

**OceanStor V3 DAS
V300R006**

Administrator Guide

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About This Document

Purpose

This document describes routine operations of the OceanStor V3 DAS storage system, including configuration, management, capacity expansion, troubleshooting, and parts replacement.

Intended Audience

This document is intended for:

- Technical support engineers
- Maintenance engineers

Symbol Conventions

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

Symbol	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
 NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue 01 (2017-06-01)

This is the first official release.

Issue 02 (2017-11-30)

This is the second official release.

Optimized some descriptions.

Issue 03 (2018-02-09)

This is the third official release.

Added description about 4 U SAS disk enclosures with DC power.

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1 Safety Operation Guide

About This Chapter

This chapter provides guidelines for safety operations during activities such as installation, maintenance, and troubleshooting. The guidelines consist of the safety regulations for personnel and equipment. These guidelines must be followed to avoid personal injury and equipment damage.

[1.1 Alarm and Safety Symbols](#)

When you install or maintain equipment, observe the precautions provided by alarms and safety symbols to prevent personal injury or equipment damage.

[1.2 ESD](#)

When installing or maintaining the equipment, follow the ESD safety precautions to prevent personal injury or equipment damage.

[1.3 Short Circuit](#)

When installing or maintaining equipment, use and place the tools according to the instructions to reduce the risk of short circuits.

[1.4 Operating the Equipment](#)

Before operating the equipment, ensure that safety precautions have been taken to prevent personal injury and equipment damage.

1.1 Alarm and Safety Symbols

When you install or maintain equipment, observe the precautions provided by alarms and safety symbols to prevent personal injury or equipment damage.

[Table 1-1](#) lists the safety symbols labeled on equipment.

Table 1-1 Safety symbols labeled on equipment

Symbol	Description
	<p>ESD Protection Symbol Indicates a caution that you need to wear an electrostatic discharge (ESD) wrist strap or glove to avoid personal injury or equipment damage caused by electrostatic.</p>
	<p>Enclosure Grounding Symbol Indicates the position of the grounding point.</p>
	<p>System Disk Swap and Installation Warning Symbol Indicates that you should be cautious to swap, install or pull out a system disk.</p>

1.2 ESD

When installing or maintaining the equipment, follow the ESD safety precautions to prevent personal injury or equipment damage.



indicates an electrostatic sensitive area. When operating equipment in this area, wear an ESD wrist strap, ESD clothes, or ESD gloves, to prevent personal injury or equipment damage. Note the following:

- Do not wear an ESD strap while the equipment is powering on. This may cause a power shock.
- Do not touch the device with bare hands to avoid damaging the electrostatic sensitive devices (ESSDs) on the circuit board.
- The electronic line is very prone to electrostatic damage. Wear the ESD wrist strap, ESD gloves, and ESD clothes properly when handling disks, especially bare disks. Hold only the edge of the disks.
- Since an ESD wrist strap only prevents static electricity from the body, ESD clothes are required to prevent static electricity from clothes.
- Before installing or replacing devices, wear an ESD wrist strap, ESD gloves, and ESD clothes to prevent static electricity from causing damage to you and equipment.
- Use special ESD bags to carry or transport the parts.

1.3 Short Circuit

When installing or maintaining equipment, use and place the tools according to the instructions to reduce the risk of short circuits.



NOTICE

- Do not place tools on the air deflection vane of the enclosure. Otherwise, a short circuit may result.
 - Do not drop screws into the enclosure or the equipment. Otherwise, a short circuit may result.
-

1.4 Operating the Equipment

Before operating the equipment, ensure that safety precautions have been taken to prevent personal injury and equipment damage.

Power-on and Power-off



DANGER

- Before checking the device and cables, ensure that the system power supply is switched off.
 - Do not wear an ESD wrist strap when the equipment is being powered on to reduce the risk of receiving a power shock.
 - Do not switch cables and field replaceable units (FRUs) during system startup. Otherwise, data loss may occur.
 - After switching off the power supply, wait at least 1 minute before switching it back on again.
 - To reduce the risk of disk damage and data loss, do not switch the power supply off while any disk running indicators are still blinking.
-

Troubleshooting



DANGER

- Do not touch the cable connectors. Otherwise, an electrical shock may occur if there is current in the cables.
 - Do not touch the device with bare hands in electrostatic sensitive areas. Wear an ESD wrist strap, ESD gloves, or ESD clothes to prevent personal injury or equipment damage.
-

For troubleshooting, be aware of the following precautions:

- Do not perform troubleshooting during thunderstorms.
- Ensure that the power cable is intact and the grounding measures are safe and effective.
- Keep the troubleshooting area clean and dry.

2 Discovering Devices on an Application Server

About This Chapter

After storage devices are installed and powered on and zones are configured, you need to scan for disks on the application server to ensure that the provided storage space is available.

[2.1 Discovering Devices on an Application Server \(Windows\)](#)

This section describes how to discover devices on an application server running Windows.

[2.2 Discovering Devices on an Application Server \(Linux\)](#)

This section describes how to discover devices on an application server running Linux.

2.1 Discovering Devices on an Application Server (Windows)

This section describes how to discover devices on an application server running Windows.

Prerequisites

The application server has been connected to the storage device and they are communicating properly.

Procedure

Step 1 Press **Windows+R** to open the **Run** dialog box.

Step 2 Type **compmgmt.msc** and press **Enter**.

The **Computer Management** interface is displayed.

Step 3 In the navigation tree, choose **Storage > Disk Management**.

On the right of the interface, check and confirm newly-added disks.

----End

2.2 Discovering Devices on an Application Server (Linux)

This section describes how to discover devices on an application server running Linux.

Prerequisites

The application server has been connected to the storage device and they are communicating properly.

Procedure

Step 1 Log in to the CLI through the management network port of the server.

Step 2 Run the **lsscsi | grep disk** command to view information about newly-added disks.

The command output is as follows:

```
[root@localhost ~]# lsscsi | grep disk
[0:0:0:0]    disk    SEAGATE  ST9300653SS      0004  -
[0:0:1:0]    disk    SEAGATE  ST9300653SS      0004  -
[0:1:0:0]    disk    LSI     Logical Volume   3000  /dev/sdbs
[1:0:365:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sda
[1:0:366:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdb
[1:0:367:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdc
[1:0:368:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdd
[1:0:369:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sde
[1:0:370:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdf
[1:0:371:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdg
[1:0:372:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdh
[1:0:373:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdi
[1:0:374:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdj
[1:0:375:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdk
[1:0:376:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdl
[1:0:377:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdm
[1:0:379:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdn
[1:0:380:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdo
[1:0:381:0]   disk    HGST    HUS726060AL4210  A7MH  /dev/sdp
```



Check that newly-added disks have been identified based on the disk model.

----End

3 Managing Storage Devices

About This Chapter

This chapter describes how to manage storage devices, including checking basic information about the devices, indicators and operating status, and powering on and off the devices.

[3.1 Managing Basic Information About a Storage Device](#)

This section describes how to query basic information about a storage device, change the password for logging in to the device, query the device running mode, and log in to the CLI of the device.

[3.2 Checking the Operating Environment of the Storage Device](#)

Check that the operating environment under which the storage device works meets associated requirements to ensure stable running of the device.

[3.3 Checking Indicators](#)

Indicators reflect the working status of hardware in real time. By observing these indicators, you can quickly assess whether the hardware is working properly.

[3.4 Checking Device Running Status \(Windows\)](#)

Checking device status enables you to quickly assess whether the devices are working normally. This section uses sg3_utils as an example to explain how to check device status using standard SES commands in the Windows operating system.

[3.5 Checking Device Running Status \(Linux\)](#)

Checking device status enables you to quickly assess whether the devices are working normally. This section uses sg3_utils as an example to explain how to check device status using standard SES commands in the Linux operating system.

[3.6 Powering on or off the Storage Device](#)

Powering on or off a storage device includes powering on or off interface modules and other hardware components. A correct procedure effectively avoids device damage caused by misoperations.

[3.7 Collecting System Logs](#)

When exceptions occur on a storage device, log information can help locating the cause. You can collect log information through a serial port or a management network port.

[3.8 Managing Bit Error Isolation](#)

When bit error isolation is enabled, a phy of a storage device will be isolated if its bit error rate exceeds the threshold, ensuring normal service running.

3.1 Managing Basic Information About a Storage Device

This section describes how to query basic information about a storage device, change the password for logging in to the device, query the device running mode, and log in to the CLI of the device.

3.1.1 Querying Basic Device Information (Windows)

This section describes how to query basic device information on a server running Windows.

Prerequisites

The sg3_utils tool has been installed on the server running Windows. This document uses sg3_utils of the 1.42 version as an example.

Procedure

Step 1 Log in to the CLI through the management network port of the server.

Step 2 Run `.\sg_scan.exe -s | findstr Device` to check the SES management systems and device number of the disk enclosure.

In the command, *Device* can be set to **HUAWEI** or the disk enclosure model (such as DAS37535U4).

- If *Device* is set to **HUAWEI**, all Huawei devices will be displayed in the output.
- If *Device* is set to the disk enclosure model (such as DAS37535U4), expander devices corresponding to this type of disk enclosures will be displayed in the output.

Taking setting *Device* to DAS37535U4 as an example, the command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_scan.exe -s | findstr
DAS37535U4
SCSI3:5,10,0    claimed=0 pdt=dh          HUAWEI      DAS37535U4-i(C)   T76
SCSI3:4,105,0   claimed=0 pdt=dh          HUAWEI      DAS37535U4        T76
SCSI3:5,43,0    claimed=0 pdt=dh          HUAWEI      DAS37535U4-i(B)   T76
```

In the output, **DAS27535U4** indicates expansion management system SES_A on the expansion module and the corresponding device number is **SCSI3:4,105,0**. **DAS27535U4-i(B)** and **DAS27535U4-i(C)** indicate expansion management systems SES_B and SES_C on the expansion module and the corresponding device numbers are **SCSI3:5,43,0** and **SCSI3:5,10,0**, respectively.

NOTE

For DAS37535U4, each expansion module includes three management systems (SES_A, SES_B, and SES_C). Some operations can be performed in SES_A only.

Step 3 Run `.\sg_ses.exe -p 0x7 "dev_id" | findstr Disk` to check disk information.

dev_id indicates the device number such as **SCSI3:4,105,0**.

NOTE

For DAS37535U4, you need to check in the three SES management systems respectively for disk information.

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0x7
"SCSI2:7,48,0" | findstr Disk
    Overall descriptor: DiskOV
    Element 0 descriptor: Disk00
    Element 1 descriptor: Disk01
    Element 2 descriptor: Disk02
    Element 3 descriptor: Disk03
    Element 4 descriptor: Disk04
    Element 5 descriptor: Disk05
    Element 6 descriptor: Disk06
    Element 7 descriptor: Disk07
    Element 8 descriptor: Disk08
    Element 9 descriptor: Disk09
    Element 10 descriptor: Disk10
```

Elementx descriptor indicates the disk ID.

Step 4 Run **.\sg_ses.exe -p 0x7 "dev_id" | findstr CoolingFan** to check fan information.

dev_id indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

For DAS37535U4, you need to check fan information in the SES_A management system.

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0x7
"SCSI2:5,28,0" | findstr CoolingFan
    Overall descriptor: CoolingFanOV
    Element 0 descriptor: CoolingFan00
    Element 1 descriptor: CoolingFan01
```

Elementx descriptor indicates the fan ID.

Step 5 Run **.\sg_ses.exe -p 0x7 "dev_id" | findstr PowerSupply** to check power supply information.

dev_id indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

For DAS37535U4, you need to check power supply information in the SES_A management system.

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0x7
"SCSI2:5,28,0" | findstr PowerSupply
    Overall descriptor: PowerSupplyOV
    Element 0 descriptor: PowerSupply00
    Element 1 descriptor: PowerSupply01
    Element 2 descriptor: PowerSupply02
    Element 3 descriptor: PowerSupply03
```

Elementx descriptor indicates the power module ID.

Step 6 Run **.\sg_ses.exe -p 0x7 "dev_id" | findstr Temperature** to check temperature information.

dev_id indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

For DAS37535U4, you need to check temperature in the SES_A management system.

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0x7
"SCSI2:5,28,0" | findstr Temperature
    Element type: Temperature sensor, subenclosure id: 0 [ti=3]
    Overall descriptor: TemperatureOV
    Element 0 descriptor: Temperature00
```

```
Element 1 descriptor: Temperature01
Element 2 descriptor: Temperature02
Element 3 descriptor: Temperature03
Element 4 descriptor: Temperature04
Element 5 descriptor: Temperature05
Element 6 descriptor: Temperature06
Element 7 descriptor: Temperature07
Element 8 descriptor: Temperature08
Element 9 descriptor: Temperature09
Element 10 descriptor: Temperature10
Element 11 descriptor: Temperature11
```

Element x descriptor indicates the power point ID.

Step 7 Run `.\sg_ses.exe -p 0x7 "dev_id" | findstr Voltage` to check voltage information.

dev_id indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

For DAS37535U4, you need to check voltage information in the SES_A management system.

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0x7
"SCSI2:5,28,0" | findstr Voltage
Element type: Voltage sensor, subenclosure id: 0 [ti=4]
    Overall descriptor: VoltageOV
    Element 0 descriptor: Voltage00
    Element 1 descriptor: Voltage01
    Element 2 descriptor: Voltage02
    Element 3 descriptor: Voltage03
    Element 4 descriptor: Voltage04
    Element 5 descriptor: Voltage05
    Element 6 descriptor: Voltage06
```

Elementx descriptor indicates the voltage point ID.

Step 8 Run `.\sg_ses.exe -p 0x7 "dev_id" | findstr Enclosure` to check disk enclosure information.

dev_id indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

For DAS37535U4, you need to check disk enclosure information in the SES_A management system.

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0x7
"SCSI2:5,28,0" | findstr Enclosure
Element type: Enclosure services controller electronics, subenclosure id: 0
[ti=5]
Element type: Enclosure, subenclosure id: 0 [ti=6]
    Overall descriptor: EnclosureOV
    Element 0 descriptor: Enclosure00
```

Elementx descriptor indicates the disk enclosure ID.

Step 9 Run `.\sg_ses.exe -p 0x7 "dev_id" | findstr Expander` to check expansion module information.

dev_id indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

For DAS37535U4, you need to check expansion module information in the SES_A management system.

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0x7
"SCSI2:5,28,0" | findstr Expander
```

```
Overall descriptor: ExpanderOV
Element 0 descriptor: Expander00
```

Elementx descriptor indicates the expansion module ID.

----End

3.1.2 Querying Basic Device Information (Linux)

This section describes how to query basic device information on a server running Linux.

Prerequisites

The sg3_utils tool has been installed on the server running Linux. This document uses sg3_utils of the 1.42 version as an example.

Procedure

Step 1 Log in to the CLI through the management network port of the server.

Step 2 Run **lsscsi -g | grep Device** or **sg_map -i | grep Device** to check the SES management systems and device number of the disk enclosure.

In the command, *Device* can be set to **HUAWEI** or the disk enclosure model (such as DAS37535U4).

- If *Device* is set to **HUAWEI**, all Huawei devices will be displayed in the output.
- If *Device* is set to the disk enclosure model (such as DAS37535U4), expander devices corresponding to this type of disk enclosures will be displayed in the output.

Taking setting *Device* to DAS37535U4 as an example, the outputs of running the two commands are as follows:

```
[root@localhost ~]# lsscsi -g | grep DAS37535U4
[1:0:64828:0]enclosu HUAWEI    DAS37535U4        T76      -          /dev/sg10
[1:0:64841:0]enclosu HUAWEI    DAS37535U4-i(B)   T76      -          /dev/sg23
[1:0:64858:0]enclosu HUAWEI    DAS37535U4-i(C)   T76      -          /dev/sg40
[root@localhost ~]# sg_map -i | grep DAS37535U4
/dev/sg10  HUAWEI    DAS37535U4        T76
/dev/sg23  HUAWEI    DAS37535U4-i(B)   T76
/dev/sg40  HUAWEI    DAS37535U4-i(C)   T76
```

In the output, **DAS27535U4** indicates expansion management system SES_A on the expansion module and the corresponding device number is **/dev/sg10**. **DAS27535U4-i(B)** and **DAS27535U4-i(C)** indicate expansion management systems SES_B and SES_C on the expansion module and the corresponding device numbers are **/dev/sg23** and **/dev/sg40**, respectively.

 **NOTE**

For DAS37535U4, each expansion module includes three management systems (SES_A, SES_B, and SES_C). Some operations can be performed in SES_A only.

Step 3 Run **sg_ses -p 0x7 /dev/sgxx | grep Disk** to check disk information.

/dev/sgxx indicates the device number such as **/dev/sg10**.

 **NOTE**

For DAS37535U4, you need to check in the three SES management systems respectively for disk information.

The execution result is as follows:

```
[root@localhost ~]# sg_ses -p 0x7 /dev/sg18 | grep Disk
    Overall descriptor: DiskOV
    Element 0 descriptor: Disk00
    Element 1 descriptor: Disk01
    Element 2 descriptor: Disk02
    Element 3 descriptor: Disk03
    Element 4 descriptor: Disk04
    Element 5 descriptor: Disk05
    Element 6 descriptor: Disk06
    Element 7 descriptor: Disk07
    Element 8 descriptor: Disk08
    Element 9 descriptor: Disk09
    Element 10 descriptor: Disk10
```

Elementx descriptor indicates the disk ID.

Step 4 Run **sg_ses -p 0x7 /dev/sgxx | grep CoolingFan** to check fan information.

/dev/sgxx indicates the device number such as /dev/sg10.

 **NOTE**

For DAS37535U4, you need to check fan information in the SES_A management system.

The execution result is as follows:

```
[root@localhost ~]# sg_ses -p 0x7 /dev/sg18 | grep CoolingFan
    Overall descriptor: CoolingFanOV
    Element 0 descriptor: CoolingFan00
    Element 1 descriptor: CoolingFan01
```

Elementx descriptor indicates the fan ID.

Step 5 Run **sg_ses -p 0x7 /dev/sgxx | grep PowerSupply** to check power supply information.

/dev/sgxx indicates the device number such as /dev/sg10.

 **NOTE**

For DAS37535U4, you need to check power supply information in the SES_A management system.

The execution result is as follows:

```
[root@localhost ~]# sg_ses -p 0x7 /dev/sg18 | grep PowerSupply
    Overall descriptor: PowerSupplyOV
    Element 0 descriptor: PowerSupply00
    Element 1 descriptor: PowerSupply01
    Element 2 descriptor: PowerSupply02
    Element 3 descriptor: PowerSupply03
```

Elementx descriptor indicates the power module ID.

Step 6 Run **sg_ses -p 0x7 /dev/sgxx | grep Temperature** to check temperature.

/dev/sgxx indicates the device number such as /dev/sg10.

 **NOTE**

For DAS37535U4, you need to check temperature in the SES_A management system.

The execution result is as follows:

```
[root@localhost ~]# sg_ses -p 0x7 /dev/sg18 | grep Temperature
    Element type: Temperature sensor, subenclosure id: 0 [ti=3]
    Overall descriptor: TemperatureOV
    Element 0 descriptor: Temperature00
    Element 1 descriptor: Temperature01
    Element 2 descriptor: Temperature02
    Element 3 descriptor: Temperature03
    Element 4 descriptor: Temperature04
    Element 5 descriptor: Temperature05
```

```
Element 6 descriptor: Temperature06
Element 7 descriptor: Temperature07
Element 8 descriptor: Temperature08
Element 9 descriptor: Temperature09
Element 10 descriptor: Temperature10
Element 11 descriptor: Temperature11
```

Element x descriptor indicates the power point ID.

Step 7 Run **sg_ses -p 0x7 /dev/sgxx | grep Voltage** to check voltage information.

/dev/sgxx indicates the device number such as /dev/sg10.

 **NOTE**

For DAS37535U4, you need to check voltage information in the SES_A management system.

The execution result is as follows:

```
[root@localhost ~]# sg_ses -p 0x7 /dev/sg18 | grep Voltage
Element type: Voltage sensor, subenclosure id: 0 [ti=4]
    Overall descriptor: VoltageOV
    Element 0 descriptor: Voltage00
    Element 1 descriptor: Voltage01
    Element 2 descriptor: Voltage02
    Element 3 descriptor: Voltage03
    Element 4 descriptor: Voltage04
    Element 5 descriptor: Voltage05
    Element 6 descriptor: Voltage06
```

Elementx descriptor indicates the voltage point ID.

Step 8 Run **sg_ses -p 0x7 /dev/sgxx | grep Enclosure** to check disk enclosure information.

/dev/sgxx indicates the device number such as /dev/sg10.

 **NOTE**

For DAS37535U4, you need to check disk enclosure information in the SES_A management system.

The execution result is as follows:

```
[root@localhost ~]# sg_ses -p 0x7 /dev/sg18 | grep Enclosure
Element type: Enclosure services controller electronics, subenclosure id: 0
[ti=5]
    Element type: Enclosure, subenclosure id: 0 [ti=6]
        Overall descriptor: EnclosureOV
        Element 0 descriptor: Enclosure00
```

Elementx descriptor indicates the disk enclosure ID.

Step 9 Run **sg_ses -p 0x7 /dev/sgxx | grep Expander** to check expansion module information.

/dev/sgxx indicates the device number such as /dev/sg10.

 **NOTE**

For DAS37535U4, you need to check expansion module information in the SES_A management system.

The execution result is as follows:

```
[root@localhost ~]# sg_ses -p 0x7 /dev/sg18 | grep Expander
Overall descriptor: ExpanderOV
Element 0 descriptor: Expander00
```

Elementx descriptor indicates the expansion module ID.

----End

3.1.3 Checking the SES Firmware Version (Windows)

This section describes how to check the SES firmware version on a server running Windows.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `.\sg_ses.exe -p 0x97 dev_id` to check the SES firmware version.

`dev_id` indicates the device number such as **SCSI3:4,105,0**.

NOTE

- For DAS37535U4, you need to run the previous command on three SES management systems respectively to check the SES firmware version.
- To obtain related device information, see [3.1.1 Querying Basic Device Information \(Windows\)](#) .

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0x97
"SCSI2:5,28,0"
    HUAWEI      DAS37535U4          T68
Cannot decode response from diagnostic page: <unknown>
 00      97 00 00 0a 32 30 2e 39  33 54 36 38 00 00           ....20.93T68..
```

----End

3.1.4 Checking the SES Firmware Version (Linux)

This section describes how to check the SES firmware version on a server running Linux.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses -p 0x97 /dev/sgxx` to check the SES firmware version.

`/dev/sgxx` indicates the device number such as the `/dev/sg10`.

NOTE

- For DAS37535U4, you need to run the previous command on three SES management systems respectively to check the SES firmware version.
- To obtain related device information, see [3.1.2 Querying Basic Device Information \(Linux\)](#) .

The execution result is as follows:

```
[root@localhost ~]# sg_ses -p 0x97 /dev/sg11
    HUAWEI      DAS37535U4          T68
Cannot decode response from diagnostic page: <unknown>
 00      97 00 00 0a 32 30 2e 39  33 54 36 38 00 00           ....20.93T68..
```

----End

3.1.5 Checking the CPLD Firmware Version (Windows)

This section describes how to check the CPLD firmware version on a server running Windows.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `.\sg_ses.exe -p 0xb2 dev_id` to check the CPLD firmware version.

`dev_id` indicates the device number such as **SCSI3:4,105,0**.



To obtain related device information, see [3.1.1 Querying Basic Device Information \(Windows\)](#).

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0xb2
"SCSI2:5,28,0"
    HUAWEI      DAS37535U4          T68
Cannot decode response from diagnostic page: <unknown>
 00      b2 00 00 0a 32 30 30 54  32 37 00 00 00 00      ....200T27....
```

----End

3.1.6 Checking the CPLD Firmware Version (Linux)

This section describes how to check the CPLD firmware version on a server running Linux.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses -p 0xb2 /dev/sgxx` to check the CPLD firmware version.

`/dev/sgxx` indicates the device number such as the `/dev/sg10`.



To obtain related device information, see [3.1.2 Querying Basic Device Information \(Linux\)](#).

The execution result is as follows:

```
[root@localhost ~]# sg_ses -p 0xb2 /dev/sg11
    HUAWEI      DAS37535U4          T68
Cannot decode response from diagnostic page: <unknown>
 00      b2 00 00 0a 32 30 30 54  32 37 00 00 00 00      ....200T27....
```

----End

3.1.7 Logging In to the CLI Through a Serial Port

This section describes how to log in to the CLI of a storage device through a serial port for device management and maintenance.

Prerequisites

The maintenance terminal has been connected to the storage device through a serial port.

Context

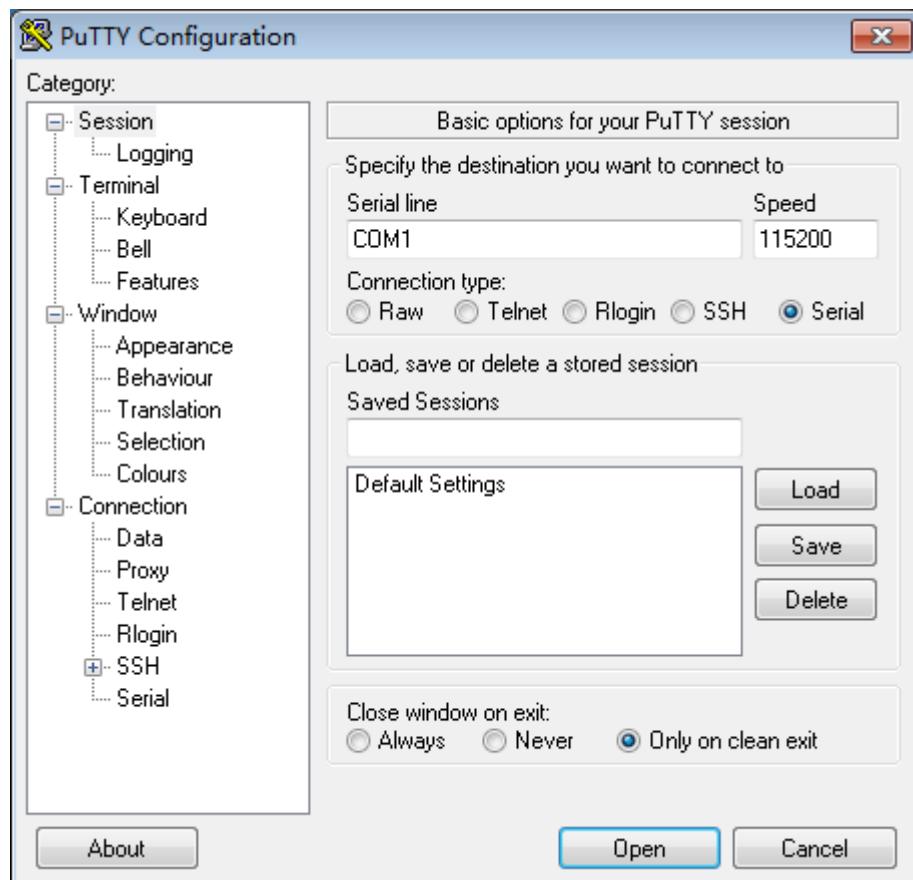
This section uses PuTTY as an example. You can download PuTTY from chiark website.

Procedure

Step 1 Run PuTTY.

The **PuTTY Configuration** dialog box is displayed, as shown in [Figure 3-1](#).

Figure 3-1 PuTTY Configuration



Step 2 In **Connection type**, select **Serial**. In **Speed**, enter **115200**.

Step 3 Click **Open**. The CLI login page is displayed, as shown in the following:

UserName:

Step 4 Enter the user name and password as prompted. The following figure shows the result of a successful login.

```
UserName:admin
Password:*****
Only authorised users are allowed to access the system in accordance with any
legal obligations.
PANGEA_SES:>
```

 **NOTE**

- The default user name and password are **admin** and **Admin@storage** respectively.
- To ensure the system security, you are advised to change the password upon your first login, and to periodically change the password in the future. For details about how to change the password, see [3.1.10 Changing the Login Password](#).

----End

3.1.8 Logging In to the CLI Through a Management Network Port (Linux)

This section describes how to log in to the CLI of a storage device through a management network port of a server running Linux for device management and maintenance.

Prerequisites

- The maintenance terminal has been connected to the server through a management network port.
- GNU Compiler Collection (GCC) has been installed on the server running Linux.

Context

- This section uses PuTTY as an example. You can download PuTTY from chiark website.
- This document uses sg3_utils-1.42 as an example. You can download the sg3_utils software from sg3_util website.

Procedure

Step 1 Install sg3_utils on the server running Linux.

1. Upload the installation package to the **/root/** directory on the server running Linux.
2. Run the **tar -zvxf** command to decompress the installation package.

```
[root@localhost ~]# tar -zvxf sg3_utils-1.42.tgz
sg3_utils-1.42/
sg3_utils-1.42/Makefile.am
sg3_utils-1.42/lib/
sg3_utils-1.42/lib/sg_pt_common.c
sg3_utils-1.42/lib/Makefile.am
sg3_utils-1.42/lib/sg_cmds_basic2.c
sg3_utils-1.42/lib/Makefile.in
sg3_utils-1.42/lib/sg_pt_solaris.c
sg3_utils-1.42/lib/sg_lib.c
```

3. Run the **cd** command to access the installation directory.

```
[root@localhost ~]# cd sg3_utils-1.42/
[root@localhost sg3_utils-1.42]#
```

4. Run the **./configure** command.

```
[root@localhost sg3_utils-1.42]#
[root@localhost sg3_utils-1.42]# ./configure
```

```
checking for a BSD-compatible install... /usr/bin/install -c
checking whether build environment is sane... yes
checking for a thread-safe mkdir -p... /usr/bin/mkdir -p
```

5. Run the **make** command.

```
[root@localhost sg3_utils-1.42]# make
make all-recursive
make[1]: Entering directory `/root/sg3_utils-1.42'
Making all in include
make[2]: Entering directory `/root/sg3_utils-1.42/include'
```

6. Run the **make install** command to install the software.

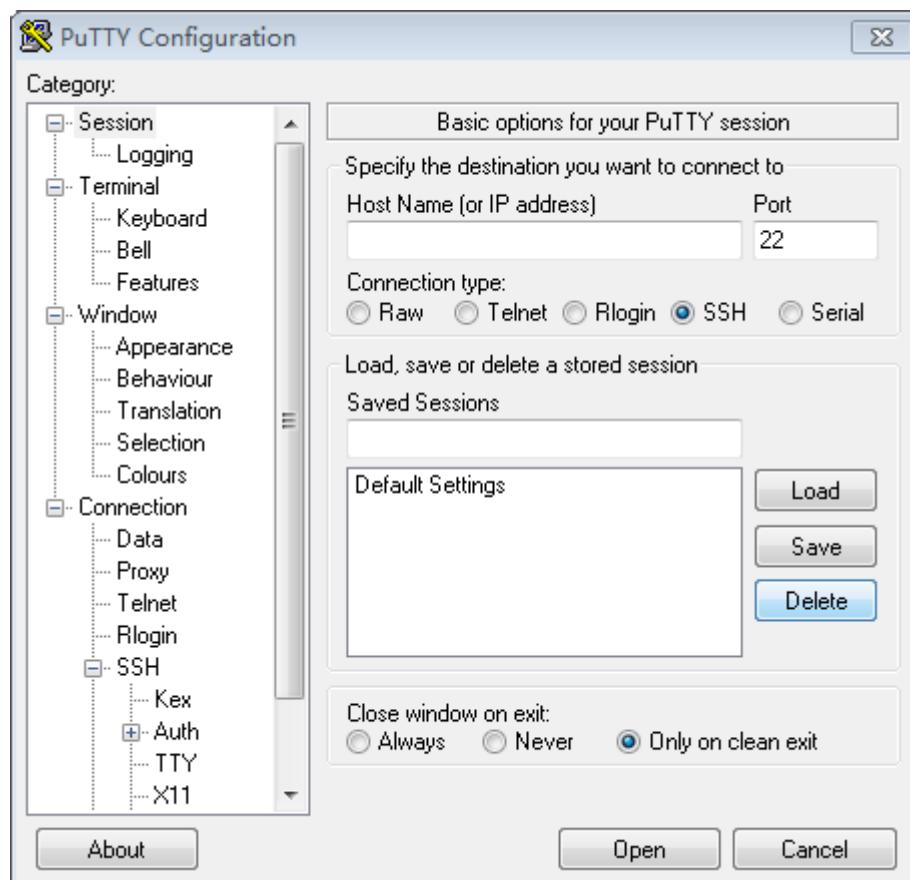
```
[root@localhost sg3_utils-1.42]#
[root@localhost sg3_utils-1.42]# make install
Making install in include
make[1]: Entering directory `/root/sg3_utils-1.42/include'
make[2]: Entering directory `/root/sg3_utils-1.42/include'
make[2]: Nothing to be done for `install-exec-am'.
/usr/bin/mkdir -p '/usr/local/include/scsi'
/usr/bin/install -c -m 644 sg_lib.h sg_lib_data.h sg_cmds.h sg_cmds_basic.h
sg_cmds_extra.h sg_cmds_mmc.h sg_pt.h sg_linux_inc.h sg_io_linux.h '/usr/
local/include/scsi'
```

7. Run the **sg_ses --version** command to query the version and confirm that the installation succeeds.

```
[root@localhost sg3_utils-1.42]# sg_ses --version
version: x.xx xxxxxx
```

Step 2 Run PuTTY.

The **PuTTY Configuration** dialog box is displayed, as shown in [Figure 3-2](#).

Figure 3-2 PuTTY Configuration

Step 3 Select **Session**. In **Host Name (or IP address)** of the **Specify the destination you want to connect to** area, enter the IP address of the Linux server's management network port that connects to the maintenance terminal and set **Connection type** to **SSH**.

Step 4 Click **Open**. The CLI login page is displayed, as shown in the following:

login as:

Step 5 Enter the user name and password as prompted. The following figure shows the result of a successful login.

```
Last login: Mon Apr 10 10:38:06 2017 from XXX.XXX.XXX.XXX
[root@localhost ~]#
```

----End

3.1.9 Logging In to the CLI Through a Management Network Port (Windows)

This section describes how to log in to the CLI of a storage device through a management network port of a server running Windows for device management and maintenance.

Prerequisites

- The maintenance terminal has been connected to the server through a management network port.
- The sg3_utils tool has been stored on the server and the storage path has been obtained.

Context

This document uses sg3_utils-1.42 as an example. You can download the sg3_utils software from sg3_util website.

Procedure

Step 1 Install sg3_utils on the server running Windows.

Decompress the installation package to any directory on the server running Windows. This document uses **C:\Users\Administrator\Documents** as an example.

Step 2 Log in to the server remotely through the maintenance terminal.

1. Choose **Start > All Programs > Accessories > Remote Desktop Connection**.

The **Remote Desktop Connection** dialog box is displayed.

2. In **Computer**, enter the IP address of the management network port on the server, and press **Enter**.

3. Enter the user name and password, and press **Enter**.

The main interface of the server is displayed.

Step 3 Open the powershell command window.

1. Press **Windows+R** to open the **Run** dialog box.

2. Type **PowerShell** and press **Enter**.

The powershell command window is displayed.

```
PS C:\Users\Administrator>
```

- Step 4** Type **cd C:\Users\Administrator\Documents\sg3_utils-1.42** and press **Enter** to open the CLI. In the command, **C:\Users\Administrator\Documents\sg3_utils-1.42** indicates the storage path of the sg3_utils tool package on the server.

```
PS C:\Users\Administrator> cd C:\Users\Administrator\Documents\sg3_utils-1.42  
PS C:\Users\Administrator\Documents\sg3_utils-1.42>
```

----End

3.1.10 Changing the Login Password

To ensure system security, you are advised to change the default password after logging in to the CLI of storage device for the first time, and change the password periodically in the future to prevent password leakage.

Prerequisites

The maintenance terminal has been connected to the device through a serial port and the communication is normal.

Procedure

- Step 1** Log in to the CLI of the storage device through a serial port.

- Step 2** Run **changepassword old_password new_password new_password**. In the command, **old_password** indicates the current login password and **new_password** indicates the new password.

The command output is as follows:

```
PANGEA_SES:>changepassword xxxx xxxx xxxx
```

UserName:



NOTE

The new password must:

- contain 8 to 20 characters.
- contain at least two of the following types: uppercase letters, lowercase letters, digits, and special characters.

- Step 3** After the password is changed, enter the user name and the new password as prompted to log in to the CLI. Then you can perform management operations on the storage device using serial port commands.

----End

3.1.11 Changing the Login Timeout Interval

If no operation is performed through the serial port within the specified login timeout interval, the serial port will be locked. To use this serial port, you need to log in to the storage device again. This enhances system security.

Prerequisites

The maintenance terminal has been connected to the device through the serial port and the communication is normal.

Procedure

Step 1 Log in to the CLI of the storage device.

Step 2 Run the **overtime time** command, where **time** indicates the login timeout interval. The value range is 120 to 2147483647 and the unit is second.

The command output is as follows:

```
PANGEA_SES:>overtime 124
set uart logout threshold 124
```

 **NOTE**

- The default login timeout interval is 5 minutes.
- If no operation is performed within this period of time, the serial port will be locked. You need to enter the user name and password again for further operations.

----End

3.1.12 Querying the Operating Mode of a Storage Device

You need to confirm that the storage device is operating in JBOD mode.

Prerequisites

The maintenance terminal has been connected to the storage device through a serial port.

Procedure

Step 1 Log in to the CLI of the storage device through a serial port.

Step 2 Run **showenclmode**.

Taking DAS32435U4 as an example, the command output is as follows:

```
PANGEA_SES:>showenclmode
Encl mode <JBOD>
```

If the operating mode is **JBOD**, the storage device is operating normally. If the operating mode is **ARRAY**, contact Huawei technical support engineers.

----End

3.2 Checking the Operating Environment of the Storage Device

Check that the operating environment under which the storage device works meets associated requirements to ensure stable running of the device.

3.2.1 Checking the Equipment Room Environment

The equipment room environment must meet requirements to ensure the stable running of storage devices. Checking the equipment room environment periodically reduces the possibility of storage system failures.

Impact on the System

Storage systems pose demanding requirements on the equipment room environment. Exceptions may occur if the environment cannot meet the requirements.

Tools and Materials

Prepare the tools and materials for checking the equipment room environment first, such as a thermometer, a hydrometer, and a multimeter.

Reference Standard

Table 3-1 describes the check items and standards of an equipment room environment.

Table 3-1 Check items and standards of an equipment room environment

Check Item		Expected Result
Temperature	Operating temperature	<ul style="list-style-type: none">● When the altitude is -60 m to 1800 m<ul style="list-style-type: none">- DAS32525U2: 5°C to 40°C- DAS32435U4: 5°C to 40°C- DAS37535U4: 5°C to 35°C● At altitudes between 1800 m and 3000 m, the ambient temperature drops by 1°C for every altitude increase of 220 m.
	Storage temperature	-40°C (-40°F) to +70°C (158°F)
Humidity	Operating humidity	10% R.H. to 90% R.H.
	Storage humidity	5%R.H. to 95%R.H.
Vibration	Operating vibration	5 Hz to 300 Hz: 1.5 m/s ² , 0.5 oct/min 3 axes, 1 sweep cycles per axis, 5 Hz to 500 Hz, 0.27 Grms, 3 axes, 10min per axis
	Non-operating vibration	5 Hz to 20 Hz, PSD: 1.0 m ² /s ³ ; 20 Hz to 200 Hz, -3 dB/oct; 3 axes, 30 min per axis
Non-working impulse		half sine, 6 ms, 300 m/s ² , 6 directions, 3 times per direction
Altitude	Operating altitude of disks	<ul style="list-style-type: none">● HDDs: -304.8 m to +3048 m● SSDs: -305 m to +3048 m
	Non-operating altitude of disks	<ul style="list-style-type: none">● HDDs: -305 m to +12,192 m● SSDs: -305 m to +12,192 m
Particle contaminants		ISO ^a 14664-1 Class8

Check Item	Expected Result	
Corrosive airborne contaminants	<ul style="list-style-type: none">● The corrosion rate of the copper test wafer is lower than 300 Å per month in compliance with ANSIc/ISAd-71.04 environmental corrosion G1 level.● The corrosion rate of the silver test wafer is lower than 200 Å per month in compliance with ANSIc/ISAd-71.04 environmental corrosion G1 level.● You are advised to ask a professional organization to monitor corrosive airborne contaminants in the equipment room.● In the following example scenarios, environmental corrosion risks exist in preliminary evaluation:<ul style="list-style-type: none">- The equipment room is near sulfurous gas emission sources, for example, porcelain factories, rubber plants, tire factories, chemical factories, sewage plants, power stations, paper mills, smelters, automobile factories, coal mines, electroplating factories, food factories, or tanneries.- The equipment room is near the sea, saline, sewer outlets, sewage treatment tanks, or industrial/heating boilers.- The equipment room was decorated in the latest six months.- Batteries are stocked in the equipment room, and battery leakage occurs.- The doors or windows of the equipment room are not closed tightly.	
Power supply indicators	DAS32525U2 rated voltage and currency	<ul style="list-style-type: none">● AC: 100 V to 240 V, ±10%, 10 A, single-phase, 50/60 Hz● High voltage DC (N/A for North America and Canada): 240 V, ±20%, 10 A
	DAS32435U4 rated voltage and currency	<ul style="list-style-type: none">● AC: 100 V to 240 V, ±10%, 10 A, single-phase, 50/60 Hz● High voltage DC (N/A for North America and Canada): 240 V, 800 W, 10 A
	DAS37535U4 rated voltage and currency	<ul style="list-style-type: none">● AC:<ul style="list-style-type: none">- 100 V to 127 V, ±10%, 10 A, single-phase, 50/60 Hz- 100 V to 240 V, ±10%, 10 A, single-phase, 50/60 Hz● DC: -48 V to -60 V, ±20%, 26 A

Check Item	Expected Result
a: ISO is short for International Organization for Standardization. b: Å is a unit of length equal to 1/10,000,000,000 (one ten billionth) of a meter. c: ANSI is short for American National Standards Institute. d: ISA is short for Instrument Society of America.	

Procedure

- Use a thermometer to measure the ambient temperature.
- Use a hydrometer to measure the ambient humidity.
- Check the altitude of the equipment room.
- Ask a professional organization to monitor particle and corrosive airborne contaminants in the equipment room.
- Check power supplies of the equipment room.

----End

Exception Handling

- If the ambient temperature or humidity is outside the normal range, adjust air conditioning.
- If the power supplies fail to meet the requirements, install dedicated power supply lines and a transformer with sufficient capacity.

3.2.2 Checking Racks

Properly installed racks of the storage device help ensure the stable and long-term running of the storage device. Check rack conditions periodically to reduce device failure possibilities.

Impact on the System

The storage device imposes demanding requirements on rack conditions. An improperly installed rack impairs the proper running of the storage device.

Tools and Materials

Ensure that the tools and materials for checking rack conditions are available. The required tools include binding straps, an electroprobe, and a multimeter.

Reference Standard

Table 3-2 lists the items and standards for checking rack conditions.

Table 3-2 Rack condition check items and standards

Check Item	Standard
General layout of cables	Power cables (with strong electrical current) and service cables (with weak electrical current) lay on different sides of a rack.
Layout of power cables	Power cables are laid out orderly and arranged in a similar manner to power cables on other racks.
Layout of service cables	Service cables are laid out orderly and arranged in a similar manner to service cables on other racks.
Cable labeling	Labels are clearly marked and securely attached.
Empty slot	Empty slots are covered with filler panels for proper heat dissipation and a neat appearance.
Power cable plug	One end of each power cable is fully plugged into an external power socket and the other end into a storage device socket.
Signal cable plug	Signal cables are fully plugged into appropriate device ports.
Ground cable	One end of each ground cable is secured by a ground clip and the other end is fastened to a rack ground terminal.
Power cable	Two groups of power cables are available for redundancy.

Procedure

- Verify that power cables (with strong electrical current) and service cables (with weak electrical current) lay on different sides of a rack.
- Verify that power cables and service cables are laid out orderly and arranged in a similar manner to cables on other racks.
- Verify that labels are clearly marked and securely attached.
- Verify that vacant slots are covered with filler panels.
- Verify that one end of each power cable is fully plugged into an external power socket and the other end into a storage device socket.
- Verify that signal cables are fully plugged into appropriate device ports.
- Verify that one end of each ground cable is secured by a ground clip and the other end is fastened to a rack ground terminal.
- Verify that two groups of power cables are available for redundancy.

----End

Exception Handling

If any check item fails to meet its standard, rectify the issue by referring to **Table 3-2**.

3.3 Checking Indicators

Indicators reflect the working status of hardware in real time. By observing these indicators, you can quickly assess whether the hardware is working properly.

3.3.1 Checking Disk Enclosure Indicators (2 U Disk Enclosure)

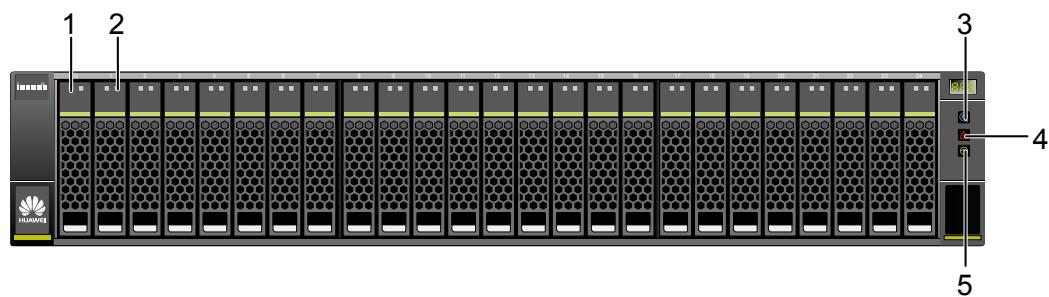
Disk enclosure indicators show the running status of a disk enclosure. By checking these indicators, you can promptly learn about the status of each component module.

Reference Standard

Disk enclosure indicators locate on the front and rear panels of the disk enclosure.

Figure 3-3 and **Figure 3-4** depict the front-panel and rear-panel indicators of the disk enclosure that has been correctly powered on.

Figure 3-3 Disk enclosure front-panel indicators



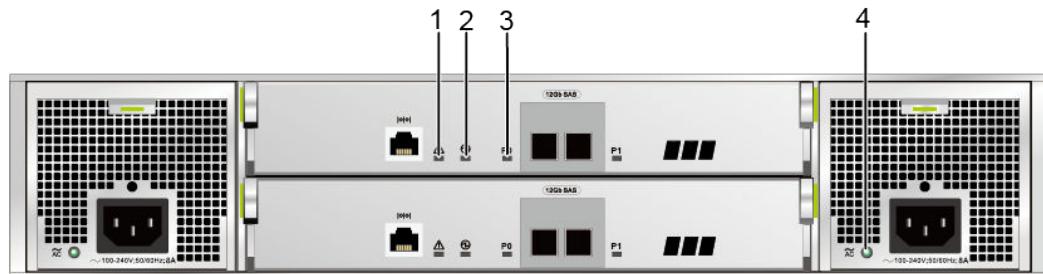
- | | |
|--|---|
| 1 Running indicator of the disk module | 2 Location/Alarm indicator of the disk module |
| 3 Location indicator of the disk enclosure | 4 Alarm indicator of the disk enclosure |
| 5 Power indicator of the disk enclosure | |

Table 3-3 lists the states and their meanings of the disk enclosure front-panel indicators shown in **Figure 3-3**.

Table 3-3 Disk enclosure front-panel indicator states and their meanings

Module	No.	Indicator	Normality	Abnormality
Disk module	1	Running indicator of the disk module	<ul style="list-style-type: none">● Steady green: The disk module is working correctly.● Blinking green: Data is being read and written on the disk module.	Off: The disk module is powered off or powered on incorrectly.

Module	No.	Indicator	Normality	Abnormality
	2	Alarm/Location indicator of the disk module	<ul style="list-style-type: none"> ● Blinking red: The disk module is being located. ● Off: The disk module is working correctly or hot swappable. 	Steady red: The disk module is faulty.
System enclosure	3	Location indicator of the disk enclosure	<ul style="list-style-type: none"> ● Blinking blue: The disk enclosure is being located. ● Off: The disk enclosure is not located. 	-
	4	Alarm indicator of the disk enclosure	Off: The disk enclosure is working correctly.	Steady red: An alarm is generated in the disk enclosure.
	5	Power indicator of the disk enclosure	Steady green: The disk enclosure is powered on.	Off: The disk enclosure is powered off.

Figure 3-4 Disk enclosure rear-panel indicators

- | | |
|---|---|
| 1 Alarm indicator of the expansion module | 2 Power indicator of the expansion module |
| 3 Indicator of the Mini SAS HD expansion port | 4 Running/Alarm indicator of the power module |

Table 3-4 lists the states and their meanings of the disk enclosure rear-panel indicators shown in **Figure 3-4**.

Table 3-4 Disk enclosure rear-panel indicator states and their meanings

Module	No.	Indicator	Normality	Abnormality
Expansion module	1	Alarm indicator of the expansion module	Off: The expansion module is working correctly.	Steady red: An alarm is generated on the expansion module.
	2	Power indicator of the expansion module	Steady green: The expansion module is powered on.	Off: The expansion module is powered off.
	3	Indicator of the Mini SAS HD expansion port	<ul style="list-style-type: none"> ● Steady blue: The link to the expansion port is normal and the data transfer rate is 4 x 12 Gbit/s. ● Steady green: The link to the expansion port is normal and the data transfer rate is 4 x 6 Gbit/s or 4 x 3 Gbit/s. 	<ul style="list-style-type: none"> ● Steady red: The port is faulty. ● Off: The link to the expansion port is down.
Power module	4	Running/Alarm indicator of the power module	<ul style="list-style-type: none"> ● Steady green: The power supply is correct. ● Blinking green: The power input is normal but the disk enclosure is powered off. 	<ul style="list-style-type: none"> ● Steady red: The power supply is faulty. ● Off: No external power input is found.

Procedure

- Check onsite front-panel and rear-panel indicators of a disk enclosure according to [Figure 3-3](#) and [Figure 3-4](#). Predetermine whether all component modules on the disk enclosure are working properly.

----End

Exception Handling

In the event that a module of the storage system is abnormal, refer to the *OceanStor V3 DAS Storage System V300R006 Product Description* to learn about detailed indicator meanings. Then, troubleshoot faults based on the detailed fault information you have obtained.

3.3.2 Checking Disk Enclosure Indicators (4 U Disk Enclosure)

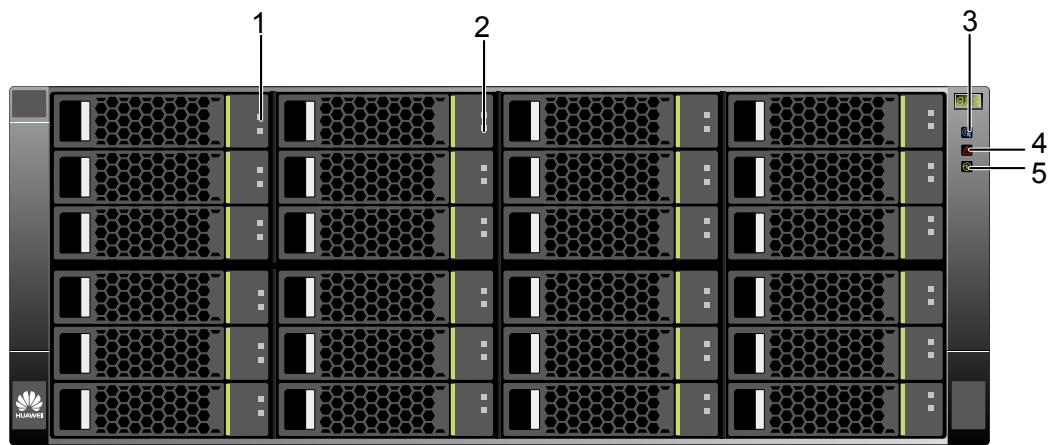
Disk enclosure indicators show the running status of a disk enclosure. By checking these indicators, you can promptly learn about the status of each component module.

Reference Standard

Disk enclosure indicators locate on the front and rear panels of the disk enclosure.

Figure 3-5 and **Figure 3-6** depict the front-panel and rear-panel indicators of the disk enclosure that has been correctly powered on.

Figure 3-5 Disk enclosure front-panel indicators



- | | |
|--|---|
| 1 Running indicator of the disk module | 2 Location/Alarm indicator of the disk module |
| 3 Location indicator of the disk enclosure | 4 Alarm indicator of the disk enclosure |
| 5 Power indicator of the disk enclosure | |

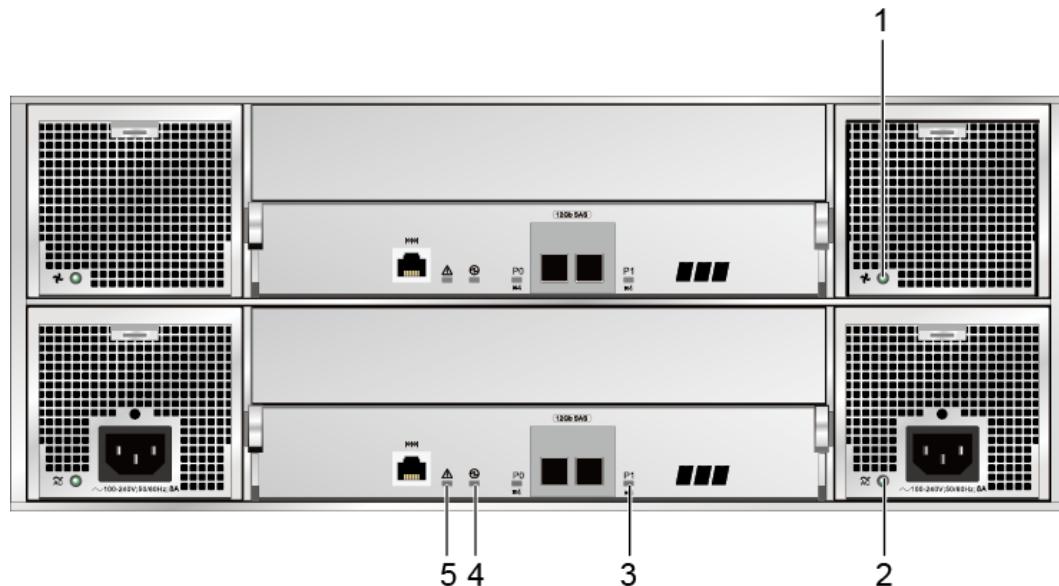
Table 3-5 lists the states and their meanings of the disk enclosure front-panel indicators shown in **Figure 3-5**.

Table 3-5 Disk enclosure front-panel indicator states and their meanings

Module	No.	Indicator	Normality	Abnormality
Disk module	1	Running indicator of the disk module	<ul style="list-style-type: none">● Steady green: The disk module is working correctly.● Blinking green: Data is being read and written on the disk module.	Off: The disk module is powered off or powered on incorrectly.

Module	No.	Indicator	Normality	Abnormality
	2	Alarm/Location indicator of the disk module	<ul style="list-style-type: none"> ● Blinking red: The disk module is being located. ● Off: The disk module is working correctly or hot swappable. 	Steady red: The disk module is faulty.
System enclosure	3	Location indicator of the disk enclosure	<ul style="list-style-type: none"> ● Blinking blue: The disk enclosure is being located. ● Off: The disk enclosure is not located. 	-
	4	Alarm indicator of the disk enclosure	Off: The disk enclosure is working correctly.	Steady red: An alarm is generated in the disk enclosure.
	5	Power indicator of the disk enclosure	Steady green: The disk enclosure is powered on.	Off: The disk enclosure is powered off.

Figure 3-6 Disk enclosure rear-panel indicators



1 Running/Alarm indicator of the fan module

2 Running/Alarm indicator of the power module

3 Indicator of the Mini SAS HD expansion port

4 Power indicator of the expansion module

5 Alarm indicator of the expansion module

Table 3-6 lists the states and their meanings of the disk enclosure rear-panel indicators shown in [Figure 3-6](#).

Table 3-6 Disk enclosure rear-panel indicator states and their meanings

Module	No.	Indicator	Normality	Abnormality
Fan module	1	Running/Alarm indicator of the fan module	Steady green: The fan module is working correctly.	<ul style="list-style-type: none">● Steady red: The fan module is faulty.● Off: The fan module is powered off.
Power module	2	Running/Alarm indicator of the power module	<ul style="list-style-type: none">● Steady green: The power supply is correct.● Blinking green: The power input is normal but the disk enclosure is powered off.	<ul style="list-style-type: none">● Steady red: The power supply is faulty.● Off: No external power input is found.
Expansion module	3	Indicator of the Mini SAS HD expansion port	<ul style="list-style-type: none">● Steady blue: The link to the expansion port is normal and the data transfer rate is 4 x 12 Gbit/s.● Steady green: The link to the expansion port is normal and the data transfer rate is 4 x 6 Gbit/s or 4 x 3 Gbit/s.	<ul style="list-style-type: none">● Steady red: The port is faulty.● Off: The link to the expansion port is down.
	4	Power indicator of the expansion module	Steady green: The expansion module is powered on.	Off: The expansion module is powered off.

Module	No.	Indicator	Normality	Abnormality
	5	Alarm indicator of the expansion module	Off: The expansion module is working correctly.	Steady red: An alarm is generated on the expansion module.

Procedure

- Check onsite front-panel and rear-panel indicators of a disk enclosure according to [Figure 3-5](#) and [Figure 3-6](#). Predetermine whether all component modules on the disk enclosure are working properly.

----End

Exception Handling

In the event that a module of the storage system is abnormal, refer to the *OceanStor V3 DAS Storage System V300R006 Product Description* to learn about detailed indicator meanings. Then, troubleshoot faults based on the detailed fault information you have obtained.

3.3.3 Checking Disk Enclosure Indicators (4 U High-density Disk Enclosure)

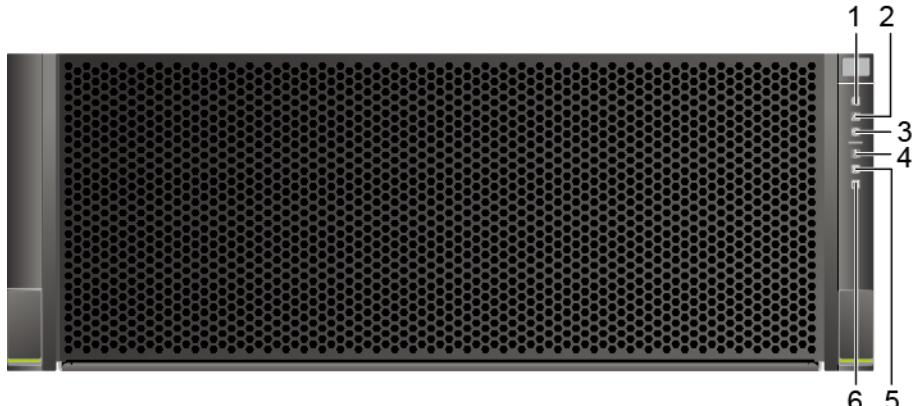
Disk enclosure indicators show the running status of a disk enclosure. By checking these indicators, you can promptly learn about the status of each component module.

Reference Standard

Disk enclosure indicators locate on the front and rear panels of the disk enclosure.

[Figure 3-7](#) and [Figure 3-8](#) depict the front-panel and rear-panel indicators of the disk enclosure that has been correctly powered on.

Figure 3-7 Disk enclosure front-panel indicators



1 High-density disk enclosure Location indicator 2 High-density disk enclosure Alarm indicator

3 High-density disk enclosure Power indicator	4 High-density disk enclosure overtemperature Alarm indicator
5 High-density disk enclosure internal module Alarm indicator	6 High-density disk enclosure rear module Alarm indicator

Table 3-7 lists the states and their meanings of the disk enclosure front-panel indicators shown in [Figure 3-7](#).

Table 3-7 Disk enclosure front-panel indicator states and their meanings

Module	No.	Indicator	Normality	Abnormality
System enclosure	1	High-density disk enclosure Location indicator	<ul style="list-style-type: none">● Blinking blue: The high-density disk enclosure has been located.● Off: The high-density disk enclosure is not located.	-
	2	High-density disk enclosure Alarm indicator	Off: The high-density disk enclosure is running correctly.	Steady red: An alarm is generated in the high-density disk enclosure.
	3	High-density disk enclosure Power indicator	Steady green: The high-density disk enclosure is powered on.	Off: The high-density disk enclosure is not powered on.
	4	High-density disk enclosure overtemperature Alarm indicator	Off: The temperature of the high-density disk enclosure is within the normal range.	Steady red: The temperature of the high-density disk enclosure is too high.
	5	High-density disk enclosure internal module Alarm indicator	Off: Internal disk modules are running correctly.	Steady red: Internal disk modules of the high-density disk enclosure are faulty.

Module	No.	Indicator	Normality	Abnormality
	6	High-density disk enclosure rear module Alarm indicator	Off: Rear FRUs are running correctly.	<p>Steady red: The number of rear field replaceable units (FRUs) is fewer than half of that in standard configuration or rear FRUs are faulty.</p> <p>NOTE Modules on the rear of the high-density disk enclosure include power modules, fan modules, and expansion modules.</p>

Figure 3-8 Disk enclosure rear-panel indicators

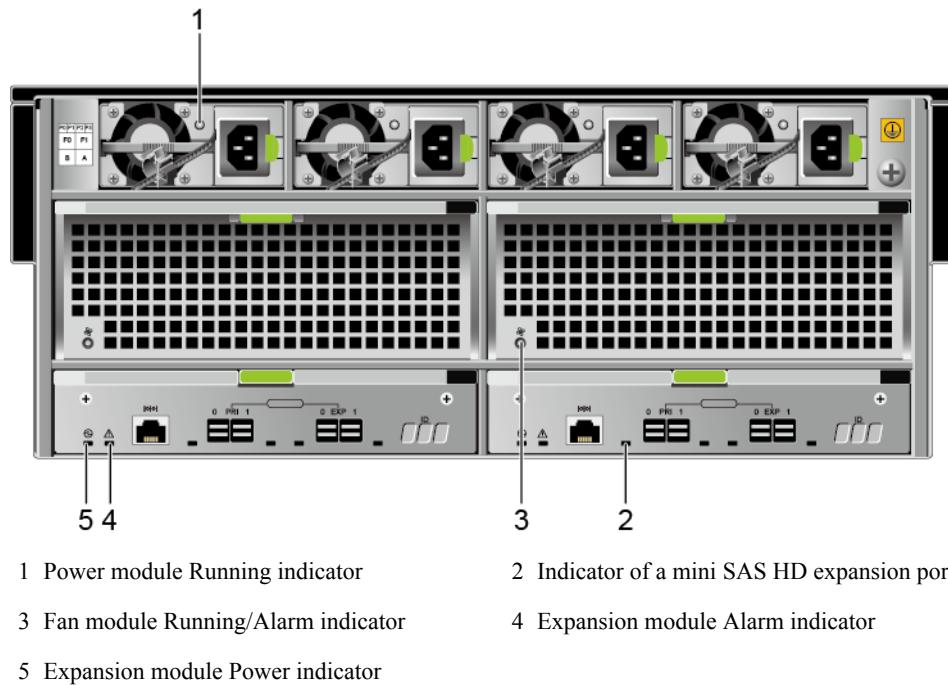


Table 3-8 lists the states and their meanings of the disk enclosure rear-panel indicators shown in **Figure 3-8**.

Table 3-8 Disk enclosure rear-panel indicator states and their meanings

Module	No.	Indicator	Normality	Abnormality
Power module	1	Power module Running indicator	Steady green: The power module is running correctly.	Off: The power module is not power on, undervoltage, or overvoltage.
Expansion module	2	Indicator of a mini SAS HD expansion port	<ul style="list-style-type: none"> ● Steady blue: The link is up and the rate is 4 x 6 Gbit/s. ● Steady green: The link is up and the rate is 4 x 3 Gbit/s. 	<ul style="list-style-type: none"> ● Steady red: The expansion port is faulty. ● Off: The link is down.
Fan module	3	Fan module Running/Alarm indicator	<ul style="list-style-type: none"> ● Steady green: The fan module is running correctly. ● Off: The fan module is not powered on. 	Steady red: The fan module is faulty.
Expansion module	4	Expansion module Alarm indicator	Off: The expansion module is running correctly.	Steady red: The expansion module is faulty.
	5	Expansion module Power indicator	Steady green: The expansion module is running correctly.	Off: The expansion module is not powered on.

Procedure

- Check onsite front-panel and rear-panel indicators of a disk enclosure according to [Figure 3-7](#) and [Figure 3-8](#). Predetermine whether all component modules on the disk enclosure are working properly.

----End

Exception Handling

In the event that a module of the storage system is abnormal, refer to the *OceanStor V3 DAS Storage System V300R006 Product Description* to learn about detailed indicator meanings. Then, troubleshoot faults based on the detailed fault information you have obtained.

3.4 Checking Device Running Status (Windows)

Checking device status enables you to quickly assess whether the devices are working normally. This section uses sg3_utils as an example to explain how to check device status using standard SES commands in the Windows operating system.

3.4.1 Checking Disk Status

Checking the disk status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `\sg_ses.exe --descriptor=DiskID "dev_id"`.

In the command, **DiskID** indicates the disk ID and **dev_id** indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe --  
descriptor=Disk00 "SCSI3:4,105,0"  
    HUAWEI      DAS37535U4      T76  
    Primary enclosure logical identifier (hex): 5112233445a8f03d  
Disk00 [0,0]  Element type: Array device slot  
    Enclosure Status:  
        Predicted failure=0, Disabled=0, Swap=0, status: OK  
        OK=0, Reserved device=0, Hot spare=0, Cons check=0  
        In crit array=0, In failed array=0, Rebuild/remap=0, R/R abort=0  
        App client bypass A=0, Do not remove=0, Enc bypass A=0, Enc bypass B=0  
        Ready to insert=0, RMV=0, Ident=0, Report=0  
        App client bypass B=0, Fault sensed=0, Fault reqstd=0, Device off=0  
        Bypassed A=0, Bypassed B=0, Dev bypassed A=0, Dev bypassed B=0  
    Additional Element Status:  
        Transport protocol: SAS  
        number of phys: 1, not all phys: 1, device slot number: 0  
        phy index: 0  
            SAS device type: end device  
            initiator port for:  
            target port for: SSP  
            attached SAS address: 0x5dd112233445503d  
            SAS address: 0x5000c500552e693e  
            phy identifier: 0x1
```

Table 3-9 describes relevant parameters.

Table 3-9 Parameter description

Parameter	Description	Value
Device off	Indicates whether the disk is powered on.	<ul style="list-style-type: none"> If the value is 0, the disk is powered on. If the value is 1, the disk is powered off.
Fault reqstd	Indicates whether the disk is normal.	<ul style="list-style-type: none"> If the value is 0, the disk is normal. If the value is 1, exceptions occur on the disk.
Ident	Indicates whether the locating indicator of the disk is on.	<ul style="list-style-type: none"> If the value is 0, the locating indicator of the disk is off. If the value is 1, the locating indicator of the disk is on.
status	Indicates the running status of the disk.	<ul style="list-style-type: none"> If the value is Unsupported, checking the disk status fails. If the value is OK, the disk is present and running normally. If the value is Critical, exceptions occur on the disk. If the value is Not Installed, the disk is absent. If the value is Not Available, the disk is present but it is powered off and not running.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.4.2 Checking the Fan Status

Checking the fan status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `.\sg_ses.exe --descriptor=CoolingFanID "dev_id"`.

In the command, **CoolingFanID** indicates the fan ID and **dev_id** indicates the device number such as **SCSI3:4,105,0**.

 NOTE

- For DAS37535U4, the fan status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe --  
descriptor=CoolingFan00 "SCSI3:4,105,0"  
    HUAWEI      DAS37535U4      T76  
    Primary enclosure logical identifier (hex): 5112233445a8f03d  
CoolingFan00 [2,0]  Element type: Cooling  
Enclosure Status:  
    Predicted failure=0, Disabled=0, Swap=0, status: OK  
    Ident=0, Do not remove=0, Hot swap=0, Fail=0, Requested on=1  
    Off=0, Actual speed=12510 rpm, Fan at intermediate speed
```

[Table 3-10](#) describes relevant parameters.

Table 3-10 Parameter description

Parameter	Description	Value
Ident	Indicates whether the fan works in automatic or manual speed adjustment mode.	<ul style="list-style-type: none">● If the value is 0, the fan works in automatic speed adjustment mode.● If the value is 1, the fan works in manual speed adjustment mode.
Fail	Indicates whether the fan is normal.	<ul style="list-style-type: none">● If the value is 0, the fan is normal.● If the value is 1, the fan is abnormal.
Requested on	Indicates whether the fan is powered on.	<ul style="list-style-type: none">● If the value is 0, the fan is powered off.● If the value is 1, the fan is powered on.
Off	Indicates whether the fan is powered on.	<ul style="list-style-type: none">● If the value is 0, the fan is powered on.● If the value is 1, the fan is powered off.
Actual speed	Indicates the actual speed of the fan.	Actual speed of the fan

Parameter	Description	Value
Fan at intermediate speed NOTE Indicates the current speed level of the fan. The value changes with the actual situation.	Speed level of the fan	<ul style="list-style-type: none"> ● If the value is Fan stopped, the fan stops running. ● If the value is Fan at lowest speed, the fan works at the lowest speed. ● If the value is Fan at second lowest speed, the fan works at the second lowest speed. ● If the value is Fan at third lowest speed, the fan works at the third lowest speed. ● If the value is Fan at intermediate lowest speed, the fan works at the intermediate speed. ● If the value is Fan at third highest speed, the fan works at the third highest speed. ● If the value is Fan at second highest speed, the fan works at the second highest speed. ● If the value is Fan at highest speed, the fan works at the highest speed.
status	Indicates the running status of the fan.	<ul style="list-style-type: none"> ● If the value is Unsupported, checking the fan status fails. ● If the value is OK, the fan is present and running normally. ● If the value is Critical, exceptions occur on the fan. ● If the value is Not Installed, the fan is absent. ● If the value is Not Available, the fan is present but it is powered off and not running.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.4.3 Checking the Power Supply Status

Checking the power supply status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `.\sg_ses.exe --descriptor=PowerSupplyID "dev_id"`.

In the command, **PowerSupplyID** indicates the power supply ID and **dev_id** indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

- For DAS37535U4, the power supply status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe --  
descriptor=PowerSupply02 "SCSI3:4,105,0"  
    HUAWEI      DAS37535U4      T76  
    Primary enclosure logical identifier (hex): 5112233445a8f03d  
PowerSupply02 [1,2] Element type: Power supply  
    Enclosure Status:  
        Predicted failure=0, Disabled=0, Swap=0, status: OK  
        Ident=0, Do not remove=0, DC overvoltage=0, DC undervoltage=0  
        DC overcurrent=0  
        Hot swap=0, Fail=0, Requested on=1, Off=0, Overtmp fail=0  
        Temperature warn=0, AC fail=0, DC fail=0
```

Table 3-11 describes relevant parameters.

Table 3-11 Parameter description

Parameter	Description	Value
DC overvoltage	Indicates whether the output power is overvoltage.	<ul style="list-style-type: none">• If the value is 0, the output power is not overvoltage.• If the value is 1, the output power is overvoltage.
DC undervoltage	Indicates whether the output power is undervoltage.	<ul style="list-style-type: none">• If the value is 0, the output power is not undervoltage.• If the value is 1, the output power is undervoltage.
DC overcurrent	Indicates whether the output power is overcurrent.	<ul style="list-style-type: none">• If the value is 0, the output power is not overcurrent.• If the value is 1, the output power is overcurrent.
Fail	Indicates whether the power supply is normal.	<ul style="list-style-type: none">• If the value is 0, the power supply is normal.• If the value is 1, exceptions occur on the power supply.
Requested on	Indicates whether the power module is turned on.	<ul style="list-style-type: none">• If the value is 0, the power module is turned off.• If the value is 1, the power module is turned on.
Off	Indicates whether the power module is turned on.	<ul style="list-style-type: none">• If the value is 0, the power module is turned on.• If the value is 1, the power module is turned off.

Parameter	Description	Value
Overtmp fail	Indicates whether the power module is overtemperature.	<ul style="list-style-type: none"> If the value is 0, the power module is not overtemperature. If the value is 1, the power module is overtemperature.
AC fail	Indicates whether external AC power input is normal.	<ul style="list-style-type: none"> If the value is 0, the external AC power input is normal. If the value is 1, the external AC power input is abnormal.
DC fail	Indicates whether DC power output is normal.	<ul style="list-style-type: none"> If the value is 0, the DC power output is normal. If the value is 1, the DC power output is abnormal.
status	Operating the running status of the power module.	<ul style="list-style-type: none"> If the value is Unsupported, checking the power supply status fails. If the value is OK, the power module is installed and running normally. If the value is Critical, exceptions occur on the power supply. If the value is Not Installed, the power module is absent. If the value is Not Available, the power module is installed but it is powered off and not running.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.4.4 Checking the Voltage Status

Checking the voltage status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `.\sg_ses.exe --descriptor=VoltageID "dev_id"`.

In the command, **VoltageID** indicates the voltage point ID and **dev_id** indicates the device number such as **SCSI3:4,105,0**.

 NOTE

- For DAS37535U4, the voltage status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe --  
descriptor=Voltage00 "SCSI3:4,105,0"  
    HUAWEI      4U75 12G EXP      RevB  
    Primary enclosure logical identifier (hex): 5112233445a8f03d  
Voltage00 [4,0] Element type: Voltage sensor  
    Enclosure Status:  
        Predicted failure=0, Disabled=0, Swap=0, status: OK  
        Ident=0, Fail=0, Warn Over=0, Warn Under=0, Crit Over=0  
        Crit Under=0  
        Voltage: 0.91 volts
```

[Table 3-12](#) describes relevant parameters.

Table 3-12 Parameter description

Parameter	Description	Value
Fail	Indicates whether the voltage status is normal.	<ul style="list-style-type: none">● If the value is 0, the voltage status is normal.● If the value is 1, the voltage status is abnormal.
Voltage	Actual voltage	Actual voltage
status	Indicates the voltage status.	<ul style="list-style-type: none">● If the value is Unsupported, checking the voltage status fails.● If the value is OK, the voltage status is normal.● If the value is Critical, the voltage status is abnormal.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.4.5 Checking Temperature

Checking temperature enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `.\sg_ses.exe --descriptor=TemperatureID "dev_id"`.

In the command, **TemperatureID** indicates the temperature point ID and **dev_id** indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

- For DAS37535U4, the temperature can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#) .

Taking DAS37535U4 as an example, the command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe --  
descriptor=Temperature00 "SCSI3:4,105,0"  
    HUAWEI      DAS37535U4      T76  
    Primary enclosure logical identifier (hex): 5112233445a8f03d  
Temperature00 [3,0]   Element type: Temperature sensor  
    Enclosure Status:  
        Predicted failure=0, Disabled=0, Swap=0, status: OK  
        Ident=0, Fail=0, OT failure=0, OT warning=0, UT failure=0  
        UT warning=0  
        Temperature=32 C
```

[Table 3-13](#) describes relevant parameters.

Table 3-13 Parameter description

Parameter	Description	Value
Fail	Indicates the temperature sensor status.	<ul style="list-style-type: none">● If the value is 0, the temperature sensor access is normal.● If the value is 1, the temperature sensor access is abnormal.
OT failure	Indicates whether the temperature reaches the severe high temperature threshold.	<ul style="list-style-type: none">● If the value is 0, the temperature does not reach the severe high temperature threshold.● If the value is 1, the temperature reaches the severe high temperature threshold.
OT warning	Indicates whether the temperature reaches the general high temperature threshold.	<ul style="list-style-type: none">● If the value is 0, the temperature does not reach the general high temperature threshold.● If the value is 1, the temperature reaches the general high temperature threshold.
UT failure	Indicates whether the temperature reaches the severe low temperature threshold.	<ul style="list-style-type: none">● If the value is 0, the temperature does not reach the severe low temperature threshold.● If the value is 1, the temperature reaches the severe low temperature threshold.

Parameter	Description	Value
UT warning	Indicates whether the temperature reaches the general low temperature threshold.	<ul style="list-style-type: none"> If the value is 0, the temperature does not reach the general low temperature threshold. If the value is 1, the temperature reaches the general low temperature threshold.
Temperature	Actual temperature	Actual temperature
status	Indicates the temperature status	<ul style="list-style-type: none"> If the value is Unsupported, checking the temperature status fails. If the value is OK, the temperature is within the normal range. If the value is Critical, the temperature is out of the normal range. If the value is Noncritical, the temperature reaches the general high/low temperature threshold.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.4.6 Checking the Disk Enclosure Status

Checking the disk enclosure status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `./sg_ses.exe --descriptor=EnclosureID "dev_id"`.

In the command, **EnclosureID** indicates the disk enclosure ID and **dev_id** indicates the device number such as **SCSI3:4,105,0**.

NOTE

- For DAS37535U4, the disk enclosure status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe --
descriptor=Enclosure00 "SCSI3:4,105,0"
    HUAWEI      DAS37535U4      T76
    Primary enclosure logical identifier (hex): 5112233445a8f03d
```

```

Enclosure00 [6,0] Element type: Enclosure
  Enclosure Status:
    Predicted failure=0, Disabled=0, Swap=0, status: OK
    Ident=0, Time until power cycle=0, Failure indication=1
    Warning indication=0, Requested power off duration=0
    Failure requested=0, Warning requested=0

```

Table 3-14 describes relevant parameters.**Table 3-14** Parameter description

Parameter	Description	Value
Ident	Indicates whether the locating indicator of the disk enclosure is on.	<ul style="list-style-type: none"> If the value is 0, the locating indicator of the disk enclosure is off. If the value is 1, the locating indicator of the disk enclosure is on.
Failure indication	Indicates the running status of the disk enclosure.	<ul style="list-style-type: none"> If the value is 0, the disk enclosure runs normally (no exception occurs and the alarm indicator is off). If the value is 1, the disk enclosure is faulty (the enclosure is faulty or a component in the disk enclosure is faulty, so the alarm indicator of the enclosure is on).
Failure requested	Indicates whether a command is delivered to turn on the alarm indicator of the disk enclosure.	<ul style="list-style-type: none"> If the value is 0, the disk enclosure is normal or no command is delivered to turn on the alarm indicator. If the value is 1, a command is delivered to turn on the alarm indicator of the disk enclosure.
status	Indicates the running status of the disk enclosure.	<ul style="list-style-type: none"> If the value is Unsupported, checking the disk enclosure status fails. If the value is OK, the disk enclosure is running normally. If the value is Critical, exceptions occur on the disk enclosure. If the value is Not Available, the disk enclosure is present and normal but it is not running.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.4.7 Checking the expansion Module Status

Checking the expansion module status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `./sg_ses.exe --descriptor=ExpanderID "dev_id"`.

In the command, **ExpanderID** indicates the expansion module ID and **dev_id** indicates the device number such as **SCSI3:4,105,0**.

NOTE

- For DAS37535U4, the expansion module status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe --  
descriptor=Expander00 "SCSI3:4,105,0"  
    HUAWEI      DAS37535U4      T76  
    Primary enclosure logical identifier (hex): 5112233445a8f03d  
Expander00 [7,0] Element type: SAS expander  
    Enclosure Status:  
        Predicted failure=0, Disabled=0, Swap=0, status: OK  
        Ident=0, Fail=0
```

Table 3-15 describes relevant parameters.

Table 3-15 Parameter description

Parameter	Description	Value
Ident	Indicates whether the locating indicator of the expansion module is on.	<ul style="list-style-type: none">If the value is 0, the locating indicator of the expansion module is off.If the value is 1, the locating indicator of the expansion module is on.
Fail	Indicates the running status of the expansion module.	<ul style="list-style-type: none">If the value is 0, the expansion module runs normally.If the value is 1, exceptions occur on the expansion module.
status	Indicates the running status of the expansion module.	<ul style="list-style-type: none">If the value is Unsupported, checking the expansion module status fails.If the value is OK, the expansion module runs normally.If the value is Critical, exceptions occur on the expansion module.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.5 Checking Device Running Status (Linux)

Checking device status enables you to quickly assess whether the devices are working normally. This section uses sg3_utils as an example to explain how to check device status using standard SES commands in the Linux operating system.

3.5.1 Checking Disk Status

Checking the disk status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses --descriptor=DiskID /dev/sgxx`.

In the command, **DiskID** indicates the disk ID and **/dev/sgxx** indicates the device number such as `/dev/sg10`.



To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
[root@localhost ~]# sg_ses --descriptor=Disk01 /dev/sg10
HUAWEI      DAS37535U4          T76
Primary enclosure logical identifier (hex): 500123456789a03d
Disk01 [0,1]  Element type: Array device slot
Enclosure Status:
  Predicted failure=0, Disabled=0, Swap=0, status: OK
  OK=0, Reserved device=0, Hot spare=0, Cons check=0
  In crit array=0, In failed array=0, Rebuild/remap=0, R/R abort=0
  App client bypass A=0, Do not remove=0, Enc bypass A=0, Enc bypass B=0
  Ready to insert=0, RMV=0, Ident=0, Report=0
  App client bypass B=0, Fault sensed=0, Fault reqstd=0, Device off=0
  Bypassed A=0, Bypassed B=0, Dev bypassed A=0, Dev bypassed B=0
Additional Element Status:
  Transport protocol: SAS
  number of phys: 1, not all phys: 1, device slot number: 1
  phy index: 0
    SAS device type: end device
    initiator port for:
    target port for: SSP
    attached SAS address: 0x500123456789a03d
    SAS address: 0x5000c50041785b4e
    phy identifier: 0x1
```

Table 3-16 describes relevant parameters.

Table 3-16 Parameter description

Parameter	Description	Value
Device off	Indicates whether the disk is powered on.	<ul style="list-style-type: none"> If the value is 0, the disk is powered on. If the value is 1, the disk is powered off.
Fault reqstd	Indicates whether the disk is normal.	<ul style="list-style-type: none"> If the value is 0, the disk is normal. If the value is 1, exceptions occur on the disk.
Ident	Indicates whether the locating indicator of the disk is on.	<ul style="list-style-type: none"> If the value is 0, the locating indicator of the disk is off. If the value is 1, the locating indicator of the disk is on.
status	Indicates the running status of the disk.	<ul style="list-style-type: none"> If the value is Unsupported, checking the disk status fails. If the value is OK, the disk is present and running normally. If the value is Critical, exceptions occur on the disk. If the value is Not Installed, the disk is absent. If the value is Not Available, the disk is present but it is powered off and not running.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.5.2 Checking the Fan Status

Checking the fan status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses --descriptor=CoolingFanID /dev/sgxx`.

In the command, **CoolingFanID** indicates the fan ID and **/dev/sgxx** indicates the device number such as `/dev/sg10`.

 NOTE

- For DAS37535U4, the fan status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
[root@localhost ~]# sg_ses --descriptor=CoolingFan00 /dev/sg10
    HUAWEI      DAS37535U4      T76
    Primary enclosure logical identifier (hex): 5112233445a8f03d
CoolingFan00 [2,0]  Element type: Cooling
    Enclosure Status:
        Predicted failure=0, Disabled=0, Swap=0, status: OK
        Ident=0, Do not remove=0, Hot swap=0, Fail=0, Requested on=1
        Off=0, Actual speed=6830 rpm, Fan at lowest speed
```

[Table 3-17](#) describes relevant parameters.

Table 3-17 Parameter description

Parameter	Description	Value
Ident	Indicates whether the fan works in automatic or manual speed adjustment mode.	<ul style="list-style-type: none">● If the value is 0, the fan works in automatic speed adjustment mode.● If the value is 1, the fan works in manual speed adjustment mode.
Fail	Indicates whether the fan is normal.	<ul style="list-style-type: none">● If the value is 0, the fan is normal.● If the value is 1, the fan is abnormal.
Requested on	Indicates whether the fan is powered on.	<ul style="list-style-type: none">● If the value is 0, the fan is powered off.● If the value is 1, the fan is powered on.
Off	Indicates whether the fan is powered on.	<ul style="list-style-type: none">● If the value is 0, the fan is powered on.● If the value is 1, the fan is powered off.
Actual speed	Indicates the actual speed of the fan.	Actual speed of the fan

Parameter	Description	Value
Fan at lowest speed NOTE Indicates the current speed level of the fan. The value changes with the actual situation.	Speed level of the fan	<ul style="list-style-type: none"> If the value is Fan stopped, the fan stops running. If the value is Fan at lowest speed, the fan works at the lowest speed. If the value is Fan at second lowest speed, the fan works at the second lowest speed. If the value is Fan at third lowest speed, the fan works at the third lowest speed. If the value is Fan at intermediate lowest speed, the fan works at the intermediate speed. If the value is Fan at third highest speed, the fan works at the third highest speed. If the value is Fan at second highest speed, the fan works at the second highest speed. If the value is Fan at highest speed, the fan works at the highest speed.
status	Indicates the running status of the fan.	<ul style="list-style-type: none"> If the value is Unsupported, checking the fan status fails. If the value is OK, the fan is present and running normally. If the value is Critical, exceptions occur on the fan. If the value is Not Installed, the fan is absent. If the value is Not Available, the fan is present but it is powered off and not running.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.5.3 Checking the Power Supply Status

Checking the power supply status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses --descriptor=PowerSupplyID /dev/sgxx`.

In the command, **PowerSupplyID** indicates the power supply ID and **/dev/sgxx** indicates the device number such as `/dev/sg10`.

 **NOTE**

- For DAS37535U4, the power supply status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
[root@localhost ~]# sg_ses --descriptor=PowerSupply00 /dev/sg10
HUAWEI      DAS37535U4          T76
Primary enclosure logical identifier (hex): 5112233445a8f03d
PowerSupply00 [1,0]   Element type: Power supply
Enclosure Status:
    Predicted failure=0, Disabled=0, Swap=0, status: Not available
    Ident=0, Do not remove=0, DC overvoltage=0, DC undervoltage=0
    DC overcurrent=0
    Hot swap=0, Fail=0, Requested on=0, Off=1, Overtmp fail=0
    Temperature warn=0, AC fail=1, DC fail=1
```

Table 3-18 describes relevant parameters.

Table 3-18 Parameter description

Parameter	Description	Value
DC overvoltage	Indicates whether the output power is overvoltage.	<ul style="list-style-type: none">If the value is 0, the output power is not overvoltage.If the value is 1, the output power is overvoltage.
DC undervoltage	Indicates whether the output power is undervoltage.	<ul style="list-style-type: none">If the value is 0, the output power is not undervoltage.If the value is 1, the output power is undervoltage.
DC overcurrent	Indicates whether the output power is overcurrent.	<ul style="list-style-type: none">If the value is 0, the output power is not overcurrent.If the value is 1, the output power is overcurrent.
Fail	Indicates whether the power supply is normal.	<ul style="list-style-type: none">If the value is 0, the power supply is normal.If the value is 1, the power supply is abnormal.
Requested on	Indicates whether the power module is turned on.	<ul style="list-style-type: none">If the value is 0, the power module is turned off.If the value is 1, the power module is turned on.

Parameter	Description	Value
Off	Indicates whether the power module is turned on.	<ul style="list-style-type: none"> If the value is 0, the power module is turned on. If the value is 1, the power module is turned off.
Overtmp fail	Indicates whether the power module is overtemperature.	<ul style="list-style-type: none"> If the value is 0, the power module is not overtemperature. If the value is 1, the power module is overtemperature.
AC fail	Indicates whether external AC power input is normal.	<ul style="list-style-type: none"> If the value is 0, the external AC power input is normal. If the value is 1, the external AC power input is abnormal.
DC fail	Indicates whether DC power output is normal.	<ul style="list-style-type: none"> If the value is 0, the DC power output is normal. If the value is 1, the DC power output is abnormal.
status	Operating the running status of the power module.	<ul style="list-style-type: none"> If the value is Unsupported, checking the power supply status fails. If the value is OK, the power module is present and running normally. If the value is Critical, exceptions occur on the power module. If the value is Not Installed, the power module is absent. If the value is Not Available, the power module is installed but it is powered off and not running.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.5.4 Checking the Voltage Status

Checking the voltage status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses --descriptor=VoltageID /dev/sgxx`.

In the command, **VoltageID** indicates the voltage point ID and `/dev/sgxx` indicates the device number such as `/dev/sg10`.

 **NOTE**

- For DAS37535U4, the voltage status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
[root@localhost ~]# sg_ses --descriptor=Voltage00 /dev/sg10
HUAWEI      DAS37535U4          T76
Primary enclosure logical identifier (hex): 5112233445a8f03d
Voltage00 [4,0]   Element type: Voltage sensor
Enclosure Status:
  Predicted failure=0, Disabled=0, Swap=0, status: OK
  Ident=0, Fail=0, Warn Over=0, Warn Under=0, Crit Over=0
  Crit Under=0
  Voltage: 0.91 volts
```

Table 3-19 describes relevant parameters.

Table 3-19 Parameter description

Parameter	Description	Value
Fail	Indicates whether the voltage status is normal.	<ul style="list-style-type: none">● If the value is 0, the voltage status is normal.● If the value is 1, the voltage status is abnormal.
Voltage	Actual voltage	Actual voltage
status	Indicates the voltage status.	<ul style="list-style-type: none">● If the value is Unsupported, checking the voltage status fails.● If the value is OK, the voltage status is normal.● If the value is Critical, the voltage status is abnormal.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.5.5 Checking Temperature

Checking temperature enables better device management and maintenance.

Prerequisites

The `sg3_utils` tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses --descriptor=TemperatureID /dev/sgxx`.

In the command, **TemperatureID** indicates the temperature point ID and **/dev/sgxx** indicates the device number such as `/dev/sg10`.

 **NOTE**

- For DAS37535U4, the temperature can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
[root@localhost ~]# sg_ses --descriptor=Temperature00 /dev/sg10
HUAWEI      DAS37535U4          T76
Primary enclosure logical identifier (hex): 5112233445a8f03d
Temperature00 [3,0]   Element type: Temperature sensor
Enclosure Status:
  Predicted failure=0, Disabled=0, Swap=0, status: OK
  Ident=0, Fail=0, OT failure=0, OT warning=0, UT failure=0
  UT warning=0
  Temperature=24 C
```

Table 3-20 describes relevant parameters.

Table 3-20 Parameter description

Parameter	Description	Value
Fail	Indicates the temperature sensor status.	<ul style="list-style-type: none">● If the value is 0, the temperature sensor access is normal.● If the value is 1, the temperature sensor access is abnormal.
OT failure	Indicates whether the temperature reaches the severe high temperature threshold.	<ul style="list-style-type: none">● If the value is 0, the temperature does not reach the severe high temperature threshold.● If the value is 1, the temperature reaches the severe high temperature threshold.
OT warning	Indicates whether the temperature reaches the general high temperature threshold.	<ul style="list-style-type: none">● If the value is 0, the temperature does not reach the general high temperature threshold.● If the value is 1, the temperature reaches the general high temperature threshold.
UT failure	Indicates whether the temperature reaches the severe low temperature threshold.	<ul style="list-style-type: none">● If the value is 0, the temperature does not reach the severe low temperature threshold.● If the value is 1, the temperature reaches the severe low temperature threshold.

Parameter	Description	Value
UT warning	Indicates whether the temperature reaches the general low temperature threshold.	<ul style="list-style-type: none"> If the value is 0, the temperature does not reach the general low temperature threshold. If the value is 1, the temperature reaches the general low temperature threshold.
Temperature	Actual temperature	Actual temperature
status	Indicates the temperature status	<ul style="list-style-type: none"> If the value is Unsupported, checking the temperature status fails. If the value is OK, the temperature is within the normal range. If the value is Critical, the temperature is out of the normal range. If the value is Noncritical, the temperature reaches the general high/low temperature threshold.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.5.6 Checking the Disk Enclosure Status

Checking the disk enclosure status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses --descriptor=EnclosureID /dev/sgxx`.

In the command, **EnclosureID** indicates the disk enclosure ID and **/dev/sgxx** indicates the device number such as /dev/sg10.

NOTE

- For DAS37535U4, the disk enclosure status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
[root@localhost ~]# sg_ses --descriptor=Enclosure00 /dev/sg10
HUAWEI      DAS37535U4          T76
Primary enclosure logical identifier (hex): 5112233445a8f03d
Enclosure00 [5,0]  Element type: Enclosure
```

```

Enclosure Status:
Predicted failure=0, Disabled=0, Swap=0, status: OK
Ident=0, Time until power cycle=0, Failure indication=0
Warning indication=0, Requested power off duration=0
Failure requested=0, Warning requested=0

```

Table 3-21 describes relevant parameters.**Table 3-21** Parameter description

Parameter	Description	Value
Ident	Indicates whether the locating indicator of the disk enclosure is on.	<ul style="list-style-type: none"> If the value is 0, the locating indicator of the disk enclosure is off. If the value is 1, the locating indicator of the disk enclosure is on.
Failure indication	Indicates the running status of the disk enclosure.	<ul style="list-style-type: none"> If the value is 0, the disk enclosure runs normally (no exception occurs and the alarm indicator is off). If the value is 1, the disk enclosure is faulty (the enclosure is faulty or a component in the disk enclosure is faulty, so the alarm indicator of the enclosure is on).
Failure requested	Indicates whether a command is delivered to turn on the alarm indicator of the disk enclosure.	<ul style="list-style-type: none"> If the value is 0, the disk enclosure is normal or no command is delivered to turn on the alarm indicator. If the value is 1, a command is delivered to turn on the alarm indicator of the disk enclosure.
status	Indicates the running status of the disk enclosure.	<ul style="list-style-type: none"> If the value is Unsupported, checking the disk enclosure status fails. If the value is OK, the disk enclosure is running normally. If the value is Critical, exceptions occur on the disk enclosure. If the value is Not Available, the disk enclosure is present and normal but it is not running.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.5.7 Checking the expansion Module Status

Checking the expansion module status enables better device management and maintenance.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses --descriptor=ExpanderID /dev/sgxx`.

In the command, **ExpanderID** indicates the expansion module ID and **/dev/sgxx** indicates the device number such as `/dev/sg10`.

 **NOTE**

- For DAS37535U4, the expansion module status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
[root@localhost ~]# sg_ses --descriptor=Expander00 /dev/sg10
    HUAWEI      DAS37535U4          T76
    Primary enclosure logical identifier (hex): 5112233445a8f03d
Expander00 [6,0] Element type: SAS expander
    Enclosure Status:
        Predicted failure=0, Disabled=0, Swap=0, status: OK
        Ident=0, Fail=0
```

[Table 3-22](#) describes relevant parameters.

Table 3-22 Parameter description

Parameter	Description	Value
Ident	Indicates whether the locating indicator of the expansion module is on.	<ul style="list-style-type: none">● If the value is 0, the locating indicator of the expansion module is off.● If the value is 1, the locating indicator of the expansion module is on.
Fail	Indicates the running status of the expansion module.	<ul style="list-style-type: none">● If the value is 0, the expansion module runs normally.● If the value is 1, exceptions occur on the expansion module.
status	Indicates the running status of the expansion module.	<ul style="list-style-type: none">● If the value is Unsupported, checking the expansion module status fails.● If the value is OK, the expansion module runs normally.● If the value is Critical, exceptions occur on the expansion module.
Other parameters	No specific meaning.	No used and no related functions.

----End

3.6 Powering on or off the Storage Device

Powering on or off a storage device includes powering on or off interface modules and other hardware components. A correct procedure effectively avoids device damage caused by misoperations.

3.6.1 Powering on a Storage Device

This topic guides you through the process of re-powering on the storage device that has been powered off.

Precautions

When powering on a storage device, note the following:

- To avoid electric shocks, do not wear an ESD wrist strap when powering on the storage device.
- During the power-on, do not remove or insert network cables, coffer disks, or expansion modules to avoid data loss.
- After the power-on, do not change the connection mode of expansion cables; otherwise, exceptions may occur on the storage device.
- When expanding disk enclosures online, connect the expansion cables before powering on the disk enclosures. This prevents the change of the expansion cable connection mode.

Sequence of powering on a storage device:

1. Turn on the external power supply switch of the disk enclosure.
2. Turn on the power switch of the application server (if the application server is powered off).

NOTE

- For DAS37535U4, you can power on the storage device in SES_A only.
- If you have powered off the disk enclosure using a serial port command, you need to log in to the CLI through the serial port and run **framepowctrl 0** to power it on. For DAS37535U4, if you have logged in another SES management system, run **switch a** to switch to SES_A and then pass identity authentication as prompted.
- If you have powered off the disk enclosure through a management network port, you need to log in to the CLI through the management network port and run a command to power it on.
 - For a server running Windows, run **\sg_ses.exe -p 0x4 -c -d "b0,00" "dev_id"**. **dev_id** indicates the device number such as **SCSI3:4,105,0**. To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#).
 - For a server running Linux, run **sg_ses -p 0x4 -c -d b0,00 /dev/sgxx**. **/dev/sgxx** indicates the device number such as **/dev/sg10**. To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Procedure

Step 1 Check whether the power cables are properly connected. Reinsert the loose cables if any.

Step 2 Check the labels on the power cables and match the power cables with the power switches in the PDU.

Step 3 Turn on the power switches corresponding to all the components in sequence.

----End

Follow-up Procedure

After the storage device is powered on, observe indicators on the components. For details about indicator information, see [3.3 Checking Indicators](#). If any component is faulty, rectify the fault following instructions in [6 Parts Replacement](#).

3.6.2 Powering off a Storage Device

This section describes how to power off a storage device properly when you want to stop using the storage device, replace the disk enclosure, or troubleshoot power lines.

Prerequisites

Services in the storage system have been stopped.

Context

Sequence of powering off a storage device: stop host services > disconnect disk enclosures from the external power supply.

NOTE

You can also power off disk enclosures through a serial port or a management network port. This method cuts the external power supply to disk enclosures but does not affect the internal power supply of the disk enclosures.

- For DAS37535U4, you can power off the storage device in SES_A only.
- If you want to power off the storage device through a serial port, log in to the CLI through the serial port and run **framepowctrl 1**. For DAS37535U4, if you have logged in another SES management system, run **switch a** to switch to SES_A and then pass identity authentication as prompted.
- If you want to power off the storage device through a management network port, log in to the CLI through the management network port and run the power-off command.
 - For a server running Windows, run `.\sg_ses.exe -p 0x4 -c -d "b0,01" "dev_id". dev_id` indicates the device number such as `SCSI3:4,105,0`. To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#) .
 - For a server running Linux, run `sg_ses -p 0x4 -c -d b0,01 /dev/sgxx`. `/dev/sgxx` indicates the device number such as `/dev/sg10`. To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Procedure

Step 1 Stop host services.

Step 2 Disconnect disk enclosures from the external power supply to complete powering off the storage device.

----End

3.6.3 Querying the Power Status of a Storage Device Through a Serial Port

When external power supply is normal, the super administrator can power on and off a storage device and query the current power status of the storage device using commands through a serial port.

Prerequisites

The maintenance terminal has been connected to the storage device through a serial port.

Procedure

Step 1 Log in to the CLI of the storage device through a serial port.

 **NOTE**

For DAS37535U4, the power status can be queried in the SES_A management system only. If you have logged in another SES management system, run **switch a** to switch to SES_A and then pass identity authentication as prompted.

Step 2 Run **showframepowstatus**.

Taking DAS37535U4 as an example, the command output is as follows:

```
PANGEA_SES:>showframepowstatus  
FramePowStatus is <on>
```

on indicates that the storage device has been powered on.

----End

3.6.4 Querying the Power Status of a Storage Device Through a Management Network Port (Windows)

When external power supply is normal, the super administrator can power on and off a storage device and query the current power status of the storage device using commands through a management network port.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run **.\sg_ses.exe -p 0xba "dev_id"**.

dev_id indicates the device number such as **SCSI3:4,105,0**.

 **NOTE**

- For DAS37535U4, the power status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#) .

Taking DAS37535U4 as an example, the command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0xba  
"SCSI2:5,28,0"
```

```
HUAWEI      DAS37535U4      T68
Cannot decode response from diagnostic page: <unknown>
00      ba 00 00 01 00      ....
```

Observe the last two digits in the last line in the command output. **00** indicate that the device has been powered on while **01** indicate that the device has been powered off.

----End

3.6.5 Querying the Power Status of a Storage Device Through a Management Network Port (Linux)

When external power supply is normal, the super administrator can power on and off a storage device and query the current power status of the storage device using commands through a management network port.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses -p 0xba /dev/sgxx`.

`/dev/sgxx` indicates the device number such as `/dev/sg10`.

 **NOTE**

- For DAS37535U4, the power status can be queried in the SES_A management system only.
- To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

Taking DAS37535U4 as an example, the command output is as follows:

```
[root@localhost ~]#
[root@localhost ~]# sg_ses -p 0xba /dev/sg18
HUAWEI      DAS37535U4      T67
Cannot decode response from diagnostic page: <unknown>
00      ba 00 00 01 00      ....
```

Observe the last two digits in the last line in the command output. **00** indicate that the device has been powered on while **01** indicate that the device has been powered off.

----End

3.7 Collecting System Logs

When exceptions occur on a storage device, log information can help locating the cause. You can collect log information through a serial port or a management network port.

3.7.1 Collecting System Logs Through a Serial Port

When exceptions occur on a storage device, you can collect log information through a serial port to help locating the cause.

Prerequisites

The maintenance terminal has been connected to the device through a serial port and the communication is normal.

Procedure

Step 1 Log in to the CLI of the storage device through a serial port.

Step 2 Run the **qlog 0** command to check log information of the storage device.



For DAS37535U4, you need to run the command in the three SES management systems respectively to collect log information. You can run **switch x** to switch between the SES management systems. In the command, **x** can be **a**, **b**, or **c**, which corresponds to SES_A, SES_B, or SES_C.

Step 3 Optional: You can copy and save the log information displayed on PuTTY to a file for the convenience of view.

----End

3.7.2 Collecting System Logs Through a Management Network Port (Windows)

When exceptions occur on a storage device, you can collect log information through a management network port to help locating the cause.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run **.\sg_ses.exe -p 0x9c "dev_id" -rr** repeatedly until no log information is displayed in the output.

dev_id indicates the device number such as **SCSI3:4,105,0**.



- For DAS37535U4, you need to run the command in the three SES management systems respectively to collect log information.
- To obtain related device information, follow instructions in [3.1.1 Querying Basic Device Information \(Windows\)](#).

The command output is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0x9c
"SCSI2:5,28,0" -rr

WWN:500123456789a03d DVER:START 20.93T68.01
cpld:Soft Reset
MIPS:0x1:PROC
PANGEA_SES:A
Slot:A
mac:00-12-34-56-78-9A
[73][00.01.01.00:01.21][13d81]saslink:phychg record 15,2, nextticks 0, diff
=0x13d81
[74][00.01.01.00:01.21][13d81]saslink:phy:1, err inc: 0, 0, 0, 0, phy_chg 1;
```

```
saslink:reason: 0x1
[75][00.01.01.00:01.21][13d81]saslink:phychg record 15,2, nextticks 0, diff
=0x13d81
[76][00.01.01.00:01.21][13d81]saslink:phy:2, err inc: 0, 0, 0, 0, phy_chg 1;
saslink:reason: 0x1
[77][00.01.01.00:01.21][13d81]saslink:phychg record 15,2, nextticks 0, diff
=0x13d81
[78][00.01.01.00:01.21][13d82]saslink:phy:3, err inc: 0, 0, 0, 0, phy_chg 1;
saslink:reason: 0x1
[79][00.01.01.00:01.21][13d82]saslink:phychg record 15,2, nextticks 0, diff
=0x13d82
[7a][00.01.01.00:01.21][13d82]saslink:phy:4, err inc: 0, 0, 0, 0, phy_chg 1;
saslink:reason: 0x1
[7b][00.01.01.00:01.21][13d82]saslink:phychg record 15,2, nextticks 0, diff
=0x13d82
====END GET:9/43====
```

Step 3 Optional: You can copy and save the log information displayed in the command outputs to a file for the convenience of view.

----End

3.7.3 Collecting System Logs Through a Management Network Port (Linux)

When exceptions occur on a storage device, you can collect log information through a management network port to help locating the cause.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run **sg_ses -p 0x9c /dev/sgxx -rr** repeatedly until no log information is displayed in the output.

/dev/sgxx indicates the device number such as /dev/sg10.

NOTE

- For DAS37535U4, you need to run the command in the three SES management systems respectively to collect log information.
- To obtain related device information, follow instructions in [3.1.2 Querying Basic Device Information \(Linux\)](#).

The command output is as follows:

```
[root@localhost ~]# sg_ses -p 0x9c /dev/sg11 -rr
WWN:5112233445a8f13d DVER:START 20.93T74.J3
cpld:Hard Reset
MIPS:0x0:HARD
PANGEA_SES:A
Slot:B
mac:11-22-33-44-5A-8F
[b4][00.01.01.00:01.22][1415a]saslink:phy:2, err inc: 0, 0, 0, 0, phy_chg 1;
saslink:reason: 0x1
[b5][00.01.01.00:01.22][1415a]saslink:phychg record 15,2, nextticks 0, diff
=0x1415a
[b6][00.01.01.00:01.22][1415a]saslink:phy:3, err inc: 0, 0, 0, 0, phy_chg 1;
```

```
saslink:reason: 0x1
[b7][00.01.01.00:01.22][1415a]saslink:phychg record 15,2, nextticks 0, diff
=0x1415a
[b8][00.01.01.00:01.22][1415a]saslink:phy:4, err inc: 0, 0, 0, 0, phy_chg 1;
saslink:reason: 0x1
[b9][00.01.01.00:01.22][1415a]saslink:phychg record 15,2, nextticks 0, diff
=0x1415a
[ba][00.01.01.00:01.22][1415a]saslink:phy:5, err inc: 0, 0, 0, 0, phy_chg 1;
saslink:reason: 0x1
[bb][00.01.01.00:01.22][1415a]saslink:phychg record 15,2, nextticks 0, diff
=0x1415a
[bc][00.01.01.00:01.22][1415a]saslink:phy:6, err inc: 0, 0, 0, 0, phy_chg 1;
saslink:reason: 0x1
====END GET:9/187====[root@localhost ~]#
```

- Step 3 Optional:** You can copy and save the log information displayed in the command outputs to a file for the convenience of view.

----End

3.8 Managing Bit Error Isolation

When bit error isolation is enabled, a phy of a storage device will be isolated if its bit error rate exceeds the threshold, ensuring normal service running.

3.8.1 Setting Bit Error Isolation (Windows)

This section describes how to enable or disable bit error isolation on a server running Windows.

Prerequisites

The sg3_utils tool has been installed on the server running Windows.

Procedure

- Step 1** Log in to the CLI through the management network port of the server running Windows.

- Step 2** Run `.\sg_senddiag.exe -p -r "c2,00,00,01,switch_value" dev_id` to enable or disable bit error isolation.

dev_id indicates the device number such as **SCSI3:4,105,0**. If the value of **switch_value** is **00**, you will disable bit error isolation; if the value is **01**, you will enable bit error isolation.



To obtain related device information, see [3.1.1 Querying Basic Device Information \(Windows\)](#).

----End

3.8.2 Setting Bit Error Isolation (Linux)

This section describes how to enable or disable bit error isolation on a server running Linux.

Prerequisites

The sg3_utils tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_senddiag -p -r c2,00,00,01,switch_value /dev/sgxx` to enable or disable bit error isolation.

`/dev/sgxx` indicates the device number such as the `/dev/sg10`. If the value of `switch_value` is **00**, you will disable bit error isolation; if the value is **01**, you will enable bit error isolation.



To obtain related device information, see [3.1.2 Querying Basic Device Information \(Linux\)](#).

----End

3.8.3 Checking the Status of Bit Error Isolation (Windows)

This section describes how to check whether bit error isolation is enabled on a server running Windows.

Prerequisites

The `sg3_utils` tool has been installed on the server running Windows.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Windows.

Step 2 Run `.\sg_ses.exe -p 0xc2 dev_id` to check the bit error isolation status.

`dev_id` indicates the device number such as **SCSI3:4,105,0**.



To obtain related device information, see [3.1.1 Querying Basic Device Information \(Windows\)](#).

The execution result is as follows:

```
PS C:\Users\Administrator\Documents\sg3_utils-1.42> .\sg_ses.exe -p 0xc2
"SCSI2:5,28,0"
    HUAWEI      DAS37535U4      T68
Cannot decode response from diagnostic page: <unknown>
  00      c2 00 00 01 00      ....
```

If the last two digits on the last line are **00**, bit error isolation is disabled; if they are **01**, bit error isolation is enabled.

----End

3.8.4 Checking the Status of Bit Error Isolation (Linux)

This section describes how to check whether bit error isolation is enabled on a server running Linux.

Prerequisites

The `sg3_utils` tool has been installed on the server running Linux.

Procedure

Step 1 Log in to the CLI through the management network port of the server running Linux.

Step 2 Run `sg_ses -p 0xc2 /dev/sgxx` to check the bit error isolation status.

`/dev/sgxx` indicates the device number such as the `/dev/sg10`.



To obtain related device information, see [3.1.2 Querying Basic Device Information \(Linux\)](#).

The execution result is as follows:

```
root@localhost ~]# sg_ses -p 0xc2 /dev/sg11
HUAWEI      DAS37535U4      T68
Cannot decode response from diagnostic page: <unknown>
00      c2 00 00 01 00      ....
```

If the last two digits on the last line are **00**, bit error isolation is disabled; if they are **01**, bit error isolation is enabled.

----End

4 Expanding Capacity of a Storage System

About This Chapter

This chapter describes how to expand capacity of a storage system when the current capacity cannot meet service requirements.

4.1 Overview

With the continued development of enterprise information systems and the ever-increasing expansion in the scale of services, massive information volumes have caused a ceaseless increase in data accumulation. The initial configuration of storage systems is often not enough to meet these demands, and so storage system capacity expansion has become a key issue in system administration. OceanStor V3 DAS storage systems provide an online expansion function that enables hitless capacity expansion without interrupting ongoing services.

4.2 About the Capacity Expansion Process

Storage system capacity must follow the process outlined below in order to minimize the risk of errors or faults. The capacity expansion process includes pre-expansion check, capacity expansion, post-expansion check, and using the newly added storage space.

4.3 Preparing for the Capacity Expansion

Make preparations before capacity expansion.

4.4 Expanding the System Capacity

You can use a capacity expansion method based on your service and capacity requirements.

4.5 Post-expansion Check

After the new disks, disk enclosures, or servers are installed and powered on, and the indicators are normally on, check on the application server whether these new disks or disk enclosures are identified and running normally.

4.1 Overview

With the continued development of enterprise information systems and the ever-increasing expansion in the scale of services, massive information volumes have caused a ceaseless increase in data accumulation. The initial configuration of storage systems is often not enough to meet these demands, and so storage system capacity expansion has become a key issue in system administration. OceanStor V3 DAS storage systems provide an online expansion function that enables hitless capacity expansion without interrupting ongoing services.

The capacity of OceanStor V3 DAS storage systems can be expanded online by adding the following devices:

- Disks
- Disk enclosures
- Links

You can choose a capacity expansion method based on capacity expansion requirements.

Table 4-1 describes the characteristics and application scenarios of the capacity expansion methods.

Table 4-1 Characteristics and application scenarios of capacity expansion methods

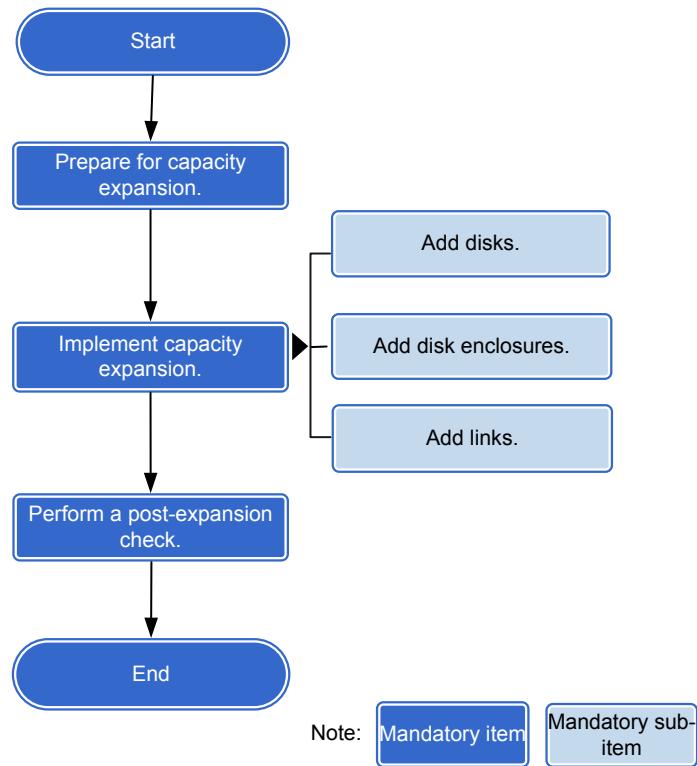
Capacity Expansion Method	Characteristics	Application Scenario
Adding disks	<ul style="list-style-type: none">● Does not interrupt services● Easy to operate● Fast● Low-cost	The storage system has enough empty disk slots to satisfy your capacity expansion requirements.
Adding disk enclosures	<ul style="list-style-type: none">● Does not interrupt services● Large expansion capacity	The storage system does not have enough empty disk slots, or the total capacity of the empty disk slots is not enough to satisfy your capacity expansion requirements. For example, 5 TB of capacity is required but only 2 TB is available after disks are added to all free disk slots.
Adding links	Does not interrupt services	The storage system does not meet service reliability requirements.

4.2 About the Capacity Expansion Process

Storage system capacity must follow the process outlined below in order to minimize the risk of errors or faults. The capacity expansion process includes pre-expansion check, capacity expansion, post-expansion check, and using the newly added storage space.

Figure 4-1 shows the capacity expansion process.

Figure 4-1 Capacity expansion process



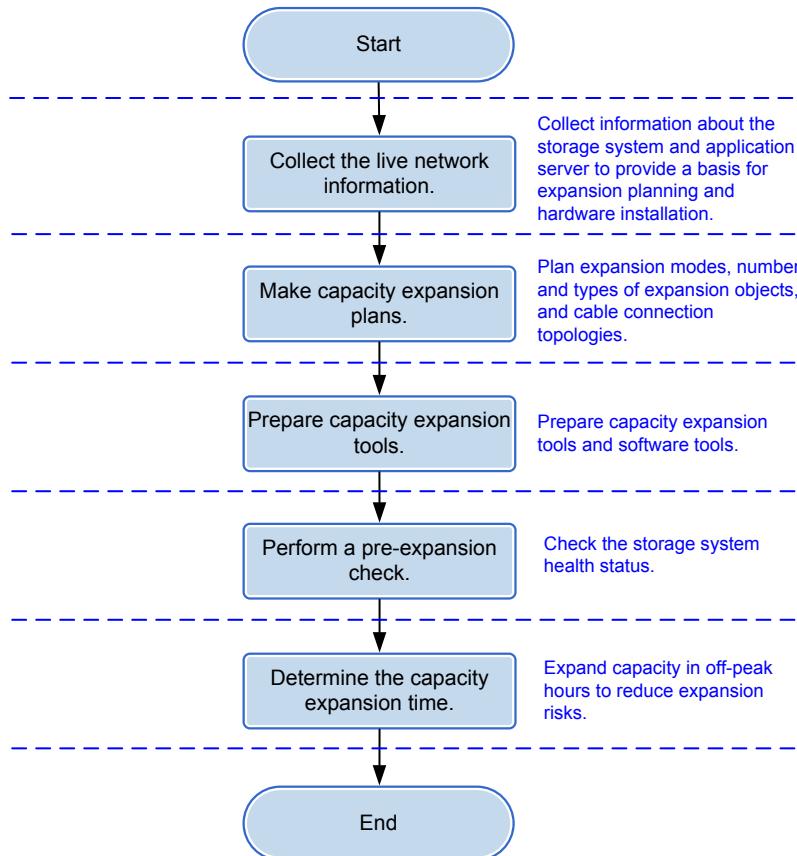
4.3 Preparing for the Capacity Expansion

Make preparations before capacity expansion.

4.3.1 Preparations Before Capacity Expansion

Before capacity expansion, collect live network information, plan capacity expansion, prepare required tools, perform pre-expansion check, determine the expansion time, and back up storage system configuration data.

[Figure 4-2](#) shows the preparation process.

Figure 4-2 Preparation process

4.3.2 Collecting Live Network Information

Live network information is required for preparing capacity expansion plans and adding devices for capacity expansion. Live network information that must be collected includes information about storage systems being expanded and application servers.

Table 4-2 describes the live network information that must be collected before capacity expansion.

Table 4-2 Collecting live network information

Category	Item	Remarks
Storage system information	Existing capacity	Estimate the capacity to be added to the storage system.
	Number of free disk slots	Estimate the capacity that can be added to the storage system using free disk slots.
	Existing disk capacity	
	Disk enclosure model	Ensure that the types and models of devices to be

Category	Item	Remarks
	Types and models of disks in existing disk domains	added are compatible with existing ones.
Application server information	Number of disk enclosures	Ensure that newly added disk enclosures and bays will not cause the storage system to exceed the current maximum system configuration.
	Name and model Types of supported HBAs	The HBA type determines the maximum number of devices that can be added. NOTE For the maximum number of devices that can be expanded for an HBA, see the specifications document of the HBA in its official website.

4.3.3 Planning Capacity Expansion

There are different capacity expansion modes and plans. The selection of a plan should be based on the compatibility of added hardware as well as the running status of the storage system.

4.3.3.1 Selecting a Capacity Expansion Mode

The capacity expansion mode varies depending on requirements such as the capacity to be expanded.

Table 4-3 lists the principles for choosing a proper expansion mode.

Table 4-3 Principles for choosing an expansion method

User Configuration Scenario	Expansion Mode
To expand the capacity in a storage array	There are free disk slots in the system and the total capacity of the new disks to be inserted in the slots can meet expansion requirements.
	There is no free disk slot in the system, the system is not fully configured with disk enclosures, and the total capacity of disks in the disk enclosures to be added can meet expansion requirements.

User Configuration Scenario	Expansion Mode
To improve system reliability	The storage system reliability cannot meet service requirements. Add links.

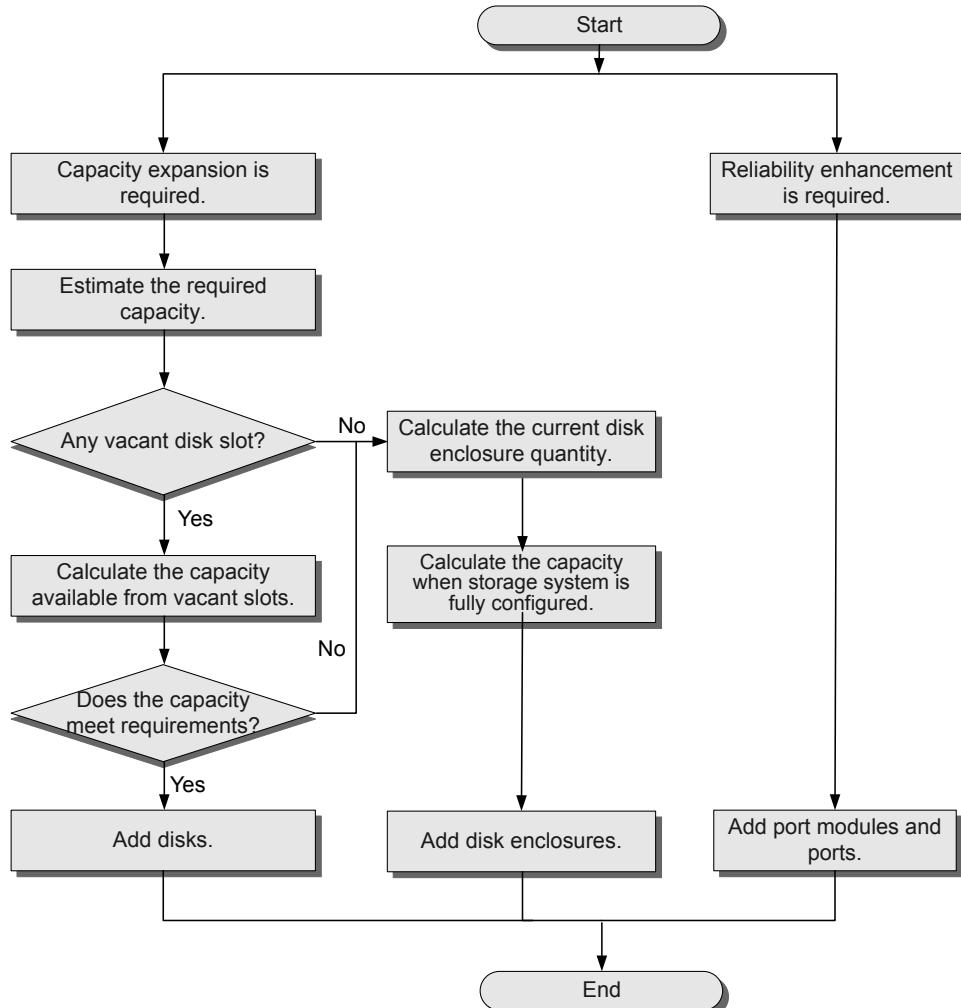
Table 4-4 lists capacity expansion modes supported by the OceanStor V3 DAS storage systems.

Table 4-4 Capacity expansion modes supported by the storage system

Expansion Mode	Description
Adding disks	For details about capacity expansion by adding disks, see 4.3.3.2 Adding Disks for Capacity Expansion .
Adding disk enclosures	Capacity expansion by adding disk enclosures involves the following two scenarios: <ul style="list-style-type: none">● Adding disk enclosures by using a free expansion port on a server● Adding disk enclosures to an existing loop For details about how to add disk enclosures by using an expansion port, see 4.3.3.3 Planning Capacity Expansion by Adding Disk Enclosures .
Adding links	For details about capacity expansion by adding links, see 4.3.3.4 Planning for Adding Links .

Figure 4-3 shows the flowchart for specifying a capacity expansion mode.

Figure 4-3 Flowchart for specifying a capacity expansion mode



The planned expansion capacity refers to the capacity that you want to add to the system. This capacity is determined based on the collected live network information and the workload of ongoing services. The planned expansion capacity must include capacity used by the metadata. This capacity must be sufficient for storage requirements of future data growth. For details about the planned expansion capacity, consult your service provider.

NOTE

The planned expansion capacity recommended by your service provider is usually the one identified by an application server. Therefore, this capacity must include capacity used by the metadata.

The allowed expansion capacity refers to the maximum available capacity of the existing free disk slots.

$$\text{Allowed expansion capacity} = \text{Capacity of a disk} \times \text{Number of free disk slots}$$

 **NOTE**

- You can estimate the actual capacity of a disk based on the capacity of existing disks used in the storage system.
- Use the actual capacity instead of the nominal capacity.

Disk manufacturers use 1000 as the conversion factor: 1 GB = 1000 MB, 1 MB = 1000 KB, 1 KB = 1000 Bytes

Operating systems use 1024 as the conversion factor: 1 GB = 1,024 MB, 1 MB = 1024 KB, 1 KB = 1024 Bytes

4.3.3.2 Adding Disks for Capacity Expansion

The process of adding disks for capacity expansion includes selecting disks that are compatible with the storage system, and specifying the number of disks to be added.

Specifying the Type and Number of the Disks to Be Added

**NOTICE**

After selecting the disk to be added, record the type and specifications of the disk enclosures in a list to facilitate verification before hardware installation and prevent a capacity expansion failure due to type or specifications incompatibility.

Comply with the following rules when adding disks:

- The disks to be added must be of the same type as the disks supported by disk enclosures. In addition, among the disks in the same disk enclosure, their types and capacities must be consistent.
- The disks to be added must be of the same type as the disks in the storage tier to be expanded.
- The RAID policy is set to RAID 6 when the capacity tier consists of NL-SAS disks.

Plan types and models of disks that you want to add based on storage system specifications, as described in [Table 4-5](#).

Table 4-5 Hardware specifications of the storage system being expanded

Parameter	Description
Supported disk enclosure types	<ul style="list-style-type: none">● DAS32525U2: 2 U SAS disk enclosures with 25 2.5-inch disks● DAS32435U4: 4 U SAS disk enclosures with 24 3.5-inch disks● DAS37535U4: 4 U high-density disk enclosures with 75 3.5-inch disks
Disk types supported by DAS32525U2 housing 2.5-inch disks	900 GB SSD

Parameter	Description
Disk types supported by DAS32435U4 housing 3.5-inch disks	<ul style="list-style-type: none">● 4 TB 7200 r/min NL-SAS● 6 TB 7200 r/min NL-SAS
Disk types supported by DAS37535U4 housing 3.5-inch disks	<ul style="list-style-type: none">● 4 TB 7200 r/min NL-SAS● 6 TB 7200 r/min NL-SAS

Determining the Number of the Disks to Be Added

After disk types are determined, estimate the number of disks based on the capacity provided by the supplier, calculate the available capacity of the storage system, and check whether the available capacity is the same as suggested.

Then, divide the planned expansion capacity by the capacity of a disk to obtain the number of disks to be added.

4.3.3.3 Planning Capacity Expansion by Adding Disk Enclosures

The type and number of disk enclosures selected for addition should be compatible with the storage system. The expansion process also includes the creation of the pertaining connection diagrams before and after the capacity upgrade.

4.3.3.3.1 Specifying the Type and Number of the Disk Enclosures to Be Added

The type and number of the disk enclosures to be added are specified based on the compatibility rules and the live network information. The live information refers to the information about disk enclosure module, and the disk type and specifications of the disks.

Specifying the Type of the Disk Enclosures to Be Added



NOTICE

After selecting the disk enclosures to be added, record the type and specifications of the disk enclosures in a list to facilitate verification before hardware installation and prevent a capacity expansion failure due to type or specifications incompatibility.

Comply with the following rules when adding disk enclosures:

- The disk enclosures to be added must be of the same type as the disk enclosures supported by storage systems. For the server and the disk enclosure types supported by a storage system, use the [OceanStor Interoperability Navigator](#) tool to query.
- The number of the disk enclosures to be added in the storage system must not exceed the specifications supported by the corresponding product. For the maximum number of disk enclosures that can be cascaded to a storage system, see the specifications document of the storage system's HBA in its official website.

- The number of the disk enclosures to be added in each loop must not exceed the specifications supported by the corresponding product. Types of disk enclosures in the same expansion loop must be consistent.
- The RAID policy is set to RAID 6 when the capacity tier consists of NL-SAS disks.

Table 4-6 lists the specification parameters of the corresponding product for your reference.

Table 4-6 Specification parameters of the storage system

Parameter	DAS32525U2	DAS32435U4	DAS37535U4
Supported disk enclosure types	2 U SAS disk enclosure with 25 2.5-inch disks	4 U SAS disk enclosure with 24 3.5-inch disks	4 U high-density disk enclosure with 75 3.5-inch disks
Max. number of disk enclosures to which a SAS port connects (Number of disk enclosures supported by each loop)	A SAS port is a good practice to connect at most five disk enclosures to one SAS port.		
Disk types supported by SAS disk enclosures	900 GB SSD (2.5-inch)	<ul style="list-style-type: none">● 4 TB 7200 r/min NL-SAS (3.5-inch)● 6 TB 7200 r/min NL-SAS (3.5-inch)	

Specifying the Number of the Disk Enclosures to Be Added

The formula for calculating the number of the disk enclosures to be added is as follows:

Number of the disk enclosures to be added = Number of disks to be added/Maximum number of disks that can be carried by a disk enclosure.

NOTE

- DAS32525U2 support a maximum of **25** disks.
- DAS32435U4 support a maximum of **24** disks.
- DAS37535U4 support a maximum of **75** disks.

4.3.3.3.2 Selecting a Disk Enclosure Connection Mode

The capacity can be expanded for the V3 DAS storage system by using the free expansion ports or the existing loop. Using expansion ports to expand capacity is preferred.

Create the connection topology between the server and disk enclosures before expanding the capacity according to the live network conditions. Emphasize P0/P1 ports or EXP/PRI ports, and cable connections in the topology. Neglect other unimportant components. Based on the cable connection rules and the connection mode, create topologies for capacity expansion and describe the cable connection and removal sequence.

Connect cables according to the cable connection diagrams when expanding the capacity of the storage system.

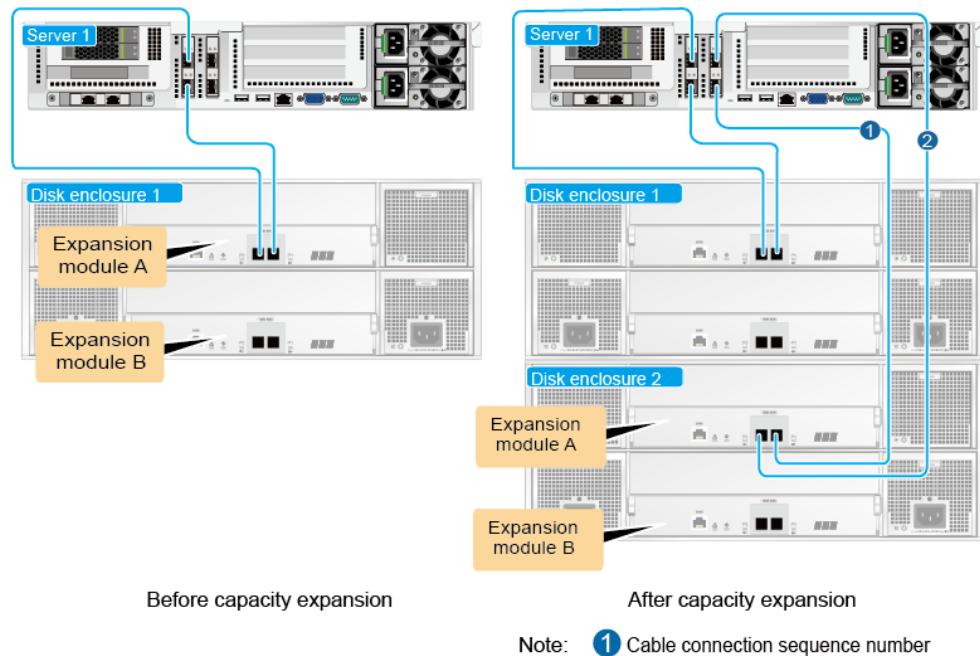
NOTICE

The number of disk enclosures in all expansion modes cannot exceed the specifications. Otherwise, new disks cannot be added to the storage system. For details about the specifications, see [4.3.3.3.1 Specifying the Type and Number of the Disk Enclosures to Be Added](#).

Expanding Capacity Using Available Expansion Ports (Applicable to 2 U/4 U SAS Disk Enclosure Only)

When a storage system contains only one disk enclosure and there are available expansion ports, you can add a disk enclosure to the storage system using the expansion ports on the server. The following illustrates how to add a 4 U SAS disk enclosure using two available expansion ports. [Figure 4-4](#) shows how the disk enclosures are connected.

Figure 4-4 Adding disk enclosures using expansion ports



NOTE

- You can only use available ports to add a maximum of one disk enclosure.
- The method of adding a 2 U SAS disks enclosure is the same as adding a 4 U SAS disk enclosure.

Expanding Capacity in the Existing Loops

If two servers are configured for the storage system, no available expansion ports exist, and the number of disk enclosures in each loop does not surpass the specification limits, you can expand capacity by adding disk enclosures to the existing loops.

This type of capacity expansion includes two scenarios: one contains only one server and the other contains two servers.

- One-server-scenario

You can expand the capacity in the existing loop without removing any cables. The following uses a 4 U SAS disk enclosure and a 4 U high-density disk enclosure as examples to illustrate how they are added to the existing loop, as shown in [Figure 4-5](#) and [Figure 4-6](#).

Figure 4-5 Adding a 4 U SAS disk enclosure to an existing loop

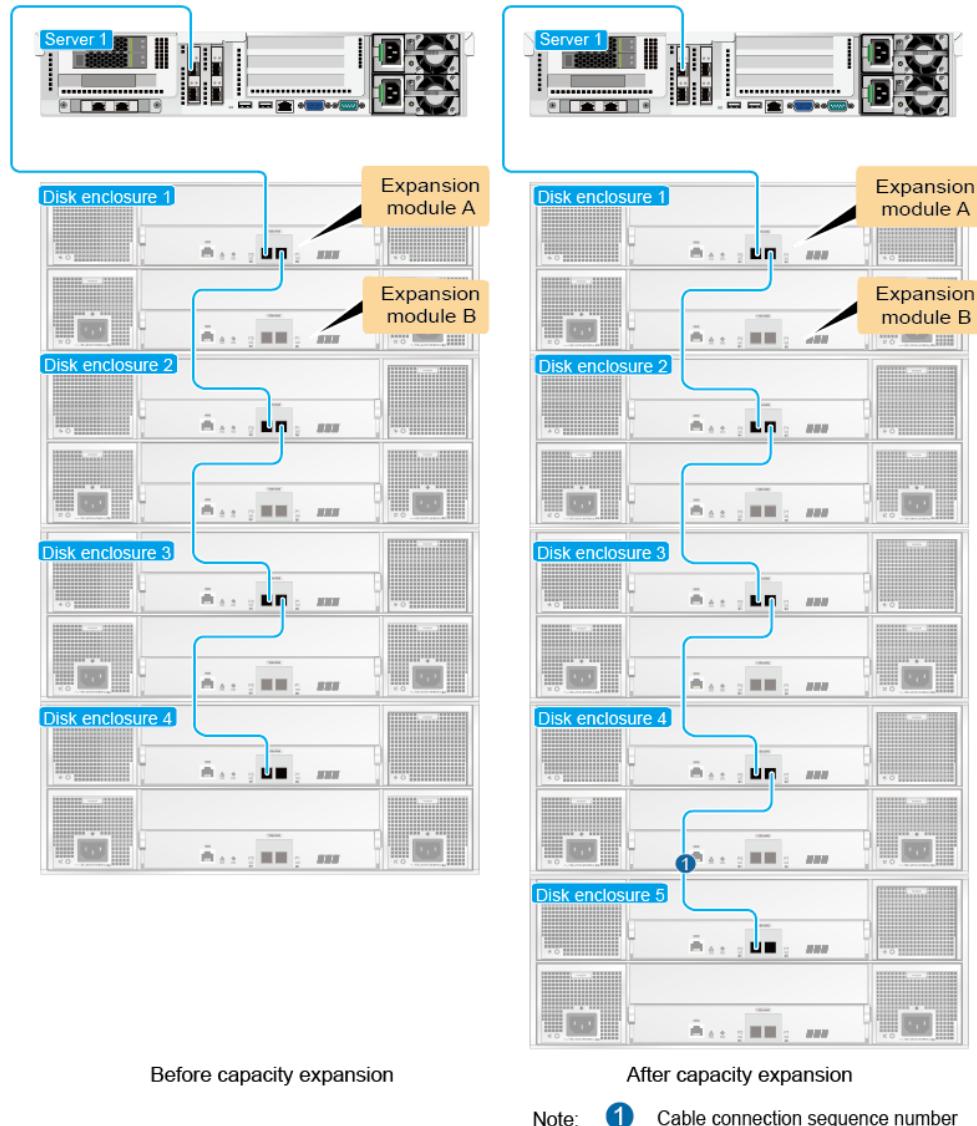
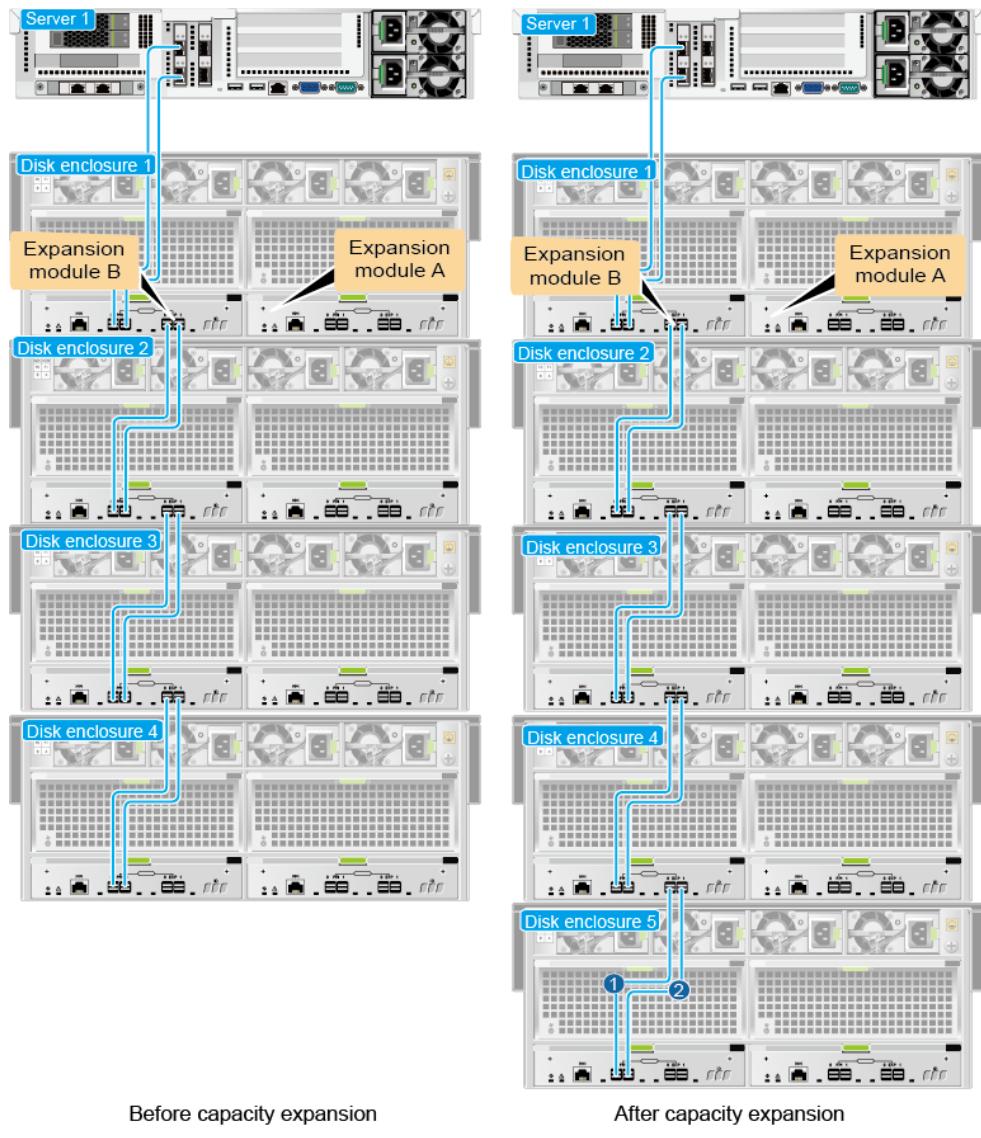


Figure 4-6 Adding a 4 U high-density disk enclosure to an existing loop



- Two-server-scenario

Two connection modes are available in this scenario:

- The cables are connected forward and backward in the loop where the disk enclosures reside.
- The cables are connected forward in the loop where the disk enclosures reside.

When cables in the loop are connected forward and backward scenario

When cables in the loop are connected forward and backward, some cables must be removed. The following uses a 4 U SAS disk enclosure and a 4 U high-density disk enclosure as examples to illustrate how they are added to the existing loop in the forward and backward manner, as shown in [Figure 4-7](#) and [Figure 4-8](#).

Figure 4-7 Adding a 4 U SAS disk enclosure to a loop where cables are connected forward and backward

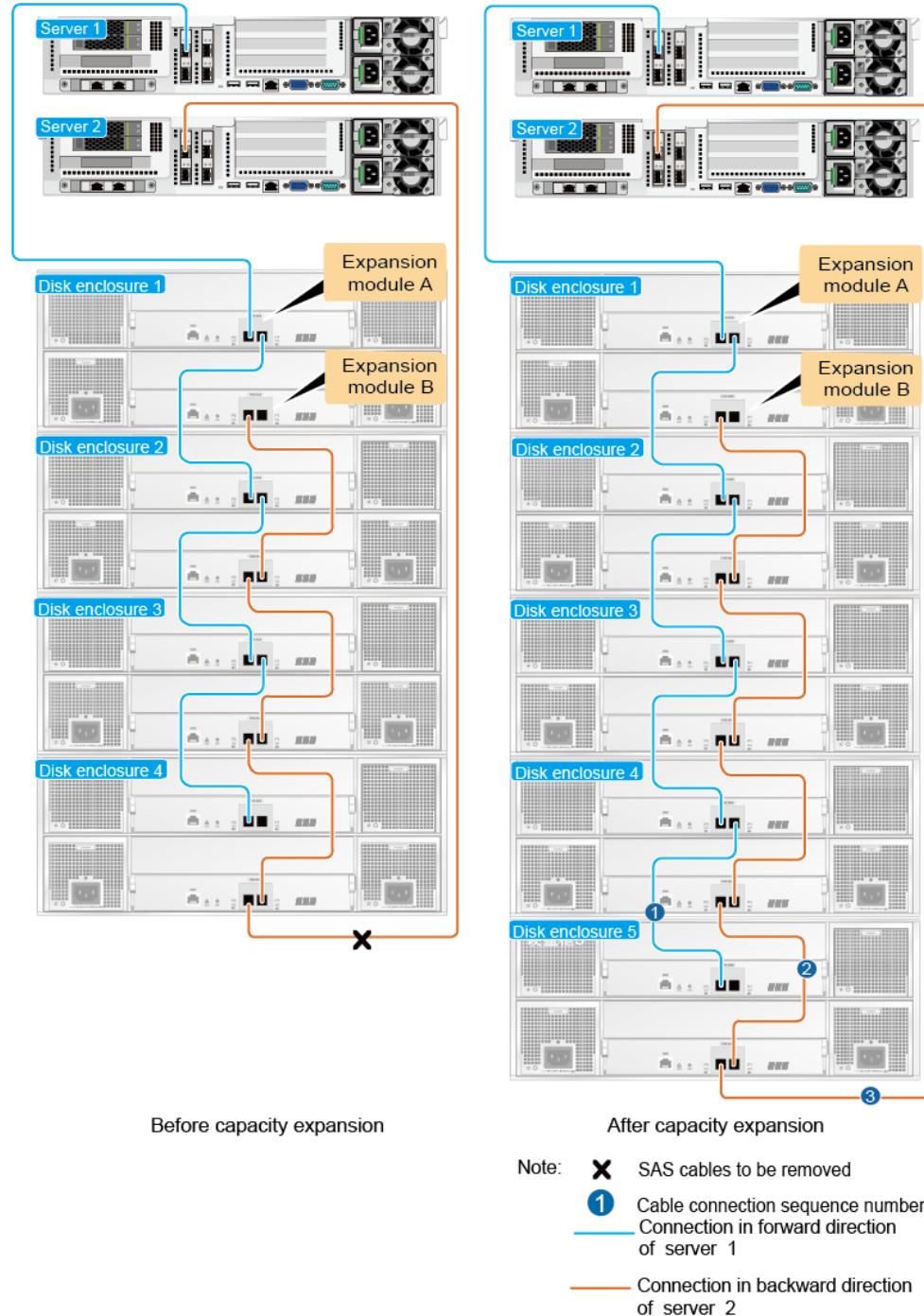
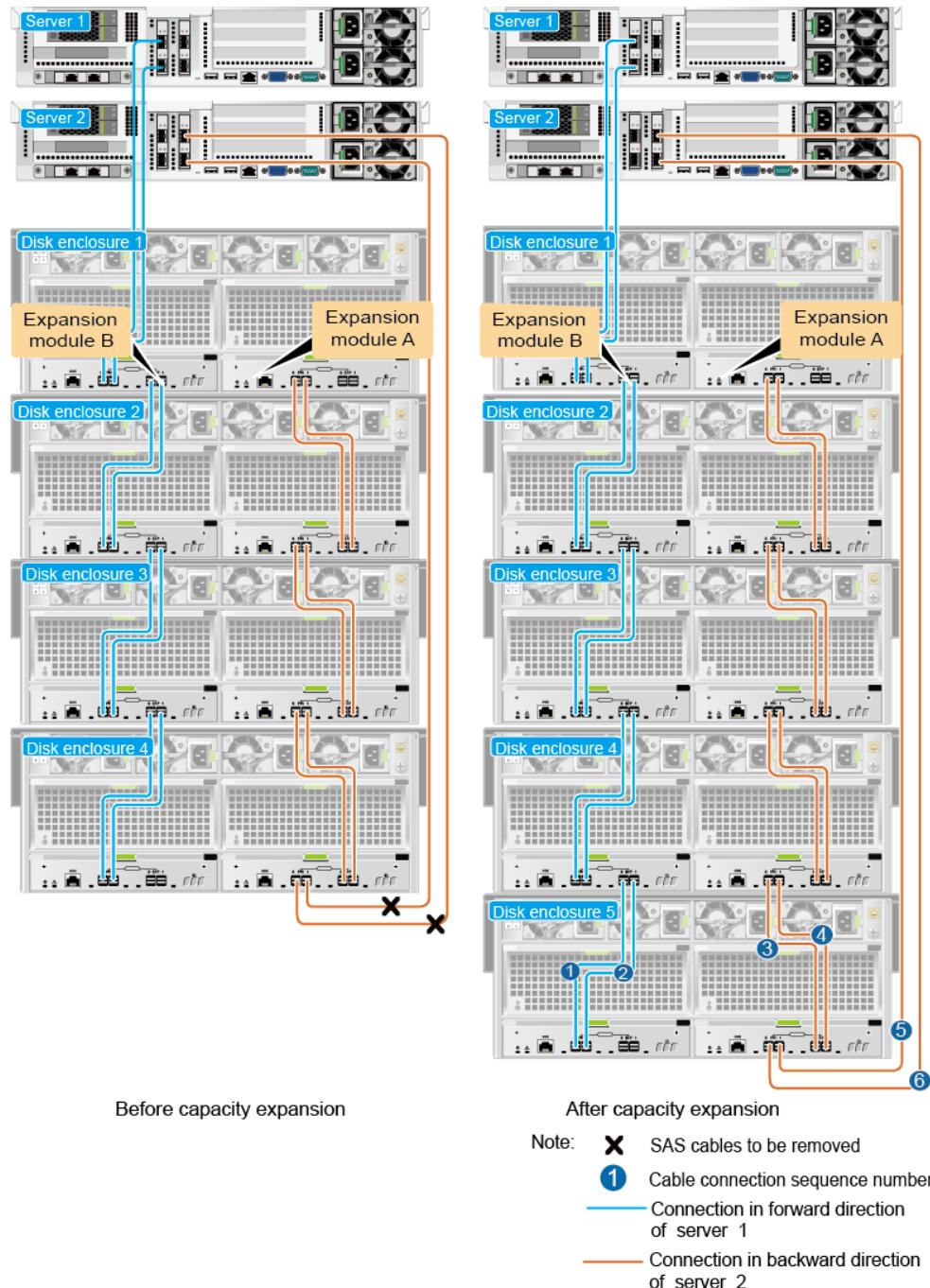


Figure 4-8 Adding a 4 U high-density disk enclosure to a loop where cables are connected forward and backward



When cables in the loop are connected forward scenario

When cables in the loop are connected forward, you can expand the capacity without removing any cables. The following uses a 4 U SAS disk enclosure and a 4 U high-density disk enclosure as examples to illustrate how they are added to the existing loop in the forward manner, as shown in [Figure 4-9](#) and [Figure 4-10](#).

Figure 4-9 Adding a 4 U SAS disk enclosure to a loop where cables are connected forward

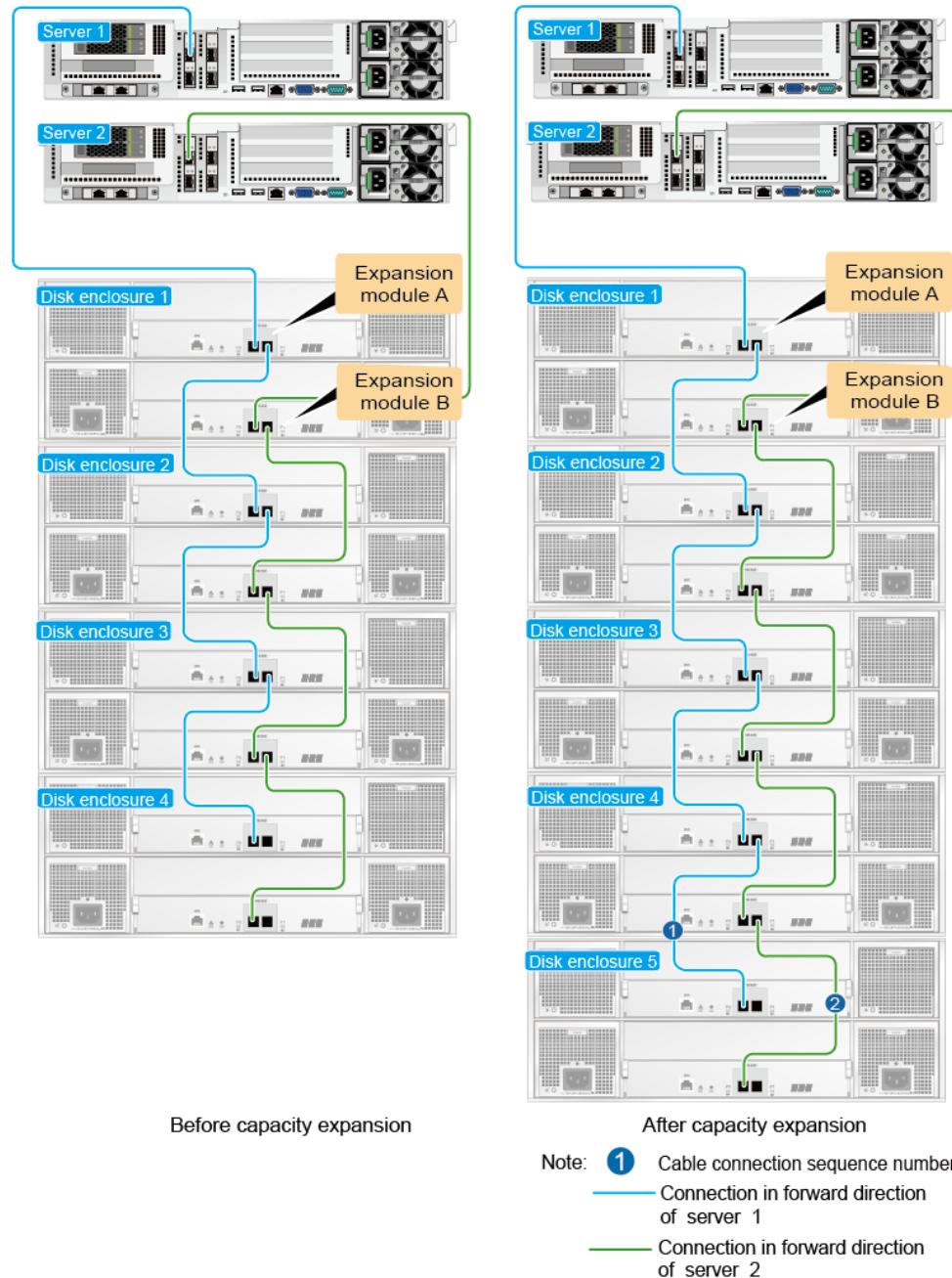
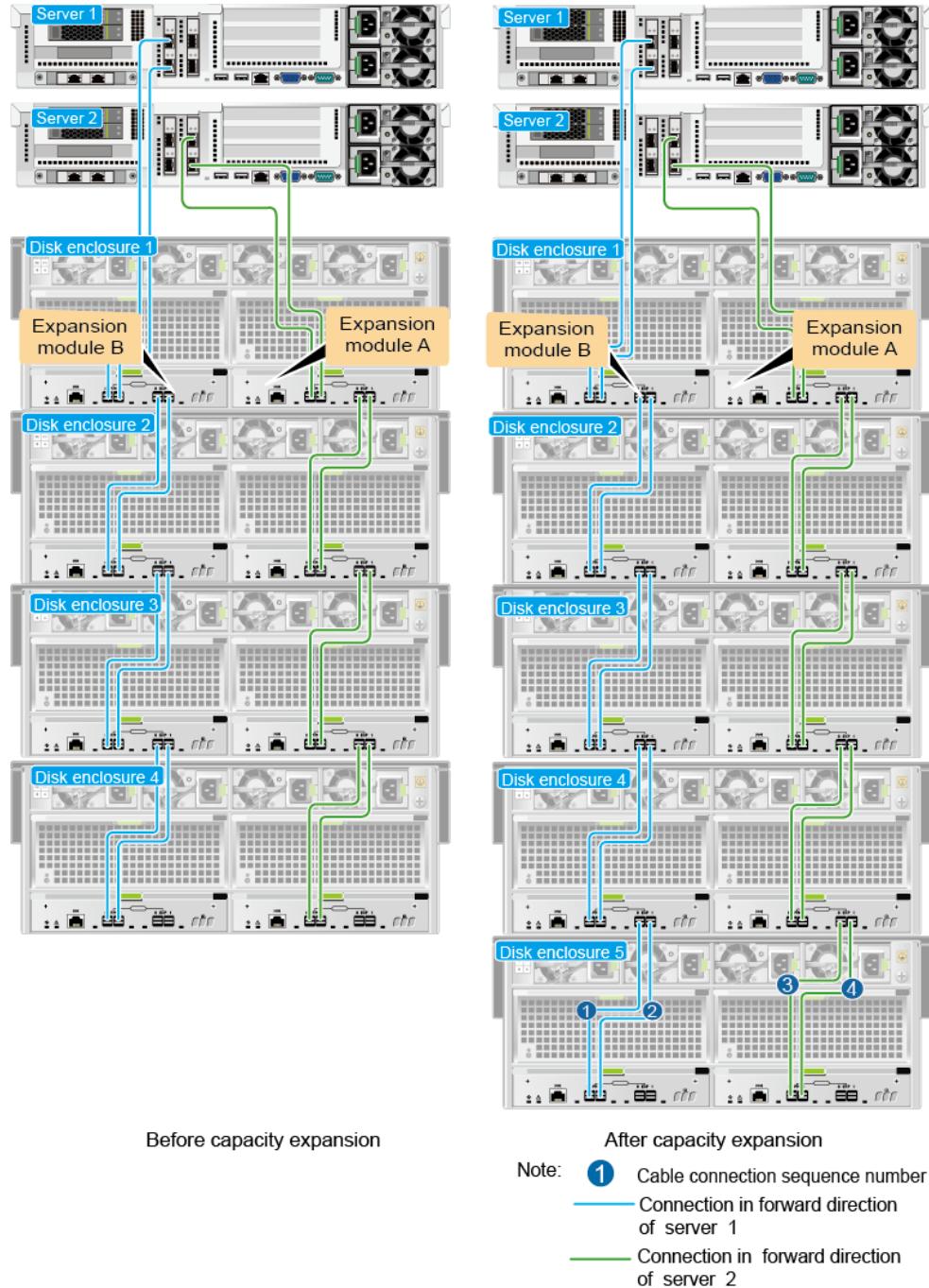


Figure 4-10 Adding a 4 U high-density disk enclosure to a loop where cables are connected forward



NOTE

The method of adding a 2 U SAS disks enclosure is the same as adding a 4 U SAS disk enclosure.

4.3.3.4 Planning for Adding Links

Planning tasks required for adding links include determining the types and number of HBAs or servers supported by the storage system and compatible with the host, and drawing the network diagram after adding links.

4.3.3.4.1 Determining the Types and Number of Interface Modules

The types and number of servers or HBAs to be added must be specified based on the compatibility rules and the live network information. The live network information refers to the information about the types and specifications of existing servers or HBAs.

You can use **OceanStor Interoperability Navigator** to query whether the server or the HBA is compatible with the storage system.

- If the server or the HBA is compatible with the storage system, the conditions of adding servers are met.
- If the server or the HBA is not compatible with the storage system, servers cannot be added. Contact Huawei technical support if you still want to add servers.

4.3.3.4.2 Drawing the Topology for Newly Added Links

The network topologies are the diagrams illustrating how to connect cables between servers and disk enclosures. For the V3 DAS storage systems, you can add servers to add links.

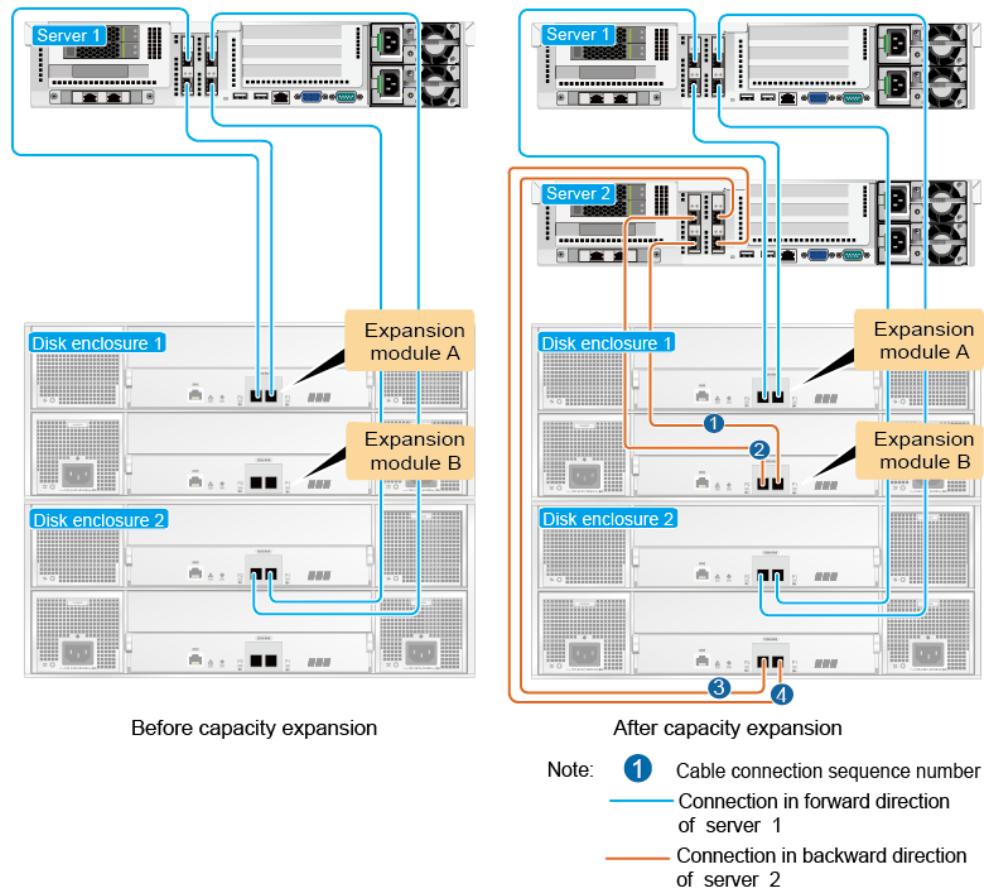
Adding Servers

This type of expansion includes two situations:

- In the live network, a server is connected to a 2 U/4 U SAS disk enclosure through two links.
- In the live network, a server is connected to 2 U/4 U SAS disk enclosures through a single link or a server is connected to 4 U high-density disk enclosures through two links.

When a server is connected to a 2 U/4 U SAS disk enclosure, you can add servers to add links. In the following example, a server is added to 4 U SAS disk enclosures to add links.

Figure 4-11 shows how they are connected.

Figure 4-11 Adding servers to 4 U SAS disk enclosures to add links**NOTE**

The method of adding links that connect to 2 U SAS disks enclosures is the same as that to 4 U SAS disk enclosures.

When a server is connected to 2 U/4 U SAS disk enclosures through one link or to 4 U high-density disk enclosures through two links, you can add servers to add links. In the following examples, a server is added to 4 U SAS disk enclosures and to 4 U high-density disk enclosures to add links. The connections are shown in [Figure 4-12](#), [Figure 4-13](#), [Figure 4-15](#), and [Figure 4-14](#).

Figure 4-12 Adding servers to 4 U SAS disk enclosures to add links (forward and backward connection)

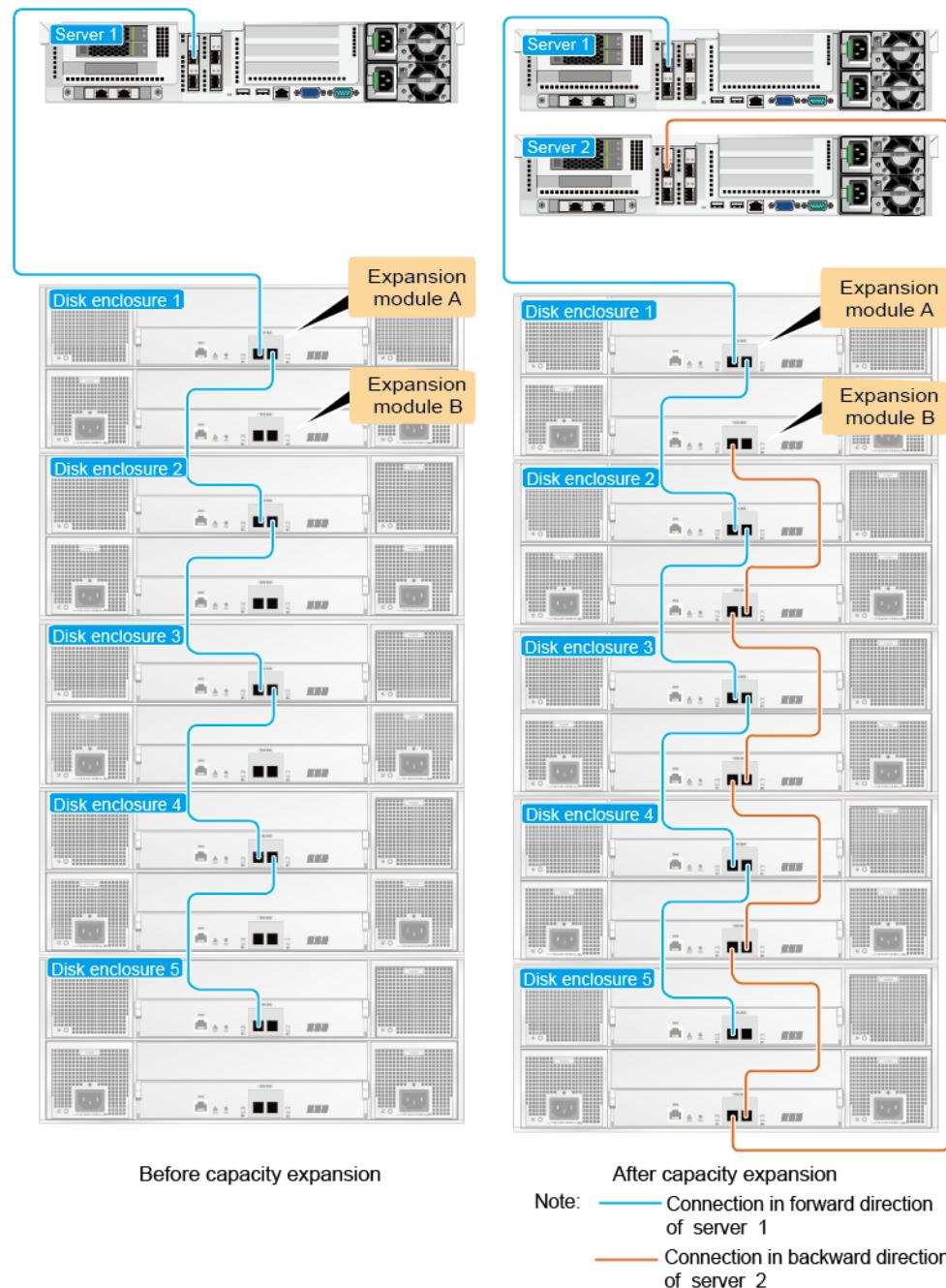


Figure 4-13 Adding servers to 4 U SAS disk enclosures to add links (forward connection)

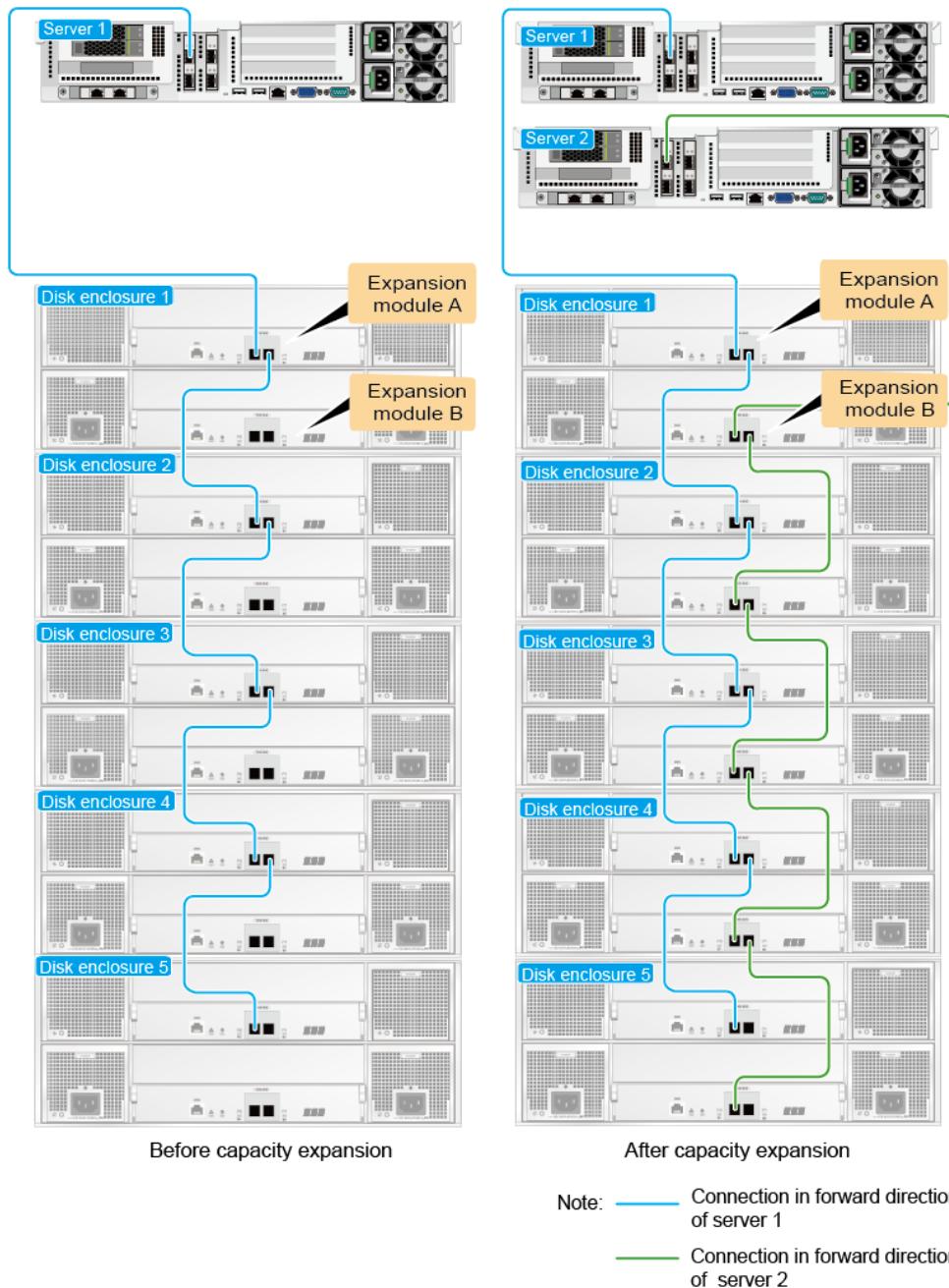


Figure 4-14 Adding servers to 4 U high-density disk enclosures to add links (forward and backward connection)

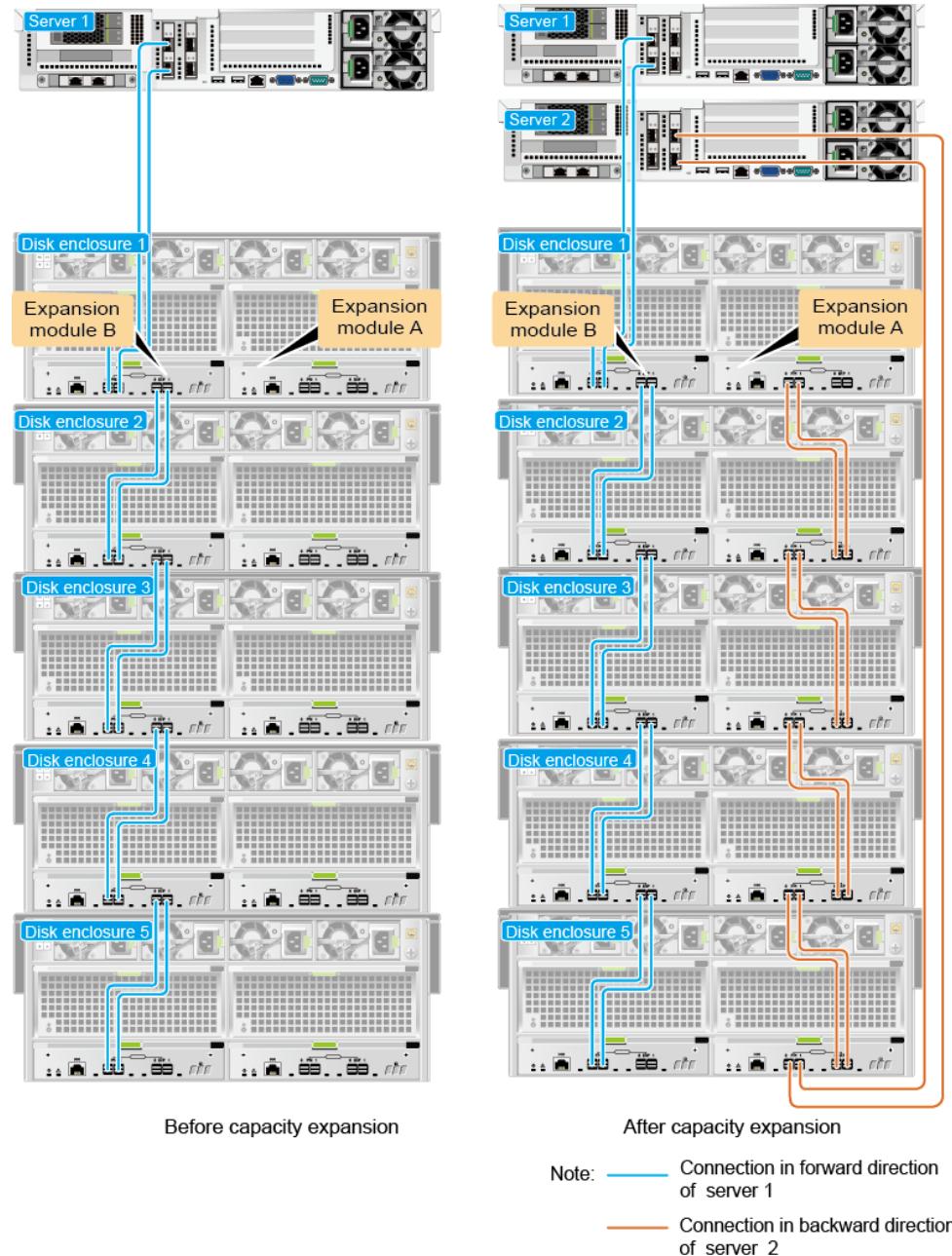
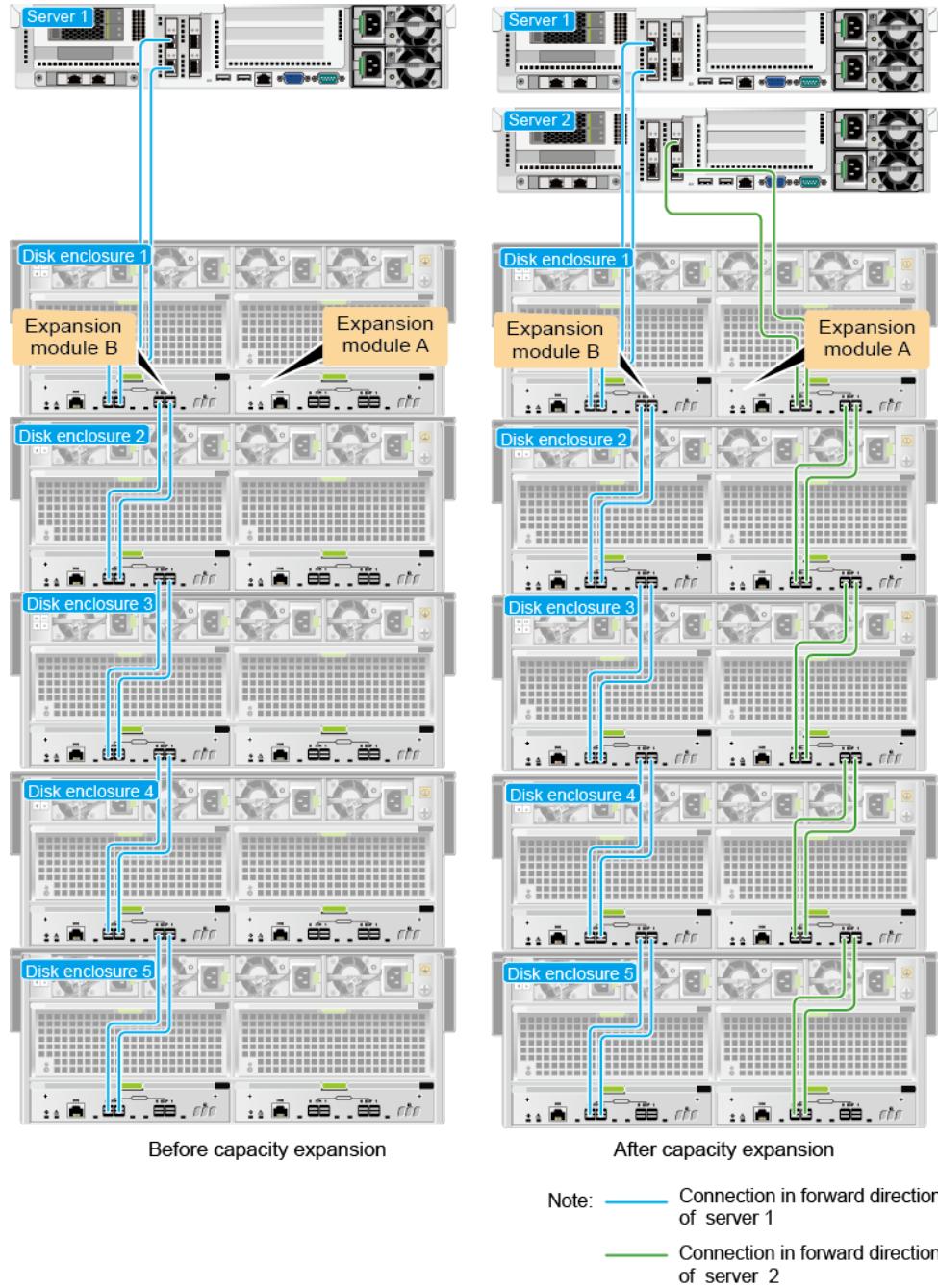


Figure 4-15 Adding servers to 4 U high-density disk enclosures to add links (forward connection)



NOTE

The method of adding links that connect to 2 U SAS disks enclosures is the same as that to 4 U SAS disk enclosures.

4.3.4 Preparing Auxiliary Materials and Software Tools

Before expanding the capacity, prepare auxiliary tools and software to help ensure a smooth implementation of capacity expansion.

Auxiliary materials used in capacity expansion include installation tools and test meters, as described in **Table 4-7**.

Table 4-7 Auxiliary installation tools

Tool Name	Usage
Serial cable	Log in to the serial port of a storage system.
(Optional) USB-to-serial cable	Connect to a storage system. If the maintenance terminal is a laptop that does not provide a serial port, you need to use the USB-to-serial cable to connect to the storage system.
Bundling tape	Bundle new cables.
Label	Mark the position of a cable before it is removed, preventing the cable from being inserted into a wrong slot during the capacity expansion.
Marker	Mark locations and scales.
Diagonal pliers	Used to make ground cables and remove binding strap.
Phillips screwdriver (M3 to M6)	Fasten small screws and bolts.
(Optional) Flat-head screwdriver (M3 to M6)	Replace the floating nut mounting bar, install and remove floating nuts.
Floating nut mounting bar	Install and remove floating nuts.
Installation template (2 U/4 U)	Determine installation positions.
ESD clothes	Prevent electrostatic discharge.
ESD gloves	Prevent electrostatic discharge.
ESD wrist strap	Prevent electrostatic discharge.
Multimeter	Test the insulation of a cabinet, connectivity of a cable, and electric performance specifications of a device, such as voltage, current, and resistance.

4.3.5 Determining the Capacity Expansion Time

Expanding system capacity at an appropriate time can reduce risks associated with the expansion process.

You are advised to expand the system capacity during off-peak hours.

 **NOTE**

Although the storage system can be expanded online, for security purposes you are advised to stop all services when adding disk enclosures or servers.

4.4 Expanding the System Capacity

You can use a capacity expansion method based on your service and capacity requirements.

4.4.1 Adding Disks

Disk-level capacity expansion is easy, fast, and cost-effective. It is applicable to application scenarios where the capacity to be expanded is small. Disk-level capacity expansion includes adding disks and confirming the status of the added disks.

4.4.1.1 Expanding Disks

If disks have not been installed into the storage devices, install the disks before installing the storage devices. If disks have been installed into the storage devices, skip this procedure.

Prerequisites

- Disks compatible with the storage system are prepared.
- Configuration data of the storage system has been backed up.

Insert a disk of the 2 U or 4 U SAS Disk Enclosure

Step 1 Insert a disk.

1. Put on ESD clothing and a pair of ESD gloves.
2. Take the disk out of an ESD bag.

 **NOTICE**

- Before inserting a disk, move the disk handle to the fully open position. Otherwise, the disk cannot be fully inserted into a slot.
- Align a disk with a disk slot and then gently insert the disk. Do not use excessive force when inserting a disk, or else disk connectors may be damaged.
- After inserting a disk, wait at least one minute before removing it, or else disks may be damaged.

-
3. Insert the disk into a vacant slot, as shown in step 1 in [Figure 4-16](#) and [Figure 4-17](#).

Figure 4-16 Installing a disk of the 2 U SAS disk enclosure

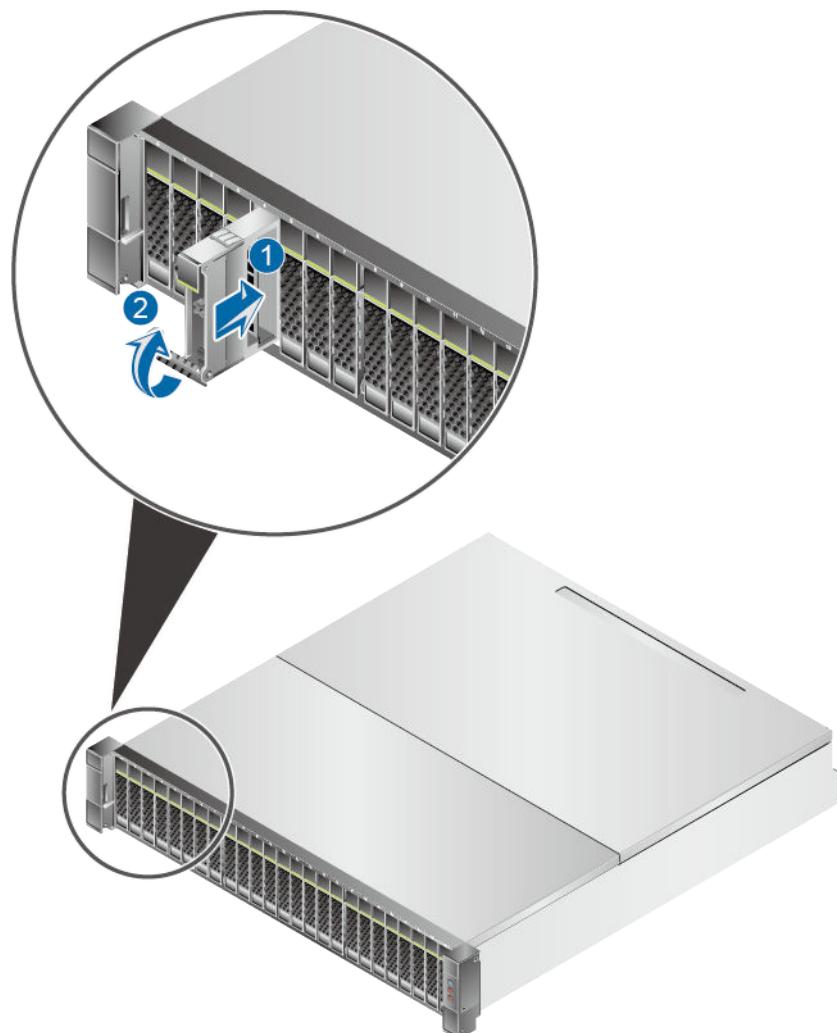
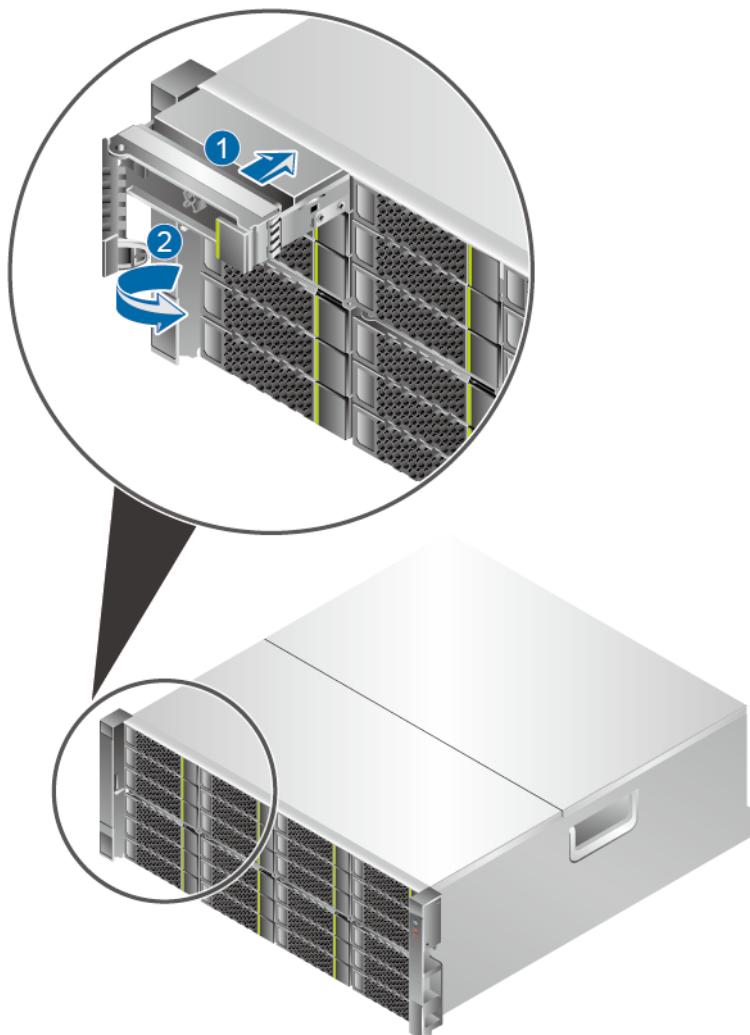


Figure 4-17 Installing a disk of the 4 U SAS disk enclosure



4. Move the disk handle to the closed position, as shown in step 2 in [Figure 4-16](#) and [Figure 4-17](#). Then wait for the disk to automatically power on.

It takes approximately 15 to 30 seconds for a disk to power on.

Step 2 View indicators on the disk and check the disk installation.



1 Running indicator of the disk module

2 Alarm/Location indicator of the disk module

 **NOTE**

The above figure with the 2.5 inch disk as an example.

- If the disk is running correctly:
 - The disk activity indicator is steady green.
 - The disk alarm/location indicator is off.
- If the disk is not running correctly:
 - The disk activity indicator is off.
 - The disk alarm/location indicator is steady red.

 **NOTE**

If the disk running indicator is off whereas the disk alarm/location indicator is steady red, the hard disk may be installed incorrectly. In this case, remove the hard disk, wait for about one minute, and reinsert the hard disk. If the disk alarm/location indicator remains steady red, the hard disk may be defective. In this case, replace it with another hard disk. If the problem persists, contact technical support engineers.

----End

Insert a disk of the 4 U High-Density Disk Enclosure

Step 1 Insert a disk.

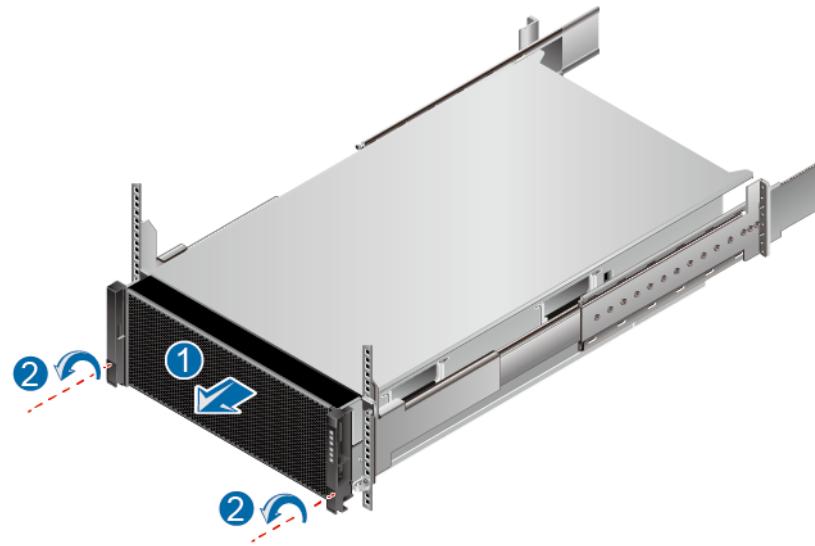
1. Put on ESD clothing and a pair of ESD gloves.
2. Take the disk out of an ESD bag.



NOTICE

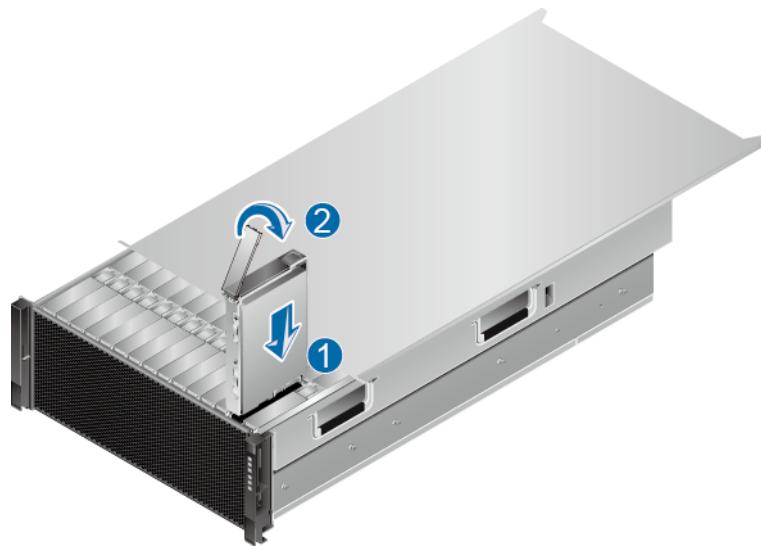
- Before inserting a disk, move the disk handle to the fully open position. Otherwise, the disk cannot be fully inserted into a slot.
 - Align a disk with a disk slot and then gently insert the disk. Do not use excessive force when inserting a disk, or else disk connectors may be damaged.
 - After inserting a disk, wait at least one minute before removing it, or else disks may be damaged.
-
3. When the storage devices are 4 U high-density disk enclosures, loosen the two screws on the panel and pull out the system enclosure, as shown in [Figure 4-18](#).

Figure 4-18 Pulling out a node



4. Insert the disk into a vacant slot, as shown in step 1 in [Figure 4-19](#).

Figure 4-19 Installing a disk of the 4 U high-density disk enclosure



5. Move the disk handle to the closed position, as shown in step 2 in [Figure 4-19](#). Then wait for the disk to automatically power on.

It takes approximately 15 to 30 seconds for a disk to power on.

Step 2 View indicators on the disk and check the disk installation.



1 Disk module status indicator

- If the disk is running correctly: the disk module status indicator is steady green.
- If the disk is not running correctly: the disk module status indicator is steady red.

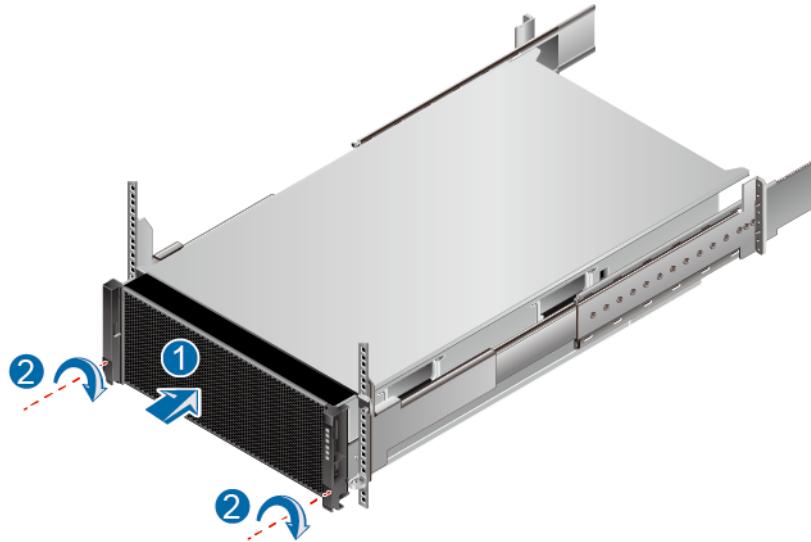
NOTE

If the disk running indicator is off whereas the disk alarm/location indicator is steady red, the hard disk may be installed incorrectly. In this case, remove the hard disk, wait for about one minute, and reinsert the hard disk. If the disk alarm/location indicator remains steady red, the hard disk may be defective. In this case, replace it with another hard disk. If the problem persists, contact technical support engineers.

Step 3 Installing the system enclosure.

1. Slide the enclosure into the cabinet slowly, as shown in step 1 in [Figure 4-20](#).
2. Fasten the two captive screws on the panel, as shown in step 2 in [Figure 4-20](#).

Figure 4-20 Fastening the two screws on the panel



----End

4.4.2 Adding Disk Enclosures

Capacity expansion by adding disk enclosures is easy to implement and provides high scalability. It is applicable to application scenarios where the capacity to be expanded is large. Adding disk enclosures includes adding disk enclosures, connecting cables, powering on the added disk enclosures, and confirming the status of the added disk enclosures.

4.4.2.1 Determining Installation Positions of 2 U/4 U SAS Disk Enclosures

Before installing disk enclosures, determine their installation positions in a cabinet. This greatly improves installation efficiency.

Prerequisites

The required installation tools and materials include:

- 4 U installation template (available in the accessory box)
- 2 U installation template (available in the accessory box)
- Marker

Context

The space occupied by devices and installation positions of floating nuts are specified in the installation templates that can help you locate the installation positions.



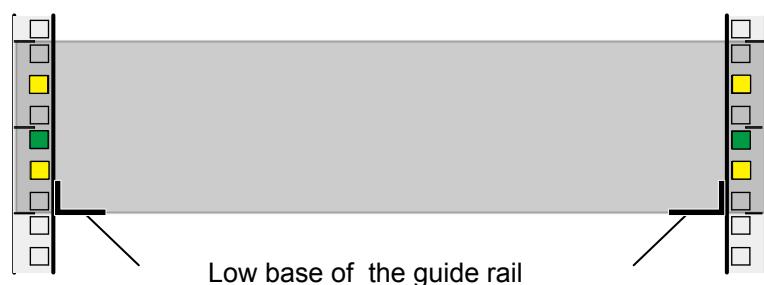
NOTICE

You are advised to install disk enclosures from the bottom up in descending order of weight.

Procedure

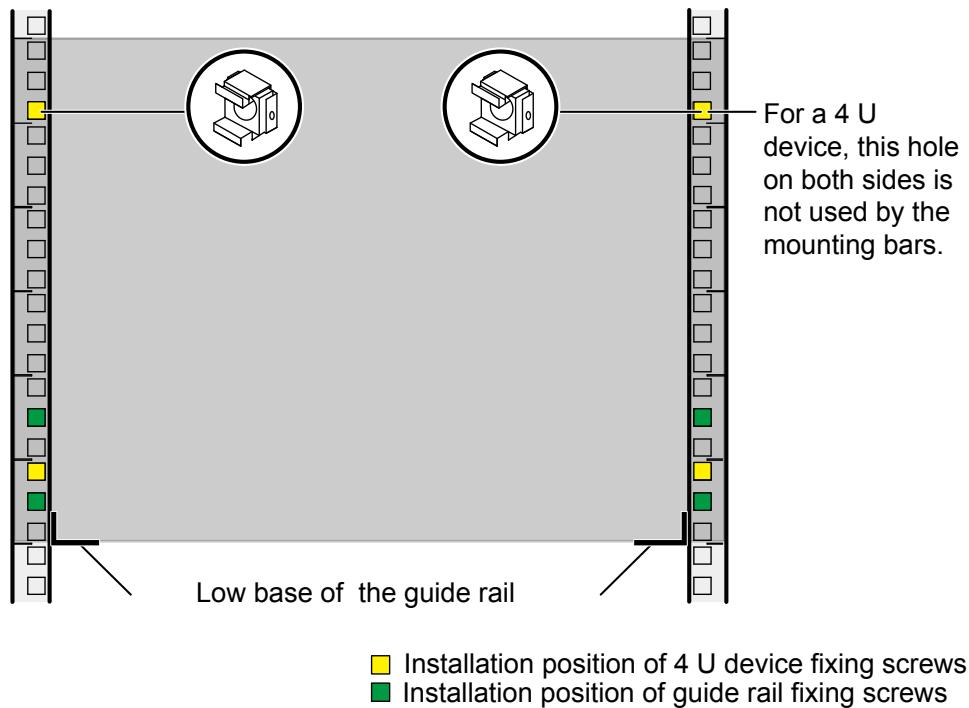
- Step 1** Align the bottom of the installation template with the integer U mark on the mounting bar of the cabinet, as shown in [Figure 4-21](#) and [Figure 4-22](#).

Figure 4-21 Determining the installation positions of 2 U SAS disk enclosures



- Installation position of 2 U device fixing screws
- Installation position of guide rail fixing screws

Figure 4-22 Determining the installation positions of 4 U SAS disk enclosures



Step 2 Following the instructions on the installation template, insert the mounting ear of the installation template into the mounting bar to fasten the installation template.

The installation template can be regarded as the front panel of the device. The installation template are the positions of the screw holes that are used to secure a 2 U or 4 U SAS disk enclosure.

Step 3 Use a marker to mark the positions of the screw holes where a device will be fastened on the mounting bar. Then, the installation positions of the disk enclosures are located.

----End

4.4.2.2 Installing Adjustable Guide Rails (Applicable to the 2 U/4 U SAS Disk Enclosure)

Adjustable guide rails are used to support storage devices. Due to their adjustable feature, the adjustable rails also allow the storage devices to be installed in the cabinets with different depths.

Prerequisites

The required installation tools and materials include:

- M3 to M6 Phillips screwdriver
- Marker

- M6 screws
- Square-hole positioning pin (for square installation holes)
- Round-hole positioning pin (for round installation holes)

Precautions



CAUTION

- Storage devices must be installed on guide rails. Stacking devices may cause damage.
- The guide rails must be installed horizontally.



Before the installation, you are advised to count several U scales upward from the position of the first scale on the bottom of the mounting bar, then mark the position to ensure that the front and rear height of the adjustable guide rails are the same.

Context

- If possible, start the installation from the bottommost allowed space in your cabinet.
- A pair of adjustable guide rails are included with each storage device.
- The length of the adjustable guide rail ranges from 600 mm (23.64 inches) to 900 mm (35.46 inches).
- The square-hole positioning pins come installed on the adjustable guide rails before delivery. If the installation holes of the screws are round, change the square-hole positioning pins to round-hole positioning pins before installing the adjustable guide rails.



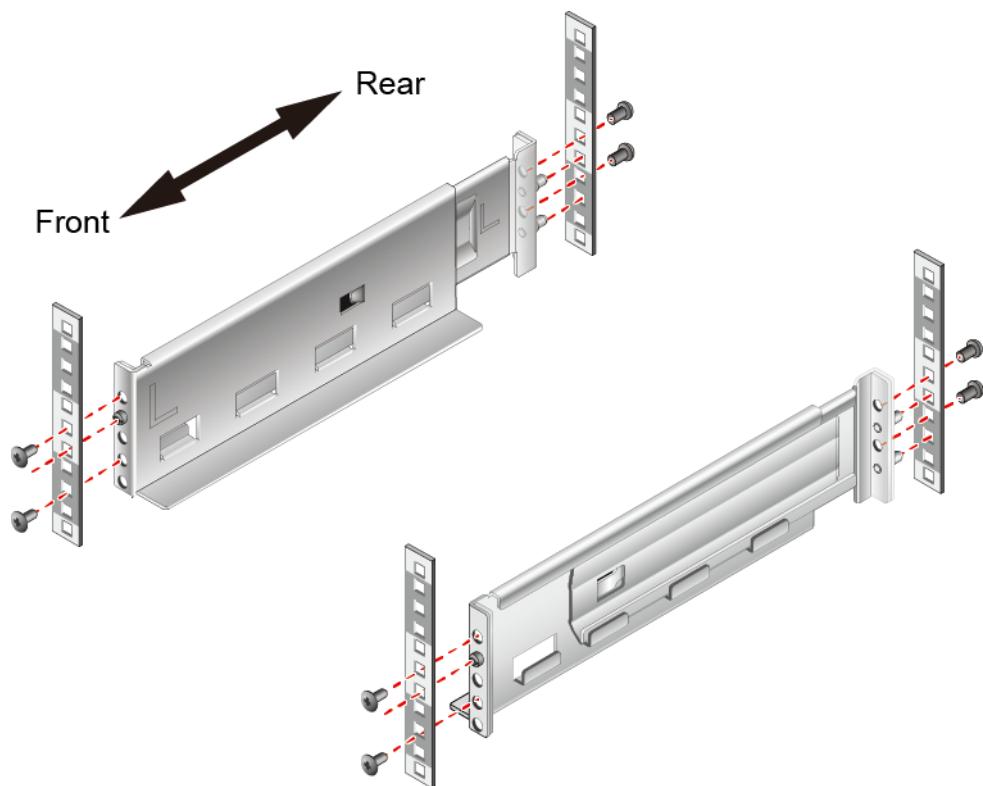
You can find the round-hole positioning pins in the accessory bag delivered with the storage device.

The following describes the recommended method of installing the adjustable guide rails (using the square-hole positioning pins as an example).

Procedure

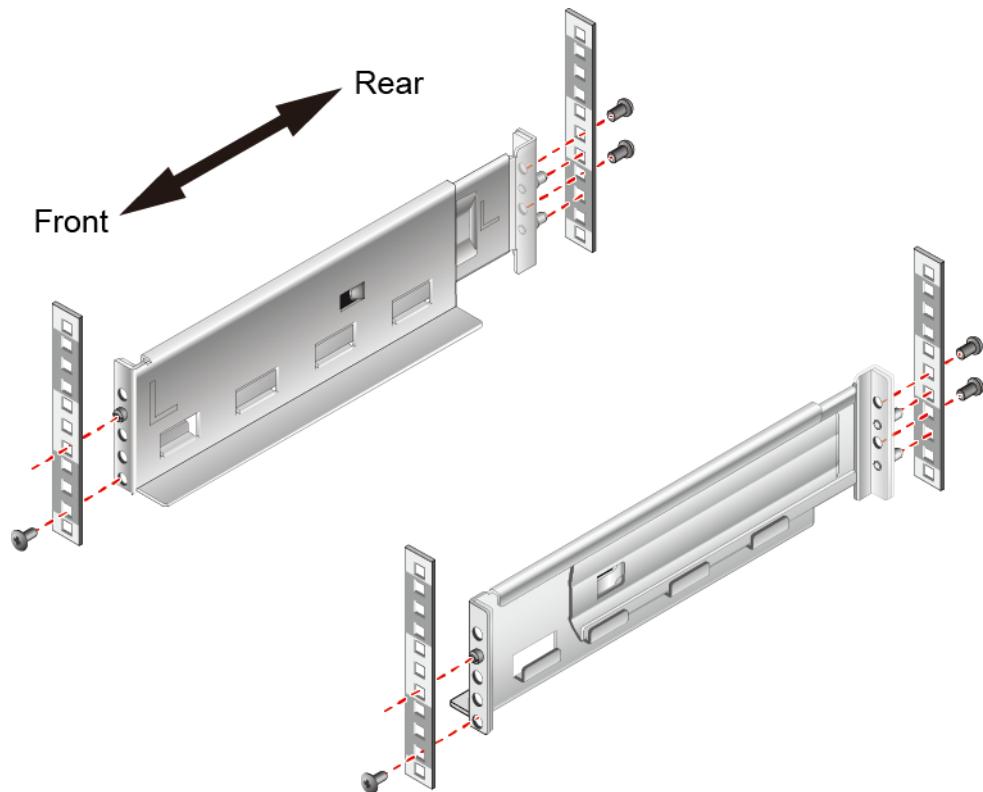
- Step 1** On the front of the cabinet, align the bottom margin of the adjustable guide rail with an integer U scale mark on the mounting bar, and fully insert the front positioning pin into the square hole.
- Step 2** Stretch the adjustable guide rail and thread the positioning pins through the rear square holes on the mounting bar.
- Step 3** Secure the adjustable guide rails with M6 screws.
- Secure the adjustable guide rails for 4 U storage devices, as shown in [Figure 4-23](#).

Figure 4-23 Securing the adjustable guide rails for 4 U devices



- Secure the adjustable guide rails for 2 U storage devices, as shown in [Figure 4-24](#).

Figure 4-24 Securing the adjustable guide rails for 2 U devices



----End

4.4.2.3 Installing Ball Bearing Guide Rails (for High-Density Disk Enclosure)

After determining where to install storage devices in the cabinet, install ball guide rails for supporting the high-density enclosures. If you do not need to install high-density enclosures, skip this step.

Prerequisites

Ensure that the following tools and materials are ready:

- M3 to M6 Phillips screwdriver
- Marker
- M6 screw
- M4 screw
- M3 screw
- installation templates
- Ball bearing guide rail components (including ball bearing guide rails, M3 screws, M4 screws, M6 screws, and installation templates)

Context



NOTICE

- The high-density enclosure must be installed on ball bearing guide rails. Stacking the enclosure will cause damage.
- Ball bearing guide rails must be installed horizontally.



NOTE

To ensure that a guide rail can be installed horizontally, it is recommended that you mark both front and rear columns where the ball bearing guide rail is to be secured before installation.

- You are advised to install storage devices in the cabinet from bottom up.
- Configure a pair of ball bearing guide rails for each high-density disk enclosure.
- The ball bearing guide rails can be extended from 600 mm (23.62 in.) to 915 mm (36.02 in.).

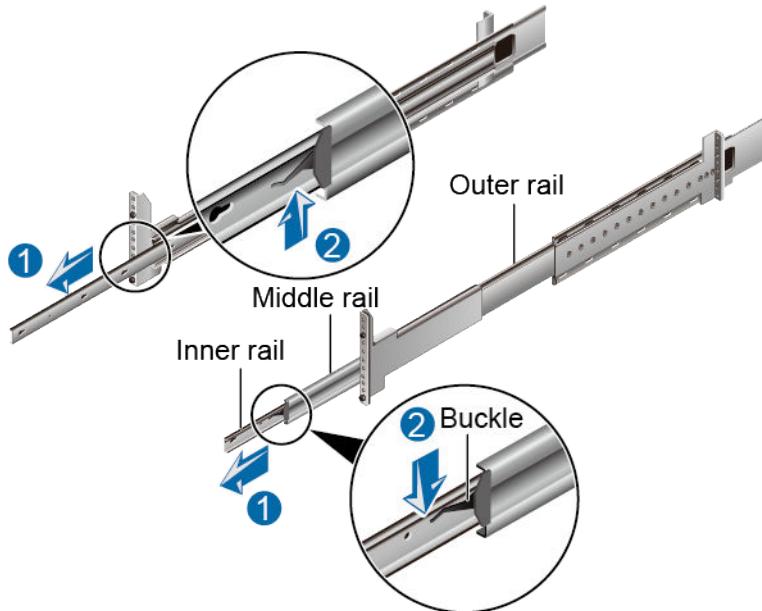
Procedure

Step 1 Pull out the inner rail of the ball bearing guide rails, as shown in [Figure 4-25](#).

1. Pull out the inner rail until the buckle is exposed.
2. Press the buckle and pull out the inner rail from the ball bearing guide rail, as shown in step 2 in [Figure 4-25](#).

Put the removed inner rail into an ESD bag. The inner rail will be used in installing a high-density disk enclosure.

Figure 4-25 Pulling out an inner rail



 **NOTE**

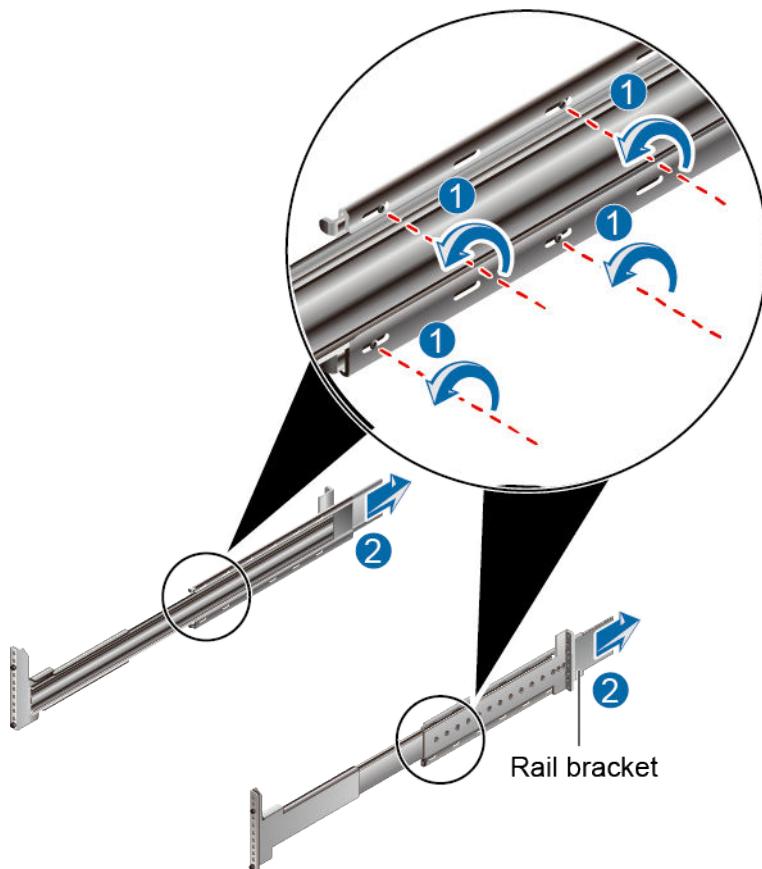
For the right ball bearing guide rail, press the buckle downward. For the left ball bearing guide rail, press the buckle upward.

Step 2 Pull out the rail bracket of a ball bearing guide rail, as shown in [Figure 4-26](#).

1. Loosen the four M3 screws on the ball bearing guide rails shown in (1) of [Figure 4-26](#).
2. Remove the rail bracket, as shown in (2) of [Figure 4-26](#).

The rail bracket will be used to fix the cable manager.

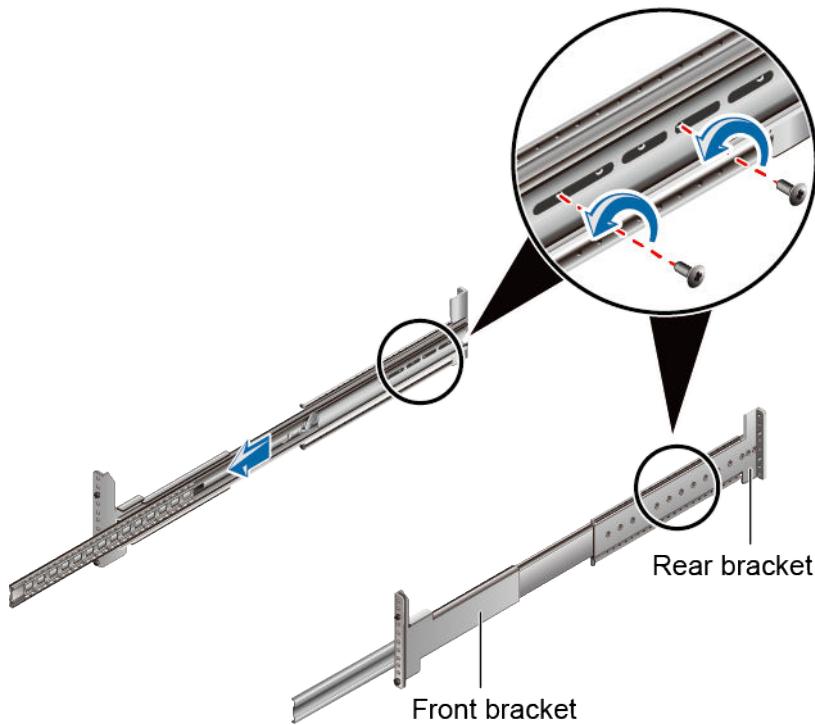
Figure 4-26 Remove a rail bracket



Step 3 Install the left inner rail (identified by L) of the ball bearing guide rails.

1. Loosen the two M4 screws on the external rail of the ball bearing guide rail, adjust the length of ball bearing guide rail.

Figure 4-27 Loosen screws

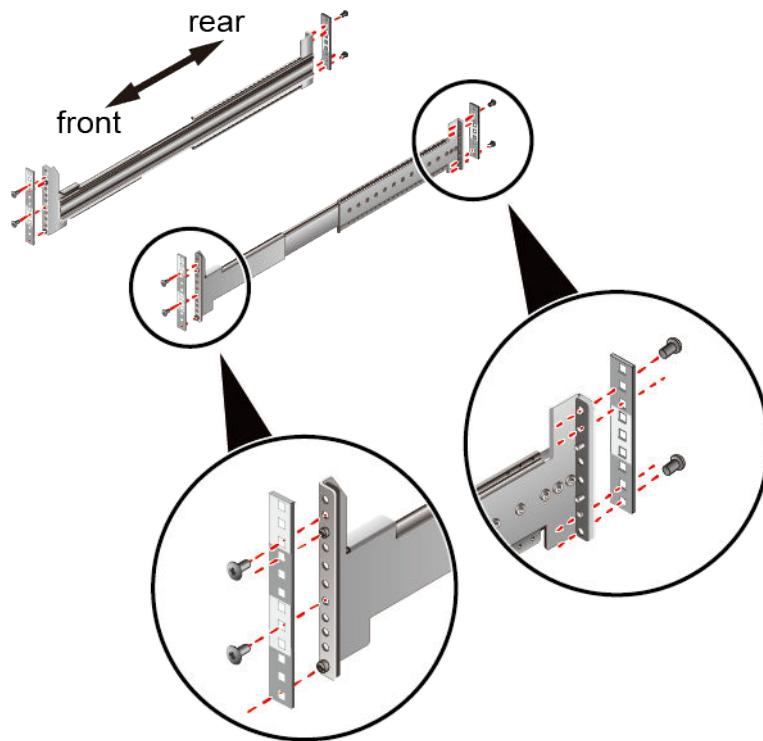


NOTE

Align the ball bearing guide rails with the mounting bar of the cabinet in advance. If the distance is not longer than 10 mm (0.39 inch) between the front and rear brackets of the ball bearing guide rails and the front and rear ends of the mounting bar, loosen the two M4 screws on the external rail of the ball bearing guide rail (pull out the middle guide rail to expose the two M4 screws on the ball bearing guide rail.), as shown in [Figure 4-27](#). If the distance is longer than 10 mm (0.39 inch), remove the two M4 screws and align the distance.

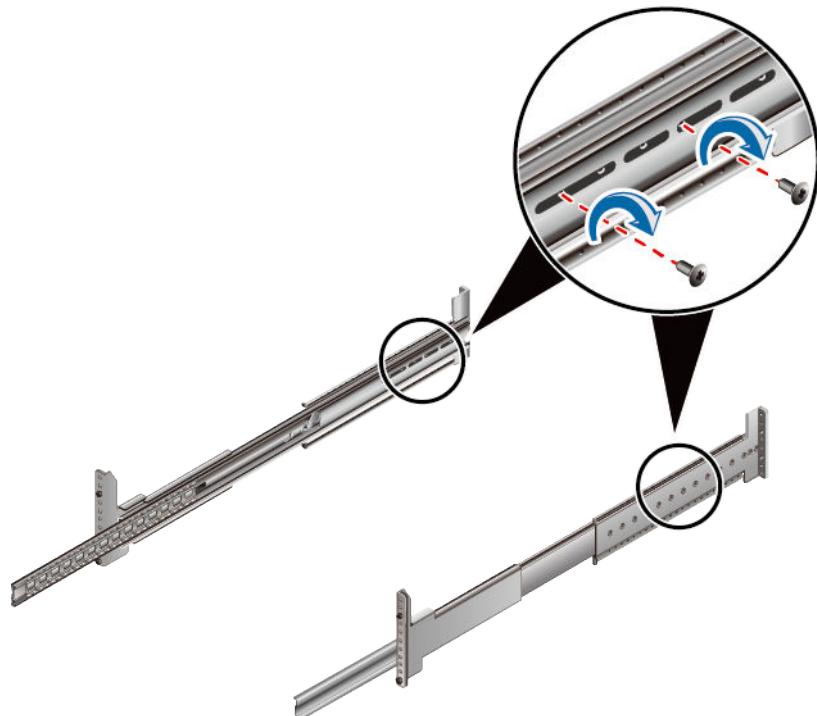
2. Align the bottom edge of the ball bearing guide rail with the U scales on the front mounting bar, and insert the front positioning pins of the ball bearing guide rail into the square holes. Use M6 screws to fix the front bracket of the ball bearing guide rail, as shown in [Figure 4-28](#).
3. Stretch the rear bracket of the ball bearing guide rail and insert the rear positioning pins into the square holes of the rear mounting bar. Use M6 screws to secure the guide rail in place, as shown in [Figure 4-28](#).

Figure 4-28 Installing a ball bearing guide rail



4. Fasten the two M4 screws on the ball bearing guide rail, as shown in [Figure 4-29](#).

Figure 4-29 Fasten screws



Step 4 Install the right inner rail (identified by R) of the ball bearing guide rails.

The installation method of the right inner rail is similar to [Step 3](#).

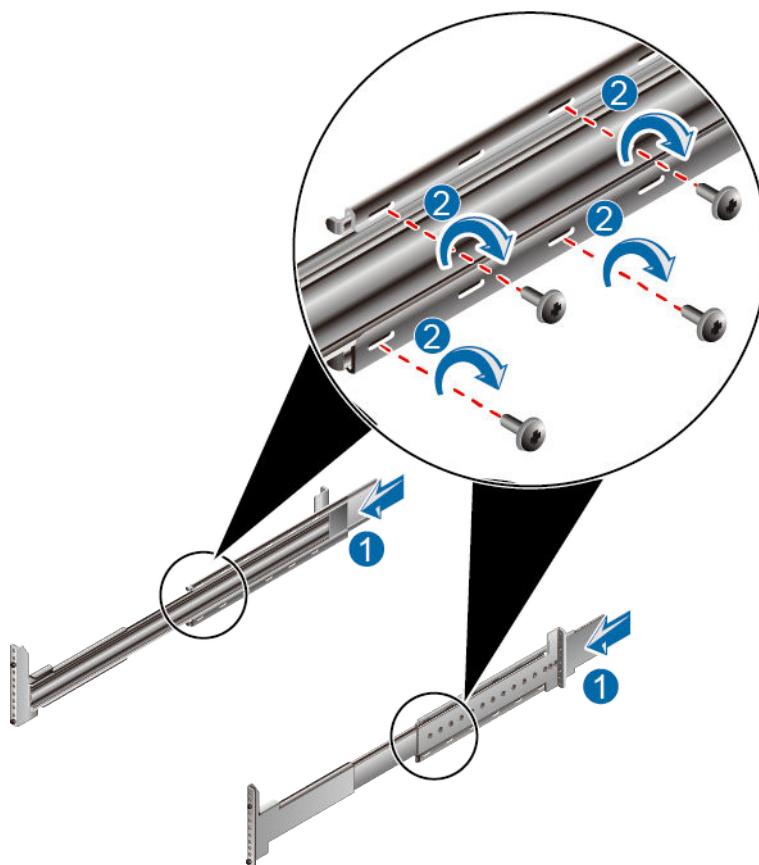
Step 5 Install the ball bearing guide rail bracket, as shown in [Figure 4-30](#).

1. Install the rail bracket and slide the bracket to the ball bearing guide rail, as shown in step 1 in [Figure 4-30](#).
2. Fasten the four M3 screws on the ball bearing guide rail, as shown in step 2 in [Figure 4-30](#).

 **NOTE**

Fasten two screws at the top and bottom of the bracket of the ball bearing guide rail, respectively.

Figure 4-30 Installing a ball bearing guide rail bracket

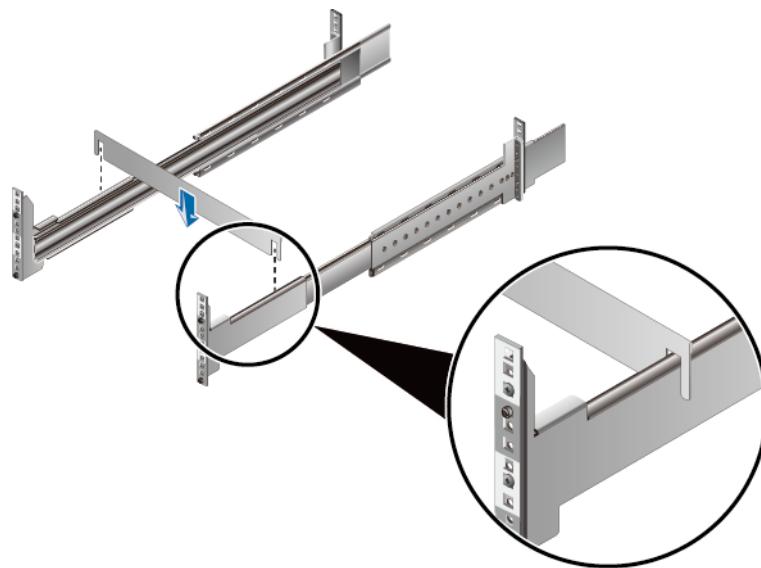


Step 6 After the installation, use the installation templates to check the distance between the left and right guide rails, and ensure that the two templates can snatch into the ball bearing guide rails, as shown in [Figure 4-31](#).

 **NOTE**

If the installation templates cannot snatch into the guide rails, loosen the M6 screws on the guide rails and mounting bars, and slightly adjust the distance between the left and right guide rails. After the installation templates successfully snatch into the guide rails, fix the M6 screws.

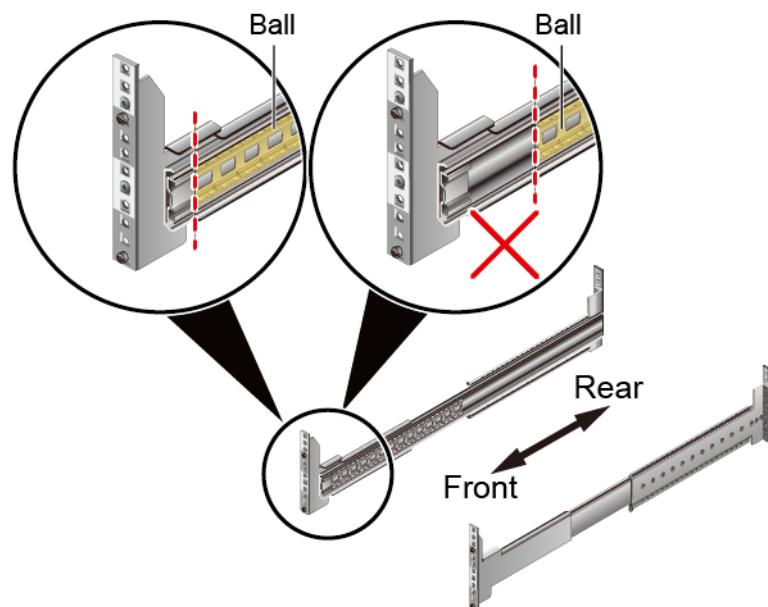
Figure 4-31 Insert installation templates



Step 7 Check the installation of the ball bearing guide rails.

1. Check whether the ball of the ball bearing guide rail is placed at the most front end of the middle rail. If not, slide it to the most front end of the middle rail, as shown in [Figure 4-32](#).

Figure 4-32 Slide the ball to the most front end of the middle rail

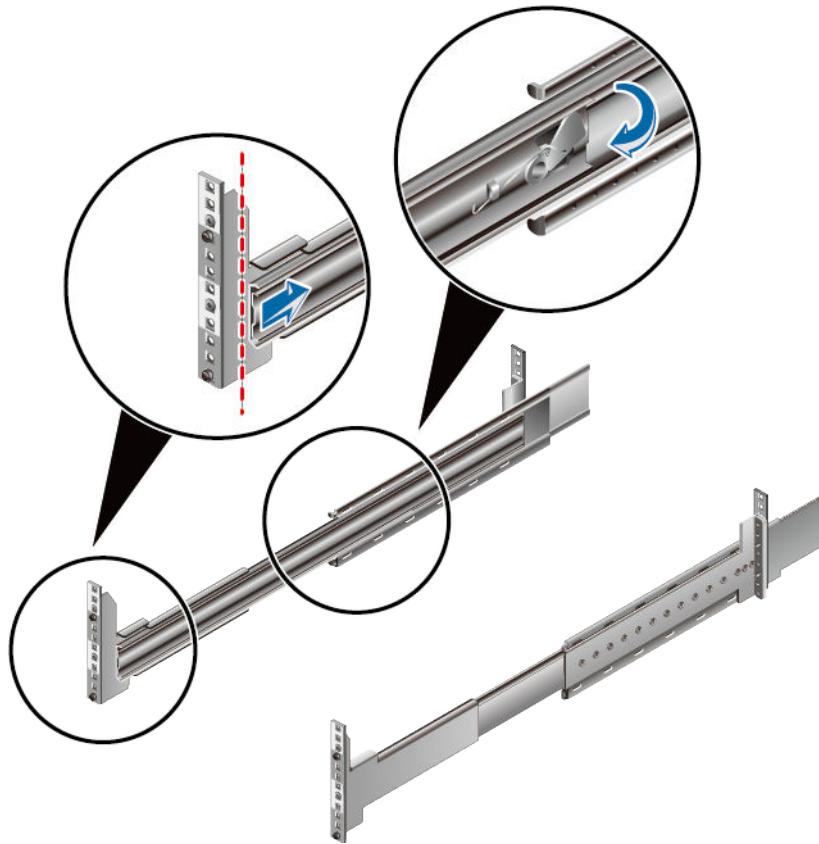


2. Check whether the middle rail of the ball bearing guide rail is completed inserted, that is, the edges of the middle rail and external rail are at the same vertical plane, as shown in [Figure 4-33](#).

 **NOTE**

If the middle guide rail is not in place, high-density disk enclosures may fail to be pushed in or pulled out smoothly later. Release the inner rail latch to push the rail into the guide rail.

Figure 4-33 Sliding the middle rail to align it with the edges of the external rail



----End

4.4.2.4 Installing a 2 U SAS Disk Enclosure

Install a disk enclosure by sliding it into the cabinet, securing it, and checking the installation.

Prerequisites

Before installing a disk enclosure into a cabinet, ensure that the guide rails are installed properly.

The required installation tools and materials are as follows:

- M6 screws
- Phillips screwdriver (M3 to M6)

Precautions



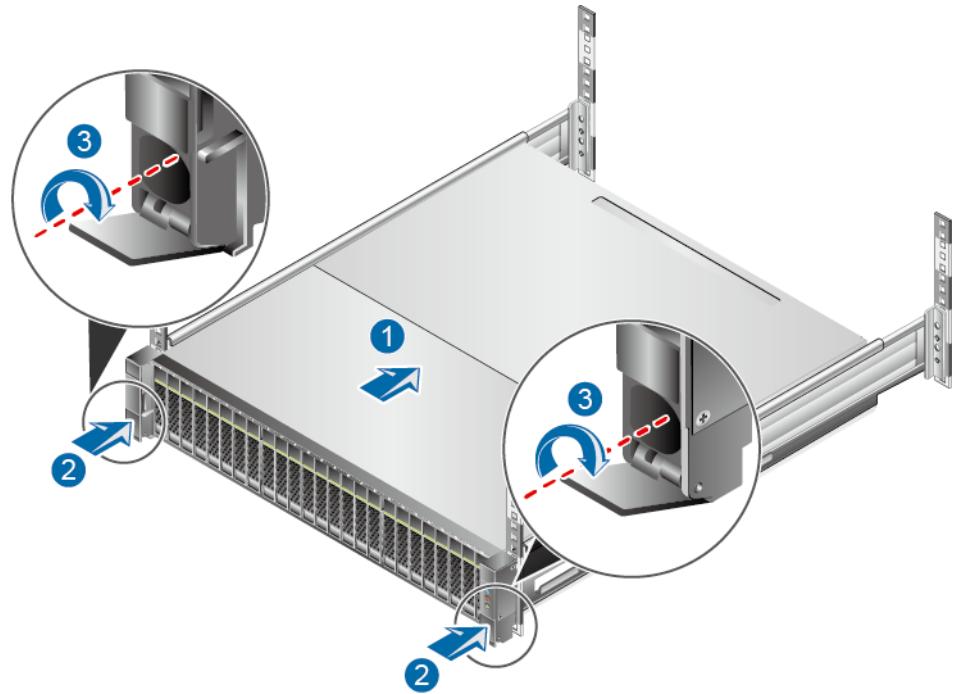
CAUTION

- Arrange for at least three persons to carry and install an enclosure to avoid personal injury or device damage.
- If you remove disks to facilitate the movement and installation of the device, record the mapping between each disk and its slot in advance. That helps insert each disk back to its correct slot after the movement and installation.
- Storage devices must be installed on adjustable guide rails. Stacking devices may damage devices.

Procedure

Step 1 Slide the disk enclosure into the cabinet and use M6 screws to secure it to the cabinet, as shown in [Figure 4-34](#).

Figure 4-34 Installing a disk enclosure into a cabinet



Step 2 Check that the disk enclosure is horizontally installed and tightly screwed.

Step 3 If more than one disk enclosure is configured, repeat the preceding steps to install the other disk enclosures.

----End

4.4.2.5 Installing a 4 U SAS Disk Enclosure

Install a disk enclosure by sliding it into the cabinet, securing it, and checking the installation.

Prerequisites

- The installation environment meets requirements.
- Before installing a disk enclosure into a cabinet, ensure that the guide rails are installed properly.

The required installation tools and materials are as follows:

- M6 screws
- Phillips screwdriver (M3 to M6)

Precautions



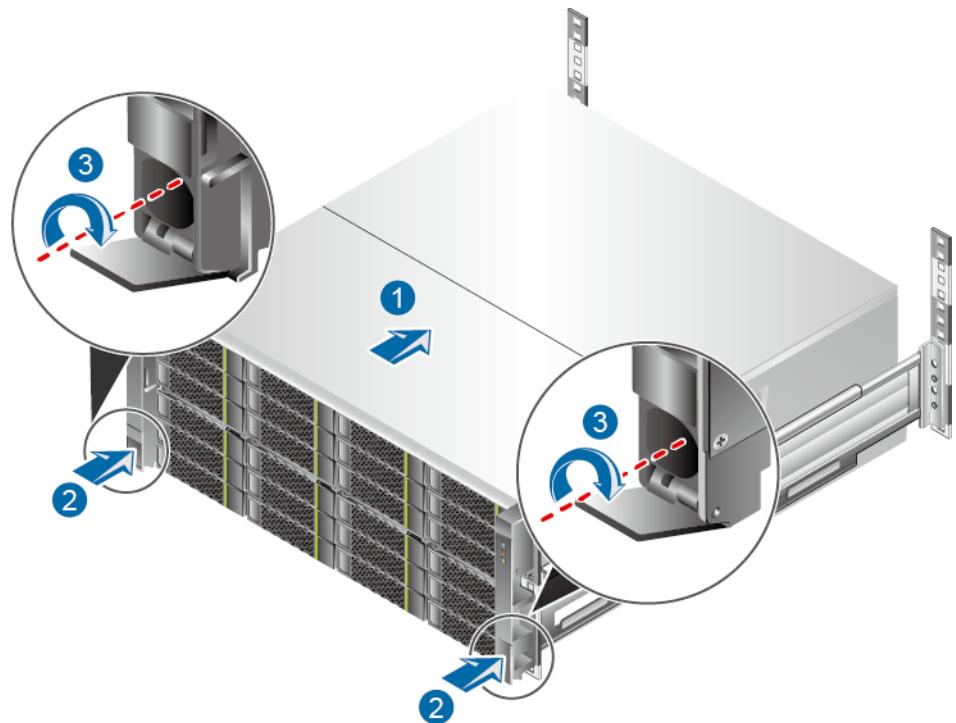
CAUTION

- Arrange for at least three persons to carry and install an enclosure to avoid personal injury or device damage.
 - If you remove disks to facilitate the movement and installation of the device, record the mapping between each disk and its slot in advance. That helps insert each disk back to its correct slot after the movement and installation.
 - Storage devices must be installed on adjustable guide rails. Stacking devices may damage devices.
 - Before you install disk modules, install the 4 U disk enclosure into the cabinet.
-

Procedure

- Step 1** Slide the disk enclosure into the cabinet and use M6 screws to secure it to the cabinet, as shown in [Figure 4-35](#).

Figure 4-35 Installing a disk enclosure into a cabinet



Step 2 Check that the disk enclosure is horizontally installed and tightly screwed.

Step 3 If more than one disk enclosure is configured, repeat the preceding steps to install the other disk enclosures.

----End

4.4.2.6 Installing a High-Density Disk Enclosure

The high-density disk enclosure provides high-performance data storage and high-speed data transmission. Install the high-density disk enclosure into the cabinet, install the cable tray, and install the disk module.

4.4.2.6.1 Installing a High-Density Disk Enclosure into a Cabinet

Install the high-density disk enclosure by sliding it into the cabinet, securing it, and checking the installation.

Prerequisites

Ensure that the following conditions are met before installing high-density disk enclosure:

- The installation environment meets requirements.
- Ensure that ball bearing guide rails used for sliding high-density disk enclosure into cabinets have been installed.

Ensure that the following tools and materials are available and ready for use:

- Phillips screwdriver
- M6 screw
- M4 screw
- M3 screw
- Protective gloves
- High-density disk enclosure

Precautions



CAUTION

- To prevent personal injury and device damage, use at least three persons to carry and install the unloaded enclosure into the cabinet and install disks modules into the enclosure.
If you remove disks to facilitate the movement and installation of the device, record the mapping between each disk and its slot in advance. That helps insert each disk back to its correct slot after the movement and installation.
- Install components into a cabinet from bottom to top to prevent the cabinet from falling over.

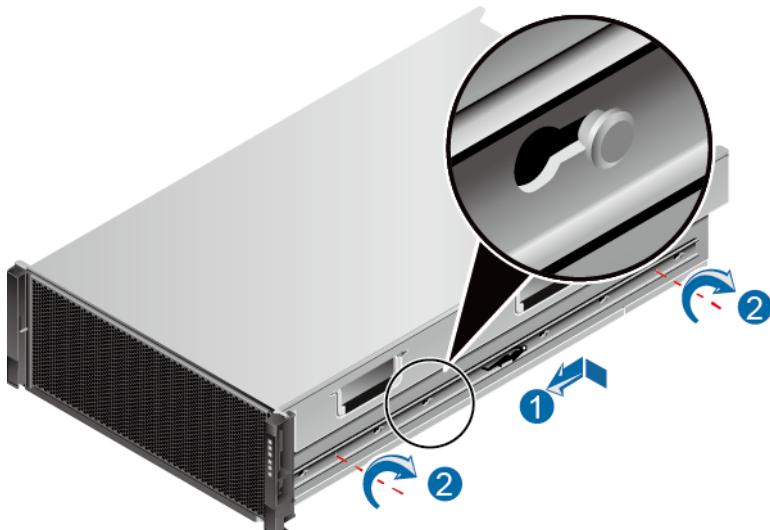
Procedure

Step 1 Wear protective gloves.

Step 2 Install the inner rail to the right of the high-density disk enclosure.

1. Install the inner rail onto the system enclosure, as shown in step 1 in [Figure 4-36](#).

Figure 4-36 Install the inner rail



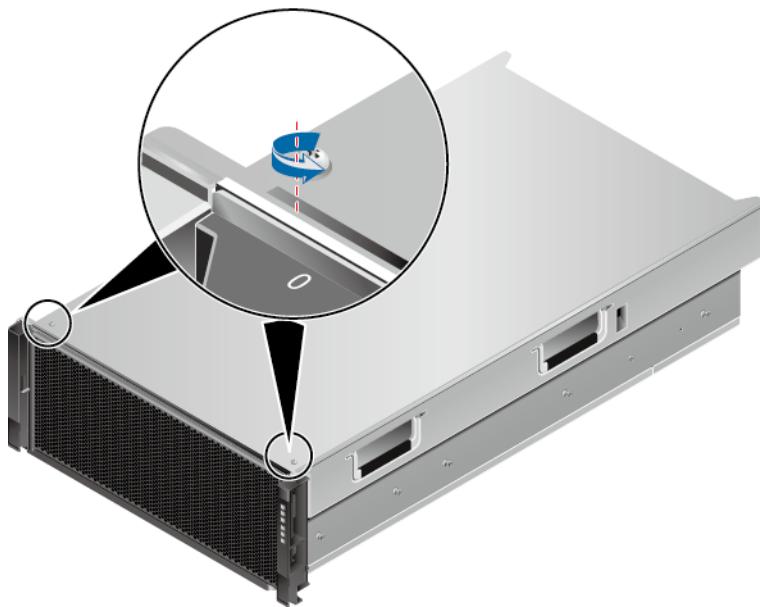
2. Use two M4 screws to secure the inner rail, as shown in step 2 in [Figure 4-36](#).

Step 3 Install the inner rail to the left of the high-density disk enclosure.

Repeat [Step 2](#) to install the left inner rail.

Step 4 Remove the two M3 screws from the upper panel, as shown in [Figure 4-37](#).

Figure 4-37 Removing screws



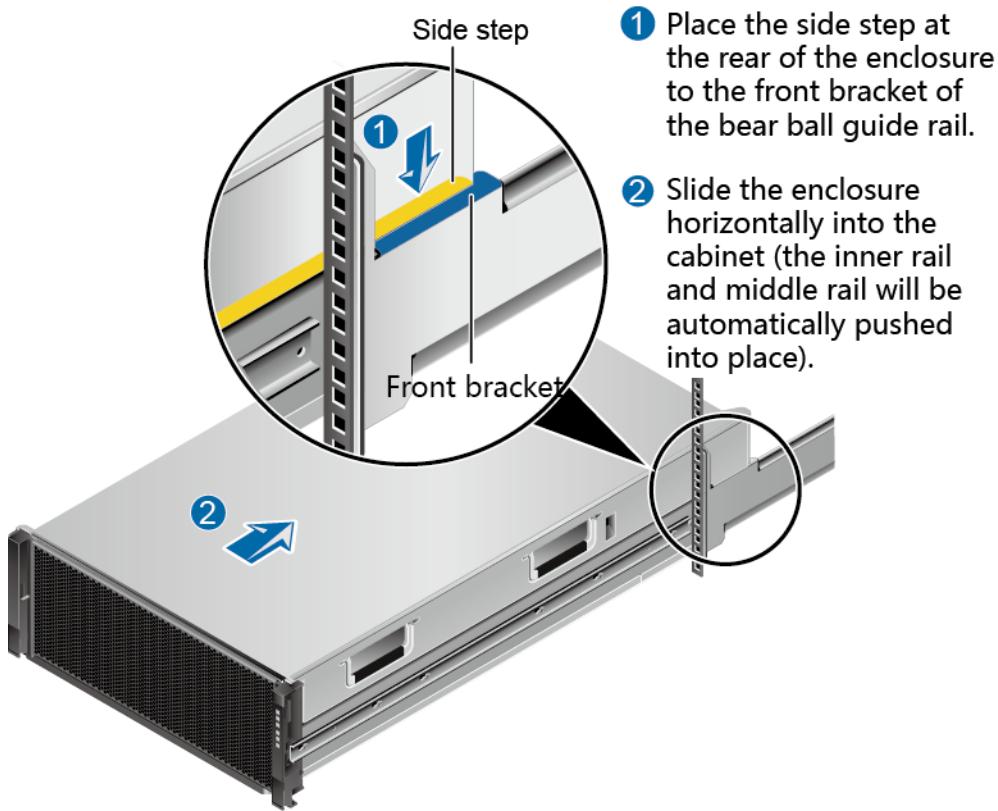
Step 5 Place the side step in the rear of the high-density disk enclosure on the front bracket of the ball bearing guide rails, and slide the disk enclosure into the cabinet along the ball bearing guide rails (no manual alignment is required because the inner rail automatically connects to the middle rail), as shown in [Figure 4-38](#).



NOTICE

- Do not pull out the middle guide rails when sliding the high-density disk enclosure into the cabinet. Otherwise, the guide rails may misalign.
 - Before you install disk modules, install the high-density disk enclosure into the cabinet.
-

Figure 4-38 Sliding the high-density disk enclosure into a cabinet



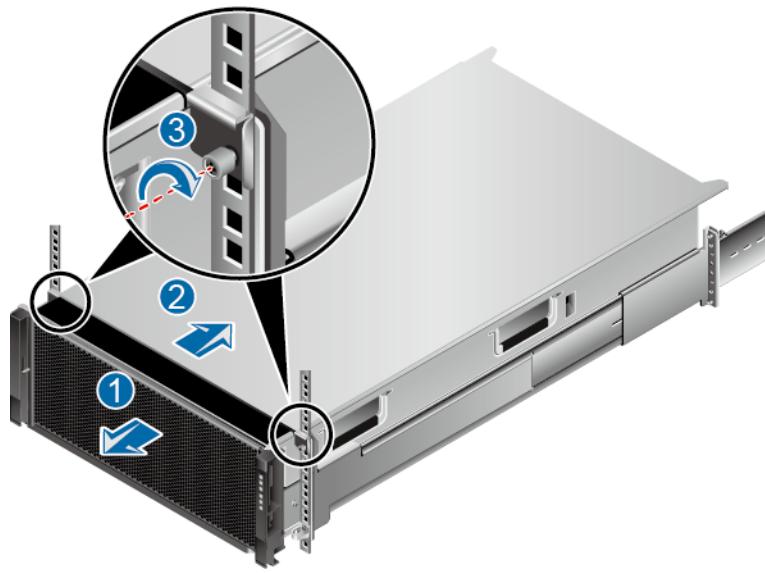
Step 6 Check the high-density disk enclosure installation.

- After sliding the high-density disk enclosure into the cabinet, pull out the high-density disk enclosure from the cabinet and slide the high-density disk enclosure into the cabinet for two times respectively to check that the ball bearing guide rails are correctly installed.
- If you cannot push or pull out a high-density disk enclosure smoothly, check whether inner rails are fully inserted into mid rails. If the inner rails are not fully inserted into mid rails, disassemble the high-density disk enclosure and check whether ball bearing guide rails meet the following conditions according to the section of **Installing Ball Bearing Guide Rails (for High-Density Disk Enclosure)**:
 - Check whether ball bearing guide rails are installed horizontally (whether front and back brackets of ball guide rails are on the same level).
 - Check whether the installation templates of ball bearing guide rails can be inserted.
 - Check whether the ball of the ball bearing guide rail is placed at the most front end of the middle rail.
 - Check whether the mid rails of ball bearing guide rails are completed inserted.

Step 7 Install a cover.

1. Pull out the enclosure slowly, as shown in step 1 in [Figure 4-39](#).
2. Push the upper cover backward until the upper cover touches the mounting bars, as shown in step 2 in [Figure 4-39](#).
3. Fasten the two captive screws on the cover, as shown in step 3 in [Figure 4-39](#).

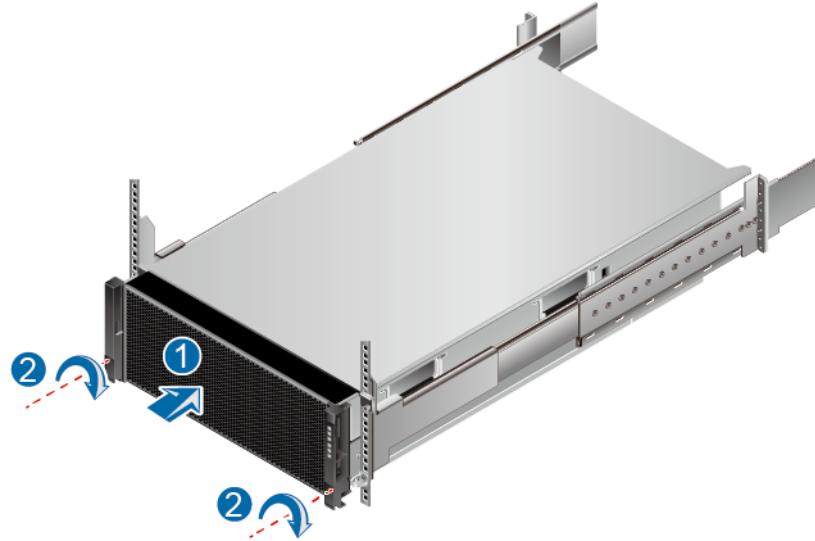
Figure 4-39 Installing a cover



Step 8 Install the system enclosure.

1. Slide the enclosure into the cabinet slowly, as shown in step 1 in **Figure 4-40**.
2. Fasten the two captive screws on the panel, as shown in step 2 in **Figure 4-40**.

Figure 4-40 Fastening the two screws on the panel



Step 9 Repeat **Step 5** to **Step 8** to install other high-density disk enclosures into the cabinet.

----End

4.4.2.6.2 Installing a Cable Manager

Cable managers are used for housing cables of the high-density disk enclosure. Each high-density disk enclosure has one cable manager.

Prerequisites

Ensure that the following conditions are met before installing cable managers:

All high-density disk enclosure have been installed.

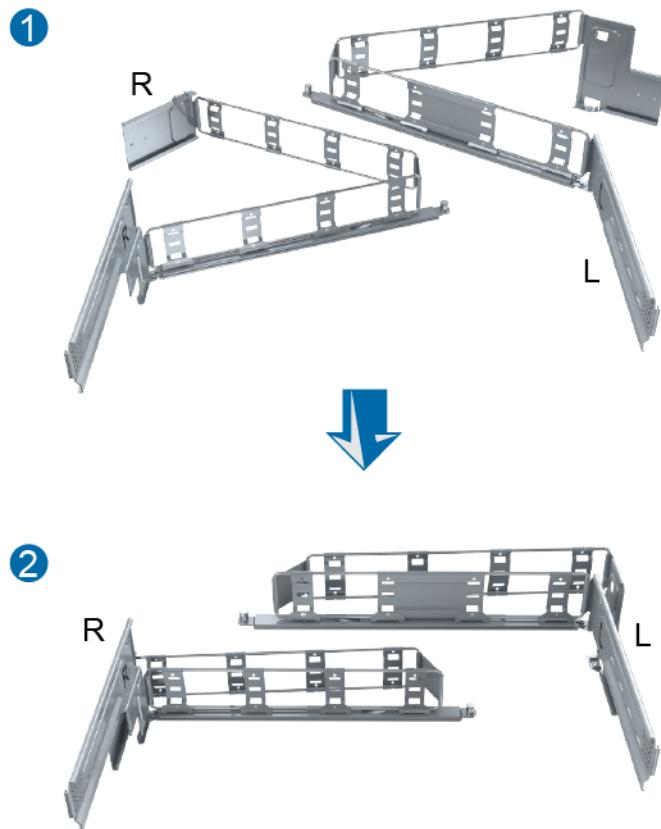
Ensure that the following tools and materials are ready:

- M3 screw
- Phillips screwdriver
- Protective gloves
- Cable manager

Procedure

Step 1 Arrange cable managers so that both ends of each cable tray are on the same side, as shown in [Figure 4-41](#).

Figure 4-41 Arrange cable managers



Step 2 Insert the two sides of the left cable manager to the same side of the ball bearing guide rail and the high-density disk enclosure.

1. Insert the upper left of the cable manager into the high-density disk enclosure, as shown in step 1 in [Figure 4-42](#).

2. Insert the lower left of the cable manager into the bracket of the ball bearing guide rail, as shown in step 2 in [Figure 4-42](#).

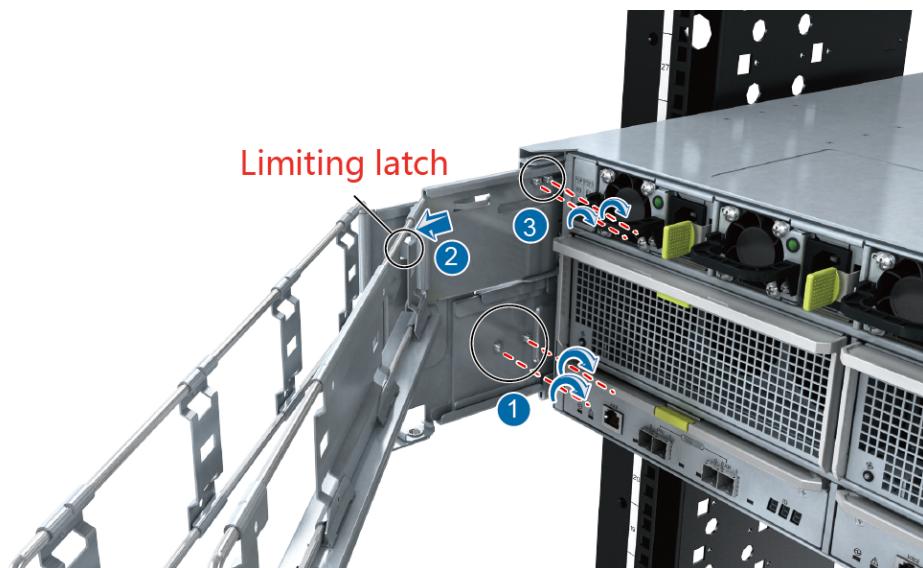
Figure 4-42 Insert the left cable manager



Step 3 Use a Phillips screwdriver to fasten M3 screws to secure the left cable manager.

1. Use a Phillips screwdriver and M3 screws to secure the lower left of the cable manager, as shown in step 1 in [Figure 4-43](#).
2. Adjust the lower left of the cable manager so that the bottom of the cable manager is against the limiting latch, as shown in step 2 in [Figure 4-43](#).
3. Use a Phillips screwdriver and M3 screws to secure the upper left of the cable manager, as shown in step 3 in [Figure 4-43](#).

Figure 4-43 Install a left cable manager



Step 4 Insert the two sides of the right cable manager to the same side of the ball bearing guide rail and the high-density disk enclosure.

1. Insert the upper right of the cable manager into the high-density disk enclosure, as shown in step 1 in [Figure 4-44](#).
2. Insert the lower right of the cable manager into the bracket of the ball bearing guide rail, as shown in step 2 in [Figure 4-44](#).

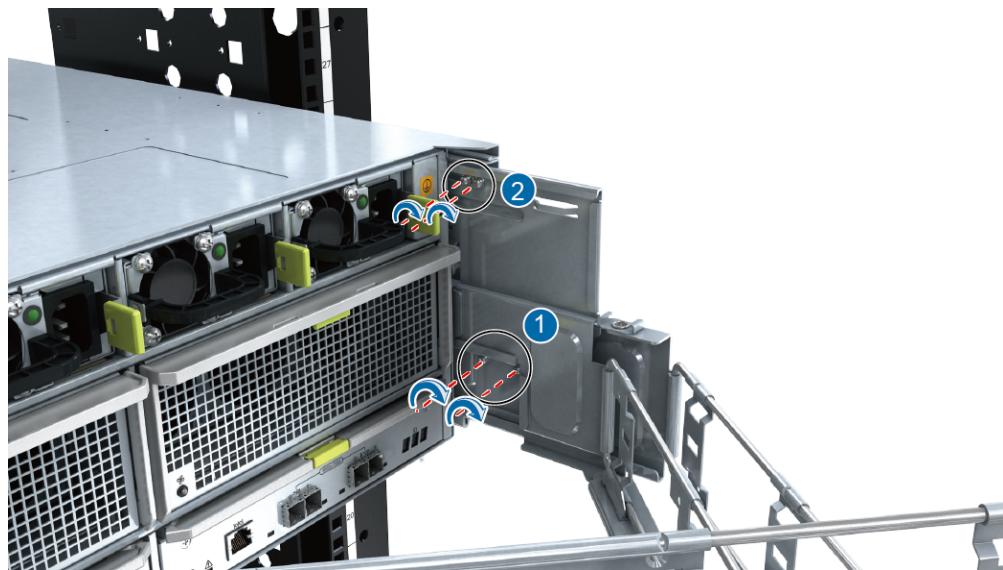
Figure 4-44 Insert the right cable manager



Step 5 Use a Phillips screwdriver to fasten M3 screws to secure the right cable manager.

1. Use a Phillips screwdriver and M3 screws to secure the lower right of the cable manager, as shown in step 1 in [Figure 4-45](#).
2. Use a Phillips screwdriver and M3 screws to secure the upper right of the cable manager, as shown in step 2 in [Figure 4-45](#).

Figure 4-45 Install a right cable manager



Step 6 Route and bind the cables on the cable manager.

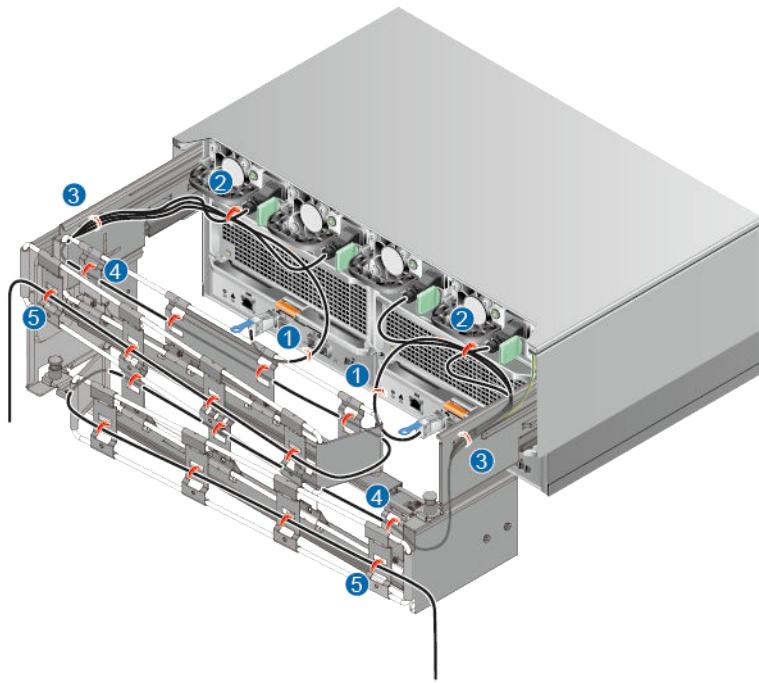
1. Bind all the mini SAS HD electrical cables on the right, Positions 1 in [Figure 4-46](#) are where the cables are bound to enter the cable manager.
2. Bind all the power cables on the right to the handle of the fan module, Positions 2 in [Figure 4-46](#) are where the cables are bound to enter the cable manager.
3. Bind all the cables on the right (including mini SAS HD electrical cables, power cables, and ground cables) to the front end of the cable manager, Positions 3 in [Figure 4-46](#) are where the cables are bound to enter the cable manager.
4. Route and bind cables along the trough of the cable manager. Positions 4 in [Figure 4-46](#) are where the cables are bound to enter the cable manager.
5. Route and bind cables along the trough of the cable manager. Positions 5 in [Figure 4-46](#) are where the cables are bound to get out of the cable manager.

Repeat the previous steps to route and bind cables onto the left cable manager.

 **NOTE**

- Evenly divide the cables connected to the storage device into two parts. Place the left part of cables into the troughs of the left cable tray, and the right part in the troughs of the right cable tray.
- To route a 5m mini SAS HD electrical cable across three cabinets, use the underfloor and side cabling methods, and do not use the overhead cabling method.
- For details about how to lay out and bind cables, see [A General Cable Routing Description](#) and [B. 1 Cable Routing and Bundling](#).

Figure 4-46 Route cables on the cable managers

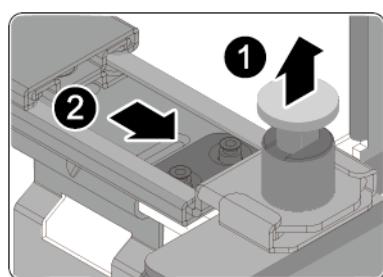


Step 7 Install the spring pins to the left and right cable managers to secure the cable managers.

1. Pull up the spring pin, as shown in step (1) of [Figure 4-47](#).
2. Adjust the cable managers to allow the stretchable guide rail of one cable manager to insert into the support of the other cable manager, as shown in step (2) of [Figure 4-47](#).

When the spring pin aligns with the hole in the support, the spring pin can automatically fall off, and the installation of the spring pin is completed.

Figure 4-47 Install the spring pin



Step 8 Check the cable manager installation.

- Loosen the captive screws on the front panel of a high-density disk enclosure. Pull the high-density disk enclosure out of the cabinet or slide the high-density disk enclosure into the cabinet several times and check whether the cable managers extend correctly.

- If yes, the cable managers are installed correctly. If no, slightly adjust screws that secure the cable managers.

----End

4.4.2.6.3 Installing a Disk Module

After the high-density disk enclosure is installed into a cabinet, install the disk module.

Prerequisites

Ensure that the following condition is met before installing function modules:

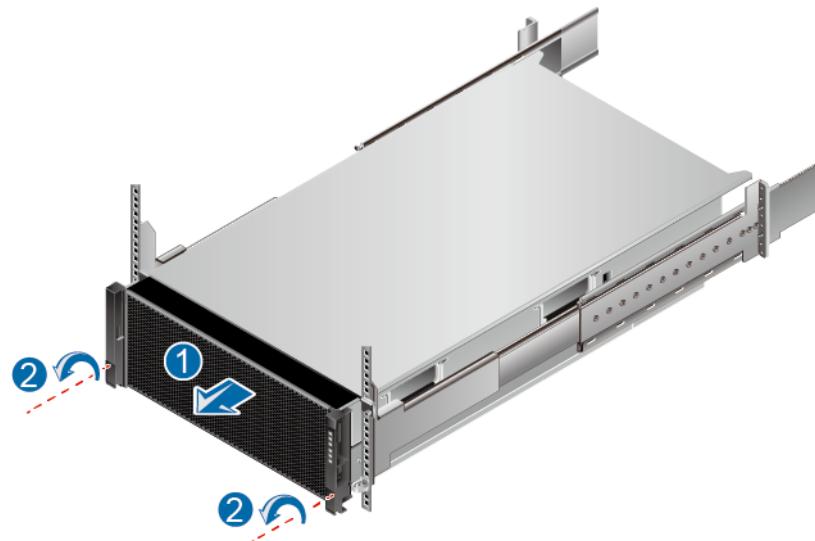
Ensure that the following tools and materials are ready:

- ESD wrist strap
- ESD clothes
- ESD gloves
- Phillips screwdriver
- M6 screw
- disk module

Procedure

- Step 1** Loosen the two screws on the panel and pull out the system enclosure, as shown in [Figure 4-48](#).

Figure 4-48 Pulling out a node



- Step 2** Disk slots of high-density disk enclosures are numbered from 0 to 14 from left to right and from E to A from inward to outward, as shown in the figure. Deployment of disk slots on high-density disk enclosures, as shown in [Figure 4-50](#).

Disk slots of high-density disk enclosures are numbered from 0 to 14 from left to right and from E to A from inward to outward, as shown in [Figure 4-49](#).

Figure 4-49 Disk slots number of high-density disk enclosures

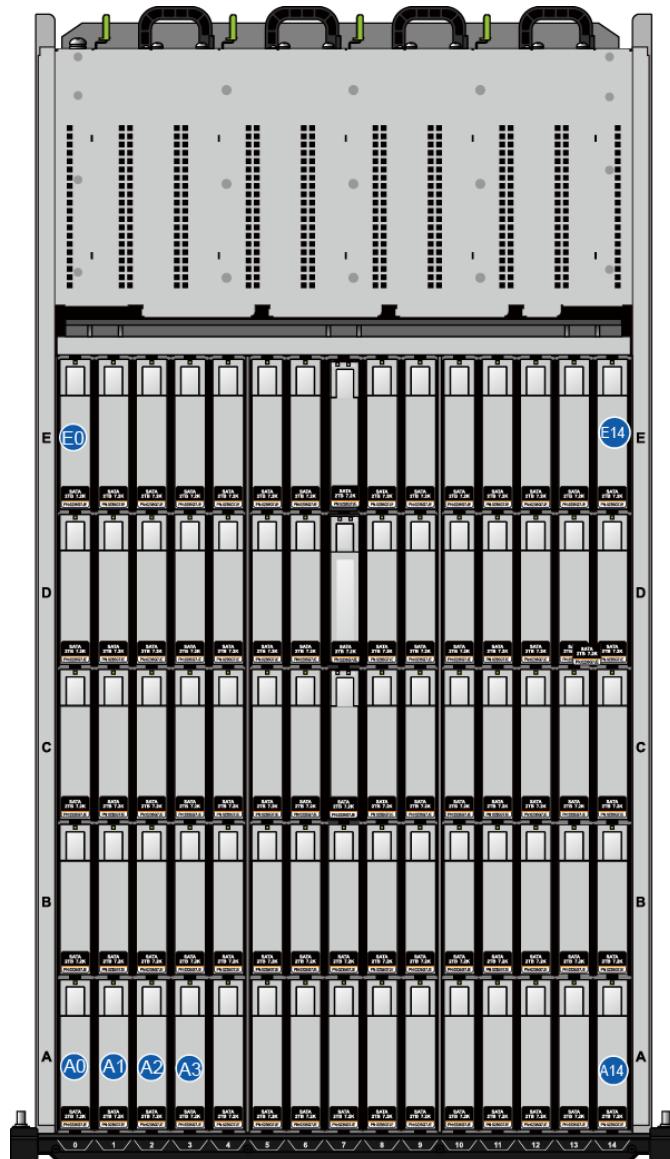
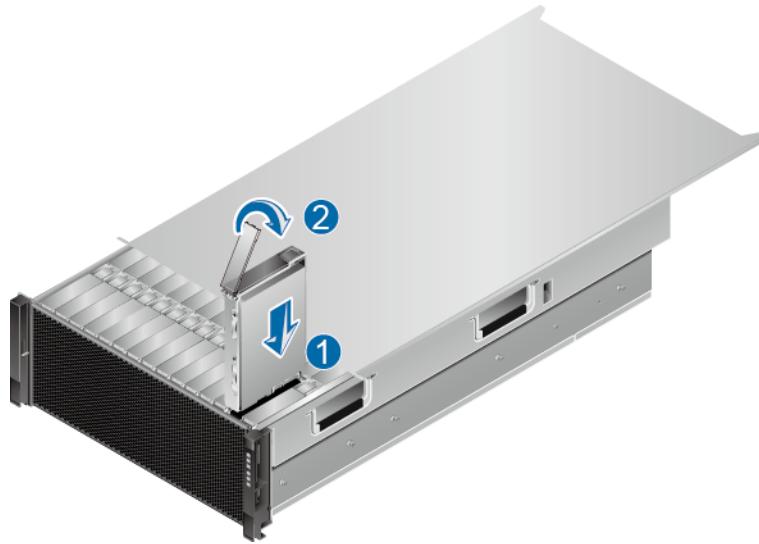


Figure 4-50 Installing a disk module



----End

Follow-up Procedure



NOTICE

After the installation is complete, install filler panels to the vacant slots to ensure proper heat dissipation. For details about installation methods, see this section.

4.4.2.7 Expanding Disk Enclosures

The storage system capacity can be greatly expanded by expanding disk enclosures. This capacity expansion method applies to scenarios that require a large capacity.

Prerequisites

- Disk enclosures have been installed.
- The live network connection topology is ready.
- The required installation tools and materials include:
 - Ground cable
 - M3 to M6 Phillips screwdriver
 - M5 screw
 - Diagonal pliers

Precautions

- During the power-on, do not wear an ESD wrist strap to avoid electric shock.

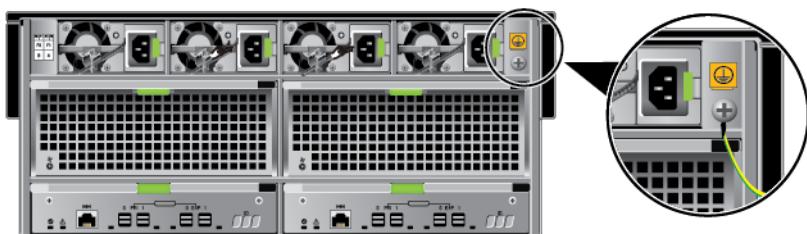
- During the power-on, do not remove or insert network cables, SAS electrical cables, or interface modules to avoid loss of system data.

Procedure

Step 1 Connecting the ground cable.

1. Remove plastic insulation tubes from the OT terminals of a ground cable using diagonal pliers.
2. Remove the ground screw from the disk enclosure with a Phillips screwdriver.
3. Fasten one OT terminal of the ground cable to a ground screw hole on the device using a ground screw, as shown in [Figure 4-51](#).

Figure 4-51 Connecting a ground cable of the 4U high-density disk enclosure



4. Connect the other OT terminal of the ground cable to the ground terminal on the cabinet in the same way.
5. Repeat the preceding operations to connect the ground cables of all devices.

Step 2 Connect SAS cables for the disk enclosures based on the cable connection topology and cable connection and removal sequence in [4.3.3.3.2 Selecting a Disk Enclosure Connection Mode](#).

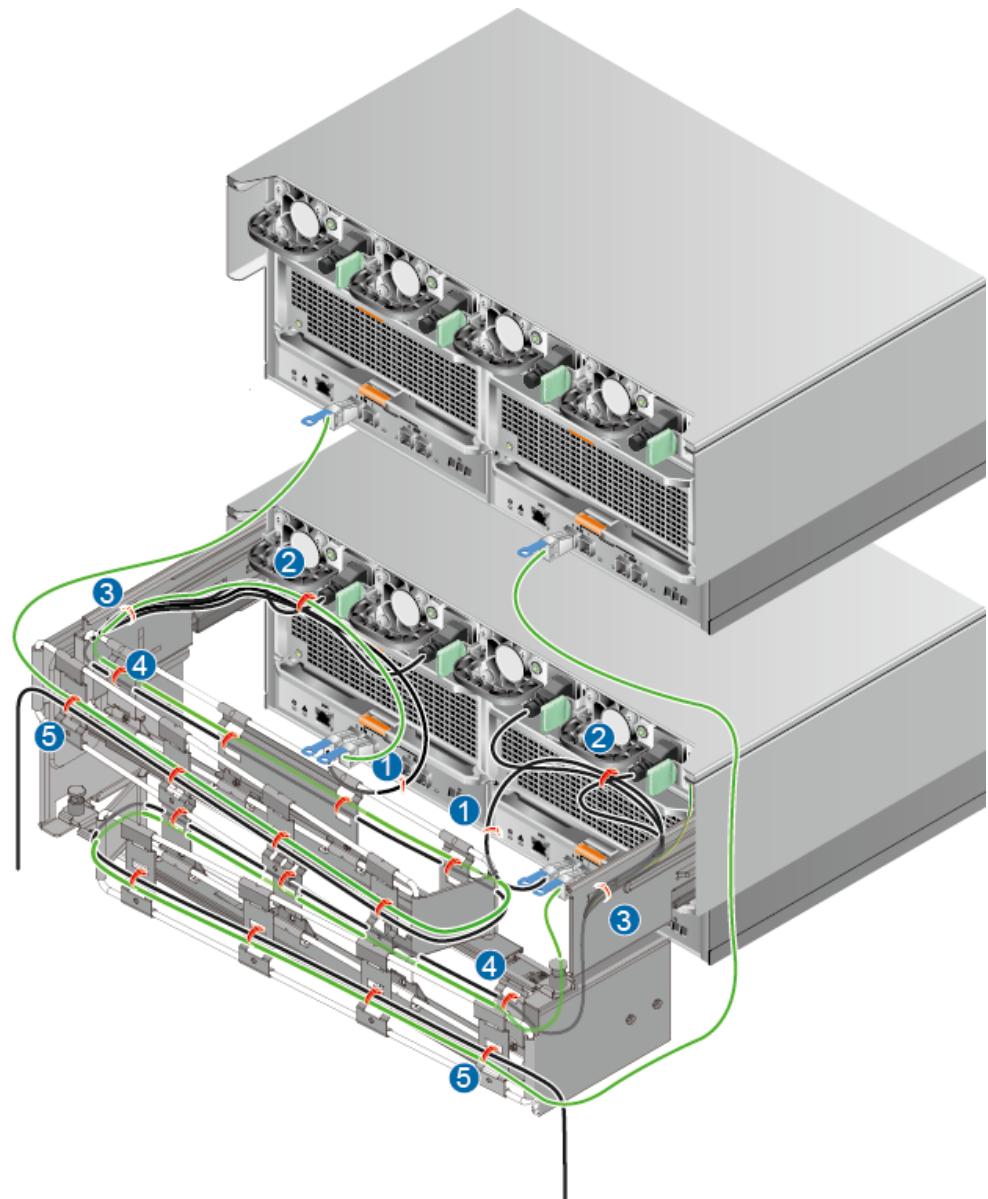


NOTICE

Removing cables are highly risky and may affect service operation. Check service operation before and after removing cables. If services are in abnormal state after cables are removed, do not perform capacity expansion.

- If a storage system configured with two servers expands the capacity of a high-density disk enclosure in the existing loop (forward and backward connections, as shown in [Figure 4-8](#)), bind the removed SAS cables to the cable manager of the newly added high-density enclosure, as the green SAS cables shown in [Figure 4-52](#).

Figure 4-52 Route SAS cables on the cable managers



- Gently push the connector of the mini SAS cable inward. Then pull the plastic ring on the connector outward and hold the plastic ring while removing the SAS cable.

Step 3 Connect power cables.

- Connect AC power cables.
 - a. Connect disk enclosures to the power sockets on the cabinet using AC power cables.

Figure 4-53 Connecting AC power cables (2 U SAS disk enclosure)

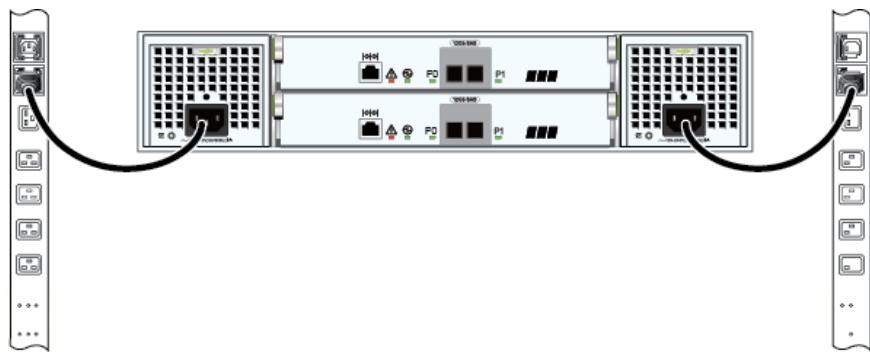
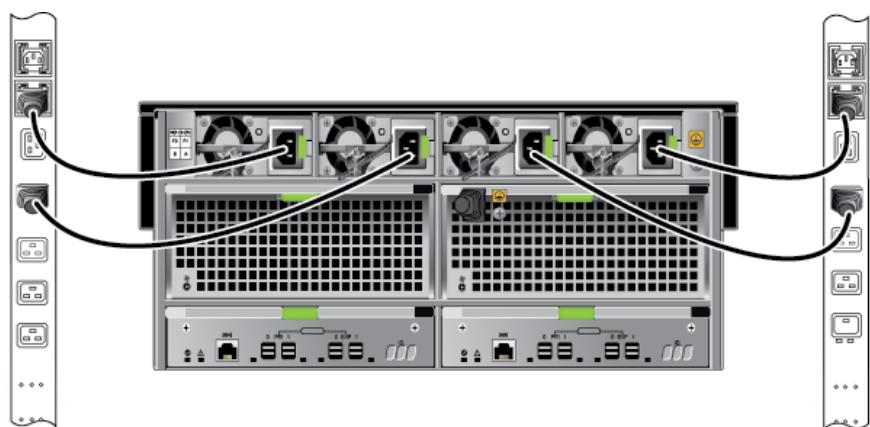


Figure 4-54 Connecting AC power cables (4 U SAS disk enclosure)



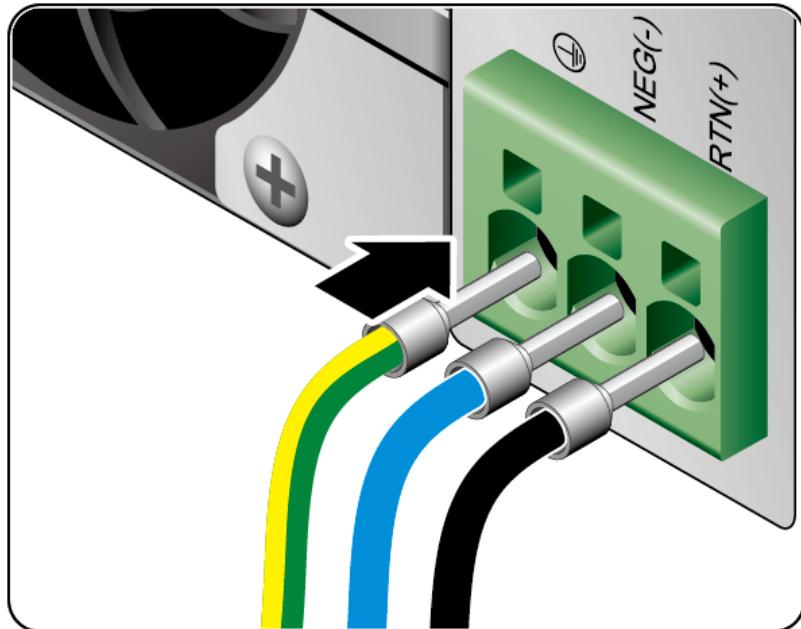
Figure 4-55 Connecting AC power cables (4 U high-density disk enclosure)



- b. Secure the AC power cable using a cable clip.
- Connect DC power cables (applicable to high-density disk enclosures).

- a. Connect the power cable to the wiring terminal on the PSU until the power cable snaps into the spring, as shown in [Figure 4-56](#).
- b. Connect the OT terminal on the ground cable to the terminal on the ground cable of the power module.
- c. Connect the OT terminal on the negative power cable to the NEG(-) wiring terminal on the power module.
- d. Connect the OT terminal on the positive power cable to the RTN(+) wiring terminal on the power module.

Figure 4-56 Connecting a high-density disk enclosure to DC power cables

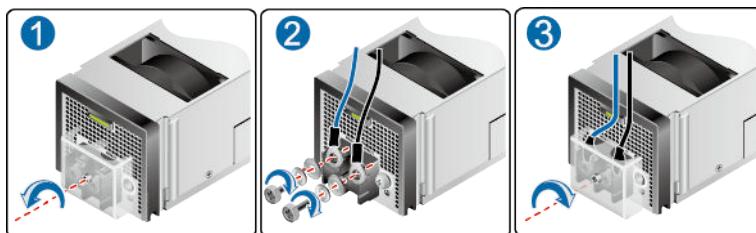


 **NOTE**

The colors of DC power cables that connect to the anode and cathode of the DC power supply are subject to the colors of the DC power cables actually used in the equipment room.

- e. Connect the other end of the power cable to the DC power distribution frame (PDF) based on the power cable connection rules.
- Connect DC power cables (applicable to 4 U SAS disk enclosures).
 - a. Remove the plastic insulation tubes on the OT terminals of the DC power cables with the diagonal pliers.
 - b. Remove the protective cover on the DC power module, as shown in step 1 of [Figure 4-57](#).

Figure 4-57 Connecting the DC power cable



- c. Unfasten the screws of the DC power cable with the Phillips screwdriver, put the screws through the shock absorption sheets, washers, and OT terminal round holes, and then fasten the screws that attach the power module, as shown in step 2 of [Figure 4-57](#).

 **NOTE**

- When unfastening the screws from the DC power cable, prevent the shock absorption sheets and washers from sliding off.
- Connect the OT terminal of the black cable to the RTN (+) end, and the OT terminal of the blue cable to the NEG (-) end. (The colors of DC power cables that connect to the anode and cathode of the DC power supply are subject to the colors of the DC power cables actually configured in users' equipment rooms.)

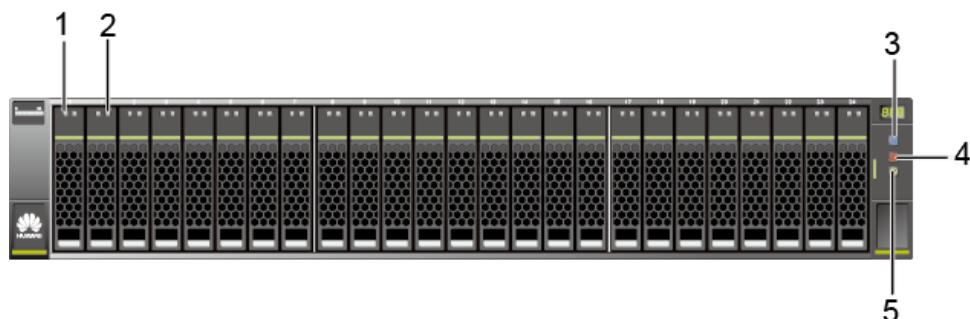
- d. Install the protective cover on the DC power module, as shown in step 3 of [Figure 4-57](#).

Step 4 Check the indicator status of the disk enclosure and ensure that the disk enclosure has been connected to the storage system.

- Check the indicator status of a 2 U SAS disk enclosure.

[Figure 4-58](#) shows the indicator status when the disk enclosure is normally powered on.

Figure 4-58 Indicators on a 2 U disk enclosure (front view)



1 Running indicator on a disk module (steady green) 2 Location/Alarm indicator on a disk module (off)

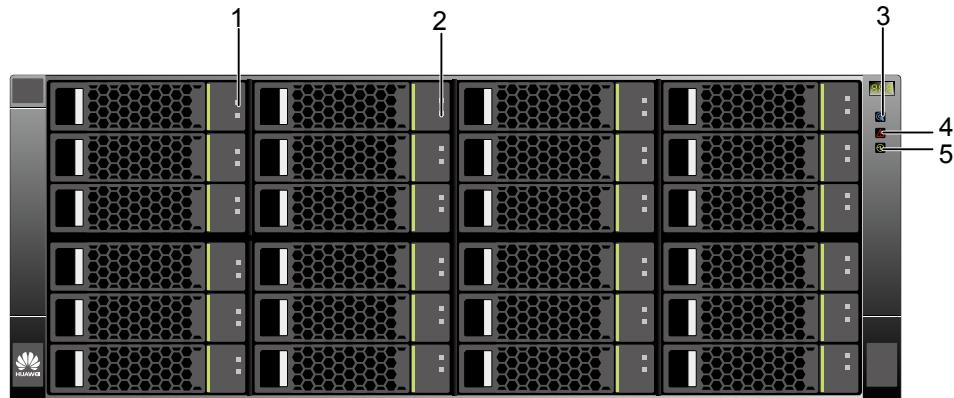
3 Location indicator on a disk enclosure (off) 4 Alarm indicator on a disk enclosure (off)

5 Power indicator on a disk enclosure (steady green)

- Check the indicator status of a 4 U SAS disk enclosure.

[Figure 4-59](#) shows the indicator status when the disk enclosure is normally powered on.

Figure 4-59 Front-panel indicators of a 4 U SAS disk enclosure after being powered on normally



1 Running indicator of the disk module (steady green) 2 Location/Alarm indicator of the disk module (off)

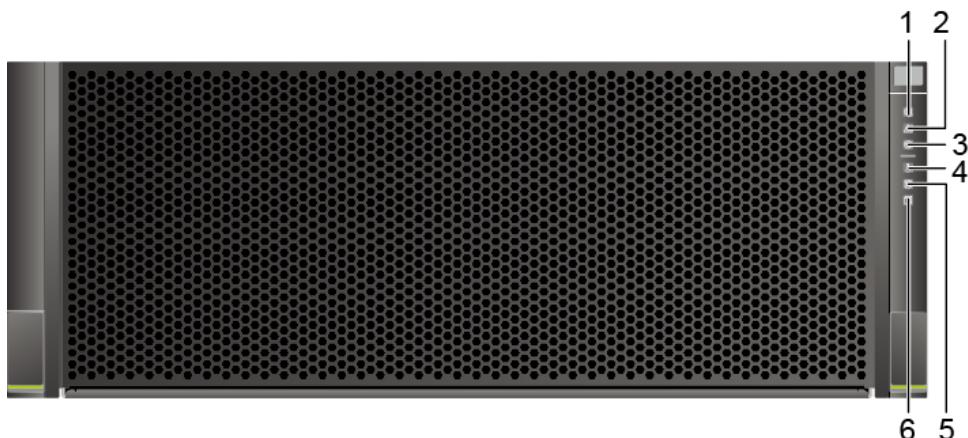
3 Location indicator of the disk enclosure (off) 4 Alarm indicator of the disk enclosure (off)

5 Power indicator of the disk enclosure (steady green)

- Check the indicator status of a high-density disk enclosure.

Figure 4-60 shows the indicator status when the disk enclosure is normally powered on.

Figure 4-60 High-density disk enclosure indicators (front view)



1 High-density disk enclosure Location indicator (off)

2 High-density disk enclosure Alarm indicator (off)

3 High-density disk enclosure Power indicator (steady green)

4 High-density disk enclosure overtemperature Alarm indicator (off)

5 High-density disk enclosure internal module Alarm indicator (off)

6 High-density disk enclosure rear module Alarm indicator (off)

----End

Follow-up Procedure

After completing disk enclosure expansion, set the ID of the disk enclosure in Window or Linux. For details about how to set, see the *OceanStor V3 DAS Storage System V300R006 Installation Guide*.

4.4.3 Scenario that Requires New Links

You can add servers or HBAs to add links to enhance the system reliability and security by link redundancy.

4.4.3.1 Adding Links

After installing the hardware, connecting cables, and configuring switches, you must make configurations on the storage system and the host to allow newly added paths to work properly.

Prerequisites

- Hardware has been installed, cables have been connected, and switches have been configured.
- The network topology is ready.
- The following tools and materials have been prepared:
 - Mini SAS HD expansion cables
 - Diagonal pliers

Precautions

- To avoid electric shocks, do not wear an ESD wrist strap when powering on disk enclosures.
- To avoid system data loss, do not remove or insert network cables, SAS electrical cables, or interface modules when powering on disk enclosures.

Procedure

- Step 1** Connect SAS cables for the disk enclosures based on the network topology and cable connection and removal sequence determined in [4.3.3.4.2 Drawing the Topology for Newly Added Links](#).
- Step 2** Connect the power cables of the servers.
- Step 3** Check indicators on servers and disk enclosures to confirm that new servers have been connected to the storage system correctly.

----End

4.5 Post-expansion Check

After the new disks, disk enclosures, or servers are installed and powered on, and the indicators are normally on, check on the application server whether these new disks or disk enclosures are identified and running normally.

4.5.1 Locating Newly-added Devices on the Application Server (Windows)

This section introduces how to locate newly-added devices on a Windows application server.

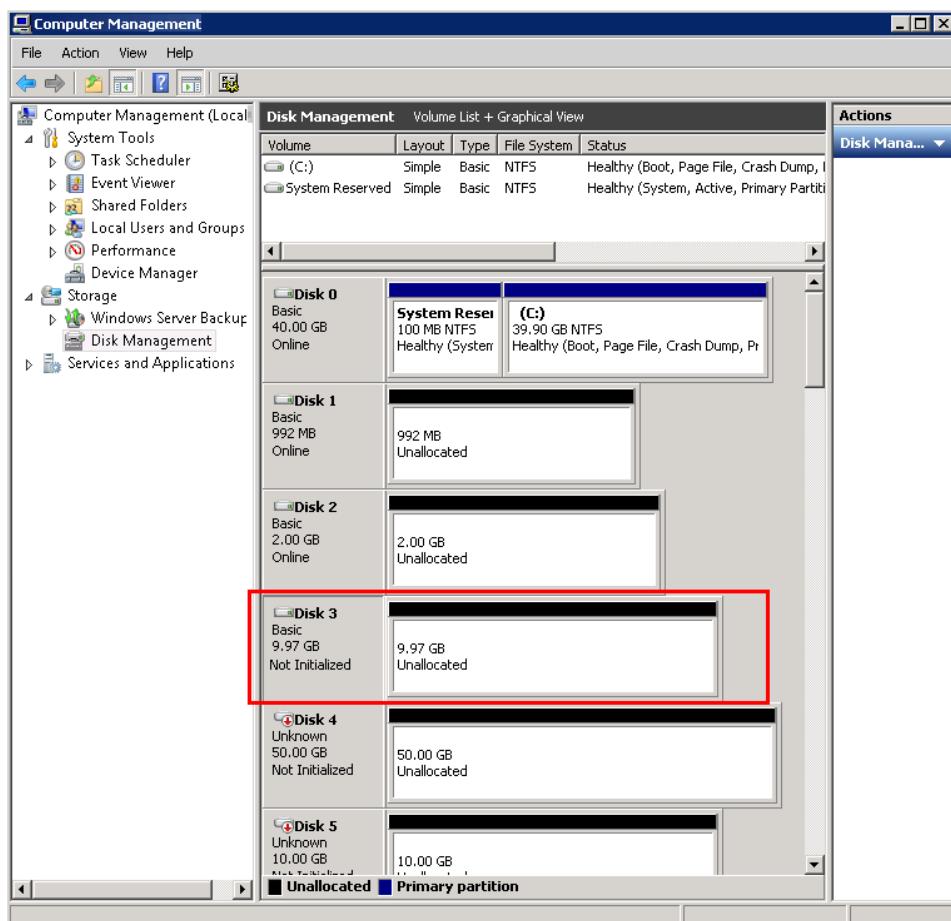
Prerequisites

The application server has been connected to the storage device and they are communicating properly.

Procedure

- Step 1** Press **Windows+R** to open the **Run** dialog box.
- Step 2** Type the **compmgmt.msc** command and press **Enter**.
The **Computer Management** page is displayed.
- Step 3** In the navigation bar on the left, choose **Storage > Disk Management**.
- Step 4** Right-click **Disk Management** and choose **Rescan Disk** from the shortcut menu.
 - After the scan is complete, new logical disks are displayed in the right area (using Disk 1 as an example), as shown in the red square in [Figure 4-61](#) (The display varies with the disk size).

Figure 4-61 Viewing newly added disks



- If no new disk is detected, perform the following steps:
 - a. Choose **Device Manager > Disk drives**.
 - b. Right-click **Disk drives** and choose **Scan for hardware changes** from the shortcut menu.
 - c. After that, rescan for disks.

 **NOTE**

If no new disk is not detected, handle the fault and rescan for the disk. Possible causes are:

- The link between the application server and the storage system is faulty.
- The HBA driver is uninstalled.

----End

5 Troubleshooting

About This Chapter

This section introduces how to handle common faults.

The common faults of OceanStor V3 DAS can be located using the indicators of each component.

5.1 Faults of 4 U 24-slot Disk Enclosures

This section introduces how to handle common faults of 4 U 24-slot disk enclosure.

5.2 Faults of 2 U 25-slot Disk Enclosures

This section introduces how to handle common faults of 2 U 25-slot disk enclosure.

5.3 Faults of 4 U 75-slot High-density Disk Enclosures

This section introduces how to handle common faults of 4 U 75-Slot high-density disk enclosure.

5.1 Faults of 4 U 24-slot Disk Enclosures

This section introduces how to handle common faults of 4 U 24-slot disk enclosure.

Table 5-1 Location indicator of a disk enclosure

Indicator Status	Possible Causes	Procedure
Blinking blue	This disk enclosure has been detected.	Cancel the locating of the disk based on needs.
Off	The disk enclosure is not detected.	<ol style="list-style-type: none">If this indicator is off when you start detecting disk enclosures, check whether there is a location error.Contact Huawei technical support engineers.

Table 5-2 Alarm indicator of a disk enclosure

Indicator Status	Possible Causes	Procedure
Off	The system is normal.	No action is required.
Steady red	An alarm has been generated on the disk enclosure.	<ol style="list-style-type: none"> 1. Check whether the module whose indicator is steady red is correctly installed. 2. Check whether the connector of the module whose indicator is steady red is broken. 3. Replace the module whose indicator is steady red. 4. Contact Huawei technical support engineers.

Table 5-3 Power indicator of a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.
Off	<ul style="list-style-type: none"> ● The power cable is not inserted. ● The power cable loosens up. ● The power module is faulty. ● The disk enclosure has been powered off. 	<ol style="list-style-type: none"> 1. Check whether the power cable is correctly inserted to available power supply. 2. Check whether the power module is correctly installed. 3. Power on the disk enclosure using serial port commands. 4. Replace the power module. 5. Contact Huawei technical support engineers.

Table 5-4 Running/alarm indicator of the fan module of a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.

Indicator Status	Possible Causes	Procedure
Steady red	An alarm is generated on the fan module.	
Off	<ul style="list-style-type: none"> ● The fan module is not installed correctly. ● The fan module has not been powered on. ● The fan module is faulty. 	<ol style="list-style-type: none"> 1. Check whether the fan module is correctly installed. 2. Check whether the fan module connector is damaged. 3. Replace the fan module. 4. Contact Huawei technical support engineers.

Table 5-5 Running/alarm indicator of the power module of a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.
Blinking green	The power input is normal but the power module has no power output.	<ol style="list-style-type: none"> 1. Blinking green on a single power module: Remove the power module. 2. Blinking green on two power modules: Run commands on serial ports to power on disk enclosures. 3. Contact Huawei technical support engineers.
Steady red	An alarm is generated on the power module.	
Off	<ul style="list-style-type: none"> ● The power module is not installed correctly. ● The power module is not powered on. ● The power module is faulty. 	<ol style="list-style-type: none"> 1. Check whether the power module is correctly installed. 2. Check whether the power module connector is damaged. 3. Replace the power module. 4. Contact Huawei technical support engineers.

Table 5-6 Power indicator of the expansion module of a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.
Off	<ul style="list-style-type: none">● The expansion module is powered off.● The expansion module is faulty.	<ol style="list-style-type: none">1. Check whether the expansion module is correctly installed.2. Check whether the expansion module connector is damaged.3. Replace the faulty expansion module.4. Contact Huawei technical support engineers.

Table 5-7 Alarm indicator of the expansion module of a disk enclosure

Indicator Status	Possible Causes	Procedure
Off	The system is normal.	No action is required.
Steady red	An alarm is generated on the expansion module.	<ol style="list-style-type: none">1. Check whether the expansion module is correctly installed.2. Check whether the expansion module connector is damaged.3. Replace the faulty expansion module.4. Contact Huawei technical support engineers.

Table 5-8 Expansion port indicator of a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady blue	The system is running normally at a transmission rate of 4 x 12 Gbit/s.	No action is required.

Indicator Status	Possible Causes	Procedure
Steady green	The transmission rate is 4 x 6 Gbit/s or 4 x 3 Gbit/s.	<ol style="list-style-type: none"> 1. Check whether the maximum rate of the peer port is 4 x 6 Gbit/s or 4 x 3 Gbit/s. If yes, the system is normal. 2. If the maximum rate of the peer port is 4 x 12 Gbit/s, check whether the cable meets the specifications and whether the two ends of the cable are properly inserted. 3. Contact Huawei technical support engineers.
Steady red	The port is faulty.	<ol style="list-style-type: none"> 1. Check whether the cable meets the specifications and whether the two ends of the cable are properly inserted. 2. Contact Huawei technical support engineers.
Off	The port is not connected.	<ol style="list-style-type: none"> 1. Check whether the cable meets the specifications and whether the two ends of the cable are properly inserted. 2. Contact Huawei technical support engineers.

Table 5-9 Running indicator of a disk module in a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The disk module is working properly.	No action is required.
Blinking green	Data is being read from and written to the disk module.	No action is required.

Indicator Status	Possible Causes	Procedure
Off	The disk module is not powered on or is powered on incorrectly.	<ol style="list-style-type: none"> Check whether the disk module is correctly installed. If not, install it again. Replace the disk module. Contact Huawei technical support engineers.

Table 5-10 Alarm/location indicator of a disk module in a disk enclosure

Indicator Status	Possible Causes	Procedure
Blinking red	The disk enclosure is detected.	Cancel the locating of the disk based on needs.
Steady red	The disk module is faulty.	<ol style="list-style-type: none"> Check whether the disk module is correctly installed. Replace the disk module. Contact Huawei technical support engineers.
Off	The disk module is normal.	No action is required.

5.2 Faults of 2 U 25-slot Disk Enclosures

This section introduces how to handle common faults of 2 U 25-slot disk enclosure.

Table 5-11 Location indicator of a disk enclosure

Indicator Status	Possible Causes	Procedure
Blinking blue	This disk enclosure has been detected.	Cancel the locating of the disk based on needs.
Off	The disk enclosure is not detected.	<ol style="list-style-type: none"> If this indicator is off when you start detecting disk enclosures, check whether there is a location error. Contact Huawei technical support engineers.

Table 5-12 Alarm indicator of a disk enclosure

Indicator Status	Possible Causes	Procedure
Off	The system is normal.	No action is required.
Steady red	An alarm has been generated on the disk enclosure.	<ol style="list-style-type: none"> 1. Check whether the module whose indicator is steady red is correctly installed. 2. Check whether the connector of the module whose indicator is steady red is broken. 3. Replace the module whose indicator is steady red. 4. Contact Huawei technical support engineers.

Table 5-13 Power indicator of a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.
Off	<ul style="list-style-type: none"> ● The power cable is not inserted. ● The power cable loosens up. ● The power module is faulty. ● The disk enclosure has been powered off. 	<ol style="list-style-type: none"> 1. Check whether the power cable is correctly inserted to available power supply. 2. Check whether the power module is correctly installed. 3. Power on the disk enclosure using serial port commands. 4. Replace the power module. 5. Contact Huawei technical support engineers.

Table 5-14 Running/alarm indicator of the power module of a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.

Indicator Status	Possible Causes	Procedure
Blinking green	The power input is normal but the power module has no power output.	<ol style="list-style-type: none"> 1. Blinking green on a single power module: Remove the power module. 2. Blinking green on two power modules: Run commands on serial ports to power on disk enclosures. 3. Contact Huawei technical support engineers.
Steady red	An alarm is generated on the power module.	<ol style="list-style-type: none"> 1. Check whether the power module is correctly installed. 2. Check whether the power module connector is damaged. 3. Replace the power module. 4. Contact Huawei technical support engineers.
Off	<ul style="list-style-type: none"> ● The power module is not installed correctly. ● The power module is not powered on. ● The power module is faulty. 	<ol style="list-style-type: none"> 1. Check whether the power module is correctly installed. 2. Check whether the power module connector is damaged. 3. Replace the power module. 4. Contact Huawei technical support engineers.

Table 5-15 Power indicator of the expansion module of a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.
Off	<ul style="list-style-type: none"> ● The expansion module is powered off. ● The expansion module is faulty. 	<ol style="list-style-type: none"> 1. Check whether the expansion module is correctly installed. 2. Check whether the expansion module connector is damaged. 3. Replace the faulty expansion module. 4. Contact Huawei technical support engineers.

Table 5-16 Alarm indicator of the expansion module of a disk enclosure

Indicator Status	Possible Causes	Procedure
Off	The system is normal.	No action is required.
Steady red	An alarm is generated on the expansion module.	<ol style="list-style-type: none">1. Check whether the expansion module is correctly installed.2. Check whether the expansion module connector is damaged.3. Replace the faulty expansion module.4. Contact Huawei technical support engineers.

Table 5-17 Expansion port indicator of a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady blue	The system is running normally at a transmission rate of 4 x 12 Gbit/s.	No action is required.
Steady green	The transmission rate is 4 x 6 Gbit/s or 4 x 3 Gbit/s.	<ol style="list-style-type: none">1. Check whether the maximum rate of the peer port is 4 x 6 Gbit/s or 4 x 3 Gbit/s. If yes, the system is normal.2. If the maximum rate of the peer port is 4 x 12 Gbit/s, check whether the cable meets the specifications and whether the two ends of the cable are properly inserted.3. Contact Huawei technical support engineers.
Steady red	The port is faulty.	<ol style="list-style-type: none">1. Check whether the cable meets the specifications and whether the two ends of the cable are properly inserted.2. Contact Huawei technical support engineers.

Indicator Status	Possible Causes	Procedure
Off	The port is not connected.	<ol style="list-style-type: none"> Check whether the cable meets the specifications and whether the two ends of the cable are properly inserted. Contact Huawei technical support engineers.

Table 5-18 Running indicator of a disk module in a disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The disk module is working properly.	No action is required.
Blinking green	Data is being read from and written to the disk module.	No action is required.
Off	The disk module is not powered on or is powered on incorrectly.	<ol style="list-style-type: none"> Check whether the disk module is correctly installed. If not, install it again. Replace the disk module. Contact Huawei technical support engineers.

Table 5-19 Alarm/location indicator of a disk module in a disk enclosure

Indicator Status	Possible Causes	Procedure
Blinking red	This disk enclosure has been detected.	Cancel the locating of the disk based on needs.
Steady red	The disk module is faulty.	<ol style="list-style-type: none"> Check whether the disk module is correctly installed. Replace the disk module. Contact Huawei technical support engineers.
Off	The disk module is normal.	No action is required.

5.3 Faults of 4 U 75-slot High-density Disk Enclosures

This section introduces how to handle common faults of 4 U 75-Slot high-density disk enclosure.

Table 5-20 Location indicator of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Blinking blue	This disk enclosure has been detected.	Cancel the locating of the disk based on needs.
Off	The disk enclosure is not detected.	<ol style="list-style-type: none">1. If this indicator is off when you start detecting disk enclosures, check whether there is a location error.2. Contact Huawei technical support engineers.

Table 5-21 Alarm indicator of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Off	The system is normal.	No action is required.
Steady red	An alarm has been generated on the disk enclosure.	<ol style="list-style-type: none">1. Check whether the module whose indicator is steady red is correctly installed.2. Check whether the connector of the module whose indicator is steady red is broken.3. Replace the module whose indicator is steady red.4. Contact Huawei technical support engineers.

Table 5-22 Power indicator of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.

Indicator Status	Possible Causes	Procedure
Off	The high-density disk enclosure is powered off.	<ol style="list-style-type: none"> 1. Ensure that there are at least two power modules that supply power normally. 2. Power on the high-density disk enclosure using serial port commands. 3. Replace the power module. 4. Contact Huawei technical support engineers.

Table 5-23 Overtemperature indicator of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Off	The system is normal.	No action is required.
Steady red	The temperature of the high-density disk enclosure is overly high.	<ol style="list-style-type: none"> 1. Check whether the environment temperature has exceeded the specifications. 2. Check whether the fan modules are correctly installed and functioning properly. 3. Contact Huawei technical support engineers.

Table 5-24 Status indicator of the internal module of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Off	The disk module is working properly.	No action is required.
Steady red	An internal disk module of the disk enclosure becomes faulty.	<ol style="list-style-type: none"> 1. Check whether the disk module is correctly installed. 2. Replace the disk module. 3. Contact Huawei technical support engineers.

Table 5-25 Status indicator of the external module of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Off	The high-density disk enclosure rear field replaceable units (FRUs) are working correctly.	No action is required.
Steady red	<ul style="list-style-type: none"> ● The number of high-density disk enclosure rear FRUs is less than half of that in standard configuration. ● The high-density disk enclosure rear FRUs are faulty. <p>NOTE The rear FRUs of a high-density disk enclosure include power modules, fan modules, and expansion modules.</p>	<ol style="list-style-type: none"> 1. Check whether the FRUs are correctly installed. 2. Check whether the FRU connectors are damaged. 3. Replace the faulty FRUs. 4. Contact Huawei technical support engineers.

Table 5-26 Indicator of a power module of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.
Off	<ul style="list-style-type: none"> ● The power cable is not inserted. ● The power cable loosens up. ● The power module is faulty. 	<ol style="list-style-type: none"> 1. Check whether the power cable is correctly inserted to available power supply. 2. Check whether the power module is correctly installed. 3. Replace the power module. 4. Contact Huawei technical support engineers.

Table 5-27 Power indicator of the expansion module of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.

Indicator Status	Possible Causes	Procedure
Off	<ul style="list-style-type: none"> ● The expansion module is powered off. ● The expansion module is faulty. 	<ol style="list-style-type: none"> 1. Check whether the expansion module is correctly installed. 2. Check whether the expansion module connector is damaged. 3. Replace the faulty expansion module. 4. Contact Huawei technical support engineers.

Table 5-28 Alarm indicator of the expansion module of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Off	The system is normal.	No action is required.
Steady red	An alarm is generated on the expansion module.	<ol style="list-style-type: none"> 1. Check whether the expansion module is correctly installed. 2. Check whether the expansion module connector is damaged. 3. Replace the faulty expansion module. 4. Contact Huawei technical support engineers.

Table 5-29 Expansion port indicator of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Steady blue	The system is running normally at a transmission rate of 4 x 12 Gbit/s.	No action is required.

Indicator Status	Possible Causes	Procedure
Steady green	The transmission rate is 4 x 6 Gbit/s or 4 x 3 Gbit/s.	<ol style="list-style-type: none"> 1. Check whether the maximum rate of the peer port is 4 x 6 Gbit/s or 4 x 3 Gbit/s. If yes, the system is normal. 2. If the maximum rate of the peer port is 4 x 12 Gbit/s, check whether the cable meets the specifications and whether the two ends of the cable are properly inserted. 3. Contact Huawei technical support engineers.
Steady red	The port is faulty.	<ol style="list-style-type: none"> 1. Check whether the cable meets the specifications and whether the two ends of the cable are properly inserted. 2. Contact Huawei technical support engineers.
Off	The port is not connected.	<ol style="list-style-type: none"> 1. Check whether the cable meets the specifications and whether the two ends of the cable are properly inserted. 2. Contact Huawei technical support engineers.

Table 5-30 Running/alarm indicator of the fan module of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The system is normal.	No action is required.
Steady red	An alarm is generated on the fan module.	<ol style="list-style-type: none"> 1. Check whether the fan module is correctly installed. 2. Check whether the fan module connector is damaged. 3. Replace the fan module.

Indicator Status	Possible Causes	Procedure
Off	<ul style="list-style-type: none">● The fan module is not installed correctly.● The fan module has not been powered on.● The fan module is faulty.	4. Contact Huawei technical support engineers.

Table 5-31 Status indicator of the disk module of a high-density disk enclosure

Indicator Status	Possible Causes	Procedure
Steady green	The disk module is working properly.	No action is required.
Blinking green	Data is being read from and written to the disk module.	No action is required.
Blinking red	This disk enclosure has been detected.	Cancel the locating of the disk based on needs.
Steady red	The disk module is faulty.	<ol style="list-style-type: none">1. Check whether the disk module is correctly installed. If not, install it again.2. Replace the disk module.3. Contact Huawei technical support engineers.
Off	The disk module is not powered on or is powered on incorrectly.	

6 Parts Replacement

About This Chapter

This chapter describes how to replace a storage component if it is faulty and needs to be replaced.

[6.1 Preparations Before Parts Replacement](#)

This chapter describes preparations required before replacing parts, including coordination with qualified maintenance personnel and preparation of tools and instruments for parts replacement.

[6.2 Replacing the Parts of a Disk Enclosure \(for 2U Disk Enclosure \)](#)

This chapter describes how to replace the parts in a disk enclosure.

[6.3 Replacing the Parts of a Disk Enclosure \(for 4U Disk Enclosure \)](#)

This chapter describes how to replace the parts in a 4 U disk enclosure.

[6.4 Replacing the Parts of a High-Density Disk Enclosure](#)

This chapter describes how to replace the parts in a high-density disk enclosure.

[6.5 Replacing a Cable](#)

This section describes how to replace a cable.

6.1 Preparations Before Parts Replacement

This chapter describes preparations required before replacing parts, including coordination with qualified maintenance personnel and preparation of tools and instruments for parts replacement.

6.1.1 Requirements for Maintenance Personnel

This section describes the professional techniques and knowledge that maintenance personnel must master.

Professional Techniques and Knowledge

Understands professional techniques and knowledge: Knows storage technologies such as redundant array of independent disks (RAID), direct attached storage (DAS), network attached storage (NAS), and storage area network (SAN).

Basic Operations

Understands basic operations:

- Knows how to operate storage devices.
- Knows how to operate various application servers.

Networking

Understands networking information:

- Understands the common networks of storage systems.
- Understands networks at maintenance sites.
- Understands device running status at maintenance sites.

Collecting and Saving Device Information

Understands how to collecting and saving device information:

- Collects and saves the alarm information of devices.
- Collects and saves the log information of devices.

6.1.2 Tools and Instruments

This section lists tools and instruments for parts replacement.

Table 6-1 lists the tools and instruments for parts replacement.

Table 6-1 Tools and instruments for parts replacement

Tool and Instrument	Function
ESD wrist strap	Protects electrostatic sensitive devices (ESSDs) from the static electricity of technicians.
ESD bag	Protects ESSDs from static electricity.
ESD gloves	Protects ESSDs from the static electricity of technicians.
ESD clothes	Protects ESSDs from the static electricity of technicians.
Phillips screwdriver	Loosens or tightens screws on devices.
Labels	Marks devices or cables.
Diagonal pliers	Removes binding straps or cable ties.

6.1.3 CRUs and FRUs

This section describes how to replace customer replaceable units (CRUs) and field replaceable units (FRUs).

CRU

CRUs are components that users can replace onsite by referring to the operation guide.

Operators: customer.



NOTICE

- Customers are allowed to replace a CRU, but are prohibited from replacing other components to prevent personal injury and device damage.
- Before replacing a CRU, carefully read the instructions on how to use the CRU replacement tool.

FRU

FRUs are components that engineers can replace onsite by referring to the operation guide.

Operators: Huawei technical support engineers and maintenance engineers or technical support engineers and maintenance engineers certificated by Huawei.

Replacing list

[Table 6-2](#) lists FRUs and CRUs.

Table 6-2 Replacing list

Device	FRU	CRU
2U Disk enclosure	Expansion module	Expansion module
	Power module	Power module
	Disk module	Disk module
	System enclosure	-
4U Disk enclosure	Expansion module	Expansion module
	Power module	Power module
	Disk module	Disk module
	Fan module	Fan module
	System enclosure	-
High-density disk enclosure	Expansion module	-

Device	FRU	CRU
	Power module	-
	Disk module	-
	Fan module	-
	System enclosure	-
Others	Cable	Cable

6.1.4 Obtaining Spare Parts

This section describes how to obtain spare parts.

Before replacing a component, make the spare part ready. You can obtain the spare part number by viewing the paper label on the component to be replaced.

6.2 Replacing the Parts of a Disk Enclosure (for 2U Disk Enclosure)

This chapter describes how to replace the parts in a disk enclosure.

6.2.1 Replacing an Expansion Module

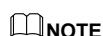
This section describes how to replace an expansion module.

Impact on the System

During the replacement of an expansion module, the system switches services from ports on this module to ports on the other expansion module in the same disk enclosure. Only one expansion module is working, causing the system reliability to degrade. You are advised to replace an expansion module during off-peak hours.

Prerequisites

- The expansion module for replacement is ready.
- The expansion module that you want to replace has been located.
- You have confirmed that the cables of the expansion module to be replaced are properly connected using Huawei Storage Networking Assistant. (<http://support.huawei.com/onlinetoolsweb/sna/?language=en>)
- The cable connection positions of the expansion module are labeled on the cables.
- The cables have been disconnected from the expansion module that you want to replace.



Before removing a SAS cable, gently push the connector of the cable inward. Then pull the plastic ring on the connector outward until the cable is completely removed from the expansion module.

Precaution

- Remove and insert an expansion module with even force. Excessive force may damage the appearance or connectors of the expansion module.
- An expansion module must be replaced within five minutes. Otherwise, the system heat dissipation is compromised.

Tools and Materials

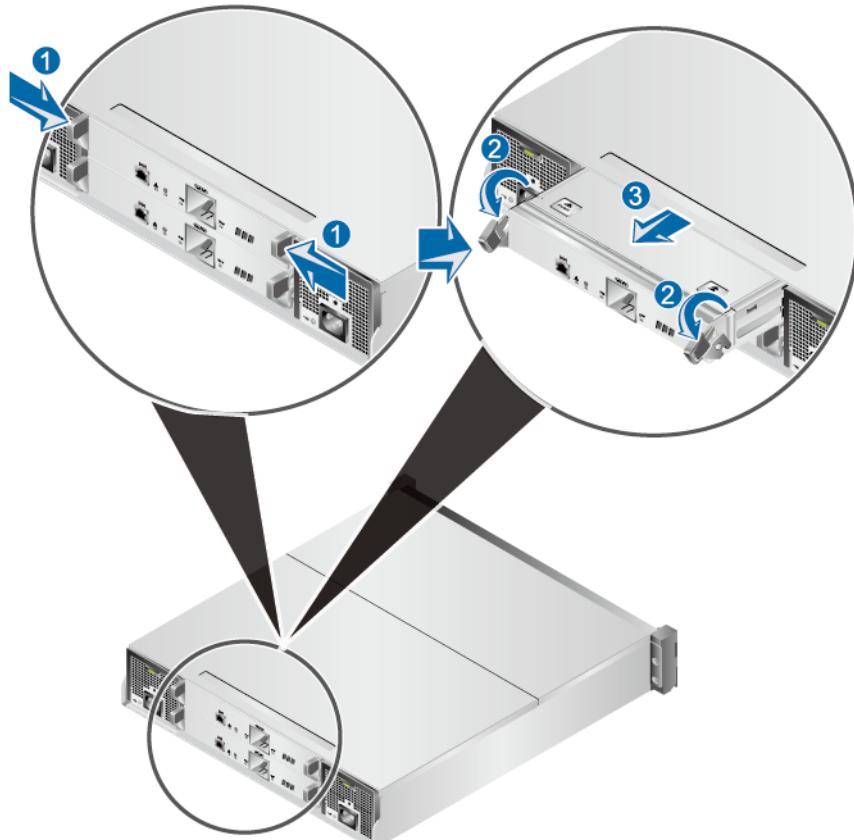
- ESD wrist strap
- ESD bag
- Label

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Press latches on the expansion module to release the handles and pull out the expansion module, as shown in [Figure 6-1](#).

Figure 6-1 Removing an expansion module

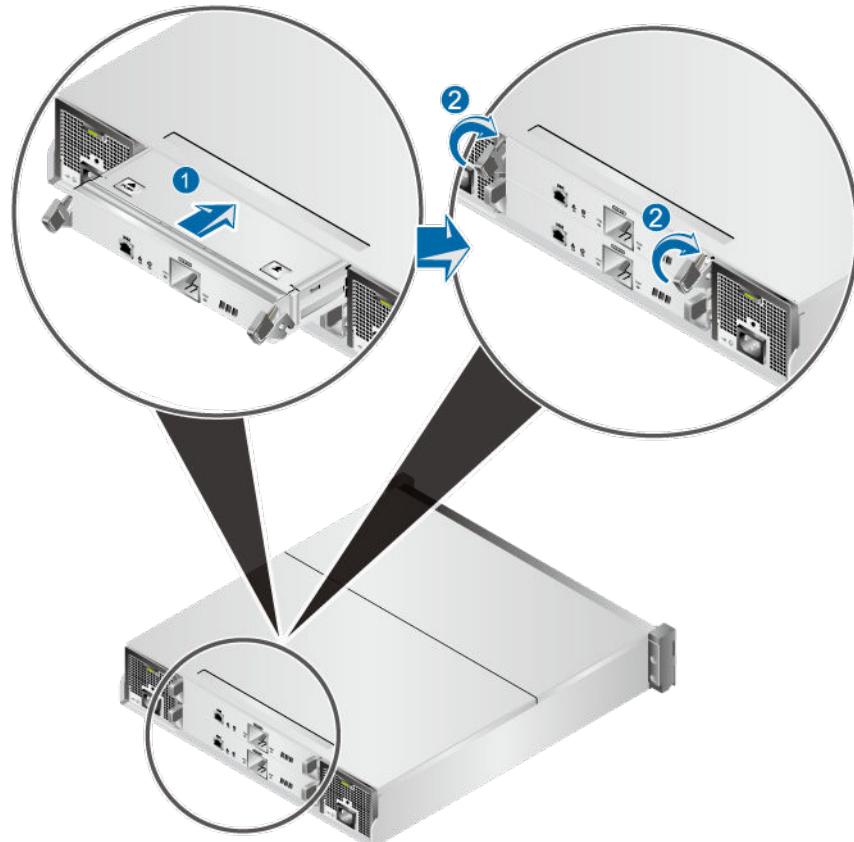


Step 3 Place the removed expansion module into an ESD bag.

Step 4 Take the replacement expansion module out of its ESD bag.

Step 5 Open the handles of the replacement expansion module, insert the expansion module into the empty slot, and close the handles, as shown in [Figure 6-2](#).

Figure 6-2 Installing an expansion module

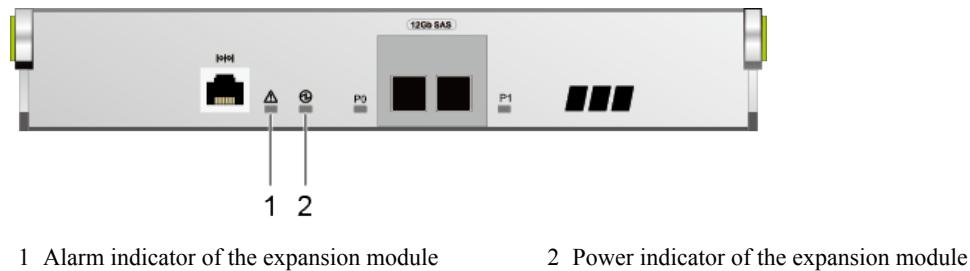


Step 6 Connect the cables.

Step 7 Wait about two minutes and check the status of the Power and Alarm indicators on the expansion module to determine whether the expansion module is successfully installed. [Figure 6-3](#) shows the locations of the Power and Alarm indicators.

- If the Power indicator is steady on and the Alarm indicator is off, the expansion module is successfully installed.
- If the Power indicator is off or the Alarm indicator is steady on, the newly installed expansion module is faulty, the expansion module slot is faulty, or the expansion module is incorrectly installed. In this case, remove and reinsert the expansion module. If the fault persists, contact Huawei technical support engineers.

Figure 6-3 Indicators on an expansion module



1 Alarm indicator of the expansion module 2 Power indicator of the expansion module

Step 8 Query whether the firmware running on the expansion module that has been replaced is the latest version.

- Yes: There is no need to upgrade the firmware. The expansion module is has been replaced successfully.
- No: Upgrade the firmware. For details, see the *OceanStor V3 DAS Storage System V300R006CXXSPCXXX Upgrade Guide*.

NOTE

- To query the firmware of the latest version, log in to Huawei support website (<http://support.huawei.com/enterprise/>) . Choose **Support > IT > Enterprise Storage > Entry-level Storage > OceanStor 2600 V3** to go to the product documentation page. Click **Downloads** to view the firmware of the latest version.
- For details about how to query the version of the firmware running on the expansion module, see the *OceanStor V3 DAS Storage System V300R006CXXSPCXXX Upgrade Guide*.

----End

Follow-up Procedure

After the expansion module is replaced, label it to facilitate subsequent operations.

6.2.2 Replacing a Power Module

This section describes how to replace a power module.

Impact on the System

During the replacement of a power module, if the redundant power module fails, the corresponding disk enclosures are unexpectedly powered off, causing all services in the disk enclosures to be interrupted.

Prerequisites

- The power module for replacement is ready.
- The power module that you want to replace has been located.

Precaution

- Do not touch the connectors of a power module and a power cable.
- Remove and insert a power module with even force. Excessive force may damage the appearance or connectors of the power module.

- Remove only one power module at a time.
- A power module must be replaced within three minutes.

Tools and Materials

- ESD wrist strap
- ESD bag
- Label

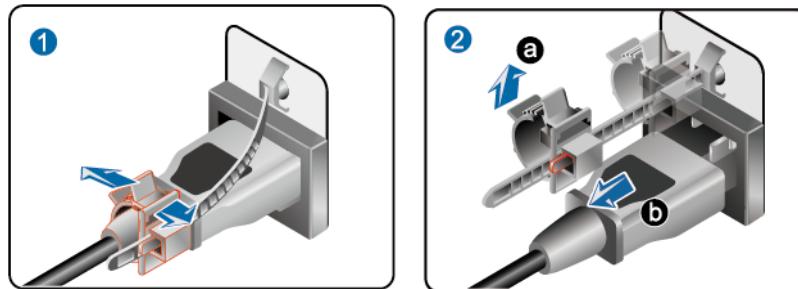
Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Remove the power cable.

1. Loosen the retention clip, as shown in step 1 in [Figure 6-4](#).

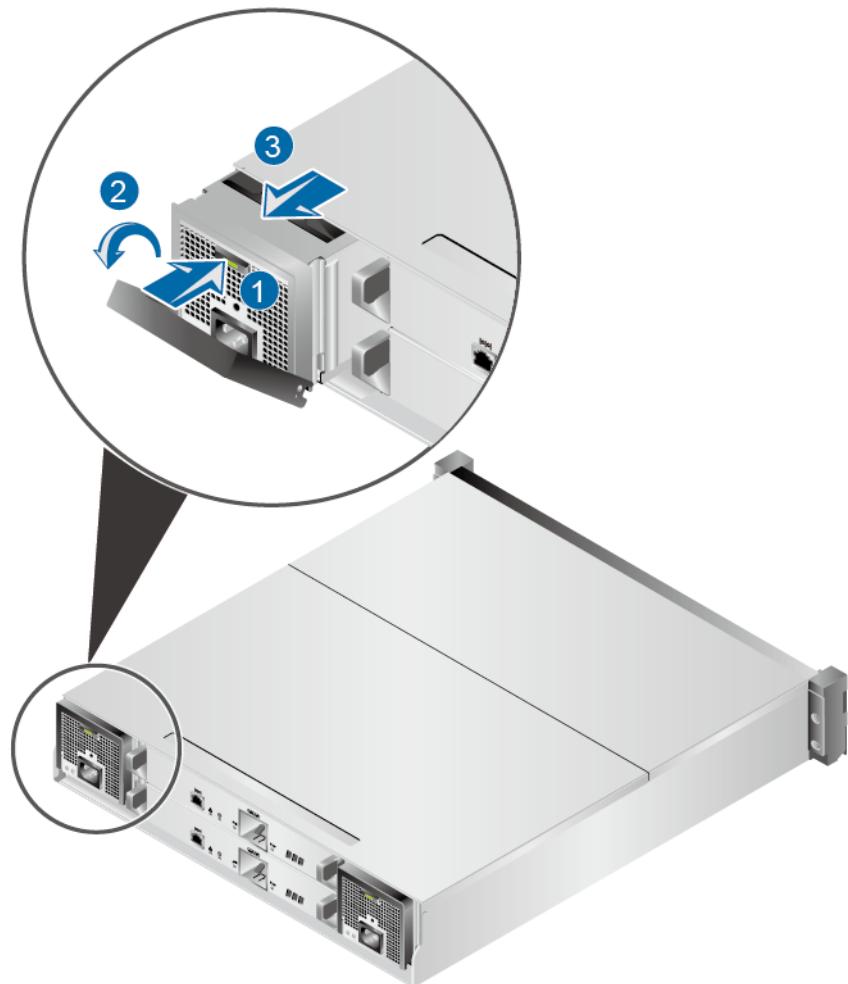
Figure 6-4 Remove the AC power cable



2. Pull up the retention clip, as shown in a of step 2 in [Figure 6-4](#).
3. Remove the AC power cable, as shown in b of step 2 in [Figure 6-4](#).

Step 3 Press the latch on the power module to release the handle and pull out the power module, as shown in [Figure 6-5](#).

Figure 6-5 Removing a power module

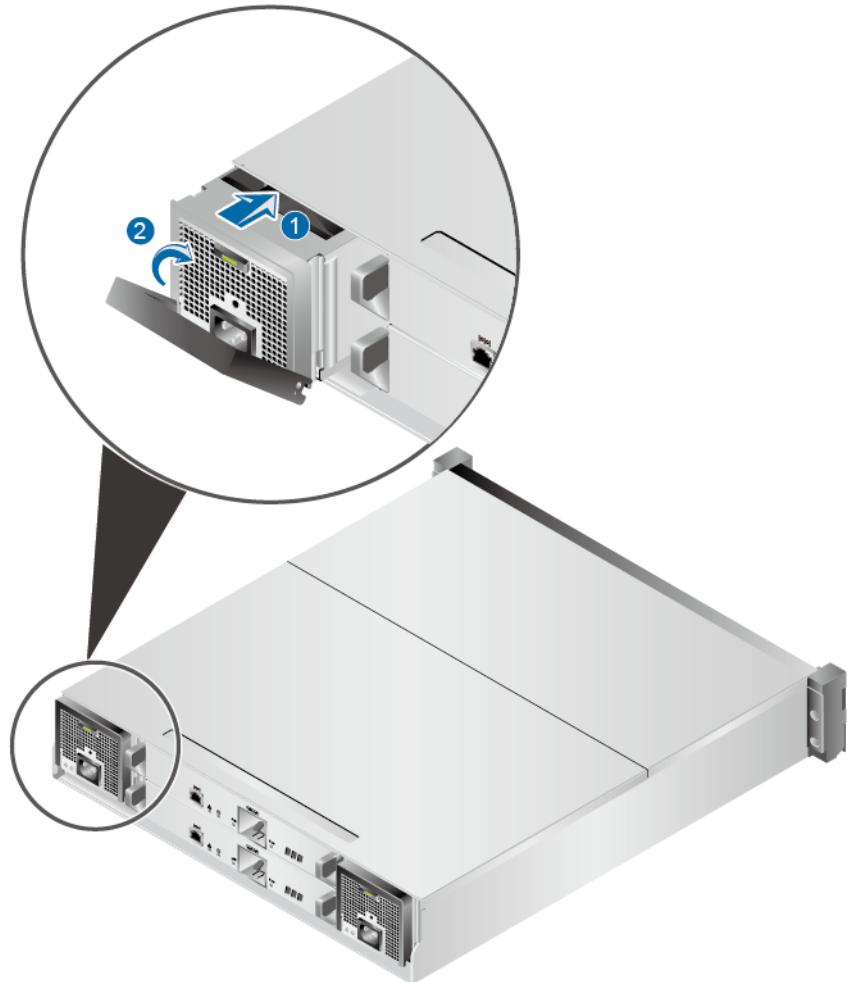


Step 4 Put the removed power module into an ESD bag.

Step 5 Take the replacement power module out of its ESD bag.

Step 6 Open the handle of the replacement power module, insert the power module into the empty slot, and close the handle, as shown in [Figure 6-6](#).

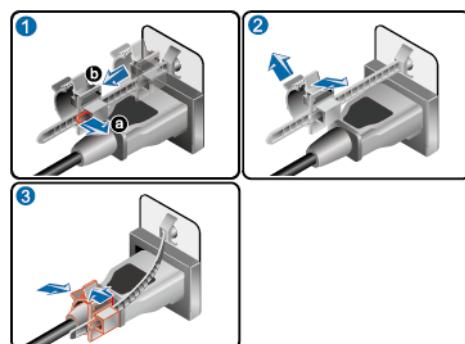
Figure 6-6 Installing a power module



Step 7 Connect the power cable and secure it to the power socket.

1. Press the locker of the retention clip outwards (as shown in a of step 1 in [Figure 6-7](#)), and meanwhile slide the retention clip to the connection part of the AC power cable (as shown in b of step 1 in [Figure 6-7](#)).

Figure 6-7 Securing the AC power cables with retention clips



2. Loosen the retention clip, as shown in step 2 in **Figure 6-7**.
3. Press the retention clip inwards to secure the connection part of the AC power cable, as shown in step 3 in **Figure 6-7**.

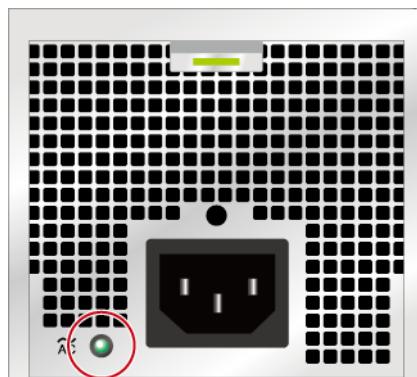
 **NOTE**

Adjust the retention clip to ensure that it holds the AC power cable tightly.

Step 8 Wait about two minutes and check the status of the Running/Alarm indicator on the power module to determine whether the power module is successfully installed. **Figure 6-8** shows the location of the Running/Alarm indicator.

- If the indicator is steady green, the power module is successfully installed.
- If the indicator is blinking green, the power input is normal but the disk enclosure is powered off.
- If the indicator is steady red or off, the newly installed power module is faulty or the power module slot is faulty. In that case, remove and reinsert the power module. If the fault persists, contact Huawei technical support engineers.

Figure 6-8 Running/Alarm indicator on a power module



----End

Follow-up Procedure

After the power module is replaced, label it to facilitate subsequent operations.

6.2.3 Replacing a Disk Module

This section describes how to replace a disk module, including the replacement of failing disks (disks not yet completely faulty) and faulty disks.

Impact on the System

During the replacement of a disk module, if the system reconstruction is complete, host services are not affected; if the system reconstruction is not complete, host services are slightly affected.

Prerequisites

- The disk module for replacement is ready.
- To prevent services from being affected, use Huawei-certified disk modules that match the product model as spare disk modules (which are obtained by service engineers based on the part numbers of failed disk modules).
- The disk module that you want to replace has been located.

Precaution

- When handling a disk module, hold only its edge to prevent it from damage.
- Remove and insert a disk module with even force. Excessive force may damage the appearance or connectors of the disk module.
- To prevent disk module damage, wait at least one minute after removal and before reinserting a disk module, or after insertion and before removal of a disk module.
- To prevent data loss, replace only a disk module whose Alarm/Location indicator is steady red.
- Please complete the replacement within five minutes after removing the original disk.
- Ensure that the replacement disk is inserted in to the same slot as the replaced disk. Otherwise, the system may work incorrectly.

Tools and Materials

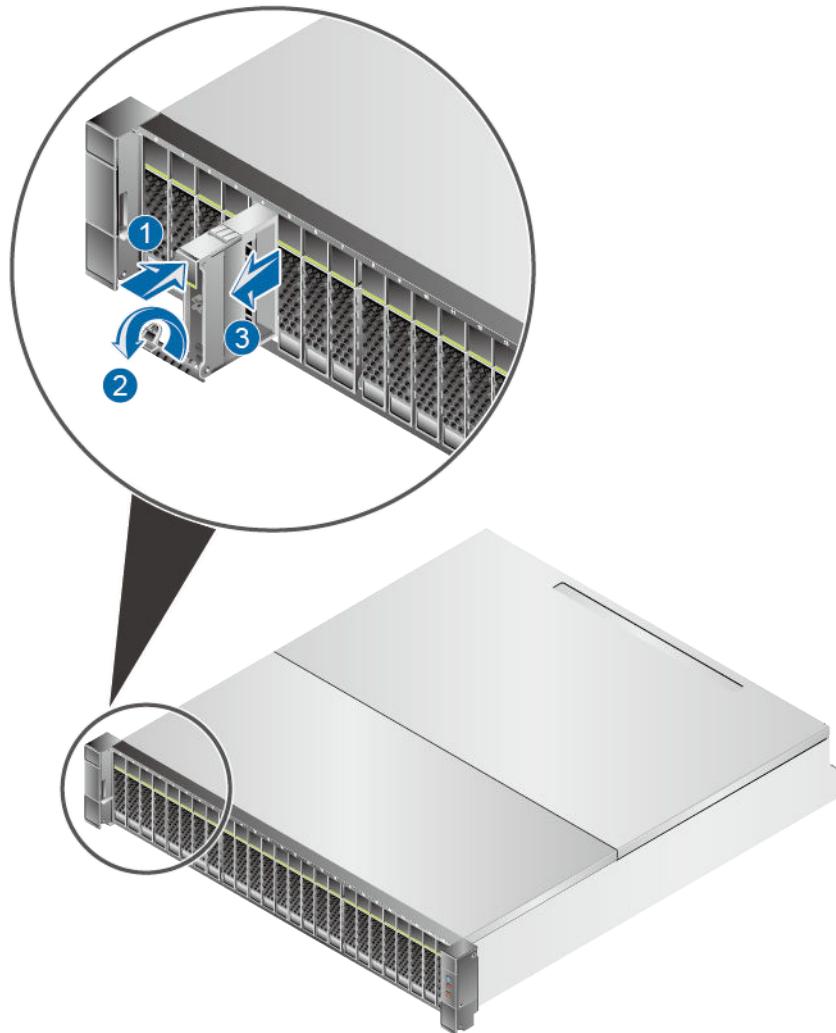
- ESD wrist strap
- ESD bag
- Label

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Press the latch on the disk module to release the handle and pull out the disk module, as shown in [Figure 6-9](#).

Figure 6-9 Removing a disk module

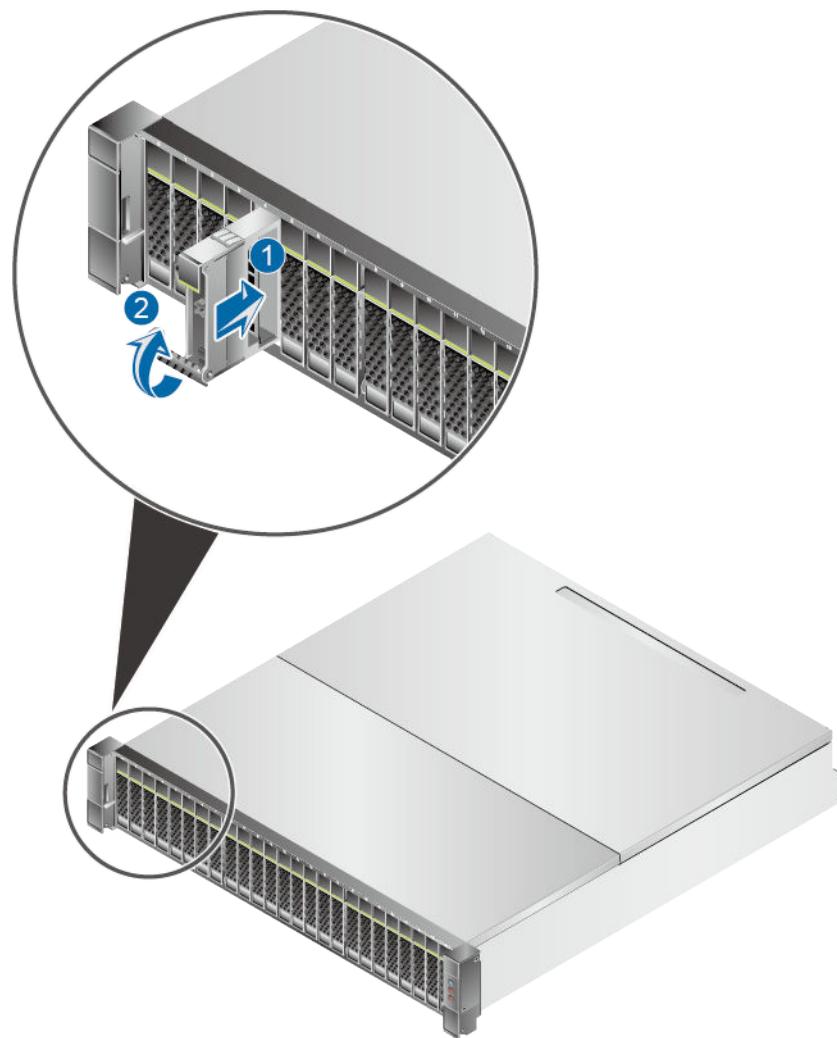


Step 3 Put the removed disk module into an ESD bag.

Step 4 Take the replacement disk module out of its ESD bag.

Step 5 Open the handle of the replacement disk module, insert the disk module into the empty slot, and close the handle, as shown in [Figure 6-10](#).

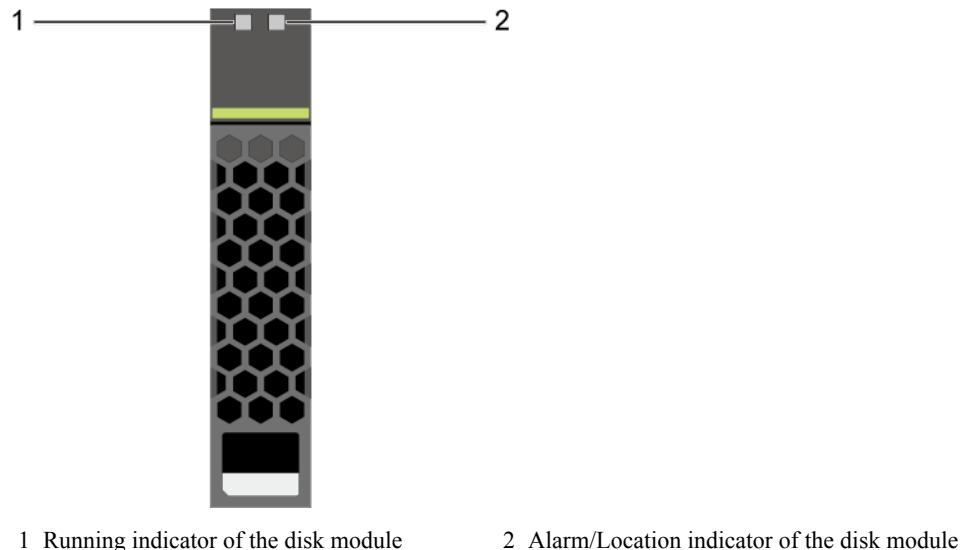
Figure 6-10 Installing a disk module



Step 6 Wait about two minutes and check the status of the Running and Alarm/Location indicators on the disk module to determine whether the disk module is successfully installed. [Figure 6-11](#) shows the locations of the Running and Alarm/Location indicators.

- If the Running indicator is steady on and the Alarm/Location indicator is off, the disk module is successfully installed.
- If the Running indicator is off or the Alarm/Location indicator is steady on, the newly installed disk module is faulty, the disk module slot is faulty, or the disk module is incorrectly installed. Remove the disk, wait one minute, and then reinsert it. If the alarm indicator remains on, the disk is defective. Replace the defective disk with a new one. If the fault persists, contact Huawei technical support engineers.

Figure 6-11 Indicators on a disk module



----End

Follow-up Procedure

After the disk module is replaced, label it to facilitate subsequent operations.

6.2.4 Replacing a System Enclosure

This section describes how to replace a system subrack.

Impact on the System

Replacing a system subrack interrupts services running on the system subrack. Perform this operation with caution and under the guidance of technical support engineers.

Prerequisites

- The system enclosure for replacement is ready.
- The system enclosure that you want to replace has been located.
- The cable connection positions of the system enclosure that you want to replace are labeled on the cables.
- Services running on the system enclosure that you want to replace have been stopped.
- The power cables have been disconnected from the system enclosure that you want to replace.

Precaution

- Before replacing the system subrack, confirm that cascading cables are properly connected.
- Remove and insert a system subrack with even force. Excessive force may damage the appearance or connectors of the system subrack.

- It is recommended that three persons are present when moving a fully configured system subrack to prevent personal injury.

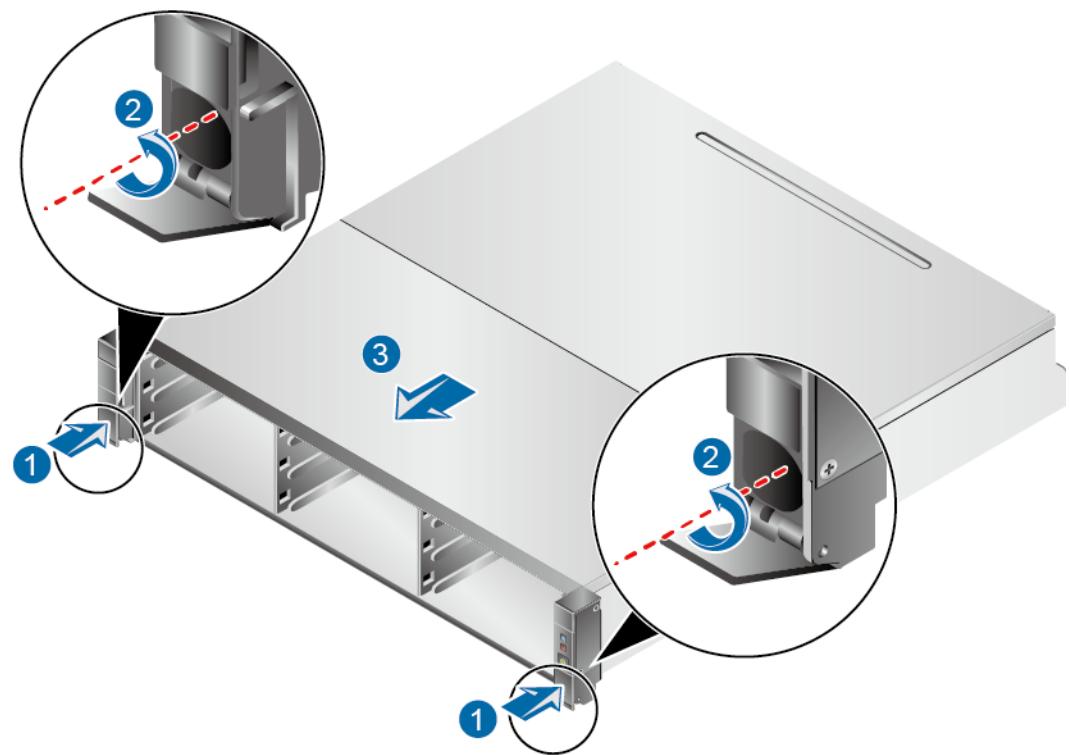
Tools and Materials

- Phillips screwdriver (M3 to M6)
- ESD wrist strap
- ESD bag
- ESD table
- Labels
- **Optional:** Nameplate
- **Optional:** Huawei logo label

Procedure

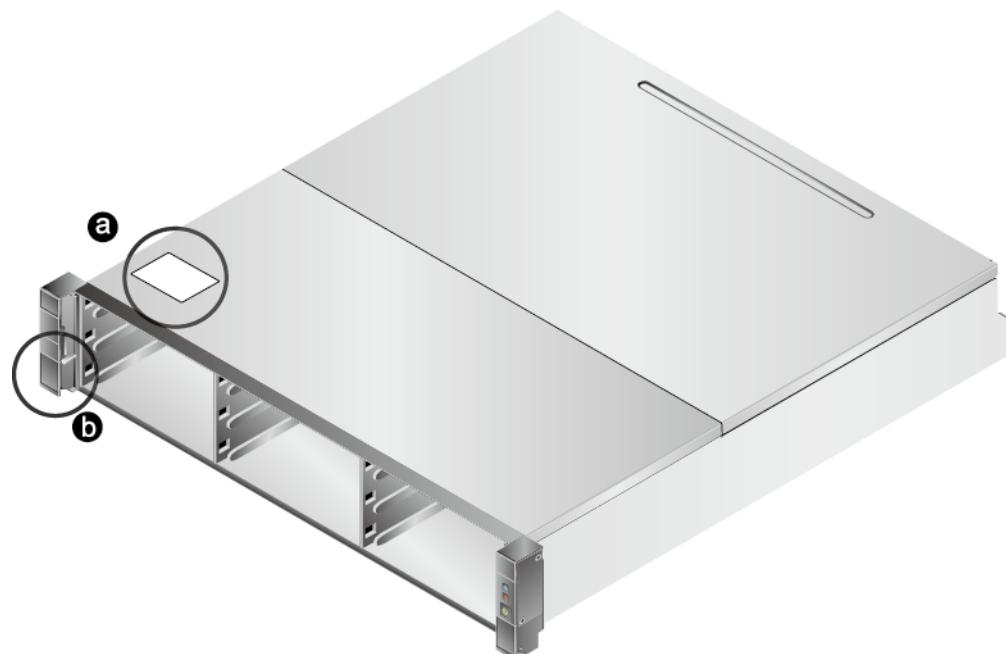
- Step 1** Wear an ESD wrist strap and remove the cables from the system enclosure that you want to replace.
- Step 2** Take the replacement system enclosure out of its ESD bag and place the system enclosure on the ESD table.
- Step 3** Remove components from the system enclosure that you want to replace and reinstall them to their original positions in the replacement system enclosure.
- Step 4** Remove the system enclosure that you want to replace from the cabinet, as shown in [Figure 6-12](#).
1. Use a Phillips screwdriver to loosen the M6 screws from the system enclosure.
 2. Pull the system enclosure out of the cabinet along guide rails and place the system enclosure on the ESD table.

Figure 6-12 Removing a system enclosure



Step 5 Optional: Attach the nameplate and the Huawei logo label to the same positions on the replacement system enclosure as those on the removed system enclosure, as shown in [Figure 6-13](#). a indicates the nameplate location and b indicates the Huawei logo label location.

Figure 6-13 Positions of the nameplate and Huawei logo label



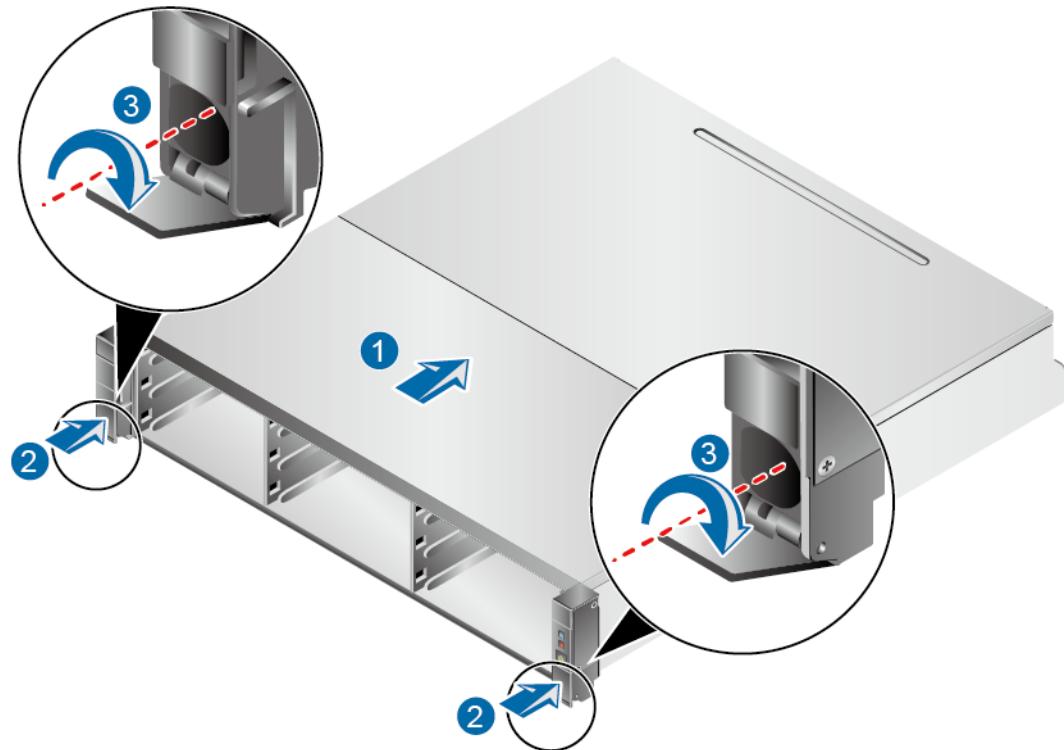
 **NOTE**

Two different nameplates are often included in the product. Please select the one that contains identical information to the nameplate on the removed system enclosure.

Step 6 Install the system enclosure into the cabinet, as shown in **Figure 6-14**.

1. Slide the system enclosure into the cabinet along guide rails.
2. Use M6 screws to fix the system enclosure in the cabinet.
3. Ensure that the system enclosure is horizontally installed and tightly screwed.

Figure 6-14 Installing a system enclosure



Step 7 Connect cables of the system enclosure.

Step 8 When the Power indicator is steady on, check whether the status of each component is normal.

- If yes, the system enclosure is successfully installed.
- If no, cables are incorrectly connected, components are incorrectly installed, or the newly installed system enclosure is faulty. In this case, remove and reinsert the faulted module or the system enclosure. If the fault persists, contact Huawei technical support engineers.

----End

Follow-up Procedure

After the system subrack is replaced, label it to facilitate subsequent operations.

6.3 Replacing the Parts of a Disk Enclosure (for 4U Disk Enclosure)

This chapter describes how to replace the parts in a 4 U disk enclosure.

6.3.1 Replacing an Expansion Module

This section describes how to replace an expansion module.

Impact on the System

During the replacement of an expansion module, the system switches services from ports on this module to ports on the other expansion module in the same disk enclosure. Only one expansion module is working, causing the system reliability to degrade. You are advised to replace an expansion module during off-peak hours.

Prerequisites

- The expansion module for replacement is ready.
- The expansion module that you want to replace has been located.
- You have confirmed that the cables of the expansion module to be replaced are properly connected using Huawei Storage Networking Assistant. (<http://support.huawei.com/onlinetoolsweb/sna/?language=en>)
- The cable connection positions of the expansion module are labeled on the cables.
- The cables have been disconnected from the expansion module that you want to replace.



Before removing a SAS cable, gently push the connector of the cable inward. Then pull the plastic ring on the connector outward until the cable is completely removed from the expansion module.

Precaution

- Remove and insert an expansion module with even force. Excessive force may damage the appearance or connectors of the expansion module.
- An expansion module must be replaced within five minutes.

Tools and Materials

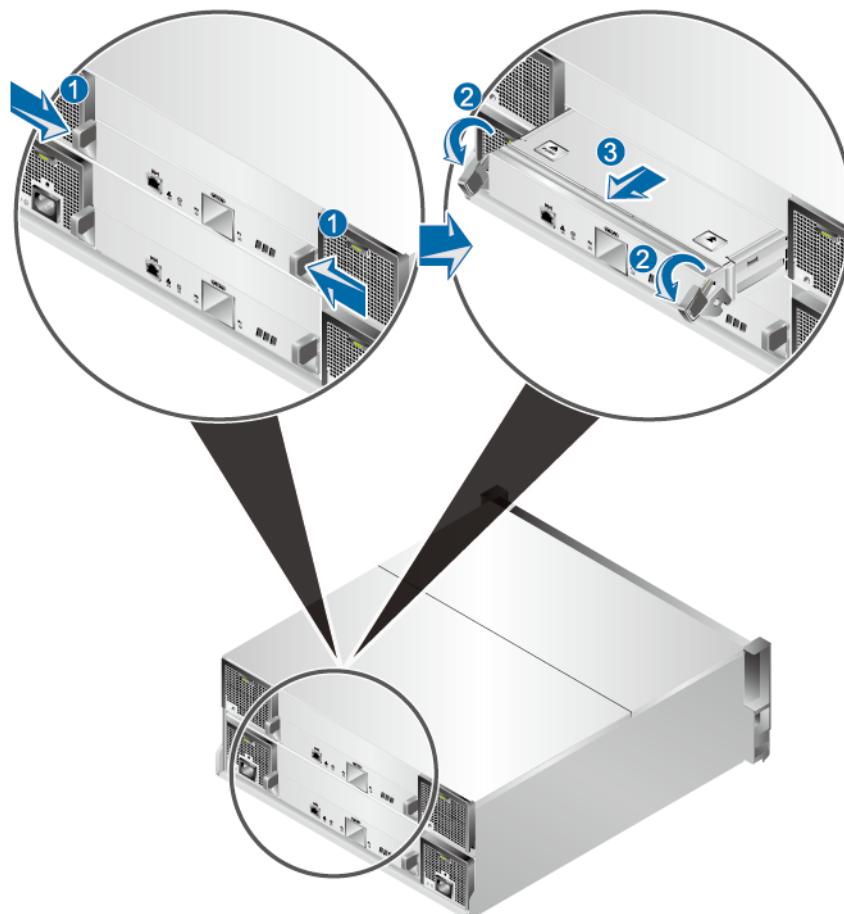
- ESD wrist strap
- ESD bag
- Label

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Press latches on the expansion module to release the handles and pull out the expansion module, as shown in [Figure 6-15](#).

Figure 6-15 Removing an expansion module

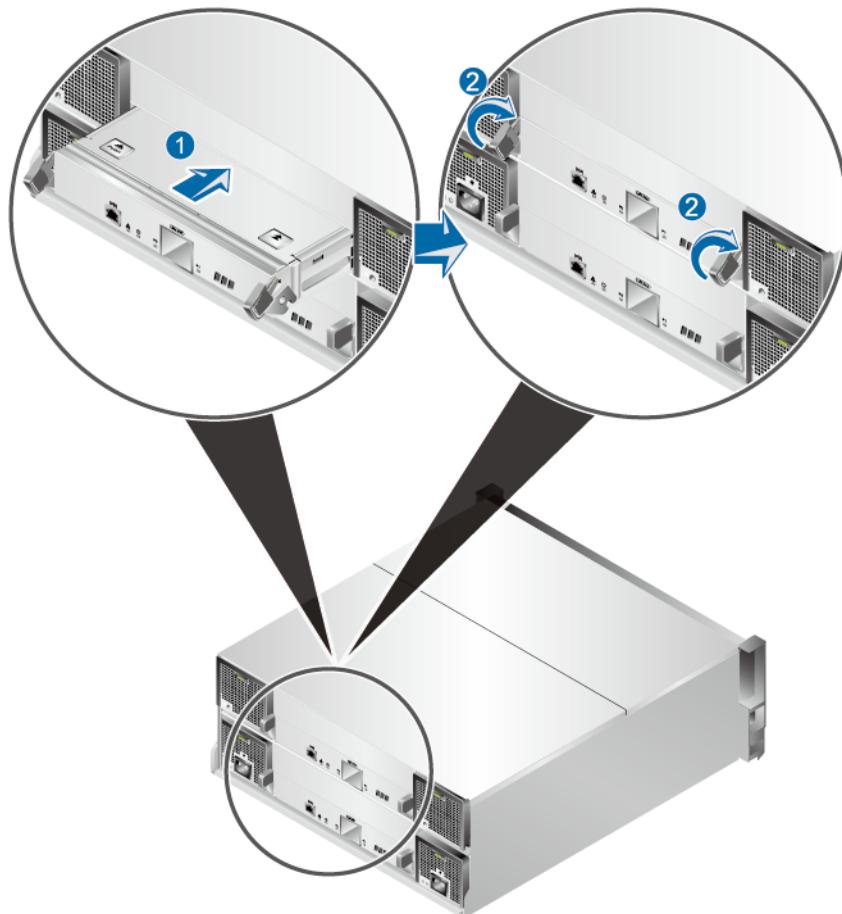


Step 3 Place the removed expansion module into an ESD bag.

Step 4 Take the replacement expansion module out of its ESD bag.

Step 5 Open the handles of the replacement expansion module, insert the expansion module into the empty slot, and close the handles, as shown in [Figure 6-16](#).

Figure 6-16 Installing an expansion module

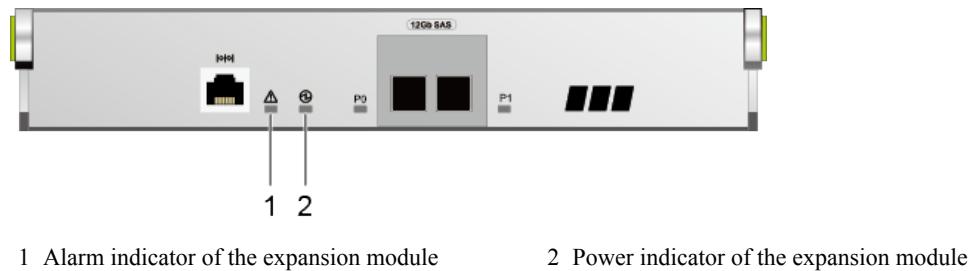


Step 6 Connect the cables.

Step 7 Wait about two minutes and check the status of the Power and Alarm indicators on the expansion module to determine whether the expansion module is successfully installed. [Figure 6-17](#) shows the locations of the Power and Alarm indicators.

- If the Power indicator is steady on and the Alarm indicator is off, the expansion module is successfully installed.
- If the Power indicator is off or the Alarm indicator is steady on, the newly installed expansion module is faulty, the expansion module slot is faulty, or the expansion module is incorrectly installed. In this case, remove and reinsert the expansion module. If the fault persists, contact Huawei technical support engineers.

Figure 6-17 Indicators on an expansion module



1 Alarm indicator of the expansion module 2 Power indicator of the expansion module

Step 8 Query whether the firmware running on the expansion module that has been replaced is the latest version.

- Yes: There is no need to upgrade the firmware. The expansion module is has been replaced successfully.
- No: Upgrade the firmware. For details, see the *OceanStor V3 DAS Storage System V300R006CXXSPCXXX Upgrade Guide*.

NOTE

- To query the firmware of the latest version, log in to Huawei support website (<http://support.huawei.com/enterprise/>) . Choose **Support > IT > Enterprise Storage > Entry-level Storage > OceanStor 2600 V3** to go to the product documentation page. Click **Downloads** to view the firmware of the latest version.
- For details about how to query the version of the firmware running on the expansion module, see the *OceanStor V3 DAS Storage System V300R006CXXSPCXXX Upgrade Guide*.

----End

Follow-up Procedure

After the expansion module is replaced, label it to facilitate subsequent operations.

6.3.2 Replacing a Power Module

This section describes how to replace power module.

Impact on the System

During the replacement of a power module, if the redundant power module fails, the corresponding disk enclosures are unexpectedly powered off, causing all services in the disk enclosures to be interrupted.

Prerequisites

- The power module for replacement is ready.
- The power module that you want to replace has been located.

Precaution

- Do not touch the connectors of a power module and a power cable.
- Remove and insert a power module with even force. Excessive force may damage the appearance or connectors of the power module.

- Remove only one power module at a time.
- A power module must be replaced within three minutes.

Tools and Materials

- ESD wrist strap
- ESD bag
- Label
- Phillips screwdriver

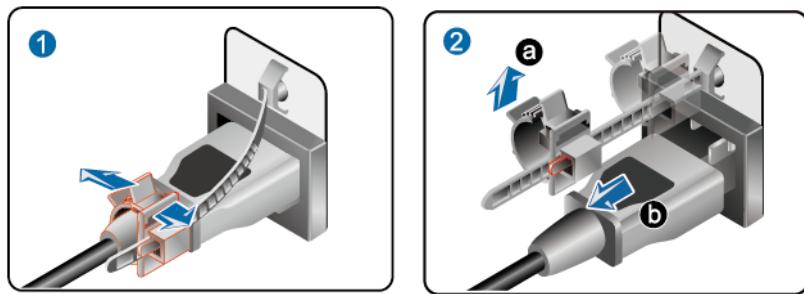
Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Remove the power cable.

- Remove the AC power cable.
 - a. Loosen the retention clip, as shown in step 1 in [Figure 6-18](#).

Figure 6-18 Removing the AC power cable



- Remove the DC power cable.
 - a. Turn off the circuit breaker which connects to the DC power module.
 - b. Remove the protective cover on the DC power module, as shown in step 1 of [Figure 6-19](#).

Figure 6-19 Removing the DC power cable



- c. Unfasten the screws of the DC power cable with the Phillips screwdriver, remove the shock absorption sheets, washers, and OT terminal round holes, as shown in step 2 of [Figure 6-19](#).

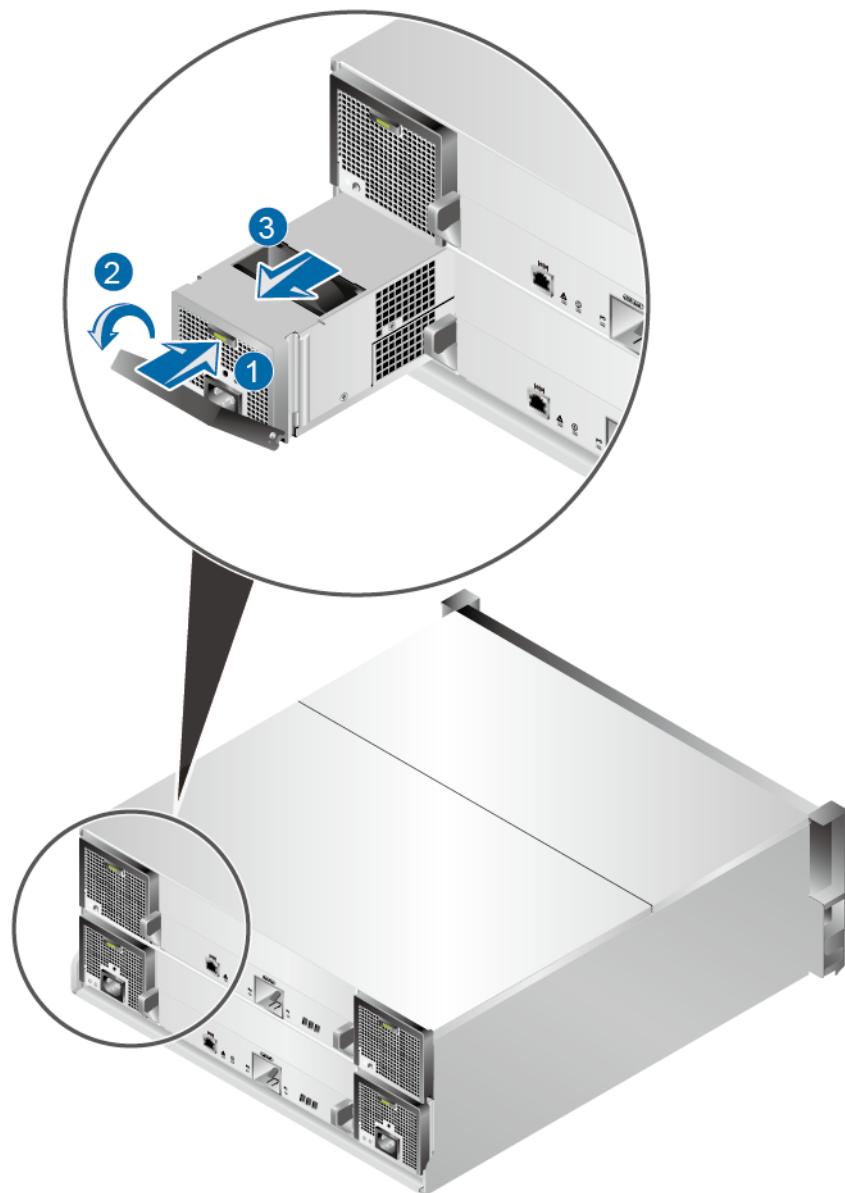
 **NOTE**

When unfastening the screws from the DC power cable, prevent the shock absorption sheets and washers from sliding off.

- d. Install the protective cover on the DC power module, as shown in step 3 of [Figure 6-19](#).

Step 3 Press the latch on the power module to release the handle and pull out the power module, as shown in [Figure 6-20](#).

Figure 6-20 Removing a power module

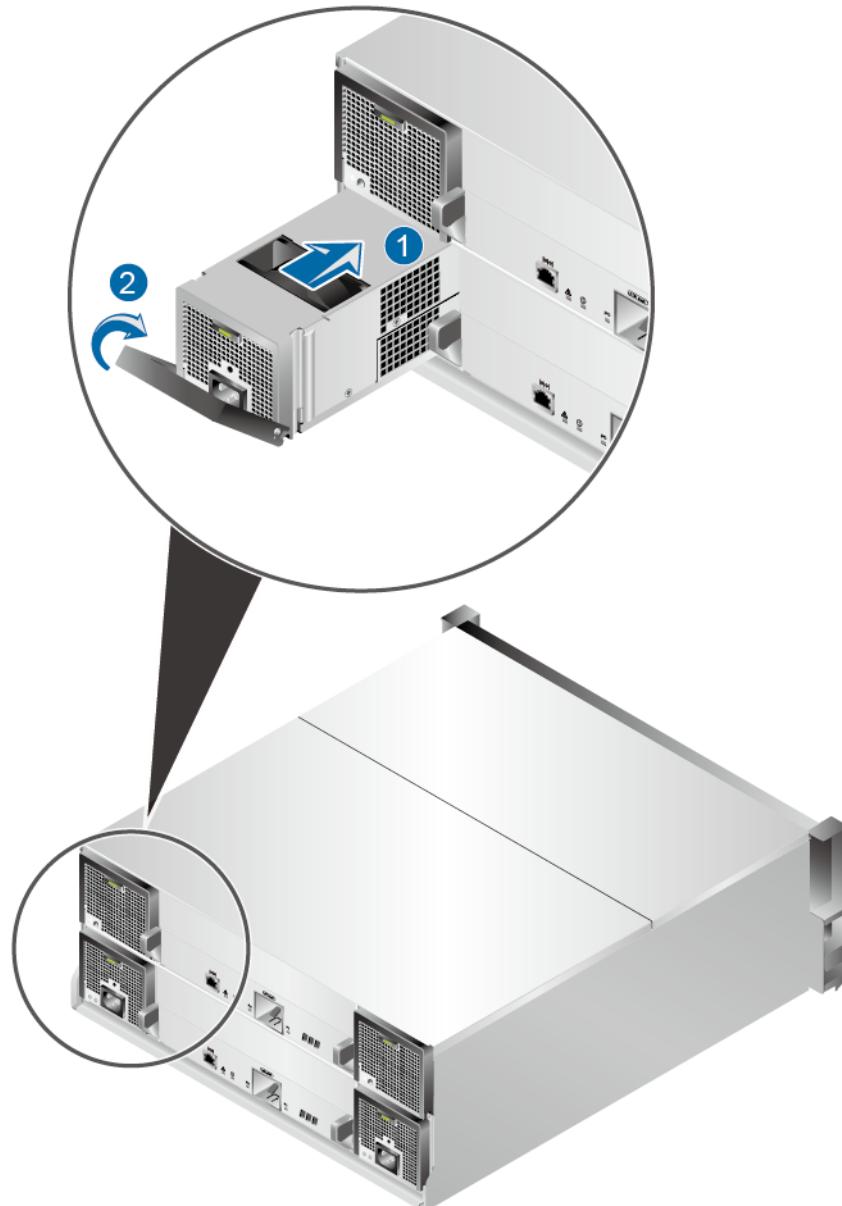


Step 4 Put the removed power module into an ESD bag.

Step 5 Take the replacement power module out of its ESD bag.

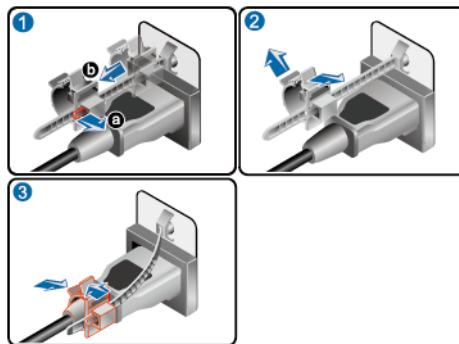
Step 6 Open the handle of the replacement power module, insert the power module into the empty slot, and close the handle, as shown in [Figure 6-21](#).

Figure 6-21 Installing a power module



Step 7 Insert the power cables.

- Secure the AC power cables with retention clips.
 - a. Press the locker of the retention clip outwards (as shown in a of step 1 in [Figure 6-22](#)), and meanwhile slide the retention clip to the connection part of the AC power cable (as shown in b of step 1 in [Figure 6-22](#)).

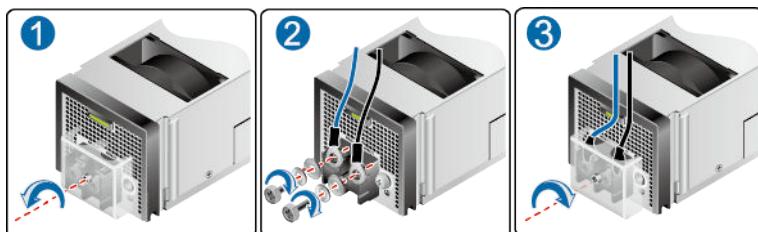
Figure 6-22 Securing the AC power cables with retention clips

- b. Loosen the retention clip, as shown in step 2 in [Figure 6-22](#).
- c. Press the retention clip inwards to secure the connection part of the AC power cable, as shown in step 3 in [Figure 6-22](#).

NOTE

Adjust the retention clip to ensure that it holds the AC power cable tightly.

- Connect the DC power cables.
 - a. Remove the protective cover on the DC power module, as shown in step 1 of [Figure 6-23](#).

Figure 6-23 Connecting the DC power cable

- b. Unfasten the screws of the DC power cable using the Phillips screwdriver, put the screws through the shock absorption sheets, washers, and OT terminal round holes in sequence, connect the OT terminal of the black cable to the RTN (+) end, and the OT terminal of the blue cable to the NEG (-) end, and then fasten the screws, as shown in step 2 of [Figure 6-23](#).

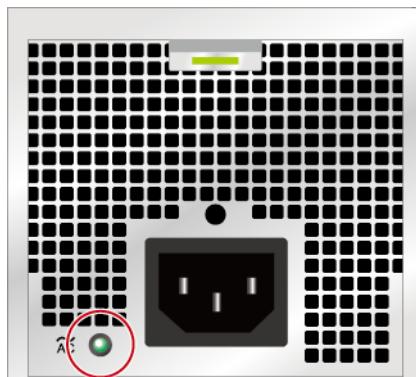
NOTE

- When unfastening the screws from the DC power cable, prevent the shock absorption sheets and washers from sliding off.
- The colors of DC power cables that connect to the anode and cathode of the DC power supply are subject to the colors of the DC power cables actually configured in users' equipment rooms.

- c. Install the protective cover on the DC power module, as shown in step 3 of [Figure 6-23](#).
- d. Turn on the circuit breaker which connects to the DC power module.

- Step 8** Wait about two minutes and check the status of the Running/Alarm indicator on the power module to determine whether the power module is successfully installed. **Figure 6-24** shows the location of the Running/Alarm indicator.
- If the indicator is steady green, the power module is successfully installed.
 - If the indicator is blinking green, the power input is normal but the disk enclosure is powered off.
 - If the indicator is steady red or off, the newly installed power module is faulty or the power module slot is faulty. In that case, remove and reinsert the power module. If the fault persists, contact Huawei technical support engineers.

Figure 6-24 Running/Alarm indicator on a power module



----End

Follow-up Procedure

After the power module is replaced, label it to facilitate subsequent operations.

6.3.3 Replacing a Disk Module

This section describes how to replace a disk module, including the replacement of failing disks (disks not yet completely faulty) and faulty disks.

Impact on the System

During the replacement of a disk module, if the system reconstruction is complete, host services are not affected; if the system reconstruction is not complete, host services are slightly affected.

Prerequisites

- The disk module for replacement is ready.
- To prevent services from being affected, use Huawei-certified disk modules that match the product model as spare disk modules (which are obtained by service engineers based on the part numbers of failed disk modules).
- The disk module that you want to replace has been located.

Precaution

- When handling a disk module, hold only its edge to prevent it from damage.
- Remove and insert a disk module with even force. Excessive force may damage the appearance or connectors of the disk module.
- To prevent disk module damage, wait at least one minute after removal and before reinserting a disk module, or after insertion and before removal of a disk module.
- To prevent data loss, replace only a disk module whose Alarm/Location indicator is steady red.
- Please complete the replacement within five minutes after removing the original disk.
- Ensure that the replacement disk is inserted in to the same slot as the replaced disk. Otherwise, the system may work incorrectly.

Tools and Materials

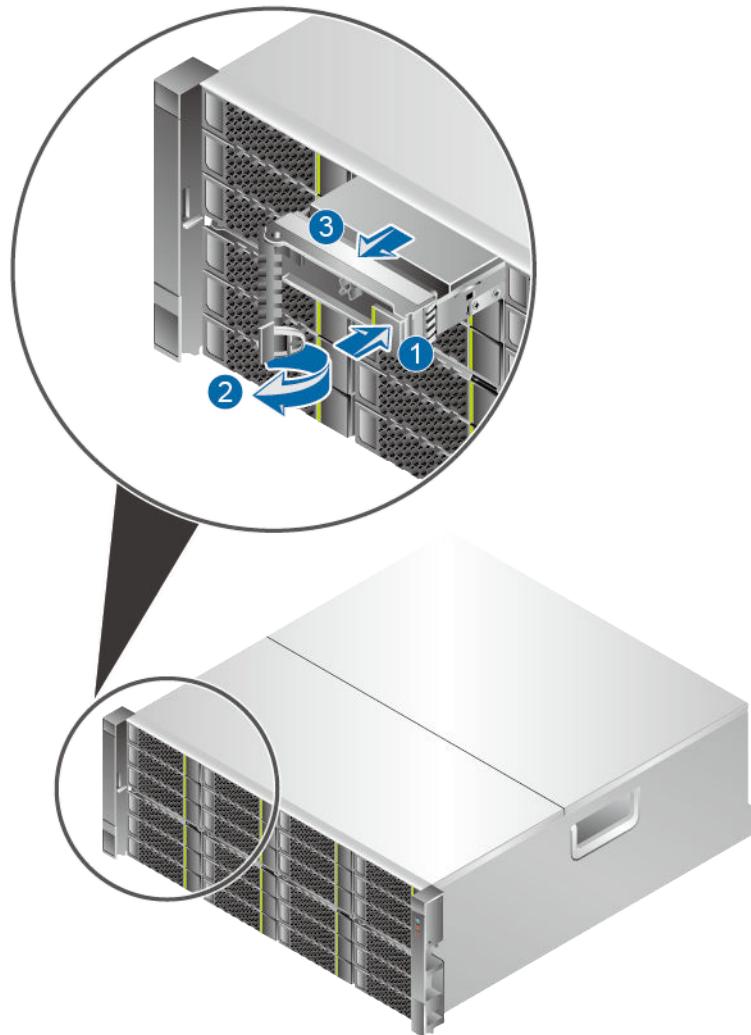
- ESD wrist strap
- ESD bag
- Label

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Press the latch on the disk module to release the handle and pull out the disk module, as shown in [Figure 6-25](#).

Figure 6-25 Removing a disk module

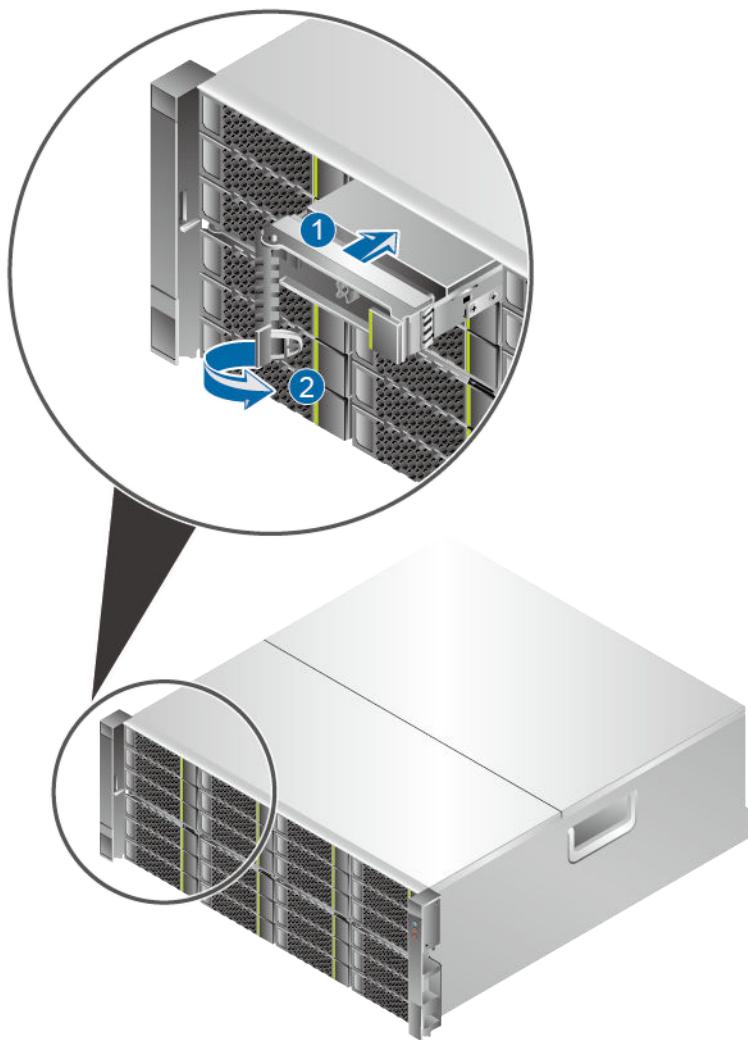


Step 3 Put the removed disk module into an ESD bag.

Step 4 Take the replacement disk module out of its ESD bag.

Step 5 Open the handle of the replacement disk module, insert the disk module into the empty slot, and close the handle, as shown in [Figure 6-26](#).

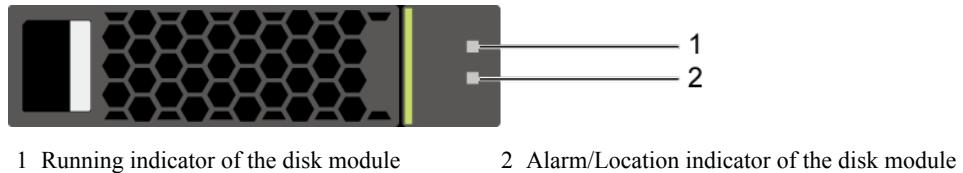
Figure 6-26 Installing a disk module



Step 6 Wait about two minutes and check the status of the Running and Alarm/Location indicators on the disk module to determine whether the disk module is successfully installed. [Figure 6-27](#) shows the locations of the Running and Alarm/Location indicators.

- If the Running indicator is steady on and the Alarm/Location indicator is off, the disk module is successfully installed.
- If the Running indicator is off or the Alarm/Location indicator is steady on, the newly installed disk module is faulty, the disk module slot is faulty, or the disk module is incorrectly installed. Remove the disk, wait one minute, and then reinsert it. If the alarm indicator remains on, the disk is defective. Replace the defective disk with a new one. If the fault persists, contact Huawei technical support engineers.

Figure 6-27 Indicators on a disk module



----End

Follow-up Procedure

After the disk module is replaced, label it to facilitate subsequent operations.

6.3.4 Replacing a Fan Module

This section describes how to replace a fan module.

Impact on the System

During the replacement of a fan module, the system's heat dissipation is affected and the system temperature increases. If the temperature of a disk enclosure reaches the self-protection threshold (55°C), the disk enclosure is automatically powered off, degrading the system reliability.

Prerequisites

- The fan module for replacement is ready.
- The fan module that you want to replace has been located.

Precaution

- Do not touch rotating fan blades.
- Remove and insert a fan module with even force. Excessive force may damage the connectors or appearance of the fan module.
- Remove only one fan module and do not remove two fan modules at a time.
- A fan module must be replaced within five minutes.

Tools and Materials

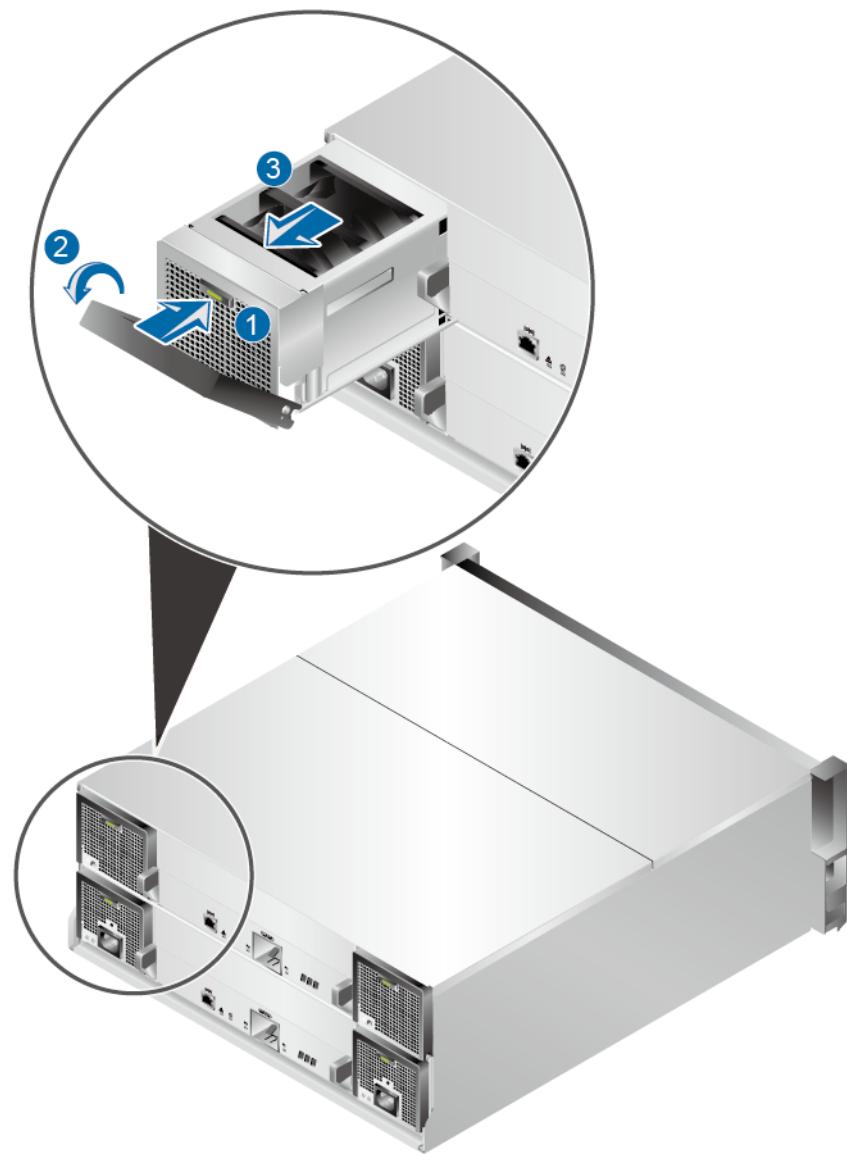
- ESD wrist strap
- ESD bag
- Label

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Press the latch on the fan module to release the handle and pull out the fan module, as shown in [Figure 6-28](#).

Figure 6-28 Removing a fan module

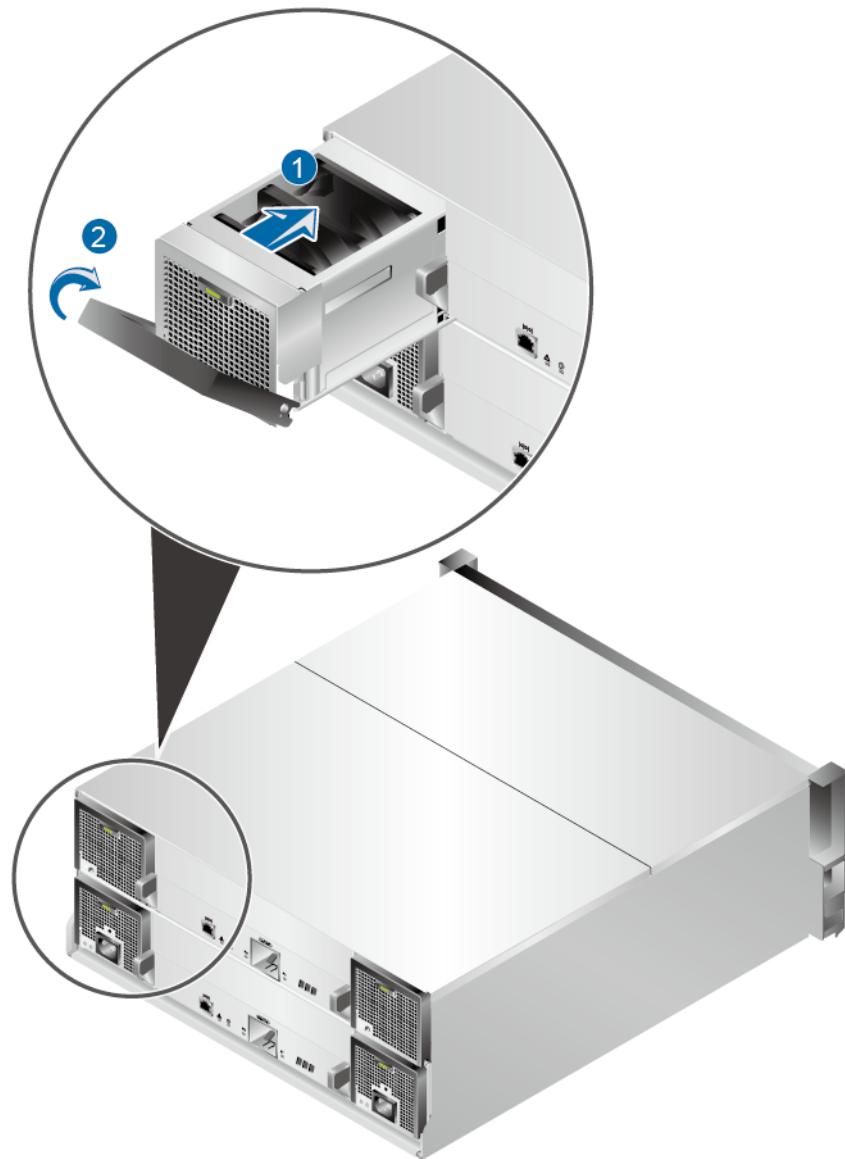


Step 3 Put the removed fan module into an ESD bag.

Step 4 Take the replacement fan module out of its ESD bag.

Step 5 Open the handle of the replacement fan module, insert the fan module into the empty slot, and close the handle, as shown in [Figure 6-29](#).

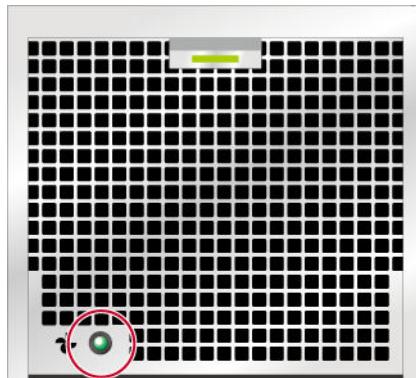
Figure 6-29 Installing a fan module



Step 6 Wait about two minutes and check the status of the Running/Alarm indicator on the fan module to determine whether the fan module is successfully installed. [Figure 6-30](#) shows the location of the Running/Alarm indicator.

- If the indicator is steady green, the power module is successfully installed.
- If the indicator is steady red or off, the newly installed fan module is faulty, the fan module slot is faulty, or the fan module is incorrectly installed. In this case, remove and reinsert the fan module. If the fault persists, contact Huawei technical support engineers.

Figure 6-30 Running/Alarm indicator on a fan module



----End

Follow-up Procedure

After the fan module is replaced, label it to facilitate subsequent operations.

6.3.5 Replacing a System Enclosure

This section describes how to replace a system subrack.

Impact on the System

Replacing a system subrack interrupts services running on the system subrack. Perform this operation with caution and under the guidance of technical support engineers.

Prerequisites

- The system enclosure for replacement is ready.
- The system enclosure that you want to replace has been located.
- The cable connection positions of the system enclosure that you want to replace are labeled on the cables.
- Services running on the system enclosure that you want to replace have been stopped.
- The power cables have been disconnected from the system enclosure that you want to replace.

Precaution

- Before replacing the system subrack, confirm that cascading cables are properly connected.
- Remove and insert a system subrack with even force. Excessive force may damage the appearance or connectors of the system subrack.
- It is recommended that three persons are present when moving a fully configured system subrack to prevent personal injury.

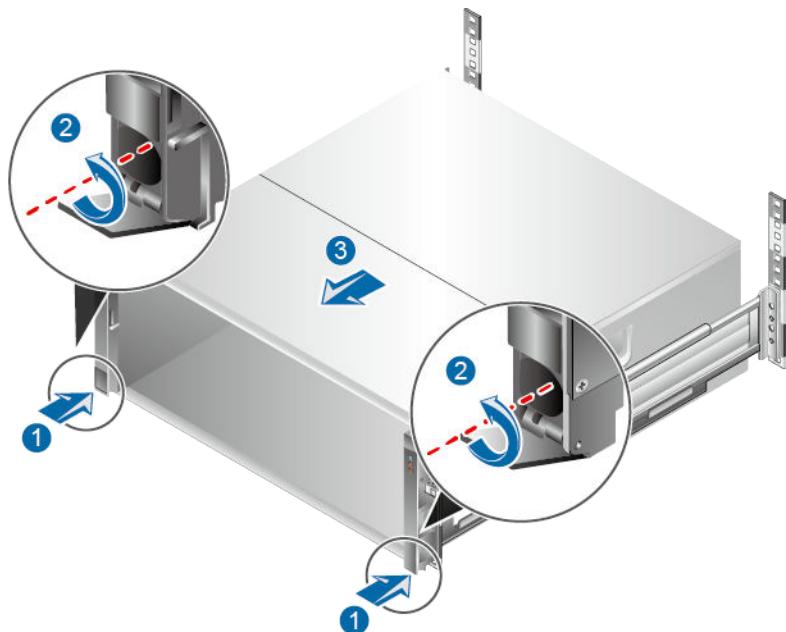
Tools and Materials

- Phillips screwdriver (M3 to M6)
- ESD wrist strap
- ESD bag
- ESD table
- Labels
- **Optional:** Nameplate
- **Optional:** Huawei logo label

Procedure

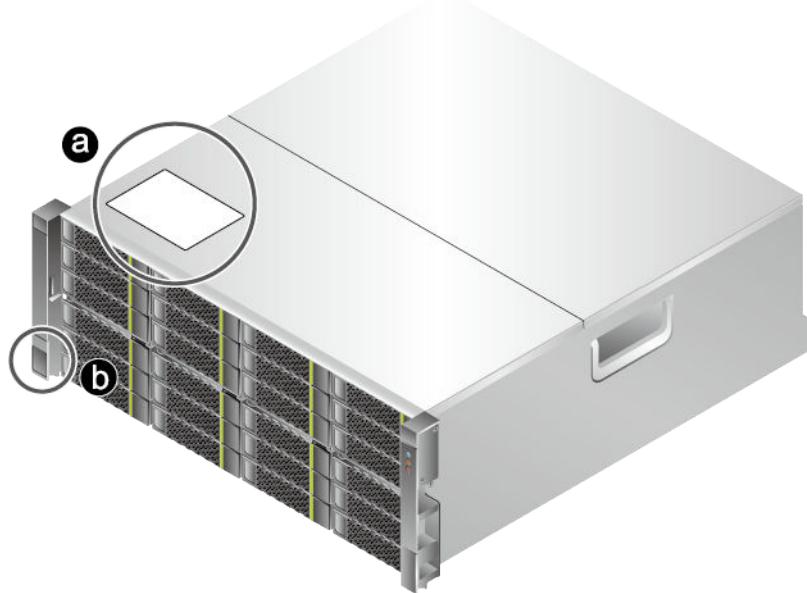
- Step 1** Wear an ESD wrist strap and remove the cables from the system enclosure that you want to replace.
- Step 2** Take the replacement system enclosure out of its ESD bag and place the system enclosure on the ESD table.
- Step 3** Remove components from the system enclosure that you want to replace and reinstall them to their original positions in the replacement system enclosure.
- Step 4** Remove the system enclosure that you want to replace from the cabinet, as shown in [Figure 6-31](#).
1. Use a Phillips screwdriver to loosen the M6 screws from the system enclosure.
 2. Pull the system enclosure out of the cabinet along guide rails and place the system enclosure on the ESD table.

Figure 6-31 Removing a system enclosure



Step 5 Optional: Attach the nameplate and the Huawei logo label to the same positions on the replacement system enclosure as those on the removed system enclosure, as shown in [Figure 6-32](#). **a** indicates the nameplate location and **b** indicates the Huawei logo label location.

Figure 6-32 Positions of the nameplate and Huawei logo label



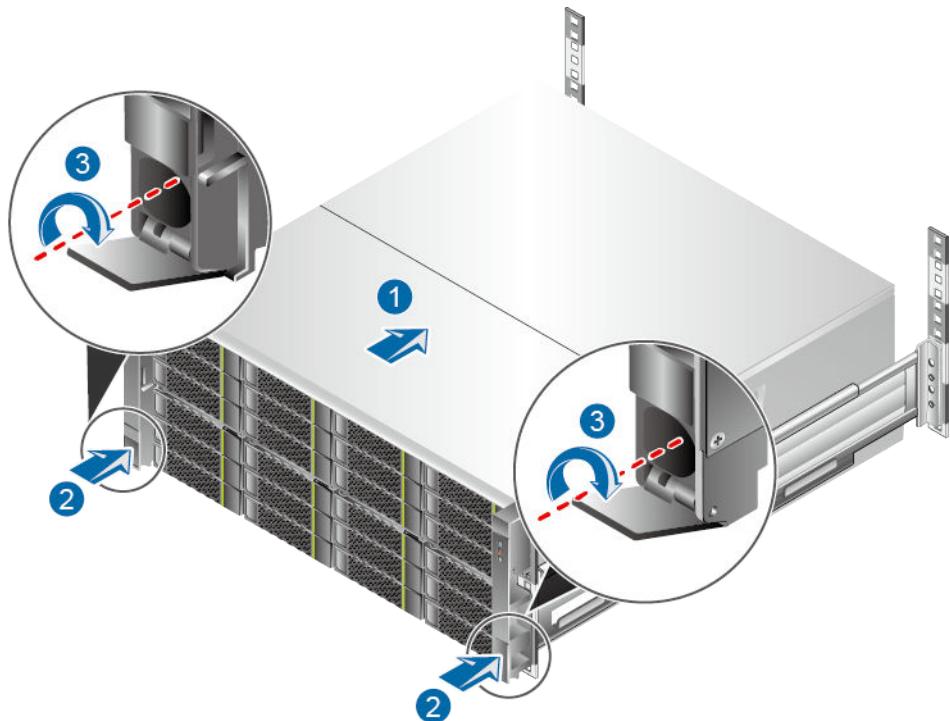
NOTE

Two different nameplates are often included in the product. Please select the one that contains identical information to the nameplate on the removed system enclosure.

Step 6 Install the system enclosure into the cabinet, as shown in [Figure 6-33](#).

1. Slide the system enclosure into the cabinet along guide rails.
2. Use M6 screws to fix the system enclosure in the cabinet.
3. Ensure that the system enclosure is horizontally installed and tightly screwed.

Figure 6-33 Installing a system enclosure



Step 7 Connect cables of the system enclosure.

Step 8 When the Power indicator is steady on, check whether the status of each component is normal.

- If yes, the system enclosure is successfully installed.
- If no, cables are incorrectly connected, components are incorrectly installed, or the newly installed system enclosure is faulty. In this case, remove and reinsert the faulted module or the system enclosure. If the fault persists, contact Huawei technical support engineers.

----End

Follow-up Procedure

After the system subrack is replaced, label it to facilitate subsequent operations.

6.4 Replacing the Parts of a High-Density Disk Enclosure

This chapter describes how to replace the parts in a high-density disk enclosure.

6.4.1 Replacing an Expansion Module

This section describes how to replace an expansion module.

Impact on the System

During the interval between removing an expansion module and installing the replacement expansion module, system performance is compromised. Therefore, replace an expansion module during off-peak hours.

Prerequisites

- The expansion module for replacement is ready.
- The expansion module that you want to replace has been located.
- You have confirmed that the cables of the expansion module to be replaced are properly connected using Huawei Storage Networking Assistant. (<http://support.huawei.com/onlinetoolsweb/sna/?language=en>)
- The cable connection positions have been labeled on the replacement expansion module.
- The cables have been disconnected from the expansion module that you want to replace.

 **NOTE**

Before removing a SAS cable, gently push the connector of the cable inward. Then pull the plastic ring on the connector outward until the cable is completely removed from the expansion module.

Precaution

- Remove and insert an expansion module with even force. Excessive force may damage the appearance or connectors of the expansion module.
- Shorten the duration of replacing an expansion module as short as possible.

Tools and Materials

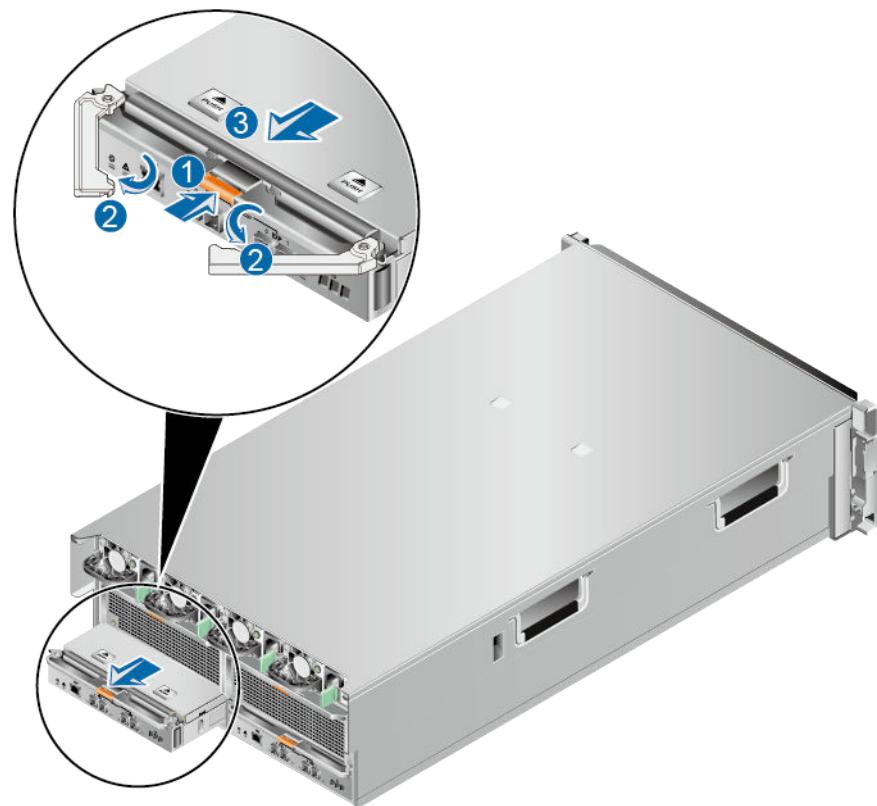
- ESD wrist strap
- ESD bag
- Labels

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Press buckles on the expansion module, open the latches, and pull out the expansion module, as shown in [Figure 6-34](#).

Figure 6-34 Removing an expansion module

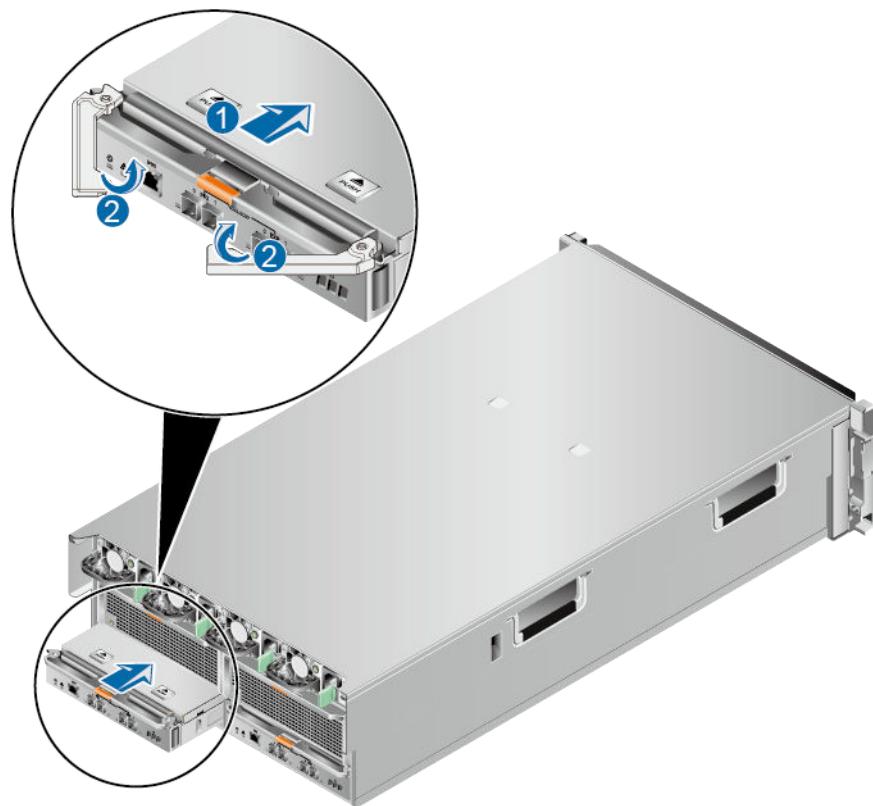


Step 3 Put the removed expansion module into an ESD bag.

Step 4 Take the replacement expansion module out of the ESD bag.

Step 5 Open latches on the replacement expansion module, insert the replacement expansion module, and close the latches, as shown in [Figure 6-35](#).

Figure 6-35 Installing an expansion module

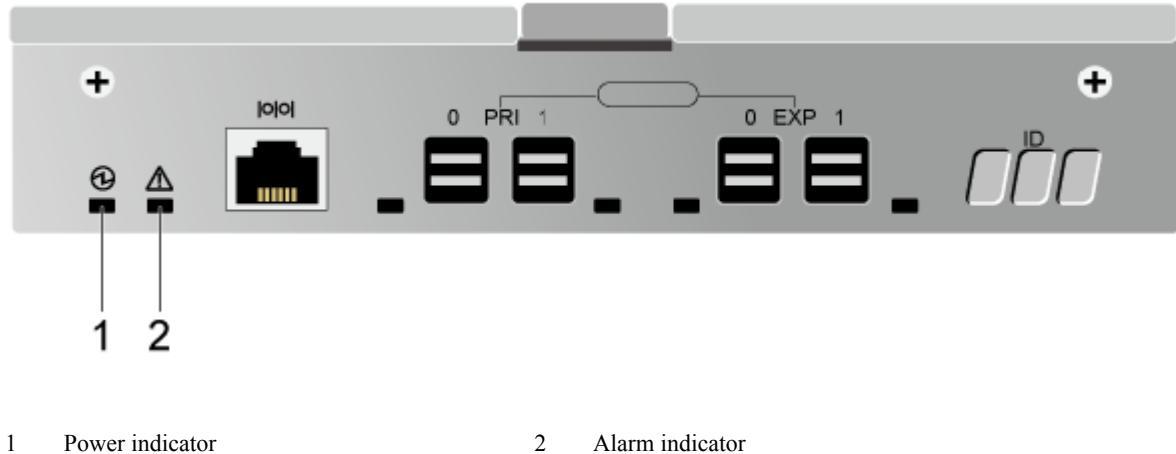


Step 6 Connect cables of the expansion module.

Step 7 Wait about two minutes and check the status of power and alarm indicators on the expansion module to determine whether the expansion module was successfully installed. [Figure 6-36](#) shows the locations of power and alarm indicators on the expansion module.

- If the power indicator is steady on and the alarm indicator is off, the expansion module was successfully installed.
- If the Power indicator is off or the Alarm indicator is steady on, the newly installed expansion module is faulty, the expansion module slot is faulty, or the expansion module is incorrectly installed. In this case, remove and reinsert the expansion module. If the fault persists, contact Huawei technical support engineers.

Figure 6-36 Indicators on an expansion module



Step 8 Query whether the firmware running on the expansion module that has been replaced is the latest version.

- Yes: There is no need to upgrade the firmware. The expansion module has been replaced successfully.
- No: Upgrade the firmware. For details, see the *OceanStor V3 DAS Storage System V300R006CXXSPCXXX Upgrade Guide*.

NOTE

- To query the firmware of the latest version, log in to Huawei support website (<http://support.huawei.com/enterprise/>). Choose **Support > IT > Enterprise Storage > Entry-level Storage > OceanStor 2600 V3** to go to the product documentation page. Click **Downloads** to view the firmware of the latest version.
- For details about how to query the version of the firmware running on the expansion module, see the *OceanStor V3 DAS Storage System V300R006CXXSPCXXX Upgrade Guide*.

----End

Follow-up Procedure

After the expansion module is replaced, label it to facilitate subsequent operations.

6.4.2 Replacing a Power Module

This section describes how to replace a power module. Except that there is a slight difference on removing and inserting power cables between AC and DC power modules, other operations performed for them are the same. This section uses AC power modules as an example.

Impact on the System

System reliability is compromised during power module replacement.

Prerequisites

- The power module for replacement is ready.
- The power module that you want to replace has been located.

Precaution

- Do not touch the connectors of a power module or power cable.
- Remove and insert a power module with even force. Excessive force may damage the appearance or connectors.
- Remove only one power module and do not remove there power modules at a time.
- Replace a power module in as short time as possible.

Tools and Materials

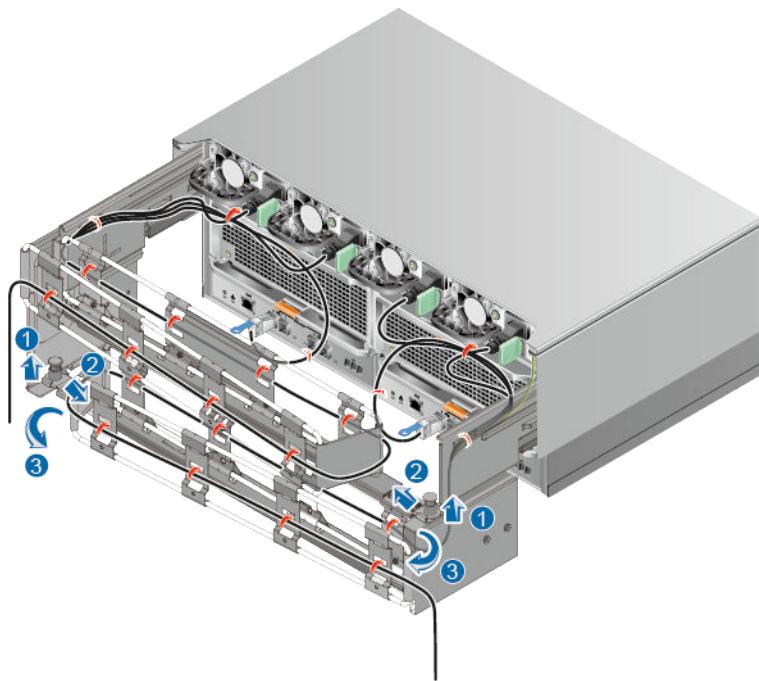
- ESD wrist strap
- ESD bag
- Label
- Phillips Screwdriver

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Pull the spring pin upward, and press the adjustable guide rails of the cable manager to open the cable manager, as shown in [Figure 6-37](#).

Figure 6-37 Opening the cable manager

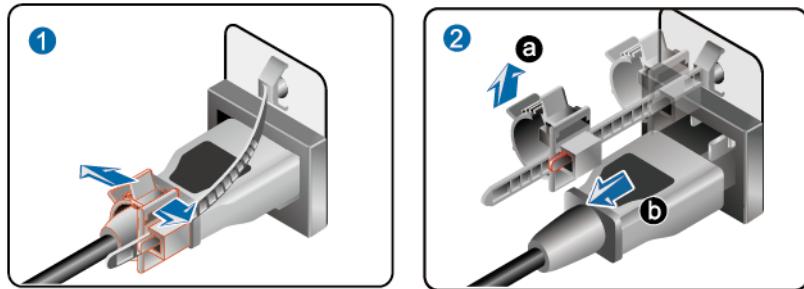


Step 3 Remove the power cable.

- Remove the AC power cable.

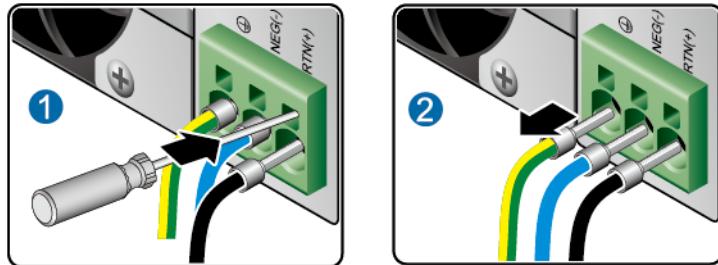
- a. Loosen the retention clip, as shown in step 1 in **Figure 6-38**.

Figure 6-38 Remove the AC power cable



- b. Pull up the retention clip, as shown in a of step 2 in **Figure 6-38**.
 - c. Remove the AC power cable, as shown in b of step 2 in **Figure 6-38**.
- Remove the DC power cable.
 - a. Turn off the circuit breaker which connects to the DC power module.
 - b. Hold down the latches above the power cables using a Phillips screwdriver to eject the power cable, as shown in step 1 of **Figure 6-39**.

Figure 6-39 Remove the DC power cable



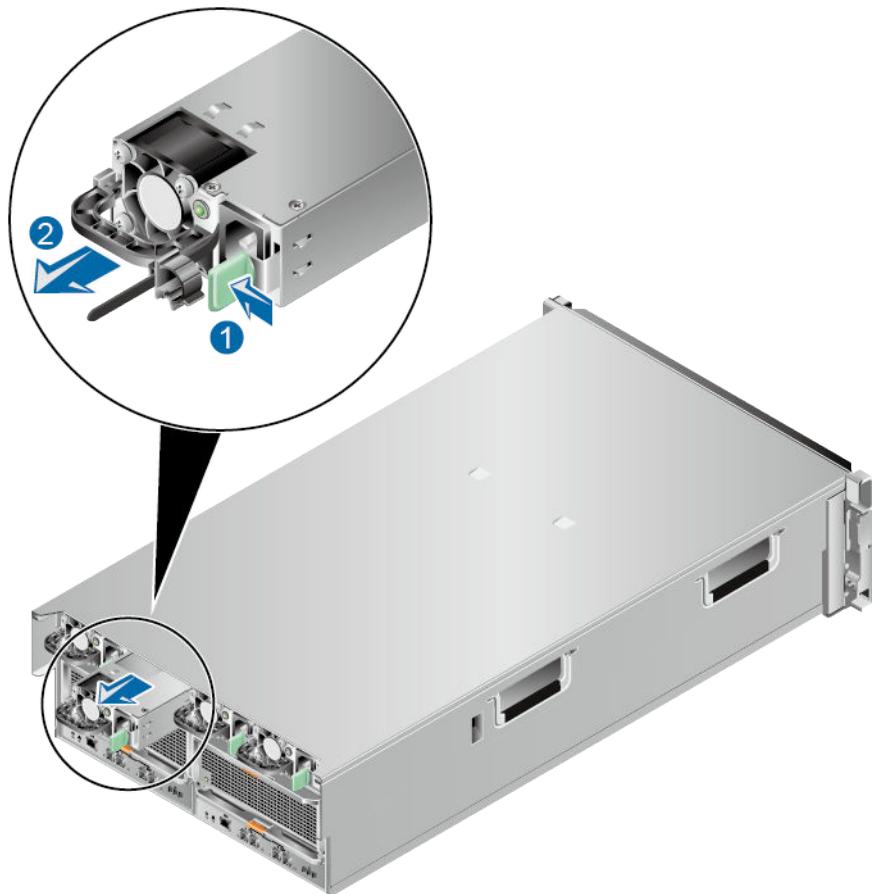
- c. Remove the DC power cables and the ground cable, as shown in step 2 of **Figure 6-39**.

Step 4 Press the latch on the power module and pull out the power module, as shown in **Figure 6-40**.

NOTE

The procedure for removing a DC power module is the same as that for removing an AC power module. This step uses the AC power module as an example.

Figure 6-40 Removing an AC power module



Step 5 Put the removed power module into an ESD bag.

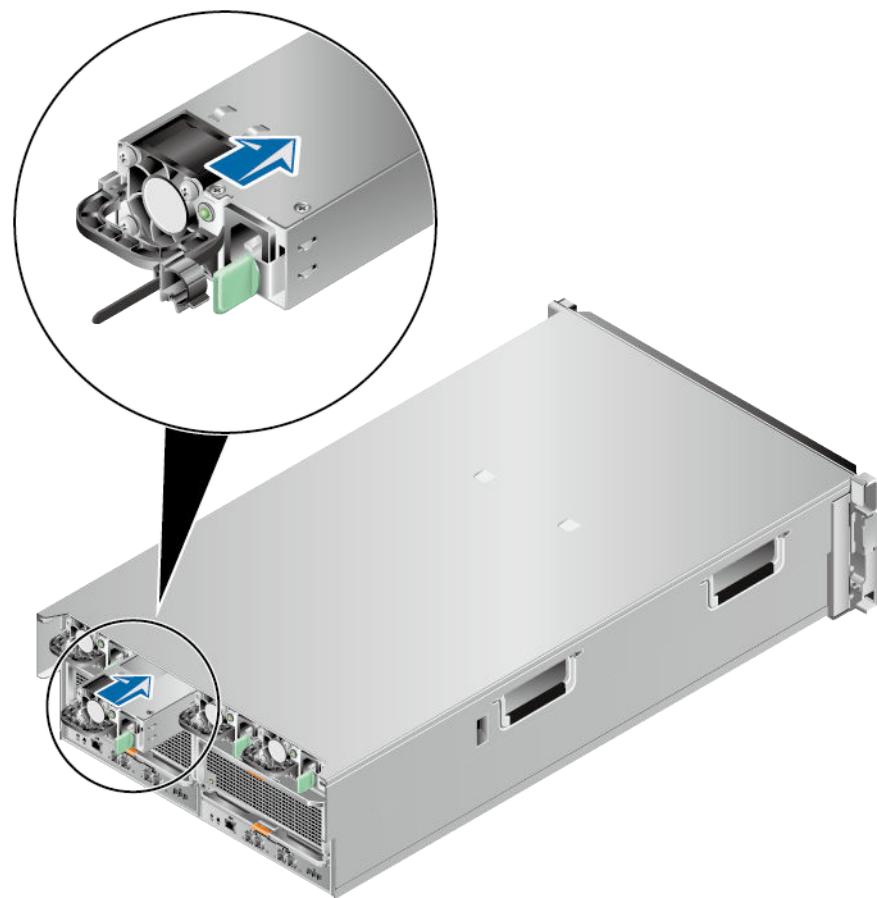
Step 6 Take the replacement power module out of the ESD bag.

Step 7 Insert the replacement power module into the slot until it clicks into place, as shown in [Figure 6-41](#).

NOTE

The procedure for installing a DC power module is the same as that for installing an AC power module. This step uses the AC power module as an example.

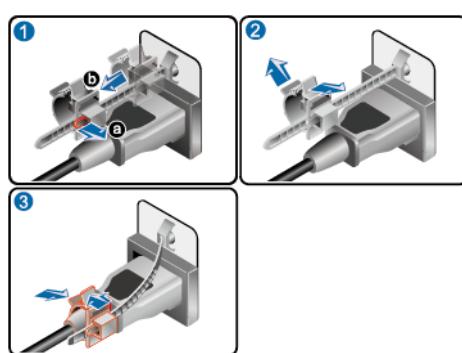
Figure 6-41 Installing an AC power module



Step 8 Connect the power cable.

- Secure the AC power cables with retention clips.
 - a. Press the locker of the retention clip outwards (as shown in a of step 1 in [Figure 6-42](#)), and meanwhile slide the retention clip to the connection part of the AC power cable (as shown in b of step 1 in [Figure 6-42](#)).

Figure 6-42 Securing the AC power cables with retention clips



- b. Loosen the retention clip, as shown in step 2 in [Figure 6-42](#).
- c. Press the retention clip inwards to secure the connection part of the AC power cable, as shown in step 3 in [Figure 6-42](#).

 **NOTE**

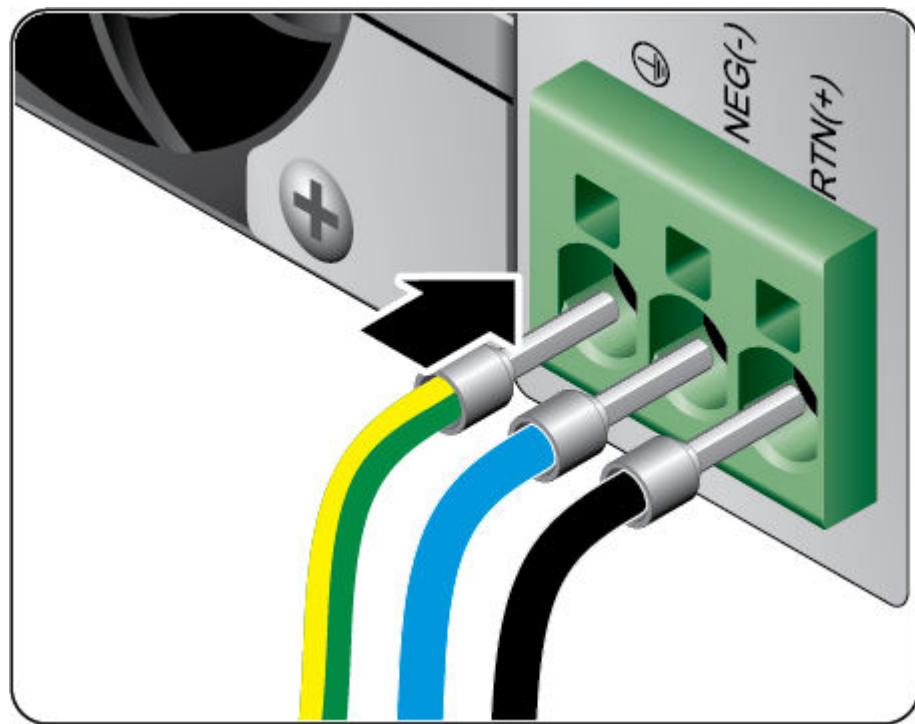
Adjust the retention clip to ensure that it holds the AC power cable tightly.

- Connect the DC power cables.
 - a. Connect the power cables to the wiring terminals on the PSU. The power cables are connected properly once they are latched. See [Figure 6-43](#).

 **NOTE**

- Connect the OT terminal on the negative power cable to the NEG(-) wiring terminal on the PSU.
- Connect the OT terminal on the positive power cable to the RTN(+) wiring terminal on the PSU.
- Connect the OT terminal on the ground cable to the ground terminal on the PSU.

Figure 6-43 Connecting the DC power cable



 **NOTE**

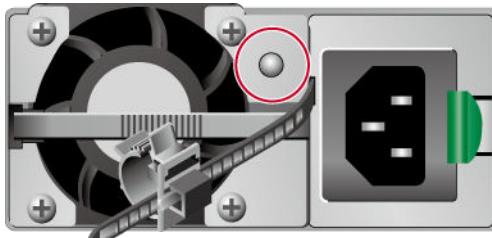
The colors of DC power cables that connect to the anode and cathode of the DC power supply are subject to the colors of the DC power cables actually configured in users' equipment rooms.

- b. Turn on the circuit breaker which connects to the DC power module.

- Step 9** Wait about two minutes and check the status of the power module Running indicator to determine whether the power module is successfully installed. [Figure 6-44](#) shows the location of a power module Running indicator.

- If the indicator is steady green, the installation is successful.
- If the indicator is steady red or off, the newly installed power module is faulty or the power module slot is faulty. In that case, remove and reinsert the power module. If the fault persists, contact Huawei technical support engineers.

Figure 6-44 Power module Running indicator



----End

Follow-up Procedure

After the power module is replaced, label the removed one to facilitate subsequent operations.

6.4.3 Replacing a Disk Module

This section describes how to replace a disk module, including the replacement of failing disk and faulty disk.

Impact on the System

During the interval between removing a disk module and installing the replacement disk module, the system performance is compromised. Therefore, replace a disk module during off-peak hours.

Prerequisites

- The disk module for replacement is ready.
- To prevent services from being affected, use Huawei-certified disk modules that match the product model as spare disk modules (which are obtained by service engineers based on the part numbers of failed disk modules).
- The disk module that you want to replace has been located.

Precaution

- To prevent the disk module from damage, pull out the enclosure or slide the enclosure into the cabinet slowly.
- Remove and insert a disk module with even force. Excessive force may damage the appearance or connectors of the disk module.
- Replace only a disk module whose status indicator is red on to prevent data loss.
- The duration of pulling an enclosure completely out of the cabinet must be shorter than five minutes.

- Please complete the replacement within five minutes after removing the original disk.
- Wait at least 15 minutes before pulling out the enclosure again.
- Only one enclosure can be pulled out at a time.
- When the overheating alarm indicator of the high-density disk enclosure is red on, slide the enclosure into the cabinet in a timely manner. Otherwise, system services may be affected.
- A high-density disk enclosure supports intermixing of SSDs and HDDs. You can install HDDs in any slots while SSDs only in slots of row A that is near the front panel.

 **NOTE**

For more slot information, see the *Product Description*.

Tools and Materials

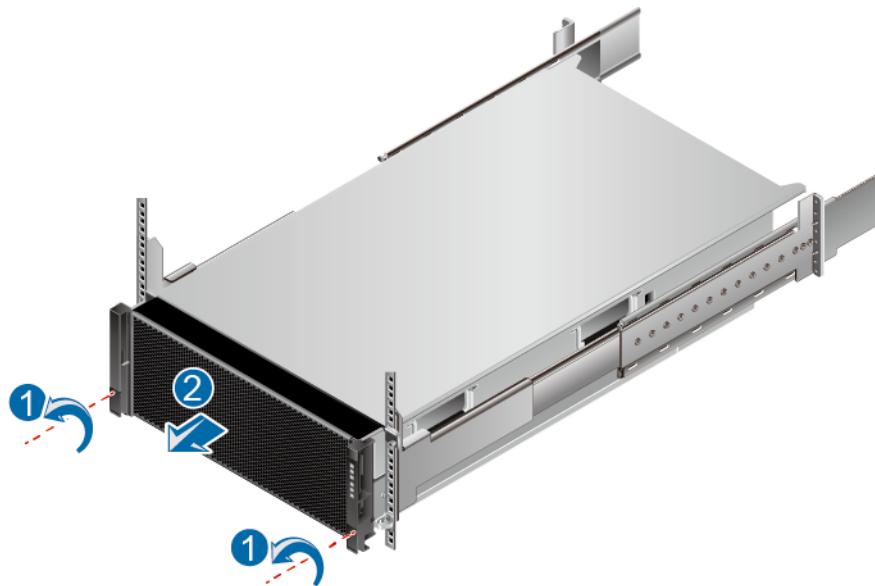
- ESD wrist strap
- ESD bag
- Labels
- Phillips Screwdriver

Procedure

Step 1 Wear an ESD wrist strap.

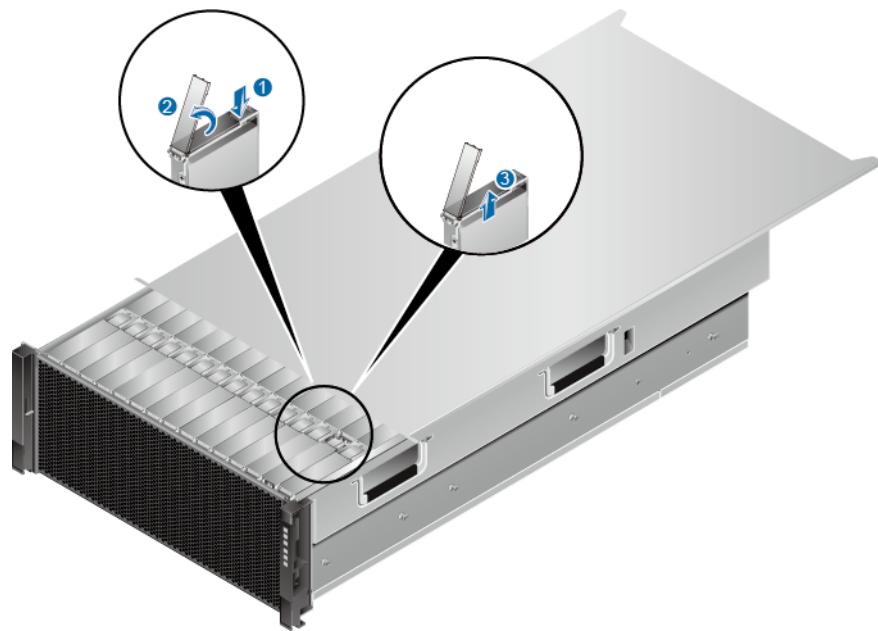
Step 2 Loosen the two screws on the panel and pull out the enclosure slowly, as shown in [Figure 6-45](#).

Figure 6-45 Pulling out an enclosure



Step 3 Press the latch of the disk module and pull out the disk module, as shown in [Figure 6-46](#).

Figure 6-46 Removing a disk module

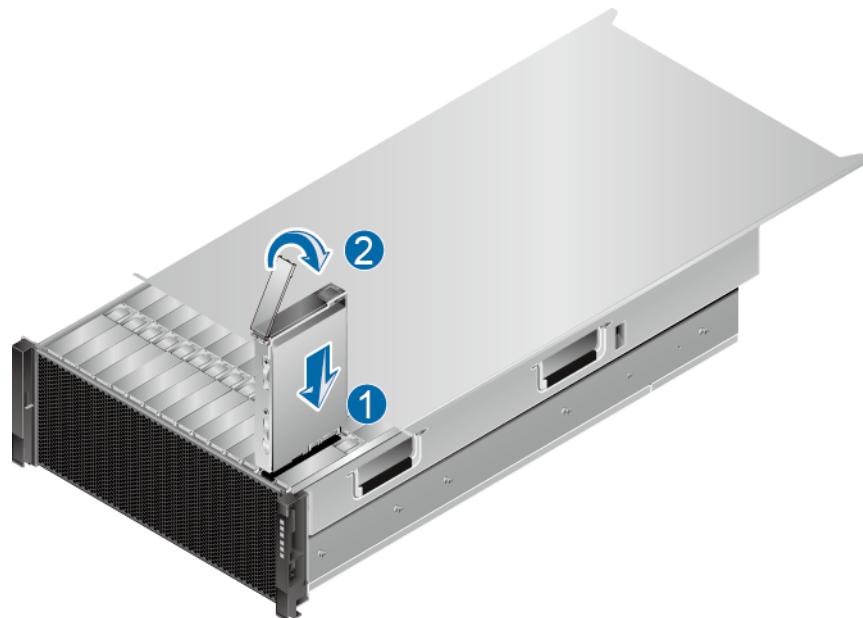


Step 4 Put the removed disk module into an ESD bag.

Step 5 Take the replacement disk module out of the ESD bag.

Step 6 Open the latch of the replacement disk module, insert the disk module, and close the latch, as shown in [Figure 6-47](#).

Figure 6-47 Installing a disk module



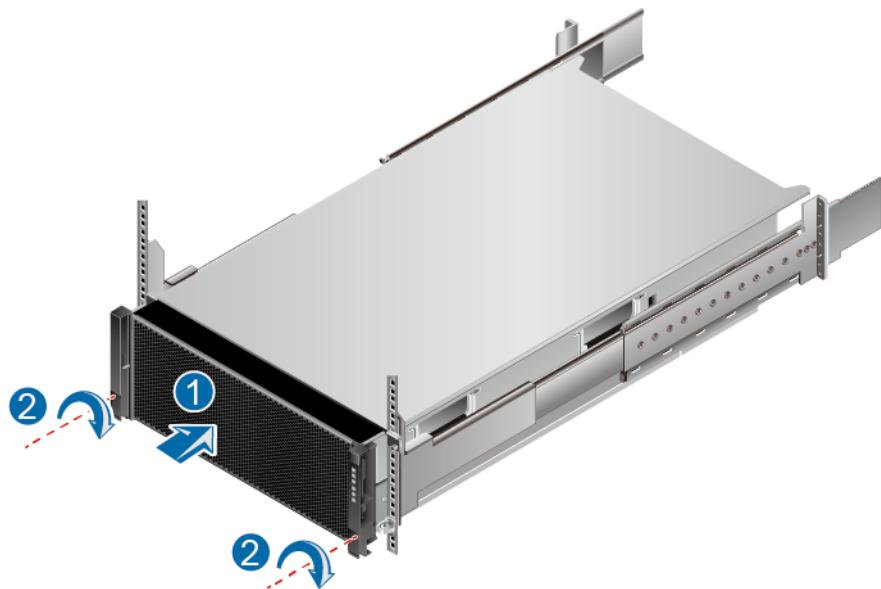
- Step 7** Wait about two minutes and check the status of status indicator on the disk module to determine whether the disk module was successfully installed. [Figure 6-48](#) shows the location of status indicator on the disk module.
- If the indicator is steady green, the disk module was successfully installed.
 - If the Running indicator is off or the Alarm/Location indicator is steady on, the newly installed disk module is faulty, the disk module slot is faulty, or the disk module is incorrectly installed. Remove the disk, wait one minute, and then reinsert it. If the alarm indicator remains on, the disk is defective. Replace the defective disk with a new one. If the fault persists, contact Huawei technical support engineers.

Figure 6-48 Status indicator on a disk module



- Step 8** After the disk module is successfully installed, slide the enclosure into the cabinet slowly and fasten the two screws on the panel, as shown in [Figure 6-49](#).

Figure 6-49 Sliding an enclosure into the cabinet



----End

Follow-up Procedure

After the disk module is replaced, label it to facilitate subsequent operations.

6.4.4 Replacing a Fan Module

This section describes how to replace a fan module.

Impact on the System

During the replacement of a fan module, the system's heat dissipation is affected and the system temperature increases. If the temperature of a disk enclosure reaches the self-protection threshold (55°C), the disk enclosure is automatically powered off, degrading the system reliability.

Prerequisites

- The fan module for replacement is ready.
- The fan module that you want to replace has been located.

Precaution

- Do not touch rotating fan blades.
- Remove and insert a fan module with even force. Excessive force may damage the appearance or connectors.
- Remove only one fan module at a time.



NOTICE

Do not concurrently remove two fan modules after the system is powered on; otherwise, the High-Density disk enclosure will be powered off and services may be interrupted.

-
- Replace a fan within two minutes. Otherwise, system services may be affected.

Tools and Materials

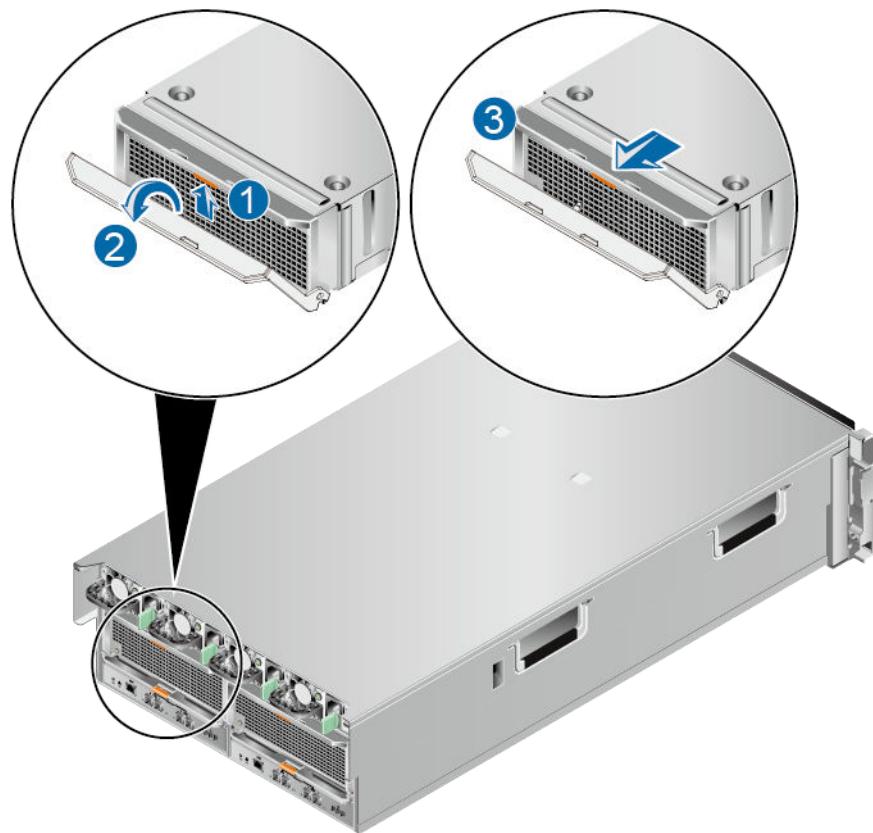
- ESD wrist strap
- ESD bag
- Label

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Press the latch on the fan module to release the latch and pull out the fan module, as shown in [Figure 6-50](#).

Figure 6-50 Removing a fan module

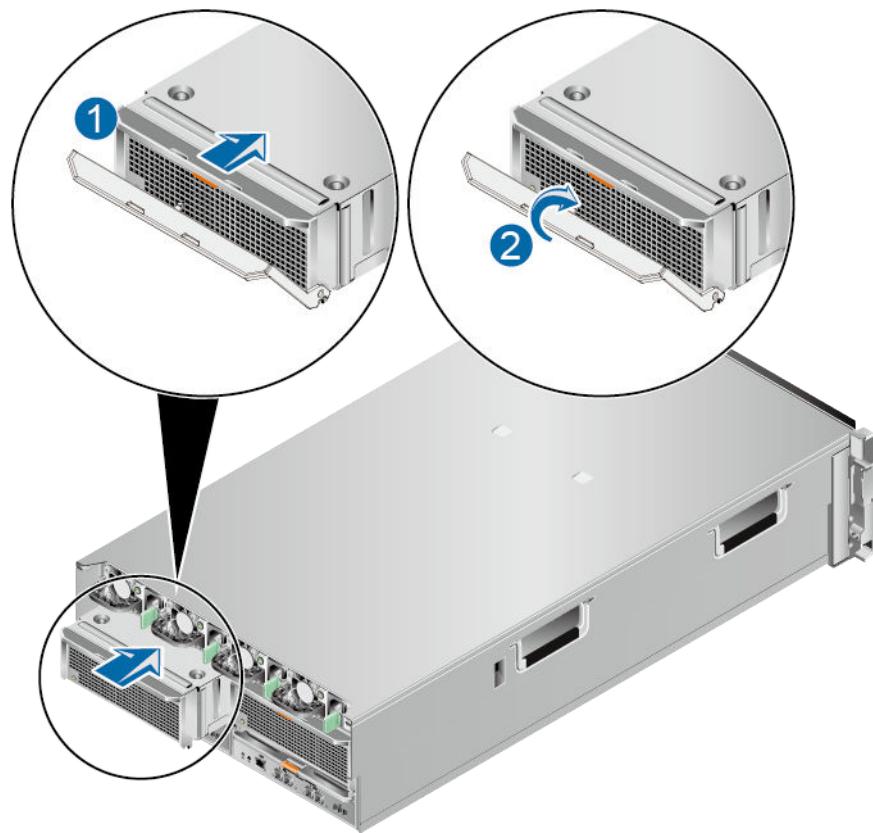


Step 3 Put the removed fan module into an ESD bag.

Step 4 Take the replacement fan module out of the ESD bag.

Step 5 Fully open the handle on the replacement fan module, insert the replacement fan module, and close the handle, as shown in [Figure 6-51](#).

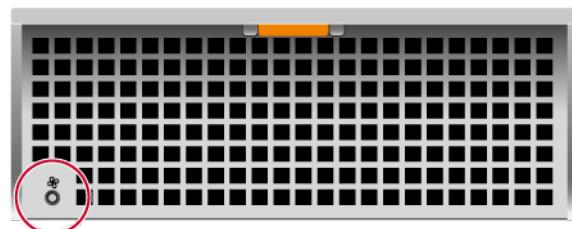
Figure 6-51 Installing a fan module



Step 6 Wait about two minutes and check the status of the fan module Running/Alarm indicator to determine whether the fan module is successfully installed. [Figure 6-52](#) shows the location of a fan module Running/Alarm indicator.

- If the indicator is steady green, the installation is successful.
- If the indicator is steady red or off, the newly installed fan module is faulty, the fan module slot is faulty, or the fan module is incorrectly installed. In this case, remove and reinsert the fan module. If the fault persists, contact Huawei technical support engineers.

Figure 6-52 Fan module Running/Alarm indicator



----End

Follow-up Procedure

After the fan module is replaced, label the removed one to facilitate subsequent operations.

6.4.5 Replacing a System Enclosure

This section describes how to replace a system enclosure.

Impact on the System

Replacing a system enclosure interrupts services running on the system enclosure. Exercise caution when performing this operation.

Prerequisites

- The system enclosure for replacement is ready.
- The system enclosure that you want to replace has been located.
- The installation positions of the cables connecting to the system enclosure that you want to replace have been clearly marked.
- Services running on the system enclosure that you want to replace have been stopped.
- The power cables have been disconnected from the system enclosure that you want to replace.

Precaution

- To avoid personal injury, arrange three persons to move a system enclosure.

Tools and Materials

- Phillips screwdriver (M3 to M6)
- ESD wrist strap
- ESD bag
- ESD table
- Diagonal pliers
- Cable tie
- Label

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Uninstall cable trays and disconnect cables from the system enclosure.

Step 3 Take the replacement system enclosure out of the ESD bag and place it on the ESD table.

Step 4 Remove all smart disk modules, power modules, fan modules, and switch board modules from the system enclosure that you want to replace and place them on the ESD table.

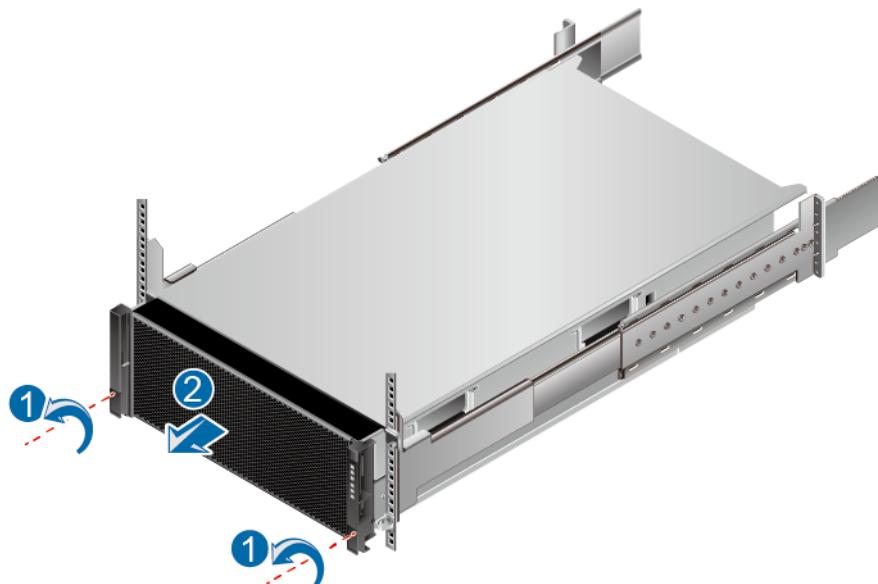
! NOTICE

Record the slots of all components. Install these components into the same slots as in the system enclosure that you want to replace. Otherwise, system services may be affected.

Step 5 Remove the system enclosure that you want to replace from the cabinet.

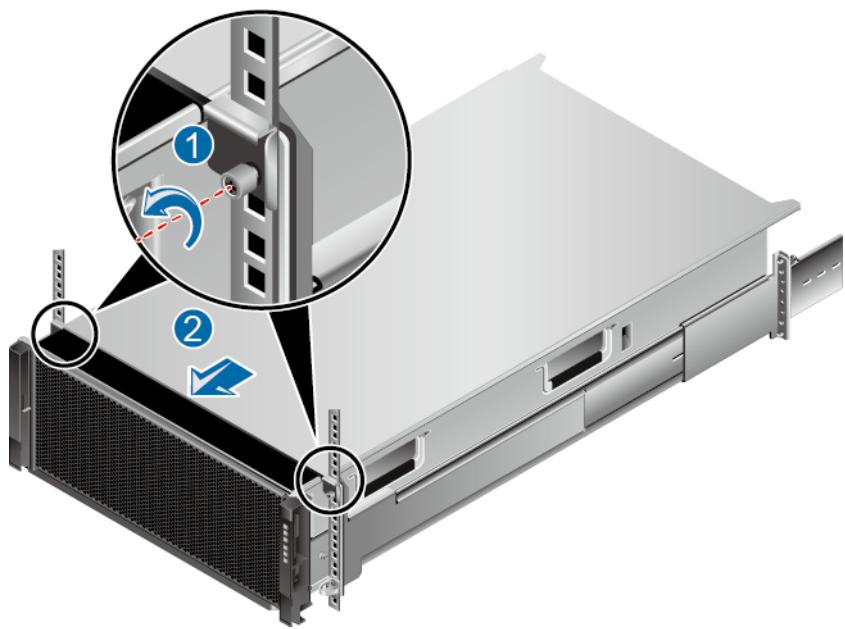
1. Loosen the two screws on the panel and pull out the enclosure slowly, as shown in [Figure 6-53](#).

Figure 6-53 Pulling out an enclosure



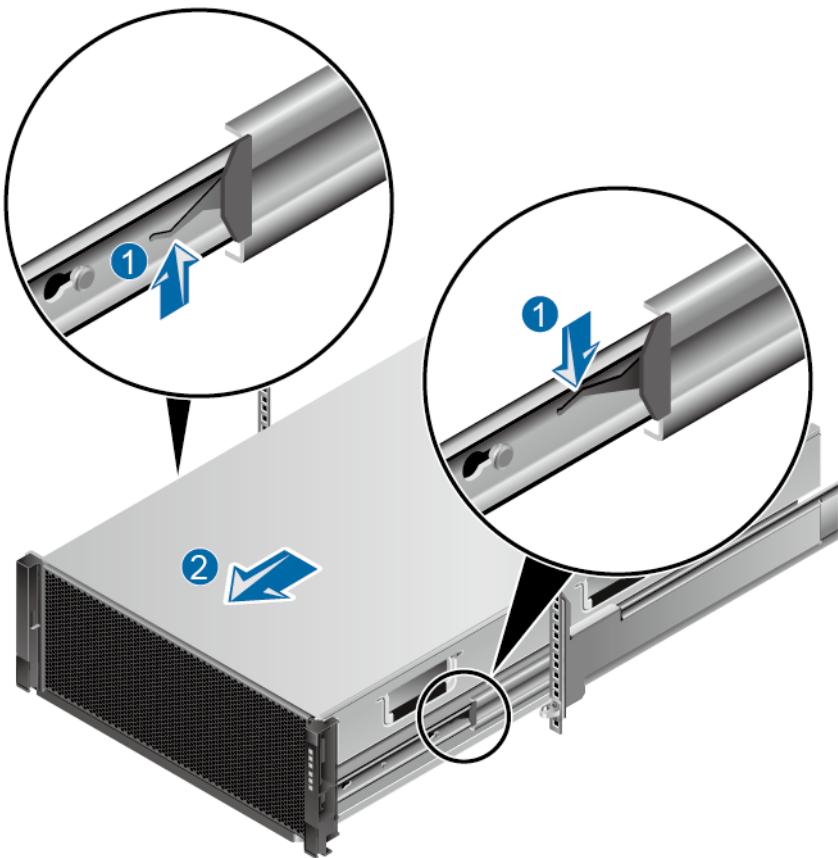
2. Loosen the two screws on the cover and remove the cover, as shown in [Figure 6-54](#).

Figure 6-54 Removing a cover



3. Press the retention clips on ball bearing guide rails, pull out the system enclosure, and place the system enclosure on the ESD table, as shown in [Figure 6-55](#).

Figure 6-55 Removing a system enclosure



Step 6 Uninstall the inner guide rails on the system enclosure that you want to replace and reinstall them to the same positions on the replacement system enclosure.

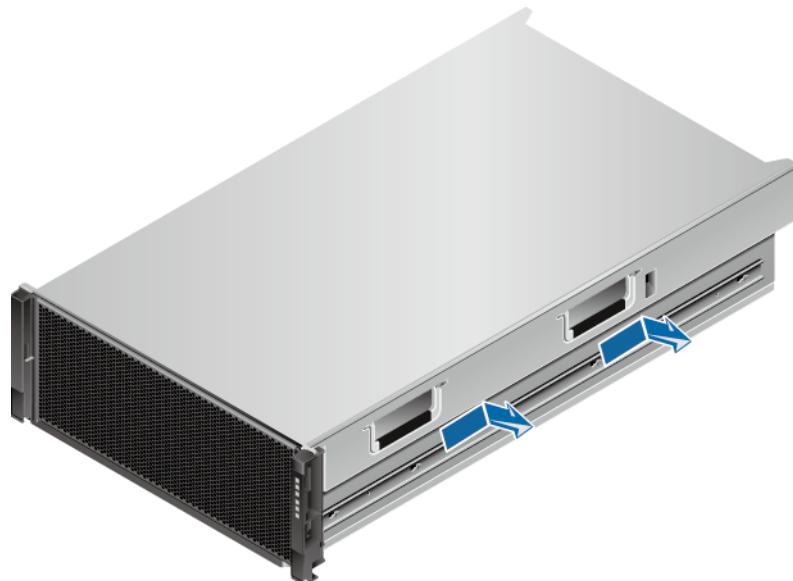
1. Use a Phillips screwdriver to loosen the four screws on the inner guide rails, as shown in [Figure 6-56](#).

Figure 6-56 Loosening screws on the inner guide rails



2. Remove the inner guide rails in the system enclosure that you want to replace, as shown in [Figure 6-57](#).

Figure 6-57 Removing inner guide rails



3. Install the inner guide rails to the replacement system enclosure, as shown in [Figure 6-58](#).

Figure 6-58 Installing inner guide rails



4. Use a Phillips screwdriver to fasten the four screws on the inner guide rails, as shown in [Figure 6-59](#).

Figure 6-59 Fastening screws on the inner guide rails



Step 7 Install the system enclosure into the cabinet.

1. Slide the system enclosure into the cabinet along guide rails.

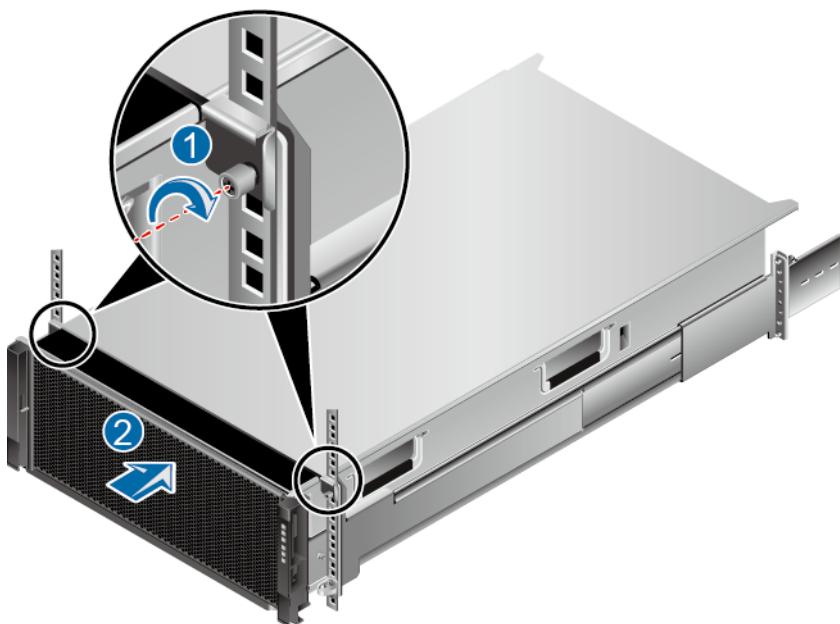
2. Loosen the two screws on the panel and slowly pull out the enclosure, as shown in [Figure 6-60](#).

Figure 6-60 Pulling out an enclosure



3. Fasten the two screws on the cover and slowly slide the enclosure into the cabinet, as shown in [Figure 6-61](#).

Figure 6-61 Installing the cover of a system enclosure



4. Fasten the two screws on the panel, as shown in [Figure 6-62](#).

Figure 6-62 Fastening screws on the panel



5. Verify that the system enclosure is horizontally installed.
6. Install all the components into the newly installed system enclosure.

! NOTICE

Install all components in the same slots as in the removed system enclosure. Otherwise, system services may be affected.

Step 8 Install cable trays and connect the cables of the system enclosure.

Step 9 When the Power indicator is steady on, check whether the components are running correctly when the Power indicator is steady on.

- If yes, the installation is successful.
- If no, cables are incorrectly connected, components are incorrectly installed, or the newly installed system enclosure is faulty. In this case, remove and reinsert the faulted module or the system enclosure. If the fault persists, contact Huawei technical support engineers.

----End

Follow-up Procedure

After the system enclosure is replaced, label the removed one to facilitate subsequent operations.

6.5 Replacing a Cable

This section describes how to replace a cable.

Impact on the System

Replacing a cable may affect or even interrupt system services. Replace the cable in off-peak hours and back up data in advance to avoid unexpected service interruption.

Prerequisites

- The cable for replacement is ready.
- The cable that you want to replace has been located.
- Data has been backed up if you replace the cable online.

Precaution

Remove and insert a cable with even force. Excessive force may damage the cable.

Tools and Materials

- ESD wrist strap
- ESD bag
- Label

Procedure

Step 1 Wear an ESD wrist strap.

Step 2 Confirm the position of the cable to be replaced and record the cable's label.

Step 3 Cut the binding tapes and remove the cable to be placed.

 **NOTE**

Before removing a SAS cable, gently push the connector of the cable inward. Then pull the plastic ring on the connector outward until the cable is completely removed from the expansion module.

Step 4 Put the removed cable into an ESD bag.

Step 5 Take the replacement cable out of the ESD bag.

Step 6 Write the content recorded in **Step 2** to a new label and attach the new label to the cable to be installed.

Step 7 Insert the replacement cable to the position of the original cable.



NOTICE

If various cables at different locations have been replaced simultaneously, ensure that the cables before and after the replacement have the same types.

Step 8 Optional: View the indicator of the cable port, and determine whether the installation is successful if you replace the cable online.

 **NOTE**

Meanings of different indicator colors vary for different interface modules. In general, a red indicator indicates that the system has alarms or is abnormal. For details, refer to the *OceanStor V3 DAS Storage System V300R006 Product Description*.

Step 9 Bind the cables.

----End

Follow-up Procedure

After the cable is replaced, label it for subsequent operations.

A General Cable Routing Description

This section describes the correct methods for routing cables (including ground cables, power cables, network cables, mini SAS cables, and serial cables) and optical fibers.

General Cable Routing Principles

- In an equipment room installed with brackets and ESD floors, cables are routed through the ground interlayer (the space between the concrete floor and the ESD floor) or the cable tray. Also, cables may be routed through a cable tray that is installed on the top of the cabinet.
- The specifications, routing, cross-section, and location for cable routing should be predetermined, and the cables should be arranged neatly.
- The insulation layer of the conductor should be intact.
- Cables must be bent smoothly with a bend radius of larger than 60 mm (2.36 inches).
- Easy maintenance and expansion should be considered when cables are routed.
- Power cables and ground cables should be separated from signal cables to reduce electromagnetic interference.

General Optical Fiber Routing Principles

- Do not forcibly pull or excessively bend the optical fibers.
- The bend radius of optical fibers must be no less than 50 mm (1.97 inches).
- Do not stack other cables on the laid optical fibers.
- When used in a cabinet, optical fibers should be placed into corrugated pipes. The corrugated pipes should be stretched into the cabinet by about 100 mm (3.94 inches).
- Cut the corrugated pipe according to the required length during hardware installation. Wrap the sharp edge of the corrugated pipe with tape to protect the optical fibers.
- In an equipment room installed with brackets and ESD floors, optical fibers shielded in the corrugated pipes are routed through the ground interlayer or the cable tray.
- Optical fibers are routed through the cable tray that is installed on the top of the cabinet.
- If the distance between the cable tray and the cabinet top is longer than 0.8 m (31.50 inches), a cable ladder should be set up on the cabinet.

B Cable Routing and Bundling Basics

Appropriate cable routing and bundling avoids unnecessary loss caused by cable damage.

B.1 Cable Routing and Bundling

This section describes the general methods and requirements for cable routing and bundling.

B.2 Fiber Cabling and Bundling

This section describes the general methods and requirements for fiber routing and bundling.

B.1 Cable Routing and Bundling

This section describes the general methods and requirements for cable routing and bundling.

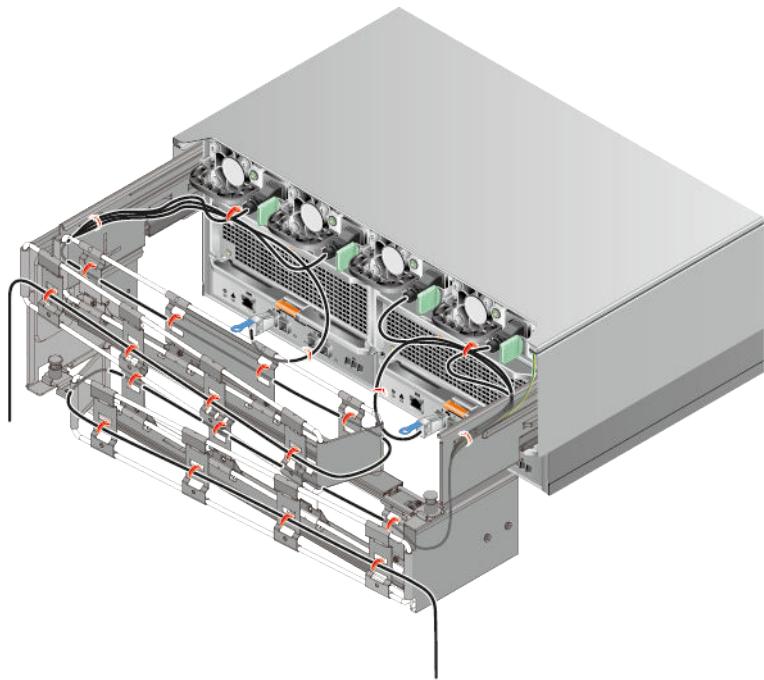
Cable Routing

- In an equipment room installed with supports and ESD floor, cables can go through the interlayer (the space between the concrete floor and the ESD floor) or the cable trough. If the cables are led out from the top of the cabinet, a cable tray should be built over the cabinet.
- The specifications, routing, section, and position for arranging the cables should be designed beforehand. The cables should be lined up neatly, without any damage on the cover.
- The cable should be turned smoothly at the bends, with the minimum bend radius no less than three times the diameter of the cable.

NOTE

Bend the mini SAS HD electrical cables at a radius equal to or greater than 35 mm (1.38 in.) The exposed length of the mini SAS HD electrical cables must be equal to or greater than 70 mm (2.76 in.), as shown in [Figure B-1](#)

Figure B-1 Routing cables before placing them into the cable trays



- If cable trays are installed for a storage device, place all cables connected to the device into the troughs of the cable trays.

 **NOTE**

- Evenly divide the cables connected to the storage device into two parts. Place the left part of cables into the troughs of the left cable tray, and the right part in the troughs of the right cable tray.
- Mini SAS HD electrical cables must be bound before being placed into the troughs of the cable managers. Bind the cables with the power cables onto the handles of the fan modules, and then place them and the ground cables to the troughs of the cable managers, as shown in [Figure B-1](#).
- The insulation layer of the conducting wire must be intact.
- The cables should be routed in a way that facilitates future maintenance and expansion.

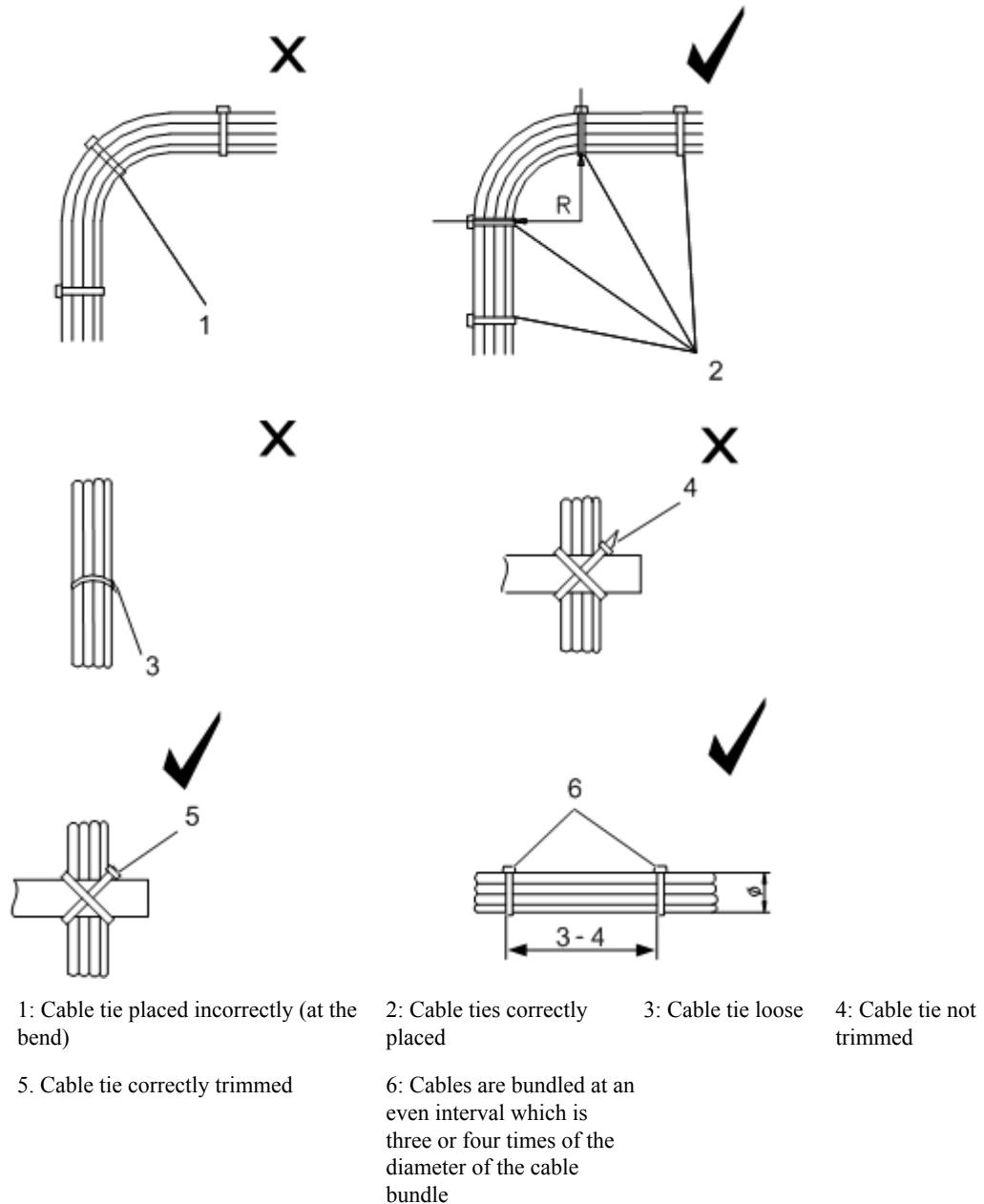
Cable Bundling

- Bind the cables when laying them on the passage. The cables should be aligned snugly together. The spacing between the cable ties should be even with a neat overall appearance.
- Cables run through the ducts do not need to be bound but should be arranged neatly without crossover. The cable should not overflow the trough. Bind or attach the cables with ties where they enter or exit the trough and at turning points.
- The bundles should be tidy and their purpose clear. The bundles can be classified by type. A large number of cables can be further classified by column. Bind each group of cables with ties.
- All cables must be bound properly in case of cable loosening or damage.
- Do not connect two or more cable ties to bind cables, as this may decrease the strength of the bundling.

- Bind the cables neatly and trim the excessive tie.
- The cable ties should be evenly spaced three to four times the diameter of the cable bundle.
- Use as long a bending radius as possible to prevent internal cable stress and breakage.

Figure B-2 shows how to bind cables.

Figure B-2 Bundling cables



B.2 Fiber Cabling and Bundling

This section describes the general methods and requirements for fiber routing and bundling.

Fiber Routing

- During the hardware installation, cut the corrugated pipe to the desired length and wrap the sharp ends with adhesive tape to protect the fiber.
- Avoid forcibly pulling or excessively bending fibers during routing. There should be no other cables on the fibers.
- If cable trays are installed for a storage device, place all cables connected to the device into the troughs of the cable trays.

 **NOTE**

Evenly divide the cables connected to the storage device into two parts. Place the left part of cables into the troughs of the left cable tray, and the right part in the troughs of the right cable tray.

- The bending radius of fibers must be no less than 50 mm (1.97 inches).
- Route fibers inside the cabinet along the posts on the sides of the cabinet and attach them when necessary.
- Corrugated pipes are required when running fibers outside the cabinet, and should be extended into the cabinet about 100 mm (3.94 inches).
- When using corrugated pipes, fibers can be run through the cable trough in an equipment room installed with supports and ESD floor, or the interlayer (the space between the concrete floor and the ESD floor).
- If the fibers are led out from the top of the cabinet, a cable tray should be installed over the cabinet for cabling. If the distance between the cable tray and the cabinet top is longer than 0.8 m (31.50 inches), a cable ladder should be used.

Fiber Bundling

- Fiber straps are usually used to bind fibers.
- Fibers should be bound neatly without crossover.
- Fibers should be arranged neatly without crossover.

C Making Cables and Connectors

This chapter describes how to make power cables, ground cables, and network cables.

[C.1 Making Ordinary Network Cables](#)

This section describes how to make ordinary network cables.

[C.2 Making Shielded Twisted Pair Cables](#)

This section describes how to make STP cables.

[C.3 Making External Power Cables and Ground Cables with OT Terminals](#)

This section describes how to make external power cables and ground cables with OT terminals.

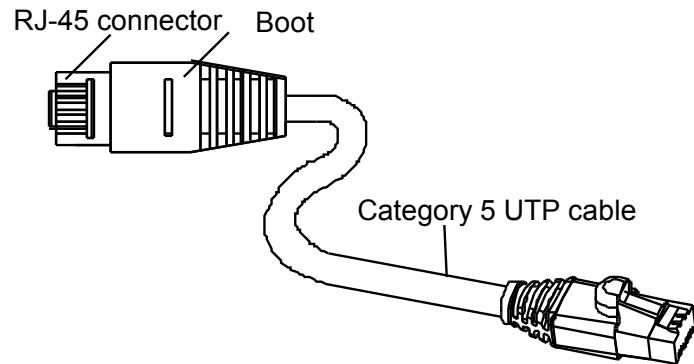
C.1 Making Ordinary Network Cables

This section describes how to make ordinary network cables.

Components of an Ordinary Network Cable

An ordinary network cable consists of two ordinary RJ45 connectors and one category 5 unshielded twisted pair (UTP) cable. [Figure C-1](#) shows an ordinary network cable.

Figure C-1 Ordinary network cable



Checking Tools and Materials

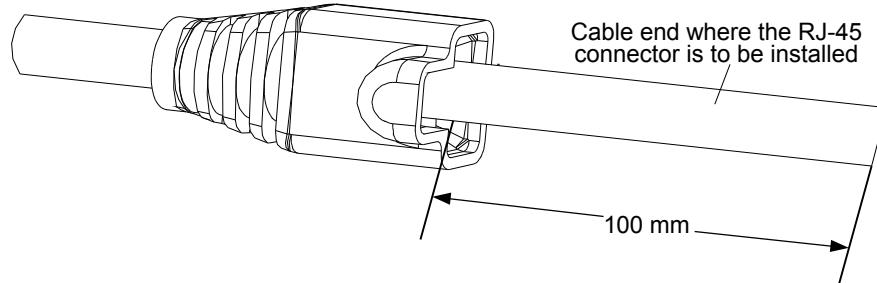
- Ensure that the necessary tools, such as the diagonal pliers, blades (or knives), and the RJ45 crimping tool, are available.
- Ensure that the materials, such as the RJ45 connectors, category 5 UTP cable, and the boots, are available.
- Ensure that the cable sheath is in proper condition. If the sheath around a part of the cable is convex, damaged, or uneven in thickness, cut the part from the cable.

Procedure

Step 1 Use the diagonal pliers to cut the cable according to the required length.

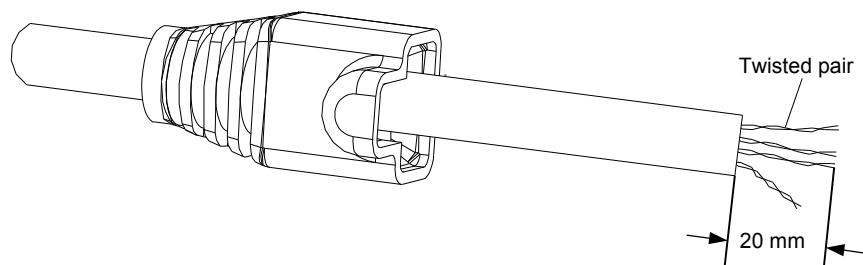
Step 2 Put the cable through the boot, and reserve at least 100 mm (3.94 inches) of the cable for installing the connector. Ensure that the boot is installed in the correct direction, as shown in [Figure C-2](#).

Figure C-2 Installing the boot of the RJ45 connector

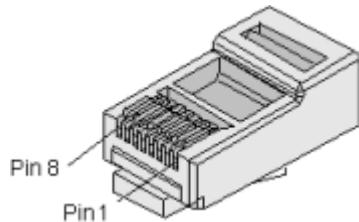


Step 3 Use a blade or a knife to peel off 20 mm (0.788 inch) of the sheath, as shown in [Figure C-3](#). Do not damage the insulation of the wires.

Figure C-3 Peeling off the sheath



Step 4 Arrange the four pairs of wires properly according to the color codes followed by pins of the RJ45 connector shown in [Table C-1](#), and [Figure C-4](#) illustrates pins of the RJ45 connector (pay attention to the pin colors).

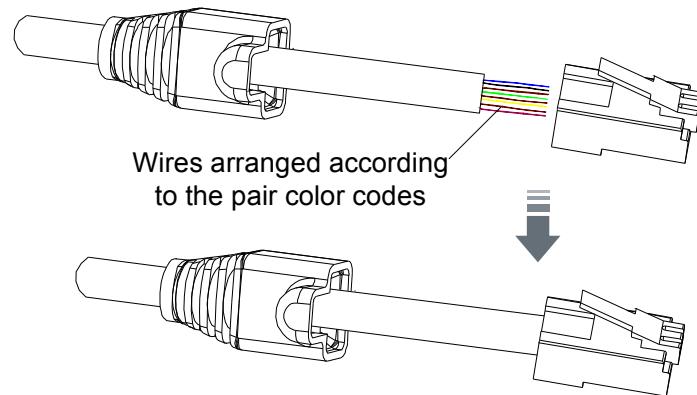
Figure C-4 Pins of the RJ45 connector**NOTE**

In **Table C-1**, end A and end B refer to both ends of a network cable.

Table C-1 Pair color codes

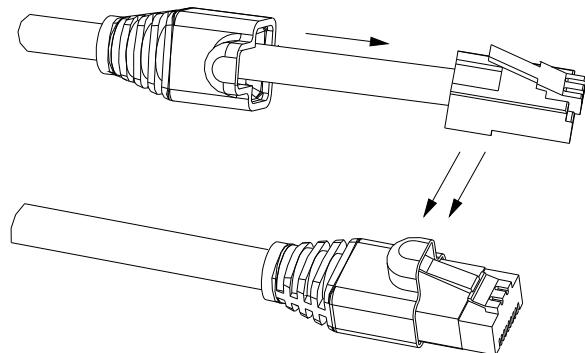
Pin	Insulation Colors			
	Straight Through Cable End A	Straight Through Cable End B	Crossover Cable End A	Crossover Cable End B
1	White and orange	White and orange	White and orange	White and green
2	Orange	Orange	Orange	Green
3	White and green	White and green	White and green	White and orange
4	Blue	Blue	Blue	Blue
5	White and blue	White and blue	White and blue	White and blue
6	Green	Green	Green	Orange
7	White and brown	White and brown	White and brown	White and brown
8	Brown	Brown	Brown	Brown

Step 5 Ensure that the wires are 13 mm (0.5122 inch) to 15 mm (0.591 inch) long. Cut off the extra part if the wires are longer than required, arrange the wires in the correct order, and then insert the wires into the RJ45 connector, as shown in **Figure C-5**.

Figure C-5 Arranging the wires according to the color codes

- Step 6** Use the RJ45 crimping tool to crimp the connector. Ensure that the connector is put in the right position in the RJ45 crimping tool. After crimping, the metal cover on the connector must be lower than other area on the connector.
- Step 7** Use a network cable tester or a multimeter to test all the wires, and ensure that the wires are connected properly.
- Step 8** Push the boot to cover the RJ45 connector, as shown in **Figure C-6**.

Figure C-6 Pushing the boot to cover the RJ45 connector



----End

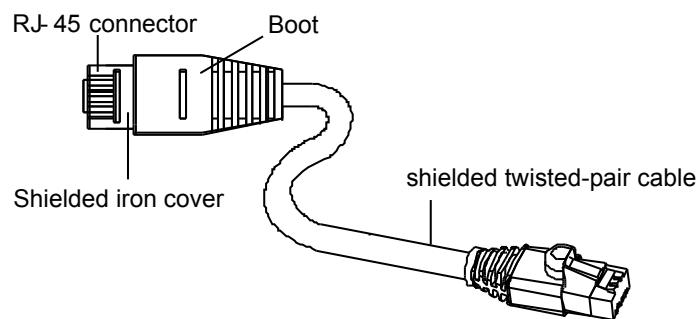
C.2 Making Shielded Twisted Pair Cables

This section describes how to make STP cables.

Components of a Network Cable

A network cable consists of two shielded RJ45 connectors and one STP cable. **Figure C-7** shows a complete STP cable.

Figure C-7 network cable

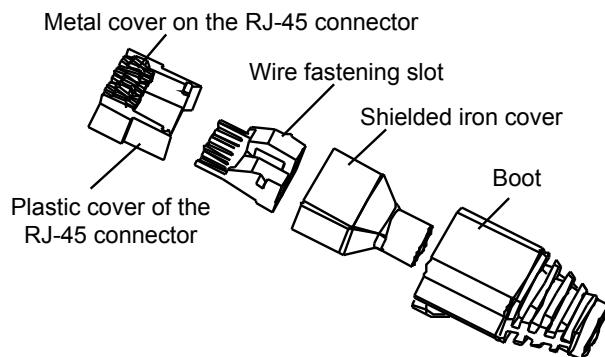


Checking Tools and Materials

Check the following items:

- Ensure that all necessary tools, such as the diagonal pliers, RJ45 crimping tool, and blades (or knives), are available.
- Ensure that the necessary materials, such as the shielded RJ45 connectors and the category 5e cables, are available. **Figure C-8** shows the shielded RJ45 connector, which has a shielded iron cover and a wire fastening slot.
- Ensure that the cable sheath is in proper condition. If the sheath round a part of the cable is convex, uneven in thickness, or damaged, cut the part off the cable.

Figure C-8 Components of a shielded RJ45 connector

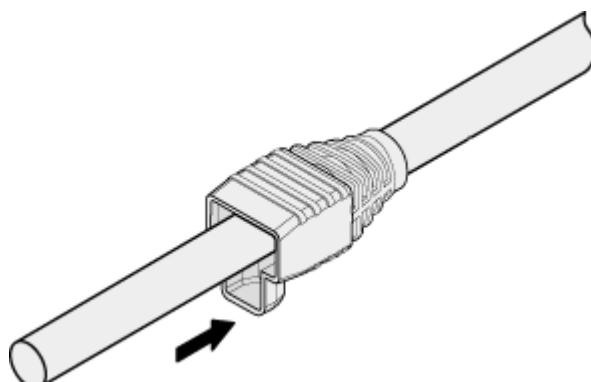


Procedure

Step 1 Install the boot of the RJ45 connector.

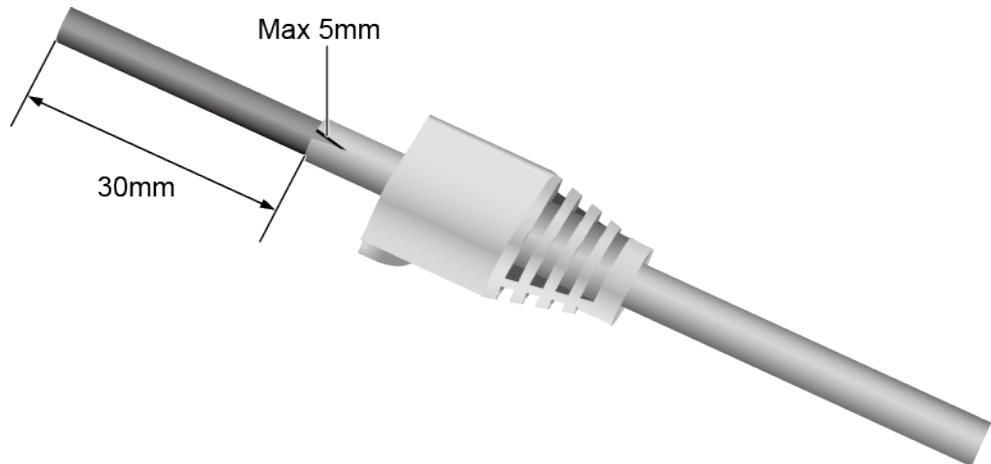
1. Select a cable of proper length and install the boot on the RJ45 connector of the cable, as shown in **Figure C-9**.

Figure C-9 Installing the boot of the RJ45 connector



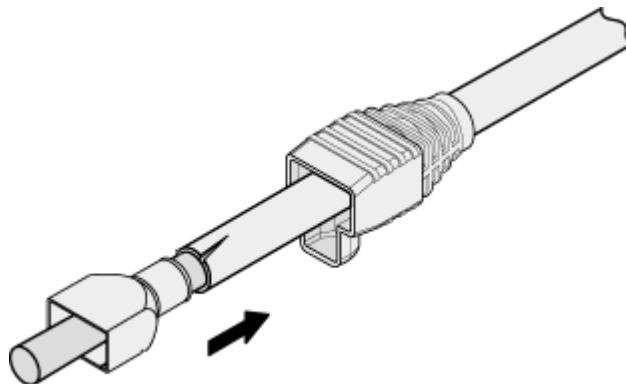
2. Use a blade or a knife to peel off 30 mm (1.182 inches) of the sheath and use a blade to slit up to 5 mm (0.197 inch) on the sheath, as shown in **Figure C-10**.

Figure C-10 Peeling off the sheath



3. Install a shielded iron cover on the cable shield, and then insert the shielded iron cover into the sheath along the crack. Install the shielded iron cover correctly, as shown in [Figure C-11](#).

Figure C-11 Installing the shielded metal cover



Step 2 Install the wires.



When peeling off the sheath of the cable, do not damage the cable shield or the insulated wires.

1. Use the diagonal pliers to peel the cable shield, grounding wire, aluminum foil, and polyester band off the first 20 mm (0.788 inch) of the cable, leaving only the insulated conductors.
2. Arrange the four twisted pairs properly and insert them into the wire fastening slot, as shown in [Figure C-12](#) and [Figure C-13](#). Maintain the original twist pitch of the twisted pairs.

Figure C-12 Leading cables through the wire holder

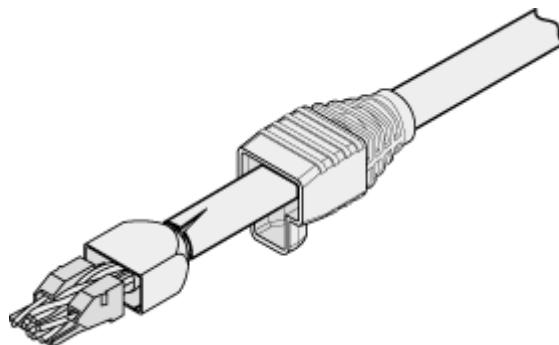
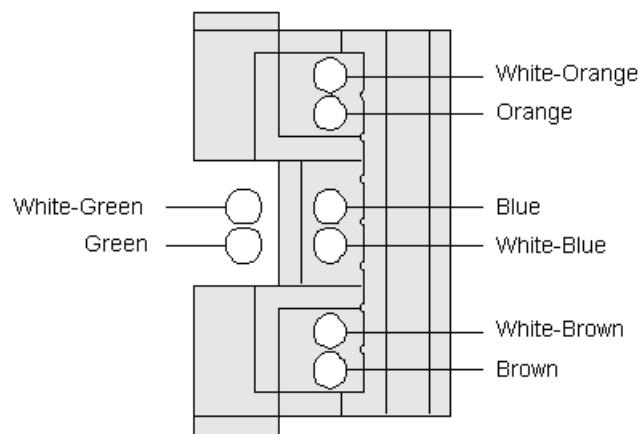


Figure C-13 Cable locations in a wire holder



3. Arrange the pairs smoothly and straightly at the aperture of the wire fastening slot.
Arrange the wires properly and cut off the extra part of the wires along the edge of the wire fastening slot. The wires order shown in [Table C-2](#), and [Figure C-14](#) shows pins of the RJ45 connector (pay attention to the colors of pins).

Figure C-14 Pins of the RJ45 connector

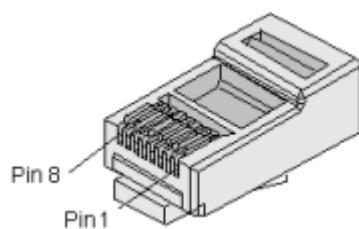
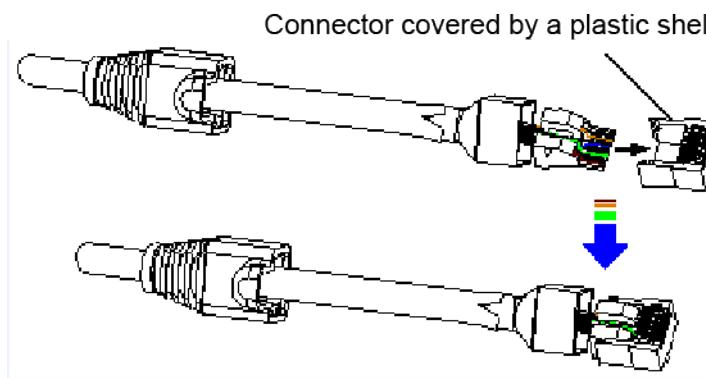


Table C-2 Pair color codes

Pin	Insulation Colors			
	Straight Through Cable End A	Straight Through Cable End B	Crossover Cable End A	Crossover Cable End B
1	White and orange	White and orange	White and orange	White and green
2	Orange	Orange	Orange	Green
3	White and green	White and green	White and green	White and orange
4	Blue	Blue	Blue	Blue
5	White and blue	White and blue	White and blue	White and blue
6	Green	Green	Green	Orange
7	White and brown	White and brown	White and brown	White and brown
8	Brown	Brown	Brown	Brown

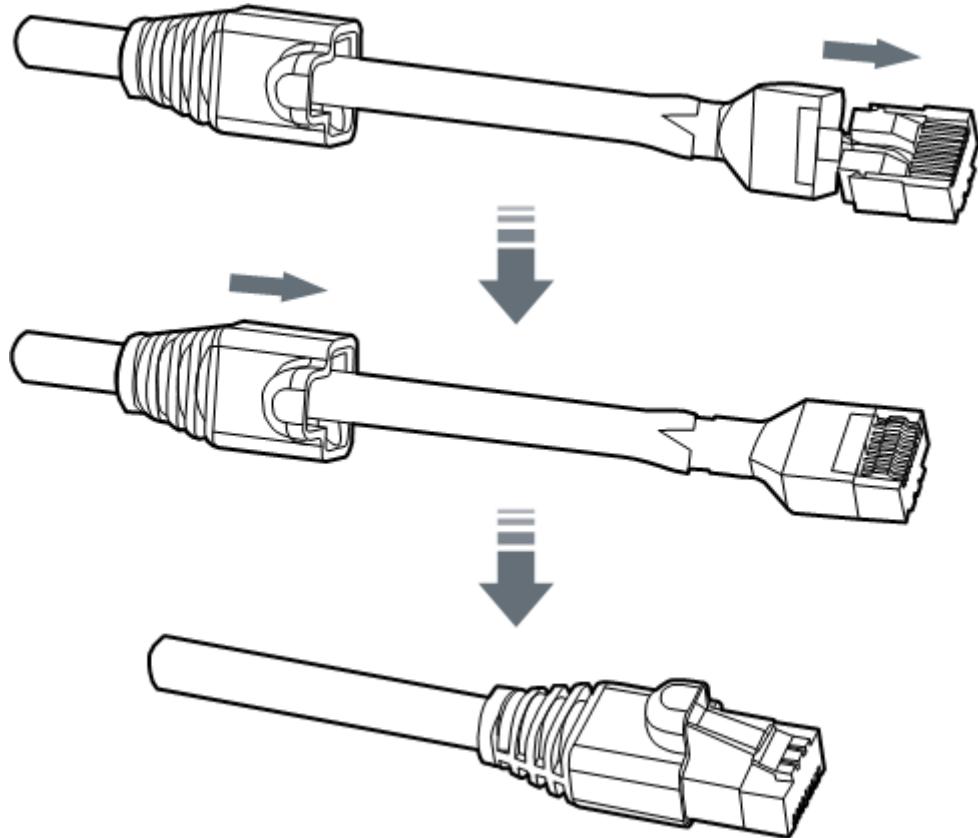
4. Install the plastic cover on the wire fastening slot, and then fasten the slot. Push the cover into the slot until you hear a click to ensure that the cover is fitted properly, as shown in **Figure C-15**.

Figure C-15 Installing the wires**Step 3** Crimp the RJ45 connector.

1. Insert the RJ45 connector into the metal cover.
2. Use the diagonal pliers to crimp the pins on the RJ45 connector. Ensure that the conductors inside the wires are properly connected to the pins and the RJ45 connector is placed correctly. After crimping, the pins on the connector must be lower than the plastic cover.
3. Use a network cable tester or a multimeter to check that the wires are connected properly.

4. Insert the RJ45 connector into the boot, as shown in **Figure C-16**.

Figure C-16 Crimping the RJ45 connector



----End

C.3 Making External Power Cables and Ground Cables with OT Terminals

This section describes how to make external power cables and ground cables with OT terminals.

Recommended Tools and Materials

The recommended tools and materials for making external power cables and ground cables with OT terminals are as follows.

Tools:

- Power cable crimping tool
- Hydraulic pliers
- Box cutter
- Diagonal pliers

- Wire clipper
- Heat gun

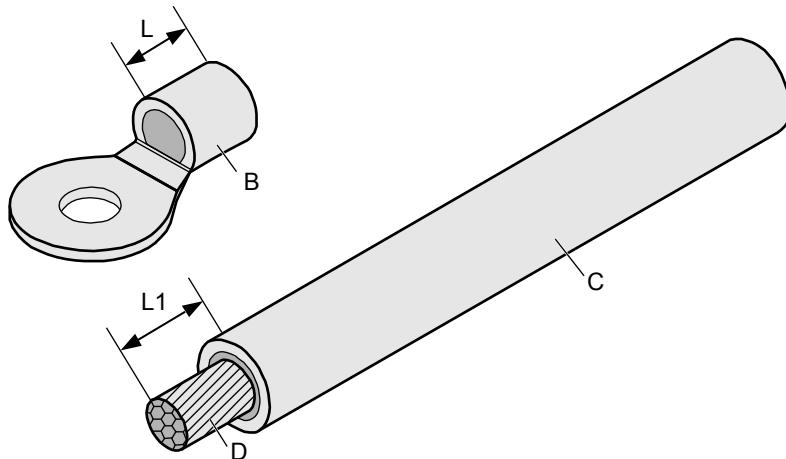
Materials:

- Power cables
- Insulation tape
- OT terminals
- Heat shrink tube

Procedure

- Step 1** Peel off a section of the insulation layer C from the power cable based on the cross-sectional area of the power cable conductors. A section of power cable conductor D with a length of L1 is exposed, as shown in **Figure C-17**. **Table C-3** lists the recommended lengths of the insulation layer to be peeled off (L1).

Figure C-17 Peeling off the insulation layer of the power cable



NOTICE

- When peeling off the insulation layer of the power cable, ensure that the conductor of the power cable is not scratched.
- You can adjust L1 according to the length of the OT terminal. $L1 = L + (1 \text{ to } 2) \text{ mm}$ ($1 \text{ mm} = 0.0394 \text{ inch}$).

Table C-3 Mapping between the cross-sectional area and the length of the insulation layer to be peeled off (L1)

Cross-Sectional Area	L1
1 mm ² (0.0015 inch ²)	7 mm (0.2758 inch)

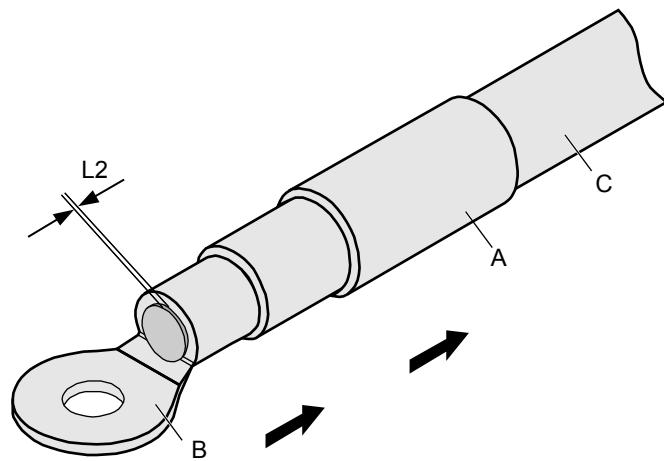
Cross-Sectional Area	L1
1.5 mm ² (0.0023 inch ²)	7 mm (0.2758 inch)
2.5 mm ² (0.0039 inch ²)	7 mm (0.2758 inch)
4 mm ² (0.0062 inch ²)	8 mm (0.3152 inch)
6 mm ² (0.0093 inch ²)	9 mm (0.3456 inch)
10 mm ² (0.0155 inch ²)	11 mm (0.4334 inch)
16 mm ² (0.0248 inch ²)	13 mm (0.5122 inch)
25 mm ² (0.0387 inch ²)	14 mm (0.5516 inch)
35 mm ² (0.0542 inch ²)	16 mm (0.6304 inch)
50 mm ² (0.0775 inch ²)	16 mm (0.6304 inch)

 **NOTE**

Skilled engineers can determine the length of insulation layer to be peeled off by comparing the cable with the connector to be crimped.

- Step 2** Insert the power cable into the heat shrink tube A, as shown in [Figure C-18](#).
- Step 3** Insert the bare conductor of the power cable into the OT terminal B, and then press the OT terminal close to the insulation layer C, as shown in [Figure C-18](#).

Figure C-18 Installing heat shrink tube and OT terminal



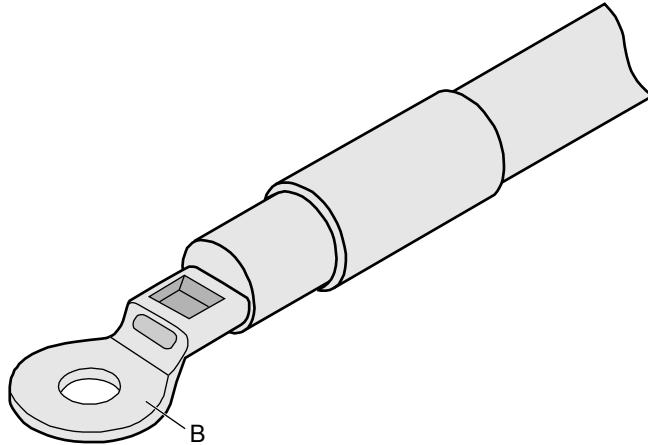


NOTICE

After the OT terminal is installed, the length of the bare conductor outside the OT terminal (L2) must not be larger than 2 mm (0.0788 inch). If L2 is larger than 2 mm (0.0788 inch), cut the redundant part by using the diagonal pliers or wire clipper, as shown in [Figure C-18](#).

-
- Step 4** Use the power cable crimping tool to clamp the tail of the OT terminal and the contact part of the conductor, as shown in [Figure C-19](#).

Figure C-19 Clamping the tail of the OT terminal with the contact part of the conductor



NOTE
The crimped shape varies with the crimping mold.

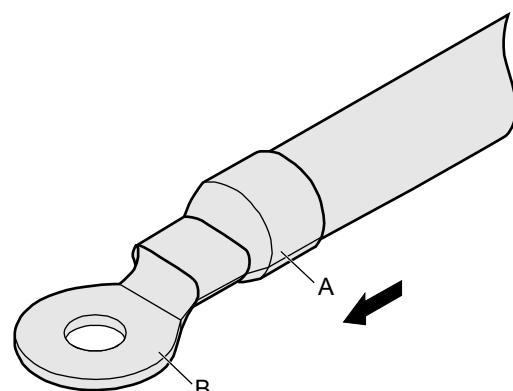
- Step 5** Push the heat shrink tube A towards the OT terminal, and cover the crimping area of the OT terminal and the conductor. Use a heat gun to heat the heat shrink tube, as shown in [Figure C-20](#).



NOTICE

Stop heating the tube once the cable is wrapped by the tube tightly. Excessive heat may damage the insulation layer.

Figure C-20 Installing the heat shrink tube



----End

D Engineering Label Specifications for Cables

This chapter describes how to make, fill in, and attach the cable labels.

Labels are affixed to the cables to identify the physical positions of the cables on different devices. There are two types of cable labels: labels for the power cables and labels for the signal cables.

The cable labels facilitate the cable connection and maintenance.

NOTE

If the customers require label consistency in their equipment rooms, fill in and arrange the labels according to customers' specified requirements.

[D.1 Introduction to Labels](#)

This section describes the materials, types, and structures of the labels. It also describes the requirements on label printing and handwriting, attaching methods, label contents, and precautions.

[D.2 Usage of Labels](#)

This section describes how to use the labels, the content on the labels, and the precautions for using the labels.

[D.3 Filling In Labels](#)

You can fill in the labels by using an oil marker.

[D.4 Affixing Labels](#)

This section describes how to attach a label for a signal cable and for a power cable.

D.1 Introduction to Labels

This section describes the materials, types, and structures of the labels. It also describes the requirements on label printing and handwriting, attaching methods, label contents, and precautions.

Material Specification

The material features of the labels are as follows:

- Thickness: 0.09 mm (0.03546 inch).
- Color: chalk white.
- Material: Polyester (PET).
- Applicable temperature: -29°C to +149°C.
- Contents on the labels can be printed by a laser printer or written with an oil marker.
- The material must pass the authentication of Underwriters Laboratories (UL) and Canadian Standards Association (CSA).

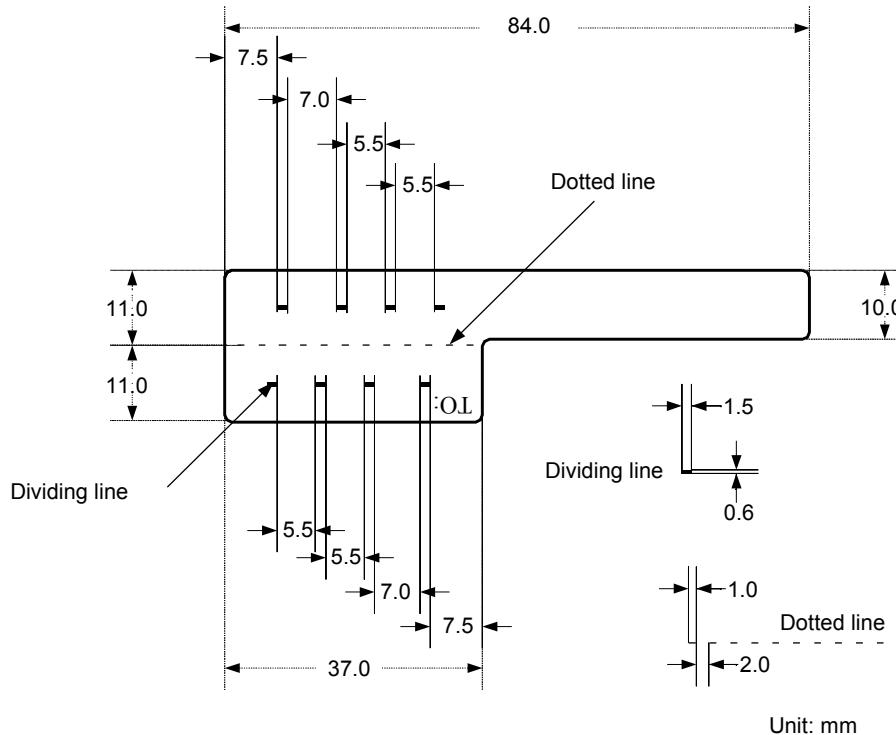
Types

There are two types of cable labels: one is for power cables and the other is for signal cables.

Label for the Signal Cable

The label for a signal cable is L-shaped and of a fixed size. **Figure D-1** shows a label for a signal cable.

Figure D-1 Label for a signal cable



The dividing lines on the label make the position of a cable clearer. For example, there is a dividing line between the cabinet number and the enclosure number, and a dividing line between the enclosure number and the slot number. The size of the dividing line is 1.5 mm (0.0591 inch) x 0.6 mm (0.02364 inch), and its color is PANTONE 656c (light blue).

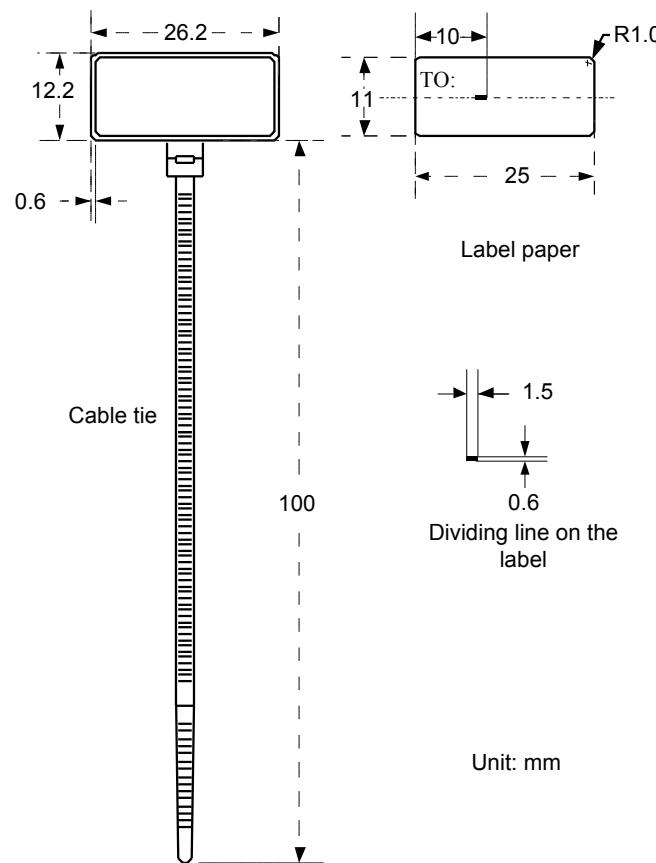
The dotted lines mark the position for folding the label when you attach it to the cable.

There is a mark "TO:" (upside down in the figure) at the lower right corner of the label. After the mark, information about the peer end of the cable, to which the label is affixed, is to be written.

Label for a Power Cable

The label for a power cable is attached to the identification plate on a cable tie. The size of the bulge around the identification plate is 0.2 mm (0.00788 inch) x 0.6 mm (0.02364 inch) (symmetric on both sides). The label is attached to the center of the plate, as shown in [Figure D-2](#).

Figure D-2 Label for a power cable



D.2 Usage of Labels

This section describes how to use the labels, the content on the labels, and the precautions for using the labels.

Contents on Labels

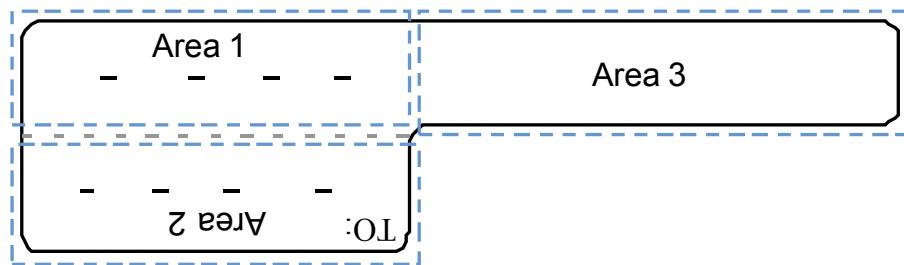
The contents on a label for a signal cable are different from the contents on a label for a power cable.

For a Signal Cable

The two sides of a label affixed to a signal cable indicate the location of the ports connected to both ends of the cable, as shown in [Figure D-3](#).

- Area 1 carries the location information about the cable end to which the label is to be affixed.
- Area 2 (with the "TO:" mark) carries the location information about the other end of the cable.
- Area 3 is folded between area 1 and area 2.

Figure D-3 Printing parts on a label for a signal cable



If the label is viewed from the cable leading-out area, it appears on the right side of the cable. The side with "TO:" that faces outward indicates the location of one end of the cable; the other side indicates the location of the other end.

For a Power Cable

A label for a power cable is affixed only to one side of the identification plate. The information (the part after the mark "TO:") on the label indicates the location of the peer end device, control cabinet, cable distribution box, or socket of the cable end to which the label is affixed.

Precautions for Using Labels

Pay attention to the following items when using the labels:

- When you print or write information on the labels or attach the labels, ensure that the labels are clean.
- Do not use ink-jet printers or ink pens to print or write on the labels because the label paper is made up of moisture proof and waterproof material.
- Affix labels neatly. The new label is of striped type. The appearance of the product is affected if the affixing position or direction is incorrect.
- Bundle the cable ties at the same height, and place all identification plates in the same direction.
- The positions of "up", "down", "right", and "left" in this section (excluding the description of printer setting) are viewed when you face the labels.

D.3 Filling In Labels

You can fill in the labels by using an oil marker.

Writing Tool

To maintain the labels legible and neat, use a black oil marker (excluding a ballpoint pen) to fill in the labels. Use a oil marker instead of a ballpoint pen. An oil marker is more effective compared to a ballpoint pen. When you use a marker to fill in the labels, ensure that the surface of the labels is not oily. The oil can smudge the letters.

 **NOTE**

The delivered marker has two nibs. Use the smaller nib to fill in the labels.

Writing Font

The handwritten font must be similar to the standard typeface "Times New Roman" so that it is clear and legible. **Table D-1** lists the standard typeface.

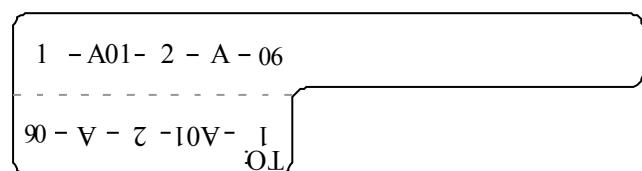
Table D-1 Standard typeface for handwriting

0	1	2	3	4	5	6	7	8
9	A	B	C	D	E	F	G	H
I	J	K	L	M	N	O	P	Q
R	S	T	U	V	W	X	Y	Z

The typeface for handwriting should be of a proper size, identifiable, and neat.

Figure D-4 shows the writing direction.

Figure D-4 Writing direction on the label



D.4 Affixing Labels

This section describes how to attach a label for a signal cable and for a power cable.

Affixing a Label to a Signal Cable

The label attaching position on a signal cable is 2 cm (0.788 inch) away from the connector. In special cases, for example, to avoid bending the cable or affecting other cables, attach the label to a different position on the cable.

A label should be affixed to each end of a cable. When the cable is placed vertically, the label should point rightwards. When the cable is placed horizontally, the label should point downwards. **Figure D-5** shows how to attach a label to the signal cable in a proper position.

Figure D-5 Affixing a label to a signal cable in a proper position

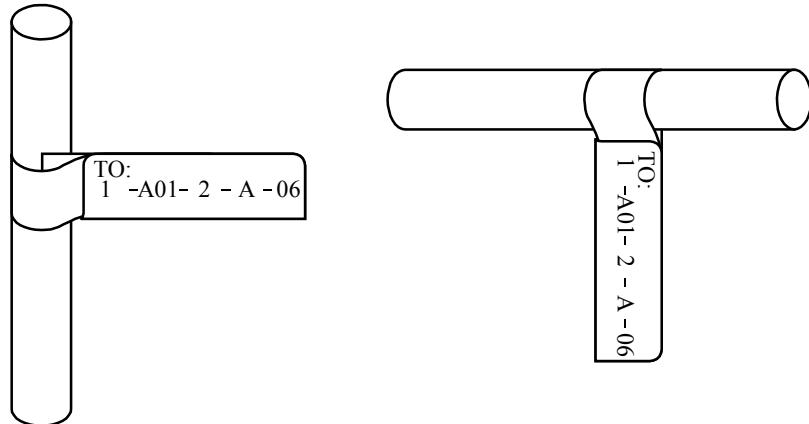
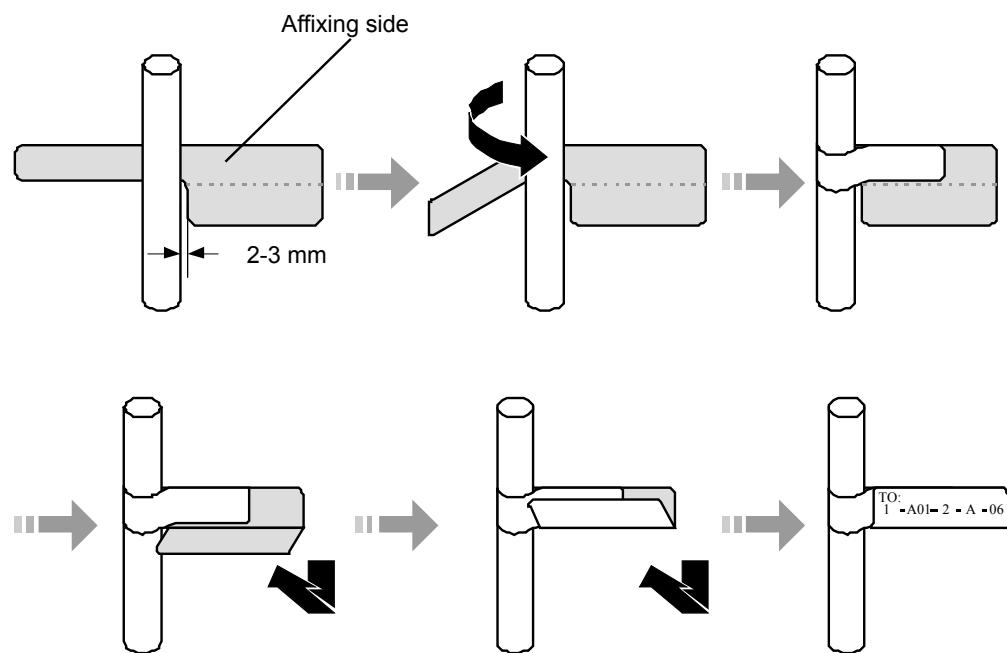


Figure D-6 shows how to attach a label to a signal cable.

Figure D-6 Affixing a label to a signal cable

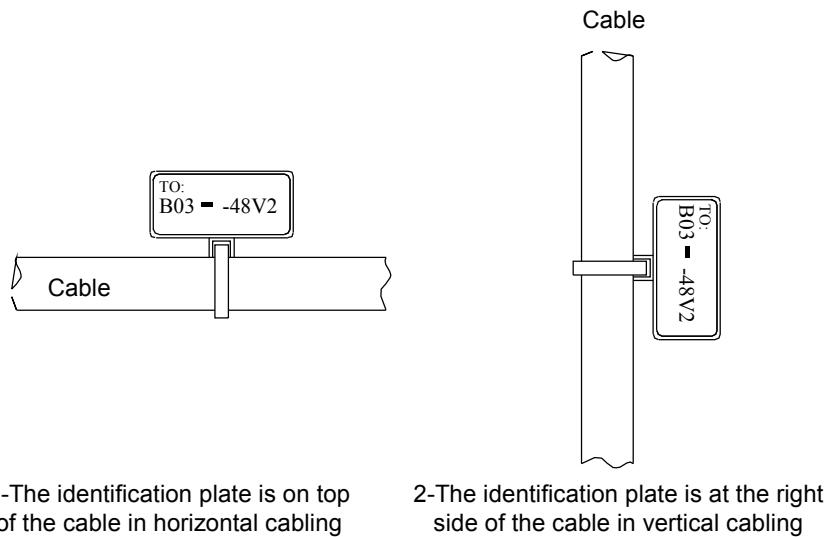


Affixing a Label to a Power Cable

Remove a label from the bottom of the label page, and then attach it to the concave part on either side of the identification plate of a cable tie. Ensure that the label directions are consistent in the equipment room. The cable tie should be fastened 2 cm (0.788 inch) away from the connectors. In special cases, the labels can be affixed to other positions.

Cable ties should be fastened at both ends of a cable. After bundling the cables, the completed identification plate should be visible on the top of the cable in the horizontal cabling, or on the right side of the cable in the vertical cabling. Make sure that the label points outwards, as shown in **Figure D-7**.

Figure D-7 Appearance of a label affixed to a power cable



E How to Obtain Help

If a tough or critical problem persists in routine maintenance or troubleshooting, contact Huawei for technical support.

[E.1 Preparations for Contacting Huawei](#)

To better solve the problem, you need to collect troubleshooting information and make debugging preparations before contacting Huawei.

[E.2 How to Use the Document](#)

Huawei provides guide documents shipped with the device. The guide documents can be used to handle the common problems occurring in daily maintenance or troubleshooting.

[E.3 How to Obtain Help from Website](#)

Huawei provides users with timely and efficient technical support through the regional offices, secondary technical support system, telephone technical support, remote technical support, and onsite technical support.

[E.4 Ways to Contact Huawei](#)

Huawei Technologies Co., Ltd. provides customers with comprehensive technical support and service. For any assistance, contact our local office or company headquarters.

E.1 Preparations for Contacting Huawei

To better solve the problem, you need to collect troubleshooting information and make debugging preparations before contacting Huawei.

E.1.1 Collecting Troubleshooting Information

You need to collect troubleshooting information before troubleshooting.

You need to collect the following information:

- Name and address of the customer
- Contact person and telephone number
- Time when the fault occurred
- Description of the fault phenomena
- Device type and software version

- Measures taken after the fault occurs and the related results
- Troubleshooting level and required solution deadline

E.1.2 Making Debugging Preparations

When you contact Huawei for help, the technical support engineer of Huawei might assist you to do certain operations to collect information about the fault or rectify the fault directly.

Before contacting Huawei for help, you need to prepare the boards, port modules, screwdrivers, screws, cables for serial ports, network cables, and other required materials.

E.2 How to Use the Document

Huawei provides guide documents shipped with the device. The guide documents can be used to handle the common problems occurring in daily maintenance or troubleshooting.

To better solve the problems, use the documents before you contact Huawei for technical support.

E.3 How to Obtain Help from Website

Huawei provides users with timely and efficient technical support through the regional offices, secondary technical support system, telephone technical support, remote technical support, and onsite technical support.

Contents of the Huawei technical support system are as follows:

- Huawei headquarters technical support department
- Regional office technical support center
- Customer service center
- Technical support website: <http://support.huawei.com/enterprise/>

You can query how to contact the regional offices at <http://support.huawei.com/enterprise/>.

E.4 Ways to Contact Huawei

Huawei Technologies Co., Ltd. provides customers with comprehensive technical support and service. For any assistance, contact our local office or company headquarters.

Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base Bantian, Longgang Shenzhen 518129 People's Republic of China

Website: <http://enterprise.huawei.com/>

F Glossary

If you want to obtain information about glossaries, visit <http://support.huawei.com/enterprise/>. In the search field, enter product model, and select a path from the paths that are automatically displayed to go to the document page of the product. Browse or download the *OceanStor V3 DAS Storage System V300R006 Glossary*.

G Acronyms and Abbreviations

A

ACL	Access Control List
AD	Active Directory
ANSI	American National Standards Institute
ASCII	American Standard Code for Information Interchange
ASP	Authorized Service Partner

C

CA	Certificate Authority
CHAP	Challenge Handshake Authentication Protocol
CLI	Command Line Interface
CPU	Central Processing Unit

D

DCB	Data Center Bridging
DHA	Disk Health Analysis
DNS	Domain Name Server
DN	Distinguished Name

E

ESN	Equipment Serial Number
ESDP	Electronic Software Delivery Platform

F

FC	Fiber Channel
FCoE	Fibre Channel over Ethernet
FRU	Field Replaceable Unit

G

GE	Gigabit Ethernet
GPT	GUID Partition Table
GSM	Global System for Mobile Communications
GTS	Global Technical Service
GUI	Graphical User Interface
GUID	Global Universal Identification

H

HBA	Host Bus Adapter
HD	High Density

I

IB	Integration Bus
ICAP	Internet Content Adaptation Protocol
I/O	Input/Output
IP	Internet Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IQN	iSCSI Qualified Name
ISA	Instrument Society of America
iSCSI	Internet Small Computer Systems Interface
iSNS	Internet Storage Name Service
ISO	International Organization for Standardization
iWARP	Internet wide-area RDMA protocol

J

JRE Java Runtime Environment

L

LACP	Link Aggregation Control Protocol
LDAP	Lightweight Directory Access Protocol
LDAPS	LDAP over SSL
LUN	Logical Unit Number
LVM	Logical Volume Manager

M

MAC	Media Access Control
MBR	Master Boot Record
MD5	Message Digest Algorithm 5
MIB	Management Information Base

N

NDMP	Network Data Management Protocol
NIS	Network Information Services
NTP	Network Time Protocol

O

OLTP	Online Transaction Processing
OLAP	Online Analytical Processing
OID	Object Identifier

P

PO	Purchase Order
POP	Post Office Protocol 3

R

RAID	Redundant Array of Independent Disks
RDMA	Remote Direct Memory Access

RDN	Relative Distinguished Name
REST	Representational State Transfer
R.H.	Relative Humidity
S	
SAS	Serial Attached SCSI
SCOM	System Center Operations Manager
SCSI	Small Computer System Interface
SHA	Secure Hash Algorithm
SIM	Subscriber Identity Module
S.M.A.R.T	Self-Monitoring, Analysis and Reporting Technology
SMI-S	Storage Management Initiative-Specification
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SSD	Solid-State Drive
SSH	Secure Shell
SSL	Secure Sockets Layer
T	
TCP/IP	Transmission Control Protocol/Internet Protocol
TOC	Total Cost of Ownership
TLS	Transport Layer Security
U	
UDP	User Datagram Protocol
USM	User-based Security Model
UTC	Universal Time Coordinated
UUID	Universally Unique Identifier
V	
VASA	vStorage APIs for Storage Awareness
VAAI	vStorage APIs for Array Integration

VG	Volume Group
VSS	Volume Shadow Copy Service
W	
WORM	Write Once Read Many
WWN	World Wide Name
WWPN	World Wide Port Name