LIVE
Post-sales

HUAWEI Live Webinar

Troubleshooting Centralized Storage Common Faults

Enterprise China GTAC

HUAWEI

About This Training

Objectives

- *Centralized Storage Maintenance Introduction.*
- *Log Collection*
- *Troubleshooting for common issue.*

Highlights

- *Daily Maintenance Introduction*
- *How to collect logs for storage*
- *Troubleshooting and case sharing*

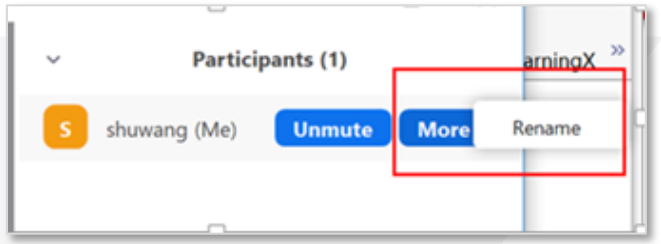
More

If you have more information, please feel free to contact us at ChannelService@Huawei.com.

Before training start:

In order to response your questions after the training and support training plan, please change your screen name to one of the following methods.

1. Your Huawei Uniportal ID
2. Your email address that has been associated with your Huawei Uniportal ID
3. Add your company full name after your screen name



Your contact information will only be used to improve your training experience.

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Warm reminder

During the training:

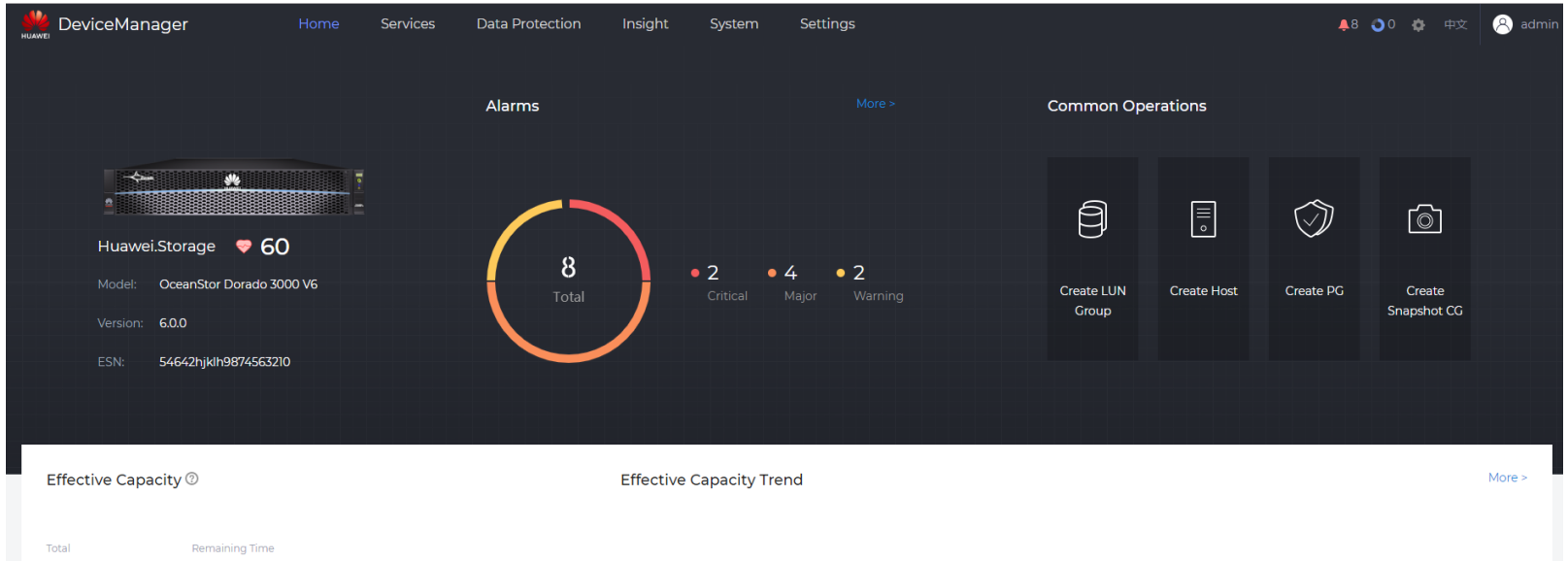
1. If you have any questions about the course, please leave a message in the message area. The moderator will remind the trainer to reply in the Q&A session.
2. If you encounter equipment or IT problems, please describe your difficulties in the message area and @Training Organizer
3. Welcome to discuss this course in the message area.
4. During the Q&A session, if you need to speak, please raise your hand in the meeting.

Content

System Management – Device Manager

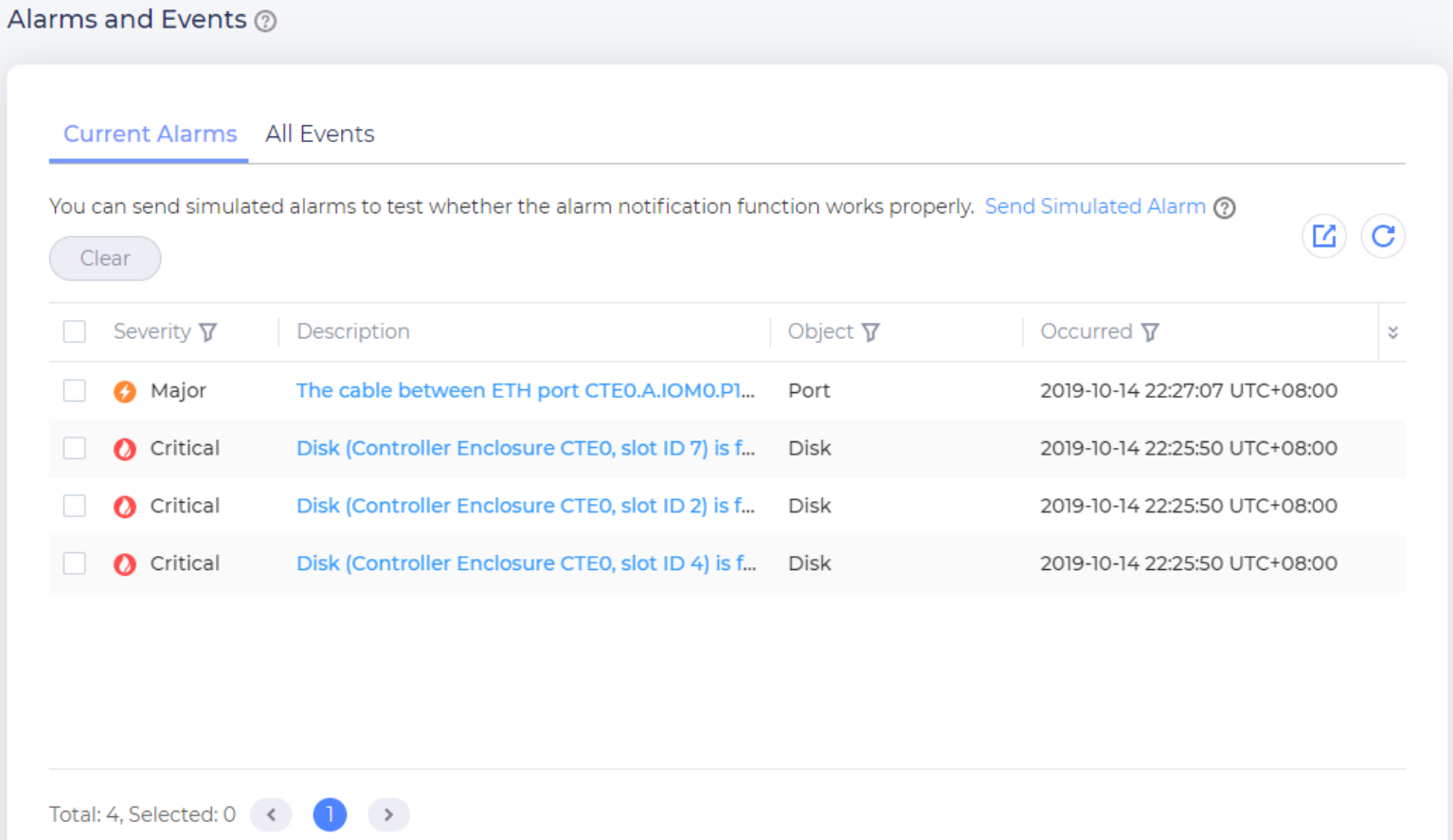
Address: https://ManagementIP:8088

The DeviceManager home page displays the current operating status, alarm information, system capacity trend, and system performance of a storage system. This information helps you prepare for device management and maintenance.



System Management – Checking Alarms

You can clear a listed alarm by referring to the detailed description and troubleshooting suggestions on the alarm.



System Management – Alarm Severity

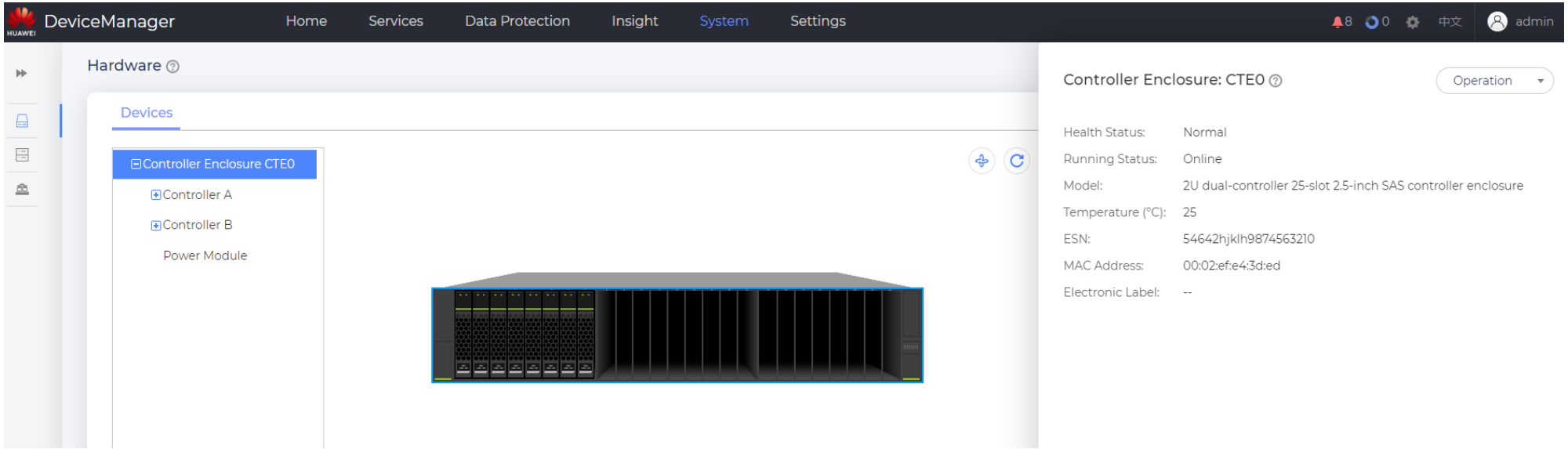
The following slides present the alarming mechanism, alarm notification methods, and alarm dump for you to better manage and clear alarms.

Alarm Severity	Icon	Definition	Way of Handling
Critical		Interrupts services or causes the system to break down.	Must be cleared immediately. Otherwise, the system may break down.
Major		Affects part of the device in a limited range or impacts the system performance.	Must be cleared as soon as possible. Otherwise, important functions will be affected.
Warning		Has no impact on the device. The system detects a potential or imminent fault that may affect services.	A warning is reported to instruct maintenance personnel to promptly find the alarm cause and rectify the potential fault.
Info		Information about operations without any effect on the device.	Lets maintenance personnel know the running status of the network and devices. They are handled based on the actual condition.

Checking Device Running Status

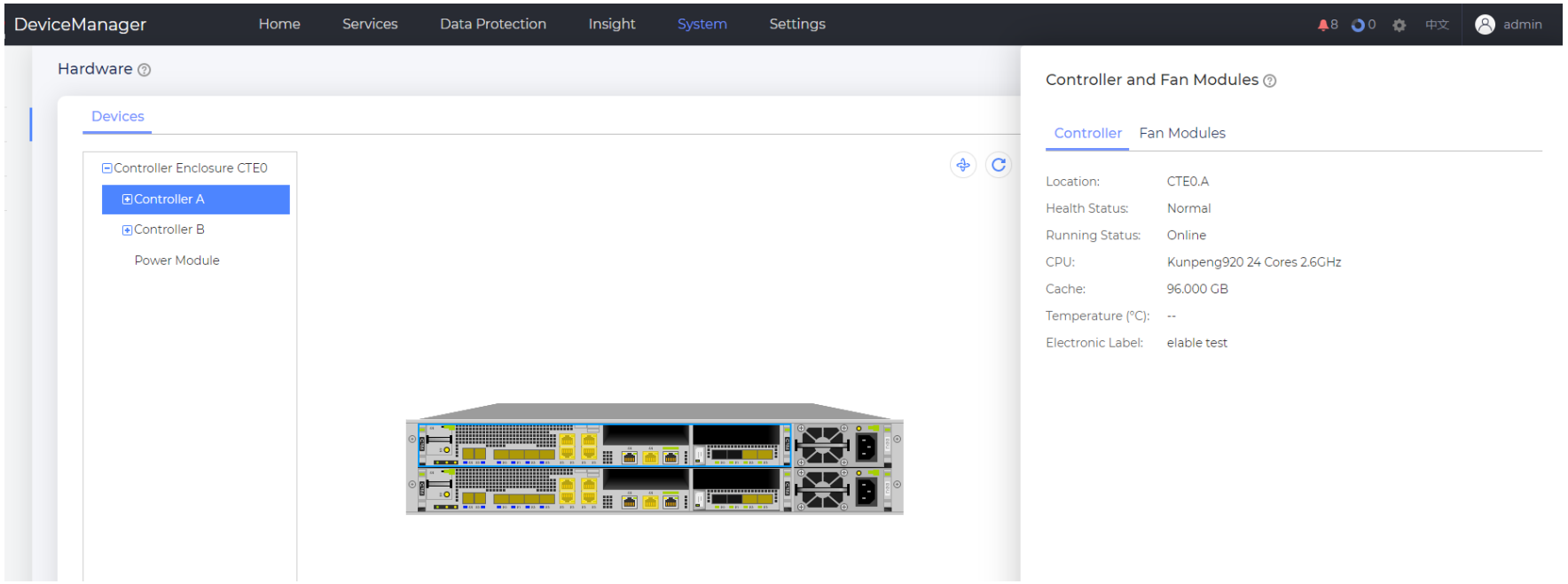
This section describes how to check the running status of a storage device and the functional status of the device on DeviceManager. This allows you to detect device faults in a timely manner.

Checking Device Running Status – Controller Enclosure



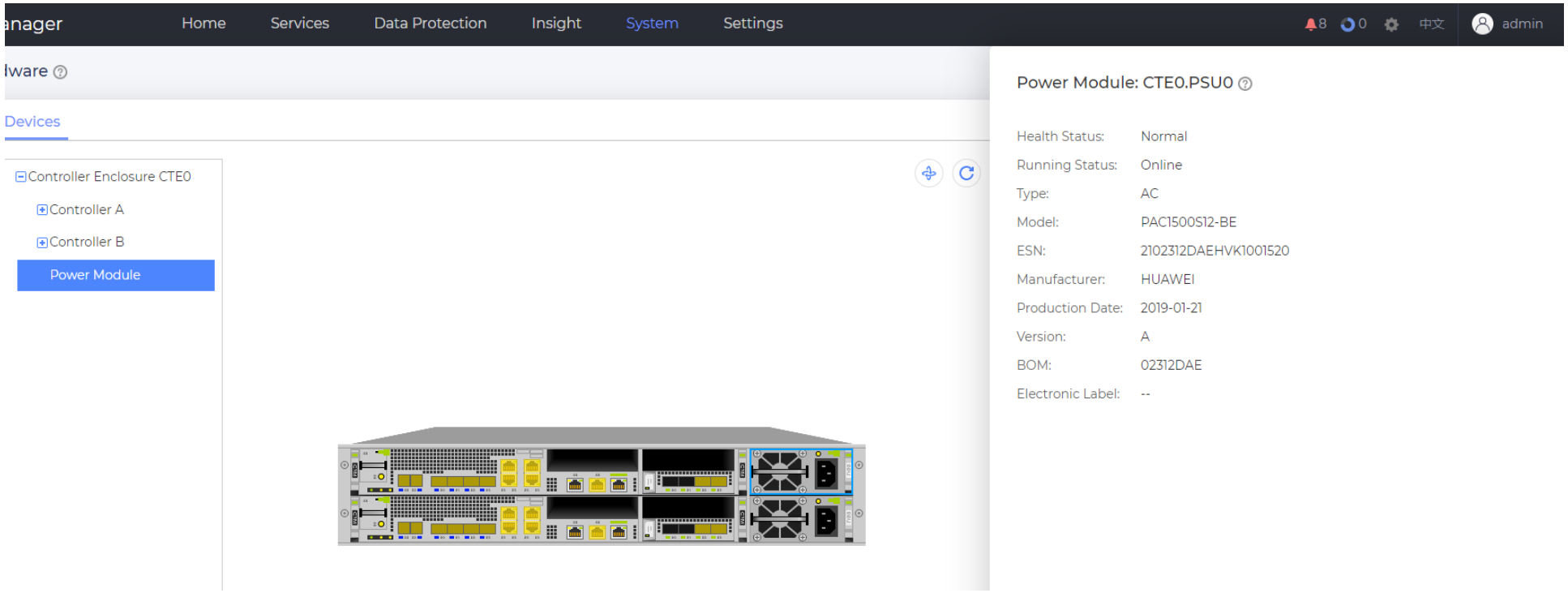
Parameter	Description
Health Status	•**Normal**: The functionality and operating performance of the enclosure are normal. •**Faulty**: The enclosure is working improperly.
Running Status	**Online** or **Offline**

Checking Device Running Status – Controller



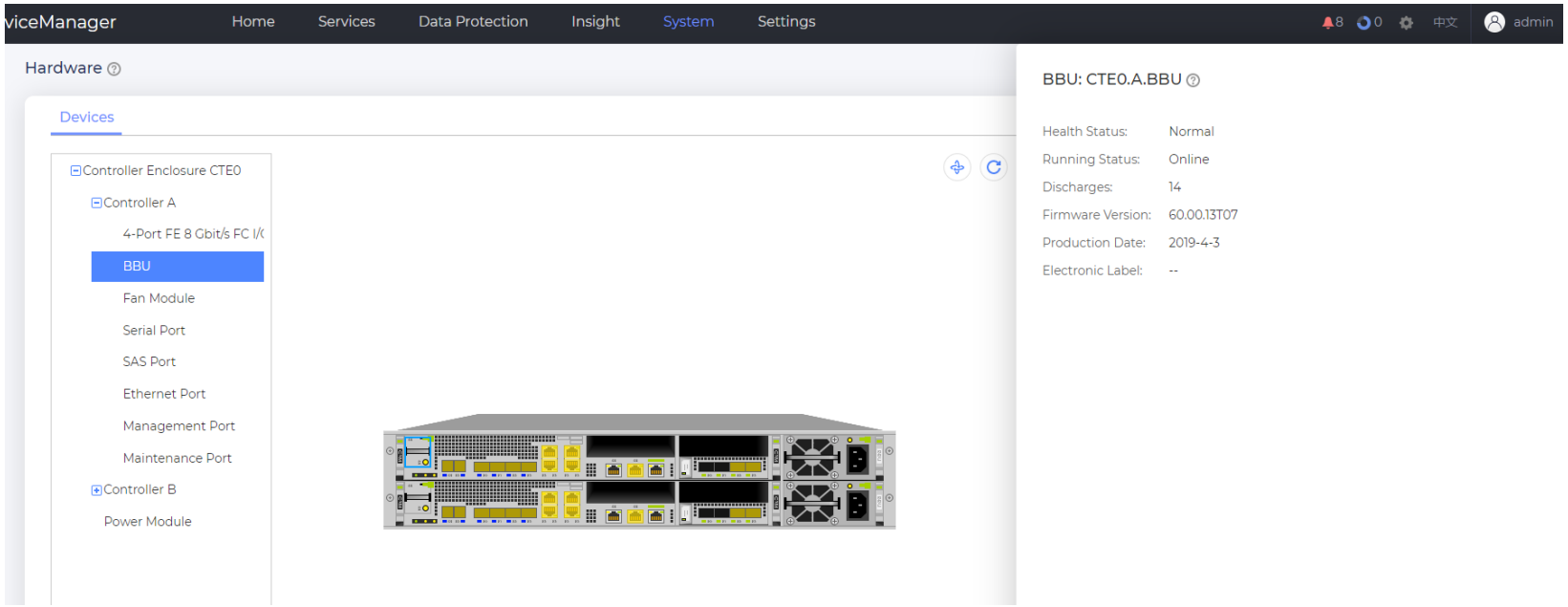
Parameter	Description
Health Status	•**Normal**: The controller is functioning and running normally. •**Faulty**: The controller is working improperly.
Running Status	**Online** or **Offline**

Checking Device Running Status – Power Module



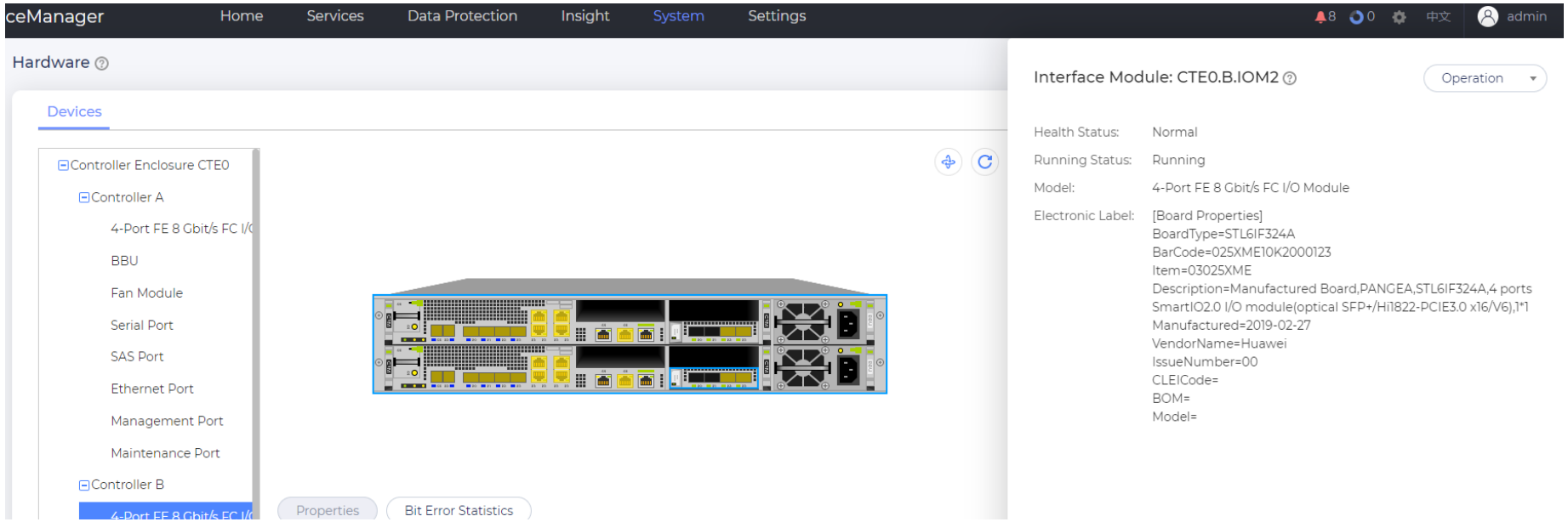
Parameter	Description
Health Status	•**Normal**: The power module is functioning and running normally. •**Faulty**: The power module is working improperly. •**No input**: The power module is in position but is not providing power.
Running Status	**Online** or **Offline**

Checking Device Running Status – Controller Enclosure BBU



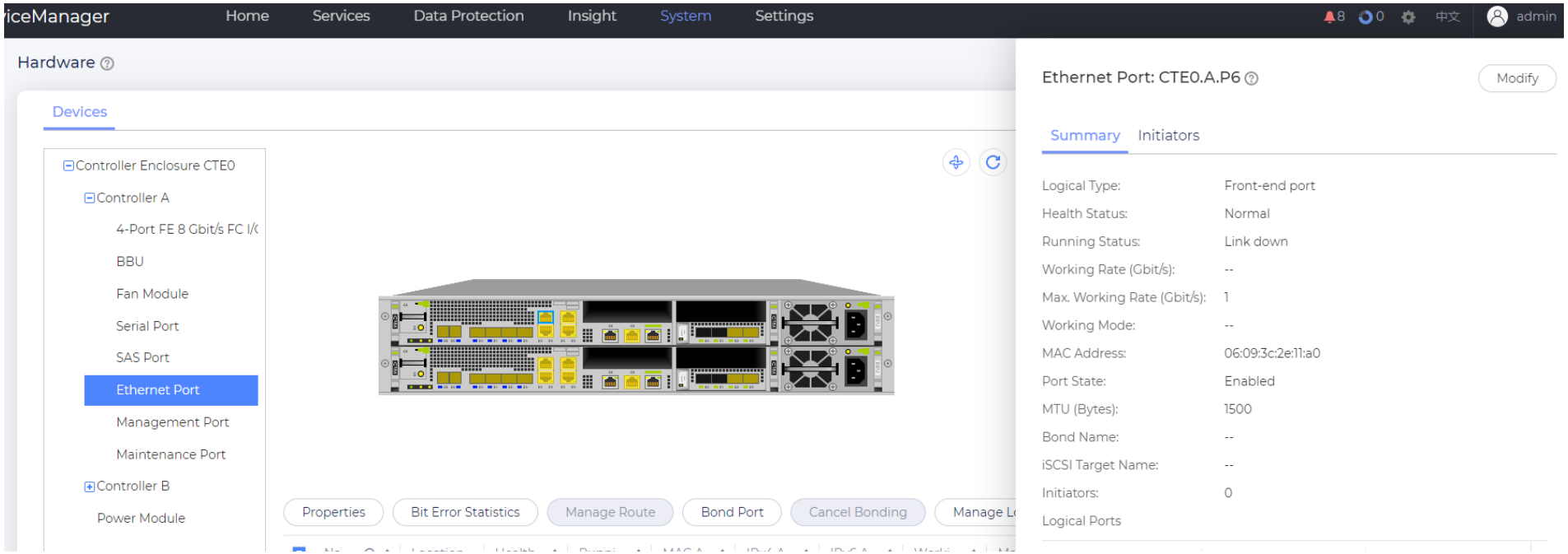
Parameter	Description
Health Status	•**Normal**: The BBU is functioning and running normally. •**Faulty**: The BBU is working improperly. •**Insufficient power**: The BBU has insufficient power but other parameters are normal.
Running Status	**Online**, **Charging**, or **Discharging**

Checking Device Running Status – Interface Module



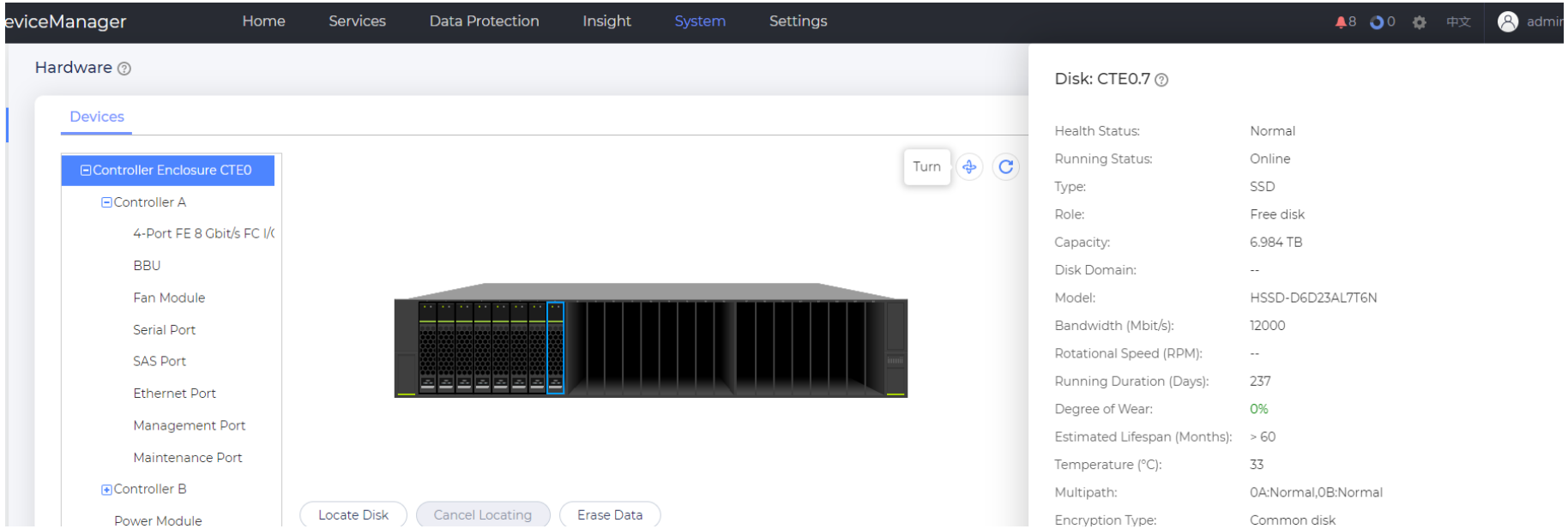
Parameter	Description
Health Status	•**Normal**: The interface module is functioning and running normally. •**Faulty**: The interface module is abnormal.
Running Status	**Running** or **Powered off**

Checking Device Running Status – Port



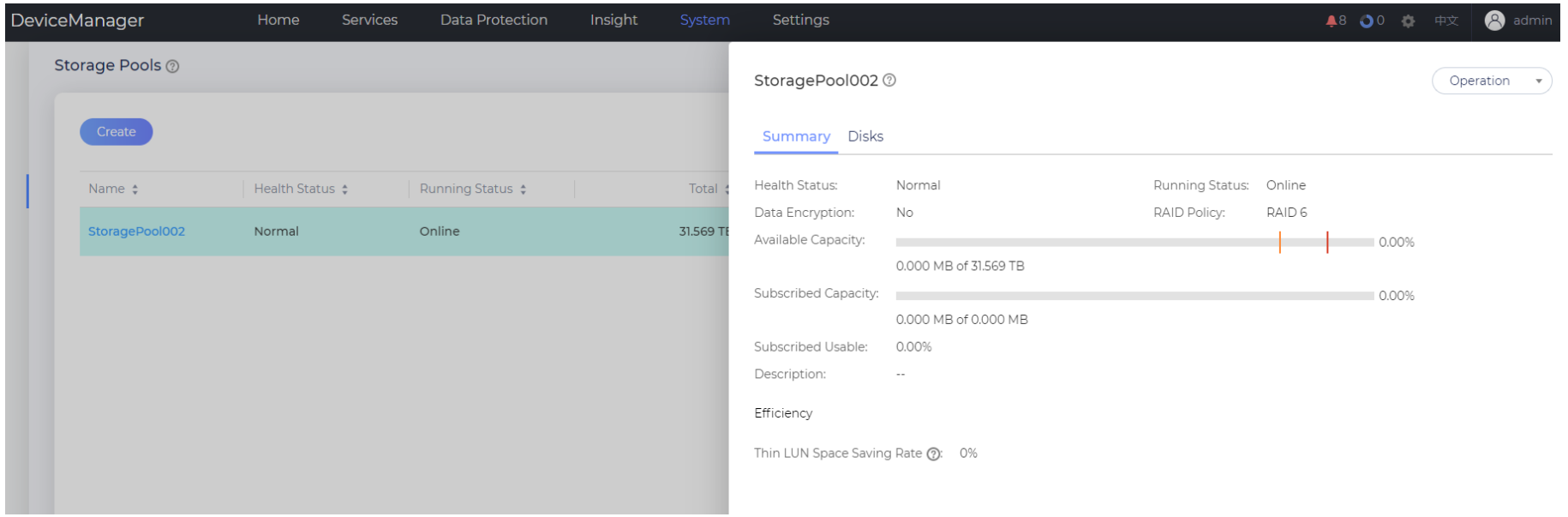
Parameter	Description
Health Status	•**Normal**: The host port is functioning and running normally. •**Faulty**: The host port is abnormal.
Running Status	**Link up** or **Link down**

Checking Device Running Status – Disk



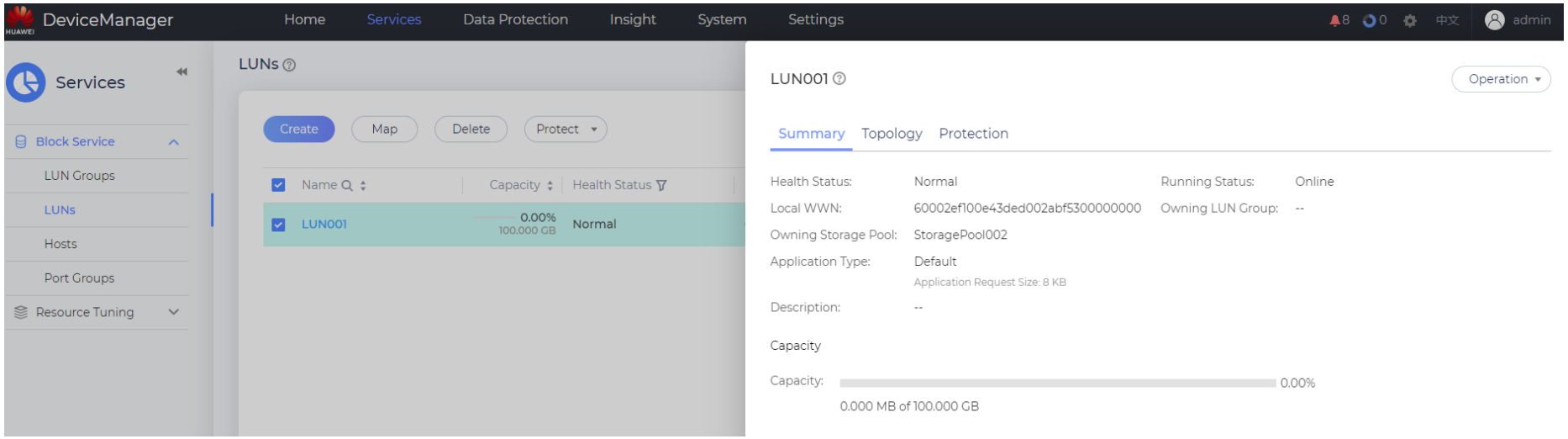
Parameter	Description
Health Status	•**Normal**: The disk is functioning and running normally. •**Faulty**: The disk is working improperly. •**Failing**. The disk is failing and needs to be replaced soon.
Running Status	**Online** or **Offline**

Checking Device Running Status – Storage Pool Status



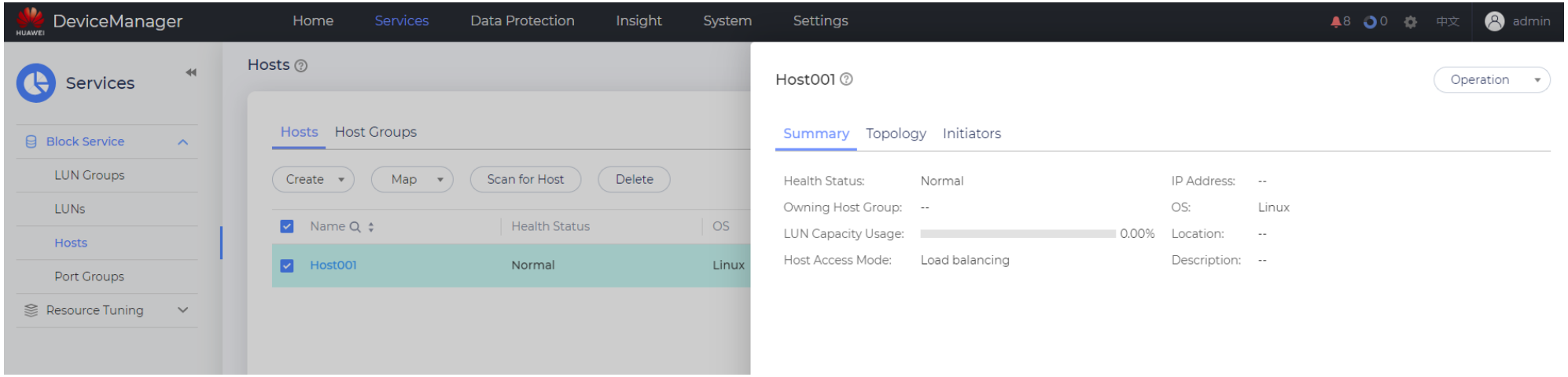
Parameter	Description
Health Status	**Normal**: The storage pool is functioning and running normally. **Degraded**: The storage pool is functioning normally, but cannot provide the optimal performance. **Faulty**: The storage pool is abnormal.
Running Status	Online, reconstruction, precopy, deleting, or offline

Checking Device Running Status – LUN



Parameter	Description
Health Status	•**Normal**: The LUN is functioning and running normally. •**Faulty**: The LUN is working improperly.
Running Status	**Online**, **Deleting**, or **Offline**

Checking Device Running Status – Host



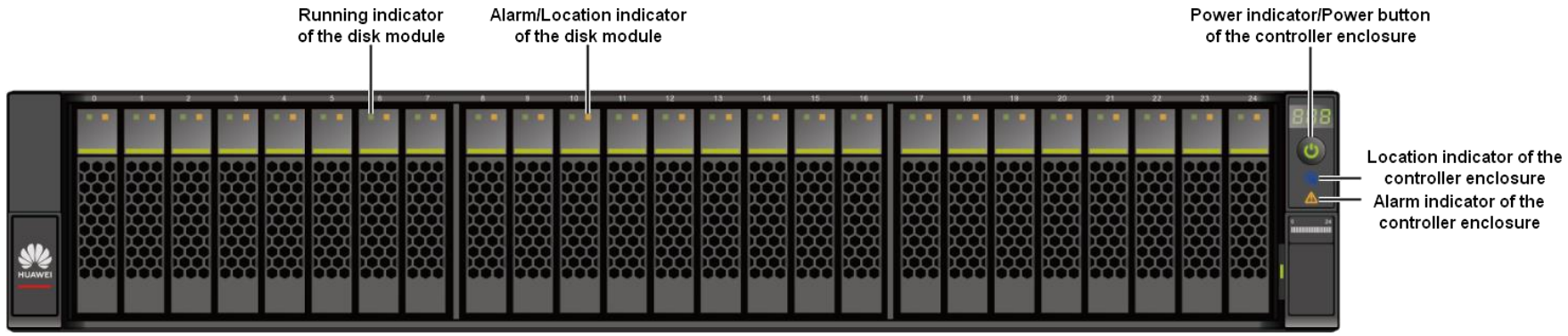
Parameter	Description
Status	•**Normal**: The host is functioning and running normally. •**Faulty**: The host is abnormal.

Checking Indicators

Controller enclosure or disk enclosure indicators show the running status of a controller enclosure or disk enclosure. By checking these indicators, you can promptly know the status of each component.

Checking Indicators -- Front Panel of the Controller Enclosure for Dorado 3000 V6

The following figure shows the indicators on the front panel of a controller enclosure.

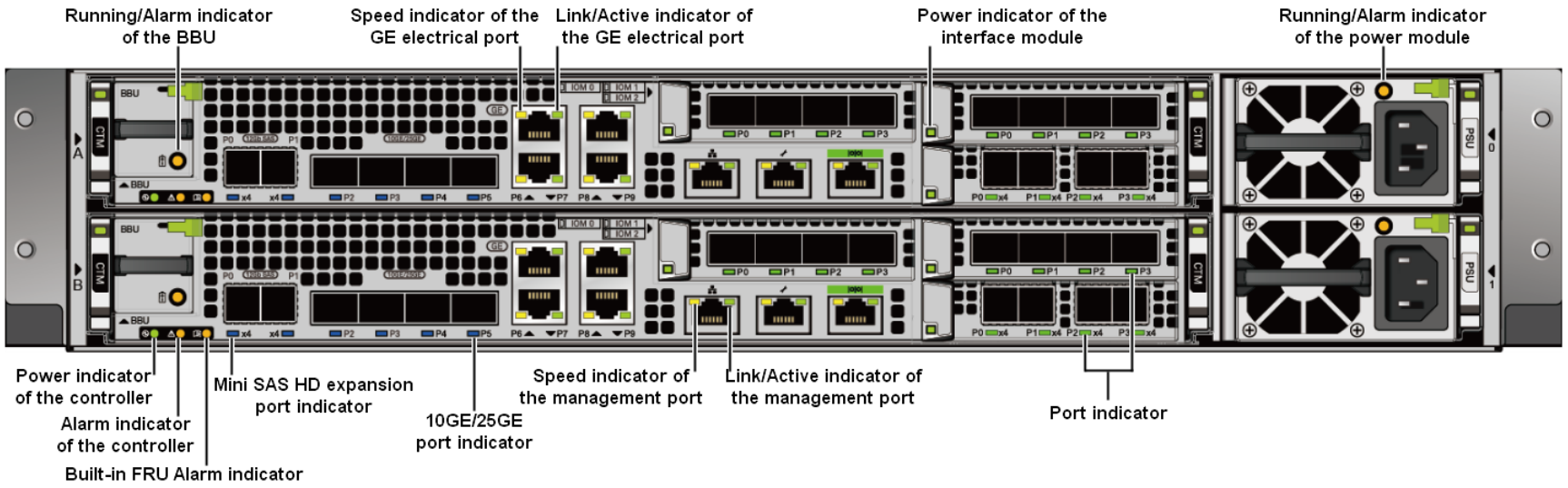


Checking Indicators -- Front Panel of the Controller Enclosure for Dorado 3000 V6

Module	Indicator Type	Status and Description
Disk module	Running indicator of the disk module	•Steady green: The disk module is working correctly. •Blinking green (4 Hz or higher): Data is being written to and read from the disk module. •Off: The disk module is powered off or powered on incorrectly.
	Disk module Location/Alarm indicator	•Steady yellow: The disk module is faulty. •Blinking yellow (2 Hz): The disk module is being located. •Off: The disk module is running properly or is pluggable.
System subrack	Controller enclosure Power indicator/Power button	•Steady green: The controller enclosure is powered on. •Blinking green (0.5 Hz): The controller enclosure has just been powered on. •Blinking green (1 Hz): The controller enclosure is in the burn-in state. •Blinking green (2 Hz): The controller enclosure is in the operating system boot process, or is being powered off. •Off: The controller enclosure is powered off or powered by the BBUs.
	Controller enclosure Location indicator	•Blinking blue (2 Hz): The controller enclosure is being located. •Off: The controller enclosure is not located.
	Controller enclosure Alarm indicator	•Steady yellow: The system has an alarm whose severity level is critical or higher. •Off: The storage system runs properly.

Checking Indicators -- Rear Panel of the Controller Enclosure for Dorado 3000 V6

The following figure shows the indicators on the rear panel of a controller enclosure.

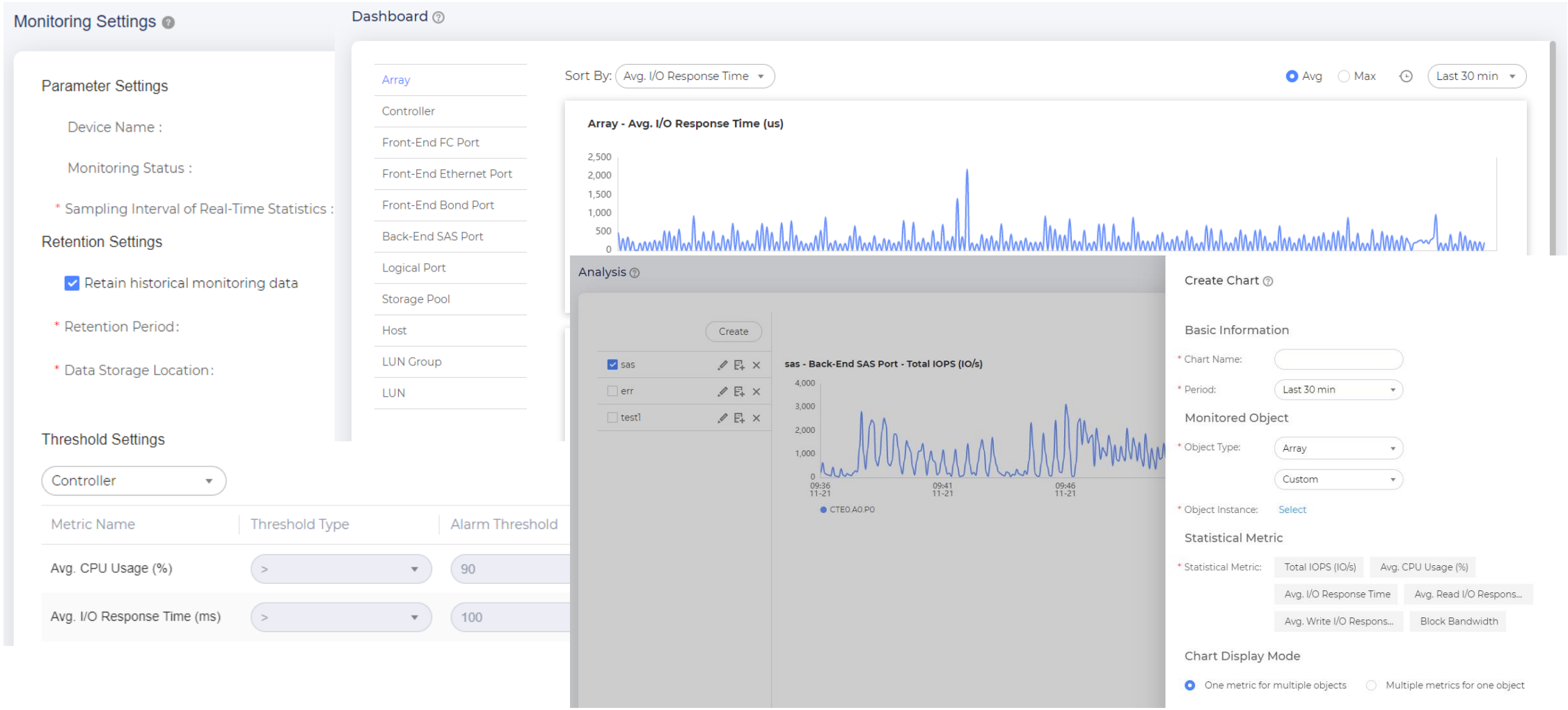


Checking Indicators -- Rear Panel of the Controller Enclosure for Dorado 3000 V6

Module	Indicator	Status and Description
Controller	BBU Running/Alarm indicator	•Steady green: The BBU is fully charged. •Blinking green (1 Hz): The BBU is being charged. •Blinking green (4 Hz): The BBU is being discharged. •Steady yellow: The BBU is faulty. •Off: The two planes are shut down or powered off successfully.
	Power indicator of the controller	•Steady green: The controller is powered on. •Blinking green (0.5 Hz): The controller is powered on and in the BIOS boot process. •Blinking green (2 Hz): The controller is in the operating system boot process, or is being powered off. •Off: The controller is absent or powered off.
	Controller Alarm indicator	•Steady yellow: An alarm is generated on the controller. •Off: The controller is working correctly.
	Built-in FRU Alarm indicator	•Steady yellow: A built-in FRU (fan module) of the controller is faulty. •Off: The built-in FRUs of the controller are normal.
	Mini SAS HD expansion port indicator	•Steady blue: Data is transmitted upward to the disk enclosure at the rate of 4 x 12 Gbit/s. •Steady green: Data is transmitted downward to the disk enclosure at the rate of 4 x 6 Gbit/s. •Steady yellow: The port is faulty. •Off: The link to the port is down.
	10GE/25GE port indicator	•Steady blue: The speed is the highest. •Blinking blue (2 Hz): The port is transmitting data at the highest speed. •Steady green: The speed is not the highest. •Blinking green (2 Hz): The port is transmitting data, but not at the highest speed. •Steady yellow: The optical module or cable is faulty or not supported by the port. •Blinking yellow (2 Hz): The problem is being located. •Off: The link to the port is down.
	Speed indicator of a 10GE electrical port	•Steady yellow: Data is transmitted between the storage system and the application server at a rate of 1 Gbit/s. •Off: Data is transmitted between the storage system and the application server at a rate lower than 1 Gbit/s.
	Link/Active indicator of a GE electrical port	•Steady green: The link to the application server is normal. •Blinking green (2 Hz): Data is being transmitted. •Off: The link to the application server is down.
	Management network port Speed indicator	•Steady yellow: Data is being transmitted at the highest rate. •Off: The speed is not the highest.
	Management network port Link/Active indicator	•Steady green: The port is properly connected. •Blinking green (2 Hz): Data is being transmitted. •Off: The port is incorrectly connected.
Interface module	Power indicator on an interface module	The controller supports various interface modules. For details about the indicator status of an interface module, see Indicator Description of an Interface Module.
	Port indicator	
Power module	Running/Alarm indicator of a power module	•Steady green: The power supply is working properly. •Blinking green (1 Hz): The power input is normal but the device is powered off. •Blinking green (4 Hz): The power module is being upgraded online. •Steady yellow: The power module is faulty. •Off: No external power is input.

Checking Performance

On DeviceManager, you can view various performance monitoring data.



Quiz

Question

1. What are the alarm severities of Dorado V6?

A. Critical *B.Major*

C. Warning *D. Info*

Answer

- *ABCD*

Content

Log Collection

- Smartkit(Recommanded)
- DeviceManager-> When can not use Smartkit
- OtherTools(eg: WinSCP)->When can’t access DeviceManager (eg: system didn’t power on normally)

Log Collection-Smartkit(Recommanded)-Installation Tool(1)

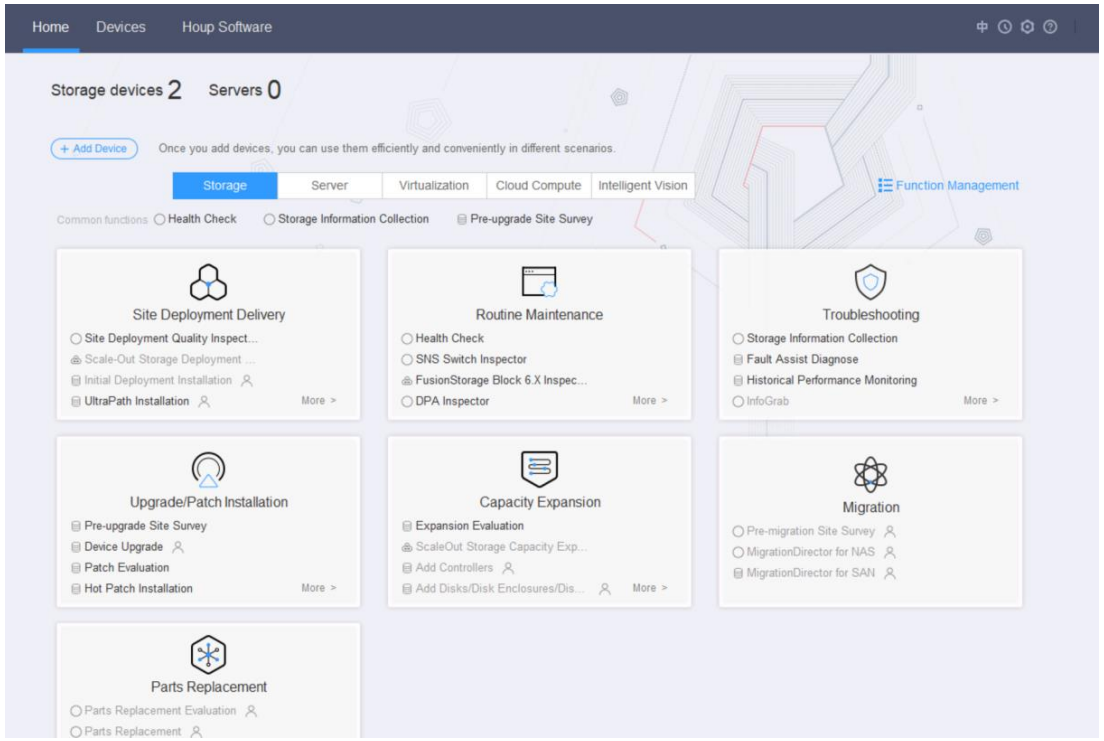
Download the Smartkit software and install it

https://support.huawei.com/enterprise/en/distributed-storage/smartkit-pid-8576706/software/260338071?idAbsPath=fixnode01%7C7919749%7C251366268%7C250389224%7C251366263%7C8576706

Version and Patch Software

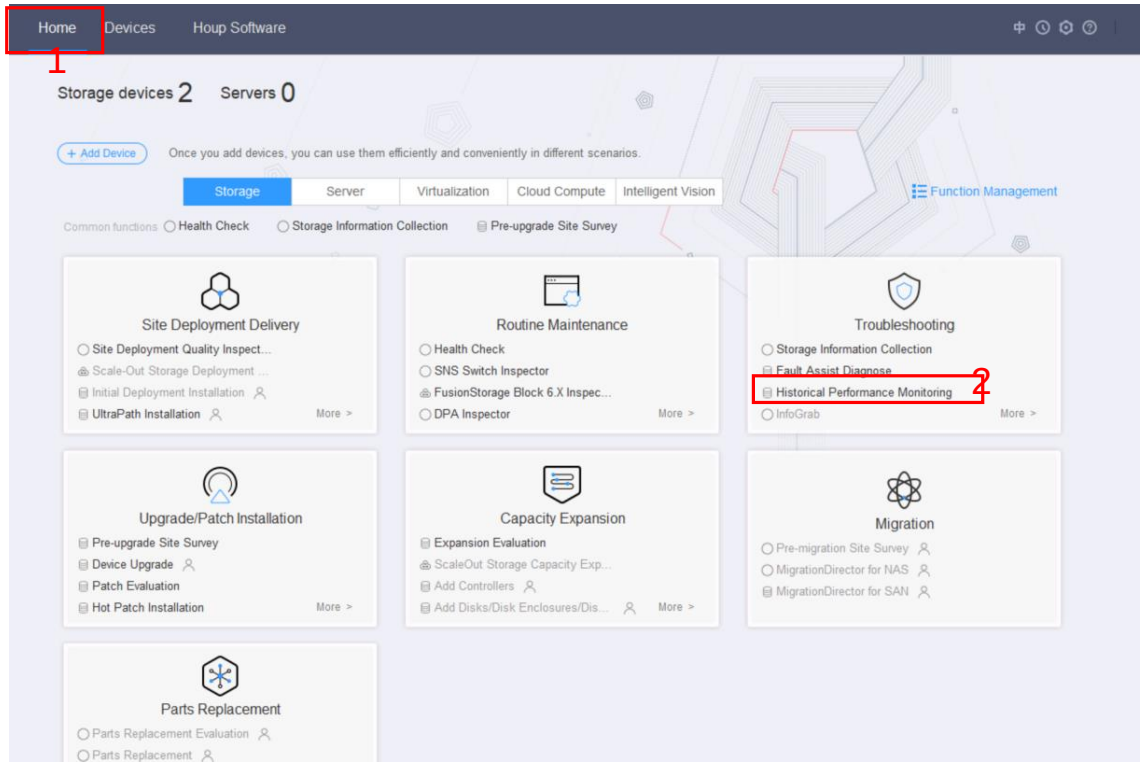
By downloading a software package, you agree to Huawei Enterprise Software License Agreement.

Software Name	Size	Publication Date	Downloads	Download software	Manual Verification Signature File	Automatic Verification Signature File
SmartKit_22.0.2.3.zip [Tool Box]SmartKit Frame(Storage products have integrated inspection, information collection, archive collection, and patching tools, and are applicable to the SVP of 18000 V3 and later. The server has integrated hardware configuration, IP configuration, IES configuration, power control, firmware upgrade, and E9000/TCE upgrade components).	889.68MB	2023-06-01	278		pgp	cms
SmartKit_22.0.2.3_Convergent_UpgradePreCheck_1.0.9.94.tar.gz [DeviceManager upgrade] Pre-upgrade evaluation (Scenario: Update the check item component package before the upgrade evaluation on DeviceManager.)	67.76KB	2023-06-01	18		pgp	cms
SmartKit_22.0.2.3_Dorado_UpgradePreCheck_1.2.13.032.tar.gz [eService upgrade] Pre-upgrade evaluation (Scenario: Update the check item component package before the upgrade evaluation on eService.)	219.20KB	2023-06-01	25		pgp	cms
SmartKit_22.0.2.3_Tool_ArrayUpgrade.zip [Tool package]Upgrade tool, help you complete an upgrade of the device, including performing a pre-upgrade check, importing the upgrade package, backing up critical data, performing the upgrade, and performing a post-upgrade verification.(Scene: Device Upgrade,Disk Firmware Upgrade,UltraPath Software Upgrade)	112.25MB	2023-06-01	188		pgp	cms
SmartKit_22.0.2.3_Tool_CollectDeviceArchives.zip [Tool package]Collect device archives tool,help you collect configuration and deployment information about storage devices and generates device archive files. IBMS archive mode is supported.	102.20MB	2023-06-01	92		pgp	cms
SmartKit_22.0.2.3_Tool_DiskHealthAnalysis.zip [Tool package]Disk health analysis tool, help you analyze the collected disk SMART information	83.22MB	2023-06-01	79		pgp	cms



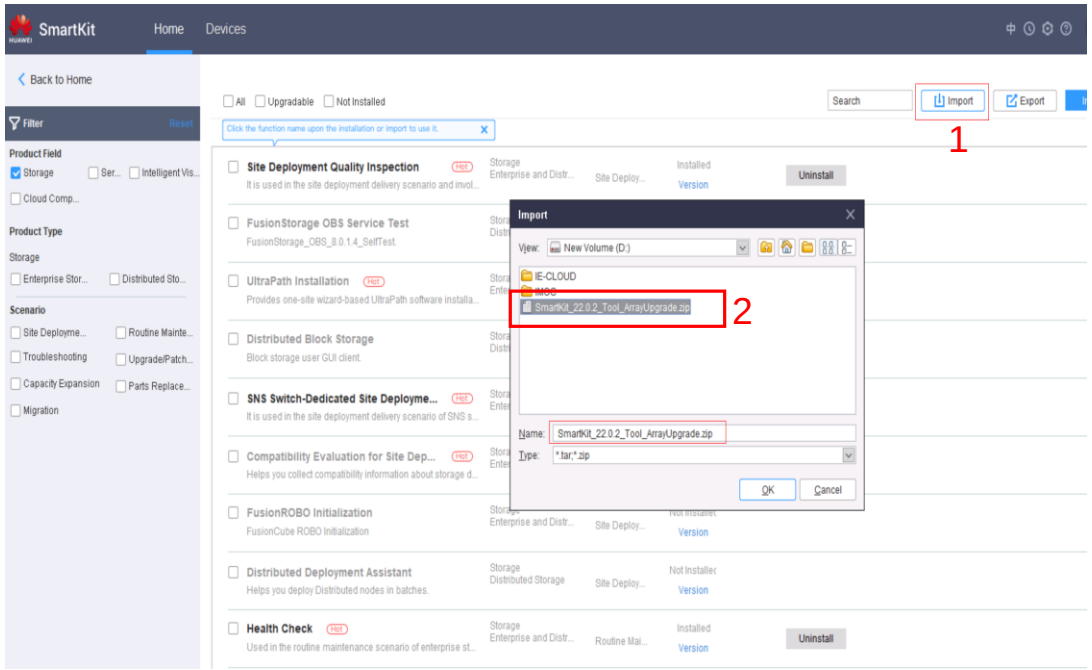
Log Collection-Smartkit(Recommanded)-Installation Tool(2)

Download and automatically install the related tools on the SmartKit page.



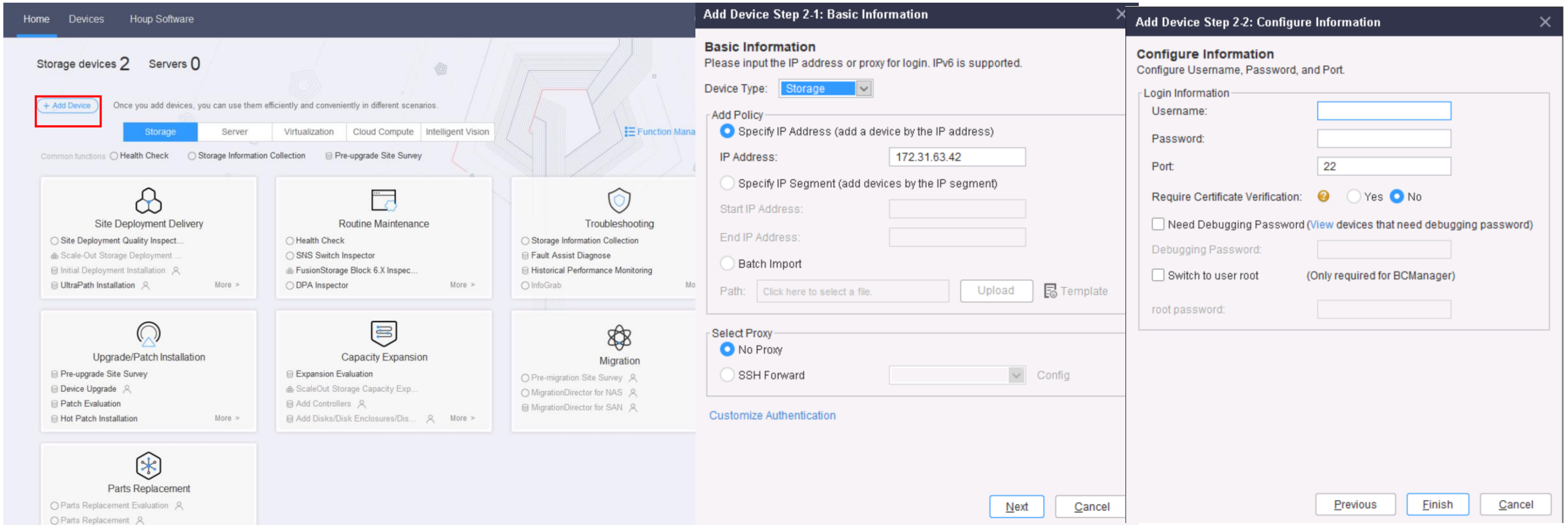
1. Go to the **Home** page.
2. Click tool icon to download and install the related tools by one click.

In a scenario where Internet is unavailable, obtain the tool package and then import it on the GUI.



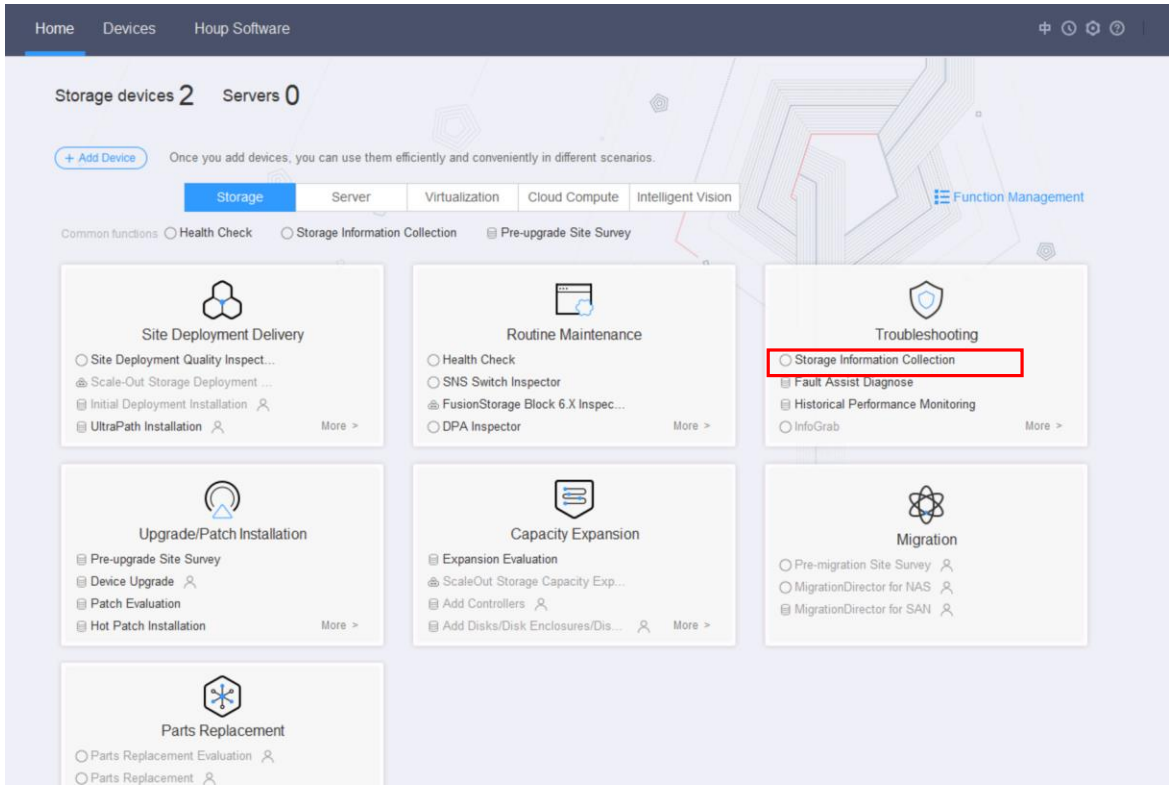
1. Click **Import**.
2. Select the tool package.

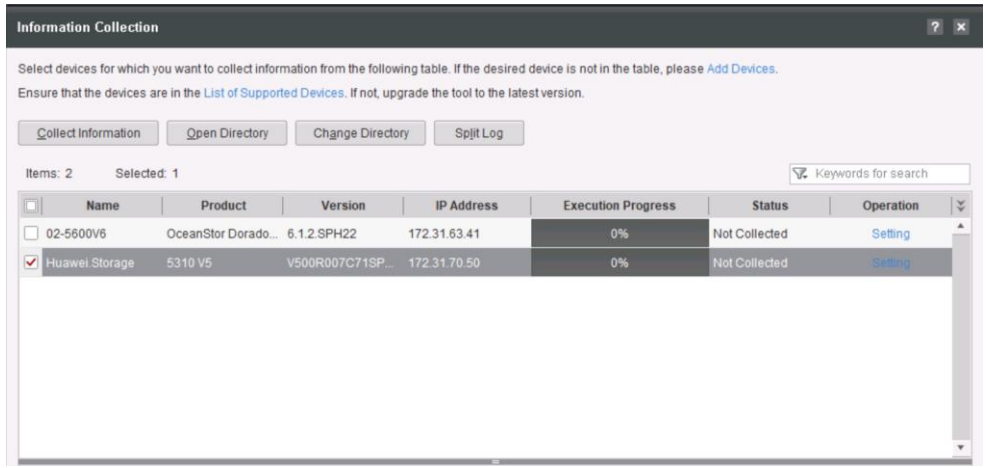
Log Collection-Smartkit(Recommanded)-Add device

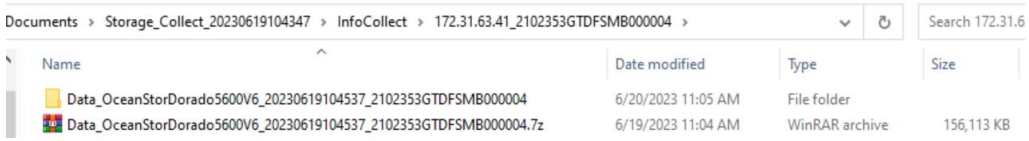


1. Click “Add Device” button
2. Input ManagementIP, username and password to add device to smartkit

Log Collection-Smartkit(Recommanded)-Collect logs





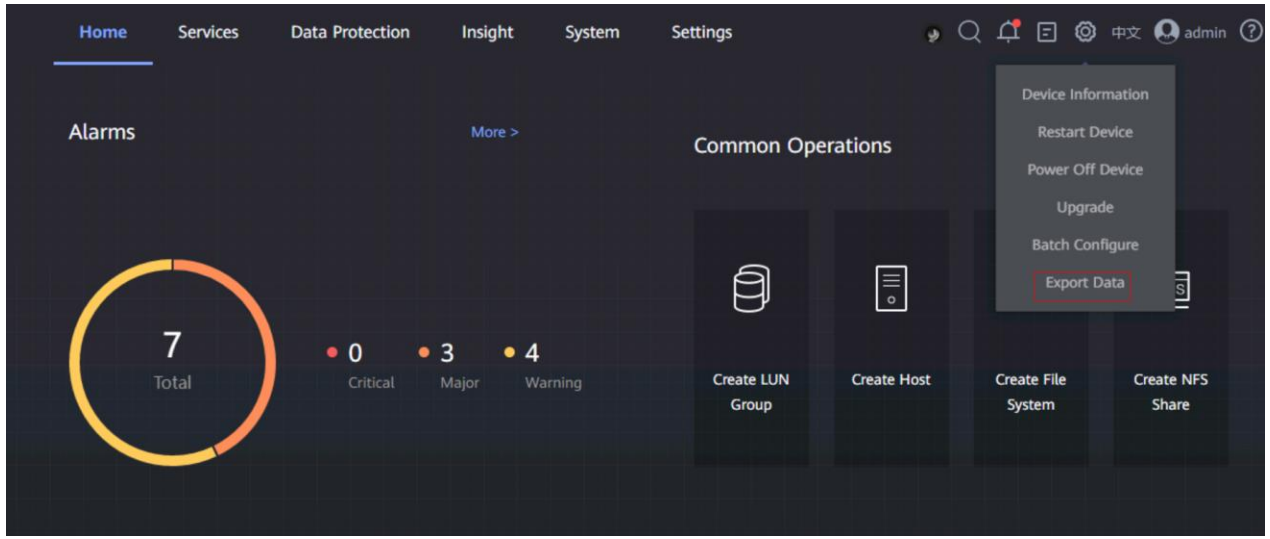


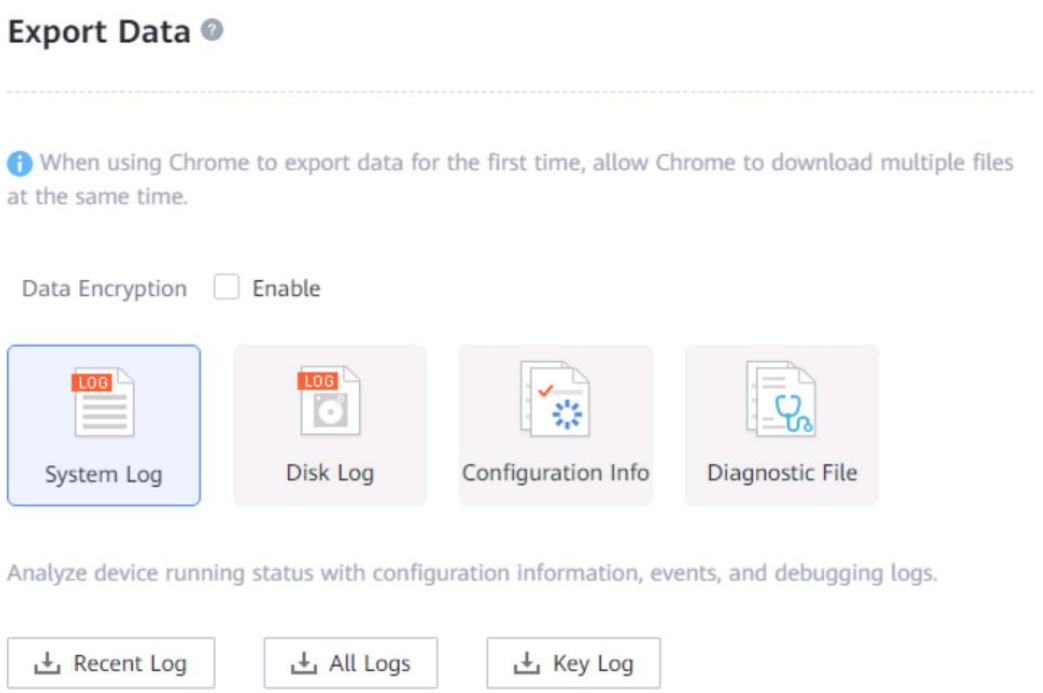
Click “Storage Information Collection” Button

PS: For some cases, we need to collect Performance log by clicking ”Historical Performance Monitoring” Button

Log Collection-DeviceManager

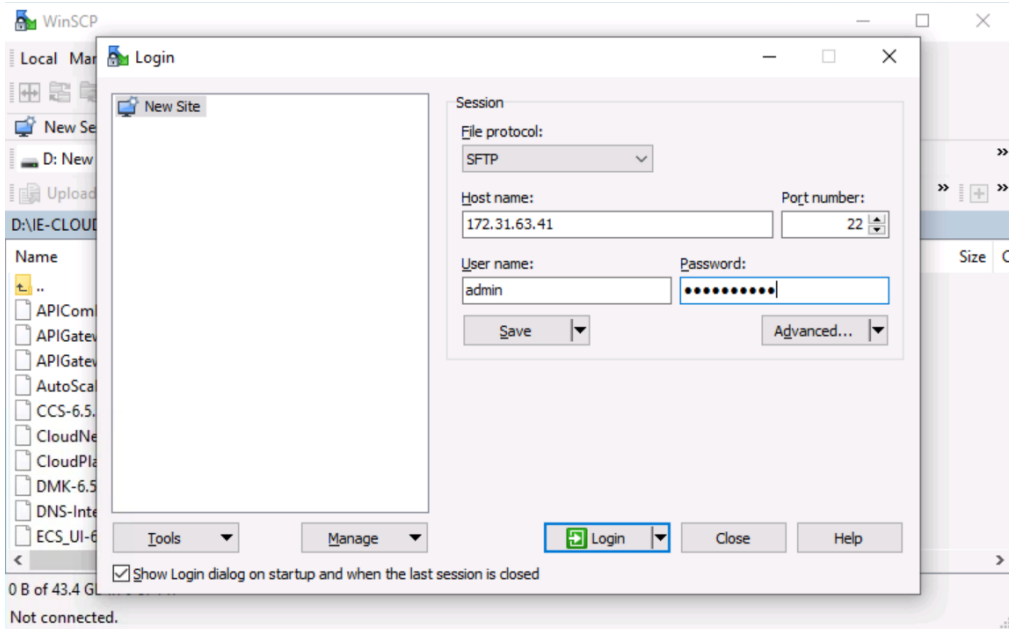
Click “Export Data”->”System Log”

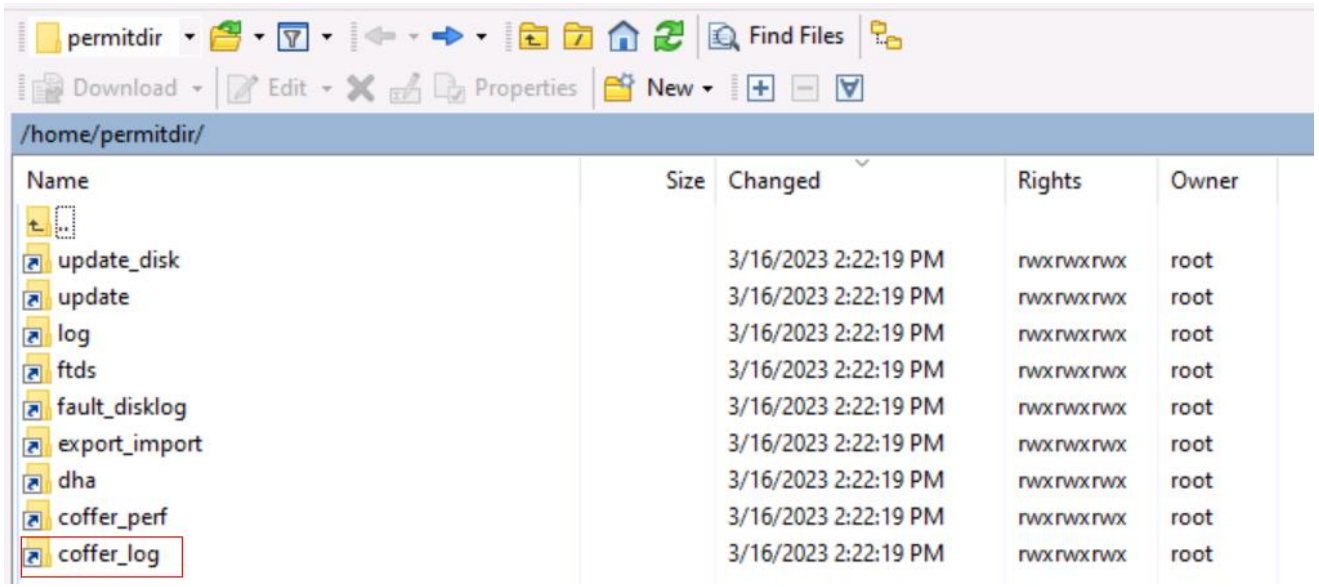




Log Collection-Other Tool(eg:WinSCP)

1.Using Tool connect storage Management IP
2.Copy OSM/coffer_log folder to local folder (OSM/coffer_data/omm/perf for performance log)





Quiz

Question

1. What are the methods to collect storage logs? ( )

A. Using Smartkit Tool

B. DeviceManager

C. WinSCP.

Answer

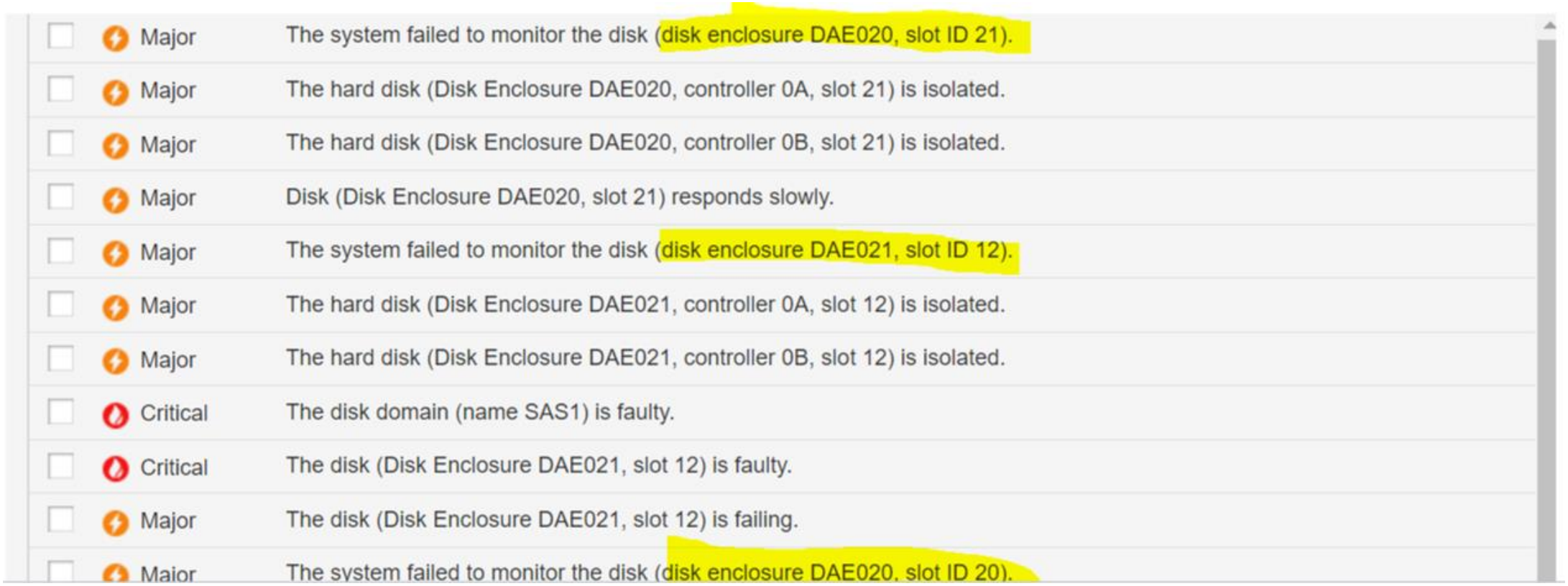
- *A,B,C*

Content

Case 1:Hardware fault

[Problem Description]

Hardware fault, device manager reports alarm regarding the fault issue.



Case 1:Hardware fault

[Problem Analysis And Solution]

Collect logs, and check event log and config.txt, double confirm the issue then find the BOM of fault part. Do the replacement for it.

Event.txt path: “DataCollect\Alarm_log \Event\local_alm_file.txt” .

config.txt patch: “\DataCollect\Running_Data\config.txt”

```
Disk ID: 560
Disk Domain ID: 1
Disk Frame and Slot ID: DAE020.21
Disk Type: SAS
Disk Health Status: Fault
Disk Running Status: Offline
Raw capacity: 555(GB)
Device Block Number: 1146125998
Disk Multipathing: A,B
Disk Sector Size: 520
Disk Impending Fault Flag: FALSE
Disk Slowing Flag: FALSE
Disk SN: [redacted]
Disk Temperature: 36
Disk Power-On Time: 6(Day)
Disk Speed: 15000(RPM)
Disk Physical Size: 3
Disk Port Address: 5FCE33CB1B526015
Disk Vendor: Seagate
Disk Model: ST600MP0006
Disk Firmware: N004
Disk Elabel:
    [Board Properties]
    BoardType=STLZB1SA600
    BarCode=[redacted]
    Item=02351CER
    Description=OceanStor 5600/5800/6800 V3,STLZB1S
    Manufactured=2020-03-23
    VendorName=Huawei
    IssueNumber=00
    CLEICode=
    BOM=
```

```
Disk ID: 577
Disk Domain ID: 1
Disk Frame and Slot ID: DAE021.12
Disk Type: SAS
Disk Health Status: Fault
Disk Running Status: Offline
Raw capacity: 555(GB)
Device Block Number: 1146125998
Disk Multipathing: A,B
Disk Sector Size: 520
Disk Impending Fault Flag: FALSE
Disk Slowing Flag: FALSE
Disk SN: [redacted]
Disk Temperature: 38
Disk Power-On Time: 5(Day)
Disk Speed: 15000(RPM)
Disk Physical Size: 3
Disk Port Address: 5FCE33CB1B51800C
Disk Vendor: Seagate
Disk Model: ST600MP0006
Disk Firmware: N004
Disk Elabel:
    [Board Properties]
    BoardType=STLZB1SA600
    BarCode=[redacted]
    Item=02351CER
    Description=OceanStor 5600/5800/6800 V3,STLZB1SA600,600GB 15K
    Manufactured=2020-03-23
    VendorName=Huawei
    IssueNumber=00
    CLEICode=
```

```
Disk ID: 556
Disk Domain ID: 1
Disk Frame and Slot ID: DAE020.20
Disk Type: SAS
Disk Health Status: Fault
Disk Running Status: Offline
Raw capacity: 555(GB)
Device Block Number: 1146125998
Disk Multipathing: A,B
Disk Sector Size: 520
Disk Impending Fault Flag: FALSE
Disk Slowing Flag: FALSE
Disk SN: [redacted]
Disk Temperature: 36
Disk Power-On Time: 5(Day)
Disk Speed: 15000(RPM)
Disk Physical Size: 3
Disk Port Address: 5FCE33CB1B526014
Disk Vendor: Seagate
Disk Model: ST600MP0006
Disk Firmware: N004
Disk Elabel:
    [Board Properties]
    BoardType=STLZB1SA600
    BarCode=[redacted]
    Item=02351CER
    Description=OceanStor 5600/5800/6800 V3,STLZB1SA600,600GB
    Manufactured=2020-03-23
    VendorName=Huawei
    IssueNumber=00
    CLEICode=
    BOM=
```

Case 2:Connection issue

[Problem Description]

Connection issue may caused by Storage, Link and Server. We need to check it one by one to find out the root cause. Use “Bit error” issue for example. Customer reported that they found a lot of alarms regarding bit error in storage, need Huawei check the reason

```
2022-11-05 18:02:30    FC front-end port (controller enclosure CTE0, SmartIO interface module R2.IOM0, port ID P3) has too many bit errors. The system performance may be affected.
2022-11-05 15:50:39    FC front-end port (controller enclosure CTE0, SmartIO interface module L2.IOM0, port ID P3) has too many bit errors. The system performance may be affected.
2022-11-05 15:35:39    FC front-end port (controller enclosure CTE0, SmartIO interface module L2.IOM0, port ID P3) has too many bit errors. The system performance may be affected.
2022-11-05 15:18:23    FC front-end port (controller enclosure CTE0, SmartIO interface module L2.IOM0, port ID P3) has too many bit errors. The system performance may be affected.
2022-11-05 15:50:59    FC front-end port (controller enclosure CTE0, SmartIO interface module R2.IOM0, port ID P3) has too many bit errors. The system performance may be affected.
```

[Problem Analysis]

1.Collect logs, check if ports in storages working normally.

```
//          ID: CTE0.R2.IOM0.P3
          Health Status: Normal
          Running Status: Link Up

        ID: CTE0.L2.IOM0.P3
      Health Status: Normal
      Running Status: Link Up
```

```
SFP Info:
    Vendor: FINISAR CORP.
    Model: FTLF8532P4BCV-HU
    SN: P1BBKN4
    Health Status: Normal
    Running Status: Link Up
    Type: Multi Mode
    Working Rate(Mbps): 32000
    Temperature(C): 52
    RxPowerReal(uW): 634.8
    RXPowerMax(uW): 3162.2
    RXPowerMin(uW): 47.8
    TxPowerReal(uW): 673.0
    TXPowerMax(uW): 1584.9
    TXPowerMin(uW): 213.7
    Item: --
    ExternalModel: --
    Rev: --
```

```
SFP Info:
    Vendor: FINISAR CORP.
    Model: FTLF8532P4BCV-HU
    SN: P1BBL26
    Health Status: Normal
    Running Status: Link Up
    Type: Multi Mode
    Working Rate(Mbps): 32000
    Temperature(C): 52
    RxPowerReal(uW): 628.9
    RXPowerMax(uW): 3162.2
    RXPowerMin(uW): 47.8
    TxPowerReal(uW): 651.9
    TXPowerMax(uW): 1584.9
    TXPowerMin(uW): 213.7
    Item: --
    ExternalModel: --
    Rev: --
```

Case 2:Connection issue

[Problem Analysis]

2.Check FC switch logs. If the attached ports in FC switch is working normally.

CTE0.R2.IOM0.P3->port 77 in switch ; CTE0.L2.IOM0.P3 ->port 78 in switch

```
// 77   77   014d00   id   N16   Online   FC   F-Port   22:03:04:fe:8d:81:83:b0

// 77:  512.1m  2.0g  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0

Warn Flags[0,1] = 0x0, 0x0
                                          Alarm                Warn
                                     low       high        low       high
Temperature: 41       Centigrade      -5        85          0         75
Current:     7.338    mAmps           2.500     12.000      2.000     11.500
Voltage:     3280.7   mVolts          3000.0    3600.0      3130.0    3460.0
RX Power:    -2.3     dBm (587.9uW)   31.6  uW  1258.9 uW   31.6  uW  794.0  uW
TX Power:    -2.7     dBm (537.6 uW)  126.0 uW  1258.9 uW   251.0 uW  794.0  uW

State transitions: 3
Last poll time: 11-09-2022 HKT Wed 16:40:18

=============
Port 78:
=============
```

```
78   78   014e00   id   N16   Online   FC   F-Port   22:13:04:fe:8d:81:83:b0

// 78:  3.0g  2.4g  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0

Warn Flags[0,1] = 0x0, 0x0
                                          Alarm                Warn
                                     low       high        low       high
Temperature: 41       Centigrade      -5        85          0         75
Current:     7.396    mAmps           2.500     12.000      2.000     11.500
Voltage:     3286.8   mVolts          3000.0    3600.0      3130.0    3460.0
RX Power:    -2.1     dBm (616.2uW)   31.6  uW  1258.9 uW   31.6  uW  794.0  uW
TX Power:    -2.5     dBm (568.0 uW)  126.0 uW  1258.9 uW   251.0 uW  794.0  uW

State transitions: 3
Last poll time: 11-09-2022 HKT Wed 16:39:46

=============
Port 79:
```

Case 2:Connection issue

[Problem Analysis]

3.Check the error code, it is BadCrc, this kind of error message usually comes from other devices.

```
[2022-11-05 15:48:03][98753193.513907] [][15000000c2696][INFO][LPort(0x110203)'s BadCrc(190), BadRx(0), DisFrame(157), LinkFail(0), LossOfSig(0), LossOfSync(0), ProtoErr(0),
RxEof(2).][FC_UNF][UNF_PollPortErrCode,18852][kworker/3:1]
```

4.Check the error message in switch, port 20 has a lot of error message. Double check the SFP power module, the Rx is low

```
asinkdsan51:FID128:admin> porterrshow
```

	frames tx	frames rx	enc in	crc err	crc g_eof	too shrt	too long	bad eof	enc out	disc c3	link fail	loss sync	loss sig	frjt	fbsy	c3timeout tx	c3timeout rx	pcs err
0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:	778.9m	3.5g	0	0	0	0	0	0	0	133	0	0	0	0	0	0	133	0
2:	2.8g	256.8m	0	0	0	0	0	0	0	203	0	0	0	0	0	0	203	0
3:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:	401.9m	280.7m	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:	3.7g	1.2g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:	3.2g	661.8m	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:	3.5g	1.2g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:	4.2g	870.3m	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:	1.1g	4.1g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:	670.3m	3.3g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:	3.7g	2.8g	0	0	0	0	0	0	0	321	0	0	0	0	0	0	321	0
17:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:	867.9m	3.5g	0	0	0	0	0	0	0	333	0	0	0	0	0	0	333	0
19:	2.3g	2.8g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:	2.2g	574.7m	2.0k	2.0k	2.0k	0	0	9	712.1k	3.0k	0	0	0	0	0	3.0k	0	0
21:	1.9g	3.0g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:	4.1g	2.3g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:	3.5g	674.6m	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24:	3.9g	1.1g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

```
                                              Alarm                  Warn
                                          low       high         low       high
Temperature:  41       Centigrade         -5        85           0         75
Current:      7.428    mAmps              2.500     12.000       2.000     11.500
Voltage:      3290.1   mVolts             3000.0    3600.0       3130.0    3460.0
RX Power:     -9.3     dBm (116.2uW)      31.6  uW  1258.9 uW    31.6  uW  794.0  uW
TX Power:     -2.5     dBm (558.6 uW)     126.0 uW  1258.9 uW    251.0 uW  794.0  uW

State transitions: 1
Last poll time: 11-09-2022 HKT Wed 16:42:30

=============
Port 21:
```

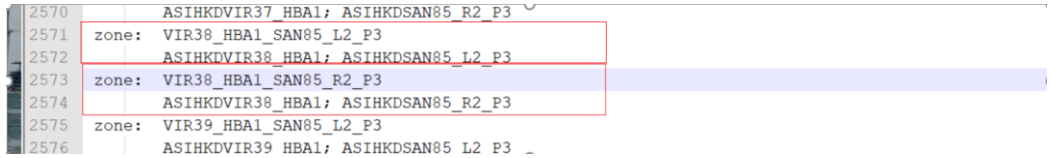

HUAWEI

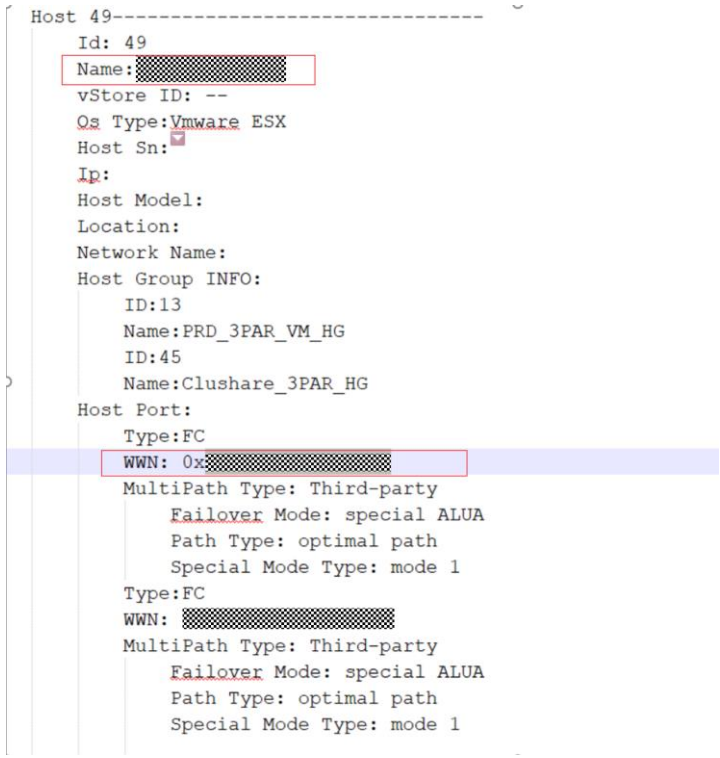
Case 2:Connection issue

[Problem Analysis]

5.Check port 20. We can find it is Zoning with storage port CTE0.R2.IOM0.P3 and CTE0.L2.IOM0.P3.

6.In storage configuration, we can know Port 20 is connect to a Server and HBA information can be find in storage configuration





Case 2:Connection issue

[Root Cause]

1. Ports on OceanStor 18000 V5: The CTE0.L2.IOM0.P3 CTE0.R2.IOM0.P3 status are normal, the receive and transmit optical power are normal.

2. Ports 77 and 78 connected to the storage on the FC switch are normal, the receive and transmit power are normal.

3. The Rx of port 20 in switch is low, Bit errors on the storage device come from the bad CRC of port 20 on the FC switch.

[Solution]

1.Suggest to replace the optical module and corresponding optical fibers on Server HBA and port 20 of FC switch.

2.If CRC bit errors persist after the optical module and optical fiber are replaced, ask the server vendor to check whether the HBA is normal.

Case 3:Performance issue

[Problem Description]

Customer reports OceanStor 18500 v5 CPU usage high warning occurred recently. .

[Problem Analysis]

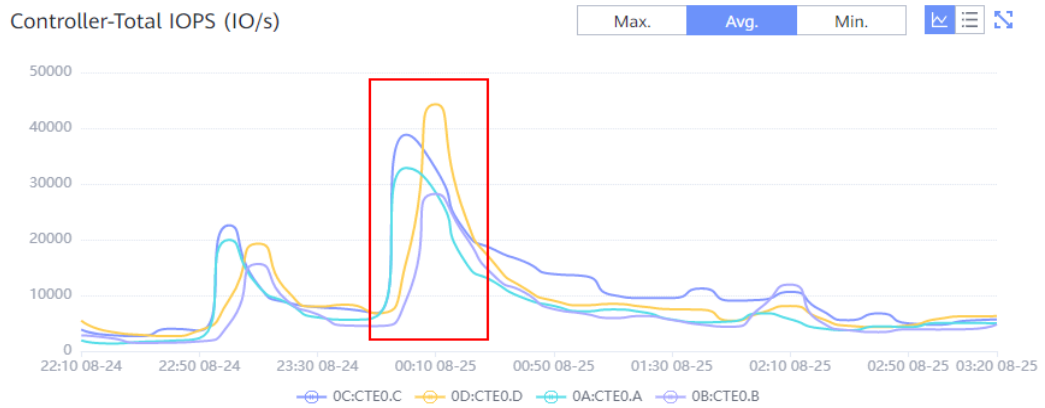
1.Analyzed storage logs. It was found that four alarms indicating that the CPU usage was higher than 90% were generated in August, and the alarm time was about 12AM.

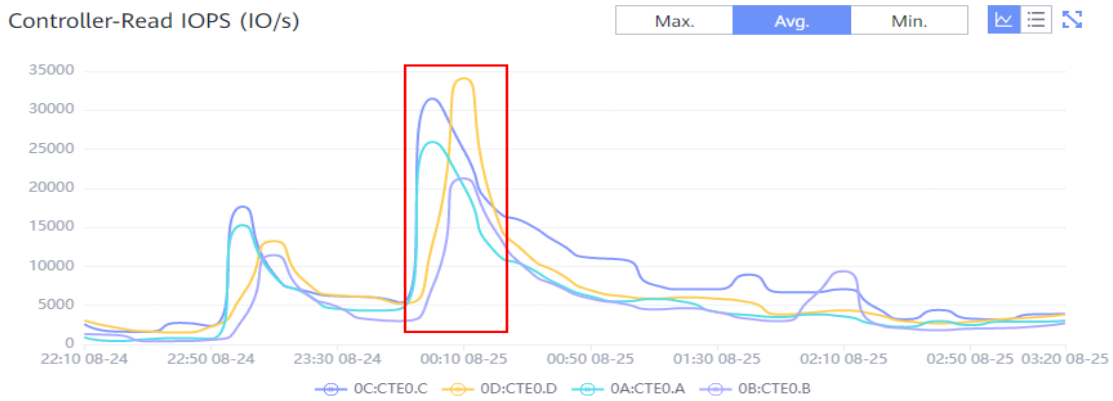
2022-08-30 00:19:43	0xF03360001	Fault	Warning	Recovered	2022-08-30 00:21:17	The controller (CTE0.D) average CPU utilization (97.0%) at 2022-08-30 00:19:37 UTC+05:00 exceeds the threshold of (90.0%).
2022-08-25 00:02:21	0xF03360001	Fault	Warning	Recovered	2022-08-25 00:03:52	The controller (CTE0.C) average CPU utilization (96.0%) at 2022-08-25 00:02:10 UTC+05:00 exceeds the threshold of (90.0%).
2022-08-23 00:20:03	0xF03360001	Fault	Warning	Recovered	2022-08-23 00:20:55	The controller (CTE0.D) average CPU utilization (92.0%) at 2022-08-23 00:19:54 UTC+05:00 exceeds the threshold of (90.0%).
2022-08-23 00:02:33	0xF03360001	Fault	Warning	Recovered	2022-08-23 00:03:29	The controller (CTE0.C) average CPU utilization (97.0%) at 2022-08-23 00:02:23 UTC+05:00 exceeds the threshold of (90.0%).

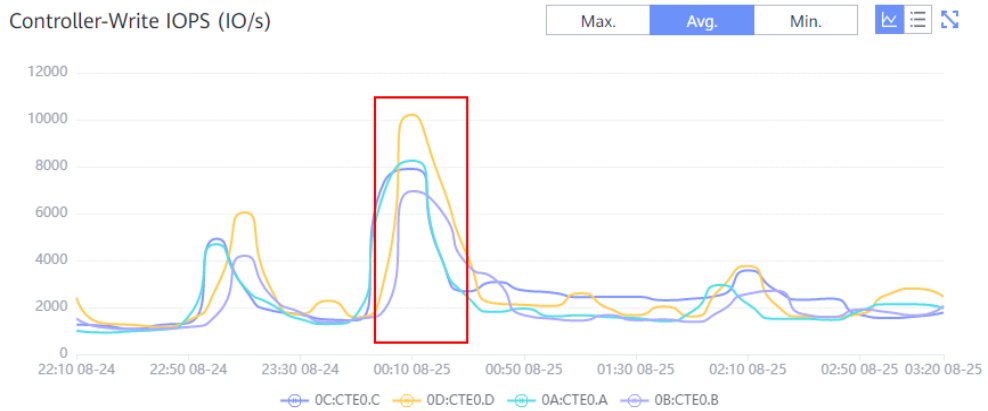
Case 3:Performance issue

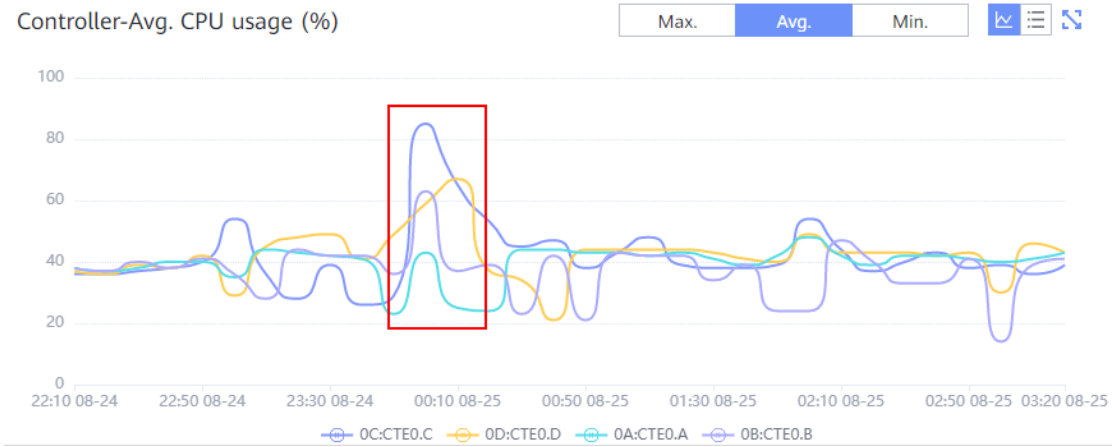
[Problem Analysis]

2.Analyzed the performance data. It was found that the read and write IOPS significantly increased at the time when the CPU usage was high. The service volume delivered to the storage device increases.





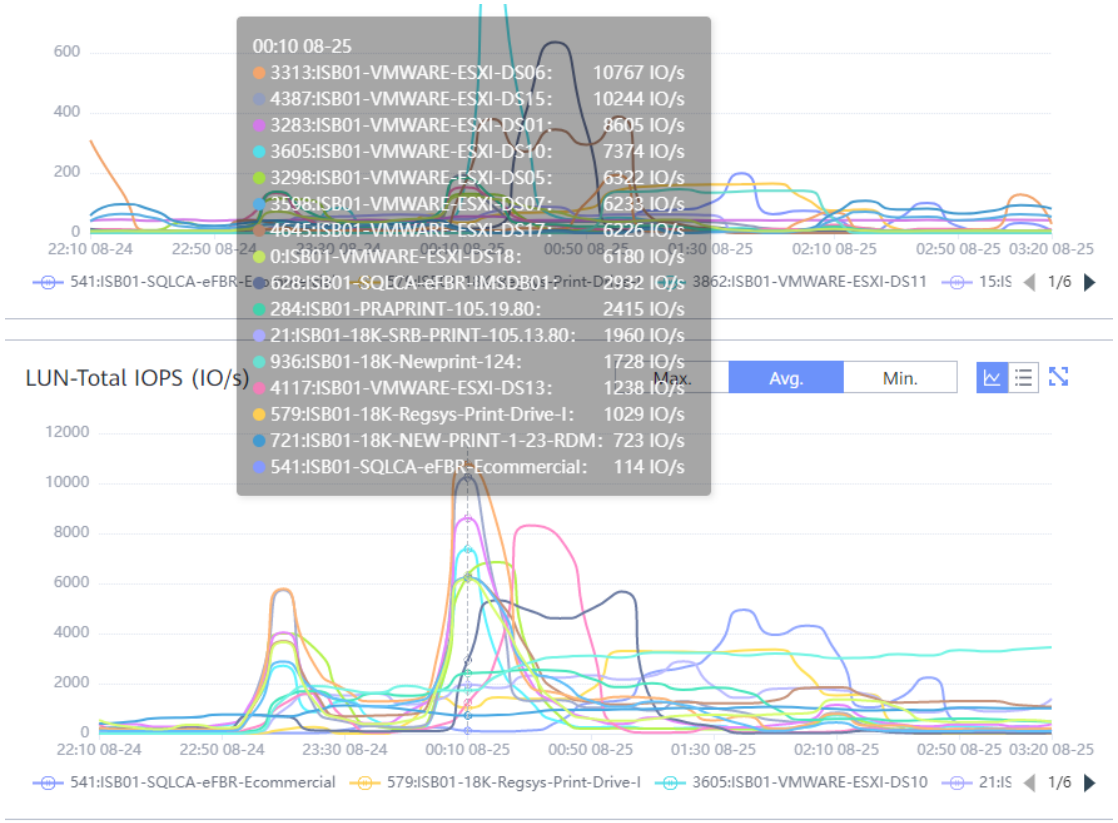




Case 3:Performance issue

[Problem Analysis]

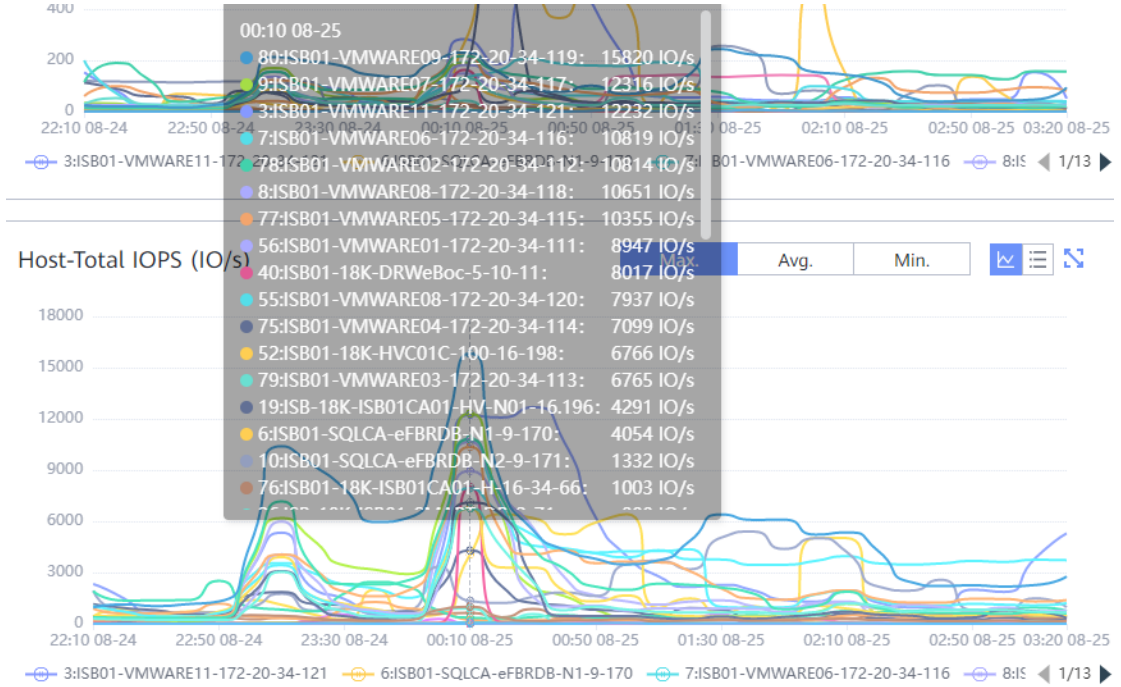
3. Analyzed the performance data of LUNs. It was found that the service volume of LUNs with IDs 3313, 4387, 3283, 3605, 3298, 3598, 4645, 0, 628, 284, 21, 936, 4117, and 579 increased.



Case 3:Performance issue

[Problem Analysis]

4. The corresponding hosts IO press increased. mapping Host IDs are 80, 9, 3, 7, 78, 8, 77, 56, 40, 55, 75, 52, 79, 19, 6, 10, 76, and 26.



Case 3:Performance issue

[Root Cause]

At about 12AM, the service volume of some hosts and LUNs increased, causing high CPU usage of the controller.
The ID of the LUN whose service volume increases are：3313、4387、3283、3605、3298、3598、4645、0、628、284、21、936、4117、579
The ID of the host whose service volume increases are：80、9、3、7、78、8、77、56、40、55、75、52、79、19、6、10、76、26

[Solution]

1.Suggest to investigate the cause of the increase in the service volume of the corresponding host and LUN at 12AM at night and check if the task can be balanced in different time.
2.Switch the Working Controller of some LUNs to A/B
3.Enable SmartQos for some LUN

Case 4:OceanStor 5300 V3 Service down

[Problem Description]

Customer report that the service on OceanStor 5300 V3 is down, a lot of applications were impacted.

[Problem Analysis]

1.Check event log of storage. path “DataCollect\Alarm_log \Event\local_alm_file.txt”

We found a lot of alarms in the system, and there is a critical alarm regarding disk domain(SAS1).

2.Near the alarm, there is another alarm regarding “disk fault”

Double check with customer, the LUNs on this diskdomain disappeared on the hosts.

```
//2023-02-02 06:53:55    0xF000A0015    Major    None    The system failed to monitor the disk (disk enclosure DAE020, slot ID 21). The error code is 1077936787.
 //2023-02-02 06:53:55    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE020, controller 0A, slot 21, serial number --) is isolated.
 //2023-02-02 06:53:47    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE020, controller 0B, slot 21, serial number --) is isolated.
 //2023-02-02 06:06:25    0xF000A005F    Major    None    Disk (Disk Enclosure DAE020, slot 21, SN 6SL9Z3EZ0000N5329WZ6) responds slowly. Error code:1077936785.This
 //2023-02-02 04:33:00    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE021, controller 0A, slot 12, serial number --) is isolated.
 //2023-02-02 04:32:57    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE021, controller 0B, slot 12, serial number --) is isolated.
 //2023-02-02 04:32:52    0x10A0002    Critical    None    The disk domain (name SAS1, ID 1) is faulty.The storage pools based on it are faulty and luns and snapshot
 //2023-02-02 04:32:51    0xF00A0001    Critical    None    The disk (Disk Enclosure DAE021, slot 12, sn 6SLA6HRB0000N5381679) is faulty.The bad sector is 0x0. The e
 //2023-02-02 04:32:36    0xF00A0003    Major    None    The disk (Disk Enclosure DAE021, slot 12, serial number 6SLA6HRB0000N5381679) is failing.
 //2023-02-02 04:25:19    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE020, controller 0A, slot 20, serial number --) is isolated.
 //2023-02-02 04:25:18    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE020, controller 0B, slot 20, serial number --) is isolated.
 //2023-02-02 04:25:14    0x10A0001    Major    None    The disk domain (name SAS1, ID 1) is degraded.
: //2023-02-02 04:25:14    0xF00A0001    Critical    None    The disk (Disk Enclosure DAE020, slot 20, sn 6SLA6HSQ0000N5381MPT) is faulty.The bad sector is 0x0. The
: //2023-02-02 04:22:54    0xF00A0003    Major    None    The disk (Disk Enclosure DAE020, slot 20, serial number 6SLA6HSQ0000N5381MPT) is failing.
: //2023-02-01 12:40:15    0xF00A0001    Critical    None    The disk (Disk Enclosure DAE020, slot 23, sn 6SL9Z39M0000N531CSM0) is faulty.The bad sector is 0x0. The
: //2023-02-01 01:36:17    0xF00A0003    Major    None    The disk (Disk Enclosure DAE021, slot 6, serial number 6SL9Y98Z0000N5300YYN) is failing.
: //2023-02-01 00:00:13    0xF00C90015    Major    None    The write cache of the controller (Controller Enclosure  CTE0, controller B) was disabled.
: //2023-02-01 00:00:13    0xF00C90015    Major    None    The write cache of the controller (Controller Enclosure  CTE0, controller A) was disabled.
3: //2023-02-01 02:20:24    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE021, controller 0A, slot 6, serial number --) is isolated.
9: //2023-02-01 02:20:18    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE021, controller 0B, slot 6, serial number --) is isolated.
4: //2023-02-01 00:00:13    0xF00C90015    Major    None    The write cache of the controller (Controller Enclosure  CTE0, controller B) was disabled.
5: //2023-02-01 00:00:13    0xF00C90015    Major    None    The write cache of the controller (Controller Enclosure  CTE0, controller A) was disabled.
```

Case 4:OceanStor 5300 V3 Service down

[Problem Analysis]

3.Check the config.txt path "\DataCollect\Running_Data\config.txt"

We found disk DAE021.12 is the member disk of disk domain(SAS1). That means, disk DAE021.12 fault caused the disk domain（SAS1） fault.

4.When disk domain fault will cause LUNs on the disk domain fault. Then disappeared on the hosts

```
Disk Domain ID: 1
Disk Domain Name: SAS1
Disk Domain Description:
Disk Domain Tier0 Hot Spare Level: 0
Disk Domain Tier1 Hot Spare Level: 1
Disk Domain Tier2 Hot Spare Level: 0
Disk Domain Pair(0) Tier0 Disk Number: 0
Disk Domain Pair(0) Tier1 Disk Number: 74
Disk Domain Pair(0) Tier2 Disk Number: 0
Disk Domain Pair(1) Tier0 Disk Number: 0
Disk Domain Pair(1) Tier1 Disk Number: 0
Disk Domain Pair(1) Tier2 Disk Number: 0
Disk Domain Pair(2) Tier0 Disk Number: 0
Disk Domain Pair(2) Tier1 Disk Number: 0
Disk Domain Pair(2) Tier2 Disk Number: 0
```

```
Disk Domain Pair(7) Tier0 Disk Number: 0
Disk Domain Pair(7) Tier1 Disk Number: 0
Disk Domain Pair(7) Tier2 Disk Number: 0
Disk Domain Health Status: Fault
Disk Domain Total Capacity: 39757947862(KB)
Disk Domain Free Capacity: 0(KB)
Disk Domain Used Capacity: 38128844800(KB)
Disk Domain Spare Capacity: 1629103062(KB)
Disk Domain Used SpareCapacity: 1086128128(KB)
```

```
Disk ID: 577
Disk Frame and Slot: DAE021.12
Disk Domain ID: 1
Disk WWN: [redacted]
Disk Serial Number: [redacted]
Disk Type: SAS
Disk Capacity: 573062999(KB)
Disk Sector Size: 520(B)
```

Case 4:OceanStor 5300 V3 Service down

[Problem Analysis]

5.After check event logs, we found other disks also fault and need to be replaced. In the meantime, there are BBU fault in the system.

6. It caused “System write cache disabled”. System performance decreased to a very low level. So need to replace BBU as well.

In 2022-11-01 BBU Module reported “BBU Module is expiring”

In 2023-02-01 BBU Module reached its expiration date and system switched from write back to write through

In 2023-02-02 Lots of disks were fault, cause disk domain fault and service down.

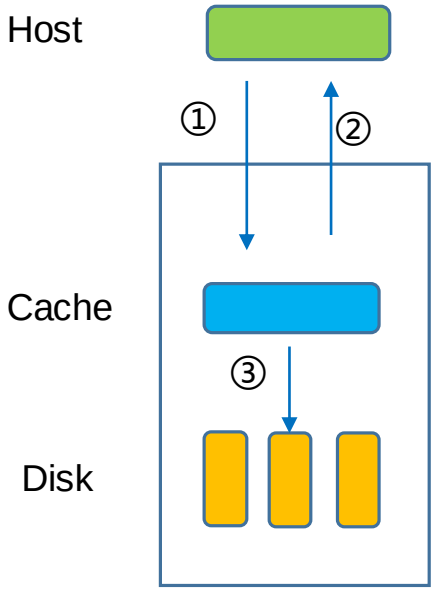
```
//2023-02-02 06:53:55    0xF000A0015    Major    None    The system failed to monitor the disk (disk enclosure DAE020, slot ID 21). The error code is 1077936787.
 //2023-02-02 06:53:55    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE020, controller 0A, slot 21, serial number --) is isolated.
 //2023-02-02 06:53:47    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE020, controller 0B, slot 21, serial number --) is isolated.
 //2023-02-02 06:06:25    0xF000A005F    Major    None    Disk (Disk Enclosure DAE020, slot 21, SN 6SL9Z3EZ0000N5329WZ6) responds slowly. Error code:1077936785.This may cause the owning RAID group to
 //2023-02-02 04:33:00    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE021, controller 0A, slot 12, serial number --) is isolated.
 //2023-02-02 04:32:57    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE021, controller 0B, slot 12, serial number --) is isolated.
 //2023-02-02 04:32:52    0x10A0002    Critical    None    The disk domain (name SAS1, ID 1) is faulty.The storage pools based on it are faulty and luns and snapshots in these storage pools are fault
 //2023-02-02 04:32:51    0xF00A0001    Critical    None    The disk (Disk Enclosure DAE021, slot 12, sn 6SLA6HRB0000N5381679) is faulty.The bad sector is 0x0. The error code is 0x0.
 //2023-02-02 04:32:36    0xF00A0003    Major    None    The disk (Disk Enclosure DAE021, slot 12, serial number 6SLA6HRB0000N5381679) is failing.
 //2023-02-02 04:25:19    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE020, controller 0A, slot 20, serial number --) is isolated.
 //2023-02-02 04:25:18    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE020, controller 0B, slot 20, serial number --) is isolated.
 //2023-02-02 04:25:14    0x10A0001    Major    None    The disk domain (name SAS1, ID 1) is degraded.
: //2023-02-02 04:25:14    0xF00A0001    Critical    None    The disk (Disk Enclosure DAE020, slot 20, sn 6SLA6HSQ0000N5381MPT) is faulty.The bad sector is 0x0. The error code is 0x0.
: //2023-02-02 04:22:54    0xF00A0003    Major    None    The disk (Disk Enclosure DAE020, slot 20, serial number 6SLA6HSQ0000N5381MPT) is failing.
: //2023-02-01 12:40:15    0xF00A0001    Critical    None    The disk (Disk Enclosure DAE020, slot 23, sn 6SL9Z39M0000N531CSM0) is faulty.The bad sector is 0x0. The error code is 0x0.
: //2023-02-01 01:36:17    0xF00A0003    Major    None    The disk (Disk Enclosure DAE021, slot 6, serial number 6SL9Y98Z0000N5300YYN) is failing.
: //2023-02-01 00:00:13    0xF00C90015    Major    None    The write cache of the controller (Controller Enclosure  CTE0, controller B) was disabled.
: //2023-02-01 00:00:13    0xF00C90015    Major    None    The write cache of the controller (Controller Enclosure  CTE0, controller A) was disabled.
3: //2023-02-01 02:20:24    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE021, controller 0A, slot 6, serial number --) is isolated.
9: //2023-02-01 02:20:18    0x200F000A005B    Major    None    The hard disk (Disk Enclosure DAE021, controller 0B, slot 6, serial number --) is isolated.
4: //2023-02-01 00:00:13    0xF00C90015    Major    None    The write cache of the controller (Controller Enclosure  CTE0, controller B) was disabled.
5: //2023-02-01 00:00:13    0xF00C90015    Major    None    The write cache of the controller (Controller Enclosure  CTE0, controller A) was disabled.
6: //2023-02-01 00:00:05    0xF0D20003    Major    None    The BBU module (Controller Enclosure CTE0, BBU module PSU 1) reaches its expiration date or is aging. When a power failure occurs, the BBU m
0: //2023-02-01 00:00:05    0xF0D20002    Major    None    The BBU module (Controller Enclosure CTE0, BBU module PSU 1) is faulty with error code (0x0), therefore, when a power failure occurs, the BE
627: //2022-11-01 00:00:05    0xF0D20007    Warning    None    The BBU module (Controller Enclosure CTE0, BBU module PSU 1) is expiring.
628: //Step1 Replace the BBU module in three months. If the alarm persists=>[Step2].
629: //Step2 Collect related information and contact technical support engineers.
631: //2022-11-01 00:00:05    0xF0D20007    Warning    None    The BBU module (Controller Enclosure CTE0, BBU module PSU 0) is expiring.
632: //Step1 Replace the BBU module in three months. If the alarm persists=>[Step2].
633: //Step2 Collect related information and contact technical support engineers.
```

Case 4:OceanStor 5300 V3 Service down

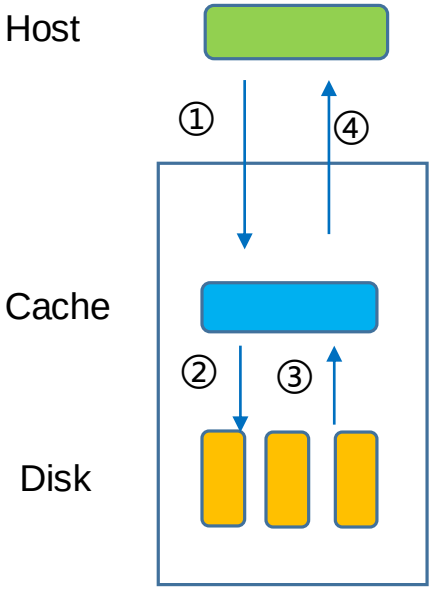
[Problem Analysis]

Write Back VS Write Through

Write Back



Write Through



Case 4:OceanStor 5300 V3 Service down

[Problem Analysis]

Find the BOM code of disks and BBU. Check the config.txt path "\DataCollect\Running_Data\config.txt"

```
Disk ID: 536
Disk Domain ID: 1
Disk Frame and Slot ID: DAE021.12
Disk Type: SAS
Disk Health Status: Fault
Disk Running Status: Offline
Raw capacity: 555(GB)
Device Block Number: 1146125998
Disk Multipathing: A,B
Disk Sector Size: 520
Disk Impending Fault Flag: FALSE
Disk Slowing Flag: FALSE
Disk SN: 6SLA6HRB0000N5381679
Disk Temperature: 36
Disk Power-On Time: 2784(Day)
Disk Speed: 15000(RPM)
Disk Physical Size: 2
Disk Port Address: 5FCE33CB1B51800C
Disk Vendor: Seagate
Disk Model: ST3600057SS
Disk Firmware: 0008
Disk Elabel:
    [Board Properties]
    BoardType=STLZA2SAS600
    BarCode=[redacted]
    Item=02350BWH
    Description=OceanStor 5300/5500 V3,STLZA2SAS600,600GB 15K RPM SAS Disk Unit(3.5"),sectorsize-520
    Manufactured=2015-05-13
    VendorName=Huawei
    IssueNumber=00
    CLEICode=
    BOM=
```

```
BBU Info---------------------------------
    Enclosure ID: CTE0
    BBU ID: CTE0.PSU0
    Owning Controller: 0A
    Health Status: Abnormal
    Running Status: Online
    Voltage(0.1V): 11.0
    Discharge Times: 22
    Firmware Version: 20.05T7
    Delivered On: 2015-2-10
    Charge State: Charge Full
    Discharge State: No Discharge
    RemainLife(days): 331
    Electronic Label:
        [Board Properties]
        BoardType=STL2BATTA01
        BarCode=[redacted]
        Item=03031MPJ
        Description=Finished Board,PANGEA,STL2BATTA01,Battery Backup Unit,V2R1C00
        Manufactured=2015-04-14
        VendorName=Huawei
        IssueNumber=0
```

Case 4:OceanStor 5300 V3 Service down

[Root Cause]

BBU expired -> Write Through -> Disk Fault -> Disk Domain Fault -> LUN Fault -> Service Down

[Solution]

Revive the disk in reverse order of fault, then replace Fault Disks and BBU

Scenarios Where the LUN Write Mode Becomes Write Through

The write mode of LUNs in a storage system is write back by default. However, the write mode will become write through in the event of a fault.

Table 1 Scenarios where the write mode of LUNs changes from write back to write through and recommended actions

Symptom	Scenario	Impact and Recommended Action
The temperature of a controller exceeds the upper limit.	• If the **Controller Enclosure Temperature Exceeds The Upper Limit** alarm is generated due to an exception in the equipment room temperature or the internal components of a storage system, LUNs remain in write back mode for a specified period of time (192 hours by default). If the alarm persists after the specified period of time, the mode changes to write through. • If the **Controller Enclosure Temperature Exceeds The Upper Limit** alarm is generated due to a fault on a single controller of a controller enclosure, LUNs remain in write back mode for a specified period of time (1 hour by default). If the alarm persists after the specified period of time, the mode changes to write through. **NOTE:** If the **Controller Enclosure Temperature Is Far Beyond The Upper Limit** alarm is generated in a storage system, the storage system will automatically power off.	• Impact The write mode of all LUNs belonging to the controller enclosure changes to write through after the specified period of time. • Recommended action Check the external refrigerating system, fan modules, and air channels to locate the cause of the over-temperature alarm and rectify faults.
Backup battery units (BBUs) on a controller enclosure malfunction.	• Dual-controller storage system: If two BBUs malfunction and an alarm is generated, the write mode changes from write back to write through. • Four-controller storage system: If two or more BBUs malfunction and an alarm is generated, the write mode changes from write back to write through.	• Impact The write mode of all LUNs belonging to the controller enclosure changes to write through. • Recommended action ▪ Check whether the BBUs are properly installed. ▪ Check whether the BBUs are faulty and replace them if necessary. ▪ Check whether the charge of the BBUs is insufficient. If the power of the BBUs is insufficient, wait until the BBUs are fully charged.

Case 4:OceanStor 5300 V3 Service down

Scenarios Where the LUN Write Mode Becomes Write Through

The coffer disks of a controller enclosure malfunction.	• Dual-controller storage system: If two coffer disks break down, the write mode changes from write back to write through. • Four-controller storage system: If all coffer disks of controllers A and B or controllers C and D break down (the controllers in the first row are controllers A and B and the controllers in the second row are controllers C and D), the write mode changes from write back to write through.	• Impact The write mode of all LUNs belonging to the controller enclosure changes to write through. • Recommended action Check whether the coffer disks are faulty and replace them if necessary.
Controllers malfunction.	LUNs stay in write back mode for the write back hold time (192 hours by default) if only one controller on a storage system is properly working. If faults are not rectified within this period, the write mode of the LUNs changes from write back to write through.	• Impact The write mode of all LUNs belonging to the controller enclosure changes to write through if the fault persists for more than the write back hold time. • Recommended action ▪ Replace the faulty controller during off-peak hours and within the 192 hour period after the malfunction. ▪ If a spare part is unavailable during the write back protection period, extend the time after assessing risks to prevent write through from adversely affecting service performance.
The remaining capacity of a storage pool is smaller than the reserved capacity.	An alarm is generated, indicating that the capacity usage of a storage pool exceeds the threshold and reminding you to expand the storage pool.	• Impact The write mode of thin LUNs and thick LUNs with value-added features changes from write back to write through. • Recommended action Expand the storage pool.

Training Summary

Training Summary

1. *Centralized Storage Maintenance Introduction*
   --Routine Maintenance, Device Manager, Alarm, Indicator, Performance check

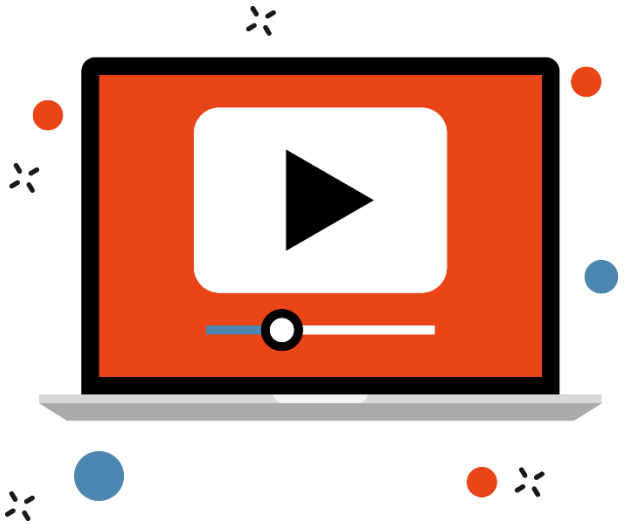
2. *Log Collection*
   --Log Collection Method.

3. *Troubleshooting for common issue*
   --Centralized Storage Common Fault Case

Demo Playback

Demo Playback

Simulate a FC port link issue in the lab and diagnose the issue.

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