



# **Storage System**

## **User Manual**

# Legal Information

©2023 Hangzhou Hikvision Digital Technology Co., Ltd. All rights reserved.

## About this Manual

The Manual includes instructions for using and managing the Product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version of this Manual at the Hikvision website (<https://www.hikvision.com/>). Please use this Manual with the guidance and assistance of professionals trained in supporting the Product.

## Trademarks

**HIKVISION** and other Hikvision's trademarks and logos are the properties of Hikvision in various jurisdictions.

Other trademarks and logos mentioned are the properties of their respective owners.

**HDMI**<sup>TM</sup>  
HIGH-DEFINITION MULTIMEDIA INTERFACE: The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc. in the United States and other countries.

## Disclaimer

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THIS MANUAL AND THE PRODUCT DESCRIBED, WITH ITS HARDWARE, SOFTWARE AND FIRMWARE, ARE PROVIDED "AS IS" AND "WITH ALL FAULTS AND ERRORS". HIKVISION MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY, SATISFACTORY QUALITY, OR FITNESS FOR A PARTICULAR PURPOSE. THE USE OF THE PRODUCT BY YOU IS AT YOUR OWN RISK. IN NO EVENT WILL HIKVISION BE LIABLE TO YOU FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR INDIRECT DAMAGES, INCLUDING, AMONG OTHERS, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, OR LOSS OF DATA, CORRUPTION OF SYSTEMS, OR LOSS OF DOCUMENTATION, WHETHER BASED ON BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE), PRODUCT LIABILITY, OR OTHERWISE, IN CONNECTION WITH THE USE OF THE PRODUCT, EVEN IF HIKVISION HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR LOSS.

YOU ACKNOWLEDGE THAT THE NATURE OF THE INTERNET PROVIDES FOR INHERENT SECURITY RISKS, AND HIKVISION SHALL NOT TAKE ANY RESPONSIBILITIES FOR ABNORMAL OPERATION, PRIVACY LEAKAGE OR OTHER DAMAGES RESULTING FROM

CYBER-ATTACK, HACKER ATTACK, VIRUS INFECTION, OR OTHER INTERNET SECURITY RISKS; HOWEVER, HIKVISION WILL PROVIDE TIMELY TECHNICAL SUPPORT IF REQUIRED.

YOU AGREE TO USE THIS PRODUCT IN COMPLIANCE WITH ALL APPLICABLE LAWS, AND YOU ARE SOLELY RESPONSIBLE FOR ENSURING THAT YOUR USE CONFORMS TO THE APPLICABLE LAW. ESPECIALLY, YOU ARE RESPONSIBLE, FOR USING THIS PRODUCT IN A MANNER THAT DOES NOT INFRINGE ON THE RIGHTS OF THIRD PARTIES, INCLUDING WITHOUT LIMITATION, RIGHTS OF PUBLICITY, INTELLECTUAL PROPERTY RIGHTS, OR DATA PROTECTION AND OTHER PRIVACY RIGHTS. YOU SHALL NOT USE THIS PRODUCT FOR ANY PROHIBITED END-USES, INCLUDING THE DEVELOPMENT OR PRODUCTION OF WEAPONS OF MASS DESTRUCTION, THE DEVELOPMENT OR PRODUCTION OF CHEMICAL OR BIOLOGICAL WEAPONS, ANY ACTIVITIES IN THE CONTEXT RELATED TO ANY NUCLEAR EXPLOSIVE OR UNSAFE NUCLEAR FUEL-CYCLE, OR IN SUPPORT OF HUMAN RIGHTS ABUSES.

IN THE EVENT OF ANY CONFLICTS BETWEEN THIS MANUAL AND THE APPLICABLE LAW, THE LATTER PREVAILS.

# Regulatory Information

## FCC Information

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC compliance: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### FCC Conditions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

## EU Conformity Statement



This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the EMC Directive 2014/30/EU, LVD Directive 2014/35/EU, the RoHS Directive 2011/65/EU.



2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated

collection points. For more information see:

<http://www.recyclethis.info>.



2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: <http://www.recyclethis.info>.

## Industry Canada ICES-003 Compliance




This device meets the CAN ICES-3 (A)/NMB-3(A) standards requirements.

## Preface

There are two types of storage systems, the one for single controller devices and another one for dual controller devices. The functions between two storage systems are similar, and this manual takes the storage system of dual controller devices as an example to introduce you its operations.

## Symbol Conventions

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

Symbol	Description
 <b>NOTE</b>	Provides additional information to emphasize or supplement important points of the main text.
 <b>WARNING</b>	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
 <b>DANGER</b>	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.

## Safety Instructions

- Proper configuration of all passwords and other security settings is the responsibility of the installer and/or end-user.
- In the use of the product, you must be in strict compliance with the electrical safety regulations of the nation and region. Please refer to technical specifications for detailed information.
- Input voltage should meet both the SELV (Safety Extra Low Voltage) and the Limited Power Source with 100~240 VAC or 12 VDC according to the IEC60950-1 standard. Please refer to technical specifications for detailed information.
- Do not connect several devices to one power adapter as adapter overload may cause over-heating or a fire hazard.
- Please make sure that the plug is firmly connected to the power socket.
- If smoke, odor or noise rise from the device, turn off the power at once and unplug the power cable, and then please contact the service center.

## Preventive and Cautionary Tips

Before connecting and operating your device, please be advised of the following tips:

- Ensure unit is installed in a well-ventilated, dust-free environment.
- Unit is designed for indoor use only.
- Keep all liquids away from the device.
- Ensure environmental conditions meet factory specifications.
- Ensure unit is properly secured to a rack or shelf. Major shocks or jolts to the unit as a result of dropping it may cause damage to the sensitive electronics within the unit.
- Use the device in conjunction with an UPS if possible.
- Power down the unit before connecting and disconnecting accessories and peripherals.
- A factory recommended HDD should be used for this device.
- Improper use or replacement of the battery may result in hazard of explosion. Replace with the same or equivalent type only. Dispose of used batteries according to the instructions provided by the battery manufacturer.

# Table of Contents

<b>Chapter 1</b>	<b>Get Started</b> .....	<b>9</b>
1.1	HDD Installation.....	9
1.2	Access via Web Browser.....	10
1.3	Activation and Login.....	11
<b>Chapter 2</b>	<b>Maintenance</b> .....	<b>12</b>
2.1	System.....	12
2.2	Performance.....	12
2.3	General.....	13
2.3.1	View Version Information.....	14
2.3.2	Default Settings.....	14
2.3.3	Download Logs.....	14
2.3.4	System Upgrade.....	14
2.4	Graphical Display.....	15
2.5	Environmental.....	16
<b>Chapter 3</b>	<b>Storage Management</b> .....	<b>17</b>
3.1	Manage Local HDD.....	17
3.1.1	View HDD Status.....	17
3.1.2	Rescan HDD.....	18
3.1.3	Position HDD.....	18
3.1.4	Initialize HDD.....	18
3.1.5	Detect HDD.....	18
3.2	Array.....	19
3.2.1	Create Array.....	20
3.2.2	Array Exception.....	21
3.2.3	Rebuild Array.....	22
3.2.4	Detect Array.....	22
3.2.5	Repair Array.....	23
3.2.6	Rename Array.....	23
3.2.7	Delete Array.....	23
3.2.8	Add Hot Spare.....	24
3.2.9	Delete Hot Spare.....	24
3.3	Storage Pool.....	25
3.3.1	Add Storage Pool.....	25
3.3.2	Delete Storage Pool.....	26
3.3.3	Position Storage Pool.....	26
3.4	LUN (Logical Volume).....	27
3.4.1	Create Logical Volume.....	27
3.4.2	Delete Logical Volume.....	28
3.4.3	Rename Logical Volume.....	28
3.4.4	Enlarge Logical Volume.....	28
3.5	Configuration.....	29
3.5.1	Configure Synchronization Speed and Type.....	29

3.5.2	Configure Flickering Time .....	29
<b>Chapter 4</b>	<b>SAN Management.....</b>	<b>30</b>
4.1	Add/Modify CHAP User .....	30
4.2	One-Key Configuration .....	31
4.3	Enable iSCSI .....	31
4.4	Disable iSCSI .....	32
<b>Chapter 5</b>	<b>Hybrid SAN .....</b>	<b>33</b>
5.1	One-Key Configuration .....	33
5.2	Hybrid SAN Configuration.....	33
5.2.1	Start Hybrid SAN .....	34
5.2.2	Reset Hybrid SAN .....	35
5.2.3	Record Volume .....	36
5.3	Backup and Restore.....	39
5.3.1	View Private Volume Information .....	39
5.3.2	Restore .....	39
5.3.3	Backup.....	39
5.3.4	Recover Video Data.....	40
5.4	N+1 Management .....	41
5.4.1	Add Backup Hybrid SAN .....	41
5.4.2	Delete Backup Hybrid SAN.....	42
5.4.3	Add Master Hybrid SAN.....	42
<b>Chapter 6</b>	<b>Hybrid SAN Sub-System .....</b>	<b>44</b>
6.1	Access by Web Browser.....	44
6.2	Information .....	44
6.3	Encoding Device.....	45
6.3.2	Add Encoding Device.....	45
6.3.3	Modify/Delete Encoding Device.....	47
6.3.4	Export/Import Encoding Device .....	47
6.4	Preview and Record .....	48
6.5	Strategy and Alarm .....	49
6.5.1	Record Plan.....	49
6.5.2	Upload Strategy .....	52
6.5.3	Alarm .....	54
6.6	Download and Play .....	55
6.6.1	Search Video.....	55
6.6.2	Lock Videos.....	56
6.6.3	Download Videos.....	56
6.7	User Management .....	57
6.7.1	Personal Set.....	57
6.7.2	Key Management.....	57
6.8	System Configuration .....	57
6.8.1	Mode Switch.....	57
6.8.2	System Alarm.....	58
6.8.3	Hybrid SAN Version .....	58



---

6.9	Log Management .....	59
6.9.1	Search Log .....	59
6.9.2	Export Log .....	59
6.9.3	Clear Log.....	59
<b>Chapter 7</b>	<b>Cluster .....</b>	<b>60</b>
7.1	Configure Cluster Heartbeat .....	60
7.2	Modify Resource IP .....	60
<b>Chapter 8</b>	<b>System.....</b>	<b>62</b>
8.2	Network .....	62
8.2.1	Modify Data Network Interface .....	62
8.2.2	Bind Network Interfaces.....	63
8.2.3	Add Route.....	63
8.2.4	MAC and IP Bonding .....	64
8.2.5	Advanced Parameters .....	65
8.3	Alarm .....	67
8.3.1	Alarm Type .....	67
8.3.2	Add Email User .....	69
8.3.3	Testing Email.....	70
8.3.4	Add SNMP Manager.....	70
8.3.5	Test SMTP Manager .....	71
8.4	Time Settings .....	71
8.4.1	Adjust System Time.....	71
8.4.2	Sync Time .....	71
8.5	Tool.....	72
8.5.1	Modify Password .....	72
8.5.2	SNMP Configuration.....	72
8.5.3	Network Test.....	73
8.5.4	Modify Storage System Name.....	73
8.5.5	View Service Status .....	74
<b>Chapter 9</b>	<b>Log System .....</b>	<b>75</b>
9.1	Maintenance Log .....	75
9.2	Operation Log.....	75
9.3	Performance Log.....	76
9.4	Upgrade Log .....	76
<b>Chapter 10</b>	<b>Software Download.....</b>	<b>77</b>

# Chapter 1 Get Started

## 1.1 HDD Installation

### *Before you start:*

Prepare the following equipment and accessories.

- A storage system
- Hard HDDs
- A pair of anti-static gloves
- A screwdriver

### *Steps:*

1. Press the blue button. Then the handle pops up.



Figure 1. 1 Press the Blue Button

2. Hold the handle and pull the HDD dummy out of the slot.



Figure 1. 2 Pull out the HDD Dummy

3. Use the screwdriver to uninstall the baffle in the bottom of HDD slot.
4. Place an HDD in the HDD dummy. The SATA interface must face the HDD dummy rear.



Figure 1. 3 Place HDD

5. Adjust the HDD position. Ensure the HDD rear aligning with HDD dummy rear and the two screw holes aiming at the holes that marked with red frame in *Figure 1. 4 HDD Position*.



Figure 1. 4 HDD Position

6. Use a screwdriver to fasten the four screws into the screw holes in both sides.

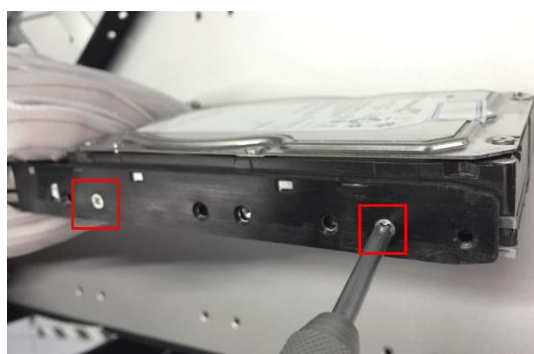


Figure 1. 5 Install Screws

7. Push the HDD dummy back into the slot.



Figure 1. 6 Push the HDD Dummy into Slot

## 1.2 Access via Web Browser

### NOTE

You shall acknowledge that the use of the product with Internet access might be under network security risks. For avoidance of any network attacks and information leakage, please strengthen your own protection. If the product does not work properly, please contact with your dealer or the nearest service center.

#### **Purpose:**

You can use Microsoft Edge web browser to access your device.

#### **Before you start:**

1. Use a network cable to connect the PC Ethernet interface and the storage system management network

interface.

2. Configure the PC IP address. Ensure it is on the same network segment with the IP address of management network interface. The default IP address of management network interface is 10.254.254.254.

**Steps:**

1. Open web browser.
2. Input the storage system IP address (https://10.254.254.254:2004) in Web browser address bar.
3. Press **Enter**.

## 1.3 Activation and Login

**Steps:**

- If the device has not been activated, you need to activate the device first before login.
  1. Set the password for the admin user account.
  2. Click **OK** to login to the device.



**WARNING**

**STRONG PASSWORD RECOMMENDED**—We highly recommend you create a strong password of your own choosing (Using a minimum of 8 characters, including at least three of the following categories: upper case letters, lower case letters, numbers, and special characters.) in order to increase the security of your product. And we recommend you reset your password regularly, especially in the high security system, resetting the password monthly or weekly can better protect your product.

- If the device is already activated:
  1. Select a login system.
    - **Basic Management:** Used to configure basic parameters of the storage system.
    - **Hybrid SAN:** Used to log in to the hybrid SAN system.
  2. Select **User**.
  3. Enter **Password**.
  4. **Mode** is **Advanced Mode** by default.
  5. Click **Enter**.

Intelligent, individual, economic and reliable data storage.

Log in to the System: Basic Management

User Name: web\_admin

Password:

Mode: Advanced Mode

Enter

HIKVISION DS-A82024D  
System Version:Hybrid\_SAN V2.3.9-2 Device Serial No.:L30221248

Figure 1.7 Login

## Chapter 2 Maintenance

### Purpose:

Maintenance function enables you to view login and iSCSI information, monitor running status, restore default settings, check and download logs, upgrade storage system, and so forth.

Table 2. 1 Module Description

Module	Description
System	<ul style="list-style-type: none"> <li>• A shortcut for reboot and shutdown.</li> <li>• Lists the login user information and iSCSI connection information.</li> </ul>
Performance	Shows you the real-time graph and data of system performance.
General	You can view system version, reset system, download logs, and upgrade system.
Graphical Display	Provides a graph to show the front view status and a pie chart to show the storage information.
Environmental	Shows the fan information, module temperature, fan control panel version, and chassis power.

## 2.1 System

### Purpose:

Once you log in to the storage system, system menu appears. System menu is a shortcut for reboot and shutdown, and it lists users and iSCSI connection information.

### Steps:

1. Go to **Maintenance > System**.

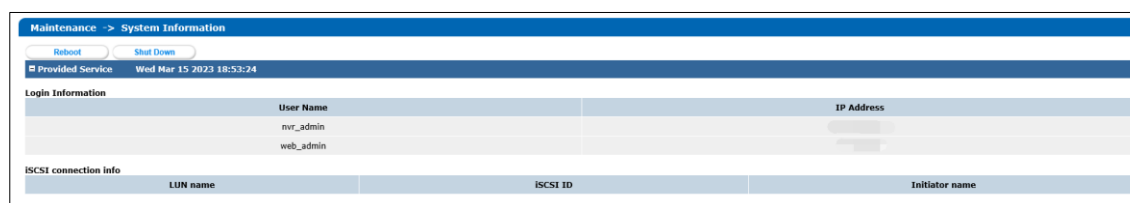


Figure 2. 2 System Monitor

2. Reboot, power off, or view login information or iSCSI connection info.
  - Click **Reboot** or **Shut Down** to restart or shut down the storage system.
  - The logged in users and IP addresses are listed in the **Login Information**.
  - The **LUN ID**, **iSCSI ID**, and **Initiator name** are listed in **iSCSI connection info**, which shows the devices that are connected to iSCSI.

## 2.2 Performance

### Purpose:

Performance menu shows the real-time graph and data of system performance, including bandwidth usage, memory usage, CPU usage, IO status, and system performance.

**Steps:**

1. Go to **Maintenance > Performance**.

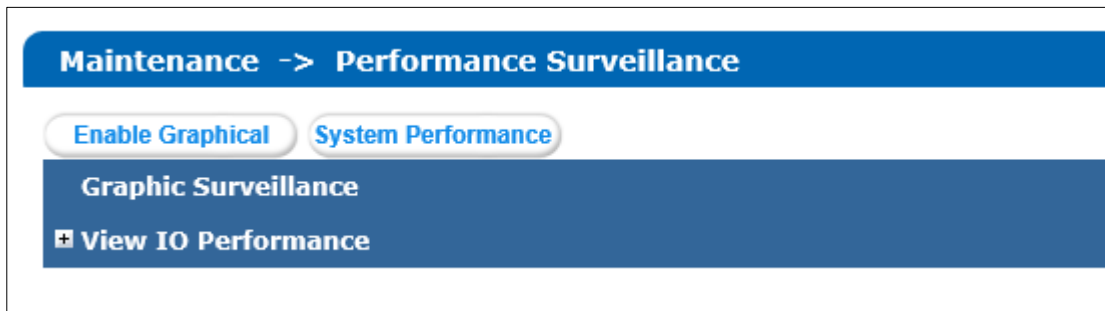


Figure 2. 3 Performance

2. Click **Enable Graphical** to show the real-time graphs of bandwidth usage, memory usage, and CPU usage.
3. Optionally, click **Disable Graphical** to fold the graphs.

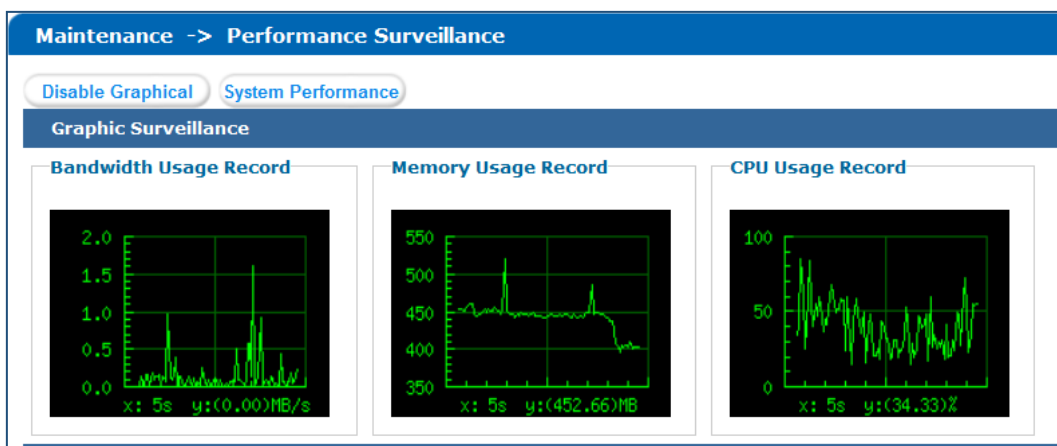


Figure 2. 4 Graph Monitor

4. Click **System Performance** to pop up system performance window. System performance updates per second.
5. Click **+/-** of View IO Performance to unfold/fold input and output status.

## 2.3 General

**Purpose:**

You can go **Maintenance > General** to view system version, reset system, download logs, and upgrade system.

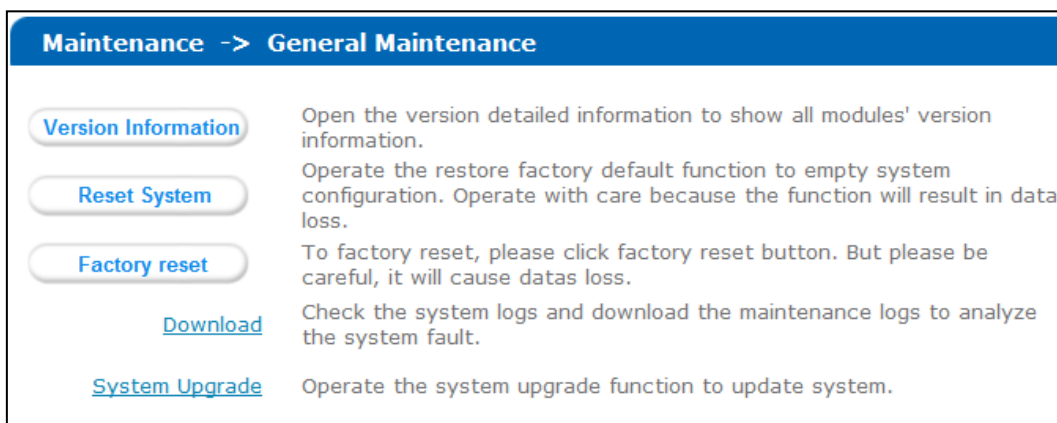


Figure 2. 5 General

## 2.3.1 View Version Information

**Purpose:**

Version information includes SMI, hybrid SAN, StoreSDK, etc.

**Steps:**

1. Click **Version Information** to view version information.
2. Click **Cancel** to close the window.

## 2.3.2 Default Settings

**Purpose:**

You can reset system to factory defaults when system is abnormal. You are recommended to reset system under the direction of professional technical support.



Resetting operation won't restore administrator user name and password, RAID configuration, hot spot configuration, and network parameters.

**Steps:**

1. Click **Reset system** or **Factory rest** as your desire.
2. Enter **yes** or **YES** in the text field.
3. Click **OK** to reset.

## 2.3.3 Download Logs

**Purpose:**

When system is abnormal, you can click **Download** in **Maintenance > General** to download logs. For details, refer to *9.1 Maintenance Log*

You can download log file through **Log System > Maintenance Log**.  
Operation Log.

## 2.3.4 System Upgrade

**Purpose:**

You are recommended to upgrade system under the help of professional support.

**Steps:**

1. Click **System Upgrade**.
2. Click **Browser** and choose the upgrade package.
3. Click **Upload** to upgrade. After upgrade succeeded, reboot the storage system to activate the new version.
4. Optionally, you can click **Restore** to restore to previous version.



You can only restore to the last upgraded version.

## 2.4 Graphical Display

**Purpose:**

The storage system provides a graph to show the front view status in **Maintenance > Graphical Display**.

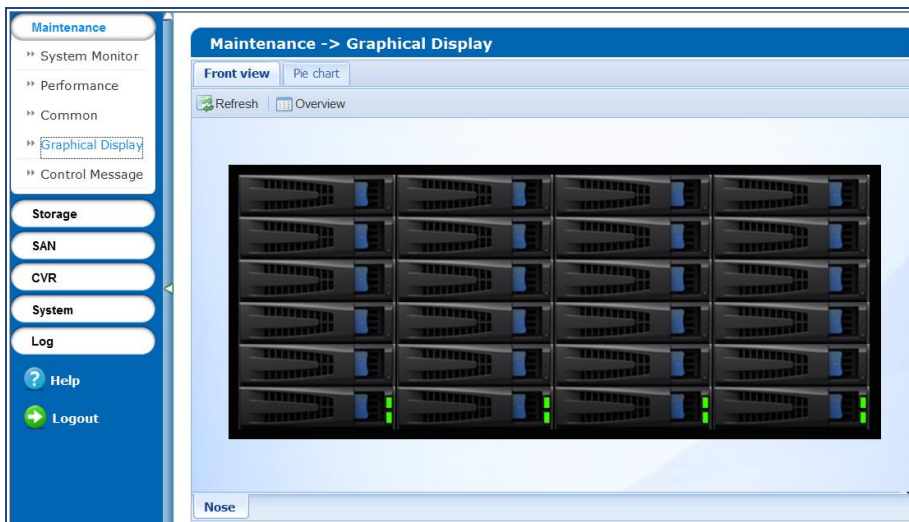


Figure 2. 6 Graphical Display

Front view shows you the HDD status. You can move the cursor in a green indicator slot to view details, or click **Overview** to view information of all HDDs.

Table 2. 2 Front View Indicator Status Description

Indicator	Color	Description
Top indicator	Unlit	HDD doesn't exist.
	Green	HDD is connected and recognized.
Bottom indicator	Green	HDD is normal.
	Blue	Reading and writing normally.
	Red	HDD is rebuilding.

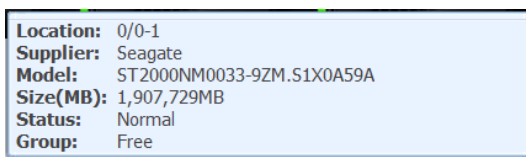


Figure 2. 7 HDD Information

Position	Supplier	Model	Capacity (MB)	Status	Group
0/0-1	Seagate	ST2000NM0001.Z1P105J3	1,907,729	Normal	Array
0/0-3	Seagate	ST2000NM0001.Z1P10PRH	1,907,729	Normal	Array
0/0-4	Seagate	ST8000NM0075.ZA103VH6000J607VTV9	7,630,885	Normal	Array
0/0-5	Seagate	ST2000NM0001.Z1P10KV9	1,907,729	Normal	Array
0/0-6	Seagate	ST8000NM0075.ZA102T6F0000J607TUCD	7,630,885	Normal	Array

Figure 2. 8 HDD Overview



## 2.5 Environmental

### Purpose:

Environmental shows the fan information, module temperature, fan control panel version, and chassis power.

### Steps:

1. Go to **Maintenance > Control Message**.

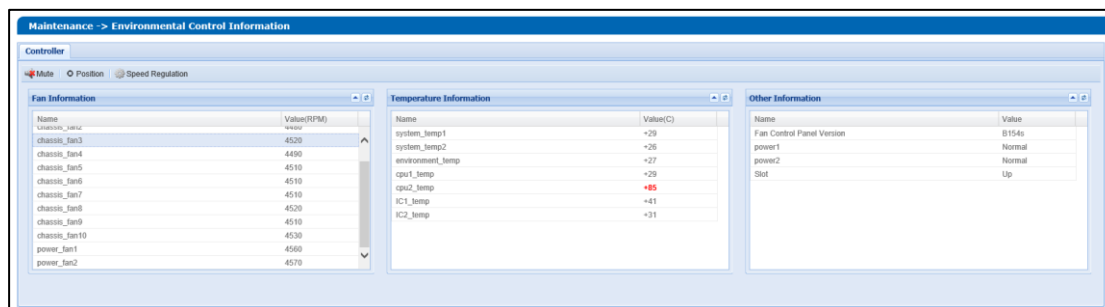


Figure 2. 9 Host

2. Optionally, click **Mute** to turn off system audible warning.
3. Optionally, click **Position** to position which controller is working. The FN indicator of working controller would light up and flash for 10 minutes.
4. Set fan speed.
  - 1) Click **Speed Regulation**.

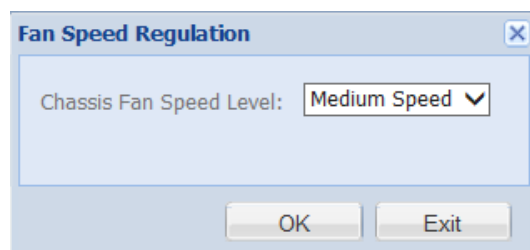


Figure 2. 10 Fan Speed

- 2) Set a speed level.
- 3) Click **OK**.

## Chapter 3 Storage Management

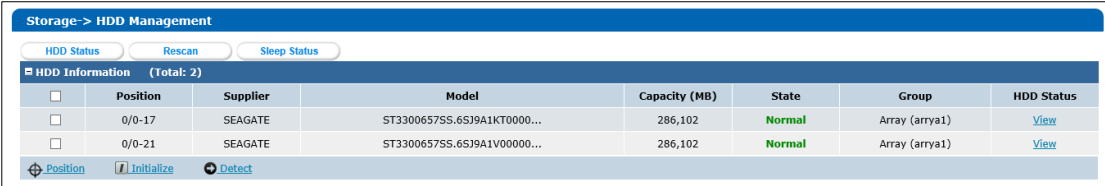
Table 3. 1 Module Description

Module	Description
HDD	You can: <ul style="list-style-type: none"> <li>● View HDD information and status.</li> <li>● Rescan, positioning, initialize, and detect HDDs.</li> </ul>
Array	You can: <ul style="list-style-type: none"> <li>● Create arrays.</li> <li>● Add hot spare.</li> <li>● View array and hot spare information.</li> <li>● Delete array and hot spare.</li> </ul>
Storage Pool	You can: <ul style="list-style-type: none"> <li>● Add, delete, and positioning storage pools.</li> <li>● Remove and positioning HDDs.</li> <li>● View system total and free capacity.</li> </ul>
LUN (Logical volume)	You can <ul style="list-style-type: none"> <li>● Add and delete LUNs.</li> <li>● Rename, expand, clone, and snapshot LUNs.</li> </ul>
Configuration	You can: <ul style="list-style-type: none"> <li>● Set array synchronization speed.</li> <li>● Set array synchronization type.</li> <li>● Set flicking frequency for HDD positioning indicator.</li> </ul>

### 3.1 Manage Local HDD

#### Purpose:

In **Storage > HDD**, you can view HDD information, rescan HDD, initialize HDD, etc.



The screenshot shows the 'Storage > HDD Management' interface. At the top, there are buttons for 'HDD Status', 'Rescan', and 'Sleep Status'. Below this is a table titled 'HDD Information (Total: 2)'. The table has columns for 'Position', 'Supplier', 'Model', 'Capacity (MB)', 'State', 'Group', and 'HDD Status'. Two HDDs are listed, both with a 'Normal' state. At the bottom of the interface, there are buttons for 'Position', 'Initialize', and 'Detect'.

Position	Supplier	Model	Capacity (MB)	State	Group	HDD Status
0/0-17	SEAGATE	ST33006575S.6S39A1KT0000...	286,102	Normal	Array (array1)	<a href="#">View</a>
0/0-21	SEAGATE	ST33006575S.6S39A1V00000...	286,102	Normal	Array (array1)	<a href="#">View</a>

Figure 3. 2 HDD Management

#### 3.1.1 View HDD Status

#### Purpose:

You can select an HDD and click **View** to view its status, or click HDD Status to view the status of all HDDs.

Table 3. 2 HDD Status Description

Status	Description
Normal	HDD works normally.

Undetected	HDD failed the HDD detection.
Lost	HDD is unrecognized.
Risky	Exception occurs during HDD detection. But it can still work.
Bad	HDD is kicked out by an array.
Warning	HDD read and writing speed is higher than 10 MB/S during pressure test.

### 3.1.2 Rescan HDD

**Purpose:**

If an HDD is installed or uninstalled, you can click **Rescan** to find or remove the HDD.



Rescanning HDDs may result in HDD status appearing as Unknown. Fresh the interface or click **Rescan** again to solve the problem.

### 3.1.3 Position HDD

**Purpose:**

HDD bottom indicator flickers after enabling the function. It enables you to find a certain HDD more easily.

**Before you start:**

Set the flickering time first. For details, refer to 3.5.2 *Configure Flickering Time*.

**Steps:**

1. Select HDD(s) to find.
2. Click **Position**.
3. View the HDD indicator at front panel. The HDD indicator would keep flickering in red color.

### 3.1.4 Initialize HDD

**Purpose:**

To recover an HDD when its status is uninitialized or when it is kicked out by an array, you can initialize it.

**Steps:**

1. Select HDD(s) to initialize.
2. Click **Initialize**.
3. Confirm the operation.

### 3.1.5 Detect HDD

**Purpose:**

To recognize an HDD which is added to a storage system for the first time, detect it.

**Steps:**

1. Select HDD(s) to detect.
2. Click **Detect**.

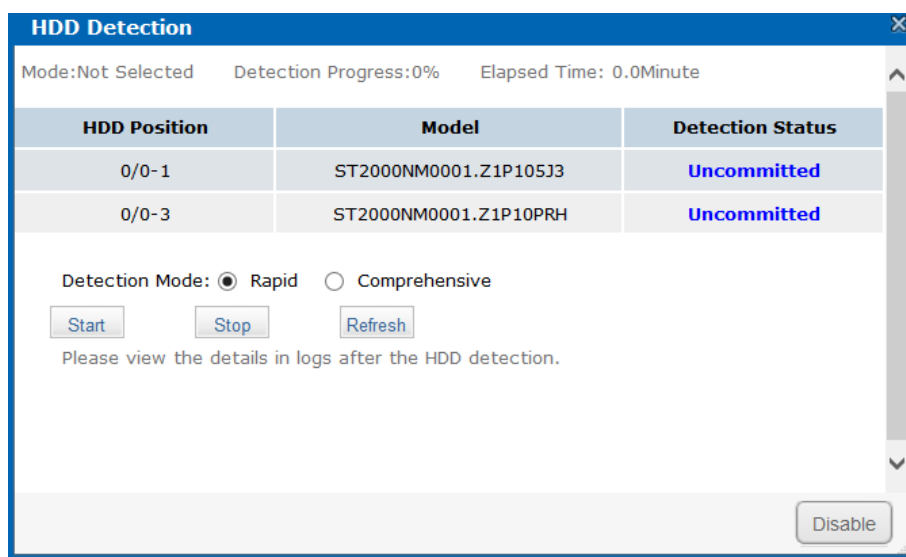


Figure 3. 3 HDD Detection

3. Select the **Detection Mode** as **Rapid** or **Comprehensive**.
  - **Rapid**: Detect parts of all HDD blocks. It takes shorter time than Comprehensive.
  - **Comprehensive**: Detect all HDD blocks. It takes longer time than Rapid.

#### NOTE

- It is recommended to operate rapid detection when system is under low pressure.
  - You are recommended to operate comprehensive detection for the first use HDD.
  - To keep data safe, detect an HDD every 3 months.
4. Click **Start** to start detecting. The selected detection mode, detection progress, and detection time are listed in the top part of the interface.
  5. Optionally, click **Refresh** to update the detection status, detection process and detection time.  
Or you can click **Stop** to end all detections.

Table 3. 3 Detection Status Description

Check Status	Description
Uncommitted	HDD detection has not been committed.
Detecting	HDD is being detected.
Waiting	Another HDD is being detected. You need to wait till the detection is finished.

## 3.2 Array

### **Purpose:**

You can create and manage array.

### **Step:**

Click **Storage** in navigation bar and choose **Array**.

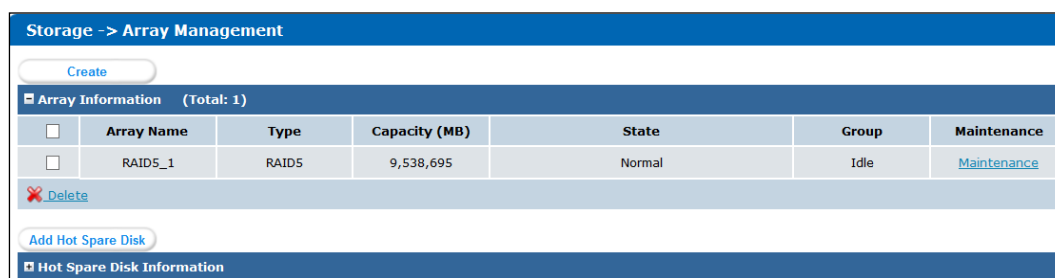


Figure 3. 4 Array

### 3.2.1 Create Array

**Purpose:**

You can use available HDDs to create array.

**Steps:**

1. Click **Create Array**.

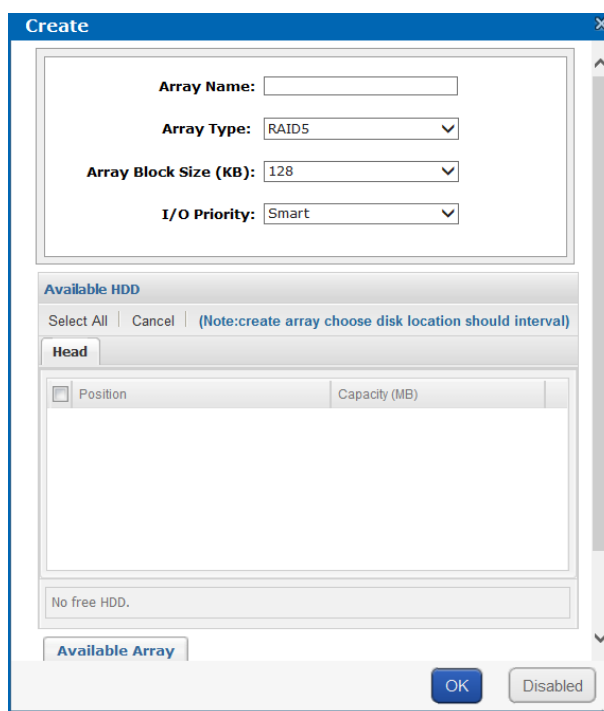


Figure 3. 5 Create Array

2. Input **Array Name** in text field.
3. Select **Array Type** in drop-down list. **RAID 0**, **RAID 1**, **RAID 3**, **RAID 5**, **RAID 6**, **RAID 10**, and **RAID 50** are selectable.

Figure 3. 6 Required HDD Quantity

Array Type	Required HDD Quantity
RAID 0	At least 2 HDDs.
RAID 1	At least 2 HDDs.
RAID 3	At least 3 HDDs.
RAID 5	Valid range: [3, 12].
RAID 6	At least 4 HDDs.
RAID 10	RAID is made of RAID 0 and RAID 1 which requires

	at least 4 even HDDs.
RAID 50	RAID is made of RAID 0 and RAID 5 which requires at least 6 even HDDs.

4. Select **Array Block Size(KB)** in drop-down list.
5. Select **I/O Priority** as **Performance Priority**, **Protection Priority**, **Balanced**, or **Smart**.
  - **Performance Priority:** To guarantee external IO task performance, internal IO task is totally stopped.
  - **Protection Priority:** To guarantee internal IO task performance, external IO task would only take the rest channel.
  - **Balanced:** When both internal and external IO task exist, Balance ensures internal IO task occupy certain channel without influencing external IO task.
  - **Smart:** Without external IO task, array is initialized in the highest speed. Or array is initialized in the lowest speed.

 **NOTE**

If RAID level is RAID 0, I/O priority is unavailable.

6. Select the **Available HDDs** to create RAID.  
Or select **Available arrays** to create RAID.  
Or select the combination of **Available HDDs** and **Available arrays**.

 **NOTE**

- Only enterprised HDDs are listed in Available HDDs list.
  - In order to increase the performance of created RAID, it is recommended to use HDDs of the same model and capacity when creating a RAID.
7. Click **OK** to create array. The successfully created array lists in Array information list. Once created, the array starts initializing.

## 3.2.2 Array Exception

**Purpose:**

If HDD failure occurs, array degrades. When more HDDs fail, array fails. Degraded array can keep working. However, failed array cannot work. Notification area will notify you once array degraded or failed. Refer to following table for array degraded and failed condition.

Table 3. 4 Array Degraded Condition

RAID Level	Degraded Condition	Failed Condition
RAID 0	RAID 0 will not degrade.	One HDD fails.
RAID 1	N-1 HDDs fail.	All HDDs fail.
RAID 3	One HDD fails.	Two HDDs fail.
RAID 5		
RAID 6	N-1 HDDs fail.	More than three HDDs fail.
RAID 10	One HDD fails.	Two HDDs fail in either contained RAID.
RAID 50		

 **NOTE**

- If array in storage pool degrades, physical volume degrades.

- If array in storage pool fails, physical volume fails.

## 3.2.3 Rebuild Array

### **Purpose:**

Rebuilding refers to the process of using a normal HDD or array to virtually replace a failed HDD in a degraded array. The normal HDD can be hot spare HDD, newly inserted HDD, and so forth.



### **NOTE**

- During rebuilding process, if the rebuilding HDD fails, the array stays degraded.
- During rebuilding process, if a normal HDD in array fails, the array becomes failed.
- During rebuilding process, if I/O error occurs to the rebuilding HDD, you need to change rebuilding HDD.

### 3.2.3.1 Rebuild with Hot Spare

#### **Before you start:**

Add global, area, or local hot spare HDD or array for array.

#### **Step:**

Once the array degraded, hot spare HDD or hot spare array automatically rebuilds the array.



### **NOTE**

When the degraded array possesses both global and local hot spare, it rebuilds with local hot spare preferentially.

### 3.2.3.2 Rebuild with Available HDD

#### **Before you start:**

Ensure there is at least one available HDD which isn't included in any array or storage pool.

#### **Steps:**

1. Click **Maintenance** of a degraded array in Array information list.
2. Click **Rebuild** to pop up Array rebuild interface.
3. Select an **Available HDD** or **Available Array**.
4. Click **OK** to start rebuilding.

## 3.2.4 Detect Array

### **Purpose:**

You can detect whether the data bit and parity data in an array match or not.



### **NOTE**

If array in storage pool starts detecting, the physical volume status is detecting.

#### **Steps:**

1. Click **Maintenance** of a degraded array in the array list.
2. Click **Detect** to start detecting.

## 3.2.5 Repair Array

### **Purpose:**

You can repair the data bit and parity data mismatch issue.



If array in storage pool starts repairing, physical volume status is repairing.

### **Steps:**

1. Click **Maintenance** of a degraded array in the array list.
2. Click **Repair** to start repairing.

## 3.2.6 Rename Array

### **Steps:**

1. Click **Maintenance** of an array in the array list.
2. Click **Rename**.
3. Enter a new name.
4. Click **OK** to save the new name.

### 3.2.6.1 Modify I/O Priority

#### **Steps:**

1. Click **Maintenance** of an array in the array list.
2. Click **Modify**.
3. Select **I/O Priority**.
4. Click **OK**.

### 3.2.6.2 Pause Initialization/Rebuilding/Detection/Repair

#### **Purpose:**

When the array is initializing, rebuilding, detecting, or repairing, you can pause.

#### **Steps:**

1. Click **Maintenance** of an array in the array list.
2. Click **Pause** to pause current process.
3. You can click **Keep** to resume.

## 3.2.7 Delete Array

### **Steps:**

1. Select an array to delete.
2. Click **Delete**.



If the array has been added to a storage pool, you need to remove it from storage pool first, or it can't be deleted.



## 3.2.8 Add Hot Spare

### Purpose:

The hot spare HDD can replace failed HDD in the degraded array. In order to protect data from damage in case of HDDs in array fail, it is recommended to add hot spare HDDs for a created array.

### NOTE

RAID 0 will not degrade. So you need not add local hot spare HDD for it.

### Steps:

1. Click **Add Hot Spare Disk**.
2. Set **Group** as **Global**, **Area**, or **Local**.
  - **Global**: Global hot spare HDDs can replace failed HDDs in any degraded arrays of storage devices in the same system.
  - **Area**: Area hot spare HDDs replace failed HDDs in any degraded arrays of one storage system.
  - **Local**: Local hot spare HDDs replace failed HDDs in designated array.

### NOTE

Priority of hot spare: Local hot spare > area hot spare > global hot spare

3. If Group is Area, Select available array in **Area** or **Array** for area or local group.
4. Select at least one **Available HDD**.  
Or select at least one **Available array**.  
Or select the combination of **Available HDD** or **Available array**.
5. Click **OK** to create hot spare.

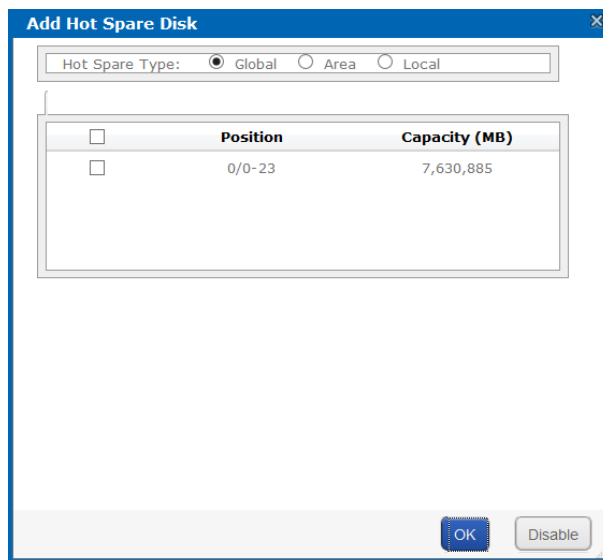


Figure 3. 7 Add Hot Spare

## 3.2.9 Delete Hot Spare

### Steps:

1. Select an array you want to delete.
2. Click **Delete** to delete.

## 3.3 Storage Pool

### Purpose:

Storage pool is made of physical volumes and contains arrays and HDDs, and it is designed for central management of storage capacity.

Go to **Storage > Storage Pool**.

Figure 3. 8 Storage Pool

Table 3. 5 Interface Description

Area	Name	Description
1	Information Area	Lists the storage pool total size, free size, LUN size, snapshot size, CVR size, iSCSI size, and FC size.
2	Configuration Area	You can add, delete, and positioning created physical volume here.

### 3.3.1 Add Storage Pool

#### Purpose:

You need to create physical volumes to build storage pool.

#### Before you start:

Ensure available array or HDD exists in the storage system.

#### Steps:

1. Click **Add**.

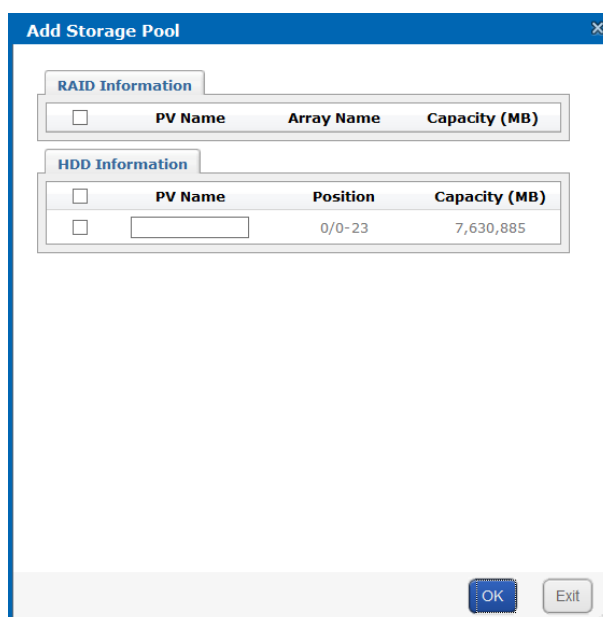


Figure 3. 9 Add Storage Pool

2. Select at least one array or HDD as storage pool.  
Or select the combination of array or HDD.
3. Input **PV Name** in text field.
4. Click **OK** to add the storage pool.

Physical Volume Information (Total: 3)					
<input type="checkbox"/>	PV Name	Device Name	Total Capacity (MB)	Idle Capacity (MB)	State
<input type="checkbox"/>	GO_POOL_RAID_1	RAID5_1	13,291,616	0	Repaired
<input type="checkbox"/>	GO_POOL_RAID_2	RAID5_2	15,209,600	0	Initialize Progress: 5.3% Remaining Time: 50 Hour 28 Minute
<input type="checkbox"/>	PV01	0/0-23	7,578,656	7,578,656	Normal

Figure 3. 10 Storage Pool

### 3.3.2 Delete Storage Pool

**Purpose:**

You can delete storage pool by deleting the added physical volumes.

**Steps:**

1. Select physical volume(s) to delete.
2. Click **Delete** or **Remove** to delete them.

 **NOTE**

Idle physical volumes can be deleted except the first created physical volume.

### 3.3.3 Position Storage Pool

**Before you start:**

Set the flickering time first. For details, refer to 3.5.2 *Configure Flickering Time*.

**Steps:**

1. Select physical volume(s) to position.

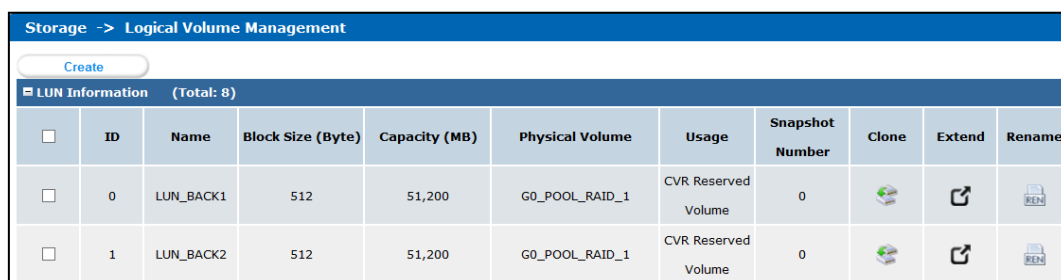
- Click **Posion**. The the HDD bottom indicator would keep flickering in green color.

## 3.4 LUN (Logical Volume)

### **Purpose:**

Logical volume is the virtual HDD which is made of physical HDD.

Go to **Storage > LUN**.



Storage -> Logical Volume Management										
LUN Information (Total: 8)										
<input type="checkbox"/>	ID	Name	Block Size (Byte)	Capacity (MB)	Physical Volume	Usage	Snapshot Number	Clone	Extend	Rename
<input type="checkbox"/>	0	LUN_BACK1	512	51,200	GO_POOL_RAID_1	CVR Reserved Volume	0			
<input type="checkbox"/>	1	LUN_BACK2	512	51,200	GO_POOL_RAID_1	CVR Reserved Volume	0			

Figure 3. 11 Logical Volume

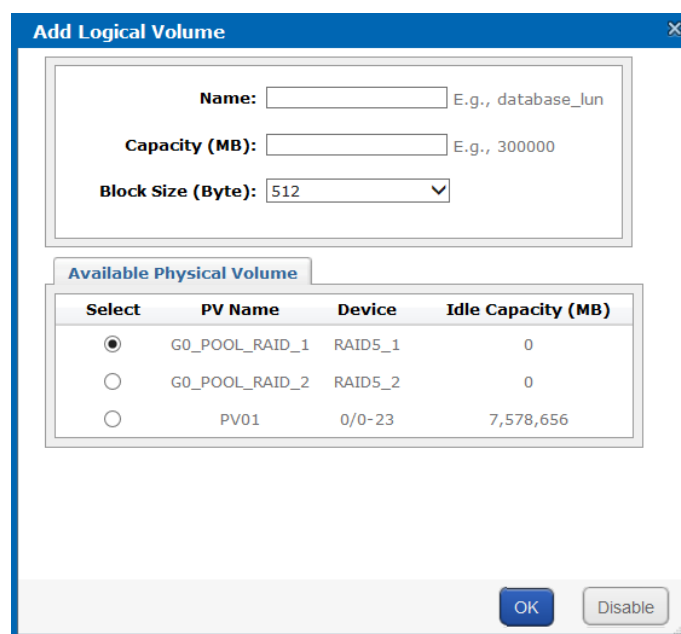
### 3.4.1 Create Logical Volume

#### **Purpose:**

You can create logical volumes by using available physical volumes.

#### **Steps:**

- Click **Create**.



**Add Logical Volume**

**Name:**  E.g., database\_lun

**Capacity (MB):**  E.g., 300000

**Block Size (Byte):**

**Available Physical Volume**

Select	PV Name	Device	Idle Capacity (MB)
<input checked="" type="radio"/>	GO_POOL_RAID_1	RAID5_1	0
<input type="radio"/>	GO_POOL_RAID_2	RAID5_2	0
<input type="radio"/>	PV01	0/0-23	7,578,656

**OK** **Disable**

Figure 3. 12 Create Logical Volume

- Enter **Name**.
- Enter **Capacity (MB)**.
- Select **Block Size (Byte)** from dropdown list.
- Choose **Available Physical Volume**.
- Click **OK** to create logical volume. Created logical volume is listed in logical volume information list.

## 3.4.2 Delete Logical Volume

### Steps:

1. Select logical volume(s) to delete.
2. Click **Delete** to delete.

### NOTE


The working logical volume cannot be deleted. Only free logical volume can be deleted.

## 3.4.3 Rename Logical Volume

### NOTE

Only free logical volumes can be renamed.

### Steps:

1. Click  of the corresponding logical volume.
2. Enter a new name.
3. Click **OK** to save the new name.

## 3.4.4 Enlarge Logical Volume


### Purpose:

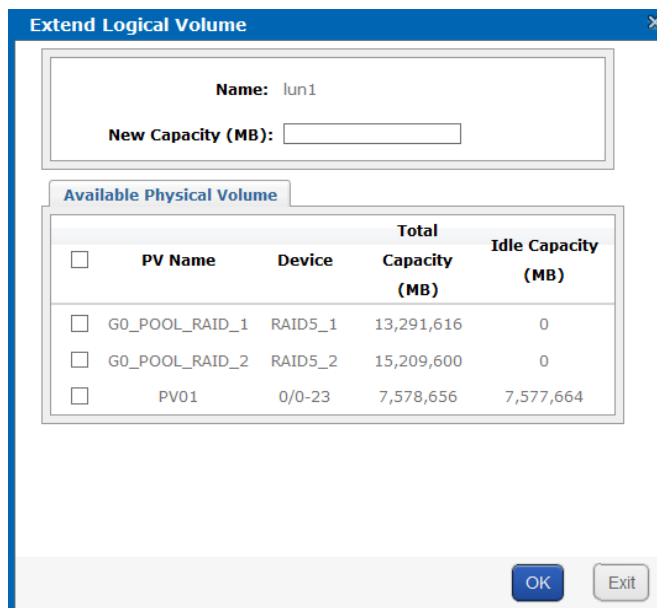
You can enlarge the size of created logical volume.

### NOTE

You can only enlarge the idle logical volumes.

### Steps:

1. Click  of the corresponding logical volume.



**Extend Logical Volume**

Name: lun1

New Capacity (MB):

Available Physical Volume

<input type="checkbox"/>	PV Name	Device	Total Capacity (MB)	Idle Capacity (MB)
<input type="checkbox"/>	G0_POOL_RAID_1	RAID5_1	13,291,616	0
<input type="checkbox"/>	G0_POOL_RAID_2	RAID5_2	15,209,600	0
<input checked="" type="checkbox"/>	PV01	0/0-23	7,578,656	7,577,664

OK Exit

Figure 3. 13 Extend LUN

2. Enter **New Capacity (MB)**.
3. Select **Available Physical Volume** to extend.
4. Click **OK**.

## 3.5 Configuration

### *Purpose:*

You can set the array synchronization speed type and flickering time of positioning indicator in **Storage > Configuration**.

Storage -> Configuration Management	
Array Synchronization Speed:	<a href="#">Modify</a>
Array Synchronization Type:	<a href="#">Modify</a>
HDD Positioning Flickering Time (s):	<input type="text"/> <a href="#">Modify</a>
Array Disk Cache:	<a href="#">Modify</a>

Figure 3. 14 Configurations

### 3.5.1 Configure Synchronization Speed and Type

#### *Purpose:*

Array synchronization speed and synchronization type is editable.

#### *Steps:*

1. Click **Modify** of **Array Synchronization Speed**.
2. Select **Array Synchronization Speed** as **High, Medium, Low, or None**.



#### **NOTE**

The faster the speed is, the higher the internal IO percentage would be.

3. Click **OK**.
4. Click **Modify** of **Array Synchronization Type**.
5. Select **Array Synchronization Type** as **Serial** or **Parallel**.
6. Click **OK**.

### 3.5.2 Configure Flickering Time

#### *Purpose:*

When positioning an HDD, the HDD bottom indicator keeps flickering for the set time.

#### *Steps:*

1. Enter a number as flickering time in **HDD Positioning Flickering Time (s)**.



#### **NOTE**

Valid flickering time ranges from 5 to 300, and the unit is second.

2. Click **Modify**.

## Chapter 4 SAN Management

### Purpose:

You can add iSCSI disks to your computer.

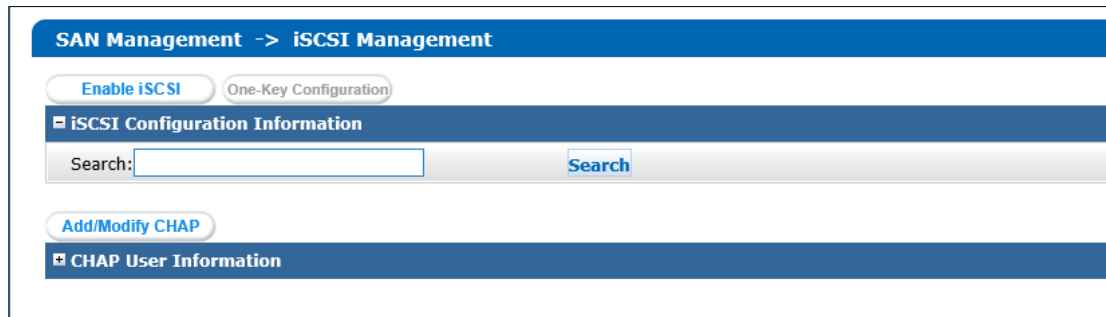


Figure 4. 1 iSCSI

### 4.1 Add/Modify CHAP User

#### Purpose:

When enabling iSCSI, you can select an added CHAP user as a way to verify your computer permission.

#### Steps:

1. Go to **SAN Management > iSCSI**.

2. Click **Add/Modify CHAP**.

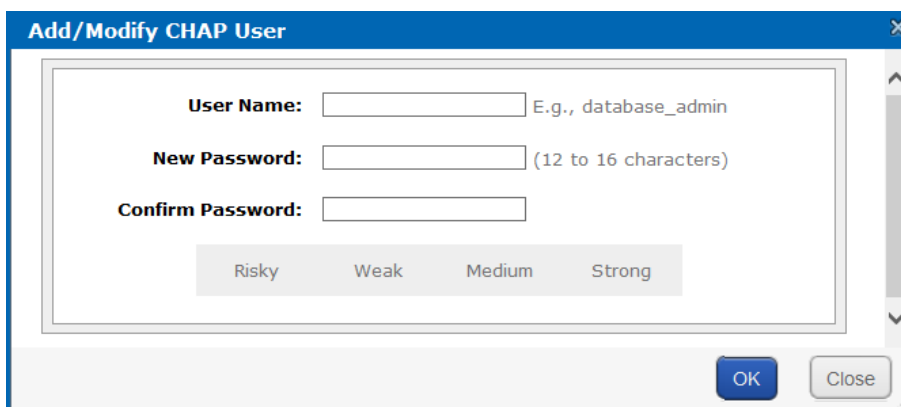


Figure 4. 2 Add CHAP User

3. Enter **CHAP User Name**, **New Password**, and **Confirm password**.
  - **User Name:** Only letters, numbers, and underline are allowed.
  - **New Password:** Only 12 to 16 characters, including letters, numbers, and underline, are allowed.
  - **Confirm Password:** It must be the same as **New Password**.

#### NOTE

Disconnect the CHAP linked iSCSIs from your computer before modifying a CHAP user.

4. Click **OK**.

## 4.2 One-Key Configuration

### Purpose:


One-key configuration is used to quickly configure the iSCSI settings in the storage system.

## 4.3 Enable iSCSI

### Purpose:

You shall enable iSCSI in the storage system before adding iSCSI HDDs in computer.

### Steps:

1. Go to **SAN Management > iSCSI**.
2. Click .

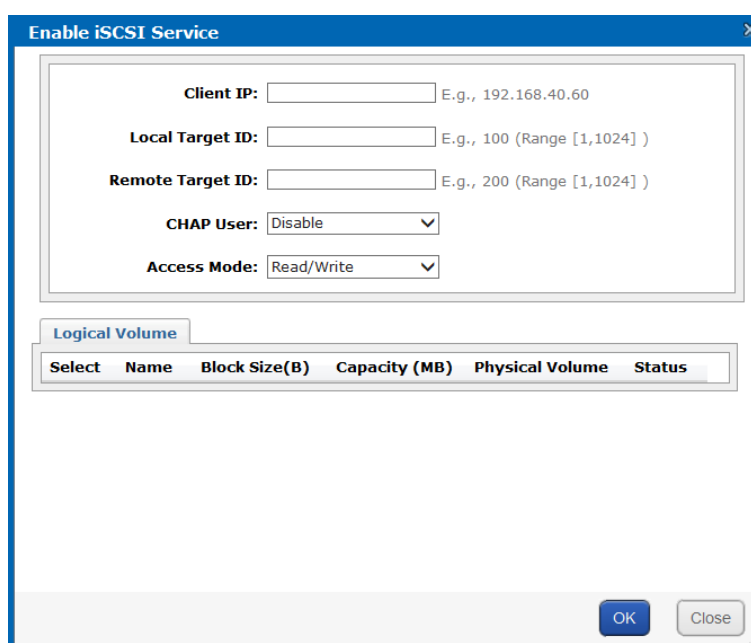


Figure 4. 3 Enable iSCSI

3. Enter **Client IP** and **iSCSI ID**.
  - **Client IP:** To turn on iSCSI for a specified client (computer), enter the client IP address. To turn on iSCSI for multiple clients, enter 0.0.0.0.
4. Select the identity authentication method of **CHAP User**.
  - **Disable:** There is no limit for client access.
  - Other CHAP user: Correct CHAP user name and password are needed for client to get access to LUN.
5. Select the logical volume **Access Mode** as **Read/Write**, **Write-Through**, **Read Only**, or **Intelligent Read-Only**.
  - **Read/Write:** Read and writing permission.
  - **Intelligent Read-Only:** Even though writing operation succeeded, data will not be written in to LUN. It is mainly used to test the storage system performance.
  - **Write-Through:** It writes the data into HDDs directly without writing into HDD buffer. A low writing speed makes the data complete.
6. Choose an available **Logical Volume**.



7. Click **OK**.



When multiple iSCSIs share the same LUN, only one iSCSI server access mode can be R/W and other servers should be RO or IRO, or file system may be damaged or data may lose.

## 4.4 Disable iSCSI

***Purpose:***

For the unnecessary iSCSIs, you can disable them, thus to keep the storage system safe and stable.

***Before you start:***

Disconnect the storage system from the clients for which you want to disable iSCSI.

***Steps:***

1. Go to **SAN Management > iSCSI**.
2. Select an iSCSI.
3. Click **Delete**.
4. Click **OK**.

## Chapter 5 Hybrid SAN

**Purpose:**

You can configure Hybrid SAN and N+1 parameters.

Table 5. 1 Module Description

Module	Description
Hybrid SAN	<ul style="list-style-type: none"> <li>● Configure private volume, CVR configuration, create record volume, and extend record volume.</li> <li>● CVR one-key configuration.</li> <li>● Manage N+1.</li> <li>● Log in Hybrid SAN sub-system to add encoders, add strategy, search video, etc.</li> </ul>
N+1	In a storage system, Hybrid SAN service has started can serve as a backup for other CVRs.

### 5.1 One-Key Configuration

**Purpose:**

One-key configuration helps you to quickly configure Hybrid SAN services.

**Before you start:**

Ensure there is neither storage pool nor array in the storage system.

**Steps:**

1. Go to **Hybrid SAN > Hybrid SAN**.
2. Click **One-Key Configuration**.
3. Click **OK**. The process will take 3 to 15 minutes.

 **NOTE**

- Bad HDD, risky HDD, and warning HDD would not be added to storage pool.
- Non-enterprise HDD shall be added to storage pool by single-HDD mode.
- Quick-setting takes longer if any undetected HDD exists.
- If HDDs in the storage system are less than 6, they are added to storage pool by single-HDD mode.
- If HDDs in the storage system are not less than 6 and HDDs in storage enclosure is less than 6, the storage system HDDs are added by array mode and the storage enclosure HDDs won't be added.
- If HDDs in the storage system and HDDs in storage enclosure are both not less than 6, they are both added to storage pool by array mode.
- If only one HDD exists, no reserved volume is created. In single-HDD mode, no reserved volume is created in the last HDD of the storage system. In array mode, two reserved volumes are created in each RAID.
- By default, a 50 GB size private volume and a 50 GB size reserved volume should be created.

### 5.2 Hybrid SAN Configuration

**Purpose:**

You can start and reset Hybrid SAN and create record volume.

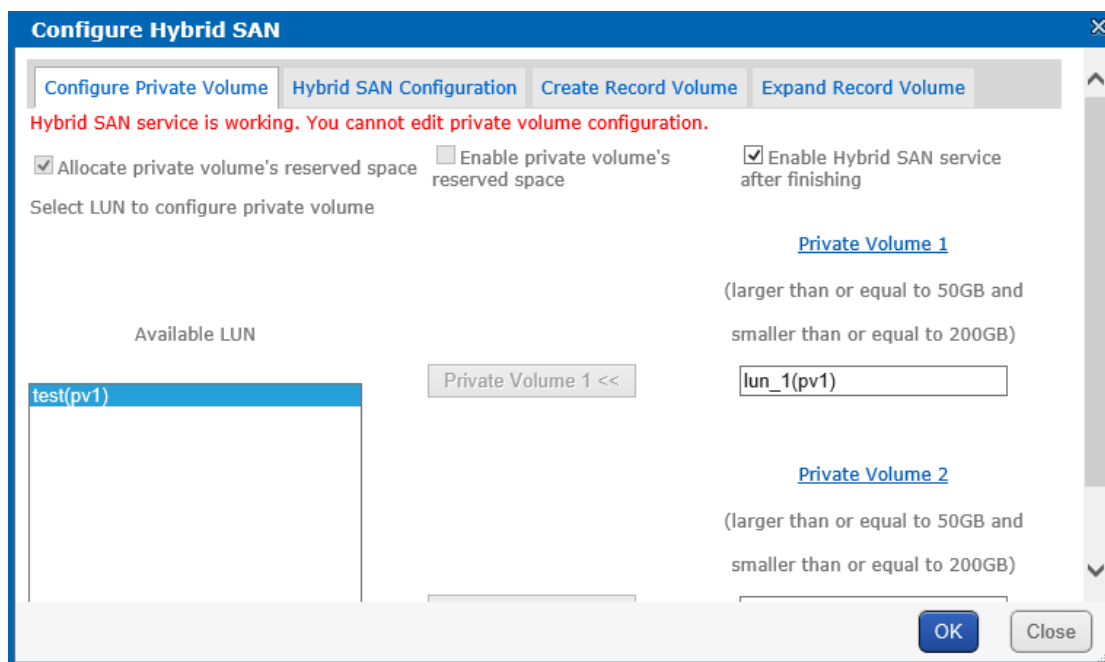


Figure 5. 2 Hybrid SAN

## 5.2.1 Start Hybrid SAN

### **Purpose:**

You can start Hybrid SAN after private volumes are created.

### **Before you start:**

1. Add HDDs to storage pool for single-HDD mode, or create arrays and add them to storage pool for array mode.
2. Create at least 5 LUNs. Ensure at least 4 of them are larger than 20 GB. The four LUNs are used to create private volume, reserved volume. Other LUNs are used to create record volume.

### **NOTE**

- If record volume size is less than 120 TB, then private volume 1 and private volume 2 size should both be larger than 50 GB.
- If record volume size ranges from 120 TB to 180 TB, then private volume 1 and private volume 2 size should both be larger than 60 GB.
- If record volume enlarges by 60 TB, record volume 1 and record volume 2 should both enlarge by 10 GB.

### **Steps:**

1. Go to **Hybrid SAN > Hybrid SAN**.
2. Click **Configure Hybrid SAN**.
3. Click **Configure Private Volume**.

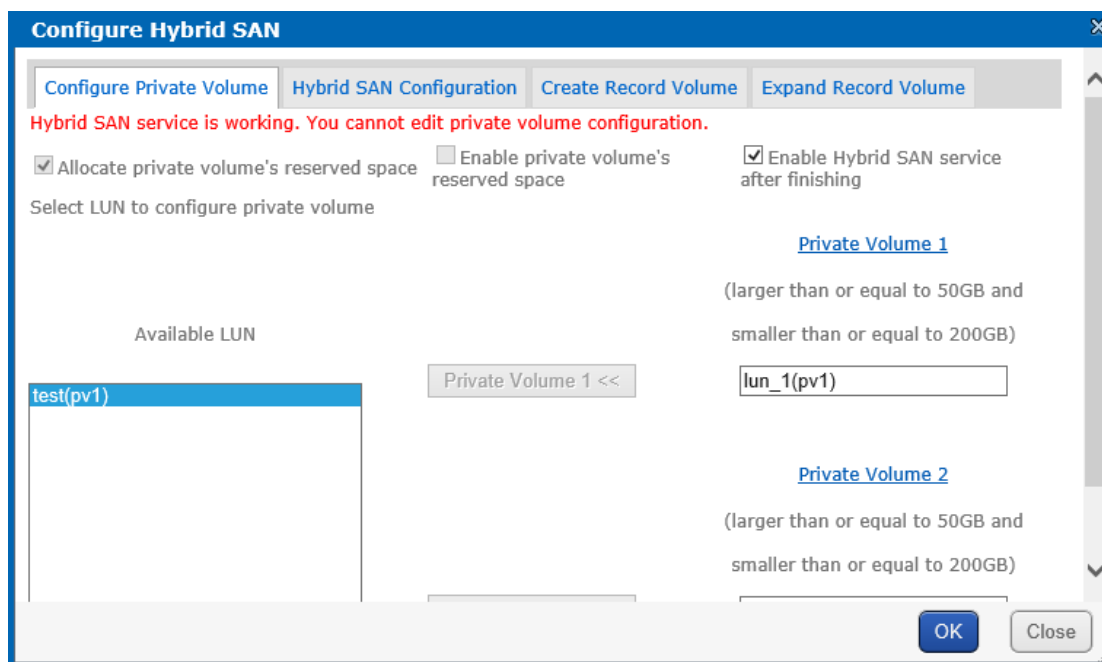


Figure 5. 3 Hybrid SAN

4. Check **Enable Hybrid SAN after finishing**.
5. Optionally, check **Allocate private volume's reserved space** and **Enable private volume's reserved space**.  
**Enable private volume's reserved space:** Create a spare volume for private volume. The spare volume works as a backup volume. When error occurs to the two private volumes, the two spare LUNs would replace them.

#### NOTE

It is not recommended to use a spare volume in the same physical volume with the private volume.

6. To add private volume 1, choose a **Free LUN** and click .
7. To add private volume 2, choose a **Free LUN** and click .

#### NOTE

- CVR configuration information is saved in private volume 1 and private volume 2.
  - It is not recommended to use the LUN created by the HDD first added to storage pool to create private volume 1.
  - The LUN capacity should meet the demand.
  - If **Allocate private volume's reserved space** and **Enable private volume's reserved space** are selected, the storage system automatically select two free LUN as the spare volumes.
8. Click **OK** to start creating the two private volumes.

## 5.2.2 Reset Hybrid SAN

### **Purpose:**

You can delete Hybrid SAN videos, encoders, and other configurations by resetting Hybrid SAN. After reset, Hybrid SAN status restores to not configured or incomplete.

### **Steps:**

1. Go to **Hybrid SAN > Hybrid SAN**.
2. Click **Configure Hybrid SAN**.
3. Click **Hybrid SAN Configuration**.

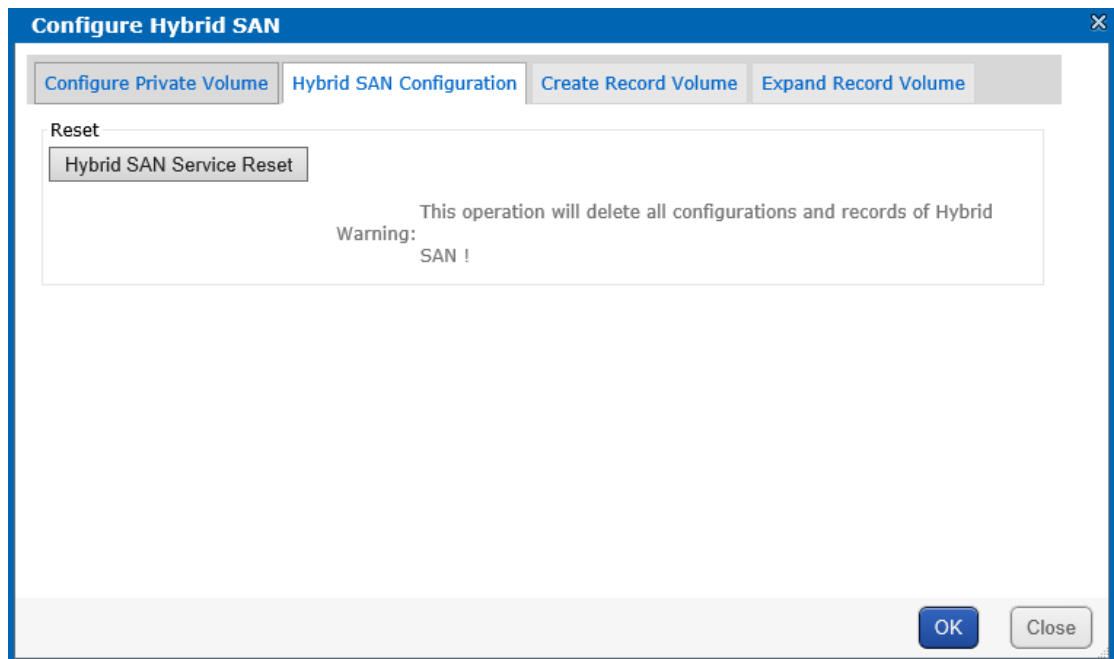


Figure 5. 4 Reset Hybrid SAN

4. Click **Hybrid SAN Service Reset**.
5. Enter **yes** or **YES**.
6. Click **OK**.

## 5.2.3 Record Volume

### ***Purpose:***

Record volume is the logical volume stores videos.

### 5.2.3.1 Create Record Volume

#### ***Steps:***

1. Go to **Hybrid SAN > Hybrid SAN**.
2. Click **Configure Hybrid SAN**.
3. Click **Create Record Volume** menu.

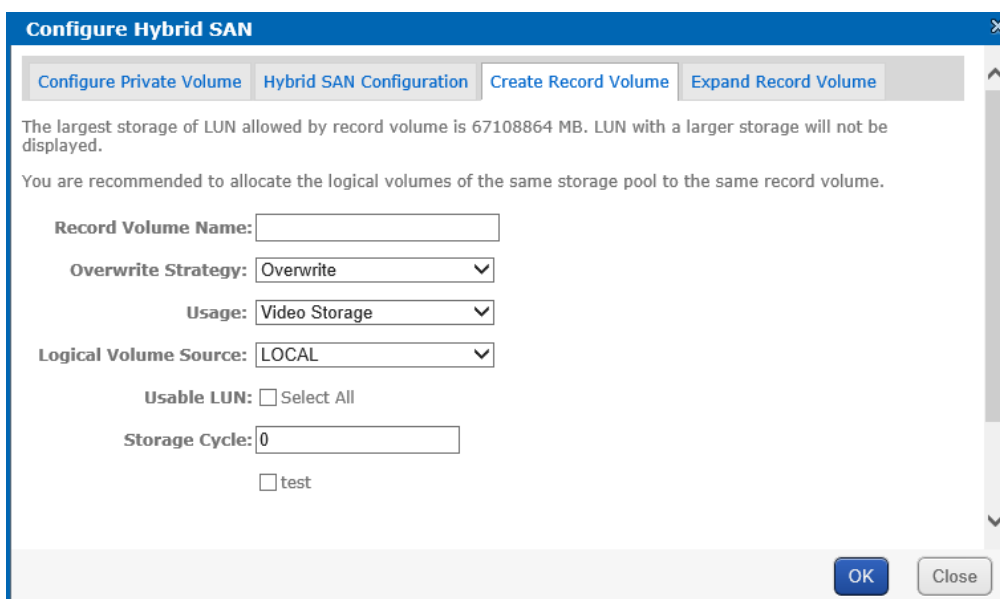


Figure 5. 5 Create Record Volume

4. Set **Record Volume Name**.
5. Select **Overwrite Strategy** as **Overwrite** or **Do Not Overwrite**.
  - **Overwrite**: Once the record volume is full, videos can still write into it by covering the earliest videos.
  - **Do Not Overwrite**: Once the record volume is full, videos cannot be written in it
6. Select **Record Volume Usage** as **Video Storage** or **Picture Storage**.
7. Select **Logical Volume Source** as **LOCAL** if you want to create record volume based on local HDD or array.
8. Select one or more **Usable LUN**.

#### NOTE

If the capacity of private volume 1 and private volume 2 are both larger than 50 GB, maximum capacity of each LUN of record volume is 8 TB.





9. Click **OK** to create the record volume. The created record volumes are listed in the record volume list.

### 5.2.3.2 Clear/Modify/Delete Record Volume

#### **Purpose:**

The created record volumes are listed in the record volume list. You can clear videos, modify record volume, and delete record volume.

Table 5. 2 Icon Description

Icon	Name	Description
	Clear data	You can clear videos saved in the record volume.
	Modify	You can modify record volume name, usage, and data overlay strategy.
	Delete	<p>You can delete the record volume. Data saved in it is removed.</p> <p> <b>NOTE</b></p> <p>Do not delete record volume when linked encoder is recording.</p>

If a record volume consists of two or more LUNs, you can delete one of them according to following steps:

#### **Steps**

1. Go to **Hybrid SAN > Hybrid SAN**.
2. Click the record volume name.

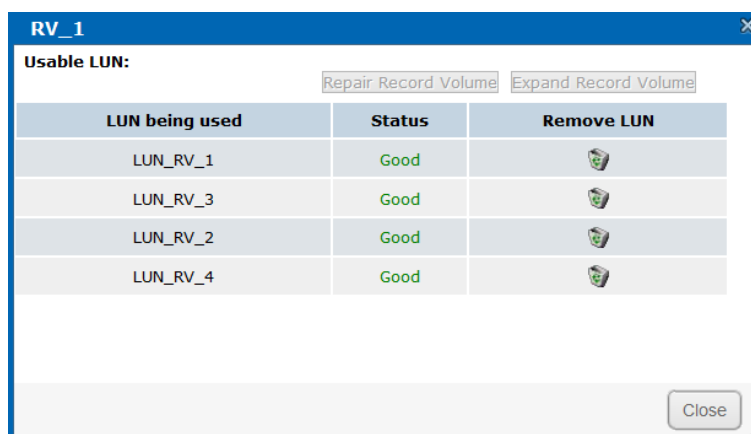


Figure 5. 6 LUNs

3. Click of the LUN you want to delete.
4. Enter **yes** or **YES**.
5. Click **OK**. After it is deleted, data saved in the LUN is deleted and the LUN status is Free.

### 5.2.3.3 Expand Record Volume

**Purpose:**

When the record volume capacity is insufficient, you can use the free LUNs to extend it.

**Steps:**

1. Go to **Hybrid SAN > Hybrid SAN**.
2. Click **Configure Hybrid SAN**.
3. Click **Expand Record Volume**.

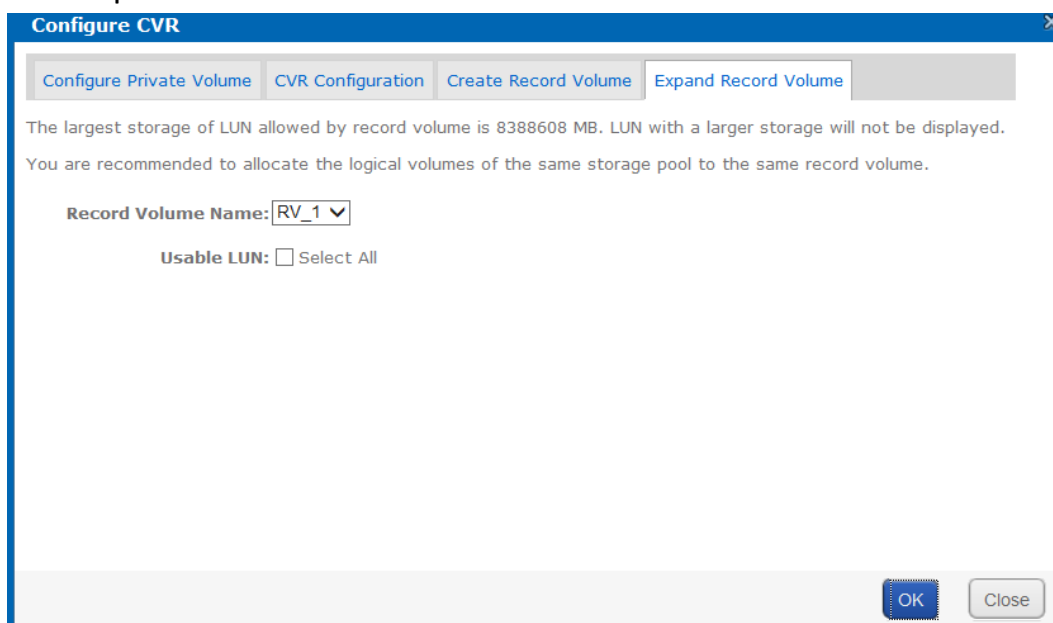


Figure 5. 7 Extend Record Volume

4. Select the record volume you want to extend in **Record Volume Name**.
5. Select **Usable LUN** to extend.

- Click **OK** to start extending.

## 5.3 Backup and Restore

### *Purpose:*

The chapter introduces the video backup and Hybrid SAN restoring steps.

### 5.3.1 View Private Volume Information

### *Purpose:*

Private volume 1 and private volume 2 are listed in **Hybrid SAN > Hybrid SAN > Backup and Restore > Private Volume Information**.

### 5.3.2 Restore

### *Purpose:*

When error occurs, restoring Hybrid SAN may recover it. Restoring may cause data loss, please contact technical support for professional help.

You can restore settings in **Hybrid SAN > Hybrid SAN > Backup and Restore > Execute Restoration Task**.

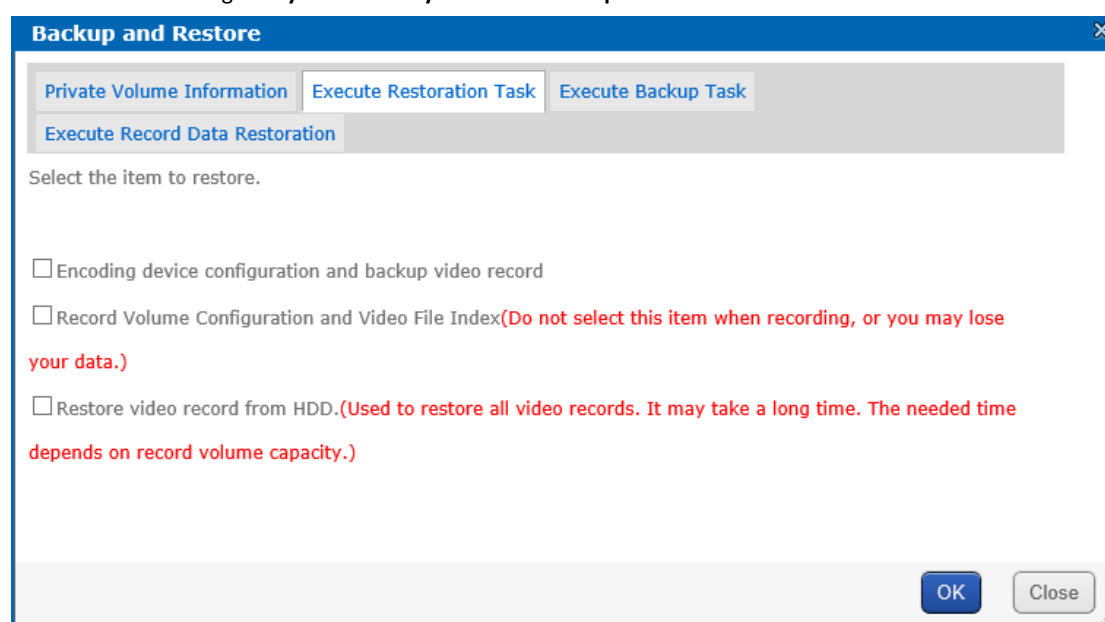


Figure 5. 8 Restore

### 5.3.3 Backup

### *Purpose:*

The storage system backs up parameters of all videos every hour. You can manually back up all video parameters according to following steps. The backed up parameters are saved in database.



The function backs up video index instead of videos.



**Steps:**

1. Go to **Hybrid SAN > Hybrid SAN**.
2. Click **Backup and Restore**.
3. Click **Execute Backup Task**.
4. Click **OK**.

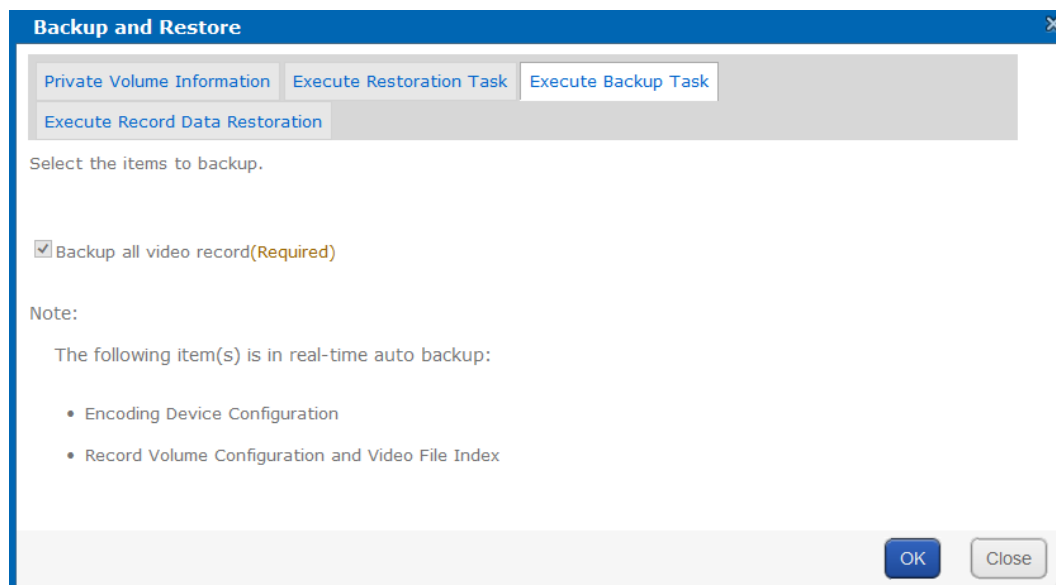


Figure 5. 9 Backup

### 5.3.4 Recover Video Data

**Purpose:**

If you reset Hybrid SAN, deleted record volume, or cleared record volume by mistake, please contact technical support for professional help.

**Step:**

1. Go to **Hybrid SAN > Hybrid SAN**.
2. Click **Backup and Restore**.
3. Click **Execute Record Data Restoration**.

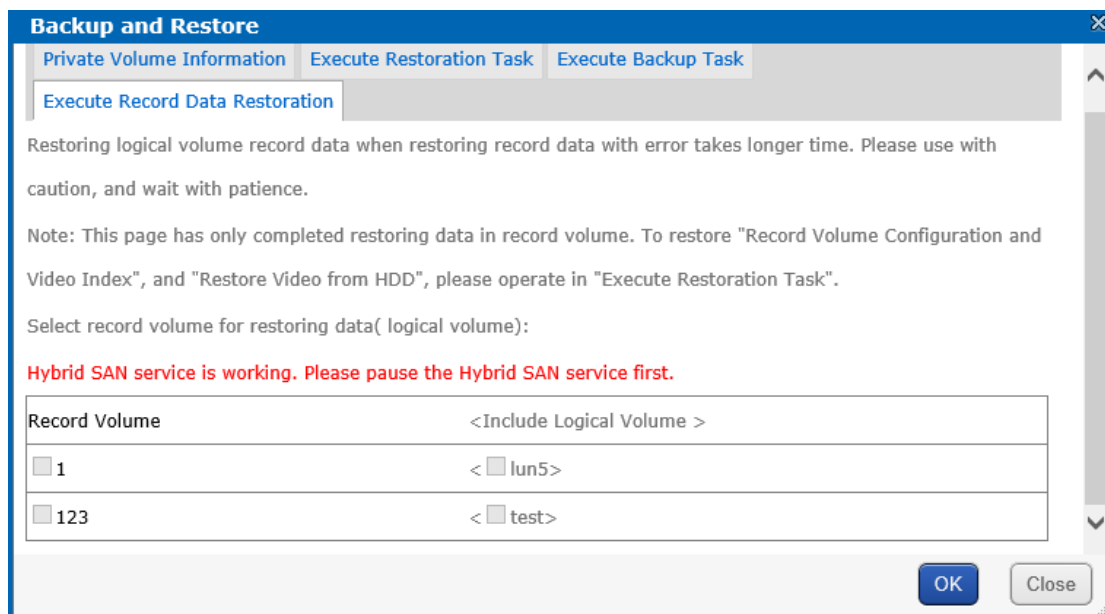


Figure 5. 10 Record Data Recovery

## 5.4 N+1 Management

### **Purpose:**

A storage system whose Hybrid SAN service has started can serve as a backup Hybrid SAN for other Hybrid SANs. When one or more master Hybrid SANs fail, the backup Hybrid SAN would record the videos from encoders. Master Hybrid SAN error includes network error, private volumes damaged, database error, and Hybrid SAN service error. After the master Hybrid SANs recovers to normal, backup Hybrid SAN would upload videos back to master Hybrid SANs.

### **NOTE**

- Log into master Hybrid SAN and add backup Hybrid SAN for master Hybrid SAN first. And then Log into backup Hybrid SAN and add master Hybrid SAN for backup Hybrid SAN.
- A storage system can be either backup Hybrid SAN or master Hybrid SAN.
- Ensure the system time of backup Hybrid SAN and master Hybrid SAN are the same. For detailed steps of modifying system time, refer to *Chapter 8.4 Time*.
- Once master Hybrid SAN can only link to one backup Hybrid SAN
- It is not recommended that encoding devices added in backup Hybrid SAN have duplicate name.

### 5.4.1 Add Backup Hybrid SAN

#### **Purpose:**

Add backup Hybrid SAN in master Hybrid SAN first.

#### **Before you start:**

Log into master Hybrid SAN.

#### **Steps:**

1. Go to **Hybrid SAN > N + 1**.
2. Click **Add Backup Hybrid SAN**.

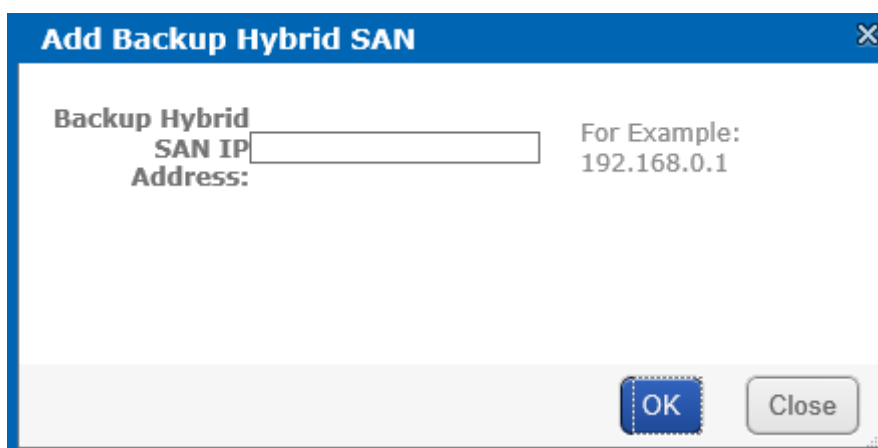


Figure 5. 11 Add Backup Hybrid SAN

3. Enter the backup Hybrid SAN IP address.
4. Click **OK**.
5. Optionally, check **Synchronization** and **Delete the videos saved in backup CVR after synchronization succeeded**, and click **Modify** to enable them.
  - **Synchronization**: Once master Hybrid SAN recovers to normal, backup Hybrid SAN uploads the videos back to master Hybrid SAN.
  - **Delete the videos saved in backup CVR after synchronization succeeded**: Delete the videos in backup Hybrid SAN once they are uploaded to master Hybrid SAN.

## 5.4.2 Delete Backup Hybrid SAN

### Steps:

1. Go to **Hybrid SAN > N + 1**.
2. Select backup Hybrid SAN you want to delete.
3. Click **Delete**.
4. Click **OK**.

## 5.4.3 Add Master Hybrid SAN

### Before you start:

1. Log into backup Hybrid SAN and enter N+1 Management interface.
2. Add the same encoding devices in backup Hybrid SAN, which have been added in master Hybrid SAN. For details, refer to *chapter 6.3.2 Add Encoding Device*. Ensure the name of encoding devices from different backup Hybrid SANs vary from each other.
3. Delete the added encoding devices in step 2.
4. Add schedules for encoding devices in backup Hybrid SAN the same as schedule in master Hybrid SAN.

### Steps:

1. Go to **Hybrid SAN > N + 1**.
2. Click **Add Master Hybrid SAN**.

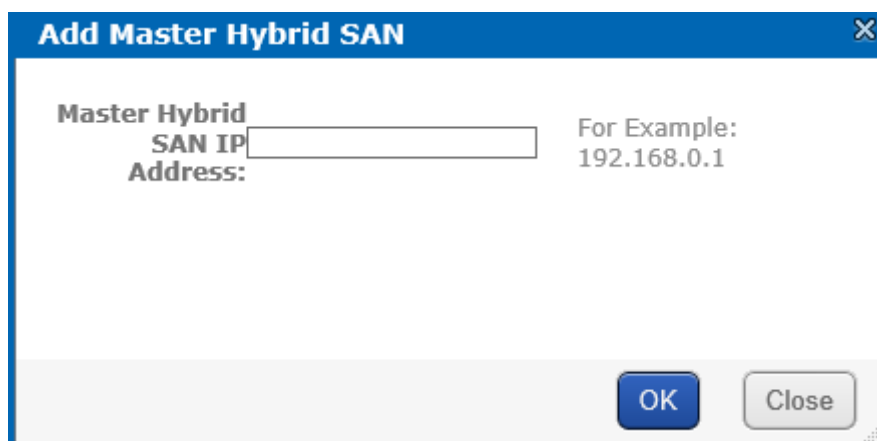


Figure 5. 12 Add Master Hybrid SAN

3. Enter master Hybrid SAN IP address.
4. Click **OK** to add. The added master Hybrid SAN is listed in Hybrid SAN master list
5. Enter **Maximum Taking Over Number** and click **Modify**. If maximum taken-over master Hybrid SAN is 4 and 7 master Hybrid SANs are added, when 5 master Hybrid SANs are abnormal, the backup CVR would take over the first added 4 master Hybrid SANs. After one or more of the 4 Hybrid SANs recovers, other master Hybrid SANs would be taken over.

 **NOTE**

The max. taken-over number cannot be more than 10. If input 0 or input nothing, system regards it as 10.

Table 5. 3 Backup CVR Status

Backup CVR Status	Description
Standby	When master Hybrid SAN is normal, backup Hybrid SAN is standby.
Working	When master Hybrid SAN is abnormal, backup CVR takes over the tasks. Now backup Hybrid SAN status is working and master Hybrid SAN status is taken-over. When master Hybrid SAN recovers, backup Hybrid SAN recovers to standby.

## Chapter 6 Hybrid SAN Sub-System

### Purpose:

You can configure the parameters for Hybrid SAN sub-system.

Table 6. 1 Module Description

Module	Description
Information	Encoding device, record schedule, and record volume information are listed.
Encoding Device	You can add and manage encoding devices, adjust CVR sub-system time, count remaining recording capacity, and analyze video loss.
Preview and Record	You can view encoding device status and live view image, and start and stop manual record of one or more encoding devices.
Strategy and Alarm	You can configure recording schedule, create uploading task and schedule, and configure alarm parameter.
Download and play	You can search, archive, backup, lock, play, and download recorded videos.
User Management	You can switch system language and edit display rows in each page.
System Config	You can configure system alarms and view CVR version.
Log Management	Log helps you figure out CVR history actions. You can search, export, and clear logs.

### 6.1 Access by Web Browser

#### Steps:

1. Open web browser.
2. Input the storage system IP address (https://10.254.254.254:2004) in Web browser address bar.
3. Press **Enter**.
4. Select **Hybrid SAN** as the system to log in.
5. Enter **Password**.



***STRONG PASSWORD RECOMMENDED***—We highly recommend you create a strong password of your own choosing (Using a minimum of 8 characters, including at least three of the following categories: upper case letters, lower case letters, numbers, and special characters.) in order to increase the security of your product. And we recommend you reset your password regularly, especially in the high security system, resetting the password monthly or weekly can better protect your product.

6. Click **Enter**.

### 6.2 Information

#### Purpose:

Encoding device, record schedule, and record volume information are listed in **Information > Information**.

Figure 6. 2 Information

Table 6. 2 Status Description

Status	Description
Free	Connection is normal and it is recording.
No video input	It appears when encoding device amount reaches the limit or CVR is rebooting.
Recording	Encoding device is recording.
Password or user name error	Incorrect user name or password for encoding device.
Not load	When CVR starts, loading encoding device failed.
Unknown	CVR is error.
Not connected	Failed to get stream for encoding device.
Recording... Archiving...	Encoding device is recording and archiving.
Recording... Uploading...	Encoding device is recording and receiving videos from front-end devices.
Archiving	Encoding device isn't recording, but is archiving.
Uploading	Encoding device isn't recording, but is receiving videos from cameras.

## 6.3 Encoding Device

**Purpose:**

You can add and manage encoding devices, adjust CVR sub-system time, count remaining recoding capacity, and analyze video loss in **Encoding Device > Encoding Device**.

Figure 6. 3 Device Management

### 6.3.2 Add Encoding Device

**Steps:**

1. Go to **Encoding Device > Encoding Device**.
2. Click **Add Encoding Device**.
3. Enter **Encoding Device Name**.
4. According to encoding device actual parameters, select **Encoding Device Type**, enter **IP/Host**, **Port**, **Channel**,

**Login user, and Password.**

5. Optionally, you can enable stream media server by checking **Enable SMS** (Stream Media System), inputting *IP address: port* (e.g., 192.168.0.2:554) in **SMS**, and select **URL Mark** and **Transmission Method**.
6. Optionally, you can enable other function according to your needs.
  - **Enable streaming according to needs:** The storage system releases occupied bandwidth, when no stream requirement for the encoding device. If selected, the encoding device Attribute marks as **P**.
  - **ANR** (Automatic Network Replenishment): When the storage system disconnects with the encoding device, the encoding device records video and stores in its own storage device, like SD card. Once connection recovers, encoding device sends the video to the storage system. If selected, the encoding device Attribute marks as **T**.
  - **Enable sub-stream to preview and record:** If selected, when you preview and record via sub-stream, it takes lower bandwidth. But sub-stream video quality and bitrate is lower than main stream. And the encoding device Attribute would mark as **S**. If record strategy exists, CVR gets stream according to strategy.
  - **Enable Arming:** If selected, when alarm occurs to encoding device, CVR can trigger alarm record. And the encoding device Attribute would mark as **A**.
7. Select related record volume in **Link to Record Volume**.
8. Click **OK** to add the encoding device.

**Add Encoding Device**

Encoding Device Name:  For example pv\_0001

Encoding Device Type:

Device IP/Domain Name:

Connection Port No.:

Connection Camera No.:  Between 0 ~ 255

Device Username:

Password:

Enable SMS

SMS:

URL Mark:

Transmission Method:

Function Selection:

Enable Streaming according to needs

ANR

User sub-stream to preview and record

Enable Arming

Link to Record Volume:


Figure 6. 4 Add Encoding Device

**NOTE**

- Repeat above steps to add more encoding devices. Up to 1024 encoding devices can be added.
- If the encoding device you add isn't in the List of Compatible of Encoding Device, the Attribute would mark as B. You can ask technical support for the List of Compatible of Encoding Device.

### 6.3.3 Modify/Delete Encoding Device

#### Steps:

- To delete encoding devices, do following steps:
  1. Select encoding device you want to delete.
  2. Click **Delete encoding device**.
- To modify encoding device parameters, do following steps:
  1. Click  of encoding device you want to modify.
  2. Edit the parameters you want to modify.
  3. Click **OK** to save the settings.
- To modify linked record volume, do following steps:
  1. Select encoding device you want to modify.
  2. Select the target record volume.

### 6.3.4 Export/Import Encoding Device

#### Purpose:

For the purpose of modifying a large number of encoding device in batch, you can export them, modify their parameters, and import them back to CVR sub-system.

#### Steps:

- To export encoding devices, do following steps:
  1. Click **Export**.
  2. Click **OK**.

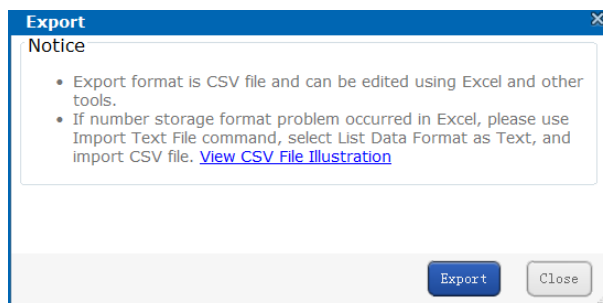


Figure 6. 5 Export

3. Select file saving path and click **OK** to save it.

#### NOTE

The exported file is a .csv file. You can view and edit it via Microsoft Excel. The content of exported file is shown in *Figure 6. 6 Exported File*.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	M_ID	NAME	TYPE	DEVICE	CHANNEL	HOST	PORT	USER	PASSWORD	USELUN	PATH	ENABLED	COMMENT	CAMINDEX	GRPINDEX	DEVICESN	HKSLLOTID	HKSTREAMS	GBDEVSN	GBDEVCHANSN	
2	1	Encoder01HK		Encoder01		1 10.16.1.250		80 admin	Hik12345		0		62								
3																					

Figure 6. 6 Exported File

- To import encoding devices, do following steps:
  1. Click **Import**.
  2. Click **Browse** and select the target file.
  3. Optionally, you can select **Operation Options**.



- **Update Duplicate Device:** When the contents of HOST and CHANNEL column of several encoding devices are the same, CVR judges them as duplicate encoding device. If it is selected, CVR would add all of the duplicate encoding devices and update the previous encoding devices' parameters. Or duplicated wouldn't be added.
  - **Update encoding device with the same name:** If selected, when encoding devices in CVR sub-system and importing file share the same name, once imported, the encoding devices in importing file would replace the one in CVR sub-system.
  - **Auto link record volume:** If selected, when encoding devices in importing file have no linked record volume, once imported they would link to the first record volume in CVR sub-system.
  - **Auto Rename:** If selected, when duplicated name exists during add and modifying, the name of added encoding devices would be renamed as "previous name\_1".
4. Click **OK** to import. The encoding device list would be updated according to imported file.

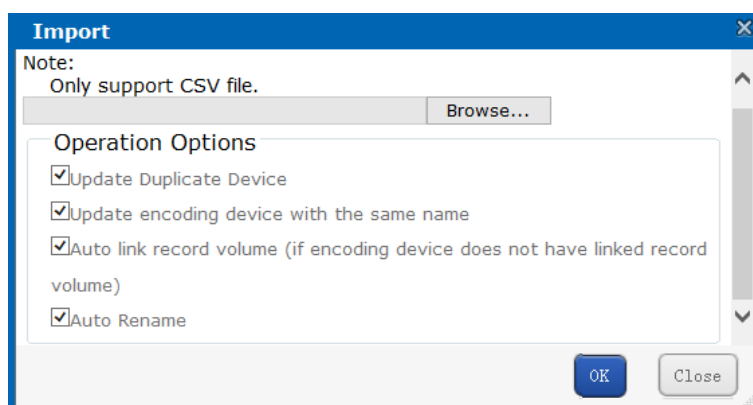


Figure 6. 7 Import

## 6.4 Preview and Record

### **Purpose:**

You can start or stop recording manually in **Preview and Record > Encoding Device**.



Figure 6. 8 Preview and Record

- To start or stop manual recording for specified encoding devices, do following steps:
  1. Select encoding device(s) to record.
  2. Click **Turn on videos** to start recording. And you can click **turn off videos** to stop recording.
- To start or stop manual recording for all encoding devices, do following step:
 

Click **Turn on All** to start recording for all. And you can click **Turn off All** to stop recording for all.

### **NOTE**

If the encoding device is recording according to record schedule, click Stop recording or All stop wouldn't stop recording, for record schedule would start recording again. For schedule details, refer to *6.5 Strategy and Alarm*.

## 6.5 Strategy and Alarm

### *Purpose:*

You can configure recording schedule, create uploading task and schedule, and configure alarm parameter in **Strategy and Alarm**.

### 6.5.1 Record Plan

#### *Purpose:*

Set the record plan, and then the encoding devices automatically starts and stops recording according to the configured plan in **Strategy and Alarm > Record Strategy**.

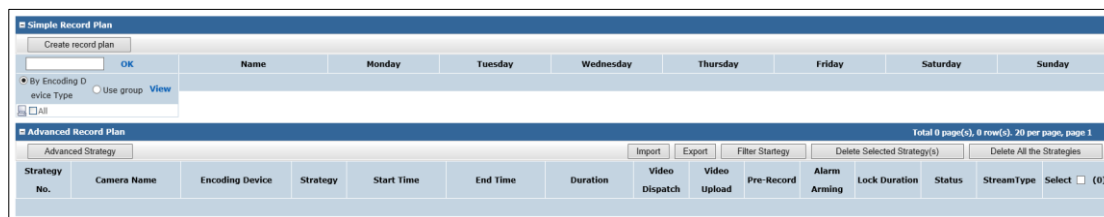


Figure 6. 9 Record Strategy



It is recommended to configure either simple record plan or advanced record plan.

#### 6.5.1.2 Simple Record Plan

#### *Purpose:*

Set the simple record plan, and then the specified encoding devices automatically start/stop recording according to the configured plan.

#### *Steps:*

1. Go to **Strategy and Alarm > Record Strategy**.
2. Click **Create record plan**.
3. Enter the encoding device name.
4. Click **OK** to select the encoding device.
5. Repeat the step to add more. Or select encoding devices or groups in the list.

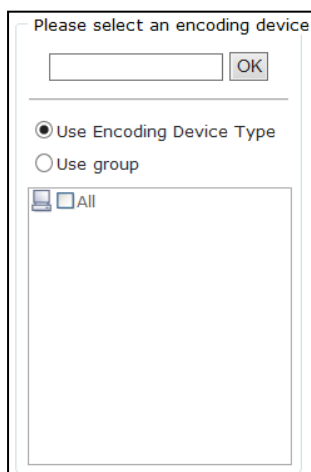


Figure 6. 10 Select Encoding Devices

6. Select **Date** on which you want to set schedule.

<b>Date Selection:</b>	<input type="checkbox"/> Monday	<input type="checkbox"/> Tuesday	<input type="checkbox"/> Wednesday	<input type="checkbox"/> Thursday
	<input type="checkbox"/> Friday	<input type="checkbox"/> Saturday	<input type="checkbox"/> Sunday	<input type="checkbox"/> The Whole Week

Figure 6. 11 Date

7. In **Record mode**, to schedule an all-day recording, check **Whole-day Video**.  
Or you can select the one or more time segments to set start time and end time.

**NOTE**

Up to 8 periods can be configured for each day. And the time periods can't be overlapped with each other.

<b>Record Mode:</b>	<input type="checkbox"/> Whole-day Video		
<input checked="" type="checkbox"/> Time 1:	02 : 00 -- 06 :	<input checked="" type="checkbox"/> Time 2:	06 : 02 -- 11 :
	00 : 00 :		00 : 00 :
<input type="checkbox"/> Time 3:	00 : 00 -- 00 :	<input type="checkbox"/> Time 4:	00 : 00 -- 00 :
	00 : 00 :		00 : 00 :
<input type="checkbox"/> Time 5:	00 : 00 -- 00 :	<input type="checkbox"/> Time 6:	00 : 00 -- 00 :
	00 : 00 :		00 : 00 :
<input type="checkbox"/> Time 7:	00 : 00 -- 00 :	<input type="checkbox"/> Time 8:	00 : 00 -- 00 :
	00 : 00 :		00 : 00 :

Figure 6. 12 Record

8. Optionally, you can select one or more **Dispatch options**.
- **Disabled by Default:** If selected, schedule status is **Stopped**. And encoding device would not start recording. Other Schedule options wouldn't take effective.
  - **Not execute record dispatch:** If selected, encoding device wouldn't start recording. Other Schedule options wouldn't take effective.
  - **Copy back:** If selected and uploading schedule exists, the camera video would upload to CVR. For details of configuring uploading schedule, refer to *chapter 6.5.2.3 Add Upload*.
  - **Disable alarm pre-record:** Pre-record refers to the time you set to record before the scheduled time or event. If selected, pre-record is turned off.
  - **Disable alarm arming:** If selected, when encoding device is error, CVR wouldn't alarm.
  - **Lock:** If selected, you need to set locking time as a specified duration or keep locking. During locking time, videos wouldn't be overlapped. Locking time must be longer than duration time.

- **Use sub stream to record:** If selected, encoding device records via sub-stream instead of main stream.

### 6.5.1.3 Advanced Record Plan

**Purpose:**

By setting advanced record plan, you can specify the start recording time and recording duration for designated.

**Steps:**

1. Go to **Strategy and Alarm > Record Strategy**.
2. Click **Advanced Strategy**.
3. Enter the encoding device name.
4. Click **OK** to select the encoding device.
5. Repeat the step to add more. Or select encoding devices or groups in the list.

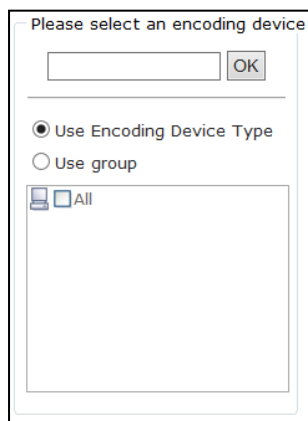


Figure 6. 13 Select Encoding Devices

6. Select **Start time** as **Instant Recording** or **Preset Time**.
  - **Instant Recording:** Starts recording once schedule is added.
  - **Preset Time:** Starts recording at the set time.
7. Select **Duration** unit as **Week, Day, Hour, Minute, or Second** and enter number.  
**Duration:** Keeps recording during the time.

Figure 6. 14 Start Time and Duration Time

8. Optionally, you can select one or more **Dispatch options**. For details, refer to *step 8 of 6.5.1.2 Simple Record Plan*.
9. Select **Use Strategy** and set the end time.

 **NOTE**

If Schedule is set as hour, minute, or customized, locking in schedule options is not selectable.

10. Click **OK** to save the schedule. Then before the end time, the selected encoding devices would repeatedly start recording at set start time and stop recording till the duration time.

### 6.5.1.4 Export/Import Advanced Record Plan

**Purpose:**

For the purpose of managing advanced schedules in batch, you can export them, modify their parameters, and import them back through **Strategy and Alarm > Record Strategy**.

## 6.5.2 Upload Strategy

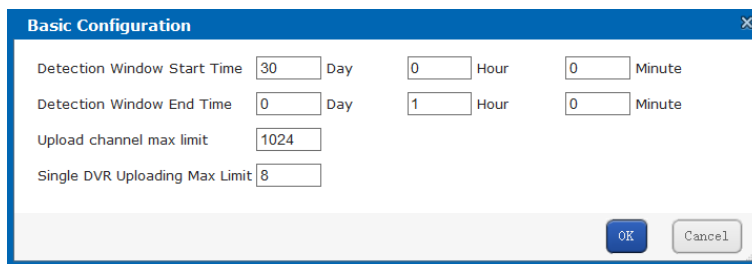
### **Purpose:**

When videos in Hybrid SAN lost, and the lost videos exist in encoding devices. You can upload the videos back to Hybrid SAN through **Strategy and Alarm > Upload Strategy**.

### 6.5.2.1 Basic Settings

#### **Steps:**

1. Go to **Strategy and Alarm > Upload Strategy**.
2. Click **Basic Configuration**.
3. Enter **Detection Start Time**, **Detection End Time**, **Max. Camera Number**, and **Max. Uploading Camera for One DVR**.
  - **Detection Window Start Time:** Start time of detecting uploading.
  - **Detection Window End Time:** End time of detecting uploading. Videos ranges from detection start time to end time would be uploaded.
  - **Upload Channel max limit:** The maximum cameras that could upload simultaneously.
  - **Single DVR Uploading Max Limit:** The maximum cameras in a DVR that could upload simultaneously.



Detection Window Start Time	<input type="text" value="30"/> Day	<input type="text" value="0"/> Hour	<input type="text" value="0"/> Minute
Detection Window End Time	<input type="text" value="0"/> Day	<input type="text" value="1"/> Hour	<input type="text" value="0"/> Minute
Upload channel max limit	<input type="text" value="1024"/>		
Single DVR Uploading Max Limit	<input type="text" value="8"/>		

OK Cancel

Figure 6. 15 Basic Configuration

4. Click **OK**.

### 6.5.2.2 Add Upload Tasks

#### **Steps:**

1. Go to **Strategy and Alarm > Upload Strategy**.
2. Click **Add Upload Task**.
3. Enter the encoding device name.
4. Click **OK** to select the encoding device.
5. Repeat the step to add more. Or select encoding devices or groups in the list.

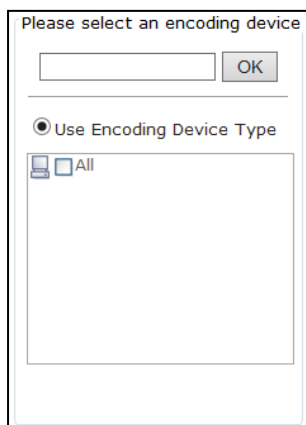


Figure 6. 16 Select Encoding Devices

6. Set **Video Start time** and **Video End time** of the video you want to upload.

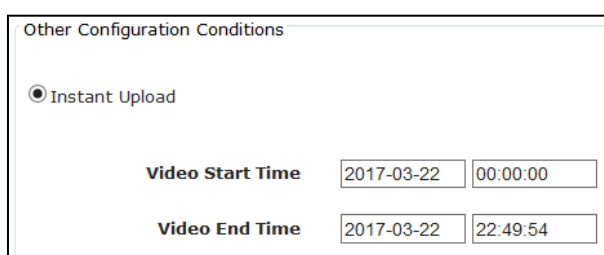


Figure 6. 17 Add Uploading Tasks

7. Click **OK** to add the task. If encoding device contains the video, it starts uploading the video to Hybrid SAN.

### 6.5.2.3 Add Upload Plan

**Purpose:**

Uploading schedule can judge whether video loss happens during record schedule. Configure the uploading schedule to upload the videos saved in encoding devices back to Hybrid SAN.

**Before you start:**

Ensure pulling back data from encoding device in schedule options is selected when configuring basic or advanced schedule. For detailed steps, refer to *chapter 6.5.1.2 Simple Record Plan* and *chapter 6.5.1.3 Advanced* .

**Steps:**

1. Go to **Strategy and Alarm > Upload Strategy**.
2. Click **Add Upload Plan**.
3. Enter the encoding device name.
4. Click **OK** to select the encoding device.
5. Repeat the step to add more. Or select encoding devices or groups in the list.

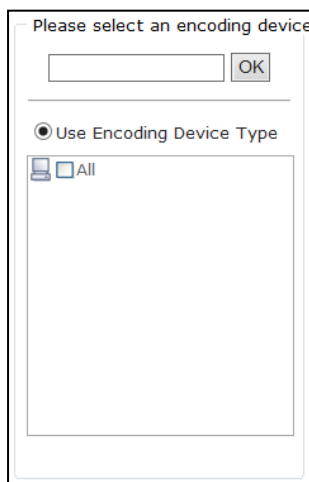


Figure 6. 18 Select Encoding Devices

9. Select the date on which you want to set schedule.
10. In **Upload mode**, to schedule an all-day uploading, check **All-day Upload**. Or you can select the one or more time segments to set start time and end time.

**NOTE**

Up to 8 periods can be configured for each day. And the time periods can't be overlapped with each other.

11. Click **OK** to add the schedule. Then selected encoding devices only upload videos during the set data and time segments.

## 6.5.3 Alarm

### **Purpose:**

You can set the recording time for alarm events.

### **Before you start:**

Enable alarm events you want to pay attention in encoding devices first. For details, refer to user manual of encoding device.

### **Steps:**

1. Go to **Strategy and Alarm > Alarm**.

Alarm Configuration														Total 1 page(s), 0 row(s), 20 per page, page 1								
														Set Alarm Configuration			Delete Alarm Configuration			Delete All		
Encoding Device	SignalsIn		MotionDetect		ViewTampering		BorderCross		GoWrongDirection		SomethingRemains		ObjectLost		Linkage Alarm		Select					
	Duration (s)	Archive	Duration (s)	Archive	Duration (s)	Archive	Duration (s)	Archive	Duration (s)	Archive	Duration (s)	Archive	Duration (s)	Archive	Duration (s)	Archive	<input type="checkbox"/> (0)					

Figure 6. 19 Alarm

2. Click **Set Alarm Configuration**.
3. Enter the encoding device name.
4. Click **OK** to select the encoding device. Repeat the step to add more. Or select encoding devices or groups in the list.

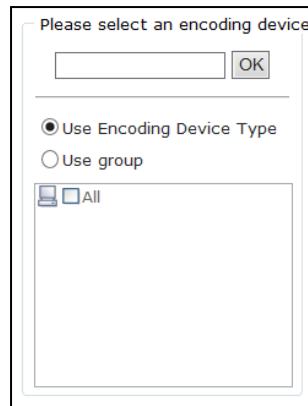


Figure 6. 20 Select Encoding Devices

5. Enter **Trigger Recording (Archive) Duration** for alarm types you want to pay attention. Valid Duration ranges from 5 to 9999. Then when an alarm occurs, CVR starts recording for the set Duration.  
The supported alarm types include Signal Source, Motion Detection, Video Tampering, Border Cross, Wrong Direction, Unattended Baggage, and Object Loss.
6. Optionally, check **Archive** of alarm types. Then the alarm videos can be viewed in **Archive Search**.

Other Configuration Conditions	
Alarm Type	Trigger Recording (Archive) Duration (Second)
SignalsIn	<input type="text"/>
MotionDetect	<input type="text"/>
ViewTampering	<input type="text"/>
BorderCross	<input type="text"/>
GoWrongDirection	<input type="text"/>
SomethingRemains	<input type="text"/>
ObjectLost	<input type="text"/>

Figure 6. 21 Other Configurations

7. Click **OK** to save the settings.

## 6.6 Download and Play

### **Purpose:**

You can search, archive, backup, lock, play, and download recorded videos.

### 6.6.1 Search Video

#### **Steps:**

1. Go to **Download and Play > Search Video**.
2. Click **Search Video**.
3. Enter the encoding device name.
4. Click **OK** to select the encoding device. Repeat the step to add more. Or select encoding devices or groups in the list.



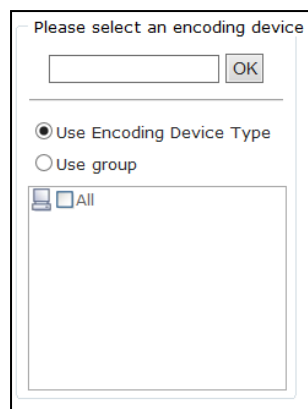


Figure 6. 22 Select Encoding Devices

5. Specify the search conditions including **Start Time**, **End Time**, **Record Type**, **Search Type**, etc.
6. Click **OK** to start search. And the videos meet the search conditions would be listed.

## 6.6.2 Lock Videos

### **Purpose:**

The locked videos will not be overlapped by other videos.

### **Before you start:**

Search videos first.

### **Steps:**

1. Select videos you want to lock. No more than 100 videos can be selected.
2. Click **Lock Configuration**.
3. Select lock mode as **Unlock**, **Lock last**, or **Lock time**.
  - **Unlock**: If selected, the locked video would be unlocked.
  - **Always Locked**: If selected, the video is locked permanently.
  - **Lock Duration**: If selected, you need to set the locking time. Then the video would be locked from the video start time for the set time.

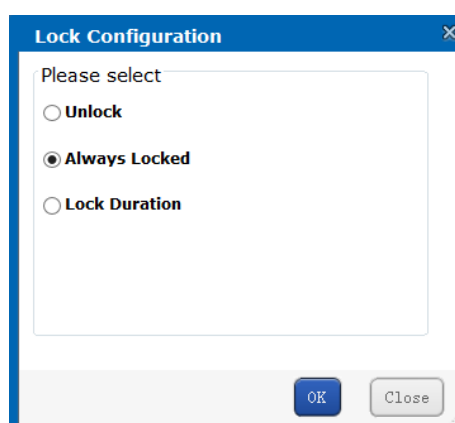


Figure 6. 23 Lock Mode

## 6.6.3 Download Videos

### **Purpose:**

In **Download and play > Search Video**, after you get the video searching result, click **Download Video** to save videos.

## 6.7 User Management

### 6.7.1 Personal Set

**Purpose:**

You can switch system language and edit display rows in each page.

**Steps:**

1. Go to **User Management > Personal Set**.
2. Select **Interface language**.
3. Select **Number of table rows shown in each page**.
4. Click **Upload Configuration** to save the Settings.

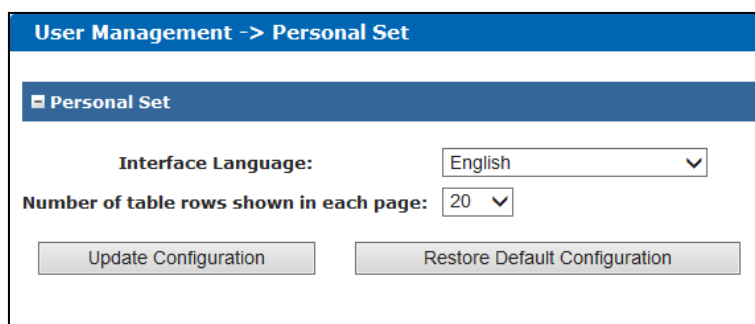


Figure 6. 24 User

### 6.7.2 Key Management

**Purpose:**

You can reset or download key file.

**Steps:**

1. Go to **User Management > Key Management**.
2. Click **Reset/Download** to reset or download key file.

## 6.8 System Configuration

**Purpose:**

You can configure system alarms and view Hybrid SAN version.

### 6.8.1 Mode Switch

**Purpose:**

In **System Config > Mode Switch**, you can enable smart switch for Hikvision HK encoding device, instead of NHK encoding device.



When **Setting Video Query Time** is set to **0**, it means there is no limit for the value.

## 6.8.2 System Alarm

### Purpose:

You can set linkage actions for alarm type, specify alarm type for alarm events, and turn on or turn off status alarm.

### Steps:

1. Go to **System Config > System Alarm**.
2. Alarm type includes **Info** (Information), **Warning**, **Error**, and **Fatal**. Specify 3 linkage actions for the 4 alarm types.

**System Config -> System Alarm**

Alarm Settings: Set the linkage action for all kinds of alarm.

<b>Information:</b>	<input type="checkbox"/> Webpage Log	<input type="checkbox"/> SMS/EMAIL/SNMP	<input type="checkbox"/> Handling Error
<b>Warning:</b>	<input checked="" type="checkbox"/> Webpage Log	<input checked="" type="checkbox"/> SMS/EMAIL/SNMP	<input type="checkbox"/> Handling Error
<b>Error:</b>	<input checked="" type="checkbox"/> Webpage Log	<input checked="" type="checkbox"/> SMS/EMAIL/SNMP	<input type="checkbox"/> Handling Error
<b>Fatal:</b>	<input checked="" type="checkbox"/> Webpage Log	<input checked="" type="checkbox"/> SMS/EMAIL/SNMP	<input checked="" type="checkbox"/> Handling Error

Figure 6. 25 Alarm Setting

3. Specify alarm type for alarm events.

Trigger Alarm: Set the triggering alarm level.

<b>Private volume 2 is damaged:</b>	<input type="radio"/> Information:	<input type="radio"/> Warning:	<input type="radio"/> Error:	<input checked="" type="radio"/> Fatal:
<b>Private volume 1 is damaged:</b>	<input type="radio"/> Information:	<input type="radio"/> Warning:	<input type="radio"/> Error:	<input checked="" type="radio"/> Fatal:
<b>CVR service is abnormally exited:</b>	<input type="radio"/> Information:	<input type="radio"/> Warning:	<input type="radio"/> Error:	<input checked="" type="radio"/> Fatal:
<b>System time changed:</b>	<input type="radio"/> Information:	<input type="radio"/> Warning:	<input checked="" type="radio"/> Error:	<input type="radio"/> Fatal:
<b>Remaining record volume capacity is too low:</b>	<input type="radio"/> Information:	<input checked="" type="radio"/> Warning:	<input type="radio"/> Error:	<input type="radio"/> Fatal:

Figure 6. 26 Alarm Events

4. Turn on or turn off status alarm.

Status Alarm: Set whether to turn on status alarm.

<b>Private volume 1 is abnormal:</b>	<input checked="" type="radio"/> On	<input type="radio"/> Off
<b>Recording volume used capacity warning:</b>	<input checked="" type="radio"/> On	<input type="radio"/> Off
<b>CVR service is abnormal:</b>	<input checked="" type="radio"/> On	<input type="radio"/> Off
<b>System resource used capacity warning:</b>	<input checked="" type="radio"/> On	<input type="radio"/> Off
<b>Recording is abnormal:</b>	<input checked="" type="radio"/> On	<input type="radio"/> Off

Figure 6. 27 Status Alarm

5. Click Submit to save the settings.

## 6.8.3 Hybrid SAN Version

### Purpose:

In **System Config > Version**, you can view Hybrid SAN version, Hybrid SAN library version, etc.

## 6.9 Log Management

### *Purpose:*

Log helps you figure out Hybrid SAN history actions. You can search, export, and clear logs.

### 6.9.1 Search Log

#### *Steps:*

1. Go to **Log Management > Operation Log**.
2. Click **Search log**.
3. Specify the search condition including **Log type**, **Start time**, **End time**, and **Including Characters**.
4. Click **OK** to start search. The matched logs would be listed.

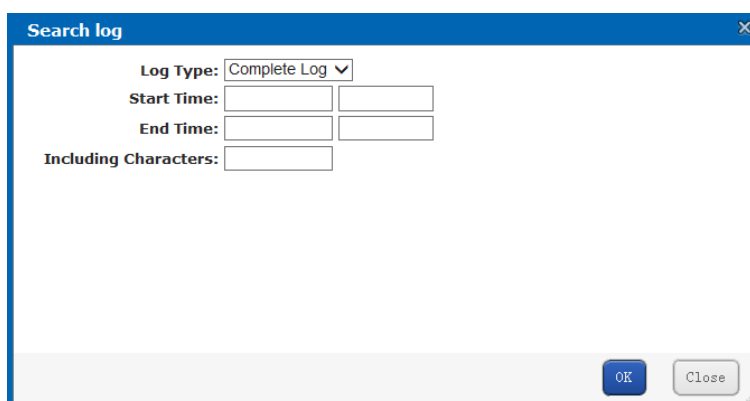


Figure 6. 28 Log Search

### 6.9.2 Export Log

#### *Purpose:*

You can export the listed logs to local HDD after searching through **Log Management > Operation Log**. The exported logs are integrated in a .csv file.

### 6.9.3 Clear Log

#### *Purpose:*

In **Log Management > Operation Log**, you can click **Clear All System Logs** to clear all logs.

## Chapter 7 Cluster

**Purpose:**

Cluster function is only available for devices with dual controllers. Array can be created after the cluster heartbeat is configured.

### 7.1 Configure Cluster Heartbeat

**Purpose:**

Array can be created after the cluster heartbeat is configured.

**Steps:**

1. Go to **Cluster > Cluster**.

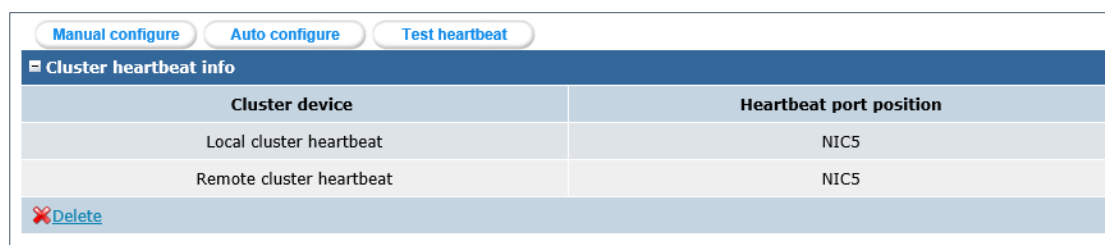


Figure 7. 1 Configure Cluster Heartbeat

2. Click **Auto configure** or **Manual configure** to automatically or manually add cluster device in to the list.
3. Restart your device after two controllers are both configured.
4. Optionally, click **Test heartbeat** to test the communication between two controllers.

### 7.2 Modify Resource IP

**Purpose:**

Resource IP address is used for the storage of other devices. It combines the usage of two controllers, if one controller fails, the applications of the failed controller would be transferred to the other controller, so the application would not be affected.

In **Cluster > Cluster**, click **Modify Resource IP** to set resource IP parameters.

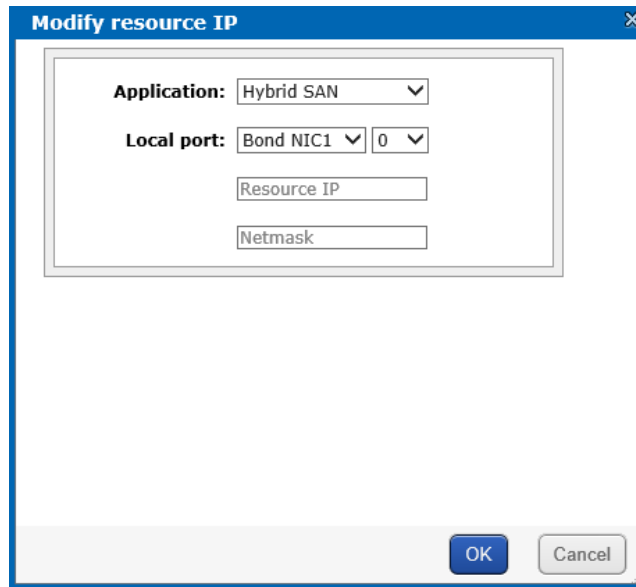


Figure 7. 2 Modify Resource IP

## Chapter 8 System

**Purpose:**

You can configure network parameters, alarm triggered action, system time, modify system password, and so forth.

Table 8. 1 Module Description

Module	Description
Network	You can: <ul style="list-style-type: none"> <li>● Modify the configuration of management network interface and data network interfaces.</li> <li>● Bond data network interfaces.</li> <li>● Remotely access the storage system via a specified gateway.</li> <li>● Edit DNS server IP address, bond mode, and network work speed.</li> </ul>
Alarm	You can: <ul style="list-style-type: none"> <li>● Send the storage system alarms to client via e-mail or SNMP manager.</li> </ul>
Time	You can: <ul style="list-style-type: none"> <li>● Manually or automatically adjust system time.</li> </ul>
Power Supply	You can: <ul style="list-style-type: none"> <li>● View UPS mode.</li> <li>● Modify UPS power-off time.</li> <li>● Modify supported UPS manufacturer.</li> </ul>
Management Tool	You can: <ul style="list-style-type: none"> <li>● Modify user password.</li> <li>● Configure SMTP parameters.</li> <li>● Test network communication between the storage system and a specified IP address.</li> <li>● Update the storage system.</li> <li>● View service status.</li> </ul>

## 8.2 Network

**Purpose:**

The storage system provides a management network interface and data network interfaces. The management network interface is designed for configuring the data network interface and device maintenance. The data network interfaces are used to transmit data.

### 8.2.1 Modify Data Network Interface

**Steps:**

1. Go to **System > Network**.
2. Click **Modify** in **Basic Network Interface**.
3. Enter new **IP Address** and **Subnet Mask** and select **MTU**.

**MTU** (Maximum Transmission Unit): Select MTU as larger than 1500 byte for the purpose of improving

- transmission performance.
- Click **OK** to save the settings.

## 8.2.2 Bind Network Interfaces

### **Purpose:**

When transmitting data via a single data network interface, once the data network interface fails, data transmission stops. By bonding multiple data network interfaces into one, they can share one IP address, thus to balance network load and create redundant links. When transmitting data via a bound network interface, once a data network interface fails, other data network interfaces take over the transmission task.



- The management network interface does not support to bind.
- The IP address of bound network interface is the same as the first data network interface.

### **Before you start:**

Connect all data network interfaces to network via network cables.

### 8.2.2.1 Create Bond

#### **Steps:**

- Go to **System > Network**.
- Select data network interfaces in **Basic Network Interface** list.
- Click **Bind Network Interface** and click **OK** in confirmation dialog box.

Bound Network Interface (Total: 1)									
<input type="checkbox"/>	Bound Network Interface	IP Address	Subnet Mask	Jumbo Frame	Status	Network Interface	Connection Status	Speed	MAC Address
<input type="checkbox"/>	Bound NIC1	10.192.54.13	255.255.254.0	1500 Byte	Enabled	Data NIC1	Connect	1000Mb/s	8c:e7:48:7c:82:a1
						Data NIC2	Connect	1000Mb/s	8c:e7:48:7c:82:a0

[Delete](#) [Modify](#)

Figure 8. 2 Bound Network Interface Information

### 8.2.2.2 Delete Bond

#### **Steps:**

- Go to **System > Network**.
- Select a bound network interface.
- Click **Delete**.
- Click **OK**. The bound network interface is recovered to several data network interfaces.

### 8.2.2.3 Modify Bonding Mode

For detailed information and steps, refer to *section 8.2.5.2 Bind Mode*.

## 8.2.3 Add Route

### **Purpose:**

By default, the route is empty, clients in different network segment access the storage system via the default



gateway. If you want to access the storage system via a specified gateway, add route here.

**Steps:**

1. Go to **System > Network**.
2. Click **Add Route**.

Figure 8. 3 Add Route

3. Input **Route IP Address**, **Subnet Mask**, and **Default Gateway**.  
The client server within route IP address can access the storage system via the default gateway.
4. Select bound data of **Network Interface**.
5. Click **OK** to add the route. The client server within 10.128.50.1 to 10.128.50.55 can access the storage system via the bound network interface 1 whose the gateway is 192.168.0.2.

## 8.2.4 MAC and IP Bonding

**Purpose:**

Only client with the specified MAC address and IP address is allowed to get access to iSCSI HDD.

**Steps:**

1. Go to **System > Network**.
2. Click **MAC&IP Bonding**.

Figure 8. 4 MAC&IP Bonding

3. Input target **Client IP Address** and **MAC Address**.



Ensure the client IP is in the same network segment with the storage system.

- Click **OK** to create bond.

## 8.2.5 Advanced Parameters

### **Purpose:**

You can configure DNS server, bond mode, and network work speed parameters.

### 8.2.5.1 DNS Server

#### **Purpose:**

You are required to add DNS server IP address if you need to access external network.

#### **Steps:**

- Go to **System > Network**.
- Click **Modify** of **Preferred DNS Server**.
- Enter IP address in text field.
- Click **OK** to save the settings.

<b>Preferred DNS Server:</b>	None	<b>Modify</b>
<b>Alternate DNS Server:</b>	None	<b>Delete</b>

Figure 8. 5 DNS Server

### 8.2.5.2 Bind Mode

#### **Purpose:**

The selection of bond mode is related to actual application and network situation. Up to seven types of bond modes are provided. For details, refer to *Table 8. 2 Bonding Mode Description*.

#### **Steps:**

- Go to **System > Network**.
- Click **Modify** of **NIC Binding Mode**.
- Select bond mode in dropdown list. Up to 7 bond modes are selectable.
- Click **OK** to save the settings.

<b>Default Gateway:</b>	10.192.54.254	
<b>NIC Binding Mode:</b>	Active-backup	<b>OK</b> <b>Cancel</b>

Figure 8. 6 NIC Binding Mode

Table 8. 2 Bonding Mode Description

Bond Mode	Description
Round-robin	<ul style="list-style-type: none"> <li>● <b>Definition:</b> <ul style="list-style-type: none"> <li>➤ All data network interfaces sends and receives data in turn.</li> <li>➤ When using the mode, it is recommended to apply protocols except TCP/IP.</li> </ul> </li> <li>● <b>Advantage:</b> <ul style="list-style-type: none"> <li>➤ Load balance.</li> <li>➤ All data network interfaces are fully used.</li> <li>➤ There is no requirement about hardware like network switch.</li> </ul> </li> <li>● <b>Disadvantage:</b></li> </ul>

Bond Mode	Description
	<ul style="list-style-type: none"> <li>➤ The order of received data is uncertain.</li> <li>➤ Low network throughput.</li> </ul>
Active-Backup	<ul style="list-style-type: none"> <li>● <b>Definition:</b> The default bond mode. Transmits data via a specified data network interface, other data network interfaces are standby. Only when the specified data network interface fails, another standby data network interface takes over transmission task.</li> <li>● <b>Advantage:</b> <ul style="list-style-type: none"> <li>➤ There is no requirement about hardware like network switch.</li> <li>➤ Redundant network links.</li> </ul> </li> <li>● <b>Disadvantage:</b> <ul style="list-style-type: none"> <li>➤ Load balance isn't supported.</li> <li>➤ Uses only one data network interface at a time. Other data network interfaces aren't fully used.</li> </ul> </li> </ul>
XOR	<ul style="list-style-type: none"> <li>● <b>Definition:</b> <ul style="list-style-type: none"> <li>➤ The storage system can figure out the relationship between each data network interface and client MAC addresses. According to the relationship, the storage system transmits data to clients with corresponding data network interface. If the working data network interface fails, another data network interface takes over the task.</li> <li>➤ It is recommended to use this mode in a local area network. However, if data is transmitted via network gateway, don't use the mode.</li> </ul> </li> <li>● <b>Advantage:</b> <ul style="list-style-type: none"> <li>➤ There is no requirement to hardware like network switch.</li> <li>➤ Balance the load in the local area network within a network switch.</li> </ul> </li> <li>● <b>Disadvantage:</b> Load balance isn't supported in different local area network.</li> </ul>
Broadcast	<ul style="list-style-type: none"> <li>● <b>Definition:</b> All the data network interfaces transmit the same data.</li> <li>● <b>Advantage:</b> <ul style="list-style-type: none"> <li>➤ There is no requirement about hardware like network switch.</li> <li>➤ Redundant network links.</li> <li>➤ Data network interfaces are fully used.</li> </ul> </li> <li>● <b>Disadvantage:</b> <ul style="list-style-type: none"> <li>➤ Load balance isn't supported.</li> <li>➤ Low data network interface usage.</li> </ul> </li> </ul>
802.3ad	<ul style="list-style-type: none"> <li>● <b>Definition:</b> The storage system figures out the relationship between each data network interface and clients' MAC addresses according to Hash Algorithm. The storage system transmits data to client via corresponding data network interface.</li> <li>● <b>Advantage:</b> <ul style="list-style-type: none"> <li>➤ Based on IEEE standard, devices in system can work efficiently if they are all 802.3ad mode.</li> <li>➤ Load balance.</li> <li>➤ Data network interfaces are fully used.</li> </ul> </li> <li>● <b>Disadvantage:</b> The storage system, network switch, and client server are all required to support 802.3ad mode.</li> </ul>

Bond Mode	Description
Tlb	<ul style="list-style-type: none"> <li>● <b>Definition:</b> The storage system allocates output traffic to each data network interfaces, according to current load. And transmits data to clients via different data network interfaces. If the working data network interface fails, another data network interface takes over the task.</li> <li>● <b>Advantage:</b> <ul style="list-style-type: none"> <li>➤ Data network interfaces are fully used.</li> <li>➤ Load balance when sending data.</li> </ul> </li> <li>● <b>Disadvantage:</b> Load balance isn't supported when receiving data.</li> </ul>
Virtualization	<ul style="list-style-type: none"> <li>● <b>Definition:</b> <ul style="list-style-type: none"> <li>➤ The storage system allocates input and output traffic to each data network interfaces, according to current load.</li> <li>➤ It is recommended to use the mode when sending and receiving data to multiple clients.</li> </ul> </li> <li>● <b>Advantage:</b> <ul style="list-style-type: none"> <li>➤ Data network interfaces are fully used.</li> <li>➤ Load balance in both sending and receiving data.</li> </ul> </li> </ul>

### 8.2.5.3 Network Work Speed

**Purpose:**

It is the speed of all data network interfaces. The default network work speed is 100 Mb/s. It is recommended to set network work speed according to actual network situation.

**Steps:**

1. Go to **System > Network**.
2. Click **Modify** of **Network Word Speed**.
3. Select **Network Work Speed** as **1000 Mb/s** or **100 Mb/s**.
4. Click **OK** to save the settings.

<b>Set Network Working Speed:</b>	1000 Mb/s	<a href="#">Modify</a>
-----------------------------------	-----------	------------------------

## 8.3 Alarm

**Purpose:**

The storage system supports notifying you about the occurring alarms via email and SMTP manager.

### 8.3.1 Alarm Type

**Purpose:**

The *Table 8. 3 Alarm Type Description* describes the supported alarm types and corresponding event level. E-mail and SNMP manager support notifying you about the alarm types in *Table 8. 3*.

Table 8. 3 Alarm Type Description

Module	Alarm Type	Event Level
Power supply	Controller power supply error	Serious
	Storage enclosure power supply error	Serious
Temperature	Temperature is too high	Warning
	Temperature is high	Serious
	Temperature is too low	Serious
Fan	Fan speed is too low	Warning
	Fan speed error	Serious
	Fan damaged or poor connection	Serious
Memory	Memory is used too much.	Warning
DOM card	Insufficient capacity	Serious
HDD	HDD loss	Serious
	HDD warning	Warning
	Bad HDD	Serious
	Risky HDD	Serious
	Drive kicked an HDD	Serious
	Array kicked an HDD	Serious
Array	Not available	Serious
	Degraded	Warning
	Rebuilding	Warning
Storage system	Physical HDD loss	Serious
	Unknown physical HDD loss	Serious
	Storage pool unmounted	Serious
	All storage pool lost	Serious
NAS	SAMBA error	Serious
	NFS error	Serious
	FTP error	Serious
	AFP error	Serious
	HTTP error	Serious
	RSYNC error	Serious
iSCSI	iSCSI configurations mismatch	Serious
	I/O error	Serious
Network	Data network interface %d unconnected	Serious
	Network speed of data network interface %d is 100M Ethernet.	Serious
	Single data network interface %d unconnected	Serious
Cluster	Cluster heartbeat communication error: network transmission failed	Serious
	Cluster resource network error: resource network interface %d disconnected	Serious

## 8.3.2 Add Email User

### **Purpose:**

Alarm messages are sent to receiving emails via sending emails.

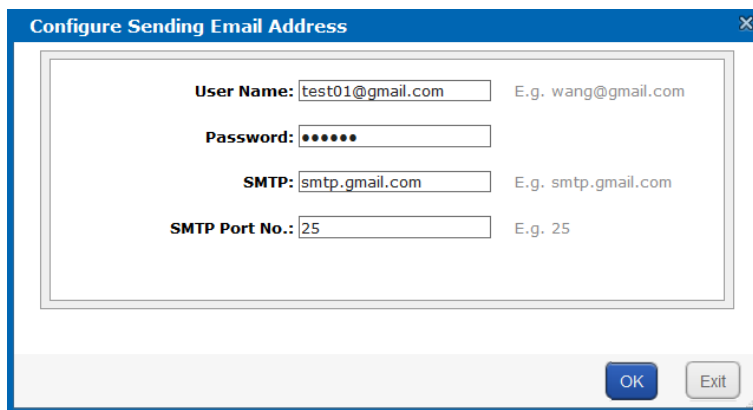
### **Before you start:**

Set DNS server first. Refer to *section 8.2.5.1 DNS Server* for detailed steps.

### 8.3.2.1 Configure Sending Email

#### **Steps:**

1. Go to **System > Alarm**.
2. Click **Configure SMTP**.
3. Enter **User Name**, **Password**, **SMTP**, and **SMTP Port**.
  - **User Name:** Sending email account.
  - **Password:** Sending email password.
  - **SMTP:** Sending email server website.
  - **SMTP Port No.:** sending email server port.
4. Click **OK** to add the sending email.



The screenshot shows a dialog box titled "Configure Sending Email Address". It contains the following fields and values:

Field	Value	Example
User Name	test01@gmail.com	E.g. wang@gmail.com
Password	•••••	
SMTP	smtp.gmail.com	E.g. smtp.gmail.com
SMTP Port No.	25	E.g. 25

Buttons: OK, Exit

Figure 8. 7 Configure Sending Email

### 8.3.2.2 Receiving Email

#### **Steps:**

1. Go to **System > Alarm**.
2. Click **Add Email User**.
3. Enter **Email** and **User Name**.
4. Choose **Event Level** as **Alarm Event** or **Serious Event**.
5. Click **OK** to add the user. The added email account is listed in List of email alarm users.

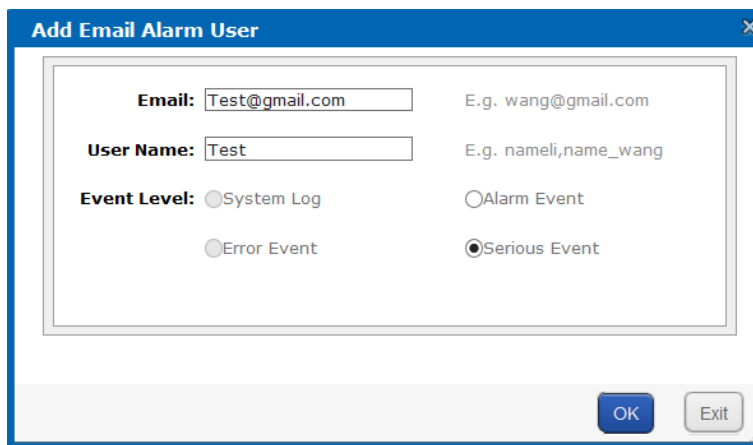


Figure 8. 8 Add Email Alarm User

### 8.3.3 Testing Email

**Purpose:**

After sending and receiving e-mail are configured, you can test the communication between them.

**Steps:**

1. Go to **System > Alarm**.
2. Check the sending email you want to test.
3. Click **Test**.
4. Click **OK** to start test.

### 8.3.4 Add SNMP Manager

**Purpose:**

SNMP manager can notify the SNMP-Trap software installed in your computer about the storage system alarm. When alarm occurs, alarm message pops up in SNMP-Trap software.

**Before you start:**

1. Install the SNMP-Trap software in your computer.
2. To receive alarm message in client, turn on Administration & Monitoring Tools in client.

**Steps:**

1. Go to **System > Alarm**.
2. Click **Add SNMP Manager**.

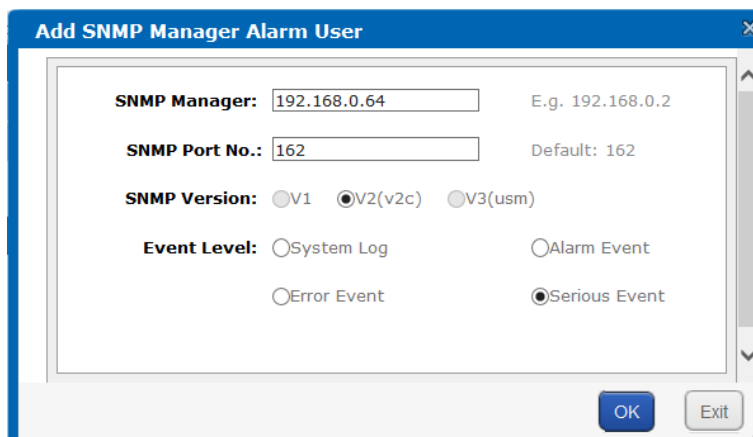


Figure 8. 9 Add SNMP Manager

3. Enter **SNMP Manager** and **SNMP Port No.**
4. **SNMP Version** is **V2(V2C)** by default.
5. Set **Event Level** as **System Log, Alarm Event, Error Event, or Serious Event.**
6. Click **OK**. The added SNMP manager is listed in SNMP manager list.

## 8.3.5 Test SMTP Manager

**Purpose:**

You can test the network communication of SMTP manager.

**Steps:**

1. Go to **System > Alarm**.
2. Check the SMTP manger to test.
3. Click **Test**.
4. Click **OK** to start test.

## 8.4 Time Settings

**Purpose:**

System time is adjustable.

### 8.4.1 Adjust System Time

1. Go to **System > Time**.
2. Optionally, enable **DST** to automatically adjust system time.
3. Set the system time parameters.

### 8.4.2 Sync Time

**Purpose:**

You can configure time synchronization strategy.

**Before you start:**

- Turn off the NTP server in client software.
- Log in the storage system via resource IP address.

**Steps:**

1. Go to **System > Time**.
2. Click **Enable** of **Time Sync Strategy Status** (Synchronization Strategy Status).
3. Enter **Time Server IP Address** .
4. Enter **Sync Cycle** (Synchronization Cycle).
5. Click **Configure** to start time synchronization.



## 8.5 Tool

### 8.5.1 Modify Password

**Purpose:**

You can modify password for basic management system and CVR sub-system user.

**Steps:**

1. Go to **System > Tool**.
2. Click **Modify password**.
3. Select **User Name** as **web\_admin** or **nvr\_admin**.
  - **web\_admin**: Basic management system user name.
  - **nvr\_admin**: Hybrid SAN sub-system user name.
4. Enter **Old Password**, **New Password** and **Confirm Password**.



- The security level of modified password shouldn't be lower than low security.
- Password can only contain numbers, lowercase, uppercase, and underline for your password.

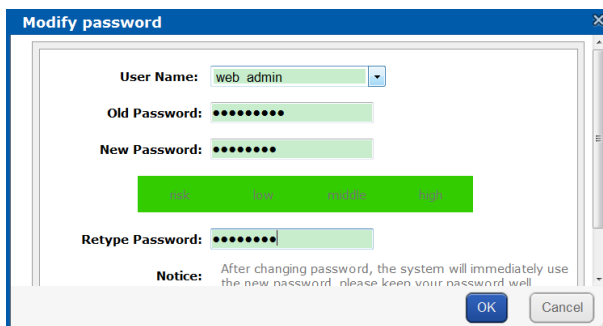


Figure 8. 10 Modify Password

5. Click **OK** to save the new password.



Once password is modified, it jumps to login interface. You need to enter the new password to log in.

### 8.5.2 SNMP Configuration

**Purpose:**

By configuring SNMP parameters, you can log in PRTG Traffic Grapher tool to monitor the system status, including exception information, CPU usage, and so forth.

**Steps:**

1. Go to **System > Tool**.
2. Click **SNMP Configure**.

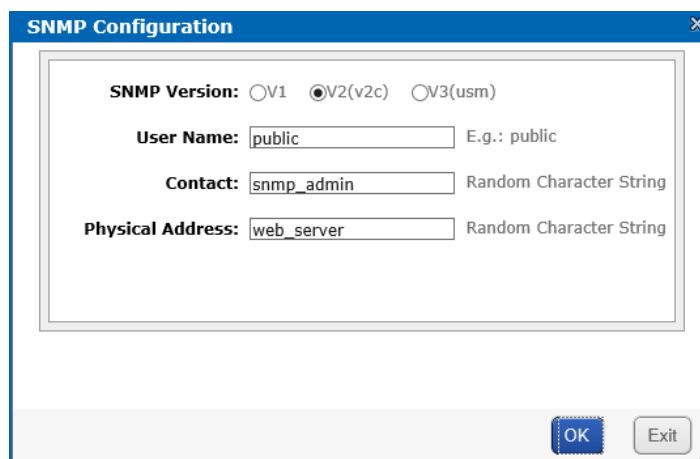


Figure 8. 11 SNMP Configuration

3. **SNMP version** is **V2(v2c)** by default.
4. Enter **User Name**, **Linkman**, and **Physical addr**.
5. Click **OK** to save the settings.

### 8.5.3 Network Test

**Purpose:**

You can test the network communication between the storage system with any other IP addresses.

**Steps:**

1. Go to **System > Tool**.
2. Click **Communication Test**.

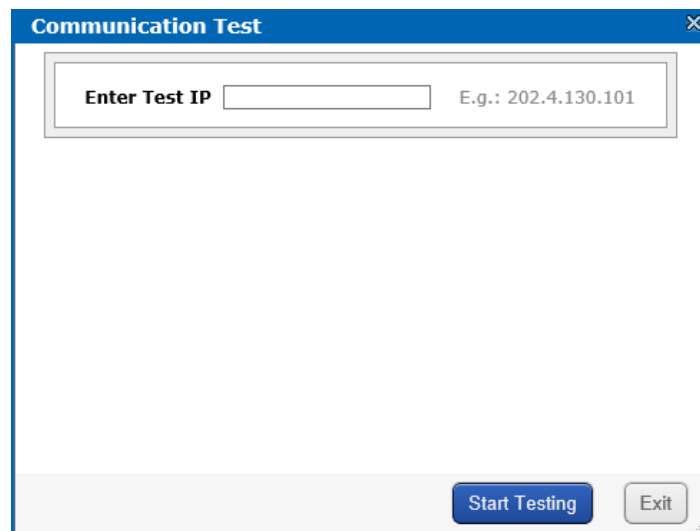


Figure 8. 12 Network Test

3. Enter the IP address you want to test.
4. Click **Start Testing** to start testing.

### 8.5.4 Modify Storage System Name

**Steps:**

1. Go to **System > Tool**.
2. Click **Modify**.

3. Enter storage system name.
4. Click **Modify** to activate the new host name.

## 8.5.5 View Service Status

**Purpose:**

Service status is listed in . You can enable, disable, or restart the services.

**Steps:**

- Click **Enable** to start the service isn't running.
- Click **Disable** to shut down the running service.
- Click **Restart** to restart services.

Services Status (Total: 2)		
Service Name	Current Status	Service Operation (Enable Disable Restart)
SNMP	Unknown status	<input type="button" value="Enable"/> <input type="button" value="Disable"/> <input type="button" value="Restart"/>
iSCSI	Running	<input type="button" value="Enable"/> <input type="button" value="Disable"/> <input type="button" value="Restart"/>

Figure 8. 13 Service Status

## Chapter 9 Log System

### Purpose:

Table 9. 1 Module Description

Module	Description
Log download	You can download logs by downloading mode.
Operation log	It records the content and time of each operation. Search, download, and clear logs are supported.
Performance log	The storage system records the performance logs at every ten minutes. Performance log includes messages of CPU usage, memory footprint, network traffic, and array read and writing speed.
Update log	It records the details information of every system update.

## 9.1 Maintenance Log

You can download log file through **Log System > Maintenance Log**.

## 9.2 Operation Log

### Purpose:

Operation log records the content and time of each operation. Search, download, and clear logs are supported through **Log System > Operation Log**.

Date	Log Content
March 22 2017 23:47:43	rsync time server 10.192.45.121 success count:86 first time:March 22 2...
March 22 2017 22:03:32	Enabling CVR service completed.
March 22 2017 22:03:29	Open raid monitor mode success
March 22 2017 22:03:05	rsync time server 10.192.45.121 success count:24 first time:March 22 2...

Figure 9. 2 Operation Log

- View Logs



Figure 9. 3 Paging

Click to turn to previous/next page.

Click to turn to the first/last page.

Or enter page number and click to go to the designated page.

- Search Logs

Figure 9. 4 Search Log

- 1) To search by time, enter date and time you want to search in **Search**.  
To search by log type, select log type.
  - 2) Choose log type as **All, Information, Warning, Error, or Serious**.
  - 3) Click **Search**. Logs meet the search conditions would be listed.
- Clear All Logs  
Click **Clear Operation Log** and click **OK** to confirm.

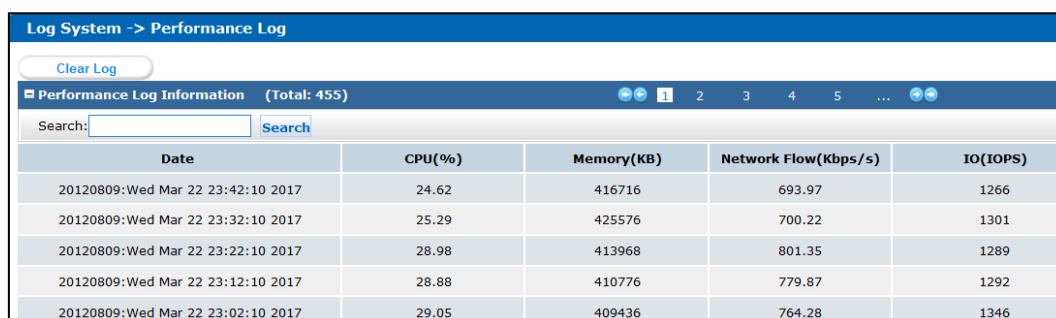
## 9.3 Performance Log

### **Purpose:**

The storage system records the performance logs at every ten minutes. Performance log includes messages of CPU usage, memory footprint, network traffic, and array read and writing speed.

### **Steps:**

1. Go to **Log System > Performance Log**.
2. For detailed steps of viewing and search performance logs, refer to *section 9.1 Maintenance Log*  
You can download log file through **Log System > Maintenance Log**.
3. Operation Log.



Date	CPU(%)	Memory(KB)	Network Flow(Kbps/s)	IO(IOPS)
20120809:Wed Mar 22 23:42:10 2017	24.62	416716	693.97	1266
20120809:Wed Mar 22 23:32:10 2017	25.29	425576	700.22	1301
20120809:Wed Mar 22 23:22:10 2017	28.98	413968	801.35	1289
20120809:Wed Mar 22 23:12:10 2017	28.88	410776	779.87	1292
20120809:Wed Mar 22 23:02:10 2017	29.05	409436	764.28	1346

Figure 9. 5 Performance Log

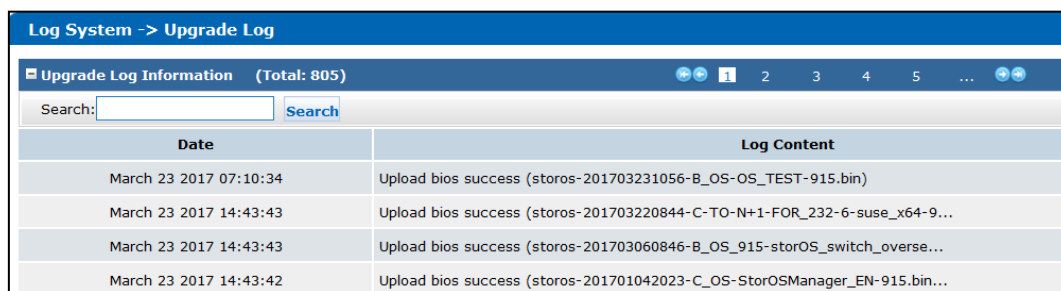
## 9.4 Upgrade Log

### **Purpose:**

Update log records the details information of every system update.

### **Steps:**

1. Go to **Log System > Upgrade Log**.
2. To view logs and search logs, refer to *section 9.1 Maintenance Log*  
You can download log file through **Log System > Maintenance Log**.
3. Operation Log for detailed steps.



Date	Log Content
March 23 2017 07:10:34	Upload bios success (storos-201703231056-B_OS-OS_TEST-915.bin)
March 23 2017 14:43:43	Upload bios success (storos-201703220844-C-TO-N+1-FOR_232-6-suse_x64-9...
March 23 2017 14:43:43	Upload bios success (storos-201703060846-B_OS_915-storOS_switch_verse...
March 23 2017 14:43:42	Upload bios success (storos-201701042023-C_OS-StorOSManager_EN-915.bin...

Figure 9. 6 Update Log

## Chapter 10 Software Download

There are software tools to download for device maintenance. Click **Use Help** to download software as you required. For example, **Centralized Management Software** is mainly used to get device running status.

<b>Download Software</b>	<a href="#">Microsoft iSCSI Client Software Package X86_64 (Version 2.08)</a> <a href="#">Microsoft iSCSI Client Software Package X86 (Version 2.08)</a> <a href="#">Microsoft Diskpart Software (for Win 2000)</a> <a href="#">Command Line Tools</a> <a href="#">Centralized Management Software</a>
--------------------------	--

Figure 10. 1 Software Download



See Far, Go Further