HIKVISION

Storage System
User Manual

UD05216B

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FCC Conditions

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

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

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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, the RoHS Directive 2011/65/EU, the LVD Directive 2014/35/EU.

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Industry Canada ICES-003 Compliance

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

Safety Instruction

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss.

The precaution measure is divided into "Warnings" and "Cautions"

Warnings:Serious injury or death may occur if any of the warnings are neglected.

Cautions:Injury or equipment damage may occur if any of the cautions are neglected.

⚡	⚠
Warnings Follow these safeguards to prevent serious injury or death.	Cautions Follow these precautions to prevent potential injury or material damage.

⚡ Warnings

- 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.

Table of Contents

Chapter 1   Overview

Purpose:

DS-A80&81 series storage system is a high-performance and highly reliable storage system. Designed with four enterprise-class gigabyte network interfaces, it provides a bandwidth with 4 to 8G bps transmission capability and a huge storage space. It is integrated with multiple advanced technologies, including a 64-bit hexa-core processors, stable architecture, and the RAID 6 storage technology, thus to run reliably and protect user data security effectively.

Figure 1. 1 GUI and Table 1. 1 GUI Introduction introduce the elements appear in the GUI (Graphical User Interface) and clarify names for each element.

Figure 1. 1 GUI

Table 1. 1 GUI Introduction

No.	Name	Description
1	Banner and device model	Shows the device model.
2	Running status	A shortcut for obtaining the real-time running status.
3	Navigation Bar	Lists the storage system menu.
4	Help and logout	A shortcut for accessing user manuals, downloading software, and logout.
5	Operation window	Lists the parameters. You can configure parameters in the area.

Chapter 2   Getting Started

Purpose:

The chapter introduces HDD installation steps, web browser access steps, and login steps.

Table 2. 1 Module Description

Module	Description
HDD Installation	Describes the steps of HDD installation.
Web Browser Access	You can get access to the storage system via a server with the web browser installed.
Login	Introduces login storage system steps.

Key Words:

HDD Installation, Web Browser Access, Login

2.1 HDD Installation

In the event of device appearance shown in following steps conflicts with real device, the later prevails.

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 2. 2 Press the Blue Button

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

Figure 2. 3 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 2. 4 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 2. 5 HDD Position.

Figure 2. 5 HDD Position

6. Use a screwdriver to fasten the four screws into the screw holes in both sides.
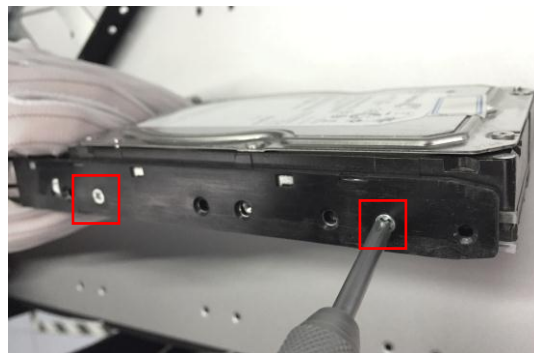
Figure 2. 6 Install Screws

7. Push the HDD dummy back into the slot.

Figure 2. 7 Push the HDD Dummy into Slot

2.2 Accessing by 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 get access to the storage system via a server with a web browser installed, without needing to install any other software. The recommended web browsers are Internet Explorer 8 and Internet Explorer 11.

Before you start:

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

2.   Configure the server IP address. Ensure it is in the same network segment with the 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.

2.3   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.

⚠️

STRONGPASSWORDRECOMMENDED–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 caseletters, 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 Login account as BasicManagement or HYBRIDSAN Sub-system.

       ➢   BasicManagement:Used to configure basic parameters of the storage system.

       ➢   HYBRIDSAN Sub-system:Used to Log into the HYBRID SAN   sub-system.

    2.   Select Username.

    3.   Enter Password.

    4.   Mode is Advancedby default and is not selectable.

    5.   Click Loginto log in the system.

Figure 2. 8 Login

Chapter 3   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 3. 1 Module Description

Module	Description
System	● A shortcut for reboot and shutdown. ● Lists the login user information and iSCSI connection information.
Performance	Shows you the real-time graph and data of system performance, including bandwidth usage, memory usage, CPU usage, IO status, and Vmstatus.
General	You can view system version, reset system, view logs, upgrade system, and add check and repair strategy.
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.

Key words:

System, Performance, General, Graphical Display, Environmental
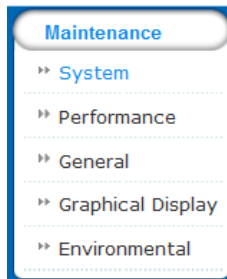
Figure 3. 2 Maintenance

3.1 System

Purpose:

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

Steps:

1.   Click Maintenance in navigation bar and choose System to enter System interface.
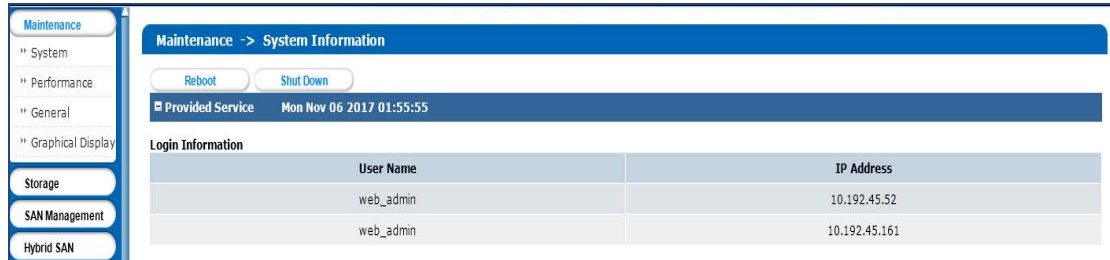
Figure 3. 3 System Monitor

2.   Reboot, power off, or view login information or iSCSI connection info.

- Click Reboot or Power off to restart or shut down the storage system.

- The logged in users and IP addresses are listed in the Login info.

- The LUN ID, iSCSI ID, and Initiator name are listed in iSCSI connection info, which shows which devices are connecting iSCSI.

3.2 Performance

Purpose:

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

Steps:

1.   Click Maintenance in navigation bar and choose Performance to enter Performance interface.
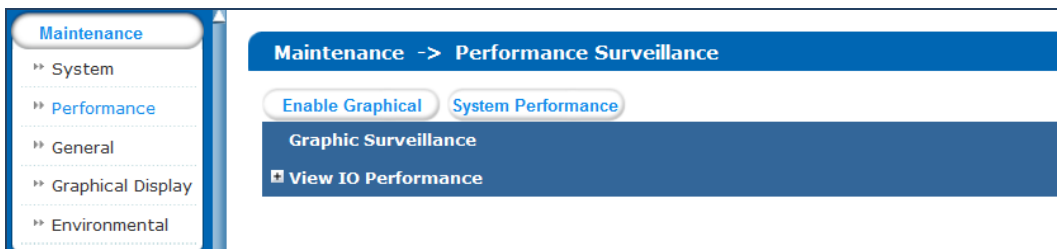
Figure 3. 4 Performance

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.
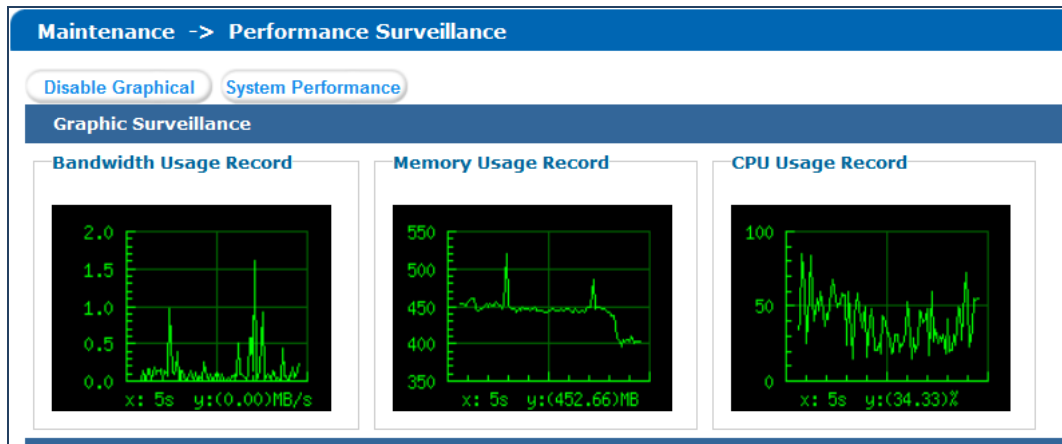
Figure 3. 5 Graph Monitor

4.   Click System Performance to pop up system performance window. System performance updates per second.

5.   Click   ⊞ of View IP Performance to unfold input/output status.

6.   Optionally, click ⊟ of View IP Performance to fold input/output status.

3.3   General

Purpose:

You can view system version, reset system, view logs, and upgrade system.

Step:

Click Maintenance in navigation bar and choose General.
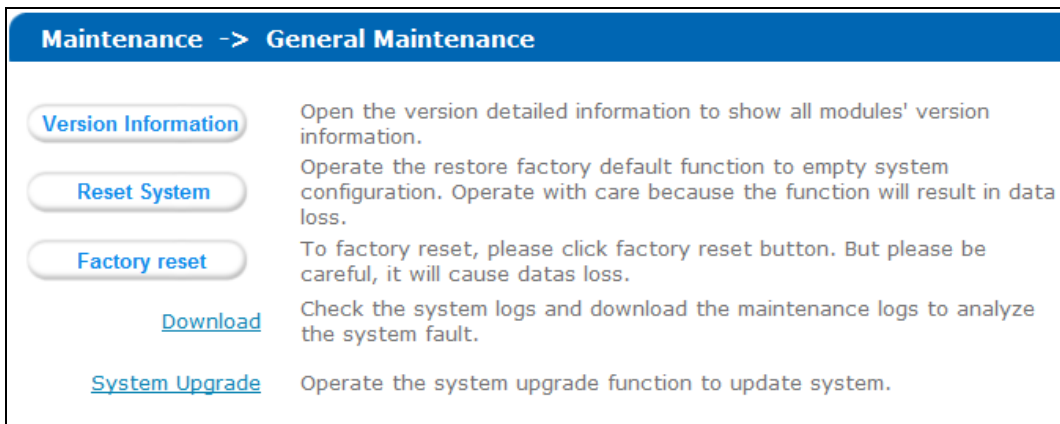
Figure 3. 6 General

3.3.1 Viewing Version Information

Purpose:

Version information interface lists information including SMI, HYBRID SAN , Support, and so on.

Steps:

1.   Click Version information to pop up version information window.

2.   Click Cancel to close the window.
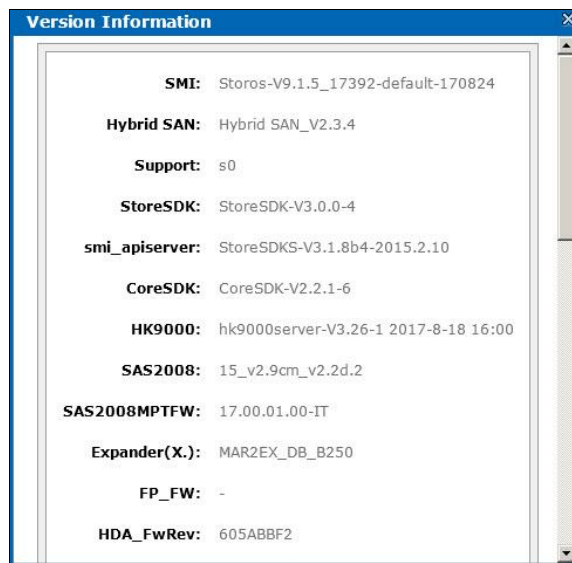
Figure 3. 7 Version Information

3.3.2 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.

![NOTE]

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

Steps:

1.   Click Reset system to pop up reset system dialog.
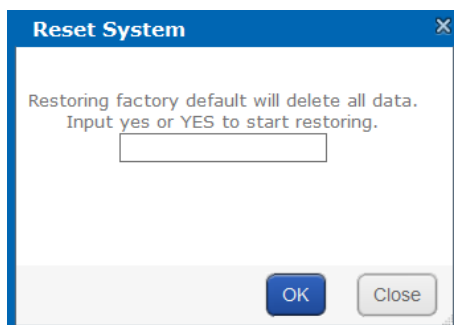
Figure 3. 8 Reset System

2.   Enter yes or YES in text field and click OK to reset.

3.3.3 Managing Maintenance Log

Purpose:

When system is abnormal, you can download the maintenance log to analyze problems.

Steps:

For details, refer to 9.1 Operation Log.

3.3.4 Modifying Password

Purpose:

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

Steps:

1.   Click Modify password. And modify password window appears.

2.   Select UserName as web_admin or nvr_admin.

   ➢   web_admin: Basic management system user name.

   ➢   nvr_admin: HYBRID SAN   sub-system user name.

3.   Enter Old Management Password and the same password in New Management Password and Confirm Management Password.

![NOTE]

   ● The security level of modified password should not be lower than low security.

   ● Password can only contain numbers, lowercase, uppercase, and underline for your password.

Figure 3. 9 Modify Password

4. Click OK and click OK in popup message dialog to save the new password.

![NOTE]

- Once password is modified, it jumps to login interface. You need to enter the new password to log in.
- Another controller password changes with the current controller password.

3.3.5 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. Click SNMP Configuration button.

Figure 3. 10 SNMP Configuration

2. SNMP Version is V2(v2c) by default and is not editable.

3. Enter User Name, Contact, and Physical address.

4. Click OK to save the settings. Then you can view system status by logging in PRTG Traffic Grapher Tool.

3.3.6 Modifying Host Name

Steps:

1. Click Modify and text field appears.

2.   Enter host name in the text field.

3.   Click Modify to activate the new host name.

Current Master Identification	
Name:	Modify

Figure 3. 11 Modify Host Name

NOTE

Only letters (a to z and A to Z), numbers (0 to 9), and underline (_) can be input.

3.3.7 Viewing Service Status

Purpose:

Whether the services are running or not. You can enable, disable, or restart the services.

Steps:

● Click Enable to start the service that is not running.

● Click Disable to shut down the running service.

● Click Restart to restart services.

Enabling and Disabling of Services (Total: 2)		
Service Name	Current Status	Service Operation (Enable/Disable/Restart)
SNMP	Running	Enable Disable Restart
iSCSI	Running	Enable Disable Restart

Figure 3. 12 Service Status

3.3.8 System Upgrade

Purpose:

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

Steps:

1.   Click System upgrade in Common menu to enter Application Service interface.

Current Upgrade File:	storos-201703231056-B_OS-OS_TEST-915.bin		
Select the system upgrade file:	Browse...	Upload	Restore

Figure 3. 13 Application Service

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.

NOTE

You can only restore to the last upgraded version.

3.4 Graphical Display

Purpose:

The storage system provides a graph to show the front view status and a pie chart to show the storage information.

Step:

Click Maintenance in navigation bar and choose Graphical Display to enter Graphical Display interface.
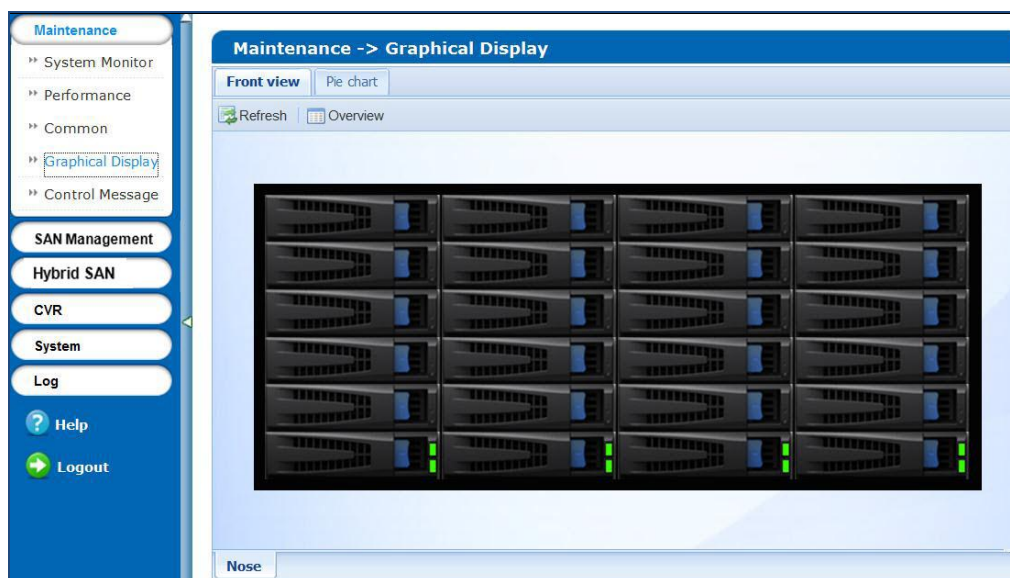
Figure 3. 14 Graphical Display

3.4.1 Front View

Purpose:

Front view can show you the HDD status.

Steps:

1. Click Front View in Graphical Display menu to show front view.

Table 3. 2 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.

2. Positioning the pointer in a green indicator slot. Then the message dialog appears.
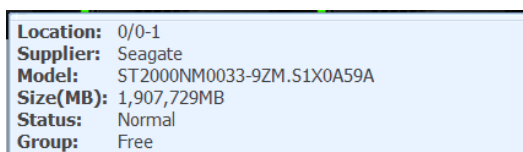
Figure 3. 15 HDD Information

3. Click Overview to view information of all HDD.

Figure 3. 16 HDD Overview

4.   Optionally, click Refresh in top-right corner to update the front view.

3.4.2 Pie Chart

Purpose:

Pie chart shows the free size of all storage modules, including system, LUN, snapshot, HYBRID SAN , iSCSI, and FC.

Steps:

1.   Click Pie Chart in Graphical Display to enter Pie Chart interface.

2.   Positioning the pointer in the part you want to view. Free size and free size Percentage appear in a dialog.

3.   Optionally, click Refresh in top-right corner to update the information.
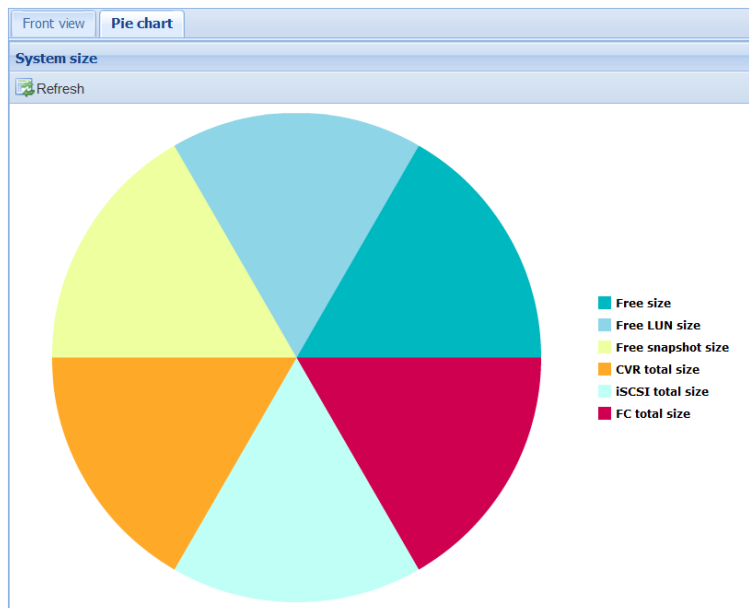
Figure 3. 17 Pie Chart

3.5 Environmental

Purpose:

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

Steps:

1.   Click Maintenance in navigation bar and choose Control Message to enter Control Message interface. Fan

RPM (Revolutions per Minute), temperature, and other information are shown.

![NOTE]

You can install or uninstall fans. Up to 6 fans' formation can be connected.
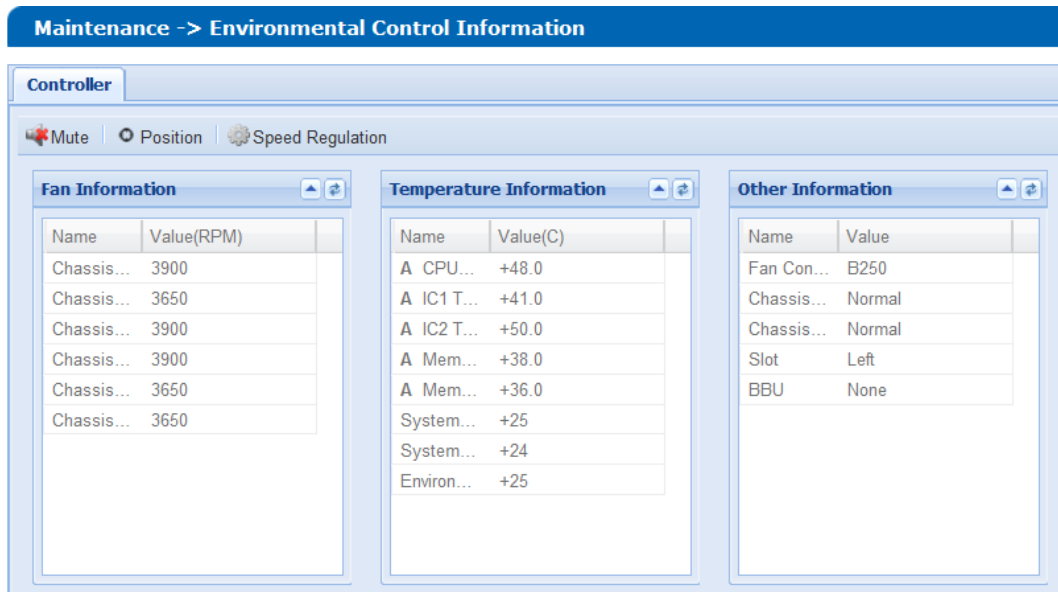
Figure 3. 18 Host

2. Click Mute in top-right corner to turn off system audible warning.

3. To find out which controller is working, click Position in top-right corner and click OK in popup dialog. The FN indicator of working controller would light up and flash for 10 minutes.

4. Set fan speed.

    1) Click SpeedRegulation in top-right corner to pop up dialog box.

Figure 3. 19 Fan Speed

    2) Choose speed as Low speed, Medium speed, or High speed in dropdown list.

    3) Click OK to save the settings.

Chapter 4   Storage Management

Purpose:

Storage management provides configuration including HDD management, array, storage pool, LUN (logical Volume), and storage settings.

Table 4. 1 Module Description

Module	Description
HDD Management	You can: ● View HDD information and status. ● Rescan, positioning, initialize, and detect HDDs.
Array	You can: ● Create arrays. ● Add hot spare. ● View array and hot spare information. ● Delete array and hot spare.
Storage pool	You can: ● Add, delete, and positioning storage pools. ● Remove and positioning HDDs. ● View system total and free capacity.
LUN (Logical volume)	You can ● Add and delete LUNs. ● Rename, expand, clone, and snapshot LUNs.
Configurations	You can: ● Set array synchronization speed. ● Set array synchronization type. ● Set flicking frequency for HDD positioning indicator.

Key words:

HDD Management, Array, Storage Pool, LUN (Logical Volume), Configuration
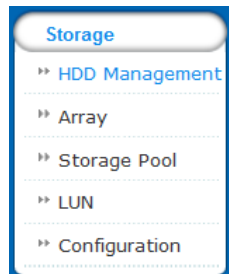
Figure 4. 2 Storage

4.1 Managing Local HDD

Purpose:

You can view the HDD information here, including HDD location, supplier, model, size, status, and belonging group.

Step:

Click Storage in navigation bar and choose HDD Management.

Figure 4. 3 HDD Management

4.1.1 Viewing HDD Status

Purpose:

You can view status of one HDD or all HDDs.

4.1.1.1 One HDD

Steps:

1. In the HDD information list, Click Details of an HDD. HDD state dialog appears.
2. Click SMART to view the HDD SMART detection information.

Figure 4. 4 HDD Status

4.1.1.2 All HDDs

Steps:

1. Click HDD Status in the upper left corner.
2. Click SMART of an HDD to view its SMART detection information.

Figure 4. 5 HDD Status

There are totally 6 kinds of status for an HDD.

Table 4. 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.

4.1.2 Rescanning HDD

Step:

● If detecting a newly installed HDD failed, click Rescan to find the HDD.

● If an HDD is uninstalled from the storage system, click Rescan to remove it from the HDD interface.

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

4.1.3 Positioning 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 4.5.2 Flickering Time.

Steps:

1. Check the checkbox of HDD you want to find.

2. Click Position and click OK in popup dialog box. Then HDD indicator keeps flickering in red for the set flickering time.

4.1.4 HDD Initialization

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. Check the checkbox of HDD you want to initialize.

2. Click Initialize and click OK in popup dialog box to start initializing.

4.1.5 HDD Detection

Purpose:

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

Steps:

1. Check the checkboxes of HDDs to detect.

2. Click Detect.
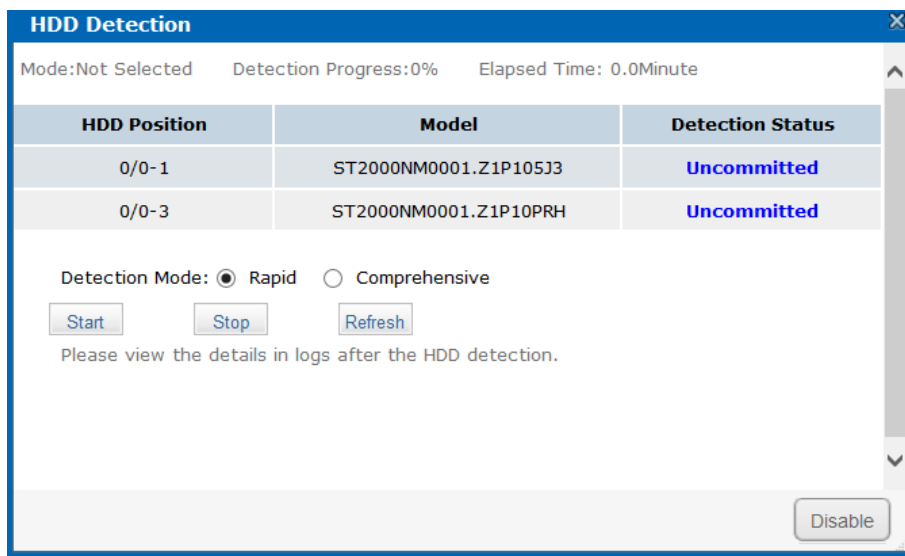
Figure 4. 6 HDD Detection

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.

![NOTE]

There are 3 kinds of detection status: Unsubmitted, Detecting, and Completed.

Table 4. 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.

4.2   Array

Purpose:

You can create and manage array.

Step:

Click Storage in navigation bar and choose Array.
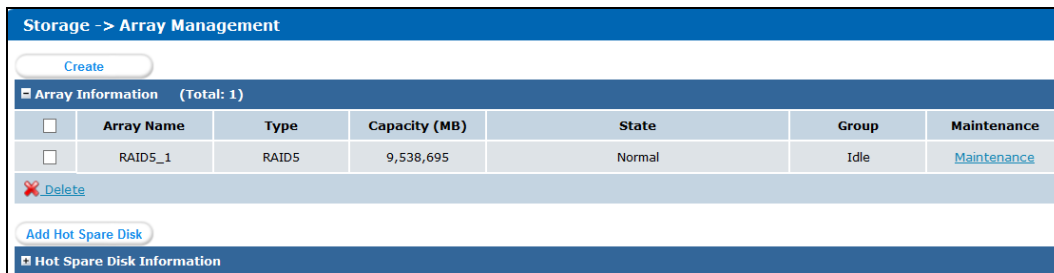
Figure 4. 7 Array

4.2.1   Creating Array

Purpose:

You can use available HDDs to create array.

Steps:

1. Click Create Array.
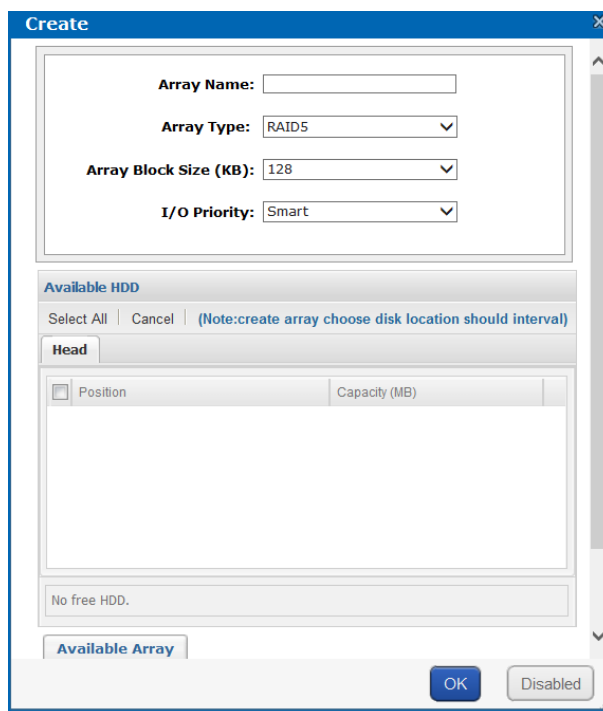
Figure 4. 8 Create Array

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 4. 9 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.

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 Auailable 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.

4.2.2 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 4. 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.

4.2.3 Rebuilding 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.

4.2.3.1 Rebuilding 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.

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

4.2.3.2 Rebuilding 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.

4.2.4 Detecting Array

Purpose:

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

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

Steps:

1. Click Maintenance of a degraded array in Array information list.
2. Click Detect to start detecting.

4.2.5 Repairing 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 Array information list.
2. Click Repair to start repairing.

4.2.6 Renaming Array

Steps:

1. Click Maintenance of an array in Array information list.
2. Click Rename.
3. Enter a new name.

4. Click OK to save the new name.

4.2.6.1 Modify I/O Priority

Steps:

1. Click Maintenance of an array in Array information list.

2. Click Modify.

3. Select I/O Priority in dropdown list.

4. Click OK.

4.2.6.2 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 Array information list.

2. Click Pause to pause current process.

3. You can click Keep to resume.

4.2.7 Deleting Array

Steps:

1. Check the checkbox of array you want to delete.

2. Click ✖ Delete button to delete.

NOTE

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.

4.2.8 Adding 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 to enter Add hot spare interface.

2. Select 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 dropdown list.

If Group is Local, select array in Array dropdown list.

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.
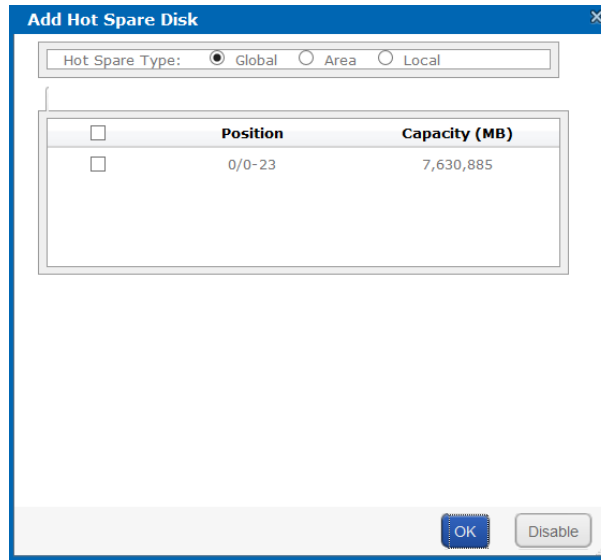

Figure 4. 10 Add Hot Spare

4.2.9 Deleting Hot Spare

Steps:

1.   Select arrays you want to delete.

2.   Click ✖ Delete button to delete.

4.3   Storage Pool

Purpose:

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

Step:

Click Storage in navigation bar and choose Storage Pool.
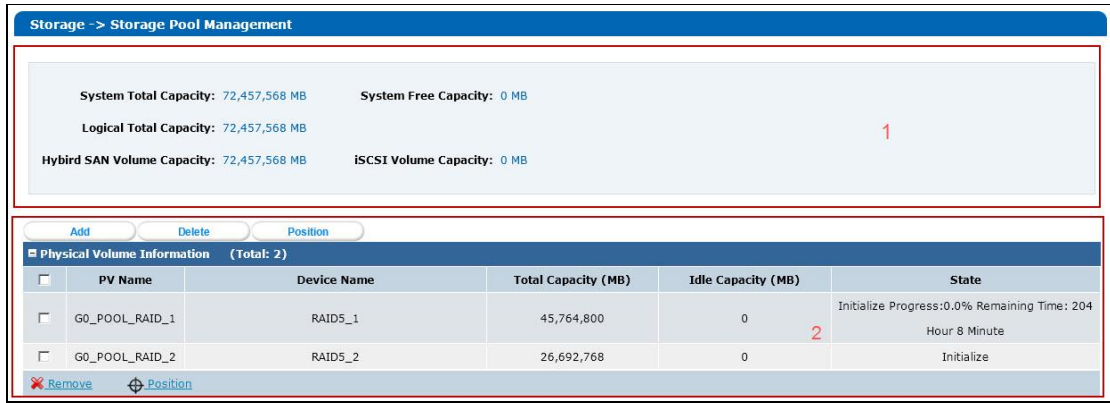
Figure 4. 11 Storage Pool

Table 4. 5 Interface Description

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

4.3.1 Adding 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 4. 12 Add Storage Pool

2. Select at least one array or HDD as storage pool.

    Or select the combination of array or HDD.

3. Input PVName in text field.

4. Click OK to add the storage pool.

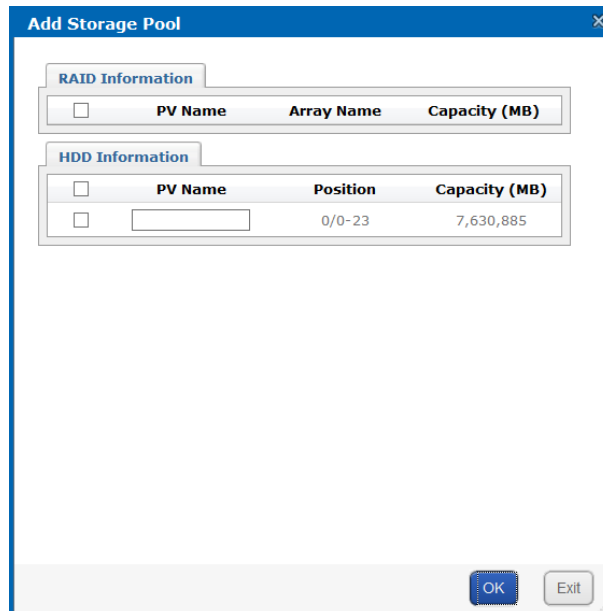|	PV Name	Device Name	Total Capacity (MB)	Idle Capacity (MB)	State
Add	Delete	Position			
☐ Physical Volume Information	(Total: 3)				
☐	G0_POOL_RAID_1	RAID5_1	13,291,616	0	Repaired
☐	G0_POOL_RAID_2	RAID5_2	15,209,600	0	Initialize Progress:5.3% Remaining Time: 50 Hour 28 Minute
☐	PV01	0/0-23	7,578,656	7,578,656	Normal
✖ Remove	⊕ Position				

Figure 4. 13 Storage Pool

4.3.2 Deleting Storage Pool

Purpose:

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

Steps:

1. Check the checkboxes of physical volumes you want to delete.

2. Click **Delete** or **✖ Remove** button to delete them.

NOTE

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

4.3.3 Positioning Storage Pool

Before you start:

Set the flickering time first. For details, refer to 4.5.2 Flickering Time.

Steps:

1. Check the checkbox of physical volume you want to positioning.

2. Click **⊕ Position** button. Then the HDD bottom indicator keeps flickering in green for the set flickering time.

4.4 Logical Volume

Purpose:

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

Step:

Click Storage in navigation bar and choose LUN.

	ID	Name	Block Size (Byte)	Capacity (MB)	Physical Volume	Usage	Snapshot Number	Clone	Extend	Rename
Storage -> Logical Volume Management										
Create										
☐ LUN Information	(Total: 8)									
☐	0	LUN_BACK1	512	51,200	G0_POOL_RAID_1	CVR Reserved Volume	0	🔷	⤴	REN
☐	1	LUN_BACK2	512	51,200	G0_POOL_RAID_1	CVR Reserved Volume	0	🔷	⤴	REN

Figure 4. 14 Logical Volume

4.4.1 Creating Logical Volume

Purpose:

You can create logical volumes by using available physical volumes.

Steps:

1. Click Create.

Figure 4. 15 Create Logical Volume

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

4.4.2 Deleting Logical Volume

Steps:

1. Select the logical volume you want to delete.
2. Click ✖ Delete button to delete them.

NOTE

The working logical volume can be deleted. Only free logical volume can be deleted.

4.4.3 Renaming Logical Volume

NOTE

You can only rename the free logical volumes.

Steps:

1. Click ![REN] button of the logical volume you want to rename.
2. Enter a new name.
3. Click OK to save the new name.

4.4.4 Enlarging Logical Volume

Purpose:
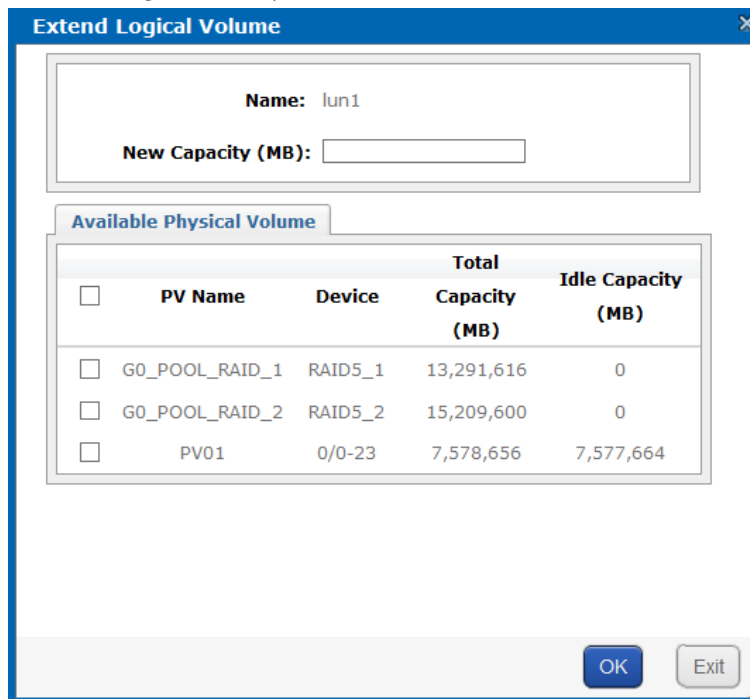
You can enlarge the size of created logical volume.

![NOTE]

You can only enlarge the idle logical volumes.

Steps:

1. Click ![icon] button of the logical volume you want to extend.

Figure 4. 16 Extend LUN

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

4.5 Configuration

Purpose:

You can set the array synchronization speed type and flickering time of positioning indicator.

Step:

Click Storage in navigation bar and choose Configuration.
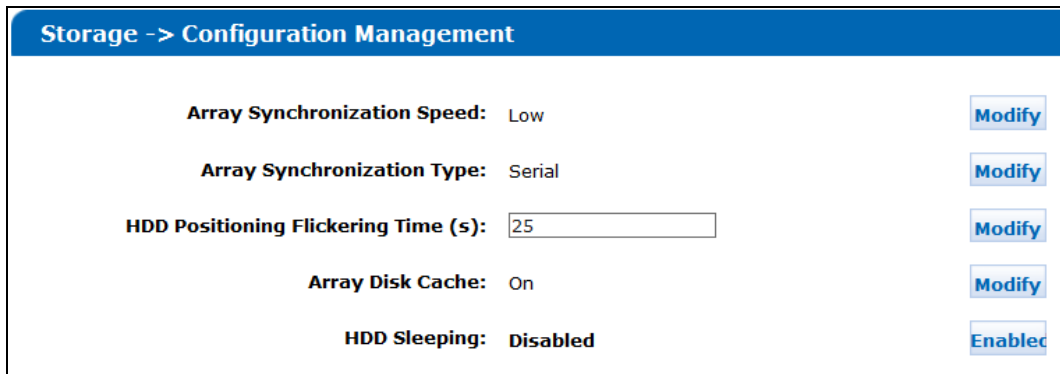
Figure 4. 17 Configurations

4.5.1 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 highest the internel IO percentage is.

3. Click OK.

4. Click Modify of Array Synchronization Type.

5. Select Array Synchronization Type as Serial or Parallel.

6. Click OK.
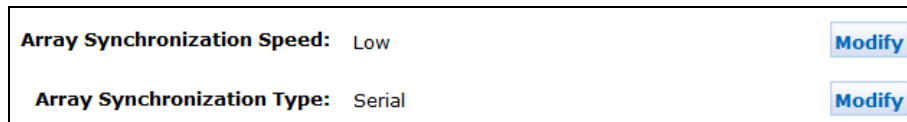
Figure 4. 18 Synchronization Speed and Type

4.5.2 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 5 SAN

Purpose:

You can add iSCSI disks and FC (Fiber Channel) disks in your computer.

Table 5. 1 Module Description

Module	Description
iSCSI	You can add iSCSI disks in your computer.
FC	You can add FC disks in your computer.

Keywords:

iSCSI, FC

Figure 5. 2 SAN

5.1 iSCSI

Purpose:

You can add iSCSI HDDs in your computer.

Step:

Click SAN in navigation bar and choose iSCSI to enter iSCSI interface.
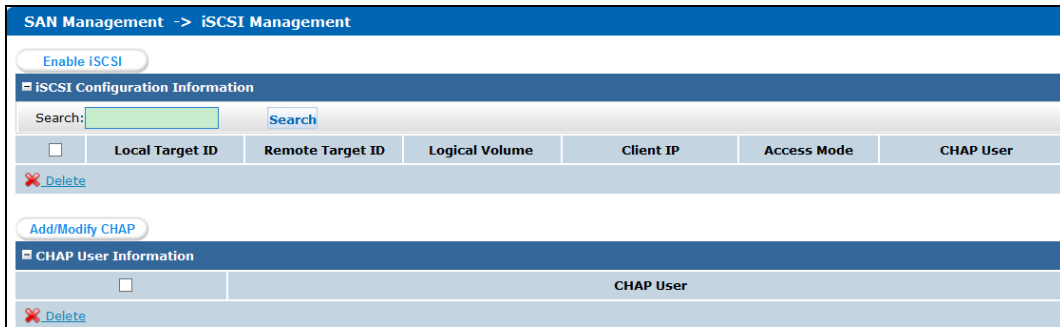
Figure 5. 3 iSCSI

5.1.1 Adding CHAP User

Purpose:

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

Steps:

1. Click Add/Modify CHAP button to enter Add CHAP User interface.
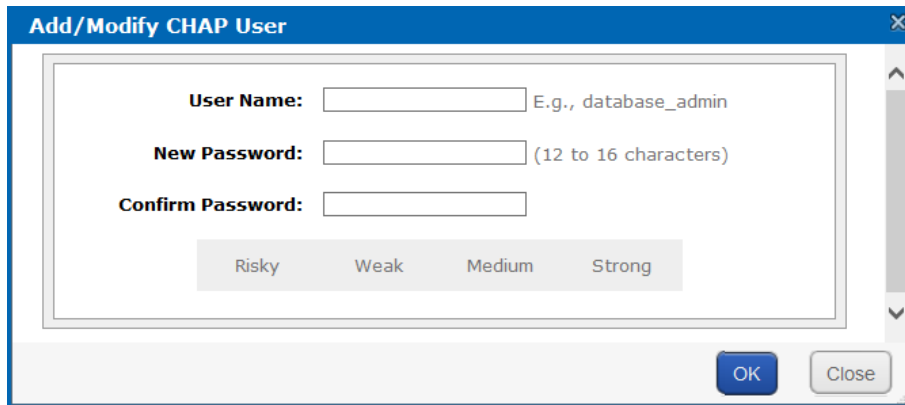
Figure 5. 4 Add CHAP User

2. Enter CHAP User Name, New Password, and Confirm password.
   - ➢ UserName: 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.
3. Click OK and click OK in confirmation dialog box to add the CHAP user.

5.1.2 Modifying CHAP User

Purpose:

You can modify the password of added users.

Before you start:

If the CHAP going to be modified is linked to one or more iSCSIs and these iSCSIs are connecting with computers, you need to disconnect them from computer first.

Steps:

1. Click **Add/Modify CHAP** button to enter Modify CHAP User Interface.
2. Enter the CHAP username you want to modify in the text field.
3. Enter a new Password and Confirm password.
4. Click OK and click OK in confirmation dialog box to modify the CHAP user.

5.1.3 Enabling iSCSI

Purpose:

Enabling iSCSI in the storage system makes it possible for you to add iSCSI HDDs in computer.

Steps:

1. Click **Enable iSCSI** button to pop up Enable iSCSI interface.

Figure 5. 5 Enable iSCSI

2. 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 in the text field.
3. Select the identity authentication method in the dropdown list 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.
4. Select the logical volume Access Mode as Read/Write, Write-Through, ReadOnly, or Intelligent Read-Only.
   - Read/Write: Read and writing permission.
   - Intelligent Read-Only: Even though writing operation succeeded, data wouldn't be written into 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.

5. Choose an available LogicalVolume.
6. Click OK to enable the iSCSI.

![NOTE icon]

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.

5.1.4 Disabling 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. Check the checkbox of iSCSI you want to disable.
2. Click ![Delete] and click OK in confirmation dialog box.

5.1.5 Modifying iSCSIPort

Purpose:

iSCSI port is needed when accessing via computer. It can be edited.

Before you start:

Disconnect all iSCSIs first, or iSCSI enabled under pervious iSCSI port couldn't be deleted.

Steps:

1. Click SAN in navigation bar and choose Setting to enter Setting interface.
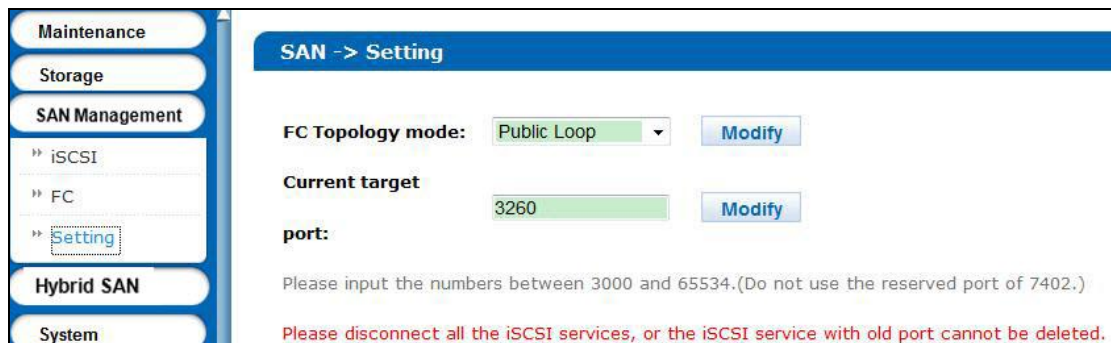

Figure 5. 6 Setting

2. Enter a number between 3000 and 65534 except 7402 in Currenttarget port text field.
3. Click Modify, click OK in confirmation dialog box, and click OK in second popup dialog box.

5.2 FC(Optional)

Purpose:

You can add FC HDDs in your computer.

Before you start:

1. Install fiber Ethernet adapter and fiber Ethernet adapter drive in both the storage system and the client server.

2. Connect the storage system and client server to fiber channel switch with fiber.

Step:

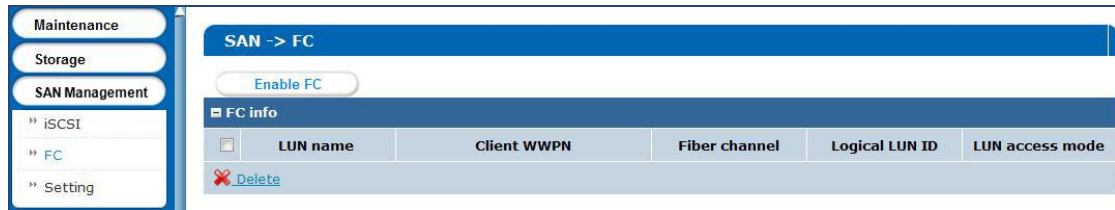Click SAN in navigation bar and choose FC to enter FC interface.

Figure 5. 7 iSCSI

5.2.1 Enabling FC

Purpose:

Enabling FC in the storage system makes it possible for you to add FC HDDs in computer. To visit FC HDD via computer, the storage system and the computer should locate in an optical fiber network. You can enable FC service for:

➢ A specified fiber channel.

➢ All available fiber channels.

➢ A specified FC port.

➢ All available FC ports.

Before you start:

● Install optical fiber card first.

● Create at least one LUN first. For detailed steps, refer to 4.4 Logical Volume.

Steps:

1. Click Enable FC to enter Enable FC interface.

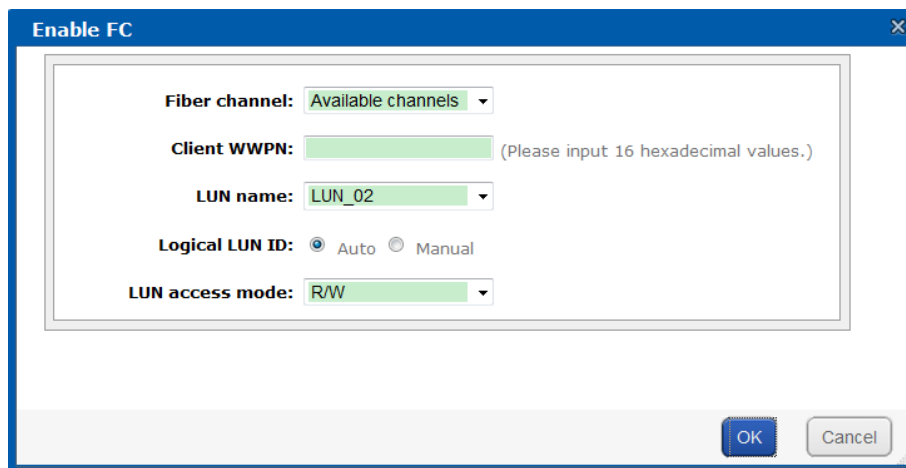

Figure 5. 8 Enable FC

2. According to actual connection, select Fiber Channel as Fiber Channel0, Fiber Channel1, Fiber Channel2, or Fiber Channel3. If you are not sure about selecting which one, select Available channels. The storage system can automatically connect the client with an available channel.

NOTE

Fiber Channel 0 refers to fiber port 1 in real panel. Fiber Channel 1 refers to fiber port 2 in rear panel. And so on.

3. To specify a client, enter Client WWPNof 16 numbers.

Client WWPN:The client fiber Ethernet adapter WWPN. You can use a fiber client to obtain WWPN. If no client is available, enter 0000000000000000. The storage system connects all available clients WWPN and share FC with all connected clients.

4. Select available LUN in the dropdown list of LUNname.

5. Choose LogicalLUNID as Auto or Manual.

   ➢ Auto: The storage system automatically specifies a free LUN ID.

   ➢ Manual: It is recommended to choose Manual. The logical LUN ID which is the first manual one must be 0.

6. Select LUN access mode as R/W, SR/W,RO,or IRO.

   ➢ R/W: Read and writing permission.

   ➢ IRO(Intelligent Read Only): Even though writing operation succeeded, data wouldn't be written into LUN. It is mainly used to test the storage system performance.

   ➢ RO:Read only

   ➢ SR/W(Synchronous Read/Write): It writes the data into HDDs directly without writing into HDD buffer. A low writing speed makes the data complete.

7. Click OKand click OKin confirmation dialog box to enable FC.

5.2.2 Disabling FC

Purpose:

You can disable FC service for:

➢ A specified fiber channel.

➢ All available fiber channels.

➢ A specified FC port

➢ All available FC ports.

Steps:

1. Check the checkbox of FC you want to disable.

2. Click ❌ Delete and click OKin confirmation dialog box.

Chapter 6   HYBRIDSAN

Purpose:

You can configure HYBRID SAN   and N+1 parameters.

Table 6. 1 Module Description

Module	Description
HYBRID SAN	You can: ● Configure private volume, HYBRID SAN configuration, create record volume, and extend record volume. ● HYBRID SAN one-key configuration. ● Manage N+1. ● Log in HYBRID SAN sub-system to add encoders, add strategy, search video, and so forth.
N+1	A storage system whose HYBRID SAN service has started can serve as a backup HYBRID SAN for other HYBRID SAN s.

Keywords:

HYBRID SAN , N+1

Figure 6. 2 HYBRID SAN

6.1 One-Key Configuration

Purpose:

Quick-setting creating helps you to create HYBRID SAN quickly.

Before you start:

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

Steps:

1. Click the One-KeyConfigurationbutton in upper right corner to start quick settings.

2. Click OKto confirm. Quick-setting takes 3 to 15 minutes. During the quick-settings, following operations are performed automatically.

   1) Add HDDs to storage pool. Or create RAIDs and add them to storage pool.

   The whole HDDs are added to storage pool with no more free capacity. You can view the storage pool usage in Storage › Storage Pool.

   2) Create private volume, reserved volume, and record volume. If more than 3 LUNs are created, one archive volume is created.
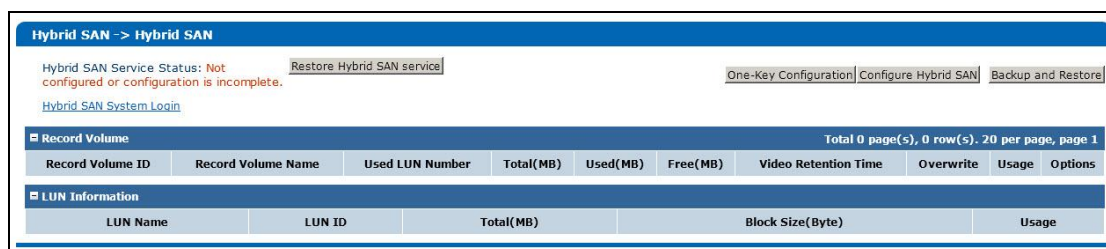
Figure 6. 3 HYBRID SAN Settings Interface

➢ Bad HDD, risky HDD, and warning HDD would not be added to storage pool.

➢ Non-enterprise HDD is 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.

6.2 HYBRIDSAN Configuration

Purpose:

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

Step:

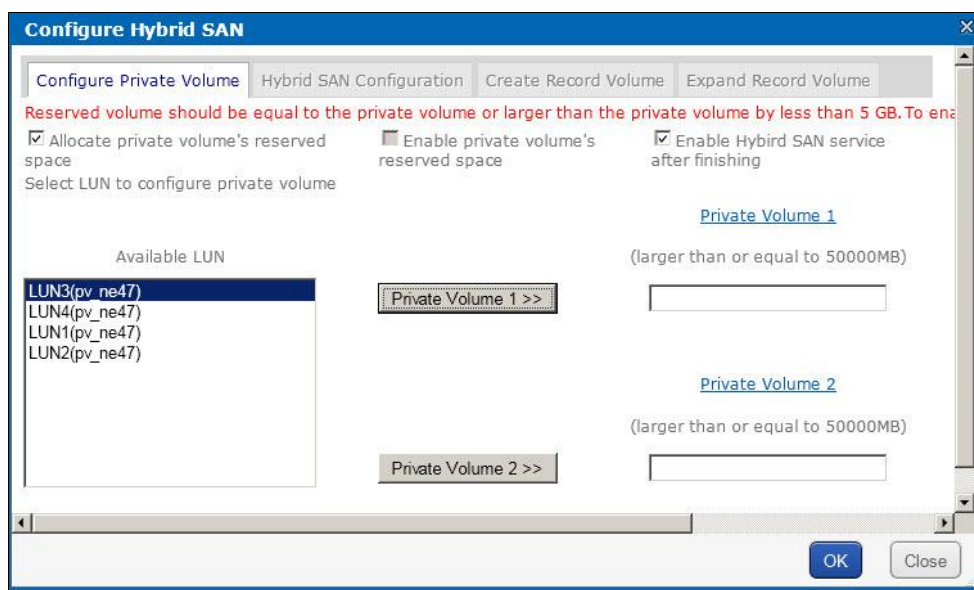Click the Configure HYBRIDSAN button in upper right corner.

Figure 6. 4 HYBRID SAN

6.2.1   Starting HYBRIDSAN

Purpose:

You can start HYBRID SAN   after private volumes are created.

Before you start:

1.   To create storage pool, do one of the following:

- Single-HDD mode: Add HDDs to storage pool.

- Array mode: Create arrays and add them to storage pool.

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.

- If record volume size is fewer than 120T, then private volume 1 and private volume 2 size should both larger 50G.

- If record volume size ranges from 120T to 180T, then private volume 1 and private volume 2 size should both larger 60G.

- If record volume enlarges by 60T, record volume 1 and record volume 2 should both enlarge by 10G.

Steps:

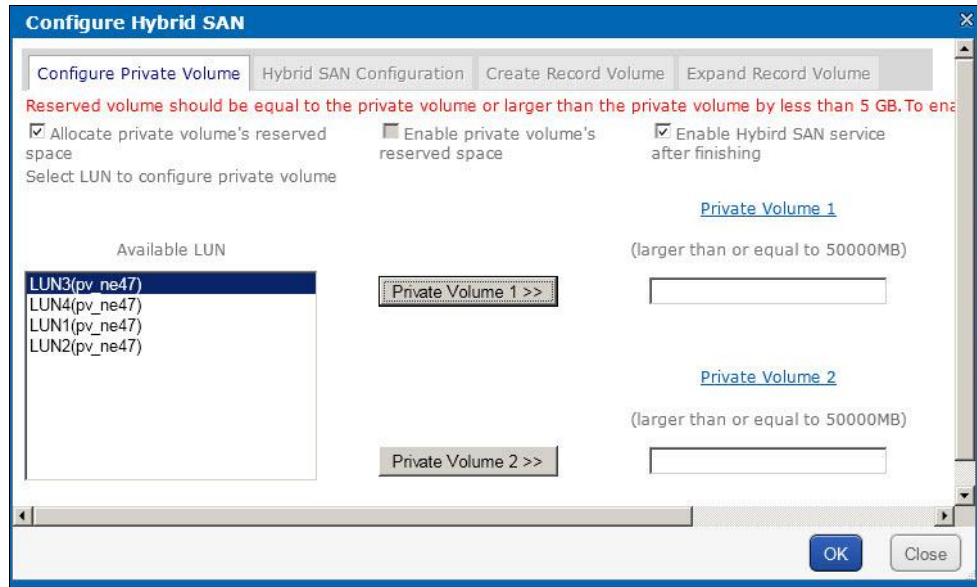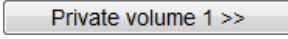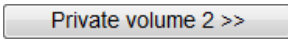1.   Click the Configure Private Volume tab.

Figure 6. 5 HYBRID SAN   Configuration

2. Check the checkbox of EnableHYBRIDSAN after finishing.

3. Optionally, check the checkbox of 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.

4. To add private volume 1, choose a FreeLUNand click 〔 Private volume 1 >> 〕 button.

5. To add private volume 2, choose a FreeLUNand click 〔 Private volume 2 >> 〕 button.

NOTE

➢ HYBRID SAN   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 chosen LUNs' capacity should meet the demand shown in red frames in Figure 6. 5 HYBRIDSAN Configuration.

➢ 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.

6. Click OK to start creating the two private volumes. After private volumes are created, HYBRID SAN   starts running.
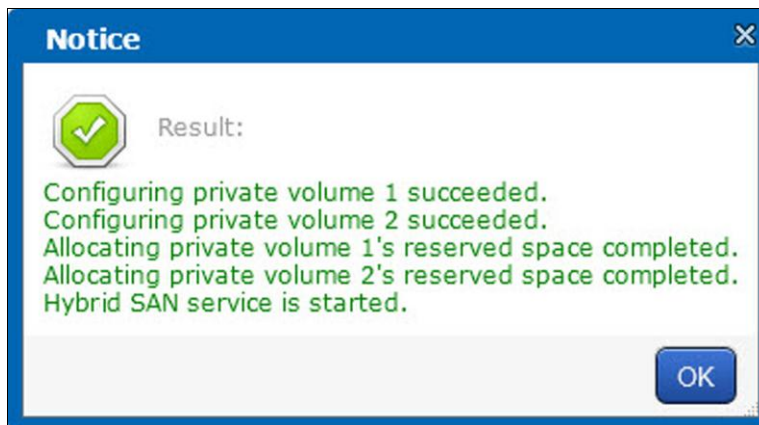
Figure 6. 6 Created Prviate Volume

Table 6. 2 HYBRID SAN Status Description

Status	Description
Not configured or incomplete	HYBRID SAN is not configured.
Running	HYBRID SAN is correctly started.
Stopped	Click Stop HYBRIDSAN to stop HYBRID SAN service. Once HYBRID SAN is stopped, you are not able to view encoder information and videos. You can click Start HYBRIDSAN to recover to Running status.
Running and Recovering	Indicators HYBRID SAN is working normally and in automatic recovery process.
Stopped and Recovering	Indicators HYBRID SAN is stopped and in automatic recovery process.

6.2.2 Resetting HYBRIDSAN

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:

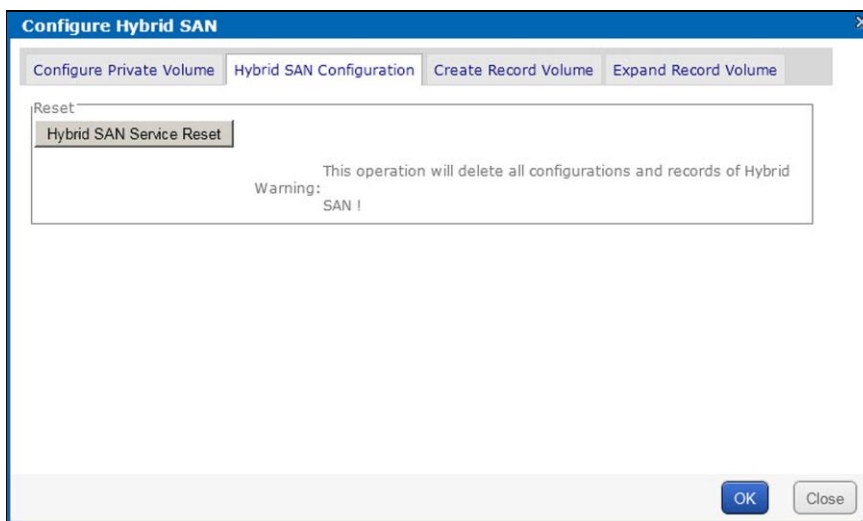1. Enter HYBRID SAN configuration menu.

Figure 6. 7 Reset HYBRID SAN

2.   Click HYBRIDSAN Service Reset.

3.   Enter yes or YES in text field to start reset.

6.2.3 Record Volume

Purpose:

Record volume is the logical volume stores videos.

6.2.3.1 Creating Record Volume

Steps:

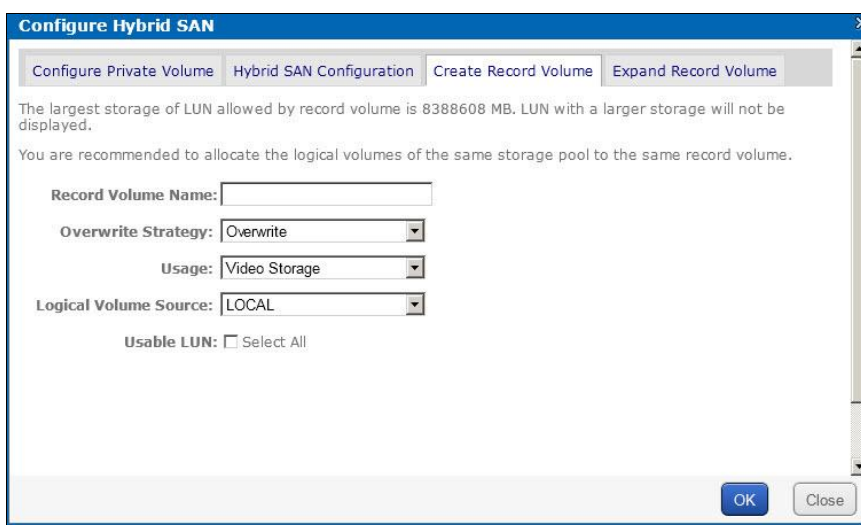1.   Click Create Record Volume menu.

Figure 6. 8 Create Record Volume

2.   Enter the Record Volume Name in text field.

3.   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

4.   Select Record Volume Usage as Video Storage or Picture Storage.

5.   If you want to create record volume based on local HDD or array, select Logical Volume Source as Local. If you want to create it based on IP SAN, select LUN source as IP SAN.

6.   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.

7.   Click OK to create the record volume. The created record volumes are listed in Record Volume list.

6.2.3.2 Clearing, Modifying, and Deleting Record Volume

Purpose:

The created record volumes are listed in Record Volume list. You can clear videos saved in it, modify its configuration, and delete it.

Table 6. 3 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	You can delete the record volume. Data saved in it is removed. NOTE Do not delete record volume when linked encoder is recording.

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

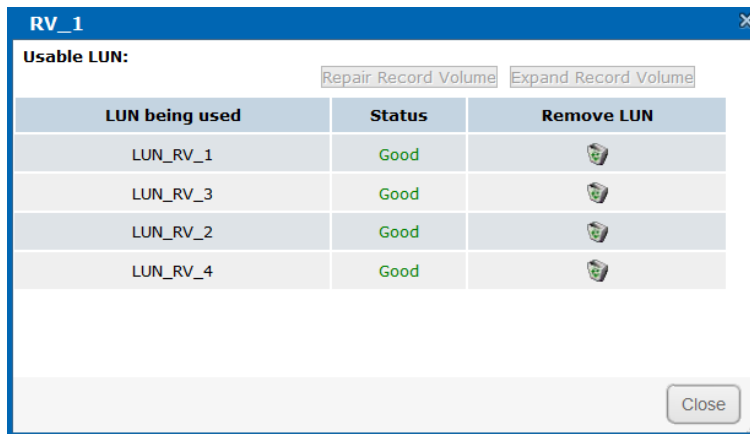Steps

1. Click the record volume name.

Figure 6. 9 LUNs

2. Click of the LUN you want to delete.

3. Enter yes or YES in text field to delete it. After it is deleted, data saved in the LUN is deleted and the LUN status is Free.

6.2.3.3 Extending

Purpose:

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

Steps:

1. Click Extend Record Volume menu.
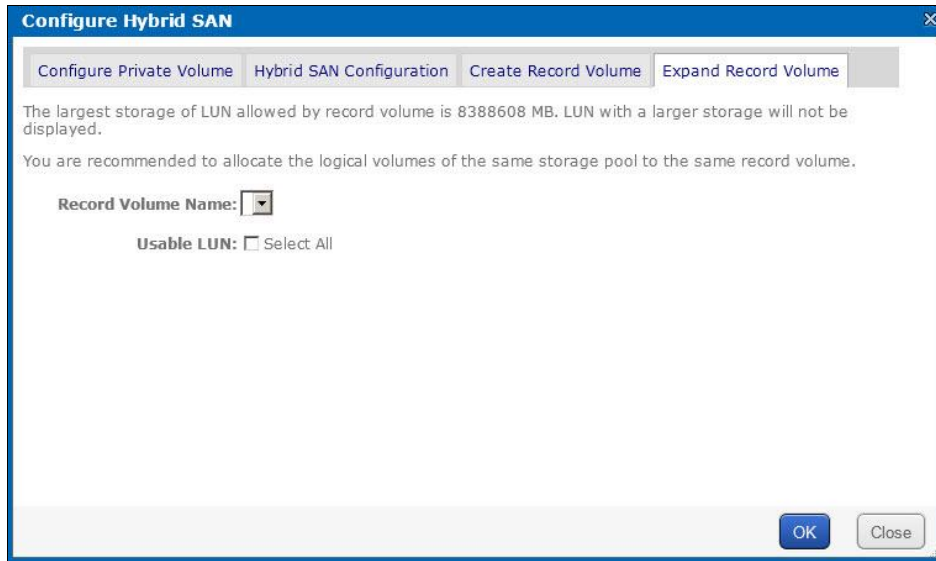
Figure 6. 10 Extend Record Volume

2.   Select the record volume you want to extend in RecordVolumeName dropdown list.

3.   Select the UsableLUN used to extend.

4.   Click OK to start extending.

6.3   Backup and Restoring

Purpose:

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

Step:

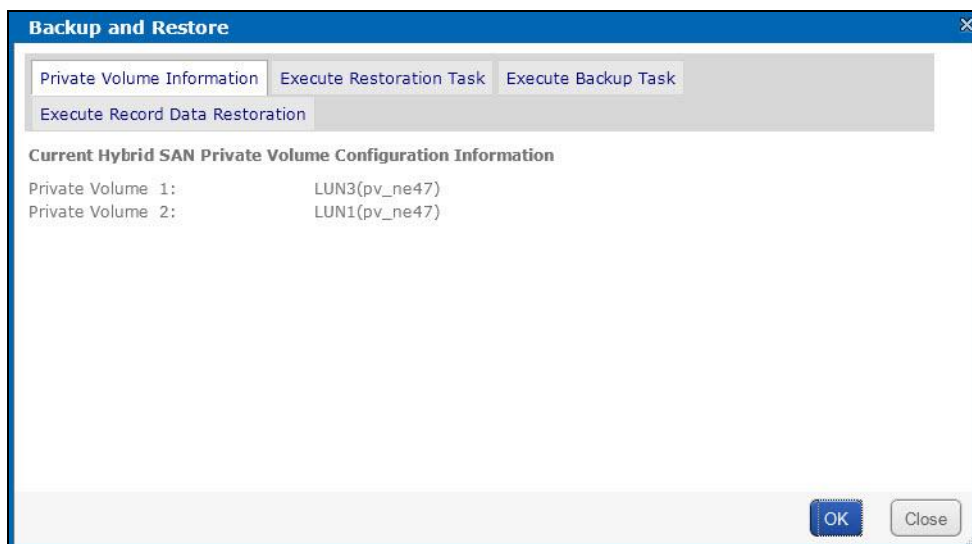Click Backup and Restore button in upper right corner.

Figure 6. 11 Back and Restore

6.3.1 Viewing Private Volume Information

Step:

Click Private volume information menu to enter Private Volume information interface. LUNs making up private volume 1 and private volume 2 are listed.

6.3.2 Restoring

Purpose:

When error occurs to HYBRID SAN , restoring HYBRID SAN can recover it. Restoring may cause data loss, so you need to contact us for professional help. We are not responsible for error caused by unprofessional operation.

Step:

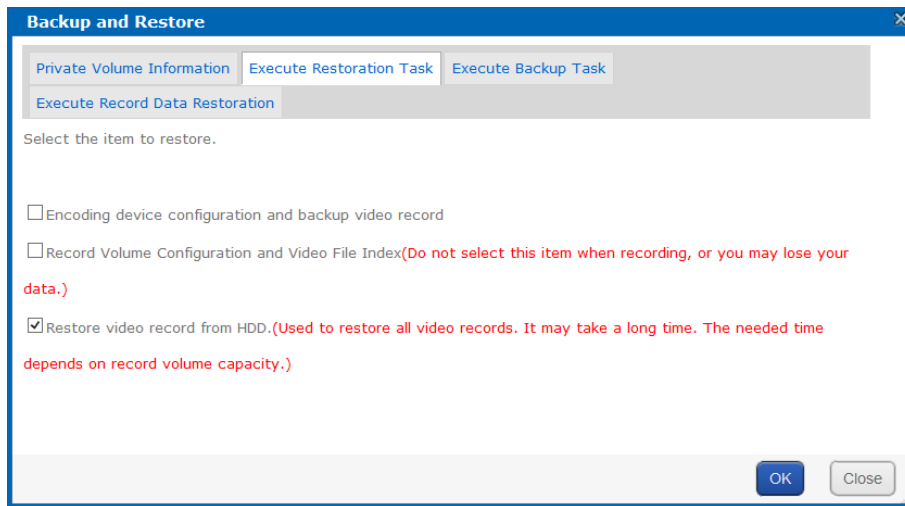Click Execute Restoration Task menu to enter Restore interface.

Figure 6. 12 Restore

6.3.3 Backup

Purpose:

The storage system backs up the index of all videos every hour. You can manually back up all videos' index according to following steps. The backed up index is saved in database.

The function backs up video index instead of videos.

Steps:

1. Click Execute Backup Task tab.
2. Click OK to start backing up.
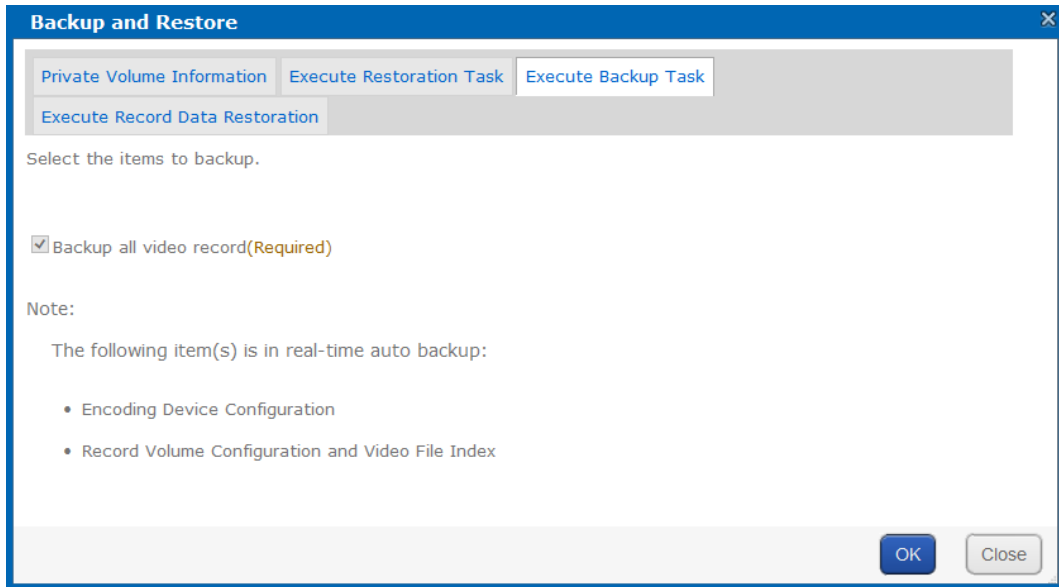
Figure 6. 13 Backup

6.3.4 Recovering Video Data

Purpose:

If you reset HYBRID SAN , deleted record volume, or cleared record volume by mistake, you can contact us for professional help, we would help you to recover these data. We are not responsible for error caused by unprofessional operation.

Step:

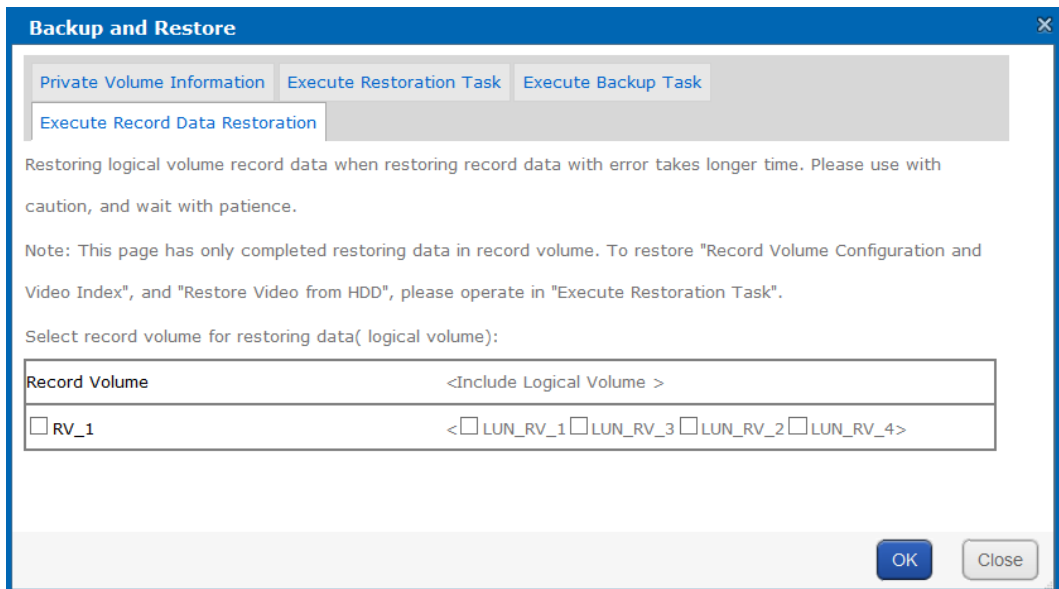Click Execute Record Data Restoration tab.

Figure 6. 14 Record Data Recovery

6.4 N+1 Management

Purpose:

A storage system whose HYBRID SAN service has started can serve as a backup HYBRID SAN for other HYBRID SAN s. When one or more master HYBRID SAN s 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 SAN s recovers to normal, backup HYBRID SAN would upload videos back to master HYBRID SAN s.

Before you start:

Start HYBRID SAN service in both master HYBRID SAN and backup HYBRID SAN .

Step:

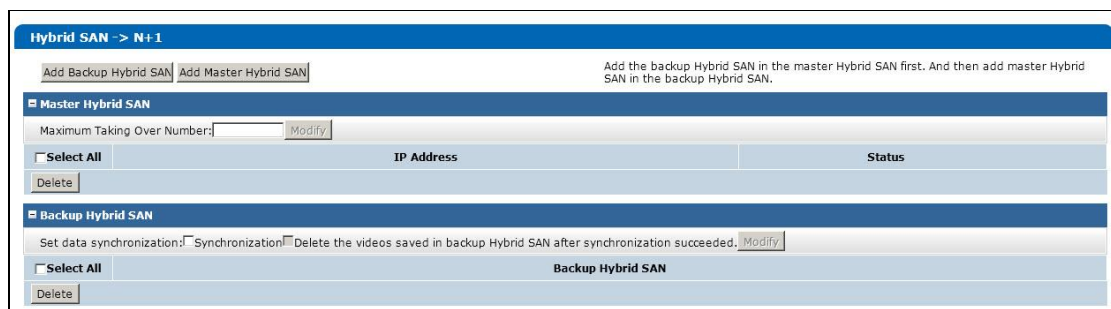Click N+1 in navigation bar and choose N+1 to enter HYBRID SAN interface.

Figure 6. 15 N+1 Management

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 8.3 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.

6.4.1 Adding Backup HYBRID SAN

Purpose:

Add backup HYBRID SAN in master HYBRID SAN first.

Before you start:

Log into master HYBRID SAN and enter N+1 Management interface.

Steps:

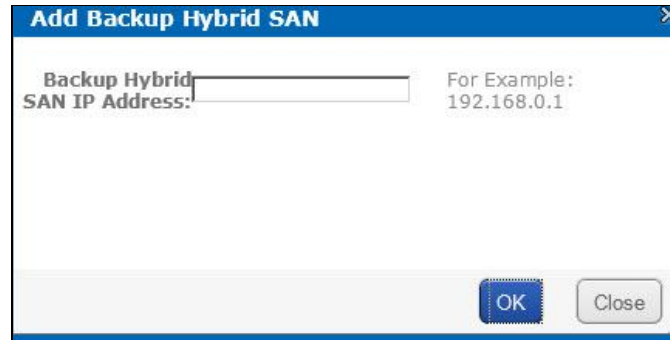1. Click the Add Backup HYBRID SAN button.

Figure 6. 16 Add Backup HYBRID SAN

2. Enter the backup HYBRID SAN   IP address.

3. Click OK to add.

4. Optionally, you can check the checkboxes of Synchronization and Delete the videos saved in backup HYBRID SAN 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 HYBRID SAN after synchronization succeeded: Delete the videos in backup HYBRID SAN   once they are uploaded to master HYBRID SAN .
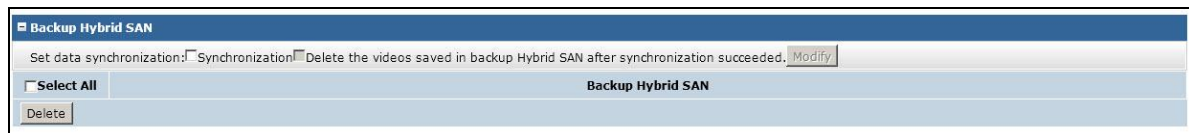

Figure 6. 17 Backup HYBRID SAN

6.4.2 Deleting Backup HYBRID SAN

Steps:

1. Check the checkbox of backup HYBRID SAN   you want to delete.

2. Click the [Delete] button and click OK in confirmation dialog box.

6.4.3 Adding 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 7.3.2 Adding Encoding Device. Ensure the name of encoding devices from different backup HYBRID SAN s varies 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:

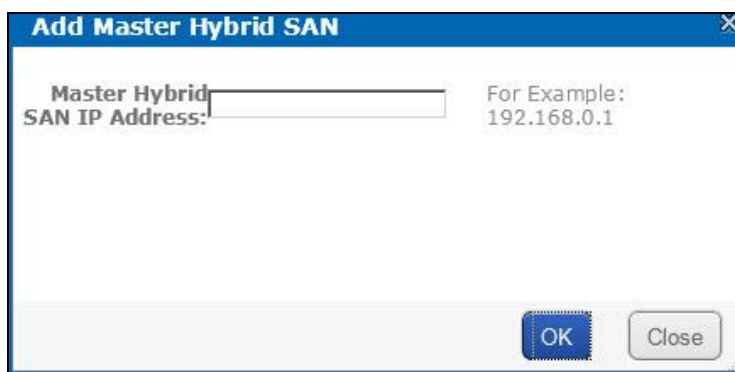1. Click the Add Master HYBRID SAN button.

Figure 6. 18 Add Master HYBRID SAN

2.   Enter master HYBRID SAN   IP address.

3.   Click OKto add. The added master HYBRID SAN   is listed in HYBRID SAN   master list

4.   Enter Maximum TakingOver Number and click Modify. If maximum taken-over master HYBRID SAN   is 4 and 7 master HYBRID SAN s are added, when 5 master HYBRID SAN s are abnormal, the backup HYBRID SAN would take over the first added 4 master HYBRID SAN s. After one or more of the 4 HYBRID SAN s recovers, other master HYBRID SAN s would be taken over.

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

Table 6. 4 Backup HYBRID SAN   Status

Backup HYBRID SAN Status	Description
Standby	When master HYBRID SAN is normal, backup HYBRID SAN is standby.
Working	When master HYBRID SAN is abnormal, backup HYBRID SAN 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 7　HYBRIDSAN　Sub-System

Purpose:

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

Table 7. 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 HYBRID SAN　sub-system time, count remaining recoding 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 HYBRID SAN　version.
Log Management	Log helps you figure out HYBRID SAN　history actions. You can search, export, and clear logs.

Key Words:

Information, Encoding Device, Preview and Record, Strategy and Alarm, Download and play, User Management, System Config, Log Management
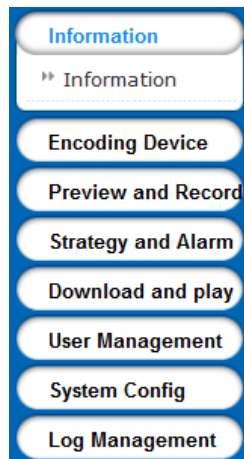
Figure 7. 2 HYBRID SAN　Sub-System

7.1 Accessby 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. Then login interface appears.

4. Enter Passwordof HYBRID SAN sub-system and click Loginto log in.

⚠ STRONGPASSWORDRECOMMENDED–Wehighlyrecommend you create a strong password of your own choosing(Usinga minimum of 8 characters, including at least three of the following categories: upper caseletters, lower caseletters, numbers, and special characters.) in order to increasethe security of your product. And we recommendyou reset your password regularly, especiallyin the high security system,resetting the password monthly or weeklycan better protect your product.

Figure 7. 3 HYBRID SAN Sub-System

7.2 Information

Purpose:

Encoding device, record schedule, and record volume information are listed.

Step:

Click Information in navigation bar.

Figure 7. 4 Information

Table 7. 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 HYBRID SAN is rebooting.
Recording	Encoding device is recording.
Password or user name error	Incorrect user name or password for encoding device.
Not load	When HYBRID SAN starts, loading encoding device failed.
Unknown	HYBRID SAN 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.

7.3   Encoding Device

Purpose:

You can add and manage encoding devices, adjust HYBRID SAN sub-system time, count remaining recoding capacity, and analyze video loss.

Step:

Click EncodingDevice in navigation bar.

Figure 7. 5 Device Management

7.3.2 Adding Encoding Device

Steps:

1. Click Add Encoding Device.

2. Enter Encoding Device Name.

3. According to encoding device acutal parameters, select EncodingDeviceType, enter IP/Host, Port, Channel, Login user, and Password.

4. Optionally, you can enable stream media server by checking the checkbox of EnableSMS (Stream Media System), inputting IP address:port (e.g., 192.168.0.2:554) in SMS, and select URLMark and Transmission Method.

5. 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.

➢ Enablesub-streamto 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, HYBRID SAN gets stream according to strategy.

➢ EnableArming: If selected, when alarm occurs to encoding device, HYBRID SAN can trigger alarm record. And the encoding device Attribute would mark as A.

6. Select related record volume in Link to RecordVolume.

7. Click OKand click OKin confirmation dialog box to add the encoding device.

Figure 7. 6 Add Encoding Device

➢ 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.

7.3.3 Modifying and Deleting

Steps:

● To delete encoding devices, do following steps:

1. Check the checkbox of encoding device you want to delete.
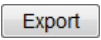
2. Click Delete encoding device.

● 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 and click OK in confirmation dialog box to save the settings.

● To modify linked record volume, do following steps:

1. Check the checkbox encoding device you want to modify.

2. Select the target record volume in the dropdown list.

7.3.4 Exporting and Importing 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 HYBRID SAN sub-system.

Steps:

● To export encoding devices, do following steps:

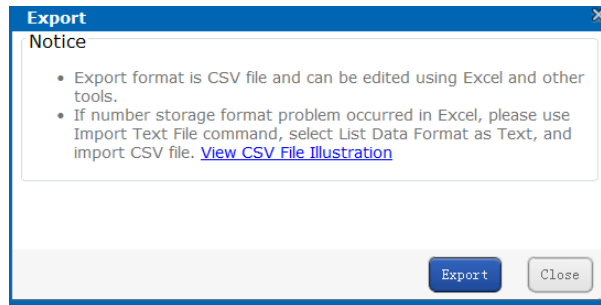1. Click Export and click OK in confirmation dialog box.
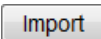

Figure 7. 7 Export

2. Select file saving path and click OK to save it.

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 7. 8 Exported File.

Figure 7. 8 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 the Operation Options.

➢ Update Duplicate Device: When the contents of HOST and CHANNEL column of several encoding devices are the same, HYBRID SAN judges them as duplicate encoding device. If it is selected, HYBRID SAN 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 HYBRID SAN sub-system and importing file share the same name, once imported, the encoding devices in importing file would replace the one in HYBRID SAN 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 HYBRID SAN 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 and click OK in confirmation dialog box to import. The encoding device list would be updated according to imported file.
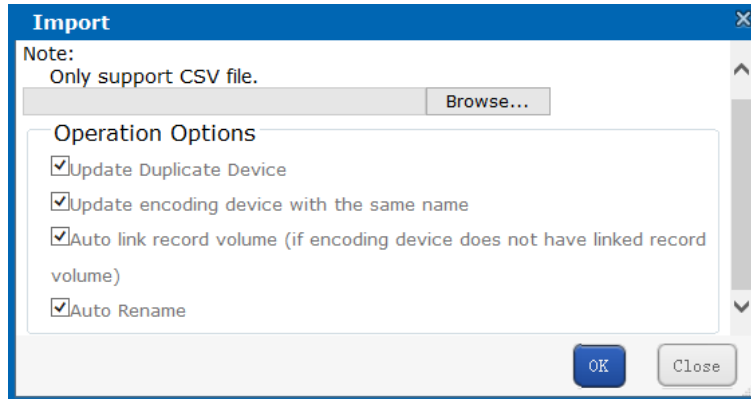

Figure 7. 9 Import

7.4   Previewing and Recording

Purpose:

Do following steps to start or stop recording manually.

Steps:
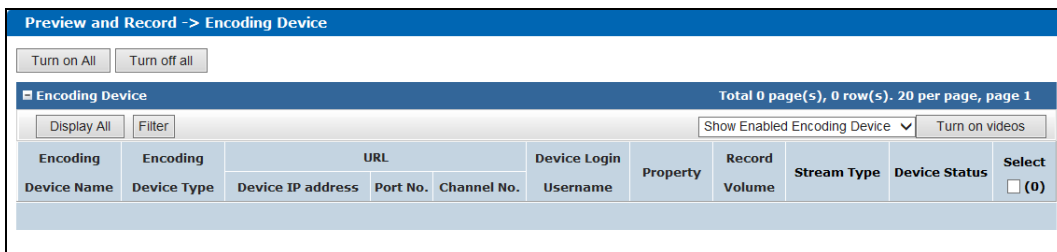
Click Preview and Record in navigation bar.

Figure 7. 10 Preview and Record

● To start or stop manual recording for specified encoding devices, do following steps:

1. Check the checkboxes of encoding devices you want to start manual 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.

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 7.5 Strategy and Alarm.

7.5 Strategy and Alarm

Purpose:

You can configure recording schedule, create uploading task and schedule, and configure alarm parameter.
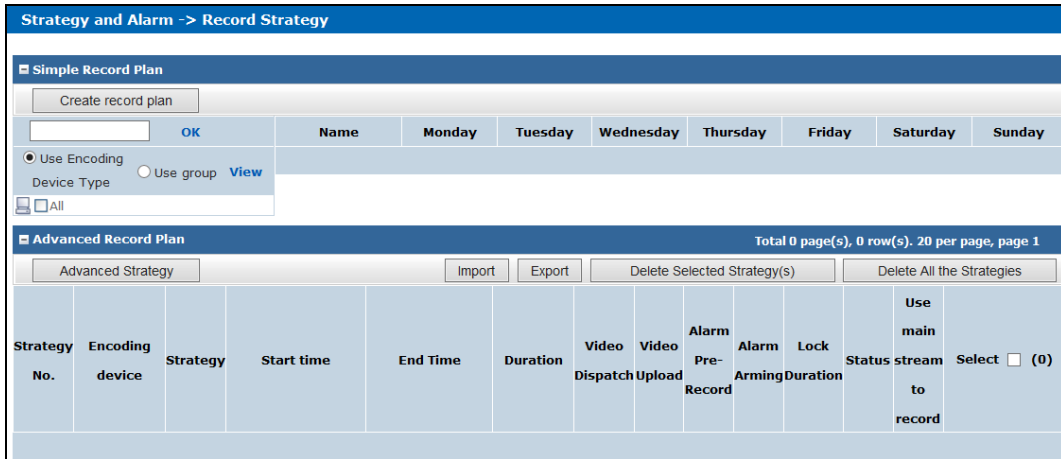
Step:

Click Strategy and Alarm in navigation bar.

Figure 7. 11 Strategy and Alarm

7.5.1 Record Plan

Purpose:

Set the record plan, and then the encoding devices automatically starts and stops recording according to the configured plan.

Step:

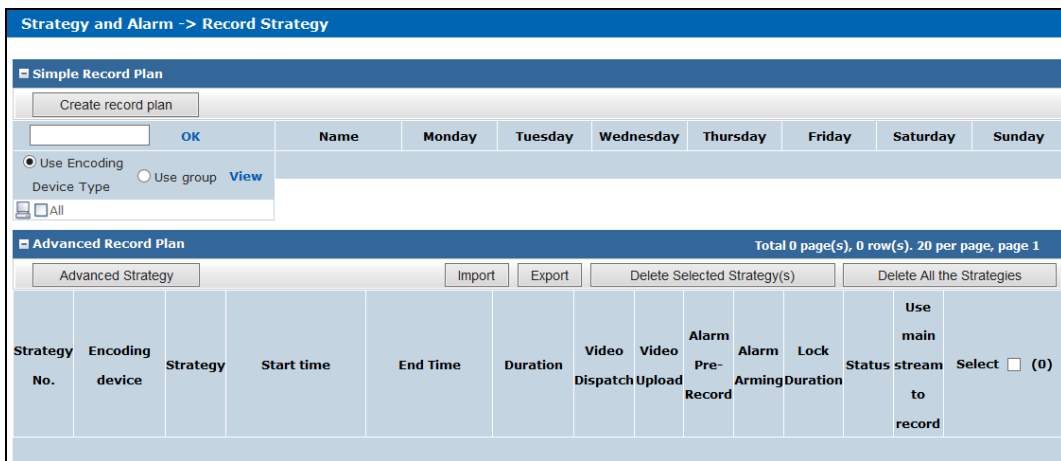Click Record Strategy in navigation bar.

Figure 7. 12 Record Strategy

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

7.5.1.2 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. Click Create record plan.

2. Enter in the encoding device name and click OK to select the encoding device. Repeat the step to add more.

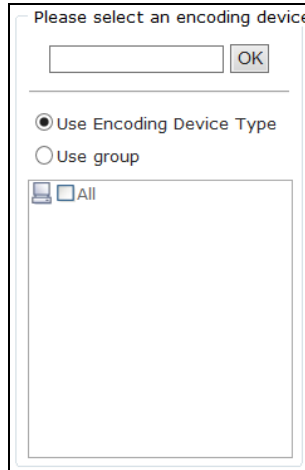   Or select encoding devices or groups in the list.

Figure 7. 13 Select Encoding Devices

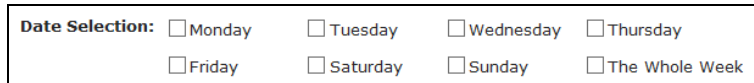3. Select the Date on which you want to set schedule.

Figure 7. 14 Date

4. In Record mode, to schedule an all-day recording, check the checkbox of Whole-day Video.

   Or you can select the one or more time segments to set start time and end time.

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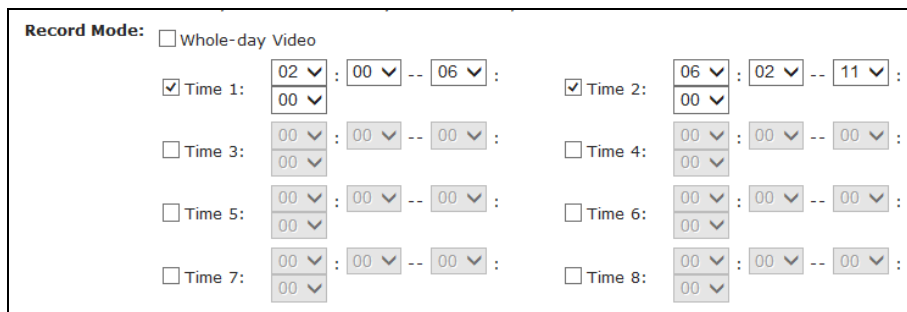

Figure 7. 15 Record

5. 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.

➢ Copyback: If selected and uploading schedule exists, the camera video would upload to HYBRID SAN . For details of configuring uploading schedule, refer to chapter 7.5.2.3 Adding 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, HYBRID SAN 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.

7.5.1.3 Advanced Record Plan

Purpose:

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

Steps:

1. Click Advanced Strategy.

2. Enter in the encoding device name and click OK to select the encoding device. Repeat the step to add more. Or select encoding devices or groups in the list.
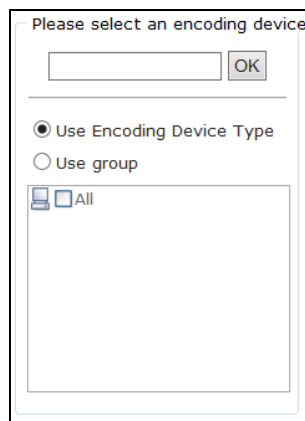

Figure 7. 16 Select Encoding Devices

3. Select Start time by Instant Recording or Preset Time.

➢ Instant Recording: Starts recording once schedule is added.

➢ Preset Time: Starts recording at the set time.

4. Select Duration unit as Week, Day, Hour, Minute, or Second and enter number.
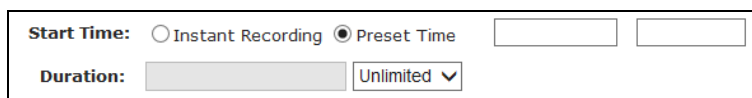
Duration: Keeps recording during the time.

Figure 7. 17 Start Time and Duration Time

5. Optionally, you can select one or more Dispatch options. For details, refer to step 5 of 7.5.1.2 Simple Record Plan.

6. Select Use Strategy and set the end time.

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

7.   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.

7.5.1.4 Exporting and Importing Advanced Record Plan

Purpose:

For the purpose of managing advanced schedules in batch, you can export them, modify their parameters, and import them back to HYBRID SAN   sub-system.

Step:

For detailed steps, you can refer to chapter 7.3.4 Exporting and Importing Encoding Device.

7.5.2 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 .

Step:

Click Strategy and Alarm in navigation bar and choose Upload Strategy.

Figure 7. 18 Upload Strategy

7.5.2.1 Basic Settings

Steps:

1.   Click Basic Configuration.

2.   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.
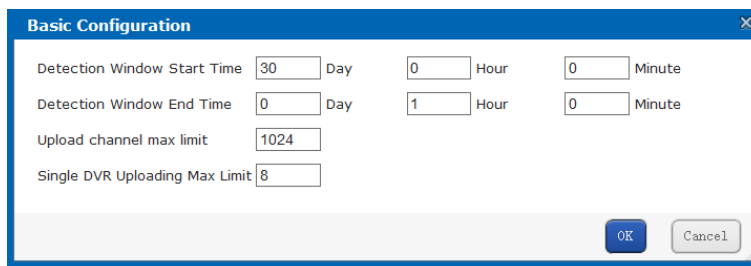
Figure 7. 19 Basic Configuration

7.5.2.2 Adding Uploading Tasks

Purpose:

When videos in HYBRID SAN lost, and the lost videos exist in encoding devices. You can upload the videos back to HYBRID SAN by adding uploading tasks.

Steps:

1. Click Add Upload Task.

2. Enter the encoding device name and click OK to select the encoding device. Repeat the step to add more. Or select encoding devices or groups in the list.
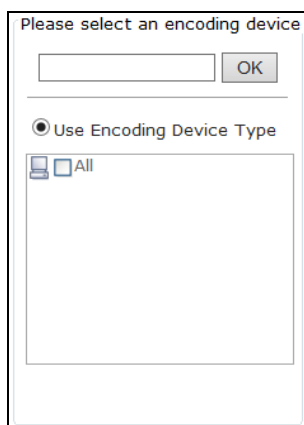

Figure 7. 20 Select Encoding Devices

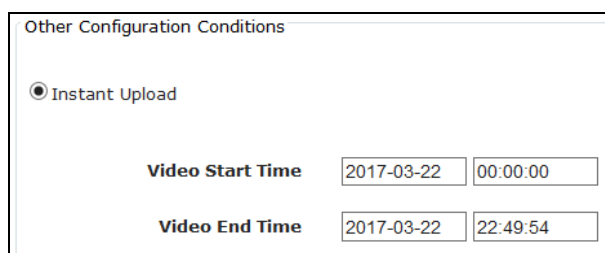3. Set the Video Starttime and Video Endtime of video you want to upload.

Figure 7. 21 Add Uploading Tasks

4. Click OK to add the task. Then if encoding device contains the video, it starts uploading the video to HYBRID SAN .

7.5.2.3 Adding 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 7.5.1.2 Simple Record Plan and chapter 7.5.1.3 Advanced.

Steps:

1.   Click Add Upload Plan.

2.   Enter the encoding device name and click OK to select the encoding device. Repeat the step to add more.
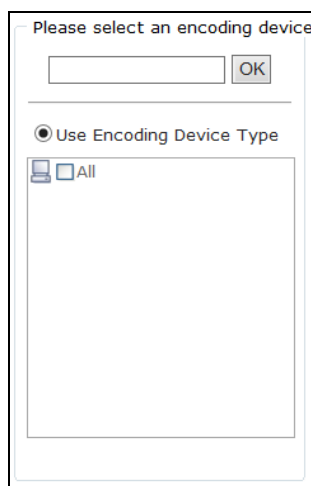   Or select encoding devices or groups in the list.

Figure 7. 22 Select Encoding Devices

6.   Select the date on which you want to set schedule.

7.   In Upload mode, to schedule an all-day uploading, check the checkbox of 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.

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

7.5.3 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:

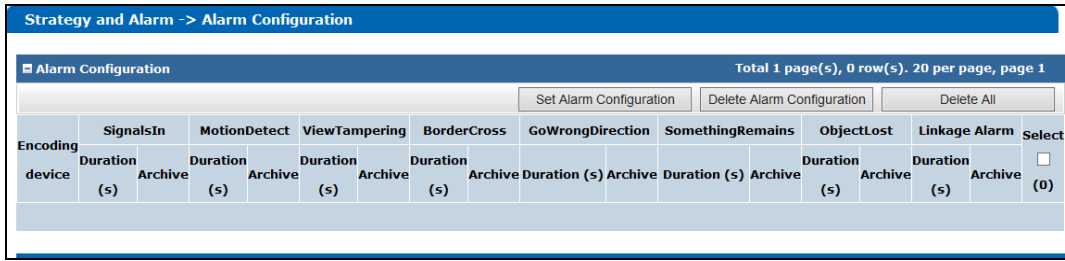1.   Click Strategy and Alarm in navigation bar and choose Alarm.

Figure 6. 23 Alarm

2.   Click Set Alarm Configuration.

3.   Enter the encoding device name and click OK to select the encoding device. Repeat the step to add more.
     Or select encoding devices or groups in the list.
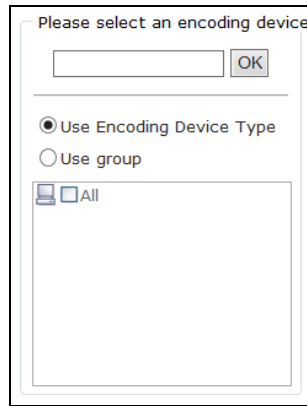

Figure 6. 24 Select Encoding Devices

4.   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, HYBRID SAN starts recording for the set Duration.
     The supported alarm types include Signal Source, Motion Detection, Video Tampering, Perimeter Cross,
     Wrong Direction, Unattended Baggage, and Object Loss.

5.   Optionally, you can check the checkbox of Archive of alarm types. Then the alarm videos can be viewed in
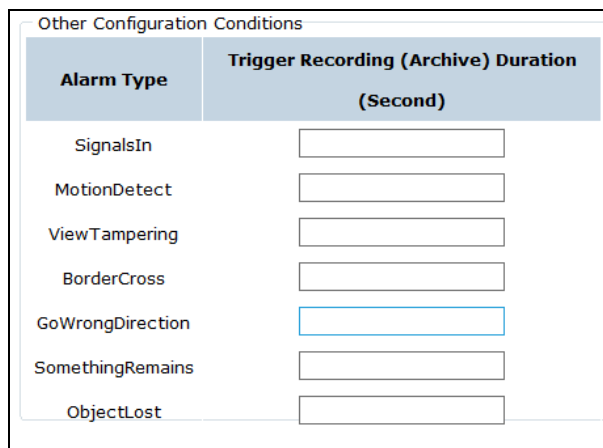   Archive Search interface.

Figure 6. 25 Other Configurations

6.   Click OK to save the settings.

7.6   Playing and Downloading

Purpose:

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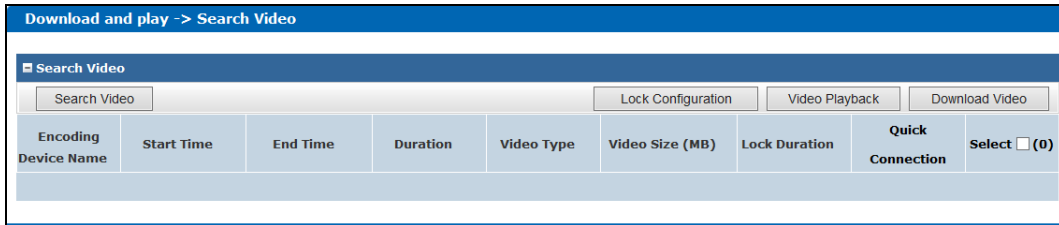
Step:

Click Download and Play in navigation bar.

Figure 7. 26 Download and Play

7.6.1   Searching Video

Steps:

1.   Click Search Video.

2.   Enter the encoding device name and click OK to select the encoding device. Repeat the step to add more.

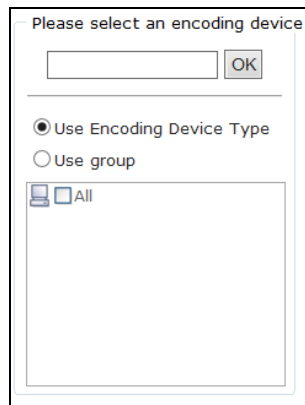Or select encoding devices or groups in the list.

Figure 7. 27 Select Encoding Devices

3.   Specify the search conditions including Start Time, End Time, Record Type, Search Type, and Display locktime (whether it is a locked video).

4.   Click OK to start search. And the videos meet the search conditions would be listed.

7.6.2   Locking Videos

Purpose:

The locked videos will not be overlapped by other videos.

Before you start:

Search videos first.

Steps:

1.   Check the checkboxes of videos you want to lock. Not more than 100 videos can be selected.

2.   Click Lock Configuration.

3. Select lock mode as Unlock, Locklast, or Locktime.

> ➢ Unlock:If selected, the locked video would be unlocked.
>
> ➢ Always Locked:If selected, the video is locked permanently.
>
> ➢ LockDuration: If selected, you need to set the locking time. Then the video would be locked from the video start time for the set time.
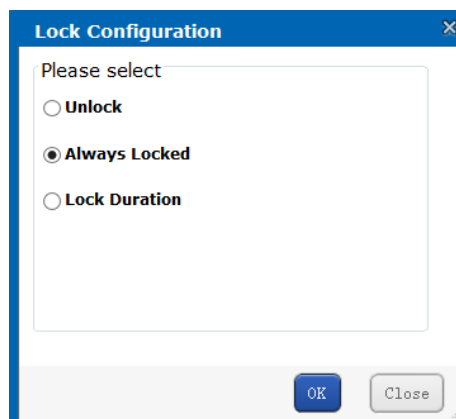

Figure 7. 28 Lock Mode

7.6.3 Playing Videos

Purpose:

Play back videos to view the history image.

Before you start:

● Search videos first.

● Add IP address of HYBRID SAN   to web browser trusted sites and enable all of ActiveX controls and plug-ins.

1. Enter Trusted Sites menu.

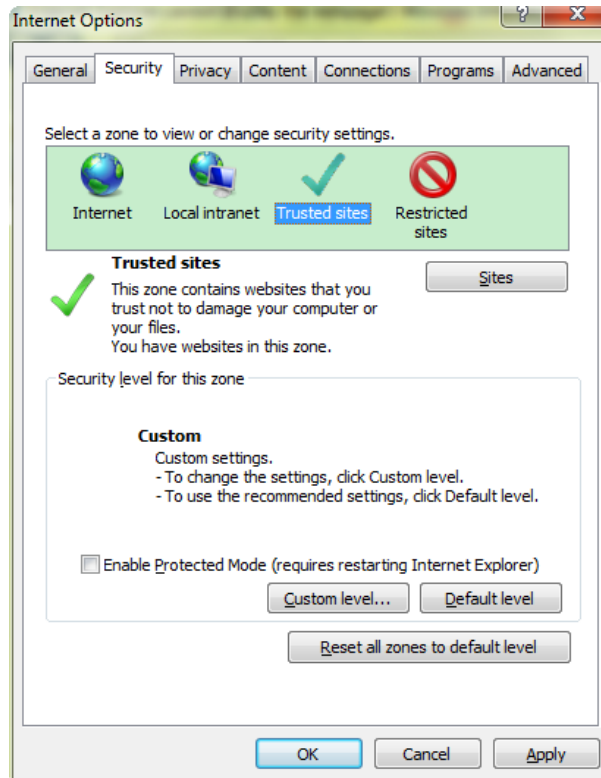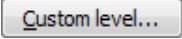Tools › Internet Options › Security › Trusted Sites

Figure 7. 29 Trusted Sites

2. Click [Sites] button, enter https://IP address of HYBRIDSAN, click Add, and click Close to go

    back to upper menu.

3. Click [Custom level...] button, enable all of ActiveX controls and plug-ins, click OK to save and go back to

    upper menu.

4. Click OK to save the settings.

7.6.3.2 Whole Video Playback

Purpose:

Play the original video.

Steps:

1. Check the checkboxes of videos you want to play. Not more than 16 videos can be selected.

2. Click Video Playback. And another window pops up. You can view the playback image.
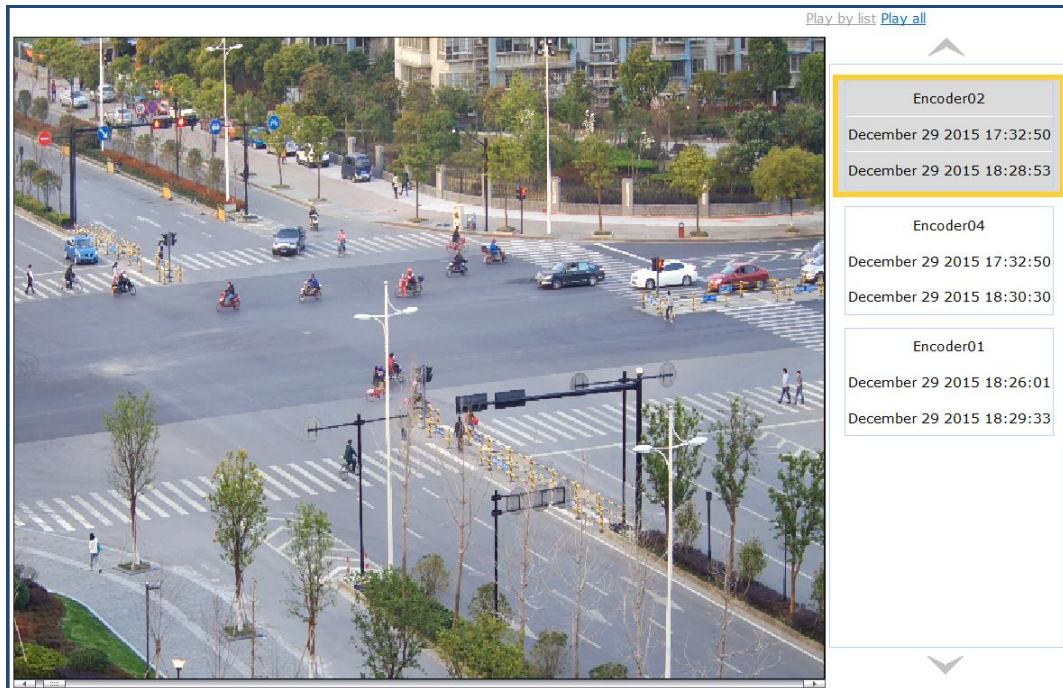
Figure 7. 30 Playback Window

3.   You can play all selected videos by clicking PlayAll in upper-right corner.

7.6.4 Downloading Videos

Purpose:

Save the videos to computer by downloading them.

Before you start:

Search videos first.

7.6.4.1 One-Key Downloading

Step:

Click ⬇ button and select the saving path to save a single video.

7.6.4.2 Block Downloading

Steps:

Click 🔲 button and click CompleteDownload to download.
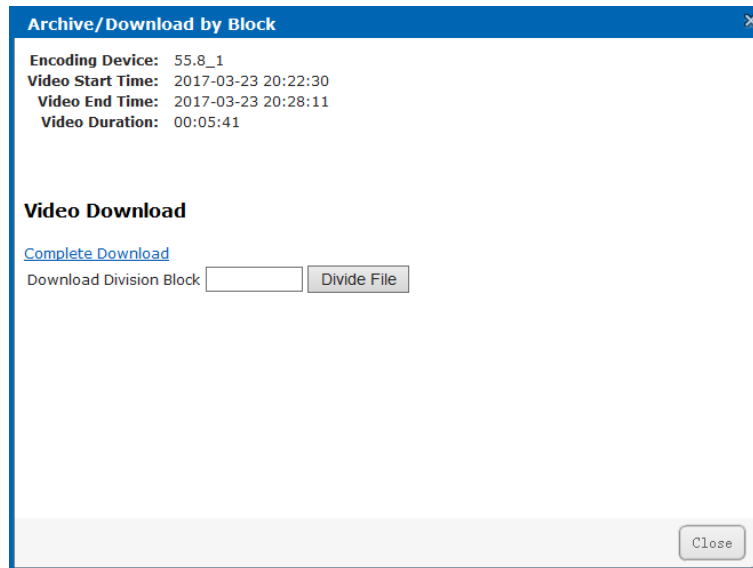
Figure 7. 31 Segment Downloading

7.6.4.3 Batch Dowloading

Steps:

1. Check the checkboxes of videos you want to download.
2. Click **Download** button to pop up batch downloading interface.
3. Click **Select** button to select saving path.
4. Select downloading mode as By signle-task or By multi-task.
   - ➢ By single-task: Download one video at a time.
     - ■ By multi-task: Download several videos simultaneously. The maximum downloading video amount is Max. number of tasks whose valid range is from 1 to 5.
5. Click Start to start downloading. You can click Stop to stop downloading.

Figure 7. 32 Batch Downloading

7.7　User

Purpose:

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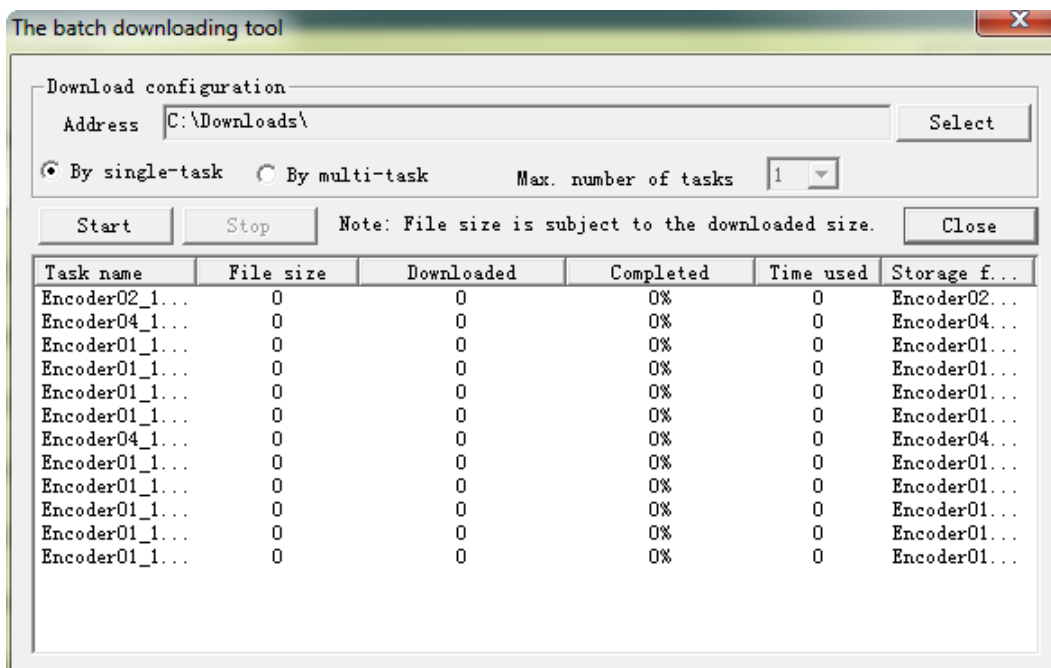
Steps:

1. Click UserManagement in navigation bar.

2. To modify Interface language, select language in the dropdown list.

3. To modify the display rows in each page, select number in the dropdown list of Number of table rows shown in each page.

4. Click Upload Configuration to save the changes.
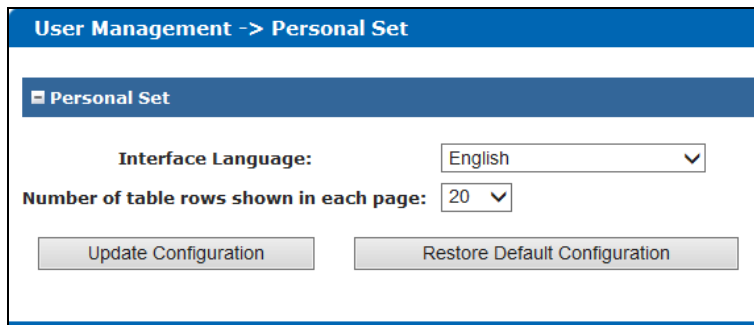
Figure 7. 33 User

7.8　SystemConfiguration

Purpose:

You can configure system alarms and view HYBRID SAN　version.

Step:

Click SystemConfig in navigation bar.

7.8.1　SystemAlarm

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. Click System in navigation bar and choose SystemAlarm to enter System Alarm interface.

2. Alarm type includes Info (Information), Warning, Error, and Fatal. Specify 3 linkage actions for the 4 alarm types.

Figure 7. 34 Alarm Setting

3.   Specify alarm type for alarm events.
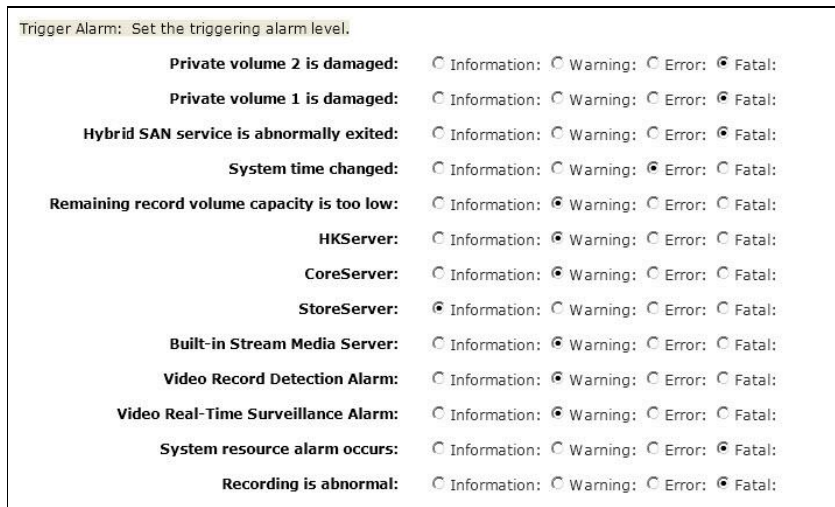
Figure 7. 35 Alarm Events

4.   Turn on or turn off status alarm.
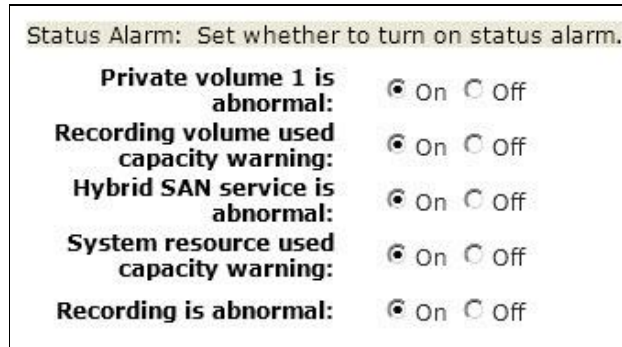
Figure 7. 36 Status Alarm

5.   Click [Submit] to save the settings.
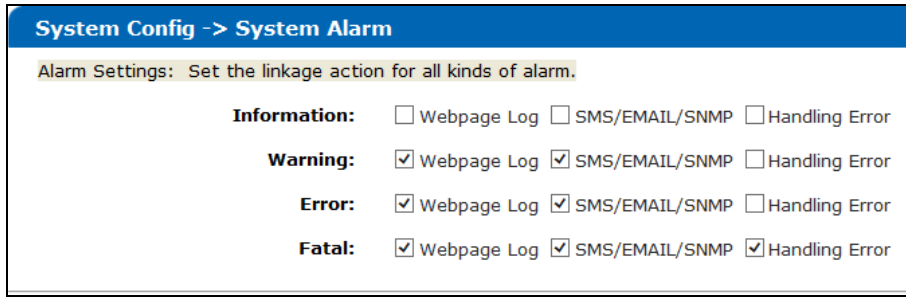
7.8.2 HYBRIDSAN   Version

Purpose:

You can view HYBRID SAN   version, HYBRID SAN   library version, and HYBRID SAN   other version.

Step:

Click SystemConfigin navigation bar and choose Version.

Figure 7. 37 HYBRID SAN Version

7.9 Log Management

Purpose:

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

Step:

Click Log Management in navigation bar to enter Log Management interface.

Figure 7. 38 Log Management

7.9.1 Searching Log

Steps:

1.   Click Search log.

2.   Specify the search condition including Log type, Start time, End time, and Including Characters.

3.   Click OK to start search. The matched logs would be listed.

Figure 7. 39 Log Search

7.9.2 Exporting Log

Purpose:

You can export the listed logs to local HDD.

Before you start:

Search the logs you want to export.

Step:

Click ExportAll Logsand choose the saving path to save it.

The exported logs are integrated in a .csv file.

7.9.3 Clearing Log

Step:

Click ClearAll SystemLogsand click OK in popup confirmation dialog box to clear all logs saved in HYBRID SAN sub-system.

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: ● Modify the configuration of management network interface and data network interfaces. ● Bond data network interfaces. ● Remotely access the storage system via a specified gateway. ● Edit DNS server IP address, bond mode, and network work speed.
Alarm	You can: ● Send the storage system alarms to client via e-mail or SNMP manager.
Time	You can: ● Manually or automatically adjust system time.
Power Supply	You can: ● View UPS mode. ● Modify UPS power-off time. ● Modify supported UPS manufacturer.
Management Tool	You can: ● Modify user password. ● Configure SMTP parameters. ● Test network communication between the storage system and a specified IP address. ● Update the storage system. ● View service status.

Keywords:
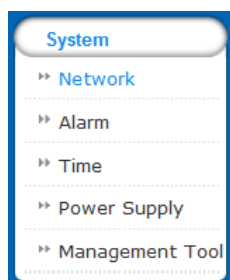
Network, Alarm, Time, Power Supply, Tool

Figure 8. 2 System

8.1 Network

Purpose:

The storage system provides one management network interface and two 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.

Step:

Click System in navigation bar and choose Network.

Basic Network Interface (Total: 1)							
Network Interface	IP Address	Subnet Mask	MAC Address	Jumbo Frame	Status	Connection Status	Speed
Management NIC	10.254.254.254	255.255.255.0	8C:E7:48:7C:82:A2	1500 Byte	Enabled	Disconnect	Unknown

Bind Network Interface   Modify

Bound Network Interface (Total: 1)								
Bound Network Interface:	IP Address	Subnet Mask	Jumbo Frame	Status	Network Interface	Connection Status	Speed	MAC Address
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. 3 Network

8.1.1 Modifying Data Network Interface

Steps:

1. Check the checkbox of data network interface.
2. Click   Modify in Basic Network Interface list.
3. Enter the new IP Address and Subnet Mask and select MTU in dropdown list.

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

4. Click OK to save the settings.

8.1.2 Binding 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.

NOTE

● The management network interface does not support bond.
● The IP addresss 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.

8.1.2.1 Creating Bond

Steps:

1.   Check the checkboxes of data network interfaces in Basic Network Interface list.
2.   Click Bind Network Interface and click OK in confirmation dialog box.

	Bound Network Interface:	IP Address	Subnet Mask	Jumbo Frame	Status	Network Interface	Connection Status	Speed	MAC Address
☐ Bound Network Interface (Total: 1)									
☐	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. 4 Bound Network Interface Information

8.1.2.2 Deleting Bond

Steps:

1.   Check the bound network interface checkbox.
2.   Click ✖ Delete and click OK in confirmation dialog box. Then the bound network interface is recovered to several data network interfaces.
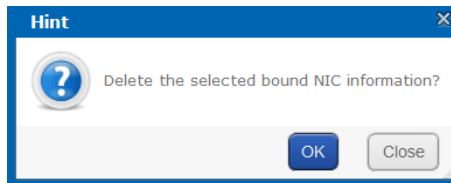
Figure 8. 5 Confirmation Dialog Box

8.1.2.3 Modifying Bonding Mode

For detailed information and steps, refer to section 8.1.5.2 Binding Mode.

8.1.3 Adding 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.   Click Add Route Info in Custom Route Information list.

Figure 8. 6 Add Route

2.   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.

3.   Select Bound data Network Interface in the dropdown list.

4.   Click OK to add the route. Thus 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.

8.1.4 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.   Click MAC&IP Bonding.

Figure 8. 7 MAC&IP Bonding

2.   Input target Client IP Address and MAC Address.

![NOTE]

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

3.   Click OK and click OK in pop up confirmation box to create bond.

8.1.5 Advanced Parameters

Purpose:

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

8.1.5.1 DNSServer

Purpose:

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

Steps:

1. Click Modify of Preferred DNSServer.

2. Enter IP address in text field.

3. Click OKand click OKin confirmation dialog box to save the settings.

| Preferred DNS Server: | None | Modify |
| Alternate DNS Server: | None | Delete |

Figure 8. 8 DNS Server

8.1.5.2 Binding 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 Table8. 2 BondingMode Description.

Steps:

1. Click Modify of NICBinding Mode.

2. Select bond mode in dropdown list. Up to 7 bond modes are selectable.

3. Click OKand click OKin confirmation dialog box to save the settings.

| Default Gateway: | 10.192.54.254 | | |
| NIC Binding Mode: | Active-backup ▼ | OK | Cancel |

Figure 8. 9 NIC Binding Mode

Table 8. 2 Bonding Mode Description

Bond Mode	Description
Round-robin	● Definition: ➢ All data network interfaces sends and receives data in turn. ➢ When using the mode, it is recommended to apply protocols except TCP/IP. ● Advantage: ➢ Load balance. ➢ All data network interfaces are fully used. ➢ There is no requirement about hardware like network switch. ● Disadvantage: ➢ The order of received data is uncertain. ➢ Low network throughput.
Active-Backup	● Definition: 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

Bond Mode	Description
	transmission task.
	● Advantage:
	➤ There is no requirement about hardware like network switch.
	➤ Redundant network links.
	● Disadvantage:
	➤ Load balance isn't supported.
	➤ Uses only one data network interface at a time. Other data network interfaces aren't fully used.
XOR	● Definition:
	➤ 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.
	➤ 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.
	● Advantage:
	➤ There is no requirement to hardware like network switch.
	➤ Balance the load in the local area network within a network switch.
	● Disadvantage:Loadbalance isn't supported in different local area network.
Broadcast	● Definition: All the data network interfaces transmit the same data.
	● Advantage:
	➤ There is no requirement about hardware like network switch.
	➤ Redundant network links.
	➤ Data network interfaces are fully used.
	● Disadvantage:
	➤ Load balance isn't supported.
	➤ Low data network interface usage.
802.3ad	● Definition: 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.
	● Advantage:
	➤ Based on IEEE standard, devices in system can work efficiently if they are all 802.3ad mode.
	➤ Load balance.
	➤ Data network interfaces are fully used.
	● Disadvantage:The storage system, network switch, and client server are all required to support 802.3ad mode.
Tlb	● Definition: 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.

Bond Mode	Description

	• Advantage:
	   ➢ Data network interfaces are fully used.
	   ➢ Load balance when sending data.
	 • Disadvantage:Load balance isn't supported when receiving data.

Virtualization	• Definition:
	   ➢ The storage system allocates input and output traffic to each data network interfaces, according to current load.
	   ➢ It is recommended to use the mode when sending and receiving data to multiple clients.
	 • Advantage:
	   ➢ Data network interfaces are fully used.
	   ➢ Load balance in both sending and receiving data.

8.1.5.3 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. Click Modify of Network Word Speed.

2. Select Network Work Speedas 1000 Mb/s or 100 Mb/s.

3. Click OK and click OK in confirmation dialog box to save the settings.

Set Network Working Speed:	1000 Mb/s	**Modify**

8.2 Alarm

Purpose:

The storage system supports notifying you about the occurring alarms via e-mail and SMTP manager.

Steps:

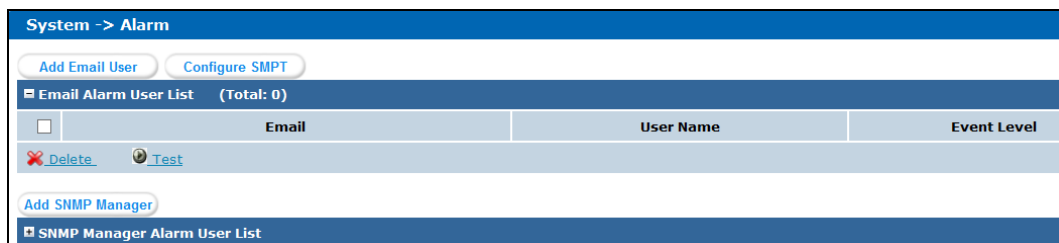Click System in navigation bar and choose Alarm to enter Network interface.

Figure 8. 10 Alarm

8.2.1 Alarm Type

Purpose:

The Table8. 3 Alarm TypeDescriptiondescribes the supported alarm types and corresponding event level. E-mail

and SNMP manager support notifying you about the alarm types in Table8.3.

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	Serious

Module	Alarm Type	Event Level
	interface % disconnected	

8.2.2 Adding Email

Purpose:

Alarm messages are sent to receiving e-mails via sending e-mails.

Before you start:

Set DNS server first. Refer to section 8.1.5.1 DNS Server for detailed steps.

8.2.2.1 Sending Email

Steps:

1. Click **Configure SMTP** button.

2. Enter User Name, Password, SMTP, and SMTP Port.

    ➢ User Name: sending e-mail account.

    ➢ Password: sending e-mail password.

    ➢ SMTP: sending e-mail server website.

    ➢ SMTP Port No.: sending e-mail server port.

3. Click OK to add the sending e-mail.

Figure 8. 11 Configure Sending Email

8.2.2.2 Receiving Email

Steps:
1. Click Add Email User.
2. Enter Email and User Name.
3. Choose Event Level as Alarm Event or Serious Event.
4. Click OK and click OK in confirmation dialog box to add the user. The added e-mail account is listed in List of email alarm users.

Figure 8. 12 Add Email Alarm User

8.2.3 Testing Email

Purpose:

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

Steps:

1. Check the checkbox of sending e-mail you want to test.

2. Click Test button and click OK in confirmation dialog box to start test. The test result is listed in a message dialog box.

8.2.4 Adding 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. Click Add SNMP manager .

Figure 8. 13 Add SNMP Manager

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2. Enter SNMPManager and SNMPPort No. in the text field.

3. SNMPVersion is V2(V2C) by default and is not editable.

4. Choose Event Level as System Log, Alarm Event, Error Event, or Serious Event.

5. Click OK and click OK in conformation dialog box. The added SNMP manager is listed in SNMP manager list.

8.2.5 Testing SMTPManager

Purpose:

You can test the network communication of SMTP manager.

Steps:

1. Check the checkbox of SMTP manger to test.

2. Click Test button and click OK to start test. Then test result pops up.
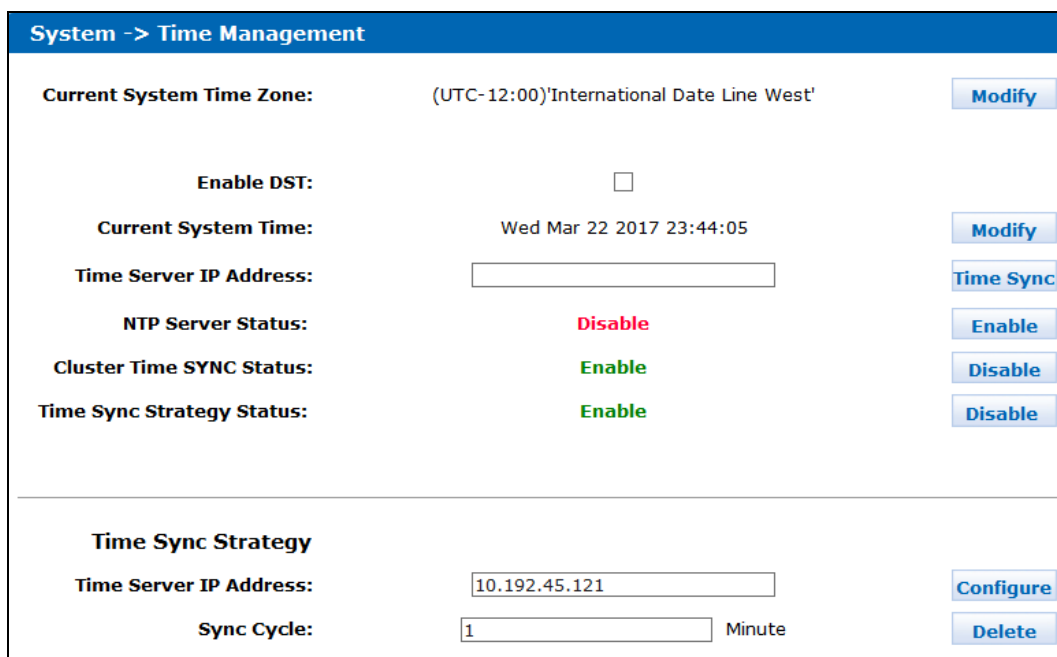
8.3 Time

Purpose:

System time is adjustable.

Steps:

Click System in navigation bar and choose Time.

Figure 8. 14 Time Management

8.3.1 Adjusting SystemTime

8.3.1.1 Manual Adjust

Steps:

Do one or more of the following:

● Adjust Time Zone

1.   Click Modify of Current System Time Zone.

2.   Select time zone in the dropdown list.

3.   Click OK and click OK in confirmation dialog box.

●   Adjust Date and Time

4.   Click Modify of Current System Time.

5.   Select date and time in text field.

6.   Click OK and click OK in confirmation dialog box.

8.3.1.2 Auto Adjust

Purpose:

The storage system automatically adjusts system time according to time server.

Before you start:

Turn off the NTP server in client software.

Steps:

1.   Enter a correct Time Server IP Address in text field.

2.   Click Enable of NTP Server Status to start auto time adjust.

Time Server IP Address:		Time Sync
NTP Server Status:	Disable	Enable

Figure 8. 15 Adjust Time Automatically

8.3.2 Synchronizing 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.   Click Enable of Time Sync Strategy Status (Synchronization Strategy Status).

2.   Enter Time Server IP Address in text field

3.   Enter Sync Cycle (Synchronization Cycle) in text field.

4.   Click Configure to start time synchronization.

Time Sync Strategy Status:	Enable	Disable
Time Sync Strategy		
Time Server IP Address:	10.192.45.121	Configure
Sync Cycle:	1 Minute	Delete

Figure 8. 16 Synchronize Time

Chapter 9   Log

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.

Keywords:

Log Download, Operation log, Performance log, Update log
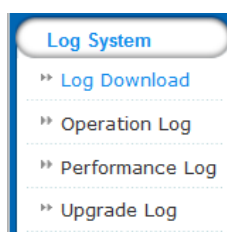
Figure 9. 2 System

9.1 Operation Log

Purpose:

Operation log records the content and time of each operation. Search, download, and clear logs are supported.

Steps:

Click Log in navigation bar and choose Operation Log to enter Operation Log interface. Do one or more of the following:

Figure 9. 3 Operation Log

- View Logs

Figure 9. 4 Paging

Click / button to turn to previous/next page.

Click / button to turn to the first/last page.

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

- Search Logs

Figure 9. 5 Search Log

1) To search by time, enter date and time you want to search in Search text field.

   To search by log type, select log type in dropdown list.

   NOTE

   Input correct data format, like March 23 2016 16:47:07.

2) Choose log type as All, Information, Warning, Error, or Serious in dropdown list.

3) Click Search. Logs meet the search conditions would be listed in operation window.

- Clear All Logs

   Click Clear Operation Log and click OK in popup dialog to confirm.

9.2 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. Click Login navigation bar and choose Operation Log to enter Operation Log interface.

2. For detailed steps of viewing and search performance logs, refer to section9.1 OperationLog.

Figure 9. 6 Performance Log

9.3　Upgrade Log

Purpose:

Update log records the details information of every system update.

Steps:

1. Click Login navigation bar and choose UpgradeLog.

2. To view logs and search logs, refer to section9.1 OperationLog for detailed steps.

Figure 9. 7 Update Log

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See Far, Go Further

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