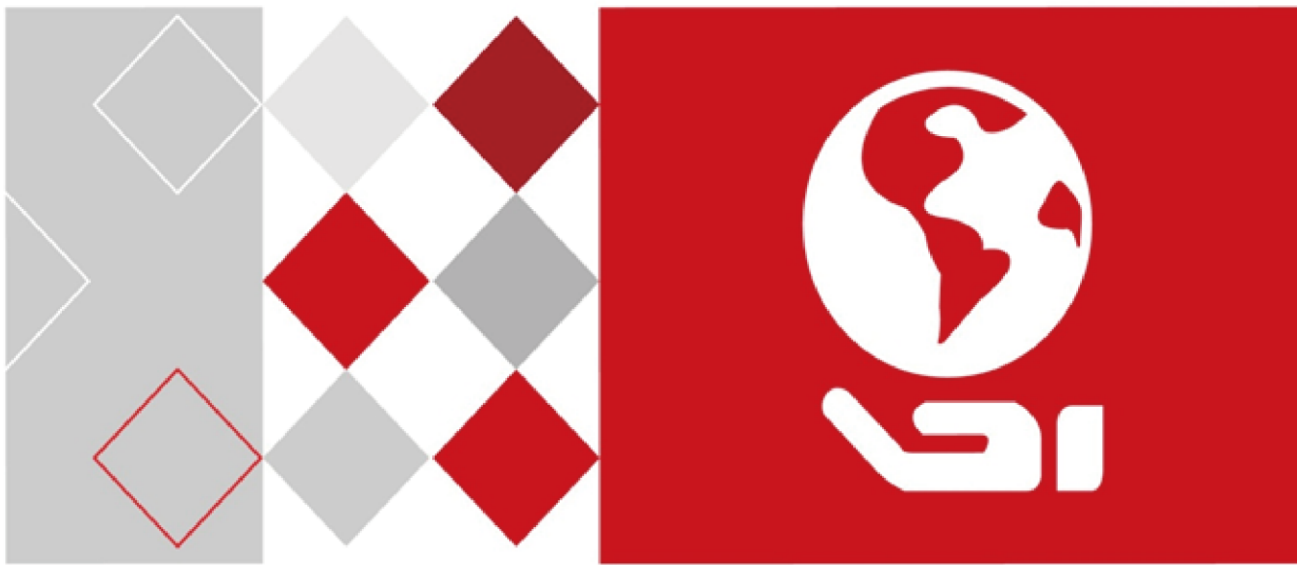


**HIKVISION**



**Storage System  
User Manual**

**UD05216B**

## **User Manual**

COPYRIGHT ©2016 Hangzhou Hikvision Digital Technology Co., Ltd.

### **ALL RIGHTS RESERVED.**

Any and all information, including, among others, wordings, pictures, graphs are the properties of Hangzhou Hikvision Digital Technology Co., Ltd. or its subsidiaries (hereinafter referred to be “Hikvision”). This user manual (hereinafter referred to be “the Manual”) cannot be reproduced, changed, translated, or distributed, partially or wholly, by any means, without the prior written permission of Hikvision. Unless otherwise stipulated, Hikvision does not make any warranties, guarantees or representations, express or implied, regarding to the Manual.

### **About this Manual**

This Manual is applicable to Storage System.

The Manual includes instructions for using and managing the product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version in the company website (<http://overseas.hikvision.com/en/>).

Please use this user manual under the guidance of professionals.

### **Trademarks Acknowledgement**

**HIKVISION** and other Hikvision’s trademarks and logos are the properties of Hikvision in various jurisdictions. Other trademarks and logos mentioned below are the properties of their respective owners.

### **Legal Disclaimer**

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THE PRODUCT DESCRIBED, WITH ITS HARDWARE, SOFTWARE AND FIRMWARE, IS PROVIDED “AS IS”, WITH ALL FAULTS AND ERRORS, AND HIKVISION MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT OF THIRD PARTY. IN NO EVENT WILL HIKVISION, ITS DIRECTORS, OFFICERS, EMPLOYEES, OR AGENTS BE LIABLE TO YOU FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR INDIRECT DAMAGES, INCLUDING, AMONG OTHERS, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, OR LOSS OF DATA OR DOCUMENTATION, IN CONNECTION WITH THE USE OF THIS PRODUCT, EVEN IF HIKVISION HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

REGARDING TO THE PRODUCT WITH INTERNET ACCESS, THE USE OF PRODUCT SHALL BE WHOLLY AT YOUR OWN RISKS. HIKVISION SHALL NOT TAKE ANY RESPONSIBILITIES FOR ABNORMAL OPERATION, PRIVACY LEAKAGE OR OTHER DAMAGES RESULTING FROM CYBER ATTACK, HACKER ATTACK, VIRUS INSPECTION, OR OTHER INTERNET SECURITY RISKS; HOWEVER, HIKVISION WILL PROVIDE TIMELY TECHNICAL SUPPORT IF REQUIRED.

SURVEILLANCE LAWS VARY BY JURISDICTION. PLEASE CHECK ALL RELEVANT LAWS IN YOUR JURISDICTION BEFORE USING THIS PRODUCT IN ORDER TO ENSURE THAT YOUR USE CONFORMS THE APPLICABLE LAW. HIKVISION SHALL NOT BE LIABLE IN THE EVENT THAT THIS PRODUCT IS USED WITH ILLEGITIMATE PURPOSES.

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

## Regulatory Information

### FCC Information

**FCC compliance:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. The device is advised to note that as a seller or a business user (Class A) Devices and intended for use outside the Home area.

### 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.

### EU Conformity Statement



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



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



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

### 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.

	
<b>Warnings</b> Follow these safeguards to prevent serious injury or death.	<b>Cautions</b> 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

<b>Chapter 1</b>	<b>Overview .....</b>	<b>6</b>
<b>Chapter 2</b>	<b>Getting Started .....</b>	<b>7</b>
2.1	HDD Installation .....	8
2.2	Accessing by Web Browser .....	9
2.3	Login .....	10
<b>Chapter 3</b>	<b>Maintenance .....</b>	<b>11</b>
3.1	System .....	12
3.2	Performance .....	12
3.3	General .....	14
3.3.1	Viewing Version Information .....	14
3.3.2	Default Settings.....	15
3.3.3	Managing Maintenance Log.....	15
3.3.4	Modifying Password.....	15
3.3.5	SNMP Configuration .....	16
3.3.6	Modifying Host Name .....	16
3.3.7	Viewing Service Status .....	17
3.3.8	System Upgrade .....	17
3.4	Graphical Display .....	18
3.4.1	Front View .....	18
3.4.2	Pie Chart .....	19
3.5	Environmental .....	19
<b>Chapter 4</b>	<b>Storage Management .....</b>	<b>21</b>
4.1	Managing Local HDD .....	22
4.1.1	Viewing HDD Status .....	22
4.1.2	Rescanning HDD.....	23
4.1.3	Positioning HDD .....	23
4.1.4	HDD Initialization .....	24
4.1.5	HDD Detection .....	24
4.2	Array.....	25
4.2.1	Creating Array .....	25
4.2.2	Array Exception.....	27
4.2.3	Rebuilding Array.....	27
4.2.4	Detecting Array .....	28
4.2.5	Repairing Array .....	28
4.2.6	Renaming Array .....	28
4.2.7	Deleting Array .....	29
4.2.8	Adding Hot Spare .....	29
4.2.9	Deleting Hot Spare .....	30
4.3	Storage Pool.....	30
4.3.1	Adding Storage Pool.....	31
4.3.2	Deleting Storage Pool.....	32
4.3.3	Positioning Storage Pool .....	32

---

4.4	Logical Volume.....	32
4.4.1	Creating Logical Volume.....	33
4.4.2	Deleting Logical Volume.....	33
4.4.3	Renaming Logical Volume .....	34
4.4.4	Enlarging Logical Volume .....	34
4.5	Configuration.....	35
4.5.1	Synchronization Speed and Type .....	35
4.5.2	Flickering Time.....	35
<b>Chapter 5</b>	<b>SAN .....</b>	<b>37</b>
5.1	iSCSI.....	38
5.1.1	Adding CHAP User.....	38
5.1.2	Modifying CHAP User.....	38
5.1.3	Enabling iSCSI.....	39
5.1.4	Disabling iSCSI.....	40
5.1.5	Modifying iSCSI Port.....	40
5.2	FC (Optional).....	40
5.2.1	Enabling FC .....	41
5.2.2	Disabling FC.....	42
<b>Chapter 7</b>	<b>System.....</b>	<b>43</b>
7.1	Network.....	45
7.1.1	Modifying Data Network Interface .....	45
7.1.2	Binding Network Interfaces .....	45
7.1.3	Adding Route .....	46
7.1.4	MAC and IP Bonding .....	47
7.1.5	Advanced Parameters .....	47
7.2	Alarm.....	50
7.2.1	Alarm Type.....	50
7.2.2	Adding Email .....	52
7.2.3	Testing Email .....	53
7.2.4	Adding SNMP Manager .....	53
7.2.5	Testing SMTP Manager .....	54
7.3	Time .....	54
7.3.1	Adjusting System Time.....	54
7.3.2	Synchronizing Time.....	55
<b>Chapter 8</b>	<b>Log .....</b>	<b>56</b>
8.1	Operation Log.....	57
8.2	Performance Log.....	57
8.3	Upgrade Log.....	58

# 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.

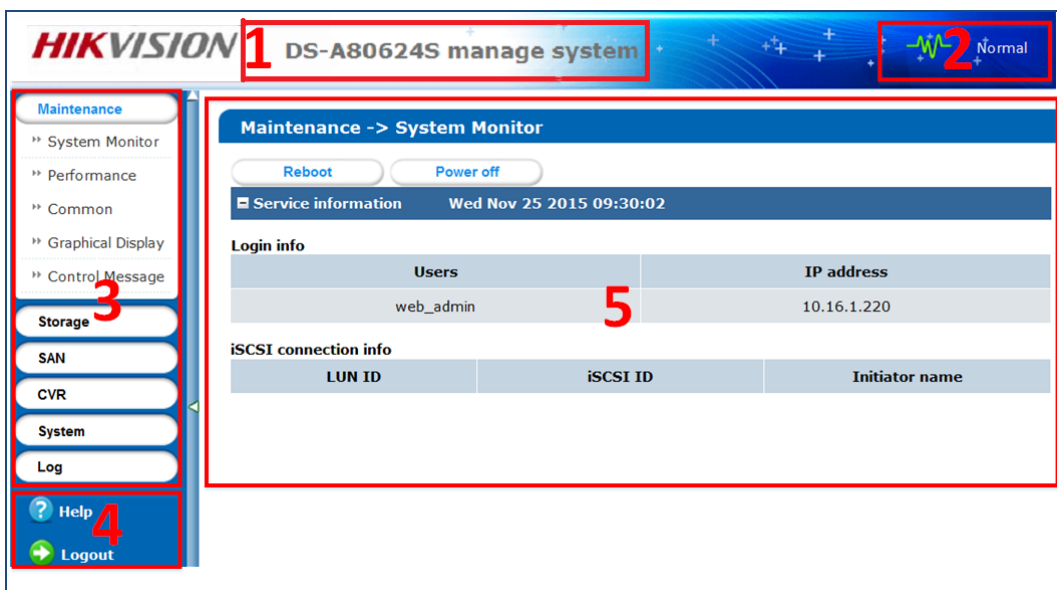


Figure 1. 1 GUI

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 handle 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.

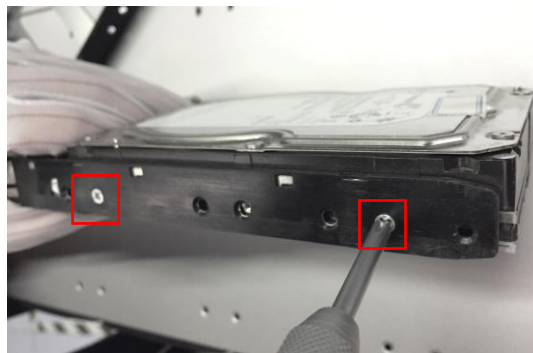


Figure 2. 6 Install Screws

7. Push the HDD dummy back into the slot.



Figure 2. 7 Push the HDD Dummy into Slot

## 2.2 Accessing by Web Browser



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.



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

- If the device is already activated:
  1. Select **Login** account as **Basic Management** or **Sub-system**.
    - **Basic Management**: Used to configure basic parameters of the storage system.
    - **Sub-system**: Used to Log into the sub-system.
  2. Select **User** name.
  3. Enter **Password**.
  4. **Mode** is **Advanced** by default and is not selectable.
  5. Click **Login** to 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	<ul style="list-style-type: none"><li>• A shortcut for reboot and shutdown.</li><li>• Lists the login user information and iSCSI connection information.</li></ul>
Performance	Shows you the real-time graph and data of system performance, 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

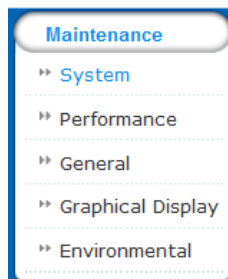


Figure 3. 2 Maintenance

## 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.

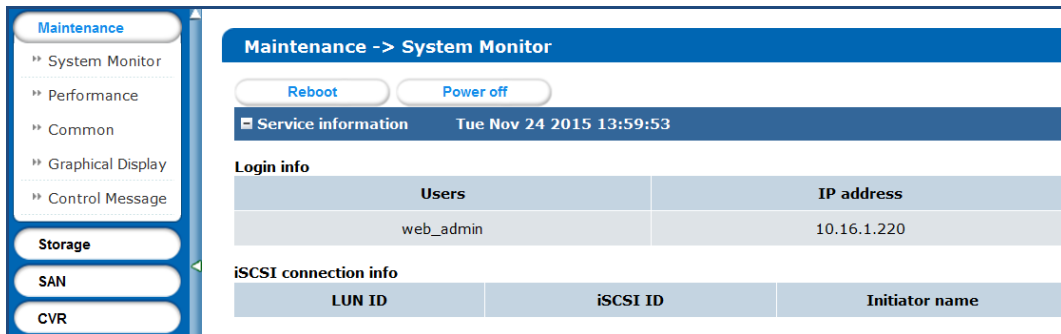


Figure 3. 3 System Monitor

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.

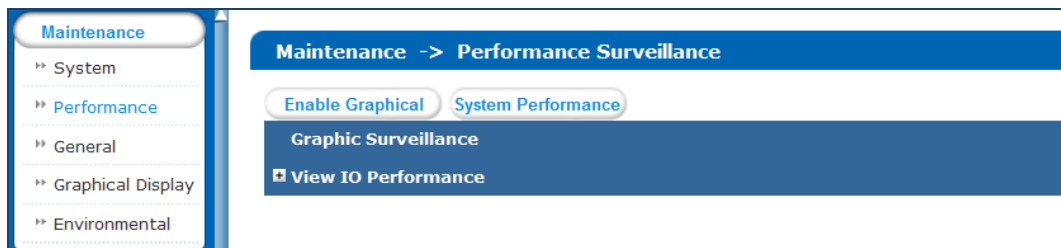


Figure 3. 4 Performance

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.

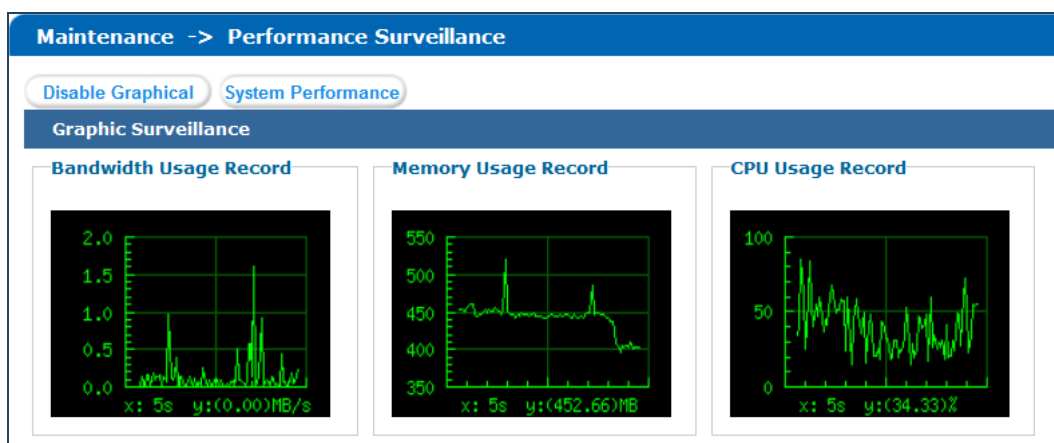


Figure 3. 5 Graph Monitor

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**.

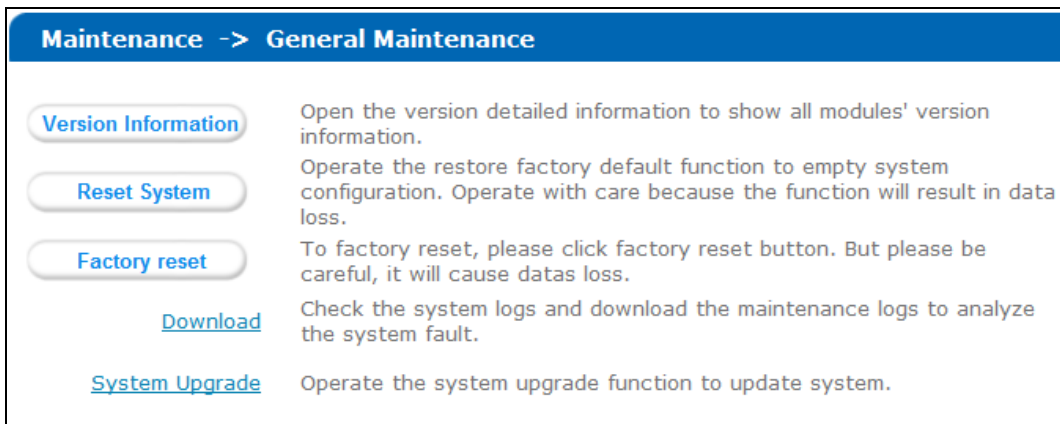


Figure 3. 6 General

### 3.3.1 Viewing Version Information

#### **Purpose:**

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

#### **Steps:**

1. Click **Version information** to pop up version information window.
2. Click **Cancel** to close the window.

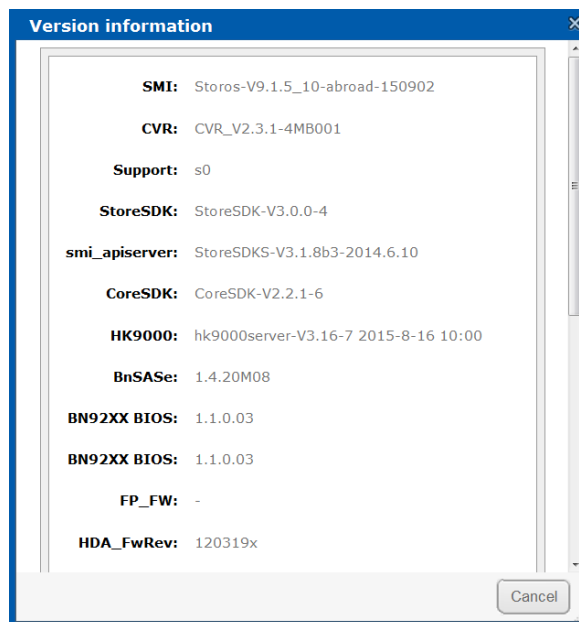


Figure 3. 7 Version Information

## 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.



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.

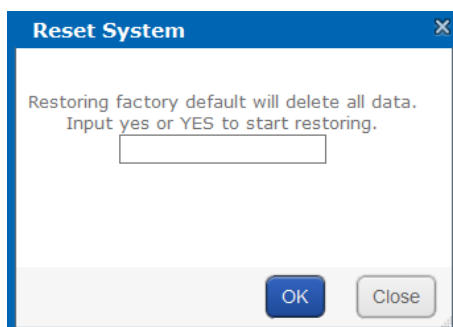


Figure 3. 8 Reset System

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 *8.1 Operation Log*.

## 3.3.4 Modifying Password

### **Purpose:**

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

### **Steps:**

1. Click **Modify password**. And modify password window appears.
2. Select **User Name** as **web\_admin** or **nvr\_admin**.
  - **web\_admin**: Basic management system user name.
  - **nvr\_admin**: sub-system user name.
3. Enter **Old Management Password** and the same password in **New Management Password** and **Confirm Management Password**.



- 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.



- 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:

Figure 3. 11 Modify Host Name



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	<input type="button" value="Enable"/> <input type="button" value="Disable"/> <input type="button" value="Restart"/>
iSCSI	Running	<input type="button" value="Enable"/> <input type="button" value="Disable"/> <input type="button" value="Restart"/>

Figure 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:

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.



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.

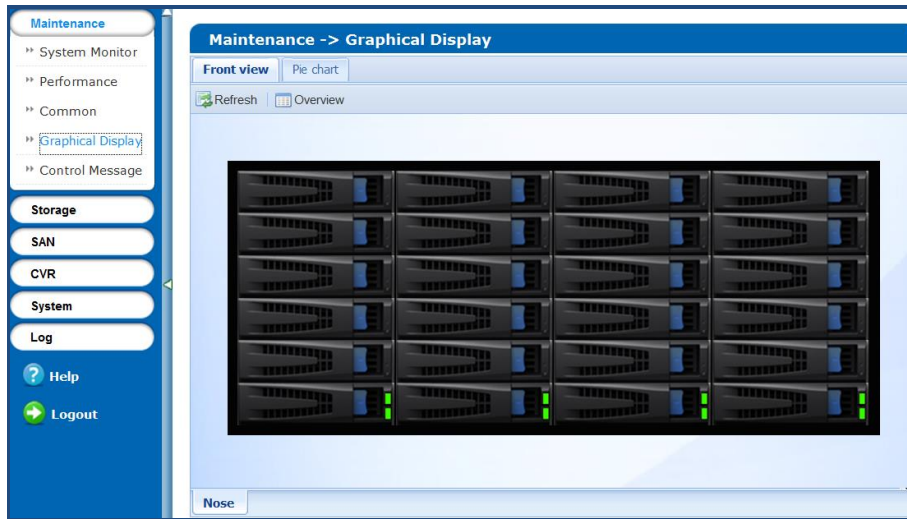


Figure 3. 14 Graphical Display

### 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.

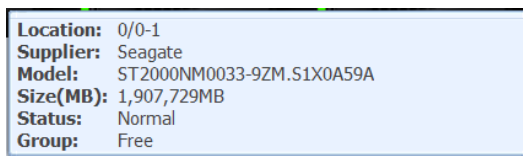


Figure 3. 15 HDD Information

3. Click **Overview** to view information of all HDD.

Position	Supplier	Model	Capacity (MB)	Status	Group
0/0-1	Seagate	ST2000NM0001.Z1P105J3	1,907,729	Normal	Array
0/0-3	Seagate	ST2000NM0001.Z1P10PRH	1,907,729	Normal	Array
0/0-4	Seagate	ST8000NM0075.ZA103VH60000J607VTV9	7,630,885	Normal	Array
0/0-5	Seagate	ST2000NM0001.Z1P10KV9	1,907,729	Normal	Array
0/0-6	Seagate	ST8000NM0075.ZA102T6F0000J607TUCD	7,630,885	Normal	Array

Figure 3. 16 HDD Overview

- 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, iSCSI, and FC.

### Steps:

- Click **Pie Chart** in Graphical Display to enter Pie Chart interface.
- Positioning the pointer in the part you want to view. **Free size** and free size **Percentage** appear in a dialog.
- Optionally, click **Refresh** in top-right corner to update the information.

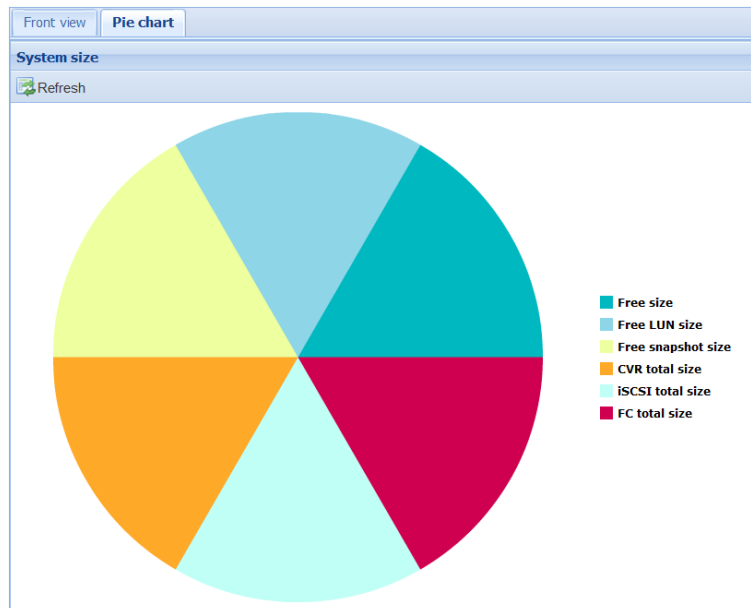


Figure 3. 17 Pie Chart

## 3.5 Environmental

### Purpose:

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

### Steps:

- 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.



You can install or uninstall fans. Up to 6 fans' formation can be connected.

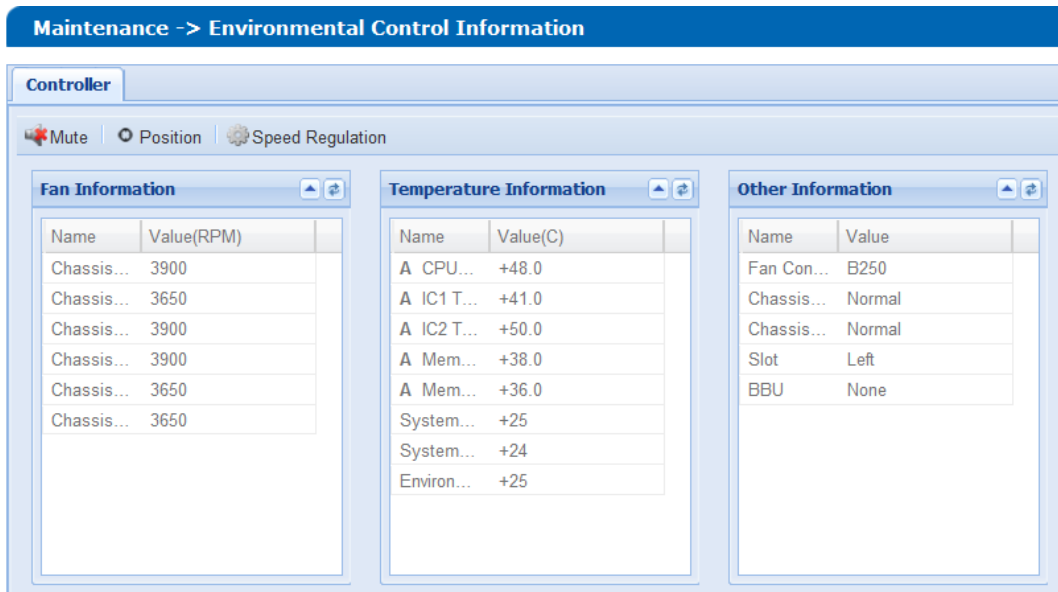


Figure 3. 18 Host

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

**Key words:**

HDD Management, Array, Storage Pool, LUN (Logical Volume), Configuration

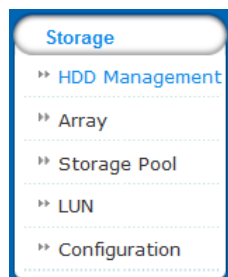


Figure 4. 2 Storage

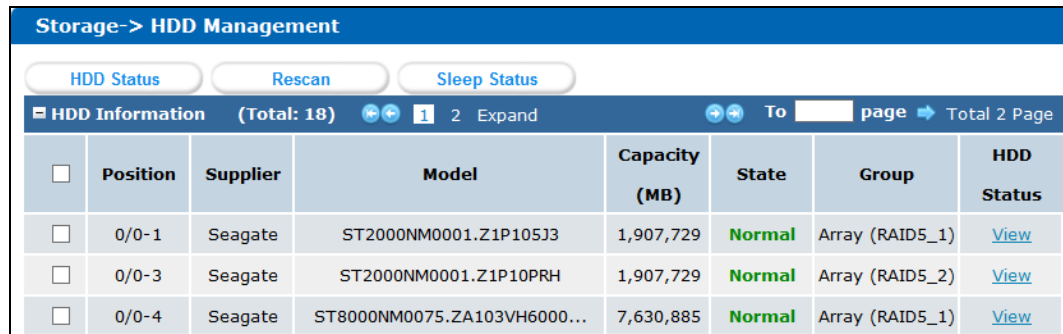
## 4.1 Managing Local HDD

### 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**.



The screenshot shows the 'Storage -> HDD Management' interface. At the top, there are buttons for 'HDD Status', 'Rescan', and 'Sleep Status'. Below these is a navigation bar with 'HDD Information (Total: 18)', page numbers '1' and '2', an 'Expand' button, and a 'To [ ] page Total 2 Page' dropdown. The main content is a table with the following data:

<input type="checkbox"/>	Position	Supplier	Model	Capacity (MB)	State	Group	HDD Status
<input type="checkbox"/>	0/0-1	Seagate	ST2000NM0001.Z1P105J3	1,907,729	Normal	Array (RAID5_1)	<a href="#">View</a>
<input type="checkbox"/>	0/0-3	Seagate	ST2000NM0001.Z1P10PRH	1,907,729	Normal	Array (RAID5_2)	<a href="#">View</a>
<input type="checkbox"/>	0/0-4	Seagate	ST8000NM0075.ZA103VH6000...	7,630,885	Normal	Array (RAID5_1)	<a href="#">View</a>

Figure 4. 3 HDD Management

### 4.1.1 Viewing HDD Status

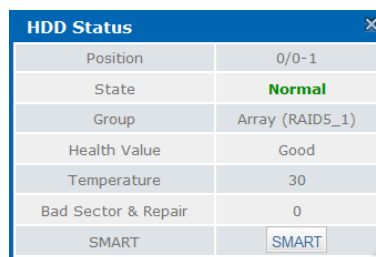
#### Purpose:

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.



The screenshot shows the 'HDD Status' dialog box with the following information:

Position	0/0-1
State	Normal
Group	Array (RAID5_1)
Health Value	Good
Temperature	30
Bad Sector & Repair	0
SMART	<a href="#">SMART</a>

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.

The screenshot shows a window titled "HDD Status" with a close button (X) in the top right corner. Below the title bar, it displays "HDD Info: (Total: 18)" and navigation controls: "Home Prev. 1 2 Expand Next Last To [ ] page Total 2 Page". The main content is a table with the following columns: Position, State, Group, Health Value, Temperature, Bad Sector & Repair, and SMART. The table lists 12 disks, with the 10th disk (0/0-14) having a "Bad" health value.

Position	State	Group	Health Value	Temperature	Bad Sector & Repair	SMART
0/0-1	Normal	Array (RAID5_1)	Good	30	0	SMART
0/0-3	Normal	Array (RAID5_2)	Good	31	0	SMART
0/0-4	Normal	Array (RAID5_1)	Good	30	0	SMART
0/0-5	Normal	Array (RAID5_2)	Good	29	0	SMART
0/0-6	Normal	Array (RAID5_1)	Good	32	0	SMART
0/0-7	Normal	Array (RAID5_2)	Good	33	0	SMART
0/0-13	Normal	Array (RAID5_1)	Good	32	0	SMART
0/0-14	Normal	Array (RAID5_2)	Bad	34	0	SMART
0/0-15	Normal	Array (RAID5_1)	Good	34	0	SMART
0/0-16	Normal	Array (RAID5_2)	Good	32	0	SMART

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**.

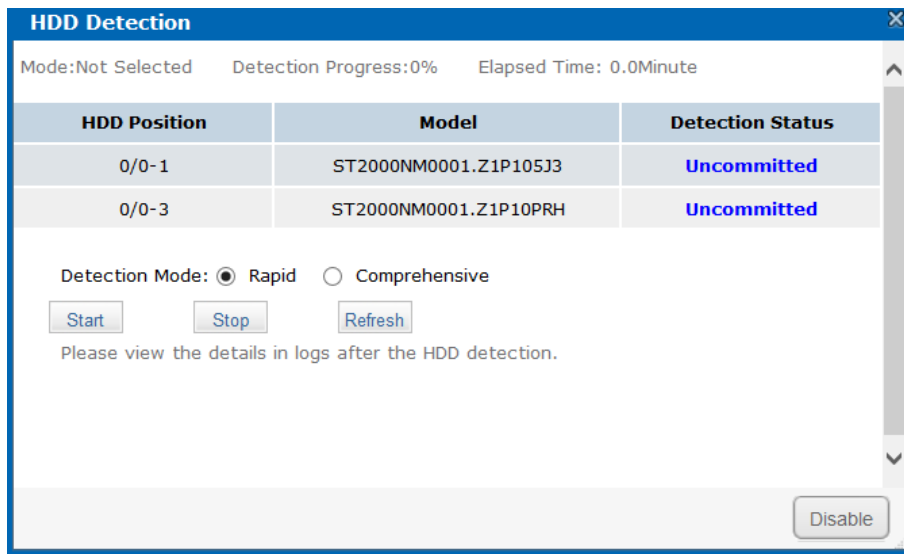


Figure 4. 6 HDD Detection

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.



- 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.



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**.

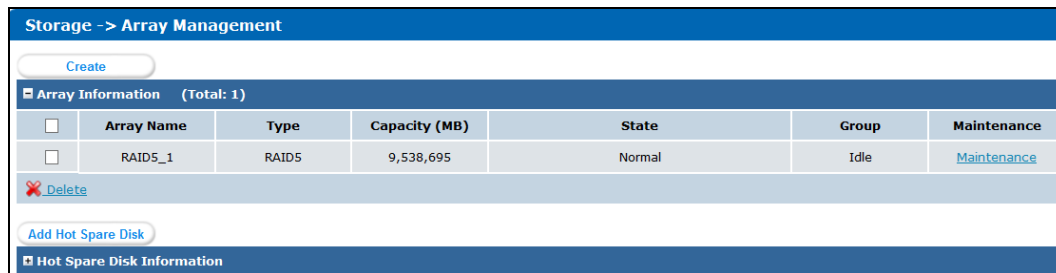


Figure 4. 7 Array

### 4.2.1 Creating Array

#### **Purpose:**

You can use available HDDs to create array.

#### **Steps:**

1. Click **Create Array**.

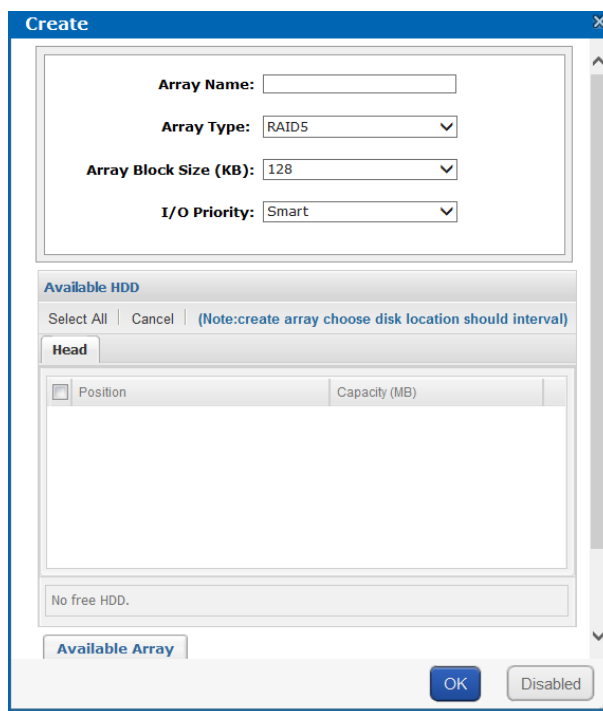


Figure 4. 8 Create Array

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**.



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

## 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		



- 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.



- 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.



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.



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.



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.

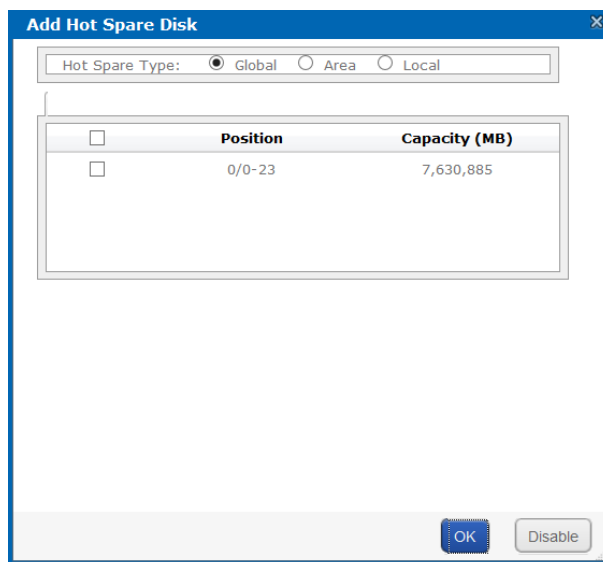



Figure 4. 10 Add Hot Spare

## 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**.

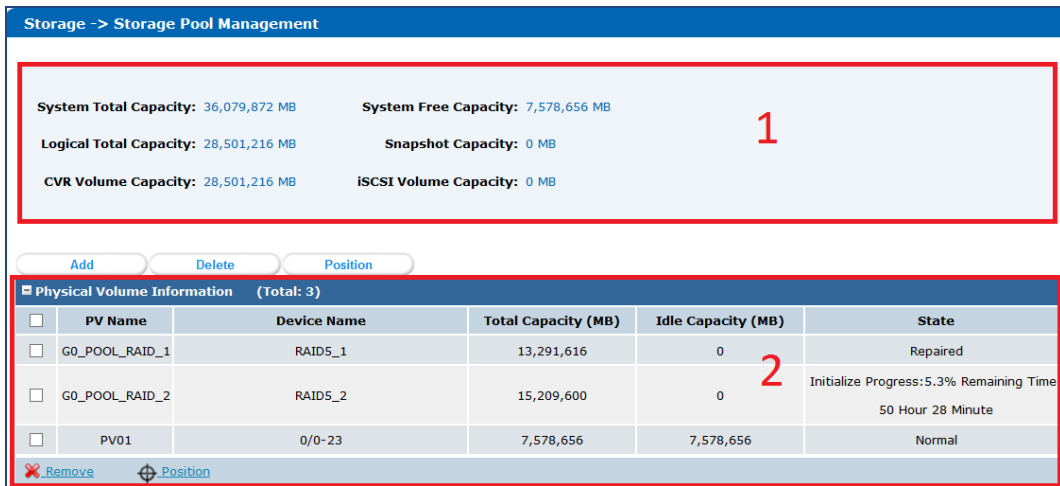


Figure 4. 11 Storage Pool

Table 4. 5 Interface Description

Area	Name	Description
1	Information Area	Lists the storage pool total size, free size, LUN size, snapshot size, 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**.

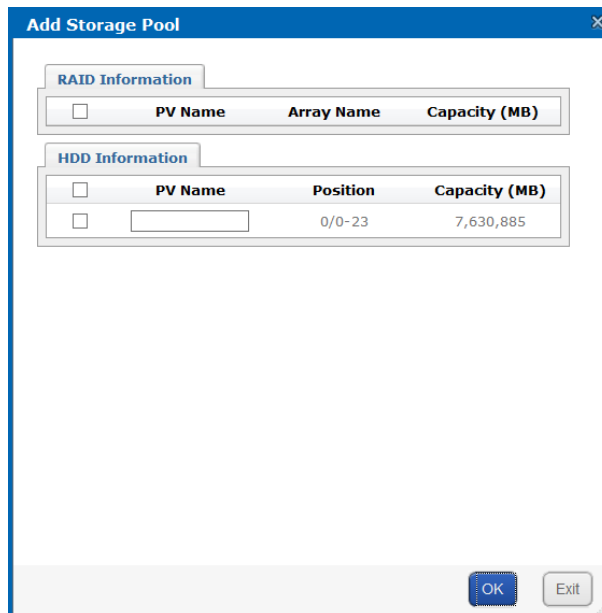


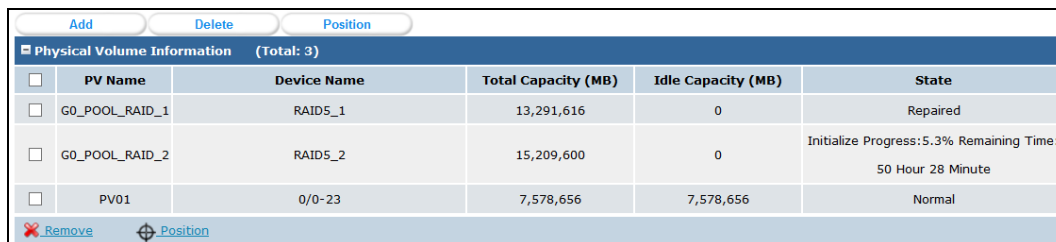
Figure 4. 12 Add Storage Pool

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



Or select the combination of array or HDD.

- Input **PV Name** in text field.
- Click **OK** to add the storage pool.



Physical Volume Information (Total: 3)					
<input type="checkbox"/>	PV Name	Device Name	Total Capacity (MB)	Idle Capacity (MB)	State
<input type="checkbox"/>	G0_POOL_RAID_1	RAID5_1	13,291,616	0	Repaired
<input type="checkbox"/>	G0_POOL_RAID_2	RAID5_2	15,209,600	0	Initialize Progress:5.3% Remaining Time: 50 Hour 28 Minute
<input type="checkbox"/>	PV01	0/0-23	7,578,656	7,578,656	Normal



Figure 4. 13 Storage Pool

## 4.3.2 Deleting Storage Pool

### **Purpose:**

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

### **Steps:**

- Check the checkboxes of physical volumes you want to delete.
- Click  or  button to delete them.




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:**

- Check the checkbox of physical volume you want to positioning.
- Click  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**.

Storage -> Logical Volume Management										
Create										
LUN Information (Total: 8)										
<input type="checkbox"/>	ID	Name	Block Size (Byte)	Capacity (MB)	Physical Volume	Usage	Snapshot Number	Clone	Extend	Rename
<input type="checkbox"/>	0	LUN_BACK1	512	51,200	G0_POOL_RAID_1	CVR Reserved Volume	0			
<input type="checkbox"/>	1	LUN_BACK2	512	51,200	G0_POOL_RAID_1	CVR Reserved Volume	0			

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**.

**Add Logical Volume**

Name:  E.g., database\_lun

Capacity (MB):  E.g., 300000

Block Size (Byte):

**Available Physical Volume**

Select	PV Name	Device	Idle Capacity (MB)
<input checked="" type="radio"/>	G0_POOL_RAID_1	RAID5_1	0
<input type="radio"/>	G0_POOL_RAID_2	RAID5_2	0
<input type="radio"/>	PV01	0/0-23	7,578,656

OK Disable

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.



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

### 4.4.3 Renaming Logical Volume



You can only rename the free logical volumes.

**Steps:**

1. Click 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.



You can only enlarge the idle logical volumes.

**Steps:**

1. Click button of the logical volume you want to extend.

**Extend Logical Volume**

Name: lun1

New Capacity (MB):

**Available Physical Volume**

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

**OK** **Exit**

Figure 4. 16 Extend LUN

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

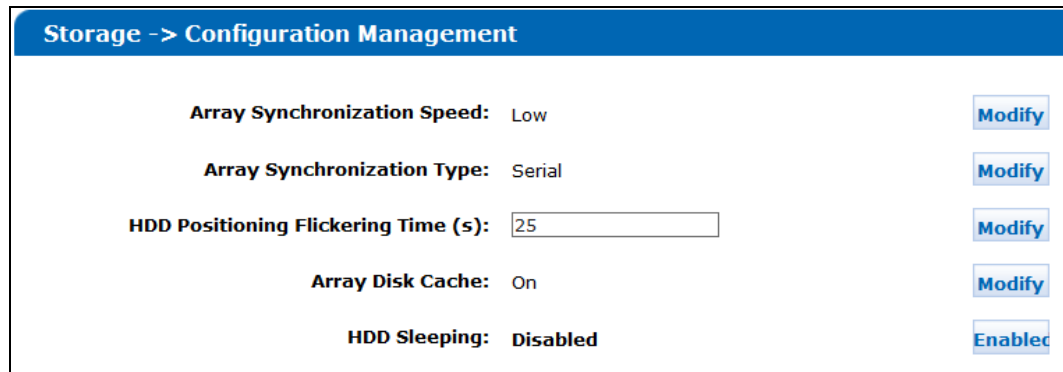
## 4.5 Configuration

### **Purpose:**

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

### **Step:**

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



The screenshot shows a web interface titled "Storage -> Configuration Management". It contains the following settings:

- Array Synchronization Speed:** Low (with a "Modify" button)
- Array Synchronization Type:** Serial (with a "Modify" button)
- HDD Positioning Flickering Time (s):** 25 (with a "Modify" button)
- Array Disk Cache:** On (with a "Modify" button)
- HDD Sleeping:** Disabled (with an "Enabled" button)

Figure 4. 17 Configurations

### 4.5.1 Synchronization Speed and Type

#### **Purpose:**

Array synchronization speed and synchronization type is editable.

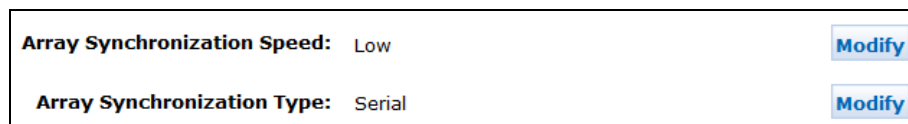
#### **Steps:**

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



The faster the speed is, the highest the internal 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**.



The screenshot shows a configuration window with the following settings:

- Array Synchronization Speed:** Low (with a "Modify" button)
- Array Synchronization Type:** Serial (with a "Modify" button)

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)**.



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

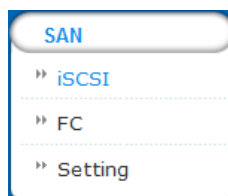


Figure 5. 2 SAN

## 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.

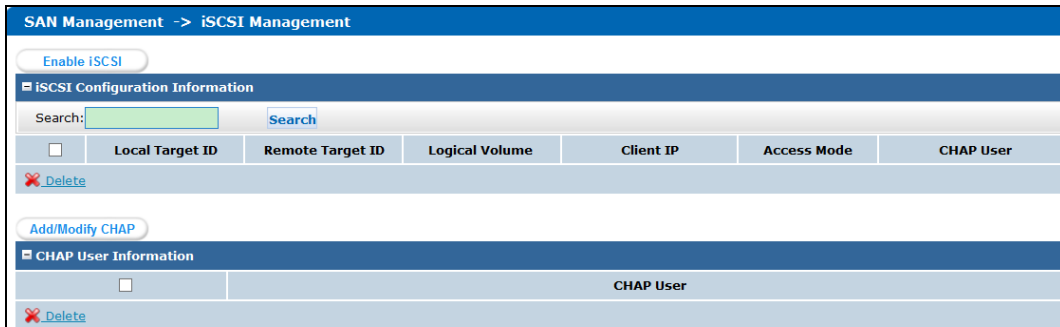


Figure 5. 3 iSCSI

### 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.

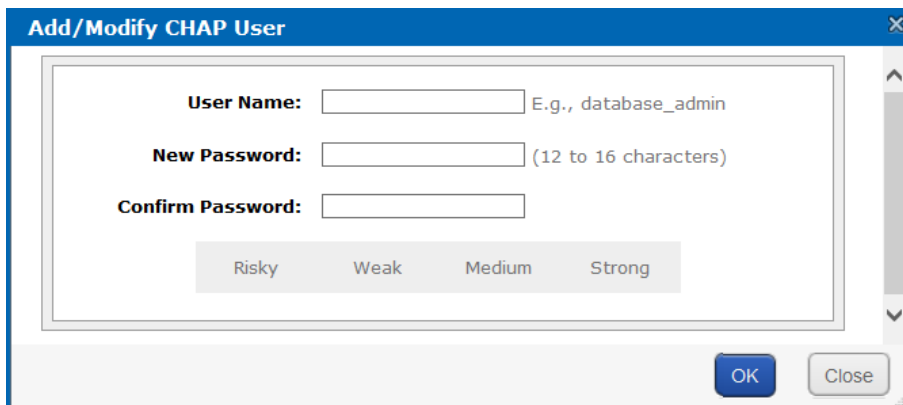


Figure 5. 4 Add CHAP User

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

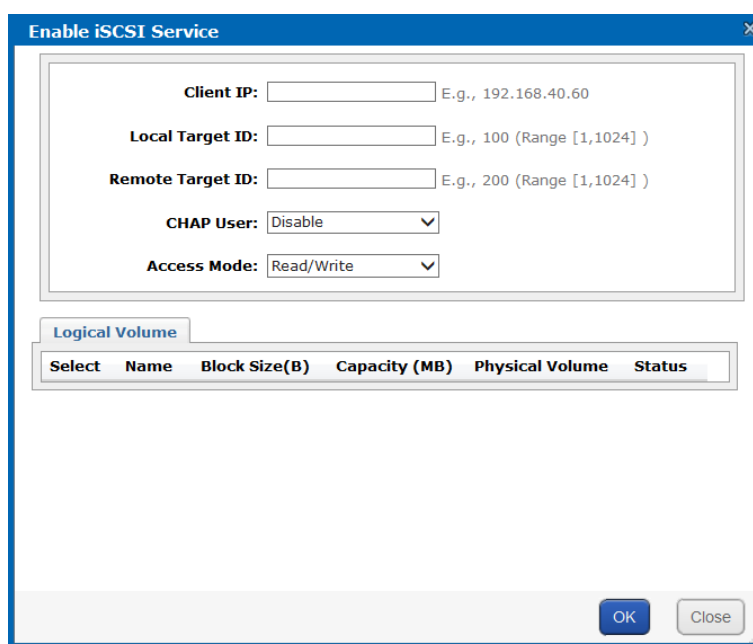


Figure 5. 5 Enable iSCSI

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**, **Read Only**, 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 **Logical Volume**.
  6. Click **OK** to enable the iSCSI.



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 iSCSI Port

### **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.

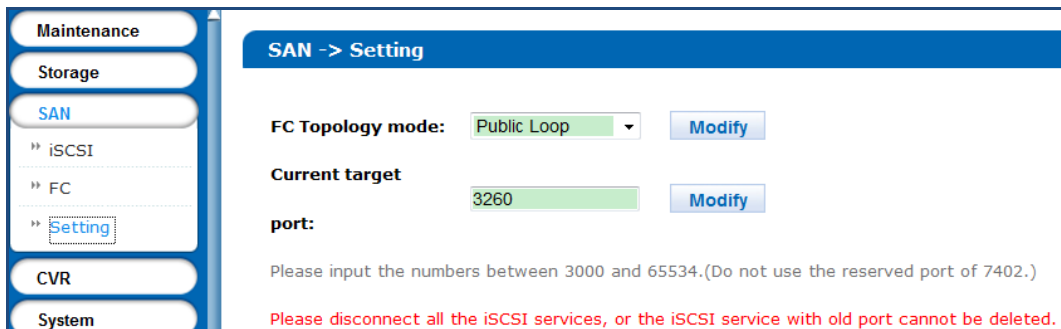


Figure 5. 6 Setting

2. Enter a number between 3000 and 65534 except 7402 in **Current target 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.

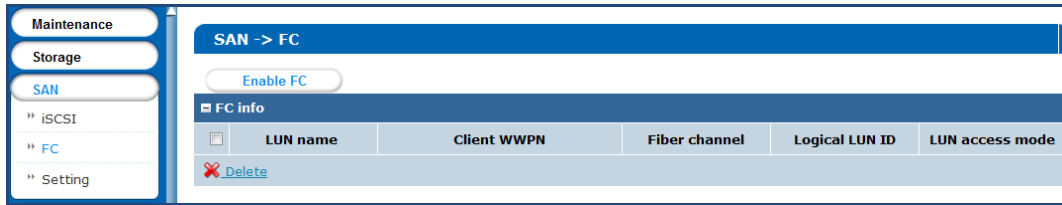


Figure 5. 7 iSCSI

## 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.

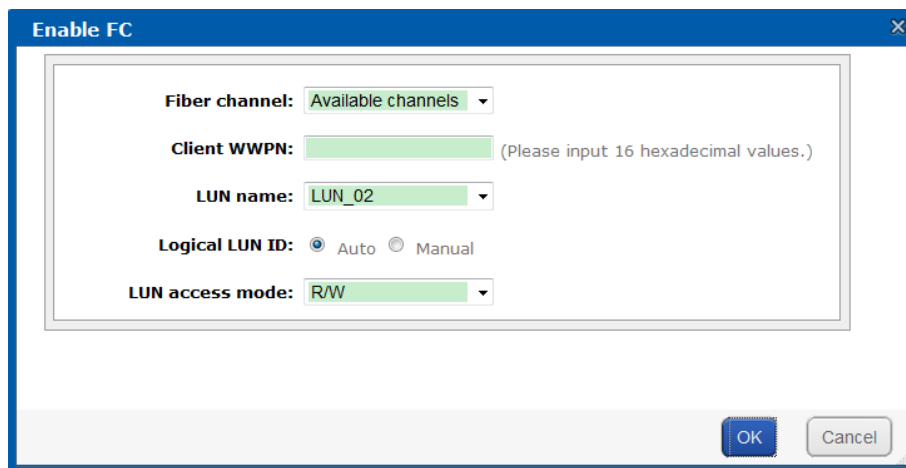


Figure 5. 8 Enable FC

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.



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 WWPN** of 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 **LUN name**.
5. Choose **Logical LUN ID** 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 **OK** and click **OK** in 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 **OK** in confirmation dialog box.

## Chapter 6

## Chapter 7 System

**Purpose:**

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

Table 7. 1 Module Description

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

**Keywords:**

Network, Alarm, Time, Power Supply, Tool

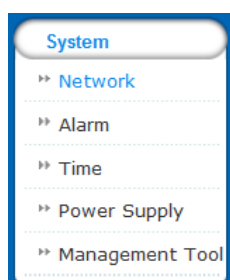


Figure 7. 2 System

## 7.1 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**.

The screenshot shows the 'System -> Network' configuration page. It is divided into two main sections: 'Basic Network Interface' and 'Bound Network Interface'.

**Basic Network Interface (Total: 1)**

<input type="checkbox"/>	Network Interface	IP Address	Subnet Mask	MAC Address	Jumbo Frame	Status	Connection Status	Speed
<input type="checkbox"/>	Management NIC	10.254.254.254	255.255.255.0	8C:E7:48:7C:82:A2	1500 Byte	Enabled	Disconnect	Unknown

Below the table are links for 'Bind Network Interface' and 'Modify'.

**Bound Network Interface (Total: 1)**

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

Below the table are links for 'Delete' and 'Modify'.

Figure 7.3 Network

### 7.1.1 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.

### 7.1.2 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.



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

#### Before you start:

Connect all data network interfaces to network via network cables.

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

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

Figure 7. 4 Bound Network Interface Information

### 7.1.2.2 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.

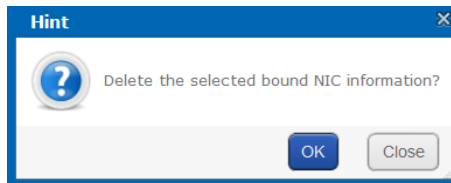


Figure 7. 5 Confirmation Dialog Box

### 7.1.2.3 Modifying Bonding Mode

For detailed information and steps, refer to *section 7.1.5.2 Binding Mode*.

## 7.1.3 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 7. 6 Add Route

- 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.
- Select Bound data **Network Interface** in the dropdown list.
- 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.

## 7.1.4 MAC and IP Bonding

### **Purpose:**

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

### **Steps:**

- Click **MAC&IP Bonding**.

Figure 7. 7 MAC&amp;IP Bonding

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



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

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

## 7.1.5 Advanced Parameters

### **Purpose:**



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

### 7.1.5.1 DNS Server

**Purpose:**

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

**Steps:**

1. Click **Modify** of **Preferred DNS Server**.
2. Enter IP address in text field.
3. Click **OK** and click **OK** in confirmation dialog box to save the settings.

<b>Preferred DNS Server:</b>	None	<input type="button" value="Modify"/>
<b>Alternate DNS Server:</b>	None	<input type="button" value="Delete"/>

Figure 7. 8 DNS Server

### 7.1.5.2 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 *Table 7. 2 Bonding Mode Description*.

**Steps:**

1. Click **Modify** of **NIC Binding Mode**.
2. Select bond mode in dropdown list. Up to 7 bond modes are selectable.
3. Click **OK** and click **OK** in confirmation dialog box to save the settings.

<b>Default Gateway:</b>	10.192.54.254	
<b>NIC Binding Mode:</b>	Active-backup	<input type="button" value="OK"/> <input type="button" value="Cancel"/>

Figure 7. 9 NIC Binding Mode

Table 7. 2 Bonding Mode Description

Bond Mode	Description
Round-robin	<ul style="list-style-type: none"> <li>● <b>Definition:</b> <ul style="list-style-type: none"> <li>➤ All data network interfaces sends and receives data in turn.</li> <li>➤ When using the mode, it is recommended to apply protocols except TCP/IP.</li> </ul> </li> <li>● <b>Advantage:</b> <ul style="list-style-type: none"> <li>➤ Load balance.</li> <li>➤ All data network interfaces are fully used.</li> <li>➤ There is no requirement about hardware like network switch.</li> </ul> </li> <li>● <b>Disadvantage:</b> <ul style="list-style-type: none"> <li>➤ The order of received data is uncertain.</li> <li>➤ Low network throughput.</li> </ul> </li> </ul>
Active-Backup	<ul style="list-style-type: none"> <li>● <b>Definition:</b> The default bond mode. Transmits data via a specified data network interface, other data network interfaces are standby. Only when the specified data network interface fails, another standby data network interface takes over</li> </ul>

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

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

### 7.1.5.3 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 Speed** as **1000 Mb/s** or **100 Mb/s**.
3. Click **OK** and click **OK** in confirmation dialog box to save the settings.

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

## 7.2 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.

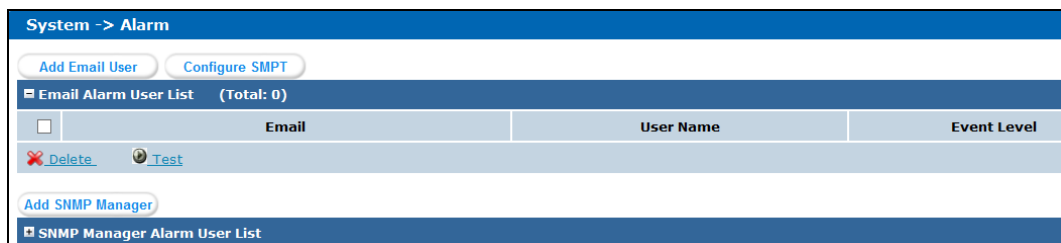


Figure 7. 10 Alarm

### 7.2.1 Alarm Type

**Purpose:**

The *Table 7. 3 Alarm Type Description* describes the supported alarm types and corresponding event level. E-mail

and SNMP manager support notifying you about the alarm types in *Table 7. 3*.

Table 7. 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	

## 7.2.2 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 7.1.5.1 DNS Server* for detailed steps.

### 7.2.2.1 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 7. 11 Configure Sending Email

### 7.2.2.2 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 7. 12 Add Email Alarm User

### 7.2.3 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.

### 7.2.4 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 .

Figure 7. 13 Add SNMP Manager


2. Enter **SNMP Manager** and **SNMP Port No.** in the text field.
3. **SNMP Version** 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.

## 7.2.5 Testing SMTP Manager

### *Purpose:*

You can test the network communication of SMTP manager.

### *Steps:*

1. Check the checkbox of SMTP manger to test.
2. Click  button and click **OK** to start test. Then test result pops up.

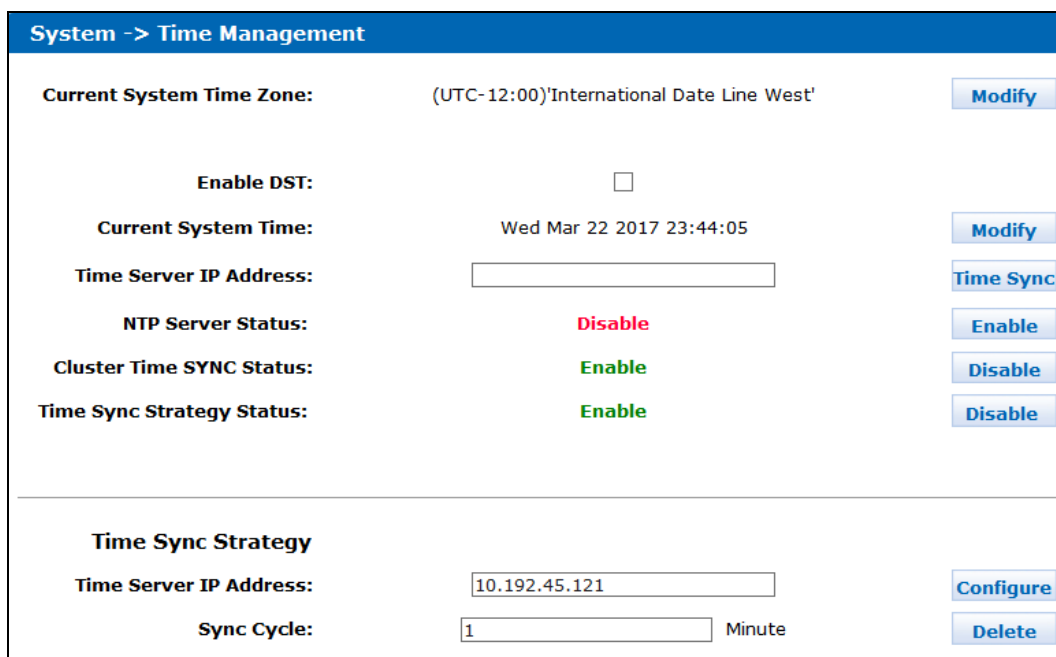
## 7.3 Time

### *Purpose:*

System time is adjustable.

### *Steps:*

Click **System** in navigation bar and choose **Time**.



System -> Time Management		
<b>Current System Time Zone:</b>	(UTC-12:00)'International Date Line West'	<a href="#">Modify</a>
<b>Enable DST:</b>	<input type="checkbox"/>	
<b>Current System Time:</b>	Wed Mar 22 2017 23:44:05	<a href="#">Modify</a>
<b>Time Server IP Address:</b>	<input type="text"/>	<a href="#">Time Sync</a>
<b>NTP Server Status:</b>	<b>Disable</b>	<a href="#">Enable</a>
<b>Cluster Time SYNC Status:</b>	<b>Enable</b>	<a href="#">Disable</a>
<b>Time Sync Strategy Status:</b>	<b>Enable</b>	<a href="#">Disable</a>
<b>Time Sync Strategy</b>		
<b>Time Server IP Address:</b>	<input type="text" value="10.192.45.121"/>	<a href="#">Configure</a>
<b>Sync Cycle:</b>	<input type="text" value="1"/> Minute	<a href="#">Delete</a>

Figure 7. 14 Time Management

## 7.3.1 Adjusting System Time

### 7.3.1.1 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.

### 7.3.1.2 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.

<b>Time Server IP Address:</b>	<input type="text"/>	<b>Time Sync</b>
<b>NTP Server Status:</b>	<b>Disable</b>	<b>Enable</b>

Figure 7. 15 Adjust Time Automatically

### 7.3.2 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.

<b>Time Sync Strategy Status:</b>	<b>Enable</b>	<b>Disable</b>
<b>Time Sync Strategy</b>		
<b>Time Server IP Address:</b>	<input type="text" value="10.192.45.121"/>	<b>Configure</b>
<b>Sync Cycle:</b>	<input type="text" value="1"/> Minute	<b>Delete</b>

Figure 7. 16 Synchronize Time



## Chapter 8 Log

**Purpose:**

Table 8. 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

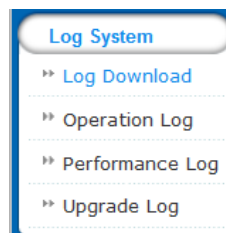


Figure 8. 2 System


## 8.1 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:




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


Figure 8. 3 Operation Log

- View Logs



Figure 8. 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

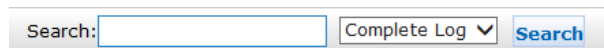


Figure 8. 5 Search Log

- 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.



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.

## 8.2 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 **Log** in navigation bar and choose **Operation Log** to enter Operation Log interface.
2. For detailed steps of viewing and search performance logs, refer to *section 8.1 Operation Log*.

Log System -> Performance Log				
Performance Log Information (Total: 455)				
Search: <input type="text"/> Search				
Date	CPU(%)	Memory(KB)	Network Flow(Kbps/s)	IO(IOPS)
20120809:Wed Mar 22 23:42:10 2017	24.62	416716	693.97	1266
20120809:Wed Mar 22 23:32:10 2017	25.29	425576	700.22	1301
20120809:Wed Mar 22 23:22:10 2017	28.98	413968	801.35	1289
20120809:Wed Mar 22 23:12:10 2017	28.88	410776	779.87	1292
20120809:Wed Mar 22 23:02:10 2017	29.05	409436	764.28	1346

Figure 8. 6 Performance Log

## 8.3 Upgrade Log

### **Purpose:**

Update log records the details information of every system update.

### **Steps:**

1. Click **Log** in navigation bar and choose **Upgrade Log**.
2. To view logs and search logs, refer to *section 8.1 Operation Log* for detailed steps.

Log System -> Upgrade Log	
Upgrade Log Information (Total: 805)	
Search: <input type="text"/> Search	
Date	Log Content
March 23 2017 07:10:34	Upload bios success (storos-201703231056-B_OS-OS_TEST-915.bin)
March 23 2017 14:43:43	Upload bios success (storos-201703220844-C-TO-N+1-FOR_232-6-suse_x64-9...
March 23 2017 14:43:43	Upload bios success (storos-201703060846-B_OS_915-storOS_switch_verse...
March 23 2017 14:43:42	Upload bios success (storos-201701042023-C_OS-StorOSManager_EN-915.bin...

Figure 8. 7 Update Log

0100001070327



First Choice for Security Professionals