

XCubeFAS XEVO 1.0 Software Manual

Applicable Models: XF2026D



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This XCubeFAS XEVO 1.0 user's manual is applicable to the following XCubeFAS models:

XCubeFAS Storage System 2U 19" Rack Mount Models

| Model Name | Controller Type | Form Factor, Bay Count, and Rack Unit |
|------------|-----------------|---------------------------------------|
| XF2026D | Dual Controller | SFF 26-disk 2U Chassis |

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Preface

About This Manual

This manual provides technical guidance for designing and implementing QSAN XCubeFAS series AFA (All-Flash Array) system, and it is intended for use by system administrators, SAN designers, storage consultants, or anyone who has purchased these products and is familiar with servers and computer networks, network administration, storage system installation and configuration, storage area network management, and relevant protocols.

Related Documents

There are related documents which can be downloaded from the website.

- All XCubeFAS Documents
- XCubeFAS QIG (Quick Installation Guide)
- XCubeFAS Hardware Manual
- XEVO 1.0 Software Manual
- <u>Compatibility Matrix</u>
- White Papers
- <u>Application Notes</u>

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- Via the Web: <u>https://qsan.com/support</u>
- Via Telephone: +886-2-77206355 (Service hours: 09:30 - 18:00, Monday - Friday, UTC+8)
- Via Skype Chat, Skype ID: qsan.support (Service hours: 09:30 - 02:00, Monday - Friday, UTC+8, Summer time: 09:30 - 01:00)
- Via Email: <u>support@qsan.com</u>



Information, Tip and Caution

This manual uses the following symbols to draw attention to important safety and operational information.



INFORMATION:

INFORMATION provides useful knowledge, definition, or terminology for reference.



TIP:

TIP provides helpful suggestions for performing tasks more effectively.



CAUTION:

CAUTION indicates that failure to take a specified action could result in damage to the system.

Conventions

The following table describes the typographic conventions used in this manual.

| Conventions | Description |
|-------------------|--|
| Bold | Indicates text on a window, other than the window title, including |
| | menus, menu options, buttons, fields, and labels. |
| | Example: Click the OK button. |
| <italic></italic> | Indicates a variable, which is a placeholder for actual text provided |
| | by the user or system. |
| | Example: copy <source-file> <target-file>.</target-file></source-file> |
| [] square | Indicates optional values. |
| brackets | Example: [a b] indicates that you can choose a, b, or nothing. |
| { } braces | Indicates required or expected values. |
| | Example: { a b } indicates that you must choose either a or b. |
| | |



| vertical bar | Indicates that you have a choice between two or more options or |
|--------------|---|
| | arguments. |
| / Slash | Indicates all options or arguments. |
| underline | Indicates the default value. |
| | Example: [<u>a</u> b] |

1. XEVO Overview

XEVO is a QSAN specified OS for AFA (All-Flash Array). It can manage, monitor, and analyze the configuration and performance of the XCubeFAS series AFA storage system. This chapter provides an overview of the XEVO functionality and includes a brief explanation of storage terminology for you to be more familiar with the storage technologies used by the XCubeFAS system.

1.1. Introduction to XEVO

The QSAN XEVO is very user-friendly, it helps you manage your storage within just a few clicks, and if you are not available at your seat during the day, you may operate your AFA with your mobile device. It offers you the most superior storage services, available only to enterprise storage experts that can help you to analyze the status of your business usage, preventing accidental damages caused by human negligence.

In XEVO, all new UX (User Experience) was developed on a foundation of three simple concepts:

- 1. All-flash arrays should be user-friendly and operable by all.
- 2. Be able to be deployed or integrated into any environment.
- 3. Should be affordable for any size business.

You can gradually discover these ideas through the operation.

1.1.1. XEVO Software Architecture

XEVO supports Dual Active (Active/Active) controller system architecture with high availability. Figure 1-1 shows the XEVO software architecture. XEVO implements rich host applications and delivers enterprise data services that are founded upon QSAN core engines. These are the technologies that really care about your data, and also drive the high performance which QSAN is proud of.



Figure 1-1 XEVO Software Architecture

The difference with SAN system is that XEVO focuses on and improves the operation and monitoring for flash drives. QSLife will monitor and analyze the activity of SSDs. It analyzes and decrypts SSD details, then turns into easy-to-understand information. The alert can be customized for SSD remaining life and health status when it approaches the threshold. In addition, it also can show the current and historical data of SSD usage.

QSRAID prevents all SSDs failure at the same time in one pool; we develop a specific algorithm for preventing pool failure due to SSD lifecycle. Due to the feature of SSD write endurance, the specific algorithm can provide that always aware user one SSD failure at one time. So you never forget to replace your SSDs before they fail.

1.1.2. XEVO 1.0 Functionality List

XEVO 1.0 provides the following functionality for administrator management.





Figure 1-2 XEVO 1.0 Dashboard Panel

Dashboard

- Provide hardware alert and system alert.
- Display array capacity information and storage overview.
- Monitor storage array performance by latency, IOPS, and throughput.
- Monitor and optimize SSD performance and longevity.
- Monitor SSD usage and learn SSD usage effectively with custom notifications.
- System reboot or shutdown.

Storage Management

- Support RAID pool with RAID level 0, 1, 3, 5, 6, 0+1, 10, 30, 50, 60, and N-way mirror.
- Also support RAID EE level 5EE, 6EE, 50EE, and 60EE.
- Support thick provisioning pool and online migrate RAID pool.
- Support thin provisioning pool with space reclamation.
- Support online storage pool capacity expansion and volume capacity extension.
- Configure disk properties with disk write cache, disk read-ahead, and command queuing.
- Configure volume properties with background I/O priority, volume write-back cache, and video editing mode for enhanced performance.
- Support global hot spares for pool.
- Support fast RAID rebuild.
- Support SSD life monitoring and S.M.A.R.T attributes.



- Support pool parity check.
- Support pool activated and deactivated for disk roaming.
- Support multiple volume creation.

Host Management

- Support host groups to bind hosts and volumes.
- Obtain host connectivity information.
- Configure iSCSI target with CHAP (Challenge-Handshake Authentication Protocol) and mutual CHAP authentication.
- List iSCSI sessions.

Protection and Data Backup

- Support protection groups to protect volumes together.
- Enable snapshot space automatically.
- Support writable snapshot with manual or schedule tasks.
- Recycle snapshots.
- Support volume cloning for local replication.
- Easily deploy the local clone without doing configurations.
- Support remote replication with traffic shaping for dynamic bandwidth controller.
- Auto Replication, easily deploy the remote replication without doing configurations
- 1 step local-to-remote.

Performance and Capacity Analysis

- Monitor volume performance and history by latency, IOPS, and throughput.
- Monitor volume capacity and history usage.

System Management

- Monitor enclosure status of head and enclosure units.
- Monitor cache to flash memory protection status. BBM (Battery Backup Module), SCM (Super Capacitor Module), and flash module are optional add-ons.
- Blink UID (Unique Identifier) LEDs for locating the storage arrays.
- Change admin's password, user's password, and configure login options.
- Change system name, date and time.
- Configuration export and import.
- Configure management IP address, DNS, and service ports.
- Configure data port settings.



- Configure iSCSI connectivity with IP address, link aggregation, VLAN (Virtual LAN) ID and jumbo frame.
- Setup entity name and iSNS (Internet Storage Name Service).
- Configure fibre channel connectivity with link speed and topology.
- Obtain system information and download service package.
- Update firmware of head unit or enclosure unit(s).
- Support disk firmware batch update.
- Support boot management including auto shutdown, wake-on-LAN, and wake-on-SAS.
- Support network UPS via SNMP.
- System reset to default and volume restoration for maintenance usage.

Message Management

- Configure alert notifications through email or SNMP traps.
- View event logs with different levels of event and download event logs.

1.2. Terminology

In this section, we introduce the terms that are used for the storage system throughout this manual.

RAID

RAID is the abbreviation of Redundant Array of Independent Disks. There are different RAID levels with different degrees of data protection, data availability, and performance to the host environment.

Pools

A storage pool is a collection of disk drives. One pool consists of a set of volumes and owns one RAID level attribute.

Volumes

Each pool can be divided into several volumes. The volumes from one pool have the same RAID level, but may have different volume capacity.



LUN

A LUN (Logical Unit Number) is a unique identifier for designating an individual or collection of physical or virtual storage devices that execute I/O commands with a host computer, as defined by the SCSI (Small Computer System Interface) standard.

iscsi

iSCSI (Internet SCSI) is a protocol which encapsulates SCSI (Small Computer System Interface) commands and data in TCP/IP packets for linking storage devices with servers over common IP infrastructures.

Fibre Channel

Fibre channel is an extremely fast system interface. It was initially developed for use primarily in the supercomputing field, but has become the standard connection type for storage area networks (SAN) in enterprise storage.

SAS

Serial-attached SCSI offers advantages over older parallel technologies. The cables are thinner, and the connectors are less bulky. Serial data transfer allows the use of longer cables than parallel data connections.

SSD

An SSD (Solid-State Drive) is a solid-state storage device that uses integrated circuit assemblies as memory to store data persistently.

Thick Provisioning

Thick provisioning is allocated upon creation the physical disk drive space and is equal to the user capacity seen by the host server. It also called fat provisioning.

Thin Provisioning

Thin provisioning is allocated on-demand and can be less than the user capacity seen by the host server. It involves using virtualization technology to give the appearance of having more physical resources than are actually available.

Snapshot

A volume snapshot is the state of a system at a particular point in time.



Local Clone

Local clone function has another physical data copy as the original volume.

Remote Replication

Remote replication function prevents primary site failure by replicating data to the remote sites.

OSAN

2. Getting Started

After completing the configuration planning, it's time to power on the system, find your system and log into XEVO (AFA operating system). This chapter explains how to discover the AFA storage system and how to sign into XEVO.

2.1. Power on the Storage System

Before you power on the system, we assume that you have followed the following hardware installation document to finish the hardware installation.

- XCubeFAS QIG (Quick Installation Guide)
- <u>XCubeFAS Hardware Owner's Manual</u>



TIP:

Please double check all the cables (including power cords, Ethernet, fibre channel, and SAS cables) are connected properly, especially network cable connects to the management port. If everything is ready, now you can power on the system.

2.2. Discover the AFA Storage System

The default setting for the management IP address is DHCP. For users who are going to install at the first time, we provide the XFinder Java utility to search for QSAN products on the network and aid quick access to the login page of the XEVO web interface.

2.2.1. XFinder Utility

XFinder utility provides to search QSAN products on LAN. You can discover the management IP addresses of the storage systems via this utility. Please download XFinder utility from the following website.

https://qsan.com/XFinder



In addition, XFinder is a java based program. It is also a highly portable utility. To execute this program, JRE (Java Runtime Environment) is required. You can visit the following websites to download and install JRE.

http://www.java.com/en/download/

After JRE is installed, run the **XFinder.jar** program. The AFA storage system in your network will be detected and listed in the table.

| | Func | tion | | Information A | rea | | | |
|-----------|---------------|---------|----------------|---------------|-------------------|---------------|-------------|------------------------|
| () XFinde | er 🚽 | | | | | | | |
| Se | arch System | Monitor | Notification | | | | (| OSAN About Language |
| Pin | System Name | Model | IP Address | QSAN Cloud | Mac Address | Firmware ver. | Notificatio | n Power |
| 쭈 | XF2026-D60000 | XF2026 | 192.168.30.242 | | 00:13:78:D6:00:00 | 1.0.0 | - | U U |
| д | XF2026-D40000 | XF2026 | 192.168.30.240 | - | 00:13:78:D4:00:00 | 1.0.0 | - | U U |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 3 System | s found | | | | | | | 2018/05/31 14:03:31 |

Figure 2-1 XFinder Utility

Take an example in Figure 2-1, Xfinder discovers two systems in LAN. The default setting of the management port IP address is gotten from the DHCP server, e.g., 192.168.30.242. The default system name is the model name plus the last 6 digits of the serial number, e.g., XF2026-D60000. Double-clicking the selected entry will automatically bring up the browser and display the login page.



INFORMATION:

XFinder utility works in the following network environments:

- Both the management port of the SAN storage system and the management computer are both on the same subnet domain of the LAN.
- The LAN works with or without DHCP server.
- If the LAN doesn't have a DHCP server, it still can work on zeroconfiguration networking. The management port will be assigned a fix IP address: 169.254.1.234/16. So you can configure the IP address of your management computer to the same subnet domain of the storage system, e.g.: 169.254.1.1/16. Then open a browser and enter <u>http://169.254.1.234</u> to go into the login page. For more information about zero configuration, please refer to: <u>https://en.wikipedia.org/wiki/Zero-configuration_networking</u>

2.3. Initial Setup

The Initial configuration wizard will guide the first time user to initialize and set up the system quickly. After discovering the storage system, please follow the steps to complete the initial configuration.



| admin | OSAN XEVO |
|-------|------------------|
| Login | admin admin |
| Login | ≙ ···· |
| | Login |
| | |

Figure 2-2 Login Page of web UI

- 1. To access the XEVO web interface, you have to enter a username and password. The initial defaults for administrator login are:
 - Username: admin
 - **Password**: 1234



TIP:

For existing users who are experienced, the Initial configuration wizard will not be shown again when you log in next time, unless the system is **Reset to Factory Defaults**. You may skip this section to start the operations of web UI in the next chapter.

You can execute **Reset to Factory Defaults** function in **System** -> **Maintenance** -> **Rescue** -> **Reset to Defaults**. Please refer to the chapter 9.4.5, <u>Rescue</u> section for more details.

OSAN

| Initial Configur | ation | |
|--------------------|---------------|-----------------|
| | 0 | ~ |
| Admin | System Name | Management Port |
| System Name | XCubeFAS_XEV0 | |
| New Password * | | |
| Confirm Password * | | |
| | | |
| | | Cancel |

Figure 2-3 Initial Configuration Step 1

- Enter a System Name, for security reason, it's highly recommended to change system name. The maximum length of the system name is 32 characters. Valid characters are [A~Z | a~z | 0~9 | -_].
- Change admin's password in New Password and reconfirm in Confirm Password, The maximum length of the password is 32 characters. Valid characters are [A~Z | a~z | 0~9 | ~!@#\$%^&*_-+=`|\(){[:;"'<>,.?/].
- 4. Click the **Next** button to proceed.



| Admin | System Name | Management Por |
|---------------|---|-----------------------------|
| Time Zone | (GMT+08:00) Taipei | A state |
| Date and Time | Keep Current Time 2018/07/ | 24 17:45:52 |
| | Manual Setting | |
| | | |
| | | |
| | Synchronize with a NTP (Netwo | ork Protocol Time) server |
| | automatically | |
| | 0.pool.ntp.org | |

Figure 2-4 Initial Configuration Step 2

- 5. Select a **Time Zone** depending on your location.
- 6. Set the local **Date and Time**. Date and time can be set by manually or synchronized with a NTP (Network Time Protocol) server.
- 7. Click the **Next** button to proceed.



| Admin | System Name | Management Port |
|--------------------|---------------|-----------------|
| DHCP | | |
| • Static | | |
| IP Address | 192.168.1.234 | |
| Subnet Mask | 255.255.255.0 | |
| Gateway | 192.168.1.254 | |
| DNS Server Address | 8.8.8.8 | |
| | | |

Figure 2-5 Initial Configuration Step 3

8. Assign an IP address for the management port by **DHCP** or **Static** IP Address.



INFORMATION:

DHCP: The Dynamic Host Configuration Protocol is a standardized network protocol used on IP (Internet Protocol) networks for dynamically distributing network configuration parameters, such as IP addresses for interfaces and services. With DHCP, computers request IP addresses and networking parameters automatically from a DHCP server, reducing the need for a network administrator or a user to configure these settings manually.

- 9. Assign a DNS Server Address. DNS (Domain Name System) provides a means to translate FQDN (Fully Qualified Domain Name) to IP address. Some notification services require DNS settings.
- 10. Click the **Apply** button to complete the initial configuration. You have to login with the new IP address of the management port and new admin password next time.

3. XEVO User Interface

This chapter illustrates the web user interface of XEVO and provides a brief introduction to the XEVO 1.0 desktop function menus.

3.1. Easy Deployment

XEVO simplifies itself – freeing you from complicated process of deploying your storage. Power it on and clicking your finger within just a few times (with our recommend configurations), then enjoy the convenience and focus on your business without paying too much attention to setting up your storage.



3.2. Accessing the Management Web UI

To access the management web user interface, open a supported web browser and enter the management IP address or Hostname of the system. The login panel is displayed, as shown in Figure 3-1.



| OSAN XEVO |
|------------------|
| admin admin |
| |
| Login |
| |
| |

Figure 3-2 Login Page of web UI

To access the web user interface, you have to enter a username and password.

- Username: admin
- Password: <Your Password>



INFORMATION:

Supported web browsers:

- Google Chrome 45 or later.
- Mozilla Firefox 45 or later.
- Microsoft Internet Explorer 10 or later.
- Apple Safari 8 or later.

3.3. XEVO Web UI Overview

When the password has been verified, the dashboard is displayed as shown in Figure 3-2.





Figure 3-3 XEVO Dashboard

The XEVO Web UI contains the following tabs:

Dashboard

The **Dashboard** function tab represents a graphical overview of the array, including hardware alert, array capacity, system alerts, storage overview, and I/O (Input/Output) performance metrics. For more information, please refer to chapter 4.1, <u>Dashboard</u> <u>Overview</u> section.

Storage

Select the **Storage** function tab to display the storage pools on the array, including disk groups and volumes. View and operate the storage pools and their snapshots. For more information, please refer to chapter 5, <u>Storage Tab</u>.

Hosts

Select the **Hosts** function tab to display the host objects on the array, including host groups, host profile, connected volumes, and CHAP settings. View and operate the host objects and the connections between them. For more information, please refer to chapter 6, <u>Hosts Tab</u>.



Protection

Select the **Protection** function tab to display the protection groups on the array. View and operate the protection groups, their snapshot plan, and replication plan. For more information, please refer to chapter 7, <u>Protection Tab</u>.

Analysis

Select the **Analysis** function tab to display the historical array information, including I/O performance metrics and storage capacity, from various viewpoints. For more information, please refer to chapter 8, <u>Analysis Tab</u>.

System

Select the **System** function tab to display the system health and array-wide information. View and manage the array components, including user accounts, system general settings, management and data port interfaces, and maintenance functions. For more information, please refer to chapter 9, <u>System Tab</u>.

Messages

Select the **Messages** function tab to display the log events, and setup the notification methods. For more information, please refer to chapter 10, <u>Messages Tab</u>.

3.3.1. XEVO Web UI Navigation

The XEVO Web UI includes several tools to help you navigate around the interface efficiently. At the upper right corner of the XEVO Web UI is the header. The XEVO Web UI header includes the following links:

Help

Click the **Help** icon to display the like page of our presale <u>FAQ</u>. If they cannot solve your issues, you may use the contact us page to fill out your queries.

QSLife

Click the **QSLife** function icon 🗮 to popup a QSLife window. It monitors and optimizes the SSD performance and longevity. For more information, please refer to the chapter 4.2, <u>Introduce QSLife Functions</u> section.



Hi, <Username>

Click the <Username> to drop down the functions that the user can perform. For example, admin can perform **Logout**, **Reboot**, and **Shutdown** the system.

The Storage, Hosts, Protection, and Analysis function tabs are divided into two main panes:

| 5 | Pool PC | ool_01 🌣 | | | | | | | | | |
|-----|------------|--|--|--|--|--|--|---|---|--|--|
| | + Capacity | 0.03 TB / 0.72 TB | | | | | 4 | H Used | | | |
| .01 | | 0.01 TB / 0.08 TB | | | | | | | | | |
| | | 0.0110100010 | | Actual / Virtual | | | | | | | |
| | He | alth Good tus Online | | Actual Spac Available Sp | 744 GB | | | | | | |
| | Co | stroller CTRL 1 | | Provisioning | Type Thin Provisioning | | | | | | |
| | | | | | | | | | | | |
| | III Di | sk Groups | | | | | | | | | |
| | | sk oloups | | | | | | | | | |
| | | | | | | | | | | | |
| | 🗐 Vo | lumes | | | | | | | | | |
| | ⊜ Vo | lumes | | | | | | | | | |
| | ⊜ Vo | lumes | | | | | | | | | 18 items 😥 |
| | | Jumes ! Volume Name | Status | Snapshot Space | Capacity | Usage | Avalible | LUN | Volume Type | Clone | 18 items 👔 |
| | | Volume Name Volume_01_03 © | Status Online | Snapshot Space 1.00 GB/1.00 GB | Capacity 5 GB | Usage | Avalible 3 GB | LUN 2 | Volume Type RAID | Clone - | 18 items 💿 📄 Permission W8 |
| | | Volume Name Volume_01_03 © Volume_01_04 © | Status Online Online | Snapshot Space 1.00 GB/1.00 GB 1.00 GB/1.00 GB | Capacity 5 GB 5 OB | Usage 20 % 20 % | Avalible 3 68 3 68 | LUN 2 3 | Volume Type RAID RAID | Cione - | 18 items 💿 Permission W8 W8 |
| | | Iumes Volume Name Volume, 01,03,0 Volume, 01,04,0 Volume, 01,04,0 Volume, 01,05,00 | Status Online Online Online | Snapshot Space 1.00 GB/1.00 GB 1.00 GB/1.00 GB 1.00 GB/1.00 GB | Capacity 5 GB 5 GB 5 GB | Usage 20 % 20 % | Avalible 3 68 3 68 3 68 | LUN 2 3 4 | Volume Type RAID RAID RAID | Clone - - | 18 items (2) Permission WB WB WB |
| | | I Volume Name • Volume, 01,03 @ • Volume, 01,04 @ • Volume, 01,05 @ • Volume, 01,05 @ | Status Online Online Online Online | Snapshot Space 1.00 GB/1.00 GB 1.00 GB/1.00 GB 1.00 GB/1.00 GB 1.00 GB/1.00 GB | Capacity 5 GB 5 GB 5 GB 5 GB | Usage 20 % 20 % 20 % 20 % | Avalible 3 68 3 68 3 68 3 68 | LUN 2 3 4 5 | Volume Type RAID RAID RAID RAID RAID | Clone - - | 18 items 😰 Pemission WB WB WB WB |
| | | Iumes Volume Name Valume, 01, 03 Volume, 01, 04 Valume, 01, 05 Valume, 01, 05 Valume, 01, 05 Valume, 01, 05 Valume, 01, 07 Valume, 01, 07 Valume, 01, 07 | Status Online Online Online Online Online | Snapshut Space 1.00 GB/1.00 GB 1.00 GB/1.00 GB 1.00 GB/1.00 GB 1.00 GB/1.00 GB 1.00 GB/1.00 GB | Capacity 5 GB 5 GB 5 GB 5 GB 5 GB | Usage 20 % 20 % 20 % 20 % | Avalible 3 68 3 68 3 68 3 68 3 68 3 68 | LUN 2 3 4 5 6 7 | Volume Type RAID RAID RAID RAID RAID RAID | Clone - - - | 18 items 😰 🗐 Permission W8 W8 W8 W8 W8 W8 |
| | | Iumes Volume Name Volume, 21,03 0 Volume, 21,04 0 Volume, 21,05 0 Volume, 21,07 0 Volume, 21,27 0 | Status Online Online Online Online Online | Snepshot Space 1.00 GB/100 GB 1.00 GB/100 GB 1.00 GB/100 GB 1.00 GB/100 GB 1.00 GB/100 GB 1.00 GB/100 GB | Capacity 508 508 508 508 508 508 508 | Usage 20 % 20 % 20 % 20 % 20 % | Avalible 3 68 3 68 3 68 3 68 3 68 3 68 3 68 | LUN 2 3 4 5 6 7 | Volume Type RAID RAID RAID RAID RAID RAID RAID | Clone - - - - | 18 items 😰 Permission WB WB WB WB WB WB WB |
| | | Volume Name Volume JL 30 Volume JL 40 Volume JL 50 Volume JL 50 | Status Online Online Online Online Online Online | Snepshot Spece 1.00 GB/100 GB 1.00 GB/100 GB | Capacity 5 08 5 08 5 08 5 08 5 08 5 08 5 08 | Usage 20% 20% 20% 20% 20% 20% 20% | Avalible 308 308 308 308 308 308 308 308 | LUN 2 3 4 5 6 7 8 | Volume Type RAID RAID RAID RAID RAID RAID RAID | Clone - - - - - | 18 items (2) Permission WB WB WB WB WB WB WB WB WB |
| | | Iumes Hame Values Hame Values JLd 0 Values JLd 10 Values JLd 10 | Status Online Online Online Online Online Online Online | Energishut Space 1 00 GB/1 00 GB 1 00 GB/1 00 GB | Capacity 5.08 5.08 5.08 5.08 5.08 5.08 5.08 5.08 | Usage 20% 20% 20% 20% 20% 20% 20% 20% 20% | Avalible 3.08 3.08 3.08 3.08 3.08 3.08 3.08 3.08 | LUN 2 3 4 5 6 7 8 9 10 | Volume Type RAID RAID RAID RAID RAID RAID RAID RAID | Clone - - - - - - - - - - - | 18 items (2) Permission WB WB WB WB WB WB WB WB WB WB WB WB |

Figure 3-4 Function Tabs are Divided into Two Main Panes

Navigation Pane

The navigation pane displays the XEVO objects related to the selected function tab. Select an object to analyze or configure the information that appears in the details pane.

| Dashboard | Storage | Hosts | Protectio | on Analysis |
|------------|---------|-------|--------------------------------|---------------|
| II Perform | nance | | ~ | Latency |
| 05 | | 0 | ् 🕶 | |
| Volume Na | ime | (| Empty Spac | ce 1 ms |
| Volume 01 | 05 | | RAID Volum | D.8 ms |
| voidine_01 | _00 | | | D.6 ms |
| | | | Backup Vol | ume ብ 4 ms |

Figure 3-5 Filter in the Analysis Tab



In the navigation pane of the **Analysis** tab, click the filter icon T to drop down the volume types, check or uncheck them to narrow the list of volume types. Or input the filter string in the field and click the search icon Q to narrow those that contain the filter string. Once you have narrowed down the list of items, select the actual item to view its details in the details pane.

Details Pane

The details pane contains information and configuration options for the selected object. Select an object in the navigation pane to analyze or configure the object details in the details pane. The details pane includes two types of icons:

| III Disk Gro | oups | | ^ |
|--------------|--------------------|--------|-------------|
| | | | 1 items 📋 🕂 |
| . ! | No. | Total | |
| • | 1 🕸 | 744 GB | |
| 4 | Disk Information | | • |
| | Replace Disk Group | | < 1 / 1 $>$ |
| | | | |
| Volume | S | | ~ |

Figure 3-6 The Details Pane Includes Two Types of Icons

- Click the expand arrow v or collapse arrow v icon to upper-right corner in a sub pane to expand or collapse it.
- Click the working icon 🗢 to the right of an object to pop up a drop down function menu. The function can be selected to execute.

3.4. Accessing the Management USB LCM

Optionally, we provide a portable USB LCM (LCD Control Module) for simple management. To access the management USB LCM, plug it into the USB port of the right ear in the front panel.
CSAN



Figure 3-7 Portable USB LCM



INFORMATION:

For the USB port in front panel, please refer to the chapter 2, System Components Overview in the <u>XCubeFAS Hardware Owner's Manual</u>.

After plugging the USB LCM into the system, the LCD screen shows the management port IP address and the system model name.

192.168.1.234 QSAN XF2026D

Figure 3-8 USB LCM Screen

TIP:

To access the LCM options, use the **ENT** (Enter) button, **ESC** (Escape) button, \blacktriangle (up) and \lor (down) to scroll through the functions. **MUTE** button to mute the buzzer when the system alarms. If there are event logs occurred, events will be displayed on the first line of the LCM.



The event alert settings can be changed, please refer to the chapter 10.2.2, <u>Allert Settings</u> section.

This table describes the function of each item.



| Table 3-1 USB | LCM Function List | | | | | |
|------------------|---|--|--|--|--|--|
| Function | Description | | | | | |
| System Info. | Display system information including firmware version and memory | | | | | |
| | size. | | | | | |
| Reset/Shutdown | Reset or shutdown the system. | | | | | |
| View IP Setting | Display current IP address, subnet mask, and gateway. | | | | | |
| Change IP | Set IP address, subnet mask, and gateway. There are three options of | | | | | |
| Config | DHCP, BOOTP, or static IP address. | | | | | |
| Enc. | Show the enclosure data of disk drive temperature, fan status, and | | | | | |
| Management | power supply status. | | | | | |
| Reset to Default | Reset the system to default settings. The default settings are: | | | | | |
| | Reset Management Port IP address to DHCP, and then fix IP | | | | | |
| | address: 169.254.1.234/16. | | | | | |
| | Reset admin's Password to 1234. | | | | | |
| | • Reset System Name to model name plus the last 6 digits of serial | | | | | |
| | number. For example: XF2026-123456. | | | | | |
| | Reset IP addresses of all iSCSI Ports to 192.168.1.1, | | | | | |
| | 192.168.2.1, etc. | | | | | |
| | Reset link speed of all Fibre Channel Ports to Automatic. | | | | | |
| | Clear all access control settings of the host connectivity. | | | | | |



INFORMATION:

DHCP: The Dynamic Host Configuration Protocol is a standardized network protocol used on IP (Internet Protocol) networks for dynamically distributing network configuration parameters, such as IP addresses for interfaces and services. With DHCP, computers request IP addresses and networking parameters automatically from a DHCP server, reducing the need for a network administrator or a user to configure these settings manually.

BOOTP: Similar to DHCP, the Bootstrap Protocol is also a computer networking protocol used in Internet Protocol networks to automatically assign an IP address to network devices from a configuration server. While some parts of BOOTP have been effectively superseded by the DHCP, which adds the feature of leases, parts of BOOTP are used to provide service to the DHCP protocol. DHCP servers also provide legacy BOOTP functionality.



This table displays the LCM menu hierarchy for your reference when you operate USB LCM.

| Menu | L1 | L2 | L3 | L4 |
|----------------------|-----------------|--|-------------------------|------------|
| <ip addr=""></ip> | System Info. | Firmware Version | | |
| QSAN <model></model> | | <n.n.n></n.n.n> | | |
| ▲ ▼ | | RAM Size <nnnn></nnnn> | | |
| | | MB | | |
| | | ▲Yes No▼ | | |
| | Reset / | Reset | ▲Yes No▼ | |
| | Shutdown | Shutdown | ▲Yes No▼ | |
| | View IP Setting | IP Config | | |
| | | <static <="" ip="" td=""><td></td><td></td></static> | | |
| | | DHCP / BOOTP> | | |
| | | IP Address | | |
| | | <192.168.001.234> | | |
| | | IP Subnet Mask | | |
| | | <255.255.255.0> | | |
| | | IP Gateway | | |
| | | <xxx.xxx.xxx.xxx></xxx.xxx.xxx.xxx> | | |
| | Change IP | DHCP | | |
| | Config | BOOTP | | |
| | | Static IP | IP Address | Adjust IP |
| | | | | address |
| | | | IP Subnet | Adjust |
| | | | Mask | Submask IP |
| | | | IP Gateway | Adjust |
| | | | | Gateway IP |
| | | | Apply IP | ▲Yes No▼ |
| | | | Setting | |
| | Enc. | Phy. Disk Temp. | Local | |
| | Management | | Slot <n>: <nn></nn></n> | |
| | | | (C) | |
| | | Cooling | Local | |
| | | | FAN <n>:</n> | |
| | | | <nnnnn> RPM</nnnnn> | |
| | | Power Supply | Local | |

Table 3-2USB LCM Menu Hierarchy



| | | PSU <n>: <status></status></n> | |
|---------------------|----------|------------------------------------|--|
| Reset to Default | ▲Yes No▼ | | |



4. Dashboard Tab and QSLife

The **Dashboard** tab displays the hardware status and a running graphical overview of the array's storage capacity and performance. It helps the user to quickly view the basic information and system health. In addition, SSD plays an important role in the use of all-flash arrays. Therefore, we provide the **QSLife** function to monitor and analyze the activity of SSDs. This chapter describes the details of the **Dashboard** tab and the **QSLife** function.

4.1. Dashboard Overview

Select the **Dashboard** tab to show a summary of the overall system. It's divided into five blocks in the details pane. There are hardware alert, array capacity, system alert, storage overview, and performance graphs.



Figure 4-1 Dashboard



4.1.1. Hardware Alert

The **Hardware Alert** pane displays the disk health in the system. To drill down and analyze the array details, please select **System** -> **Arrays**.



Figure 4-2 Hardware Alert in the Dashboard

Hovering over the slot will display the slot number. This table shows the hardware alert pane descriptions.

| | dware Alert 1 and Descriptions | | | | | | |
|-------------|--|--|--|--|--|--|--|
| Name | Description | | | | | | |
| Disk Health | The status of disk health: | | | | | | |
| | Green Color / Normal: The disk drive is good. | | | | | | |
| | Orange Color / Abnormal: The disk drive has unrecoverable read | | | | | | |
| | errors or S.M.A.R.T. error. | | | | | | |
| | Red Color / Warning: The disk drive has failed. | | | | | | |

Table 4-1 Hardware Alert Pane Descriptions

4.1.2. Array Capacity

The **Array Capacity** pane contains a summary of the capacity usage including used, total, and the amount of storage occupied by provisioned volumes and snapshots.





Figure 4-3 Array Capacity in the Dashboard

The pane includes the following items:

- **Percentage (%):** Percentage of the system's storage space occupied by provisioned volumes and snapshots. The percentage value is displayed in the circle of the pane.
- **Used:** Storage space occupied by volumes and snapshots.
- **Total:** Total physical usable space on the array.
- Provisioned: Total provisioned capacity of all volumes.
- Snapshots: Physical space occupied by data unique to one or more snapshots.
- Empty Space: Unused space available for allocation.

4.1.3. System Alert

The **System Alert** pane contains a summary of the abnormal and warning event messages. In addition, clicking the items or the numbers will jump to the **Messages** function tab.



| System Alert | | |
|--------------|---------|--|
| A | 0 | |
| Abnormal | Warning | |
| 153 | 20 | |

Figure 4-4 System Alert in the Dashboard

The pane includes the following items:

- Abnormal: The number under the item is the count of the abnormal messages.
- Warning: The number under the item is the count of the warning messages.

4.1.4. Storage Overview

The **Storage Overview** pane contains a summary of the abnormal and warning event messages. In addition, clicking the Array, Disk, Pool, or Volume or the numbers will jump to the **Storage** function tab. Clicking the Host or the number will jump to the **Hosts** function tab.

| Storage Overview | | | | | |
|------------------|-----------|-----------|-----------|-------------|--|
| | | 2 | | | |
| Array 1 | Disk 6 | Host 1 | Pool 1 | Volume 1 | |

Figure 4-5 Storage Overview in the Dashboard

The pane includes the following items:

- **Array:** The number under the item is the count of total arrays including the head and the expansion units.
- **Disk:** The number under the item is the count of total disk drives in the system.
- Host: The number under the item is the count of total host groups in the system.
- **Pool:** The number under the item is the count of total pools in the system.
- Volume: The number under the item is the count of total volumes in the system.



4.1.5. Performance Graphs



The **Performance Graphs** pane displays the performance charts in real time.

Figure 4-6 Performance Graphs in the Dashboard

The performance graphs include the Latency, IOPS, and Bandwidth graphs.

- Latency: The Latency graph displays the average time it takes the array to process a read, write, or read+write I/O request. The blue line represents the average read time, measured in milliseconds; it takes the array to perform a read I/O operation. The green line represents the average write time, measured in milliseconds; it takes the array to perform a write I/O operation. The dotted gray line represents the average read+write time, also measured in milliseconds; it takes the array to perform a read+write I/O operation.
- **IOPS:** The IOPS (Input/output Operations Per Second) graph displays host I/O requests processed per second by the array. The counts request per second, regardless of how much data is transferred in each. The blue line represents the number of read requests processed per second. The green line represents the number of write requests processed per second. The dotted gray line represents total read+write requests processed per second.
- **Bandwidth:** The Bandwidth graph displays the number of bytes transferred per second to and from all hosts. The data is counted to reflect what is transferred over the storage network. The blue line represents the number of bytes read per second. The green line



represents the number of bytes written per second. The dotted gray line represents the number of bytes read+written per second.

The performance graphs display the performance metrics in real time along with a scrolling graph; the incoming data appears along the right side of each graph as older numbers drop off the left side. Click the I/O Type drop-down arrow in the bottom-left corner of the window to filter the performance metrics of read, write, or read+write. By default, the performance graphs display performance metrics for the past 1 hour. Click the Zoom drop-down arrow in the bottom-right corner of the window to view performance metrics from as recent as 1 hour to as far back as 1 year. Drag the Range buttons to further narrow the view to a specific range of time.



Figure 4-7 Performance Indicator in the Dashboard



Hover your mouse over the line and click to display the point-in-time performance indicator. It shows the detailed number of read, write, and read+write. Clicking the "x" on the upper right corner will turn off the indicator.

INFORMATION:

The performance graphs present the information as the following.

- The performance graphs are updated once every 1 minute.
- The performance graphs display up to 1 year's worth of historical data.

4.2. Introduce QSLife Functions

QSLife (QSAN SSD Life) is based on a specific algorithm to decrypt the attributes within the SSD to display detailed information. SSD has become the basic usage of the storage system as a mature and reliable data protection device. However, with the rapid growth in data storage capacity demand and the emergence of higher performance applications in recent years, SSDs have gradually exposed their flaws.



SSDs today are almost universally comprised of NAND flash, which wears out with use. Each flash memory cell can only be written specific times before it becomes unreliable. As the number of I/O increases, the number of SSDs writes also increases significantly. This is one of the toughest issues in enterprise storage management today. In the past few days when SSDs were only written from 10GB to 100GB, the lifespan of SSDs was not a problem without special attention. However, as daily writes grow to hundreds of gigabytes or even terabytes, SSD's remaining life management will be one of the major issues in storage management.



This section will describe the operations of checking SSDs' status and the threshold settings. Click the **QSLIfe icon** to popup a window.



Figure 4-10 QSLife Popup Window

4.2.1. Check Life Remaining of SSD

Select the **QSLife Settings** function menu in the **QSLife** popup window. It will go to **QSLife Settings** function tab which is used to monitor and optimize SSD performance and longevity. Here is an example of checking the life remaining of the SSD.

1. Select a unit at the Array function submenu. It will scan and display all SSDs of this unit.



| ₩ QSLife | | | | \geq |
|----------|---------------------------|----------------|----------|--------|
| | QSLife Settings SSD Usage | Alert Settings | | |
| Array | | | | |
| Head | | Model Name | XCubeFAS | |
| | | Slot | Slot 1 v | |
| | | SSD Health | Normal | |
| | | Life Remaining | 96 % | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Figure 4-11 QSLife Settings

2. Select an SSD which you want to watch in **Slot**, the system will display the health status and the life remaining of the SSD. It is highly recommended to replace the SSD if the life remaining is under 10%.

4.2.2. Check SSD Usage

Select the **SSD Usage** function tab in the **QSLife** to be used to monitor the SSD usage status and history. With this information, we can easily estimate the actual DWPD required for a more accurate procurement strategy. Here is an example of checking the SSD usage.

1. Select a unit at the Array function submenu. It will scan and display all SSDs of this unit.





Figure 4-12 SSD Usage Step 1

2. Select an SSD which you want to watch in **Slot**, the system will display the SSD usage information. It includes a usage history of up to 1 year for analyzing the actual usage of your business.



| 🚎 QSLife | | | \times |
|----------|--------|---|----------|
| | | QSLife Settings SSD Usage Alert Settings | |
| Array | Slot | | |
| HEAD | Slot 1 | Model Name XCubeFAS | |
| | Slot 2 | Total Read 27663290 MB | |
| | Slot 3 | Written 45416784 MB | |
| | Slot 4 | Average Written | |
| | Slot 5 | 1 week ~ 156536.48 MB | |
| | Slat 6 | 70000 MB | |
| | 3101 0 | 60000 MB | |
| | | 50000 MB | |
| | | 40000 MB | |
| | | 30000 MB | |
| | | 20000 МВ | |
| | | | |
| | | 0 MB 11/1/2018, 14:52:50 11/2/2018, 12:54:30 11/3/2018, 10:55:20 11/4/2018, 08:57:00 11/5/2018, 17:59:30 | |
| | | I/O Type R&W - OZoom 1 day | |

Figure 4-13 SSD Usage Step 2

3. It displays the **Total** read and written bytes of the SSD from the beginning.

Options on SSD Usage

- **Average Written:** The period of average written can be changed to display the current average written bytes. The options are average 1 week, 1 month, and 1 year.
- **I/O Type:** The I/O type of the SSD usage can be changed in the diagram for a different viewpoint. The options are Read, Written, and R&W (Read & Written).
- **Zoom:** The period of the SSD usage can be changed in the diagram to watch the usage in the different period. The options are 1 day, 1 week, 1 month, and 1 year.

4.2.3. Alert Settings

Select the **Alert Settings** function tab in the **QSLife** to be used to learn SSD usage effectively with custom notifications. User can customize the SSD endurance threshold settings at this page. Here is an example of setting the SSD alert.



| == QSlife | | | | | > | < |
|----------------------------|------------------------|--|-----------|----------------|---|---|
| | | QSLife Settings | SSD Usage | Alert Settings | | |
| An alert message is obtain | ed when the SSD life d | lrops by a certain percenta | age. | | - | |
| | | | | | | |
| 0 | 0 | 0 | | | | |
| Information | 50 % | Take no action | | | | |
| | (| Alert by decreasing ev | ery 10% | | | |
| 🛕 Warning | 30 % 4 | Alert by decreasing every | | | | |
| | | 010 % 💿 5 % | | | | |
| Error | 10 % 4 | Alert by decreasing every | | | | |
| | | 5% 💽 1% | | | | |
| Canad | | | | | | |
| Cancer | | | | | | |
| | | | | | | |

Figure 4-14 Alert Settings

- There are three levels of the alert can be set. The options include Information, Warning, and Error. Drag the dot on the slide bar or enter the percentages of the SSD endurance thresholds. The actions can also be changed at every alert level.
- 2. Then press the **Apply** button to confirm your configurations.

If you use the default alert settings, the Information level sets 50% and the option sets **Alert by decreasing every 10%**, you will receive the notifications when the life remaining of every SSD reaches 50%, 40%, and 30% in the **Information** level. Alert by decreasing every **5%** during 30% to 10% in the **Warning** level. Finally, you may receive the notifications by decreasing every **1%** in the **Error** level. The purpose is to keep you informed that the SSD should be replaced during the life remaining counts down.



Storage Tab 5.

The Storage tab manages the storage pools. It displays the storage pool status, configures the storage pool, and takes snapshots. This chapter describes the details of storage management operations and examples.



INFORMATION:

For the storage technologies of RAID, storage pool, volume, and LUN mapping, please refer to the chapter 8, Storage Management in the QSAN Software Manual SANOS 4.0.

5.1. **Configure Storage Pools**

Select the Storage tab to manage the storage pools. In this tab, you can create, modify, delete, or view the status of all pools.



5.1.1. Create a Pool

We design smart storage wizards for deployment in a few clicks, and also provide recommend configurations to set up quickly. Here is an example of creating a thick provisioning pool with 3 disks configured in RAID 5. At the first time of creating a thick provisioning pool, it contains a disk group and the maximum quantity of disk in a disk group is 64.



1. Click the + icon in the **Pools** pane to pop up a wizard.



Figure 5-2 Create a Pool Step 1-1

2. Click the + icon to select disks to add into the pool.

| Select [| Disks to , | Add | | | |
|--------------|------------|--------------|------------------|-------------|-------------|
| Enclosure ID | 0 (Head Un | iit: XF2026) | ~ | | 6 items |
| | ! Slot | Capacity | Disk Type | Manufacture | Model |
| | • 1 | 372GB | SAS SSD 12.0Gb/s | SEAGATE | ST400FM0053 |
| | • 2 | 372GB | SAS SSD 12.0Gb/s | SEAGATE | ST400FM0053 |
| | • 3 | 744GB | SAS SSD 12.0Gb/s | SEAGATE | ST800FM0173 |
| | • 4 | 744GB | SAS SSD 12.0Gb/s | SEAGATE | ST800FM0173 |
| | • 5 | 744GB | SAS SSD 12.0Gb/s | TOSHIBA | PX05SMB080 |
| | 6 | 744GB | SAS SSD 12.0Gb/s | TOSHIBA | PX05SMB080 |
| | | | | | < 1 / 1 > |
| | | | | | Cancel |

Figure 5-3 Select Disks to Add

3. Check disk slots which you want to add. The maximum quantity of disk in a disk group is 64. Select an **Enclosure ID** from the drop-down list to select disks from expansion enclosures. Then click the **Add** button to continue.

| • | 0 | | 0 | ~ |
|-----------------|-------------|------------|--------------------------|--------|
| Pool | Volume | | Host | Finish |
| elected Slots | | | | |
| | 0 / 3 items | Pool Name | Pool_01 | |
| Enclosure ID: 0 | | Deal Trees | | |
| Slot 3 | 744GB | Роог Туре | Thick Provisioning | ~ |
| Slot 4 | 744GB | RAID Level | RAID 5 | ~ |
| Slot 5 | 744GB | C | | |
| | | Spares | | ~ |
| | | Subgroups | | × ? |
| | | | Actual Capacity: 1488 Gi | 3 |
| | | | Spare Capacity: - | |
| | | | | |
| | | | | |
| | | | | |

Figure 5-4 Create a Pool Step 1-2

OSAN

- 4. The selected disk slots are listed in the box and can be removed. Check disk slots which you want to remove and then click the ___ button.
- The recommended Pool Name, Pool Type, and RAID Level are provided. Enter a new Pool Name if necessary. The maximum length of the pool name is 16 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
- 6. Change the **Pool Type** with the drop down options. There are Thick Provisioning, and Thin Provisioning options.
- 7. The recommended **RAID Level** depends on the number of disks you select. The same, it can be changed with the drop down options.
- 8. Select the RAID EE **Spares** if you select the RAID EE level. Select the **Subgroups** if you select the compound RAID level.
- 9. Click the **Next** button to continue.



| Create Pool | | | |
|------------------|--------------|--------------|------------------|
| • | | 0 | ~ |
| Pool | Volume | Host | Finish |
| Volume Name | Volume_01 | | |
| Multiple Volumes | | | |
| Quantity | 2 | | |
| Capacity per Vol | 100 GB ~ | Max: 1339 GB | |
| Block Size | 4096 v Bytes | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | Cancel Back Next |

Figure 5-5 Create a Pool Step 2

- 10. The recommended **Volume Name**, **Capacity per Vol**, and **Block Size** are provided. Enter a new **Volume Name** if necessary. The maximum length of the volume name is 32 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
- 11. Check the **Multiple Volumes** checkbox if you want to create multiple volumes at once. Then enter a number for **Quantity**. The maximum quantity is 64.
- 12. The recommended **Capacity per Vol** is the maximum capacity which can be created. Change it if necessary. At this time, change it to 100GB.
- 13. Change the **Block Size** with the drop down options. The options are 512 Bytes to 4,096 Bytes.
- 14. Click the **Next** button to continue.



TIP:

The system automatically reserves 10% of the pool capacity for snapshot space.

| reate Pool | | | |
|--------------------------|----------------------|------|-------------------|
| Pool | Volume | Host | Finish |
|) Forbid All Connections | | | |
| Selected Host Group | Allowed Host Group V | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | Ca | ncel Back App |

Figure 5-6 Create a Pool Step 3

OSAN

- 15. If there are host groups which are created already, check the **Selected Host Group** checkbox and select a host group with the drop down options. Or keep it default as **Forbid All Connections** and change it later.
- 16. Click the **Apply** button to continue.



| Create Pool | | | |
|--------------------|-----------|------|--------|
| Pool | Volume | Host | Finish |
| Results | | | |
| Overall Status | 📀 Success | | |
| Details | | | |
| Create Pool | Success | | |
| Create Volume | Success | | |
| Connect Host Group | Success | | |
| | | | |
| | | | Close |

Figure 5-7 Create a Pool Step 4

17. There is a result page. Click the **Close** button to finish.



| Pool | Pool_01 | ٥ | | |
|----------|--------------------------------|--------------------------|--------|---|
| Capacity | 0.09 T | B / 1.45 TB | | 6% Used |
| | Health Status Controller | Good Online CTRL 1 | | Actual Space 1489 GB Available Space 1389 GB Provisioning Type Thick Provisioning |
| | Disk Grou | ps | | ~ |
| ())) | Volumes | | | ^ |
| | | | | 1 items 💿 🥛 🕂 |
| | ! \ | Volume Name | Status | Snapshot Space |
| | • • | Volume_01 🏟 | Online | 0 MB/0 MB |
| 4 | | | | < 1 / 1 > |

Figure 5-8 A Pool is Created

18. A pool with a volume has been created. If necessary, click the + icon in the **Pools** pane to create others.

5.1.2. List and Configure Pools

All pools are listed in the **Pools** pane. You can click one of them to display the details.

| Pools | | |
|-------------------------|----------------|---|
| | | + |
| Pool_01 | | |
| • Pool_02 Figure 5-9 | List All Pools | |



A thick provisioning pool and a thin provisioning pool are shown here.

| Pool | Pool_01 ° | 5 | | | |
|----------|---|--------------------------|------------------|---|---|
| Capacity | 0.09 TB | / 1.45 TB | | 6% Used | |
| | Health Status | Good | | Actual Space Available Space | 1489 GB 1389 GB |
| | Controller | CTRL 1 | | Provisioning Type | Thick Provisioning |
| Figure : | 5-10 Thic Pool_02 © | k Provisioning I | Pool Details | | |
| Capacity | 0 TB / 0.36 | тв | | 0% Used | |
| | 0 TB / 0.09 TB | | Actual / Virtual | | |
| | Health | Good | | Actual Space | 372 GB |
| | Status | Online | | Available Space | 370 GB |
| | Controller | CTRL 1 | | Provisioning Type | e Thin Provisioning |
| Capacity | 0 TB / 0.36 0 TB / 0.09 TB Health Status Controller | Good Online CTRL 1 | Actual / Virtual | 0% Used Actual Space Available Space Provisioning Type | 372 GB 370 GB e Thin Provisioning |

Figure 5-11 Thin Provisioning Pool Details

This table shows the pool descriptions.

| Column Name | Description |
|-------------|--|
| Pool | The pool name. |
| Capacity | The bar color: |
| | Green Bar: Fewer than 90% used space. |
| | Orange Bar: 90% ~ 100% used space. |
| | • Red Bar: 100% used space. |
| | The number in the bar: |
| | Used space / Actual space |
| | The 2nd bar is only visible when the pool type is thin provisioning: |
| | Actual used space / Virtual space |
| Health | The health of the pool: |
| | Good: The pool is good. |
| | Abnormal: The pool is unhealthy and incomplete. The cause may |

| Table 5-1 | Pool Column | Descriptions |
|-----------|-------------|--------------|
| Table 5-1 | | Descriptions |



| | be a disk loss or failure. |
|-----------------|---|
| | Warning: The pool has failed. |
| Status | The status of the pool: |
| | Online: The pool is online. |
| | Offline: The pool is offline. |
| | Rebuilding: The pool is being rebuilt. |
| | Migrating: The pool is being migrated. |
| | Relocating: The pool is being relocated. |
| | • EE Rebuilding: The pool is being RAID EE rebuilt. |
| Controller | The current running controller of the pool. |
| Actual Space | Total capacity of the pool. |
| Available Space | Available capacity of the pool. |
| Provisioning | The provisioning type of the pool: |
| Туре | Thick Provisioning. |
| | Thin Provisioning. |

Click the ⁽²⁾ icon beside the pool name to list the drop down options. These options are available in the pool.

| Pool | Pool_ | 01 | • |
|----------|--------|-----|----------------------------|
| Capacity | | | Delete |
| | | 0.0 | Disk Properties |
| | | | Deactivate |
| | Uselth | | Change Prefered Controller |
| | Status | | Verify Parity |
| Figure | 5-12 | Poo | ol Options |

· ·

Delete

Click the **Delete** option to delete the pool. Click the **Apply** button to confirm and delete.





Disk Properties

1. Click the **Disk Properties** option to change disk properties of the pool.

| | Disk Properties |
|----------------------|-----------------|
| Disk Write Cache | |
| Disk Read-ahead | ON ON |
| Disk Command Queuing | ON ON |
| | |
| | Cancel Apply |

Figure 5-13 Change Disk Properties

- 2. Click the switch to turn ON (Enable) or OFF (Disable).
 - **Disk Write Cache**: Enabling the disk write cache will improve write I/O performance but have a risk of losing data when power failure.
 - Disk Read-ahead: When enabling the disk read-ahead, the system will preload data to disk buffer based on previously retrieved data. This feature will efficiently improve the performance of sequential data retrieved.
 - **Disk Command Queuing**: When enabling the disk command queuing, the system will send multiple commands to a disk at once to improve performance.
- 3. After change the disk properties, click the **Apply** button to take effect.

Activate or Deactivate

Click the **Activate** or **Deactivate** option to activate or deactivate the pool. Click the **Apply** button to confirm.

TIP:

These options are usually used for online disk roaming. Deactivate can be executed when the status is online. Conversely, activate can be executed when the pool status is offline.



Change Preferred Controller

1. Click the **Change Preferred Controller** option to change the pool ownership to the other controller.

| | Change Prefered Controller |
|-----------------|----------------------------------|
| Preferred Owner | Controller 1 |
| | O Controller 2 |
| | |
| | Cancel Apply |

Figure 5-14 Change Preferred Controller

2. Select **Controller 1** or **Controller 2**, and then click the **Apply** button to take effect.

Thin Provisioning Policy (Only visible when the pool type is thin provisioning)

1. Click the **Thin Provisioning Policy** option to change policy of the thin provisioning pool.

| No. | Threshold | Alert Level | | Action |
|-----|-----------|-------------|------|-------------------------|
| 1 | 60% | Informatio | in v | Take no Action 🗸 |
| 2 | 70% | Informatio | in V | Take no Action 🗸 |
| 3 | 80% | Informatio | in V | Take no Action 🗸 |
| 4 | 85% | Warning | ~ | Reclaim Space 🗸 |
| 5 | 90% | Warning | ~ | Delete Snapsh \vee |
| 6 | 95% | Warning | ~ | De-activate pool \vee |

Figure 5-15 Change Thin Provisioning Policy

2. There are 6 levels of threshold percentage and the default values defined. The event log levels and actions can be changed when the usage of the pool capacity reaches the threshold.



3. After change the thin provisioning policies, click the **Apply** button to take effect.

Verify Parity

Click the **Verify Parity** option to regenerate parity for the pool. Click the **Apply** button to confirm and proceed.



INFORMATION:

It supports RAID level 3, 5, 6, 30, 50, 60 and RAID EE level 5EE, 6EE, 50EE, 60EE.

5.1.3. List and Configure Disk Groups

Click the **Disk Groups** pane to list all disk groups in the pool.

| Pool | Pool_01 | ¢ | | | | |
|----------|--------------------------------|--------------------------|---------|---|--|--|
| Capacity | 0.09 TI | B / 1.45 TB | | 6% Used | | |
| | Health Status Controller | Good Online CTRL 1 | | Actual Space 1489 GB Available Space 1389 GB Provisioning Type Thick Provisioning | | |
| | Disk Grou | ps | | 1 items 📋 🕂 | | |
| | 1 ! | No. | Total | | | |
| | • 1 | ٥ | 1489 GB | | | |
| 4 | | | | < 1 / 1 > | | |
| 0)) | Volumes | | | ~ | | |

Figure 5-16 List Disk Groups



This table shows the disk group descriptions.

| Table 5-2 Disk | Group Column Descriptions | | | | | |
|----------------|--|--|--|--|--|--|
| Column Name | Description | | | | | |
| ! | The status of the disk group: | | | | | |
| | • Green Color / Normal: The disk group is good. | | | | | |
| | • Orange Color / Abnormal: The pool is unhealthy and incomplete. | | | | | |
| | The cause may be a disk loss or failure. | | | | | |
| | Red Light / Warning: The disk group has failed. | | | | | |
| No. | The number of the disk group. | | | | | |
| Total | Total capacity of the disk group. | | | | | |
| Disks | The quantity of disk drives in the disk group. | | | | | |
| RAID | The RAID level of the disk group. | | | | | |

The options are available in this pane.

Add a Disk Group

Here is an example to add a disk group.

1. Click the + icon in the **Disk Groups** pane to pop up a window.



| Create Disk Group | | | |
|--|------------|---|------------|
| Selected Slots | | | |
| Please select at least one disk | | | |
| The maximum quantity of disk in a disk group is 64 | | | |
| 0 items | RAID Level | · · · · · · · · · · · · · · · · · · · | · |
| | Spares | | · |
| | Subgroups | | . 2 |
| | <u> </u> | | |
| | | Actual Capacity: - Spare Capacity: - | |
| | | opure oupdoity. | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| + - | | | |
| | | | |
| | | | ncel Applu |
| | | L'a | Apply |

Figure 5-17 Create Disk Group

2. Click the + icon to select disks to add into the disk group

| Select Disks to Add | | | | | | | | | |
|---------------------|---------|-------------|----------|------------------|-------------|------------|--|--|--|
| Enclosure | ID 0 (H | ead Unit: X | F2026) | × | | 1 itama | | | |
| | Į. | Slot | Capacity | Disk Type | Manufacture | Model | | | |
| | • | 6 | 744GB | SAS SSD 12.0Gb/s | TOSHIBA | PX05SMB080 | | | |
| | | | | | | < 1 > | | | |
| | | | | | | Cancel | | | |

Figure 5-18 Select Disks to Add



3. Check disk slots which you want to add. The maximum quantity of disk in a disk group is 64. Select an **Enclosure ID** from the drop-down list to select disks from expansion enclosures. Then click the **Add** button to continue.

| Create Disk Grou | p | | | |
|---|------------------------------|------------|--|------------|
| Selected Slots Please select at least one dis The maximum quantity of dis | k k in a disk group is 64 | | | |
| | 1 items | RAID Level | RAID 0 | |
| Enclosure ID: 0 | | Spares | | |
| Slot 6 | 744GB | Cubanana | | |
| | | Subgroups | `````````````````````````````````````` | . 3 |
| + - | | | Actual Capacity: 745 GB Spare Capacity: - | |
| | | | | |
| | | | Ca | ncel Apply |

Figure 5-19 Create Disk Group

- 4. The selected disk slots are listed in the box and can be removed. Check disk slots which you want to remove and then click the ____ button.
- 5. The recommended **RAID Level** depends on the number of disks you select. It can be changed with the drop down options.
- 6. Select the RAID EE **Spares** if you select the RAID EE level. Select the **Subgroups** if you select the compound RAID level.
- 7. Click the **Apply** button to add a disk group.



| II Disk Gro | oups | | ^ |
|-------------|------|---------|-------------|
| | | | 2 items 📋 🕂 |
| . ! | No. | Total | |
| • | 10 | 1489 GB | |
| • | 2 💠 | 744 GB | |
| 4 | | | • |
| | | | < 1 / 1 > |

Figure 5-20 List Disk Groups

8. A disk group has been created. If necessary, click the + icon in the **Disk Groups** pane to create others.

Delete Disk Groups

1. Check the disk group checkboxes which you want to delete.

| III Disk | Groups | | ^ |
|----------------|--------|---------|-------------|
| | | | 2 items 📋 🕂 |
| - - - 1 | No. | Total | |
| • | 1 🕸 | 1489 GB | |
| • | 2 🌣 | 744 GB | |
| 4 | | | • |
| | | | < 1 / 1 > |

Figure 5-21 Delete Disk Groups

2. Click the icon to continue. Then click the **Apply** button to confirm and delete.





CAUTION:

If the pool contains only one disk group, it cannot be deleted. If the disk group is being used and not empty, it also cannot be deleted.

Click the concerning the number of the disk group to list the drop down options. These options are available in the disk group.

Disk Groups



Figure 5-22 Disk Group Options

Disk Information

1. Click the **Disk Information** option to display the disk information in the disk group.

| Disk Information | | | | | | | | |
|------------------|------|--------------|----------|--------|----------------------|-------------|-------------|--|
| | | | | | | | 3 items | |
| ! | Slot | Enclosure ID | Capacity | Status | Disk Type | Manufacture | Model | |
| • | 3 | 0 | 744 GB | Online | NL-SAS SSD 12.0Gb/s. | SEAGATE | ST800FM0173 | |
| • | 4 | 0 | 744 GB | Online | NL-SAS SSD 12.0Gb/s. | SEAGATE | ST800FM0173 | |
| • | 5 | 0 | 744 GB | Online | NL-SAS SSD 12.0Gb/s. | TOSHIBA | PX05SMB080 | |
| | | | | | | | 1 / 1 > | |
| | | | | | | | Close | |

Figure 5-23 Disk Information



This table shows the disk descriptions.

| able 5-3 Disk Column Descriptions | | | | | |
|-----------------------------------|--|--|--|--|--|
| Column Name | Description | | | | |
| ! | The status of the disk: | | | | |
| | Green Color / Normal: The disk drive is good. | | | | |
| | • Orange Color / Abnormal: S.M.A.R.T. error alerts or the disk drive | | | | |
| | has unrecoverable read errors. | | | | |
| | Red Color / Warning: The disk drive has failed. | | | | |
| Slot | The position of the disk drive. | | | | |
| Enclosure ID | The enclosure ID. | | | | |
| Capacity | The capacity of the disk drive. | | | | |
| Status | The status of the disk drive: | | | | |
| | Online: The disk drive is online. | | | | |
| | Missing: The disk drive is missing in the pool. | | | | |
| | Rebuilding: The disk drive is being rebuilt. | | | | |
| | • Transitioning: The disk drive is being migrated or is replaced by | | | | |
| | another disk when rebuilding occurs. | | | | |
| | Scrubbing: The disk drive is being scrubbed. | | | | |
| | • Check Done: The disk drive has been checked the disk health. | | | | |
| | Copying Back: The disk drive is being copied back. | | | | |
| Disk Type | The type of the disk drive: | | | | |
| | • [SAS HDD NL-SAS HDD SAS SSD SATA SSD] | | | | |
| | • [12.0Gb/s 6.0Gb/s 3.0Gb/s 1.5Gb/s] | | | | |
| Manufacturer | The manufacturer of the disk drive. | | | | |
| Model | The model name of disk drive. | | | | |

2. Click the **Close** button to close the window.

Migrate Disk Group (Only visible when the pool type is thick provisioning)

Here is an example to migrate the disk group to RAID 6.

1. Click the **Migrate Disk Group** option to pop up a window.



| ected Slots ceptable minimum slot is 3 e maximum quantity of dis | 3, total capacity cant't be lowe k in a disk group is 64 | r than 1489 GB. | | | |
|--|---|-----------------|---|------|---|
| | 0 / 3 items | RAID Level | RAID 0 | ~ | |
| Enclosure ID: 0 | | Spares | 0 | ~ | |
| Slot 3 | 744GB | | | | |
| Slot 4 | 744GB | Subgroups | 1 | × . | ? |
| Slot 5 | 744GB | | Actual Capacity: 223 Spare Capacity: - | 5 GB | |
| + - | | | | | |

Figure 5-24 Migrate Disk Group

2. Click the + icon to select disks to add into the disk group

| Select | Dis | ks to A | dd | | | |
|-------------|------|--------------|-----------|------------------|-------------|------------|
| Enclosure I | ID 0 |) (Head Unit | : XF2026) | × | | 1 items |
| | ļ | Slot | Capacity | Disk Type | Manufacture | Model |
| | • | 6 | 744GB | SAS SSD 12.0Gb/s | TOSHIBA | PX05SMB080 |
| | | | | | | < 1 / 1 → |
| | | | | | | Cancel |

Figure 5-25 Select Disks to Add


 Check disk slots which you want to add. The maximum quantity of disk in a disk group is 64. Select an Enclosure ID from the drop-down list to select disks from expansion enclosures. Then click the Add button to continue.

| ected Slots ceptable minimum slot is 3 e maximum quantity of dis | 8, total capacity cant't be lowe k in a disk group is 64 | r than 1489 GB. | | | |
|--|---|-----------------|--------------------|--------|---|
| | 0 / 4 items | RAID Level | RAID 6 | ~ | |
| Enclosure ID: 0 | 74468 | Spares | | ~ | |
| Slot 4 | 744GB | Subgroups | | ~ | ? |
| Slot 5 | 744GB | | Actual Canacity: 1 | 488 GB | |
| Slot 6 | 744GB | | Spare Capacity: - | 400 00 | |
| | | | | | |
| | | | | | |
| | | | | | |
| + -) | | | | | |

Figure 5-26 Migrate Disk Group

- 4. The selected disk slots are listed in the box and can be removed. Check disk slots which you want to remove and then click the ____ button.
- 5. Select the **RAID Level** which you want to migrate with the drop down options.
- 6. Select the RAID EE **Spares** if you select the RAID EE level. Select the **Subgroups** if you select the compound RAID level.
- 7. Click the **Apply** button to migrate the disk group.

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TIP:

There are some operation limitations when a pool is being migrated.

- The capacity after migration must be larger than the current capacity.
- A traditional RAID level can be migrated to RAID EE level, but RAID EE level can be migrated to RAID EE level only.

TIP:

There are some operation limitations when a pool is being migrated. The System would reject these operations:

- Add dedicated spare.
- Remove a dedicated spare.
- Create a new volume.
- Delete a volume.
- Extend a volume.
- Scrub a volume.
- Perform another migration operation.
- Scrub entire pool.
- Take a snapshot.
- Delete a snapshot.
- Expose a snapshot.
- Rollback to a snapshot.



TIP:

Pool migration cannot be executed during rebuilding or volume extension.

Replace Disk Group (Only visible when the pool type is thin provisioning) Here is an example to migrate the disk group to RAID 6.

1. Click the **Replace Disk Group** option to pop up a window.



| Replace Disk | Group | |
|--------------------------------------|---|---|
| Selected Slots Acceptable minimum | slot is 1 total capacity cant't be lower than 372 | GB |
| The maximum quantit | y of disk in a disk group is 64 | |
| | 0 / 0 items | Actual Capacity: - Spare Capacity: - |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| + - | | |
| | | Cancel |

Figure 5-27 Replace Disk Group

2. Click the + icon to select disks to add into the disk group

| Select D | isk | ks to A | dd | | | |
|--------------|-----|-----------|-----------|------------------|-------------|-------------|
| Enclosure ID | 0 (| Head Unit | : XF2026) | ~ | | 2 itema |
| | ! | Slot | Capacity | Disk Type | Manufacture | Model |
| | • | 2 | 372GB | SAS SSD 12.0Gb/s | SEAGATE | ST400FM0053 |
| | | 6 | 744GB | SAS SSD 12.0Gb/s | TOSHIBA | PX05SMB080 |
| | | | | | | < 1 / 1 > |
| | | | | | | Cancel |

Figure 5-28 Select Disks to Add



3. Check disk slots which you want to add. The maximum quantity of disk in a disk group is 64. Select an **Enclosure ID** from the drop-down list to select disks from expansion enclosures. Then click the **Add** button to continue.

| elected Slots cceptable minimum slot is 1, total capacity cant't be lower than 372 GB. | | | | |
|---|-------|-------------------|--|--|
| The maximum quantity of disk in a disk group is 64 0 / 1 items Actual Capacity: 372 GB | | | | |
| Enclosure ID: 0 | | Spare Capacity: - | | |
| Slot 2 | 372GB | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| + -) | | | | |

Figure 5-29 Replace Disk Group

- 4. The selected disk slots are listed in the box and can be removed. Check disk slots which you want to remove and then click the ____ button.
- 5. Click the **Apply** button to replace the disk group.

5.1.4. List and Configure Volumes

Click the **Volumes** pane to list all volumes in the pool.



| S Volume | es | | | ^ |
|----------|-------------|--------|----------------|---------------|
| | | | | 1 items 🚺 🧻 🕂 |
| . ! | Volume Name | Status | Snapshot Space | Capacity |
| • | Volume_01 🏟 | Online | 0 MB/0 MB | 150 GB |
| • | | | | • |
| | | | | < 1 / 1 > |

Figure 5-30 List Volumes

This table shows the volume descriptions.

| Table 5-4 Volui | me Column Descriptions |
|-----------------|---|
| Column Name | Description |
| ! | The status of the disk group: |
| | Green Color / Normal: The volume is good. |
| | • Orange Color / Abnormal: The pool is unhealthy and incomplete. |
| | The cause may be a disk loss or failure. |
| | Red Light / Warning: The disk group has failed. |
| Volume Name | The volume name. |
| Status | The status of the volume: |
| | Online: The volume is online. |
| | Offline: The volume is offline. |
| | Erasing: The volume is being erased. |
| | Initiating: The volume is being initialized. |
| | Rebuilding: The volume is being rebuilt. |
| | Migrating: The volume is being migrated. |
| | Rollback: The volume is being rolled back. |
| | Parity Checking: The volume is being parity check. |
| | Relocating: The volume is being relocated. |
| | • EE Rebuilding: The volume is being RAID EE rebuilt. |
| Snapshot space | Used snapshot space / Total snapshot space. The first capacity is |
| | current used snapshot space, and the second capacity is reserved |
| | total snapshot space. |
| Capacity | Total capacity of the volume. |
| Usage (This | Total usage of the volume. |

Table F 1 . . . ~ . _ rinti

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| option is only | |
|-------------------|---|
| visible when the | |
| pool type is thin | |
| provisioning) | |
| Available (This | Total available space of the volume. |
| option is only | |
| visible when the | |
| pool type is thin | |
| provisioning) | |
| LUN | Display LUN (Logical Unit Number) or "-" as none. |
| Volume Type | The type of the volume: |
| | RAID Volume. |
| | Backup Volume. |
| Clone | The target name of the clone volume or "-" as none |
| Permission | The access right of the volume: |
| | |
| | • WT: Write Through. |
| | WT: Write Through. WB: Write Back. |

The options are available in this pane.

Create Volumes

Here is an example to create multiple volumes.

1. Click the + icon in the **Volumes** pane to pop up a window.



| Create Volume | | | |
|--------------------------------------|--------------|------------------|--------|
| • | | 0 | ~ |
| Volume | | Host | Finish |
| Volume Name | Volume_03 | | |
| Multiple Volumes | | | |
| Quantity | 3 | | |
| Capacity per Vol | 50 | GB V Max: 463 GB | |
| Block Size | 4096 v Bytes | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | Cancel |

Figure 5-31 Create Volumes Step 1

- The recommended Volume Name, Capacity per Vol, and Block Size are provided. Enter a new Volume Name if necessary. The maximum length of the volume name is 32 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
- 3. Check the **Multiple Volumes** checkbox. Then enter a number for **Quantity**. The maximum quantity is 64. At this time, change it to 3.
- 4. The recommended **Capacity per Vol** is the maximum capacity which can be created. Change it if necessary. At this time, change it to 50GB.
- Change the Block Size with the drop down options. The options are 512 Bytes to 4,096 Bytes.
- 6. Click the **Next** button to continue.



Figure 5-32 Create Volumes Step 2

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- 7. Check the **Selected Host Group** checkbox and select a host group which is created already with the drop down options. Or keep it default as **Forbid All Connections** and change it later.
- 8. Click the **Apply** button to continue.



| Create Volume | | | | | |
|--------------------|---------|------|--|--------|--|
| • | | • | | | |
| Volume | | Host | | Finish | |
| Results | | | | | |
| Overall Status | Success | | | | |
| Details | | | | | |
| Create Volume | Success | | | | |
| Connect Host Group | Success | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | Close | |

Figure 5-33 Create Volumes Step 3

9. There is a result page. Click the **Close** button to finish.

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| 9 V | olume | S | | | ^ |
|-----|-------|----------------|--------------------|----------------|---|
| | | | | 4 items 👩 🧻 | + |
| | ! | Volume Name | Status | Snapshot Space | |
| | • | Volume_01 🌣 | Online | 0 MB/0 MB | |
| | • | Volume_03 🏚 | Online | 0 MB/0 MB | |
| | • | Volume_03_02 🏟 | 🔅 Initiating - 21% | 0 MB/0 MB | |
| | • | Volume_03_03 🏟 | 🔅 Initiating - 0% | 0 MB/0 MB | |
| | | | | | • |
| | | | | < 1 / 1 | |

Figure 5-34 List Volumes

10. Multiple volumes have been created. If necessary, click the + icon in the **Volumes** pane to create others.

Delete Volumes

1. Check the volume checkboxes which you want to delete.

| | olumo | es | | ^ |
|----------|-------|----------------|--------|----------------|
| | | | | 4 items 💿 📋 🕂 |
| | ! | Volume Name | Status | Snapshot Space |
| | • | Volume_01 💠 | Online | 0 MB/0 MB |
| ~ | • | Volume_03 🌣 | Online | 0 MB/0 MB |
| ~ | • | Volume_03_02 🏟 | Online | 0 MB/0 MB |
| | • | Volume_03_03 🏟 | Online | 0 MB/0 MB |
| | | | | 4 |
| | | | | < 1 / 1 > |

Figure 5-35 Delete Volumes

2. Click the icon to delete.



| The volume you would like to delete already exists in the Host G removed from the group relationship at the same time. | roups or Portection Groups, this item will |
|---|--|
| How do you deal with the item you would like to delete? | Delete all |
| Volume 02 | |
| Volume_03_02 | н |
| Volume_03_03 | н |
| | |
| | |

Figure 5-36 Delete Volumes

3. If the volumes are already exists in the **Host Groups** or **Protection Groups**, it will display the above dialog asking you how to handle the items you would like to delete.



- P: The volume exists in the **Protection Groups**.
- P/H: The volume exists both in the Host Groups and Protection Groups.

Select the **Delete all** option will delete all volumes and remove them from the group relationships at the same time. Select the **Delete items that are not affected and retain the following items** option will delete the volumes which are "none" relationship only.

4. Click the **Apply** button to delete.

Take a Snapshot

1. Check the volume checkboxes which you want to take a snapshot.

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| € V | olum | es | | | ^ |
|-----|------|-------------|--------|------------------|---------------|
| | | | | | 1 items 🖸 📋 🕂 |
| | 1 | Volume Name | Status | Snapshot Space | Capacity |
| | • | Volume_02 🏟 | Online | 1.00 GB/20.00 GB | 100 GB |
| | | | | | • |
| | | | | | < 1 / 1 > |

Figure 5-37 Take a Snapshot

2. Click the 💿 icon; it will pop up a window.

| Take a Snapshot | |
|----------------------|--------------|
| Snapshot Name | |
| Snap_20181130_160654 | |
| | |
| | |
| | Cancel Apply |

- 3. The recommended **Snapshot Name** is provided. Enter a new **Snapshot Name** if necessary. The maximum length of the snapshot name is 32 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
- 4. Click the **Apply** button to take.



Click the \bigcirc icon beside the volume name to list the drop down options. These options are available in the volume.



| ! | Volume Nan | ne | | | | |
|---|------------|-------------------|--|--|--|--|
| • | Volume_02 | Volume_02 🌣 | | | | |
| | | Rename | | | | |
| | | Properties | | | | |
| | | Snapshot Center | | | | |
| | | Edit LUN | | | | |
| | | Extend Volume | | | | |
| | | Space Reclamation | | | | |

Figure 5-38 Volume Options

Rename

1. Click the **Rename** option to rename the volume.

| | Rename | |
|------|-----------|--------------|
| Name | Volume_02 | |
| | | |
| | | Cancel Apply |

Figure 5-39 Rename Volume

- 2. Enter a new **Volume Name**. The maximum length of the volume name is 32 characters. Valid characters are $[A \sim Z | a \sim z | 0 \sim 9 | <>]$.
- 3. Click the **Apply** button to rename.

Properties

1. Click the **Properties** option to change the volume properties.

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Figure 5-40 Change the Volume Properties

- 2. Volume advanced settings can be configured optionally.
 - **Priority**: The options are High, Medium, and Low. The priority compares to other volumes. Set it as High if the volume has many I/O.
 - **Background I/O Priority**: The options are High, Medium, and Low. It will influence volume initialization, rebuild, and migration.
 - Cache Mode: The options are Write-through Cache, Write-back Cache, and Read-only.
 Write-back optimizes the system speed but comes with the risk where the data may be inconsistent between cache and disks in one short time interval.
 - Volume Type: The options are RAID Volume and Backup Volume. RAID Volume is for general RAID usage and Backup Volume is for the target volume of local clone or remote replication.
 - Enable Video Editing Mode: Check to enable video editing mode function. It is optimized for video editing usage. Please enable it when your application is in video editing environment. This option provides a more stable performance figure without high and low peaks but slower in average.
 - **Enable Read-ahead**: Check to enable the read ahead function of volume. The system will discern what data will be needed next based on what was just retrieved from disk and then preload this data into the disk's buffer. This feature will improve performance when the data being retrieved is sequential.
- 3. After change the volume properties, click the **Apply** button to take effect.



Snapshot Center

About the snapshot center, please refer to the chapter 7.2.3, <u>Snapshot Center</u> section for more details.

Edit LUN

1. Click the **Edit LUN** option to change the LUN (Logical Unit Number).

| | | Edit LUN | |
|-----|---|----------|--------------|
| LUN | 0 | ~ | |
| | | | |
| | | | |
| | | | Cancel Apply |

Figure 5-41 Edit LUN

- 2. Select the LUN with the drop down options. The options are LUN 0 to LUN 254 except the LUNs which are occupied.
- 3. Click the **Apply** button to take effect.

group.



TIP: If the LUN cannot be edited, the volume must first be assigned to a host

Extend Volume

1. Click the **Extend Volume** option to extend the volume capacity.

| | Extend Volume | |
|----------|-------------------------------|--------------|
| Capacity | | |
| 150 | GB V Min: 100 GB Max: 1489 GB | |
| | | Cancel Apply |



Figure 5-42 Extend Volume

- 2. Enter a new **Capacity** number which you want to extend. There are minimum and maximum capacity numbers after the **Capacity** field.
- 3. Click the **Apply** button to extend.

Space Reclamation (Only visible when the pool type is thin provisioning) Click the **Space Reclamation** option to reclaim space from the volume when the volume is in a thin provisioning pool. Click the **Apply** button to confirm and proceed.

5.2. Hot Spares

The XEVO system sets all free disks as a global spare. If one disk drive of the pool fails or has been removed from any singly redundant RAID, the pool status will change to degraded mode. At the moment, the XEVO system will search the spare disk to execute pool/volume/data rebuild into a healthy RAID drive automatically.

5.3. Disk Roaming

Disks can be re-sequenced in the same system or move all member disks in the same pool from system-1 to system-2. This is called disk roaming. The system can execute disk roaming online. Please follow these steps.

- 1. Select the **Storage** tab, selects a pool. Click the [©] icon beside the pool name, and then click the **Deactivate** option.
- 2. Click the **Apply** button to apply. The Status changes to **Offline**.
- 3. Move all member disks of the pool to another system.
- 4. In the **Storage** tab, select the pool. Click the 🌣 icon beside the pool name, and then click the **Activate** option.
- 5. Click the **Apply** button to apply. The Status changes to **Online**.

Disk roaming has some constraints as described in the following.

- 1. Check the firmware version of two systems first. It is better for both systems to have the same firmware version or the firmware version of the system-2 is newer.
- 2. All physical disks of the pool should be moved from system-1 to system-2 together. The configuration of both pool and volume will be kept but LUN configuration will be cleared in order to avoid conflict with the current setting of the system-2.





CAUTION:

XCubeFAS series does NOT support disk roaming from XCbueSAN, AegisSAN LX, AegisSAN Q500, and AegisSAN V100.



6. Hosts Tab

The **Hosts** tab manages the host groups. It displays the host group status, configures the host profile and connected volumes. This chapter describes the details of host group management operations and examples.

6.1. Configure Host Groups

Select the **Hosts** tab to manage the host groups. In this tab, you can create, modify, delete, or view the status of all host groups.



6.1.1. Create a Host Group

Here is an example of creating a host group and connecting a volume.

1. Click the + icon in the **Host Groups** pane to pop up a wizard.



| Create Hos | st Group | | | | |
|------------------|------------------------|---------------------|------------------|-----------------|--------|
| • | | | | | ~ |
| Host | | | Port | | Volume |
| Group Name | HostGroup_001 | | | | |
| Protocol | iSCSI / IQN O FC / | WWN | | | |
| Add a New Host | IQN.0000-00.com.xxxxxx | x0000-000xx0000:dev | v0.ctr0 | Add to IQN List | |
| | | | | | |
| Select iSCS | I / IQNs | | | | |
| | | 0 item | | | 1 item |
| | | | | * | |
| | | | | | |
| | | | | | |
| | Not Found | | $\left[\right]$ | | |
| | | | _ | | |
| | | | | | |
| | | | | | |
| Remove Selected | Itams | | | | |
| Neriove Selected | nemo | | | | |
| | | | | | Cancel |

Figure 6-2 Create a Host Group Step 1-1

- The recommended Group Name is provided. Enter a new Group Name if necessary. The maximum length of the pool name is 32 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
- 3. Select the **Protocol** for **iSCSI / IQN** or **FC / WWN**.



INFORMATION:

The **FC / WWN** will appear only when the system has a fibre channel host card installed.



- If selecting the iSCSI/ IQN option, you can add an IQN for access control. Enter a host IQN in Add a New Host, and then click the Add to IQN List button. It will be added to the Select iSCSI / IQNs box.
- 5. If necessary, add another host IQN.

| mosť | | Port | Volume |
|--|--|---------------------|--------|
| iroup Name 'rotocol .dd a New Host | HostGroup_001 ISCSI / IQN FC / WWN IQN.0000-00.com.xxxxxx0000- | 000xx0000:dev0.ctr0 | |
| Select iSCS | I / IQNs | 1/2 items | 1 item |
| iqn.1991-0 | 5.com.microsoft:server1 | * | |
| iqn.1991-0 | 5.com.microsoft:server2 | | |
| | | | |
| | | < | |

Figure 6-3 Create a Host Group Step 1-2

- 6. The **Select iSCSI / IQNs** boxes are divided into two sides. The left side is an ineffective list, and the right side is effective.
- 7. Select the IQN and click the button to move it from the left side to the right side.



| Create Hos | st Group | | | |
|--|--|-----------------------------------|---------------------|------------------|
| Host | | | Port | Volume |
| Group Name Protocol Add a New Host | HostGroup_001 iSCSI/IQN FC/Wi IQN.0000-00.com.xxxxxxx00 | //N 00-000xx0000:dev0.c | tr0 Add to IQN List | |
| Select iSCS | I / IQNs | 2 items | | 1 item |
| * | | | iqn.1991-05.com.mi | icrosoft:server1 |
| iqn.1991-0 | 5.com.microsoft:server2 | | | |
| | | | | |
| | | | | |
| | | | | |
| Remove Selected | ltems | | | |
| | | | | |

Figure 6-4 Create a Host Group 1-3

8. At the same time, the wide card "*" will be move to the left side automatically.



INFORMATION:

The wide card "*" means the host group can be accessed by all hosts without access control. A conflict occurs when a dedicated host or all hosts can access it.

9. If the created IQNs are wrong or unuseful, select the IQNs and click the **Remove Selected Items** to remove from the list.



10. If selecting the **FC / WWN** option, the automatically detected host FC / WWNs are listed in the **Select FC / WWN** box. Select the WWNs and click the button or the subtron to make them effective or not.

| • | | 0 | ~ |
|--|--------------|----------------------------------|--------|
| Host | | Port | Volume |
| iroup Name HostGroup_ | 001 | | |
| rotocol iSCSI / IQ | N FC / WWN | | |
| | | | |
| | | | |
| Select FC / WWNs | | | |
| | | | |
| • | 1/8 items | | 1 item |
| 21000024FF7965B3 | 1/8 items | • | 1 item |
| 21000024FF7965B3 21000024FF7965B1 | 1/8 items | * | 1 item |
| 21000024FF7965B3 21000024FF7965B1 21000024FF7965B2 | 1/8 items | * | 1 item |
| 21000024FF7965B3 21000024FF7965B1 21000024FF7965B2 21000024FF7965B0 | 1/8 items | * | 1 item |
| 21000024FF7965B3 21000024FF7965B1 21000024FF7965B2 21000024FF7965B0 21000024FF78467F | 1/8 items | * * | 1 item |
| 21000024FF7965B3 21000024FF7965B1 21000024FF7965B2 21000024FF7965B0 21000024FF78467F 21000024FF78467C | 1/8 items | * | 1 item |
| 21000024FF7965B3 21000024FF7965B1 21000024FF7965B2 21000024FF7965B0 21000024FF78467F 21000024FF78467C 21000024FF78467D | 1/8 items | * | 1 item |

Figure 6-5 Create a Host Group 1-4

11. Click the **Next** button to continue.



| Host | | P | ort | | Volume |
|------|--------------|----------|--------|-----------|------------|
| | Controller 1 | t1 | Slot 2 | Onboard - | |
| | Controller 2 | t 1 | Slot 2 | Onboard - | |
| CTRL | Interface | Location | Port | Status | IP Address |
| 1 | ISCSI (10Gb) | Onboard | LAN1 | 1 Gb/s | 10.10.1.1 |
| 1 | ISCSI (10Gb) | Onboard | LAN2 | 1 Gb/s | 10.10.1.2 |
| 2 | ISCSI (10Gb) | Onboard | LAN1 | 1 Gb/s | 10.10.1.3 |
| 2 | ISCSI (10Gb) | Onboard | LAN2 | 1 Gb/s | 10.10.1.4 |
| | | | | | < 1 / 1 |

Figure 6-6 Create a Host Group Step 2

- 12. The all **Ports** (Network Portals) are enabled. If necessary, check the interfaces checkbox which you want to enable or disable.
- 13. Click the **Next** button to continue.

Create Host Group •• Host Port Volume Select Volumes 0 item 1/2 items Volume_01 150.00 GB Volume_02 100.00 GB Create Volume Done Cancel Back

Figure 6-7 Create a Host Group Step 3-1

OSAN

- 14. The **Select Volumes** boxes are divided into two sides. The left side is an ineffective list, and the right side is effective.
- 15. Select volumes and click the Dutton to move it from the left side to the right side.



| Create Host Group | | | | |
|-------------------|-----------|------|-----------|--------------------|
| Host | | Port | | √ Volume |
| Select Volumes | | | | |
| | 1 item | | | 1 item |
| Volume_02 | 100.00 GB | < | Volume_01 | 150.00 GB |
| Create Volume | | | | |
| | | | | Cancel Back Done |

Figure 6-8 Create a Host Group Step 3-2

16. Click the **Done** button to finish.



Host Group HostGroup_001 🌣

| Protocol Volumes Hosts Enabled [| Data Ports | IQN 1 1 4 | | | | | |
|---|-----------------|-----------------------------------|----|-------|--------|--------|---------|
| CTRL | Target Name | | | Alias | Slot 1 | Slot 2 | Onboard |
| 1 | iqn.2004-08.cor | n.qsan:xf2026-000d40000:dev1.ctr1 | ۰. | - | | | ** |
| 2 | iqn.2004-08.cor | n.qsan:xf2026-000d40000:dev1.ctr2 | ٥ | - | | | |

| % Host P | Profile | ^ |
|-----------|-----------------------------------|--------------|
| | | 1 items |
| Host Name | Host Initiator | Status |
| Dev01 🏟 | iqn.1991-05.com.microsoft:server1 | Disconnected |
| | | < 1 / 1 $>$ |
| Conne | ected Volumes | ~ |
| 🔒 СНАР | Settings | ~ |

Figure 6-9 A Host Group is Created

17. A host group has been created. If necessary, click the + icon in the **Host Groups** pane to create others.

6.1.2. List and Configure Host Groups

All host groups are listed in the **Host Groups** pane. You can click one of them to display the details.



| ⊃ి. Host Groups | |
|-----------------|---|
| | + |
| iSCSI | |
| HostGroup_001 | |
| FC | |
| HostGroup_002 | |

Figure 6-10 List All Host Groups

An iSCSI host group and a FC host group are shown here.

| Host Group HostGroup_001 🌣 | | | | | | | | | |
|----------------------------|-----------------|-----------------------------------|------------|--------|--------|---------|--|--|--|
| Protocol | | IQN | | | | | | | |
| Volumes | | 1 | | | | | | | |
| Hosts | | 1 | | | | | | | |
| Enabled I | Data Ports | 4 | | | | | | | |
| CTRL | Target Name | | Alias | Slot 1 | Slot 2 | Onboard | | | |
| 1 | iqn.2004-08.cor | n.qsan:xf2026-000d40000:dev1.ctr1 | 0 | | | | | | |
| 2 | iqn.2004-08.cor | n.qsan:xf2026-000d40000:dev1.ctr2 | o - | | | | | | |

Figure 6-11 iSCSI Host Group Details

Host Group HostGroup_002 🌣

| Protocol | WWN |
|--------------------|-----|
| Volumes | 1 |
| Hosts | 1 |
| Enabled Data Ports | 4 |
| | |

| CTRL | Target Name | Alias | Slot 1 | Slot 2 | Onboard |
|------|--------------------|-------|--------|--------|---------|
| 1 | 2000001378D601B0 🏟 | - | | | |
| 2 | 2000001378D601B0 🌣 | - | ** ** | | |

Figure 6-12 FC Host Group Details

This table shows the host group descriptions.



| Column Name | Description |
|--------------|---|
| Protocol | The protocol of the host group: |
| | IQN: iSCSI protocol. |
| | WWN: Fibre channel protocol. |
| Volumes | The quantity of the connected volumes. |
| Hosts | The quantity of the hosts. |
| Enabled Data | The quantity of the enabled data ports. |
| Ports | |
| CTRL | Controller 1 or 2. |
| Target Name | Target name of iSCSI or FC. |
| Alias | Alias name. |
| Slot 1 | Port icons in slot 1. |
| Slot 2 | Port icons in slot 2. |
| Onboard | Port icons onboard. |

Click the 🌣 icon beside the host group name to list the drop down options. These options are available in the host group.

| Host Group HostG | roup_001 | • |
|--------------------|----------|-----------------------|
| | | Rename |
| Protocol | IQN | |
| Volumes | 1 | Delete Host Group |
| Hosts | 1 | E la la c |
| Enabled Data Ports | 4 | Edit Host |
| | | Change Connected Port |
| 07DI T | | enange senneoteur ort |

Figure 6-13 Host Group Options

Rename

1. Click the **Rename** option to rename the host group.



| | Rename Host Group |
|------|-------------------|
| Name | HostGroup_001 |
| | |
| | |
| | Cancel Rename |

Figure 6-14 Rename Host Group

- 2. Enter a new **Group Name**. The maximum length of the volume name is 32 characters. Valid characters are $[A \sim Z | a \sim z | 0 \sim 9 | <>]$.
- 3. Click the **Rename** button to rename.

Delete

Click the **Delete Host Group** option to delete the host group. Click the **Delete** button to confirm and delete.

Edit Host

1. Click the **Edit Host** option to edit the host group.

| 010001 | iSCSI / IQN | | | | |
|-------------------------------|-------------------------------|-------------------|-------------------|-------------------------|--------|
| dd a New Host | IQN.0000-00.com.xxxxxx0000-00 | 00xx0000:dev0. | Add to IQN Li | st | |
| elect iSCS arning: Any cha | I / IQNS | e lost or the dat | a in transit lost | | |
| | | 2 items | | | 1 item |
| * | | | iqn.1991-0 | 5.com.microsoft:server1 | |
| iqn.1991-(| 05.com.microsoft:server2 | | | | |
| | | | | | |
| | | | < | | |
| | | L | > | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Figure 6-15 Edit Host for iSCSI

- 2. If editing the protocol of iSCSI / IQN, select the IQNs and click the button or the subtraction to make them effective or not.
- 3. Click the **Apply** button to edit.



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CAUTION:

Any changes may cause the connection to be lost or the data in transit lost.



| Edit Host | | | | | |
|---|--|------------|--------|--|--|
| Protocol FC / WWN | | | | | |
| | | | | | |
| Select FC / WWNs Warning: Any changes may cause the co | nnection to be lost or the data in tra | insit lost | | | |
| | 8 items | | 1 item | | |
| 21000024FF7965B0 | | * | | | |
| 21000024FF7965B1 | | | | | |
| 21000024FF7965B2 | | | | | |
| 21000024FF7965B3 | | | | | |
| 21000024FF78467F | | | | | |
| 21000024FF78467C | | | | | |
| 21000024FF78467D | | | | | |
| 21000024FF78467E | | | | | |
| | | | | | |
| | | | | | |
| | | | Cancel | | |

Figure 6-16 Edit Host for FC

- 4. If editing the protocol of FC / WWN, select the WWNs and click the button or the button to make them effective or not.
- 5. Click the **Apply** button to edit.

Change Connected Port

1. Click the **Change Connected Port** option to change the connected ports in the host group.



| Change Connected Port | | | | | | | | |
|-----------------------|--------------|----------|--------|---------|------------|------|--|--|
| | Controller 1 | Slot 1 | Slot 2 | Onboard | | | | |
| | Controller 2 | Slot 1 | Slot 2 | Onboard | | | | |
| CTRL | Interface | Location | Port | Status | IP Address | - | | |
| 2 1 | ISCSI (10Gb) | Onboard | LAN1 | 1 Gb/s | 10.10.1.1 | - | | |
| 2 1 | ISCSI (10Gb) | Onboard | LAN2 | 1 Gb/s | 10.10.1.2 | | | |
| 2 | ISCSI (10Gb) | Onboard | LAN1 | 1 Gb/s | 10.10.1.3 | | | |
| 2 | ISCSI (10Gb) | Onboard | LAN2 | 1 Gb/s | 10.10.1.4 | - | | |
| | | | | | < 1 / 1 | | | |
| | | | | | Cancel | oply | | |

Figure 6-17 Change Connected Port

- 2. Check the interfaces checkbox which you want to enable or disable.
- 3. Click the **Apply** button to change.

Click the 🌣 icon beside the target name to list the drop down options. These options are available in the disk group.

| CTRL | Target Name | |
|------|---|---------------------|
| 1 | iqn.2004-08.com.qsan:xf2026-000d40000:dev1.ctr1 | |
| 2 | iqn.2004-08.com.qsan:xf2026-000d40000:dev1.ctr2 | Rename Local Target |
| | 1 | Rename Alias |

Figure 6-18 Host Target Options



Rename Local Target

1. Click the **Rename Local Target** option to rename the local target name.

| | Rename Local Target |
|------|-------------------------------------|
| Name | iqn.2004-08.com.qsan:xf: :dev1.ctr1 |
| | |
| | Cancel |

Figure 6-19 Rename Local Target Name

- 2. Enter a new **Local Target Name**. The maximum length of the volume name is 223 characters. Valid characters are [a~z | 0~9 | -.:].
- 3. Click the **Rename** button to rename.

Rename Alias

1. Click the **Rename Alias** option to add or change the alias.

| Rename Alias | | | | |
|--------------|--------|--|--|--|
| Alias | | | | |
| | Cancel | | | |

Figure 6-20 Rename Alias

- Enter a new Alias. If you want to remove an alias, clear out the current name. The maximum length of the volume name is 223 characters. Valid characters are [a~z | 0~9 | -.:].
- 3. Click the **Rename** button to rename.

6.1.3. List and Configure Host Profile

Click the **Host Profile** pane to list all host profiles in the host group.

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| % Host F | Profile | ^ |
|-----------|-----------------------------------|--------------|
| | | 1 items |
| Host Name | Host Initiator | Status |
| Dev01 🌣 | iqn.1991-05.com.microsoft:server1 | Disconnected |
| | | < 1 / 1 > |

Figure 6-21 List Host Profile

Click the 🗢 icon beside the host name to list the drop down options. These options are available in the host profile.

| Host N | ame |
|--------|----------|
| Dev01 | 0 |
| | Rename |
| | Sessions |

Figure 6-22 Host Profile Options

Rename

1. Click the **Rename** option to rename the host name.

| Rename Host | | | | |
|-------------|-------|--------|--|--|
| Name | Dev01 | | | |
| | | | | |
| | | | | |
| | | Cancel | | |

Figure 6-23 Rename Host Name

- 2. Enter a new **Host Name**. The maximum length of the volume name is 32 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
- 3. Click the **Rename** button to rename.



Sessions

1. Click the **Sessions** option to display the host sessions in the host group.

| Sessions | | | | |
|----------------|---|-----------|-----------------|---------|
| | Controller 1 | - Onboard |] | |
| | Controller 2 | Onboard |] | |
| Host Initiator | server1 v | | | |
| Host Group | All | | | |
| | | | | 8 items |
| CTRL | Target Name | MaxOutR2T | MaxDataBurstLen | Initi |
| Ctrl_1 | iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr1 | 1 | 262144 | Yes |
| Ctrl_1 | iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr1 | 1 | 262144 | Yes |
| Ctrl_1 | iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr1 | 1 | 262144 | Yes |
| Ctrl_1 | iqn.2004-08.com.qsan:xf2026-000d60030:dev1.ctr1 | 1 | 262144 | Yes |
| Ctrl_2 | iqn.2004-08.com.qsan:xf2026-000d60030:dev2.ctr2 | 1 | 262144 | Yes |
| Ctrl_2 | iqn.2004-08.com.qsan:xf2026-000d60030:dev2.ctr2 | 1 | 262144 | Yes |
| Ctrl_2 | iqn.2004-08.com.qsan:xf2026-000d60030:dev2.ctr2 | 1 | 262144 | Yes |
| Ctrl_2 | iqn.2004-08.com.qsan:xf2026-000d60030:dev2.ctr2 | 1 | 262144 | Yes |
| • | | | | • |
| | | | Close | 1 > |

Figure 6-24 Display Sessions

This table shows the column descriptions.

| Column Name | Description |
|-------------|--|
| CTRL | Controller 1 or 2. |
| TSIH | TSIH (Target Session Identifying Handle) is used for this active |
| | session. |
| Target Name | It displays the controller name. |
| MaxOutR2T | MaxDataOutR2T (Maximum Data Outstanding Ready to Transfer) |
| | determines the maximum number of outstanding ready to transfer |

 Table 6-2
 Active Sessions Column Descriptions



| | per task. The default value is 1. | | |
|-----------------|---|--|--|
| MaxDataBurstLe | MaxDataBurstLen (Maximum Data Burst Length) determines the | | |
| n | maximum SCSI data payload. The default value is 256kb. | | |
| InitialR2T | InitialR2T (Initial Ready to Transfer) is used to turn off either the use | | |
| | of a unidirectional R2T command or the output part of a bidirectional | | |
| | command. The default value is Yes. | | |
| Immed. data | Immed. data (Immediate Data) sets the support for immediate data | | |
| | between the initiator and the target. Both must be set to the same | | |
| | setting. The default value is Yes. | | |
| DataSeginOrder | DataSeginOrder (Data Sequence in Order) determines if the PDU | | |
| | (Protocol Data Units) are transferred in continuously non-decreasing | | |
| | sequence offsets. The default value is Yes. | | |
| DataPDU InOrder | DataPDU InOrder (Data PDU in Order) determines if the data PDUs | | |
| | within sequences are to be in order and overlays forbidden. The | | |
| | default value is Yes. | | |

2. Click the **Close** button to close the window.

6.1.4. List and Configure Connected Volumes

Click the **Connected Volumes** pane to list all connected volumes in the host gorup.

| Connected Volumes | | | ^ |
|-------------------|-----------|-----|-------------------------------|
| | | | 1 items 次 🕂 |
| ! Volume Name | Capacity | LUN | Volume Type |
| • Volume_01 | 150.00 GB | 0 | RAID |
| | | | $< \boxed{1} / 1 \rightarrow$ |

Figure 6-25 List Connected Volumes

This table shows the connected volume descriptions.


| Column Name | Description | | | | | |
|-------------|---|--|--|--|--|--|
| ! | The status of the disk group: | | | | | |
| | Green Color / Normal: The volume is good. | | | | | |
| | Orange Color / Abnormal: The pool is unhealthy and incomplete | | | | | |
| | The cause may be a disk loss or failure. | | | | | |
| | Red Light / Warning: The disk group has failed. | | | | | |
| Volume Name | The volume name. | | | | | |
| Capacity | Total capacity of the volume. | | | | | |
| LUN | Display LUN (Logical Unit Number). | | | | | |
| Volume Type | The type of the volume: | | | | | |
| | RAID Volume. | | | | | |
| | Backup Volume. | | | | | |

| Table 6-3 Connected Vo | olume Column Descriptions |
|------------------------|---------------------------|
|------------------------|---------------------------|

The options are available in this pane.

Connect Volumes

Here is an example to add volumes to the host group.

1. Click the + icon in the **Connected Volumes** pane to pop up a window.



Figure 6-26 Add Volumes to the Host Group

- 2. The **Select Volumes** boxes are divided into two sides. The left side is an ineffective list, and the right side is effective.
- 3. Select volumes and click the button or the subtraction to make them effective or not.
- 4. Click the **Apply** button to add.

Disconnect Volumes

OSAN

1. Check the volume checkboxes which you want to disconnect.



| Connected Volumes | | | | | | | |
|-------------------|---|-------------|-----------|-----|-------------|--|--|
| | | | | | 2 items 次 🕂 | | |
| | ļ | Volume Name | Capacity | LUN | Volume Type | | |
| | • | Volume_01 | 150.00 GB | 0 | RAID | | |
| | • | Volume_02 | 100.00 GB | 1 | RAID | | |
| | | | | | < 1 / 1 > | | |

Figure 6-27 Disconnect Volumes

2. Click the *icon* to continue. Then click the **Disconnect** button to confirm and disconnect.

6.1.5. List and Configure CHAP Settings

Click the **CHAP Settings** pane to list all CHAP settings in the host group. This pane is only visible when the protocol of the host group is iSCSI. Here is an example to enable CHAP settings.

1. Check the **Select IQNs & WWNs** checkbox to enable CHAP.



| ocicor igno a minio | | | | | |
|---------------------|-----------|--------|--------|-----------|--|
| | | 0 item | | | |
| | | | | | |
| | | | | | |
| | | | < | | |
| | Not Found | | \geq | Not Found | |
| | | | | | |
| | | | | | |
| | | | | | |
| CHAP Settings | | | | | |
| | | | | | |
| Enable Mutual CHA | | | | | |
| | | | | | |
| | | | | | |

Figure 6-28 CHAP Settings 1

2. Click **CHAP Settings** to add CHAP accounts.



| CHAP Settings | |
|---------------|-----|
| | E + |
| CHAP Account | |
| No dat | a |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | ок |

Figure 6-29 CHAP Accounts 1

3. Click the + icon in the **Volumes** pane to pop up a window.

| | Create CHAP Account |
|------------------|---------------------|
| Username | chap1 |
| Password | |
| Confirm Password | |
| | Cancel Apply |

Figure 6-30 Create a CHAP Account



- 4. Enter **Username** of CHAP user. The maximum length of the username is 223 characters. Valid characters are [A~Z | a~z | 0~9 | ~!@#%^&*_-+=|(){}[:;<>.?/].
- 5. Enter Password (CHAP secret) and Confirm Password. The length of the password is between 12 to 16 characters. Valid characters are [A~Z | a~z | 0~9 | ~!@#\$%^&*_-+=`|\(){[];;"'<>,.?/].
- 6. Click the **Apply** button to create a CHAP account.

| CHAP | Settings | | | | |
|------|--------------|--|--|-----|-------|
| | | | | | ÷ + |
| | CHAP Account | | | | |
| | chap1 | | | | |
| | | | | < 1 | / 1 > |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | ОК |

Figure 6-31 CHAP Account 2

- 7. A CHAP account has been created. If necessary, click the + icon to create others.
- 8. If the CHAP accounts are useless, check the account checkboxes which you want to delete, and then click the 🔳 icon to delete.
- 9. Click the **OK** button to close the window.



| Select IONs & WWNs | | | | |
|--------------------|-----------|------------------|-----------|--|
| | 1/1 item | | | |
| | i/ i item | | | |
| 🖌 chap1 | | | | |
| | | | | |
| | | | | |
| | | $\left[\right]$ | | |
| | | | Not Found | |
| | | _ | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| CHAP Settings | | | | |
| | | | | |
| Enable Mutual CHAP | | | | |
| | | | | |
| | | | | |
| | | | | |

Figure 6-32 CHAP Settings 2

10. The **CHAP Settings** boxes are divided into two sides. The left side is an ineffective list, and the right side is effective. Select the CHAP accounts and click the button or the button to make them effective or not.



| elect IQNs & WWN | s | | | | |
|------------------|------------------------------|-----------------|----------|-------|--|
| | | 0 item | | | |
| | | | | chap1 | |
| | | | | | |
| | | | | | |
| | Not Found | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| CHAP Settings | | | | | |
| Enable Mutual (| СНАР | | | | |
| * Before enable | Mutual CHAP, please Select a | at least one CH | AP Accou | nt. | |
| Username | mutualchap1 | | | | |
| | | | | | |

Figure 6-33 CHAP Settings 3

- 11. If necessary, check **Enable Mutual CHAP** to enable mutual CHAP authentication.
- 12. Enter **Username** of mutual CHAP user. The maximum length of the username is 223 characters. Valid characters are [A~Z | a~z | 0~9 | ~!@#%^&*_-+=|(){]:;<>.?/].
- 13. Enter **Password** (mutual CHAP secret). The length of the password is between 12 to 16 characters. Valid characters are [A~Z | a~z | 0~9 | ~!@#\$%^&*_-+=`\\(){}[:;"'<>,.?/].
- 14. Click the **Apply** button to setup the CHAP settings.

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7. Protection Tab

The **Protection** tab manages the protection groups. It displays the protection group status, configures the protection plan and protection volumes. This chapter describes the details of protection group management operations and examples.

7.1. Protection Features

XEVO provides protection group functionality for binding one or some volumes. These volumes can perform data backup services at the same time with some simple settings. In addition to the basic functions of snapshots, local cloning, and remote replication, there are new designs and are described below.

7.1.1. About Snapshot

Enable Snapshot Space Automatically

A volume snapshot is based on copy-on-write technology. Snapshots require more space to hold differential data. When the schedule function is enabled, all volumes belonging to the protection group will automatically enable snapshot space. The default snapshot space is 10% of the volume capacity. You can also enter the **Snapshot Center** of the volume and customize it.

Recycle Snapshots

Snapshot recycle bin can restore or permanently destroy the snapshots. It offers additional protection for backup from accidentally or deliberately deleting of a snapshot.



Figure 7-1 Recycle Snapshots



7.1.2. About Local Clone

It does easily deploy the local clone without doing configurations. In a protection group, select a new and empty target pool, the system will send the configurations of source volumes to the target pool. Then the target pool will generate the corresponding volumes.



Figure 7-2 Auto Local Clone

The limit is that the capacity of the target pool should be larger than the total capacity of all volumes in the protection group.

7.1.3. About Remote Replication

Auto Replication

It does easily deploy the remote replication without doing configurations. In a protection group, you only need to log in a remote system through management port. The source system will send the configurations of volumes to the remote system. The remote system will generate the corresponding volumes for the source system.





Figure 7-3 Auto Replication

The target system has to prepare at least 3 disk drives and the capacity of the target pool should be larger than the total capacity of all source volumes in the protection group.

1 Step Local-to-Remote

Through local-to-remote, transfer your local backup to remote sites without having to redo the full copy. On the remote side, you only need to insert all disk drives without any configurations. And then complete the local-to-remote process.



Figure 7-4 1 Step Local-to-Remote

CSAN



INFORMATION:

The **Auto Replication** and **1 Step Local-to-Remote** features are supported by XEVO of XCubeFAS series only. It means that the source and target arrays are both running XEVO. In addition, The management ports and data ports of the source and target arrays must be connected to each other. Whether they are direct connections or through LAN switches.

7.2. Configure Protection Groups

Select the **Protection** tab to manage the protection groups. In this tab, you can create, modify, delete, or view the status of all protection groups.





INFORMATION:

A protection group includes one of a **Snapshot Plan** and/or either one of **Replication Plan** for Local or Remote.

7.2.1. Create a Protection Group

Here is an example of creating a protection group and connecting volumes.

1. Click the + icon in the **Protection Groups** pane to pop up a wizard.



| Create Protection Grou | р | |
|----------------------------|-------------------|-----------|
| • Volume Group | Protection Plan | Finish |
| Group Name ProtectionGroup | Jp_001 | |
| Select Volumes | | |
| • | 1/2 items | 0 item |
| Volume_01 | | |
| Volume_02 | | |
| | $\langle \rangle$ | |
| | | Not Found |
| | | |
| | | |
| | | |
| Create Volume | | |
| | | |
| | | Cancel |

Figure 7-6 Create a Protection Group Step 1-1

- The recommended Group Name is provided. Enter a new Group Name if necessary. The maximum length of the pool name is 32 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
- 3. The **Select Volumes** boxes are divided into two sides. The left side is an ineffective list, and the right side is effective.
- 4. Select volumes and click the Dutton to move it from the left side to the right side.

| Volume Group | Protection Plan | Finish |
|---------------|------------------|----------|
| volume oloup | FIOLEGUION FIBIL | 1 111311 |
| ProtectionGro | up_001 | |
| elect Volumes | | |
| | 1 item | 1 item |
| Volume_02 | Volume_01 | |
| | | |
| | | |
| | \bigcirc | |
| | | |
| | | |
| | | |
| eate Volume | | |
| | | |

Figure 7-7 Create a Protection Group Step 1-2

5. Click the **Next** button to continue.

CSAN



| Create Protec | tion Group | | |
|-------------------|------------|-----------------|------------------|
| • Volume Group | | Protection Plan | Finish |
| Snapshot Plan | | | |
| Snapshot | 🖹 Disable | | Enable |
| Replication Pla | n | | |
| Remote | 🖹 Disable | | Enable |
| Local | 🗈 Disable | | Enable |
| | | | Cancel Back Next |

Figure 7-8 Create a Protection Group Step 2-1

Enable Snapshot Plan

6. Click the **Enable** text in the **Snapshot** pane to enable the **Snapshot Plan**.



| Snapshot Plan | |
|---|--------------|
| Schedule 2 | |
| Once | |
| Repeat | |
| ✓ Daily / Weekly | |
| ✔ Mon ✔ Tue ✔ Wen ✔ Thr ✔ Fri ✔ Sat ✔ Sun | |
| every 30 minutes V | |
| | |
| | Cancel Apply |

Figure 7-9 Enable Snapshot Plan

- 7. Select the **Once** option to execute the plan once. Or select the **Repeat** option to repeat the plan, and then check the repeat frequency.
- 8. Click the **Apply** button to continue.



| Create Protec | tion Group | | |
|-------------------|---------------------------------------|-------------|--------------|
| • Volume Group | Protection Plan | F | -√ -inish |
| Snapshot Plan | | | |
| Snapshot | 崮 Every 30 mins ; Every Mon, Wen, Fri | Disable | Edit |
| Replication Pla | 1 | | |
| Remote | 🗈 Disable | | Enable |
| Local | 🗊 Disable | | Enable |
| | | Cancel Back | Next |

Figure 7-10 Create a Protection Group Step 2-2



INFORMATION:

A protection group can only be enabled one of the **Remote** or **Local** replication plan.

Enable Replication Plan - Remote

9. Click the **Enable** text in the **Remote** pane to enable the **Replication Plan - Remote**.



| Remote Replication Planning | |
|---|--------|
| | • |
| Deployment Method | |
| Auto | |
| O Manual | |
| Schedule | |
| Once | |
| Repeat | |
| ✓ Daily / Weekly | |
| ✔ Mon ✔ Tue ✔ Wen ✔ Thr ✔ Fri ✔ Sat ✔ Sun | |
| every 30 minutes V | |
| Enable Traffic Shaping | |
| Shaping Group 1 v Edit | |
| | Cancel |

Figure 7-11 Enable Remote Replication Plan Step 1

10. Select the Deployment Method as Auto or Manual.



INFORMATION:

The **Auto** option of the **Deployment Method** supports **Auto Replication** feature described in the chapter 7.1.3 <u>About Remote Replication</u>.

- 11. Select the **Once** option to execute the plan once. Or select the **Repeat** option to repeat the plan, and then check the repeat frequency.
- 12. Check the **Enable Traffic Shaping** option if necessary and then click the **Edit** button to edit the shaping group.



| Traffic Shaping Configuration | | | | | |
|-------------------------------|-------------|-------------|--------------|--|--|
| Ohaning Ohani | Objection O | | | | |
| Shaping Group | Shaping Gro | oup I | <u> </u> | | |
| Peak | 100 | MB | | | |
| Enable Traffic Shaping | | | | | |
| Off-Peak | 200 | MB | | | |
| Peak Day | | | | | |
| 🗖 Daily / Weekly | | | | | |
| 🗹 Mon 🔽 Tue 🔽 We | en 🔽 Thr | 🖌 Fri 📃 Sat | Sun | | |
| Peak Time | 09:00 | · 18:00 | G | | |
| | | (| Cancel Apply | | |

Figure 7-12 Traffic Shaping Configuration

- 13. Select a Shaping Group to be modified, enter a maximum throughput during Peak hours. Check the Enable Traffic Shaping option if necessary, and then enter a maximum throughput during Off-Peak hours and define the Peak Day.
- 14. Click the **Apply** button to continue.
- 15. Select the **Shaping Group** which you want.
- 16. Click the **Apply** button to continue.

| Remote Repl | ication Plan | |
|-------------------|---------------|-----|
| | | |
| Source Port | Auto ~ | ·] |
| Remote Syste | m | |
| Remote IP address | 192.168.1.235 | |
| Username | admin | |
| Password | | |
| | | |
| | | |

Figure 7-13 Enable Remote Replication Plan Step 2



- 17. Select the **Once** option to execute the plan once. Or select the **Repeat** option to repeat the plan, and then check the repeat frequency.
- 18. Click the **Apply** button to continue.

| | ion Group | | ~ |
|-----------------|---------------------------------------|-------------|--------|
| Volume Group | Protection Plan | F | inish |
| apshot Plan | | | |
| Snapshot | ⊞ Every 30 mins ; Every Mon, Wen, Fri | Disable | Edit |
| eplication Plan | | | |
| Remote | ⊞ Every 30 mins ; Every Tue, Thr, Sat | Disable | Edit |
| Local | i⇒ Disable | | Enable |
| | | Cancel Back | Nex |

Figure 7-14 Create a Protection Group Step 2-3



INFORMATION:

A protection group can only be enabled one of the **Remote** or **Local** replication plan.

Enable Replication Plan - Local

19. Click the **Enable** text in the **Local** pane to enable the **Replication Plan - Local**.



| Local Replication Plan | |
|---|--------------|
| Selected Target Pool | |
| | |
| | |
| | |
| | |
| | |
| Create Pool | |
| Schedule | |
| Once | |
| Repeat | |
| ✓ Daily / Weekly | |
| 🗸 Mon 🗸 Tue 🗹 Wen 🗸 Thr 🖌 Fri 🗹 Sat 🖌 Sun | |
| every 30 minutes V | |
| | |
| | Cancel Apply |

Figure 7-15 Local Replication Plan Step 1

20. Select a target pool, or click the **Create Pool** option to create one if it's empty.

| ected Slots | | | | |
|-----------------|-------------|------------|---|-----|
| | 0 / 2 items | Pool Name | Pool_02 | |
| Enclosure ID: 0 | | Real Type | | |
| Slot 1 | 372GB | гоогтуре | Thick Provisioning | ~ |
| Slot 2 | 372GB | RAID Level | RAID 1 | × |
| | | Spares | | ~ |
| | | Subgroups | | × ? |
| | | | Actual Capacity: - Spare Capacity: - | |
| | | | | |

Figure 7-16 Create a Replication Target Pool

OSAN

21. Please refer to the chapter 5.1.1 <u>Create a Pool</u> section for more details to create a pool.22. Click the **Apply** button to continue.



| Local Replication Plan | | | |
|---|-----------|--------|-----|
| Selected Target Pool | | | |
| Pool_02 | 744.72 GB | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Create Pool | | | |
| Schedule | | | |
| Once | | | |
| Repeat | | | |
| ✔ Daily / Weekly | | | |
| 🗹 Mon 🗹 Iue 💟 Wen 💟 Ihr 🗹 Fri 💟 Sat 💟 Sun | | | |
| every 30 minutes V | | | |
| | | | |
| | | Cancel | ply |

Figure 7-17 Local Replication Plan Step 2

- 23. Select a target pool, and select the **Once** option to execute the plan once. Or select the **Repeat** option to repeat the plan, and then check the repeat frequency.
- 24. Click the **Apply** button to continue.

| Create Protect | ion Group | |
|-------------------|---------------------------------------|--------------|
| • Volume Group | Protection Plan | ✓ |
| Snapshot Plan | | |
| Snapshot | ⊞ Every 30 mins ; Every Mon, Wen, Fri | Disable Edit |
| Replication Plan | | |
| Remote | 🗈 Disable | Enable |
| | 崮 Every 30 mins ; Every Tue, Thr, Sat | Disable Edit |

Figure 7-18 Create a Protection Group Step 2-4

25. Click the Next button to continue.



| Create Protectio | on Group | | |
|--------------------------|-----------------------------|-----------------|-------------|
| • Volume Group | | Protection Plan | ✓ Finish |
| Results | | | |
| Overall Status | 📀 Success | | |
| Details | | | |
| Connect Volume | 📀 Success | | |
| Enable Snapshot Plan | Success | | |
| Enable Replication Plann | Success | | |
| | | | |
| | | | |
| | | | |
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| | | | |
| | | | |
| | | | |
| | | | |
| | | | Cancel |

Figure 7-19 Local Replication Plan Step 3

26. There is a result page. Click the **Close** button to finish.



Group ProtectionGroup_001 🌣

| Snapsho | t Plan | Replication | a Plan-Local | | Replication P | lan-Remote | |
|----------------|-----------------|-------------------|--------------|--------|---------------|-------------------|-----|
| Protection Vol | ume | | | | | | |
| Snapshot Task | Replication Tas | k | | | | | |
| | | | | | 1 items | Take Snapshot Now | + |
| Volume Nam | e | The Last Snapshot | Ca | pacity | Created / Co | mpleted | |
| + Volume_01 | ۰ | | 10 | OGB | | | |
| | | | | | | < 1 / | 1 > |

Figure 7-20 A Protection Group is Created

27. A protection group has been created. If necessary, click the + icon in the **Protection Groups** pane to create others.

7.2.2. List and Configure Snapshot Plan

All protection groups are listed in the **Protection Groups** pane. You can click one of them to display the details.



Figure 7-21 List All Protection Groups

A protection group is shown here.



Group ProtectionGroup_001 Constraints of the second second

Figure 7-22 Protection Group with Snapshot Plan

The green box enables the service. The above figure enables the **Snapshot Plan** service. Clicking it will display the current snapshot plan.



Figure 7-23 Snapshot Plan

Click the 🗢 icon beside the protection group name to list the drop down options.



Figure 7-24 Protection Group Options with Snapshot Plan

These options are available in the protection group.

Rename

1. Click the **Rename** option to rename the host group.



| | | Rename Protection Group |
|------|---------------------|-------------------------|
| Name | ProtectionGroup_001 | |
| | | |
| | | |
| | | Cancel Rename |

Figure 7-25 Rename Protection Group

- 2. Enter a new **Group Name**. The maximum length of the volume name is 32 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
- 3. Click the **Rename** button to rename.

Protection Plan Setting

Click the **Protection Plan Setting** option to change the protection plan. Please refer to the chapter 7.2.1, <u>Create a Protection Group</u> section for more details.



| Protection Pla | n Setting | |
|------------------|-------------------------------------|--------|
| Snapshot Plan | | |
| V O Snapshot | l Every 30 mins ; Every day Disable | Edit |
| Replication Plar | 1 | |
| Remote | T Disable | Enable |
| Local | Ti Disable | Enable |
| | | Cancel |

Figure 7-26 Protection Plan Setting

Delete

Click the **Delete** option to delete the protection group. Click the **Delete** button to confirm and delete.

At the **Protection Volume** pane, click the **Snapshot Task** tab to list all snapshot tasks.



Protection Volume

| Snapshot Task | Replication Task | | |
|---------------|---------------------|----------|---------------------------------|
| | | | 1 items Take Snapshot Now + |
| Volume Name | The Last Snapshot | Capacity | Created / Completed |
| + Volume_01 🔅 | CLONE-Volume_01-m30 | 100GB | Fri Jan 18 18:30:07 2019 |
| | | | $\langle 1 \rangle / 1 \rangle$ |

Figure 7-27 List Snapshot Tasks

The options are available in this tab.

Add Volumes

Here is an example to add volumes in the protection group.

1. Click the + icon in the **Snapshot Task** tab to pop up a window.



| | Add V | /olume | | |
|------------------------|-------|--------|---|--------|
| Select Volumes | | | | |
| - 1/2 items | | | | 0 item |
| Volume_01_back - 100.0 | | | | |
| Volume_02 - 110.00 GB | | | | |
| | | | | |
| | _ | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| reate Volume | | | | |
| | | | ٢ | Cancel |

Figure 7-28 Add Volumes to the Protection Group

- 2. The **Select Volumes** boxes are divided into two sides. The left side is an ineffective list, and the right side is effective.
- 3. Select volumes and click the button or the subtraction to make them effective or not.
- 4. Click the **Add** button to add.

Take Snapshot Now

1. Click the **Take Snapshot Now** button to take a snapshot immediately.



Protection Volume

| Snap | oshot Task | Replication Task | | | |
|------|-------------|---------------------------------|----------|---------------------------|---|
| | | | | 2 items Take Snapshot Now | ÷ |
| | Volume Name | The Last Snapshot | Capacity | Created / Completed | |
| + | Volume_01 | ProtectionGroup_0013705237540_0 | 100GB | Fri Jan 18 18:38:42 2019 | |
| + | Volume_02 | ProtectionGroup_0013698159653_1 | 110GB | Fri Jan 18 18:38:42 2019 | |
| | | | | < 1 / 1 | |

Figure 7-29 Take Snapshot Now

2. The snapshots are taken and displayed at **The Last Snapshot** field.

Click the 🌣 icon beside the volume name to list the drop down options. These options are available in the **Snapshot task** tab.



Figure 7-30 Snapshot Task Options

Ungroup

- 1. Click the **Ungroup** option to remove the volume from the protection group, and then pop up a confirm dialog box.
- 2. Click the **Ungroup** button to confirm.

Snapshot Center

About the snapshot center, please refer to the chapter 7.2.3, <u>Snapshot Center</u> section for more details.



7.2.3. Snapshot Center

Snapshot Center is a center for managing all snapshot functions. It can enable and expand the snapshot space. It also can take, rollback, or delete snapshots of the volume. In addition, the snapshot recycle bin can restore or permanently destroy the snapshots. Click the **Snapshot Center** option to pop up a window.

| Snapshot | t Center | | | |
|-------------|---------------------------------|--------------------------|-----------------|----|
| Volume Name | Volume_01 | | | |
| Enable Sna | pshot Space | | | |
| Capacity | 10 GB ~ Availible: 1268 GB | Minimum: 10 GB | | |
| Snapshots | Deleted Snapshots | | | |
| | | | 5 items 🅥 📋 | + |
| | Snapshot Name | Created / Completed | Expose Capacity | |
| • | CLONE-Volume_01-m00 | Fri Jan 18 19:00:07 2019 | 0 MB | |
| • | Volume-m00 | Fri Jan 18 19:00:01 2019 | 0 MB | |
| • | ProtectionGroup_0013705237540_0 | Fri Jan 18 18:38:42 2019 | 0 MB | |
| • | CLONE-Volume_01-m30 | Fri Jan 18 18:30:07 2019 | 0 MB | |
| • | Volume-m30 | Fri Jan 18 18:30:02 2019 | 0 MB | |
| | | | < 1 / 1 | |
| | | | Cancel | ly |

Figure 7-31 Snapshot Center

Snapshot Space

1. Check the **Enable Snapshot Space** checkbox and enter a new **Capacity** number which is reserved for the snapshot space.





TIP:

The recommended minimum capacity is set to 20% of the volume. Volumes in the thin provisioning pool will automatically reserve 20% of the capacity for the snapshot space. However, volumes in the thick provisioning pool are not preserved. You have to enable the snapshot space manually.

There are two tabs. One is the **Snapshots** tab to display all volume snapshots; the other is the **Deleted Snapshots** tab of the snapshot recycle bin. The options are available in the **Snapshots** tab.

Take a Snapshot

Here is an example to take a snapshot.

1. Click the + icon in the **Snapshots** tab to take a snapshot.

| Take a Snapshot | |
|----------------------|--------------|
| Snapshot Name | |
| Snap_20190118_185352 | |
| | |
| | |
| | Cancel Apply |

Figure 7-32 Take a Snapshot

- The recommended Snapshot Name is provided. Enter a new Snapshot Name if necessary. The maximum length of the snapshot name is 32 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
- 3. Click the **Apply** button to take a snapshot.



TIP: If it failed to take a snapshot, you have to **Enable Snapshot Space** first in the **Snapshot Center**.



Delete the Snapshot

- 1. In the **Snapshots** tab, check the snapshot checkbox which you want to delete.
- 2. Click the 🔳 icon, and then pop up a confirm dialog box.
- 3. Click the **Delete** button to confirm to delete the snapshot.

Rollback the Snapshot

- 1. In the **Snapshots** tab, check the snapshot checkbox which you want to rollback.
- 2. Click the \bigcirc icon, and then pop up a confirm dialog box.
- 3. Click the **Apply** button to confirm to rollback the snapshot to the volume.



CAUTION:

Before executing rollback, it is better that the disk is unmounted on the host computer for flushing data from cache.

When a snapshot has been rolled-back, the related snapshots which are earlier than it will also be removed. But the rest snapshots will be kept after rollback.

Expose the Snapshot

- 1. In the **Snapshots** tab, click the switch to **O** in the **Expose** to expose the snapshot volume.
- 2. The exposed snapshot is mapped a LUN automatically.



| Enabl | ame e Snap: | Volume_01 shot Space | | | |
|-------|----------------|---------------------------------|--------------------------|--------|----------|
| Capa | city 1 | 0 GB V Availible: 1268 GB | Minimum: 10 GB | | |
| Snaps | hots | Deleted Snapshots | | | |
| | | _ | | 5 iter | ms 'O 🗎 |
| | l. | Snapshot Name | Created / Completed | Expose | Capacity |
| ~ | • | CLONE-Volume_01-m00 | Fri Jan 18 19:00:07 2019 | | 0 MB |
| | • | Volume-m00 | Fri Jan 18 19:00:01 2019 | | 0 MB |
| | • | ProtectionGroup_0013705237540_0 | Fri Jan 18 18:38:42 2019 | | 0 MB |
| | • | CLONE-Volume_01-m30 | Fri Jan 18 18:30:07 2019 | | 0 MB |
| | • | Volume-m30 | Fri Jan 18 18:30:02 2019 | | 0 MB |
| | | | | | 1 / 1 |

Figure 7-33 Expose the Snapshot

Unexpose the Snapshot

1. Click the switch to **O** in the **Expose** to unexpose.

Click the **Deleted Snapshots** tab. It's a recycle bin of the deleted snapshots. The options are available in the **Deleted Snapshots** tab.


| Snaps | Snapshot Center | | | | | | | | |
|----------|------------------|-------------------------|-----------------------------------|--------------------------|--------------|--|--|--|--|
| Volume N | lame le Snaps | Volume_01 shot Space | | | | | | | |
| Сара | city 1 | 0 GB ~ | Availible: 1268 GB Minimum: 10 GB | | | | | | |
| Snaps | shots | Deleted Snapshots | | | | | | | |
| | | | | | 1 items 🕑 🔨 | | | | |
| | 1 | Snapshot Name | Completed | Delete | Capacity | | | | |
| | ٠ | Volume-m30 | Fri Jan 18 18:30:02 2019 | Fri Jan 18 19:22:35 2019 | 0 MB | | | | |
| | | | | | < 1 / 1 > | | | | |
| | | | | | Cancel Apply | | | | |

Figure 7-34 Deleted Snapshots

Rescue the Snapshot

- 1. In the **Deleted Snapshots** tab, check the snapshot checkbox which you want to rescue.
- 2. Click the \mathbb{C} icon, and then pop a confirm dialog box.
- 3. Click the **Rescue** button to rescue the deleted snapshot and it will be back to the snapshot volumes.

Destroy the Snapshot

- 1. In the **Deleted Snapshots** tab, check the snapshot checkbox which you want to destroy.
- 2. Click the $^{\frown}$ icon, and then pop a confirm dialog box.
- 3. Click the **Destroy** button to destroy the deleted snapshot..



CAUTION:

If a snapshot has been deleted, the other snapshots which are earlier than it will also be deleted. The space occupied by these snapshots will be released after deleting.

OSAN

7.2.4. List and Configure Replication Plan-Local

A protection group with replication plan-local is shown here.

```
Group ProtectionGroup_001 🌣
```



Figure 7-35 Protection Group with Replication Plan-Local

The green box enables the service. The above figure enables the **Replication Plan-Local** service. Clicking it will display the current snapshot plan.



Figure 7-36 Replication Plan-Local

Click the 😳 icon beside the protection group name to list the drop down options.

| Group ProtectionGroup_001 | ٥ |
|---------------------------|---------------------------|
| | Rename |
| | Protection Plan Setting |
| | Local Replication Options |
| | Delete |

Figure 7-37 Protection Group Options with Replication Plan-Local



These options are available in the protection group.

Rename, Protection Plan Setting, Delete

About the Rename, Protection Plan Setting, and Delete functions, please refer to the chapter 7.2.2, <u>List and Configure Snapshot Plan</u> section for more details.

Local Replication Options

1. Click the Local Replication Options option to change the local replication settings.

| Local Replicatio | n Options | |
|-------------------------------------|-----------|-------|
| Snapshot Space Allocation Ratio 💿 | 2.0 | ~ |
| Snapshot Checkpoint Threshold 🛛 😨 | 50 % | ~ |
| If it failed restart the task after | Disable | ~ |
| | Cancel | Apply |

Figure 7-38 Local Replication Options

Three options are described in the following.

- Snapshot Space Allocation Ratio: This setting is the ratio of the source volume and snapshot space. If the ratio is set to 2, when there is no snapshot space assigned for the volume, the system will automatically reserve a free pool space to set as the snapshot space with twice capacity of the volume. The options are 0.5 ~ 3.
- Snapshot Checkpoint Threshold: The setting will be effective after enabling schedule clone. The threshold will monitor the usage amount of the snapshot space. When the used snapshot space achieves the threshold, system will take a snapshot and start clone process automatically. The purpose of threshold could prevent the incremental copy failure immediately when running out of the snapshot space. For example, the default threshold is 50%. The system will check the snapshot space every hour. When the snapshot space is used over 50%, the system will start the clone task automatically. And then continue monitoring the snapshot space. When the rest snapshot space has been used 50%, in other words, the total snapshot space has been used 75%, the system will start the clone task again.

CSAN

- If it failed to restart the task: The setting will be effective after enabling a scheduled clone. When running out of snapshot space, the volume clone process will be stopped because there is no more available snapshot space. If this option is checked, the system will clear the snapshots of the clone in order to release snapshot space automatically, and the clone task will be restarted after an hour. This task will start a full copy.
- 2. Click the **Apply** button to change.



Protection Volume

CAUTION:

The default snapshot space allocated by the system is two times the capacity of the source volume. That is the best value of our suggestion. If user sets snapshot space manually and lowers than the default value, understand that if the snapshot space is not enough, the clone task will fail.

At the **Protection Volume** pane, click the **Replication Task** tab to list all replication tasks.

Snapshot Task **Replication Task** Replicate Now 1 items Volume Name The Last Task Capacity Target Name Created Completed Volume 01 🏩 CLONE83359 100GB Fri Jan 18 19:26:35 2019 Volume 01 back 1 / 1 →

Figure 7-39 List Replication Tasks

The options are available in this tab.

Add Volumes

Here is an example to add volumes in the protection group.

1. Click the + icon in the **Replication Task** tab to pop up a window.



| Add Volume | | | | | | | |
|---|---|--|---|--------|--|--|--|
| Select Volumes | | | | | | | |
| 1/2 items | | | (| 0 item | | | |
| Volume_01_back - 100.0 ✓ Volume_02 - 110.00 GB | | | | | | | |
| | < | | | | | | |
| | | | | | | | |
| Create Volume | | | | | | | |

Figure 7-40 Add Volumes to the Protection Group

- 2. The **Select Volumes** boxes are divided into two sides. The left side is an ineffective list, and the right side is effective.
- 3. Select volumes and click the button or the subtraction to make them effective or not.
- 4. Click the **Add** button to add.

Replicate Now

1. Click the **Replicate Now** button to replicate all volumes immediately.



Protection Volume

| Snap | shot Task | eplication Task | | | | | |
|------|-------------|---------------------------------|----------|----------------|---------|------|--------------------------|
| | | | | | | 2 i1 | tems Replicate Now |
| | Volume Name | The Last Task | Capacity | Target Name | Created | | Completed |
| + | Volume_01 🌼 | CLONE-Volume_01-m30 | 100GB | Volume_01_back | | • | Mon Jan 21 19:30:06 2019 |
| + | Volume_02 🌼 | ProtectionGroup_0013698159653_1 | 110GB | Volume_02_back | | • | Fri Jan 18 18:38:42 2019 |
| | | | | | | | < 1 / 1 > |

Figure 7-41 Replication Now

2. The volume is added into the replication task. And the snapshot is taken and displayed at **The Last Snapshot** field.

Start Task

- 1. Select a volume, and then click the local to replicate the volume immediately.
- 2. The progress bar displays the current status.

Stop Task

1. Click the **O** icon of the volume to stop the replication task.



TIP:

The **Replicate Now** button will replicate all volumes in the protection group. And click the ▶ icon of the volume will replicate the volume only.

Click the 🗢 icon beside the volume name to list the drop down options.

| | Volume Name | | | | |
|---|-------------|-----------------|--|--|--|
| + | Volume_01 | ٥ | | | |
| + | Volume_02 | ٥ | | | |
| | | Ungroup | | | |
| | | Snapshot Center | | | |

Figure 7-42 Replication Task Options



These options are available in the **Replication Task** tab.

Ungroup

- 1. Click the **Ungroup** option to remove the volume from the protection group.
- 2. Click the Ungroup button to confirm.

Snapshot Center

About the snapshot center, please refer to the chapter 7.2.3, <u>Snapshot Center</u> section for more details.

7.2.5. List and Configure Replication Plan-Remote

Group ProtectionGroup_001 🌣

A protection group with replication plan-remote is shown here.



Figure 7-43 Protection Group with Replication Plan-Remote

The green box enables the service. The above figure enables the **Replication Plan-Remote** service. Clicking it will display the current snapshot plan.



Figure 7-44 Replication Plan-Remote



Click the 🌣 icon beside the protection group name to list the drop down options.

| Group ProtectionGroup_001 | \$ |
|---------------------------|----------------------------|
| | Rename |
| | Protection Plan Setting |
| | Remote Replication Options |
| | Traffic Shaping |
| | Delete |

Figure 7-45 Protection Group Options with Replication Plan-Remote

These options are available in the protection group.

Rename, Protection Plan Setting, Delete

About the Rename, Protection Plan Setting, and Delete functions, please refer to the chapter 7.2.2, <u>List and Configure Snapshot Plan</u> section for more details.

Remote Replication Options

1. Click the **Remote Replication Options** option to change the remote replication settings.

| Remote Replicat | ion Options |
|-------------------------------------|----------------|
| Snapshot Space Allocation Ratio 👔 | 2.0 ~ |
| Snapshot Checkpoint Threshold | 50 % |
| If it failed restart the task after | Disable \vee |
| | Cancel Apply |

Figure 7-46 Remote Replication Options

Three options are described in the following.

 Snapshot Space Allocation Ratio: This setting is the ratio of the source volume and snapshot space. If the ratio is set to 2, when there is no snapshot space assigned for the volume, the system will automatically reserve a free pool space to set as the snapshot space with twice capacity of the volume. The options are 0.5 ~ 3.



- Snapshot Checkpoint Threshold: The setting will be effective after enabling schedule replication. The threshold will monitor the usage amount of the snapshot space. When the used snapshot space achieves the threshold, system will take a snapshot and start replication process automatically. The purpose of threshold could prevent the incremental copy failure immediately when running out of the snapshot space. For example, the default threshold is 50%. The system will check the snapshot space every hour. When the snapshot space is used over 50%, the system will start replication task automatically. And then continue monitoring the snapshot space. When the rest snapshot space has been used 50%, in other words, the total snapshot space has been used 75%, the system will start replication task again.
- If it failed restart the task: The setting will be effective after enabling schedule replication. When running out of snapshot space, the volume replication process will be stopped because there is no more available snapshot space. If this option is checked, the system will clear the snapshots of replication in order to release snapshot space automatically, and the replication task will be restarted after an hour. This task will start a full copy.
- 2. Click the **Apply** button to change.



CAUTION:

The default snapshot space allocated by the system is two times the capacity of source volume. That is the best value of our suggestion. If user sets snapshot space by manually and lower than the default value, user should take the risk if the snapshot space is not enough and the replication task will fail.

Traffic Shaping

1. Click the **Traffic Shaping** option to edit the traffic shaping configurations.



| Тп | affic Shaping | Configuration | |
|------------------------|---------------|---------------|--------------|
| Shaning Group | Shaping Gro | nun1 | ~ |
| Shaping Gloup | onaping ore | Jup I | |
| Peak | 100 | MB | |
| Enable Traffic Shaping | | | |
| Off-Peak | 200 | MB | |
| Peak Day | | | |
| 🗖 Daily / Weekly | | | |
| 🗹 Mon 🔽 Tue 🔽 We | n 🔽 Thr | ✓ Fri Sat | Sun |
| Peak Time | 09:00 | · ~ 18:00 | () |
| | | | Cancel Apply |

Figure 7-47 traffic shaping configurations

- Select a Shaping Group to be modified, enter a maximum throughput during Peak hours. Check the Enable Traffic Shaping option if necessary, and then enter a maximum throughput during Off-Peak hours and define the Peak Day.
- 3. Click the **Apply** button to continue.

At the **Protection Volume** pane, click the **Replication Task** tab to list all replication tasks.

| Prot | ection Volu | ume | | | | | | |
|------|-------------|------------------|----------|-------------|------------|--------------------------|-----------|-----------|
| Sna | pshot Task | Replication Task | | | | | | |
| | | | | | | | | 1 items 井 |
| | Volume Name | e The Last Task | Capacity | Target Name | Target LUN | Created | Completed | Status |
| + | Volume_01 | volume-m30 | 100GB | | | Tue Jan 22 15:30:02 2019 | • | Connected |
| | | | | | | | < 1 | / 1 → |

Figure 7-48 List Replication Tasks

The options are available in this tab.



Add Volumes

Here is an example to add volumes in the protection group.

1. Click the + icon in the **Replication Task** tab to pop up a window.

| Add Volume | | | | | | |
|--|---|--|--|--------|--|--|
| Select Volumes | | | | | | |
| ■ 1/2 items □ Volume_01_back - 100.0 ☑ Volume_02 - 110.00 GB | < | | | 0 item | | |
| Create Volume | | | | | | |

Figure 7-49 Add Volumes to the Protection Group

- 2. The **Select Volumes** boxes are divided into two sides. The left side is an ineffective list, and the right side is effective.
- 3. Select volumes and click the Dutton or the Sutton to make them effective or not.
- 4. Click the **Add** button to add.

Start Task

- 1. Select a volume, and then click the local to replicate the volume immediately.
- 2. The progress bar displays the current status.



Stop Task

1. Click the O icon of the volume to stop the replication task.

Click the 😳 icon beside the volume name to list the drop down options.



Figure 7-50 Replication Task Options

These options are available in the **Replication Task** tab.

Ungroup

- 1. Click the **Ungroup** option to remove the volume from the protection group.
- 2. Click the Ungroup button to confirm.

Connection Properties

1. Click the **Connection Properties** option to enable multipath and add connections.



| Connection Properties | | | | | | | | |
|----------------------------------|-------------------------------|---|-------------------|--------------|--|--|--|--|
| Protection Group Pr Volume Vo | otectionGroup_001 plume_01 | | | | | | | |
| | | | | 3 items | | | | |
| No. | Source Port | | Target IP Address | Status | | | | |
| 1 Add | Connection | ~ | 10.10.1.11 | C' Connected | | | | |
| 1 | Auto | ~ | 10.10.1.12 | | | | | |
| 2 Add | Connection Auto | ~ | 10.10.1.13 | | | | | |
| | | | | < 1 / 1 > | | | | |
| | | | | Cancel Apply | | | | |

Figure 7-51 Connection Properties

- 2. Check the **Enable MultiPath** option if necessary, and then select the **Source Port** and enter a **Target IP Address**.
- 3. Or click the **Add Connection** button to add another connection. Select the **Source Port** and enter a **Target IP Address**.
- 4. If the connection is not stable, click the \mathbb{C} icon to reconnect the connection.
- 5. Click the **Apply** button to take effect.

Snapshot Center

About the snapshot center, please refer to the chapter 7.2.3, <u>Snapshot Center</u> section for more details.

7.2.6. Switch Local to Remote

Here is an example of switching a replication plan-local to replication plan-remote.

1. Click the **Protection Plan Setting** option to configure the switch local to remote.



| Protection Pla | n Setting | |
|-----------------|---|--------|
| Snapshot Plan | | |
| Snapshot | 🖄 Disable | Enable |
| Replication Pla | 1 | |
| Remote | 🗈 Disable | Enable |
| Local | li Every 30 mins ; Every day Disable Switch to Remote | Edit |
| | | Cancel |

Figure 7-52 Switch to Remote

2. Click the **Switch to Remote** text to configure the replication plan.



| Edit Remote Replication Plan | |
|---|--------------|
| Schedule @ | |
| O Once | |
| Repeat | |
| ✔ Daily/Weekly ✔ Mon ✔ Tue ✔ Wen ✔ Thr ✔ Fri ✔ Sat ✔ Sun | |
| every 30 minutes V | |
| Shaping Group | |
| Shaping Group1 | |
| | Cancel Apply |

Figure 7-53 Edit Remote Replication Plan

- 3. Select the **Once** option to execute the plan once. Or select the **Repeat** option to repeat the plan, and then check the repeat frequency.
- 4. Check the **Enable Traffic Shaping** option if necessary and then click the **Edit** button to edit the shaping group.
- 5. Click the **Apply** button to continue.
- 6. Move all disk drives of the source pool to the target array.



| Protection Pla | n Setting | | |
|-----------------|---------------|-----------|----------|
| Snapshot Plan | | | |
| Snapshot | 🖹 Disable | | Enable |
| Replication Pla | 1 | | |
| Remote | Disconnection | Disable R | econnect |
| Local | 🗈 Disable | | Enable |
| | | | Cancel |

Figure 7-54 Remote Reconnect

- 7. Click the **Reconnect** text to reconnect.
- 8. Done.

CSAN

8. Analysis Tab

The **Analysis** tab displays historical array data, including I/O performance trends across all volumes, storage capacity, and consumption on the array.

8.1. Analysis Features

XEVO provides QReport to help you analysis the status of your business usage. The system generates performance and capacity analytics as far back as 1 year. It eases the effort of IT managers by exporting a report to analyze the storage usage, and allows IT generalists to make a better resource arrangement faster than ever and easier.



Figure 8-1 Analysis Features

8.2. Array Analysis

Select the **Analysis** tab to view performance and capacity changes of the array.



8.2.1. Performance Monitoring

Select the **Performance** pane to monitor performance.

CSAN



Figure 8-3 List All Volumes in the Performance Pane

All volumes are listed. You can select one or more volumes to view performance.



Figure 8-4 Performance Graph

The performance graph displays a series of rolling graphs consisting of real-time performance. The incoming data appears along the right side of each graph as older numbers drop off the left side. The curve in each graph consists of a series of individual data points.

The **I/O type** specified in the bottom-left corner of the performance graph pane determines the information. I/O types include Read, Write, and R & W. The **Zoom** specified in the bottom-right corner determines the performance interval. There is a time from 1 hour to 1 year.





INFORMATION:

XEVO maintains a rolling one-year history of data. The granularity of the historical data increases with age. Older data points are spaced further apart in time than the nearest data points.

Single Point Report

Click any part of the graph to display values for a specific point in time.





Click the **Export** button to pop-up a window to display more details. Or click the **x** icon to unselect.

| Export Performance | | | | | | | |
|--------------------|------|---------------------|---------------------|--|----------------|--|--|
| Time | | 1/11/2019, 14:35:28 | | | | | |
| Volumes | | Volume_01, Volume_0 | 2 | | | | |
| | | Total 2 items | | | | | |
| Latency | IOPS | Throughput | | | | | |
| R/W | | | 1/11/2019, 14:35:28 | | | | |
| Read | | | 2.51 ms | | | | |
| Write | | | 0.67 ms | | | | |
| Read+Write | | | 3.06 ms | | | | |
| | | | | | | | |
| | | | | | Close Download | | |

Figure 8-6 Export Performance of Single Point



Three tabs can be selected to observe **Latency**, **IOPS**, and **Throughput**. Click the **Download** button to download the performance report to a file. Or click the **Clear** button to close the window.

Two-point Interval Report

Click any two points of the graph to display values for two specific points in time.



Figure 8-7 Two Points Report

Click the **Export** button to pop-up a window and display more details. Or click the **x** icon to unselect.



| Export P | erformanc | e | | | | | |
|-----------------|---|--------------------------|------------------|----------|---|----------|--|
| Time Volumes | nes Volume_01, Volume_02 Total 2 items | | | | | | |
| Latency | IOPS 1 | Throughput | | | | | |
| 1/11/2019, 14 | :35:28 | 2.51 / 0.67 / 3.06 (Read | d / Write / R+W) | | | | |
| 1/11/2019, 14 | :49:03 | 2.56 / 0.66 / 3.15 (Read | d / Write / R+W) | | | | |
| | | | | | and all the last star and star | | |
| | | | | | | | |
| 1/11/2019, 14 | :35:28 | 1/11/2019, 14:40:00 | 1/11/2019 | 14:44:32 | 1/11/2019, | 14:49:03 | |
| Single Hig | hest Value | | | | | | |
| R/W | Maximum | Volume Name | | | Time | | |
| Read | 2.58 ms | Volume_01, Volume_02 | | | 1/11/2019, 14:47 | :03 | |
| Write | 0.75 ms | Volume_01, Volume_02 | | | 1/11/2019, 14:40 | :00 | |
| Read+Write | 3.15 ms | Volume_01, Volume_02 | | | 1/11/2019, 14:47 | :03 | |
| | | | | | Close | wnload | |

Figure 8-8 Export Performance of Two-point Interval

The same, three tabs can be selected to observe **Latency**, **IOPS**, and **Throughput**. Click the **Download** button to download the performance report to a file. Or click the **Clear** button to close the window.

8.2.2. Capacity Analysis

Select the Capacity pane to monitor array capacity.

CSAN



All volumes are listed. You can select one or more volumes to view capacity changes.



Figure 8-10 Array Capacity Graph

The capacity graph displays a series of rolling graphs consisting of real-time capacity.





Figure 8-11 Array Capacity Report

Click the **Export** button to pop-up a window and display more details. Or click the **x** icon to unselect.



9. System Tab

The **System** tab manages the system settings. It displays array health status, and system information; configures general system settings, management and data ports; maintains system firmware, disks; rescues system setting or volume information. This chapter describes the details of system operations and examples.

9.1. Arrays Information

Select the System tab and the Arrays subtab to displays array health status.



Figure 9-1 Arrays Subtab in the System Tab

9.1.1. List Arrays

All arrays including head and expansion units are listed in the left pane. You can click one of them to display the details.



There are front and rear pictures in the right pane. You can move your mouse over the system components and watch the status of disks, controllers, management ports, data

ports, fan modules, power supply modules, and cache to flash modules.





Front and Rear Pictures of the Array Figure 9-3

9.1.2. Array Information

There are three icons at the left side. They are array information, temperatures, and identification.

Array Information

Click the first icon to display the array information.



Figure 9-4 Array Information

This table shows the array descriptions.

| Table 9-1 Array | v Descriptions |
|-----------------|---|
| Row Name | Description |
| Model Name | The model name of the array. |
| Status | The status of array: |
| | • Green Color / Normal: Dual controllers and expansion units are in |
| | normal stage. |
| | Orange Color / Abnormal: The configurations of two controllers |
| | are different, including the CPU model, memory capacity, host |
| | cards, and controller firmware version. Please check the |
| | hardware configurations of two controllers or execute firmware |

T.I.I. 0 1 _ . ..



| | synchronization. |
|------------------|--|
| | Red Color / Warning: In dual controller mode, one controller or |
| | one of expansion unit fails or they have been plugged out. Please |
| | replace or insert a good controller. |
| Serial Number | The seiral number of the array. |
| System | The status of system availability: |
| Controller | Dual Controller, Active/Active: Dual controllers and expansion |
| | units are in normal stage. |
| | Dual Controller, Degraded: In dual controller mode, one controller |
| | or one of expansion unit fails or they have been plugged out. |
| | Please replace or insert a good controller. |
| | Dual Controller, Lockdown: In dual controller mode, the |
| | configurations of two controllers are different, including the |
| | memory capacity, host cards, and controller firmware version. |
| | Please check the hardware configurations of two controllers or |
| | execute firmware synchronization. |
| Master | Current master controller. |
| Controller | |
| Backplane Serial | The backplane serial number of the array. |
| Number | |
| Backplane ID | The backplane ID of the array. |
| MCU Version | The MCU version of the backplane. |

Array Temperatures

Click the second icon to display the several temperatures of the array.



Figure 9-5 Array Temperatures



Array Identification

The UID (Unique Identifier) LEDs help users to easily identify the system location within the rack. Clicking on the third icon will turn on the UID LED control mechanism.



When the UID LEDs are turn on, they are light blue color, located on the right panel of front view and both controllers of rear view. Click it again to turn off the UID LEDs.



INFORMATION:

For the front and rear view about the UID LEDs, please refer to chapter 2, System Components Overview in the <u>QSAN Hardware Manual XF2026D</u>.

9.1.3. Disk Information

Move your mouse over the disk and the disk information will appear in a popup box.





This table shows the disk descriptions.

| Table 9-2 Disk | Descriptions |
|----------------|--|
| Row Name | Description |
| Name | The position of the disk drive. |
| Status | The status of disk health: |
| | Green Color / Normal: The disk drive is good. |
| | Orange Color / Abnormal: The disk drive has unrecoverable read |
| | errors or S.M.A.R.T. error. |
| | Red Color / Warning: The disk drive has failed. |
| Temperature | The temperature of the disk drive. |
| Estimated Life | The life remaining of the disk drive. |
| Remaining | |
| Disk Type | The type of the disk drive: |
| | Free Disk: This disk drive is free for use |
| | • RAID Disk: This disk drive has been set to a pool. |
| | Global Spare: This disk drive has been set as global spare of |
| | whole system. |

The options are available in disk information.

S.M.A.R.T.

S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology) is a diagnostic tool for disk drives to deliver warning of drive failures in advance. It provides users a chance to take actions before a possible drive failure. Click the **S.M.A.R.T.** button to display S.M.A.R.T. information.



| S.M.A.R.T. | | |
|--|-----------------|----|
| ltem | Information | |
| Write errors corrected with possible delays | 0 | • |
| Total write errors | 0 | |
| Total write errors corrected | 0 | |
| Total write errors corrected by algorithm | 0 | |
| Total bytes written | 163701085426688 | |
| Total uncorrected write errors | 0 | |
| Read errors corrected by ECC hardware method | 0 | |
| Read errors corrected with possible delays | 0 | |
| Total read errors | 0 | |
| Total read errors corrected | 0 | |
| Total read errors corrected by algorithm | 0 | - |
| | | ок |

Figure 9-8 S.M.A.R.T. Information

Click the **OK** button to close the window.

Set Global Disk

Click the **Set Global Disk** button appears if the disk drive is free. You can set it as a global spare disk. Click the **Set Global Disk** button to set it up.

Set Free Disk

Click the **Set Free Disk** button appears if the disk drive is a global spare disk. You can set it as a free disk. Click the **Set Free Disk** button to set it up.

9.1.4. Rear Component Information

Move your mouse over the rear components in the array, the component information will appear in a popup box. You can watch the information of controllers, management ports, data ports, fan modules, power supply modules, and BBM, and flash module.



Controller Information



Figure 9-9 Controller Information

Rear

| | | <u>≏</u> ġ | |
|--|-------------|----------------|--|
| | Managen | nent Port | |
| | Location | Ctrl1 | |
| | Status | Up | |
| | IP Address | 192.168.30.234 | |
| | Subnet Mask | 255.255.255.0 | |
| | Gateway | 192.168.30.254 | |

Figure 9-10 Management Port Information



Figure 9-11 Data Port Information





Figure 9-12 Fan Module Information

Rear Power Supply Name PSU1 Status Normal

Figure 9-13 Power Supply Information

9.2. Configure System Settings

Select the **System** tab and the **Settings** subtab to configure system settings. There are four panes in this subtab. They are **Accounts**, **General Settings**, **Configuration Backup**, and **Management Port**.

| | ○ XCubeFA | S | | | | | 0 | 🚎 Hi, Admin |
|-----------|-------------|--------|------------|----------|------------|-------------|---|---------------|
| Dashboard | Storage | Hosts | Protection | Analysis | System | Messages | | |
| | | Arrays | Settings | 5 | Data Ports | Maintenance | | |
| | | | | | | | | |

Figure 9-14 Settings Subtab in the System Tab

9.2.1. Account Settings

Click the **Accounts** pane to manage the user accounts.

OSAN

| La Account | s | | ~ |
|------------|--------------------------|--|---|
| 0,0 | Admin Change Password | | |

Figure 9-15 Accounts Pane

Click the Change Password button to change the passwords of administrator and user.

| | Change Password | |
|--------------|------------------|--------|
| Admin | | |
| 0 | Old Password | |
| X | New Password | |
| | Confirm Password | |
| | | Apply |
| User | | |
| Ο | New Password | |
| $\int \odot$ | Confirm Password | |
| | | Apply |
| | | Cancel |

Figure 9-16 Change Password

- Change Admin Password: Enter the current password in Old Password, and then change admin's password in New Password and reconfirm in Confirm Password, The maximum length of the password is 32 characters. Valid characters are [A~Z | a~z | 0~9 | ~!@#\$%^&*_-+=`|\(){[]:;"'<>,.?/]. Click the Apply button to take effect.
- Change User Password: Change user's password in New Password and reconfirm in Confirm Password, The maximum length of the password is 32 characters. Valid characters are [A~Z | a~z | 0~9 | ~!@#\$%^&*_-+=`|\(){}[:;"'<>,.?/]. Click the Apply button to take effect.

When finished, click the **OK** button to close the window.



9.2.2. General Settings

Click the **General Settings** pane to setup the system name, data and time, and configure the login options.

| 🌣 General Se | ttings |
|----------------------------|--|
| System Name | XCubeFAS |
| Date and Time | |
| Current Time | 2019/01/07 18:00:52 |
| Time Zone | (GMT+08:00) Taipei \lor |
| Manual | |
| Date | 2019/01/07 17:58:44 |
| O NTP Server | |
| Login Options | |
| Auto Logout | 5 Minutes 30 Minutes 60 Minutes 💿 Disabled |
| Login limitation | Multi login Single login |
| Apply | |

Figure 9-17 General Settings

The options are available in this pane.

System Name

Change the system name, highlight the old name and type in a new one. Maximum length of the system name is 32 characters. Valid characters are [$A \sim Z \mid a \sim z \mid 0 \sim 9 \mid -$].

Date and Time

Change the current date, time and time zone as required. Date and time can be set by manually or synchronized from a NTP (Network Time Protocol) server.



Login Options

- **Auto Logout:** When the auto logout option is enabled, you will be logged out of the admin interface after the time specified. There are Disabled (default), 5 minutes, 30 minutes, and 60 minutes options.
- **Login Lock:** When the login lock is enabled, the system allows only one user to login to the web UI at a time. There are Multi login (default) and Single login options.

When finished, click the **Apply** button to take effect.

9.2.3. Configuration Backup

Click the **Configuration Backup** pane to be used to either save system configuration (export) or apply a saved configuration (import).

| Configuration Ba | ickup | ^ |
|----------------------------|-----------------|---|
| Export Mode Export File | System v Export | |
| Import File | import Import | |

Figure 9-18 Configuration Backup

While the volume configuration settings are available for exporting, to prevent conflicts and overwriting existing data, they cannot be imported.

The options are available in this pane.

Export

Select the **Export Mode** for exporting system or volume configurations, then click the **Export** button to save a file.

Import

Import all system configurations excluding volume configuration.





CAUTION:

The Import option will import all system configurations excluding volume configuration. The current system configurations will be replaced.

9.2.4. Configure Management Port

Click the **Management Port** pane to show the information of the management ports. MAC address is displayed for reference and it is used on wake-on-LAN feature. IP address, DNS server, and service ports can be modified according to the management purpose.

| Management | t Port |
|--------------------------|---------------------|
| Enable Dual Managemer | nt Ports |
| Main Controller - Contro | ller1 |
| MAC Address | 00:13:78:D4:00:00 |
| Туре | Static IP Address ∨ |
| IP Address | 192.168.1.234 |
| Subnet Mask | 255.255.255.0 |
| Gateway | 192.168.1.254 |
| DNS Server Address | 8.8.8.8 |
| | |
| Service Ports | |
| HTTP Port | 80 |
| HTTPS Port | 443 |
| SSH Port | 22 |
| Apply | |

Figure 9-19 Configure Management Port

The options are available in this pane.

Enable Dual Management Ports

This is for dual controller models. When the setting is enabled, both management ports of the controllers have their own IP addresses and MAC addresses, and both are active. If the setting is disabled, only the management port of the master controller is active, the other



one is on standby. Both controller management ports share the same IP address and MAC address. The management port fails over to the slave controller when the master controller goes offline, either planned or unplanned.



INFORMATION:

For deployment of management ports, please refer to the chapter 4 Deployment Types and Cabling in the <u>XCubeFAS Hardware Manual</u>.

Main Controller

- **MAC Address:** Display the MAC address of the management port.
- **Type:** The option can change IP address for remote administration usage. There are three options for **DHCP**, **BOOTP**, or **Static IP Address**.



INFORMATION:

DHCP: The Dynamic Host Configuration Protocol is a standardized network protocol used on IP (Internet Protocol) networks for dynamically distributing network configuration parameters, such as IP addresses for interfaces and services. With DHCP, computers request IP addresses and networking parameters automatically from a DHCP server, reducing the need for a network administrator or a user to configure these settings manually.

BOOTP: Similar to DHCP, the Bootstrap Protocol is also a computer networking protocol used in Internet Protocol networks to automatically assign an IP address to network devices from a configuration server. While some parts of BOOTP have been effectively superseded by the DHCP, which adds the feature of leases, parts of BOOTP are used to provide service to the DHCP protocol. DHCP servers also provide legacy BOOTP functionality.

 DNS Server Address: DNS (Domain Name System) provides a means to translate FQDN (Fully Qualified Domain Name) to IP address. Some notification services need DNS setting. Enter an IP address of DNS server here.


Service Ports

• Uncheck to disable the service ports of **HTTP**, **HTTPS**, and **SSH**. If the default port numbers of the service ports are not allowed on your network environment, they can be changed here.

When finished, click the **Apply** button to take effect.

9.3. Configure Data Port Settings

Select the **System** tab and the **Data Ports** subtab to configure iSCSI or fibre channel data ports.

| CSAN XEVO XCubeFAS | | | | | | | ? | 🚎 Hi, Admin |
|----------------------|---------|--------|------------|----------|---------|-------------|---|---------------|
| Dashboard | Storage | Hosts | Protection | Analysis | System | Messages | | |
| | | Arrays | Settings | Dat | a Ports | Maintenance | | |

Figure 9-20 Data Ports Subtab in the System Tab

9.3.1. Data Port Overview

XCubeFAS provides different type of host connectivity according to the system configuration, it could be base system or host cards installed system. The base system has two 10GbE iSCSI ports onboard per controller. The host cards are installed the same type on both controllers. Currently host card has three types, 1GbE iSCSI (RJ45), 10GbE iSCSI (SFP+), and 16Gb FC (SFP+), for selection according to system infrastructure.

The **Data Port Overview** displays all the host connectivity in system. The icons show the data ports connected or disconnected.

| Data Port Overview | | | |
|--------------------|--------|--------|---------|
| CTRL 1 | Slot 1 | Slot 2 | Onboard |
| CTRL 2 | Slot 1 | Slot 2 | Onboard |



Figure 9-21 Data Port Overview



INFORMATION:

For hardware information about host cards, please refer to the chapter 3.3, Installing the Optional Host Cards section in the <u>XCubeFAS Hardware</u> <u>Manual</u>.

9.3.2. Configure iSCSI Data Ports

Click the **iSCSI Ports** pane to show information of iSCSI ports where they are located (onboard or host cards).

| <≎ is | CSI Po | orts | | | | | | ^ |
|----------|--------|------------------|----------|------|--------|-----|------------|-------|
| | CTRL | Interface | Location | Port | Status | LAG | IP Address | Gatew |
| A | 1 | iSCSI (10GB) 🏼 🌣 | Onboard | LAN1 | 1 Gb/s | N/A | 10.10.1.1 | |
| Δ. | 1 | iSCSI (10GB) 🏼 🌣 | Onboard | LAN2 | 1 Gb/s | N/A | 10.10.1.2 | |
| а – | 2 | iSCSI (10GB) 🏼 🌣 | Onboard | LAN1 | 1 Gb/s | N/A | 10.10.1.3 | |
| A | 2 | iSCSI (10GB) 🏼 🌣 | Onboard | LAN2 | 1 Gb/s | N/A | 10.10.1.4 | |
| • | | | | | | | | Þ |



The columns display information of an connected or disconnected icon, **CTRL** (Controller), **Interface** name, **Location**, **Port**, **Status**, **LAG** (Link Aggregation), **IP address**, **Gateway** IP address, **VLAN ID** (Virtual LAN ID), **Jumbo Frame** status, and **MAC address**.

Click the \circ icon beside the interface to list the drop down options. These options are available in the iSCSI ports.



| ¢ | iSCSI Po | rts | |
|----------|----------|--------------|----------------------|
| | CTRL | Interface | Location |
| ъ | 1 | iSCSI (10GB) | Cnboard |
| A | 1 | iSCSI (10GB) | Set IP Address |
| А | 2 | iSCSI (10GB) | Set Link Aggregation |
| а. | 2 | iSCSI (10GB) | Set Default Gateway |
| • | | | Set VLAN ID |
| | | | Set Jumbo Frame |
| 6 | iSCSI Se | ttings | Ping Host |
| | | | Reset Port |

Figure 9-23 iSCSI Options

Set IP Address

Click the **Set IP Address** option to assign an iSCSI IP address of the iSCSI data port. There are two options: Use DHCP to acquire an IP address automatically or specify a Static IP Address to set the IP address manually.



INFORMATION:

DHCP: The Dynamic Host Configuration Protocol is a standardized network protocol used on IP (Internet Protocol) networks for dynamically distributing network configuration parameters, such as IP addresses for interfaces and services. With DHCP, computers request IP addresses and networking parameters automatically from a DHCP server, reducing the need for a network administrator or a user to configure these settings manually.

| | Set IP Address |
|----------------------------|----------------|
| O DHCP 2 | |
| Static | |
| IP Address | 10.10.1.1 |
| Subnet Mask | 255.255.255.0 |
| Gateway | |
| | |
| | Cancel Apply |

Figure 9-24 iSCSI IP Address Settings

Set Link Aggregation

Click the **Set Link Aggregation** option, the default mode of each iSCSI data port is connected without any bonding. Two bonding methods, Trunking and LACP (Link Aggregation Control Protocol), can be selected. At least two iSCSI data ports must be checked for iSCSI link aggregation.

| | Set Link Aggrega | tion |
|----------------|-----------------------|--------------|
| Bonding Method | • Trunking 🕐 | |
| | LACP 2 | |
| IP Address | 10.10.1.1 | |
| Subnet Mask | 255.255.255.0 | |
| Gateway | | |
| Network Setup | Onboard-LAN1 \times | |
| | Onboard-LAN2 \times | |
| | | |
| | | Cancel Apply |

Figure 9-25 Set Link Aggregation



INFORMATION:

Trunking: Sometimes called "Port Trunking" configures multiple iSCSI ports to be grouped together into one in order to increase the connection speed beyond the limit of a single iSCSI port.

LACP: The Link Aggregation Control Protocol is part of IEEE 802.3ad that allows bonding several physical ports together to form a single logical channel. LACP allows a network switch to negotiate an automatic bundle by sending LACP packets to the peer. LACP can increase bandwidth usage and automatically perform failover when the link status fails on a port.

Set Default Gateway

Click the **Set Default Gateway** option to set the gateway of the IP address as default gateway. There can be only one default gateway.

Set VLAN ID

Click the **Set VLAN ID** option, VLAN (Virtual LAN) is a logical grouping mechanism implemented on switch device. VLANs are collections of switching ports that comprise a single broadcast domain. It allows network traffic to transfer more efficiently within these logical subgroups. Please consult your network switch user manual for VLAN setting instructions. Most of the work is done at the switch. Please make sure that your VLAN ID of iSCSI port matches that of switch port. If your network environment supports VLAN, you can use this function to change the configurations. Fill in VLAN ID and Priority settings to enable VLAN.

| | Set VLAN ID |
|----------|------------------------------------|
| VLAN ID | 2 |
| | Valid number is between 2 and 4096 |
| Priority | 0 |
| | Cancel |
| | Gancer Apply |

Figure 9-26 Set VLAN ID



INFORMATION:

VLAN ID: VLAN ID is a number ranges from 2 to 4094. Three numbers (0, 1, and 4095) are reserved for special purposes.

Priority: The PCP (Priority Code Point) is a number ranges from 0 to 7 and reserved for QoS (Quality of Service). The definition is compliant with IEEE 802.1p protocol and 0 is the default value. In normal cases, you don't need to set this value.

Remove Default Gateway

To remove the default gateway, click the **Remove Default Gateway** option.

Set Jumbo Frames

Click the **Set Jumbo Frames** option to set the MTU (Maximum Transmission Unit) size. The jumbo frame size could be set as 4000 or 9000 bytes. Jumbo Frame is disabled by default.



Figure 9-27 Set Jumbo Frame



CAUTION:

If the VLAN ID or jumbo frames are set, the related switching hub and HBA on host must be set, too. Otherwise, the LAN connection cannot work properly.



Ping Host

Click the **Ping Host** option to verify the port connection from a target to the corresponding host data port. Input the host's IP address and click **Start** button. The system will display the ping result. Click **Stop** button will stop ping activity.

| Ping Host | | |
|-----------|-------|--------|
| 10.10.1.1 | Start | |
| | | |
| | | |
| | | ĥ |
| | | Cancel |

Figure 9-28 Ping Host

Reset Port

Click the **Reset Port** option to be generally used to recover from a port malfunction.

9.3.3. Configure iSCSI Settings

Click the **iSCSI Settings** pane to provide to set up entity name of the system and iSNS (Internet Storage Name Service) server. The entity name is default in IQN (iSCSI Qualified Name) format and could be modified for management purpose. The iSNS IP is used by iSNS protocol for automated discovery, management and configuration of iSCSI devices on a TCP/IP network. To use iSNS, an iSNS server must be added to the SAN. The iSNS server IP address must be added to the storage system for iSCSI initiator service to send queries.

| 🏠 iSCSI Sett | ings | ^ | |
|-----------------|---------------------------------------|---|--|
| Entity Name | iqn.2004-08.com.qsan:xf2026-000d40000 | 0 | |
| iSNS IP Address | | 0 | |
| Apply | | | |

Figure 9-29 Entity Name and iSNS Settings

The options are available in this pane.

- Entity Name: Change the entity name; highlight the old name and type in a new one. The maximum length of entity name is 200 characters. Valid characters are [a~z | 0~9 | -.:].
- **iSNS IP Address:** The option can change iSNS IP address for internet storage name service.

When finished, click the **Apply** button to effect changes.



INFORMATION:

iSNS: The iSNS protocol allows automated discovery, management, and configuration of iSCSI devices on a network.

9.4. Maintenance

Select the **System** tab and the **Maintenance** subtab to provide **System Information**, **Firmware**, **Disk Services**, **Power Settings**, and **Rescue** functions.



Figure 9-30 Maintenance Subtab in the System Tab



9.4.1. System Information

Click the **System Information** pane to display all system information.

| i Syste | em Information | | |
|------------------|--|---|--|
| | | | |
| 0 | System Name Model Name Serial Number Controller Status Master Controller | XCubeFAS XF2026 QW3160160I0021001 Normal Controller 1 | |
| Controller 1 | | | |
| Serial Number | | 50013780080B32C0 | |
| CPU | | Intel(R) Processor D1500 4 Cores | |
| Memory | | 32 GB | |
| Host Card Slot | 1 | Empty | |
| Host Card Slot | 2 | Empty | |
| Firmware Ver | | 1.0.1 | |
| SAS IOC Firmw | are Ver | 07.00.01.00 | |
| SAS Expander F | Firmware Ver | 1000 | |
| Controller 2 | | | |
| Serial Number | | 50013780080B3340 | |
| CPU | | Intel(R) Processor D1500 4 Cores | |
| Memory | | 32 GB | |
| Host Card Slot | 1 | Empty | |
| Host Card Slot : | 2 | Empty | |
| Firmware Ver | | 1.0.1 | |
| SAS IOC Firmwa | are Ver | 07.00.01.00 | |
| SAS Expander F | Firmware Ver | 1000 | |
| Backplane | | | |
| Backplane Seria | al Number | 001378D40000 | |
| Backplane ID | | QW316 | |
| MCU Verion | | 1.2.0 | |
| Download Se | ervice Package | | |

Figure 9-31 System Information

The options are available in this pane.

• **Download Service Package:** Click button to download system information for service.





CAUTION:

If you try to increase the system memory and running in dual controller mode, please make sure both controllers have the same DIMM on each corresponding memory slot. Failing to do so will result in controller malfunction, which will not be covered by warranty.

9.4.2. Firmware Update

Click the **Firmware** pane to be used to update controller firmware, expansion unit firmware.



TIP:

Before upgrading, we recommend you to export your system configurations first in the **Configuration Backup** function tab. Please refer to the chapter 9.2.3, <u>Configuration Backup</u> section for more details.

| Head Unit Firmware Un | late | |
|--|------------------------------------|-------|
| Medel Name | VE2026 | |
| Firmware Version | 1.0.1 | |
| Update File | file path | Apply |
| Synchronization The firmware versions are th | e same between the two controllers | |
| Synchronization The firmware versions are the Synchronize | e same between the two controllers | |
| Synchronization The firmware versions are the Synchronize | e same between the two controllers | |
| Synchronization The firmware versions are the Synchronize Expansion Unit Firmware | e same between the two controllers | |
| Synchronization The firmware versions are the Synchronize Expansion Unit Firmware Expansion Unit | e Same between the two controllers | ~ |
| Synchronization The firmware versions are the Synchronize Expansion Unit Firmware Expansion Unit Firmware Version | e Update | ~ |

Figure 9-32 Firmware Update

The options are available in this pane.



Head Unit Firmware Update

Please prepare new controller firmware file named "xxxx.bin" in local hard drive, click the icon to select the firmware file. Then click the **Apply** button, it will pop up a warning message, click the **OK** button to start upgrading the firmware.

When upgrading, there is a progress bar running. After finished upgrading, the system must reboot manually to make the new firmware take effect.



TIP:

Firmware update can be done without downtime if the MPIO configuration is well-configured between the connected host / server and both controllers. A firmware update process will update both controllers at the same time. After finished updating, you have to reboot the system.

A system reboot will reboot the master controller first. At this point, the slave controller will take over all tasks (and becomes a new master controller). After the original master controller finishes the booting process (the original master controller is slave controller at this moment), the new master controller (the original slave controller) will reboot automatically, and so on for the original master controller to take over the tasks, once the original slave controller finishes the booting process, the firmware update procedure is completed.

Synchronization

If the firmware versions between two controllers are different, it will display a warning message. Click the **Synchronize** button to synchronize and force a reboot.

Expansion Unit Firmware Update

To upgrade expansion unit firmware, first select an expansion unit. Then other steps are the same as the head unit firmware update. After finished upgrading, the expansion unit must reboot manually to make the new firmware take effect.

9.4.3. Disk Services

Click the **Disk Services** pane to clear disk read error and update disk firmware.



Disk Services

Clear Disk Read Error

This action will not affect any data inside the disks. The same issue may still occur if the disks are defective and cannot communicate with the system, and it is recommended to replace the disks by then.

~

| pdate D | isk Firr | mware | | | | |
|-------------|----------|-------|--|-----------|------------------|-----------|
| lpdate File | е | | | | | |
| nclosure | ID | | 0 (Head Uint: XF2026) | ~ | | |
| elect by | | | Manufacturer Slot | | | |
| /lanufactu | ırer | | SEAGATE | ~ | | |
| lodel | | | ST400FM0053 | ~ | | |
| Selected | Disks | | | | | 2 item |
| | ! | Slot | Firmware Version | Capacity | Disk Type | Status |
| | ٢ | 1 | 0006 | 372.36 GB | SAS SSD 12.0Gb/s | Online |
| | ۲ | 2 | 0006 | 372.36 GB | SAS SSD 12.0Gb/s | Online |
| | | | | | | < 1 / 1 → |
| | | | | | | |

Figure 9-33 Disk Services

The options are available in this pane.

Clear Disk Read Error

Click the **Clear Read Error** button to clean the read error of the disk drive and reset the failed status.

Update Disk Firmware

Select disks by manufacturer or slot, and click the \Box icon to select a firmware file, and then click the **Update** button to upgrade the firmware of the disk drive.



9.4.4. Power Settings

Click the **Power Settings** pane to configure the boot options and UPS (Uninterruptible Power Supply).

| U Power Settings | k |
|--|---|
| Boot Management Auto Shutdown ON If the auto shutdown feature is enabled, the system will shut down automatically when the voltage and temperature exceed a critical level. Wake-on-LAN ON If the wake-on-LAN feature is enabled, the system will accept a magic packet from the management port to power on the system. Wake-on-SAS ON If the wake-on-SAS feature is enabled and the expansion units are connected to the proprietary wake-on-SAS cables, the expansion units will power on or shut down together with the head unit. | |
| UPS Enable UPS Support Communication Type Shutdown Battery Level SNMP IP Address SNMP Version Communication Type | |
| UPS Status - UPS Battery Level - UPS Manufacturer - UPS Model - | |

Figure 9-34 Power Settings

The options are available in this pane.

Boot Management

Click the switch to turn ON (Enable) or OFF (Disable).

• **Auto Shutdown:** Check to enable the auto shutdown feature. If it is enabled, the system will shut down automatically when the voltage and temperature exceed a critical level.



TIP:

For better protection and to avoid a single short period of abnormal voltage or temperature, enabling the setting could trigger an automatic shutdown. This is done using several sensors placed on key systems that the system checks every 30 seconds for present voltages or temperatures.

• **Enable Wake-on-LAN:** Check to enable the wake-on-LAN feature. If it is enabled, the system will accept a magic packet from the management port to power on the system.



TIP:

To execute wake-on-LAN function, MAC address of management port is needed. For the information of MAC address, please refer to the chapter 9.2.4, <u>Configure Management Port</u> page.

• Enable Wake-on-SAS: Check to enable the wake-on-SAS feature. If the wake-on-SAS feature is enabled and the expansion units (XD5300 series) are connected to the proprietary wake-on-SAS cables, the expansion units will power on or shut down together with the head unit.



INFORMATION:

For deployment of the head unit and expansion units, please refer to the chapter 4, Deployment Types and Cabling in the <u>XCubeFAS Hardware</u> <u>Manual</u>.



CAUTION:

Wake-on-SAS feature required QSAN proprietary expansion cables connected between the head unit and expansion units. Please contact local sales for this accessory.



UPS

Check the **Enable UPS Support** checkbox to enable UPS supported. Now we support network UPS via SNMP, Serial UPS with COM port, and USB UPS.



INFORMATION:

For deployment of UPS, please refer to the chapter 3, Installing the System Hardware in the <u>XCubeFAS Hardware Manual</u>.

- **Communication Type:** Now we support network UPS via SNMP, Serial UPS with COM port, and USB UPS.
- **Shutdown battery Level:** If the power is shortage, the system will execute shutdown process when reaching the UPS battery level.

If Communication Type selects SNMP:

- **SNMP IP Address:** Enter the IP address of the network UPS via SNMP.
- **SNMP Version:** Select SNMP supported versions: v1, v2c, or v3. Please enter community if select SNMP v1 or v2c. If select SNMP v3, it needs more options for authentication. Please enter a username, check to use authentication if necessary, select an authentication protocol and enter an authentication password, check to use privacy if necessary, the privacy protocol supports DES, and enter a privacy password.
- If Communication Type selects Serial:
- **UPS Manufacturer:** Select the UPS manufacture.
- UPS Model: Select the UPS model.

When finished, click the **Apply** button to take effect.

This table shows the UPS status.

| Table 9-3 UPS | Status Descriptions |
|---------------|---|
| Column Name | Description |
| UPS Status | The status of UPS: |
| | On Line: The UPS is online. |
| | On Battery: The UPS is on battery. |
| | Low Battery: The voltage of the battery is low. |
| | • High Battery: The voltage of the battery is high. |
| | Replace Battery: The battery needs to be replaced. |



| | Charging: The battery is charging |
|--------------|--|
| | onarging. The battery is charging. |
| | Discharging: The battery is discharging. |
| | Bypass Mode: The power circuit bypasses the UPS battery, so no |
| | battery protection is available. It may happen to check if the UPS |
| | operates properly during a power loss. Or the UPS is offline for |
| | maintenance. |
| | • Offline: UPS is offline and is not supplying power to the load. |
| | Overloaded: UPS is overloaded. You plugged more equipments |
| | into the UPS than it was designed to handle. |
| | Forced Shutdown: Forced shutdown the UPS. |
| UPS Battery | The battery level of the UPS. |
| Level | |
| UPS | The manufacturer of the UPS. |
| Manufacturer | |
| UPS Model | The model of the UPS. |

9.4.5. Rescue

Click the **Rescue** pane to allow users to reset the system configurations back to the factory default settings, clean all configurations of the expansion enclosure ID, and restore the volume configuration from the volume creation history.



| 🛍 Resc | ue | | | | | | | ^ |
|---|--|--|--|-----------------------------------|---|--|---|---|
| Reset to Fact Click the Reset checked, it will if it fails while th Clear all voi Reset to Def Clean Expans Click the Clean Clean | ory Defaults to Defaults button to also clear all volume here is no record. Ple lume restoration reco aults sion Enclosure ID button to clean all co pration | clear all user restoration re ase carefully rds nfigurations | r-entered co ecords. It is consider b of the expa | onfigura i irrevers efore m | tions and res sible, the syst aking this re nclosure ID. | et the system to Factor tem won't be able to rest set. | y default. If the following item is core the recorded RAID configuration | n |
| The volume res | toration can restore y | our previous | volume co | nfigurat | ions when a | pool corruption or a mis | -delete occurs. Before restoration, | |
| the lost data wi | ll be recovered. | er uisks are ir | istalled exa | actiy in t | ne same sio | is as before. The volume | restoration cannot guarantee an | |
| Please contact | for support before us | ing this func | tion. | | | | | |
| Enclosure ID | 0 (Head Unit: XF20 | 26) 🗸 | | | | | | |
| | Volume Na me | Pool Na me | Capaci ty | Disk s | Disk Slot | Time | Log | |
| Restore | Volume_05 | Pool_01 | 4 GB | 3 | 0:3, 0:4, 0:5 | 2019/01/08 02:51:51 CST | The volume is created. | |
| Figure 9-35 | Rescue | | | | | | | |

The options are available in this pane.

Reset to Factory Defaults

Click the **Reset to Defaults** button to progress reset to defaults and force a reboot. The default settings are:

- Reset Management Port IP address to DHCP, and then fix IP address: 169.254.1.234/16.
- Reset admin's **Password** to 1234.
- Reset **System Name** to model name plus the last 6 digits of serial number. For example: XF2026-123456.
- Reset IP addresses of all **iSCSI Ports** to 192.168.1.1, 192.168.2.1, ... etc.
- Reset link speed of all Fibre Channel Ports to Automatic.
- Clear all access control settings of the host connectivity.

Clear all volume restoration records

Check the **Clear all volume restoration records** to clear all volume restoration records.



CAUTION:

Process the **Reset to Defaults** function will force a reboot. To clear all volume restoration records is irreversible. The system won't be able to restore the recorded RAID configuration if it fails while there is no record. Please carefully consider before making this reset.

Clean Expansion Enclosure ID

Click the **Clean** button to clean all configurations of expansion enclosure ID. A clean will cause the system shutdown, and then you have to start manually.



INFORMATION:

The XCubeDAS XD5300 series features the seven-segment LED display for users to easily identify a specific XCubeDAS system. The enclosure ID is assigned by head unit (XCubeSAN series) automatically. The seven segment LED display supports up to ten XCubeDAS systems, and the numbering rule will start from 1 to A. For dual controller models, both controllers will display the same enclosure ID. After the XD5300 had been assigned the enclosure ID, head unit will assign the same enclosure ID when the system reboots or goes shutdown. For hardware information enclosure ID, please refer to the chapter 2.7, Seven-segment LED Display section in the <u>XCubeDAS Hardware Manual</u>.



CAUTION:

Process the **Clean Expansion Enclosure ID** function will force the system shutdown to clean all configurations of expansion enclosure ID.

Volume Restoration

This function will restore the volume configuration from the volume creation history. It is used for pool corruption and tries to recreate the volume. When trying to do data recovery, the same volume configurations as original must be set and all member disks must be installed by the same sequence as the original. Otherwise, data recovery will fail. The volume restoration does not guarantee that the lost data can be restored. Please get help from an expert before executing this function.



Volume Restoration

The volume restoration can restore your previous volume configurations when a pool corruption or a mis-delete occurs. Before restoration, please make sure that all the member disks are installed exactly in the same slots as before. The volume restoration cannot guarantee all the lost data will be recovered.

Please contact for support before using this function.

Enclosure ID 0 (Head Unit: XF2026) ∨

| | Volume Na me | Pool Na me | Capaci ty | Disk s | Disk Slot | Time | Log |
|---------|-----------------|---------------|--------------|-----------|------------------|----------------------------|--------------------------------------|
| Restore | Volume_05 | Pool_01 | 4 GB | 3 | 0:3, 0:4, 0:5 | 2019/01/08 02:51:51 CST | The volume is created. |
| Restore | Volume_Ro b | Pool_01 | 10 GB | 3 | 0:3, 0:4, 0:5 | 2019/01/08 02:50:21 CST | The volume is expanded. |
| Restore | Volume_Ro b | Pool_01 | 7 GB | 3 | 0:3, 0:4, 0:5 | 2019/01/08 02:46:36 CST | The volume is created. |
| Restore | Volume_02 | Pool_01 | 100 GB | 3 | 0:3, 0:4, 0:5 | 2019/01/07 16:26:49 CST | The snapshot space has initial ized. |
| Restore | Volume_02 | Pool_01 | 100 GB | 3 | 0:3, 0:4, 0:5 | 2019/01/07 16:26:19 CST | The snapshot space has initial ized. |
| Restore | Volume_06 | Pool_02 | 18 GB | 2 | 0:1, 0:1 | 2019/01/04 15:23:52 CST | The volume is created. |
| Restore | Volume_01 | Pool_01 | 150 GB | 3 | 0:3, 0:4, 0:5 | 2019/01/03 23:07:59 CST | The snapshot space has initial ized. |
| Restore | Volume_05 | Pool_03 | 334 GB | 1 | 0:2 | 2019/01/03 18:20:03 CST | The volume is created. |
| Restore | Volume_04 | Pool_01 | 200 GB | 3 | 0:3, 0:4, 0:5 | 2019/01/02 12:11:48 CST | The volume is created. |
| Restore | Volume_03 | Pool_02 | 334 GB | 2 | 0:1, 0:1 | 2019/01/01 16:21:39 CST | The volume is created. |
| | | | | | | | < 1 / 7 → |

Figure 9-36 Volume Restoration

This table shows the column descriptions.

| Table 9-4 Volu | me Restoration Column Descriptions |
|----------------|---|
| Column Name | Description |
| Volume Name | The original volume name. |
| Pool Name | The original pool name. |
| Capacity | The original capacity of the volume. |
| Disks | The original quantity of physical disk in the pool. |
| Disk Slot | The original physical disk locations. |

 Table 9-4
 Volume Restoration Column Descriptions



| Time | The last action time of the volume. |
|------|-------------------------------------|
| Logs | The last event of the volume. |

TIP:

When attempting data recovery, the same volume configurations as the original must be set and all member disks must be installed by the same sequence as original. Otherwise, data recovery will fail.



CAUTION:

Performing data recovery does not guarantee that the lost data can be restored 100%. It depends on the real operation and the degree of physical damages on disks. Users assume all risk when attempting data recovery procedures.

Click the **Restore** button to restore the deleted volume in the pool. And then click the **Restore** button to proceed.

10. Messages Tab

The **Messages** tab displays event logs and configures the notification settings. This chapter describes the details of message operations and examples.

10.1. Log Center

Select the **Messages** tab and the **Log** subtab to show event messages.



Figure 10-1 Log Subtab in the Messages Tab

Click All, or the icon 0 (information), A (warning), 9 (error) to filter the event levels. The numbers next to the levels are the sum of the events.

| | | Ali(1594) 🔀 (<u>1592)</u> 🛕 (1) 🔮 🌾 🔳 |
|---|----------------------------|---|
| | Time | Content |
| 0 | Wed, Jan 09, 2019 16:59:43 | [CTR1] admin login from 192.168.80.179 via web UI. |
| 0 | Wed, Jan 09, 2019 13:34:07 | [CTR1] The alert setting of QSLife error has been changed to [10]%, `Alert by decreasing every 5%`. |
| 0 | Wed, Jan 09, 2019 13:29:37 | [CTR1] admin login from 182.232.66.108 via web UI. |
| 0 | Wed, Jan 09, 2019 10:47:01 | [CTR1] admin login from 192.168.30.124 via web UI. |
| 0 | Wed, Jan 09, 2019 10:24:01 | [CTR1] admin login from 192.168.30.115 via web UI. |
| 0 | Tue, Jan 08, 2019 02:52:04 | [CTR1] The LUN 0 is mapped to the volume 'Volume_05'. |
| 0 | Tue, Jan 08, 2019 02:51:58 | [CTR1] The volume 'Volume_05' completed initialization. |
| 0 | Tue, Jan 08, 2019 02:51:52 | [CTR1] The volume 'Volume_05' starts initialization. |
| 0 | Tue, Jan 08, 2019 02:51:52 | [CTR1] The volume 'Volume_05' completed the erasing process. |
| 0 | Tue, Jan 08, 2019 02:51:51 | [CTR1] The volume 'Volume_05' starts the erasing process. |



< 3 / 160 >



The event logs are displayed in reverse order which means the latest event log is on the first / top page. They are actually saved in the first four disk drives of the head unit, each disk drive has one copy of event log. For one system, there are four copies of event logs to make sure users can check event log any time when there are failed disks. If there are no disk drives in the first four slots, the event logs will keep in memory temporary and will disappear after system reboots.

The event logs record all system events. Each event has time frame that identifies the type of event that occurred, and has one of the following severities:

- **Error 9:** A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible.
- **Warning** A: A problem occurred that may affect system stability, but not data integrity. Evaluate the problem and correct it if necessary.
- Information 1: An operation recorded that may help to debug.

The options are available in this pane.

Download Event Logs

Click the $\frac{1}{2}$ icon to save the event log as a file. It will pop up a filter dialog as the following.



Figure 10-3 Download Event Logs

Select the options and then click the **Download** button to download event logs.



Mute Buzzer

Click the 🏂 icon to stop alarm if the system alerts.

Clear Event Logs

Click the icon to clear all event logs.



Figure 10-4 Clear All Event Logs

Select the options and then click the **Apply** button to clear event logs.



CAUTION:

Please plug-in any of the first four hard drives, then event logs can be saved and displayed in next system boot up. Otherwise, the event logs cannot be saved.

10.2. Configure Notification Settings

Select the **Messages** tab the **Settings** subtab to configure the notification settings via **Email**, **Alert** and **SNMP**.

| | O XCubeFA | S | | | | | 0 | 🚎 Hi, Admin |
|-----------|-----------|-------|------------|----------|----------|----------|---|---------------|
| Dashboard | Storage | Hosts | Protection | Analysis | System | Messages | | |
| | | | | Log | Settings | | | |

Figure 10-5 Settings Subtab in the Messages Tab



10.2.1. Email Settings

Click the **Email** pane to be used to enter up to three email addresses for receiving the event notifications.

| MTP Settings | | | | |
|--|---|-------------|-------------------|-----------------------|
| MTP Server | smtp.company.com | | | |
| MTP Port | 25 | | | |
| mail-from Address | admin@company.com | | | |
| Authentication Required | | | | |
| Username | admin | | | |
| Password | | | | |
| ecure Connection | None SSL TLS | | | |
| ecure Connection Subject Prefix Email Notification Settings | None O SSL O TLS [FAS] | | | 4 items |
| ecure Connection Subject Prefix Semail Notification Settings No. Emai | None SSL TLS [FAS] | Information | Warning | 4 items Error |
| ecure Connection ubject Prefix mail Notification Settings No. Emai | None SSL TLS [FAS] | Information | Warning 💌 | 4 items Error © |
| Secure Connection Subject Prefix | None SSL TLS [FAS] [FAS] [additional statement of the second statement of the | Information | Warning 💌 | 4 items |
| Secure Connection Subject Prefix | None SSL TLS [FAS] [FAS] [FAS] [additional statement of the second statement | Information | Warning 🖌 🖌 | 4 items |

Figure 10-6 Email Settings

The options are available in this pane.



SMTP Settings

- **SMTP Server:** Enter the IP address or FQDN (Fully Qualified Domain Name) of SMTP server to deliver the notification mails.
- SMTP Port: Default is port 25. You can change the SMTP port here.
- Email-from Address: Enter the sender email address.
- Authentication Required: Some email servers require authentication for SMTP relay. Check to enable authentication and enter the **Username** and **Password**.
- Secure Connection: Using SSL (Secure Sockets Layer) or TLS (Transport Layer Security) for secure connection.
- Subject Prefix: The input string will be appended to the front of the email subject.

Email Notification Settings

• **Email-to-Address:** Enter the email address for receiving the event notifications. You can also select which levels of event logs which you would like to receive. The default setting only includes **Warning** and **Error** event logs.



TIP:

Please make sure the IP address of DNS server is well-setup in **Management Port**. So the event notification emails can be sent successfully. Please refer to the <u>Confiture Management Port</u> section for more details.

When finished, click the **Send Test Email & Apply** button to take effect. Or click the **Reset to Default** button to reset settings.

10.2.2. Alert Settings

Click the **Alert** pane to be used to setup alerts via alerts on the front display. The device buzzer is also managed here.

| Alert | ~ |
|--|---|
| | |
| Admin LCM Alerts 2 | |
| Show Alerts on LCM Information 🗹 Warning 🗹 Error | |
| Device Buzzer | |
| Reset to Default Apply | |

Figure 10-7 Alert Settings

The options are available in this pane.

Admin LCM Alerts

You can check or uncheck the alert levels which you would like to show on LCM.

Device Buzzer

Check it to enable the device buzzer. Uncheck it to disable device buzzer.

When finished, click the **Apply** button to tack effect. Or click the **Reset to Default** button to reset settings.



INFORMATION:

The device buzzer features are listed below:

- The buzzer alarms 1 second when system boots up successfully.
- The buzzer alarms continuously when there is error occurred. The alarm will be stopped after error resolved or be muted.
- The alarm will be muted automatically when the error is resolved. For example, when a RAID 5 pool is degraded and alarm rings immediately, user replaces one disk drive for rebuild. When the rebuild process is done, the alarm will be muted automatically.



10.2.3. SNMP Settings

Click the **SNMP** pane to be used to setup SNMP (Simple Network Management Protocol) traps for alerting with event logs and also setup SNMP server settings for client monitoring.

| SNMP | | ~ |
|-------------------------------|--|---|
| SNMP Trap | | |
| If the SNMP (Simple Network M | anagement Protocol) trap feature is er | nabled, the event logs are sent to the SNMP trap agent. |
| Enable SNMP Trap | | |
| SNMP Trap Port | 162 | Default Port: 162 |
| | Information 🔽 Warning 🤇 | Error |
| SNMP Trap Address 1 | | |
| SNMP Trap Address 2 | | |
| SNMP Trap Address 3 | | |
| | | |
| SNMP Server | | |
| SNMP Version | SNMP v1 / v2 v | |
| Reset to Default Appl | | |
| Download MIB Files | | |
| SNMP MIB File | Download | |
| iSCSI MIB File | Download | |

Figure 10-8 SNMP Settings

The options are available in this pane.

SNMP Trap

• Enable SNMP Trap: Check to enable SNMP trap to send system event logs to SNMP trap agent. The default SNMP trap port is 162. You can check or uncheck the alert levels which you would like to receive. And then fill in up to three SNMP trap addresses for receiving the event notifications.



SNMP Server

SNMP Version: Select SNMP supported versions: v1/v2, or v3. If select SNMP v3, it
needs more options for authentication. Please enter a username, select an
authentication protocol and enter an authentication password, check to use privacy if
necessary, select a privacy protocol, and enter a privacy password.

When finished, click the **Apply** button to take effect. Or click the **Reset to Default** button to reset settings.



INFORMATION:

Authentication Protocol:

- MD5: The MD5 algorithm is a widely used hash function producing a 128-bit hash value. It can still be used as a checksum to verify data integrity, but only against unintentional corruption.
- **SHA:** SHA (Secure Hash Algorithm) is a cryptographic hash function which is a mathematical operation run on digital data; by comparing the computed "hash" (the output from execution of the algorithm) to a known and expected hash value, a person can determine the data's integrity.

Privacy Protocol:

- **DES:** The DES (Data Encryption Standard) is a symmetric-key algorithm for the encryption of electronic data.
- **AES:** The AES (Advanced Encryption Standard) is a specification for the encryption of electronic data. It supersedes the DES.

Download MIB Files

- **SNMP MIB File:** Click the **Download** button to save the SNMP MIB file which can be imported to the SNMP client tool to get system information. You can view fan, voltage, and system status via SNMP MIB.
- **iSCSI MIB File:** Click the **Download** button to save the iSCSI MIB file which can be imported to the SNMP client tool to get network information. You can view iSCSI traffic via iSCSI MIB.

11. Support and Other Resources

11.1. Getting Technical Support

After installing your device, locate the serial number on the sticker located on the side of the chassis or from the XEVO -> **System** -> **Maintenance** > **System Information** and use it to register your product at <u>https://partner.qsan.com/</u> (End-User Registration). We recommend registering your product in QSAN partner website for firmware updates, document download, and latest news in eDM. To contact QSAN Support, please use the following information.

- Via the Web: <u>https://qsan.com/support</u>
- Via Telephone: +886-2-77206355
 (Service hours: 09:30 18:00, Monday Friday, UTC+8)
- Via Skype Chat, Skype ID: qsan.support (Service hours: 09:30 - 02:00, Monday - Friday, UTC+8, Summer time: 09:30 - 01:00)
- Via Email: <u>support@qsan.com</u>

Information to Collect

- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages or capture screenshots
- Product-specific reports and logs
- Add-on products or components installed
- Third-party products or components installed

Information for Technical Support

The following system information is necessary for technical support. Please refer to following for what and where to get the information of your XCubeFAS Series model.

If the technical support requests you to download the Service Package, please navigate in the XEVO -> **System** -> **Maintenance** > **System Information**, and then click the **Download Service Package** button to download. Then the system will automatically generate a zip file the default download location of your web browser.

| System Model Serial Contro Master | n Name Name Number Iller Status r Controller | XCubeFAS XF2026 QW316016010021001 Normal Controller 1 | |
|---|--|---|--|
| Controller 1 | | | |
| Serial Number | | 50013780080B32C0 | |
| CPU | | Intel(R) Processor D1500 4 Cores | |
| Memory | | 32 GB | |
| Host Card Slot 1 | | Empty | |
| Host Card Slot 2 | | Empty | |
| Firmware Ver | | 1.0.1 | |
| SAS IOC Firmware Ver | | 07.00.01.00 | |
| Controllor 2 | | | |
| Serial Number | | 50013780080B3340 | |
| CPU | | Intel(R) Processor D1500 4 Cores | |
| Memory | | 32 GB | |
| Host Card Slot 1 | | Empty | |
| Host Card Slot 2 | | Empty | |
| Firmware Ver | | 1.0.1 | |
| SAS IOC Firmware Ver | | 07.00.01.00 | |
| SAS Expander Firmware | e Ver | 1000 | |
| Backplane | | | |
| Backplane Serial Numb | er | 001378D40000 | |
| Backplane ID | | QW316 | |
| MCU Verion | | 1.2.0 | |
| 7 | | | |

Figure 11-1 Download Service Package

11.2. Online Customer Support

For better customer support, every XCubeFAS series models include the console cable (two for dual controller models), one for single controller models) for online support. Please follow the procedures below to setup the online help environment for QSAN support team.

The following procedure will help you to setup the serial console via the console cable that is enclosed in the shipping carton. The following image is the appearance of the console cable.





Figure 11-2 Appearance of a Console Cable

Procedures to Setup the Serial Console

1. Setup the serial cable between the controller and one server/host like in the below image.



Figure 11-3 Connect the Console Cable

2. You must use terminal software such as HyperTerminal or Putty to open the console after the connection is made.



INFORMATION:

For more information about terminal software, please refer to HyperTerminal: <u>http://www.hilgraeve.com/hyperterminal/</u>

PuTTY: <u>http://www.putty.org/</u>



 Here we first demonstrate HyperTerminal. The console settings are on the following. Baud rate: 115200, 8 data bit, no parity, 1 stop bit, and no flow control Terminal type: vt100

| 1 - HyperTerminal | | |
|-------------------|---|---|
| | rer Deb | |
| | Connect To COM3 Properties Pot Settings Bits per second: 115200 ▼ Data bits: 8 ▼ Barity: None ▼ Stop bits: 1 ▼ Elow control: None Restore Defaults OK Cancel Apply | |
| Disconnected | Auto detect Auto detect SCROLL CAPS NUM Capture Print echo | / |



| 📇 - HyperTerminal | | - 🗆 × |
|--|--|----------|
| File Edit View Call Trans | sfer Help | |
| New Connection | | |
| Open | | |
| Save | | |
| Save As | Qsan Technology | 1 |
| Page Setup | Could rear new | + |
| Print | Llation . | |
| Properties | 1guration | |
| Envit Alta Ed | guration | |
| *E*nclosure *M*aintenance *L*ogout | rgunarton management | |
| *+- <mark>*Path:</mark> */* | | |
| + <u>lume_confi</u> | guration | * |
| | | i |
| 1 | | + |
| | | |
| | | |
| | | + |
| | | _ |
| File | | |



Figure 11-4 The Procedures of Setup Serial Console by HyperTerminal

4. If you are using PuTTY instead, please refer to below

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| Basic options for yo | our PuTTY session |
|--|---|
| Specify the destination you w | vant to connect to |
| Serial line | Speed |
| COM1 | 115200 |
| Connection type: | |
| C Raw C Telnet C R | login C SSA 💽 Serial |
| ÷ | \sim |
| Load, save or delete a stored | 1 session |
| Saved Sessions | |
| | |
| Default Settings | Load |
| 0.000 | |
| | Save |
| | Delete |
| | 1 |
| | |
| Close window on evit | |
| C Always C Never | Only on clean exit |
| | |
| Ontions controllin | |
| Options controllin | a loopi sorint lissos |
| | g local serial lines |
| Select a serial line | g local serial lines |
| Select a serial line Serial line to connect to | g local serial lines |
| Select a serial line Serial line to connect to Configure the serial line | g local senal lines |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) | g local senal lines |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) | g local serial lines COM1 115200 |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits | g local serial lines COM1 115200 8 |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits | g local serial lines COM1 115200 8 1 |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity | g local serial lines COM1 115200 8 1 None |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity | g local senal lines COM1 115200 8 1 None |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity Flow control | g local senal lines COM1 115200 8 1 None |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity Flow control | g local senal lines COM1 115200 8 1 None None None None |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity Flow control | g local senal lines COM1 115200 8 1 None None XON/XOFF RTS/CTS |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity Flow control | g local senal lines COM1 115200 8 1 None None None None None None None None None None None None None None None None None |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity Flow control | g local senal lines COM1 115200 8 1 None |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity Flow control | g local senal lines COM1 115200 8 1 None |
| Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity Flow control | g local senal lines COM1 115200 8 1 None None None None None None None None None None None None None None None None |
| | Basic options for you Specify the destination you v Serial line COM1 Connection type: C Raw C Telnet C R Load, save or delete a stored Saved Sessions Default Settings Close window on exit: C Always C Never |



| Session Logging Terminal Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Serial | Options controlling the effects of keys |
|--|---|
| | Change the sequences sent by: |
| | The Backspace key C Control-H C Control-? (127) |
| | The Home and End keys • Standard |
| | The Function keys and keypad C ESC[n~ C Linux C Xterm R6 C VT400 • VT100+ C SC0 |
| | Application keypad settings: Initial state of cursor keys: Normal Application Initial state of numeric keypad: Normal Application NetHack |
| | Enable extra keyboard features: AltGr acts as Compose key Control-Alt is different from AltGr |

Figure 11-5 The Procedures of Setup Serial Console by PuTTY

5. Users should be able to login the controller system via console cable by following the procedures above.

Setup the Connection for Online Support

Following is the procedure to setup the connection for online support via TeamViewer:

- 1. Please download the TeamViewer from following hyper link: <u>https://www.teamviewer.com/en/download/</u>
- 2. Install TeamViewer.
- 3. Please provide the ID/password showed on the application to QSAN support team member to join the online support session.

11.3. Accessing Product Updates

To download product updates, please visit QSAN website:

https://qsan.com/download



11.4. Documentation Feedback

QSAN is committed to providing documentation that meets and exceeds your expectations. To help us improve the documentation, email any errors, suggestions, or comments to <u>docsfeedback@qsan.com</u>.

When submitting your feedback, include the document title, part number, revision, and publication date located on the front cover of the document.


Appendix

Glossary and Acronym List

Common Terminology

| Item | Description |
|--------|---|
| RAID | Redundant Array of Independent Disks. There are different RAID |
| | levels with different degree of data protection, data availability, and |
| | performance to host environment. |
| Disk | The Physical Disk belongs to the member disk of one specific RAID |
| | group. |
| Pool | A collection of removable media. One pool consists of a set of |
| | volumes and owns one RAID level attribute. |
| Volume | Each pool could be divided into several volumes. The volumes from |
| | one pool have the same RAID level, but may have different volume |
| | capacity. |
| LUN | Logical Unit Number. A logical unit number (LUN) is a unique |
| | identifier which enables it to differentiate among separate devices |
| | (each one is a logical unit). |
| WebUI | Web User Interface. |
| WT | Write-Through cache-write policy. A cache technique in which the |
| | completion of a write request is not signaled until data is safely |
| | stored in non-volatile media. Each data is synchronized in both data |
| | cache and accessed physical disks. |
| WB | Write-Back cache-write policy. A cache technique in which the |
| | completion of a write request is signaled as soon as the data is in |
| | cache and actual writing to non-volatile media occurs at a later time. |
| | It speeds up system write performance but needs to bear the risk |
| | where data may be inconsistent between data cache and the physical |
| | disks in one short time interval. |
| RO | Set the volume to be Read-Only. |
| GS | Global Spare disks. It is shared for rebuilding purpose. If some RAID |



| | groups need to use the global spare disks for rebuilding, they could |
|------------|---|
| | get the spare disks out from the common spare disks pool for such |
| | requirement. |
| DG | DeGraded mode. Not all of the array's member disks are functioning, |
| | but the array is able to respond to application read and write requests |
| | to its virtual disks. |
| SCSI | Small Computer System Interface |
| SAS | Serial Attached SCSI |
| S.M.A.R.T. | Self-Monitoring Analysis and Reporting Technology |
| WWN | World Wide Name |
| HBA | Host Bus Adapter |
| SES | SCSI Enclosure Services |
| NIC | Network Interface Card |
| BBM | Battery Backup Module |

FC / iSCSI / SAS Terminology

| Item | Description |
|--------|---|
| FC | Fibre Channel |
| FC-P2P | Point-to-Point |
| FC-AL | Arbitrated Loop |
| FC-SW | Switched Fabric |
| iSCSI | Internet Small Computer Systems Interface |
| LACP | Link Aggregation Control Protocol |
| MPIO | Multipath Input/Output |
| MC/S | Multiple Connections per Session |
| MTU | Maximum Transmission Unit |
| CHAP | Challenge Handshake Authentication Protocol. An optional security |
| | mechanism to control access to an iSCSI storage system over the |
| | iSCSI data ports. |
| iSNS | Internet Storage Name Service |
| SAS | Serial Attached SCSI |



Dual Controller Terminology

| ltem | Description |
|--------|---|
| 6G MUX | Bridge board is for SATA II disk to support dual controller mode. |

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