XEVO

Software Manual

November 2023

ANNOUNCEMENT

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PREFACE

About This Manual

This manual provides technical guidance for QSAN flash-based storage management, and it is intended for use by system administrators, 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.

- QIG (Quick Installation Guide)

- Hardware Manual

- Compatibility Matrix

- White Papers

- Application Notes

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- Via the Web: https://www.qsan.com/technical_support

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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>	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: copy *<source-file> <target-file>*.
[ ] square brackets	Indicates optional values. 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: [a | b]

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1. GETTING STARTED

XEVO is a flash-based storage management system designed by QSAN. XEVO's core technology provides the excellence, flexibility, and intelligence needed to simplify all content for a hybrid storage system. Its features set the foundation for the next generation of flash-based storage from enterprise data services for all workloads to proven its availability and optimization. This chapter explains how to discover the storage system and how to sign into XEVO.

INFORMATION

SSD cache and auto tiering are only available for hybrid storage models, optional and not included in the default package. These features are NOT supported on all-flash array models such as the XCubeFAS series.

1.1. Discover the 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. Here's a Quick Installation Guide for the steps to discover a storage system and a video on discovering a storage system for the first time. Please refer to the QSAN Storage System Unpacking.

1.2. Initial Setup

The initial configuration wizard will guide the first-time user to initialize and set up the system quickly. Here is a video to setup the storage for the first time. Please refer to the Setup the Storage through the Quick Installation Wizard Tutorial.

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2.   XEVO USER INTERFACE

This chapter illustrates the graphical user interface and provides a brief introduction to the desktop function menus.

2.1.   Web UI Overview

To access the management web user interface, open a supported web browser and enter the management IP address or Hostname of the system. When the password has been verified, the dashboard is displayed.

Figure 2-1   XEVO Dashboard

The Web UI contains the following menus:

Dashboard

The **Dashboard** function menu 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 Section 3.1, <u>Dashboard Overview</u>.

XEVO User Interface
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Storage

Select the **Storage** function menu 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 4, Storage Menu.

Hosts

Select the **Hosts** function menu 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 5, Hosts Menu.

Protection

Select the **Protection** function menu 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 6, Protection Menu.

Analysis

Select the **Analysis** function menu to display the historical array information, including I/O performance metrics and storage capacity, from various viewpoints. For more information, please refer to Chapter 7, Analysis Menu.

System

Select the **System** function menu 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 8, System Menu.

Messages

Select the **Messages** function menu to display the log events, and setup the notification methods. For more information, please refer to Chapter 9, Messages Menu.

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2.2.   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.

Figure 2-2   Portable USB LCM

After plugging the USB LCM into the system, the LCD screen shows the management port IP address and the system model name.
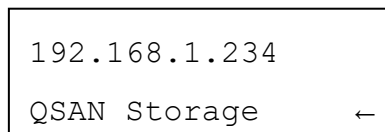
Figure 2-3   USB LCM Screen

To access the LCM options, use the **ENT** (Enter) button, **ESC** (Escape) button, ▲ (up) and ▼ (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.

TIP

The event alert settings can be changed, please refer to the chapter 9.2.2, Alert Settings section.

3. DASHBOARD MENU

The **Dashboard** menu 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.

3.1. Dashboard Overview

Select the **Dashboard** menu 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 3-1   XEVO Dashboard

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

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Table 3-1   Hardware Alert Pane 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.

3.1.2.   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.

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.

3.1.3.   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 menu.

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.

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3.1.4. Storage Overview

The **Storage Overview** pane contains a summary of the abnormal and warning event messages. Clicking the text link of Array, Disk, Pool, Volume, or the number below the text will jump to the **Storage** function menu, clicking the text link of Host or the number below the text will jump to the **Hosts** function menu.

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.

3.1.5. Performance Graphs

The **Performance Graphs** pane displays the performance metrics in real time along with a scrolling graph and includes the Latency, IOPS, and Bandwidth. 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.
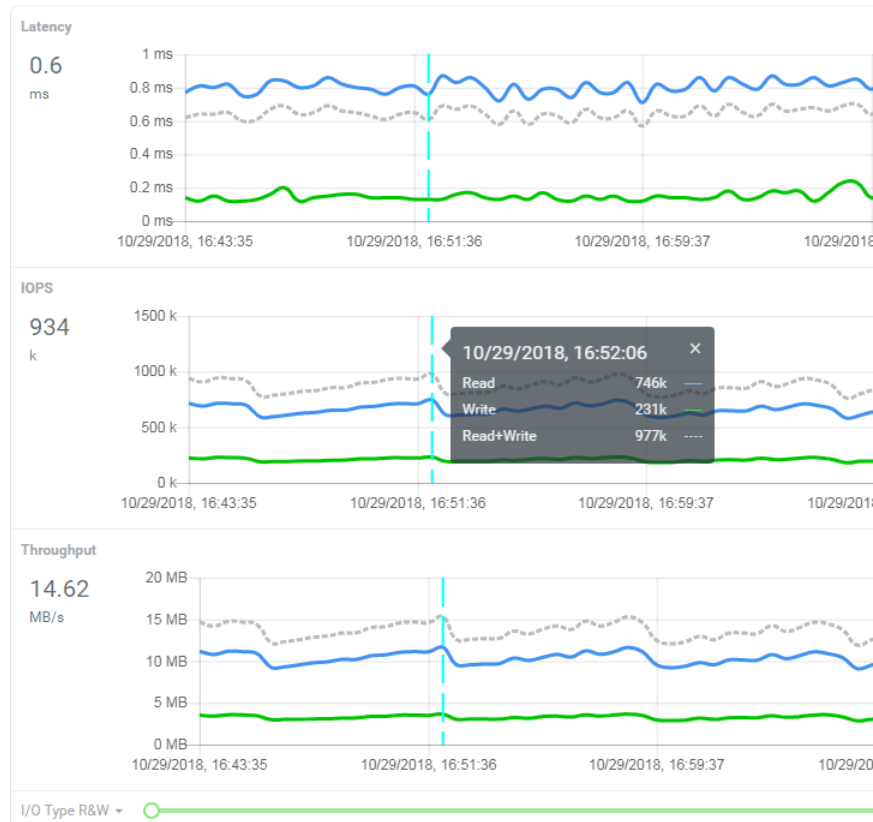
Figure 3-2   Performance Graphs in Dashboard

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 years' worth of historical data.

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3.1.6. Introduce the Upper Right Corner Icons

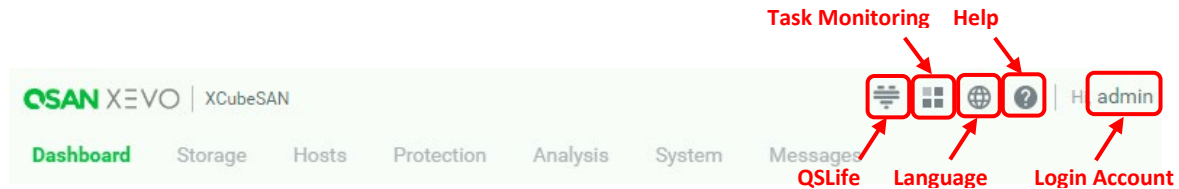At the top right corner, there are four icons and one login name.

Figure 3-3   Upper Right Corner Icons

The following options are available.

QSLife

Click the ⇌ icon in the upper right corner to popup a window for QSLife functions. QSLife (Intelligent Disk Drive Analyzer) is based on QSAN's native SSD technology and offers users a specified technology to analyze the SSD activity and uses a unique algorithm to help to keep an eye on the health and other information of drives. For more information, please refer to the QSLife White Paper from QSAN website. Here is a video to introduce QSLife. Please refer to the Introduction to QSLife.

Task Monitoring

Click the ⊞ icon at the top right corner to popup a window to display the task monitoring of the system.

Language

Click the 🌐 icon in the upper right corner to list the drop-down options to change the language in the web UI.

Help

Click the ❔ icon in the upper right corner to popup the help information.

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Login Account

Click the username in the upper right corner to list the drop-down options to execute the system functions.

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4.   STORAGE MENU

The **Storage** menu 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.

4.1.   Configure Storage Pools

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

4.1.1.   Create a Pool

Here is an example to create a pool. Please refer to the Create a RAID Pool Tutorial.

TIP

When creating a pool, the system automatically sets the preferred controller (CTRL1 or CTRL2) to achieve perfect load balancing. You can also adjust the pool owner in the **Change Preferred Controller** option.

4.1.2.   List and Configure Pools

All pools are listed in the **Pools** pane. You can click one of them to display the details. A thin provisioning pool is shown here.
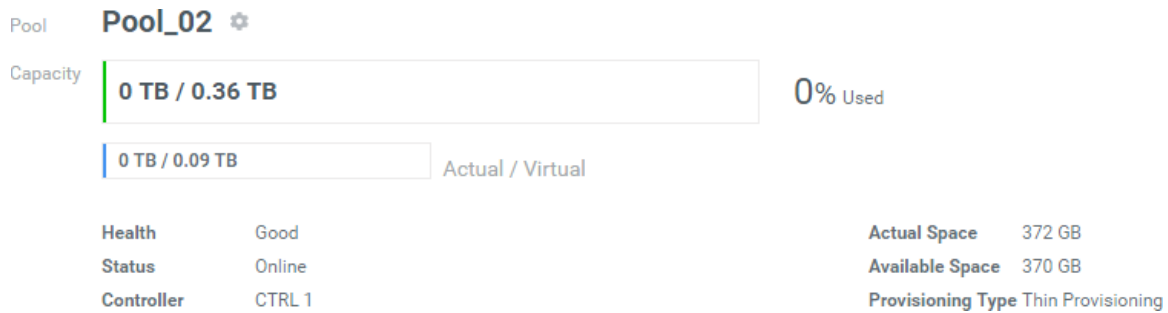
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Figure 4-1   Thin Provisioning Pool Details

Click the ⚙ icon beside the pool name to list the drop-down options. The following options are available.

Rename

1. Click the **Rename** option to rename the pool.
2. Enter a new **Pool Name**. The maximum length of the pool name is 15 characters. Valid characters are [A~Z | a~z | 0~9 | -_<>].
3. Click the **Apply** button to rename.

Delete

1. Click the **Delete** option, and then pop up a confirm dialog box.
2. Click the **Apply** button to confirm and delete.

TIP

The pool cannot be deleted when there are volumes in the pool.

Disk Properties

1. Click the **Disk Properties** option to change disk properties of the pool.
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.
- ▪ **Disk Standby** *(Only visible for hybrid storage models)*: Check to enable the auto spin down function of disks. The disks will be spun down for power saving when they are idle for the period specified.

3. After changing the disk properties, click the **Apply** button to take effect.

Activate or Deactivate

1. Click the **Activate** or **Deactivate** option to activate or deactivate the pool.
2. 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.
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 or auto tiering)*

1. Click the **Thin Provisioning Policy** option to change policy of the thin provisioning pool.
2. There are 2 levels of threshold percentage and the default values defined. The threshold percentage 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.

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Data Scrub

1. Click the **Data Scrub** option to regenerate parity for the pool.
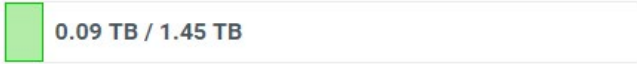2. Click the **Apply** button to confirm and proceed.

INFORMATION

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

4.1.3. List and Configure Disk Groups

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

Pool	Pool_01 ⚙			
Capacity	0.09 TB / 1.45 TB		6% Used	

Health	Good		Actual Space	1489 GB
Status	Online		Available Space	1389 GB
Controller	CTRL 1		Provisioning Type	Thick Provisioning

▌▌ Disk Groups

1 items 🗑 ➕

☐	!	No.	Total
☐	●	1 ⚙	1489 GB

< 1 / 1 >

🗃 Volumes

Figure 4-2   List Disk Groups

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The following options are available.

Create a Disk Group

Here is an example to create a disk group. Please refer to the Extending the RAID Pool Tutorial.

Delete Disk Groups

1. Check the disk group checkboxes which you want to delete.
2. Click the 🗑 icon, and then pop up a confirm dialog box.
3. 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 ⚙ icon beside the number of the disk group to list the drop-down options. The following options are available.

Disk Information

1. Click the **Disk Information** option to display the disk information in the disk group.
2. Click the **Close** button to close the window.

Properties

1. Click the **Properties** option to change the property of the disk group.
2. Click the switch to turn 🟢 ON (Enable) or ⚪ OFF (Disable).

   - **High Latency Disk Warning**: Enable the high latency disk warning to predict which disks are at risk.

3. After changing the property, click the **Apply** button to take effect.

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

Here is an example to migrate the disk group. Please refer to the [Extending the RAID Pool Tutorial](#).

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.
- Pool migration cannot be executed during rebuilding or volume extension.

TIP

The system would reject these operations when a pool is being migrated.

- Add a 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 a snapshot

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Replace Disk Group *(Only visible when the pool type is thin provisioning or auto tiering)*

Here is an example to migrate the disk group. Please refer to the [Extending the RAID Pool Tutorial](#).

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4.1.4. List and Configure Volumes

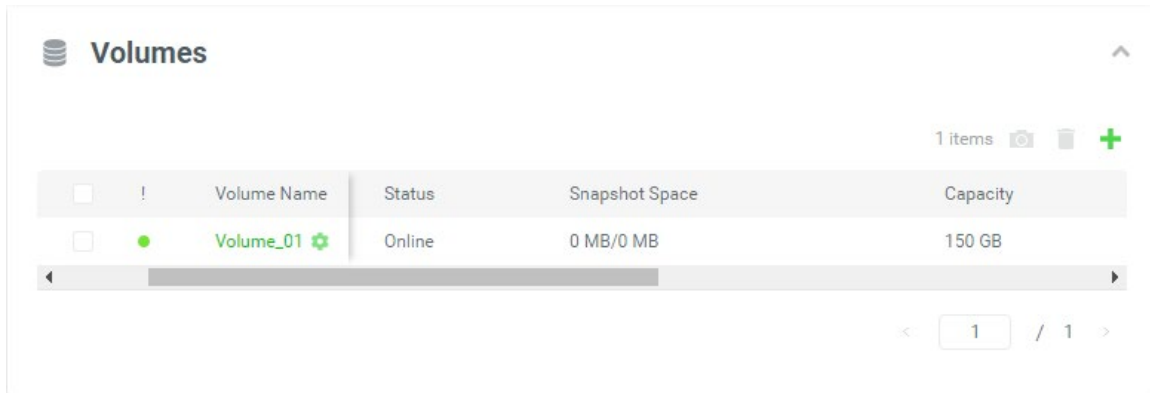Click the **Volumes** pane to list all volumes in the pool.

Figure 4-3   List Volumes

The following options are available.

Create Volumes

Here is an example to create multiple volumes. Please refer to the [Multiple Volume Creation Tutorial](#).

Delete Volumes

1. Check the volume checkboxes which you want to delete.
2. Click the 🗑 icon, and then pop up a confirm dialog box.
3. If the volumes are already existed in the **Host Groups** or **Protection Groups**, it will display the dialog asking you how to handle the items you would like to delete.

INFORMATION

There are four relationships shown after the volume name.

- none: The volume does not exist in the **Host Groups** nor **Protection Groups**.

- H: The volume exists in the **Host Groups**.

- 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 confirm and delete.

Take a Snapshot

1. Check the volume checkboxes which you want to take a snapshot.
2. Click the 📷 icon; it will pop up a window.
3. The recommended **Snapshot Name** is provided. Enter a new **Snapshot Name** if necessary.
4. Click the **Apply** button to take.

TIP

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

Click the ⚙ icon beside the volume name to list the drop-down options. The following options are available.

Rename

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

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2. Enter a new **Volume Name**.

3. Click the **Apply** button to rename.

Properties

1. Click the **Properties** option to 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 and Write-back Cache. 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, Backup Volume, and Read-only Volume. RAID Volume is for general RAID usage and Backup Volume is for the target volume of local clone or remote replication. If the volume capacity in thin provisioning exceeds the threshold, it will enter a read-only state.

- **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 changing the volume properties, click the **Apply** button to take effect.

Snapshot Center

About the snapshot center, please refer to the chapter 6.2.4, Snapshot Center section for more details.

Extend Volume

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

2. Enter a new **Capacity** number which you want to extend. The **Capacity** field is followed by a scalable minimum and maximum capacity number.

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3. Click the **Apply** button to extend.

Space Reclamation *(Only visible when the pool type is thin provisioning or auto tiering)*

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.

4.2. Hot Spares

The system can set free disks as global spares. 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. Now, the system will search the spare disk to execute pool / volume / data rebuild into a healthy RAID drive automatically.

4.3. 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** menu, 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** menu, 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 to avoid conflict with the current setting of the system-2.

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CAUTION

Models with XEVO do NOT support disk roaming from models with SANOS.

4.4. SSD Cache

SSD cache allows an SSD to function as read cache or write buffer for an HDD volume. In SSD read cache, it is a secondary cache that improves performance by keeping frequently accessed data on SSDs where they are read far more quickly than from the HDD volume. When reads or writes are performed, the data from the HDDs are copied into the SSD cache. Although the data is duplicated to SSD cache pool, it does not matter if the read cache pool is corrupted.

In SSD write cache, SSDs are a write buffering storage that improves performance by storing the write data in SSDs temporary where they are write far more quickly than to the HDD volume. And then the write data will be flushed to the HDD volume at the appropriate time. It may take risk of losing data during the period that the write data is stored in SSD cache if the SSD cache pool is corrupted. The write data has not yet written back to the HDD volume. So, the read-write cache pool needs data protection to protect the write data.

INFORMATION

SSD cache is only available for hybrid storage models, optional and not included in the default package. This feature is NOT supported on all-flash array models such as the XCubeFAS series.

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CAUTION

Using SSD read-write cache may take risk of losing data if the SSD cache pool is corrupted. User has to monitor the health of the SSD cache pool carefully.

For more information, please refer to the SSD Cache White Paper from QSAN website.

4.5. Auto Tiering

Auto tiering is the automated progression or demotion of data across different tiers (types) of storage devices and media. The movement of data takes place in an automated way with the help of software and is assigned to the ideal storage media according to performance and capacity requirements. It also includes the ability to define rules and policies that dictate when data can be moved between the tiers, and in many cases provides the ability to pin data to tiers permanently or for specific periods of time.

INFORMATION

Auto tiering is only available for hybrid storage models, optional and not included in the default package. This feature is NOT supported on all-flash array models such as the XCubeFAS series.

For more information, please refer to the Auto Tiering White Paper from QSAN website.

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5. HOSTS MENU

The **Hosts** menu 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.

5.1. Configure Host Groups

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

5.1.1. Create a Host Group

Here is an example to create a host group. Please refer to the Create a Host Group and Map LUN Tutorial.

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

Figure 5-1   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 5-2   FC Host Group Details

Click the ⚙ icon beside the host group name to list the drop-down options. The following options are available.

Rename

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

Delete

1. Click the **Delete Host Group** option, and then pop up a confirm dialog box.
2. Click the **Apply** button to confirm and delete.

Edit Host

1. Click the **Edit Host** option to edit the host group.
2. If editing the protocol of iSCSI / IQN, select the IQNs and click the **>** button or the **<** button to make them effective or not.
3. Click the **Apply** button to apply.

⚠ **CAUTION**

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

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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 apply.

Change Connected Port

1. Click the **Change Connected Port** option to change the connected ports in the host group.
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. The following options are available.

Rename Local Target

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

Rename Alias

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

5.1.3. List and Configure Host Profile

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

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Figure 5-3   List Host Profile

Click the ⚙ icon beside the host name to list the drop-down options. The following options are available.

Rename

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

Sessions

1. Click the **Sessions** option to display the host sessions in the host group.
2. Click the **Close** button to close the window.

5.1.4. List and Configure Connected Volumes

Click the **Connected Volumes** pane to list all connected volumes in the host group.
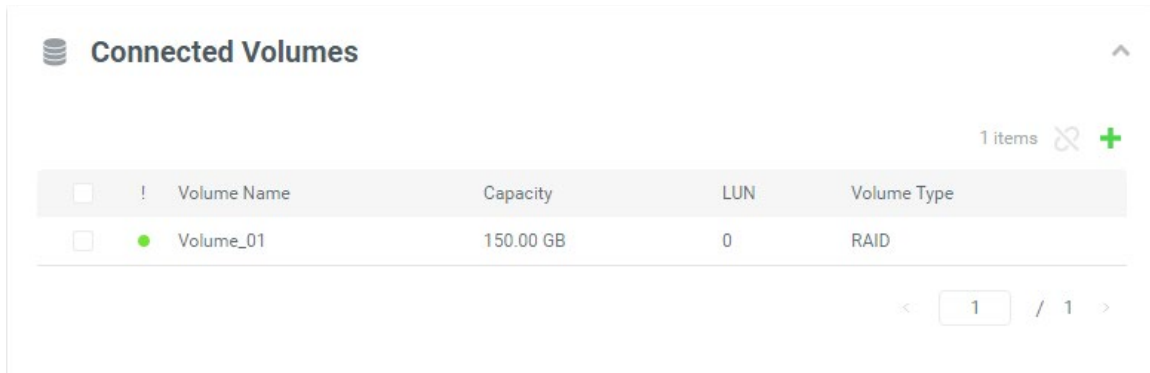
Figure 5-4   List Connected Volumes

The following options are available.

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.
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 ◀ button to make them effective or not.
4. Click the **Apply** button to add.

Disconnect Volumes

1. Check the volume checkboxes which you want to disconnect.
2. Click the ✂ icon, and then pop up a confirm dialog box.
3. Click the **Apply** button to confirm and disconnect.

5.1.5.   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 CHAP Accounts** checkbox to enable CHAP.
2. Click **CHAP Settings** to add CHAP accounts.
3. Click the ✚ icon in the **Volumes** pane to pop up a window.
4. Enter **Username** of CHAP user. The maximum length of the username is 223 characters. Valid characters are [A~Z | a~z | 0~9 | ~!@#%^&*_-+=|(){}[]:;<>.?/].

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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.

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.

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.

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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6. PROTECTION MENU

The **Protection** menu 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.

6.1. 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 snapshot, local cloning, and remote replication, there are new designs and are described below.

6.1.1. 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.

CAUTION

Snapshot function can only take the image of data which has been written into the corresponding volume. For the cached data that resides in the server's cache, that doesn't yet be flushed into the storage system, it is unable to protect, which means the taken snapshot might consist of inconsistent data / file / boot image. Please make sure to take snapshot at the time point when there is no data I/O incoming to the storage system, to prevent the situation as much as possible. Any functionality that base on snapshot function to perform will have this kind of concern, e.g., local clone and remote replication.

SUGGESTION

It is recommended to use native remote replication function upon the corresponding Operating System to prevent the situation, e.g., vSphere Replication, so that the cached data can be seamlessly replicated to the target site.

6.1.2. 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.

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

6.1.3. About Remote Replication

QSAN QReplica 3.0 (Remote Replication) provides synchronous and asynchronous replication solutions. With QReplica 3.0 feature, DR (Disaster Recovery) can be achieved with simple and easy orchestration between QSAN platforms. For more information, please refer to the QReplica White Paper from QSAN website.

6.2. Configure Protection Groups

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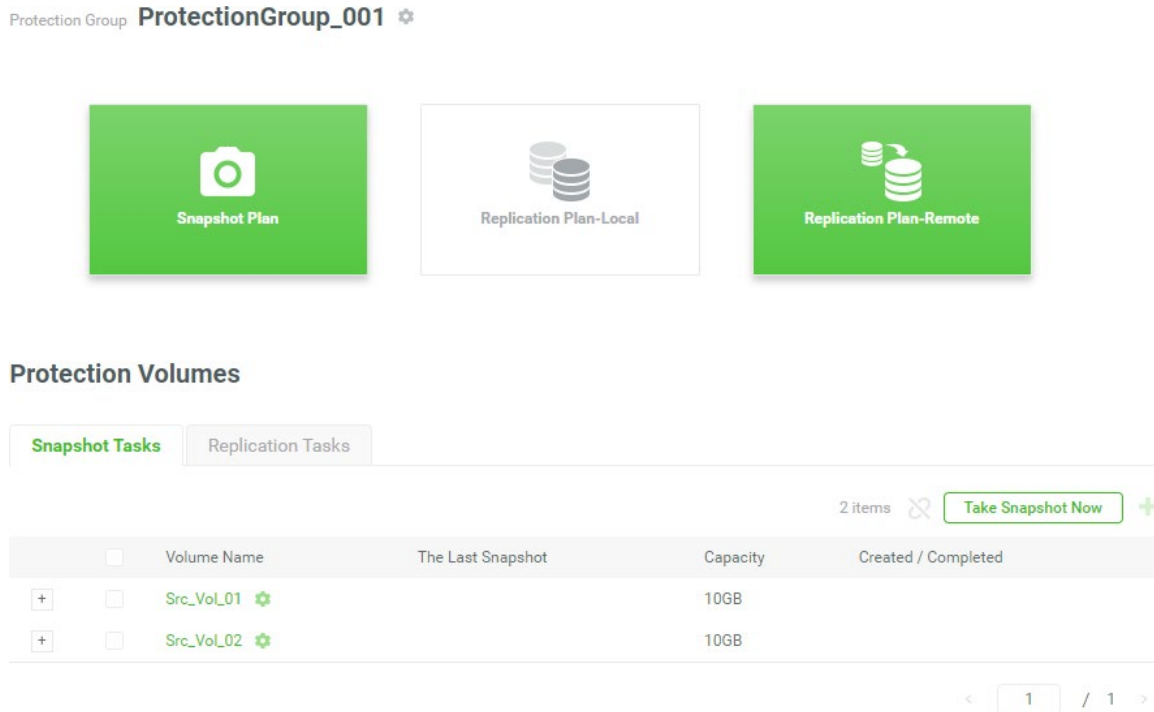

Figure 6-1   Protection Group

INFORMATION

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

6.2.1. Create a Protection Group

Here is an example to create a protection group and setup a remote replication task with schedule. Please refer to the Create a Protection Group Tutorial.

INFORMATION

Synchronous replication requires a license. Please contact your local sales to obtain a license. If there is no license, the synchronization option is not visible.

6.2.2.   List and Configure Protection Groups

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

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

Rename

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

Protection Plan Setting

1. Click the **Protection Plan Setting** option to change the protection plan.

Delete

1. Click the **Delete** option, and then pop up a confirm dialog box.
2. Click the **Apply** button to confirm and delete.

6.2.3.   List and Configure Snapshot Plan

A protection group with snapshot is shown here.

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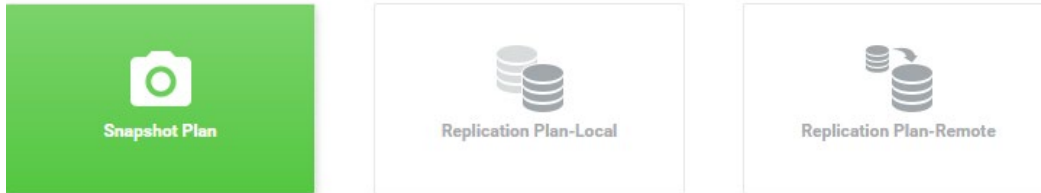Protection Group **ProtectionGroup_001** ⚙

Figure 6-2   Protection Group with Snapshot Plan

Snapshot Tasks

At the **Protection Volumes** pane, click the **Snapshot Tasks** menu to list all snapshot tasks.

Figure 6-3   List Snapshot Tasks

The following options are available.

Add Volumes

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

1. Click the ✚ icon in the **Snapshot Task** menu to pop up a window.
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 `<` button 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.
2. The snapshots are taken and displayed at **The Last Snapshot** field.

Ungroup

1. Check the volume checkboxes which you want to ungroup.
2. Click the ✕ icon to pop up a confirm dialog box. Then click the **Apply** button to confirm and ungroup.

Snapshot Center

Click the ⚙ icon beside the volume name to list the drop-down options. About the **Snapshot Center** option, please refer to the chapter 6.2.4, Snapshot Center section for more details.

6.2.4. 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.
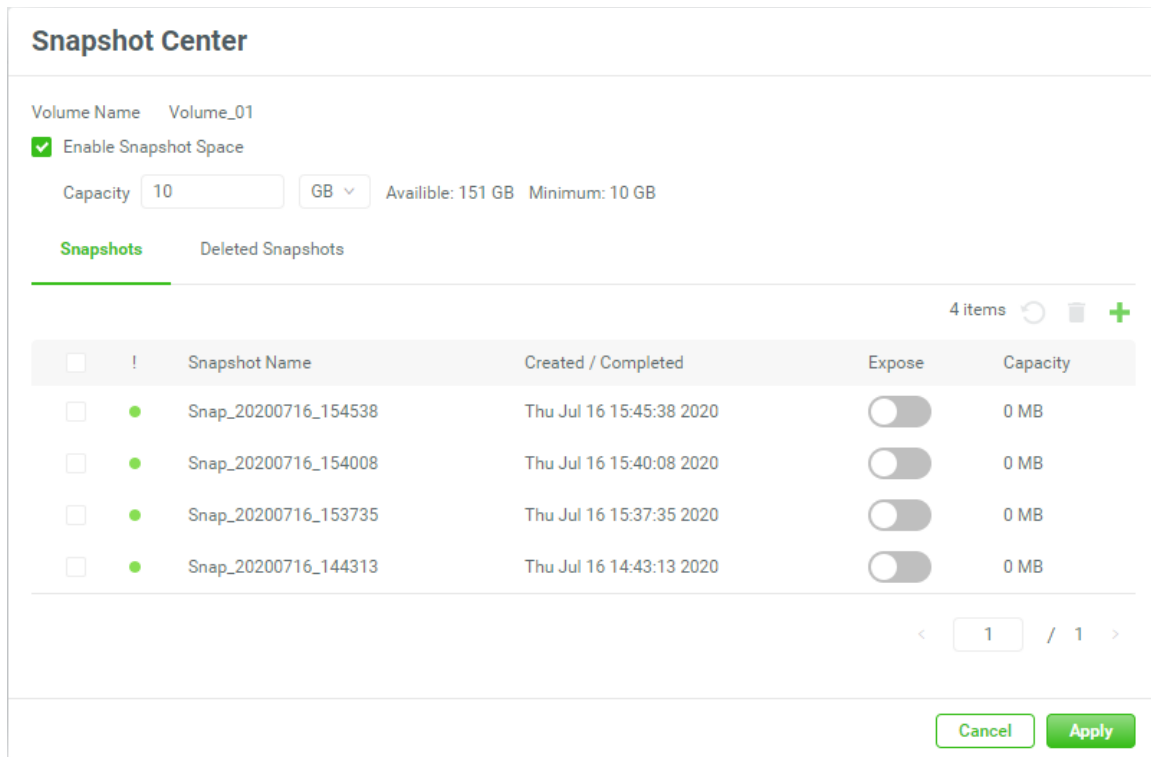
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Figure 6-4   Snapshot Center

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 10% of the volume. Volumes in the thin provisioning pool will automatically reserve 10% of the capacity for the snapshot space. However, volumes in the thick provisioning pool are not preserved. You must 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 following options are available.

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Take a Snapshot

Here is an example to take a snapshot.

1. Click the ➕ icon in the **Snapshots** tab to take a snapshot.
2. The recommended **Snapshot Name** is provided. Enter a new **Snapshot Name** if necessary. The maximum length of the snapshot name is 31 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 must **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 **Apply** button to confirm and delete.

Rollback the Snapshot

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

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Expose the Snapshot

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

Unexpose the Snapshot

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

Click the **Deleted Snapshots** tab. It's a recycle bin of the deleted snapshots. Here is a video to introduce recycle the snapshot. Please refer to the [Introduction to Recycling Snapshots](). The following options are available.

Rescue the Snapshot

1. In the **Deleted Snapshots** tab, check the snapshot checkbox which you want to rescue.
2. Click the ↻ 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 ⛏ icon, and then pop a confirm dialog box.
3. Click the **Destroy** button to confirm and destroy.

⚠ **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.

6.2.5. List and Configure Replication Plan-Local

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

Figure 6-5   Protection Group with Replication Plan-Local

Replication Tasks

At the **Protection Volumes** pane, click the **Replication Tasks** menu to list all replication tasks.

Figure 6-6   List Replication Tasks

The following options are available.

Add Volumes

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

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1. Click the ➕ icon in the **Replication Task** menu to pop up a window.
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 **<** button 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.

Start Task

1. Select a volume, and then click the ▶ icon to replicate the volume immediately.
2. The progress bar ⬤▬▬ ◯ displays the current status.

Stop Task

1. Click the ◯ 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.

Ungroup

1. Check the volume checkboxes which you want to ungroup.
2. Click the ✂ icon to pop up a confirm dialog box. Then click the **Apply** button to confirm and ungroup.

Snapshot Center

Click the ⚙ icon beside the volume name to list the drop-down options. About the **Snapshot Center** option, please refer to the chapter 6.2.4, [Snapshot Center](#) section for more details.

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6.2.6. List and Configure Replication Plan-Remote

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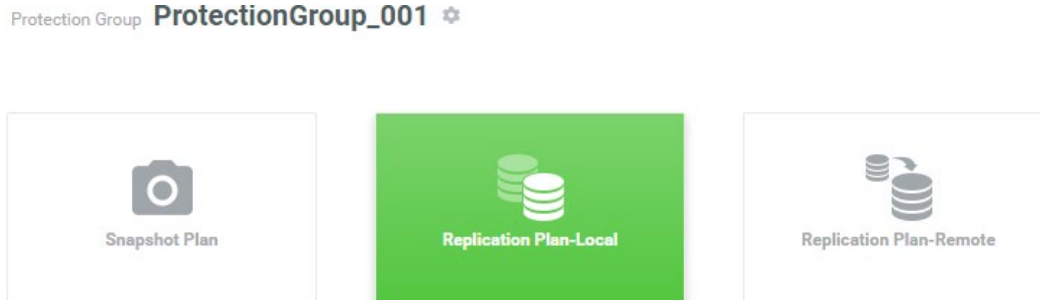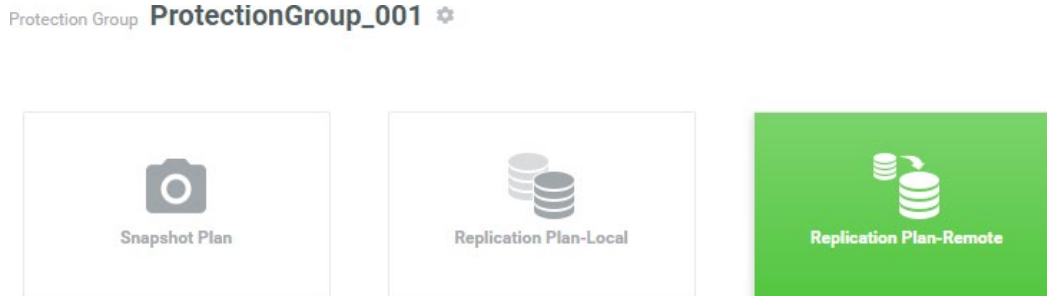

Figure 6-7   Protection Group with Replication Plan-Remote

Replication Tasks

At the **Protection Volumes** pane, click the **Replication Task** menu to list all replication tasks.
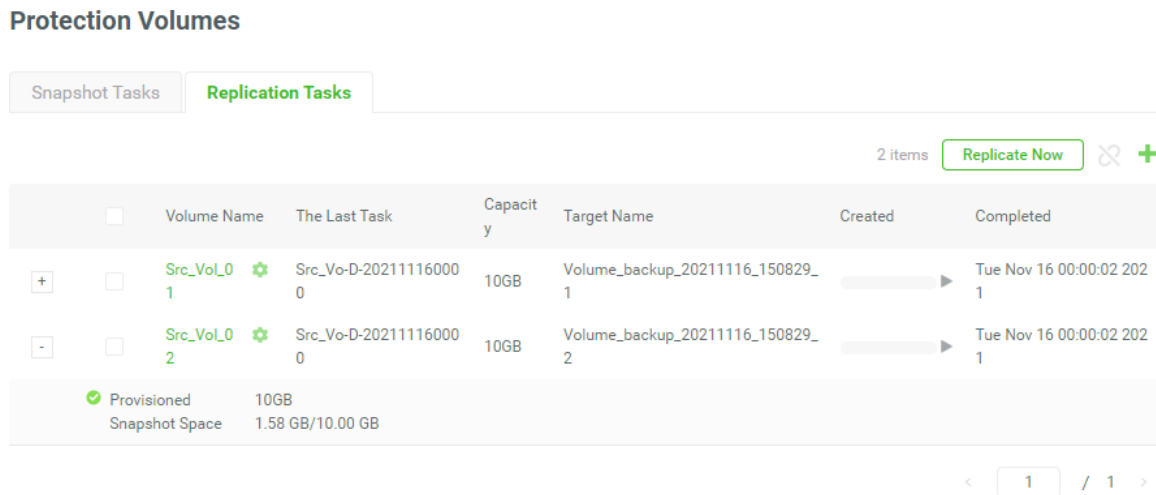

Figure 6-8   List Replication Tasks

The following options are available.

Start Task

1. Select a volume, and then click the ▶ icon to replicate the volume immediately.
2. The progress bar ⬤▬▬◯ displays the current status.

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Stop Task

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

Ungroup

1. Check the volume checkboxes which you want to ungroup.
2. Click the ✕ icon to pop up a confirm dialog box.. Then click the **Apply** button to confirm and ungroup.

Connection Properties

1. Click the ⚙ icon beside the volume name to list the drop-down options. Click the **Connection Properties** option to enable multipath and add connections.
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 ↻ icon to reconnect the connection.
5. Click the **Apply** button to take effect.

Snapshot Center

Click the ⚙ icon beside the volume name to list the drop-down options. About the **Snapshot Center** option, please refer to the chapter 7.2.4, Snapshot Center section for more details.

6.2.7. Traffic Shaping

The traffic shaping function can help reserve the necessary bandwidth for non-replication I/O operations. Eight shaping groups can be set. In each shaping group, peak and off-peak time slots are provided for different bandwidths. Here is an example to configure traffic shaping. Please refer to the Setup Traffic Shaping Tutorial.

6.2.8. Switch Local Clone to Remote Replication

Through local-to-remote, you can transfer local backup to remote sites without redoing full copy. You can plug and play when local-to-remote without any configurations. Here is an

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example of switching a local clone to a remote replication plan. Please refer to the [Local to Remote Tutorial](#).

7. ANALYSIS MENU

The **Analysis** menu displays historical array data, including I/O performance trends across all volumes, disks, and data ports; storage capacity report; and SSD cache, auto tiering statistic on the array.

7.1. Analysis Features

XEVO provides QReport to help you analyze 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.

7.2. Array Analysis

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

Figure 7-1   Performance Graph

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7.2.1. Performance Monitoring and Capacity Analysis

Here is an example to generate an analysis report. Please refer to the [Generate Analysis Report Tutorial](#).

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.

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8. SYSTEM MENU

The **System** menu 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.

8.1. Arrays Information

Select the **System** menu and the **Arrays** submenu to displays array health status.

8.1.1. 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.

8.1.2. Array Information

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

Array Information

Click the 🗔 icon to display the array information.

Array Temperatures

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

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Array Identification

The UID (Unique Identifier) LEDs help users to easily identify the system location within the rack. Click the 💡 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.

8.1.3. Disk Information

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

Disk Identification

The disk Identifier LED helps users to easily identify the disk location. Click the ▪ icon on the upper right corner will turn on the disk Identifier.

When the disk Identifier LED is turn on, it is blinking amber color, the disk in web UI is also blinking. Click it again to turn off the disk Identifier LED.

The following options are available.

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.

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

Set Global Disk

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

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.

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8.1.4. 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.

TIP

In XF3126, when mouse over to the fan module, it will change to the fan module view.

8.2. Configure System Settings

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

8.2.1. Account Settings

Here is an example to create an account. Please refer to the Create and Confiture Storage Account Tutorial.

INFORMATION

There is a default account **admin** in the **Administrators** group. Account **user** in the **Users** group. Account **system** in the **System Managers** group. And account **storage** in the **Storage Managers** group. These default accounts cannot be deleted.

The **admin** account can be disabled only if the other account belongs to the **Administrators** group login.

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8.2.2. General Settings

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

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~Z | a~z | 0~9 | -_].

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.
- **Login Lock:** When the login lock is enabled, the system allows only one user to login to the web UI at a time.

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

8.2.3. Configuration Backup

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

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

Export

Select the **Export Mode** to export system or volume configuration, then click the **Export** button to save a file.

Import

Import all system configurations excluding volume configuration.

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CAUTION

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

8.2.4. 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.

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.

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**.

- **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.

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

8.2.5. Configure QoS Settings

Click the **QoS Settings** pane to configure QoS (Quality of Service) settings. For more information, please refer to the [QoS White Paper](#) from QSAN website.

8.3. Configure Data Port Settings

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

8.3.1. Data Port Overview

Storage system provides different type of host connectivity according to the system configuration, it could be base system or host cards installed system. The host cards must be installed the same type on both controllers. Currently host card has several types 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.

8.3.2. Configure iSCSI Data Ports

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

The columns display 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 ⚙ icon beside the interface to list the drop-down options. The following options are available.

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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.

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 Default Gateway / Remove Default Gateway

Click the **Set Default Gateway** option to set the IP address as default gateway. There can be only one default gateway. To remove the default gateway, click the **Remove Default Gateway** option.

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 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.

Ping Host

Click the **Ping Host** option to verify the 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.

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Reset Port

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

8.3.3. 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 protocol is used 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. Then the iSNS server IP address is added to the storage system for iSCSI initiator service to send queries.

The following options are available.

▪ **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.

8.3.4. Configure Fibre Channel Ports

Click the **Fibre Channel Ports** pane to show information of fibre channel ports where they are located on the host cards.

The columns display connected or disconnected icon, **CTRL** (Controller), **Interface** name, **Location**, **Port**, **Status**, **Topology**, **WWNN / WWPN** (World Wide Node Name / World Wide Port Name), **Loss of Signal**, **Loss of Sync**, **Link Failure**, and **Invalid CRC**.

Click the ⚙ icon beside the interface to list the drop-down options. The following options are available.

Change Link Speed

Click the **Change Link Speed** option to change the link speed of fibre channel. The options are **Automatic** (default) to 32 Gb/s. Recommend to set it as **Automatic** to detect the data rate automatically.

Change Topology

Click the **Change Topology** option to change the topology of fibre channel. The option Point-to-Point is for 16 Gb/s and 32 Gb/s fibre channel, Point-to-Point and Loop modes are for 4 Gb/s and 8 Gb/s fibre channel. Set it appropriately according to your fibre channel environment.

> ⚠️ **CAUTION**
>
> If the link speed and topology are set, the related fibre channel switch and HBA on host must be set, too. Otherwise, the connection cannot work properly.

Clear Counters

Click the **Clear Counters** option to clear all counters of fibre channels. It will pop up a confirm dialog, and then click the **Apply** button to take effect.

8.4. Maintenance

Select the **System** menu and the **Maintenance** submenu to provide System Information, Firmware, Disk Services, Power Settings, Rescue, and License functions.

8.4.1. System Information

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

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

- **Change Operation Mode:** This option can be modified to operate in dual-controller or single-controller mode here. If the system installed only one controller, switch this mode to **Single Controller**, and then click the **Apply** button. After changing the operation mode, the system must reboot manually to take effect.

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.

8.4.2. 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 menu. Please refer to the chapter 8.2.3, Configuration Backup section for more information.

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.

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.

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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.

8.4.3.   Disk Services

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

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 icon to select a firmware file, and then click the **Update** button to upgrade the firmware of the disk drive.

CAUTION

If the disk to be updated firmware is a member of the pool and there are multiple disks of the same model, it is not recommended to update all at the same time. You need to set one disk to idle and then update the disk firmware. After completion, perform pool rebuild and then execute the next disk firmware update. These steps will avoid the risk of data loss.

Instant Erase

For more information, please refer to the SED and ISE White Paper from QSAN website.

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8.4.4. Power Settings

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

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 8.2.4, Configure Management Port 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 are connected to the proprietary wake-on-SAS cables, the expansion units will power on or shut down together with the head unit.

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.

- **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. Then fill in the necessary information below.

If Communication Type selects Serial:

- **UPS Manufacturer:** Select the UPS manufacturer.

- **UPS Model:** Select the UPS model.

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

8.4.5. Rescue

Click the **Rescue** pane 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.

Reset to Factory Defaults

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

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- 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 must start manually.

INFORMATION

The XCubeDAS expansion series features the seven-segment LED display for users to easily identify a specific XCubeDAS system. The enclosure ID is assigned by head unit automatically. After the XCubeDAS expansion units had been assigned the enclosure ID, head unit will assign the same enclosure ID when the system reboots.

> ⚠️ **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.

> ⚠️ **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.

8.4.6. Licenses

Click the **Licenses** pane to allow users to active licenses.

- **SSD Cache License / Auto Tiering License / Synchronous Replication License:** The ssd cache, auto tiering, synchronous replication functions are optional. Before using, you have to enable them individually. Click the **Request License** button to download the file and send to

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your local sales to obtain a License Key. After getting the license key, click the ☐ icon to select it, and then click the **Apply** button to enable. Each license key is unique and dedicated to a specific system. After enabling the license, the system must reboot manually to take effect.

- **Trial License:** This option enables trial license. Click the **Request License** button to download the file and register on our website in a few clicks, then you will get a 30-day trial license via email. After getting the license key, click the ☐ icon to select it, check that I have read and agree to the Trial License Agreement, and then click the **Apply** button to enable. Each license key is unique and dedicated to a specific system. After enabling, you can fully experience the advanced features.

INFORMATION

SSD cache and auto tiering are only available for hybrid storage models, optional and not included in the default package. These features are NOT supported on all-flash array models such as the XCubeFAS series.

8.5. Data Encryption

Select the **System** menu and the **Data Encryption** submenu to provide **Data Encryption** and **SEDs** functions.

For more information, please refer to the SED and ISE White Paper from QSAN website.

9. MESSAGES MENU

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

9.1. Log Center

Select the **Messages** menu and the **Log** submenu to show event messages. Click **All**, or the icon ⓘ (information), ⚠ (warning), ❗ (error) to filter the event levels. The numbers next to the levels are the sum of the events.

The event logs are displayed in reverse order which means the latest event log is on the first / top page. They are 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** ❗**:** A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible.

- **Warning** ⚠ **:** A problem occurred that may affect system stability, but not data integrity. Evaluate the problem and correct it if necessary.

- **Information** ⓘ**:** An operation recorded that may help to debug.

The following options are available.

Download Event Logs

1. Click the ⬇ icon to save the event log as a file. It will pop up a filter dialog.
2. Select the options and then click the **Download** button to download event logs.

Mute Buzzer

1. Click the 🔕 icon to stop alarm if the system alerts.

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Clear Event Logs

1. Click the 🗑 icon to clear all event logs.
2. Select the options and then click the **Apply** button to clear event logs.

9.2. Configure Notification Settings

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

9.2.1. Email Settings

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

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.

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> **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 Configure Management Port 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.

9.2.2. Alert Settings

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

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.

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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.

9.2.3. SNMP Settings

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

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. Then fill in the necessary information below.

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

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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.

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10. SUPPORT AND OTHER RESOURCES

10.1. 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 https://www.qsan.com/business_partnership. 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: https://www.qsan.com/technical_support

- 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: support@qsan.com

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

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**

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Package button to download. Then the system will automatically generate a zip file the default download location of your web browser.

10.2. 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 docsfeedback@qsan.com.

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

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APPENDIX

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Miscellaneous

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