P2X0-0700-02ENZ0

ETERNUS

ETERNUS DX60/DX80

Web GUI

User Guide

FUJITSU

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Preface

This guide provides a variety of basic information about Web GUI for the ETERNUS DX60/DX80. It should be referred to when setting up and maintaining the ETERNUS DX60/DX80.
This guide is specially written for ETERNUS DX60/DX80 Web GUI system administrators and operators. Knowledge of UNIX or Windows® systems is required.

Second Edition
October 2009

Structure of This Manual

This manual consists of the following 8 chapters and an Appendix.

- Chapter 1 Outline

  This chapter describes the outlines, features, operation environment, and operating topology for GUI.

- Chapter 2 Startup and Shutdown

  This chapter describes how to start, exit, log on and log off from GUI, and information about operation screens.

- Chapter 3 Initial Setup

  This chapter describes the Initial Setup menu.

- Chapter 4 Status Menu

  This chapter describes the status display menu for the device.

- Chapter 5 Configuration

  This chapter describes the configuration related menu.
  Details for Configuration Wizard, RAID group management, volume management, and Advanced Copy management are provided.

- Chapter 6 Global Settings

  This chapter describes the user management, network settings, remote support settings, system settings, and Host I/F (host interface) management.

- Chapter 7 Maintenance

  This chapter describes the hardware maintenance procedures.

- Chapter 8 Display and Download Information (Diagnosis)

  This chapter describes how to display and download ETERNUS DX60/DX80 related information.

Procedures to install the site certificate of the Web site are provided for the Appendix.

Latest Information

The information in this document is subject to change without notice for functionality expansion of ETERNUS DX60/DX80 and improvement. The latest version of this document and the latest information about the ETERNUS DX60/DX80 is released in the following web-site. Access the following address if needed.

http://www.fujitsu.com/global/services/computing/storage/eternus/products/diskstorage/dx60-dx80/

Related Materials

Other manuals for the ETERNUS DX60/DX80 are as follows:

- ETERNUS DX60/DX80 Disk storage systems User Guide
- ETERNUS DX60/DX80 Command Line Interface (CLI) User's Guide
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) (*1)
- ETERNUS Disk storage systems Server Connection Guide (iSCSI) (*1)
- ETERNUS Disk storage systems Server Connection Guide (SAS) (*1)

*1: Download the required manuals for your device environment (server OS and Fibre Channel card type, etc.) from the specified web site. Refer to the Document CD provided with the ETERNUS DX60/DX80 for URLs of the manual download site.

Acknowledgments

Abbreviations

The following products will be represented throughout this manual by the following abbreviations.

- Microsoft® Windows® 2000 Server operating system and Microsoft® Windows® 2000 Advanced Server operating system are abbreviated as Windows® 2000.
- Microsoft® Windows Server® 2003, Standard Edition, and Microsoft® Windows Server® 2003, Enterprise Edition are abbreviated as Windows Server® 2003.
- Microsoft® Windows Server® 2008, Standard Edition, and Microsoft® Windows Server® 2008, Enterprise Edition are abbreviated as Windows Server® 2008.
- Windows® Server refers to both the Windows Server® 2003 and Windows Server® 2008.
- Windows® refers to all the Windows products listed here: Windows® 2000, Windows Server® 2003, and Windows Server® 2008.
- Solaris™ Operating System is abbreviated as Solaris OS.

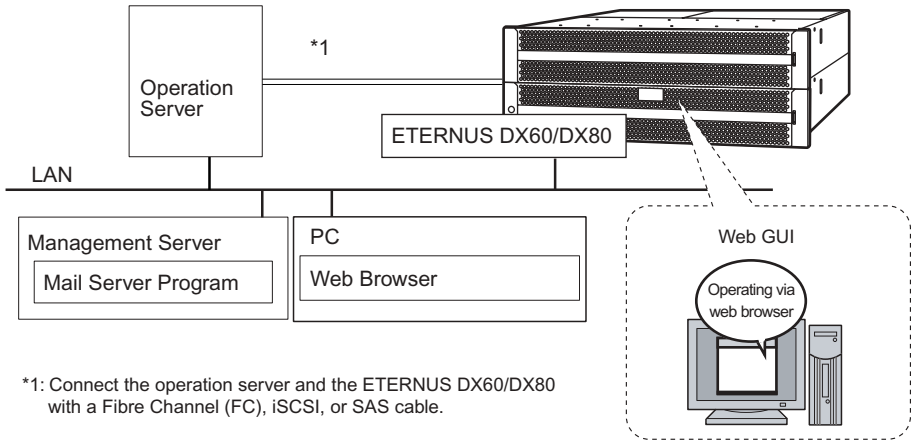
Contents

Chapter 1 Outline

This chapter describes the outlines, features, operating environment, and operating topology for ETERNUS DX60/DX80 Web GUI (hereinafter referred to as "GUI").
GUI is installed in controllers of the ETERNUS DX60/DX80 (hereinafter also referred to as "the device"), and used for performing settings and maintenance via web browser.

1.1 Outline

Use GUI to set the operating environment and check status for the ETERNUS DX60/DX80.
GUI can be operated from a web browser by connecting the PC via a LAN connection.



*1: Connect the operation server and the ETERNUS DX60/DX80 with a Fibre Channel (FC), iSCSI, or SAS cable.

Refer to "2.1 Startup" (page 13) for details of GUI start up.

1.2 Features

The features for GUI are as follows:

- Initial and basic settings by the wizard

  The wizard enables you to set the minimum requirement to run the ETERNUS DX60/DX80 by following the instructions on the wizard screen.

- System status

  This function displays the device installation image.

- Disk configuration check function

  This function displays a list of disk drives. It is also possible to display the number of constructible RAID groups by specifying the RAID group configuration requirements.

- Checking the extent of a failure

  If a disk drive failure occurs, "Host Port", "Affinity Group", "Volume", "RAID group", and "installation location" can be referenced to determine the extent of the failure.

- Easy operation

  If a hardware failure is detected, the system administrator can receive a mail containing detected failure information.

1.3 Operating Environment

The following server or PC environment is required for the use of GUI.

Confirmed operating environment		Version
Browsers	Microsoft® Internet Explorer	6.0 or 7.0
	Mozilla Firefox™	3.0.x
Image resolution	1024 x 768 or more	-

Caution

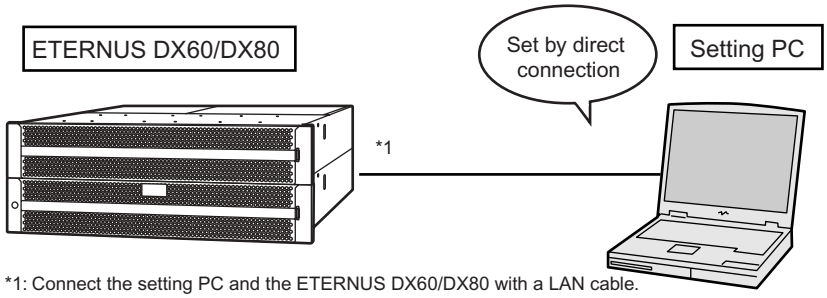
- Set the web browser not to use a proxy server and cache (Temporary Internet Files).
- Browsers require the following operating environment. Enable the following functions for each browser.
  - JavaScript and Style Sheet
  - Cookie

1.4 Operating Topology

GUI can be operated by a PC or workstation with a web browser installed, that is connected via a LAN.
Two connection topologies are allowed:

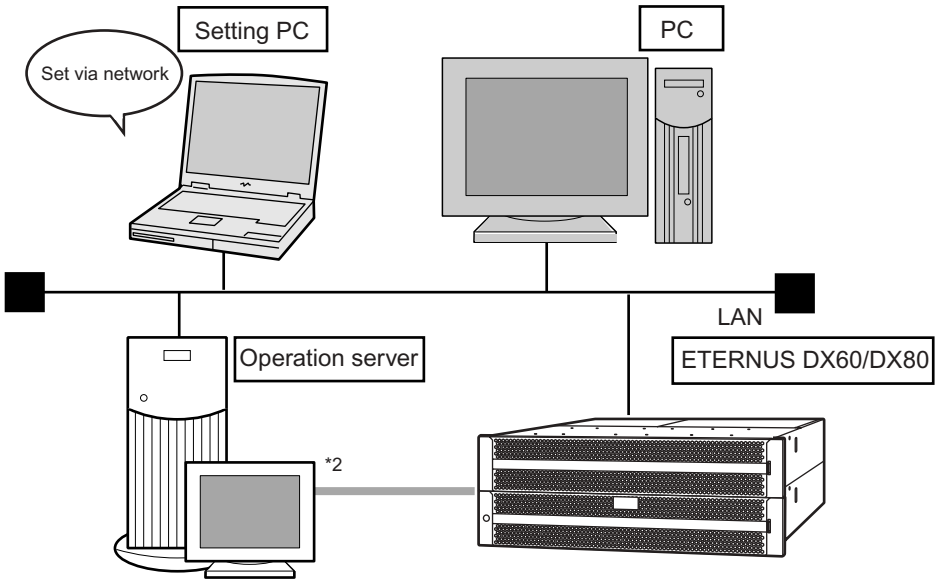
- Direct connection of the PC to the device
- Network connection via an existing LAN

The operating topology diagram below shows a direct connection with a LAN cable.



*1: Connect the setting PC and the ETERNUS DX60/DX80 with a LAN cable.
Either a straight through or crossover LAN cable can be used.

The operating topology diagram below shows operation on an existing network.



*2: Connects the operation server and the ETERNUS DX60/DX80 using a Fibre Channel (FC), iSCSI, or SAS cable.

Chapter 2 Startup and Shutdown

This chapter describes how to start, exit, log on and log off from GUI, and information about operation screens.

2.1 Startup

Startup the logon screen for GUI.
Connect the PC and the ETERNUS DX60/DX80 using a LAN cable, and display the logon screen via the web browser.
The procedure to start up the logon screen for GUI is as follows:

Procedure

1. Directly connect the PC and MNT port of the ETERNUS DX60/DX80 via LAN cable.
2. Set the IP address and subnet mask for the PC to match the ETERNUS DX60/DX80 network settings.
3. Enter the URL to the address bar in the web browser.

   Specify "http://IP address of the device/" or "https://IP address of the device" (Default IP address is "192.168.1.1").

   → The logon screen for GUI is displayed. Refer to "2.2 Logon" (page 15) for detailed procedure to logon.

Caution

The confirmation screens for site certificate may be displayed when using SSL (https) to start up GUI (the display contents vary according to your web browser).
However, this should not cause any problems. Accept the site certificate and continue the process.
The following shows an example when using Internet Explorer 7.

> There is a problem with this website's security certificate. The security certificate presented by this website was not issued by a trusted certificate authority.
>
> Security certificate problems may indicate an attempt to fool you or intercept data you send to the server.
> We recommend that you close this webpage and do not continue to this Web site.

This warning will not be displayed after installing the site information. Refer to "Appendix A Install Site Certificate" (page 236) for procedure to install the site certificate to the your web browser.

Note

- Refer to "6.2.1 Setup Network Environment" (page 147) for procedure to set the IP address of the MNT port.
- The following ports should be used for http and https connections:

Protocol	Port to be used (Default)
http	80
https	443

End of procedure

2.2 Logon

Log on to GUI to start the operation. The GUI operation screen appears.
The menu displayed pertains to the logged on user role. An Advanced privilege user (CE) can access various maintenance/settings menus, a Standard user (SE) has operational access, and a Monitor user (general user) can access the status display menus.

Caution

The following will cause an error. If this occurs, note the error message and try re-logging on after completing the process.

- Attempting to logon while four users are already logged on.
- Attempting to logon while another application is already logged on.

The procedure for logging on is as follows:

Procedure

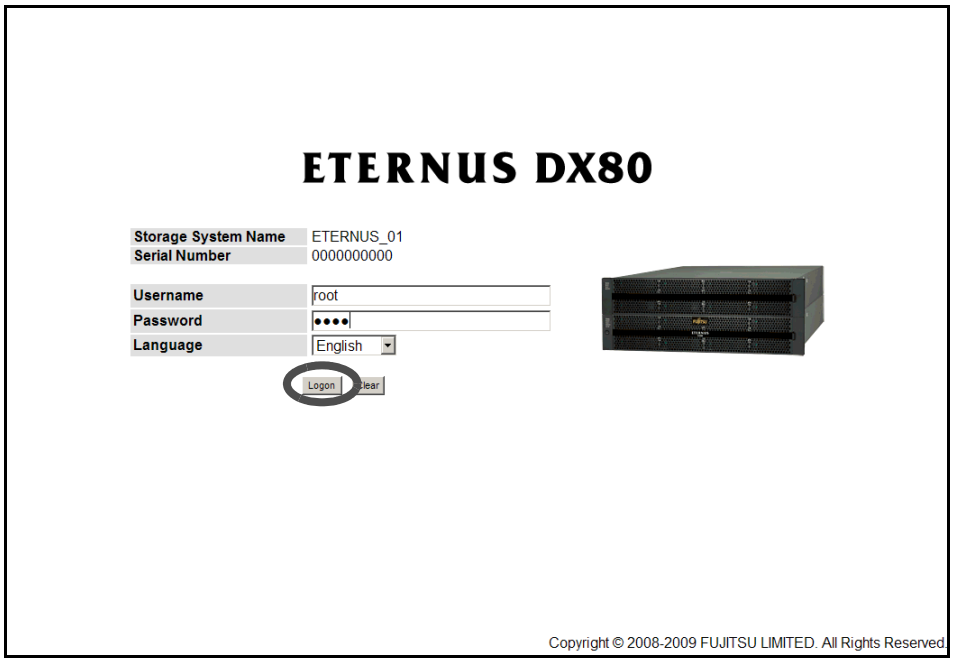
1. Select the language (English or Japanese) from the logon screen.
2. Enter the Username and Password, and click the [Logon] button.

   The Username and the Password vary depending on which account is being used to logon.

   - Username
     root
   - Password
     root (Default)

Note

- Refer to "6.1 User Management" (page 140) for user accounts.
- If the input error occurs, enter the Username and Password again to log on to the ETERNUS DX60/DX80.



→ The operation screen appears.

Caution

Up to four users can be logged on concurrently. Logging on five or more users is not allowed.
Also note that a warning message appears in the following conditions and some functions cannot be used. Confirm the current GUI usage state and start operation.

- When attempting to logon, another user is already logged on and performing one of the following operations.
  - Applying controller firmware
  - Applying disk firmware
  - RAID group diagnosis
  - Disk diagnosis

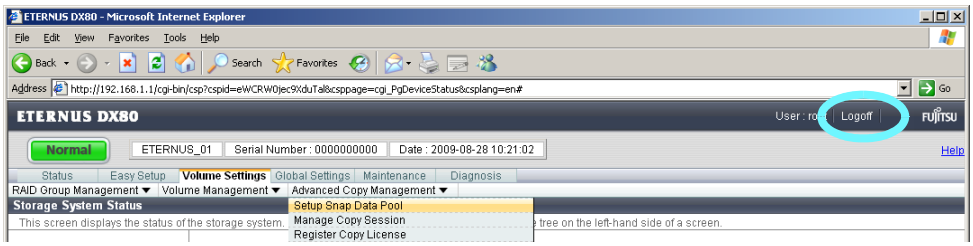
End of procedure

2.3 Logoff

Log off from GUI to finish the operation.
The procedure for logging off is as follows:

Procedure

1 Click the [Logoff] link on the top right of the screen.



→ A confirmation screen appears.

2 Click the [OK] button.

→ This completes the logging off process.
The logon screen appears.

End of procedure

2.4 Exit

Exit from GUI.

Caution Make sure to perform "2.3 Logoff" (page 17) operation before exiting GUI. If exiting GUI without logging off, the logon status is not released.

The procedure to exit is as follows:

Procedure

1. Click the [Close] button for the web browser.
   → Exit from GUI.
   The logon screen does not appear.

End of procedure

2.5 Operation Screens

This section provides a description about GUI operation screens.
Click the [Help] link or [Help] button for a detailed explanation of the functions used during operation. An explanation (help) screen of the function is displayed.

Caution

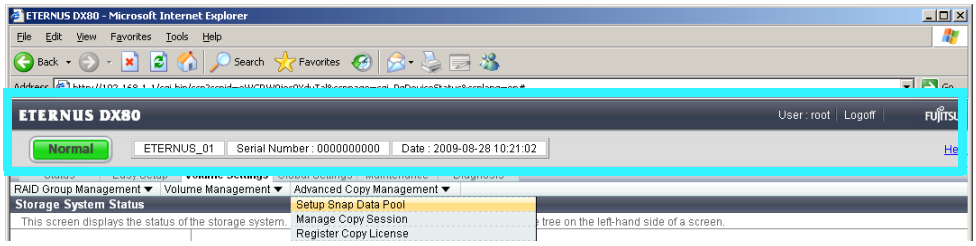
- Be sure to log off after all necessary operations are completed.
- If the operation screen is not updated when accessing the GUI, close the web browser, and log on again.

2.5.1 Screen structures

The following shows the main contents that configure the operation screen. They are always displayed.

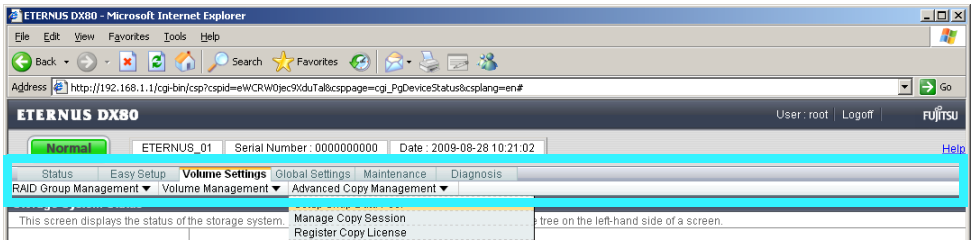
Global Header

ETERNUS DX60 or ETERNUS DX80 logo, [Logoff] and [Help] links, general status, device serial number, and date and time are displayed in the Global Header.
General status of ETERNUS DX60/DX80 is displayed as an image with character strings.



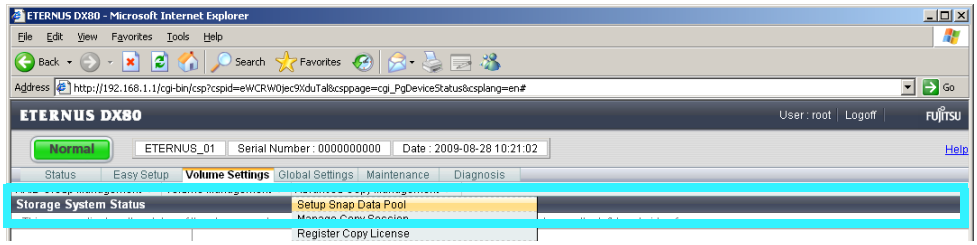
Menu Bar

Clicking the tabs in the menu bar displays sub menus related to the selected function. Clicking the sub menu with the "▼" symbol displays pull-down menu options.



- Title Bar

  The current function name is displayed.



2.5.2 User Role

The available menus for GUI will differ according to the account type.
The following table shows the difference between user roles.

User role	Available functions	Default account
Advanced	"Advanced" is a maintenance engineer privilege. Setting maintenance such as status display, configuration management, and maintenance functions are available.	f.ce
Standard	"Standard" is a system administrator privilege. Functions such as status display and configuration management are available.	root
Monitor	"Monitor" is a general user privilege. Only the status display function is available.	None

- Settings and functions for an Advanced privilege user

  - Initial Setup
  - Status
  - Volume Settings
  - Global Settings
  - Maintenance
  - Diagnosis
  - Utilities

- Settings and functions for a Standard privilege user

  - Initial Setup
  - Status
  - Volume Settings
  - Global Settings
  - Maintenance (Add Drive Enclosures)
  - Diagnosis

- Settings and functions for a Monitor privilege user

  - Status
  - Diagnosis (Display Event Log and Display Performance Information)

The following table shows the availability of functions for each user role.

Chapter	Category	Function	User Role		
			Monitor	Standard	Advanced
Startup and Shutdown	Logon		OK	OK	OK
	Logoff		OK	OK	OK
Initial Setup	Set Date and Time		–	OK	OK
	Set Storage System Name		–	OK	OK
	Change Password		–	OK	OK
	Setup Network Environment		–	OK	OK
Status Menu	Storage System Status		OK	OK	OK
	RAID Group Status		OK	OK	OK
	Volume Status		OK	OK	OK
	Advanced Copy Status		OK	OK	OK
Configuration	Configuration Wizard		–	OK	OK
	RAID Group Management	Create RAID Group	–	OK	OK
		Delete RAID Group	–	OK	OK
		Assign Hot Spare	–	OK	OK
		Release Hot Spare	–	OK	OK
		Logical Device Expansion	–	OK	OK
		Set RAID Group Name	–	OK	OK
		Set Eco-mode Schedule	–	OK	OK
		Change CM Ownership	–	OK	OK
		Modify RAID Group Parameters	–	–	OK
	Volume Management	Create Volume	–	OK	OK
		Delete Volume	–	OK	OK
		Format Volume	–	OK	OK
		Encrypt Volume	–	OK	OK
		LUN Concatenation	–	OK	OK
		RAID Migration	–	OK	OK
		Initialize Snap Data Volume	–	OK	OK
		Modify Cache Parameters	–	–	OK
		Release Reservation	–	OK	OK
		Set Volume Name	–	OK	OK
		Configure LUN Mapping	–	OK	OK
Configuration	Advanced Copy Management	Setup Snap Data Pool	–	OK	OK
		Manage Copy Session	–	OK	OK
		Register Copy License	–	OK	OK
		Modify Copy Parameters	–	OK	OK
		Modify EC/OPC Priority	–	OK	OK
		Modify Copy Table Size	–	OK	OK

Chapter	Category	Function	User Role		
			Monitor	Standard	Advanced
Global Settings	User Management	Setup User Account	–	OK	OK
		Change User Password	–	OK	OK
		Initialize User Account	–	OK	OK
	Network Settings	Setup Network Environment	–	OK	OK
		Setup SNMP Agent	–	OK	OK
		Download MIB File	–	OK	OK
		Perform SNMP Trap Test	–	OK	OK
		Setup E-Mail Notification	–	OK	OK
		Display SMTP Log	–	OK	OK
		Setup Event Notification	–	OK	OK
		Renew SSL Certificate	–	OK	OK
	Remote Support	Display Support Information	–	OK	OK
		Display Communication Log	–	OK	OK
		Setup Remote Support	–	OK	OK
		Update Customer Information	–	OK	OK
		Update Communication Environment Information	–	OK	OK
		Setup Log Sending Parameters	–	OK	OK
		Stop/Restart Remote Support	–	OK	OK
		Download Controller Firmware	–	–	OK
		Setup Firmware Update from Peer Storage System	–	–	OK

Chapter	Category	Function	User Role		
			Monitor	Standard	Advanced
Global Settings	System Settings	Modify Date and Time	–	OK	OK
		Modify Storage System Name	–	OK	OK
		Setup Encryption Mode	–	OK	OK
		Change Box ID	–	OK	OK
		Setup Power Management	–	OK	OK
		Setup Subsystem Parameters	–	–	OK
		Setup Disk Patrol	–	–	OK
		Setup SMI-S Environment	–	–	OK
	Host I/F Management	Set Port parameters	–	OK	OK
		Setup Host	–	OK	OK
		Setup Host Response	–	OK	OK
		Modify Reset Group	–	OK	OK
Maintenance	Start/End Maintenance		–	–	OK
	Hardware Maintenance	Hot Maintenance (*1)	–	–	–
		Concurrent Preventive Maintenance	–	–	OK
		Force Disable	–	–	OK
		Force Enable	–	–	OK
		Add Drive Enclosure	–	OK	OK
		Remove Drive Enclosure	–	–	OK
		Add Disk (*1)	–	–	–
		Reduce Disk	–	–	OK
		Add Controller Module	–	OK	OK
	Firmware Maintenance	Apply Controller Firmware	–	–	OK
		Register Disk Firmware	–	–	OK
		Apply Disk Firmware	–	–	OK
		Delete Disk Firmware	–	–	OK
	Clear Sense Data		–	–	OK
Diagnosis	Display Event Log		OK	OK	OK
	Export/Delete Log		–	OK	OK
	Export Panic Dump		–	OK	OK
	Start/Stop Performance Monitoring		–	OK	OK
	Display Performance Information		OK	OK	OK
	Display Error Information		–	OK	OK
	Export Configuration		–	–	OK
	Get G-List		–	–	OK

Chapter	Category	Function	User Role		
			Monitor	Standard	Advanced
Utilities	Shutdown/Restart Storage System		–	–	OK
	Initialize System Disks		–	–	OK
	Cache Utilities	Manage Pinned Data	–	–	OK
		Force Write Back	–	–	OK
	Recovery Utilities	Apply Configuration	–	–	OK
		Backup Configuration	–	–	OK
		Reset Backup/Restore Fail	–	–	OK
		Force Restore	–	–	OK
		Reset Machine Down Recovery Fail	–	–	OK
		Reboot All CMs	–	–	OK
	Diagnostic Utilities	Perform Disk Diagnostic	–	–	OK
		Perform RAID Group Diagnostic	–	–	OK

OK: Available –: Not available

*1: Function does not require any operation from GUI.

Note

- Some functions are not displayed for some firmware versions and device model names.
- "5.3.4 Encrypt Volume" (page 99) function will be available after using the "6.4.3 Setup Encryption Mode" (page 187) function. However, when the encryption function is not available, the "Setup Encryption Mode" is not displayed in the menu.

Chapter 3 Initial Setup

This chapter describes the Initial Setup menu. This menu supports the initial setup required before starting operations.

- Set Date and Time

  This screen is used to set the time/date and time zone (device location) of the internal clock.

- Set Storage System Name

  This screen is used to set the name, administrator, and installation site of the ETERNUS DX60/DX80 Disk storage system.
  Information registered in this screen is used for the following functions and screens:
  - Network management using SNMP
  - Storage system name displayed in logon screen and operation screens
  - Friendly Name (storage system name)(*1) for Virtual Disk Service (VDS)

    *1: VDS is a storage management function of the Windows Server®.

- Change Password

  Change the password for the default account before starting operations.

- Setup Network Environment

  Set the environment for the ETERNUS DX60/DX80 Disk storage system to communicate on the network such as IP address and subnet mask.

Note that the value specified in the Initial Setup menu can be changed subsequently. Refer to the following sections for details.

Initial Setup	Refer to:
Set Date and Time	"6.4.1 Modify Date and Time" (page 184)
Set Storage System Name	"6.4.2 Modify Storage System Name" (page 186)
Change Password	"6.1.2 Change User Password" (page 144)
Setup Network Environment	"6.2.1 Setup Network Environment" (page 147)

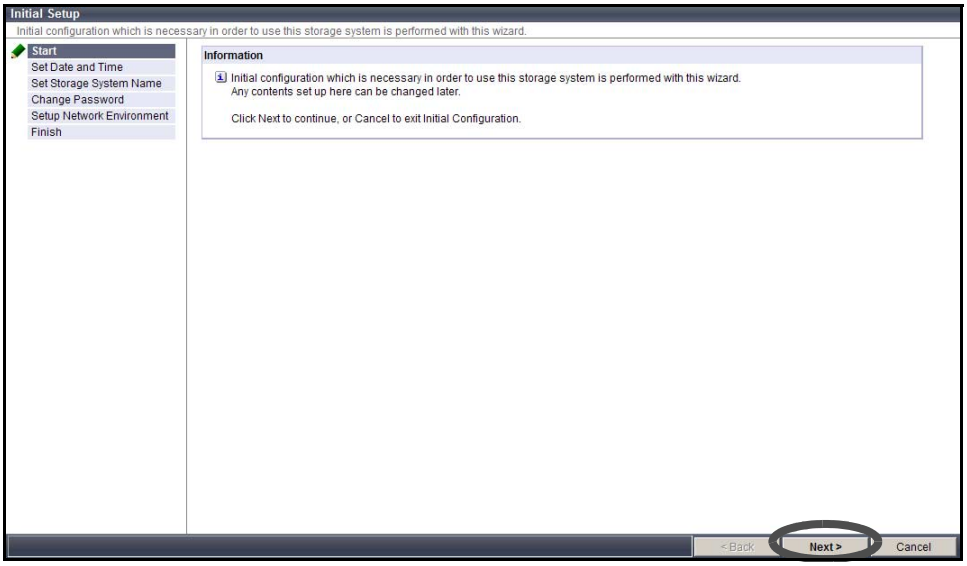
Start the Initial Setup. The initial setup procedure is as follows:

Procedure

1 Click the [Initial Setup] menu on the [Easy Setup] tab.

→ The Start screen of the [Initial Setup] function appears.

2 Click the [Next >] button.



→ Initial Setup starts. The "Set Date and Time" screen appears.

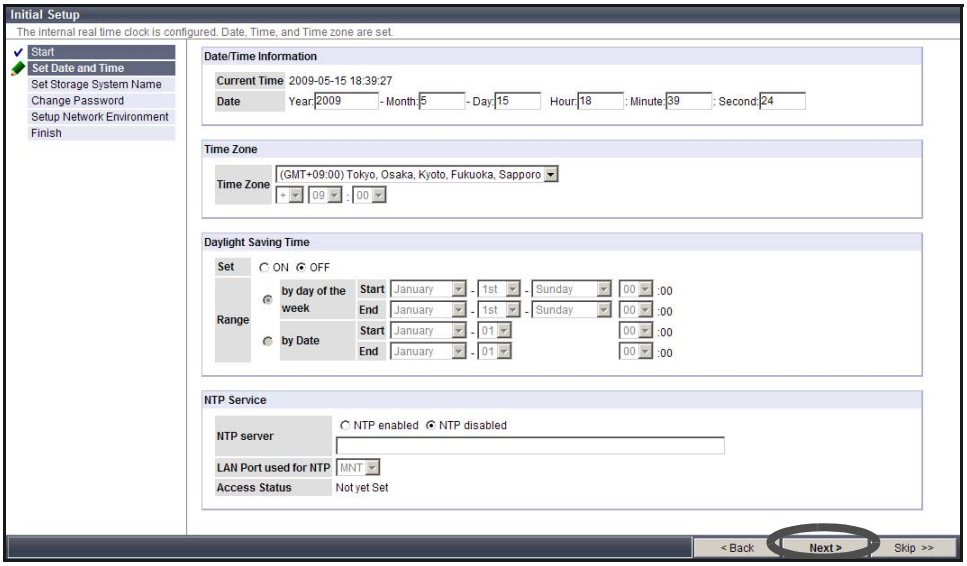
3 Set the following parameters, and click the [Next >] button.

- Date/Time Information
  - Current Time
    Current date and time setting is displayed.
  - Date
    To change the "Current Time", input the new date and time.
- Time Zone
  Set the time difference (GMT).
  - Time Zone
    Select the Time Zone from the list box. If the appropriate Time Zone does not exist, select "Direct Input", and specify the time difference using "+" or "-", hour, and minute.
- Daylight Saving Time
  - Set
    Select whether to set the Daylight Saving Time "ON" or "OFF" with the radio button.
  - Range
    If "Set" is "ON", set the Daylight Saving Time period. Select "by day of the week" or "by Date" with the radio button, and input the required parameters.

- NTP Service
  - NTP server
    Select "NTP enabled" or "NTP disabled" with the radio button. When NTP is enabled, input the IP address or domain name for the NTP server in the text box. ETERNUS DX60/DX80 is synchronized with the NTP server in a step mode fashion.
  - LAN Port used for NTP
    Select the LAN port to be used for NTP connection from "MNT" or "RMT".
  - Access Status
    Access state to the NTP server is displayed.

Note

Click the [Skip >>] button to move on to the next screen without setting.



→ A confirmation screen appears.

4 Click the [OK] button.

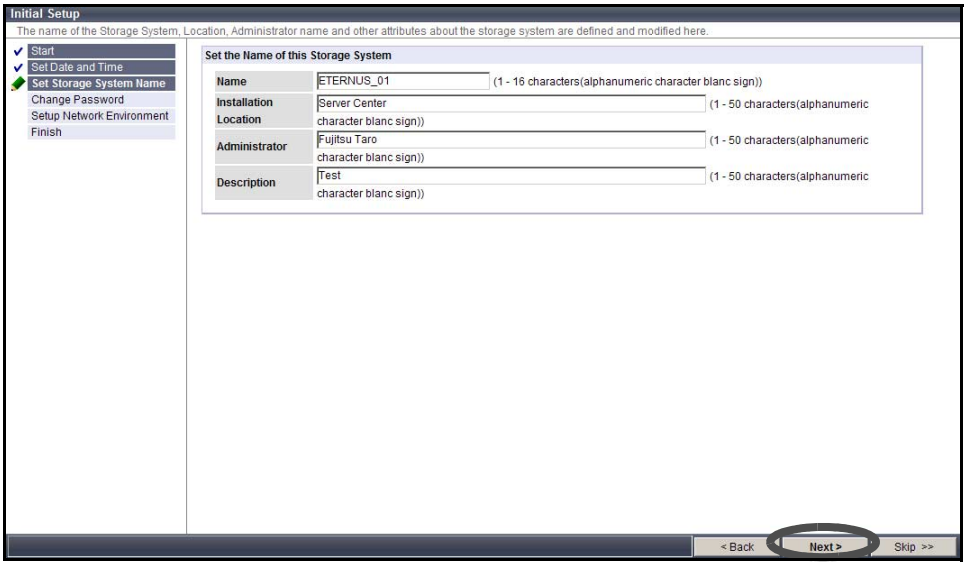
→ The date and time setting is set, and the "Set Storage System Name" screen appears.

5 Set the following parameters, and click the [Next >] button.

Values specified in this screen are used for SNMP.

- Name
  Enter the storage system name between 1 to 16 alphanumeric characters and symbols (including blanks).
- Installation Location
  Enter the instillation location of the ETERNUS DX80 or ETERNUS DX60 Disk storage system between 1 to 50 alphanumeric characters and symbols (including blanks).
- Administrator
  Enter the name of system administrator between 1 to 50 alphanumeric characters and symbols (including blanks).

- Description
  Enter the description of the ETERNUS DX80 or ETERNUS DX60 Disk storage system between 1 to 50 alphanumeric characters and symbols (including blanks).



→ A confirmation screen appears.

6 Click the [OK] button.

→ The storage system name is set, and the "Change Password" screen appears.

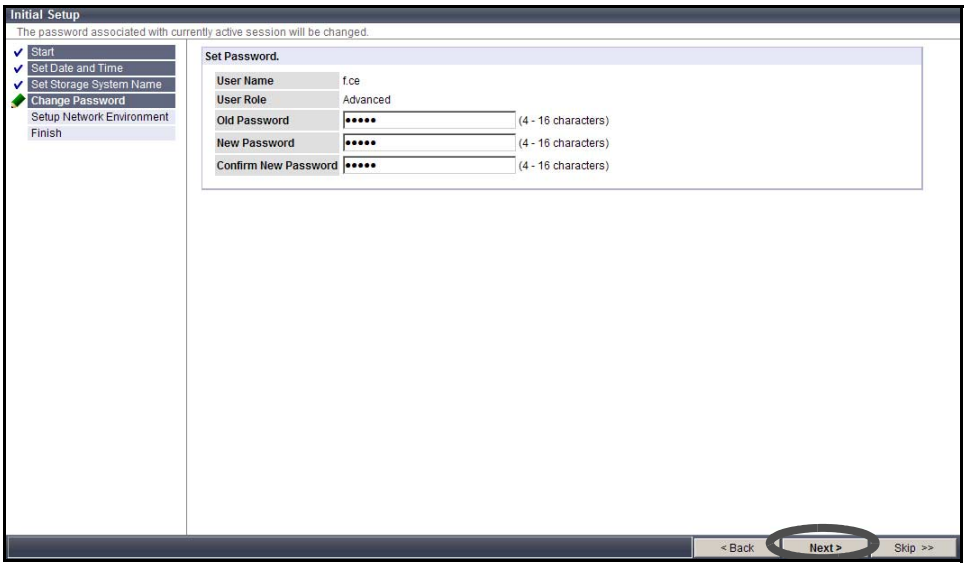
7 Set the following parameters, and click the [Next >] button.

- User Name
  The current (your) user account name is displayed.
- User Role
  The current (your) user role is displayed.
- Old Password
  Enter the current password.
- New Password
  Enter the new password between 4 to 16 characters.
  Alphanumeric characters and symbols ([!], [-], [_], [.]) can be used.
- Confirm New Password
  Enter the same character strings as the value entered in the "New Password" field for confirmation.

Caution

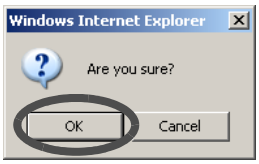
When changing a user password, an error occurs in the following conditions.

- When the "Old password" does not match the current password
- When the "Old password", "New Password", and/or "Confirm New Password" is not entered
- When the password does not match the confirmation password
- When the password is less than 4, or more than 16 characters (If 17 or more characters are entered, ETERNUS DX60/DX80 ignores the 17th and later characters, and the password is registered using the first 16 characters only)
- When the password includes characters other than alphanumeric characters and symbols ([!], [-], [_], [.])



→ A confirmation screen appears.

8 Click the [OK] button.



→ The password is changed, and the "Setup Network Environment" screen appears.

9 Set the following parameters, and click the [Next >] button.

- Select Network Port
  Select the port to be used from the "MNT" or "RMT".
- Interface
  - Speed and Duplex
    Select the communication speed and mode from the following. The default setting is [Auto Negotiation].
    - Auto Negotiation
    - 1Gbps
    - 100Mbps Half
    - 100Mbps Full
    - 10Mbps Half
    - 10Mbps Full
  - Master CM IP Address
    Enter the IP address (0 to 255) for the Master CM in the ETERNUS DX60/DX80 Disk storage system.
  - Slave CM IP Address
    Enter the IP address (0 to 255) for the Slave CM in the ETERNUS DX60/DX80 Disk storage system. This setting is required to duplicate LAN path.

Note

When the ETERNUS DX60/DX80 has only one CM, a Slave IP address cannot be specified.

  - Subnet Mask
    Set the Subnet Mask (0 to 255) for the ETERNUS DX60/DX80 Disk storage system.
  - Default Gateway
    Set the Gateway address (0 to 255) for the ETERNUS DX60/DX80 Disk storage system.
  - Primary DNS
    Set the IP address for the Primary DNS server (0 to 255) for the ETERNUS DX60/DX80 Disk storage system.
  - Secondary DNS
    Set the IP address for the Secondary DNS server (0 to 255) for the ETERNUS DX60/DX80 Disk storage system.
- Allowed IP List
  The value entered in this field is enabled when the Gateway has been set.
  Set the destination network address (IP address and Subnet Mask).
  Up to 16 addresses can be set. Make sure to set the IP address and Subnet Mask in pairs.

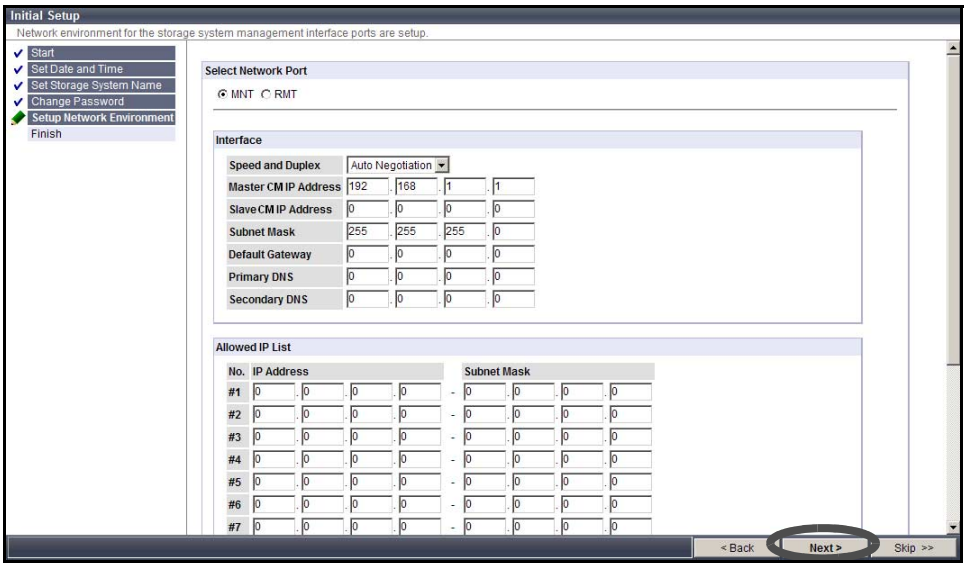
Caution

Note the following when specifying the IP address and Subnet Mask.

- Specify the IP address using IPv4 notation (character string in d.d.d.d format based on the 256 radix system).
- RMT port is used when it is required to use the dedicated network for Remote Support. IP addresses for the RMT port and MNT port must be in different subnets.
- "Slave CM IP Address" is specified when connecting to the Slave CM. IP addresses for the Slave CM and Master CM must be in the same subnet.
- Specify the IP address of "Default Gateway" when allowing access from outside of the subnetwork. The IP address must be in the same subnetwork as the port.
- For "Allowed IP List", specify the IP address or network address that allows access to the ETERNUS DX60/DX80. These settings are not required for access from the network address (same sub-network) which the ETERNUS DX60/DX80 belongs to.

Note

For the two CMs in the ETERNUSDX60/DX80, the CM that has the priority to manage the device is called the Master CM, and the other is called the Slave CM. If a CM or LAN failure occurs, ETERNUS DX60/DX80 changes the Master CM automatically. The IP address for prior Master CM is taken over to the new Master CM. Specifying an IP address for the Slave CM enables forcible changing of the Master CM. When an error occurs and access to the Master CM is disabled, users can access the Slave CM and change the Master CM.

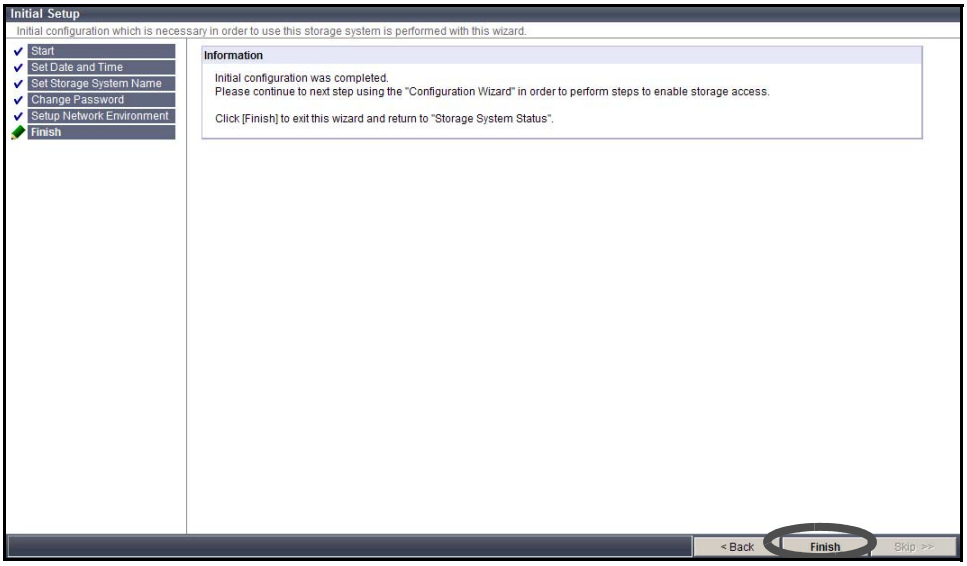


→ A confirmation screen appears.

10 Click the [OK] button.

→ The Network Environment is set, and the "Finish" screen appears.

11 Click the [Finish] button.



→ The [Initial Setup] completes.

Note

Device setting operation cannot be continued if the IP address is changed. Logon again with the new IP address is required.

End of procedure

Chapter 4 Status Menu

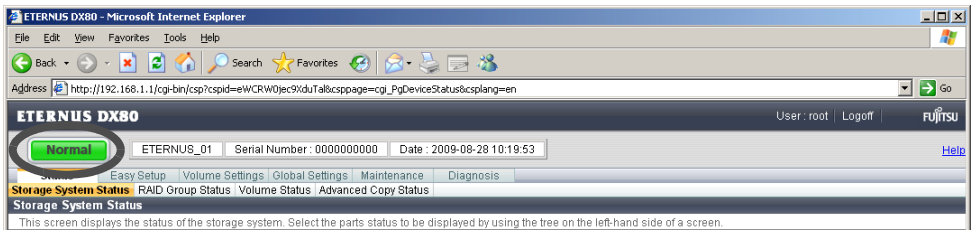
This chapter describes the status display menu for the storage system, RAID groups, volumes, and Advanced Copy function.

4.1 Storage System Status

This function is used to check the status of components configuring the ETERNUS DX60/DX80. Status of each component in the ETERNUS DX60/DX80 is monitored periodically, and the result is displayed as a general status image with character strings.

- General Status

  The general status of ETERNUS DX60/DX80 is displayed as an image with character strings in the Global Header.
  The general status is determined by each component status.



A "Normal (green)" general status image indicates normal status, while other color images indicate a failure.
The following table shows an each status images.

Image	Description
Normal (Green)	ETERNUS DX60/DX80 is in normal state.
Not Ready (Red)	"Not Ready" is a status where an abnormality is detected at a power-off, and I/O access from the host cannot be received.
Error (Red)	ETERNUS DX60/DX80 is in error state.
Maintenance (Orange)	ETERNUS DX60/DX80 is under maintenance.
Warning (Yellow)	ETERNUS DX60/DX80 is in warning state.
Offline (Gray)	The component is installed in the ETERNUS DX60/DX80, but not used.

- General status image display priority

  A general status image is determined by integrated status of components such as Controller Enclosure, Drive Enclosure, and cables, which configures the ETERNUS DX60/DX80.
  The following shows the general status display priority.

  High ← Not Ready (Red: Not Ready) – Error (Red: Error) – Maintenance (Orange: During maintenance work) – Warning (Yellow: Warning) – Normal (Green: Normal) – Offline (Gray: Installed, but not used) → Low

When the general status is changed, check the component status. Expand the device tree in the [Storage System Status] menu on the [Status] tab, and select the target component.

- Component Status

  Status of each component is displayed as a status symbol in the device tree of [Storage System Status] menu on the [Status] tab.
  The following table shows the component status symbols.

Symbol	Description
(Green)	The component is in normal status.
(Red)	An error occurs in the component.
(Yellow)	The component requires the preventive maintenance.
(Orange)	The component is under maintenance.
(Blue)	The component is installed, but not used. (Caution) If a disk is in this state, "Normal (green)" is displayed instead of "Warning (yellow)" as a general status.
(Gray)	Status other than described above is detected in the component.

- Component list

  The following table shows the each component name in the device tree displayed on the left of the [Storage System Status] menu.

Component name	Description	Remarks
Enclosure (Storage system name registered in the "Chapter 3 Initial Setup" (page 25) or "6.4.2 Modify Storage System Name" (page 186))	Storage system name	–
Controller Enclosure	Controller enclosure	–
Drive Enclosure	Drive enclosure	–
Controller Module	Controller module	Displayed under the "Controller Enclosure".
Expander	Expander	Displayed under the "Drive Enclosure".

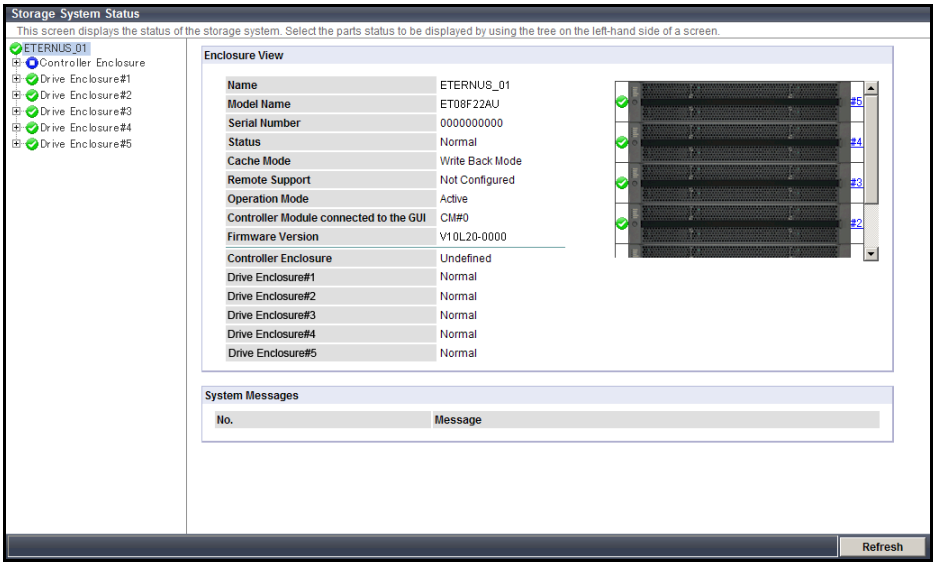
Component name	Description	Remarks
Port	Host I/F port	Displayed under the "Controller Module".
Power Supply Unit	PSU (Power Supply Unit)	Displayed under the "Controller Enclosure" and "Drive Enclosure".
Disks	All disks in the device	
Disk	Each disk in the controller enclosure or drive enclosure	Displayed under the "Disks".
SAS Cable	SAS cable	–

The procedure to display the storage system status is as follows:

Procedure

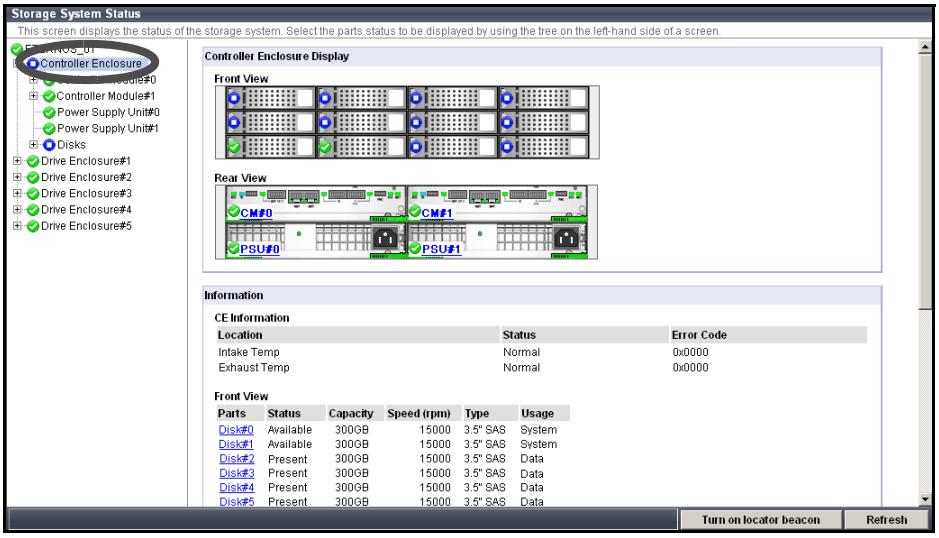
1 Click the [Storage System Status] menu on the [Status] tab.

→ The [Storage System Status] screen appears.
The device tree in the left of the screen displays the components that configure the ETERNUS DX60/DX80.



2 Click the component icon to display the status.

→ Detailed information of the selected component is displayed on the right of the screen.



For details about displayed information, refer to the following sections.

Note

When clicking the [Turn on locator beacon] button, "IDENTIFY LED" on the ETERNUS DX60/DX80 front cover blinks blue or turns off. This button is used to identify the target controller or drive enclosure.

End of procedure

4.1.1 Storage System

Detailed information of the ETERNUS DX60/DX80 is displayed.

- Enclosure Status Display

The following contents are displayed for the enclosure status display.

Display contents	Description
Enclosure View	
Name	Storage system name ("Friendly Name" for the VDS (*1)) Refer to "6.4.2 Modify Storage System Name" (page 186) for detailed procedure to register the storage system name.
Model Name	Model of the ETERNUS DX60/DX80
Serial Number	Serial number of the ETERNUS DX60/DX80
Status	General status of the ETERNUS DX60/DX80
Cache Mode	Operational state of the cache (factor of "Write Through" state) (Write Back Mode/Write Through Mode (Pinned Data/Battery/ Maintenance))
Remote Support	Status of the remote support (Operating/Stopping/Maintenance/Not Configured)

Display contents	Description
Operation Mode	Operational state of the ETERNUS DX60/DX80 (Active/Maintenance)
Controller Module connected to the GUI	Controller module that can be controlled via GUI
Firmware Version	Current controller firmware version
Controller Enclosure	Status of the controller enclosure
Drive Enclosure	Status of the drive enclosure
System Message	
No.	Number of the system message
Message	Details of the system message

*1: Virtual Disk Service (VDS) is a storage management function of the Windows Server®.

4.1.2 Controller Enclosure

This screen shows the status of controller enclosure and its components.

- Controller Enclosure Status Display

  The following contents are displayed for the Controller Enclosure status display.

Display contents	Description
Controller Enclosure Display	
Front View	Installation diagram for the front of the ETERNUS DX60/DX80
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
Information	
CE information	
Serial Number	Serial number of the controller enclosure
Other Information	Other information for the controller enclosure
Intake Temp	External temperature of the ETERNUS DX60/DX80 (Normal/Error/Warning)
Exhaust Temp	Internal temperature of the ETERNUS DX60/DX80 (Normal/Error/Warning)
Front View	
Status, Capacity, Speed (rpm), Type, Usage, and RAID group of each component (disk)	
Rear View	
Status and Expanded Information of each component (CM and PSU) are displayed	

Controller Module Status Display

The following contents are displayed for the Controller Module status display.

Display contents	Description
CM Display	
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
CM Information	
CM Information	
Location	Number of the controller module
Status	Status of the controller module (Normal/Maintenance/Error/Check1/Undefined/Unconnected/ Unmounted/ Warning)
Status Code	Status code of the controller module
Error Code	Error factor of the controller module
Memory Size (GB)	Cache memory capacity of the controller module (GB)
Type	Type of the Host I/F port installed in the controller module (Fibre Channel (FC) model/iSCSI model/SAS model)
WWN (for FC model or SAS model)	WWN of the controller module
Part Number	Component number of the controller module
Serial Number	Serial number of the controller module
Hardware Revision	Hardware revision of the controller module
CPU Clock (MHz/GHz)	Clock frequency of the CPU in the controller module
Active EC	Edition Control (EC) number of the currently running firmware
Next EC	EC number of the firmware that is to be run after the next power-on
CM Internal Parts Information	
Status, Error Code, and Note for the following Parts (components) are displayed. - [for FC model/iSCSI model/SAS model] • Memory • BE Expander • BE EXP Port • DI Port • SCU • NAND Controller • Flash ROM - [for FC model only] • SAS Cable • FC Port - [for iSCSI model only] • SAS Cable • iSCSI Port - [for SAS model only] • SAS Port • FE Expander	

● Port Status Display (for FC model)

The following contents are displayed for the FC port status display.

Display contents	Description
CM Display	
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
CM Port Information	
Location	Number of the port
Status	Status of the port (Normal/Maintenance/Error/Undefined)
Status Code	Status code of the port
Error Code	Error factor of the port
Type	FC port type
Connection	Connection method to the host (Loop/Fabric)
Loop ID	Allocated ID when the fixed Loop ID is used (0x00 – 0x7D)
Transfer Rate	Port transfer rate (For 4Gbps model: 4Gbps/2Gbps/1Gbps/Auto Negotiation) (For 8Gbps model: 8Gbps/4Gbps/2Gbps/Auto Negotiation)
Link Status	Link status (For 4Gbps model: 4Gbps Link Up/2Gbps Link Up/1Gbps Link Up/Link Down) (For 8Gbps model: 8Gbps Link Up/4Gbps Link Up/2Gbps Link Up/Link Down)
WWN	WWN of the port
Host Affinity	Current Host Affinity function setting (enabled or disabled)
Host Response	Host response allocated to the port when the Host Affinity function is not used.
Part Number	Component number of the port
Serial Number	Serial number of the port
Hardware Revision	Hardware revision of the port

● Port Status Display (for iSCSI model)

The following contents are displayed for the iSCSI port status display.

Display contents	Description
CM Display	
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
CM Port Information	
Location	Number of the port
Status	Status of the port (Normal/Maintenance/Error/Undefined)
Status Code	Status code of the port
Error Code	Error factor of the port
Type	iSCSI port type
Transfer Rate	Port transfer rate (1Gbps)

Display contents	Description
Link Status	Link status (1Gbps Link Up/Link Down)
iSCSI Name	iSCSI name of the port
iSCSI Alias Name	iSCSI alias name of the port
Host Affinity	Current Host Affinity function setting (enabled or disabled)
Host Response	Host response allocated to the port when the Host Affinity function is not used.

- Port Status Display (for SAS model)

The following contents are displayed for the SAS port status display.

Display contents	Description
CM Display	
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
CM Port Information	
Location	Number of the port
Status	Status of the port (Normal/Maintenance/Error/Undefined)
Status Code	Status code of the port
Error Code	Error factor of the port
Type	SAS port type
Transfer Rate	Port transfer rate (3Gbps)
Link Status	Link status (Phy#0: 3.0Gbps Link Up/1.5Gbps Link Up/Link Down) (Phy#1: 3.0Gbps Link Up/1.5Gbps Link Up/Link Down) (Phy#2: 3.0Gbps Link Up/1.5Gbps Link Up/Link Down) (Phy#3: 3.0Gbps Link Up/1.5Gbps Link Up/Link Down)
SAS Address	SAS Address of the port
Host Affinity	Current Host Affinity function setting (enabled or disabled)
Host Response	Host response allocated to the port when the Host Affinity function is not used.

- SAS Cable Status Display

The following contents are displayed for the SAS cable status display.

Display contents	Description
CM Display	
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
CM SAS Cable Information	
Status	Status of the SAS cable (Normal/Error/Maintenance/Warning)
Status Code	Status code of the SAS cable
Error Code	Error factor of the SAS cable

- Power Supply Unit Status Display

The following contents are displayed for the Power Supply Unit (PSU) status display.

Display contents	Description
CE PSU Display	
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
CE PSU Information	
Location	Number of the power supply unit
Status	Status of the power supply unit (Normal/Error/Maintenance)
Status Code	Status code of the power supply unit
Error Code	Error factor of the power supply unit
Part Number	Component number of the power supply unit
Serial Number	Serial number of the power supply unit
Hardware Revision	Hardware revision of the power supply unit

- Disks Status Display

The following contents are displayed for the Disks status display.

Display contents	Description
Controller Enclosure Display	
Front View	Installation diagram for the front of the ETERNUS DX60/DX80
Information	
Front View	
Status, Capacity, Speed (rpm), Type, Usage, and RAID group for each component (disk) are displayed	

- Disk Status Display

The following contents are displayed for the Disk status display.

Display contents	Description
Controller Enclosure Disk Display	
Front View	Installation diagram for the front of the ETERNUS DX60/DX80
Information	
Location	Disk slot number
Status	Status of the disk (Unknown/Available/Broken/Not Available/Not Supported/ Present/Readying/Rebuild/Copyback/Failed Usable/Spare/ Formatting/Not Format/Not Exist/Redundant Copy)
Status Code	Status code of the disk
Error Code	Error factor of the disk
Capacity	Disk capacity (GB/TB)
Type	Disk size (3.5") and type (SAS/SSD)
Speed (rpm)	Speed of the disk
Usage	Usage of the disk (Data/System/Spare/-)
RAID Group	RAID group where disks are registered

Display contents	Description
Motor Status	Status of the disk motor (Active/In the Boot Process/Idle/In the Stop Process)
Rebuild/ Copyback Progress	Rebuild/Copyback progress (%)
Vender ID	Vendor ID of the disk
Product ID	Product name of the disk
Serial Number	Serial number of the disk
WWN	WWN for the disk
Firmware Revision	Disk firmware version

4.1.3 Drive Enclosure

This screen shows the status of drive enclosure and its components.

- Drive Enclosure Status Display

The following contents are displayed for the Drive Enclosure status display.

Display contents	Description
Drive Enclosure Display	
Front View	Installation diagram for the front of the ETERNUS DX60/DX80
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
Information	
DE Information	
Serial Number	Serial number of the drive enclosure
Other Information	Other information for the drive enclosure
Intake Temp	External temperature of the ETERNUS DX60/DX80 (Normal/Error/Warning)
Exhaust Temp	Internal temperature of the ETERNUS DX60/DX80 (Normal/Error/Warning)
Front View	
Status, Capacity, Speed (rpm), Type, Usage, and RAID group of each component (disk)	
Rear View	
Status and Expanded Information of each component (EXP and PSU) are displayed	

- Expander Status Display

The following contents are displayed for the Expander status display.

Display contents	Description
Drive Enclosure Display	
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80

Display contents	Description
DE EXP Information	
DE EXP Information	
Status	Status of the expander (Normal/Maintenance/Error/Undefined/Warning)
Status Code	Status code of the expander
Error Code	Error factor of the expander
WWN	WWN of the expander
Part Number	Component number of the expander
Serial Number	Serial number of the expander
Hardware Revision	Hardware revision of the expander
Active EC	EC number of the currently running firmware
Next EC	EC number of the firmware that is to be run after the next power-on
DE EXP Internal Parts Information	
Status and error code of each component (SAS Cable) are displayed	

- SAS Cable Status Display

The following contents are displayed for the SAS cable status display.

Display contents	Description
Drive Enclosure Display	
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
DE EXP SAS Cable Information	
Status	Status of the SAS cable (Normal/Error/Maintenance/Warning)
Status Code	Status code of the SAS cable
Error Code	Error factor of the SAS cable

- Power Supply Unit Status Display

The following contents are displayed for the Power Supply Unit (PSU) status display.

Display contents	Description
DE PSU Display	
Rear View	Installation diagram for the rear of the ETERNUS DX60/DX80
DE PSU Information	
Location	Number of the power supply unit
Status	Status of the power supply unit (Normal/Error/Maintenance)
Status Code	Status code of the power supply unit
Error Code	Error factor of the power supply unit
Part Number	Component number of the power supply unit
Serial Number	Serial number of the power supply unit
Hardware Revision	Hardware revision of the power supply unit

Disks Status Display

The following contents are displayed for the Disks status display.

Display contents	Description
Drive Enclosure Display	
Front View	Installation diagram for the front of the ETERNUS DX60/DX80
Information	
Front View	
Status, Capacity, Speed (rpm), Type, Usage, and RAID group for each component (disk) are displayed	

Disk Status Display

The following contents are displayed for the Disk status display.

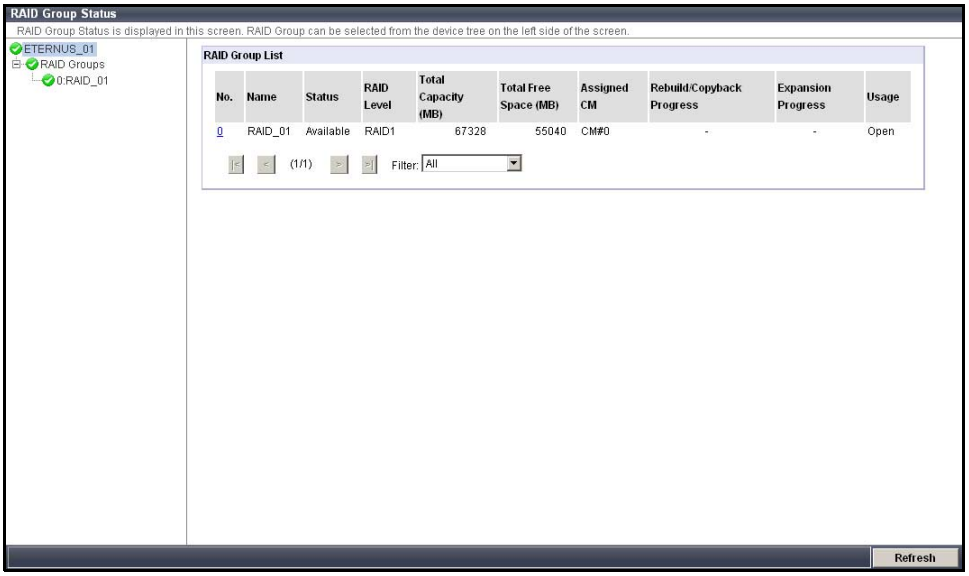
Display contents	Description
Drive Enclosure Disk Display	
Front View	Installation diagram for the front of the ETERNUS DX60/DX80
information	
Location	Disk slot number
Status	Status of the disk (Unknown/Available/Broken/Not Available/Not Supported/Present/ Readying/Rebuild/Copyback/Failed Usable/Spare/Formatting/ Not Format/Not Exist/Redundant Copy)
Status Code	Status code of the disk
Error Code	Error factor of the disk
Capacity	Disk capacity (GB/TB)
Type	Disk size (3.5") and type (SAS/SSD)
Speed (rpm)	Speed of the disk
Usage	Usage of the disk (Data/System/Spare/-)
RAID Group	RAID group where disks are registered
Motor Status	Status of the disk motor (Active/In the Boot Process/Idle/In the Stop Process)
Rebuild/ Copyback Progress	Rebuild/Copyback progress (%)
Vender ID	Vendor ID of the disk
Product ID	Product name of the disk
Serial Number	Serial number of the disk
WWN	WWN for the disk
Firmware Revision	Disk firmware version

4.2 RAID Group Status

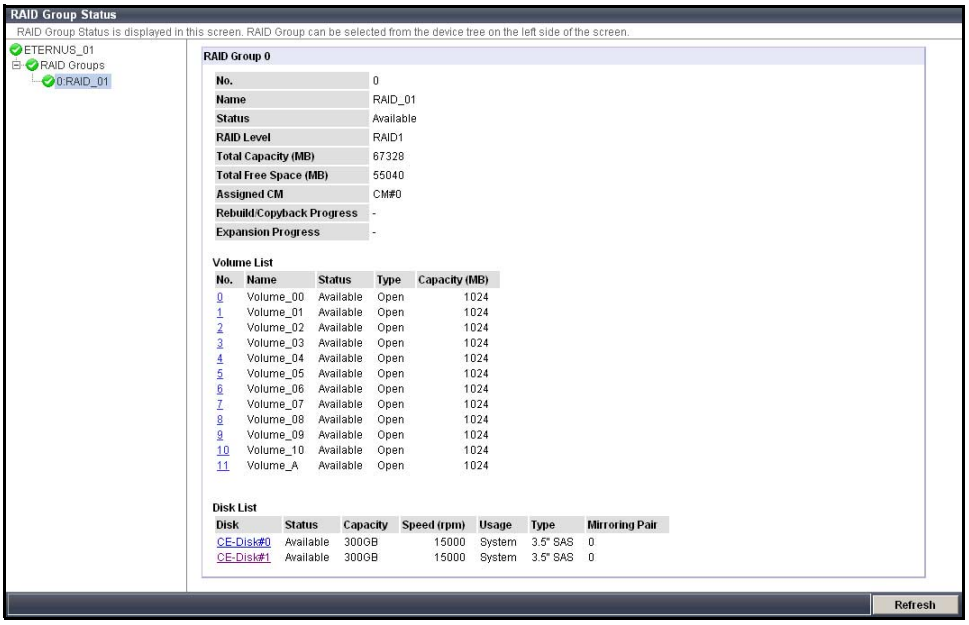
The [RAID Group Status] displays the status of RAID groups registered in the ETERNUS DX60/DX80.
The procedure to display the RAID group status is as follows:

Procedure

1. Click the [RAID Group Status] menu on the [Status] tab.
   → The [RAID Group Status] screen appears.
   The tree and list of the registered RAID groups are displayed.
2. Click the target RAID group icon in the tree or link in the "RAID Group List" to display detailed information.



→ The detailed information of the RAID group is displayed.



End of procedure

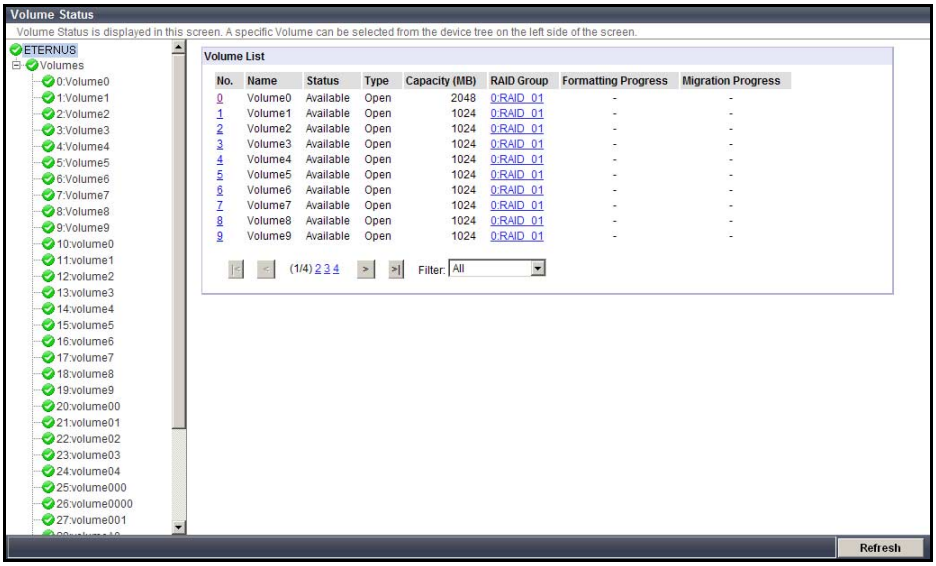
4.3 Volume Status

The [Volume Status] displays the status of volumes registered in the ETERNUS DX60/DX80.
The procedure to display the volume status is as follows:

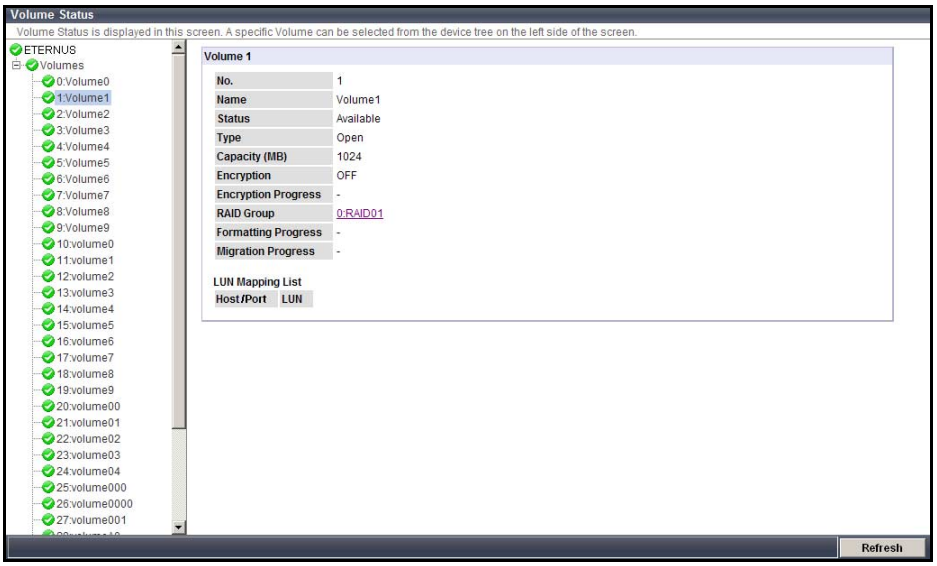
Procedure

1. Click the [Volume Status] menu on the [Status] tab.
   → The [Volume Status] screen appears.
   The tree and list of the registered volumes are displayed.

2. Click the target volume icon in the tree or link in the "Volume List" to display detailed information.



→ Detailed information of the volume is displayed.



Note

The volume number and the location of the volume in the RAID group may be different.

End of procedure

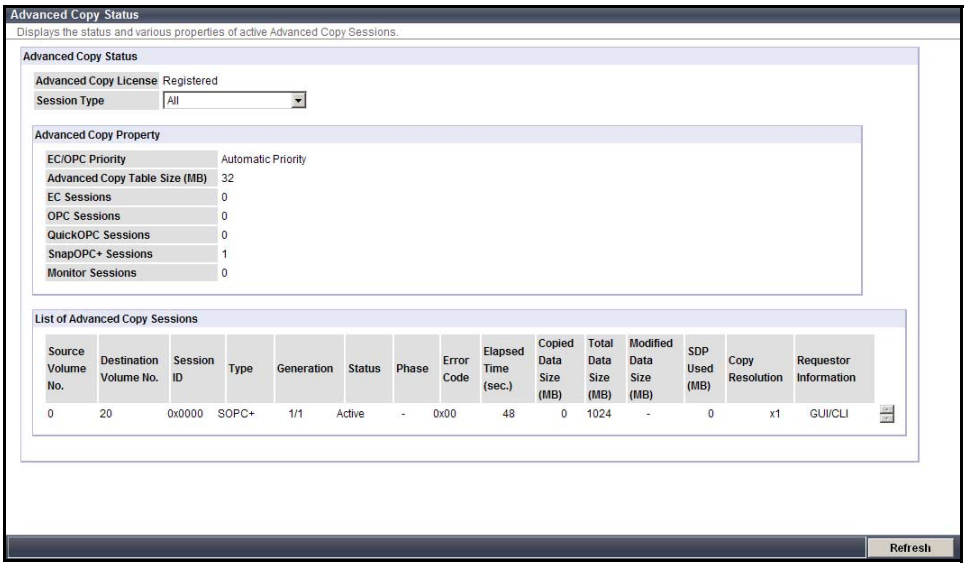
4.4 Advanced Copy Status

The [Advanced Copy Status] displays the Advanced Copy related status.
The procedure to display the Advanced Copy status is as follows:

Procedure

1 Click the [Advanced Copy Status] menu on the [Status] tab.

→ The [Advanced Copy Status] screen appears.
Current Advanced Copy status and list of sessions are displayed.



End of procedure

Chapter 5 Configuration

This chapter describes the ETERNUS DX60/DX80 configuration related menu.
The following menus are provided:

- Configuration Wizard
- RAID Group Management
- Volume Management
- Advanced Copy Management

5.1 Configuration Wizard

The [Configuration Wizard] function provides series of settings required for ETERNUS DX60/DX80 operation on the wizard screen.
This function provides configurations in the following order: Create RAID Group, Create Volume, Define Host, Configure Affinity Group, and Define LUN Mapping.
Also, adding volumes and changing settings for existing RAID groups are available.

Caution

- The value specified in each screen is immediately reflected to the ETERNUS DX60/DX80. Even if the operation is canceled in the middle of it, the specified contents cannot be canceled.
- Perform "6.5.1 Set Port Parameters" (page 195) before starting the Configuration Wizard. When using the Host Affinity functions, make sure to "Enable" the Host Affinity setting of the port.
  Refer to "6.5 Host I/F Management" (page 193) for details about the host affinity

- Create RAID Group

  Create a RAID group (group of disks configuring RAID in the device) on this screen.

- Create Volume

  Create volumes (disk area in the RAID group) on this screen. The server recognizes the volume as units of RAID configuration.

- Define Host

  Register the server information to be connected to the ETERNUS DX60/DX80 via a port.
  This setting is not needed when the Host Affinity function is not used.

- Configure Affinity Group

  Creates the group of volumes to be recognized from the server (affinity group).
  Associate a server recognized Logical Unit Number (LUN) and volume numbers.
  The server recognizes the affinity group using the Host Affinity setting that allocates the affinity group to the server.
  This setting is not needed when the host affinity function is not used.

- Define LUN Mapping

  Specify the volume to be recognized from the server.

  - When the host affinity function is used
    Allocate the affinity group for each server connected to the port (Host Affinity setting).
  - When the host affinity function is not used
    Allocate the volume number managed in the ETERNUS DX60/DX80 and server recognized LUN for each port (LUN mapping setting).

Note that the value specified in the Configuration Wizard menu can be changed subsequently. Refer to the following sections for details.

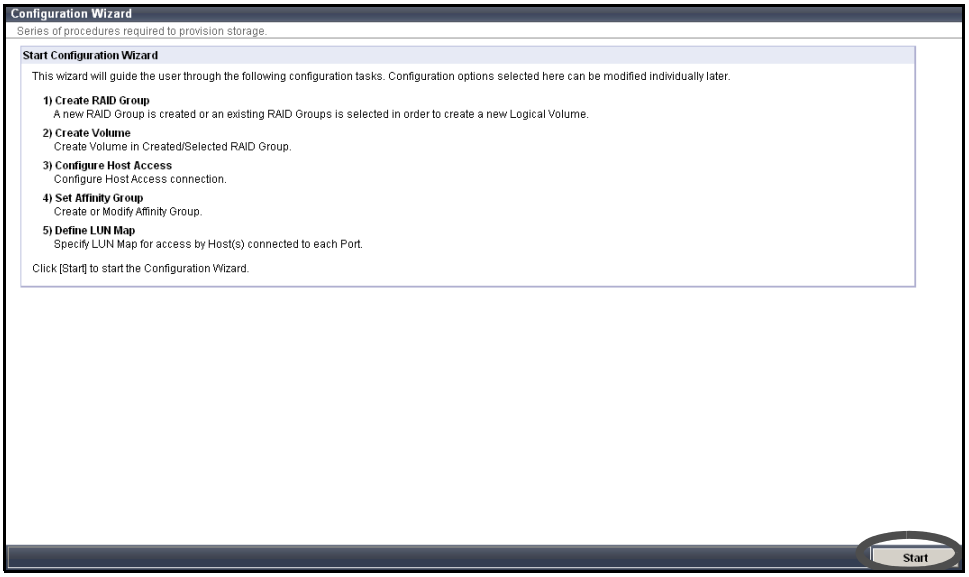
Configuration Wizard	Refer to
Create RAID Group	"5.2.1 Create RAID Group" (page 69)
Create Volume	"5.3.1 Create Volume" (page 93)
Define Host	"6.5.2 Setup Host" (page 202)
Configure Affinity Group Define LUN Mapping	"5.3.10 Configure LUN Mapping" (page 112)

The following shows the procedure of configuration wizard:

Procedure

1. Click the [Configuration Wizard] button on the [Easy Setup] tab.
   → The [Configuration Wizard] menu appears.

2 Click the [Start] button.



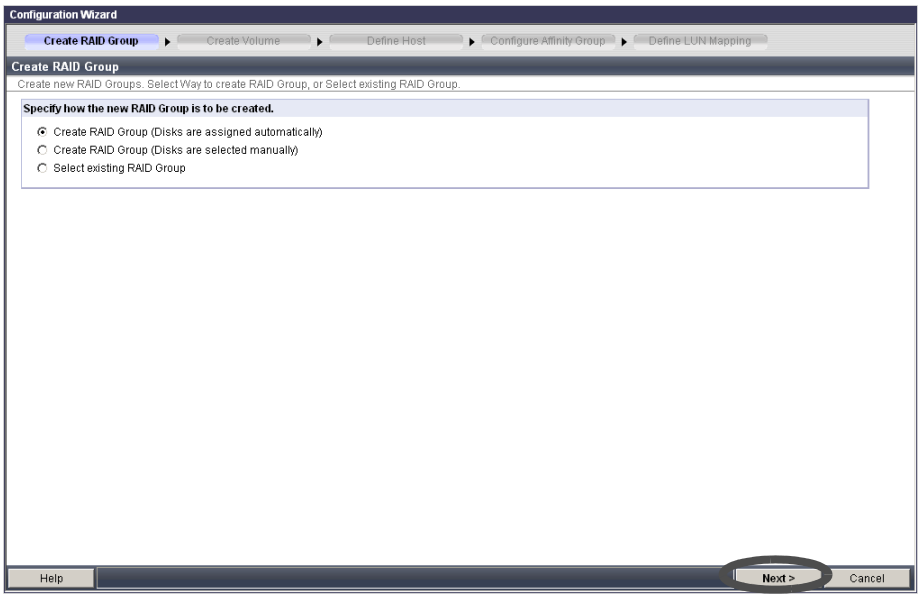
→ The Configuration Wizard starts. The [Create RAID Group] screen appears.

3 Set the following items, and click the [Next >] button.

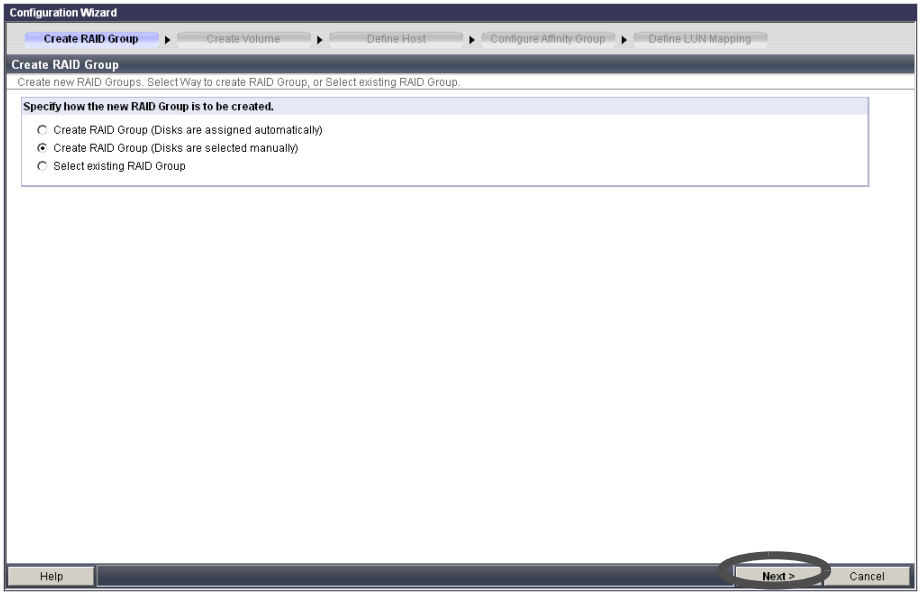
Select the RAID group creating method from the following:

- Create RAID Group (Disks are assigned automatically)
  Creates a RAID group with an automatically selected disk.
- Create RAID Group (Disks are selected manually)
  Creates a RAID group with a user specified disk.
- Select existing RAID Group
  Creates volumes in an existing RAID group of ETERNUS DX60/DX80.
  When this item is selected, the "Select Target RAID Group" field is displayed. Select the RAID group to create volumes. Note that Step 4 and Step 5 of in the following procedure are skipped in this method.

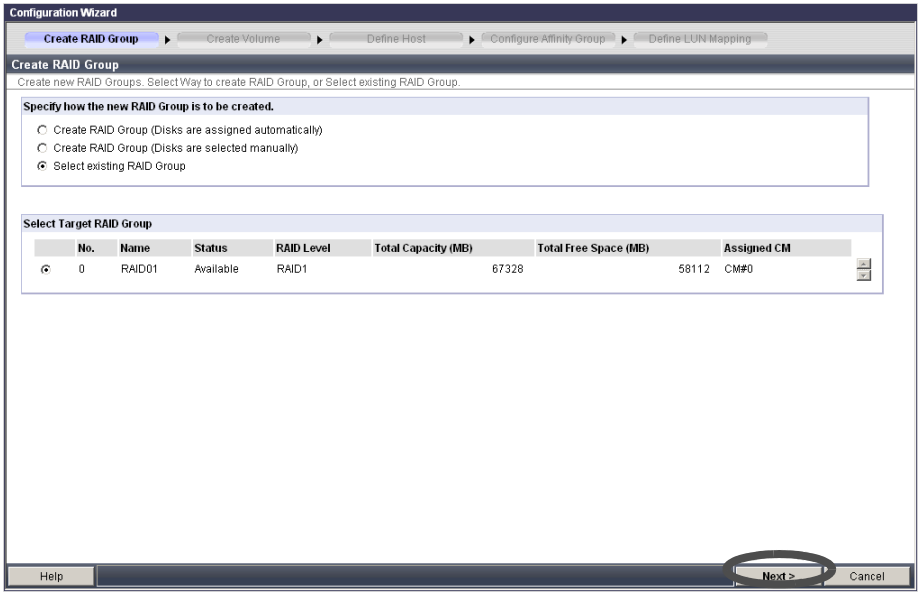
- Create RAID Group (Disks are assigned automatically)



- Create RAID Group (Disks are selected manually)



- Select existing RAID Group



→ When "Create RAID Group (Disks are assigned automatically)" or "Create RAID Group (Disks are selected manually)" is selected: Move on to Step 4.
When "Select existing RAID Group" is selected: Move on to Step 6.

4 Specify the following items, and click the [Create] button.

- RAID Group Name
  Enter the RAID group name to be created.
  Up to 16 alphanumeric characters and symbols (including blanks) can be used (required).
- RAID Level
  Select the RAID level from the following:
  - RAID0
  - RAID1
  - RAID1+0
  - RAID5
  - RAID6
  - RAID5+0
- Disk Capacity
  Select the capacity and number of disk to be used in the RAID group.
  Available disk capacity is as follows:
  - 300GB SAS
  - 450GB SAS
  - 750GB SAS
  - 1TB SAS
  - 100GB SSD
  - 200GB SSD

  Available number of disks varies depending on the specified RAID level.
  - RAID0: 2 – 16
  - RAID1: 2
  - RAID1+0: 4 – 32 (even number)
  - RAID5: 3 – 16
  - RAID6: 5 – 16
  - RAID5+0: 6 – 32 (even number)
- Assigned CM
  Select the assigned CM for the RAID group from "Automatic", "CM#0", or "CM#1".
  Normally, select the "Automatic". When the "Automatic" is selected, the control CM to be assigned varies according to the RAID group number. If the RAID group number is an even number, CM#0 is assigned to the new RAID group. For an odd number RAID group, CM#1 is assigned to the new RAID group.


Note

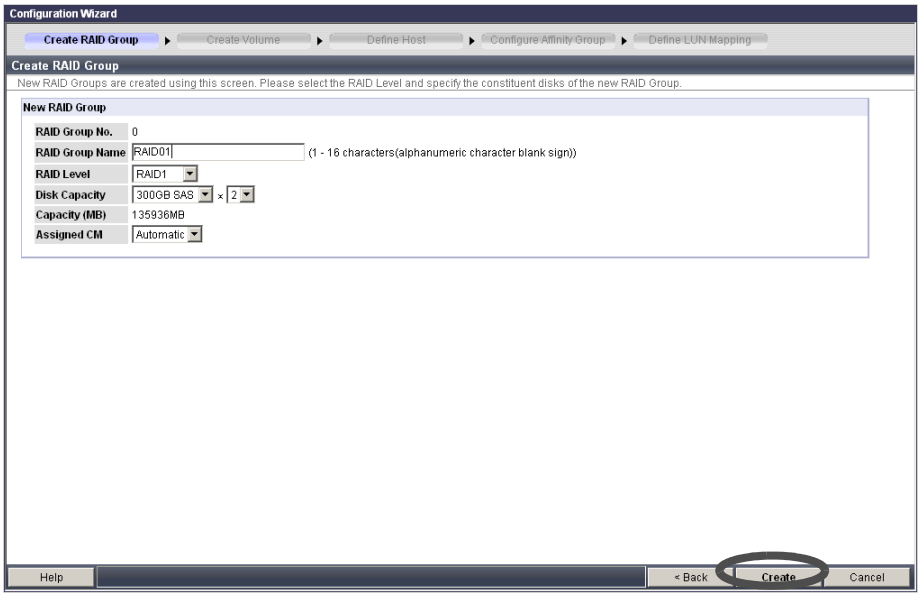
When the ETERNUS DX60/DX80 has only one CM, CM#1 cannot be specified as the Assigned CM.

- Select Disk
  When "Create RAID Group (Disks are selected manually)" is selected in Step 3, select the disks to be registered in the RAID Group (required).

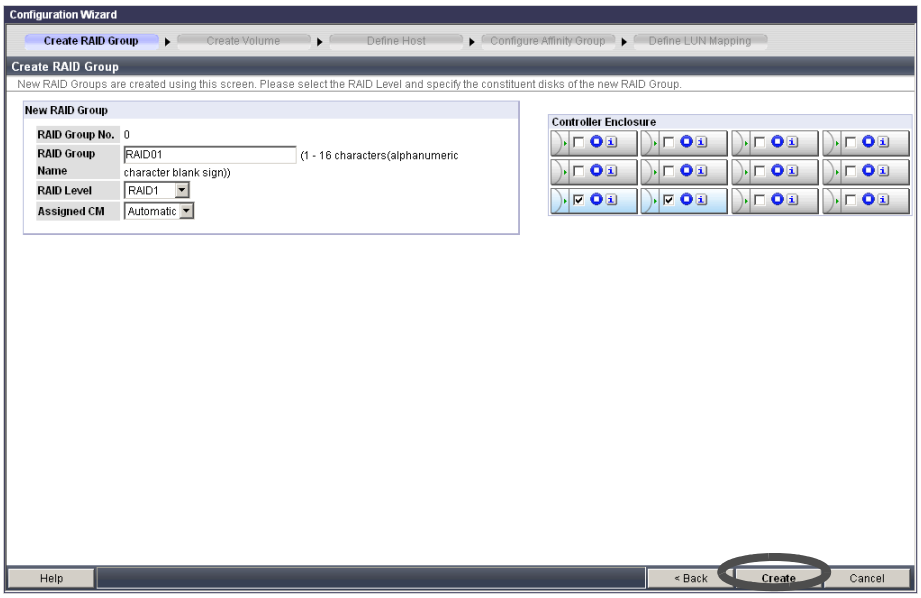
Caution

- A RAID group name that is already registered in the ETERNUS DX60/DX80 cannot be specified.
- It is not possible to select more than, or less than, the specified number of configuration disks for each RAID level.
- RAID0 has no data redundancy. RAID1, RAID1+0, RAID5, RAID6, and RAID5+0 are recommended for the RAID level.
- If disks of different capacities exist in a RAID group, the smallest capacity becomes the standard, and all other disks are regarded as having the same capacity as the smallest disk. In this case, the remaining disk space will NOT be used.
- Different disks and types (SAS/SSD) cannot exist together in one RAID group.

- Create RAID Group (Disks are assigned automatically)



- Create RAID Group (Disks are selected manually)



→ A confirmation screen appears.

5 Click the [OK] button.

→ A RAID Group is created. Move on to the [Create Volume] screen.

Note

Refer to "5.2.5 Logical Device Expansion" (page 80) or "5.2.8 Change CM Ownership" (page 91) to change the setting items after creating the RAID group.

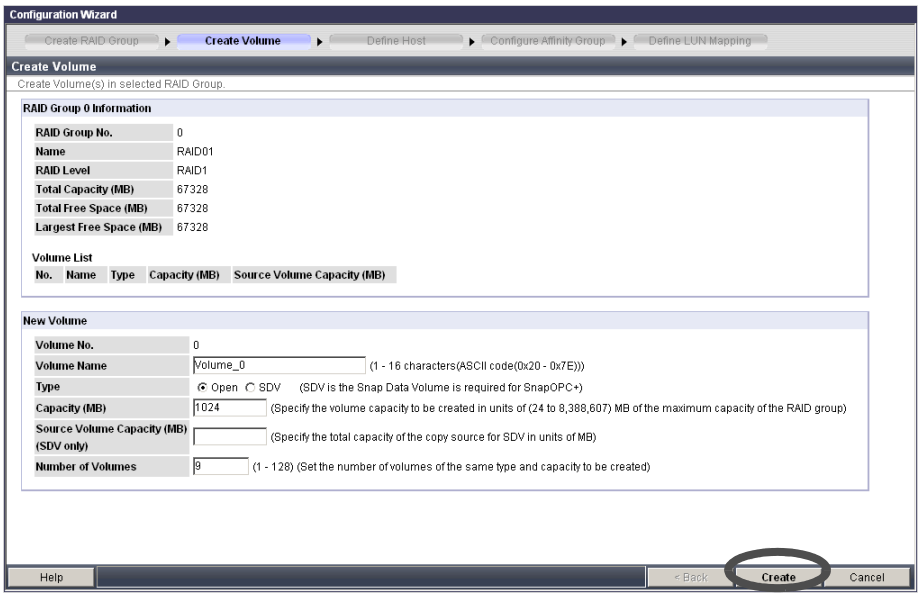
6 Specify the following items, and click the [Create] button.

- Volume Name
  Enter the volume name to be created.
  Up to 16 alphanumeric characters and symbols (including blanks) can be used (required).
- Type
  Select the volume type (Open or SDV).
- Size (MB)
  Specify the volume capacity to be created in units of MB.
  Set the value between 24 to 8,388,607 (MB), or maximum capacity of the RAID group.

Caution

When creating an SDV, the total SDV capacity (MB) and 0.1% of the copy source volume capacity is secured in the ETERNUS DX60/DX80. 0.1% of the copy source volume is the capacity used for the controlling information area in the SDV.

- Source Volume Size (MB) (SDV only)
  When SDV is selected for "Type", specify the total capacity of the copy source volume in units of MB.
- Encryption
  This item is displayed only when encryption mode is enabled.
  Select whether to "Enable" or "Disable" encryption mode for the new volume.
  An encrypted volume cannot be changed to a non-encrypted volume.
  Refer to "6.4.3 Setup Encryption Mode" (page 187) and "5.3.4 Encrypt Volume" (page 99) for details.
- Number of Volumes
  When creating multiple volumes with the same type and capacity, enter the number of volumes to be created.
  Note that all the volumes are created with the same name. Change the volume name (refer to "5.3.9 Set Volume Name" (page 111)) if needed.



→ A confirmation screen appears.

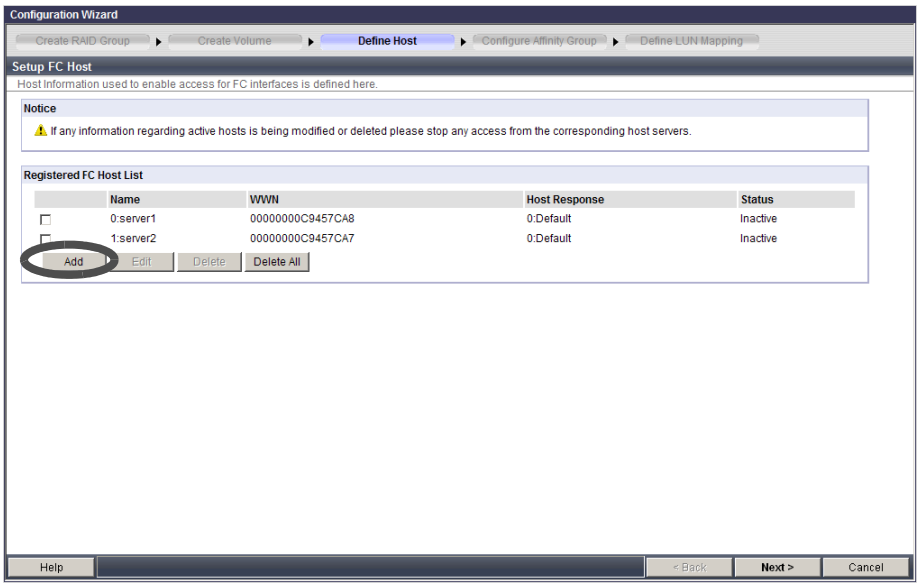
7 Click the [OK] button.

→ Volumes are created. Move on to the [Define Host] screen.

8 Click the [Add] button.

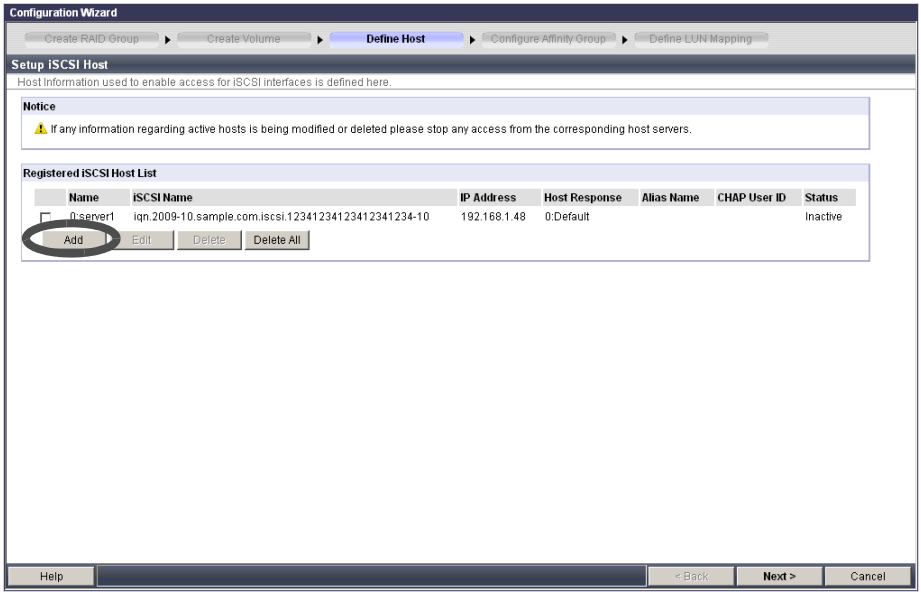
Caution This setting is not needed when the host affinity function is not used.

- For FC host



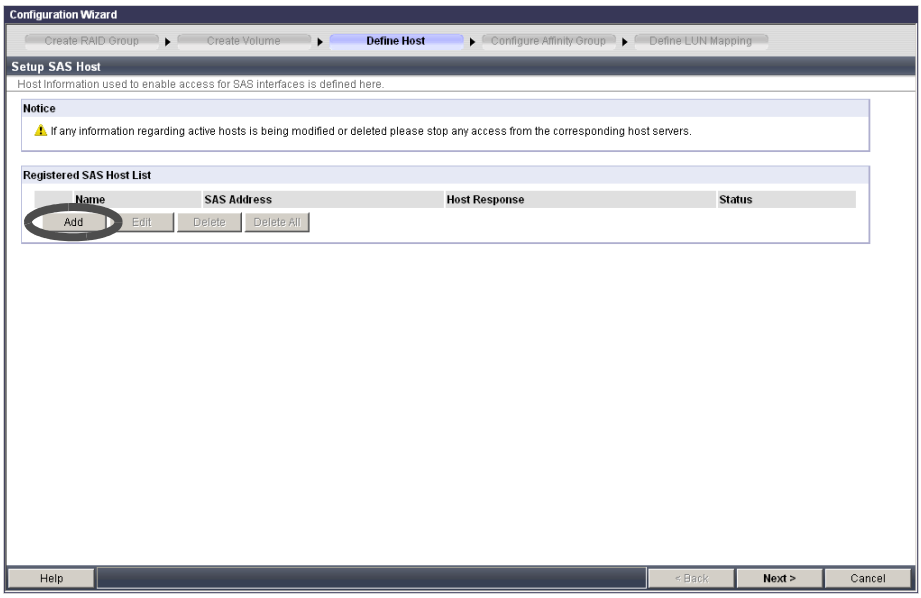
→ The "Add New FC Host" field is displayed.

- For iSCSI host



→ The "Add New iSCSI Host" field is displayed.

- For SAS host



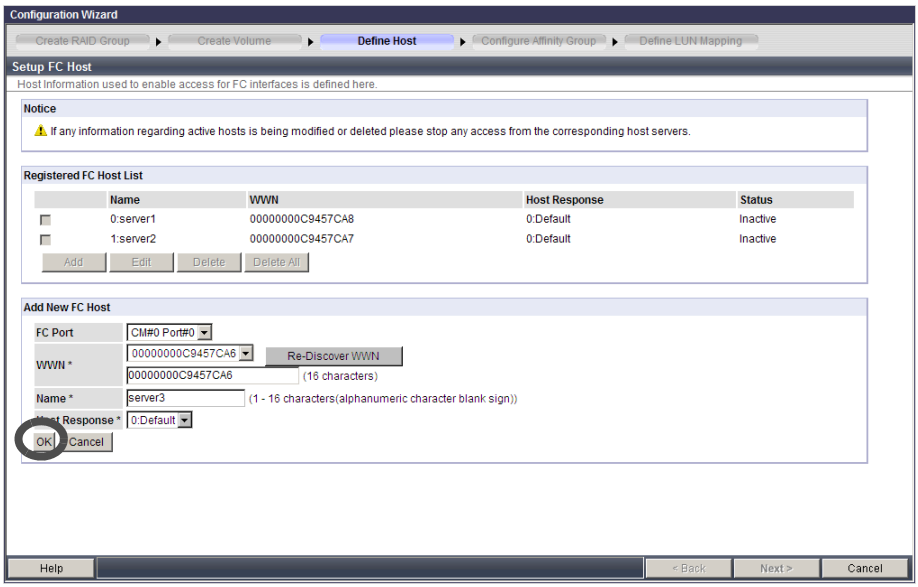
→ The "Add New SAS Host" field is displayed.

9 Specify the following items, and click the [OK] button.

- For FC host
  - FC Port
    The list of FC ports that exist in the ETERNUS DX60/DX80 is displayed.

    Caution When the fibre channel switch is connected to the ETERNUS DX60/DX80, settings between the fibre channel switch and server (FC host) must be completed in advance.

  - WWN
    Select the WWN, or directly input a WWN (required). 16 capital letters and numerals can be used.
  - Name
    Input the FC Host Name (required). Up to 16 alphanumeric characters and symbols (including blanks) can be used.
  - Host Response
    Specify the host response for the target host (required). Refer to "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)" for details.



→ The target FC host is displayed in the "Registered FC Host List" field.

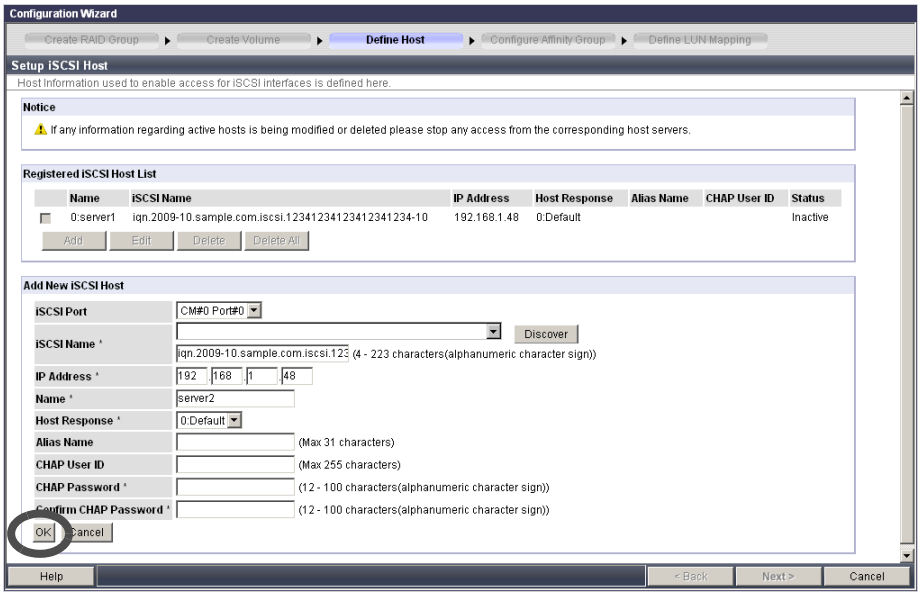
- For iSCSI host
  - iSCSI Port
    The list of iSCSI ports that exist in the ETERNUS DX60/DX80 is displayed.
  - iSCSI Name
    Select the iSCSI Name, or directly input the iSCSI Name. Between 4 and 223 alphanumeric characters and symbols (required) can be used.

    Caution
    In the following conditions, iSCSI Name cannot be obtained automatically:
    - When the [Discover] button is inactivated
    - When "Disable" is selected for the "iSNS server" in the "Set iSCSI Port Parameters"
  - IP address
    Specify the IP address of the target host (iSCSI port) (required).
  - Name
    Specify the target host (iSCSI port) name (required). Between 1 and 16 alphanumeric characters and symbols (including blanks) can be used.
  - Host Response
    Specify the host response for the target host (required). Refer to "ETERNUS Disk storage systems Server Connection Guide (ISCSI)" for details.
  - Alias Name
    Specify the alias name of the target host (iSCSI port). Up to 31 alphanumeric characters and symbols can be used.
  - CHAP User ID
    Specify the user ID that accesses the target host (iSCSI port). Up to 255 alphanumeric characters and symbols can be used.
    It is not necessary to set this item if CHAP Authentication is not performed.

- CHAP Password
  Specify the password to access the target host. Between 12 and 100 alphanumeric characters and symbols can be used (required).

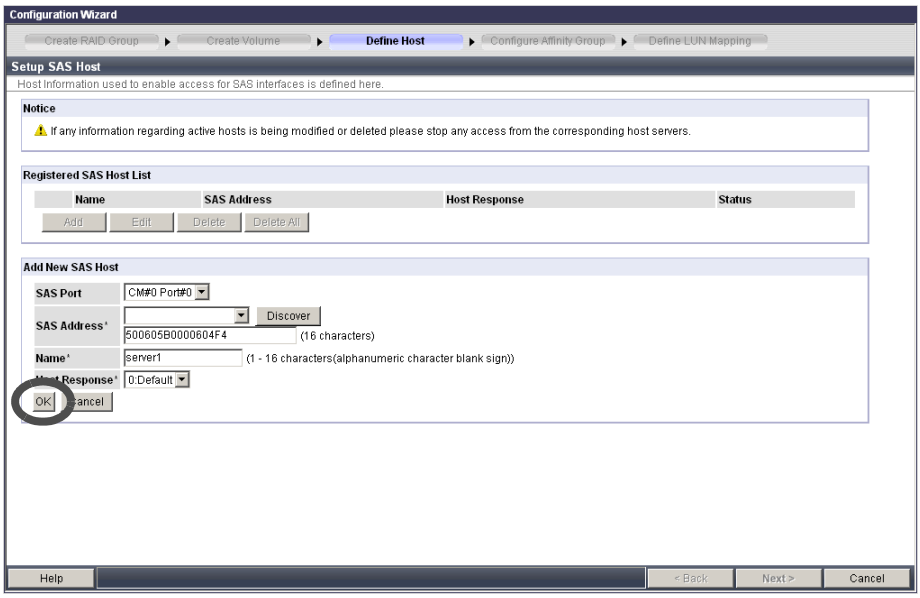
  Caution Make sure to set the user name and password in pairs.

- Confirm CHAP Password
  Enter the same password as in the CHAP Password field (required).



→ The target iSCSI host is displayed in the "Registered iSCSI Host List" field.

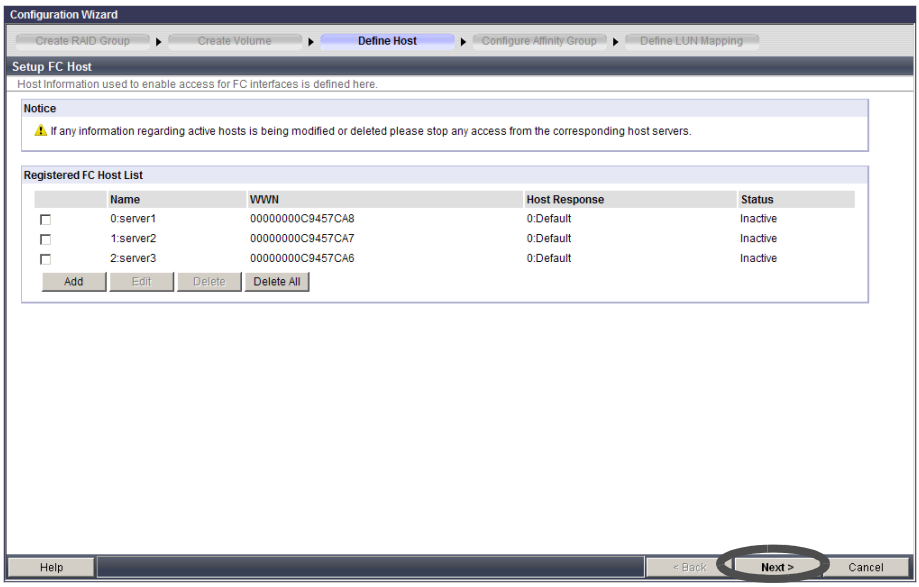
- For SAS host
  - SAS Port
    The list of SAS ports that exist in the ETERNUS DX60/DX80 is displayed.
  - SAS Address
    Select the SAS address, or directly input a SAS address (required). 16 capital letters and numerals can be used.
  - Name
    Specify the target host (SAS port) name (required). Up to 16 alphanumeric characters and symbols (including blanks) can be used.
  - Host Response
    Specify the host response for the target host (required). Refer to "ETERNUS Disk storage systems Server Connection Guide (SAS)" for details.



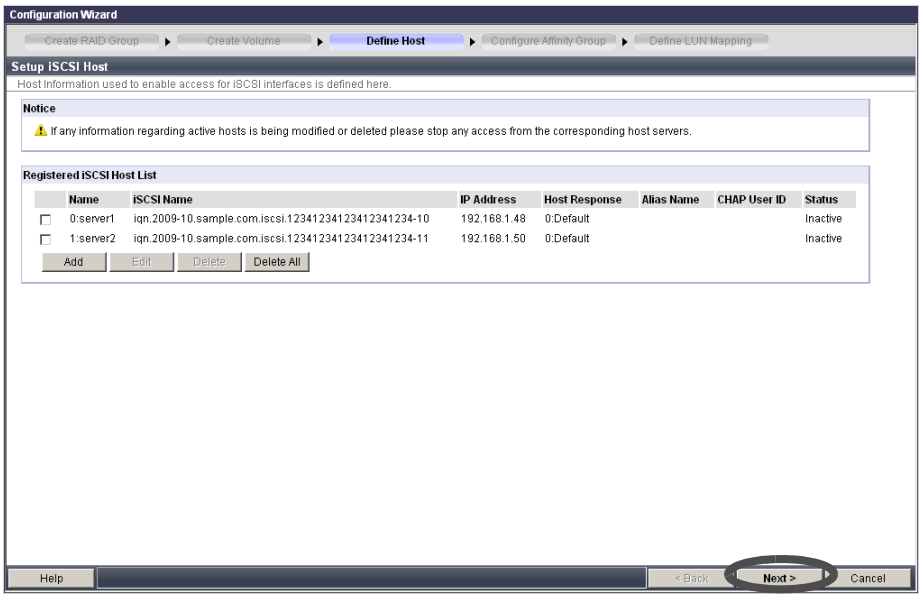
→ The target SAS host is displayed in the "Registered SAS Host List" field.

10 Click the [Next >] button.

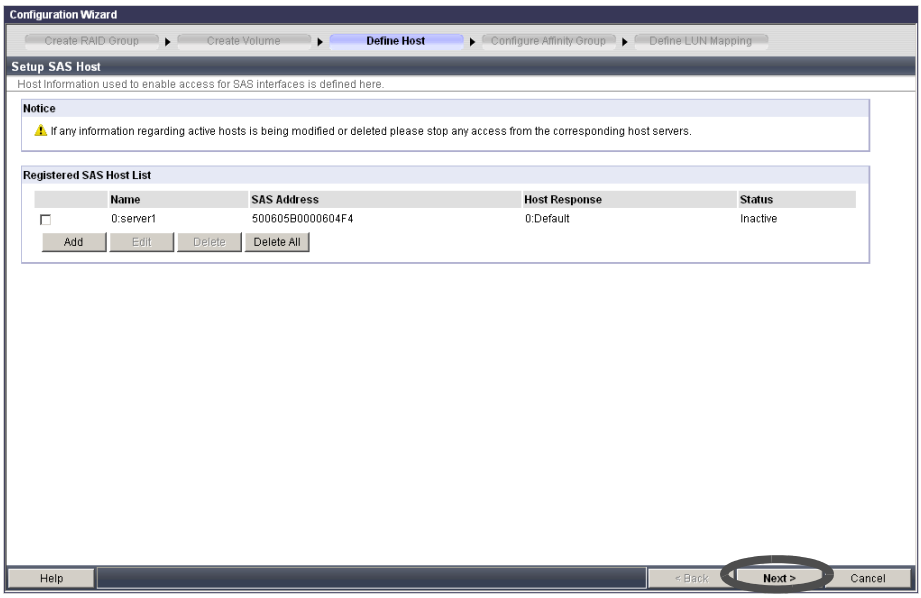
- For FC host



- For iSCSI host

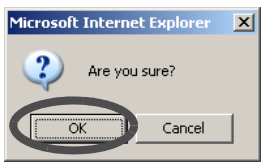


- For SAS host



→ A confirmation screen appears.

11 Click the [OK] button.

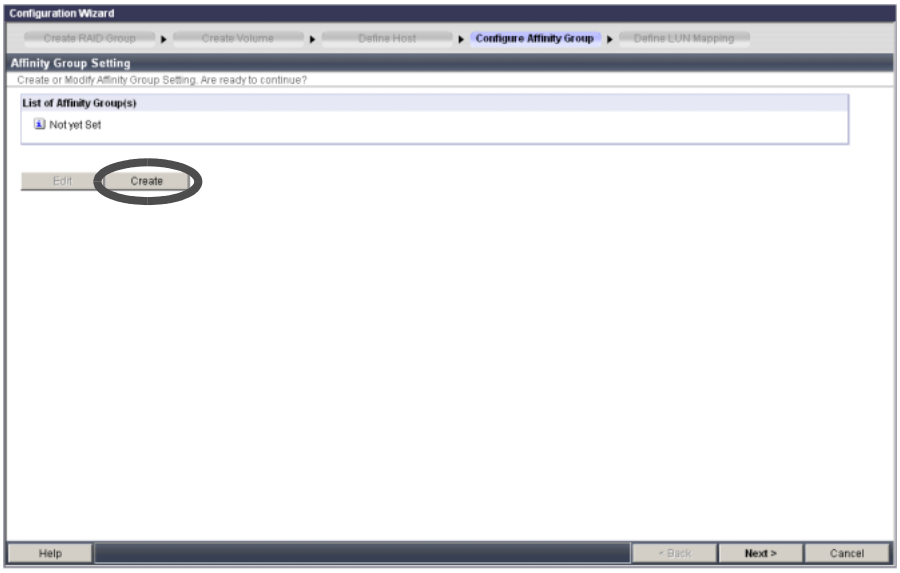


→ The specified host setting is registered. Move on to the [Configure Affinity Group] screen.

12 Click the [Create] button.

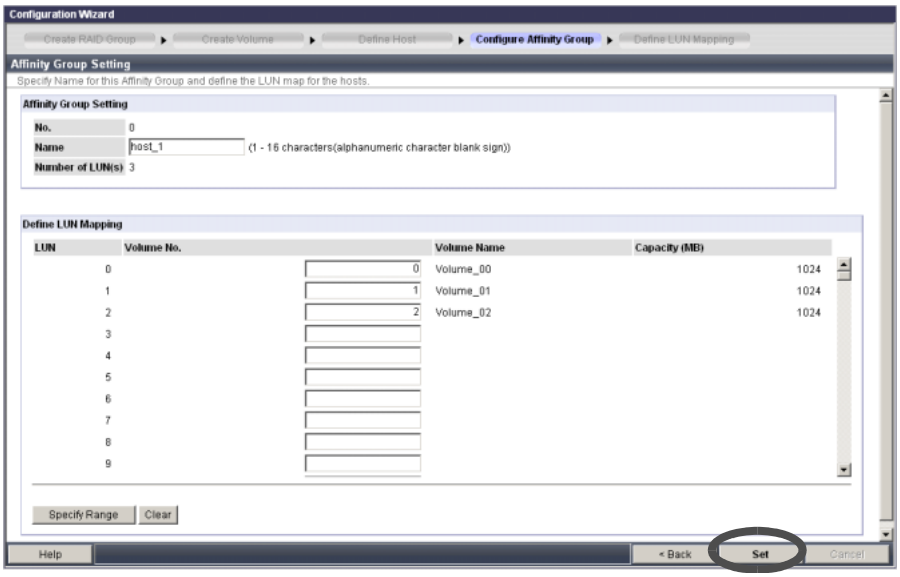
Caution This setting is required when using the host affinity function. When the host affinity function is not used, click the [Next >] button to move on to the " Configure LUN Mapping" setting menu.
Also, this setting is not required when using an existing affinity group (displayed in the "List of Affinity Group(s)" field).

Note When using the existing affinity group, select the target group from the "List of Affinity Group(s)" field and click the [Edit] button.



→ The "Affinity Group Setting" and "Define LUN Mapping" fields are displayed.

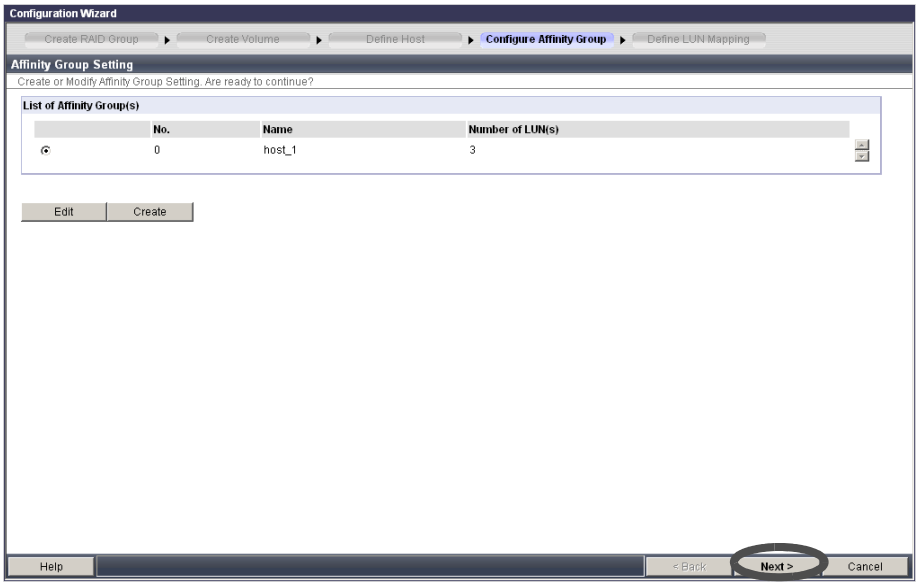
13 Enter the affinity group name and specify a volume number corresponding to the LUN number, and click the [Set] button.



→ A confirmation screen appears.

14 Click the [OK] button.

15 Click the [Next >] button.

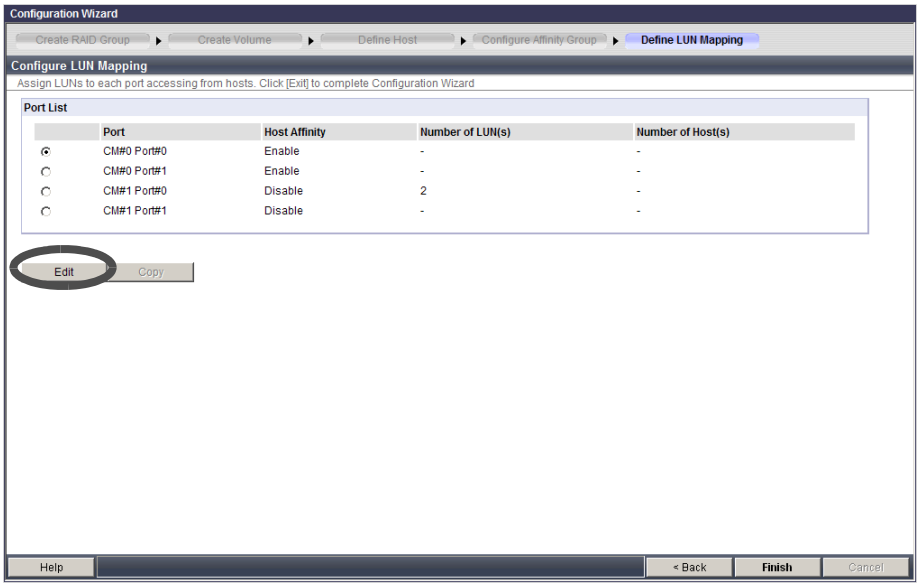


→ Move on to the [Define LUN Mapping] screen.

16 Select the port that is connected to the target server from the "Port List" field.

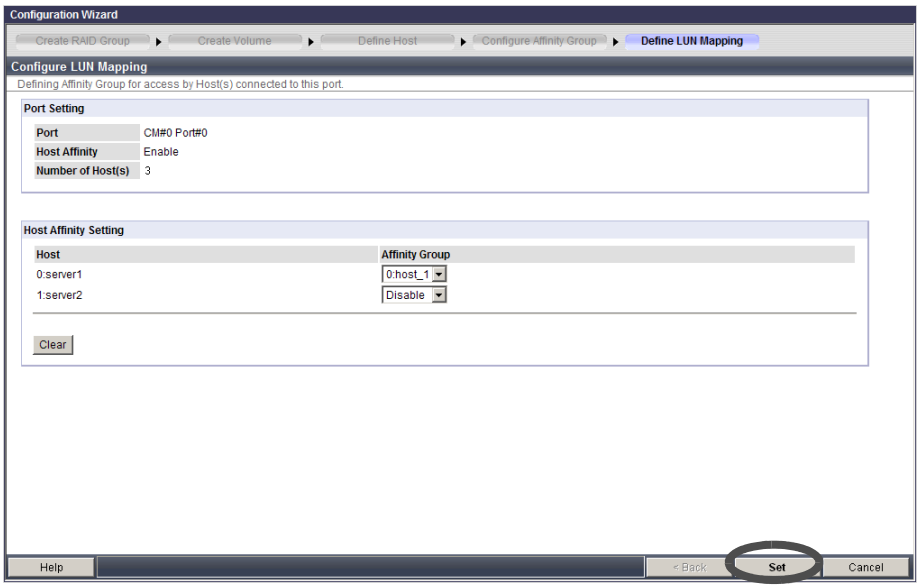
■ When using the Host Affinity function:

(1) Click the [Edit] button.



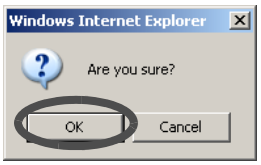
→ The "Host Affinity Setting" field is displayed.

(2) Assign the affinity group to the server, and click the [Set] button.

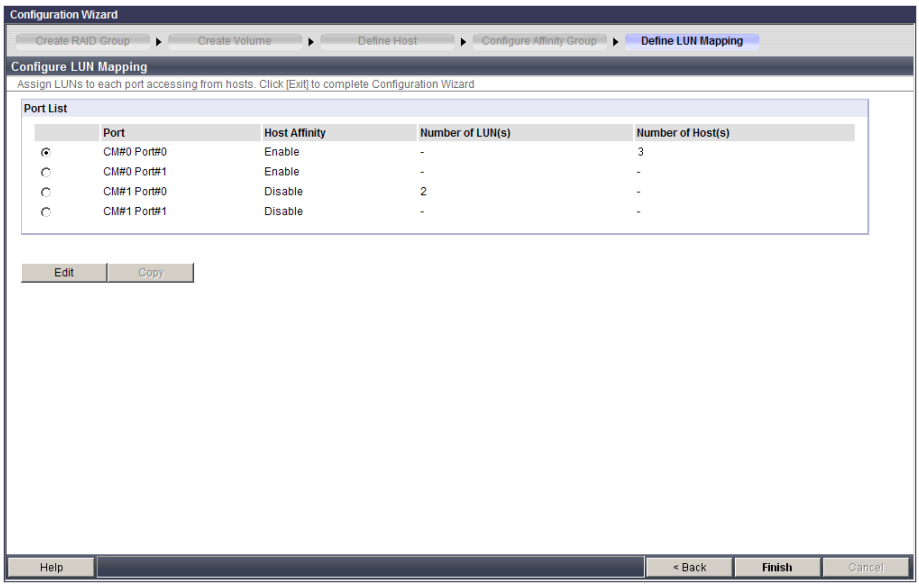


→ A confirmation screen appears.

(3) Click the [OK] button.



→ Returns to the "Port List" screen.

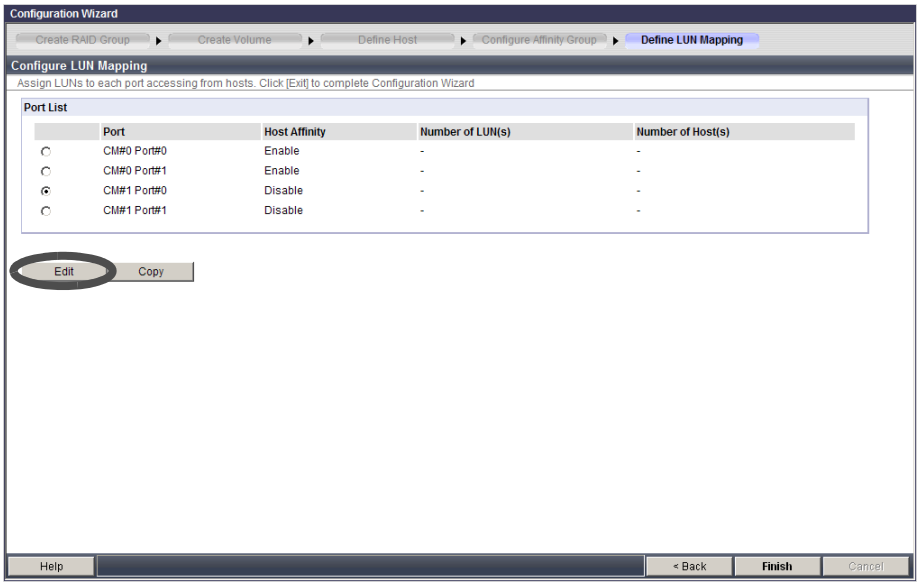


■ When the Host Affinity function is not used:

(1) Click the [Edit] button.

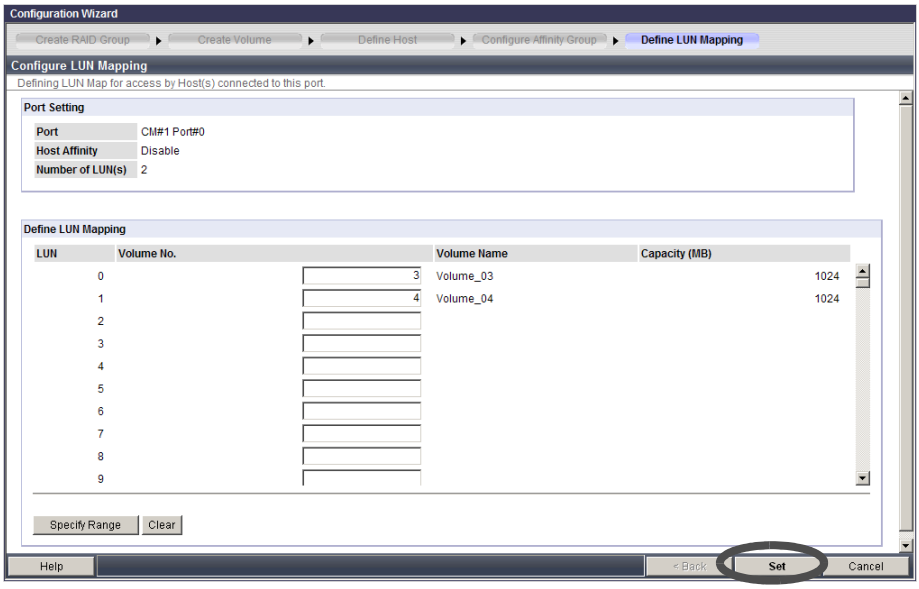
Note

Click the [Copy] button to copy the LUN mapping information from the other port.



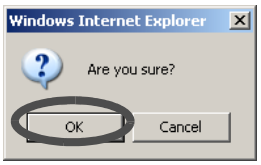
→ The [Define LUN Mapping] field is displayed.

(2) Adjust the LUN mapping information for the target port, and click the [Set] button.

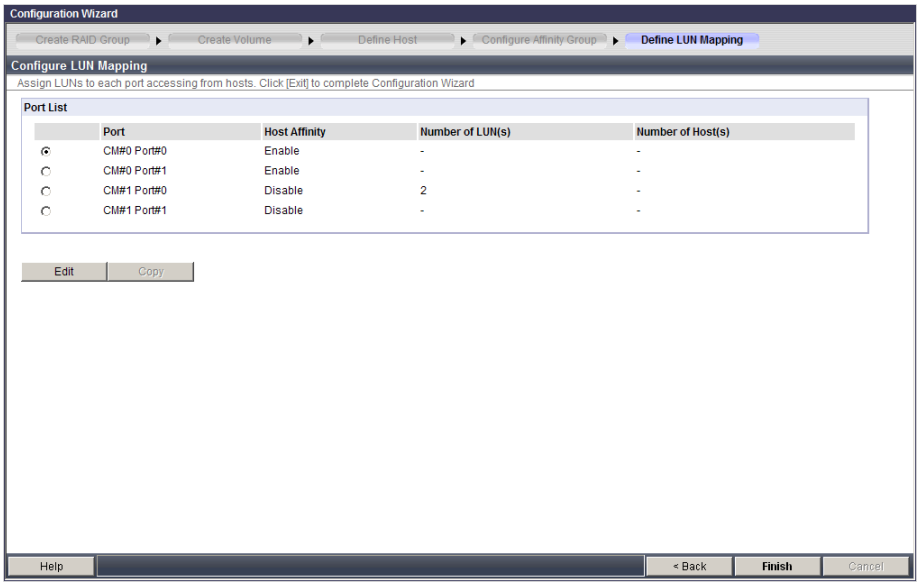


→ A confirmation screen appears.

(3) Click the [OK] button.



→ Returns to the "Port List" screen.



17 Click the [Finish] button.

→ A confirmation screen appears.

18 Click the [OK] button.

→ The Configuration Wizard screen is closed.

End of procedure

5.2 RAID Group Management

The following settings are available for RAID group management.

- Create/Delete RAID Group
- Assign/Release Hot Spare
- Logical Device Expansion
- Set RAID Group name
- Set Eco-mode Schedule
- Change CM Ownership

5.2.1 Create RAID Group

The RAID groups are usually set at the time of shipping. However if you wish to change the RAID settings or add extra disks, then you need to create new RAID groups. You can confirm the groups that are created from the [RAID Group Status] menu on the [Status] tab.

● Number of disks that can be set for each RAID level

The number of disks that can be set for each RAID level is as follows.
The available number of disks varies according to ETERNUS DX60/DX80.

RAID level	Number of disks that can be created		Recommended number of disks
	ETERNUS DX60	ETERNUS DX80	
RAID0	2 – 16	2 – 16	–
RAID1	2	2	2(1D+1M)
RAID1+0	4 – 24	4 – 32	4(2D+2M), 6(3D+3M), 8(4D+4M), 10(5D+5M)
RAID5	3 – 16	3 – 16	3(2D+1P), 4(3D+1P), 5(4D+1P), 6(5D+1P)
RAID6	5 – 16	5 – 16	5(3D+2P), 6(4D+2P), 7(5D+2P)
RAID5+0	(3 – 12) × 2	(3 – 12) × 2	3(2D+1P) × 2, 4(3D+1P) × 2, 5(4D+1P) × 2, 6(5D+1P) × 2

- The maximum number of RAID groups that can be set to each RAID level

The maximum number of RAID groups that can be created is 12 for the ETERNUS DX60, and 60 for the ETERNUS DX80.
The maximum number of RAID groups that can be set for each RAID level is as follows.
The available number of RAID groups varies according to each device.

RAID level	Number of RAID groups that can be created	
	ETERNUS DX60	ETETRNUS DX80
RAID0	12	60
RAID1	12	60
RAID1+0	6	30
RAID5	8	40
RAID6	4	24
RAID5+0	4	20

- The maximum number of volumes that can be set

The maximum number of volumes that can be set for each RAID group and device is as follows.
The available number of volumes varies according to each device.

Device name	per RAID group	per device
ETERNUS DX60	Up to 128	Up to 512
ETERNUS DX80	Up to 128	Up to 1,024

Caution

- RAID groups can be created when the disk satisfies all the following conditions:
  - The disk is not one that configures a RAID group
  - The disk is not specified as a hot spare
  - The disk status is "Available" or "Present"
- In the following conditions, RAID groups cannot be created:
  - There are no disks to configure the RAID group
  - When the maximum number of RAID groups has already been created

Note

Creating RAID groups is required before creating volumes.

The procedure to create a RAID group is as follows:

Procedure

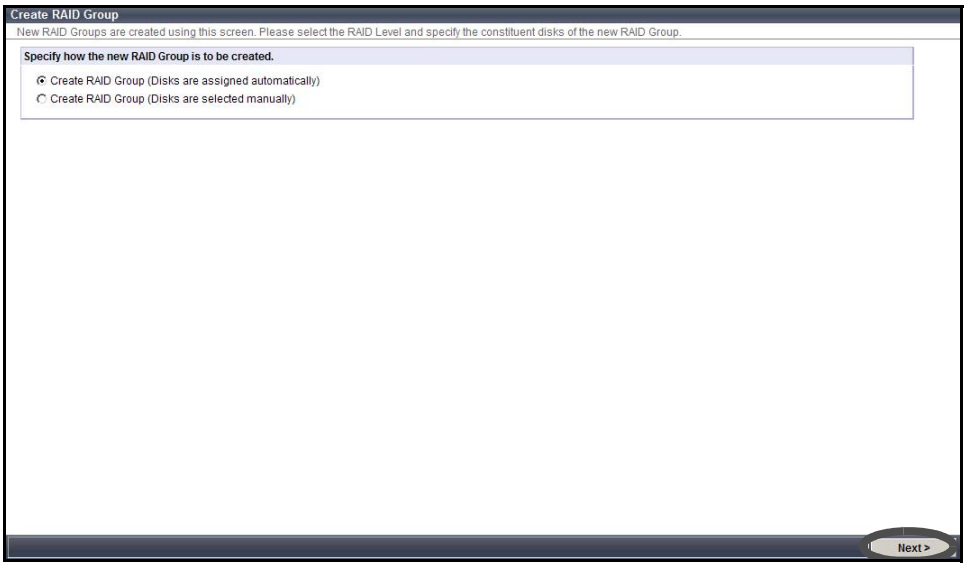
1. Click the [Create RAID Group] under the [RAID Group Management] menu on the [Volume Settings] tab.
   → The [Create RAID Group] screen appears.

2 Specify the following items, and click the [Next >] button.

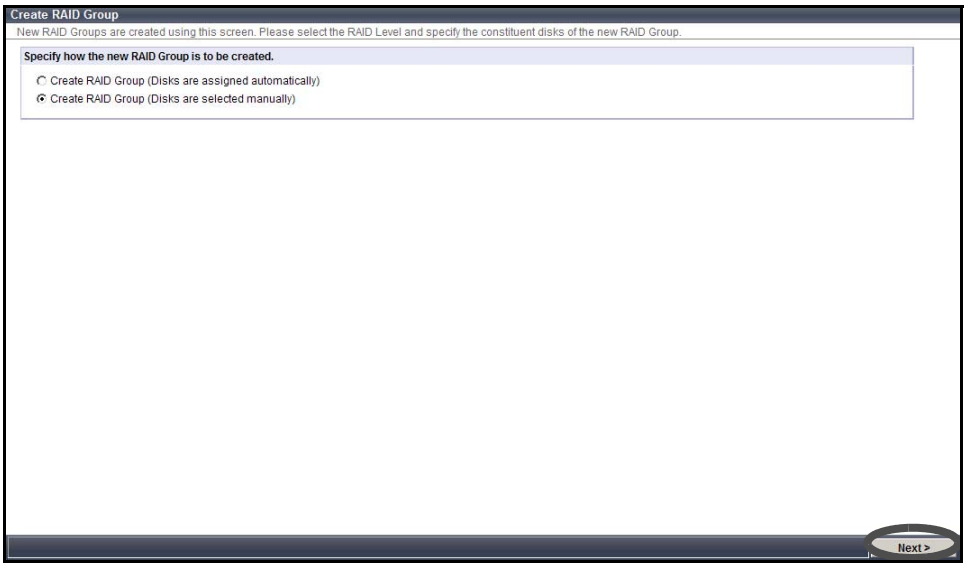
Select one of the following items:

- Create RAID Group (Disks are assigned automatically)
  Creates a RAID group with automatically selected disks.
- Create RAID Group (Disks are selected manually)
  Creates a RAID group with user specified disks.

- Create RAID Group (Disks are assigned automatically)



- Create RAID Group (Disks are selected manually)



→ The "New RAID Group" field is displayed.

3 Specify the following items, and click the [Create] button.

- RAID Group Name
  Enter the RAID group name to be created.
  Up to 16 alphanumeric characters and symbols (including blanks) can be used (required).
- RAID Level
  Select the RAID level from the following:
  - RAID0
  - RAID1
  - RAID1+0
  - RAID5
  - RAID6
  - RAID5+0
- Disk Capacity
  When selecting "Create RAID Group (Disks are assigned automatically)" in Step 2, select the capacity and number of disks to be used in the RAID group.
  - 300GB SAS
  - 450GB SAS
  - 750GB SAS
  - 1TB SAS
  - 100GB SSD
  - 200GB SSD

  Available number of disks varies depending on the specified RAID level.
  - RAID0: 2 – 16
  - RAID1: 2
  - RAID1+0: 4 – 32 (even number)
  - RAID5: 3 – 16
  - RAID6: 5 – 16
  - RAID5+0: 6 – 32 (even number)
- Assigned CM
  Select the assigned CM for the RAID group from "Automatic", "CM#0", or "CM#1".
  Normally, select the "Automatic". When the "Automatic" is selected, the control CM to be assigned varies according to the RAID group number. If the RAID group number is an even number, CM#0 is assigned to the new RAID group. For an odd number RAID group, CM#1 is assigned to the new RAID group.


Note

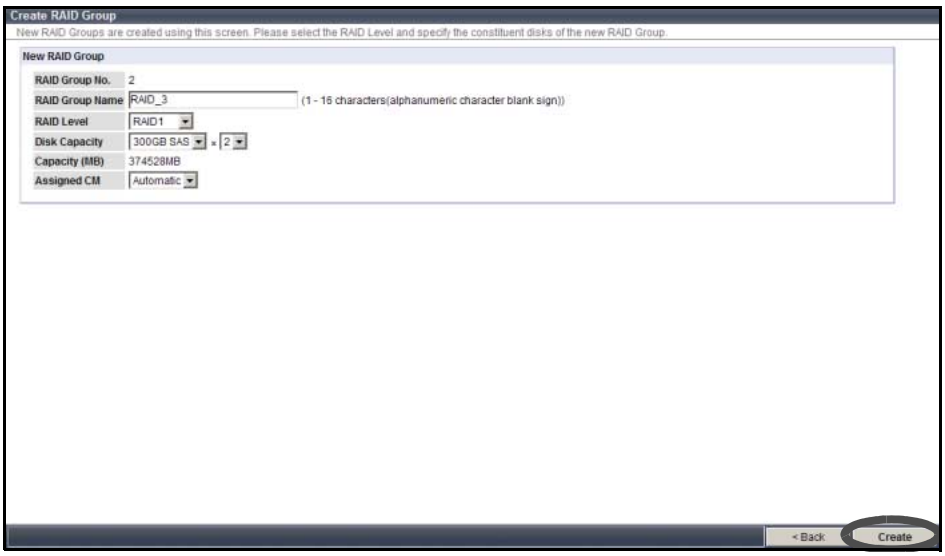
When the ETERNUS DX60/DX80 has only one CM, CM#1 cannot be specified as the Assigned CM.

- Select Disk
  When "Create RAID Group (Disks are selected manually)" is selected in Step 2, select the disks to be registered in the RAID Group (required).

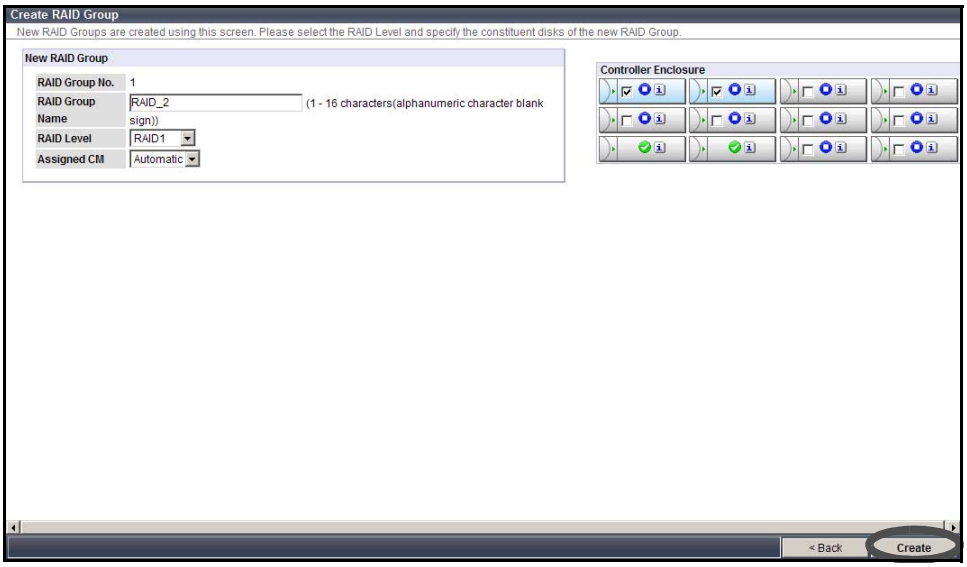
Caution

- A RAID group name that is already registered in the ETERNUS DX60/DX80 cannot be specified.
- It is not possible to select more than, or less than, the specified number of configuration disks for each RAID level.
- RAID0 has no data redundancy. RAID1, RAID1+0, RAID5, RAID6, and RAID5+0 are recommended for the RAID level.
- If disks of different capacities exist in a RAID group, the smallest capacity becomes the standard, and all other disks are regarded as having the same capacity as the smallest disk.
  In this case, the remaining disk space will NOT be used.
- The different disks and types (SAS/SSD) cannot exist together in one RAID group.

- Create RAID Group (Disks are assigned automatically)

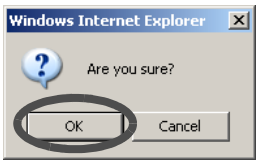


- Create RAID Group (Disks are selected manually)



→ A confirmation screen appears.

4 Click the [OK] button.



→ The RAID group is created.

Note

Refer to "5.2.5 Logical Device Expansion" (page 80) or "5.2.8 Change CM Ownership" (page 91) to change the setting items after creating the RAID group.

End of procedure

5.2.2 Delete RAID Group

The [Delete RAID Group] function deletes the registered RAID groups. When a RAID group is deleted, the status of the disks that configured the RAID group change to data disks that are not used by any RAID group.

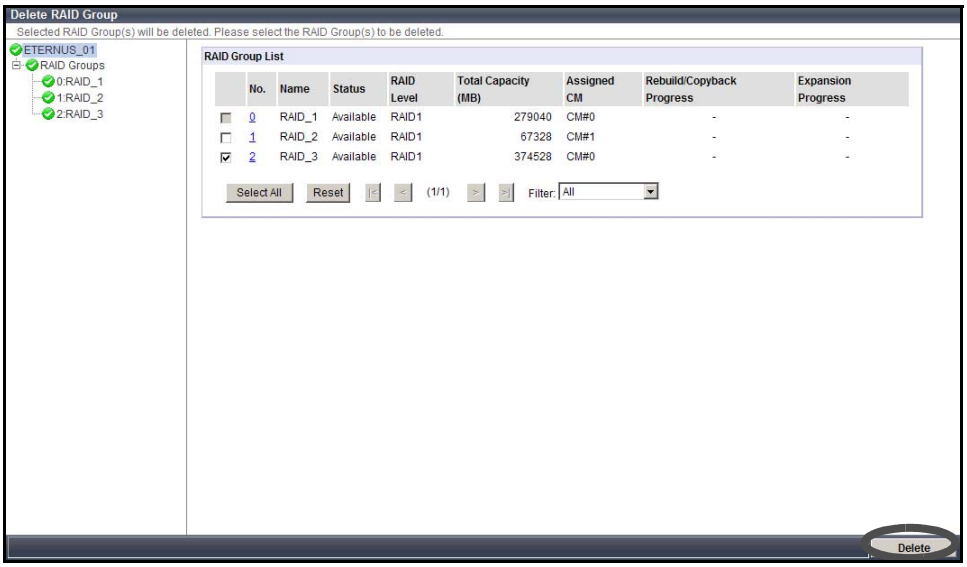
Caution

RAID groups that have volumes registered cannot be deleted. All volumes must be deleted before deleting a RAID group. Refer to "5.3.2 Delete Volume" (page 96) for procedure to delete volumes.

The procedure to delete RAID group is as follows:

Procedure

1. Click the [Delete RAID Group] under the [RAID Group Management] menu on the [Volume Settings] tab.
   → The [Delete RAID Group] function screen appears.
2. Select the target RAID group, and click the [Delete] button.



→ A confirmation screen appears.

3. Click the [OK] button.

→ The selected RAID group is deleted.

End of procedure

5.2.3 Assign Hot Spare

The [Assign Hot Spare] function registers a hot spare, which enables automatic data copy (Rebuild) in the background when a disk failure occurs.
Hot spare is a disk that is available as a substitute for a failed disk.
There are two types of hot spare as follows:

- Global Hot Spare
  Hot spare used by all the RAID groups
- Dedicated Hot Spare
  Hot spare used by the dedicated RAID group (one specific RAID group)

Caution

Note the following items when adding a hot spare:

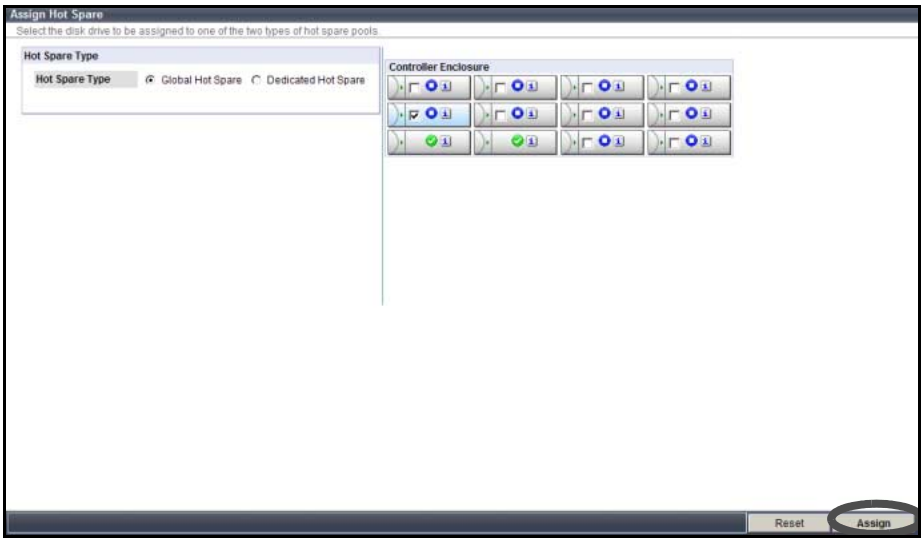
- A system disk (Slot#0 to Slot#1 of the controller enclosure) cannot be specified as a hot spare.
- A hot spare that substitutes for a failed disk must have the same or a larger capacity than the data disk. If the hot spare capacity is smaller than the data disk, the disk does not work as the hot spare.
- A hot spare can be specified for any disk with the exception of the system disks.
- When switching in a hot spare for a failed disk, a hot spare with the same capacity as the failed disk will be used first. If such a hot spare does not exist, a large capacity hot spare will be used (when there are multiple numbers of such disks, the smallest capacity hot spare among them is used). Note that a Global Hot Spare is used in this situation.
- When you replace a failed disk, the data is copied back from the hot spare that is substituting for the failed disk, and the hot spare disk then returns to a spare disk.
- When a mix of SAS disks, Nearline SAS disks, and SSDs are installed together in the ETERNUS DX60/DX80, hot spare of each type is required. Install the hot spare that has the same capacity as the largest capacity disks of the same type installed in the ETERNUS DX60/DX80.

The procedure to assign a hot spare is as follows:

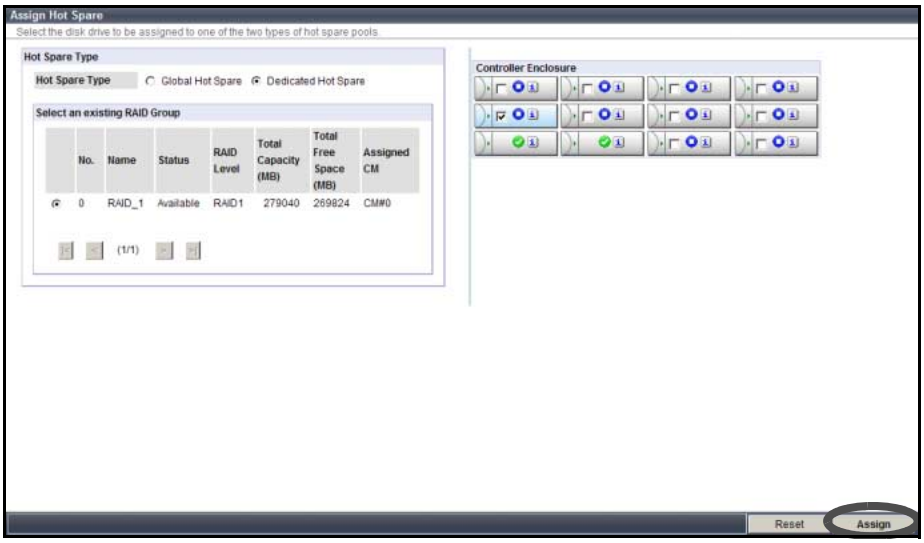
Procedure

1. Click the [Assign Hot Spare] under the [RAID Group Management] menu on the [Volume Settings] tab.
   → The [Assign Hot Spare] screen appears.
2. Specify the following items, and click the [Assign] button.
   - Hot Spare Type
     Select from the following items:
     - Global Hot Spare
       Global hot spare is shared by any RAID group in the device.
     - Dedicated Hot Spare
       Dedicated hot spare is used by specified RAID group.
   - Select an existing RAID Group
     When selecting the "Dedicated Hot Spare", specify the target RAID group.
   - Select Disk
     Select the disk to be used as hot spare.

- When adding "Global Hot Spare"



- When adding "Dedicated Hot Spare"



→ A confirmation screen appears.

3 Click the [OK] button.

→ The hot spare is added.

End of procedure

5.2.4 Release Hot Spare

The [Release Hot Spare] function deletes a registered hot spare. A released disk can be used as a data disk after it is registered in a RAID group.

Caution

Hot spare cannot be deleted in the following conditions:

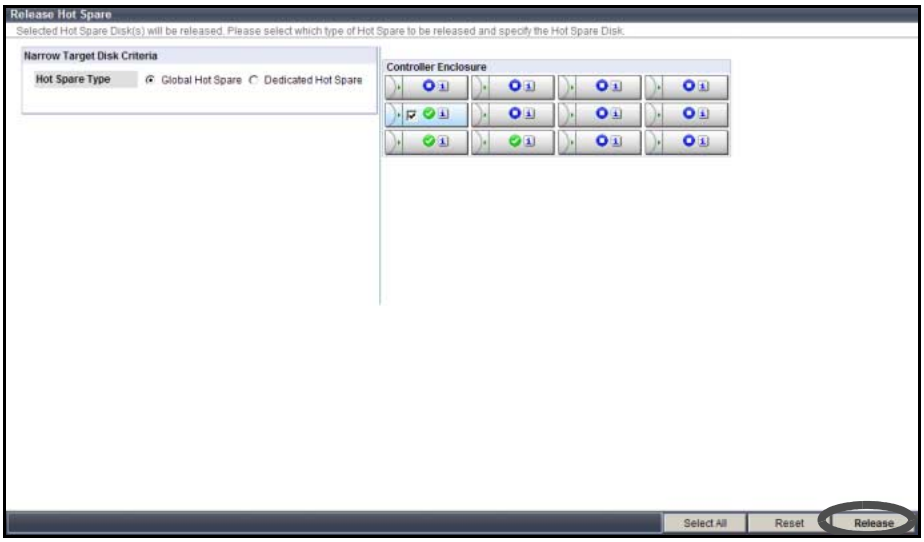
- When the usage of the hot spare is other than "Spare"
- When the status of the hot spare is other than "Present"
- When one of the following operations is in progress:
  - Registering controller firmware
  - Applying controller firmware
  - Registering disk firmware
  - Applying disk firmware
  - During the RAID group diagnosis
  - During the disk diagnosis

The procedure to delete hot spare is as follows:

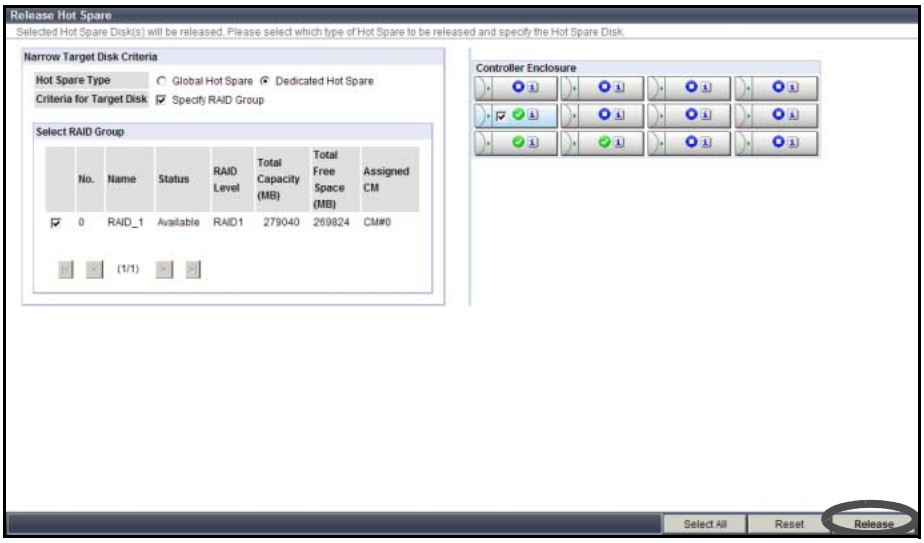
Procedure

1. Click the [Release Hot Spare] under the [RAID Group Management] menu on the [Volume Settings] tab.
   → The [Release Hot Spare] screen appears.
2. Specify the following items, and click the [Release] button.
   - Hot Spare Type
     Select one of the following as a condition of the hot spare to be released.
     - Global Hot Spare
       Global hot spare is shared by any RAID group in the device.
     - Dedicated Hot Spare
       Dedicated hot spare is used by a specified RAID group.
   - Criteria for Target Disk
     This field is displayed when selecting the "Dedicated Hot Spare". If the "Specify RAID Group" checkbox is checked, the target RAID group can be specified.
   - Select Disk
     Select the disk to be released as hot spare.

- When releasing "Global Hot Spare"



- When releasing "Dedicated Hot Spare"



→ A confirmation screen appears.

3 Click the [OK] button.

→ The selected hot spare is deleted.

End of procedure

5.2.5 Logical Device Expansion

The [Logical Device Expansion] function expands the capacity of an existing RAID group by adding new disks or changing RAID levels.
Normally, volume expansion requires adding RAID groups. This method requires multiple disks to be installed (used). However, this function can add disks to the existing RAID group in units of one disk. This enables capacity expansion of RAID groups with smaller number of disk expansion.
This function can be performed with taking over data in the disks.

Caution

- Disks that are a different type (SAS/SSD) than the disks that configure the RAID group cannot be added.
- Logical Device Expansion is not available in the following conditions:
  - RAID groups are not in normal status (Rebuilding, Copybacking, or using hot spare etc.)
  - When another Logical Device Expansion is being performed
  - When the target RAID level or changed RAID level is RAID5+0
  - Changing RAID level to RAID0

Note

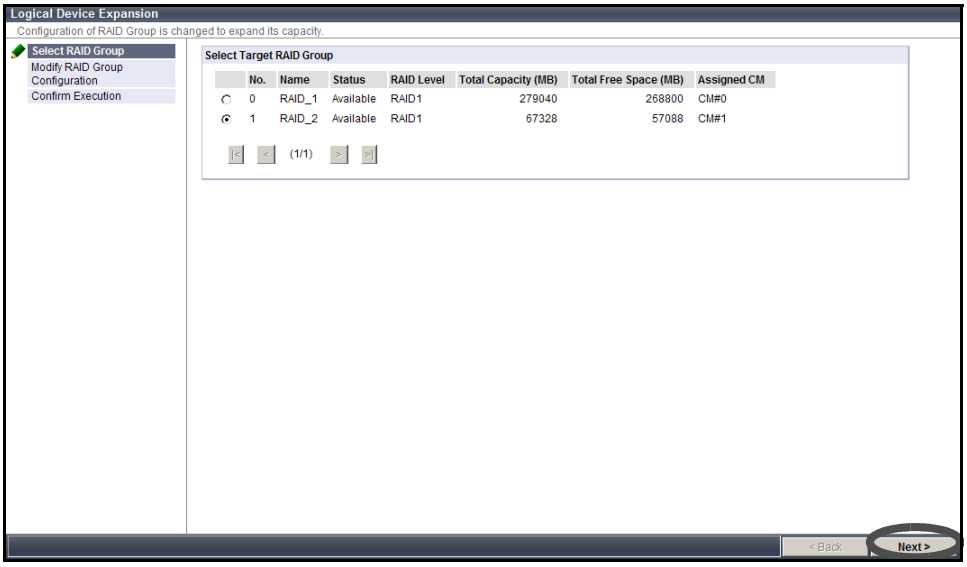
Note that existing volume size is not changed even if the RAID level is changed or capacity is expanded.

The procedure for Logical Device Expansion is as follows:

Procedure

1. Click the [Logical Device Expansion] under the [RAID Group Management] menu on the [Volume Settings] tab.
   → The [Logical Device Expansion] screen appears.

2 Select the target RAID group, and click the [Next >] button.



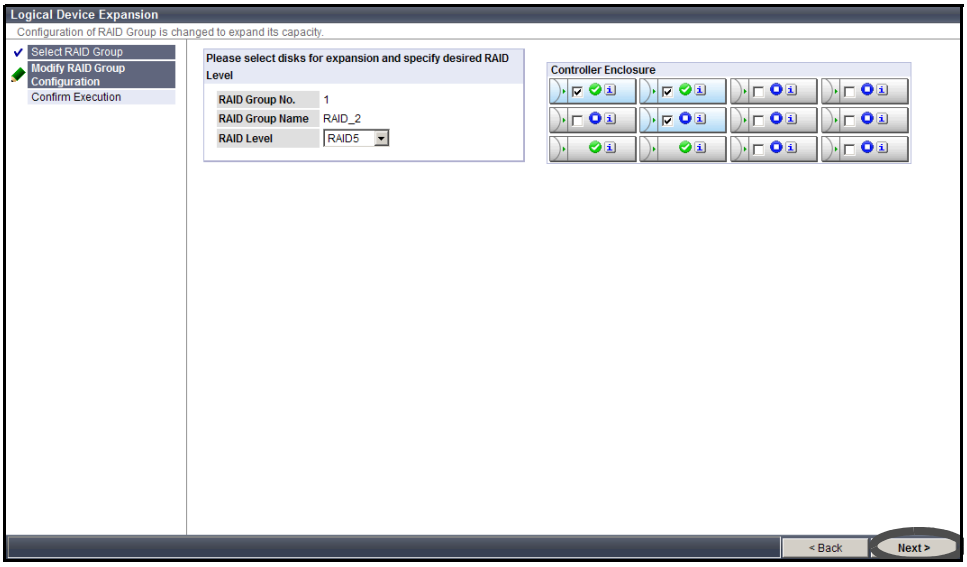
→ The "Modify RAID Group Configuration" screen appears.

3 Specify the following items, and click the [Next >] button.

- RAID Level
  Select (change) the RAID level.

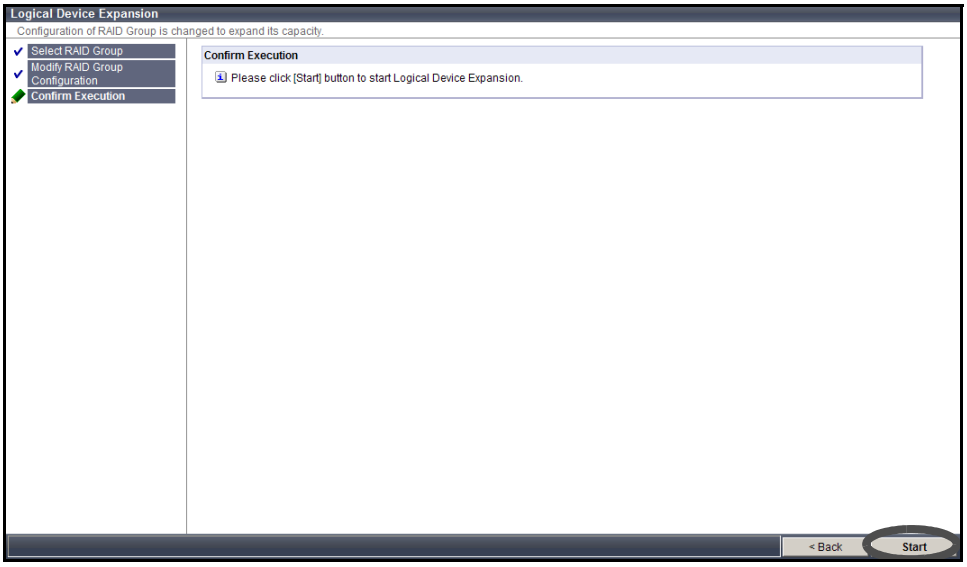
Caution Only for adding disks, changing RAID level is not required.

- Select Disk
  Select (add) disks according to the new RAID level.



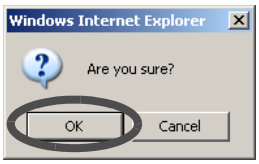
→ A confirmation screen appears.

4 Click the [Start] button.



→ A confirmation screen appears.

5 Click the [OK] button.



→ Logical Device Expansion is performed.

End of procedure

5.2.6 Set RAID Group Name

The [Set RAID Group Name] function can change the existing RAID group name.
The procedure to change RAID group name is as follows:

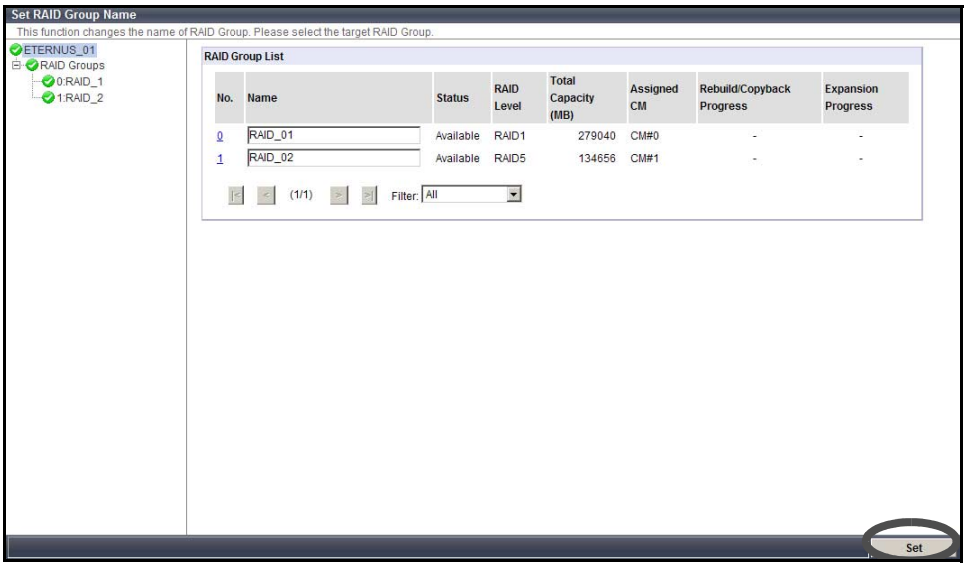
Procedure

1 Click the [Set RAID Group Name] under the [RAID Group Management] menu on the [Volume Settings] tab.
→ The [Set RAID Group Name] screen appears.

2 Change the target RAID group name, and click the [Set] button.

Enter the volume name between 1 to 16 alphanumeric characters and symbols (including blanks).

Caution RAID group name that is already registered in the ETERNUS DX60/DX80 cannot be specified.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The RAID group name is changed.

End of procedure

5.2.7 Set Eco-mode Schedule

The [Set Eco-mode Schedule] provides the following functions:

- Eco-mode General Setting

  Enables or disables the Eco-mode setting for ETERNUS DX60/DX80.
  Also, this function specifies the disk monitoring time. If the disk is not accessed for a specified time, the disk motor is inactivated

- Eco-mode Schedule Setting

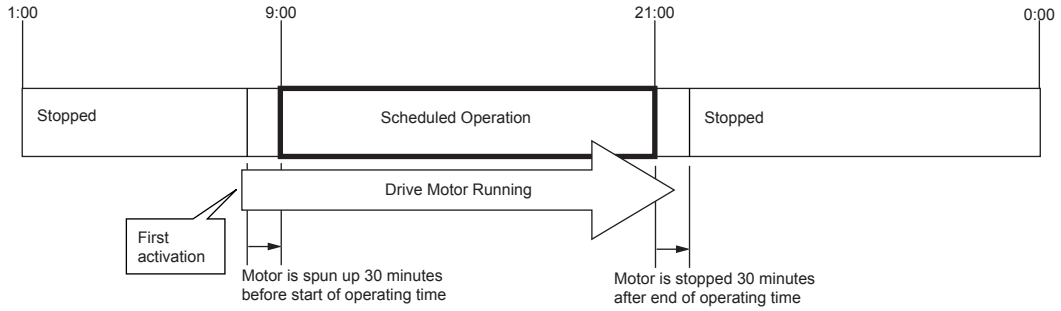
  Specifies the disk operating time (term for activating disk motor constantly) as an Eco-mode schedule.

- Apply Eco-mode Schedule

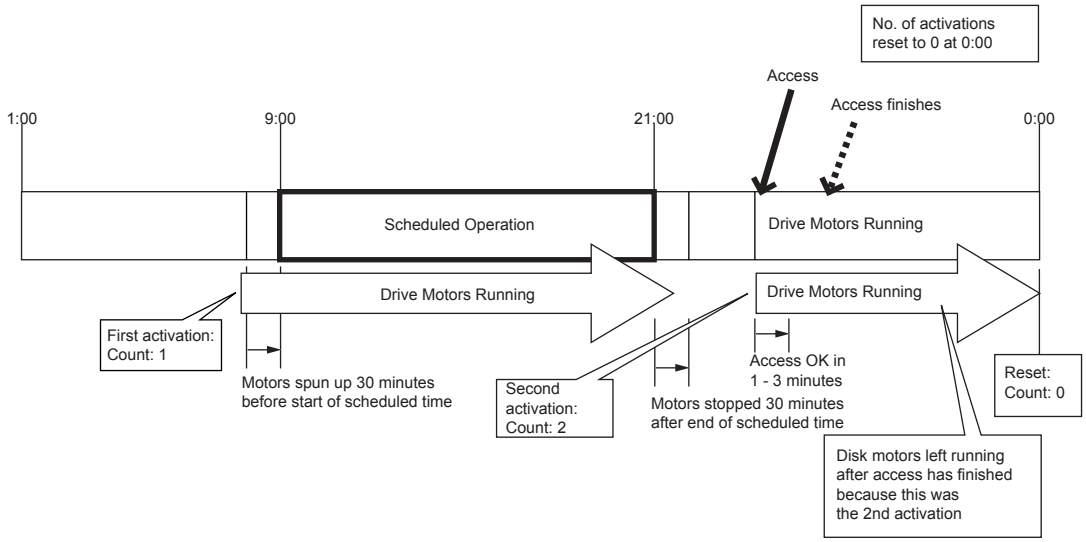
  Applies the created Eco-mode schedule for each RAID group.

If an access occurs while a motor is stopped, the disk drive is immediately spun up and access proceeds normally after one to three minutes. If a disk drive is activated more than a set amount of times in a day, a state of increased access frequency is assumed and the Eco-mode will cease stopping the disk drive motor. Disk operation time varies depending on the Eco-mode schedule settings and disk access. The following shows examples:

- Operation schedule is set as 9:00 to 21:00, the allowed number of activations is one time, and there are no accesses outside of the scheduled period



- Operation schedule is set as 9:00 to 21:00, the allowed number of activations is one time, and there are accesses outside of the scheduled period



Caution

- To perform schedule operations using this function, the Eco-mode setting for the ETERNUS DX60/DX80 must be enabled.
- Eco mode is not available for the following disks.
  - System disks
  - Hot spares
  - SSD
  - Disks in a RAID group the satisfies the following conditions:
    - A RAID group including system disks
    - A RAID group where no volume is registered
    - A RAID group where SDPVs are registered
- If any of the following conditions occur during the Eco-mode scheduled time, the disk motor is not inactivated. Note that the Eco-mode schedule will be re-enabled when these conditions have finished.
  - Target RAID group or volume status is other than "Available"
  - Performing functions that changes RAID group or volume configuration
  - During maintenance
  - During host access
  - During disk or RAID group diagnosis
  - Exporting G-List
  - Changing assigned CM for RAID group
  - Module error related to access path to the controller modules and disks is detected
- When setting the Eco-mode for the Advanced Copy source/destination, it is necessary to schedule a disk motor to be activated while performing Advanced Copy. If it is difficult to schedule, do not set the Eco-mode to the copy source/destination. If the disks are inactivated, the Advanced Copy cannot be executed.
- The target disks where Eco-mode schedule can be set are SAS disks and Nearline SAS disks. SSDs are not available for this function.

Eco-mode General Setting

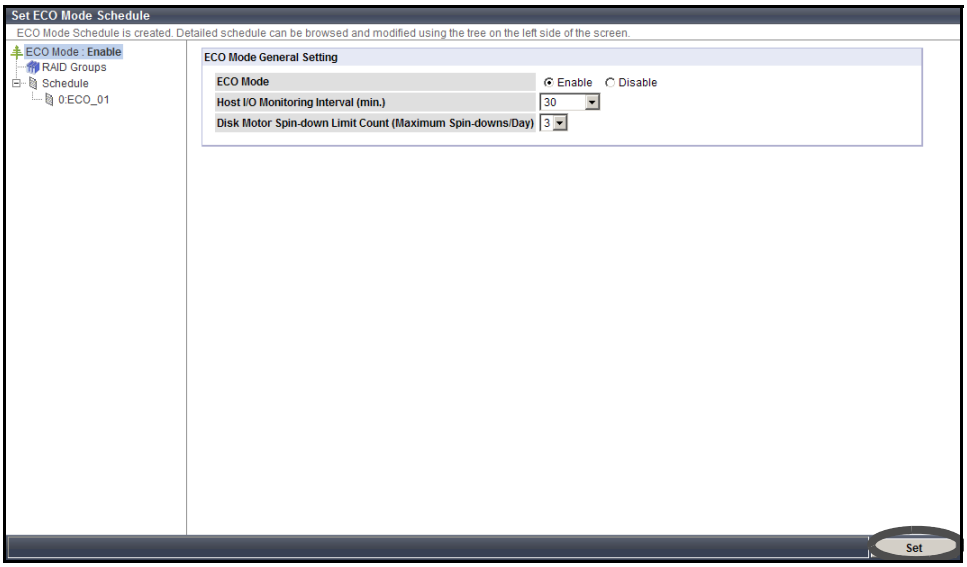
Enables or disables the Eco-mode setting for ETERNUS DX60/DX80.
The procedure for Eco-mode General Setting is as follows:

Procedure

1. Click the [Set Eco-mode Schedule] under the [RAID Group Management] menu on the [Volume Settings] tab.
   → The [Set Eco-mode Schedule] screen appears.

2 Specify the following items, and click the [Set] button.

- Eco-mode
  Select whether to "Enable" or "Disable" the Eco-mode for ETERNUS DX60/DX80.
- Host I/O Monitoring Interval (min.)
  Specify the disk access monitoring time between 10 and 60 (minutes) before inactivating the disk motor.
  If disk access is detected during the monitoring time, extend the monitoring time for specified minutes after completing the relevant disk access. When the monitoring time has passed, the disk motor is inactivated.
  Monitoring disk access is performed for each RAID group.
- Disk Motor Spin-down Limit Count (Maximum Spin-downs/Day)
  Specify the maximum number of disk motor spin-downs (per day) between 1 and 5 times.
  The disk motor spin-down limit indicates the number of times to stop the activating disk motor. GUI monitors the number of inactivation per day. If the number of disk motor spin-downs reaches the specified maximum number, the motor is not stopped again.
  Monitoring the disk motor spin-down is performed for each RAID group.
  Number of inactivations is reset to "0" at 0:00 everyday.



→ A confirmation screen appears.

3 Click the [OK] button.

→ Eco-mode commonness setting is applied.
When the Eco-mode has been disabled, the setting switches to "Enabled".
When the Eco-mode has been enabled, the setting switches to "Disabled".

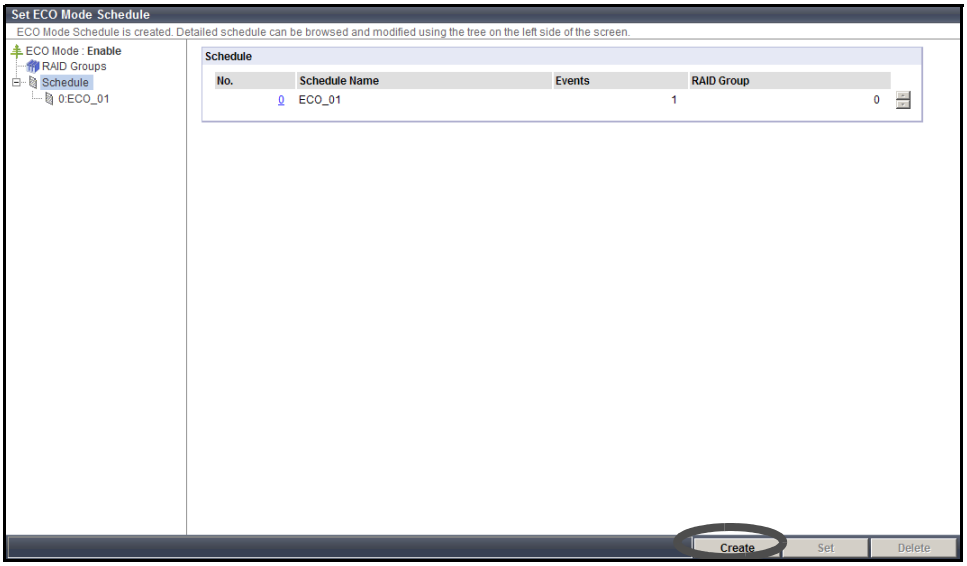
End of procedure

Eco-mode Schedule Setting

Specify the disk operation time as an Eco-mode schedule.
Up to 64 Eco-mode schedules can be created.
The procedure to create the Eco-mode schedule is as follows:

Procedure

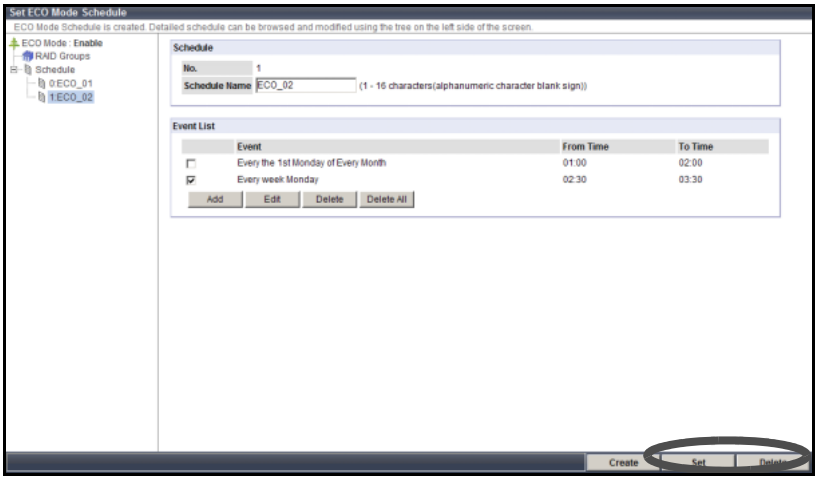
1. Click the [Set Eco-mode Schedule] under the [RAID Group Management] menu on the [Volume Settings] tab.
   → The [Set Eco-mode Schedule] screen appears.
2. Click the "Schedule" icon from the tree in the left of the screen.
   → The "Schedule" field is displayed.
3. Click the [Create] button.



→ The setting fields for new schedule is displayed.

Note

When changing or deleting the Eco-mode schedules, select the target event in the "Schedule" field or the tree in the left of the screen, and click the [Set] or [Delete] button.



4 Set the following items.

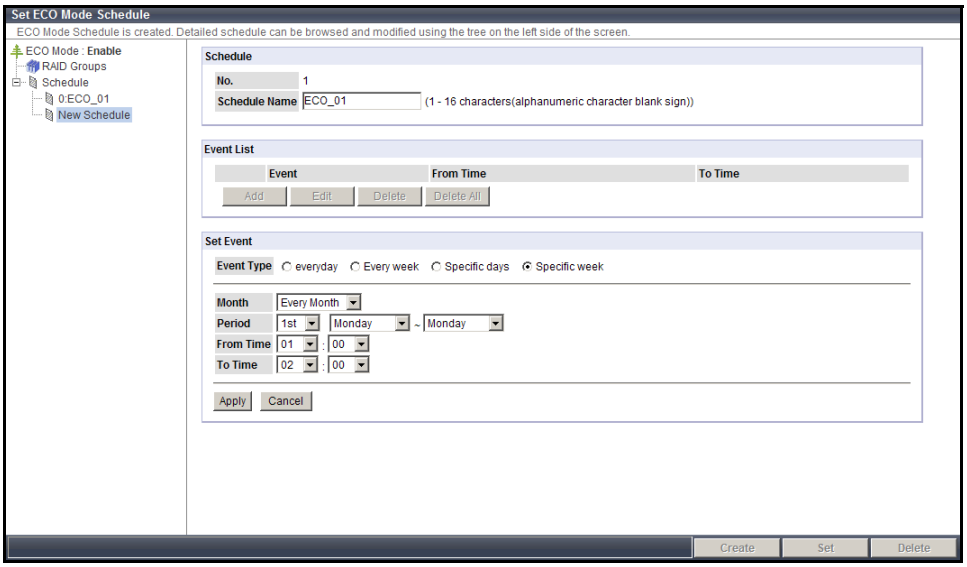
- Schedule Name
  Enter the schedule name between 1 to 16 alphanumeric characters and symbols (including blanks).
- Event List
  Set the schedule event in this field. Click the [Add] button.
  The "Set Event" field is displayed.
  Up to eight events per schedule can be created.

Note

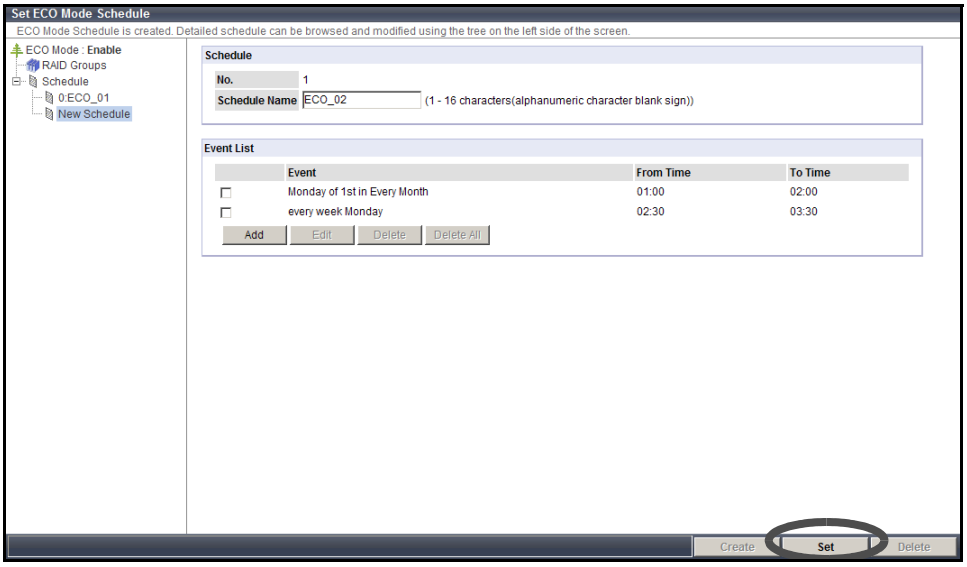
- When changing the event details, select the target event, and click the [Edit] button.
- When deleting the event, select the target event(s) to be deleted (multiple selections can be made), and click the [Delete] button.
- Clicking the [Delete All] button deletes all the specified events in the schedule.

- Set Event
  Specify the following items, and click the [Apply] button.
  - Event Type
    Select one of the following items:
    - Every Month
    - Every week
    - everyday
    - Specific days
    - Specific week

    Also, enter a Period (when selecting other than "everyday"), Month (when selecting "Every week" or "Specific week"), and start/end time of the disk activation.



5 Click the [Set] button.



→ A confirmation screen appears.

6 Click the [OK] button.

→ The new Eco-mode schedule setting is started.

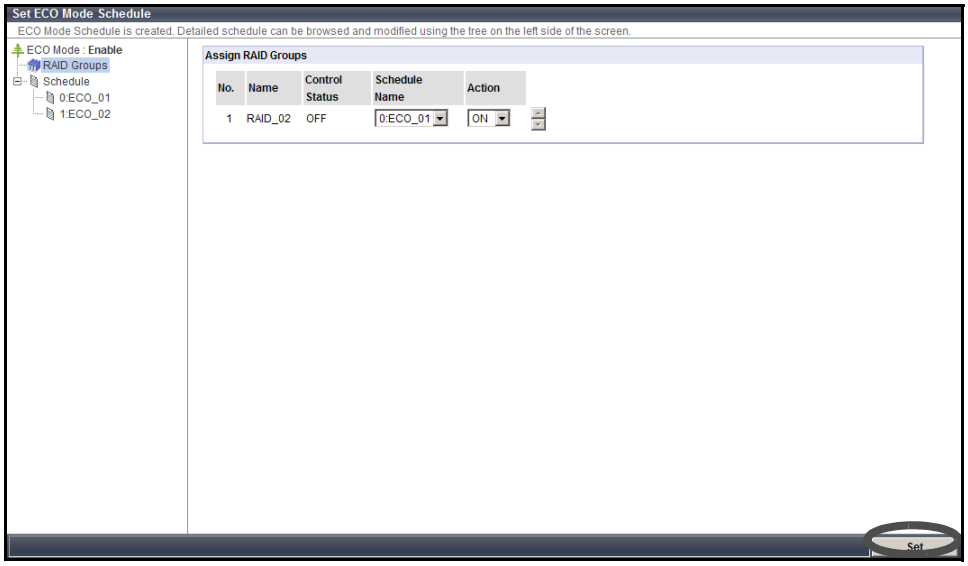
End of procedure

Apply Eco-mode Schedule

This function applies the Eco-mode schedule to the RAID group.
The procedure to apply the Eco-mode schedule is as follows:

Procedure

1. Click the [Set Eco-mode Schedule] under the [RAID Group Management] menu on the [Volume Settings] tab.
   → The [Set Eco-mode Schedule] screen appears.
2. Click the "RAID Groups" icon from the tree in the left of the screen.
   → The "Assign RAID Groups" field is displayed.
3. Specify the following items, and click the [Set] button.
   - Schedule Name
     Select the Eco-mode schedule to be applied
     When disabling the Eco-mode schedule for the relevant RAID group, select "Disable".
   - Action
     Select whether to turn the Eco-mode schedule "ON" or "OFF" for the RAID group to be applied.



→ A confirmation screen appears.

4. Click the [OK] button.

→ The Eco-mode schedule is applied for the RAID groups.

End of procedure

5.2.8 Change CM Ownership

The [Change CM Ownership] function changes the assigned CM specified when creating the RAID group.
Usually, the assigned CM is automatically allocated. If the load is not balanced evenly between CMs, the assigned CMs can be manually allocated to balance the load.

Note

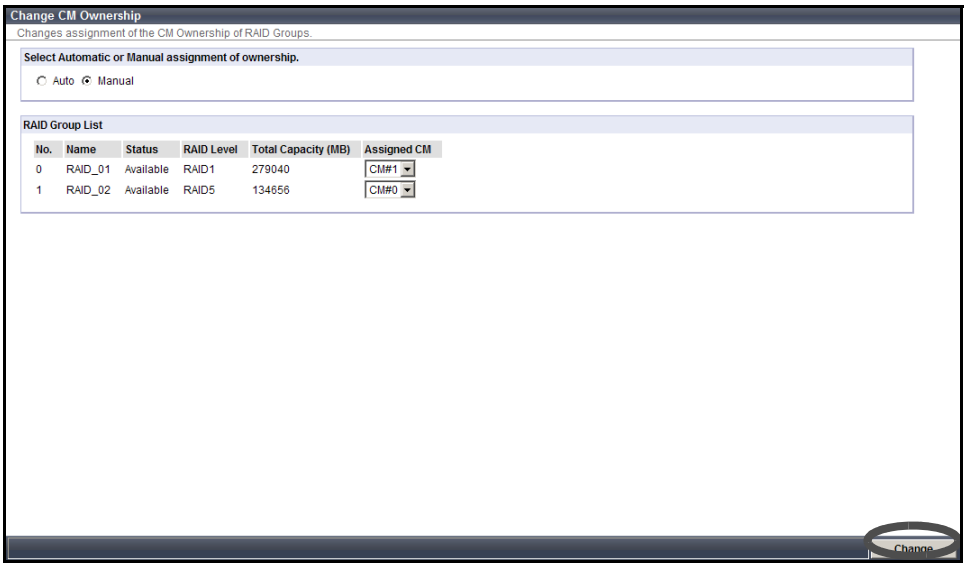
When the ETERNUS DX60/DX80 has only one CM, the assigned CM cannot be changed.

The procedure to change RAID group assigned CM is as follows:

Procedure

1. Click the [Change CM Ownership] under the [RAID Group Management] menu on the [Volume Settings] tab.
   → The [Change CM Ownership] screen appears.

2. Specify the following items, and click the [Change] button.
   - Select Automatic or Manual assignment of ownership.
     Select the method for assigning the CM from "Auto" or "Manual".
     If changing the current setting, a confirmation screen appears.
   - RAID Group List
     When selecting the "Manual" for "Select Automatic or Manual assignment of ownership." field, specify the assigned CM for the RAID group.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The assigned CM is changed.

End of procedure

5.3 Volume Management

The following settings are available as the volume management.

- Create/Delete Volume
- Format Volume
- Encrypt Volume
- LUN Concatenation
- RAID Migration
- Initialize Snap Data Volume
- Release Reservation
- Set Volume Name
- Configure LUN Mapping

5.3.1 Create Volume

The [Create Volume] function creates the volumes in the existing RAID group.
Open or Snap Data Volume (SDV) can be created with this function. After completing the volume creation, the new volumes are formatted automatically.
Volumes can be accessed from the host when created in the RAID group and LUN mapped.

- The maximum number of volumes that can be registered

  The following table shows the maximum number of volumes can be created for each device.

Device Type	per RAID group	per Device
ETERNUS DX60	Up to 128	Up to 512
ETERNUS DX80	Up to 128	Up to 1,024

Caution

- When the maximum number of volumes has already been created in the ETERNUS DX60/DX80, more volumes cannot be created. In this case, to create a new volume, first delete volumes using the "5.3.2 Delete Volume" (page 96) function, and then try creating a new volume again.
- A volume is allocated to uninterrupted free space in the order of creation.
  If an area with the necessary capacity cannot be acquired from the free space available, use the "5.3.5 LUN Concatenation" (page 101) function to concatenate multiple spaces into a volume.

Note

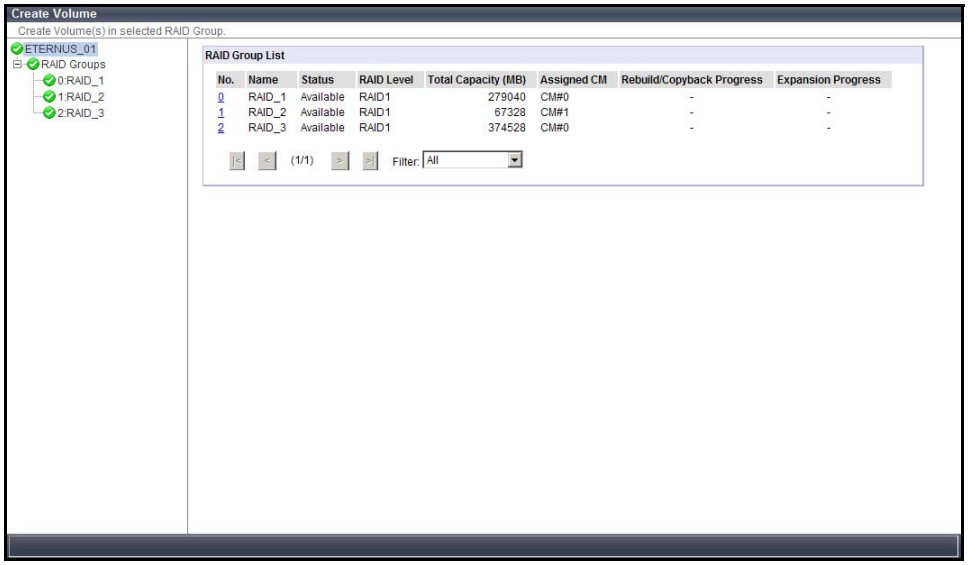
SDV is the Snap Data Volume that is required for SnapOPC+. Refer to "5.4.2 Manage Copy Session" (page 129) for details about SnapOPC+.

The procedure to create a volume is as follows:

Procedure

1. Click the [Create Volume] under the [Volume Management] menu on the [Volume Settings] tab.
   → The [Create Volume] screen appears.

2. Select the RAID group where the volumes are created from the tree in the left of the screen, or RAID Group List.



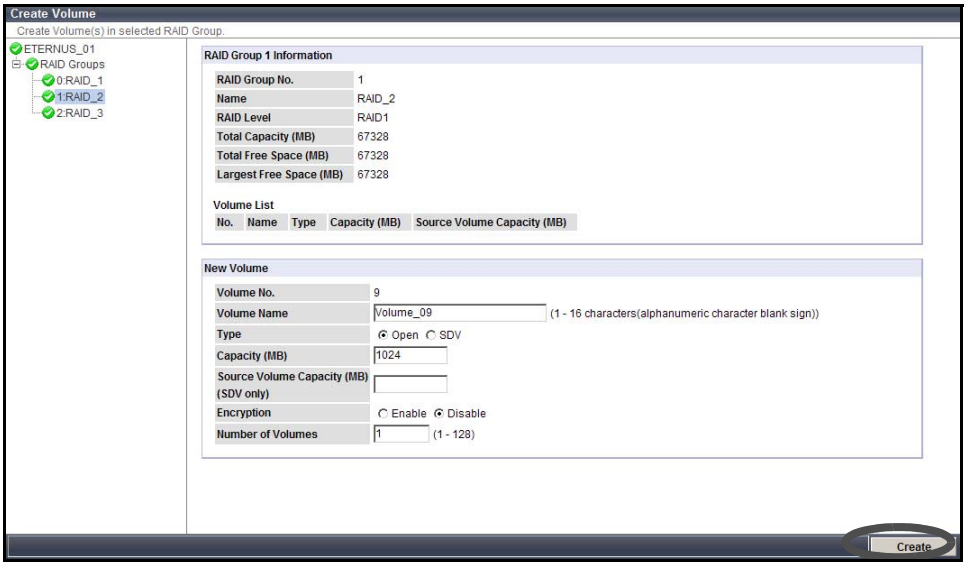
   → The detailed information of the selected RAID group is displayed.

3. Specify the following items, and click the [Create] button.
   - Volume Name
     Enter the volume name between 1 to 16 alphanumeric characters and symbols (including blanks).
   - Type
     Select the volume type (Open or SDV).
   - Capacity (MB)
     Specify the volume capacity to be created in units of MB.
     Set the value between 24 to 8,388,607 (MB), or the maximum capacity of the RAID group.

Caution When creating an SDV, the total SDV capacity (MB) and 0.1% of the copy source volume capacity is secured in the ETERNUS DX60/DX80. 0.1% of the copy source volume is the capacity used for the controlling information area in the SDV.

   - Source Volume Capacity (MB) (SDV only)
     Specify the total capacity of the copy source for SDV in units of MB.

- Encryption
  Select whether to "Enable" or "Disable" encryption mode for the new volume.
  An encrypted volume cannot be changed to non-encrypted volumes.
  Refer to "5.3.4 Encrypt Volume" (page 99) for details.
- Number of Volumes
  When creating multiple volumes of the same type and capacity, set the number of volumes to be created. All the volumes are created with the same name. Change the volume names as required (Refer to "5.3.9 Set Volume Name" (page 111)).



→ A confirmation screen appears.

4 Click the [OK] button.

→ The volumes are created.

End of procedure

5.3.2 Delete Volume

The [Delete Volume] function deletes the volumes in the RAID group.
Make sure to backup any necessary data before proceeding.

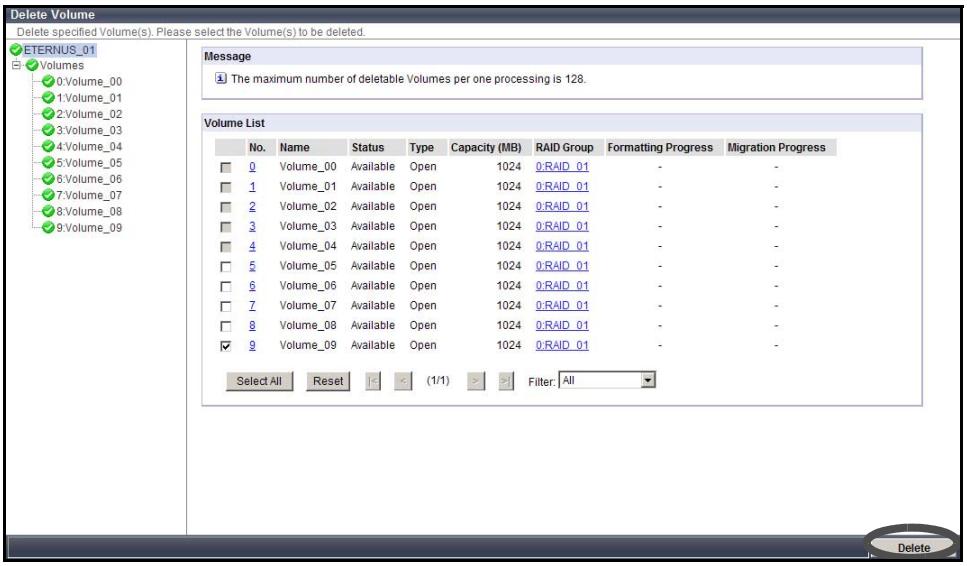
Caution

- The following volumes cannot be deleted.
  - Volumes that are allocated to a Host Affinity or mapped LUN.
  - Volumes during RAID migration.
  - Copy source and destination volumes during Advanced Copy session.
  - Volumes in the RAID group during Logical Device Expansion.
- A volume is allocated to uninterrupted free space in order of creation. When a volume is deleted, the space where the volume existed becomes free space. By repeating creation and deletion of volumes, free space may be dispersed in the RAID group.
- Up to 128 volumes can be deleted at once.

The procedure to delete a volume is as follows:

Procedure

1. Click the [Delete Volume] under the [Volume Management] menu on the [Volume Settings] tab.
   → The [Delete Volume] screen appears.
2. Select the volume to be deleted from the "Volume List" field (multiple selections can be made), and click the [Delete] button.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The selected volumes are deleted.

End of procedure

5.3.3 Format Volume

The [Format Volume] function is used to format (clear data in) the selected volume.

Caution

- If selecting and formatting a volume that is in use, the data stored in the volume will be deleted.
- For a newly created volume, formatting with this function is not required. Newly created volumes are formatted automatically.
- The following volumes cannot be formatted.
  - Volumes with a status other than "Readying" or "Available"
  - Volumes in the RAID group during Logical Device Expansion
  - Volumes for which Advanced Copy is being performed
  - Volumes during RAID migration

Note

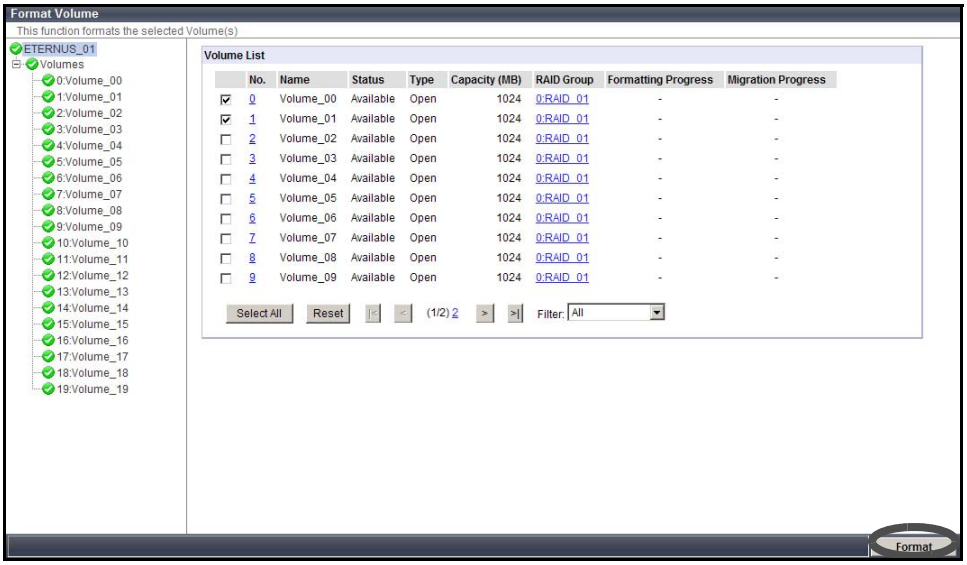
Progress of formatting can be checked from the [Volume Status] menu on the [Status] tab.

The procedure to format a volume is as follows:

Procedure

1 Click the [Format Volume] under the [Volume Management] menu on the [Volume Settings] tab.
→ The [Format Volume] screen appears.

2 Select the volume to be formatted from the tree in the left of the screen, or "Volume List" field (multiple selections can be made), and click the [Format] button.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The selected volumes are formatted.

End of procedure

5.3.4 Encrypt Volume

The [Encrypt Volume] function encrypts the data in the disks to prevent the data leakage caused by theft or loss when removing disks.

Caution

- When encrypting volumes, enable the encryption mode using the "6.4.3 Setup Encryption Mode" (page 187) function. However, when the "Setup Encryption Mode" is not displayed in the menu, the encryption function is not available. However, when the encryption function is not available, the "Setup Encryption Mode" is not displayed in the menu.
- This function prevents data leakage from removal of disks. Therefore, when accessing from the server, data in the disks is not encrypted. Note that this function cannot prevent data leakage by server access.
- Once a volume has been encrypted, it cannot be changed back to a non-encrypted volume.
- Canceling volume encryption is not possible.
- This function cannot be used under the following conditions:
  - Encryption mode is not set (refer to "6.4.3 Setup Encryption Mode" (page 187))
  - A warning status component exists in the controller enclosure
  - There is no volume to be encrypted
- Volumes in the following conditions cannot be selected as an encryption target volume (not displayed in the Volume List).
  - Volumes which are not in normal status (Rebuilding/Copybacking, etc.)
  - Volumes which are being formatted
  - Volumes in RAID migration operation
  - Volumes in a RAID group in which Logical Device Expansion is being executed
  - Volumes which are already encrypted
  - Volumes which are being encrypted
- When encrypting Advanced Copy target volumes, both the copy source and copy destination volumes must be encrypted.
- The following performance may be degraded for encrypted volumes compared with non-encrypted volumes.
  - Access to the encrypted volumes
  - Copy transfer of encrypted volumes

Note

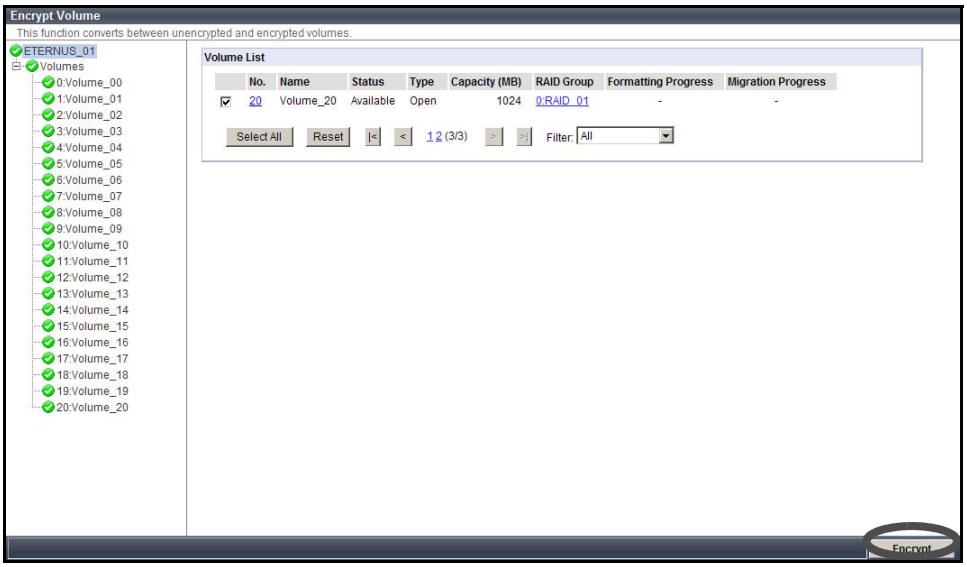
The progress of an encryption operation can be checked from [Volume Status] menu on the [Status] tab screen.

The procedure to encrypt a volume is as follows:

Procedure

1. Click the [Encrypt Volume] under the [Volume Management] menu on the [Volume Settings] tab.
   → The [Encrypt Volume] screen appears.

2. Select the volume to be encrypted from the tree in the left of the screen or "Volume List" field (multiple selections can be made), and click the [Encrypt] button.



   → A confirmation screen appears.

3. Click the [OK] button.

   → The selected volume is encrypted.

End of procedure

5.3.5 LUN Concatenation

LUN concatenation adds new space for volumes and expands the volume capacity that can be used from the server.
This function enables the use of free area in the RAID group, and solves capacity shortages.
This function obtains the area to be used for capacity expansion from unused areas in an existing RAID group. LUN concatenation creates a new volume with the obtained area, and concatenates these volumes to be used as a large capacity volume.
Concatenation of multiple free areas from different RAID groups is possible. Also, concatenation is possible even if the RAID levels of the groups are different.
Up to 16 volumes can be concatenated. The maximum volume capacity after concatenation is 32TB.

- Conditions of the volumes to be concatenated

  - The volume type must be "Open" (Open volume)
  - The volume status must be "Available"
  - The volume capacity must be 1,024MB to 8,388,607MB
  - Cannot be concatenated during RAID Migration
  - Cannot be concatenated when there is an Advanced Copy session
  - The RAID group to which the volume belongs is not in the Logical Device Expansion process

- Conditions of RAID groups to obtain unused area

  - The RAID Group status must be "Available"
  - A RAID group with less than 128 volumes registered
  - A RAID group must not be blocked

Caution

- Concatenation of volumes is not possible in RAID groups configured with disks of different types (SAS/SSD).
- When expanding the existing volume capacity using the [LUN Concatenation] function, the server is required to recognize the expanded volume capacity after the concatenation.

Note

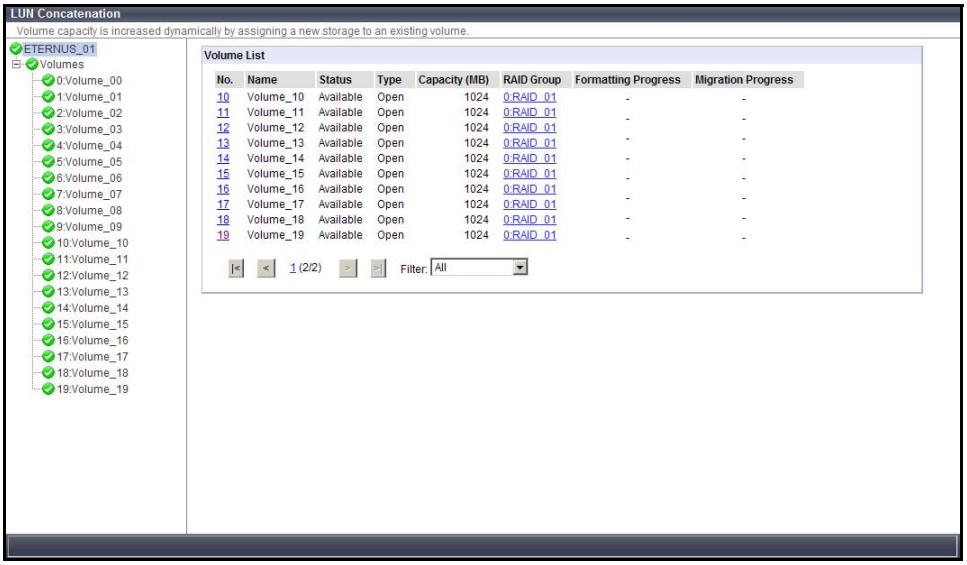
A new concatenated volume is automatically formatted. The progress of formatting may be checked in the [Volume Status] screen on the [Status] tab.

The procedure for LUN Concatenation is as follows:

Procedure

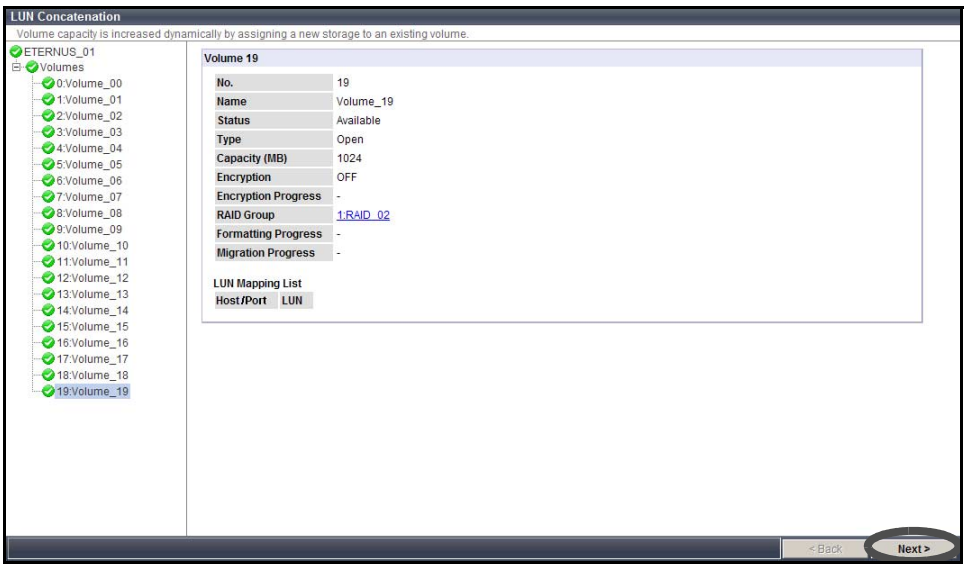
1. Click the [LUN Concatenation] under the [Volume Management] menu on the [Volume Settings] tab.
   → The [LUN Concatenation] screen appears.

2. Select the volume to be concatenated from the tree in the left of the screen, or Volume List.



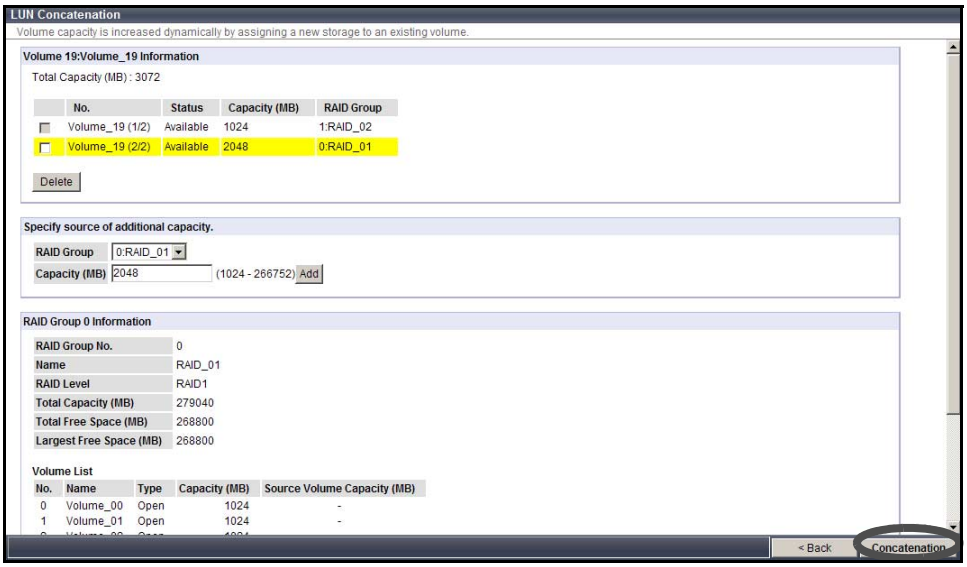
→ Detailed information of the target volume is displayed.

3. Click the [Next >] button.



4 Set the following items, and click the [Concatenation] button.

- RAID Group
  Select the existing RAID group where the concatenation volume is obtained.
- Capacity (MB)
  Specify the capacity of concatenation volume, and click the [Add] button. Concatenation volume is added in the "Volume Information" field.



→ A confirmation screen appears.

5 Click the [OK] button.

→ LUN concatenation is started.

End of procedure

5.3.6 RAID Migration

This function migrates a volume in a RAID group to a free area in another RAID group.
Setting (expanding) the volume capacity is also available.
This function enables load balancing of host access. Creation and format of new volumes and host interface establishment are automatically performed. Because data in the volume will be moved to a new volume, users are allowed to access the data anytime without being affected by the migration. After the RAID migration is completed, the migration source volume is deleted.

- Conditions of the migration source volume

  - The volume type must be "Open" (Open volume)
  - The volume status must be "Available"
  - Cannot be migrated while formatting
  - Cannot be migrated during RAID Migration
  - Cannot be migrated during Advanced Copy
  - A concatenated volume cannot be migrated
  - The RAID group to which the volume belongs is not in the Logical Device Expansion process.
  - The total capacity of the Open Volume to be migrated and the capacity of the volumes being migrated must not exceed 8TB

- Conditions of the migration destination RAID group

  - If Open Volumes are created in the RAID group, the number of volumes in the RAID group must be less than 128
  - The total number of defined Open Volumes and Snap Data Volumes must be 128 or less
  - No volumes in Advanced Copy status exist in the RAID Group
  - The status of the RAID group must be "Available" or "Present"
  - A RAID group must not be blocked
  - The free area (sequential space) for the RAID group must be equal to or larger than the migration source volume capacity
  - The migration destination is not in the same RAID group as the migration source (migration in the same RAID group is not available)
  - The RAID group to which the volume belongs is not in the Logical Device Expansion process.

- Conditions of the RAID migration session

  - Up to 32 RAID migration sessions can be migrated at the same time
  - Up to 8TB capacity of RAID migration can be executed at the same time

- The maximum number of volumes that can be registered

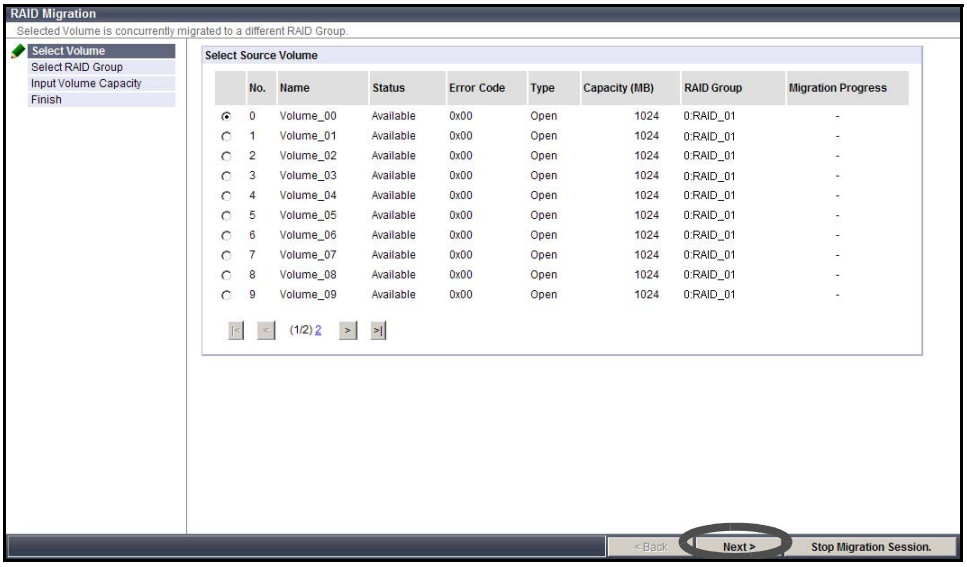
  RAID Migration creates a new volume. Refer to table "The maximum number of volumes that can be registered" (page 93) in "5.3.1 Create Volume" (page 93) for the maximum number of volumes that can be created for ETERNUS DX60/DX80.

The procedure for RAID migration is as follows:

Procedure

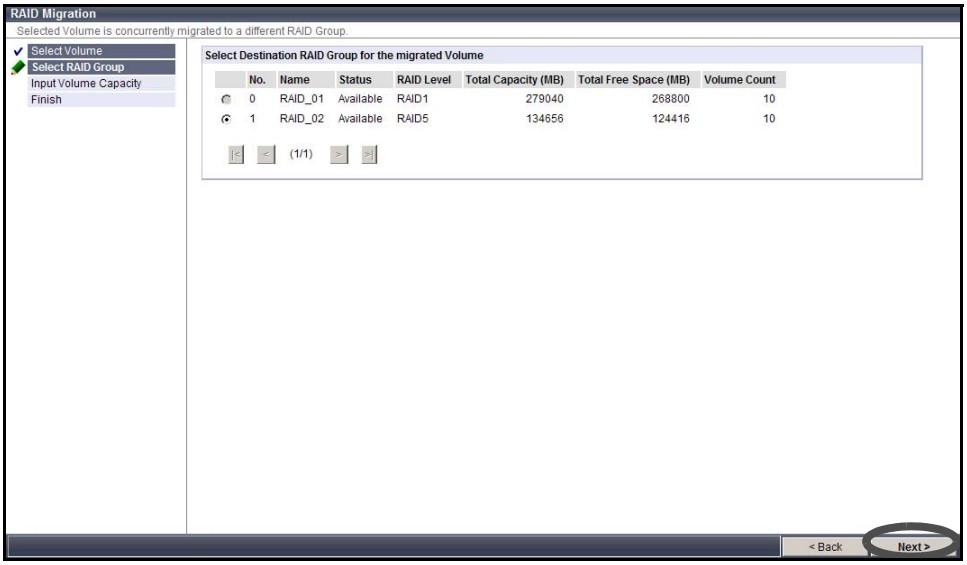
1. Click the [RAID Migration] under the [Volume Management] menu on the [Volume Settings] tab.
   → The [RAID Migration] screen appears.

2 Select the migration source volume, and click the [Next >] button.



→ The "Select Destination RAID Group for the migrated Volume" setting field is displayed.

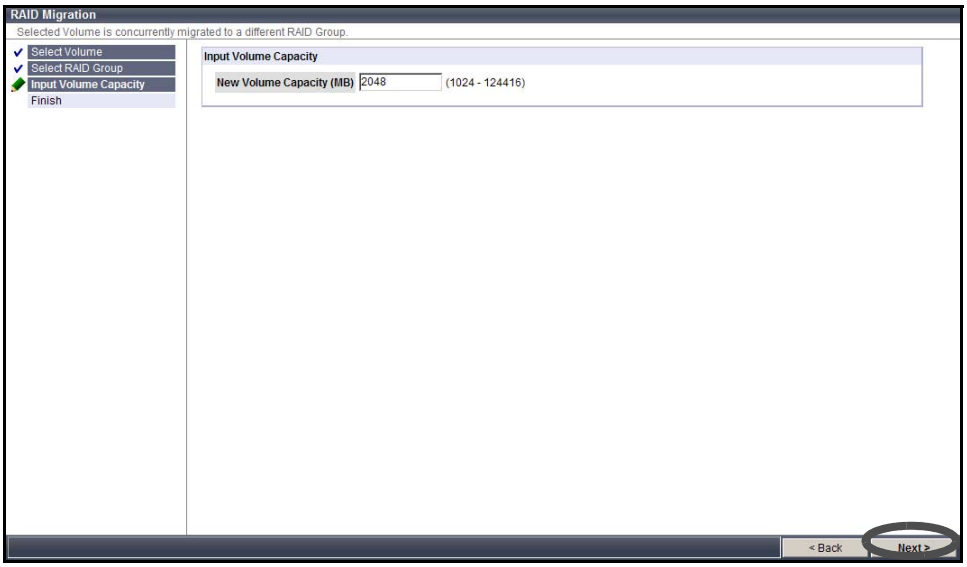
3 Select the migration destination RAID group, and click the [Next >] button.



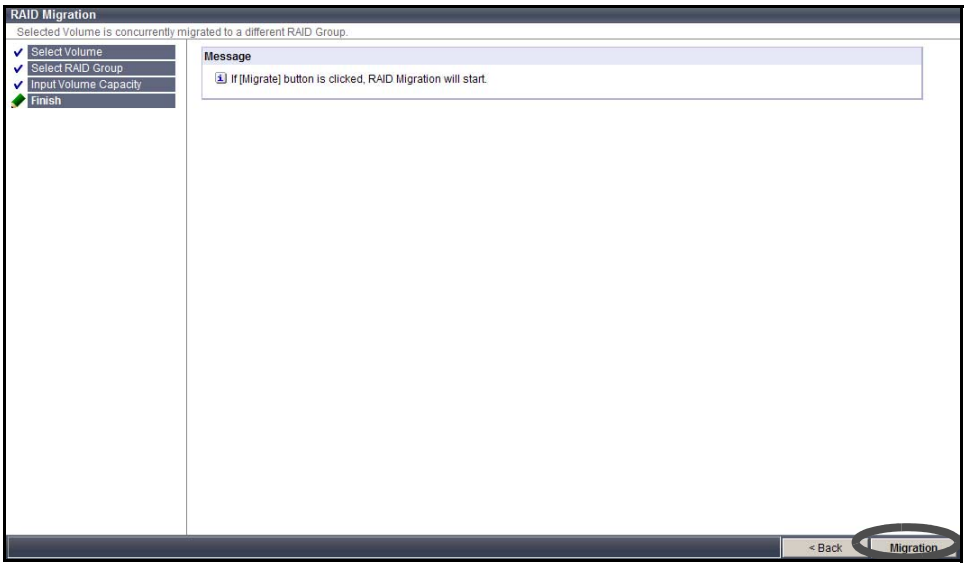
→ The "Input Volume Capacity" setting field is displayed.

4 Input the new volume capacity (in MB), and click the [Next >] button.

Specifying (Expanding) the target volume capacity is available at the RAID migration. Added capacity is created as a new volume in the migration destination RAID group.



5 Click the [Migration] button.



→ A confirmation screen appears.

6 Click the [OK] button.

→ The RAID migration process is started.

Note

If the RAID migration process cannot be continued during the operation, the process is canceled and the RAID migration destination volume is deleted.

End of procedure

5.3.7 Initialize Snap Data Volume

The [Initialize Snap Data Volume] function initializes the management information for the Snap Data Volume (SDV) that is created as the copy destination for SnapOPC+.
When using the SnapOPC+, create the Snap Data Volume as the copy destination from the screen to create a volume. The Snap Data Volume includes the data area and copy management information area.
This function is used to initialize the management information for the Snap Data Volume when changing the copy source or canceling the copy. Note that data area will not be initialized (formatted).

Caution

In the following conditions, the management information for the Snap Data Volume (SDV) cannot be initialized.

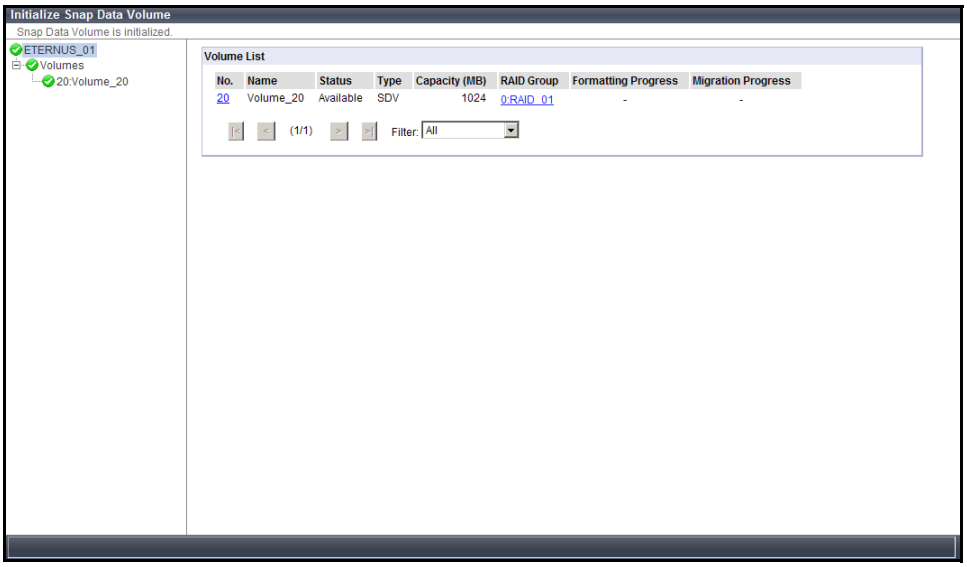
- When there is no volume to be initialized
- When the target volume is not Snap Data Volume
- When the target volume status is not "Available"
- When the copy session is specified for the target volume
- When this function is already in operation in the ETERNUS DX60/DX80

The procedure to initialize a Snap Data Volume is as follows:

Procedure

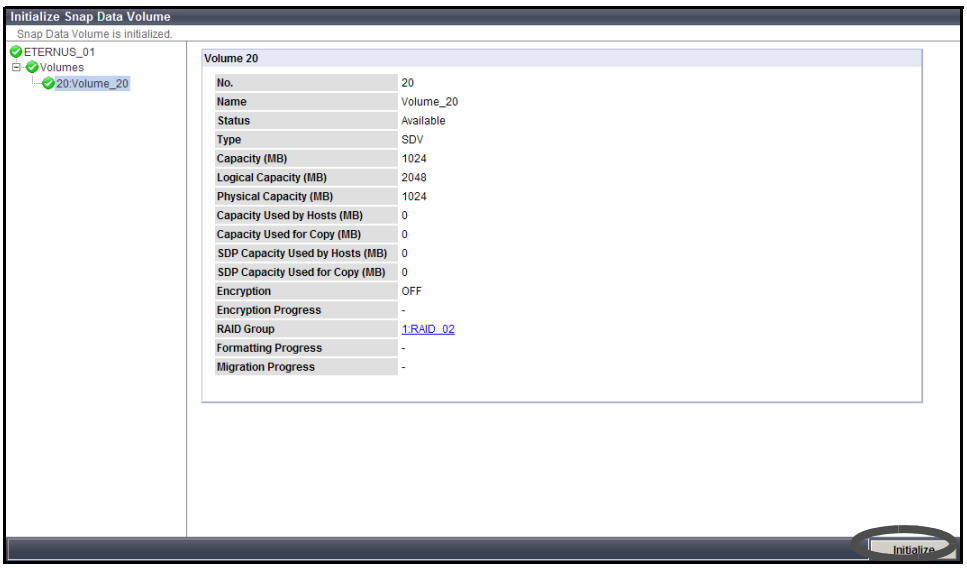
1 Click the [Initialize Snap Data Volume] under the [Volume Management] menu on the [Volume Settings] tab.
→ The [Initialize Snap Data Volume] screen appears.

2 Select the Snap Data Volume to be initialized from the tree in the left of the screen, or "Volume List" field.



→ The detailed information of the selected volume is displayed.

3 Click the [Initialize] button.



→ A confirmation screen appears.

4 Click the [OK] button.

→ The selected Snap Data Volumes are initialized.

End of procedure

5.3.8 Release Reservation

Some server may reserves volumes.
A volume in Reserve (Persistent Reserve) status set by the server can be released, and all Reservation Keys can be deleted with GUI.
Normally, the server executes Reserve (occupation) and Release (release occupation) of a volume. This function is used only when the server cannot release the volume reservation because of a server failure, etc.

Caution Be sure to pay attention when using this function as it may cause data corruption.

The procedure to release reservation is as follows:

Procedure

1. Click the [Release Reservation] under the [Volume Management] menu on the [Volume Settings] tab.
   → The [Release Reservation] screen appears.
   The following items are displayed:
   - No.
     The volume number is displayed.
   - Name
     The volume name is displayed.
   - CM Port
     The CM port to which the volume is LUN mapped is displayed.
   - Affinity Group
     When the host affinity function is used, the affinity group to which the volume is LUN mapped is displayed.
   - LUN
     The reserved LUN is displayed. When the volume is not reserved, "-" is displayed.
   - Registrant Count
     The number of Reservation Keys registered in the volume is displayed.
   - Reservation Type
     When the volume is in persistent reservation status, one of the following persistent reservation types is displayed.
     - WE (Write Exclusive)
     - EA (Exclusive Access)
     - WE-RO (Write Exclusive-Registrants Only)
     - EA-RO (Exclusive Access-Registrants Only)
     - WE-AR (Write Exclusive-All Registrants)
     - EA-AR (Exclusive Access-All Registrants)

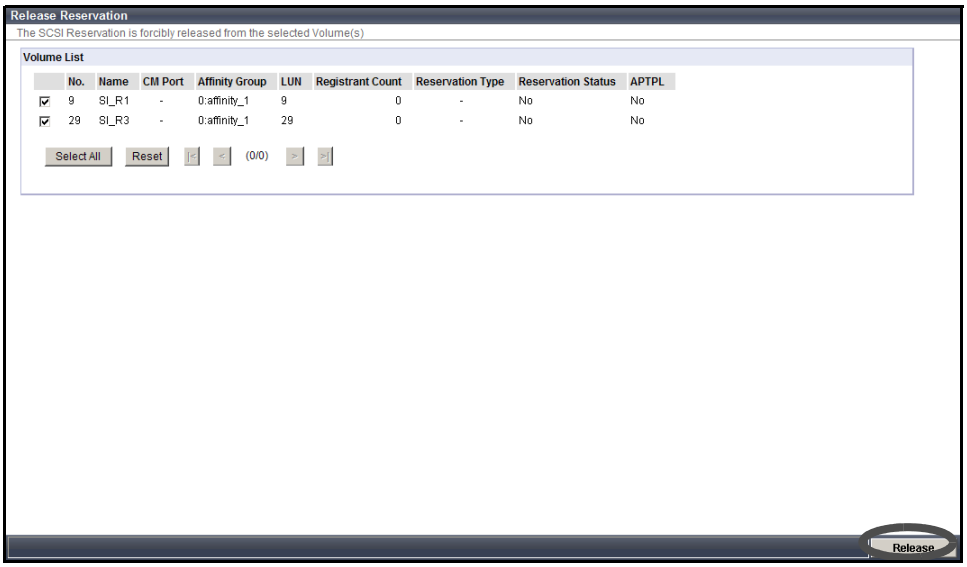
     When the volume is in reservation status other than persistent reservation status, "-" is displayed.

- Reservation Status
  The volume reservation status is displayed.
  "Yes": In persistent reservation status
  "No": In reservation status, but not in persistent reservation status
  "-": Only the reservation key is registered (not reserved)
- APTPL
  Whether or not persistent reservation information is kept after the ETERNUS DX60/DX80 has been shutdown/rebooted is displayed.
  "Yes": The persistent reservation information is kept.
  "No": The persistent reservation information is not kept.
  When the volume is in reservation status other than persistent reservation status, "No" is displayed.

2 Select the volumes to release the reservation (multiple selections can be made), and click the [Release] button.

Note

Clicking the [Reset] button clears selections for all volumes.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The reservation status for the selected volume is released.

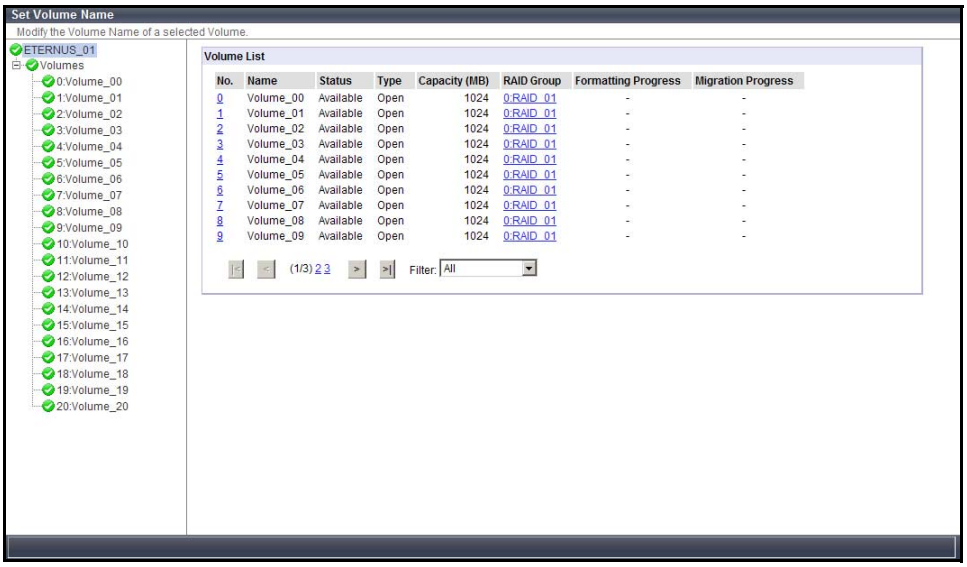
End of procedure

5.3.9 Set Volume Name

The [Set Volume Name] function changes the existing volume name.
The procedure to set volume name is as follows:

Procedure

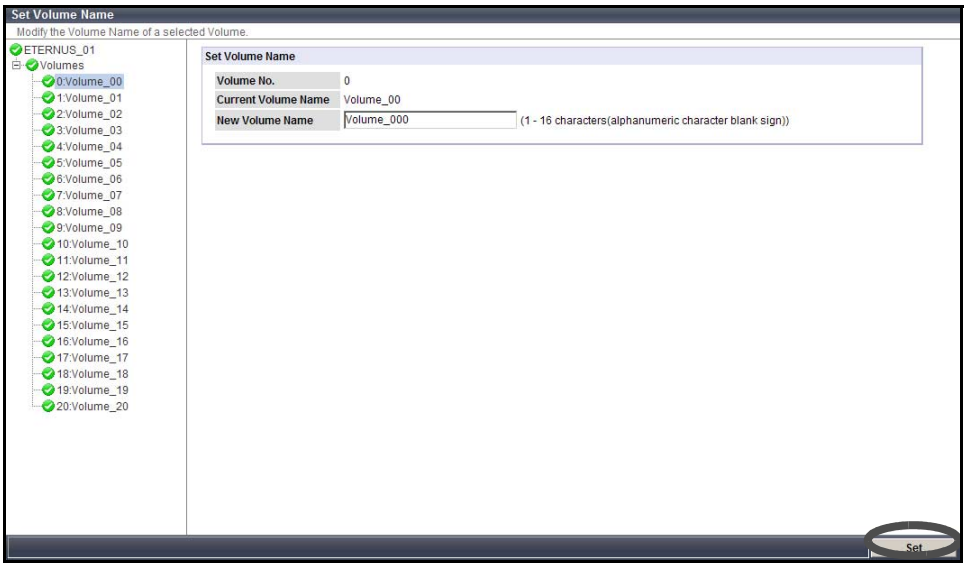
1. Click the [Set Volume Name] under the [Volume Management] menu on the [Volume Settings] tab.
   → The [Set Volume Name] screen appears.
2. Select the volume to change the volume name from the tree in the left of the screen, or "Volume List" field.



→ The "Set Volume Name" field is displayed.

3 Specify the following items, and click the [Set] button.

- Current Volume Name
  The current volume name is displayed.
- New Volume Name
  Enter the new volume name between 1 and 16 alphanumeric characters and symbols (including blanks).



→ A confirmation screen appears.

4 Click the [OK] button.

→ The selected volume name is changed.

End of procedure

5.3.10 Configure LUN Mapping

The [Configure LUN Mapping] function sets the relationship between a Logical Unit Number (LUN) and volume number. LUN mapping enables the server access to the volumes in the ETERNUS DX60/DX80.

● Maximum number of LUNs that can be accessed

Note that the number of LUNs that can be accessed varies depending on the host specific mode of host response that is set for the server.
The following table shows the maximum number of LUN mappings for each port.

Host specific mode of host response	ETERNUS DX60	ETERNUS DX80
Normal (other than HP-UX mode)	256	256
HP-UX mode	512	1,024

Caution

- When changing or deleting LUN mapping during operation, stop access from the server allocated to the target port.
- To add new LUN mapping, it is not necessary to stop the host access.
- Mapping to a "Work Volume" during RAID Migration is not allowed.
- When no volume is defined, this function cannot be used.
- Host affinity functions cannot be used in the following conditions:
  - When no affinity group is registered
  - When there is no port for which host affinity is enabled
  - When no server is registered to a port for which host affinity is enabled
- Host affinity group that is allocated to the server cannot be deleted.
- Up to 1,024 LUNs can be mapped by connecting two affinity groups. Servers can access 1,024 LUNs only when the host specific mode of the Host Response is "HP-UX mode". Note this when allocating the server and the Affinity Group.

When using the Host Affinity function

This section describes the following settings:

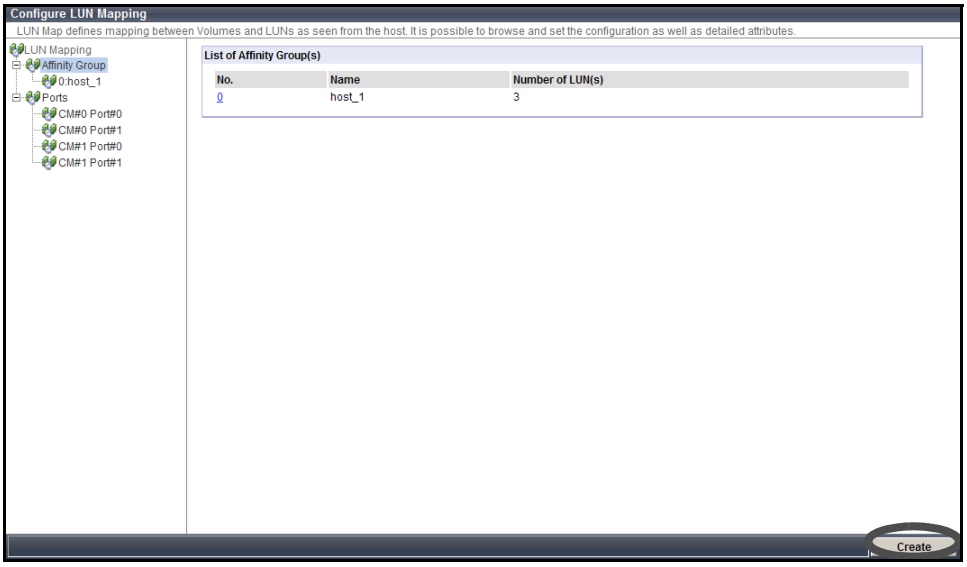
- LUN Mapping
- Affinity Group
- Port connected to the server
- Specific information (HBA) for the server to access the affinity group

This function creates an "affinity group", a combination of volumes and LUN (multiple groups may be created), and allocates them to each server.
The procedure to set LUN mapping when using the Host Affinity function is as follows:

Procedure

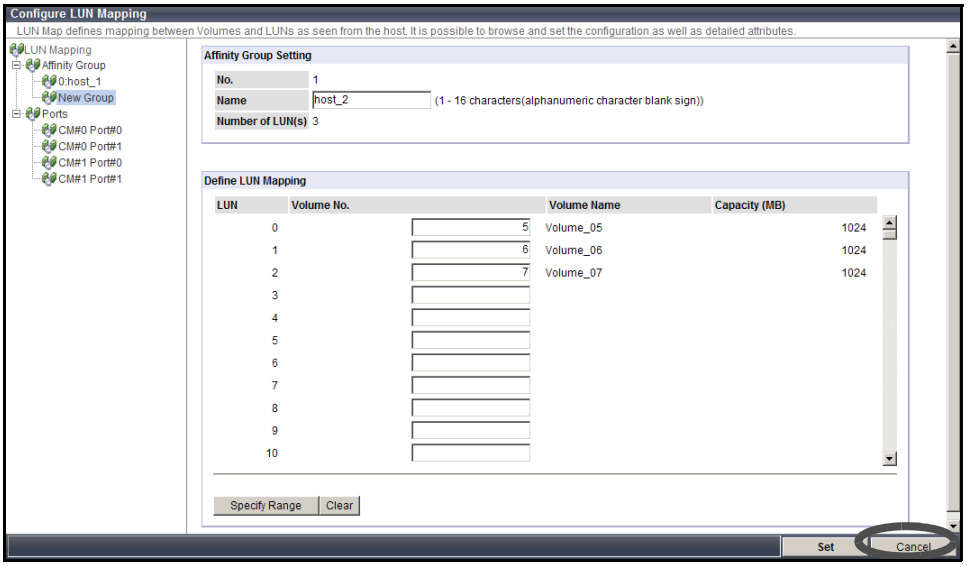
1. Click the [Configure LUN Mapping] under the [Volume Management] menu on the [Volume Settings] tab.
   → The [Configure LUN Mapping] screen appears.
2. Click the "Affinity Group" icon on the left of the screen.

3 Click the [Create] button.



→ The "Affinity Group Setting" and "Define LUN Mapping" fields are displayed.

4 Set the affinity group name, and volume number corresponding to the LUN, and click the [Set] button.



→ A confirmation screen appears.

5 Click the [OK] button.

→ The new affinity group is created. Go on to the next setting to allocate affinity group to the server.

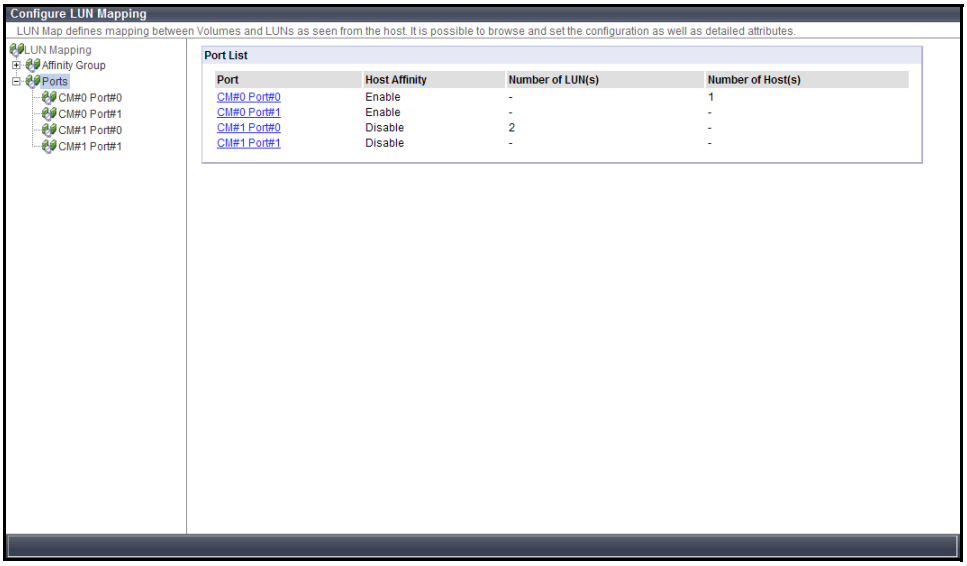
6 Click the [Configure LUN Mapping] under the [Volume Management] menu on the [Volume Settings] tab.

→ The [Configure LUN Mapping] screen appears.

7 Click the "Ports" icon on the left of the screen.

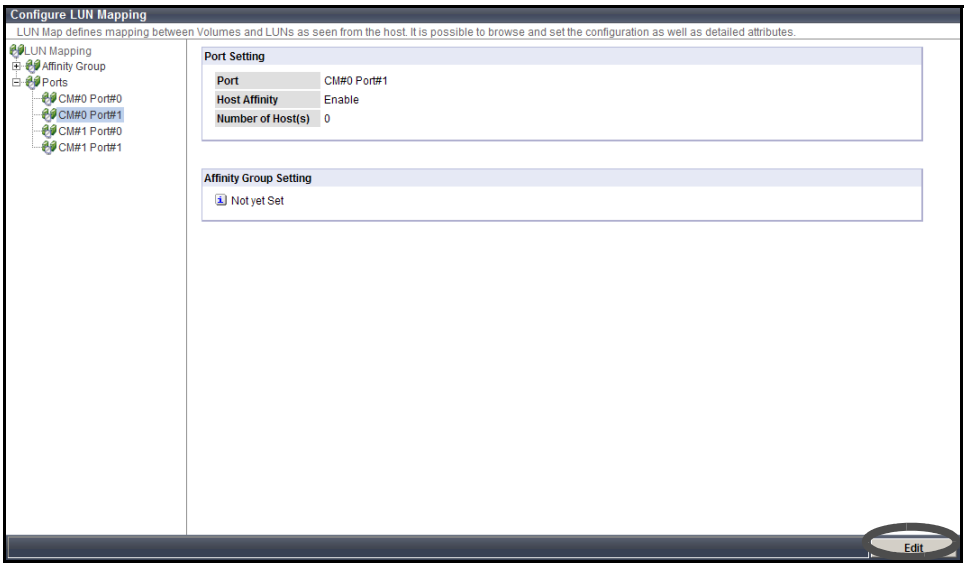
8 Select the port to be connected to the server from the tree in the left of the screen or Port List.

Caution Select a port in which "Host Affinity" is "Enable".



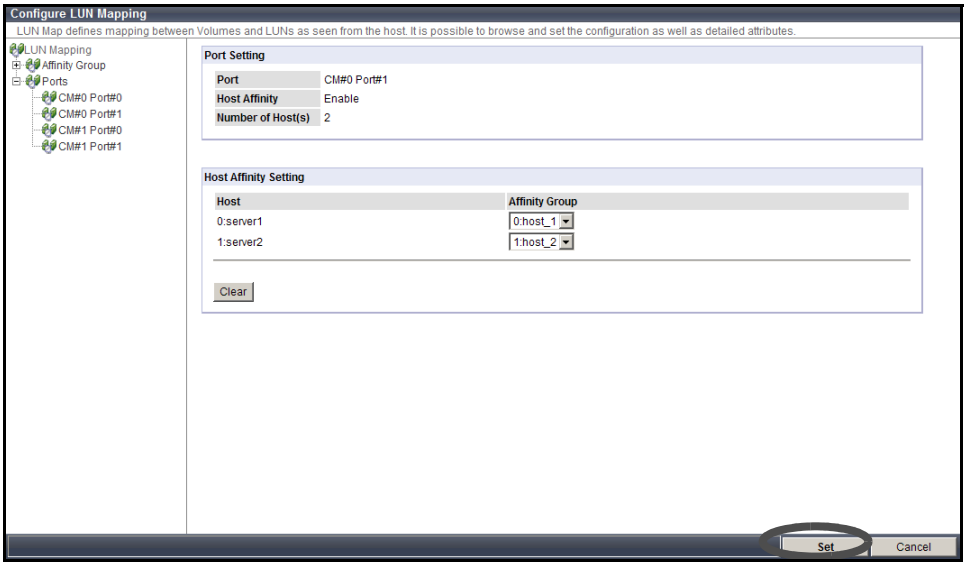
→ Detailed information of the selected port is displayed.

9 Click the [Edit] button.



→ The "Host Affinity Setting" field is displayed.

10 Allocate the affinity group to the server, and click the [Set] button.



→ A confirmation screen appears.

11 Click the [OK] button.

→ The host affinity setting is executed. LUN mapping configuration when using an affinity group completes.

Note

When changing or deleting the an affinity group, select the target affinity group from the tree in the left of screen or target affinity group listed in the "Affinity Group List" field, and click the [Edit] or [Delete] button.

End of procedure

When the Host Affinity function is not used

This section describes the following settings:

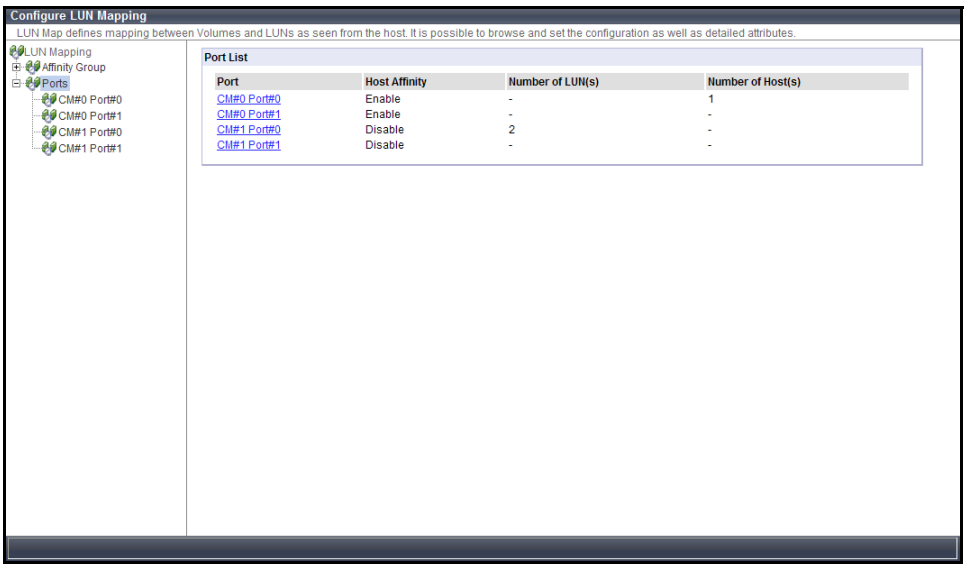
- LUN Mapping
- Port connected to the server

This function specifies the Host LUN allocation to the volume for each port.
The procedure to configure LUN Mapping when the Host Affinity function is not used is as follows:

Procedure

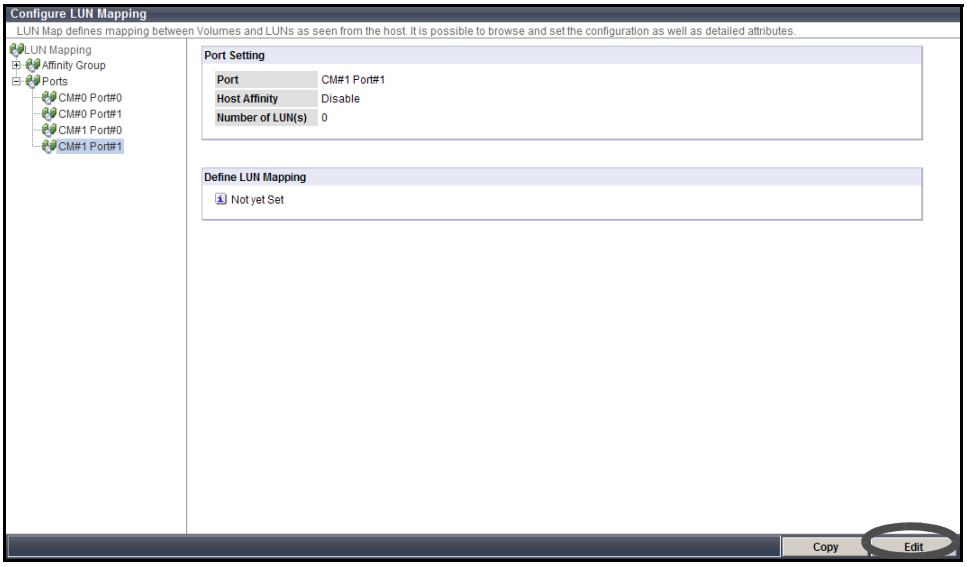
1. Click the [Configure LUN Mapping] under the [Volume Management] menu on the [Volume Settings] tab.
   → The [Configure LUN Mapping] screen appears.
2. Click the "Ports" icon on the left of the screen.
3. Select the target port from the tree in the left of the screen, or Port List.

Caution Select a port in which "Host Affinity" is "Disable".



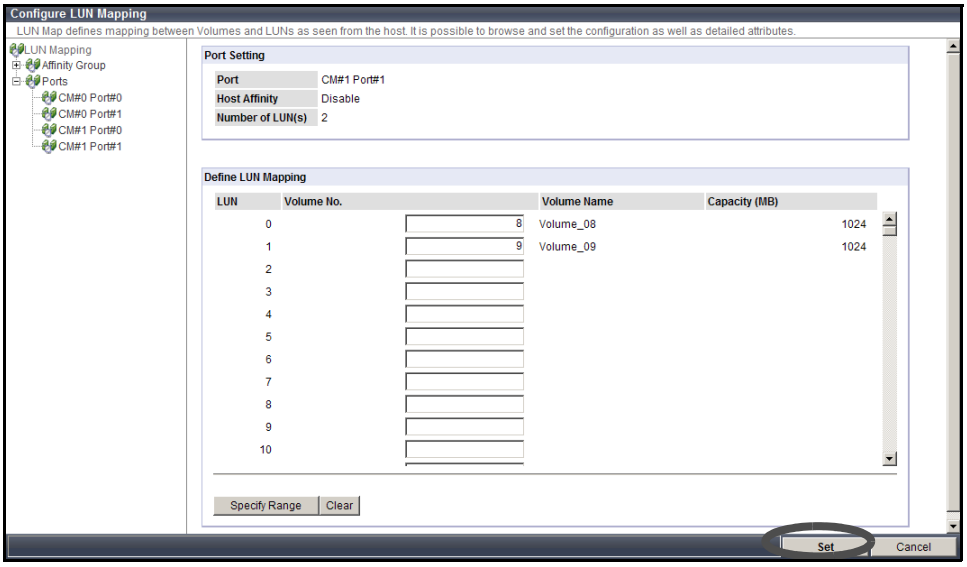
→ Detailed information of the selected port is displayed.

4 Click the [Edit] button.



→ The "Define LUN Mapping" field is displayed.

5 Change the LUN Mapping information for the target port, and click the [Set] button.



→ A confirmation screen appears.

6 Click the [OK] button.

→ LUN mapping is set.

End of procedure

5.4 Advanced Copy Management

Advanced Copy Management provides the following functions.

- Setup Snap Data Pool
- Manage Copy Session
- Register Copy License
- Modify Copy Parameters
- Modify EC/OPC Priority
- Modify Copy Table Size

Advanced Copy function

Advanced Copy is a function used to quickly copy data (volume) to another volume in the same device, at any given point in time. By using the copy destination volume, it is possible to backup data without suspending operations.

The copy function of ETERNUS DX60/DX80 can be used by the following methods:

- Copy in units of volumes using GUI or CLI command
- Obtaining snapshots of volumes by using the Windows Volume Shadow Copy Service function
- Obtaining backup and replication that is associated with operation by using the ETERNUS SF AdvancedCopy Manager

The copy function of ETERNUS DX60/DX80 creates a snapshot of the selected volume. Copy usage (such as backup and replication) and the procedure for copy vary depending on the OS and software to be used. Refer to the manuals for each OS and software for details.

Type of Advanced Copy

Equivalent Copy (EC) function and One Point Copy (OPC) function (*1) are available as the Advanced Copy function.

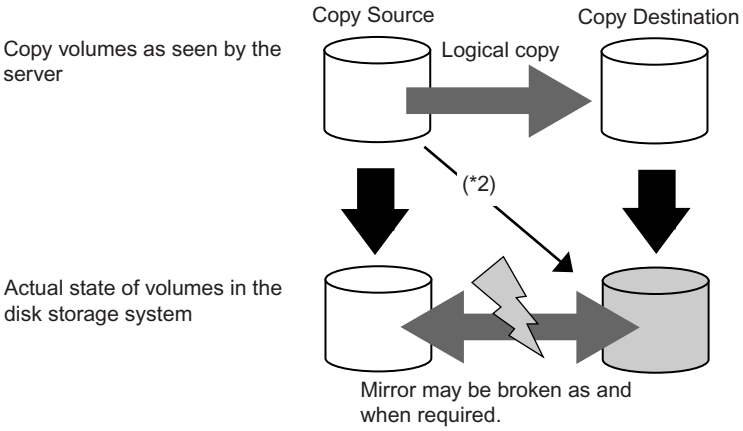
- EC
  EC is used when copying large volumes, or when processing time can be estimated easily.
- OPC
  OPC is used when it is difficult to estimate the backup time.

*1: In this manual, "OPC function" indicates OPC, QuickOPC, and SnapOPC+.

Each function is described below.

- EC (Mirror Breaking method)

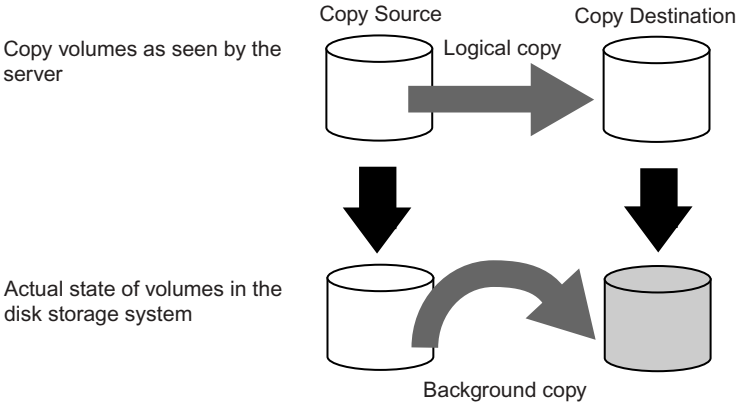
  EC makes a mirror copy of the copy source to the copy destination beforehand and then keeping it up to date while it is needed, at which time the mirror relationship is "broken" to reveal the desired copy.
  The updated data in the copy source will be reflected to the copy destination volume after completing the operation. After mirror is established, all writes are also duplicated.



*2: After mirror is established, all writes are also duplicated.

- OPC (Background Copy method)

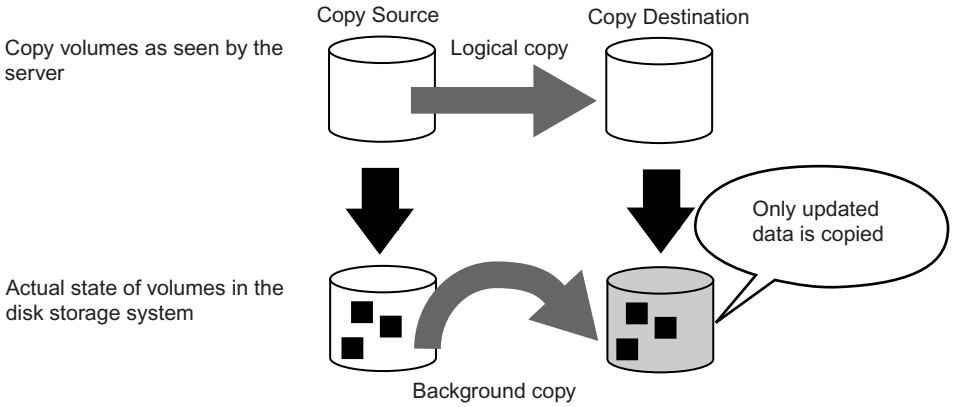
  The OPC function logically copies all data from the copy source to the copy destination in the same device, when the host requests the operation. The ETERNUS DX60/DX80 immediately returns an OPC completion response to the copy request. This function then allows prompt access to both the original and copied data while the actual physical copying proceeds in the background. Unlike EC, the updated data in the copy source will not be reflected to the copy destination volume after completing the operation.



The following functions relating to the OPC are also available.

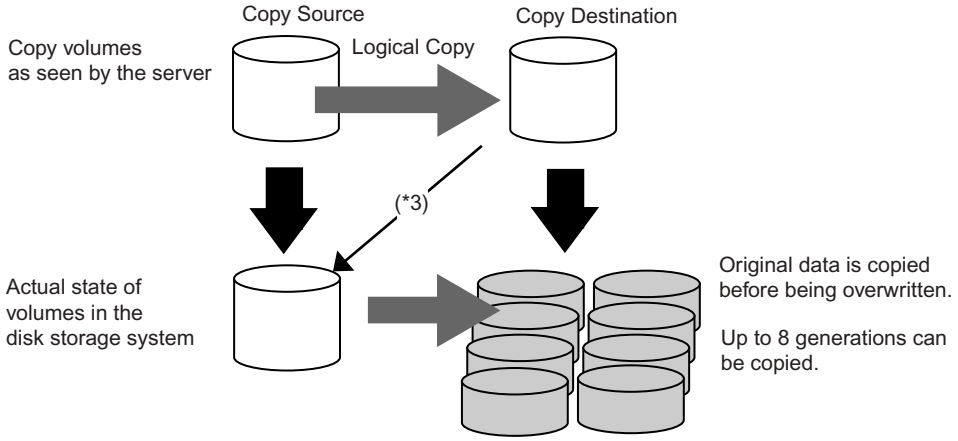
- QuickOPC

Just as for OPC, QuickOPC copies all the data in the copy source volume at the initial-physical copy. After the initial-physical copy has completed, only updated data needs to be copied hereafter. Because it reduces the copy volume and realizes high-speed backup, QuickOPC is recommended for backing up a large-scale database.



- SnapOPC+

SnapOPC+ manages data by allocating OPC data and sessions that form generations, and copies updated data only to the latest generation.
SnapOPC+ manages generations of differences between updated data as modification history. It enables copying to be performed with less physical capacity. Maximum number of generations varies depending on the ETERNUS models and software.
SnapOPC+ is recommended for backing up less updated volumes such as the file server.

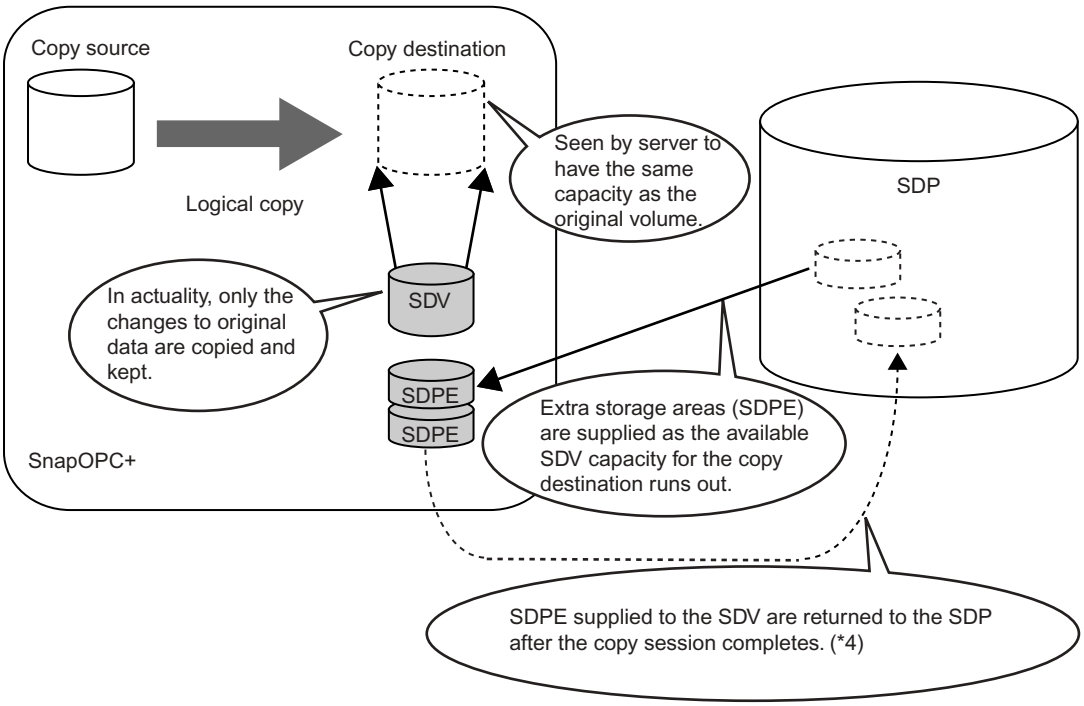


*3: Original data is referenced when an uncopied area is read.

SnapOPC+ uses the unique volume (Snap Data Volume: SDV) as a copy destination.
Also, a setting pool area for SDV (Snap Data Pool Volume), to continue the copy session even when the amount of update data exceeds the SDV capacity, is available.

- SDV (Snap Data Volume)
  SDV is an area used as a copy destination for SnapOPC+.
  Only one copy destination can be specified per SDV.
  Refer to "5.3.1 Create Volume" (page 93) for detailed procedure to create SDV.

- SDP (Snap Data Pool)
  SDP is a standby storage area to continue sessions even when the amount of update data exceeds the SDV capacity. It enables the storage area to be supplied from SDP to SDV as required. This continues the copy session even when the amount of update data exceeds the SDV capacity.
  Note that SDP is configured by a unique volume Snap Data Pool Volume (SDPV).
  Creating SDPV enables SDP.
- SDPV (Snap Data Pool Volume)
  SDPV is a unique volume for SDP.
  Created SDPV is automatically added to the SDP.
- SDPE (Snap Data Pool Element)
  SDPE is a unit of SDP that is managed in the ETERNUS DX60/DX80.
  Once the copy destination SDV capacity runs out, SDPEs are supplied from SDP to SDV and the storage area is automatically expanded. Supplied storage (SDPE) returns to SDP after the copy session complete.
  Note that SDPE capacity is fixed to 1GB.



*4: After the ETERNUS SF AdvancedCopy Manager completes the session instead of a user, another SnapOPC+ copy session may be created.
ETERNUS disk storage system returns the SDPE when accepting a SnapOPC+ session deletion request.

Preparations for the Advanced Copy function

This section describes how to prepare for using the Advanced Copy function and perform SnapOPC+.

- License registration

  Register a license for using the Advanced Copy function.
  If a license is not registered, up to eight copy sessions are available.

  Caution When an Advanced Copy feature is purchased, refer to "5.4.3 Register Copy License" (page 131) to register the license.

- Copy destination volume creation

  When performing the SnapOPC+, create SDV and SDP.
  Create the copy destination volume to store the copied data (SDV) and the pool area to store the copied data when all of the SDV capacity is used (SDPV).

  - SDV creation
    Create SDVs, the copy destination for SnapOPC+, in the RAID group.
    Refer to "5.3.1 Create Volume" (page 93).
  - SDP creation
    SDP is created automatically with Snap Data Pool Volume (SDPV).
    Create SDPVs in the RAID group.
    Refer to "5.4.1 Setup Snap Data Pool" (page 124).

  Caution
  - The RAID configurations of copy source and copy destination can be different.
  - Before setting SnapOPC+, prepare physical or SDPV area in the copy destination volume according to the amount of copy source capacity.
  - The Advanced Copy function cannot be used when either the copy source or copy destination volume is encrypted. Encrypt the both volumes in advance.

  - Copy table size setting
    Set the copy table size depending on the capacity of copy target volume.
    Refer to "5.4.6 Modify Copy Table Size" (page 135).
  - Copy priority setting
    Specify the copy priority in the ETERNUS DX60/DX80.
    Refer to "5.4.5 Modify EC/OPC Priority" (page 134).
  - Copy parameter setting
    Specify the threshold to report the shortage of SDP volume capacity during the copy operation.
    Refer to "5.4.4 Modify Copy Parameters" (page 132).

- Copy session management

  After preparation for Advanced Copy is complete, create a copy session to start copying volumes. During operation, also check the status of the copy sessions and delete unnecessary copy sessions.

  - SnapOPC+ copy execution
    Create a copy session to start the SnapOPC+ copy.
    Refer to "5.4.2 Manage Copy Session" (page 129).
  - SnapOPC+ copy check
    Check the status of created SnapOPC+ session using the [Advanced Copy Status] screen.
    The [Advanced Copy Status] displays the status of all the copy sessions.
    Refer to "4.4 Advanced Copy Status" (page 49).
  - Copy session deletion
    Delete unnecessary copy sessions.
    SDPs used by the deleted copy sessions are released. Data in the copy destination volume loses its meaning (becomes undefined).
    Refer to "5.4.2 Manage Copy Session" (page 129).

5.4.1 Setup Snap Data Pool

This section describes how to setup Snap Data Pool (SDP), the pool area for SDV.

Create SDPV

This function creates the SDPV in the registered RAID group.
When the SDPV creation process is completed, the SDPV will be formatted automatically.
The following table shows the conditions for SDPV creation.

- Condition of SDPV

  The SDPV capacity must be smaller than 2TB (2,048GB)

- Conditions of the RAID group to create SDPV

  - The status of the RAID group must be "Available" or "Present"
  - If volumes are created in the RAID group, the number of volumes in the RAID group must be less than 128
  - The free area for the RAID group must be equal or larger than 1GB
  - The RAID group must not be blocked
  - The RAID group must not be in the Logical Device Expansion process

- The maximum number of SDPVs that can be set

  The maximum number of SDPVs for ETERNUS DX60/DX80 is shown below.

Device name	per RAID group	per device
ETERNUS DX60	Up to 128	Up to 512
ETERNUS DX80	Up to 128	Up to 1,024

Caution

- If the encryption mode is disabled, encrypted SDPV cannot be created.
- The following functions cannot be used for SDPV:
  - Host Affinity settings
  - LUN mapping
  - Volume Encryption
  - LUN Concatenation
  - RAID Migration
- This function cannot be used in the following conditions:
  - No RAID groups are registered in the ETERNUS DX60/DX80
  - When no SDPV is created in the ETERNUS DX60/DX80, and the RAID group is in the following conditions:
    - Only one RAID group is registered in the ETERNUS DX60/DX80, and Logical Device Expansion is in progress in the RAID group
    - The status of all the RAID groups is not "Available", or "Present"
  - When no SDPV is created in the ETERNUS DX60/DX80, and the maximum number of volumes for each model is already registered.

Note

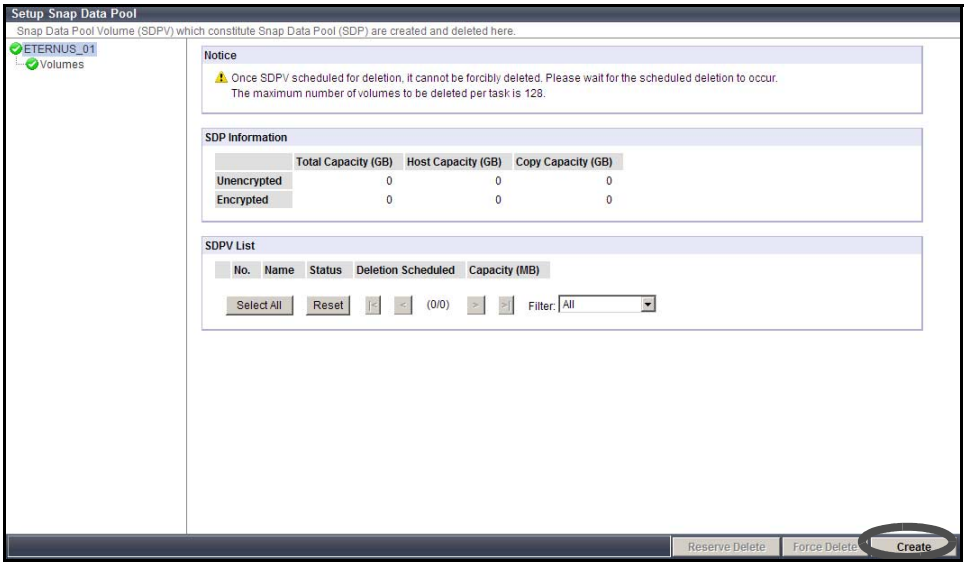
- Unlike other volumes, SDPV cannot be created by "5.3.1 Create Volume" (page 93) menu or deleted by "5.3.2 Delete Volume" (page 96) menu.
- While SDPV can be created in any level RAID group, it is recommended that the same RAID group configuration be used for all SDPVs created.
- The maximum capacity of SDP is 32TB for ETERNUS DX60, and 64TB for ETERNUS DX80.
- Allocated space (SDPE) to SDV from the SDPV is released in the following conditions:
  - When deleting the SnapOPC+ session:
    If one SnapOPC+ session is deleted, all the SnapOPC+ sessions started earlier than that session are also deleted. The space used in the SDV for the stopped generation is released.
  - When the SnapOPC+ session turns to "Error" status:
    If one SnapOPC+ session status turns to Error, the status for all the SnapOPC+ sessions started earlier than that session also change to Error. The space used in the SDV for the generation in Error status is released.

The procedure to create SDPV is as follows:

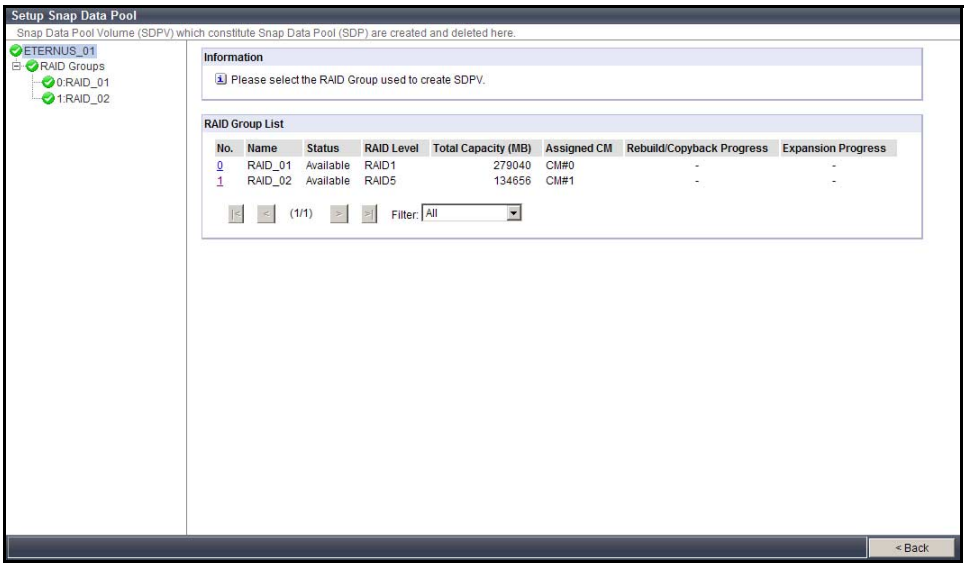
Procedure

1. Click the [Setup Snap Data Pool] under the [Advanced Copy Management] menu on the [Volume Settings] tab.
   → The [Setup Snap Data Pool] screen appears.

2 Click the [Create] button.



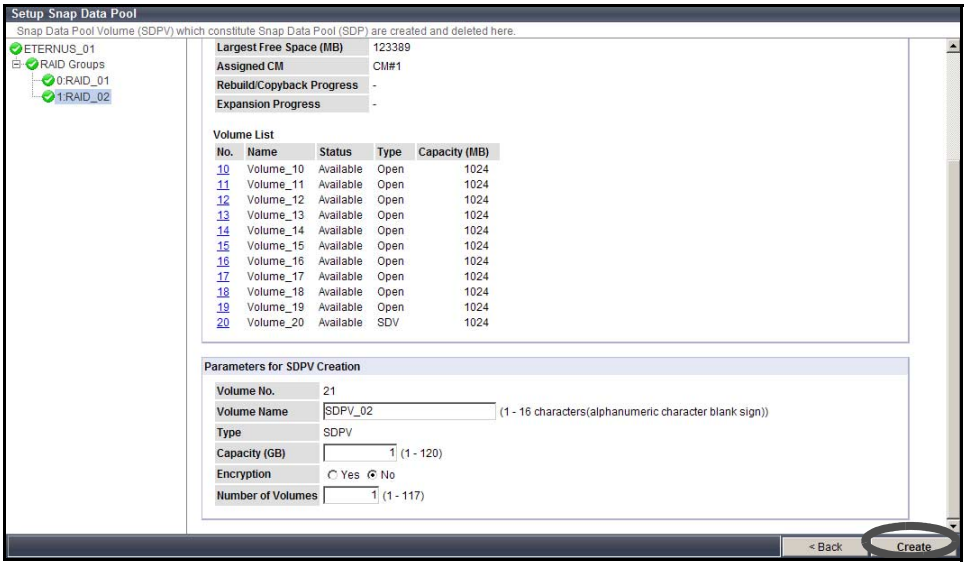
3 Select the target RAID group icon in the tree on the left of the screen or RAID Group List where the SDPV is created.



→ The detailed information of the selected RAID group is displayed.

4 Specify the following items, and click the [Create] button.

- Volume Name
  Enter the SDPV name to be created.
- Type
  The volume type (SDPV) is displayed.
- Capacity (GB)
  Specify the SDPV capacity.
- Encryption
  Select "Yes" or "No" to enable or disable the encryption mode for the new volume.
- Number of Volumes
  When creating multiple volumes with the same type and capacity, enter the number of volumes to be created.
  Note that all the volumes are created with the same name. Change the volume name (refer to "5.3.9 Set Volume Name" (page 111)) if needed.



→ A confirmation screen appears.

5 Click the [OK] button.

→ Snap Data Pool setting is started. The SDPV is created in the selected RAID group. After SDPV is created, new volume is automatically formatted.

End of procedure

Delete SDPV

This function deletes the registered SDPV.
There are two methods for deletion: "Reserve Delete" and "Force Delete".

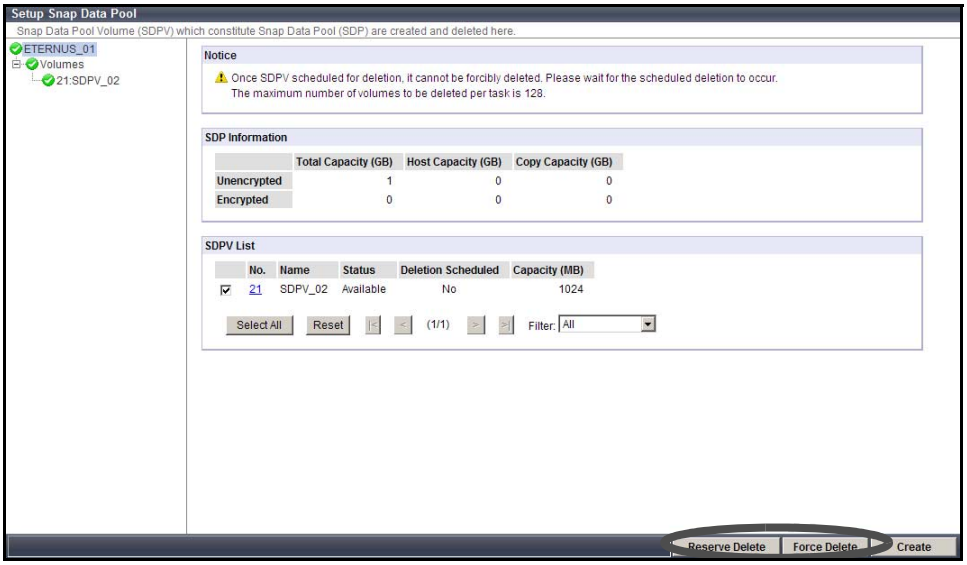
- Reserve Delete
  If the target SDPV is being used, the SDPV is scheduled for deletion. SDPV that is scheduled for deletion will be deleted after the Advanced Copy session completes (when the usage of SDPV becomes "0").
- Force Delete
  The selected SDPV is forcibly deleted even if the copy session is under progress. However, SDPV that is scheduled for deletion cannot be deleted. Wait for the scheduled deletion to occur.

Caution Up to 128 SDPVs can be deleted at the same time.

The procedure to delete SDPV is as follows:

Procedure

1. Click the [Setup Snap Data Pool] under the [Advanced Copy Management] menu on the [Volume Settings] tab.
   → The [Setup Snap Data Pool] screen appears.
2. Select the target SDPV from the tree on the left of the screen or "SDPV List" field, and click the [Reserve Delete] button or [Force Delete] button.



3 Click the [OK] button.

→ The selected SDPV is deleted.

End of procedure

5.4.2 Manage Copy Session

The [Manage Copy Session] function creates and deletes the Advanced Copy session.

Caution Only the SnapOPC+ copy sessions can be created using GUI.
For creating EC, OPC, QuickOPC sessions, use copy management software for the server.

Create Copy Session

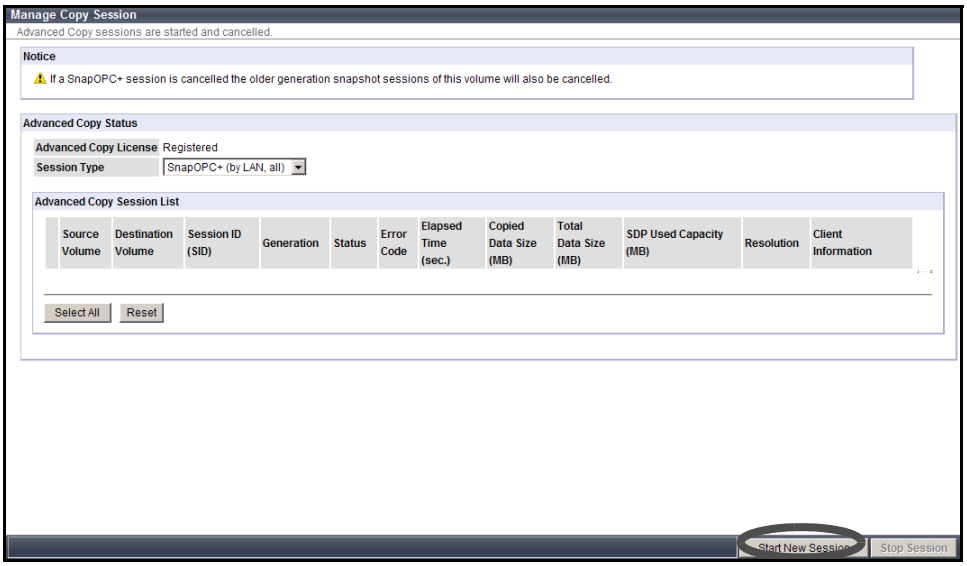
The procedure to create copy session is as follows:

Procedure

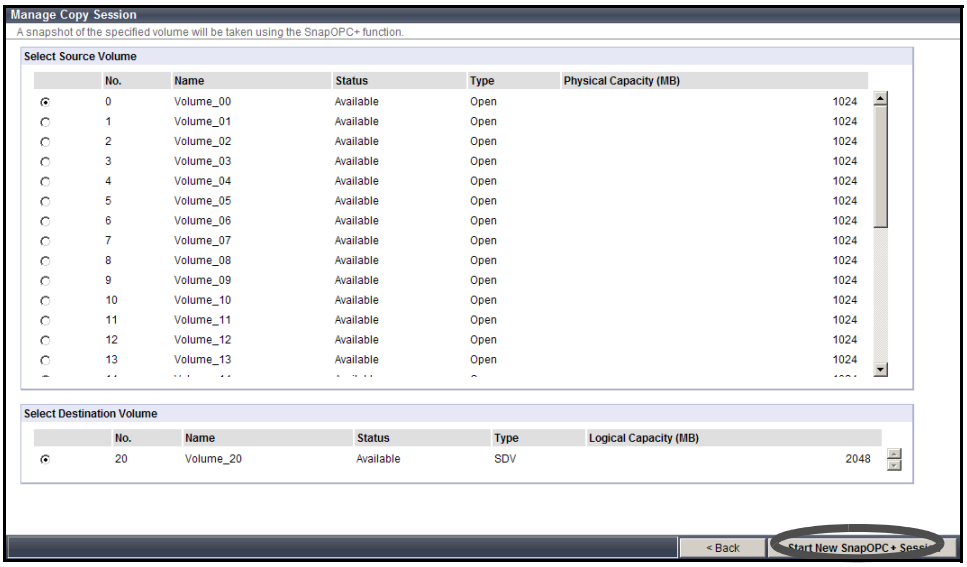
1 Click the [Manage Copy Session] under the [Advanced Copy Management] menu on the [Volume Settings] tab.

→ The [Manage Copy Session] screen appears.
The Advanced Copy session list is displayed.

2 Click the [Start New Session] button.



3 Select the copy source volume and copy destination volume, and click the [Start New SnapOPC Session] button.



→ A confirmation screen appears.

4 Click the [OK] button.

→ The created Advanced Copy session is started.

End of procedure

Delete Copy Session

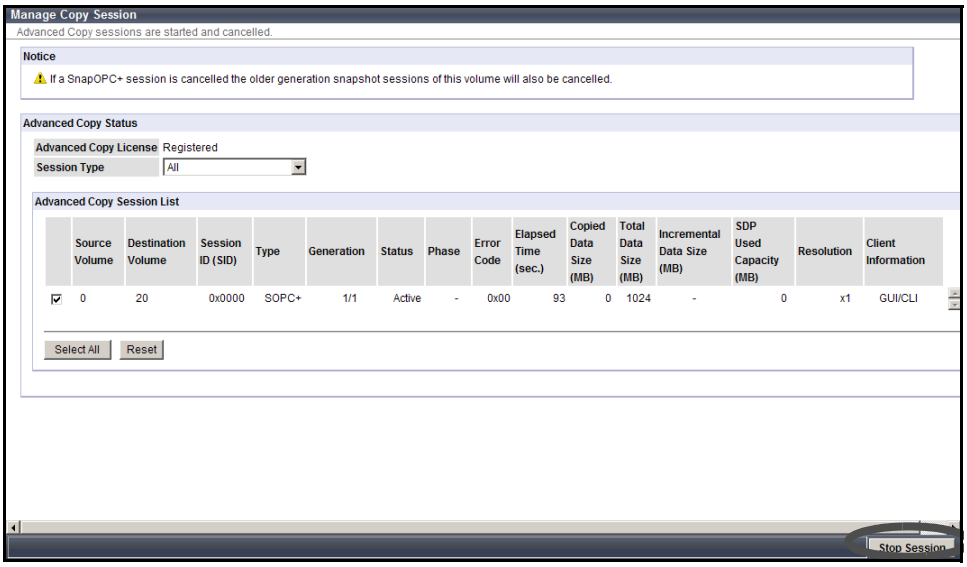
The procedure to delete copy session is as follows:

Procedure

1 Click the [Manage Copy Session] under the [Advanced Copy Management] menu on the [Volume Settings] tab.

→ The [Manage Copy Session] screen appears.
The list of Advanced Copy session registered in the ETERNUS DX60/DX80 is displayed.

2 Select the copy session to be deleted from the "Advanced Copy Session List", and click the [Stop Session] button.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The selected Advanced Copy session is deleted.

End of procedure

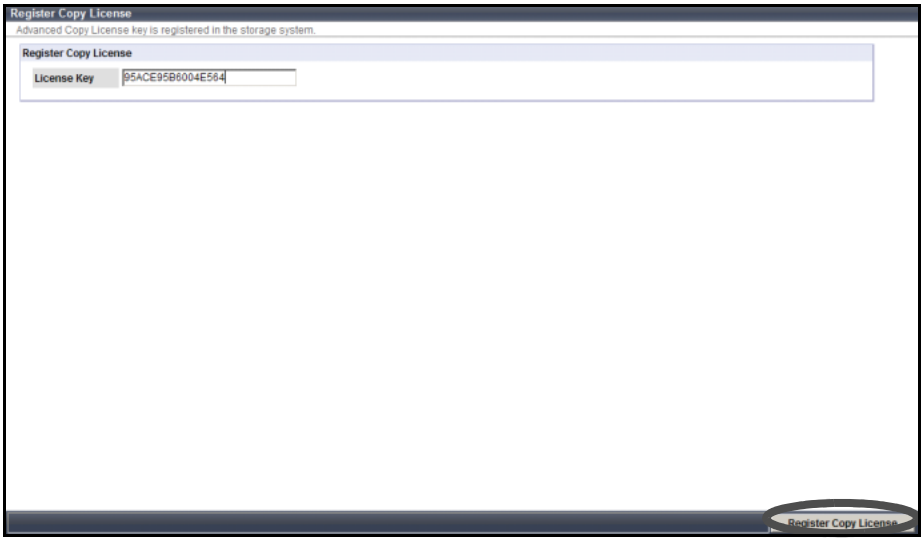
5.4.3 Register Copy License

The [Register Copy License] function is used to register an Advanced Copy license.
The procedure to register a copy license is as follows:

Procedure

1 Click the [Register Copy License] under the [Advanced Copy Management] menu on the [Volume Settings] tab.
→ The [Register Copy License] screen appears.

2 Input the license key, and click the [Register Copy License] button.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The Advanced Copy License is registered.

End of procedure

5.4.4 Modify Copy Parameters

The [Modify Copy Parameters] function sets the parameters to enable automatic reporting and processing when a SDP capacity shortage occurs during the SnapOPC+ operation.
If the copy source data exceeds the physical capacity of copy destination (and when the free SDP does not exist), an error occurs in the relevant copy session and other older copy sessions. This function prevents stopping copy session when the capacity shortage occurs.
There are three methods for notification; E-mail, SNMP Trap, and Host Sense. ETERNUS DX60/DX80 reports the notification using the method specified in the "Setup Event Notification" screen. Select whether to notify when a SDP capacity shortage occurs. When notifying, select the notification method in advance.
The procedure to modify copy parameters is as follows:

Procedure

1 Click the [Modify Copy Parameters] under the [Advanced Copy Management] menu on the [Volume Settings] tab.
→ The [Modify Copy Parameters] screen appears.

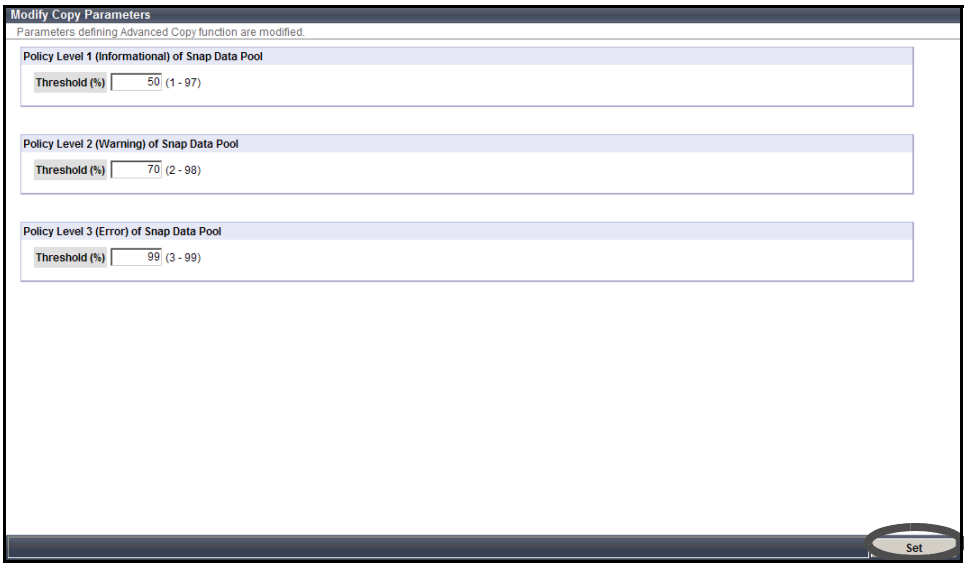
2 Specify the following items, and click the [Set] button.

Select the threshold for SDP usage ratio.

- Policy Level 1 (Informational) of Snap Data Pool
  - Threshold (%)
    Specify the usage ratio of SDP between 1 and 97.
    If the copy source data exceeds the specified value, the ETERNUS DX60/DX80 notifies that effect.
- Policy Level 2 (Warning) of Snap Data Pool
  - Threshold (%)
    Specify the usage ratio of SDP between 2 and 98.
    If the copy source data exceeds the specified value, the ETERNUS DX60/DX80 notifies that effect.
- Policy Level 3 (Error) of Snap Data Pool
  - Threshold (%)
    Specify the usage ratio of SDP between 3 and 99.
    If the copy source data exceeds the specified value, the ETERNUS DX60/DX80 notifies that effect.

Caution

- When reporting automatically if the threshold is exceeded, set the notification method using the method specified in the "6.2.7 Setup Event Notification" (page 160) in advance.
- Notification of the shortage of SDP capacity is sent only once for each policy level. Even if the threshold is satisfied again within the 24 hours from the first notification, the ETERNUS DX60/DX80 does not report that effect. After 24 hours has passed, the device sends a notification again.
- If the threshold for multiple policies is satisfied at the same time, the ETERNUS DX60/DX80 notifies of the highest policy level.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The specified copy parameters are registered.

End of procedure

5.4.5 Modify EC/OPC Priority

The [Modify EC/OPC Priority] function is used to set the copy speed when using EC and OPC (OPC, QuickOPC, and SnapOPC+).
The EC/OPC speed is usually set in consideration of the host's I/O load and copy processing load. The set speed of EC/OPC becomes effective when the next session starts.

Select the EC/OPC priority from the following:

- Automatic Priority
  This mode changes the EC/OPC priority automatically in response to the operating load status.
  This is the default setting.
- High Priority
  This mode operates by making maximum use of internal resources.
  This mode greatly affects host access performance, thus should not be used during normal operation. Use when the operation load is low.
- Low Priority
  This is a mode in which the influence on host access is reduced to a minimum.
  Set this mode when using EC and/or OPC during operation.

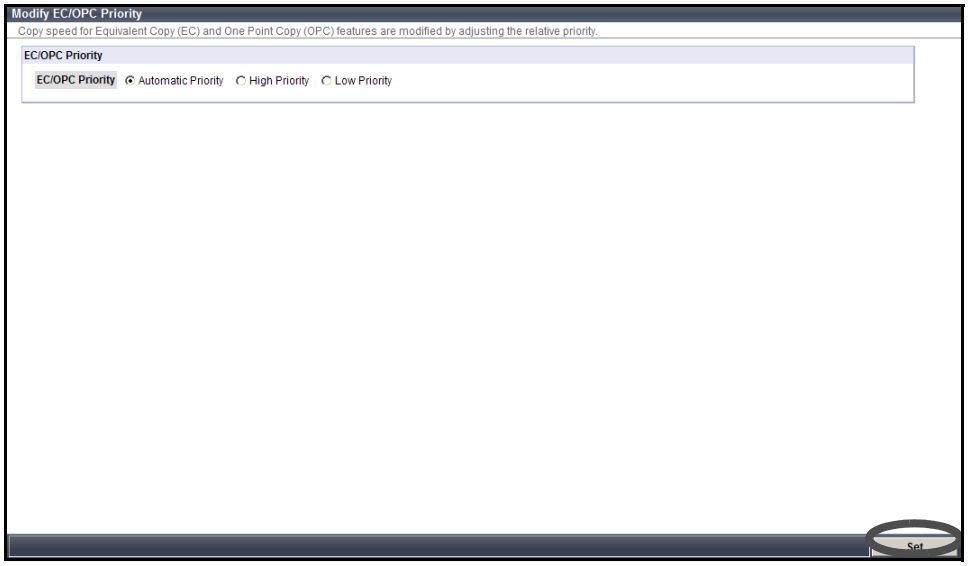
The procedure to modify EC/OPC priority is as follows:

Procedure

1 Click the [Modify EC/OPC Priority] under the [Advanced Copy Management] menu on the [Volume Settings] tab.
→ The [Modify EC/OPC Priority] screen appears.

2 Specify the following item, and click the [Set] button.

- EC/OPC Priority
  Select the EC/OPC speed from "Automatic Priority", "High Priority", or "Low Priority".



→ A confirmation screen appears.

3 Click the [OK] button.

→ The selected EC/OPC priority is set.

End of procedure

5.4.6 Modify Copy Table Size

The [Modify Copy Table Size] function is used to set the control table size on the CM cache memory installed in the ETERNUS DX60/DX80, which is used by the device firmware.
When an EC, or OPC (OPC, QuickOPC, or SnapOPC+) function is in use, this control table (hereafter: copy table) is used as the bitmap area that manages the progress of the copy.
Changed settings will be effective when the next session is started.

Caution

- When the copy table size is equal to 0MB, copy functions cannot be used. Note that the initial (factory default) copy table size setting is 0MB.
- Make sure to stop the copy session before reducing the copy table size.
- The copy session status can be checked from the [Advanced Copy Status] screen on the [Status] tab.

Copy table size (table size) and resolution vary according to the copy capacity and number of sessions that are operated at the same time.

(1) Resolution

This value determines the amount of data each bit in the copy bitmap represents.
The allowed resolution settings of "1 (standard)", "2", "4", "8", and "16" respectively give 8KB, 16KB, 32KB, 64KB, and 128KB regions of data per bitmap bit. The same value is used in the ETERNUS DX60/DX80.
The resolution should be set as small as possible to reduce the internal process overhead. Set "1" if possible.

(2) Copy Table Size

A dedicated memory area is required for Advanced Copy management and is allocated as a table size.
The table size and resolution settings are determined by the copy capacity and the number of sessions (volumes) that will be run simultaneously. The following shows the table sizing formula.

S (Table size) [MB] =
S1 (EC table size) [MB]
+ S2 (OPC table size without OPC Restoration) [MB]
+ S3 (OPC table size with OPC Restoration) [MB]
+ S4 (QuickOPC table size without OPC Restoration) [MB]
+ S5 (QuickOPC table size with OPC Restoration) [MB]
+ S6 (SnapOPC+ table size) [MB]

Caution

- Round the derived value up to the next multiple of 8 to obtain the correct setting for the copy table size.
- A copy table of the appropriate size (as derived above) is created in each controller (CM0/CM1).
- If the total table size value (S) exceeds the maximum size allowed, adjust the resolution (M) upward until the maximum table size is no longer exceeded. The resolution should be kept as small as possible.
- Maximum allowed table sizes are as follows:
  ETERNUS DX60: 64MB
  ETERNUS DX80: 128MB
- Allowance should be made for possible future increases in the copy capacity when calculating the EC/OPC/QuickOPC/SnapOPC+ table size.
- If the resolution is changed during an existing copy session, the following table sizing formula is not applied.

● EC table size (S1)

M: Resolution
C1: EC copy capacity [GB](*1)
N1: Number of EC sessions

S1 [MB] = ((2 × C1 / M) + N1) × 8 [KB] / 1024 (counting fractions as one)

● OPC table size without OPC Restoration (S2)

M: Resolution
C2: Copy capacity for OPC where OPC is not used for OPC Restoration [GB](*1)
N2: Number of OPC sessions where OPC is not used for OPC Restoration

S2 [MB] = ((2 × C2 / M) + N2) × 8 [KB] / 1024 (counting fractions as one)

- OPC table size with OPC Restoration (S3)

  M: Resolution

  C3: Copy capacity for OPC where OPC is used for OPC Restoration [GB](*1)
  N3: Number of OPC sessions where OPC is used for OPC Restoration

  S3 [MB] = ((2 × C3 / M) + N3) × 2 × 8 [KB] / 1024 (counting fractions as one)

- QuickOPC table size without OPC Restoration (S4)

  M: Resolution

  C4: Copy capacity for QuickOPC where QuickOPC is not used for OPC Restoration [GB](*1)
  N4: Number of QuickOPC sessions where QuickOPC is not used for OPC Restoration

  S4 [MB] = ((2 × C4 / M) + N4) × 2 × 8 [KB] / 1024 (counting fractions as one)

- QuickOPC table size with OPC Restoration (S5)

  M: Resolution

  C5: Copy capacity for QuickOPC where QuickOPC is used for OPC Restoration [GB](*1)
  N5: Number of QuickOPC sessions where QuickOPC is used for OPC Restoration

  S5 [MB] = ((2 × C5 / M) + N5) × 3 × 8 [KB] / 1024 (counting fractions as one)

- SnapOPC+ table size (S6)

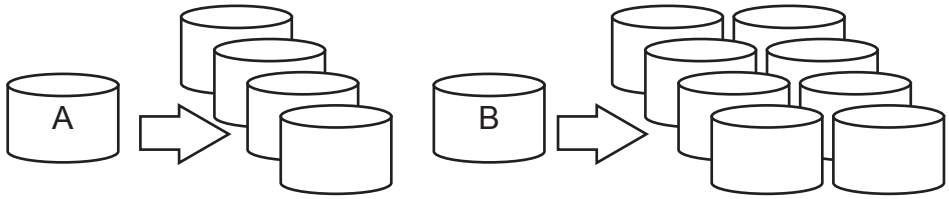
  M: Resolution

  C6: Copy capacity for SnapOPC+ [GB](*2)

  N6: Number of SnapOPC+ sessions(*3)

  S6 [MB] = ((2 × C6 / M) + N6) × 8 [KB] / 1024 (counting fractions as one)

*1: For EC, OPC, and QuickOPC copy sources, the copy capacity is the total capacity of all volumes (slices or partitions) in the ETERNUS DX60/DX80 that are defined as copy sources.
For multi-copy sessions, the copy capacity is the total capacity of multi-copy source volumes (slices or partitions), multiplied by the number of multi-copy destinations for each copy source.
[Example] Calculating capacity of multi-copy sessions:
Copy area in the copy source volume A: 200MB, Multi-copy destination: 4
Copy area in the copy source volume B: 500MB, Multi-copy destination: 8



200 × 4 + 500 × 8 = 4800MB.
Add this 4,800MB to the copy capacity C1, C2, or C4, depending on the copy type. (For EC, add the value to C1. For OPC, add the value to C2. For QuickOPC, add the value to C4.)
When using EC, add the number of multi-copy sessions to obtain N1. When using OPC, add the number of multi-copy sessions to obtain N2. When using QuickOPC, add the number of multi-copy sessions to obtain N4. In this example, use 12 (= 4 + 8) for N1, N2, or N4, depending on the copy type.
When using multi-copy and executing OPC Restoration from the copy destination, select one copy destination and apply the above formula. (For QuickOPC, the QuickOPC destination should be used.)
Other copy destinations are calculated as for normal multi-copy.

*2: For SnapOPC+, copy capacity indicates the total capacity of SnapOPC+ copy source volumes (slices or partitions) × number of generations in a device.
[Example] Calculating capacity of SnapOPC+ sessions:
SnapOPC+ copy area in the copy source volume C: 200MB, Number of SnapOPC+ generations: 8
SnapOPC+ copy area in the copy source volume D: 500MB, Number of SnapOPC+ generations: 4

Capacity of SnapOPC+ copy source = 200 [MB] × 8 + 500 [MB] × 4 = 3600 [MB]
3600 [MB] derived above is the copy source capacity C6.

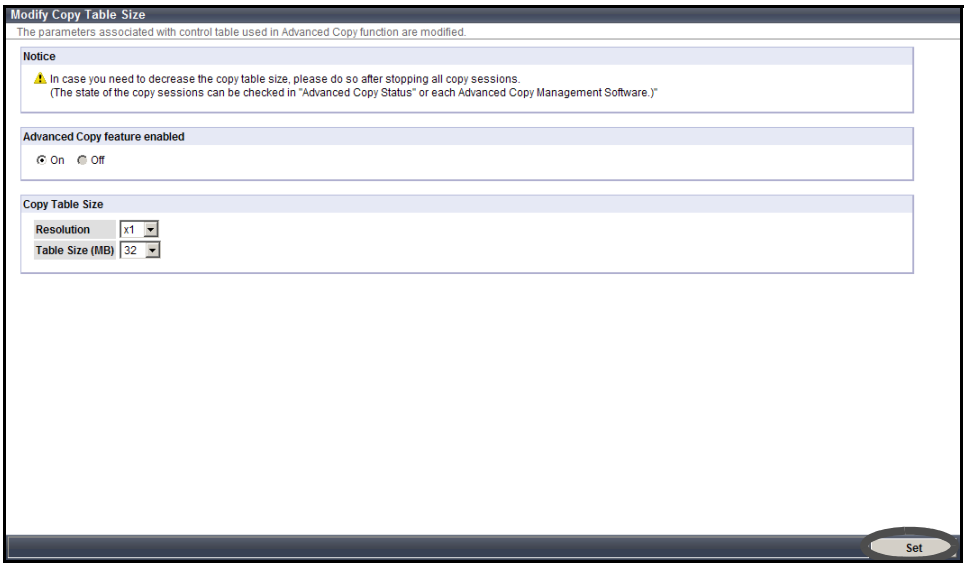
*3: In the example above, use 12 (= 8 + 4) for N6, the number of SnapOPC+ sessions (total number of generations).

The procedure to set the copy table size is as follows:

Procedure

1. Click the [Modify Copy Table Size] under the [Advanced Copy Management] menu on the [Volume Settings] tab.
   → The [Modify Copy Table Size] screen appears.
2. Specify the following items, and click the [Set] button.
   - Advanced Copy feature enabled
     Select whether to turn the Advanced Copy feature "On" or "Off".
   - Resolution
     Select from "× 1", "× 2", "× 4", "× 8", or "× 16".
   - Table Size (MB)
     For ETERNUS DX60, select between 0 and 64 (MB). For ETERNUS DX80, select between 0 and 128 (MB). (Unit: 8MB)

Caution Stop the copy session before reducing the table size.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The copy table size is set.

End of procedure

Chapter 6 Global Settings

This chapter describes the ETERNUS DX60/DX80 global setting menu.
The global settings provides the following functions:

- User Management
- Network Settings
- Remote Support
- System Settings
- Host I/F Management

6.1 User Management

This section describes how to manage the user account.

User Role

The available functions depend on the user role (privileges of the account) used to logon.
The following table provides the description for each user role.

User role	Available functions	Default account
Advanced	"Advanced" is a maintenance engineer privilege. Functions such as status display, configuration management, and maintenance functions are available.	f.ce
Standard	"Standard" is a system administrator privilege. Functions such as status display and configuration management are available.	root
Monitor	"Monitor" is a general user privilege. Only the status display function is available.	None

6.1.1 Setup User Account

The [Setup User Account] function adds, edits, and deletes the user account.

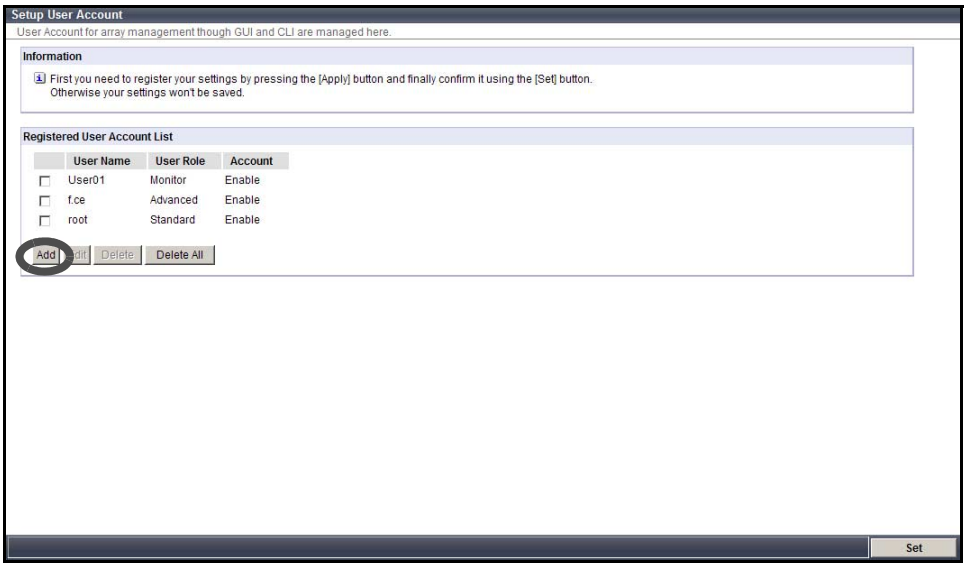
Caution

- Up to 16 users including default accounts (f.ce and root) can be registered.
- Default accounts (f.ce and root) can be edited or deleted.
- Entered letters are case-sensitive.
- The current user account (your account) can be changed or deleted. When deleting a user account, at least one manager account (Standard or Advanced) must remain. The changed or deleted setting will be available from next logon.

The procedure to add a new user is as follows:

Procedure

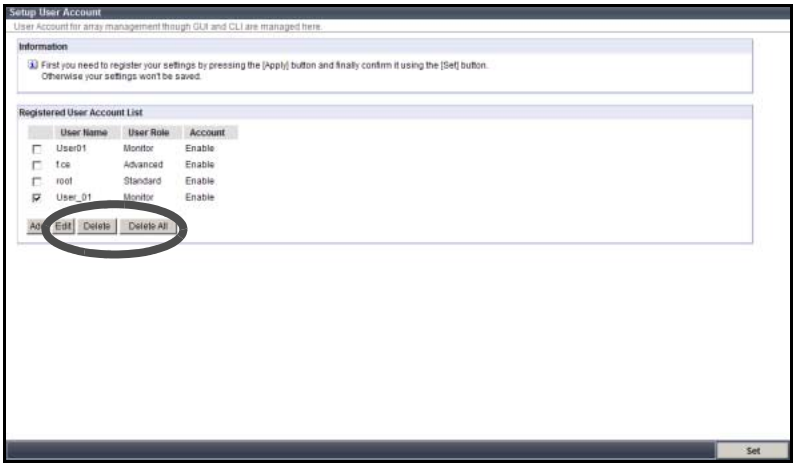
1. Click the [Setup User Account] under the [User Management] menu on the [Global Settings] tab.
   → The [Setup User Account] screen appears.
2. Click the [Add] button.



→ The "Add New User Account" field is displayed.

Note

When editing or deleting the user account, select the target user account from the "Registered user Account List" field, and click the [Edit] or [Delete] button. When deleting all the registered user accounts, click the [Delete All] button.



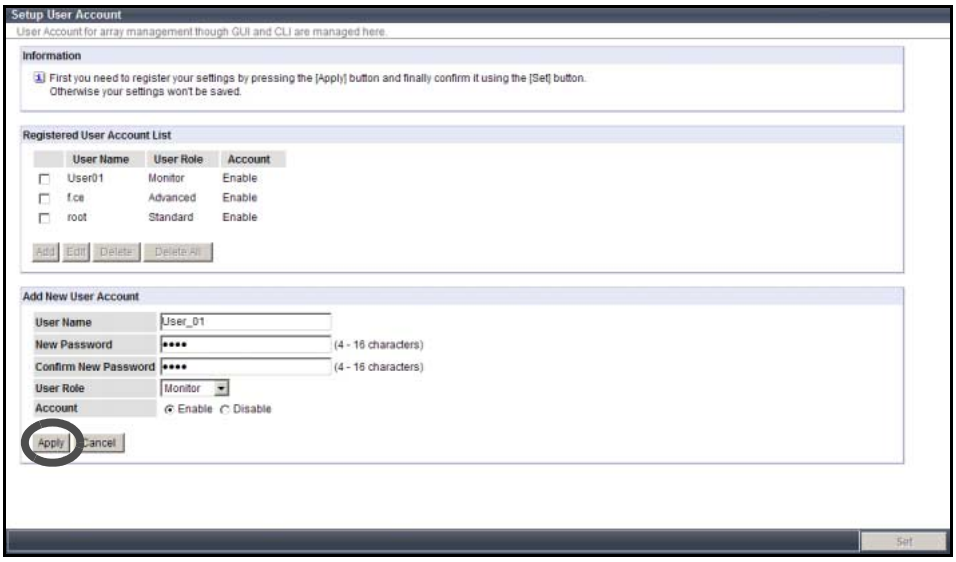
3 Specify the following items, and click the [Apply] button.

- User Name
  Set the user name between 4 to 16 characters.
  Alphanumeric characters and symbols ([!], [-], [_], [.]) can be used.
- New Password
  Set the password between 4 to 16 characters.
  Alphanumeric characters and symbols ([!], [-], [_], [.]) can be used.
- Confirm New Password
  Input the same character strings as the value entered in the "New Password" field for confirmation.
- User Role
  Select the user role from "Advanced", "Standard", and "Monitor".
  Select "Advanced" for the maintenance engineer account, select "Standard" for the system administrator account, and select "Monitor" for a general user account.
  Refer to "2.5 Operation Screens" (page 19) for available functions for each privilege.
- Account
  Select whether to "Enable" or "Disable" the user account.

Caution

When registering a user account, an error occurs in the following conditions.

- When the specified user name is already registered
- When the "User Name", "New Password", and/or "Confirm New Password", are not entered
- When the password does not match the confirmation password
- When the user name or password is less than 4, or more than 16 characters (If 17 or more characters are entered, ETERNUS DX60/DX80 ignores the 17th and later characters, and the password is registered using the first 16 characters only)
- When the user name or password includes characters other than alphanumeric characters and symbols ([!], [-], [_], [.])

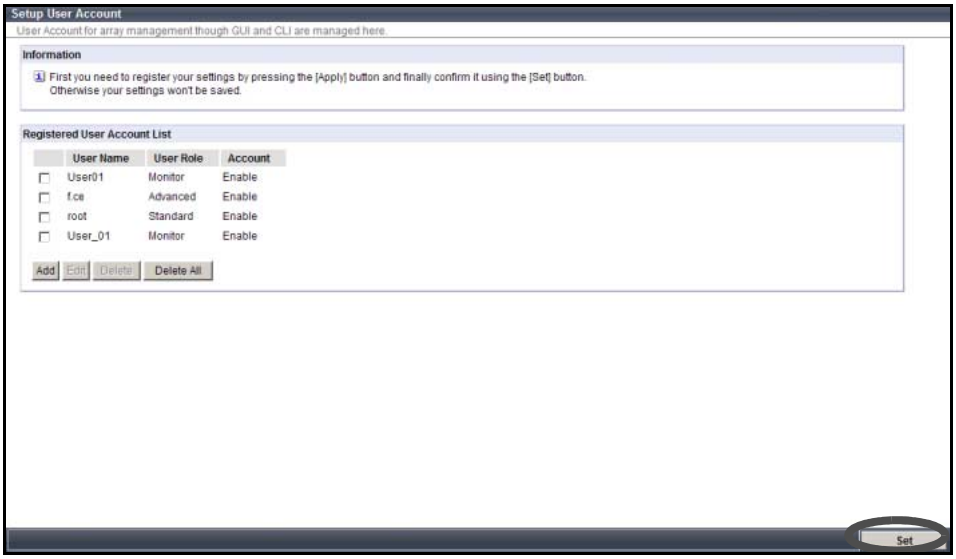


→ The new user account is added in the "Registered User Account List" field.

Note

Repeat Step 3 as required.

4 Click the [Set] button.



→ A confirmation screen appears.

5 Click the [OK] button.

→ New user account is registered in the ETERNUS DX60/DX80.

End of procedure

6.1.2 Change User Password

The [Change User Password] function changes the current user's (your) password.
The procedure to change your password is as follows:

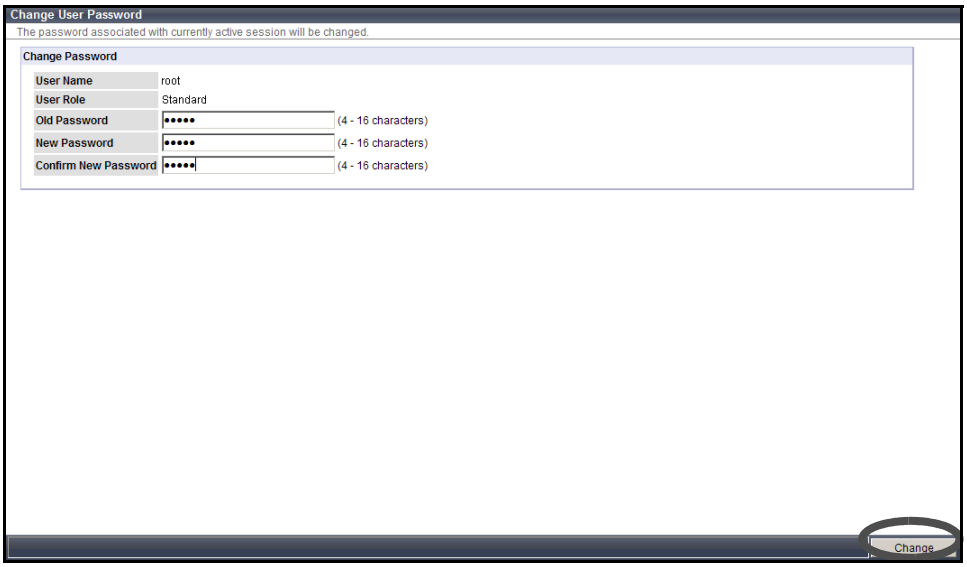
Procedure

1. Click the [Change User Password] under the [User Management] menu on the [Global Settings] tab.
   → The [Change User Password] screen appears.
2. Specify the following items, and click the [Change] button.
   - User Name
     Current user's (your) name is displayed.
   - User Role
     Current user's (your) user role is displayed.
   - Old Password
     Input the current password.
   - New Password
     Set the new password between 4 to 16 characters.
     Alphanumeric characters and symbols ([!], [-], [_], [.]) can be used.
   - Confirm New Password
     Input the same character strings as the value entered in the "New Password" field for confirmation.

Caution

When changing a user password, an error occurs in the following conditions.

- When the "Old Password" does not match the current password
- When the "New Password", "Confirm New Password", and/or "Old Password" is not entered
- When the password does not match the confirmation password
- When the password is less than 4, or more than 16 characters (If 17 or more characters are entered, ETERNUS DX60/DX80 ignores the 17th and later characters, and the password is registered using the first 16 characters only)
- When the password includes characters other than alphanumeric characters and symbols ([!], [-], [_], [.])



→ A confirmation screen appears.

3 Click the [OK] button.

→ The password is changed.

End of procedure

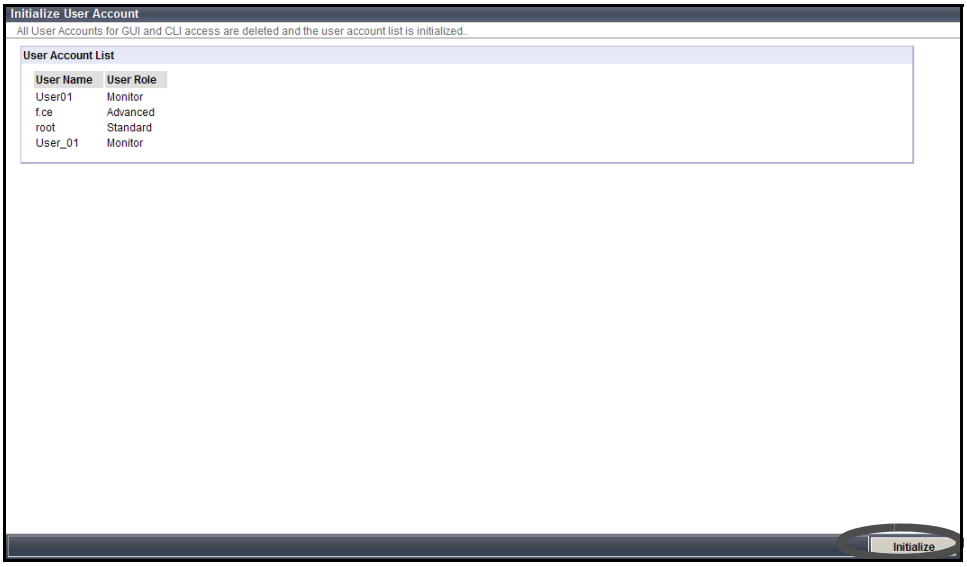
6.1.3 Initialize User Account

The [Initialize User Account] function initializes a registered user account. By using this function, registered accounts are deleted and the default accounts (f.ce and root) revert back to factory settings. Passwords for default accounts are also restored to default settings.
The procedure to initialize user account is as follows:

Procedure

1 Click the [Initialize User Account] under the [User Management] menu on the [Global Settings] tab.
→ The [Initialize User Account] screen appears.

2 Click the [Initialize] button.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The user accounts are initialized.

End of procedure

6.2 Network Settings

6.2.1 Setup Network Environment

Set the environment for the ETERNUS DX60/DX80 to communicate with external hosts on TCP/IP based network.
The IP address, subnet mask, Gateway, DNS server of the ETERNUS DX60/DX80, and network address for the remote operation from outside of the subnet can be set.

Network environment setting is required for each MNT and RMT port.

- MNT port
  MNT port is used for general communication between ETERNUS DX60/DX80 and external hosts.
- RMT port
  RMT port is used for communication between ETERNUS DX60/DX80 and Remote Support center.

Caution

- If the IP address or the subnet mask for the ETERNUS DX60/DX80 is changed, changing the network address (IP address or subnet mask) of the FST may be required.
- If the IP address of the ETERNUS DX60/DX80 becomes uncertain, refer to "ETERNUS DX60/DX80 Disk storage system User Guide" to initialize the IP address.
- After completing the setting, logon to GUI again.

The procedure to setup network environment is as follows:

Procedure

1. Click the [Setup Network Environment] under the [Network Settings] menu on the [Global Settings] tab.
   → The [Setup Network Environment] screen appears.

2 Specify the following items, and click the [Set] button.

- Select Network Port
  Select the setting target port from "MNT" or "RMT".
- Interface
  - Speed and Duplex
    Select the communication speed and mode. The default setting is [Auto Negotiation].
    Select from the following:
    - Auto Negotiation
    - 1Gbps
    - 100Mbps Half
    - 100Mbps Full
    - 10Mbps Half
    - 10Mbps Full
  - Master CM IP Address (required)
    Set the IP address (0 to 255) for the Master CM.
  - Slave CM IP Address
    Set the IP address (0 to 255) for the Slave CM.
    Specify this value when duplicating the LAN path.


Note

When the ETERNUS DX60/DX80 has only one CM, a Slave IP address cannot be specified.

  - Subnet Mask (required)
    Set the Subnet Mask (0 to 255) for the ETERNUS DX60/DX80 Disk storage system.
  - Default Gateway
    Set the Gateway address (0 to 255) for the ETERNUS DX60/DX80 Disk storage system.
  - Primary DNS
    Set the IP address for the Primary DNS server (0 to 255) for the ETERNUS DX60/DX80 Disk storage system.
  - Secondary DNS
    Set the IP address for the Secondary DNS server (0 to 255) for the ETERNUS DX60/DX80 Disk storage system.
- Allowed IP List
  The value entered in this field is enabled when the Gateway has been set.
  Set the destination network address (IP address and Subnet Mask).
  Up to 16 addresses can be set. Make sure to set the IP address and Subnet Mask in pairs.

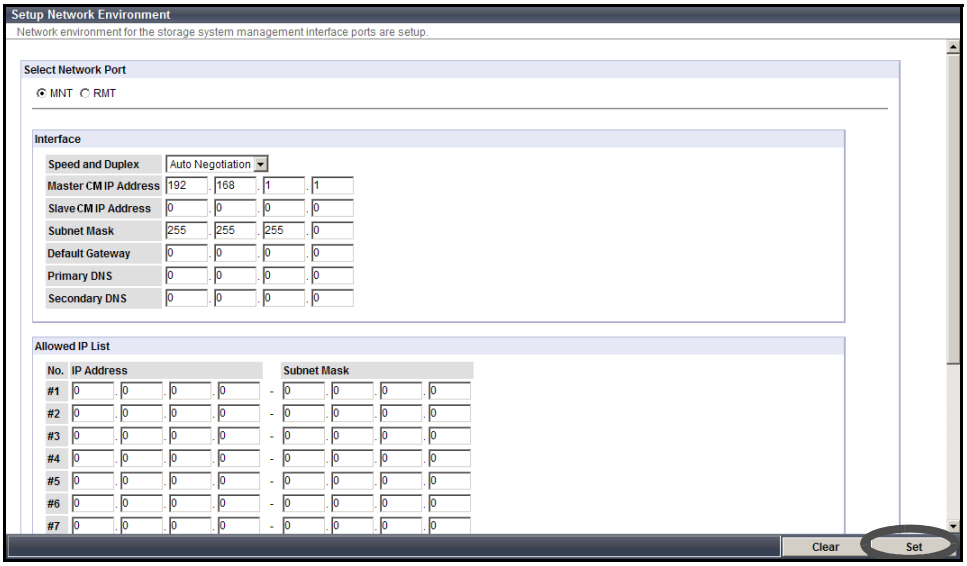
Caution

Note the following when specifying the IP address and Subnet Mask.

- Specify the IP address using IPv4 notation (character string in d.d.d.d format based on the 256 radix system).
- RMT port is used when it is required to use the dedicated network for Remote Support. IP addresses for the RMT port and MNT port must be in different subnets.
- "Slave CM IP Address" is specified when connecting to the Slave CM. IP addresses for the Slave CM and Master CM must be in the same subnet.
- Specify the IP address of "Default Gateway" when allowing access from outside of the subnetwork. The IP address must be in the same subnetwork as the port.
- For "Allowed IP List", specify the IP address or network address that allows access to the ETERNUS DX60/DX80. These settings are not required for access from the network address (same sub-network) which the ETERNUS DX60/DX80 belongs to.

Note

For the two CMs in the ETERNUSDX60/DX80, the CM that has the priority to manage the device is called the Master CM, and the other is called the Slave CM. If a CM or LAN failure occurs, ETERNUS DX60/DX80 changes the Master CM automatically. The IP address for prior Master CM is taken over to the new Master CM. Specifying an IP address for the Slave CM enables forcible changing of the Master CM. When an error occurs and access to the Master CM is disabled, users can access the Slave CM and change the Master CM.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The network environment is set. GUI will logoff automatically.

End of procedure

6.2.2 Setup SNMP Agent

Simple Network Management Protocol (SNMP) is a standard protocol used by the network management of TCP/IP. This standard protocol is used to monitor the equipment connected with the network, via the network.
SNMP is comprised of a monitoring part (SNMP Manager) and a monitored part (SNMP Agent). Information to be transferred with SNMP is defined in the Management Information Base (MIB), a database installed in the SNMP Agent. The equipment that configures the network is managed by transferring parameters between the SNMP Manager and SNMP Agent.
SNMP uses the following five commands to request, respond to, and provide the management information between SNMP Manager and SNMP Agent.

Caution When an ETERNUS DX60/DX80 uses the SNMP Agent environment, it is necessary to install software in the SNMP Manager.

The procedure to set an SNMP Agent is as follows:

Procedure

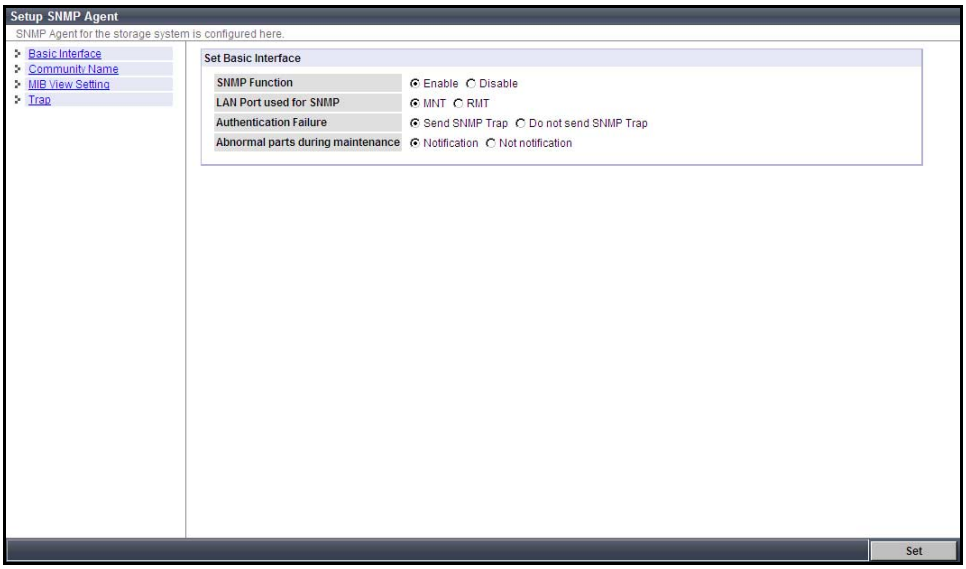
1 Click the [Setup SNMP Agent] under the [Network Settings] menu on the [Global Settings] tab.
→ The [Setup SNMP Agent] screen appears.

2 Specify the following items.
Click the link on the left of the screen to display the setting fields for each item.

Caution

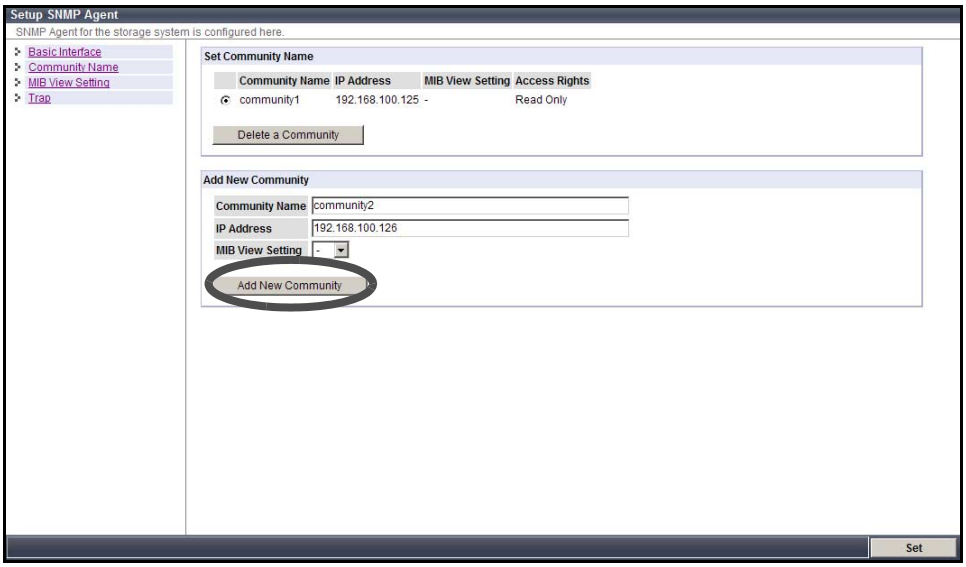
- When the entry, numbers, or characters of setting items are wrong, an error screen appears.
- Capital letters and lower case letters distinguish entered letters
- Allowed input symbols are shown as below.
  [!], [#], [$], [%], [&], [_], [+], [-], [*], [/], [=]
- One blank in the "Community Name" field represents two characters.

- Basic Interface
  Specify the following items:
  - SNMP Function
    Select whether to "Enable" or "Disable" the SNMP function.
  - LAN Port used for SNMP
    When "Enable" is selected for "SNMP Function", select "MNT" or "RMT".
  - Authentication Failure
    When "Enable" is selected for "SNMP Function", select "Send SNMP Trap" or "Do not send SNMP Trap" for when authentication fails.
  - Abnormal parts during maintenance
    When reflecting an error status during maintenance, set "Notification". When not reflecting, set "Not notification".



- Community Name
  Community is a range of available networks for SNMP. The setting value is used as the password for SNMP Manager to access the SNMP Agent. The SNMP Agent accepts the request from the SNMP Manager when the SNMP Manager reports the same Community as the SNMP Agent's Community.
  The "Read Only" access privileges is added for the specified Community. Community with other access privileges cannot be specified.
  If no Community is specified, "public" is used as default.
  The following procedure describes how to set a new Community.

  Specify the following items, and click the [Add New Community] button.
  - Community Name
    Enter the name for the Community that the target Agent belongs to within 50 alphanumeric characters and symbols (including blanks). This setting cannot be omitted.
  - IP Address
    Enter the IP address for the SNMP Manager. When "0.0.0.0" is specified, all hosts are accepted.
  - MIB View Setting
    Enter the MIB View name accessed by this Community (may be omitted, which will allow access to all Objects).

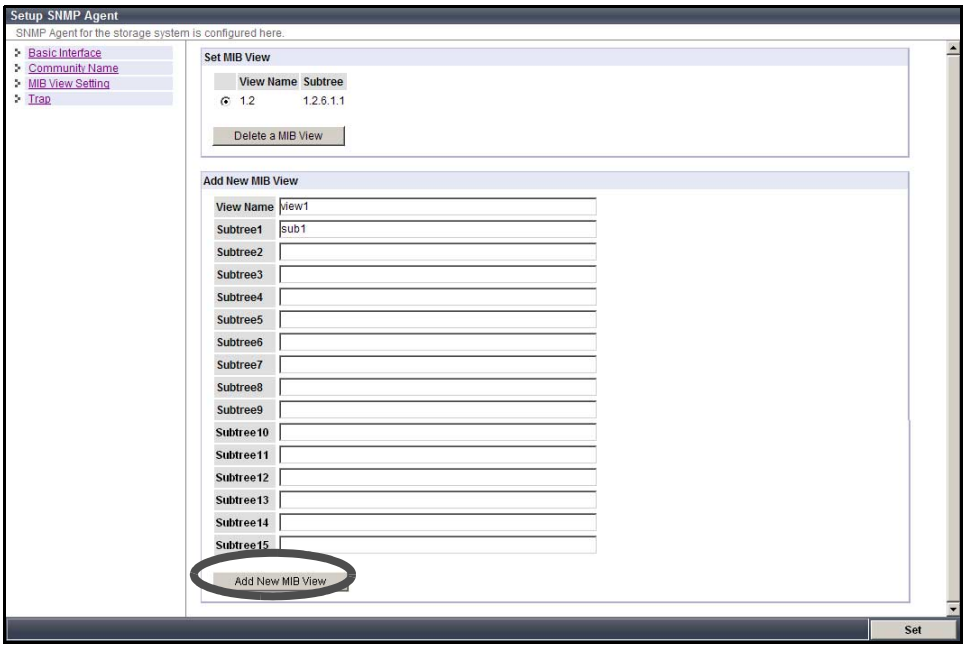


The new Community is added in the "Set Community Name" field.

- MIB View Setting
  MIB View is used for defining the accessible area in the Management Information Base (MIB) database, with a tree type structure. Use this function to release only the part of the information in the MIB.
  The following procedure describes how to set new MIB View.

  Specify the following items, and click the [Add New MIB View] button.

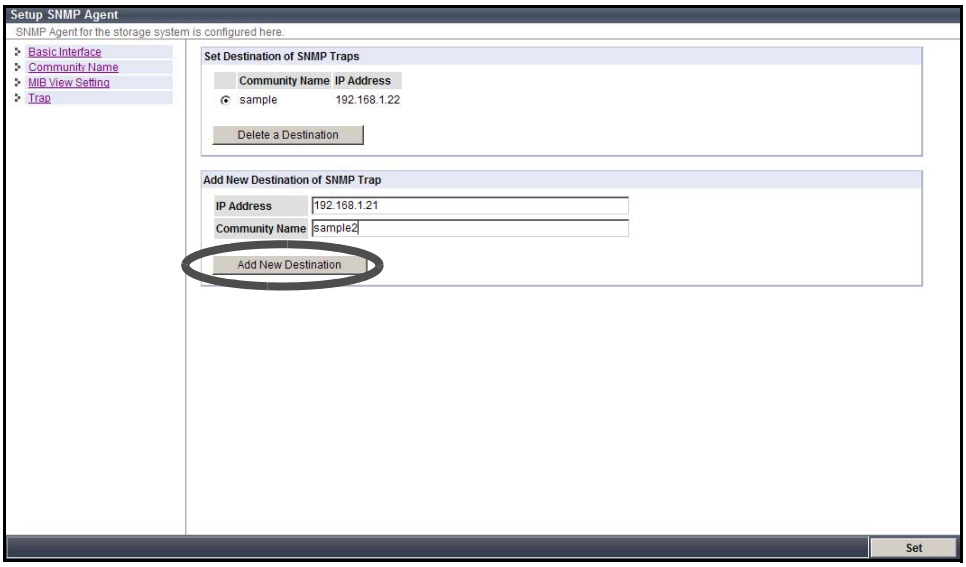
  - View Name
    Enter the MIB Object ID within 60 numerals (including [.]). This setting cannot be omitted.
  - Subtree
    Enter the Object ID for the subtree within 60 numerals (including [.]). This setting can be omitted. A maximum of 15 Sub Trees can be specified at the same time.



The new MIB View is added in the "Set MIB View" field.

- Trap
  Trap is used to report the error contents to the SNMP Manager immediately when a device error occurs.
  The following procedure describes how to set new destination of SNMP Trap.

  Specify the following items, and click the [Add New Destination] button.
  - IP Address
    Enter the IP address for the transfer destination of the Trap. This setting cannot be omitted.
  - Community Name
    Enter the Community name to which to transfer the trap, in no more than 50 alphanumeric characters and symbols (including blanks). This setting cannot be omitted.



The new destination of SNMP Trap is added in the "Set Destination of SNMP Traps" field.

3 Click the [Set] button.

→ A confirmation screen appears.

4 Click the [OK] button.

→ The SNMP Agent is set.

End of procedure

6.2.3 Download MIB File

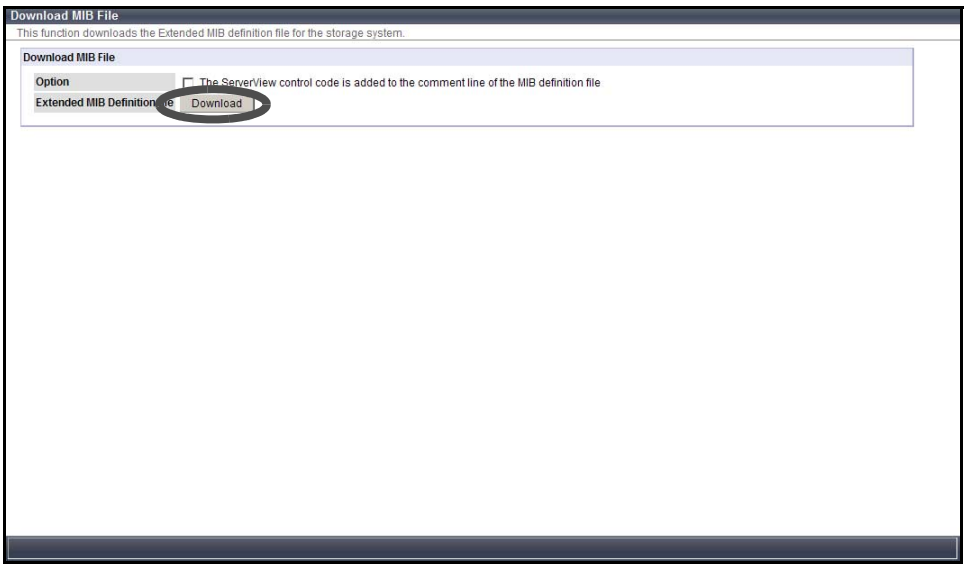
The [Download MIB File] function exports the MIB definition file registered in the ETERNUS DX60/DX80.
Management Information Base (MIB) is the information for Manager to manage Agent with Simple Network Management Protocol (SNMP). This information is a database with a tree type structure.
The MIB definition file is used for the ETERNUS DX60/DX80 SNMP environment settings, and for allowing other applications that use SNMP (SNMP Manager) to handle the ETERNUS DX60/DX80 (SNMP Agent).

Caution This function is necessary when the ETERNUS DX60/DX80 uses the SNMP Agent environment.

The procedure to download MIB definition file is as follows:

Procedure

1. Click the [Download MIB File] under the [Network Settings] menu on the [Global Settings] tab.
   → The [Download MIB File] screen appears.
2. Specify the following item, and click the [Download] button.
   - Option
     Check the "The ServerView control code is added to the comment line of the MIB definition file" checkbox when downloading MIB file used for device monitoring by ServerView.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The MIB definition file is downloaded. A screen to save the downloaded MIB definition file appears.

4 Save the downloaded file.

→ The MIB definition file is saved.

End of procedure

6.2.4 Perform SNMP Trap Test

The [Perform SNMP Trap Test] function transmits the test trap from the SNMP Agent to the SNMP Manager.
The SNMP trap is the event information reported by the ETERNUS DX60/DX80 (SNMP Agent) that contains the storage system status information.
Perform SNMP Agent and SNMP Manager settings before executing this test.

Caution

Perform "6.2.1 Setup Network Environment" (page 147) and "6.2.2 Setup SNMP Agent" (page 150) before using this function.
This function transmits a test trap.

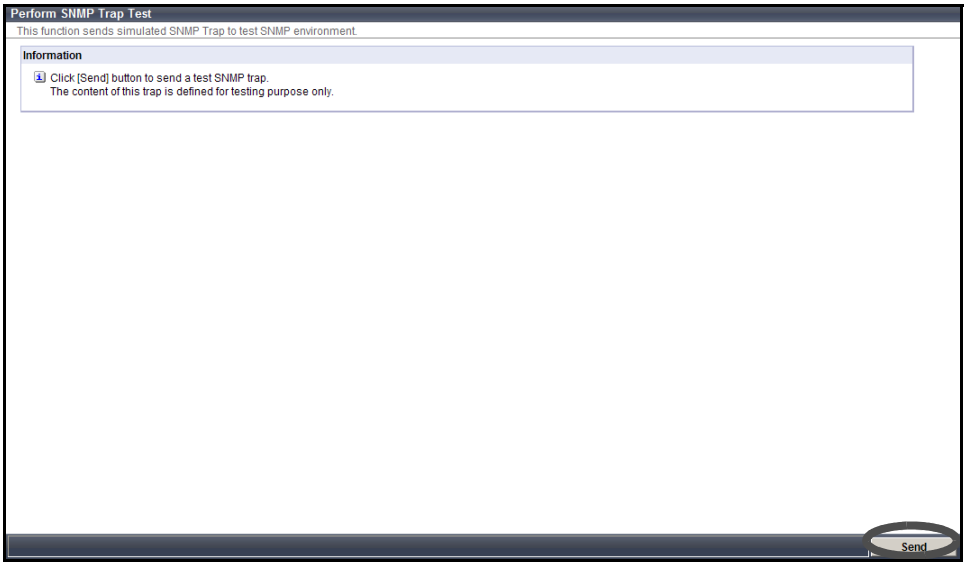
The procedure to perform SNMP trap test is as follows:

Procedure

1 Click the [Perform SNMP Trap Test] under the [Network Settings] menu on the [Global Settings] tab.

→ The [Perform SNMP Trap Test] screen appears.

2 Click the [Send] button.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The SNMP trap test is performed.

End of procedure

Caution Confirm that the trap can be normally received in the SNMP Manager after the SNMP Trap test.

6.2.5 Setup E-Mail Notification

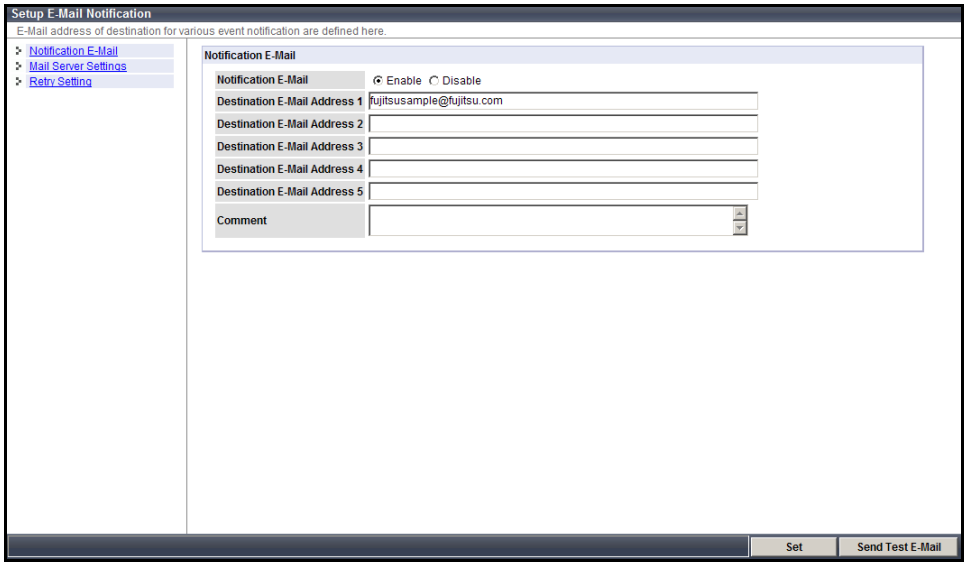
The [Setup E-Mail Notification] function configures the E-mail Notification settings for the various events detected by the storage system.
If an error occurs in the ETERNUS DX60/DX80, the E-Mail of error information is sent to the specified address.
Refer to "6.2.7 Setup Event Notification" (page 160) for detailed contents of the event.

The procedure to set the E-mail notification is as follows:

Procedure

1. Click the [Setup E-Mail Notification] under the [Network Settings] menu on the [Global Settings] tab.
   → The [Setup E-Mail Notification] screen appears.

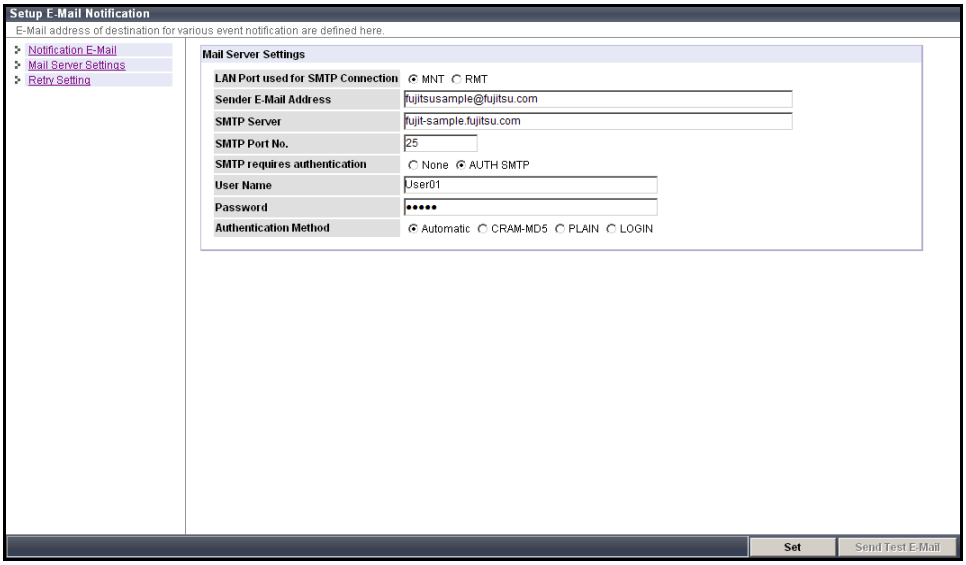
2. Specify the following items.
   Click the link on the left of the screen to display the setting fields for each item.
   - Notification E-Mail
     - Notification E-Mail
       Select whether to "Enable" or "Disable" the E-Mail send function.
     - Destination E-Mail Address
       Specify the E-Mail destination address. Up to five addresses can be registered.
     - Comment
       Input the message (comment) to be added to the E-Mail (if needed). Up to 255 alphanumeric characters, symbols, and blanks within 10 lines can be used.



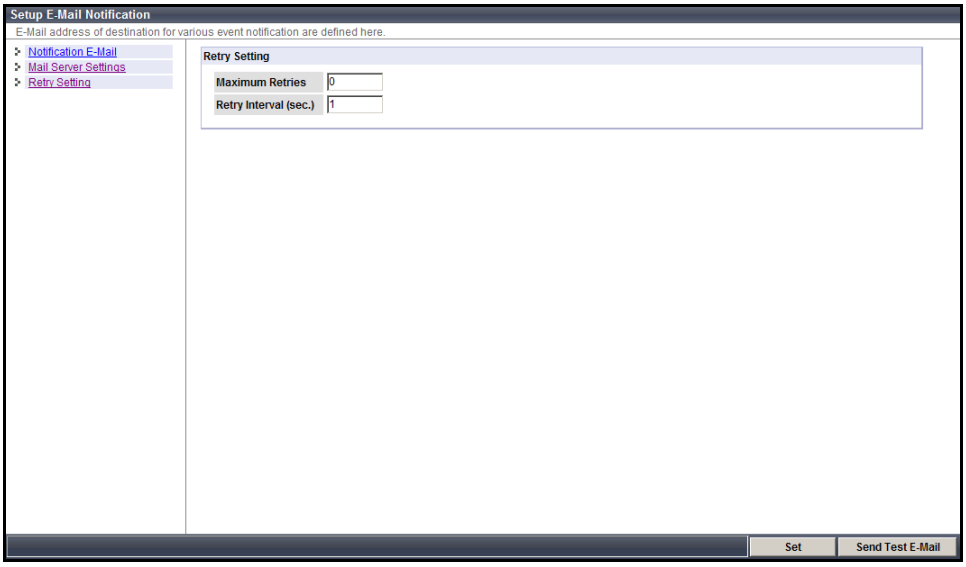
Note

Click the [Send Test E-Mail] button to confirm that an E-mail can be sent to the specified address. When sending a test E-mail, select "Enable" for the "Notification E-Mail" setting.

- Mail Server Settings
  - LAN Port used for SMTP Connection
    Select the LAN port connecting to the SMTP server from "MNT" or "RMT".
  - Sender E-Mail Address
    Input the mail sender E-Mail address.
  - SMTP Server
    Specify the IP address or domain name of the SMTP server to be used.
  - SMTP Port No.
    Input the port number used by the SMTP server.
  - SMTP requires authentication
    Select the user authorization method to connect to the SMTP server from "None" or "AUTH SMTP".
  - User Name
    If "AUTH SMTP" is selected for "SMTP requires authentication", input the sender user name.
  - Password
    If "AUTH SMTP" is selected for "SMTP requires authentication", input the sender password.
  - Authentication Method
    If "AUTH SMTP" is selected for "SMTP requires authentication", select the authentication method from "Automatic", "CRAM-MD5", "PLAIN", or "LOGIN".



- Retry Setting
  - Maximum Retries
    Input the maximum number of retry ("0" or "1").
  - Retry Interval (Sec.)
    Specify the interval between retry in units of seconds.



3 Click the [Set] button.

→ A confirmation screen appears.

4 Click the [OK] button.

→ The specified send E-mail setting is registered.

End of procedure

6.2.6 Display SMTP Log

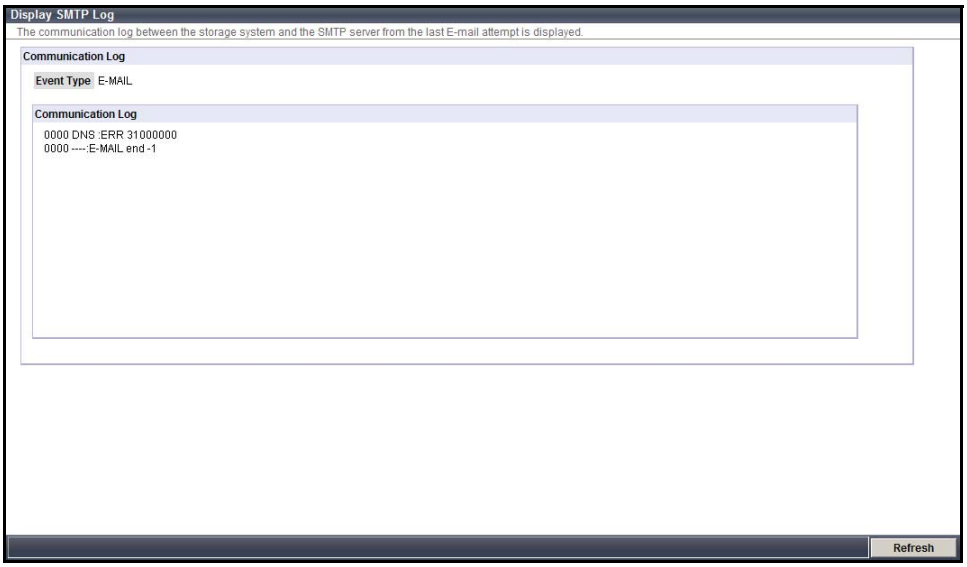
The [Display SMTP Log] function displays the SMTP log between the ETERNUS DX60/DX80 and the server. If the E-Mail communication is not working normally, this function may identify the cause of problem.
SMTP log contains request from the ETERNUS DX60/DX80 to the server and response from the server to the ETERNUS DX60/DX80. Note that this function displays the SMTP log for the latest event.

Caution Perform "6.2.5 Setup E-Mail Notification" (page 156) in advance.

The procedure to display SMTP log is as follows:

Procedure

1. Click the [Display SMTP Log] under the [Network Settings] menu on the [Global Settings] tab.
   → The [Display SMTP Log] screen appears.
2. Check the displayed "Event Type" and "Communication Log".



Note

Click the [Refresh] button to update the log.

End of procedure

6.2.7 Setup Event Notification

The [Setup Event Notification] function selects whether to report events detected in the ETERNUS DX60/DX80.
There are three methods for event notification: E-Mail, SNMP Trap, and Host Sense.
For E-Mail notification, performing "6.2.5 Setup E-Mail Notification" (page 156) is required.
For SNMP Trap notification, performing "6.2.2 Setup SNMP Agent" (page 150) is required.
A notification setting can be selected for each type of event.

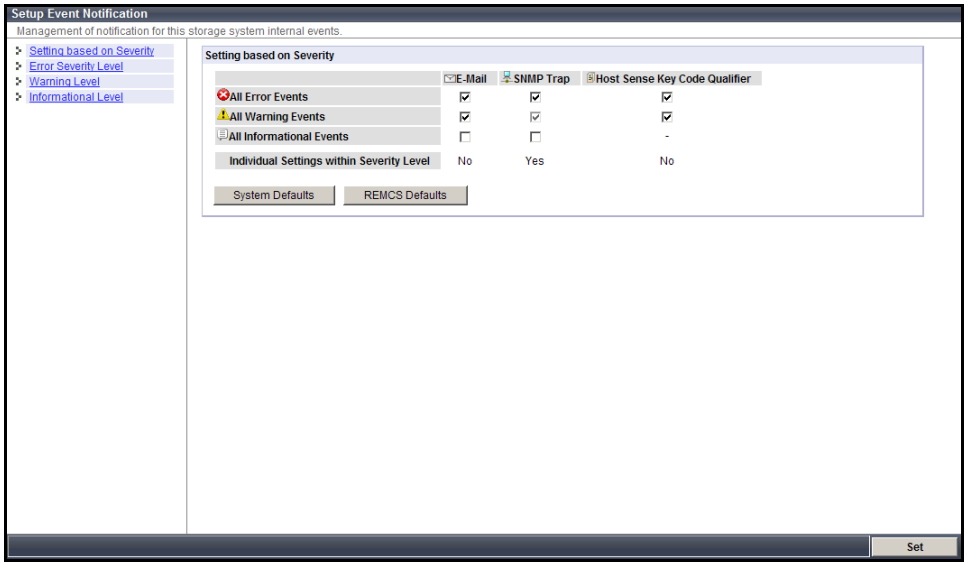
The procedure to setup event notification is as follows:

Procedure

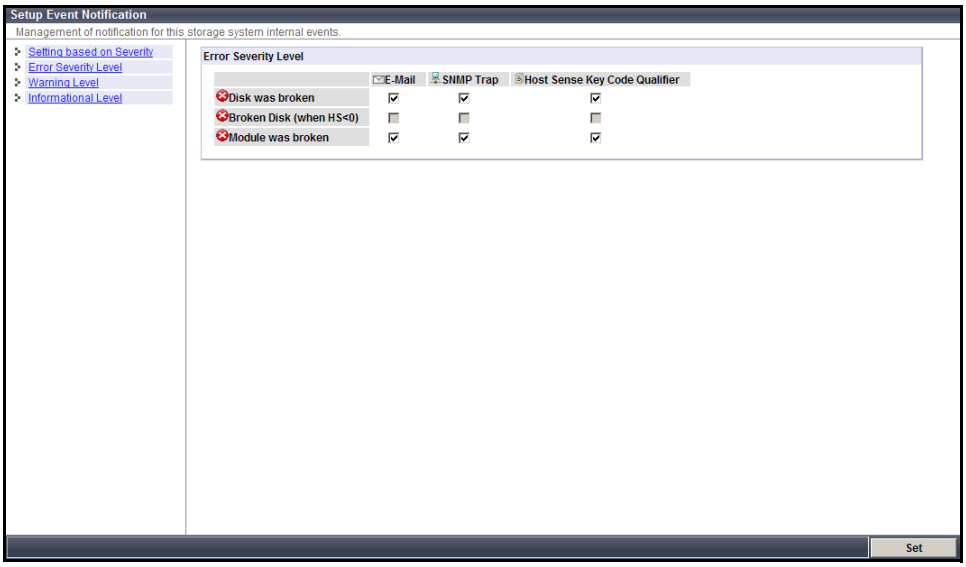
1. Click the [Setup Event Notification] under the [Network Settings] menu on the [Global Settings] tab.
   → The [Setup Event Notification] screen appears.

2. Select whether or not to report for each event type.
   The events are classified into three levels: "Error Severity Level", "Warning Level", and "Informational Level".
   Click the link on the left of the screen to display the setting fields for each level.

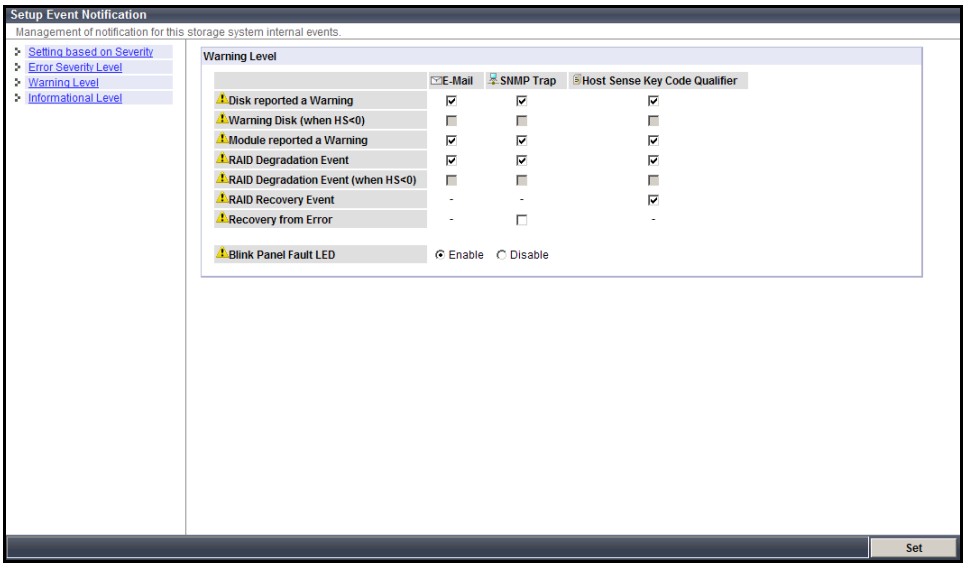
   - Setting based on Severity
     Select whether to notify of an event in units of level. When enabling the notification, select the method from "E-Mail", "SNMP Trap", or "Host Sense Key Code Qualifier" (multiple selections can be made).
     When setting the notification method for each event, move on to the setting fields for each level.



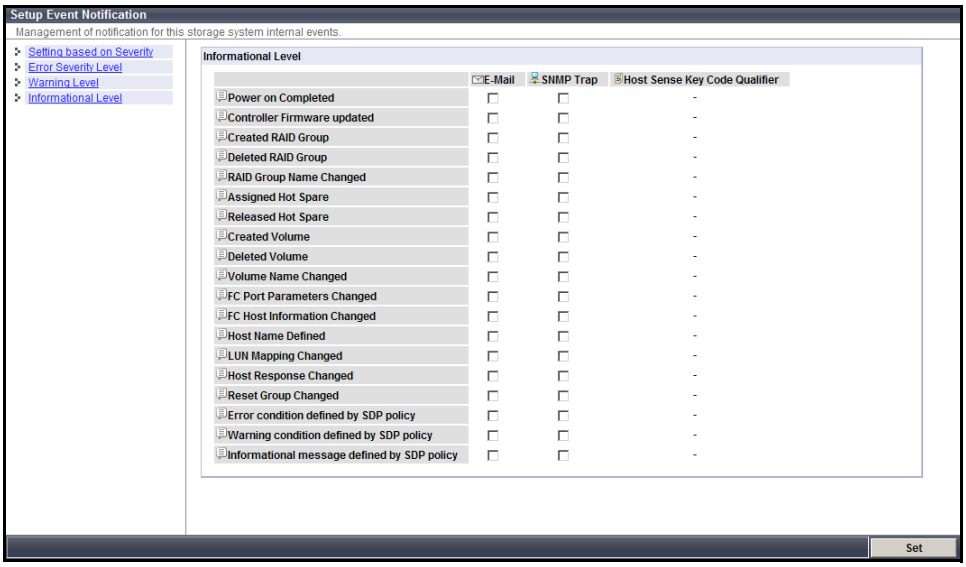
- Error Severity Level
  Select whether to notify of the error event for each event type.
  When enabling the notification, select the method from "E-Mail", "SNMP Trap", or "Host Sense Key Code Qualifier" (multiple selections can be made).



- Warning Level
  Select whether to notify of a warning event for each event type.
  When enabling the notification, select the method from "E-Mail", "SNMP Trap", or "Host Sense Key Code Qualifier" (multiple selections can be made).



- Informational Level
  Select whether to notify of an information event for each event type.
  When notification is enabled, select the method from "E-Mail" or "SNMP Trap" (both settings can be selected).



Note

Threshold of SDP policy level can be specified with "5.4.4 Modify Copy Parameters" (page 132) function.

3 Click the [Set] button.

→ A confirmation screen appears.

4 Click the [OK] button.

→ The specified event notification setting is enabled.

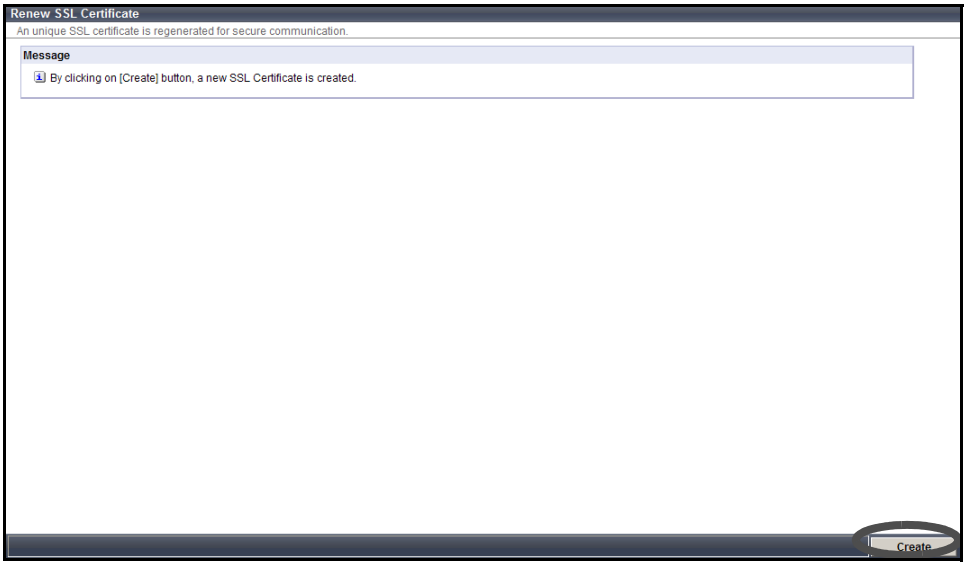
End of procedure

6.2.8 Renew SSL Certificate

The [Renew SSL Certificate] function creates new SSL certificate used to encrypt the communication.
The data transmitted in the network may be intercepted from a third party. This function creates the SSL certificate again, and prevents the impersonation caused by SSL certificate theft.
The procedure to create SSL certificate is as follows:

Procedure

1. Click the [Renew SSL Certificate] under the [Network Settings] menu on the [Global Settings] tab.
   → The [Renew SSL Certificate] screen appears.
2. Click the [Create] button.



   → A confirmation screen appears.
3. Click the [OK] button.

   → The SSL certificate is created.

End of procedure

6.3 Remote Support

The [Remote Support] setting menu registers user information related to the ETERNUS DX60/DX80, and settings for Remote support function to REMCS (REMote Customer Support system) center and the ETERNUS DX60/DX80.

REMCS, a unique remote maintenance system by Fujitsu, provides the following maintenance functions.

- Failure Notice
  This function reports various failures that occur in the ETERNUS DX60/DX80 to the REMCS center. The maintenance engineer is notified of a failure immediately.
- Information Transfer
  This function sends information such as logs and configuration information to be used when checking a failure. It reduces time required to collect information for the REMCS center.

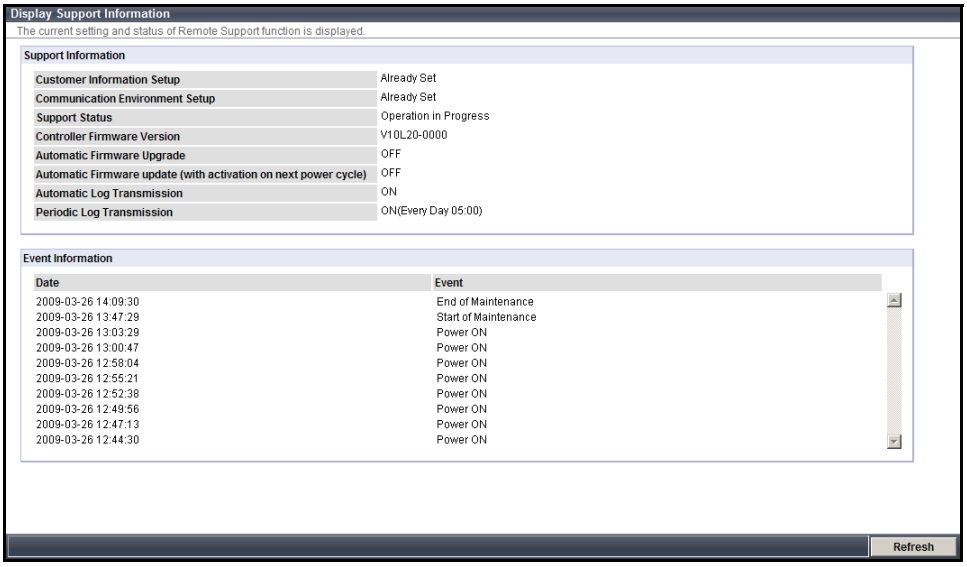
6.3.1 Display Support Information

The [Display Support Information] function checks the Remote Support function settings and operation status.
The procedure to check the display support information is as follows:

Procedure

1. Click the [Display Support Information] under the [Remote Support] menu on the [Global Settings] tab.
   → The [Display Support Information] screen appears.

2 Check the displayed "Support Information" and "Event Information".



Note

Click the [Refresh] button to obtain the latest information.

End of procedure

6.3.2 Display Communication Log

This function displays the communication log when the Remote Support function is operated between the ETERNUS DX60/DX80 and the server. When the Remote Support function cannot be operated properly, for example, cannot be connected to the REMCS center, use this log to identify the cause of the problem.
The communication log includes requests from the device to the server, and responses from the server to the device. Only the communication log of the last executed event is displayed.

Caution

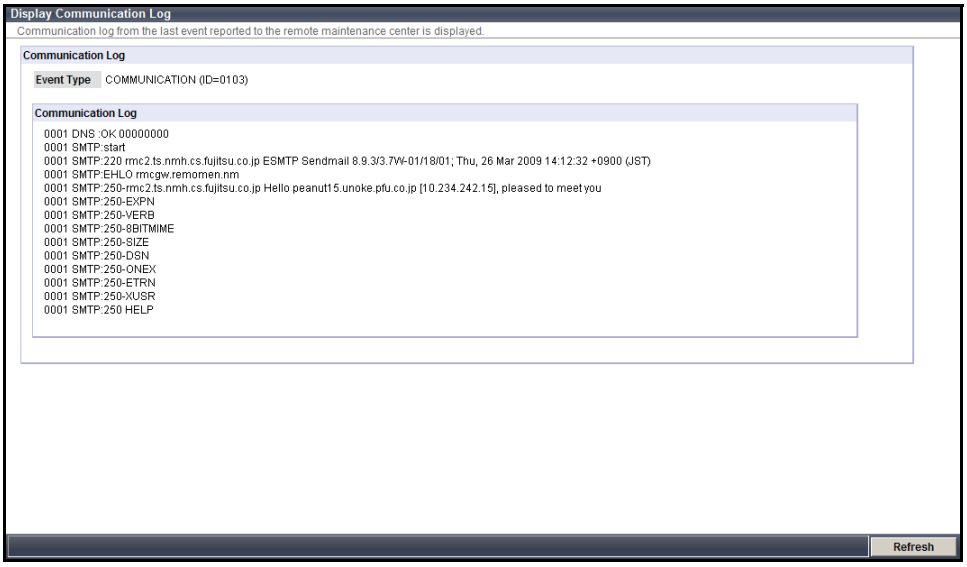
Setting the server connection in advance is necessary.

The procedure to display the communication log is as follows:

Procedure

1 Click the [Display Communication Log] under the [Remote Support] menu on the [Global Settings] tab.
→ The [Display Communication Log] screen appears.

2 Check the displayed "Event Type" and the "Communication Log".



Note

Click the [Refresh] button to obtain the latest information.

End of procedure

6.3.3 Setup Remote Support

The [Setup Remote Support] function registers the customer information and communication environment information required to be given to Remote Support from the REMCS center.

Caution

- When changing the registered information, use the descriptions in "6.3.4 Update Customer Information" (page 176) and "6.3.5 Update Communication Environment Information" (page 177).
- The Remote Support setting information file (customer information file and communication environment information file) created by using REMCS Environment Setup Assist Tool (REMCS ESAT) can be imported to the device, to simplify the input operation required to be set for each device.

The procedure to setup Remote Support is as follows:

Procedure

1 Click the [Setup Remote Support] under the [Remote Support] menu on the [Global Settings] tab.
→ The [Setup Remote Support] screen appears.

2 Specify the following items.

Note

When importing Remote Support settings to the ETERNUS DX60/DX80 all at once, click the [Browse...] button to specify the location where the settings file has been stored, and click the [Import] button.

- Customer Information
  Customer information saved in the ETERNUS DX60/DX80 can be deleted after transmitting the information to the REMCS center. Select the "Delete any Customer Identity information from the storage system after the information is sent to the "REMCS Center"." checkbox to delete the information.
  - Detailed Settings
    - Company Name (required)
      Input the company name that owns ETERNUS DX60/DX80.
      Up to 60 alphanumeric characters can be used.
    - Department/Division
      Input the department or division that owns ETERNUS DX60/DX80.
      Up to 40 alphanumeric characters can be used.
    - Address (required)
      Input the address of the company that owns ETERNUS DX60/DX80.
      Up to 60 alphanumeric characters can be used.
    - Building Name
      Input the building name where the company that owns ETERNUS DX60/DX80 is located.
      Up to 40 alphanumeric characters can be used.
    - Administrator Name (required)
      Input the system administrator's name that manages the ETERNUS DX60/DX80.
      Up to 40 alphanumeric characters and symbols can be used.
    - Administrator E-Mail Address (required)
      Input the E-mail address of the system administrator who manages the ETERNUS DX60/DX80.
      Up to 40 alphanumeric characters (including symbols) can be used.
    - Postal Code (Zip Code)
      Input the post code for the company that owns ETERNUS DX60/DX80.
      Up to 10 alphanumeric characters (including symbols) can be used.
    - Phone Number (required)
      Input the phone number for the company that owns ETERNUS DX60/DX80.
      Up to 20 alphanumeric characters (including symbols) can be used.
    - FAX Number
      Input the FAX number for the company that owns ETERNUS DX60/DX80.
      Up to 20 alphanumeric characters (including symbols) can be used.
    - Storage System Unique Name
      Input the nickname for the ETERNUS DX60/DX80.
      Up to 32 alphanumeric characters (including symbols) can be used.
    - Country of Installation (ISO3166 A2) Example: JP, US, DE, etc. (required)
      Input the country code for the country where the ETERNUS DX60/DX80 is located.
      Capital letters or 99 can be entered.

- Installation Location
  - Address
    Input the address where the ETERNUS DX60/DX80 locates.
    Up to 60 alphanumeric characters can be used.
  - Building Name
    Input the building name where the ETERNUS DX60/DX80 is located.
    Up to 40 alphanumeric characters can be used.
- Information filled by Field Engineers
  - Installation Date
    Input the date when the ETERNUS DX60/DX80 is installed.
    Numerals can be used.
  - Field Engineer E-Mail Address
    Input the mail address for the field engineer who installed the ETERNUS DX60/DX80.
    Up to 60 alphanumeric characters and symbols can be used.
  - Customer Code
    Input the customer code.
    Up to 8 numerals (including symbols) can be used.

- Communication Environment Information
  - Connection
    - Connection Type
      Select the connection method when using the REMCS operation.
      - Internet Connection
      - Internet Connection (Mail only)
      - P-P Connection
      - P-P Connection (Mail only)
      - P-P Connection (VPN Connection)
      - P-P Connection (VPN Connection Mail only)
    - LAN Port used for Remote Support
      Select the device LAN port used for REMCS operation from "MNT" or "RMT".
  - Service
    - Scheduled Connection Time (required)
      Input the time for scheduled REMCS connection.
      Numerals can be used.
    - Scheduled Connection Period (required)
      Select the term for scheduled REMCS connection.
      - Every Day
      - Every Day (excluding Sunday)
      - Every Day (excluding Saturday and Sunday)
      - Once a Week

- Specify the Day of the Week
  When "Once a Week" is selected for "Scheduled Connection Period", select the day of the week for scheduled REMCS connection.
  - Sunday
  - Monday
  - Tuesday
  - Wednesday
  - Thursday
  - Friday
  - Saturday

- Proxy Server
  - Proxy Server
    Input the IP address or domain name for the proxy server used for REMCS operation.
    Up to 63 alphanumeric characters and symbols can be used.
  - Port No.
    Input the port number for the proxy server.
    Numerals between 0 and 65535 can be used.
  - User Name
    Input the user name when using the proxy server.
    Up to 31 ASCII codes (alphanumeric characters and symbols) can be used.
  - Password
    Input the password for when using the proxy server.
    Up to 31 ASCII codes (alphanumeric characters and symbols) can be used.
- Storage System E-Mail Configuration
  - SMTP Server (required)
    Input the IP address or domain name for the SMTP server used for REMCS operation.
    Up to 63 alphanumeric characters and symbols can be used.
  - Port No. (required)
    Input the port number for the SMTP server.
    Numerals between 0 and 65535 can be used.
  - Sender Mail Address (required)
    Input an address for mails sent by the ETERNUS DX60/DX80 for REMCS operations.
    Up to 63 alphanumeric characters and symbols can be used.
- SMTP Authentication Information
  - Authentication Type
    Select the SMTP authentication method.
    - No SMTP Authentication
    - POP Before SMTP Authentication
    - AUTH SMTP Authentication
  - Authentication Method
    When the "Authentication Type" is "AUTH SMTP Authentication", specify the Authentication Method.
    - Automatic
    - CRAM-MD5
    - PLAIN
    - LOGIN

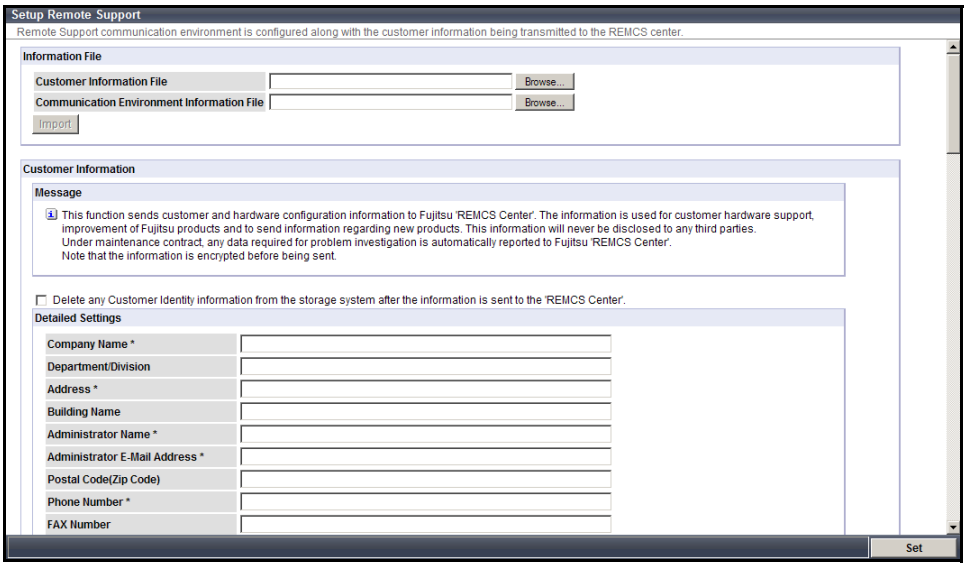
- POP Server
  When the "Authentication Type" is "POP Before SMTP Authentication", specify the domain name or IP address for the POP server used for SMTP Authentication.
  Up to 63 alphanumeric characters and symbols can be used.
- Port No.
  Input the port number for the POP server.
  Numerals between 0 and 65535 can be used.
- User Name
  Input the user name when using the POP server.
  Up to 31 alphanumeric characters and symbols can be used.
- Password
  Input the password when using the POP server.
  Up to 31 alphanumeric characters and symbols can be used.

- REMCS Center
  - REMCS Center (required)
    Select the REMCS center where the ETERNUS DX60/DX80 is connected.
    - Fujitsu America
    - Australia
    - Brazil
    - Hong-Kong
    - China
    - Indonesia
    - Korea
    - Malaysia
    - Philippine
    - Singapore
    - Taiwan
    - Thailand
    - Vietnam
    - Individual support in Hawaii
    - OSC
    - Inputting directly
  - HTTP Server
    If "Inputting directly" is selected for "REMCS Center" field, input the IP address or domain name for the destination HTTP server.
    Up to 63 alphanumeric characters and symbols can be used.
  - Port No.
    Input the port number for the HTTP server specified above.
    Numerals between 0 and 65535 can be used.
  - Receiver Mail Address
    When "Inputting directly" is selected, input the E-mail address for the REMCS center specified above as a report destination of the REMCS operation.
    Up to 63 alphanumeric characters and symbols can be used.

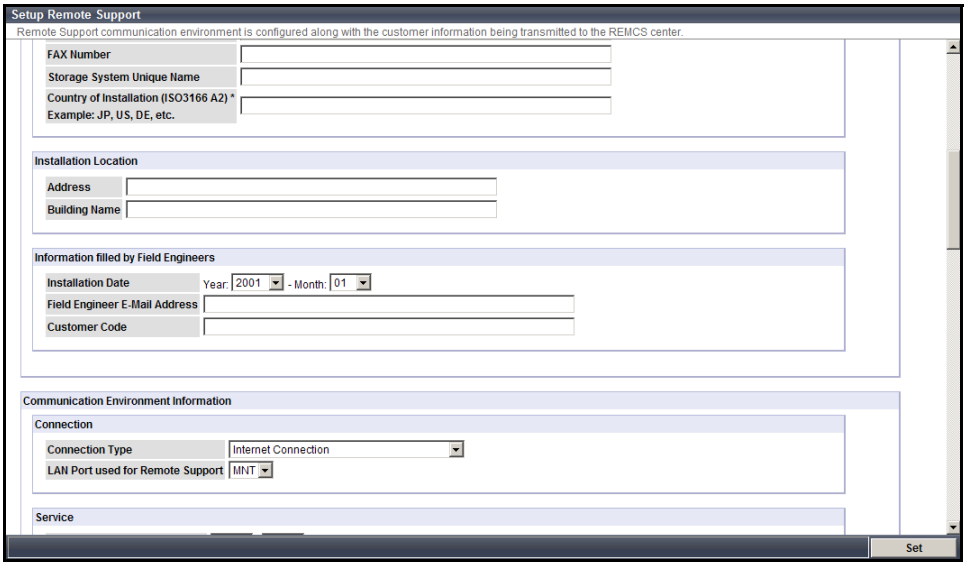
- Detailed Configuration Information
  - Mail Message Fragmentation Setting
    Select whether to "Enable Message Fragmentation" or "Disable Message Fragmentation" into the specified size.
    If splitting the mail, specify the units in which to split the mail, between 64 and 6400 (KB).
  - Specify Storage System Name for HELO/EHLO Announcement when Sending Mail
    Select whether to "Specify" or "Do not specify" the storage system name for HELO/EHLP announcement when sending mail. If "Specify" is selected, input the storage system name. Up to 32 alphanumeric characters and symbols can be used.

- Time Information
  This item is not required for setting.
  If changing the setting values, select the "Change following Timing Parameter items" checkbox.
  - SMTP Response Timeout (sec.)
    Input the timeout limit when using SMTP connection.
    Numerals between 1 and 3600 can be used. The default setting is "60".
  - SMTP Retry Count
    Input the retry number of SMTP.
    Numerals between 1 and 60 can be used. The default setting is "5".
  - SMTP Retry Interval (sec.)
    Input the intervals for retrying SMTP.
    Numerals between 1 and 3600 can be used. The default setting is "30".
  - HTTP Timeout (sec.)
    Input the timeout limit when using HTTP connection.
    Numerals between 1 and 3600 can be used. The default setting is "30".
  - HTTP Retry Count
    Input the retry number of HTTP.
    Numerals between 1 and 60 can be used. The default setting is "5".
  - HTTP Retry Interval (sec.)
    Input the intervals for retrying HTTP.
    Numerals between 1 and 3600 can be used. The default setting is "5".
  - Queue Time before Sending Mails (msec.) (only when POP Before SMTP authentication is enabled)
    Input the waiting time for sending mail.
    Numerals between 1 and 3600 can be used. The default setting is "1000".

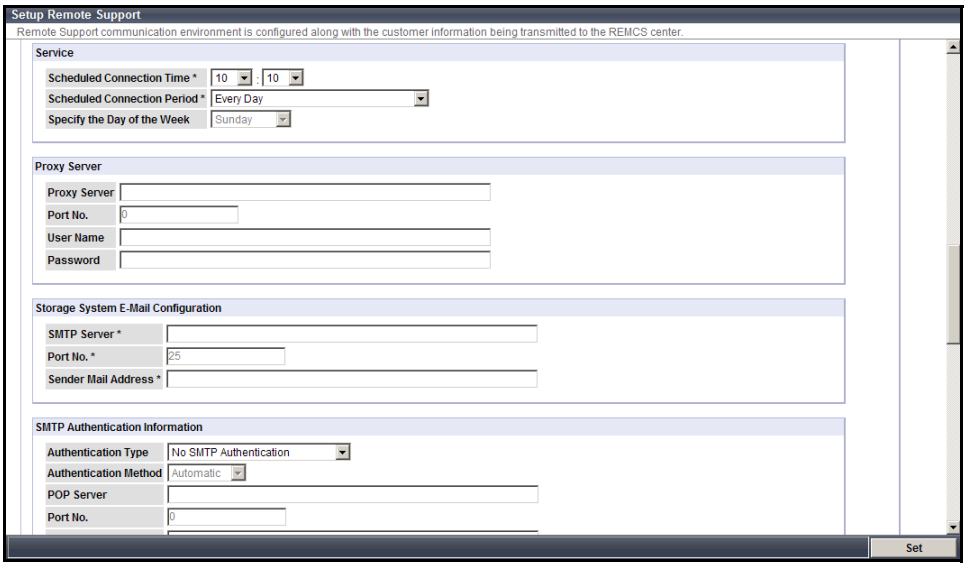
- [Setup Remote Support] screen (1/5)



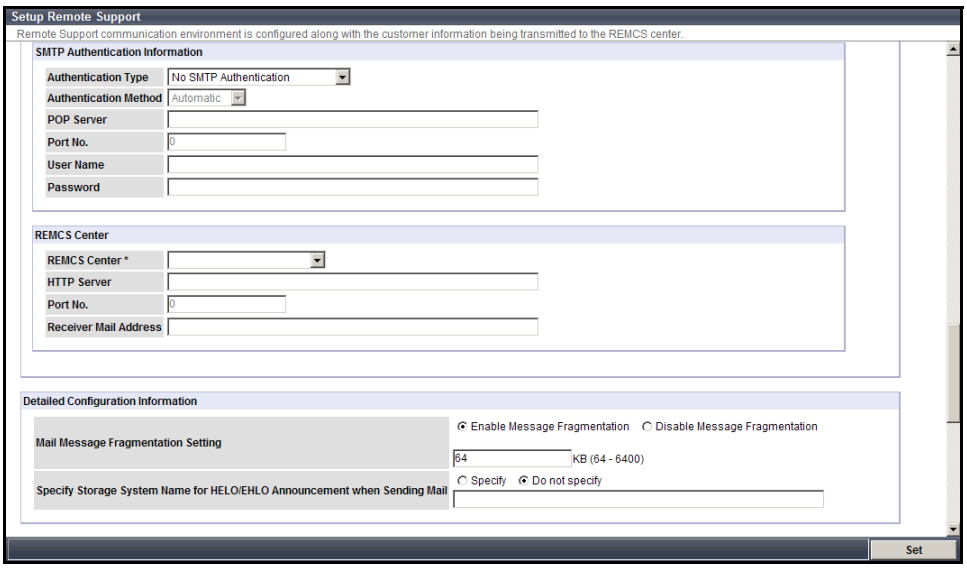
- [Setup Remote Support] screen (2/5)



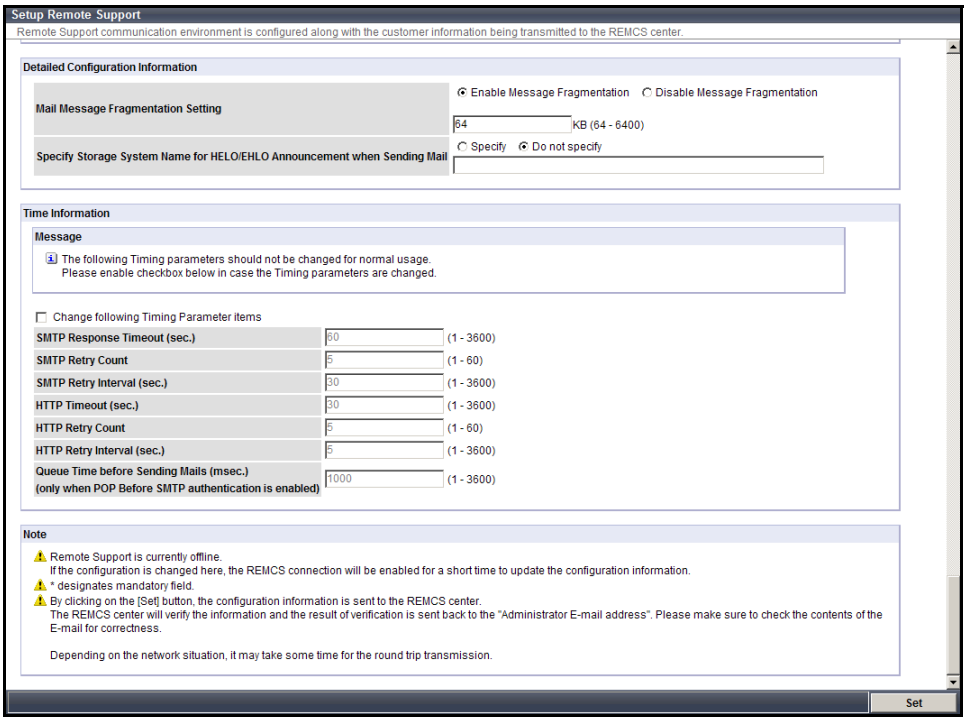
- [Setup Remote Support] screen (3/5)



- [Setup Remote Support] screen (4/5)



- [Setup Remote Support] screen (5/5)



3 Click the [Set] button.

→ A confirmation screen appears.

Caution

In the following conditions, an error screen appears.

- Click the [Set] button without setting the required item (items with "*")
- Click the [Set] button with invalid values
- When the selected setting information file is not correct
- When file format of the selected setting information file is not correct

4 Click the [OK] button.

→ The specified Remote Support setting is registered.

End of procedure

Caution

After completing the setting, the REMCS center sends the setting result to the specified "Administrator E-Mail Address". Make sure to confirm the settings.

6.3.4 Update Customer Information

The [Update Customer Information] function changes the customer information specified in "6.3.3 Setup Remote Support" (page 167).

Caution

- Customer information saved in the ETERNUS DX60/DX80 can be deleted after transmitting the information to the REMCS center. Check the "Delete any Customer Identity information from the storage system after the information is sent to the "REMCS Center"." and then delete personal information saved in device" checkbox to delete the information.
- The Remote Support setting information file (customer information file) created by using REMCS Environment Setup Assist Tool (REMCS ESAT) can be imported to the device, to simplify the input operation required to be set for each device.

The procedure to change the customer information is as follows:

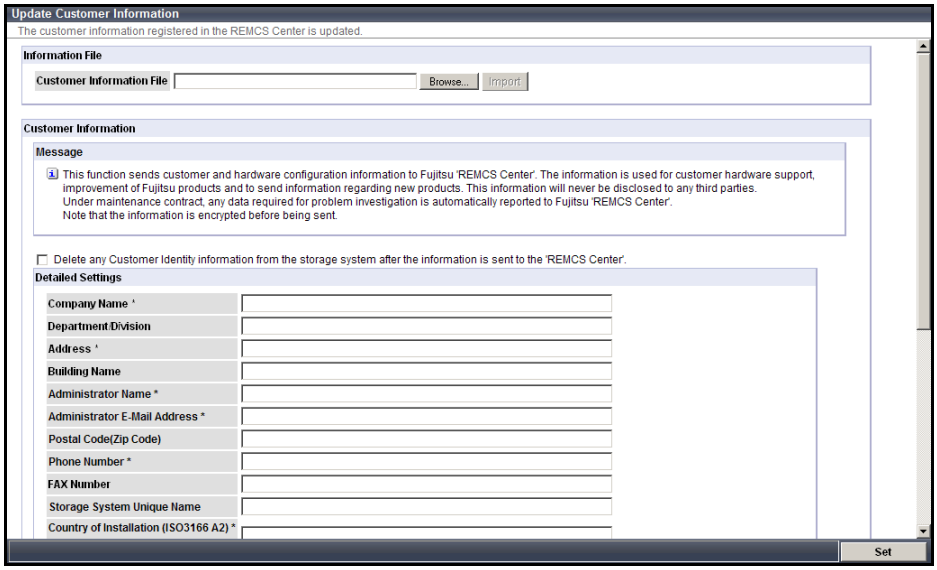
Procedure

1. Click the [Update Customer Information] under the [Remote Support] menu on the [Global Settings] tab.
   → The [Update Customer Information] screen appears.
2. Set the customer information again.

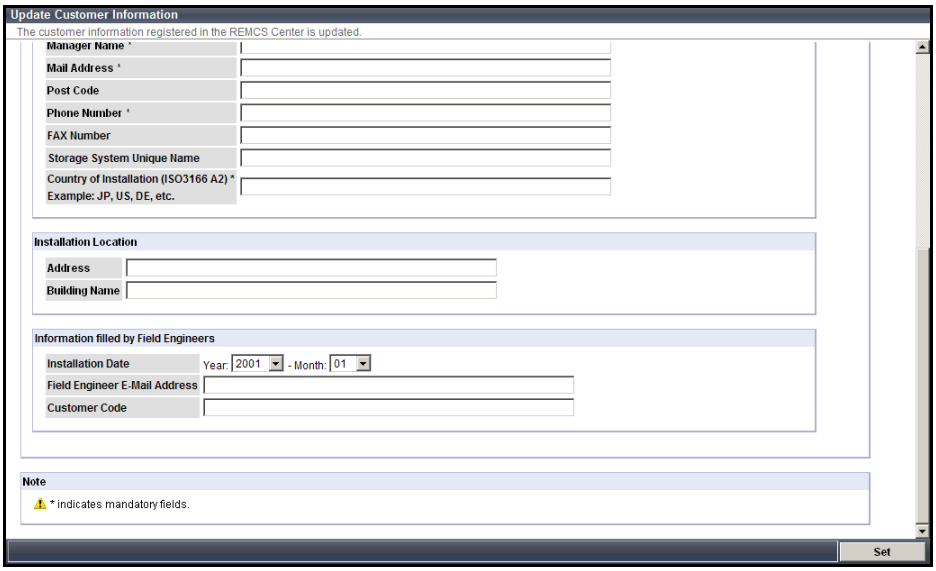
Note

When importing customer information to the ETERNUS DX60/DX80 all at once, click the [Browse...] button to specify the location where the settings file has been stored, and click the [Import] button.

- [Update Customer Information] screen (1/2)



- [Update Customer Information] screen (2/2)



3 Click the [Set] button.

→ A confirmation screen appears.

4 Click the [OK] button.

→ The customer information is changed.

End of procedure

6.3.5 Update Communication Environment Information

The [Update Communication Environment Information] function changes the communication environment information specified in the "6.3.3 Setup Remote Support" (page 167).

Caution

The Remote Support setting information file (communication environment information file) created by using REMCS Environment Setup Assist Tool (REMCS ESAT) can be imported to the device, to simplify the input operation required to be set for each device.

The procedure to update communication environment information is as follows:

Procedure

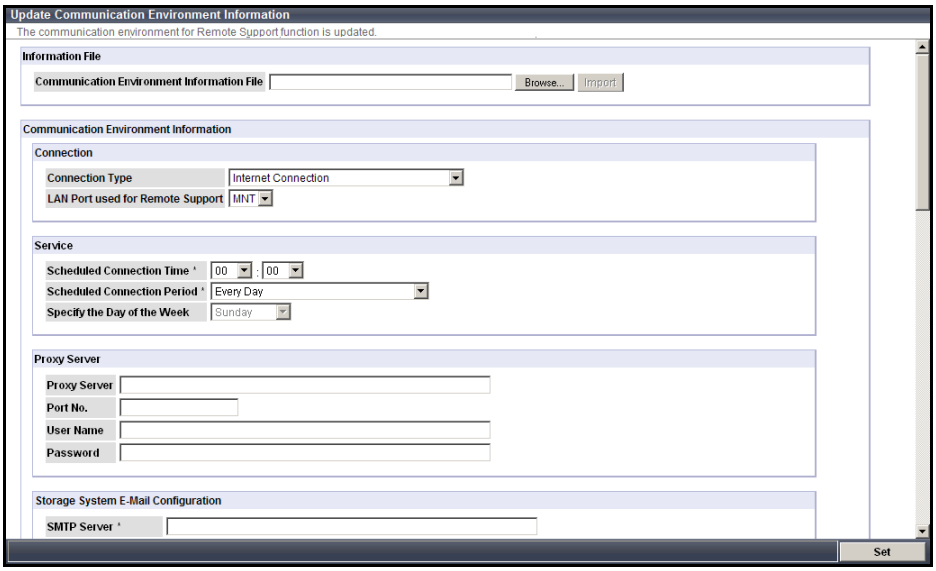
1. Click the [Update Communication Environment Information] under the [Remote Support] menu on the [Global Settings] tab.
   → The [Update Communication Environment Information] screen appears.

2. Set the communication environment information again.

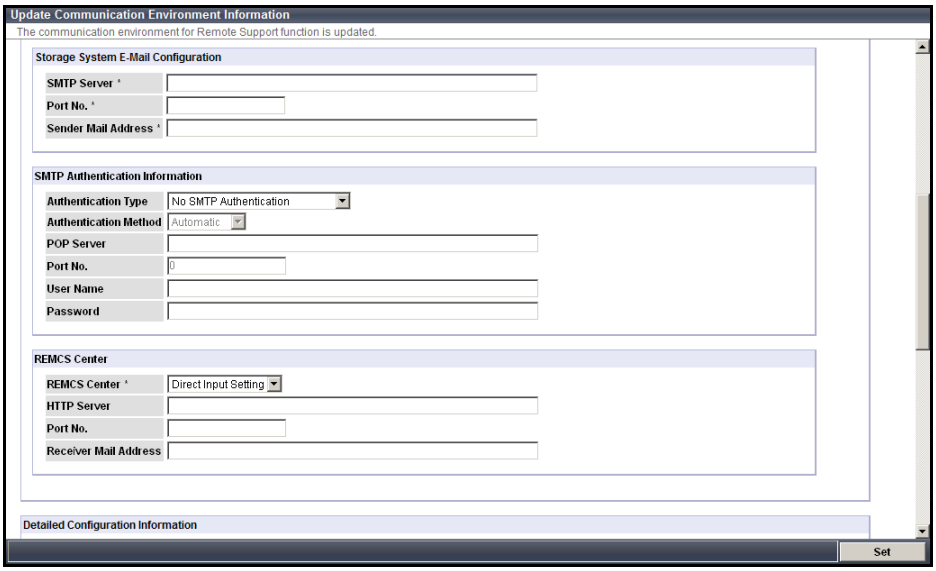
Note

When importing communication environment information to the ETERNUS DX60/DX80 all at once, click the [Browse...] button to specify the location where the settings file has been stored, and click the [Import] button.

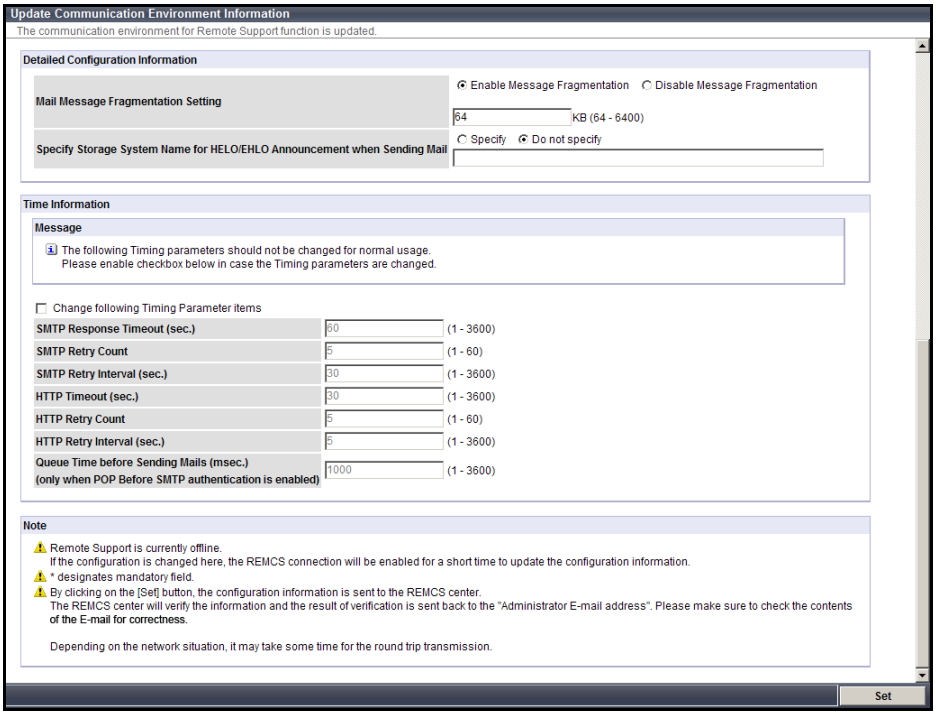
- [Update Communication Environment Information] screen (1/3)



- [Update Communication Environment Information] screen (2/3)



- [Update Communication Environment Information] screen (3/3)



3 Click the [Set] button.

→ A confirmation screen appears.

4 Click the [OK] button.

→ The communication environment information is changed.

End of procedure

6.3.6 Setup Log Sending Parameters

The [Setup Log Sending Parameters] function transfers the internal log to the REMCS center. Select "Send Log Automatically" or "Send Log Manually".

- Send Log Automatically
  ETERNUS DX60/DX80 sends the log automatically.
- Send Log Manually
  Send log manually.

Caution

This function is not available in the following conditions:

- When "6.3.3 Setup Remote Support" (page 167) is not finished
- When a problem is detected in the Remote Support settings
- When the "Receiver Mail Address" (REMCS center) is not specified for the Remote Support
- When the Remote support function is "Stopping" (refer to "6.3.7 Stop/Restart Remote Support" (page 182))

The procedure to send log is as follows:

Send Log Automatically

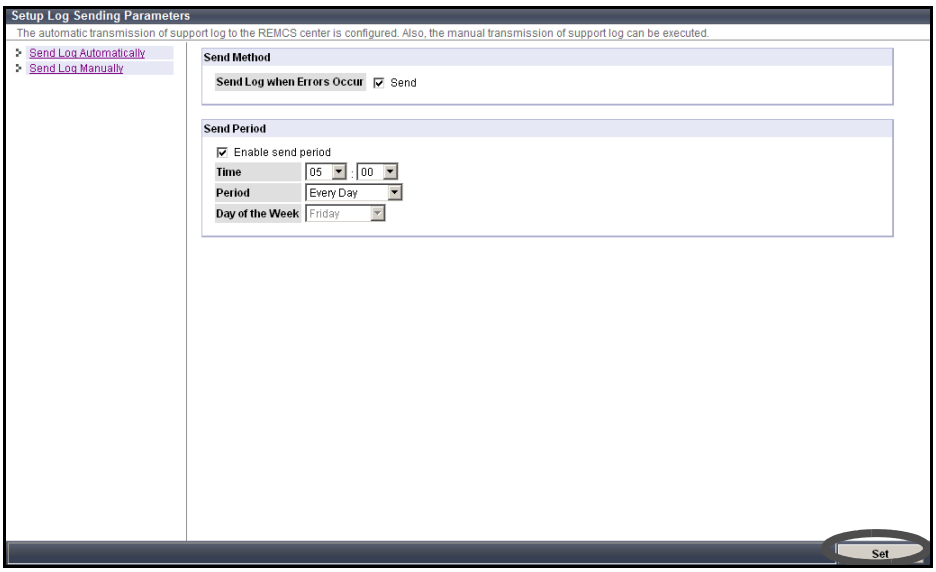
Procedure

1 Click the [Setup Log Sending Parameters] under the [Remote Support] menu on the [Global Settings] tab.
→ The [Setup Log Sending Parameters] screen appears.

2 Click the [Send Log Automatically] link on the left of the screen.

3 Specify the following items, and click the [Set] button.

- Send Method
  To send logs automatically in the case of a failure, check the "Send" checkbox.
- Send Period
  To send logs on regular basis.
  Check the "Enable send period" checkbox, and specify time, period, and day of the week.



→ A confirmation screen appears.

4 Click the [OK] button.

→ The send log (Send Log Automatically) is performed.

End of procedure

Send Log Manually

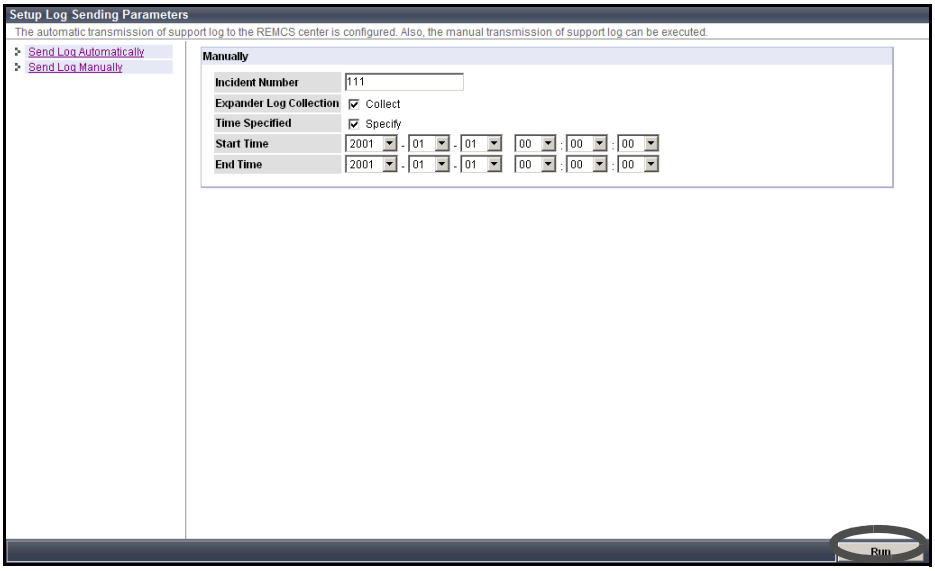
Procedure

1 Click the [Setup Log Sending Parameters] under the [Remote Support] menu on the [Global Settings] tab.
→ The [Setup Log Sending Parameters] screen appears.

2 Click the [Send Log Manually] link on the left of the screen.

3 Specify the following items, and click the [Run] button.

- Incident Number
  Specify the incident number of the manually sent log.
- Expander Log Collection
  To obtain the Expander log, check the "Collect" checkbox.
- Time Specified
  To specify the time to send log, check the "Specify" checkbox, and specify the start and end time.



→ A confirmation screen appears.

4 Click the [OK] button.

→ The send log (Send Log Manually) operation is performed.

End of procedure

6.3.7 Stop/Restart Remote Support

The [Stop/Restart Remote Support] function stops or restarts the Remote Support.
This function is used for long time suspension such as relocating the system.
When suspending the Remote Support function, the device support status is changed from "Operating" to "Stopping". When restarting the Remote Support function, the device support status is changed from "Stopping" to "Operating". When in the "Stopping", all Remote Support functions, such as automatic notification of device errors to the REMCS center, are stopped.

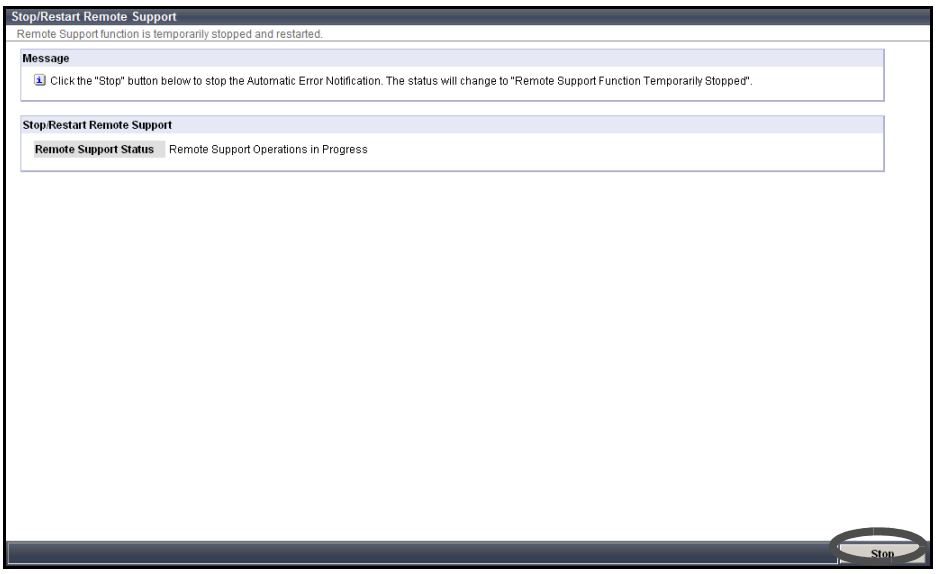
Caution

- Perform "6.3.3 Setup Remote Support" (page 167) in advance.
- This function is not available when the ETERNUS DX60/DX80 is in "Maintenance".
- The event of stopping or restarting the Remote Support function is transferred from the ETERNUS DX60/DX80 to the REMCS center.

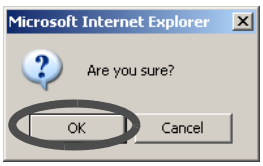
The procedure to stop or restart the Remote Support is as follows:

Procedure

1. Click the [Stop/Restart Remote Support] under the [Remote Support] menu on the [Global Settings] tab.
   → The [Stop/Restart Remote Support] screen appears.
2. Click the [Stop] or [Restart] button.



   → A confirmation screen appears.
3. Click the [OK] button.



   → The stopping/restarting Remote Support is performed.

End of procedure

6.4 System Settings

6.4.1 Modify Date and Time

The [Modify Date and Time] function is used to set the time/date and time zone (device location) of the internal clock.
The clock is used for checking the internal log and Eco-mode, etc. of the ETERNUS DX60/DX80. This function is used when moving the ETERNUS DX60/DX80 to a new installation site, and/or changing the device date/time. The time zone setting is used for Remote Support function. It is possible to setup the NTP server to automatically set the time. If an NTP function cannot be used, resetting the time once a month is recommended.

Caution

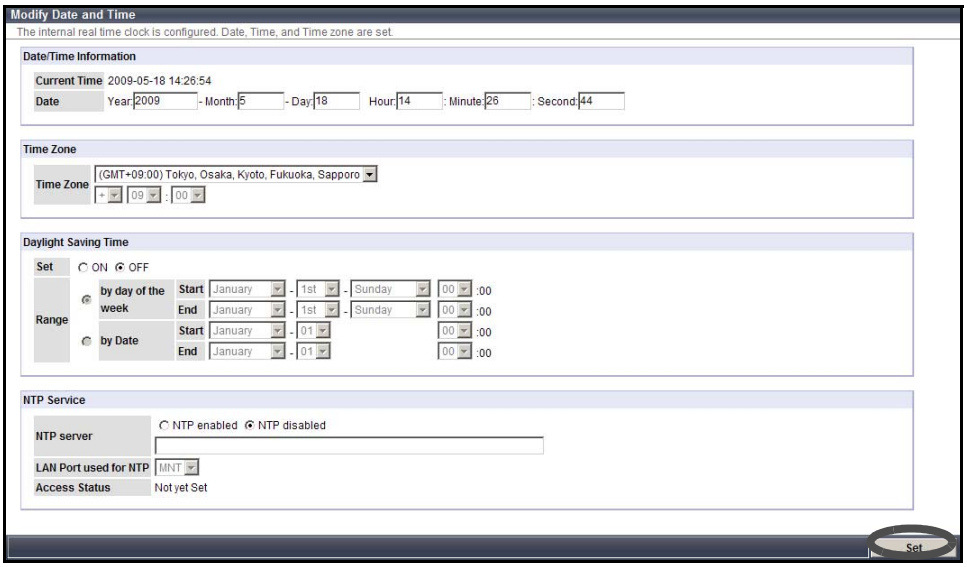
- When using Eco mode, make sure to set the time/date correctly.
  If the time/date of the ETERNUS DX60/DX80 is wrong, processes used for stopping and starting the disk motor cannot be performed per the Eco mode schedule.
- When using the NTP server, the time modification method is step mode (modify immediately).

The procedure to modify date and time is as follows:

Procedure

1. Click the [Modify Date and Time] under the [System Settings] menu on the [Global Settings] tab.
   → The [Modify Date and Time] screen appears.
2. Specify the following items, and click the [Set] button.
   - Date/Time Information
     - Current Time
       Current date and time setting is displayed.
     - Date
       To change the "Current Time", input the new date and time.
   - Time Zone
     Set the time difference (GMT).
     - Time Zone
       Select the Time Zone from the list box. If the appropriate Time Zone does not exist, select "Direct Input", and specify the time difference using "+" or "-", hour, and minute.

- Daylight Saving Time
  - Set
    Select whether to set the Daylight Saving Time "ON" or "OFF" with the radio button.
  - Range
    If "Set" is "ON", set the Daylight Saving Time period. Select "by day of the week" or "by Date" with the radio button, and input the required parameters.
- NTP Service
  - NTP server
    Select "NTP enabled" or "NTP disabled" with the radio button. When NTP is enabled, input the IP address or domain name for the NTP server in the text box. ETERNUS DX60/DX80 is synchronized with the NTP server in a step mode fashion.
  - LAN Port used for NTP
    Select the LAN port to be used for NTP connection from "MNT" or "RMT".
  - Access Status
    Access state to the NTP server is displayed.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The date and time setting is set.

End of procedure

6.4.2 Modify Storage System Name

The [Modify Storage System Name] function is used to set the name, administrator, and installation site of the ETERNUS DX60/DX80 Disk storage system.
Information registered in this screen is used for the following functions and screens:

- Network management using SNMP
- Storage system name displayed in logon screen and operation screens
- Friendly Name (storage system name)(*1) for Virtual Disk Service (VDS)

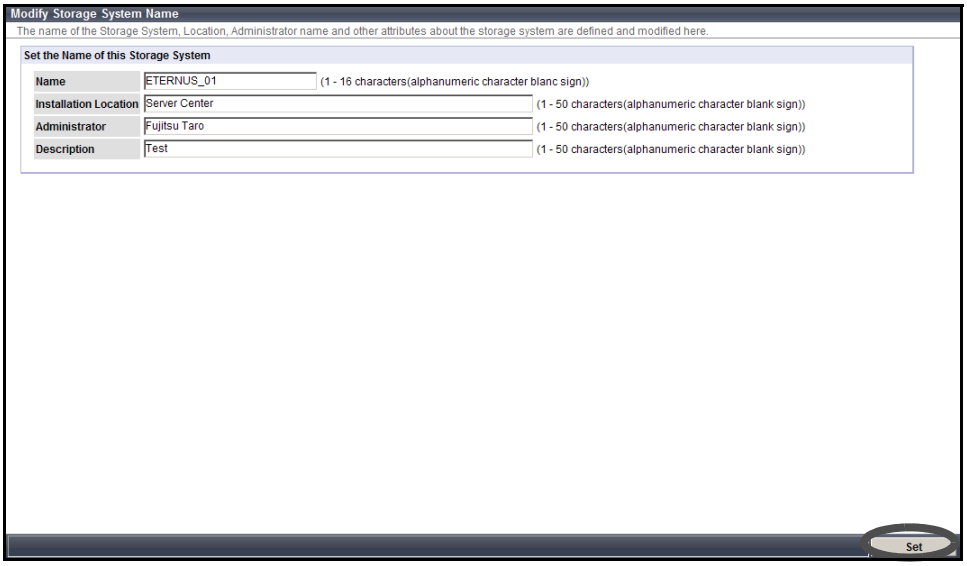
*1: VDS is a storage management function of the Windows Server®.

The procedure to register the storage system name is as follows:

Procedure

1. Click the [Modify Storage System Name] under the [System Settings] menu on the [Global Settings] tab.
   → The [Modify Storage System Name] screen appears.

2. Specify the following items, and click the [Set] button.
   - Name
     Input the storage system name.
     Up to 16 alphanumeric characters and symbols (including blanks) can be used.
   - Installation Location
     Input the device installation location.
     Up to 50 alphanumeric characters and symbols (including blanks) can be used.
   - Administrator
     Input the system administrator information (contact name and address).
     Up to 50 alphanumeric characters and symbols (including blanks) can be used.
   - Description
     Input the system description.
     Up to 50 alphanumeric characters and symbols (including blanks) can be used.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The specified storage system name is registered.

End of procedure

6.4.3 Setup Encryption Mode

The [Setup Encryption Mode] function enables or disables encryption mode.
When encryption mode is enabled, an encryption buffer is secured in the cache memory of the controller module.

Caution

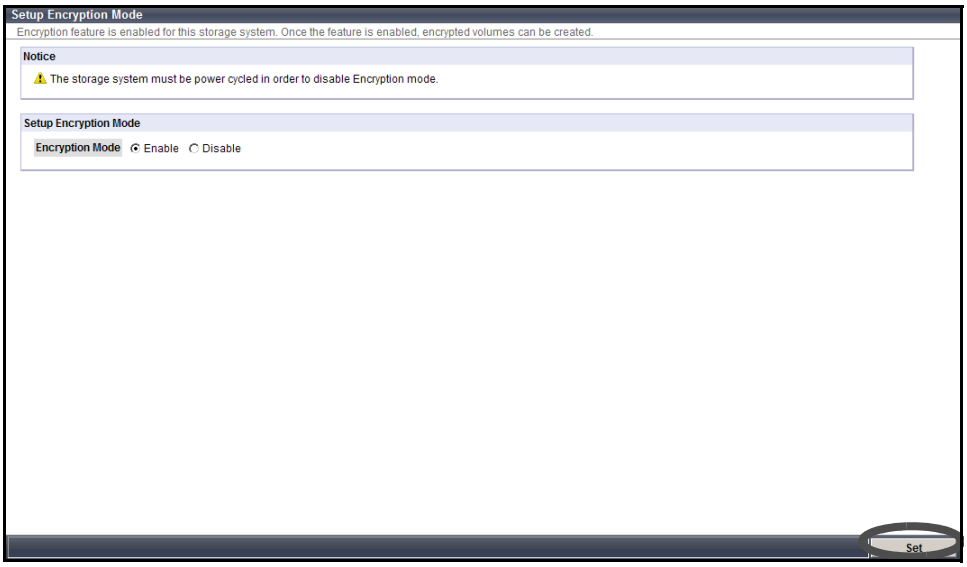
- When the "Setup Encryption Mode" is not displayed in the menu, the encryption function is not available.
- Encryption related functions are only available after enabling encryption mode.
- When disabling the encryption mode, reboot the ETERNUS DX60/DX80.
- The encryption buffer capacity for each controller module (CM0/CM1) is 76MB for ETERNUS DX60, and 230MB for ETERNUS DX80.
- Once encrypted, volumes cannot be changed to non-encrypted volumes.
- When disabling the encryption mode, delete all the encrypted volumes and volumes being encrypted in advance.
- Encryption function cannot be used under the following conditions:
  - Encrypted volumes exist
  - Volumes being encrypted exist
  - The cache memory capacity for all the controller modules in the ETERNUS DX60/DX80 is not the same
  - Required cache memory capacity cannot be secured for enabling the encryption mode

The procedure to setup encryption mode is as follows:

Procedure

1 Click the [Setup Encryption Mode] under the [System Settings] menu on the [Global Settings] tab.
→ The [Setup Encryption Mode] screen appears.

2 Select whether to "Enable" or "Disable" encryption mode, and click the [Set] button.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The encryption mode is set.

End of procedure

6.4.4 Change Box ID

The [Change Box ID] function changes the Box ID that identifies an ETERNUS DX60/DX80 in the user system.
Box ID is used as information to identify the ETERNUS DX60/DX80 from applications connected to the ETERNUS DX60/DX80. The initial Box ID is a device ID that is created by combining device information (series name, model, serial number, etc.).
If upgrading or replacing the ETERNUS DX60/DX80, the existing Box ID will change with the ETERNUS DX60/DX80 change. Therefore, there is a risk that the backup data saved in the previous ETERNUS DX60/DX80 cannot be used, so it is necessary to reconfigure the user system after the ETERNUS DX60/DX80 is upgraded or replaced. This function changes the device BOX ID to the same ID as that of the previous ETERNUS DX60/DX80 in order to avoid any problems and also use the same backup data in the new device.

Caution

- A Box ID is a unique name in the user system. Make the Box ID different from that of other ETERNUS Disk storage systems in the user system. If the Box ID is not changed, the Device ID is used as a Box ID.
- You cannot change the Box ID during Advanced Copy or RAID migration.

The procedure to change Box ID is as follows:

Procedure

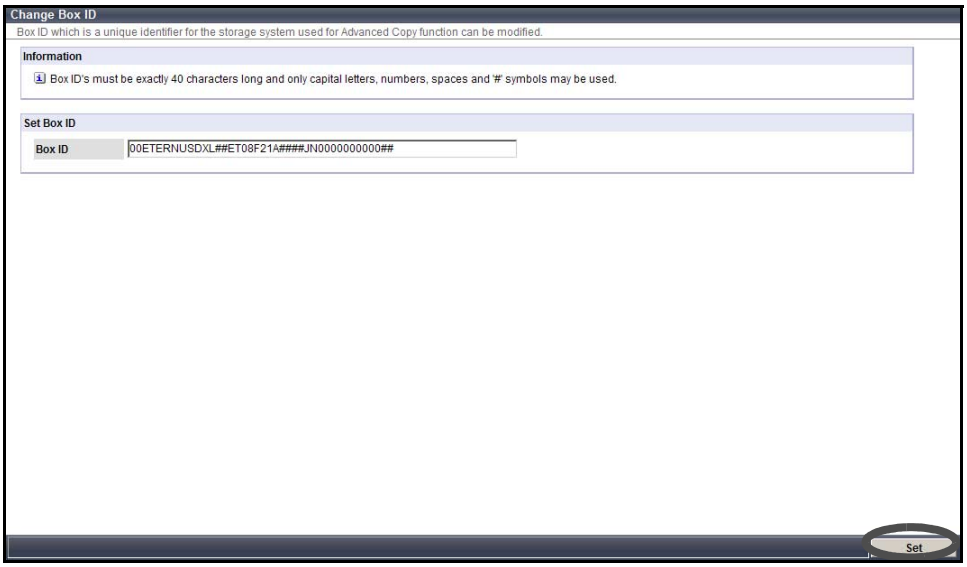
1 Click the [Change Box ID] under the [System Settings] menu on the [Global Settings] tab.
→ The [Change Box ID] screen appears.

2 Input the Box ID and click the [Set] button.
Set the Box ID with 40 characters.
Alphabetic characters (upper case), numerals, blanks, and hash key characters (#) can be used.

Caution

In the following conditions, a Box ID cannot be set.

- When a Box ID is not entered
- When the input value of a Box ID is less than 40 characters
- When the entered value of a Box ID is not alphabetic characters (upper case), numerals, blanks, or hash key characters (#)



→ A confirmation screen appears.

3 Click the [OK] button.

→ The specified Box ID is registered.

End of procedure

6.4.5 Setup Power Management

The [Setup Power Management] function connects the external input device and controls (shuts down) the ETERNUS DX60/DX80 power.

Caution

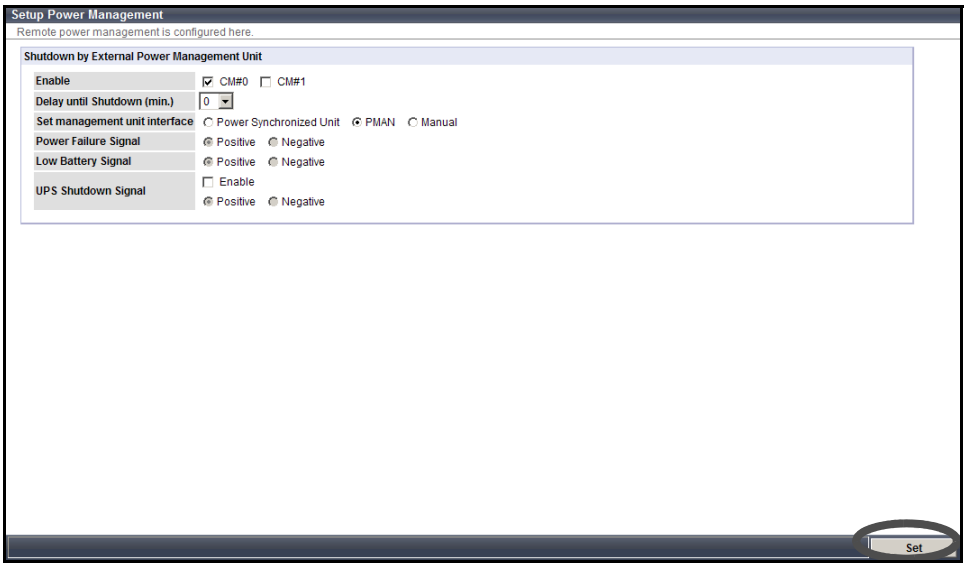
- When using power management function, the AUTO POWER switch (AC power interlock mode) setting as well as GUI setting for ETERNUS DX60/DX80 is required. Refer to "ETERNUS DX60/DX80 Disk storage system User Guide" for details.
- If this function is enabled by mistake, the ETERNUS DX60/DX80 may shut down unexpectedly.

The procedure to setup power management is as follows:

Procedure

1. Click the [Setup Power Management] under the [System Settings] menu on the [Global Settings] tab.
   → The [Setup Power Management] screen appears.
2. Specify the following items, and click the [Set] button.
   - Enable
     Select the controller module to enable power management by an external input device (both checkbox can be selected at the same time).
     - CM#0
     - CM#1

     Note: When the ETERNUS DX60/DX80 has only one CM, CM#1 cannot be selected.
   - Delay until Shutdown (min.)
     Set the delay time before starting shutdown after receiving a battery low signal between 0 and 15 (minutes).
   - Set management unit interface
     Select the device connecting via RS232C interface.
     The "Manual" setting is for particular use, thus should not be used during normal operation.
     - Power Synchronized Unit
     - PMAN
     - Manual
   - Power Failure Signal
     Select the signal logic for power failure signal when the power failure occurs (Positive: positive logic, Negative: negative logic).
   - Low Battery Signal
     Select the signal logic for a low battery signal when a low battery charge occurs (Positive: positive logic, Negative: negative logic).
   - UPS Shutdown Signal
     When enabling the UPS shutdown signal, check the "Enable" checkbox. Also, select the signal logic for UPS shutdown signal (Positive: positive logic, Negative: negative logic).



→ A confirmation screen appears.

3 Click the [OK] button.

→ The power management setting is set.

End of procedure

6.5 Host I/F Management

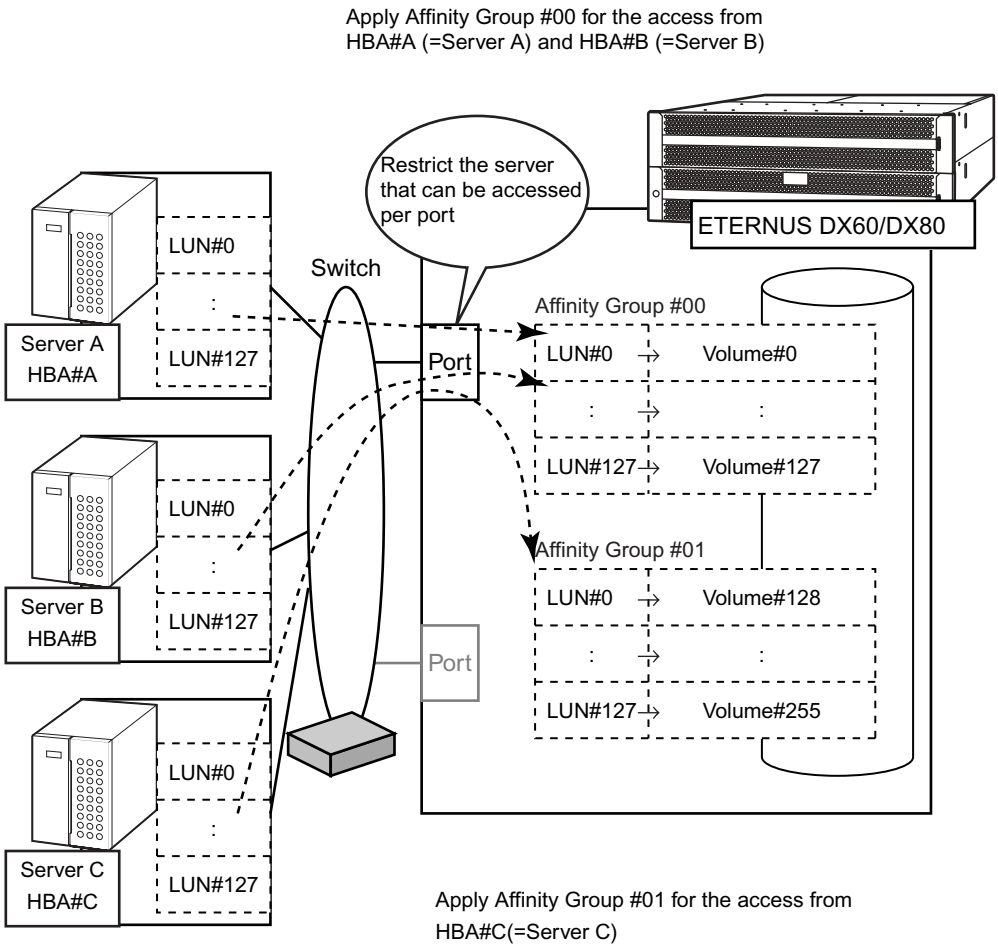
Host I/F Management provides the following host connection related functions.

- Set Port Parameters
- Setup Host
- Setup Host Response
- Modify Reset Group

ETERNUS DX60/DX80 can relate the Logical Unit Number (LUN) of the host to volumes in the device, and set or limit the volume that is recognized from the host.
Host Affinity relates the LUN and volume to each interface port connected in the host.

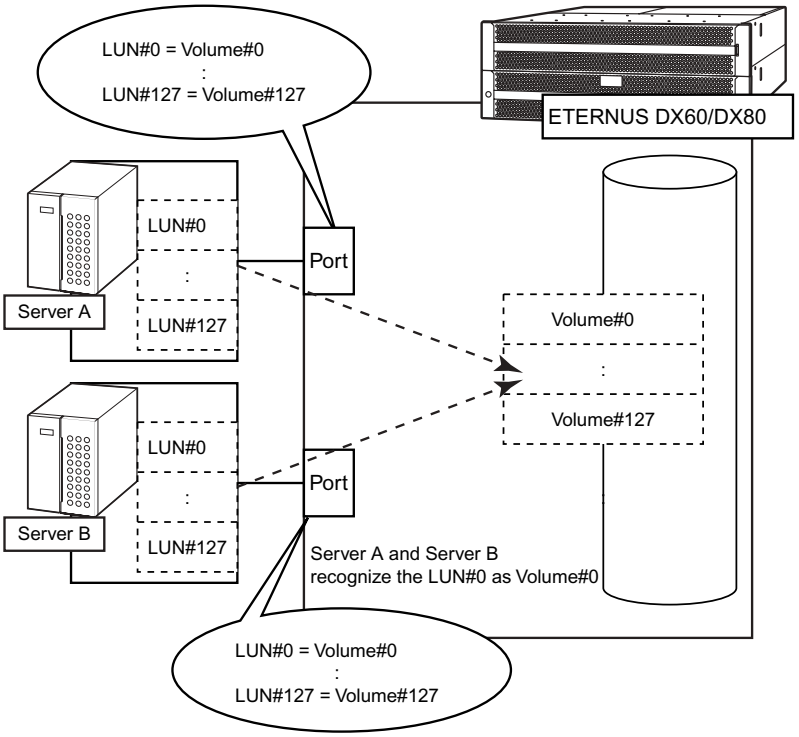
When using Host Affinity function

The [Host I/F Management] is used when connecting multiple servers via a switch.
The server recognizes the affinity group specified for each Host Bus Adapter (HBA).
By restricting the volumes can be recognized from each server, security improvement is expected.
The following shows a basic concept for affinity group.

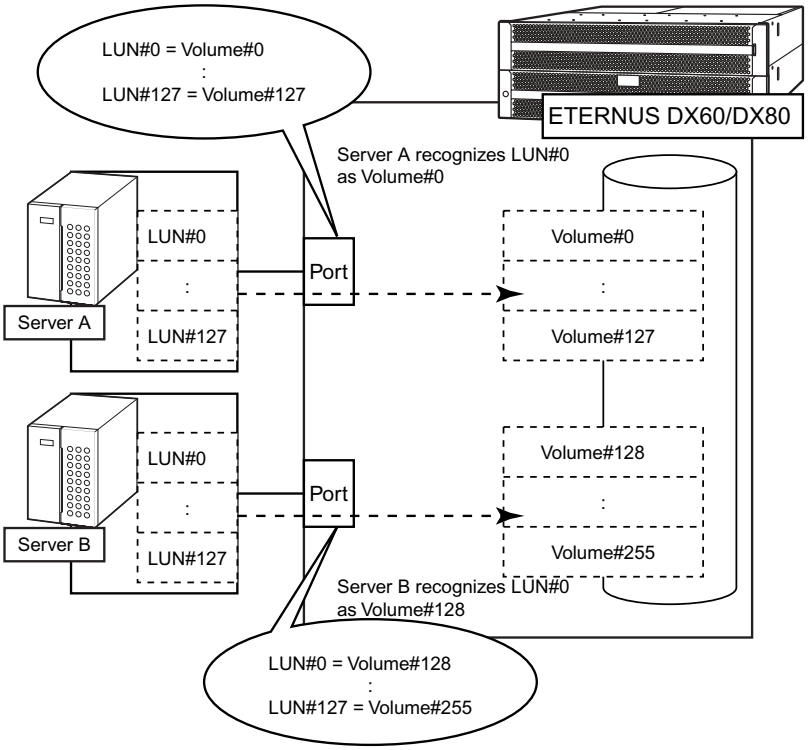


- When Host Affinity function is not used

When the host affinity function is not used, the server recognizes the volume related to LUN in each ETERNUS DX60/DX80 port.
This method is suitable for connecting the server and ETERNUS DX60/DX80 directly.
The following shows a basic concept when the same volume is LUN mapped to each port.



The following shows a basic concept when different volumes are LUN mapped to each port.



6.5.1 Set Port Parameters

The [Set Port Parameters] function sets the connecting information for ports to connect to the server.
There are three types of Host I/F; FC, iSCSI, and SAS. Procedures to set port parameters varies depending on the Host I/F types.

Caution When the Host Affinity function is enabled, use the [Setup Host] function to set the host response for each host. When the Host Affinity function is disabled, use the [Set Port Parameters] function to set the host response for each port.

Note For details, refer to "ETERNUS Disk storage systems Server Connection Guide" for each operating system.

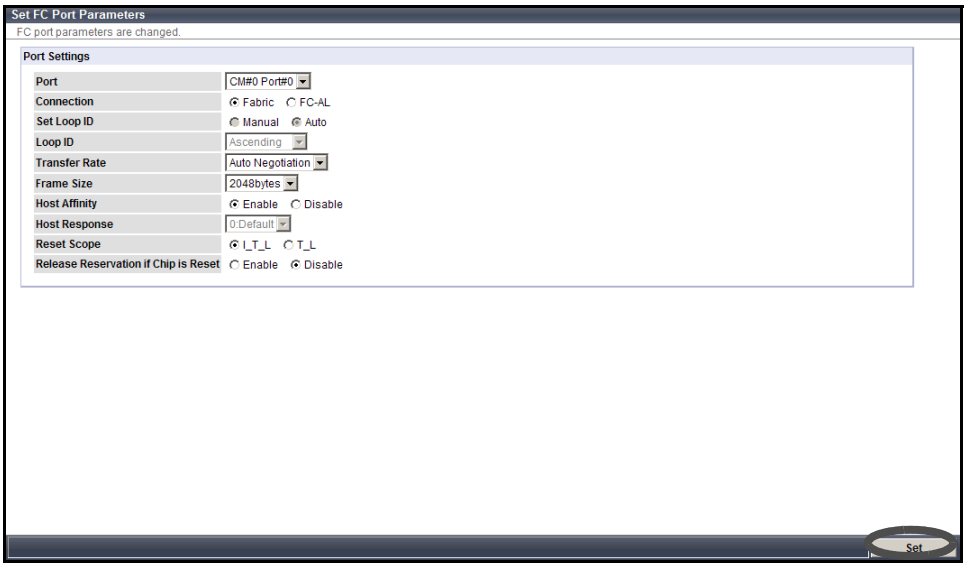
Set FC Port Parameters

The [Set FC Port Parameters] function sets the connection information between the FC port of the ETERNUS DX60/DX80 and host (FC port parameters).
The procedure to set FC port parameters is as follows:

Procedure

1. Click the [Set FC Port Parameters] under the [Host I/F Management] menu on the [Global Settings] tab.
   → The [Set FC Port Parameters] screen appears.
2. Specify the following items, and click the [Set] button.
   - Port
     Select the target port.
   - Connection
     Select the connection method for the target port from the "Fabric" or "FC-AL". The default setting is "FC-AL". When "FC-AL" is selected, it is necessary to assign a Loop-ID to the port.
   - Set Loop ID
     When the "Connection" is "FC-AL", select "Manual" or "Auto" to specify the Loop ID.
   - Loop ID
     When the "Set Loop ID" is "Auto", select "Ascending" or "Descending".
     When the "Set Loop ID" is "Manual", specify the Loop ID (last 2 digits of 0x00 to 0x7D).

- Transfer Rate
  Select the transfer speed from the following:
  - For 4Gbps models
    - Auto Negotiation
    - 1Gbps
    - 2Gbps
    - 4Gbps
  - For 8Gbps models
    - Auto Negotiation
    - 2Gbps
    - 4Gbps
    - 8Gbps
- Frame Size
  Select the frame size of the target port according to the destination server or switch (2,048Byte, 1,024Byte, or 512Byte).
- Host Affinity
  Select whether to "Enable" or "Disable" the host affinity function for the target port.
  Select "Enable" when restricting access per server (when connecting via switches).
  When the switch is not connected (directly connected to the ETERNUS DX60/DX80), select "Disable".
- Host Response
  When the "Host Affinity" is "Disabled", select the host response to allocate to the target port.
  - Default
    The initial pattern is displayed. Sense information is not converted.
  - Host Response (Number:Name)
    Identification number of the host response registered in the ETERNUS DX60/DX80 is displayed.
    When the host response name is registered, it is also displayed.
- Reset Scope
  Select the reset scope from "I_T_L" or "T_L". The default setting is "I_T_L".
  Reset scope is the range where the command reset request from the server is performed, when the port is connected to multiple servers.
  - I_T_L (I: Initiator, T: Target, L: LUN)
    Reset (cancel) the command request from the server that sent the command reset request.
  - T_L (T: Target, L: LUN)
    Reset (cancel) the command request from all servers that are connected to the port (regardless of whether the LUN is recognized).
- Release Reservation if Chip is Reset
  Select whether to "Enable" or "Disable" the function to release the volume's reserved status when the target port (chip) is in Reset status.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The FC port parameters are set.

End of procedure

Set iSCSI Port Parameters

The [Set iSCSI Port Parameters] function sets the connection information between the iSCSI port of the ETERNUS DX60/DX80 and host (iSCSI port parameters).

Caution

- Each port must have a unique IP address. The same IP address cannot be set again in the ETERNUS DX60/DX80.
- An iSCSI name is a unique name in the ETERNUS DX60/DX80. The same iSCSI name cannot be specified for multiple iSCSI ports. However, the same iSCSI name has been specified for all ports by default (only the default value can be same). When these name must be recognized separately, change the iSCSI names. For multipath connection, iSCSI names must be changed.

The procedure to set iSCSI port parameters is as follows:

Procedure

1. Click the [Set iSCSI Port Parameters] under the [Host I/F Management] menu on the [Global Settings] tab.
   → The [Set iSCSI Port Parameters] screen appears.
2. Specify the following items, and click the [Set] button.
   - Port
     Select the target port.
   - IP Address
     Specify the IP address for the target port (required).

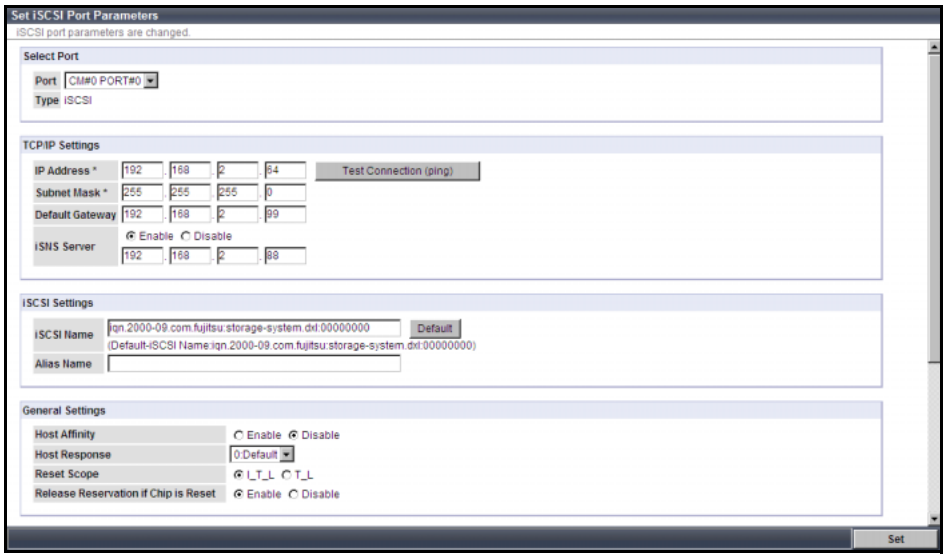
     Note: Click the [Test Connection (ping)] button to display the [Send ping Command] screen. Specify the IP address of the connection destination device whose connection status is to be checked and number of execution, and click the [Send] button.
     Sending the "ping" command enables you to check whether the IP address is allocated correctly, and connection path to the destination device is normal.
   - Subnet Mask
     Set the subnet mask for the target port (required).
   - Default Gateway
     Set the default gateway for the target port.
   - iSNS Server
     Select wether to use the iSNS server in the target port.
     When "Enable" is selected, specify the IP address for the iSNS server.

     Note: Internet Storage Name Service (iSNS) is almost equivalent to Domain Name System (DNS) for the Internet. iSNS server is used to convert the iSCSI name to the IP address on the iSCSI network.
   - iSCSI Name
     Set the iSCSI name for the target port. Up to 233 alphanumeric characters and symbols ([!], [-], [_], [.]) can be used. Click the [Default] button to set the default iSCSI name.

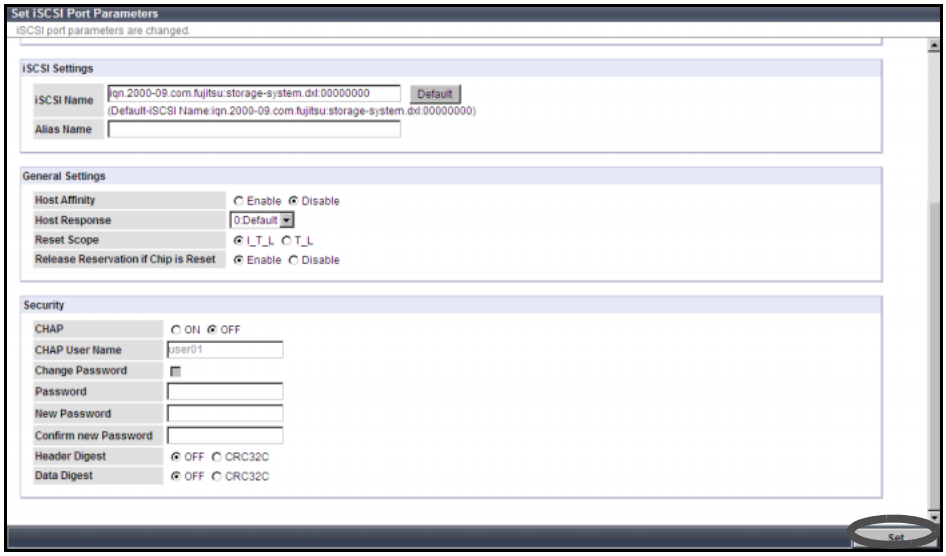
     Caution: An iSCSI name is a unique name in the ETERNUS DX60/DX80. The same iSCSI name cannot be set to multiple iSCSI port except the device iSCSI name.
   - Alias Name
     Set the alias name for the target port. Up to 31 alphanumeric characters and symbols (including blanks) can be used.
     While the iSCSI name is a formal nomenclature that specifies the target iSCSI port, an alias name is used as nickname.

- Host Affinity
  Select whether to "Enable" or "Disable" the Host Affinity function for the target port.
  Select "Enable" when restricting access per server (when connecting via switches).
  When the switch is not connected (directly connected to the ETERNUS DX60/DX80), select "Disable".
- Host Response
  When the "Host Affinity" is "Disabled", select the host response to allocate to the target port.
  - Default
    The initial pattern is displayed. Sense information is not converted.
  - Host Response (Number: Name)
    Identification number of the host response registered in the ETERNUS DX60/DX80 is displayed.
    When the host response name is registered, it is also displayed.
- Reset Scope
  Select the reset scope from "I_T_L" or "T_L". The default setting is "I_T_L".
  Reset scope is the range where the command reset request from the server is performed, when the port is connected to multiple servers.
  - I_T_L (I: Initiator, T: Target, L: LUN)
    Reset (cancel) the command request from the server that sent the command reset request.
  - T_L (T: Target, L: LUN)
    Reset (cancel) the command request from all servers that are connected to the port (regardless of whether the LUN is recognized).
- Release Reservation if Chip is Reset
  Select whether to "Enable" or "Disable" the function to release the volume's reserved status when the target port (chip) is in Reset status.
- CHAP
  Select "ON" when enabling CHAP authentication (Bidirectional CHAP) for the target port. To disable, select "OFF".
  For CHAP Authentication, an encrypted password based on a random key that the ETERNUS DX60/DX80 receives from the host is sent, and connection possibility is judged on the server side.
- CHAP User Name
  When "ON" is selected for "CHAP", specify the user name that accesses the target port. Up to 255 characters of alphanumeric characters and symbols (including blanks) can be used.
  This setting is required when CHAP authentication is used.
  Make sure to set the user name and password in pairs.
- Change CHAP Password
  When changing the CHAP password, select the checkbox. This checkbox can only be selected when "ON" is selected for "CHAP" and the password has already been set.
- Password
  Specify the password for the currently specifying "Chap User Name".
- New Password
  When "ON" is elected for "CHAP", specify the password that accesses the target port.
  Between 12 and 100 alphanumeric characters and symbols (including blanks) can be used.
  Make sure to set the user name and password in pairs.

- Confirm New Password
  Input the same character strings as the value entered in the "New Password" field for confirmation.
- Header Digest
  Select "OFF" when not adding Header Digest of the target port. When adding, select "CRC32C". Header Digest is a check code to be added to the header part of the iSCSI port detailed information.
  Specify "CRC32C" when the host requests to add the check code. "CRC32C" is algorithmic to create a check code.
- Data Digest
  Select "OFF" when not adding Data Digest of the target port. When adding, select "CRC32C". Data Digest is a check code to be added to the data area of the iSCSI port detailed information.
  Specify "CRC32C" when the host requests to add the check code. "CRC32C" is algorithmic to create a check code.
- [Set iSCSI Port Parameters] screen (1/2)



- [Set iSCSI Port Parameters] screen (2/2)



→ A confirmation screen appears.

3 Click the [OK] button.

→ The iSCSI port parameters are set.

End of procedure

Set SAS Port Parameters

The [Set SAS Port Parameters] function sets the connection information between the SAS port of the ETERNUS DX60/DX80 and host (SAS port parameters).
The procedure to set SAS port parameters is as follows:

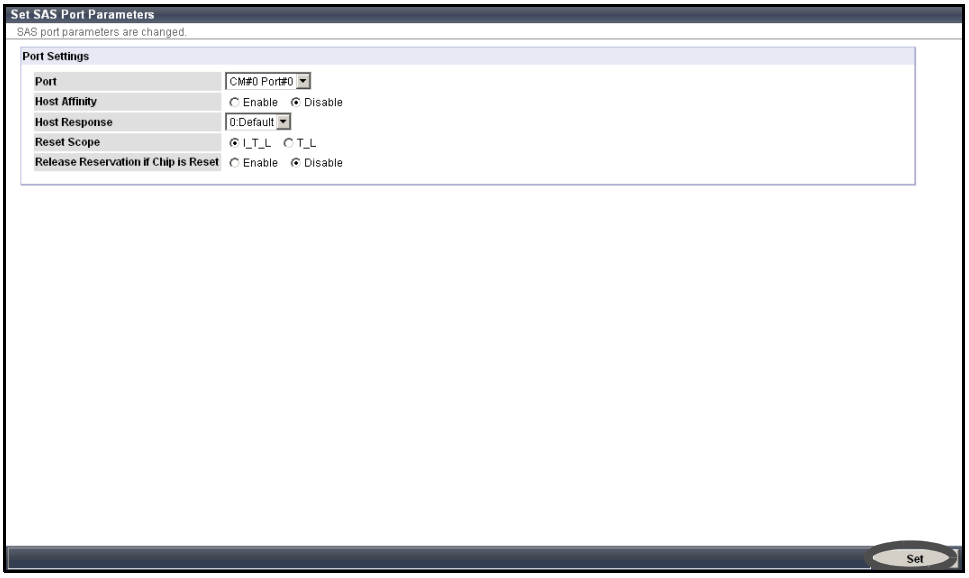
Procedure

1 Click the [Set SAS Port Parameters] under the [Host I/F Management] menu on the [Global Settings] tab.
→ The [Set SAS Port Parameters] screen appears.

2 Specify the following items, and click the [Set] button.

- Port
  Select the target port.
- Host Affinity
  Select whether to "Enable" or "Disable" the Host Affinity function for the target port.
  Select "Enable" when restricting access per server (when connecting via switches).
  When the switch is not connected (directly connected to the ETERNUS DX60/DX80), select "Disable".
- Host Response
  When the "Host Affinity" is "Disabled", select the host response to allocate to the target port.
  - Default
    The initial pattern is displayed. Sense information is not converted.
  - Host Response (Number: Name)
    Identification number of the host response registered in the ETERNUS DX60/DX80 is displayed.
    When the host response name is registered, it is also displayed.
- Reset Scope
  Select the reset scope from "I_T_L" or "T_L". The default setting is "I_T_L".
  Reset scope is the range where the command reset request from the server is performed, when the port is connected to multiple servers.
  - I_T_L (I: Initiator, T: Target, L: LUN)
    Reset (cancel) the command request from the server that sent the command reset request.
  - T_L (T: Target, L: LUN)
    Reset (cancel) the command request from all servers that are connected to the port (regardless of whether the LUN is recognized).

- Release Reservation if Chip is Reset
  Select whether to "Enable" or "Disable" the function to release the volume's reserved status when the target port (chip) is in Reset status.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The SAS port parameters are set.

End of procedure

6.5.2 Setup Host

The [Setup Host] function registers the HBA information to the ETERNUS DX60/DX80. By registering HBA information, access to the volumes in the ETERNUS DX60/DX80 is restricted, and connections from servers with unregistered hosts are not allowed (when the Host Affinity function is enabled).
There are three types of Host I/F; FC, iSCSI, and SAS. The required setting varies depending on the Host I/F type.

Caution

- This setting is not needed when the Host Affinity function is not used.
- When deleting the currently running host, the access from the target host must be stopped. To set a new host, it is not necessary to stop host access.
- When deleting host information, the settings for the affinity group and LUN mapping that are associated with the host must be disabled in advance.
- When using the Host Affinity functions, make sure to "Enable" the Host Affinity setting of the port using the [Set Port Parameters] function.

Note

For details, refer to "ETERNUS Disk storage systems Server Connection Guide" for each operating system.

Setup FC Host

The [Setup FC Host] function registers the FC information of the HBAs installed in the FC host to be connected to the ETERNUS DX60/DX80.

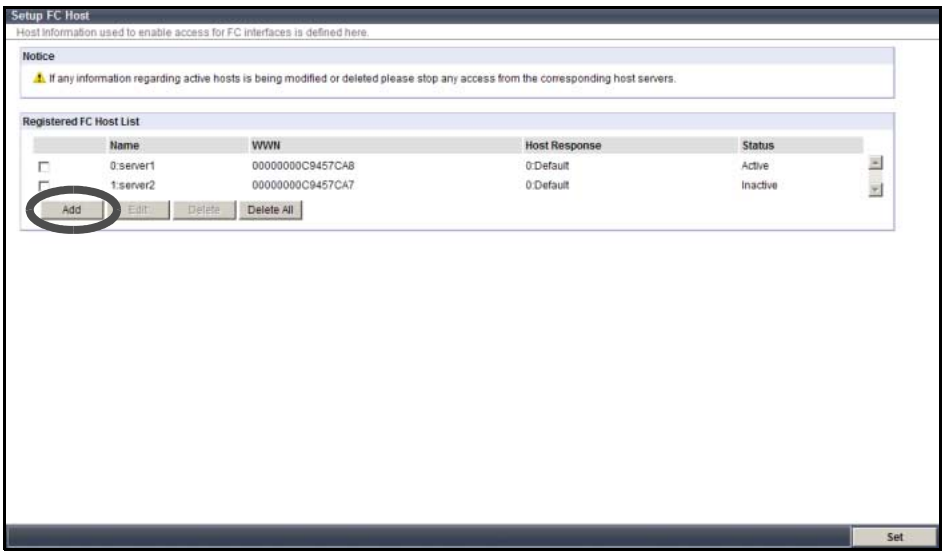
Caution

Up to 16 FC hosts (HBAs) per port can be connected for ETERNUS DX60. For ETERNUS DX80, up to 32 FC hosts per port can be connected.

The procedures to set the FC Host (register) are as follows:

Procedure

1. Click the [Setup FC Host] under the [Host I/F Management] menu on the [Global Settings] tab.
   → The [Setup FC Host] screen appears.
2. Click the [Add] button.



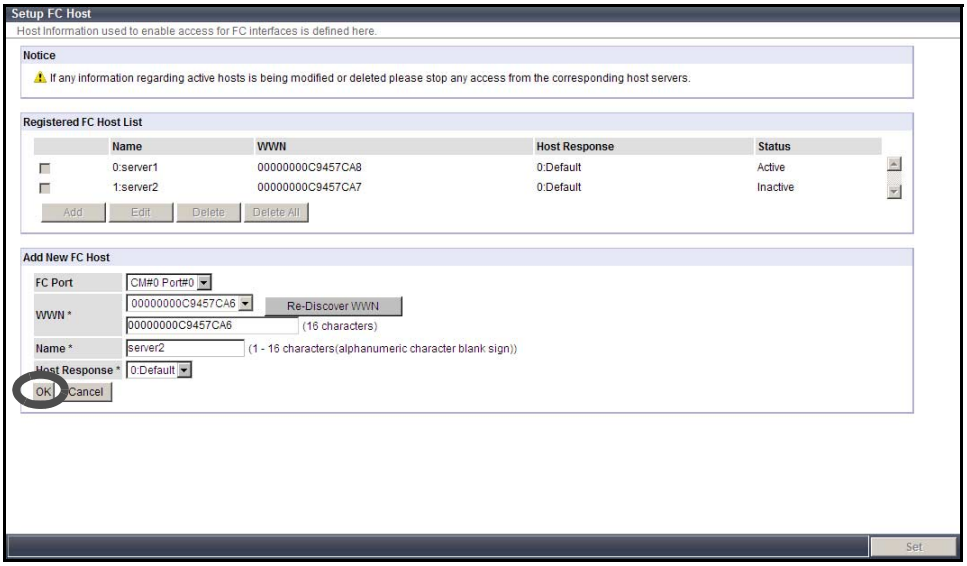
→ The "Add New FC Host" field is displayed.

3 Specify the following items, and click the [OK] button.

- FC Port
  The list of FC port existing in the ETERNUS DX60/DX80 is displayed.

> **Caution** When the fibre channel switch is connected to the ETERNUS DX60/DX80, settings between the fibre channel switch and server (FC host) must be completed in advance.

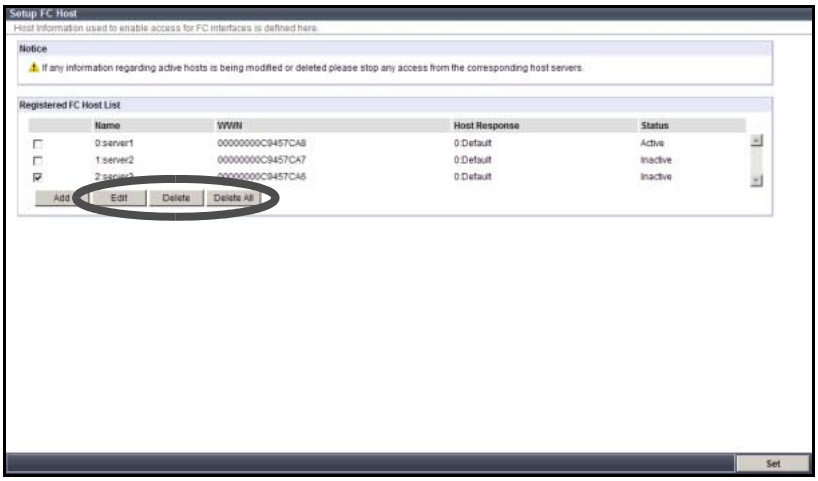
- WWN
  Select the WWN, or directly input a WWN (required). 16 capital letters and numerals can be used.
- Name
  Specify the FC Host Name (required). Up to 16 alphanumeric characters and symbols (including blanks) can be used.
- Host Response
  Specify the host response for the target host (required).



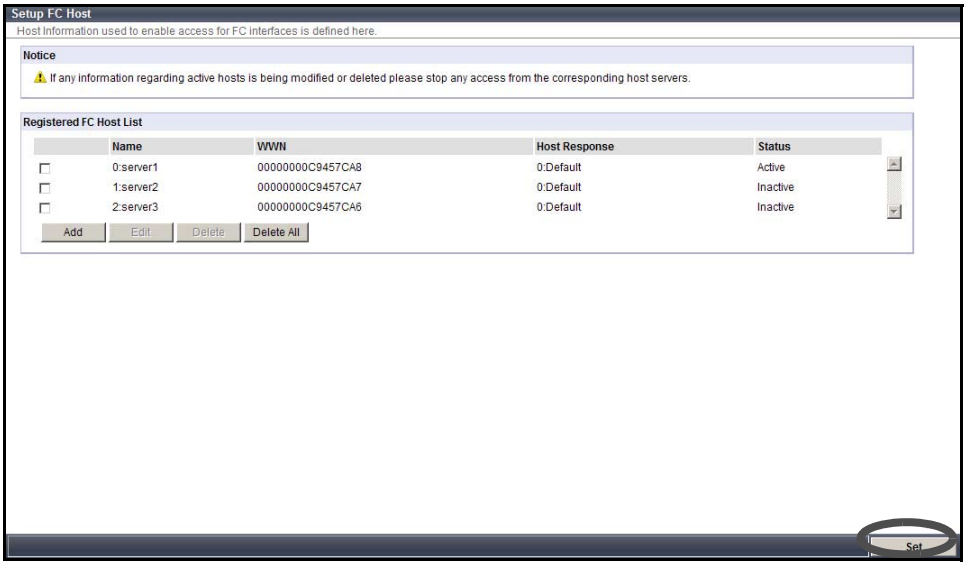
→ The target FC host is added in the "Registered FC Host List".

Note

When changing or deleting the FC host settings, select the target FC host in the "Registered FC Host List" field, and click the [Edit] or [Delete] button.
When deleting all the registered FC hosts, click the [Delete All] button.



4 Click the [Set] button.



→ A confirmation screen appears.

5 Click the [OK] button.

→ The FC host is set (registered).

End of procedure

Setup iSCSI Host

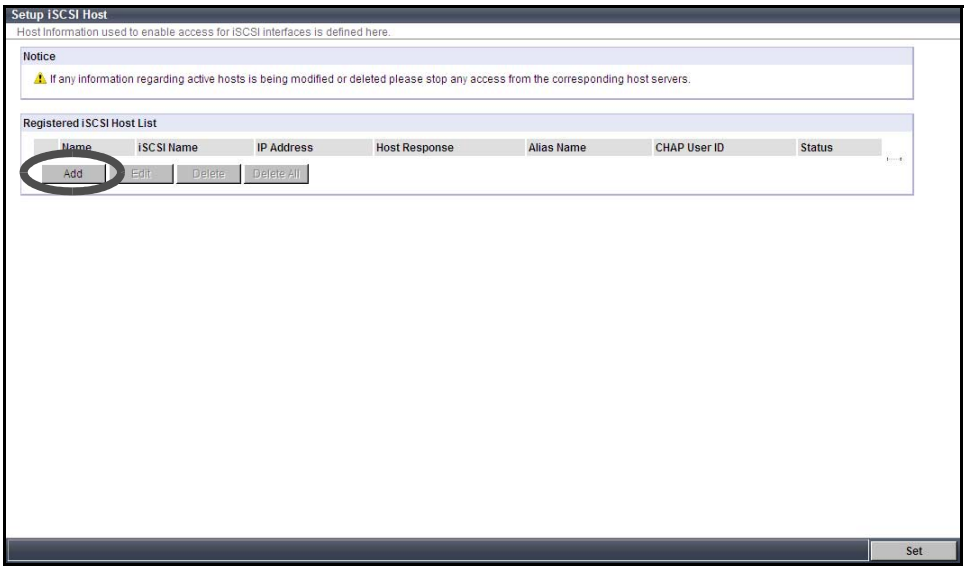
The [Setup SAS Host] function registers the SAS information of the Host Bus Adapters (HBAs) installed in the SAS host to be connected to the ETERNUS DX60/DX80.
For iSCSI connection, configure the server as an iSCSI initiator (the host that sends commands), and the ETERNUS DX60/DX80 as an iSCSI target (the device that executes the commands). Authentication is performed using the iSCSI name in each session between an initiator and target. CHAP Authentication, which matches the user name and password, can be performed in this phase.

Caution Up to 16 iSCSI hosts (HBAs) per port can be connected for ETERNUS DX60. For ETERNUS DX80, up to 32 iSCSI hosts per port can be connected.

The procedures to set the iSCSI Host (register) are as follows:

Procedure

1. Click the [Setup iSCSI Host] under the [Host I/F Management] menu on the [Global Settings] tab.
   → The [Setup iSCSI Host] screen appears.
2. Click the [Add] button.



   → The "Add New iSCSI Host" field is displayed.
3. Specify the following items, and click the [OK] button.
   - iSCSI Port
     The list of iSCSI port existing in the ETERNUS DX60/DX80 is displayed.
   - iSCSI Name
     Select the iSCSI Name, or directly input the iSCSI Name (required). Between 4 and 223 alphanumeric characters and symbols can be used.

Caution

The iSCSI Name cannot be obtained automatically in the following conditions:

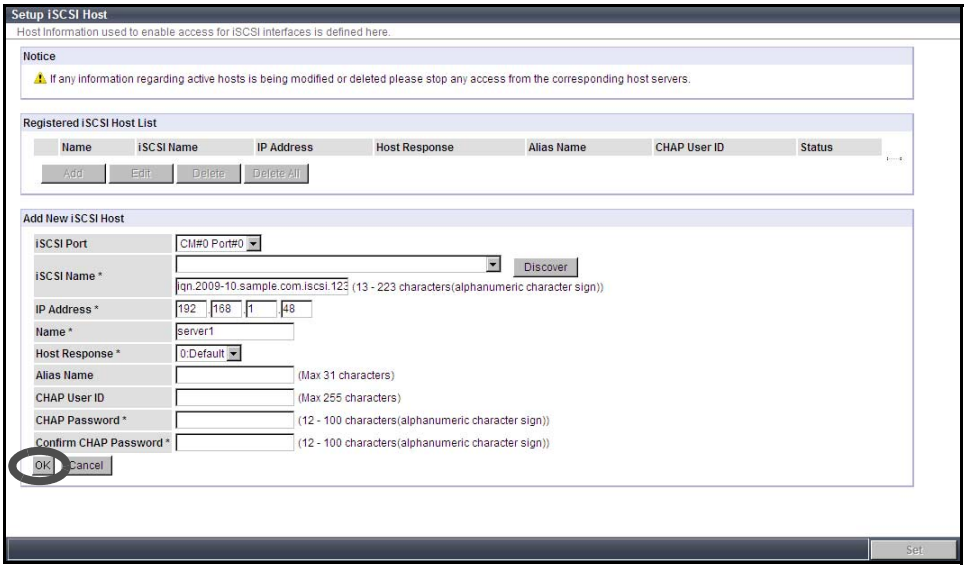
- The [Discover] button is inactivated
- When "Disable" is selected for the "iSNS server" in the "Set iSCSI Port Parameters"

- IP Address
  Specify the IP address for the iSCSI host (required).
- Name
  Specify the iSCSI Host Name (required). Up to 16 alphanumeric characters and symbols (including blanks) can be used.
- Host Response
  Specify the host response for the target host (required).
- Alias Name
  Specify the alias name for the iSCSI host. Up to 31 alphanumeric characters and symbols can be used.
- CHAP User Name
  Specify the user name to access the target host. Up to 255 alphanumeric characters and symbols can be used. This setting is not needed when CHAP authentication is not used.
- CHAP Password
  Specify the password to access the target host. Between 12 and 100 alphanumeric characters and symbols can be used (required).

Caution

Make sure to set the user name and password in pairs.

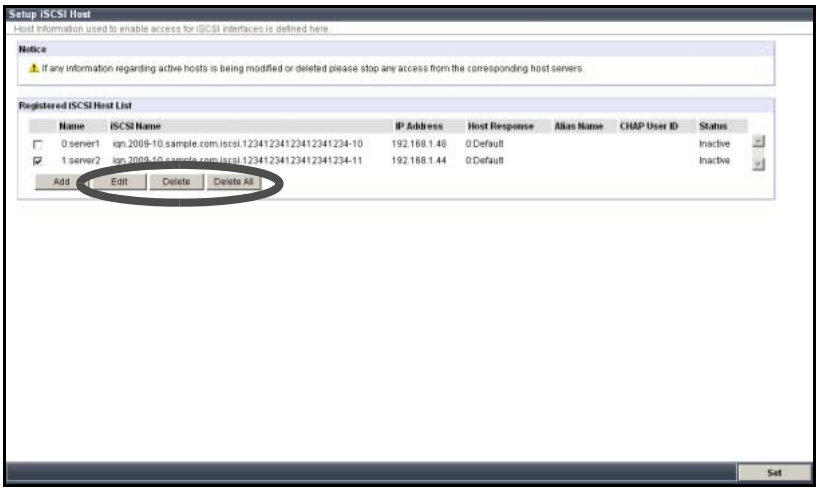
- Confirm CHAP Password
  Input the same character strings as the value entered in the "CHAP Password" field for confirmation (required).



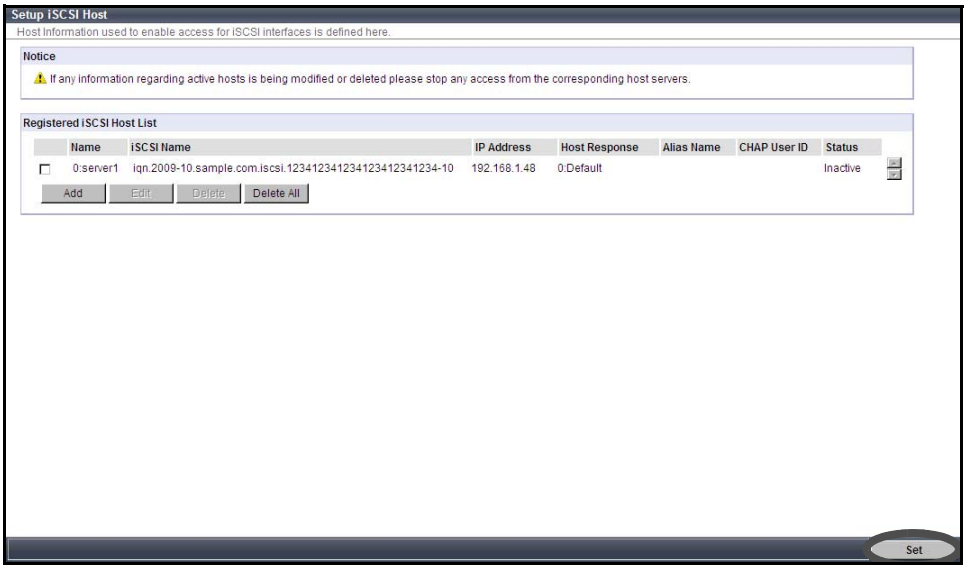
→ The target iSCSI host is added in the "Registered iSCSI Host List".

Note

When changing or deleting the iSCSI host settings, select the target iSCSI host in the "Registered iSCSI Host List" field, and click the [Edit] or [Delete] button.
When deleting all the registered iSCSI hosts, click the [Delete All] button.



4 Click the [Set] button.



→ A confirmation screen appears.

5 Click the [OK] button.

→ The iSCSI host is set (registered).

End of procedure

Setup SAS Host

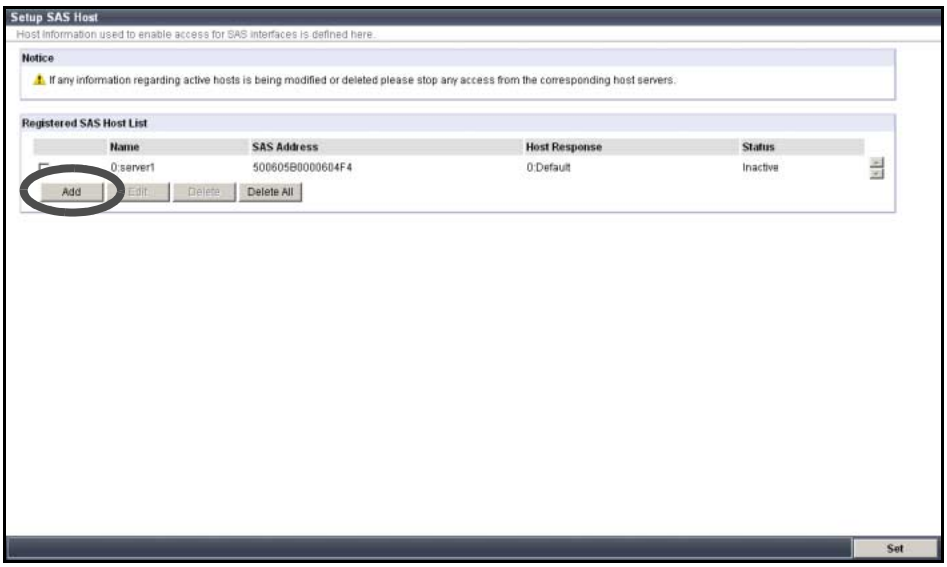
The [Setup SAS Host] function registers the SAS information of the Host Bus Adapters (HBAs) installed in the SAS host to be connected to the ETERNUS DX60/DX80.

Caution Up to one SAS host (HBAs) per port can be connected.

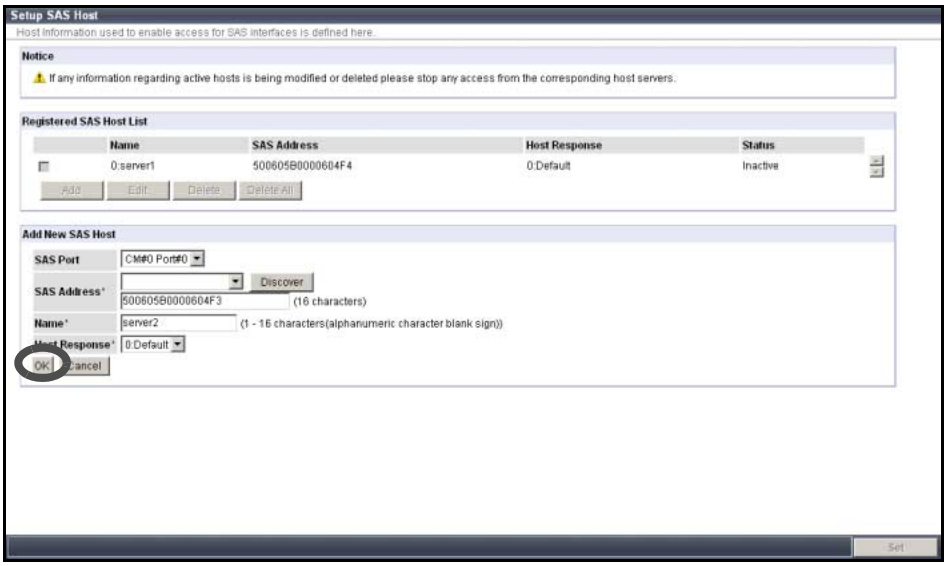
The procedures to set the SAS Host (register) are as follows:

Procedure

1. Click the [Setup SAS Host] under the [Host I/F Management] menu on the [Global Settings] tab.
   → The [Setup SAS Host] screen appears.
2. Click the [Add] button.



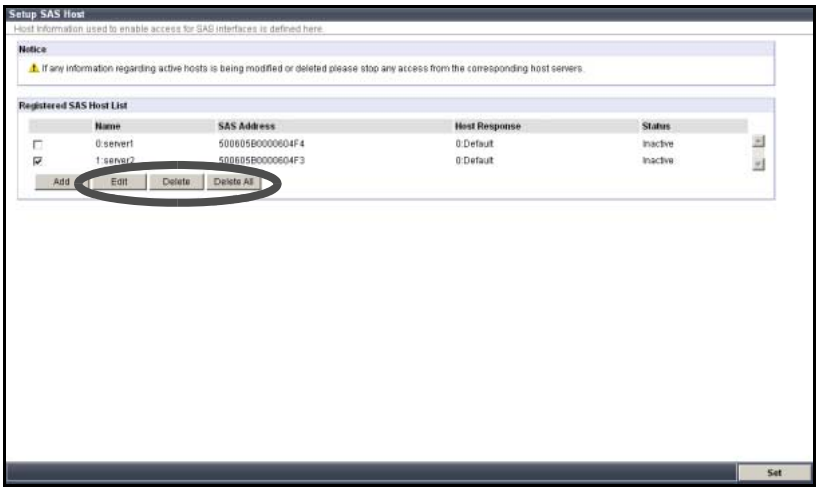
   → The "Add New SAS Host" field is displayed.
3. Specify the following items, and click the [OK] button.
   - SAS Port
     The list of SAS port existing in the ETERNUS DX60/DX80 is displayed.
   - SAS Address
     Select the SAS address, or directly input a SAS address (required). 16 capital letters and numerals can be used.
   - Name
     Specify the SAS Host Name (required). Up to 16 alphanumeric characters and symbols (including blanks) can be used.
   - Host Response
     Specify the host response for the target host (required). Refer to "ETERNUS Disk storage systems Server Connection Guide (SAS)" for details.



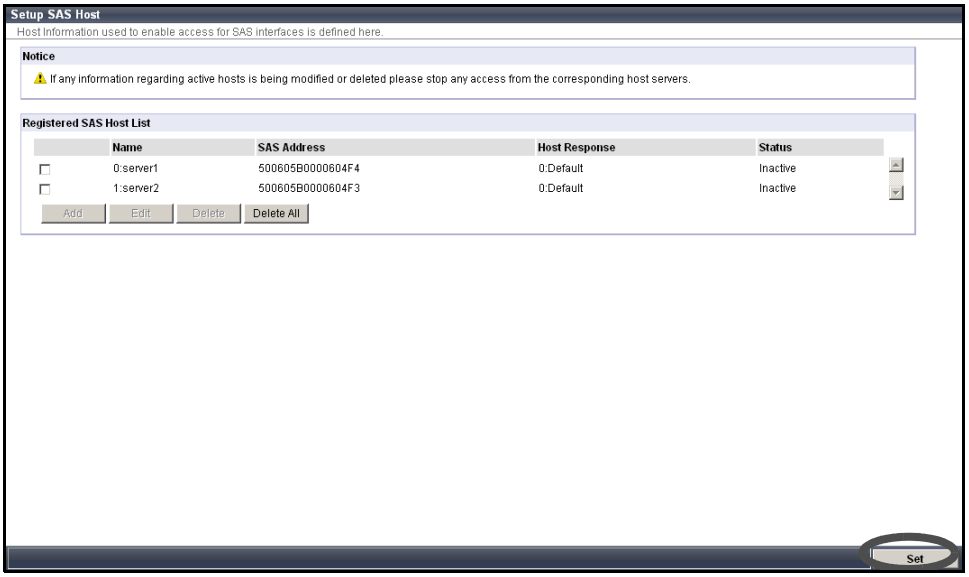
→ The target SAS host is added in the "Registered SAS Host List".

Note

When changing or deleting the SAS host settings, select the target SAS host in the "Registered SAS Host List" field, and click the [Edit] or [Delete] button.
When deleting all the registered SAS hosts, click the [Delete All] button.



4 Click the [Set] button.



→ A confirmation screen appears.

5 Click the [OK] button.

→ The SAS host is set (registered).

End of procedure

6.5.3 Setup Host Response

The [Setup Host Response] function adds, changes, and/or deletes the Host Response settings, which is the information added to the response to the server.
By specifying the correct host response, it prevents the following conditions:

- Server cannot recognize the ETERNUS DX60/DX80 when connecting
- Server cannot take appropriate measures against an ETERNUS DX60/DX80 error

For more details about setting the Host Response for each OS type, refer to "ETERNUS Disk storage systems Server Connection Guide".

Caution

- If the Host Response is not changed, the default pattern provided by the ETERNUS DX60/DX80 is assigned.
- If a host response item is in use by a port or host, release it from the port or host (by associating them with the default host response) before editing or deleting the host response.
- Up to 256 Host Responses can be set.

Note

The target to be assigned to the Host Response varies depending on whether the Host Affinity function is used or not used.

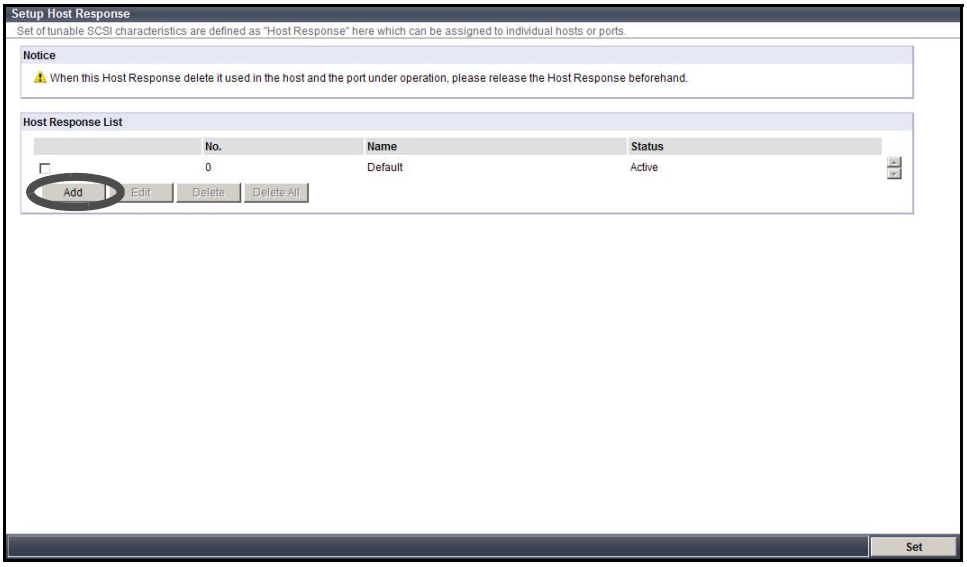
- When the Host Affinity function is used.
  Set the Host Response per server HBA (Refer to "6.5.2 Setup Host" (page 202)).
- When the Host Affinity function is not used.
  Set the Host Response per port (Refer to "6.5.1 Set Port Parameters" (page 195)).

The procedure to add the host response is as follows:

Procedure

1. Click the [Setup Host Response] under the [Host I/F Management] menu on the [Global Settings] tab.
   → The [Setup Host Response] screen appears.

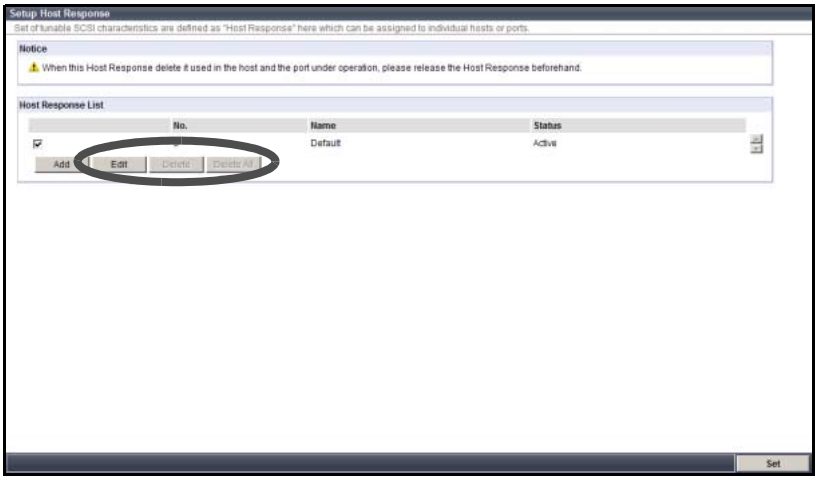
2 Click the [Add] button.



→ The "Edit Host Response" field is displayed.

Note

When changing or deleting the Host Response, select the target Host Response from the tree in the left of screen or target Host Response listed in the "Host Response List" field, and click the [Edit] or [Delete] button.
When deleting all the registered Host Responses, click the [Delete All] button.

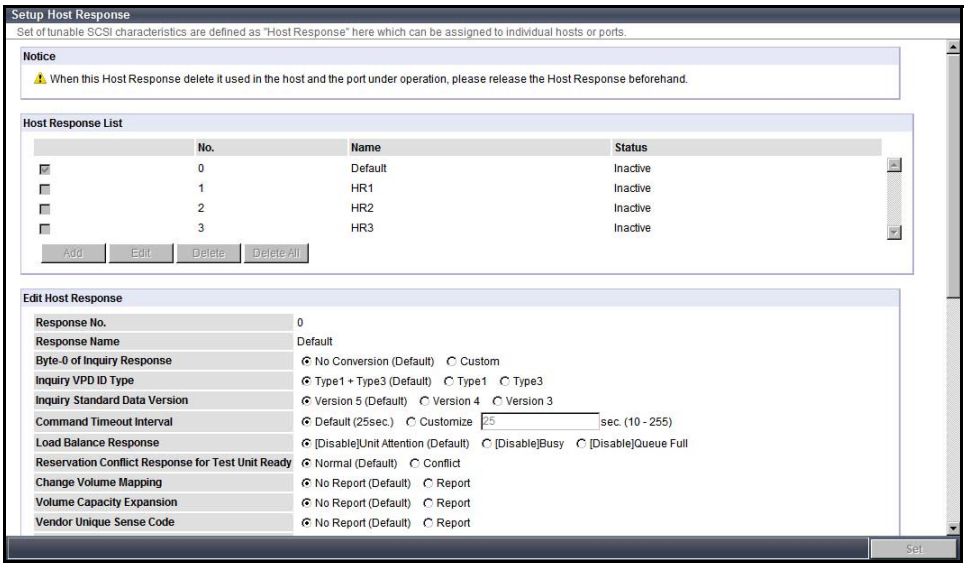


3 Specify the following items, and click the [OK] button.

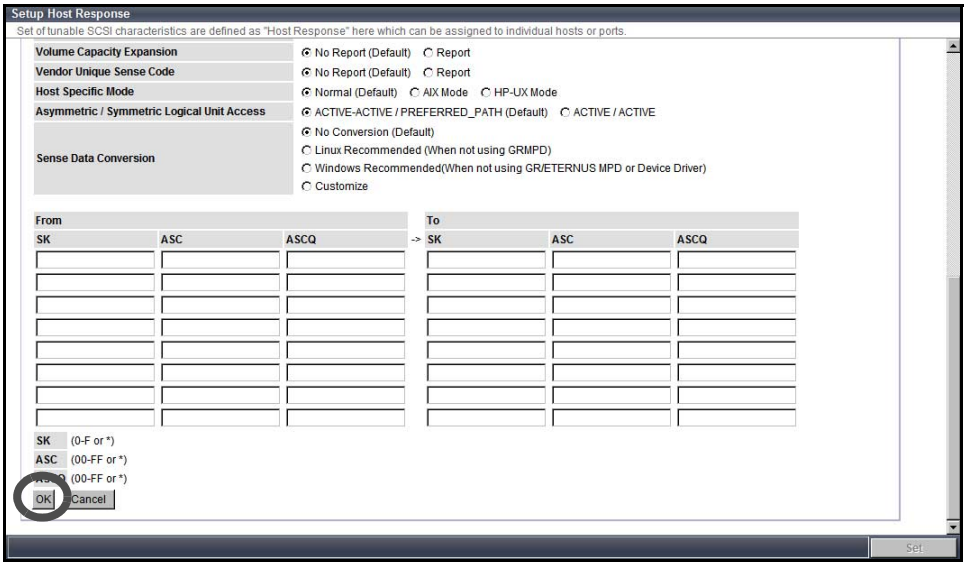
- Response No.
  Host response identification number is displayed.
- Response Name
  Enter the host response name (may be omitted). Up to 16 alphanumeric characters and symbols (including blanks) can be used.
- Byte-0 of Inquiry Response
  Set the value for Byte-0 of the Inquiry command from "No Conversion (Default)" or "Custom".
  After the link between the ETERNUS DX60/DX80 and the host is established, the host sends an "Inquiry command" to check the status of the volumes for a certain period of time.
  Specify the Byte-0 of the Inquiry data to response this Inquiry command.
  Byte-0 in the Inquiry data indicates the volume status.
  - No Conversion (Default)
    Responses with the value specified in the ETERNUS DX60/DX80.
  - Custom
    When the Byte-0 is "0x20 (configuration is available, unformatted)", converts the Byte-0 value to "0x7f (configuration is not available)" and responses.
- Inquiry VPD ID Type
  Set the Vital Product Data (VPD) information type to respond to the host.
  VPD information includes the device information (Vender ID, Product ID for each model, volume number, etc.) for the volume. Type1 and Type3 indicate the data format.
  - Type1 + Type3 (Default)
  - Type1
  - Type3
- Inquiry Standard Data Version
  Specify the Standard Data Version (version number of the SCSI standard) of the Inquiry command.
  - Version 5 (Default)
  - Version 4
  - Version 3
- Command Timeout Interval
  Select the setting method for the command timeout interval from the following items.
  - Default (25sec.)
  - Customize
    When "Customize" is selected, input a value between 10 and 255 seconds (numeric).
- Load Balance Response
  This field sets the response status when an overload-derived timeout is detected. The server retry reaction is determined by this setting.
  While the default response should be compatible with all systems, the setting may be changed as required by any problems that occur. Contact your maintenance engineer to change the setting.
  - [Disable] Unit Attention (Default)
  - [Disable] Busy
  - [Disable] Queue Full

- Reservation Conflict Response for Test Unit Ready
  Select whether to notify or not notify the Reservation Conflict to the "Test Unit Ready" command when volumes from the other host are reserved.
  - Normal (Default)
  - Conflict
- Change Volume Mapping
  Select whether to "No Report (Default)" or "Report" to the host when a volume that can be accessed from the host is added or deleted.
- Volume Capacity Expansion
  Select whether to "No Report (Default)" or "Report" to the host when the capacity of a volume is changed.
- Vendor Unique Sense Code
  Select whether to "No Report (Default)" or "Report" the vendor unique sense code to the host.
  Vendor Unique Sense indicates the unique sense code for each vendor that is not coincident with host I/O.
- Host Specific Mode
  Set the operation for specific host.
  - Normal (Default)
  - AIX Mode
    Select this to prevent the command initialization and performance degradation.
  - HP-UX Mode
    Select this to recognize volumes with more than 8LU(s).
- Asymmetric / Symmetric Logical Unit Access
  Select the access type from the host to Logical Unit.
  - ACTIVE-ACTIVE / PREFERRED_PATH (Default)
  - ACTIVE / ACTIVE
- Sense Data Conversion
  Select the sense code conversion pattern.
  - No Conversion (Default)
  - Linux Recommended (When not using GRMPD)
    Select this pattern to prevent malfunction of Linux hosts for which GR Multipath Driver has not been installed.
  - Windows Recommended (When not using GR/ETERNUS MPD or Device Driver)
    Select this pattern to prevent malfunction of Windows® hosts for which GR/ETERNUS Multipath Driver, or Device Driver have not been installed.
  - Customize
    This setting is displayed only when the special sense conversion pattern is specified.
    Settings can be checked in the "SK/ASC/ASCQ".
- SK/ASC/ASCQ
  This field is displayed when "Customize" is selected for the "Sense Data Conversion".
  - SK: Sense Key
  - ASC: Additional Sense Code
  - ASCQ: Additional Sense Code Qualifier

- [Setup Host Response] screen (1/2)



- [Setup Host Response] screen (2/2)



4 Click the [Set] button.

→ A confirmation screen appears.

5 Click the [OK] button.

→ The new host response is added.

End of procedure

6.5.4 Modify Reset Group

The [Modify Reset Group] sets the reset group to switch the path for some servers.
A reset group is a setting that groups multiple ports that will be reset. If a host is unable to access the volumes in a port, this function releases the volumes reserved by the inaccessible port to the ports in the specified reset group, without affecting other ports. The reset group setting sets this range for each port.
When a 2-port configuration server (including duplication) using the same volume cannot be accessed, it is possible to access the ETERNUS DX60/DX80 from the opposite port (standby side). The port for the paths that access the same volume must be grouped in the same reset group. Even if the server is different, ports accessing the same volume must be set in the same reset group.

Caution

- When a port is shared by multiple servers using the "5.3.10 Configure LUN Mapping" (page 112) function, only volumes that are included in the LUN mapping assigned to the target server in the Host Affinity setting are subject to release.
- One port cannot be registered in multiple reset groups.

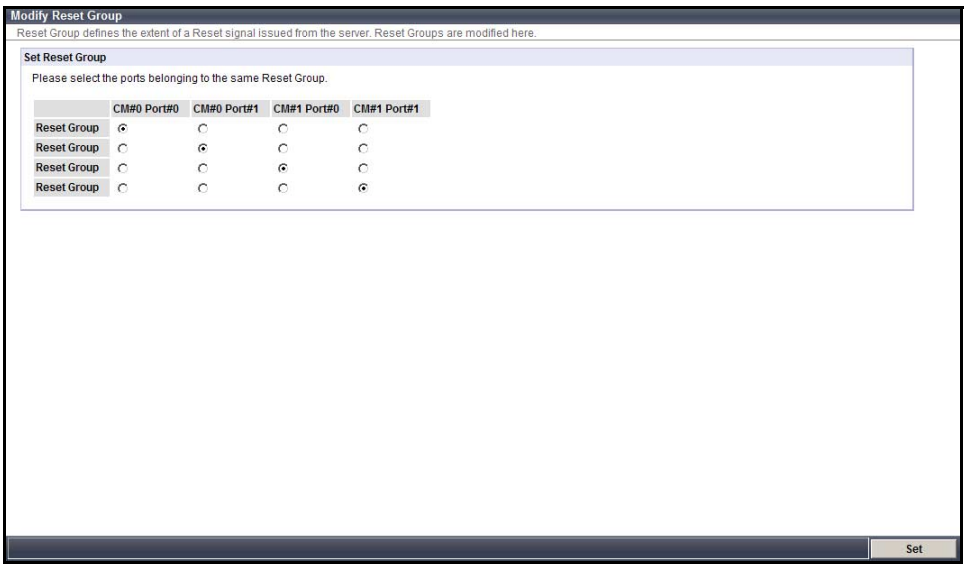
Note

For more details on which server is necessary to set/change the reset group, refer to "ETERNUS Disk storage systems Server Connection Guide" for each OS type.

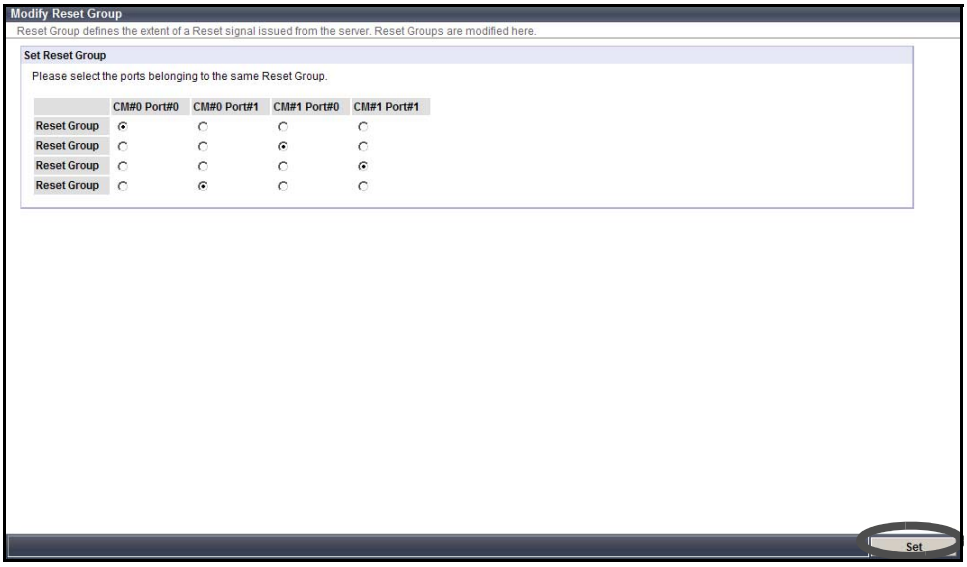
The procedure to set the reset group is as follows:

Procedure

1. Click the [Modify Reset Group] under the [Host I/F Management] menu on the [Global Settings] tab.
   → The [Modify Reset Group] screen appears.



2 Select the port that belongs to the same reset group, and click the [Set] button.



→ A confirmation screen appears.

3 Click the [OK] button.

→ The reset group is set.

End of procedure

Chapter 7 Maintenance

This chapter describes maintenance related operations.

7.1 Hot Expansion

This function can expand the components without stopping device operation.
The device needs expansion of components to the original configuration in order to enhance performance, increase the number of available volumes, or increase the number of connected hosts.
Disks and drive enclosures can be expanded in hot mode.
Disks can be expanded in hot mode by physical installation in the ETERNUS DX60/DX80. This operation does not require GUI operation.

- The maximum number of disks and drive enclosures

  The following explains the maximum number of disks and drive enclosures that can be installed in each model.

Model	Disk	Drive enclosure
ETERNUS DX60	24	1
ETERNUS DX80	120 (*1)	9

*1: Up to nine SSDs can be installed in the ETERNUS DX60/DX80.

Caution

- The expanded disks can be used after registering in the RAID group or as hot spare disks.
- When the maximum number of parts set for each model has already been installed, the parts cannot be expanded.
- When adding two or more disks, install disks one by one after an interval (of approximately 30 seconds). Confirm that the status LED of the expanded disk glows green, then add the next disks.
- Be sure to use authorized expansion parts. If parts other than the expansion parts are used, operation is not guaranteed.
- When encryption is in progress, disk expansion is not available. Perform the disk expansion operation after completing the encryption process.
- Only one drive enclosure can be added at once. To add multiple drive enclosures, repeat the procedure for all the drive enclosures to be added.

Note

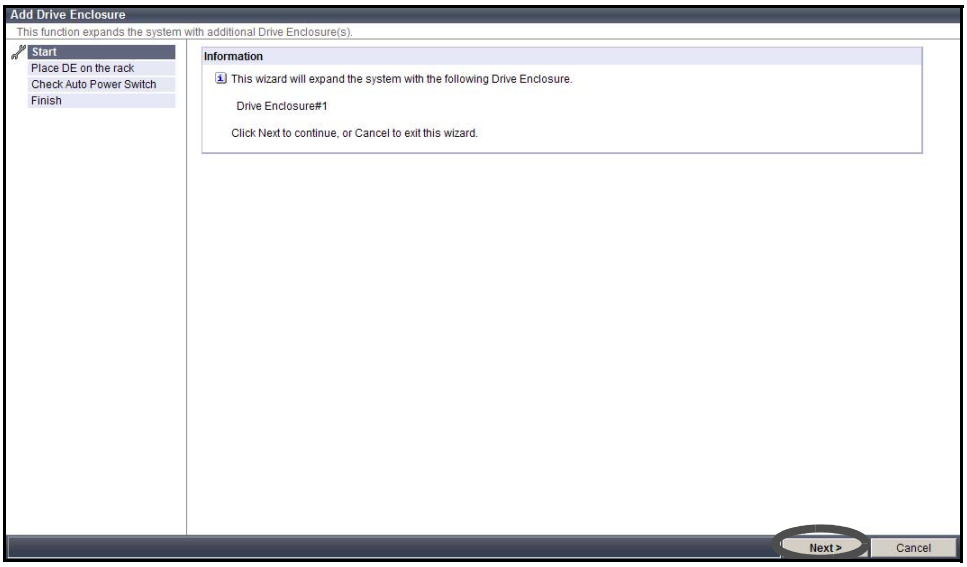
Refer to "4.1 Storage System Status" (page 33) for component status display.

7.1.1 Add Drive Enclosure

The [Add Drive Enclosure] function can expand the drive enclosure while the ETERNUS DX60/DX80 is operating.
If expansion fails due to an error or problem, the expansion can be restarted from the interrupted point by starting this function again and recovering the failed expansion parts. However, when disk operation is not normal, maintenance is required.
The procedure to add a drive enclosure in hot mode is as follows:

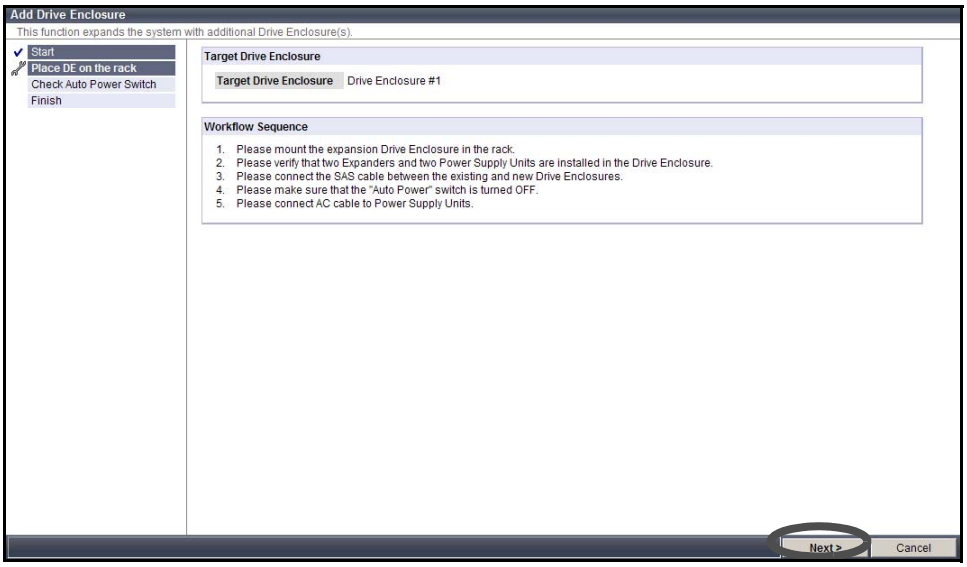
Procedure

1. Click the [Add Drive Enclosure] under the [Hardware Maintenance] menu on the [Maintenance] tab.
   → The [Add Drive Enclosure] screen appears.
2. Click the [Next >] button.

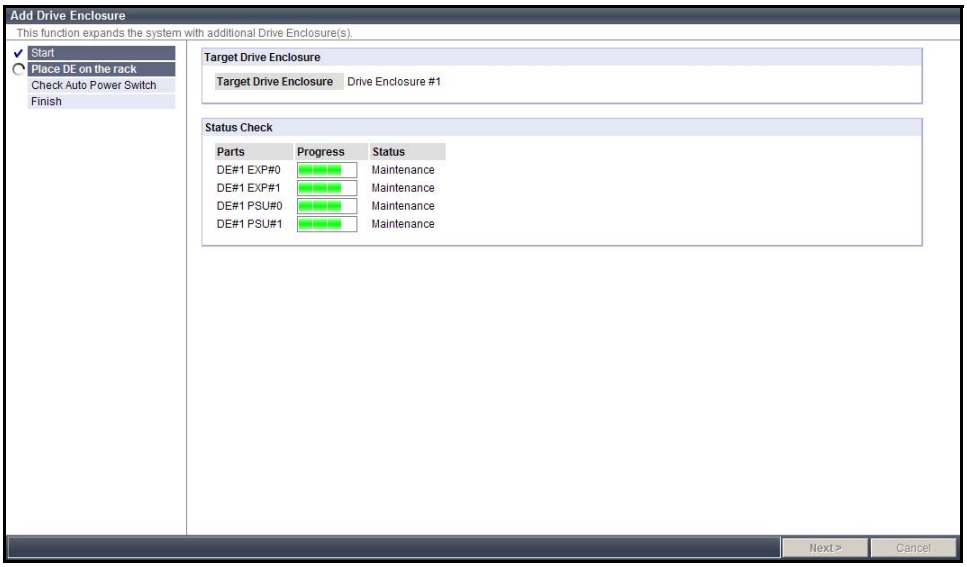


→ The procedure to add DE is displayed.

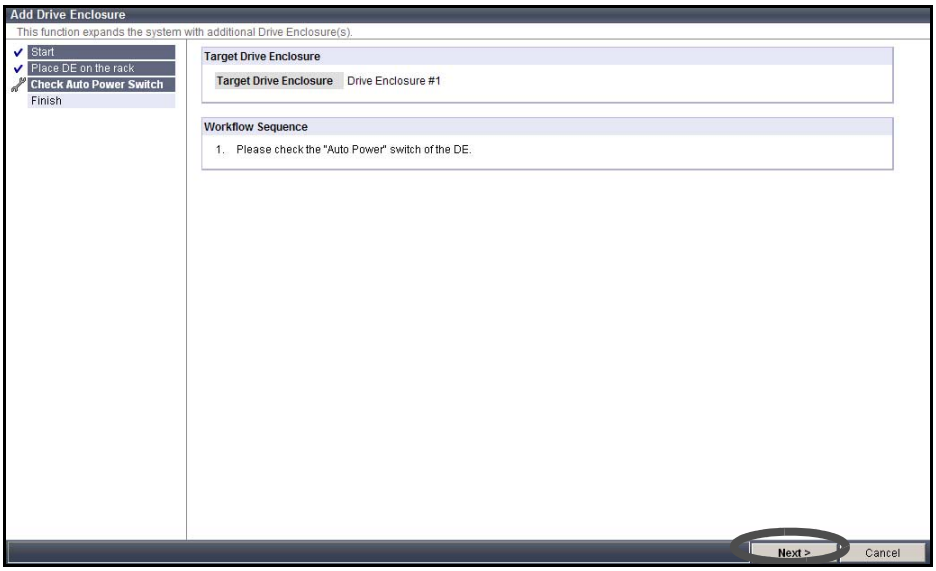
3 Install the drive enclosure in the rack according to the displayed procedure, and click the [Next >] button.



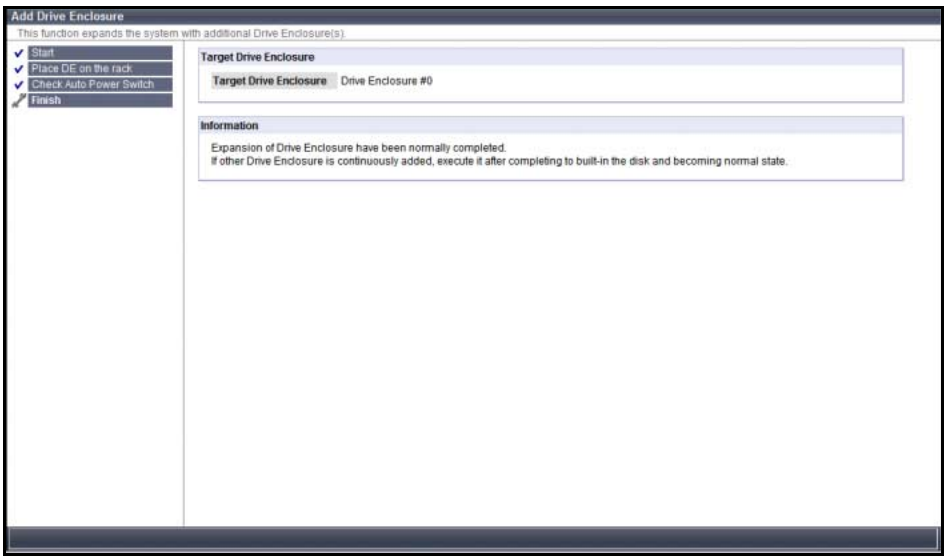
→ The expanded components identification process starts.



4 Confirm the "Auto Power" switch for the target drive enclosure is "OFF", and click the [Next >] button.



→ The [Add Drive Enclosure] procedure is completed.



End of procedure

Chapter 8 Display and Download Information (Diagnosis)

This chapter describes how to display and download ETERNUS DX60/DX80 related information.

8.1 Display Event Log

The [Display Event Log] function records and displays the event history of the ETERNUS DX60/DX800 as an event log.
The event log is one of the internal logs stored in the ETERNUS DX60/DX80. The event log contains a history of events that are related to setup information changes, such as module failures and volume creation.
Up to 800 (400 per a CM) event logs can be displayed. Once the recorded event log is no longer necessary, it can also be deleted.

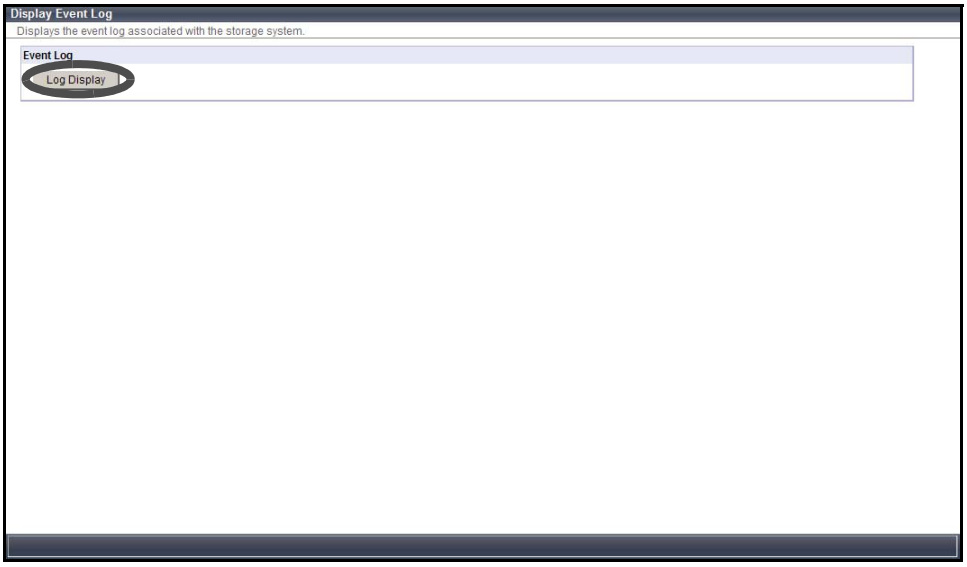
Caution Even after deleting internal logs using the "8.2 Export/Delete Log" (page 225) function, the event log remains in the ETERNUS DX60/DX80.

The procedure to display the event log is as follows:

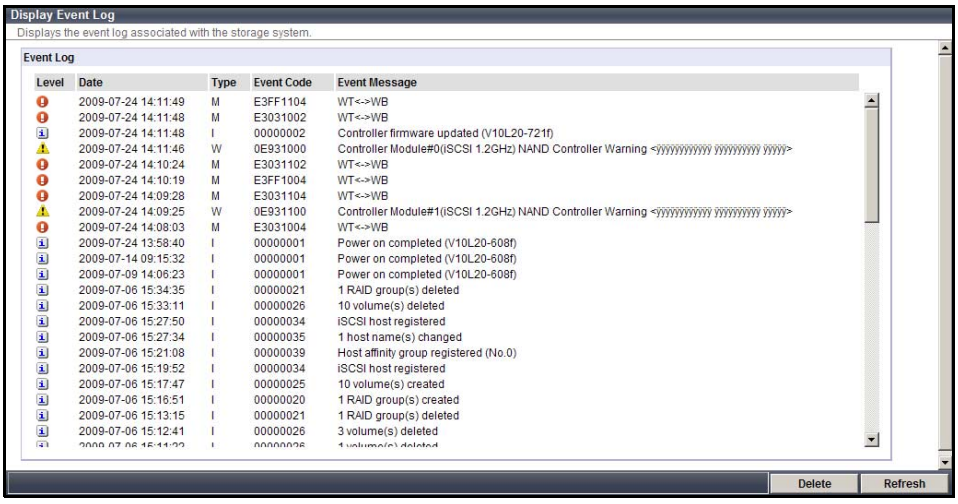
Procedure

1. Click the [Display Event Log] menu on the [Diagnosis] tab.
   → The [Display Event Log] screen appears.

2 Click the [Log Display] button.



→ The event log is displayed.



Note

- Click the [Delete] button to delete the event log.
- Click the [Refresh] button to update the event log.

End of procedure

8.2 Export/Delete Log

The [Export/Delete Log] function exports and saves the ETERNUS DX60/DX80 maintenance information (log) according to user-specified time. An exported log can be stored on a floppy disk or hard disk, or sent by mail. Also users can select a log segment size in accordance with save destination.

- The maintenance information to be exported

  Logs include an internal log and setup information.
  - Internal log
    Detected errors, warnings, and traces.
  - Setup information
    The setup information exported from the device.

Caution

- The internal log and setup information cannot be exported separately.
- If logs saved in the ETERNUS DX60/DX80 are no longer needed, click the [Delete] button to delete the logs. When using this function, all log data is deleted. Make sure to backup any necessary data before proceeding.
- Event logs cannot be deleted with this function. Use "8.1 Display Event Log" (page 223) to delete event logs.

The procedure to export log information is as follows:

Procedure

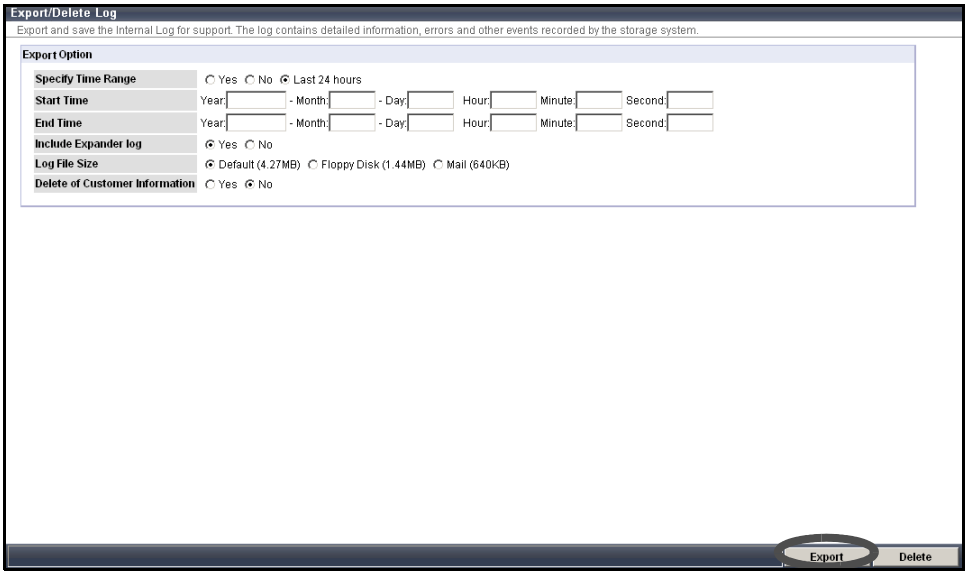
1. Click the [Export/Delete Log] menu on the [Diagnosis] tab.
   → The [Export/Delete Log] screen appears.
2. Set the following items and click the [Export] button.
   - Specify Time Range
     Select whether to specify the time range with "Yes" or "No", or select the "Last 24 hours" radio button.
   - Start Time
     When a time range is to be specified, specify the date and time to start exporting logs.
   - End Time
     When a time range is to be specified, specify the date and time to end exporting logs.
   - Include Expander log
     Select whether to export the Expander log with the "Yes" or "No" radio button.
   - Log File Size
     Select the log segment size when saving the exported log.
     - Default (4.27MB)
     - Floppy Disk (1.44MB)
     - Mail (640KB)

- Delete of Customer Information
  Select whether to delete the customer information with the "Yes" or "No" radio button.

Caution

In the following conditions, an error screen appears.

- When the input date and/or time are not valid (For example: February 31st)
- When the end time is earlier than the start time

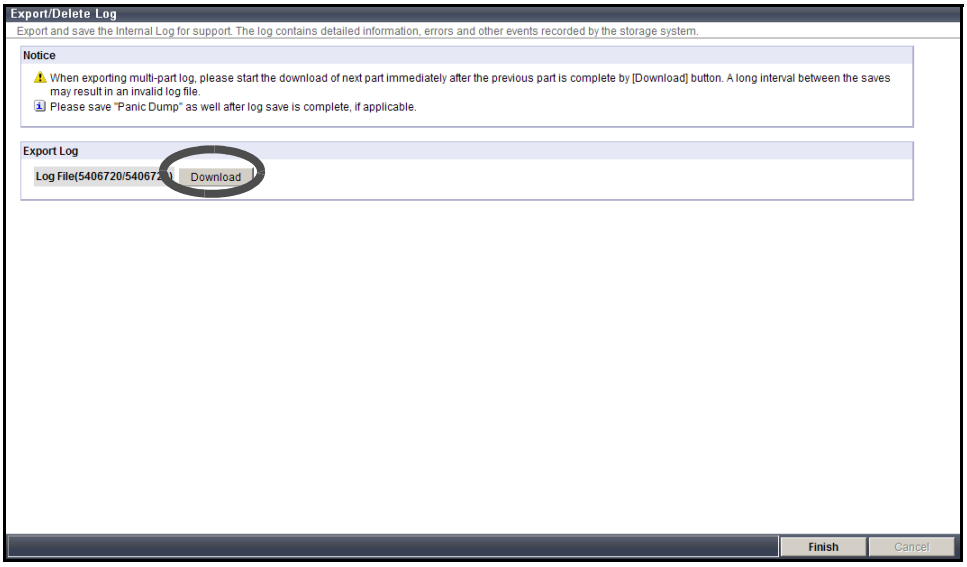


→ A confirmation screen appears.

3 Click the [OK] button.

→ The log is exported.
After exporting log completes, a dialog box to download the log file appears.

4 Click the [Download] button to save the exported log.



Caution After exporting the log completes, save the log file immediately.

5 Save the log file.

Caution

- Take care so that the segments are not overwritten.
- When exporting segmented log files, make sure to export the segment within five minutes. If five minutes passes before exporting the next segment, exporting the log fails. After saving one segment is finished, save the next segment immediately.

→ If the log file is segmented, download and save the next segment (save all the segmented files).

Note After saving all log files, the [Download] button described in the Step 4 becomes deactivated.

6 Click the [Finish] button.

→ Exporting log is completed.

Caution After exporting the log completes, make sure to perform "8.3 Export Panic Dump" (page 228).

End of procedure

8.3 Export Panic Dump

"Panic Dump" is the action of outputting (dump) memory information when an error (panic) occurs, and also the name of the output information itself. This function exports and saves the memory information of the controller that is stored in the panic dump data, in a segment size specified by the user. An exported panic dump can be stored on a floppy disk or hard disk, or sent by mail.
Panic dump data is used to analyze the cause of a firmware abnormality or hardware error.

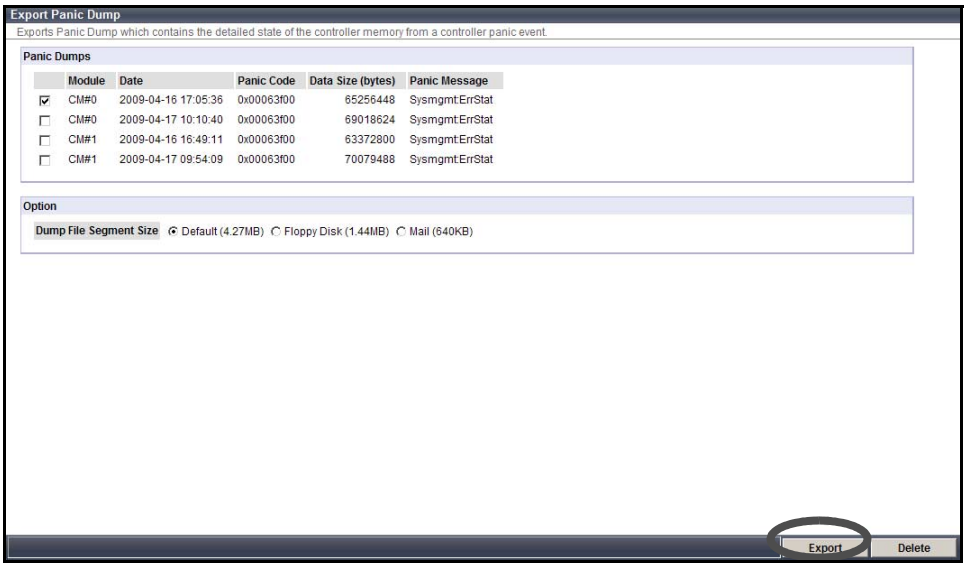
Caution

- This function cannot be used when there is no panic dump to be exported in the device.
- Two panic dumps are stored per CM, and four per device. After exporting a panic dump has finished, immediately deletion of the panic dump is necessary because panic dumps that were exported within 14 days are not overwritten. If all four panic dumps saved in the ETERNUS DX60/DX80 were exported within the last 14 days, new panic dumps are not saved because there is no target to be overwritten.

The procedure to export panic dump is as follows:

Procedure

1. Click the [Export Panic Dump] menu on the [Diagnosis] tab.
   → The [Export Panic Dump] screen appears.
2. Set the following items, and click the [Export] button.
   - Panic Dumps
     Select panic dump to be exported from the list displayed in the screen.
   - Option
     - Dump File Segment Size
       Select the dump file segment size to save the obtained panic dump.
       - Default (4.27MB)
       - Floppy Disk (1.44MB)
       - Mail (640KB)

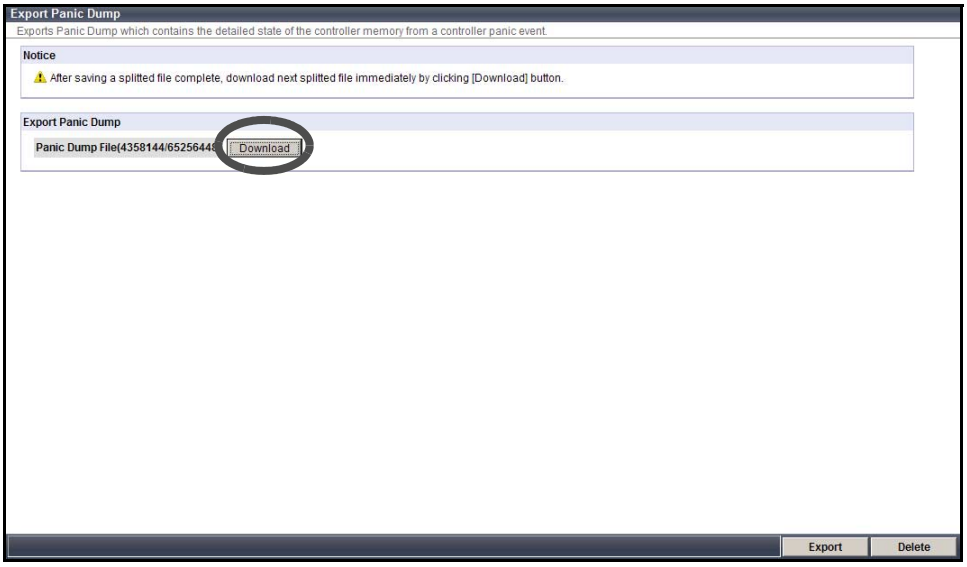


→ A confirmation screen appears.

3 Click the [OK] button.

→ The selected panic dump is exported.
After the panic dump export is finished, a screen to execute saving the panic dump is displayed.

4 Click the [Download] button to save the exported panic dump.



Note

When exporting a panic dump file is finished, save the panic dump file.

5 Save the panic dump.

Caution

- Take care so that the segments are not overwritten.
- When exporting segmented panic dump files, make sure to export the segment within five minutes. If five minutes passes before exporting the next segment, exporting the panic dump fails. After saving one segment is finished, save the next segment immediately.

→ When the panic dump file is segmented, download and save the next segment (save all the segmented files).

Note

After saving all the panic dump files, the [Download] button described in the Step 4 becomes deactivated.

End of procedure

8.4 Start/Stop Performance Monitoring

GUI contains a function that acquires performance information and displays the result.
The [Start/Stop Performance Monitoring] function is used to start/stop acquiring the ETERNUS DX60/DX80 performance information.
Acquired information can be checked using the "8.5 Display Performance Information" (page 233) function.

Caution

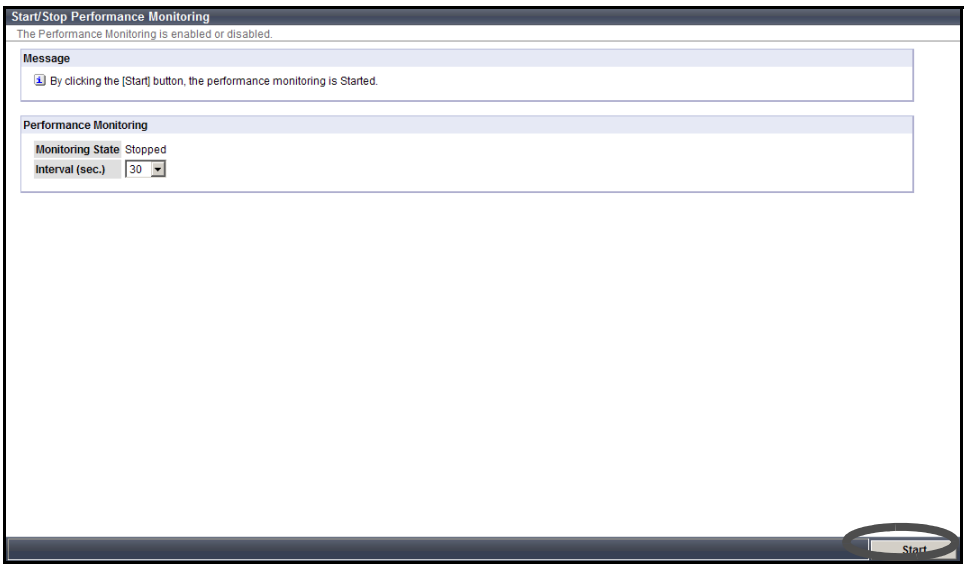
- When the ETERNUS DX60/DX80 is rebooted, monitoring performance process is stopped.
- When other monitoring software, such as ETERNUS SF Storage Cruiser, is controlling performance information, performance information cannot be acquired using the Web GUI.

The procedure to start/stop acquiring performance information is as follows:

Start Performance Monitoring

Procedure

1. Click the [Start/Stop Performance Monitoring] menu on the [Diagnosis] tab.
   → The [Start/Stop Performance Monitoring] screen appears.
2. Specify the following item, and click the [Start] button.
   - Monitoring State
     Current status of performance information acquisition operation is displayed.
   - Interval (sec.)
     Input the interval to acquire the performance information between 30 and 300 (sec.) in units of 30 seconds.



→ A confirmation screen appears.

3 Click the [OK] button.

→ Acquisition of performance information is started.

End of procedure

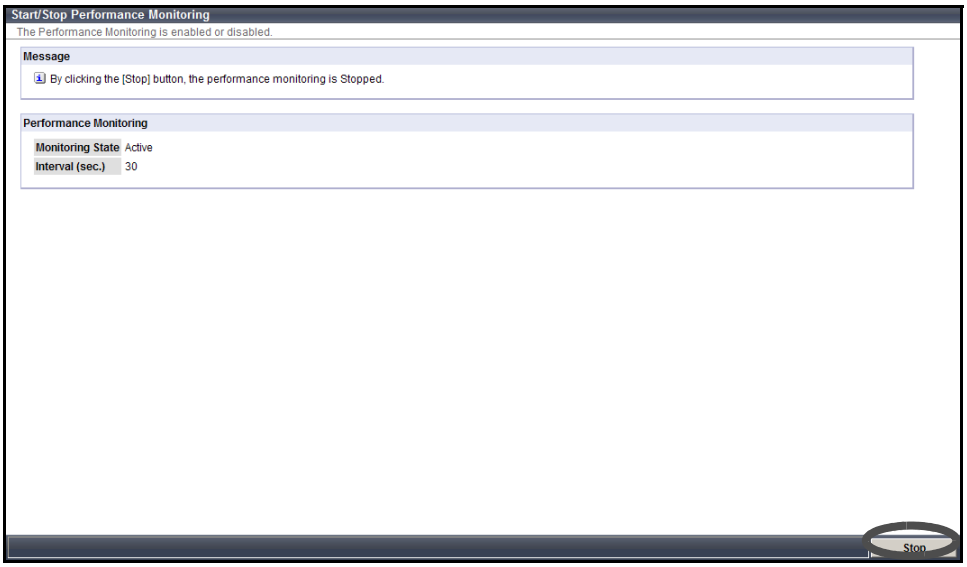
Stop Performance Monitoring

Procedure

1 Click the [Start/Stop Performance Monitoring] menu on the [Diagnosis] tab.

→ The [Start/Stop Performance Monitoring] screen appears.

2 Click the [Stop] button.



→ A confirmation screen appears.

3 Click the [OK] button.

→ Acquisition of performance information is stopped.

End of procedure

8.5 Display Performance Information

The [Display Performance Information] function displays performance information related to the Host I/O, Advanced Copy, disks, CM, and host port, which is obtained by the Master CM in advance. By collecting the CM (CPU) usage rate in the device and busy ratio of the disk, operating conditions and work load in the device can be checked.

Caution

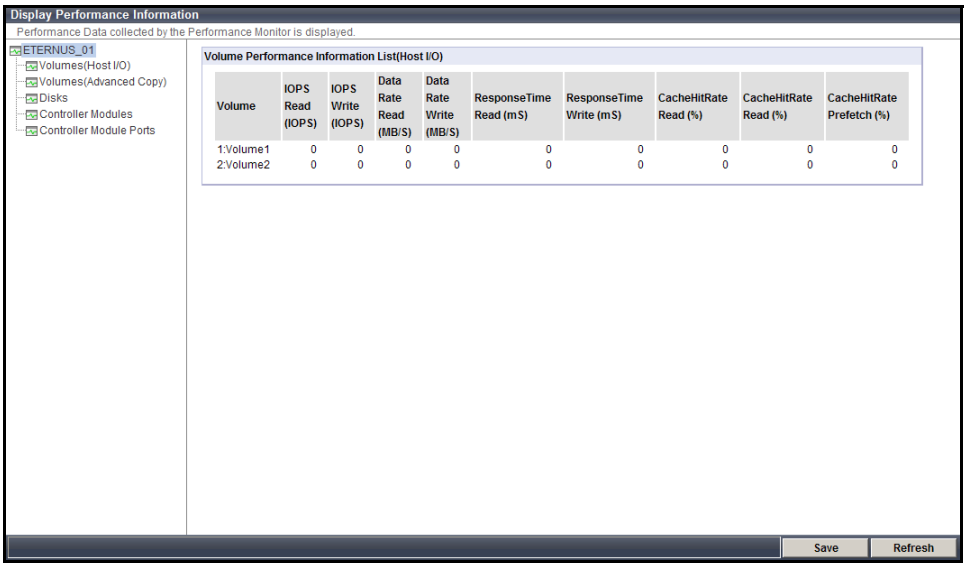
The performance information acquisition operation must be started by using the "8.4 Start/Stop Performance Monitoring" (page 231) function or other monitoring software (such as ETERNUS SF Storage Cruiser) in advance.

The procedure to display the performance information is as follows:

Procedure

1 Click the [Display Performance Information] menu on the [Diagnosis] tab.

→ The [Display Performance Information] menu appears.
Click the tree view on the left of the screen to display information for each component.



Note

- Click the [Save] button to save the performance information.
- Click the [Refresh] button to display the latest information.

End of procedure

8.6 Display Error Information

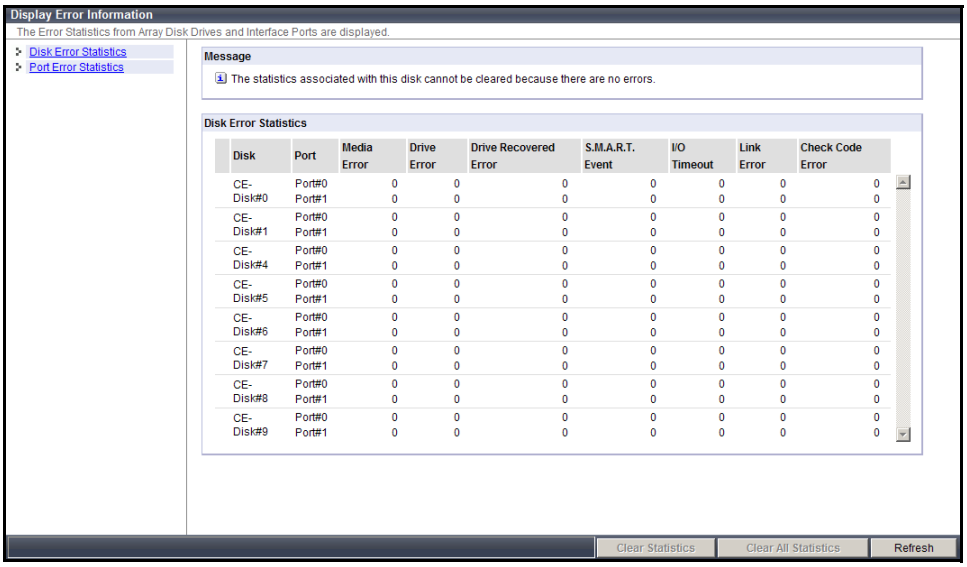
The [Display Error Information] function displays the total number of errors for disks and ports.
An increasing number of error occurrences in the information is used to indicate early replacement of warning status components, and for analysis information when performance degradation occurs.
Also, deleting unnecessary disk error information can be deleted.
The procedure to display error information is as follows:

Procedure

1 Click the [Display Error Information] menu on the [Diagnosis] tab.

→ The [Display Error Information] screen appears.
Click the link on the left of the screen, and display the [Disk Error Statistics] screen and [Port Error Statistics] screen.

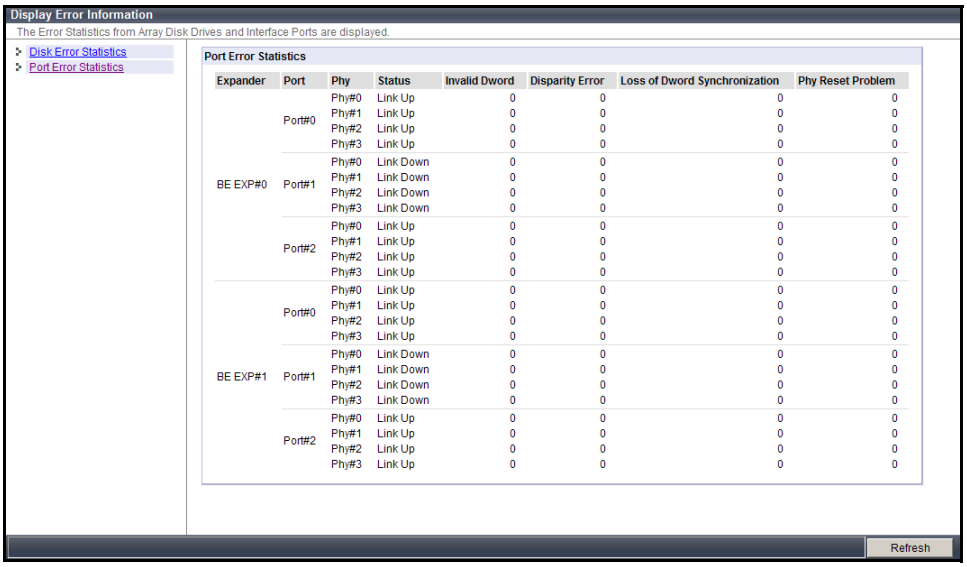
- Disk Error Statistics



Caution

- To clear the error information for each disk, select the checkbox for the target disk and click the [Clear Statistics] button.
- To clear the error information for all the disks, click the [Clear All Statistics] button.
- The [Clear Statistics] targeting checkboxes are only provided for disks with error information.

- Port Error Statistics



Expander	Port	Phy	Status	Invalid Dword	Disparity Error	Loss of Dword Synchronization	Phy Reset Problem
BE EXP#0	Port#0	Phy#0	Link Up	0	0	0	0
		Phy#1	Link Up	0	0	0	0
		Phy#2	Link Up	0	0	0	0
		Phy#3	Link Up	0	0	0	0
	Port#1	Phy#0	Link Down	0	0	0	0
		Phy#1	Link Down	0	0	0	0
		Phy#2	Link Down	0	0	0	0
		Phy#3	Link Down	0	0	0	0
	Port#2	Phy#0	Link Up	0	0	0	0
		Phy#1	Link Up	0	0	0	0
		Phy#2	Link Up	0	0	0	0
		Phy#3	Link Up	0	0	0	0
BE EXP#1	Port#0	Phy#0	Link Up	0	0	0	0
		Phy#1	Link Up	0	0	0	0
		Phy#2	Link Up	0	0	0	0
		Phy#3	Link Up	0	0	0	0
	Port#1	Phy#0	Link Down	0	0	0	0
		Phy#1	Link Down	0	0	0	0
		Phy#2	Link Down	0	0	0	0
		Phy#3	Link Down	0	0	0	0
	Port#2	Phy#0	Link Up	0	0	0	0
		Phy#1	Link Up	0	0	0	0
		Phy#2	Link Up	0	0	0	0
		Phy#3	Link Up	0	0	0	0

End of procedure

Appendix A Install Site Certificate

This chapter describes how to install the web-site certificate.
This chapter provides an example of when using Internet Explorer and Firefox.

A.1 For Internet Explorer

This section describes the procedure to install security certificate.
The procedure to install security certificate for Internet Explorer 7 is as follows:

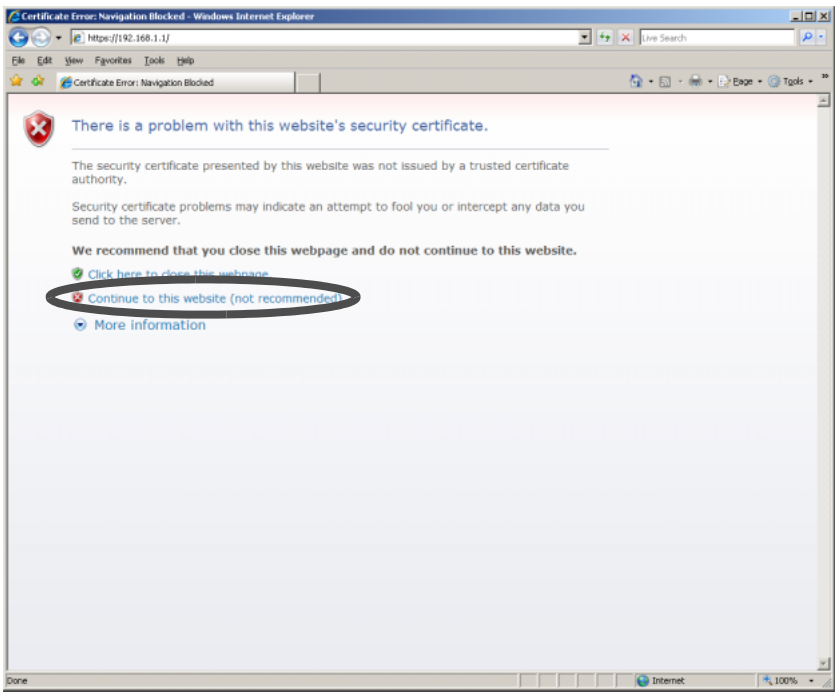
Procedure

1 Enter the URL to the address bar in the web browser.

Specify "https://IP address of the ETERNUS DX60/DX80" (Default IP address is "192.168.1.1").

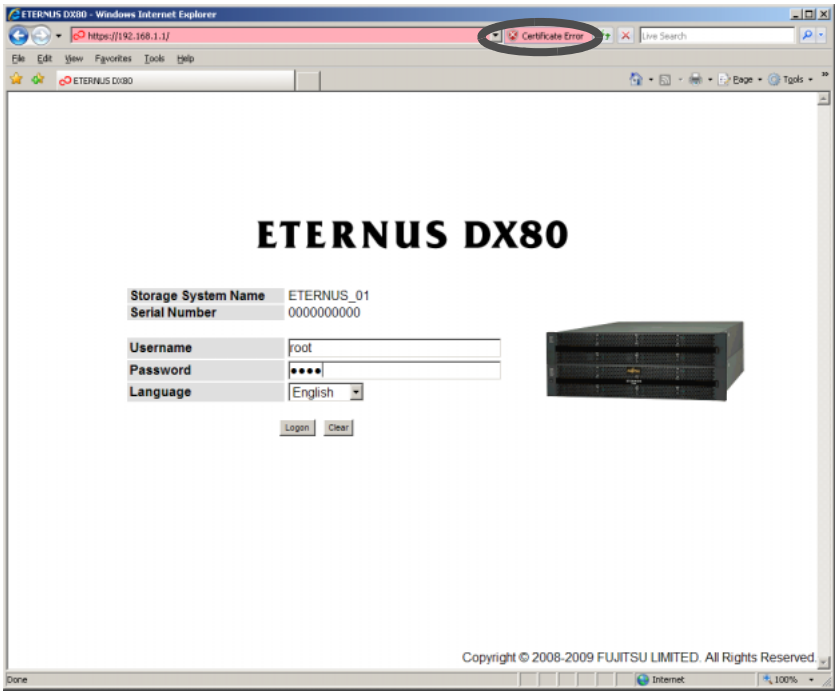
→ A confirmation screen for security certificate appears.

2 Click the "Continue to this website (not recommended)" link.



→ The logon screen for GUI is displayed.

3 Click the "Certificate Error".

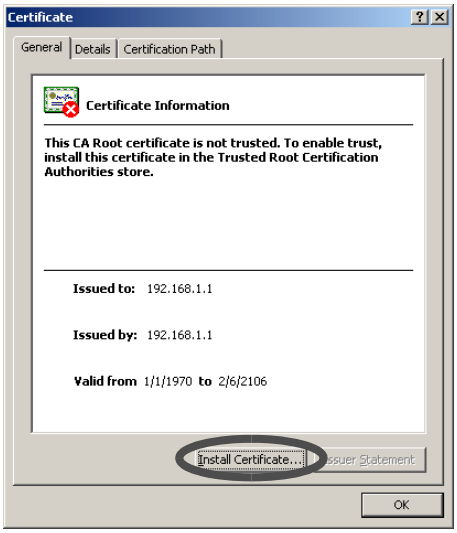


→ A warning message appears.

4 Click the "View Certificates" link.

→ The site certificate information appears.

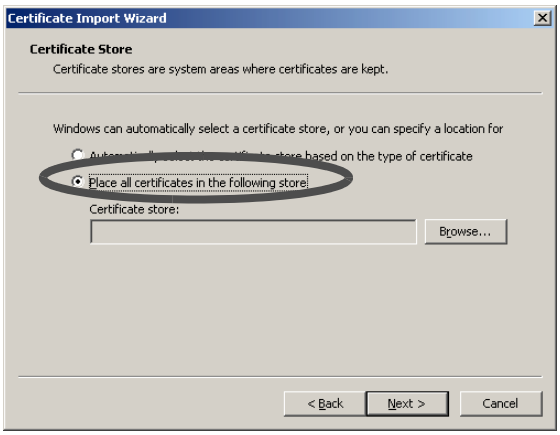
5 Click the [Install Certificate] button.



→ The "Certificate Import Wizard" appears.

6 Click the [Next >] button.

7 Select "Place all certificates in the following store".



→ The "Select Certificate Store" screen appears.

Caution

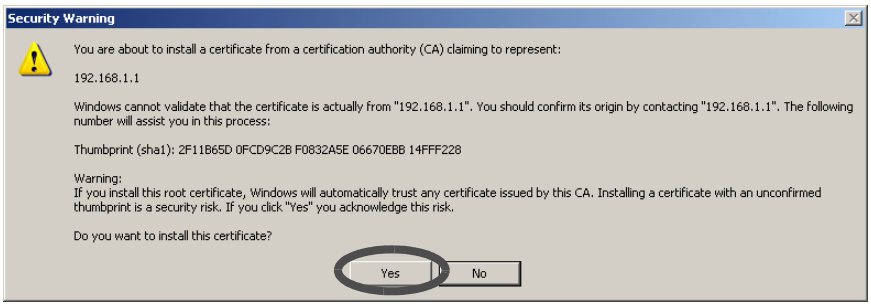
If "Automatically select the certificate store based on the type of certificate" is selected in the "Certificate Import Wizard", an error may occur in the security certificate according to the customer environment.

8 Select the "Trusted Root Certification Authorities", and click the [OK] button.

9 Click the [Finish] button.

→ The "Security Warning" dialog box appears.

10 Click the [Yes] button.



Caution

After clicking the [No] button, the operation may not be continuable. If this occurs, restart the web browser.

→ The completion screen appears.

11 Click the [OK] button.

→ The security certificate is installed. Restart the web browser.

End of procedure

A.2 For Firefox

This section provides the procedure to install the security certificate.
The example when installing security certificate for Firefox 3.0.8 is as follows:

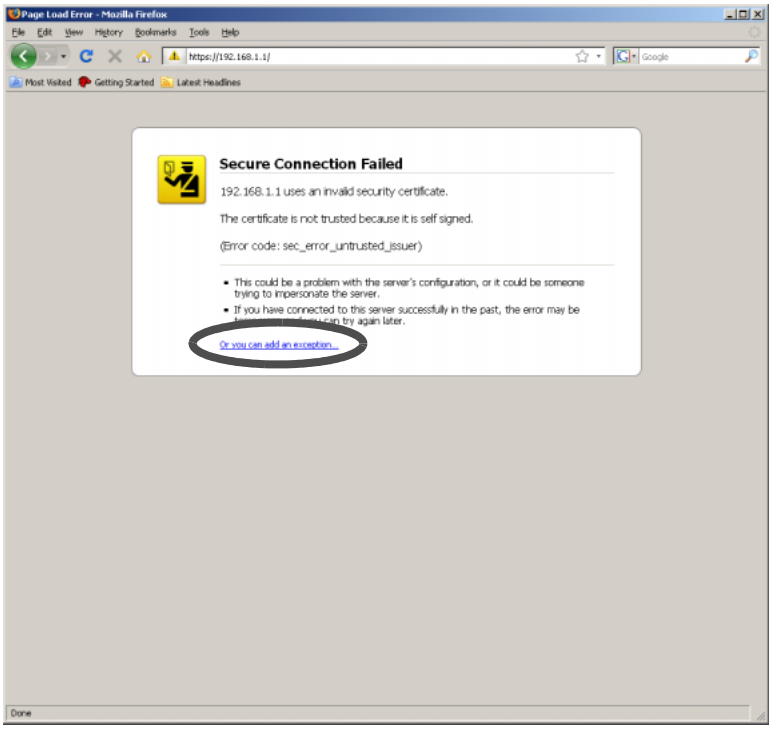
Procedure

1 Enter the URL to the address bar in the web browser.

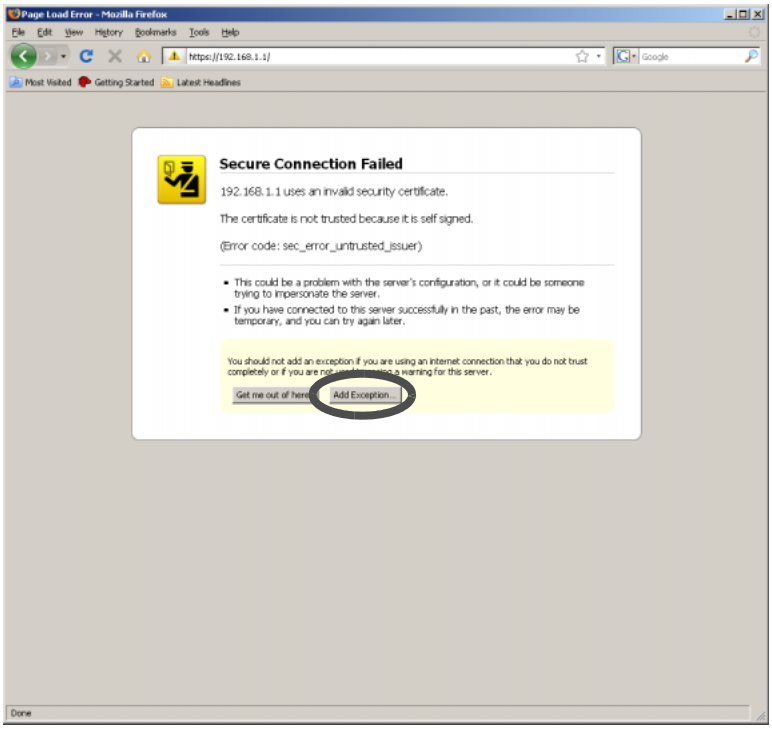
Specify "https://IP address of the ETERNUS DX60/DX80" (Default IP address is "192.168.1.1").

→ A confirmation screen for security certificate appears.

2 Click the "Or you can add an exception..." link.

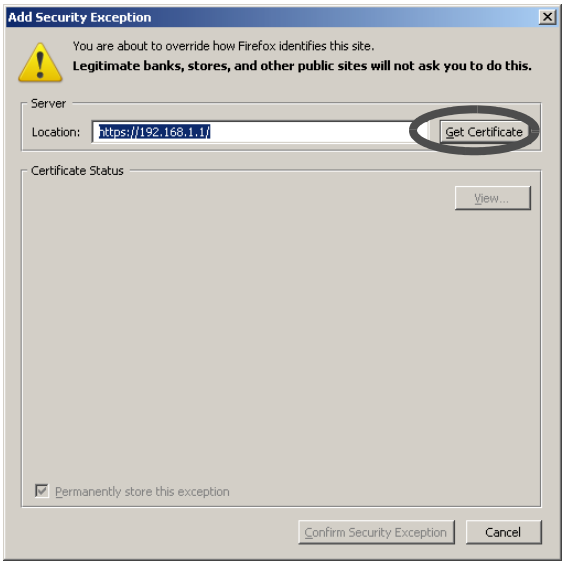


3 Click the [Add Exception...] button.



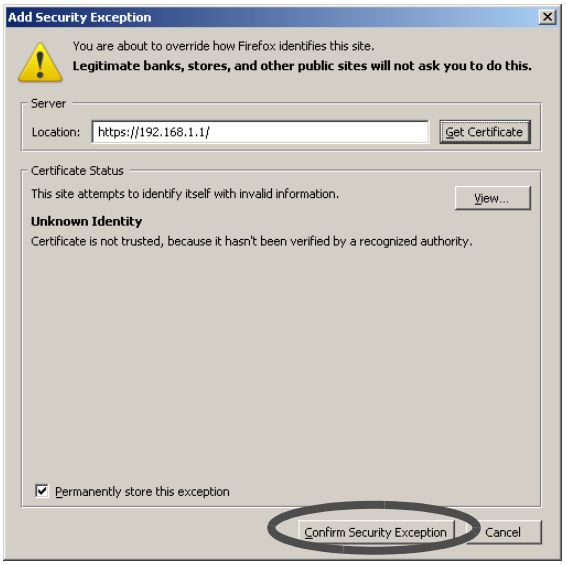
→ The [Add Exception] screen appears.

4 Click the [Get Certificate] button.



→ The status of certificate is displayed.

5 Click the [Confirm Security Exception] button.



→ The security certificate is installed. Restart the web browser.

End of procedure

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ETERNUS DX60/DX80 Web GUI User Guide

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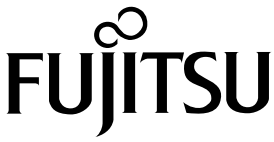
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