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ETERNUS
DX60/DX80/DX90
CLI

User Guide



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Preface

This document is written for standard-level users who are familiar with the basic functions of the ETERNUS DX60/DX80/DX90, and describes how to use the command line interface (CLI) to create and manage a RAID system with the following ETERNUS DX60/DX80/DX90 Disk storage systems.

- ETERNUS DX60 Fibre Channel model
- ETERNUS DX80 Fibre Channel model
- ETERNUS DX60 SAS model
- ETERNUS DX80 SAS model
- ETERNUS DX60 iSCSI model
- ETERNUS DX80 iSCSI model
- ETERNUS DX90

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Content and Structure

This manual contains the following six chapters and appendixes:

- Chapter 1 Overview
This chapter introduces the ETERNUS DX60/DX80/DX90 Disk storage system command line interface (CLI).
- Chapter 2 Status
This chapter explains the commands used for displaying the status details for the ETERNUS DX60/DX80/DX90 as a whole, as well as for various ETERNUS DX60/DX80/DX90 components.
- Chapter 3 Configuration
This chapter explains the commands used for RAID group management, volume management, and host interface management, these being the basic settings for the ETERNUS DX60/DX80/DX90.
- Chapter 4 Settings
This chapter explains the commands used for user account management, advanced copy management, network management (Redundant IP/SNMP etc.), date and time/NTP, system configuration (Box ID, Storage system name), power synchronization, and SSH/SSL security configuration.

- Chapter 5 Information

This chapter explains the commands used to provide performance data and a variety of other information.

- Chapter 6 CLI Original Functions

This section explains the commands used by some original functions of the CLI environment.

The appendixes describe "Error Messages", "List of Supported Commands", and "The Number of Concurrent Volume Formats".

Related Manuals

The following manuals contain further relevant information:


- ETERNUS DX60/DX80/DX90 Disk storage systems User Guide
- ETERNUS DX60/DX80/DX90 Web GUI User Guide
- ETERNUS DX Disk storage systems Server Connection Guide (Fibre Channel) ETERNUS Disk Storage System Settings for ETERNUS DX60/DX80/DX90
- ETERNUS DX Disk storage systems Server Connection Guide (Fibre Channel) for Solaris™ Operating System
- ETERNUS DX Disk storage systems Server Connection Guide (Fibre Channel) for HP-UX
- ETERNUS DX Disk storage systems Server Connection Guide (Fibre Channel) for AIX
- ETERNUS DX Disk storage systems Server Connection Guide (Fibre Channel) for Windows®
- ETERNUS DX Disk storage systems Server Connection Guide (Fibre Channel) for Linux
- ETERNUS DX Disk storage systems Server Connection Guide (Fibre Channel) for Fibre Channel Switch Settings
- ETERNUS DX Disk storage systems Server Connection Guide (Fibre Channel) for VMware® ESX
- ETERNUS DX Disk storage systems Server Connection Guide (Fibre Channel) for Egenera BladeFrame
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI) ETERNUS Disk Storage System Settings for ETERNUS DX60/DX80
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI) for Solaris™ Operating System
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI) for HP-UX
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI) for Windows®
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI) for Linux (Red Hat Enterprise Linux)
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI) for Linux (SUSE Linux Enterprise Server)
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI) for VMware® ESX
- ETERNUS DX Disk storage systems Server Connection Guide (SAS) ETERNUS Disk Storage System Settings for ETERNUS DX60/DX80
- ETERNUS Disk storage systems Server Connection Guide (SAS) for Solaris™ Operating System
- ETERNUS Disk storage systems Server Connection Guide (SAS) for Windows®

- ETERNUS Disk storage systems Server Connection Guide (SAS) for Linux
- ETERNUS Disk storage systems Server Connection Guide (SAS) for VMware® ESX

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■ Notations used throughout the text

Typeface	Meaning	Examples
[]	Brackets indicate that the enclosed parameter is optional.	[<i>parameter</i>]
[]	A separator within brackets indicates that exactly one of the separated parameters may be specified.	[<i>parameter</i> <i>parameter</i>]
{ }	A separator within braces indicates that exactly one of the separated parameters must be specified. Caution  Note that in some cases, multiple comma-delimited parameters can be specified.	{ <i>parameter</i> <i>parameter</i> }

- Italics are used to show variables such as values and characters that appear in command parameters and output examples.

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Chapter 1 Overview

ETERNUS DX60/DX80/DX90 command line interface (hereinafter referred to as "CLI") is installed in controllers of the ETERNUS DX60/DX80/DX90. CLI is used for performing settings and maintenance via commands and command scripts. This chapter describes the outlines for the CLI.

1.1 Accessing the CLI

The CLI software embedded in each ETERNUS DX60/DX80/DX90 controller module enables storage systems to be configured, monitored, and managed. This may be done via LAN connection to the controller module's Ethernet port, using telnet, an SSH application, or a terminal emulator on a remote administrator client. For telnet connection, a user name and password are required. For SSH, in addition to a user name and password, SSH public key authentication is also supported. For details, refer to the "import ssh-public-key" command.

Default IP address, user name, and password are as follows:

IP address:	192.168.1.1
user name:	root
password:	root

The CLI will display the following pre-login message on the terminal:

```
ETERNUS login is required. [2010-01-01 05:38:00]
```

Date and time are the local system values. However, this message is not displayed for SSH sessions (depended on the terminal software used).

1.2 Command Syntax

This section explains the command syntax.

1.2.1 Command Format

The command format is as follows.

```
command-name parameter parameter ... parameter  
command-name: Verb section + Object section (Ex: create volume)  
parameter: hyphenated parameter section + Operand section (Ex: -n 80)
```

Basically, command names consist of a verb section and an object section. For example, "create volume". But there are also some single word commands too; for example, "logoff", "shutdown". A parameter consists of a parameter name section and an operand section, with parameter names hyphenated; for example, "-name". An operand is always required after the parameter name; for example, "-name abcdef".

1.2.2 Keywords and Parameters

Command and parameter names are not case-sensitive and can be entered in either or both uppercase and lowercase. Operands, however, are case-sensitive. Any of the printable ASCII codes 0x20-0x7e (hexadecimal notation) are allowed as input characters, subject to the following additional restrictions:

- Question marks (?) cannot be used.
- When spaces () and hash marks (#) are used as characters, they must be enclosed by double quotation marks ("). Ex: "ABC DEF", "ABC#DEF"
- When double quotation marks (") and single quotation marks (') are used as characters, they must be backslash escaped. Ex: \"
- Dollar signs (\$) cannot be used to begin operand names.
- Percent symbols (%) may not be used to begin operand names. If leading % is specified, it will be replaced by a "not found" string.

Example: "-filename %tlog.bin" becomes "not found"
"-name %volume" becomes "not found"

1.2.3 Disk Syntax

The format used for disk numbers is "xyy", a fixed 3-digit number. The "x" is an enclosure number, "0" for Controller Enclosures, "1" – "9" for Drive Enclosures. The "yy" is the disk number (a 2-digit decimal). For 3.5 inch disks, the range of "yy" is 00-11. For 2.5 inch disks, the range of "yy" is 00-23. Disk numbers may be combined as follows:

- A single disk number. For example, "003"
- A list of disk numbers. For example, "003,004"

- A hyphenated range of disk numbers from a to z. For example, "010-011"
- A comma-separated list of disk numbers, ranges, or both; do not include spaces before or after the commas. For example, "003,006,010-011"

1.2.4 Alias Name Syntax

This format used for alias names is a string with a maximum of 16 ASCII characters. Usable characters are those given in the ["1.2.2 Keywords and Parameters" \(page 13\)](#) of the document overview, excepting only that commas (,) may not be used.

1.2.5 RAID Group Syntax

There are two methods for specifying RAID group identifiers; using either RAID group numbers or RAID group names.

- RAID group numbers
A RAID group number is automatically created by the ETERNUS DX60/DX80/DX90 when a RAID group is created. This is a decimal number. RAID group numbers can be displayed using the "show raid-groups" command. RAID group numbers may be combined as follows:
 - A single RAID group number. For example, "1"
 - A list of RAID group numbers. For example, "1,8,12"
 - A hyphenated range of RAID group numbers from a to z. For example, "2-5"
 - A comma-separated list of RAID group numbers, ranges, or both; do not include spaces before or after the commas. For example, "1,3,10-12"
- RAID group names
You must specify the RAID group name when creating a RAID, using the same syntax as given in ["1.2.4 Alias Name Syntax" \(page 14\)](#). Some commands can accept a comma-separated list of RAID group names, but RAID group names and RAID group numbers may not be mixed. Do not include spaces before or after the commas.



Caution Some commands do not allow multiple parameters. Refer to the individual descriptions for parameter specification details.

1.2.6 Volume Syntax

There are two methods for specifying volume identifiers; using either volume numbers or volume names.

- Volume numbers
A volume number is automatically created by the ETERNUS DX60/DX80/DX90 when a volume is created. This is a decimal number. Volume numbers can be displayed by using the "show volumes" command. Volume numbers may be combined as follows:
 - A single volume number. For example, "1"
 - A list of volume numbers. For example, "5,10"
 - A hyphenated range of volume numbers from a to z. For example, "2-5"

- A comma-separated list of volume numbers, ranges, or both; do not include spaces before or after the commas. For example, "1,3,10-12"
- Volume names
You must specify the volume name when creating a volume, using the same syntax as given in ["1.2.4 Alias Name Syntax" \(page 14\)](#). Some commands can accept a comma-separated list of volume names, but volume names and volume numbers may not be mixed. Do not include spaces before or after the commas.



Caution Some commands do not allow multiple parameters. Refer to the individual descriptions for parameter specification details.

1.2.7 Host Syntax

There are two methods for specifying host identifiers; using either host numbers or host names.

- Host numbers
A host number is automatically created by the ETERNUS DX60/DX80/DX90 when a host identifier is registered. This is a decimal number. The following types of host identifier are available:
 - Host WWN name (FC model)
 - SAS address (SAS model)
 - iSCSI host name (iSCSI model)

The identifier can be displayed by using the appropriate commands:

- "show host-wwn-names"
- "show host-sas-addresses"
- "show host-iscsi-names"

Host numbers may be combined as follows:

- A single host number. For example, "1"
 - A list of host numbers. For example, "2,3"
 - A hyphenated range of host numbers from a to z, For example, "2-5"
 - A comma-separated list of host numbers, ranges, or both; do not include spaces before or after commas. For example, "1,3,10-12"
- Host names
You must specify a host nickname when registering a host identifier. For information about syntax, refer to ["1.2.4 Alias Name Syntax" \(page 14\)](#). Some commands accept a comma-separated list of host names, but both names and numbers cannot be mixed. Do not include spaces before or after the commas.



Caution Some commands do not allow multiple parameters. Refer to the individual descriptions for parameter specification details.

1.2.8 Affinity Group Syntax

There are two methods for describing an affinity group identifier. It is necessary to specify either an affinity group number or an affinity group name.

- Affinity group numbers
An affinity group number is automatically created by the ETERNUS DX60/DX80/DX90 when an affinity group is created. This is a decimal number. They can be displayed by using "show affinity-groups" command. Affinity group numbers may be combined as follows:
 - A single affinity group number. For example, "1"
 - A list of affinity group numbers. For example, "2,8"
 - A hyphenated range of affinity group numbers from a to z, For example, "2-5"
 - A comma-separated list of affinity group numbers, ranges; do not include spaces before or after the commas. For example, "1,3,10-12"
- Affinity group names
You must specify an affinity group name when creating an affinity group. For information about syntax, refer to ["1.2.4 Alias Name Syntax" \(page 14\)](#). Some commands accept a comma-separated list of host names, but both its names and numbers cannot be mixed. Do not include spaces before or after the commas.



Some commands do not allow multiple parameters. Refer to the individual descriptions for parameter specification details.

1.2.9 Host Response Syntax

There are two methods to describe a host response identifier. It is necessary to specify either a host response number or name.

- Host response numbers
The host response number defined in advance by the ETERNUS DX60/DX80/DX90 can be set. This is a decimal number. They can be displayed by using the "show host-response" command. Host numbers may be combined as follows:
 - A single host response number. For example, "1"
 - A list of host response numbers. For example, "2,5"
 - A hyphenated range of host response numbers from a to z, For example, "2-5"
 - A comma-separated list of host response numbers, ranges; do not include spaces before or after the commas. For example, "1,3,10-12"
- Host response names
You must specify a host response name when registering a host response. For information about syntax, refer to ["1.2.4 Alias Name Syntax" \(page 14\)](#). Some commands accept a comma-separated list of host names, but both names and numbers cannot be mixed. Do not include spaces before or after the commas.



Some commands do not allow multiple parameters. Refer to the individual descriptions for parameter specification details.

1.2.10 ECO Schedule Syntax

There are two methods to describe an ECO schedule identifier. It is necessary to specify either an ECO schedule number or an ECO schedule name.

- ECO schedule numbers
 An ECO schedule number is automatically created by the ETERNUS DX60/DX80/DX90 when an ECO schedule is created. This is a decimal number. They can be displayed by using the "show eco-schedule" command. ECO schedule numbers may be combined as follows:
 - A single ECO schedule number. For example, "1"
 - A list of ECO schedule numbers. For example, "2,5"
 - A hyphenated range of ECO schedule numbers from a to z, For example, "2-5"
 - A comma-separated list of ECO schedule numbers, ranges, or both; do not include spaces before or after the commas. For example, "1,3,10-12"
- ECO schedule names
 You must specify an ECO schedule name when creating an ECO schedule. For information about syntax, refer to ["1.2.4 Alias Name Syntax" \(page 14\)](#). Some commands accept a comma-separated list of ECO schedule names, but both names and numbers cannot be mixed. Do not include spaces before or after the commas.



Caution Some commands do not allow multiple parameters. Refer to the individual descriptions for parameter specification details.

1.2.11 Host Interface Port Syntax

A fixed 2-digit "xy" numbering format is used, where "x" is the controller module (CM) number and "y" is the host interface port number.

Example: "10" indicates CM#1-Port#0

Multiple ports can be specified for some commands using comma separators.

Example: "-port 00,10" indicates both CM#0-Port#0 and CM#1-Port#0

The following table shows the possible host interface port configurations.

Type of host interface	No. of ports per controller	No. of controllers	Possible host interface ports
FC	4	2	00 01 02 03 10 11 12 13
FC	4	1	00 01 02 03
FC	2	2	00 01 10 11
FC	2	1	00 01
FC	1	2	00 10
FC	1	1	00
SAS	2	2	00 10 (*)
SAS	2	1	00 (*)
SAS	1	2	00 10
SAS	1	1	00
iSCSI	2	2	00 01 10 11
iSCSI	2	1	00 01

Type of host interface	No. of ports per controller	No. of controllers	Possible host interface ports
iSCSI	1	2	00 10
iSCSI	1	1	00

(*) Note that SAS is different from the other host interfaces in that it has only one settable port, even when there are two physical interfaces for host server connection.

1.3 Size of Devices and Logical Units

The size of disks and logical units such as RAID groups and volumes are presented in a base 2 (binary) formats.

Unit	Size in binary
KByte (KB)	1024 Bytes
MByte (MB)	1024 KBytes (1,048,576 bytes)
GByte (GB)	1024 MBytes (1,073,741,824 bytes)
TByte (TB)	1024 GBytes (1,099,511,627,776 bytes)

1.4 Command Auto-completion and History Recall

The CLI supports command auto-completion and retains a recallable command history. When using the auto-complete command function, if too few letters have been entered to uniquely identify a keyword, the CLI lists possible matches and redisplay the entry string for further input. The auto-completion function works for command names, parameter names and singular operand names. It does NOT work for lists of multiple, comma-separated operands. Apart from the operands, when sufficient letters have been entered to uniquely identify a keyword, the completed character string is assumed with no need to enter the remaining letters. The command history contains all the commands that have been entered during the active CLI session. Commands can be recalled from the history, edited, and run again.

For details about usable keys, refer to ["1.5 Command Editing Key Assignment" \(page 19\)](#).

1.5 Command Editing Key Assignment

The CLI supports the following keys for command editing:

To	Press
Complete a partially entered keyword	Tab
Get the previous command from history	Up Arrow or Ctrl-P or Ctrl-p
Get the next command from history	Down Arrow or Ctrl-N or Ctrl-n
Move the cursor left	Left Arrow or Ctrl-B or Ctrl-b
Move the cursor right	Right Arrow or Ctrl-F or Ctrl-f
Move the back one word	Esc-B or Esc-b
Move the forward one word	Esc-F or Esc-f
Move the cursor to start of line	Ctrl-A or Ctrl-a
Move the cursor to end of line	Ctrl-E or Ctrl-e
Transpose the current and previous character	Ctrl-T or Ctrl-t
Delete the current character	Ctrl-D or Ctrl-d
Delete the previous character	Ctrl-H or Ctrl-h
Delete the word up to cursor	Ctrl-W or Ctrl-w
Delete the rest of word	Esc-D or Esc-d
Delete the text up to cursor	Ctrl-U or Ctrl-u
Delete the rest of the line	Ctrl-K or Ctrl-k
Convert the rest of a word to uppercase	Esc-C or Esc-c
Convert the rest of a word to lowercase	Esc-L or Esc-l
Enter the command and redisplay prompt	Ctrl-Z or Ctrl-z
Refresh the input line	Ctrl-L or Ctrl-l

1.6 Viewing Command Help

If a question mark (?) is entered after a CLI command name or parameter name, a brief description is supplied. Alternately, the "help" command may be used to check the command syntax. Refer to the ["help"](#) command for details.

```
# If a question mark [?] is entered by itself, the entire command list is displayed.
CLI> ?
copy                - copy
create              - create
delete              - delete
discover            - discover
exit                - Exit the CLI sessions.
... (snip)

# If [s?] is entered, all the commands beginning with "s" are displayed.
CLI> s?
set                 show          start          stop

# If [show ?] is entered (note the space between the "show" and "?"), all the "show" command
objects are displayed.
CLI> show ?
advanced-copy-licens - Display the Extended Advanced Copy license status.
advanced-copy-parame - Display the Advanced Copy parameters.
advanced-copy-policy - Display the currently registered Advance Copy policy.
advanced-copy-sessio - Display the list of Advance Copy sessions.
affinity-groups     - Display a list of affinity groups or display the details of a specified affinity group.
.... (snip)

# If [show m?] is entered, all the "show" command objects beginning with "m" are displayed.
CLI> show m?
mapping            migration

# If [create raid-group ?] is entered (note the space between the "create raid-group" and "?"),
the possible parameters of the "create raid-group" command are displayed.
# Bracketed parameters are optional. All other parameters are required.
CLI> create raid-group ?
-name              - Name of a RAID group
-disks             - Disks to use in the RAID group
-level             - RAID level
[-assigned-cm]    - Assigned controller for the RAID group

# Long parameters and command names are truncated at 20 characters, as in the following
example.
CLI> show host-response ?
[-host-response-num - Host response numbers to display details
[-host-response-nam - Host response names to display details
```

1.7 Error Message Format

This section explains the CLI error messages. Basically, when a CLI command ends normally, nothing is output to the terminal and the CLI prompt appears on the next line. However, if an error occurs, an error message is output using the format shown in the following example. For information about actual error messages, refer to the ["Appendix A Error Messages" \(page 323\)](#) of this document.

```
Error: E0019 Inconsistent parameter.  
      A      B  
          [001C-0002] -disks 003  
          C      D
```

- A: Error message number (fixed 4 digits)
- B: Error message (human readable message)
- C: Internal error code (fixed 4 digits + hyphen + fixed 4 digits)
- D: Details (the specified parameters, etc.)

There are also error messages without an error message number, but with a circumflex (^) instead. This indicates the location of a syntax error in the input string. Use the error message and position of the circumflex (^) to identify the problem.

Some examples follow:

```
CLI> create raid-group -a  
                        ^  
Error: Missing parameter data
```

```
CLI> show disks -de 1 -de 2  
                    ^
```

1.8 Multiple Sessions

In ETERNUS DX60/DX80/DX90, a maximum of two CLI sessions can be started, but they may compete for exclusive resources. A session for which resources are available can finish normally, but the other session will terminate with an error message. In this case, wait for the previous command to finish and execute the failed command again. If necessary, locked resources can be forcibly released by using a specific command, the "set clienv-force-unlock" command. This is effective when a terminal is suddenly disconnected or an unexpected error occurs.

1.9 Slave Controller Logins

For dual controller ETERNUS DX60/DX80/DX90 models, at any given time one of the controllers is the master and the other the slave. Normal logins are to the master controller, and are able to access all the normal functions. However, if the master controller becomes inaccessible, a redundant IP address function is available that allows a (reduced functionality) login to the slave controller.

Slave controller login is only possible if a redundant IP address has been preset, and allows the use of some, but not all, of the "show" commands to check the status of components. It also allows the "change master" command to be used to forcibly swap the master-slave relationship of the two controllers. This command cannot be used from the master controller, only from the slave controller.

Commands that are not supported by the current login type will fail with an error message if attempted. Further information is provided in ["Appendix B List of Supported Commands" \(page 334\)](#).

1.10 CLI User Authority

ETERNUS DX60/DX80/DX90 has some access levels set as user authority.

- Monitor A user who can use a restricted set of reference-only commands
- Standard A user who can use the basic storage system functions
- Advanced A user who is familiar with the storage system including maintenance operations

1.11 Note for Specifying FTP Server

If an ftp server is specified by domain name format, name resolution is performed by the DNS servers assigned to the specified Ethernet port. In the ftp server is specified by IP address, an appropriate Ethernet port is automatically assigned by the system. Therefore, even though designation of an Ethernet port is not required by the CLI commands, doing so allows the operator to specify which network an ftp server is to belong to.

1.12 Command Descriptions

This section explains the commands in functional order. Each command topic includes one or more of the following sections.

- Description
A description of the command's function
- Syntax
About the command Syntax
- Parameters
A description of any parameter(s)
- Output (only for reference commands)
A description of the information displayed by the command
- Example(s)
One or more examples of command usage

Chapter 2 Status

This chapter explains the commands used to display the status details of various ETERNUS DX60/DX80/DX90 components.

2.1 Storage System Status

This section explains the commands used to display the status of the storage system and its components. These are as follows:

What is displayed	Command syntax
General status	<code>show status</code>
Summary status of each enclosure	<code>show enclosure-status</code>
Controller enclosure's status	<code>show enclosure-status -type ce</code>
Specific drive enclosure's status	<code>show enclosure-status -type de -de {1 2 3 4 5 6 7 8 9}</code>
Controller enclosure's and all drive enclosure's status	<code>show enclosure-status -type all</code>
Controller module status	<code>show fru-ce -type {cm0 cm1}</code>
PSU's status in controller enclosure	<code>show fru-ce -type {psu0 psu1}</code>
All components' status in controller enclosure	<code>show fru-ce</code>
Expander's status in a specific drive enclosure	<code>show fru-de -de {1 2 3 4 5 6 7 8 9} -type {exp0 exp1}</code>
All expanders' status in all drive enclosure	<code>show fru-de -type {exp0 exp1}</code>
PSU's status in a specific drive enclosure	<code>show fru-de -de {1 2 3 4 5 6 7 8 9} -type {psu0 psu1}</code>
All PSU's status in all drive enclosure	<code>show fru-de -type {psu0 psu1}</code>
All components' status in specific drive enclosure	<code>show fru-de -de {1 2 3 4 5 6 7 8 9}</code>
All components' status in all drive enclosure	<code>show fru-de</code>
All undefined disk's status	<code>show disks -type undefined</code>
All disks' status in the controller enclosure	<code>show disks -type ce</code>
All of disk status in a specific drive enclosure	<code>show disks -type de -de {1 2 3 4 5 6 7 8 9}</code>
Details of specific disks	<code>show disks -disks disks</code>
All disks' details	<code>show disks -disks all</code>
All disks' product IDs	<code>show disks -disks productid</code>
Hardware information	<code>show hardware-information</code>

show status

This command displays a summary of the system status. It shows whether there are fatal/warning status components in the ETERNUS DX60/DX80/DX90, rather than whether disk access is possible from the host servers.

Syntax show status

Parameters No parameters.

Output Summary status

The general status of ETERNUS DX60/DX80/DX90 is displayed.

Normal ETERNUS DX60/DX80/DX90 is in normal state.

Not Ready "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 ETERNUS DX60/DX80/DX90 is in error state.

Maintenance ETERNUS DX60/DX80/DX90 is under maintenance.

Warning ETERNUS DX60/DX80/DX90 is in warning state.

Offline The component is installed in the ETERNUS DX60/DX80/DX90, but not used.

Example(s) The following examples display the possible system summary statuses:

```
CLI> show status
Summary Status [Normal]

CLI> show status
Summary Status [Error]

CLI> show status
Summary Status [Warning]
```

show enclosure-status

This command displays details of the status of the controller enclosure and/or drive enclosures. Detailed information will be displayed if the type of enclosure is specified.

Syntax show enclosure-status [-type { all | ce | de [-de *enclosure_number*]}]

Parameters -type Optional. This parameter specifies the enclosure type. If the type is omitted, only summary information will be displayed.

all Detailed status of the controller enclosure and all drive enclosures is displayed.

ce Detailed status of the controller enclosure is displayed.

de Detailed status of the specified drive enclosure is displayed.

-de Optional. A drive enclosure number parameter can be specified to request the details of that drive enclosure only. If omitted, then all drive enclosures are selected. Cannot be used for other enclosure types.

Ex. -type de -de 1
(to request the details of drive enclosure #1)

Output The following information is output when all parameters are omitted.

Name Series name of the ETERNUS DX60/DX80/DX90

Model Upgrade Status

Model upgrade status. This means whether or not the model has been upgraded. If the model can and has been upgraded, [Completed] is displayed. If the model can but has not been upgraded yet, [Possible] is displayed. If the model cannot be upgraded, [Not Possible] is displayed.

Model Name

Model name of the ETERNUS DX60/DX80/DX90

Serial Number

Serial number of the ETERNUS DX60/DX80/DX90

Device Identification Number

Device identification number used by the Fujitsu Multipath Driver or other external software to identify the storage system.

Status

Status of the ETERNUS DX60/DX80/DX90

Cache Mode

The cache control mode (Write Back Mode or Write Through Mode)

Remote Support

The remote support state (Operating, Maintenance, Stopping, or Not yet Set)

Operating: Remote support is already set.

Maintenance: Remote support is suspended for Maintenance mode operation.

Stopping: Remote support is suspended.

Not yet Set: Remote support is not set yet.

Operation Mode

The operation mode (Active or Maintenance)

CLI Connecting Controller Module

Controller module whose CLI connection is active

Firmware Version

Version number of the current firmware

Controller Enclosure

Summary status

Drive Enclosure #n

Representative status of each drive enclosure (the #n shows the drive enclosure number).

Ex. Drive Enclosure #1 [status]

(giving the status of drive enclosure)

System Message

Messages that identifies any error events occurring in the ETERNUS DX60/DX80/DX90

The following information is output for the controller enclosure components:

Intake Temp

ETERNUS DX60/DX80/DX90 intake temperature status, status code and intake temperature values. Each controller has two redundant intake temperature sensors, and both temperature values are displayed in Celsius. If a sensor fails, "Failed" is displayed.

Exhaust Temp

ETERNUS DX60/DX80/DX90 internal temperature status and error code. Note that exhaust temperature values are not displayed.

CM#0 Controller Module #0 status and status code

CM#1 Controller Module #1 status and status code

PSU#0 Power Supply Unit #0 status and status code

PSU#1 Power Supply Unit #1 status and status code

DISK#xyy Disk status

Ex. CE-Disk#1 [status] (giving the status of disk #001)
(for details, refer to ["1.2.3 Disk Syntax" \(page 13\).](#))

The following information is output for the drive enclosure components.

Intake Temp

ETERNUS DX60/DX80/DX90 intake temperature status, status code and intake temperature values. Each controller has two redundant intake temperature sensors, and both temperature values are displayed in Celsius. If a sensor fails, "Failed" is displayed.

Exhaust Temp

ETERNUS DX60/DX80/DX90 internal temperature status and error code. Note that exhaust temperature values are not displayed.

EXP#0 Expander #0 status and status code

EXP#1 Expander #1 status and status code

PSU#0 Power Supply Unit #0 status and status code

PSU#1 Power Supply Unit #1 status and status code

DISK#xyy Disk status

Ex. DE#1-Disk#1 [status] (giving the status of disk #001)
(for details, refer to ["1.2.3 Disk Syntax" \(page 13\).](#))

Example(s) The following information is displayed when no parameters are specified:

```
CLI> show enclosure-status
Enclosure View
Name [ETERNUS DX80]
Model Upgrade Status [Not Possible]
Model Name [ET06F21A]
Serial Number [000000]
Device Identification Number [010000]
Status [Normal]
Cache Mode [Write Back Mode]
Remote Support [Not yet Set]
Operation Mode [Maintenance]
CLI Connecting Controller Module [CM#0]
Firmware Version [V10L11-0000]

Controller Enclosure (3.5") [Normal]
Drive Enclosure #1 (3.5") [Error]
Drive Enclosure #2 (3.5") [Error]

System Message
No. Message
1 P 100000XX-XXXXX
2 P 500000XX-XXXXX
```

The following example shows the information displayed when the controller enclosure is specified:

```
CLI> show enclosure-status -type ce
Controller Enclosure Information
Location      Status      Error Code  Sensor 1 / Sensor 2
Intake Temp   Normal      0x0000      25 (C) / 25 (C)
Exhaust Temp  Normal      0x0000      -

Controller Enclosure Status
Controller Module Status/Status Code
CM#0 [Normal / 0xE001]
CM#1 [Normal / 0xE001]
Power Supply Unit Status/Status Code
PSU#0 [Normal / 0xE001]
PSU#1 [Normal / 0xE001]
Disk Status
CE-Disk#0 [Rebuild/Copyback ] CE-Disk#1 [Rebuild/Copyback ]
CE-Disk#2 [Available ] CE-Disk#3 [Broken ]
CE-Disk#4 [Available ] CE-Disk#5 [Available(Predictive Failure)]
CE-Disk#6 [Available(Predictive Failure)] CE-Disk#7 [Present ]
CE-Disk#8 [Present ] CE-Disk#9 [Present ]
CE-Disk#10 [Present ] CE-Disk#11 [Spare ]
```

The following example shows the information displayed when drive enclosure #1 is specified:

```
CLI> show enclosure-status -type de -de 1
Drive Enclosure #1 Information
Location      Status      Error Code  Sensor 1 / Sensor 2
Intake Temp   Normal      0x0000      25 (C) / 25 (C)
Exhaust Temp  Normal      0x0000      -

Drive Enclosure #1 Status
Expander Status/Status Code
EXP#0 [Normal / 0xE001]
EXP#1 [Normal / 0xE001]
Power Supply Unit Status/Status Code
PSU#0 [Normal / 0xE001]
PSU#1 [Normal / 0xE001]
Disk Status
DE#1-Disk#0 [Available ] DE#1-Disk#1 [Available ]
DE#1-Disk#2 [Available ] DE#1-Disk#3 [Rebuild/Copyback ]
DE#1-Disk#4 [Rebuild/Copyback ] DE#1-Disk#5 [Available ]
DE#1-Disk#6 [Available ] DE#1-Disk#7 [Available(Predictive Failure)]
DE#1-Disk#8 [Available ] DE#1-Disk#9 [Available ]
DE#1-Disk#10 [Available(Predictive Failure)] DE#1-Disk#11 [Broken ]
```

The following example shows the information displayed when all of the enclosures are specified:

```

CLI> show enclosure-status -type all
Controller Enclosure Information
Location      Status      Error Code  Sensor 1 / Sensor 2
Intake Temp   Normal      0x0000      25 (C) / 25 (C)
Exhaust Temp  Normal      0x0000      -

Controller Enclosure Status
Controller Module Status/Status Code
CM#0 [Normal / 0xE001]
CM#1 [Normal / 0xE001]
Power Supply Unit Status/Status Code
PSU#0 [Normal / 0xE001]
PSU#1 [Normal / 0xE001]
Disk Status
CE-Disk#0 [Rebuild/Copyback ] CE-Disk#1 [Rebuild/Copyback ]
CE-Disk#2 [Available ] CE-Disk#3 [Broken ]
CE-Disk#4 [Available ] CE-Disk#5 [Available(Predictive Failure)]
CE-Disk#6 [Available(Predictive Failure)] CE-Disk#7 [Present ]
CE-Disk#8 [Present ] CE-Disk#9 [Present ]
CE-Disk#10 [Present ] CE-Disk#11 [Spare ]

Drive Enclosure #1 Information
Location      Status      Error Code  Sensor 1 / Sensor 2
Intake Temp   Normal      0x0000      25 (C) / 25 (C)
Exhaust Temp  Normal      0x0000      -

Drive Enclosure #1 Status
Expander Status/Status Code
EXP#0 [Normal / 0xE001]
EXP#1 [Normal / 0xE001]
Power Supply Unit Status/Status Code
PSU#0 [Normal / 0xE001]
PSU#1 [Normal / 0xE001]
Disk Status
DE#1-Disk#0 [Available ] DE#1-Disk#1 [Available ]
DE#1-Disk#2 [Available ] DE#1-Disk#3 [Rebuild/Copyback ]
DE#1-Disk#4 [Rebuild/Copyback ] DE#1-Disk#5 [Available ]
DE#1-Disk#6 [Available ] DE#1-Disk#7 [Available(Predictive Failure)]
DE#1-Disk#8 [Available ] DE#1-Disk#9 [Available ]
DE#1-Disk#10 [Available(Predictive Failure)] DE#1-Disk#11 [Broken ]

```

show fru-ce

This command displays the status of the controller enclosure's Field Replaceable Unit components.

Syntax `show fru-ce [-type {cm0 | cm1 | psu0 | psu1}]`

Parameters `-type` Optional. This parameter may be used to specify the name of a single target component (FRU) to display its details and status, including any sub-components. If omitted, then details of all FRUs are displayed.

`cm0` Details and status of Controller Module Unit #0 and its sub-components

`cm1` Details and status of Controller Module Unit #1 and its sub-components

`psu0` Details and status of Power Supply Unit #0

`psu1` Details and status of Power Supply Unit #1

Output The following information is output for the controller module and sub-components:

CM#n Information (n: The controller module number)

Status/Status Code

Controller Module (CM#n) status and the status Code

Error Code Error code to identify error events occurring in the controller module

This information is only displayed when the Status is not Normal or Undefined.

Memory Size

Available memory capacity on the controller module

Type Host interface type (FC / SAS / iSCSI)

Parts Number

Parts number

Serial Number

Serial number

Hardware Revision

Hardware version

CPU Clock CPU clock frequency

Active EC EC number (generation number) of the currently running firmware

Next EC EC number (generation number) of the firmware that is to be run after the next power-on

CM#n Internal Parts Status/Status Code
(n: The controller module number)

Memory Memory status and status code

BE Expander
 Backend expander status and status code

BE EXP Port#0
 Backend expander port #0 status and status code

BE EXP Port#1
 Backend expander port #1 status and status code

BE EXP Port#2
 Backend expander port #2 status and status code

DI Port#0 DI Port#0 status and status code

DI Port#1 DI Port#1 status and status code

FC Port#0 FC port #0 status and status code

FC Port#1 port #1 status and status code

SAS Cable#1(OUT)
 SAS Cable status chained to DE#1

NAND Controller
 NAND controller status and the status code

Flash ROM Flash memory status and the status code

CM#n SCU Information (n: The controller module number)

 Note

System Capacitor Unit = electric double layer capacitors embedded in the controller module to provide power to move the cache data to the NAND flash memory if there is a power outage

Status/Status Code
 SCU status and status code

Voltage Charging voltage of SCU

Expires Expiring date of SCU

CM#n Port#m Information

(n: controller module number, m: port number) (for Fibre Channel model)

Port Mode It shows if FC host interface port mode is CA or RA. This is only displayed for FC models.

Status/Status Code
Host interface Port (Port#m) status and status code

Error Code Error code to identify error events occurring on the host interface port
This information is only displayed when the Status is not Normal or Undefined.

Connection Connection condition

Loop ID Loop ID

Transfer Rate
Transfer rate (an operator specified value)

Link Status Link status (Link Up, Link Down, or the actual transfer rate if auto negotiation is used.)

WWN World-Wide-Name

Host Affinity
Shows whether Host Affinity Mode is enabled, or not.

Host Response
Host response information assigned to this port

The following information is output regarding the power supply units.

Status/Status Code
Power supply unit (PSU#n) status and status code

Error Code Error code to identify error events occurring in the power supply unit
This information is only displayed when the Status is not Normal or Undefined.

Example(s) For Fibre Channel model, the following example displays the status and details of the controller module #0 sub-components.

```

CLI> show fru-ce -type cm0
CM#0 Information
Status/Status Code [Normal / 0xE001]
Memory Size [2.0GB]
Type [FC Model]
Parts Number [CA07059-C021]
Serial Number [PP07520322]
Hardware Revision [AA ]
CPU Clock [1.20GHz]
Active EC [EC#2]
Next EC [EC#2]
CM#0 Internal Parts Status/Status Code
Memory [Normal / 0xE001]
BE Expander [Normal / 0xE001]
BE EXP Port#0 [Normal / 0xE001]
BE EXP Port#1 [Undefined / 0x0000]
BE EXP Port#2 [Normal / 0xE001]
DI Port#0 [Normal / 0xE001]
DI Port#1 [Normal / 0xE001]
FC Port#0 [Normal / 0xE001]
FC Port#1 [Normal / 0xE001]
SAS Cable#1 (OUT) [- / - ]
NAND Controller [Normal / 0xE001]
Flash ROM [Normal / 0xE001]
CM#0 SCU Information
Status/Status Code [Normal / 0xE001]
Voltage [9.40V]
Expires [0-00]
CM#0 Port#0 Information
Port Mode [CA]
Status/Status Code [Normal / 0xE001]
Connection [Loop]
Loop ID [0x00]
Transfer Rate [Auto Negotiation]
Link Status [Link Down]
WWN [500000E0D0000006]
Host Affinity [Disable]
Host Response [Default]
CM#0 Port#1 Information
Port Mode [CA]
Status/Status Code [Normal / 0xE001]
Connection [Loop]
Loop ID [0x00]
Transfer Rate [Auto Negotiation]
Link Status [Link Down]
WWN [500000E0D0000007]
Host Affinity [Enable]
Host Response [-]
  
```

The SAS and iSCSI model outputs, differ from the FC model output at the "CM#x Port#x Information" level.

For SAS models, the following information is displayed:

```

CM#0 Port#0 Information
Status/Status Code [Normal / 0xE001]
Transfer Rate [3Gbit/s]
Link Status PHY#0[3.0Gbit/s Link Up] PHY#1[3.0Gbit/s Link Up]
PHY#2[3.0Gbit/s Link Up] PHY#3[3.0Gbit/s Link Up]
SAS Address [500000E0D0000106]
Host Affinity [Disable]
Host Response [Default]
CM#0 Port#1 Information Status/Status Code [Normal / 0xE001]
Transfer Rate [3Gbit/s]
Link Status PHY#0[Link Down ] PHY#1[Link Down ]
PHY#2[Link Down ] PHY#3[Link Down ]
SAS Address [500000E0D0000106]
Host Affinity [Disable]
Host Response [Default]
  
```

For iSCSI models, the following information is displayed:

```
CM#0 Port#0 Information
Status/Status Code [Normal      / 0xE001]
Transfer Rate      [1Gbit/s]
Link Status        [Link Down]
iSCSI Name         [iqn.2000-09.com.fujitsu:storage-system.etermus-dx1:00000000]
iSCSI Alias Name   []
Host Affinity      [Disable]
Host Response      [Default]
CM#0 Port#1 Information
Status/Status Code [Normal      / 0xE001]
Transfer Rate      [1Gbit/s]
Link Status        [Link Down]
iSCSI Name         [iqn.2000-09.com.fujitsu:storage-system.etermus-dx1:00000000]
iSCSI Alias Name   []
Host Affinity      [Enable]
Host Response      [-]
```

The following example displays the status of power supply unit (PSU) #0:

```
CLI> show fru-ce -type psu0
CE PSU#0 Information
Status/Status Code [Normal      / 0xE001]
```

show fru-de

This command displays the status of the drive enclosures' Field Replaceable Unit components.

Syntax show fru-de [-de *enclosure_number*] [-type {exp0 | exp1 | psu0 | psu1}]

Parameters -de Optional. This parameter may be used to specify the number of a single target drive enclosure. If omitted, then all the connected drive enclosures are selected.

Ex. -de 1
(for the drive enclosure #1 only)

-type Optional. This parameter may be used to specify the name of a single target component (FRU) to display its details and status, including any sub-components. If omitted, then details of all FRUs are displayed.

exp0	Details and status of Expander #0
exp1	Details and status of Expander #1
psu0	Details and status of Power Supply Unit #0
psu1	Details and status of Power Supply Unit #1

Output The following information is output for Expanders.

DE#n EXP#m Information
(n: drive enclosure number, m: expander number)

Status/Status Code

Expander (Expander#n) status and status code

Error Code Error code to identify error events occurring in the expander.
This information is only displayed when the Status is not Normal or Undefined.

WWN World-Wide-Name

Active EC EC number (generation number) of the active firmware (the currently running firmware)

Next EC EC number (generation number) of the stand-by firmware (the next-to-be run firmware)

DE#n EXP#m Internal Parts Status/Status Code

SAS Cable(Expander Port)#0(IN)

SAS Cable(Expander Port)#0(IN) status and status code

Error Code Error code to identify error events occurring in the above port#0
This information is only displayed when the Status is not Normal or Undefined.

SAS Cable(Expander Port)#1(OUT)
SAS Cable(Expander Port)#1(OUT) status and status code

Error Code Error code to identify error events occurring in the above port#1

The following information is output regarding Power Supply units:

Status/Status Code
Power Supply Unit (PSU#n) status and status code

Error Code Error code to identify error events occurring in the power supply unit
This information is only displayed when the Status is not Normal or Undefined.

Example(s) The following example displays the status of expander #0 of drive enclosure #1:

```
CLI> show fru-de -de 1 -type exp0
DE#1 EXP#0 Information
Status/Status Code      [Normal      / 0xE001]
WWN                     [500000E0D060C4FF]
Active EC                [EC#2]
Next EC                  [EC#2]
DE#1 EXP#0 Internal Parts Status/Status Code
SAS Cable(Expander Port)#0(IN) [Normal      / 0xE001]
SAS Cable(Expander Port)#1(OUT) [Normal      / -      ]
```

The following example displays the status of power supply unit #0 (PSU#0) in drive enclosure #2:

```
CLI> show fru-de -de 2 -type psu0
DE#2 PSU#0 Information
Status/Status Code      [Normal      / 0xE001]
```

show disks

This command displays the details and status of disks. It may be applied to an enclosure (all disks contained in the specified enclosure), a specific disk, or all undefined disks.

Syntax	show disks [-type {undefined ce de -de <i>enclosure_number</i> } -disks { <i>disks</i> all productid}]	
Parameters	-type	Optional. This parameter specifies the category for which summary information is to be displayed. This cannot be combined with the "-disks" parameter. If all parameters are omitted, the list of all disks registered in the ETERNUS DX60/DX80/DX90 is displayed.
	undefined	All undefined disks
	ce	All disks of the controller enclosure
	de	All disks of the specified drive enclosure. If selected, a "-de" drive enclosure number must be specified together with this parameter.
	-de	Optional. A drive enclosure number parameter must be specified to request the details of a single drive enclosure's disks only. Cannot be used for other category types.
	-disks	Optional. This parameter may be used to specify disk numbers for which disk details are to be displayed. One or more parameters can be requested at a time. For details, refer to the " 1.2.3 Disk Syntax " (page 13). If " <i>all</i> " is specified, details of all disks will be displayed. If " <i>productid</i> " is specified, the product ID list for all disks is displayed. This function is supported for disk firmware update functions.
	all	Details of all disks
	productid	Product ID list for all disks
Output	In case of the summary, the following items are displayed.	
	Location	slot number
	Status	status
	Size	Disk capacity
	Type	Disk type
	Speed	Rotating speed (unit: rpm)
	Usage	Disk usage type Ex. Data, Spare, System, etc.

In case of details, the following items are displayed.

Location	Disk slot number
Status	Disk status
Error Code	Error Code to identify error events occurring in the disk This information is displayed only when the Status is not Available.
Size	Disk capacity
Type	Disk type
Speed	Rotating speed (unit: rpm)
Usage	Disk type of usage Ex. Data, Spare, System, etc.
RAID Group	RAID group to which this disk belongs
Motor Status	Disk motor status due to the ECO function
Rebuild/Copy back Progress	Progress status of Rebuild and Copy back
Vendor ID	Vendor ID
Product ID	Product ID
Serial Number	Serial number
WWN	World-Wide-Name
Firmware Revision	Disk firmware version

In case of the product ID list, the following items are displayed.

Product ID	Product ID
Revision	Disk firmware revision

Example(s) The following example displays the summary of all disks:

```
CLI> show disks
Location      Status      Size      Type      Speed (rpm)  Usage
CE-Disk#0    Available  73GB     3.5" SAS  15000      System
CE-Disk#1    Available  73GB     3.5" SAS  15000      System
```

The following example displays the summary of disks in the controller enclosure:

```
CLI> show disks -type ce
Location      Status      Size  Type      Speed (rpm)  Usage
CE-Disk#0    Available  146GB  3.5" SAS  15000      System
CE-Disk#1    Available  146GB  3.5" SAS  15000      System
CE-Disk#2    Available  146GB  3.5" SAS  15000      Data
CE-Disk#3    Available(Predictive Failure)  146GB  3.5" SAS  15000      Data
CE-Disk#4    Available  146GB  3.5" SAS  15000      Data
CE-Disk#5    Available  146GB  3.5" SAS  15000      Data
CE-Disk#6    Available  146GB  3.5" SAS  15000      Data
CE-Disk#7    Available  146GB  3.5" SAS  15000      Data
CE-Disk#8    Available  146GB  3.5" SAS  15000      Data
CE-Disk#9    Available  146GB  3.5" SAS  15000      Present
CE-Disk#10   Available  146GB  3.5" SAS  15000      Global Hot Spare
CE-Disk#11   Available  146GB  3.5" SAS  15000      Dedicated Hot Spare
```

The following example displays the summary of disks in drive enclosure #1:

```
CLI> show disks -type de -de 1
Location      Status      Size  Type      Speed (rpm)  Usage
DE#1-Disk#0  Available(Predictive Failure)  146GB  3.5" SAS  15000      Data
DE#1-Disk#1  Available  146GB  3.5" SAS  15000      Data
DE#1-Disk#2  Available  146GB  3.5" SAS  15000      Data
DE#1-Disk#3  Available  146GB  3.5" SAS  15000      Data
DE#1-Disk#4  -
DE#1-Disk#5  Available  146GB  3.5" SAS  15000      Data
DE#1-Disk#6  -
DE#1-Disk#7  -
DE#1-Disk#8  -
DE#1-Disk#9  Available  146GB  3.5" SAS  15000      Data
DE#1-Disk#10 Available  146GB  3.5" SAS  15000      Global Hot Spare
DE#1-Disk#11 Available  146GB  3.5" SAS  15000      Dedicated Hot Spare
```

The following example displays the summary of all undefined disks:

```
CLI> show disks -type undefined
Location      Status      Size  Type      Speed (rpm)  Usage
DE#4-Disk#0  Available  146GB  3.5" SAS  15000      Data
DE#4-Disk#1  Available  146GB  3.5" SAS  15000      Data
DE#5-Disk#1  Available  146GB  3.5" SAS  15000      Data
DE#6-Disk#11 Available(Predictive Failure)  146GB  3.5" SAS  15000      Data
```

The following example displays the details of disk #100 (disk #00 in drive enclosure #1):

```
CLI> show disks -disks 100
Drive Enclosure #1 Disk #0 Information
Location      [DE#1-Disk#0]
Status        [Error] (Error Code : 0x0010)
Size          [146GB]
Type          [3.5" SAS]
Speed         [7200rpm]
Usage         [Data]
RAID Group    [00 : RGP001]
Motor Status  [Active]
Rebuild/Copyback Progress [-]
Vendor ID     [FUJITSU]
Product ID    [FT373207C-K]
Serial Number [1234567890]
WWN           [1111111111111111]
Firmware Revision [12CD]
```

The following example displays the product ID list:

```
CLI> show disks -disks productid
Product ID    Revision
ST373455SS   12CD
ST99999999   3456
```


show hardware-information

This command displays hardware information for each enclosure and sub-component.

Syntax show hardware-information

Parameters No parameters.

Output For each enclosure, the following items are displayed. All possible drive enclosures are displayed, irrespective of whether or not they are currently installed, with drive enclosures that do not exist being indicated by hyphens.

Serial No. Serial number embedded in the enclosure

Other Information

Individual identifier embedded in the enclosure and managed by Fujitsu

For each component, the following items are displayed. For single controller models, both controller module #1 and expander module #1 are indicated by hyphens. Information is not displayed for drive enclosures that do not exist.

Part No. Individual part number embedded in the component by Fujitsu

Serial No. Individual serial number embedded in the component by Fujitsu

Version Component hardware version number

Example(s) For FC model system configurations with a single drive enclosure, the following hardware information is displayed:

```

CLI> show hardware-information
Enclosure          Serial No.          Other Information
Controller Enclosure ST35CE000012       35CE000012
Drive Enclosure#1  ST35DE000009       35DE000009
Drive Enclosure#2  ST35DE000011       35DE000011
Drive Enclosure#3  ST35DE000019       35DE000019
Drive Enclosure#4  ST35DE000018       35DE000018
Drive Enclosure#5  ST35DE000023       35DE000023
Drive Enclosure#6  -                   -
Drive Enclosure#7  -                   -
Drive Enclosure#8  -                   -
Drive Enclosure#9  -                   -

Component          Part No.            Serial No.          Version
CM#0               CA07111-C631       PP09280285         AA
CM#1               CA07111-C631       PP0928028A         AA
PSU#0              CA05954-0860       FA09060095         06A
PSU#1              CA05954-0860       FA09060088         06A
CM#0-Port#0 (SFP)  FTLF8528P2BCV     UEC03RR            A
CM#0-Port#1 (SFP)  FTLF8528P2BCV     UE801B0            A
CM#1-Port#0 (SFP)  FTLF8528P2BCV     UEA02NW            A
CM#1-Port#1 (SFP)  FTLF8528P2BCV     UE6023G            A
DE#1-EXP#0         CA07111-C661       PP08510027         AA
DE#1-EXP#1         CA07111-C661       PP085100YT         AA
DE#1-PSU#0         CA05954-0860       FA09030006         05A
DE#1-PSU#1         CA05954-0860       FA08520078         05A
DE#2-EXP#0         CA07111-C661       PP085100YP         AA
DE#2-EXP#1         CA07111-C661       PP085100YW         AA
DE#2-PSU#0         CA05954-0860       FA08520085         05A
DE#2-PSU#1         CA05954-0860       FA08520084         05A
DE#3-EXP#0         CA07111-C661       PP085100Z9         AA
DE#3-EXP#1         CA07111-C661       PP085100ZD         AA
DE#3-PSU#0         CA05954-0860       FA09050024         06A
DE#3-PSU#1         CA05954-0860       FA09050025         06A
DE#4-EXP#0         CA07111-C661       PP085100Z0         AA
DE#4-EXP#1         CA07111-C661       PP085100YZ         AA
DE#4-PSU#0         CA05954-0860       FA09040009         06A
DE#4-PSU#1         CA05954-0860       FA09040011         06A
DE#5-EXP#0         CA07111-C661       PP085102T0         AA
DE#5-EXP#1         CA07111-C661       PP085102T1         AA
DE#5-PSU#0         CA05954-0860       FA09060036         06A
DE#5-PSU#1         CA05954-0860       FA09060038         06A
  
```

For SAS and iSCSI model system configurations with no drive enclosure, the following hardware information is displayed:

```

CLI> show hardware-information
Enclosure          Serial No.          Other Information
Controller Enclosure ST35CE000012       35CE000012
Drive Enclosure#1  -                   -
Drive Enclosure#2  -                   -
Drive Enclosure#3  -                   -
Drive Enclosure#4  -                   -
Drive Enclosure#5  -                   -
Drive Enclosure#6  -                   -
Drive Enclosure#7  -                   -
Drive Enclosure#8  -                   -
Drive Enclosure#9  -                   -

Component          Part No.            Serial No.          Version
CM#0               CA07111-C631       PP09280285         AA
CM#1               CA07111-C631       PP0928028A         AA
PSU#0              CA05954-0860       FA09060095         06A
PSU#1              CA05954-0860       FA09060088         06A
  
```

Chapter 3 Configuration

This chapter explains the commands used for RAID group management, volume management, and host interface management, these being the basic settings for the ETERNUS DX60/DX80/DX90.

3.1 RAID Group Management

This chapter explains the commands used for the following functions:

- RAID group settings
- Hot spares
- ECO settings

3.1.1 RAID Groups

This section explains the commands used for RAID group management. All disks contained in a RAID group must be the same disk type.

create raid-group

This command creates a RAID group using the specified RAID group name, RAID level, and disks. If registering a Hot Spare, refer to the "set global-spare" or "set dedicated-spare" commands.

Syntax `create raid-group -name alias_name -disks disks -level {0|1|5|6|10|50} [-assigned-cm {0|1|auto}]`

Parameters **-name** This parameter may be used to specify the alias name of a single RAID group. For details, refer to the ["1.2.4 Alias Name Syntax" \(page 14\)](#).

-disks This parameter specifies the disks that are to be used to form the RAID group. For details, refer to the ["1.2.3 Disk Syntax" \(page 13\)](#).

-level This parameter specifies the RAID level.

0	RAID0
1	RAID1
5	RAID5
6	RAID6
10	RAID1+0
50	RAID5+0

-assigned-cm

Optional. This parameter specifies the assigned controller of the specified RAID group. If "auto" is selected, load-balancing between the controllers and RAID groups is automatic. If omitted, then this parameter is handled as if "auto" was selected.

0	Owned by Controller module #0
1	Owned by Controller module #1
auto	Automatic load-balancing (default)

Example(s) The following example creates a RAID group named "RGP001" as a RAID1 using the two disks, #003 and #004:

```
CLI> create raid-group -name RGP001 -level 1 -disks 003,004
```

set raid-group

This command changes already registered RAID group information, RAID group names, and associated controller module (CM) numbers.

Syntax `set raid-group {-rg-number rg_number | -rg-name rg_name } [-name name] [-assigned-cm {0|1}]`

Parameters `-rg-number` This parameter specifies the identifier of the RAID group that is to be changed. For details, refer to the ["1.2.5 RAID Group Syntax" \(page 14\)](#).

`-rg-name` When requesting a RAID group alias name change, only one parameter is allowed at a time.

When requesting an assigned CM number change, one or more parameters are requested.

`-name` Optional. This parameter specifies a new RAID group name. If omitted, then this parameter value is not changed. For details, refer to the ["1.2.4 Alias Name Syntax" \(page 14\)](#).

`-assigned-cm` Optional. This parameter specifies the CM number for the controller module that is to be assigned control of the RAID group. If omitted, then this parameter value is not changed.

0 Owned by controller module #0 (CM#0)

1 Owned by controller module #1 (CM#1)

Example(s) The following example changes the RAID group name from "RGP001" to "RAID002":

```
CLI> set raid-group -rg-name RGP001 -name RAID002
```

The following example changes the associated CM number of the RAID group named "RGP001" to CM#1:

```
CLI> set raid-group -rg-name RGP001 -assigned-cm 1
```

The following example changes the associated CM number of two or more RAID groups at the same time. In this case the target RAID group numbers are #2 and #4:

```
CLI> set raid-group -rg-number 2,4 -assigned-cm 1
```

delete raid-group

This command deletes currently registered RAID groups. Note that a RAID group cannot be deleted if it contains one or more volumes.

Caution



All volumes must be deleted from a RAID group before it can be deleted.

Syntax	<code>delete raid-group {-rg-number <i>rg_numbers</i> -rg-name <i>rg_names</i> }</code>
Parameters	<code>-rg-number</code> This parameter specifies the identifiers of the RAID group(s) to be deleted. One or more RAID groups may be deleted at the same time. For details, refer to the "1.2.5 RAID Group Syntax" (page 14) . <code>-rg-name</code>

Example(s) The following example deletes the RAID group named "R1" only:

```
CLI> delete raid-group -rg-name R1
```

The following example deletes consecutive RAID groups #1-8:

```
CLI> delete raid-group -rg-number 1-8
```

show raid-groups

This command displays a summary list of all RAID groups. When requesting specific RAID groups, details can be displayed.

Syntax show raid-groups [-rg-number *rg_numbers* | -rg-name *rg_names*]

Parameters -rg-number Optional. This parameter specifies the identifier of the RAID group(s) for which details are to be displayed. One or more RAID groups can be requested at the same time. For details, refer to the ["1.2.5 RAID Group Syntax" \(page 14\)](#). If omitted, a summary list for all RAID groups is displayed.

Output

#	RAID Group	RAID Level	Assigned CM	Status	Total Capacity (MB)	Free Capacity (MB)	
#	1	RAIDGROUP001	RAID1+0	CM#0	Spare in Use	134656	132535
#	A	B	C	D	E	F	G
#	<Disk List>						
#	Disk	Status	Usage	Mirroring			
#	CE-Disk#3	Available	Data	CE-Disk#5			
#	H	I	J	K			

- A: RAID group number
- B: RAID group name
- C: RAID level
- D: Associated CM number, CM number to control a RAID group
- E: RAID group status
- F: Total capacity (Unit: MB)
- G: Free capacity (Unit: MB)
- H: Disk location included in a RAID group (Only when viewing details)
- I: Disk status included in a RAID group (Only when viewing details)
- J: Disk usage of type included in a RAID group (Only when viewing details)
- K: Pair disk information in case of RAID1/1+0 (Only when viewing details)

Example(s) The following example displays a summary list for all disks registered in the ETERNUS DX60/DX80/DX90:

```
CLI> show raid-groups
RAID Group      RAID Level  Assigned CM  Status          Total Capacity (MB)  Free Capacity (MB)
No. Name
1 RAIDGROUP001  RAID1+0    CM#0          Spare in Use      134656               132535
2 RAIDGROUP002  RAID5      CM#1          Available         134656               132532
```

The following example displays details of a RAID5 (4+1) group named "R1". In this example, two disks have failed and two Hot Spares are in use. Some spare disks have also failed, with "Failed Usable" indicating the latest failed disk:

```
CLI> show raid-groups -rg-name R1
RAID Group      RAID Level  Assigned CM  Status          Total Capacity (MB)  Free Capacity (MB)
No. Name
0 R1            RAID5      CM#0          Broken          1116160              1116136
<Disk List>
Disk           Status      Usage
CE-Disk#0     Available  System
CE-Disk#1     Available  System
CE-Disk#2     Available  Data
CE-Disk#3     Broken     Data
CE-Disk#4     Broken     Data
CE-Disk#5     Broken     Dedicated Hot Spare
CE-Disk#6     Failed Usable  Global Hot Spare
```

The following example displays the details of RAID group #0. Mirroring information is also displayed for RAID1 and RAID1+0 groups:

```

CLI> show raid-groups -rg-number 0
RAID Group          RAID   Assigned Status          Total   Free
No. Name            Level  CM          Spare in Use   Capacity(MB) Capacity(MB)
0 RAIDGROUP1       RAID1+0 CM#0
<Disk List>
Disk      Status          Usage          Mirroring
CE-Disk#2 Broken          Data           -
CE-Disk#3 Available      Data           CE-Disk#5
CE-Disk#4 Available      Data           CE-Disk#7
CE-Disk#5 Available      Data           CE-Disk#3
CE-Disk#7 Available      Global Hot Spare CE-Disk#4

```


show raid-group-progress

This command displays the progress status of current Rebuild/Copyback and RAID group expansion (Logical Device Expansion) operations for a RAID group.

Syntax show raid-group-progress [-rg-number *rg_numbers* | -rg-name *rg_names*]

Parameters -rg-number Optional. This parameter specifies the identifier of the target RAID group(s). If omitted, then a progress list for all RAID groups is displayed.
 -rg-name Optional. For details, refer to the ["1.2.5 RAID Group Syntax" \(page 14\)](#).

Output

#	RAID Group	Status	Rebuild/Copyback Progress	Expanding Progress
#	No. Name			
#	0 RAIDGROUP001	Copyback	87%	-
#	1 RAIDGROUP012	Available	-	19%
	A B	C	D	E

- A: RAID Group number
- B: RAID Group name
- C: RAID Group status
- D: Progress status of Rebuild/Copyback
- E: Progress status of expanding RAID groups

Example(s) The following example displays a progress list for all RAID groups:

```
CLI> show raid-group-progress
RAID Group      Status          Rebuild/Copyback Progress  Expanding Progress
No. Name
0 RAIDGROUP001  Copyback       87%      -
1 RAIDGROUP012  Rebuild        87%      -
```

The following example only displays the progress status of RAID group #1:

```
CLI> show raid-group-progress -rg-number 1
RAID Group      Status          Rebuild/Copyback Progress  Expanding Progress
No. Name
1 RAIDGROUP012  Available      -         19%
```

The following example displays the progress status of the RAID groups named "RAIDGROUP001" and "RAIDGROUP012":

```
CLI> show raid-group-progress -rg-name RAIDGROUP001,RAIDGROUP012
RAID Group      Status          Rebuild/Copyback Progress  Expanding Progress
No. Name
0 RAIDGROUP001  Copyback       87%      -
1 RAIDGROUP012  Available      -         19%
```

expand raid-group

RAID group expansion (Logical Device Expansion). This command expands the capacity of the currently registered RAID group by adding new disks, and can be used to convert the RAID level at the same time. If several volumes exist in the specified RAID group, they are relocated in the RAID group.

Caution

- RAID5+0 is not supported, not even for pure capacity expansion operations.
- Expanding a RAID level other than RAID0 to RAID0 is not supported.
- When RAID group capacity is expanded without changing the RAID level, specify only the new disks to be added for the '-disks' parameter.
- If the RAID level is changed with RAID group expansion, at least one disk that is already configured in an expansion source RAID group and all the new disks that are to be added must be specified for the '-disks' parameter.

Syntax	expand raid-group {-rg-number <i>rg_number</i> -rg-name <i>rg_name</i> } -disks <i>disks</i> [-level {0 1 5 6 10}] [-name <i>name</i>]	
Parameters	-rg-number or -rg-name	This parameter specifies the identifier of the RAID group that is to be expanded (single RAID group only). For details, refer to the "1.2.5 RAID Group Syntax" (page 14) .
	-disks	This parameter specifies disks to expand a RAID group. One or more parameters can be specified at the same time. For details, refer to the "1.2.3 Disk Syntax" (page 13) .
	-level	Optional. This parameter specifies the RAID level to be converted to in concert with expanding the RAID group. RAID5+0 is not supported.
	0	RAID0
	1	RAID1
	5	RAID5
	6	RAID6
	10	RAID1+0
	-name	Optional. This parameter specifies a new RAID group name to be changed to in concert with expanding the RAID group. For details, refer to the "1.2.4 Alias Name Syntax" (page 14) .

Example(s) The following example expands RAID group "RGP001" using six disks, and converts it to RAID5 at the same time:

```
CLI> expand raid-group -rg-name RGP001 -disks 101-103,201-203 -level 5
```

The following example adds two disks to expand the RAID group capacity for RAID group number 1 without changing the RAID level.

```
CLI> expand raid-group -rg-number 1 -disks 005,006
```

3.1.2 Hot Spares

This section explains related commands for controlling Hot Spares. There are two types of Hot Spares.

- Global Hot Spare
A Hot Spare can be used by all RAID groups except RAID0.
- Dedicated Hot Spare
A Hot Spare can be used by specific RAID group only (one RAID group).

The Hot Spares must be the same type of disks as those included in the RAID group, and must be the same size or larger than size of them. A list of registered hot spare disks can be displayed by using the "show disks" command.

set global-spare

This command newly assigns Global Hot Spares. When a disk in a RAID group fails, an assigned Global Hot Spare is used instead. The Global Hot Spares are shared by all RAID groups registered in the ETERNUS DX60/DX80/DX90, with exception of RAID0. A list of registered Global Hot Spares can be displayed using the "show disks" command.

Syntax `set global-spare -disks disks`

Parameters `-disks` This parameter specifies disks to be registered to the Global Hot Spare. One or more parameters can be requested at the same time. For details, refer to the ["1.2.3 Disk Syntax" \(page 13\)](#).

Example(s) The following example registers both disks #101 and #102 as Global Hot Spares at the same time:

```
CLI> set global-spare -disks 101,102
```

In the following example, first disks #101 and #102 are assigned as Global Hot Spares. Then disk #103 is also assigned as a Global Hot Spare. Note that this does not affect the Global Hot Spare status of disks #101 and #102, as adding additional Global Hot Spares does not negate any previously set hot spares:

```
CLI> set global-spare -disks 101,102
CLI> set global-spare -disks 103
```

release global-spare

This command releases Global Hot Spares. The disk will then have an unassigned status.

Syntax `release global-spare -disks disks`

Parameters `-disks` This parameter specifies disks to be released from the Global Hot Spare. One or more parameters can be requested at the same time. For details, refer to the ["1.2.3 Disk Syntax" \(page 13\)](#).

Example(s) The following example releases disk #011 from use as a Global Hot Spare:

```
CLI> release global-spare -disks 011
```

The following example releases consecutive disks #101-105 from use as Global Hot Spares:

```
CLI> release global-spare -disks 101-105
```

set dedicated-spare

This command assigns Dedicated Hot Spares. When a disk in a RAID group fails, the assigned Dedicated Hot Spare is used instead of it. In this case, if a Dedicated Hot Spare is not assigned, a Global Hot Spare is used. One Dedicated Hot Spare cannot belong to two or more RAID groups. However, one RAID group can have one or more Dedicated Hot Spares.

Syntax	<code>set dedicated-spare -disks <i>disks</i> {-rg-number <i>rg_numbers</i> -rg-name <i>rg_names</i> }</code>	
Parameters	-disks	This parameter specifies disks to be registered to the Dedicated Hot Spare. One or more parameters can be requested at the same time. If two or more parameters are requested, it must be specified with synchronizing with the following RAID group identifier parameters. For details, refer to the "1.2.3 Disk Syntax" (page 13) .
	-rg-number or -rg-name	This parameter specifies RAID group identifiers to be registered to the Dedicated Hot Spares. One or more parameters can be requested at the same time. If two or more parameters are requested, it must be specified with synchronizing the above disk parameters. For details, refer to the "1.2.5 RAID Group Syntax" (page 14) .
Example(s)	The following example assigns disk #110 as the Dedicated Hot Spare belonging to RAID group "RGP001":	

```
CLI> set dedicated-spare -disks 110 -rg-name RGP001
```

The following example simultaneously assigns two different disks as the Dedicated Hot Spare of a single RAID group. Specifically, it assigns disks #110 and #111 as Dedicated Hot Spares for the RAID group named "RGP001". In this case, specify the same RAID group name twice, comma-separated, as follows:

```
CLI> set dedicated-spare -disks 110,111 -rg-name RGP001
```

The following example respectively assigns two different disks to two different RAID groups at the same time. One assigns disk #110 as the Dedicated Hot Spare belonging to the RAID group named "RGP1", and another assigns disk #111 as the Hot Spare belonging to the RAID group named "RGP2":

```
CLI> set dedicated-spare -disks 110,111 -rg-name RGP1,RGP2
```

In the following example, first disk #101 is assigned as a Dedicated Hot Spare. Then disk #102 is also assigned as a Dedicated Hot Spare. Note that this does not affect the Dedicated Hot Spare status of disk #101, as adding additional Dedicated Hot Spares does not negate any previously set hot spares:

```
CLI> set dedicated-spare -disks 101 -rg-name RGP1  
CLI> set dedicated-spare -disks 102 -rg-name RGP1
```


release dedicated-spare

This command releases the Dedicated Hot Spares. The disk will then have an unassigned status

Syntax release dedicated-spare -disks *disks*

Parameters -disks This parameter specifies disks to be released from the Dedicated Hot Spare. One or more parameters can be requested at the same time. For details, refer to the ["1.2.3 Disk Syntax" \(page 13\)](#).

Example(s) The following example releases the disk #110 from Dedicated Hot Spare:

```
CLI> release dedicated-spare -disks 110
```

The following example releases two disks, #110 and #111 from being Dedicated Hot Spares:

```
CLI> release dedicated-spare -disks 110,111
```

3.1.3 ECO Management

This section explains the related commands for ECO functions. In case using this function, you must enable the Eco-mode using "set eco-mode" command.

The procedures to use the ECO functions are as follows.

Procedure

- 1** Enable the Eco-mode
- 2** Create an ECO schedule
- 3** Assign the ECO schedule to RAID groups

End of procedure

set eco-mode

Eco-mode is a function that turns off the disk motors when disks are not being accessed. This command sets or resets the Eco-mode. The ECO functions cannot be used unless the overall Eco-mode is enabled with this command.

Syntax `set eco-mode [-mode {enable | disable}] [-monitoring-time {10|20|30|40|50|60}] [-limit {1|2|3|4|5}]`

Parameters `-mode` Optional. This parameter specifies whether the Eco-mode is enabled, or not. If omitted, then this parameter value is not changed.

`enable` The Eco-mode is enabled.

`disable` The Eco-mode is disabled.

`-monitoring-time`

 Optional. This parameter specifies the monitoring time of host I/O at interval of which value is multiples of 10 minutes, up to 60. If omitted, then this parameter value is not changed.

 10 10 minutes

 20 20 minutes

 30 30 minutes

 40 40 minutes

 50 50 minutes

 60 60 minutes

`-limit`

 Optional. This parameter specifies the number of restrictions in the range for turning the disk motor OFF/ON in one day. If omitted, then this parameter value is not changed.

 1 once

 2 twice

 3 three times

 4 four times

 5 five times

Example(s) The following example sets the Eco-mode. In addition, the monitoring time is 60 minutes, and the number of disk motor OFF/ON restrictions is five times:

```
CLI> set eco-mode -mode enable -monitoring-time 60 -limit 5
```

The following example resets the Eco-mode:

```
CLI> set eco-mode -mode disable
```

show eco-mode

This command displays the currently set Eco-mode and its optional parameters.

Syntax show eco-mode

Parameters No parameters.

Output

```
CLI> show eco-mode
# Mode [Enable]
A
# Host I/O Monitoring Time [60 min.]
B
# Disk Motor Control Limit Count [5]
C
```

A: The Eco-mode, it shows whether the ECO function is enabled, or not.

B: The monitoring time of host I/O

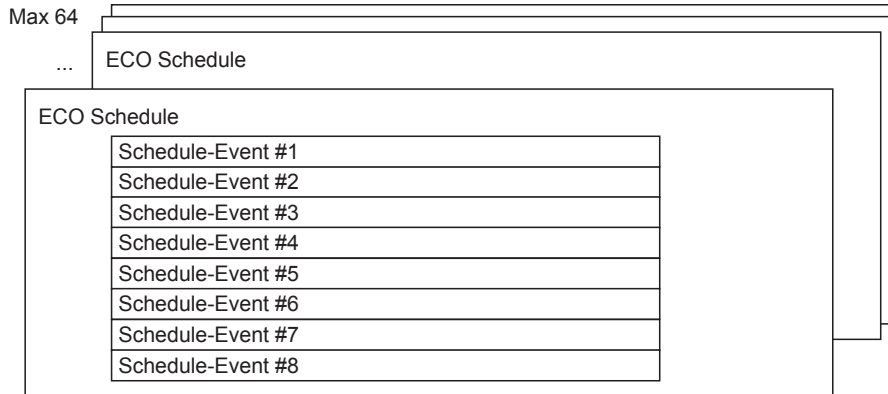
C: The number of restriction to set a function of the disk motor OFF/ON on one day

Example(s) The following example displays the currently set Eco-mode:

```
CLI> show eco-mode
Mode [Enable]
Host I/O Monitoring Time [60 min.]
Disk Motor Control Limit Count [5]
```

create eco-schedule

An ECO schedule is a schedule that defines how and when the ECO function is applied. The periods defined in an ECO schedule are handled as the times in which the disk motors are turned on, not turned off. A maximum of 64 ECO schedules can be created. Each ECO schedule consists of a maximum of 8 ECO schedule events, and at least one ECO schedule event is required in each ECO schedule. This command creates a single ECO schedule with a single ECO schedule event. The "set eco-schedule" command should be used to create additional ECO schedule events. The following diagram shows the ECO scheduler.



Syntax `create eco-schedule -name schedule_name -event-type`
 `{every-day |`
 `every-week,{mon|tue|wed|thu|fri|sat|sun}, {mon|tue|wed|thu|fri|sat|sun} |`
 `specific-day,MMDD,R | specific-week,MM,{1st|2nd|3rd|4th|last},`
 `{mon|tue|wed|thu|fri|sat|sun},{mon|tue|wed|thu|fri|sat|sun}`
 `}`
 `-event-from hhmm -event-to hhmm`

Parameters `-name` This parameter specifies the name of a single ECO schedule. For details, refer to the ["1.2.10 ECO Schedule Syntax" \(page 17\)](#).

`-event-type` This parameter specifies the ECO schedule event type.

`every-day` Daily operation is scheduled. The format is only "every-day". A sub-operand is not required for this option.

 Ex. `-event-type every-day`

every-week Weekly operation is scheduled. The format is "every-week,STA,END" (comma-separated), where "STA" specifies the starting day of the week and "END" the ending day of the week. Days of the week must be specified using the following format, and the ending day of the week must come after the starting day of the week.

Ex. OK → -event-type every-week,mon,fri
(from Monday to Friday is OK.)

Ex. NG → -event-type every-week,fri,tue
(from Friday to Tuesday is not supported.)

sun Sunday

mon Monday

tue Tuesday

wed Wednesday

thu Thursday

fri Friday

sat Saturday

specific-day Operation on a specific day is scheduled. The format is "specific-day,MMDD,R" (comma-separated), where "MM" specifies a specific month (01-12, or "em" if operation every month is required), "DD" specifies the specific day (01-31), and "R" specifies the number of days (1-7) the schedule should run.

Ex. -event-type specific-day,0501,3
(For three days, from May 1st to May 3rd)

Ex. -event-type specific-day,0630,2
(For two days, from June 30th to July 1st)

specific-week

Operation for a specific week is scheduled. The format is

"specific-week *MM,W,STA,END*" (comma-separated), where "*MM*" specifies a specific month (01-12, or "em" if operation every month is required), "*W*" specifies a week of the month (1st, 2nd, 3rd, 4th, or last) for the "*STA*" and "*END*" days, "*STA*" specifies the starting day of the week, and "*END*" the ending day of the week. Days of the week must be specified using the following format, and the ending day of the week must come after the starting day of the week.

Ex. OK → -event-type
 specific-week,05,3rd,mon,wed
 (from 3rd Monday to 3rd Wednesday in
 May)

Ex. NG → -event-type
 specific-week,05,3rd,wed,mon
 (from 3rd Wednesday to 3rd Monday in
 May)

sun	Sunday
mon	Monday
tue	Tuesday
wed	Wednesday
thu	Thursday
fri	Friday
sat	Saturday

-event-from

This parameter specifies the time at which the ECO schedule is to start. The format is "*hhmm*", where "*hh*" is the hour (00-23), and "*mm*" is the minute (00 or 30).

Disk motor operation resumes from the time requested in this parameter.

-event-to

This parameter specifies the time at which the ECO schedule is to end. The format is "*hhmm*", where "*hh*" is the hour (00-23), and "*mm*" is the minute (00 or 30).

Example(s)

The following example creates an ECO schedule with the name "SC001", containing an every day event type, with operation specified from 06:00 to 18:00:

```
CLI> create eco-schedule -name SC001 -event-type every-day -event-from 0600 -event-to 1800
```


set eco-schedule

This command changes the specified ECO schedule. New events may also be added to the ECO schedule.

Syntax	<pre>set eco-schedule {-schedule-number <i>schedule_number</i> -schedule-name <i>schedule_name</i>} [-name <i>schedule_name</i>] [-event-number {1 2 3 4 5 6 7 8}] [-event-type {every-day every-week,{mon tue wed thu fri sat sun}, {mon tue wed thu fri sat sun} specific-day,<i>MMDD,R</i> specific-week,<i>MM</i>,{1st 2nd 3rd 4th last}, {mon tue wed thu fri sat sun},{mon tue wed thu fri sat sun} }} [-event-from <i>hhmm</i>] [-event-to <i>hhmm</i>]</pre>
Parameters	<p>-schedule-number or -schedule-name</p> <p>This parameter specifies an ECO schedule identifier to be changed. Two or more parameters cannot be requested at the same time. For details, refer to the "1.2.10 ECO Schedule Syntax" (page 17).</p> <p>-name</p> <p>Optional. This parameter specifies a new ECO schedule name. If omitted, then this parameter value is not changed. For details, refer to the "1.2.4 Alias Name Syntax" (page 14).</p> <p>-event-number</p> <p>Optional. This parameter specifies the ECO schedule event number to change or to add the ECO schedule event. The ECO schedule event number specifies a value in the range from 1 to 8. Two or more parameters cannot be requested at the same time. The ECO schedule event number can be displayed by using "show eco-schedule" command. If omitted, then the ECO schedule event is not changed.</p> <p>-event-type</p> <p>Optional. This parameter specifies the ECO schedule event type. If omitted, then this parameter value is not changed.</p> <p>every-day</p> <p>Daily operation is scheduled. The format is only "every-day". An operand is not required for this type option.</p> <p>Ex. -event-type every-day</p>

every-week Weekly operation is scheduled. The format is "every-week,*STA,END*" (comma-separated), where "*STA*" specifies the starting day of the week and "*END*" the ending day of the week. Days of the week must be specified using the following format, and the ending day of the week must come after the starting day of the week.

Ex. OK → -event-type every-week,mon,fri
(from Monday to Friday is OK.)

Ex. NG → -event-type every-week,fri,tue
(from Friday to Tuesday is not supported.)

sun	Sunday
mon	Monday
tue	Tuesday
wed	Wednesday
thu	Thursday
fri	Friday
sat	Saturday

specific-day Operation on a specific day is scheduled. The format is "specific-day,*MMDD,R*" (comma-separated), where "*MM*" specifies a specific month (01-12, or "em" if operation every month is required), "*DD*" specifies the specific day (01-31), and "*R*" specifies the number of days (1-7) the schedule should run.

Ex. -event-type specific-day,0501,3
(For three days, from May 1st to May 3rd)

Ex. -event-type specific-day,0630,2
(For two days, from June 30th to July 1st)

specific-week

Operation for a specific week is scheduled. The format is

"specific-week *MM,W,STA,END*" (comma-separated), where "*MM*" specifies a specific month (01-12, or "em" if operation every month is required), "*W*" specifies a week of the month (1st, 2nd, 3rd, 4th, or last) for the "*STA*" and "*END*" days, "*STA*" specifies the starting day of the week, and "*END*" the ending day of the week. Days of the week must be specified using the following format, and the ending day of the week must come after the starting day of the week.

e.g. OK → -event-type
 specific-week,05,3rd,mon,wed
 (from 3rd Monday to 3rd Wednesday in
 May)

e.g. NG → -event-type
 specific-week,05,3rd,wed,mon
 (from 3rd Wednesday to 3rd Monday in
 May)

sun	Sunday
mon	Monday
tue	Tuesday
wed	Wednesday
thu	Thursday
fri	Friday
sat	Saturday

-event-from

Optional. This parameter specifies the time at which the ECO schedule is to start. The format is "*hhmm*", where "*hh*" is the hour (00-23), and "*mm*" is the minute (00 or 30).

If omitted, this parameter is left unchanged.

Disk motor operation resumes from the time requested by this parameter.

-event-to

Optional. This parameter specifies the time at which the ECO schedule is to end. The format is "*hhmm*", where "*hh*" is the hour (00-23), and "*mm*" is the minute (00 or 30).

If omitted, this parameter is left unchanged.

Example(s) The following example adds ECO schedule event #2 to the ECO schedule named "SC001":

```
CLI> set eco-schedule -schedule-name SC001 -event-number 2 -event-type every-day -  
event-from 0600 -event-to 1800
```

The following example changes the ECO schedule name to "SC002_NEW":

```
CLI> set eco-schedule -schedule-name SC001 -name SC002_NEW
```

delete eco-schedule

This command may be used to delete entire ECO schedules (single or multiple schedules) or a specific ECO schedule event (single event only).

Syntax	<code>delete eco-schedule {-schedule-number <i>schedule_numbers</i> -schedule-name <i>schedule_names</i>} [-event-number {1 2 3 4 5 6 7 8}]</code>
Parameters	<p><code>-schedule-number</code> or <code>-schedule-name</code></p> <p>This parameter specifies one or more ECO schedule identifiers to target the ECO schedules that are to be deleted or the ECO schedule from which an ECO schedule event is to be deleted. If two or more identifiers are specified, the corresponding ECO schedules are deleted and the "-event-number" parameter cannot be used to delete a specific ECO schedule event. For details, refer to the "1.2.10 ECO Schedule Syntax" (page 17).</p> <p><code>-event-number</code></p> <p>Optional. This parameter specifies the number of the specific ECO schedule event that is to be deleted (1-8). ECO schedule event numbers can be displayed using the "show eco-schedule" command. Two or more ECO schedule events cannot be deleted at the same time. If omitted, then the specified ECO schedule is deleted entirely.</p>

Example(s) The following example only deletes the ECO schedule named "SC002":

```
CLI> delete eco-schedule -schedule-name SC002
```

The following example only deletes the ECO schedule event #2 in the ECO schedule named "SC001":

```
CLI> delete eco-schedule -schedule-name SC001 -event-number 2
```

The following example deletes both the ECO schedule named "SC002" and "SC003" at the same time:

```
CLI> delete eco-schedule -schedule-name SC002,SC003
```

show eco-schedule

This command displays ECO schedules, ECO schedules and ECO schedule events.

Syntax show eco-schedule
[-schedule-number *schedule_numbers* | -schedule-name *schedule_names*]

Parameters -schedule-number
or
-schedule-name
Optional. This parameter specifies one or more ECO schedules identifier for which to display details. If omitted, then information for all ECO schedules is displayed. For details, refer to the ["1.2.10 ECO Schedule Syntax" \(page 17\)](#).

Output

```
# ECO Schedule
# No. Name
# 0 SC001
  A B
# Event
# No. Type Details Time
# 1 Specific-week December 1st week Monday-Friday from [06:00] to [18:00]
  C D E F G
```

- A: An ECO schedule number
- B: An ECO schedule name
- C: An ECO schedule event number
- D: An ECO schedule event type
- E: An explanation for the ECO schedule event type
- F: A Starting ECO schedule time
- G: An ending ECO schedule time

Example(s) The following example displays the list of all registered ECO schedules:

```
CLI> show eco-schedule
ECO Schedule
No. Name
0 SC001
1 SC002
2 SC003_TEMP
```

The following example displays the schedule information of the ECO schedule named "SC001":

```
CLI> show eco-schedule -schedule-name SC001
ECO Schedule
No. Name
0 SC001
Event
No. Type Details Time
1 Every-day from [06:00] to [18:00]
2 Every-week Monday-Friday from [06:00] to [18:00]
3 Specific-day 6days from December 13 from [06:00] to [18:00]
4 Specific-week December 1st week Monday-Friday from [06:00] to [18:00]
```

The following example displays the schedule information of the ECO schedules named "SC002" and "SC003_TEMP" together:

```
CLI> show eco-schedule -schedule-name SC002,SC003_TEMP
ECO Schedule
No. Name
  2 SC002
Event
No. Type          Details                               Time
  1 Every-day     from [06:00] to [18:00]
  2 Every-week    Monday-Friday                       from [06:00] to [18:00]

ECO Schedule
No. Name
  3 SC003_TEMP
Event
No. Type          Details                               Time
  1 Specific-day  6days from December 13              from [06:00] to [18:00]
  2 Specific-week December 1st week Monday-Friday      from [06:00] to [18:00]
```

set eco-raid-group

This command associates an ECO schedule with RAID groups. Eco-mode may not be used for RAID groups that contain SSD drives.

Syntax `set eco-raid-group {-rg-number rg_numbers | -rg-name rg_names}
 [-schedule-number schedule_number | -schedule-name schedule_name]
 -action {enable|disable}`

Parameters -rg-number This parameter specifies RAID groups identifiers to be associated.
 or
 -rg-name One or more parameters can be requested at the same time. For details, refer to the ["1.2.5 RAID Group Syntax" \(page 14\)](#).

Caution

- RAID groups which include the system disks cannot be requested.
- RAID groups which do not include a volume cannot be requested.

-schedule-number

or

-schedule-name

Optional. This parameter specifies an ECO schedule identifier to be associated. Two or more parameters cannot be requested at the same time. If omitted, then this parameter value is not changed. For details, refer to the ["1.2.10 ECO Schedule Syntax" \(page 17\)](#).

-action This parameter specifies whether the associated definition is enabled, or not.

enable Enables the associated definition.

disable Disables the associated definition.

Example(s) The following example associates the ECO schedule named "SC001" with the RAID group named "RGP001":

```
CLI> set eco-raid-group -rg-name RGP001 -schedule-name SC001 -action enable
```

The following example associates the ECO schedule named "SC001" with all of the consecutive RAID groups #1-10 together:

```
CLI> set eco-raid-group -rg-number 1-10 -schedule-name SC001 -action enable
```

The following example disables the ECO function for the RAID group named "RGP001":

```
CLI> set eco-raid-group -rg-name RGP001 -action disable
```


The following example first associates ECO schedule #1 with the RAID group named "RGP001", and then associates ECO schedule #2 with the same RAID group. This results in the initially associated ECO schedule (#1) being released and replaced by the second ECO schedule (#2):

```
CLI> set eco-raid-group -rg-name RGP001 -schedule-number 1 -action enable
CLI> set eco-raid-group -rg-name RGP001 -schedule-number 2 -action enable
```

release eco-raid-group

This command releases an ECO schedule from RAID groups.

Syntax `release eco-raid-group {-rg-number rg_numbers | -rg-name rg_names}`

Parameters `-rg-number` This parameter specifies one or more RAID group identifiers or whose ECO schedules are to be released. For details, refer to the `-rg-name` ["1.2.5 RAID Group Syntax" \(page 14\)](#).

Example(s) The following example releases the ECO schedules associated with the RAID group named "RGP001":

```
CLI> release eco-raid-group -rg-name RGP001
```

The following example releases the ECO schedules associated with all of the consecutive RAID groups #1-10 together:

```
CLI> release eco-raid-group -rg-number 1-10
```

show eco-raid-group

This command displays a list of RAID groups associated with ECO schedules.

Syntax show eco-raid-group

Parameters No parameters.

Output

# RAID Group	Level	Status	Assigned Capacity	ECO Schedule	Motor	Control
# No. Name			CM (MB)	Action No.Name	Status	Status
# 28 RGP028	RAID1	Available	CM#0	53647 [ON] 1 SC001	Active	[OFF]
A B	C	D	E	F G H I	J	K

- A: RAID group number
- B: RAID group name
- C: RAID level
- D: RAID group status
- E: Controller module to own RAID group
- F: RAID group capacity
- G: ECO schedule action, It means whether the ECO schedule is associated, or not
- H: ECO schedule number (In case of a schedule by cooperative software, [128] is displayed.)
- I: ECO schedule name (In case of a schedule by cooperative software, [External] is displayed.)
- J: Current status of Disk motor
- K: Determent status by control command

Example(s) The following example displays the list of all RAID groups that have an ECO schedule associated with them:

```
CLI> show eco-raid-group
```

RAID Group	Level	Status	Assigned Capacity	ECO Schedule	Motor	Control
No. Name			CM (MB)	Action No.Name	Status	Status
28 RGP028	RAID1	Available	CM#0	53647 [ON] 1 SC001	Active	[OFF]
29 RGP029	RAID1+0	Available	CM#0	60000 [ON] 1 SC001	Active	[OFF]
30 RGP030	RAID5	Available	CM#1	89654 [OFF] 128 External	Active	[OFF]
31 RGP031	RAID0	Present	CM#1	22301 [OFF] 2 SC002	Active	[OFF]

3.2 Volume Management

This chapter explains the commands used for the following functions.

- Volume settings

3.2.1 Volumes

This section explains the volume management related commands.

create volume

This command creates volumes in the specified RAID group. When creating two or more volumes at a time, they can be created in one RAID group based on "-name" and "-count" parameter. The created volumes are formatted automatically.

Note

- Encryption-related functions may not be available for some user environments.
- The number of concurrent volume formats differs depending on the user environment. Refer to the ["Appendix C The Number of Concurrent Volume Formats" \(page 339\)](#) for details.

Syntax	<code>create volume -name name {-rg-number <i>rg_number</i> -rg-name <i>rg_name</i> } -type {open sdv sdpv} -size size{tb gb mb} [-count <i>count</i>] [-virtual-size <i>virtual_size</i>{tb gb mb}] [-encryption {enable disable}]</code>						
Parameters	<p>-name This parameter specifies a volume name. For details, refer to the "1.2.4 Alias Name Syntax" (page 14).</p> <p>-rg-number or -rg-name This parameter specifies a RAID group identifier to create new volumes. For details, refer to the "1.2.5 RAID Group Syntax" (page 14).</p> <p>-type This parameter specifies the volume type.</p> <table><tr><td>open</td><td>Normal/open volumes (OPEN)</td></tr><tr><td>sdv</td><td>Snap data volumes (SDV) for Advanced Copy functions</td></tr><tr><td>sdpv</td><td>Snap data pool volumes (SDPV) for Advanced Copy functions</td></tr></table> <p>-size This parameter specifies a volume size. A size must be selected from terabyte (TB), gigabyte (GB), or megabyte (MB).</p> <p>Ex. 1tb (1TB), 120gb (120GB), 512mb (512MB)</p>	open	Normal/open volumes (OPEN)	sdv	Snap data volumes (SDV) for Advanced Copy functions	sdpv	Snap data pool volumes (SDPV) for Advanced Copy functions
open	Normal/open volumes (OPEN)						
sdv	Snap data volumes (SDV) for Advanced Copy functions						
sdpv	Snap data pool volumes (SDPV) for Advanced Copy functions						

Note

- If OPEN is selected, you can specify a volume size.
- If SDV is selected, you can specify a physical volume size, and also the following "-virtual-size" parameter must be specified as the volume size.
- If SDPV is selected, you can specify a pool volume size, a size that is smaller than (or equal to) 2TB.
- SDPV must be specified in units of GB.

-count Optional. This parameter specifies the number of volumes to be created. If omitted, a single volume is created with the name determined by the *"-name"* parameter.
Requesting two or more volumes results in the creation of volumes with names determined by the *"-name"* parameter with a trailing index number, starting from "0".

Ex. For *"-count 3 -name abc"*, the volumes named "abc0", "abc1", and "abc2" are created. If these volumes already exist, this command terminates abnormally.

-virtual-size This parameter must be specified when selecting an SDV type, and can specify the volume size. It must be bigger than the size specified by the *"-size"* parameter.
This parameter must be omitted when selecting a type other than the SDV.

-encryption Optional. This parameter specifies an encryption option. When "enable" is selected, the specified volume data is encrypted. If omitted, then it is handled as if "disable" is selected.

enable The volume data is encrypted.

disable The volume data is not encrypted.

Example(s) The following example creates a volume named "VOL001" in a RAID group named "RGP001". The volume type is OPEN. The volume size is 2TB:

```
CLI> create volume -name VOL001 -rg-name RGP001 -type open -size 2tb
```

The following example creates consecutive OPEN volumes named "VOL0"- "VOL9" in a RAID group named "RGP001":

```
CLI> create volume -name VOL -count 10 -rg-name RGP001 -type open -size 20gb
```

The following example creates a volume named "SDV1" in a RAID group named "RGP002". The volume type is an SDV, the physical size is 20GB, and the logical size is 100GB:

```
CLI> create volume -name SDV1 -rg-name RGP002 -type sdv -size 20gb -virtual-size 100gb
```

The following example creates a volume named "SDPV-ALL" in RAID group #11. The volume type is SDPV, and the pool size is 1GB:

```
CLI> create volume -name SDPV-ALL -rg-number 11 -type sdpv -size 1gb
```

The following example creates an encrypted volume:

```
CLI> create volume -name VOL001 -rg-name RGP001 -type open -size 2tb -encryption enable
```

set volume

This command changes the information of already registered volumes.



Note

Encryption-related functions may not be available for some user environments.

Syntax	<code>set volume {-volume-number <i>volume_number</i> -volume-name <i>volume_name</i> } [-name <i>name</i>] [-encryption {enable disable}]</code>
Parameters	<p><code>-volume-number</code> or <code>-volume-name</code></p> <p>This parameter specifies a volume identifier to be changed. Two or more parameters cannot be requested at the same time. For details, refer to the "1.2.6 Volume Syntax" (page 14).</p> <p><code>-name</code> Optional. This parameter specifies a new volume name. If omitted, then this parameter value is not changed. For details, refer to the "1.2.4 Alias Name Syntax" (page 14).</p> <p><code>-encryption</code> Optional. This parameter specifies an encryption option. When "enable" is selected, the specified volume data is encrypted. If omitted, this parameter is left unchanged.</p> <p><code>enable</code> The volume data is encrypted.</p> <p><code>disable</code> Null operation</p>



Note

- Simply disabling encryption does not decrypt any of the encrypted data.

Example(s) The following example changes a volume named "VOL003". The new name is "VOLUME003":

```
CLI> set volume -volume-name VOL003 -name VOLUME003
```

delete volume

This command deletes currently registered volumes. A snap data pool volume (SDPV) cannot be specified. An SDPV can be deleted by using the "delete snap-data-pool-volume" command.

- You must release all mappings that are associated with the host before you can delete it.
- You must stop all migrating volumes (RAID migration) before you can delete it.
- You must stop Advanced Copy sessions to be deleted before you can delete it.
- You can delete up to 128 volumes at once.

Syntax delete volume
 {-volume-number *volume_numbers* | -volume-name *volume_names* }

Parameters -volume-number
 or
 -volume-name
 This parameter specifies volume identifiers to be deleted. One or more parameters can be requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

Example(s) The following example deletes the volumes named "VOL001" and "VOL002" at the same time:

```
CLI> delete volume -volume-name VOL001,VOL002
```


delete all-volumes

This command deletes all volumes from the specified RAID group, except for snap data pool volumes. If the designated RAID group contains an expanded volume source, then the expanded destination is also deleted, while if the designated RAID group contains an expanded volume destination, the command fails with an error message. In this case, try again after first deleting the expanded volume from the source-side.

Syntax `delete all-volumes {-rg-number rg_number | -rg-name rg_name }`

Parameters `-rg-number` This parameter specifies the RAID group identifiers to delete all
or the volumes contained in the RAID groups. Only one parameter
`-rg-name` may be used at a time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

Example(s) The following example deletes all the volumes contained in the RAID group named "RGP001":

```
CLI> delete all-volumes -rg-name RGP001
```

show volumes

This command lists details a specified subset or all of the system's volumes.



Note

Encryption-related functions may not be available for some user environments.

Syntax	show volumes [{-rg-number <i>rg_number</i> -rg-name <i>rg_name</i> } -type {open sdv sdpv} -mode {expansion default}]				
Parameters	<table><tr><td>-rg-number</td><td>Optional. This parameter specifies the RAID group identifier for which volumes details are to be displayed. If omitted, then a summary for all volumes in the system is displayed. For details, refer to the "1.2.5 RAID Group Syntax" (page 14).</td></tr><tr><td>-rg-name</td><td></td></tr></table>	-rg-number	Optional. This parameter specifies the RAID group identifier for which volumes details are to be displayed. If omitted, then a summary for all volumes in the system is displayed. For details, refer to the "1.2.5 RAID Group Syntax" (page 14) .	-rg-name	
-rg-number	Optional. This parameter specifies the RAID group identifier for which volumes details are to be displayed. If omitted, then a summary for all volumes in the system is displayed. For details, refer to the "1.2.5 RAID Group Syntax" (page 14) .				
-rg-name					

Caution

- Only one parameter can be specified.
- Cannot be specified with other parameters (except "-mode default").

-type Optional. This parameter specifies the volume type to be displayed. If omitted, then selection of all types is assumed.

Caution

- Only one parameter can be specified.
- Cannot be specified with other parameters (except "-mode default").

open	An normal/open volume (OPEN)
sdv	A snap data volume for Advanced Copy functions (SDV)
sdpv	A snap data pool volume for Advanced Copy functions (SDPV)

-mode Optional. This parameter toggles the output mode used for extended volumes. If omitted, then only basic volume information is displayed.

Caution

- Only one parameter can be specified.
- Cannot be specified with other parameters (except "-mode default").

expansion	Detailed volume information is displayed for LUN concatenation volumes.
default	Basic volume information is displayed.

Output

#	Volume No.	Name	Status	Type	Encryption	Expansion (Concatenation)	RAID Group No.	RAID Group Name	Size (MB)	Reserved Deletion
#	1	VOL001	Available	SDV	CN		10	10 RGP010	32768	
A	B	C	D	E	F	G	H	I	J	

- A: Volume number
- B: Volume name
- C: Volume status
- D: Volume type
- E: Encryption state
- F: Expansion volume number (for LUN concatenation only)
- G: RAID group number
- H: RAID group name
- I: Volume size
- J: Reserved deletion sign (for SDPV only)

Example(s)

The following example displays a list of all volumes in the ETERNUS DX60/DX80/DX90:

```
CLI> show volumes
```

Volume No.	Name	Status	Type	Encryption	Expansion (Concatenation)	RAID Group No.	RAID Group Name	Size (MB)	Reserved Deletion
1	VOL001	Available	Open	CN		10	10 RGP010	32768	
2	VOL002	Available	Open	Encrypting		-	10 RGP010	512	
3	VOL003	Available	SDV	Decrypting		-	12 RAID-GROUP-NO#12	2048	
4	VOL004	Available	SDPV	OFF		-	13 RAID-GROUP-NO#13	1024	No
5	VOL005	Available	Open	OFF		3	10 RGP010	3072	
6	VOL006	Available	SDPV	OFF		-	14 RAID-GROUP-NO#14	1024	No

The following example displays a list of all volumes in the RAID group named "RGP010". Free space information is also displayed:

```
CLI> show volumes -rg-name RGP010
```

Volume No.	Name	Status	Type	Encryption	Expansion (Concatenation)	RAID Group No.	RAID Group Name	Size (MB)	Reserved Deletion
1	VOL001	Available	Open	CN	1/10	10	RGP010	2048	
		Free				-		1024	
2	VOL002	Available	Open	Encrypting		-	10 RGP010	512	
5	VOL005	Available	Open	OFF	1/3	10	RGP010	1024	
5	VOL005	Available	Open	OFF	3/3	10	RGP010	1024	

The following example displays a list of all SDPV type volumes:

```
CLI> show volumes -type sdpv
```

Volume No.	Name	Status	Type	Encryption	Expansion (Concatenation)	RAID Group No.	RAID Group Name	Size (MB)	Reserved Deletion
4	VOL004	Available	SDPV	OFF		-	13 RAID-GROUP-NO#13	1024	No
6	VOL006	Available	SDPV	OFF		-	14 RAID-GROUP-NO#14	1024	No

The following example displays detailed LUN concatenation volumes information:

```

CLI> show volumes -mode expansion
Volume                               Status                               Type   Encryption Expansion   RAID Group   Size (MB)   Reserved
No.  Name                               (Concatenation) No. Name                                     Deletion
-----
1 VOL001                               Available                               Open   ON                    10 RGP010      32768
1/10 10 RGP010                          ( 2048)
2/10 1 RGP001                          ( 2048)
3/10 2 RGP002                          ( 2048)
4/10 1 RGP001                          ( 2048)
5/10 1 RGP001                          ( 2048)
6/10 11 RGP011                         ( 2048)
7/10 13 RAID-GROUP-NO#13              ( 2048)
8/10 13 RAID-GROUP-NO#13              ( 2048)
9/10 14 RAID-GROUP-NO#14              ( 2048)
10/10 14 RAID-GROUP-NO#14              ( 2048)

2 VOL002                               Available                               Open   Encrypting           - 10 RGP010      512
3 VOL003                               Available                               SDV    Decrypting           - 12 RAID-GROUP-NO#12 2048
4 VOL004                               Available                               SDFV   OFF                  - 13 RAID-GROUP-NO#13 1024 No
5 VOL005                               Available                               Open   OFF                  3 10 RGP010      3072
1/ 3 10 RGP010                          ( 1024)
2/ 3 11 RGP011                          ( 1024)
3/ 3 10 RGP010                          ( 1024)

6 VOL006                               Available                               SDFV   OFF                  - 14 RAID-GROUP-NO#14 1024 No
    
```

show volume-progress

This command displays the progress status of functions related to volumes, format progress, migration progress, and encryption progress.



Note

Encryption-related functions may not be available for some user environments.

Syntax show volume-progress
 [-volume-number *volume_numbers* | -volume-name *volume_names*]

Parameters -volume-number
 or
 -volume-name

Optional. This parameter specifies volume identifiers to be narrowed down. One or more parameters can be requested at the same time. If omitted, then the progress status list of all volumes is displayed. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

Output

```
# show volume-progress -volume-number 1
#Volume      Status      Formatting Migrating  Encrypting
#No.  Name      Progress    Progress    Progress
#  1  VOL001    Available    100%        -          -
  A    B          C          D          E          F
```

- A: Volume number
- B: An alias name of volume
- C: Volume status
- D: Progress status of formatting
- E: Progress status of migrating
- F: Progress status of encryption

Example(s) The following example displays the progress status of volume #1:

```
CLI> show volume-progress -volume-number 1
Volume      Status      Formatting Migrating  Encrypting
No.  Name      Progress    Progress    Progress
  1  VOL001    Available    80%        -          -
```

The following example displays the progress status for the volumes named "VOL001" and "VOL012":

```
CLI> show volume-progress -volume-name VOL001,VOL012
Volume      Status      Formatting Migrating  Encrypting
No.  Name      Progress    Progress    Progress
  1  VOL001    Available    80%        -          -
 12  VOL012    Rebuild     80%        -          -
```

The following example displays the progress status for all volumes:

```
CLI> show volume-progress
Volume
No.  Name           Status           Formatting   Migrating   Encrypting
      Name           Status           Progress     Progress    Progress
  1  VOL001         Available        80%         -           -
  2  VOL002         Available        -           -           10%
  3  VOL003         Rebuild         35%         -           -
  4  VOL004         Rebuild         90%         -           -
 10  VOL010         Available        80%         40%         -
```

format volume

This command formats volumes.



Note

The number of concurrent volume formats differs depending on the user environments. Refer to the "[Appendix C The Number of Concurrent Volume Formats](#)" ([page 339](#)) for details.

Syntax `format volume`
 `{-volume-number volume_numbers | -volume-name volume_names }`

Parameters `-volume-number`
 or
 `-volume-name`
 This parameter specifies volume identifiers to be formatted. One or more parameters can be requested at the same time. For details, refer to the "[1.2.6 Volume Syntax](#)" ([page 14](#)).

Example(s) The following example only formats the volume named "VOL001":

```
CLI> format volume -volume-name VOL001
```

The following example formats consecutive volumes #80-99 at the same time:

```
CLI> format volume -volume-number 80-99
```

expand volume

Volume expansion (LUN Concatenation). This command adds free space to expand the capacity of a currently registered volume, allowing free space to be assigned efficiently.

Syntax	<code>expand volume</code> <code>{-volume-number <i>volume_number</i> -volume-name <i>volume_name</i>}</code> <code>{-rg-number <i>rg_numbers</i> -rg-name <i>rg_names</i> } -size <i>size</i>{tb gb mb}</code>
Parameters	<code>-volume-number</code> or <code>-volume-name</code> This parameter specifies a single volume identifier as an expansion target. For details, refer to the "1.2.6 Volume Syntax" (page 14) . <code>-rg-number</code> or <code>-rg-name</code> This parameter specifies the RAID group identifiers that are to be added to the volume to expand it. Up to 15 parameters may be specified. When multiple parameters are specified, they must be matched with equivalent multiple size values (next parameter). For details, refer to the "1.2.5 RAID Group Syntax" (page 14) . <code>-size</code> This parameter specifies a new area size. This must be specified in either terabyte (TB) or gigabyte (GB) units, and must be at least 1GB. Multiple parameters may be specified, but these must be matched with equivalent multiple RAID group identifiers (previous parameter).

Ex. 1tb (1TB), 120gb (120GB)

Example(s) The following example expands the volume named "VOL001" as a new area of 800GB in RAID group #5:

```
CLI > expand volume -volume-name VOL001 -rg-number 5 -size 800gb
```

The following example expands the volume named "VOL001" as a new area of 800GB in RAID group #5 and 400GB in RAID group #6:

```
CLI > expand volume -volume-name VOL001 -rg-number 5,6 -size 800gb,400gb
```


start migration

This command moves the currently registered volume to another RAID group, can change a volume's capacity at the same time.

Syntax start migration
 {-volume-number *volume_number* | -volume-name *volume_name*}
 {-rg-number *rg_number* | -rg-name *rg_name* } -size *size*{tb|gb|mb}

Parameters -volume-number
 or
 -volume-name

This parameter specifies a volume identifier to be moved. Two or more parameters cannot be requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

-rg-number This parameter specifies a RAID group identifier to store the moved volume. Two or more parameters cannot be requested at the same time. For details, refer to the ["1.2.5 RAID Group Syntax" \(page 14\)](#).

-size This parameter specifies a new area size. A size must be selected from terabyte (TB), gigabyte (GB), or megabyte (MB).

Ex. 1tb (1TB), 120gb (120GB)

Example(s) The following example moves the volume named "VOL003" to RAID group named "RGP004". The new volume size is 512GB:

```
CLI> start migration -volume-name VOL003 -rg-name RGP004 -size 512gb
```

stop migration

This command stops a previously started volume migration (RAID Migration). Unless the volume migration (RAID Migration) is stopped, the move source/destination volumes cannot be deleted.

Syntax stop migration {-volume-number *volume_numbers* | -volume-name *volume_names*}

Parameters -volume-number
or
-volume-name

This parameter specifies the move source volume numbers or names corresponding to a previously started migration. Details can be displayed with the "show migration" command. Two or more parameters are requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

Example(s) The following example stops the volume migration (RAID Migration):

```
CLI> stop migration -volume-number 1
```

show migration

This command displays the list of migrating volumes.

Syntax `show migration`

Parameters **No parameters.**

Output

#	Migration No.	Source Volume Name	Migration Status	Progress	Error Code	Work Volume No.
#	7	vol0007	Active	50%	0x05	6
A		B	C	D	E	F

- A: The move source volume number
- B: The move source volume name
- C: The volume migration (RAID Migration) status
- D: The volume migration (RAID Migration) progress
- E: The volume migration (RAID Migration) error code
- F: Working volume number (In order to be used as a move destination)

Example(s) The following example displays a list of all migrating volume:

```
CLI> show migration
Migration Source Volume Migration Progress Error Work Volume
No. Name Status Code No.
- - Reserve - - -
1 Volume-Number#01 Error 20% 0x16 5
2 Volume-Number#02 Suspend 10% 0x1c 6
3 Volume-Number#03 Active 90% 0x00 4
```

3.3 Host Interface Management

This section explains the commands relating to the following host interface management.

- Host interface port parameters settings (Switching Host Affinity Mode, and etc.)
- Host identifiers (Host nickname)
- Affinity group
- Mapping, associated an affinity group with a host identifier
- Mapping, associated volumes with LUNs
- Host response
- Resetting group

■ Host interface type:

There are three host interface types, Fibre Channel (FC), Serial Attached SCSI (SAS) and Internet Small Computer System Interface (iSCSI).
The FC type has 8Gbit/s and 4Gbit/s speed sub-types.

■ Number of host interface ports:

For FC models (other than the ETERNUS DX90) and iSCSI models, the number of available host interface ports per controller module can be set (to either "1" or "2"). For SAS models, either of the physical interfaces may be used to connect the host servers, but only one port is settable.

The related terminology regarding "affinity" is as follows:

■ Host Affinity Mode:

There are two mapping methods to associate volumes with host LUNs. It is necessary they are separated and used depending on whether Host Affinity Mode is enabled, or not. The Host Affinity Mode can be set to each host interface port respectively. When Host Affinity Mode is enabled, it can associate affinity groups (the definition which associates volumes with host LUNs) with the host HBA. When Host Affinity Mode is disabled, it does not require an affinity group, and can associate volumes with host LUNs from all host servers. This mode can be set with the "set fc-parameters" command.

■ Affinity group:

If only the Host Affinity Mode is enabled, affinity groups can be created. The affinity group is a definition to associate volumes with host LUNs.

■ Mapping method:

The following is an example when the Host Affinity Mode is enabled.

```
CLI> set fc-parameters -port 00 -host-affinity enable
CLI> create raid-group -name r1 -level 1 -disks 006,007
CLI> create volume -name v -count 3 -rg-name r1 -type open -size 256mb
CLI> create affinity-group -name a1 -volume-name v0,v1,v2 -lun 0-2
CLI> create host-wwn-name -name h1 -wwn a00000e0d0100000
CLI> set host-affinity -host-name h1 -ag-name a1 -port 00
```

Procedure

- 1 Enable the Host Affinity Mode of host interface port 00. (For Fibre Channel models)
- 2 Create a RAID group named "r1".
- 3 Create volumes named "v0", "v1", and "v2" in RAID group named "r1".
- 4 Create an affinity group named "a1", the mapping relation of volume named v0/v1/v2 and LUN 0/1/2.
- 5 Register a host WWN named "h1". (For Fibre Channel models)
- 6 Mapping, it associates the affinity group named "a1" with host identifier named "h1" through host interface port 00.

End of procedure

The following is an example when the Host Affinity Mode is disabled.

```
CLI> set fc-parameters -port all -host-affinity disable
CLI> create raid-group -name r1 -level 1 -disks 006,007
CLI> create volume -name v -count 3 -rg-name r1 -type open -size 256mb
CLI> set mapping -volume-name v0,v1,v2 -lun 0-2 -port all
```

Procedure

- 1 Disable Host Affinity Mode. (For Fibre Channel models)
- 2 Create a RAID group named "r1".
- 3 Create volumes named "v0", "v1", and "v2" in RAID group named "r1".
- 4 Mapping, it associates the volume named v0/v1/v2 with LUN 0/1/2 through all ports.

End of procedure

3.3.1 Host Interface Port Parameters

This section explains the related commands regarding parameters of each host interface model.

set fc-parameters

This command sets up the parameters for controlling each FC host interface port. Also, using this command can change the Host Affinity Mode.

For a change of host port mode, refer to the "set host-port-mode" command.

Syntax `set fc-parameters -port {xy|all } [-host-affinity {enable | disable}] [-connect {loop | fabric}]`
 `[-rate {auto|1g|2g|4g|8g}]`
 `[-loop-id-assign {auto-ascending | auto-descending | manual}]`
 `[-loop-id loop_id] [-frame-size {512|1024|2048}]`
 `[-host-response-number host_response_number |`
 `-host-response-name host_response_name]`
 `[-reset-scope {initiator-lun | target-lun}] [-reserve-cancel {enable | disable}]`

Parameters `-port` This parameter specifies the FC interface port number to be set up. Two or more parameters can be requested by separating with a comma.

Ex. `-port 00,10`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

`xy` "x" is the controller module (CM) number, and "y" is the FC port number.

Ex. 10 (FC port#0 on CM#1)

`all` All the FC interface ports

`-host-affinity`

Optional. This parameter specifies the Host Affinity Mode. If omitted, this parameter is left unchanged. The host affinity is the security capability of the ETERNUS DX60/DX80/DX90 against host servers. By enabling the host Affinity Mode, it can limit the access from host servers. If the RA mode is being set for the specified ports, this parameter cannot be specified.

`enable` The Host Affinity Mode is enabled.

`disable` The Host Affinity Mode is disabled.

`-connect`

Optional. This parameter specifies the connection condition of the FC port. If omitted, this parameter is left unchanged. The default value is a loop connection (FC-AL).

`loop` Loop connection (default)

`fabric` Fabric connection

-rate Optional. This parameter specifies the FC transfer rate. If omitted, this parameter is left unchanged.

auto Auto negotiation

1g 1Gbit/s

2g 2Gbit/s

4g 4Gbit/s

8g 8Gbit/s

Caution 

- 1g, 2g, or 4g may be specified for the FC-4Gbit/s model, but not 8g.
- 2g, 4g, or 8g may be specified for the FC-8Gbit/s model, but not 1g.

-loop-id-assign

Optional. This parameter specifies how to assign the loop ID, and can be requested only when selecting "*-connect loop*". If omitted, this parameter is left unchanged.

auto-ascending

It assigns an automatically ascending order.

auto-descending

It assigns an automatically descending order.

manual

It assigns manual.

-loop-id Optional. This parameter specifies the loop ID, hexadecimal number, and can be requested only when selecting "*-loop-id-assign manual*". The range of value is from 0x00 to 0x7d, hexadecimal number. If omitted, this parameter is left unchanged.

-frame-size Optional. This parameter specifies the FC frame size. If omitted, this parameter is left unchanged. If the RA mode is being set for the specified ports, this parameter cannot be specified.

512 512 bytes.

1024 1024 bytes.

2048 2048 bytes.

-host-response-number

or

-host-response-name

Optional. This parameter specifies a host response identifier. Two or more parameters cannot be requested at the same time. If omitted, this parameter is left unchanged. If the RA mode is being set for the specified ports, this parameter cannot be specified. For details, refer to the ["1.2.9 Host Response Syntax" \(page 16\)](#).

-reset-scope

Optional. This parameter specifies the range of reset action. If omitted, this parameter is left unchanged. If the RA mode is set, this parameter cannot be specified.

initiator-lun Reset (cancel) the command request from the server that sent the command reset request.

target-lun Reset (cancel) the command request from all servers that are connected to the port (regardless of whether the LUN is recognized).

-reserve-cancel

Optional. This parameter specifies whether reservations are canceled or not when a host interface port is reset. If omitted, this parameter is left unchanged. If the RA mode is being set for the specified ports, this parameter cannot be specified.

enable Reservations are canceled.

disable Reservations are not canceled.

Example(s) The following example sets up the parameters to control the FC interface port #0 on CM#1. The Host Affinity Mode is disabled:

```
CLI> set fc-parameters -port 10 -host-affinity disable
```

The following example sets up the parameters to control FC interface port #1 on CM#0. The connection condition of FC port is the fabric connection, and the FC frame size is 2048 bytes:

```
CLI> set fc-parameters -port 01 -connect fabric -frame-size 2048
```

show fc-parameters

This command displays the parameters of each FC host interface port.

Syntax show fc-parameters

Parameters No parameters.

Output

# Port	CM#0 Port#0	CM#0 Port#1	CM#1 Port#0	CM#1 Port#1
→ Each host interface port number				
# Port Mode	CA	CA	CA	CA
→ It shows if either CA or RA mode is set. The RA mode is used for Remote Equivalent Copy.				
# Connection	FC-AL	FC-AL	Fabric	Fabric
→ Connection condition of each FC port (loop connection (FC-AL) or fabric connection)				
# Loop ID Assign	Manual (0x01)	Auto (Ascending)	Auto (Descending)	Manual (0x01)
→ How to assign the loop ID (Loop ID is shown only when selecting manual.) (Either ascending order or descending order is shown when selecting automatic.)				
# Transfer Rate	Auto Negotiation	4Gbit/s	4Gbit/s	4Gbit/s
→ FC transfer rate (Auto Negotiation, 1Gbit/s, 2Gbit/s, 4Gbit/s, or 8Gbit/s)				
# Frame Size	2048bytes	512bytes	512bytes	512bytes
→ FC frame size (512/1024/2048 byte)				
# Host Affinity	Disable	Enable	Enable	Enable
→ Host affinity mode of each host interface port				
# Host Response No.	5	-	-	-
# Host Response Name	HP05	-	-	-
→ Host response number and name (The hyphen is shown when the host affinity mode is enabled.)				
# Reset Scope	I T L	I T L	I T L	I T L
→ Range of reset action (I_T_L (I: Initiator, T: Target, L: LUN) or T_L (T: Target, L: LUN))				
# Reserve Cancel at Chip Reset	Disable	Enable	Disable	Disable
→ This shows whether reservations are canceled or not when the host interface port is reset.				

Example(s)

The following example shows the parameters displayed for each FC interface port. This example is for the ETERNUS DX90 which has 8 FC host interface ports per system.

```

CLI> show fc-parameters
Port                               CM#0 Port#0  CM#0 Port#1  CM#0 Port#2  CM#0 Port#3
Port Mode                           CA            CA            RA            RA
Connection                           FC-AL        FC-AL        Fabric        Fabric
Loop ID Assign                       Manual (0x01) Auto (Ascending) Auto (Descending) Manual (0x01)
Transfer Rate                         Auto Negotiation 1Gbit/s      1Gbit/s      1Gbit/s
Frame Size                            2048bytes    512bytes     512bytes     512bytes
Host Affinity                         Enable       Disable      -            -
Host Response No.                     -           6            -            -
Host Response Name                     -           HP06        -            -
Reset Scope                           I T L       I T L       -            -
Reserve Cancel at Chip Reset          Disable     Enable       -            -

Port                               CM#1 Port#0  CM#1 Port#1  CM#1 Port#2  CM#1 Port#3
Port Mode                           CA            CA            CA            CA
Connection                           FC-AL        FC-AL        Fabric        Fabric
Loop ID Assign                       Manual (0x01) Auto (Ascending) Auto (Descending) Manual (0x01)
Transfer Rate                         Auto Negotiation 1Gbit/s      1Gbit/s      1Gbit/s
Frame Size                            2048bytes    512bytes     512bytes     512bytes
Host Affinity                         Enable       Disable      Disable      Disable
Host Response No.                     -           6            5            5
Host Response Name                     -           HP06        HP05        HP05
Reset Scope                           I T L       I T L       I T L       I T L
Reserve Cancel at Chip Reset          Disable     Enable       Disable      Disable
    
```

set sas-parameters

This command sets up the parameters of each SAS interface port.
It can also be used to change the Host Affinity Mode.

Syntax `set sas-parameters -port {xy|all}[-host-affinity {enable | disable}]`
 `[-host-response-number host_response_number |`
 `-host-response-name host_response_name]`
 `[-reset-scope {initiator-lun | target-lun}] [-reserve-cancel {enable | disable}]`

Parameters `-port` This parameter specifies which SAS interface port is to be set.

Ex. `-port 00`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

`xy` "x" is the controller module (CM) number, and "y" is the SAS port number.

Ex. 10 (CM#1-SAS port#0)

`all` All SAS interface ports

`-host-affinity`

Optional. This parameter specifies the Host Affinity Mode. If omitted, this parameter is left unchanged.

Host affinity is a security mechanism used to restrict access by a given host to only a specific set of LUNs.

`enable` The Host Affinity Mode is enabled.

`disable` The Host Affinity Mode is disabled.

`-host-response-number` or `-host-response-name`

Optional. This parameter specifies a host response identifier. Only one identifier can be specified at any given time. If omitted, this parameter is left unchanged. For details, refer to ["1.2.9 Host Response Syntax" \(page 16\)](#).

`-reset-scope`

Optional. This parameter specifies which LUN is to be affected by reset actions. If omitted, this parameter is left unchanged.

`initiator-lun` Reset (cancel) the command request from the server that sent the command reset request.

`target-lun` Reset (cancel) the command request from all servers that are connected to the port (regardless of whether the LUN is recognized).

-reserve-cancel

Optional. This parameter specifies whether or not reservations are canceled when a host interface port is reset. If omitted, this parameter is left unchanged.

enable Reservations are canceled.

disable Reservations are not canceled.

Example(s) The following example disables Host Affinity Mode for SAS interface port#0 on CM#1:

```
CLI> set sas-parameters -port 10 -host-affinity disable
```

The following example sets the initiator LUN as the reset scope for SAS interface port #0 on CM#0:

```
CLI> set sas-parameter -port 00 -reset-scope initiator-lun
```

show sas-parameters

This command displays the parameters of each SAS host interface port.

Syntax show sas-parameters

Parameters No parameters.

Output

# Port	CM#0 Port#0	CM#1 Port#0
→ Each host interface port number		
# Host Affinity	Disable	Enable
→ Host affinity mode of each host interface port		
# Host Response No.	5	-
# Host Response Name	HP05	-
→ Host response number and name (The hyphen is shown when Host Affinity Mode is enabled.)		
# Reset Scope	I_T_L	I_T_L
→ Range of reset action (I_T_L (I: Initiator, T: Target, L: LUN) or T_L (T: Target, L: LUN))		
# Reserve Cancel at Chip Reset	Disable	Enable
→ This shows whether reservations are canceled or not when the host interface port is reset.		

Example(s) The following example displays the parameters of all SAS host interface ports for a 2-port model:

```
CLI> show sas-parameters
Port                CM#0 Port#0-1    CM#1 Port#0-1
Host Affinity       Disable          Disable
Host Response No.   5                6
Host Response Name  HP05             HP06
Reset Scope         T_L              T_L
Reserve Cancel at Chip Reset Enable            Enable
```

The following example displays the parameters of all SAS host interface ports for a 1-port model:

```
CLI> show sas-parameters
Port                CM#0 Port#0      CM#1 Port#0
Host Affinity       Disable          Disable
Host Response No.   5                6
Host Response Name  HP05             HP06
Reset Scope         T_L              I_T_L
Reserve Cancel at Chip Reset Disable            Disable
```

set iscsi-parameters

This command sets up the parameters of each iSCSI host interface port.
It can also be used to change the Host Affinity Mode.

Syntax	<pre>set iscsi-parameters -port {xy all} [-host-affinity {enable disable}] [-iscsi-name <i>iscsi_name</i>] [-alias-name <i>alias_name</i>] [-host-response-number <i>host_response_number</i> -host-response-name <i>host_response_name</i>] [-reset-scope {initiator-lun target-lun}] [-reserve-cancel {enable disable}] [-ip <i>ip_address</i>] [-netmask <i>netmask</i>] [-gateway <i>gateway</i>] [-isns-server-ip <i>isns_server_ip</i>] [-isns-server {enable disable}] [-chap {enable disable}] [-chap-user <i>chap_user_name</i>] [-header-digest {enable disable}] [-data-digest {enable disable}] [-jumbo-frame {enable disable}] [-rate {auto 1g 100m}]</pre>
Parameters	<p>-port This parameter specifies which iSCSI interface port is to be set. Multiple, comma-separated ports may be specified.</p> <p>Ex. -port 00 For details, refer to "1.2.11 Host Interface Port Syntax" (page 17).</p> <p>xy "x" is the controller module (CM) number, and "y" is the iSCSI port number. Ex. 10 (iSCSI port#0 on CM#1)</p> <p>all All iSCSI interface ports</p> <p>-host-affinity Optional. This parameter specifies the Host Affinity Mode. If omitted, this parameter is left unchanged. Host affinity is a security mechanism used to restrict access by a given host to only a specific set of LUNs.</p> <p>enable The Host Affinity Mode is enabled.</p> <p>disable The Host Affinity Mode is disabled.</p> <p>-iscsi-name Optional. This parameter specifies an iSCSI name for the specified host interface port. If omitted, this parameter is left unchanged.</p> <ul style="list-style-type: none">• Up to 223 alphanumerical characters including hyphens (-), dots (.), and colons (:) can be used to specify this parameter.• "iqn." or "eui." must be added in front of the character string.• Characters are not case-sensitive.

-alias-name

Optional. This parameter specifies an alias for the iSCSI name defined by the "-iscsi-name" parameter. Between 1 and 31 alphanumeric characters can be used. Usable characters are those given in the ["1.2.2 Keywords and Parameters" \(page 13\)](#) of the document overview. Note that commas (,) cannot be used.

This name is not used for control purposes. It is merely handled with a comment corresponding to the iSCSI name

-host-response-number or -host-response-name

Optional. This parameter specifies a host response identifier. Only one identifier can be specified at any given time. If omitted, this parameter is left unchanged. For details, refer to ["1.2.9 Host Response Syntax" \(page 16\)](#).

-reset-scope

Optional. This parameter specifies which LUN is to be affected by reset actions. If omitted, this parameter is left unchanged.

initiator-lun Reset (cancel) the command request from the server that sent the command reset request.

target-lun Reset (cancel) the command request from all servers that are connected to the port (regardless of whether the LUN is recognized).

-reserve-cancel

Optional. This parameter specifies whether or not reservations are canceled when a host interface port is reset. If omitted, this parameter is left unchanged.

enable Reservations are canceled.

disable Reservations are not canceled.

-ip

Optional. This parameter specifies an IP address used to connect to an iSCSI network, using standard IPv4 notation (a base 256 "d.d.d.d" string). If omitted, this parameter is left unchanged.

Ex. -ip 192.168.1.1

-netmask

Optional. This parameter specifies a subnet mask used to connect to an iSCSI network, using standard IPv4 notation (a base 256 "d.d.d.d" string). If omitted, this parameter is left unchanged.

Ex. -netmask 255.255.255.0

-gateway

Optional. This parameter specifies a gateway server address, using standard IPv4 notation (a base 256 "d.d.d.d" string). If omitted, this parameter is left unchanged.

Ex. -gateway 10.1.0.250

-isns-server-ip

Optional. This parameter specifies an IP address of an iSNS server, using standard IPv4 notation (a base 256 "d.d.d.d" string). The iSNS Server must belong to the same iSCSI network as the iSCSI interface port specified by "-port" parameter. If omitted, this parameter is left unchanged.

* iSNS server: Internet Storage Name Service

Ex. -isns-server-ip 10.1.1.12

-isns-server

Optional. This parameter specifies whether or not an iSNS server is used. If omitted, this parameter is left unchanged.

enable An iSNS server is used.

disable An iSNS server is not used.

-chap

Optional. This parameter specifies whether or not CHAP authentication is used. If omitted, this parameter is left unchanged.

enable A CHAP authentication is used.

disable A CHAP authentication is not used.

-chap-user

Optional. This parameter specifies a user name for CHAP authentication. It is only applicable if CHAP authentication is used. If omitted, this parameter is left unchanged.

-header-digest

Optional. This parameter specifies whether or not the PDU header's CRC32C checksum is validated. If omitted, this parameter is left unchanged.

enable PDU header is validated by CRC32C.

disable PDU header is not validated.

-data-digest

Optional. This parameter specifies whether or not the PDU data's CRC32C checksum is validated. If omitted, this parameter is left unchanged.

enable PDU data is validated by CRC32C.

disable PDU data is not validated.

-jumbo-frame

Optional. This parameter specifies whether or not the iSCSI jumbo frame is accepted. If omitted, then this parameter value is left unchanged. The initial value is set to "disable".

enable The iSCSI jumbo frame is accepted.

Caution 

If this parameter is enabled, make sure the jumbo frame is supported by devices when connected via iSCSI.

disable The iSCSI jumbo frame is not accepted.

-rate Optional. This parameter specifies the connection speed of the iSCSI port. If omitted, then this parameter is not changed. The initial value is set as 1Gbit/s.

auto Auto negotiation. This is the mode for which either 1Gbit/s or 100Mbit/s full-duplex is automatically selected.

1g 1Gbit/s

100m 100Mbit/s full-duplex

Caution 

100Mbit/s half-duplex is not supported. Therefore, if this operand 100m (100Mbit/s) is selected, set 100Mbit/s full-duplex to devices which are connected to the ETERNUS DX60/DX80. In the case of a directly-connected device, confirm the NIC on the host. In the case of a Switch-connected device, confirm the switch.

Example(s) The following example disables Host Affinity Mode for iSCSI interface port#0 on CM#1:

```
CLI> set iscsi-parameters -port 10 -host-affinity disable
```

The following example sets an IP address of "192.168.1.1", a subnet mask of "255.255.255.0", and a CHAP user name of "user01" for iSCSI interface port#1 on CM#0:

```
CLI> set iscsi-parameters -port 01 -ip 192.168.1.1 -netmask 255.255.255.0 -chap-user user01
Password :
Confirm Password :
```

The following example enables the iSCSI jumbo frame function on all the iSCSI interface ports.

```
CLI> set iscsi-parameters -port all -jumbo-frame enable
```

The following example forcibly sets the iSCSI transfer rate of all the interface ports to 100Mbit/s full-duplex.

```
CLI> set iscsi-parameters -port all -rate 100m
```

show iscsi-parameters

This command displays the parameters of each iSCSI host interface port.

Syntax show iscsi-parameters

Parameters No parameters.

Output

```
# CM#0 Port#0
# Host Affinity Disable
# iSCSI Name ign.2000-09.com.fujitsu:storage-system.eternus_dxl:000000
# Alias Name
# Host Response No. 1
# Host Response Name HP1
# Reset Scope I T L
# Reserve Cancel at Chip Reset Disable
# IP Address 192.168.2.64
# Subnet Mask 255.255.255.0
# Gateway Address 0.0.0.0
# iSNS Server Disable
# iSNS Server IP Address -
# CHAP Disable
# CHAP User Name user00
# Header Digest CRC32
# Data Digest OFF
# Jumbo Frame Disable
# The above information shows whether or not the iSCSI jumbo frame is supported. In this case, the jumbo
# frame is disabled.
# Transfer Rate 1Gbit/s
# iSCSI transfer speed (Auto Negotiation / 1Gbit/s / 100Mbit/s)
# Link Status 1Gbit/s Link Up
# The above information shows actual transfer speed and link status such as 'Link Up/Down'.
```

Example(s) The following example displays the parameters of all iSCSI interface ports:

```
CLI> show iscsi-parameters
CM#0 Port#0
Host Affinity Disable
iSCSI Name ign.2000-09.com.fujitsu:storage-system.eternus_dxl:000000
Alias Name ALIAS00
Host Response No. 1
Host Response Name HP0
Reset Scope I T L
Reserve Cancel at Chip Reset Disable
IP Address 192.168.2.64
Subnet Mask 255.255.255.0
Gateway Address 0.0.0.0
iSNS Server Disable
iSNS Server IP Address -
CHAP Disable
CHAP User Name user00
Header Digest CRC32
Data Digest OFF
Jumbo Frame Enable
Transfer Rate Auto Negotiation
Link Status 1Gbit/s Link Up
. . . continue
```

3.3.2 Host Identifiers (Host Nickname)

This section explains the related commands regarding a definition of host identifiers for each model.

create host-wwn-name

This command registers a host nickname corresponding to the WWN (World Wide Name), which identifies the FC type of HBAs (Host Bus Adapters). Two or more WWNs cannot be registered at the same time. The maximum number of available definitions depends on the number of available host interface ports and the model type. This enables the nickname to be used instead of the numeric WWN when mapping volumes to host servers.

Syntax	<code>create host-wwn-name -wwn <i>wwn</i> -name <i>name</i> [-host-response-number <i>host_response_number</i> -host-response-name <i>host_response_name</i>]</code>
Parameters	<p><code>-wwn</code> This parameter specifies a WWN which corresponds to an HBA, a hexadecimal number of 16 bytes to be registered.</p> <p>Ex. <code>-wwn 40000000abc80e38</code></p> <p><code>-name</code> This parameter specifies a host WWN nickname. For details, refer to the "1.2.4 Alias Name Syntax" (page 14).</p> <p><code>-host-response-number</code> or <code>-host-response-name</code> Optional. This parameter specifies a host response identifier. Two or more parameters cannot be requested at the same time. For details, refer to the "1.2.9 Host Response Syntax" (page 16). If omitted, this parameter is left unchanged.</p>
Example(s)	The following example registers the host nicknamed "HBA1". The WWN is "e000000000e0e000", and host response #1 is assigned:

```
CLI> create host-wwn-name -wwn e000000000e0e000 -name HBA1 -host-response-number 1
```

set host-wwn-name

This command changes a currently registered FC host identifier.

Syntax	<code>set host-wwn-name</code> <code>{-host-number <i>host_number</i> -host-name <i>host_name</i> } [-wwn <i>wwn</i>]</code> <code>[-name <i>name</i>] [-host-response-number <i>host_response_number</i> </code> <code>-host-response-name <i>host_response_name</i>]</code>
Parameters	<p><code>-host-number</code> or <code>-host-name</code></p> <p>This parameter specifies the FC host identifier that is to be changed. Basically, two of more parameters cannot be requested at the same time, unless they are host response identifiers. For details, refer to the "1.2.7 Host Syntax" (page 15).</p> <p><code>-wwn</code></p> <p>Optional. This parameter specifies the 8 byte hexadecimal WWN which corresponds to the HBA that is to be changed. Only one parameter is allowed at a time. If omitted, this parameter is left unchanged.</p> <p>Ex. <code>-wwn 40000000abc78856</code></p> <p><code>-name</code></p> <p>Optional. This parameter specifies the host WWN nickname. Only one parameter is allowed at a time. For details, refer to the "1.2.4 Alias Name Syntax" (page 14). If omitted, this parameter is left unchanged.</p> <p><code>-host-response-number</code> or <code>-host-response-name</code></p> <p>Optional. This parameter specifies the host response identifier that is to be changed. Multiple parameters can be requested at the same time. For details, refer to the "1.2.9 Host Response Syntax" (page 16). If omitted, this parameter is left unchanged.</p>

Example(s) The following example changes the host response definition of hosts named "HBA1" and "HBA2" at the same time:

```
CLI> set host-wwn-name -host-name HBA1,HBA2 -host-response-number 2
```

The following example changes the host named "HBA1". The new nickname is "HBA123":

```
CLI> set host-wwn-name -host-name HBA1 -name HBA123
```

delete host-wwn-name

This command deletes currently registered FC host identifiers.

Syntax delete host-wwn-name
 {-host-number *host_numbers* | -host-name *host_names* }

Parameters -host-number
 or
 -host-name

This parameter specifies FC host identifiers to be deleted. One or more parameters can be requested at the same time. For details, refer to the ["1.2.7 Host Syntax" \(page 15\)](#).

Example(s) The following example deletes the consecutive FC host identifiers #1-3:

```
CLI> delete host-wwn-names -host-number 1-3
```

The following example only deletes the host named "HBA2":

```
CLI> delete host-wwn-names -name HBA2
```

show host-wwn-names

This command displays the list of all registered FC host identifiers.

Syntax show host-wwn-names

Parameters No parameters.

Output

#	Host	WWN	Host Response
#	No. Name		No. Name
#	1 HBA1	aabbccddeeff0011	1 HP01
A	B	C	D E

- A: Host number
- B: Host WWN nickname
- C: World-Wide-Name
- D: Assigned the host response number
- E: Assigned the host response name

Example(s) The following example displays the list of all registered FC host identifiers:

```
CLI> show host-wwn-names
Host                WWN                Host Response
No. Name            No. Name
1 HBA1              aabbccddeeff0011  0 Default
2 HBA2              aabbccddeeff0012  1 HP01
3 HBA33             ffeeffeefeff03   1 HP01
```

discover host-wwn-names

This command displays the list of the host World-Wide-Name (WWN) discovered from the specified FC interface port.

Syntax discover host-wwn-names [-port {xy|all }]

Parameters -port Optional. This parameter specifies the FC interface ports to discover host WWN names. Two or more parameters can be requested by separating with a comma. If omitted, then it is handled with as all the FC interface ports are selected.

Ex. -port 00,10

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

xy "x" is the controller module (CM) number, and "y" is the FC port number.

Ex. 10 (FC port#0 on CM#1)

all All the FC interface ports (default)

Output

```
# 0123456789abcdef  
A
```

A: Discovered World-Wide-Name

Example(s) The following example displays a list of the host WWNs discovered from all the FC interface ports on CM#0 (In case of FC 4 ports model):

```
CLI> discover host-wwn-names -port 00,01  
CM#0 Port#0  
aabbccddeeff0011  
aabbccddeeff0012  
ffeeffeeffeeff03  
  
CM#0 Port#1  
aabbccddeeff0011  
aabbccddeeff0012  
ffeeffeeffeeff03
```


create host-sas-address

This command registers a host alias for the SAS (Serial Attached SCSI) address used to identify a SAS-type HBA (Host Bus Adapter). This alias can then be used instead of the numeric SAS address when mapping volumes to hosts.

Only one SAS address can be specified at a time. The maximum number of alias definitions allowed depends on the number of available host interface ports and the storage system model.

Syntax `create host-sas-address -address address -name name
 [-host-response-number host_response_number |
 -host-response-name host_response_name]`

Parameters `-address` This parameter specifies a SAS address, which is a 16 character hexadecimal number that corresponds to an HBA.

Ex. `-address 500605b000b5f344`

`-name` This parameter specifies the SAS address alias. For details, refer to the ["1.2.4 Alias Name Syntax" \(page 14\)](#).

`-host-response-number`

or

`-host-response-name`

Optional. This parameter specifies a host response identifier. Only one identifier can be specified at any given time. For details, refer to the ["1.2.9 Host Response Syntax" \(page 16\)](#). If omitted, this parameter is left unchanged.

Example(s) The following example registers the alias "HBA1" for the HBA with SAS address "500605b000b5f344":

```
CLI> create host-sas-address -address 500605b000b5f344 -name HBA1
```

set host-sas-address

This command changes the details of an existing SAS host identifier.

Syntax `set host-sas-address {-host-number host_number | -host-name host_name }
[-address address] [-name name]
[-host-response-number host_response_number |
-host-response-name host_response_name]`

Parameters -host-number
 or
 -host-name

This parameter specifies the SAS host identifier to be changed. Only one SAS host identifier can be specified at any given time, unless the host response identifier is being set, in which case multiple SAS host identifiers may be changed simultaneously. For details, refer to the ["1.2.7 Host Syntax" \(page 15\)](#).

-wwn Optional. This parameter specifies a SAS Address, which is a 16 character hexadecimal number that corresponds to an HBA. Only one SAS address can be specified at any given time. If omitted, this parameter is left unchanged.

Ex. `-address 500605b000b5f344`

-name Optional. This parameter specifies a new SAS address alias. Only one name can be specified at any given time. For details, refer to the ["1.2.4 Alias Name Syntax" \(page 14\)](#). If omitted, this parameter is left unchanged.

-host-response-number
 or
-host-response-name

Optional. This parameter specifies a host response identifier. One or more parameters can be specified at the same time. For details, refer to the ["1.2.9 Host Response Syntax" \(page 16\)](#). If omitted, this parameter is left unchanged.

Example(s) The following example changes the host named "HBA1", assigning it the host response number "2":

```
CLI> set host-sas-address -host-name HBA1 -host-response-number 2
```

The following example changes the host response definition of all the consecutively numbered hosts #1-#10 at once:

```
CLI> set host-sas-address -host-number 1-10 -host-response-number 5
```

The following example changes the host named "HBA1", assigning it the new alias "HBA123":

```
CLI> set host-sas-address -host-name HBA1 -name HBA123
```

delete host-sas-address

This command deletes existing SAS host identifier(s).

Syntax delete host-sas-address
 {-host-number *host_numbers* | -host-name *host_names* }

Parameters -host-number
 or
 -host-name

This parameter specifies which SAS host identifiers are to be deleted. One or more identifiers can be specified at the same time. For details, refer to the ["1.2.7 Host Syntax" \(page 15\)](#).

Example(s) The following example deletes the SAS hosts with consecutively numbered identifiers #1 - #3:

```
CLI> delete host-sas-address -host-number 1-3
```

The following example only deletes the host named "HBA2":

```
CLI> delete host-sas-address -host-name HBA2
```

show host-sas-addresses

This command displays a list of all the SAS host identifiers in the system.

Syntax show host-sas-addresses

Parameters No parameters.

Output

#	Host	SAS Address	Host Response
#	No. Name		No. Name
#	1 HBA1	500605b000b5f344	1 HP001
A	B	C	D E

- A: Host number
- B: Host nickname
- C: SAS address
- D: Assigned the host response number
- E: Assigned the host response name

Example(s) The following example displays the list of all registered SAS host identifiers:

```
CLI> show host-sas-addresses
Host          SAS Address      Host Response
No. Name
1 HBA1        500605b000b5f344 1 HP001
2 HBA2        500605b000b5f348 1 HP001
3 HBA3        500605b000b5f34c 1 HP001
```

discover host-sas-addresses

This command displays a list of the host SAS addresses that have been discovered for the specified SAS interface port(s).

Syntax discover host-sas-addresses [-port {xy|all}]

Parameters -port Optional. This parameter specifies the SAS interface port(s) whose discovered host SAS addresses are to be listed. If this parameter is omitted, then the hosts discovered for all SAS host interface ports are displayed.

Ex. -port 00,10

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

xy "x" is the controller module (CM) number, and "y" is the SAS port number.

Ex. 10 (SAS port#0 on CM#1)

all All the SAS interface ports (default)

Output

```
# 500605b000b5f144  
A
```

A: Discovered SAS Address

Example(s)

The following example displays a list of the SAS Addresses discovered for all the SAS interface ports on both CMs:

```
CLI> discover host-sas-addresses -port all  
CM#0 Port#0-1  
500605b000b5d8e4  
500605b000b5e004  
  
CM#1 Port#0-1  
500605b000b5f144  
500605b000b5f244  
500605b000b5f344
```

create host-iscsi-name

This command registers a host alias for the iSCSI (internet Small Computer System Interface) name and the IP address used to identify an iSCSI-type HBA (Host Bus Adapter). This alias can then be used instead of the long iSCSI name when mapping volumes to hosts.

Only one iSCSI name can be specified at a time. The maximum number of alias definitions allowed depends on the number of available host interface ports and the storage system model.

Syntax `create host-iscsi-name -iscsi-name iscsi_name
 [-alias-name alias_name] [-ip ip_address] -name name [-chap-user chap_user]
 [-host-response-number host_response_number |
 -host-response-name host_response_name]`

Parameters -iscsi-name This parameter specifies an iSCSI name that corresponds to an HBA

- Between 4 and 223 alphanumeric characters including hyphens (-), dots (.), and colons (:) can be used to specify this parameter.
- "iqn." or "eui." must be added in front of the character string.
- Characters are not case-sensitive.

-alias-name Optional. This parameter specifies an alias to the iSCSI name. Between 1 and 31 alphanumeric characters can be used. Usable characters are those given in the ["1.2.2 Keywords and Parameters" \(page 13\)](#) of the document overview, excepting only that commas (,) may not be used.

-ip Optional. This parameter specifies an IP address for the corresponding HBA, using standard IPv4 notation (a base 256 "d.d.d.d" string).

Ex. -ip 192.168.1.10

If omitted, any IP addresses are allowed. With the same iSCSI name designation, a specific IP address is distinguished from the omitted one.

-name This parameter specifies the iSCSI host alias. For details, refer to ["1.2.4 Alias Name Syntax" \(page 14\)](#).

-chap-user Optional. When using CHAP authentication, this parameter is used to specify a CHAP user name. Up to 255 alphanumeric characters and symbols can be used. If this parameter is specified, then the command prompts for a CHAP user password.

-host-response-number

or

-host-response-name

Optional. This parameter specifies a host response identifier. Only one identifier can be specified at any given time. For details, refer to ["1.2.9 Host Response Syntax" \(page 16\)](#). If omitted, this parameter is left unchanged.

Example(s) The following example registers the alias "HBA1" for the iSCSI host "iqn.1991-05.com.microsoft", and the iSCSI ip address "10.111.10.1". The host response number #1 is also assigned:

```
CLI> create host-iscsi-name -iscsi-name iqn.1991-05.com.microsoft -ip 10.111.10.1 -name HBA1 -host-response-number 1
```

Below is an example with two NICs in a single server and registering an iSCSI host for each NIC. The iSCSI name is a property of the server and is the same for both NICs, but each NIC has a different IP address. The following commands register "HBA11" and "HBA12" as the respective alias for each NIC. For a case in which two iSCSI HBAs are used, the iSCSI names will also be different:

```
CLI> create host-iscsi-name -iscsi-name iqn.1991-05.com.microsoft -ip 10.1.0.1 -name HBA11  
CLI> create host-iscsi-name -iscsi-name iqn.1991-05.com.microsoft -ip 10.1.1.1 -name HBA12
```

The following example registers the alias "HBA1" for the iSCSI host "iqn.1991-05.com.microsoft", and any IP address is allowed by omitting the -ip parameter.

```
CLI> create host-iscsi-name -iscsi-name iqn.1991-05.com.microsoft -name HBA1
```

In addition to the above example, IP addresses with the same iSCSI name can be specified as the different alias.

```
CLI> create host-iscsi-name -iscsi-name iqn.1991-05.com.microsoft -name HBA1  
CLI> create host-iscsi-name -iscsi-name iqn.1991-05.com.microsoft -ip 10.1.0.1 -name HBA2
```

set host-iscsi-name

This command changes the details of an existing iSCSI host identifier.

Syntax	<pre>set host-iscsi-name {-host-number <i>host_number</i> -host-name <i>host_name</i> } [-iscsi-name <i>iscsi_name</i>] [-alias-name <i>alias_name</i>] [-ip <i>ip_address</i>] [-name <i>name</i>] [-chap-user <i>chap_user</i>] [-host-response-number <i>host_response_number</i> -host-response-name <i>host_response_name</i>]</pre>
Parameters	<p>-host-number or -host-name</p> <p>This parameter specifies the iSCSI host identifier to be changed. Only one iSCSI host identifier can be specified at any given time, unless the host response identifier is being set, in which case multiple iSCSI host identifiers may be changed simultaneously. For details, refer to the "1.2.7 Host Syntax" (page 15).</p> <p>-iscsi-name</p> <p>Optional. This parameter specifies an iSCSI name that corresponds to an HBA. Between 4 and 223 alphanumeric characters including hyphens (-), dots (.), and colons (:) can be used. If omitted, this parameter is left unchanged. Only one name can be specified at any given time.</p> <p>-alias-name</p> <p>Optional. This parameter specifies an alias to the iSCSI name. Between 1 and 31 alphanumeric characters can be used. Usable characters are those given in the "1.2.2 Keywords and Parameters" (page 13) of the document overview. Note that commas (,) cannot be used. If omitted, this parameter is left unchanged. Only one name can be specified at any given time.</p> <p>This name is not used for control purposes. It is merely handled with a comment corresponding to the iSCSI name.</p> <p>-ip</p> <p>Optional. This parameter specifies an IP address for the HBA, using standard IPv4 notation (a base 256 "d.d.d.d" string). If omitted, this parameter is left unchanged. Only one IP address can be specified at any given time.</p> <p>Ex. -ip 192.168.1.10</p> <p>When changing the access from a specific IP address to any IP address, delete the relevant host name using the "delete host-iscsi-name" command, and then create the same host name again using the "create host-iscsi-name" command (without specifying the -ip parameter).</p> <p>-name</p> <p>Optional. This parameter specifies a new iSCSI-host alias. For details, refer to "1.2.4 Alias Name Syntax" (page 14). If omitted, this parameter is left unchanged. Only one name can be specified at any given time.</p>

-chap-user Optional. When using CHAP authentication, this parameter is used to specify a CHAP user name. Up to 255 alphanumeric characters and symbols can be used. To delete an existing CHAP user name, specify the operand as "" (two consecutive double quotations with no intervening space). If omitted, this parameter is left unchanged. Only one user can be specified at any given time.

-host-response-number

or

-host-response-name

Optional. This parameter specifies a host response identifier. One or more identifier can be specified at the same time. For details, refer to the ["1.2.9 Host Response Syntax" \(page 16\)](#). If omitted, this parameter is left unchanged.

Example(s) The following example changes the host named "HBA21", assigning it the new IP address "10.1.1.2":

```
CLI> set host-iscsi-name -host-name HBA21 -ip 10.1.1.2
```

The following example changes the host named "HBA21", assigning it the host response number "2":

```
CLI> set host-iscsi-name -host-name HBA21 -host-response-number 2
```

The following example changes the host response definition of all the consecutively numbered hosts #1-#10 at once:

```
CLI> set host-iscsi-name -host-number 1-10 -host-response-number 5
```

The following example changes the host named "HBA21", assigning it the new alias "HBA22":

```
CLI> set host-iscsi-name -host-name HBA21 -name HBA22
```

delete host-iscsi-name

This command deletes existing iSCSI host identifier(s).

Syntax delete host-iscsi-name
 {-host-number *host_numbers* | -host-name *host_names* }

Parameters -host-number
 or
 -host-name

This parameter specifies which iSCSI host identifiers are to be deleted. One or more identifiers can be specified at the same time. For details, refer to the ["1.2.7 Host Syntax" \(page 15\)](#).

Example(s) The following example deletes the iSCSI hosts with consecutively numbered identifiers #1 - #3:

```
CLI> delete host-iscsi-name -host-number 1-3
```

The following example only deletes the host named "HBA2":

```
CLI> delete host-iscsi-name -host-name HBA2
```

show host-iscsi-names

This command displays a list of iSCSI hosts registered in the system. If iSCSI host identifiers are specified, iSCSI host details are displayed.

Syntax show host-iscsi-names
 [-host-number *host_numbers* | -host-name *host_names*]

Parameters -host-number
 or
 -host-name

Optional. This parameter specifies which iSCSI host identifier(s) details are to be displayed. One or more identifiers can be specified at the same time. If this parameter is omitted, then an iSCSI host summary list is displayed. For details, refer to the ["1.2.7 Host Syntax" \(page 15\)](#).

Output When the iSCSI host identifier parameter is omitted, then an iSCSI host summary list for all host identifiers is displayed:

# Host No.	Host Name	Host Response No.	Host Response Name	IP Address	iSCSI Name
A	B	C	D	E	F
1	HBA-ISCISI-001	1	HP01	192.168.1.1	iqn.1991-05.com.microsoft

- A: Host number
- B: Host nickname
- C: Assigned the host response number
- D: Assigned the host response name
- E: IP address which corresponds to a HBA
If the IP address is not specified, the * mark is displayed.
- F: iSCSI host name which corresponds to a HBA

# Host No.	1
# Host Name	HBA1
# iSCSI Name	iqn.1991-05.com.microsoft
# Alias Name	IQN-DXL1
# IP Address	10.1.1.1
# Chap User Name	User01
# Host Response No.	0
# Host Response Name	Default

Example(s) The following example displays the iSCSI host summary list:

```
CLI> show host-iscsi-names
Host No. Name      Host Response No. Name      IP Address      iSCSI Name
1 HBA-ISCISI-001  1 HP01           192.168.1.1    iqn.1991-05.com.microsoft
2 HBA-ISCISI-002  1 HP01           192.168.1.2    iqn.1993-05.com.microsoft
```

The following example displays the iSCSI host summary list. The * mark on the IP Address stands for any IP address.

```
CLI> show host-iscsi-names
Host No. Name      Host Response No. Name      IP Address      iSCSI Name
1 HBA-ISCISI-001  1 HP01           192.168.1.1    iqn.1991-05.com.microsoft
2 HBA-ISCISI-002  1 HP01           192.168.1.2    iqn.1993-05.com.microsoft
3 HBA-ISCISI-003  1 HP01           *                iqn.1993-05.com.microsoft
```

The following example displays the iSCSI host details of the host named "HBA1":

```
CLI> show host-iscsi-names -host-name HBA1
Host No.                1
Host Name               HBA1
iSCSI Name              iqn.1991-05.com.microsoft
Alias Name              IQN-DXL
IP Address              10.1.1.1
Chap User Name          User01
Host Response No.      1
Host Response Name      HP01
```

discover host-iscsi-names

This command displays the list of the iSCSI host names that have been discovered for the specified iSCSI port(s). The iSCSI parameters must be set up first, using the "set-iscsi-parameters" command.

- An iSNS server definition must be set to use this command.
- Host Affinity Mode must be enabled to use this command.

Syntax discover host-iscsi-names [-port {xy|all}]

Parameters -port Optional. This parameter specifies the iSCSI interface port(s) whose discovered host iSCSI names are to be listed. One or more host interface ports can be specified at the same time. If this parameter is omitted, then the hosts discovered for all iSCSI interface ports are displayed.

Ex. -port 00,10

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

xy "x" is the controller module (CM) number, and "y" is the iSCSI port number.

Ex. 10 (iSCSI port#0 on CM#1)

all All the iSCSI interface ports (default)

Output

```
# CM#0 Port#0
A
# Alias iSCSI Name
# IQN-DXL1 iqn.1991-05.com.microsoft
B C
```

- A: The target host interface port
- B: The alias of the iSCSI host discovered
- C: The discovered iSCSI name

Example(s) The following example displays a list of the iSCSI hosts discovered for all the iSCSI interface ports on CM#0:

```
CLI> discover host-iscsi-names -port 00,01
CM#0 Port#0
Alias iSCSI Name
IQN-DXL1 iqn.1991-05.com.microsoft

CM#0 Port#1
Alias iSCSI Name
IQN-DXL1 iqn.1991-05.com.microsoft
IQN-DXL2 iqn.1993-05.com.microsoft
```

3.3.3 Affinity Groups

This section explains the related commands to control affinity groups. An Affinity group is the definition associated volumes with LUNs, and you must use it only when the Host Affinity Mode is enabled.

create affinity-group

This command creates an affinity group. The maximum number of available groups depends on the number of available host interface ports and the model type. Usually you can set 0-255 as the value of a LUN, but can set 0-1023 in the case of HP-UX host environment. In this case, the resource is used twice as an affinity group.

Syntax	<code>create affinity-group -name name {-volume-number <i>volume_numbers</i> -volume-name <i>volume_names</i> } -lun <i>luns</i></code>
Parameters	<p>-name This parameter specifies a name of an affinity group. Two or more parameters cannot be requested at the same time. For details, refer to the "1.2.4 Alias Name Syntax" (page 14).</p> <p>-volume-number or -volume-name This parameter specifies volume identifiers to associate volumes with host LUNs. One or more parameters can be requested at the same time. For details, refer to the "1.2.6 Volume Syntax" (page 14).</p> <p>Ex. <code>-volume-number 10-12 -lun 1-3</code> → The volume #10 and LUN 1 are pairs. → The volume #11 and LUN 2 are pairs. → The volume #12 and LUN 3 are pairs. <code>-volume-name v1,v2 -lun 1-2</code> → The volume named "v1" and LUN 1 are pairs. → The volume named "v2" and LUN 2 are pairs.</p> <p>-lun This parameter specifies LUNs to associate volumes with host LUNs. Two or more parameters can be requested by separating with a comma, a hyphen, or both, and also must be specified and synchronized.</p> <p>Ex. <code>-lun 0,1 -lun 0-10 -lun 0,1-10</code></p>

Example(s) The following example creates an affinity group named "AG001". This definition associates volume #8 with LUN #10:

```
CLI> create affinity-group -name AG001 -volume-number 8 -lun 10
```

The following example creates the affinity group named "AG001". It is the definition associated consecutive volumes #0-10 with LUNs #0-10:

```
CLI> create affinity-group -name AG001 -volume-number 0-10 -lun 0-10
```

set affinity-group

This command changes the currently registered affinity group, and adds a definition to it.

Syntax `set affinity-group`
 `{-ag-number source_ag_number | -ag-name source_ag_name }[-name name]`
 `[-volume-number volume_numbers | -volume-name volume_names] [-lun luns]`

Parameters `-ag-number`
 or
 `-ag-name`

This parameter specifies the affinity group identifier to be changed. Two or more parameters cannot be requested at the same time. For details, refer to the ["1.2.8 Affinity Group Syntax" \(page 16\)](#).

`-name` Optional. This parameter specifies a new affinity group name. Two or more parameters cannot be requested at the same time. If omitted, this parameter is left unchanged.

`-volume-number`
or
`-volume-name`

Optional. This parameter specifies volume identifiers to add a definition to the specified affinity group, and is paired with the "-lun" parameter. One or more parameters can be requested at the same time. If omitted, this parameter is left unchanged. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#). If two or more LUNs are specified, this parameter must be specified and synchronized. But, the already assigned definition cannot be requested.

Ex. `-volume-number 10-12 -lun 1-3`

→ The volume #10 and LUN 1 are pairs.

→ The volume #11 and LUN 2 are pairs.

→ The volume #12 and LUN 3 are pairs.

`-volume-name v1,v2 -lun 1-2`

→ The volume named "v1" and LUN 1 are pairs.

→ The volume named "v2" and LUN 2 are pairs.

`-lun` Optional. This parameter specifies LUNs to add as definitions to the specified affinity group, and is paired with volume identifiers. If omitted, this parameter is left unchanged. If two or more of the volume identifiers above are specified, this parameter must be specified and synchronized. However, a definition that has already been assigned cannot be requested.

Two or more parameters can be requested by separating with a comma, a hyphen, or both.

Ex. `-lun 0,1 -lun 0-10 -lun 1,6-8`

Example(s) The following example changes an affinity group named "AGP001". The new name is "NEW_AGP002":

```
CLI> set affinity-group -ag-name AGP001 -name NEW_AGP002
```

In the following example, First, a definition associating consecutive volumes #0-10 with LUNs #0-10 as the affinity group named "AGP001" is created. Then it adds a definition associating consecutive volumes #101-105 with LUNs #11-15. In this case, the previous definition is not changed by the set using "set affinity-group" command, and they are kept. The latter definition is added:

```
CLI> create affinity-group -name AGP001 -volume-number 0-10 -lun 0-10  
CLI> set affinity-group -ag-name AGP001 -volume-number 101-105 -lun 11-15
```

copy affinity-group

This command copies an affinity group.

Syntax `copy affinity-group -name name
 {-source-ag-number source_ag_number | -source-ag-name source_ag_name }`

Parameters `-name` This parameter specifies an affinity group name for the copy destination. Two or more parameters cannot be requested at the same time.

`-source-ag-number`

or

`-source-ag-name`

This parameter specifies an affinity group identifier for the copy source. Two or more parameters cannot be requested at the same time. For details, refer to the ["1.2.8 Affinity Group Syntax" \(page 16\)](#).

Example(s) The following example copies the affinity group named "AG001", and creates a new affinity group named "AG002":

```
CLI> copy affinity-group -name AG002 -source-ag-name AG001
```

delete affinity-group

This command deletes the specified affinity groups, or releases a partial definition of the specified affinity group.

Syntax delete affinity-group {-ag-number *ag_numbers* | -ag-name *ag_names* }
[-lun *luns*]

Parameters -ag-number
or
-ag-name

This parameter specifies affinity group identities to be deleted. One or more parameters can be requested at the same time. For details, refer to the ["1.2.8 Affinity Group Syntax" \(page 16\)](#). By requesting together with the following "-lun" parameter, the partial relation registered in the specified affinity group can be released. In this case, the Affinity group is not deleted.

-lun Optional. This parameter specifies LUNs that release a partial definition of the specified affinity group. Separating with a comma, hyphen or both, can specify two or more parameters. If omitted, then the specified affinity groups are deleted.

Ex. -lun 1,2 -lun 1-3 -lun 1-3,5

Example(s) The following example only deletes affinity group #1:

```
CLI> delete affinity-group -ag-number 1
```

The following example deletes affinity group #1 and #2:

```
CLI> delete affinity-group -ag-number 1,2
```

The following example only releases the definition of LUN #1 associated with the affinity group named "AGP001":

```
CLI> delete affinity-group -ag-name AGP001 -lun 1
```

The following example only releases the definitions of LUN #1 and #2 associated with the affinity group named "AGP001":

```
CLI> delete affinity-group -ag-name AGP001 -lun 1,2
```

The following example respectively releases the relations of LUN #1 and #2 associated with the affinity group named "AGP001" and "AGP002":

```
CLI> delete affinity-group -ag-name AGP001,AGP002 -lun 1,2
```

show affinity-groups

This command displays a list of the registered affinity groups. If this parameter is omitted, the summary list of all the registered affinity groups is displayed. By requesting affinity group details, the definitions associated with volumes with LUNs can be displayed.

Caution 

Multi-group volume information is a status flag which indicates whether or not the same volume is defined for multiple affinity groups.

Syntax show affinity-groups [-ag-number *ag_numbers* | -ag-name *ag_names*]

Parameters -ag-number
 or
 -ag-name

Optional. This parameter specifies affinity group identifiers to display details. One or more parameters can be requested at the same time. If omitted, then a summary of all registered affinity groups is displayed.

Output When the parameter is omitted, a summary of all the registered affinity groups is displayed.

#	Affinity Group No.	Affinity Group Name	Multi-Group Volumes
#	6	AG006	Yes
	A	B	C

- A: Affinity group number
- B: Affinity group name
- C: It shows whether or not the same volume identifier is defined between affinity groups.
 If the same definitions exist, "Yes" is displayed in target affinity groups. Otherwise, "No" is displayed.

When the parameter is requested, the details of the specified affinity group are displayed.

#	Affinity Group No.	Affinity Group Name	LUN No.	Volume Name	Status	Size (MB)	Multi-Group Volume
#	6	AG006	3	VOLUME_003	Available	32	No
	A	B	C	D	E	F	G
							H

- A: Affinity group number
- B: Affinity group name
- C: Logical unit number (LUN)
- D: Volume number
- E: Volume name
- F: Volume status
- G: Volume size
- H: It shows whether or not the same volume identifier is defined between affinity groups.
 If the same definitions exist, "Yes" is displayed in target volumes. Otherwise, "No" is displayed.

Example(s) The following example displays a summary of all of the existing affinity groups:

```
CLI> show affinity-groups
Affinity Group      Multi-Group
No. Name            Volumes
4 AG004            Yes
5 AG005            No
6 AG006            Yes
```

The following example displays details of affinity group #6:

```
CLI> show affinity-groups -ag-number 6
Affinity Group No.6
Affinity Group Name AG006
LUN  Volume      Status      Size (MB) Multi-Group
    No.  Name
1    1  VOLUME_001  Available  32 No
2    2  VOLUME_002  Available  32 No
3    3  VOLUME_003  Available  32 No
```

3.3.4 Mapping (When the Host Affinity Mode is Enabled)

This section explains the related commands for mapping when Host Affinity Mode is enabled. Mapping in which Host Affinity Mode is enabled is the definition of associated host identifiers with an affinity group. So it is necessary that affinity groups are defined and created in advance.

set host-affinity

This command associates affinity groups with host identifiers (HBA) through host interface ports. By this designation, security can be sustained by accessing from host servers. You cannot use this when the Host Affinity Mode of the requested host interface port is disabled. The maximum number of available definitions depends on the number of available host interface ports and the model type.

Syntax `set host-affinity -port {xy|all} {-ag-number ag_numbers | -ag-name ag_names } {-host-number host_numbers | -host-name host_names }`

Parameters `-port` This parameter specifies a host interface port to associate affinity groups with host servers. Two or more parameters can be requested by separating with a comma.

Ex. `-port 00,10`

For details, refer to "[1.2.11 Host Interface Port Syntax](#)" (page 17).

`xy` "x" is the controller module (CM) number, and "y" is the FC port number.

Ex. `10` (FC port#0 on CM#1)

`all` All the FC interface ports (default)

`-ag-number`
or
`-ag-name`

This parameter specifies affinity group identifiers to be associated. One or more parameters can be requested at the same time. For details, refer to the "[1.2.8 Affinity Group Syntax](#)" (page 16). If two or more parameters are requested, also the following host identifier parameters must be requested and synchronized.

`-host-number` or `-host-name`

This parameter specifies host identifiers to be associated. One or more parameters can be requested at the same time. For details, refer to the "[1.2.7 Host Syntax](#)" (page 15). If two or more parameters are requested, also the above affinity group identifier parameters must be requested and synchronized.

Example(s) The following example associates affinity group #1 with host #1 through host interface port #0 on CM#0:

```
CLI> set host-affinity -port 00 -ag-number 1 -host-number 1
```

The following example respectively associates the consecutive affinity groups #1-3 with hosts #1-3, all through host interface port #0 on CM#0:

```
CLI> set host-affinity -port 00 -ag-number 1-3 -host-number 1-3
```

The following example associates the same affinity group (#1) with two hosts (#1 and #2) at the same time:

```
CLI> set host-affinity -port 00 -ag-number 1 -host-number 1,2
```

The following example associates the affinity group named "AGP001" with the host named "HBA001" through all the host interface ports:

```
CLI> set host-affinity -port all -ag-name AGP001 -host-name HBA001
```

The following example associates the affinity group named "AGP001" with the host named "HBA001" through all the host interface ports on the CM#1:

```
CLI> set host-affinity -port 10,11 -ag-name AGP001 -host-name HBA001
```

(identical with the following)

```
CLI> set host-affinity -port 10 -ag-name AGP001 -host-name HBA001  
CLI> set host-affinity -port 11 -ag-name AGP001 -host-name HBA001
```


copy host-affinity

This command copies the mapping definition associated through the specified host interface port to others. You cannot use this when the Host Affinity Mode of the host interface port is disabled.

Syntax `copy host-affinity -source-port {xy} -destination-port {xy|all}`

Parameters `-source-port`

This parameter specifies a host interface port for the copy source. Only one parameter is allowed at the same time.

Ex. `-source-port 00`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

`xy` "x" is the controller module (CM) number, and "y" is the host port number.

Ex. `10 (host port#0 on CM#1)`

`-destination-port`

This parameter specifies host interface ports for the copy destination. Two or more parameters can be requested by separating with a comma.

Ex. `-destination-port 00,10`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

If selecting "all", all the host interface ports are changed identically.

`xy` "x" is the controller module (CM) number, and "y" is the host port number.

Ex. `10 (host port#0 on CM#1)`

`all` All the host interface ports

Example(s) The following example copies the host affinity definition from the host interface port #0 on the CM#0 to the host interface port #0 on the CM#1:

```
CLI> copy host-affinity -source-port 00 -destination-port 10
```

The following example copies the host affinity definition from the host interface port #0 on the CM#0 to all the host interface ports on the CM#1:

```
CLI> copy host-affinity -source-port 00 -destination-port 10,11
```

release host-affinity

This command releases the mapping definition associated with affinity groups with host identifiers. You cannot use this when the Host Affinity Mode of the host interface port is disabled.

Syntax `release host-affinity -port {xy|all}`
 `[-host-number host_numbers | -host-name host_names]`

Parameters `-port` This parameter specifies host interface ports to be released. Two or more parameters can be requested by separating with a comma.

Ex. `-port 00,10`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

If this parameter together with host identifiers is requested, only the mapping definition of host interface ports corresponding to the specified host identifiers are released.

`xy` "x" is the controller module (CM) number, and "y" is the host port number.

Ex. `10` (host port#0 on CM#1)

`all` All the host interface ports

`-host-number`

or

`-host-name`

Optional. This parameter specifies host identifiers to release host identifiers of the specified host interface port. One or more parameters can be requested at the same time. If omitted, then all definitions of the specified host interface ports are released.

Example(s) The following example releases all host affinities through host port #0 on CM#1:

```
CLI> release host-affinity -port 10
```

The following example only releases the host affinity of the host named "H1" through host port #0 on CM#0:

```
CLI> release host-affinity -port 00 -host-name H1
```

The following example releases the host affinity of the host named "H1" through host port #0 and #1 on CM#0:

```
CLI> release host-affinity -port 00,01 -host-name H1
```

The following example respectively releases the host affinities of the host named "H1" and "H2" through host port #0 and #1 on CM#0:

```
CLI> release host-affinity -port 00,01 -host-name H1,H2
```

The following example respectively releases the host affinities of host #1 and #2 through host port #0 on CM#0:

```
CLI> release host-affinity -port 00 -host-number 1,2
```

show host-affinity

This command displays a list of the mapping definitions associating affinity groups with host identifiers. By requesting affinity groups, host identifiers, or host interface ports, the mapping can be narrowed down and displayed. You cannot use this when the Host Affinity Mode of the host interface port is disabled.



Caution

Multi-group volume information is a status flag which indicates whether or not the same volume is defined for multiple affinity groups

Syntax	show host-affinity [-port {xy all}] [-ag-number <i>ag_numbers</i> -ag-name <i>ag_names</i>] [-host-number <i>host_numbers</i> -host-name <i>host_names</i>]
Parameters	<p>-port Optional. This parameter specifies host interface ports to be narrowed down. Two or more parameters can be requested by separating with a comma. If omitted, then it is handled with as all the host interface ports are selected.</p> <p> Ex. -port 00,10 For details, refer to "1.2.11 Host Interface Port Syntax" (page 17).</p> <p>xy "x" is the controller module (CM) number, and "y" is the host port number. Ex. 10 (host port#0 on CM#1)</p> <p>all All the host interface ports (default)</p> <p>-ag-number or -ag-name Optional. This parameter specifies affinity group identifiers to be narrowed down. One or more parameters can be requested at the same time. For details, refer to the "1.2.8 Affinity Group Syntax" (page 16). If omitted, then this parameter is ignored.</p> <p>-host-number or -host-name Optional. This parameter specifies host identifiers to be narrowed down. One or more parameters can be requested at the same time. For details, refer to the "1.2.7 Host Syntax" (page 15). If omitted, then this parameter is ignored.</p>

Output

# CM#0 Port#0				
# Host		Affinity Group		Multi-Group
# No. Name		No. Name		Volumes
# 1 HBA1		4 AG004		No
A B		C D		E

- A: Host number
- B: Host name
- C: Affinity group number
- D: Affinity group name
- E: It shows whether or not the same volume identifier is defined between affinity groups.
 If the same definitions exist, "Yes" is displayed in target affinity groups. Otherwise, "No" is displayed.

Example(s) The following example displays all the registered mappings.

```

CLI> show host-affinity
CM#0 Port#0 (Host Affinity Mode Enable)
Host          Affinity Group      Multi-Group
No. Name      No. Name             Volumes
 1 HBA1        4 AG004              No

CM#0 Port#1 (Host Affinity Mode Enable)
Host          Affinity Group      Multi-Group
No. Name      No. Name             Volumes
 1 HBA1        4 AG004              No
 2 HBA2        5 AG005              No
 3 HBA33       5 AG005              No

CM#1 Port#0 (Host Affinity Mode Disable)

CM#1 Port#1 (Host Affinity Mode Enable)
Host          Affinity Group      Multi-Group
No. Name      No. Name             Volumes
 5 HBA5        6 AG006              No
    
```

The following example displays all mappings associated through the host interface port #0 on CM#0:

```

CLI> show host-affinity -port 00
CM#0 Port#0 (Host Affinity Mode Enable)
Host          Affinity Group      Multi-Group
No. Name      No. Name             Volumes
 1 HBA1        4 AG004              No
    
```

The following example only displays the mapping associated with the affinity group #4:

```

CLI> show host-affinity -ag-number 4
CM#0 Port#0 (Host Affinity Mode Enable)
Host          Affinity Group      Multi-Group
No. Name      No. Name             Volumes
 1 HBA1        4 AG004              No

CM#0 Port#1 (Host Affinity Mode Enable)
Host          Affinity Group      Multi-Group
No. Name      No. Name             Volumes
 1 HBA1        4 AG004              No
    
```

The following example only displays the mapping associated with the host named "HBA5":

```
CLI> show host-affinity -host-name HBA5
CM#1 Port#1 (Host Affinity Mode Enable)
Host
No. Name          Affinity Group  Multi-Group
5 HBA5            6 AG006         No
```

The following is an example that includes multi-group volumes. In this case a volume identifier in affinity group "AG001" is also defined in affinity group "AG002", as indicated by the "Yes" displayed for both affinity groups "AG001" and "AG002", while "No" is displayed for affinity group "AG003":

```
CLI> show host-affinity -port 00
CM#0 Port#0 (Host Affinity Mode Enable)
Host
No. Name          Affinity Group  Multi-Group
1 HBA1            1 AG001         Yes
1 HBA2            2 AG002         Yes
1 HBA3            3 AG003         No
```

3.3.5 Mapping (When the Host Affinity Mode is Disabled)

This section explains the related commands for mapping when the Host Affinity Mode is disabled. Mapping in which the Host Affinity Mode is not enabled is a definition of associated volumes with host LUNs.

set mapping

This command is used for mapping when the host affinity mode is disabled. This command associates the specified volumes with host LUNs (logical unit number) through the specified host interface port. Usually you can set 0-255 as the value of a LUN, but can set 0-511 in the case of HP-UX host environment. You cannot use this when the Host Affinity Mode of the host interface port is enabled.

Syntax	set mapping -port {xy all} {-volume-number <i>volume_numbers</i> -volume-name <i>volume_names</i> } -lun <i>luns</i>	
Parameters	-port	This parameter specifies host interface ports to associate volumes with LUNs. Two or more parameters can be requested by separating with a comma. Ex. -port 00,10 For details, refer to "1.2.11 Host Interface Port Syntax" (page 17) . xy "x" is the controller module (CM) number, and "y" is the host port number Ex. 10 (host port#0 on CM#1) all All the host interface ports
	-volume-number or -volume-name	This parameter specifies volumes identifiers to be associated. One or more parameters can be requested at the same time. For details, refer to the "1.2.6 Volume Syntax" (page 14) . If two of more LUNs are specified, this parameter must also be specified and synchronized. Ex. -volume-number 10-12 -lun 1-3 → The volume #10 and LUN 1 are pairs. → The volume #11 and LUN 2 are pairs. → The volume #12 and LUN 3 are pairs. -volume-name v1,v2 -lun 1-2 → The volume named "v1" and LUN 1 are pairs. → The volume named "v2" and LUN 2 are pairs.
	-lun	This parameter specifies LUNs to be associated. If two or more volumes are specified, this parameter must also be specified and synchronized. Two or more parameters can be requested by separating with a comma, a hyphen, or both. Ex. -lun 1,2 -lun 0-10 -lun 1,2-9
Example(s)	The following example associates the volume named "VOL001" with LUN #1 through host interface port #0 on CM#1:	

```
CLI> set mapping -port 10 -volume-name VOL001 -lun 1
```


The following example associates the volume named "VOL002" and LUN #2 through all the host interface ports:

```
CLI> set mapping -port all -volume-name VOL002 -lun 2
```

The following example associates the volume named "VOL002" and LUN #2 through host interface ports #0 and #1 on CM#0:

```
CLI> set mapping -port 00,01 -volume-name VOL002 -lun 2
```

(identical with the following)

```
CLI> set mapping -port 00 -volume-name VOL002 -lun 2  
CLI> set mapping -port 01 -volume-name VOL002 -lun 2
```

The following example respectively associates the consecutive volume #0-9 with LUN #0-9 through host interface port #0 on CM#0:

```
CLI> set mapping -port 00 -volume-number 0-9 -lun 0-9
```

copy mapping

This command copies the mapping definition associated through the specified host interface port to others. You cannot use when the Host Affinity Mode of the host interface port is enabled.

Syntax `copy mapping -source-port {xy} -destination-port {xy|all}`

Parameters `-source-port`

This parameter specifies a host interface port for the copy source. Only one parameter is allowed at the same time.

Ex: `-source-port 00`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

`xy` "x" is the controller module (CM) number, and "y" is the host port number.

Ex. 10 (host port#0 on CM#1)

`-destination-port`

This parameter specifies host interface ports for the copy destination. Two or more parameters can be requested by separating with a comma.

Ex: `-destination-port 00,10`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

If selecting "all", all the host interface ports are changed identically.

`xy` "x" is the controller module (CM) number, and "y" is the host port number.

Ex. 10 (host port#0 on CM#1)

`all` All the host interface ports

Example(s) The following example copies the mapping definition from host interface port #0 on CM#0 to host interface port #0 on CM#1:

```
CLI> copy mapping -source-port 00 -destination-port 10
```

The following example copies the mapping definition from host interface port #0 on CM#0 to host interface ports #0 and #1 on CM#1:

```
CLI> copy mapping -source-port 00 -destination-port 10,11
```

release mapping

This command releases the mapping definition associating volumes with LUNs. You cannot use this when the Host Affinity Mode of the host interface port is enabled.

Syntax `release mapping -port {xy|all} [-lun luns]`

Parameters `-port` This parameter specifies host interface ports to be released. Two or more parameters can be requested by separating with a comma.

Ex. `-port 00,10`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

If the following LUN parameter is omitted, all mappings associated with the specified host interface port are released. If this parameter is requested along with the LUN parameter, only the mapping definition of the host interface port corresponding to the specified LUN is released.

`xy` "x" is the controller module (CM) number, and "y" is the host port number.

Ex. `10` (host port#0 on CM#1)

`all` All the host interface ports

`-lun` Optional. This parameter specifies LUNs to release the partial mapping association. Separating with a comma, a hyphen or both can specify two or more parameters. If omitted, then all definitions of the specified host interface port are deleted.

Ex. `-lun 1,2 -lun 1-3 -lun 1-3,5`

Example(s) The following example releases all the mappings through host interface port #0 on CM#0:

```
CLI> release mapping -port 00
```

The following example only releases the mapping definition of LUN #2 through host interface port #1 on CM#1:

```
CLI> release mapping -port 11 -lun 2
```

The following example releases all the mappings through host interface ports #0 and #1 on CM#1:

```
CLI> release mapping -port 10,11
```

The following example releases all the registered mappings:

```
CLI> release mapping -port all
```

show mapping

This command displays a list of the mapping definitions associating volumes with host LUNs. By requesting either volumes or host interface ports, they can be narrowed down and displayed. You cannot use this when the Host Affinity Mode of the host interface port is enabled.

Syntax `show mapping [-port {xy|all}]`
 `[-volume-number volume_numbers | -volume-name volume_names]`

Parameters `-port` Optional. This parameter specifies host interface ports to be narrowed down. Two or more parameters can be requested by separating with a comma. If omitted, this parameter is ignored.

Ex. `-port 00,10`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

`xy` "x" is the controller module (CM) number, and "y" is the host port number.

Ex. `10` (host port#0 on CM#1)

`all` All the host interface ports (default)

`-volume-number`

or

`-volume-name`

Optional. This parameter specifies volume identifiers to narrow down. One or more parameters can be requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#). If omitted, then this parameter is ignored.

Output

#	CM#0	Port#0	(Host Affinity Mode Disable)		
A	B				
#	LUN	Volume	Status		Size (MB)
#	No.	Name			
#	100	1001 VOLUME	000000001 Available		32
C	D	E	F		G

- A: Host interface port
- B: Host affinity mode
- C: Logical unit number (LUN)
- D: Volume number
- E: Volume name
- F: Volume status
- G: Volume size

Example(s) The following example displays all of the existing mappings:

```
CLI> show mapping
CM#0 Port#0 (Host Affinity Mode Disable)
LUN Volume Status Size (MB)
  No. Name
  1 1 VOL001 Available 32
  2 2 VOL002 Available 32
  3 3 VOL003 Available 32

CM#0 Port#1 (Host Affinity Mode Enable)

CM#1 Port#0 (Host Affinity Mode Disable)
LUN Volume Status Size (MB)
  No. Name
  3 1 VOL001 Available 32
  4 2 VOL002 Available 32
  5 3 VOL003 Available 32

CM#1 Port#1 (Host Affinity Mode Enable)
```

The following example only displays the mappings associated with the volume named "VOL001":

```
CLI> show mapping -volume-name VOL001
CM#0 Port#0 (Host Affinity Mode Disable)
LUN Volume Status Size (MB)
  No. Name
  1 1 VOL001 Available 32

CM#1 Port#0 (Host Affinity Mode Disable)
LUN Volume Status Size (MB)
  No. Name
  3 1 VOL001 Available 32
```

The following example displays the mappings associated with host interface port #0 on CM#0:

```
CLI> show mapping -port 00
CM#0 Port#0 (Host Affinity Mode Disable)
LUN Volume Status Size (MB)
  No. Name
  1 1 VOL001 Available 32
  2 2 VOL002 Available 32
  3 3 VOL003 Available 32
```

3.3.6 Host Response

This section explains the related commands to set up host response.

set host-response

This command defines or changes host responses. The maximum number of available definitions depends on the number of available host interface ports and the model type. Host response #0 is reserved by the ETERNUS DX60/DX80/DX90 as a default. Although the name of default #0 cannot be changed, the values are modifiable.

When initially defining a host response, the host response number must be used and a host response name must be set.

Syntax `set host-response`
 `{-host-response-number host_response_number |`
 `-host-response-name host_response_name }`
 `[-inquiry {enable | disable}] [-vpd {type1 | type1-3 | type3}]`
 `[-conflict {enable | disable}] [-name name] [-timeout timeout] [-version {5|4|3}]`
 `[-host-specific-mode {normal | aix | hp-ux}] [-symmetric {active | passive}]`
 `[-lun-change {enable | disable}] [-lun-expand {enable | disable}]`
 `[-vendor-unique-sense {enable|disable}]`

Parameters `-host-response-number`
 or
 `-host-response-name`


This parameter specifies a host response identifier, and is available from #0, system default in ascending. When a new host response is defined, it needs an unused host response number. Confirm it using the "show host-response" command. Two or more parameters cannot be requested at the same time. For details, refer to the ["1.2.9 Host Response Syntax" \(page 16\)](#).

`-inquiry` Optional. After the link between the ETERNUS DX60/DX80/DX90 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. If omitted, this parameter is left unchanged.

`enable` When the Byte-0 is "0x20 (configuration is available, unformatted)", converts the Byte-0 value to "0x7f (configuration is not available)" and responses.

`disable` Responses with the value specified in the ETERNUS DX60/DX80/DX90. (default)

- vpd Optional. This parameter specifies the Vital Product Data (VPD) information type to respond to the host. VPD information includes the device information (Vendor ID, Product ID for each model, volume number, etc.) for the volume. Type1 and Type3 indicate the data format. If omitted, this parameter is left unchanged.
- | | |
|---------|-------------------------|
| type1 | type1 |
| type1-3 | type1 + type3 (default) |
| type3 | type3 |
- conflict Optional. This parameter specifies whether to notify or not notify the Reservation Conflict to the "Test Unit Ready" command when volumes are reserved from the other host. If omitted, this parameter is left unchanged.
- | | |
|---------|----------------------------------------|
| enable | Conflict response is notified. |
| disable | Normal response is notified. (default) |
- name Optional. This parameter specifies the host response name that corresponds to this definition. If omitted, this parameter is left unchanged. If selecting host response #0, this parameter cannot be requested. For details, refer to the ["1.2.4 Alias Name Syntax" \(page 14\)](#).
- Caution** 
- This parameter is required when initially defining a host response.
- timeout Optional. This parameter specifies the timeout of a host command. The range is 10-255, and a unit of a timeout is one second. If omitted, this parameter is left unchanged. The initial value is 25 seconds.
- version Optional. This parameter specifies the Standard Data Version (version number of the SCSI standard) of the Inquiry command. If omitted, this parameter is left unchanged.
- | | |
|---|------------------------------------|
| 5 | The data version is 5th. (default) |
| 4 | The data version is 4th. |
| 3 | The data version is 3rd. |

-host-specific-mode

Optional. This parameter specifies the host specific mode. If omitted, this parameter is left unchanged. If selecting the HP-UX mode, the number of mappings can be set up to 1024. In other cases, it can be set up to 256.

normal Normal response (default)

aix AIX Mode
Specify this to prevent the command initialization and performance degradation.

hp-ux HP-UX Mode
Specify this to recognize volumes with more than 8LU(s).

-symmetric Optional. This parameter specifies symmetrical access to a Logical Unit. If omitted, this parameter is left unchanged.

active ACTIVE/ACTIVE

passive ACTIVE-ACTIVE / PREFERRED_PATH (default)

-lun-change

Optional. This parameter specifies notification when LUN mapping is changed. If omitted, this parameter is left unchanged.

enable Notified

disable Not notified (default)

-lun-expand

Optional. This parameter specifies the notification when LUN capacity is changed. If omitted, this parameter is left unchanged.

enable Notified

disable Not notified (default)

-vendor-unique-sense

Optional. This parameter specifies 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. If omitted, this parameter is left unchanged.

enable Notified

disable Not notified (default)

Example(s) The following example sets up the host response corresponding to host response #1. The new host response name is "win-x". The host command timeout is 30 seconds:

```
CLI> set host-response -host-response-number 1 -name win-x -timeout 30
```

delete host-response

This command deletes host responses corresponding to the specified host response.

Syntax `delete host-response {-host-response-number host_response_numbers | -host-response-name host_response_names}`

Parameters `-host-response-number`
 or
 `-host-response-name`

This parameter specifies host response identifiers to be deleted, but host response #0, system default, cannot be deleted. One or more parameters can be requested at the same time. For details, refer to the ["1.2.9 Host Response Syntax" \(page 16\)](#).

Example(s) The following example deletes the consecutive host responses #1-3:

```
CLI> delete host-response -host-response-number 1-3
```

The following example only deletes the host response named "HOSTRESP1":

```
CLI> delete host-response -host-response-name HOSTRESP1
```

show host-response

This command displays the host response. If this parameter is omitted, a list of host responses is displayed. Otherwise, details of the specified parameters are displayed.

Syntax show host-response [-host-response-number *host_response_numbers* | -host-response-name *host_response_names*]

Parameters -host-response-number
or
-host-response-name

Optional. This parameter specifies a host response identifier to display details. One or more parameters can be requested at the same time. If omitted, then the summary list is displayed. For details, refer to the ["1.2.9 Host Response Syntax" \(page 16\)](#).

Output When requesting a host response, details are displayed.

```
# Host Response No.5
# Host Response Name                am0005
# Byte-0 of Inquiry Response        Not conversion (Default)
# Inquiry VPD ID Type                Type1 + Type3 (Default)
# Inquiry Standard Data Version      Version 5 (Default)
# Command Timeout Interval           25 (Default)
# Load Balance Response              Unit Attention (Default)
# Reservation Conflict Response for Test Unit Ready Normal (Default)
# Change Volume Mapping              Not report (Default)
# Volume Capacity Expansion          Not report (Default)
# Vendor Unique Sense Code           Not report (Default)
# Host Specific Mode                 Normal (Default)
# Asymmetric / Symmetric Logical Unit Access ACTIVE-ACTIVE / PREFERRED_PATH (Default)
```

When parameters are omitted, the summary list is displayed.

```
# Host Response
# No. Name
  1 am0001
  A B
```

A: Host response number
B: Host response name

Example(s) The following example displays details corresponding to the specified host response #5:

```
CLI> show host-response -host-response-number 5
Host Response No.5
Host Response Name                am0005
Byte-0 of Inquiry Response        Not conversion (Default)
Inquiry VPD ID Type                Type1 + Type3 (Default)
Inquiry Standard Data Version      Version 5 (Default)
Command Timeout Interval           25 (Default)
Load Balance Response              Unit Attention (Default)
Reservation Conflict Response for Test Unit Ready Normal (Default)
Change Volume Mapping              Not report (Default)
Volume Capacity Expansion          Not report (Default)
Vendor Unique Sense Code           Not report (Default)
Host Specific Mode                 Normal (Default)
Asymmetric / Symmetric Logical Unit Access ACTIVE-ACTIVE / PREFERRED_PATH (Default)
```

The following example lists the summary of all the registered host responses:

```
CLI> show host-response
Host Response
No. Name
  1 am0001000111
  2 am0002
  3 am0003
```

set host-sense

This command can set the preset host sense corresponding to a specific host operating system.

Syntax	set host-sense {-host-response-number <i>response-numbers</i> -host-response-name <i>response-names</i> } -preset {no-conversion linux windows}
Parameters	-host-response-number or -host-response-name This parameter specifies a host response identifier that is to be used to set a host sense. One or more parameters can be specified at the same time. For details, refer to the "1.2.9 Host Response Syntax" (page 16) . -preset This parameter specifies the preset host sense corresponding to the specific host operating system. no-conversion It will revert to the default host sense value. (Default) Linux Linux host. (When Linux GRMPD is not in use.) Windows Windows host. (When GR/ETERNUS MPD and its device driver are not in use.)

Example(s) The following example sets the preset host sense for 'Linux' to host response #1.

```
CLI> set host-sense -host-response-number 1 -preset linux
```

In the following example, the host sense that is set to host response #1 reverts to the default value.

```
CLI> set host-sense -host-response-number 1 -preset no-conversion
```

show host-sense

This command displays a list of the host responses and the associated sense code conversion information. Only preset information can be shown.

Syntax show host-sense {-host-response-number *host_response_numbers* |
 -host-response-name *host_response_names*}

Parameters -host-response-number
 or
 -host-response-name

This parameter specifies the host response identifiers whose entries are to be displayed. One or more host response identifiers can be specified at the same time. For details, refer to the ["1.2.9 Host Response Syntax" \(page 16\)](#).

Output

#	Host Response	Sense	Original	Converted
#	No. Name	No.	Sense Code	Sense Code
#	6 fj0006	1	04/**/**	06/**/** (Linux)
	A B	C	D E F	G H I J

- A: Host response number
- B: Host response name
- C: Host sense number
- D: Original sense key
- E: Original sense code (Additional sense code)
- F: Original sub sense code (Additional sense code qualifier)
- G: Converted sense key
- H: Converted sense code (Additional sense code)
- I: Converted sub sense code (Additional sense code qualifier)
- J: Preset function name

Example(s) The following example displays the host responses and associated sense conversions:

```
CLI> show host-sense -host-response-number 1,2
Host Response      Sense Original  Converted
No. Name           No.   Sense Code  Sense Code
1 fj0001           1     04/**/**    06/**/**    (Linux)
2 fj0002           1     03/**/**    04/**/**    (Windows)
```

3.3.7 Reset Group for Host Interface Port

This section explains the related commands regarding "Reset Group for Host Interface Port".

set ca-reset-group

This command sets the reset groups for the host interface ports (Controller Module Channel Adapters). Up to a maximum of eight can be specified for the ETERNUS DX90 which has eight FC host interface ports per system.

Syntax `set ca-reset-group [-group1 xy] [-group2 xy] [-group3 xy] [-group4 xy] [-group5 xy] [-group6 xy] [-group7 xy] [-group8 xy]`

Parameters `-group1` Optional. This parameter sets up a combination of the resetting host interface ports. By separating with a comma, two or more host interface ports can be requested at the same time.
`-group2`
`-group3`
`-group4`
`-group5` Ex. `-group 00,10`
`-group6` For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).
`-group7`
`-group8`

Caution

- One port cannot belong to two or more groups.
- When a combination of the ports to be reset is changed, recreate each reset group.

`xy` "x" is the controller module (CM) number, and "y" is the host port number.

Ex. 10 (host port#0 on CM#1)

Example(s) The following example sets up the reset groups. The group number specifies both #1 and #2. The combination of reset group #1 is both ports on CM#0. And, that group #2 is both ports CM#1:

```
CLI> set ca-reset-group -group1 00,01 -group2 10,11
```


show ca-reset-group

This command displays the groups of host interface ports that will be reset. The number of output host interface ports depends on available ones.

Syntax show ca-reset-group

Parameters No parameters.

Output For the ETERNUS DX60/DX80:

#	CM#0 Port#0	CM#0 Port#1	CM#1 Port#0	CM#1 Port#1
#	A	B	C	D
# Reset Group	*		*	
	E	F	E	F

- A: A host interface port #0 on CM#0
- B: A host interface port #1 on CM#0
- C: A host interface port #0 on CM#1
- D: A host interface port #1 on CM#1
- E: Assignment indicator
- F: Not assigned (blank)

For the ETERNUS DX90:

```

# CLI> show ca-reset-group
#
#           CM#0    CM#0    CM#0    CM#0    CM#1    CM#1    CM#1    CM#1
#           Port#0  Port#1  Port#2  Port#3  Port#0  Port#1  Port#2  Port#3
#           A      B      C      D      E      F      G      H
# Reset Group  *
# Reset Group
# Reset Group
# Reset Group
# Reset Group
# Reset Group
# Reset Group
# Reset Group
# Reset Group
# Reset Group
# Reset Group
#           J      J      J      J      J      J      J      I
    
```

- A: A host interface port #0 on CM#0
- B: A host interface port #1 on CM#0
- C: A host interface port #2 on CM#0
- D: A host interface port #3 on CM#0
- E: A host interface port #0 on CM#1
- F: A host interface port #1 on CM#1
- G: A host interface port #2 on CM#1
- H: A host interface port #3 on CM#1
- I: Assignment indicator
- J: Not assigned (blank)

Example(s) The following example displays the reset groups when 4 ports are available:

```

CLI> show ca-reset-group
           CM#0    CM#0    CM#1    CM#1
           Port#0  Port#1  Port#0  Port#1
Reset Group  *
Reset Group
Reset Group
Reset Group
    
```

The following example displays the reset groups when 2 ports are available:

```

CLI> show ca-reset-group
           CM#0    CM#1
           Port#0  Port#0
Reset Group  *
Reset Group
    
```

The following example displays the reset groups for the 2-port (per controller) SAS case. This model has two physical interfaces per controller that can be used for host server connection, but only one settable port, so the label "Port#0-1" is used:

```
CLI> show ca-reset-group
      CM#0    CM#1
      Port#0-1 Port#0-1
Reset Group      *
Reset Group      *
```

The following example displays the reset group when 8 host interface ports are available:

```
CLI> show ca-reset-group
      CM#0    CM#0    CM#0    CM#0    CM#1    CM#1    CM#1    CM#1
      Port#0  Port#1  Port#2  Port#3  Port#0  Port#1  Port#2  Port#3
Reset Group      *
Reset Group      *
Reset Group      *
Reset Group      *
Reset Group      *
Reset Group      *
Reset Group      *
Reset Group      *
```

3.3.8 Ping Command for iSCSI Hosts

This section explains the ping related commands used in an iSCSI environment.

test iscsi-ping

This command issues a ping command from the specified host interface port to the specified iSCSI host.

Syntax `test iscsi-ping -port port -ip iscsi_host [-count count]`

Parameters `-port` This parameter specifies the source host interface port used to issue the ping command. Only one host interface port can be specified at any given time.

Ex. `-port 00`

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

`xy` "x" is the controller module (CM) number, and "y" is the host port number.

Ex. `10 (host port#0 on CM#1)`

`-ip` This parameter specifies the IP address of the target iSCSI host. Only one iSCSI host can be specified at any given time.

`-count` Optional. This parameter specifies the number of times that the ping command is to be issued. Any value between 1 and 10 can be specified. If omitted, this parameter value defaults to 1.

Example(s) The following example causes two pings to be issued from port#0 on CM#1 to the iSCSI host 192.168.2.10. In this case, a "Success" string is displayed. This result indicates that a normal response was received to both pings:

```
CLI> test iscsi-ping -port 10 -ip 192.168.2.10 -count 2
Success
```

The following example uses the same command as the previous example, but in this case, a "Failure" string is displayed. This result indicates that a normal response was not received for at least one of the pings:

```
CLI> test iscsi-ping -port 10 -ip 192.168.2.10 -count 2
Failure
```

Chapter 4 Settings

This chapter explains the commands used for the following functions.

- User account management
- Advanced copy management
- Network management (Redundant IP/SNMP etc.)
- Date and Time/NTP
- System configuration (Box ID, Storage system name)
- Power synchronization
- SSH/SSL security configuration

4.1 User Management

This section explains the commands used to manage user accounts and passwords.

An SSH public key can be used for user authentication.

create user

This command creates a new user account. Previously registered user names cannot be used.

Syntax	create user -name <i>name</i> -level {monitor standard advanced} [-function {enable disable}]																
Parameters	<table><tr><td>-name</td><td>This parameter must specify a unique name for the new user account. Alphanumeric characters (case-sensitive), exclamation points (!), hyphens (-), underscores (_), and periods (.) may be used, with a maximum of 16 letters allowed, and a minimum of 4 letters required. A password must be entered from the terminal after the command is executed. The input rules for the password are the same as for the user name.</td></tr><tr><td>-level</td><td>This parameter specifies the user level. For details, refer to "1.10 CLI User Authority" (page 22). <table><tr><td>monitor</td><td>Monitor authority</td></tr><tr><td>standard</td><td>Standard authority</td></tr><tr><td>advanced</td><td>Advanced authority</td></tr></table></td></tr><tr><td>-function</td><td>Optional. This parameter specifies whether the user account is enabled when it is created, or not. If omitted, "enable" is assumed. <table><tr><td>enable</td><td>The created user account is enabled immediately. (default)</td></tr><tr><td>disable</td><td>The user account is created but left nonfunctional.</td></tr></table></td></tr></table>	-name	This parameter must specify a unique name for the new user account. Alphanumeric characters (case-sensitive), exclamation points (!), hyphens (-), underscores (_), and periods (.) may be used, with a maximum of 16 letters allowed, and a minimum of 4 letters required. A password must be entered from the terminal after the command is executed. The input rules for the password are the same as for the user name.	-level	This parameter specifies the user level. For details, refer to "1.10 CLI User Authority" (page 22) . <table><tr><td>monitor</td><td>Monitor authority</td></tr><tr><td>standard</td><td>Standard authority</td></tr><tr><td>advanced</td><td>Advanced authority</td></tr></table>	monitor	Monitor authority	standard	Standard authority	advanced	Advanced authority	-function	Optional. This parameter specifies whether the user account is enabled when it is created, or not. If omitted, "enable" is assumed. <table><tr><td>enable</td><td>The created user account is enabled immediately. (default)</td></tr><tr><td>disable</td><td>The user account is created but left nonfunctional.</td></tr></table>	enable	The created user account is enabled immediately. (default)	disable	The user account is created but left nonfunctional.
-name	This parameter must specify a unique name for the new user account. Alphanumeric characters (case-sensitive), exclamation points (!), hyphens (-), underscores (_), and periods (.) may be used, with a maximum of 16 letters allowed, and a minimum of 4 letters required. A password must be entered from the terminal after the command is executed. The input rules for the password are the same as for the user name.																
-level	This parameter specifies the user level. For details, refer to "1.10 CLI User Authority" (page 22) . <table><tr><td>monitor</td><td>Monitor authority</td></tr><tr><td>standard</td><td>Standard authority</td></tr><tr><td>advanced</td><td>Advanced authority</td></tr></table>	monitor	Monitor authority	standard	Standard authority	advanced	Advanced authority										
monitor	Monitor authority																
standard	Standard authority																
advanced	Advanced authority																
-function	Optional. This parameter specifies whether the user account is enabled when it is created, or not. If omitted, "enable" is assumed. <table><tr><td>enable</td><td>The created user account is enabled immediately. (default)</td></tr><tr><td>disable</td><td>The user account is created but left nonfunctional.</td></tr></table>	enable	The created user account is enabled immediately. (default)	disable	The user account is created but left nonfunctional.												
enable	The created user account is enabled immediately. (default)																
disable	The user account is created but left nonfunctional.																

Example(s) The following example creates a new Standard access level user account named "user1":

```
CLI> create user -name user1 -level standard  
Password :  
Confirm Password :
```

set user

This command changes the profile information of a currently registered user. User names cannot be changed. Currently logged in user accounts can be changed, with changes enabled after the next login.

Syntax	<code>set user -name <i>name</i> [-level {monitor standard advanced}] [-function {enable disable}]</code>	
Parameters	<code>-name</code>	This parameter must specify a single user name.
	<code>-level</code>	Optional. This parameter specifies the user level authority. If omitted, the access level is not changed. For details, refer to "1.10 CLI User Authority" (page 22) .
	<code>monitor</code>	Monitor authority
	<code>standard</code>	Standard authority
	<code>advanced</code>	Advanced authority
	<code>-function</code>	Optional. This parameter specifies whether the modified user account is enabled, or not. If omitted, "enable" is assumed.
	<code>enable</code>	The specified user account is enabled.
	<code>disable</code>	The specified user account is disabled.

Example(s) The following example changes the access level of the user account named "user1" to Monitor:

```
CLI> set user -name user1 -level monitor
```

delete user

This command deletes the specified user account. Even if a disabled user account is specified, the user account can be deleted. And if an SSH public key is registered, the key is also automatically deleted when this command is executed.

Syntax `delete user -name name`

Parameters `-name` This parameter must specify a single user account name.

Example(s) The following example deletes the user account named "user1":

```
CLI> delete user -name user1
```


show users

This command displays all the registered user accounts.

Syntax show users

Parameters No parameters.

Output

#	User Name	Privilege	Availability	SSH Public Key
	user1	Advanced	[Enable]	[Registered]
A		B	C	D

- A: User account name
- B: User level, privilege
- C: It shows whether a user account is enabled, or not
- D: This indicates if an SSH public key is registered.

Example(s) The following example displays all of the existing user accounts. Additionally, for each user account it indicates whether a SSH public key has been registered.

```
CLI> show user
User Name      Privilege  Availability  SSH Public Key
manager        Advanced  [Enable ]    [Registered ]
user1          Monitor   [Disable]    [Not Registered]
user2          Standard  [Enable ]    [Registered ]
user3          Monitor   [Enable ]    [Registered ]
```

set password

This command changes a password of the specified user account. A password can be entered from a terminal after command input.

Syntax `set password -name name`

Parameters `-name` This parameter specifies a user account name for changing a password. Two or more parameters cannot be requested at the same time. The new password is confirmed after command input.

Example(s) The following example changes the password of user account named "user1":

```
CLI> set password -name user1
Old Password :
New Password :
Confirm Password :
```

initialize all-users

This command clears all the registered user accounts and only the initial default user is enabled.

Syntax initialize all-users -execution {yes|no}

Parameters -execution This parameter specifies the execution mode. User accounts are initialized only when selecting "yes".

 yes All the user accounts are initialized.

 no Ineffective operation

Example(s) The following example initializes all the registered user accounts:

```
CLI> initialize all-users -execution yes
```

import ssh-public-key

For SSH (Secure SHell) connections, authentication may be accomplished in either of two ways, either with passwords or with SSH public keys. This command is used to import an SSH public key into a storage system from an ftp server when using the SSH public key method of authentication.

- One SSH public key corresponds to a single user account.
- Even if a specific user account is disabled, a key may still be imported.

The kinds of keys supported are as follows:

- OpenSSH style RSA for SSH v1 (Strength 1024bit or 2048bit)
- IETF style DSA for SSH v2 (Strength 1024bit)
- IETF style RSA for SSH v2 (Strength 1024bit or 2048bit).

Syntax	<code>import ssh-public-key -account-name <i>account_name</i> -port {maintenance remote} -server <i>server_name</i> -user <i>login_user_account</i> -filename <i>filename</i> [-indicator {enable disable}]</code>
Parameters	<p><code>-account-name</code> This parameter specifies the user account name for which the SSH public key is to be used for authentication. Only one user name can be specified at the same time.</p> <p><code>-port</code> This parameter specifies which Ethernet port is used to connect to an ftp server. For further information, refer to "1.11 Note for Specifying FTP Server" (page 22).</p> <p>maintenance MNT port</p> <p>remote RMT port</p> <p><code>-server</code> This parameter specifies the name of the ftp server on which the public key is stored. The server name format is IPv4 standard notation (as a base-256 notation "d.d.d.d" format string) or a fully qualified domain name.</p> <p>Ex. <code>-server 192.168.1.20</code> Ex. <code>-server foo.bar</code></p> <p><code>-user</code> This parameter specifies the user name that is to be used to access the ftp server. The command prompts for the ftp server password.</p> <p><code>-filename</code> This parameter specifies the name of the file that contains a public key.</p>

-indicator Optional. This parameter specifies whether the progress indicator is displayed. If omitted, then the progress indicator is displayed.

enable Progress indicator is displayed.

disable Progress indicator is not displayed.

Example(s) For user account name "manager", the following example imports a public key for SSH authentication from an ftp server named "ftp.a.com" using the Ethernet Maintenance port (MNT port). The user name used to log into the ftp server is "cli-user" and the file that contains the SSH public key is "/tmp/ssh_key1":

```
CLI> import ssh-public-key -account-name manager -port maintenance -server ftp.a.com -filename /
tmp/ssh_key1 -user cli-user
Password : _____ (An Operator should input a password, which is hidden.)
importing /tmp/ssh_key1 from ftp.a.com
complete.
```

The following example is the same as above except that the progress indicator is not shown:

```
CLI> import ssh-public-key -user-account manager -port maintenance -server ftp.a.com -filename /
tmp/ssh_key1 -user cli-user -indicator disable
Password : _____ (An Operator should input a password, which is hidden.)
```

delete ssh-public-key

This command deletes an existing SSH public key. Even if the specified user account is disabled at the time, its SSH public key may still be deleted.

Syntax `delete ssh-public-key -account-name account_name`

Parameters `-account-name`
 This parameter specifies an existing user account name with an SSH public key. Only one user account name can be specified at once.

Example(s) The following example deletes the SSH public key for the "manager" user account.

```
CLI> delete ssh-public-key -account-name manager
```

4.2 Advanced Copy Management

Advanced Copy is a function that copies an arbitrary volume of data at a certain point. The CLI command only supports the SnapOPC+ and REC. The management unit of Advanced Copy is referred to as "copy session" or merely "session".

This section explains the related commands regarding functions to control Advanced Copy (SnapOPC+).

Advanced Copy functions for ETERNUS DX60/DX80/DX90 have the following features:

- Quick copy processes can be performed in units of a volume using ETERNUSmgr or CLI commands.
- Snapshots of volumes can be created using the Windows Volume Shadow Copy Service function.
- Backups and replications can be created using ETERNUS SF AdvancedCopy Manager.

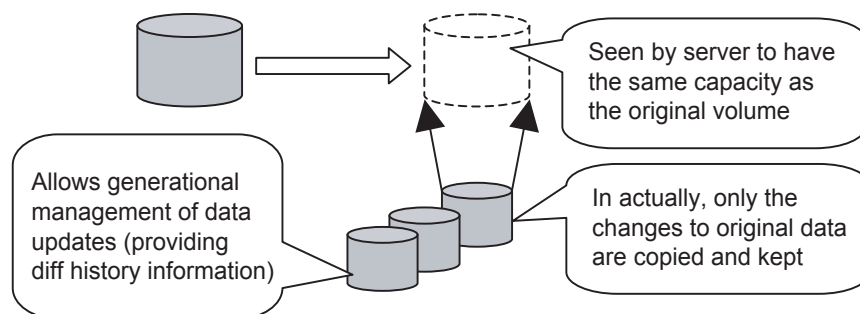
This section explains how to perform Advanced copy in units of a volume using ETERNUS DX60/DX80/DX90 CLI. The CLI command only supports the snapshot-type SnapOPC+ and REC. For details about setting parameters for each command, refer to this manual.

Note that snapshots of the specified volume are created by the ETERNUS Advanced Copy function for ETERNUS DX60/DX80/DX90. The purposes of the Advanced Copy function (such as creating backups and replications) and the procedure for using the Advanced Copy function via OS or software depends on the OS or software that is used. For details about purposes and procedures, refer to the manual of the OS or software that will be used.

Manage the Advanced Copy function by performing copy operations, and checking and deleting copy sessions after preparing the Advanced Copy function.

4.2.1 SnapOPC+ Outline

SnapOPC+ is a function that, to the server, appears to copy a volume (the copy source) in an ETERNUS DX60/DX80/DX90 to a different volume (the copy destination) in the same ETERNUS DX60/DX80/DX90 at a specific point in time. Only a logical copy is performed initially, following which the SnapOPC+ records changes as the data is updated. Access to changed areas is then referenced via the SnapOPC+ record, while access to the unchanged areas is transparently passed back to the original data (in the copy source area). The expected amount of updates must be considered when deciding the size of the copy destination area. By its nature, SnapOPC+ is best used for the temporary backup to tape of file server files and other low modification rate data, as provision against operating failures and software errors.



4.2.2 Preparations for the Advanced Copy Function

4.2.2.1 Basic Settings

■ License registration

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

[Example]

Registering a license key "1928569802345721"

```
CLI> set advanced-copy-license -key 1928569802345721
```

■ Copy parameter settings (required)

Set the internal table size to match the capacity of the volume to be copied, and the copy speed in the device.

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

- 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 for all the copy sessions in the ETERNUS DX60/DX80/DX90.

The resolution should be set as small as possible to reduce the internal process overhead.
Set "1" if possible.

- Internal 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/REC 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/DX90: 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 table sizing formula described in this section is not applied.
- The same bitmap ratio (M) value must be used by both the copy source device and copy destination device. If the bitmap ratio settings (M) for the copy source and copy destination devices are different, REC cannot be performed. Note that the table sizes (S) do not need to be identical.

When different bitmap ratios (M) are calculated for of the copy source and copy destination devices, use whichever bitmap ratio (M) is larger for both devices, recalculating the table size (S) setting for the device whose original bitmap ratio (M) was lower.

- EC/REC table size (S1)

M: Resolution (Select 1, 2, 4, 8, or 16. Keep the value as small as possible.)

C1: EC/REC copy capacity [GB]

N1: Number of EC/REC sessions

$$S1 \text{ [MB]} = ((2 \times C1 / M) + N1) \times 8 \text{ [KB]} / 1024 \text{ (counting fractions as one)}$$

- OPC table size without OPC Restoration (S2)

M: Resolution (Select 1, 2, 4, 8, or 16. Keep the value as small as possible.)

C2: Copy capacity for OPC where OPC is not used for OPC Restoration [GB]

N2: Number of OPC sessions where OPC is not used for OPC Restoration

$$S2 \text{ [MB]} = ((2 \times C2 / M) + N2) \times 8 \text{ [KB]} / 1024 \text{ (counting fractions as one)}$$

- OPC table size with OPC Restoration (S3)

M: Resolution (Select 1, 2, 4, 8, or 16. Keep the value as small as possible.)

C3: Copy capacity for OPC where OPC is used for OPC Restoration [GB]

N3: Number of OPC sessions where OPC is used for OPC Restoration

$$S3 \text{ [MB]} = ((2 \times C3 / M) + N3) \times 2 \times 8 \text{ [KB]} / 1024 \text{ (counting fractions as one)}$$

- QuickOPC table size without OPC Restoration (S4)

M: Resolution (Select 1, 2, 4, 8, or 16. Keep the value as small as possible.)
 C4: Copy capacity for QuickOPC where QuickOPC is not used for OPC Restoration [GB]
 N4: Number of QuickOPC sessions where QuickOPC is not used for OPC Restoration

$$S4 \text{ [MB]} = ((2 \times C4 / M) + N4) \times 2 \times 8 \text{ [KB]} / 1024 \text{ (counting fractions as one)}$$

- QuickOPC table size with OPC Restoration (S5)

M: Resolution (Select 1, 2, 4, 8, or 16. Keep the value as small as possible.)
 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

$$S5 \text{ [MB]} = ((2 \times C5 / M) + N5) \times 3 \times 8 \text{ [KB]} / 1024 \text{ (counting fractions as one)}$$

- SnapOPC+ table size without OPC Restoration (S6)

M: Resolution (Select 1, 2, 4, 8, or 16. Keep the value as small as possible.)
 C6: Copy capacity for SnapOPC+ [GB>(*2)
 N6: Number of SnapOPC+ sessions

$$S6 \text{ [MB]} = ((2 \times C6 / M) + N6) \times 8 \text{ [KB]} / 1024 \text{ (counting fractions as one)}$$

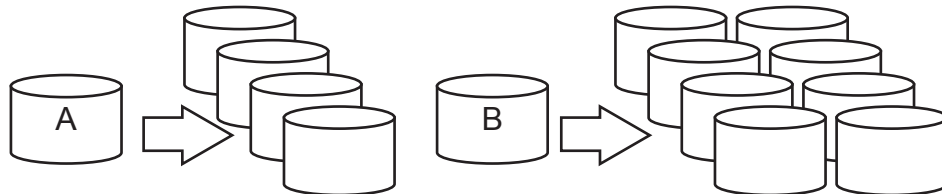
- *1: For EC, OPC, QuickOPC, and REC copy sources, the copy capacity is the total capacity of all volumes (slices or partitions) in the ETERNUS DX60/DX80/DX90 that are defined as copy sources. For REC copy destinations, the copy capacity is the total capacity of all the volumes (slices or partitions) in the ETERNUS DX90 that are defined as copy destinations.

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



$$200 \times 4 + 500 \times 8 = 4800\text{MB.}$$

Add this 4,800MB to the copy capacity C1, C2, or C4, depending on the copy type. (For EC/REC, add the value to C1. For OPC, add the value to C2. For QuickOPC, add the value to C4.)

When using EC/REC, 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.
In this example, use 12 (= 8 + 4) for N6 (total number of generations).

- Copy speed
Specify the copy speed from one of the following, to match the operation to give priority during the copy operation.

Low: Gives priority to operation process
High: Gives priority to copy process
Auto: Priority is set automatically

[Example]

Setting the Bitmap ratio to 2, table size to 32MB, and copy speed to Low.

```
CLI> set advanced-copy-parameters -resolution 2 -table-size 32 -ec-opc-priority low
```

4.2.2.2 Copy Destination Volume Creation

Create the copy destination volume to store the copied data (Snap Data Volume: SDV) and the pool area to store the copied data when all of the SDV capacity is used (Snap Data Volume Pool: SDPV)

■ RAID group creation

Create a RAID group used for SDV in the normal procedure.
(Refer to this manual for how to create a RAID group.)

When considering the effect on performance, creating SDVs in a RAID group that is not used for the operation is recommended, although the SDVs can be created in an existing RAID group.

■ SDV (Snap Data Volume) creation

Create SDVs, the copy destination for SnapOPC+, in the RAID group created in step (1).

[Example]

Creating one SDV having 3GB physical capacity and 10GB logical capacity in RAID group = 2.

```
CLI> create volume -name SDV001 -rg-number 2 -type sdv -size 3gb -virtual-size 10gb -count 1
```

After creating the SDV, check the volume number.

```
CLI> show snap-data-volume
```

Volume Format is performed automatically after the SDV is created. Set the mapping to the LUN.

■ SDP (Snap Data Pool) creation

Create SDPVs in the created RAID group.

[Example]

Creating one SDPV having 1TB capacity in the RAID group = 4

```
CLI> create volume -name SDPV01 -rg-number 4 -type sdpv -size 1tb -count 1
```

Volume Format is performed automatically after the SDPV is created.

4.2.2.3 Operation settings

■ Operation policy setup

Set the threshold for notification of SDPV overflow that may occur during copy operations and the action of the notification.

[Example]

Setting for notification of "information", "warning", and "error" if up to 60% and 80%, and more than 95% of the SDPV capacity is used respectively.

```
CLI> set advanced-copy-policy -level information -threshold 60
CLI> set advanced-copy-policy -level warning -threshold 80
CLI> set advanced-copy-policy -level error -threshold 95
```

[Example]

Set whether to send a notification for each threshold with an e-mail message (or SNMP) or not.

```
CLI> set event-notification -level i-sdp-policy-information -target email -suppression
disable
```

4.2.3 Copy Session Management

4.2.3.1 Copy 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 by using the "start advanced-copy" command to start the SnapOPC+ copy.

[Example]

Starting the SnapOPC+ copy from the copy source volume#0 to copy destination volume (SDV) #100.

```
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 100
```

[Example]

Performing copies of seven generations with day-by-day rotation.

```
(Monday)
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 100
(Tuesday)
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 101
(Wednesday)
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 102
(Thursday)
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 103
(Friday)
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 104
(Saturday)
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 105
(Sunday)
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 106
(Monday)
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 100
(Tuesday)
CLI> start advanced-copy -source-volume-number 0 -destination-volume-number 101
:
:
(Daily copy operations are repeated hereinafter)
:
```

When setting the SnapOPC+ session of volume#0100 for Monday,

- The SnapOPC+ session for the last Monday is deleted.
- The SDP used for the SnapOPC+ session for the last Monday is released and a new SnapOPC+ session is set as a new backup point.

If the update size exceeds the SDV capacity, additional capacity is allocated from the SDPV area in units of SDPE (1GB).

■ Copy session check

Check the status of the copy sessions by using the "show advanced-copy-sessions" command. The "show advanced-copy-sessions" command displays the status of all the copy sessions.

[Example]

```
CLI> show advanced-copy-sessions
```

■ Copy session deletion

Delete unnecessary copy sessions by using the "stop advanced-copy" command. SDPs used by the deleted copy sessions are released. Data in the copy destination volume loses its meaning (becomes undefined).

[Example]

Deleting the SnapOPC+ copy from the copy source volume#0 to copy destination volume (SDV) #100.

```
CLI> stop advanced-copy -delete-session oldest -source-volume-number 0 -destination-volume-number 100
```

set advanced-copy-license

This command registers the Advanced Copy license to extend the number of usable sessions.

Syntax `set advanced-copy-license -key key`

Parameters `-key` This parameter specifies the Advanced Copy license key. The license key length is fixed 16 letters.

Example(s) The following example registers Advanced Copy license:

```
CLI> set advanced-copy-license -key 1928569802345721
```

delete advanced-copy-license

This command deletes the currently registered Advanced Copy license.

Syntax `delete advanced-copy-license -execution {yes | no}`

Parameters `-execution` This parameter specifies the execution mode. The currently registered Advanced Copy license is deleted only when selecting "yes".

`yes` The currently registered Advanced Copy license is deleted.

`no` Ineffective operation

Example(s) The following example deletes the currently registered Advanced Copy license:

```
CLI> delete advanced-copy-license -execution yes
```

show advanced-copy-license

This command displays the registration status of the Advanced Copy license.

Syntax show advanced-copy-license

Parameters No parameters.

Output

```
# Extended License [Registered]
A
```

A: The registration status of Advanced Copy license

Example(s) The following example displays the registration status of the Advanced Copy license:

```
CLI> show advanced-copy-license
Extended License [Registered]

CLI> show advanced-copy-license
Extended License [Not Registered]
```


set advanced-copy-policy

This command sets the Advanced Copy pool policy. The policy specifies the Snap Data Pool space usage levels that trigger information, warning, or error events

Syntax	set advanced-copy-policy -level {information warning error} -threshold <i>threshold</i>	
Parameters	-level	This parameter specifies the policy level of the Advanced Copy. Two or more policy levels cannot be requested at the same time. information Information level. <ul style="list-style-type: none">- Settable range is 1 – 97%.- Initial value is 50%. warning Warning level. <ul style="list-style-type: none">- Settable range is 2 – 98%.- Initial value is 70%. error Error level. <ul style="list-style-type: none">- Settable range is 3 – 99%.- Initial value is 99%.
	-threshold	This parameter specifies a threshold corresponding to the specified policy level. You must set it based on the following rule. 0% < Information level < Warning level < Error level < 100%

Example(s) The following example sets Warning level 80%:

```
CLI> set advanced-copy-policy -level warning -threshold 80
```

show advanced-copy-policy

This command displays the currently registered Advance Copy policy.

Syntax show advanced-copy-policy

Parameters No parameters.

Output

```
# Level      Threshold
# Error     99%
A            B
```

A: Advanced Copy policy level

B: Thresholds

Example(s) The following example displays the Advanced Copy policy:

```
CLI> show advanced-copy-policy
Level      Threshold
Information 50%
Warning     90%
Error       99%
```

set advanced-copy-parameters

This command sets up parameters for using the Advanced Copy function.

- You must set the Advanced Copy table size to 0 when disabling the Advanced Copy usable mode.
- You must enable the Advanced Copy usable mode when changing the Advanced Copy table size or resolution.

Syntax `set advanced-copy-parameters [-resolution {1|2|4|8|16}]`
`[-table-size {0|8|16|24|32|40|48|56|64|72|80|88|96|104|112|120|128}]`
`[-ec-opc-priority {auto|high|low}] [-usable-mode {enable|disable}]`

Parameters `-resolution` Optional. This parameter specifies the Advanced Copy resolution. If omitted, this parameter is left unchanged.

1	x1 (default)
2	x2
4	x4
8	x8
16	x16

`-table-size` Optional. This parameter specifies the Advanced Copy table size, multiples of 8MB up to 128MB. The initial value is 0MB. If omitted, this parameter is left unchanged.

`-ec-opc-priority`
Optional. This parameter specifies EC/OPC priority, EC/OPC rate mode. If omitted, this parameter is left unchanged.

auto	Automatically
high	High rate
low	Low rate

`-usable-mode`
Optional. This parameter specifies the Advanced Copy usable mode, which determines whether Advanced Copy functions (starting sessions) can be used, or not. If omitted, this parameter is left unchanged. The initial state is "enable".

enable	Advanced Copy sessions can be used.
disable	Advanced Copy sessions cannot be used.

Example(s) The following example sets up Advanced Copy parameters, the resolution is multiples of 2, the table size is 128MB, and the EC/OPC priority is automatic:

```
CLI> set advanced-copy-parameters -resolution 2 -table-size 128 -ec-opc-priority auto
```

The following example disables the Advanced Copy Usable Mode. This means that sessions are completely unstartable:

```
CLI> set advanced-copy-parameters -usable-mode disable
```

show advanced-copy-parameters

This command displays the currently set Advanced Copy parameters.

Syntax show advanced-copy-parameters

Parameters No parameters.

Output

```
# Resolution [x2]
A
# Advanced Copy Table Size [128MB]
B
# EC/OPC Priority [Auto]
C
# Advanced Copy Usable Mode [ON ]
D
```

A: Resolution

B: Table size

C: EC/OPC priority, EC/OPC rate mode (Ex. Auto, High Priority, Low Priority)

D: Advanced Copy Usable Mode

Example(s) The following example displays the Advanced Copy parameters:

```
CLI> show advanced-copy-parameters
Resolution [x2]
Advanced Copy Table Size [128MB]
EC/OPC Priority [Auto]
Advanced Copy Usable Mode [OFF]
```

initialize snap-data-volume

This command initializes the snap data volumes (SDV). Volume types other than it cannot be requested.

Syntax initialize snap-data-volume
 {-volume-number *volume_numbers* | -volume-name *volume_names* }

Parameters -volume-number
 or
 -volume-name
 This parameter specifies SDV identifiers to be initialized. One or more parameters can be requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

Example(s) The following example initializes SDV #1-5:

```
CLI> initialize snap-data-volume -volume-number 1-5
```

show snap-data-volume

This command displays all the registered snap data volumes (SDV). They include a logical size, a physical size, a used size, and other information etc.

Syntax show snap-data-volume

Parameters No parameters.

Output

# Volume	Status	Size(MB)	Logical Size(MB)	Physical Size(MB)	Host Used Size(MB)	Copy Used Size(MB)	Host SDP Using Size(MB)	Copy SDP Using Size(MB)
# 100 SDV001	Available	102400	5120	4144	3120	1024	3120	1024
A B	C	D	E	F	G	H	I	J

- A: Snap data volume number
- B: Snap data volume name
- C: Volume status
- D: Volume size (unit: MB)
- E: Logical size of SDV (unit: MB)
- F: Physical size of SDV (unit: MB)
- G: Host Used size (unit: MB)
- H: Copy Used size (unit: MB)
- I: Host Using size of snap data pool (SDP) area (unit: MB)
- J: Copy Using size of snap data pool (SDP) area (unit: MB)

Example(s) The following example displays all the registered SDVs:

```
CLI> show snap-data-volume
```

Volume No.	Name	Status	Size(MB)	Logical Size(MB)	Physical Size(MB)	Host Used Size(MB)	Copy Used Size(MB)	Host SDP Using Size(MB)	Copy SDP Using Size(MB)
100	SDV001	Available	102400	5120	4144	3120	1024	3120	1024
105	SDV002	Available	102400	5120	4144	3120	1024	3120	1024
108	SDV003	Available	102400	5120	4144	3120	1024	3120	1024

show snap-data-pool

This command displays the Total and assigned Copy Sizes of the snap data pool (SDP) areas.



Note

Encryption-related functions may not be available for some user environments.

Syntax show snap-data-pool

Parameters No parameters.

Output

# Snap Data Pool Information				
#	Total Size(GB)	Host Size(GB)	Copy Size(GB)	
# Unencrypted	5120	0	5120	
	A	B	C	
# Encrypted	4096	0	4096	
	D	E	F	
Snap Data Pool Volume List				
No.	Name	Status	Reserved Deletion	Size(MB)
0	sdpv1	Available	No	5120
G	H	I	J	K

- A: Total amount of unencrypted data (in GB)
- B: Amount of unencrypted data directly updated by the host (in GB)
- C: Amount of SDP used for copying unencrypted data due to lack of SDV capacity (in GB)
- D: Total amount of encrypted data (in GB)
- E: Amount of encrypted data directly updated by the host (in GB)
- F: Amount of SDP used for copying encrypted data due to lack of SDV capacity (in GB)
- G: Snap data pool volume number
- H: Snap data pool volume name
- I: Snap data pool volume status
- J: It indicates whether the deletion of snap data pool volume is reserved.
- K: Snap data pool volume size

Example(s) The following example displays the SDP:

```

CLI> show snap-data-pool
Snap Data Pool Information
      Total Size(GB)  Host Size(GB)  Copy Size(GB)
Unencrypted          5120             0           5120
Encrypted            4096             0           4096

Snap Data Pool Volume List
No.  Name      Status      Reserved Deletion      Size(MB)
  0  sdpv1     Available   No                      5120
    
```


delete snap-data-pool-volume

This command deletes snap data pool volumes (SDPV). Volume types other than it cannot be requested.

Syntax delete snap-data-pool-volume
 {-volume-number *volume_numbers* | -volume-name *volume_names* }
 -mode {force | reservation}

Parameters -volume-number
 or
 -volume-name This parameter specifies SDPV identifiers to be deleted. One or more parameters can be requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

 -mode This parameter specifies the deletion mode.

 force SDPV is immediately deleted, even if SDP elements (SDPE) have been assigned. If this parameter is specified, up to 128 SDPVs can be deleted at once.

 reservation SDPV is deleted when SDPE are no longer assigned.

Example(s) The following example forcibly deletes the SDPV named "SDPV1":

```
CLI> delete snap-data-pool-volume -volume-name SDPV1 -mode force
```

The following example deletes the consecutive SDPV #1-10. The deletion mode is the reservation mode:

```
CLI> delete snap-data-pool-volume -volume-number 1-10 -mode reservation
```

start advanced-copy

This command starts Advanced Copy session.

Syntax start advanced-copy
 {-source-volume-number *volume_number* | -source-volume-name
 volume_name }
 {-destination-volume-number *sdv_number* | -destination-volume-name
 sdv_name }

Parameters -source-volume-number
 or
 -source-volume-name

This parameter specifies a volume identifier of copy source. It must be OPEN type. Two or more parameters cannot be requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

-destination-volume-number
or
-destination-volume-name

This parameter specifies a volume identifier of copy destination. It must be SDV type. Two or more parameters cannot be requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

Example(s) The following example starts Advanced Copy session from the volume named "OPEN1" to the volume named "SDV1":

```
CLI> start advanced-copy -source-volume-name OPEN1 -destination-volume-name SDV1
```

stop advanced-copy

This command stops Advanced Copy session.

Syntax stop advanced-copy -delete-session {oldest | all | force}
 {-source-volume-number *volume_number* | -source-volume-name
 volume_name }
 [-destination-volume-number *volume_number* | -destination-volume-name
 volume_name]

Parameters -delete-session

This parameter specifies the unit of session to be deleted.

oldest The oldest session associated with the specified volume of the copy source with a copy destination is deleted. When the specified session is not the oldest session, this command is terminated abnormally.

all All sessions associated with the specified volume of the copy source, are deleted.

force The specific session associated with the specified volume of the copy source are deleted with the copy.

-source-volume-number
or
-source-volume-name

This parameter specifies a volume identifier of copy source. Two or more parameters cannot be requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

-destination-volume-number
or
-destination-volume-name

Optional. This parameter specifies a volume identifier of copy destination. Two or more parameters cannot be requested at the same time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#). When selecting "*-delete-session all*", this parameter must be not specified. Otherwise, this parameter must be specified.

Example(s) The following example stops Advanced Copy session. The deleted session is the oldest one:

```
CLI> stop advanced-copy -delete-session oldest -source-volume-name open1 -destination-volume-name sdv1
```

The following example stops Advanced Copy session. The deleted session is all ones:

```
CLI> stop advanced-copy -delete-session all -source-volume-name open1
```

show advanced-copy-sessions

This command displays the list of Advance Copy sessions (SnapOPC+ only) started by GUI/CLI.

Syntax show advanced-copy-sessions
 [-volume-number *volume_number* | -volume-name *volume_name*]

Parameters -volume-number
 or
 -volume-name

Optional. This parameter specifies the specific volume identifier for which sessions are to be displayed. Only one volume can be specified at a time. For details, refer to the ["1.2.6 Volume Syntax" \(page 14\)](#).

- If an OPEN type volume is specified, a list of the sessions for which it is the copy source is shown
- If an SDV type volume is specified, a list of the sessions for which it is the copy destination is shown
- If an SDPV type volume is specified, a list of the sessions for which it is the *in-use* snap data pool is shown

Output

#	SID	Generation	Status	Error Code	Time(sec)	Source Volume No.	Source Volume Name	Destination Volume No.	Destination Volume Name	Requestor	Using Snap Data Pool No.	Using Snap Data Pool Name
A	B	C	D	E	F	G	H	I	J	K	L	
#	0x0000	1/ 1	Active	0x00	6535	100	Volume1	200	SDV001	GUI/CLI	16	SDPV001
#	Completed Data Size : 12345 MB											
#	Total Data Size : 99999 MB											
#	Host Used Size : 0 MB											
#	Copy Used Size : 99999 MB											

- A: Session ID
- B: Generation
- C: Session status
- D: Error code
- E: Elapsed time (unit: sec.)
- F: Source volume number
- G: Source volume name
- H: Destination volume number
- I: Destination volume name
- J: Requestor (Client)
- K: In-use Snap data pool volume number
- L: In-use Snap data pool volume name
- M: Amount of data completed (in MB)
- N: Total amount of data (in MB)
- O: Amount of data directly updated by host (in MB)
- P: Amount of data copied (in MB)

Example(s) The following example displays the list of Advanced Copy sessions:

```

CLI> show advanced-copy-sessions
SID      Generation Status Error Time(sec) Source Volume      Destination Volume  Requestor Using Snap Data Pool Volume
        Code      No. Name          No. Name
0x0000   1/ 9 Active  0x00 343  0 RGP000V000      259 RGP001SDV1      GUI/CLI  16 SDPV001
  Completed Data Size : 15 MB
  Total Data Size : 2048 MB
  Host Used Size : 0 MB
  Copy Used Size : 15 MB
0x0001   2/ 9 Active  0x00 251  0 RGP000V000      260 RGP002SDV2      GUI/CLI  16 SDPV001
  Completed Data Size : 6 MB
  Total Data Size : 2048 MB
  Host Used Size : 0 MB
  Copy Used Size : 6 MB
0x0002   3/ 9 Active  0x00 225  0 RGP000V000      261 RGP003SDV3      GUI/CLI  16 SDPV001
  Completed Data Size : 3 MB
  Total Data Size : 2048 MB
  Host Used Size : 0 MB
  Copy Used Size : 3 MB
0x0003   4/ 9 Active  0x00 207  0 RGP000V000      262 RGP004SDV4      GUI/CLI  16 SDPV001
  Completed Data Size : 5 MB
  Total Data Size : 2048 MB
  Host Used Size : 0 MB
  Copy Used Size : 5 MB
0x0004   5/ 9 Active  0x00 186  0 RGP000V000      263 RGP005SDV5      GUI/CLI  16 SDPV001
  Completed Data Size : 8 MB
  Total Data Size : 2048 MB
  Host Used Size : 0 MB
  Copy Used Size : 8 MB
0x0005   6/ 9 Active  0x00 159  0 RGP000V000      258 RGP000SDV0      GUI/CLI  16 SDPV001
  Completed Data Size : 15 MB
  Total Data Size : 2048 MB
  Host Used Size : 0 MB
  Copy Used Size : 15 MB
0x0006   7/ 9 Active  0x00 102  0 RGP000V000      264 RGP000SDV6      GUI/CLI  16 SDPV001
  Completed Data Size : 21 MB
  Total Data Size : 2048 MB
  Host Used Size : 0 MB
  Copy Used Size : 21 MB
0x0007   8/ 9 Active  0x00 26  0 RGP000V000      265 RGP000SDV7      GUI/CLI  16 SDPV001
  Completed Data Size : 2 MB
  Total Data Size : 2048 MB
  Host Used Size : 0 MB
  Copy Used Size : 2 MB
0x0008   9/ 9 Active  0x00 5  0 RGP000V000      266 RGP002SDV8      GUI/CLI  16 SDPV001
  Completed Data Size : 0 MB
  Total Data Size : 2048 MB
  Host Used Size : 0 MB
  Copy Used Size : 0 MB
    
```

4.2.4 Remote Equivalent Copy Management



The functions described in this section are only supported by the ETERNUS DX90.

Remote Equivalent Copy (REC) is a function that is used to perform Equivalent Copy (EC) between remote storage systems. The CLI for settings related to REC allows the composing of REC path information, setting information, tuning performance and similar, but cannot support the starting of sessions and session management. For controlling sessions, use ETERNUS SF Advanced Copy Manager (ACM) or ETERNUS SF Express. For further information, refer to the related documentation.

Regarding the license required to use REC sessions, it is the same as the Advanced Copy license. Refer to the "set advanced-copy-license" and "show advanced-copy-license" commands.

This section explains the CLI commands related to the environment settings used to control the REC. At a minimum, a path information file that defines the data transmission line and related performance boosting settings are required for both the copy source storage system and the copy destination storage system.

4.2.5 Summary of REC Environment Settings through CLI

Though REC sessions may be started by using ETERNUS SF Advanced Copy Manager (ACM) or ETERNUS SF Express upon applying the REC environment settings using CLI, it is recommended that the round trip times be measured to optimize the performance between storage systems. The steps involved in setting the REC environment using CLI are as follows:

Procedure

- 1** Switch host interface ports to RA mode (on both copy source and copy destination storage systems)
Set the host interface port that is to be used to establish a REC path to RA mode using the "set host-port-mode" command. The currently set mode can be also displayed by using the "show host-port-mode" command. Parameter settings for each host interface port can be set by using "set fc-parameters" command.
- 2** Create the REC path information as TEXT type (the recommended type for CLI)
Describe the REC path information using a text editor, commercial software, etc. For details, refer to the descriptions that follow.

3 Apply the REC path information

Apply the REC path information to the target storage systems, both copy source and copy destination, using the "import rec-path" command. If a syntax error is detected, the command will terminate with an error message and an error line. Make sure that the information in the REC path information file matches the actual setup.

4 Measure and apply a round trip time

Firstly, measure the round trip time using the "measure rec-round-trip-time" command in automatic mode and apply it in the system. Individual round trip times can be manually measured and applied afterwards if necessary. A multiplicity can be also set to fine tune the REC performance. For detail, refer to the "set rec-multiplicity" command.

5 Define a REC buffer (Only for the REC Asynchronous Consistency Mode)

If this mode is used, define a REC buffer using the "set rec-buffer" command. The REC buffer configuration and status can be checked using the "show rec-buffer" command.

End of procedure

The following functions (services) are also supported:

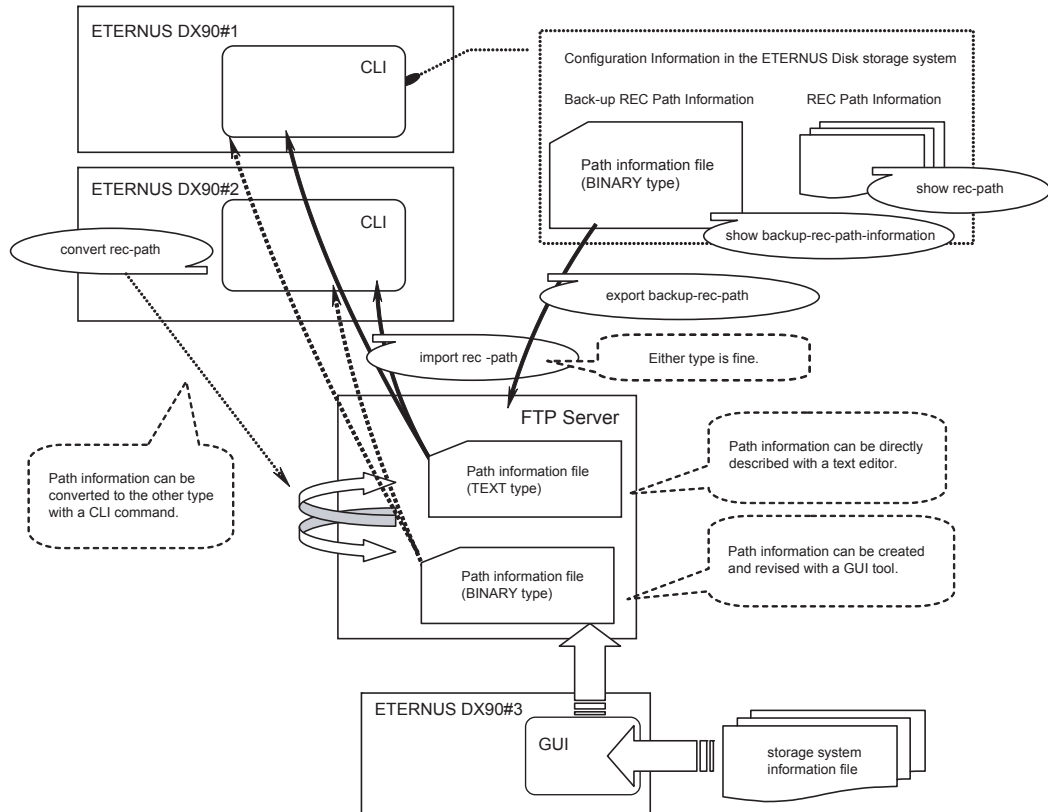
- Exporting the REC path information system backup file to an ftp server.
- Converting the REC path information file type bi-directionally, from TEXT type to BINARY type, or from BINARY type to TEXT type.

4.2.5.1 About the REC path information file

In order to control the REC, a path information file must be created. This file contains Box IDs (storage system identification information) and FC-RA information (RA mode host interface port information). In the ETERNUS DX90, two different path information file formats are supported, a TEXT type and a BINARY type.

- TEXT type
Path information is directly described using a text editor or similar tool (details follow). This is the recommended approach for CLI-use.
- BINARY type
Path information is created and revised using a GUI edit function. This is the recommended approach for GUI-use.

The contents of a typical REC path information file are as follows:



4.2.5.2 Path information file syntax (TEXT type)

For CLI-use, a path information file should be created using a text editor, or similar tool. The TEXT type path information file description rules are as follows:

■ Basic rules

- Only ASCII characters can be used.
- All label names must be in lowercase. The following example is correct:

```
storage 10
```

The following example has an uppercase label, a syntax error:

```
STORAGE 10
```

- Lines "starting" (first non-space character) with a hash mark (#) are handled as comment lines. The following would be a correct example as a comment line.

```
# definition of storage system
```

The following line is NOT handled as a comment line because the "box-id" string appears before the hash mark:

```
box-id ###DXL###
```


- There is no particular restriction on the number of spaces. Note that at least one or more spaces are required between label names and operand values. The following example would be accepted as correct:

```
storage      10
```

The following example has no spaces between the "storage" label name and the operand value "10", a syntax error:

```
storage10
```

- The ASCII characters CR+LF (hexadecimal code 0x0d0a) are expected for line breaks, with CR or LF alone also being interpreted as a line break. When exporting the system backup path information, line breaks are output as ASCII code CR+LF.
- Maximum number of characters per line is 256, including the line break characters.

■ Authentication strings

- The following fixed string is expected in line 1, column 1, with no leading spaces:

```
eternus-rec-path-text-0001
```

■ Storage system definitions

storage Defines an identification number (0 – 127) for each of the local and remote storage systems. Usable numbers can be freely selected within this range. The following example uses "0" as the storage system id number:

```
storage 0
```

box-id Defines a Box ID for the target storage system. Examples follow:

- The Box ID value must be double-quoted.
- Lowercase characters are automatically converted to uppercase.
- Hash mark (#) characters are automatically appended when fewer than 40 characters are specified.
- The Box ID can be confirmed using the "show boxid" command.

```
box-id "00DXL#####ET06F21AUABCPJ000000#####"
```

cmX-portY Defines the WWN (World-Wide-Name) of a host interface port set to RA mode in the target storage system. The X in a label name is the controller module number and the Y is the host interface port number on that controller. An example follows. In this case, all of the host interface ports on CM#0 are defined.

- RA mode can be switched by using the "set host-port-mode" command.
- Host interface port WWNs may be confirmed using the "show fru-ce" command.

Example host interface port WWN definitions:

```
cm0-port0 40000000abc80e38
cm0-port1 40000000abc80e3a
cm0-port2 40000000abc80e3c
cm0-port3 40000000abc80e3e
```

■ Inter-storage-system REC path information definitions

In order to use REC, a file that specifies the inter-storage-system copy paths must be created. This contains REC path information indicating the whole paths (copy source, copy destination, and the path between them) that are to be used for REC. The following examples describe the various inter-storage-system REC path information parameters.

storage-link X,Y

Defines the numbers of the two storage systems (X indicates the copy source and Y indicates the copy destination) that are to be linked. The numbers are those used in the storage system definitions. An example follows:

```
storage-link 5,6
```

path-type {direct | switched}

Defines the type of path connection between the linked storage systems. If the storage systems are directly connected (P2P), use "direct". If the storage systems are connected through a switch, use "switched".

Direct connection example:

```
path-type direct
```

Switched connection example:

```
path-type switched
```

line-speed {1-65535}

Defines an effective line speed for the path between the linked storage systems. This is the WAN bandwidth that is actually available and used for the REC. The possible range is 1 to 65535 and the units are Mbit/s. This definition is only specified for remote type paths. The following example specifies 100 Mbit/s as the effective line speed.

```
line-speed 100
```

compression-ratio {0-99}

Defines a line unit compression ratio for the path between the linked storage systems. This function can be utilized only with communication devices possessing a compression function. The possible range is a percentage value from 0(%) to 99(%). Zero percent indicates no compression. This definition is only specified for remote connections. The following example specifies a 20% line unit compression ratio.

```
compression-ratio 20
```

port-link cmX-portY,cmZ-portW

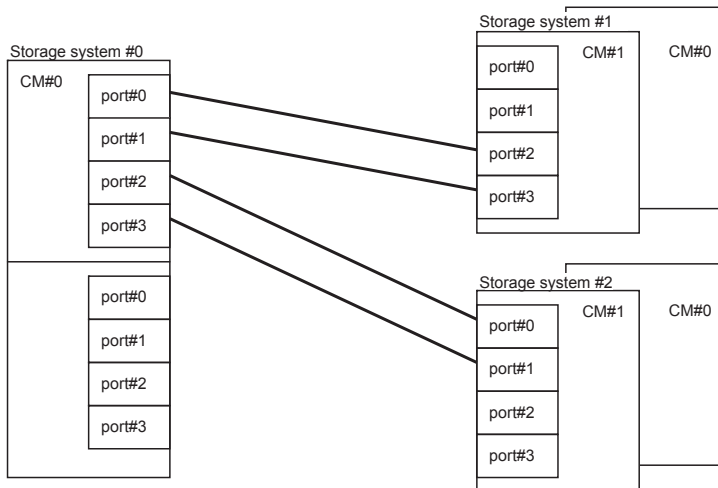
Respectively defines the target host interface ports in the local and remote storage systems in the same order as used in the "storage-link" field. For the following example, for the "storage-link 5,6" used in the above storage system definition example, cm0-port2 belongs to storage system #5 and cm1-port3 belongs to storage system #6. In the "cmX-portY,cmZ-portW" format, X and Z indicate the controller module number, while Y and W indicate the host interface port number on the controller.

```
port-link cm0-port2,cm1-port3
```

Note that space characters may not be inserted before and after the comma. The following example has a space character after the comma, a syntax error:

```
port-link cm0-port2, cm1-port3
```

The example path information file that follows is based on the path topology shown below.



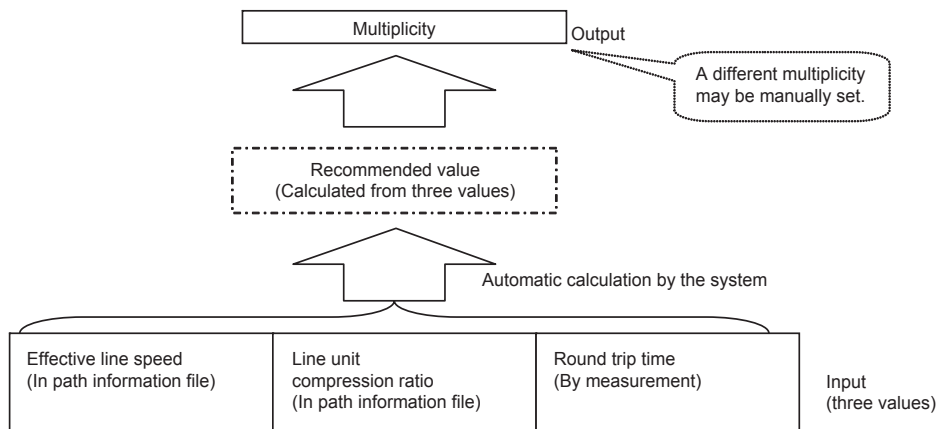
```
eternus-rec-path-text-0001
# REC Path information file for ETERNUS
# Definition of storage system
# Storage system #0
storage 0
box-id "00DXL#####ET06F21AUABCPJ000001#####
cm0-port0 40000000abc80e38
cm0-port1 40000000abc80e3a
cm0-port2 40000000abc80e3c
cm0-port3 40000000abc80e3e
# Storage system #1
storage 1
box-id "00DXL#####ET06F21AUABCPJ000002#####
cm1-port2 40000000abc80e40
cm1-port3 40000000abc80e41
# Storage system #2
storage 2
box-id "00DXL#####ET06F21AUABCPJ000003#####
cm1-port0 40000000abc80e42
cm1-port1 40000000abc80e43
# Definition of REC path information
# Linked between 0 and 1
storage-link 0,1
path-type switched
line-speed 100
compression-ratio 1
port-link cm0-port0,cm1-port2
port-link cm0-port1,cm1-port3
# Linked between 0 and 2
storage-link 0,2
path-type switched
line-speed 100
compression-ratio 1
port-link cm0-port2,cm1-port0
port-link cm0-port3,cm1-port1
```

4.2.5.3 Determining the REC multiplicity

A REC multiplicity value must be set for the REC path between storage systems, and is decided based on the following three values:

- Effective line speed (as described in the REC path information file)
- Line unit compression ratio (as described in the REC path information file)
- Round trip time (as actually measured)

The schematic diagram for determining the REC multiplicity is as follows:



4.2.5.4 Assigning REC buffers

REC buffer must be assigned when the REC Asynchronous Consistency function is used. REC buffers can be assigned by separating a 512 MB memory space area retained in the system cache into a maximum of 4 partitions. Each partition is handled by specifying its partition number, from 1 to 4.

Case.1. Assign the whole memory to a single partition:

512MB

Case.2. Assign half the memory each to two separate partitions:

256MB	256MB
-------	-------

Case.3. Assign one quarter of the memory each to four separate partitions:

128MB	128MB	128MB	128MB
-------	-------	-------	-------

Case.4. Assigning the memory to three separate partitions, one with 256MB and the other two each with 128MB:

256MB	128MB	128MB
-------	-------	-------

set host-port-mode

This command is used to switch host interface ports from CA mode to RA mode, and back again.

Caution

- All host interface ports used for REC functions must be switched to RA mode.
- When switching to RA mode, all host mapping information associated with the port is lost.
- When reverting to CA mode, all REC path information defined for the port is lost.

Syntax	set host-port-mode -port {xy all} -mode {ra ca}	
Parameters	-port	This parameter specifies the number of the host interface port that is to be switched. Two or more parameters can be specified if comma-separated. Ex. -port 00,10 For details, refer to "1.2.11 Host Interface Port Syntax" (page 17) . xy "x" is the controller module (CM) number, and "y" is the host interface port number. Ex. 10 (port#0 on CM#1) all All the host interface ports
	-mode	Optional. This parameter specifies the new operation mode for the host interface port. RA mode must be set when the REC functions are used. ra RA mode (for REC) ca CA mode
Example(s)	The following example switches host interface port #0 on CM#1 to RA mode:	

```
CLI> set host-port-mode -port 10 -mode ra
```

The following example reverts port #3 on CM#1 to CA mode:

```
CLI> set host-port-mode -port 13 -mode ca
```

The following example switches all the host interface ports to RA mode:

```
CLI> set host-port-mode -port all -mode ra
```

show host-port-mode

This command is used to display the operation mode that is set for each host interface port.

Syntax show host-port-mode

Parameters No parameters.

Output

#	CM#0	Port#0	Port Mode
	A		RA
			B

A: A location of a host interface port

B: Operation mode for a host interface port

Example(s) The following example displays the operation mode that is set for each host interface port in a system:

```
CLI> show host-port-mode
      Port Mode
CM#0 Port#0 RA
CM#0 Port#1 RA
CM#0 Port#2 CA
CM#0 Port#3 CA
CM#1 Port#0 RA
CM#1 Port#1 RA
CM#1 Port#2 CA
CM#1 Port#3 CA
```

import rec-path

This command is used to import a REC path information file from a specified ftp server and apply it to a system. Either file type, TEXT or BINARY, may be used.



Note

- For details, refer to ["4.2.4 Remote Equivalent Copy Management" \(page 198\)](#).
- If a TEXT type path information file has syntax errors, the number of the problem line is included with the error message.
- This command may also be used to apply a GUI-created BINARY type path information file.

Syntax	<code>import rec-path -port {maintenance remote} -server <i>server_name</i> -user <i>login_user_account</i> -filename <i>filename</i> [-indicator {enable disable}]</code>
Parameters	<p><code>-port</code> This parameter specifies which Ethernet port is to be used to connect to the ftp server. For further information, refer to "1.11 Note for Specifying FTP Server" (page 22).</p> <p><code>maintenance</code> MNT port</p> <p><code>remote</code> RMT port</p> <p><code>-server</code> This parameter specifies the name of the ftp server that contains the REC path information file. The server name should be either in IPv4 standard notation (a base 256 "d.d.d.d" string) or a fully qualified domain name.</p> <p>e.g. <code>-server 192.168.1.20</code> e.g. <code>-server foo.bar</code></p> <p><code>-user</code> This parameter specifies a user name with which to access the ftp server. The command prompts for the ftp server password.</p> <p><code>-filename</code> This parameter specifies a REC path information filename.</p> <p><code>-indicator</code> Optional. This parameter specifies whether or not a progress indicator is to be displayed. If omitted, then the progress indicator is displayed.</p> <p><code>enable</code> Progress indicator is displayed.</p> <p><code>disable</code> Progress indicator is not displayed.</p>
Example(s)	<p>The following example uses the user name "cli-user" to import the REC path information file "/tmp/rec-path1.txt" from the ftp server "ftp.a.com" using the Maintenance port (MNT port):</p>

```
CLI> import rec-path -port maintenance -server ftp.a.com -filename /tmp/rec-  
path1.txt -user cli-user  
Password : _____ (An Operator should input a password, which is hidden.)  
importing /tmp/rec-path1.txt from ftp.a.com  
complete.
```

The following example is exactly the same, except that a progress indicator is not shown:

```
CLI> import rec-path -port maintenance -server ftp.a.com -filename /tmp/rec-  
path1.txt -user cli-user -indicator disable  
Password : _____ (An Operator should input a password, which is hidden.)
```


show rec-path

This command is used to display the detailed REC path information set up of a system, and also displays the status of any remotely connected storage systems. If the parameter is omitted, the information regarding all remote storage systems is listed. If the parameter is specified, the path information for a single device can be displayed.

Syntax show rec-path [-remote-boxid *remote_storage_box_id*]

Parameters -remote-boxid

Optional. This parameter specifies the Box ID of the storage system whose REC path information details are to be displayed. Only a single Box ID can be specified each time. If this parameter is omitted, a list of this storage system and its remote storage systems is displayed.

- Box IDs use a maximum of 40 alphanumeric characters, spaces, and hash marks (#).
- All alphabetic characters are handled as uppercase.
- Hash mark (#) characters are automatically appended when fewer than 40 characters are specified.

Output

When the parameter is omitted:

# Remote Storage System	Path Type	Line Speed (Mbit/s)	Compression Ratio (%)	Round Trip Time (ms)	Multiplicity Current / Recommended
# E Remote Box ID					
#					
# 00DXL#####ET06F21AUABCFJ000002#####	Direct	-	-	-	-
# * 00DXL#####ET06F21AUABCFJ000004#####	Switched	10	50	20	4 / 3
A B	C	D	E	F	G H

- A: Error Sign. If "*" mark is output, it means that path information status between storage systems is not normal. You can check details by trying this command with this remote Box ID.
- B: Box ID of a remote storage system registered in the system
- C: Connection form of a remote storage system registered in the system
- D: Effective line speed of a remote storage system registered in the system
- E: Line unit compression ratio of a remote storage system registered in the system
- F: Round trip time of a remote storage system registered in the system. If a round trip time is not measured, "Unknown" is displayed.
- G: Actual multiplicity of a remote storage system registered in the system. If "Auto" is displayed, it indicates that a recommended multiplicity is used.
- H: Multiplicity recommended by the system. If the round trip time is "Unknown", "*" is displayed.

When the parameter is specified:

```
# Storage Information
# Local Box ID (Current Storage System) 00DXL#####ET06F21AUABCPJ000001#####
# Remote Box ID 00DXL#####ET06F21AUABCPJ000000#####
# Line Information
# Path type Switched
# Effective Line Speed 10 (Mbit/s)
# Line Unit Compression Ratio 50 (%)
# Round Trip Time 12 (ms)
# Current Multiplicity Auto
# Recommended Multiplicity 3
# Path Information (to Remote Storage System)
# Local Port Remote Port WWN Status
# CM#0 Port#0 500000E0D0C40006 Error
# I J K
```

- A: Box ID of the local storage system
- B: Box ID of the specified remote storage system
- C: Connection form of the remote storage system registered in the system
- D: Effective line speed of the remote storage system registered in the system. A unit is Mbit/s.
- E: Line unit compression ratio of the remote storage system registered in the system. A unit is percent.
- F: Round trip time of the remote storage system registered in the system. A unit is millisecond.
- G: Multiplicity of the remote storage system registered in the system
- H: Multiplicity recommended by the system
- I: Host interface port number of the local storage system
- J: WWN, World-Wide-Name of FC-RA of the remote storage system
- K: Path status between the local storage system and the remote storage system

Example(s) The following example displays the list of remote storage systems connected to this system. In this case, that there is an error in the path information status is indicated with a "*" mark.

```
CLI> show rec-path
Remote Storage System
E Remote Box ID
Path Type Line Speed Compression Round Trip Multiplicity
(Mbit/s) Ratio (%) Time (ms) Current / Recommended
00DXL#####ET06F21AUABCPJ000002##### Direct - - - -
* 00DXL#####ET06F21AUABCPJ000004##### Switched 10 50 20 4 3
00DXL#####ET06F21AUABCPJ000006##### Switched 10 50 Unknown 4 3
```

The following example displays the path information details for the specified storage system. Note that if spaces or hash mark (#) characters are used, the Box ID must be double quoted:

```
CLI> show rec-path -remote-boxid "00DXL#####ET06F21AUABCPJ000000#####"
Storage Information
Local Box ID (Current Storage System) 00DXL#####ET06F21AUABCPJ000001#####
Remote Box ID 00DXL#####ET06F21AUABCPJ000000#####
Line Information
Path Type Switched
Effective Line Speed 10 (Mbit/s)
Line Unit Compression Ratio 50 (%)
Round Trip Time 12 (ms)
Current Multiplicity Auto
Recommended Multiplicity 3
Path Information (to Remote Storage System)
Local Port Remote Port WWN Status
CM#0 Port#0 500000E0D0C40006 Normal
Port#1 500000E0D0C40006 Error (Suspect: Current Host Port, Cable, Switch, Other Host port)
500000E0D0C40087 Error (Suspect: Current Host Port)
500000E0D0C40086 Normal
Port#2 500000E0D0C40007 Normal
CM#1 Port#2 500000E0D0C40006 Error (Suspect: Cable)
```

export backup-rec-path

Each ETERNUS DX90 Disk storage system contains a back-up path information file. This is a backup copy of the original path information file, not of the current state of the settings in the system's configuration information database. When the original path information file is imported a backup copy is stored on the system disk. If the original file was TEXT type, it is automatically converted to BINARY type. This command exports the backup REC path information file to an external ftp server.



Note

- If the specified file already exists on the ftp server, it is overwritten.
- If the backup file is exported as TEXT type, comment lines are eliminated from the file. Therefore, even if the originally imported path information file was also TEXT type, the TEXT type exported backup file may not be identical.

Syntax	export backup-rec-path -port {maintenance remote} -server <i>server_name</i> -user <i>login_user_account</i> -filename <i>filename</i> -type {text binary} [-indicator {enable disable}]	
Parameters	-port	This parameter specifies which Ethernet port is to be used to connect to the ftp server. For further information, refer to "1.11 Note for Specifying FTP Server" (page 22) . maintenance MNT port remote RMT port
	-server	This parameter specifies the name of the ftp server name that is to receive the backup REC path information file. The server name should be either in IPv4 standard notation (a base 256 "d.d.d.d" string) or a fully qualified domain name. e.g. -server 192.168.1.20 e.g. -server foo.bar
	-user	This parameter specifies a user name with which to access the ftp server. The command prompts for the ftp server password.
	-filename	This parameter specifies a REC path information filename.
	-type	This parameter specifies the type of path information file that is to be exported. text TEXT type binary BINARY type
	-indicator	Optional. This parameter specifies whether or not a progress indicator is to be displayed. If omitted, then the progress indicator is displayed. enable Progress indicator is displayed. disable Progress indicator is not displayed.

Example(s) The following example uses the user name "cli-user" to export the backup REC path information file as the TEXT-type file "/tmp/rec-path1.txt" on the ftp server "ftp.a.com" using the Maintenance port (MNT port):

```
CLI> export backup-rec-path -port maintenance -server ftp.a.com -filename /tmp/rec-  
path1.txt -user cli-user -type text  
Password : _____(An Operator should input a password, which is hidden.)  
exporting /tmp/rec-path1.txt from ftp.a.com  
complete.
```

The following example is exactly the same, except that a progress indicator is not shown:

```
CLI> export backup-rec-path -port maintenance -server ftp.a.com -filename /tmp/rec-  
path1.txt -user cli-user -type text -indicator disable  
Password : _____(An Operator should input a password, which is hidden.)
```

show backup-rec-path-information

This command is used to display the date and file size of the system's backup REC path information file.

Syntax show backup-rec-path-information

Parameters No parameters.

Output

# Date	<u>2009-06-02 15:24:17</u>
	A
# File Size	<u>51224 Bytes</u>
	B

A: Date of the backed up path information file

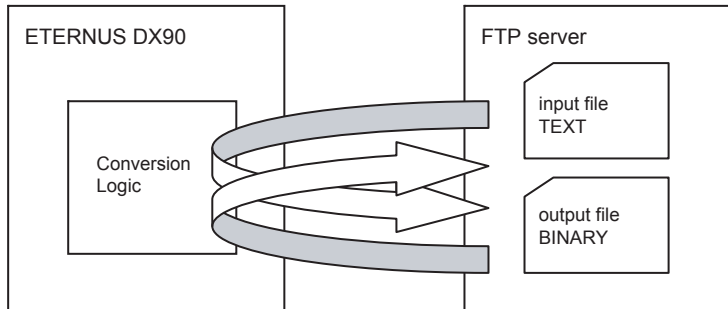
B: File size of the backed up path information file

Example(s) The following example displays the date and file size of the backup REC path information file.

```
CLI> show backup-rec-path-information
Date      2009-06-02 15:24:17
File Size 51224 Bytes
```

convert rec-path

This command is used to convert the type of the REC path information file to the other file type that is saved on and to an ftp server by passing it through the ETERNUS DX90. This conversion only affects the REC path information file on the ftp server, and has no effect on the current system setup.



Caution

- If the specified file already exists on the ftp server, it is overwritten.
- If a TEXT type path information file has syntax errors, the number of the problem line is included with the error message.

Syntax	<code>convert rec-path -port {maintenance remote} -server <i>server_name</i> -user <i>login_user_account</i> -source-file <i>source_file</i> -output-file <i>output_file</i> -mode {t2b b2t} [-indicator {enable disable}]</code>	
Parameters	-port	This parameter specifies which Ethernet port is to be used to connect to the ftp server. For further information, refer to "1.11 Note for Specifying FTP Server" (page 22) .
	maintenance	MNT port
	remote	RMT port
	-server	Both the conversion source file and the conversion destination file must be on an ftp server. This parameter specifies the name of the ftp server. The server name should be either in IPv4 standard notation (a base 256 "d.d.d.d" string) or a fully qualified domain name. Ex. -server 192.168.1.20 Ex. -server foo.bar
	-user	This parameter specifies a user name with which to access the ftp server. The command prompts for the ftp server password.
	-source-file	This parameter specifies a REC path information filename as the conversion source.
	-output-file	This parameter specifies a REC path information filename as the conversion destination.

- mode This parameter specifies the conversion mode.
 - t2b TEXT type is converted to BINARY.
 - b2t BINARY type is converted to TEXT.
- indicator Optional. This parameter specifies whether or not a progress indicator is to be displayed. If omitted, then the progress indicator is displayed.
 - enable Progress indicator is displayed.
 - disable Progress indicator is not displayed.

Example(s) The following example uses the user name "cli-user" to fetch the TEXT type REC path information file "/tmp/rec-path.txt" from the ftp server "ftp.a.com" using the Maintenance port (Ethernet: MNT port), converts it from TEXT type to BINARY type, and sends it back to the ftp server as the BINARY type REC path information file "/tmp/bin/rec_path.bin":

```
CLI> convert rec-path -port maintenance -server ftp.a.com -user cli-user -source-  
file /tmp/rec_path.txt -output-file /tmp/bin/rec_path.bin -mode t2b  
password : _____ (Operator inputs password, but it is hidden.)  
importing /tmp/rec_path.txt from ftp.a.com  
exporting /tmp/rec_path.bin to ftp.a.com  
complete.
```

The following example is exactly the same, except that a progress indicator is not shown.

```
CLI> convert rec-path -port maintenance -server ftp.a.com -user cli-user -source-  
file /tmp/rec_path.txt -output-file /tmp/bin/rec_path.bin -mode t2b -indicator dis-  
able  
Password : _____ (Operator inputs password, but it is hidden.)
```

measure-rec-round-trip-time

After setting up the REC path information, the round trip times to all remote storage systems where a time has not yet been set must be measured. This command measures the round trip time for each REC path, displays it, and can also save it in the system if so desired.

Caution 

- If the round trip time is measured with "-mode auto" specified, the path multiplicity is automatically set to the recommended multiplicity.
- If the round trip time is measured with "-mode manual" specified, the path multiplicity is automatically changed to the recommended multiplicity only if the operator orders that the results be saved to the system.

Syntax	measure-rec-round-trip-time -mode {auto manual} [-remote-boxid <i>remote_storage_system_box_id</i>]	
Parameters	-mode	This parameter specifies the round trip time measurement and setting mode.
	auto	Automatic mode. Round trip times are measured for all remote storage systems for which a round trip time has not yet set, and these times are set to the system as base information to optimize REC performance. This mode is recommended for the initial setup.
	manual	Manual mode. Round trip times are measured for the specified single remote storage system. The displayed can then be saved to the system if so requested by the operator.
	-remote-boxid	Optional. This parameter specifies the Box ID of a single remote storage system. Only one Box ID can be specified at a time. <ul style="list-style-type: none"> • This parameter cannot be specified for "-mode auto", but must be specified for "-mode manual". • Box IDs use a maximum of 40 alphanumeric characters, spaces, and hash marks (#). • All alphabetic characters are handled as uppercase. • Hash mark (#) characters are automatically appended when fewer than 40 characters are specified.

Output When "manual" mode is selected:

```
# Remote Box ID                               Round Trip Time (ms)
# 00DXL#####ET06F21AUABCPJ000002#####    20
A                                             B
```

A: Box ID of a remote storage system
 B: A measured round trip time

Example(s) The following example measures the round trip times to all remote storage systems for which a round trip time has not yet been set, and automatically reflects this to the system. Remote storage systems for which a round trip time has been already set, are not remeasured or otherwise affected:

```
CLI> measure-rec-round-trip-time -mode auto
```

The following example displays the measured round trip time, and confirms with the operator whether or not the result is to be saved to the system. In this example the measured round trip time is reflected to the system:

```
CLI> measure-rec-round-trip-time -mode manual -remote-boxid  
"00DXL#####ET06F21AUABCPJ000002#####"  
Remote Box ID                               Round Trip Time(ms)  
00DXL#####ET06F21AUABCPJ000002#####          20  
Enter 'y' to save this round trip time or 'n' to cancel.  
> y  
Complete.
```

The following example is the same as the above except that a cancel is entered. In this case, the round trip time is not reflected to the system:

```
CLI> measure-rec-round-trip-time -mode manual -remote-boxid  
"00DXL#####ET06F21AUABCPJ000002#####"  
Remote Box ID                               Round Trip Time(ms)  
00DXL#####ET06F21AUABCPJ000002#####          20  
Enter 'y' to save this round trip time or 'n' to cancel.  
> n  
Canceled.
```

set rec-multiplicity

Normally a REC multiplicity does not need to be set because the recommended multiplicity, which is automatically calculated by the system, is used. However, the REC multiplicities for individual paths can be tuned in order to maximize REC performance. This command is used to manually set the REC multiplicity.

Syntax `set rec-multiplicity -remote-boxid remote_storage_system_box_id
 -multiplicity {auto | multiplicity}`

Parameters -remote-boxid

This parameter specifies the Box ID of a single remote storage system for which the REC multiplicity is to be set.

- Box IDs use a maximum of 40 alphanumeric characters, spaces, and hash marks (#).
- All alphabetic characters are handled as uppercase.
- Hash mark (#) characters are automatically appended when fewer than 40 characters are specified.

-multiplicity This parameter specifies a REC multiplicity value. The possible values are either the range 1 to 256, or "auto" to use the recommended multiplicity.

auto Recommended multiplicity is used.

Example(s) The following example sets the REC multiplicity to 5:

```
CLI> set rec-multiplicity -remote-boxid "00DXL#####ED06F21AUABCPJ000001#####" -multiplicity 5
```

set rec-buffer

This command sets up REC buffers for use by the REC Asynchronous Consistency function. Up to 4 REC buffers can be set. When a REC buffer is newly defined, all the parameters must be specified. When an existing REC buffer is changed, only the parameters being changed need to be specified.

Caution

- The maximum value of the total REC buffer transfer size is 512 MB.
- Receive and Send REC buffers must both be independently defined if the REC buffer is to be used bi-directionally.

Syntax	<pre>set rec-buffer -partition {1 2 3 4} [-remote-boxid <i>storage_system_box_id</i>] [-buffer-size {128mb 256mb 512mb}] [-buffer-type {receive send}] [-forwarding-interval {1 2 4 8 15 30 45 60 75 90 105 120}] [-halt-wait-timer {0 5 10 15}] [-monitoring-time {0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15}]</pre>									
Parameters	-partition	<p>This parameter specifies a partition number for which a REC buffer is to be defined. The range is 1 to 4.</p> <table border="0"> <tr><td>1</td><td>Partition #1</td></tr> <tr><td>2</td><td>Partition #2</td></tr> <tr><td>3</td><td>Partition #3</td></tr> <tr><td>4</td><td>Partition #4</td></tr> </table>	1	Partition #1	2	Partition #2	3	Partition #3	4	Partition #4
1	Partition #1									
2	Partition #2									
3	Partition #3									
4	Partition #4									
	-remote-boxid	<p>Optional. This parameter specifies the Box ID of a single remote storage system for which REC buffers are to be defined. Only one Send/Receive REC buffer transfer can be set using the Box ID of a single remote storage system. This parameter must be specified for the initial setup. If omitted, this parameter value cannot be changed.</p> <ul style="list-style-type: none"> • Box IDs use a maximum of 40 alphanumeric characters and spaces. • All alphabetic characters are handled as uppercase. • Hash mark (#) characters are automatically appended when fewer than 40 characters are specified. 								
	-buffer-size	<p>Optional. This parameter specifies a buffer size value, up to 512MB. This parameter must be specified for the initial setup. If omitted, this parameter value cannot be changed.</p> <table border="0"> <tr><td>128mb</td><td>128MB will be allocated. If this size is selected, up to the maximum of 4 partitions can be set.</td></tr> <tr><td>256mb</td><td>256MB will be allocated.</td></tr> <tr><td>512mb</td><td>512MB will be allocated. If this size is selected, only one partition can be set.</td></tr> </table>	128mb	128MB will be allocated. If this size is selected, up to the maximum of 4 partitions can be set.	256mb	256MB will be allocated.	512mb	512MB will be allocated. If this size is selected, only one partition can be set.		
128mb	128MB will be allocated. If this size is selected, up to the maximum of 4 partitions can be set.									
256mb	256MB will be allocated.									
512mb	512MB will be allocated. If this size is selected, only one partition can be set.									

-buffer-type

Optional. This parameter specifies the REC buffer type. This parameter must be specified for the initial setup. If omitted, this parameter value cannot be changed.

receive Use as a Receive buffer.

send Use as a Send buffer.

-forwarding-interval

Optional. This parameter specifies the interval at which data should be transferred. A long interval will reduce the Host I/O overhead, but increase the amount of data susceptible to loss in an event of disaster. This parameter must be specified for the initial setup. If omitted, this parameter value cannot be changed.

1 1 second (recommended value)

2 2 seconds

4 4 seconds

8 8 seconds

15 15 seconds

30 30 seconds

45 45 seconds

60 60 seconds

75 75 seconds

90 90 seconds

105 105 seconds

120 120 seconds

-halt-wait-timer

Optional. This parameter specifies the maximum no-response time for which host I/O responses may be delayed in order to prioritize data transfers from the REC buffer when it is in a high-load state. When this time is exceeded, communication with the host I/O reopens, but the copy session is halted. This parameter must be specified for the initial setup. If omitted, this parameter value cannot be changed.

0	Disabled
5	5 seconds
10	10 seconds
15	15 seconds (Recommended value)

-monitoring-time

Optional. This parameter specifies a monitoring time for high-load state REC buffers. The possible range is 0 to 15 seconds. Zero means the monitoring function is disabled. When the REC buffer has lots of data to be stored and is in a high-load state, the time required for I/O responses to the server is gradually incremented by the "-halt-wait-timer" parameter value. Once the delay state has continued for longer than this parameter value, all REC Asynchronous Consistency Mode sessions that are currently transferring data are halted to allow priority processing of the server responses. This parameter must be specified for the initial setup. If omitted, this parameter value cannot be changed.

0	Disabled
1 – 15	1 to 15 minutes. Recommended value is 5 minutes.

Example(s) The following example sets up partition #1:

```
CLI> set rec-buffer -partition 1 -buffer-type receive -remote-boxid  
"00DXL#####ET06F21AUABCPJ000002#####" -buffer-size 128mb -forwarding-interval 1 -halt-wait-  
timer 15 -monitoring-time 5
```

The following example changes the defined size of partition #2 to 256MB:

```
CLI> set rec-buffer -partition 2 -buffer-size 256mb
```

delete rec-buffer

This command deletes an existing REC buffer definition.

Syntax delete rec-buffer -partition {1|2|3|4}

Parameters -partition This parameter specifies the number of the partition (1 to 4) that is to be deleted.

1 Partition #1

2 Partition #2

3 Partition #3

4 Partition #4

Example(s) The following example deletes partition #1:

```
CLI> delete rec-buffer -partition 1
```

show rec-buffer

This command can display the information defined for REC buffers.

Syntax show rec-buffer

Parameters No parameters.

Output

#	Part.	Type	Remote Box ID	Status	Size (MB)	Forwarding Interval (s)	Monitoring Time (m)	Halt Wait Timer (s)
#	1	Receive	00DXL#####ET06F21AUABCPJ000002#####	Active	128	1	5	15
	A	B	C	D	E	F	G	H

- A: Assigned partition number
- B: REC buffer type
- C: Box ID of a storage system that uses a REC buffer
- D: REC buffer status
- E: REC buffer size
- F: Forwarding interval (unit: second)
- G: Monitoring time (unit: minute)
- H: HALT wait timer (unit: second)

Example(s) The following example displays the REC buffer information and REC buffer status:

```
CLI> show rec-buffer
Part. Type Remote Box ID Status Size Forwarding Monitoring Halt Wait
(MB) Interval (s) Time (m) Timer (s)
1 Receive 00DXL#####ET06F21AUABCPJ000002##### Active 128 4 3 10
2 Send 00DXL#####ET06F21AUABCPJ000002##### Inactive 128 1 1 5
3 (Unused) - - - - - - - - -
4 Receive ??? - 128 1 1 5
```

4.3 Network Management

This section explains the related commands regarding the following network configuration management.

- System network configurations
- SNMP configurations
- SMI-S settings
- SSL/SSH configurations

4.3.1 Network Settings

This section explains the related commands regarding the settings to connect network.

set network

This command sets up the parameters used to connect to the Ethernet network, and checks their consistency. If the ETERNUS DX60/DX80/DX90 detects an inconsistency, the input command is terminated abnormally.

- IP addresses may be deleted by specifying "0.0.0.0".
- The IP address that connects to the maintenance port (MNT port) of the master controller module (CM) cannot be deleted.
- When making critical changes, such as changing a subnet address, it is recommended that all of the network parameters should be reconfigured.
- When the setup changes such that the command connection cannot be kept, it is logged off automatically.

Syntax `set network -port {maintenance | remote}`
 `[-master-ip ip_address] [-slave-ip ip_address]`
 `[-slave-ip-enable {enable | disable}]`
 `[-netmask netmask] [-gateway gateway]`
 `[-allow-ip1 ip_address,netmask] [-allow-ip2 ip_address,netmask]`
 `[-allow-ip3 ip_address,netmask] [-allow-ip4 ip_address,netmask]`
 `[-allow-ip5 ip_address,netmask] [-allow-ip6 ip_address,netmask]`
 `[-allow-ip7 ip_address,netmask] [-allow-ip8 ip_address,netmask]`
 `[-allow-ip9 ip_address,netmask] [-allow-ip10 ip_address,netmask]`
 `[-allow-ip11 ip_address,netmask] [-allow-ip12 ip_address,netmask]`
 `[-allow-ip13 ip_address,netmask] [-allow-ip14 ip_address,netmask]`
 `[-allow-ip15 ip_address,netmask] [-allow-ip16 ip_address,netmask]`
 `[-speed {1000|100full|100half|10full|10half|auto}]`
 `[-primary-dns-ip ip_address] [-secondary-dns-ip ip_address]`
 `[-wake-on-lan {enable|disable}]`

Parameters -port This parameter specifies the Ethernet port that is to be setup.

 maintenance Maintenance port (MNT port)

 remote Remote port (RMT port)

 -master-ip Optional. This parameter specifies an IP address to connect to the master CM. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) If omitted. If it is omitted this parameter value is not changed.

Ex. -master-ip 192.168.1.1

Caution

If the slave IP address is active, both master/slave IP addresses must belong to the same subnet address.

-slave-ip Optional. This parameter specifies an IP address to connect to the slave CM. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) If omitted, this parameter is left unchanged.

Ex. -slave-ip 192.168.1.2

Caution 

Both the master/slave IP addresses must belong to the same subnet address.

-slave-ip-enable Optional. This parameter specifies whether the slave IP address is set to the active or not. If omitted, this parameter is left unchanged.

enable The slave IP address is enabled.

disable The slave IP address is disabled.

-netmask Optional. This parameter specifies a subnet mask for the specified Ethernet port. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) If omitted, this parameter is left unchanged.

Ex. -netmask 255.255.255.0

-gateway Optional. This parameter specifies the gateway address for the specified Ethernet port. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) It is required when you permit access beyond the sub-network, the network address to which the ETERNUS DX60/DX80/DX90 belongs. If omitted, then this parameter value is not changed.

Ex. -gateway 10.1.1.2

- allow-ip1 Optional. These parameters specify an IP address or a network address to permit a connection to ETERNUS DX60/DX80/DX90.
- allow-ip2 They can specify the maximum of 16 items. If omitted, this parameter is left unchanged. It is not required when connecting from the sub-network, the network address to which the ETERNUS DX60/DX80/DX90 belongs. The following is description examples.
- allow-ip3
- allow-ip4
- allow-ip5
- allow-ip6
- allow-ip7
- allow-ip8
- allow-ip9 Ex. When you only permit access from a terminal that has the IP address "192.168.1.2" and the subnet mask "255.255.255.0", specify like the following.
- allow-ip10 "-allow-ip1 192.168.1.2,255.255.255.0"
- allow-ip11
- allow-ip12
- allow-ip13
- allow-ip14 Ex. When you permit access from all terminal which has the IP address "192.168.3.*" and the subnet mask is "255.255.255.0", specify like the following.
- allow-ip15 "-allow-ip1 192.168.3.0,255.255,255,0"
- allow-ip16
- Ex. When the element is deleted, Specify like the following.
"-allow-ip1 0.0.0.0,0.0.0.0"
- speed Optional. This parameter specifies the connection speed of Ethernet port. If omitted, this parameter is left unchanged.

1000	1Gbit/s
100full	100Mbit/s full-duplex
100half	100Mbit/s half-duplex
10full	10Mbit/s full-duplex
10half	10Mbit/s half-duplex
auto	Auto negotiation
- primary-dns-ip Optional. This parameter specifies the primary DNS IP address of the Ethernet port. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) If omitted. If it is omitted this parameter is not changed.
- secondary-dns-ip Optional. This parameter specifies the secondary DNS IP address of the Ethernet port. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) If omitted. If it is omitted this parameter is not changed.

-wake-on-lan

Optional. This parameter specifies whether or not the Wake on LAN (WOL) function is enabled. This function can be independently set for each Ethernet port (MNT/RMT). The initial value is set to "disable". If omitted, this parameter is left unchanged.

enable Wake on LAN is enabled.

disable Wake on LAN is disabled.

Example(s) The following example sets up network parameters. The IP address is "192.168.1.100", and a subnet mask is "255.255.255.0":

```
CLI> set network -port maintenance -master-ip 192.168.1.100 -netmask 255.255.255.0
```

The following example sets up network parameters. The IP address is "10.10.10.1", a subnet mask is "255.255.0.0", and a gateway address is "10.10.10.250", accessible terminals are both "10.10.*.*" and "192.168.1.1":

```
CLI> set network -port maintenance -master-ip 10.10.10.1 -netmask 255.255.0.0 -  
gateway 10.10.10.250 -allow-ip1 10.10.0.0,255.255.0.0 -allow-ip2  
192.168.1.1,255.255.255.0
```

The following example changes the Ethernet speed of maintenance port (MNT port) to the 100M full-duplex:

```
CLI> set network -port maintenance -speed 100full
```

show network

This command displays the Ethernet configuration parameters.

Syntax show network

Parameters No parameters.

Output

```
# MNT port Enable
Maintenance Port (MNT port) name and [Enable/Disable]
# Master IP 192.168.1.1
IP address of maintenance port (MNT port) on master CM
# Slave IP 192.168.1.2 Enable
IP address of maintenance port (MNT port) on slave CM, and valid sign
# Subnet Mask 255.255.255.0
Subnet mask of maintenance port (MNT port)
# Gateway 192.168.1.250
Gateway address of maintenance port (MNT port)
# Primary DNS 192.168.1.253 Secondary DNS 192.168.1.254
Primary and secondary DNS IP address
# Speed and Duplex Auto Negotiation
Connection speed of maintenance port (MNT port)
# Allowed IP1 192.168.2.0,255.255.255.0 Allowed IP2 10.10.10.0,255.255.255.0
IP address Subnet mask IP address Subnet mask
# Allowed IP15 192.168.9.0,255.255.255.0 Allowed IP16 10.10.17.0,255.255.255.0
IP address Subnet mask IP address Subnet mask
The list of Allowed IP1-16 is accessible terminals through maintenance port (MNT port).
# Wake on LAN Disable
It indicates if a function of the Wake on LAN is enabled on the MNT port.
# MAC Address CM#0 01:02:03:04:05:06 CM#1 11:12:13:14:15:16
Each MAC address of the MNT port on both controller modules
A hyphen (-) is displayed to the field of CM#1 in the case of 1CM model.

# RMT port Enable
Remote Port (RMT port) name and [Enable/Disable]
# Master IP 192.168.128.1
IP address of remote port (RMT port) on master CM
# Slave IP 192.168.128.1 Disable
IP address of remote port (RMT port) on slave CM, and enabled/disabled sign
# Subnet Mask 255.255.255.0
Subnet mask of remote port (RMT port)
# Gateway 192.168.128.250
Gateway address of remote port (RMT port)
# Primary DNS 192.168.128.253 Secondary DNS 192.168.128.254
Primary and Secondary DNS IP address of remote port (RMT port)
# Speed and Duplex Auto Negotiation
Connection speed of remote port (RMT port)
# Allowed IP1 192.168.129.0,255.255.255.0 Allowed IP2 10.10.10.1,255.255.255.0
IP address Subnet mask IP address Subnet mask
# Allowed IP15 192.168.136.0,255.255.255.0 Allowed IP16 10.10.10.8,255.255.255.0
IP address Subnet mask IP address Subnet mask
The list of Allowed IP1-16 is accessible terminals through remote port (RMT port).
# Wake on LAN Disable
It indicates if a function of the Wake on LAN is enabled on the RMT port.
# MAC Address CM#0 01:02:03:04:05:06 CM#1 11:12:13:14:15:16
Each MAC address of the RMT port on both controller modules
A hyphen (-) is displayed to the field of CM#1 in the case of 1CM model.
```

Example(s) The following example displays the Ethernet configuration parameters:

```
CLI> show network
MNT port
Master IP      192.168.1.1
Slave IP      192.168.1.2 Enable
Subnet Mask   255.255.255.0
Gateway      192.168.1.250
Primary DNS   192.168.1.253   Secondary DNS 192.168.1.254
Speed and Duplex Auto Negotiation
Allowed IP1   192.168.2.0,255.255.255.0      Allowed IP2  10.10.10.0,255.255.255.0
Allowed IP3   0.0.0.0,0.0.0.0                Allowed IP4  0.0.0.0,0.0.0.0
Allowed IP5   0.0.0.0,0.0.0.0                Allowed IP6  0.0.0.0,0.0.0.0
Allowed IP7   0.0.0.0,0.0.0.0                Allowed IP8  0.0.0.0,0.0.0.0
Allowed IP9   0.0.0.0,0.0.0.0                Allowed IP10 0.0.0.0,0.0.0.0
Allowed IP11  0.0.0.0,0.0.0.0                Allowed IP12 0.0.0.0,0.0.0.0
Allowed IP13  0.0.0.0,0.0.0.0                Allowed IP14 0.0.0.0,0.0.0.0
Allowed IP15  0.0.0.0,0.0.0.0                Allowed IP16 0.0.0.0,0.0.0.0
Wake on LAN   Disable
MAC Address   CM#0 01:02:03:04:05:06 CM#1 11:12:13:14:15:16

RMT port
Master IP      192.168.128.1
Slave IP      192.168.128.2 Disable
Subnet Mask   255.255.255.0
Gateway      192.168.128.250
Primary DNS   192.168.128.253   Secondary DNS 192.168.128.254
Speed and Duplex Auto Negotiation
Allowed IP1   0.0.0.0,0.0.0.0                Allowed IP2  0.0.0.0,0.0.0.0
Allowed IP3   0.0.0.0,0.0.0.0                Allowed IP4  0.0.0.0,0.0.0.0
Allowed IP5   0.0.0.0,0.0.0.0                Allowed IP6  0.0.0.0,0.0.0.0
Allowed IP7   0.0.0.0,0.0.0.0                Allowed IP8  0.0.0.0,0.0.0.0
Allowed IP9   0.0.0.0,0.0.0.0                Allowed IP10 0.0.0.0,0.0.0.0
Allowed IP11  0.0.0.0,0.0.0.0                Allowed IP12 0.0.0.0,0.0.0.0
Allowed IP13  0.0.0.0,0.0.0.0                Allowed IP14 0.0.0.0,0.0.0.0
Allowed IP15  0.0.0.0,0.0.0.0                Allowed IP16 0.0.0.0,0.0.0.0
Wake on LAN   Disable
MAC Address   CM#0 21:22:23:24:25:26 CM#1 31:32:33:34:35:36
```

set firewall

This command is used to enable and disable the individual Ethernet application service ports. Initially all ports (excluding the ETERNUS Maintenance Secure port) are enabled.

Protocol	Service type	
http	GUI	The "-confirm-close-all yes" parameter is required when both of the GUI service port connections and both of the CLI service port connections are being disabled, or when both of the CLI service port connections are being disabled. Otherwise, the CLI command is terminated with an error.
https	GUI	
telnet	CLI	
SSH	CLI	
ETERNUS Maintenance	Storage platform software (monitoring software, etc.)	
ETERNUS Maintenance Secure	Secure storage platform software (monitoring software, etc.)	
ICMP	ping	

Caution

- All the service ports can be disabled by using this command, but all software, CLI, GUI, and external software will then not be able to establish a connection. In this case, the initial "all ports open" state can be reverted to by pushing the system's IP RESET switch. However, note that this will also clear all the network information. For further information, refer to "ETERNUS DX60/DX80/DX90 Disk storage system User Guide".
- When any settings but ICMP are changed, the CLI session is automatically disconnected after the command is executed. Note that the session is disconnected even if a setting value not involved in CLI connections is changed. For example, if the system has both the SSH and HTTPS ports open, and all other ports closed, then an SSH session will be disconnected even if just the HTTPS port is closed. After a session is disconnected, it will be necessary to log in the system again.
- It can take a little time for the requested changes to be effected. For example, when the GUI is used to request the opening of the SSH port, it may be a minute or so before an SSH connected CLI session can be initiated.

Syntax `set firewall -port {maintenance | remote} [-http {open | close}] [-https {open | close}] [-telnet {open | close}] [-ssh {open | close}] [-maintenance {open | close}] [-maintenance-secure {open | close}] [-icmp {open | close}] [-confirm-close-all {yes | no}]`

Parameters

-port	This parameter specifies an Ethernet port.
maintenance	MNT port
remote	RMT port

- http** Optional. This parameter specifies if the http connection is enabled or disabled. If omitted, the parameter value is not changed. The initial state is "open".
- open The http connection is enabled.
 - close The http connection is disabled.
- https** Optional. This parameter specifies if the https connection is enabled or disabled. If omitted, the parameter value is not changed. The initial state is "open".
- open The https connection is enabled.
 - close The https connection is disabled.
- telnet** Optional. This parameter specifies if the telnet connection is enabled or disabled. If omitted, the parameter value is not changed. The initial state is "open".
- open The telnet connection is enabled.
 - close The telnet connection is disabled.
- ssh** Optional. This parameter specifies if the SSH (Secure Shell) connection is enabled or disabled. If omitted, the parameter value is not changed. The initial state is "open".
- open The SSH connection is enabled.
 - close The SSH connection is disabled.
- maintenance** Optional. This parameter specifies if the ETERNUS Maintenance connection, which is used to access from the monitoring software, is enabled or disabled. If omitted, the parameter value is not changed. The initial state is "open".
- open The ETERNUS Maintenance connection is enabled.
 - close The ETERNUS Maintenance connection is disabled.
- maintenance-secure** Optional. This parameter specifies if the ETERNUS Maintenance Secure connection, which is used to access from the monitoring software, is enabled or disabled. This connection uses the data encryption for data transferring. If omitted, the parameter value is not changed. The initial state is "close".
- open The ETERNUS Maintenance Secure connection is enabled.
 - close The ETERNUS Maintenance Secure connection is disabled.

-icmp Optional. This parameter specifies if the ICMP (Internet Control Message Protocol) connection is enabled or disabled. This connection is used when transferring ping command from PC. If omitted, the parameter value is not changed. The initial state is "open".

open The ICMP connection is enabled.

close The ICMP connection is disabled.

-confirm-close-all

Optional. "-confirm-close-all yes" parameter must be specified in either of the following cases:

- When disabling all the service ports for both GUI and CLI connections (HTTP, HTTPS, telnet, and SSH)
- When disabling both of the service ports for CLI connections (telnet, and SSH)

In all other cases, this parameter is ignored. For example, if a command such as "set firewall -port remote -icmp close -confirm-close-all no" is entered, the command is executed with exactly the same result as if ICMP service protocol was disabled normally.

yes Only required when all of the GUI and CLI related service ports are being disabled.

no Handled as a "no operation".

Example(s) The following example closes all the service ports except the SSH service for CLI:

```
CLI> set firewall -port remote -http close -https close -telnet close -maintenance
close -maintenance-secure close -icmp close
CLI> set firewall -port maintenance -http close -https close -telnet close -mainte-
nance close -maintenance-secure close -icmp close
```

The following example closes all the service ports involved in both GUI and CLI connections:

```
CLI> set firewall -port remote -http close -https close -telnet close -ssh close -
confirm-close-all yes
CLI> set firewall -port maintenance -http close -https close -telnet close -ssh
close -confirm-close-all yes
```

show firewall

This command displays the status of each Ethernet application service port.

Syntax show firewall

Parameters No parameters.

Output

```
# MNT Port
# http [Closed]
# https [Closed]
# telnet [Closed]
# SSH [Open ]
# Maintenance [Closed]
# Maintenance-Secure [Closed]
# ICMP [Closed]
#
# RMT Port
# http [Closed]
# https [Closed]
# telnet [Closed]
# SSH [Open ]
# Maintenance [Closed]
# Maintenance-Secure [Closed]
# ICMP [Closed]
```

MNT Port: This means maintenance port of Ethernet.

RMT Port: This means remote port of Ethernet.

The port status of application service http, https, telnet, SSH, ETERNUS Maintenance, ETERNUS Maintenance Secure, and ICMP are displayed respectively. [Open] indicates that the port is opened. [Closed] indicates the port is closed.

Example(s) The following example displays the status of each application service port.

```
CLI> show firewall
MNT Port
http [Closed]
https [Closed]
telnet [Closed]
SSH [Open ]
Maintenance [Closed]
Maintenance-Secure [Closed]
ICMP [Closed]

RMT Port
http [Closed]
https [Closed]
telnet [Closed]
SSH [Open ]
Maintenance [Closed]
Maintenance-Secure [Closed]
ICMP [Closed]
```

4.3.2 SNMP

This section explains the related commands for SNMP settings, MIB view settings, community settings, and SNMP trap settings.

- SNMP configurations settings
- SNMP MIB view settings
- SNMP community settings
- SNMP trap settings
- Exporting enhanced SNMP MIB files

set snmp

This command sets the SNMP parameters, preparation for using the SNMP.

Syntax	set snmp [-function {enable disable}] [-port {maintenance remote}] [-during-maintenance {enable disable}] [-authentication-failure {enable disable}]
Parameters	<p>-function Optional. This parameter specifies whether SNMP functions are enabled or not. The initial value is set to "disable". If omitted, this parameter is left unchanged.</p> <p>enable Functions of each SNMP are enabled.</p> <p>disable Functions of each SNMP are disabled. (default)</p> <p>-port Optional. This parameter specifies the Ethernet port to use SNMP functions. If omitted, this parameter is left unchanged.</p> <p>maintenance Maintenance port (MNT port)</p> <p>remote Remote port (RMT port)</p> <p>-during-maintenance Optional. This parameter specifies if SNMP notification of Error and Warning status components is to be continued while maintenance work is being performed. Note that this is unrelated to SNMP trapping, and that SNMP trap notification does not depend on this setting.</p> <p>The initial value is set to "enable" (= notified). If omitted, this parameter is left unchanged.</p> <p>enable An error status is notified during maintenance.</p> <p>disable An error status is not notified during maintenance.</p> <p>-authentication-failure Optional. This parameter specifies if the SNMP authentication failure function is enabled. This function is used to notify the operator of Authentication Failure as an SNMP trap when this system is accessed from other than an existing SNMP community. If omitted, this parameter is not changed. The initial value is set to "enable".</p> <p>enable An SNMP trap is notified when SNMP authentication fails.</p> <p>disable An SNMP trap is not notified when SNMP authentication fails.</p>

Example(s) The following example disables SNMP functions:

```
CLI> set snmp -function disable
```

The following example uses the remote port (RMT port) for SNMP:

```
CLI> set snmp -port remote
```

The following example suppresses SNMP notification of Error and Warning status components during maintenance work:

```
CLI> set snmp -during-maintenance disable
```

show snmp

This command displays the SNMP parameters.

Syntax show snmp

Parameters No parameter

Output

```
# SNMP [Enable]
  A
# Port [MNT]
  B
# During Maintenance [Disable]
  C
# Authentication Failure [Enable]
  D
```

- A: It shows whether SNMP functions are enabled or not
- B: Ethernet port to use SNMP functions
- C: It shows whether or not an Error or Warning status of components is notified during a maintenance work through SNMP.
- D: It shows whether to notify the Authentication Failure as SNMP trap when this system is accessed from not existing SNMP communities.

Example(s) The following example displays the SNMP parameters:

```
CLI> show snmp
SNMP [Enable]
Port [MNT]
During Maintenance [Disable]
Authentication Failure [Enable]
```

create snmp-view

This command creates an SNMP Management Information Base view (MIB view). The MIB view is defined by the access scope of the MIB, which is a database that uses a tree structure.

Caution

The following rules apply to the description of SNMP MIB view names and subtree view names:

- A maximum of 60 characters may be used.
- Names must be specified as a combination of numbers and periods (.). [eg. "1.3.5"]
- At least one period (.) must be used. [eg. "15" is invalid]
- Just "0" cannot be used between periods (.). [eg. "1.0.1" is invalid]
- Numbers may not start with "0". [eg. "1.01.1" is invalid]

Syntax	<pre>create snmp-view -view <i>view_name</i> [-subtree1 <i>subtree1</i>] [-subtree2 <i>subtree2</i>] [-subtree3 <i>subtree3</i>] [-subtree4 <i>subtree4</i>] [-subtree5 <i>subtree5</i>] [-subtree6 <i>subtree6</i>] [-subtree7 <i>subtree7</i>] [-subtree8 <i>subtree8</i>] [-subtree9 <i>subtree9</i>] [-subtree10 <i>subtree10</i>] [-subtree11 <i>subtree11</i>] [-subtree12 <i>subtree12</i>] [-subtree13 <i>subtree13</i>] [-subtree14 <i>subtree14</i>] [-subtree15 <i>subtree15</i>]</pre>
Parameters	<p>-view This parameter specifies a MIB view name, up to a maximum of 30 MIB views. It is a unique name, and must be specified with a combination of numbers and periods (.). For example, "1.3.6". Two or more parameters cannot be created at the same time.</p> <p>-subtree1 Optional. These parameters specify accessible sub-trees corresponding to the specified MIB view, up to the maximum of 15 sub-trees in a MIB view. If omitted, they are handled with as disabled.</p> <p>...</p> <p>-subtree15</p>

Caution

- These parameters must be specified sequentially, in ascending order, without omission.
- A name must be specified using a combination of the numbers and dot (.). For example, "1.3.5".

Example(s) The following example creates the MIB view named "1.3". It includes one subtree named "1.3.6.1.2.1" in a MIB view:

```
CLI> create snmp-view -view 1.3 -subtree1 1.3.6.1.2.1
```

The following is incorrect example because the parameters are not specified sequentially without omission:

```
CLI> create snmp-view -view 1.3 -subtree1 1.3.6.1.2.1 -subtree3 1.3.6.1.2.2  
^
```

set snmp-view

This command adds subtrees to or deletes subtrees from the specified SNMP MIB view.

Caution

The following rules apply to the description of SNMP MIB view names and subtree view names:

- A maximum of 60 characters may be used.
- Names must be specified as a combination of numbers and periods (.). [eg. "1.3.5"]
- At least one period (.) must be used. [eg. "15" is invalid]
- Just "0" cannot be used between periods (.). [eg. "1.0.1" is invalid]
- Numbers may not start with "0". [eg. "1.01.1" is invalid]

Syntax	<pre>set snmp-view -view view_name [-subtree1 subtree1] [-subtree2 subtree2] [-subtree3 subtree3] [-subtree4 subtree4] [-subtree5 subtree5] [-subtree6 subtree6] [-subtree7 subtree7] [-subtree8 subtree8] [-subtree9 subtree9] [-subtree10 subtree10] [-subtree11 subtree11] [-subtree12 subtree12] [-subtree13 subtree13] [-subtree14 subtree14] [-subtree15 subtree15]</pre>
Parameters	<p>-view This parameter specifies a MIB view name to be changed. Two or more MIB views cannot be requested at the same time.</p> <p>-subtree1 Optional. These parameters specify accessible sub-trees corresponding to the specified MIB view, up to the maximum of 15 subtrees in a MIB view. If omitted, these parameters are not changed.</p> <p>...</p> <p>-subtree15</p>

Caution

- When deleting a sub-tree, you can describe two double quotation characters consecutively. For example, `-subtree3 ""`. In this case, all the sub-trees are sequentially relocated.

Example(s) The following example adds to the sub-tree named "1.3.6.1.2.2" in the MIB view named "1.3":

```
CLI> set snmp-view -view 1.3 -subtree2 1.3.6.1.2.2
```

The following example deletes "subtree#2" from the MIB view named "1.3" (being replaced by "subtree#3"):

```
CLI> set snmp-view -view 1.3 -subtree2 ""
```


delete snmp-view

This command deletes SNMP MIB views.

Syntax `delete snmp-view -view view_name`

Parameters `-view` This parameter specifies a MIB view name to be deleted. Two or more MIB views can be requested with using asterisk (*), a wildcard at the same time.

Caution

- Numbers and wildcards cannot be mixed in the same field (for example, between dot characters).
- Wildcards cannot precede numbers.
- The number shown between dot characters can be specified only.
- Also a description, such as a number shown behind an asterisk cannot be specified.

The examples are shown below.

```
*      ... OK
10.*   ... OK
10.1*  ... NG
*.1    ... NG
```

Example(s) The following example deletes the MIB view named "1.3":

```
CLI> delete snmp-view -view 1.3
```

The following example deletes the MIB views beginning with the name "1.":

```
CLI> delete snmp-view -view 1.*
```

The following example deletes all registered MIB views:

```
CLI> delete snmp-view -view *
```

show snmp-view

This command displays a list of the registered SNMP MIB view, and also can display a list of sub-trees by requesting that name.

Syntax	show snmp-view [-view <i>view_name</i>]
Parameters	-view Optional. This parameter specifies a MIB view name to display sub-trees. Two or more can be requested by using an asterisk (*), and a wildcard at the same time. If omitted, then all registered SNMP MIB view names are listed.

Caution

- The number shown between dot characters can be specified only.
- Also a description, such as a number shown behind an asterisk cannot be specified.

The examples are shown below.

```
*      ... OK
10.*   ... OK
10.1*  ... NG
*.1    ... NG
```

Output When omitting parameter.

```
# 1.3
   MIB view name
```

When requesting SNMP MIB view.

```
# View-name : 1.3
             A
# Subtree1   : 1.3.6.1.2.3
             B
```

A: MIB view name
B: Sub-tree information

Example(s) The following example displays the list of all registered MIB view names:

```
CLI> show snmp-view
1.3
1.4
1.5
```

The following example displays the list of sub-trees of the MIB view named "1.3":

```
CLI> show snmp-view -view 1.3
View-name : 1.3
Subtree1   : 1.3.6.1.2.1
Subtree2   : 1.3.6.1.2.2
Subtree3   : 1.3.6.1.2.3
```

The following example displays the sub-trees of the MIB views beginning with the named "1.":

```
CLI> show snmp-view -view 1.*
View-name : 1.2
Subtree1  : 1.2.6.1.2
Subtree2  : 1.2.6.1.2
Subtree3  : 1.2.6.1.2

View-name : 1.3
Subtree1  : 1.3.6.1.2.1
Subtree2  : 1.3.6.1.2.2
Subtree3  : 1.3.6.1.2.3
```

The following example displays all registered MIB views and its sub-trees:

```
CLI> show snmp-view -view *
View-name : 1.2
Subtree1  : 1.2.6.1.2
Subtree2  : 1.2.6.1.2
Subtree3  : 1.2.6.1.2

View-name : 1.3
Subtree1  : 1.3.6.1.2.1
Subtree2  : 1.3.6.1.2.2
Subtree3  : 1.3.6.1.2.3

View-name : 2.8
Subtree1  : 2.8.6.1.2.1
Subtree2  : 2.8.6.1.2.2
Subtree3  : 2.8.6.1.2.3
```

create community-profile

This command establishes the scope of the SNMP network by defining a community profile as an association between an SNMP community name, IP address and MIB view. The same community name and IP address combination cannot be used in more than one profile, and a maximum of 30 profiles can be created.

The system's SNMP agent permits access requests by an SNMP manager when the request matches a community profile, i.e. when the following conditions are met:

- The community name presented by the manager to the agent must match the community name of the profile.
- The IP address of the SNMP manager must also match the address defined in the profile. If the profile contains the IP address "0.0.0.0", then all manager IP addresses are considered to match.

The MIB view associated with the community profile defines what information the manager is able retrieve from the agent.

Read-only authority is granted to SNMP manager requests that match the community profile. It is not possible for a profile to grant any authority other than read-only.

Syntax create community-profile -community *community_name*
 -ip-address *ip_address* -view {*view_name* | all}

Parameters -community

This parameter specifies an SNMP community name, a maximum of 50 alphanumeric characters, symbols ('!', '#', '\$ (except for the first letter)', '% (except for the first letter)', '&', '_' (underscore), '+', '-' (hyphen), '*', and '/'), and blanks (except for the first and last letter) can be used. Two or more parameters cannot be requested at the same time.

Caution

- If you include a space (), SNMP community name must be enclosed by double quotations (""). In this case, it is counted as the number of letters.

Ex. -community "community 001" (using 15 letters)

-ip-address This parameter specifies an IP address for the SNMP manager. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d)

Ex. -ip-address 192.168.1.20

Caution

- When requesting "0.0.0.0", it is accessed from all SNMP managers.
- The domain format name cannot be requested.

-view This parameter specifies an SNMP MIB view name accessed to this.

 **Note**

- When requesting "all", all registered MIB views are selected.

all All registered MIB views are selected.

Example(s) The following example creates an SNMP community. The IP address of SNMP manager is 0.0.0.0, all access, and an SNMP MIB view name is "view1":

```
CLI> create community-profile -community community1 -ip-address 0.0.0.0 -view view1
```

The following example creates an SNMP community with a SNMP community name of "community1", an SNMP manager IP address of "192.168.1.1" and the SNMP MIB view able to access all MIB views:

```
CLI> create community-profile -community community1 -ip-address 192.168.1.1 -view all
```

delete community-profile

This command deletes an SNMP community.

Syntax delete community-profile -community *community_name*
 [-ip-address *ip_address*]

Parameters -community This parameter specifies an SNMP community name to be deleted. Two or more parameters cannot be requested at the same time.

-ip-address Optional. This parameter specifies an IP address for the SNMP manager. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) If omitted, then it is handled as if all IP addresses are contained in the specified SNMP community.

Ex. -ip-address 192.168.1.20

Caution

- The domain format name cannot be requested.

Example(s) The following example deletes the SNMP community named "community1":

```
CLI> delete community-profile -community community1
```

The following example deletes the SNMP community profile with SNMP community name "community1" and IP address "192.168.1.1":

```
CLI> delete community-profile -community community1 -ip-address 192.168.1.1
```

show community-profile

This command displays a list of all registered SNMP community.

Syntax show community-profile

Parameters No parameters.

Output

#	Name	IP Address	Authority	MIB View
#	community1	192.168.100.125	Read Only	view1
A	B	C	D	

A: Community name

B: IP Address

C: Authority

D: MIB view name

If nothing is displayed on the MIB View field, it means that SNMP community can be accessed to all registered MIB views.

Note

A maximum of 50 alphanumeric letters can be used for an SNMP community name. Therefore, the start position of an IP address field is automatically adjusted according to the length of the SNMP community name.

Example(s) The following example displays a list of all registered SNMP community:

```
CLI> show community-profile
Name      IP Address      Authority MIB View
community1 192.168.100.125 Read Only view1
community2 0.0.0.0         Read Only
```

set snmp-trap

This command sets an SNMP trap, a definition associating an SNMP community with an IP address, with a maximum of 50.

Syntax `set snmp-trap -community community_name -ip-address ip_address`

Parameters `-community`

This parameter specifies an SNMP community name, and can specify the maximum of 50 alphanumeric letters. Two or more parameters cannot be requested at the same time.

`-ip-address` This parameter specifies an IP address for SNMP trap. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) Two or more IP addresses corresponding to one SNMP community can be requested.

Ex. `-ip-address 192.168.1.20`

Example(s) The following example sets the SNMP trap corresponding to the SNMP community named "community1" and the IP-address set "192.168.1.1":

```
CLI> set snmp-trap -community community1 -ip-address 192.168.1.1
```


delete snmp-trap

This command deletes the SNMP trap corresponding to an SNMP community. In this command, the specified SNMP community is not deleted.

Syntax `delete snmp-trap -community community_name [-ip-address ip_address]`

Parameters `-community`
This parameter specifies an SNMP community name to delete an SNMP trap. Two or more parameters cannot be requested at the same time.

`-ip-address` Optional. This parameter specifies an IP address to delete an SNMP trap. The format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) If omitted, then it is handled as if all the IP addresses corresponding to the specified SNMP community name are selected.

Ex. `-ip-address 192.168.1.20`

Example(s) The following example deletes the IP address "192.168.1.1" of SNMP trap associated with the SNMP community named "community1":

```
CLI> delete snmp-trap -community community1 -ip-address 192.168.1.1
```

The following example deletes all the IP addresses of SNMP trap associated with the SNMP community named "community1":

```
CLI> delete snmp-trap -community community1
```

show snmp-trap

This command displays a list of the defined SNMP trap.

Syntax show snmp-trap

Parameters No parameters.

Output

```
# IP Address            Community Name
# 192.168.100.250      community1
A                      B
```

A: IP Address
B: SNMP community name

Example(s) The following example displays a list of all defined SNMP traps:

```
CLI> show snmp-trap
IP Address            Community Name
192.168.100.250      community1
192.168.2.1           community2
```

test snmp-trap

This command sends the SNMP trap to the registered SNMP Manager for testing.

Syntax test snmp-trap

Parameters No parameters.

Example(s) The following example sends the SNMP trap for testing:

```
CLI> test snmp-trap
```

export enhanced-mib

This command exports the enhanced MIB file in the ETERNUS DX60/DX80/DX90 to the ftp server.

Syntax `export enhanced-mib -port {maintenance|remote} -server server_name
 -user login_user_name [-server-view {enable|disable}] [-dir directory]
 [-filename filename]`

Parameters

-port This parameter specifies the Ethernet port to connect to the ftp server. For further details, refer to ["1.11 Note for Specifying FTP Server" \(page 22\)](#).

maintenance Maintenance port (MNT port).

remote Remote port (RMT port).

-server This parameter specifies an ftp server name to store the enhanced MIB file. The server name format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) or full domain.

 Ex. -server 192.168.1.20
 Ex. -server foo.bar

-user This parameter specifies a user account name to access to ftp server. And, a password can be entered from a terminal after command input.

-server-view Optional. This parameter specifies whether a file defined for server view is included, or not. If omitted, then it is not included.

enable The file defined for server view is included.

disable The file defined for server view is not included.

-dir Optional. This parameter specifies a directory name on the server to be stored. A filename and a directory name must be specified by separating.

-filename Optional. This parameter specifies a filename to be stored. A filename and a directory name must be specified by separating. If omitted, then the default file named "FJDARY-E60.MIB" is stored. If the file already exists, it is overwritten.

By including the following converter, which begins with the percent, the part is replaced by the converted string. If other converters are requested, this command is abnormally terminated with an error message.

%s	Serial number of the ETERNUS DX60/DX80/DX90 Ex. MIB%s-mib.bin → MIB123456789012-mib.bin
%d	Current date Ex. MIB%d-mib.bin → MIB20080819-mib.bin
%t	Current Time Ex. MIB%t-mib.bin → MIB144855-mib.bin
%%	Percent character Ex. mib%%.bin → mib%.bin

Example(s) The following example exports the enhanced MIB to the ftp server named "ftp.a.com". The user logs in using the name "profile1". The storage location is "/temp". The stored filename is the default ("/FJDARY-E60.MIB"), and the Ethernet port used is the maintenance port (MNT port):

```
CLI> export enhanced-mib -port maintenance -server ftp.a.com -user profile1 -dir /temp
Password : exporting /temp/FJDARY-E60.MIB to ftp.a.com
Complete.
```

4.3.3 E-mail Notification

This section explains related commands regarding E-mail notification setup.

set email-notification

This command sets up parameters regarding E-mail notification functions.

Syntax	set email-notification [-send {enable disable}] [-port {maintenance remote}] [-port-number <i>port_number</i>] [-server <i>smtp_server</i>] [-authentication {none auto cram-md5 plain login}] [-user <i>user_name</i>] [-from <i>mail_address</i>] [-to1 <i>address</i>] [-to2 <i>address</i>] [-to3 <i>address</i>] [-to4 <i>address</i>] [-to5 <i>address</i>] [-text-count <i>count</i>] [-text1 <i>strings</i>] [-text2 <i>strings</i>] [-text3 <i>strings</i>] [-text4 <i>strings</i>] [-text5 <i>strings</i>] [-text6 <i>strings</i>] [-text7 <i>strings</i>] [-text8 <i>strings</i>] [-text9 <i>strings</i>] [-text10 <i>strings</i>]	
Parameters	-send	Optional. This parameter specifies the E-mail notification mode. It shows whether the E-mail notification function is enabled, or not. If omitted, this parameter is left unchanged. The initial value is set to "disable". When enabling it, you must specify all necessary parameters in order to send E-mail. enable E-mail notification is enabled. disable E-mail notification is disabled. (Default)
	-port	Optional. This parameter specifies the Ethernet port for connecting to an SMTP Server. If omitted, this parameter is left unchanged. For further details, refer to "1.11 Note for Specifying FTP Server" (page 22) . maintenance Maintenance port (MNT port) remote Remote port (RMT port)
	-port-number	Optional. This parameter specifies a port number for connecting to an SMTP server. If omitted, this parameter is left unchanged. The initial value is 25.
	-server	Optional. This parameter specifies an SMTP server address, up to the maximum of 64 letters. The server name format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) or full domain. If omitted, this parameter is left unchanged. Ex. -server 192.168.1.20 Ex. -server foo.bar

-authentication

Optional. This parameter specifies the authentic method to connect to an SMTP server. If omitted, this parameter is left unchanged.

none The ETERNUS DX60/DX80/DX90 connects to an SMTP server without using any authentication.

auto The ETERNUS DX60/DX80/DX90 connects to an SMTP server using AUTH SMTP authentication, and the ETERNUS DX60/DX80/DX90 automatically selects the appropriate authentication method from "*cram-md5*", "*plain*" or "*login*".

cram-md5 The ETERNUS DX60/DX80/DX90 connects to an SMTP server using AUTH SMTP authentication, and the ETERNUS DX60/DX80/DX90 uses "*cram-md5*" as the authentic method.

plain The ETERNUS DX60/DX80/DX90 connects to an SMTP server using AUTH SMTP authentication, and the ETERNUS DX60/DX80/DX90 uses "*plain*" as the authenticate method.

login The ETERNUS DX60/DX80/DX90 connects to an SMTP server using AUTH SMTP authentication, and the ETERNUS DX60/DX80/DX90 uses "*login*" as the authenticate method.

-user Optional. This parameter specifies a user account name to connect to an SMTP server using AUTH SMTP authentication. A password can be entered from a terminal after command input. When selecting "*-authentication none*", this parameter is unnecessary. If omitted, this parameter is left unchanged.

-from Optional. This parameter specifies the "from address" field of E-mail sent from the ETERNUS DX60/DX80/DX90. If omitted, this parameter is left unchanged.

-to1 Optional. This parameter specifies E-mail addresses sent from the ETERNUS DX60/DX80/DX90, with a maximum of 5. If omitted, this parameter is left unchanged.

-to2
-to3
-to4
-to5

Caution 

- When deleting it, you can describe two double quotation characters consecutively. For example, -to2 "".

-text-count Optional. This parameter specifies the number of valid message line. The fixed message is output according to the specified one. Although this command is optional, you must specify this when the fixed message is modified.

Caution 

- When requesting 0, the fixed message is deleted.

-text1 Optional. This parameter specifies the fixed E-mail messages.
... The maximum amount of letters is 255 bytes in all, and the maximum line is 10. The ETERNUS DX60/DX80/DX90 sends the message from "-text1" parameter to the last parameter, which is not blank, as consecutive messages. If omitted, this parameter is left unchanged.
-text10

Caution 

- The number after "-text" indicates which line of message. For example, "-text5" indicated 5th line. Two bytes of carriage return code (CR) is added to each line which non-blank letter has. However, the last enabled line is not added.
Ex. -text1 Hello -text2 Hello -text3 Hello
The number of letter is 19 (5*3 + 2*2)
- A fixed message must be specified in order from "-text1".
Ex. -text1 Hello
-text2 Morning.
-text3 bye.
- When requesting consecutive two double quotations, the specified text line is overwritten to the blank line.
Ex. -text1 Hello
-text2 ""
-text3 bye
Result of this example,
line1: Hello
line2:
line3: bye
* The line2 is blank line.
- If a line includes a blank letter, then both ends of parameter must be enclosed by a double quotation mark ("). This is not included in the letter amount.
Ex. -text1 Hello.
-text2 "This is your system." (20 letters)
- When describing double quotation mark, you must describe it using a back slash. The number of letters does not include the back slash character.
Ex. -text1 abc\"def\"ghi (11 letters)
Result of this example,
abc\"def\"ghi

Example(s) The following example sets up parameters for the E-mail server. The used Ethernet port specifies the maintenance port (MNT port), the SMTP server is "foo1.bar1", the authentication method is "CRAM-MD5". The user name logs in with "profile1" to connect to the SMTP server named "foo1.bar1", the SMTP port number is not changed, an authentic method specifies the "CRAM-MD5", and an E-mail sender address specifies "foo2@bar2", and E-mail receiver address is "foo@bar". Last, A fixed message is following:

```
test-line 1  
test-line 2
```

```
CLI> set email-notification -send enable -port maintenance -server foo1.bar1 -  
authentication cram-md5 -user profile1 -from foo2@bar2 -to1 foo@bar -text1 "test-  
line 1" -text2 "test-line 2"  
Password :
```

show email-notification

This command displays parameters regarding E-mail notification functions.

Syntax show email-notification

Parameters No parameters.

Output

#Send E-Mail	<u>Enable</u>
	A
#Port	<u>MNT</u>
	B
#SMTP Server	<u>fool.bar1</u>
	C
#SMTP Port No	<u>25</u>
	D
#Authentication	<u>Auto</u>
	E
#User Name	<u>profile1</u>
	F
#From	<u>foo2@bar2</u>
	G
#To1	<u>fool@bar1</u>
	H
#Text1	<u>Hello</u>
	I

- A: E-mail notification mode
- B: Ethernet port
- C: SMTP server name
- D: Access port number to an SMTP server
- E: SMTP authentic method
- F: User name for SMTP authentication
- G: Sender of E-mail address
- H: E-mail address sent from the ETERNUS DX60/DX80/DX90
- I: The fixed messages included in E-mail message

Example(s) The following example displays parameters regarding E-mail notification setup:

```
CLI> show email-notification
Send E-Mail      Enable
Port             MNT
SMTP Server      fool.bar1
SMTP Port No     25
Authentication   Auto
User Name        profile
From             foo2@bar2
To1              fool@bar1
To2              foo2@bar2
To3              foo3@bar3
To4              foo4@bar4
To5
Text1            Hello
Text2            This is the E2000.
Text3            Thank you.
```

test email

This command sends an E-mail from the ETERNUS DX60/DX80/DX90 for testing.

Syntax test email

Parameters No parameters.

Example(s) The following example tests whether the E-mail can correctly be sent, or not:

```
CLI> test email
```

4.3.4 Event Notification

Event notification is a function which sets up how and when notifications are issued by the system in response to the occurrence of various events.

This section explains the commands used to set up the event notifications.

set event-notification

This command sets the parameters used for event notification. If one of the "preset" parameter options is selected, the other parameters become unavailable.

Syntax	<pre>set event-notification {-preset {system-default remcs-default} -level {error warning information e-broken-disk e-broken-module e-remote-path e-halt-path e-halt-overload e-halt-other e-copy-session-error w-warning-disk w-warning-module w-raid-degrade-event w-raid-recovery-event w-recovery-from-error i-complete-power-on i-update-firmware i-sdp-policy-error i-sdp-policy-warning i-sdp-policy-information i-create-raid-group i-delete-raid-group i-set-raid-group i-add-hot-spare i-release-hot-spare i-create-volume i-delete-volume i-set-volume i-set-host-parameters i-set-host i-set-host-name i-set-host-response i-assign-lun-mapping i-set-reset-group } -method {email snmp host remcs} -suppression {enable disable disable-when-no-hs}}</pre>
Parameters	<p>-preset Optional. This parameter is used to select a previously determined set of settings that are recommended for event notification. When the preset parameter is selected, the other parameters cannot be used. The actual values applied by each preset option are given in the examples section for this command. If omitted, the preset function is disabled.</p> <p>system-default Use the system defaults. (Factory shipping defaults)</p> <p>remcs-default Use the remote service defaults. (Recommended for REMCS operation)</p> <p>-level Optional. This parameter specifies the event level/type(s) giving rise for each notification, and cannot be combined with the preset parameter. Operand names beginning with "e-" indicate Error level events, "w-" is used to indicate Warning level events, and "i-" for Information level events. Multiple event types can be requested if comma separated.</p> <p>Ex. -level error, w-warning-disk (to specify notification for both "error" and "w-warning-disk")</p> <p>Note that the "-suppression disable-when-no-hs" option, which indicates that the specified event is to be notified only when there are no hot spares available in the system, can only be used for the "e-broken-disk", "w-warning-disk", and "w-raid-degrade-event" level options.</p> <p>error All Error level events</p> <p>warning All Warning level events</p>

information All Information level events

e-broken-disk

Error level event. Disk is broken.

e-broken-module

Error level event. Other module is broken.

e-remote-path

Error level event. When REC path(s) are in an error condition. Any notice method may be specified.

e-halt-path

Error level event. When REC path(s) are halted due to the path(s) error. SNMP, E-mail, and REMCS may be specified as the notice method.

e-halt-overload

Error level event. When REC path(s) are halted due to line overload. SNMP, E-mail, and REMCS may be specified as the notice method.

e-halt-other

Error level event. When REC path(s) are halted due to another cause. SNMP, E-mail, and REMCS may be specified as the notice method.

e-copy-session-error

Error level event. When an error occurs for a copy session or an abnormal copy session disappears, error level events are notified. SNMP, E-mail, and REMCS may be specified as the notice method.

w-warning-disk

Warning level event. Disk is in a warning state.

w-warning-module

Warning level event. Other module is in a warning state.

w-raid-degrade-event

Warning level event. RAID group has been taken offline.

w-raid-recovery-event

Warning level event. RAID groups have been recovered. Can only be used with the host sense notice method.

w-recovery-from-error

Warning level event. System has recovered from some error. Can only be used with the SNMP trap notice method.

i-complete-power-on

Information level event. System has finished booting. Can only be used with the SNMP trap and e-mail notice methods.

i-update-firmware

Information level event. Firmware has been updated. Can only be used with the SNMP trap and e-mail notice methods.

i-sdp-policy-error

Information level event. Snap data pool usage has reached the Error level specified in the Advanced Copy policy. Can only be used with the SNMP trap and e-mail notice methods.

i-sdp-policy-warning

Information level event. Snap data pool usage has reached the Warning level specified in the Advanced Copy policy. Can only be used with the SNMP trap and e-mail notice methods.

i-sdp-policy-information

Information level event. Snap data pool usage has reached the Information level specified in the Advanced Copy policy. Can only be used with the SNMP trap and e-mail notice methods.

i-create-raid-group

Information level event. RAID group has been created. Can only be used with the SNMP trap and e-mail notice methods.

i-delete-raid-group

Information level event. RAID group has been deleted. Can only be used with the SNMP trap and e-mail notice methods.

i-set-raid-group

Information level event. RAID group name has been changed. Can only be used with the SNMP trap and e-mail notice methods.

i-add-hot-spare

Information level event. Hot spare has been added. Can only be used with the SNMP trap and e-mail notice methods.

i-release-hot-spare

Information level event. Hot spare has been released. Can only be used with the SNMP trap and e-mail notice methods.

i-create-volume

Information level event. Volume has been created. Can only be used with the SNMP trap and e-mail notice methods.

i-delete-volume

Information level event. Volume has been deleted. Can only be used with the SNMP trap and e-mail notice methods.

i-set-volume

Information level event. Volume name has been changed. Can only be used with the SNMP trap and e-mail notice methods.

i-set-host-parameters

Information level event. When FC, SAS or iSCSI host parameters are set. Can only be used with the SNMP trap and e-mail notice methods.

i-set-host

Information level event. When FC host addresses, WWNs, SAS addresses or iSCSI host names are registered. Can only be used with the SNMP trap and e-mail notice methods.

i-set-host-name

Information level event. When FC host names, SAS addresses or iSCSI host names are changed. Can only be used with the SNMP trap and e-mail notice methods.

i-set-host-response

Information level event. Host response information has been registered. Can only be used with the SNMP trap and e-mail notice methods.

i-assign-lun-mapping

Information level event. LUN mapping has been assigned. Can only be used with the SNMP trap and e-mail notice methods.

i-set-reset-group

Information level event. Reset group has been set for host ports. Can only be used with the SNMP trap and e-mail notice methods.

-method Optional. This parameter specifies the method(s) to be used for notification. It cannot be combined with the preset parameter. Two or more methods can be requested if comma separated.

Ex. `-method email,snmp`
 (to specify notification by both "e-mail" and "SNMP")

- email E-mail
- snmp SNMP trap
- host Host sense
- remcs REMCS, Remote service notification

-suppression Optional. This parameter specifies the suppression mode, and cannot be combined with the preset parameter. It determines whether the specified event level(s) and notification method(s) are to be enabled or disabled.

Caution 

Enable suppression when notification is not required for the target event(s).

- enable Notification is suppressed
- disable Notification is enabled
- disable-when-no-hs Notification is enabled, but only when no hot spares are available

Example(s) The following example shows the values set by the system default preset:

```

CLI> set event-notification -preset system-default
CLI> show event-notification

```

	E-mail	SNMP	Host	REMCS
[Error Level]				
Broken Disk	Notify	Notify	Notify	-
Broken Module	Notify	Notify	Notify	-
Remote Path Error	Notify	Notify	Notify	Notify
REC Buffer Halt (Path Error)	Notify	Notify	-	Notify
REC Buffer Halt (Overload)	Notify	Notify	-	Notify
REC Buffer Halt (Other Error)	Notify	Notify	-	Notify
Copy Session Error	Do not notify	Do not notify	-	Do not notify
[Warning Level]				
Warning Disk	Notify	Notify	Notify	-
Warning Module	Notify	Notify	Notify	-
RAID Degradation Event	Notify	Notify	Notify	-
RAID Recovery Event	-	-	Notify	-
Recovery from Error	-	Do not notify	-	-
[Information Level]				
Power on Completed	Do not notify	Do not notify	-	-
Controller Firmware Updated	Do not notify	Do not notify	-	-
Created RAID Group	Do not notify	Do not notify	-	-
Deleted RAID Group	Do not notify	Do not notify	-	-
Set RAID Group Name	Do not notify	Do not notify	-	-
Added Hot Spare	Do not notify	Do not notify	-	-
Released Hot Spare	Do not notify	Do not notify	-	-
Created Volume	Do not notify	Do not notify	-	-
Deleted Volume	Do not notify	Do not notify	-	-
Set Volume Name	Do not notify	Do not notify	-	-
Set FC Port Parameters	Do not notify	Do not notify	-	-
Set FC Host	Do not notify	Do not notify	-	-
Set Host Name	Do not notify	Do not notify	-	-
Assigned LUN Mapping	Do not notify	Do not notify	-	-
Set Host Response	Do not notify	Do not notify	-	-
Set Reset Group	Do not notify	Do not notify	-	-
SDP Policy (Error)	Do not notify	Do not notify	-	-
SDP Policy (Warning)	Do not notify	Do not notify	-	-
SDP Policy (Information)	Do not notify	Do not notify	-	-

The following example shows the values set by the remote service default pre-set:

```

CLI> set event-notification -preset remcs-default
CLI> show event-notification

```

	E-mail	SNMP	Host	REMCS
[Error Level]				
Broken Disk	Notify(when HS<0)	Notify(when HS<0)	Do not notify	-
Broken Module	Notify	Notify	Notify	-
Remote Path Error	Notify	Notify	Notify	Notify
REC Buffer Halt (Path Error)	Notify	Notify	-	Notify
REC Buffer Halt (Overload)	Notify	Notify	-	Notify
REC Buffer Halt (Other Error)	Notify	Notify	-	Notify
Copy Session Error	Do not notify	Do not notify	-	Do not notify
[Warning Level]				
Warning Disk	Do not notify	Do not notify	Do not notify	-
Warning Module	Do not notify	Do not notify	Do not notify	-
RAID Degradation Event	Notify(when HS<0)	Notify(when HS<0)	Notify(when HS<0)	-
RAID Recovery Event	-	-	Do not notify	-
Recovery from Error	-	Do not notify	-	-
[Information Level]				
Power on Completed	Do not notify	Do not notify	-	-
Controller Firmware Updated	Do not notify	Do not notify	-	-
Created RAID Group	Do not notify	Do not notify	-	-
Deleted RAID Group	Do not notify	Do not notify	-	-
Set RAID Group Name	Do not notify	Do not notify	-	-
Added Hot Spare	Do not notify	Do not notify	-	-
Released Hot Spare	Do not notify	Do not notify	-	-
Created Volume	Do not notify	Do not notify	-	-
Deleted Volume	Do not notify	Do not notify	-	-
Set Volume Name	Do not notify	Do not notify	-	-
Set FC Port Parameters	Do not notify	Do not notify	-	-
Set FC Host	Do not notify	Do not notify	-	-
Set Host Name	Do not notify	Do not notify	-	-
Assigned LUN Mapping	Do not notify	Do not notify	-	-
Set Host Response	Do not notify	Do not notify	-	-
Set Reset Group	Do not notify	Do not notify	-	-
SDP Policy (Error)	Do not notify	Do not notify	-	-
SDP Policy (Warning)	Do not notify	Do not notify	-	-
SDP Policy (Information)	Do not notify	Do not notify	-	-

The following example sets the parameters to be used for event notification. The level parameter specifies notification for all Warning level events, while the method parameter specifies notification by e-mail:

```

CLI> set event-notification -level warning -method email -suppression disable

```

The following example sets the parameters to be used for event notification. The level parameter specifies notification for all Error level and Warning level events, while the method parameter specifies notification by e-mail and SNMP traps:

```

CLI> set event-notification -level error,warning -method email,snmp -suppression disable

```

show event-notification

This command displays the parameters used for event notification.

Syntax show event-notification

Parameters No Parameters.

Output

#	E-mail	SNMP	Host	REMCS
# [Error Level]				
# Broken Disk	<u>Do not notify</u>	<u>Notify</u>	<u>Do not notify</u>	D
# . . .	A	B	C	
# [Warning Level]				
# RAID Degradation Event	Notify	<u>Notify(when HS<0)</u>	Notify	
		E		

- A: It indicates whether it is notified by E-mail, or not.
- B: It indicates whether it is notified by SNMP trap, or not.
- C: It indicates whether it is notified by Host sense, or not.
- D: It indicates whether it is notified by REMCS, or not.
- E: It indicates conditions when there was no hot spare in the system.

Caution

- Set FC Port Parameters field is rewritten to Set SAS Port Parameters in the SAS model, or Set iSCSI Port Parameters in the iSCSI model.
- Set FC Host field is rewritten to Set SAS Host in the SAS model, or Set iSCSI Host in the iSCSI model.

Both all of the REMCS notification status and the following items related to REC functions are displayed only when the storage system model that is supporting REC functions.

- Remote Path Error
- REC Buffer Halt (Path Error)
- REC Buffer Halt (Overload)
- REC Buffer Halt (Other Error)

Example(s) The following example shows the values set by the system default preset:

```

CLI> show event-notification

```

	E-mail	SNMP	Host	REMCS
[Error Level]				
Broken Disk	Do not notify	Notify	Do not notify	-
Broken Module	Do not notify	Do not notify	Do not notify	-
Remote Path Error	Notify	Do not notify	Notify	Do not notify
REC Buffer Halt (Path Error)	Notify	Do not notify	-	Notify
REC Buffer Halt (Overload)	Notify	Do not notify	-	Notify
REC Buffer Halt (Other Error)	Notify	Do not notify	-	Notify
Copy Session Error	Do not notify	Do not notify	-	Do not notify
[Warning Level]				
Warning Disk	Notify	Notify	Notify	-
Warning Module	Notify	Notify	Notify	-
RAID Degradation Event	Notify	Notify(when HS<0)	Notify	-
RAID Recovery Event	-	-	Notify	-
Recovery from Error	-	Do not notify	-	-
[Information Level]				
Power on Completed	Do not notify	Do not notify	-	-
Controller Firmware Updated	Do not notify	Do not notify	-	-
Created RAID Group	Do not notify	Do not notify	-	-
Deleted RAID Group	Do not notify	Do not notify	-	-
Set RAID Group Name	Do not notify	Do not notify	-	-
Added Hot Spare	Do not notify	Do not notify	-	-
Released Hot Spare	Do not notify	Do not notify	-	-
Created Volume	Do not notify	Do not notify	-	-
Deleted Volume	Do not notify	Do not notify	-	-
Set Volume Name	Do not notify	Do not notify	-	-
Set FC Port Parameters	Do not notify	Do not notify	-	-
Set FC Host	Do not notify	Do not notify	-	-
Set Host Name	Do not notify	Do not notify	-	-
Assigned LUN Mapping	Do not notify	Do not notify	-	-
Set Host Response	Do not notify	Do not notify	-	-
Set Reset Group	Do not notify	Do not notify	-	-
SDP Policy (Error)	Do not notify	Do not notify	-	-
SDP Policy (Warning)	Do not notify	Do not notify	-	-
SDP Policy (Information)	Do not notify	Do not notify	-	-

4.3.5 SMI-S

This section explains the related commands for SMI-S settings.

set smi-s

This command enables or disables the SMI-S functions.

Syntax	set smi-s [-function {enable disable}] [-indication {enable disable}]	
Parameters	-function	Optional. This parameter specifies whether all SMI-S settings are enabled, or not. The initial value is set to "disable". If omitted, this parameter is left unchanged. In order to enable it, you need power cycle of the ETERNUS DX60/DX80/DX90.
	enable	Each SMI-S setting is enabled.
	disable	Each SMI-S setting is disabled. (default)
	-indication	Optional. This parameter specifies whether a function of SMI-S indication is enabled, or not. The initial value is set to "disable". If omitted, then this parameter value is not changed.
	enable	A function of SMI-S indication is enabled.
	disable	A function of SMI-S indication is disabled. (default)

Example(s) The following example disables all SMI-S settings:

```
CLI> set smi-s -function disable
```

The following example disables a function of SMI-S indication:

```
CLI> set smi-s -indication disable
```

show smi-s

This command displays whether the SMI-S functions are enabled or disabled.

Syntax show smi-s

Parameters No parameters.

Output

```
# SMI-S            [Enable]
                  A
# Indication      [Disable]
                  B
```

A: It shows whether all SMI-S settings are enabled, or not.

B: It shows whether a function of SMI-S indication is enabled, or not.

Example(s) The following example displays whether the SMI-S settings are enabled or not:

```
CLI> show smi-s
SMI-S            [Enable]
Indication      [Disable]
```


4.3.6 SSH/SSL security

This section explains the commands used for network security functions using SSH/SSL.

create ssl-certificate

This command renews an SSH (Secure Shell) server key and an SSL (Secure Socket Layer) server certificate.

Syntax create ssl-certificate

Parameters No parameters.

Example(s) The following example renews an SSL server certificate:

```
CLI> create ssl-certificate
```

4.4 Miscellaneous

This section explains the various commands used for the following miscellaneous functions.

- Date and time
- NTP
- Storage system name
- Box ID

4.4.1 Date, Time and NTP

This section explains the commands used to set and check date and time for the ETETENUS DX60/DX80/DX90. The ETERNUS DX60/DX80/DX90 also supports time correction using the Network Time Protocol (NTP).

set date

This command sets the date and time of the ETERNUS DX60/DX80/DX90.

Syntax `set date`
`[-time YYYYMMDDhhmmss][-timezone number][-dst {enable|disable}]`
`[-from{MMDDhh|MM,{1st|2nd|3rd|4th|last},{sun|mon|tue|wed|thu|fri|sat},hh}]`
`[-to {MMDDhh|MM,{1st|2nd|3rd|4th|last},{sun|mon|tue|wed|thu|fri|sat},hh}]`

Parameters `-time` Optional. This parameter specifies the date and time. The format is "YYYYMMDDhhmmss", where "YYYY" is the year as a four-digit number, "MM" is the month as a number (01-12), "DD" is the day as a number (01-31), "hh" is the hours as on a 24-hour clock (00-23), "mm" is the minutes (00-59), and "ss" is the seconds (00-59). If omitted, this parameter is left unchanged.

`-timezone` Optional. This parameter specifies a preset time difference from Greenwich Mean Time (GMT). The following numbers are selectable. If omitted, this parameter is left unchanged.

0	Eniwetok, Kwajalein	-12:00
1	Samoa	-11:00
2	Honolulu	-10:00
3	Alaska	-9:00
4	Los Angels, San Francisco, San Diego	-8:00
5	Arizona	-7:00
6	Chicago, Mexico City	-6:00
7	New York, Bogota	-5:00
8	Caracas	-4:00
9	Newfoundland	-3:30
10	Sao Paulo, Brasilia	-3:00
11	Mid-Atlantic Ocean	-2:00
12	Azores Island, Cape Verde	-1:00
13	Dublin, London, Manchester, Lisbon	0:00
14	Paris, Madrid, Stockholm	+1:00
15	Rome, Vienna, Berlin	+1:00
16	Milan, Amsterdam	+1:00
17	Athens, Helsinki, Cairo	+2:00

18	Beirut, Cape Town	+2:00
19	Nairobi, Moscow	+3:00
20	Abu Dhabi	+4:00
21	Islamabad, Karachi	+5:00
22	New Delhi	+5:30
23	Dhaka	+6:00
24	Bangkok, Jakarta	+7:00
25	Hong Kong, Manila, Singapore	+8:00
26	Beijing, Taipei, Kuala Lumpur, Perth	+8:00
27	Tokyo, Osaka, Kyoto, Fukuoka, Sapporo	+9:00
28	Seoul	+9:00
29	Adelaide	+9:30
30	Guam, Sydney, Melbourne	+10:00
31	Solomon Islands, New Caledonia	+11:00
32	Wellington, Auckland, Fiji	+12:00

-dst Optional. This parameter specifies whether daylight saving time is enabled or not. If omitted, this parameter is left unchanged.

enable Enables DST.

disable Disables DST.

Caution 

- For "enable", both starting and ending information must also be specified.
- For "disable", neither starting nor ending information may be specified.

-from Optional. This parameter specifies the start of DST (daylight saving time), and must be specified when enabling DST. If omitted, this parameter is left unchanged.

There are two formats. One is "MMDDhh", where "MM" is the starting month as a number (01-12), "DD" is the starting day as a number (01-31), and "hh" is the starting hour as on a 24-hour clock (00-23). The other is

"MM,{1st|2nd|3rd|4th|last},{sun|mon|tue|wed|thu|fri|sat},hh", where "MM" is the starting month as a number (01-12), "{1st|2nd|3rd|4th|last}" is the week of the month and applies to "{sun|mon|tue|wed|thu|fri|sat}" which is the day of that week, and "hh" is the starting hour as on a 24-hour clock (00-23).

-to Optional. This parameter specifies the end of DST (daylight saving time), and must be specified when enabling DST. If omitted, this parameter is left unchanged.

There are two formats. One is "MMDDhh", where "MM" is the ending month as a number (01-12), "DD" is the ending day as a number (01-31), and "hh" is the ending hour as on a 24-hour clock (00-23). The other is

"MM,{1st|2nd|3rd|4th|last},{sun|mon|tue|wed|thu|fri|sat},hh", where "MM" is the ending month as a number (01-12), both "{1st|2nd|3rd|4th|last}" and "{sun|mon|tue|wed|thu|fri|sat}" are pairs, and mean the number of the order of the day in the month and the day of the week, and "hh" is the ending hour as on a 24-hour clock (00-23).

Example(s) The following example sets the ETERNUS DX60/DX80/DX90 system date to 11:55 PM on January 12, 2009 GMT:

```
CLI> set date -time 20090112235500
```

The following example sets the ETERNUS DX60/DX80/DX90 system date to 11:55 PM on January 12, 2009 in the New York time zone (GMT -5:00):

```
CLI> set date -time 20090112235500 -timezone 7
```

The following example sets the ETERNUS DX60/DX80/DX90 system date to 12:30 PM on January 1, 2009 in the Honolulu time zone (GMT-10:00). DST is set from 1:00 AM on the last Sunday in March to 1:00 AM on the last Sunday in October:

```
CLI> set date -time 20090101123000 -timezone 2 -dst enable -from 03,last,sun,01 -to 10,last,sun,01
```

The following example sets the date in the ETERNUS DX60/DX80/DX90 to 12:30 PM on January 1, 2009 GMT. DST is set from 2:00 AM on March 1 to 2:00 AM on October 30:

```
CLI> set date -time 20090101123000 -timezone 2 -dst enable -from 030102 -to 103002
```

show date

This command displays the date and time of the ETERNUS DX60/DX80/DX90.

Syntax show date

Parameters No parameters.

Output

```
# 2008-12-31 00:00:03 GMT+03:00 (Nairobi, Moscow)
date      time      timezone

# DST [ON] 06-01 02:00 - 09-30 02:00
dst: from 2:00 AM on June 1 to 2:00 AM on September 30

# 2008-01-01 23:55:00 GMT+01:00 (Paris, Madrid, Stockholm)
date      time      timezone  dst
DST [ON] 03-last-Sun 02:00 - 10-last-Sun 02:00
dst: from 2:00 AM on March last Sunday to 2:00 on October last Sunday
```

Example(s) The following example displays the ETERNUS DX60/DX80/DX90 system date/time:

```
CLI> show date
2008-10-01 10:59:59 GMT+09:00 (Tokyo, Osaka, Kyoto, Fukuoka, Sapporo)
DST [OFF]

CLI> show date
2008-12-31 00:00:03 GMT+03:00 (Nairobi, Moscow)
DST [ON] 06-01 02:00 - 09-30 02:00

CLI> show date
2008-01-01 23:55:00 GMT+01:00 (Paris, Madrid, Stockholm)
DST [ON] 03-last-Sun 01:00 - 10-last-Sun 01:00
```


set ntp

The ETERNUS DX60/DX80/DX90 is provided with an NTP client that allows time correction using the Network Time Protocol (NTP). This command is used to set up the NTP environment.

Syntax	<code>set ntp [-function {enable disable}] [-server <i>server_address</i>] [-port {maintenance remote}]</code>	
Parameters	-function	Optional. This parameter specifies whether the NTP client is enabled or not. If omitted, this parameter is left unchanged. enable NTP is enabled. disable NTP is disabled.
	-server	Optional. This parameter specifies an NTP server address, with a maximum of 64 letters. The server name format is IPv4 standard notation (as a string in the base 256 notation d.d.d.d) or full domain. If omitted, this parameter is left unchanged. Ex. -server 192.168.1.20 Ex. -server foo.bar
	-port	Optional. This parameter specifies the Ethernet port to connect to the NTP Server. If omitted, this parameter is left unchanged. maintenance Maintenance port (MNT port) remote Remote port (RMT port)

Example(s) The following example sets the NTP configuration, with "ntpserver.com" specified as the NTP Server, and the Maintenance port (MNT port) specified as the Ethernet port to be used:

```
CLI> set ntp -function enable -server ntpserver.com -port maintenance
```

The following example sets the NTP configuration, with "10.1.1.100" specified as the NTP Server, and the Remote port (RMT port) specified as the Ethernet port to be used:

```
CLI> set ntp -function enable -server 10.1.1.100 -port remote
```

The following example disables NTP:

```
CLI> set ntp -function disable
```

show ntp

This command displays the NTP configuration.

Syntax show ntp

Parameters No parameters.

Output

```
CLI> show ntp
# NTP [Enable]
      It shows whether the NTP function is enabled, or not.
# NTP Server [ntpserver.com]
      NTP Server name
# NTP LAN Port [MNT]
      Ethernet port to connect to NTP server
# Access Status [2008-02-21 08:30:00 succeeded SYNC]
      Result of synchronization
```

Example(s) The following example displays the NTP configuration:

```
CLI> show ntp
NTP [Enable]
NTP Server [10.1.1.100]
NTP LAN Port [RMT]
Access Status [2008-02-21 08:30:00 succeeded SYNC]

CLI> show ntp
NTP [Enable]
NTP Server [10.1.1.100]
NTP LAN Port [RMT]
Access Status [0000-00-00 00:00:00 failed SYNC]

CLI> show ntp
NTP [Disable]
NTP Server [10.1.1.100]
NTP LAN Port [RMT]
Access Status [0000-00-00 00:00:00 succeeded SYNC]
```

4.4.2 Storage System Name

This section explains commands used to set the storage system name.

set storage-system-name

This command sets the machine information. The storage system name shows the Friendly Name corresponding to the virtual disk service (VDS).

Syntax `set storage-system-name [-name name] [-installation-site location]
 [-contact contact] [-description description]`

Parameters **-name** Optional. This parameter specifies a storage system name, up to a maximum of 16 letters. For a list of usable characters, refer to the ["1.2.2 Keywords and Parameters" \(page 13\)](#). If omitted, this parameter is left unchanged.

-installation-site
Optional. This parameter specifies an installation site name, up to a maximum of 50 letters. For a list of usable characters, refer to the ["1.2.2 Keywords and Parameters" \(page 13\)](#). If omitted, this parameter is left unchanged.

-contact Optional. This parameter specifies a contact address, up to a maximum of 50 letters. For a list of usable characters, refer to the ["1.2.2 Keywords and Parameters" \(page 13\)](#). If omitted, this parameter is left unchanged.

-description
Optional. This parameter specifies a description of the machine, up to a maximum of 50 letters. For a list of usable characters, refer to the ["1.2.2 Keywords and Parameters" \(page 13\)](#). If omitted, this parameter is left unchanged.

Example(s) The following example sets the storage system name, installation site name, descriptions, and contact address:

```
CLI> set storage-system-name -name DXL-1 -installation-site FJ -contact AVRIL -description CALC2
```

show storage-system-name

This command displays the storage system name.

Syntax show storage-system-name

Parameters No parameters.

Output

```
# Name [E2000]
Storage system name
# Installation Site [FJ]
Installation site
# Contact [xxx.xxx.xxxx]
Contact address
# Description [admin-machine]
Description of the storage system
```

Example(s) The following example displays the registered storage system name:

```
CLI> show storage-system-name
Name [DXL-1]
Installation Site [FJ]
Contact [AVRIL]
Description [CALC1]
```

4.4.3 Encryption Mode

This chapter explains the various encryption mode commands. Encryption mode must first be enabled to allow use of the encryption functions of the ETERNUS DX60/DX80/DX90.



Note

Encryption-related functions may not be available for some user environments.

set encryption

This command specifies whether the encryption mode is to be enabled, or not. After switching the encryption mode from enabled to disabled, the storage system power must be turned off and back on again to effect the change. When switching the encryption mode from disabled to enabled, this operation is not required.



Note

Encryption-related functions may not be available for some user environments.

Syntax	<code>set encryption -mode {enable disable}</code>						
Parameters	<table><tr><td><code>-mode</code></td><td>This parameter specifies the encryption mode.</td></tr><tr><td><code>enable</code></td><td>Enables the encryption mode</td></tr><tr><td><code>disable</code></td><td>Disables the encryption mode</td></tr></table>	<code>-mode</code>	This parameter specifies the encryption mode.	<code>enable</code>	Enables the encryption mode	<code>disable</code>	Disables the encryption mode
<code>-mode</code>	This parameter specifies the encryption mode.						
<code>enable</code>	Enables the encryption mode						
<code>disable</code>	Disables the encryption mode						
Example(s)	The following example enables the encryption mode:						

```
CLI> set encryption -mode enable
```

The following example sets the encryption mode to be disabled, then reboots the storage system to effect the change:

```
CLI> set encryption -mode disable  
CLI> shutdown -mode reboot
```

show encryption

This command displays the status of the encryption mode.



Note

Encryption-related functions may not be available for some user environments.

Syntax show encryption

Parameters No parameters.

Output

```
# Encryption Mode [Enable]
A
```

A: Encryption mode

Example(s) The following example displays the encryption mode:

```
CLI> show encryption
Encryption Mode [Enable]
```


4.4.4 Box ID

This section explains the Box ID related commands.

set boxid

The Box ID is identification information for the use of applications to which the ETERNUS DX60/DX80/DX90 is connected. This command sets the Box ID. An initial value is created using a combination of the series name, model name, serial number, etc.

Syntax `set boxid -id box_id`

Parameters `-id` This parameter specifies a Box ID, up to a maximum of 40 alphanumeric characters, spaces, and hash marks (#). Each Box ID must be unique.

Note

- All alphabetic characters are handled as uppercase.
- Hash mark (#) characters are automatically appended when fewer than 40 characters are specified.

Example(s) The following example sets the Box ID:

```
CLI> set boxid -id "00DXL#####ET06F21AUABCPJ000000#####" 
```

show boxid

This command displays the registered Box ID.

Syntax show boxid

Parameters No parameters.

Output

```
Box ID [00E2000#####ET06F21AUABCPJ000000#####]  
A  
  
A:    Box ID
```

Example(s) The following example displays the registered Box ID:

```
CLI> show boxid  
Box ID [00E2000#####ET06F21AUABCPJ000000#####]
```

4.4.5 Power Synchronization

This section explains the power synchronization related commands.

set power-synchronization

This command configures the way in which the shutdown function interacts with an external sensor device.

Syntax	set power-synchronization [-cm { 0 1 all none }] [-shutdown-time <i>shutdown_time</i>] [-preset { power-sync pman }] [-power-fail-signal { positive negative }] [-low-battery-signal { positive negative }] [-ups-shutdown-signal { positive negative }] [-ups-shutdown { enable disable }]	
Parameters	-cm	Optional. This parameter specifies the number of the controller module that is to be RS-232C connected to an external sensor device. If omitted, this parameter is left unchanged. 0 Controller module #0 1 Controller module #1 all Both none No connection. If selected, the following parameters cannot be specified.
	-shutdown-time	Optional. This parameter specifies a time in minutes between when a power outage signal is received and when ETERNUS DX60/DX80/DX90 shutdown begins. If omitted, then this parameter is not changed.
	-preset	Optional. This parameter specifies the power synchronized interface preset. If selected, the "-power-fail-signal" and "-low-battery-signal" parameters cannot be specified. If omitted, this parameter is left unchanged. power-sync Power synchronized unit. If selected, "-power-fail-signal" parameter assigns the positive and "-low-battery-signal" parameter assigns the negative. pman PMAN. If selected, "-power-fail-signal" parameter assigns the positive and "-low-battery-signal" parameter assigns the positive.
	-power-fail-signal	Optional. This parameter specifies the signal polarity of the power outage signal when the power supply fails and power is not provided. If omitted, this parameter is left unchanged. positive Positive is set. negative Negative is set.

-low-battery-signal

Optional. This parameter specifies the signal polarity of the low battery voltage signal when the battery usage is low. If omitted, this parameter is left unchanged.

positive Positive is set.

negative Negative is set.

-ups-shutdown-signal

Optional. This parameter specifies the signal polarity of the UPS stop signal when completing shutdown. If omitted, this parameter is left unchanged.

positive Positive is set.

negative Negative is set.

-ups-shutdown

Optional. This parameter specifies whether the stop signal of UPS output is enabled or not when completing shutdown. If omitted, this parameter is left unchanged.

enable Enabled.

disable Disabled.

Example(s) The following example sets the shutdown from external sensor device function. Both controller modules are selected, the shutdown time is specified as 5 minutes, and the power outage signal of the input is specified as positive:

```
CLI> set power-synchronization -cm all -shutdown-time 5 -power-fail-signal positive
```

show power-synchronization

This command displays the state of the shutdown controlled by an external sensor device function.

Syntax show power-synchronization

Parameters No parameters.

Output

# Controller Module #0	<u>Enable</u>
	A
# Controller Module #1	<u>Disable</u>
	B
# Waiting Time to Shutdown	<u>5 min.</u>
	C
# Type	<u>Power Synchronized Unit</u>
	D
# Power Fail Signal	<u>Positive</u>
	E
# Low Battery Signal	<u>Negative</u>
	F
# UPS Shutdown Signal	<u>Negative</u>
	G
# UPS Shutdown	<u>Enable</u>
	H

- A: It shows whether the CM#0 is connected to the power synchronized device.
- B: It shows whether the CM#1 is connected to the power synchronized device.
- C: The time which starts the ETERNUS DX60/DX80/DX90 shutdown when received the power outage signal from external sensor device.
- D: The preset interface (Power Synchronized Unit, PMAN, or manual). In this output, the preset interface is displayed if the same setup as the preset is set by manual setup.
- E: The signal polarity which controls the input power outage signal when a power supply fails and power is not provided.
- F: The signal polarity which controls the battery voltage low signal when battery usage of UPS was low.
- G: The signal polarity which controls the UPS output stop signal when completing shutdown.
- H: It shows whether the UPS output stop signal is enabled or not when completing shutdown.

Example(s) The following example displays the settings that govern how the shutdown function interacts with the external sensor device:

```
CLI> show power-synchronization
Controller Module #0      Enable
Controller Module #1      Disable
Waiting Time to Shutdown 5 min.
Type                      Power Synchronized Unit
Power Fail Signal         Positive
Low Battery Signal        Negative
UPS Shutdown Signal       Negative
UPS Shutdown              Enable
```

4.4.6 Subsystem Parameters

This section explains the commands used to set and check the subsystem parameters.

set subsystem-parameters

This command sets up the storage unit subsystem parameter.

Caution

Do not change the setting after installing the ETERNUS DX60/DX80/DX90, unless a maintenance engineer instructs otherwise.

Syntax `set subsystem-parameters [-load-balance {enable | disable}]`
 `[-reject-inquiry {enable | disable}] [-enforce-checkcode {enable | disable}]`
 `[-reset-internalbus {enable | disable}]`

Parameters `-load-balance`

Optional. This parameter specifies if controlling load balance of the system is enabled. This function will allow the system to return sense information to a host even if the I/O traffic for the overall system is overloaded. If omitted, then this parameter is not changed. The initial value is set to "enable".

Caution

When connecting the ETERNUS DX60/DX80/DX90 and HP-UX hosts, disable this parameter. If this parameter is enabled, incorrect logs may be recorded in the hosts.

`enable` Load balance control is enabled.

`disable` Load balance control is disabled.

`-reject-inquiry`

Optional. This parameter specifies if an INQUIRY command that is issued from an unauthorized host is rejected. Enable this parameter if VERITAS Volume Manager Dynamic Multipathing (VxVM DMP) is used. If omitted, then this parameter value is left unchanged. The initial value is set to "disable".

`enable` An Affinity Error is returned for an INQUIRY command that is issued from an unauthorized host.

`disable` A normal response is returned for an INQUIRY command that is issued from an unauthorized host.

`-enforce-checkcode`

Optional. This parameter specifies whether to enable the Checkcode Enforcement mode. If this mode is enabled, error detection within the ETERNUS DX60/DX80/DX90 is enhanced. When write I/O for user-data is duplicated, the checkcodes of all the data blocks are checked. If omitted, then this parameter value is left unchanged. The initial value is set to "disable".

`enable` The Checkcode Enforcement mode is enabled.

`disable` The Checkcode Enforcement mode is disabled.

-recover-internalbus

Optional. This parameter specifies whether to reset the internal bus to recover from internal errors. If omitted, then this parameter is left unchanged. The initial value is set to disable.

Note

- This parameter only works with an 8Gbit/s Fibre Channel interface. If another type of interface is used, enabling this parameter has no effect.
- Note that Fibre Channel connection is lost for a few seconds during recovery processes. Whether to enable this parameter needs to be decided based on the behavior of the driver software of the host OS that is connected to the 8Gbit/s Fibre Channel interface.

enable The internal bus reset function is enabled.

disable The internal bus reset function is disabled.

Example(s) The following example sets the subsystem load balancing parameter:

```
CLI> set subsystem-parameters -load-balance enable
```

show subsystem-parameters

This command displays the subsystem parameter.

Syntax show subsystem-parameters

Parameters No parameters.

Output

# <u>Load Balance</u>	[Enable]
This indicates that the system load balance is being controlled.	
# <u>Reject INQUIRY from Unauthorized Host</u>	[Enable]
This indicates whether or not to reject an INQUIRY command issued from an unauthorized host, which is the same as when an Affinity Error is returned for an INQUIRY command.	
# <u>Checkcode Enforcement Mode</u>	[Enable]
This indicates whether the Checkcode Enhancement mode is enabled.	
# <u>Internal Bus Recovery Mode</u>	[Enable]
This indicates whether the internal bus reset function is enabled to recover from the internal errors.	

Example(s) The following example displays the subsystem parameter:

```
CLI> show subsystem-parameters
Load Balance                               [Disable]
Reject INQUIRY from Unauthorized Host      [Disable]
Checkcode Enforcement Mode                 [Enable ]
Internal Bus Recovery Mode                  [Enable ]
```

Chapter 5 Information

This chapter explains various information related commands.

5.1 Performance

5.1.1 Performance Information

This function is used to display the performance information collected and stored by the ETERNUS DX60/DX80/DX90 for each volume, host interface port, disk, controller module, etc. Performance information can only be displayed if its collection has been enabled.

This section explains the performance information related commands.

start performance

This command starts the collection of performance information. Note that collection will be terminated with an error message if it is already being collected.

Syntax	start performance [-interval { 30 60 90 120 150 180 210 240 270 300 }]	
Parameters	-interval	Optional. This parameter specifies the interval time (in seconds) at which performance information is updated. If omitted, 30 seconds is used.
	30	Updated every 30 seconds. (default)
	60	Updated every 60 seconds.
	90	Updated every 90 seconds.
	120	Updated every 120 seconds.
	150	Updated every 150 seconds.
	180	Updated every 180 seconds.
	210	Updated every 210 seconds.
	240	Updated every 240 seconds.
	270	Updated every 270 seconds.
	300	Updated every 300 seconds.

Example(s) The following example starts the collection of performance information every 30 seconds:

```
CLI> start performance -interval 30
```

stop performance

This command stops the collection of performance information.

Syntax stop performance

Parameters No parameters.

Example(s) The following example stops the collection of performance information:

```
CLI> stop performance
```

show performance

This command displays the performance information collected and stored by the ETERNUS DX60/DX80/DX90. It can be displayed only when collected through the CLI/GUI.

Syntax	show performance [-type {host-io [-volume-number <i>volume_numbers</i> -volume-name <i>volume_names</i>] advanced-copy [-volume-number <i>volume_numbers</i> -volume-name <i>volume_names</i>] disks [-disks <i>disks</i>] cm [-cm {0 1}] port [-port <i>xy</i>]}]	
Parameters	-type	Optional. This parameter specifies the kind of performance information collected. If omitted, the status of whether performance information is currently being collected or not is displayed.
	host-io	Host I/O factors for each volume.
	advanced-copy	Advanced copy factors for each volume.
	disks	For each disk.
	cm	For controller module.
	port	For host interface port.
	-volume-number or -volume-name	Optional. This parameter specifies one or more volume identifiers, and is only used for either "-type <i>host-io</i> " or "-type <i>advanced-copy</i> ". For details, refer to the "1.2.6 Volume Syntax" (page 14) . If omitted, then all corresponding volumes are listed.
	-disks	Optional. This parameter specifies one or more disk identifiers, and is only used for "-type <i>disks</i> ". For details, refer to the "1.2.3 Disk Syntax" (page 13) . If omitted, then all corresponding disks are listed.
	-cm	Optional. This parameter specifies a specific controller module number, and is only used for "-type <i>cm</i> ". If omitted, then both CMs are listed.
	0	Controller module #0
	1	Controller module #1

-port Optional. This parameter specifies a specific host interface port number and is only used for "-type port". If omitted, then all host interface ports are listed.

Ex. -port 00

For details, refer to ["1.2.11 Host Interface Port Syntax" \(page 17\)](#).

xy "x" is the controller module (CM) number, and "y" is the host port number.

Ex. 10 (host port#0 on CM#1)

Output

With no parameters:

```
# Status        [ON]
# Interval     [30sec]
```

- A: It shows whether performance information is started, or not.
- B: The interval time by which performance information is updated

When the host I/O performance information type is selected:

#	Volume	IOPS (IOPS)		Throughput (MB/s)		Response Time (msec.)		Cache Hit Rate (%)		
		Read	Write	Read	Write	Read	Write	Read	Write	Prefetch
#	1 VOL001	6621	5192	589	379	17055	12056	41	37	36
#	2 VOL002	7791	6608	613	292	12148	11045	41	37	36
A	B	C	D	E	F	G	H	I	J	K

- A: Volume number
- B: Volume name
- C: Read IOPS
- D: Write IOPS
- E: Read Throughput
- F: Write Throughput
- G: Read Response Time
- H: Write Response Time
- I: Read Cache Hit
- J: Write Cache Hit
- K: Prefetch Cache Hit

When the Advanced Copy performance information type is selected:

#	Volume	IOPS (IOPS)		Throughput (MB/s)		Cache Hit Rate (%)		
		Read	Write	Read	Write	Read	Write	Prefetch
#	1 VOL001	6621	5192	589	379	41	37	36
#	2 VOL002	7791	6608	613	292	41	37	36
A	B	C	D	E	F	G	H	I

- A: Volume number
- B: Volume name
- C: Read IOPS
- D: Write IOPS
- E: Read Throughput
- F: Write Throughput
- G: Read Cache Hit
- H: Write Cache Hit
- I: Prefetch Cache Hit

When the disks performance information type is selected:

# Location	Busy Rate(%)
# <u>CE-Disk#1</u>	<u>66</u>
A	B

- A: Disk number
- B: Disk Usage Rate

When the CM performance information type is selected:

# Location	Busy Rate(%)	Copy Residual	Quantity(MB)
# <u>CM#1</u>	<u>52</u>		<u>55191552</u>
A	B		C

- A: Controller module number
- B: Controller module busy rate
- C: Copy Remaining Amount

When the host interface port performance information type is selected and the host interface port mode is CA:

# Location	IOPS (IOPS)		Throughput (MB/s)	
	Read	Write	Read	Write
# <u>CM Port#1</u>	<u>7791</u>	<u>6608</u>	<u>613</u>	<u>292</u>
A	B	C	D	E

- A: Volume number
- B: Read IOPS
- C: Write IOPS
- D: Read Throughput
- E: Write Throughput

When the host interface port performance information type is selected and the host interface port mode is RA:

# Location	IOPS (IOPS)		Throughput (MB/s)	
	Transmitted	Received	Transmitted	Received
# <u>CM#0 Port#2</u>	<u>6621</u>	<u>5192</u>	<u>589</u>	<u>379</u>
A	B	C	D	E

- A: Host interface location
- B: Transmitted IOPS
- C: Received IOPS
- D: Transmitted Throughput
- E: Received Throughput

Example(s) The following example displays the status of collection of performance information:

```
CLI> show performance
Status [ON]
Interval [30sec]
```

The following example displays performance information when the host I/O performance information type is selected:

```
CLI> show performance -type host-io
Volume IOPS (IOPS) Throughput (MB/s) Response Time (msec.) Cache Hit Rate (%)
No. Name Read Write Read Write Read Write Read Write Prefetch
1 VOL001 6621 5192 589 379 17055 12056 41 37 36
2 VOL002 7791 6608 613 292 12148 11045 41 37 36
```

The following example displays performance information when the host I/O performance information type is selected for the volume named "VOL001":

```
CLI> show performance -type host-io -volume-name VOL001
Volume
No. Name IOPS (IOPS) Throughput (MB/s) Response Time (msec.) Cache Hit Rate (%)
Read / Write Read / Write Read / Write Read / Write / Prefetch
1 VOL001 6621 5192 589 379 17055 12056 41 37 36
```

The following example displays performance information when the advanced copy performance information type is selected:

```
CLI> show performance -type advanced-copy
Volume
No. Name IOPS (IOPS) Throughput (MB/s) Cache Hit Rate (%)
Read / Write Read / Write Read / Write / Prefetch
1 VOL001 6621 5192 589 379 41 37 36
2 VOL002 7791 6608 613 292 41 37 36
```

The following example displays performance information when the advanced copy performance information type is selected for volume #2:

```
CLI> show performance -type advanced-copy -volume-number 2
Volume
No. Name IOPS (IOPS) Throughput (MB/s) Cache Hit Rate (%)
Read / Write Read / Write Read / Write / Prefetch
2 VOL002 7791 6608 613 292 41 37 36
```

The following example displays performance information when the disks performance information type is selected:

```
CLI> show performance -type disks
Location Busy Rate (%)
CE-Disk#0 67
CE-Disk#1 66
```

The following example displays performance information when the disks performance information type is selected for disk #0 in the controller enclosure:

```
CLI> show performance -type disks -disks 000
Location Busy Rate (%)
CE-Disk#0 67
```

The following example displays performance information when the controller module performance information type is selected for both CMs:

```
CLI> show performance -type cm
Location Busy Rate (%) Copy Residual Quantity (MB)
CM#0 66 55191552
CM#1 52 55191552
```

The following example displays performance information when the controller module performance information type is selected for CM#1:

```
CLI> show performance -type cm -cm 1
Location Busy Rate (%) Copy Residual Quantity (MB)
CM#1 52 55191552
```

For the FC and iSCSI models, the following example displays the performance information for the host interface ports:

```
CLI> show performance -type port
Location      IOPS (IOPS)      Throughput (MB/s)
              Read / Write     Read / Write
CM#0 Port#0   6621  5192     589   379
CM#1 Port#1   7791  6608     613   292
```

For the SAS models, the following example displays the performance information for the host interface ports. This model has two physical interfaces per controller that can be used for host server connection, but only one settable port, so the label "Port#0-1" is used:

```
CLI> show performance -type port
Location      IOPS (IOPS)      Throughput (MB/s)
              Read / Write     Read / Write
CM#0 Port#0-1 6621  5192     589   379
CM#1 Port#0-1 7791  6608     613   292
```

The following example displays performance information when the host interface port performance information type is selected for CM#0-port#0:

```
CLI> show performance -type port -port 00
Location      IOPS (IOPS)      Throughput (MB/s)
              Read / Write     Read / Write
CM#0 Port#0   6621  5192     589   379
```

The following example displays performance information when the host interface port performance information type is selected and the host interface port is RA mode:

```
CLI> show performance -type port
RA Port Information
Location      IOPS (IOPS)      Throughput (MB/s)
              Transmitted / Received Transmitted / Received
CM#0 Port#2   6621  5192     589   379
CM#1 Port#0   7791  6608     613   292
CM#1 Port#1   6621  5192     589   379
CM#1 Port#2   7791  6608     613   292
```

The following example displays performance information when the host interface port performance information type is selected and the host interface ports are a mix of both the RA and CA modes.

```
CLI> show performance -type port
CA Port Information
Location      IOPS (IOPS)      Throughput (MB/s)
              Read / Write     Read / Write
CM#0 Port#0   6621  5192     589   379
CM#0 Port#1   7791  6608     613   292
CM#0 Port#3   6621  5192     589   379
CM#1 Port#3   7791  6608     613   292

RA Port Information
Location      IOPS (IOPS)      Throughput (MB/s)
              Transmitted / Received Transmitted / Received
CM#0 Port#2   6621  5192     589   379
CM#1 Port#0   7791  6608     613   292
CM#1 Port#1   6621  5192     589   379
CM#1 Port#2   7791  6608     613   292
```

5.1.2 Performance Turning Parameters

This section explains the performance tuning parameter related commands for the ETERNUS DX60/DX80/DX90.

set raid-tuning

This command sets the performance tuning parameter for a specific RAID group.

Syntax `set raid-tuning {-rg-number rg_numbers | -rg-name rg_names }
-dcmf {1|2|3|4|5|6|7|8|9|10}`

Parameters `-rg-number` This parameter specifies one or more RAID group identifiers that are to be targeted for tuning. For details, refer to the ["1.2.5 RAID Group Syntax" \(page 14\)](#).
`-rg-name`

`-dcmf` This parameter specifies the disk command multiplication factor, the multiple used when issuing disk commands to disks, in order to increase the sequential write access performance. The initial value of "1" is doubled if "2" is selected, and increased ten times if "10" is selected.

Example(s) The following example sets a DCMF performance tuning parameter of "10" for the RAID group named "R1":

```
CLI> set raid-tuning -rg-name R1 -dcmf 10
```

The following example sets a DCMF performance tuning parameter of "5" for two RAID groups at the same time:

```
CLI> set raid-tuning -rg-name R1,R2 -dcmf 5
```

show raid-tuning

This command displays the performance tuning parameters of all RAID groups.

Syntax show raid-tuning

Parameters No parameters.

Output

#	RAID Group	RAID	Status	DCMF
#	No. Name	Level		
#	1 RAIDGROUP001	RAID1+0	Spare in Use	4
	A B	C	D	E

- A: RAID group number
- B: RAID group name
- C: RAID level
- D: RAID group status
- E: DCMF (A multiplying factor which issues disk commands to disks)

Example(s) The following example displays the performance tuning parameters of all RAID groups:

```
CLI> show raid-tuning
RAID Group      RAID   Status      DCMF
No. Name
1 RAIDGROUP001 RAID1+0 Spare in Use 4
2 RAIDGROUP002 RAID5   Available   2
```

set cache-parameters

This command sets up various cache control tuning parameters for specific volumes.

Syntax	set cache-parameters {-volume-number <i>volume_numbers</i> -volume-name <i>volume_names</i> } [-fp {enable disable}] [-pl <i>pre_fetch</i>] [-mwc <i>multi_writeback_counter</i>]
Parameters	-volume-number or -volume-name This parameter specifies one or more volume identifiers as targets for cache control tuning. For details, refer to the "1.2.6 Volume Syntax" (page 14) . -fp Optional. This parameter specifies the Force Pre-fetch mode. If omitted, this parameter is left unchanged. enable Enables the Force Pre-fetch mode. disable Disables the Force Pre-fetch mode. -pl Optional. This parameter specifies the Pre-fetch Limit value. If omitted, this parameter is left unchanged. -mwc Optional. This parameter specifies the Multi Write Back Counter, and is used to increase the sequential write access performance. It may or may not be available for the specified volume, depending on the configuration of the RAID group that it belongs to. The range of allowed MWC values can be displayed by using "show cache-parameters" command. If omitted, this parameter is left unchanged.
Example(s)	The following example sets a Pre-fetch Limit of "20" for all the consecutive volumes #1-8 together:

```
CLI> set cache-parameters -volume-number 1-8 -pl 20
```

show cache-parameters

This command displays the cache data control parameters for all volumes.

Syntax show cache-parameters

Parameters No parameters.

Output

#	Volume	Type	FP	PL	MWC (Range)
#	No. Name				
#	0 LV0000	Open	ON	8	4 (1-4)
A	B	C	D	E	F

- A: Volume number
- B: Volume name
- C: volume type
- D: Force Pre-fetch Mode
- E: Pre-fetch Limit
- F: Multi Write back Count (Selectable range)

Example(s) The following example displays the cache control parameters:

```
CLI> show cache-parameters
Volume          Type      FP  PL  MWC (Range)
No.  Name
0  LV0000      Open     ON   8   4 (1-4)
3  LogicalVolume003 SDV     OFF  9   1 (1-1)
```


5.2 Event Log Information

This section explains the commands used to display system event related information for the ETERNUS DX60/DX80/DX90.

show events

This command displays event information that has occurred in the ETERNUS DX60/DX80/DX90. Requesting parameters can narrow them down. If all the parameters are omitted, all events are displayed. And, they can be specified and combined together with other parameters.

Syntax	show events [-level { information warning error }] [-cm {0 1}] [-count <i>count</i>] [-dst { enable disable }]	
Parameters	-level	Optional. This parameter specifies the event level whose event information is to be displayed. Two or more levels cannot be requested at the same time. If omitted, then all event levels are displayed.
		information Information level
		warning Warning level
		error Error level
	-cm	Optional. This parameter specifies the number of the CM whose event information is to be displayed. If omitted, then information for both CMs is displayed.
		0 Controller module #0
		1 Controller module #1
	-count	Optional. This parameter specifies the number of events that are to be output, starting from the latest event. If omitted, this option is ignored.
	-dst	Optional. This parameter specifies whether "DST" is displayed for event time stamps.
		enable "DST" is displayed for the time stamps of events that occur during the daylight saving time period.
		disable "DST" is not displayed.

Output

```
# 2010-10-01 12:00:05 DST Error P 01000000 Controller module #0 Fault
A B C D E F
```

- A: The date and time when the events have occurred (for standard time and DST)
- B: "DST" is displayed during the daylight saving time period.
This information is not displayed when "-dst disable" is specified or when the "-dst" parameter is omitted.
- C: Event type
- D: Abbreviation of event type
(T: Test I: Information J/W: Warning P/E: Error M: Maintenance R: Recovery)
- E: Event code (fixed eight-digit)
- F: Event message

Example(s) The following example displays Error level event information:

```
CLI> show events -level error
2008-01-01 12:00:05 Error P 01000000 Controller module #0 Fault
```

The following example displays "DST" by enabling the "-dst" parameter:

```
CLI> show events -level error -dst enable
2008-09-01 13:00:05 DST Error P 01000000 Controller module #0 Fault
```

delete events

This command deletes the records of all system events that have occurred.

Syntax delete events

Parameters No parameters.

Example(s) The following example deletes all the event information:

```
CLI> delete events
```

Chapter 6 CLI Original Functions

6.1 CLI Environment

This section explains the commands used by some original functions of the CLI environment.

- Forcibly releasing resources which the CLI and the controller firmware control
- Selecting page scroll mode
- Logoff
- Viewing help

set clienv-force-unlock

When there are multiple sessions, processes may compete for exclusive resources. In this case, one session may be able to execute its commands, but the other session(s) terminate with an error message. If this happens, wait for the other processes to complete and then retry the failed commands.

Currently running commands may also be forcibly cancelled using this command, if they become inaccessible due to unexpected errors, such as sudden terminal disconnection. This command forcibly releases any exclusive resources held for the CLI by the RAID controller firmware.

Syntax set clienv-force-unlock

Parameters No parameters.

Example(s) The following example forcibly releases exclusively locked CLI resources:

```
CLI> set clienv-force-unlock
```

set clienv-show-more

This command sets the page scroll mode used when the output is over one page in length.

Syntax set clienv-show-more -scroll {enable | disable}

Parameters -scroll This parameter specifies the page scroll mode used when the output is over one page long. The initial mode is disabled.

Caution

- It may not work correctly when there is operator interaction with the CLI command, such as inputting a password.

enable Enables the page scroll mode.

disable Disables the page scroll mode. (default)

Example(s) The following example disables the page scroll mode:

```
CLI> set clienv-show-more -scroll disable
```

The following shows some example output with this mode enabled. The example command is "show fru-ce", and the "Q" or "q" key is used to return to the CLI prompt:

```
CLI> show fru-ce
CM#0 Information
Status/Status Code [Normal / 0xE001]
Memory Size [2.0GB]
Type [FC Model]
Parts Number [CA07059-C021]
Serial Number [PP07520322]
Hardware Revision [AA ]

... (snip)

Host Response [Default]
CM#1 Information
Status/Status Code [Normal / 0xE001]
Memory Size [2.0GB]
Type [FC Model]
Press any key to continue (Q to quit)
```

logoff/logout/exit

This command causes the CLI session to quit.

Syntax logoff
 logout
 exit

Parameters No parameters.

Example(s) All of the following examples quit the CLI session:

```
CLI> logoff
CLI> logout
CLI> exit
```


help

This command displays brief descriptions of all command names supported by the CLI.

Syntax help [*command_name*]

Parameters Optional. This command parameter specifies the CLI command name. You can request either the verb section (the first part of CLI command name) or the complete command name. If omitted, all CLI command names are listed.

The examples of parameter designation are as follows:

OK - CLI> help (In case of no parameter)

OK - CLI> help show (In case of the verb section only)

OK - CLI> help show mapping (In case of the completed command)

NG - CLI> help mapping (In case of the object section only)

NG - CLI> help sh (In case of incomplete command of verb section)

NG - CLI> help show m (In case of incomplete command of object section)

Note

There are "*show mapping*" and "*show migration*" as complete command. So it cannot be decided as completed command.

OK - CLI> help show ma (In case of incomplete command but OK)

Note

- There is only "*show mapping*" as complete command.
- In case inputting incomplete command, a case in which the command name can be identified by the input strings is handled with as complete command.

Example(s) The following example is that there is no parameter. The brief descriptions of all command names are displayed:

```
CLI> help
copy affinity-group          - Copy the definitions from a source affinity group to a destination
affinity group.
copy host-affinity          - Copy host affinity group associations from a host interface port
to other ports.
copy mapping                 - Copy the LUN mapping definitions from a specified host interface
port to one or more host interface ports.
create affinity-group        - Create an affinity group.
create community-profile     - Create a SNMP community profile.
create eco-schedule          - Create one ECO schedule and only one ECO schedule event.
... (snip)
```

The following example shows when inputting a verb section (the first part of CLI command name) as a command parameter. The brief descriptions of all command names beginning with the word "create", are displayed:

```
CLI> help create
create affinity-group      - Create an affinity group.
create community-profile  - Create a SNMP community profile.
create eco-schedule       - Create one ECO schedule and only one ECO schedule event.
create host-wwn-name      - Create a host identifier and alias for an FC host port.
create raid-group         - Create a RAID group with the specified RAID group name, RAID level and disks.
create snmp-view          - Create an SNMP Management Information Base view (MIB view).
create ssl-certificate    - Re-create a server key and a server certificate for network security using SSH/SSL.
create user               - A new user name of profile
create volume             - Create one or more volumes on a specified RAID group.
```

The following example, the detail descriptions of the specified "create raid-group" command name is displayed:

```
CLI> help create raid-group
Descriptions:
  Create a RAID group with the specified RAID group name, RAID level and disks.
Syntax:
  create raid-group -name alias_name -disks disks -level {0|1|5|6|10|50} [-assigned-cm {0|1|auto}]
Parameter description(s):
  -name
    Name of a RAID group
  -disks
    Disk drives to use in the RAID group
  -level
    RAID level
      0 : RAID0
      1 : RAID1
      5 : RAID5
      6 : RAID6
      10 : RAID1+0
      50 : RAID5+0
  -assigned-cm
    Assigned controller for the RAID group
      0 : Controller Module #0
      1 : Controller Module #1
      auto : Automatically (default)
```

Appendix A Error Messages

This chapter explains the actual error messages output by the CLI. Message numbers, messages, and actions that should be taken are given. (Refer to the ["1.7 Error Message Format" \(page 21\)](#) in the document overview for details of the error message format.)

Message number	Message Countermeasure for the error
E0001	Bad value.
	The operand of the specified parameter is incorrect. Check the parameters identified in the detailed section of this message.
E0002	Value out of range.
	The operand of the specified parameter is out of correct range. Check the parameters identified in the detailed section of this message.
E0003	Too many parameters.
	Too many parameters were specified. Check the parameters identified in the detailed section of this message.
E0004	Missing parameter.
	Too few parameters were specified. Check the parameters identified in the detailed section of this message.
E0005	Incorrect parameter combination.
	The combination of the parameters specified is incorrect. Check the parameters identified in the detailed section of this message.
E0006	Inconsistent status.
	The status of the object specified is inappropriate for the operation requested. Check the status of the object identified in the detailed section of this message.
E0007	Inconsistent usage.
	The usage requested is incorrect for the specified object. Check the permitted usage of the object identified in the detailed section of this message.
E0008	Inconsistent size.
	The size requested is inconsistent with the current size. Check the size of the object identified in the detailed section of this message.
E0009	Inconsistent RAID level.
	The operation is not appropriate for the RAID level of the specified RAID group. Check the RAID level of the group identified in the detailed section of this message using the "show raid-groups" command.
E0010	Inconsistent model type of device.
	The specified operation is not appropriate for the type of device. The device is identified in the detailed section of this message.
E0011	Inconsistent network setup.
	An error occurred in the network settings. Check the network environment settings using the "show network" command.

Message number	Message Countermeasure for the error
E0012	Inconsistent e-mail setup.
	An error occurred in the e-mail settings. Check the e-mail environment settings using the "show email-notification" command.
E0014	Inconsistent disk status.
	Cannot execute the requested command because the disk is not in an appropriate state. Check the status of the disks identified in the detailed section of this message using the "show disks" command.
E0015	Inconsistent enclosure status.
	Cannot execute the requested command because the enclosure is not in the correct state. Check the status of the disks identified in the detailed section of this message using the "show enclosure-status" command.
E0019	Inconsistent parameter.
	The specified parameter is inconsistent with the command. Check the parameters indicated in the detailed section of this message.
E0020	Internal error.
	An internal errors has occurred. First retry the command, and if unsuccessful, escalate to the support department.
E0030	Command not supported.
	This command is not supported. Check the execution conditions; for example, host interface type.
E0031	Reserved keyword is used.
	Reserved keyword was used. Try another name.
E0032	Controller firmware cannot be downgraded.
	Reverting the controller firmware to an earlier version is not allowed for the hot application mode. Confirm the controller firmware version using "show firmware" command, and use the cold application mode if necessary.
E0041	Incorrect password syntax.
	The syntax of the specified password is incorrect. Check that the password conforms to password rules; for example length and acceptable characters.
E0042	Incorrect password.
	The passwords entered did not match. Check the password and re-enter.
E0050	Incorrect file.
	The specified file format is incorrect. Check the format of the file identified in the detail section.
E0051	Incorrect license key.
	The specified license key is incorrect. Check the license key shown in the detail section of the error message.
E0052	File access failure.
	Could not access the specified file. Check the filename, access authority, directory path, and network environment.
E0053	Remote server access failure.
	Could not access the remote server. Check that the network environment and remote server are setup correctly.

Message number	Message Countermeasure for the error
E0060	Resource locked.
	Exclusive resource is used by other sessions. Wait for a while and retry the command. If the retry does not work, exclusive resources can be forcibly released by using the "set clienv-force-unlock" command.
E0070	Resource busy.
	Resources corresponding to the specified parameter are used by another process. Confirm the working status of the resources identified in the detail section of this message.
E0071	Resource is linked to the other resource.
	The specified parameter is associated with other resources. Confirm the associated status of the specified parameter. If necessary, resource associations may be released. For example, with host mapping associations are released using the "release host-affinity" or "release mapping" command, and with Eco-mode definition associations are released using the "release eco-raid-group" command.
E0072	Resource is temporarily insufficient.
	Could not execute because required resource is temporarily insufficient. Wait for a while and retry the command.
E0080	Resource limited.
	A resource has reached its upper limit. Confirm the upper limit and the status of the specified parameter/function.
E0081	Number of active disks has reached the system limit.
	Number of activated disks has reached its upper limit. For the DX60, up to 24 disks can be used. For the DX80/DX90, up to 120 disks can be used.
E0089	Not available under current Advanced Copy usable mode conditions.
	The current Advanced Copy mode does not permit this operation. Check the Advanced Copy usable mode using the "show-advancedcopy-parameters" command. If necessary, the Advanced Copy Usable Mode may be released using the "set advanced-copy-parameters" command.
E0090	Not available under current system status conditions.
	The current system status does not permit this operation. Check the system status and the allowed execution conditions for the operation using the "show status" or "show enclosure-status" command.
E0091	Not available under current SNMP settings.
	The current SNMP mode does not permit this operation. Check the SNMP mode using "show snmp" command. If necessary, the SNMP mode may be changed using the "set advanced-copy-parameters" command.
E0092	Not available under current operation mode conditions.
	The current operation mode does not permit this operation. Check the operation mode using "show enclosure-status" command. The operation mode can be set or canceled using the "start maintenance" or "stop maintenance" command respectively.
E0093	Not available under current host affinity mode conditions.
	The current host affinity mode does not permit this operation. Check the host affinity mode using "show fc-parameters", "show sas-parameters", or "show iscsi-parameters" command. If necessary, Host Affinity Mode can be set or canceled using the "show fc-parameters", "show sas-parameters", or "show iscsi-parameters" command.
E0094	Not available under current encryption status conditions.
	The current encryption mode does not permit this operation. Check the encryption mode or encryption state using the "show encryption" or "show volumes" command. Encryption mode can be set or canceled using the "set encryption" command.

Message number	Message Countermeasure for the error
E0095	Not available under current e-mailing conditions.
	The current e-mail send condition does not permit this operation. Confirm whether the e-mail notification function is enabled using the "show email-notification" command. If necessary, the e-mail environment may be corrected using the "set email-notification" command.
E0097	Not available under master controller module.
	Could not execute this command from the master controller module. Try again from the slave controller module, which you can access by the redundant IP address. For details, refer to "show network" command.
E0098	Not available under slave controller module.
	Could not execute this command from the slave controller module. Try again from the master controller module.
E0100	No space.
	There is insufficient space available to allow the specified operation. Check the available space.
E0101	No memory.
	Could not allocate working memory. Close other sessions and try again.
E0102	Not available under system disk status.
	System disk status does not match the execution conditions. Check the system disk status using the "show disks" command.
E0103	Additional host interface port license is required.
	Could not perform host interface port expansion because a host interface port license has not been registered yet. Use the "set host-port-license" command to register the license first.
E0110	Resource does not exist.
	Resources corresponding to the specified parameter do not exist. Check the resources associated with the object identified in the detail section of this message.
E0111	Resource is not reserved.
	Resources corresponding to the specified parameter are not reserved. Check the status of resources associated with the object identified in the detailed section of this message.
E0113	No SNMP trap information.
	Could not execute because SNMP trap information is not registered. Check the SNMP trap information using "show snmp-trap" command. If necessary, SNMP TRAP information may be created using the "create snmp-trap" command.
E0114	No volumes in the RAID Group.
	There are no volumes in the specified RAID group. Check the volumes in the specified RAID group by using the "show raid-groups" command.
E0115	Performance monitor has not started.
	Collecting performance information is not started. Start collecting performance information by using the "start performance" command.
E0116	The system disks are included in the RAID group.
	This operation is not permitted because the specified RAID group includes system disks. Check RAID groups using "show raid-groups" command and specify a RAID group that does not including system disks.

Message number	Message Countermeasure for the error
E0117	No target disks.
	The target disks do not exist. Confirm the disk status or details using the "show disks" command.
E0118	Remote Copy target is not supported model.
	The specified storage system is not supported for Remote Equivalent Copy. Check whether or not to specify an appropriate storage system. Only the ETERNUS DX90 can be specified.
E0120	Already registered.
	The resource is already registered. Check the status of the object shown in the detailed section of this error message.
E0122	Closure of all CLI and GUI ports requires confirmation.
	Displayed when all the connections methods for both the CLI and GUI are to be disabled. If this is intentional, retry the command with the "-confirm-close-all yes" parameter specified. Following this, the storage system will no longer be accessible via the CLI or GUI.
E0123	Closure of all CLI ports requires confirmation.
	Displayed when all the CLI connection methods are to be disabled. If this is intentional, retry the command with the "-confirm-close-all yes" parameter specified. Following this, the storage system will no longer be accessible via the CLI or GUI.
E0131	Already unmapped.
	Resources corresponding to the specified parameter are already unmapped. Check the resources identified in the detail section of this error message.
E0132	Already stopped.
	Resources corresponding to the specified parameter are already stopped. Check the resources identified in the detail section of this error message.
E0140	One or more components have failed.
	One or more components have failed during the maintenance operation. Check the reason of failure or ask the support department to investigate.
E0141	At least one resource is required.
	At least one or more resources are required. Check the specifications.
E0142	One or more encrypted volumes exist.
	Cannot execute this command because encrypted volumes exist. Please check the status of volumes using the "show volumes" command.
E0143	Unexpected error occurred during operator intervention.
	During operator intervention, an unexpected error occurred. For example, the terminal session was suddenly disconnected. Try the operation again.
E0144	Expanding drive enclosure condition.
	A drive enclosure is currently being added. Wait for the expansion operation to complete and try again.
E0145	Advanced Copy table exists.
	Advanced Copy table has already been defined in the ETERNUS DX60/DX80/DX90. Check the Advanced Copy table size using "show advanced-copy-parameters" command. The table size should be "0". If necessary, the Advanced Copy table size may be changed to "0" using the "set advanced-copy-parameters" command.

Message number	Message Countermeasure for the error
E0146	RAID group contains a temporary volume.
	Could not execute because temporary volumes exists in the RAID group. If necessary, retry the command after deleting the temporary volumes.
E0150	Collecting performance data.
	Performance data is currently being collected. Wait for a while and retry the command.
E0151	Power-off or power-on in process.
	Could not execute while the ETERNUS DX60/DX80/DX90 is turning on or turning off. Try again when the system has completed power-on.
E0152	Volumes formatting in process.
	Could not execute while volumes are formatting. Check the progress status of volumes using "show volume-progress" command. Try again after the formatting process completes.
E0153	Encryption or decryption of volumes in process.
	Could not execute while volumes are being encrypted. Please check the progress of volumes operations by using the "show volume-progress" command. Try again after the encryption or decryption process completes.
E0154	Advanced Copy session active.
	Could not execute while an Advanced Copy session is running. Check the status using "show advanced-copy-sessions" command and wait for the session to complete before retrying the command. Try again after the Advanced Copy session has finished.
E0155	Volumes migration in process.
	Could not execute while volumes are being migrated. Check the progress status of volumes using "show volume-progress" command.
E0156	RAID group expansion in process.
	Could not execute while a RAID group is being expanded. Check the progress status of RAID group operations by using the "show raid-group-progress" command.
E0157	Remote Copy session active.
	Could not execute while Remote Copy sessions are processing. Check the status using GUI, ACM (ETERNUS SF Advanced Copy Manager), or ETERNUS SF Express.
E0158	Controller firmware update in process.
	Could not execute while controller firmware update is processing. Wait for a while and retry the command after finishing controller firmware update.
E0159	Remote maintenance in process.
	Could not execute while remote maintenance is processing. Wait for a while and retry the command after finishing remote maintenance.
E0160	Competing with background process.
	Some operations are being performed by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using the "set clienv-force-unlock" command.
E0161	Competing with disk diagnosis running in background process.
	Disk diagnosis is being performed by another process. Wait for a while and try again or stop the disk diagnosis. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.

Message number	Message Countermeasure for the error
E0162	Competing with RAID group diagnosis running in background process.
	RAID group diagnosis is being performed by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0163	Competing with hot update of firmware in background process.
	Hot update of firmware is being performed by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0164	Competing with cold update of firmware in background process.
	Cold update of firmware is being performed by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0165	Competing with update of disk firmware in background process.
	Disk firmware is being updated by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0166	Competing with quick formatting of volume in background process.
	Quick formatting of a volume is running in other process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0167	Competing with changing Advanced Copy parameters in background process.
	Advanced Copy parameters are being changed by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0168	Competing with allocating remote copy buffer in background process.
	A remote copy buffer is being allocated by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0169	Competing with preparing firmware update in background process.
	A firmware update is being prepared by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0170	Competing with setting cache control in background process.
	Cache control parameters are being set by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0171	Competing with reassigning RAID group controller in background process.
	A RAID group is being reassigned to a different controller by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0172	Competing with initializing volume in background process.
	A volume is being initialized by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0173	Competing with encrypting or decrypting volume in background process.
	A volume is being encrypted or decrypted by another process. Please wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.

Message number	Message Countermeasure for the error
E0174	Competing with registering RAID group in background process.
	A RAID group is being registered by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0175	Competing with deleting RAID group in background process.
	A RAID group is being deleted by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0176	Competing with registering volume in background process.
	A volume is being registered by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0177	Competing with deleting volume in background process.
	A volume is being deleted by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0178	Competing with registering global hot spare in background process.
	A Global Hot Spare is being registered by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0179	Competing with changing maintenance mode in background process.
	The maintenance mode is being changed by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0180	Competing with moving volume in background process.
	A volume is being moved by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0181	Competing with expanding RAID group in background process.
	A RAID group is being expanded by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0182	Competing with collecting G-List information in background process.
	G-List information is being collected by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0183	Competing with setting ECO mode in background process.
	An Eco-mode is being set by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0184	Competing with assigning ECO schedule in background process.
	ECO schedule is being assigned by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0185	Competing with setting ECO schedule in background process.
	ECO schedule is being set by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.

Message number	Message Countermeasure for the error
E0186	Competing with setting date and time in background process.
	Date and time are being set by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0187	Competing with expanding volume in background process.
	A volume is being expanded by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0188	Competing with deleting Advanced Copy session in background process.
	An Advanced Copy session is being deleted by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0190	Competing with registering dedicated hot spare in background process.
	A Dedicated Hot Spare is being registered by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0191	Competing with releasing dedicated hot spare in background process.
	A Dedicated Hot Spare is being released by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0192	Competing with collecting event information in background process.
	Event information is being collected by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0193	Competing with deleting snap data volume in background process.
	A Snap Data Volume is being deleted by another process. Wait for a while and try again. If retry does not work, then resources can be forcibly released by using "set clienv-force-unlock" command.
E0300	Syntax error in REC path information. (Incorrect file header)
	Syntax error was detected in the specified REC path information file. Specifically, the header identifier is incorrect. Check the output line given in the details information and amend the header identifier.
E0301	Syntax error in REC path information. (Version mismatch)
	Syntax error was detected in the specified REC path information file. Specifically, the version information is mismatched. Check the output line given in the details information and amend the version information.
E0302	Syntax error in REC path information. (Incorrect label)
	Syntax error was detected in the specified REC path information file. Specifically, the label name is incorrect. Check the output line given in the details information and amend the label name.
E0303	Syntax error in REC path information. (Incorrect operand)
	Syntax error was detected in the specified REC path information file. Specifically, the operand name is incorrect. Check the output line output given in the information and amend the operand.
E0304	Syntax error in REC path information. (Duplicate definition)
	Syntax error was detected in the specified REC path information file. Specifically, the specified definitions are duplicated. Check the output line given in the details information and amend the incorrect definition.

Message number	Message Countermeasure for the error
E0305	Syntax error in REC path information. (Missing label)
	Syntax error was detected in the specified REC path information file. Specifically, the required label names are missing. Check the output line given in the details information and add the required label names.
E0306	Syntax error in REC path information. (Too many labels)
	Syntax error was detected in the specified REC path information file. Specifically, unnecessary label names exist. Check the output line given in the details information and delete any unnecessary label names.
E0307	Syntax error in REC path information. (Missing double quotes)
	Syntax error was detected in the specified REC path information file. Specifically, the specified operand name is not enclosed in double quotations. Check the output line given in the details information.
E0308	Syntax error in REC path information. (Unexpected label)
	Syntax error was detected in the specified REC path information file. Specifically, the specified label names are mismatched. Check the output line given in the details information and amend it to the correct label.
E0309	Syntax error in REC path information. (Undefined information)
	Syntax error was detected in the specified REC path information file. Specifically, undefined information was found. Check the output line given in the details information and amend it to match the defined information.
E0311	Syntax error in REC path information. (Too many lines)
	Syntax error was detected in the specified REC path information file. Specifically, the number of lines used has reached its upper limit. Delete unnecessary lines.
E0312	Syntax error in REC path information. (Overlong line)
	Syntax error was detected in the specified REC path information file. Specifically, the number of characters used has reached its upper limit. Begin on a new line.
E0313	Syntax error in REC path information. (WWN does not match actual)
	Syntax error was detected in the specified REC path information file. Specifically, an inappropriate WWN was used. Check the output line given in the details information and amend it to the appropriate WWN.
E0314	Syntax error in REC path information. (Host port mode does not match actual)
	Syntax error was detected in the specified REC path information file. Specifically, an inappropriate host interface port mode was used. Check the output line given in the details information and amend it to the appropriate host interface port mode.
E0315	Syntax error in REC path information. (Number of storage-links for one storage system over upper limit)
	Syntax error was detected in the specified REC path information file. Specifically, the number of path information definitions for one storage system has reached its upper limit. Check the output line given in the details information.
E0316	Syntax error in REC path information. (Number of storage-links between one pair of storage systems over upper limit.)
	Syntax error was detected in the specified REC path information file. Specifically, the number of path information definitions between one pair of storage systems has reached its upper limit. Check the output line given in the details information.

Message number	Message Countermeasure for the error
E0317	Syntax error in REC path information. (Number of port-links for one host interface port over upper limit)
	Syntax error was detected in the specified REC path information file. Specifically, the number of path information definitions for one host interface port has reached its upper limit. Check the output line given in the details information.
E0318	Syntax error in REC path information. (Number of host interface ports for one storage system over upper limit)
	Syntax error was detected in the specified REC path information file. Specifically, the number of host interface port definitions for one storage system has reached its upper limit. Check the output line given in the details information.
E0319	Syntax error in REC path information. (Total number of storage systems over upper limit)
	Syntax error was detected in the specified REC path information file. Specifically, the number of storage system definitions has reached its upper limit. Check the output line given in the details information.
E0320	Syntax error in REC path information. (Total number of links over upper limit)
	Syntax error was detected in the specified REC path information file. Specifically, the total number of linkages has reached its upper limit. Refine the result to obtain the necessary information.
E0390	Backup REC Path information does not exist.
	Backup file does not exist in the system. Systems for which a path information file has not yet been set do not contain backup files either.
E0391	Round trip time measurement has failed.
	Measuring the round trip time has been failed for any reason. Confirm the inter-storage-system environment.
E0392	Unsupported path type.
	Could not execute due to the path type. Confirm the path type using "show rec-path" command.
E0399	Syntax error in REC path information.
	For any reason, a syntax error was detected in the specified REC path information file. Check the details information.

Appendix B List of Supported Commands

This chapter shows all of the supported commands.
An "x" mark indicates that the command is supported for the indicated conditions.

Command name	Host interface				User authority			Slave control	Remarks
	FC		SAS	iSCSI	Monitor	Standard	Advanced		
	DX90	DX60/ DX80							
Storage System Status									
show status	x	x	x	x	x	x	x	x	
show enclosure-status	x	x	x	x	x	x	x	x	
show fru-ce	x	x	x	x	x	x	x	x	
show fru-de	x	x	x	x	x	x	x	x	
show disks	x	x	x	x	x	x	x	x	
show hardware-information	x	x	x	x	x	x	x	x	
RAID Group Management									
create raid-group	x	x	x	x		x	x		
set raid-group	x	x	x	x		x	x		
delete raid-group	x	x	x	x		x	x		
show raid-groups	x	x	x	x	x	x	x	x	
show raid-group-progress	x	x	x	x	x	x	x		
expand raid-group	x	x	x	x		x	x		
set global-spare	x	x	x	x		x	x		
release global-spare	x	x	x	x		x	x		
set dedicated-spare	x	x	x	x		x	x		
release dedicated-spare	x	x	x	x		x	x		
set eco-mode	x	x	x	x		x	x		
show eco-mode	x	x	x	x		x	x	x	
create eco-schedule	x	x	x	x		x	x		
set eco-schedule	x	x	x	x		x	x		
delete eco-schedule	x	x	x	x		x	x		
show eco-schedule	x	x	x	x		x	x	x	
set eco-raid-group	x	x	x	x		x	x		
release eco-raid-group	x	x	x	x		x	x		
show eco-raid-group	x	x	x	x		x	x	x	
Volume Management									
create volume	x	x	x	x		x	x		*1
set volume	x	x	x	x		x	x		*1
delete volume	x	x	x	x		x	x		
delete all-volumes	x	x	x	x		x	x		
show volumes	x	x	x	x	x	x	x	x	*1
show volume-progress	x	x	x	x	x	x	x		*1
format volume	x	x	x	x		x	x		
expand volume	x	x	x	x		x	x		
start migration	x	x	x	x		x	x		

Command name	Host interface				User authority			Slave control	Remarks
	FC		SAS	iSCSI	Monitor	Standard	Advanced		
	DX90	DX60/ DX80							
stop migration	x	x	x	x		x	x		
show migration	x	x	x	x	x	x	x		
Host Interface Management									
set fc-parameters	x	x				x	x		
show fc-parameters	x	x				x	x	x	
set sas-parameters			x			x	x		
show sas-parameters			x			x	x	x	
set iscsi-parameters				x		x	x		
show iscsi-parameters				x		x	x	x	
create host-wwn-name	x	x				x	x		
set host-wwn-name	x	x				x	x		
delete host-wwn-name	x	x				x	x		
show host-wwn-names	x	x				x	x	x	
discover host-wwn-names	x	x				x	x		
create host-sas-address			x			x	x		
set host-sas-address			x			x	x		
delete host-sas-address			x			x	x		
show host-sas-addresses			x			x	x	x	
discover host-sas-addresses			x			x	x		
create host-iscsi-name				x		x	x		
set host-iscsi-name				x		x	x		
delete host-iscsi-name				x		x	x		
show host-iscsi-names				x		x	x	x	
discover host-iscsi-names				x		x	x		
create affinity-group	x	x	x	x		x	x		
set affinity-group	x	x	x	x		x	x		
copy affinity-group	x	x	x	x		x	x		
delete affinity-group	x	x	x	x		x	x		
show affinity-groups	x	x	x	x	x	x	x	x	
set host-affinity	x	x	x	x		x	x		
copy host-affinity	x	x	x	x		x	x		
release host-affinity	x	x	x	x		x	x		
show host-affinity	x	x	x	x	x	x	x	x	
set mapping	x	x	x	x		x	x		
copy mapping	x	x	x	x		x	x		
release mapping	x	x	x	x		x	x		
show mapping	x	x	x	x	x	x	x	x	
set host-response	x	x	x	x		x	x		
delete host-response	x	x	x	x		x	x		
show host-response	x	x	x	x		x	x	x	
set host-sense	x	x	x	x		x	x		
show host-sense	x	x	x	x		x	x	x	
set ca-reset-group	x	x	x	x		x	x		
show ca-reset-group	x	x	x	x		x	x	x	
test iscsi-ping				x		x	x		

Command name	Host interface				User authority			Slave control	Remarks
	FC		SAS	iSCSI	Monitor	Standard	Advanced		
	DX90	DX60/ DX80							
User Management									
create user	x	x	x	x		x	x		
set user	x	x	x	x		x	x		
delete user	x	x	x	x		x	x		
show users	x	x	x	x		x	x	x	
set password	x	x	x	x		x	x		
initialize all-users	x	x	x	x		x	x		
import ssh-public-key	x	x	x	x		x	x		
delete ssh-public-key	x	x	x	x		x	x		
Advanced Copy Management									
set advanced-copy-license	x	x	x	x		x	x		
delete advanced-copy-license	x	x	x	x		x	x		
show advanced-copy-license	x	x	x	x	x	x	x	x	
set advanced-copy-policy	x	x	x	x		x	x		
show advanced-copy-policy	x	x	x	x		x	x	x	
set advanced-copy-parameters	x	x	x	x		x	x		
show advanced-copy-parameters	x	x	x	x		x	x		
initialize snap-data-volume	x	x	x	x		x	x		
show snap-data-volume	x	x	x	x		x	x	x	
show snap-data-pool	x	x	x	x		x	x		*1
delete snap-data-pool-volume	x	x	x	x		x	x		
start advanced-copy	x	x	x	x		x	x		
stop advanced-copy	x	x	x	x		x	x		
show advanced-copy-sessions	x	x	x	x	x	x	x		
set host-port-mode	x					x	x		
show host-port-mode	x					x	x		
import rec-path	x					x	x		
show rec-path	x					x	x		
export backup-rec-path	x					x	x		
show backup-rec-path-information	x					x	x		
convert rec-path	x					x	x		
measure rec-round-trip-time	x					x	x		
set rec-multiplicity	x					x	x		
set rec-buffer	x					x	x		
delete rec-buffer	x					x	x		
show rec-buffer	x					x	x		
Network Management									
set network	x	x	x	x		x	x		
show network	x	x	x	x		x	x	x	
set firewall	x	x				x	x		
show firewall	x	x	x	x		x	x	x	
set snmp	x	x	x	x		x	x		
show snmp	x	x	x	x		x	x	x	
create snmp-view	x	x	x	x		x	x		
set snmp-view	x	x	x	x		x	x		
delete snmp-view	x	x	x	x		x	x		

Command name	Host interface				User authority			Slave control	Remarks
	FC		SAS	iSCSI	Monitor	Standard	Advanced		
	DX90	DX60/ DX80							
show snmp-view	x	x	x	x		x	x	x	
create community-profile	x	x	x	x		x	x		
delete community-profile	x	x	x	x		x	x		
show community-profile	x	x	x	x		x	x	x	
set snmp-trap	x	x	x	x		x	x		
delete snmp-trap	x	x	x	x		x	x		
show snmp-trap	x	x	x	x		x	x	x	
test snmp-trap	x	x	x	x		x	x		
export enhanced-mib	x	x	x	x		x	x		
set email-notification	x	x	x	x		x	x		
show email-notification	x	x	x	x		x	x	x	
test email	x	x	x	x		x	x		
set event-notification	x	x	x	x		x	x		
show event-notification	x	x	x	x		x	x	x	
set smi-s	x	x	x	x		x	x		
show smi-s	x	x	x	x		x	x	x	
create ssl-certificate	x	x	x	x		x	x		
Miscellaneous									
set date	x	x	x	x		x	x		
show date	x	x	x	x		x	x	x	
set ntp	x	x	x	x		x	x		
show ntp	x	x	x	x		x	x	x	
set storage-system-name	x	x	x	x		x	x		
show storage-system-name	x	x	x	x		x	x	x	
set encryption	x	x	x	x		x	x		*1
show encryption	x	x	x	x		x	x	x	*1
set boxid	x	x	x	x		x	x		
show boxid	x	x	x	x		x	x	x	
set power-synchronization	x	x	x	x		x	x		
show power-synchronization	x	x	x	x		x	x	x	
set subsystem-parameters	x	x	x	x		x	x		
show subsystem-parameters	x	x	x	x		x	x	x	
Performance									
start performance	x	x	x	x		x	x		
stop performance	x	x	x	x		x	x		
show performance	x	x	x	x		x	x		
set raid-tuning	x	x	x	x		x	x		
show raid-tuning	x	x	x	x		x	x	x	
set cache-parameters	x	x	x	x		x	x		
show cache-parameters	x	x	x	x		x	x		
Event Log Information									
show events	x	x	x	x		x	x		
delete events	x	x	x	x		x	x		
CLI Environment									
set clienv-force-unlock	x	x	x	x		x	x		
set clienv-show-more	x	x	x	x		x	x		

Command name	Host interface				User authority			Slave control	Remarks
	FC		SAS	iSCSI	Monitor	Standard	Advanced		
	DX90	DX60/ DX80							
logoff/logout/exit	x	x	x	x	x	x	x		
help	x	x	x	x	x	x	x		

*1: Encryption-related functions are included in the command itself or as part of the command.

Appendix C The Number of Concurrent Volume Formats

The number of concurrent volume formats (*1) differs depending on RAID levels, volume capacity, and the model. If 80 or more 2TB disks have been installed in the ETERNUS DX80/DX90, the maximum number of concurrent volume formats may be exceeded. In this case, an error message appears.

Use the following procedure to check the number of concurrent volume formats.

Calculate the corresponding value for each formatting volume. When the total of corresponding values for all the formatting volumes is smaller than the maximum value, concurrent volume formats are available.

1*: Includes the volume format that is performed automatically when creating a new volume.

Procedure

- 1 Calculate the corresponding value for each formatting volume.

Use the following formula to calculate the value for each volume to be formatted.

$$\text{Corresponding Value for each Volume} = \text{Volume Capacity (MB)} / \text{Coefficient}$$

Volume capacity:

The capacity of the volume to be formatted (MB).

Coefficient

The following table shows the coefficient for each RAID level where the target volume is registered.

RAID1	Coefficient
1D+1D	4

RAID1+0	Coefficient
2D+2D	4
3D+3D	6
4D+4D	8
5D+5D	5
6D+6D	6
7D+7D	7
8D+8D	8
9D+9D	4.5
10D+10D	5
11D+11D	5.5
12D+12D	6
13D+13D	6.5
14D+14D	7
15D+15D	7.5
16D+16D	8

RAID5	Coefficient
2D+1P	4
3D+1P	6
4D+1P	8
5D+1P	5
6D+1P	6
7D+1P	7
8D+1P	8
9D+1P	4.5
10D+1P	5
11D+1P	5.5
12D+1P	6
13D+1P	6.5
14D+1P	7
15D+1P	7.5

RAID5+0	Coefficient	RAID6	Coefficient
(2D+1P) × 2	8	3D+2P	6
(3D+1P) × 2	12	4D+2P	8
(4D+1P) × 2	16	5D+2P	5
(5D+1P) × 2	10	6D+2P	6
(6D+1P) × 2	12	7D+2P	7
(7D+1P) × 2	14	8D+2P	8
(8D+1P) × 2	16	9D+2P	4.5
(9D+1P) × 2	9	10D+2P	5
(10D+1P) × 2	10	11D+2P	5.5
(11D+1P) × 2	11	12D+2P	6
(12D+1P) × 2	12	13D+2P	6.5
(13D+1P) × 2	13	14D+2P	7
(14D+1P) × 2	14		
(15D+1P) × 2	15		

2 Compare the total of the corresponding values and the maximum number of concurrent volume formats.

If the total of the corresponding values is smaller than the maximum value, concurrent volume formats are available.

Total of Corresponding Values < Maximum Value

The total of corresponding values:

Add up the corresponding values for each volume.

The maximum value of concurrent volume formats:

The following table shows the maximum value of concurrent volume formats for each model.

The maximum value: 33,554,432

End of procedure

The following table shows an example when formatting volumes in the RAID5(5D+1P) in which the capacity is 9,331,200MB.

Number of volumes	Formula and corresponding value	Concurrent volume format
17	$(9,331,200 / 5) \times 17 = 31,726,080$	Available
18	$(9,331,200 / 5) \times 18 = 33,592,320$	Not Available


Up to 17 volumes can be formatted concurrently. However, 18 or more volumes cannot be formatted. In this case, the error message "E0072: Resource is temporarily insufficient." appears, and the 17 available volumes are formatted. Refer to the ["show volumes"](#) command to confirm which volumes are being formatted. The remaining volumes can be formatted after the current volume formatting is complete.

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CLI User Guide

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