

FUJITSU Storage
ETERNUS DX60 S3
Disk storage system

Operation Guide (Basic)

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Fujitsu would like to thank you for purchasing our FUJITSU Storage ETERNUS DX60 S3 Disk storage system (hereinafter referred to as ETERNUS DX).

The ETERNUS DX is designed to be connected to Fujitsu servers (Fujitsu M10, PRIMEQUEST, or PRIMERGY) or non-Fujitsu servers.

This manual describes the operation management and maintenance of the ETERNUS DX.

This manual is intended for use of the ETERNUS DX in regions other than Japan.

Please carefully review the information outlined in this manual.

Third Edition

January 2016

About This Manual

Organization

This manual is composed of the following six chapters:

- "Chapter 1 Component Name/LED Name" (page 12)

This chapter provides component names of the ETERNUS DX.

- "Chapter 2 Basic Operation" (page 31)

This chapter explains how to turn on and off the ETERNUS DX and how to operate the buttons on the operation panel.

- "Chapter 3 Storage System Monitoring" (page 41)

This chapter describes the status monitoring of the ETERNUS DX.

- "Chapter 4 Component Expansion/Function Enhancement " (page 45)

This chapter explains how to install drives and drive enclosures in the ETERNUS DX.

- "Chapter 5 Maintenance" (page 74)

This chapter describes maintenance once the ETERNUS DX starts to be operated.

- "Chapter 6 Troubleshooting" (page 75)

This chapter explains troubleshooting when errors occur on the ETERNUS DX.

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Naming Conventions

■ Product Names

- The following abbreviations are used for Microsoft® Windows Server®.

Product name	Abbreviation
Microsoft® Windows Server® 2008 Datacenter	Windows Server 2008
Microsoft® Windows Server® 2008 R2 Datacenter	
Microsoft® Windows Server® 2008 Enterprise	
Microsoft® Windows Server® 2008 R2 Enterprise	
Microsoft® Windows Server® 2008 Standard	
Microsoft® Windows Server® 2008 R2 Standard	
Microsoft® Windows Server® 2008 for Itanium-Based Systems	
Microsoft® Windows Server® 2008 R2 for Itanium-Based Systems	
Microsoft® Windows Server® 2008 HPC Edition	
Microsoft® Windows Server® 2008 R2 HPC Edition	

Product name	Abbreviation
Microsoft® Windows Server® 2012 Datacenter	Windows Server 2012
Microsoft® Windows Server® 2012 R2 Datacenter	
Microsoft® Windows Server® 2012 Standard	
Microsoft® Windows Server® 2012 R2 Standard	
Microsoft® Windows Server® 2012 Essentials	
Microsoft® Windows Server® 2012 R2 Essentials	

- The following abbreviations are used for Red Hat Linux.

Product name	Abbreviation
Red Hat Enterprise Linux 5 (for x86)	Red Hat Enterprise Linux 5
Red Hat Enterprise Linux 5 (for Intel64)	
Red Hat Enterprise Linux 6 (for x86)	Red Hat Enterprise Linux 6
Red Hat Enterprise Linux 6 (for Intel64)	
Red Hat Enterprise Linux 7 (for Intel 64)	Red Hat Enterprise Linux 7

■ Symbols Used in This Manual

The following symbols are used throughout this manual:



This indicates information for the user to note when using the ETERNUS DX. Please be sure to read this information.



This indicates supplementary and reference information.

■ Abbreviations Used in This Manual

- "ETERNUS DX" refers to the FUJITSU Storage ETERNUS DX60 S3 Disk storage system.
- "CA" refers to a host interface module that is used in an ETERNUS DX to connect to a server.
- "Host Bus Adapter (HBA)" refers to an interface module that is normally used in a server to connect to ETERNUS DX storage systems.
- Trademark symbols such as ™ and ® are omitted in this document.

Warning Signs

Warning signs are shown throughout this manual in order to prevent injury to the user and/or material damage. These signs are composed of a symbol and a message describing the recommended level of caution. The following explains the symbol, its level of caution, and its meaning as used in this manual.



This symbol indicates the possibility of serious or fatal injury if the ETERNUS DX is not used properly.



This symbol indicates the possibility of minor or moderate personal injury, as well as damage to the ETERNUS DX and/or to other users and their property, if the ETERNUS DX is not used properly.

IMPORTANT This symbol indicates IMPORTANT information for the user to note when using the ETERNUS DX.

The following symbols are used to indicate the type of warnings or cautions being described.

Electric Shock



△ The triangle emphasizes the urgency of the WARNING and CAUTION contents. Inside the triangle and above it are details concerning the symbol (e.g. Electrical Shock).

No Disassembly



⊘ The barred "Do Not..." circle warns against certain actions. The action which must be avoided is both illustrated inside the barred circle and written above it (e.g. No Disassembly).

Unplug



● The black "Must Do..." circle indicates actions that must be taken. The required action is both illustrated inside the black disk and written above it (e.g. Unplug).

How Warnings are Presented in This Manual

A message is written beside the symbol indicating the caution level. This message is marked with a vertical ribbon in the left margin, to distinguish this warning from ordinary descriptions.

A display example is shown here.

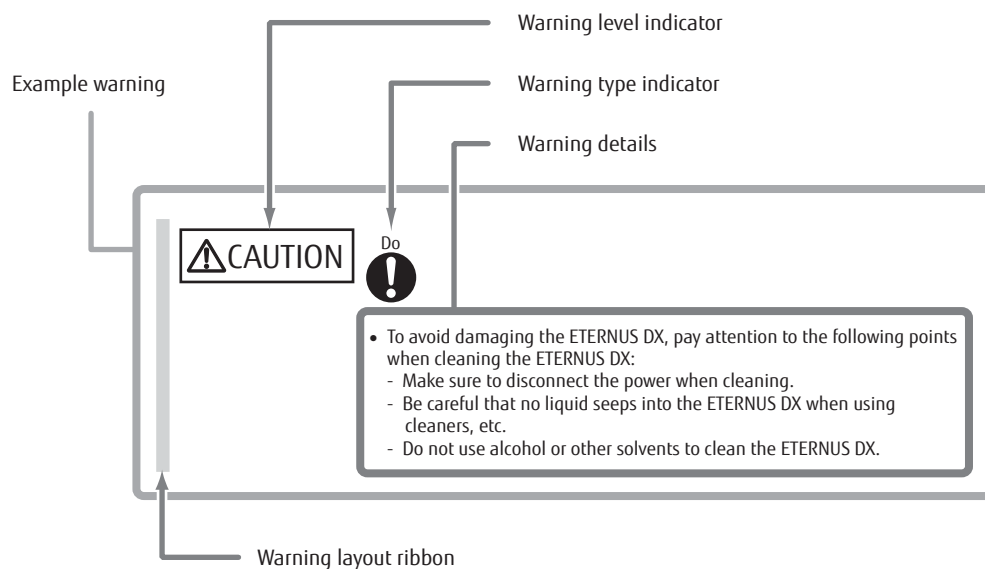


Table of Contents

Chapter 1 Component Name/LED Name	12
1.1 Controller Enclosures.....	12
1.1.1 Front.....	12
1.1.2 Rear.....	13
1.1.3 Components (Front)	15
1.1.4 Components (Rear)	18
1.2 Drive Enclosure.....	22
1.2.1 Front.....	22
1.2.2 Rear.....	23
1.2.3 Components (Front)	24
1.2.4 Components (Rear)	26
1.3 Power Distribution Units (for Regions other than the EMEIA, North American, Central American, and Caribbean Regions).....	29
1.3.1 Power Distribution Units (1U)	29
1.3.2 Power Distribution Units (2U)	30
Chapter 2 Basic Operation	31
2.1 Powering On and Off	31
2.1.1 Switching On and Off the Main Line Switch on the Power Distribution Unit (for Regions other than the EMEIA, North American, Central American, and Caribbean Regions)	31
2.1.2 Switching On and Off the PSU Switch on the Power Supply Unit	34
2.1.3 Powering On	36
2.1.4 Powering Off.....	37
2.2 Using the FUNCTION Button	39
Chapter 3 Storage System Monitoring	41
3.1 Checking LED Status.....	41
3.2 Displaying Status via ETERNUS Web GUI.....	41
3.3 Displaying Status via ETERNUS CLI.....	42
3.4 Event Notification.....	43
3.5 Audit Log.....	44
Chapter 4 Component Expansion/Function Enhancement	45

4.1 Installing Additional Drives	45
4.1.1 Installable Drives	45
4.1.2 Drive Handling Instructions	46
4.1.3 Additional Drive Installation Procedure	47
4.2 Installing Additional Drive Enclosures	52
4.2.1 Installable Drive Enclosures	52
4.2.2 Drive Enclosure Handling Instructions	52
4.2.3 Additional Drive Enclosure Installation Procedure	54
4.3 Adding Servers	67
4.3.1 RAID Group Creation	67
4.3.2 Volume Creation	68
4.3.3 Connection Setup.....	69
Chapter 5 Maintenance	74
5.1 Periodic Backup.....	74
5.2 Maintenance Service	74
5.2.1 Maintenance Support Period	74
5.2.2 Related Service	74
Chapter 6 Troubleshooting	75
6.1 Check List	75
6.2 Required Information for Inquiries	83

List of Figures

Figure 1.1	Front View of a 2.5" Type Controller Enclosure.....	12
Figure 1.2	Front View of a 3.5" Type Controller Enclosure.....	13
Figure 1.3	Rear View of a Controller Enclosure (When Only One Controller Is Installed).....	13
Figure 1.4	Rear View of a Controller Enclosure (When Two Controllers Are Installed).....	14
Figure 1.5	Operation Panel (Controller Enclosure)	15
Figure 1.6	2.5" Drives	17
Figure 1.7	Drive Slot Numbers (2.5" Type Controller Enclosure)	17
Figure 1.8	3.5" Drives	17
Figure 1.9	Drive Slot Numbers (3.5" Type Controller Enclosure)	17
Figure 1.10	Controllers.....	18
Figure 1.11	Power Supply Unit (Controller Enclosure)	21
Figure 1.12	Front View of a 2.5" Type Drive Enclosure.....	22
Figure 1.13	Front View of a 3.5" Type Drive Enclosure.....	22
Figure 1.14	Rear View of a Drive Enclosure (When Only One I/O Module Is Installed)	23
Figure 1.15	Rear View of a Drive Enclosure (When Two I/O Modules Are Installed)	23
Figure 1.16	Operation Panel (Drive Enclosure)	24
Figure 1.17	2.5" Drives	25
Figure 1.18	Drive Slot Numbers (2.5" Type Drive Enclosure)	25
Figure 1.19	3.5" Drives	25
Figure 1.20	Drive Slot Numbers (3.5" Type Drive Enclosure)	25
Figure 1.21	I/O Module	26
Figure 1.22	Power Supply Unit (Drive Enclosure)	28
Figure 1.23	Power Distribution Unit (AC200-240V, 1U, 4 Outlets).....	29
Figure 1.24	Power Distribution Unit (AC200-240V, 2U, 12 Outlets).....	30
Figure 1.25	Power Distribution Unit (AC200-240V, 2U, 16 Outlets).....	30
Figure 2.1	ON Position (Marked "I") of the Main Line Switches on a 1U Power Distribution Unit	31
Figure 2.2	ON Position (Marked "I") of the Main Line Switches on a 2U Power Distribution Unit	32
Figure 2.3	OFF Position (Marked "O") of the Main Line Switches on a 1U Power Distribution Unit	32
Figure 2.4	OFF Position (Marked "O") of the Main Line Switches on a 2U Power Distribution Unit	33
Figure 2.5	ON Position (Marked "I") of the PSU Switch on a Power Supply Unit	34
Figure 2.6	OFF Position (Marked "O") of the PSU Switch of a Power Supply Unit	35
Figure 3.1	ETERNUS Web GUI Screen	41
Figure 3.2	Event Notification	44
Figure 3.3	Audit Log.....	44

List of Tables

Table 1.1	Status and Meanings of Each LED (Operation Panel (Controller Enclosure))	15
Table 1.2	Status and Meanings of Each LED (Drive (Controller Enclosure))	18
Table 1.3	Status and Meanings of Each LED (Controller)	19
Table 1.4	Status and Meanings of Each LED (Power Supply Unit (Controller Enclosure))	21
Table 1.5	Status and Meanings of Each LED (Operation Panel)	24
Table 1.6	Status and Meanings of Each LED (Drive (Drive Enclosure))	26
Table 1.7	Status and Meanings of Each LED (I/O Module)	26
Table 1.8	Status and Meanings of Each LED (Power Supply Unit)	28
Table 3.1	General Status of ETERNUS Web GUI	42
Table 3.2	General Status of ETERNUS CLI	42

Chapter 1

Component Name/LED Name

This chapter provides component names of the ETERNUS DX.

1.1 Controller Enclosures

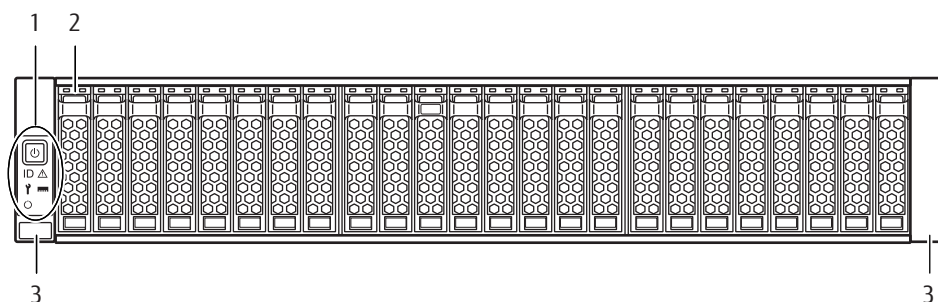
An operation panel and drives are installed in the front of the controller enclosure. Controllers and power supply units are installed in the rear.

1.1.1 Front

This section provides the names of the components in the front of a controller enclosure.

■ 2.5" Type

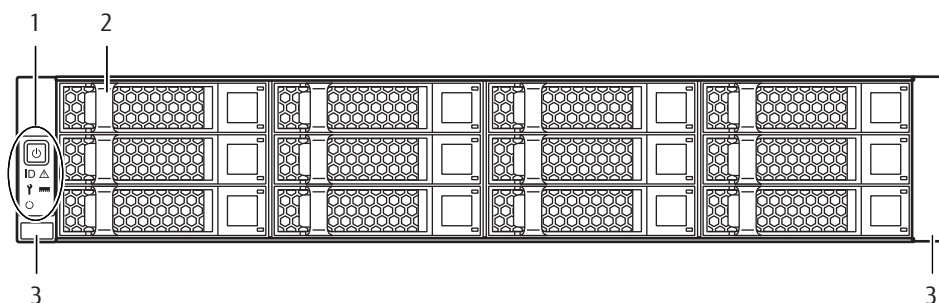
Figure 1.1 Front View of a 2.5" Type Controller Enclosure



1. Operation panel
2. 2.5" drive
3. Flange cover

■ 3.5" Type

Figure 1.2 Front View of a 3.5" Type Controller Enclosure

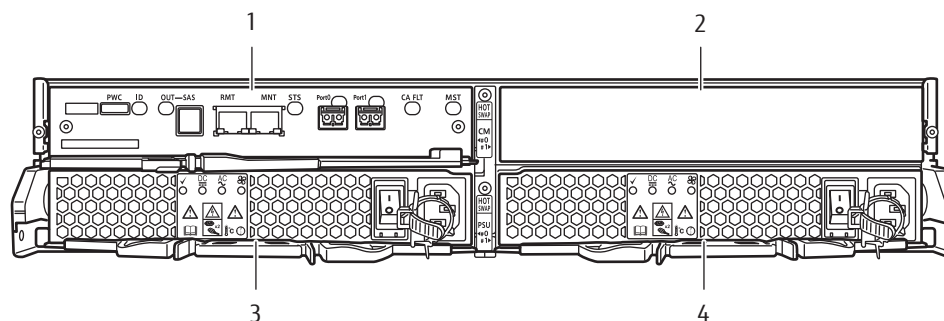


1.1.2 Rear

This section provides the names of the components in the rear of a controller enclosure.

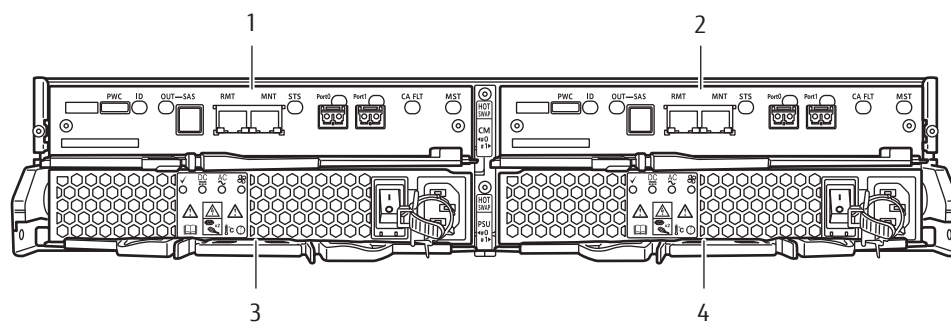
■ When Only One Controller Is Installed

Figure 1.3 Rear View of a Controller Enclosure (When Only One Controller Is Installed)



■ When Two Controllers Are Installed

Figure 1.4 Rear View of a Controller Enclosure (When Two Controllers Are Installed)



1. Controller (CM#0)
2. Controller (CM#1)
3. Power supply unit (PSU#0)
4. Power supply unit (PSU#1)

1.1.3 Components (Front)

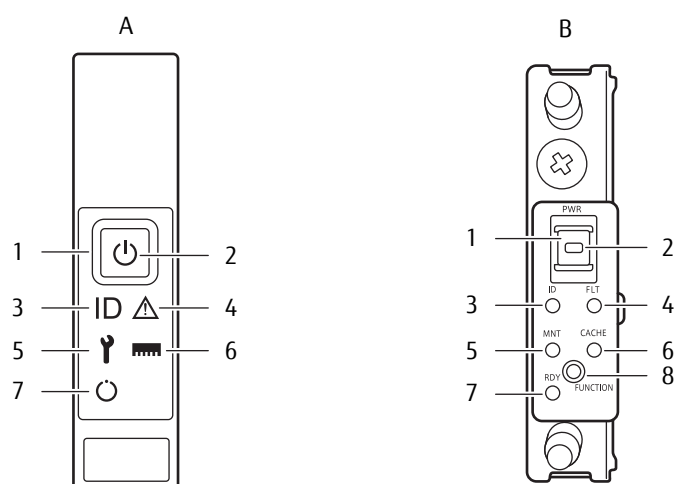
This section describes the operation panel and the drives in the front of the controller enclosure.

■ Operation Panel

An operation panel has LEDs, a Power switch, and a FUNCTION button.

Figure 1.5 shows the operation panel. Table 1.1 shows the status and meanings of each LED.

Figure 1.5 Operation Panel (Controller Enclosure)



A. With a flange cover

B. Without a flange cover

1. Power switch

This switch is used to turn on or off the ETERNUS DX.

2. POWER LED

3. IDENTIFY LED

4. FAULT LED

5. MAINTENANCE LED

6. CACHE LED

7. READY LED

8. FUNCTION button

This button is used to switch the maintenance status, to switch the master CM (when two controllers are mounted), to initialize the LAN ports, or to initialize the user settings.

The LEDs turn on or blink to indicate the statuses that are listed below.

Table 1.1 Status and Meanings of Each LED (Operation Panel (Controller Enclosure))

LED name	LED status	Meaning
POWER	 (green)	DC power is supplied to the controller enclosure.
IDENTIFY	 (blinks blue)	The installation location of the controller enclosure is identified according to the instruction that is issued from ETERNUS Web GUI or ETERNUS CLI.

LED name	LED status	Meaning
FAULT	 (amber)	The ETERNUS DX is in error status.
	 (blinks amber)	A part of the ETERNUS DX requires preventive maintenance.
MAINTENANCE	 (green)	Maintenance for the ETERNUS DX is in progress.
	 (blinks green)	Maintenance (from ETERNUS Web GUI or ETERNUS CLI) is being performed or a status check of the ETERNUS DX is necessary.
CACHE	 (green)	There is data in the cache memory of the ETERNUS DX.
READY	 (green)	The ETERNUS DX is available for use.

■ Drives

● 2.5" Drives

Figure 1.6 shows the 2.5" drive. Figure 1.7 shows the slot number of each 2.5" drive.
Table 1.2 shows the status and meanings of each LED.

Figure 1.6 2.5" Drives



- 1. DRIVE READY LED
- 2. DRIVE FAULT LED

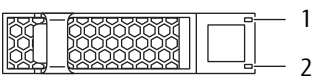
Figure 1.7 Drive Slot Numbers (2.5" Type Controller Enclosure)

	Slot#0	Slot#1	Slot#2	Slot#3	Slot#4	Slot#5	Slot#6	Slot#7	Slot#8	Slot#9	Slot#10	Slot#11	Slot#12	Slot#13	Slot#14	Slot#15	Slot#16	Slot#17	Slot#18	Slot#19	Slot#20	Slot#21	Slot#22	Slot#23
--	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------

● 3.5" Drives

Figure 1.8 shows the 3.5" drive. Figure 1.9 shows the slot number of each 3.5" drive.
Table 1.2 shows the status and meanings of each LED.

Figure 1.8 3.5" Drives



- 1. DRIVE READY LED
- 2. DRIVE FAULT LED

Figure 1.9 Drive Slot Numbers (3.5" Type Controller Enclosure)

	Slot#8	Slot#9	Slot#10	Slot#11
	Slot#4	Slot#5	Slot#6	Slot#7
	Slot#0	Slot#1	Slot#2	Slot#3

The LEDs turn on or blink to indicate the statuses that are listed below.

Table 1.2 Status and Meanings of Each LED (Drive (Controller Enclosure))

LED name	LED status	Meaning
DRIVE READY	 (green)	The drive is in normal status.
	 (blinks green)	
DRIVE FAULT	 (amber)	- The drive is in error status. - The LED light up operation was performed from the ETERNUS CLI command line in order to identify the drive location.

1.1.4 Components (Rear)

This section describes the controllers and the power supply units in the rear of the controller enclosure.

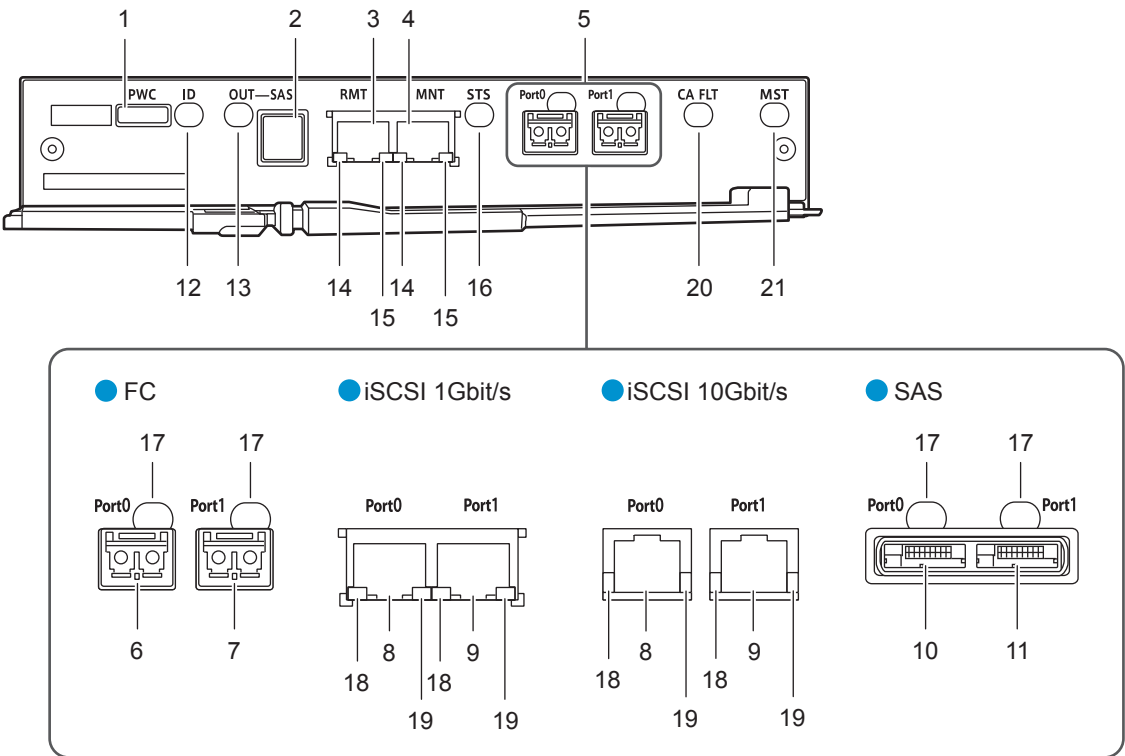
■ Controllers

The controller contains a CPU, cache memory, System Capacitor Unit (SCU), host interfaces, drive interface (DI) ports, and LAN ports. The controller controls all operations in the ETERNUS DX.

Controllers (FC, iSCSI 1Gbit/s, iSCSI 10Gbit/s, and SAS) are available for different types of host interfaces.

Figure 1.10 shows the controller. Table 1.3 shows the status and meanings of each LED.

Figure 1.10 Controllers



1. PWC port

This port is used to connect a power synchronization unit with an RS232C cable.

2. DI (OUT) port
This port is used to connect a controller enclosure to a drive enclosure with a mini SAS HD cable between enclosures.
3. LAN (RMT) port
These are the RJ-45 connectors to connect LAN cables.
4. LAN (MNT) port
These are the RJ-45 connectors to connect LAN cables.
5. Host interface (CA#0)
This interface is used for connecting a controller with a server.
6. Host interface port (FC port) (CA#0, Port#0)
These are the Dual LC connectors to connect FC cables.
7. Host interface port (FC port) (CA#0, Port#1)
These are the Dual LC connectors to connect FC cables.
8. Host interface port (iSCSI port) (CA#0, Port#0)
These are the RJ-45 connectors to connect LAN cables.
9. Host interface port (iSCSI port) (CA#0, Port#1)
These are the RJ-45 connectors to connect LAN cables.
10. Host interface port (SAS port) (CA#0, Port#0)
These are the miniSAS (SFF-8088) connectors to connect miniSAS cables.
11. Host interface port (SAS port) (CA#0, Port#1)
These are the miniSAS (SFF-8088) connectors to connect miniSAS cables.
12. IDENTIFY/SCU READY LED
13. DI (OUT) LINK/FAULT LED
14. LAN ACT LED
15. LAN LINK LED
16. READY/FAULT LED
17. LINK/FAULT LED
18. FAULT LED
19. LINK LED
20. CA#0 FAULT LED
21. MASTER LED

The LEDs turn on or blink to indicate the statuses that are listed below.

Table 1.3 Status and Meanings of Each LED (Controller)

LED name	LED status	Meaning
IDENTIFY/SCU READY	 (blinks blue)	As ordered via ETERNUS Web GUI or ETERNUS CLI, the installation location of the controller is identified.
	 (blinks green)	System Capacitor Unit (SCU) is charging.

LED name	LED status	Meaning
DI (OUT) LINK/FAULT	 (green)	The link between the DI (OUT) port and the destination port has been established.
	 (amber)	- The link between the DI (OUT) port and the destination port is in error status. - The ports to remove the mini SAS HD cables between enclosures from are indicated. This occurs while a drive enclosure is being added.
	 (blinks amber)	The ports to connect the cables are indicated. This occurs while a drive enclosure is being added.
LAN ACT	 (blinks green)	Data is being sent or received via the LAN port.
LAN LINK	 (green)	The link between the LAN port and the destination has been established.
READY/FAULT	 (green)	The controller is in normal status.
	 (blinks green)	An error has occurred during startup.
	 (amber)	- The controller is performing the initial setup after the power is turned on. - The controller is in error status.
	 (blinks amber)	
LINK/FAULT	 (green)	The link between the host interface port (FC or SAS) and the destination port has been established.
	 (amber)	The host interface port (FC or SAS) is in error status.
FAULT	 (green)	The link between the host interface port (iSCSI) and the destination port has been established.
LINK	 (amber)	The host interface port (iSCSI) is in error status.
CA FAULT	 (amber)	The host interface is in error status.
MASTER	 (green)	The controller is set as a Master CM.

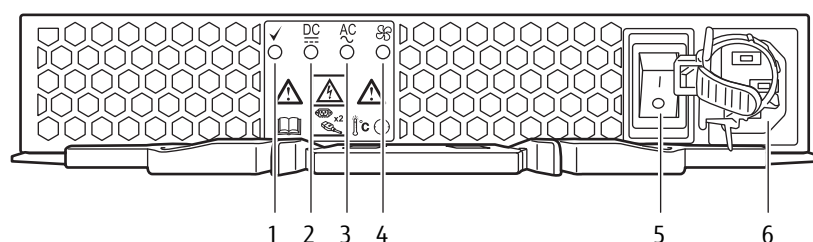
■ Power Supply Units

The power supply unit transforms input AC power from a power socket to DC power and supplies power to each component.

Each power supply unit contains fans.

Figure 1.11 shows the power supply unit. Table 1.4 shows the status and meanings of each LED.

Figure 1.11 Power Supply Unit (Controller Enclosure)



1. POWER LED
2. FAULT LED
3. AC MISSING LED
4. FAN FAIL LED
5. PSU switch

This switch is used to turn on and off the AC power supply.

6. Inlet

This inlet is used to connect a power cord.

The LEDs turn on or blink to indicate the statuses that are listed below.

Table 1.4 Status and Meanings of Each LED (Power Supply Unit (Controller Enclosure))

LED name	LED status	Meaning
POWER	● (green)	AC power is supplied to the power supply unit.
	● (blinks green)	AC power is supplied to the power supply unit, but DC power is not supplied to the ETERNUS DX.
FAULT	● (amber)	AC power is not supplied to the power supply unit.
AC MISSING	● (amber)	AC power is not supplied to this power supply unit, but AC power is supplied to the other power supply unit.
FAN FAIL	● (amber)	The power supply unit or the fan in the power supply unit is in error status.

1.2 Drive Enclosure

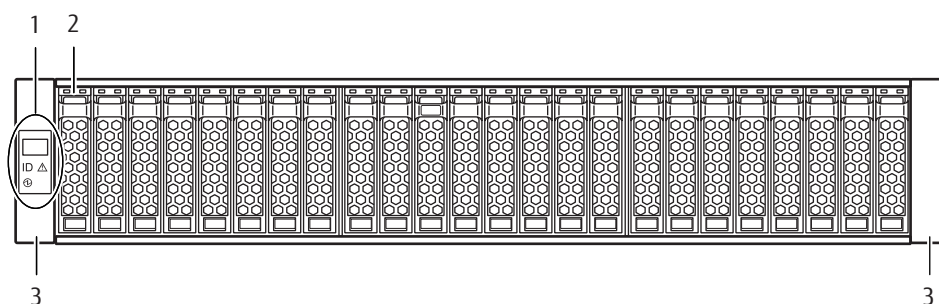
An operation panel and drives are installed in the front of the drive enclosure. I/O modules and power supply units are installed in the rear.

1.2.1 Front

This section provides the names of the components in the front of a drive enclosure.

■ 2.5" Type

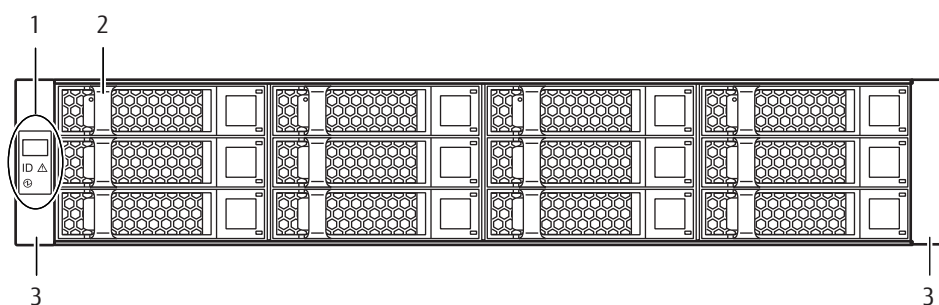
Figure 1.12 Front View of a 2.5" Type Drive Enclosure



1. Operation panel
2. 2.5" drive
3. Flange cover

■ 3.5" Type

Figure 1.13 Front View of a 3.5" Type Drive Enclosure



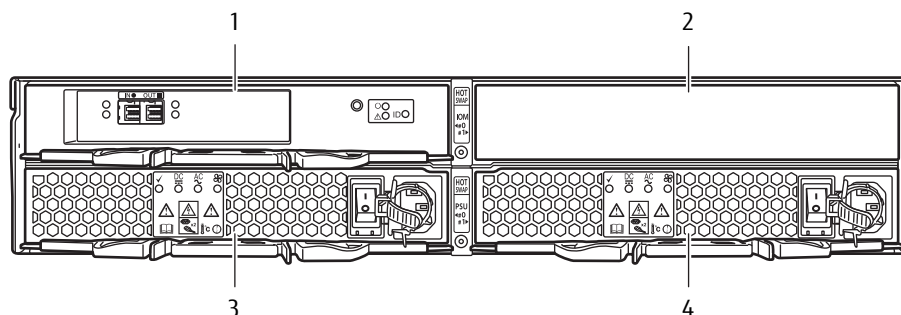
1. Operation panel
2. 3.5" drive
3. Flange cover

1.2.2 Rear

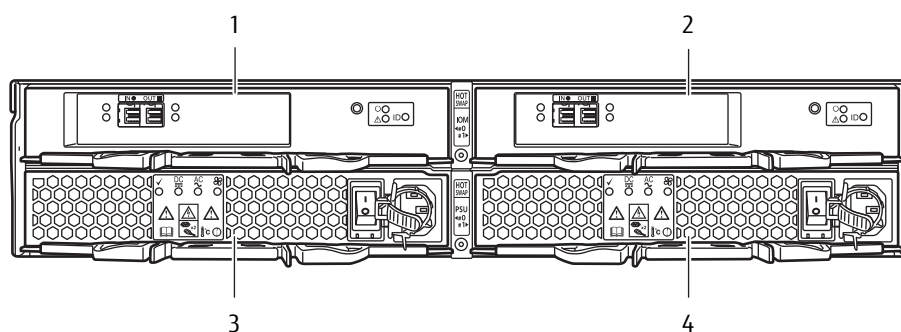
This section provides the names of the components in the rear of a drive enclosure.

- When only one I/O module is installed

Figure 1.14 Rear View of a Drive Enclosure (When Only One I/O Module Is Installed)



1. I/O module (IOM#0)
 2. Cover
Remove this when installing an additional I/O module (optional).
 3. Power supply unit (PSU#0)
 4. Power supply unit (PSU#1)
- When two I/O modules are installed
- Figure 1.15 Rear View of a Drive Enclosure (When Two I/O Modules Are Installed)



1. I/O module (IOM#0)
2. I/O module (IOM#1)
3. Power supply unit (PSU#0)
4. Power supply unit (PSU#1)

1.2.3 Components (Front)

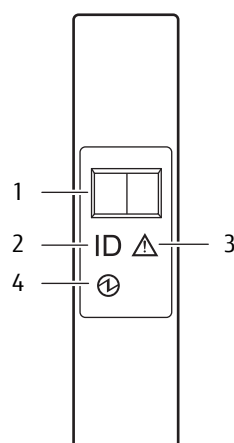
This section describes the operation panel and the drives in the front of the drive enclosure.

■ Operation Panel

An operation panel has a DE-ID display and LEDs.

Figure 1.16 shows the operation panel. Table 1.5 shows the status and meanings of each LED.

Figure 1.16 Operation Panel (Drive Enclosure)



1. DE-ID
The DE-ID (drive enclosure number) of the drive enclosure is displayed.
2. IDENTIFY LED
3. FAULT LED
4. POWER LED

The LEDs turn on or blink to indicate the statuses that are listed below.

Table 1.5 Status and Meanings of Each LED (Operation Panel)

LED name	LED status	Meanings
IDENTIFY	ID (blinks blue)	The installation location of the drive enclosure is identified according to the instruction that is issued from ETERNUS Web GUI or ETERNUS CLI.
FAULT	⚠ (amber)	The drive enclosure is in error status.
POWER	Ⓢ (green)	DC power is supplied to the drive enclosure.

- Drives

- 2.5" Drives

Figure 1.17 shows the 2.5" drive. Figure 1.18 shows the slot number of each 2.5" drive.

Table 1.6 shows the status and meanings of each LED.

Figure 1.17 2.5" Drives



1. DRIVE READY LED
2. DRIVE FAULT LED

Figure 1.18 Drive Slot Numbers (2.5" Type Drive Enclosure)

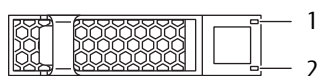
⏮ ⏪ ⏩ ⏭	Slot#0
	Slot#1
	Slot#2
	Slot#3
	Slot#4
	Slot#5
	Slot#6
	Slot#7
	Slot#8
	Slot#9
	Slot#10
	Slot#11
	Slot#12
	Slot#13
	Slot#14
	Slot#15
	Slot#16
	Slot#17
	Slot#18
	Slot#19
	Slot#20
	Slot#21
	Slot#22
	Slot#23

- 3.5" Drives

Figure 1.19 shows the 3.5" drive. Figure 1.20 shows the slot number of each 3.5" drive.

Table 1.6 shows the status and meanings of each LED.

Figure 1.19 3.5" Drives



1. DRIVE READY LED
2. DRIVE FAULT LED

Figure 1.20 Drive Slot Numbers (3.5" Type Drive Enclosure)

ID ▲ Ⓢ	Slot#8	Slot#9	Slot#10	Slot#11
	Slot#4	Slot#5	Slot#6	Slot#7
	Slot#0	Slot#1	Slot#2	Slot#3

The LEDs turn on or blink to indicate the statuses that are listed below.

Table 1.6 Status and Meanings of Each LED (Drive (Drive Enclosure))

LED name	LED status	Meanings
DRIVE READY	 (green)	The drive is in normal status.
	 (blinks green)	
DRIVE FAULT	 (amber)	- The drive is in error status. - The LED light up operation was performed from the ETERNUS CLI command line in order to identify the drive location.

1.2.4 Components (Rear)

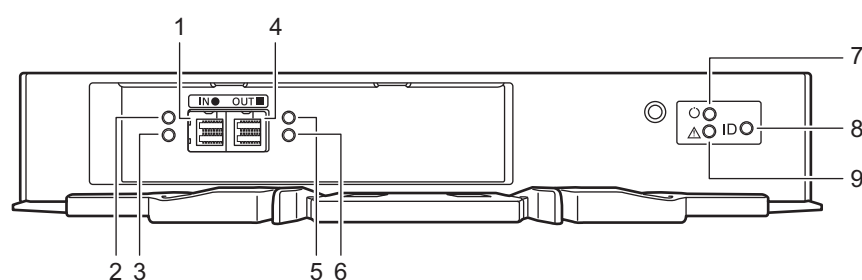
This section describes the I/O modules and the power supply units in the rear of the drive enclosure.

I/O Modules

The I/O module is a component that controls how the controller and the drives interact.

Figure 1.21 shows the I/O module. Table 1.7 shows the status and meanings of each LED.

Figure 1.21 I/O Module



- DI (IN) port
These ports are used to connect between enclosures.
- DI (IN) LINK LED
- DI (IN) FAULT LED
- DI (OUT) port
These ports are used to connect between enclosures.
- DI (OUT) LINK LED
- DI (OUT) FAULT LED
- READY LED
- IDENTIFY LED
- FAULT LED

The LEDs turn on or blink to indicate the statuses that are listed below.

Table 1.7 Status and Meanings of Each LED (I/O Module)

LED name	LED status	Meaning
DI (IN) LINK	 (green)	The link between the DI (IN) port and the source port has been established.

LED name	LED status	Meaning
DI (IN) FAULT	 (amber)	The link between the DI (IN) port and the source port is in error status.
	 (blinks amber)	The ports to connect the cables are indicated. This occurs while a drive enclosure is being added.
DI (OUT) LINK	 (green)	The link between the DI (OUT) port and the destination port has been established.
DI (OUT) FAULT	 (amber)	The link between the DI (OUT) port and the destination port is in error status.
	 (blinks amber)	The ports to connect the cables are indicated. This occurs while a drive enclosure is being added.
READY	 (green)	The I/O module is in normal status.
IDENTIFY	 (blinks blue)	The installation location of the I/O module is identified according to the instruction that is issued from ETERNUS Web GUI or ETERNUS CLI.
FAULT	 (amber)	The I/O module is in error status.

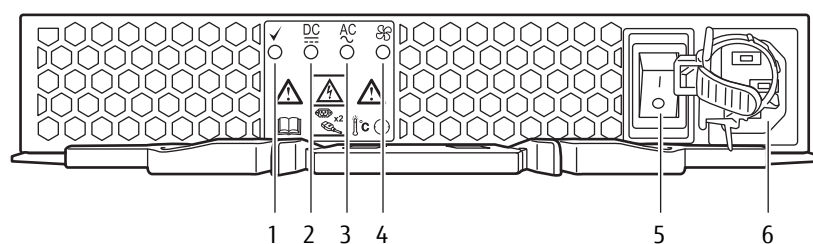
■ Power Supply Units

The power supply unit transforms input AC power from a power socket to DC power and supplies power to each component.

Each power supply unit contains fans.

Figure 1.22 shows the power supply unit. Table 1.8 shows the status and meanings of each LED.

Figure 1.22 Power Supply Unit (Drive Enclosure)



1. POWER LED
2. FAULT LED
3. AC MISSING LED
4. FAN FAIL LED
5. PSU switch

This switch is used to turn on and off the AC power supply.

6. Inlet

This inlet is used to connect a power cord.

The states of LEDs are listed below.

Table 1.8 Status and Meanings of Each LED (Power Supply Unit)

LED name	LED status	Meaning
POWER	● (green)	AC power is supplied to the power supply unit.
FAULT	● (amber)	AC power is not supplied to the power supply unit.
AC MISSING	● (amber)	AC power is not supplied to this power supply unit, but AC power is supplied to the other power supply unit.
FAN FAIL	● (amber)	The power supply unit or the fan in the power supply unit is in error status.

1.3 Power Distribution Units (for Regions other than the EMEA, North American, Central American, and Caribbean Regions)

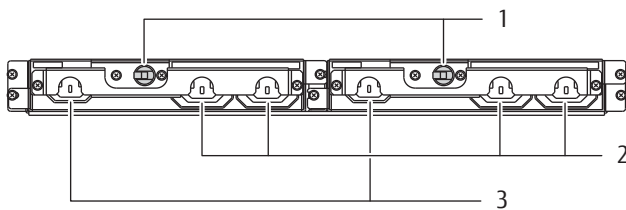
There are two sizes for power distribution units: 1U and 2U.

1.3.1 Power Distribution Units (1U)

The 1U power distribution unit has four outlets and two inlets.

■ Power Distribution Unit (AC200-240V, 1U, 4 Outlets)

Figure 1.23 Power Distribution Unit (AC200-240V, 1U, 4 Outlets)



1. Main line switch
This turns on and off the power distribution unit.
2. Outlet (OUTPUT)
This is a socket (IEC60320 C13) for outgoing power supply. This socket is used to connect a power cord (AC output cable).
3. Inlet (INPUT)
This is a socket (IEC60320 C14) for incoming power supply. This socket is used to connect a power cord (AC input cable).

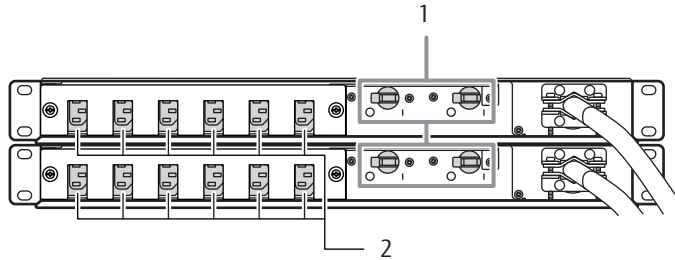
1.3.2 Power Distribution Units (2U)

2U power distribution units are available in two types: a 12 outlet type and a 16 outlet type.

■ Power Distribution Unit (AC200-240V, 2U, 12 Outlets)

There are 12 outlets.

Figure 1.24 Power Distribution Unit (AC200-240V, 2U, 12 Outlets)

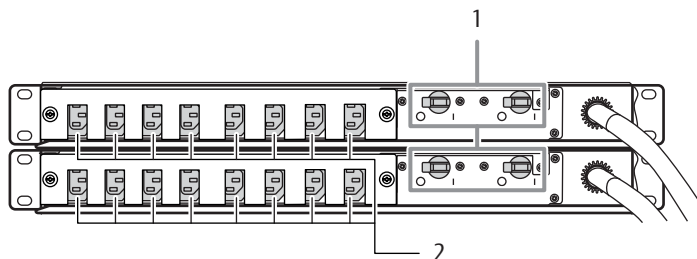


1. Main line switch
This turns on and off the power distribution unit.
2. Outlet (OUTPUT)
This is a socket (IEC60320 C13) for outgoing power supply. This socket is used to connect a power cord (AC output cable).

■ Power Distribution Unit (AC200-240V, 2U, 16 Outlets)

There are 16 outlets.

Figure 1.25 Power Distribution Unit (AC200-240V, 2U, 16 Outlets)



1. Main line switch
This turns on and off the power distribution unit.
2. Outlet (OUTPUT)
This is a socket (IEC60320 C13) for outgoing power supply. This socket is used to connect a power cord (AC output cable).

Chapter 2

Basic Operation

This chapter explains how to turn on and off the ETERNUS DX and how to operate the FUNCTION button on the controller enclosure.

2.1 Powering On and Off

This section explains how to turn on and off the ETERNUS DX.

2.1.1 Switching On and Off the Main Line Switch on the Power Distribution Unit (for Regions other than the EMEIA, North American, Central American, and Caribbean Regions)

This section explains how to switch the main line switch of the power distribution unit to ON and OFF.

■ To Switch to ON

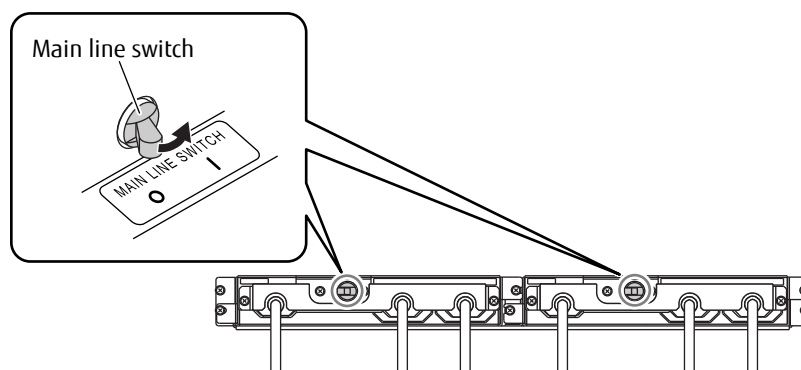
Turn the main line switch of the power distribution unit to the ON position (marked "I").

IMPORTANT

Make sure all of the main line switches are in the ON position.

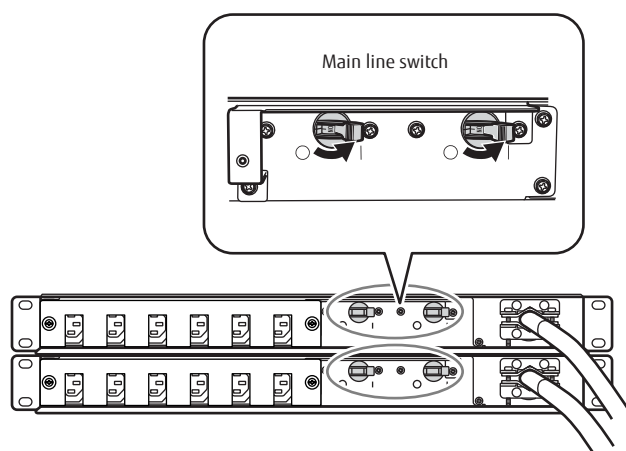
● For 1U

Figure 2.1 ON Position (Marked "I") of the Main Line Switches on a 1U Power Distribution Unit



● For 2U

Figure 2.2 ON Position (Marked "|") of the Main Line Switches on a 2U Power Distribution Unit



■ To Switch to OFF

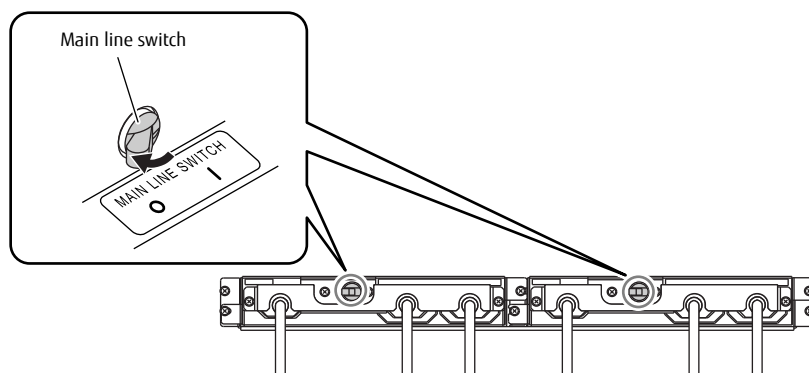
Turn the main line switch of the power distribution unit to the OFF position (marked "O").

● **Note**

This does not need to be turned off for normal operation. If the ETERNUS DX must be turned off, such as before any inspections of power supply devices are performed, turn off the ETERNUS DX by using the procedure described in ["2.1.4 Powering Off" \(page 37\)](#), turn all the PSU switches of the power supply unit to the OFF position, and turn the main line switch to the OFF position.

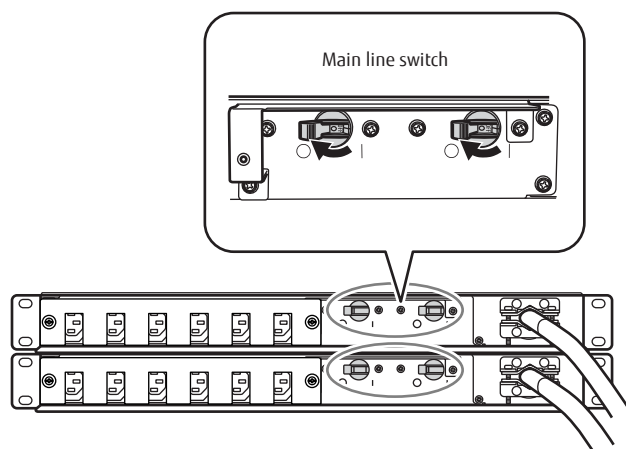
● For 1U

Figure 2.3 OFF Position (Marked "O") of the Main Line Switches on a 1U Power Distribution Unit



- For 2U

Figure 2.4 OFF Position (Marked "O") of the Main Line Switches on a 2U Power Distribution Unit



IMPORTANT

When turning the main line switch to ON (marked "|") right after turning the main line switch to OFF (marked "O"), turn it back to ON (marked "|") after the POWER LED of the power supply unit has turned off completely.

2.1.2 Switching On and Off the PSU Switch on the Power Supply Unit

This section explains how to move the PSU switch of the power supply unit of the controller enclosure and drive enclosures to the ON and OFF positions in each enclosure.

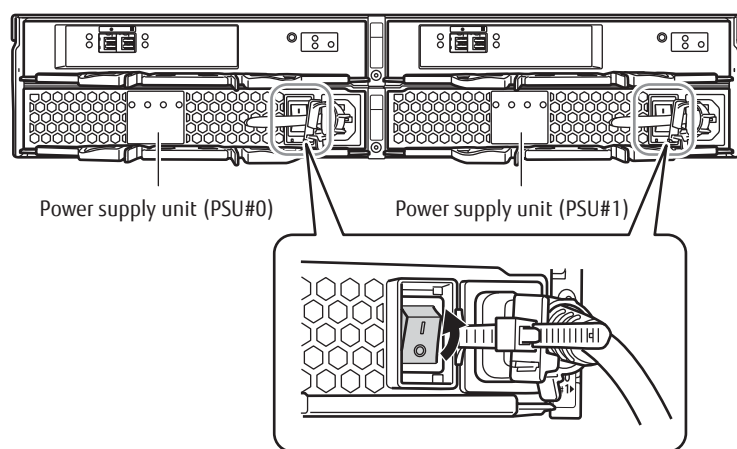
■ To Switch to ON

Turn the PSU switch of the power supply unit to the ON position (marked "|").

IMPORTANT

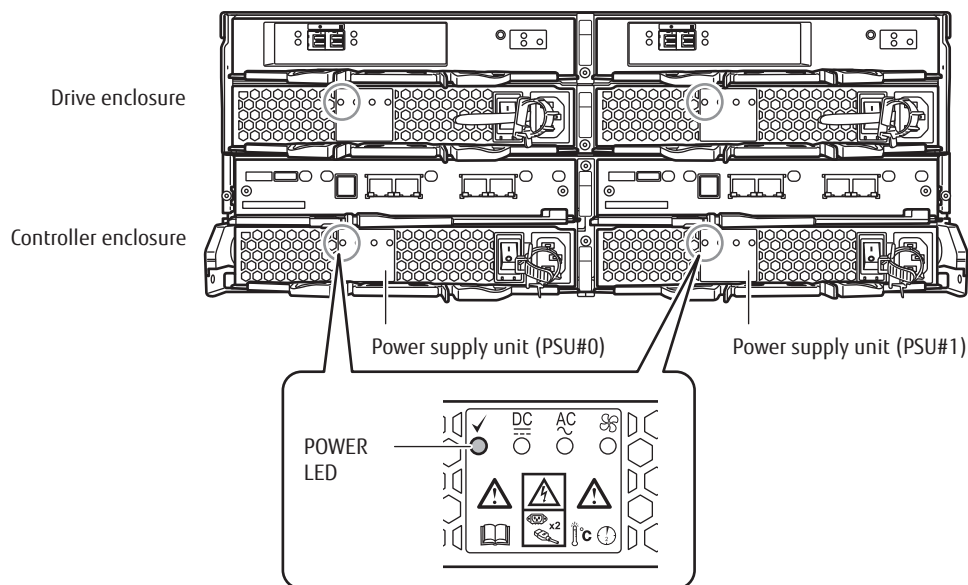
Make sure all of the PSU switches are in the ON position.

Figure 2.5 ON Position (Marked "|") of the PSU Switch on a Power Supply Unit



AC power is supplied to an enclosure.

- For the controller enclosure, the POWER LED on the power supply unit blinks green.
- For the drive enclosure, the POWER LED on the power supply unit emits green lights and the fan revolves at high speed for 30 seconds.



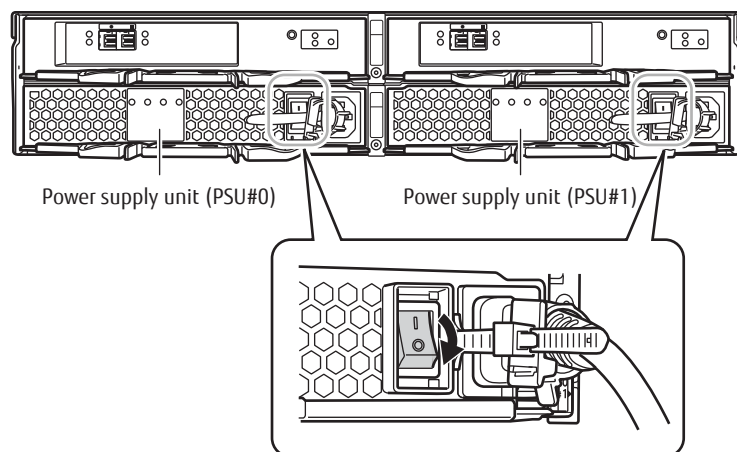
■ To Switch to OFF

Turn the PSU switch of the power supply unit to the OFF position (marked "O").

● **Note**

This does not need to be turned off for normal operation.

Figure 2.6 OFF Position (Marked "O") of the PSU Switch of a Power Supply Unit



Check that the POWER LED of the power supply unit is off.

2.1.3 Powering On

This section explains how to turn on the ETERNUS DX.

To turn on the ETERNUS DX, perform the following procedure.

- Via the power switch

Press the Power switch to turn on the ETERNUS DX.

The following methods can be used to turn the power on by linking with the server.

- Power Synchronized Unit

Use the power synchronized unit to turn on the ETERNUS DX.

- Wake On LAN

Use the Wake On LAN function to turn on the power.

Note

Before turning on the ETERNUS DX, make sure that the main line switches of the power distribution units and the PSU switches on the power supply units of the ETERNUS DX are "ON". Do not turn the main line switches of the power distribution units and the PSU switches on the ETERNUS DX to the OFF position.

IMPORTANT

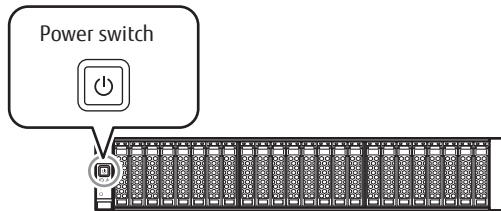
- After turning on the power of the ETERNUS DX, it takes approximately five minutes to be in the READY state (the READY LED turns on). If an error is detected in a component during the initial power-on diagnostics, it may take up a maximum of 10 minutes for the ETERNUS DX to be in a READY state. If a scheduled operation is being performed, make configurations by taking the operation into consideration.
- Before turning the server on, check that the ETERNUS DX and the network devices that connect the ETERNUS DX and the server are all in READY status.
If the server is turned on while any of these devices are not in READY status, the server may not be able to recognize the ETERNUS DX.
- To turn on the ETERNUS DX by linking with the server, the server must wait until the ETERNUS DX is in a READY state.
- If the Auto Power function is enabled via ETERNUS Web GUI or ETERNUS CLI, the ETERNUS DX is automatically turned on when power is supplied to the ETERNUS DX.
- If the Power Resume function is enabled via ETERNUS Web GUI or ETERNUS CLI, the ETERNUS DX is automatically turned on after the power is restored.
- After power-off, wait for about one minute before turning power on again.

This section explains how to use the Power switch to turn on the ETERNUS DX.

For other procedures, refer to the related manuals.

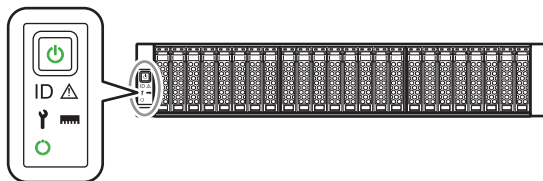
Procedure

- 1 Press the Power switch of the controller enclosure.



The POWER LED is turned on.

- 2 After approximately five minutes, check that the READY LED is lit up.



End of procedure

2.1.4 Powering Off

This section explains how to turn off the ETERNUS DX.

To turn off the ETERNUS DX, perform one of the procedures below.

- Via power switch
Press the Power switch to turn off the ETERNUS DX.
- Via ETERNUS Web GUI or ETERNUS CLI
Use ETERNUS Web GUI or ETERNUS CLI to turn off the ETERNUS DX.

The following methods can be used to turn off the power by linking with the server.

- Via the power synchronized unit
Use the power synchronized unit to turn off the ETERNUS DX.

IMPORTANT

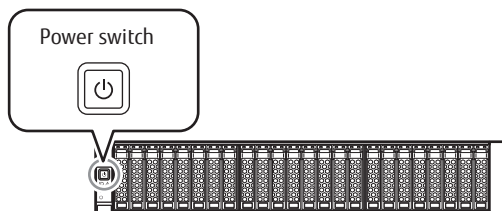
- When the ETERNUS DX is turned off, the power shuts off after the write data in the cache memory is written back to the drives. As a result, it may take approximately five minutes or up to 10 minutes maximum for the power supply to be completely turned off.
- Do not turn off the power of the ETERNUS DX and the network devices that connect the ETERNUS DX to a server while the server is operating. This may result in the loss of data or prevent data from being saved in the ETERNUS DX.
- When using a power synchronized unit for power control, turn off the power of the ETERNUS DX via the power synchronized unit. When a power synchronized unit is connected, the power of the ETERNUS DX is automatically turned on because the power synchronization function is activated.
- After power-off, wait for about one minute before turning power on again.

This section explains how to use the Power switch to turn off the ETERNUS DX.

For other procedures, refer to the related manuals.

Procedure

- 1 Press and hold the Power switch of the controller enclosure for four seconds or more.



The READY LED is turned off.

IMPORTANT

Press the Power switch only once. If the Power switch is pressed again between the time of the READY LED turning off and the POWER LED turning off, the ETERNUS DX power may turn on.

- 2 The power of the ETERNUS DX is disconnected.
When the power is disconnected, the POWER LED is turned off.

End of procedure

2.2 Using the FUNCTION Button

This section explains how to use the FUNCTION button of the controller enclosure.

The following settings can be performed by using the FUNCTION button:

- Switching the Master CM to the other controller

Note

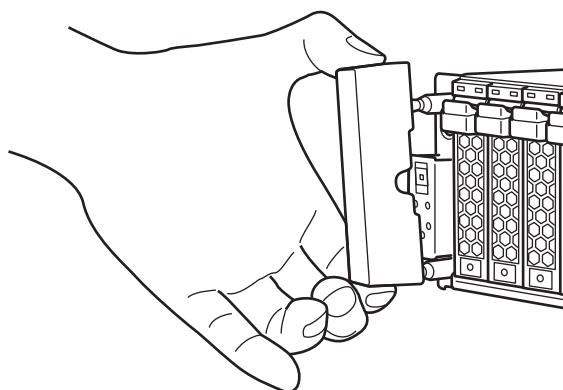
For the two controllers in the ETERNUS DX, the controller through which the ETERNUS DX is set up and operated is called the "Master CM", while the other controller is called the "Slave CM". The single-controller type only has a "Master CM" controller.

- Restoring the factory default settings (network environment settings and firewall settings) of the LAN ports
- Restoring the factory default user settings (user account, role, and RADIUS settings)

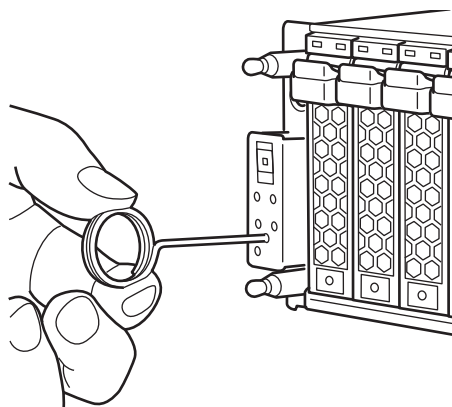
The following procedure explains how to use the FUNCTION button.

Procedure

- 1 Remove the flange cover of the controller enclosure.



- 2 Change the status of the ETERNUS DX to maintenance status.
Use the pin to push down the FUNCTION button for three seconds.



The ETERNUS DX is in maintenance status when the MAINTENANCE LED is green.

- 3 Use the FUNCTION button to change settings.
 - Switching the Master CM to the other controller when two controllers are installed
Use the pin to push down the FUNCTION button twice within three seconds.
The MASTER LED for the controller that is set as the Master CM is green.
 - Restoring the factory default settings of the LAN ports
Use the pin to push down the FUNCTION button three times within three seconds.
After the default settings of the LAN ports are restored, the MAINTENANCE LED blinks green a few times a second for several seconds.
 - Restoring the factory default user settings
 - (1) Remove all the LAN cables from the LAN ports (MNT ports and RMT ports) of all the controllers.
 - (2) Use the pin to push down the FUNCTION button five times within three seconds.
After the default user settings are restored, the MAINTENANCE LED blinks green approximately every second for several seconds.
- 4 Release maintenance status.
Use the pin to push down the FUNCTION button for three seconds.
The MAINTENANCE LED turns off, which indicates that the ETERNUS DX is no longer in maintenance status.
- 5 Attach the flange cover.

End of procedure

Chapter 3

Storage System Monitoring

This chapter describes the status monitoring of the ETERNUS DX.

3.1 Checking LED Status

The status of the ETERNUS DX can be checked by the LEDs.
If the FAULT LED in the operation panel is amber, contact your maintenance engineer.

3.2 Displaying Status via ETERNUS Web GUI

The status of the ETERNUS DX and the usage status of RAID groups, TPPs, and SDPs can be checked in the Overview screen of ETERNUS Web GUI.

Figure 3.1 ETERNUS Web GUI Screen

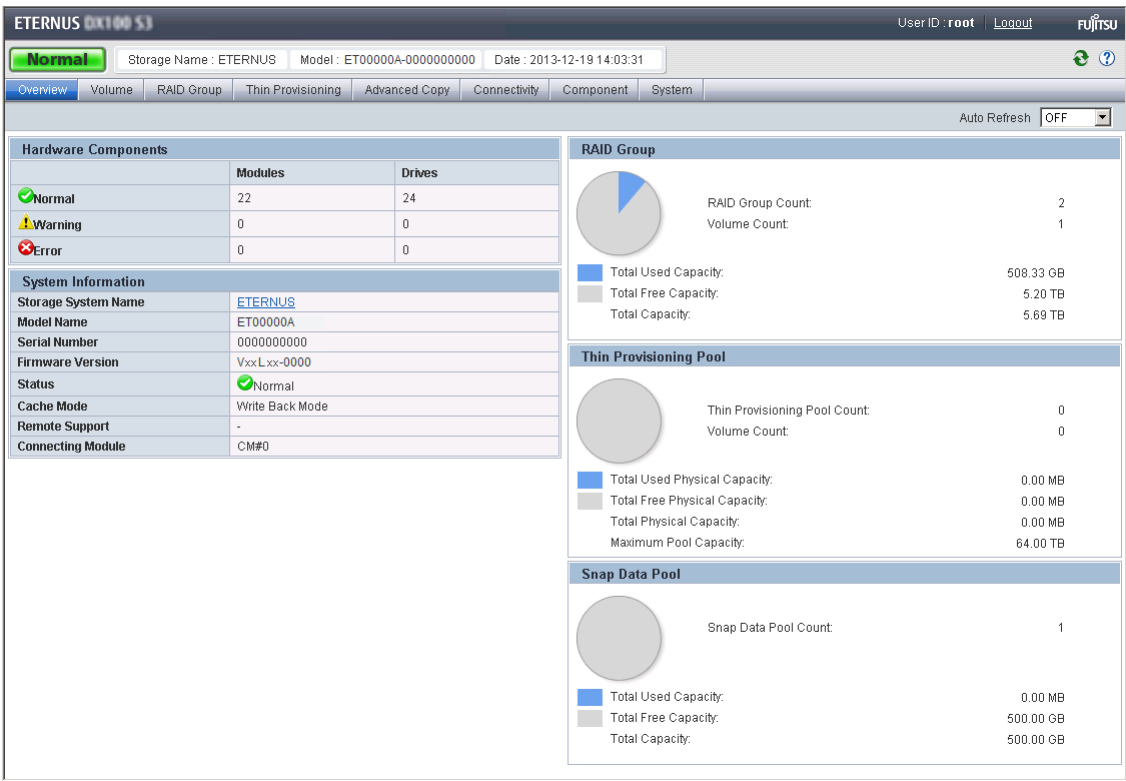


Table 3.1 shows the general status.

Status of the ETERNUS DX is monitored periodically, and the result is displayed as a general status icon with character strings.

Table 3.1 General Status of ETERNUS Web GUI

Status	Description
 (green)	The ETERNUS DX is in a normal state.
 (red)	An abnormality is detected at a power-off, and I/O access from the server cannot be received.
 (red)	The ETERNUS DX is in error state.
 (orange)	The ETERNUS DX is under maintenance.
 (yellow)	The ETERNUS DX is in warning state.

For details, refer to "Configuration Guide (Web GUI)".

3.3 Displaying Status via ETERNUS CLI

The status of the ETERNUS DX and the usage status of RAID groups, TPPs, and SDPs can be checked by sending the status display command via ETERNUS CLI.

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

The general status of the ETERNUS DX indicates whether an error status component or a warning status component exists in the storage system.

Table 3.2 General Status of ETERNUS CLI

Status	Description
Empty	An undefined or uninstalled component exists in the ETERNUS DX.
Normal	The ETERNUS DX is in a normal state.
Pinned Data	Pinned data exists in the ETERNUS DX.
Unused	An undefined component is installed in the ETERNUS DX.
Warning	The ETERNUS DX contains a component that requires preventive maintenance.
Maintenance	The ETERNUS DX is under maintenance.
Error	An error has occurred in a component that is installed in the ETERNUS DX.
Loop Down	The ETERNUS DX is in BackEnd Down status.
Not Ready	An abnormality is detected and access from the host cannot be received.
Subsystem Down	The ETERNUS DX cannot be used.
Change Assigned CM	CM hot expansion recovery is required.

3.4 Event Notification

By setting event notification, if an error (event) occurs in the ETERNUS DX, the event information is notified. The methods that can be used to notify an event are "e-mail", "SNMP Trap", "Syslog", "remote support", and "host sense".

For the procedure on setting event notification, refer to "Configuration Guide (Basic)".

■ E-mail

When an event occurs in the ETERNUS DX, an e-mail is sent to the specified e-mail address.

For more details on notified event information, refer to "Message List".

■ SNMP Trap

When an event occurs in the ETERNUS DX, an SNMP Trap is sent to the SNMP Manager (monitoring server).

For more details on event information notified by SNMP Trap, refer to "Message List".

■ Syslog

When an event occurs in the ETERNUS DX, the event log can be sent to the external server (Syslog server).

For the notified Syslog messages, refer to "Message List".

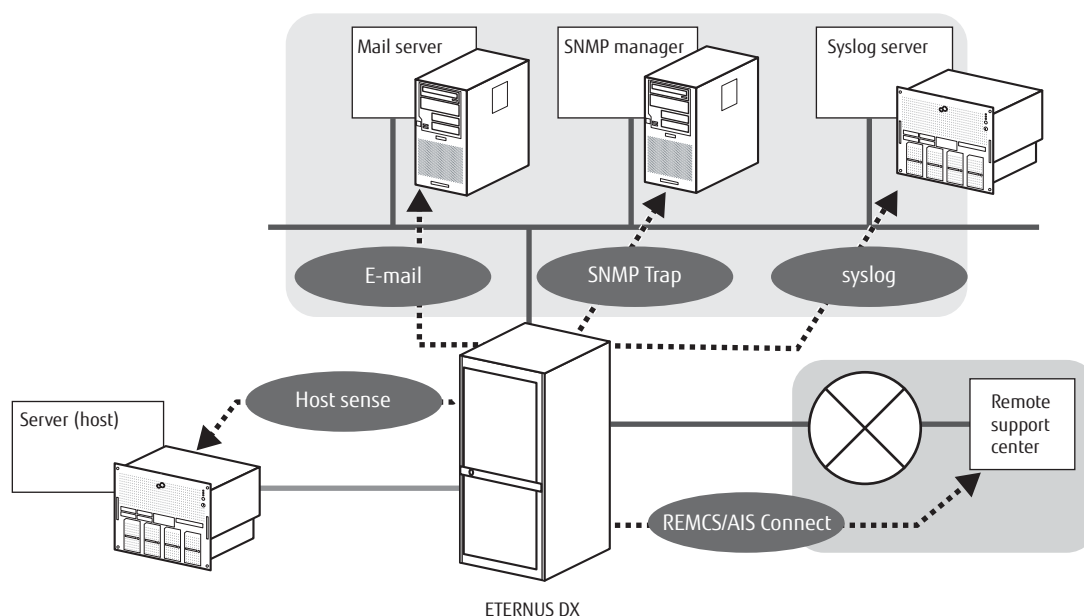
■ Remote Support

The information for errors that occur in the ETERNUS DX is notified to the remote support center.

■ Host Sense

When an event occurs in the ETERNUS DX, host senses (sense codes) are sent to the server. For details on sense codes, refer to "Message List".

Figure 3.2 Event Notification

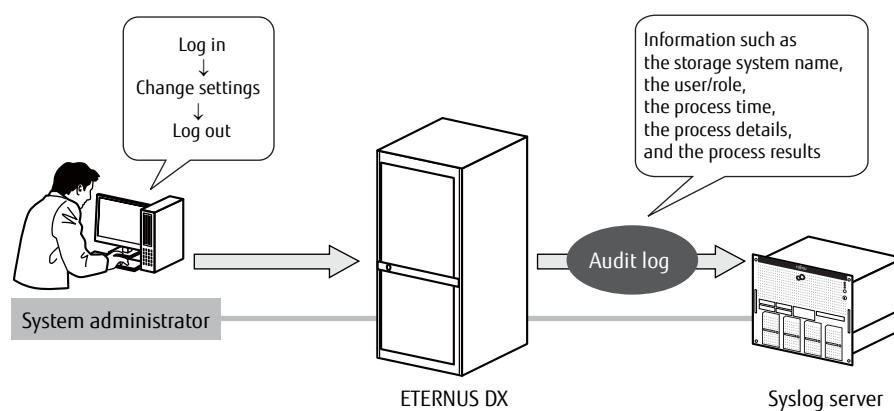


3.5 Audit Log

By setting audit log, audit trail logs (hereinafter referred to as "audit log") that record performed operations by using the ETERNUS DX and the system actions that are associated with these operations can be sent to the Syslog server.

For the procedure on setting audit logs, refer to "Configuration Guide (Basic)". For log information, refer to "Message List".

Figure 3.3 Audit Log



Chapter 4

Component Expansion/Function Enhancement

For the ETERNUS DX, customers can expand (add) the following optional products.

- Drives
- Drive enclosures

This chapter explains the handling instructions and installation procedures for these optional products.

Make sure to read "Safety Precautions" before performing any of these procedures.

When adding servers to be connected, refer to ["4.3 Adding Servers" \(page 67\)](#).

4.1 Installing Additional Drives

Drives can be installed while the ETERNUS DX is running without affecting the system.

This section explains how to install drives in the ETERNUS DX.

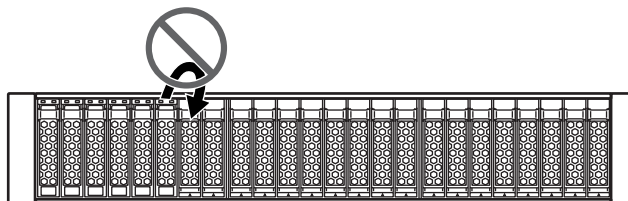


Do Not



- Do not uninstall or move a drive that is already installed.

Contact your sales representative or maintenance engineer if drives that are installed by default need to be uninstalled or moved to another slot.



4.1.1 Installable Drives

For installable drives, refer to "Product List".

4.1.2 Drive Handling Instructions

■ About Condensation



- When moving a drive from a cold place, such as an unconditioned store house in winter, to a warmer place such as an air-conditioned room, the severe temperature change may result in condensation forming.

To avoid this, allow the packed drive sufficient time in the warmer place (one hour for each 15°C of temperature difference) to adapt to the new temperature.

■ About Static Electricity



- Do not touch the surface of the board of the drives.



- When handling drives, make sure to wear a wrist strap or touch a metal part to discharge the human body's natural static electricity. Failure to discharge static electricity may cause device failure.
- Leave the drive in its package until ready to install it.

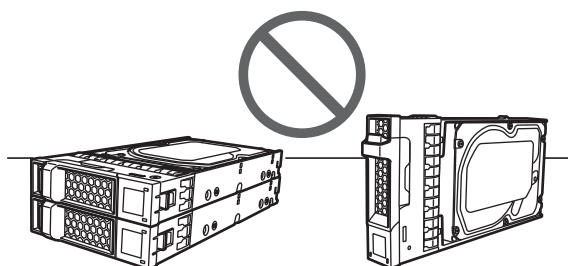
■ About Shock



Do Not



- Do not lay the drives directly on a desk or similar hard surface. Always use a rubber mat or other soft material to cushion the drives against physical shocks.
- Do not stack drives or stand drives on end.



- Do not apply external force to the interface connectors.
- Do not knock or drop the drives on hard objects.

4.1.3 Additional Drive Installation Procedure

This section explains how to install optional drives in the ETERNUS DX.
Drives can be installed in any slots.



Do



- If components are installed in a way other as described in this section, damage and/or device failure or electrical shock may occur.

Do Not

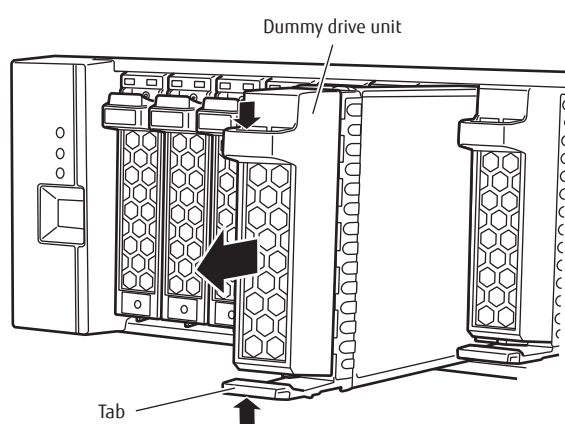


- Do not install drives that are for use in other devices.

■ For 2.5" Drives

Procedure

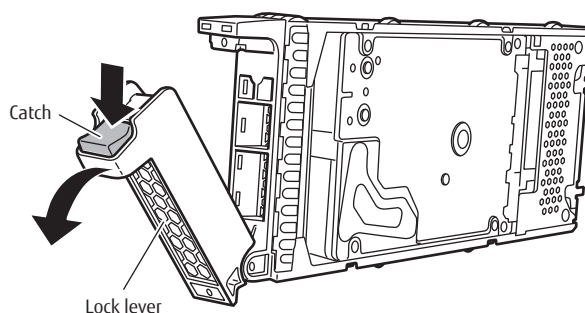
- 1 In the [Storage] screen of [Component] on the ETERNUS Web GUI screen, check that all components of the ETERNUS DX are in normal status.
- 2 Wear a wrist strap or touch a metal part to discharge the human body's natural static electricity.
- 3 Remove the dummy drive unit from the slot in which the drive is to be installed.
Push into the tab of the dummy drive unit and pull it straight out of the drive slot.



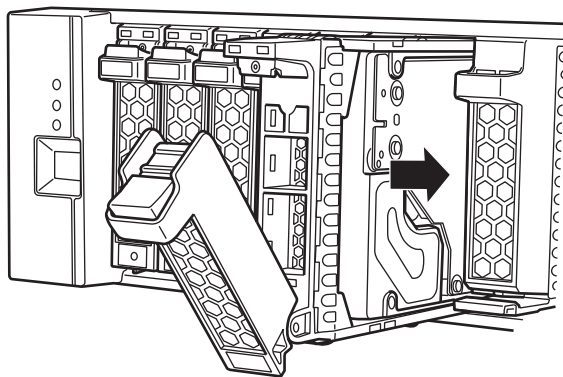
IMPORTANT

Keep the removed dummy drive units in a safe place where they will not be lost.

- 4 Install the new drive.
(1) Press the catch on the drive lock lever to unlock it.

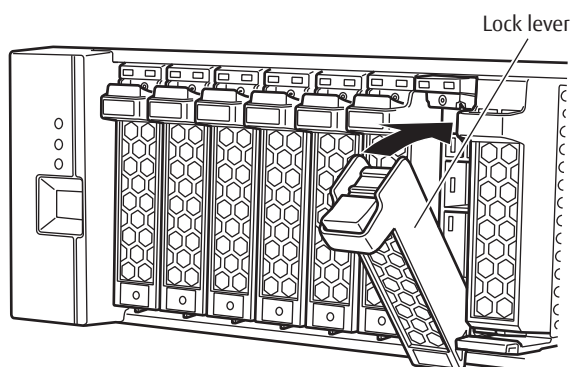


- (2) Insert the drive all the way into the slot, making sure that it is firmly seated and that the lock lever is still left open.



- Hold the drive with both hands to protect against jarring.

- (3) Swing the lock lever in the direction of the arrow, until the lock clicks shut.



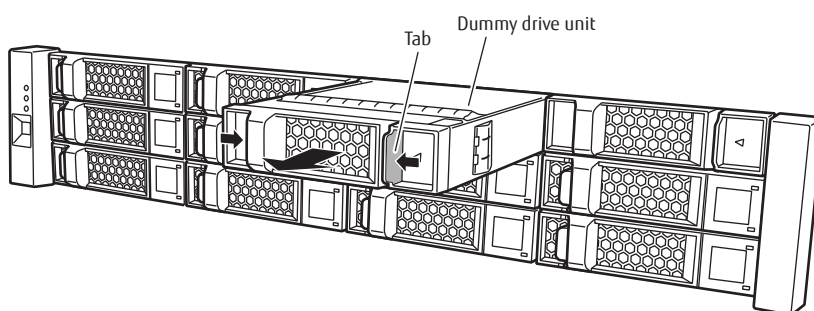
- (4) Check that the newly installed drive's DRIVE READY LED lights up green.
- 5 To install more additional drives, repeat [Step 3](#) and [Step 4](#).
 - 6 If a wrist strap is used, remove the wrist strap.
 - 7 In the [Drives] screen of [Component] on the ETERNUS Web GUI screen, check that the added drives have been recognized.
 - 8 Set up RAID groups, volumes, hot spares, and host affinity settings, as required.

End of procedure

■ For 3.5" Drives

Procedure

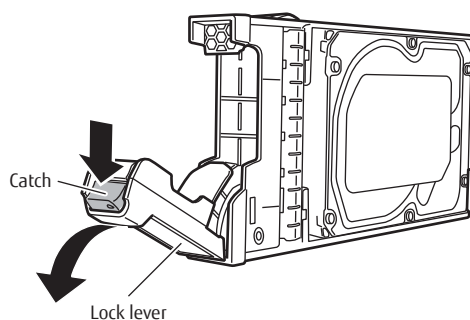
- 1 In the [Storage] screen of [Component] on the ETERNUS Web GUI screen, check that all components of the ETERNUS DX are in normal status.
- 2 Wear a wrist strap or touch a metal part to discharge the human body's natural static electricity.
- 3 Remove the dummy drive unit from the slot in which the drive is to be installed.
Push into the tab of the dummy drive unit and pull it straight out of the drive slot.



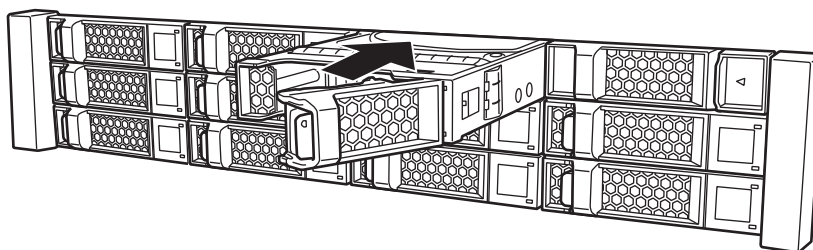
IMPORTANT

Keep the removed dummy drive units in a safe place where they will not be lost.

- 4 Install the new drive.
 - (1) Press the catch on the drive lock lever to unlock it.



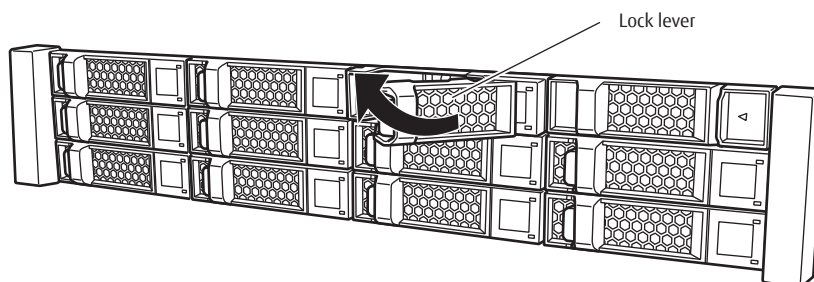
- (2) Insert the drive all the way into the slot, making sure that it is firmly seated and that the lock lever is still left open.





- Hold the drive with both hands to protect against jarring.

(3) Swing the lock lever in the direction of the arrow, until the lock clicks shut.



(4) Check that the newly installed drive's DRIVE READY LED lights up green.

- 5 To install more additional drives, repeat [Step 3](#) and [Step 4](#).
- 6 If a wrist strap is used, remove the wrist strap.
- 7 In the [Drives] screen of [Component] on the ETERNUS Web GUI screen, check that the added drives have been recognized.
- 8 Set up RAID groups, volumes, hot spares, and host affinity settings, as required.

End of procedure

4.2 Installing Additional Drive Enclosures

Drive enclosures can be installed while the ETERNUS DX is running without affecting the system. This section explains how to install drive enclosures in the ETERNUS DX.



Do Not



- Do not uninstall or move a drive enclosure that is already installed. Contact your sales representative or maintenance engineer if a drive enclosure needs to be uninstalled or moved.

Do



- When installing the ETERNUS DX, secure the rack to the floor to prevent the rack from moving out of place or from toppling over. For details on the rack installation requirements, refer to "Site Planning Guide".

4.2.1 Installable Drive Enclosures

For installable drive enclosures, refer to "Product List".

4.2.2 Drive Enclosure Handling Instructions

■ About Condensation



Do



- When moving a drive enclosure from a cold place, such as an unconditioned store house in winter, to a warmer place such as an air-conditioned room, the severe temperature change may result in condensation forming.

To avoid this, allow the packed drive enclosure sufficient time in the warmer place (one hour for each 15°C of temperature difference) to adapt to the new temperature.

■ About Static Electricity



- When handling drive enclosures, make sure to wear a wrist strap or touch a metal part to discharge the human body's natural static electricity. Failure to discharge static electricity may cause device failure.

■ About Shock



- Do not handle the drive enclosure roughly or subject it to physical shocks when laying it down.
- Do not stack the drive enclosures.
- Do not knock or drop the drive enclosure on hard objects.

4.2.3 Additional Drive Enclosure Installation Procedure

This section explains how to install additional drive enclosures in the ETERNUS DX.

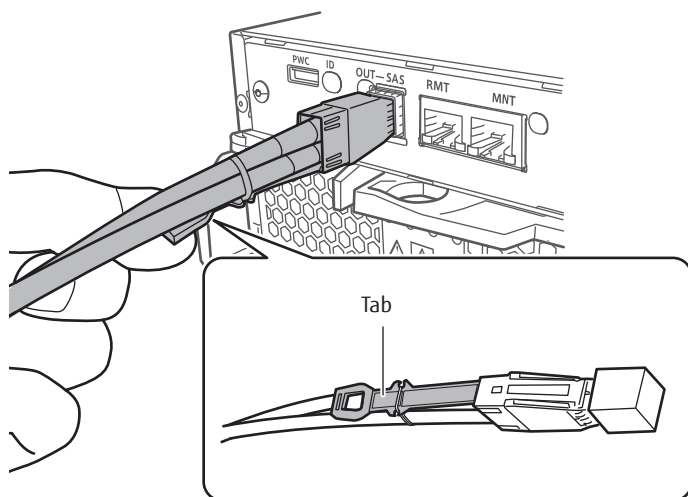


- If components are installed in a way other as described in this section, damage and/or device failure or electrical shock may occur.
- Do not install the drive enclosure in the rack with cables, such as power cords, connected.
- Do not knock the other devices installed in the rack when installing drive enclosures.

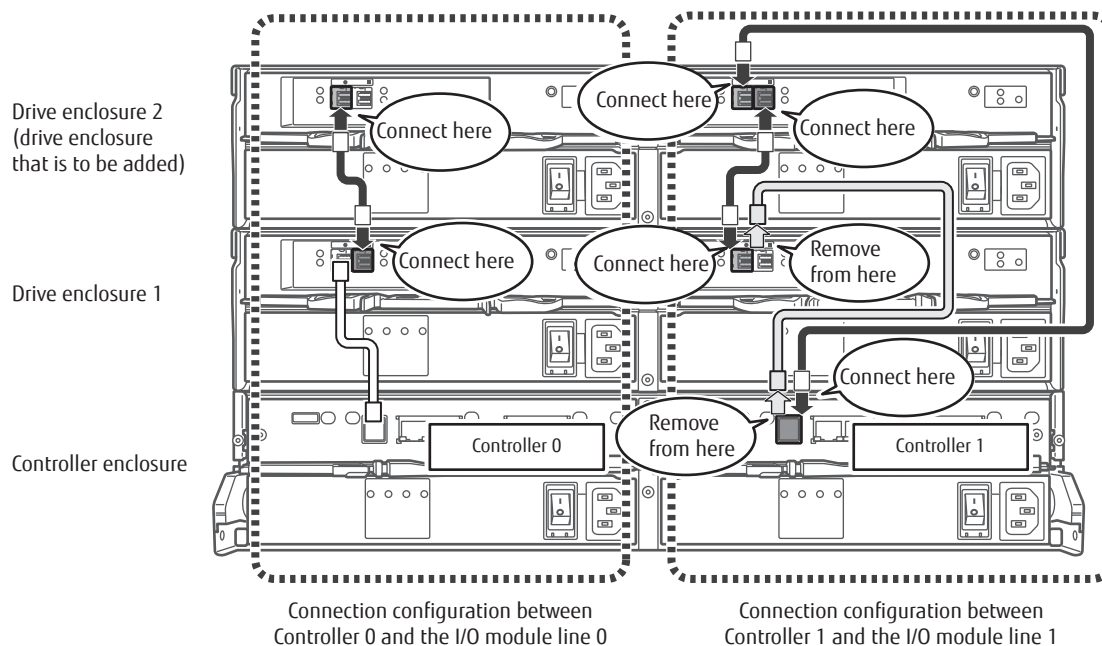
IMPORTANT

When connecting the mini SAS HD cable between enclosures, check the direction of the connector (the tab must be pointed downward) and firmly insert all the way in.

To disconnect the mini SAS HD cables between enclosures, hold the tab and then pull out the connector.



The following figure shows how the mini SAS HD cables between enclosures are connected when drive enclosure 2 is added.



Procedure

- 1 In the [Storage] screen of [Component] on the ETERNUS Web GUI screen, check that all components of the ETERNUS DX are in normal status. In addition, check the DE-IDs (drive enclosure numbers) of the installed enclosures in the [Drive Enclosure] screen.
- 2 Display the [Add Drive Enclosure] screen.
 - (1) In the [Storage] screen of [Component], click [Add Drive Enclosure] in [Action].
The [Add Drive Enclosure] screen appears.

- (2) Select which DE-ID to connect the additional drive enclosure to and the type of drive enclosure that is to be added in "Target Drive Enclosure", and then click the [Next>>] button.

Enclosure	Type
CE	2.5" 24DE
DE#01	2.5" 24DE
DE#02	2.5" 24DE
DE#03	2.5" 24DE

- Type
Select the type of drive enclosure that is to be added.
 - 2.5" 24DE
2.5" type drive enclosure
 - 3.5" 12DE
3.5" type drive enclosures

A screen that shows which DE-ID the additional drive enclosure is to be connected to, the type of drive enclosure that is to be added, and the procedure to add the drive enclosure is displayed.

Enclosure	Type
DE#03	2.5" 24DE

1. Please mount the expansion Drive Enclosure in the rack.
2. Please verify I/O Module and Power Supply Units are installed in the Drive Enclosure.
3. Please connect I/O Module#0 by SAS cable.
Connection Source : DE#02 IOM#0 DI(OUT) Port / Connection Destination : DE#03 IOM#0 DI(IN) Port
4. Please connect power cable to Power Supply Units.
5. Please make sure that the "Power Supply Units" power switch is turned ON.

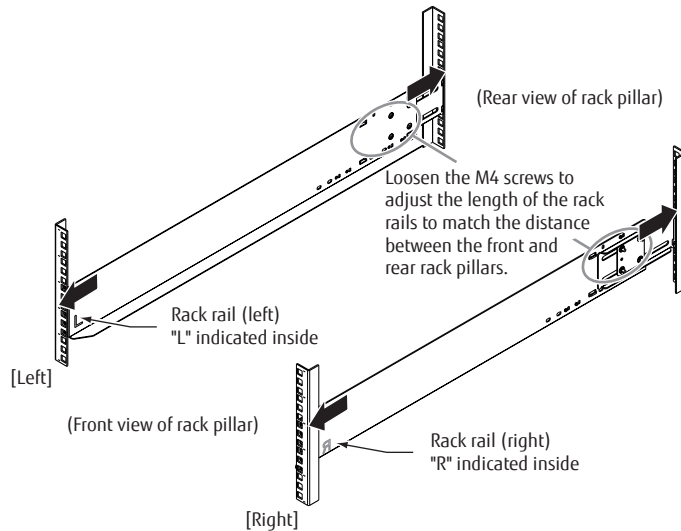
- 3 Wear a wrist strap or touch a metal part to discharge the human body's natural static electricity.

4 Install the drive enclosure in the rack.

This step explains how to install drive enclosures that are used in regions other than the EMEA, North American, Central American, and Caribbean regions.

(1) Adjust the sizes of the rack rail (for left side) and the rack rail (for right side) to fit the rack.

Loosen the M4 screws to adjust the length of the rack rails to match the distance between the front and rear rack pillars. Leave the M4 screws slightly unscrewed, as the rack rails must be attached to the rack before they can be completely tightened.

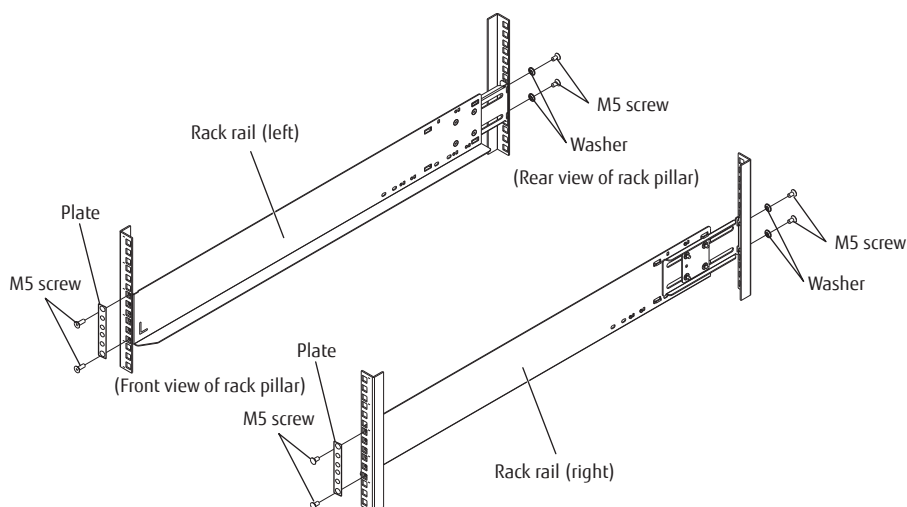


(2) Attach the rack rails to the rack.

Use the two plates to fasten the rack rails to the front rack pillars. Use the washers to fasten the rack rails to the rear rack pillars.

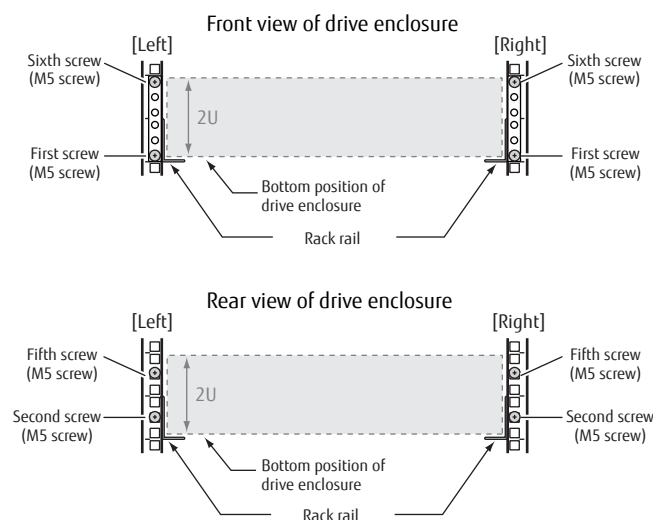
Note

Make sure to attach the rack rails to rack pillars so that they fit exactly together without any space between them.



The M5 screw positions for the rack rails are determined by the drive enclosure base line.

Insert the M5 screws in the 1st and 6th holes on the front rack pillars above the base line and in the 2nd and 5th holes on the rear rack pillars above the base line to fasten the rack rails.

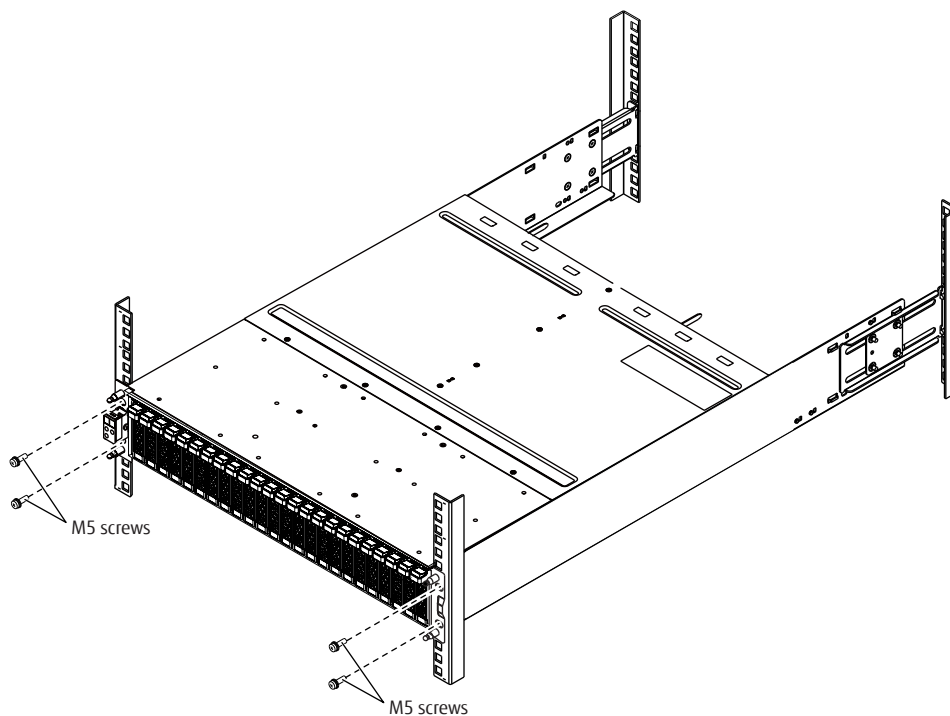


- (3) Tighten the M4 screws of the rack rails that were slightly unscrewed in [Step \(1\)](#).
- (4) Install the drive enclosure in the rack.



- When installing or removing the drive enclosure to or from the rack, make sure that the sides and the bottom of the drive enclosure are held by two or more people. Failure to do so may cause injury.

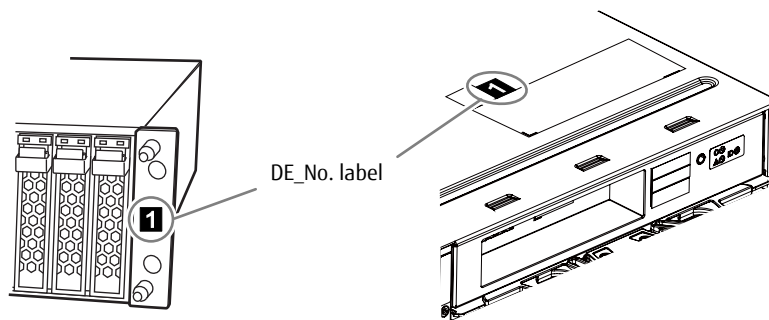
- (5) Fasten the drive enclosure in the rack.
Use four M5 screws to fasten it in the rack pillar.



- (6) Attach the "DE_No." labels to the positions shown below.
Attach the labels in the same installation order as the drive enclosures (cable between enclosures connection order).

Right front side of the drive enclosure

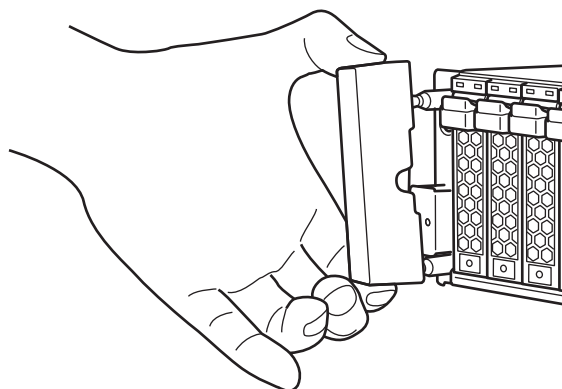
Upper right rear side of the drive enclosure



Note

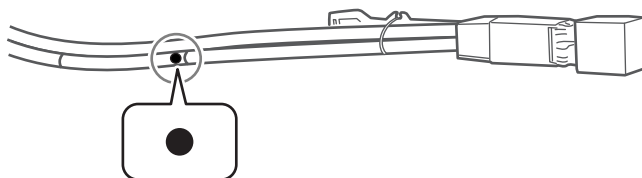
The DE_No. labels are supplied with the ETERNUS DX.

(7) Attach the flange cover.

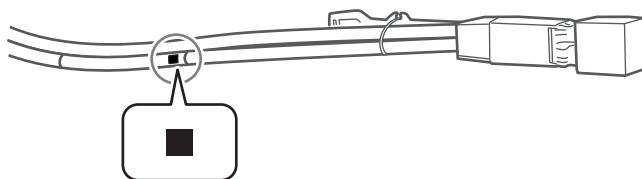


5 Check the connection destination of the mini SAS HD cables between enclosures.

- The connectors on the cable with the "●" symbol are connected to the DI (IN) ports on the added drive enclosure.

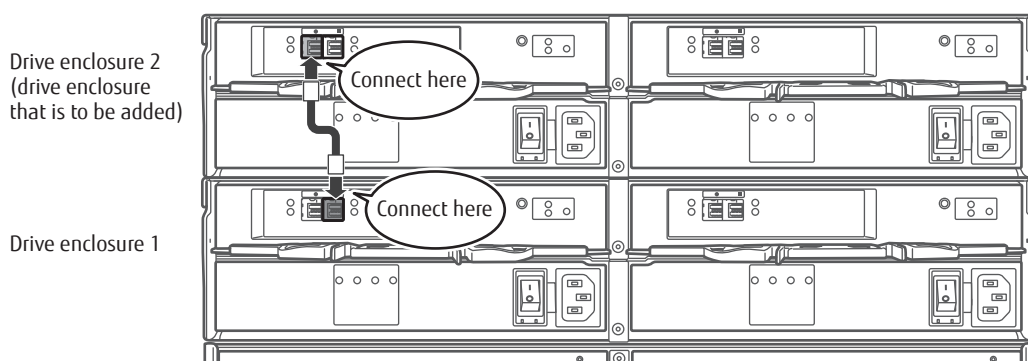


- The connectors on the cable with the "■" symbol are connected to the DI (OUT) ports on the nearest enclosure.



6 Connect the DI (IN) port of IOM#0 in the drive enclosure that is to be added to the DI (OUT) port of IOM#0 in the nearest drive enclosure with the mini SAS HD cable between enclosures.

The following figure shows how the mini SAS HD cables between enclosures are connected when drive enclosure 2 is added.

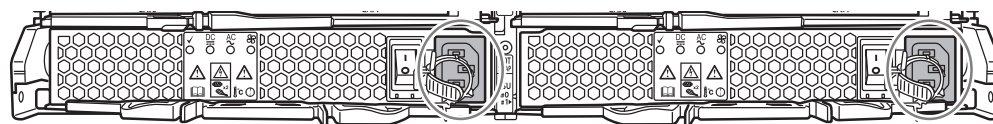


- 7 Connect the power cord.
 - (1) Connect the power cord to the drive enclosure.

IMPORTANT

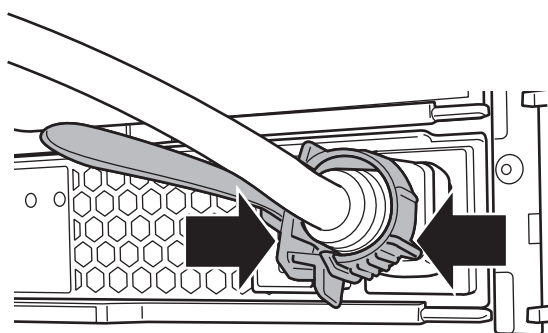
Each enclosure has two power supply units. Make sure that the power cords are connected to all the power supply units.

- (i) Connect the power cord plugs to the power inlets of the power supply units.



- (ii) Fasten the plug of the power cord with the release tie.

Wrap the release tie around the power cord and fasten the release tie from either side. Make sure that the release tie is not loose.



- (2) Connect the power cord on the power socket side.
Connect the other end of the power cord plug to a power socket or an inlet on the power distribution unit.
- 8 Move the PSU switches for PSU#0 and PSU#1 in the drive enclosures to the ON position (marked "|").

- 9 In the [Add Drive Enclosure] screen, click the [Next>>] button.

Configuration of IOM#0 in the drive enclosure that is to be added and the power supply units in the system is performed.

Add Drive Enclosure

Start > Place DE on the rack > Enable DE > **Disable IOM#1** > Check Disable IOM#1 Progress > Detach Cable > Connect Cable > Enable IOM#1 >>

Finish

Target Drive Enclosure: DE#02 [Help](#)

Information

The expansion Drive Enclosure is being included in the configuration.
Processing... please wait.

Status Check

Enclosure	Type	Parts	Progress	Status
DE#02	2.5" 24DE	IOM#0	100 %	Normal
		PSU#0	100 %	Normal
		PSU#1	100 %	Normal

When the configuration process is complete, the [Disable IOM#1] screen appears.

- 10 In the IOM#1 disconnection screen, click the [Next>>] button.

Add Drive Enclosure

Start > Place DE on the rack > Enable DE > **Disable IOM#1** > Check Disable IOM#1 Progress > Detach Cable > Connect Cable > Enable IOM#1 >>

Finish

Target Drive Enclosure: DE#02 [Help](#)

Information

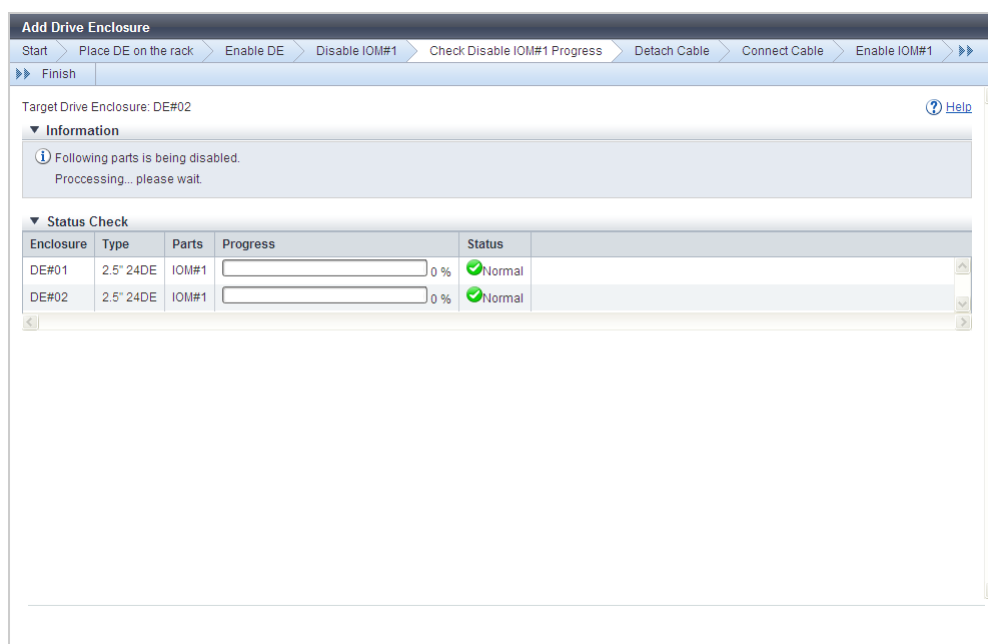
This step will prepare to include IOM#1 of expansion Drive Enclosure.
Following parts becomes disabled until this wizard is finished.

Target Parts

Enclosure	Type	Parts	Status
DE#01	2.5" 24DE	IOM#1	Normal
DE#02	2.5" 24DE	IOM#1	Unconnected

Next >> Cancel

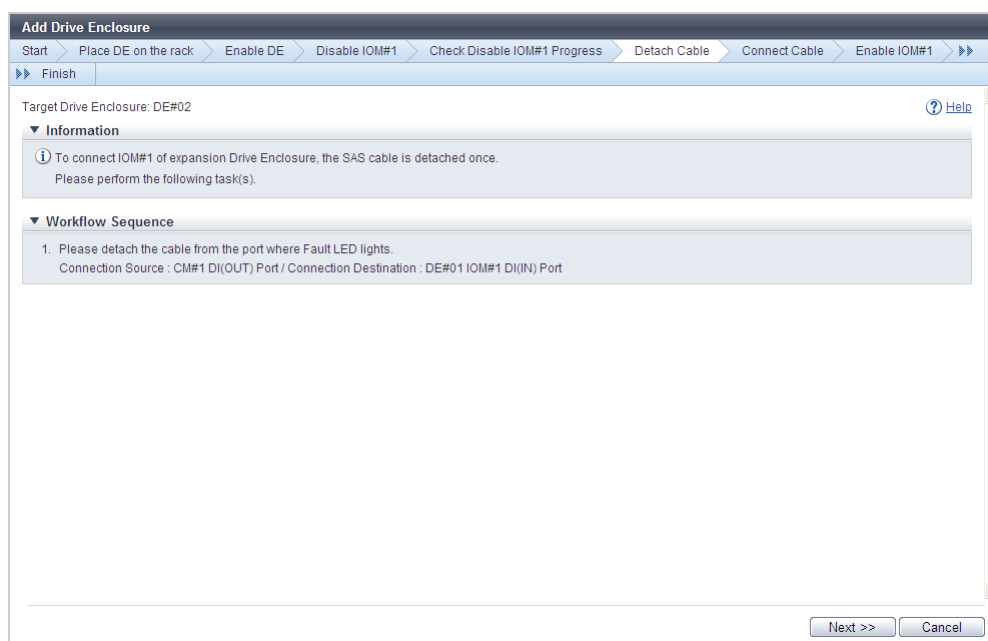
The process to disconnect IOM#1 starts.



When the disconnection process is complete, the [Detach Cable] screen appears.

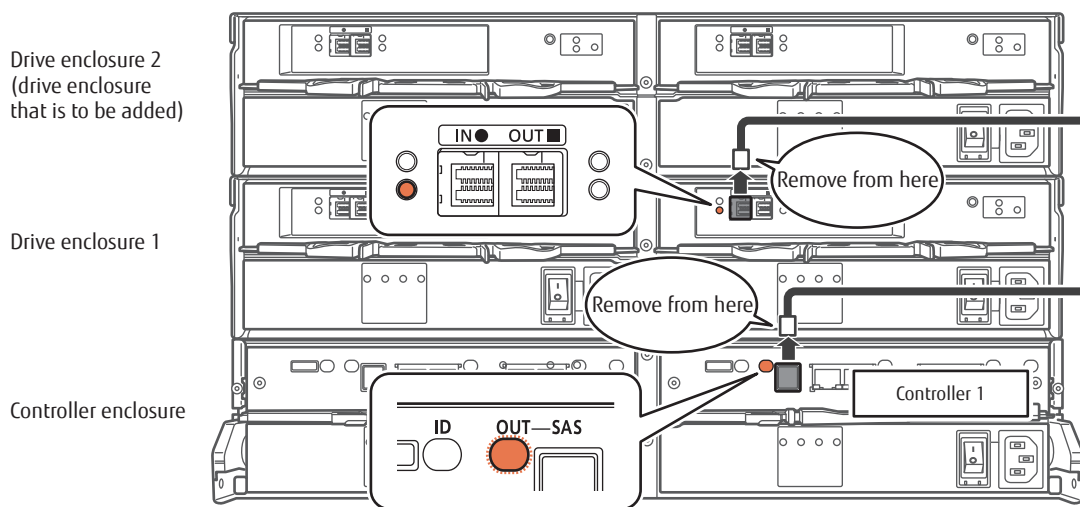
11 Disconnect the cables from I/O module line 1.

Remove the cable that connects the DI (OUT) port of CM#1 in the controller enclosure and the DI (IN) port of IOM#1 in the drive enclosure, which is nearest to the drive enclosure that is to be added.

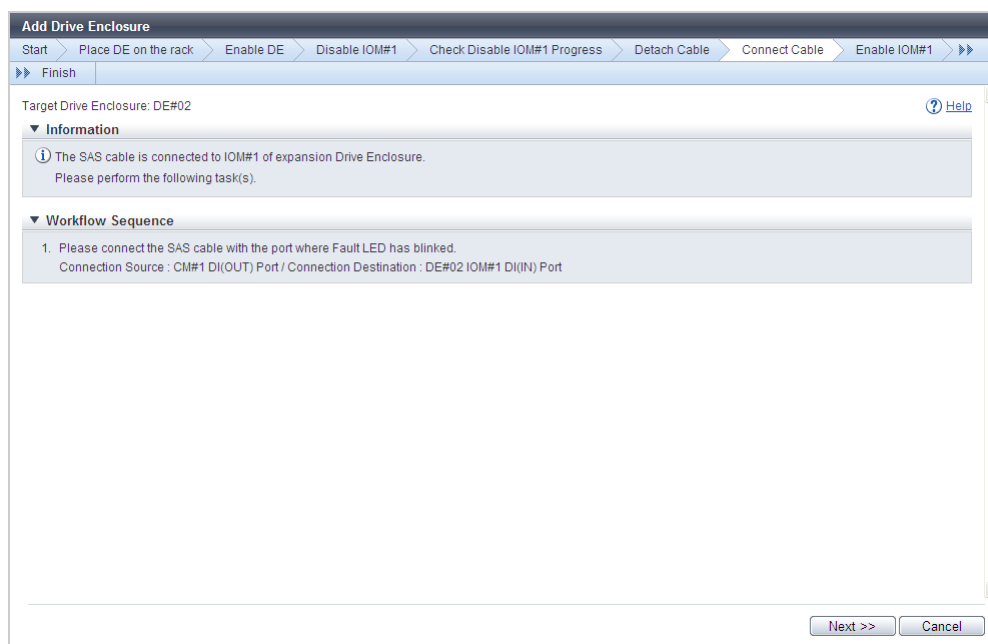


The following figure shows the cable (between CE and DE) that needs to be disconnected from the enclosures when drive enclosure 2 is added.

The FAULT LED for the DI (IN) port from which the cable is to be disconnected and the LINK/FAULT LED for the DI (OUT) port in the controller enclosure turn on.

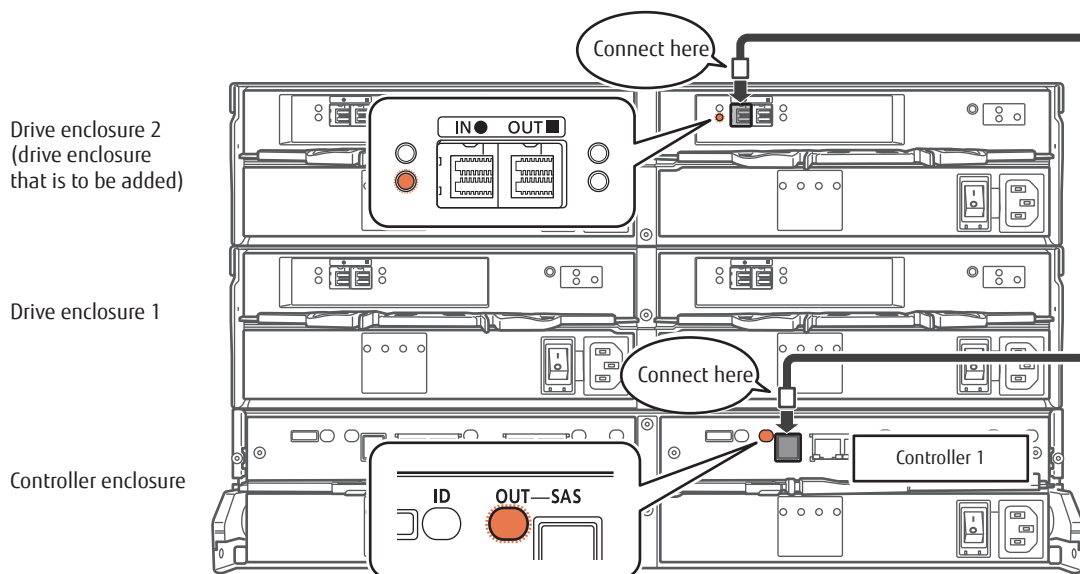


- 12 Click the [Next >>] button.
The [Connect Cable] screen appears.
- 13 Connect the DI (OUT) port of CM#1 in the controller enclosure to the DI (IN) port of IOM#1 in the drive enclosure that is to be added with a mini SAS HD cable between enclosures.

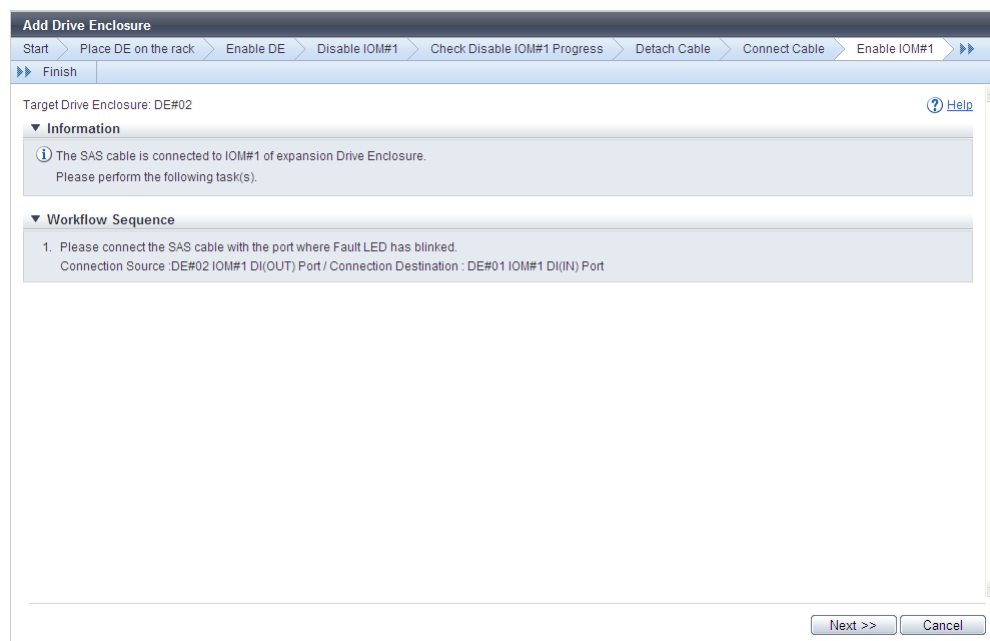


The following figure shows how a mini SAS HD cable between enclosures (CE and DE) is connected when drive enclosure 2 is added.

The FAULT LED for the DI (IN) port to which the cable is to be connected and the LINK/FAULT LED for the DI (OUT) port blink on and off.

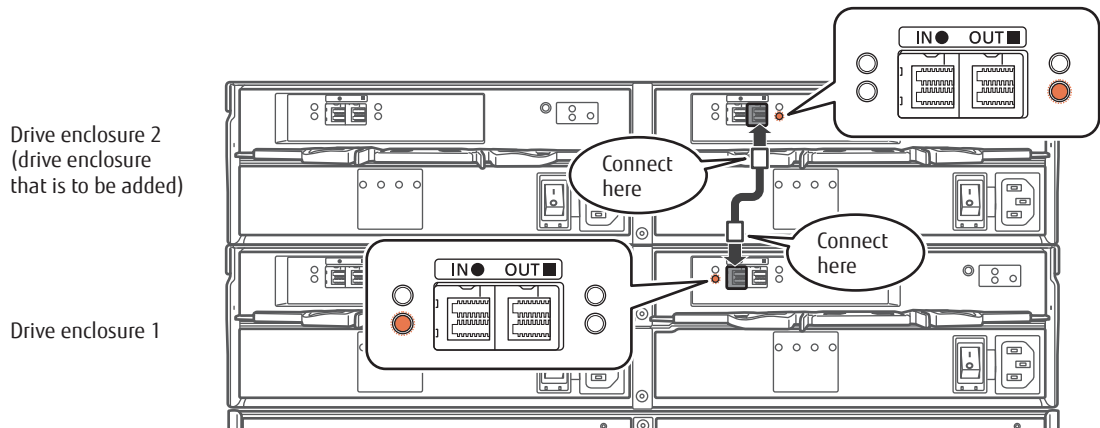


- 14 Click the [Next >>] button.
The [Enable IOM#1] screen appears.
- 15 Connect the DI (OUT) port of IOM#1 in the drive enclosure that is to be added to the DI (IN) port of IOM#1 in the drive enclosure that is nearest to the drive enclosure that is to be added with the mini SAS HD cable between enclosures.

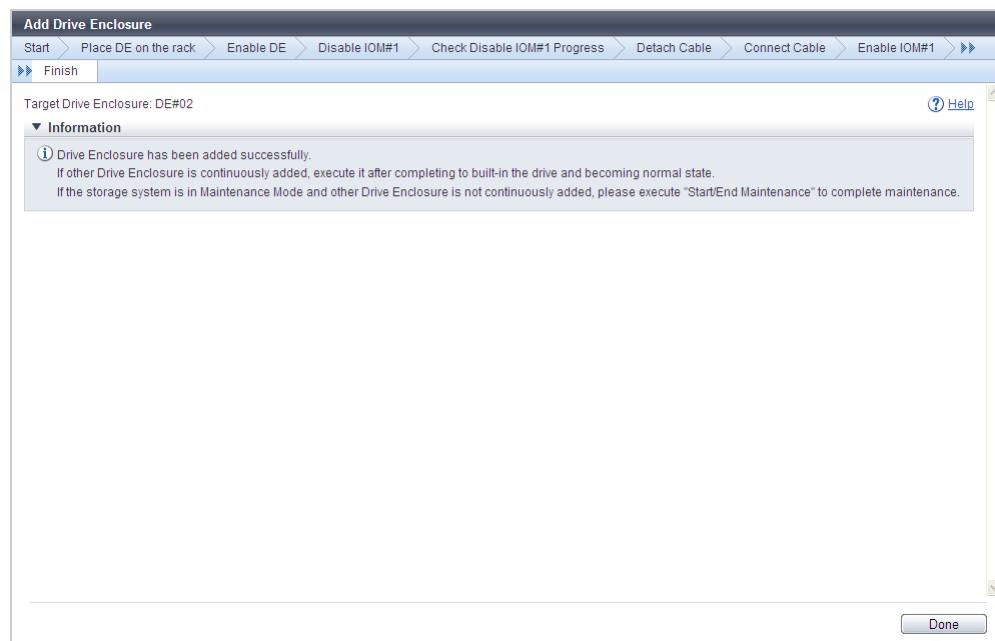


The following figure shows how a mini SAS HD cable between enclosures (DE and DE) is connected when drive enclosure 2 is added.

The FAULT LED for the DI (IN) port to which the cable is to be connected and the FAULT LED for the DI (OUT) port blink on and off.



- 16 Click the [Next >>] button.
A screen that indicates the drive enclosure has been added appears.
- 17 Click the [Done] button.



- The [Add Drive Enclosure] screen closes and the screen display returns to the [Drive Enclosure] screen.
- 18 In the [Storage] screen of [Component], check that the added drive enclosure is displayed.
 - 19 To install more additional drive enclosures, repeat [Step 1](#) to [Step 18](#).
 - 20 Install the drives.
For details on drive installation, refer to "[4.1.3 Additional Drive Installation Procedure](#)" (page 47).
 - 21 If a wrist strap is used, remove the wrist strap.

End of procedure

4.3 Adding Servers

To connect a new server to ETERNUS DX, preparation is required.

4.3.1 RAID Group Creation

Create RAID groups in order to create volumes to be used by the added server.

If free space in an existing RAID group is used, this procedure can be omitted.

The procedure to register a RAID group is as follows:

Procedure

- 1 Click the [RAID Group] tab on the navigation of the ETERNUS Web GUI screen.
The [RAID Group] screen appears.
- 2 In [Action], click [Create].
The [Create RAID Group] screen appears.
- 3 Enter the name of the RAID group that is to be registered and select "Automatic" or "Manual" for "Create Mode".
When "Automatic" is selected, the settings for "Automatic Setting" are displayed.
When "Manual" is selected, the settings for "Manual Setting" are displayed.
- 4 Set the required items and click the [Create] button.
A confirmation screen appears.
- 5 Click the [OK] button.
The RAID group is registered and the registration completion screen appears.
- 6 Click the [Done] button.
The screen display returns to the [RAID Group] screen.

End of procedure

4.3.2 Volume Creation

Create volumes in the RAID group. The procedure to create a volume is as follows:

Procedure

- 1 Click the [Volume] tab on the navigation of the ETERNUS Web GUI screen.
The [Volumes] screen appears.
- 2 In [Action], click [Create].
The [Create Volumes] screen appears.
- 3 Select "Automatic" or "Manual" for "RAID Group / TPP Selection".
- 4 Enter the name of the volume that is to be created in "Name", set the required items, and click the [Create] button.
A confirmation screen appears.
- 5 Click the [OK] button.
The volume is created and the registration completion screen appears.
- 6 Click the [Done] button.
The screen display returns to the [Volumes] screen.

End of procedure

4.3.3 Connection Setup

On the ETERNUS DX, perform information registration and host affinity creation for the server that is to be added. On the server, operations such as preparing drivers and performing a LUN check are required.

For details on connection related setting procedures, refer to "Configuration Guide (Basic)" or "Configuration Guide (Web GUI)". Also refer to "Configuration Guide -Server Connection-" as required.

The procedure to create a host affinity is as follows:

- Host group addition
- CA port parameter settings
- CA port group creation
- LUN group addition
- Host affinity creation

■ Host Group Addition

Add the information on the hosts (servers) that access the ETERNUS DX via the host interface port.

A host group is a group of HBAs that have the same host interface and access the same LUN groups.

Note

Make sure to perform the appropriate host response settings before performing host group registration.
If the appropriate host response settings are not set, the volumes may not be recognized or the expected performance may not be achieved.

The procedure to register a host group is as follows:

Procedure

- 1 Click the [Connectivity] tab on the navigation of the ETERNUS Web GUI screen.
- 2 In [Action], click the [Add Host Group] that corresponds to the host interface of the server that is to be added.
The screen to add a host group appears.
- 3 Specify a host group name to be created, and select a host response to be assigned to the host group.
- 4 Register a host in a host group, and then click the [Add] button.
A confirmation screen appears.
- 5 Click the [OK] button.
The host group is added and the registration completion screen appears.

End of procedure

■ CA Port Parameter Settings

Set the CA port parameters if the port information of the ETERNUS DX needs to be changed because of the server that is to be added.

When any server is already connected, make sure that the server will not be affected by the change.

For details on how to change the settings, refer to "Configuration Guide (Web GUI)".

■ CA Port Group Creation

Create a CA port group for a host to access the ETERNUS DX.

A CA port group is a group of host interface ports that have the same interface and connect to the specific host group.

The procedure to create a CA port group is as follows:

Procedure

- 1 Click the [Connectivity] tab on the navigation of the ETERNUS Web GUI screen, and then click "Port Group" in [Category].
The [CA Port Group] screen appears.
- 2 In [Action], click the [Create CA Port Group] that corresponds to the host interface of the port group that is to be added.
The [Create CA Port Group] screen appears.
- 3 In the [Create CA Port Group] screen, enter the name of the CA port group that is to be created, select the checkbox for the ports that are to be registered in the CA port group, and click the [Create] button.
A confirmation screen appears.
- 4 Click the [OK] button.
The CA port group is created and the setting completion screen appears.
- 5 Click the [Done] button.
The screen display returns to the [CA Port Group] screen.

End of procedure

■ LUN Group Addition

Add a group of volumes that can be recognized by the host (LUN group).

For each LUN group, volume numbers are assigned for the Logical Unit Numbers (LUNs) that are recognized by the host.

The procedure to create a LUN group is as follows:

Procedure

- 1 Click the [Connectivity] tab on the navigation of the ETERNUS Web GUI screen, and then click "LUN Group" in [Category].
The [LUN Group] screen appears.
- 2 In [Action], click [Add LUN Group].
The [Add LUN Group] screen appears.
- 3 Enter the LUN group name in [LUN Group Setting], and then click the [Add] button in [Define LUN Group].
The [Add LUN] screen appears.
- 4 Enter the number for the first LUN and number of LUNs to allocate to the LUN group in [LUN Setting], select the number for the first volume to be allocated, and click the [OK] button.
The LUNs that are to be registered in the LUN group and the information for the volumes that are allocated to the LUNs are displayed.
- 5 Click the [Create] button.
A confirmation screen appears.
- 6 Click the [OK] button.
The LUN group is added and the setting completion screen appears.
- 7 Click the [Done] button.
The screen display returns to the [LUN Group] screen.

End of procedure

■ Host Affinity Creation

Create an association between a host group and a CA port group and an association between a host group and a LUN group to enable the host to recognize a LUN group.

The procedure to create a host affinity is as follows:

Procedure

- 1 Click the [Connectivity] tab on the navigation of the ETERNUS Web GUI screen, and then click [Create Host Affinity] in [Action].
The [Create Host Affinity] screen appears.
- 2 Select "Host Group - CA Port Group" in "Target Connection".
- 3 Select the "Host Group", the "CA Port Group", and the "LUN Group" that are to be associated.
 - (1) Click the [Browse] button in "Host Group".
A screen to select the host group appears.
 - (2) Select "Host Group" or "All" in "Target Connection".

Note

To allow all of the hosts to recognize the LUN group, select "All".

- When "Host Group" is selected
Select a host group that is to be associated, and click the [OK] button.
 - When "All" is selected
Select a host response, and then click the [OK] button.
- (3) Click the [Browse] button in [CA Port Group].
A screen to select the CA port group appears.
 - (4) Select the CA port group that is to be associated and click the [OK] button.
The name of the selected CA port group is displayed in [CA Port Group].
 - (5) Click the [Browse] button in [LUN Group].
A screen to select the LUN group appears.
 - (6) Select the LUN group that is to be associated, and then click the [OK] button.
The name of the selected LUN group is displayed in [LUN Group].
- 4 Check the path between the host and the host interface port on the ETERNUS DX in [Host - CA Port Connection], and click the [Create] button.
A confirmation screen appears.
 - 5 Click the [OK] button.
The host affinity is created and the registration completion screen appears.

- 6 Click the [Done] button.
The screen display returns to the [Connectivity] screen.

End of procedure

Chapter 5

Maintenance

This chapter describes maintenance once the ETERNUS DX starts to be operated.

5.1 Periodic Backup

In case of an unexpected problems, important data should be regularly backed up.



- We recommend that you backup important data regularly. If the ETERNUS DX fails and the data has not been backed up, it may be lost.

5.2 Maintenance Service

This section explains the ETERNUS DX maintenance service.

IMPORTANT

When performing maintenance service, the maintenance engineer connects a PC used for maintenance to the ETERNUS DX. Also, the maintenance engineer may require information that is necessary for performing maintenance operations. If the maintenance engineer has any requirement, we ask that they be handled.

5.2.1 Maintenance Support Period

The standard maintenance support period for ETERNUS DX is five years from the date of purchase, or is defined in your service level agreement (SLA). Contact your sales representative for details if you prefer to extend the period.

5.2.2 Related Service

■ Remote Support

If a possible error that may occur is detected or an error occurs when remote support service is used, the contents of events are automatically sent to the remote support center and notified to the user.

Chapter 6

Troubleshooting

This chapter explains troubleshooting when errors occur.

If something unusual occurs during operation, refer to ["6.1 Check List" \(page 75\)](#) to check the ETERNUS DX status, and contact your maintenance engineer according to ["6.2 Required Information for Inquiries" \(page 83\)](#).

- When the ETERNUS DX is turned off
- When the ETERNUS DX refuses to turn on
- When the READY LED is not on
- When the FAULT LED is on
- When the FAULT LED blinks
- When the DRIVE FAULT LED is on
- When the ETERNUS DX cannot be connected via a network service
- When I/O access is slow
- When the server does not recognize the volumes
- When a server HBA fails and needs to be replaced

6.1 Check List

■ When the ETERNUS DX Is Turned Off

Check the points that are shown below. If the problem cannot be resolved, leave the ETERNUS DX alone and contact your maintenance engineer.

- Is the ETERNUS DX's power cord disconnected?
- Is PSU switch of the power supply unit turned to OFF (O)?
- Has the server been turned off?

If the ETERNUS DX power is in conjunction with the power synchronized unit, the power of the ETERNUS DX will turn off when the server is turned off.

- Is the main line switch of the power distribution unit turned OFF (O)?
- Is there a power failure?
- Has there been a recent main power failure?

If the Power Resume function is enabled, the ETERNUS DX turns on automatically after the power is restored.

■ When the ETERNUS DX Refuses to Turn On

Check the points that are shown below. If the problem cannot be resolved, leave the ETERNUS DX alone and contact your maintenance engineer.

- Is the ETERNUS DX's power cord disconnected?
- Is PSU switch of the power supply unit turned to OFF (○)?
- Is the main line switch of the power distribution unit turned OFF (○)?
- Is there a power failure?
- Is the mini SAS HD cable between enclosures disconnected?

■ When the READY LED Is Not On

If more than 10 minutes have passed since the power of the ETERNUS DX was turned on and the READY LED still has not turned on, contact your maintenance engineer.

■ When the FAULT LED Is On

Check the general status and the system messages in ETERNUS Web GUI. Perform the necessary actions to correct the problem. If the problem cannot be resolved, leave the ETERNUS DX alone and contact your maintenance engineer.

Note

For details about how to check the general status via ETERNUS CLI, refer to ["3.3 Displaying Status via ETERNUS CLI"](#) (page 42).

- When the general status of ETERNUS Web GUI is 
 - Check whether one side of the mini SAS HD cable between enclosures is disconnected. If so, install the connector in the DI port.
 - Check if the mini SAS HD cable between enclosures is connected. If the mini SAS HD cable between enclosures is not connected, use the following procedure to connect the mini SAS HD cable between enclosures.
 - Check that the ● (IN) and ■ (OUT) side of the mini SAS HD cable between enclosures is connected correctly. If the mini SAS HD cable between enclosures is connected incorrectly, use the procedure that is shown below to reconnect it.
- When the general status of ETERNUS Web GUI is 

Check that the ● (IN) and ■ (OUT) side of the mini SAS HD cable between enclosures is connected correctly. If the mini SAS HD cable between enclosures is not connected correctly, use the procedure that is shown below to reconnect the mini SAS HD cable between enclosures.

Procedure

When a mini SAS HD cable between enclosures is not connected

- 1 Press the controller enclosure's Power switch for four seconds or more to turn off the ETERNUS DX. Drive enclosures with no mini SAS HD cable between enclosures connected will remain on.

- 2 Connect the mini SAS HD cable between enclosures while the drive enclosure is on.
- 3 Press the controller enclosure's Power switch to turn on the ETERNUS DX.

When the ● (IN) and ■ (OUT) side of the mini SAS HD cable between enclosures is incorrectly connected

- 1 Press the controller enclosure's Power switch for four seconds or more to turn off the ETERNUS DX, and turn off the AC power.
- 2 Reconnect the mini SAS HD cable between enclosures.
- 3 Make sure that AC power is being supplied, then turn the ETERNUS DX on.

End of procedure

■ **When the FAULT LED Blinks**

Check the general status and the system messages in ETERNUS Web GUI. A general status of  indicates that the ETERNUS DX contains a component that requires preventive maintenance.

In the details screen for each component, check the detailed information for each component with the  symbol and contact your maintenance engineer.

 Note

For details about how to check the general status via ETERNUS CLI, refer to "[3.3 Displaying Status via ETERNUS CLI](#)" (page 42).

■ **When the DRIVE FAULT LED Is On**

Check the drive status.

While the Protection (Shield) function is being used, the DRIVE FAULT LED is temporarily turned on. For details on how the Protection (Shield) function works and how to check whether it is running, refer to "Design Guide (Basic)".

If the problem persists, contact your maintenance engineer.

■ When the ETERNUS DX Cannot Be Connected via a Network Service

Check the points that are shown below. If the problem persists, contact your maintenance engineer.

- Is the ETERNUS DX turned off?
- Has the LAN cable become disconnected? For a dual-controller type, does the controller to which the LAN cable is connected have an unlit MASTER LED?

To switch the Master CM, perform one of the following procedures.

- Using the FUNCTION button to switch the Master CM

Push down the FUNCTION button twice within three seconds during maintenance to switch the Master CM to another controller.

- Using ETERNUS Web GUI to switch the Master CM

If the IP address for the Slave CM is specified, access to the Slave CM IP address via ETERNUS Web GUI to switch the Master CM is performed.

- Have any network devices (such as LAN switch or router) failed? Are the network device settings invalid?
- Are the environment settings for the network service invalid?
- Is the IP address incorrect?
- Are the settings for the ETERNUS DX LAN ports (firewall) invalid?

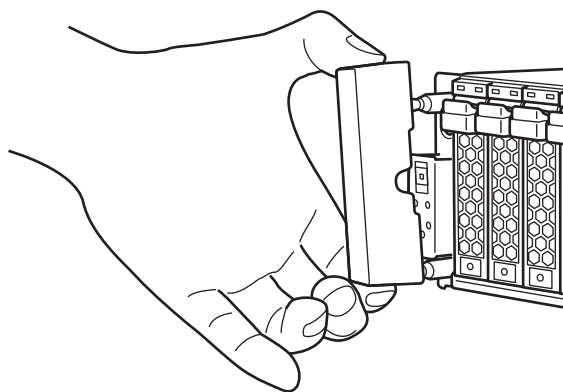
If the problem is not resolved, follow the procedure below to restore the default values for the ETERNUS DX network environment settings and the firewall settings.

IMPORTANT

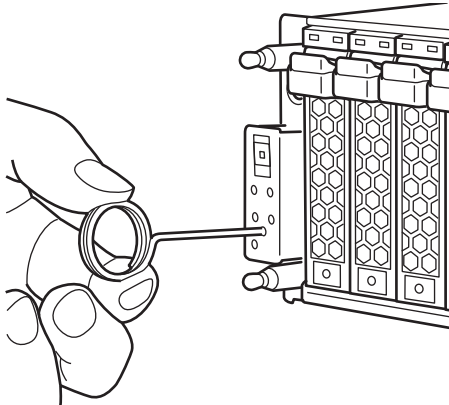
Note that the settings (network environment settings and firewall settings) for all of the LAN ports are initialized after the following procedure is performed.

Procedure

- 1 Remove the flange cover of the controller enclosure.



- 2 Change the status of the ETERNUS DX to maintenance status.
Use the pin to push down the FUNCTION button for three seconds.



The ETERNUS DX is in maintenance status when the MAINTENANCE LED is green.

- 3 Use the pin to push down the FUNCTION button three times within three seconds.
After the default settings of the LAN ports are restored, the MAINTENANCE LED blinks green a few times a second for several seconds.
- 4 Release maintenance status.
Use the pin to push down the FUNCTION button for three seconds.
The MAINTENANCE LED turns off.
- 5 Access ETERNUS Web GUI or ETERNUS CLI by using the default IP address to perform the network environment settings and the firewall settings.

IMPORTANT

Make sure to enable the firewall setting for the protocol that is used for each service.

- To use ETERNUS Web GUI, enable the http or https connection. If the connection is disabled, the ETERNUS DX cannot connect to the network via GUI.
- To use ETERNUS CLI, enable the telnet or SSH connection. If the connection is disabled, the ETERNUS DX cannot connect to the network via CLI.
- To use the "ping" command for the ETERNUS DX, enable the ICMP connection. If the connection is disabled, the ETERNUS DX does not respond to the "ping" command.
- To use monitoring software, enable the Maintenance Secure connection. If the connection is disabled, the ETERNUS DX cannot connect to the network via monitoring software.
- To use the SNMP Manager, enable the SNMP connection. If the connection is disabled, the ETERNUS DX does not respond to SNMP access.

- 6 Check whether each service can connect to the ETERNUS DX.
If it cannot connect, contact your maintenance engineer.

End of procedure

■ When I/O Access Is Slow

Check the points that are shown below. When the cause is not identified, contact your maintenance engineer.

- Check that the ambient temperature does not exceed the operating environment conditions.
If the ambient temperature exceeds the operating environment conditions, Nearline SAS disk performance may be reduced.
- Click the icon of each part on the [Storage] screen of [Component] of ETERNUS Web GUI to check if an abnormality is detected in ETERNUS DX parts.
If an abnormality is detected, contact your maintenance engineer.
- Check the path status.
 - If the ETERNUS Multipath Driver is used, start ETERNUS Multipath Manager.
If an abnormality is detected in a path, refer to the ETERNUS Multipath Driver manuals and follow the direction given in the manuals.
 - If the ETERNUS Multipath Driver is not used, check the path status by using the path management tool that each software provides and handle any problems as required.
- Check the loading of the ETERNUS DX. If the load is out of balance because of operation content changing or for other reasons, review the configuration and settings.
- Check the transfer rate of the FC port.
If the transfer rate for the ETERNUS DX is different from the server or the FC switch, set the same transfer rate as the server or FC switch.
- Check the number of command queues in the server.
When there are no problems in the process capacity of the server, adjust the number of command queues so that the I/Os are issued for the appropriate number.
For details on the number of command queues, refer to "Configuration Guide -Server Connection-".
- Check the message log of the OS on the server that is connected and then take the appropriate actions.
- Check the status of the RAID group.
When rebuild/copyback or redundant copy is being performed in a RAID group with a "High" rebuild priority, the performance may be reduced until the operation is complete.
- Check the cache parameter settings of the volumes.
The performance may be reduced when multiple sequential read accesses simultaneously occur for volumes that do not have the Force Prefetch mode enabled. Enable the Force Prefetch mode and specify the appropriate value for the Prefetch Limit.
This may be caused by accesses that are used for video distribution businesses.

■ When the Server Does Not Recognize the Volumes

Check the points that are shown below. If the problem cannot be resolved, leave the ETERNUS DX alone and contact your maintenance engineer.

- Check the status of the ETERNUS DX and other devices such as network devices connecting the server and the ETERNUS DX, and ensure that there are no problems with the power supply.
- Check if an error occurs in a path by using a path management tool such as ETERNUS Multipath Manager. Refer to the relevant manuals and take the required actions.

■ When a Server HBA Fails and Needs to be Replaced

This section explains the procedure that is required when the HBAs on the server need to be replaced due to an FC card failure.

Only an overview of this procedure is provided here. For details, refer to related manuals.

Note

Identifiers such as WWNs and IP addresses of ports persist even after CMs and ports of the ETERNUS DX are changed.

● FC Card Replacement

The following procedure explains how to replace the FC card.

Procedure

- 1 Use ETERNUS Web GUI or ETERNUS CLI to check the WWN, the host affinity and the other settings of the FC card that is to be removed, and then record the settings.
- 2 Replace the FC card on the server.
 - (1) Turn off the server where the FC card is to be replaced.
 - (2) Replace the FC card.
- 3 Use ETERNUS Web GUI or ETERNUS CLI to specify the required settings.
 - (1) Change the WWN, host affinity, and other settings of the removed FC card.
Set the WWN, host affinity, and other settings of the new FC card by referring to the information recorded in [Step 1](#).
 - (2) When a switch is used, the WWN zoning settings need to be changed. For details on this setting, refer to relevant manuals of the switch.
- 4 After completing the settings, confirm that access from the server is available.

End of procedure

● LAN Card Replacement

The following procedure explains how to replace the LAN card.

Procedure

- 1 Turn off the server where the LAN card is to be replaced.
- 2 Replace the LAN card.
For details on the replacement procedure, refer to the relevant documentation for the LAN card.

- 3 After completing the settings, confirm that access from the server is available.

End of procedure

- SAS Card Replacement

The following procedure explains how to replace the SAS card.

Procedure

- 1 Check the SAS address, the host affinity and the other settings of the SAS card that is to be removed from ETERNUS Web GUI or ETERNUS CLI, and then record the settings.
- 2 Replace the SAS card on the server.
 - (1) Turn off the server where the SAS card is to be replaced.
 - (2) Replace the SAS card.

For details on the replacement procedure, refer to the relevant documentation for the SAS card.
- 3 Change the SAS address, host affinity, and other settings of the removed SAS card.

Set the SAS address, host affinity, and other settings of the new SAS card by referring to the information recorded in [Step 1](#).
- 4 After completing the settings, confirm that access from the server is available.

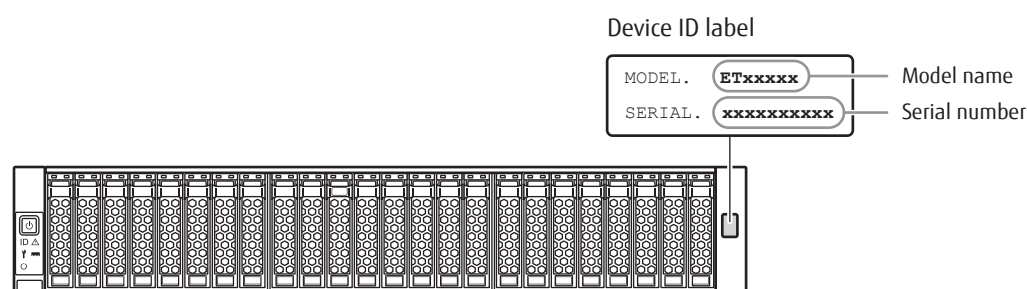
End of procedure

6.2 Required Information for Inquiries

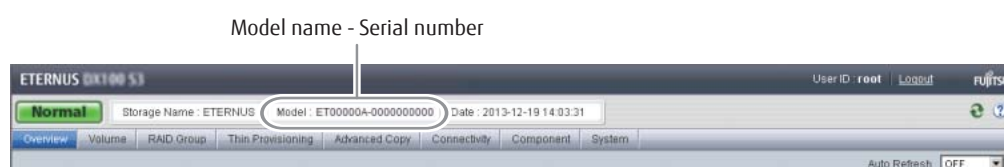
Before contacting your maintenance engineer when trouble occurs, prepare the information that is shown below. For details on the maintenance service, refer to ["5.2 Maintenance Service" \(page 74\)](#).

- The Model Name and the Serial Number of the ETERNUS DX

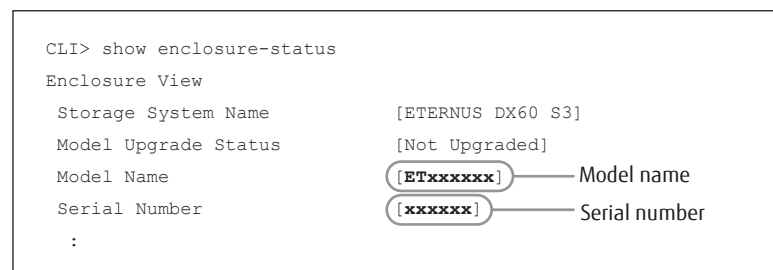
This information can be checked by using a device ID label, ETERNUS Web GUI, or ETERNUS CLI.



ETERNUS Web GUI screen



ETERNUS CLI ("show enclosure-status" command)



- Details about the Trouble, Any Actions Taken, and the Results of These Actions
- The Devices That Are Connected to the ETERNUS DX
 - The models of the server and network devices
 - The power synchronized unit model
 - The UPS model
- Log/Dump Information of the ETERNUS DX

When your maintenance engineer asks for the log/dump information of the ETERNUS DX, obtain the required log/dump information using the log/dump collection function of ETERNUS Web GUI.

For details on obtaining the log/dump information, refer to "Web GUI User's Guide (Settings)".

FUJITSU Storage ETERNUS DX60 S3 Disk storage system Operation Guide (Basic)

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