RAID
INCORPORATED

Xanadu
User's Guide

NOTE:
Read this manual carefully before using the unit. Keep this manual nearby as a handy reference and refer to the "CAUTION" and "WARNING" statements whenever necessary.

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7/1/2008

Introduction

At this time, we would like to thank you for purchasing RAID Inc. products.

This manual is written at the level of an individual who is capable of server system construction and network setup. It is for systems that meet the following conditions.

- Connected servers and OS:
  Windows or Linux supported by RAID Storage program products
  For details, refer to the "RAID Storage Manager Installation Guide", as well as the "RAID Storage PathManager Installation Guide" and "RAID Storage ControlCommand Installation Guide", depending on your purchase.
  * Xanadu-beta version supports only Windows and Linux servers (excluding the Itanium
  Processor Familiy).
- Configuration: Storage Area Network and Direct Attached Storage configurations containing the sample recommended configuration in the figure below
- Other: Fibre Channel switches and modems are not covered.
  * These require separate setup by maintenance personnel.

Chapters 7 through 14 of this manual describe facilities that are restricted to Windows and Linux environments.

To use them in another operating system environment, ask your maintenance service agent, since maintenance personnel of the maintenance service agent will configure the RAID Storage unit.

This guide explains the general methods used in setting up RAID Storage itself, installing RAID Storage Manager, and installing RAID Storage ControlCommand.

Prepare in advance for program products for which a license sheet is included.

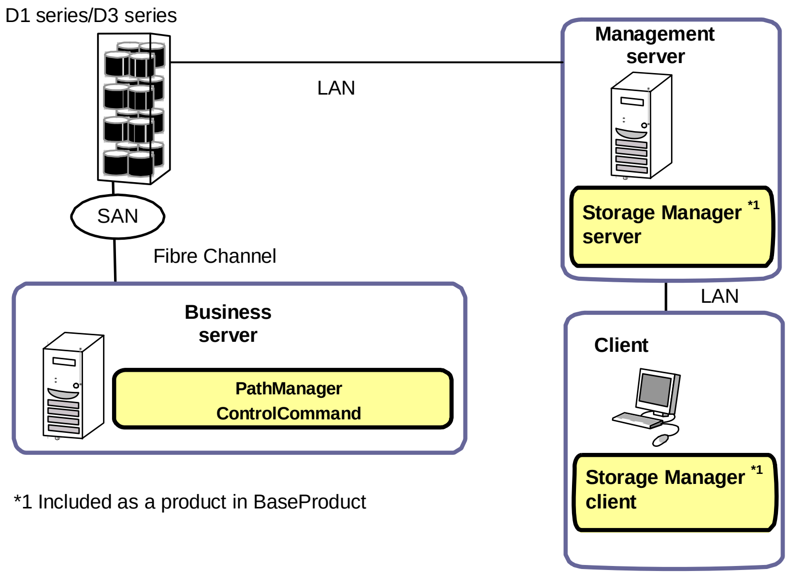

D1 series/D3 series
LAN
Management server
Storage Manager *1 server
SAN
Fibre Channel
LAN
Business server
PathManager
ControlCommand
Client
Storage Manager *1 client
*1 Included as a product in BaseProduct

Figure i. Sample Recommended Configuration

This guide also documents procedures for setting up products for the first time that are based on the sample recommended configuration in the figure. If your configuration is different, read the appropriate changes into the procedures.

For installation on management servers and business servers, setup methods in Windows and Linux vary depending on the OS that is used.

For details about each software product, refer to the manual that comes with each software product.

The tasks documented in this manual can also be entrusted to your maintenance service agent.

Remarks

1. This guide explains functions implemented by the following program products:
    - RAID Storage Manager and RAID Storage BaseProduct
    - RAID Storage AccessControl

2. This guide is applicable to the program products of the following versions:
    - RAID Storage Manager Ver5.1 or later
    - RAID Storage BaseProduct Ver5.1 or later

3. The following terms in this guide refer to the corresponding RAID Storage software products unless otherwise stated.

Term	RAID Storage Software Product
Storage Manager	RAID Storage Manager
BaseProduct	RAID Storage BaseProduct
ControlCommand	RAID Storage ControlCommand (Note)
AccessControl	RAID Storage AccessControl
PathManager	RAID Storage PathManager

Note: RAID Storage ControlCommand is a program product that has integrated the following five functions.

- ReplicationControl
- SnapControl
- ReplicationControl/DisasterRecovery
- ProtectControl
- PowerControl

The following terms in this guide refer to the corresponding RAID Storage software manuals unless otherwise stated.

Term	RAID Storage Software Manual
PathManager User's Manual (Linux)	RAID Storage Software RAID Storage PathManager User's Manual (Linux)
PathManager User's Manual (Windows)	RAID Storage Software RAID Storage PathManager User's Manual (Windows)
User's Manual (UNIX)	RAID Storage Software RAID Storage Manager User's Manual (UNIX)
User's Manual	RAID Storage Software RAID Storage Manager User's Manual
Configuration Setting Tool User's Manual (GUI)	RAID Storage Software Configuration Setting Tool User's Manual (GUI)
Data Replication User's Manual (Function Guide)	RAID Storage Software Data Replication User's Manual (Function Guide)
Snapshot User's Manual (Function Guide)	RAID Storage Software Snapshot User's Manual (Function Guide)

5. In this document, the capacity is calculated based on units of 1024 (for example 1 KB = 1024 bytes) unless otherwise specified.

Trademarks and registered trademarks

- UNIX is a registered trademark of The Open Group in the United States and other countries.
- Microsoft®, Windows®, and Windows Vista™ are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries.
- Linux is a trademark or registered trademark of Mr. Linus Torvalds in the United States and other countries.
- Java and JRE (Java™ 2 Runtime Environment) are registered trademarks of Sum Microsystems, Inc.

Other product names and company names, etc. are trademarks or registered trademarks of the associated companies.

Text Conventions

The following symbols are used throughout this guide.

Display Types

Type	Description
⚠	Items that are mandatory or require attention when using the unit
ℹ	Information such as restrictions on operations
📖	Supplemental explanations of text

The table below explains notation used in this guide.

Disk array unit	Denotes unit NF51x1-xR4xx-* shown on the front cover.
Disk enclosure	Denotes an NF5021-xE60x extended SAS/SATA disk enclosure.
Disk drive	Denotes a hard disk drive with an exclusive tray. NF5021-xM6xxx (SAS drive) NF5021-xM8xxx (SATA drive) * SATA is referred to as “ATA” in the software.
Dummy tray	Denotes an exclusive tray (used for an uninstalled hard disk drive).
Host bus adapter (HBA)	Denotes a Fibre Channel controller.
DAC (disk array controller)	Denotes a disk array unit.
CONT (controller)	Denotes a controller in the DAC portion.
Extended BBU	Denotes an extended battery backup unit.
DE (disk enclosure)	Denotes a disk enclosure.
PS (power supply)	Denotes a power supply (unit)

Safety Precautions

Carefully read and understand these Safety Precautions before using this unit in order to use it safely.

The following symbols are used in this guide to make it easy to understand how to operate the unit safely and correctly.

⚠ WARNING	Indicates that there is a risk of death, serious injury, or burns.
⚠ CAUTION	Indicates that there is a risk of injury and/or loss of assets.

Risks and necessary actions to reduce risks are indicated individually by the following symbols.

⚠	Indicates that smoking and/or ignition may occur.
⚡	Indicates that you may be electrically shocked.
❗	Indicates proper procedure for safety.
🔌	Indicates that the plugs of power cords should be removed for safety.
🚫	Indicates general prohibitions.
🚫	Indicates that fire should not be brought near devices for safety.
🚫	Indicates that devices are prohibited from being disassembled for safety.

Notes on Safety

Before using the disk array unit, carefully read and understand these "Notes on Safety" for safe use of the unit.

⚠ WARNING

🚫	Never use the disk array unit in a location where there is flammable gas or combustible material. Doing so could cause a fire or explosion.
⚠	Do not use the disk array unit in a location that is unusually damp or a location where water is handled. Doing so could cause failure, electric shock, or fire.
⚠	Do not install the disk array unit in a dusty location. Remove dust adhering to the unit, outlets, and power cord plugs. Using these with dust on them could cause a fire.
⚠ ⚠	Do not perform any disassembly or rebuilding other than that described in this manual. Doing so could cause failure, electric shock, or fire.
⚠ ⚠	Do not install the disk array unit in a location where there is direct sunlight or near a heater or other object that generates heat. Doing so could cause failure, fire, or electric shock.
⚠	Do not handle the disk array unit with wet hands. Doing so could cause electric shock.
⚠	Do not set up the disk array unit in an unstable location. If it fell, it could cause failure or injury.
⚠	Install the disk array unit so that vent holes are not blocked. Blocking the vent holes could cause the temperature inside the unit to rise, leading to failure or fire.
🔌	If abnormalities such as smoking or odors occur, turn off the power to the disk array unit and remove the power plug from the outlet. Immediately request inspection and repair from your sales or maintenance service agent.
⚠ ⚠	When moving the disk array unit, do so after removing power cords and cables. Moving it while these are connected could cause failure, electric shock, or fire.
🚫	Do not put your hands into the disk array unit. If you must put your hands into the unit, do so after turning off the power and removing power plugs from outlets. Be careful not to catch or bump your fingers.

WARNING

Warnings concerning power

Do not overload an outlet with the power cords of the disk array unit and extended BBU.
Doing so could cause a fire.

Do not put heavy objects on the power cords of the disk array unit or extended BBU.
If the covering of a power cord is torn, it could cause a fire or electric shock.

Although the disk array unit and extended BBU are compatible with AC 100 V-AC 240 V, the accompanying power cords are as follows according to model number.

- Model numbers NF5111-S*/NF5131-S*: For AC 100 V
- Model numbers NF5111-N*/NF5131-N*: For AC 200 V

When using the accompanying power cord, use it with AC 100 V (50/60 Hz) or AC 200 V (50/60 Hz), depending on the product model number.
Using it with a different voltage could cause electric shock, smoke, or fire.

Insert the plug of the power cord of the disk array unit or extended BBU in an outlet securely.
Provide sufficient slack in the power cord so that excessive force is not placed on the power cord plug or the power cord.
If the power cord is disconnected during operation, it could cause data loss or failure.

To prevent electric shock, connect the power cords of the disk array unit and extended BBU to outlets that have ground terminals.
Grounding to an object such as a gas pipe is hazardous and must never be done.

Warnings concerning batteries

The batteries of the disk array unit could explode if brought near flames or soaked in water.

When lithium batteries (button batteries) and nickel metal hydride batteries no longer operate correctly due to their life spans, do not disassemble, exchange, or charge them yourself, but contact your sales or maintenance service agent.

⚠ WARNING

❗	It is recommended that setup and maintenance of the disk array unit be entrusted to service engineers with specialized knowledge from your maintenance service agent. For details, contact your sales agent. Although installation and maintenance of the disk array unit can be done by customers themselves, they must understand that RAID and its sales agents shall not assume responsibility for any damage to the disk array unit, its components, or connected devices or for any outcome occurring during, before, or after operation when customers do these things themselves.
❗	When installing the disk array unit, follow the documentation in the “Disk Array Unit Installation Guide.” The “Disk Array Unit Installation Guide” is included in the accompanying CD.
🛇	Because the disk array unit is precision equipment, do not expose it to strong vibrations or shock, regardless of whether the power is on or off.
🛇	Do not disconnect a disk drive, cable, or other part while the power is on.
❗	If customers themselves change connections of the disk array unit system once it has been configured, there is a risk of operation ceasing or data disappearing. To change connections, it is recommended that you ask your maintenance service agent.
⚠	To expand the system, turn off the power of the disk array unit and remove power cords from outlets. Not doing so could cause failure or electric shock.

⚠ WARNING

❗ Be sure to perform backup of the data of the disk array unit regularly.
It is recommended that particularly important files be backed up on media such as magnetic tape.
Reason: The disk array unit, which is available on strictly hard failures, cannot cope with unexpected vibrations or shocks, power cuts due to electrical outages, or soft faults. Damage from soft faults can be kept to a minimum by performing backups.
A hard failure is a phenomenon such as a disk drive being damaged or a disk drive being unable to rotate.
A soft fault is a phenomenon such as a human error or a host malfunctioning.

❗ It is recommended that the latest software and firmware for the disk array unit be used.

🚫 The disk array unit could be destroyed if you power it off or it becomes powered off while updating its firmware. Be sure that it does not become powered off during a firmware update.

🚫 Do not power off the disk array unit or the host unit or reset the host unit if the ACTIVE/FAULT LED (green or orange) of a disk drive of the disk array unit is blinking, if the host unit shows that a disk is being accessed, or if it shows that initialization is in progress.

❗ If a fault occurs in the disk array unit, the SERVICE LED of the disk array unit and the FAULT LED corresponding to the faulted component illuminate.
When faults occur, contact your sales or maintenance service agent.

Cautions concerning power

❗ If a component of the disk array unit normally is not fully inserted or is loose, or if a cable normally is not fully inserted or is loose, it could cause failure.

❗ Always connect all power supplies of the disk array unit and pass current through them. If no current is passed, data is not duplicated and data may be lost. A power supply that is not connected is judged to be abnormal.

▲ CAUTION

Cautions concerning disk drives

A disk drive is an electronic device.
When handling one, take measures against static electricity, such as using a wrist strap.
If you do not have a wrist strap, firmly place one hand on the unpainted metal surface of the disk drive before handling it.

Mount three disk drives in the disk array unit at locations 00, 01, and 02 of the unit. If these are not mounted, data may be lost.

Do not remove more than one of the drives at locations 00, 01, and 02 of the disk array unit while the power to the unit is off. Moreover, do not turn off the power if more than one of the drives at locations 00, 01, and 02 are removed. If you remove drives, data may be lost.

When adding disk drives or changing the locations at which disk drives are mounted, be sure to work on one at a time in powering them on. Install the next disk drive after confirming that the installed disk drive is ready.

When installing a disk drive, lock the ejector after it has been inserted fully. Not inserting it fully may cause failure.

Do not change the locations at which disk drives are installed if logical disks have been configured. Data may be lost.

⚠ CAUTION

Cautions concerning batteries

The batteries of the disk array unit have a life span.
If batteries are used past their life span, the backup time cannot be guaranteed and user data may be destroyed on a power outage.

When replacing batteries due to their life span, a request for battery purchase and maintenance must be made.
Ask your sales or maintenance service agent for details.

Make use of backup using the battery of the disk array unit no more than 4 times per year.
If this is done more than four times in a year, the battery life cannot be guaranteed.

Backups: Power-offs without a power-off sequence. Power outages, for example.

Performance may deteriorate while charging the battery of the disk array unit.

Reason: Fast writing in which a cache is used is not done unless the battery is fully charged, since backup time on a power outage cannot be guaranteed.

Do not use the disk array unit at temperatures higher than what is documented in the "Disk Array Unit Setup Guide."
The battery life cannot be guaranteed if you use it beyond that temperature.

When disposing of batteries of the disk array unit, do so in accordance with local government regulations.
For details, contact your local government. The unit is equipped with batteries as follows.
Each controller: Lithium battery (button battery)
Each controller: Nickel metal hydride battery
Each extended BBU: Nickel metal hydride battery

⚠ CAUTION

Cautions concerning cables

🚫 For the FC cables and SAS cables used in connections in the disk array unit, use cables and cable lengths specified by RAID. If cables other than those specified are used, data can be lost.

❗ Check cable specifications and connectors so that there will be no wiring errors.
If the unit were operated with wiring errors, data could be lost. When correcting wiring, it may be necessary to erase all disk drive data.

❗ When installing, confirm that there is no bending or other damage, dust adhesion, or dirt on connectors or contacts.

🚫 Do not forcibly insert cable connectors.
A connector cannot be connected unless it is inserted with the correct orientation and at the correct angle.
When inserted correctly, they go in smoothly without applying excessive force. If you cannot insert one successfully, do not forcibly insert it, but check the orientation and shape of the connector.

🚫 Handle cable connectors carefully so that they are not dropped on a floor and damaged.

🚫 Do not place excessive strain on the connector portion or the cable portion of an installed cable.
Do not deform a cable by stepping on it or putting heavy objects on it.

❗ Treat optical fiber cables with care and respect. Rough treatment of optical fiber cables could cause deterioration of characteristics or mechanical damage (line disconnection).
(How to treat optical fiber cables)

1. Ensure a minimum bending radius of 30 mm.
2. Do not drop a cable on the floor or otherwise shock it.
3. If not connecting a cable, place caps on it.

When connecting a cable, do not discard the caps but save them (as well as those for connectors on the unit).

❗ Optical power may be attenuated by dust or dirt present when inserting an optical fiber cable in a controller of the disk array unit and result in data errors. When inserting a cable, always be sure to clean the optical connector using the following procedure.
(Cleaning method)

1. Spray air or another parts cleaning gas on the optical connector for several seconds.
2. Wipe the optical connector lightly several times with a non-fibrous cloth wetted with isopropyl alcohol.
3. Spray parts cleaning gas on the optical connector for several seconds again.

❗ Treat SAS cables with care and respect. Rough treatment of the cables may cause deterioration of characteristics or mechanical damage (line disconnection).
(How to treat SAS cables)

1. Make allowance for cable forming.
2. Do not forcibly stretch a cable or otherwise stress it.
3. Ensure a minimum bending radius of 50 mm.

⚠ WARNING

Cautions concerning LAN

🚫 In connecting to the Storage Manager, be sure to connect to a LAN port and not to a MNT port.

🚫 Assign different addresses for the IP address of the CONT#0 LAN and the IP address of the CONT#1 LAN. This disk array unit does not support several features, including teaming.

❗ Set Auto Detect for servers, hubs, and other devices connected to the LAN.
Reason: Connecting to a device in full duplex mode could cause abnormal operation.
If settings do not match, it may be impossible to connect intermittently even if a connection is established temporarily.
To set Speed and Detect settings other than Auto Detect, ask your sales or maintenance service agent.

❗ **Use a shielded straight cable to connect a LAN cable via a hub or a shielded cross cable to connect it directly.**

🚫 Do not place excessive strain on the cable portion or connector portion of an installed LAN cable. Do not deform the cable by stepping on it or putting heavy objects on it.

Cautions concerning UPS

❗ Constructing a system configuration in which a UPS is used allows the system to operate stably even if an accidental power interruption or momentary AC power outage occurs.
Consult your sales or maintenance service agent concerning configuring a system in which a UPS is used.

❗ A disk array unit and a directly connected UPS can be linked only if the host is an NX server.
Consult your sales or maintenance service agent concerning configuring a system in which a UPS is used.

❗ UPSs and power controls that use ESMPRO can be used.
Consult your sales or maintenance service agent regarding UPSs and power controls that use ESMPRO.

🚫 Do not use a UPS other than the ones specified.
Operation is not guaranteed if you use one other than one that is specified.

🚫 Do not connect a UPS to the UPS interface without the AC power turned on.
This state is equivalent to a power interruption and mistakenly causes processing for power interruptions to operate.

Cautions concerning modems

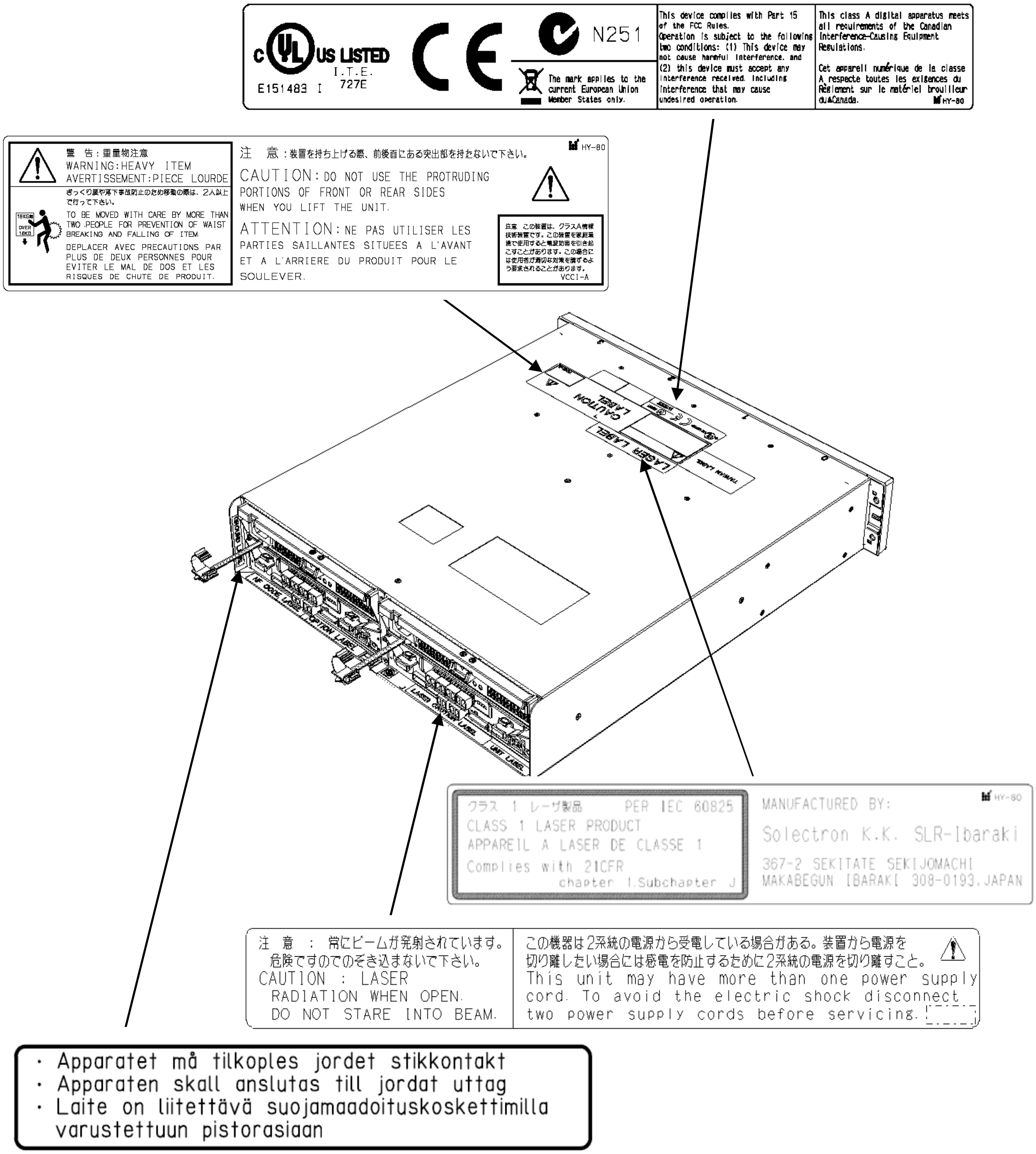
❗ Remote monitoring service through a modem requires a maintenance contract with a maintenance service agent. Contact your sales agent.

Indication on Safety

The warning label is attached to components with possible danger or their vicinity in your disk array unit to inform the user that a hazardous situation may arise when operating the disk array unit. (Do not intentionally remove or damage any of the labels.)

If you find any labels totally/partially removed or illegible due to damage, contact your sales representative.

Disk Array Unit



c UL US LISTED I.T.E. E151483 I 727E

N251

The mark applies to the current European Union Member States only.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

HY-80

警　告：重量物注意
WARNING:HEAVY ITEM
AVERTISSEMENT:PIECE LOURDE

ぎっくり腰や落下事故防止のため移動の際は、2人以上で行って下さい。

18KG OVER 18KG

TO BE MOVED WITH CARE BY MORE THAN TWO PEOPLE FOR PREVENTION OF WAIST BREAKING AND FALLING OF ITEM.

DEPLACER AVEC PRECAUTIONS PAR PLUS DE DEUX PERSONNES POUR EVITER LE MAL DE DOS ET LES RISQUES DE CHUTE DE PRODUIT.

注　意：装置を持ち上げる際、前後面にある突出部を持たないで下さい。

CAUTION: DO NOT USE THE PROTRUDING PORTIONS OF FRONT OR REAR SIDES WHEN YOU LIFT THE UNIT.

ATTENTION: NE PAS UTILISER LES PARTIES SAILLANTES SITUEES A L'AVANT ET A L'ARRIERE DU PRODUIT POUR LE SOULEVER.

注意　この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。
VCCI-A

HY-80

クラス 1 レーザ製品　PER IEC 60825
CLASS 1 LASER PRODUCT
APPAREIL A LASER DE CLASSE 1
Complies with 21CFR chapter 1.Subchapter J

MANUFACTURED BY:
Solectron K.K. SLR-Ibaraki
367-2 SEKITATE SEKIJOMACHI
MAKABEGUN IBARAKI 308-0193.JAPAN

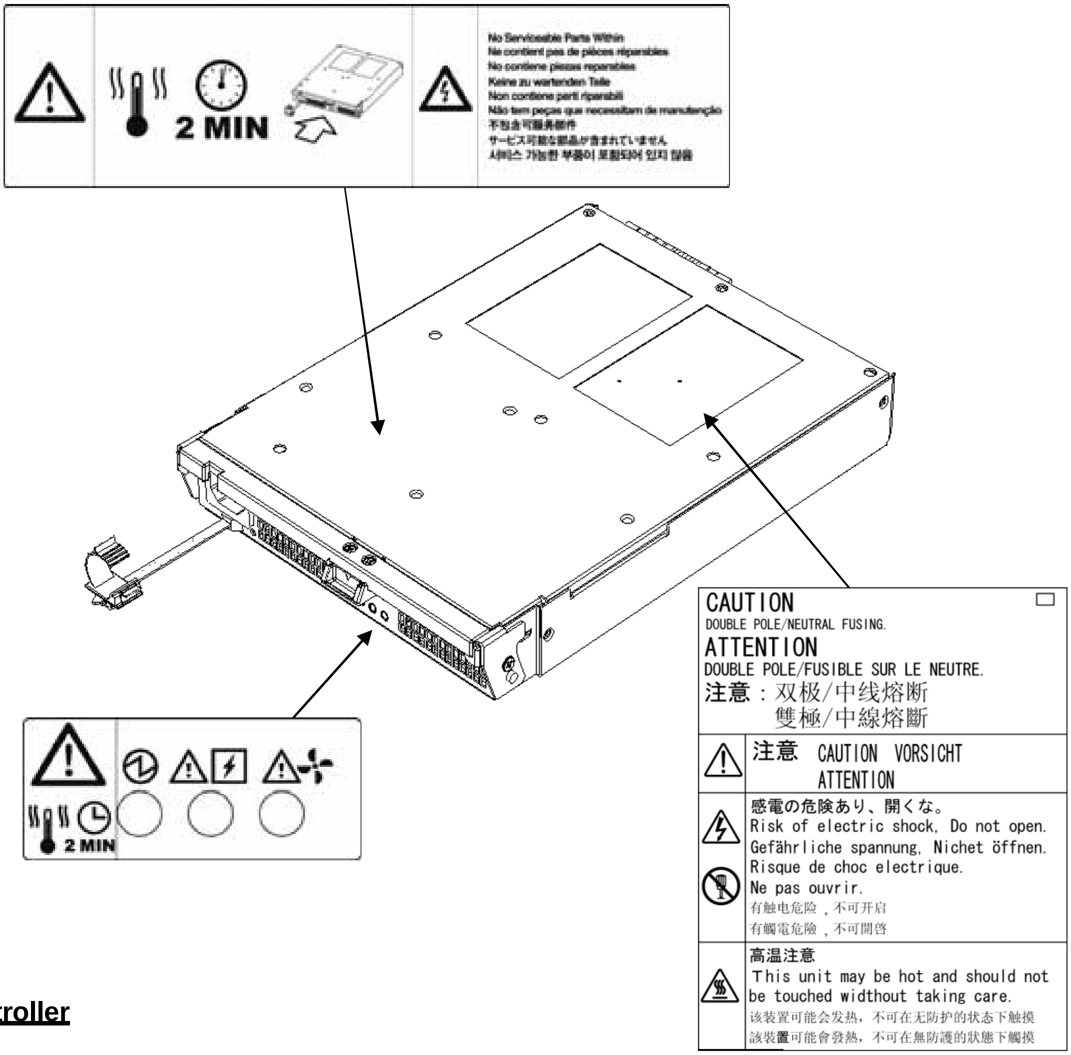
HY-80

注　意　：　常にビームが発射されています。
危険ですのでのぞき込まないで下さい。
CAUTION : LASER
RADIATION WHEN OPEN.
DO NOT STARE INTO BEAM.

この機器は2系統の電源から受電している場合がある。装置から電源を切り離したい場合には感電を防止するために2系統の電源を切り離すこと。
This unit may have more than one power supply cord. To avoid the electric shock disconnect two power supply cords before servicing.

- Apparatet må tilkoples jordet stikkontakt
- Apparaten skall anslutas till jordat uttag
- Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan

Power Supply



No Serviceable Parts Within
Ne contient pas de pièces réparables
No contiene piezas reparables
Keine zu wartenden Teile
Non contiene parti riparabili
Não tem peças que necessitam de manutenção
不包含可服务部件
サービス可能な部品が含まれていません
서비스 가능한 부품이 포함되어 있지 않음

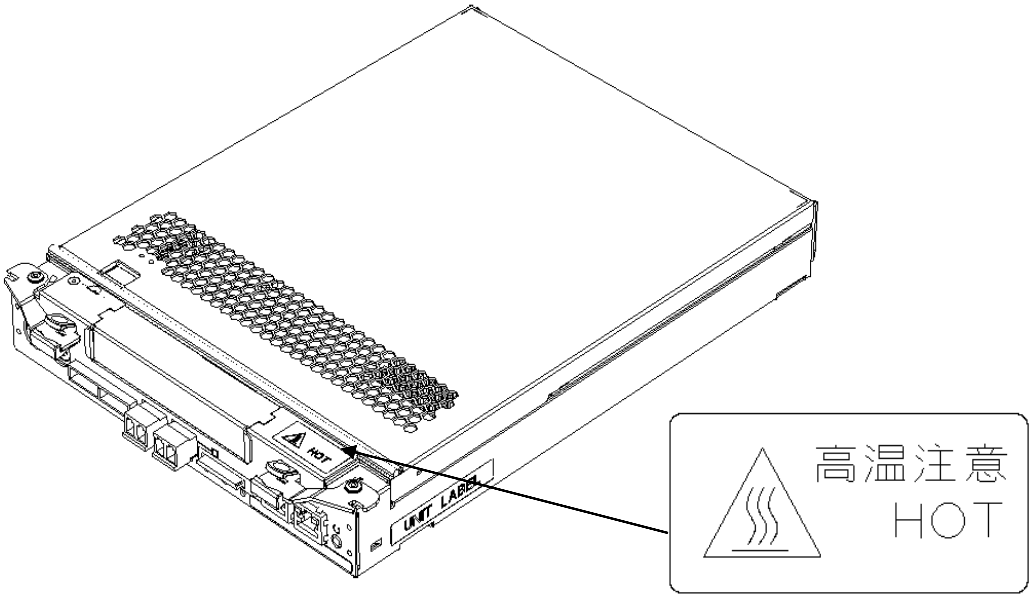
CAUTION
DOUBLE POLE/NEUTRAL FUSING.
ATTENTION
DOUBLE POLE/FUSIBLE SUR LE NEUTRE.
注意：双极/中线熔断
雙極/中線熔斷

注意 CAUTION VORSICHT
ATTENTION

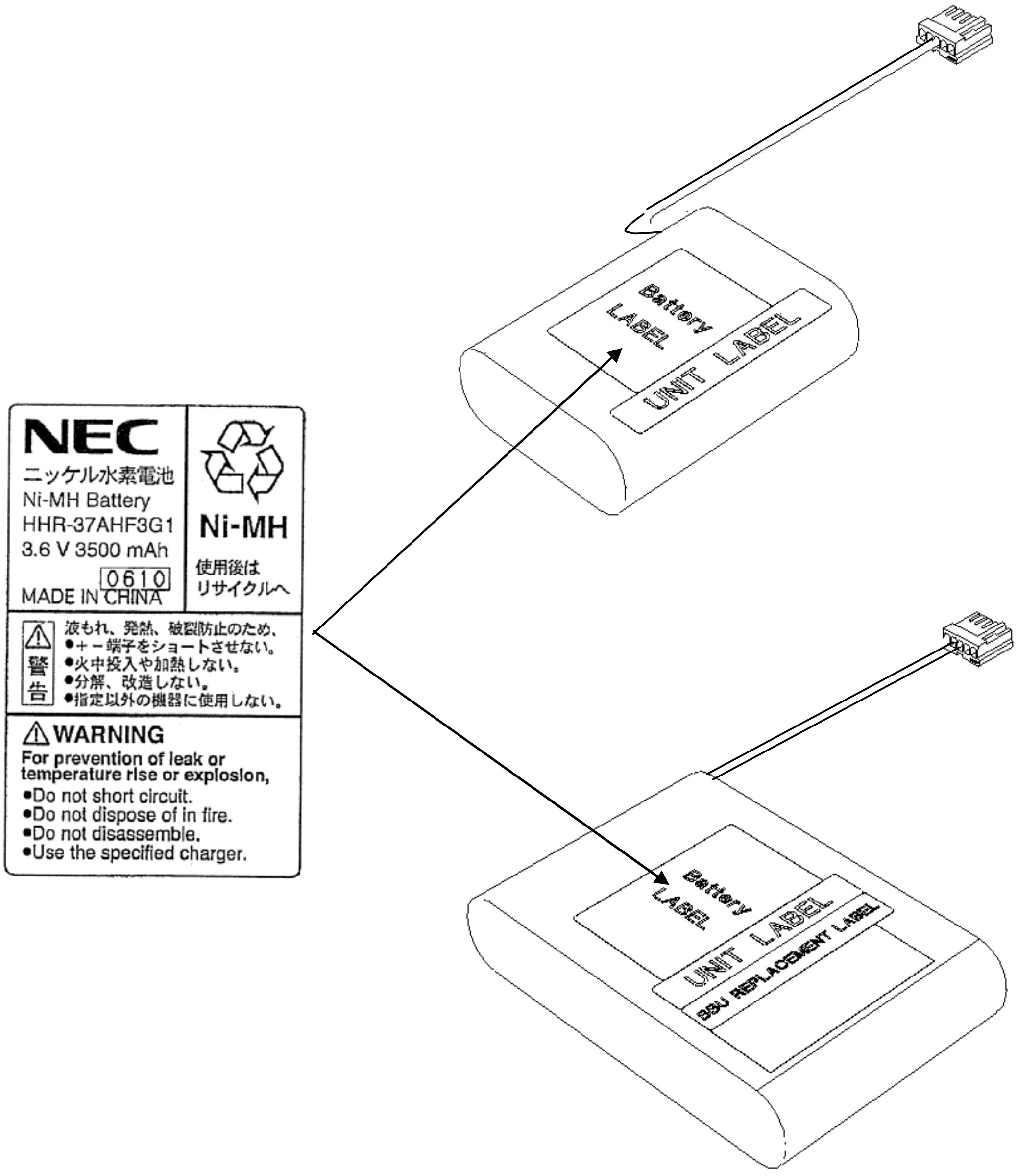
感電の危険あり、開くな。
Risk of electric shock, Do not open.
Gefährliche spannung, Nichet öffnen.
Risque de choc electrique.
Ne pas ouvrir.
有触电危险，不可开启
有觸電危險，不可開啓

高温注意
This unit may be hot and should not be touched widthout taking care.
该装置可能会发热，不可在无防护的状态下触摸
該裝置可能會發熱，不可在無防護的狀態下觸摸

Controller



Battery



NEC

ニッケル水素電池

Ni-MH Battery

HHR-37AHF3G1

3.6 V 3500 mAh

0610

MADE IN CHINA

Ni-MH

使用後は

リサイクルへ

警告

液もれ、発熱、破裂防止のため、

- +－端子をショートさせない。
- 火中投入や加熱しない。
- 分解、改造しない。
- 指定以外の機器に使用しない。

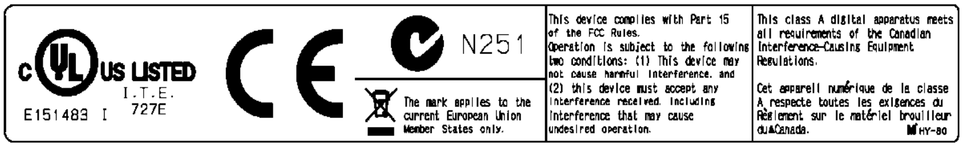
WARNING

For prevention of leak or temperature rise or explosion,

- Do not short circuit.
- Do not dispose of in fire.
- Do not disassemble.
- Use the specified charger.

Battery LABEL
UNIT LABEL
Battery LABEL
UNIT LABEL
SSU REPLACEMENT LABEL

Disk Enclosure



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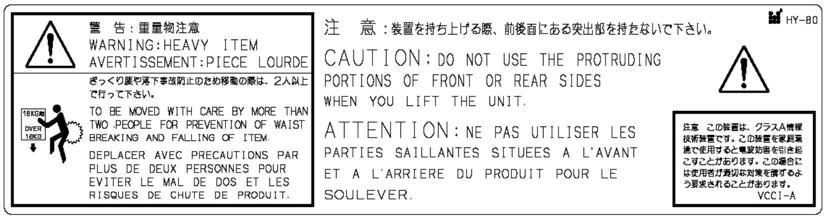
HY-80



警　告：重量物注意
WARNING:HEAVY ITEM
AVERTISSEMENT:PIECE LOURDE

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18KG超
OVER 18KG

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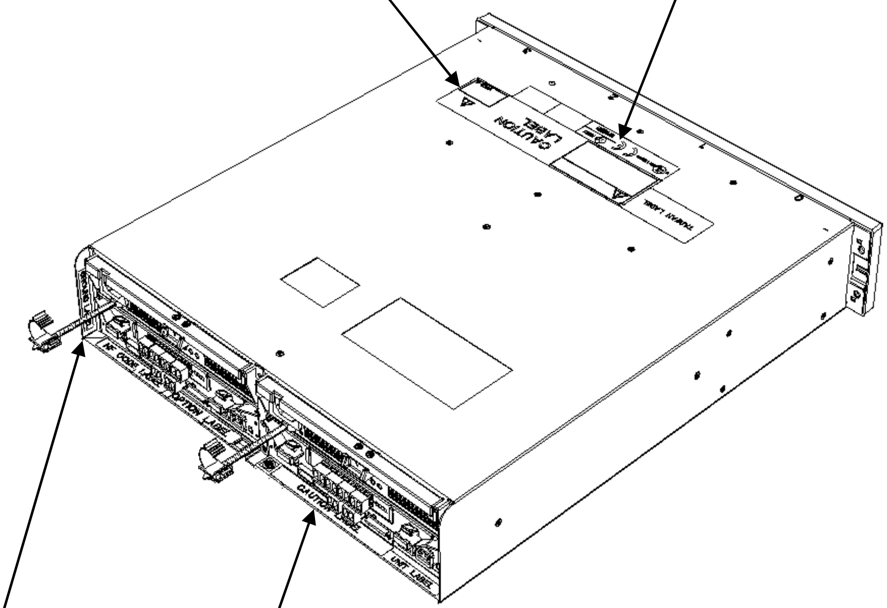
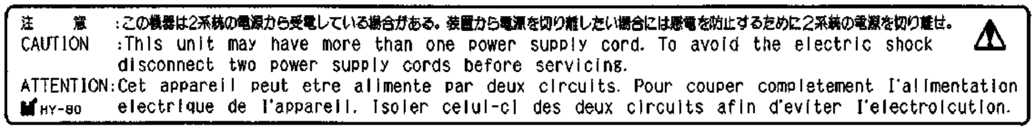
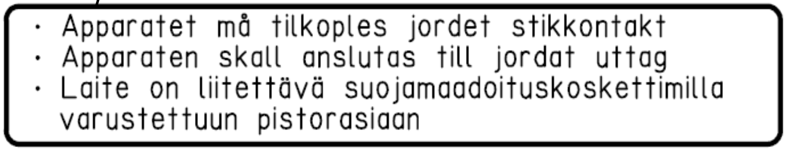
VCCI-A



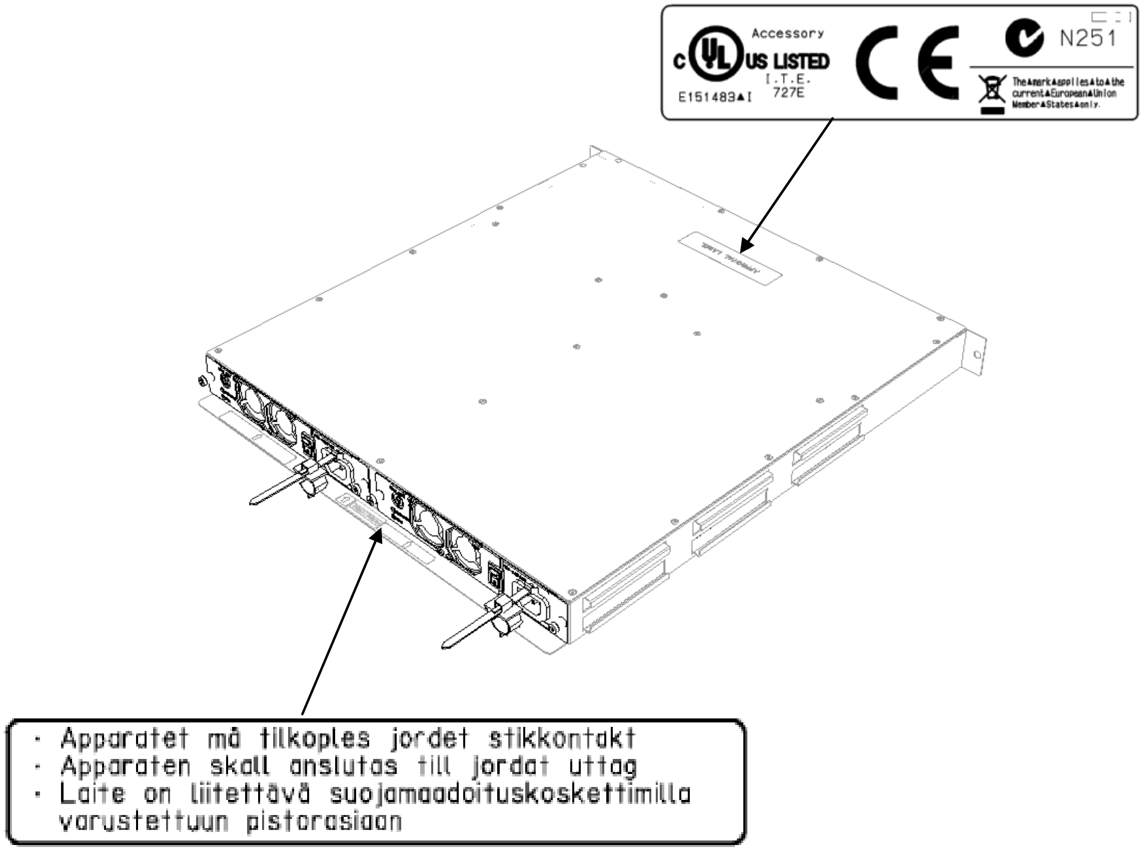


注　意　：この機器は2系統の電源から受電している場合がある。装置から電源を切り離したい場合には感電を防止するために2系統の電源を切り離せ。
CAUTION　：This unit may have more than one power supply cord. To avoid the electric shock disconnect two power supply cords before servicing.
ATTENTION：Cet appareil peut etre alimente par deux circuits. Pour couper completement l'alimentation electrique de l'appareil. Isoler celui-ci des deux circuits afin d'eviter l'electrocution.
HY-80

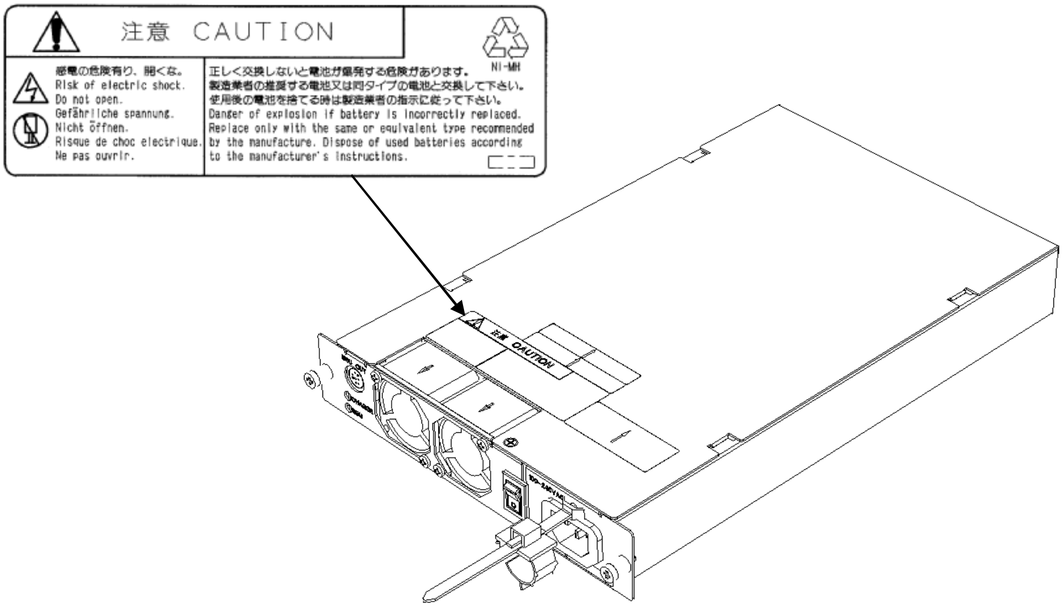


- Apparatet må tilkoples jordet stikkontakt
- Apparaten skall anslutas till jordat uttag
- Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan

Extended Battery Backup Unit


Accessory
c UL US LISTED
I.T.E.
727E
E151483▲I
CE
N251
The▲mark▲applies▲to▲the current▲European▲Union Member▲States▲only.
· Apparatet må tilkoples jordet stikkontakt
· Apparaten skall anslutas till jordat uttag
· Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan

Extended Battery Backup Unit Power Supply


注意 CAUTION
NI-MH
感電の危険有り、開くな。
Risk of electric shock.
Do not open.
Gefährliche spannung.
Nicht öffnen.
Risque de choc electrique.
Ne pas ouvrir.
正しく交換しないと電池が爆発する危険があります。
製造業者の推奨する電池又は同タイプの電池と交換して下さい。
使用後の電池を捨てる時は製造業者の指示に従って下さい。
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacture. Dispose of used batteries according to the manufacturer's instructions.
注意 CAUTION

Cautions

(1) No part of this manual may be reproduced in any form without prior written consent from RAID.

(2) The information in this manual is subject to change without notice.

(3) This manual was created with the greatest care, but in the event that any technical or editorial errors or omissions are found, contact your dealer.

(4) RAID shall not be liable for any claims of loss or lost profits caused by the use of this disk array unit, regardless of item (3) above.

(5) This unit is not intended to be installed in installations or equipment associated with human life, such as medical equipment, atomic installations or equipment, aviation and space equipment, transportation installations or equipment or to be installed in and used to control installations or equipment requiring high reliability. If this unit is used in such installations, equipment, or control systems, RAID shall not be liable for any accident leading to personal injury or death or any property damage that may occur.

(6) If you transfer (or sell) the disk array unit to a third party, deliver this manual along with it.

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Documentation Besides this Manual

Besides this manual, the user-oriented information below is also available.

Since this is necessary information that is important for installation and stable operation, be sure to check it.

Title	Content
Setup Guide	Contains the setup procedures of this guide. Packaged with the unit.

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1. OVERVIEW

1.1 Features

The features of this disk array unit are shown below.

- High performance, large capacity
    - Fibre channel (FC-AL/Fabric, 400 MB/s) is employed in the host interface.
    - Disk drives employed are 73 GB (15,000 rpm), 147 GB (15,000 rpm), or 300 GB (15,000 rpm) SAS disk drives, and 500 GB (7200 rpm) or 750 GB (7200 rpm) SATA disk drives, of which a maximum of 72 (Xanadu-beta version) drives or a maximum of 144 (Xanadu) drives can be implemented.
    - SAS disk drives and SATA disk drives can be mixed in a disk enclosure.
    - Connection as a Windows, Linux, HP-UX, Solaris, or AIX server storage system is possible.

      Note: Xanadu-beta version supports only Windows and Linux servers (excluding the Itanium Processor Family).

- High reliability, high availability
    - Controllers, caches, power supplies, fans, and other major components are made redundant.

      Note: In the Xanadu-beta version Single Controller model, the controller and cache are not made redundant.
    - Caches are double-written between controllers so that even if one controller fails, data is preserved in the cache of another controller.

      Notes:
        - In the Xanadu-beta version Single Controller model, caches are not double-written.
        - In the Xanadu-beta version Single Controller model, the initial value of the write cache function is OFF.
    - Data in a cache is held a standard 24 hours by the battery.
      By adding an optional extended battery backup unit, the backup time can be extended to a maximum of 120 hours (Xanadu-beta version) or a maximum of 72 hours (Xanadu).
    - RAID-1, 5, 10, 50, and 6 are supported.
      Even if one disk drive fails, continuous operation is possible and data is not lost.
      Note: RAID-6 is supported for SATA disk drives.
    - Multiple hot spare disks can be established.

- Operation management
    - Configuration, status display, and status monitoring can be performed easily using Storage Manager.

      Note: In order to use this disk array unit, you must purchase the program product BaseProduct separately.
      Storage Manager is included in BaseProduct.

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2. Initiating Setup

2.1 Tasks and Procedure for New Setup

Execute setup tasks according to the following procedure.

An asterisk (*) before processing indicates that it is executed depending on conditions. Always execute processing that is not so marked.

	Chapter 2 Initiating Setup
	Preparation, unpacking, and checking sent items
	Chapter 4 Installation
	Mounting the disk array unit and disk enclosures on a rack
	Installation of disk drives
*	Setting AC operating mode
	Installing and removing the front panel
*	Mounting an extended BBU on a rack
	Chapter 5 Cable Connections
*	SAS cable connections
	Connection to the business server
	Connection of LAN cables
*	Connection of controller to extended BBU
	Connection of power cables
	Chapter 6 Turning On/Off Unit Power
	Turning on the unit power
	Chapter 7/8 Installation of Storage Manager
	Installation of Storage Manager
	Installation of the volume list command
*	Installation of ControlCommand
	Chapter 9 Collection of Host Information on Business Server
*	Collecting the host information using a file output on a business server
	Chapter 10 Installation of the Storage Manager Client
	Chapter 11 Initialization of RAID Storage
	Initialization using the initialization wizard
	Chapter 12 Easy Configuration of RAID Storage
*	Batch unlocking of licenses
*	LD bind easy configuration
	Chapter 13 Connection Confirmation from Business Server
*	Chapter 14 Storing Host Information Output to File on Business Server

2.2 Preparation

For this setup task, the following supplies and tools are required. Since preparation is required at the business server connecting RAID Storage, also perform that in advance.

(1) Prepare the following.

- Management server, business server, client, installation CD
- LAN cable (shielded)
  - Use a cross cable to connect the disk array unit to the management server directly.
  - Use a straight cable to connect the disk array unit to the management server via a hub.
- Prepare as many IP addresses to assign to the disk array unit as there are connection ports. Also prepare the subnet mask and gateway address after confirming them with the network administrator.
- Phillips screwdriver (No. 1)
- At least three people (required to move the disk array unit)
- **At least three** disk drives are required at the time of setup. Please purchase additional disk drives.

(2) Execute the setup tasks below at the business server connecting RAID Storage.

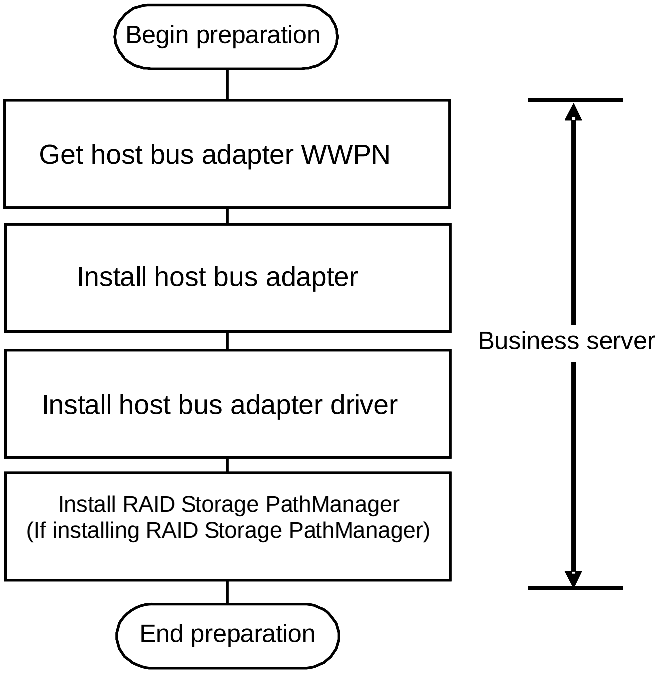
Begin preparation
Get host bus adapter WWPN
Install host bus adapter
Install host bus adapter driver
Install RAID Storage PathManager
(If installing RAID Storage PathManager)
End preparation
Business server

Figure 2.2.1 Flow of Preparation

(a) Getting the WWPN (World Wide Port Name) of the host bus adapter (Fibre Channel controller)

This setup is only for WWN mode (using the WWPN of the host bus adapter to allocate LUN to the business server) as the AccessControl setup mode. During the setup task, the WWPN of the host bus adapter installed on the business server is obtained using software. However, it is recommended that you make note of it and provide for a substitute task (confirmation of the server expansion slot location at which the host bus adapter is installed and the WWPN) in case of a host bus adapter fault.

The WWPN that is assigned to the host bus adapter may have to be input manually if the WWPN of the host bus adapter cannot be obtained by the software.

(b) Installing the host bus adapter

If a host bus adapter has already been installed in the business server, this task is not necessary.

Install the host bus adapter in the business server according to the host bus adapter and business server user’s manuals.

(c) Installing the host bus adapter driver

If a driver for the host bus adapter that is installed in the business server has already been installed and set up, this task is not necessary.

Perform the tasks of host bus adapter driver installation and setup according to the manual that came with the host bus adapter product installed in the server or information provided on the Web.

(d) Installing PathManager (Windows/Linux)

If PathManager has already been installed and set up for the business server, or if PathManager is not being installed, this task is not necessary.

■ To perform this task, installation and setup of the host bus adapter driver must be done first.

Perform the tasks of PathManager installation and setup according to the “PathManager User’s Manual” that comes with the PathManager product, or the “PathManager Installation Guide”.

2.3 Unpacking

This is the task of unpacking a delivered disk array unit and removing the materials used to protect the unit for transportation.

- In order to prevent condensation, unpack after sufficiently acclimating the unit to the ambient temperature following delivery (approximately nine hours).
- In unpacking, take the disk array unit itself and the accessories out of the carton in such a way that they are not exposed to excessive shocks.
- The disk array unit is extremely heavy. If only one or two persons lift it when taking it out of the carton, they may hurt their backs.
- At least three people should take the disk array unit out of the carton by supporting the bottom of the unit and not holding on to projections such as power supplies and controllers.
- The carton is designed to transport precision equipment. Do not discard the carton because it will be needed when returning the unit to the factory for repair.

2.4 Checking Sent Items

When finished unpacking, confirm that all of the items shown in the table below have been sent. If anything is missing, contact your sales representative.

Next, inspect the unit and the accessories.

If there is any damage, contact your sales representative.

* In order to perform the setup tasks for this disk array unit, at least three disk drives are needed.

If you have not bought disk drives, purchase them before performing the setup tasks.

Table 2.4.1 List of Included Items for Disk Array

No.	Item Name	Qty.
1	Rack mount kit	1
2	Front mask	1
	AC cable ■ 3	
4	Xanadu microprogram	1
5	Setup Guide	1
6	User’s Guide	1
7	User’s Guide (CD-R edition)	1
8	Warranty	1
9	List of Included Items	1

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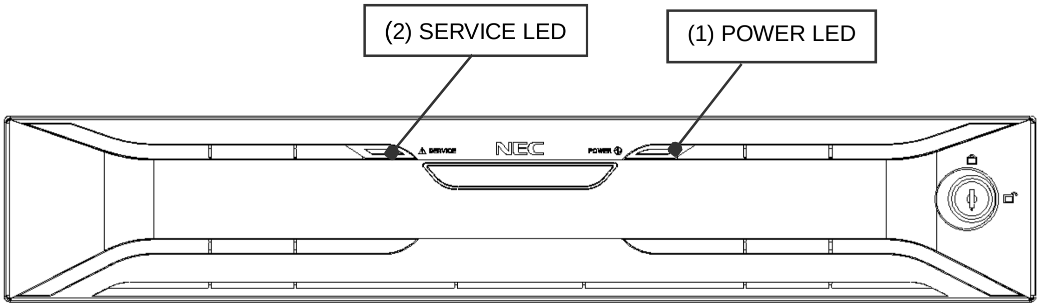
3. Checking Appearance and Features

3.1 Disk Array Unit

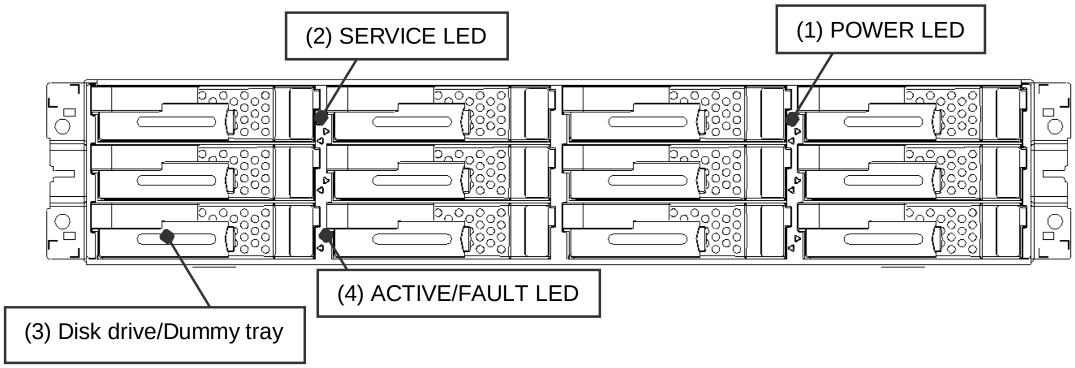
This section describes the names and functions of each portion of the disk array unit.

3.1.1 Front View


(2) SERVICE LED
(1) POWER LED
SERVICE
NEC
POWER

* Refer to 4.4 “Installing and Removing Front Panel” for a description of how to remove the front panel.

3.1.2 Front View (viewed when front panel is removed)


(2) SERVICE LED
(1) POWER LED
(4) ACTIVE/FAULT LED
(3) Disk drive/Dummy tray

(1) POWER LED (green)

The POWER LED illuminates to indicate normal operation.

(2) SERVICE LED (orange)

The SERVICE LED illuminates to indicate that the entire unit containing the disk enclosure requires maintenance.

The LED blinks to indicate that the power-on or power-off sequence is in progress.

The LED turns off to indicate that the power-on or power-off sequence is completed.

■ ON/OFF status of POWER and SERVICE LEDs

POWER LED	SERVICE LED	Description
ON	OFF	Normal operation
ON	ON	Requesting maintenance or processing a maintenance task (such as during recovery)
ON	Blinking	It is one of the following. Check the controller LEDs. - Power-on sequence in progress - Online download sequence in progress - Automatic download sequence in progress Note: Do not turn off power while a sequence is in progress.
ON	ON for 5 sec. and OFF for 7 sec.	Requesting maintenance (battery backup failure; write data may have been lost)
Blinking	OFF	Power-off sequence in progress
OFF	OFF	Powered off

(3) Disk drive/Dummy tray

A single disk array unit can be equipped with 12 disk drives/dummy trays.

Disk drive: Hard disk drive (HDD) with exclusive tray

Dummy tray: Exclusive tray only

■ Locations and disk drive numbers

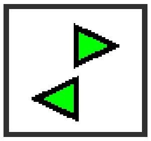
00	01	02	03
04	05	06	07
08	09	0A	0B

(4) ACTIVE/FAULT LED (green/orange)

A single ACTIVE/FAULT LED is installed on each disk drive/dummy tray.

The LEDs indicate the states of the respective disk drives.

■ Status display



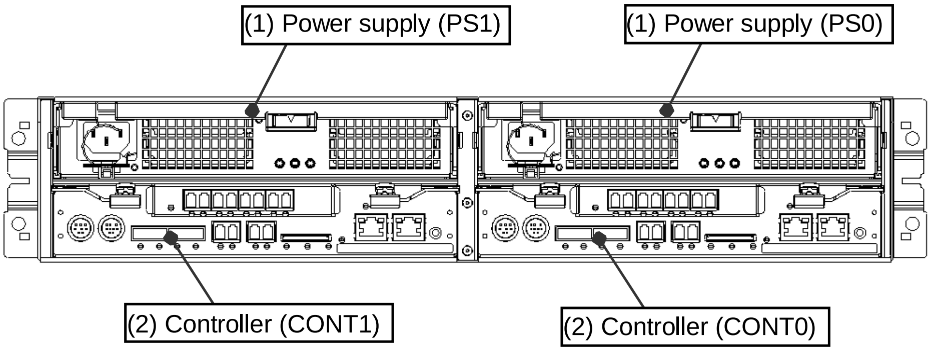
Indicates the status of the disk drive located to the right.

Indicates the status of the disk drive located to the left.

■ ON/OFF status of ACTIVE/FAULT LED

ACTIVE/FAULT LED	Status
Green : Lighting	Normal status (ready)
Green : Blinking	Normal status (accessing)
Green/orange : Alternate blinking	Restoring
Orange only : Blinking	HDD low power state
Orange : Lighting	Abnormal status

3.1.3 Rear View


(1) Power supply (PS1)
(1) Power supply (PS0)
(2) Controller (CONT1)
(2) Controller (CONT0)

(1) Power supplies (PS0/PS1)

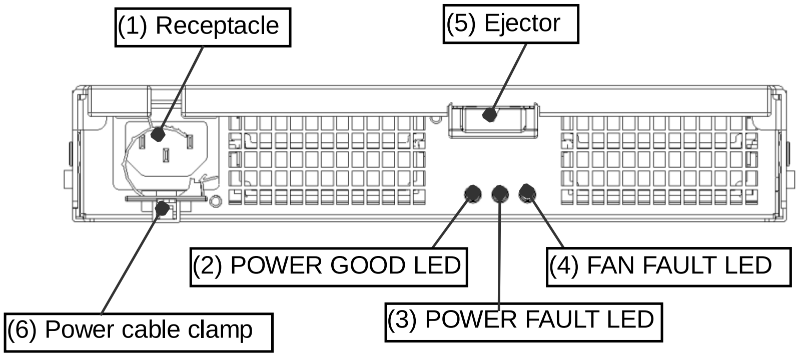
A single disk array unit is equipped with two power supplies.

Supply AC power to both of the power supplies.

(2) Controllers (CONT0/CONT1)

A single disk array unit can be equipped with up to two controllers.

3.1.4 Power Supply



(1) Receptacle

Connect the power cable that comes with the disk array unit to the receptacle to supply AC power.

(2) POWER GOOD LED (green)

The LED illuminates to indicate that AC power is being supplied to the unit.

(3) POWER FAULT LED (orange)

The POWER FAULT LED illuminates to indicate that the power supply (excluding the fan) is faulted.

Blinking indicates a temperature abnormality inside the power supply or that a controller has not been installed in the housing.

This LED is effective when AC power is being supplied to either PS0 or PS1.

(4) FAN FAULT LED (orange)

The FAN FAULT LED illuminates to indicate that the fan is faulted.

The power supply FAN operates when AC power is being supplied to either PS0 or PS1.

This LED is effective when AC power is being supplied to either PS0 or PS1.

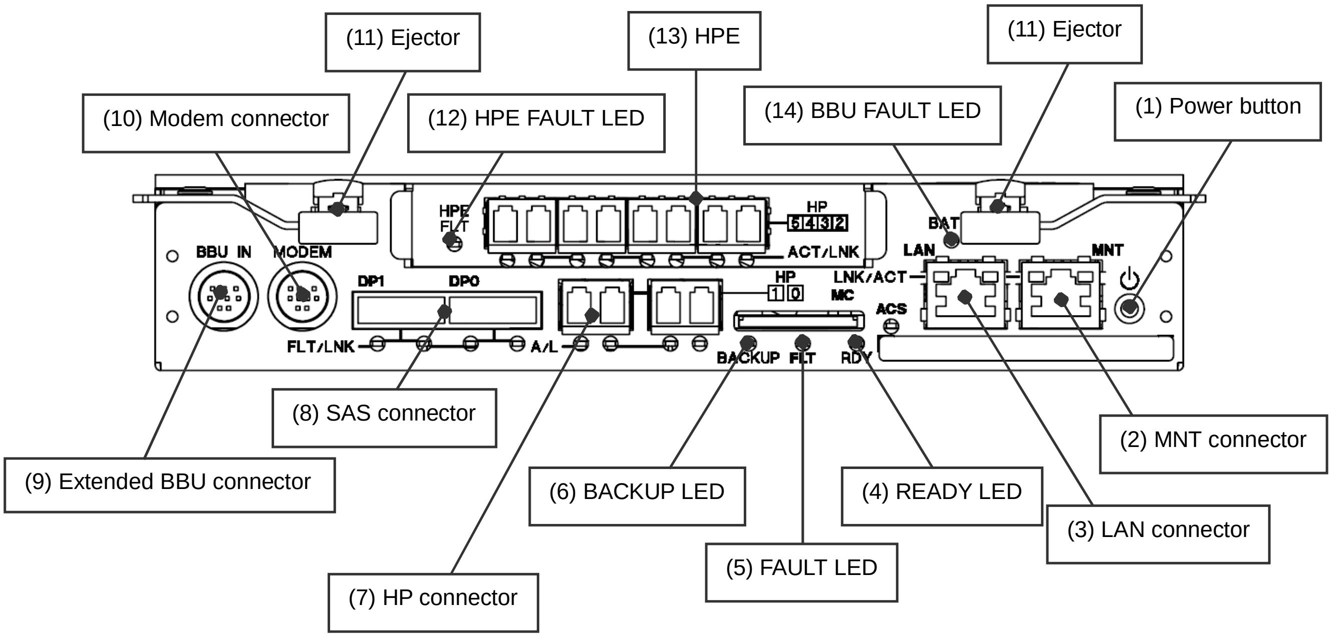
(5) Ejector

The ejector is used in installing or removing the power supply.

(6) Power cable clamp

The power cable clamp is a mechanism that prevents the power cable from being disconnected unintentionally.

3.1.5 Controller



(11) Ejector
(13) HPE
(11) Ejector
(10) Modem connector
(12) HPE FAULT LED
(14) BBU FAULT LED
(1) Power button
HPE FLT
HP
5 4 3 2
ACT/LNK
BAT
BBU IN
MODEM
LAN
MNT
DP1
DP0
HP
1 0
LNK/ACT
MC
ACS
FLT/LNK
A/L
BACKUP
FLT
RDY
(8) SAS connector
(2) MNT connector
(9) Extended BBU connector
(6) BACKUP LED
(4) READY LED
(3) LAN connector
(5) FAULT LED
(7) HP connector

(1) Power button

The power button is used to turn the power on or off.

(2) MNT connector

The MNT connector is used to connect the controller to a maintenance PC. (This is not used.)

(3) LAN connector

The LAN connector is used to connect the controller to Storage Manager or a LAN for SNMP.

There is a LINK LED (left) and an ACTIVE LED (right) on the connector.

LINK LED (LNK) (green)

The LINK LED indicates that a LAN is physically connected.

Depending on the type of hub, it may not illuminate or it may blink.

ACTIVE LED (orange)

The ACTIVE LED illuminates during a TCP protocol connection from a host.

It illuminates if monitoring is being done by Storage Manager.

(4) READY LED (green)

The READY LED illuminates during the power-on sequence.

The READY LED blinks during normal operation.

Rapid blinking indicates that power was disrupted.

(5) FAULT LED (orange)

The FAULT LED illuminates to indicate that a fault occurred in the controller.

■ READY LED and FAULT LED

READY LED	FAULT LED	State
Blinking	OFF	Normal operation
ON	ON	Starting
Blinking (5 times/second)	OFF	Power-off sequence complete AC power can be turned off.
Blinking asynchronously		Online/automatic download sequence in progress
Blinking synchronously		In download mode
OFF	ON	Occurrence of fault
ON	OFF	Power-on sequence in progress
ON	Blinking slowly	Waiting for disk enclosure power-on
OFF	OFF	Powered off

(6) BACKUP LED (orange)

The BACKUP LED blinks to indicate the battery backup state.

(7) HP connector

A host connection port is for connecting the disk array unit to a host.

Without an expansion port, there are two ports per controller.

With an expansion port, there are four ports per controller.

There is an ACCESS LED (left) and a LINK LED (right) below each connector.

Descriptions of HP Link LED and Active LED are as follows

- ■ Illumination of the HP Link LED indicates that the corresponding FC link is in an Up state.
- ■ Illumination of HP Active indicates that I/O processing is in progress.
- ■ Both LEDs blinking simultaneously (1-second intervals) indicates that the port is offline.
- ■ Both LEDs blinking rapid (500 ms intervals) simultaneously indicates that power-off processing is in progress.
- ■ Simultaneous blinking other than the above indicates that port setup was not done correctly.

■ Locations and port numbers

HP5	HP4	HP3	HP2
	HP1	HP0	

(8) SAS connectors

The SAS connectors are for connecting the disk array unit to disk enclosures.

There are two connectors per controller.

There is a FAULT LED (left) and LINK LED (right) below each connector.

■ LINK LED (LNK) (green)

The LINK LED illuminates to indicate link-up.

The LED is off to indicate link-down.

■ FAULT LED (FLT) (orange)

The FAULT LED illuminates to indicate that an error is detected.

■ Locations and port numbers

DP1	DP0

* DP1 is supported only by Xanadu.

(9) Extended BBU connector

The extended BBU connector is for connecting the disk array unit to an extended BBU.

(10) Modem connector

The modem connector is for connecting the disk array unit to a modem for (optional) remote maintenance.

(11) Ejector

The ejectors are used to install or remove the controller.

(12) HPE FAULT LED (orange)

The HPE FAULT LED illuminates to indicate that there is an abnormality in the host port extension.

(13) HPE (Host Port Extension)

The optional HPE is for extending the HP connector.

* HPE is supported only by Xanadu.

(14) Battery FAULT LED (orange)

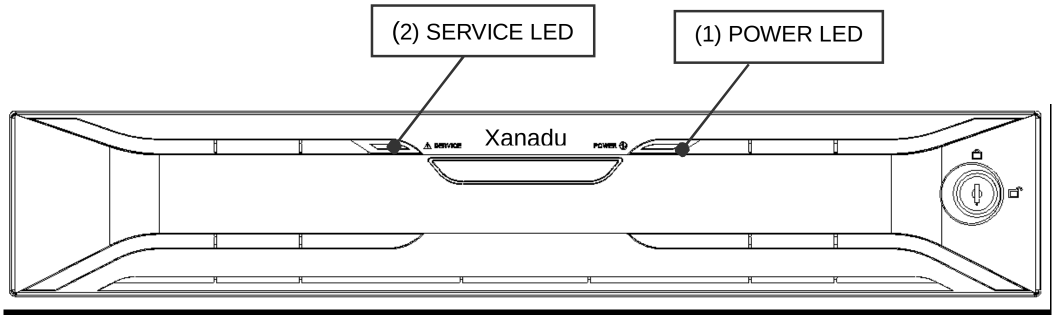
The BBU FAULT LED illuminates to indicate that an error occurs in the battery backup unit.

The LED blinks to indicate the battery backup unit must be replaced due to its life.

3.2 Disk Enclosure

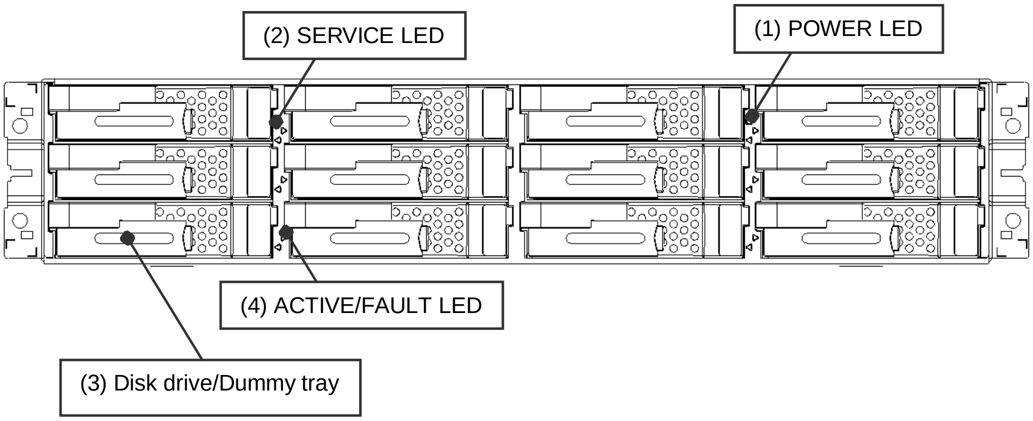
This section describes the names and functions of each portion of the disk enclosure (DE).

3.2.1 Front View


(2) SERVICE LED
(1) POWER LED
SERVICE
Xanadu
POWER

* Refer to 4.4 “Installing and Removing Front Panel” for a description of how to remove the front panel.

3.2.2 Front View (viewed when front panel is removed)


(2) SERVICE LED
(1) POWER LED
(4) ACTIVE/FAULT LED
(3) Disk drive/Dummy tray

(1) POWER LED (green)

The POWER LED illuminates to indicate normal operation.

(2) SERVICE LED (orange)

The SERVICE LED illuminates to indicate that the entire unit containing the disk enclosure requires maintenance.

The LED blinks to indicate that the power-on or power-off sequence is in progress.

The LED is off to indicate that the power-on or power-off sequence is completed.

■ ON/OFF status of POWER and SERVICE LEDs

Condition	POWER LED	SERVICE LED	Description
Operating	ON	OFF	Normal operation
	ON	ON	Requesting maintenance or processing a maintenance task (such as system recovery)
Power-off	OFF	OFF	Powered off

(3) Disk drive/Dummy tray

A single disk enclosure is equipped with 12 disk drives/dummy trays.

Disk drive: Hard disk drive (HDD) with exclusive tray

Dummy tray: Exclusive tray only

■ Locations and disk drive numbers

x0	x1	x2	x3
x4	x5	x6	x7
x8	x9	xA	xB

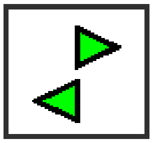
The symbol x in the table indicates the disk enclosure number (x: 1 to F (hexadecimal)).

(4) ACTIVE/FAULT LED (green/orange)

A single ACTIVE/FAULT LED is installed for each disk drive/dummy tray.

The LEDs indicate the states of the respective disk drives.

■ Status display



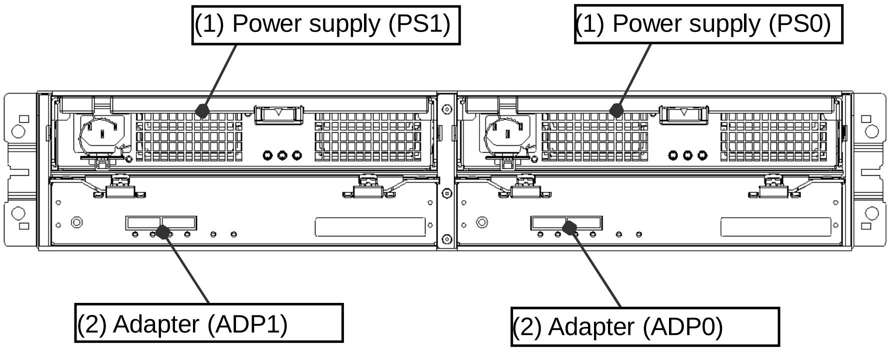
Indicates the status of the disk drive located to the right.

Indicates the status of the disk drive located to the left.

■ ON/OFF status of ACTIVE/FAULT LED

ACTIVE/FAULT LED	Status
Green : Lighting	Normal status (ready)
Green : Blinking	Normal status (accessing)
Green/orange : Alternate blinking	Restoring
Orange only : Blinking	HDD low power state
Orange : Lighting	Abnormal status

3.2.3 Rear View


(1) Power supply (PS1)
(1) Power supply (PS0)
(2) Adapter (ADP1)
(2) Adapter (ADP0)

(1) Power supplies (PS0/PS1)

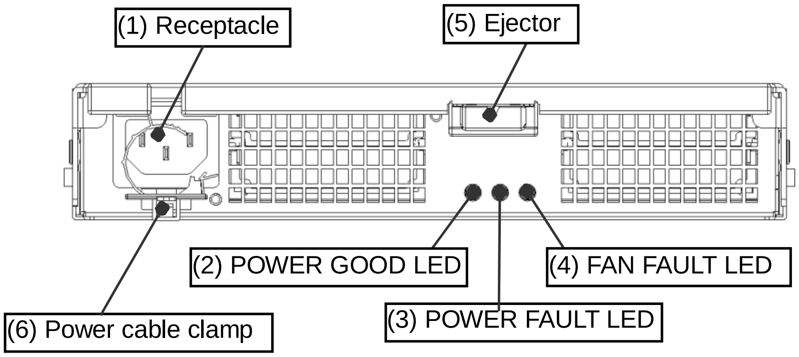
A single disk enclosure is equipped with two power supplies.

Supply AC power to both of the power supplies.

(2) Adapters (ADP0/ADP1)

A single disk enclosure is equipped with two adapters.

3.2.4 Power Supply


(1) Receptacle
(5) Ejector
(2) POWER GOOD LED
(4) FAN FAULT LED
(3) POWER FAULT LED
(6) Power cable clamp

(1) Receptacle

Connect the power cable that comes with the disk array unit to the receptacle to supply AC power.

(2) POWER GOOD LED (green)

The LED illuminates to indicate that AC power is being supplied to the unit.

(3) POWER FAULT LED (orange)

The POWER FAULT LED illuminates to indicate that the power supply (excluding the fan) is faulted.

(4) FAN FAULT LED (orange)

The FAN FAULT LED illuminates to indicate that the fan is faulted.

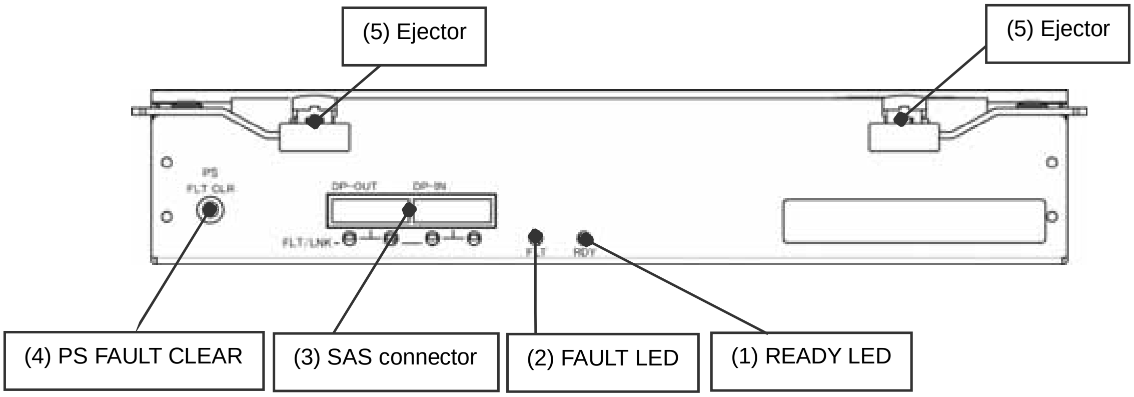
(5) Ejector

The ejector is used in installing or removing the power supply.

(6) Power cable clamp

The power cable clamp is a mechanism for preventing the power cable from being disconnected unintentionally.

3.2.5 Adapter


(5) Ejector
(5) Ejector
PS
FLT CLR
DP-OUT
DP-IN
FLT/LNK
FLT
RDY
(4) PS FAULT CLEAR
(3) SAS connector
(2) FAULT LED
(1) READY LED

(1) READY LED

The READY LED illuminates to indicate normal operation.

(2) FAULT LED

The FAULT LED illuminates to indicate that an error occurred in the adapter.

■ READY LED and FAULT LED

READY LED	FAULT LED	Status
OFF	OFF	No connection or powered off
ON	OFF	Normal operation
Blinking	OFF	Starting
ON	ON	Fault inside adapter

(3) SAS connector

The SAS connector is for connecting the adapter to a disk array device or disk enclosure.

There are two ports per adapter.

There is a FAULT LED (left) and a LINK LED (right) below each connector.

■ LINK LED (LNK) (green)

The LINK LED illuminates to indicate link-up.

The LED is off to indicate link-down.

■ FAULT LED (FLT) (orange)

Lighting or blinking indicates that an abnormality was detected.

■ Locations and names of SAS connectors

DP-OUT	DP-IN

■ DP-IN (Connector on right): Connection to controller or adapter on side near controller

■ DP-OUT (Connector on left): Connection to adapter of next connection stage

(4) PS FAULT CLEAR

The switch can be used to clear the fault status of the corresponding power supply.

(5) Ejectors

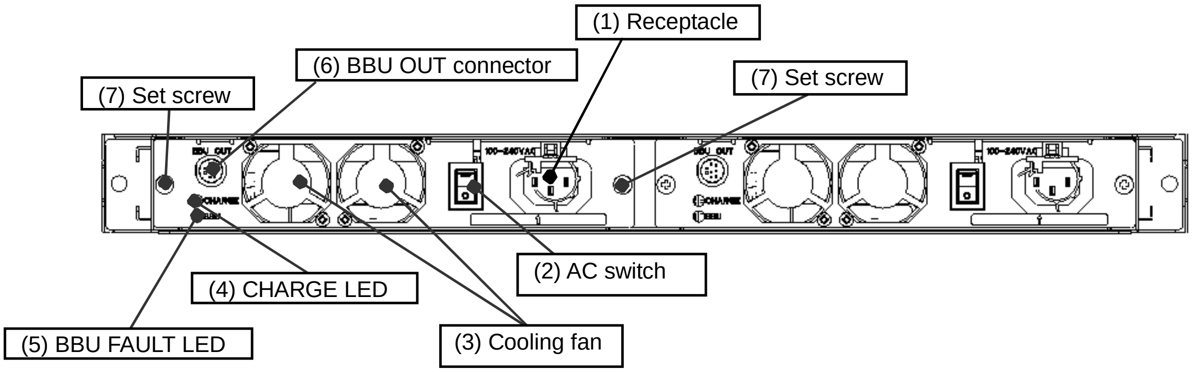
The ejectors are used to install or remove the adapter.

3.3 Extended BBU

This section describes the names and functions of each portion of the extended BBU.

3.3.1 Front View

3.3.2 Rear View


(1) Receptacle
(6) BBU OUT connector
(7) Set screw
(7) Set screw
(2) AC switch
(4) CHARGE LED
(5) BBU FAULT LED
(3) Cooling fan

(1) Receptacle

Connect the power cable that comes with the disk array unit to the receptacle to supply AC power.

(2) AC switch

The AC switch is the switch for turning AC power to the extended BBU on or off. "-" indicates ON and "○" indicates OFF.

(3) Cooling fan

The cooling fan is a fan for cooling the extended BBU.

(4) CHARGE LED

Illuminated:	Indicates that AC power to the extended BBU is turned on.
Blinking:	Indicates that the battery is charging.

(5) BBU FAULT LED

Illuminated: 1) Indicates that a fault has occurred in the extended BBU.

2) The BBU FAULT LED also illuminates when the BBU cable described in (6) is not connected normally to the body of the DAC unit.

Blinking: The BBU FAULT LED blinks when the battery exchange period is up. (Please exchange the BBU within the prescribed interval.)

(6) BBU OUT connector

The BBU OUT connector is the output connector of the BBU. Connect the accompanying BBU cable between the BBU-IN pin on the DAC unit and this terminal.

4. Installation

4.1 Mounting Disk Array Unit and Disk Enclosures on Rack

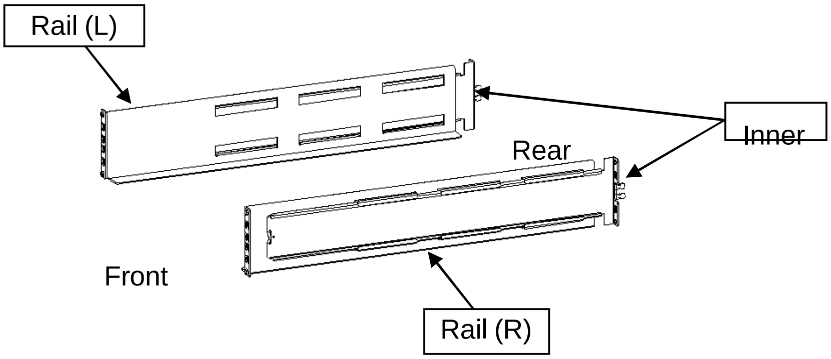
This section describes how to mount the disk array unit and disk enclosures on a rack.

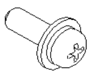
- Follow the instructions in the “Disk Array Unit Setup Guide”.
- The disk array unit weighs up to 31 kg and a disk enclosure up to 29 kg. At least three people should perform the tasks of mounting the units on a rack.
- Mount disk enclosures, disk array unit, and extended BBU in that order from the top.
- If adding an extended BBU, reserve space to mount the extended BBU (1 unit) below the disk array unit.

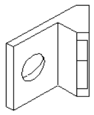
How to attach the rack mount kit that is shipped with the disk array unit to a rack is described below.

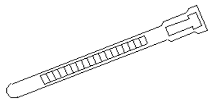
Rack mount kit parts list

No.	Part Name	Qty.
1	Rail (L)	1
2	Rail (R)	1
3	M5 screw	12
4	Cable clamp	4
5	Releasable tie	5

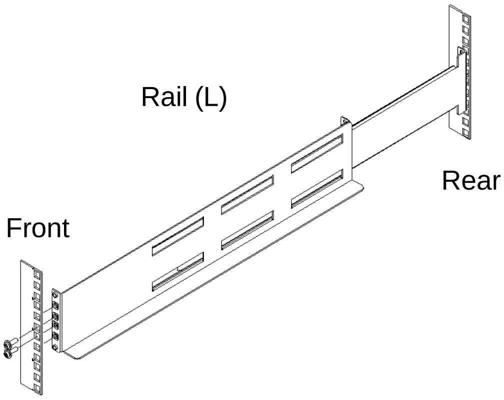



M5 screw


Cable clamp

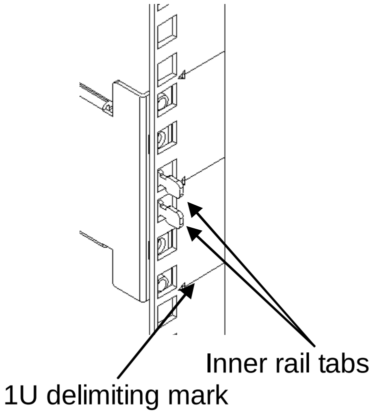

Releasable tie

(1) Check the rail (L).
The rear is the side that has an inner rail.
The rail (L) is the rail whose cross-section when viewed from the front forms the letter L.
Install this rail on the left-hand-side when viewed from the front of the rack.


Rail (L)
Rear
Front

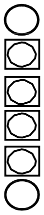
(2) Mate the bottom of the rail to a 1U delimiting mark on the rear support of the rack and insert the two inner rail projections.

Attachment to rear support

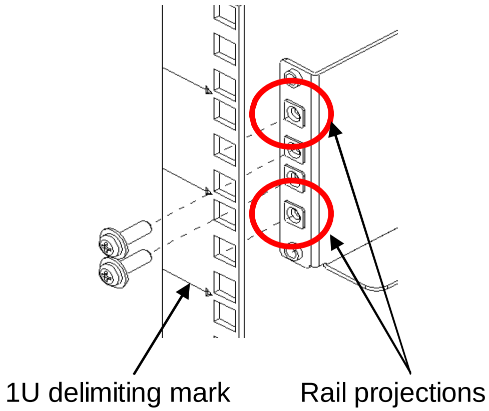

Inner rail tabs
1U delimiting mark

(3) Mate the bottom of the rail to a 1U delimiting mark on the front support of the rack and insert the two rail projections.
Racks may be square-holed racks or round-holed racks and their respective rail projections differ.
Affix the rail by inserting M5 screws in the two center screw holes in the front support of the rack.

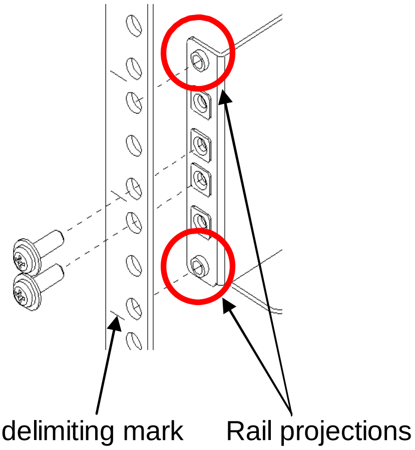
Rail front
Relative positions
of projections



Installation in front support
(Square-holed rack)

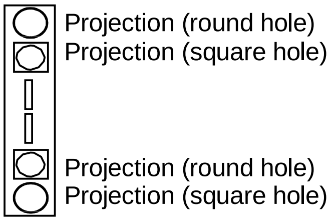

1U delimiting mark
Rail projections

Installation in front support
(Round-holed rack)


1U delimiting mark
Rail projections

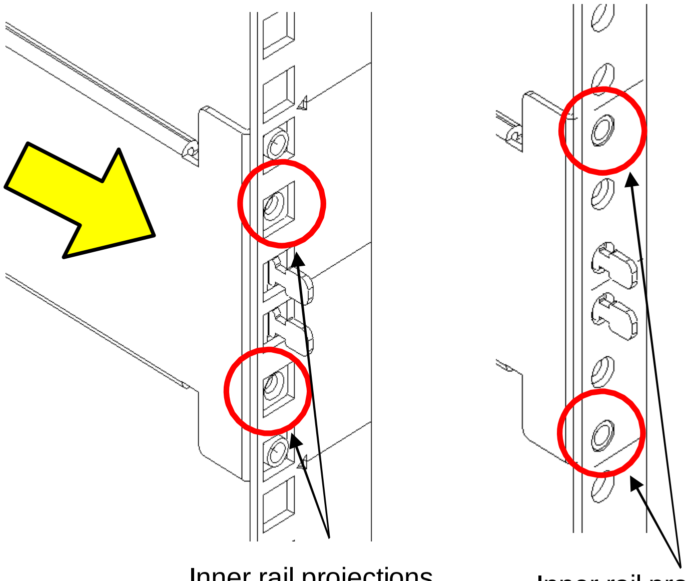
(4) Draw the inner rail to the rear support of the rack and insert the two projections.

Rail front
Relative positions of projections


Projection (round hole)
Projection (square hole)
Projection (round hole)
Projection (square hole)

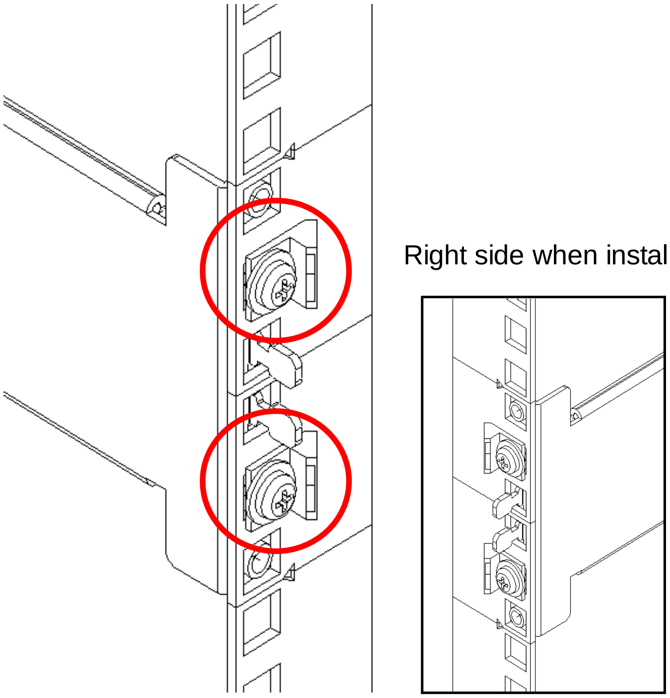
Installation in rear support (Square-holed rack)

Installation in rear support (Round-holed rack)


Inner rail projections
Inner rail projections

(5) Affix the inner rail by inserting M5 screws in the cable clamps in two center screw holes in the rear support of the rack.
Make the cable clamp installation direction as shown in the figure to the right.

Installing cable clamps and affixing inner rail in rear support

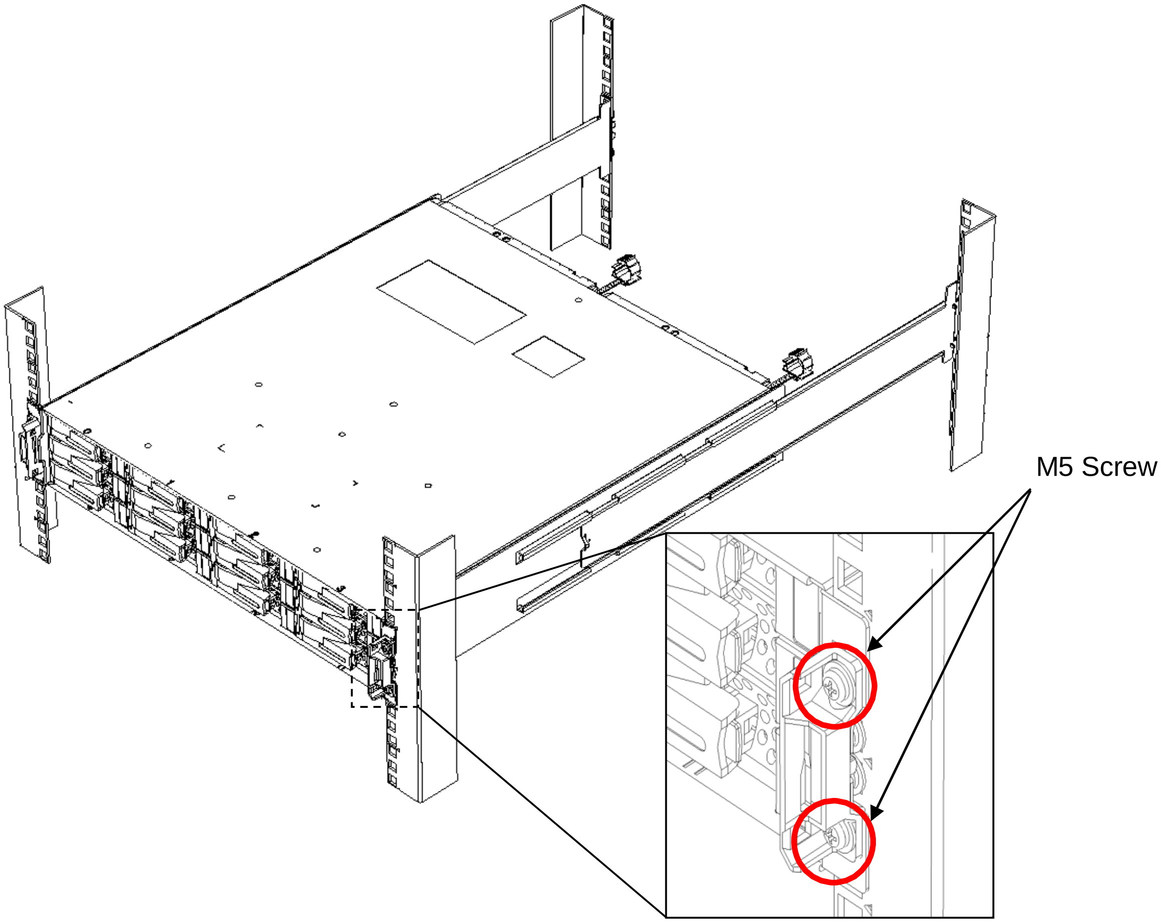

Right side when installed

(6) Also install rail (R) on the right-hand side of the rack by the same procedure.
Installation of the rack mount kit is complete.

(7) Mount units from the front of the rack.
Raise a unit, place the rear of it on the rail, and slide it in.

⚠	At least three people should perform the tasks of mounting a unit in a rack. Because the units are heavy, watch out for pinched fingers or other injuries. Do not drop a unit.

(8) From the front of the rack, affix the unit.
Affix the unit using M5 screws in two places each on the left and right of the front of the unit.
Mounting in the rack is complete.



4.2 Installation of Disk Drives

- Disk drives have a plug-in structure. Plug in each disk drive slowly.
- Carefully install disk drives one at a time.
  While powered on, insert the next disk drive after disk drives previously inserted are in a ready state.
- Always use new SAS/SATA disk drives.
  If a disk drive is diverted or reused, operation of the system cannot be guaranteed.
- Refer to 4.4 “Installing and Removing Front Panel” regarding how to install or remove the front panel.

1. Remove the front panel if installed.
2. Remove the dummy tray from where the additional disk drive will be installed.
3. Install the disk drive. (See the next page for details.)
4. Repeat steps (2) and (3) for each additional disk drive.

⚠

- A disk drive is an electronic component.
  When handling one, take measures against static electricity, such as using a wrist strap.
  If you do not have a wrist strap, firmly place one hand on the unpainted metal surface of the disk drive before handling it.
- You must mount three disk drives in locations 00, 01, and 02.
- Do not take out more than one of the disk drives inserted in locations 00, 01, and 02 at one time.
- Do not expose the disk array unit to excessive vibration or shock because it is precision equipment.
- When replacing the disk drive, confirm that the model number of a new one is the same as that to be replaced.

- Disk drives include SAS drives and SATA drives.
  This is printed on the front label.

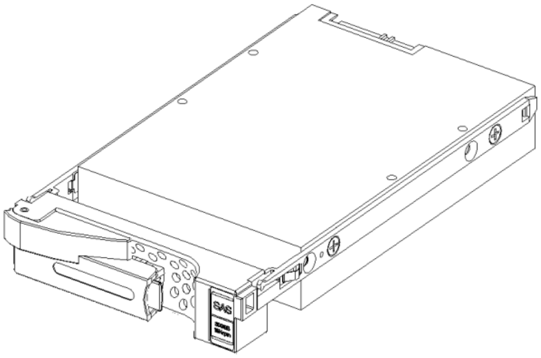


Figure 4.2.1 Disk Drive (SAS drive)

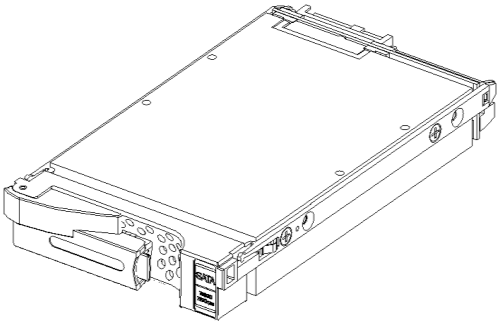
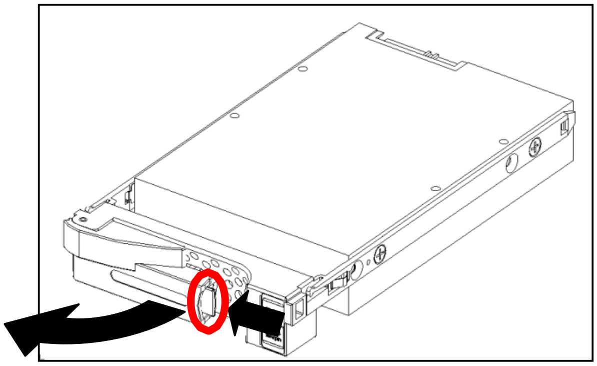


Figure 4.2.2 Disk Drive (SATA drive)

The disk drive installation procedure is described below.

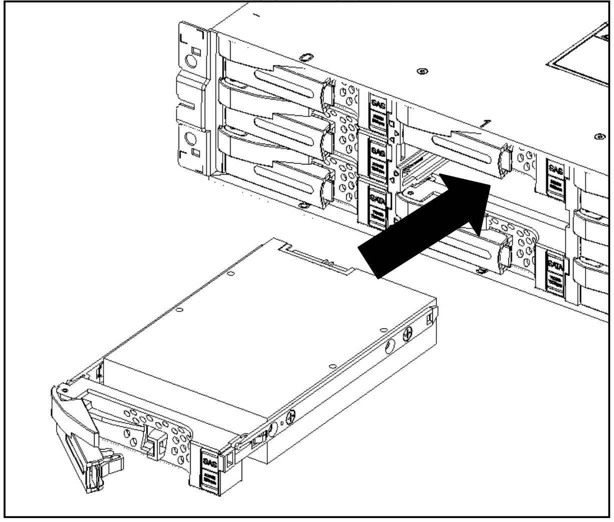
(1) Open the disk drive lever.
When shipped, the disk drive lever is closed.
Push the circled portion in the direction of the arrow and the open the lever 40 degrees while it is pushed.

Open the lever.



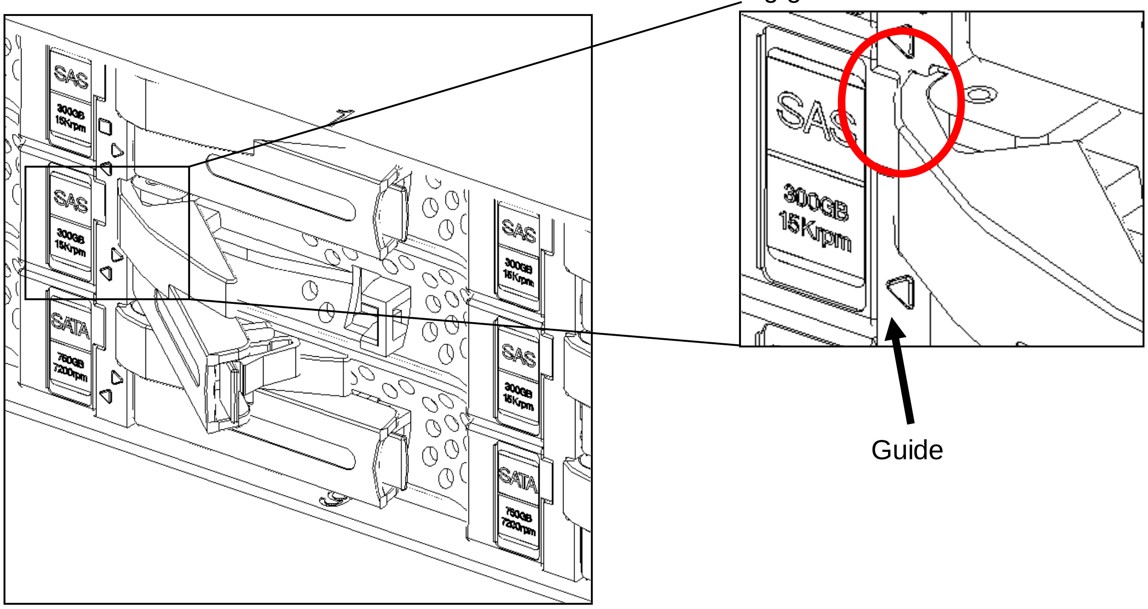
(2) Insert the drive in the unit.
With the lever opened 40 degrees insert the disk drive perpendicular to the front of the unit.

Insert the unit.



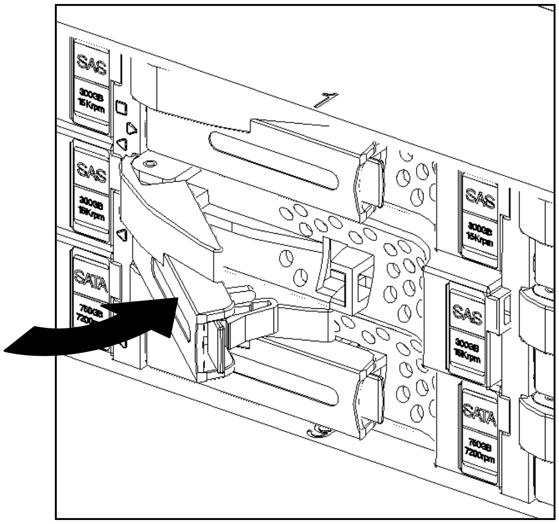
(3) Insert until the end of the lever touches the guide on the unit.

Insert until touching guide.



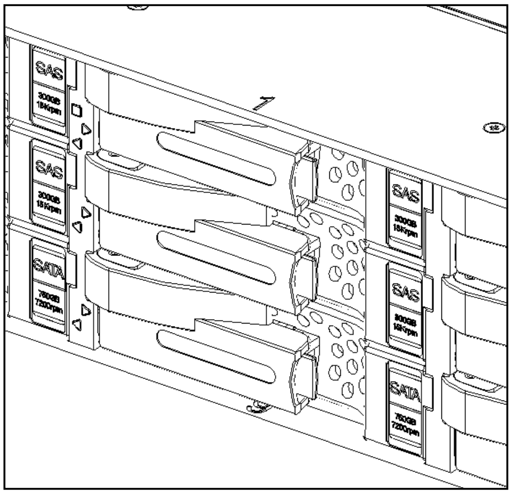
(4) Close the lever.
Close the lever all the way.

Close the lever.


SAS
300GB
15Krpm
SATA
750GB
7200rpm
1

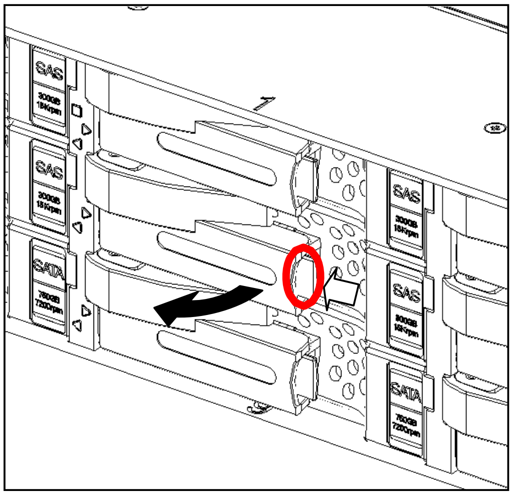
(5) The installation task is complete.

Complete

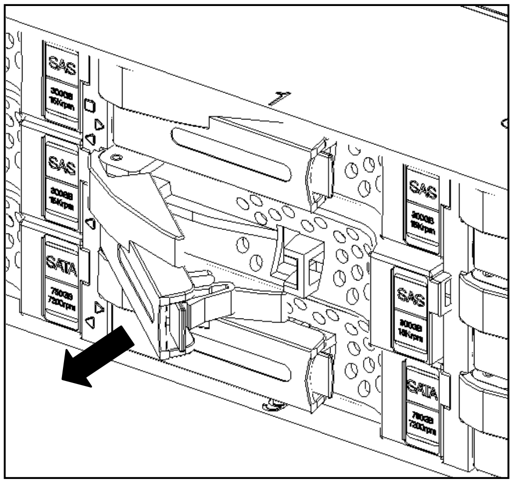

SAS
300GB
15Krpm
SATA
750GB
7200rpm
1

The disk drive removal procedure is described below.

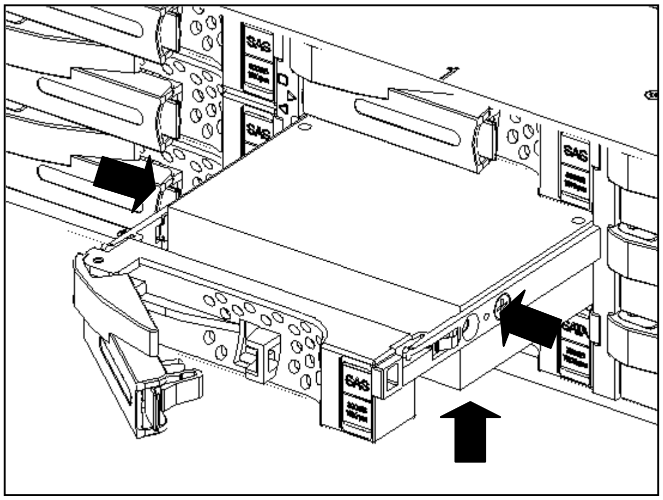
(1) Push the circled portion in the direction of the arrow and open the lever 40 degrees while it is pushed.



(2) Hold the lever and move the disk drive about 10 cm.



(3) With both hands, hold the sides and underside of the disk drive and pull it all the way out.



4.3 Setting AC Operating Mode

This disk array unit is equipped with an AC operating mode in which it is powered on when the AC power is turned on.

The AC operating mode is enabled when the unit is shipped. It can be disabled by changing DIP switch settings in the controller of the disk array unit. When the AC operating mode is disabled, power is controlled by the power button of the disk array unit.

> ⚠ When AC operating mode is disabled, the facility to control power using ESMPRO cannot be used since power to the control circuits on the controller is not on. To use the facility for power control by ESMPRO and NX coordination mechanisms (UPS), be sure to enable AC operating mode.

[How to change mode]

To disable AC operating mode by changing shipped state

Change the DIP switch by referring to 15.7 “Changing DIP Switches”.

Making the first switch (Bit1) of the DIP switch OFF disables AC operating mode.

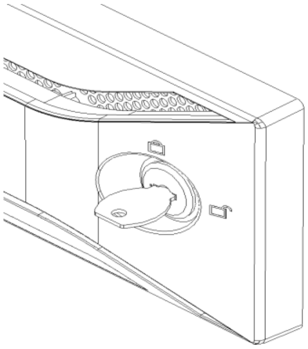
Making it ON enables AC operating mode.

> ⚠ Make the settings of CONT0 and CONT1 the same.

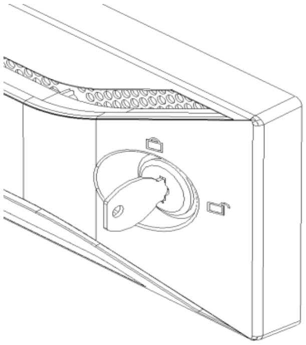
4.4 Installing and Removing Front Panel

State of mask key

- The left figure shows the key unlocked when the key is in a horizontal state.
- The right figure shows the key locked when the key is in a vertical state.



Shows key in unlocked state.



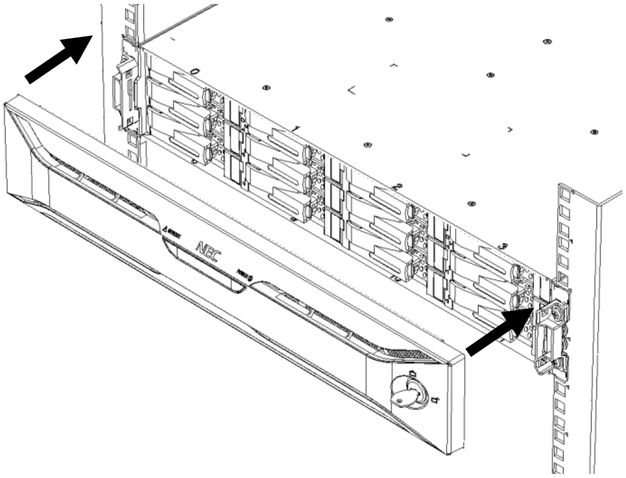
Shows key in locked state.

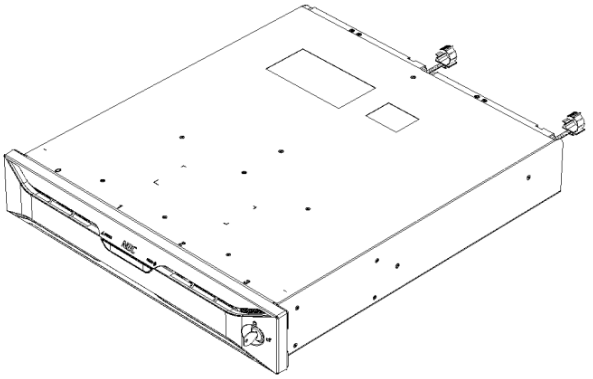
[Front panel installation procedure]

(1) To install the mask, first unlock it by turning the key to the horizontal position.

(2) Mate the mask to the top and bottom, left and right of the unit and push it straight in until it clicks.
* If it clicks, it has been installed accurately.

(3) After installing the mask, lock it by turning the key counterclockwise and mask installation is complete.

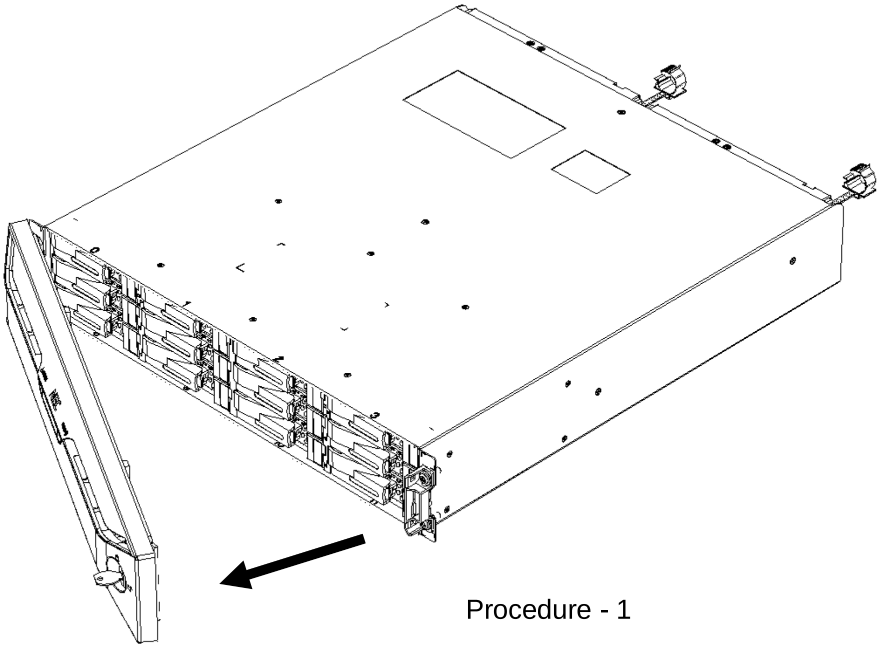




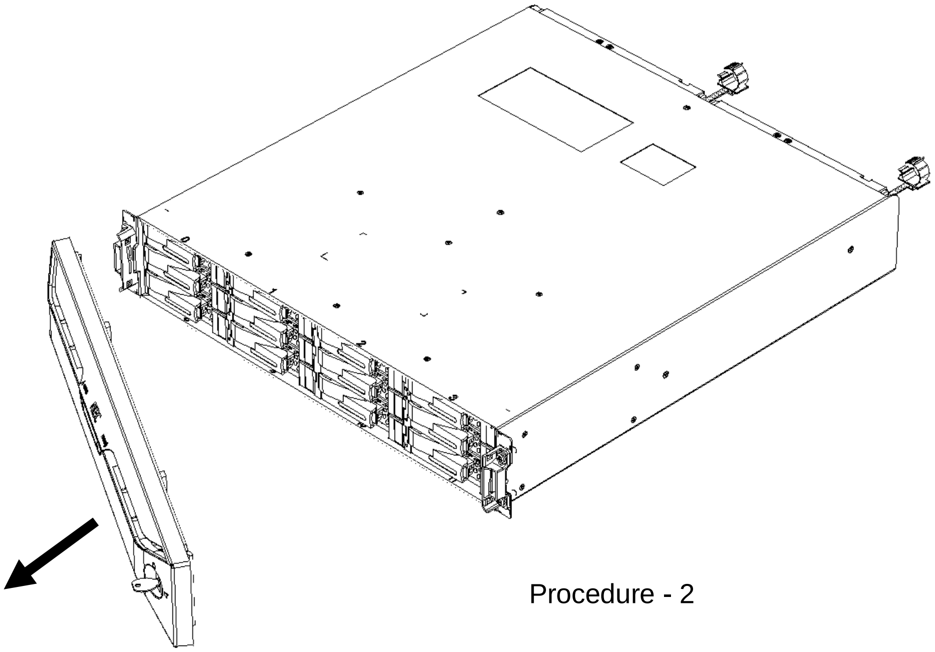
[Front panel removal procedure]

(1) Release the lock by turning the key clockwise.

(2) Pull the right side toward you by pivoting the left end, detach the left side, and pull the entire mask toward you.



Procedure - 1

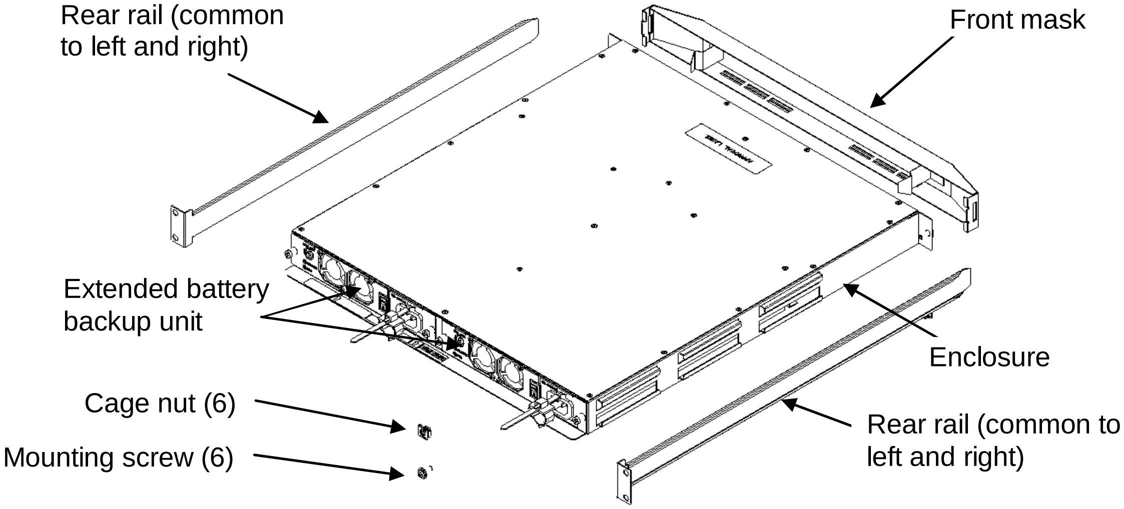


Procedure - 2

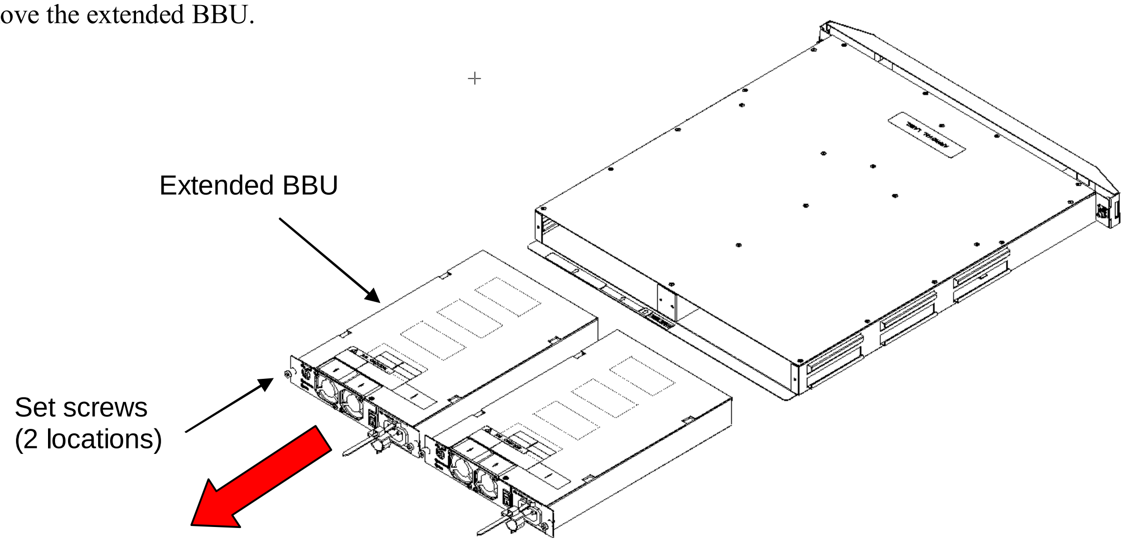
4.5 Mounting an Extended BBU on a Rack

■ List of included items for extended BBU

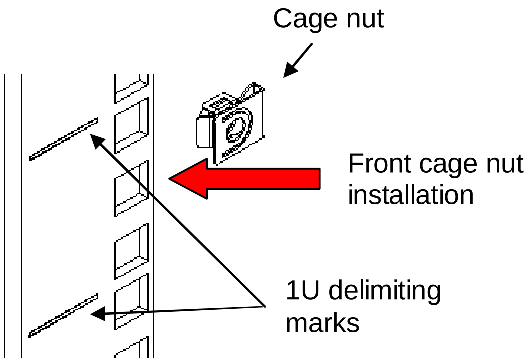
No.	Item Name	Qty.
1	Extended battery backup unit	2
2	Rack mount kit	1
	Enclosure	1
	Rear rail	2
	Core nut	6
	Screw	6
3	Front mask	1
4	AC cord assembly (100VAC, 3 m)	2
5	BBU-CONT connection cable	2
6	Warranty	1
7	List of Included Items	1


Rear rail (common to left and right)
Front mask
Extended battery backup unit
Enclosure
Cage nut (6)
Mounting screw (6)
Rear rail (common to left and right)

(1) For safety, remove the extended BBU from the chassis.
Loosen the set screws (2 per extended BBU) of the extended BBU and pull out and remove the extended BBU.

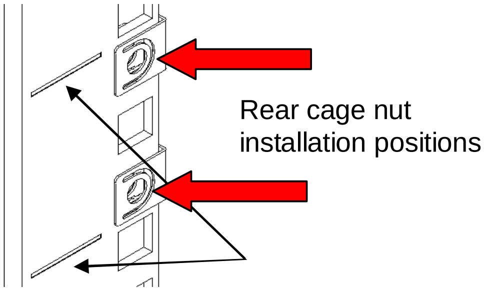

Extended BBU
Set screws (2 locations)

(2) Install cage nuts in the rack support.
Determine the position for installing cage nuts by looking at 1U delimiting marks on the rack.
The figure to the right shows the position in which to install a cage nut in the support on the front left side of the rack.
Install cage nuts on the left and right sides by inserting a nut in the center hole between 1U delimiting marks and catching the sheet metal in it.


Cage nut
Front cage nut installation
1U delimiting marks

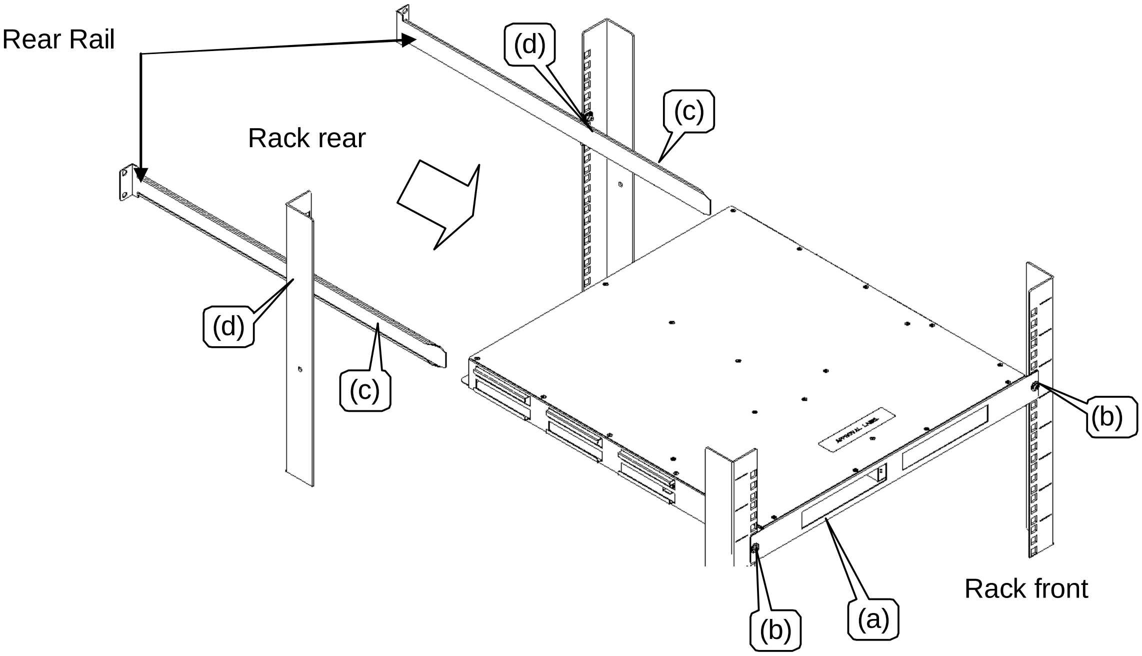
Rack front left side

The figure to the right shows the positions in which to install cage nuts in the support in the rear left side of the rack.
Install cage nuts on the left and right sides by inserting two of them in holes above and below 1U delimiting marks and catching the sheet metal in them.


Rear cage nut installation positions

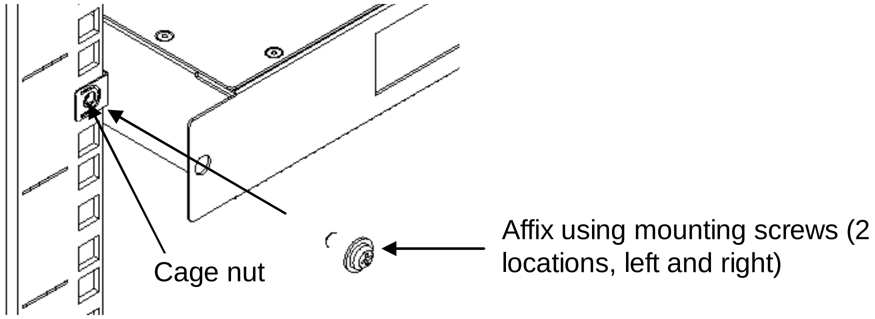
Rack rear left side

(3) Rack mounting chassis and rear rails
Work in order of the numbers in the figure below.

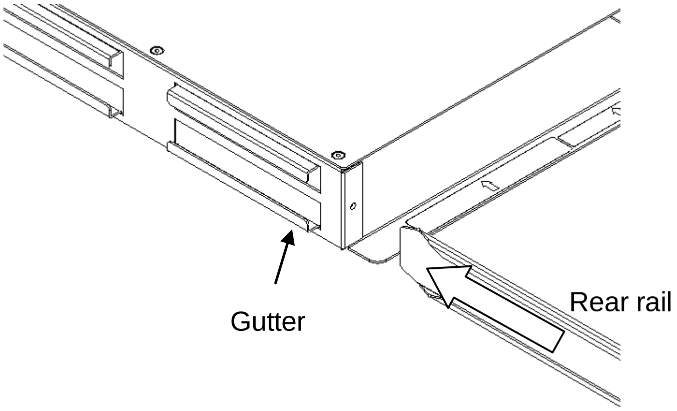

Rear Rail
Rack rear
(d)
(c)
(d)
(c)
(b)
(b)
(a)
Rack front

(a) Slowly insert the enclosure from the front of the rack.

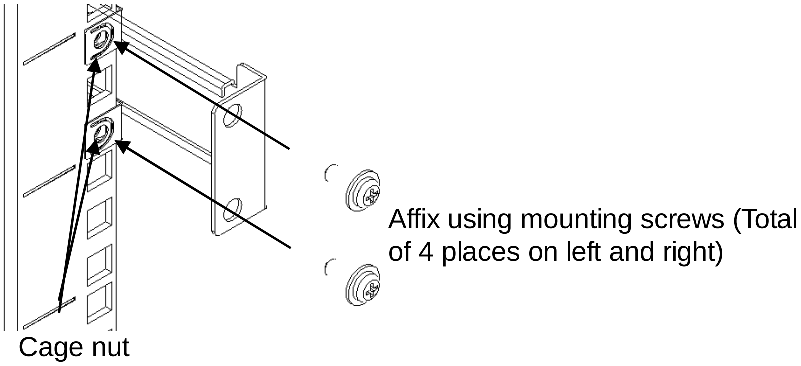
(b) Affix the enclosure to the attached cage nuts on the left and right using two mounting screws.


Cage nut
Affix using mounting screws (2 locations, left and right)

(c) From the rear of the rack, insert a rear rail in the gutters along the side of the enclosure and slide it forward


Gutter
Rear rail

(d) Affix the rear rail to the rack using two mounting screws.
Also affix a rear rail on the right side of the enclosure by the same method.

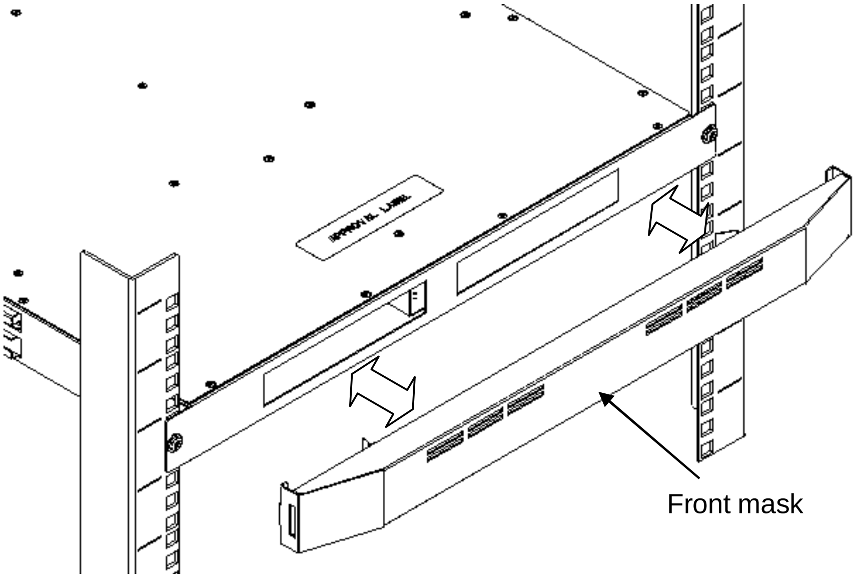

Affix using mounting screws (Total of 4 places on left and right)
Cage nut

(4) Mounting battery units
Return battery units to the enclosure and fasten them with set screws (2 per extended BBU) and rack mounting of the extended BBU is complete.

(5) Installation and removal of front mask

To install the front mask, mate the springs on back of the front mask to the edges of the enclosure cutouts and push in.

To remove the front mask, press the top and bottom or left and right sides of the front mask and pull it toward you.



5. Cable Connections

5.1 Notes on Cable Connections

Check the following for each cable connection of the disk array unit.

(1) Cables used for connections

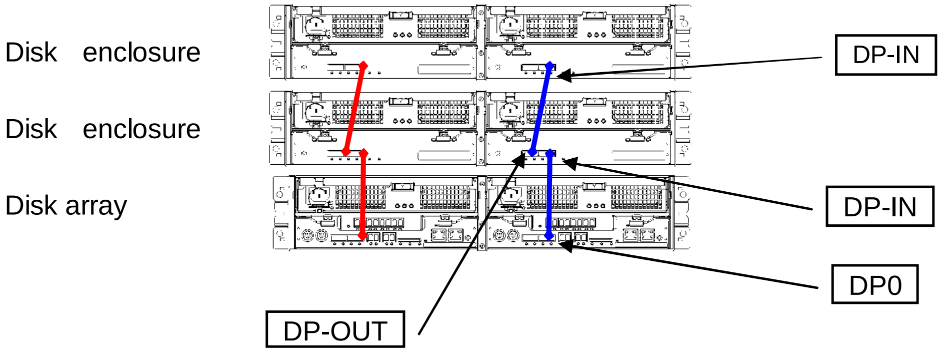
- Use the SAS cables that come with the disk array unit or ones specified by RAID to connect to power supplies.
- To connect the disk array unit to the host bus adapter or FC switch in the host, always use the FC cables specified by RAID.
- To connect the disk array unit and disk enclosures, always use the DE cables that come with the disk enclosures.

(2) Maximum length of FC cable

Host Interface	Maximum Cable Length
1 Gbps	500 m
2 Gbps	300 m
4 Gbps	150 m

5.2 Connection of SAS Cables

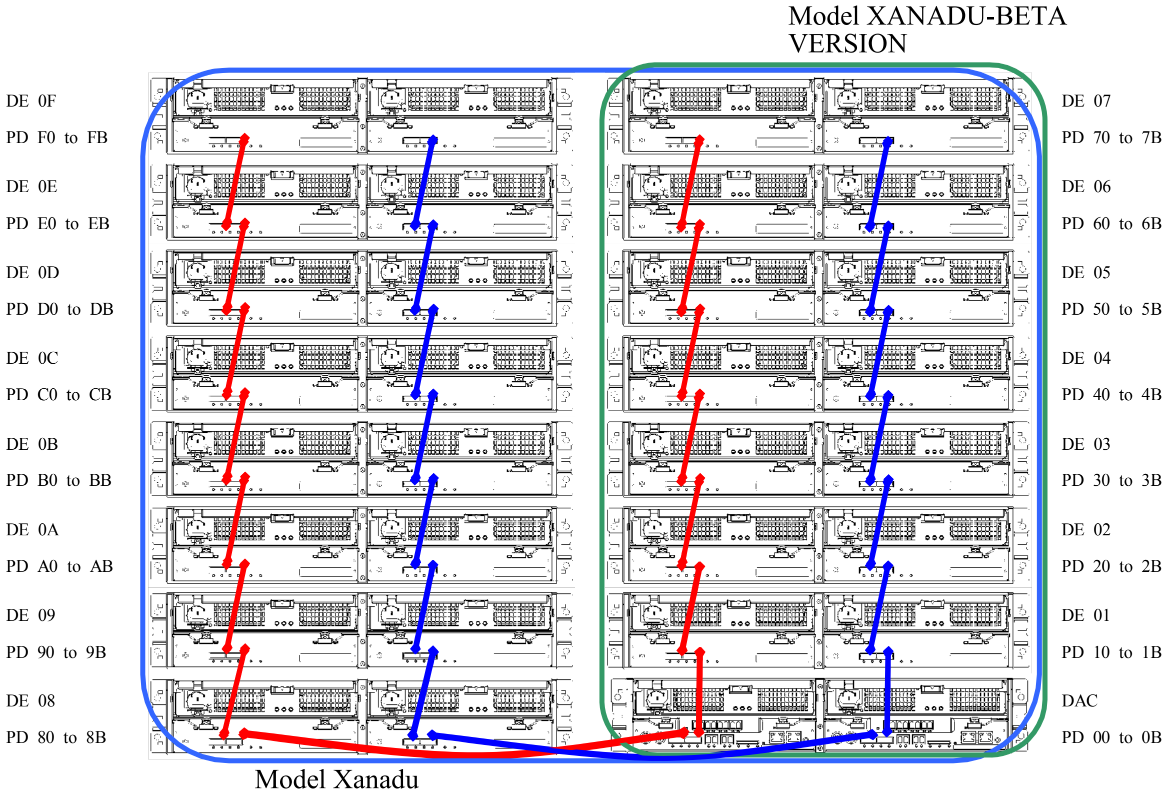
When connecting a disk enclosure, connect DP-IN on the disk enclosure to DP0 or DP1 on the disk array unit. To connect more than one disk enclosure, connect DP-IN on the next disk enclosure to DP-OUT on a previously connected disk enclosure.



5.3 SAS Cable Connections and DE and PD Numbers

This disk array configuration shows the Xanadu-beta version (a maximum of five DE can be connected) and the Xanadu (a maximum of eleven DE can be connected). Functions equivalent to “DE 00” are implemented in the DAC.

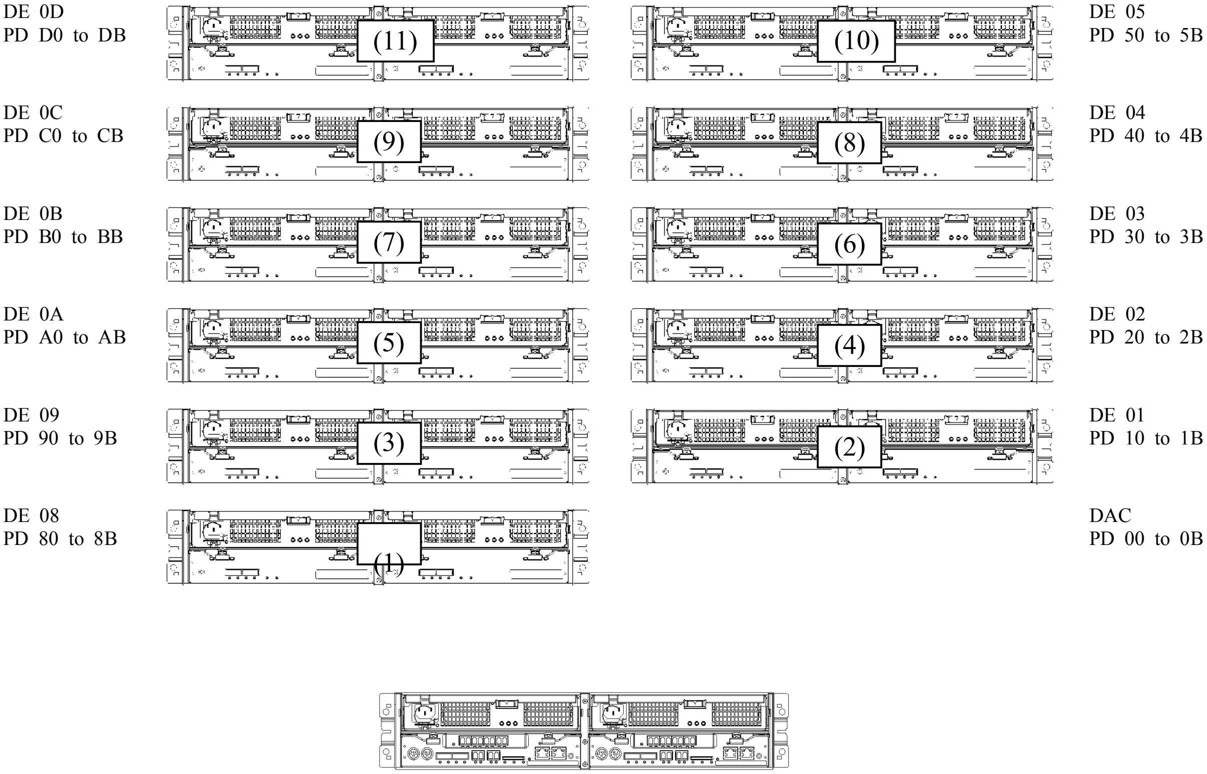
The figure below shows how to connect disk enclosures and the DE numbers and PD numbers.


Model XANADU-BETA VERSION
DE 0F
PD F0 to FB
DE 0E
PD E0 to EB
DE 0D
PD D0 to DB
DE 0C
PD C0 to CB
DE 0B
PD B0 to BB
DE 0A
PD A0 to AB
DE 09
PD 90 to 9B
DE 08
PD 80 to 8B
DE 07
PD 70 to 7B
DE 06
PD 60 to 6B
DE 05
PD 50 to 5B
DE 04
PD 40 to 4B
DE 03
PD 30 to 3B
DE 02
PD 20 to 2B
DE 01
PD 10 to 1B
DAC
PD 00 to 0B
Model Xanadu

For the model Xanadu, configuration in order of the numbers below is recommended

Example: In a configuration with 3 DE, connect DE in the order (1)(DE 08), (2)(DE 01), (3)(DE 09).

The order of DE configuration is shown below.


DE 0D
PD D0 to DB
(11)
(10)
DE 05
PD 50 to 5B
DE 0C
PD C0 to CB
(9)
(8)
DE 04
PD 40 to 4B
DE 0B
PD B0 to BB
(7)
(6)
DE 03
PD 30 to 3B
DE 0A
PD A0 to AB
(5)
(4)
DE 02
PD 20 to 2B
DE 09
PD 90 to 9B
(3)
(2)
DE 01
PD 10 to 1B
DE 08
PD 80 to 8B
(1)
DAC
PD 00 to 0B

5.4 Connection of Disk Array Unit to Business Server

Connect an FC cable between an RAID Storage host connection port (HP connector) and the business server.

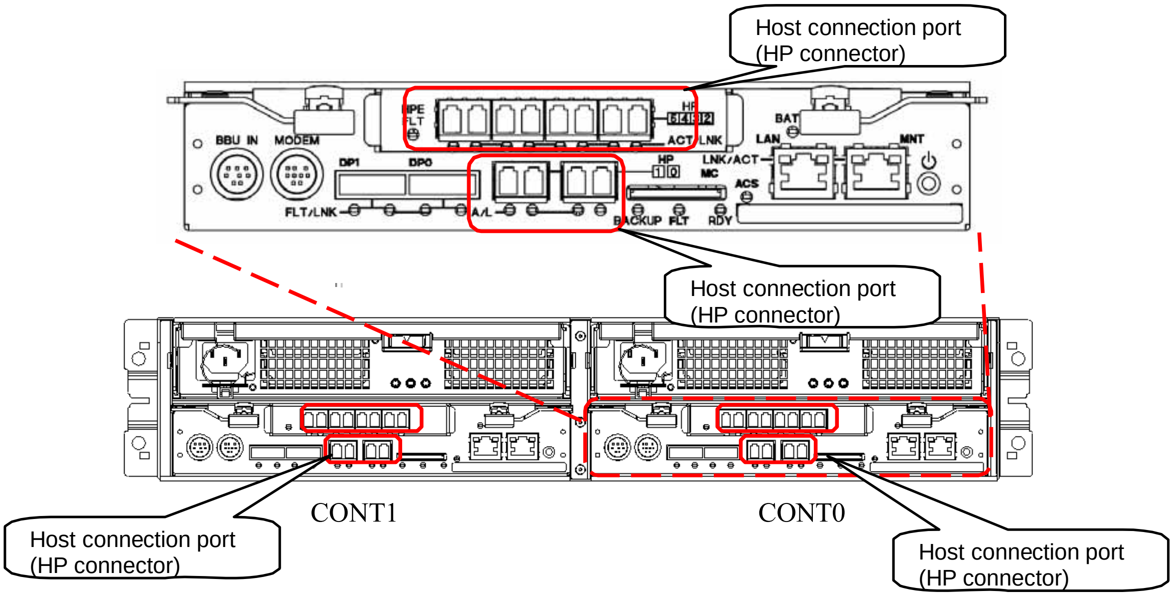

Host connection port (HP connector)
PE
FLT
HP
ACT/LNK
BAT
LAN
MNT
BBU IN
MODEM
DP1
DP0
HP
LNK/ACT
MC
ACS
FLT/LNK
A/L
BACKUP
FLT
RDY
Host connection port (HP connector)
Host connection port (HP connector)
CONT1
CONT0
Host connection port (HP connector)

Figure 5.4.1 Rear View of Disk Array Unit

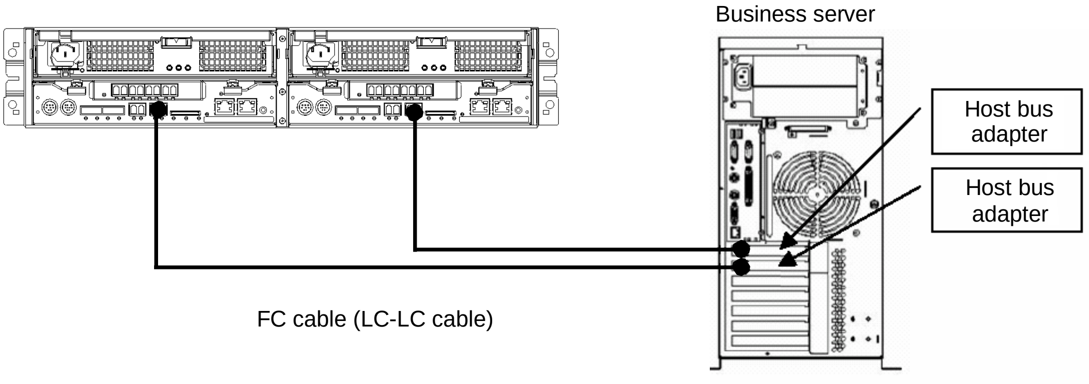
The figure below shows a sample recommended connection (a path redundant configuration in combination with PathManager).

The sample recommendation requires two host bus adapters to be installed in the host.

Two LC-LC cables are required to connect the disk array unit and host bus adapters.

A one-controller unit requires a single host bus adapter and a single cable.

Configuration sample:


Business server
Host bus adapter
Host bus adapter
FC cable (LC-LC cable)

* The dust-proof cover put on the host connection port of the controller is required when the controller is moved. Keep it in a safe place.

Connect the disk array unit to the business server with FC cables by the following procedure:

1. Checking power supplies

   Make sure that the plug of each power cable **is disconnected from** the outlet.

2. Connecting disk array unit to business server

   Push a separately purchased FC cable (LC-LC cable) into a host connection port (HPx) of a disk array unit controller (CONT0 or CONT1) until a click is heard. The connectors at both ends of the FC cable are the same.

   Connect the other connector of the FC cable to the connector of a host bus adapter installed in the business server.

   Similarly, connect the connector of the other host bus adapter to the other controller.

⚠ ■ Pushing the connectors excessively may damage their ends, which may decrease optical output and cause inferior operation.

5.5 Connecting LAN Cables

Various servers and clients connect to RAID Storage by LAN cables. The disk array unit, management server, and client must be connected in order to perform initial setup and monitoring of RAID Storage.

Configuration change and fault occurrence can be monitored for the disk array unit through LAN by using the management software Storage Manager. Storage Manager is required for using RAID Storage.

Connect separately purchased shielded LAN cables to the LAN ports (LAN connectors) for Storage Manager on the controllers.

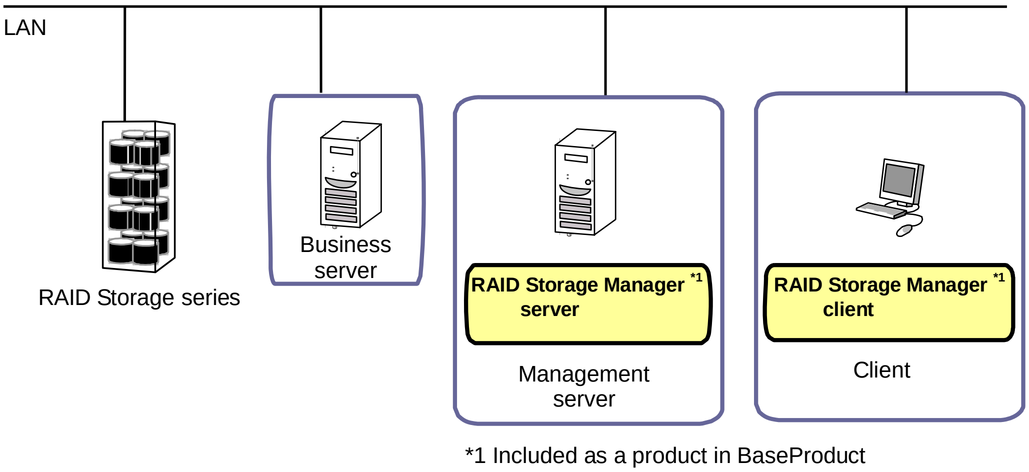

LAN
RAID Storage series
Business server
RAID Storage Manager *1 server
Management server
RAID Storage Manager *1 client
Client
*1 Included as a product in BaseProduct

Figure 5.5.1 Sample LAN Cable Connection Configuration

Although the Storage Manager server can be connected to CONT0 or CONT1, connect it on the CONT0 side if only connecting one. It is recommended that you set IP addresses for the CONT0 and CONT1 LAN ports for Storage Manager use individually to make them redundant and use them via Ether-HUB.

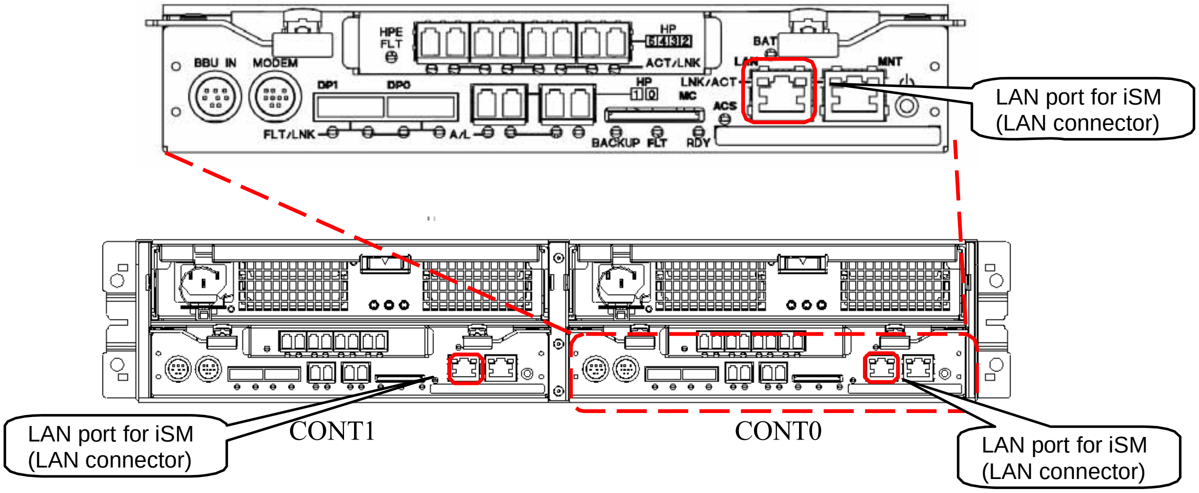

HPE
FLT
HP
5 4 3 2
ACT/LNK
BAT
LAN
MNT
BBU IN
MODEM
DP1
DP0
HP
1 0
LNK/ACT
MC
ACS
FLT/LNK
A/L
BACKUP
FLT
RDY
LAN port for iSM
(LAN connector)
LAN port for iSM
(LAN connector)
CONT1
CONT0
LAN port for iSM
(LAN connector)

Figure 5.5.2 Rear View of Controller Board

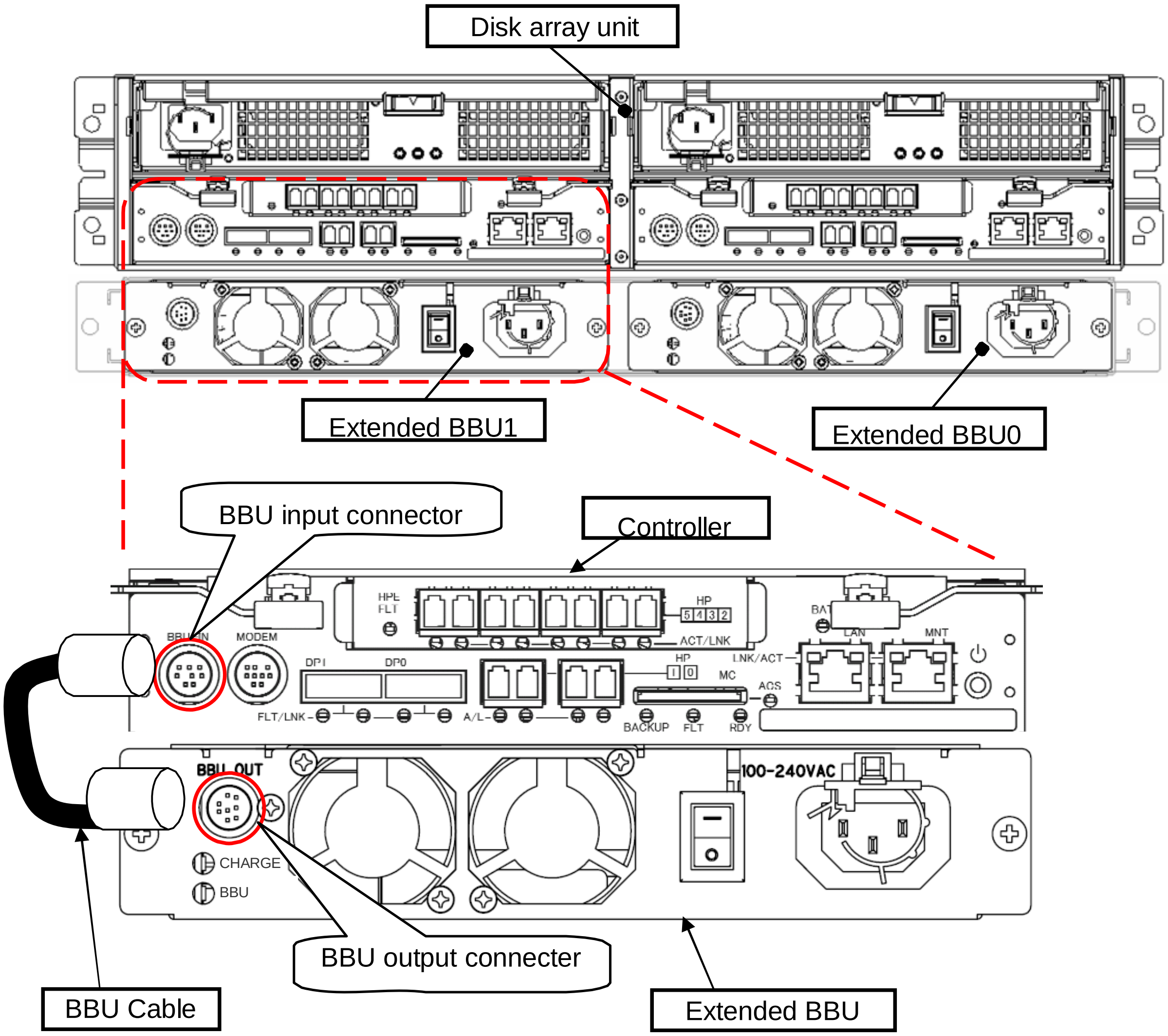
LAN cables used to connect to management server

- Use a shielded cross cable to connect a terminal to the unit directly.
- Use a shielded straight cable to connect a terminal to the unit via a hub.

5.6 Connection of Extended BBU and Controllers

Connect an extended BBU to the disk array unit using the BBU cable shipped with the unit.

(1) Mount the extended BBU directly below the disk array unit.



Disk array unit
Extended BBU1
Extended BBU0
BBU input connector
Controller
HPE FLT
HP
5 4 3 2
ACT/LNK
BAT
LAN
MNT
BBU IN
MODEM
DP1
DP0
HP
1 0
LNK/ACT
MC
ACS
FLT/LNK
A/L
BACKUP
FLT
RDY
BBU OUT
CHARGE
BBU
100-240VAC
BBU output connecter
BBU Cable
Extended BBU

(2) Connect BBU IN of the controller to BBU OUT of the extended BBU using BBU cable.

Use the BBU cable shipped with the extended BBU.

5.7 Connecting Power Cables

WARNING

- Do not put too many loads on a single outlet. Failure to follow this warning may cause fire to occur.
- Do not insert the plug of a power cord into an outlet with wet hands. Failure to follow this warning may cause electric shock to occur.
- Do not put heavy objects on power cords. The coverings of power cords may be damaged and cause fire or electric shock to occur.

- Since the AC operating mode is functioning in the shipped state, connect the AC cable of the disk array unit last.
- Use power cables that are shipped with the disk array unit.
  The disk array unit and disk array enclosures have dual power supply configurations so that they do not halt even if one power supply breaks down. When using this disk array unit, connect two power cables to the disk array unit and each disk enclosure.

(1) Before turning on the power, push each disk drive to make sure that it has not loosened.

(2) Connect disk enclosure power cables as in [Connection procedure].
Be sure to connect power supply PS0 and power supply PS1.
Check power connections of all installed disk enclosures.

(3) Turn off the AC switches of extended BBU.
Connect the power cables of extended BBU.
Turn on the AC switches of extended BBU.
Be sure to connect extended BBU BBU0 and extended BBU BBU1.

(4) Connect the power cable of the disk array unit.
Since the AC operating mode is functioning in the shipped state, it will be powered on when you connect the power cable if electricity is being supplied.

* AC operating mode can be changed by setting a DIP switch in the controller.

(5) Supply power after (4) if power is not supplied.

(6) Wait until the RDY LEDs start blinking at 1-second intervals. (Configuration takes a minimum of approximately 4 minutes and a maximum of approximately 7 minutes).

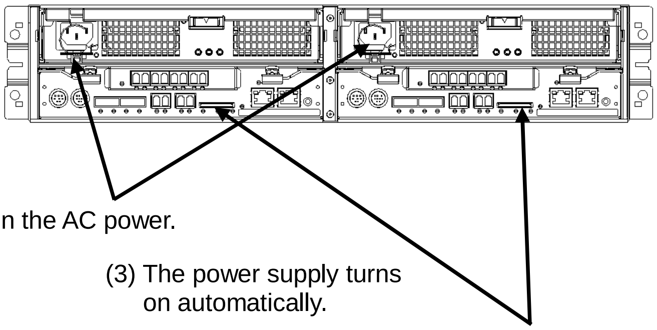
The disk array unit performs self-test and initialization. If the disk array unit is ready after completion of the self-test and initialization, the RDY LED on each controller changes from lighting to blinking.

(7) Confirm that the RDY LEDs start blinking and then turn on the power of the business server.

- Until the RDY LEDs blink, do not perform any operations using Storage Manager. If one or more disk enclosures are connected to the disk array unit, always turn on the AC power of the disk enclosures before turning on the power of the disk array unit.
- Wait until the RDY LEDs start blinking at 1-second intervals before turning on the power of the business server.

[Power-on procedure]

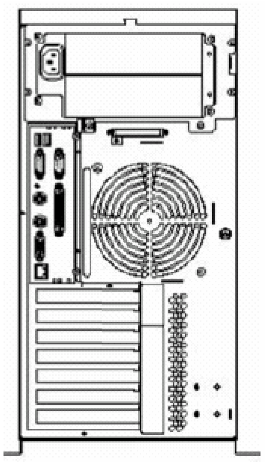
(1) Push each disk array securely to make sure that it is not loosened.



(2) Turn on the AC power.

(3) The power supply turns on automatically.

(4) Make sure that the RDY LEDs blink.



(5) Turn on the power of the business server.

Figure 5.7.1 Power-on Procedure

[Connection procedure]

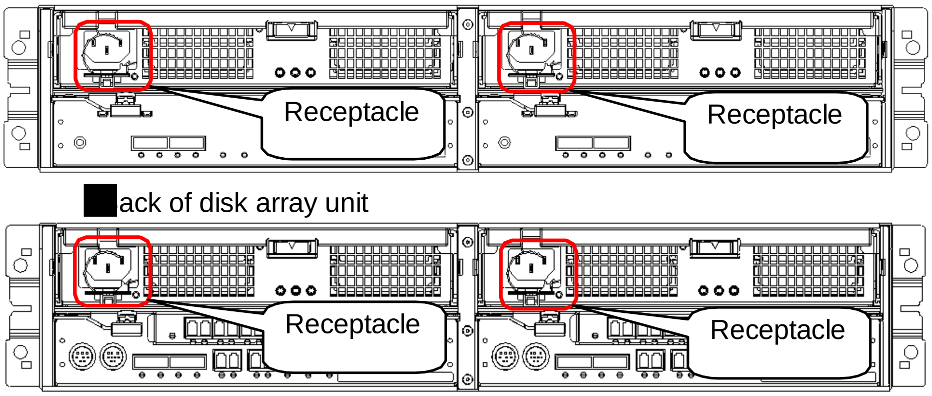
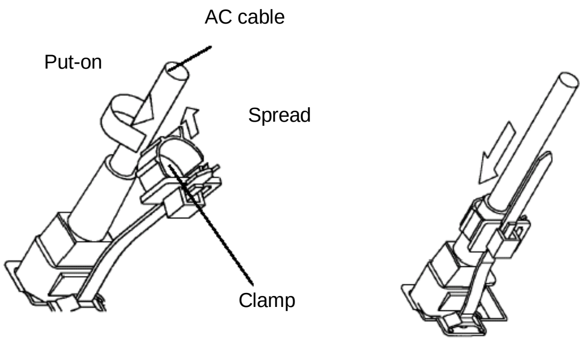

Receptacle
Receptacle
ack of disk array unit
Receptacle
Receptacle

Figure 5.7.2 Rear Views of Disk Array Unit and Disk Enclosure

(1) Spread the AC cable clamp, connect the power cable, and loosely lock the clamp.

(2) Move the clamp in the direction of the arrows and fix the clamp securely at a point close to the base of the plug.


AC cable
Put-on
Spread
Clamp

*** NOTE**

If the clamp is locked loosely, the power cable may come out. Fix the AC cable clamp securely at a point close to the base of the power cable.

6. Turning On/Off Unit Power

This chapter describes the procedure of turning on the power of the disk array unit and disk enclosures. The following procedure turns on the power of the disk array unit.

6.1 Power-on Procedure

Since the AC operating mode is functioning in the shipped state, power supplies are turned on by turning on the AC power. See 5.7 “Connecting Power Cables”.

6.2 Power-off Procedure

(1) When powering off, first turn off the power of the business server.

(2) Press the power button at the right end of the rear face of the disk array unit for at least five seconds.

(The READY LED blinks rapidly if power is disrupted.)

(If two controllers are installed, press the power button on either of the controllers. You need not press both buttons.)

(Pressing the power button for 15 seconds or longer continuously forcibly turns off the power, which may be bad for the disk array unit. Accordingly, stop pressing the button as soon as possible after power-off is accepted.)

In this processing, the disk array unit writes to disk all data in the cache that has not yet been written to disk. After writing is completed, it turns off the DC power in the unit.

(3) The power of the disk array unit and of disk enclosures is turned off within ten minutes. (All LEDs other than those on the power supplies go off and the fans stop rotating.)

(4) Turn off the AC power of the disk array unit, extended BBU, and disk enclosures. Disconnect the AC power of the disk array unit and disk enclosures by unplugging the AC input receptacle or disconnecting it at a breaker.

[Power-off procedure]

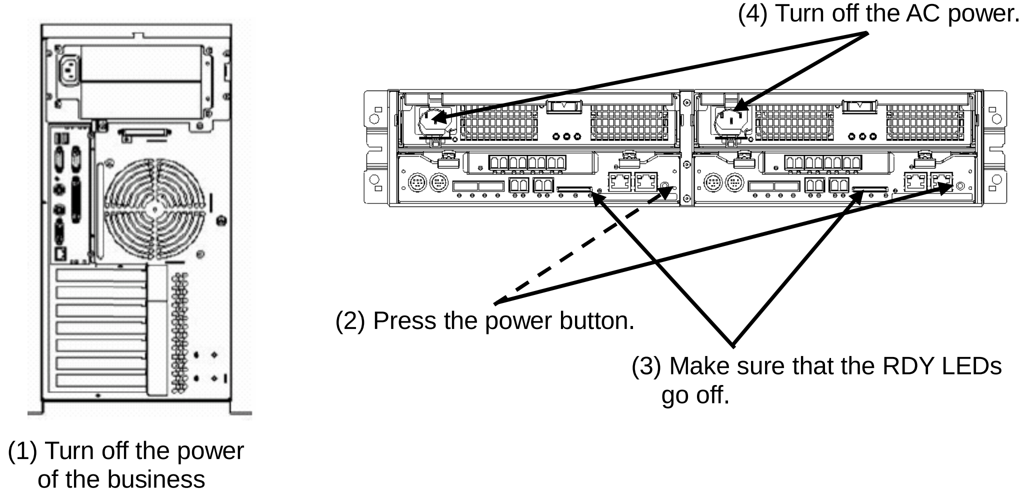

(4) Turn off the AC power.
(2) Press the power button.
(3) Make sure that the RDY LEDs go off.
(1) Turn off the power of the business server.

Figure 6.2.1 Power-off Procedure

- Start power-off for the disk array unit and disk enclosures after power-off of the business server is completed.
- Turn off the AC power only after the RDY LEDs go off.
- If one or more disk enclosures are connected to the disk array unit, always turn off the AC power of the disk enclosures after power-off of the disk array unit is completed.

6.3 Powering On When AC Power Has Not Been Turned Off

If the AC power was not turned off on turning off power supplies, power-on using the procedure below.

(1) Press the power button on the right end of the rear surface of the disk array unit for three or more seconds.

(Continue to press it until the DC power supply is turned on.)

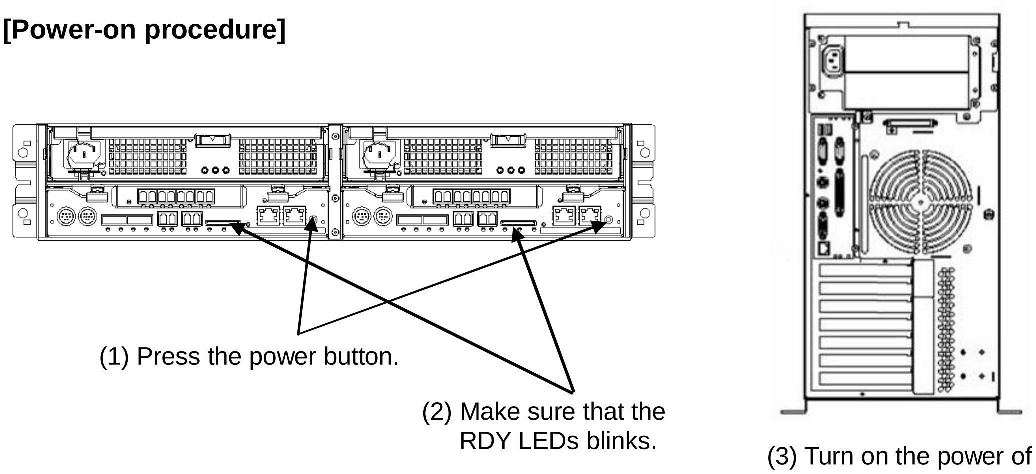
(For a two-controller mode, press the power button of either controller.
You need not press both.)

(2) Wait until the RDY LED blinks at 1-second intervals. (This takes about two minutes.) The

disk array unit performs self-test and initialization. If the disk array unit is ready after completion of the self-test and initialization, the RDY LED on each controller changes from lighting to blinking.

(3) Confirm that the RDY LEDs start blinking and then turn on the power of the business server.

[Power-on procedure]



(1) Press the power button.

(2) Make sure that the RDY LEDs blinks.

(3) Turn on the power of the business server

Figure 6.3.1 Power-on Procedure

6.4 Notes on Turning Off the AC Power

If you disconnect the AC power without performing the procedures in 6.2 “Power-off Procedure” or 6.5 “Power Control Means Besides Power Button”, the disk array unit saves the cache by battery.

This unit retains the cache by battery if you turn off the AC power without turning off the power supply.

The retention time of the battery is limited. Always turn off the AC power after tuning off the power supply.

If you try to retain the cache past the retention time of the battery, you will lose the data in the cache.

To recover, data must be restored from backup data saved on magnetic tape or other media.

It takes **up to 8 hours** from the battery being discharged until it is fully charged.

When it is not fully charged, fast writing that uses the cache (Cache Fast Write) is not done, which lowers performance.

Since the cache cannot be retained at power-off, data is written to disk without using the cache.

The retention time of a battery that is not fully charged cannot be guaranteed.

■ Startup when data in the cache has been lost

1. After you turn on the unit, the service LED iterates blinking for 5 seconds and going out for 7 seconds. The unit does not start normally.
2. Turn off and then turn on the unit.
3. It starts normally.
4. Charging the battery takes up to 8 hours.

■ Battery backup retention time

Product Name	Without Extended BBU	With Extended BBU
Xanadu-beta version	24 hours	120 hours (5 days)
Xanadu	24 hours	72 hours (3 days)

■ The extended BBU varies by Product Name.

■ Notes on using snapshot function

Update difference management information for data managed by the snapshot facility is in cache memory.

If update difference management information in cache memory is volatilized due to power-off in which the disk array unit battery backup time is exceeded when power to the disk array unit was disconnected by performing the procedure in 6.2 “Power-off Procedure”, the next time the disk array unit starts, it copies the update difference management information from disk drives to cache memory.

Because of this, the startup time of the disk array unit is delayed approximately 10 seconds per TB of update differences.

Note: If update difference management information in cache memory is volatilized due to power-off in which the battery backup time is exceeded when power to the disk array was disconnected without performing the procedure in 6.2 “Power-off Procedure”, the next time the disk array unit starts, it refreshes update difference management information from disk drives and copies it to cache memory.

The startup time of the disk array unit in this case is delayed approximately 10 minutes per TB of update differences.

■ Notes on using DynamicDataReplication/RemoteDataReplication

Update difference management information (= storage system information) for data managed by the data replication function is in cache memory.

If storage system information in cache memory is volatilized due to power-off in which the disk array unit battery backup time is exceeded when power to the disk array unit was disconnected by performing the procedure in 6.2 “Power-off Procedure”, the following matters require attention.
Note: DynamicDataReplication/RemoteDataReplication are functions of the Xanadu.

Main Operating State	Synchronized State	Pair State
Separate state	Separated state	Entire area is differences. State does not change.
	Separating	Changes to FAULT state and copying is halted.
Replicate state	Replicating	Entire area is differences and Replicate is automatically tried again from the beginning.
	Synchronous state	State does not change.
Restore state	Restoring	Entire area is differences and Replicate is automatically tried again from the beginning.
	Synchronous state	State does not change.

To restore a faulted pair, perform the replication operation below.

1. Execute the Forced Separate operation on the RV subject.
2. Execute an operation that returns to the previous state again (Replicate → Separate or Restore).

Note: Although copying is started again, it is a full copy operation to which all areas of a logical disk are subject.

About the storage system information save function

The storage system information save function backs up storage system information to the storage system volume. (The storage system volume is configured on disk drives.)

If storage system information in cache memory is volatilized due to power-off in which the disk array unit battery backup time is exceeded when power to the disk array unit was disconnected by performing the procedure in 6.2 “Power-off Procedure”, the next time the disk array unit starts, it is restored from the storage system volume to cache memory. Accordingly, it is not a full copy operation the first time that data is replicated. When using the data replication function, it is recommended that you configure a storage system volume.

Storage system volume configuration is performed by Storage Manager.

6.5 Power Control Means Besides Power Button

Control Means	Host OS	Features
ESMPRO (UPS coordination)	Windows Linux	Coordination with a host is possible by using a server for power control. For details, check ESMPRO.
ESMPRO (Autorun)	Windows Linux	Automatic running is possible by using a server for power control. For details, check ESMPRO.
NX UPS coordination (NQH-55/07 series UPS coordination)	HP-UX Windows Linux	This is an NX exclusive power control means. For details, check with your sales agent.
UPS (No UPS coordination)	Unspecified	This is for countering momentary power interruption. Since there is no UPS coordination, the cache cannot be retained if the battery backup retention time described in 6.4 "Notes on Turning Off the AC Power" is exceeded.

* Coordination refers to a mechanism that notifies the unit that AC input to the UPS was disconnected and begins shutdown processing.

- When using UPS, duplex them by connecting them to each power supply of the unit.
- Do this so that CONT0 and CONT1 are not simultaneously disconnected from AC power on a fault on one UPS.

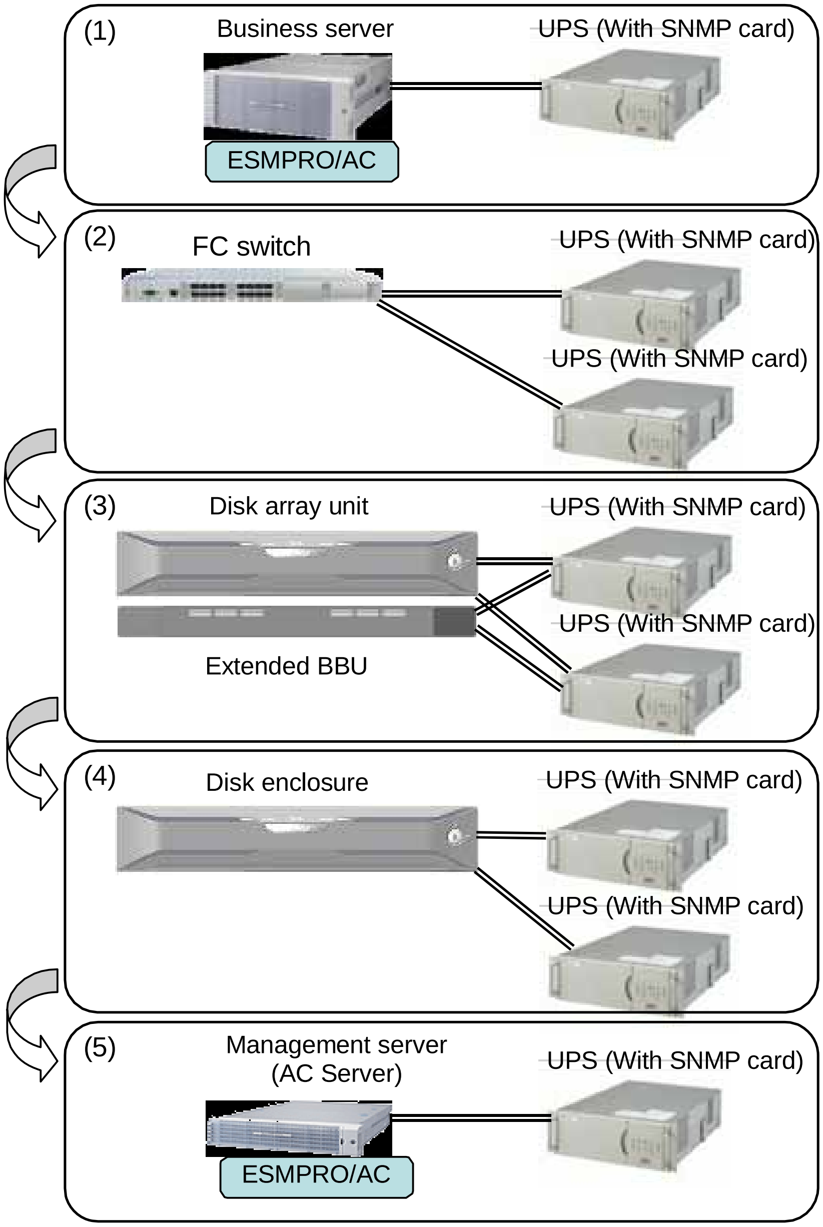
6.6 Notes on UPS Coordination and Automatic Running

Pay attention to the AC power-off sequence when using ESMPRO or NX UPS.

■ AC power-off sequence

(1) Business server [redacted]) FC switch [redacted]) Disk array unit (including extended BBU) [redacted]
(4) Disk enclosure [redacted]) Management server (ESMPRO only)

There is no designated AC power-off sequence for multiple disk enclosures.


(1)
Business server
UPS (With SNMP card)
ESMPRO/AC
(2)
FC switch
UPS (With SNMP card)
UPS (With SNMP card)
(3)
Disk array unit
UPS (With SNMP card)
UPS (With SNMP card)
Extended BBU
(4)
Disk enclosure
UPS (With SNMP card)
UPS (With SNMP card)
(5)
Management server
(AC Server)
UPS (With SNMP card)
ESMPRO/AC

7. Installation of Storage Manager in a Windows Environment

Install the Storage Manager server software on the management server, and the volume list command on the business server.

7.1 Installation and Initial Setup of Storage Manager Server

Storage Manager server installation is done from “Storage Manager Setup”.

“Storage Manager Setup,” which starts up when you insert the CD, makes it easy to install Storage Manager server by following the instructions in the screens.

Refer to the “Storage Manager Installation Guide” for details. You will find the manual on the Storage Manager CD.

The procedure for using “Storage Manager Setup” is as follows.

(1) Login as a user with administrator privileges.

(2) Insert the Storage Manager CD on the management server.

(3) “Storage Manager Setup” starts automatically. Install the Storage Manager server by following the screen instructions.

Depending on the environment in which it is used, the program may not start automatically. In that case, directly start the following on the CD.

```
¥INSTALL¥WINDOWS¥ISMINST.EXE
```

7.2 Installation and Volume List Command

If ControlCommand has been installed as in 7.3 “Installation of ControlCommand”, this task is unnecessary.

7.2.1 Prior to Setup

Before beginning the volume list command (iSMvollist command) installation, be sure of the following.

- By installing the volume list command, the functions of the host information collection command (iSMcc_hostinfo) and iSM Host Agent Service become available.
- Refer to the “Storage Manager Installation Guide” for details about OS environments in which the host information collection command (iSMcc_hostinfo) and iSM Host Agent Service can be used.

7.2.2 Installation

Install the volume list command by following the procedure below.

Refer to the “Storage Manager Installation Guide” for details. You will find the manual on the Storage Manager CD.

(1) Login as a user with administration privileges.

(2) Insert the Storage Manager CD on the business server.

(3) “Storage Manager Setup” starts automatically. Install the volume list command by following the screen instructions.

Depending on the environment in which it is used, the program may not start automatically. In that case, directly start the following on the CD.

¥INSTALL¥WINDOWS¥ISMINST.EXE

7.3 Installation of ControlCommand

If ControlCommand has not been purchased, this task is unnecessary.

7.3.1 Prior to Setup

Before beginning ControlCommand installation, be sure of the following.

- By installing ControlCommand, functions of the host information collection command (iSMcc_hostinfo) and iSM Host Agent Service become available.
- Refer to the “ControlCommand on Windows Installation Guide” for details about OS environments in which the host information collection command (iSMcc_hostinfo) and iSM Host Agent Service can be used.

7.3.2 Installation

Install ControlCommand according to the procedure below.

Refer to the “ControlCommand on Windows Installation Guide” for details.

You will find the manual on ControlCommand on Windows CD.

By installing ControlCommand, the functions below become available.

ReplicationControl
ReplicationControl/DisasterRecovery
* Cannot be used on D1 series or D3 series units
SnapControl
ProtectControl
PowerControl
Storage Manager volume list command (iSMvollist)

If any of the software below has already been installed, uninstall all of it before you install ControlCommand.

If ReplicationControl/DisasterRecovery has been installed, you must uninstall ReplicationControl/DisasterRecovery before you uninstall

ReplicationControl
ReplicationControl/DisasterRecovery
SnapControl
Storage Manager volume list command *
ControlCommandSet or ControlCommand

* If the Storage Manager volume list command that is installed is Ver5.1 or later and coincides exactly with the version of ControlCommand, you can install ControlCommand by overwriting with the Storage Manager volume list command installed.

The version of the software that you install must support disk arrays that are connected to the server.

Moreover, if a disk array has RemoteDataReplication configured, the remote disk array to which it connects must also be supported.

If you apply quota management*1 or file screening*2 to the disk or folder that is the installation destination, be sure to use it appropriately. When these are used erroneously, there can be problems during installation or during operation.

*1 This is a facility for setting a limit on used capacity and making it impossible to use more than the set limit.

*2 This is a facility for making it impossible to save a file of a specific file name (extension).

After installing ControlCommand, to use it from the Windows task scheduler or from previously installed job scheduling software, you must restart the system in order for the path name of the executable file that was installed to be recognized and to start the installed iSM Host Agent Service.

(1) Login as a user with administrator privileges.

(2) Insert the ControlCommand CD on the business server and execute the following installation program on the CD drive.

```
¥iSMCCS¥SETUP.EXE
```

(3) Follow the instructions of the installer.

8. Installation of Storage Manager in a Linux Environment

Install the Storage Manager server software (hereafter, referred to as the Storage Manager server) on the management server, and the volume list command on the business server.

8.1 Installation of Storage Manager Server

8.1.1 Installation of Storage Manager Server

Install the Storage Manager server by following the procedure below.

Refer to the “Storage Manager Installation Guide” for details. You will find the manual on the Storage Manager CD.

(1) Login as root.

(2) Insert the Storage Manager CD on the management server.

* For servers on which the CD cannot be used, file transfer iSMsvr.rpm from another server.

(3) Mount the CD.

■ Create the mount directory (For example, /cdrom)

■ Mount using the mount command

```
mount -r    /dev/cdrom    /cdrom
```

(4) Install using the rpm command.

```
rpm -ivh    /cdrom/SERVER/LINUX/iSMsvr.rpm
```

(5) Installation is complete when the message below is output.

```
Installation of iSMsvr was successful.
```

(6) Unmount the CD.

■ Unmount using the umount command

```
umount /cdrom
```

8.1.2 Storage Manager Server Environment Setup

In order to start the Storage Manager server, environment setup is needed.

The Storage Manager server is supplied with a sample environment definition file (/etc/iSMsvr/iSMsvr.conf) for each character code. A sample file for the minimum possible environment setup for the D series (iSMsvr.easy-D.sample) is shown in the references here. Refer to the “Storage Manager Installation Guide” for other sample files. Explanations of each parameter are also given in comments in the sample files.

(1) Copy iSMsvr.easy-D.sample to create an environment definition file.

```
# cp iSMsvr.easy-D.sample iSMsvr.conf
```

(2) Edit the copied iSMsvr.conf and make the following settings.

(a) Disk array IP settings

When using the initialization wizard to perform initialization, disk array IP settings are not needed.

(b) Set the user to specify when connecting from the Storage Manager client

When using the initialization wizard to perform initialization, the user settings for a system administrator (L3) are needed.

```
     login1 = (iSM     , iSM      , L1)
#    login2 = (username, password , L3)
```

Remove the commenting out (#) of the line above and input the login2 user name and password. An L3 user is at the user level of a system administrator to whom all operations are available. The password value can be encrypted.

(c) Setting of Web browser destination port number

```
#    web_port_no = 8070
```

If the default port number above conflicts with another application, remove the commenting out (#) of the above line and change the port number.

(d) Setting of operation log file

```
#    file_directory = /opt/iSMsvr/etc/log/
```

To change the directory storing the operation log from the above default value, remove the commenting out (#) of the above line and change the path.

(3) Check the syntax of the environment definition file

```
#iSMsvr check
 Verifying syntax(/etc/iSMsvr/iSMsvr.conf)...success
 Verifying disk free space(/opt/iSMsvr/etc/log/)...success
```

The iSMsvr check command checks in advance for syntax errors in the environment definition file and for insufficient disk capacity where the Storage Manager server operation log is stored. If there is not sufficient free capacity, change the directory for storing the operation log (default value: /opt/iSMsvr/etc/log). Specify the -p option to encrypt the user password value specified when connecting from the Storage Manager client.

(4) Starting the Storage Manager server

```
#iSMsvr start
```

Enter the start command (iSMsvr start) or restart Linux to start the Storage Manager server. If you wish to avoid having the Storage Manager server start automatically due to a system restart, refer to “Server Start/Stop” in the “User’s Manual (UNIX)”.

8.2 Installation of Volume List Command

If ControlCommand has been installed as in 8.3, this task is unnecessary.

8.2.1 Prior to Setup

Before beginning volume list command (iSMvollist command) installation, be sure of the following.

- By installing the volume list command, the functions of the host information collection command (iSMcc_hostinfo) becomes available.
- Refer to the “Storage Manager Installation Guide” for details about OS environments in which the host information collection command (iSMcc_hostinfo) and iSM Host Agent Service can be used.

8.2.2 Installation

Install the volume list command by following the procedure below.

Refer to the “Storage Manager Installation Guide” for details. You will find the manual on the Storage Manager CD.

(1) Login with root authority or switch to root authority.

(2) Confirm that none of the following software is installed.

iSMrpl (ReplicationControl)
iSMrcd (ReplicationControl/DisasterRecovery)
iSMsc (SnapControl)
iSMvol (Storage Manager volume list command)
iSMccs (ControlCommandSet or ControlCommand)

```
rpm -q   iSMrpl
rpm -q   iSMrcd
rpm -q   iSMsc
rpm -q   iSMvol
rpm -q   iSMccs
```

If any of these are installed, uninstall them.

(3) Insert the CD on the business server.

For servers on which the CD cannot be used, file transfer iSMvol.rpm from another server.

(4) Mount the CD.

- Create the mount directory (For example, /cdrom)
- Mount using the mount command

```
mount -r   /dev/cdrom    /cdrom
```

(5) Install using the rpm command.

```
rpm -ivh /cdrom/VOLLIST/LINUX/iSMVOL/iSMvol.rpm
```

(6) Installation is complete when the message below is output.

```
Installation completed.
```

(7) Unmount the CD.

■ Unmount using the umount command

```
umount /cdrom
```

8.3 Installation of ControlCommand

If you have not purchased ControlCommand, this task is unnecessary.

8.3.1 Prior to Setup

Before beginning ControlCommand installation, be sure of the following.

- By installing ControlCommand, the functions of the host information collection command (iSMcc_hostinfo) become available.
- Refer to the "ControlCommand on Linux Installation Guide" for details about OS environments in which the host information collection command (iSMcc_hostinfo) can be used.

8.3.2 Installation

Install ControlCommand by using the Linux rpm command and following the procedure below. Refer to the "ControlCommand on Linux Installation Guide" for details. You will find the manual on ControlCommand on Linux CD.

By installing ControlCommand, the functions below become available.

ReplicationControl
ReplicationControl/DisasterRecovery
* Cannot be used on D1 series or D3 series units
SnapControl
ProtectControl
PowerControl
Storage Manager volume list command (iSMvollist)

⚠

If any of the software below has already been installed, uninstall all of it before you install ControlCommand.

If ReplicationControl/DisasterRecovery has been installed, you must uninstall ReplicationControl/DisasterRecovery before you uninstall

ReplicationControl
ReplicationControl/DisasterRecovery
SnapControl
Storage Manager volume list command
ControlCommandSet or ControlCommand

The version of the software that you install must support disk arrays that are connected to the server.

Moreover, if a disk array has RemoteDataReplication configure, the remote disk array to which it connects must also be supported.

ControlCommand is 32-bit software.

If it will be used in an IA64 server environment, a 32-bit emulator, 32-bit compatible library, or other package offered by the OS must be installed in advance in order for the 32-bit software to run. Refer to the “ControlCommand on Linux Installation Guide” for details.

(1) Login as root or switch to root.

(2) Confirm that none of the following software is installed.

iSMrpl (ReplicationControl)
iSMrcd (ReplicationControl/DisasterRecovery)
iSMsc (SnapControl)
iSMvol (Storage Manager volume list command)
iSMccs (ControlCommandSet or ControlCommand)

```
rpm -q   iSMrpl
rpm -q   iSMrcd
rpm -q   iSMsc
rpm -q   iSMvol
rpm -q   iSMccs
```

If any of these are installed, uninstall them.

(3) Insert the CD on the business server.

For servers on which the CD cannot be used, file transfer iSMccs.rpm from another server.

(4) Mount the CD.

■ Create the mount directory (For example, /cdrom)

■ Mount using the mount command

```
mount -r   /dev/cdrom   /cdrom
```

(5) Install using the rpm command.

```
rpm -ivh /cdrom/LINUX/iSMCCS/iSMccs.rpm
```

(6) Installation is complete when the message below is output.

```
Installation completed.
```

(7) Unmount the CD.

■ Unmount using the umount command

```
umount /cdrom
```

9. Collection of Host Information on Business Server

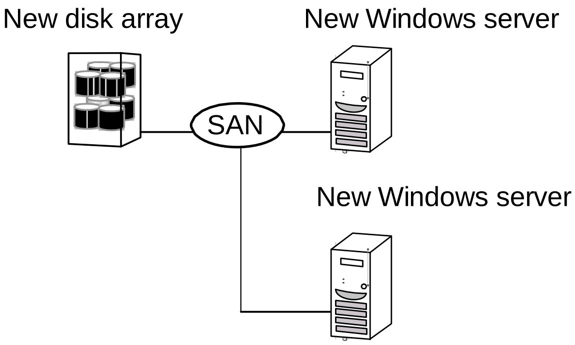
This chapter describes the collection of host information from a business server.

Collection of the host information on a business server obtains WWPN information from the host bus adapter (HBA) installed in the business server.

If business servers use only Windows OS and the system is an entirely new installation, automatic collection of host information can be done. If you are setting up a disk array in a system that has already been in operation, or if a business server contains a Linux OS, collect host information using the methods shown in 9.1 and 9.2.

(1) Configuration for which automatic collection of host information is possible

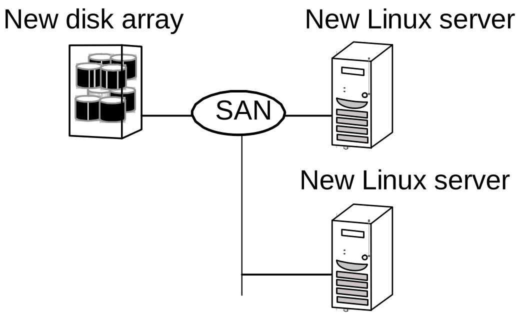
This method can be used if all business server OS of a new installation connected by Fibre Channel cable are Windows and the disk array unit is also newly installed. Perform setup using the Storage Manager initialization wizard. (Refer to (5) “Host information collection method selection” in 11.1.2.)

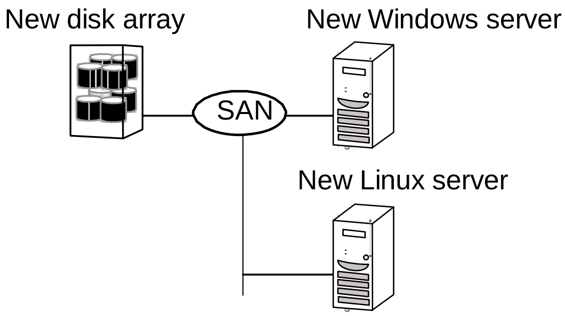


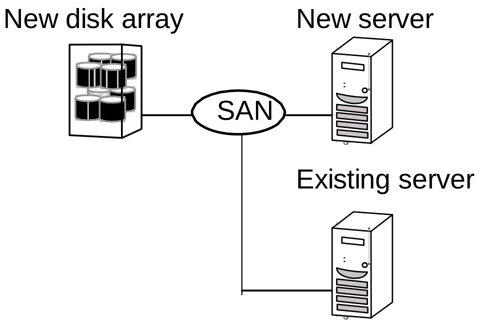
(2) Host information collection using file output from host information collection command

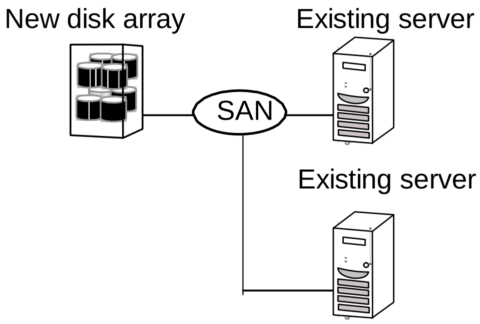
If setting up a disk array unit in a system that has already begun operation, or if a business server connected by Fibre Channel cable contains a Linux OS, the host information collection command can be used to output a file. The logical disk can be created and assigned to the business server by reading the output file using the Storage Manager initialization wizard (refer to (10) "Logical disk binding" in 11.1.2).

See 9.1 and 9.2 regarding the user of the host information collection command.


New disk array
New Linux server
SAN
New Linux server


New disk array
New Windows server
SAN
New Linux server


New disk array
New server
SAN
Existing server


New disk array
Existing server
SAN
Existing server

9.1 Host Information Collection Using File Output on Business Server in Windows Environment

(1) Execute the host information collection command (iSMcc_hostinfo command) from the command prompt. In the -export option, specify the file that is the output destination of the host information (host information file).

Execute the host information collection command (iSMcc_hostinfo command) as a user with administrator privileges.

```
D:¥> iSMcc_hostinfo -export ¥ServerName
iSMcc_hostinfo: Info:        iSM11700: Please wait a minute.
iSMcc_hostinfo: Info:        iSM11770: Host Information was exported successfully.
(code=aaaa-bbbb-bbbb-bbbb)
iSMcc_hostinfo: Info:        iSM11100: Command has completed successfully.
```

(2) After executing the host information collection command (iSMcc_hostinfo command), confirm that message iSM11770 is output and that host information collection succeeded. The processor number is output in *aaaa* in the message and an internal code for maintenance is output in *bbbb*.

(3) Transfer the host information file that is output by executing the host information collection command (iSMcc_hostinfo command) to the client and to the management server on which the Storage Manager server is running by using file transfer or USB memory.

The host information file transferred to the client can be read and used when selecting the host in the Storage Manager initialization wizard (refer to (10) “Logical disk binding” in 11.1.2).

After initialization ends, use the host information storage command (iSMhoststore command) on the management server on which the Storage Manager server is running to store the host information in the disk array.

9.2 Collecting Host Information Using File Output on Business Server in Linux Environment

(1) Execute the host information collection command (iSMcc_hostinfo command) from the command prompt. In the -export option, specify the file that is the output destination of the host information (host information file).

Execute the host information collection command (iSMcc_hostinfo command) as a super user.

```
# iSMcc_hostinfo -export /tmp/ServerName
iSMcc_hostinfo: Info:          iSM11700: Please wait a minute.
iSMcc_hostinfo: Info:          iSM11770: Host Information was exported successfully.
(code=aaaa-bbbb-bbbb-bbbb)
iSMcc_hostinfo: Info:          iSM11100: Command has completed successfully.
```

(2) After executing the host information collection command (iSMcc_hostinfo command), confirm that message iSM11770 is output and that host information collection succeeded. The processor number is output in *aaaa* in the message and an internal code for maintenance is output in *bbbb*.

(3) Transfer the host information file that is output by executing the host information collection command (iSMcc_hostinfo command) to the client and to the management server on which the Storage Manager server is running by using file transfer or USB memory.

The host information file transferred to the client can be read and used in selecting the host in (10) “Logical disk binding” of 11.1.2.

After initialization ends, use the host information storage command (iSMhoststore command) on the management server on which the Storage Manager server is running to store the host information in the disk array.

10. Installation of the Storage Manager Client

10.1 Configurations Offered by the Storage Manager Client

The Storage Manager client, which runs on a PC connected by a LAN to a management server, offers users monitoring and operating procedures through graphical user interfaces (GUI). The Storage Manager client offers the following two types of GUI.

- Web-based GUI
- Windows-based GUI

This manual documents installation methods for the Web-based GUI.

If it is necessary to distinguish them specifically in the text, the term “Storage Manager client (Web GUI)” is used to indicate just the former and the term “Storage Manager client (Win GUI)” is used to indicate just the latter.

The Storage Manager client runs only in a Windows environment.

For details, refer to the “Storage Manager Installation Guide”.

⚠ In an environment in which the Storage Manager client (Web GUI) is running, if a product that runs using a Java Runtime Environment (JRE) has already been installed, they can coexist and operate only if the environment conforms to the condition below.

- The latest versions of everything within the JRE that is installed in the environment in question must be supported by both the Storage Manager client (Web GUI) and the other product.

If this condition is not met, the Storage Manager client (Web GUI) or the other product must be operated on another machine.

10.2 Installing the Storage Manager Client

This section describes the use of Storage Manager client (Web GUI).
When using it for the first time, refer to [Please read first of all].

The Storage Manager client (Web GUI) connects to the Storage Manager server by starting a Web browser. Use the Storage Manager client (Web GUI) if using a D series.

Install the Storage Manager client by following the procedure below.

For details, refer to the “Storage Manager Installation Guide”.

Refer to the Storage Manager CD for the above manual.

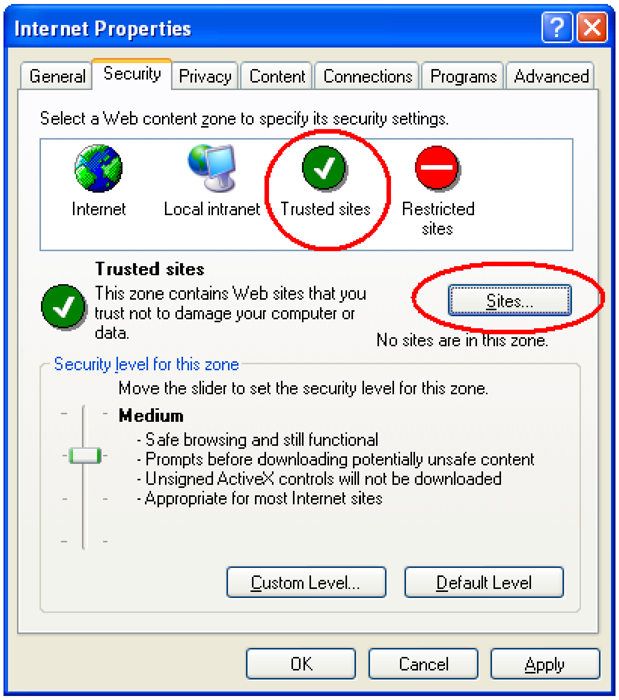
Perform the following setup in advance for the Web browser to be used with the Storage Manager client (Web GUI).

1. Set the Storage Manager server to connect in [Trusted sites].

   Set this as follows.

   (1) From [Control Panel], select [Internet Options] and then select the [Security] tab.

   (2) Select [Trusted sites] and click the [Sites] button.


Internet Properties
General
Security
Privacy
Content
Connections
Programs
Advanced
Internet
Local intranet
Trusted sites
Restricted sites
Sites...
Custom Level...
Default Level
OK
Cancel
Apply

Select a Web content zone to specify its security settings.

Trusted sites

This zone contains Web sites that you trust not to damage your computer or data.

No sites are in this zone.

Security level for this zone

Move the slider to set the security level for this zone.

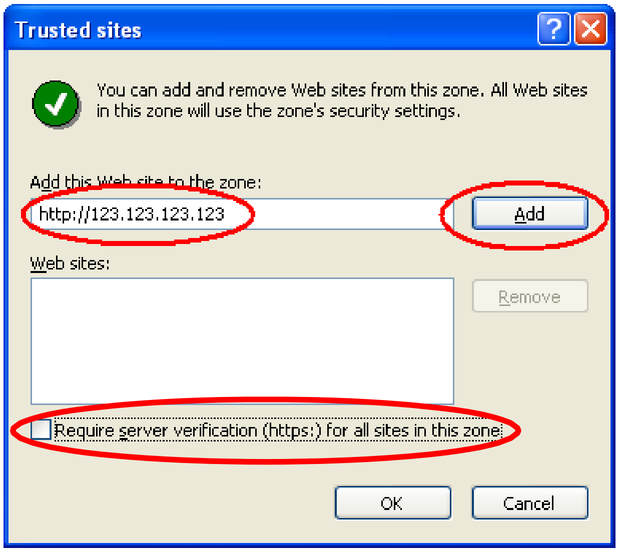
Medium

- Safe browsing and still functional
- Prompts before downloading potentially unsafe content
- Unsigned ActiveX controls will not be downloaded
- Appropriate for most Internet sites

Figure 10.2.1 Internet Properties Screen

(3) Input the URL of the Storage Manager server to connect (for example: http://[IP address (host name) of Storage Manager server to connect]) in [Add this website to the zone:] and click the [Add] button.

* Uncheck [Require server verification (https:) for all sites in this zone].



You can add and remove Web sites from this zone. All Web sites in this zone will use the zone's security settings.

Add this Web site to the zone: http://123.123.123.123

☐ Require server verification (https:) for all sites in this zone

Figure 10.2.2 Trusted Site Setting Screen

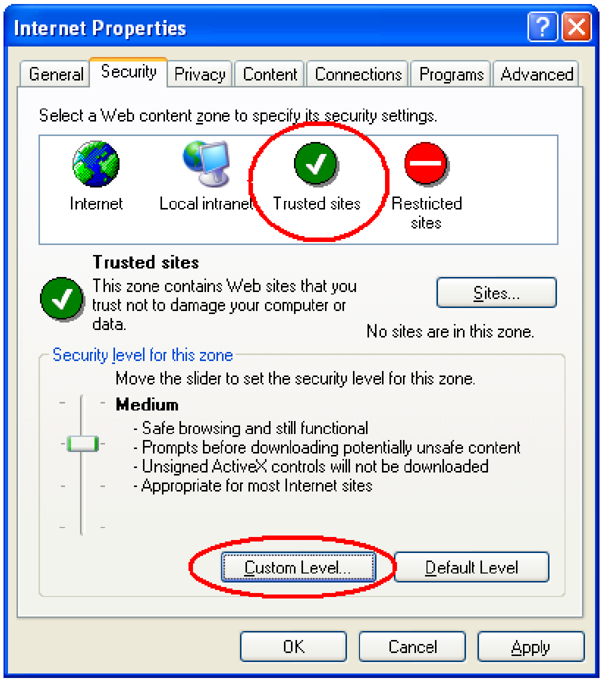
(4) Click the [OK] button to close the screen.

2. Set the security level of [Trusted Sites].

Set this as follows.

(1) From [Control Panel], select [Internet Options] and then select the [Security] tab.

(2) Select [Trusted Sites] and click the [Custom level] button.


Internet Properties
General
Security
Privacy
Content
Connections
Programs
Advanced
Internet
Local intranet
Trusted sites
Restricted sites
Sites...
Custom Level...
Default Level
OK
Cancel
Apply

Select a Web content zone to specify its security settings.

Trusted sites

This zone contains Web sites that you trust not to damage your computer or data.

No sites are in this zone.

Security level for this zone

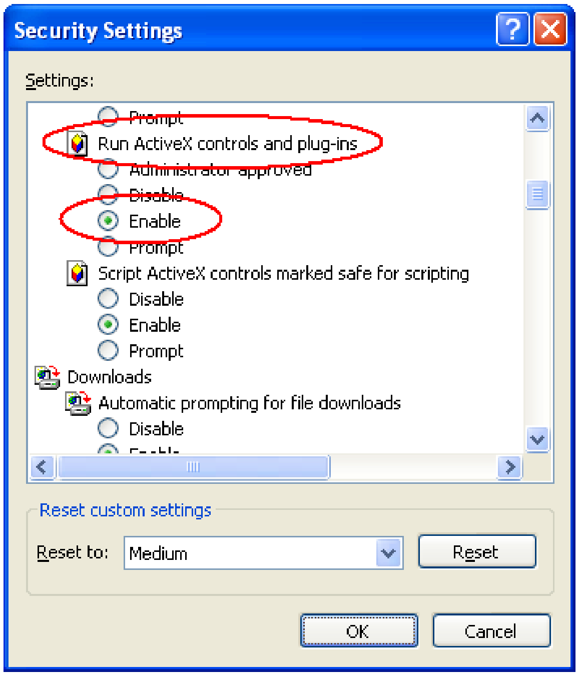
Move the slider to set the security level for this zone.

Medium

- Safe browsing and still functional
- Prompts before downloading potentially unsafe content
- Unsigned ActiveX controls will not be downloaded
- Appropriate for most Internet sites

Figure 10.2.3 Internet Options Screen

(3) Under [ActiveX controls and plug-ins], set [Run ActiveX controls and plug-ins] to [Enable].


Security Settings
Settings:
Reset custom settings
Reset
OK
Cancel

○ Prompt

Run ActiveX controls and plug-ins

○ Administrator approved

○ Disable

● Enable

○ Prompt

Script ActiveX controls marked safe for scripting

○ Disable

● Enable

○ Prompt

Downloads

Automatic prompting for file downloads

○ Disable

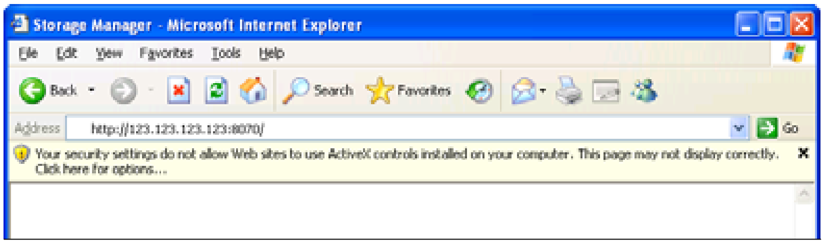
○ Enable

Reset to: Medium

Figure 10.2.4 Security Setting Screen

(4) Click the [OK] button to close the screen.

1. If the Storage Manager server is connected without making trusted sites settings and security level settings for the Web browser, the message below may be displayed and the connection fail.
   Change the settings by following the above procedure and connect again.

   http://123.123.123.123:8070/

   Your security settings do not allow Web sites to use ActiveX controls installed on your computer. This page may not display correctly. Click here for options...

   Figure 10.2.5 Web Browser Screen (When setup is not performed)

   When using the Storage Manager client (Web GUI), set it up to allow ActiveX controls and plug-ins to run in the Web browser.
   This can be set in the [Security] tab of the screen displayed by selecting [Internet Options] from [Control Panel].

2. When connecting to the Storage Manager server, a “Warning – Security” screen may be displayed. If so, confirm that the issuer is “RAID Inc.” and click the [Run] button.

3. When connecting to the Storage Manager server, a message showing that a function of Internet Explorer (or program name of Web browser used) is being blocked may be displayed in a “Windows Security Alert” screen. If so, release blocking through the screen in question or release the blocking of “Internet Explorer” (or program name of Web browser used) in firewall setup beforehand.

4. If use via a proxy server has been specified in setup of the Web browser being used, connection may fail. In that case, specify a proxy exception in Web browser setup to make connection to the Storage Manager server not be via the proxy server.
   Note that no change is needed if using the Storage Manager client (Web GUI) on the same computer as the Storage Manager server.
   Make changes by the following procedure.

   (1) From [Control Panel], select [Internet Options] and display the local area network settings screen by clicking on [LAN settings] in the [Connections] tab.
   (2) If [Use a proxy server for your LAN] is not checked, you need not perform the following. If it is checked, display the proxy settings screen by clicking on [Advanced].
   (3) Add the host name or IP address of the server to connect to [Do not use proxy for addresses beginning with:].
   (4) Check JRE proxy settings by the following procedure.
      - JRE 1.4.2
        From [Control Panel], select [Java Plug-in] and the [Proxies] tab and look at whether [Use browser settings] is checked. If it is not checked, add the host name or IP address of the server to connect to No Proxy Host].

- JRE 5.0
  From [Control Panel], select [Java] and [Network Settings] and look at whether [Use browser settings] is checked. If it is not checked, select [Advanced] and add the host name or IP address of the server to connect to [Exceptions].

(5) Once this is finished for all Web browsers used, restart.

5. If you newly installed the Storage Manager client (Win GUI) by downloading the installer from the Storage Manager client (Web GUI), a shortcut to start the Storage Manager client is not created in the start menu or on the desktop.
   For an overwritten installation or if the Storage Manager client (Win GUI) was installed previously on the same PC, a shortcut to start the Storage Manager client is created in the start menu and on the desktop, but since it is not needed in order to use the Storage Manager client (Web GUI), it may be deleted.

6. After JRE installation, it is recommended that you disable automatic updating of JRE.
   From [Control Panel], select the [Java] or [Java Plug-in] icon and change it in the Java Control Panel that is displayed.

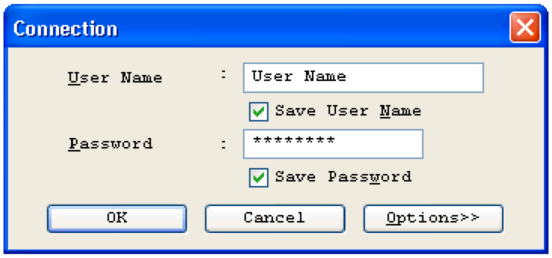
7. The Storage Manager client (Web GUI) can be operated only by a user having Administrator privileges.

10.3 Starting the Storage Manager Client

Input the name and port number of the host on which the Storage Manager server to connect is running in the Web browser URL field to start the client.

Example: http://*hostname*:8070

If connection to the Storage Manager server succeeded, a login screen is displayed.



User Name : User Name

☑ Save User Name

Password : ********

☑ Save Password

Figure 10.3.1 Login Screen

(1) User Name

Input a user name registered at setup on the Storage Manager server.

To perform initial setup, the user level must be L3 (level 3).

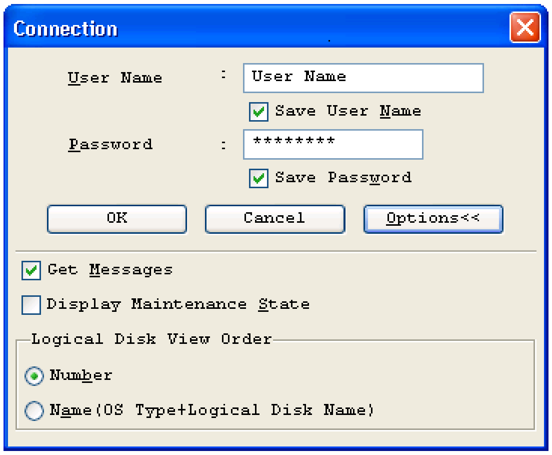
(2) Password

Input a password registered at setup on the Storage Manager server.

Although the user name and password each can be saved, care is needed since this makes it possible for anyone to connect.

Clicking the [Options>>] button extends the login screen as shown in Figure 10.3.2 and makes it possible to change the settings for operations following login.

Refer to the "User's Manual" for details.


Connection

User Name : User Name

☑ Save User Name

Password : ********

☑ Save Password

OK
Cancel
Options<<

☑ Get Messages

☐ Display Maintenance State

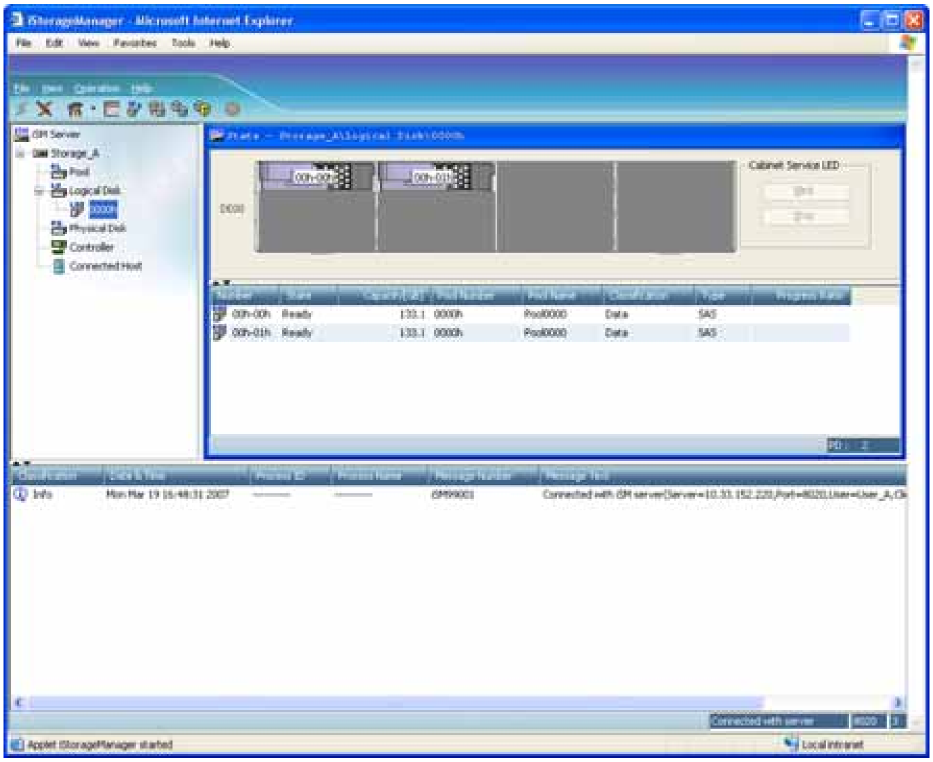
Logical Disk View Order

● Number

○ Name(OS Type+Logical Disk Name)

Figure 10.3.2 Login Screen (Detail)

When you click the [OK] button, the main window starts up.


iStorageManager - Microsoft Internet Explorer
File
Edit
View
Favorites
Tools
Help
File
View
Operation
Help
iSM Server
Storage_A
Pool
Logical Disk
0000h
Physical Disk
Controller
Connected Host
Cabinet Service LED
00h-00h
00h-01h
DE00
Applet iStorageManager started
Local intranet
Connected with server

Number	State	Capacity(GB)	Pool Number	Pool Name	Classification	Type	Progress Rate
00h-00h	Ready	133.1	0000h	Pool0000	Data	SAS	
00h-01h	Ready	133.1	0000h	Pool0000	Data	SAS	

Classification	Date & Time	Process ID	Process Name	Message Number	Message Text
Info	Mon Mar 19 16:48:31 2007	-------	-------	iSM99001	Connected with iSM server(Server=10.33.152.220,Port=8020,User=User_A,Cli

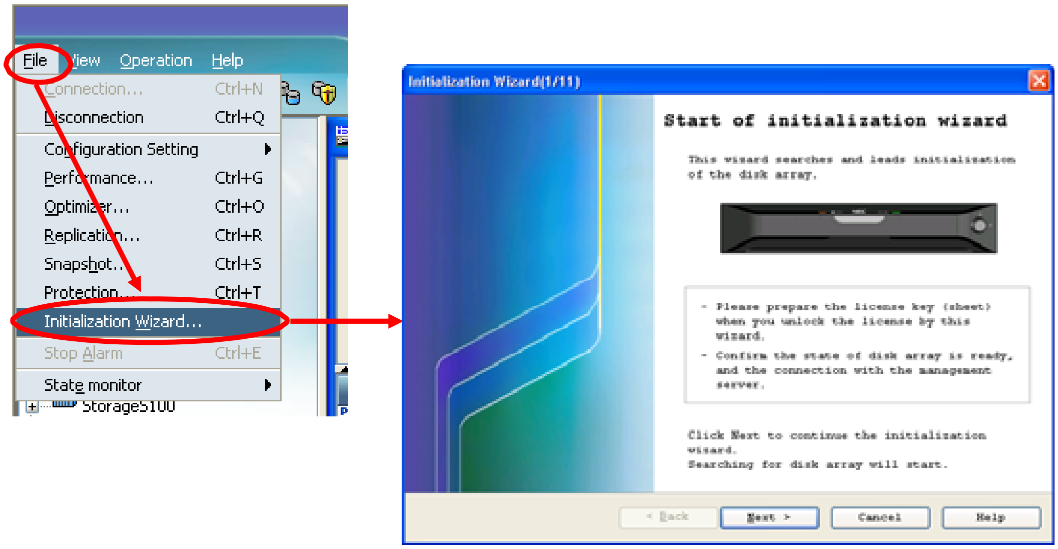
Figure 10.3.3 Main Window Screen

11. Initialization of RAID Storage

11.1 Initialization Using Initialization Wizard

11.1.1 How to Start

Selecting [File] → [Initialization Wizard] from the menu bar starts the initialization wizard.


File
View
Operation
Help
Connection… Ctrl+N
Disconnection Ctrl+Q
Configuration Setting
Performance… Ctrl+G
Optimizer… Ctrl+O
Replication… Ctrl+R
Snapshot… Ctrl+S
Protection… Ctrl+T
Initialization Wizard…
Stop Alarm Ctrl+E
State monitor
Storage5100
Initialization Wizard(1/11)
< Back
Next >
Cancel
Help

Start of initialization wizard

This wizard searches and leads initialization of the disk array.

- Please prepare the license key (sheet) when you unlock the license by this wizard.
- Confirm the state of disk array is ready, and the connection with the management server.

Click Next to continue the initialization wizard.
Searching for disk array will start.

Figure 11.1.1 Starting the Initialization Wizard

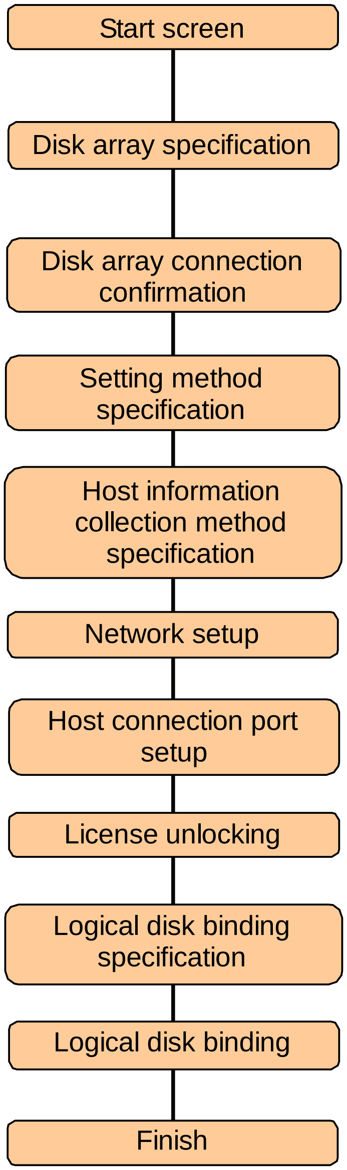
After the initialization wizard starts, make settings by following the screens that are displayed.

If startup fails, a message dialog is displayed.

11.1.2 Initialization

When installing a new system or disk array unit, set it up by following the procedure below.

If you cancel this before finishing, or to change settings once initialization has been done, refer to 11.2 “Setup Modification”.


Start screen
Disk array specification
Disk array connection confirmation
Setting method specification
Host information collection method specification
Network setup
Host connection port setup
License unlocking
Logical disk binding specification
Logical disk binding
Finish

Perform preliminary checks before starting the initialization wizard.
Refer to (1) “Start screen” for details.

Specify the disk array to set up.
Refer to (2) “Disk array specification” for details.

Confirm the disk array connections.
Refer to (3) “Disk array connection confirmation” for details.

Select the setting method.
Refer to (4) “Setting method specification” for details.

Specify the host information collection method.
Refer to (5) “Host information collection method selection” for details.

Set disk array network information.
Refer to (6) “Network setup” for details.

Set the disk array’s host connection port.
Refer to (7) “Host connection port setup” for details.

Unlock the licenses of purchased products.
Refer to (8) “License unlocking” for details.

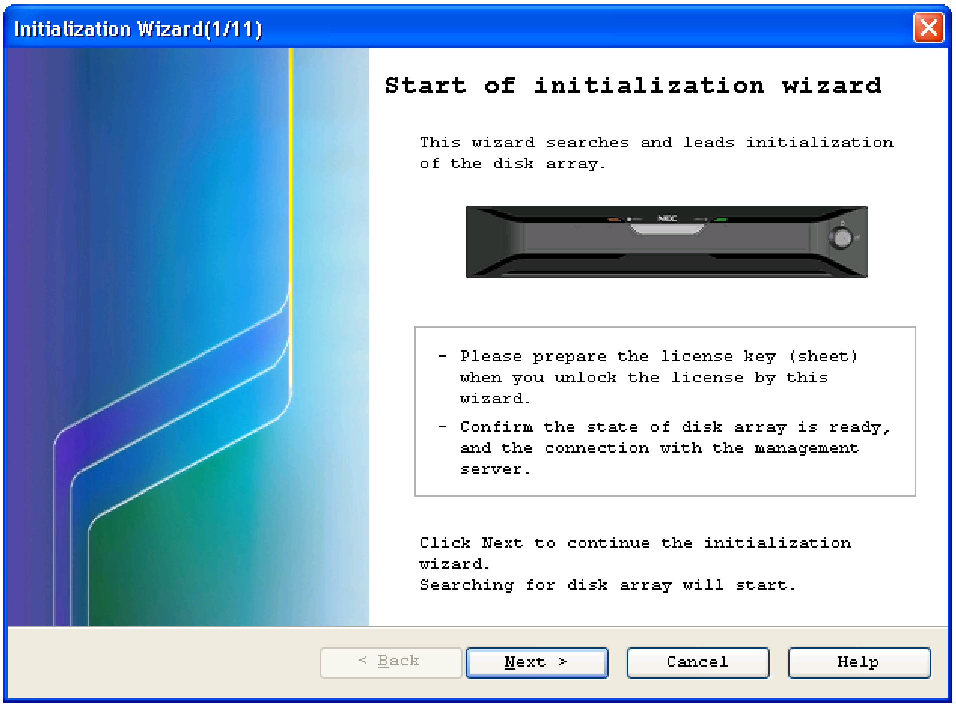
Specify whether to do logical disk binding in the Initialization Wizard.
Refer to (9) “Logical disk binding specification” for details.

Set the host to assign to the logical disk binding.
Refer to (10) “Logical disk binding” for details.

Confirm that settings were made successfully.
Refer to (12) “Setup completion” for details.
If setup failed, check the state of the disk array unit. Refer to (13) “If setup fails” for details.

(1) Start screen

The start screen of the initialization wizard is displayed.



Start of initialization wizard

This wizard searches and leads initialization of the disk array.

- Please prepare the license key (sheet) when you unlock the license by this wizard.
- Confirm the state of disk array is ready, and the connection with the management server.

Click Next to continue the initialization wizard.
Searching for disk array will start.

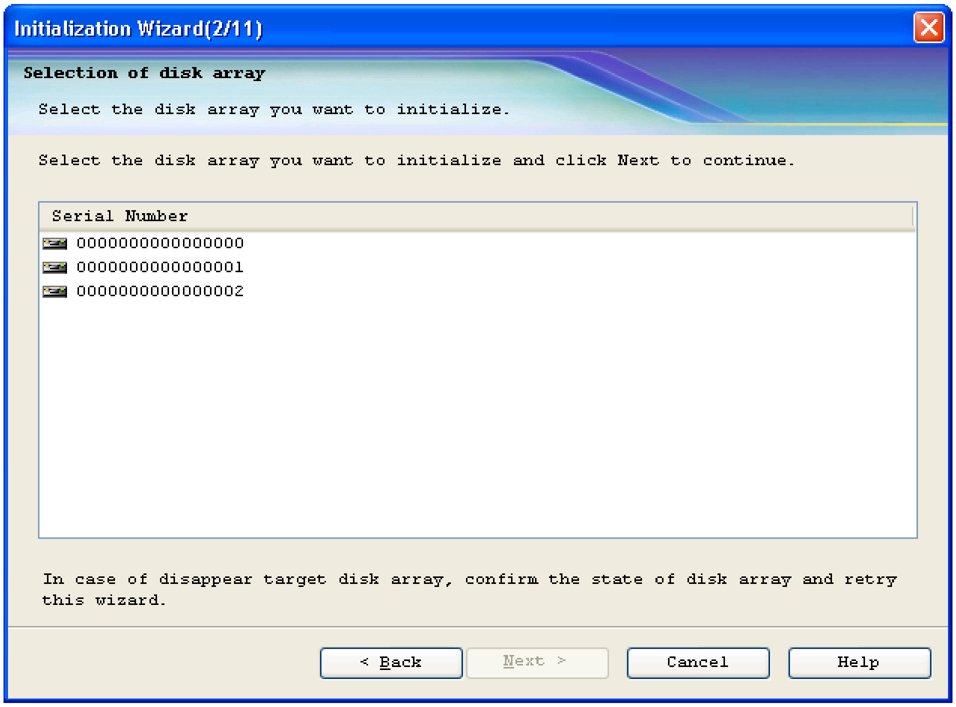
Figure 11.1.2 Initialization Wizard Start Screen

Check its contents and proceed to the next screen.

Clicking [Cancel] closes the initialization wizard.

(2) Disk array specification

Disk array specification specifies the disk array to be initialized.



Initialization Wizard(2/11)

Selection of disk array

Select the disk array you want to initialize.

Select the disk array you want to initialize and click Next to continue.

Serial Number
0000000000000000
0000000000000001
0000000000000002

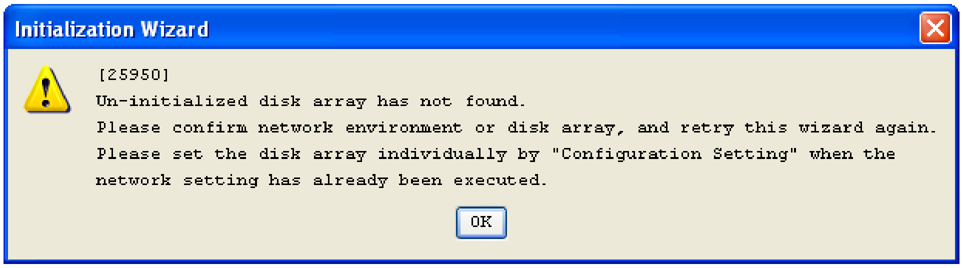
In case of disappear target disk array, confirm the state of disk array and retry this wizard.

Figure 11.1.3 Disk Array Specification Screen

The initialization wizard performs initialization for the one unit that is selected. If multiple units are displayed, start the initialization wizard again to perform initialization for another disk array.

- Only disk arrays that are connected to the same network as the management server can be retrieved.
- To retrieve disk arrays, use the User Datagram Protocol (UDP) and use port number “2730”. If a firewall has been installed, set it so that retrieval packets for the management server and disk array network can pass through.
- Once a disk array has undergone network setup in initialization, it cannot be reinitialized by the initialization wizard. Refer to 11.2 “Setup Modification” to make individual settings.

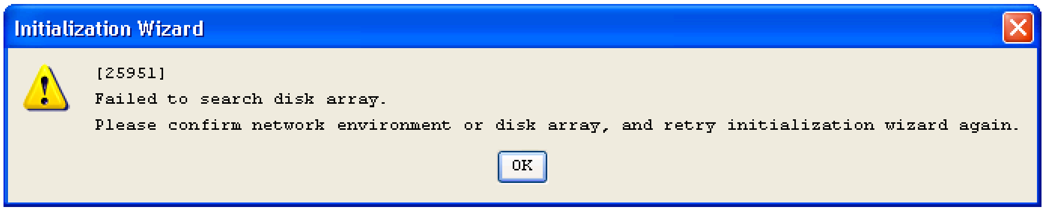
If disk arrays are not found, the initialization wizard ends after displaying the dialog shown in Figure 11.1.4.



[25950]
Un-initialized disk array has not found.
Please confirm network environment or disk array, and retry this wizard again.
Please set the disk array individually by "Configuration Setting" when the network setting has already been executed.

Figure 11.1.4 Message Box

If there is a communication error in the network environment, the initialization wizard terminates after displaying the dialog shown in Figure 11.1.5.

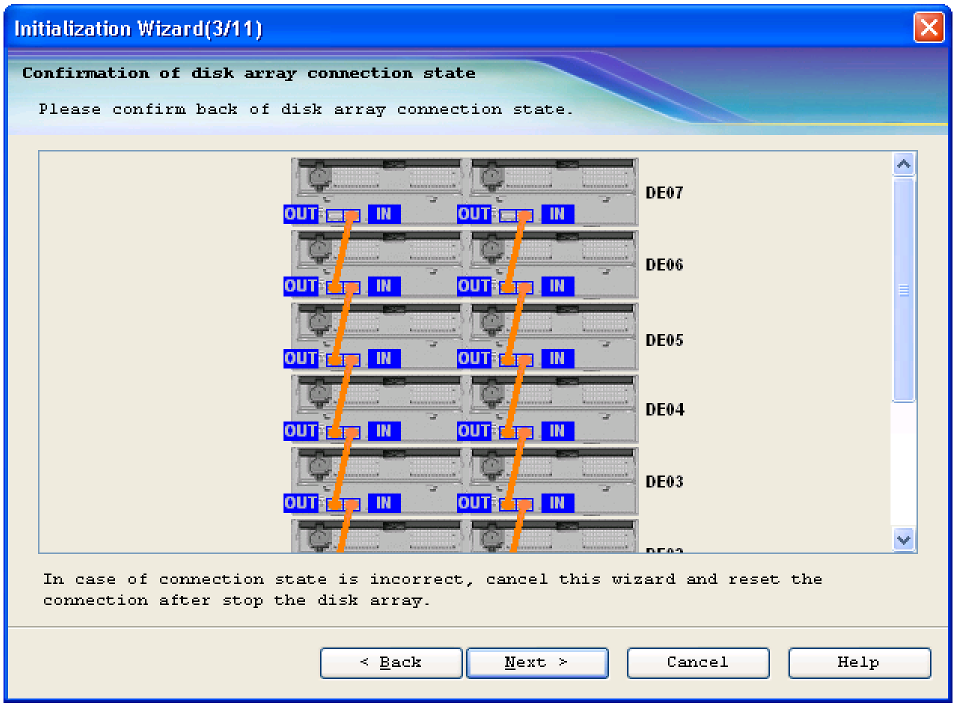


[25951]
Failed to search disk array.
Please confirm network environment or disk array, and retry initialization wizard again.

Figure 11.1.5 Message Box

(3) Disk array connection confirmation

Next, confirm the disk array connections.



Initialization Wizard(3/11)

Confirmation of disk array connection state

Please confirm back of disk array connection state.

In case of connection state is incorrect, cancel this wizard and reset the connection after stop the disk array.

Figure 11.1.6 Disk Array Connection Confirmation Screen (Example for D1 series)

An illustration of the disk array connections is displayed. The displayed connection image shows the maximum configuration for each series. Confirm that the respective connection lines are correct.

Check its contents and proceed to the next screen.

Clicking [Cancel] closes the initialization wizard.

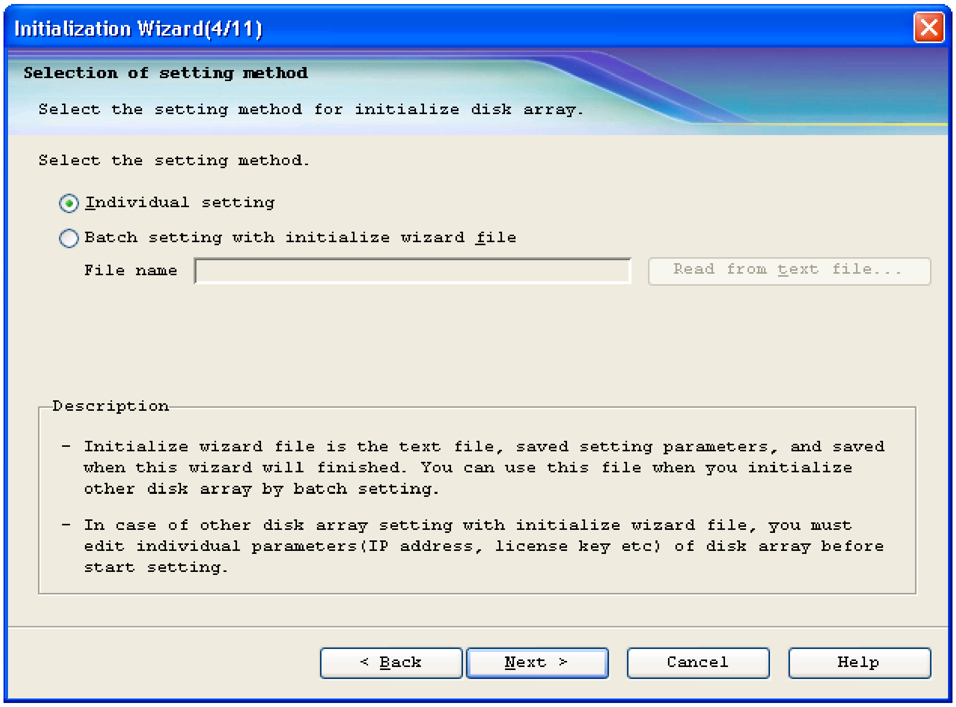
Clicking [Back] returns to the disk array specification screen.

⚠ When making changes such as modifying cable connections, be sure to do so after turning off the power to the entire disk array.

To perform initialization again, start the initialization wizard by powering on the disk array.

(4) Setting method specification

Setting method specification selects the initialization method.



Initialization Wizard(4/11)

Selection of setting method

Select the setting method for initialize disk array.

Select the setting method.

● Individual setting

○ Batch setting with initialize wizard file

File name

Description

- Initialize wizard file is the text file, saved setting parameters, and saved when this wizard will finished. You can use this file when you initialize other disk array by batch setting.
- In case of other disk array setting with initialize wizard file, you must edit individual parameters(IP address, license key etc) of disk array before start setting.

Figure 11.1.7 Setting Method Specification Screen

The initialization wizard provides the following two methods.

- Individual setting

  Do not use the “initialize wizard file” but make settings by following the wizard hereafter.

- Batch setting with initialize wizard file

  Batch initialization can be performed by using an initialize wizard file prepared in advance. An “initialize wizard file” may have been created if another disk array was initialized previously. Refer to (12) “Setup completion” regarding saving the initialize wizard file.

Pay heed to the following points when using an initialize wizard file.

- Use it for disk arrays of the same configuration.
- Use it after editing the IP address and license key.
  Do not edit other parameters, but make any changes to their settings from “Configuration Setting” after initialization ends.
- Since path information in an LD Set is information for the server that was used when the initialize wizard file was saved, confirm or modify it by manipulating Access Control in “Configuration Setting” after initialization ends if a different server is being used.

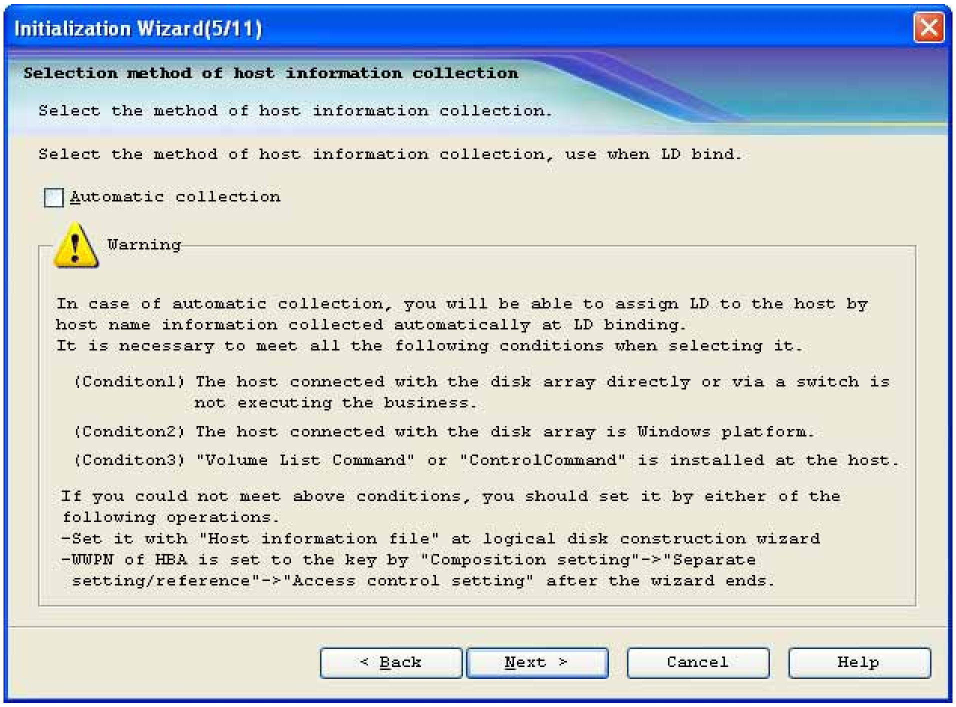
Select a setting method and click the [Next] button. Selecting [Batch setting with initialize wizard file] and clicking the [Next] button displays the settings confirmation screen ((11) “Settings Confirmation”).

Clicking the [Cancel] button terminates the initialization wizard. To initialize the same disk array, run the initialization wizard again.

Clicking the [Return] button returns to the disk array connection confirmation screen.

(5) Host information collection method selection

If [Individual setting] was selected in (4) “Setting method specification”, specify the host information collection method.



Selection method of host information collection

Select the method of host information collection.

Select the method of host information collection, use when LD bind.

☐ Automatic collection

Warning

In case of automatic collection, you will be able to assign LD to the host by host name information collected automatically at LD binding.
It is necessary to meet all the following conditions when selecting it.

(Conditon1) The host connected with the disk array directly or via a switch is not executing the business.

(Conditon2) The host connected with the disk array is Windows platform.

(Conditon3) "Volume List Command" or "ControlCommand" is installed at the host.

If you could not meet above conditions, you should set it by either of the following operations.
-Set it with "Host information file" at logical disk construction wizard
-WWPN of HBA is set to the key by "Composition setting"->"Separate setting/reference"->"Access control setting" after the wizard ends.

Figure 11.1.8 Host Information Collection Method Specification Screen

Specify whether to perform automatic collection of host information or not.

- Perform automatic collection of host information

  Select [Automatic collection] if the entire system is a completely new installation and the host (business server) is a Windows platform, as indicated in Chapter 9 (1).

- Does not perform automatic collection of host information

  For system configurations that do not satisfy the conditions to perform automatic collection of host information, do not check [Automatic collection] but use a “host information file” to perform logical disk binding as in (10) “Logical disk binding” or else manually input host information using [Configuration Setting] → [Configuration Reference] → [Setting Access Control] after the initialization wizard ends to perform logical disk assignment for the target host.

To perform automatic collection of host information, the following conditions must be satisfied.

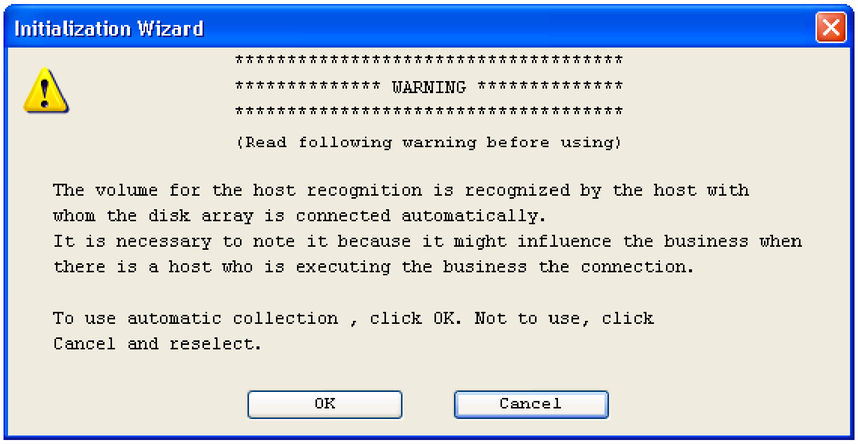
1. The host that is being connected must be a newly installed Windows platform. If an operating host were to be connected, tasks of the operating host could be affected by the host recognize volume that is created at the time of automatic collection of host information.
2. The Storage Manager volume list command or ControlCommand must be installed on the host that is being connected.
3. After selecting [Automatic collection], if an initialization wizard screen subsequently is forcibly (abnormally) terminated, the setting of the host recognize volume remains ON (enabled). Temporarily set it to OFF (disabled) through “Setting Host Recognize Volume mode” in Individual Setting. Depending on the host recognition volume, this may affect tasks on an operating host.

Following specification, click the [Next] button.

Clicking the [Cancel] button terminates the initialization wizard. To initialize the same disk array, run the initialization wizard again.

Clicking the [Back] button returns to the setting method specification screen.

Checking [Automatic collection] and clicking the [Next] button displays a warning dialog.



```
                    ****************************************
                    ************** WARNING **************
                    ****************************************
                    (Read following warning before using)

The volume for the host recognition is recognized by the host with
whom the disk array is connected automatically.
It is necessary to note it because it might influence the business when
there is a host who is executing the business the connection.

To use automatic collection , click OK. Not to use, click
Cancel and reselect.
```

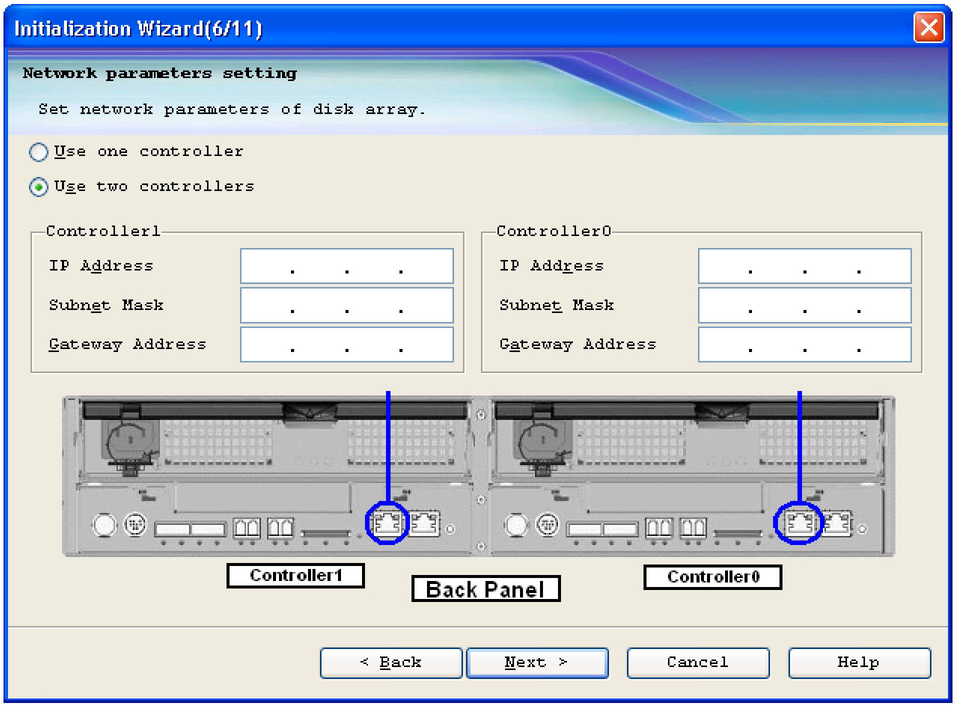
Figure 11.1.9 Host Information Collection Method Warning Screen

If you are satisfied with the specification to perform automatic collection of host information, click the [OK] button.

To cancel, click the [Cancel] button. This returns to collection method specification.

(6) Network setup

Network setup sets disk array network information.


Initialization Wizard(6/11)

Network parameters setting

Set network parameters of disk array.

○ Use one controller

● Use two controllers

Controller1
IP Address
Subnet Mask
Gateway Address
Controller0
IP Address
Subnet Mask
Gateway Address
Controller1
Back Panel
Controller0
< Back
Next >
Cancel
Help

Figure 11.1.10 Network Setup Screen

First, select a controller you want to use. If you chose to [Use one controller], only network setup for controller 0 is effective.

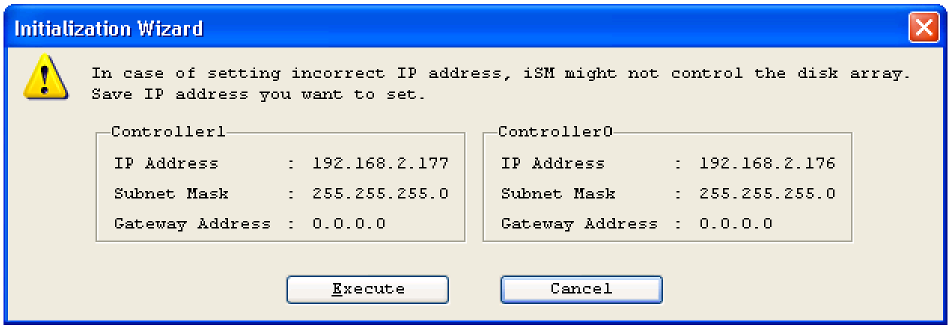
Next, specify an IP address, subnet mask, and gateway address for each controller.

Performing this setup makes it possible to monitor the disk array from the Storage Manager server by specifying an IP address that is set. For the IP address of a controller, specify a valid value other than 10.1.0.0 through 10.1.0.255 or 0.0.0.0. To not specify a gateway address, input 0.0.0.0.

Following specification, click the [Next] button. This displays the confirmation dialog that is shown in Figure 11.1.11.

Clicking the [Cancel] button terminates the initialization wizard. To initialize the same disk array, run the initialization wizard again.

Clicking the [Back] button returns to the setting method specification screen.



Initialization Wizard

In case of setting incorrect IP address, iSM might not control the disk array.
Save IP address you want to set.

Controller1
IP Address : 192.168.2.177
Subnet Mask : 255.255.255.0
Gateway Address : 0.0.0.0

Controller0
IP Address : 192.168.2.176
Subnet Mask : 255.255.255.0
Gateway Address : 0.0.0.0

Figure 11.1.11 Confirmation Dialog

Click the [Execute] button to set the specified value to the disk array.

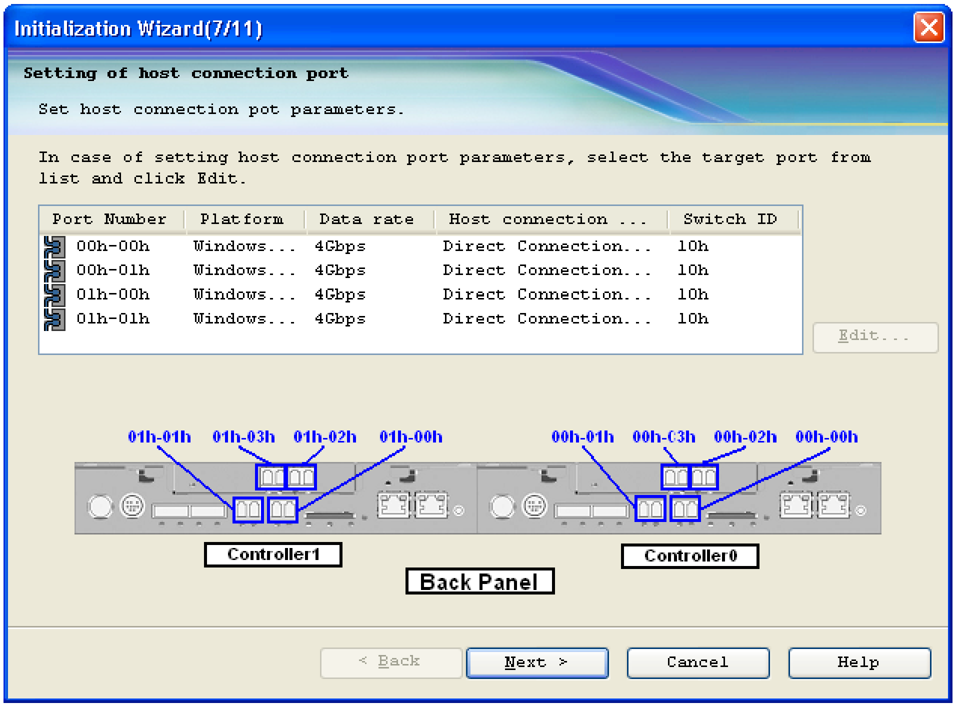
Clicking the [Cancel] button returns to the network setting screen.

⚠

- If an IP address, subnet mask, or gateway address has not been set correctly, monitoring by Storage Manager is not possible.
  If error message [05068] is displayed, refer to 16.3.1 “Changing Network Settings for Monitoring Disk Arrays from Storage Manager”.
- If the initialization wizard is interrupted after network setup by the [Cancel] button or due to an abnormality, perform initialization from individual settings. Refer to 11.2 “Setup Modification” for details.

(7) Host connection port setup

Host connection port setup sets the platform and connection type of a host (business server) that is connected to a host connection port of the disk array.



Initialization Wizard(7/11)

Setting of host connection port

Set host connection pot parameters.

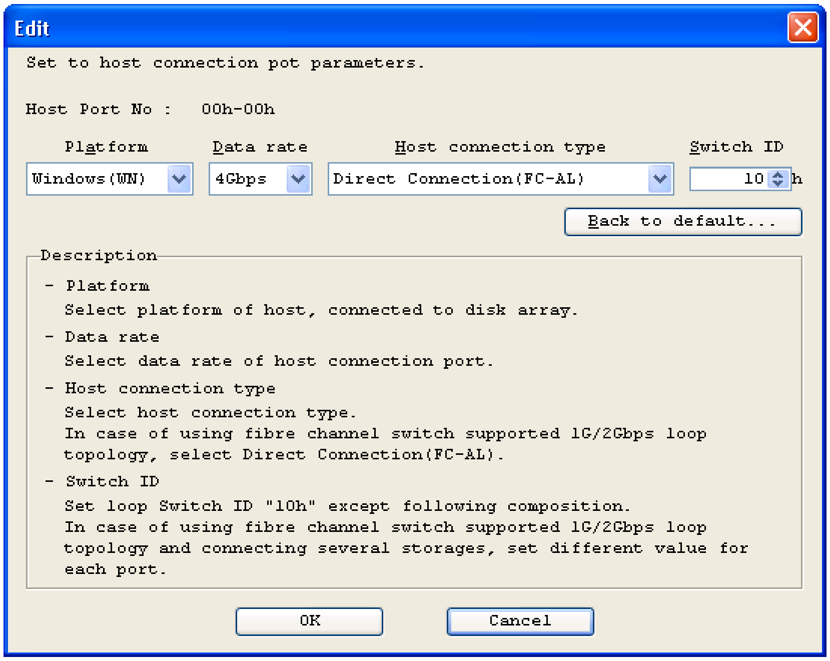
In case of setting host connection port parameters, select the target port from list and click Edit.

Port Number	Platform	Data rate	Host connection ...	Switch ID
00h-00h	Windows...	4Gbps	Direct Connection...	10h
00h-01h	Windows...	4Gbps	Direct Connection...	10h
01h-00h	Windows...	4Gbps	Direct Connection...	10h
01h-01h	Windows...	4Gbps	Direct Connection...	10h

Figure 11.1.12 Port Connection Setup

Default values are displayed in the list. To change settings, select the port to edit from the list and click the [Edit] button. Make changes to each port in the edit screen shown in Figure 11.1.13.

If you click the [Cancel] button, setup through network setup is performed for the disk array and the initialization wizard cannot be run again. Perform subsequent initialization by performing Individual Setting from “Configuration Setting”. For details, refer to 11.2 “Setup Modification”.



Set to host connection pot parameters.

Host Port No : 00h-00h

Platform: Windows(WN)
Data rate: 4Gbps
Host connection type: Direct Connection(FC-AL)
Switch ID: 10 h

Description
- Platform
  Select platform of host, connected to disk array.
- Data rate
  Select data rate of host connection port.
- Host connection type
  Select host connection type.
  In case of using fibre channel switch supported 1G/2Gbps loop topology, select Direct Connection(FC-AL).
- Switch ID
  Set loop Switch ID "10h" except following composition.
  In case of using fibre channel switch supported 1G/2Gbps loop topology and connecting several storages, set different value for each port.

Figure 11.1.13   Host Connection Port Setting Edit Screen

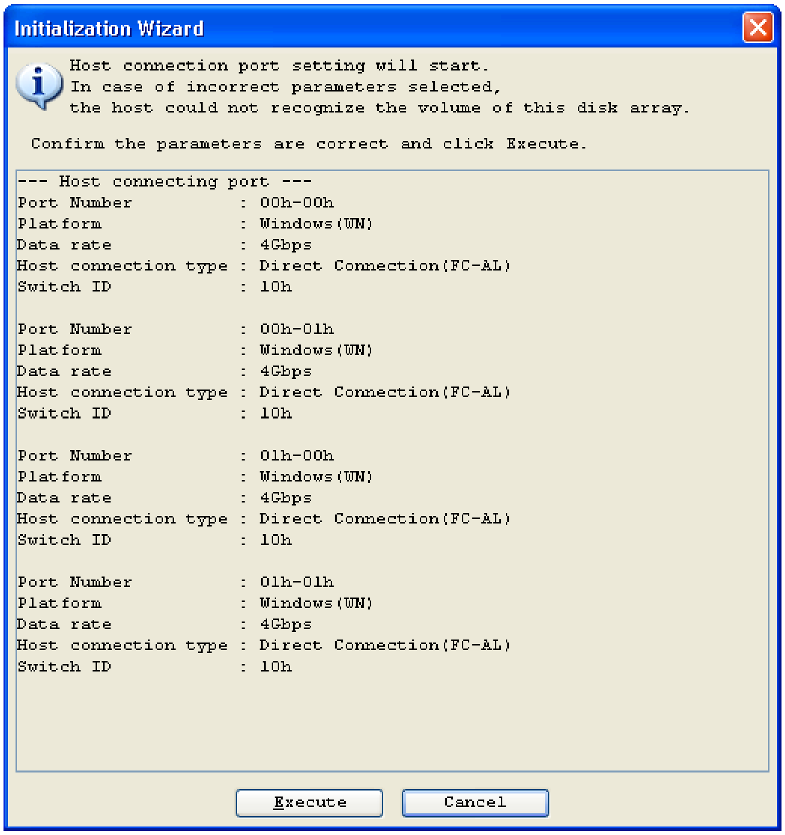
For each parameter, specify the setting corresponding to the platform and connection configuration of the host (business server). To return the displayed selections to default values, click the [Back to default] button.

⚠ For a Microsoft Cluster Service (MSCS) configuration, or if connecting to a fault tolerant server, set the Switch IDs of ports to connect to the same value.
(Setting the Switch IDs to the same value makes the IDs (AL_PA) of the ports the same value.)
For details, refer to Appendix A.

Following specification, click the [OK] button. This completes specification of the selected port. To change the settings for another port, select the port to be edited from the list in the Setting of host connection port screen and click the [Edit] button.

Clicking the [Cancel] button cancels changed settings and returns to the Setting of host connection port screen.

After finished editing, clicking the [Next] button in the Setting of host connection port screen displays the confirmation screen shown in Figure 11.1.14.



```
Host connection port setting will start.
In case of incorrect parameters selected,
the host could not recognize the volume of this disk array.

Confirm the parameters are correct and click Execute.

--- Host connecting port ---
Port Number          : 00h-00h
Platform             : Windows(WN)
Data rate            : 4Gbps
Host connection type : Direct Connection(FC-AL)
Switch ID            : 10h

Port Number          : 00h-01h
Platform             : Windows(WN)
Data rate            : 4Gbps
Host connection type : Direct Connection(FC-AL)
Switch ID            : 10h

Port Number          : 01h-00h
Platform             : Windows(WN)
Data rate            : 4Gbps
Host connection type : Direct Connection(FC-AL)
Switch ID            : 10h

Port Number          : 01h-01h
Platform             : Windows(WN)
Data rate            : 4Gbps
Host connection type : Direct Connection(FC-AL)
Switch ID            : 10h
```

Figure 11.1.14 Host Connection Port Setup Confirmation Screen

Confirm that the specified values are correct. For an explanation of display contents, refer to (11) “Settings confirmation”.

Upon confirming, click the [Execute] button to set the specified values to the disk array.

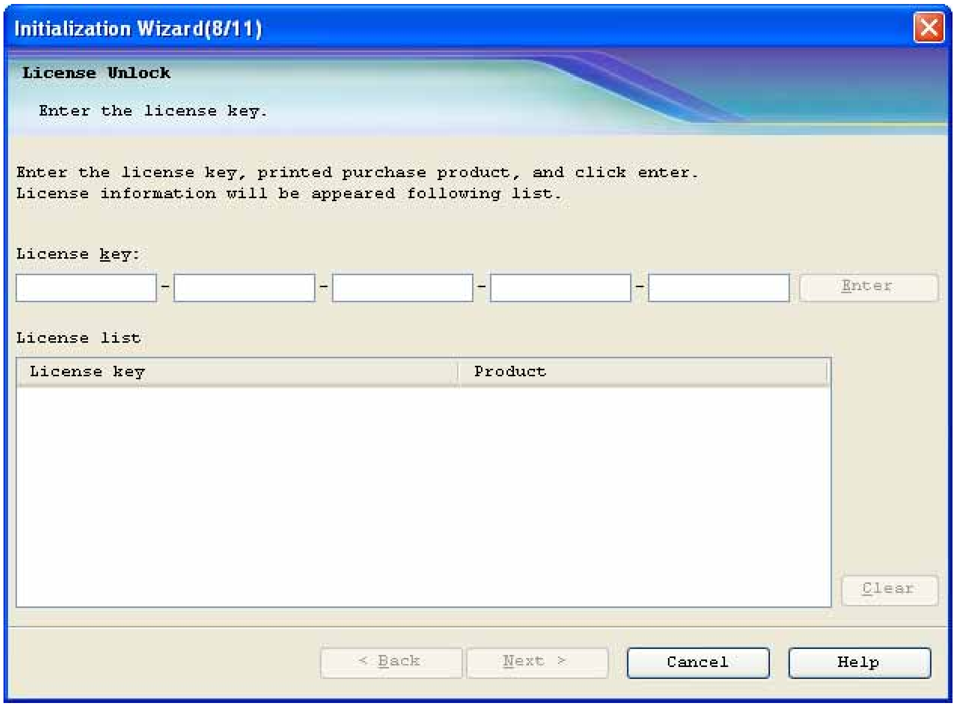
⚠

If settings was may by mistake, such as setting a data rate that differs from that of the host bus adapter, it will not be possible to recognize volume from the host (business server) being connected.

If volumes cannot be recognized, recheck the connection between the host connection port and the host bus adapter and the settings.

(8) License unlocking

Unlock the license of the program product that you have purchased.



Initialization Wizard(8/11)

License Unlock

Enter the license key.

Enter the license key, printed purchase product, and click enter.
License information will be appeared following list.

License key:

License list

Figure 11.1.15 License Unlocking Screen

Input a license key that is entered in the "Program Product License Sheet" for RAID Storage software.

Then click the [Enter] button. A license key is displayed in the list of input keys.

If you wish to clear an input key from the list, select it from the list and click the [Clear] button.

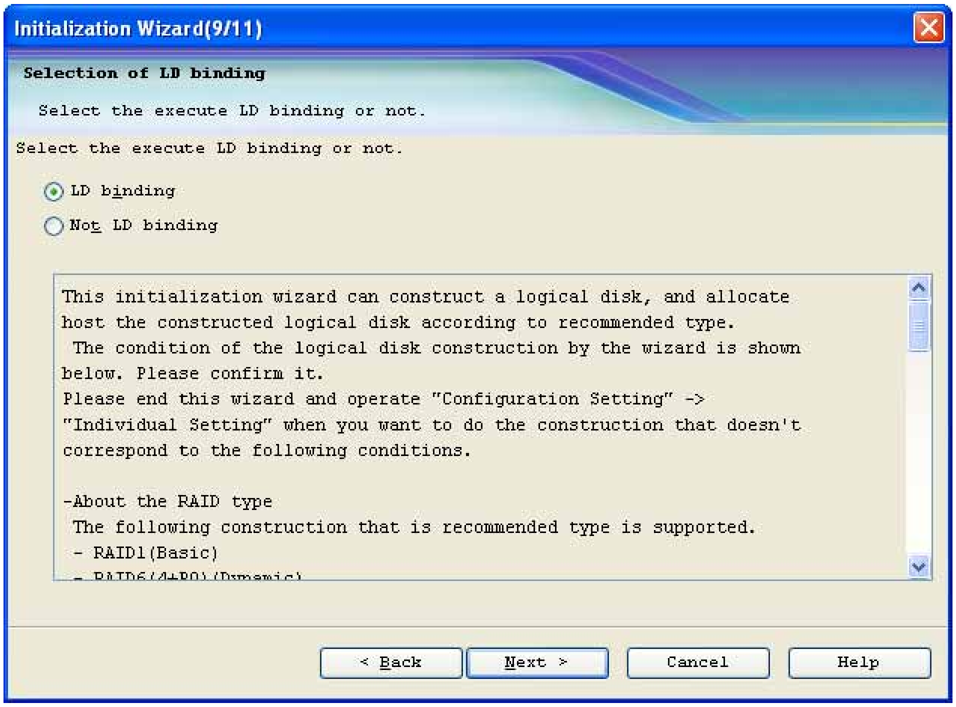
- Be sure to input the program product license of the BaseProduct.
- If the cursor becomes invisible in the middle of being moved by the Tab key, move it using the Ctrl+Tab key.

When you have input all of the license keys, click the [Next] button.

If you click the [Cancel] button, setup through host connection port setup is performed for the unit and the initialization wizard cannot be run again. Perform subsequent initialization by performing Individual Setting from "Configuration Setting". For details, refer to 11.2 "Setup Modification".

(9) Logical disk binding specification

Logical disk binding specification specifies whether to a bind logical disk in the initialization wizard.


Initialization Wizard(9/11)
Selection of LD binding
Select the execute LD binding or not.
< Back
Next >
Cancel
Help

Select the execute LD binding or not.

● LD binding
○ Not LD binding

This initialization wizard can construct a logical disk, and allocate host the constructed logical disk according to recommended type.
The condition of the logical disk construction by the wizard is shown below. Please confirm it.
Please end this wizard and operate "Configuration Setting" -> "Individual Setting" when you want to do the construction that doesn't correspond to the following conditions.

-About the RAID type
The following construction that is recommended type is supported.
- RAID1(Basic)
- RAID6(4+PQ)(Dynamic)

Figure 11.1.16　Logical Disk Binding Specification Screen

Specify whether to a bind logical disk or not.

- If [LD binding] is selected

  The logical disk binding screen ((10) "Logical disk binding") is displayed.

  RAID types that can be bound are as follows. When binding a spare, a special processing disk is needed.

  RAID1 (Basic):　Configured on 2 physical disks
  RAID6 (4+PQ) (Dynamic):　Configured on 6 physical disks
  RAID6 (8+PQ) (Dynamic):　Configured on 10 physical disks

- If [Not LD binding] is selected

  The settings confirmation screen ((11) "Settings confirmation") is displayed.

- When binding logical disks using the initialization wizard, it is possible to bind multiple logical disks of the same capacity in one RAID type.
- When not binding logical disk using the initialization wizard, disk binding is performed by easy configuration or individual setting.

If you execute replication or snapshot operations, it is recommended to bind logical disks individually using individual setting.

Refer to Chapter 12 “Easy Configuration of RAID Storage” for details of easy configuration.

Refer to the “Configuration Setting Tool User’s Manual (GUI)” for details about individual setting.

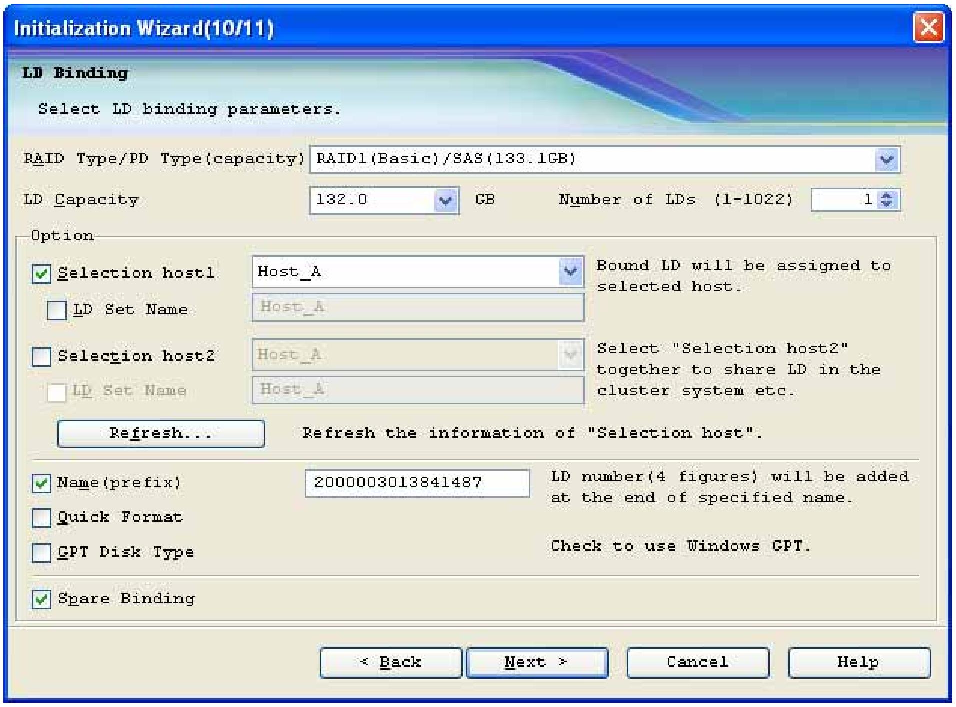
Following specification, click the [Next] button.

If you click the [Cancel] button, setup through host connection port setup is performed for the unit and the initialization wizard cannot be run again. Perform subsequent initialization including license unlocking by performing Individual Setting from “Configuration Setting”. For details, refer to 11.2 “Setup Modification”.

Clicking the [Return] button returns to the license unlocking screen.

(10) Logical disk binding

If [LD binding] was selected in (9) “Logical disk binding specification”, next bind the logical disk and assign it to the host (business server).



Initialization Wizard(10/11)

LD Binding

Select LD binding parameters.

RAID Type/PD Type(capacity) RAID1(Basic)/SAS(133.1GB)

LD Capacity 132.0 GB

Number of LDs (1-1022) 1

Option

☑ Selection host1 Host_A

☐ LD Set Name Host_A

Bound LD will be assigned to selected host.

☐ Selection host2 Host_A

☐ LD Set Name Host_A

Select "Selection host2" together to share LD in the cluster system etc.

Refresh the information of "Selection host".

☑ Name(prefix) 2000003013841487

LD number(4 figures) will be added at the end of specified name.

☐ Quick Format

☐ GPT Disk Type

Check to use Windows GPT.

☑ Spare Binding

Figure 11.1.17 Logical Disk Binding Screen

Here, for a specified host, set one RAID type or PD (physical disk) type, one logical disk capacity, and one or more logical disks, referring to the following.

■ RAID Type/PD Type

Select one of the RAID types/PD (physical disk) types displayed in a pull-down.

■ LD Capacity

Specify the capacity of the logical disk to bind.

The capacity that is displayed by default shows the maximum capacity of a logical disk that can be bound if Selection host1 and Selection host2 are specified, excluding the 0.2 GB capacity of each control volume that is bound.

The maximum capacity shown in the pull-down can be bound if a host is not specified.

■ Number of LDs

Specify the number of logical disks to bind.

■ Selection host1/Selection host2

Check this to assign a bound logical disk to a specified host (business server). Host specification cannot be done unless the AccessControl license key has been input.

- If checked

  A logical disk to be bound is assigned to a specified host (business server).

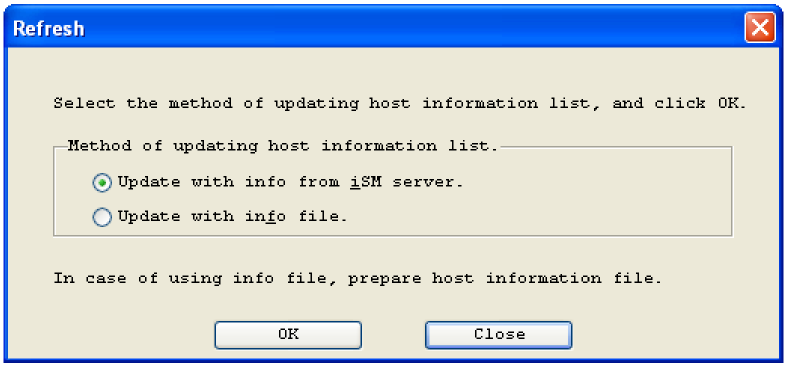
  If [Automatic collection] was selected in (5) “Host information collection method specification”, hosts connected to the disk array are shown in the pull-down. Select the host to which to assign the logical disk.

- If not checked

  The logical disk is only bound. However, it is not assigned to a specified host (business server). Assignment to a host can be performed by setting Access Control in a separate individual setting. Refer to the “Configuration Setting Tool User’s Manual (GUI)” for details.

■ [Refresh] button

If the name of the host to assign to the logical disk is not displayed in the Selection host1/Selection host2 specification, click the [Refresh] button. The following screen is displayed.



Select the method of updating host information list, and click OK.

Method of updating host information list.

● Update with info from iSM server.

○ Update with info file.

In case of using info file, prepare host information file.

Figure 11.1.18 List Update Screen

Select the method of getting host information.

- Update with info from the Storage Manager server.

  Use this to reacquire host information.

- Update with info file.

  Use this to perform host specification using the host information file.

  The host information file is the file that is output in 9.1 and 9.2. If there is no file, output a host information file.

Clicking the [OK] button acquires the specified host information.

Clicking [Close] returns to the logical disk binding screen without performing any processing.

⚠ When no host name is displayed after executing [Update with info from the iSM server], refer to the following and take appropriate action.

16 “Troubleshooting”

16.3 “Troubleshooting in Initialization Wizard/Easy Configuration”

Condition: In an environment in which a Windows OS is used in the business server, [Automatic collection] was specified in the host information collection method specification screen of the initialization wizard, but the host is not displayed in [Selection host] of the logical disk binding screen.

■ LDset Name

Use this to set and name a grouping of logical disks (LD Set) accessible to the specified host. The default value of the LD Set name is the name of the assigned host.

To edit the LD Set name, check the checkbox displayed ahead of [LDset Name].

■ Name

To specify an arbitrary name for the logical disk, check the checkbox and change the name. A four-digit logical disk number is added to the specified name.

■ Quick Format

By performing only the minimum necessary processing and omitting data area initialization (clearing), this formats in a short time.

This is available only for RAID types and platforms supported by quick formatting in a basic pool.

RAID Storage provides basic pools and dynamic pools. Refer to the “Configuration Setting Tool User’s Manual (GUI)” for details.

■ GPT Disk Type

Specify this when using the logical disk to bind in a Windows partition format GUID partition table (GPT).

■ Spare Binding

Use this to automatically bind a spare physical disk that has the same PD type as that selected in [RAID Type/PDP Type (capacity)]. This does not bind a spare disk if there is no physical disk of the same PD type to bind to a physical disk as a spare.

Clicking the [Next] button executes license unlocking and logical disk binding.

- Moreover, to bind additional logical disks, select [File] → [Configuration Setting] → [Easy Configuration] → [LD Bind Easy Configuration] or [File] → [Configuration Setting] → [Configuration Setting] → [Individual Setting/Reference] → [LD Bind/Unbind] from the menu bar after the initialization wizard has ended.

  Refer to Chapter 12 "Easy Configuration of RAID Storage" for details of easy configuration.

  Refer to the "Configuration Setting Tool User's Manual (GUI)" for details about individual setting.

- When not binding logical disk using the initialization wizard, disk binding is performed by Access Control setting of individual setting. Refer to the "Configuration Setting Tool User's Manual (GUI)" for details about individual setting.
- Specifying the host binds a 0.2 GB control volume besides the logical disk to bind to the LD Set. (Two control volumes are bound when both Host1 and Host2 are specified.) Refer to the "Data Replication User's Manual (Function Guide)" and "Configuration Setting Tool User's Manual (GUI)" regarding control volumes.

Following specification, click the [Next] button.

If you click the [Cancel] button, setup through host connection port setup is performed for the unit and the initialization wizard cannot be run again. Perform subsequent initialization including license unlocking by performing Individual Setting from "Configuration Setting". For details, refer to 11.2 "Setup Modification".

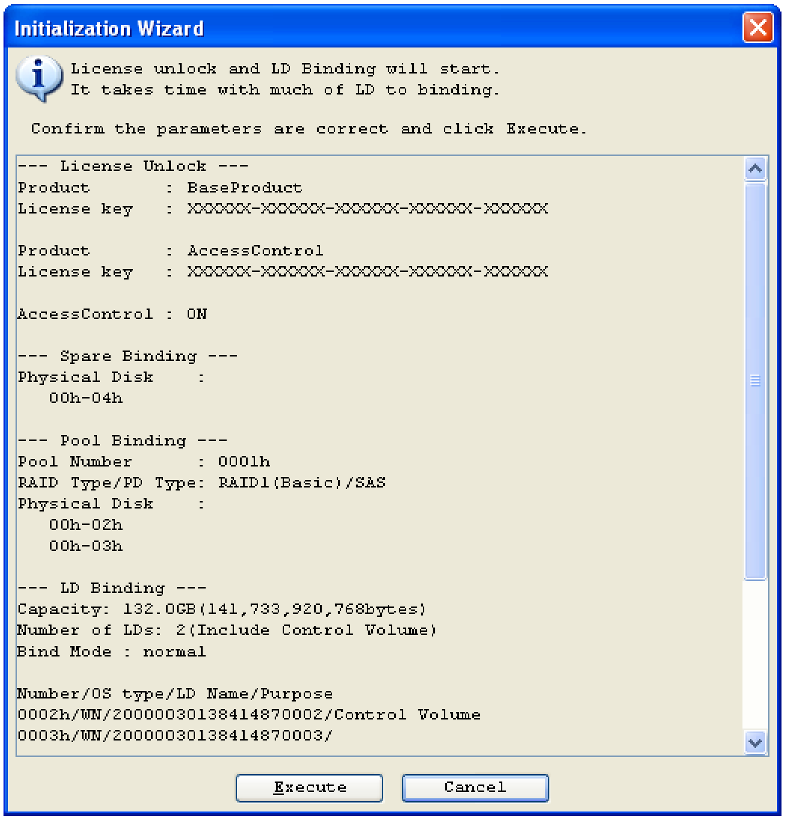
Clicking the [Back] button returns to the logical disk binding specification screen.

(11) Settings confirmation

Check the content to be set in the disk array.

(a) For Individual setting

If [Individual setting] was selected in (4) "Setting method specification", the screen below is displayed.



```
License unlock and LD Binding will start.
It takes time with much of LD to binding.

 Confirm the parameters are correct and click Execute.
```

```
--- License Unlock ---
Product        : BaseProduct
License key    : XXXXXX-XXXXXX-XXXXXX-XXXXXX-XXXXXX

Product        : AccessControl
License key    : XXXXXX-XXXXXX-XXXXXX-XXXXXX-XXXXXX

AccessControl : ON

--- Spare Binding ---
Physical Disk     :
   00h-04h

--- Pool Binding ---
Pool Number       : 0001h
RAID Type/PD Type: RAID1(Basic)/SAS
Physical Disk     :
   00h-02h
   00h-03h

--- LD Binding ---
Capacity: 132.0GB(141,733,920,768bytes)
Number of LDs: 2(Include Control Volume)
Bind Mode : normal

Number/OS type/LD Name/Purpose
0002h/WN/200000301384148700002/Control Volume
0003h/WN/200000301384148700003/
```

Figure 11.1.19 Settings Confirmation Screen (for individual setting)

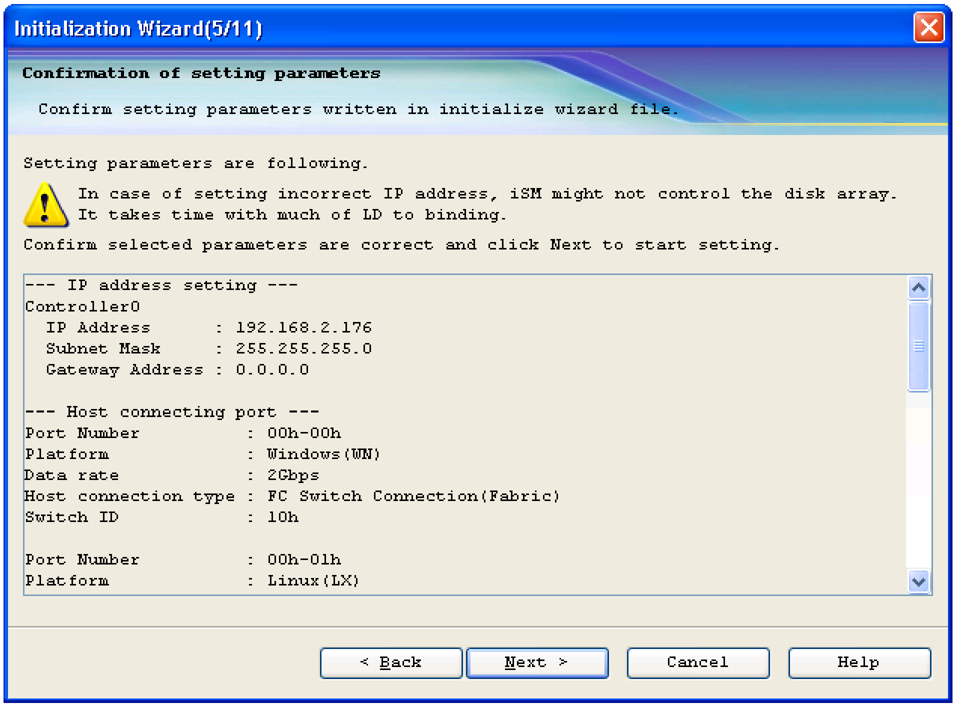
Check the settings of each parameter. For settings for each parameter, refer to (c) "Settings for each parameter".

After confirming the settings, click the [Execute] button. This makes the settings for the disk array.

Clicking the [Cancel] button returns to the logical disk binding or logical disk binding specification screen.

(b) For Batch setting with initialize wizard file

If [Batch setting with initialize wizard file] was selected in (4) “Setting method specification”, the screen below is displayed.



Confirmation of setting parameters

Confirm setting parameters written in initialize wizard file.

Setting parameters are following.

In case of setting incorrect IP address, iSM might not control the disk array.
It takes time with much of LD to binding.

Confirm selected parameters are correct and click Next to start setting.

```
--- IP address setting ---
Controller0
  IP Address      : 192.168.2.176
  Subnet Mask     : 255.255.255.0
  Gateway Address : 0.0.0.0

--- Host connecting port ---
Port Number          : 00h-00h
Platform             : Windows(WN)
Data rate            : 2Gbps
Host connection type : FC Switch Connection(Fabric)
Switch ID            : 10h

Port Number          : 00h-01h
Platform             : Linux(LX)
```

Figure 11.1.20 Settings Confirmation Screen (For Batch setting with initialize wizard file)

Check the settings of each parameter. For settings for each parameter, refer to (c) “Settings for each parameter”.

After confirming the settings, click the [Next] button. This makes the settings for the disk array.

Clicking the [Cancel] button terminates the initialization wizard. Run the initialization wizard again.

Clicking the [Back] button returns to the setting method specification screen.

(c) Settings for each parameter

The settings for each parameter are shown below. The parameters to check vary with the specification of [Individual setting] or [Batch setting with initialize wizard file] in (4) “Setting method specification”.

<Network Settings> * Only when the initialize wizard file is used

Disk array network settings are displayed.

- Controller

  The target controller is displayed.

- IP Address

  The IP address to set is displayed.

- Subnet Mask

  The subnet mask to set is displayed.

- Gateway Address

  The gateway address to set is displayed.

[Example]

```
--- IP address setting ---
Controller0
   IP Address         : 192.168.2.176
   Subnet Mask        : 255.255.255.0
   Gateway Address : 0.0.0.0
```

<Host connecting port> * Only when the initialize wizard file is used

The settings for the host connection port are displayed.

- Port Number

  The target port number is displayed.

- Platform

  The platform to set is displayed.

- Data rate

  The data rate is displayed.

- Host connection type

  The host connection type to set is displayed.

- Switch ID

  The Loop Switch ID to set is displayed.

[Example]

```
--- Host connecting port ---
Port Number              : 00h-00h
Platform                  : Windows(WN)
Data rate                : 4Gbps
Host connection type   : Direct Connection(FC-AL)
Switch ID                 : 10h
```

<License Unlock>

The specifications for setting license unlocking are displayed.

- Product * Only for individual setting

  The product of which license is to be unlocked is displayed.

- License key

  The license key of the license to unlock is displayed.

- AccessControl

  ON is displayed if the AccessControl license was unlocked.

[Example]

```
--- License Unlock ---
Product      :BaseProduct
License key :ABCDEF-GHIJKL-MNOPQR-STUVWX-YZABCD

AccessControl :ON
```

<Pool Binding>

Pool binding specifications are displayed. This is displayed only if [LD binding] was selected in logical disk binding specification.

- Pool Number

  The pool number to bind is displayed.

- RAID Type/PD Type

  The RAID type and PD type of the pool to bind are displayed.

- Physical Disk

  A list of the physical disks that make up the pool to bind is displayed in 00h-00h format.

[Example]

```
--- Pool Binding ---
Pool Number          : 0000h
RAID Type/PD Type: RAID1(Basic)/FC
Physical Disk        :
    00h-01h
    00h-0ch
```

<Spare Binding>

The specifications for spare binding are displayed. This is displayed if [LD binding] was selected in logical disk binding specification and the [Spare Binding] checkbox was checked.

- Physical Disk

A list of the physical disks that make up the spare to bind is displayed in 00h-00h format.

[Example]

```
--- Spare Binding ---
Physical Disk        :
    00h-0dh
```

<LD Binding>

The specifications for logical disk binding are displayed.

- Start Number * Only when the initialize wizard file is used

The starting logical disk number of logical disks to bind is displayed.

- Capacity

The capacity of the logical disk to bind is displayed.

- Number of LDs

The number of logical disks to bind is displayed.

- OS type

The format of the logical disk to bind is displayed.

- Name(prefix)

The name (prefix) of the logical disk to bind is displayed.

- Purpose

The purpose of the logical disk to bind is displayed.

Control Volume is displayed in Purpose.

[Example]

```
--- LD Binding ---
Start Number: 00dh
Capacity: 0.2GB
Number of LDs: 1
OS type: WN
Name(prefix): WG
Purpose: Control Volume

--- LD Binding ---
Start Number: 00eh
Capacity: 2.0GB
Number of LDs: 2
OS type: WN
Name(prefix): WG
```

<Access Control Setting>

Specifications set for Access Control are displayed.

- Platform

  The platform of the LD Set is displayed.

- LD Set Name

  The name of the LD Set is displayed.

- Host Name

  The host name is displayed.

- Path Info

  WWPN information set for the LD Set is displayed.

- Assigned logical disks   * Only when the initialize wizard file is used

  Information about logical disks assigned to the LD Set is displayed.

  - LUN

    The LUN is displayed.

  - Number

    The logical disk number to bind is displayed.

  - LD name

    The logical disk name to bind is displayed.

  - Capacity

    The capacity of the logical disk to bind is displayed.

  - RAID Type

The RAID type of the pool to bind is displayed.

- PD Type

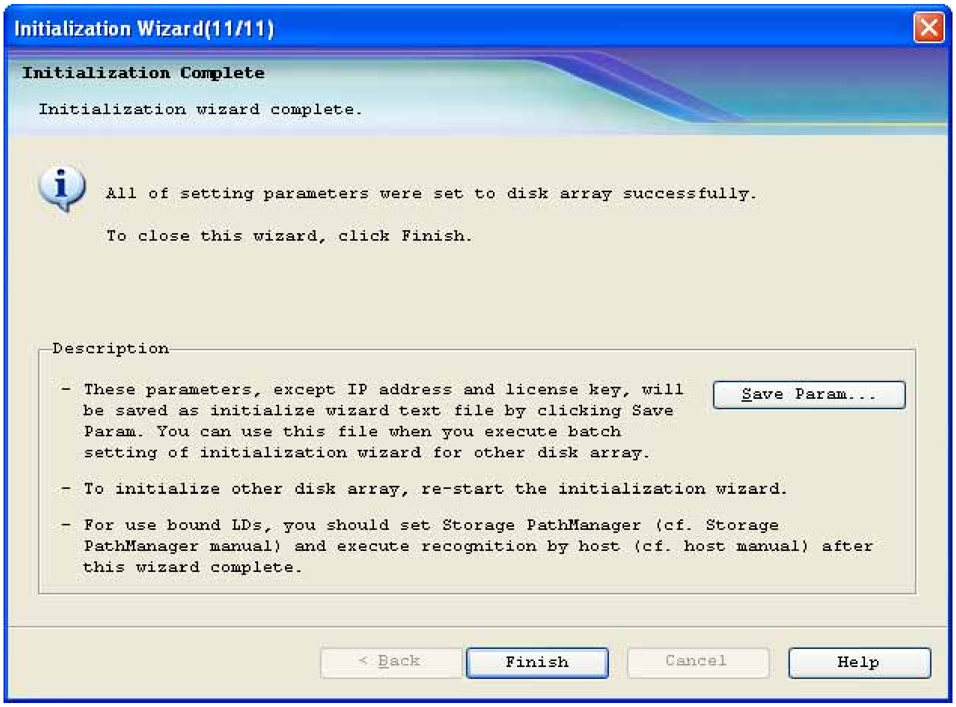
  The PD type of the pool to bind is displayed.

[Example]

```
--- Access Control Setting (Host1) ---
Platform      : WN
LD Set Name : EXP12DV1
Host Name     : EXP12DV1
Path Info     : 1000-0000-c92d-3f03
                1000-0000-c92d-3f99

  --- Logical Disk Assigned to Host ---
  LUN/Number/OS type/LD Name/Capacity/RAID Type/PD Type
   0000h/001Dh/WN/WG001D/0.2GB/RAID1(Basic)/FC
   0001h/001Eh/WN/WG001E/2.0GB/RAID1(Basic)/FC

--- Access Control Setting (Host2) ---
Platform      : WN
LD Set Name : EXP12DV1
Host Name     : EXP12DV1
Path Info     : 1000-0000-c92d-3f03
                1000-0000-c92d-3f99

  --- Logical Disk Assigned to Host ---
  LUN/Number/OS type/LD Name/Capacity/RAID Type/PD Type
   0000h/001Fh/WN/WG001F/0.2GB/RAID1(Basic)/FC
   0001h/001Gh/WN/WG001G/2.0GB/RAID1(Basic)/FC
```

(12) Setup completion

The following screen is displayed if the disk array was initialized correctly.



Initialization Complete

Initialization wizard complete.

All of setting parameters were set to disk array successfully.

To close this wizard, click Finish.

Description

- These parameters, except IP address and license key, will be saved as initialize wizard text file by clicking Save Param. You can use this file when you execute batch setting of initialization wizard for other disk array.
- To initialize other disk array, re-start the initialization wizard.
- For use bound LDs, you should set Storage PathManager (cf. Storage PathManager manual) and execute recognition by host (cf. host manual) after this wizard complete.

Figure 11.1.21 Setup Completion Screen

Check “Description”.

Click the [Save Param...] button to use the settings made in the initialization wizard when initializing another disk array. The settings made in the initialization wizard (except for IP address and license information) are saved in text format. The saved file can be used as the file used for batch setting in (4) “Setting method selection” when initializing another disk array. For the contents of the file, refer to Appendix B “Initialize Wizard File”. To use the saved initialize wizard file for another disk array, it is necessary to edit the IP address and license key in advance.

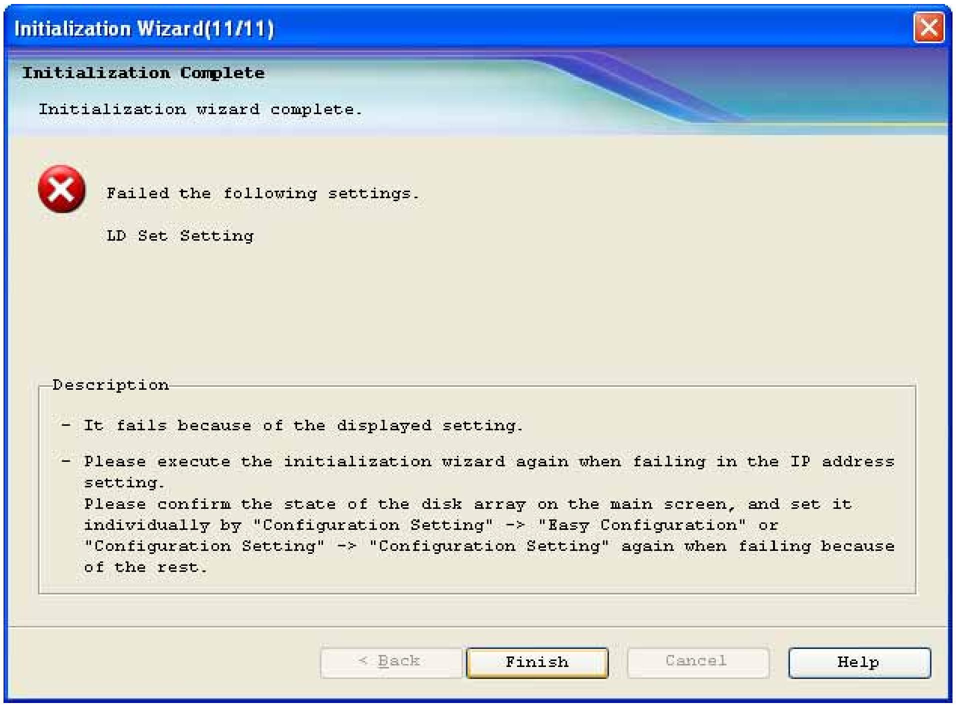
After confirming “Description”, click the [Finish] button to terminate the initialization wizard.

This returns you to the Storage Manager main window screen.

If setting modifications and additions do not bind logical disks, perform procedures described in Chapter 13 “Connection Confirmation from Business Server”.

(13) If setup fails

If initializing the disk array fails in the initialization wizard, the following screen is displayed.



Initialization Complete

Initialization wizard complete.

Failed the following settings.

LD Set Setting

Description

- It fails because of the displayed setting.
- Please execute the initialization wizard again when failing in the IP address setting.
  Please confirm the state of the disk array on the main screen, and set it individually by "Configuration Setting" -> "Easy Configuration" or "Configuration Setting" -> "Configuration Setting" again when failing because of the rest.

Figure 11.1.22 Initialization Failure Screen

Refer to the displayed error content and the main items to check that are listed below and check setting information and connections.

If initialization through (6) “Network setup” terminated normally, perform subsequent initialization from individual settings. Refer to 11.2 “Setup Modification” for details If initialization failed in (6) “Network setup”, execute the initialization wizard again.
After confirming the displayed error content, click the [Finish] button to terminate the initialization wizard.

This returns you to the Storage Manager client (Web GUI) main window screen.

11.2 Setup Modification

Disk array setting modification, including when the initialization wizard is canceled, can be performed by Easy Configuration or Configuration Setting.

Table 11.2.1 shows the items of Easy Configuration and Configuration Setting that correspond to initialization.

Table 11.2.1 Correspondence between Initialization Wizard, Easy Configuration, and Individual Setting

	Initialization Wizard	Easy Configuration	Individual Setting
(1)	Host information collection method specification	-	Host recognize volume setting
(2)	Network setting	-	Network setting
(3)	Host connection port setting	-	Host connection port setting
(4)	License unlocking	Batch license unlocking	License unlocking and display
(5)	Logical disk binding	Logical disk easy configuration	Logical disk binding/unbinding

For the easy configuration, refer to Chapter 12.

To start Configuration Setting, select [File] → [Configuration Setting] → [Configuration Setting] from the menu bar in the Storage Manager client (Web GUI) main screen or click the [Configuration] icon in the tool bar and select [Configuration Setting].

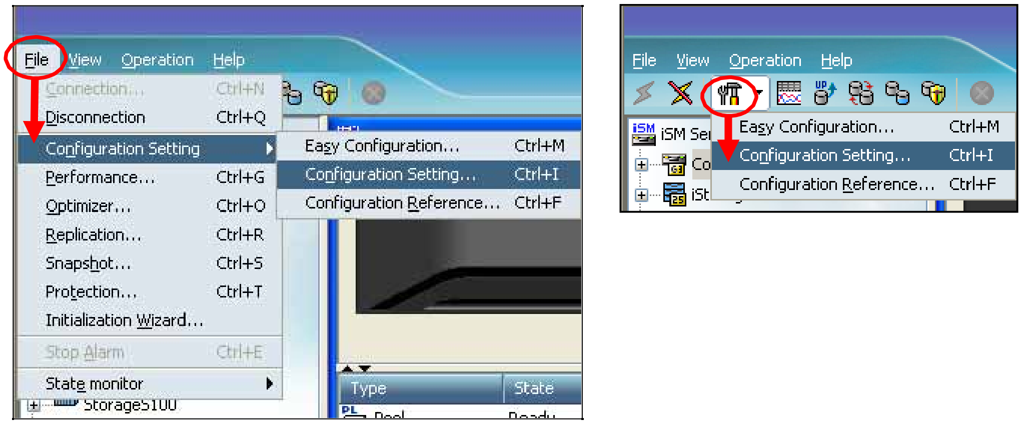
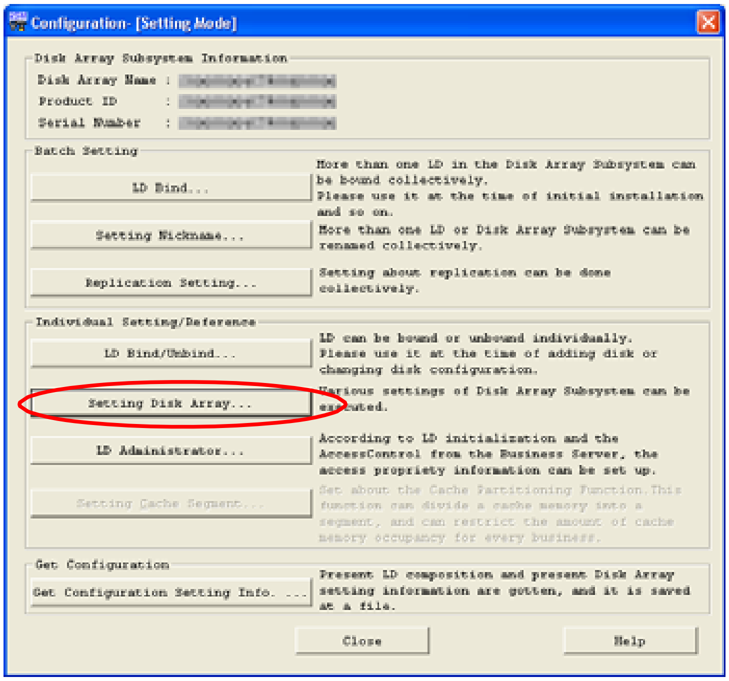

File View Operation Help
Connection... Ctrl+N
Disconnection Ctrl+Q
Configuration Setting
Performance... Ctrl+G
Optimizer... Ctrl+O
Replication... Ctrl+R
Snapshot... Ctrl+S
Protection... Ctrl+T
Initialization Wizard...
Stop Alarm Ctrl+E
State monitor
StorageS100
Easy Configuration... Ctrl+M
Configuration Setting... Ctrl+I
Configuration Reference... Ctrl+F
Type
State
Pool
Ready
File View Operation Help
iSM Ser
Easy Configuration... Ctrl+M
Configuration Setting... Ctrl+I
Configuration Reference... Ctrl+F

Figure 11.2.1 Starting Configuration Setting

Click the [Setting Disk Array] button in [Individual Setting/Reference] to make various configuration settings.


Configuration- [Setting Mode]
LD Bind...
Setting Nickname...
Replication Setting...
LD Bind/Unbind...
Setting Disk Array...
LD Administrator...
Setting Cache Segment...
Get Configuration Setting Info. ...
Close
Help

Disk Array Subsystem Information

Disk Array Name : [redacted]
Product ID : [redacted]
Serial Number : [redacted]

Batch Setting

More than one LD in the Disk Array Subsystem can be bound collectively. Please use it at the time of initial installation and so on.

More than one LD or Disk Array Subsystem can be renamed collectively.

Setting about replication can be done collectively.

Individual Setting/Reference

LD can be bound or unbound individually. Please use it at the time of adding disk or changing disk configuration.

Various settings of Disk Array Subsystem can be executed.

According to LD initialization and the AccessControl from the Business Server, the access propriety information can be set up.

Set about the Cache Partitioning Function.This function can divide a cache memory into a segment, and can restrict the amount of cache memory occupancy for every business.

Get Configuration

Present LD composition and present Disk Array setting information are gotten, and it is saved as a file.

Figure 11.2.2 Configuration Setting Menu Screen

Refer to the "Configuration Setting Tool User's Manual (GUI)" regarding other settings.

⚠

The following conditions must be satisfied in order to make the host recognize volume setting effective.

1. The host being connected must be a newly installed Windows platform. If an operating host were to be connected, tasks of the operating host could be affected by the host recognize volume that is created on automatic collection of host information.
2. The Storage Manager volume list command or ControlCommand must be installed on the host being connected.
3. To bind a logical disk using host information, make the host recognize volume setting ineffective.

12. Easy Configuration of RAID Storage

Easy configuration, which is started from the menu bar or Configuration icon in the main screen, has the following two functions.

- Batch unlocking of licenses
- Easy configuration of logical disks

12.1 Starting Easy Configuration

After selecting the target disk array from the main window screen of the Storage Manager client, start Easy Configuration by selecting [File] → [Configuration Setting] → [Easy Configuration] from the menu bar or by clicking the [Configuration] icon from the tool bar and selecting [Easy Configuration].

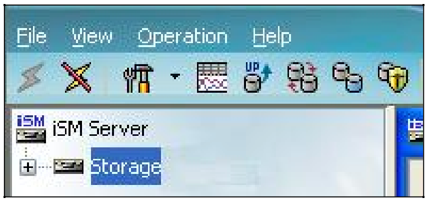

File
View
Operation
Help
iSM Server
Storage

Figure 12.1.1 Main Window Screen of the Storage Manager Client (Web GUI)

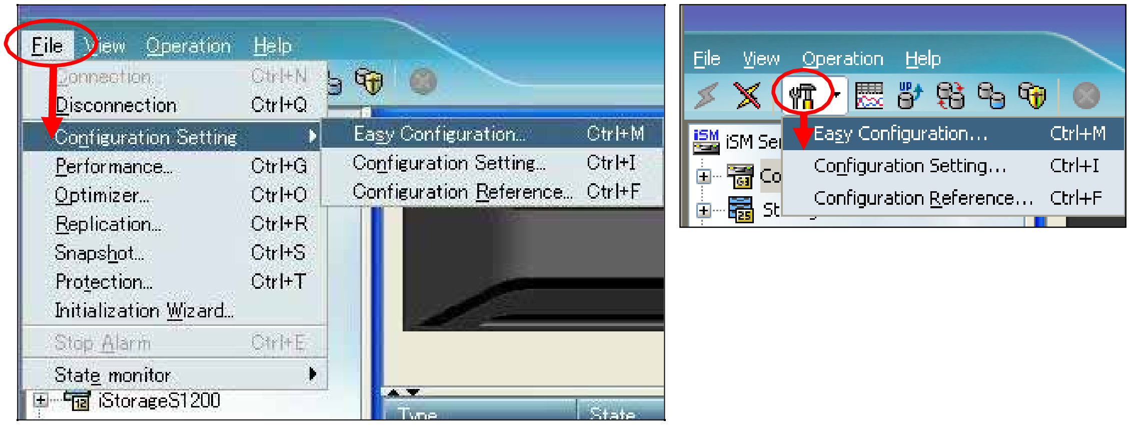
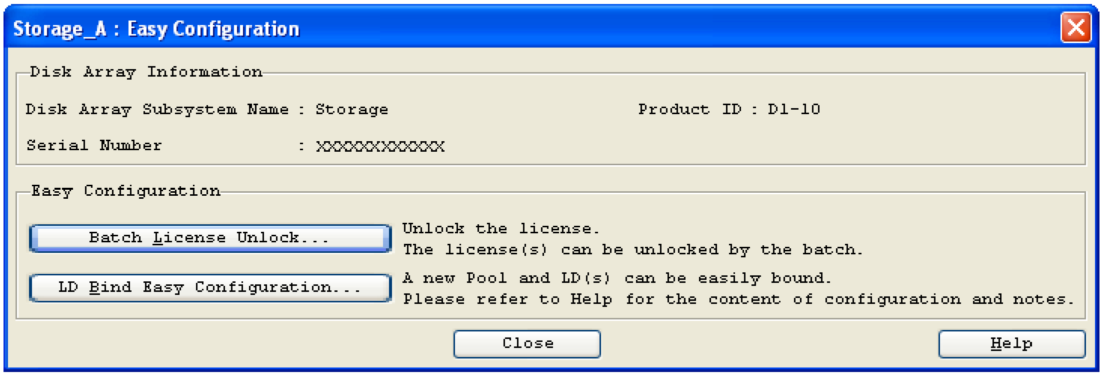

File
View
Operation
Help
Connection... Ctrl+N
Disconnection Ctrl+Q
Configuration Setting
Performance... Ctrl+G
Optimizer... Ctrl+O
Replication... Ctrl+R
Snapshot... Ctrl+S
Protection... Ctrl+T
Initialization Wizard...
Stop Alarm Ctrl+E
State monitor
iStorageS1200
Easy Configuration... Ctrl+M
Configuration Setting... Ctrl+I
Configuration Reference... Ctrl+F
Type
State
File
View
Operation
Help
iSM Se
Co
St
Easy Configuration... Ctrl+M
Configuration Setting... Ctrl+I
Configuration Reference... Ctrl+F

Figure 12.1.2 Selecting Easy Configuration

Easy Configuration can be performed only at the (L3) user level.

12.2 Easy Configuration Menu Screen

Various easy configurations can be performed from the menu screen.



Storage_A : Easy Configuration

Disk Array Information

Disk Array Subsystem Name : Storage

Product ID : D1-10

Serial Number : XXXXXXXXXXXX

Easy Configuration

Batch License Unlock...

Unlock the license.
The license(s) can be unlocked by the batch.

LD Bind Easy Configuration...

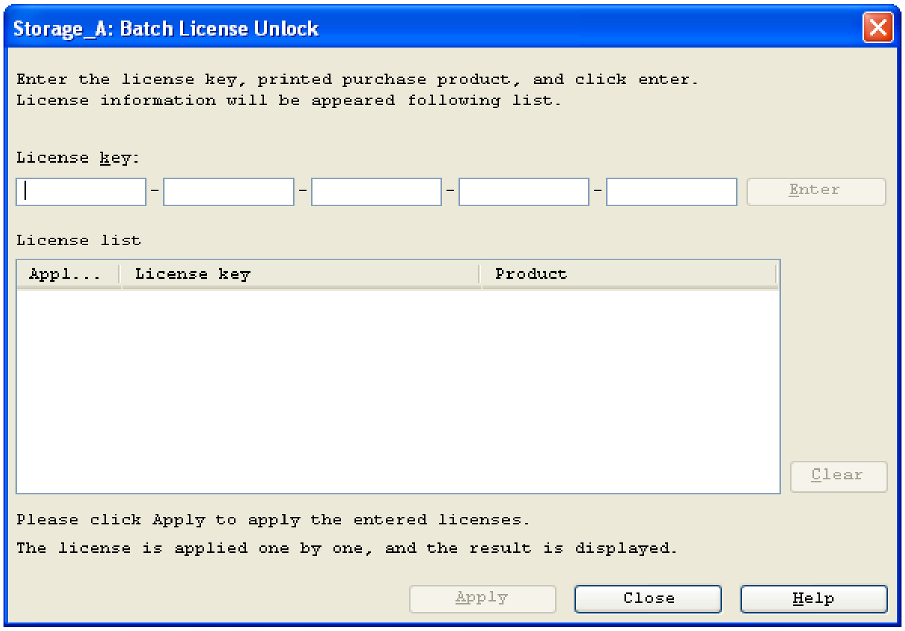
A new Pool and LD(s) can be easily bound.
Please refer to Help for the content of configuration and notes.

Figure 12.2.1 Easy Configuration Menu Screen

For each configuration, refer to 12.3 and subsequent sections.

12.3 Batch Unlocking of Licenses

Batch License Unlock can be used to unlock multiple licenses at once.



Enter the license key, printed purchase product, and click enter.
License information will be appeared following list.

Please click Apply to apply the entered licenses.
The license is applied one by one, and the result is displayed.

Figure 12.3.1 Batch License Unlock Screen

- License key

  Input the license key of a purchased product.

- License list

  Input license keys are displayed. To apply them, click the [Apply] button and the results of executing license unlocking will be displayed. For a success, the result indicates that license unlocking was carried out, and for a failure, it shows that license unlocking could not be done.

  - [Enter] button

    The input license key is checked and if it is a valid license key, it is reflected in the input key list. If the input license key is in error, a warning message is output.

  - [Clear] button

    Selecting a license key from the input key list and clicking the [Clear] button removes the selected license key from the input key list.

  - [Apply] button

    This executes unlocking of the input licenses.

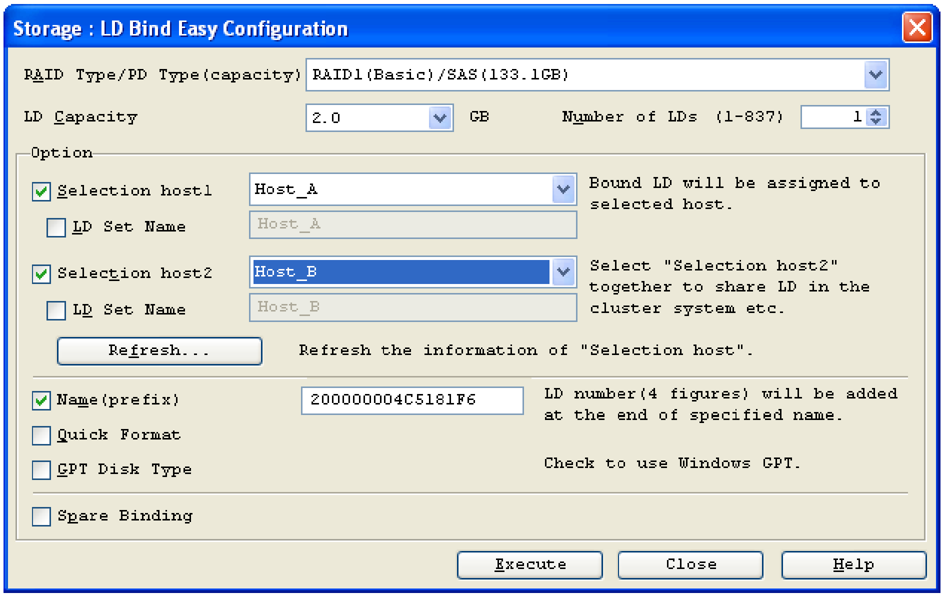
  - [Cancel] button

    This terminates the Batch License Unlock dialog.

12.4 Easy Configuration of Logical Disks

Clicking the [LD Bind Easy Configuration] button from the Easy Configuration screen displays the LD Bind Easy Configuration screen.

This can be used to configure RAID and bind logical disks in addition to logical disks bound by the initialization wizard.



Storage : LD Bind Easy Configuration

RAID Type/PD Type(capacity): RAID1(Basic)/SAS(133.1GB)

LD Capacity: 2.0 GB   Number of LDs (1-837): 1

Option

☑ Selection host1: Host_A — Bound LD will be assigned to selected host.

☐ LD Set Name: Host_A

☑ Selection host2: Host_B — Select "Selection host2" together to share LD in the cluster system etc.

☐ LD Set Name: Host_B

Refresh... — Refresh the information of "Selection host".

☑ Name(prefix): 200000004C5181F6 — LD number(4 figures) will be added at the end of specified name.

☐ Quick Format

☐ GPT Disk Type — Check to use Windows GPT.

☐ Spare Binding

Figure 12.4.1 Logical Disk Easy Configuration Screen

- RAID Type/PD Type

  The RAID types and PD (physical disk) types that can be selected are displayed in a pull-down.

- LD Capacity

  Specify the capacity of the logical disk to bind.

- Number of LDs

  Specify the number of logical disks to bind.

- Selection host1/Selection host2

  Check this to assign a bound logical disk to a specified host (business server). Host specification cannot be done unless the AccessControl license key has been input.

  - If checked

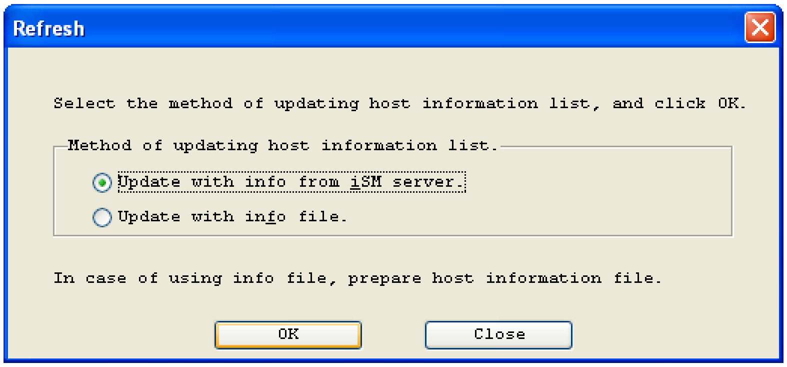
    A logical disk to be bound is assigned to a specified host (business server). Hosts connected to the disk array are shown in the pull-down. Select the host to which to assign the logical disk.

  - If not checked

The logical disk is only bound. However, it is not assigned to a specified host (business server). Assignment to a host can be performed by setting Access Control in a separate individual setting. Refer to the “Configuration Setting Tool User’s Manual (GUI)” for details.

■ [Refresh] button

If the name of the host to assign to the logical disk is not displayed in the Selection host1/Selection host2 specification, click the [Refresh] button. The following screen is displayed.



Select the method of updating host information list, and click OK.

Method of updating host information list.

● Update with info from iSM server.

○ Update with info file.

In case of using info file, prepare host information file.

Figure 12.4.2 List Update Screen

Select the method of getting host information.

- Update with info from the Storage Manager server

  Use this to reacquire host information.

  If the host name is not displayed after execution, select [Update with info file].

- Update with info file

  Use this to perform host specification using the host information file.

  The host information file is the file that is output in 9.1 and 9.2. If there is no file, output a host information file.

Clicking the [OK] button acquires the specified host information.

Clicking [Close] returns to the logical disk binding screen without performing any processing.

■ LDset Name

Use this to set and name a grouping of logical disks (LD Set) accessible to the specified host. The default value of the LD Set name is the name of the assigned host.

To edit the LD Set name, check the checkbox displayed ahead of [LDset Name].

■ Name

To specify an arbitrary name for the logical disk, check the checkbox and change the name. A four-digit logical disk number is added to the specified name.

■ Quick Format

By performing only the minimum necessary processing and omitting data area initialization (clearing), this formats in a short time.

This is available only for RAID types and platforms supported by quick formatting in a basic pool.

* To use a disk on which important data has been placed or another disk that has already been used, the data can be initialized (cleared) by performing normal formatting.

RAID Storage provides basic pools and dynamic pools. Refer to the “Configuration Setting Tool User’s Manual (GUI)” for details.

■ GPT Disk Type

Specify this when using the logical disk to bind in a Windows partition format GUID partition table (GPT).

■ Spare Binding

Use this to automatically bind a spare physical disk that has the same PD type as that selected in [RAID Type/PDP Type (capacity)]. This does not bind a spare disk if there is no physical disk of the same PD type to bind to a physical disk as a spare.

■ [Execute] button

Clicking the [Execute] button performs logical disk binding.

If you create a new LD Set by performing host specification, this binds a 0.2 GB control volume to the LD Set besides the logical disk that it binds.

Refer to the “Data Replication User’s Manual (Function Guide)” and “Snapshot User’s Manual (Function Guide)” regarding the control volume.

■ [Cancel] button

This terminates the LD Bind Easy Configuration dialog.

⚠

In logical disk easy configuration, a logical disk cannot be added to an existing RAID.

Add it in a separate individual setting.

Refer to the “Configuration Setting Tool User’s Manual (GUI)” for details.

13. Connection Confirmation from Business Server

13.1 Connection Confirmation in a Windows Environment

(1) Confirmation procedure from Windows OS

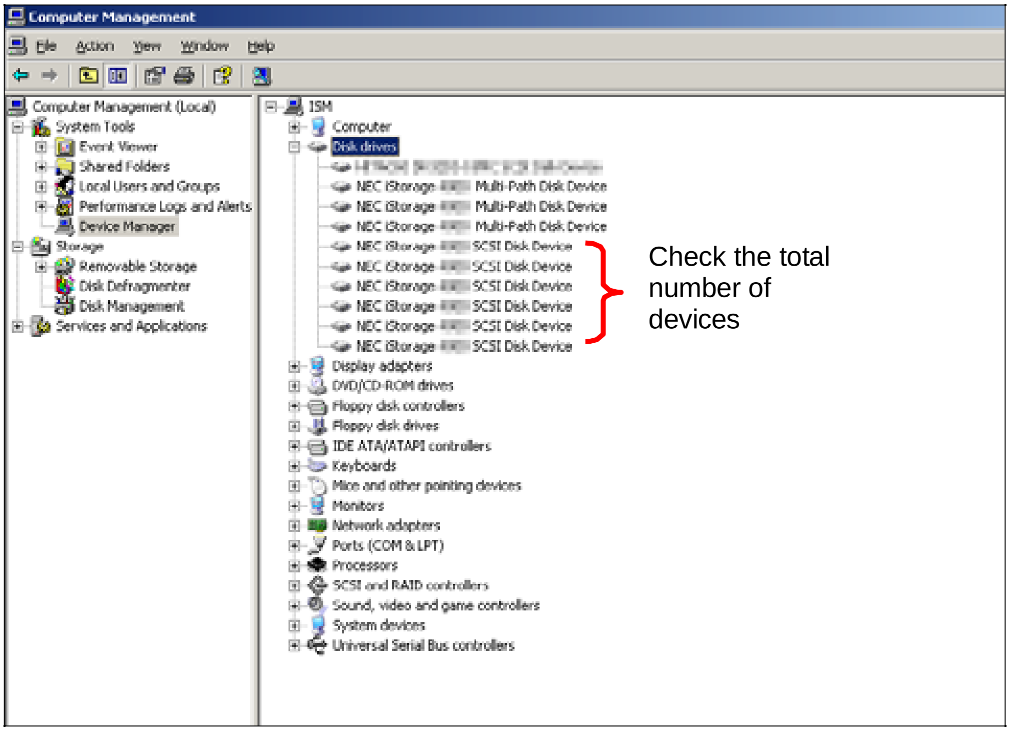
After confirming that an FC cable is connected between the server and RAID Storage, restart the server and perform confirmation tasks by following the procedure below.

1. Start [Administrative Tools] → [Computer Management] → [Device Manager].
2. Click “Disk drives” and check the number of logical disks (as many as the number of logical disks assigned to the server times the number of access paths from the server to each logical disk are displayed) and the respective disk drives (RAID Storage 1000 SCSI Disk Device).

* If none are displayed, the logical disks in RAID Storage that are assigned to the server are not being recognized by the OS. Check connections between the server and RAID Storage, AccessControl settings, and the host bus adapter driver setup.

[Sample display]

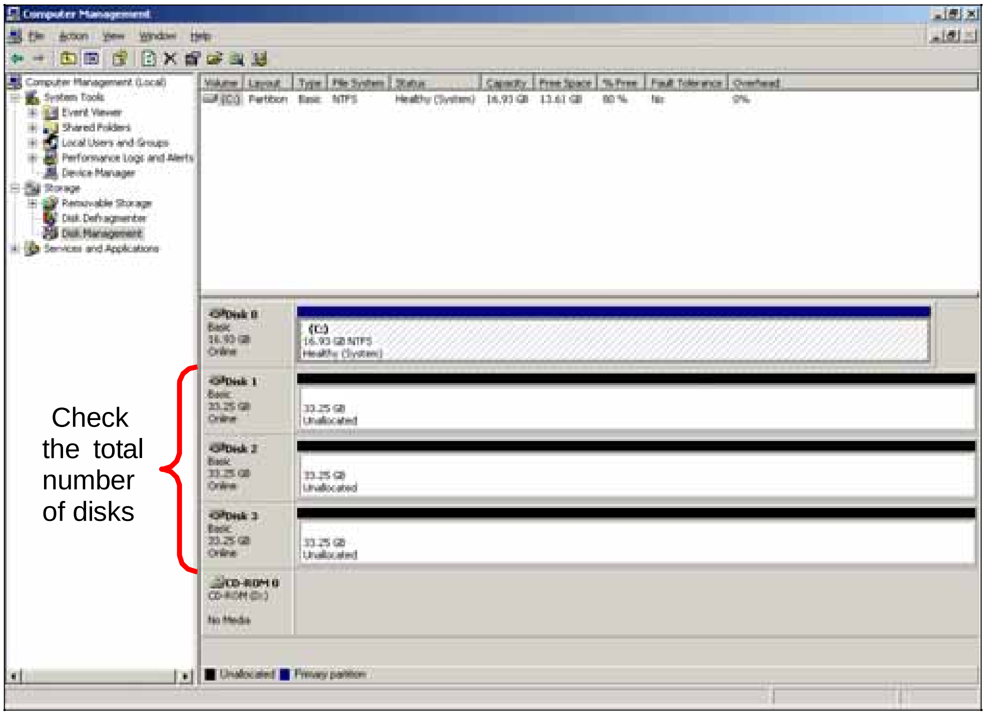
When two logical disks are assigned to the server and there are two access paths for each logical disk


Computer Management
File
Action
View
Window
Help
Computer Management (Local)
System Tools
Event Viewer
Shared Folders
Local Users and Groups
Performance Logs and Alerts
Device Manager
Storage
Removable Storage
Disk Defragmenter
Disk Management
Services and Applications
ISM
Computer
Disk drives
[redacted]
NEC iStorage [redacted] Multi-Path Disk Device
NEC iStorage [redacted] Multi-Path Disk Device
NEC iStorage [redacted] Multi-Path Disk Device
NEC iStorage [redacted] SCSI Disk Device
NEC iStorage [redacted] SCSI Disk Device
NEC iStorage [redacted] SCSI Disk Device
NEC iStorage [redacted] SCSI Disk Device
NEC iStorage [redacted] SCSI Disk Device
NEC iStorage [redacted] SCSI Disk Device
Display adapters
DVD/CD-ROM drives
Floppy disk controllers
Floppy disk drives
IDE ATA/ATAPI controllers
Keyboards
Mice and other pointing devices
Monitors
Network adapters
Ports (COM & LPT)
Processors
SCSI and RAID controllers
Sound, video and game controllers
System devices
Universal Serial Bus controllers

Check the total number of devices

Figure 13.1.1 Device Manager

3. Open [Disk Management] and check the number of logical disks (as many as the number of logical disks assigned to the server are displayed).


Computer Management
File
Action
View
Window
Help
Computer Management (Local)
System Tools
Event Viewer
Shared Folders
Local Users and Groups
Performance Logs and Alerts
Device Manager
Storage
Removable Storage
Disk Defragmenter
Disk Management
Services and Applications
Disk 0
Basic
16.93 GB
Online
(C:)
16.93 GB NTFS
Healthy (System)
Disk 1
Basic
33.25 GB
Online
33.25 GB
Unallocated
Disk 2
Basic
33.25 GB
Online
33.25 GB
Unallocated
Disk 3
Basic
33.25 GB
Online
33.25 GB
Unallocated
CD-ROM 0
CD-ROM (D:)
No Media
■ Unallocated
■ Primary partition

Volume	Layout	Type	File System	Status	Capacity	Free Space	% Free	Fault Tolerance	Overhead
(C:)	Partition	Basic	NTFS	Healthy (System)	16.93 GB	13.61 GB	80 %	No	0%

Check the total number of disks

Figure 13.1.2 Disk Management

(2) PathManager setup and status confirmation

If you have not installed PathManager, this task is unnecessary.

After confirming that an FC cable is connected between the server and RAID Storage, restart the server and execute the commands below from the command prompt.

Refer to the “PathManager User’s Manual (Windows)” or the “PathManager for Windows Installation Guide” for details.

1. For a MSCS (Microsoft Cluster Service) environment

   Execute the following commands from the command prompt.

   ```
   spscmd -avail :::

   spscmd -setmscsmode E
   ```

2. If not a MSCS environment

   Execute the following command from the command prompt.

   ```
   spscmd -avail :::
   ```

3. PathManager status confirmation

   Execute the following command from the command prompt.

   ```
   spscmd -getlun
   ```

   Look at the messages displayed on command execution (Figure 13.1.3 “Sample spscmd -getlun Output”) and confirm the number of logical disks assigned to the server, the number of access paths to each logical disk, and the path status.

   [Sample display]

   When two logical disks are assigned to the server and there are two access paths for each logical disk

```
C:¥>spscmd  -getlun

+++  LogicalUnit  #0  +++  [least_size]
 >     0:  Priority=2,  PathNumber=4:0:0:0
       1:  Priority=1,  PathNumber=5:0:1:0

+++  LogicalUnit  #1  +++  [least_size]
 >     0:  Priority=2,  PathNumber=4:0:0:1
       1:  Priority=1,  PathNumber=5:0:1:1
```

Figure 13.1.3 Sample spscmd -getlun Output

* If nothing is displayed, the logical disks in RAID Storage that are assigned to the server are not being recognized on any access path. Check the connection between the server and RAID Storage, AccessControl settings, and host bus adapter driver setup.

13.2 Connection Confirmation in a Linux Environment

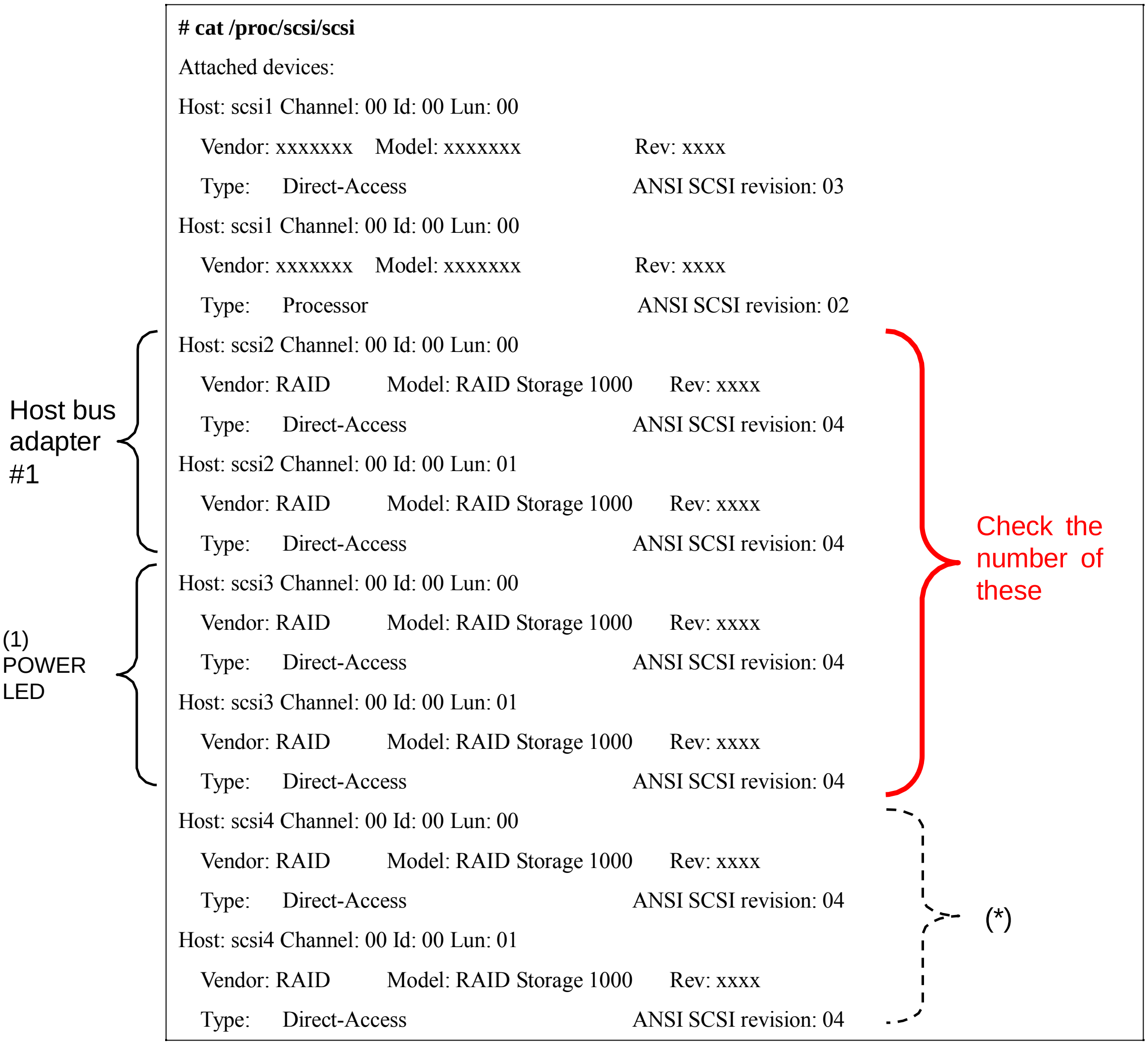
(1) Confirmation procedure from Linux OS

After confirming that an FC cable is connected between the server and RAID Storage, restart the server and execute the command below to check the number of logical disks (as many as the number of logical disks assigned to the server times the number of access paths from the server to each logical disk are displayed) and the vendor and model (RAID, RAID Storage 1000) of each.

* If none are displayed, the logical disks in RAID Storage that are assigned to the server are not being recognized by the OS. Check connections between the server and RAID Storage, AccessControl settings, and the host bus adapter driver setup.

[Sample display]

When two logical disks are assigned to the server and there are two access paths for each logical disk



```
# cat /proc/scsi/scsi
Attached devices:
Host: scsi1 Channel: 00 Id: 00 Lun: 00
   Vendor: xxxxxxx   Model: xxxxxxx              Rev: xxxx
   Type:      Direct-Access                      ANSI SCSI revision: 03
Host: scsi1 Channel: 00 Id: 00 Lun: 00
   Vendor: xxxxxxx   Model: xxxxxxx              Rev: xxxx
   Type:      Processor                          ANSI SCSI revision: 02
Host: scsi2 Channel: 00 Id: 00 Lun: 00
   Vendor: RAID       Model: RAID Storage 1000      Rev: xxxx
   Type:      Direct-Access                      ANSI SCSI revision: 04
Host: scsi2 Channel: 00 Id: 00 Lun: 01
   Vendor: RAID       Model: RAID Storage 1000      Rev: xxxx
   Type:      Direct-Access                      ANSI SCSI revision: 04
Host: scsi3 Channel: 00 Id: 00 Lun: 00
   Vendor: RAID       Model: RAID Storage 1000      Rev: xxxx
   Type:      Direct-Access                      ANSI SCSI revision: 04
Host: scsi3 Channel: 00 Id: 00 Lun: 01
   Vendor: RAID       Model: RAID Storage 1000      Rev: xxxx
   Type:      Direct-Access                      ANSI SCSI revision: 04
Host: scsi4 Channel: 00 Id: 00 Lun: 00
   Vendor: RAID       Model: RAID Storage 1000      Rev: xxxx
   Type:      Direct-Access                      ANSI SCSI revision: 04
Host: scsi4 Channel: 00 Id: 00 Lun: 01
   Vendor: RAID       Model: RAID Storage 1000      Rev: xxxx
   Type:      Direct-Access                      ANSI SCSI revision: 04
```

Figure 13.2.1 Confirmation of Number of LDs in a Linux OS Environment

* In an environment in which PathManager is installed, logical disks that are subject to PathManager control may be displayed after the logical disks recognized by the OS via host bus adapters (host adapter #1 and host bus adapter #2 sections of the above sample display), depending on the Linux kernel version.

(2) PathManager setup and status confirmation

If you have not installed PathManager, this task is unnecessary.

After confirming that an FC cable is connected between the server and RAID Storage, restart the server and perform the checks below from the command prompt.

Refer to the “PathManager User’s Manual (Linux)” or the “PathManager for Linux Installation Guide” for details.

1. Confirmation of kernel version

   Confirm that PathManager supported by the kernel being used is installed.

   Confirm that kernel version (A) displayed by “uname -r” and kernel version (B) displayed by “rpm -qi” are the same.

```
# uname -r
2.4.X-XX
# rpm -qa | grep sps
sps-xxx-yyyy
# rpm -qi sps-xxx-yyyy
Name : sps-X-XXX Relocations: (not relocateable)
Version : 2.X.X Vendor: RAID Inc.
Release : 2.X.XX.XX Build Date: 200y MM DD hh mm ss
Install date: 200y MM DD hh mm ss Build Host: RAID.co.jp
Group : Utilities/System Source RPM: sps-X-XX.X.src.rpm
Size : XXXXXX License: commercial
Summary : SCSI dual-path driver and utilities for RAID Storage
Description :
This package contains a driver, daemon and some utilities. The
driver (dd_mod,dd) provides the redundant SCSI-path for
RAID Storage Disk Array System.
The daemon (dd_daemon) supervises the driver.
And, some utilities work for the maintenance.
It runs on 2.4.X.XX kernel.
```

Kernel version (A)

Kernel version (B) in which PathManager is supported

Figure 13.2.2 Confirmation of Kernel Version

* This may differ somewhat if the OS is a 2.6 series kernel.

2. PathManager status confirmation

   - For a 2.4 series kernel

Check /proc/dualpath/ddX (where X is a, b, c … as many as number of logical disks assigned to server).

If the "*partition-info*" field is "NML", the paths have been multiplexed normally.

* If nothing is displayed, the logical disks in RAID Storage that are assigned to the server are not being recognized on any access path. Check connections between the server and RAID Storage, AccessControl settings, and the host bus adapter driver setup.

[Sample display]

When two logical disks are assigned to the server and there are two access paths for each logical disk

```
# cat /proc/dualpath/dda
disk-info: RAID , RAID Storage 1000 , xxxxxxxxxxxxxxxx,
xxxxx path-info: 2: 0, 0, 0, ACT, 1
path-info: 3: 0, 0, 0, HOT, 2
lb-info: S
partition-info: 0, NML
#
```

Figure 13.2.3 PathManager Status Confirmation (for 2.4 series)

- For a 2.6 series kernel

Check /proc/scsi/ddX (where X is a, b, c … as many as number of logical disks assigned to server).

If a "*path-info*" line exists only for multiplexed portions of each device and the "*device-info*:" Status fields all are "NML", the paths have been multiplexed normally.

* If nothing is displayed, the logical disks in RAID Storage that are assigned to the server are not being recognized on any access path. Check connections between the server and RAID Storage, AccessControl settings, and the host bus adapter driver setup.

[Sample display]

When two logical disks are assigned to the server and there are two access paths for each logical disk

```
# cat /proc/scsi/sps/dda
device:/dev/dda
disk-info:RAID ,RAID Storage 1000
,xxxxxxxxxxxxxxxx,xxxxx device-info:Host:scsi:2 Channel:0
Id:0 Lun:0 Status:NML LoadBalance:D2
path-info:0 Host:scsi:0 Channel:0 Id:0 Lun:0 Priority:1 Watch:Enable Status:ACT
path-info:1 Host:scsi:1 Channel:0 Id:0 Lun:0 Priority:2 Watch:Enable Status:ACT
 #
```

Figure 13.2.4 PathManager Status Confirmation (for 2.6 series)

3. Confirmation of path patrol daemon

Confirm that the path patrol daemon is running.

If the path patrol daemon is running, the message shown below is displayed.

```
# /etc/rc.d/init.d/dd_daemon status
dd_daemon (pid XXX) is running ...
#
```

Figure 13.2.5 Confirmation of path patrol daemon (for 2.6 series)

14. Storing Host Information Output to File on Business Server

First, execute the host information collection command (iSMcc_hostinfo command) on the business server and transfer the output host information file to the management server on which the Storage Manager server is operating using file transfer or USB memory.

Next, execute the host information storage command (iSMhoststore command) from the command prompt (in a windows environment) or the command line (in a Linux environment) on the server on which the Storage Manager server is operating. In the -import option, specify the host information file that was transferred from the business server. And in the -arrayname option, specify the nickname of the disk array to which the operation applies.

Execute the host information collection command (iSMcc_hostinfo command) as a user with administrator privileges in a Windows environment or as a super user in a Linux environment. Moreover, when performing host information storage, the target disk array that is the storage destination must be being monitored normally from the Storage Manager server.

Execution example when the Storage Manager server is operating in a Windows environment

```
D:¥> iSMhoststore -import ¥ServerName -arrayname StorageName
iSMhoststore: 002 Host Information was imported successfully. (Disk Array=StorageName)
iSMhoststore: 001 Command completed successfully.
```

Execution example when the Storage Manager server is operating in a UNIX environment (Linux)

```
# iSMhoststore -import /tmp/ServerName -arrayname StorageName
iSMhoststore: 002 Host Information was imported successfully. (Disk Array=StorageName)
iSMhoststore: 001 Command completed successfully.
```

After you execute the host information storage command (iSMhoststore command), message 002 is output. Check this to confirm that host information storage succeeded.

15. Expansion Methods

15.1 Notes on Expansion

Check the precautions and working methods below when performing installation tasks for options installed in the disk array unit.

Although users can install optional products themselves, RAID assumes no responsibility for damage to the disk array unit or components or for effects resulting from use if they do so. It is recommended that this work be performed by maintenance engineers of your maintenance service agent who have detailed expert knowledge about the disk array unit.

- Options and cables should be parts that RAID specifies. There is a charge for repairs associated with malfunction, failure, or damage to the unit that occurs as a result of using parts other than those specified.

About electrostatic countermeasures

The internal parts of the disk array unit are electronic parts that are weak against static electricity. Be careful of component failure due to static electricity when working.

- Wearing a wrist strap (arm band, antistatic glove, or other)

  Wrap a wrist grounding strap around your wrist. If you do not have one, touching an uncoated metal surface of the cabinet before touching a part discharges static electricity stored in your body.

  Also periodically touch a metal surface while working so that you discharge static electricity.

- Workplace checks
  - Work on a floor for which measures to prevent static electricity have been taken or on concrete.
  - If working on carpet or another location in which static electricity readily occurs, do the work after taking measures to prevent static electricity.
- Use of work stands

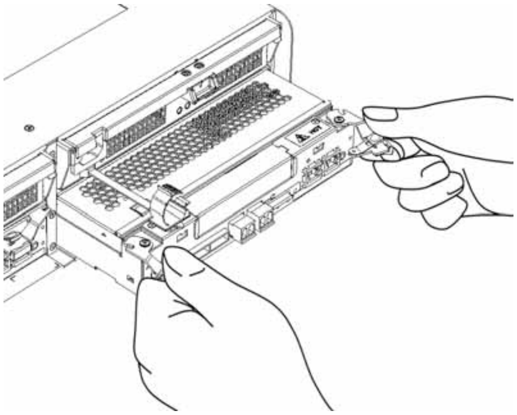
  Place the disk array unit on an antistatic mat and do the work on that as well.

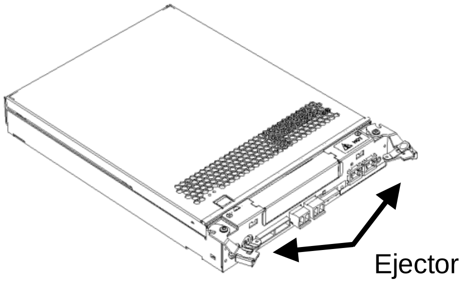
- Clothing
  - Do not work wearing clothing made of wool and synthetic fibers.
  - Work wearing antistatic shoes.
  - Remove precious metals (such as rings, bracelets, or watches) before working.
- Parts handling
  - Put parts to install in antistatic bags until inserting them in the disk array unit.
  - Hold the edges of each part and do not touch pins or mounting parts.
  - When storing or transporting parts, put them in antistatic bags.

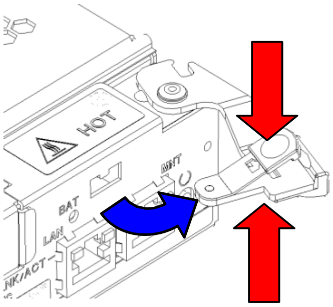
15.2 Removing and Installing Controllers

■ The procedure for removing a controller from its housing is as follows.

1. Confirm that the power is turned off.
2. Confirm that the power cable of the unit and the cable of the controller in question are not connected.
3. Take an ejector of the controller in each hand and open them to the left and right.
   The ejectors are locked at bottom.
   The controller comes out by freeing it on the left and right.







4. Holding the ejectors in both hands, pull horizontally approximately 10 cm.
5. Hold the controller firmly in both hands and pull it all the way out.

■ The procedure for installing a controller in the housing is as follows.

1. Insert the controller in the housing.
   Firmly push it all the way in.
2. Close the ejectors and firmly press the protruding portions of the ejectors.
   Confirm that both ejectors are locked.

⚠ If the controller is not fully inserted, it could lead to malfunction.

15.3 Installing and Removing Disk Drives

For installing and removing disk drives, see the sections below.

Chapter 4Installation
4.2 Installation of Disk Drives
4.4 Installing and Removing Front Panel

> ⚠ When removing a disk drive that has been set up, contact your maintenance service agent. If it is removed without changing settings inside the unit, an abnormality is reported.

15.4 Installing and Removing Disk Enclosures

For installing and removing disk enclosures, see the sections below.

Chapter 4Installation
4.1 Mounting Disk Array Unit and Disk Enclosures on Rack
4.2 Installation of Disk Drives
4.4 Installing and Removing Front Panel
Chapter 5 Cable Connections
5.1 Notes on Cable Connections
5.2 Connection of SAS Cables
5.3 SAS Cable Connections and DE and PD Numbers
5.7 Connecting Power Cables

> ⚠ When removing a disk enclosure that has been set up, contact your maintenance service agent. If it is removed without changing settings inside the unit, an abnormality is reported.

15.5 Installing and Removing Extended BBU

For installing and removing the extended BBU, see the sections below.

Chapter 4Installation
4.5 Mounting an Extended BBU on a Rack
Chapter 5 Cable Connections
5.6 Connection of Extended BBU and Controllers

> ⚠ When removing an extended BBU that has been set up, contact your maintenance service agent. If it is removed without changing settings inside the unit, an abnormality is reported.

15.6 Installing and Removing Expansion Ports

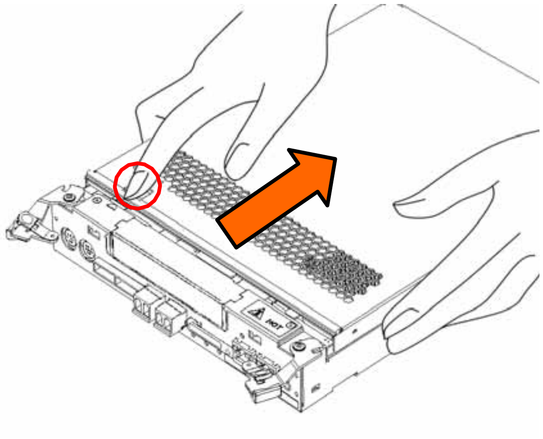
The procedure for installing expansion ports is as follows.

1. Remove the controller from the housing.

   See 15.2 “Removing and Installing Controllers”.

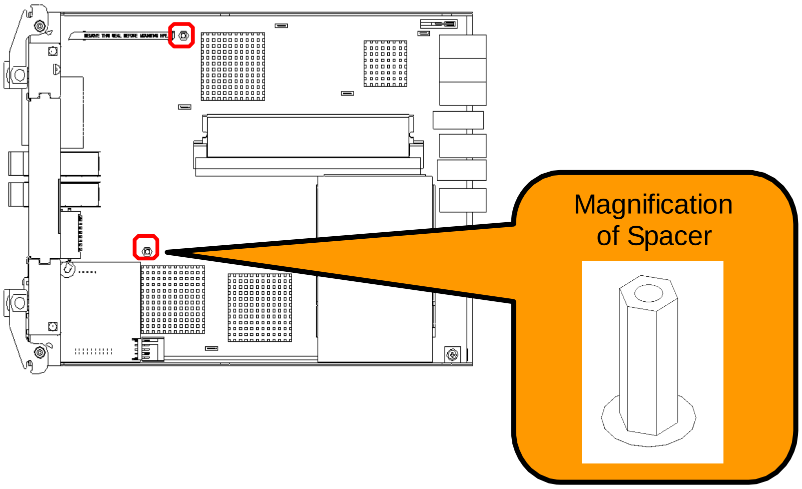
2. Remove the cover of the controller.

   Remove the cover by sliding it while pressing the lock (indicated in red in figure below).



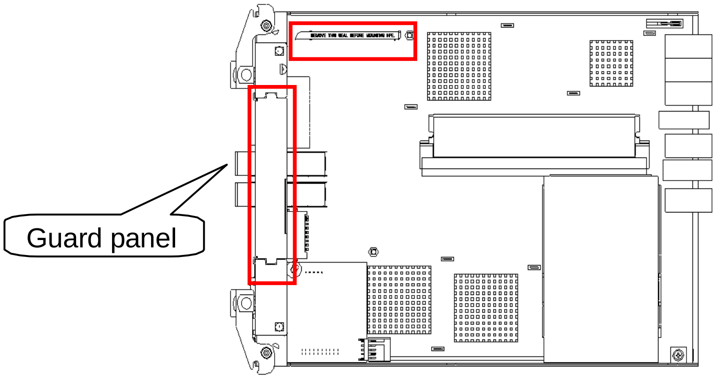
3. The following shows the surface of the controller and the location of the expansion port spacer.

   Confirm the location of the expansion port spacer.

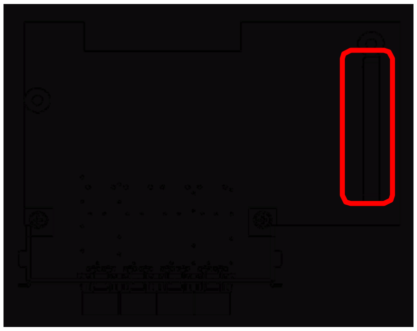


4. Confirm the locations of the respective connectors of the controller and the expansion port rear surface. (Red rectangles in figures below)

Controller



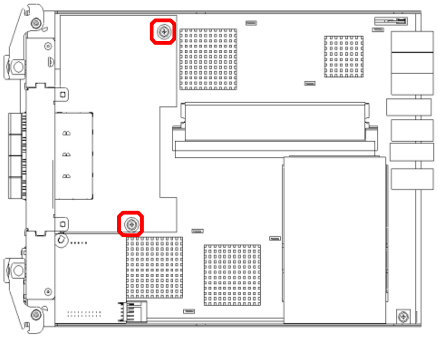
Expansion port



5. Remove the guard panel on the front view of the controller (blue rectangle in figure above).

   Next, insert the expansion port by matching the connector locations.

   (Insert by matching the expansion port front view panel location to the reference.)



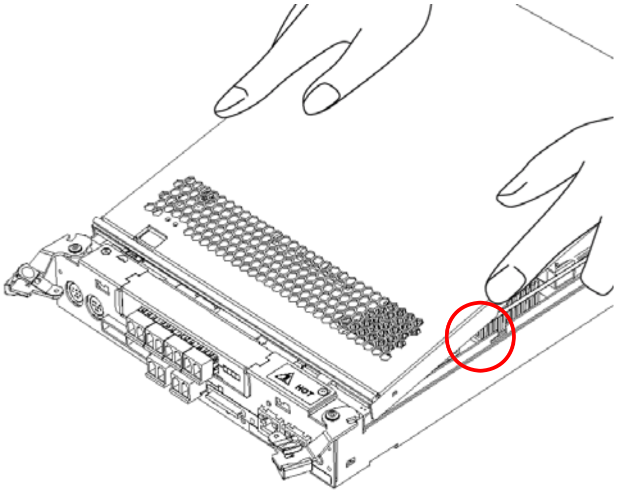
6. Confirm that it is firmly inserted and there is no play in the expansion port.

   Screw in at the two places in the figure above.

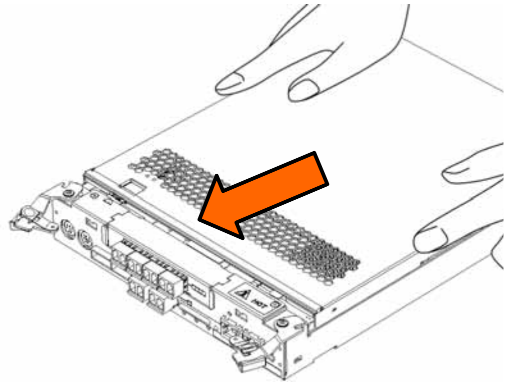
7. Install the cover of the controller.

   Match the end of the cover to the grove in the controller.

   Put it on so that the location of the side lock of the cover (figure below) meets it.



8. Close the cover by sliding it as shown in the figure below.

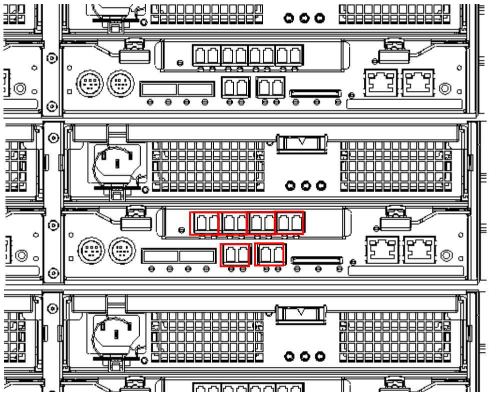


9. Install the controller.

   See 15.2 “Removing and Installing Controllers”.

10. Check the operation of the unit after expansion port installation.
    Power-on and confirm normal startup.

    Confirm that the LEDs (LINK and ACCESS) in the places in the figure below are blinking.



The expansion port installation task is finished.

15.7 Changing DIP Switches

This section describes the procedure for changing the DIP switches on the surface of a controller.

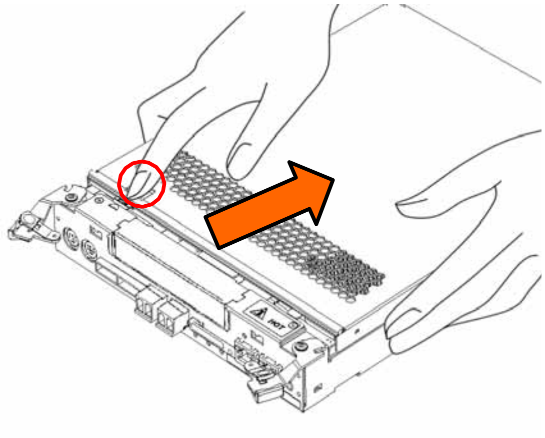
Have a toothpick or other fine-tipped tool available.

1. Remove the controller from the housing.

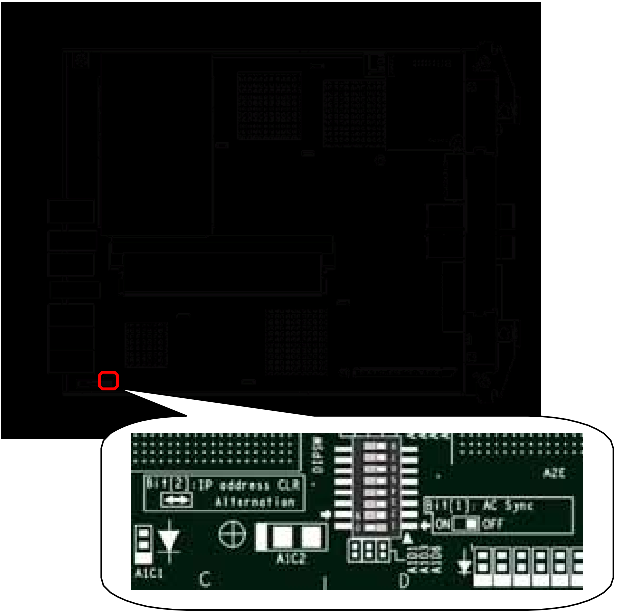
   See 15.2 “Removing and Installing Controllers”.

2. Remove the cover of the controller.

   Remove the cover by sliding it while pressing the lock (indicated in red in figure below).



3. The following shows the location of the DIP switches on the surface of the controller.


DIPSW
Bit 2 : IP address CLR
Alternation
Bit 1 : AC Sync
ON
OFF
A2E
A1C1
A1C2
C
D

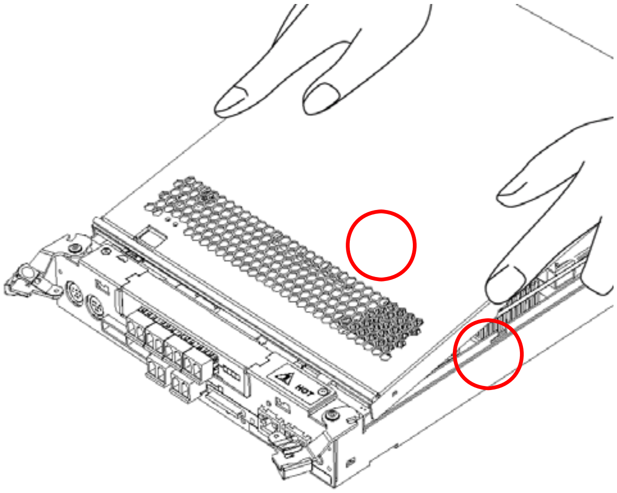
4. Change the DIP switches on the surface of the controller.

   Manipulate the switches using a fine-tipped tool such as a toothpick.

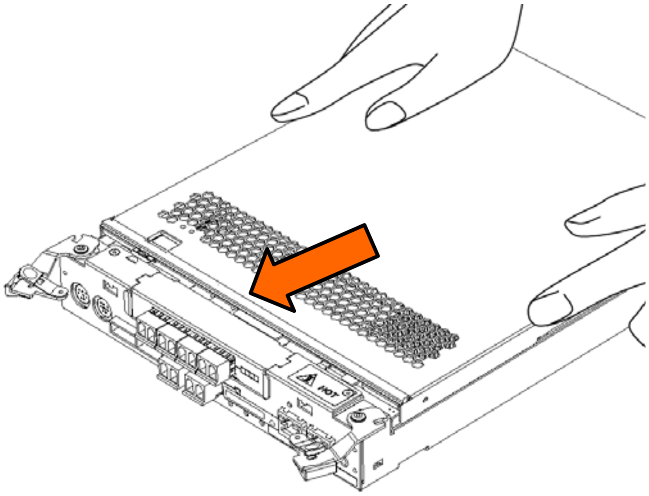
5. Install the cover of the controller.

   Match the end of the cover to the grove in the controller.

   Put it on so that the location of the side lock of the cover (figure below) meets it.



6. Close the cover by sliding it as shown in the figure below.



7. Install the controller.

   See 15.2 “Removing and Installing Controllers”.

16. Troubleshooting

This chapter describes trouble conditions and actions for them. When trouble other than the following is detected, or when you could not recover the disk array unit from the trouble by taking the corresponding action, refer to 16.6 “Before You Call” and contact your sales representative or 16.7 “Contacts for Questions and Consultation”.

16.1 Troubleshooting According to Device Conditions

In this section, troubles are classified as follows, according to the location where the trouble occurs.

(1) Trouble in disk array unit (front panel LED status)

(2) Trouble in disk array unit (rear panel controller LED status)

(3) Trouble in disk array unit or disk enclosure (rear panel power LED status)

(4) Trouble in disk enclosure

(5) Trouble in extended BBU

(1) Trouble in disk array unit (front panel LED status)

Condition	Action
POWER LED (green) illuminates, but SERVICE LED is out	**This is not a fault.** This indicates that the disk array unit is in normal operation after turning on.
POWER LED (green) is out	his indicates the disk array unit power-on sequence has not been completed. It takes several minutes until POWER LED illuminates after turning on the unit. If POWER LED does not illuminate in 10 minutes, check the following. ■ Confirm that AC power is being supplied to the unit. Confirm that POWER GOOD LED on the back of the unit illuminates. If this LED is out, check cable connection and power source.

Condition	Action
SERVICE LED (orange) illuminates	This indicates that the disk array unit, connected disk enclosure, or extended BBU requires maintenance. Since there are two or more maintenance requests at the same time, check all of the following. ■ Confirm that AC power is being supplied to both PS0 and PS1 in the disk array unit, connected disk enclosure, or extended BBU. To ensure that AC power is being supplied, confirm that POWER LEDs of the disk array unit and disk enclosure illuminate and CHARGE LED of the extended BBU is not out. ■ When SERVICE LED of the connected disk enclosure illuminates, refer to the description of “SERVICE LED illuminates” in (4) “Trouble in disk enclosure”. ■ When either of the FUALT LEDs of the extended BBU illuminates, refer to the description of “BBU FAULT LED blinks” in (5) “Trouble in extended BBU”. ■ When the last operation is maintenance, processing such as disk recovery may take time. Ask the maintenance personnel for the estimated time of completion. If the disk is not recovered beyond the estimated time, ask the maintenance personnel to investigate.
SERVICE LED (orange) blinks at intervals	This indicates that the power-on sequence or download sequence of the disk array unit is in progress. It takes several minutes from start to finish of the sequence. When SERVICE LED still blinks in 10 minutes, there may be a failure. **Caution: Do not turn off the power or AC power while SERVICE LED blinks at intervals.**
SERVICE LED (orange) iterates turning on and off at intervals (illuminating for 5 seconds and going out for 7 seconds)	This indicates that battery backup failed in the last power-off status. Files may be destroyed. Restore those files using backup files. This may occur because of the following causes. Remove the appropriate cause. 1. The power-off status continued exceeding the battery backup retention time when disconnecting the AC power without performing the power-off procedure. 2. Battery backup was performed past the battery or extended BBU life spans. 3. The disk array unit or extended BBU was continuously used or has been used at the temperature higher than the predetermined temperature. 4. Battery backup was or has been performed more than the predetermined backup frequency. **Caution: In the cases other than 1, the battery backup retention time of the battery or extended BBU cannot be guaranteed. It is necessary to replace the battery or extended BBU due to its life span. Contact your sales or maintenance service agent. (There is a charge for battery exchange due to life span.)**

(2) Trouble in disk array unit (rear panel controller LED status)

Condition	Action
READY LED (green) illuminates	This indicates that the power-on sequence is in progress. It takes several minutes from start to finish of the sequence. When READY LED still illuminates in 10 minutes, there may be a failure.
READY LED (green) blinks	**This is not a fault.** This indicates that the controller is in normal operation.
READY LED (green) blinks rapidly	This indicates that power is disrupted. It takes several minutes from start to finish of the sequence. When READY LED still blinks rapidly in 10 minutes, there may be a failure.
BACK UP LED (orange) illuminates while AC power is disconnected	**This is not a fault.** This indicates that data is retained by the battery.
The battery FAULT LED (orange) blinks	**This is not a fault.** It is one year before the end of the life span of the battery installed in the disk array unit. A battery purchase and maintenance request must be made. Contact your sales or maintenance service agent. (There is a charge for battery exchange due to life span.)
LINK LED (green) of the LAN connector is out, or blinks	When connecting a cable to the LAN connector, LINK LED (green) may not turn on because of the following causes. ■ The power of HUB, switch, or server to connect has not been turned on. ■ The power supply of HUB, switch, or server to connect is at fault. ■ The cable type is wrong. A cross cable and straight cable are not recognized automatically. Use a cable following the predetermined connection method. ■ The Speed and Duplex settings do not match. Auto Detect is set as default. Since connecting to a device in full duplex mode could cause abnormal operation, set Auto Detect or Half Duplex to the device to connect. (To set Full Duplex, ask your sales or maintenance service agent.) ■ Depending on the type of hub, it may not illuminate or it may blink.
ACTIVE LED (orange) of the LAN connector illuminates, or blinks	**This is not a fault.** ACTIVE LED (orange) illuminates when connection is established via the disk array unit monitoring protocol with a cable connected to the LAN connector. If the cable is removed from the unit, ACTIVE LED still illuminates for a while.

(3) Trouble in disk array unit or disk enclosure (rear panel power LED status)

Condition	Action
POWER GOOD LED (green) illuminates	**This is not a fault.** This indicates that AC power is being supplied to the unit and the power supply is in normal operation. **Caution: The unit has dual power supply configuration. Therefore, SERVICE LED illuminates when neither PS0 nor PS1 illuminates.**

(4) Trouble in disk enclosure

Condition	Action
POWER LED (green) illuminates, but SERVICE LED (orange) is out	**This is not a fault.** This indicates that the disk enclosure is in normal operation after turning on.
POWER LED (green) is out	This indicates that starting the disk enclosure has not been complete. The power of the disk enclosure is turned on in conjunction with the power of the connected disk enclosure or disk array unit. It takes several minutes until POWER LED of the disk enclosure turns on after turning on the unit power. If POWER LED does not illuminate in 10 minutes, check the following. ■ Check whether POWER GOOD LED of the disk enclosure power supply illuminates, indicating that the power is supplied to the disk enclosure. ■ Check cable connection status to confirm whether this disk enclosure is normally connected to other disk enclosures or the disk array unit. ■ Check POWER LED of the disk array unit to confirm whether the power of the disk array unit was turned on. If this LED is out, check whether the power source is normal.
SERVICE LED (orange) illuminates	This indicates that the disk enclosure is out of order or maintenance has not been complete. ■ When the last operation is maintenance, processing such as disk recovery may take time. Ask the maintenance personnel for the estimated time of completion. If the disk is not recovered beyond the estimated time, ask the maintenance personnel to investigate.

(5) Trouble in extended BBU

Condition	Action
CHARGE LED (green) does not illuminate	CHARGE LED does not illuminate when the power of the extended BBU is not turned on. ■ Confirm that the AC switch of the extended BBU is ON. ■ Check whether cable connection and power source are normal.
CHARGE LED (green) blinks	This indicates that AC power is being supplied to the extended BBU.
BBU FAULT LED (orange) is blinking	**This is not a fault.** It is one year before the end of the life span of the extended BBU connected to the disk array unit. An extended BBU purchase and maintenance request must be made. Contact your sales or maintenance service agent. (There is a charge for battery exchange due to life span.)
BBU FAULT LED (orange) illuminates	The extended BBU may be out of order or may not connect to the disk array unit, or the power of the disk array unit may not be turned on. This LED turns on five minutes after the extended BBU detected an abnormality. ■ Check the cable connection between the disk enclosure and the disk array unit. ■ Confirm that the power of the disk array unit has been turned on. **Caution: When only the power of the extended BBU has been turned on, it is assumed that connection has not been established.**

16.2 LED Checks

In cases in which state monitoring is not done by iSM, states can be checked at LEDs on devices. When an abnormality is detected, identification of the location of the abnormality and arrangement for recovery can be done more rapidly if this is conveyed by the states of LEDs.

Disk array unit (front face)

(1)	POWER LED (green)	ON / Blinking / OFF	
(2)	SERVICE LED (orange)	ON / Blinking / ON for 5 sec. and OFF for 7 sec. / OFF	
(3)	ACTIVE/FAULT (orange / green)	Alternate blinking orange and green / Only orange ON Alternate blinking orange and green / Only orange ON Alternate blinking orange and green / Only orange ON	Location ( ) Location ( ) Location ( )

Disk array unit (rear face)

PS0	(1)	POWER GOOD LED (green)	ON / OFF	
	(2)	POWER FAULT LED (orange)	ON / OFF	
	(3)	FAN FAULT LED (orange)	ON / OFF	
PS1	(1)	POWER GOOD LED (green)	ON / OFF	
	(2)	POWER FAULT LED (orange)	ON / OFF	
	(3)	FAN FAULT LED (orange)	ON / OFF	
CONT0	(4)	HPE GOOD LED (orange)	ON / OFF	
	(5)	Battery FAULT (orange)	ON / Blinking / OFF	
	(6)	BACKUP LED (orange)	ON / Blinking / OFF	
	(7)	FAULT LED (orange)	ON / Blinking / Blinking slowly / OFF	
	(8)	READY LED (green)	ON / Blinking / OFF	
	(9)	SAS connector FAUTL LED (FLT) (orange)	ON / OFF	Location ( )
CONT1	(4)	HPE GOOD LED (orange)	ON / OFF	
	(5)	Battery FAULT (orange)	ON / Blinking / OFF	
	(6)	BACKUP LED (orange)	ON / Blinking / OFF	
	(7)	FAULT LED (orange)	ON / Blinking / Blinking slowly / OFF	
	(8)	READY LED (green)	ON / Blinking / OFF	
	(9)	SAS connector FAUTL LED (FLT) (orange)	ON / OFF	Location ( )

Extended BBU (rear face)

Extended BBU0	(1)	CHARGE LED (green)	ON / Blinking / OFF
	(2)	BBU FAULT LED (orange)	ON / Blinking / OFF
	(3)	AC switch (orange)	ON (-) / OFF (O)
Extended BBU1	(1)	CHARGE LED (green)	ON / Blinking / OFF
	(2)	BBU FAULT LED (orange)	ON / Blinking / OFF
	(3)	AC switch (orange)	ON (-) / OFF (O)

Disk enclosure

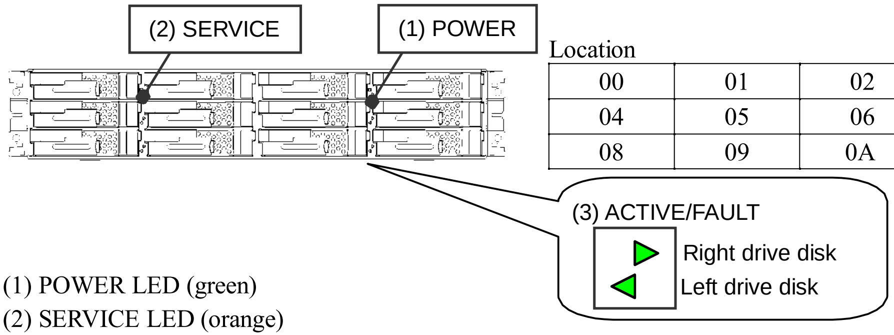
Disk enclosure (front face)

(1)	POWER LED (green)	ON / Blinking / OFF	
(2)	SERVICE LED (orange)	ON / Blinking / ON for 5 sec. and OFF for 7 sec. / OFF	
(3)	ACTIVE/FAULT (orange / green)	Alternate blinking orange and green / Only orange ON	Location ( )
		Alternate blinking orange and green / Only orange ON	Location ( )
		Alternate blinking orange and green / Only orange ON	Location ( )

Disk enclosure (rear face)

PS0	(1)	POWER GOOD LED (green)	ON / OFF	
	(2)	POWER FAULT LED (orange)	ON / OFF	
	(3)	FAN FAULT LED (orange)	ON / OFF	
PS1	(1)	POWER GOOD LED (green)	ON / OFF	
	(2)	POWER FAULT LED (orange)	ON / OFF	
	(3)	FAN FAULT LED (orange)	ON / OFF	
ADP0	(4)	SAS connector FAUTL LED (FLT) (orange)	ON / OFF	Location ( )
	(5)	FAULT LED (orange)	ON / OFF	
	(6)	READY LED (green)	ON / Blinking / OFF	
ADP1	(4)	SAS connector FAUTL LED (FLT) (orange)	ON / OFF	Location ( )
	(5)	FAULT LED (orange)	ON / OFF	
	(6)	READY LED (green)	ON / Blinking / OFF	

Disk array unit front view (viewed when front panel is removed)



Location

00	01	02	03
04	05	06	07
08	09	0A	0B

(1) POWER LED (green)

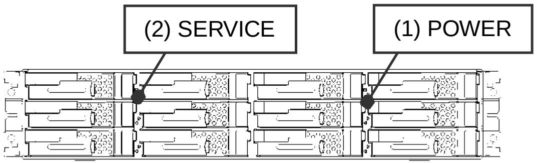
(2) SERVICE LED (orange)

STATUS	POWER LED	SERVICE LED	Description
Operating	**ON**	**OFF**	**Normal operation**
	ON	ON	Requesting maintenance or processing a maintenance task (such as during recovery)
Power-on	ON	Blinking	Power-on sequence in progress
	ON	ON for 5 sec. and OFF for 7 sec.	Requesting maintenance (battery backup failure; write data may have been lost)
Power-off	Blinking	OFF	Power-off sequence in progress
	OFF	OFF	Powered off

(3) ACTIVE/FAULT LED (green/orange) for each disk drive

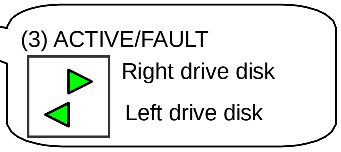
ACTIVE/FAULT LED	Status
Green : Lighting	**Normal status (ready)**
Green : Blinking	**Normal status (accessing)**
Green/orange : Alternate blinking	Restoring
Orange only : Blinking	HDD low power state
Orange : Lighting	Abnormal status

Disk enclosure front view (viewed when front panel is removed)



Location

x0	x1	x2	x3
x4	x5	x6	x7
x8	x9	xA	xB



(1) POWER LED (green)

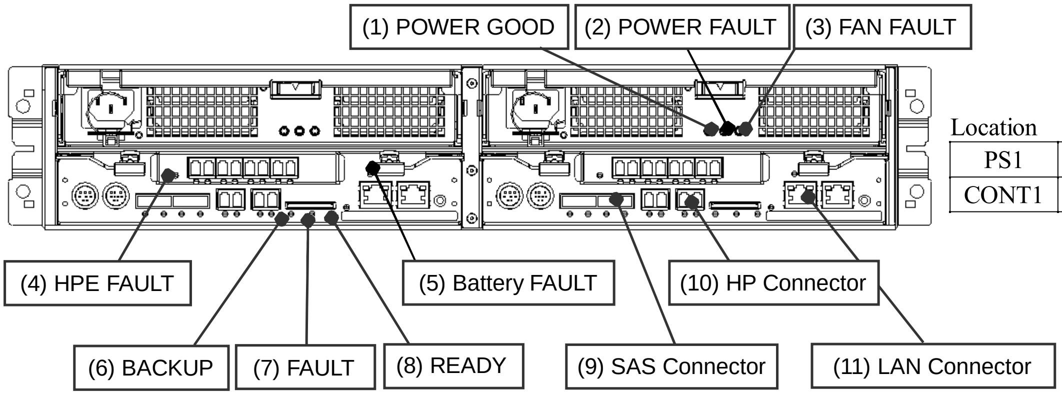
(2) SERVICE LED (orange)

STATUS	POWER LED	SERVICE LED	Description
Operating	**ON**	**OFF**	**Normal operation**
	ON	ON	Requesting maintenance or processing a maintenance task (such as during recovery)
Power-off	OFF	OFF	Powered off

(3) ACTIVE/FAULT LED (green/orange) for each disk drive

ACTIVE/FAULT LED	Status
Green : Lighting	**Normal status (ready)**
Green : Blinking	**Normal status (accessing)**
Green/orange : Alternate blinking	Restoring
Orange only : Blinking	HDD low power state
Orange : Lighting	Abnormal status

Disk array unit rear view


(1) POWER GOOD
(2) POWER FAULT
(3) FAN FAULT
(4) HPE FAULT
(5) Battery FAULT
(10) HP Connector
(6) BACKUP
(7) FAULT
(8) READY
(9) SAS Connector
(11) LAN Connector

Location

PS1	PS0
CONT1	CONT0

		ON / Blinking	OFF
(1)	POWER GOOL LED (green)	**Normal**	AC power is not being supplied
(2)	POWER FAULT LED (orange)	Power supply fault (excluding the fan)	**Normal**
(3)	FAN FAULT LED (orange)	Fan fault	**Normal**
(4)	HPE FAULT LED (orange)	HPE fault	**Normal**
(5)	Battery FAULT (orange)	Battery backup unit status ON: Fault Blinking: To be replaced due to its life	**Normal**
(6)	BACKUP LED (orange)	Blinking: Battery backup state	**Normal**

(7) FAULT LED (orange)

(8) READY LED (green)

READY LED	FAULT LED	State
OFF	OFF	Powered off
OFF	ON	Occurrence of fault
ON	OFF	Power-on sequence in progress
ON	Blinking slowly	Waiting for disk enclosure power-on
Blinking	**OFF**	**Normal operation**

(9) SAS connector

LINK LED (LNK) (green)	ON: Link-up, OFF: Link-down
FAULT LED (FLT) (orange)	ON: Error detection, **OFF: Normal**

■ Location and port numbers

DP1	DP0

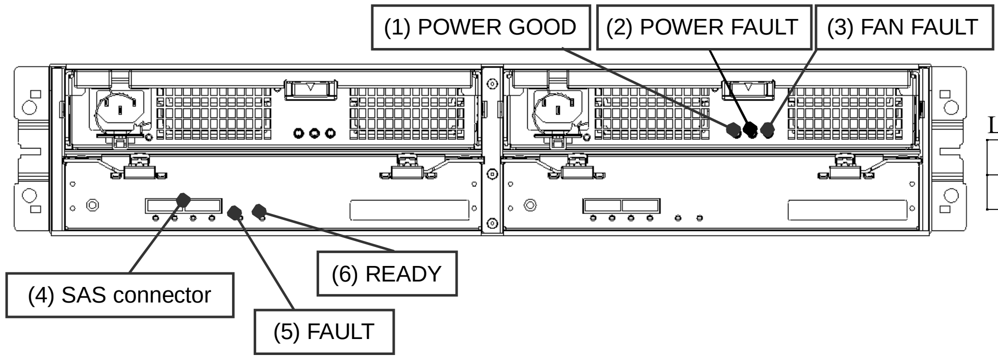
(10) HP connector

LINK LED (L) (green)	ON: Link-up, OFF: Link-down
ACCESS LED (A) (green)	ON, blinking: I/O access
Concurrent blinking both LINK and ACCESS LEDs	Once in 2 seconds: Offline Twice in 2 seconds: Waiting setup

■ Location and port numbers

HP5	HP4	HP3	HP2
	HP1	HP0	

Disk enclosure rear view


(1) POWER GOOD
(2) POWER FAULT
(3) FAN FAULT
(4) SAS connector
(6) READY
(5) FAULT

Location

PS1	PS0
ADP1	ADP0

		ON / Blinking	OFF
(1)	POWER GOOL LED (green)	**Normal**	AC power is not being supplied
(2)	POWER FAULT LED (orange)	Power supply fault (excluding the fan)	**Normal**
(3)	FAN FAULT LED (orange)	Fan fault	**Normal**

(4) SAS connector

LINK LED (LNK) (green)	ON: Link-up, OFF: Link-down
FAULT LED (FLT) (orange)	ON: Error detection, **OFF: Normal**

■ Location and port numbers

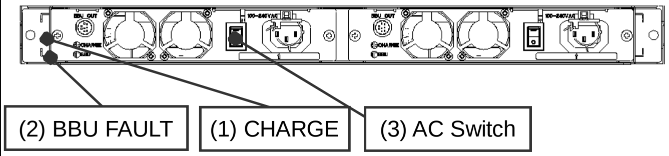
DP1	DP0

(5) FAULT LED (orange)

(6) READY LED (green)

READY LED	FAULT LED	Status
OFF	OFF	No connection or powered off
ON	**OFF**	**Normal operation**
Blinking	OFF	Starting
ON	ON	Fault inside adapter

Extended BBU rear view


(2) BBU FAULT
(1) CHARGE
(3) AC Switch

Location

PS1	PS0

		ON / Blinking	OFF
(1)	CHARGE LED (green)	**ON: Normal**, Blinking: Recharging	AC power is not being supplied
(2)	BBU FAULT LED (orange)	ON: Fault Blinking: To be replaced due to its life	**Normal**

16.3 Troubleshooting in Initialization Wizard/Easy Configuration

When trouble is detected, treat it by selecting the conditions below

Condition	Action
A disk array was not found by the initialization wizard	Resolve the problem by referring to (2) “Disk array specification” in 11.1.2 “Initialization”. If it still cannot be found, contact your maintenance service agent.
Initialization cannot be executed after initialization aborted, disk array setup failed, or initialization was canceled	Execute initialization again. If the disk array cannot be found, make initial settings individually by referring to 16.3.1 “Changing Network Settings for Monitoring Disk Arrays from Storage Manager”. If initialization still cannot be executed, contact your maintenance service agent.
Initialization was executed by mistake	If network settings were changed, refer to 16.3.1 (1) “Changing Network Settings from Storage Manager” to change the network settings of the disk array. If the specification of the host information collection method, port connection setting, or logical disk binding was changed, refer to 11.2 “Setup Modification” to change each setting of the disk array. Contact your maintenance service agent concerning changes to license unlocking.

Condition	Action
In an environment in which a Windows OS is used in the business server, [Automatic collection] was specified in the host information collection method specification screen of the initialization wizard, but the host is not displayed in [Selection host] of the logical disk binding screen	Check as follows. * Refer to Chapter 6 “Volume List Installation (Windows)”of the installation guide for OS in which automatic collection of host information is possible. 1. Confirm that the iSMvollist command or ControlCommand has been installed on the business server. (This can be checked from [Add or Remove Programs] in [Control Panel].) 2. Since it is possible that the host recognize volume is not being recognized by the business server (OS), restart iSM Host Agent Service (RAID Storage Manager Host Agent). (Execute from [Services] in [Administrative Tools].) Three minutes later, click the [Refresh] button in the logical disk binding screen of the Storage Manager client (Web GUI) initialization wizard, select [Update with info from Storage Manager server], click [OK], and perform host specification again. 3. If host information is not displayed in the logical disk binding screen even after executing (2) above, refer to 3.4 “Host Information Collection” in the “User’s Manual” and execute the host information collection command to register host information in the disk array. Alternatively, execute the host information collection command to output a host information file. Subsequently, after confirming that host information registration or host information file output completed normally, click the [Refresh] button in the logical disk binding screen, select [Update with info from Storage Manager server] or [Update with info file], click [OK], and then perform host specification in the logical disk binding screen again. 4. If host information is not displayed in the logical disk binding screen even after executing (3) above, it is possible that necessary information failed to be fetched in initialization. Contact your maintenance service agent.
The screen that was being used cannot be seen	It is possible that it is being hidden by another screen. Switch screens using ALT+TAB.
The cursor or button focus becomes unknown when the TAB key is pressed	Pressing the TAB key while pressing the CTRL key moves the cursor or the button focus.

Condition	Action
The message "[25957] LD binding would not execute with selected parameters(RAID type,PD type,number,capacity). Please confirm the parameters." is displayed over and over	It is assumed that the capacity and number of logical disks that can be bound in the specified RAID type/PD type is great. 1. Confirm that physical disks with the same capacity are installed in each RAID type. If [Spare binding] is selected, one more physical disk is needed for spare. RAID1 (basic): consisting of two physical disks RAID6(4+PQ) (dynamic): consisting of six physical disks RAID6(8+PQ) (dynamic): consisting of 10 physical disks In the case of LD Bind Easy Configuration, confirm that there is a physical disk with the same capacity, which has not been used to configure RAID, in the Storage Manager client (Web GUI) main window. 2. If the number of physical disks is sufficient in (1), it is assumed that the specified capacity and number of logical disks are too great. If [Selection host] is selected, there is that much insufficient capacity since a control volume of 0.2 GB is created per host. The maximum capacity shown in the pull-down menu cannot be bound. The logical disk capacity displayed as default is the maximum capacity of a logical disk to be bound when a host is specified. If multiple logical disks are specified, reduce the logical disk capacity.
Unable to change the LD Set name in the logical disk binding screen	Since the LD Set has already been registered, only addition of logical disks can be performed.

16.3.1 Changing Network Settings for Monitoring Disk Arrays from Storage Manager

If a disk array cannot be monitored correctly from Storage Manager due to faults occurring in performing initialization or erroneous settings, network settings must be changed.

Change disk array network settings using any of the following three procedures.

(1) Changing Network Settings from Storage Manager

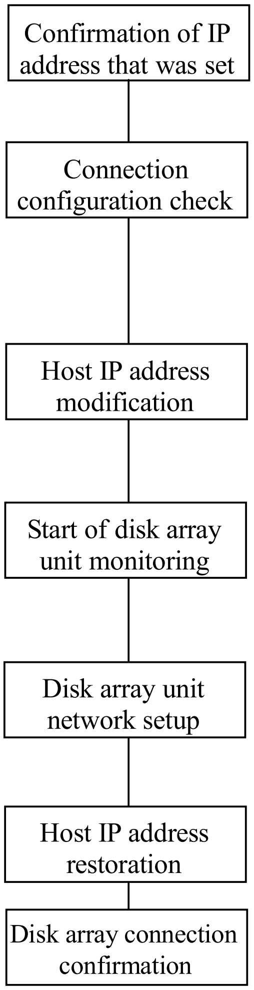
If the disk array can be monitored from Storage Manager in spite of wrong network settings, the disk array unit network settings can be changed from Storage Manager.

Make changes using [Disk Array Setting] → [Network] from the menu [File] → [Configuration Setting] → [Configuration Setting] → [Individual Setting/Reference]. For details, refer to “Configuration Setting Tool User’s Manual (GUI)”.

If monitoring is not being done by Storage Manager but there is a host connected by FC to the disk array, changes can also be made using the network relief setting command (iSMnetconf) from the host. For details, refer to the “Configuration Setting Tool User’s Manual (GUI)”.

(2) Changing Network Settings by Changing Management Server Network Settings

To perform disk array unit initialization by Individual Setting in Storage Manager after faults have occurred in network setup during initialization, it can also be executed after temporarily making network settings of the current disk array unit coincide with management server network settings and changing them to make monitoring from Storage Manager possible.


Confirmation of IP address that was set
Connection configuration check
Host IP address modification
Start of disk array unit monitoring
Disk array unit network setup
Host IP address restoration
Disk array connection confirmation

Provide the IP address, subnet mask, and gateway address noted in the network setting screen of the initialization wizard. (*1)

Check the settings of the IP address, subnet mask, and gateway address in each controller of the disk array and of the IP address, subnet mask, and gateway address of the network interface card (hereafter, NIC) in the host on which the Storage Manager server is installed (hereafter, management server), as well as the physical connection configuration. (*2) (*3)

Temporarily change the IP address, subnet mask, and gateway address of the management server NIC so that the IP address of the management server NIC is in the same subnet as the IP address of each controller. (*4) (*5)

Referring to the installation guide, perform environment setup so that disk array monitoring is performed through a LAN connection from the Storage Manager server and restart the Storage Manager server.

Referring to the “Configuration Setting Tool User’s Manual (GUI)”, set the IP address, subnet mask, and gateway address of the disk array. (*6) (*7) (*8)

After restoring the temporary IP address, subnet mask, and gateway address of the management server NIC, restart the Storage Manager server.

Confirm that disk array monitoring is being performed by the Storage Manager client.

Since disk array unit initialization is not complete, host connection port setup, license unlocking, logical disk binding, and other initialization must be performed separately.
Refer to 11.2 “Setup Modification” to make settings.

*1: If an IP address is not provided, refer to SVP Number (controller number), IP Address, Subnetmask, and Gateway, which are output in message number “iSM14483” in the message display area of the Storage Manager client (Web GUI). Once you have restarted (reconnected) the Storage Manager client (Web GUI), since messages are output only from that time, refer to SVP Number (controller number), IP Address, Subnetmask, and Gateway, which are output in message number “iSM14483” in the log file of the Storage Manager server. For the Storage Manager server log file output destination, refer to “Log Output” in the “User’s Manual” of the OS being used.

```
Fry Jan 12 14:32:46 2007 0000004380 Info          iSMconfig      iSM14483:Set IP
Address(Product ID=xxxxx ,Serial Number=xxxxxxxxxxxxxxxx) : SVP number=xxh, IP
Address=x.x.x.x, Subnetmask=x.x.x.x, Gateway=x.x.x.x, status=failed
```

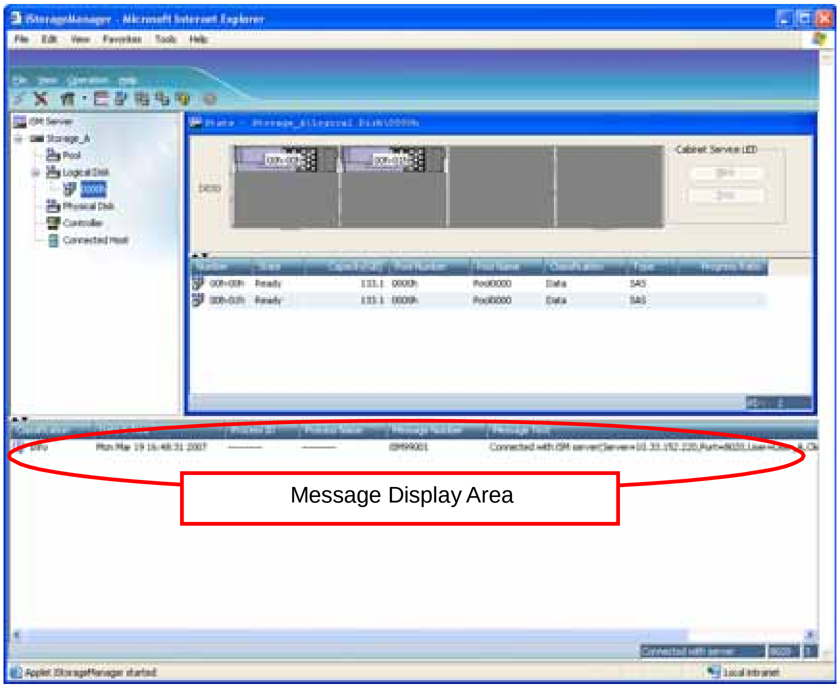


Figure 16.3.1   Storage Manager Client (Web GUI) Message Display Area

*2: If disk array unit network settings and server connections are correct, contact your sales agent.

*3: If there are multiple NIC in the management server, refer to the manual for each server and OS for the correspondence between IP addresses and NIC.

*4: Since changes to disk array network settings cannot be made until monitoring can be performed from the Storage Manager server, it is necessary to temporarily change the management server IP address, subnet mask, and gateway address to configure the disk array so that it can be monitored.

*5: Change the IP address to that of the NIC that is physically connected to the disk array.

*6: Since the IP addresses of controller 0 and controller 1 cannot be made the same, another IP address must be set temporarily when switching IP addresses.

*7: To change multiple IP addresses, view device properties in the main screen of the Storage Manager client and make changes from the side that is not the control path (1).

*8: Since the Storage Manager server environment settings are not changed if the disk array IP address is changed to an IP address that cannot be monitored after the change, the Storage Manager server environment settings must be changed manually after making the change.

(3) Disk Array Network Setting Initialization

It is possible to initialize the disk array unit network settings in order to perform operations described in Chapter 11 “Initialization of RAID Storage” from the start.

However, only perform this initialization if network setup by the initialization wizard failed.

Change DIP switches by referring to 15.7 “Changing DIP Switches”.

Changing the second switch (Bit2) of the DIP switches initializes network settings at startup. The value of the second switch of the DIP switches when the network was set up is stored. At startup, if the value of the second switch of the DIP switches and the stored value differ, network settings are initialized.

It is not necessary to restore the changed value because a mismatch with the value when the network was set up is detected.

⚠

- Since changed values are checked, CONT0 and CONT1 settings need not be the same.
- For initialization, change both CONT0 and CONT1.

⚠

On a disk array unit for which initialization already was completed, since there is a risk of previously set contents being changed by mistake when continuing setup in the initialization wizard, do not initialize network settings by this method. If initialization already has been completed, perform 16.3.1 (1) “Changing Network Settings from Storage Manager”.

If network settings have already been initialized by mistake due to DIP switches, perform the following minimum necessary setup using the initialization wizard.

1. Initialization wizard startup

   Click [Next].

2. Disk array specification

   Select the disk array unit for which to perform setup and click [Next]

3. Disk array connection confirmation

   Click [Next].

4. Setting method specification

   Select [Individual Setting] and click [Next].

5. Host information collection method specification

   Uncheck [Automatic collection] and click [Next].

6. Network setup

   Input the correct values and click [Next] and then click [Execute] after confirming that there were no problems from the confirmation screen.

7. Host connection port setup

   When the screen is displayed, click [Cancel] to terminate.

16.4 Unit Life Span and Maintenance Period

The unit life span and maintenance period after production ends for the disk array unit are as follows.

Parts used in the disk array unit include parts that must be exchanged due to their life spans (such as cooling fans and battery backup units). Since life spans may be shorter than five years depending on the environment in which the disk array unit is used, it is recommended that parts be exchanged regularly. Contact your maintenance service agent regarding exchanges and life spans.

- Unit life span: 5 years
- Maintenance period: 5 years after production ends

Caution: If you continue to use the unit past the unit life span, be sure to perform overhaul (for a fee) in addition to contracted hardware maintenance. Overhaul can be done only once.

Note that repair may not be possible in the cases below. Moreover, a fee may be charged even if within the warranty period.

- Stained goods, dropped goods, goods damaged by mishandling
- Goods damaged by mishandling in storage or shipping
- Items touched by the user
- Items whose life spans are over
- Goods damaged by reason of earthquake, lightning, fire, or other disaster, and goods damaged due to an accident or other external cause

Parts that have life spans

- Fan (Power supply): 50,000 hours
- Battery: 5 years
- Extended BBU: 5 years

Caution: As backup frequency increases, the battery life span of this unit becomes shorter. This life span is calculated considering only accidental power disconnection such as power outage. Be sure to turn of the power according to the proper power-off procedure.
The battery life span of this unit also becomes shorter when it is used at high temperatures. The life span is about five years when the unit is used under conditions in which the ambient temperature is 25°C (77°F), but will be reduced to approximately half (about two years and six months) when the ambient temperature rises by 10°C (18°F).

16.5 Disposing of Equipment

Lithium batteries and nickel metal hydride batteries are used in the disk array unit.

Batteries are implemented as follows.

Each controller:	Lithium battery (Button battery)
Each controller:	Nickel metal hydride battery
Extended BBU:	Nickel metal hydride battery

Consult the sales agent from whom you purchase them or your maintenance service agent concerning disposal of the unit (including battery disposal (and exchange)).

16.6 Before You Call

Before telephoning to ask questions or consult on a failure or abnormality of the disk array unit, have the following items ready.

- The warranty and this manual
- Conditions of the fault or abnormality, notes on content of questions
- Notes on the configuration of the disk array unit and software used with the disk array unit
- Notes on the configuration of the connection of the host unit to the disk array unit and the configuration of peripheral equipment connected to the host unit
- Manuals of the host unit and peripheral equipment connected to the host unit and manuals of software used

16.7 Contacts for Questions and Consultation

For questions and consultation about the disk array unit, contact RAID support at 800-330-7335 or email support@raidinc.com.

Appendix A. Notes on Using MSCS (Microsoft Cluster Service) in a Windows Server 2003 Environment and on Connecting FC Switches in a Fault Tolerant Server Environment

[Notes on using MSCS (Microsoft Cluster Service) in a Windows Server 2003 environment]

When you use MSCS in a Windows Server 2003 environment, according to MSCS specifications, Target ID and LUN (number) of the RAID Storage disk array that each server recognizes must be set to the same values. A cluster cannot be set up if they are set to different values.

For details, refer to the URL below.

[KB331801] Cluster setup may not work when you add nodes.

http://support.microsoft.com/kb/331801/en-us

(1) Target ID

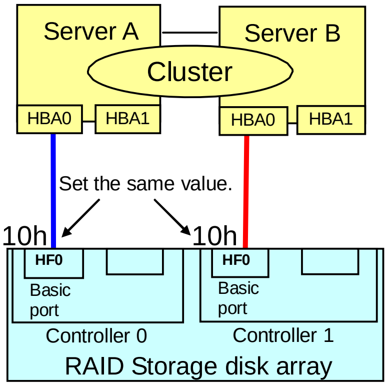
How to set the Target IDs of controllers of a disk array unit that are recognized by servers to the same value is described below for each connection configuration.

■ Directly connecting disk array unit to server (HBA)

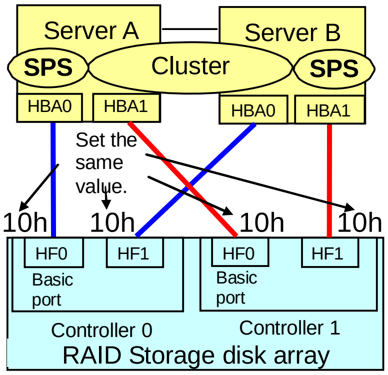
Set the Loop Switch IDs of disk array unit controllers to the same value.

The Switch ID that is set becomes the Target ID recognized by the server.

Also set **the Loop Switch IDs of all connected controller ports to the same value** in the same way when the disk array unit is connected to the server by multiple paths.


Server A
Server B
Cluster
HBA0
HBA1
HBA0
HBA1
Set the same value.
10h
10h
HF0
Basic port
HF0
Basic port
Controller 0
Controller 1
RAID Storage disk array

Single-path configuration


Server A
Server B
SPS
Cluster
SPS
HBA0
HBA1
HBA0
HBA1
Set the same value.
10h
10h
10h
10h
HF0
HF1
HF0
HF1
Basic port
Basic port
Controller 0
Controller 1
RAID Storage disk array

Dual-path configuration

SPS: PathManager

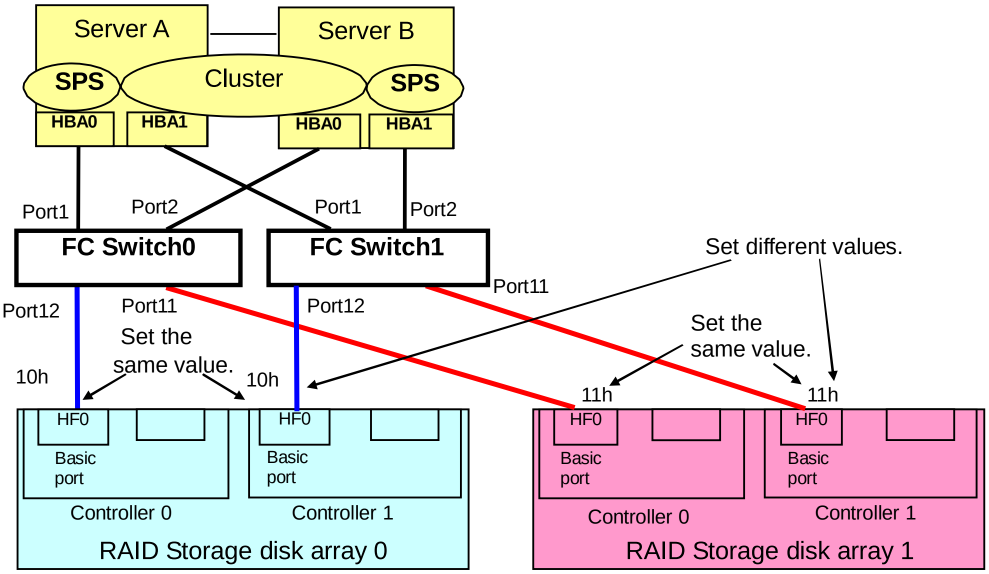
- Connecting to Loop Topology FC Switch (N8190-119 or other)

For controllers of the same disk array unit, **set the Loop Switch ID to the same value**.

The Switch ID that is set becomes the Target ID recognized by the server.

When connecting multiple disk array units to a FC Switch, **be sure to set the Loop Switch ID for each disk array unit to a different value**. If set to the same value, the units will not start normally.

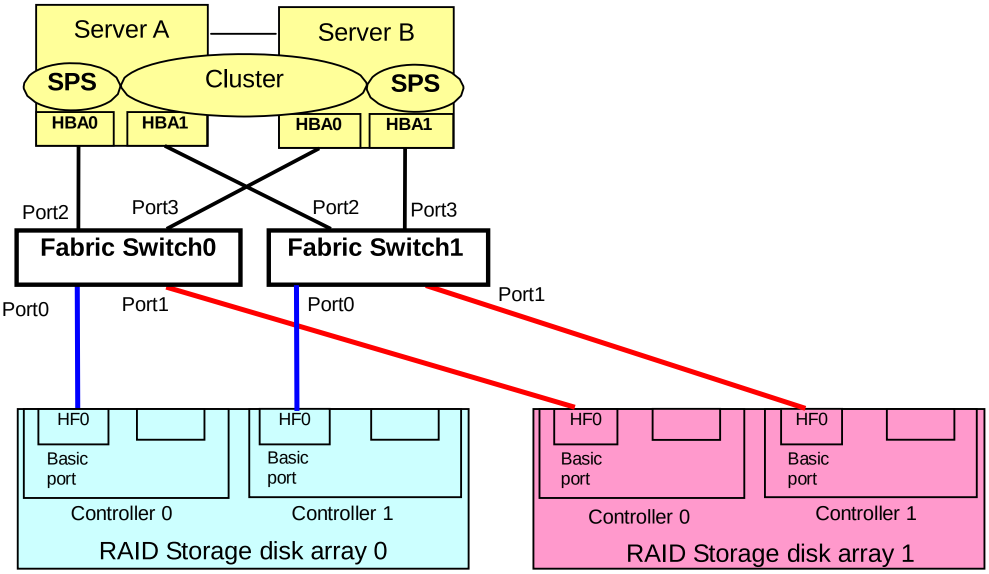
* For Loop Topology FC Switches, binding with one FC Switch is not possible since different Loop Switch IDs must be set within a FC Switch.


Server A
Server B
SPS
Cluster
SPS
HBA0
HBA1
HBA0
HBA1
Port1
Port2
Port1
Port2
FC Switch0
FC Switch1
Port12
Port11
Port12
Port11
Set different values.
Set the same value.
Set the same value.
10h
10h
11h
11h
HF0
Basic port
HF0
Basic port
HF0
Basic port
HF0
Basic port
Controller 0
Controller 1
Controller 0
Controller 1
RAID Storage disk array 0
RAID Storage disk array 1

■ Connecting to Fabric Switch (NF9320-xSxx/SS11x, NF9330-xSxx, N8406-019/020 or other)

Connect the connections from a server and a disk array unit to the same port number of each switch by Fabric Switch or by zoning group, as shown in the figure below.

Target IDs starting from 0 are assigned to Targets recognized by the server in order from the lower numbered N_Port ID (lower numbered Port of Switch).


Server A
Server B
SPS
Cluster
SPS
HBA0
HBA1
HBA0
HBA1
Port2
Port3
Port2
Port3
Fabric Switch0
Fabric Switch1
Port0
Port1
Port0
Port1
HF0
Basic port
HF0
Basic port
Controller 0
Controller 1
RAID Storage disk array 0
HF0
Basic port
HF0
Basic port
Controller 0
Controller 1
RAID Storage disk array 1

Switch No. Port No.	Connection device	Switch ID	Target ID
Switch0 - Port0	RAID Storage 0 - Cont0	10h	0
Switch0 - Port1	RAID Storage 1 - Cont0	12h	1
Switch0 - Port2	Server A - HBA0	-	-
Switch0 - Port3	Server B - HBA0	-	-
Switch1 - Port0	RAID Storage 0 - Cont1	11h	0
Switch1 - Port1	RAID Storage 1 - Cont1	13h	1
Switch1 - Port2	Server A - HBA1	-	-
Switch1 - Port3	Server B - HBA1	-	-

Recognizes Targets connected to Fabric Switch as Target ID 0, 1, … in order detected starting from lower numbered Port of Switch.

[Note] If you mix up the RAID Storage connected to Ports of Switch0 and Switch1, cluster setup is not possible since Target IDs differ between controller 0 and controller 1.

Swtich0 - Port0 : RAID Storage 0 - Cont0 🟦rget ID 0
Swtich0 - Port1 : RAID Storage 1 - Cont0 🟥rget ID 1
Swtich1 - Port0 : RAID Storage 1 - Cont1 🟥rget ID 0
Swtich1 - Port1 : RAID Storage 0 - Cont1 🟦rget ID 1

Target IDs at CNT0 and CNT1 differ.

(2) LUN (number)

How to set disk array unit LUN (numbers) recognized by the server to the same value is described below.

The disk array unit offers the Access Control function that maps logical disk masking and LDN starting from LUN 0. If this Access Control has not been installed, the logical disks (LDN) bound in the disk array unit are the logical disks (LUN) that can be accessed from the server. Installing Access Control may change the logical disks (LUN) that can be accessed from the server.

For example, if LDN00 to 03 are in the disk array unit, Access Control makes it possible to set them so that LDN00=LUN00, LDN01=LUN01, LDN02=LUN02 are recognized by Server A and also to set them so that LDN00=LUN01, LDN01=LUN02, LDN03=LUN00 are recognized by Server B. In this case, the LUN being recognized by Server A and the LUN being recognized by Server B are different LDN.

■ If you do not install Access Control

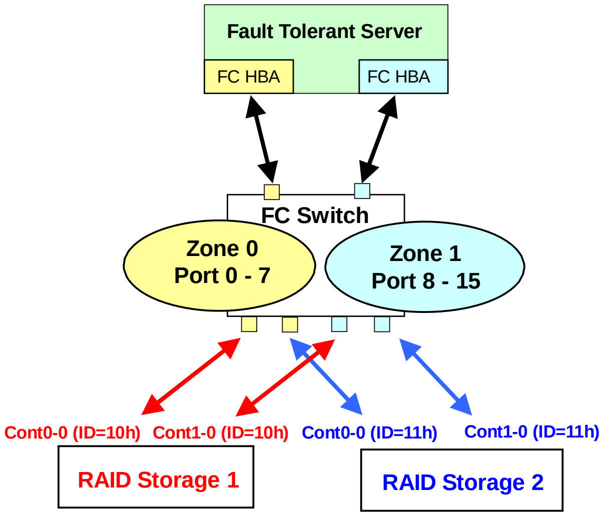
Special setting is not necessary.

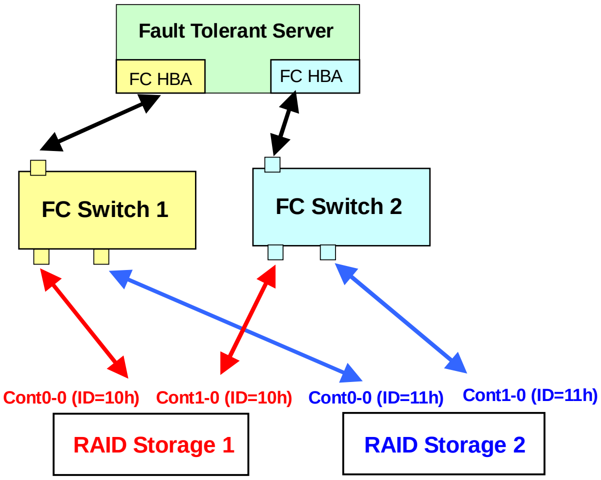
■ If you install Access Control

When setting up Access Control, **be sure to** **set it so that an LDN in the disk array unit is recognized as the same LUN (number)** by each server.

[Notes on connecting FC switches in a fault tolerant server environment]

Connect so that Switch Port numbers are the same by ZONE and by Switch.


Fault Tolerant Server
FC HBA
FC HBA
FC Switch
Zone 0
Port 0 - 7
Zone 1
Port 8 - 15
Cont0-0 (ID=10h)
Cont1-0 (ID=10h)
Cont0-0 (ID=11h)
Cont1-0 (ID=11h)
RAID Storage 1
RAID Storage 2


Fault Tolerant Server
FC HBA
FC HBA
FC Switch 1
FC Switch 2
Cont0-0 (ID=10h)
Cont1-0 (ID=10h)
Cont0-0 (ID=11h)
Cont1-0 (ID=11h)
RAID Storage 1
RAID Storage 2

Zone 0

	Switch Port No.	Connection Device	Loop ID
Zone 0	Port 0	**Fault tolerant server**	
	Port 1	**RAID Storage 1 Cont0-0**	**10h**
	Port 2	**RAID Storage 2 Cont0-0**	**11h**
Zone 1	Port 8	**Fault tolerant server**	
	Port 9	**RAID Storage 1 Cont1-0**	**10h**
	Port 10	**RAID Storage 2 Cont1-0**	**11h**

Zone 1

Controllers have the same Loop ID number

Different Loop ID numbers for each unit

Switch No. - Port No.	Connection Device	Loop ID
Switch 1 - Port 0	**Fault tolerant server**	
Switch 1 - Port 1	**RAID Storage 1 Cont0-0**	**10h**
Swtich 1 - Port 2	**RAID Storage 2 Cont0-0**	**11h**
Switch 2 - Port 0	**Fault tolerant server**	
Swtich 2 - Port 1	**RAID Storage 1 Cont1-0**	**10h**
Switch 2 - Port 2	**RAID Storage 2 Cont1-0**	**11h**

Appendix B. Initialize Wizard File

Batch initialization of disk arrays can be performed using an initialize wizard file. This file is created saving the settings on the Initialization Complete screen of the initialization wizard. To prevent the same IP address and license from being used for other disk arrays, they are described as “xxx” in the saved file. This file becomes available by editing the IP address and license.

Be careful not to edit other items.

The format and sample settings of the initialize wizard file are shown below.

(1) File format

The format to perform batch settings from a user-defined file is explained.

(a) The file is an ASCII character format text file (*.txt).

(b) From a “#” (sharp) to the end of a line is treated as a comment.

(c) A section must be enclosed in [ ] and start from the beginning of a line.

(d) A section description action is in effect until the next section description appears.

(e) A sentence within a section in the syntax for settings by section is complete in one line.

(f) The syntax for settings by section is the format below.

- *Key*=*Value*

  The setting for *Key* is described by *Value*.

- *KeyValue*.*Subkey*=*Value*

  This specifies a subkey of the value set above it and describes its setting in *Value*.

Key and *Subkey* names vary by section.

(g) If a section name begins with “*”, it is not used in setting.

(h) Since uppercase and lowercase characters are distinguished, take care in description.

[Format of initialize wizard file]

```
# Comment line
Initialization wizard .................. (1)

[SVPConf] ............................... (2)
00h.GateWay=x.x.x.x
00h.IP=x.x.x.x
00h.Mask=x.x.x.x
SVPNO=00h

[License] ................................ (3)
License=XXXXXX-XXXXXX-XXXXXX-XXXXXX-XXXXXX

[*DiskArray] ............................. (4)
Serial=Serial-number
```

(1) Key information

This has the description “Initialization wizard” as key information to show that the parameters to follow are a setup file.

(2) Section (Network)

This describes the network (IP address, etc.) to set in the disk array.

Explanation of syntax

Section:	[SVPConf]
Key:	SVPNO
Subkeys:	IP, GateWay, Mask
Syntax:	SVPNO=xx
	xx.IP=aaa.bbb.ccc.ddd
	xx.GateWay= aaa.bbb.ccc.ddd
	xx.Mask= aaa.bbb.ccc.ddd

SVPNO: Describes the SVP (service processor) number in 2 hexadecimal digits.

“00h”: Service processor number on controller 0 side

“01h”: Service processor number on controller 1 side

IP: Represents an IP address in “.” delimited decimal notation.

GateWay: Describes a gateway in the same format as an IP address.

Mask: Describes a subnet mask in the same format as an IP address.

Example:

```
SVPNO=00h
00h.IP=192.168.1.1
00h.GateWay=255.255.255.0
00h.Mask=0.0.0.0
SVPNO=01h
00h.IP=192.168.1.2
00h.GateWay=255.255.255.0
00h.Mask=0.0.0.0
```

(3) Section (License)

This describes a license key to unlock.

Explanation of syntax

Section:	[License]
Key:	License
Syntax:	License=xxxxxx-xxxxxx-xxxxxx-xxxxxx-xxxxxx When unlocking multiple license keys, describe them on multiple lines.
Example:	License=12345-12345-12345-12345-12345;

(4) Section (Disk array)

This is key information for displaying the disk array type being set.

The section name begins with "[*DiskArray]" and is not used in initialization.

(5) Section (Host connection port)

This describes the host connection port settings.

The section name is displayed as "[FCPort]".

(6) Section (Logical disk)

This describes the binding of logical disks.

The section name is displayed as "[LD]".

(7) Section (LD Set)

This describes the binding of an LD Set.

The section name is displayed as "[LDSET]".

(8) Section (Assignment of logical disks to LD Set)

This describes the logical disks assigned to an LD Set.

This section is ignored at re-initialization because it exists as a result of execution.

The section name is displayed as “[*LDSET_ASS]”.

(9) Section (Pool)

This describes the binding of a pool.

The section name is displayed as “[Pool]”.

(10) Section (Spare)

This describes the binding of a spare disk.

The section name is displayed as “[Spare]”.