



NEC Express Server
Express5800 Series

Express5800/T120e EXP246 User's Guide

Model Number: N8100-2089F/2090F/2091F

Chapter 1 General Description

Chapter 2 Preparations

Chapter 3 Setup

Chapter 4 Appendix

Documents for This Product

Documents for this product are provided as booklets (📖) and electronic manuals (📄) in the EXPRESSBUILDER disc (📀).



Precautions for Use

Describes points of caution to ensure the safe use of this server.
Read these cautions before using this server.



Getting Started

Describes how to use this server, from unpacking to operations. See this guide at first and confirm an outline of this product.



EXPRESSBUILDER



User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server's parts
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and ideal location for this server
Chapter 3: Setup	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications and other information



Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and important information for installation
Chapter 2: Installing Bundled Software	Installation of bundled software, such as NEC ESMPRO and Universal RAID Utility



Maintenance Guide




Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Useful Features	The detail of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs




Other documents

Provides the detail of NEC ESMPRO, Universal RAID Utility, and the other features.

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Notations Used in This Document

Notations used in the text

In addition to safety-related symbols urging caution, three other types of notations are used in this document. These notations have the following meanings.

Important	Indicates critical items that must be followed when handling the server or operating software. If the procedures described are not followed, <u>server failure, data loss, and other serious malfunctions could occur.</u>
Note	Indicates items that must be confirmed when handling the server or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drive

This server is equipped with one of the following drives. These drives are referred to as *optical disk drive* in this document.

- DVD-ROM drive
- DVD Super MULTI drive

Hard disk drive

Unless otherwise stated, *hard disk drive* (HDD) described in this document refer to the following.

- Hard disk drive (HDD)
- Solid state drive (SSD)

Removable media

Unless otherwise stated, *removable media* described in this document refer to the following.

- USB flash drive
- Flash FDD

Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.

See Chapter 1 (1.2 Supported Windows OS) in *Installation Guide (Windows)* for detailed information.

Notations in this document	Official names of Windows
Windows Server 2012	Windows Server 2012 Standard
	Windows Server 2012 Datacenter
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise
Windows Server 2008 *	Windows Server 2008 Standard
	Windows Server 2008 Enterprise

* Includes 64-bit and 32-bit Editions unless otherwise stated.

The following appears on EXPRESSBUILDER.

- Windows Server 2008 64-bit Edition: Windows Server 2008 x64
- Windows Server 2008 32-bit Edition: Windows Server 2008 x86

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Regulatory Notices

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Class A Emission Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CE / Australia and New Zealand Statement

This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement


警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Turkish RoHS information relevant for Turkish market

EEE Yönetmeliğine Uygundur.

Disposing of your used product



In the European Union

EU-wide legislation as implemented in each Member State requires that used electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes Information and Communication Technology (ICT) equipment or electrical accessories, such as cables or DVDs.

When disposing of used products, you should comply with applicable legislation or agreements you may have. The mark on the electrical and electronic products only applies to the current European Union Member States.

Outside the European Union

If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority and ask for the correct method of disposal.

CCC Statement

Keep in mind the CCC Class A Statement when you use the product.

声 明

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

Vietnam RoHS

Vietnam RoHS information relevant for Vietnam market
Complying with "CIRCULAR, No.30/2011/TT-BCT (Hanoi, August 10 2011),
Temporary regulations on content limit for certain hazardous substances in
electrical products"

Ukrainian RoHS

English	<p style="text-align: center;">Declaration of Conformity with the requirements of Technical Regulation on the Restriction Of the use of certain Hazardous Substances in Electrical and Electronic Equipment (adopted by Order №1057 of Cabinet of Ministers of Ukraine)</p> <p>The Product is in conformity with the requirements of Technical Regulation on the Restriction Of the use of certain Hazardous Substances in electrical and electronic equipment (TR on RoHS).</p> <p style="text-align: center;">The content of hazardous substance with the exemption of the applications listed in the Annex №2 of TR on RoHS:</p> <ol style="list-style-type: none"> 1. Lead (Pb) – not over 0,1wt % or 1000wt ppm; 2. Cadmium (Cd) – not over 0,01wt % or 100wt ppm; 3. Mercury (Hg) – not over 0,1wt % or 1000wt ppm; 4. Hexavalent chromium (Cr6+) – not over 0,1wt % or 1000wt ppm; 5. Polybrominated biphenyls (PBBs) – not over 0,1wt % or 1000wt ppm; 6. Polybrominated diphenyl ethers (PBDEs) – not over 0,1wt % or 1000wt ppm.
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Ukrainian	<p style="text-align: center;">Декларація про Відповідність Вимогам Технічного Регламенту Обмеження Використання деяких Небезпечних Речовин в електричному та електронному обладнанні (затвердженого Постановою №1057 Кабінету Міністрів України)</p> <p>Виріб відповідає вимогам Технічного Регламенту Обмеження Використання деяких Небезпечних Речовин в електричному та електронному обладнанні (ТР ОВНР).</p> <p>Вміст небезпечних речовин у випадках, не обумовлених в Додатку №2 ТР ОВНР, :</p> <ol style="list-style-type: none"> 1. свинець(Pb) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон; 2. кадмій (Cd)– не перевищує 0,01 % ваги речовини або в концентрації до 100 частин на мільйон; 3. ртуть(Hg) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон; 4. шестивалентний хром (Cr⁶⁺) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон; 5. полібромбіфеноли (PBB) – не перевищує 0,1% ваги речовини або в концентрації до 1000 частин на мільйон; 6. полібромдефенілові ефіри (PBDE) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон.
Russian	<p style="text-align: center;">Декларация о Соответствии Требованиям Технического Регламента об Ограничении Использования некоторых Вредных Веществ в электрическом и электронном оборудовании (утверждённого Постановлением №1057 Кабинета Министров Украины)</p> <p>Изделие соответствует требованиям Технического Регламента об Ограничении Использования некоторых Вредных Веществ в электрическом и электронном оборудовании (ТР ОИВВ).</p> <p>Содержание вредных веществ в случаях, не предусмотренных Дополнением №2 ТР ОИВВ:</p> <ol style="list-style-type: none"> 1. свинец (Pb) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 2. кадмий (Cd) – не превышает 0,01 % веса вещества или в концентрации до 100 миллионных частей; 3. ртуть (Hg) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 4. шестивалентный хром (Cr⁶⁺)– не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 5. полибромбифенолы (PBB) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 6. полибромдифеноловые эфиры (PBDE) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей.

产品中有毒有害物质或元素的名称及含量标识格式

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板	×	○	○	○	○	○
CPU, Memory	×	○	○	○	○	○
PCI Board	×	○	○	○	○	○
HDD	×	○	○	○	○	○
电源	×	○	○	○	○	○
机箱、支架	○	○	○	○	○	○
其他(电缆等)	×	○	○	○	○	○

○: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006标准规定的限量要求以下。
×: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求。
This only applies to China.

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Keep this document for future reference.

Latest editions

This document was created based on the information available at the time of its creation. The screen images, messages and procedures are subject to change without notice. Substitute as appropriate when content has been modified.

The most recent version of User's Guide, as well as other related documents, is also available for download from the following website.

<http://www.nec.com/>



Precautions for Use (Be Sure to Read)

The following provides information required to use your server safely and properly. For details of names in this section, refer to *Names and Functions of Parts* in this document.

Safety precautions

Follow the instructions in this document for the safe use of NEC Express server.

This User's Guide describes hazardous parts of the server, possible hazards, and how to avoid them. Server components with possible danger are indicated with a warning label placed on or around them (or, in some cases, by printing the warnings on the server).

In User's Guide or on warning labels, **WARNING** or **CAUTION** is used to indicate a degree of danger. These terms are defined as follows:



Indicates there is a risk of death or serious personal injury

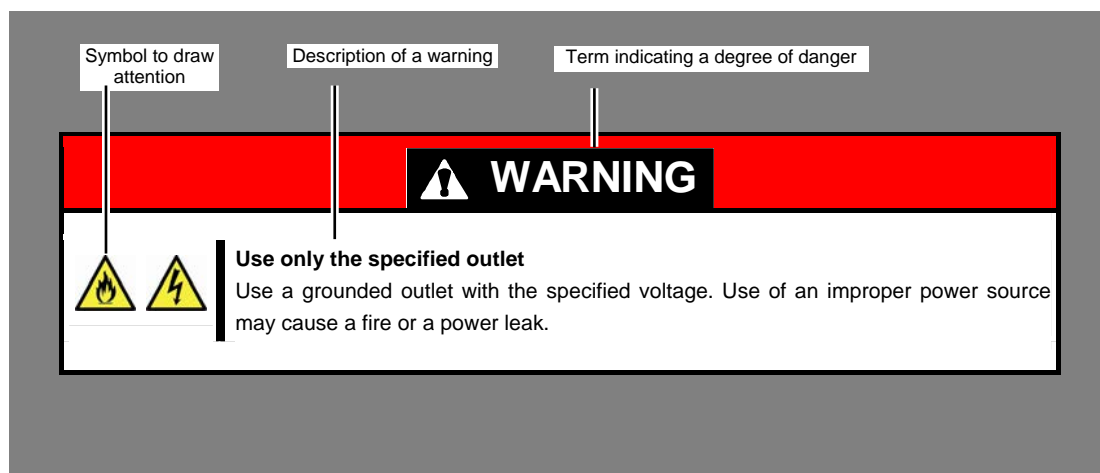


Indicates there is a risk of burns, other personal injury, or property damage

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	Attention	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example) (Electric shock risk)
	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) (Do not disassemble)
	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example) (Disconnect a plug)

(A label example used in this User's Guide)



Symbols used in this document and on warning labels

Attentions

	Indicates the presence of electric shock hazards.		Indicates the presence of mechanical parts that can result in bodily injury.
	Indicates the presence of a hot surface or component. Touching this surface could result in bodily injury.		Indicates the presence of mechanical parts that can result in pinching or other bodily injury.
	Indicates there is a risk of explosion.		Indicates the presence of laser beam that cause blindness.
	Indicates there is a risk of fire or fumes.		Indicates a general notice or warning that cannot be specifically identified.

Prohibited Actions

	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.		Do not touch the server with wet hand. Otherwise, an electric shock may be caused.
	Do not touch the component specified by this symbol. Otherwise, an electric shock or burn may be caused.		Do not use the server in the place where water or liquid may pour. Otherwise, an electric shock or fire may be caused.
	Do not place the server near the fire. Otherwise, a fire may be caused.		Indicates a general prohibited action that cannot be specifically identified.


Mandatory Actions


	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.		Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.
	Make sure equipment is properly grounded. Otherwise, an electric shock or fire may be caused.		

Safety notes


This section provides notes on using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, refer to *Safety precautions*.

Rack Installation


 CAUTION

- 


Elevated Operating Ambient

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
- 


Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- 

Mechanical Loading

Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- 

Circuit Overloading

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- 

Reliable Earthing

Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

Multiple power sources

 CAUTION













Disconnect all power supply cords before servicing.

Rack mounted equipment marking – Slide/rail marking

 CAUTION	
	Slide/rail mounted equipment is not to be used as a shelf or a work space.

General

 WARNING	
	<p>Do not use the server for services where human life may be at stake or high reliability is required.</p> <p>This server is not intended for use in medical, nuclear, aerospace, mass transit or other applications where human life may be at stake or high reliability is required, nor is it intended for use in controlling such applications. We disclaim liability for any personal injury and property damages caused by such use of this server.</p>
 	<p>Do not use the server if any smoke, odor, or noise is present.</p> <p>If smoke, odor, or noise is present, immediately turn off the server and disconnect the power plug from the outlet, then contact the store where you purchased the product or your maintenance service company. Using the server in such conditions may cause a fire.</p>
 	<p>Do not insert needles or metal objects.</p> <p>Do not insert needles or metal objects into ventilation holes in the server or openings in the optical disk drive. Doing so may cause an electric shock.</p>

 CAUTION	
  	<p>Keep water or foreign matter away from the server.</p> <p>Do not let any liquid such as water or foreign materials including pins or paper clips enter the server. Failure to follow this warning may cause an electric shock, a fire, or failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server, and contact the store where you purchased the product or your maintenance service company.</p>

Power supply and power cord use

WARNING



Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.



Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

CAUTION



Plug in to a proper power source.

Use a grounded outlet with the specified voltage. Use of an outlet with a voltage other than that specified causes fire and electrical leakage. Do not install the server in any environment that requires an extension cord. Connecting to a cord that does not conform to the power supply specs of the server causes overheating, resulting in fire.

If you want to use an AC cord set with a ground wire of class 0I, be sure to connect the ground wire before inserting the power plug into the outlet. Before disconnecting the ground wire, be sure to disconnect the power plug from the output.



Do not connect many cords into a single outlet by using extension cords.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.



Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

Do not use any unauthorized power cord.

Use only the power cords provided with the server. Electric current that exceeds the amount allowed could cause fire. Also, observe the following precautions to prevent electrical shock or fire caused by a damaged power cord.



- Do not stretch the cord harness
- Do not bend the power cord.
- Do not twist the power cord
- Do not step on the power cord.
- Uncoil the power cord before use
- Do not secure the power cord with staples or equivalents

- Do not pinch the power cord
- Keep chemicals away from the power cord
- Do not place any object on the power cord
- Do not alter, modify, or repair the power cord
- Do not use a damaged power cord (replace the damaged power cord with a power cord of the same standard. For information on replacing the power cord, contact the store where you purchased the product or a maintenance service company)

⚠ CAUTION**Do not use the attached power cord for any other devices or usage.**

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

**Do not unplug the power cord by holding the cable part.**

Pull the power cord straight out by holding the plug. Pulling the power cord by holding the cable part or applying extra pressure to the connector may damage the cable part, which may cause a fire or electric shock.

Installation, relocation, storage, and connection**⚠ CAUTION****Do not attempt to lift the server by yourself**

Some servers weigh up to 33 kg depending on the server components. Carrying the server by yourself may damage your back. At least two people should securely hold the server from the bottom when carrying it. Do not attempt to lift it by holding the front bezel. Doing so may cause the front bezel to come off, which may cause not only breakage of the server but also cause the server to fall on to persons resulting in personal injury.

**Do not install the server in any place other than specified.**

Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.

- A dusty place
- A humid place such as near a boiler
- A place exposed to direct sunlight
- An unstable place

**Do not use the server in an environment where corrosive gas is present**

Do not install the server in a place subject to corrosive gases including sodium chloride, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, or ozone. Do not install the server in an environment that contains dust, chemicals that accelerate corrosion such as NaCl or sulfur, or conductive materials. Failure to follow this warning may cause the wiring on the printed wiring board to short-circuit, leading to fire. If you have any questions, contact the store where you purchased the product or a maintenance service company.

**Do not connect or disconnect any interface cable with the power cord of the server plugged to a power source.**

Be sure to power off the server and unplug the power cord from a power outlet before installing/removing any optional internal device or connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire resulted from a short circuit.

⚠ CAUTION**Do not apply any weight on the server when it is extended from the rack**

Do not apply force on the server when it is extended from the rack. Doing so cause the frames to bend, which makes it impossible to be mounted on the rack. It also may cause the server to fall, resulting in personal injury.

**Do not attempt to connect or disconnect the interface cable while the power cord is plugged into an outlet**

Be sure to unplug the power cord from a power outlet before connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching a cable or connector may cause an electric shock or a fire resulted from a short circuit.

Use only the specified interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire.



Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
 - Do not step on the cable.
 - Do not place any object on the cable.
 - Do not use the server with loose cable connections.
- Do not use any damaged cable.

Cleaning and working with internal devices**⚠ WARNING****Do not disassemble, repair, or alter the server.**

Never attempt to disassemble, repair, or alter the server on any occasion except as described in this document. Failure to follow this warning may cause not only malfunction of the server but also an electric shock or fire.

**Do not look into the optical disk drive**

A laser beam used in the optical disk is harmful to the eyes. Do not look into or insert a mirror into the drive while the drive is powered on. If a laser beam (which is invisible) enters your eyes, you may lose your eyesight.

**Do not attempt to remove lithium, NiMH, or Li-ion batteries.**

The server contains the lithium, NiMH, or Li-ion battery (some optional devices have a lithium, NiMH, or Li-ion battery installed). Do not remove the battery. Placing a battery close to a fire or in the water may cause an explosion.



When the server does not operate appropriately due to the dead battery, contact the store you purchased the product or your maintenance service company. Do not attempt to disassemble the server to replace or recharge the battery by yourself.

⚠ WARNING**Disconnect the power plug before cleaning the server.**

Be to power off the server and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even of the server is off-powered.

Occasionally disconnect the power plug from the outlet and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

⚠ CAUTION**High temperature**

Components including internal hard disk drives in the server are extremely hot just after the server is turned off. Allow the surface to cool before installing/removing.

**Secure cables or cards in place**

Be sure to secure the power cable, interface cables, and cards in place. Incomplete installation causes a loose connection, resulting in smoke or fire

**Electric shock**

The redundant cooling fan, hard disk drives (only when hot-plug hard disk drives are installed), and power supply unit (only when redundant power supply are installed) support hot swapping. If replacing a component when the electrical current is being supplied, use extreme caution not to get electric shock by touching terminal parts of the internal components.

During operation**⚠ CAUTION****Do not pull out or remove the server from the rack.**

Do not pull the server out of the rack or remove it from the rack. In addition to causing equipment to not function properly, separating the server from the rack may result in personal injury.

**Avoid contact with the server during thunderstorms.**

Do not touch any part of the server including the cables when a thunderstorm is approaching. Also, do not connect or disconnect any devices. There may be a risk of electric shock from lightning strike.

**Keep animals away from the server.**

Keep animals such as pets away from the server. Pet hair or other waste enters the server, which may cause a fire or electric shock.

**Do not leave the optical disk drive tray open.**

Dust may get in the server when the tray is open, which may result in a malfunction. In addition, bumping the open tray could cause personal injury.

 **CAUTION**



Do not place any object on top of servers.

Separating the server from the rack may result in personal injury and damage to nearby personal belongings.










Do not get yourself caught in the fan

Keep your hands and hair away from the cooling fan at the rear of the server during operation. Failure to observe this warning may cause your hands or hair to catch in the fan, resulting in personal injury.

Warning labels

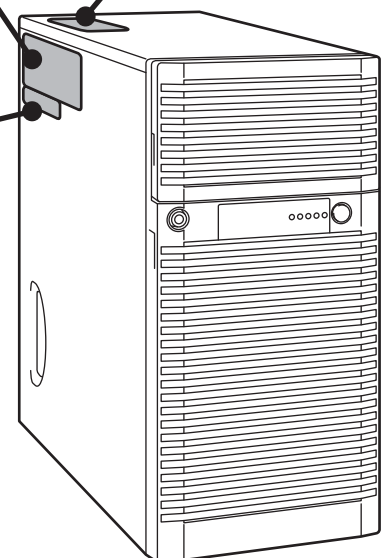
Warning label are attached on or near the components with potential hazards (This label is either attached or printed on the component.) to draw attention from users to potential hazards involved in handling the server. (Do not remove or black out this label and keep it clean). If no label is attached or printed on the server, or if there is a label coming off or stained, contact your sales representative .

External view

 注意 CAUTION	
オプションの取付け、取外し時は電源プラグをコンセントから抜き、外部装置と接続しているケーブルを外してください。 Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.	  電源プラグを抜く 感電注意
ネジは本体内部へ落とさない様、十分ご注意ください。 Do not drop any screws inside the system.	
ボード及びオプション機器の接続の際は、必ずユーザズガイドを参照し、正しく接続してください。誤った接続は、故障や火災の原因となります。 Refer to the "User's Guide" when option board or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.	
指をはさんだり、ぶついたりしないように注意してください。 To avoid the risk of personal injury, be careful when accessing the inside of the system.	
装置の持ち上げ、移動の際は、装置の底面をしっかりと持って持ち上げてください。 Firmly hold the bottom of the system when required to lift and carry the system.	

 重量物注意 WARNING: HEAVY ITEM	
ぎっくり腰や落下事故防止のため移動のさいは2人以上で行って下さい。 To avoid the risk of personal injury or damage to the unit, move the unit with at least two or more people.	

 注意 CAUTION	
<ul style="list-style-type: none"> ・高温になるコンポーネントがあります。十分に冷えてから触れるようにしてください。 ・電源を切ってもバッテリーで稼働している部分があります。保守をするまえに各々のコンポーネントの取り扱い説明書をお読みください。 	 
<ul style="list-style-type: none"> ・ As some components may become very hot during system operation, give ample time to allow cooling as well as use precaution when handling internal components immediately after power down. ・ Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance. 	



Handling precautions (for proper operations)

Be sure to observe the following precautions for the proper functioning of the server. Ignoring the precautions may cause server malfunction or failure.

- **Do not use any cell phone or PHS and switch off them near the server. Electric waves from such devices can cause server to malfunction.**
- **Install the server in an appropriate place. For details about the installation location, refer to *Chapter 2 Preparations (2. Ideal Location and Connection)*.**
- **Before connecting/removing cables to/from peripheral devices, make sure that the server is off and unplug the power cord.**
- **Connect the provided power cord to a 100 VAC outlet. If an optional cable is used, you may connect to a 100 or 200 VAC power system.**
- **Make sure that the access LED on the server is off before turning off the power or ejecting an optical disk.**
- **After connecting power cord to power outlet, do not press the POWER switch to turn on the server before the POWER LED (amber) is unlit.**
- **Wait for at least 30 seconds before turning on the server after turning off the server. If any Uninterruptible Power Supply unit is connected, set it to wait for at least 30 seconds before turning on the server after power off.**
- **Wait for at least 30 seconds before connecting power cord after disconnecting it from power outlet.**
- **Turn off the server and unplug the power cord before moving it.**
- **Regularly clean the server to prevent various types of failure. (Refer to *Chapter 1 Maintenance (2. Daily Maintenance)* in "*Maintenance Guide*" for details about cleaning.)**
- **Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.**
- **We do not guarantee that any copy-protected CD that does not conform to standards will play on the server's optical disk drive.**
- **In the following cases, check and adjust the system clock before operation.**
 - After transportation
 - After storage
 - After the server is used following a period of disuse, in which storage conditions did not conform to those that guarantee server operations (temperature: 10°C to 40°C; humidity: 20% to 80%). Check the system clock approximately once per month. Use of a time server (NTP server) is recommended if high accuracy timing is required by the system.
If you notice that the system clock runs significantly faster or slower over time even after adjustment, contact the store where you purchased the product or your maintenance service company for repair.
- **In order to get the server and internal devices to work properly, we recommend you store the server at room temperature.**
Observe the storage conditions (Temperature: –10°C to 55°C, Humidity: 20% to 80%, No condensation of moisture) to store the server.
- **If this server, internal optional devices, and media set for the backup devices (tape cartridges) are moved from a cold place to a warm place in a short time, condensation will occur and cause malfunctions and failures when these are used in such state. To protect important stored data and property, make sure to wait for a sufficient period to use the server and components in the operating environment.**
 - Reference: Time effective at avoiding condensation in winter (more than 10°C differences between the room temperature and atmospheric temperature)
 - Disk devices: Approximately 2 to 3 hours Tape media: Approximately 1 day
- **For optional devices, we recommend you use our NEC products. Even if they are successfully installed or connected, installation of unsupported devices can cause the server to malfunction or even failure. You will be charged to repair failure or damage caused by use of such products even within warranty period.**

Tips for your health and safety

Using a computer extensively may affect different parts of your body. Here are tips you should follow while working on a computer to minimize strain on your body.

Keep proper posture

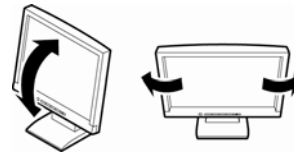
The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when your muscles are most relaxed.

Working on the computer with bad posture such as hunching over or being too close to the monitor could cause fatigue or deteriorated eyesight.



Adjust the angle of your display

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. Working without adjusting the display to a comfortable angle makes it difficult for you to maintain a proper posture and you will get tired easily. Adjust the viewing angle before use.



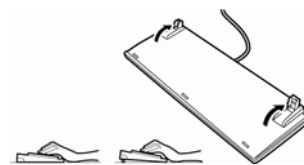
Adjust the brightness and contrast of the display

Display screens have functions to control brightness and contrast. The most suitable brightness/contrast depends on age, individuals, and environment, so adjust it to suit your preferences. A too bright or too dark display is bad for your eyes.



Adjust the angle of keyboard

Some keyboards are ergonomically designed, which allow the angle to be adjusted. Adjusting the angle of the keyboard is effective to reduce tension on your shoulders, arms, and fingers.



Clean your equipment

Keeping your equipment clean is important not only for the appearance but also for functional and safety reasons. A dusty monitor makes it difficult to see the display contents, so clean it regularly.

Take rest breaks

When you feel tired, take a break. Light exercise is also recommended.



General Description

This chapter introduces the features of this server and the name of each part.

1. Introduction

2. Accessories

Verify the condition of your server's accessories.

3. Standard Features

This section describes the server's features and the server management.

4. Names and Functions of Parts

This section describes the name of each part contained in this server.

***1.* Introduction**

Thank you for purchasing this NEC Express5800 Series product.

This high performance server is powered by the latest microprocessor "Intel® Xeon® processor/Intel® Pentium® processor".

NEC's latest technology and architectures realize high-power and high-speed operation that cannot be matched by existing servers.

The server is designed with consideration of not only reliability but also expandability, which enables you to use it as a network server.

Read this document before using the server thoroughly to fully understand handling of Express5800 Series Server and appreciate its functions to the maximum extent.

2. Accessories

The carton box contains various accessories which are required for setup or maintenance. **Make sure you have them all** for future use.

- **Bezel Lock Key (attached to Server)**
- **EXPRESSBUILDER^{*1}**
- **Getting Started**
- **Use notes (Traditional Chinese version)**
- **SDR UPDATE TOOL**

*1 Documents are stored in EXPRESSBUILDER. Adobe Reader is required to read the documents so make sure you have it installed in your PC.

Make sure you have all accessories and inspect them. If an accessory is missing or damaged, contact your sales representative.

Important

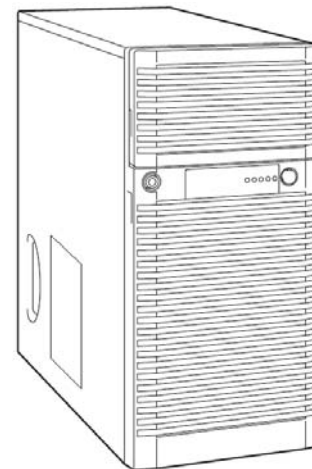
The chassis serial number plate and maintenance label is located on the server. If the serial number does not match the number on the warranty, you may not be guaranteed against failure even within the warranty period. Contact your sales representative if they do not match.

3. Standard Features

The server has the following standard features:

High performance

- Intel® Xeon® processor
 - Xeon processor E5-2403 v2 (1.80GHz 4Core)
 - Xeon processor E5-2407 v2 (2.40GHz 4Core)
 - Xeon processor E5-2420 v2 (2.20GHz 6Core)
 - Xeon processor E5-2430 v2 (2.50GHz 6Core)
 - Xeon processor E5-2440 v2 (1.90GHz 8Core)
 - Xeon processor E5-2470 v2 (2.40GHz 10Core)
- Intel® Turbo Boost feature *1
- Intel® Hyper Threading feature *2
- High-speed memory access (DDR3 1600 supported)*2
- High-speed disk access (SATA 3Gbps, 6Gbps, and SAS 6Gbps supported)
- High-speed 1000BASE-T/100BASE-TX/10BASE-T (2 ports) interface (1Gbps/100Mbps/10Mbps supported)



High reliability

- Processor throttle-ring feature
- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Memory x4 SDDC feature
- Memory mirroring, memory LockStep (x8 SDDC), memory sparing features
- Memory throttle-ring feature
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Power redundant feature (hot swapping supported) *3
- RAID System (Disk Array)
- Auto rebuild feature (hot swapping supported)
- BIOS password feature
- The security lock that comes with Front Bezel
- Redundant fan system (hot swapping supported) *4

Management Utilities

- NEC ESMPRO
- ExpressUpdate
- Remote controlling feature (EXPRESSSCOPE Engine 3)
- RAID System management utility (Universal RAID Utility)
- Hard disk drive monitoring
- Power monitoring feature

Power saving and noiseless design

- Can select the best power supply unit according to system environment / load / configuration.
- Power monitoring feature
- Power control feature
- 80 PLUS[®] Platinum certified high efficiency power supply *5
- Fan control appropriate to environment, work load, and configuration
- Silent sound design
- Enhanced Intel SpeedStep[®] Technology supported

Expandability

- PCI Express 3.0 (x16 lanes): 1 slot
- PCI Express 3.0 (x8 lanes): 2 slots *6
- PCI Express 2.0 (x4 lanes): 1 slot (x8 socket)
- PCI Express 2.0 (x1 lanes): 1 slot (x4 socket)
- Large capacity memory of up to 384 GB *7
- Can upgrade to multi-processor system with up to two processors
- Expansion Bay (for hard disk drives): 24 slots *8
- Optical disk drive bay provided as standard
- USB2.0 interface
- Two LAN ports (one for management LAN)

Ready to use

- No cable connection is required to install a hard disk drive and additional power supply unit (hot swap supported). *9

Many built-in Features

- Redundant power supply system supported *10
- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Power switch mask
- Baseboard Management Controller (BMC) conforming to IPMI v2.0

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D) utility

Easy setup

- EXPRESSBUILDER (setup utility)
- BIOS Setup utility (SETUP)

Maintenance features

- Off-line Tools
- Memory dump feature using DUMP Switch
- Feature to back up and restore BIOS/BMC settings using EXPRESSSCOPE Profile Key

*1: Unsupported on Xeon® processor E5-2403 v2 and E5-2407 v2 embedded models.

*2: Processor core speed depends on processor type, number and type of DIMMs installed, and operating voltage (1.35/1.5 V).

*3: N8100-2090F and N8100-2091F.

*4: When N8181-98 redundant fan kit is installed.

*5: N8100-2090F and N8100-2091F. 80 PLUS® Gold is certified for N8100-2089F.

*6: In 2-CPU configuration. One slot in 1-CPU configuration.

*7: In 2-CPU configuration. Up to 192 GB in 1-CPU configuration

*8: When three N8154-42F 2.5-inch HDD cages are installed. 0 slot in standard configuration.

*9: When N8154-42F 2.5-inch HDD cage or N8154-44F 3.5-inch HDD cage is installed.

*10: Model No. N8100-2090F and N8100-2091F.

3.1 Management Features

The hardware components of the server provide operation control/reliability features as shown below. Additionally, *NEC ESMPRO Agent*, which is provided in EXPRESSBUILDER, enables you to collectively manage the state of your systems. You can also monitor the server states from a PC to manage the network where *NEC ESMPRO Manager* provided in EXPRESSBUILDER is installed.

The features available on this server are as shown in the table below.

Function	Availability	Description
Hardware		Shows physical hardware information.
Memory bank	○	Shows physical memory information.
Device info	○	Shows information specific to the server.
CPU	○	Shows physical CPU information.
System	○	Shows logical CPU information and monitors the load factor. Shows logical memory information and monitors the status.
I/O device	○	Shows information on I/O devices (serial ports, keyboard, mouse, and video).
System environment		Monitors temperatures, fans, voltage, power supply, and others.
Temperature	○	Monitors the temperature inside of the chassis.
Fan	○	Monitors the fans.
Voltage	○	Monitors the voltage inside of the chassis.
Power supply	○	Monitors the power supply unit.
Door	○	Monitors chassis intrusion (open/close of the covers and doors on the chassis).
Software	○	Shows service, driver, and OS information.
Network	○	Shows network (LAN) information and monitors packets.
BIOS	○	Shows BIOS information.
Local polling	○	Monitors the values of MIB items obtained by NEC ESMPRO Agent.
Storage	○	Monitors controllers and storage devices including hard disk drives.
File system	○	Shows the file system configuration and monitors the free space.
RAID System	○	Monitors standard RAID Controller and the following RAID Controllers: • Optional RAID Controller (N8103-172/173/174/161/168)
Others*	○	Monitors OS stall using the Watch Dog Timer.
	○	Performs alert processing after an OS STOP error occurs.

○: Supported. △: Partially supported. ×: Unsupported.

*: Not displayed on the NEC ESMPRO Manager screen.

Tips

NEC ESMPRO Manager and NEC ESMPRO Agent are supplied with the server as standard. For how to install and use each software component, refer to the explanation of the component.

3.2 Firmware and Software Version Management

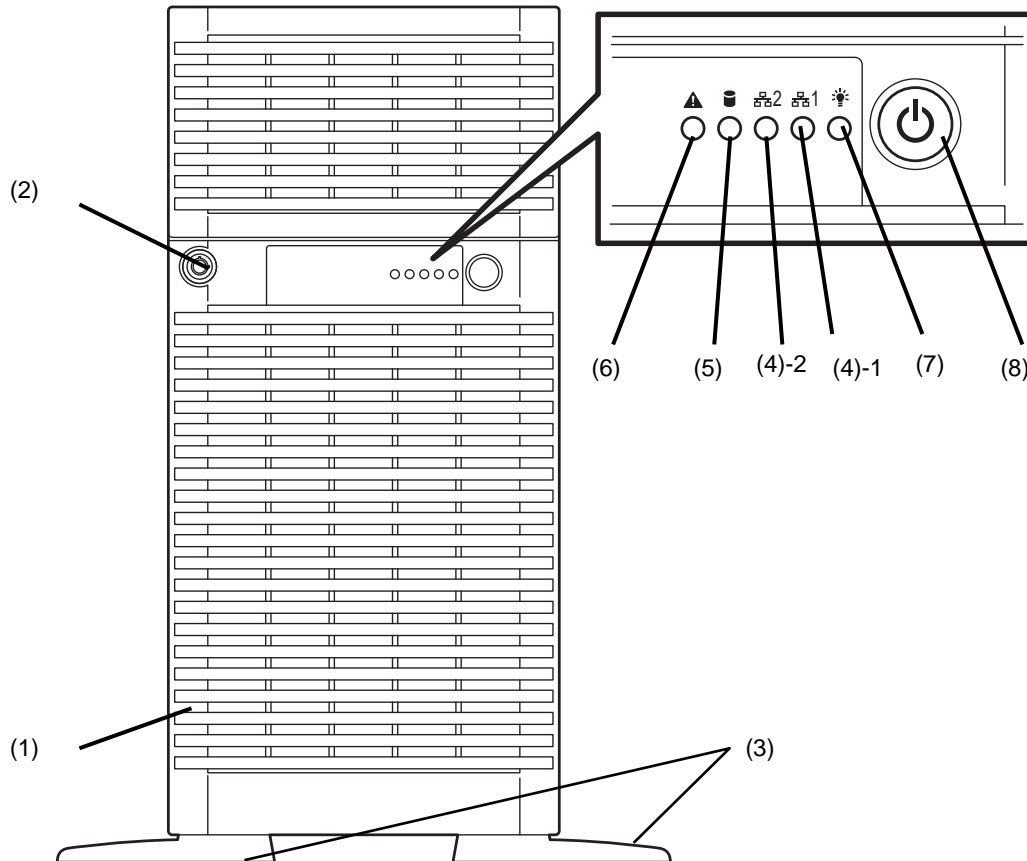
Use of NEC ESMPRO Manager and ExpressUpdate Agent allows you to manage versions of firmware and software as well as update them by applying update packages.

This feature automatically updates modules without stopping the system just by specifying the updating packages from NEC ESMPRO Manager.

4. Names and Functions of Parts

This section describes the names of the server parts.

4.1 Front View



(1) Front Bezel

The cover to protect the front of the server. This cover can be locked with the provided Bezel Lock Key.

(2) Key Slot

The slot for Bezel Lock Key that is used to lock Front Bezel.

(3) Stabilizers

Open stabilizers to fix the server to installation site.

(4) LINK/ACT LED (green)

This LED turns on when the server is connected to the network.

The LED of (4)-1 means LAN1 and (4)-2 means LAN2.

(5) DISK Access LED (green/amber)

This LED lights green when the internal HDD or ODD are being accessed.

An amber light turns on if a HDD is broken, and a light flashes green and amber alternately when a HDD is being rebuilt. (RAID System only)

(6) STATUS LED (green/amber)

This LED indicates the server status. It lights green when the server is operating normally. This LED flashes green when a degeneration is detected in redundant hardware configuration. If a failure is detected, it turns on or flashes amber.

(7) POWER LED (green)

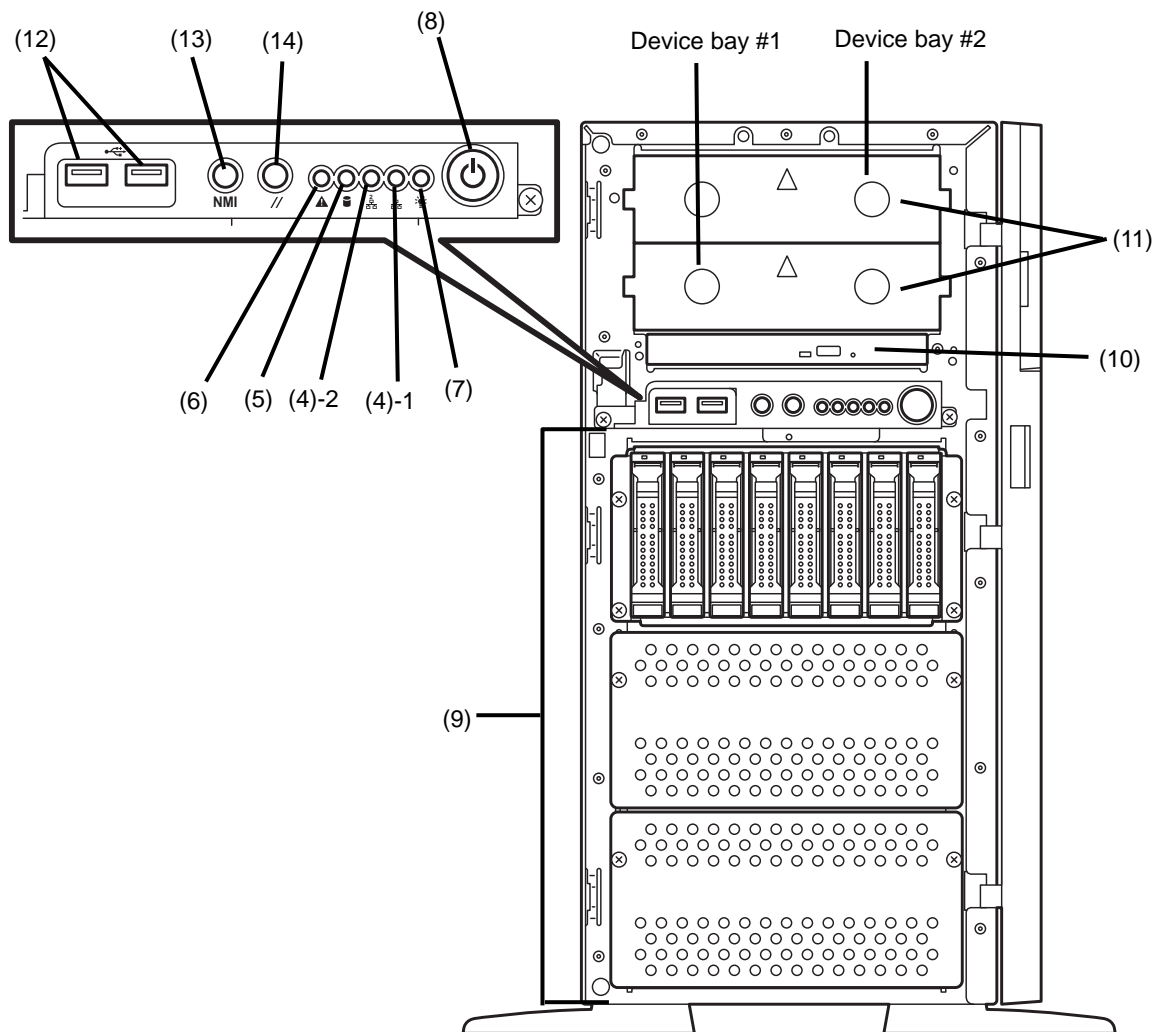
This LED lights green when the power is ON. This LED lights amber when power cord is connected to power outlet until the system becomes ready to power-on.

(8) POWER Switch

The switch to turn the server on and off. Press once to turn on the server. POWER LED lights when it is on. Press it again to turn off the server. Hold down the switch for 4 seconds or more to forcibly turn off the server.

4.2 Front View (without Front Bezel)

The illustration below shows the server with optional optical disk drive and 2.5-inch HDD cage are installed.



(9) Drive bay

The following optional cage can be installed:

- 2.5-inch HDD cage: Up to 3
- 3.5-inch HDD cage: Up to 2
- 3.5-inch fixed type HDD cage: 1

Dummy trays are installed in all vacant slots of 2.5-inch HDD cage or 3.5-inch HDD cage in standard configuration.

* The illustration shows one 2.5-inch HDD cage is installed.

(10) Optical disk drive

Either of the following drive can be installed:

- Slim DVD-ROM drive
- Slim DVD Super MULTI drive

The drive provides the following: an eject button to eject the tray; an LED that indicates Hard Disk Drive access; and an eject hole for forcibly ejecting the tray

(11) 5.25-inch device bay

The bay where two drives such as optional DAT drives can be installed. The bay is equipped with EMI brackets.

(12) USB connectors (front)

These connectors are used to connect devices that support the USB interface.

(13) DUMP Switch (NMI)

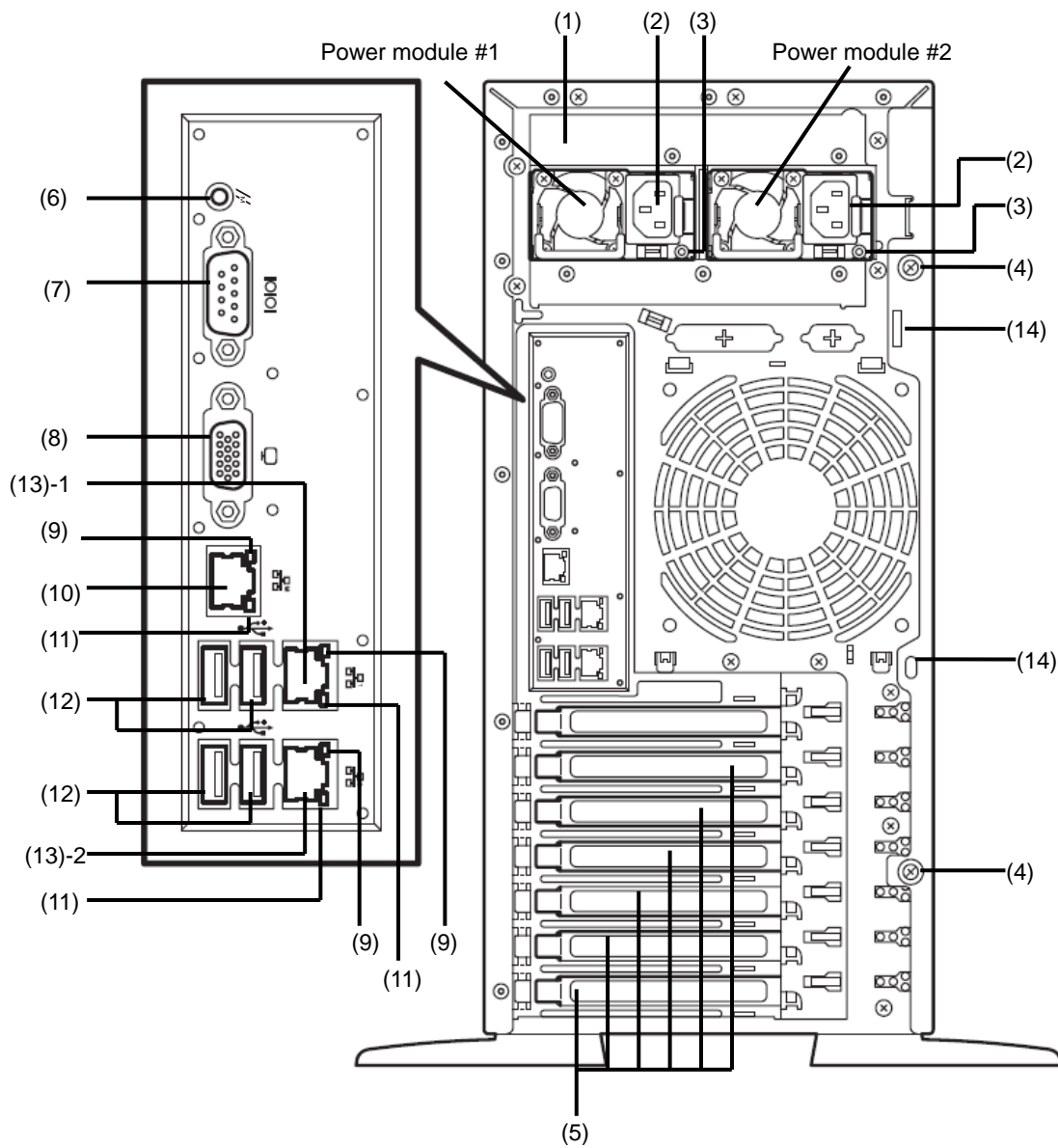
Press this switch to collect memory dump.

(14) RESET switch

Press this switch to reset the server.

4.3 Rear View

The illustration below shows the server with optional redundant power supply unit installed.



- (1) Power supply unit**

The power unit supplies DC power to the server.

* The illustration shows when redundant power supply unit is installed.
- (2) AC Inlet**

This socket is used to connect the power cord.

* Only one AC inlet with non-redundant power system.
- (3) AC POWER LED (green/amber)**

The LED indicates power supply status.

The LED starts blinking when AC power is supplied from power cord, and stays lit green when the server is powered on.

* Redundant power supply unit only.
- (4) Fixing screw**

Used to secure the side cover.
- (5) PCI slot**

Slot to install full-height PCI board.
- (6) BMC RESET Switch**

The switch to reset BMC of this server. Use the switch only when there is something wrong with EXPRESSSCOPE Engine 3 (BMC).

To use this switch, press it at least five seconds. The remote management feature is disabled for about 40 seconds after BMC is reset.
- (7) Serial port (COM)**

This connector is used to connect devices that support a serial interface. Note that it is not possible to directly connect to a dedicated line.
- (8) Display connector**

The connector to connect a display.
- (9) LINK/ACT LED (green)**

The LED indicates the access status of LAN
- (10) Management LAN connector**

A LAN connector which supports 100BASE-TX/10BASE-T. This port cannot be used as a data transmission port. This port is used for connecting to EXPRESSSCOPE Engine 3.
- (11) SPEED LED (green/amber)**

The LED indicates the transfer speed of LAN ports
- (12) USB connectors**

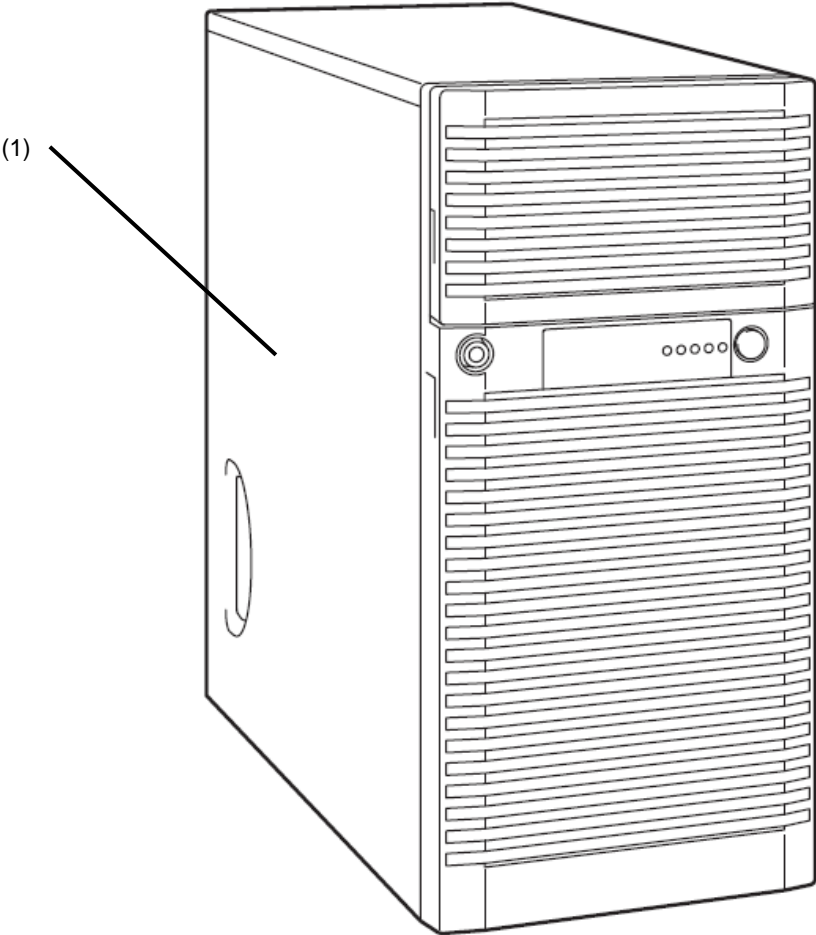
These connectors are used to connect devices that support the USB interface.
- (13) LAN connectors**

1000BASE-T/100BASE-TX/10BASE-T supported network connectors

The LED of (13)-1 means LAN1 and (13)-2 means LAN2. If Shared BMC LAN feature is enabled in ROM Utility, LAN connector 1 can also be used as the management LAN port. However, sharing port is not recommended from the point of performance and security, because LAN port 1 may receive both data.
- (14) Chassis lock**

Attach an antitheft device to protect the internal components.

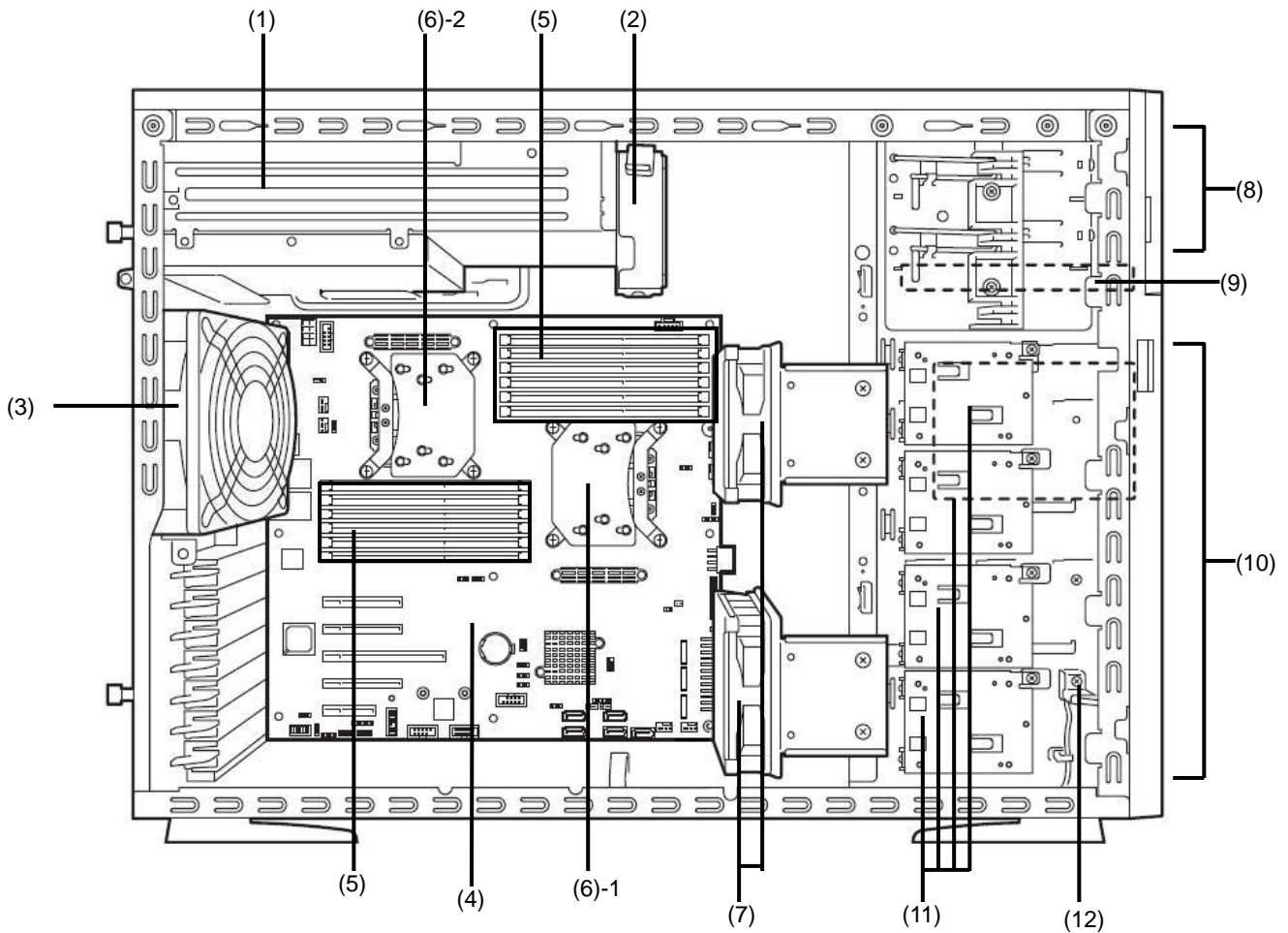
4.4 External View



(1) Side Cover

4.5 Internal View

The illustration below does not show the processor duct.



(1) Power Supply Unit

* The illustration shows when optional redundant power supply unit is installed.

(2) Cooling fan for power supply unit

* For redundant power supply unit only

(3) Cooling fans (Rear)

* The illustration shows when optional non-redundant fan unit is installed.

(4) Motherboard

(5) DIMM (optional)

(6) Processor

* Processor is attached under the heat sink.

-1 Processor #1 (CPU #1)

-2 Processor #2 (CPU #2) (Option)

(7) Cooling fans (Front)

* The illustration shows when optional non-redundant fan unit is installed.

(8) 5.25-inch device bay

(9) Optical disk drive

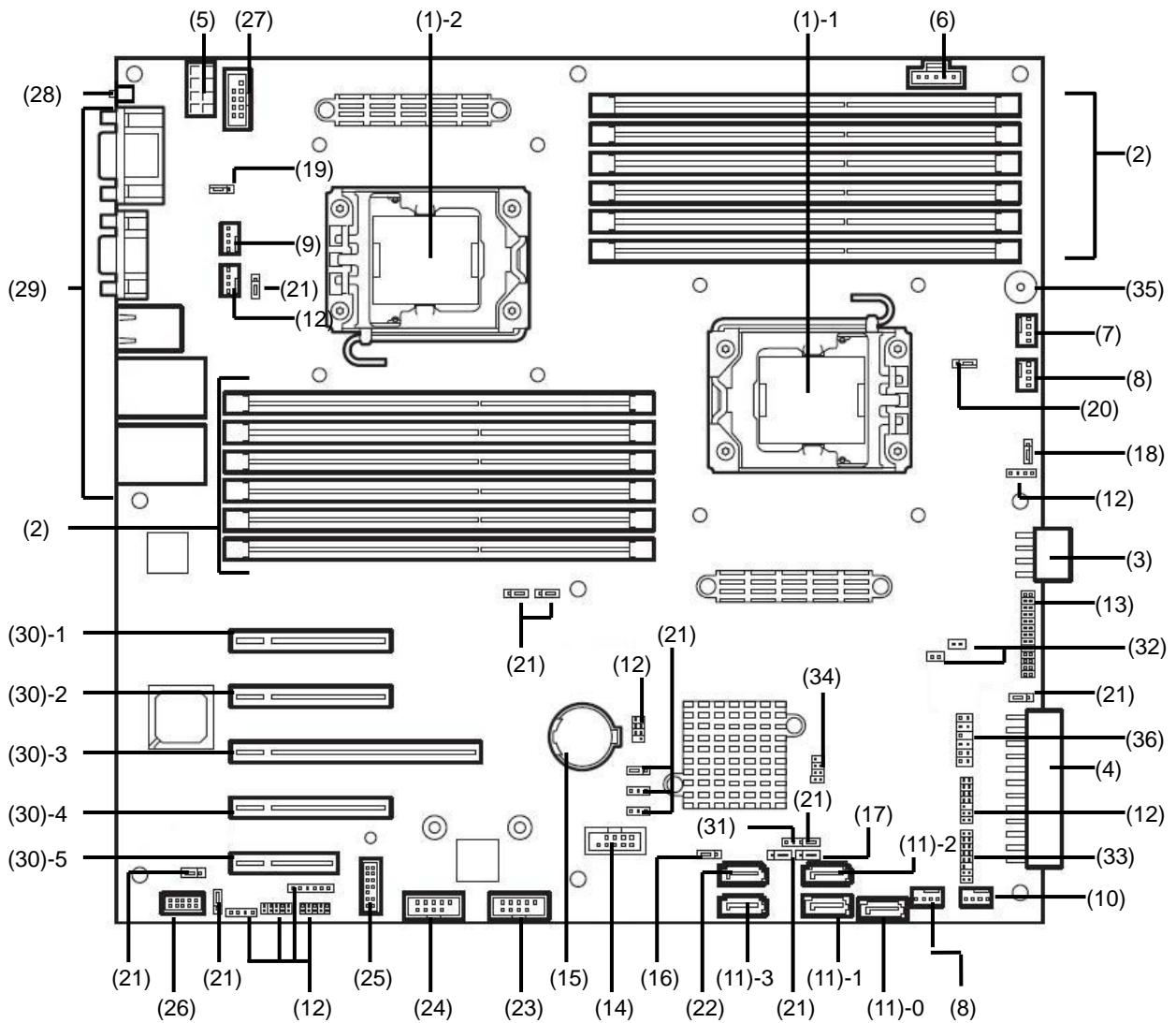
(10) Drive bay

* The illustration shows when optional 2.5-inch HDD cage is installed.

(11) Battery tray for RAID Controller

(12) Side cover open switch

4.6 Motherboard



- (1) **Processor (CPU) socket**
-1: Processor #1 (CPU #1)
-2: Processor #2 (CPU #2)
- (2) **DIMM socket**
- (3) **DC connector**
- (4) **DC connector**
- (5) **DC connector**
- (6) **PM-BUS connector**
- (7) **Connector for power supply unit cooling fan**
- (8) **Connector for front cooling fan**
- (9) **Connector for rear cooling fan**
- (10) **Connector for front cooling fan**
Connector for optional redundant cooling fan
- (11) **Serial ATA connector**
(the number after hyphen indicates port number)
- (12) **Unused connector**
- (13) **Front Panel connector**
- (14) **USB connector (front)**
- (15) **Lithium battery**
- (16) **Clear CMOS Jumper**
- (17) **Clear Password Jumper**
- (18) **RAID Configuration Jumper**
- (19) **Power configuration jumper**
- (20) **Fan configuration jumper**
- (21) **Unused jumper switch**
- (22) **Serial ATA (DVD) connector**
- (23) **Internal USB device**
- (24) **Connector for internal flash memory**
- (25) **TPM kit connector**
- (26) **SPI Flash Mezzanine connector**
EXPRESSSCOPE Profile Key (SPI flash memory) has been installed, where BIOS and BMC configuration data is stored. Relocate it when replacing MB to keep using the data.
- (27) **Connector for option COM**
- (28) **BMC RESET Switch**
The switch to reset BMC of this server. Use the switch only when there is something wrong with EXPRESSSCOPE Engine 3 (BMC).
To use this switch, press it at least five seconds. The remote management feature is disabled for about 40 seconds after BMC is reset.
- (29) **Connectors for external devices**
- (30) **PCI slots**
(30-1) PCI EXPRESS3.0 x8
(30-2) PCI EXPRESS3.0 x8
(30-3) PCI EXPRESS3.0 x16
(30-4) PCI EXPRESS2.0 x4 (x8 connector)
(30-5) PCI EXPRESS2.0 x1 (x4 connector)
- (31) **Connector for side cover open switch**
- (32) **LED cable connector**
When connecting 3.5-inch fixed HDD cage using optional RAID controller, use this connector to connect a cable to LED connector on RAID controller.
- (33) **SGPIO cable connector**
When using optional hot-swap HDD cage, use this connector to connect a cable to SGPIO connector on HDD cage.
- (34) **SGPIO signal connector**
Use this connector to connect with SGPIO signal connector of optional K410-258(00) cable.
- (35) **Buzzer**
- (36) **Flow sensor connector**
Use this connector to connect flow sensor cable of optional filter replacement sensor

4.7 Status Indicators

This section explains the indication and meanings of the server LEDs.

4.7.1 POWER LED ()

POWER LED lights green when the server is on. The light turns off when power is not being supplied to the server. The LED lights amber when power cord is connected to power outlet until the server becomes ready to power-on.

4.7.2 STATUS LED ()

While hardware is operating normally, STATUS LED lights green. STATUS LED is off or flashes green or lights/flashes amber if there is a hardware failure.

The following table lists STATUS LED patterns, their explanation and solution.

Tips

Once you have installed NEC ESM PRO, you can reference error logs to check the causes of failures.

Tips

The STATUS LED does not reflect the disk drive failure if 3.5-inch fixed disk drive is connected by using RAID controller.

STATUS LED pattern	Explanation	Solution
On (green)	Normal state	
Flashing (green)	Memory is in a degraded state	Identify the device in degraded state by using BIOS Setup Utility (SETUP), and replace it as soon as possible.
	A correctable memory error has often occurred.	
	Operating while CPU error is detected.	
	In redundant power configuration, power is not supplied to either of power unit.	
Off	The power is off.	Turn on the server.
	POST is in progress.	Wait for a while. STATUS LED will turn green after POST completes.
	Watchdog timer expired.	Turn the power off and then turn it on.
	An uncorrectable error in memory is detected.	If POST screen displays any error message, take notes of the message, and contact your sales representative.
	Memory dump is being requested. (e.g. when DUMP Switch is pressed) Note: It remains green if the dump is caused by software.	Wait until the memory dump is completed.
On (amber)	A temperature alarm was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change, contact your sales representative.
	A CPU error occurred.	Turn the power off and then turn it on.
	A PCI system error occurred	If POST screen displays any error message, take notes of the message, and contact your sales representative.
	A PCI parity error occurred	
	A PCI bus error occurred.	
	A voltage alarm was detected.	Contact your sales representative.
	Fan error was detected.	
	Sensor error was detected.	
	A CPU temperature alarm was detected.	
An error occurred on Node Manager.		
Flashing (amber)	Power Supply Unit is broken.	Contact your sales representative.
	A fan alarm was detected.	Check if the internal fan cable is properly connected. If the LED indication does not change, contact your sales representative.
	A temperature warning was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change, contact your sales representative.
	A voltage warning was detected	Contact your sales representative.
	One or more hard disk drives are broken.	
	Side cover is open.	Close the side cover. If the LED indication does not change, contact your sales representative.

4.7.3 DISK Access LED ()

DISK Access LED indicates the status of HDDs and optical disk drive.

The LED lights green whenever accessing to the HDD or optical disk drive.

If DISK Access LED lights amber, it means the HDD has failure. While rebuilding the HDD in the RAID system, DISK Access LED flashes green and amber alternately. You can see the status of each HDD by confirming DISK LED on the HDD

Tips

When using 3.5-inch fixed disk drive with RAID controller, the indication of DISK Access LED is as shown below.

The DISK Access LED lights amber when disk drive is degraded. However, it may be shown as blinking depending on access status.

The DISK Access LED lights amber and green alternately while disk drives are being rebuilt. However, LED may irregularly light amber and green depending on access status.

4.7.4 Optical Disk Access LED

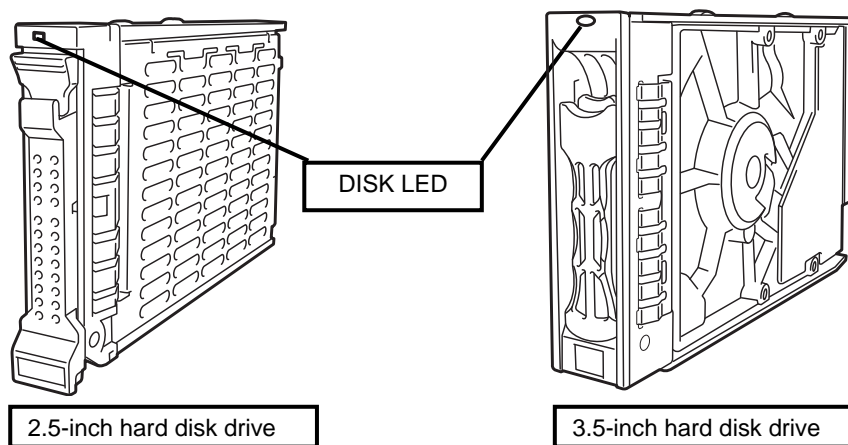
The LED for optical disk drive at the front of the server flashes when a CD or DVD is being accessed.

4.7.5 LINK/ACT LED

The LINK LED lights green when the server and hub are powered and properly connected. ACT LED blinks green when the port is transmitting or receiving data. The LINK LED lights green when the port is connected with network.

4.7.6 LED on a hard disk drive

Each Hot-Swap HDD is equipped with DISK LED.



DISK LED indicates the following status by lighting.

- **The LED flashes green**

This indicates a HDD is being accessed.

- **The LED flashes amber**

When logical drives are configured in the RAID System, this indicates the installed HDD is broken.

In RAID system having data redundancy (RAID1, RAID5, RAID6, RAID10, RAID50, or RAID60), the server can continue operation even if one (or two HDDs in RAID6 or RAID60) of the HDDs fails.

However, **replace the HDD as soon as possible, and perform reconstruction (rebuild) processing.** (The failing HDD can be replaced by using hot swapping.)

- **The LED flashes green and amber alternately**

This indicates that the HDD is being rebuilt (not a defect). In a RAID System, the HDD is automatically rebuilt upon replacing a broken HDD (auto rebuild feature). The LED flashes green and amber alternately while the HDD is being rebuilt.

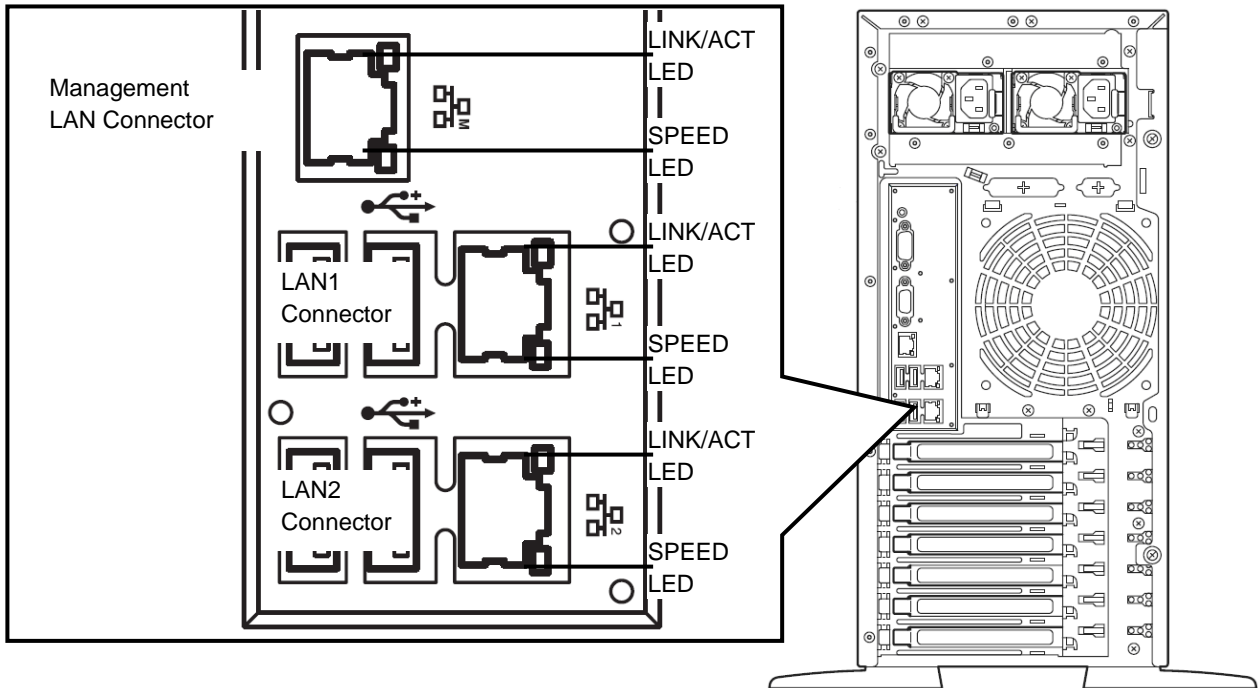
The LED goes off when rebuilding completes. If rebuilding fails, the LED flashes amber.

Important Observe the following precautions whenever you use the auto rebuild feature.

- Do not turn off or reboot the server while a HDD is being rebuilt.
- Wait at least 90 seconds before installing a HDD after removing one.
- Do not replace a HDD while another HDD is being rebuilt.

4.7.7 LEDs for LAN connectors

The three LAN connectors provided at the rear of the server have two LEDs each.



- **LINK/ACT LED (꠆꠆1, ꠆꠆2, ꠆꠆M)**

This LED indicates the state of the LAN port. LINK LED lights green when the server and hub are powered and properly connected. ACT LED flashes green when the port is transmitting or receiving data.

If the LED does not turn on in LINK state, check the cable or connection.

- **SPEED LED (꠆꠆1, ꠆꠆2, ꠆꠆M)**

This LED indicates which network interface is used.

- Two onboard LANs (꠆꠆1, ꠆꠆2) support 1000BASE-T, 100BASE-TX, and 10BASE-T.

The LED indicates which network interface is being used.

- Amber: Operating with 1000BASE-T
- Green: Operating with 100BASE-TX
- OFF: Operating with 10BASE-T

- Management LAN (꠆꠆M) supports 100BASE-TX and 10BASE-T.

The LED indicates which network interface is being used.

- Green: Operating with 100BASE-TX
- OFF: Operating with 10BASE-T

Preparations

This chapter describes preparations for using this server.

1. Installing Internal Optional Devices

You can skip this section if you did not purchase any optional devices.

2. Installation and Connection

Place the server in a proper location and connect some cables following this section.

1. Installing Internal Optional Devices

This section describes the instructions for installing supported optional devices and precautions. If you did not purchase any optional device requiring installation, you may skip this section.


Important

- Use only the devices and cables specified by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.

1.1 Safety Precautions

Be sure to observe the following precautions to install and remove optional devices properly and safely.


⚠ WARNING



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions in Precautions for Use*.

- Do not disassemble, repair, or modify the server.
- Do not remove the lithium battery, NiMH battery, or Li-ion battery.
- Disconnect the power plug when installing and removing devices.

⚠ CAUTION



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions in Precautions for Use*.

- Do not drop
- Make sure to complete installation.
- Do not get your fingers caught.
- High temperature
- Electrical shock

1.2 Anti-static Measures

This product contains static-sensitive electronic components. Follow the measures below to avoid a failure caused by static electricity when installing or uninstalling any optional device.

- **Wearing Anti-static Wrist Strap Or Anti-static Gloves**

Wear a wrist strap on your wrist and connect the wire to the chassis. If there is no wrist strap, touch an unpainted metal surface of the chassis connected to the ground to discharge static electricity from your body before touching the component. Touch the metal part occasionally to discharge the static electricity while working on the component.

- **Checking the Workplace**

- Work on an anti-static floor or concrete floor.
- If you work on a place where static electricity is likely to be generated (e.g. carpet), be sure to provide anti-static protection.

- **Using the Work Table**

Place the server on a mat with Electrostatic Discharge (ESD) protection.

- **Clothing**

- Do not wear wool or synthetic clothes.
- Wear anti-static shoes.
- Remove any kind of metal accessories such as a ring, bracelet or wrist watch.

- **Handling of Components**

- Keep the component in an anti-static bag until you install it to the server.
- Hold the component by the edges to avoid touching any terminals or mounting parts.
- Place the component in an anti-static bag when storing or moving them.

- **Handling of Cables**

When connecting a cable (e.g., LAN cable), static electricity may also be charged due to friction against the floor. Connecting the charged cable with an I/O device may cause damage to the devices in the system. It is recommended to use a product such as electrostatic discharge kit to eliminate the static charge before connecting the cable.

- **Installing and Uninstalling the Optional Device**


- To avoid electric hazard and malfunction, be sure to turn off the power switch of the server and unplug the power cord from the outlet before installing or uninstalling any optional device. If the device is hot-swappable, you do not need to turn off the power switch and unplug the power cord.
- The device contains static-sensitive electronic components. When installing or uninstalling the optional device, wear an anti-static wrist strap on your wrist to avoid a failure caused by the static electricity. To use the strap, connect the wire to the chassis.

1.3 Overview of Installation and Removal

Install/remove components by using the following procedure.

When installing hot-plug hard disk drive with the server located on site, secure clearance of about 1 to 2 m in front, rear, left, and top of the server.

⚠ CAUTION



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions in Precautions for Use*.

- Do not drop the server
- Beware of high temperatures
- Do not get your fingers caught when installing components

1. Shutdown OS.
2. If the server is ON, turn it off.
Refer to Chapter 3 (6. Turning Off the Server).
3. Disconnect the power cord from the outlet and the server.

Important After disconnecting the power cord from the server, wait for at least 5 seconds before continuing to work because the components on the motherboard might still be operating for 3 to 4 seconds even after the power cord was disconnected.

4. Remove the Front Bezel.
Refer to Chapter 2 (1.4 Removing Front Bezel).
5. You need to pull out the server from rack when installing or removing the following component:

Optical disk drive,	Non-hot-plug HDD,
DIMM,	processor,
TPM module,	Internal Flash Memory,
Additional HDD cage,	PCI board,
RAID Controller,	Battery / Flash Backup Unit for RAID Controller,
5.25-inch device,	Power supply unit
Fan unit	

If your are going to install hot-plug hard disk drive only, go to Step 12.
6. Remove side cover.
Refer to Chapter 2 (1.5 Removing Side Cover).
7. Remove CPU duct.
Refer to Chapter 2 (1.6 Removing CPU Duct).

8. Depending on the components to be installed or removed, follow the procedure in order.
Refer to Chapter 2 (1.7 Internal Flash Memory to 1.14 Optical Disk Drive).
9. Install CPU duct.
Refer to Chapter 2 (1.20 Installing CPU Duct).
10. Attach side cover.
Refer to Chapter 2 (1.21 Installing Side Cover).
11. Locate the server at installation site.
Refer to Chapter 2 (2.1 Installation).
12. Install hot-plug hard disk drives.
Refer to Chapter 2 (1.22 Hot-plug Hard Disk Drive).
13. Attach Front Bezel.
Refer to Chapter 2 (1.4 Removing Front Bezel).
14. If installing or removing power supply unit or HDD cage, be sure to apply SDR data to system by using SDR media provided with the server.
Refer to Chapter 2 (1.25 Applying SDR Data).

Important | An error may occur before SDR data is applied to the system.

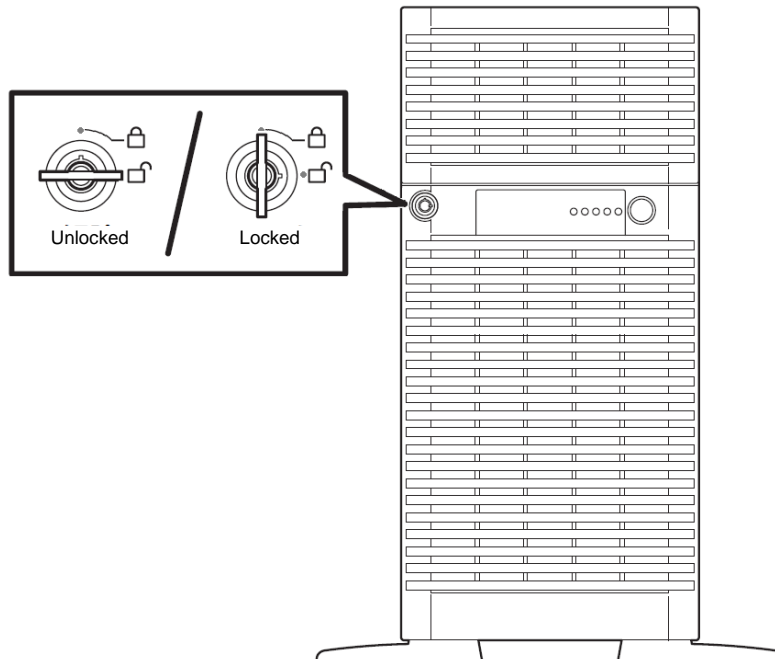
This is the end of the installation or removal procedures for internal optional devices.

Continue the setup with reference to *Chapter 2 (2.2 Connection)*.

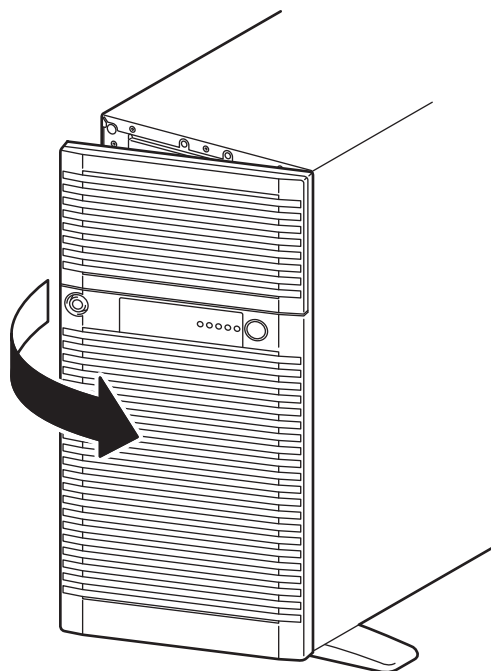
1.4 Removing Front Bezel

Remove the front bezel when manipulating switches such as RESET switch, using front USB connector, or installing/replacing hot-plug hard disk drive.

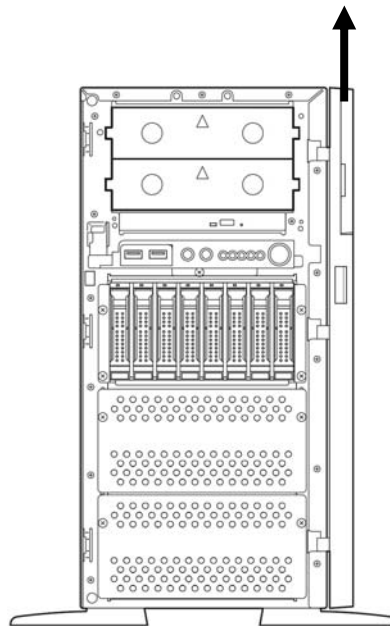
1. Insert the attached Bezel Lock Key into the key slot and turn the key to the front bezel side while pressing it lightly to release the lock.



2. Hold the left side of front bezel and pull it toward you to open.



3. With front bezel opened, slide it upward to release the tab from the chassis frame, and remove the front bezel from the server.

**Note**

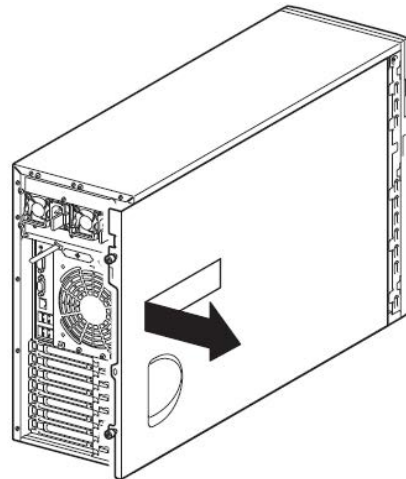
- Be careful not to press POWER Switch.

1.5 Removing Side Cover

You need to remove side cover when installing or removing the following component or change internal cable connection:

Optical disk drive,	Non-hot-plug HDD,
DIMM,	processor,
TPM module,	Internal Flash Memory,
Additional HDD cage,	PCI board,
RAID Controller,	Battery / Flash Backup Unit for RAID Controller,
5.25-inch device,	Power supply unit
Fan unit	

1. Refer to steps 1 to 5 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Loosen thumb nut on the rear panel.
3. Hold the handle and move the side cover toward rear of the server.
4. Lift off the side cover from the server.



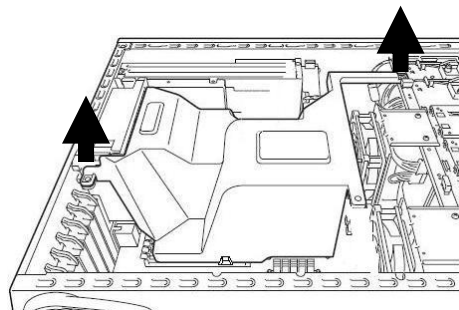
1.6 Removing CPU Duct

You need to remove CPU duct when installing or removing the following components:

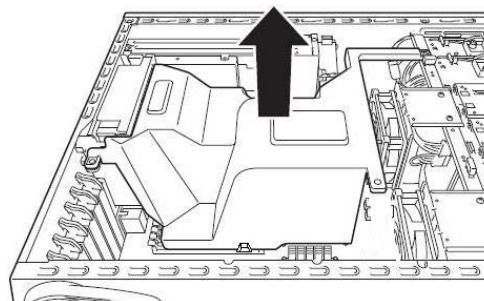
DIMM, Processor (CPU)

Fan unit

1. Pull the end of two rivets to unlatch the CPU duct.
Note: Do not remove rivets, just pull them out.

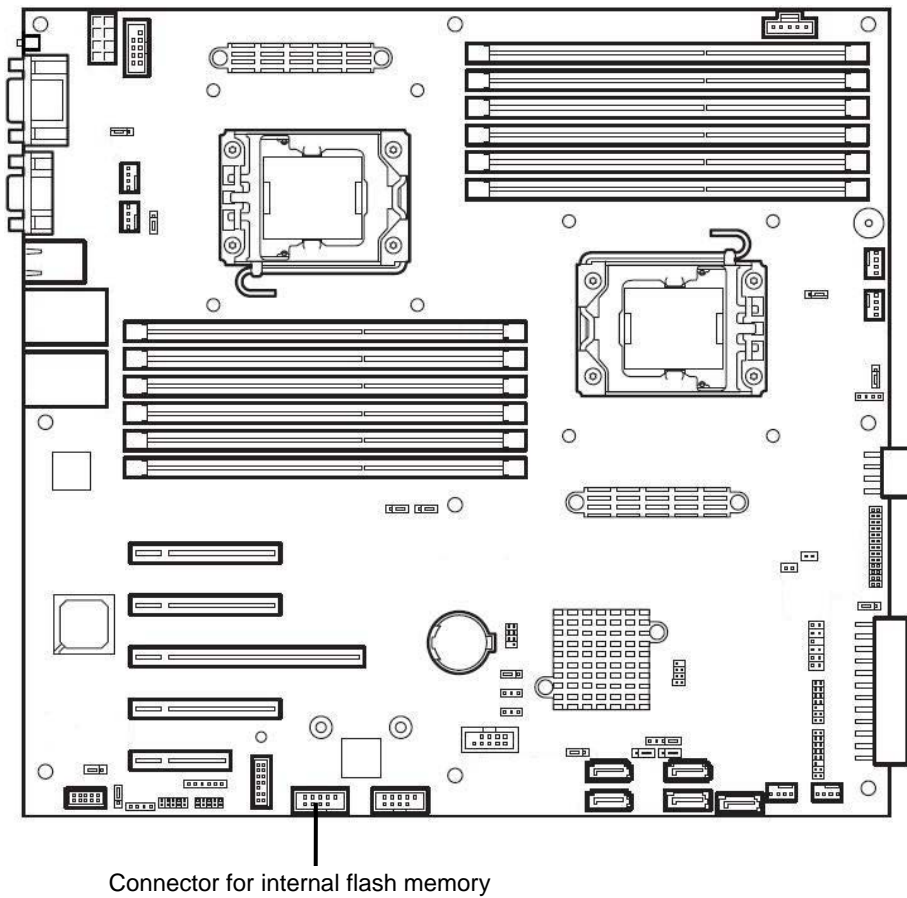


2. Hold the CPU duct, and remove it from chassis.



1.7 Internal Flash Memory

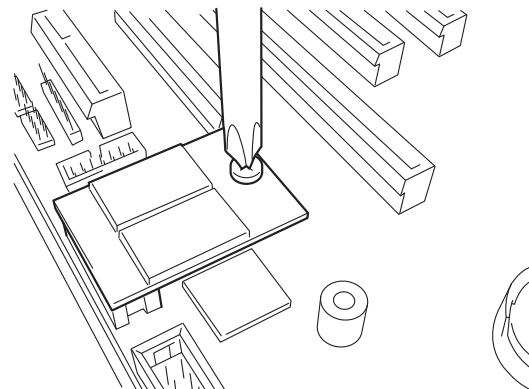
This section describes the procedure for installing optional internal flash memory.



1.7.1 Installation

Install internal flash memory in the following procedure.

1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Install internal flash memory and secure with a screw provided with internal flash memory.

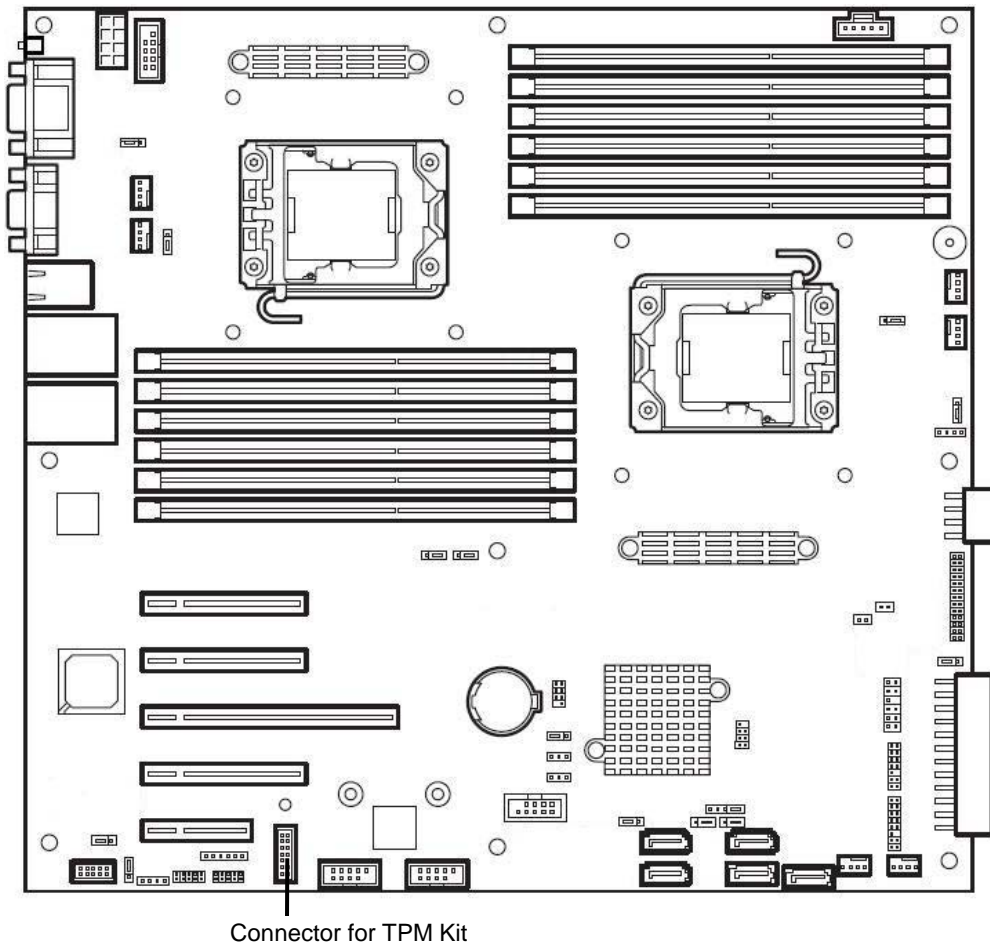


1.7.2 Removal

To remove a flash memory, reverse the installation procedure.

1.8 TPM Kit

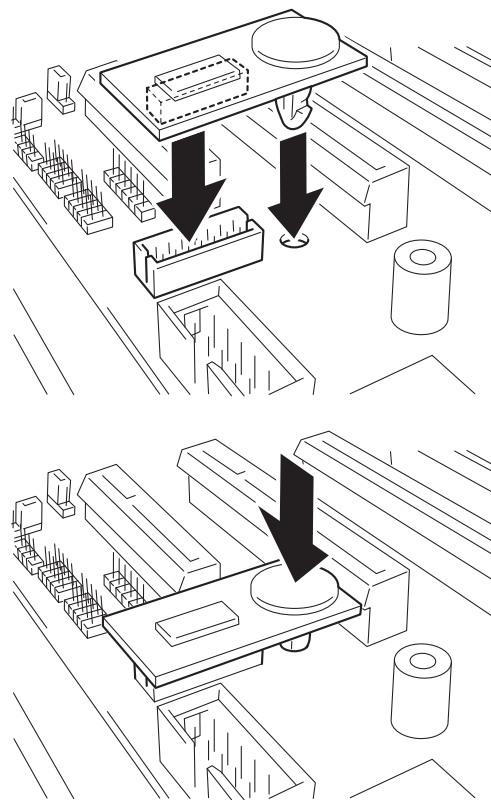
This section describes the procedure for installing optional TPM Kit.



1.8.1 Installation

Install TPM Kit in the following procedure.

1. Refer to steps 1 to 6 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations.
2. Install TPM Kit and secure it by pushing the nylon rivet provided with TPM Kit.

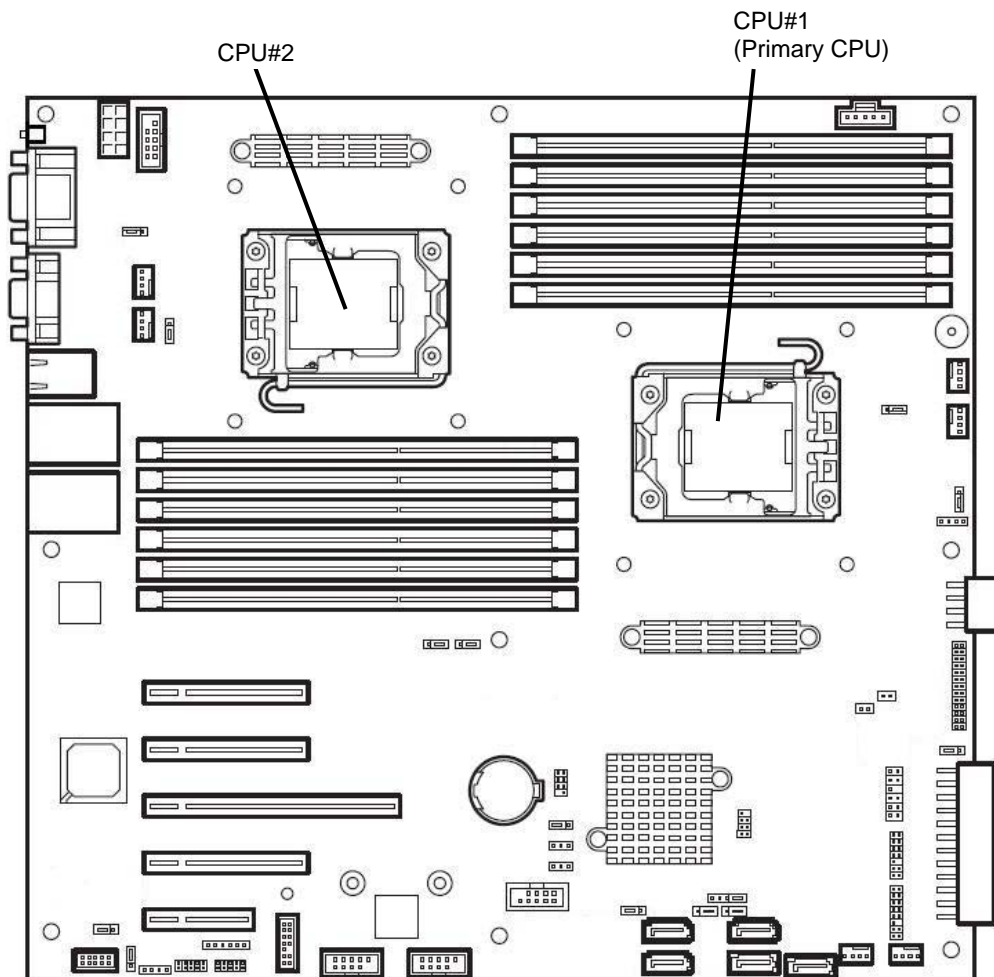


1.8.2 Removal

Removal of TPM kit requires removal of motherboard. Ask your sales representative for removal.

1.9 Processor

You can configure the multi-processor system by adding an optional processor.



Important

- You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.
- Make sure to use the processor authorized by NEC. Installing a third-party processor may cause a failure of the processor as well as the motherboard. Repair of the server due to failures or damage resulted from installing such a processor will be charged.
- Two CPUs must have the same clock frequency. Make sure of the CPU type appropriate to the server.
- If you install an additional CPU, you need to change DIMM installation location. Refer to *Chapter 2 (1.10 DIMM)*.

Tips

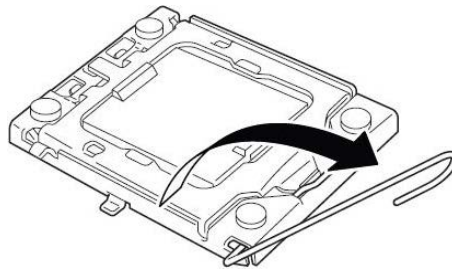
After adding the processor, Windows may record the event log to System category of Event Viewer, but it is no problem for operation.

1.9.1 Installation

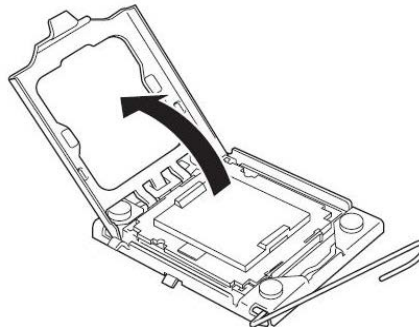
Follow steps below to install the processor. (A part of retention is omitted in the illustration below for easy understanding.)

Important The CPU is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not touch the CPU pins by a bare hand or place the CPU directly on the desk. For static notes, refer to *Chapter 2 (1.2 Anti-static Measures)*.

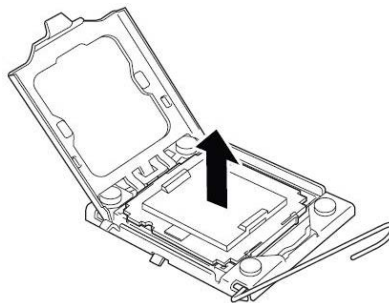
1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the CPU socket to which you are going to install a processor.
3. Push down the socket lever once to unlatch it from the hook, then slowly open the lever until it stops.



4. Lift the plate.



5. Remove the protective cover from the CPU socket.

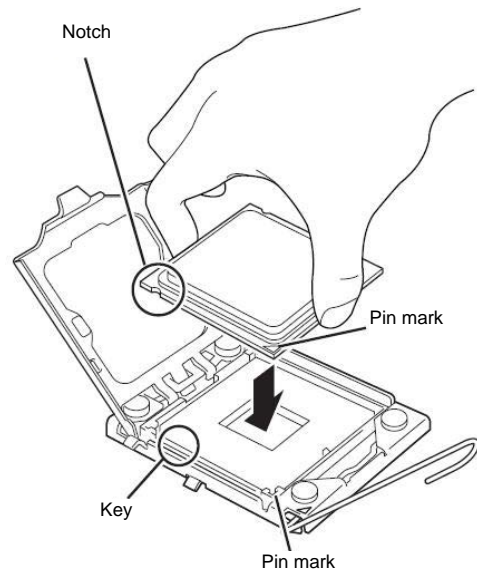


Note Keep the removed protective cover for future use.

Important Do not touch the socket contacts.

- Put the additional processor on the CPU socket slowly and gently.

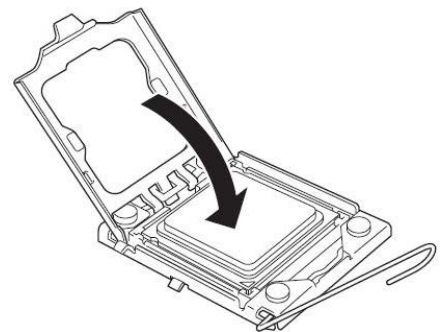
For easy installation, hold edges of processor with your thumb and index fingers so that the notch is aligned with the key on the CPU socket.



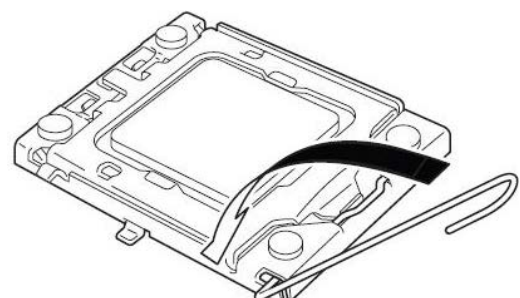
- Important**
- Be sure to hold the processor only at the edges.
 - Pay attention not to touch the bottom of the processor (pin section).

- Note**
- Insert the processor while aligning the notch on the processor with the key on the CPU socket.
 - Bring down the processor straight without tilting or sliding it in the socket.

- Lightly push the processor to the CPU socket, and close the plate.



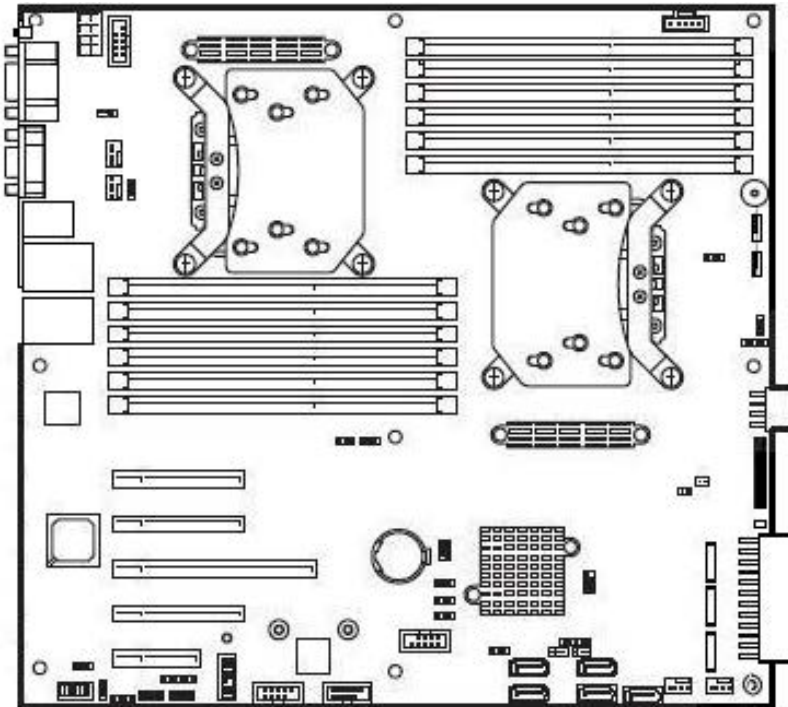
- Close the socket lever to fix it.



9. Put the heat sink on the processor and fix the heat sink with four screws.

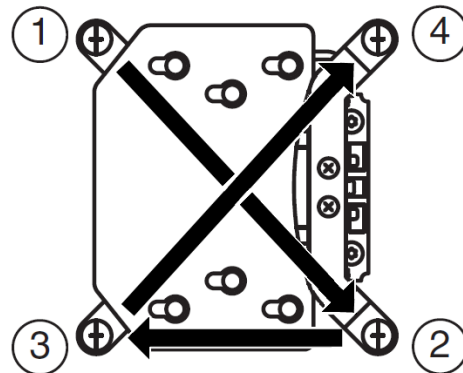
Note

Be aware of orientation of heat sink.



10. Temporarily tighten the four screws diagonally, then tighten them securely.

Make sure that the screw aligns with the screw hole. If not, the screw may damage the motherboard.



11. Make sure that the heat sink is installed on a level with the motherboard.

Note

- If the heat sink is not level, remove it, and then install it again.
- The following probably causes the heat sink not to be level:
 - The CPU is not positioned correctly.
 - All screws are not completely tightened.
- Do not move the secured heat sink.

12. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
13. Run BIOS Setup Utility (SETUP) to confirm the following settings. Refer to *Chapter 3 (2. System BIOS Setup)* in this document.

[Advanced] → [Processor Configuration] → [Processor Information]

[CPU ID]

[L2 Cache RAM]

[L3 Cache RAM]

1.9.2 Replacement / Removal

Follow steps below to replace or remove the processor.

Important Do not remove any processor unless it is failed.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the processor you are going to remove.
3. Remove screws from the heat sink, slightly move the heat sink horizontally, then remove the processor.
4. Heat of processor may make the cool seat at the bottom of the heat sink adhere to the processor.
To remove the heat sink from the processor, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the processor.

Important Removing the heat sink with it adhering to the processor may cause the processor and/or CPU socket to be defected.

5. Push down the socket lever once to unlatch it from the hook, then slowly open the lever until it stops.
6. Lift the plate.
7. Lift the processor straight upward, and remove it.
8. When removing the processor, install the protective cover to the CPU socket.
9. When replacing a processor, install a new processor.
10. If you replace the processor, lightly press the processor to CPU socket, and close the plate.
11. Close the socket lever to fix it.
12. If you replace the processor, put the heat sink on the processor and fix the heat sink with four screws.
Temporarily tighten the four screws diagonally, then tighten them securely.
Make sure that the screw aligns with the screw hole. If not, the screw may damage the motherboard.
13. Make sure that the heat sink is installed on a level with the motherboard.

Note

- If the heat sink is not level, remove it, and then install it again.
- The following probably causes the heat sink not to be level:
 - The CPU is not positioned correctly.
 - All screws are not completely tightened.
- Do not move the secured heat sink.

14. If you replace the processor, continue to install or remove internal optional devices, mount and connect the server, and turn it on.

Run BIOS Setup Utility (SETUP) to confirm the following settings. Refer to *Chapter 3 (2. System BIOS Setup)* in this document.

[Advanced] → [Processor Configuration] → [Processor Information]

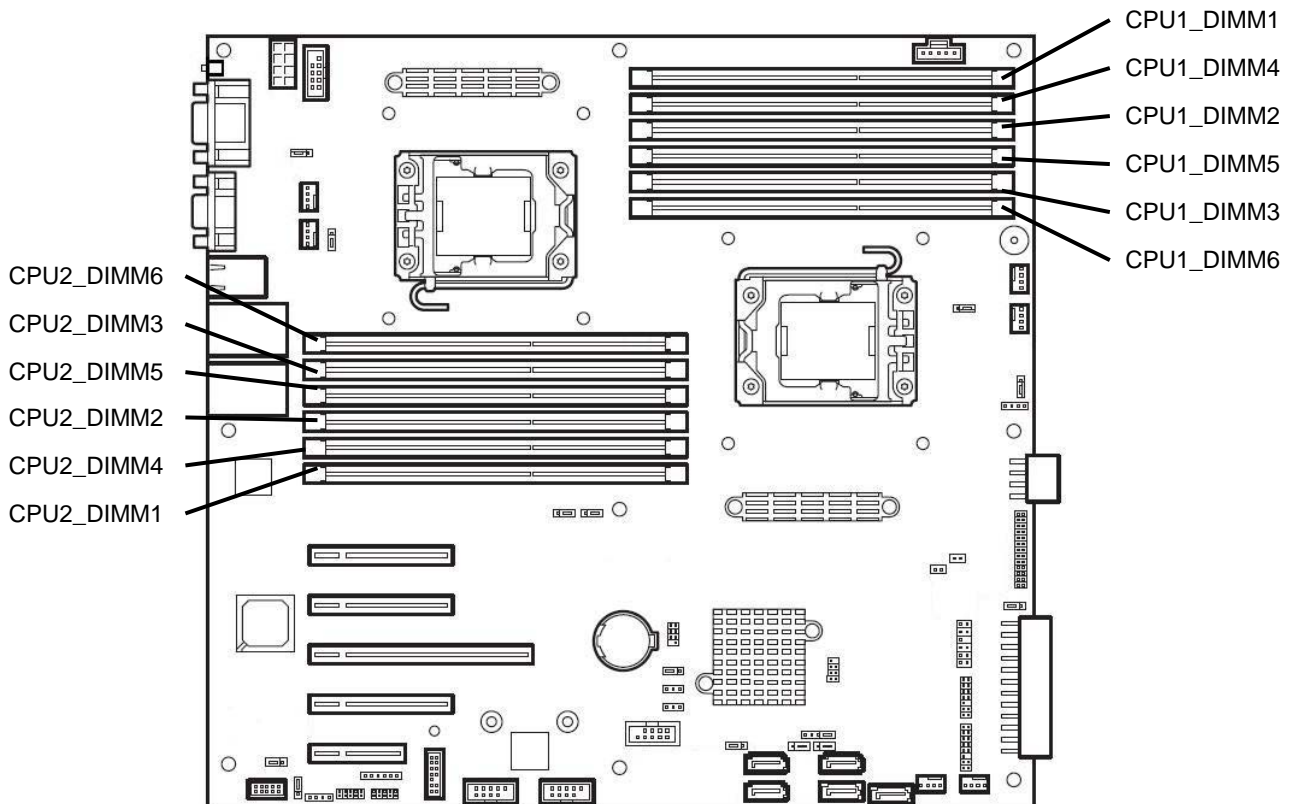
[CPU ID]

[L2 Cache RAM]

[L3 Cache RAM]

1.10 DIMM

Install a DIMM (Dual Inline Memory Module) to a DIMM socket on the motherboard in the server. The motherboard provides twenty-four sockets to install DIMMs.



Important

- You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.
- Use only the specified DIMMs. Installing a DIMM from a third party may damage not only the DIMM but the motherboard. You will be charged to repair failures or damages caused by the use of such products even within the warranty period.

Tips

Up to 384 GB (32 GB x 12) can be installed in 2-CPU configuration. Up to 192 GB (32 GB x 6) can be installed in 1-CPU configuration. No DIMM is factory installed in standard configuration.

1.10.1 Maximum supported DIMM size

The maximum available DIMM size on the server depends on the architecture and OS specs.

List of maximum DIMM sizes

OS	The maximum DIMM size supported on each OS	The maximum DIMM size supported on the server
Microsoft Windows Server 2008 Standard	4 GB	4 GB (If using HW-DEP feature) * Default factory settings
		About 2 GB (If not using HW-DEP feature) Note: If you are not using the HW-DEP feature, set Execute Disable Bit (XD Bit) to Disable in the BIOS settings.
Microsoft Windows Server 2008 Standard (x64) Microsoft Windows Server 2008 R2 Standard (x64)	32 GB	32 GB
Microsoft Windows Server 2008 Enterprise	64 GB	64 GB
Microsoft Windows Server 2008 Enterprise (x64) Microsoft Windows Server 2008 R2 Enterprise (x64)	2 TB	384 GB
Microsoft Windows Server 2012 Standard Microsoft Windows Server 2012 Datacenter	4 TB	
RedHat Enterprise Linux 5 (x86) RedHat Enterprise Linux 6 (x86)	16 GB	16 GB
RedHat Enterprise Linux 5 (EM64T)	1 TB	384 GB
RedHat Enterprise Linux 6 (x86_64)	3 TB	384 GB

1.10.2 Memory clock

The server supports the memory clock speed of DDR3-800/1066/1333/1600MHz. However, the actual memory clock speed depends on CPU and DIMM configuration. (The all of DIMMs operate at the same clock speed.)

E5-2403 v2 or E5-2407 v2

N code and product name	Memory clock speed
N8102-556F 4GB DDR3-1600 REG Memory Kit	1333MHz
N8102-557F 8GB DDR3-1600 REG Memory Kit	
N8102-558F 16GB DDR3-1600 REG Memory Kit	
N8102-559F 32GB DDE3-1333 REG Memory Kit	800MHz
N8102-560 8GB DDR3-1600 REG Memory Kit	1333MHz
N8102-561 16GB DDR3-1600 REG Memory Kit	
N8102-562 32GB DDR3-1600 REG Memory Kit	
N8102-564 32GB DDR3-1600 REG Memory Kit	

E5-2420 v2 or E52430 v2 or E52440 v2 or E5-2470 v2

N code and product name	Memory clock speed	
	When set to 1.35 V	When set to 1.5 V
N8102-556F 4GB DDR3-1600 REG Memory Kit	1333MHz	1600MHz
N8102-557F 8GB DDR3-1600 REG Memory Kit		
N8102-558F 16GB DDR3-1600 REG Memory Kit		
N8102-559F 32GB DDE3-1333 REG Memory Kit	800MHz	800MHz
N8102-560 8GB DDR3-1600 REG Memory Kit	1333MHz	1600MHz
N8102-561 16GB DDR3-1600 REG Memory Kit		
N8102-562 32GB DDR3-1600 REG Memory Kit		
N8102-564 32GB DDR3-1600 REG Memory Kit		

1.10.3 Memory RAS feature

The server supports the following RAS features. Some restrictions (e.g., DIMM installation location) are imposed on using the Memory Mirroring or Memory Lock Step Memory Sparing feature. Refer to *Chapter 2 (1.10.7 Using memory RAS feature)* for conditions appropriate to your requirements.

- Standard memory feature (x4 SDDC ECC memory)*1
- Memory Mirroring feature (restrictions imposed on DIMM configuration)
- Memory Lock Step feature (x8 SDDC ECC memory) (restrictions imposed on DIMM configuration)
- Memory Sparing feature

*1 N8102-556F is not supports to x4 SDDC.

Supported RAS features depend on additiional memory board.

See the table below for RAS features supported by additiional memory board.

List of features supported by additiional memory board

N code Product name	Standard feature (x4 SDDC)	Memory Mirroring feature	Memory LockStep feature (x8 SDDC)	Memory Sparing feature
N8102-556F 4GB DDR3-1600 REG Memory Kit	×	×	×	×
N8102-557F 8GB DDR3-1600 REG Memory Kit	○	×	×	×
N8102-558F 16GB DDR3-1600 REG Memory Kit	○	×	×	×
N8102-559F 32GB DDE3-1333 REG Memory Kit	○	×	×	×
N8102-560 8GB DDR3-1600 REG Memory Kit	×	○	○	×
N8102-561 16GB DDR3-1600 REG Memory Kit	×	○	○	×
N8102-562 32GB DDR3-1600 REG Memory Kit	×	○	○	×
N8102-564 32GB DDR3-1600 REG Memory Kit	×	×	×	○

○: Supported
×: Not supported

1.10.4 DIMM installation order

Note

- DIMM installation order in 1-CPU configuration differs from that in 2-CPU configuration.
- If CPU2 is not installed, CPU2_DIMM1 to CPU2_DIMM6 are disabled.
- Refer to *List of features supported by additional memory board* before using memory RAS feature.

In 1-CPU configuration, install DIMMs starting from the smallest slot number.

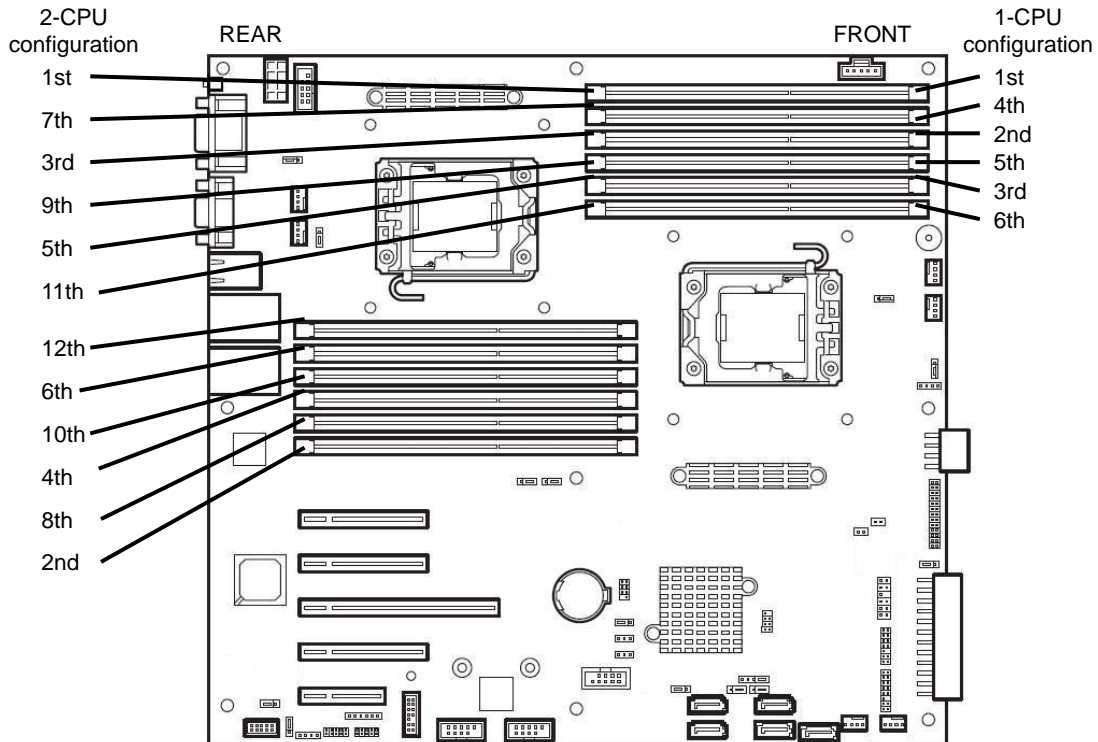
In 2-CPU configuration, alternately install DIMMs starting from the smallest slot number of each CPU.

Installation order depends on combination of DIMMs to be installed.

See the table below to find allowable combination of DIMMs, and install DIMMs starting from the largest capacity and from the smallest slot number.

N code	N8102-							
	556F	557F	558F	559F	560	561	562	564
N8102-556F	○	○	○	○	×	×	×	×
N8102-557F	○	○	○	○	×	×	×	×
N8102-558F	○	○	○	○	×	×	×	×
N8102-559F	○	○	○	○	×	×	×	×
N8102-560	×	×	×	×	○	○	○	×
N8102-561	×	×	×	×	○	○	○	×
N8102-562	×	×	×	×	○	○	○	×
N8102-564	×	×	×	×	×	×	×	○

○: Allowed to be install together
 ×: Not allowed to be install together



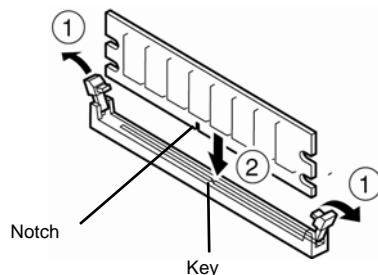
1.10.5 Installation

Install a DIMM by using the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Open levers at both ends of the target DIMM slot.
3. Rotate both levers outward and push the

DIMM straight into the socket.

When a DIMM is inserted into the socket, the lever automatically closes.



Important

- Make sure the orientation of the DIMM. The DIMM has a notch, preventing being wrongly inserted.
- Do not apply too much pressure when you push a DIMM into the socket. Doing so can damage the socket or terminal part.

4. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
5. Confirm that no error messages are displayed in POST screen.
If any error messages are displayed, refer to *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".
6. Run BIOS Setup Utility and select **Memory Configuration** and then **Memory Information** from the **Advanced** menu. Make sure the capacity of added DIMM is displayed properly.
Refer to *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".
7. Select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**.
After that, select **Save Changes and Exit** to reboot.
8. Set the size of Paging File to the recommended value (Total memory size x 1.5) or more.
If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
For other OS, follow the manual of the OS.

1.10.6 Removal

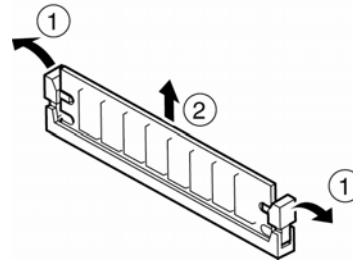
Remove a DIMM in the following procedure.

Note

- When removing a defective DIMM, check error messages displayed at POST or NEC ESM PRO and check the DIMM socket where the defective DIMM is installed.
- At least one DIMM needs to be installed for the server to operate.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.

2. Rotate both levers of the DIMM socket outward. The socket is unlocked and DIMM can be removed.



3. Pull out the DIMM straight.

4. Confirm that no error messages are displayed on POST. If any error message is displayed, refer to *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".

5. Run BIOS Setup Utility, select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**. After that, select **Save Changes and Exit** to reboot.

6. Set the size of Paging File to the recommended value (Total memory size x 1.5) or more.

If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".

For other OS, follow the manual of the OS.

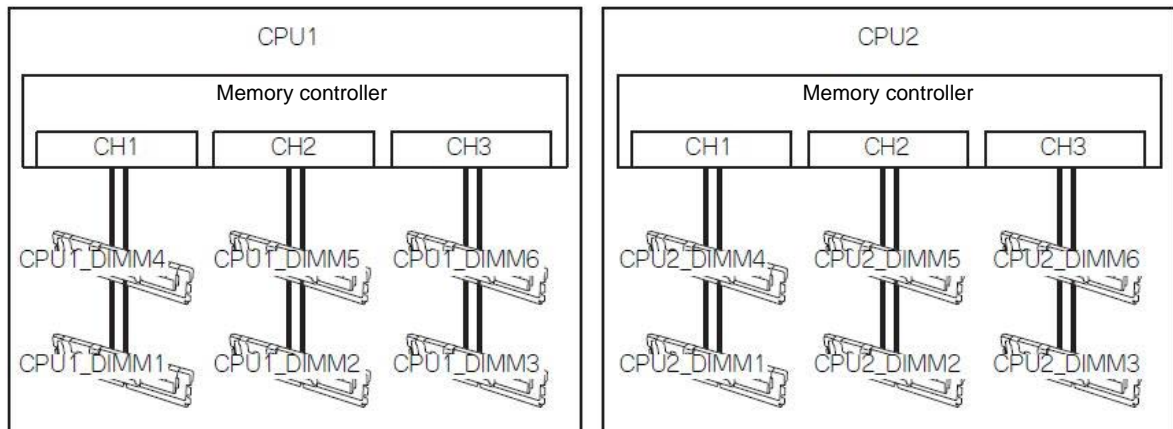
1.10.7 Using memory RAS feature

This server has RAS feature including "Standard memory feature (x4 SDDC ECC memory)", "Memory mirroring feature", "Lock Step feature (x8 SDDC ECC memory)", and Memory Sparing feature. SDDC (Single Device Data Correction) allows automatic correction of memory error (multi-bit error).

Note

- Refer to *List of features supported by additional memory board in 1.10.3 Memory RAS Feature* before using memory RAS feature.
- Only the features that additional memory board supports can be used.
- N8102-556F is not supported to x4 SDDC.

The memory area on the motherboard of the server is divided into three memory channels.



Memory Mirroring and Memory Lock Step (x8 SDDC) features keep memory redundancy between memory channels by monitoring or altering memory active/inactive status, respectively.

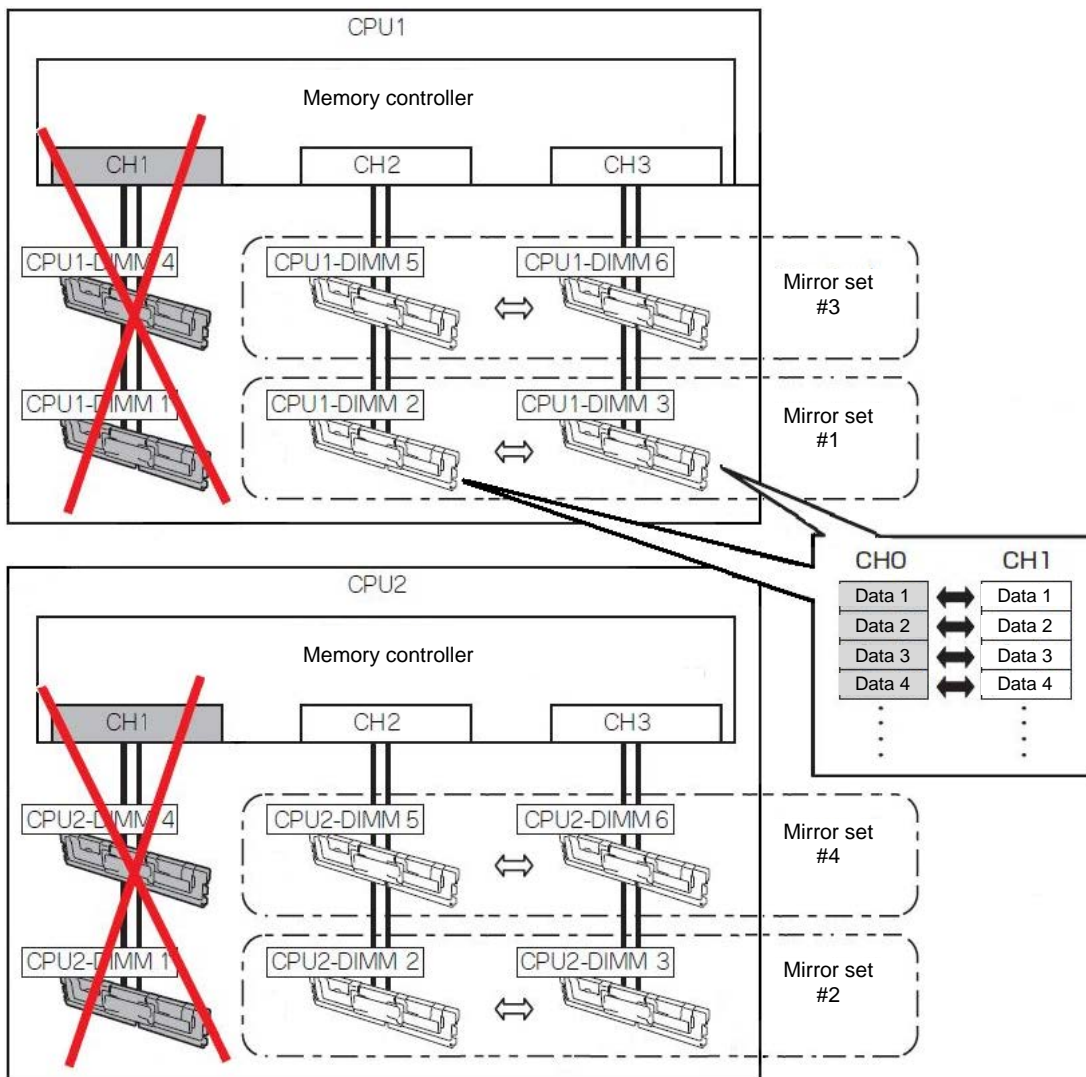
(1) Memory Mirroring Feature

Memory Mirroring feature writes the same data into two groups of DIMMs corresponding with each other between memory channels (channels 2 and 3) to provide data redundancy.

Note

- Memory Mirroring feature uses channels 2 and 3. In Memory Mirroring configuration, the memory channel 1 of each CPU (CPU1-DIMM1/4, CPU2-DIMM1/4) is disabled.
- To use Memory Mirroring feature, install N8102-560/561/562 additional memory board (two DIMMs of same model).
- Any other memory board than N8102-560/561/562 cannot be installed together.
- To use Memory Mirroring feature in 2-CPU configuration, install two sets of N8102-560/561/562 additional memory board (four DIMMs of same model).

Example: 2-CPU configuration

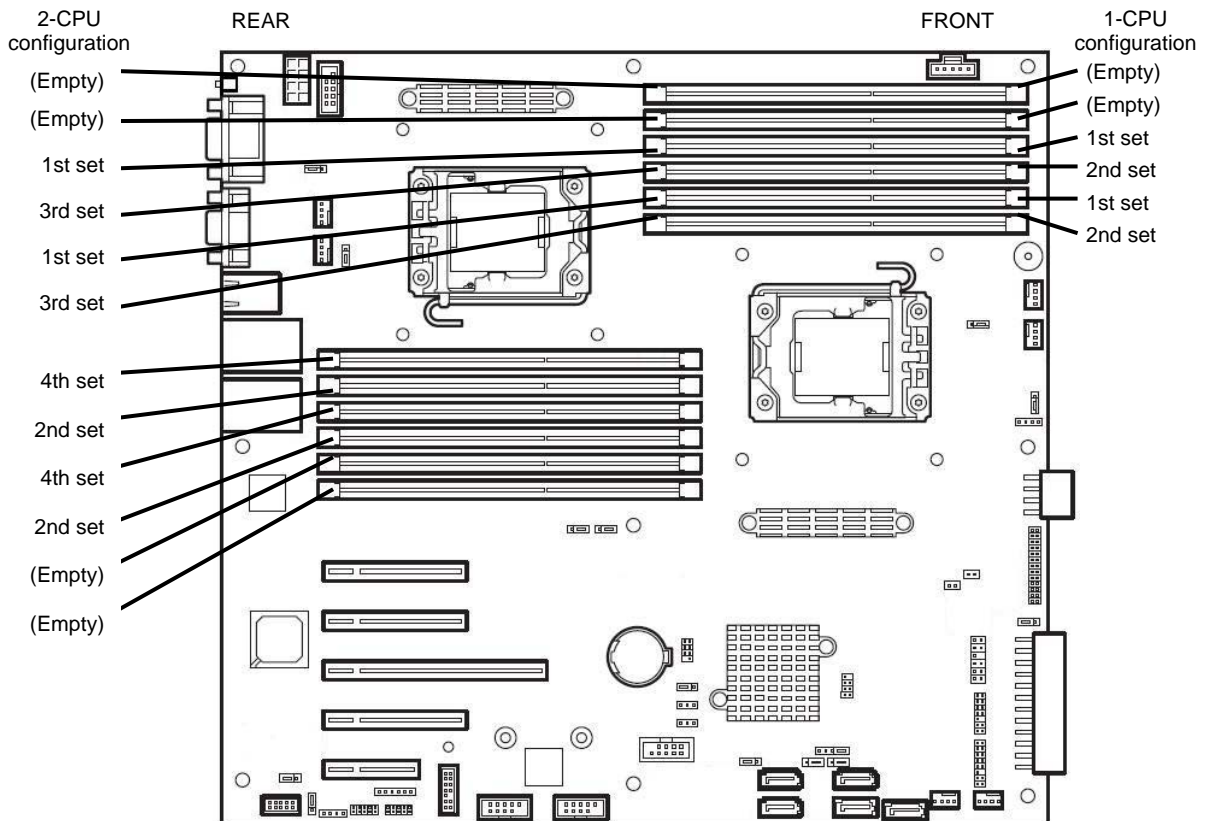


Tips

The operating system only recognizes a half of the total physical capacity.

Memory Mirroring feature can be used under the following conditions:

- Install DIMMs in two DIMM sockets configuring a mirror set.
- Refer to *Chapter 2 (1. System BIOS)* in "Maintenance Guide", check if your server supports Memory Mirroring feature.
Select **Advanced** → **Memory Configuration** → **Memory Information**, and check if **Supported** is displayed in **Mirroring**.
- Refer to *Chapter 2 (1. System BIOS Setup)* in "Maintenance Guide", change parameters as shown below, save the settings and exit from SETUP.
Advanced → **Memory Configuration** → **Memory RAS Mode**: Change to **Mirroring**.
- After restart, run SETUP again, and check if "**Mirrored**" is displayed for the following parameter.
Advanced → **Memory Configuration** → **Memory Information** → **CPUx_DIMMx Status**
- Installation order depends on CPU configuration. See the figure below.



Memory Mirroring cannot be configured in the following case:

- Memory Mirroring within a specific memory channel

Notes on Configuring Memory Mirroring

When you additionally install or remove DIMMs that unable to configure Memory Mirroring configuration, Memory RAS Mode is changed to "Independent".

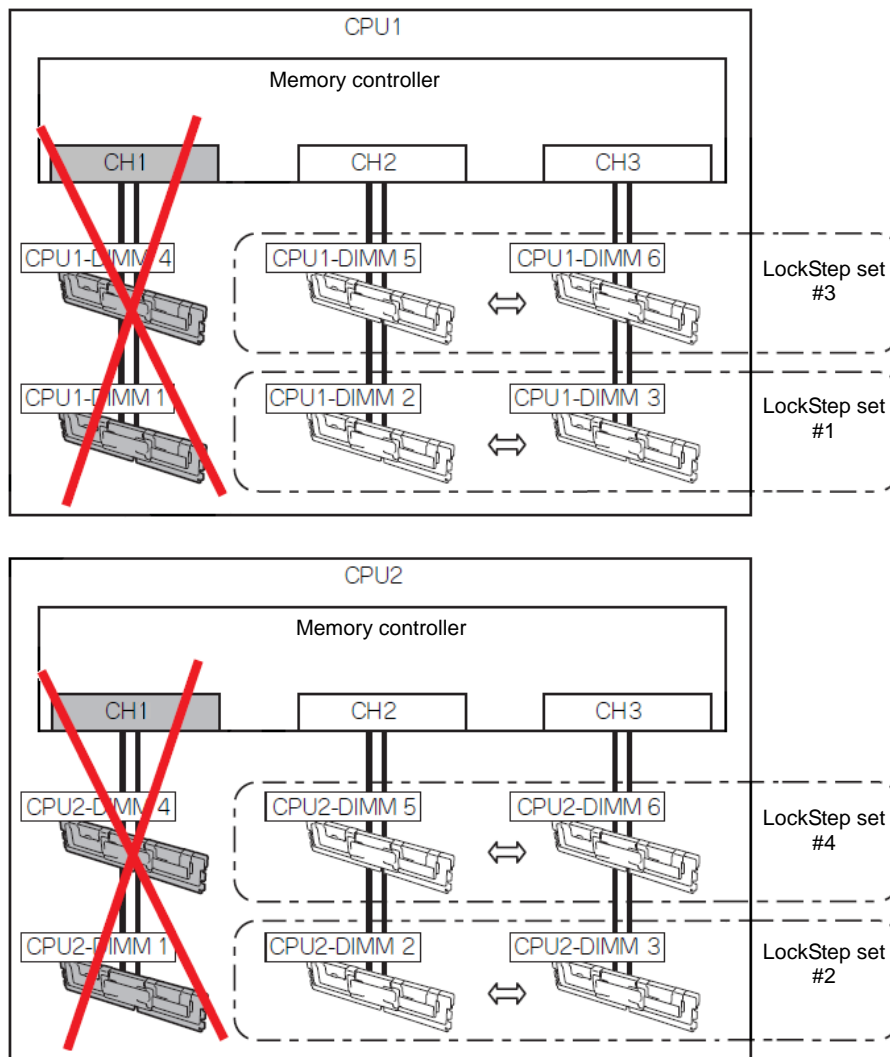
"Mirrored" is removed from **Advanced** → **Memory Configuration** → **Memory Information** → **CPUx_DIMMx Status xxx MB (Mirrored)** in BIOS SETUP.

(2) Memory Lock Step Feature (x8 SDDC)

In Memory Lock Step feature, the DIMMs in two groups corresponding to two memory channels (channels 2 and 3) is multiplexed and operated in parallel to enable x8 SDDC (x8 Single Device Data Correction). With this feature, a single device can detect and correct one to eight-bit error.

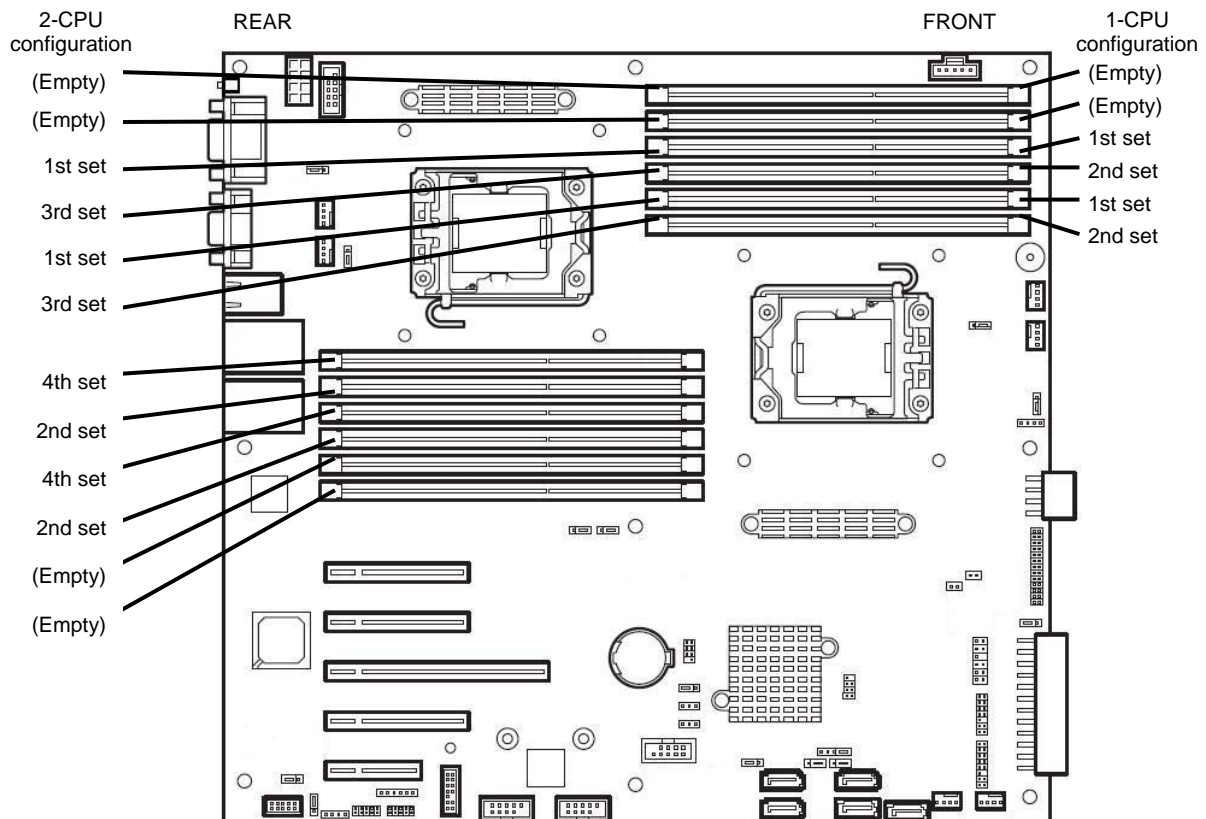
Note

- Memory Lock Step feature uses channels 2 and 3. In Memory Lock Step configuration, the memory channel 1 of each CPU (CPU1-DIMM1/4, CPU2-DIMM1/4) is disabled.
- To use Memory LockStep feature (x8 SDDC), install N8102-560/561/562 additional memory board (two DIMMs of same model).
- Any other memory board than N8102-560/561/562 cannot be installed together.
- To use Memory LockStep feature in 2-CPU configuration, install two sets of N8102-560/561/562 additional memory board (four DIMMs of same model).
- DIMMs to be installed in Lockstep set must have same capacity.



Memory Lock Step feature can be used under the following conditions:

- Install two DIMMs that operate in parallel in memory socket.
- All the installed DIMMs should have the same model number.
- Refer to *Chapter 2 (1. System BIOS Setup)* in "Maintenance Guide", change parameters as shown below, save the settings and exit from SETUP.
[Advanced] – [Memory Configuration] – [Memory RAS Mode] : Change to [Lock Step]
- After restart, run SETUP again, and check if **Lock Step** is displayed for the following parameter.
Advanced → **Memory Configuration** → **Memory Information** → **CPUx_DIMMx Status**
- Installation order depends on CPU configuration. See the figure below.



Memory Lock Step cannot be configured in the following cases:

- Memory Lock Step between memory channels of different memory controllers (CPU)
- Memory Lock Step within the same memory channel

Notes on Configuring Lock Step

When you additionally install or remove DIMMs that unable to configure Memory LockStep configuration, Memory RAS Mode is changed to "Independent".

"LockStep" is removed from **Advanced** → **Memory Configuration** → **Memory Information** → **CPUx_DIMMx Status xxx MB (LockStep)** in BIOS SETUP.

(3) Memory Sparing Feature

Memory Sparing feature puts a memory channel 2 of a memory controller in each CPU into standby status as spare devices. If a correctable error occurs in a DIMM in the running memory controller, the feature automatically changes the running DIMM from the failed one to a DIMM in the standby state to continue the processing.

Note

To use Memory Sparing feature, install N8102-564 additional memory board (three DIMMs of same model).

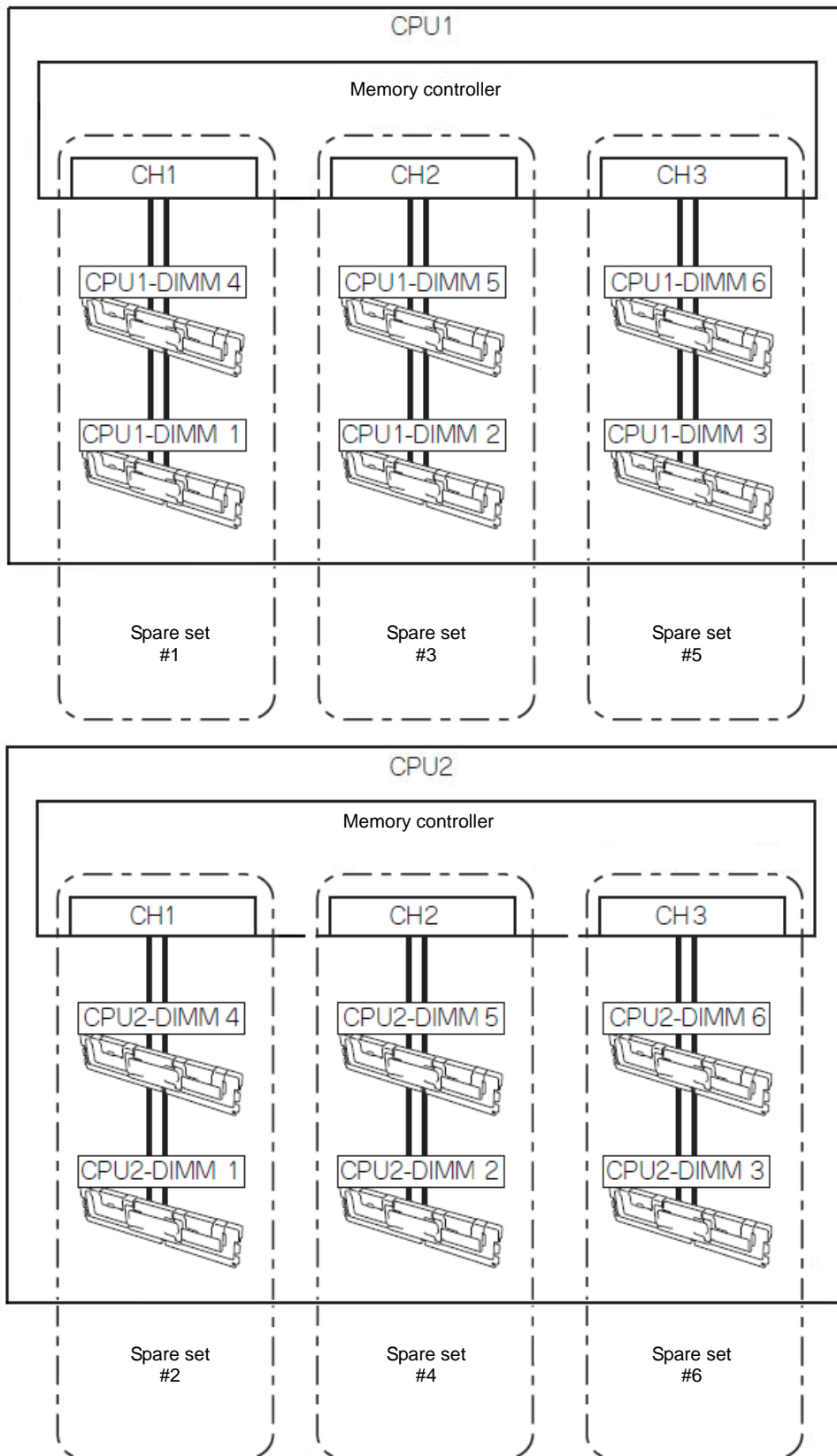
DIMMs to be installed in sparing set must have same capacity.

Tips

- The operating system recognizes the DIMMs as those with capacities less than the actual physical capacities. (The recognized capacities vary depending on the number of DIMMs and the physical capacity per DIMM.)
- DIMMs to be installed in sparing set must have same capacity.

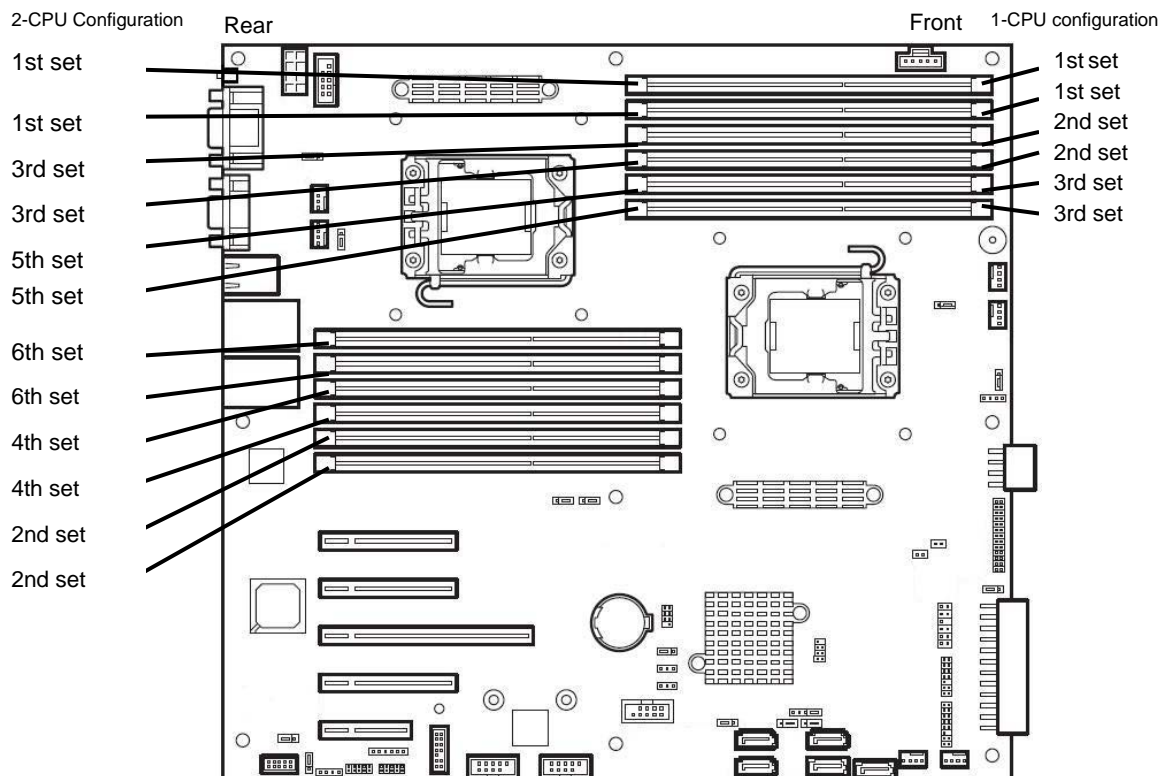
The following table shows configuration allowable for memory sparing and system logical memory capacity.

Number of CPUs	Number of DIMMs	Capacity of DIMM installed
		N8102-564 (16GB x2)
1	2	24GB
	4	48GB
	6	72GB
2	4	48GB
	8	96GB
	12	144GB



Memory Sparing feature can be used under the following conditions:

- DIMMs to be installed should have the same model number.
- Refer to *Chapter 2 (1. System BIOS)* in "Maintenance Guide", check if your server supports Memory Sparing feature.
Select **Advanced** → **Memory Configuration** → **Memory Information**, and check if **Supported** is displayed in **Sparing**.
- Refer to *Chapter 2 (1. System BIOS Setup)* in "Maintenance Guide", change parameters as shown below, save the settings and exit from SETUP.
[Advanced] – [Memory Configuration] – [Memory RAS Mode] : Change to [Sparing]
- After restart, run SETUP again, and check if "Spared" is displayed for the following parameter.
Advanced → **Memory Configuration** → **Memory Information** → **CPUx_DIMMx Status**
- Installation order depends on CPU configuration. See the figure below.



The following Memory Sparing cannot be configured.

- A DIMM of different model number is installed.
- Memory Sparing with different memory channels

Notes on Configuring Memory Sparing

When you additionally install or remove DIMMs that unable to configure Memory Sparing configuration, Memory RAS Mode is changed to "Independent".

"Spared" is removed from **Advanced** → **Memory Configuration** → **Memory Information** → **CPUx_DIMMx Status xxxx MB (Spared)** in BIOS SETUP.

1.1.1 Battery / Flash Backup Unit for RAID Controller

If a RAID Controller (N8103-172/173/174/161/168) is installed with a battery or Flash Backup Unit (FBU), you can avoid data loss caused by accidents including temporary blackout during Write Back operation. The model of the battery or FBU to be used depends on RAID Controller.

- For N8103-172/173/174, use N8103-154
- For N8103-161/168, use N8103-161/168 accessories Flash Backup Unit (FBU)

1.1.1.1 Handling precautions

Described below are the precautions to be observed whenever using the battery or FBU. Be sure to observe the following, otherwise property such as data or other devices might be destroyed.

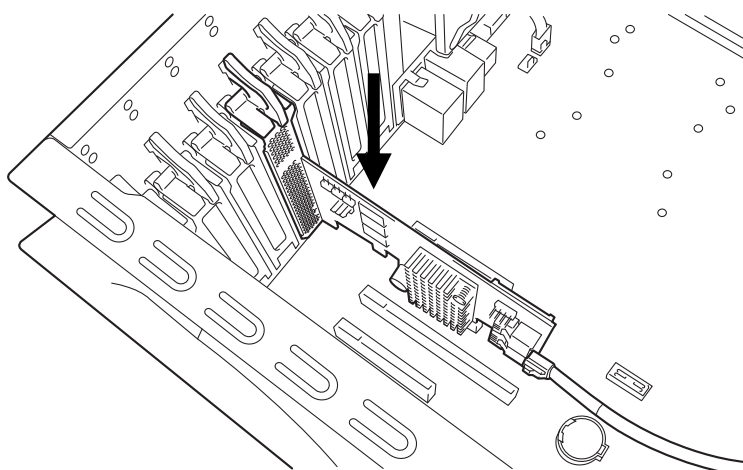
- Use the battery or FBU dedicated to the RAID Controller you are using.
- The battery or FBU is a very delicate electronic device. Before installation, touch the metal frame part of the server to discharge the static electricity from your body.
- Do not drop or bump the battery or FBU.
- For recycling and disposing of the battery or FBU, refer to the User's Guide that comes with it.

1.1.1.2 Installing battery (N8103-154)

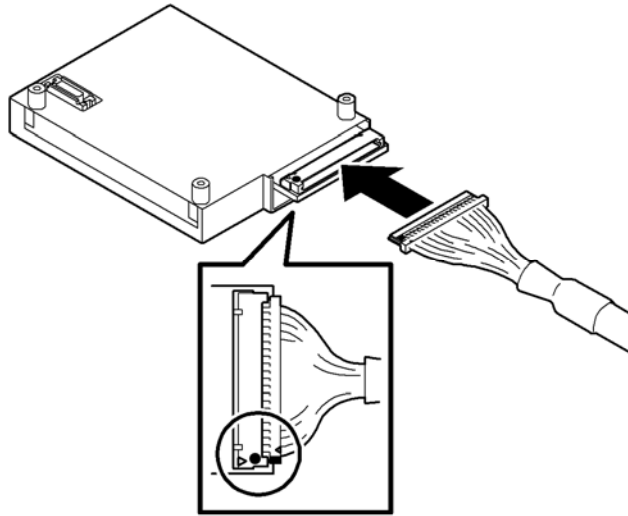
This section describes the procedure of installing a battery for RAID Controller (N8103-172/173/174).

1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. If no RAID controller is installed, install a RAID controller in PCI slot.

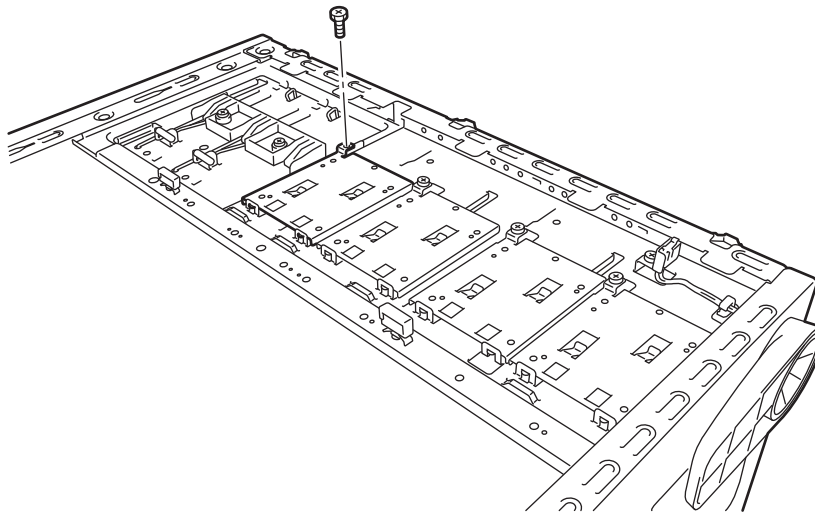
Connect SAS/SATA cable according to *Chapter 2 (1.18 Use of Internal hard disk drives in the RAID System)*.



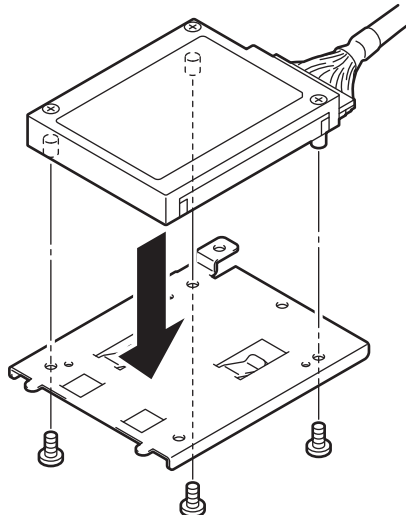
3. Connect a cable that comes with additional battery to the additional battery.
Align BLACK dot on the connectors of a Battery Control Cable and a Battery Connector on a BBU.



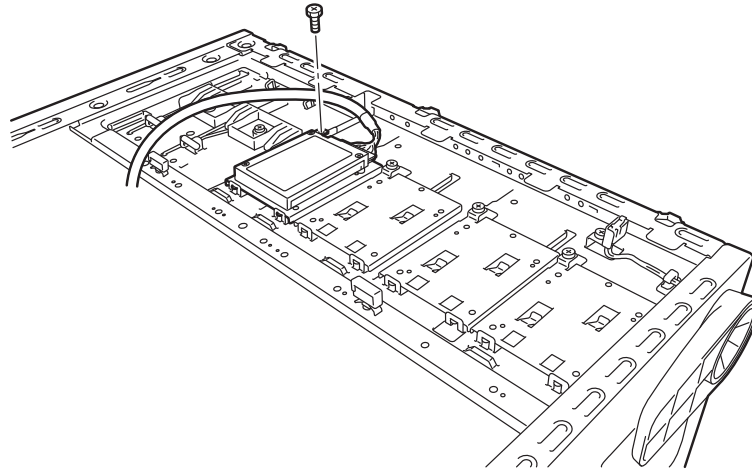
4. Remove a single screw and remove battery tray for RAID Controller.



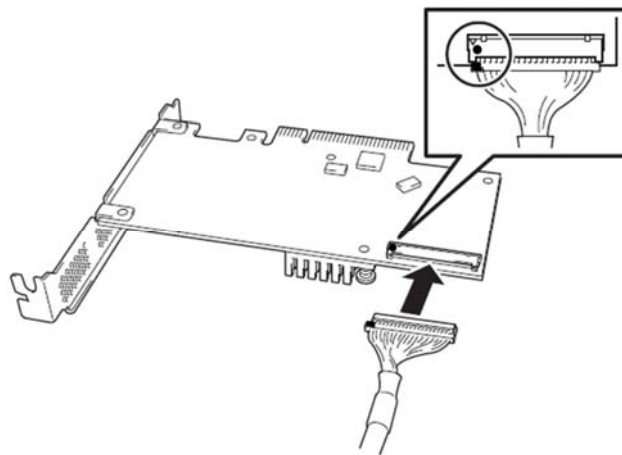
5. Install the additional battery to the battery tray by using three screws.



6. Install the battery tray for RAID Controller using a single screw removed in Step 2.



7. Connect the cable of additional battery to RAID Controller.
Align BLACK dot on the connectors of a Battery Control Cable and a Battery Connector on a RAID controller.



Important

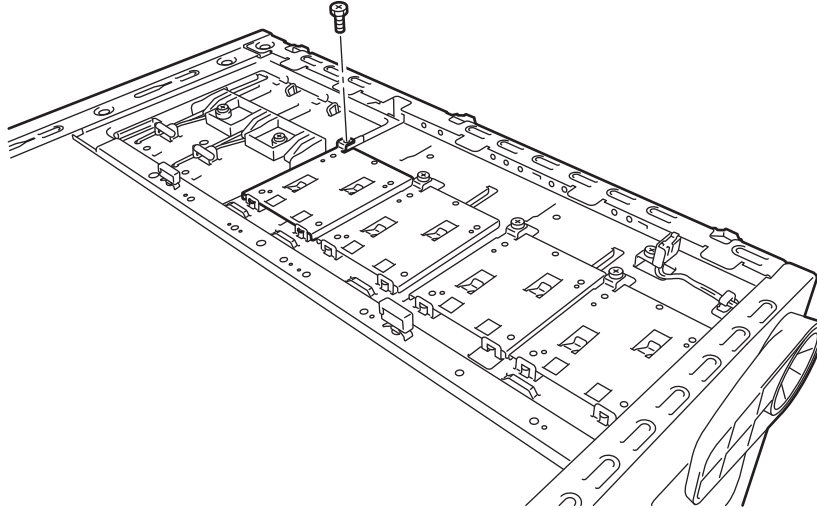
- When you connect a Battery control cable to a RAID controller, align a black mark on each connector of the Battery control cable and the RAID controller. If you connect the cable in wrong direction, there is a risk to damage parts on the Battery.

1.11.3 Installing FBU

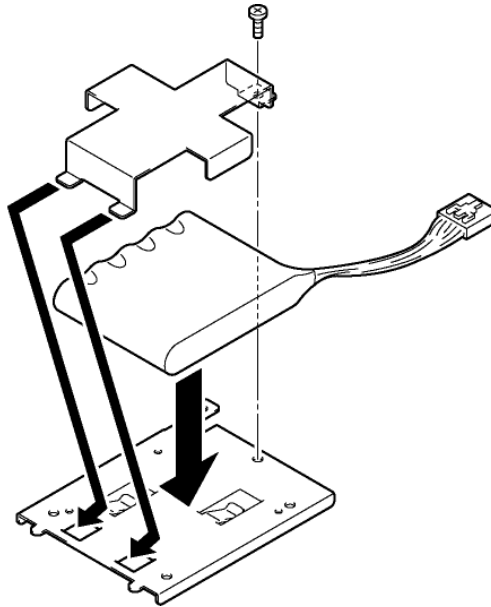
This section describes the procedure of installing a FBU for RAID Controller (N8103-161/168).

1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.

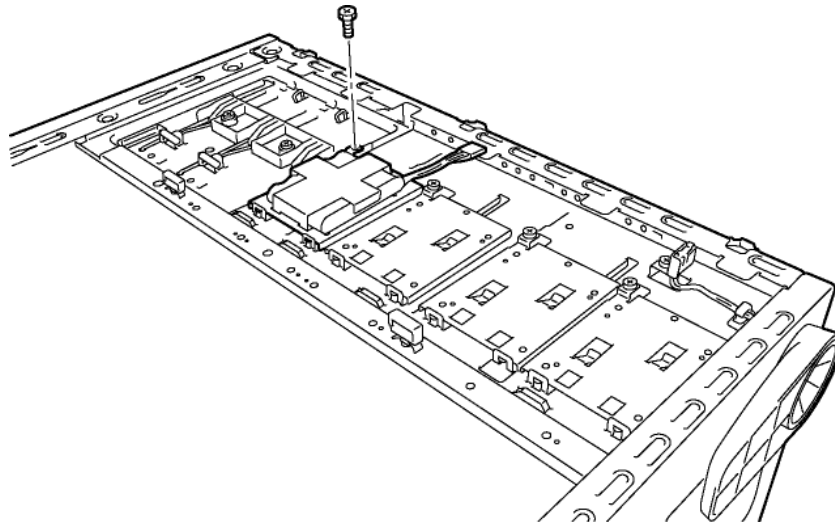
2. Remove a Screw and remove battery tray for RAID Controller.



3. Put a FBU on the battery tray and cover the FBU with the FBU bracket in accordance with the figure and fix them with a screw provided with the RAID controller.

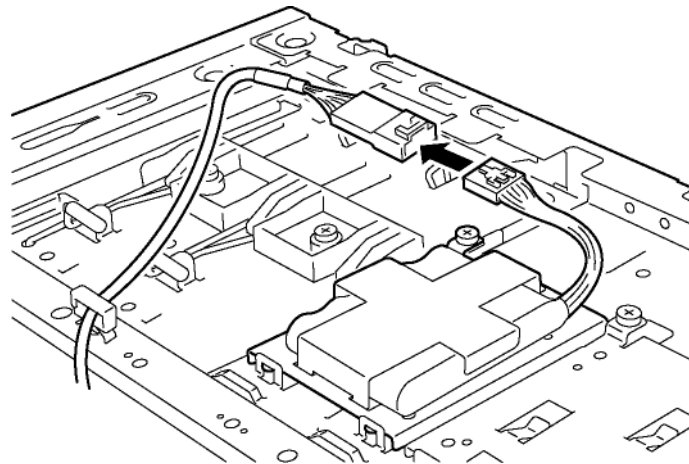


4. Fix the battery tray with a screw removed at step 2.

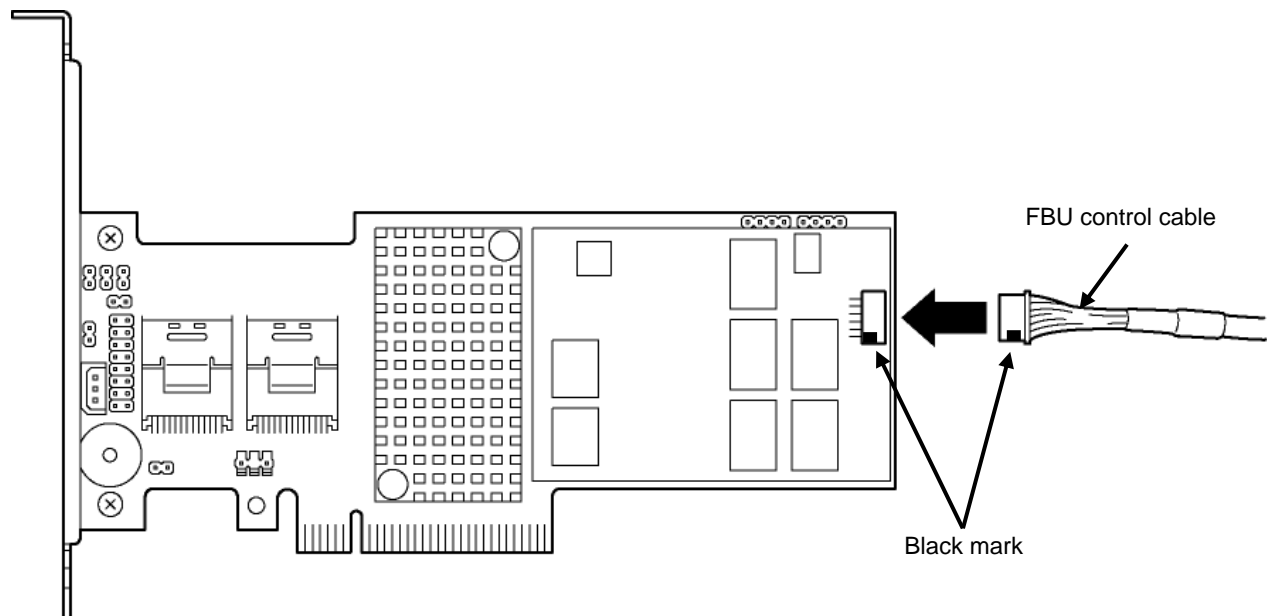


5. Connect the FBU control cable (800mm) to the FBU.

Pass the FBU control cable through the cord clamp in accordance with the figure.



6. Connect the FBU control cable to the RAID controller.



Important

- When you connect a FBU control cable to a RAID controller, align a black mark on each connector of the FBU control cable and the RAID controller. If you connect the cable in wrong direction, there is a risk to damage parts on the FBU.

1.11.4 Removal

For removing the FBU for the RAID Controller, reverse the installation procedure.

1.12 PCI board

The server is equipped with five slots for PCI board and one slot for additional RS-232C connector kit.

Important You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.

1.12.1 Notes

Read the following notes when installing or removing a PCI board.

- Do not touch the terminals of the PCI boards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- PCI slot numbers are assigned as follows:
COM, #1, #2, #3, #4, and #5 from top. PCI slot #1 is disabled in 1-CPU configuration.
- The search order for PCI bus slot on boot is as follows.
Slot2 → Slot3 → Slot5 → Slot4 → Slot1
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or RAID Configuration Utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

PCI device	Bus number	Device number	Function number
Onboard NIC1	03h	0	0
Onboard NIC2	03h	0	1
Slot 1	90h	0	X
Slot 2	04h	0	X
Slot 3	20h	0	X
Slot 4	48h	0	X
Slot 5	68h	0	X

- If an additional LAN adaptor is installed, it is hard to push the catch of the connector with your finger that is connected to the LAN adapter. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN adapter.
- If a bootable device such as a PCI board or USB device is added, the boot order may change. In BIOS Setup Utility, select **Hard Drive BBS Priorities** from the **Boot** menu, and then specify a higher priority for the boot device.
Boot → **Hard Drive BBS Priorities** → Check the display
If the boot device is an HDD under an optional RAID Controller, the display is (Bus xx Dev 00) PCI RAID Adapter. Note that the value for xx changes depending on the PCI slot where a RAID board is installed.
- For a RAID Controller, LAN adapter (network boot), or Fibre Channel controller, if no hard disk drive on which an OS is installed is connected, set the option ROM for that slot to **Disabled**. Refer to *Chapter 3 (2. Detail of System BIOS)* for how to specify it.

1.12.2 Supported boards and available slots

The following tables list supported boards and slots available for them. For details of the features of each board, refer to the manual supplied with it.

Tips

Different boards mounted on the same bus operate at the lower frequency.

Model name	Product name	Slot number	COM	PCIe 3.0 #1	PCIe 3.0 #2	PCIe 3.0 #3	PCIe 2.0 #4	PCIe 2.0 #5	Remarks	
		PCI slot performance *1	–	x8 lane		x16 lane	x4 lane	x1 lane		
		Transfer bandwidth *1 (per lane)	–	8 Gb/s			5 Gb/s			
		Slot size	–	Full height						
		PCI board type *2	–	x8 socket		x16 socket	x8 socket	x4 socket		
		Available board size	–	Up to 300 mm						
N8103-172	RAID Controller (512MB, RAID 0/1) [PCI Express 3.0(x8)]	–	–	○	–	–	–	–	Dedicated to connect with internal hard disk drive. N8103-1172/173/174/168 cannot be installed together with each other.	
N8103-173	RAID Controller (512MB, RAID 0/1/5/6) [PCI Express 3.0(x8)]	–	–	○	–	–	–	–	Up to one (or three with external RAID controller) can be installed.	
N8103-174	RAID Controller (1GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]	–	–	○	–	–	–	–	Additional battery N8103-154 can be mounted.	
N8103-168	RAID Controller (1GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]	–	–	○	–	–	–	–	Dedicated to connect with internal hard disk drive. N8103-172/173/174/168 cannot be installed together with each other. Flash Backup Unit is included.	
N8103-166	SAS Expander Card	–	–	–	–	–	–	○	Required when connecting nine or more HDDs to one RAID controller.	
N8103-161	RAID Controller (1GB, RAID 0/1/5/6) [PCI EXPRESS 3.0(x8)]	–	○	○	○	○	○	–	Dedicated to connect with external devices. Up to two (or three with internal RAID controller) can be installed. Flash Backup Unit is included.	
N8103-142	SAS Controller [PCI Express 2.0(x8)]	–	○	○	○	○	○	–	Dedicated to connect with internal/external devices. Cannot connect with internal HDD or SSD.	
N8190-153	Fibre Channel controller (1ch) (8 Gbps/Optical) [PCI Express 2.0(x8)]	–	○	○	○	○	○	–	For connecting an external Fibre Channel	
N8190-154	Fibre Channel controller (2ch) (8 Gbps/Optical) [PCI Express 2.0(x8)]	–	○	○	○	○	○	–	For connecting an external Fibre Channel	

Model name	Product name	Slot number	COM	PCIe 3.0 #1	PCIe 3.0 #2	PCIe 3.0 #3	PCIe 2.0 #4	PCIe 2.0 #5	Remarks		
		PCI slot performance *1	–	x8 lane		x16 lane	x4 lane	x1 lane			
		Transfer bandwidth *1 (per lane)	–	8 Gb/s			5 Gb/s				
		Slot size	–	Full height							
		PCI board type *2	–	x8 socket		x16 socket	x8 socket	x4 socket			
		Available board size	–	Up to 300 mm							
N8190-157	Fibre Channel controller (1ch) (16 Gbps/Optical) [PCI Express 3.0(x8)]	–	○	○	○	○	–	–	For connecting an external Fibre Channel		
N8190-158	Fibre Channel controller (2ch) (16 Gbps/Optical) [PCI Express 3.0(x8)]	–	○	○	○	○	–	–	For connecting an external Fibre Channel		
N8104-132	1000BASE-T connection board (2 ch) [PCI Express 2.0 (x1)]	–	○	○	○	○	○	○	For additional LAN Teaming (AFT/SFT/ALB) and bonding with N8104-132/133/138 and on-board LAN is supported.		
N8104-133	1000BASE-T connection board (4 ch) [PCI Express 2.0 (x2)]	–	○	○	○	○	○	○			
N8104-138	1000BASE-T connection board (1 ch) [PCI Express 2.0 (x1)]	–	○	○	○	○	○	○			
N8104-128	10GBASE connection board (SFP+/2ch) [PCI Express 2.0(x8)]	–	○	○	○	○	○	–	For additional LAN Teaming (AFT/SFT/ALB) and bonding on the same board is supported. Prepare SFP module [N8104-129] if needed.		
N8104-131	10G Converged Network Adapter (2ch) (10Gbps/Optical) [PCI Express 2.0(x8)]	–	○	○	○	○	○	–	For additional LAN Teaming (AFT/SFT/ALB) and bonding on the same board is supported.		
N8104-146	InfiniBand Host Channel Adapter (1ch) [PCI Express 3.0(x8)]	–	○	○	○	–	–	–	InfiniBand FDR(56Gbps)		
N8104-147	InfiniBand Host Channel Adapter (2ch) [PCI Express 3.0(x8)]	–	○	○	○	–	–	–	InfiniBand FDR(56Gbps)		
N8117-01A	Additional RS-232C connector kit *3	○	–	–	–	–	–	–	For additional serial (RS-232C) port B Up to 1		

● Installed as standard ○ Can be installed – Cannot be installed

*1 Data transfer rate of PCI slot = Transfer bandwidth x Number of lanes

<Example> x8 lane = 64 Gbps (one-way)

*2 Connector size. Boards exceeding the number of sockets cannot be connected.

<Example> x4 socket can connect with x1 and x4 boards, but not x8 board.

*3 Use RS-232C cable (B).

* For details of functions of each board, refer to the technical guide.

* The board performance described in the parentheses after the Product name indicates the maximum operation performance of the board.

- * When the operation performance of a PCI board is higher than the PCI slot on the server, the PCI board operates with the performance of the PCI slot on the server.
- * PCIe3.0 #1 is available only in 2-CPU configuration.
- * RAID controller must be installed in the order of PCIe #2→#3→#4→#1.

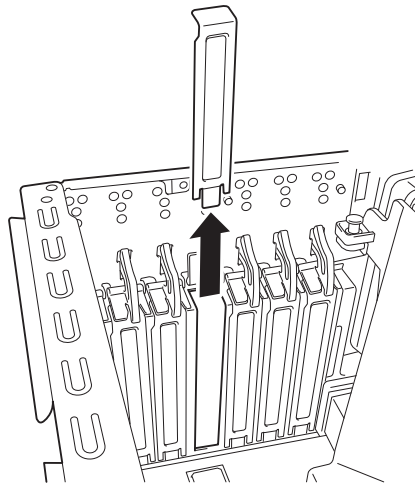
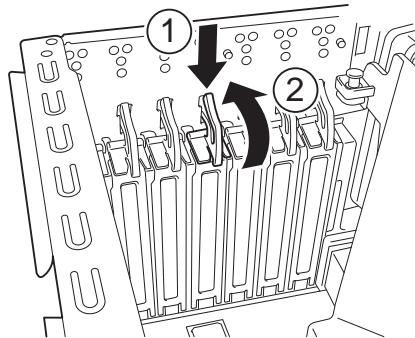
1.12.3 Installing PCI board

Install a PCI board to a PCI slot in the following procedure.

Important When installing a PCI board, make sure the connector of the board fits the connector of the slot.

Note If the battery for RAID controller is installed, refer to *Chapter 2 (1.11 Battery for RAID Controller)*.

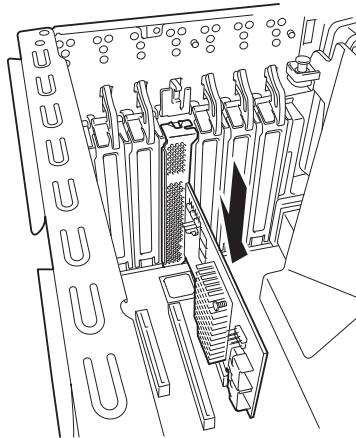
1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Confirm the installation position with the reference to the table in *Chapter 2 (1.12.2 Supported boards and available slots)*.
3. Push the retention to unlock the PCI board from PCI slot. Bring down the lever toward rear of the server, and remove the blank cover.



Note Keep the removed blank cover for future use.

4. Install a PCI board to the PCI slot.

When installing the board, position the terminal part of the PCI board to the PCI slot and insert it.

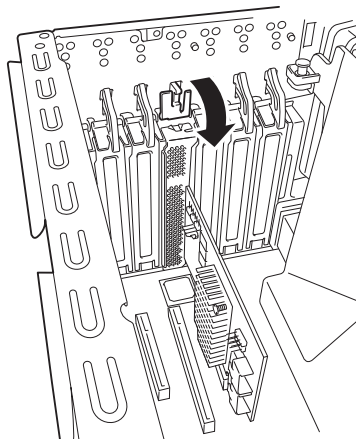


Important Do not touch the connector of PCI slot or the terminal part of PCI boards and the signal pins of electric parts installed on the board. Installing boards with dirt or oil can cause malfunction.

Note

- Make sure that the head of a PCI board bracket is seated into the fixed slot.
- Depending on type of PCI boards, the terminal part of the PCI board may be too large to fit in the connector.
- If you have trouble installing the board, remove the board once and try again. If you apply excessive pressure on the board, a PCI board or PCI connector might break.

5. Bring back the lever to its original position, and fix the PCI board.



Tips If the locking mechanism of PCI slot is tight, fix the PCI board slowly until it is surely locked.

6. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.

7. Make sure that no error messages are displayed on POST screen.

For details on POST error messages, refer to *Chapter 3 (1. POST Error Message)* in "Maintenance Guide".

8. Start the configuration utility installed on the mounted board to set up the board.

Availability or startup and operation procedure of the utility depends on board. For details, refer to the manual that comes with the board. **If a PCI board including RAID Controller, SCSI controller, and LAN adapter which connects to any bootable device is added, the boot priority might be changed to the default setting.**

In that case, configure the boot priority in **Boot** menu of BIOS Setup Utility. For details, refer to *Chapter 2 (1. System BIOS)* in "Maintenance Guide".

(1) When using the optional controller (N8103-172/173/174/161/168)

For details, refer to the manual that comes with optional RAID Controller (N8103-172/173/174/161/168).

- Important**
- You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.
 - Do not change the mode to hibernate during building a RAID System.

- Note**
- When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot xx ROM** (xx is PCI slot number) is set to **Enabled**.
 - When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.

1.12.4 Installing SAS Expander Card (N8103-166)

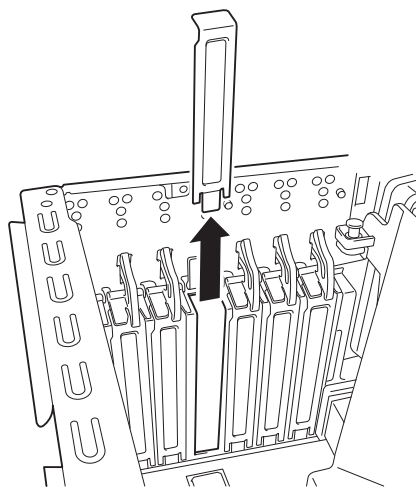
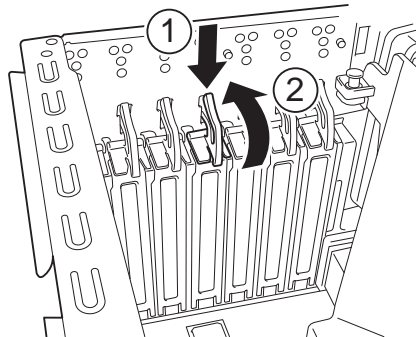
Install the SAS Expander Card to a PCI slot in the following procedure.

- Important**
- When installing a SAS Expander Card, make sure the connector of the board fits the connector of the slot.**

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Confirm the installation position with the reference to the table on *Chapter 2 (1.12.2 Supported boards and available slots)*.

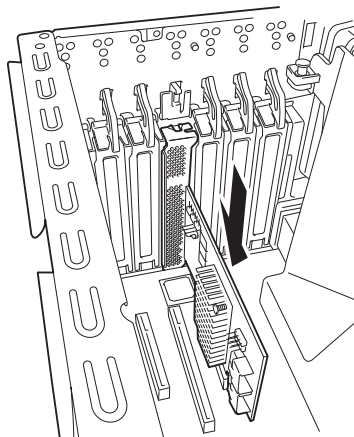
3. Push the retention to unlock the PCI board from PCI slot. Bring down the lever toward rear of the server, and remove the blank cover.

(A figure indicates PCI board loading method to a PCI#2 slot. Please load the SAS Expander Card into a [PCI#5] slot by a way like a figure.)

**Note**

Keep the removed blank cover for future use.

4. Install a SAS Expandr Card to the PCI slot.
When installing the SAS Expander Card position the terminal part of the SAS Expander Card to the PCI slot and insert it.

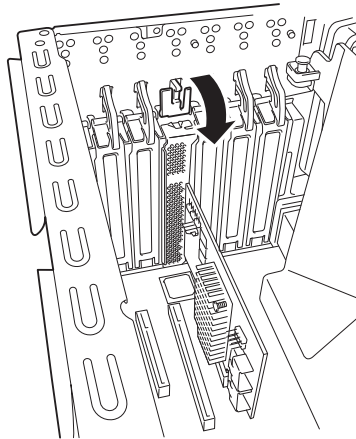


Important Do not touch the connector of PCI slot or the terminal part of SAS Expander Card and the signal pins of electric parts installed on the board. Installing boards with dirt or oil can cause malfunction.

Note

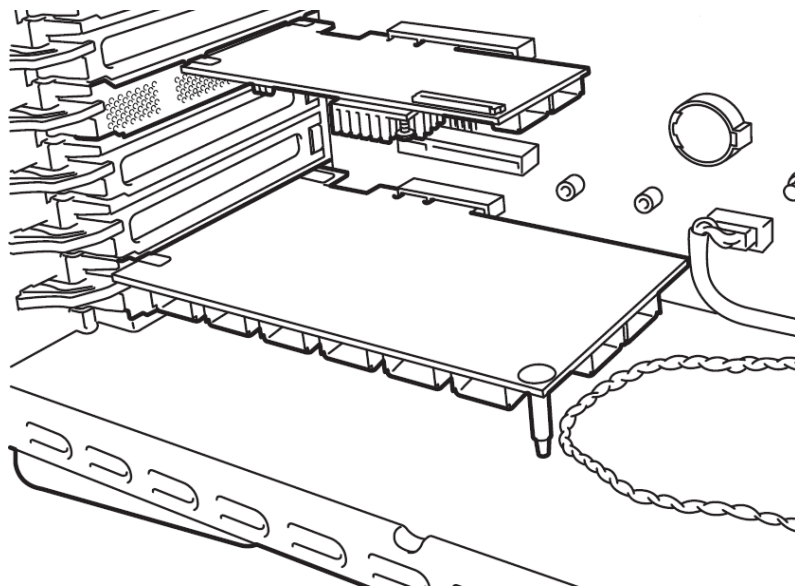
- Make sure that the head of a SAS Expander Card bracket is seated into the fixed slot.
- If you have trouble installing the SAS Expander Card, remove the SAS Expander Card once and try again. If you apply excessive pressure on the SAS Expander Card, SAS Expander Card or PCI connector might break.

5. Bring back the lever to its original position, and fix the SAS Expander Card.



Tips If the locking mechanism of PCI slot is tight, fix the SAS Expander Card slowly until it is surely locked.

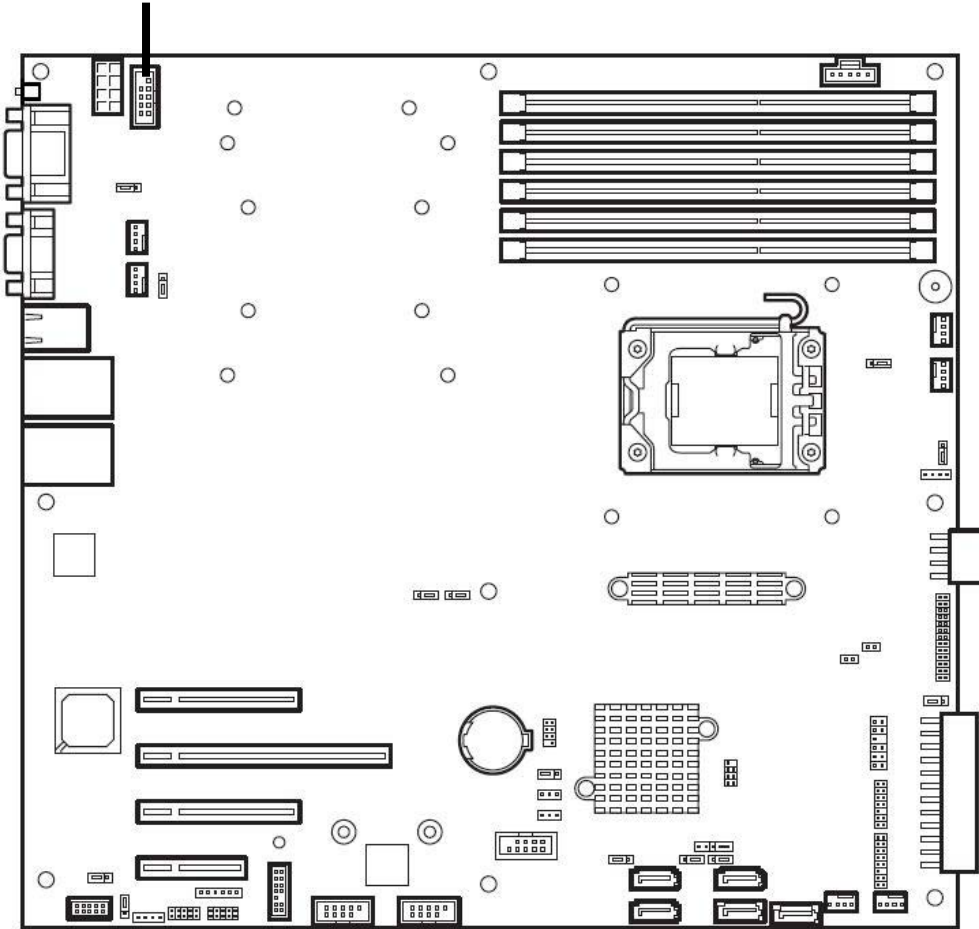
The installation state of the SAS Expander Card and the RAID controller



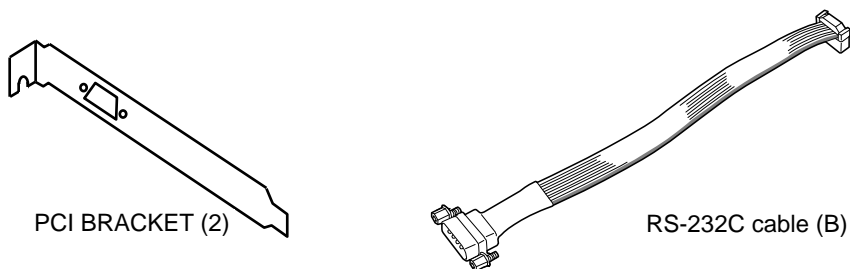
1.12.5 RS-232C Connector Kit

Install the RS-232C Connector Kit to a PCI slot in the following procedure.

Connector for RS-232C Connector Kit



1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Use the RS-232C cable (B) and PCI bracket (2) that comes with RS-232C Connector Kit



3. Remove the screws attached to the RS-232C cable (B) and connect the RS-232C cable (B) to the PCI bracket (2) by using the removed screws.
4. Remove the COM slot cover referring to *Chapter 2 (1.12.3 Installing PCI board)*.
5. Check that the end of the bracket is correctly inserted in the frame guide, and then return the lock lever to its original position to firmly lock the bracket.

6. Attach the connector on the other end of the cable to the connector for attaching an extra RS-232C cable connector on the motherboard.
7. After attaching the connector, the COM port setting might need to be configured by using the BIOS setup utility. An example of how to configure the COM port is shown below.
 - a) Turn on the server. Press the F2 key while the POST screen is displayed to launch the BIOS setup utility.
 - b) Select **Advanced**, and then **Serial Port Configuration**. Make sure that **Serial Port B** is set to "Enabled". (If not, set it so.)

By setting **Serial Port B** to "Enabled", the **Base I/O** and **Interrupt** menus are added. By default, **Base I/O** is set to "2F8h", and **Interrupt** is set to "IRQ 3".

1.12.6 Removal

To remove a PCI board, reverse the installation procedure.

Run SETUP and change boot order in Boot menu. Refer to *Chapter 3 (2. System BIOS Setup)* for how to specify it.

If using the server while the board is removed, attach the blank cover that comes with the PCI slot.

Important

Pay attention in case that the Internal cables are hooked on a chassis when you removed the PCI board. If the cables are hooked the PCI board may be damaged.

1.13 HDD Cage

The server can have HDD cage to install hard disk drives.

If you install or remove HDD cage, be sure to apply SDR data to the system by using SDR media provided with the server.

Refer to *Chapter 2 (1.25.1 How to apply SDR data)* for how to apply SDR data.

Important An error may occur before the SDR data is applied to the system.

1.13.1 Installation

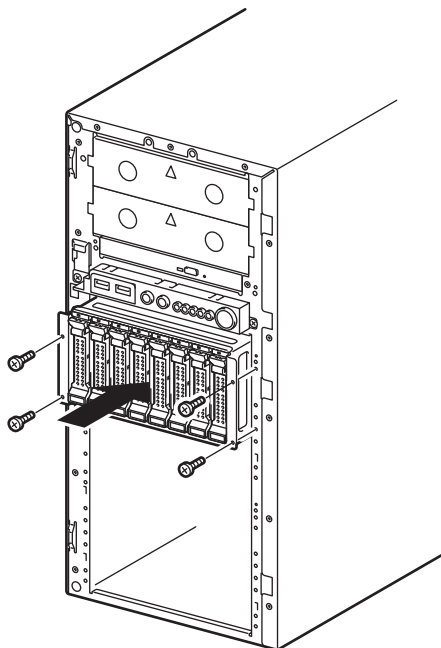
(1) 2.5-inch HDD cage

The server can contain up to three 2.5-inch HDD cages. Install cages starting from the top bay.

Install a 2.5-inch HDD cage in the following procedure.

Important If three 2.5-inch HDD cages are installed, hot-plug redundant fans must also be installed.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Install 2.5-inch HDD cage in the bay, and secure it with four screws provided with the cage.



When installing only one 2.5-inch HDD cage, attach two blank covers provided with the cage to the vacant bays using four screws.

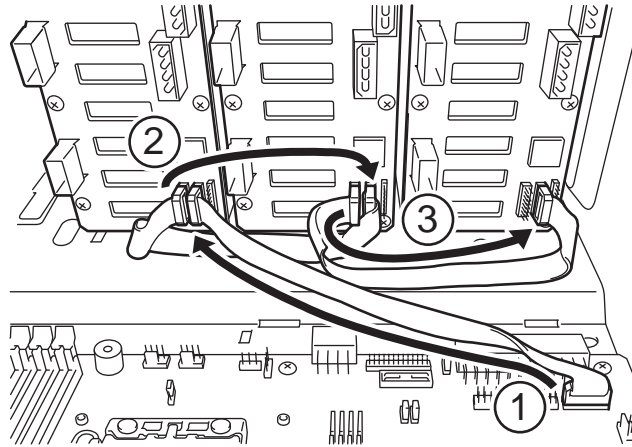
When installing two 2.5-inch HDD cages, attach one blank cover provided with the cage to the vacant bay using two screws.

3. Connect SGPIO cable.

Use SGPIO cable provided with 2.5-inch HDD cage.

When installing the first 2.5-inch HDD cage, use the SGPIO cable for connecting between motherboard and HDD cage. The SGPIO cable for connecting between HDD cages is not used.

When installing the second or third HDD cage, use the SGPIO cable for connecting between HDD cages. Connect between the first and the second cages, then connect between the second and the third cages. SGPIO cable for connecting between motherboard and HDD cage is not used.



4. Connect SAS/SATA cable (option) and power cable.

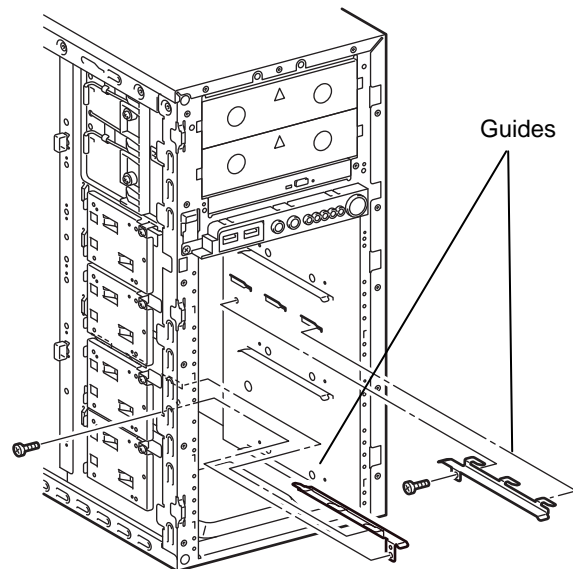
Refer to *Chapter 2 (1.18 Use of Internal hard disk drives in the RAID System)* for how to connect SAS/SATA cable.

(2) 3.5-inch HDD cage

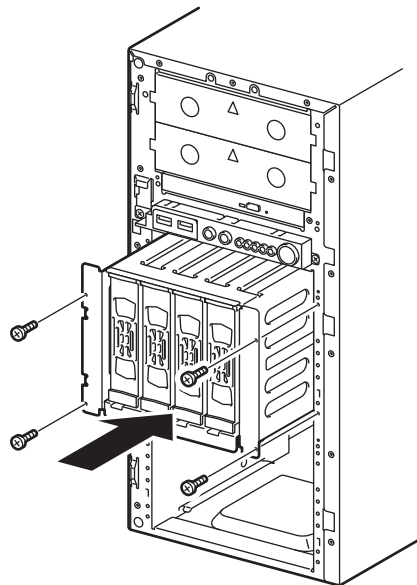
The server can contain up to two 3.5-inch HDD cages. Install cages starting from the top slot.

Install a 3.5-inch HDD cage in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Install two guides provided with the cage in server chassis by using two screws.



3. Install 3.5-inch HDD cage in the bay, and secure it with four screws provided with the cage.
When installing only one 3.5-inch HDD cage, attach one blank cover provided with the cage to the vacant bay using two screws.

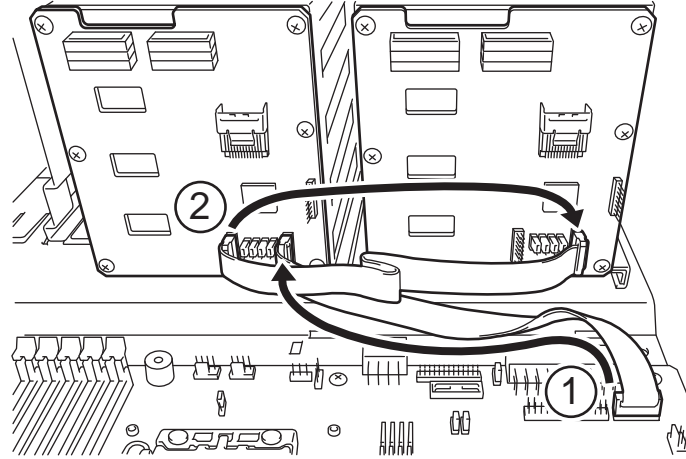


4. Connect SGPIO cable.

Use SGPIO cable provided with 3.5-inch HDD cage.

When installing the first 3.5-inch HDD cage, use the SGPIO cable for connecting between motherboard and HDD cage. The SGPIO cable for connecting between HDD cages is not used.

When installing the second HDD cage, use the SGPIO cable for connecting between HDD cages. SGPIO cable for connecting between motherboard and HDD cage is not used.



5. Connect SAS/SATA cable (option) and power cable.

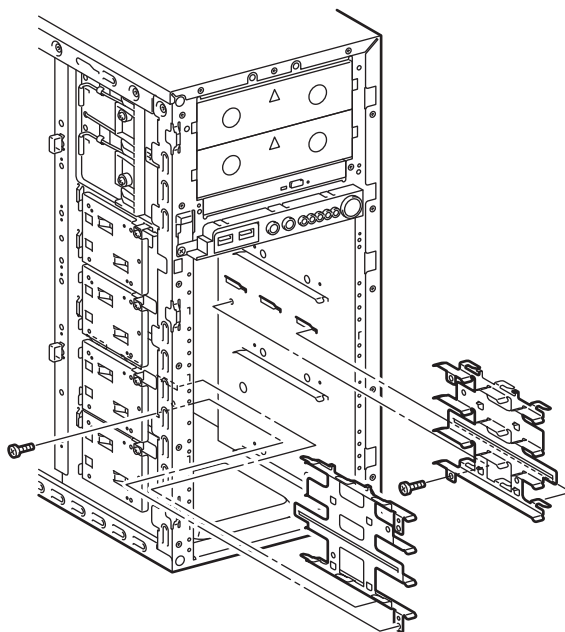
Refer to *Chapter 2 (1.18 Use of Internal hard disk drives in the RAID System)* for how to connect SAS/SATA cable.

(3) 3.5-inch fixed type HDD cage

The server can contain one 3.5-inch fixed type HDD cage.

Install a 3.5-inch fixed type HDD cage in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Install a tray rails provided with 3.5-inch fixed type HDD cage by using four screws provided with the cage.



3. Install hard disk drives in 3.5-inch fixed tray, and secure the tray with four screws.
4. Install 3.5-inch fixed tray to the server chassis, and secure it with two screws. Refer to *Chapter 2 (1.15 Fixed Type Hard Disk Drive)*.
Install 3.5-inch fixed tray with hard disk drive in cage starting from bottom bay.
Repeat Steps 3 and 4 for installing other hard disk drives.
For the tray with no hard disk drive mounted, install it in the cage.
Attach one blank cover provided with the cage to the bay using two screws.
5. Connect SAS/SATA cable (option) and power cable.
Refer to *Chapter 2 (1.18 Use of Internal hard disk drives in the RAID System)* for how to connect SAS/SATA cable.

1.13.2 Removal

(1) 2.5-inch HDD cage

The server can contain up to three 2.5-inch HDD cages. Remove cages starting from the bottom bay.

Remove 2.5-inch HDD cage in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove hard disk drives from 2.5-inch HDD cage.
3. Disconnect SAS/SATA cable, SGPIO cable, and power cable.
4. Remove screws that secure the 2.5-inch HDD cage.
5. Pull out 2.5-inch HDD cage from the server.
6. To use the server with 2.5-inch HDD cage removed, attach blank covers using screws.

Important | To maintain cooling effect in the server, be sure to attach blank covers.

(2) 3.5-inch HDD cage

The server can contain up to two 3.5-inch HDD cages. Remove cages starting from the bottom bay.

Remove 3.5-inch HDD cage in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove hard disk drives from 3.5-inch HDD cage.
3. Disconnect SAS/SATA cable, SGPIO cable, and power cable.
4. Remove screws that secure the 3.5-inch HDD cage.
5. Pull out 3.5-inch HDD cage from the server.
6. To use the server with 3.5-inch HDD cage removed, attach blank covers using screws.

Important | To maintain cooling effect in the server, be sure to attach blank covers.

7. If you install another HDD cage, remove two guides.

(3) 3.5-inch fixed type HDD cage

Remove 3.5-inch fixed type HDD cage in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Disconnect SAS/SATA cable and power cable.
3. Remove eight screws that secure 3.5-inch fixed tray.
4. PULL out 3.5-inch fixed tray from the server.
5. To use the server with 3.5-inch fixed type HDD cage removed, remove hard disk drives from the tray, install the fixed tray, and secure the tray with screws.

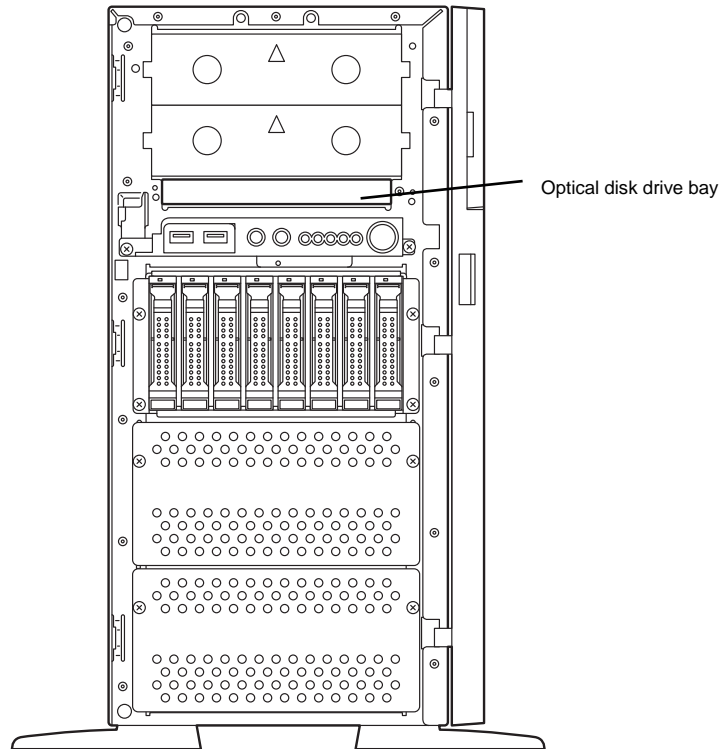
Important | To maintain cooling effect in the server, be sure to attach blank covers.

6. If you install another HDD cage, remove two tray rails.

1.14 Optical Disk Drive

This section describes the procedure for installing the optional optical disk drive.

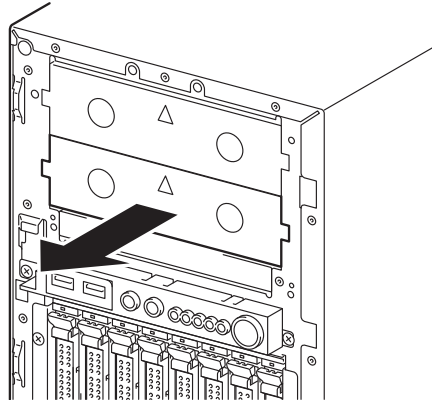
Important Do not install any unsupported optical disk drive.
Optical disk drive is required option for the server.



1.14.1 Installation

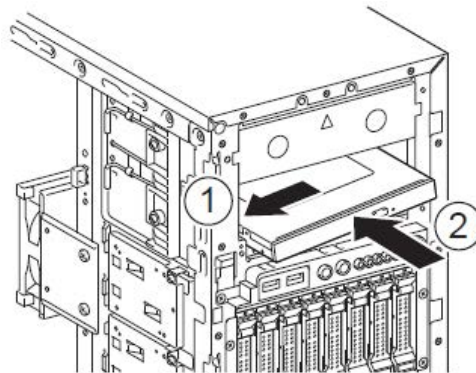
Install an optical disk drive in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Pull out the 5.25-inch device bay cover from additional slot 1.

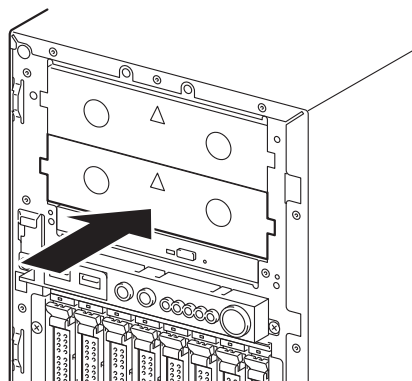


Important If an additional slot 1 contains any 5.25-inch device, remove the device before installing an optical disk drive.

3. Align the screw hole of optical disk drive with protrusion at left side of optical disk drive bay, and press the upper right portion of optical disk drive to seat the drive.



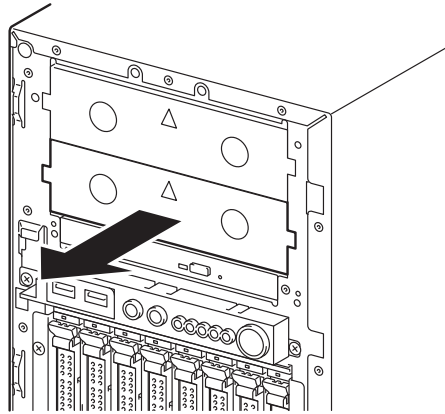
4. Connect a cable to optical disk drive.
5. Attach a 5.25-inch device bay cover to additional slot 1.



1.14.2 Removal

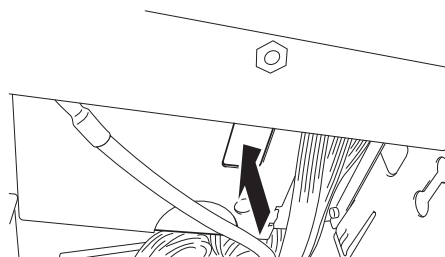
Remove optical disk drive in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Pull out the 5.25-inch device bay cover from additional slot 1.

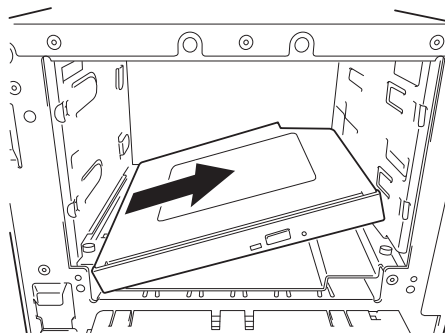


Important If an additional slot 1 contains any 5.25-inch device, remove the device before removing an optical disk drive.

3. Push the optical disk drive upward through the hole at bottom of optical disk drive bay.



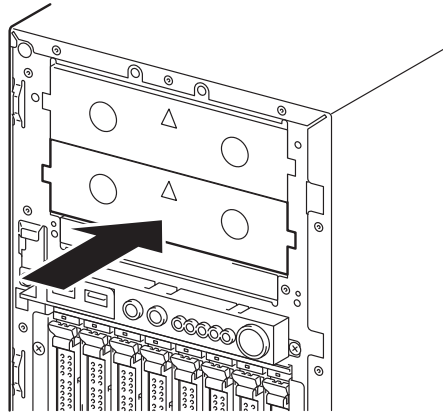
4. Move the optical disk drive toward right, disengage optical disk drive from protrusion at left side of drive bay, and remove the optical disk drive.



5. Disconnect a cable from optical disk drive.

Important Connector of optical disk drive cable has locking mechanism to prevent unintentional disconnection. Push the latch on connector to unlock before removing the cable.

6. Install 5.25-inch device or device bay cover to additional slot 1.



Important Do not use the server with optical disk drive removed.

1.15 Fixed Type Hard Disk Drive

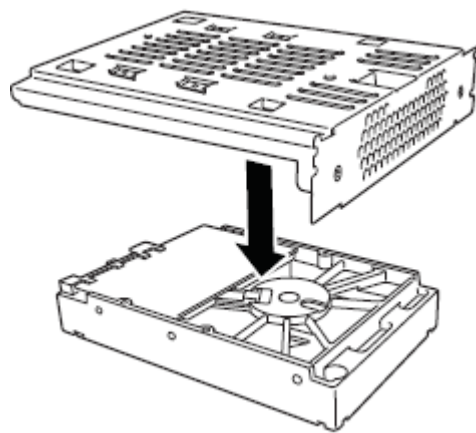
This section describes installation procedure for optional fixed type hard disk drive.

Important Do not use unsupported hard disk drive.

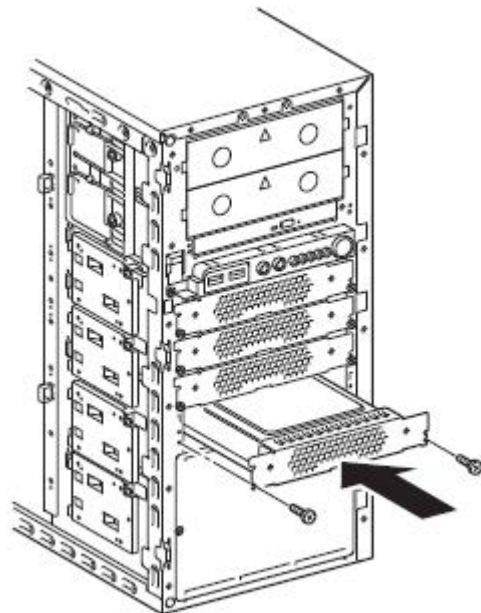
1.15.1 Installation

Install fixed type hard disk drive in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Secure a hard disk drive to HDD tray of 3.5-inch fixed HDD cage using four screws.



3. Secure the HDD tray with hard disk drive to the server using two screws.
4. Install hard disk drives starting from bottom bay.



Important To maintain cooling efficiency, install HDD trays to which no hard disk drive is mounted.

Use optional K410-256(00) internal SAS/SATA cable to connect 3.5-inch fixed type HDD cage with motherboard. Connect power cable to power connector of K410-256(00) internal SAS/SATA cable.

Refer to *Chapter 1 (5.6 Motherboard)* for connectors on motherboard.

To use the hard disk drives in RAID system, refer to *Chapter 2 (1.18.1(4) 3.5-inch fixed type HDD cage)*.

Connector on motherboard	HDD
SATA0 (SATA cable 0)	0 (SAS/SATA cable 0)
SATA1 (SATA cable 1)	1 (SAS/SATA cable 1)
SATA0 (SATA cable 2)	2 (SAS/SATA cable 2)
SATA0 (SATA cable 3)	3 (SAS/SATA cable 3)

1.15.2 Removal

Remove hard disk drive in reverse procedure of installation.

***1.16* Power Supply Unit**

Model N8100-2090F and N8100-2091F is hot-swap redundant power supply unit (450 W or 800 W).


The redundant power system can be configured with two redundant power module.

In redundant power system, the server can continue operation even one of the power module fails.

1.16.1 Replacing failed redundant power supply unit

Replace the power supply unit only when redundant power supply unit fails.

⚠ CAUTION



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use*.

- Pay attention to electric hazard.

- Important**
- Do not remove the power supply module that is working normally.
 - Do not use the server with failed power supply module removed. Power supply module must be removed only when it is replaced.

(1) Replacement of power supply module

1. Identify the failing power supply module on which AC POWER LED is lit amber or flashing amber.

- Tips**
- If the system is running with two power supply units, the failed power supply module can be replaced with the system power on.

2. Disconnect power cord from the failing power supply module you have identified in Step 1.
3. Push the lever of power supply module toward inside, and pull the module toward you while holding the handle.

- Important**
- The failed power supply module must be replaced. The system cannot run with a single power supply module.

4. Install the new power supply module. Make sure that no error is indicated on STATUS LED or POST screen. If any error messages are displayed, refer to *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*". If AC POWER LED is not lit, re-install the power supply unit. If the same error occurs, contact your sales representative. Be sure to install the module for replacement.

1.17 Fan Unit

The server can contain non-redundant fan unit or hot-swap redundant fan unit.

With redundant fan unit, the server can continue operation even one of the fan unit fails.

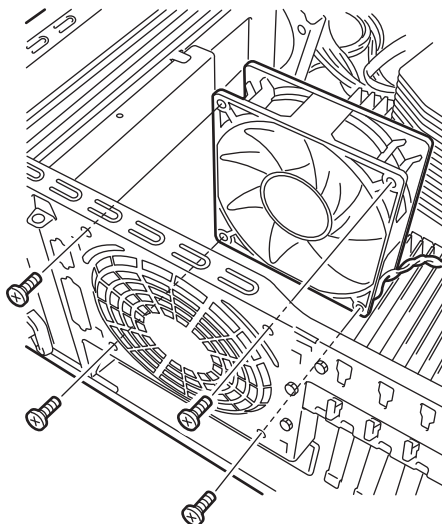
Note

It is recommended to install fan unit after installing other optional devices except for hot-plug hard disk drive.

1.17.1 Installing non-redundant fan unit

Install fan unit in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Secure the rear fan (120 mm sq.) to the chassis using four screws provided with non-redundant fan unit, and connect the fan cable to FAN2 connector on motherboard.

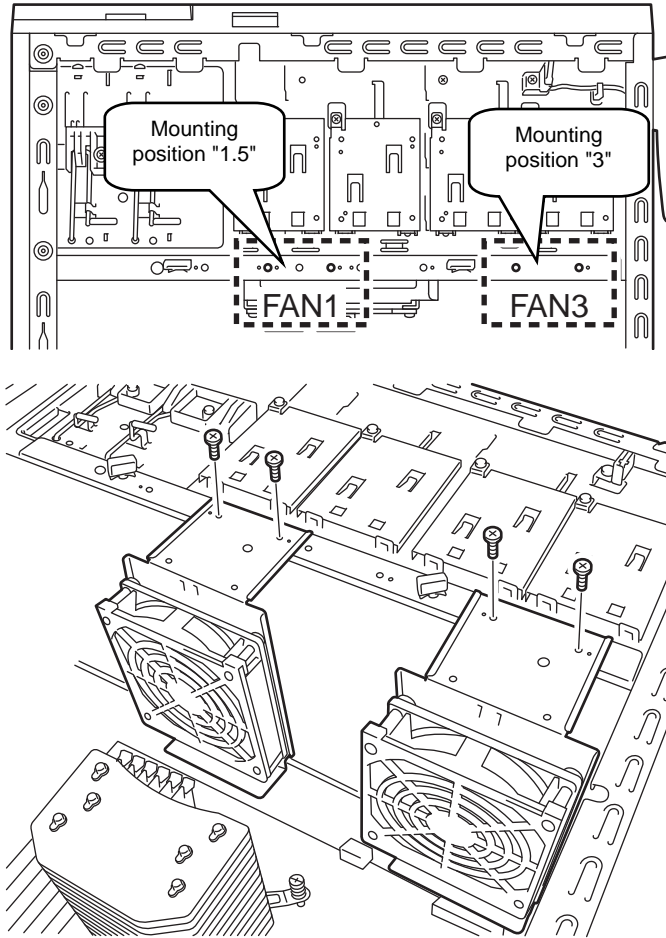


3. Connect two cables for front fan unit (92 mm sq.) to motherboard.
Connect a cable for fan unit in FAN1 with FAN1 connector on motherboard.
Connect a cable for fan unit in FAN4 with FAN4 connector on motherboard.
Connect a cable for fan unit in FAN3 with FAN3 connector on motherboard.
See the figure below.

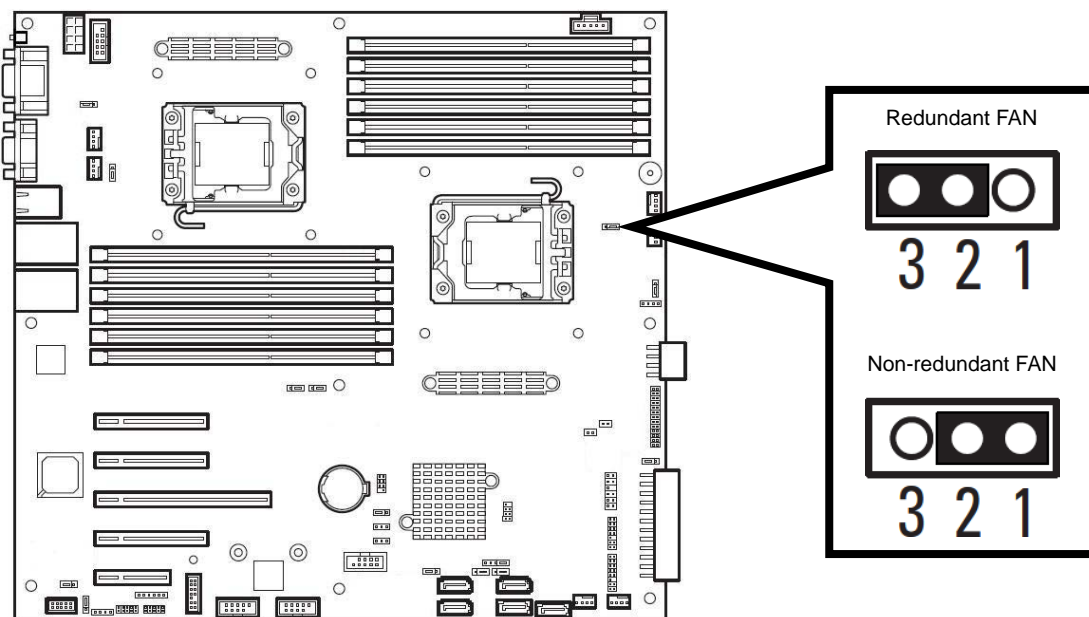
Note

After the front fan is installed, it is difficult to connect a fan cable to motherboard. Thus, first connect fan cable to motherboard, then install the front fan.

4. Install two front fan units (92 mm sq.) to the locations FAN1 and FAN3 (enclosed with dotted line in the figure below). Use the four screws (two screws for one fan unit) provided with non-redundant fan unit to secure the fan unit.



5. Change jumper switch setting on motherboard to Non-redundant FAN.



1.17.2 Replacing/removing failed non-redundant fan unit

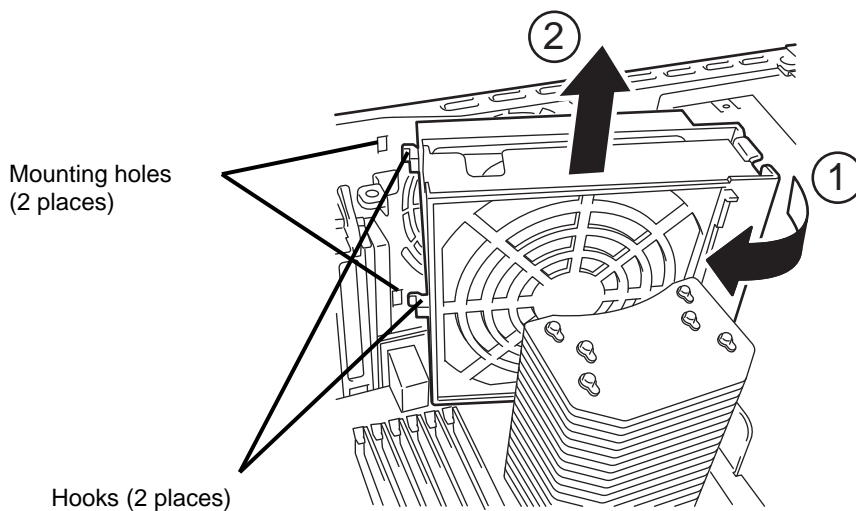
Replace the fan unit only when it fails.

1. Power off the server.
2. Disconnect power cord from power supply unit.
3. To remove the fan unit, reverse the installation procedure.

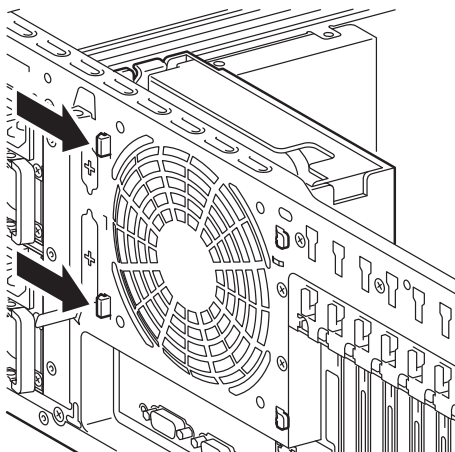
1.17.3 Installing hot-plug redundant fan unit

Install redundant fan unit in the following procedure.

1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Insert hooks of rear fan (120 mm sq.) on the fan holder into mounting holes at rear of the server.



3. Push the fixing claw on rear fan case (120 mm sq.) to mounting holes at rear of the server until they click. The rear fan holder is fixed to the chassis.



Important Be sure not to jam the fan cable between the fan holder and the chassis. Otherwise, the fan cable might become damaged, which might damage the

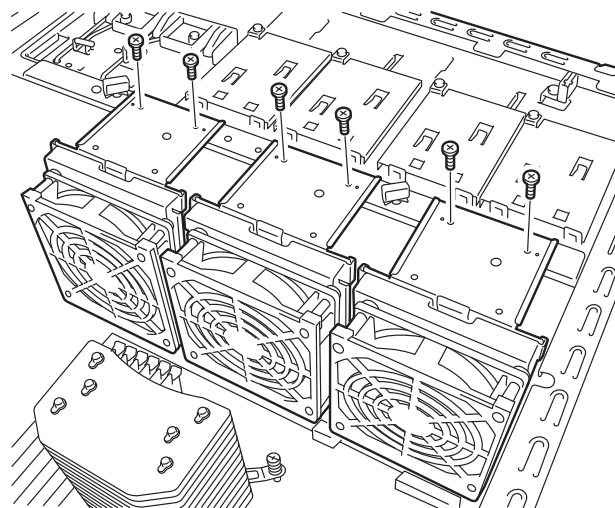
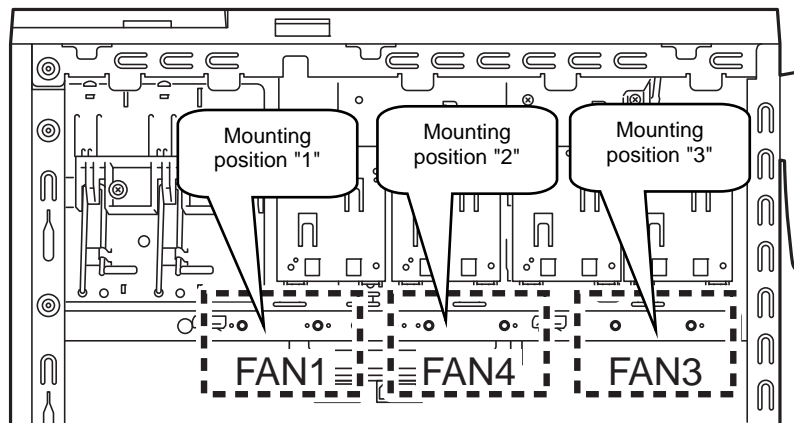
server as well as the fan.

4. Connect the cable for rear fan to FAN2 connector on motherboard.
5. Connect three cables for front fan (92 mm sq.) to motherboard.
Connect a cable for fan unit in FAN1 with FAN1 connector on motherboard.
Connect a cable for fan unit in FAN3 with FAN3 connector on motherboard.
See the figure below.

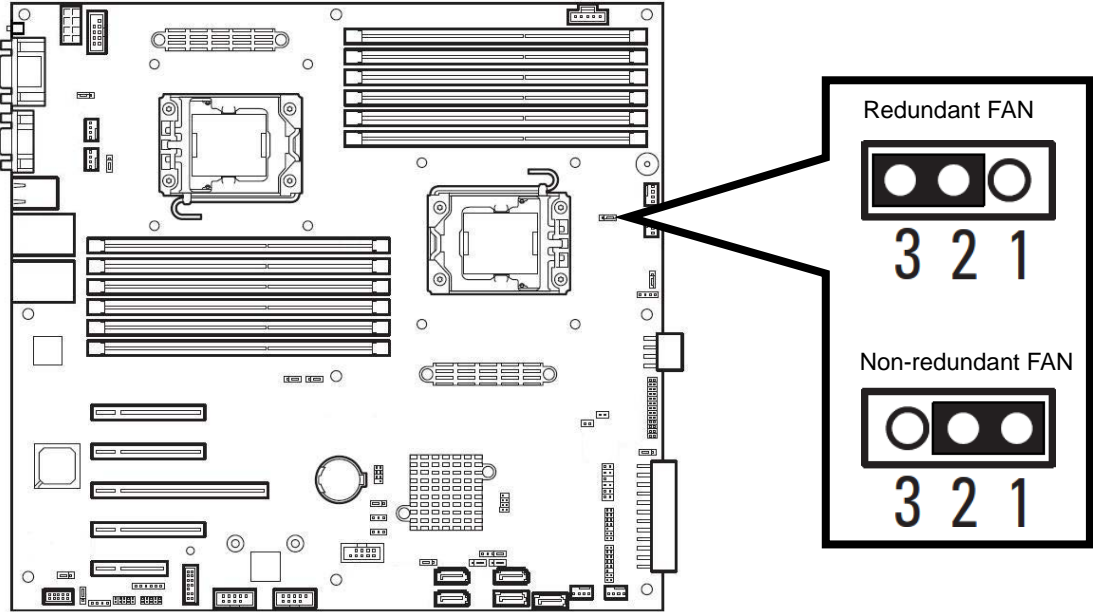
Note

After the front fan is installed, it is difficult to connect a fan cable to motherboard. Thus, first connect fan cable to motherboard, then install the front fan.

6. Install three front fan units (92 mm sq.) to the locations FAN1, FAN4, and FAN3 (enclosed with dotted line in the figure below). Use the six screws (two screws for one fan unit) provided with redundant fan unit to secure the fan unit.



- 7. Change jumper switch setting on motherboard to Redundant FAN.



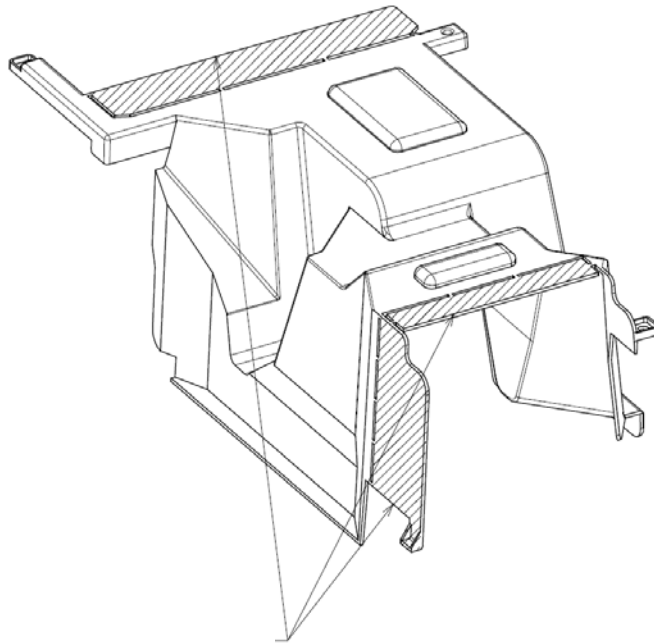
8. Arrange the CPU duct according to the figure below.

Tips

Be sure to arrange CPU duct. If not, CPU duct cannot be mounted on server correctly.

Note

Arranging CPU duct allows you to replace the hot-plug redundant fan without removing CPU duct.




Cut the shaded portion (3 places)
with nipper or the like.

1.17.4 Replacing failed hot-plug redundant fan unit

Replace the hot-plug redundant fan unit only when it fails. The fan unit can be replaced while the system is powered on and running.

⚠ CAUTION



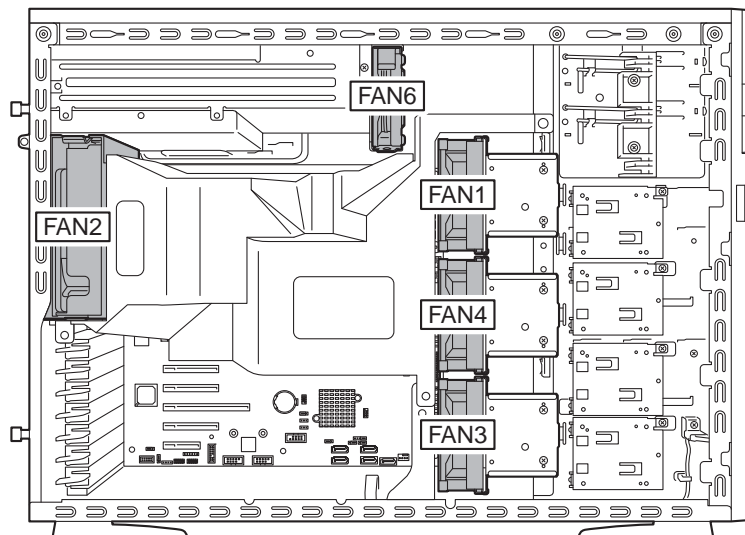
Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions in Precautions for Use*.

- Pay attention to electric hazard.

Important Do not remove the fan unit that works normally.

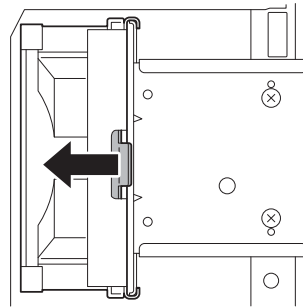
1. Identify the failed fan unit using management tool such as EXPRESSSCOPE Engine 3.

Indication of management tool of EXPRESSSCOPE Engine 3 associates actual fan unit is as shown below.

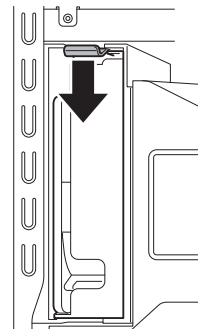


2. Unlock the fan bracket, and remove the failed fan from fan case. For locking mechanism of each fan unit, see below.

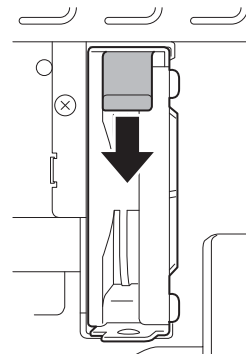
**Front fan unit
(FAN1, FAN3, FAN4)**



**Rear fan unit
(FAN2)**



**Power supply fan unit
(FAN6)**



3. Insert the fan unit for replacement into fan case.
Be sure to install fan unit for replacement.
4. Confirm that no error messages are displayed in POST screen or STATUS LED does not show an error.
If any error messages are displayed, refer to *Chapter 3 (1. POST Error Message) in "Maintenance Guide"*.

Tips

The failed fan unit can be replaced while the system is powered on if hot-plug redundant fan units are used.

1.17.5 Removing hot-plug redundant fan unit

Replace the fan unit only when it fails.

1. Power off the server.
2. Disconnect the power cord from the power supply unit.
3. To remove the fan unit, reverse the installation procedure.

1.18 Use of Internal hard disk drives in the RAID System

This section describes how to use the hard disk drives installed in the HDD cage at the front of the server in the RAID System.

Important

- If you use hard disk drives in the RAID System or change the RAID level, initialize the hard disk drives. If the hard disk drive contains valuable data, be sure to backup the hard disk drive before installing the RAID Controller and configuring the RAID System.
- If both PCI #1 and PCI #2 slots contain RAID controller, OS is installed in hard disk drive connected to RAID Controller in PCI #2 slot. Use the hard disk drive connected with RAID controller in PCI slot #1 for storing data.

Note

In the RAID System, use hard disk drives that have the same specifications (capacity, rotational speed, and standard) for each Disk Array.

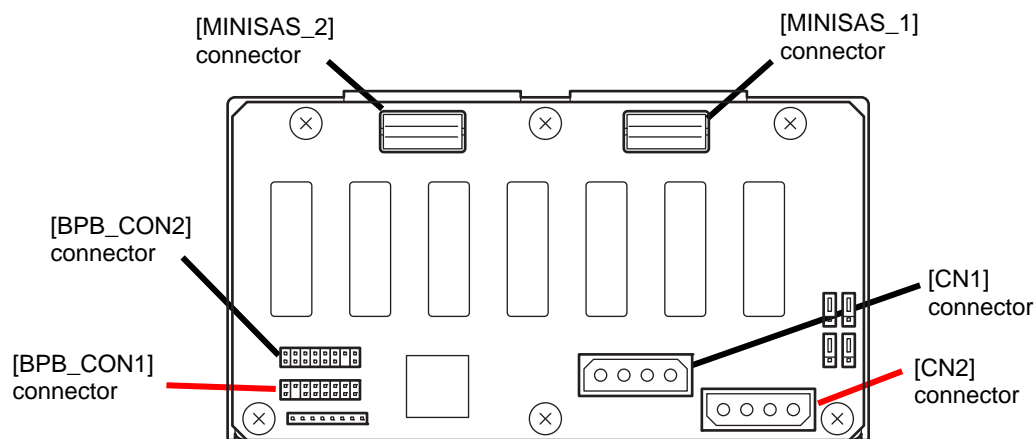
Tips

- Logical Drives can be created even with only one Physical Device.
- When using SAS hard disk drives, RAID Controllers must be connected.

1.18.1 Connecting cables

(1) 2.5-inch HDD cage

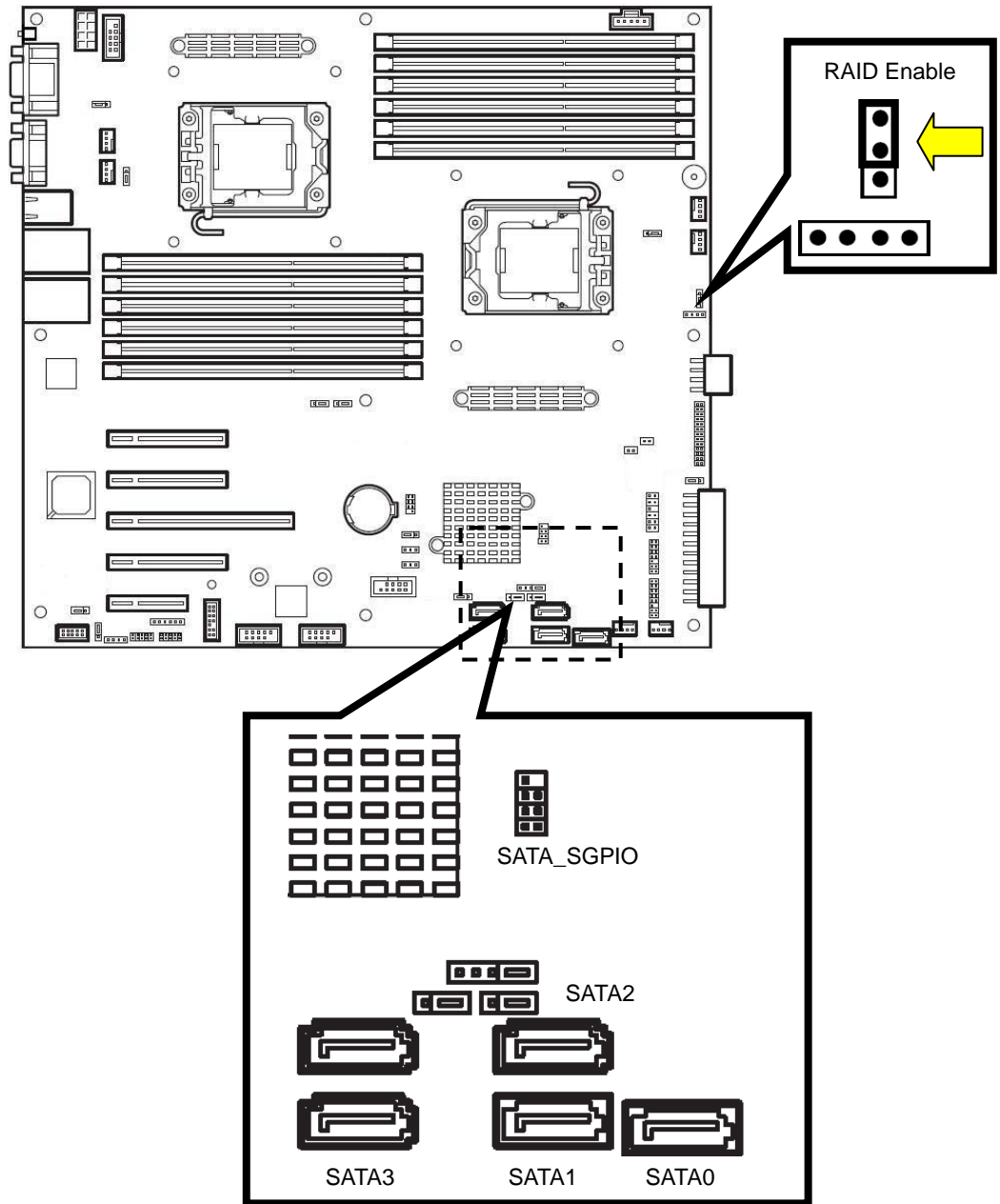
Connect cables to 2.5-inch HDD cage by referring to the illustration below.



(2) When using SW RAID for 2.5-inch HDD cage (1 to 4 HDDs)

Change RAID configuration jumper to RAID Enable by referring the illustration below.

Use optional K410-258(00) internal SAS/SATA cable to connect 2.5-inch HDD cage with motherboard. Make sure the position of key pin of SGPIO cable before connection.



Connector on motherboard	2.5-inch HDD cage
SATA0 (SATA cable 0)	MINISAS_1 (MINI_SAS cable)
SATA1 (SATA cable 1)	
SATA2 (SATA cable 2)	
SATA3 (SATA cable 3)	
SATA_SGPIO	

(a) When using optional RAID Controller for 2.5-inch HDD cage (1 to 24 HDDs)

- To use 8 hard disk drives, a single RAID Controller and a single 2.5-inch HDD cage are required.
The N8103-166 SAS Expander Card is required when using nine or more HDDs.

To use 9 to 16 hard disk drives, two 2.5-inch HDD cage are required.

To use 17 to 24 hard disk drives, three 2.5-inch HDD cage are required.

- A single K410-259(00) or K410-274(00) internal SAS/SATA cable can use 4 hard disk drives.
To use 5 to 8 hard disk drives, two internal SAS/SATA cable are required.
To use 9 to 12 hard disk drives, three internal SAS/SATA cable are required.
To use 13 to 16 hard disk drives, four internal SAS/SATA cable are required.
To use 17 to 20 hard disk drives, five internal SAS/SATA cable are required.
To use 21 to 24 hard disk drives, six internal SAS/SATA cable are required.

Model number of internal SAS/SATA cable required for connection

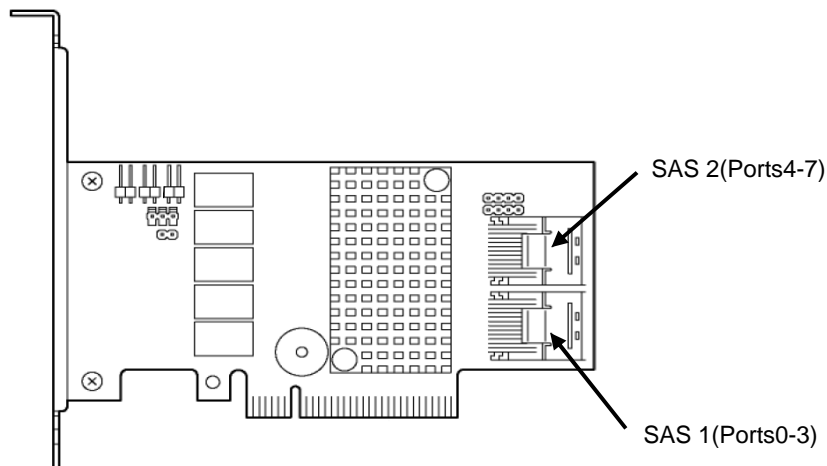
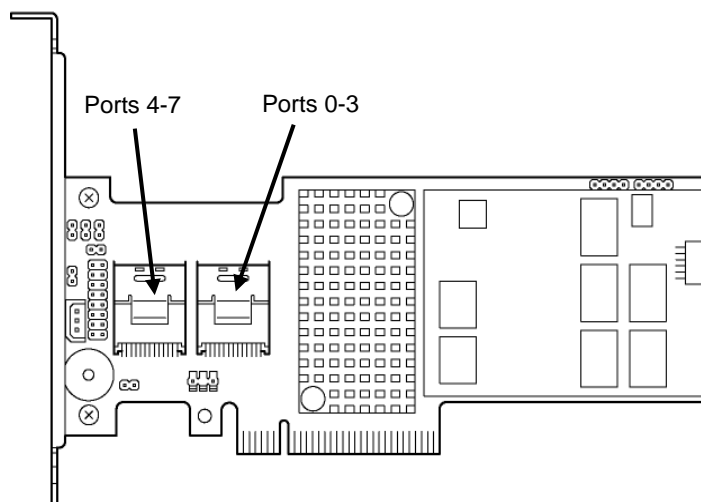
Connecting N8103-168 RAID controller to 2.5-inch HDD cage: K410-259(00) internal SAS/SATA cable

Connecting N8103-172/173/174 RAID controller to 2.5-inch HDD cage: K410-274(00) internal SAS/SATA cable

Connecting N8103-166 SAS Expander Card to 2.5-inch HDD cage: K410-274(00) internal SAS/SATA cable

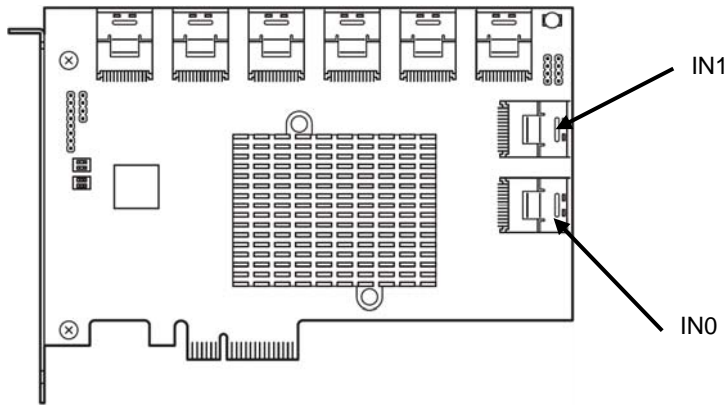
Connecting RAID controller to 2.5-inch HDD cage

Use optional K410-259(00) or K410-274(00) internal SAS/SATA cable to connect 2.5-inch HDD cage with RAID Controller.

Connector for N8103-172/173/174 RAID controller**Connector for N8103-168 RAID controller**

Optional RAID Controller	2.5-inch HDD cage
SAS 1 (Ports0-3)	MINISAS_1
SAS 2 (Ports4-7)	MINISAS_2

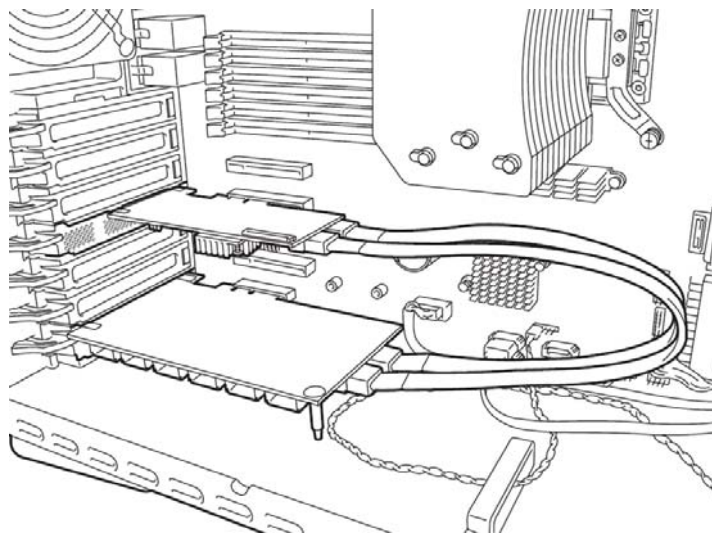
**Connecting RAID controller to SAS Expander Card
Connector for RAID controller**



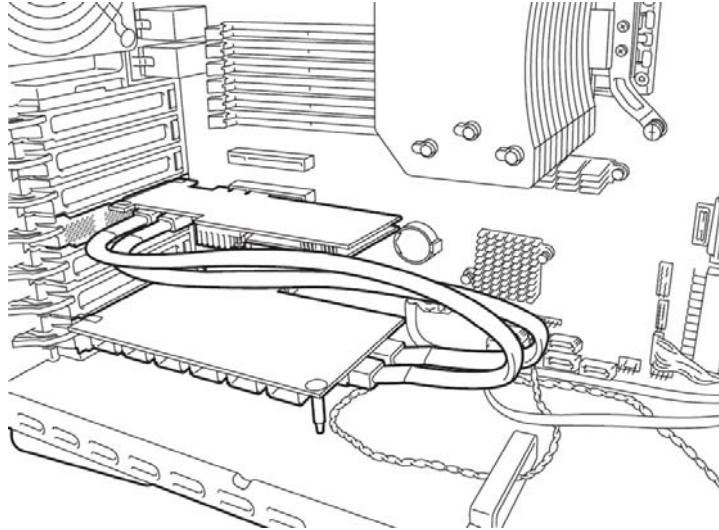
See the figure below and connect the RAID controller to the SAS Expander Card as shown in the table below by using the SAS/SATA cable that comes with the SAS Expander Card.

Optional RAID Controller	SAS Expander Card
Ports0-3	IN0
Ports4-7	IN1

- Connecting N8103-172/173/174 RAID controller to SAS Expander Card



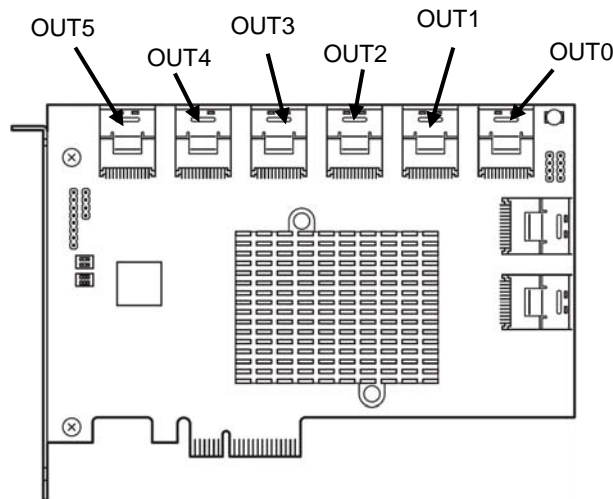
- Connecting N8103-168 RAID controller to SAS Expander Card



Connecting SAS Expander Card to 2.5-inch HDD cage

Connect the SAS Expander Card to the 2.5-inch HDD cage by using the optional K410-274(00) internal SAS/SATA cable.

2.5-inch HDD cage connector

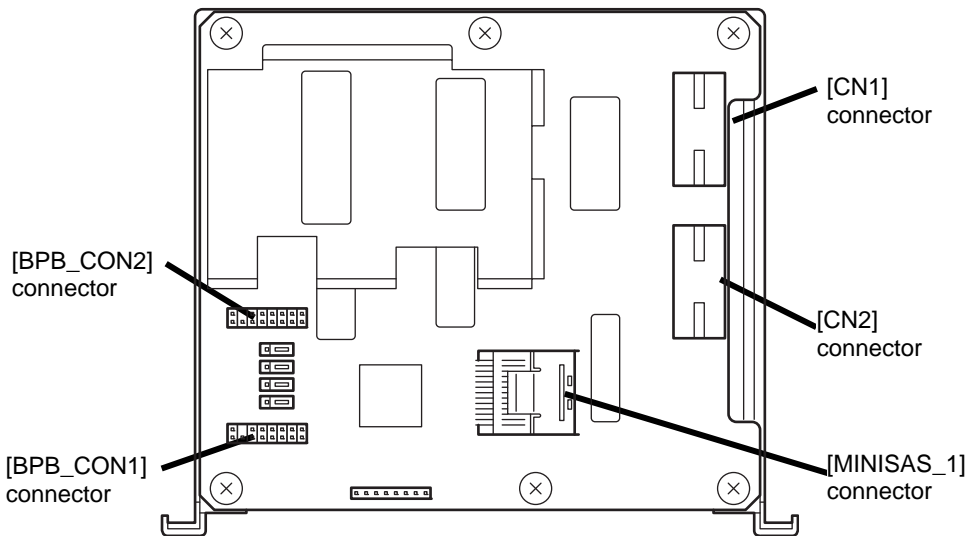


Connect the SAS Expander Card to the 2.5-inch HDD cage as shown in the table below.

Optional SAS Expander Card	2.5-inch HDD cage
OUT0	First: MINISAS_1
OUT1	First: MINISAS_2
OUT2	Second: MINISAS_1
OUT3	Second: MINISAS_2
OUT4	Third: MINISAS_1
OUT5	Third: MINISAS_2

(3) 3.5-inch HDD cage

Connect cables to 3.5-inch HDD cage by referring to the illustration below.



(a) When using SW RAID for 3.5-inch HDD cage (1 to 4 HDDs)

Use optional K410-258(00) internal SAS/SATA cable to connect 3.5-inch HDD cage with motherboard. Make sure the position of key pin of SGPIO cable before connection.

Refer to *When using SW RAID for 2.5-inch HDD cage (1 to 4 HDDs)* for connectors on motherboard and RAID configuration jumper switch setting.

Connector on motherboard	3.5-inch HDD cage
SATA0 (SATA cable 0)	MINISAS_1 (MINI_SAS cable)
SATA1 (SATA cable 1)	
SATA2 (SATA cable 2)	
SATA3 (SATA cable 3)	
SATA_SGPIO	

(b) When using optional RAID Controller for 3.5-inch HDD cage (1 to 8 HDDs)

- A single 3.5-inch HDD cage can use 4 hard disk drives.
To use 5 to 8 hard disk drives, two 3.5-inch HDD cages are required.
- A single K410-274(00) internal SAS/SATA cable can use 4 hard disk drives.
To use 5 to 8 hard disk drives, two K410-274(00) internal SAS/SATA cables are required.

Use optional K410-274(00) internal SAS/SATA cable to connect 3.5-inch HDD cage with RAID Controller.

Refer to *When using optional RAID Controller for 2.5-inch HDD cage (1 to 24 HDDs)* for connectors on RAID Controller.

Optional RAID Controller	3.5-inch HDD cage
SAS 1 (Ports 0-3)	First: MINISAS_1
SAS 2 (Ports 4-7)	Second: MINISAS_1

(4) 3.5-inch fixed type HDD cage

(a) When using SW RAID for 3.5-inch fixed type HDD cage (1 to 4 HDDs)

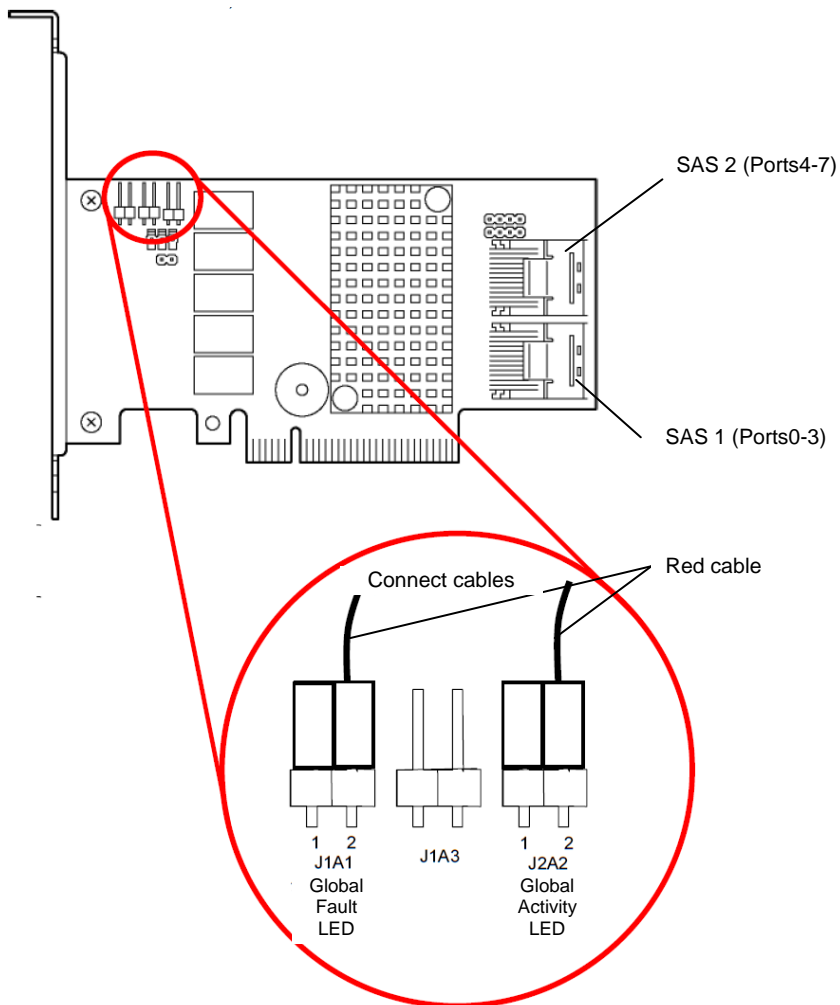
Use optional K410-256(00) internal SAS/SATA cable to connect 3.5-inch fixed type HDD cage with motherboard. Connect power cable to power connector of K410-256(00) internal SAS/SATA cable.

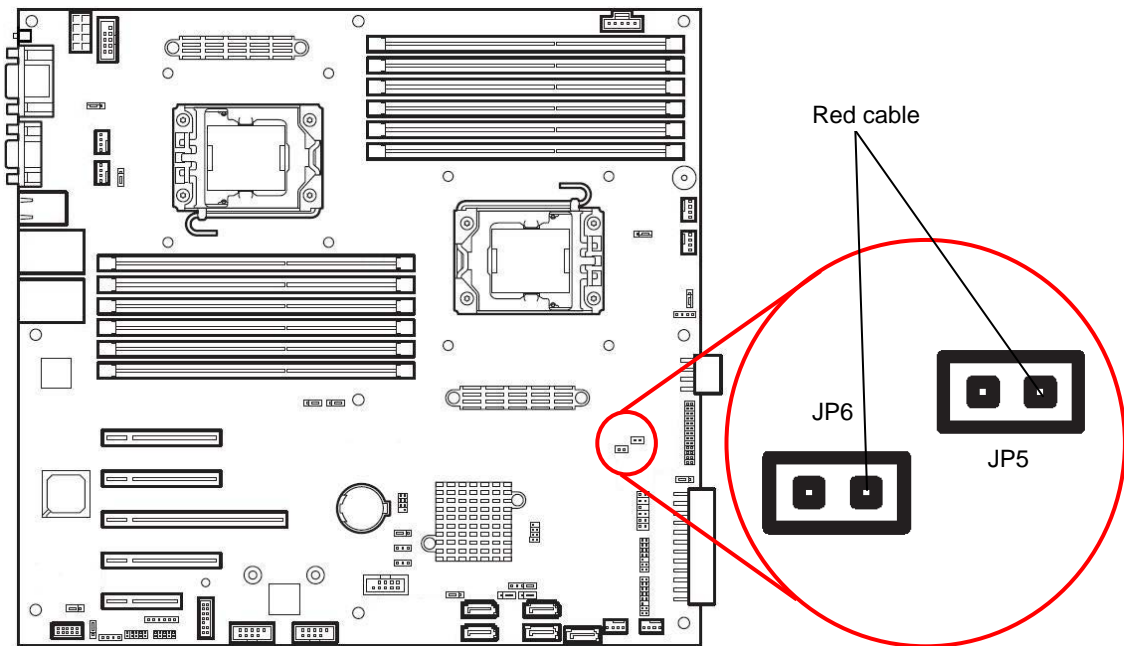
Refer to *When using SW RAID for 2.5-inch HDD cage (1 to 4 HDDs)* for connectors on motherboard and RAID configuration jumper switch setting.

Connector on motherboard	HDD
SATA0 (SATA cable 0)	0 (SAS/SATA cable 0)
SATA1 (SATA cable 1)	1 (SAS/SATA cable 1)
SATA2 (SATA cable 2)	2 (SAS/SATA cable 2)
SATA3 (SATA cable 3)	3 (SAS/SATA cable 3)

(b) When using optional RAID Controller for 3.5-inch fixed HDD cage (1 to 4 HDDs)

- The 3.5-inch fixed type HDD cage can use four hard disk drives.
- The 3.5-inch fixed type HDD cage cannot be connected with the N8103-168 RAID Controller.





Use optional K410-218(00) internal SAS/SATA cable to connect 3.5-inch fixed type HDD cage with motherboard. Connect power cable to power connector of K410-218(00) internal SAS/SATA cable.

Use one LED cable that comes with optional optional K410-218(00) internal SAS/SATA cable and one LED cable that comes with 3.5-inch fixed type HDD cage to connect motherboard with RAID Controller.

SAS/SATA cable connection

HDD	Connector on RAID Controller
0 (SAS/SATA cable 0)	MINISAS_1 (MINI_SAS cable)
1 (SAS/SATA cable 1)	
2 (SAS/SATA cable 2)	
3 (SAS/SATA cable 3)	

LED cable connection

Connector on motherboard	Connector on RAID Controller
JP5	J2A2 (Global Activity LED)
JP6	J1A1 (Global Fault LED)

1.18.2 Notes on setting up a RAID System

Note the following points when setting up a RAID System.

- The number of hard disk drives required varies in each RAID level.
- If the optional RAID Controller (N8103-172) is used, the RAID System cannot be built in RAID5/RAID6/RAID50.

RAID level	The minimum number of hard disk drives required to set up a RAID System	
	N8103-172	N8103-173/174/168
RAID 0	1	1
RAID 1	2	2
RAID 5		3
RAID 6		3
RAID 10	4	4
RAID 50		6

- Use SAS/SATA hard disk drives or SSDs that have the same capacity and rotational speed.
- If you intend to install the OS to the RAID System, the process from RAID configuration to OS installation can be easily completed by using the EXPRESSBUILDER. If you wish to install the OS manually, use a RAID System Configuration utility (WebBIOS). The utility can be run during POST which starts immediately after the server is turned on. For details on the procedure of configuring a Logical Drive, refer to *Chapter 2 (4. RAID System Configuration)* in "*Maintenance Guide*" or the manual supplied with the optional RAID Controller (N8103-172/173/174/168).

Important

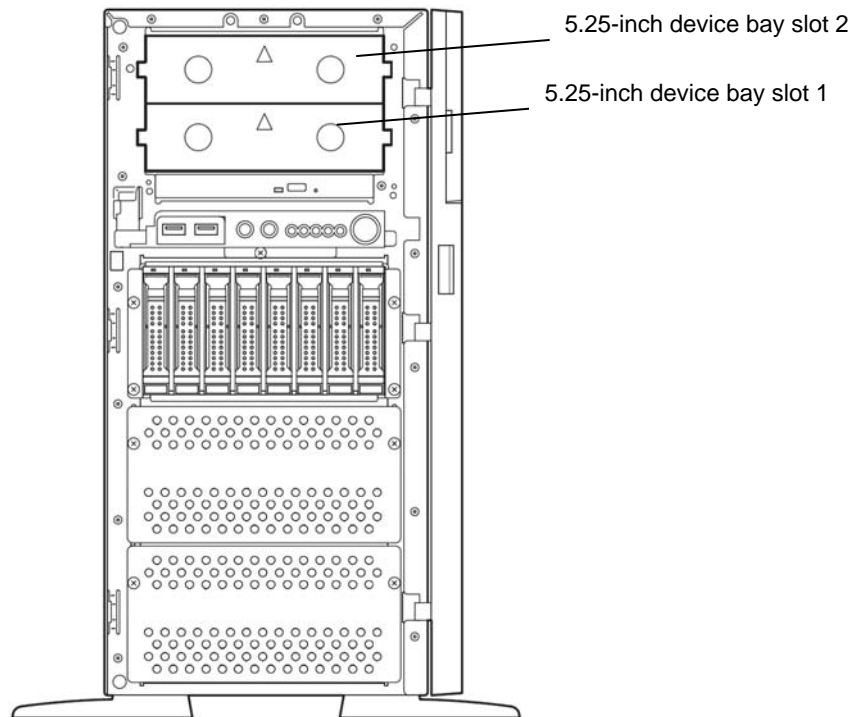
- Do not change the RAID System mode to hibernate.
- Build a Disk Array in the RAID System using hard disk drives that have the same specifications (capacity, rotational speed, and standard).

1.19 5.25-inch Device

This section describes installation procedure for 5.25-inch device.

Important

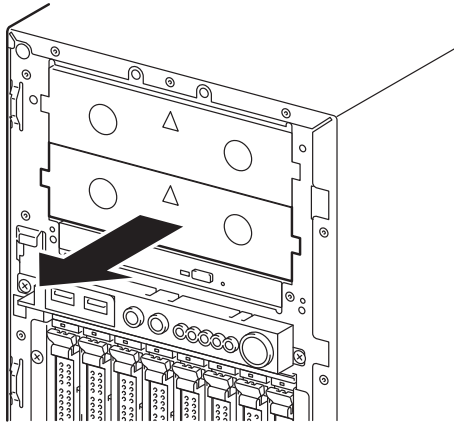
- Do not use unsupported device.
- Only a single internal USB device can be installed.



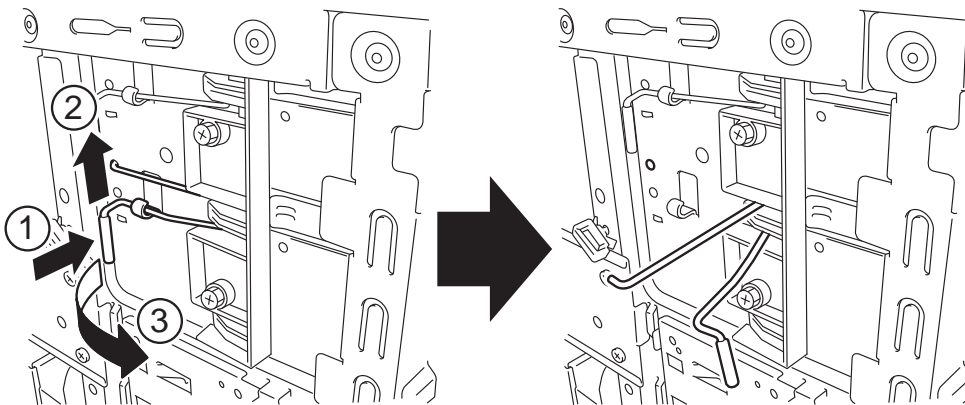
1.19.1 Installation

Install 5.25-inch device in the following procedure.

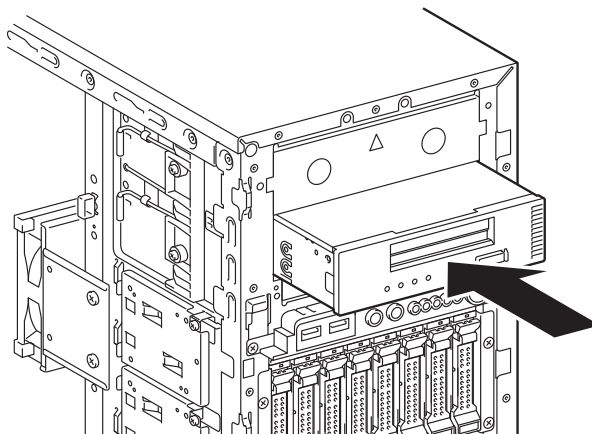
1. Refer to steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Pull the device bay cover toward you to remove it.



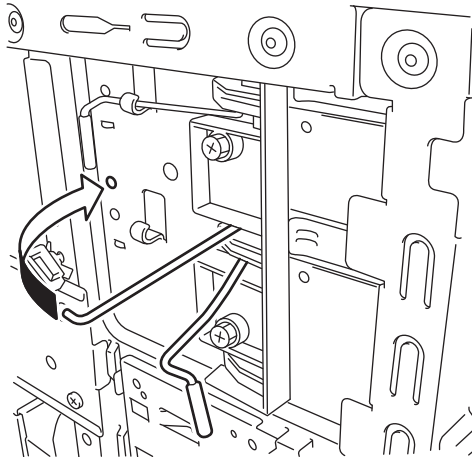
3. Unlock the fixing bracket while pushing the lever (blue) of fixing bracket and moving upward. Then, open the lever.



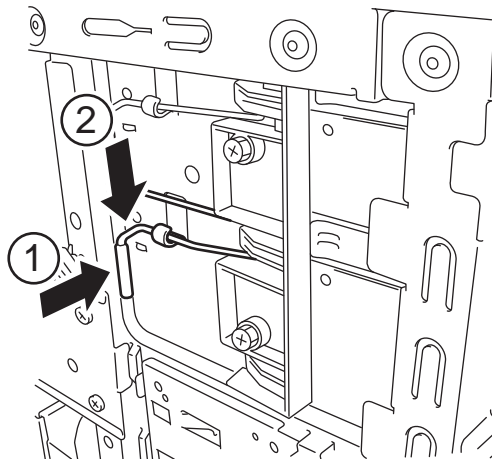
4. Insert the 5.25-inch device into the device bay.



5. Connect a signal cable and a power cable to 5.25-inch device. If you install an internal USB device, connect the internal USB cable to USB2 connector on motherboard.
6. Align screw holes of 5.25-inch device with those on fixing bracket, and insert the end of fixing bracket into the screws holes of 5.25-inch device.



7. Lock the fixing bracket while pushing the lever (blue) of fixing bracket and moving downward. Then, fix the 5.25-inch device to the server.



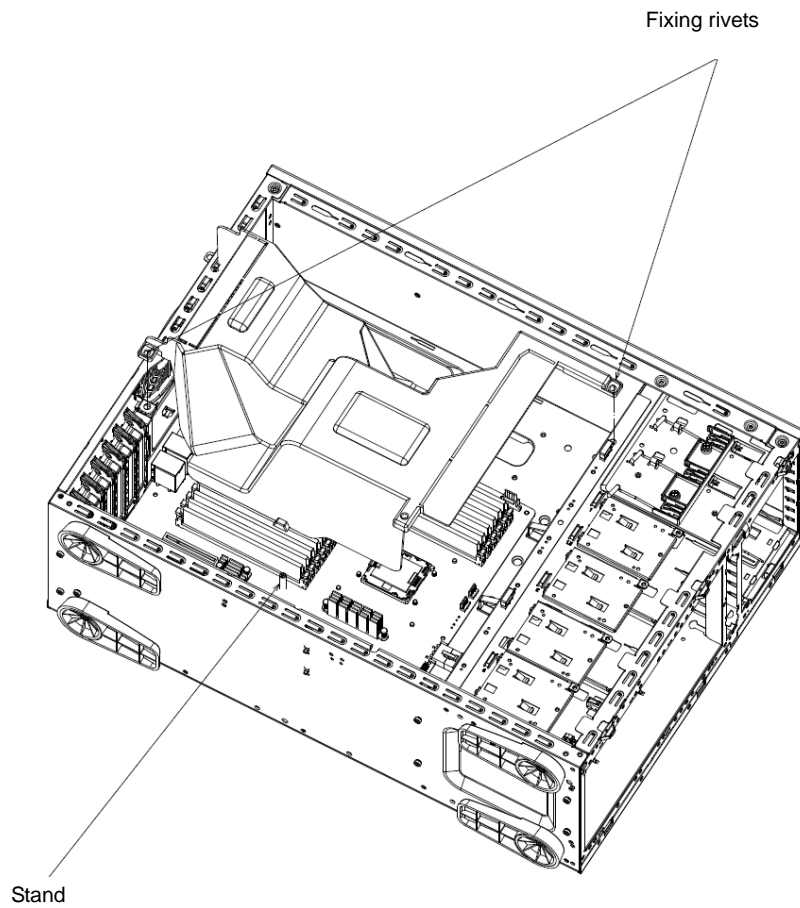
1.19.2 Removal

Remove 5.25-inch device in reverse procedure of installation.

1.20 Installing CPU Duct

Install the CPU duct according to the following procedures.

1. Insert the CPU duct so that the swelling of CPU duct covers the stand on motherboard. See the figure below.



2. Push the two rivets of CPU duct to secure the duct.

1.21 Installing Side Cover

Install the side cover according to the following procedures.

1. Insert the guide metals (front and rear, 2 places) located lower inside of the side cover, into the frame of the server.
2. Insert hooks (5 places) located upper inside of the side cover, into the holes on upper side of the server. Then, move the side cover toward the front of server.
3. Tighten the thumb nut at rear of the server.

1.22 Hot-plug Hard Disk Drive

The server can contain HDD trays to connect with hard disk drives.

A hard disk drive mounted on a dedicated tray can be purchased. Install the hard disk drive on the server with it mounted on the tray.

Important Use hard disk drives specified by NEC. Installing a third-party hard disk drive might cause a failure of the server and the hard disk drive.

- 3.5-inch hot-swap HDD cage can contain four disk drives per one HDD cage.
- 2.5-inch hot-swap HDD cage can contain eight disk drives per one HDD cage.
- A unique port number is assigned to each slot.

Note the following precautions to install hard disk drives.

- You may need to change jumper switch setting or cable connection to build a RAID system.
- In 3.5-inch HDD cage, hard disk drives having different capacities, interface types, or rotational speeds cannot be installed together.
- In 2.5-inch HDD cage, hard disk drives or SSD having different capacities, interface types, or rotational speeds can be installed together, if the following conditions are satisfied:

Mixture of SAS HDD, SATA HDD and SAS SSD in 2.5-inch HDD cage

- You need to prepare the followings:
 - One RAID Controller or one RAID Controller and one SAS Expander Card
 - One to three 2.5-inch HDD cage
 - Two to six internal SAS cables
- You need to prepare RAID Controller if internal disk drives of different types are installed together.
- In the specific RAID group (pack), HDD and SSD cannot be installed together.
- Three types of internal drives cannot be installed together under the specific RAID Controller (in the same HDD cage).
- To avoid mixture of different types of disk drives in specific pack, specify a hot spare disk for the disk drive of the same type.
- When several RAID Controllers are to be installed, they must be of the same model.
- With specific RAID Controller, connecting disk drives extending over several HDD cages is not allowed.

Internal drive	SAS HDD 10Krpm	SAS HDD 15Krpm	SATA HDD 7.2Krpm	SATA HDD 10Krpm	SAS SSD
SAS HDD 10Krpm	○	○	○	○	○
SAS HDD 15Krpm	○	○	○	○	○
SATA HDD 7.2Krpm	○	○	○	○	○
SATA HDD 10Krpm	○	○	○	○	○
SAS SSD	○	○	○	○	○

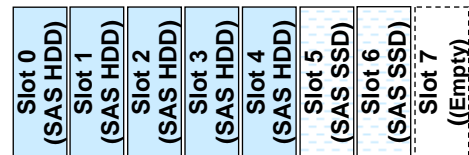
Allowable combinations of internal disk drives are listed in the table above.

- When installing different types of HDDs, first install the same type of HDDs in the slots starting from the smallest number in the 2.5-inch HDD cage, and then install the other types of HDDs in the remaining slots.

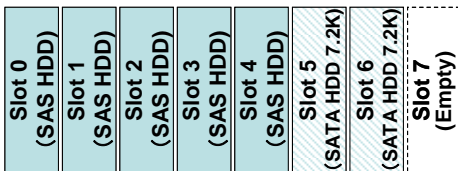
Example of mixture of internal disk drives



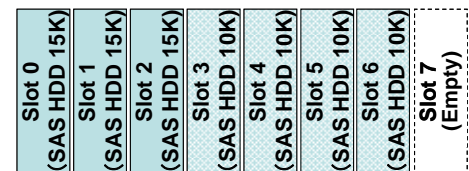
Install SAS SSDs in slots 0 to 2.
Install SATA HDDs in slots 3 to 6.
Leave slot 7 empty.



Install SAS HDDs in slots 0 to 4.
Install SAS SSDs in slots 5 and 6.
Leave slot 7 empty.



Install SAS HDDs in slots 0 to 4.
Install SATA HDDs in slots 5 and 6.
Leave slot 7 empty.



Install SAS HDDs 15K in slots 0 to 2.
Install SAS HDDs 10K in slots 3 to 6.
Leave slot 7 empty.

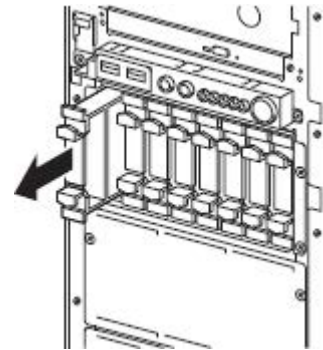
1.22.1 Installation

This section describes installation procedure for 2.5-inch hot-swap hard disk drives. Follow the same installation procedure for 3.5-inch hot-swap hard disk drive.

Note

In the RAID group (pack), build a Disk Array using hard disk drives that have the same specifications (capacity, rotational speed, and standard).

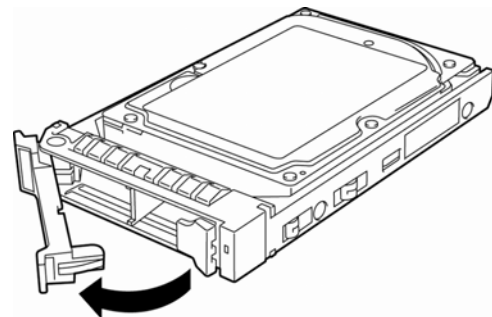
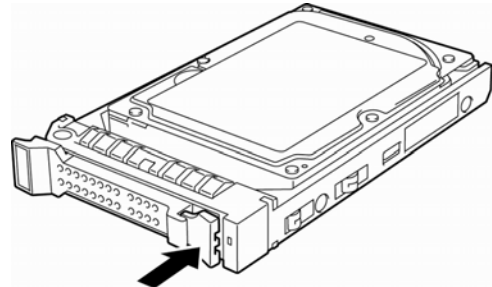
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the slot where you install the hard disk drive.
Install hard disk drives in ascending order of port number.
3. Remove the dummy trays.
Dummy trays are installed in all slots.



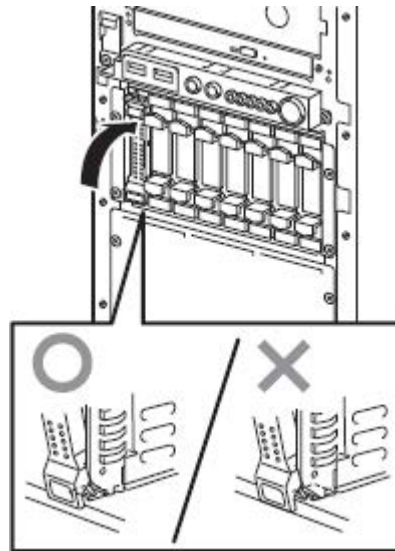
Note

Keep the dummy trays for future use.

4. Unlock the handle of the drive carrier.



5. Hold the drive carrier firmly and insert it into the slot.

**Note**

- Push it all the way until the handle's lock touches the frame.
- Hold the drive carrier firmly with both hands.

6. Slowly close the handle.
The drive carrier is locked making a clicking sound.

Note

When you push the drive into the slot, confirm the handle got hooked on the frame.

7. Turn on the server, start the SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 3 (2. System BIOS Setup)*.

Tips

The saved boot order is cleared when a hard disk drive is added.

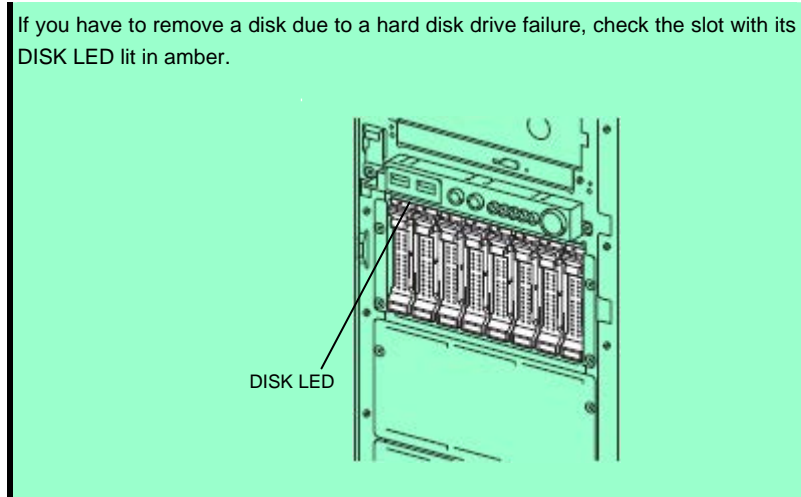
1.22.2 Removal

Remove a hard disk drive in the following procedure.

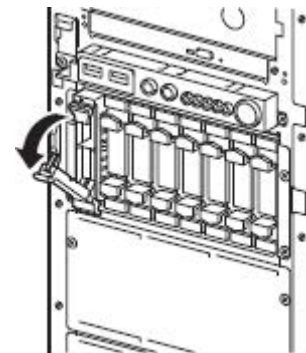
If you transfer or dispose of the removed hard disk drive, you must erase the stored data completely. Refer to *Chapter 1 (1. Transfer, Movement, and Disposal)* in “Maintenance Guide” to erase data.

Important NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.

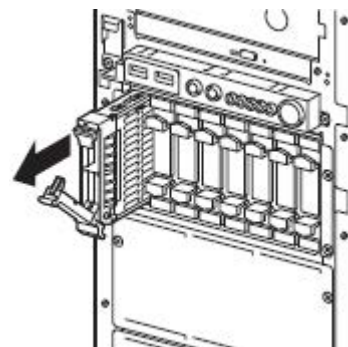
Note If you have to remove a disk due to a hard disk drive failure, check the slot with its DISK LED lit in amber.



1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Push the lever to unlock and open the handle.



3. Hold the drive carrier firmly and pull out the hard disk drive.
4. If you intend to use the server while the hard disk drive is removed, fill the open slot with a dummy tray.



Note Do not pull the slot out from the handle. Doing so may damage the handle.

1.22.3 Replacing a hard disk drive in the RAID System

In the RAID System, you can use the auto rebuild feature to restore data back to the state before a failure occurred by writing the data saved before the replacement to a new hard disk drive after replacing the broken hard disk drive.

The auto rebuild feature is enabled in logic drives set to RAID 1, RAID 5, RAID 6, RAID 10, and RAID 50.

The disk is automatically rebuilt when hot swapping (replacing a disk while the power on) a failed hard disk drive.

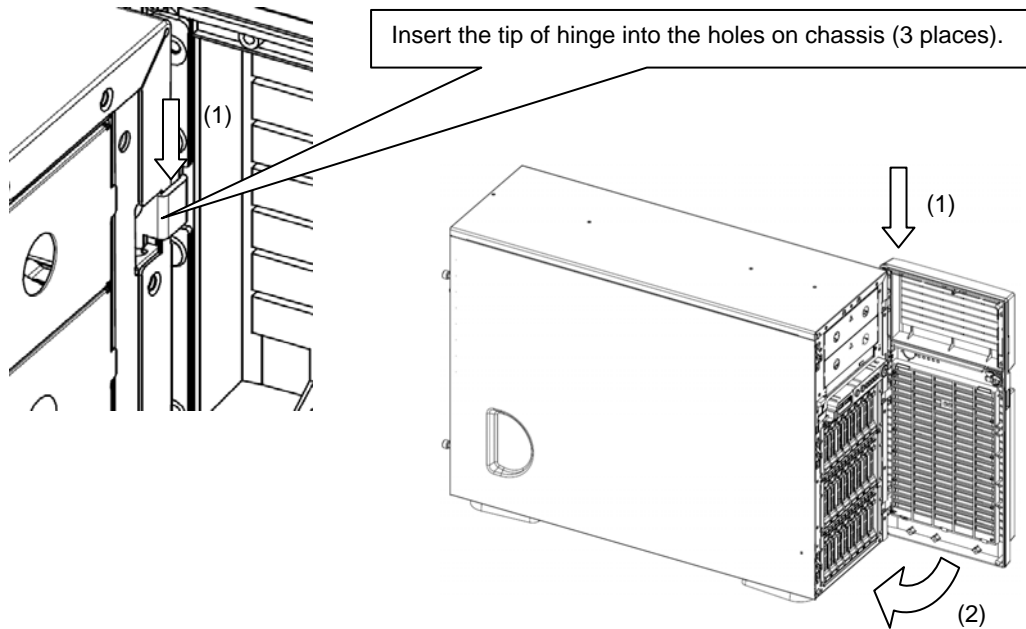
During the auto rebuild, the DISK LED on the hard disk drive flashes green and amber alternately to indicate that the autorebuild is being performed.

Observe the following precautions whenever executing the auto rebuild

- Do not turn off the server until the auto build completes after a hard disk drive fails.
- Leave an interval of at least 90 seconds between a hard disk drive removal and a hard disk drive installation.
- Do not replace a disk during the auto rebuilding of another hard disk drive (during an auto rebuild, the DISK LED on the hard disk drive flashes green and amber alternately).

1.23 Installing the Front Bezel

To install the front bezel, insert three tabs on left end of front bezel into frame holes on front right side of the server, and close the front bezel. After installation, lock the front bezel with security key.



Important Be careful not to press POWER Switch.

1.24 Dust Proof Kit

The following two types of dust proof bezels can be attached to this server.

- N8146-28 Dust Proof Kit with Sensor
- N8146-33 Dust Proof Kit

The N8146-33 Dust Proof Kit can be used as the N8146-28 Dust Proof Kit with Sensor by attaching the N8146-29 filter replacement sensor to it. The N8146-29 filter replacement sensor cannot be used alone; it must be used with the N8146-33 Dust Proof Kit.

Note

The outer dimension after Dust Proof Kit is attached is as follows.
200.0 mm (width) X 613.5 mm (depth) X 438.0 mm (height) (projection excluded)

1.24.1 Installing Dust Proof Kit

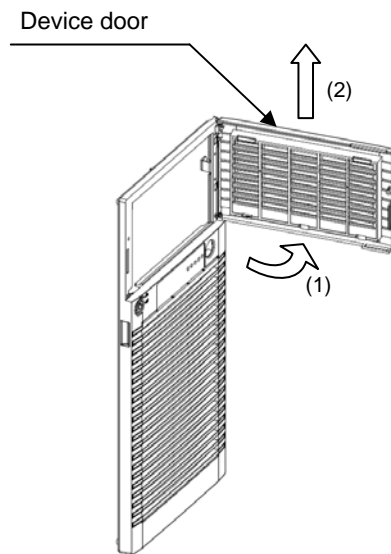
Perform the following steps to attach the Dust Proof Kit.

Perform steps 1 to 11 to attach the N8146-28 Dust Proof Kit with Sensor.

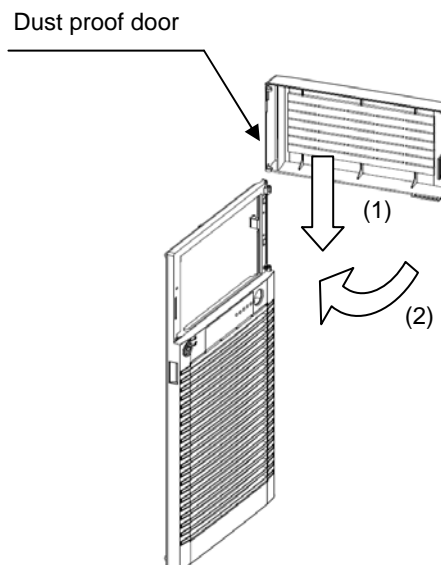
Perform steps 1 to 4, 8, and 10 to attach the N8146-33 Dust Proof Kit.

Perform steps 1 and 4 to 11 to attach the N8146-29 filter replacement sensor. In step 4, read “accent cover” as “dust proof cover.”

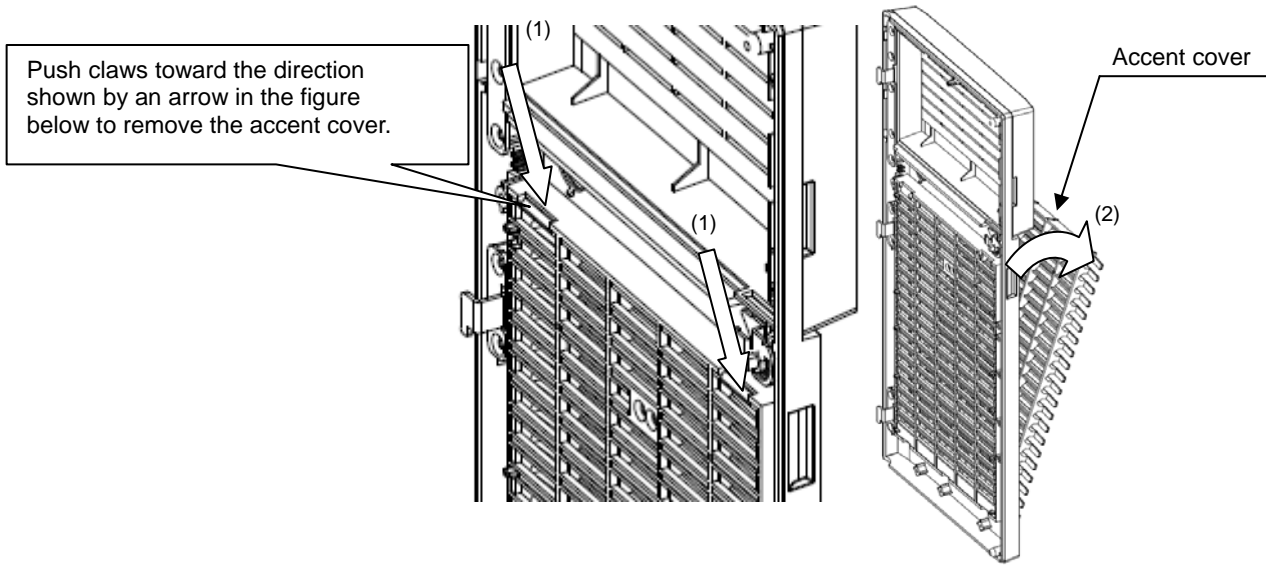
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Open the device door on the front bezel removed in the previous section and slide it upward to remove.



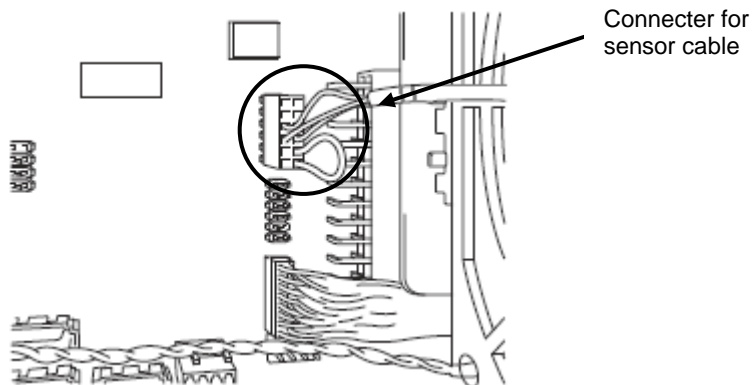
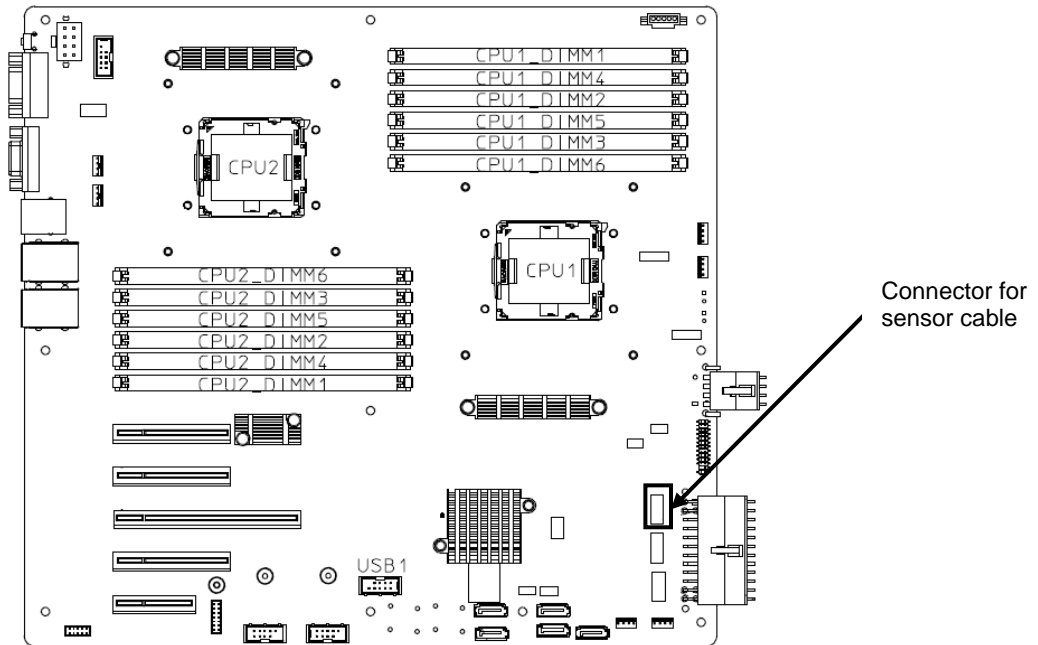
3. Install the dust proof door in reverse order of removal procedure of device door (Step 2).



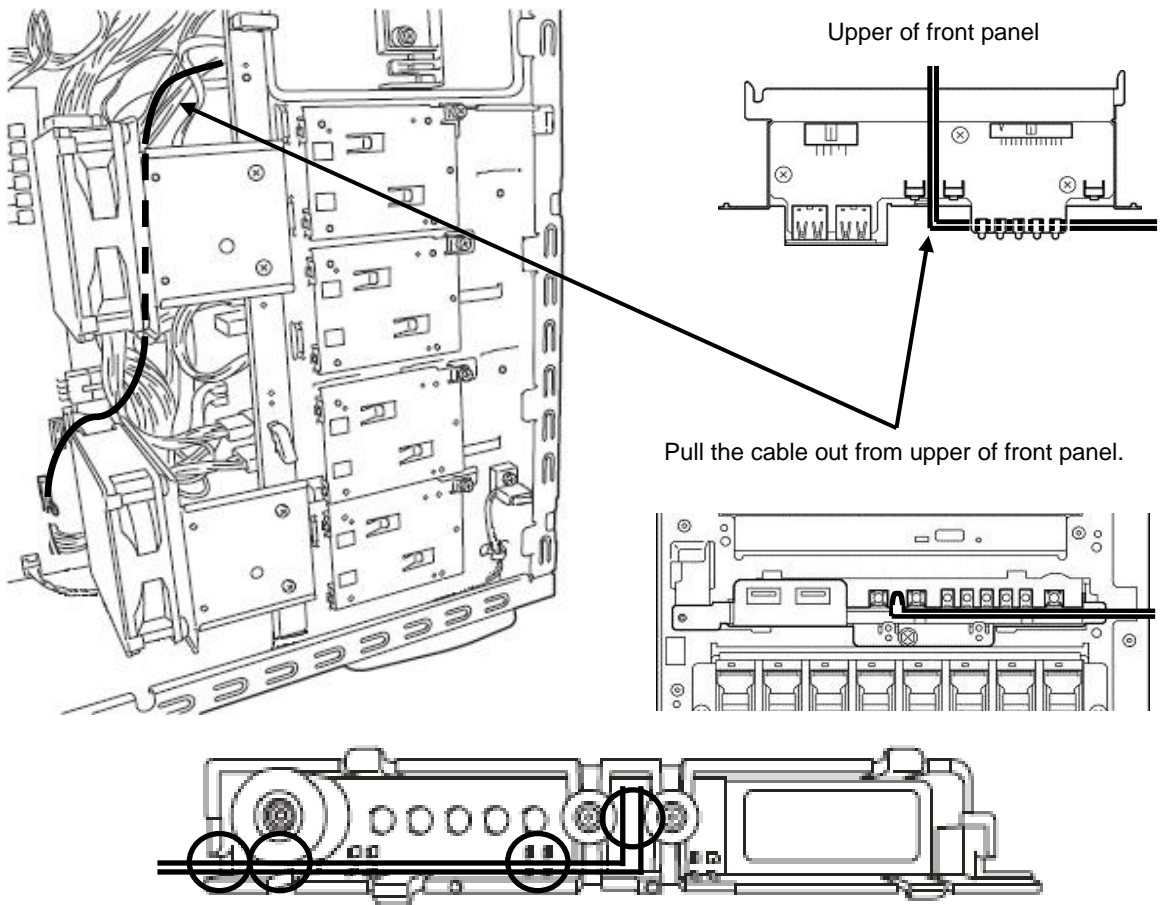
4. Push claws (2 places) on accent cover, and remove the accent cover from front bezel.



5. Connect the sensor cable to the connector on the motherboard.

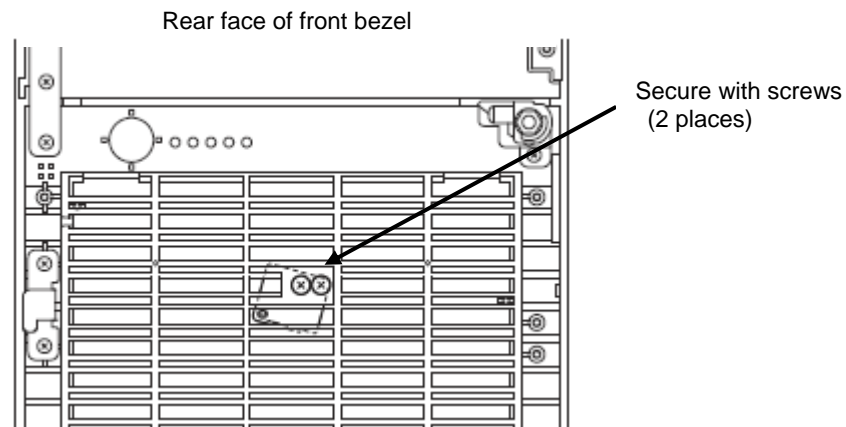


- Route the sensor cable as shown in the figure below.

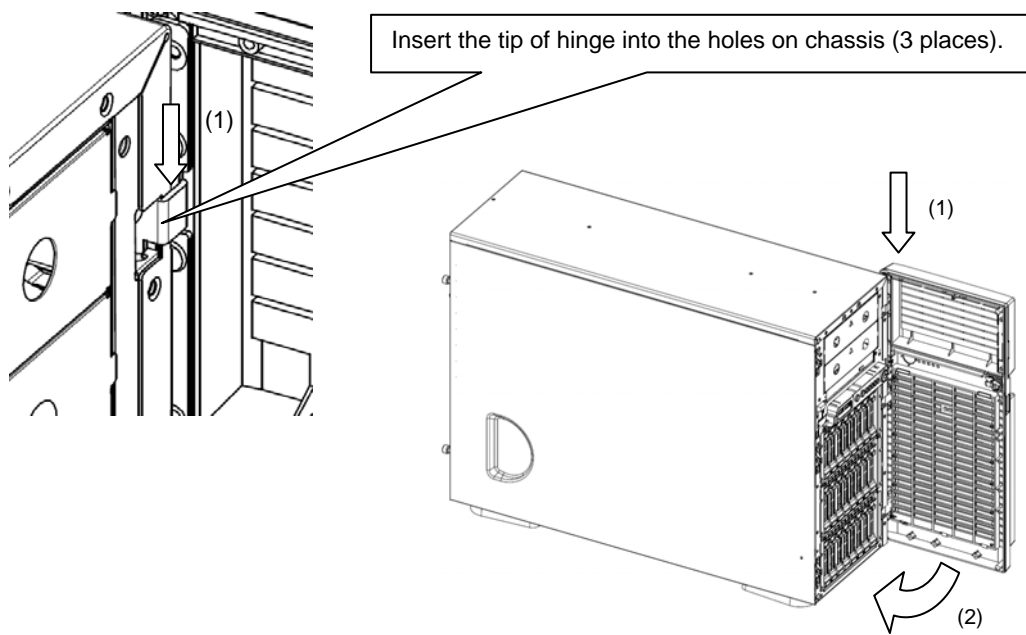


Remove the sub-bezel, and connect the cable.
Clamp a cable in four places of the O mark.
Install the sub-bezel.

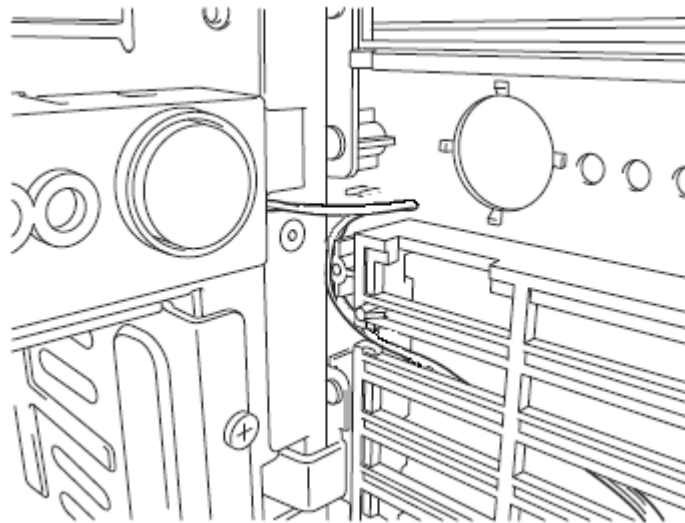
- Install the filter monitoring sensor to the front bezel with two fixing screws.



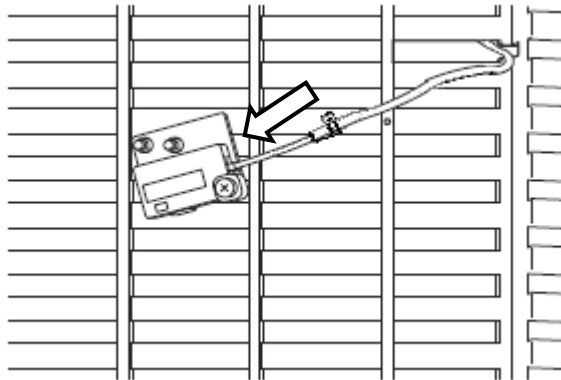
8. Install the front bezel to server chassis.



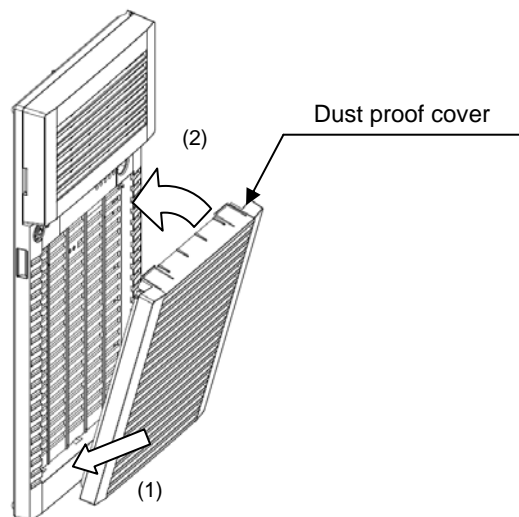
Pull the cable out to the front of front bezel.



9. Connect the cable to monitoring sensor.



10. Install the dust proof cover to the front bezel in reverse procedure of removal of accent cover.



11. Installation of Filter Monitoring Software.

For the installation procedure of the Filter Monitoring Software, refer to "*FilterMonitorSoftware (Windows) Instruction Guide*" in the FilterMonitorSoftware (Windows) folder or "*FilterMonitorSoftware (for Linux) Instruction Guide*" in the FilterMonitorSoftware (Linux) folder of the attached CD-ROM.

1.24.2 Removing Dust Proof Kit

To remove a Dust Proof Kit, reverse the installation procedure.

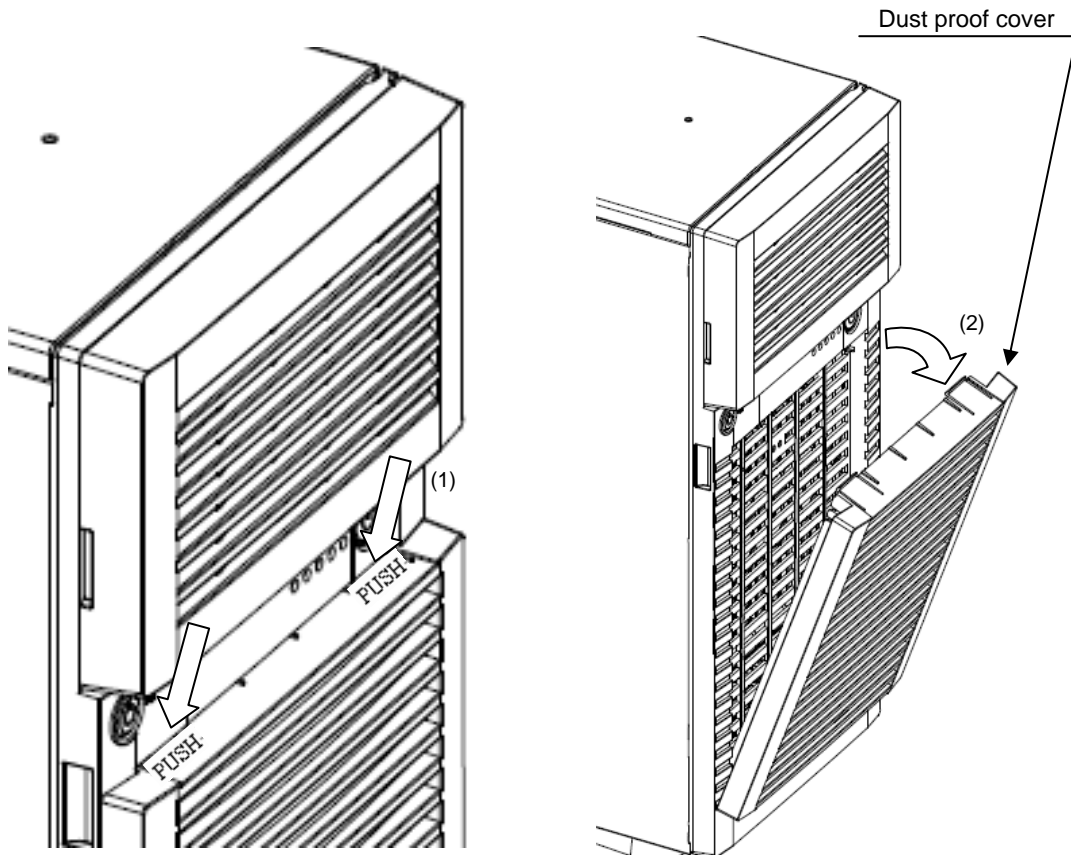
1.24.3 Replacement of Dust Proof Filter

The service life of dust proof filter is six months (recommended) or one year (maximum).

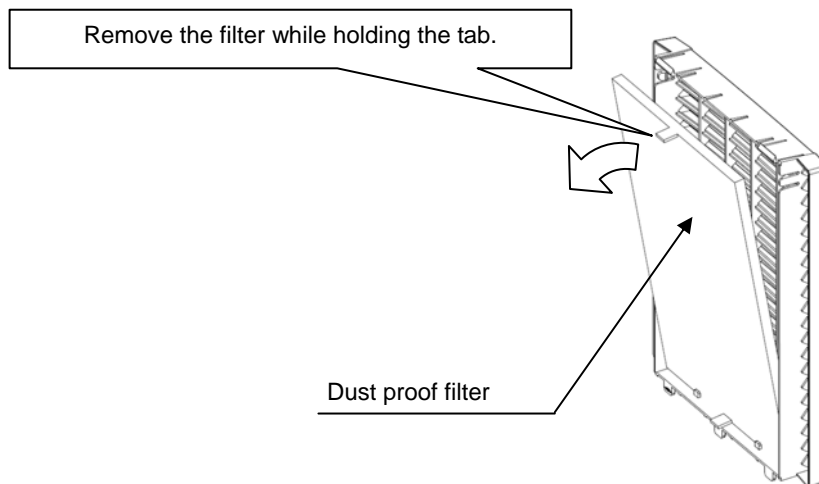
The life time depends on usage environment. Use N8147-24 Dust proof filter for replacement.

Important If the server is operated for long time beyond the maximum service life, the temperature inside the device raises due to clogged dust, and may cause a device failure.

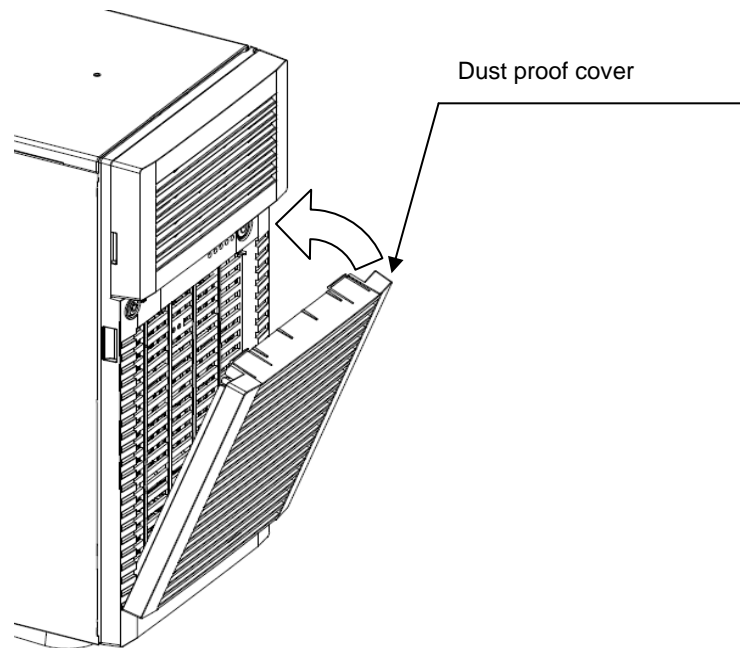
1. Remove the dust proof cover by pushing down the portion marked with "PUSH" on dust proof cover.



2. Replacement of Dust Proof Filter.
 - 2.1 Remove the dust proof filter from inside of dust proof cover.



- 2.2 In the reverse procedure of removal, mount the filter to dust proof cover so that its tab faces toward you.
3. Install the dust proof cover to front bezel.



1.25 Applying SDR Data

If installing or removing HDD cage, be sure to apply SDR data to system by using SDR media provided with the server.

Before starting the server, make sure that jumper switches for power configuration and fan configuration are properly set.

Make sure of SGPIO cable connection status when 2.5-inch or 3.5-inch HDD cage is installed in the server.

1.25.1 How to apply SDR data

1. Prepare "SDR UPDATE TOOL (243-423836-504)" provided with the server.

Important An error may occur and sensor error or other error may be logged before SDR data is applied to the system. You can ignore the error logged before application of SDR data.

Note If the following error appears during setup of SDR, the target server is incorrect. Check the server model.

Error, incorrect server platform found

To perform this work, the system must be booted from CD-ROM. If boot device order is changed, run SETUP and change boot order to boot from CD-ROM. You may restore the original setting upon completion of this work.

2. Apply SDR data to the server in the following procedure.
3. Turn on the power of server, and start the system.
4. Set the CD-ROM "SDR UPDATE TOOL (243-423836-504)" to optical disk drive of the server.
5. Press <Ctrl>+<Alt>+ key to reset the server.

Important Before applying SDR data, POST may detect an error and issue a message to prompt key entry. In this case, press <F1> key to start the system.

6. System starts from "SDR UPDATE TOOL (243-423836-504)" CD-ROM, and applying SDR data starts automatically. It takes about 2 or 3 minutes after system startup.

Important Never attempt to power off the server while applying SDR data. The server may fail to start.

When the message as shown below appears, application of SDR data completes.

```

-----
CFG Identify : ncfg1000           ← Check the value.
SDR Revision : SDR Version 00.09 ← Check the value.
-----
Remove the media, Press any key to Reboot

```

Confirm that "CFG Identify" and "SDR Revision" of the installed/replaced power supply unit and HDD cage are indicated as shown below.

Model number of server	HDD cage	CFG Identify	SDR Revision
N8100-2089F	N8154-43F	ncfg5000	SDR Version xx.xx
	One N8154-44F	ncfg5010	
	Tow N8154-44F	ncfg5020	
	One N8154-42F	ncfg5011	
	Tow N8154-42F	ncfg5021	
	Three N8154-42F	ncfg5031	
N8100-2090F N8100-2091F	N8154-43F	ncfg5100	
	One N8154-44F	ncfg5110	
	Tow N8154-44F	ncfg5120	
	One N8154-42F	ncfg5111	
	Tow N8154-42F	ncfg5121	
	Three N8154-42F	ncfg5131	

* "xx.xx" of SDR Revision represents the revision number indicated on "SDR UPDATE TOOL(243-423836-504)" media provided with the server.

If the applied SDR data differs from system configuration, power off the server, disconnect power cord, and confirm jumper switch settings for power configuration and fan unit configuration.

Also make sure that SGPIO cable is properly connected if 2.5-inch or 3.5-inch HDD cage is installed in the server.

If jumper setting and/or cable connection is improper, correct them, and apply SDR data again.

If no incorrectness was found, contact your sales representative.

Remove the CD-ROM "SDR UPDATE TOOL (243-423836-504)" from optical disk drive of the server.

Press any key on keyboard to restart the server.

Press the <F4> key while POST is running to launch ROM Utility.

Clear System Event Log (SEL) by selecting menus in the order as shown below.

Keyboard Type Select → **Maintenance Utility** → **IPMI Information Viewer**
→ **Clear the System Event Log (SEL) Repository** → **Enter** → **Enter**



Now the System Event Log (SEL) is cleared.



Press the <ESC> key to return to **Off-line TOOL MENU**, and select **Exit**. The server restarts.

2. Installation and Connection

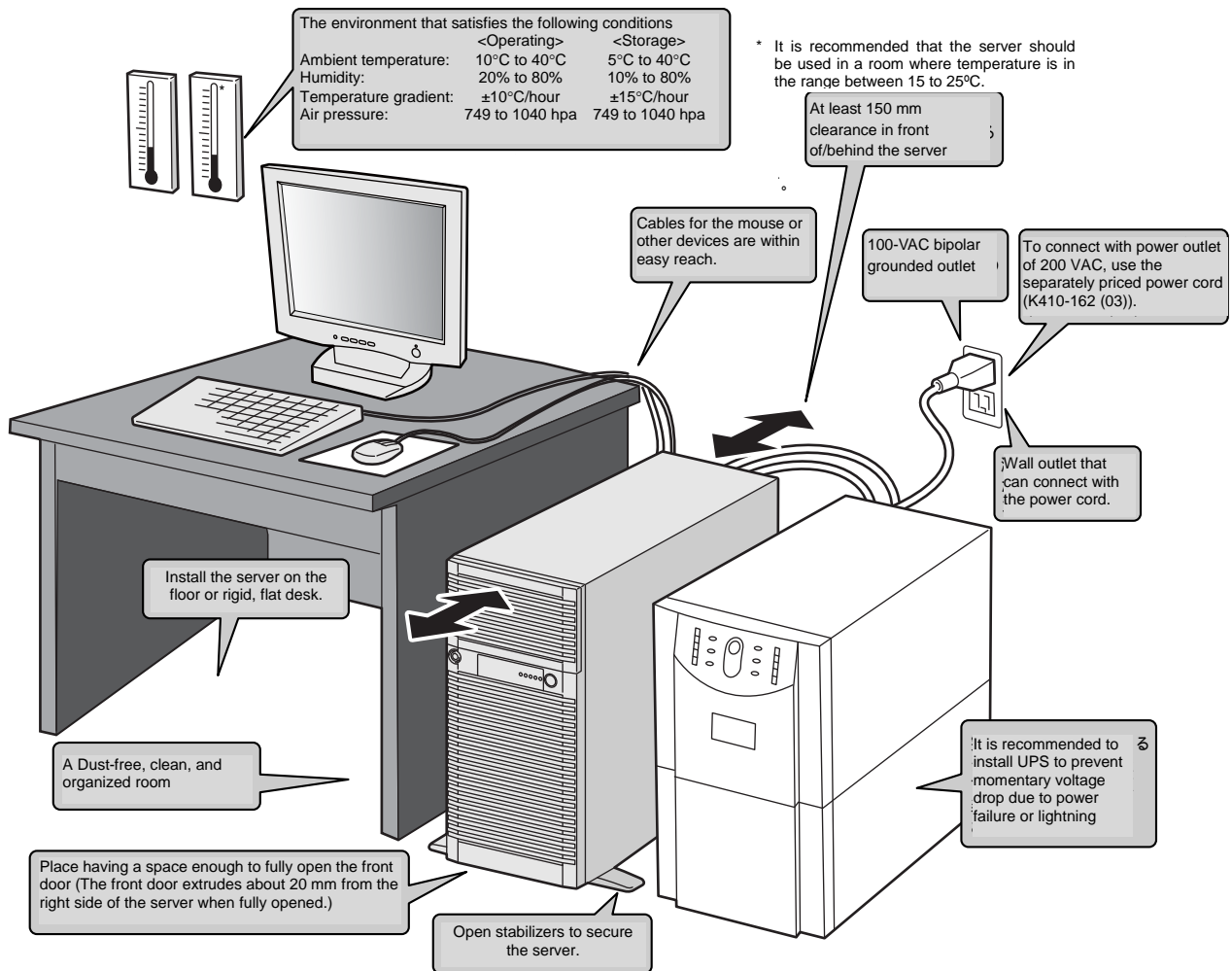
This section describes how to position the server and connect cables.

2.1 Installation

 WARNING	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to <i>Safety precautions in Precautions for Use</i>.</p> <ul style="list-style-type: none">• Use only in the specified environment.• Do not connect the ground wire to a gas pipe.

 CAUTION	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to <i>Safety precautions in Precautions for Use</i>.</p> <ul style="list-style-type: none">• Do not carry or install the server only by a single person.• Do not install the server so that the load may be concentrated on a specific point.• Do not provide the wiring for the server to exceed the rating of the power supply.• Do not use in the environment where corrosive gas is generated.

The environment suitable for the server is as follows.

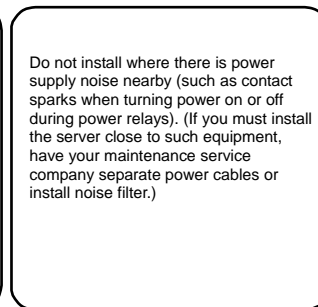
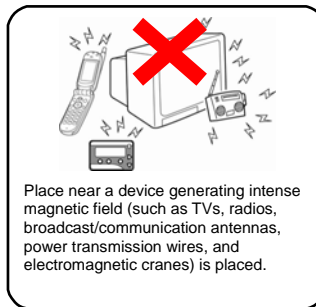
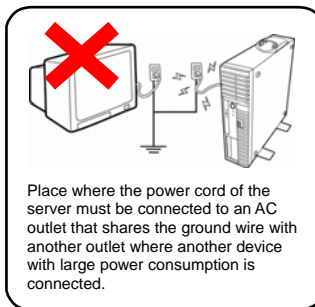
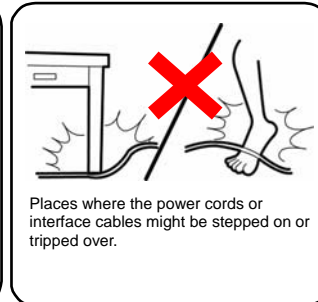
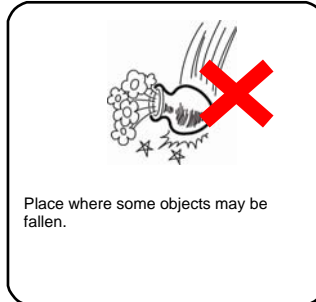
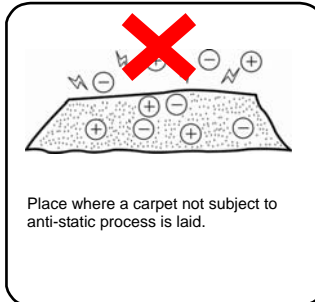
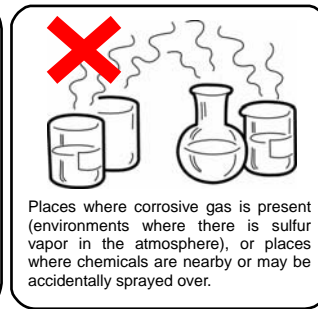
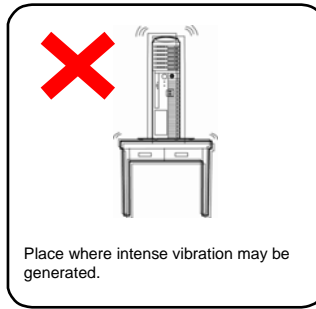
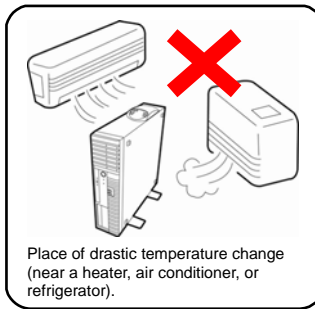


When you have selected a server site, hold the server by its bottom with at least two persons and carry it to the site, then place it slowly and gently.

Important

- Do not hold the server by its front bezel to lift the server. The front bezel may be disengaged and damage the server.
- Open the stabilizers and secure the server to the site.
- Do not hold the handle on the redundant power module when carrying the server.

Do not install the server in an environment in which any of the following conditions apply: Installing the server in any of the following conditions will cause the server to malfunction.




2.2 Connection

Connect peripheral devices to the server.

Connectors that allow a variety of peripheral devices to be connected are provided at the front and rear of the server. The illustration below shows locations of peripheral devices and their connector available in standard configuration. First connect the peripheral devices and then connect the power cord to the server. After that, connect the power plug to the outlet.


⚠ WARNING



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions in Precautions for Use*.

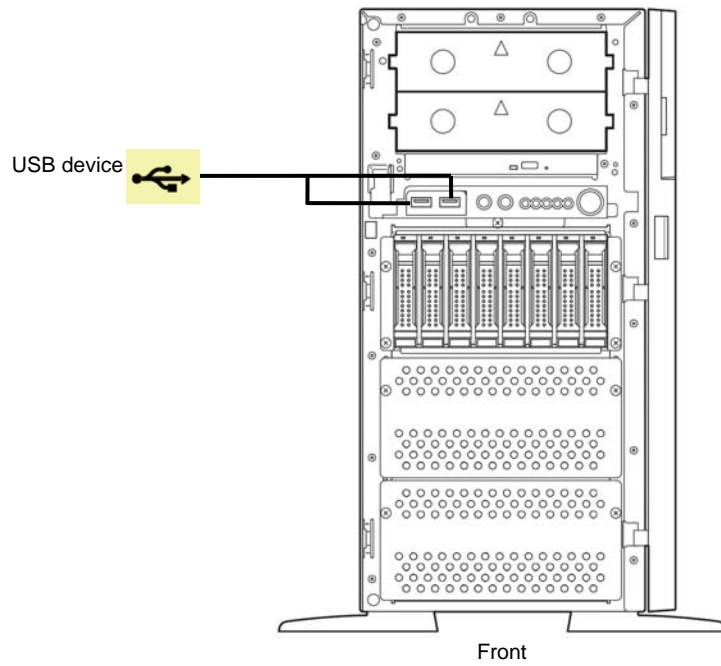
- Do not hold the power plug with wet hands
- Do not connect the ground wire to a gas pipe

⚠ CAUTION

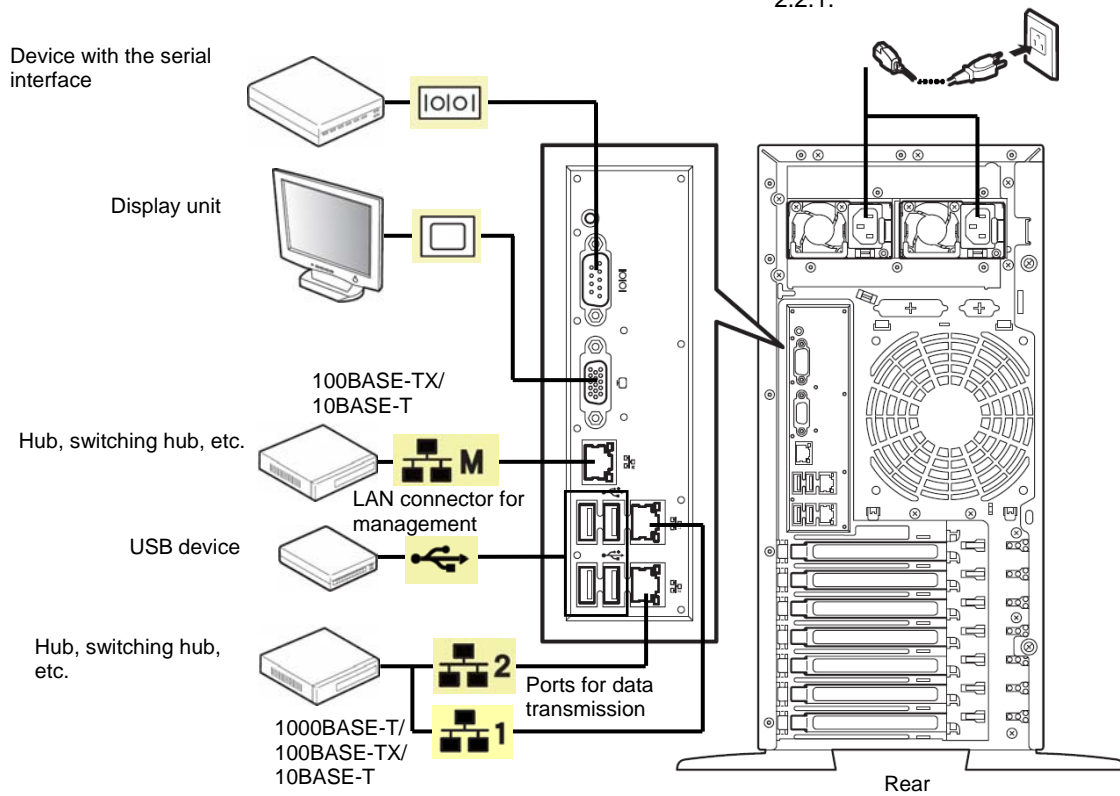


Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions in Precautions for Use*.

- Use only the specified outlet to insert.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use only the specified power cord
- Do not connect or disconnect the interface cable with the power plugged in the outlet.
- Use only the specified interface cable



Finally, connect the power cord to an outlet.
For connecting to the UPS, refer to the next section 2.2.1.



Tips | A dedicated line cannot be directly connected to the serial port connector.

Note the following precautions to connect cables.

- When the device is not Plug and Play device, turn off the server and devices to be connected before connecting.
- If connecting any peripheral device and its interface cable made by other companies (a third party), contact your sales representative to check if they can be used with the server beforehand.
- Fix the power cord or interface cable with cable ties.
- Make sure that no pressure is applied on the plug of power cord.

2.2.1 Connecting to a uninterruptible power supply (UPS)

To connect the power cord of the server to the uninterruptible power supply (UPS), use the connector output on the rear of the UPS. For details, refer to the manual supplied with the UPS.

When the power cord is connected to a UPS, the BIOS settings may need to be changed in order to link the server with the power supply from the UPS.

To change the settings, select **Server** and then **AC-LINK** in the BIOS setup utility, and change the displayed parameters. Select **Power On** to perform automatic operations by using the UPS. For details, refer to *Chapter 3 (2. System BIOS Setup)*.

NEC Express5800 Series Express5800/T120e

3

Setup

This chapter describes how to set up the server.

1. Turning on the Server

POST (Power-On Self-Test) is explained in this section.

2. System BIOS Setup

You can customize the BIOS settings by following the instructions in this section.

3. EXPRESSSCOPE Engine 3

EXPRESSSCOPE Engine 3 provides useful features through the Baseboard Management Controller (BMC).

4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows and maintain the server.

5. Installing Software Components

You can install Windows and bundled software by following the instructions in "*Installation Guide (Windows)*".

6. Turning off the Server

Turn off power when not using the server.

1. Turning on the Server

Pressing the POWER switch at the front of the server turns on the server.

Turn on the server by using the following procedure.

Tips

- Do not power on the server before amber POWER LED is unlit.
- Wait for at least 30 seconds before turning on the server after turning off the server.

1. Turn on the peripheral devices that connect to the display monitor and the server.

Note

If the power cord is connected to power control system such as an Uninterruptible Power Supply (UPS), make sure that the power control system is turned on.

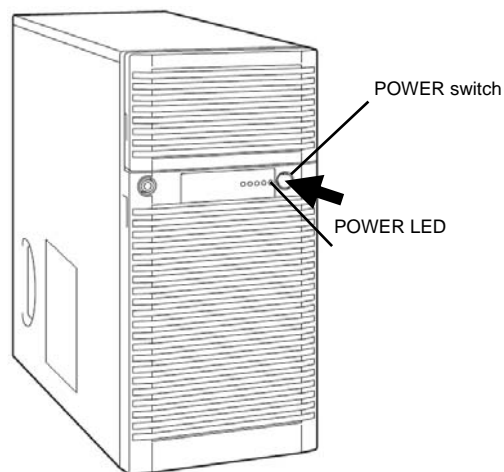
2. Press the POWER switch at the front of the server.

The POWER LED is turned on green and after a while, the NEC logo appears on the display.

While the NEC logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, refer to *Chapter 3 (1.1.1 POST sequence)*.

Important

Do not connect or disconnect USB device while POST is running.



1.1 POST

Power-On Self-Test (POST) is a self-diagnostic program stored in the server as standard. POST automatically runs immediately after the server is turned on and checks the motherboard, DIMM, and processor (CPU). POST also displays the start-up messages of different utilities during the operation.

Usually, you do not need to check the contents of POST. However, check messages displayed at POST in the following cases.

- When introducing a server
- If you suspect a failure
- When you hear beep many times during the time between Power ON and OS startup
- When any error message is displayed

1.1.1 POST sequence

Explains how POST runs in order.

1. Turn on the server. POST starts running and the initialization message indicating that modules such as the memory and PCI device are being initialized is displayed. Following the initialization message, the NEC logo is displayed.



Note

- Keyboard becomes operable after the logo appears.
- The screen might go black several times while the initialization message is displayed. This does not cause any operational problems.
- The initialization message might not be displayed when the optional VGA controller is connected or depending on the settings specified by using the BIOS setup utility (SETUP)
- The initialization message is not displayed on the serial port console redirection screen.

2. If Enabled is specified for Password On Boot in Security menu of SETUP, you will be prompted to enter password after the logo is displayed. If you enter the incorrect password three times consecutively, **POST aborts**. (You can no longer proceed.) In this case, power off the server, and power it on.

Important

Do not set a password before OS is installed.

3. If the <Esc> key is pressed, the logo disappears and the details of POST are displayed.

Tips

If **Quiet Boot** is **Disabled** from **Boot** menu in BIOS settings, the logo is not displayed without requiring <ESC> key to be pressed.

4. POST displays several types of message. These messages let you know that the installed CPU or memory capacity is detected.

5. After a while, the following message is displayed on the screen.

Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network

By pressing the designated function key following messages, you can call the functions below upon completion of POST.

- <F2> key: Run the SETUP. For information on the SETUP, refer to *Chapter 3 (2. System BIOS Setup)*.
- <F3> key: Run EXPRESSBUILDER from Internal Flash Memory (optional). For information on EXPRESSBUILDER, refer to *Chapter 3 (4. EXPRESSBUILDER)*.

Note

- If the optional Internal Flash Memory is not installed in the system, the <F3> key message will not be displayed.
- The <F3> key must be pressed within 5 seconds of the message being displayed.
- Note that the server will not boot from the Internal Flash Memory even if it is specified to do so by pressing the <F3> key, as long as a bootable CD/DVD-ROM is set on the drive with the boot priority of CD/DVD-ROM is set to higher than hard disk drive.

- <F4> key: Run the offline tool. For information on the offline tool, refer to *Chapter 1 (9. Offline Tools) in "Maintenance Guide"*.
- <F12> key: Boot from network.

6. If a controller which has its dedicated BIOS such as a RAID controller board is installed, a message that prompts you to start the dedicated utility to set each board is displayed.

Example: If an optional RAID Controller is installed

Press <Ctrl> <H> for Web BIOS

The utility starts by pressing the <Ctrl> + <H> keys.

For details on the utility, refer to the manual supplied with each optional board.

Depending on the configuration, the message "Press Any Key" might appear to prompt a key entry. This is a behavior of the BIOS of the optional board. Continue to operate after checking the manual of the optional board.

7. The OS starts when POST is completed.

1.1.2 POST error messages

When POST detects an error, it displays an error message on the screen or beeps for some errors. For descriptions of error messages, causes, and countermeasures, refer to *Chapter 3 (1. POST Error Message) in "Maintenance Guide"*.

Note

- Take notes on the messages displayed before consulting with your maintenance service company. Alarm messages are useful information for maintenance.

2. System BIOS Setup

This section describes how to configure Basic Input Output System (BIOS).

Before you install the server and add or remove optional devices, make sure you have read and understood this section to configure properly.

2.1 Overview

BIOS Setup Utility (SETUP) is a utility to do basic hardware settings. This utility is pre-installed in the Internal Flash Memory in the server as standard and can be run without requiring a media for boot.

BIOS settings were configured with optimal settings before the server was shipped to you. Therefore, in most of cases, you should not need to use the SETUP. **Use only when the case applies to any of cases described in Chapter 3 (2.4 Cases that Require Configuration).**

2.2 Starting and Exiting SETUP Utility

2.2.1 Starting SETUP Utility

Run POST following *Chapter 3 (1.1.1 POST sequence)*.

After a while, the following message will be displayed on the lower left of the screen (On-screen message may differ from the one shown below depending on your environment).

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

If you press the <F2> key at this time, SETUP runs and displays the **Main** menu upon completion of POST. (You can also press <F2> key while expanding option ROM to display **Main** menu.)

Password

If you have set a password, a message prompt you to enter password will be displayed from the next time.

```
Enter password [          ]
```

You can attempt password entry up to 3 times. **If you entered a wrong password 3 times, operation stops.** (You cannot operate further.) Turn off the power.

2.2.2 Exiting SETUP Utility

To exit SETUP after saving parameters, select **Save & Exit** → **Save Changes and Exit**.

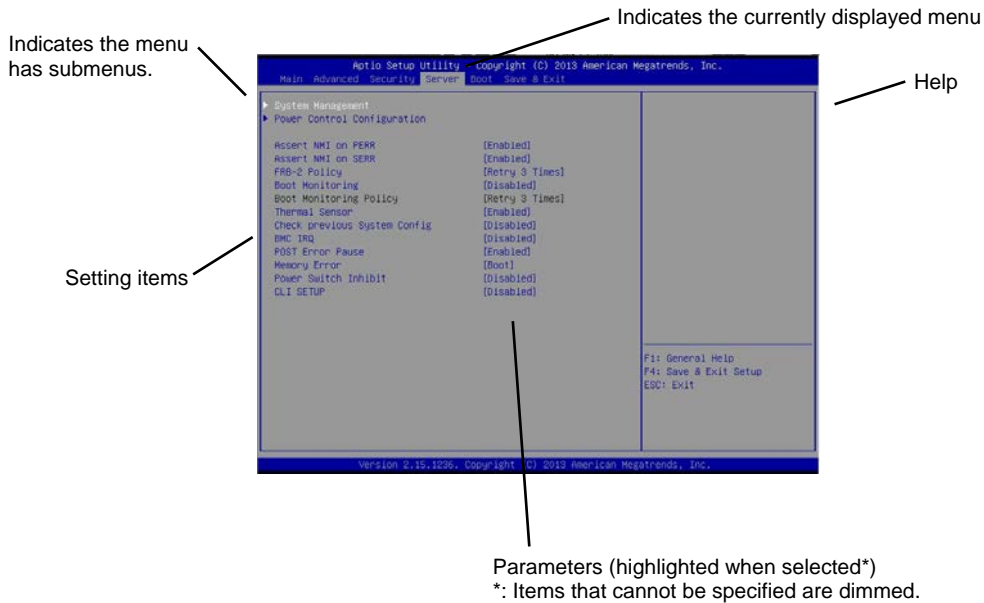
To exit SETUP without saving parameters, select **Save & Exit** → **Discard Changes and Exit**.

Tips

To restore the default value, select **Save & Exit** → **Load Setup Defaults**.
(The default value might be different from the factory setting.)

2.3 Description on On-Screen Items and Key Usage

This section shows display examples and how to control the key. Use the keyboard to work with the SETUP utility.



- Cursor keys (<↑>, <↓>)
Select an item displayed on the screen. If characters of an item are highlighted, that means the item is currently selected.
- Cursor keys (<←>, <→>)
Select menus including **Main**, **Advanced**, **Security**, **Server**, **Boot**, and **Save & Exit**.
- <→> key/<+> key
Change the value (parameter) of the selected item. You cannot use this key when a menu which has ► on the left is selected.
- <Enter> key
Press this key to confirm the selected parameter.
- <Esc> key
Cancels the pop-up screen. On submenu screen, pressing the <Esc> key returns to the previous screen. On top menu screen, the screen as shown below appears if you keep pressing the <Esc> key. If you select **Yes**, the SETUP closes without saving the changed parameters.

Quit without saving?	
[Yes]	No

- <F1> key
If you press this key, navigation for keyboard operation is displayed. If you need help using the SETUP, press this key. Press the <Esc> key to go back to the original screen.

<F2> key

If you press this key, the following window appears. If you select **Yes**, the previous parameter(s) are restored. If you have saved setting with [Save & Changes], the saved value is restored.

Load Previous Values?	
[Yes]	No

 <F3> key

If you press this key, the following window appears. If you select **Yes**, restore the parameters of the currently selected item to the default setting. (**This might be different from the parameters configured before shipment.**)

Load Setup Defaults?	
[Yes]	No

 <F4> key

If you press this key, the following window appears. If you select **Yes**, the parameter you configured is saved and SETUP closes.

Save configuration and exit?	
[Yes]	No

2.4 Cases that Require Configuration

Only if a case applies to any of following cases, use the SETUP utility to change a parameter which was configured as shipping defaults. A list of SETUP parameters and shipping defaults are described in **Chapter 2 (1. System BIOS) in "Maintenance Guide"**.

Category	Description	To be changed	Remark
Basic	Change date and time	Main → System Date Main → System Time	Configurable on OS
	Turn ON NumLock feature at power-on	Boot → Bootup Numlock State → ON	
	Hide display of logo during POST	Boot → Quite Boot → Disabled	By pressing the <Esc> key, prevent the display of the logo.
Memory	Add or change DIMM	Advanced → Memory Configuration → Memory Retest → Yes	After rebooting, Memory Retest changes No automatically.
	Use memory RAS feature	Advanced → Memory Configuration → Memory RAS Mode → set RAS mode appropriately	Some of RAS features may not be used depending on DIMM configuration.
Optional board	Disable Option ROM Scan of installed option board	Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCIXX Slot Option ROM → Disabled	XX is PCI slot number of the option board
Boot	Change the boot order of devices	Boot → Boot Option Priorities → Change the boot priority	When you use EXPRESSBUILDER, set <u>CD/DVD</u> to the highest priority.
	Use remote power on feature (via modem)	Advanced → Advanced Chipset Configuration → Wake On Ring → Enabled	
	Use remote power on feature (via RTC alarm)	Advanced → Advanced Chipset Configuration → Wake On RTC Alarm → Enabled	
	Use console redirection feature	Advanced → Serial Port Configuration → Console Redirection Setting → Change respective setting.	
Security	Set a password	Security → Administrator Password → Set a password Security → User Password → Set a password	If password is set, a message to enter password is displayed at next time SETUP is launched.
	Restrict bootup by entering password	Security → Password on Boot → Enabled	Can be selected when password is set.
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	Server → Power Control Configuration → AC-LINK → Power On	
	If it is turned off by using POWER switch, leave it OFF even when UPS supplies power.	Server → Power Control Configuration → AC-LINK → Last State	
	Keep the power OFF even when UPS supplies power.	Server → Power Control Configuration → AC-LINK → Stay off	

3. EXPRESSSCOPE ENGINE 3

3.1 Overview

EXPRESSSCOPE Engine 3 provides a variety of features using BMC (Baseboard Management Controller), which is a system management LSI.

EXPRESSSCOPE Engine 3 monitors the power unit, fans, temperature, and voltage of the server. If you have the management LAN port connected to the network, you can remotely perform the following over a web browser or SSH client:

- Manage the server
- Remotely control the keyboard, video, and mouse (KVM)*
- Remotely access a CD/DVD/floppy disk/ISO image/USB memory*.

* To enable this feature, the optional license for remote management (N8115-04) is required.

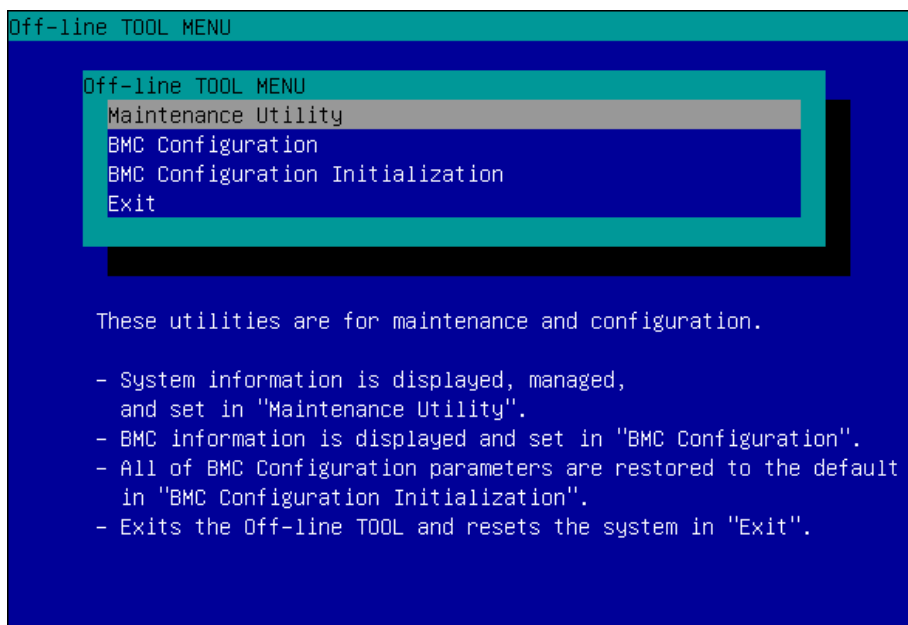
To actualize these functions, virtual USB mass storage (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is always connected as USB mass storage.

3.2 EXPRESSSCOPE ENGINE 3 Network configuration

To enable EXPRESSSCOPE Engine 3 to be used via network, network configuration is required. Below is an example of the configuration procedure which enables EXPRESSSCOPE Engine 3 to be used via a web browser.

1. Run POST following *Chapter 3 (1.1.1 POST sequence)*. Wait until the following message appears on the lower left of the screen.

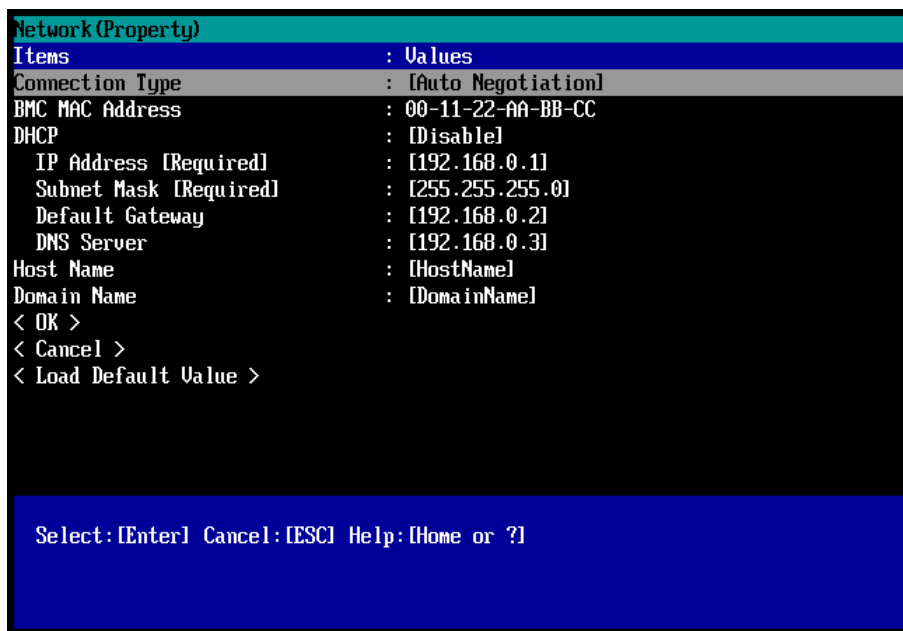
```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```
2. If you press the <F4> key at this time, ROM utility starts upon completion of POST. You can also press the <F4> key while the NEC logo is being displayed to open the Off-line TOOL MENU screen.
3. The keyboard selection screen appears. Select your keyboard type.
After that, the Off-line TOOL MENU screen appears. On this screen, specify the network settings for EXPRESSSCOPE Engine 3.
4. When the Off-line TOOL MENU appears, select **BMC Configuration, BMC Configuration, Network,** and then **Property**.



5. If **Property** is selected, the following screen is displayed. On this screen, specify whether to use DHCP and if DHCP is not used, configure IP Address/Subnet Mask.

Tips

If Shared BMC LAN is enabled, Web feature, remote media/KVM feature, or command line interface feature may be interrupted. In this case, wait for a while, and connect with network again.



6. Connect the LAN cable to the management LAN connector in order to connect to the network. It will be available for use if you access EXPRESSSCOPE Engine 3 via Web browser from PC for management according to the setting.

4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows or maintain the server.

4.1 Features of EXPRESSBUILDER

EXPRESSBUILDER provides the following features.

Feature	Description
Setup (Windows reinstallation)	Installs Windows on your server. Easily completes the process from RAID configuration to installation of applications. To use this feature, choose OS installation in Boot Selection Menu.
Bundled software*	Stores various bundled software, such as NEC ESMPRO Agent.
Maintenance	Diagnoses your server system. To use this feature, choose Tool menu in Boot Selection Menu.
Instruction manuals *	Stores various documents, such as " <i>User's Guide</i> ", " <i>Installation Guide</i> " and " <i>Maintenance Guide</i> ".

* Manuals and some software components are not stored in N8115-09 Internal Flash Memory (optional).

4.2 Usage of EXPRESSBUILDER

If you want to install Windows, start EXPRESSBUILDER by using the following ways.

EXPRESSBUILDER disc:

Insert the disc into the server and either turn on the server or restart the server by pressing <Ctrl> + <Alt> + <Delete> keys. EXPRESSBUILDER starts from disc.

If you want to install any bundled software or see manuals, insert the disc into a computer running Windows. Autorun menu appears automatically.

N8115-09 Internal Flash Memory (optional):

Confirm that the EXPRESSBUILDER disc or other bootable disc is not inserted. Press <F3> key when the following message appears on POST screen.

Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network

5. Installing Software Components

Continue to install software components such as OS.

Refer to the instructions below.

- [Installation Guide \(Windows\)](#)

6. Turning Off the Server

Turn off the server by using the following procedure. If the power cord of the server is connected to a UPS, refer to the documentation supplied with the UPS or the documentation for the application controlling the UPS.

1. Shut down the OS.
2. The server automatically turns off after the OS shuts down.
Confirm that POWER LED is OFF.
3. Turn off peripheral devices.

Tips

Hibernate function of Windows Server cannot be used. Do not set Hibernate at Windows shutdown.

NEC Express5800 Series Express5800/T120e

4

Appendix

1. Specifications
2. Interrupt Lines

1. Specifications

Model		N8100-2089F or N8100-2090F or N8100-2091F						
CPU	Type	Intel®Xeon® processor						
		E5-2403 v2	E5-2407 v2	E5-2420 v2	E5-2430 v2	E5-2440 v2	E5-2470 v2	
	Clock speed	1.80GHz	2.40GHz	2.20GHz	2.50GHz	1.9GHz	2.40GHz	
	Standard/Maximum	1/2						
	3rd cache	10M		15M		20M		25M
Number of cores (C) / Number of threads (T) (1 CPU)		4C/4T		6C/12T		8C/16T		10C/20T
Chipset		Intel® C602 chipset						
Memory	Standard/Maximum		Not pre-installed / Registered DIMM: 384GB(12x 32GB)					
	Memory module		DDR3L-1333 Registered DIMM(32GB), DDR3L-1600Registered DIMM(4/8/16GB)					
	Maximum clock speed		1333MHz		1600MHz			
	Error check, correction		ECC, x4 SDDC, Memory LockStep (x8 SDDC)					
	Memory Sparing		Supported					
	Memory Mirroring		Supported					
Auxiliary storage device	Drive bay	Standard	-					
		Maximum	When 2.5-inch HDD cage (3x N8154-42F) is selected: SATA 24TB (24x 1TB), SAS 28.8TB (24x 1.1TB), SAS SSD 9.6TB (24x 400GB) When 3.5-inch HDD cage (2x N8154-44F) is selected: SATA 32TB (8x 4TB) When 3.5-inch Fixed HDD cage (N8154-43F) is selected: SATA 16TB (4x 4TB)					
		Hot swap	Supported (N8154-42F or N8154-44F is installed)					
	Interface level / RAID System		SATA 3Gb/s or 6Gb/s : RAID 0/1/10 (Standard), RAID 5/6/50/60 (Option), SAS 6Gb/s : RAID 0/1/5/6/10/50/60 (Option)					
	Optical disk drive		Internal DVD-ROM or internal DVDSuperMULTI (Option) *1					
	Device bay		5.25-inch device bay x2					
Expansion slots	Supported slot		1x PCI EXPRESS 3.0(x16 lane, x16 socket) (Full height, 300mm in length) 2x PCI EXPRESS 3.0(x8 lane, x8 socket) (Full height, 300mm in length) (Only one slot is available in 1-CPU configuration.) 1x PCI EXPRESS 2.0(x4 lane, x8 socket) (Full height, 300mm in length) 1x PCI EXPRESS 2.0(x1 lane, x4 socket) (Full height, 300mm in length)					
	Chip / VideoRAM		Management controller chip / 32MB					
Graphics	Graphic display / resolution		16,770,000 colors: 640x840, 800x600, 1,024x768, 1,280x1,024					
	Interface		9x USB 2.0(2x Front, 4x Rear, x3 Internal), 1x Analog RGB (Mini D-sub 15 pin, 1x Rear), 1x Serial port (RS-232C compliant /D-sub 9 pin, serial port A, 1x Rear, optional port can be used (up to two ports in total)), 2x 1000BASE-T LAN connector (1000BASE-T/100BASE-TX/10BASE-T supported, RJ45, 2x Rear), 1x Management LAN connector (100BASE-T/10BASE-T supported, RJ45, 1x Rear)					
Redundant power supply		Supported (hot-plug available)						
Redundant fan		Supported (option, hot-plug available)						
External dimensions (width × depth × height)*2.		N8100-2089F: 200.0mm x 599.0mm x 438.0mm (Front bezel, projections are excluded) 200.0mm x 611.0mm x 438.0mm (Front bezel, projections are included) N8100-2090F or N8100-2091F: 200.0mm x 599.0mm x 438.0mm (Front bezel, projections are excluded) 200.0mm x 626.0mm x 438.0mm (Front bezel, projections are included)						
Weight (Min.*3/ Max.)		17kg / 33kg						
Power supply		N8100-2089F: 700W 80 PLUS® Glod compliant (bipolar grounded outlet) (hot-plug unavailable, AC 100/200V±10%) N8100-2090F or N8100-2091F: 2x 450W or 800W 80 Plus® Platinum compliant (bipolar grounded outlet) (hot-plug available, AC 100/200V±10%, 50/60Hz±3Hz)						
Power consumption (100V at maximum configuration, standby state)		304VA/302W	275VA/273W	274VA/272W	269VA/267W	308VA/306W	284VA/282W	
Power consumption (100V at maximum configuration, high-load state)		372VA/371W	362VA/361W	435VA/433W	457VA/455W	518VA/516W	568VA/566W	
Environmental requirements Temperature/Humidity		Operating: 10 to 40°C /20 to 80%, Storage: -10 to 55°C /20 to 80%(no condensation either when operating or when stored)						
Main accessories		EXPRESSBUILDER (NEC ESMPRO Manager) (Windows), NEC ESMPRO Agent, User's Guide (electronic document) included, Getting Started, Notes on Use, Warranty, Security key						
Installed OS		-						
Supported OSs		Microsoft Windows Server 2008 Standard (RTM, SP2 or later), Microsoft Windows Server 2008 Enterprise (RTM, SP2 or later), Microsoft Windows Server 2008 Standard (x64) (RTM, SP2 or later), Microsoft Windows Server 2008 Enterprise (x64) (RTM, SP2 or later), Microsoft Windows Server 2008 R2 Standard (RTM, SP1 or later), Microsoft Windows Server 2008 R2 Enterprise (RTM, SP1 or later), Microsoft Windows Server 2012 Standard, Microsoft Windows Server 2012 Datacenter Red Hat Enterprise Linux 5.9 or later (x86), Red Hat Enterprise Linux 5.9 or later (EM64T) Red Hat Enterprise Linux 6.4 or later (x86), Red Hat Enterprise Linux 6.4 or later (x86_64)						

*1 If you do not intend to install an internal DVD-ROM or an internal DVD SuperMULTI in all systems, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.

*2 For outer dimension of server including dust-proof kit, refer to "Dust-proof kit and dust-proof filter" in System Configuration Guide.

*3 Minimum configuration allowable for operation (1x CPU, 1x DIMM, and 1x HDD)

2. Interrupt Lines

Interrupt lines are assigned as factory settings as shown below. Use this table as a reference when you add optional devices.

- **Interrupt lines**

As factory settings, interrupt lines are assigned as follows.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	12	–
1	–	13	Numeric data processor
2	–	14	–
3	COM 2 serial port	15	–
4	COM 1 serial port	16	LAN1, USB
5	–	17	LAN2, SATA
6	–	18	SM Bus, VGA
7	–	19	–
8	Real-time clock	20	–
9	ACPI Compliant System	21	–
10	PCI	22	–
11	Motherboard resource	23	USB