Fujitsu SPARC M12-2/M12-2S

Service Manual

Manual Code: C120-0019-18EN
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Contents

Preface

This document describes the maintenance procedures for the Oracle or Fujitsu SPARC M12.
The document can also be used as a disassembly procedure for disposal or recycling.
The maintenance work should be performed by service engineers and/or field engineers.

Fujitsu SPARC M12 is sold as SPARC M12 by Fujitsu in Japan.
Fujitsu SPARC M12 and SPARC M12 are identical products.

Audience

This document is intended for trained technicians and authorized service personnel who have been instructed on the hazards within the equipment and are qualified to remove and replace hardware. They may be called service engineers or field engineers.

Related Documentation

All documents for your server are available online at the following locations.

- Sun Oracle software-related documents (Oracle Solaris, etc.)
  https://docs.oracle.com/en/

- Fujitsu documents
  Global site

  https://www.fujitsu.com/global/products/computing/servers/unix/sparc/downloads/manuals/

  Japanese site

  https://www.fujitsu.com/jp/products/computing/servers/unix/sparc/downloads/manual/

The following table lists documents related to SPARC M12 systems.

Documentation Related to the SPARC M12

Manual Names (*1)
Fujitsu SPARC M12 Product Notes
Fujitsu SPARC M12 Quick Guide
Fujitsu SPARC M12 Getting Started Guide (*2)
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Important Legal and Safety Information (*2)
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Safety and Compliance Guide
Software License Conditions for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Security Guide
Fujitsu SPARC Servers/SPARC Enterprise/PRIMEQUEST Common Installation Planning Manual
Fujitsu SPARC M12-1 Installation Guide
Fujitsu SPARC M12-2 Installation Guide
Fujitsu SPARC M12-2S Installation Guide
Fujitsu SPARC M12 PCI Card Installation Guide
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 RCIL User Guide (*3)
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF MIB and Trap Lists
Fujitsu SPARC M12-1 Service Manual
Fujitsu SPARC M12-2/M12-2S Service Manual
Crossbar Box for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual
PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Glossary
External USB-DVD Drive user guide

*1 The listed manuals are subject to change without notice.
*2 Printed manuals are provided with the product.
*3 This document applies specifically to the SPARC M12/M10 and FUJITSU ETERNUS disk storage system.

Notes on Safety

Read the following documents thoroughly before using or handling the SPARC M12.

- *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Important Legal and Safety Information*

- *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Safety and Compliance Guide*

Text Conventions

This manual uses the following fonts and symbols to express specific types of information.

Font/Symbol	Meaning	Example
`AaBbCc123`	What you type, when contrasted with on-screen computer output. This font is used to indicate an example of command input.	`XSCF>` **`adduser jsmith`**

`AaBbCc123`	The names of commands, files, and directories; on-screen computer output.
	This font is used to indicate an example of command output in the frame.
		`XSCF>` **`showuser -P`**
		`User Name:    jsmith`
		`Privileges:   useradm`
		`              auditadm`

Italic	Indicates the name of a reference manual.	See the *Fujitsu SPARC M12-2S Installation Guide*.
" "	Indicates the names of chapters, sections, items, buttons, or menus.	See "Chapter 2 Network Connection."

Command Syntax in the Text

While the XSCF commands have a section number of (8) or (1), it is omitted from the text.
For details on the commands, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual*.

Syntax of the Command-Line Interface (CLI)

The command syntax is as follows:

- A variable that requires the input of a value is in Italics.
- An optional element is enclosed in [].
- A group of options for an optional keyword is enclosed in [] and delimited by `|`.

Document Feedback

If you have any comments or requests regarding this document, please take a moment to share them with us. Along with the manual code, manual title, and page number, state your points specifically at one of the following websites:

- Global site
  https://www.fujitsu.com/global/contact/
- Japanese site
  https://www.fujitsu.com/jp/products/computing/servers/unix/sparc/contact/

Chapter 1

Before Starting Maintenance Work

This chapter describes the safety precautions that must be observed before the start of any maintenance work, and the tools required for the maintenance work.

Check the following items to ensure that the work is done correctly:

- Warning/Caution Indications
- Labels
- RFID Tag
- Safety Precautions
- Precautions on Static Electricity
- Other Precautions
- Emergency Power-Off
- Tools Required for Maintenance

1.1 Warning/Caution Indications

This manual uses the following conventions to indicate warning and alert messages, which are intended to prevent injury to the user and others as well as damage to property.

Warning - "WARNING" indicates a potential hazard that could result in death or serious personal injury if the user does not perform the procedure correctly.

Caution - "CAUTION" indicates a potential hazard that could result in minor or moderate personal injury if the user does not perform the procedure correctly. This also indicates that damage to the unit itself or other property may occur if the user does not perform the procedure correctly.

1.2 Labels

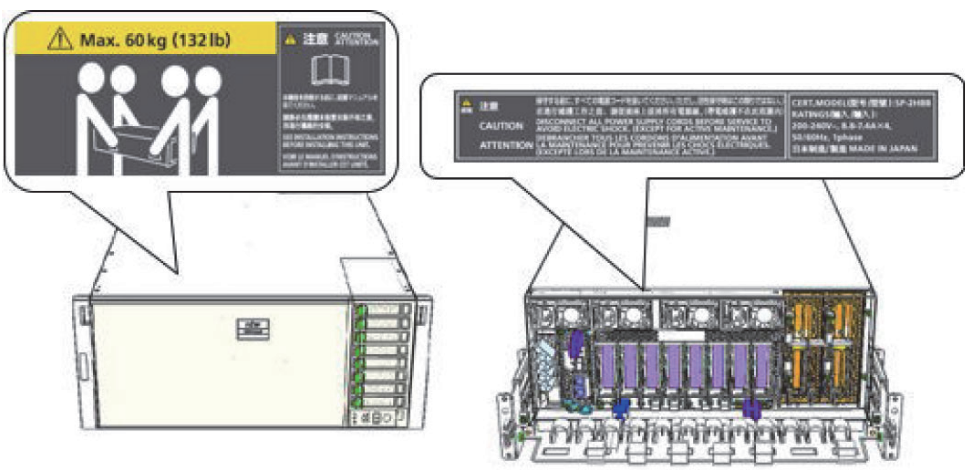
This section describes the labels affixed on the SPARC M12-2/M12-2S.
The labels affixed on the SPARC M12-2/M12-2S unit identify the operation panel as "OPNLU", whereas this manual identifies it as "OPNL".

Caution - Never peel off the labels.

1.2.1 Warning Labels

Warning labels are affixed on the top and rear of the SPARC M12-2/M12-2S (Figure 1-1). When performing maintenance work, observe the instructions given in the warning label affixed on the top of the SPARC M12-2/M12-2S. The warning label affixed on the rear of the SPARC M12-2/M12-2S describes the power requirements. The designs of the warning labels may differ depending on when the product is purchased.

Figure 1-1 Locations of Warning Labels

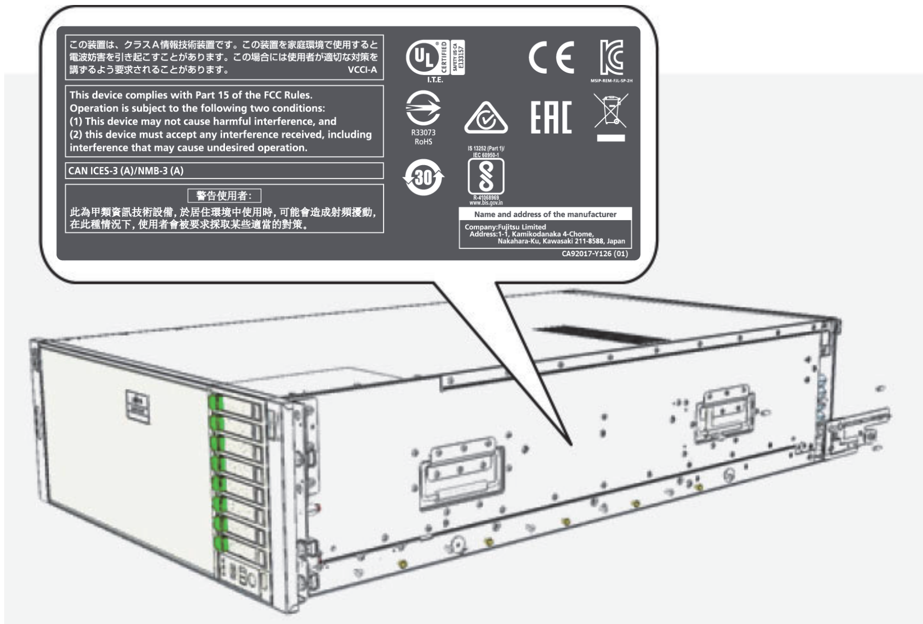


1.2.2 Standard Label

The standard label is affixed in the center of the right side of the SPARC M12-2/ M12-2S chassis as seen from the front (Figure 1-2). The standard label describes the standards for which certification has been obtained.

- Safety: UL/cUL and BIS
- Radio wave: VCCI, FCC, ICES, and KCC
- Safety and radio wave: CE, BSMI, EAC, and RCM

Figure 1-2 Location of the Standard Label

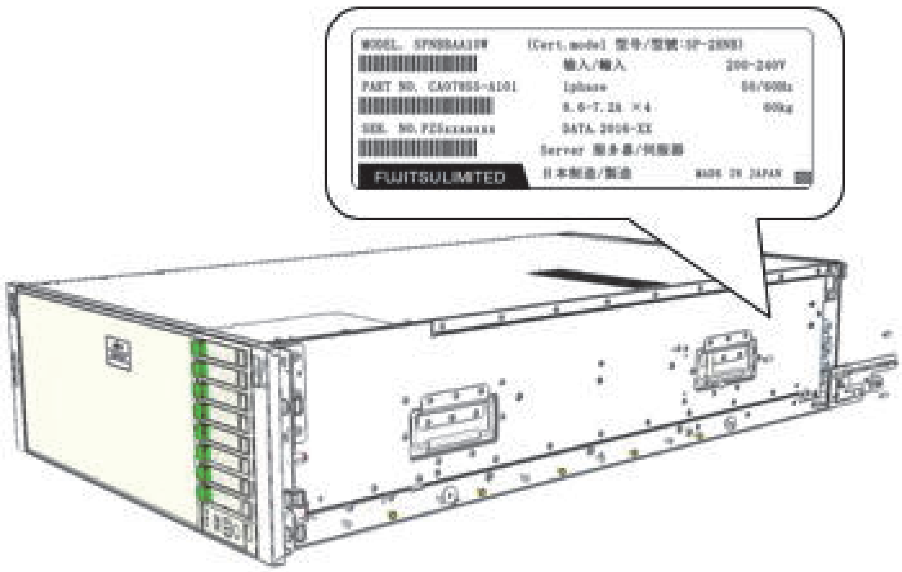


For the latest information on the standards for which certification has been obtained, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Safety and Compliance Guide*. The design of the standard label may differ depending on when the product is purchased.

1.2.3 System Nameplate Label

The system nameplate label is affixed in the rear of the right side of the SPARC M12-2/M12-2S chassis as seen from the front (Figure 1-3). The system nameplate label describes the model number, serial number, manufacture date, rated voltage/current, number of phases, power supply frequency, and weight.
The design of the system nameplate label may differ depending on when the product is purchased.

Figure 1-3 Location of the System Nameplate Label

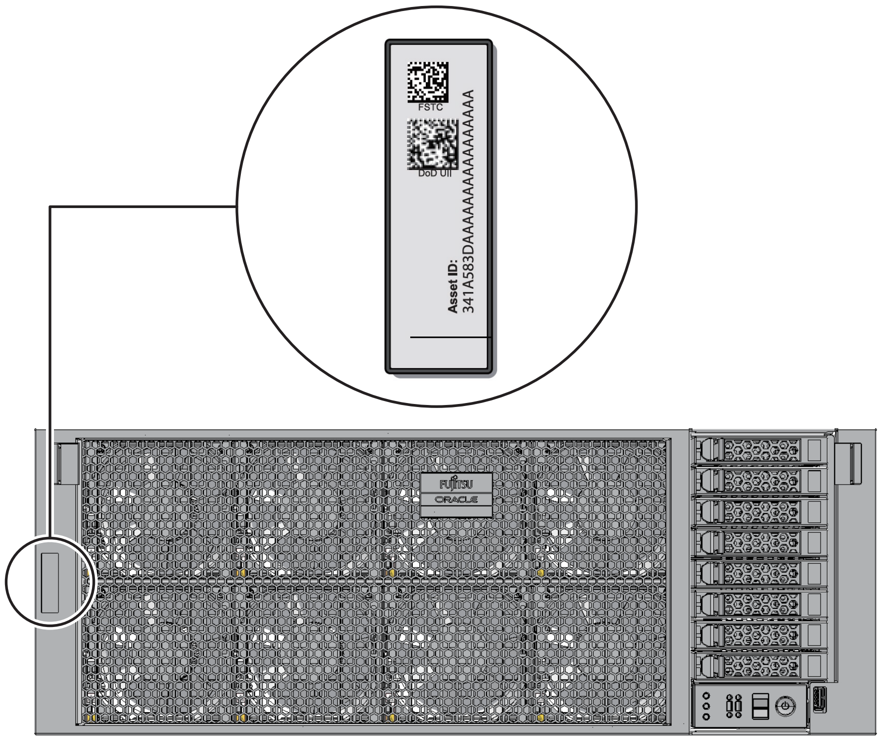


1.3 RFID Tag

The RFID tag is fixed to the chassis (Figure 1-4). The RFID tag carries an assert ID.

Note - The content of the RFID tag shown here may differ from that of the actually affixed one.

Figure 1-4 Location of the RFID Tag



1.4 Safety Precautions

Caution - Observe the following precautions to protect yourself when performing maintenance.

- Observe all the stated precautions, warnings, and instructions provided on the

SPARC M12-2/M12-2S.

- Do not insert any foreign object into the openings of the SPARC M12-2/M12-2S. Any object that touches high-voltage circuitry or causes a unit to short circuit may cause a fire or electric shock.

Safety precautions when working with electricity

- Confirm that the voltage and frequency of your input power match the electrical rating described on the system nameplate label affixed on the server.
- Wear a wrist strap when handling the internal storage (HDD/SSD), CPU memory unit (upper/lower), memory, or other printed circuit boards.
- Use grounded power outlets.
- Do not attempt to make any mechanical or electrical modifications. Fujitsu Limited shall not be responsible for regulatory compliance of a modified SPARC M12-2/M12-2S.

Safety precautions regarding racks

- The rack must be fixed to the floor, ceiling, or nearest frame.
- The quakeresistant options kit may be supplied with the rack. The use of the quakeresistant options kit prevents the rack from falling over during the installation or maintenance of the SPARC M12-2/M12-2S.
- In the following case, a safety evaluation must be performed by a field engineer before installation or maintenance.
  - When the quakeresistant options kit is not supplied and the rack is not fixed to the floor with bolts: Check safety such as whether the rack may fall.
- When mounting multiple SPARC M12-2/M12-2S units in the rack, see "Planning and Preparing for System Installation" in the *Installation Guide* for your server.

1.5 Precautions on Static Electricity

Caution - Observe the precautions related to electrostatic discharge (ESD) as described in Table 1-1 to ensure the safety of personnel and the system.

Table 1-1 Precautions on ESD

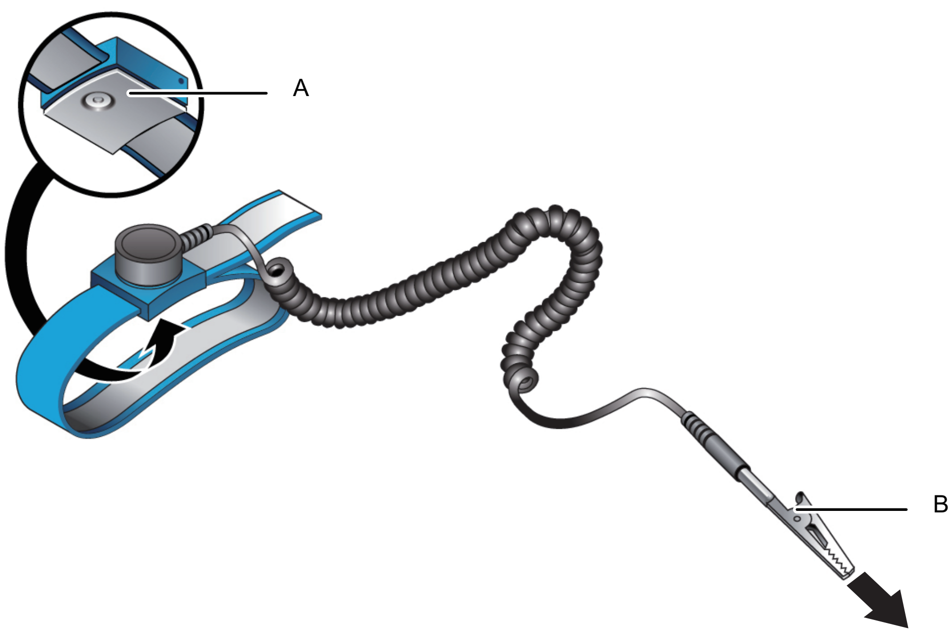
Item	Precaution
Wrist strap	Wear an antistatic wrist strap when handling printed boards and units containing electronic components.
ESD mat	An approved ESD mat provides protection from static damage when used with a wrist strap. The mat also acts as a cushion to protect the small parts that are attached to printed circuit boards.
Antistatic bag/ ESD safe packaging box	After removing a printed circuit board or unit, place it in the antistatic bag or ESD safe packaging box.

How to use a wrist strap

Wear a wrist strap in such a way that the inner metal surface (A in Figure 1-5) of the wrist strap band is in contact with your skin. Connect the clip (B in Figure 1-5) directly to the chassis.

Caution - Do not connect the wrist strap clip to the ESD mat. Connecting the wrist strap clip to the chassis ensures that the operator and units have the same electrical potential, thus eliminating the danger of static damage.

Figure 1-5 Wrist Strap Connection Destinations



1.6 Other Precautions

Caution - Observe the precautions shown below to ensure the safety of the system.

- The printed circuit boards in the SPARC M12-2/M12-2S can be easily damaged by static electricity. To prevent damage to the printed circuit boards, wear a wrist strap, and connect it to the chassis prior to starting maintenance.
- When mounting any unit in the SPARC M12-2/M12-2S, check the connectors beforehand to confirm that none of the pins are bent and that all the pins are neatly arranged in lines. If a unit is mounted with a bent pin in a connector, the SPARC M12-2/M12-2S may be damaged. When mounting a component, perform the work carefully so as not to bend any pins.
- If excessive force is applied to a CPU memory unit, the units mounted on printed circuit boards may be damaged. When handling a CPU memory unit, observe the following precautions.
  - Hold the CPU memory unit by the metal frame.
  - When holding the CPU memory unit, keep it horizontal until you lay it on the cushioned ESD mat.
  - The CPU memory unit consists of printed circuit boards connected with thin connection pins. Therefore, do not place the CPU memory unit on a hard surface.
  - Be careful not to damage the components located on either side of the CPU memory unit.
- The heat sinks can be damaged by incorrect handling. Do not touch the heat sinks while replacing or removing a CPU memory unit. If a heat sink is disconnected or otherwise damaged, obtain a replacement CPU memory unit. When storing or carrying a CPU memory unit, ensure that the heat sinks are sufficiently protected.
- When removing a cable such as a LAN cable, if you cannot reach the latch lock of the connector, use a flathead screwdriver, etc. to push the latch and release the cable. If you use force to remove the cable, the LAN port of the CPU memory unit or the PCI Express card may be damaged.
- Do not use any power cords other than those specified.
- Check the appearance of the products before starting work. When unpacking them, confirm that no unit is deformed, no connector is damaged, and there are no other such defects.
  Do not mount the products that have a defect in the appearance. Mounting a product that has a defect in appearance may damage the SPARC M12-2/M12-2S.

1.7 Emergency Power-Off

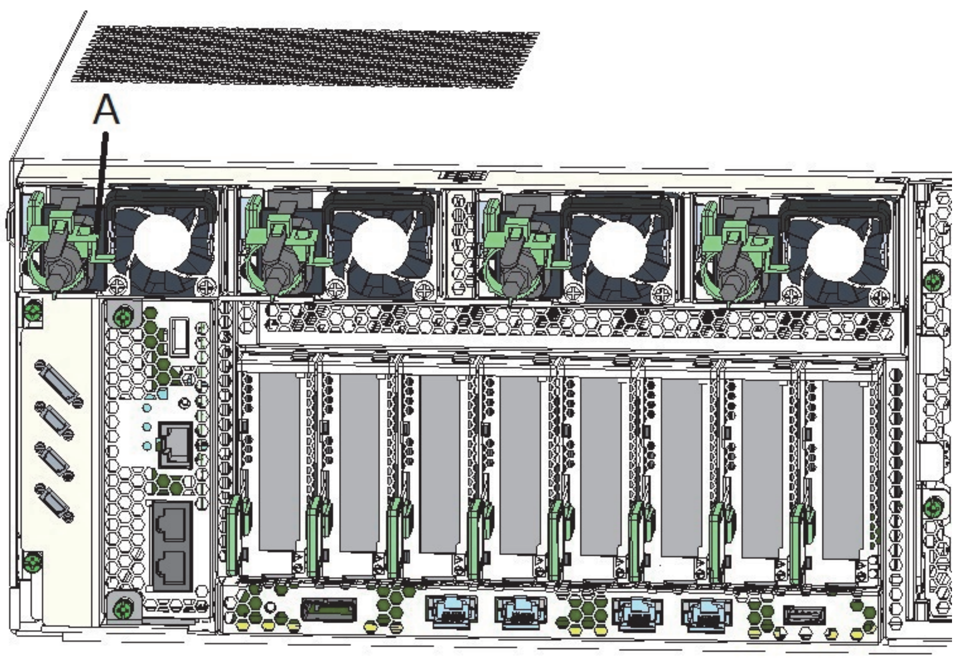
This section describes the procedure for powering off the system in an emergency.

Caution - In an emergency (such as smoke or flames coming from the SPARC M12-2/M12-2S), immediately stop using the unit and turn off the power supply. Give top priority to fire prevention, even if the system is in operation.

After removing the cable clamps from the power cords, remove the power cords from the power supply unit.

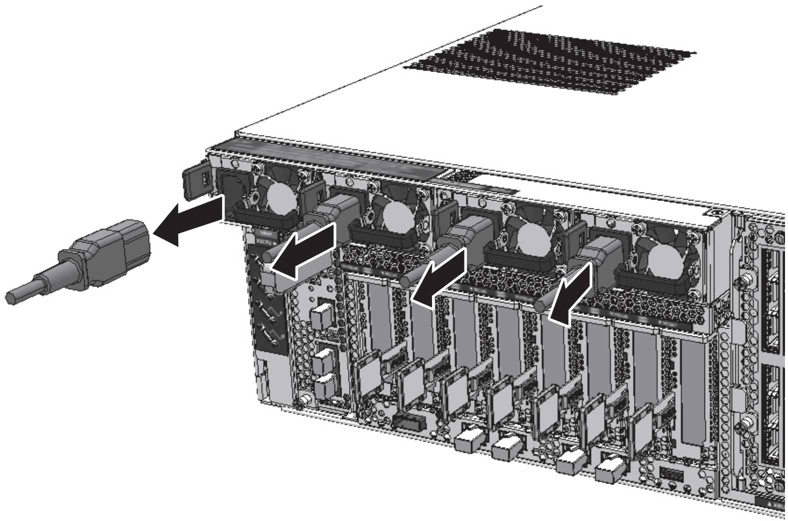
1. **Release the tab of the cable clamp (A in Figure 1-6).**

Figure 1-6 Releasing a Cable Clamp



2. **Remove the power cords from all the power supply units.**

Figure 1-7 Removing a Power Cord



1.8 Tools Required for Maintenance

Table 1-2 lists the tools required for FRU maintenance.

Table 1-2 Maintenance Tools

Item	Use
Phillips screwdriver (No. 2)	For removing or installing screws
Wrist strap	For static grounding
ESD mat	For static grounding
SAS-2 Integrated RAID Configuration Utility (*1)	For maintenance on hardware RAID volumes

*1 For details on how to obtain SAS-2 Integrated RAID Configuration Utility (SAS2IRCU) (referred to below as the SAS2IRCU utility) and the user guide, see "Obtaining SAS-2 Integrated RAID Configuration Utility" in the latest version of the *Fujitsu SPARC M12 Product Notes*.

Chapter 2

Understanding the System Units

This chapter describes the units mounted in the SPARC M12.

Before starting any maintenance work, you need to confirm and fully understand the configurations of the units mounted in the SPARC M12-2/M12-2S as well as the LED indications.

- Understanding the Names and Locations of the Units
- Checking the Memory Configuration Rules
- Understanding the OPNL Functions
- Understanding the LED Indications
- Understanding the Types of Cable

Note - In this manual, unless otherwise stated, "internal storage" refers to both a hard disk drive (HDD) and a solid state drive (SSD).

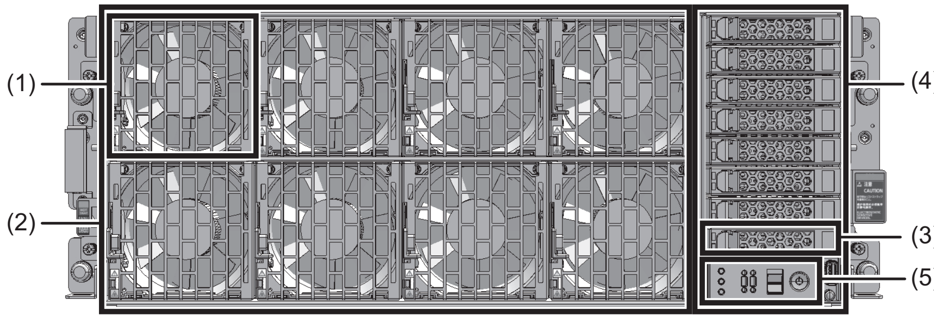
2.1 Understanding the Names and Locations of the Units

This section describes the names and locations of the units mounted in the SPARC M12.

2.1.1 Units Accessible From the Front

Figure 2-1 shows the types and mounting locations of units accessible from the front.

Figure 2-1 Units Accessible From the Front



Location No.	Unit
1	Fan unit (FANU)
2	Fan backplane unit (FANBPU)
3	Internal storage
4	HDD backplane unit (HDDBPU)
5	Operation panel (OPNL)

Shown in parentheses is an abbreviated name. Hereinafter, each component is represented by its abbreviated name.

You can access the FANU after removing the front cover from the SPARC M12-2/M12-2S.

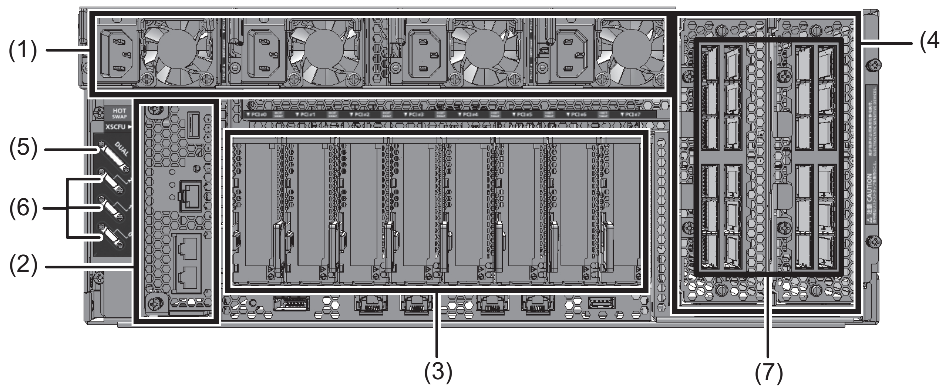
You can access the HDDBPU after removing the FANBPU from the SPARC M12-2/M12-2S.

You can access the OPNL after removing the HDD from the HDDBPU and then removing the HDDBPU from the SPARC M12-2/M12-2S.

2.1.2 Units Accessible From the Rear

Figure 2-2 shows the types and mounting locations of units accessible from the rear.

Figure 2-2 Units Accessible From the Rear



Location No.	Unit
1	Power supply unit (PSU)
2	XSCF unit (XSCFU)
3	PCIe card cassette (PCICS)
4	Crossbar unit (XBU) (*1)
5	XSCF DUAL control port
6	XSCF BB control port
7	Port for crossbar cable connection

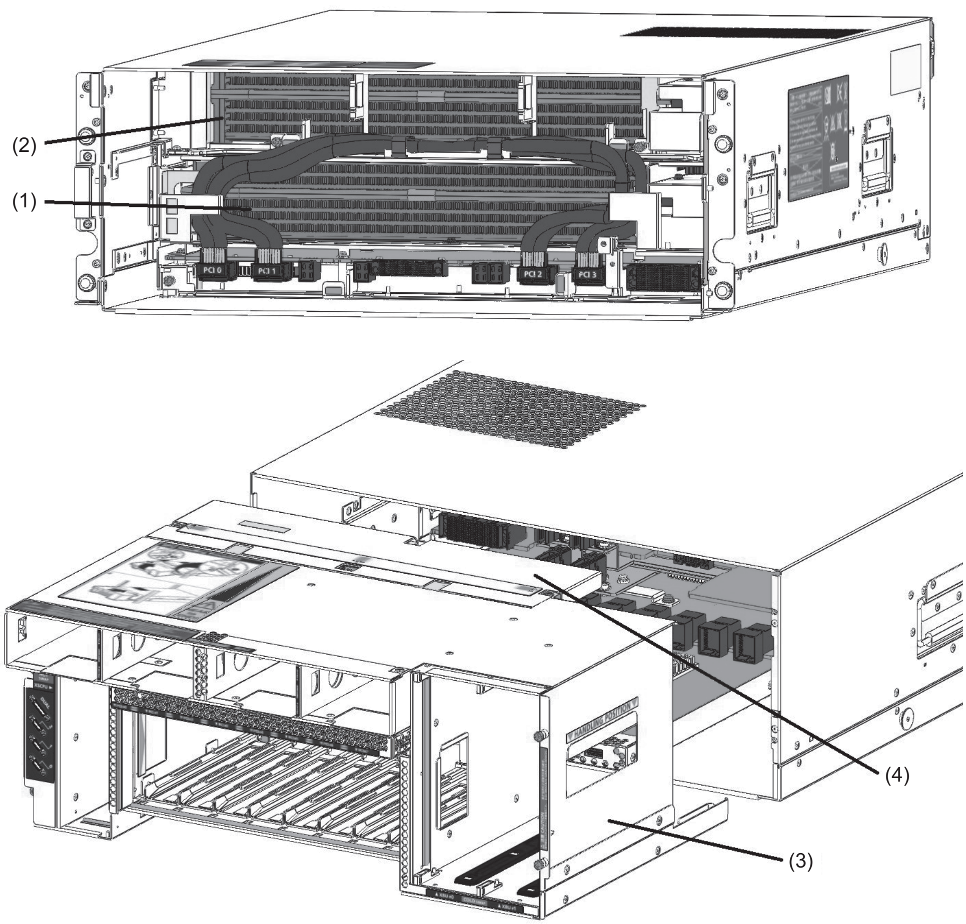
*1 This unit is mounted only in the SPARC M12-2S. In the case of the SPARC M12-2, you can mount the PCICS, which can house up to three PCIe cards.

Shown in parentheses is an abbreviated name. Hereinafter, each component is represented by its abbreviated name.

2.1.3 Internal Units

Figure 2-3 shows the types and mounting locations of internal units.

Figure 2-3 Internal Units



Location No.	Unit
1	CPU memory unit lower (CMUL) (*2)
2	CPU memory unit upper (CMUU) (*1) (*2)
3	Backplane unit (BPU)
4	PSU backplane unit (PSUBPU)

*1 When purchased with no CMUU mounted, the SPARC M12-2/M12-2S has a CMU filler unit mounted.
*2 The CMUL and the CMUU together are collectively called the CMU.

Shown in parentheses is an abbreviated name. Hereinafter, each component is represented by its abbreviated name.

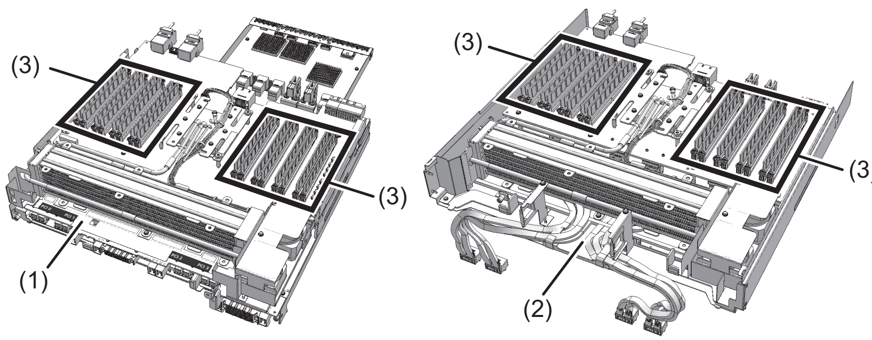
Figure 2-4 shows the CMUL and CMUU removed from the SPARC M12-2/M12-2S.

You can access the CMUL after removing the FANBPU, HDDBPU, and PCICS.

You can access the CMUU after removing the FANBPU and HDDBPU.

In the case of the SPARC M12-2S, you can access both the CMUU and CMUL after removing the XBU.

Figure 2-4 CMU Removed From the Server



Location No.	Unit
1	CPU memory unit lower (CMUL)
2	CPU memory unit upper (CMUU)
3	Memory (MEM)

Shown in parentheses is an abbreviated name. Hereinafter, each component is represented by its abbreviated name.

Note - You cannot replace the CPU alone.

2.2 Checking the Memory Configuration Rules

This section describes the memory installation rules and the method for checking memory information.

2.2.1 Memory Installation Rules

Install memory according to the following rules.

- Install the memory in units of eight modules.
- All of the memory installed in a unit of eight modules must be of the same capacity, rank, and type.
- Within the same system, you can install memory modules of different capacities. However, the memory installed in the DIMM slots under each CMU (CMUL or CMUU) must be a combination of memory modules shown in Table 2-1 and Table 2-2.
- When installing memory modules for the CMU in the SPARC M12-2/M12-2S (16 memory slots), install memory group A and then memory group B.
- When installing memory modules of different capacities for the CMU in the SPARC M12-2/M12-2S (24 memory slots), install memory group A, memory group B, and memory group C in this order, from largest to smallest capacity.
- For the SPARC M12-2S in a multiple-BB configuration, install at least one set of memory modules (eight dual inline memory modules (DIMMs)) in each chassis.
- To mount a 64 GB DIMM, see "Notes on Memory" in the latest version of the *Fujitsu SPARC M12 Product Notes*.

Table 2-1 Memory Module Combinations in the SPARC M12-2/M12-2S (16 Memory Slots)

	Memory Group	
	A	**B**
(a) 64 GB memory module	8 GB DIMM x 8	-
	8 GB DIMM x 8	8 GB DIMM x 8
(b) 128 GB memory module	16 GB DIMM x 8	-
	16 GB DIMM x 8	16 GB DIMM x 8
(c) 256 GB memory module	32 GB DIMM x 8	-
	32 GB DIMM x 8	32 GB DIMM x 8
(d) 512 GB memory module	64 GB DIMM x 8	-
	64 GB DIMM x 8	64 GB DIMM x 8
Mix of (a) and (b)	8 GB DIMM x 8	16 GB DIMM x 8
	16 GB DIMM x 8	8 GB DIMM x 8
Mix of (a) and (c)	8 GB DIMM x 8	32 GB DIMM x 8
	32 GB DIMM x 8	8 GB DIMM x 8
Mix of (b) and (c)	16 GB DIMM x 8	32 GB DIMM x 8
	32 GB DIMM x 8	16 GB DIMM x 8
Mix of (c) and (d)	32 GB DIMM x 8	64 GB DIMM x 8

Table 2-1 Memory Module Combinations in the SPARC M12-2/M12-2S (16 Memory Slots) *(continued)*

	Memory Group	
	A	B
	64 GB DIMM x 8	32 GB DIMM x 8

- : Empty

Table 2-2 Memory Module Combinations in the SPARC M12-2/M12-2S (24 Memory Slots)

	Memory Group		
	A	B	C
(b) 128 GB memory module	16 GB DIMM x 8	-	-
	16 GB DIMM x 8	16 GB DIMM x 8	-
	16 GB DIMM x 8	16 GB DIMM x 8	16 GB DIMM x 8
(c) 256 GB memory module	32 GB DIMM x 8	-	-
	32 GB DIMM x 8	32 GB DIMM x 8	-
	32 GB DIMM x 8	32 GB DIMM x 8	32 GB DIMM x 8
(d) 512 GB memory module	64 GB DIMM x 8	-	-
	64 GB DIMM x 8	64 GB DIMM x 8	-
	64 GB DIMM x 8	64 GB DIMM x 8	64 GB DIMM x 8
Mix of (b) and (c)	32 GB DIMM x 8	16 GB DIMM x 8	-
	32 GB DIMM x 8	16 GB DIMM x 8	16 GB DIMM x 8
	32 GB DIMM x 8	32 GB DIMM x 8	16 GB DIMM x 8
Mix of (c) and (d)	64 GB DIMM x 8	32 GB DIMM x 8	-
	64 GB DIMM x 8	32 GB DIMM x 8	32 GB DIMM x 8
	64 GB DIMM x 8	64 GB DIMM x 8	32 GB DIMM x 8

-: Empty

When configuring memory mirroring

In addition to the above installation rules, observe the rules below as well when you configure memory mirroring.

- Configure a mirroring pair as a unit of eight modules by combining two sets of memory, with four modules per set. (See Figure 2-5 and Figure 2-6.)
- For memory groups A and B of each CPU in the SPARC M12-2/M12-2S (16 memory slots), install memory modules that are all of the same capacity and rank.
- For memory groups A, B, and C of each CPU in the SPARC M12-2/M12-2S (24 memory slots), install memory modules that are all of the same capacity and rank.
- Set the memory mirror mode for each CPU or CMU.

Memory Installation Locations and Memory Installation Patterns

Figure 2-5 and Figure 2-6 show all the memory installation locations, where a to f indicate memory installed in units of eight modules. Also, Table 2-3, Table 2-4, Table 2-5, Table 2-6, Table 2-7, and Table 2-8 list memory installation configurations. The memory installation locations vary depending on the number of mounted CMUs. When expanding or reducing memory, see the figures and tables.

Figure 2-5 Memory Installation Locations in the SPARC M12-2/M12-2S (16 Memory Slots)

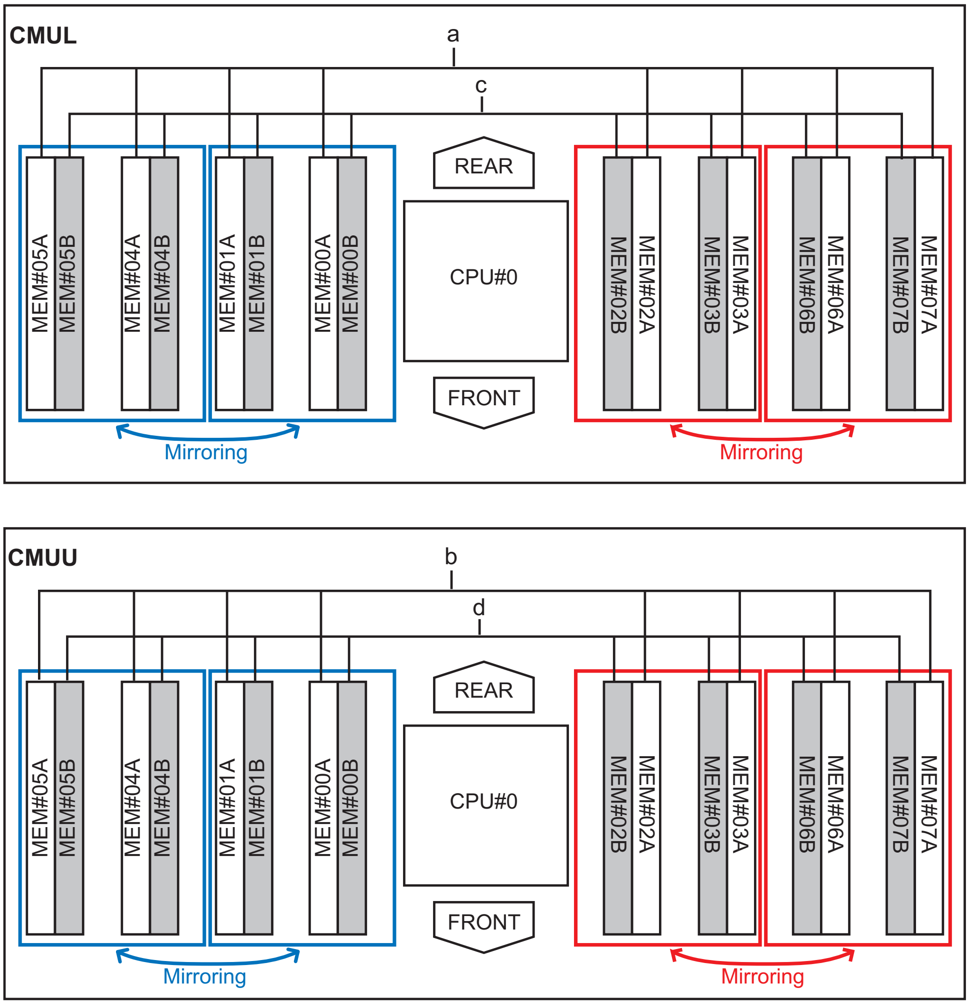
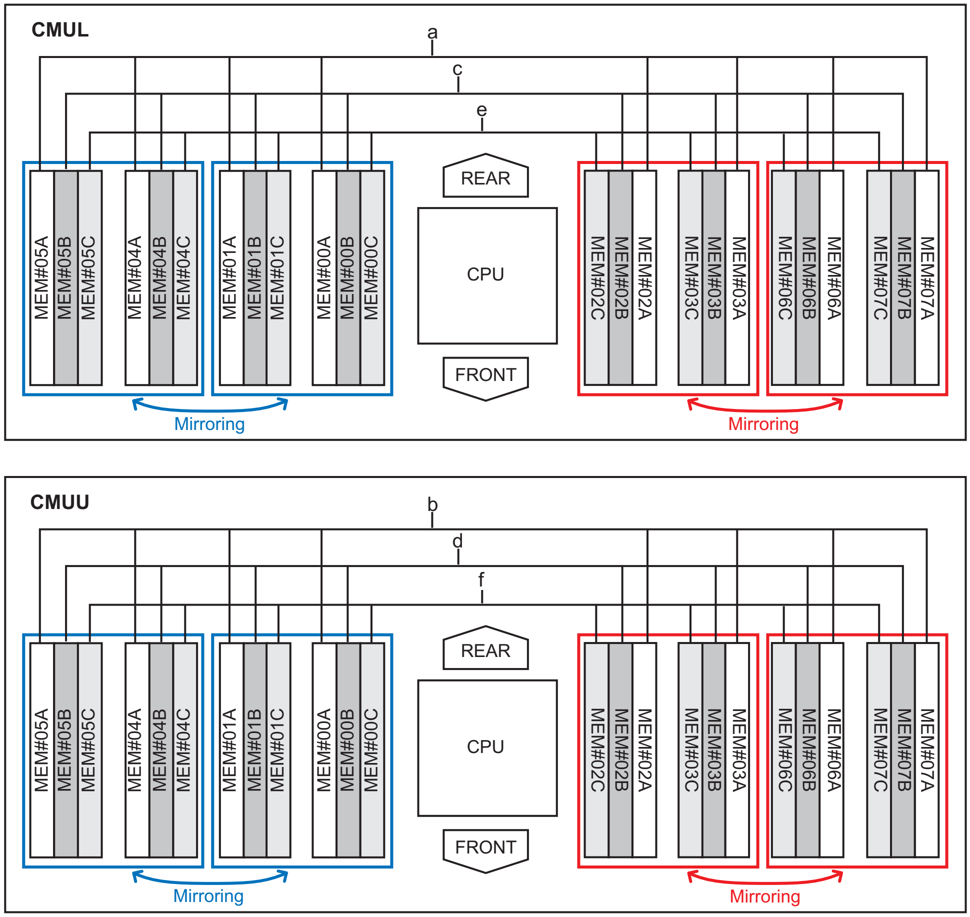


Figure 2-6 Memory Installation Locations in the SPARC M12-2/M12-2S (24 Memory Slots)



When only the CMUL is mounted

Table 2-3 Memory Installation Patterns (CMUL Only) in the SPARC M12-2/M12-2S (16 Memory Slots)

Memory Module Count	Installed Memory	
8	a in Figure 2-5	-
16	a in Figure 2-5	c in Figure 2-5

Table 2-4 Memory Installation Patterns (CMUL Only) in the SPARC M12-2/M12-2S (24 Memory Slots)

Memory Module Count	Installed Memory		
8	a in Figure 2-6	-	-
16	a in Figure 2-6	c in Figure 2-6	-
24	a in Figure 2-6	c in Figure 2-6	e in Figure 2-6

When the CMUL and CMUU are mounted

Table 2-5 Memory Installation Patterns (CMUL and CMUU) in the SPARC M12-2/M12-2S (16 Memory Slots)

Memory Module Count	Installed Memory			
8	a in Figure 2-5	-	-	-
16	a in Figure 2-5	b in Figure 2-5	-	-
24	a in Figure 2-5	b in Figure 2-5	c in Figure 2-5	-
32	a in Figure 2-5	b in Figure 2-5	c in Figure 2-5	d in Figure 2-5

Table 2-6 Memory Installation Patterns (CMUL and CMUU) in the SPARC M12-2/M12-2S (24 Memory Slots)

Memory Module Count	Installed Memory					
8	a in Figure 2-6	-	-	-	-	-
16	a in Figure 2-6	b in Figure 2-6	-	-	-	-
24	a in Figure 2-6	b in Figure 2-6	c in Figure 2-6	-	-	-
32	a in Figure 2-6	b in Figure 2-6	c in Figure 2-6	d in Figure 2-6	-	-
40	a in Figure 2-6	b in Figure 2-6	c in Figure 2-6	d in Figure 2-6	e in Figure 2-6	-
48	a in Figure 2-6	b in Figure 2-6	c in Figure 2-6	d in Figure 2-6	e in Figure 2-6	f in Figure 2-6

When adding a CMUU

When installing memory by adding a CMUU to a chassis in which only the CMUL is mounted, you do not need to remove the memory installed in the CMUL.
Install memory using an installation configuration from Table 2-7/Table 2-8 or Table 2-5/Table 2-6.

Table 2-7 Memory Installation Patterns (CMUU Added) in the SPARC M12-2/M12-2S (16 Memory Slots)

Memory Module Count	Installed Memory			
8	a in Figure 2-5	-	-	-
16	a in Figure 2-5	c in Figure 2-5	-	-
24	a in Figure 2-5	c in Figure 2-5	b in Figure 2-5	-
32	a in Figure 2-5	c in Figure 2-5	b in Figure 2-5	d in Figure 2-5

Table 2-8 Memory Installation Patterns (CMUU Added) in the SPARC M12-2/M12-2S (24 Memory Slots)

Memory Module Count	Installed Memory					
8	a in Figure 2-6	-	-	-	-	-
16	a in Figure 2-6	b in Figure 2-6	-	-	-	-
24	a in Figure 2-6	b in Figure 2-6	c in Figure 2-6	-	-	-
32	a in Figure 2-6	b in Figure 2-6	c in Figure 2-6	d in Figure 2-6	-	-
40	a in Figure 2-6	b in Figure 2-6	c in Figure 2-6	d in Figure 2-6	e in Figure 2-6	-
48	a in Figure 2-6	b in Figure 2-6	c in Figure 2-6	d in Figure 2-6	e in Figure 2-6	f in Figure 2-6

2.2.2 Checking Memory Information

Check the type and size of memory by using the showhardconf command of the XSCF firmware.

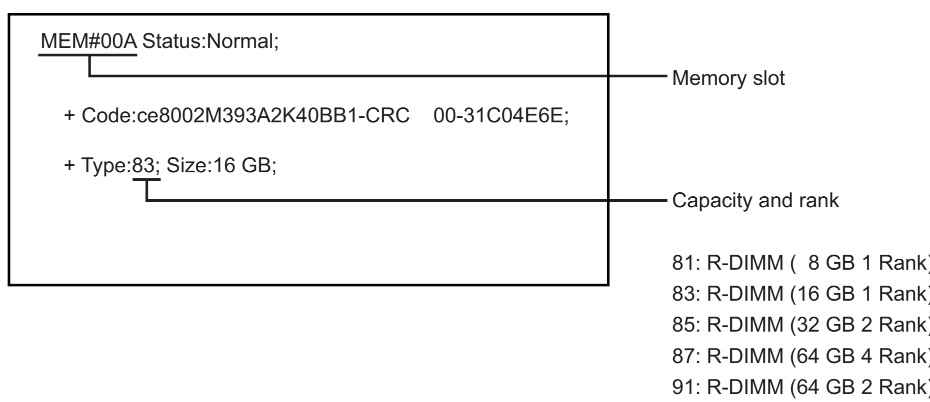
1. **Log in to the XSCF shell.**
2. **Execute the showhardconf command.**

[Command execution example]

```
XSCF> showhardconf
SPARC M12-2S;
    + Serial:PZ51649002; Operator_Panel_Switch:Service;
    + System_Power:On; System_Phase:Cabinet Power On;
    Partition#0 PPAR_Status:Running;
    BB#00 Status:Normal; Role:Master; Ver:3015h; Serial:PZ51649002;
        + FRU-Part-Number:CA20369-B17X 005AC/7341758              ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:2101h; Serial:PP164804GG  ;
            + FRU-Part-Number:CA07855-D301 A5   /7341541             ;
            + Memory_Size:128 GB; Type: C ;
```

```
            CPU#0 Status:Normal; Ver:4242h; Serial:00070051;
                + Freq:4.250 GHz; Type:0x30;
                + Core:12; Strand:8;
            MEM#00A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04E6E;
                + Type:83; Size:16 GB;
            :
        CMUU Status:Normal; Ver:2101h; Serial:PP164804GN  ;
            + FRU-Part-Number:CA07855-D451 A4   /7341568              ;
            + Memory_Size:128 GB; Type: C ;
            CPU#0 Status:Normal; Ver:4242h; Serial:00070043;
                + Freq:4.250 GHz; Type:0x30;
                + Core:12; Strand:8;
            MEM#00A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04EF7;
                + Type:83; Size:16 GB;
            :
        XBU#0 Status:Normal; Ver:1101h; Serial:PP164601DU  ;
            + FRU-Part-Number:CA20369-B18X 004AB/7341570              ;
            + Type: C ;
        XBU#1 Status:Normal; Ver:1101h; Serial:PP164601DV  ;
            + FRU-Part-Number:CA20369-B18X 004AB/7341570              ;
            + Type: C ;
        XSCFU Status:Normal; Ver:0101h; Serial:PP164603JA  ;
            + FRU-Part-Number:CA20369-B08X 006AC/7341765              ;
            + Type: A ;
            :
XSCF>
```

Figure 2-7 How to Interpret the Memory Information



2.3 Understanding the OPNL Functions

This section describes the functions of the OPNL mounted on the SPARC M12-2/

M12-2S.

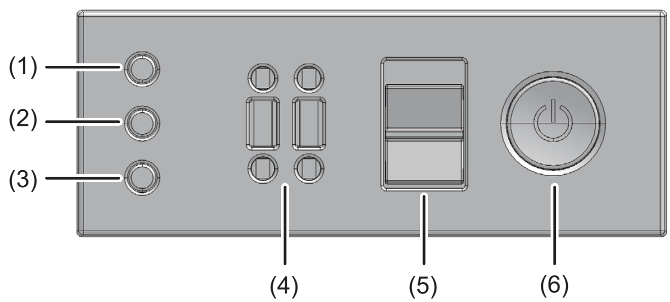
The OPNL is mounted at the lower right as seen from the front of the panel (see Figure 2-1).

The OPNL provides the display and control functions of the system. The field engineer and system administrator can control the operation mode or start/stop of the system while checking the LEDs indicating the system operation status.

Note - In a building block configuration, the functions of the Mode switch and POWER switch are disabled on the OPNL except for the master XSCF.

Note - In a building block configuration where the crossbar boxes are connected, all the OPNL functions are enabled only for the OPNL of the crossbar box used as the master XSCF.

Figure 2-8 OPNL



Location No.	LED/Switch
1	POWER LED
2	XSCF STANDBY LED
3	CHECK LED
4	BB-ID switch (only on SPARC M12-2S)
5	Mode switch
6	Power switch

Table 2-9 lists the functions of the OPNL LEDs and switches.

Table 2-9 Functions of the OPNL LEDs and Switches

OPNL LED/Switch	Functional Overview
POWER LED	Indicates the run/stop status of the SPARC M12-2/M12-2S.
XSCF STANDBY LED	Indicates the XSCF status of the system.
CHECK LED	Indicates any abnormality of the SPARC M12-2/M12-2S.

Table 2-9 Functions of the OPNL LEDs and Switches *(continued)*

OPNL LED/Switch	Functional Overview
BB-ID switch (*1)	Sets the identifier of the SPARC M12-2S.
Mode switch (*2)(*3)	Sets the system operation mode.
Power switch (*2)	Starts/Stops the system.

*1 The SPARC M12-2 has no BB-ID switch. The BB-ID is fixed to 0.
*2 In the building block configuration, this switch can be operated only with the SPARC M12-2S of the master XSCF.
*3 Set the same operation mode for both the SPARC M12-2S of the master XSCF and that of the standby XSCF. If the operation mode is different, an asterisk (*) is displayed next to the unit names in the output result of the showhardconf or showstatus command.

2.3.1 OPNL Display Function

The OPNL displays the following status and information with the three LED indicators shown as (1) to (3) in Figure 2-8. For details, see "2.4.1 OPNL LEDs."

- General system status
- System error warning
- System error location

2.3.2 OPNL Control Function

The OPNL allows you to perform the following operations with the three switches shown as (4) to (6) in Figure 2-8.

- BB-ID switch
  Sets the identifier of the SPARC M12-2S in a building block configuration.
- Mode switch (slide switch)
  Sets the operation mode of the SPARC M12-2/M12-2S either to Locked or Service.
- Power switch
  Starts or stops the system.

BB-ID switch

Use the BB-ID switch to set the BB-ID number of the SPARC M12-2S. Set a number from 00 to 15 as the BB-ID number. Table 2-10 lists the BB-ID switch operation methods.

Table 2-10 BB-ID Switch Operation Methods

Operation	Description
Pressing the + side	The BB-ID number increases by 1.
Pressing the - side	The BB-ID number decreases by 1.

Mode switch (slide switch)

Use the mode switch to set the operation mode for the system.
There are two system operation modes, Locked and Service. The mode can be switched as appropriate for the system status.
Set the Locked mode when the system is in operation and the Service mode for system maintenance.

Note - Set the same operation mode for both the SPARC M12-2S of the master XSCF and that of the standby XSCF.

Table 2-11 describes the major differences in system operations between the operation modes. For information on system operations other than those described in Table 2-11, see "Chapter 13 Switching to Locked Mode/Service Mode" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Table 2-11 System Operation Modes

Icon	Operation Mode	Description
	Locked mode	- Pressing of the POWER switch Starts the system. - Break signal Depends on the operation mode (break_signal) set for the physical partition (*1).
	Service mode	- Pressing of the POWER switch Stops the system when done for 4 seconds or more. - Break signal Valid regardless of the operation mode (break_signal) set for the physical partition (*1).

*1 Use the setpparmode command to set the operation mode for the physical partition. For details, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XCP version used.

Power switch

Use the POWER switch to start or stop the system.
The system starts or stops differently depending on how the POWER switch is pressed and the system operation mode.

Table 2-12 describes how the system starts or stops differently depending on how the POWER switch is pressed.

Table 2-12 Functions of the Power Switch

Icon	POWER Switch Pressing Time	Operation Mode	Description
	1 second or more and less than 4 seconds	Locked mode	The system starts when it is stopped. If a power-on wait time and warm-up time for the air conditioning facilities are set in the XSCF, the power-on time and warm-up completion wait time for the air conditioning facilities are omitted.
			The operation is invalid when the system is in operation. The system does not react if the POWER switch is pressed.
		Service mode	The operation is invalid, regardless of the operation status of the system. The system does not react if the POWER switch is pressed.
	4 seconds or more	Locked mode	The system starts when it is stopped.
			The operation is invalid in any case other than when the system is stopped. The system does not react if the POWER switch is pressed.
		Service mode	The system starts when it is stopped. If a power-on completion wait time and warm-up completion wait time for the air conditioning facilities are set in the XSCF, the wait times are omitted.
			When the system is in operation, the shutdown process is performed to stop the system.
			When the system is being started, the system startup process is canceled to stop the system.
			The operation is invalid when the system is being stopped. The system does not react if the POWER switch is pressed.

*1 If the system has been started, it means that at least one physical partition has been powered on.

2.4 Understanding the LED Indications

This section describes the functions of the LEDs mounted on the SPARC M12.

The LEDs are provided on the OPNL, system locator, and units. If hardware detects an error, an LED lets you identify the unit that contains the part suspected to be faulty.

2.4.1 OPNL LEDs

The three OPNL LEDs shown in Figure 2-9 indicate the operation status of the entire system.

In addition, you can check the system status by the combination of LEDs that are on, blinking, or off.

Table 2-13 lists the system operation status indicated by the LEDs, and Table 2-14 lists the system status indicated by the combination of LEDs.

Figure 2-9 OPNL LEDs

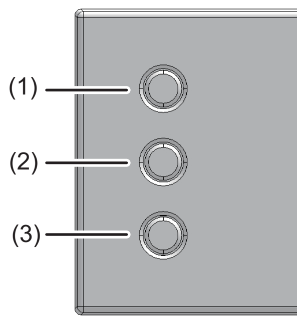


Table 2-13 System Operation Status Indicated by LEDs

Location No.	Icon	Name	Color	Description
1		POWER	Green	Indicates the operation status of the system including the target SPARC M12-2/M12-2S. - On: The system is running. - Off: The system is stopped. - Blinking: The system is being stopped.
2	XSCF	XSCF STANDBY	Green	Indicates the status of the XSCF for the entire system or for each SPARC M12-2/M12-2S. - On: The XSCF is running. - Off: The XSCF is stopped. (This includes the state where it is disconnected from the building block configuration and stopped.) - Blinking: The XSCF is being started.
3		CHECK	Amber	Indicates the operation status of the SPARC M12-2/M12-2S. - On: Hardware has detected an error. - Off: The target SPARC M12-2/M12-2S is operating normally. Or no power is being supplied. - Blinking: SPARC M12-2/M12-2S specified when the XSCF command instructing the blinking was executed. This (locator) is used to identify the location of the SPARC M12-2/M12-2S requiring maintenance.

Table 2-14 System Status Indicated by the Combination of LEDs

LED State			Description
POWER	XSCF STANDBY	CHECK	
Off	Off	Off	The power is disconnected.
Off	Off	On	The XSCF has detected an error before system start or after system stop.
Off	Blinking	Off	The XSCF is being initialized.
Off	On	Off	The XSCF is in the standby state. Or the system is waiting for power-on of the air conditioning facilities (in the data center).
On	On	Off	Warm-up standby processing is in progress. After the end of this processing, the system starts up. Or the system startup processing is in progress. Or the system is in operation.
On	On	On	Although the system is operating normally, an error has been detected.
Blinking	On	Off	System stop processing is in progress. The FANU stops after the processing ends.

2.4.2 System Locator

The field engineer or system administrator can identify which SPARC M12-2/M12-2S needs maintenance, by looking at the CHECK LED (A in Figure 2-10) on the rear of the SPARC M12-2/M12-2S. The CHECK LED is called the system locator and has the same function as CHECK on the OPNL.

Note that it is also used as the CHECK LED of the CMUL.
If this LED is on, check the operation status and error information of the corresponding SPARC M12-2/M12-2S to determine whether it is on as a system locator indication or to indicate a CMUL error.

Figure 2-10 Location of the System Locator

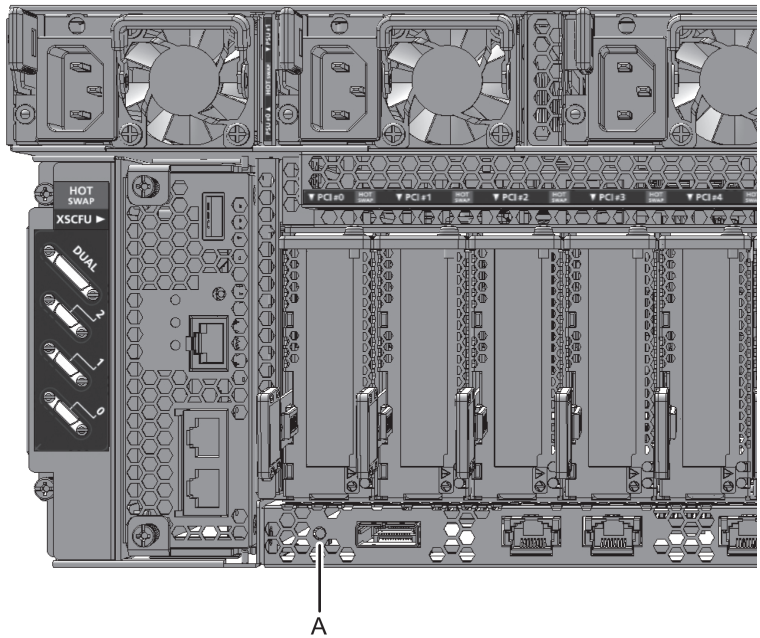


Table 2-15 Status of the System Locator

Icon	Name	Color	Description
⚠	CHECK	Amber	Indicates the operation status of the SPARC M12-2/M12-2S. - On: Hardware has detected an error. - Off: The target SPARC M12-2/M12-2S is operating normally. Or no power is being supplied. - Blinking: SPARC M12-2/M12-2S specified when the XSCF command instructing the blinking was executed. This (locator) is used to identify the location of the SPARC M12-2/M12-2S requiring maintenance.

2.4.3 LEDs of Each Unit

The SPARC M12 units have LEDs mounted on them. If a unit detects a hardware error, identify that unit by using the LED and perform maintenance work.

This section shows the LEDs on each unit and their states.

XSCFU

Figure 2-11 LED Locations on the XSCFU

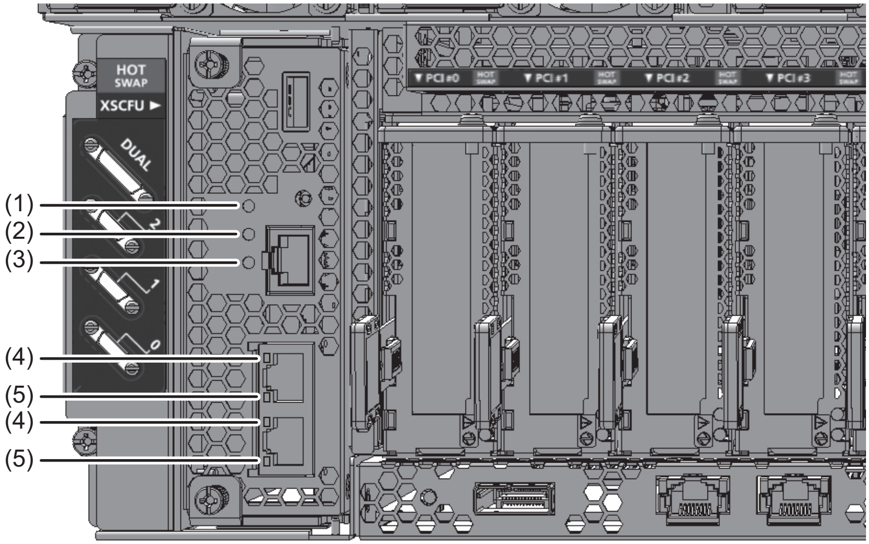


Table 2-16 XSCFU LEDs and Their States

Location No.	Name	Color	State	Description
1	READY	Green	On	The XSCF is running.
			Blinking	The XSCF is being started.
		-	Off	The XSCF is stopped. (This includes the state where it has been disconnected from the building block configuration and is stopped.)
2	CHECK	Amber	On	A hardware error has occurred in the XSCFU. (It is normal if the LED goes on for several seconds and then goes off immediately after the power on.)
			Blinking	Component that requires maintenance (This function is also called a locator.)
		-	Off	The XSCFU is in the normal state. Or no power is being supplied.
3	MASTER (SPARC M12-2S only)	Green	On	The XSCF is operating as the master XSCF.
			Blinking	The standby XSCF is switching over to the master XSCF.
		-	Off	The XSCF is being started. Or the XSCF is operating as the standby or slave XSCF.

Table 2-17 XSCF-LAN Port LEDs and Their States

Location No.	Name	Color	State	Description
4	ACT	Green	Blinking	Indicates that data transmission/reception is ongoing.
		-	Off	Indicates that data transmission/reception is not ongoing.
5	LINK SPEED	Amber	On	Indicates that the communication speed is 1 Gbps.
		Green	On	Indicates that the communication speed is 100 Mbps.
		-	Off	Indicates that the communication speed is 10 Mbps.

CMU (on-board LAN port)

Figure 2-12 LED Locations on the CMU (On-Board LAN Ports)

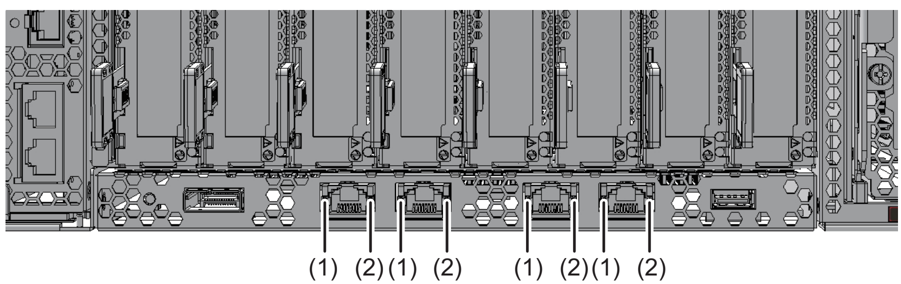


Table 2-18 CMU (On-Board LAN Port) LEDs and Their States

Location No.	Name	Color	State	Description
1	LINK SPEED	Green	On	Indicates that the communication speed is 10 Gbps.
		Amber	On	Indicates that the communication speed is 1 Gbps.
		-	Off	Indicates that the communication speed is 100 Mbps.
2	ACT	Green	Blinking	Indicates that data transmission/reception is ongoing.
		-	Off	Indicates that data transmission/reception is not ongoing.

FANU

Figure 2-13 LED Locations on the FANU

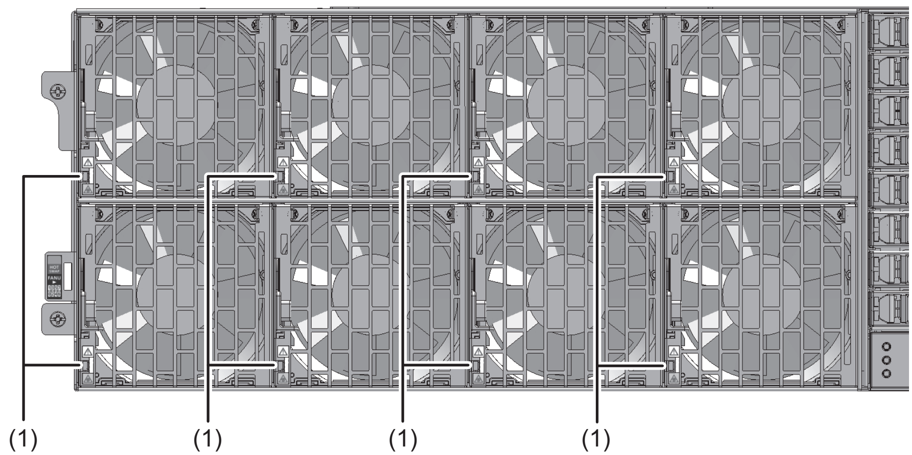


Table 2-19 FANU LEDs and Their States

Location No.	Name	Color	State	Description
1	CHECK	Amber	On	Indicates that an error has occurred.
			Blinking	Indicates that the unit (locator) requires maintenance.
		-	Off	Indicates the normal state.

PSU

Figure 2-14 LED Locations on the PSU

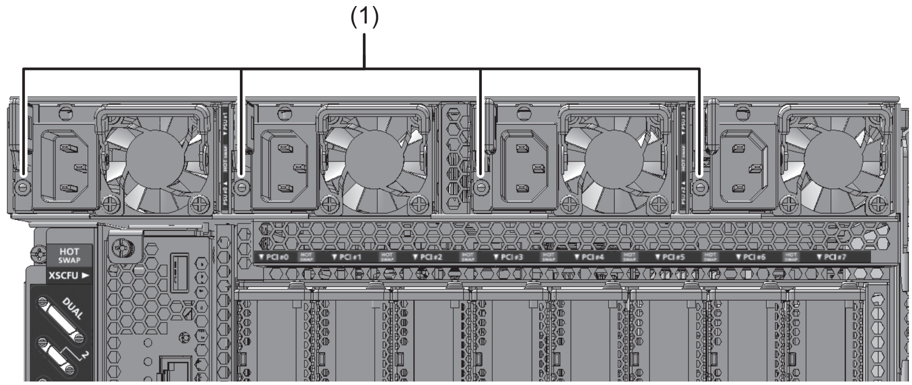


Table 2-20 PSU LEDs and Their States

Location No.	Name	Color	State	Description
1	CHECK	Green	On	The input power is on, and power is being supplied normally.
			Blinking	The power supply to this PSU is off.
		Amber	On	A hardware error has occurred. The input power to this PSU is turned off in redundant operation.
			Blinking	A hardware error has occurred, but this PSU is operating.
		-	Off	Indicates that power is not being supplied.

PCIe card slot

Figure 2-15 LED Locations of the PCIe Card Slots

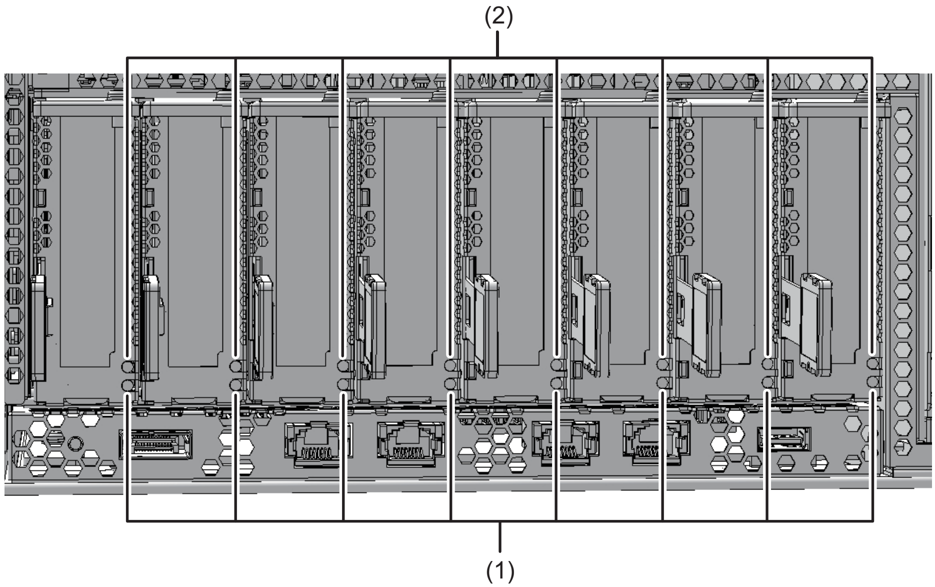


Table 2-21 PCIe Card Slot LEDs and Their States

Location No.	Name	Color	State	Description
1	POWER	Green	On	Indicates that power is being supplied.
		-	Off	Indicates that power is not being supplied.
2	ATTENTION	Amber	On	Indicates that an error has occurred.
			Blinking	Indicates that the unit (locator) requires maintenance.
		-	Off	Indicates the normal state.

HDD/SSD

Figure 2-16 LED Locations on the HDD/SSD

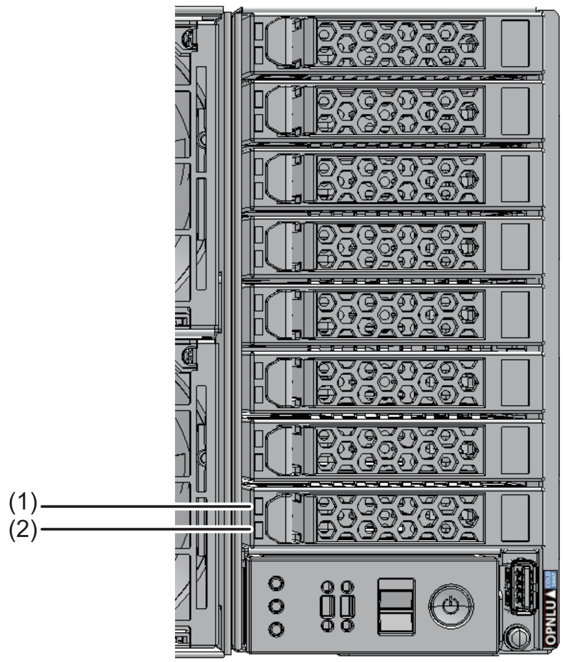


Table 2-22 HDD/SSD LEDs and Their States

Location No.	Name	Color	State	Description
1	READY	Green	Blinking	Indicates that the disk is being accessed. This LED is normally on, but it blinks while the disk is being accessed. While the LED is blinking, maintenance such as removal of the disk cannot be performed.
		-	Off	Indicates that maintenance such as removal of the disk can be performed.
2	CHECK	Amber	On	Indicates that an error has occurred.
			Blinking	Indicates that the unit (locator) requires maintenance.
		-	Off	Indicates the normal state.

2.5 Understanding the Types of Cable

This section describes the types of cables used to connect multiple SPARC M12-2S units or to connect a crossbar box to a SPARC M12-2S unit in a building block configuration, as well as their port locations.

The types and number of cables used vary depending on the number of SPARC M12-2S units in the building block configuration.

2.5.1 Types of Cable

In a building block configuration, use the following cables for connection:

- Crossbar cable
  Use either crossbar cables (optical) or crossbar cables (electrical) exclusively for the connections of the XBU mounted in each SPARC M12-2S. Use only crossbar cables (optical) for the connections between a crossbar box and the XBU in the SPARC M12-2S. Cables simply described as "crossbar cables" in this manual refer to both crossbar cables (optical) and crossbar cables (electrical).

- XSCF BB control cable
  This cable is used to connect XSCFs mounted in different SPARC M12-2S units or to connect a crossbar box and the XSCF of a SPARC M12-2S unit.

- XSCF DUAL control cable
  This cable is used to connect the master XSCF to a standby XSCF to duplicate the XSCF.

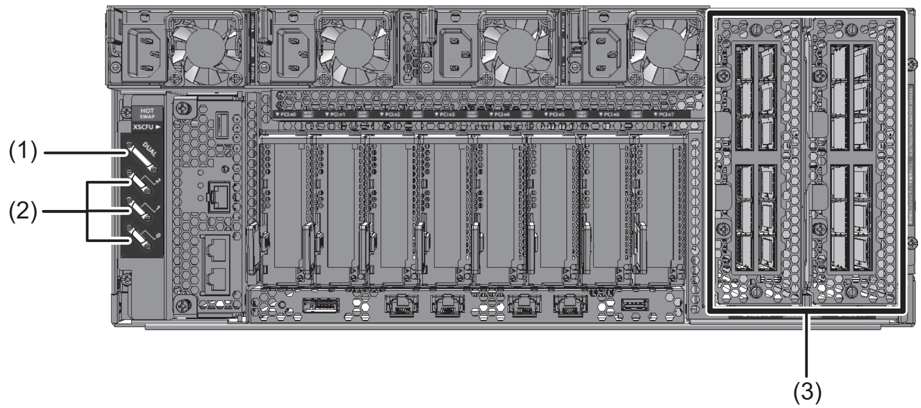
Each cable has an attached tag used for maintenance notes and management.

2.5.2 Ports for Cable Connections

Figure 2-17 shows the locations of the SPARC M12-2S ports for cable connections. For the cable maintenance procedures, see the following chapters:

- Chapter 19 Maintaining the Crossbar Cable
- Chapter 20 Maintaining the Crossbar Unit
- Chapter 21 Maintaining the XSCF DUAL Control Cable
- Chapter 22 Maintaining the XSCF BB Control Cable

Figure 2-17 Locations of the Ports for Cable Connections



Location No.	Port
1	XSCF DUAL control port
2	XSCF BB control port
3	Port for crossbar cable connection

Chapter 3

Understanding the Types of Maintenance

There are several types of maintenance on the field replaceable units (FRUs) of the SPARC M12.

This chapter first describes the types of maintenance and then describes, by model, which types of maintenance are applicable to each FRU. The maintenance work procedure varies depending on the type of maintenance. Before starting maintenance work, fully understand the features of each type of maintenance so as to determine the type to apply.

For specific work procedures corresponding to the types of maintenance, see "Chapter 4 FRU Replacement Workflows," "Chapter 5 FRU Addition Workflows," and "Chapter 6 FRU Removal Workflows."

Table 3-1 defines the terms used in this and subsequent chapters.

Table 3-1 Definitions of Terms

Term	Definition
Physical partition requiring maintenance	Physical partition to which the SPARC M12-2/M12-2S belongs that has the FRU requiring maintenance mounted in it
SPARC M12-2/M12-2S requiring maintenance	SPARC M12-2/M12-2S chassis with the FRU requiring maintenance mounted in it
BB configuration	Building block configuration A configuration consisting of one SPARC M12-2S unit is referred to as the 1BB configuration. A configuration consisting of two SPARC M12-2S units is referred to as the 2BB configuration. And a configuration consisting of multiple SPARC M12-2S units is referred to as the multiple-BB configuration.

3.1 Types of Maintenance

The types of FRU maintenance are classified according to the operation status of the physical partition (PPAR) and the hot/cold status of the SPARC M12-2/M12-2S.

Classification by physical partition (PPAR) operation status

The types of maintenance have the following three classifications according to the operation status of the physical partition (PPAR) to which the FRU requiring maintenance belongs:

- Active maintenance
  Maintenance is performed on a FRU while the physical partition to which the FRU belongs is operating.

- Inactive maintenance
  Maintenance is performed on a FRU while the physical partition to which the FRU belongs is stopped.

  Inactive maintenance applies to a system with two or more partitions in a multiple-BB configuration only.

  Therefore, regarding the SPARC M12-2 and also the SPARC M12-2S with the 1BB configuration, the type of maintenance performed with the physical partition stopped is system-stopped maintenance, not inactive maintenance.

- System-Stopped maintenance
  Maintenance is performed with all physical partitions stopped.

Classification by the hot/cold status of the SPARC M12-2/M12-2S

Maintenance is classified into the following two types according to the hot/cold status of the SPARC M12-2/M12-2S that has the FRU requiring maintenance mounted in it:

- Hot maintenance
  Maintenance is performed when the SPARC M12-2/M12-2S that has the FRU requiring maintenance mounted in it is in the hot state.

- Cold maintenance
  Maintenance is performed when the SPARC M12-2/M12-2S that has the FRU requiring maintenance mounted in it is in the cold state.

By combining the above classifications, the six types of maintenance shown in Table 3-2 are available for the SPARC M12-2/M12-2S.

Table 3-2 Types of Maintenance

PPAR Operation Status	Hot/Cold Status of SPARC M12 Chassis With Mounted FRU Requiring Maintenance	Type of Maintenance
The PPAR to which the FRU requiring maintenance belongs is operating.	Hot	Active/Hot maintenance
	Cold	Active/Cold maintenance
The PPAR to which the FRU requiring maintenance belongs is stopped.	Hot	Inactive/Hot maintenance
	Cold	Inactive/Cold maintenance
All PPARs in the system are stopped.	Hot	System-Stopped/Hot maintenance
	Cold	System-Stopped/Cold maintenance

Use the maintenance menu when performing maintenance work.
However, system-stopped/cold maintenance has the following two types of maintenance work:

- Maintenance using the maintenance menu when only the SPARC M12-2S requiring maintenance is in the cold state
- Maintenance without using the maintenance menu when every SPARC M12-2/ M12-2S is in the cold state

Table 3-3 lists the characteristics of each type of maintenance viewed from three aspects: system availability, the time required for maintenance, and the difficulty level of maintenance work.

Table 3-3 Characteristics of Each Type of Maintenance

Type of Maintenance	System Availability	Time Required for Maintenance	Difficulty Level of Maintenance Work
Active/Hot maintenance	Higher	Shorter	Higher
Active/Cold maintenance	|	|	|
Inactive/Hot maintenance	|	|	|
Inactive/Cold maintenance	|	|	|
System-Stopped/Hot maintenance	|	|	|
System-Stopped/Cold maintenance	Lower	Longer	Lower

Table 3-4 shows the applicability of each type of maintenance according to the model and system configuration.

Table 3-4 Applicability of Types of Maintenance by Model/Configuration

-: Not applicable

Model or Configuration	**Active Maintenance**		**Inactive Maintenance**		**System-Stopped Maintenance**	
	Hot	**Cold**	**Hot**	**Cold**	**Hot**	**Cold**
SPARC M12-2	OK	-	-	-	OK	OK
SPARC M12-2S (1 BB configuration)	OK	-	-	-	OK	OK
SPARC M12-2S (multiple-BB configuration)	OK	OK	OK	OK	OK	OK

However, the types of maintenance actually applicable are narrowed down depending on the FRU requiring maintenance and the purpose of maintenance (replacement, expansion, or reduction). For details, see the section below corresponding to your model and configuration:

- For the SPARC M12-2
  See "3.2 Types of Maintenance Applicable to the SPARC M12-2."
- For the SPARC M12-2S in the 1BB configuration
  See "3.3 Types of Maintenance Applicable to the SPARC M12-2S (1BB Configuration)."
- For the SPARC M12-2S in a multiple-BB configuration
  See "3.4 Types of Maintenance Applicable to the SPARC M12-2S (Multiple-BB Configuration)."

3.2 Types of Maintenance Applicable to the SPARC M12-2

This section describes the types of maintenance applicable to each FRU of the SPARC M12-2, according to the particular purpose of maintenance.

Inactive maintenance is not available for the SPARC M12-2. Inactive maintenance is possible only in systems that use the SPARC M12-2S in a building block configuration.

3.2.1 Types of Maintenance for FRU Replacement (SPARC M12-2)

Table 3-5 lists the replaceable FRUs in the SPARC M12-2 and the applicable types of maintenance in the replacement of each FRU.

Table 3-5 Applicable Types of Maintenance in FRU Replacement for the SPARC M12-2

-: Not applicable

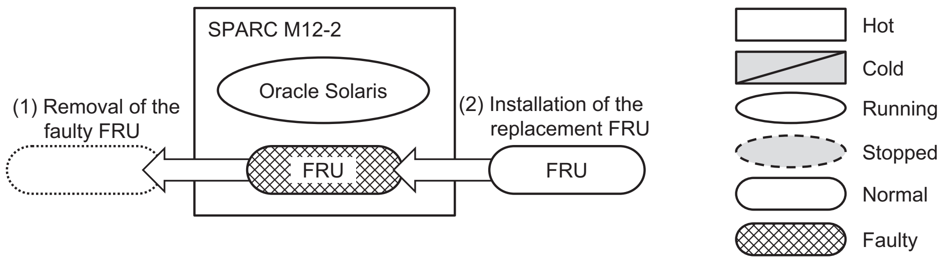
FRU	Active Replacement		Inactive Replacement		System-Stopped Replacement	
	Hot	Cold	Hot	Cold	Hot	Cold
XSCFU	-	-	-	-	-	OK
PCIe card	OK (*1)	-	-	-	OK	OK
PSU	OK (*2)	-	-	-	OK	OK
FANU	OK (*2)	-	-	-	OK	OK
FANBPU	-	-	-	-	-	OK
HDD/SSD	OK (*3)	-	-	-	OK	OK
HDDBPU	-	-	-	-	-	OK
OPNL	-	-	-	-	-	OK
CMU	-	-	-	-	-	OK
Memory	-	-	-	-	-	OK
BPU	-	-	-	-	-	OK
PSUBP	-	-	-	-	-	OK
PCI expansion unit (chassis)	OK	-	-	-	OK	OK

*1 Maintenance is performed using the SR-IOV function, dynamic reconfiguration function for PCIe devices, and PCI Hot Plug function.
*2 This is possible only if the target FRU is in a redundant configuration.
*3 This is possible only for hardware RAID configurations (RAID1 and RAID1E) when the HDD/SSD used as the boot device is being replaced.

Active/Hot replacement

Figure 3-1 shows the state of the system during active/hot replacement in the SPARC M12-2.

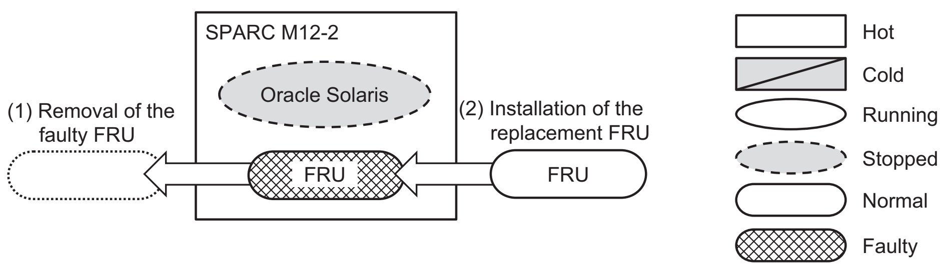
Figure 3-1 Active/Hot Replacement in the SPARC M12-2



System-Stopped/Hot replacement

Figure 3-2 shows the state of the system during system-stopped/hot replacement in the SPARC M12-2.

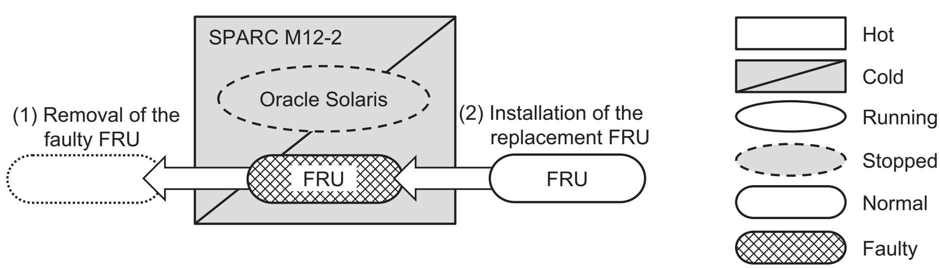
Figure 3-2 System-Stopped/Hot Replacement in the SPARC M12-2



System-Stopped/Cold replacement

Figure 3-3 shows the state of the system during system-stopped/cold replacement in the SPARC M12-2.

Figure 3-3 System-Stopped/Cold Replacement in the SPARC M12-2



3.2.2 Types of Maintenance for FRU Addition (SPARC M12-2)

Table 3-6 lists the FRUs that can be added to the SPARC M12-2 and the applicable types of maintenance in the addition of each FRU.

Table 3-6 Applicable Types of Maintenance in FRU Addition to the SPARC M12-2

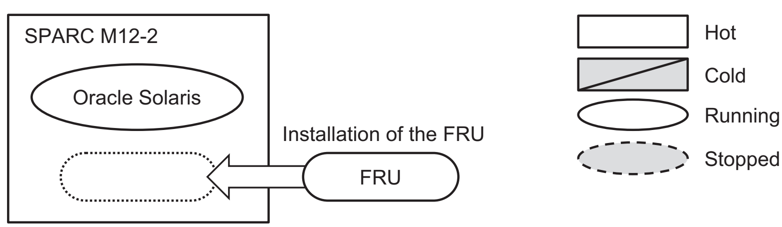
-: Not applicable

FRU	Active Addition		Inactive Addition		System-Stopped Addition	
	Hot	Cold	Hot	Cold	Hot	Cold
PCIe card	OK	-	-	-	OK	OK
HDD/SSD	OK	-	-	-	OK	OK
CMUU	-	-	-	-	-	OK
Memory	-	-	-	-	-	OK
PCI expansion unit (chassis)	OK	-	-	-	OK	OK

Active/Hot addition

Figure 3-4 shows the state of the system during active/hot addition in the SPARC M12-2.

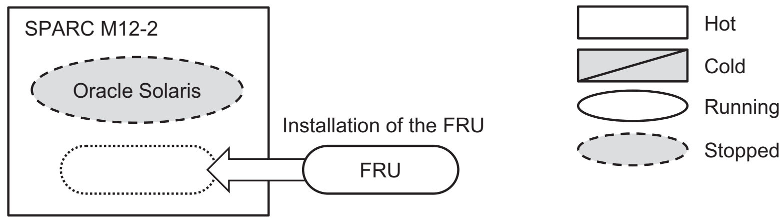
Figure 3-4 Active/Hot Addition in the SPARC M12-2



System-Stopped/Hot addition

Figure 3-5 shows the state of the system during system-stopped/hot addition in the SPARC M12-2.

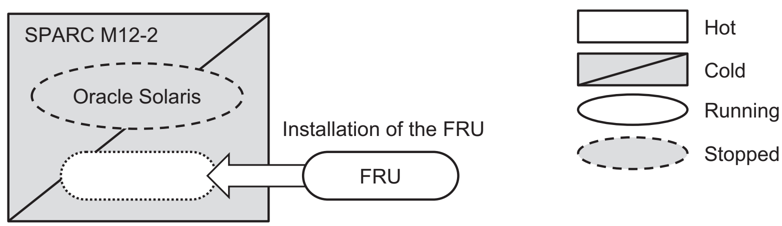
Figure 3-5 System-Stopped/Hot Addition in the SPARC M12-2



System-Stopped/Cold addition

Figure 3-6 shows the state of the system during system-stopped/cold addition in the SPARC M12-2.

Figure 3-6 System-Stopped/Cold Addition in the SPARC M12-2



3.2.3 Types of Maintenance for FRU Removal (SPARC M12-2)

Table 3-7 lists the FRUs that can be removed from the SPARC M12-2 and the applicable types of maintenance in the removal of each FRU.

Table 3-7 Applicable Types of Maintenance in FRU Removal from the SPARC M12-2

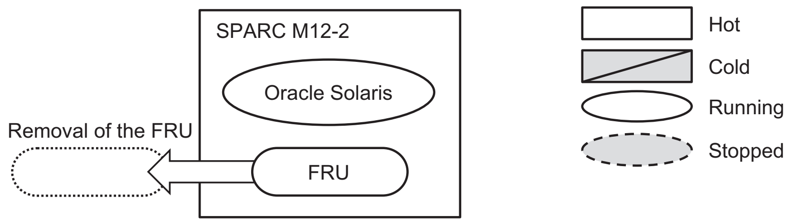
-: Not applicable

FRU	Active Removal		Inactive Removal		System-Stopped Removal	
	Hot	Cold	Hot	Cold	Hot	Cold
PCIe card	OK	-	-	-	OK	OK
HDD/SSD	OK	-	-	-	OK	OK
CMUU	-	-	-	-	-	OK
Memory	-	-	-	-	-	OK
PCI expansion unit (chassis)	OK	-	-	-	OK	OK

Active/Hot removal

Figure 3-7 shows the state of the system during active/hot removal in the SPARC M12-2.

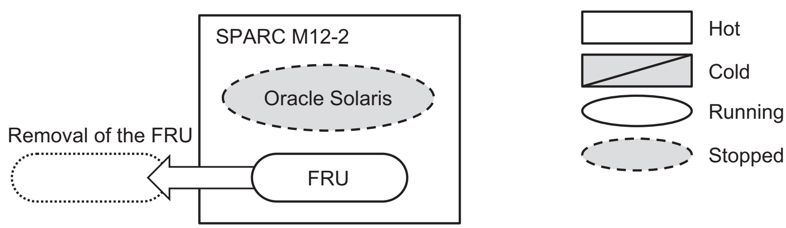
Figure 3-7 Active/Hot Removal in the SPARC M12-2



System-Stopped/Hot removal

Figure 3-8 shows the state of the system during system-stopped/hot removal in the SPARC M12-2.

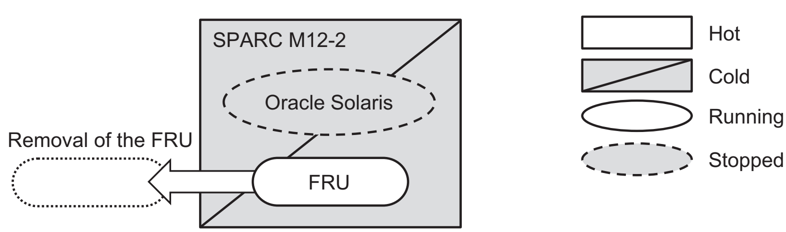
Figure 3-8 System-Stopped/Hot Removal in the SPARC M12-2



System-Stopped/Cold removal

Figure 3-9 shows the state of the system during system-stopped/cold removal in the SPARC M12-2.

Figure 3-9 System-Stopped/Cold Removal in the SPARC M12-2



3.3 Types of Maintenance Applicable to the SPARC M12-2S (1BB Configuration)

This section describes the types of maintenance applicable to each FRU in the SPARC M12-2S in the 1BB configuration, according to the particular purpose of maintenance.

3.3.1 Types of Maintenance for FRU Replacement (SPARC M12-2S in the 1BB Configuration)

Table 3-8 lists the replaceable FRUs in the SPARC M12-2S (1BB configuration) and the applicable types of maintenance in the replacement of each FRU.

Table 3-8 Applicable Types of Maintenance in FRU Replacement for the SPARC M12-2S (1BB Configuration)

-: Not applicable

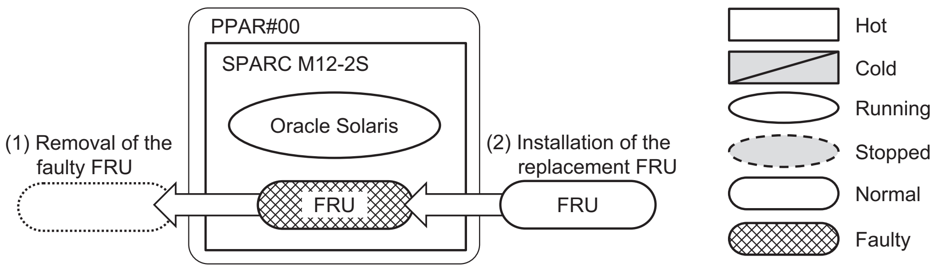
FRU	Active Replacement		Inactive Replacement		System-Stopped Replacement	
	Hot	Cold	Hot	Cold	Hot	Cold
XSCFU	-	-	-	-	-	OK
PCIe card	OK (*1)	-	-	-	OK	OK
PSU	OK (*2)	-	-	-	OK	OK
FANU	OK (*2)	-	-	-	OK	OK
FANBPU	-	-	-	-	-	OK
HDD/SSD	OK (*3)	-	-	-	OK	OK
HDDBPU	-	-	-	-	-	OK
OPNL	-	-	-	-	-	OK
CMU	-	-	-	-	-	OK
Memory	-	-	-	-	-	OK
BPU	-	-	-	-	-	OK
PSUBP	-	-	-	-	-	OK
XBU	-	-	-	-	-	OK
PCI expansion unit (chassis)	OK	-	-	-	OK	OK

*1 Maintenance is performed using the SR-IOV function, dynamic reconfiguration function for PCIe devices, and PCI Hot Plug function.
*2 This is possible only if the target FRU is in a redundant configuration.
*3 This is possible only for hardware RAID configurations (RAID1 and RAID1E) when the HDD/SSD used as the boot device is being replaced.

Active/Hot replacement

Figure 3-10 shows the state of the system during active/hot replacement on the SPARC M12-2S (1BB configuration).

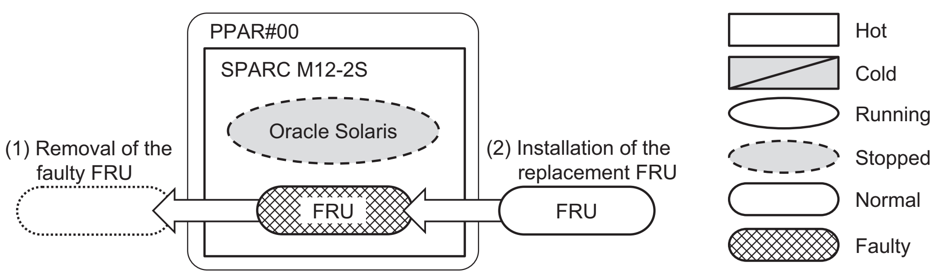
Figure 3-10 Active/Hot Replacement in the SPARC M12-2S (1BB Configuration)



System-Stopped/Hot replacement

Figure 3-11 shows the state of the system during system-stopped/hot replacement in the SPARC M12-2S (1BB configuration).

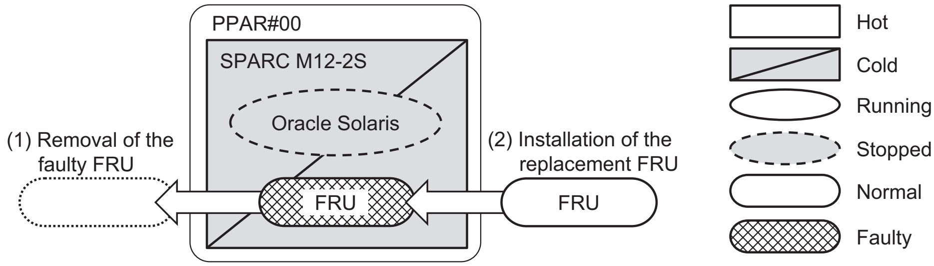
Figure 3-11 System-Stopped/Hot Replacement in the SPARC M12-2S (1BB Configuration)



System-Stopped/Cold replacement

Figure 3-12 shows the state of the system during system-stopped/cold replacement in the SPARC M12-2S (1BB configuration).

Figure 3-12 System-Stopped/Cold Replacement in the SPARC M12-2S (1BB Configuration)



3.3.2 Types of Maintenance for FRU Addition (SPARC M12-2S in the 1BB Configuration)

Table 3-9 lists the FRUs that can be added to the SPARC M12-2S (1BB configuration) and the applicable types of maintenance in the addition of each FRU.

Table 3-9 Applicable Types of Maintenance in FRU Addition to the SPARC M12-2S (1BB Configuration)

-: Not applicable

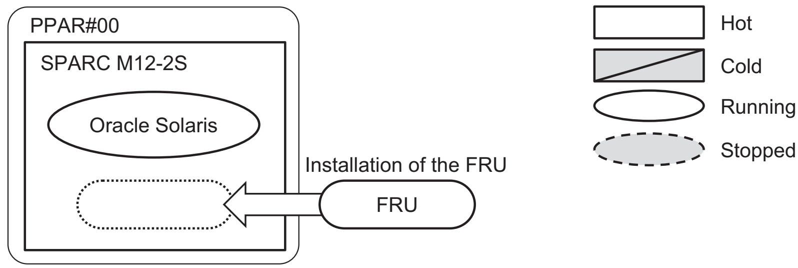
FRU	Active Addition		Inactive Addition		System-Stopped Addition	
	Hot	Cold	Hot	Cold	Hot	Cold
PCIe card	OK	-	-	-	OK	OK
HDD/SSD	OK	-	-	-	OK	OK
CMUU	-	-	-	-	-	OK
Memory	-	-	-	-	-	OK
PCI expansion unit (chassis)	OK	-	-	-	OK	OK
SPARC M12-2S (*1)	-	OK (*2)	-	OK (*3)	-	OK (*4)

*1 The XSCF DUAL control cable, XSCF BB control cable, and crossbar cable need to be connected.
*2 When adding a SPARC M12-2S unit by using the PPAR DR function for the physical partition where Oracle Solaris is operating on the existing SPARC M12-2S (1BB configuration)
*3 When adding a SPARC M12-2S unit into a physical partition different from the physical partition where Oracle Solaris is operating on the existing SPARC M12-2S (1BB configuration)
*4 When adding a SPARC M12-2S unit when the existing physical partition is stopped

Active/Hot addition

Figure 3-13 shows the state of the system during active/hot addition in the SPARC M12-2S (1BB configuration).

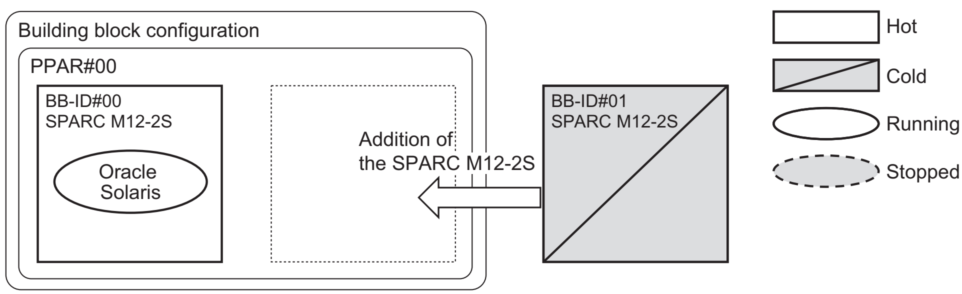
Figure 3-13 Active/Hot Addition in the SPARC M12-2S (1BB Configuration)



Active/Cold addition

Figure 3-14 shows the state of the system during active/cold addition in the SPARC M12-2S (1BB configuration).

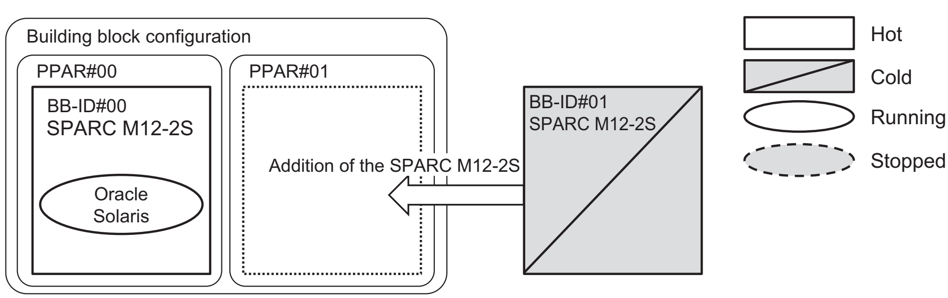
Figure 3-14 Active/Cold Addition in the SPARC M12-2S (1BB Configuration)



Inactive/Cold addition

Figure 3-15 shows the state of the system during inactive/cold addition in the SPARC M12-2S (1BB configuration).

Figure 3-15 Inactive/Cold Addition in the SPARC M12-2S (1BB Configuration)

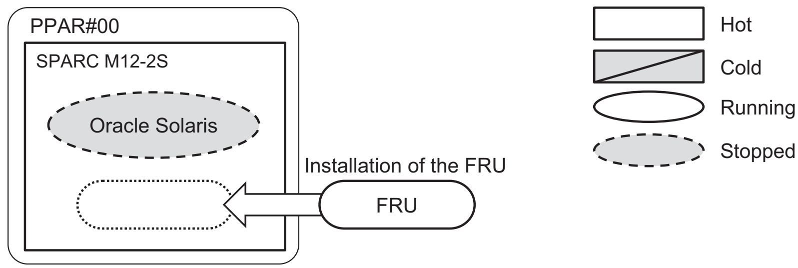


System-Stopped/Hot addition

Figure 3-16 shows the state of the system during system-stopped/hot addition in the

SPARC M12-2S (1BB configuration).

Figure 3-16 System-Stopped/Hot Addition in the SPARC M12-2S (1BB Configuration)



System-Stopped/Cold addition

Figure 3-17 to Figure 3-21 show the state of the system during system-stopped/cold addition in the SPARC M12-2S (1BB configuration).

Figure 3-17 System-Stopped/Cold Addition in the SPARC M12-2S (1BB Configuration) (1)

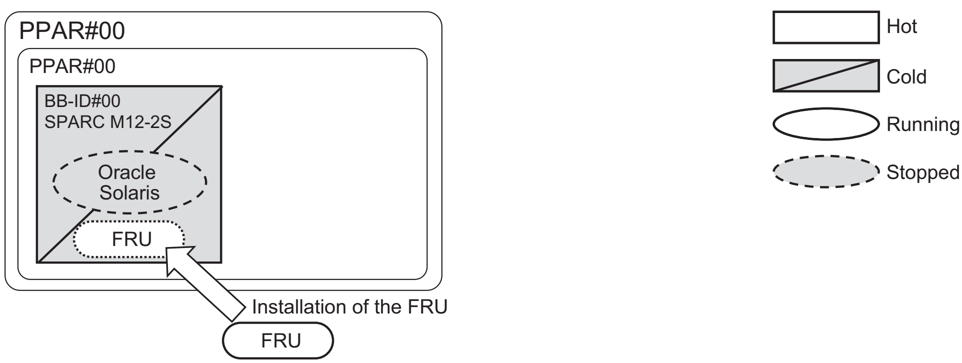


Figure 3-18 System-Stopped/Cold Addition in the SPARC M12-2S (1BB Configuration) (2)

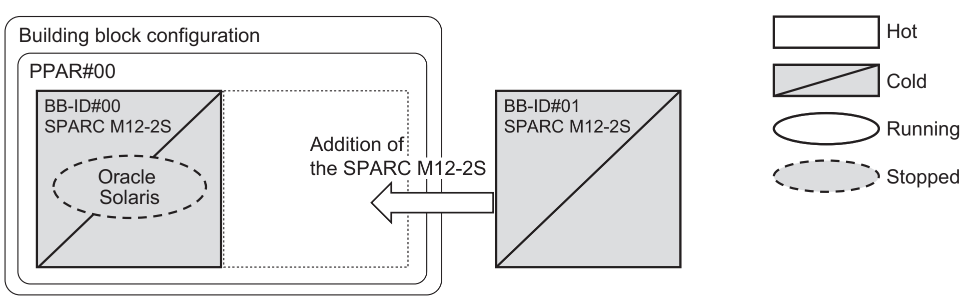


Figure 3-19 System-Stopped/Cold Addition in the SPARC M12-2S (1BB Configuration) (3)

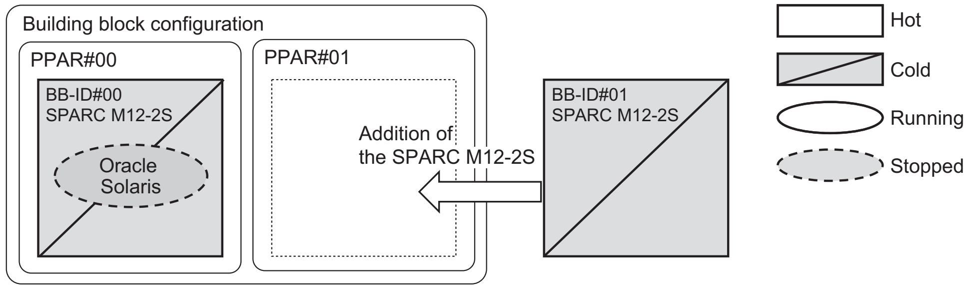


Figure 3-20 System-Stopped/Cold Addition in the SPARC M12-2S (1BB Configuration) (4)

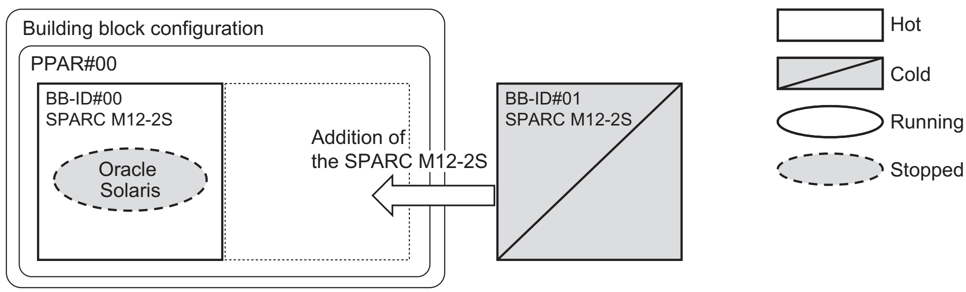
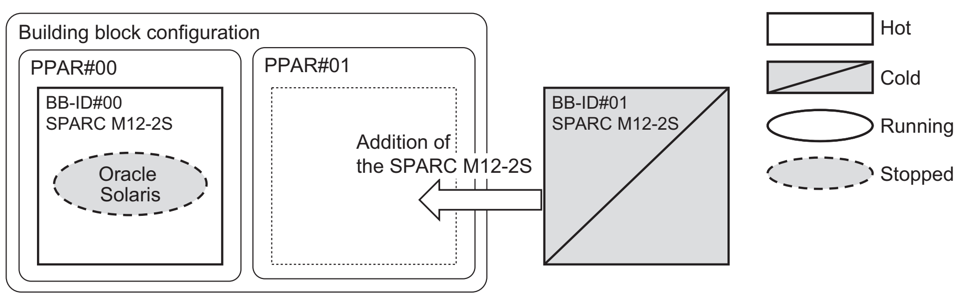


Figure 3-21 System-Stopped/Cold Addition in the SPARC M12-2S (1BB Configuration) (5)



3.3.3 Types of Maintenance for FRU Removal (SPARC M12-2S in the 1BB Configuration)

Table 3-10 lists the FRUs that can be removed from the SPARC M12-2S (1BB configuration) and the applicable types of maintenance in the removal of each FRU.

Table 3-10 Applicable Types of Maintenance in FRU Removal for the SPARC M12-2S (1BB Configuration)

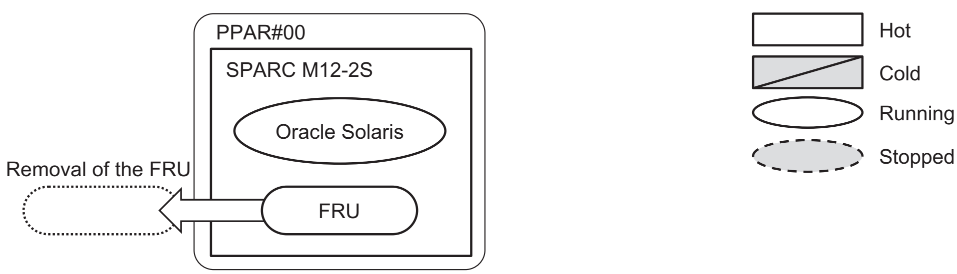
-: Not applicable

FRU	Active Removal		Inactive Removal		System-Stopped Removal	
	Hot	Cold	Hot	Cold	Hot	Cold
PCIe card	OK	-	-	-	OK	OK
HDD/SSD	OK	-	-	-	OK	OK
CMUU	-	-	-	-	-	OK
Memory	-	-	-	-	-	OK
PCI expansion unit (chassis)	OK	-	-	-	OK	OK

Active/Hot removal

Figure 3-22 shows the state of the system during active/hot removal in the SPARC M12-2S (1BB configuration).

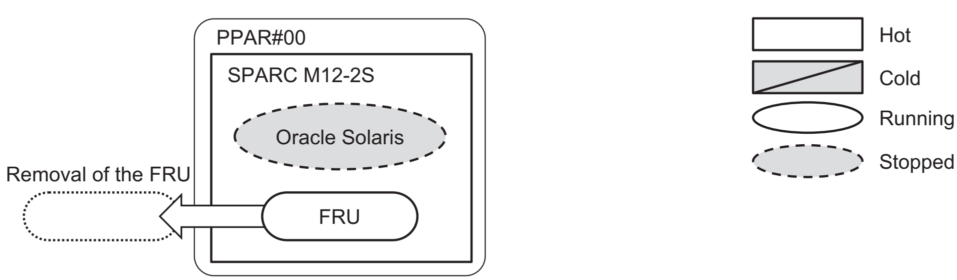
Figure 3-22 Active/Hot Removal in the SPARC M12-2S (1BB Configuration)



System-Stopped/Hot removal

Figure 3-23 shows the state of the system during system-stopped/hot removal in the SPARC M12-2S (1BB configuration).

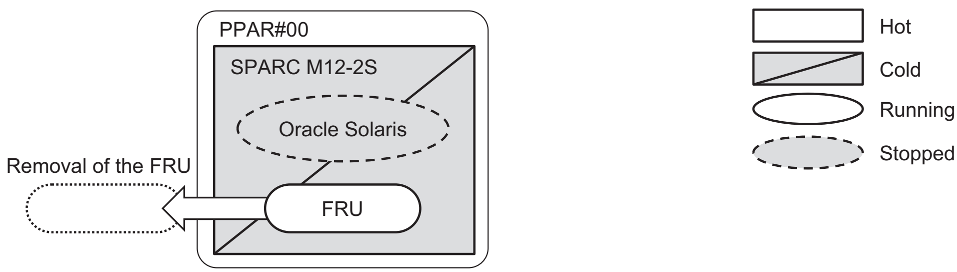
Figure 3-23 System-Stopped/Hot Removal in the SPARC M12-2S (1BB Configuration)



System-Stopped/Cold removal

Figure 3-24 shows the state of the system during system-stopped/cold removal in the SPARC M12-2S (1BB configuration).

Figure 3-24 System-Stopped/Cold Removal in the SPARC M12-2S (1BB Configuration)



3.4 Types of Maintenance Applicable to the SPARC M12-2S (Multiple-BB Configuration)

This section describes the types of maintenance applicable to each FRU in the SPARC M12-2S in the multiple-BB configuration, according to the particular purpose of maintenance.

3.4.1 Types of Maintenance for FRU Replacement (SPARC M12-2S in a Multiple-BB Configuration)

Table 3-11 lists the replaceable FRUs in the SPARC M12-2S (multiple-BB configuration) and the applicable types of maintenance in the replacement of each FRU.

Table 3-11 Applicable Types of Maintenance in FRU Replacement for the SPARC M12-2S (Multiple-BB Configuration)

-: Not applicable

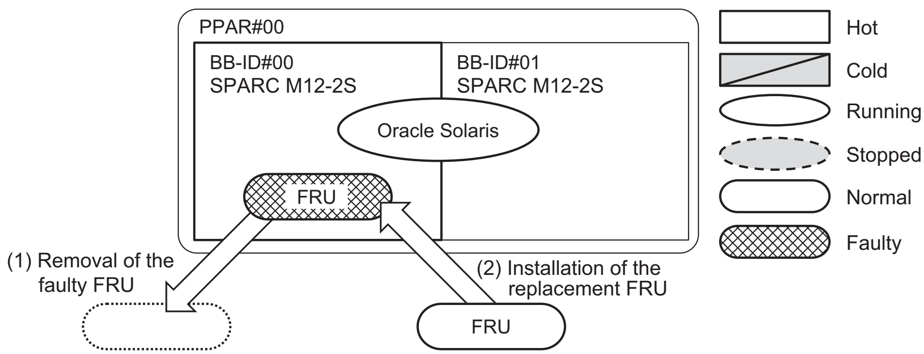
FRU	Active Replacement		Inactive Replacement		System-Stopped Replacement	
	Hot	Cold (*1)	Hot	Cold (*1)	Hot	Cold
XSCFU	OK	OK (*2)	OK	OK (*3)	OK	OK (*4) (*5)
PCIe card	OK (*6)	OK	OK	OK	OK	OK (*4)
PSU	OK (*7)	OK	OK	OK	OK	OK (*4)
FANU	OK (*7)	OK	OK	OK	OK	OK (*4)
FANBPU	-	OK	-	OK	-	OK (*4)
HDD/SSD	OK (*8)	OK	OK	OK	OK	OK (*4)
HDDBPU	-	OK	-	OK	-	OK (*4)
OPNL	-	OK	-	OK	-	OK (*4)
CMU	-	OK	-	OK	-	OK (*4)
Memory	-	OK	-	OK	-	OK (*4)
BPU	-	OK	-	OK	-	OK (*4)
PSUBP	-	OK	-	OK	-	OK (*4)
XBU	-	-	-	OK	-	OK (*4)
Crossbar cable	-	-	-	OK	-	OK (*9)
XSCF DUAL control cable	-	OK (*10)	-	OK (*10)	-	OK (*9)
XSCF BB control cable	-	OK (*10)	-	OK (*10)	-	OK (*9)
PCI expansion unit (chassis)	OK (*6)	OK	OK	OK	OK	OK

*1 The replacefru(8) command is used for maintenance. For this purpose, select BB in the maintenance menu.
*2 If the XSCFU requiring maintenance is not running, perform active/hot replacement.
*3 If the XSCFU requiring maintenance is not running, perform inactive/hot replacement.
*4 The replacefru(8) command is used for maintenance. For this purpose, select BB in the maintenance menu. Alternatively, without using the replacefru(8) command, you can replace a FRU after placing every SPARC M12-2S in the building block configuration into the cold state.
*5 If the XSCFU requiring maintenance is not running, perform system-stopped/hot replacement. Alternatively, place every SPARC M12-2S in the building block configuration into the cold state, and replace the XSCFU.
*6 Maintenance is performed using the SR-IOV function, dynamic reconfiguration function for PCIe devices, and PCI Hot Plug function.
*7 This is possible only if the target FRU is in a redundant configuration.
*8 This is possible only for hardware RAID configurations (RAID1 and RAID1E) when the HDD/SSD used as the boot device is being replaced.
*9 The FRU can be replaced only when every SPARC M12-2S in the building block configuration is in the cold state.
*10 The XSCF DUAL control cable or XSCF BB control cable requiring replacement is connected to the XSCFU. If the READY LED of the XSCFU is off, place every SPARC M12-2S in the building block configuration into the cold state, and replace the cable.

Active/Hot replacement

Figure 3-25 shows the state of the system during active/hot replacement on the SPARC M12-2S (multiple-BB configuration).

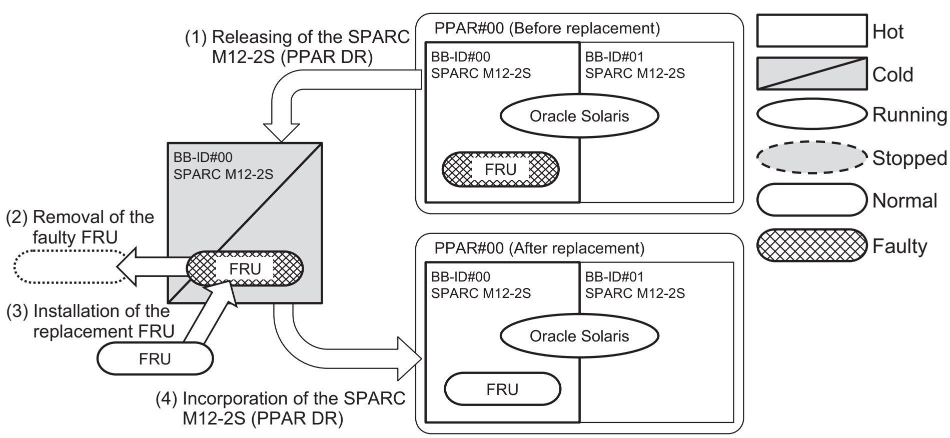
Figure 3-25 Active/Hot Replacement in the SPARC M12-2S (Multiple-BB Configuration)



Active/Cold replacement

Figure 3-26 shows the state of the system during active/cold replacement on the SPARC M12-2S (multiple-BB configuration).

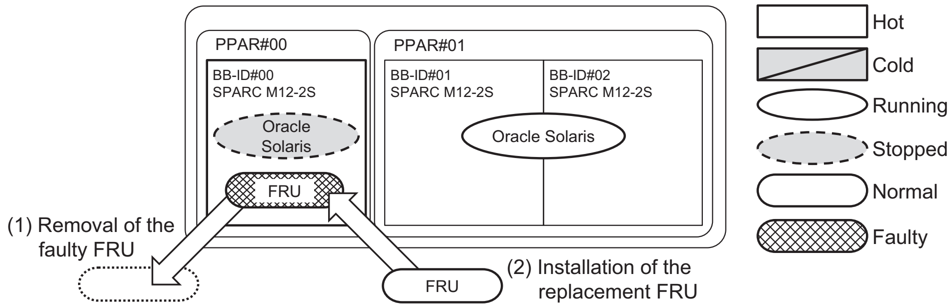
Figure 3-26 Active/Cold Replacement in the SPARC M12-2S (Multiple-BB Configuration)



Inactive/Hot replacement

Figure 3-27 shows the state of the system during inactive/hot replacement on the SPARC M12-2S (multiple-BB configuration).

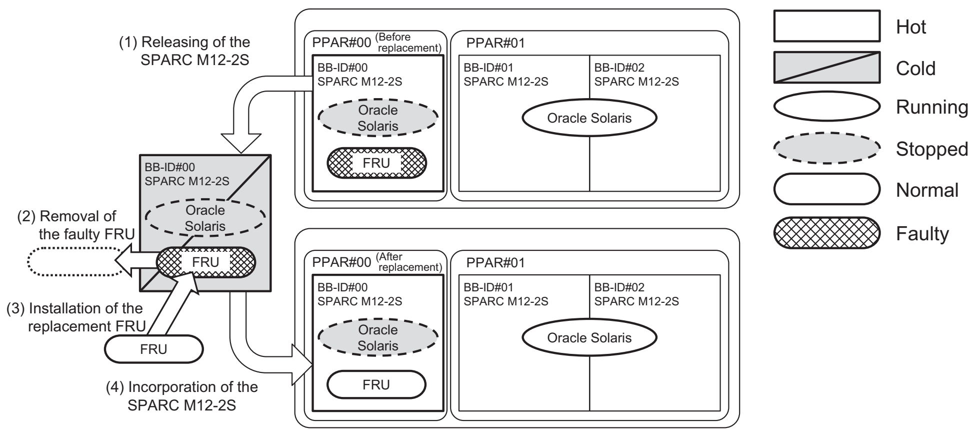
Figure 3-27 Inactive/Hot Replacement in the SPARC M12-2S (Multiple-BB Configuration)



Inactive/Cold replacement

Figure 3-28 shows the state of the system during inactive/cold replacement on the SPARC M12-2S (multiple-BB configuration).

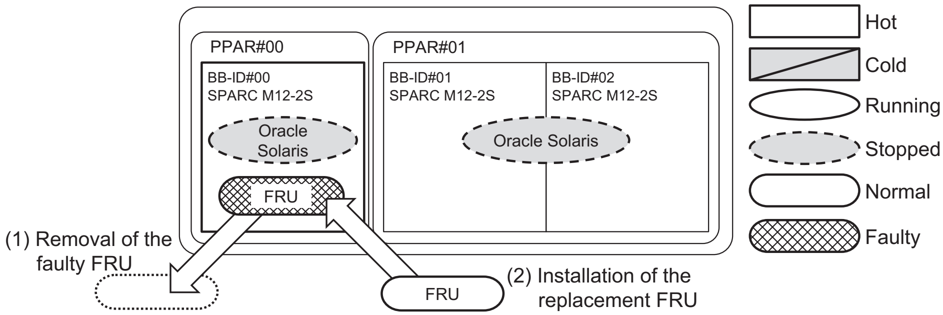
Figure 3-28 Inactive/Cold Replacement in the SPARC M12-2S (Multiple-BB Configuration)



System-Stopped/Hot replacement

Figure 3-29 shows the state of the system during system-stopped/hot replacement in the SPARC M12-2S (multiple-BB configuration).

Figure 3-29 System-Stopped/Hot Replacement in the SPARC M12-2S (Multiple-BB Configuration)



System-Stopped/Cold replacement

Figure 3-30 and Figure 3-31 show the state of the system during system-stopped/cold replacement in the SPARC M12-2S (multiple-BB configuration).

Figure 3-30 System-Stopped/Cold Replacement in the SPARC M12-2S (Multiple-BB Configuration) (1)

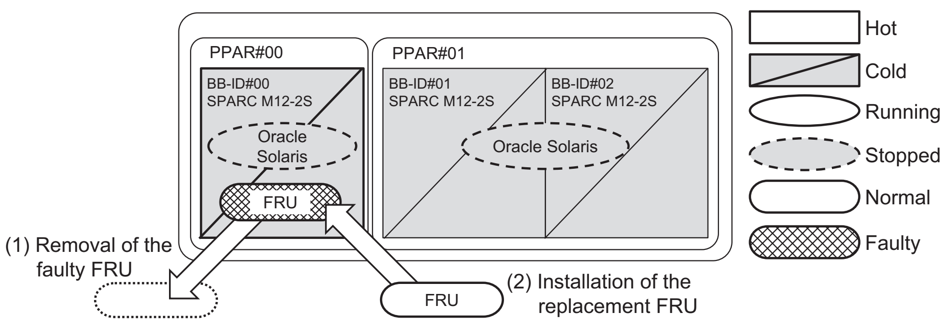
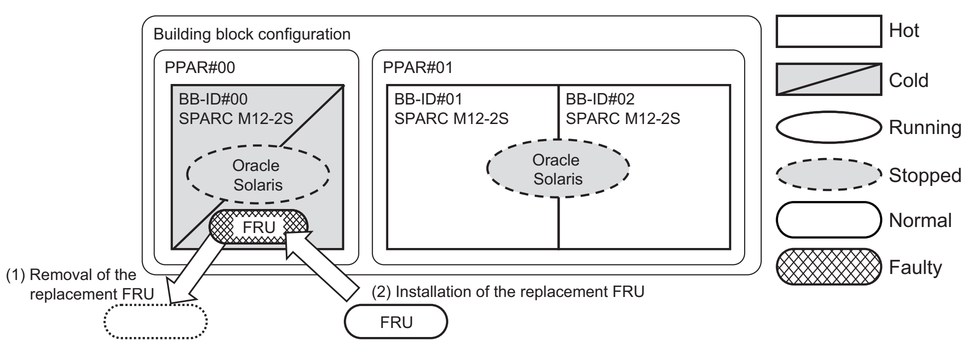


Figure 3-31 System-Stopped/Cold Replacement in the SPARC M12-2S (Multiple-BB Configuration) (2)



3.4.2 Types of Maintenance for FRU Addition (SPARC M12-2S in the Multiple-BB Configuration)

Table 3-12 lists the FRUs that can be added to the SPARC M12-2S (multiple-BB configuration) and the applicable types of maintenance in the addition of each FRU.

Table 3-12 Applicable Types of Maintenance in FRU Addition to the SPARC M12-2S (Multiple-BB Configuration)

-: Not applicable

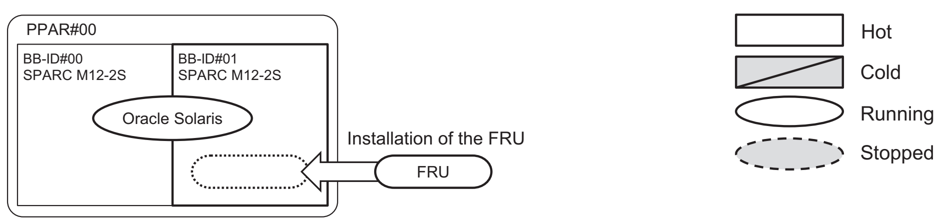
FRU	Active Addition		Inactive Addition		System-Stopped Addition	
	Hot	Cold	Hot	Cold	Hot	Cold
PCIe card	OK	OK	OK	OK	OK	OK
HDD/SSD	OK	OK	OK	OK	OK	OK
CMUU	-	OK	-	OK	-	OK
Memory	-	OK	-	OK	-	OK
PCI expansion unit (chassis)	OK	OK	OK	OK	OK	OK
SPARC M12-2S (*1)	-	OK	-	OK	-	OK

*1 The XSCF DUAL control cable, XSCF BB control cable, and crossbar cable need to be connected.

Active/Hot addition

Figure 3-32 shows the state of the system during active/hot addition in the SPARC M12-2S (multiple-BB configuration).

Figure 3-32 Active/Hot Addition in the SPARC M12-2S (Multiple-BB Configuration)



Active/Cold addition

Figure 3-33 and Figure 3-34 show the state of the system during active/cold addition in the SPARC M12-2S (multiple-BB configuration).

Figure 3-33 Active/Cold Addition in the SPARC M12-2S (Multiple-BB Configuration) (1)

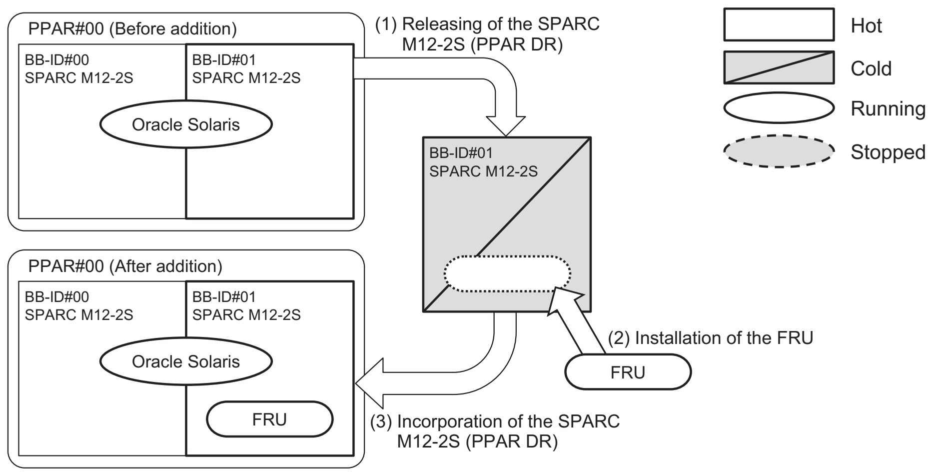
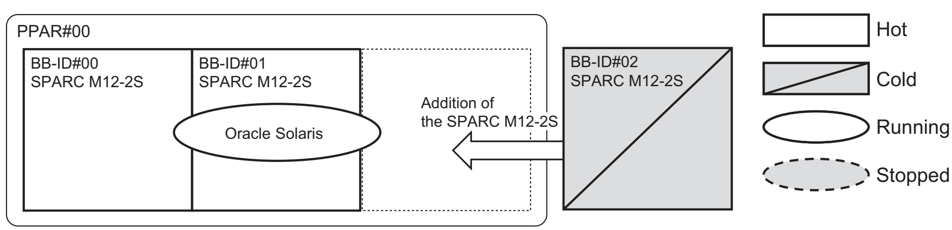


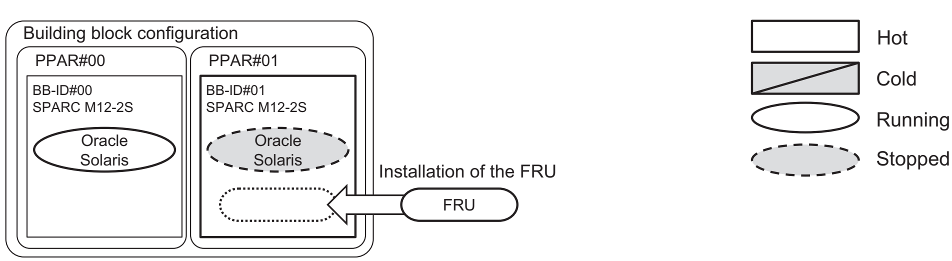
Figure 3-34 Active/Cold Addition in the SPARC M12-2S (Multiple-BB Configuration) (2)



Inactive/Hot addition

Figure 3-35 shows the state of the system during inactive/hot addition in the SPARC M12-2S (multiple-BB configuration).

Figure 3-35 Inactive/Hot Addition in the SPARC M12-2S (Multiple-BB Configuration)



Inactive/Cold addition

Figure 3-36 and Figure 3-37 show the state of the system during inactive/cold addition in the SPARC M12-2S (multiple-BB configuration).

Figure 3-36 Inactive/Cold Addition in the SPARC M12-2S (Multiple-BB Configuration) (1)

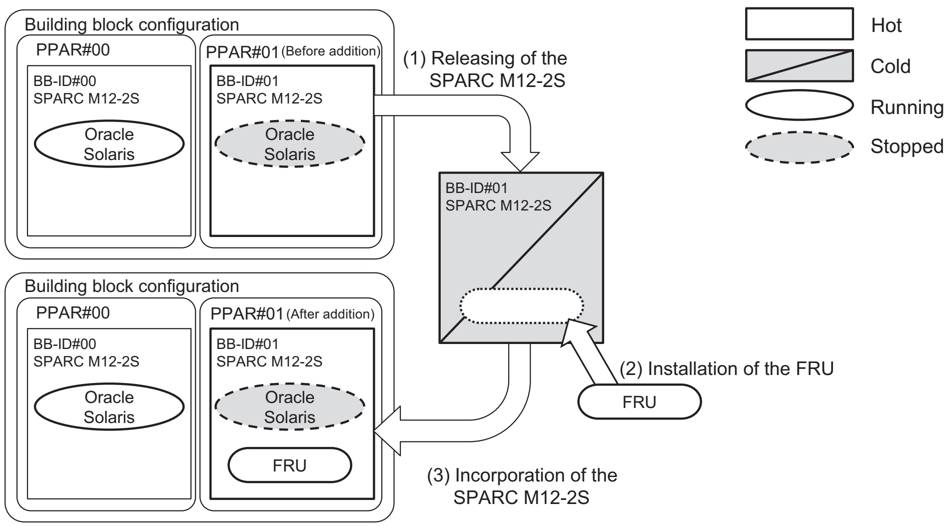
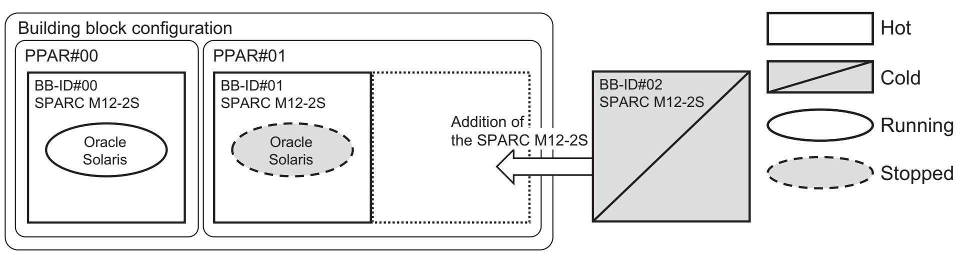


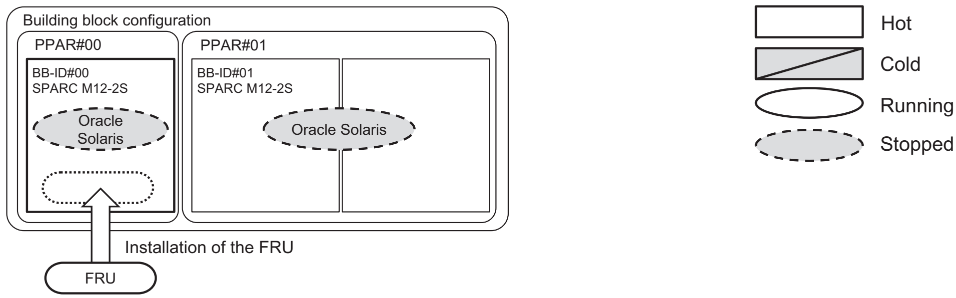
Figure 3-37 Inactive/Cold Addition in the SPARC M12-2S (Multiple-BB Configuration) (2)



System-Stopped/Hot addition

Figure 3-38 shows the state of the system during system-stopped/hot addition in the SPARC M12-2S (multiple-BB configuration).

Figure 3-38 System-Stopped/Hot Addition in the SPARC M12-2S (Multiple-BB Configuration)



System-Stopped/Cold addition

Figure 3-39 and Figure 3-40 show the state of the system during system-stopped/cold addition in the SPARC M12-2S (multiple-BB configuration).

Figure 3-39 System-Stopped/Cold Addition in the SPARC M12-2S (Multiple-BB Configuration) (1)

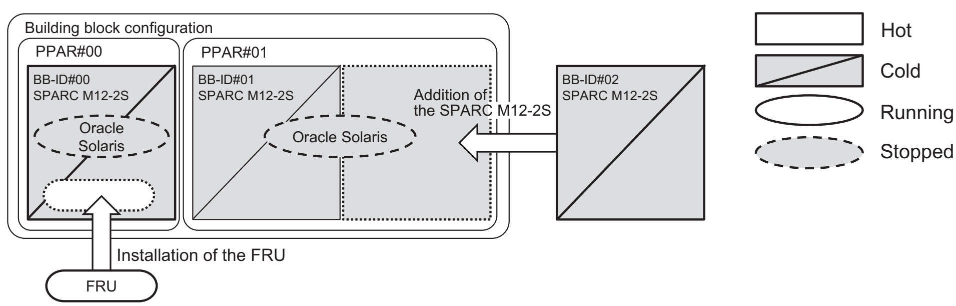
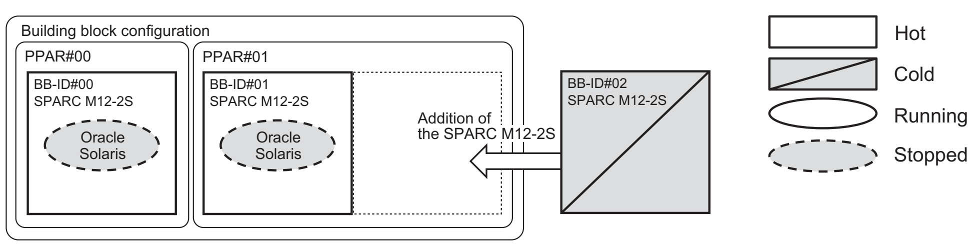


Figure 3-40 System-Stopped/Cold Addition in the SPARC M12-2S (Multiple-BB Configuration) (2)



3.4.3 Types of Maintenance for FRU Removal (SPARC M12-2S in the Multiple-BB Configuration)

Table 3-13 lists the FRUs that can be removed from the SPARC M12-2S (multiple-BB configuration) and the applicable types of maintenance in the removal of each FRU.

Table 3-13 Applicable Types of Maintenance in FRU Removal for the SPARC M12-2S (Multiple-BB Configuration)

-: Not applicable

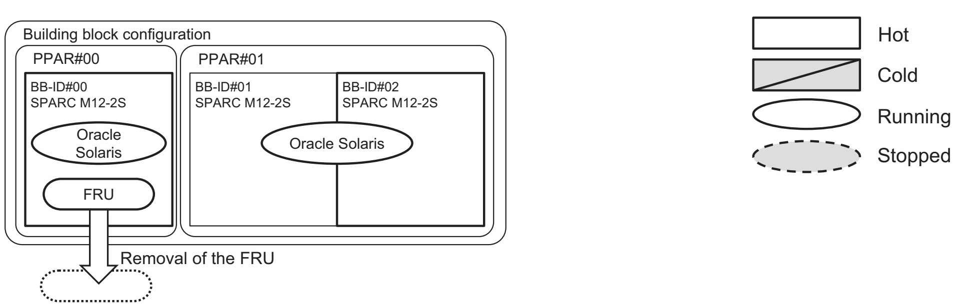
FRU	Active Removal		Inactive Removal		System-Stopped Removal	
	Hot	Cold	Hot	Cold	Hot	Cold
HDD/SSD	OK	OK	OK	OK	OK	OK
PCIe card	OK	OK	OK	OK	OK	OK
CMUU	-	OK	-	OK	-	OK
Memory	-	OK	-	OK	-	OK
PCI expansion unit (chassis)	OK	OK	OK	OK	OK	OK
SPARC M12-2S (*1)	-	OK (*2)	-	OK (*2)	-	OK (*2)

*1 The XSCF DUAL control cable, XSCF BB control cable, and crossbar cable need to be connected.
*2 Use the initbb command to remove a SPARC M12-2S when every connected SPARC M12-2S is in the hot state. After the SPARC M12-2S initialized by the initbb command enters the cold state, remove it from the system.

Active/Hot removal

Figure 3-41 shows the state of the system during active/hot removal in the SPARC M12-2S (multiple-BB configuration).

Figure 3-41 Active/Hot Removal in the SPARC M12-2S (Multiple-BB Configuration)



Active/Cold removal

Figure 3-42 and Figure 3-43 show the state of the system during active/cold removal in the SPARC M12-2S (multiple-BB configuration).

Figure 3-42 Active/Cold Removal in the SPARC M12-2S (Multiple-BB Configuration) (1)

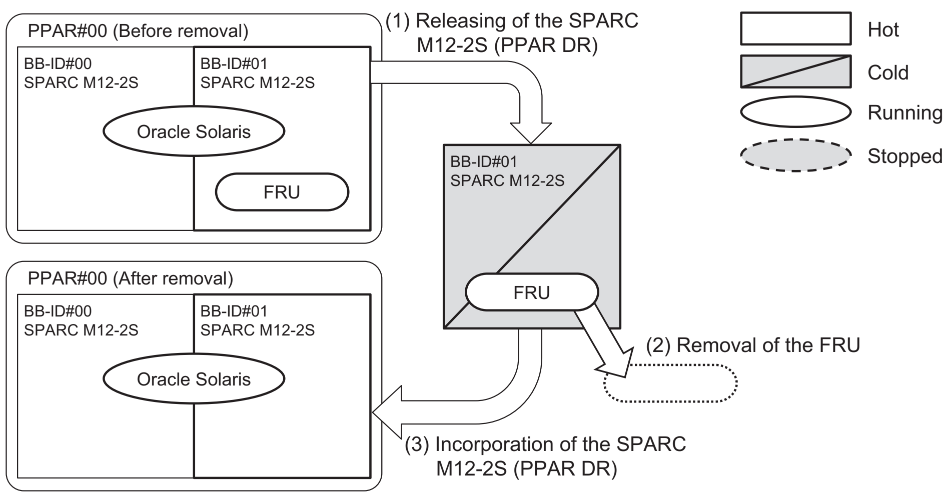
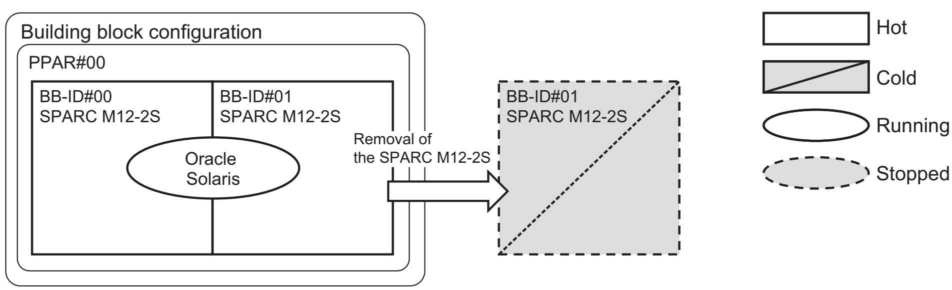


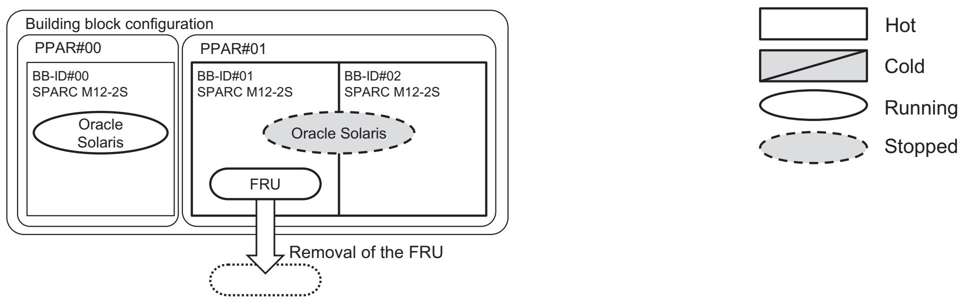
Figure 3-43 Active/Cold Removal in the SPARC M12-2S (Multiple-BB Configuration) (2)



Inactive/Hot removal

Figure 3-44 shows the state of the system during inactive/hot removal in the SPARC M12-2S (multiple-BB configuration).

Figure 3-44 Inactive/Hot Removal in the SPARC M12-2S (Multiple-BB Configuration)



Inactive/Cold removal

Figure 3-45 and Figure 3-46 show the state of the system during inactive/cold removal in the SPARC M12-2S (multiple-BB configuration).

Figure 3-45 Inactive/Cold Removal in the SPARC M12-2S (Multiple-BB Configuration) (1)

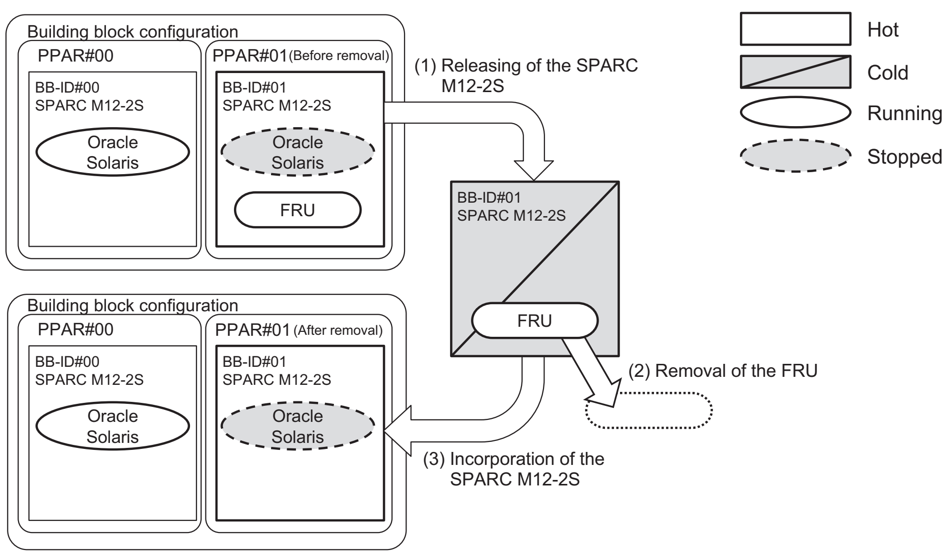
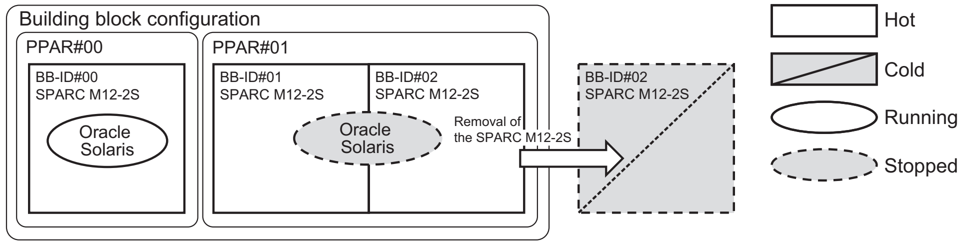


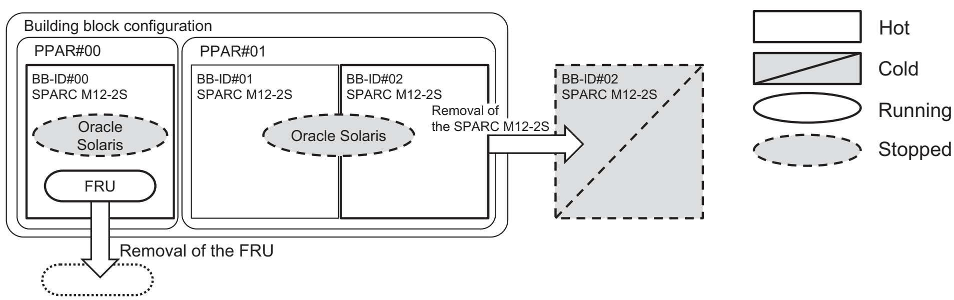
Figure 3-46 Inactive/Cold Removal in the SPARC M12-2S (Multiple-BB Configuration) (2)



System-Stopped/Cold removal

Figure 3-47 shows the state of the system during system-stopped/cold removal in the SPARC M12-2S (multiple-BB configuration).

Figure 3-47 System-Stopped/Cold Removal in the SPARC M12-2S (Multiple-BB Configuration)



Chapter 4

FRU Replacement Workflows

This chapter describes replacement workflows by type of maintenance for FRUs and the PCI expansion unit mounted to the SPARC M12-2/M12-2S.
See "Chapter 8 Preparation for Maintenance" before starting maintenance. Check the system configuration to confirm whether there is a fault.
For the installation and removal procedures of each FRU, see Chapter 11 and subsequent chapters.

For the replacement procedure for the FRUs mounted in the PCI expansion unit, see the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.

4.1 Active/Hot Replacement Workflows

This section describes the workflows for active/hot replacement of the FRUs mounted in the SPARC M12-2/M12-2S.

Before performing replacement work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to active/hot replacement:

- XSCFU
- PCIe card

- PSU
- FANU
- HDD/SSD
- PCI expansion unit

4.1.1 Active/Hot Replacement Workflow of the XSCFU

You can perform active/hot replacement of the XSCFU in the following configuration:

- Building block configuration connecting two or more SPARC M12-2S units

Before replacing the XSCFU, see "Precautions for XSCFU and PSUBP replacement" in "7.1 Precautions for FRU Replacement."

Table 4-1 shows the workflow for active/hot replacement of the XSCFU.

Table 4-1 Active/Hot Replacement Procedure of the XSCFU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XSCFU to be replaced	"8.2 Troubleshooting"
3	Confirming that the XSCFU to be replaced is the standby or slave XSCF and is currently replaceable (*1)	"Table 2-16 XSCFU LEDs and Their States"
4	Releasing the XSCFU from the SPARC M12-2S	"9.6.4 Releasing the XSCFU"
5	Removing the XSCFU from the SPARC M12-2S	"11.4 Removing the XSCFU"
6	Switching the SD card (*2)	"11.5 Switching an SD Card"
7	Mounting the XSCFU in the SPARC M12-2S	"11.6 Installing the XSCFU"
8	Incorporating the XSCFU into the SPARC M12-2S	"10.4.4 Incorporating the XSCFU"
9	Confirming that there is no problem with the replacement XSCFU	"10.5.3 Checking the FRU Status After Maintenance"
10	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Before replacing the XSCFU, confirm that the READY LED of the XSCFU is lit in green or off.
If the READY LED of the XSCFU is blinking, wait until the LED stays lit or is turned off.

*2 If the SD card installed in the maintenance part will be used, this work is not required.

4.1.2 Active/Hot Replacement Workflow of a PCIe Card

This section describes the workflow for active/hot replacement of a PCIe card. The same workflow applies when you perform active/hot replacement for a PCIe card mounted in the PCI expansion unit.

Before replacing the PCIe card, see "Precautions for PCIe card replacement" in "7.1 Precautions for FRU Replacement." When replacing a link card connected to the PCI expansion unit, see the precautions for link card replacement in "4.2.1 Precautions for Replacement" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.

Table 4-2 shows the workflow for active/hot replacement of a PCIe card using the PCI Hot Plug function.

Table 4-2 Active/Hot Replacement Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Releasing the assignment of the PCIe card	"9.3 Releasing I/O Resources From a Logical Domain"
3	Enabling the removal of the faulty PCIe card from the system	"9.4 Enabling the Removal of Hardware"
4	Removing the faulty PCIe card from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
5	Removing the PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
6	Installing the replacement PCIe card in the PCICS to install it in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
7	Incorporating the replacement PCIe card into the system	"10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function"
8	Confirming that there is no problem with the replacement PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
9	Restoring logical domains	"10.7 Incorporating I/O Resources Into a Logical Domain"

Note - Active/Hot replacement of the link card connected to the PCI expansion unit includes the work of incorporating the link card into the system. At that time, remove all the PCIe cards mounted in the PCI expansion unit.

4.1.3 Active/Hot Replacement Workflow of the Power Supply Unit (PSU)

You can perform active/hot replacement only when the PSU has a redundant configuration.

Before replacing the PSU, see "Precautions for PSU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-3 shows the workflow for active/hot replacement of the PSU.

Table 4-3 Active/Hot Replacement Procedure of the PSU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PSU to be replaced	"8.2 Troubleshooting"
3	Releasing the faulty PSU from the system	"9.6.3 Releasing the PSU"
4	Removing the power cord of the faulty PSU, and removing the PSU from the SPARC M12-2/M12-2S	"13.3 Removing a PSU"
5	Installing a PSU in the SPARC M12-2/M12-2S, and installing the power cord on the PSU	"13.4 Installing a PSU"
6	Incorporating the PSU into the System	"10.4.3 Incorporating the PSU"
7	Confirming that there is no problem with the replacement PSU	"10.5.3 Checking the FRU Status After Maintenance"

4.1.4 Active/Hot Replacement Workflow of the FANU

You can perform active/hot replacement only when the FANU has a redundant configuration.

Before replacing the FANU, see "Precautions for FANU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-4 shows the workflow for active/hot replacement of the FANU.

Table 4-4 Active/Hot Replacement Procedure of the FANU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the faulty FANU from the system	"9.6.2 Releasing the FANU"
3	Removing the FANU from the SPARC M12-2/M12-2S	"14.3.1 Removing a FANU"
4	Installing the FANU in the SPARC M12-2/M12-2S	"14.4.2 Installing a FANU"
5	Incorporating the FANU into the system	"10.4.2 Incorporating the FANU"
6	Confirming that there is no problem with the replacement FANU	"10.5.3 Checking the FRU Status After Maintenance"

4.1.5 Active/Hot Replacement Workflow of the HDD/SSD

If the HDD to be replaced is in a hardware RAID configuration, see "Active/Hot Replacement Workflow of an HDD in a Hardware RAID Configuration."

Before replacing the HDD/SSD, see "Precautions for HDD/SSD replacement" in "7.1 Precautions for FRU Replacement."

Table 4-5 shows the workflow for active/hot replacement of the HDD/SSD.

Table 4-5 Active/Hot Replacement Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Releasing the faulty HDD/SSD from the system	"9.4.2 Dynamically Releasing the HDD/SSD From a Logical Domain"
3	Removing the HDD/SSD from the SPARC M12-2/M12-2S	"15.3.1 Removing an HDD/SSD"
4	Installing an HDD/SSD in the SPARC M12-2/M12-2S	"15.4.1 Installing an HDD/SSD"
5	Incorporating the replacement HDD/SSD into the system	"10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function"
6	Confirming that there is no problem with the replacement HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"

Active/Hot Replacement Workflow of an HDD in a Hardware RAID Configuration

This section describes the workflow for active/hot replacement of an HDD in a hardware RAID configuration. For a software RAID configuration, see the manual for the software being used, enable the removal of the HDD, and then replace it.

Table 4-6 shows the workflow for active/hot replacement of an HDD in a hardware RAID configuration.

Table 4-6 Active/Hot Replacement Procedure of an HDD in a Hardware RAID Configuration

Work Order	Task	Reference
1	Identifying the mounting location of the faulty HDD	"14.2.9 Checking for a Failed Disk Drive" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide* "14.2.3 Precautions Concerning Hardware RAID" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*
2	Checking whether the faulty HDD is disconnected from the hardware RAID volume	"14.2.8 Checking the Status of a Hardware RAID Volume and a Disk Drive" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*
3	(If not disconnected from the hardware RAID volume) Disconnecting the faulty HDD from the hardware RAID volume (*1)	"F.9 Disconnecting a Disk Drive From the Hardware RAID Volume" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*
4	Replacing the faulty HDD	"14.2.10 Replacing a Failed Disk Drive" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide* "15.3.1 Removing an HDD/SSD" "15.4.1 Installing an HDD/SSD"
5	Confirming that there is no problem with the replacement HDD	"10.5.3 Checking the FRU Status After Maintenance"

*1 Disconnect the HDD to be replaced from the hardware RAID volume by using the sas2ircu setoffline command of the SAS2IRCU utility.
For the conditions to use the sas2ircu setoffline command, see "Notes on the SAS-2 Integrated RAID Configuration Utility" in the latest version of the *Fujitsu M12 Product Notes*.

4.1.6 Active/Hot Replacement Workflow of the PCI Expansion Unit

Table 4-7 shows the workflow for active/hot replacement of a FRU in a PCI expansion unit.
Table 4-7 describes the procedure for replacing a FRU while the power cords of the PCI expansion unit are disconnected.
For the work of active/hot replacement of a PCIe card mounted in a PCI expansion unit, see "4.1.2 Active/Hot Replacement Workflow of a PCIe Card."
For replacement procedures for FRUs (power supply unit and fan unit) that can be replaced while the power cords of the PCI expansion unit are connected, see "7.1.1 Hot Replacement" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.

Table 4-7 Active/Hot Replacement Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Releasing the assignment of PCIe cards mounted in the PCI expansion unit	"9.3 Releasing I/O Resources From a Logical Domain"
3	Enabling the removal of all the PCIe cards mounted in the PCI expansion unit from the system	"9.4 Enabling the Removal of Hardware"
4	Removing all the PCIe cards mounted in the PCI expansion unit	"8.3 Removing a PCI Express Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
5	Enabling the removal of the link card connected to the PCI expansion unit from the system	"9.4 Enabling the Removal of Hardware"
6	Removing the link card from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
7	Removing the FRUs in the faulty PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
8	Installing a FRU in the PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
9	Incorporating the link card into the system (*1)	"10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function"

Table 4-7 Active/Hot Replacement Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
10	Installing all the PCIe cards that were mounted in the PCI expansion unit	"8.4 Installing a PCI Express Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
11	Incorporating all the PCIe cards installed in the PCI expansion unit into the system	"10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function"
12	Confirming that there is no problem with the replacement PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
13	Restoring logical domains	"10.7 Incorporating I/O Resources Into a Logical Domain"

*1 The direct I/O function needs to be disabled. Remove all the PCIe cards mounted in the PCI expansion unit when incorporating the link card into the system.

4.2 Active/Cold Replacement Workflows

This section describes the workflows for active/cold replacement of the FRUs mounted in the SPARC M12-2S.

Since physical partition (PPAR) DR is used for active/cold replacement, you can perform it only in a configuration connecting two or more SPARC M12-2S units to a physical partition.

To use PPAR DR, see the precautions at the beginning of "9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition," and confirm that the system configuration allows the use of PPAR DR.

Before performing replacement work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to active/cold replacement:

- XSCFU
- PCIe card
- PSU
- FANU
- FANBPU
- HDD/SSD
- HDDBPU

- OPNL
- CMU
- Memory
- BPU
- PSUBP
- PCI expansion unit
- XSCF DUAL control cable
- XSCF BB control cable

4.2.1 Active/Cold Replacement Workflow of the XSCFU

You can perform active/cold replacement of the XSCFU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before replacing the XSCFU, see "Precautions for XSCFU and PSUBP replacement" in "7.1 Precautions for FRU Replacement."

Table 4-8 shows the workflow for active/cold replacement of the XSCFU.

Table 4-8 Active/Cold Replacement Procedure of the XSCFU

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Confirming the XSCFU to be replaced	"8.2 Troubleshooting"
3	Confirming that the XSCFU to be replaced is the standby or slave XSCF and is currently replaceable (*1)	"Table 2-16 XSCFU LEDs and Their States"
4	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
5	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
6	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
7	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
8	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"

Table 4-8 Active/Cold Replacement Procedure of the XSCFU *(continued)*

Work Order	Task	Reference
9	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
10	Removing the XSCFU from the SPARC M12-2S	"11.4 Removing the XSCFU"
11	Switching the SD card (*2)	"11.5 Switching an SD Card"
12	Installing the XSCFU in the SPARC M12-2S (*3)	"11.6 Installing the XSCFU"
13	Placing the SPARC M12-2S that required maintenance into the hot state	"10.1.1 Installing a Power Cord"
14	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
15	Confirming that there is no problem with the replacement XSCFU	"10.5.3 Checking the FRU Status After Maintenance"
16	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
17	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
18	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

*1 If the XSCFU requiring maintenance is not running, perform active/hot replacement.
*2 If the SD card installed in the maintenance part will be used, this work is not required.
*3 This unit and the PSUBP cannot be replaced at the same time.

4.2.2 Active/Cold Replacement Workflow of a PCIe Card

You can perform active/cold replacement of a PCIe card in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before replacing the PCIe card, see "Precautions for PCIe card replacement" in "7.1 Precautions for FRU Replacement."

Table 4-9 shows the workflow for active/cold replacement of a PCIe card.

Table 4-9 Active/Cold Replacement Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the faulty PCIe card from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
9	Removing the faulty PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
10	Installing the replacement PCIe card in the PCICS to install it in the SPARC M12-2S or PCI expansion unit	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
11	Placing the SPARC M12-2S that required maintenance into the hot state	"10.1.1 Installing a Power Cord"
12	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
13	Diagnosing the SPARC M12-2S requiring maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"
14	Confirming that there is no problem with the replacement PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
15	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
16	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"

Table 4-9 Active/Cold Replacement Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
17	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

4.2.3 Active/Cold Replacement Workflow of the PSU

You can perform active/cold replacement of the PSU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before replacing the PSU, see "Precautions for PSU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-10 shows the workflow for active/cold replacement of the PSU.

Table 4-10 Active/Cold Replacement Procedure of the PSU

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the PSU from the SPARC M12-2S	"13.3 Removing a PSU"
9	Installing a PSU in the SPARC M12-2S	"13.4 Installing a PSU"
10	Placing the SPARC M12-2S that required maintenance into the hot state	"10.1.1 Installing a Power Cord"

Table 4-10 Active/Cold Replacement Procedure of the PSU *(continued)*

Work Order	Task	Reference
11	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
12	Confirming that there is no problem with the replacement PSU	"10.5.3 Checking the FRU Status After Maintenance"
13	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
14	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
15	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

4.2.4 Active/Cold Replacement Workflow of the FANU

You can perform active/cold replacement of the FANU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before replacing the FANU, see "Precautions for FANU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-11 shows the workflow for active/cold replacement of the FANU.

Table 4-11 Active/Cold Replacement Procedure of the FANU

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"

Table 4-11 Active/Cold Replacement Procedure of the FANU *(continued)*

Work Order	Task	Reference
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the FANU from the SPARC M12-2S	"14.3.1 Removing a FANU"
9	Installing the FANU in the SPARC M12-2S	"14.4.2 Installing a FANU"
10	Placing the SPARC M12-2S that required maintenance into the hot state	"10.1.1 Installing a Power Cord"
11	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
12	Confirming that there is no problem with the replacement FANU	"10.5.3 Checking the FRU Status After Maintenance"
13	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
14	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
15	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

4.2.5 Active/Cold Replacement Workflow of the FANBPU

You can perform active/cold replacement of the FANBPU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before replacing the FANBPU, see "Precautions for FANBPU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-12 shows the workflow for active/cold replacement of the FANBPU.

Table 4-12 Active/Cold Replacement Procedure of the FANBPU

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the FANBPU from the SPARC M12-2S	"9.8.2 Removing the Power Cords" "14.3 Removing a FANU or the FANBPU"
8	Installing the FANBPU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"14.4 Installing a FANU or the FANBPU"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Confirming that there is no problem with the replacement FANBPU	"10.5.3 Checking the FRU Status After Maintenance"
11	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
12	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
13	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

4.2.6 Active/Cold Replacement Workflow of the HDD/SSD

You can perform active/cold replacement of the HDD/SSD in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before replacing the HDD/SSD, see "Precautions for HDD/SSD replacement" in "7.1 Precautions for FRU Replacement."

Table 4-13 shows the workflow for active/cold replacement of the HDD/SSD.

Table 4-13 Active/Cold Replacement Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the HDD/SSD from the SPARC M12-2S	"15.3.1 Removing an HDD/SSD"
9	Installing an HDD/SSD in the SPARC M12-2S	"15.4.1 Installing an HDD/SSD"
10	Placing the SPARC M12-2S that required maintenance into the hot state	"10.1.1 Installing a Power Cord"
11	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"

Table 4-13 Active/Cold Replacement Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
12	Diagnosing the SPARC M12-2S requiring maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"
13	Confirming that there is no problem with the replacement HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
14	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
15	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
16	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

4.2.7 Active/Cold Replacement Workflow of the HDDBPU

You can perform active/cold replacement of the HDDBPU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Table 4-14 shows the workflow for active/cold replacement of the HDDBPU.

Table 4-14 Active/Cold Replacement Procedure of the HDDBPU

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"

Table 4-14 Active/Cold Replacement Procedure of the HDDBPU *(continued)*

Work Order	Task	Reference
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the HDDBPU from the SPARC M12-2S	"16.3 Removing the HDDBPU or OPNL"
8	Installing the HDDBPU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"16.4 Installing the HDDBPU or OPNL"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S requiring maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement HDDBPU	"10.5.3 Checking the FRU Status After Maintenance"
12	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
13	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
14	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

4.2.8 Active/Cold Replacement Workflow of the OPNL

You can perform active/cold replacement of the OPNL in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before replacing the OPNL, see "Precautions for OPNL replacement" in "7.1 Precautions for FRU Replacement."

Table 4-15 shows the workflow for active/cold replacement of the OPNL.

Table 4-15 Active/Cold Replacement Procedure of the OPNL

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the OPNL from the SPARC M12-2S	"16.3 Removing the HDDBPU or OPNL"
8	Installing the OPNL on the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state (*1)	"16.4 Installing the HDDBPU or OPNL"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Confirming that there is no problem with the replacement OPNL	"10.5.3 Checking the FRU Status After Maintenance"
11	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
12	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
13	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

*1 Confirm that the set BB-ID is the same as that of the faulty OPNL.

4.2.9 Active/Cold Replacement Workflow of the CMU

You can perform active/cold replacement of the CMU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before replacing the CMU, see "Precautions for CMU and memory replacement" in "7.1 Precautions for FRU Replacement."

Table 4-16 shows the workflow for active/cold replacement of the CMU.

Table 4-16 Active/Cold Replacement Procedure of the CMU

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the CMU from the SPARC M12-2S	"17.4 Removing the CMU or Memory"
8	Installing the CMU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"17.5 Installing the CMU and Memory"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S with the replacement CMU (*2)	"10.5.1 Diagnosing the SPARC M12 Hardware"

Table 4-16 Active/Cold Replacement Procedure of the CMU *(continued)*

Work Order	Task	Reference
11	Diagnosing the XBU and crossbar cable of the SPARC M12-2S with the replacement CMU	"10.5.2 Diagnosing the XBU and Crossbar Cable"
12	Confirming that there is no problem with the replacement CMU	"10.5.3 Checking the FRU Status After Maintenance"
13	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
14	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain (*1)	"10.7 Incorporating I/O Resources Into a Logical Domain"
15	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

*1 If the replaced CMUL had the hardware RAID setting enabled, enable the setting again.
*2 If the replaced CMUU was in a SPARC M12-2S with no PCIe cards mounted, or if the CMUL was replaced, no diagnosis is necessary (because diagnosis was performed in the previous step).

4.2.10 Active/Cold Replacement Workflow of Memory

You can perform active/cold replacement of memory in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before replacing the memory, see "Precautions for CMU and memory replacement" in "7.1 Precautions for FRU Replacement."

Table 4-17 shows the workflow for active/cold replacement of memory.

Table 4-17 Active/Cold Replacement Procedure of Memory

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"

Table 4-17 Active/Cold Replacement Procedure of Memory *(continued)*

Work Order	Task	Reference
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing memory from the SPARC M12-2S	"17.4 Removing the CMU or Memory"
8	Installing memory in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state (*1)	"17.5 Installing the CMU and Memory"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S with the replacement memory (*2)	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Diagnosing the XBU and crossbar cable of the SPARC M12-2S with the replacement memory	"10.5.2 Diagnosing the XBU and Crossbar Cable"
12	Confirming that there is no problem with the replacement memory	"10.5.3 Checking the FRU Status After Maintenance"
13	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
14	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
15	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

*1 Install memory of the same type and at the same location as those of the faulty memory.
*2 If the replaced memory was in a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

4.2.11 Active/Cold Replacement Workflow of the BPU

You can perform active/cold replacement of the BPU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Table 4-18 shows the workflow for active/cold replacement of the BPU.

Table 4-18 Active/Cold Replacement Procedure of the BPU

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the BPU from the SPARC M12-2S	"18.4 Removing the BPU and PSUBP"
8	Installing the BPU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"18.5 Installing the BPU and PSUBP"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S requiring maintenance (*1)	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Diagnosing the XBU and crossbar cable of the SPARC M12-2S requiring maintenance	"10.5.2 Diagnosing the XBU and Crossbar Cable"
12	Confirming that there is no problem with the replacement BPU	"10.5.3 Checking the FRU Status After Maintenance"
13	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
14	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"

Table 4-18 Active/Cold Replacement Procedure of the BPU *(continued)*

Work Order	Task	Reference
15	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

*1 If the replaced BPU was in a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

4.2.12 Active/Cold Replacement Workflow of the PSUBP

You can perform active/cold replacement of the PSUBP in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Table 4-19 shows the workflow for active/cold replacement of the PSUBP.

Table 4-19 Active/Cold Replacement Procedure of the PSUBP

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the PSUBP from the SPARC M12-2S	"18.4 Removing the BPU and PSUBP"
8	Installing the PSUBP in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state (*1)	"18.5 Installing the BPU and PSUBP"

Table 4-19 Active/Cold Replacement Procedure of the PSUBP *(continued)*

Work Order	Task	Reference
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S requiring maintenance (*2)	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Diagnosing the XBU and crossbar cable of the SPARC M12-2S requiring maintenance	"10.5.2 Diagnosing the XBU and Crossbar Cable"
12	Confirming that there is no problem with the replacement PSUBP	"10.5.3 Checking the FRU Status After Maintenance"
13	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
14	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
15	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

*1 This unit and the XSCFU cannot be replaced at the same time.
*2 If the replaced PSUBP was in a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

4.2.13 Active/Cold Replacement Workflow of the PCI Expansion Unit

You can perform active/cold replacement of a PCI expansion unit in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Table 4-20 shows the workflow for active/cold replacement of a PCI expansion unit.
Table 4-20 describes the procedure for replacing a FRU while the power cords of the PCI expansion unit are disconnected.
For replacement procedures for FRUs while the power cords of the PCI expansion unit are connected, see "7.1.1 Hot Replacement" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.

Table 4-20 Active/Cold Replacement Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the FRUs in the faulty PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
9	Installing a FRU in the PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
10	Placing the SPARC M12-2S that required maintenance into the hot state	"10.1.1 Installing a Power Cord"
11	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
12	Diagnosing the SPARC M12-2S requiring maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"
13	Confirming that there is no problem with the replacement PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
14	Incorporating the SPARC M12-2S that required maintenance into the physical partition (*1)	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
15	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"

Table 4-20 Active/Cold Replacement Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
16	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

*1 Remove all the PCIe cards mounted in the PCI expansion unit when incorporating the SPARC M12-2S into the physical partition.

4.2.14 Active/Cold Replacement Workflow of the XSCF DUAL Control Cable

You can perform active/cold replacement of the XSCF DUAL control cable in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Table 4-21 shows the workflow for active/cold replacement of the XSCF DUAL control cable.

Table 4-21 Active/Cold Replacement Procedure of the XSCF DUAL Control Cable

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the XSCF DUAL control cable from the SPARC M12-2S	"21.3 Removing the XSCF DUAL Control Cable"

Table 4-21 *(continued)* Active/Cold Replacement Procedure of the XSCF DUAL Control Cable

Work Order	Task	Reference
8	Installing the XSCF DUAL control cable on the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"21.4 Installing the XSCF DUAL Control Cable"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Confirming that there is no problem with the replacement XSCF DUAL control cable	"10.5.3 Checking the FRU Status After Maintenance"
11	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
12	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
13	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

4.2.15 Active/Cold Replacement Workflow of the XSCF BB Control Cable

You can perform active/cold replacement of the XSCF BB control cable in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Table 4-22 shows the workflow for active/cold replacement of the XSCF BB control cable.

Table 4-22 Active/Cold Replacement Procedure of the XSCF BB Control Cable

Work Order	Task	Reference
1	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

Table 4-22 Active/Cold Replacement Procedure of the XSCF BB Control Cable *(continued)*

Work Order	Task	Reference
4	Releasing I/O resources of the SPARC M12-2S requiring maintenance from a logical domain	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the XSCF BB control cable from the SPARC M12-2S	"22.3 Removing the XSCF BB Control Cable"
8	Installing the XSCF BB control cable on the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"22.4 Installing the XSCF BB Control Cable"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Confirming that there is no problem with the replacement XSCF BB control cable	"10.5.3 Checking the FRU Status After Maintenance"
11	Incorporating the SPARC M12-2S that required maintenance into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
12	Incorporating I/O resources of the SPARC M12-2S requiring maintenance into a logical domain	"10.7 Incorporating I/O Resources Into a Logical Domain"
13	Checking the operating condition of the system and the I/O device usage status	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"

4.3 Inactive/Hot Replacement Workflows

This section describes the workflows for active/hot replacement of the FRUs mounted in the SPARC M12-2S.

You can perform inactive/hot replacement only in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before performing replacement work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to inactive/hot replacement:

- XSCFU
- PCIe card
- PSU
- FANU
- HDD/SSD
- PCI expansion unit

4.3.1 Inactive/Hot Replacement Workflow of the XSCFU

You can perform inactive/hot replacement of the XSCFU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the XSCFU, see "Precautions for XSCFU and PSUBP replacement" in "7.1 Precautions for FRU Replacement."

Table 4-23 shows the workflow for inactive/hot replacement of the XSCFU.

Table 4-23 Inactive/Hot Replacement Procedure of the XSCFU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XSCFU to be replaced	"8.2 Troubleshooting"
3	Confirming that the XSCFU to be replaced is the standby or slave XSCF and is currently replaceable (*1)	"Table 2-16 XSCFU LEDs and Their States"
4	Powering off the physical partition containing the SPARC M12-2S that houses the FRU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the XSCFU from the SPARC M12-2S	"9.6.4 Releasing the XSCFU"
7	Removing the XSCFU from the SPARC M12-2S	"11.4 Removing the XSCFU"
8	Switching the SD card (*2)	"11.5 Switching an SD Card"
9	Installing the XSCFU in the SPARC M12-2S	"11.6 Installing the XSCFU"
10	Incorporating the XSCFU into the SPARC M12-2S	"10.4.4 Incorporating the XSCFU"

Table 4-23 Inactive/Hot Replacement Procedure of the XSCFU *(continued)*

Work Order	Task	Reference
11	Confirming that there is no problem with the replacement XSCFU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
13	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Before replacing the XSCFU, confirm that the READY LED of the XSCFU is lit in green or off. If the READY LED of the XSCFU is blinking, wait until the LED stays lit or is turned off.
- If the XSCFU requiring replacement is not running when the physical partition containing the XSCFU is powered on, perform active/hot replacement.
- If the physical partition containing the XSCFU requiring replacement is powered off, you can perform hot replacement of the XSCFU even when it is not running. In that case, proceed to step 5.
*2 If the SD card installed in the maintenance part will be used, this work is not required.

4.3.2 Inactive/Hot Replacement Workflow of a PCIe Card

You can perform inactive/hot replacement of a PCIe card in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the PCIe card, see "Precautions for PCIe card replacement" in "7.1 Precautions for FRU Replacement."

Table 4-24 shows the workflow for inactive/hot replacement of a PCIe card.

Table 4-24 Inactive/Hot Replacement Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PCIe card to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the PCIe card to be replaced	"Table 2-21 PCIe Card Slot LEDs and Their States"
4	Powering off the physical partition containing the SPARC M12-2S that houses the FRU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the faulty PCIe card from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"

Table 4-24 Inactive/Hot Replacement Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
7	Removing the faulty PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
8	Installing the replacement PCIe card in the PCICS to install it in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
9	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.8 Powering on a Physical Partition" (*1)
10	Confirming that there is no problem with the replacement PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Do not switch the mode switch on the OPNL to Locked at this point.

4.3.3 Inactive/Hot Replacement Workflow of the PSU

You can perform inactive/hot replacement of the PSU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the PSU, see "Precautions for PSU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-25 shows the workflow for inactive/hot replacement of the PSU.

Table 4-25 Inactive/Hot Replacement Procedure of the PSU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PSU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the PSU to be replaced	"Table 2-20 PSU LEDs and Their States"
4	Powering off the physical partition containing the SPARC M12-2S that houses the FRU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the PSU from the SPARC M12-2S	"9.6.3 Releasing the PSU"

Table 4-25 Inactive/Hot Replacement Procedure of the PSU *(continued)*

Work Order	Task	Reference
7	Removing the PSU from the SPARC M12-2S	"13.3 Removing a PSU"
8	Installing a PSU in the SPARC M12-2S	"13.4 Installing a PSU"
9	Incorporating the PSU into the SPARC M12-2S	"10.4.3 Incorporating the PSU"
10	Confirming that there is no problem with the replacement PSU	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
12	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.3.4 Inactive/Hot Replacement Workflow of the FANU

You can perform inactive/hot replacement of the FANU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the FANU, see "Precautions for FANU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-26 shows the workflow for inactive/hot replacement of the FANU.

Table 4-26 Inactive/Hot Replacement Procedure of the FANU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the FANU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the FANU to be replaced	"Table 2-19 FANU LEDs and Their States"
4	Powering off the physical partition containing the SPARC M12-2S that houses the FRU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the FANU from the SPARC M12-2S	"9.6.2 Releasing the FANU"
7	Removing the FANU from the SPARC M12-2S	"14.3.1 Removing a FANU"

Table 4-26 Inactive/Hot Replacement Procedure of the FANU *(continued)*

Work Order	Task	Reference
8	Installing the FANU in the SPARC M12-2S	"14.4.2 Installing a FANU"
9	Incorporating the FANU into the SPARC M12-2S	"10.4.2 Incorporating the FANU"
10	Confirming that there is no problem with the replacement FANU	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
12	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.3.5 Inactive/Hot Replacement Workflow of the HDD/SSD

You can perform inactive/hot replacement of the HDD/SSD in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the HDD/SSD, see "Precautions for HDD/SSD replacement" in "7.1 Precautions for FRU Replacement."

Table 4-27 shows the workflow for inactive/hot replacement of the HDD/SSD.

Table 4-27 Inactive/Hot Replacement Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the HDD/SSD to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the HDD/SSD to be replaced	"Table 2-22 HDD/SSD LEDs and Their States"
4	Powering off the physical partition containing the SPARC M12-2S that houses the HDD/SSD requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the HDD/SSD from the SPARC M12-2S	"15.3.1 Removing an HDD/SSD"

Table 4-27 Inactive/Hot Replacement Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
7	Installing an HDD/SSD in the SPARC M12-2S	"15.4.1 Installing an HDD/SSD"
8	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.8 Powering on a Physical Partition" (*1)
9	Confirming that there is no problem with the replacement HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
10	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
11	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Do not switch the mode switch on the OPNL to Locked at this point.

4.3.6 Inactive/Hot Replacement Workflow of the PCI Expansion Unit

You can perform inactive/hot replacement of a PCI expansion unit in the following configuration:

- Building block configuration where two or more physical partitions are operating

Table 4-28 shows the workflow for inactive/hot replacement of a PCI expansion unit.
Table 4-28 describes the procedure for replacing a FRU while the power cords of the PCI expansion unit are disconnected.
For replacement procedures for FRUs while the power cords of the PCI expansion unit are connected, see "7.1.1 Hot Replacement" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.

Table 4-28 Inactive/Hot Replacement Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PCI expansion unit to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S connected to the PCI expansion unit to be replaced	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
4	Powering off the physical partition containing the SPARC M12-2S connected to the PCI expansion unit requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"

Table 4-28 Inactive/Hot Replacement Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the FRUs in the faulty PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
7	Installing a FRU in the PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
8	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.8 Powering on a Physical Partition" (*1)
9	Confirming that there is no problem with the replacement PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
10	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
11	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Do not switch the mode switch on the OPNL to Locked at this point.

4.4 Inactive/Cold Replacement Workflows

This section describes the workflows for inactive/cold replacement of the FRUs mounted in the SPARC M12-2S.

You can perform inactive/cold replacement only in the following system configurations:

- Building block configuration where two or more physical partitions are operating

Before performing replacement work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to inactive/cold replacement:

- XSCFU
- PCIe card
- PSU
- FANU
- FANBPU
- HDD/SSD

- HDDBPU
- OPNL
- CMU
- Memory
- BPU
- PSUBP
- Crossbar cable
- XBU
- PCI expansion unit
- XSCF DUAL control cable
- XSCF BB control cable

4.4.1 Inactive/Cold Replacement Workflow of the XSCFU

You can perform inactive/cold replacement of the XSCFU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the XSCFU, see "Precautions for XSCFU and PSUBP replacement" in "7.1 Precautions for FRU Replacement."

Table 4-29 shows the workflow for inactive/cold replacement of the XSCFU.

Table 4-29 Inactive/Cold Replacement Procedure of the XSCFU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XSCFU to be replaced	"8.2 Troubleshooting"
3	Confirming that the XSCFU to be replaced is the standby or slave XSCF and is currently replaceable (*1)	"Table 2-16 XSCFU LEDs and Their States"
4	Powering off the physical partition containing the SPARC M12-2S that houses the XSCFU to be replaced	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"

Table 4-29 Inactive/Cold Replacement Procedure of the XSCFU *(continued)*

Work Order	Task	Reference
8	Removing the XSCFU from the SPARC M12-2S	"11.4 Removing the XSCFU"
9	Switching the SD card (*2)	"11.5 Switching an SD Card"
10	Installing the XSCFU in the SPARC M12-2S	"11.6 Installing the XSCFU"
11	Placing the SPARC M12-2S that required maintenance into the hot state	"10.1.1 Installing a Power Cord"
12	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
13	Confirming that there is no problem with the replacement XSCFU	"10.5.3 Checking the FRU Status After Maintenance"
14	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
15	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Before replacing the XSCFU, confirm that the READY LED of the XSCFU is lit in green or off. If the READY LED of the XSCFU is blinking, wait until the LED stays lit or is turned off.
- If the XSCFU requiring replacement is not running when the physical partition containing the XSCFU is powered on, perform active/hot replacement.
- If the physical partition containing the XSCFU requiring replacement is powered off, you can perform hot replacement of the XSCFU even when it is not running. In that case, proceed to step 5.

*2 If the SD card installed in the maintenance part will be used, this work is not required.

4.4.2 Inactive/Cold Replacement Workflow of a PCIe Card

You can perform inactive/cold replacement of a PCIe card in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the PCIe card, see "Precautions for PCIe card replacement" in "7.1 Precautions for FRU Replacement."

Table 4-30 shows the workflow for inactive/cold replacement of a PCIe card.

Table 4-30 Inactive/Cold Replacement Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PCIe card to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the PCIe card to be replaced	"Table 2-21 PCIe Card Slot LEDs and Their States"
4	Powering off the physical partition containing the SPARC M12-2S that houses the PCIe card requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the faulty PCIe card from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
9	Removing the faulty PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
10	Installing the replacement PCIe card in the PCICS to install it in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
11	Placing the SPARC M12-2S that required maintenance into the hot state	"10.1.1 Installing a Power Cord"
12	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
13	Diagnosing the SPARC M12-2S requiring maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"
14	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.8 Powering on a Physical Partition" (*1)
15	Confirming that there is no problem with the replacement PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
16	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
17	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Do not switch the mode switch on the OPNL to Locked at this point.

4.4.3 Inactive/Cold Replacement Workflow of the PSU

You can perform inactive/cold replacement of the PSU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the PSU, see "Precautions for PSU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-31 shows the workflow for inactive/cold replacement of the PSU.

Table 4-31 Inactive/Cold Replacement Procedure of the PSU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PSU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the PSU to be replaced	"Table 2-20 PSU LEDs and Their States"
4	Powering off the physical partition containing the SPARC M12-2S that houses the FRU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the PSU from the SPARC M12-2S	"13.3 Removing a PSU"
9	Installing a PSU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"13.4 Installing a PSU" "10.1.1 Installing a Power Cord"
10	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
11	Confirming that there is no problem with the replacement PSU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
13	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.4.4 Inactive/Cold Replacement Workflow of the FANU

You can perform inactive/cold replacement of the FANU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the FANU, see "Precautions for FANU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-32 shows the workflow for inactive/cold replacement of the FANU.

Table 4-32 Inactive/Cold Replacement Procedure of the FANU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the FANU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the FANU to be replaced	"Figure 2-13 LED Locations on the FANU"
4	Powering off the physical partition containing the SPARC M12-2S that houses the FRU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the FANU from the SPARC M12-2S	"14.3.1 Removing a FANU"
9	Installing the FANU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"14.4.2 Installing a FANU"
10	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
11	Confirming that there is no problem with the replacement FANU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
13	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.4.5 Inactive/Cold Replacement Workflow of the FANBPU

You can perform inactive/cold replacement of the FANBPU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the FANBPU, see "Precautions for FANBPU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-33 shows the workflow for inactive/cold replacement of the FANBPU.

Table 4-33 Inactive/Cold Replacement Procedure of the FANBPU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the FANBPU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the FANBPU to be replaced	"8.1.2 Checking Hardware"
4	Powering off the physical partition containing the SPARC M12-2S that houses the FANBPU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the FANBPU from the SPARC M12-2S	"14.3 Removing a FANU or the FANBPU"
9	Installing the FANBPU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"14.4 Installing a FANU or the FANBPU"
10	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
11	Confirming that there is no problem with the replacement FANBPU	"10.5.3 Checking the FRU Status After Maintenance"

Table 4-33 Inactive/Cold Replacement Procedure of the FANBPU *(continued)*

Work Order	Task	Reference
12	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
13	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.4.6 Inactive/Cold Replacement Workflow of the HDD/SSD

You can perform inactive/cold replacement of the HDD/SSD in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the HDD/SSD, see "Precautions for HDD/SSD replacement" in "7.1 Precautions for FRU Replacement."

Table 4-34 shows the workflow for inactive/cold replacement of the HDD/SSD.

Table 4-34 Inactive/Cold Replacement Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the HDD/SSD to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the HDD/SSD to be replaced	"Figure 2-16 LED Locations on the HDD/SSD"
4	Powering off the physical partition containing the SPARC M12-2S that houses the HDD/SSD requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state	"9.8.2 Removing the Power Cords"
8	Removing the HDD/SSD from the SPARC M12-2S	"15.3.1 Removing an HDD/SSD"

Table 4-34 Inactive/Cold Replacement Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
9	Installing an HDD/SSD in the SPARC M12-2S	"15.4.1 Installing an HDD/SSD"
10	Placing the SPARC M12-2S that required maintenance into the hot state	"10.1.1 Installing a Power Cord"
11	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
12	Diagnosing the SPARC M12-2S requiring maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"
13	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.8 Powering on a Physical Partition" (*1)
14	Confirming that there is no problem with the replacement HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
15	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
16	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Do not switch the mode switch on the OPNL to Locked at this point.

4.4.7 Inactive/Cold Replacement Workflow of the HDDBPU

You can perform inactive/cold replacement of the HDDBPU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Table 4-35 shows the workflow for inactive/cold replacement of the HDDBPU.

Table 4-35 Inactive/Cold Replacement Procedure of the HDDBPU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the HDDBPU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the HDDBPU to be replaced	"8.1.2 Checking Hardware"

Table 4-35 Inactive/Cold Replacement Procedure of the HDDBPU *(continued)*

Work Order	Task	Reference
4	Powering off the physical partition containing the SPARC M12-2S that houses the HDDBPU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the HDDBPU from the SPARC M12-2S	"16.3 Removing the HDDBPU or OPNL"
8	Installing the HDDBPU in the SPARC M12-2S, and placing the SPARC M12-2S into the hot state	"16.4 Installing the HDDBPU or OPNL"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Confirming that there is no problem with the replacement HDDBPU	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
12	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.4.8 Inactive/Cold Replacement Workflow of the OPNL

You can perform inactive/cold replacement of the OPNL in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the OPNL, see "Precautions for OPNL replacement" in "7.1 Precautions for FRU Replacement."

Table 4-36 shows the workflow for inactive/cold replacement of the OPNL.

Table 4-36 Inactive/Cold Replacement Procedure of the OPNL

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the OPNL to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the OPNL to be replaced	"2.4 Understanding the LED Indications"
4	Powering off the physical partition containing the SPARC M12-2S that houses the OPNL requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the OPNL from the SPARC M12-2S	"16.3 Removing the HDDBPU or OPNL"
8	Installing the OPNL on the SPARC M12-2S, and placing the SPARC M12-2S into the hot state	"16.4 Installing the HDDBPU or OPNL"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Confirming that there is no problem with the replacement OPNL	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
12	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.4.9 Inactive/Cold Replacement Workflow of the CMU

You can perform inactive/cold replacement of the CMU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the CMU, see "Precautions for CMU and memory replacement" in "7.1 Precautions for FRU Replacement."

Table 4-37 shows the workflow for inactive/cold replacement of the CMU.

Table 4-37 Inactive/Cold Replacement Procedure of the CMU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the CMU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the CMU to be replaced	"2.4.2 System Locator"
4	Powering off the physical partition containing the SPARC M12-2S that houses the CMU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the CMU from the SPARC M12-2S	"17.4 Removing the CMU or Memory"
8	Installing the CMU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"17.5 Installing the CMU and Memory"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S requiring maintenance (*2)	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Diagnosing the XBU and crossbar cable of the SPARC M12-2S requiring maintenance	"10.5.2 Diagnosing the XBU and Crossbar Cable"
12	Confirming that there is no problem with the replacement CMU	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance (*1)	"10.8 Powering on a Physical Partition"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 If you replaced a CMU that uses the hardware RAID function, enable the hardware RAID function before starting Oracle Solaris. For details, see "Re-enabling a Hardware RAID Volume on OpenBoot PROM" in "14.2.11 Re-enabling a Hardware RAID Volume" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.
*2 If the replaced CMUU was in a SPARC M12-2S with no PCIe cards mounted, or if the CMUL was replaced, no diagnosis is necessary (because diagnosis was performed in the previous step).

4.4.10 Inactive/Cold Replacement Workflow of Memory

You can perform inactive/cold replacement of memory in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before replacing the memory, see "Precautions for CMU and memory replacement" in "7.1 Precautions for FRU Replacement."

Table 4-38 shows the workflow for inactive/cold replacement of memory.

Table 4-38 Inactive/Cold Replacement Procedure of Memory

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the memory to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the memory to be replaced	"2.2.2 Checking Memory Information"
4	Powering off the physical partition containing the SPARC M12-2S that houses the memory requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing memory from the SPARC M12-2S	"17.4 Removing the CMU or Memory"
8	Installing memory in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"17.5 Installing the CMU and Memory"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S requiring maintenance (*1)	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Diagnosing the XBU and crossbar cable of the SPARC M12-2S requiring maintenance	"10.5.2 Diagnosing the XBU and Crossbar Cable"
12	Confirming that there is no problem with the replacement memory	"10.5.3 Checking the FRU Status After Maintenance"

Table 4-38 Inactive/Cold Replacement Procedure of Memory *(continued)*

Work Order	Task	Reference
13	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 If the replaced memory was in a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

4.4.11 Inactive/Cold Replacement Workflow of the BPU

You can perform inactive/cold replacement of the BPU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Table 4-39 shows the workflow for inactive/cold replacement of the BPU.

Table 4-39 Inactive/Cold Replacement Procedure of the BPU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the BPU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the BPU to be replaced	"8.1.2 Checking Hardware"
4	Powering off the physical partition containing the SPARC M12-2S that houses the BPU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the BPU from the SPARC M12-2S	"18.4 Removing the BPU and PSUBP"
8	Installing the BPU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"18.5 Installing the BPU and PSUBP"

Table 4-39 Inactive/Cold Replacement Procedure of the BPU *(continued)*

Work Order	Task	Reference
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S requiring maintenance (*1)	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Diagnosing the XBU and crossbar cable of the SPARC M12-2S requiring maintenance	"10.5.2 Diagnosing the XBU and Crossbar Cable"
12	Confirming that there is no problem with the replacement BPU	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 If the replaced BPU was in a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

4.4.12 Inactive/Cold Replacement Workflow of the PSUBP

You can perform inactive/cold replacement of the PSUBP in the following configuration:

- Building block configuration where two or more physical partitions are operating

Table 4-40 shows the workflow for inactive/cold replacement of the PSUBP.

Table 4-40 Inactive/Cold Replacement Procedure of the PSUBP

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PSUBP to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the PSUBP to be replaced	"8.1.2 Checking Hardware"
4	Powering off the physical partition containing the SPARC M12-2S that houses the PSUBP requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"

Table 4-40 Inactive/Cold Replacement Procedure of the PSUBP *(continued)*

Work Order	Task	Reference
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the PSUBP from the SPARC M12-2S	"18.4 Removing the BPU and PSUBP"
8	Installing the PSUBP in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"18.5 Installing the BPU and PSUBP"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S requiring maintenance (*1)	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Diagnosing the XBU and crossbar cable of the SPARC M12-2S requiring maintenance	"10.5.2 Diagnosing the XBU and Crossbar Cable"
12	Confirming that there is no problem with the replacement PSUBP	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 If the replaced PSUBP was in a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

4.4.13 Inactive/Cold Replacement Workflow of the Crossbar Cable

You can perform inactive/cold replacement of the crossbar cable in the following configuration:

- Building block configuration where two or more physical partitions are operating

Table 4-41 shows the workflow for inactive/cold replacement of the crossbar cable.

Table 4-41 Inactive/Cold Replacement Procedure of the Crossbar Cable

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the crossbar cable to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that is connected to the crossbar cable to be replaced	"10.5.2 Diagnosing the XBU and Crossbar Cable"
4	Powering off the physical partition containing the SPARC M12-2S that is connected to the crossbar cable requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the crossbar cable from the SPARC M12-2S	"19.3 Removing the Crossbar Cable"
8	Installing the crossbar cable on the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"19.4 Installing the Crossbar Cable"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the crossbar cable	"10.5.2 Diagnosing the XBU and Crossbar Cable"
11	Confirming that there is no problem with the replacement crossbar cable	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
13	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.4.14 Inactive/Cold Replacement Workflow of the XBU

You can perform inactive/cold replacement of the XBU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Table 4-42 shows the workflow for inactive/cold replacement of the XBU.

Table 4-42 Inactive/Cold Replacement Procedure of the XBU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XBU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the XBU to be replaced	"8.1.2 Checking Hardware"
4	Powering off the physical partition containing the SPARC M12-2S that houses the XBU requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the XBU from the SPARC M12-2S	"20.3 Removing an XBU"
8	Installing the XBU in the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"20.4 Installing an XBU"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the XBU and crossbar cable of the SPARC M12-2S requiring maintenance	"10.5.2 Diagnosing the XBU and Crossbar Cable"
11	Confirming that there is no problem with the replacement XBU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
13	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.4.15 Inactive/Cold Replacement Workflow of the PCI Expansion Unit

You can perform inactive/cold replacement of a PCI expansion unit in the following configuration:

- Building block configuration where two or more physical partitions are operating

Table 4-43 shows the workflow for inactive/cold replacement of a PCI expansion unit.
Table 4-43 describes the procedure for replacing a FRU while the power cords of the PCI expansion unit are disconnected.
For replacement procedures for FRUs while the power cords of the PCI expansion unit are connected, see "7.1.1 Hot Replacement" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.

Table 4-43 Inactive/Cold Replacement Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PCI expansion unit to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S connected to the PCI expansion unit to be replaced	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
4	Powering off the physical partition containing the SPARC M12-2S connected to the PCI expansion unit requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Removing the FRUs in the faulty PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
8	Installing a FRU in the PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S requiring maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"

Table 4-43 Inactive/Cold Replacement Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
11	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.8 Powering on a Physical Partition" (*1)
12	Confirming that there is no problem with the replacement PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Do not switch the mode switch on the OPNL to Locked at this point.

4.4.16 Inactive/Cold Replacement Workflow of the XSCF DUAL Control Cable

You can perform inactive/cold replacement of the XSCF DUAL control cable in the following configuration:

- Building block configuration where two or more physical partitions are operating

Table 4-44 shows the workflow for inactive/cold replacement of the XSCF DUAL control cable.

Table 4-44 Inactive/Cold Replacement Procedure of the XSCF DUAL Control Cable

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XSCF DUAL control cable to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S connected to the XSCF DUAL control cable to be replaced	"8.1.2 Checking Hardware"
4	Powering off the physical partition containing the SPARC M12-2S connected to the XSCF DUAL control cable requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"

Table 4-44 Inactive/Cold Replacement Procedure of the XSCF DUAL Control Cable *(continued)*

Work Order	Task	Reference
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the XSCF DUAL control cable from the SPARC M12-2S	"21.3 Removing the XSCF DUAL Control Cable"
8	Installing the XSCF DUAL control cable, which is a maintenance part, on the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"21.4 Installing the XSCF DUAL Control Cable"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Confirming that there is no problem with the replacement XSCF DUAL control cable	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
12	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.4.17 Inactive/Cold Replacement Workflow of the XSCF BB Control Cable

You can perform inactive/cold replacement of the XSCF BB control cable in the following configuration:

- Building block configuration where two or more physical partitions are operating

Table 4-45 shows the workflow for inactive/cold replacement of the XSCF BB control cable.

Table 4-45 Inactive/Cold Replacement Procedure of the XSCF BB Control Cable

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XSCF BB control cable to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S connected to the XSCF BB control cable to be replaced	"8.1.2 Checking Hardware"

Table 4-45 Inactive/Cold Replacement Procedure of the XSCF BB Control Cable *(continued)*

Work Order	Task	Reference
4	Powering off the physical partition containing the SPARC M12-2S connected to the XSCF BB control cable requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Placing the SPARC M12-2S requiring maintenance into the cold state, and removing the XSCF BB control cable from the SPARC M12-2S	"22.3 Removing the XSCF BB Control Cable"
8	Installing the XSCF BB control cable, which is a maintenance part, on the SPARC M12-2S, and placing the SPARC M12-2S that required maintenance into the hot state	"22.4 Installing the XSCF BB Control Cable"
9	Incorporating the SPARC M12-2S that required maintenance into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Confirming that there is no problem with the replacement XSCF BB control cable	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked, and powering on the physical partition containing the SPARC M12-2S that has undergone maintenance	"10.8 Powering on a Physical Partition"
12	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.5 System-Stopped/Hot Replacement Workflows

This section describes the workflows for system-stopped/hot replacement of the FRUs mounted in the SPARC M12.

Before performing replacement work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each

FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to system-stopped/hot replacement:

- XSCFU
- PCIe card
- PSU
- FANU
- HDD/SSD
- PCI expansion unit

4.5.1 System-Stopped/Hot Replacement Workflow of the XSCFU

You can perform system-stopped/hot replacement of the XSCFU in the following configuration:

- Building block configuration connecting two or more SPARC M12-2S units

Before replacing the XSCFU, see "Precautions for XSCFU and PSUBP replacement" in "7.1 Precautions for FRU Replacement."

Table 4-46 shows the workflow for system-stopped/hot replacement of the XSCFU.

Table 4-46 System-Stopped/Hot Replacement Procedure of the XSCFU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XSCFU to be replaced	"8.2 Troubleshooting"
3	Confirming that the XSCFU to be replaced is the standby or slave XSCF and is currently replaceable (*1)	"Table 2-16 XSCFU LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the XSCFU from the SPARC M12-2S	"9.6.4 Releasing the XSCFU"
7	Removing the XSCFU from the SPARC M12-2S	"11.4 Removing the XSCFU"
8	Switching the SD card (*2)	"11.5 Switching an SD Card"
9	Installing the XSCFU in the SPARC M12-2S	"11.6 Installing the XSCFU"
10	Incorporating the XSCFU into the SPARC M12-2S	"10.4.4 Incorporating the XSCFU"

Table 4-46 System-Stopped/Hot Replacement Procedure of the XSCFU *(continued)*

Work Order	Task	Reference
11	Confirming that there is no problem with the replacement XSCFU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Before replacing the XSCFU, confirm that the READY LED of the XSCFU is lit in green or off. If the READY LED of the XSCFU is blinking, wait until the LED stays lit or is turned off.
- If the XSCFU requiring replacement is not running when the physical partition containing the XSCFU is powered on, perform active/hot replacement.
- If the physical partition containing the XSCFU requiring replacement is powered off, you can perform hot replacement of the XSCFU even when it is not running. In that case, proceed to step 5.

*2 If the SD card installed in the maintenance part will be used, this work is not required.

4.5.2 System-Stopped/Hot Replacement Workflow of a PCIe Card

Before replacing the PCIe card, see "Precautions for PCIe card replacement" in "7.1 Precautions for FRU Replacement."

Table 4-47 shows the workflow for system-stopped/hot replacement of a PCIe card.

Table 4-47 System-Stopped/Hot Replacement Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PCIe card to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the PCIe card to be replaced	"Table 2-21 PCIe Card Slot LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the faulty PCIe card from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
7	Removing the faulty PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"

Table 4-47 System-Stopped/Hot Replacement Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
8	Installing the replacement PCIe card in the PCICS to install it in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
9	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
10	Confirming that there is no problem with the replacement PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.5.3 System-Stopped/Hot Replacement Workflow of the PSU

Before replacing the PSU, see "Precautions for PSU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-48 shows the workflow for system-stopped/hot replacement of the PSU.

Table 4-48 System-Stopped/Hot Replacement Procedure of the PSU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PSU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the PSU to be replaced	"Table 2-20 PSU LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the PSU from the SPARC M12-2/M12-2S	"9.6.3 Releasing the PSU"
7	Removing the PSU from the SPARC M12-2/M12-2S	"13.3 Removing a PSU"
8	Installing a PSU in the SPARC M12-2/M12-2S	"13.4 Installing a PSU"

Table 4-48 System-Stopped/Hot Replacement Procedure of the PSU *(continued)*

Work Order	Task	Reference
9	Incorporating the PSU into the SPARC M12-2/M12-2S	"10.4.3 Incorporating the PSU"
10	Confirming that there is no problem with the replacement PSU	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
13	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.5.4 System-Stopped/Hot Replacement Workflow of the FANU

Before replacing the FANU, see "Precautions for FANU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-49 shows the workflow for system-stopped/hot replacement of the FANU.

Table 4-49 System-Stopped/Hot Replacement Procedure of the FANU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the FANU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the FANU to be replaced	"Table 2-19 FANU LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the FANU from the SPARC M12-2/M12-2S	"9.6.2 Releasing the FANU"
7	Removing the FANU from the SPARC M12-2/M12-2S	"14.3.1 Removing a FANU"
8	Installing the FANU in the SPARC M12-2/M12-2S	"14.4.2 Installing a FANU"
9	Incorporating the FANU into the SPARC M12-2/M12-2S	"10.4.2 Incorporating the FANU"

Table 4-49 System-Stopped/Hot Replacement Procedure of the FANU *(continued)*

Work Order	Task	Reference
10	Confirming that there is no problem with the replacement FANU	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
13	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.5.5 System-Stopped/Hot Replacement Workflow of the HDD/SSD

Before replacing the HDD/SSD, see "Precautions for HDD/SSD replacement" in "7.1 Precautions for FRU Replacement."

Table 4-50 shows the workflow for system-stopped/hot replacement of the HDD/SSD.

Table 4-50 System-Stopped/Hot Replacement Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the HDD/SSD to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the HDD/SSD to be replaced	"Table 2-22 HDD/SSD LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the HDD/SSD from the SPARC M12-2/M12-2S	"15.3.1 Removing an HDD/SSD"
7	Installing an HDD/SSD in the SPARC M12-2/M12-2S	"15.4.1 Installing an HDD/SSD"
8	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
9	Confirming that there is no problem with the replacement HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
10	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

Table 4-50 System-Stopped/Hot Replacement Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
11	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.5.6 System-Stopped/Hot Replacement Workflow of the PCI Expansion Unit

Table 4-51 shows the workflow for system-stopped/hot replacement of a PCI expansion unit.
Table 4-51 describes the procedure for replacing a FRU while the power cords of the PCI expansion unit are disconnected.
For replacement procedures for FRUs while the power cords of the PCI expansion unit are connected, see "7.1.1 Hot Replacement" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.

Table 4-51 System-Stopped/Hot Replacement Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PCI expansion unit to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S connected to the PCI expansion unit to be replaced	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the FRUs in the faulty PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
7	Installing a FRU in the PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
8	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
9	Confirming that there is no problem with the replacement PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
10	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

Table 4-51 System-Stopped/Hot Replacement Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
11	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6 System-Stopped/Cold Replacement Workflows

This section describes the workflows for system-stopped/cold replacement of the FRUs mounted in the SPARC M12-2/M12-2S.
The described procedures are performed after all the SPARC M12-2/M12-2S units are placed in the cold state, without using the maintenance menu.
Note that, in a building block configuration, you can perform maintenance using the maintenance menu when only the SPARC M12-2S requiring maintenance is in the cold state. For work procedures with the maintenance menu, see "4.4 Inactive/Cold Replacement Workflows."
The XSCF DUAL and XSCF BB control cables cannot be maintained by using the maintenance menu.

Before performing replacement work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to system-stopped/cold replacement:

- XSCFU
- PCIe card
- PSU
- FANU
- FANBPU
- HDD/SSD
- HDDBPU
- OPNL
- CMU
- Memory
- BPU
- PSUBP
- Crossbar cable

- XBU
- XSCF DUAL control cable
- XSCF BB control cable
- PCI expansion unit

4.6.1 System-Stopped/Cold Replacement Workflow of the XSCFU

Before replacing the XSCFU, see "Precautions for XSCFU and PSUBP replacement" in "7.1 Precautions for FRU Replacement."

Table 4-52 shows the workflow for system-stopped/cold replacement of the XSCFU.

Table 4-52 System-Stopped/Cold Replacement Procedure of the XSCFU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XSCFU to be replaced	"8.2 Troubleshooting"
3	Confirming that the XSCFU to be replaced is the standby or slave XSCF and is currently replaceable (*1)	"Table 2-16 XSCFU LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the XSCFU from the SPARC M12-2/M12-2S	"11.4 Removing the XSCFU"
8	Switching the SD card (*2)	"11.5 Switching an SD Card"
9	Installing the XSCFU in the SPARC M12-2/M12-2S	"11.6 Installing the XSCFU"
10	Installing the power cords on all the SPARC M12-2/M12-2S units (*3)(*4)(*5)	"10.1.1 Installing a Power Cord"
11	Checking the XCP firmware version (*6)	"11.7 Checking the XCP Firmware Version" "11.8 Checking the XCP Firmware Version (Building Block Configuration)
12	Confirming that there is no problem with the replacement XSCFU	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

Table 4-52 System-Stopped/Cold Replacement Procedure of the XSCFU *(continued)*

Work Order	Task	Reference
14	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
15	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 Before replacing the XSCFU, confirm that the READY LED of the XSCFU is lit in green or off. If the READY LED of the XSCFU is blinking, wait until the LED stays lit or is turned off.
- If the XSCFU requiring replacement is not running when the physical partition containing the XSCFU is powered on, perform active/hot replacement.
- If the physical partition containing the XSCFU requiring replacement is off, you can replace the XSCFU even when it is not running. To do so, proceed to "5. Switching the mode switch on the OPNL to Service."

*2 If the SD card installed in the maintenance part will be used, this work is not required.

*3 In a system with a building block configuration, the XCP firmware version may be different between the maintenance part and the existing system. If so, the message "XSCF firmware update now in progress. BB#xx, please wait for XSCF firmware update complete." appears at login to the XSCF. Then, the XCP firmware version will be automatically matched. The version matching takes about 50 minutes. Execute the showlogs monitor command, and check for the "XCP firmware version synchronization completed" message. The displayed message indicates the completion of XCP firmware matching.

*4 If the SD card installed in the maintenance part was used in "8. Switching the SD card," the "SCF:Gaps between BB-ID" message may appear in the error log. If so, ignore the message.

*5 If the "SCF:SCF Diagnosis initialize RTC" message appears in the error log, ignore the message.

*6 If you switched the SD card in "8. Switching the SD card," this step is not necessary.

4.6.2 System-Stopped/Cold Replacement Workflow of a PCIe Card

Before replacing the PCIe card, see "Precautions for PCIe card replacement" in "7.1 Precautions for FRU Replacement."

Table 4-53 shows the workflow for system-stopped/cold replacement of a PCIe card.

Table 4-53 System-Stopped/Cold Replacement Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PCIe card to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the PCIe card to be replaced	"Table 2-21 PCIe Card Slot LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"

Table 4-53 System-Stopped/Cold Replacement Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
7	Removing the faulty PCIe card from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
8	Removing the faulty PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
9	Installing the replacement PCIe card in the PCICS to install it in the SPARC M12-2/M12-2S or PCI expansion unit	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
10	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
11	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
12	Confirming that there is no problem with the replacement PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
14	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
15	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.3 System-Stopped/Cold Replacement Workflow of the PSU

Before replacing the PSU, see "Precautions for PSU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-54 shows the workflow for system-stopped/cold replacement of the PSU.

Table 4-54 System-Stopped/Cold Replacement Procedure of the PSU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the PSU of the SPARC M12-2/M12-2S	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the PSU to be replaced	"Table 2-20 PSU LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"

Table 4-54 System-Stopped/Cold Replacement Procedure of the PSU *(continued)*

Work Order	Task	Reference
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the PSU from the SPARC M12-2/M12-2S	"13.3 Removing a PSU"
8	Installing a PSU in the SPARC M12-2/ M12-2S	"13.4 Installing a PSU"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement PSU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.4 System-Stopped/Cold Replacement Workflow of the FANU

Before replacing the FANU, see "Precautions for FANU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-55 shows the workflow for system-stopped/cold replacement of the FANU.

Table 4-55 System-Stopped/Cold Replacement Procedure of the FANU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the FANU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the FANU to be replaced	"Table 2-19 FANU LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"

Table 4-55 System-Stopped/Cold Replacement Procedure of the FANU *(continued)*

Work Order	Task	Reference
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the FANU from the SPARC M12-2/M12-2S	"14.3.1 Removing a FANU"
8	Installing the FANU in the SPARC M12-2/M12-2S	"14.4.2 Installing a FANU"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement FANU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.5 System-Stopped/Cold Replacement Workflow of the FANBPU

Before replacing the FANBPU, see "Precautions for FANBPU replacement" in "7.1 Precautions for FRU Replacement."

Table 4-56 shows the workflow for system-stopped/cold replacement of the FANBPU.

Table 4-56 System-Stopped/Cold Replacement Procedure of the FANBPU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the FANBPU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the FANBPU to be replaced	"8.1.2 Checking Hardware"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"

Table 4-56 System-Stopped/Cold Replacement Procedure of the FANBPU *(continued)*

Work Order	Task	Reference
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the FANBPU from the SPARC M12-2/M12-2S	"14.3 Removing a FANU or the FANBPU"
8	Installing the FANBPU in the SPARC M12-2/M12-2S	"14.4 Installing a FANU or the FANBPU"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement FANBPU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.6 System-Stopped/Cold Replacement Workflow of the HDD/SSD

Before replacing the HDD/SSD, see "Precautions for HDD/SSD replacement" in "7.1 Precautions for FRU Replacement."

Table 4-57 shows the workflow for system-stopped/cold replacement of the HDD/SSD.

Table 4-57 System-Stopped/Cold Replacement Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the HDD/SSD to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the HDD/SSD to be replaced	"Table 2-22 HDD/SSD LEDs and Their States"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"

Table 4-57 System-Stopped/Cold Replacement Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the HDD/SSD from the SPARC M12-2/M12-2S	"15.3.1 Removing an HDD/SSD"
8	Installing an HDD/SSD in the SPARC M12-2/M12-2S	"15.4.1 Installing an HDD/SSD"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.7 System-Stopped/Cold Replacement Workflow of the HDDBPU

Table 4-58 shows the workflow for system-stopped/cold replacement of the HDDBPU.

Table 4-58 System-Stopped/Cold Replacement Procedure of the HDDBPU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the HDDBPU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the HDDBPU to be replaced	"8.1.2 Checking Hardware"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"

Table 4-58 System-Stopped/Cold Replacement Procedure of the HDDBPU *(continued)*

Work Order	Task	Reference
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the HDDBPU from the SPARC M12-2/M12-2S	"16.3 Removing the HDDBPU or OPNL"
8	Installing the HDDBPU in the SPARC M12-2/M12-2S	"16.4 Installing the HDDBPU or OPNL"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement HDDBPU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.8 System-Stopped/Cold Replacement Workflow of the OPNL

Before replacing the OPNL, see "Precautions for OPNL replacement" in "7.1 Precautions for FRU Replacement."

Table 4-59 shows the workflow for system-stopped/cold replacement of the OPNL.

Table 4-59 System-Stopped/Cold Replacement Procedure of the OPNL

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the OPNL to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the OPNL to be replaced	"2.4 Understanding the LED Indications"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"

Table 4-59 System-Stopped/Cold Replacement Procedure of the OPNL *(continued)*

Work Order	Task	Reference
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the OPNL from the SPARC M12-2/M12-2S	"16.3 Removing the HDDBPU or OPNL"
8	Installing the OPNL on the SPARC M12-2/M12-2S	"16.4 Installing the HDDBPU or OPNL"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement OPNL	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.9 System-Stopped/Cold Replacement Workflow of the CMU

Before replacing the CMU, see "Precautions for CMU and memory replacement" in "7.1 Precautions for FRU Replacement."

Table 4-60 shows the workflow for system-stopped/cold replacement of the CMU.

Table 4-60 System-Stopped/Cold Replacement Procedure of the CMU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the CMU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the CMU to be replaced	"2.4.2 System Locator"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"

Table 4-60 System-Stopped/Cold Replacement Procedure of the CMU *(continued)*

Work Order	Task	Reference
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the CMU from the SPARC M12-2/M12-2S	"17.4 Removing the CMU or Memory"
8	Installing the CMU in the SPARC M12-2/M12-2S	"17.5 Installing the CMU and Memory"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement CMU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions (*1)	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

*1 If you replaced a CMU that uses the hardware RAID function, enable the hardware RAID function before starting Oracle Solaris. For details, see "Re-enabling a Hardware RAID Volume on Oracle Solaris" in "14.2.11 Re-enabling a Hardware RAID Volume" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

4.6.10 System-Stopped/Cold Replacement Workflow of Memory

Before replacing the memory, see "Precautions for CMU and memory replacement" in "7.1 Precautions for FRU Replacement."

Table 4-61 shows the workflow for system-stopped/cold replacement of memory.

Table 4-61 System-Stopped/Cold Replacement Procedure of Memory

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the memory to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the memory to be replaced	"2.2.2 Checking Memory Information"

Table 4-61 System-Stopped/Cold Replacement Procedure of Memory *(continued)*

Work Order	Task	Reference
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing memory from the SPARC M12-2/M12-2S	"17.4 Removing the CMU or Memory"
8	Installing memory in the SPARC M12-2/M12-2S	"17.5 Installing the CMU and Memory"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement memory	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.11 System-Stopped/Cold Replacement Workflow of the BPU

Table 4-62 shows the workflow for system-stopped/cold replacement of the BPU.

Table 4-62 System-Stopped/Cold Replacement Procedure of the BPU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the BPU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the BPU to be replaced	"8.1.2 Checking Hardware"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"

Table 4-62 System-Stopped/Cold Replacement Procedure of the BPU *(continued)*

Work Order	Task	Reference
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the BPU from the SPARC M12-2/M12-2S	"18.4 Removing the BPU and PSUBP"
8	Installing the BPU in the SPARC M12-2/M12-2S	"18.5 Installing the BPU and PSUBP"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement BPU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.12 System-Stopped/Cold Replacement Workflow of the PSUBP

Table 4-63 shows the workflow for system-stopped/cold replacement of the PSUBP.

Table 4-63 System-Stopped/Cold Replacement Procedure of the PSUBP

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PSUBP to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S that houses the PSUBP to be replaced	"8.1.2 Checking Hardware"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"

Table 4-63 System-Stopped/Cold Replacement Procedure of the PSUBP *(continued)*

Work Order	Task	Reference
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the PSUBP from the SPARC M12-2/M12-2S	"18.4 Removing the BPU and PSUBP"
8	Installing the PSUBP in the SPARC M12-2/M12-2S	"18.5 Installing the BPU and PSUBP"
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement PSUBP	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.13 System-Stopped/Cold Replacement Workflow of the Crossbar Cable

You can perform system-stopped/cold replacement of the crossbar cable in the following configuration:

- Building block configuration connecting two or more SPARC M12-2S units

Table 4-64 shows the workflow for system-stopped/cold replacement of the crossbar cable.

Table 4-64 System-Stopped/Cold Replacement Procedure of the Crossbar Cable

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the crossbar cable to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that is connected to the crossbar cable to be replaced	"10.5.2 Diagnosing the XBU and Crossbar Cable"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"

Table 4-64 System-Stopped/Cold Replacement Procedure of the Crossbar Cable *(continued)*

Work Order	Task	Reference
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2S units, and removing the crossbar cable from the SPARC M12-2S	"19.3 Removing the Crossbar Cable"
7	Installing the crossbar cable on the SPARC M12-2S, and installing the power cords of all the SPARC M12-2S units	"19.4 Installing the Crossbar Cable"
8	Diagnosing all the SPARC M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
9	Confirming that there is no problem with the replacement crossbar cable	"10.5.3 Checking the FRU Status After Maintenance"
10	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
11	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
12	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.14 System-Stopped/Cold Replacement Workflow of the XBU

Table 4-65 shows the workflow for system-stopped/cold replacement of the XBU.

Table 4-65 System-Stopped/Cold Replacement Procedure of the XBU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XBU to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that houses the XBU to be replaced	"10.5.2 Diagnosing the XBU and Crossbar Cable"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2S units	"9.8.2 Removing the Power Cords"

Table 4-65 System-Stopped/Cold Replacement Procedure of the XBU *(continued)*

Work Order	Task	Reference
7	Removing the XBU from the SPARC M12-2S	"20.3 Removing an XBU"
8	Installing the XBU in the SPARC M12-2S	"20.4 Installing an XBU"
9	Installing the power cords on all the SPARC M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement XBU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.15 System-Stopped/Cold Replacement Workflow of the XSCF DUAL Control Cable

You can perform system-stopped/cold replacement of the XSCF DUAL control cable in the following configuration:

- Building block configuration connecting two or more SPARC M12-2S units

Table 4-66 shows the workflow for system-stopped/cold replacement of the XSCF DUAL control cable.

Table 4-66 System-Stopped/Cold Replacement Procedure of the XSCF DUAL Control Cable

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XSCF DUAL control cable to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that is connected to the XSCF DUAL control cable to be replaced	"Chapter 21 Maintaining the XSCF DUAL Control Cable"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"

Table 4-66 System-Stopped/Cold Replacement Procedure of the XSCF DUAL Control Cable *(continued)*

Work Order	Task	Reference
6	Removing the power cords of all the SPARC M12-2S units, and removing the XSCF DUAL control cable from the SPARC M12-2S	"21.3 Removing the XSCF DUAL Control Cable"
7	Installing the XSCF DUAL control cable on the SPARC M12-2S, and installing the power cords of all the SPARC M12-2S units	"21.4 Installing the XSCF DUAL Control Cable"
8	Confirming that there is no problem with the replacement XSCF DUAL control cable	"10.5.3 Checking the FRU Status After Maintenance"
9	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
10	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
11	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.16 System-Stopped/Cold Replacement Workflow of the XSCF BB Control Cable

You can perform system-stopped/cold replacement of the XSCF BB control cable in the following configuration:

- Building block configuration connecting two or more SPARC M12-2S units

Table 4-67 shows the workflow for system-stopped/cold replacement of the XSCF BB control cable.

Table 4-67 System-Stopped/Cold Replacement Procedure of the XSCF BB Control Cable

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the XSCF BB control cable to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2S that is connected to the XSCF BB control cable to be replaced	"Chapter 22 Maintaining the XSCF BB Control Cable"
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"

Table 4-67 System-Stopped/Cold Replacement Procedure of the XSCF BB Control Cable *(continued)*

Work Order	Task	Reference
6	Removing the power cords of all the SPARC M12-2S units, and removing the XSCF BB control cable from the SPARC M12-2S	"22.3 Removing the XSCF BB Control Cable"
7	Installing the XSCF BB control cable on the SPARC M12-2S, and installing the power cords of all the SPARC M12-2S units	"22.4 Installing the XSCF BB Control Cable"
8	Confirming that there is no problem with the replacement XSCF BB control cable	"10.5.3 Checking the FRU Status After Maintenance"
9	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
10	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
11	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

4.6.17 System-Stopped/Cold Replacement Workflow of the PCI Expansion Unit

Table 4-68 shows the workflow for system-stopped/cold replacement of a PCI expansion unit.
Table 4-68 describes the procedure for replacing a FRU while the power cords of the PCI expansion unit are disconnected.
For replacement procedures for FRUs while the power cords of the PCI expansion unit are connected, see "7.1.1 Hot Replacement" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.

Table 4-68 System-Stopped/Cold Replacement Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Confirming the PCI expansion unit to be replaced	"8.2 Troubleshooting"
3	Checking the operation status of the SPARC M12-2/M12-2S connected to the PCI expansion unit to be replaced	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
4	Stopping all physical partitions	"9.5.2 Stopping All Physical Partitions"

Table 4-68 System-Stopped/Cold Replacement Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
7	Removing the FRUs in the faulty PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
8	Installing a FRU in the PCI expansion unit	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
9	Installing the power cords on all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
10	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Confirming that there is no problem with the replacement PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

Chapter 5

FRU Addition Workflows

This chapter describes addition workflows by type of maintenance for FRUs and the PCI expansion unit mounted to the SPARC M12. For the installation and removal procedures of each FRU, see Chapter 11 and subsequent chapters.

5.1 Active/Hot Addition Workflows

This section describes the workflows for active/hot addition of FRUs to the SPARC M12.

Before performing addition work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to active/hot addition:

- PCIe card
- HDD/SSD
- PCI expansion unit

5.1.1 Active/Hot Addition Workflow of a PCIe Card

Before adding the PCIe card, see "Precautions for PCIe card addition" in "7.2 Precautions for FRU Expansion."

Table 5-1 shows the workflow for active/hot addition of a PCIe card using the PCI Hot Plug function.

Table 5-1 Active/Hot Addition Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
3	Removing the PCICS from the SPARC M12-2/M12-2S or PCI expansion unit	"12.3.1 Enabling the Removal of a PCIe Card"
4	Removing the PCIe card filler of the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
5	Installing a PCIe card in the PCICS to install it in the SPARC M12-2/M12-2S or PCI expansion unit	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
6	Incorporating the added PCIe card into the system	"10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function"
7	Confirming that there is no problem with the added PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
8	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
9	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.1.2 Active/Hot Addition Workflow of the HDD/SSD

Before adding the HDD/SSD, see "Precautions for HDD/SSD addition" in "7.2 Precautions for FRU Expansion."

Table 5-2 shows the workflow for active/hot addition of the HDD/SSD.

Table 5-2 Active/Hot Addition Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
3	Removing the filler unit from the SPARC M12-2/M12-2S	"15.3.2 Removing a Filler Unit"
4	Installing an HDD/SSD in the SPARC M12-2/M12-2S	"15.4.1 Installing an HDD/SSD"
5	Incorporating the added HDD/SSD into the system	"When incorporating the HDD/SSD" in "10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function"
6	Confirming that there is no problem with the added HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
7	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
8	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.1.3 Active/Hot Addition Workflow of the PCI Expansion Unit

Before adding the PCI expansion unit, mount it in the rack. (See "3.3 Mounting the SPARC M12-2 and the PCI Expansion Unit in a Rack" in the *Fujitsu SPARC M12-2 Installation Guide* or "3.4 Mounting the SPARC M12-2S and the PCI Expansion Unit in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*.)
Table 5-3 shows the workflow for active/hot addition of the PCI expansion unit.

Table 5-3 Active/Hot Addition Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
3	Removing the PCICS from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"

Table 5-3 Active/Hot Addition Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
4	Removing the PCIe card filler from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
5	Installing the link card in the PCICS	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
6	Installing the link card in the SPARC M12-2/M12-2S	"12.4.2 Incorporating a PCIe Card Into the System"
7	Connecting a PCI expansion unit to the link card	"4.2 Connecting Cables to the PCI Expansion Unit" in the *Fujitsu SPARC M12-2 Installation Guide* or "5.2 Connecting Cables to the PCI Expansion Unit" in the *Fujitsu SPARC M12-2S Installation Guide*
8	Incorporating the added PCI expansion unit into the system (*1)	"10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function"
9	Confirming that there is no problem with the added PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
10	Installing all the PCIe cards to be mounted in the PCI expansion unit	"8.4 Installing a PCI Express Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
11	Incorporating all the PCIe cards installed in the PCI expansion unit into the system	"10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function"
12	Confirming that there is no problem with the added PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
14	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 The direct I/O function needs to be disabled. Do not mount any PCIe card in the PCI expansion unit during active addition of the PCI expansion unit.

5.2 Active/Cold Addition Workflows

This section describes the workflows for active/cold addition of FRUs to the SPARC

M12-2S and active/cold addition of the SPARC M12-2S.

Since active/cold addition uses physical partition (PPAR) DR, it is supported only in a building block configuration connecting two or more SPARC M12-2S units to a physical partition.

Before performing addition work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to active/cold addition:

- PCIe card
- HDD/SSD
- CMUU
- Memory
- PCI expansion unit
- SPARC M12-2S

5.2.1 Active/Cold Addition Workflow of a PCIe Card

You can perform active/cold addition of a PCIe card in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before adding the PCIe card, see "Precautions for PCIe card addition" in "7.2 Precautions for FRU Expansion."

Table 5-4 shows the workflow for active/cold addition of a PCIe card.

Table 5-4 Active/Cold Addition Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of PCIe cards mounted in the SPARC M12-2S requiring maintenance	"9.3 Releasing I/O Resources From a Logical Domain"

Table 5-4 Active/Cold Addition Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"
8	Removing the PCICS from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
9	Removing the PCIe card filler from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
10	Installing a PCIe card in the PCICS to install it in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
11	Installing the power cords on the SPARC M12-2S with the added PCIe card, and incorporating it into the building block configuration	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
12	Diagnosing the SPARC M12-2S with the added PCIe card	"10.5.1 Diagnosing the SPARC M12 Hardware"
13	Confirming that there is no problem with the added PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
14	Incorporating the SPARC M12-2S with the added PCIe card into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
15	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
16	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.2.2 Active/Cold Addition Workflow of the HDD/SSD

You can perform active/cold addition of the HDD/SSD in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before adding the HDD/SSD, see "Precautions for HDD/SSD addition" in "7.2 Precautions for FRU Expansion."

Table 5-5 shows the workflow for active/cold addition of the HDD/SSD.

Table 5-5 Active/Cold Addition Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of PCIe cards mounted in the SPARC M12-2S requiring maintenance	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"
8	Removing the filler unit from the SPARC M12-2S	"15.3.2 Removing a Filler Unit"
9	Installing an HDD/SSD in the SPARC M12-2S	"15.4.1 Installing an HDD/SSD"
10	Installing the power cords on the SPARC M12-2S with the added HDD/SSD, and incorporating it into the building block configuration	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
11	Diagnosing the SPARC M12-2S with the added HDD/SSD	"10.5.1 Diagnosing the SPARC M12 Hardware"
12	Confirming that there is no problem with the added HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
13	Incorporating the SPARC M12-2S with the added HDD/SSD into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
14	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

Table 5-5 Active/Cold Addition Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
15	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.2.3 Active/Cold Addition Workflow of the CMUU

You can perform active/cold addition of the CMUU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before adding the CMUU, see "Precautions for CMUU expansion" in "7.2 Precautions for FRU Expansion."

Table 5-6 shows the workflow for active/cold addition of the CMUU.

Table 5-6 Active/Cold Addition Procedure of the CMUU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of PCIe cards mounted in the SPARC M12-2S requiring maintenance	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"
8	Removing the filler unit from the SPARC M12-2S	"17.4 Removing the CMU or Memory"

Table 5-6 Active/Cold Addition Procedure of the CMUU *(continued)*

Work Order	Task	Reference
9	Installing the CMUU in the SPARC M12-2S (*1)	"17.5 Installing the CMU and Memory"
10	Installing the power cords on the SPARC M12-2S with the added CMUU, and incorporating it into the building block configuration	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
11	Diagnosing the SPARC M12-2S requiring maintenance (*2)	"10.5.1 Diagnosing the SPARC M12 Hardware"
12	Diagnosing the XBU and crossbar cable of the SPARC M12-2S requiring maintenance	"10.5.2 Diagnosing the XBU and Crossbar Cable"
13	Confirming that there is no problem with the added CMUU	"10.5.3 Checking the FRU Status After Maintenance"
14	Incorporating the SPARC M12-2S into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
15	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
16	Assigning the resources of the added SPARC M12-2S to logical domains	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 If the CMUU has no memory installed, install memory before installing the CMUU in the SPARC M12-2S.
*2 If the CMU was added to a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

5.2.4 Active/Cold Addition Workflow of Memory

You can perform active/cold addition of memory in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before adding memory, see "Precautions for memory expansion" in "7.2 Precautions for FRU Expansion."

Table 5-7 shows the workflow for active/cold addition of memory.

Table 5-7 Active/Cold Addition Procedure of Memory

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of PCIe cards mounted in the SPARC M12-2S requiring maintenance	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"
8	Removing the CMU from the SPARC M12-2S	"17.4 Removing the CMU or Memory"
9	Installing memory in the CMU and installing this unit in the SPARC M12-2S	"17.5 Installing the CMU and Memory"
10	Installing the power cords on the SPARC M12-2S requiring maintenance, and incorporating it into the building block configuration	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
11	Diagnosing the SPARC M12-2S requiring maintenance (*1)	"10.5.1 Diagnosing the SPARC M12 Hardware"
12	Diagnosing the XBU and crossbar cable of the SPARC M12-2S requiring maintenance	"10.5.2 Diagnosing the XBU and Crossbar Cable"
13	Confirming that there is no problem with the added memory	"10.5.3 Checking the FRU Status After Maintenance"
14	Incorporating the SPARC M12-2S into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
15	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

Table 5-7 Active/Cold Addition Procedure of Memory *(continued)*

Work Order	Task	Reference
16	Assigning the resources of the added SPARC M12-2S to logical domains	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 If the CMUU has no memory installed, install memory before installing the CMUU in the SPARC M12-2S.
*2 If the memory was added to a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

5.2.5 Active/Cold Addition Workflow of the PCI Expansion Unit

You can perform active/cold addition of a PCI expansion unit in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before adding the PCI expansion unit, mount it in the rack. (See "3.4 Mounting the SPARC M12-2S and the PCI Expansion Unit in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*.)
Table 5-8 shows the workflow for active/cold addition of a PCI expansion unit.

Table 5-8 Active/Cold Addition Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of PCIe cards mounted in the SPARC M12-2S requiring maintenance	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"

Table 5-8 Active/Cold Addition Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
7	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"
8	Removing the PCICS from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
9	Removing the PCIe card filler from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
10	Installing a link card in the PCICS to install it in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
11	Connecting a PCI expansion unit to the link card	"5.2 Connecting Cables to the PCI Expansion Unit" in the *Fujitsu SPARC M12-2S Installation Guide*
12	Installing the power cords on the SPARC M12-2S with the added PCI expansion unit, and incorporating it into the building block configuration (*1)	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
13	Diagnosing the SPARC M12-2S with the added PCI expansion unit	"10.5.1 Diagnosing the SPARC M12 Hardware"
14	Powering on the physical partition of the added PCI expansion unit	"10.9.1 Starting the System With an XSCF Command"
15	Confirming that there is no problem with the added PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
16	Incorporating the SPARC M12-2S with the added PCI expansion unit into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
17	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
18	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 Do not mount any PCIe card in the PCI expansion unit during active addition of the PCI expansion unit.

5.2.6 Active/Cold Addition Workflow of the SPARC M12-2S

Before adding the SPARC M12-2S to the building block configuration, see "Precautions for SPARC M12-2S addition" in "7.2 Precautions for FRU Expansion."

To mount the SPARC M12-2S to be added in a rack, see "3.4.1 Mounting the SPARC M12-2S in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*.

Table 5-9 shows the workflow for active/cold addition of the SPARC M12-2S.

Table 5-9 Active/Cold Addition Procedure of the SPARC M12-2S

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
3	Incorporating the SPARC M12-2S into a building block configuration (*1)	"10.3 Adding the SPARC M12-2S to a Building Block Configuration"
4	Diagnosing the added SPARC M12-2S (*2)	"10.5.1 Diagnosing the SPARC M12 Hardware"
5	Diagnosing the XBU and crossbar cable of the added SPARC M12-2S	"10.5.2 Diagnosing the XBU and Crossbar Cable"
6	Confirming that there is no problem with the added SPARC M12-2S	"10.5.3 Checking the FRU Status After Maintenance"
7	Configuring memory mirroring if duplicating memory	"7.6 Configuring Memory Mirroring" in the *Fujitsu SPARC M12-2S Installation Guide*
8	Adding the added SPARC M12-2S to the PPAR configuration list for the physical partition that is the incorporation destination	"7.7 Creating a PPAR Configuration List" in the *Fujitsu SPARC M12-2S Installation Guide*
9	Assigning the SPARC M12-2S (system board) to the physical partition	"7.8.1 Assigning a Physical System Board (PSB) to a Physical Partition (PPAR)" in the *Fujitsu SPARC M12-2S Installation Guide*
10	Incorporating the SPARC M12-2S into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Assigning the resources of the added SPARC M12-2S to logical domains	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 Connect cables by following the workflow of the addfru command.
*2 If a SPARC M12-2S with no PCIe cards mounted was added, no diagnosis is necessary (because diagnosis was performed in the previous step).

5.3 Inactive/Hot Addition Workflows

This section describes the workflows for inactive/hot addition of FRUs to the SPARC M12-2S.

Before performing addition work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to inactive/hot addition:

- PCIe card
- HDD/SSD
- PCI expansion unit

5.3.1 Inactive/Hot Addition Workflow of a PCIe Card

You can perform inactive/hot addition of a PCIe card in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before adding a PCIe card, see "Precautions for PCIe card addition" in "7.2 Precautions for FRU Expansion."

Table 5-10 shows the workflow for inactive/hot addition of a PCIe card.

Table 5-10 Inactive/Hot Addition Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition containing the SPARC M12-2S to which to add a PCIe card	"9.5.1 Stopping a Specific Physical Partition"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Removing the PCICS from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
5	Removing the PCIe card filler of the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
6	Installing a PCIe card in the PCICS to install it in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
7	Diagnosing the SPARC M12-2S that has undergone maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"
8	Confirming that there is no problem with the added PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
9	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
10	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
11	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.3.2 Inactive/Hot Addition Workflow of the HDD/SSD

You can perform inactive/hot addition of the HDD/SSD in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before adding the HDD/SSD, see "Precautions for HDD/SSD addition" in "7.2 Precautions for FRU Expansion."

Table 5-11 shows the workflow for inactive/hot addition of the HDD/SSD.

Table 5-11 Inactive/Hot Addition Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition containing the SPARC M12-2S to which to add the HDD/SSD	"9.5.1 Stopping a Specific Physical Partition"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Removing the filler unit from the SPARC M12-2S	"15.3.2 Removing a Filler Unit"
5	Installing an HDD/SSD in the SPARC M12-2S	"15.4.1 Installing an HDD/SSD"
6	Diagnosing the SPARC M12-2S that has undergone maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"
7	Confirming that there is no problem with the added HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
8	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
9	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
10	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.3.3 Inactive/Hot Addition Workflow of the PCI Expansion Unit

You can perform inactive/hot addition of a PCI expansion unit in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before adding the PCI expansion unit, be sure to check the precautions in "1.7.2 Notes on Adding/Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.
Before adding the PCI expansion unit, mount it in the rack. (See "3.4 Mounting the SPARC M12-2S and the PCI Expansion Unit in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*.)
Table 5-12 shows the workflow for inactive/hot addition of a PCI expansion unit.

Table 5-12 Inactive/Hot Addition Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition containing the SPARC M12-2S to which to add a PCI expansion unit	"9.5.1 Stopping a Specific Physical Partition"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Removing the PCICS from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
5	Removing the PCIe card filler from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
6	Installing a link card in the PCICS to install it in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
7	Connecting a PCI expansion unit to the link card	"5.2 Connecting Cables to the PCI Expansion Unit" in the *Fujitsu SPARC M12-2S Installation Guide*
8	Installing a PCIe card in the PCI expansion unit.	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
9	Diagnosing the SPARC M12-2S that has undergone maintenance	"10.5.1 Diagnosing the SPARC M12 Hardware"
10	Confirming that there is no problem with the added PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
13	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.4 Inactive/Cold Addition Workflows

This section describes the workflows for inactive/cold addition of FRUs to the SPARC M12-2S and inactive/cold addition of the SPARC M12-2S.

Before performing addition work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to inactive/cold addition:

- PCIe card
- HDD/SSD
- CMUU
- Memory
- PCI expansion unit
- SPARC M12-2S

5.4.1 Inactive/Cold Addition Workflow of a PCIe Card

You can perform inactive/cold addition of a PCIe card in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before adding a PCIe card, see "Precautions for PCIe card addition" in "7.2 Precautions for FRU Expansion."

Table 5-13 shows the workflow for inactive/cold addition of a PCIe card.

Table 5-13 Inactive/Cold Addition Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition containing the SPARC M12-2S requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"
5	Removing the PCICS from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
6	Removing the PCIe card filler from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
7	Installing a PCIe card in the PCICS to install it in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"

Table 5-13 Inactive/Cold Addition Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
8	Installing the power cords on the SPARC M12-2S with the added PCIe card, and incorporating it into the building block configuration	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
9	Diagnosing the SPARC M12-2S with the added PCIe card	"10.5.1 Diagnosing the SPARC M12 Hardware"
10	Confirming that there is no problem with the added PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Powering on the physical partition of the added PCIe card	"10.9.1 Starting the System With an XSCF Command"
13	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.4.2 Inactive/Cold Addition Workflow of the HDD/SSD

You can perform inactive/cold addition of the HDD/SSD in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before adding the HDD/SSD, see "Precautions for HDD/SSD addition" in "7.2 Precautions for FRU Expansion."

Table 5-14 shows the workflow for inactive/cold addition of the HDD/SSD.

Table 5-14 Inactive/Cold Addition Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition containing the SPARC M12-2S requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"

Table 5-14 Inactive/Cold Addition Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
5	Removing the filler unit from the SPARC M12-2S	"15.3.2 Removing a Filler Unit"
6	Installing an HDD/SSD in the SPARC M12-2S	"15.4.1 Installing an HDD/SSD"
7	Installing the power cords on the SPARC M12-2S with the added HDD/SSD, and incorporating it into the building block configuration	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
8	Diagnosing the SPARC M12-2S with the added HDD/SSD	"10.5.1 Diagnosing the SPARC M12 Hardware"
9	Confirming that there is no problem with the added HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
10	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
11	Powering on the physical partition of the added HDD/SSD	"10.9.1 Starting the System With an XSCF Command"
12	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.4.3 Inactive/Cold Addition Workflow of the CMUU

You can perform inactive/cold addition of the CMUU in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before adding the CMUU, see "Precautions for CMUU expansion" in "7.2 Precautions for FRU Expansion."

Table 5-15 shows the workflow for inactive/cold addition of the CMUU.

Table 5-15 Inactive/Cold Addition Procedure of the CMUU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition containing the SPARC M12-2S requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"
5	Removing the filler unit from the SPARC M12-2S	"17.4 Removing the CMU or Memory"
6	Installing the CMUU in the SPARC M12-2S (*1)	"17.5 Installing the CMU and Memory"
7	Installing the power cords on the SPARC M12-2S with the added CMUU, and incorporating it into the building block configuration	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
8	Reconfiguring the I/O bus as required	"3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
9	Diagnosing the SPARC M12-2S with the added CMUU (*2)	"10.5.1 Diagnosing the SPARC M12 Hardware"
10	Diagnosing the XBU and crossbar cable of the SPARC M12-2S with the added CMUU	"10.5.2 Diagnosing the XBU and Crossbar Cable"
11	Confirming that there is no problem with the added CMUU	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Powering on the physical partition of the added CMUU	"10.9.1 Starting the System With an XSCF Command"
14	Assigning the resources of the added SPARC M12-2S to logical domains	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 If the CMUU has no memory installed, install memory before installing the CMUU in the SPARC M12-2S.
*2 If the CMUU was added to a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed two steps earlier).

5.4.4 Inactive/Cold Addition Workflow of Memory

You can perform inactive/cold addition of memory in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before adding memory, see "Precautions for memory expansion" in "7.2 Precautions for FRU Expansion."

Table 5-16 shows the workflow for inactive/cold addition of memory.

Table 5-16 Inactive/Cold Addition Procedure of Memory

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition containing the SPARC M12-2S requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"
5	Removing the CMU from the SPARC M12-2S	"17.4 Removing the CMU or Memory"
6	Installing memory in the CMU and installing this unit in the SPARC M12-2S	"17.5 Installing the CMU and Memory"
7	Installing the power cords on the SPARC M12-2S with the added memory, and incorporating it into the building block configuration	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
8	Diagnosing the SPARC M12-2S with the added memory (*1)	"10.5.1 Diagnosing the SPARC M12 Hardware"
9	Diagnosing the XBU and crossbar cable of the SPARC M12-2S with the added memory	"10.5.2 Diagnosing the XBU and Crossbar Cable"
10	Confirming that there is no problem with the added memory	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Powering on the physical partition of the expanded memory	"10.9.1 Starting the System With an XSCF Command"
13	Assigning the resources of the expanded memory to logical domains	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 If the memory was added to a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

5.4.5 Inactive/Cold Addition Workflow of the PCI Expansion Unit

You can perform inactive/cold addition of a PCI expansion unit in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before adding the PCI expansion unit, be sure to check the precautions in "1.7.2 Notes on Adding/Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.
Before adding the PCI expansion unit, mount it in the rack. (See "3.4 Mounting the SPARC M12-2S and the PCI Expansion Unit in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*.)
Table 5-17 shows the workflow for inactive/cold addition of a PCI expansion unit.

Table 5-17 Inactive/Cold Addition Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition containing the SPARC M12-2S requiring maintenance	"9.5.1 Stopping a Specific Physical Partition"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Releasing the SPARC M12-2S requiring maintenance from the building block configuration, and removing the power cords	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration" "9.8.2 Removing the Power Cords"
5	Removing the PCICS from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
6	Removing the PCIe card filler from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
7	Installing a link card in the PCICS to install it in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
8	Connecting a PCI expansion unit to the link card	"5.2 Connecting Cables to the PCI Expansion Unit" in the *Fujitsu SPARC M12-2S Installation Guide*
9	Installing a PCIe card in the PCI expansion unit.	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
10	Installing the power cords on the SPARC M12-2S with the added PCI expansion unit, and incorporating it into the building block configuration	"10.1.1 Installing a Power Cord" "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"

Table 5-17 Inactive/Cold Addition Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
11	Diagnosing the SPARC M12-2S with the added PCI expansion unit	"10.5.1 Diagnosing the SPARC M12 Hardware"
12	Confirming that there is no problem with the added PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
14	Powering on the physical partition of the added PCI expansion unit	"10.9.1 Starting the System With an XSCF Command"
15	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.4.6 Inactive/Cold Addition Workflow of the SPARC M12-2S

You can perform inactive/cold addition of the SPARC M12-2S in the following model:

- One or more SPARC M12-2S units

Before adding the SPARC M12-2S, see "Precautions for SPARC M12-2S addition" in "7.2 Precautions for FRU Expansion." To mount the SPARC M12-2S to be added in a rack, see "3.4.1 Mounting the SPARC M12-2S in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*.

Table 5-18 shows the workflow for inactive/cold addition of the SPARC M12-2S.

Table 5-18 Inactive/Cold Addition Procedure of the SPARC M12-2S

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition into which to incorporate the added SPARC M12-2S	"9.5.1 Stopping a Specific Physical Partition"
3	Connecting the added SPARC M12-2S	"3.4.1 Mounting the SPARC M12-2S in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*
4	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"

Table 5-18 Inactive/Cold Addition Procedure of the SPARC M12-2S *(continued)*

Work Order	Task	Reference
5	Incorporating the SPARC M12-2S into a building block configuration (*1)	"10.3 Adding the SPARC M12-2S to a Building Block Configuration"
6	Diagnosing the crossbar cable	"10.5.2 Diagnosing the XBU and Crossbar Cable"
7	Confirming that there is no problem with the added SPARC M12-2S	"10.5.3 Checking the FRU Status After Maintenance"
8	Configuring memory mirroring if duplicating memory	"7.6 Configuring Memory Mirroring" in the *Fujitsu SPARC M12-2S Installation Guide*
9	Adding the added SPARC M12-2S to the PPAR configuration list for the physical partition that is the incorporation destination	"7.7 Creating a PPAR Configuration List" in the *Fujitsu SPARC M12-2S Installation Guide*
10	Assigning the SPARC M12-2S (system board) to the physical partition	"7.8.1 Assigning a Physical System Board (PSB) to a Physical Partition (PPAR)" in the *Fujitsu SPARC M12-2S Installation Guide*
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Powering on the physical partition of the added SPARC M12-2S	"10.9.1 Starting the System With an XSCF Command"
13	Assigning the resources of the added SPARC M12-2S to logical domains	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 Connect cables by following the workflow of the addfru command.

5.5 System-Stopped/Hot Addition Workflows

This section describes the workflows for system-stopped/hot addition of FRUs to the SPARC M12-2/M12-2S.

Before performing addition work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to system-stopped/hot addition:

- PCIe card
- HDD/SSD
- PCI expansion unit

5.5.1 System-Stopped/Hot Addition Workflow of a PCIe Card

Before adding the PCIe card, see "Precautions for PCIe card addition" in "7.2 Precautions for FRU Expansion."

Table 5-19 shows the workflow for system-stopped/hot addition of a PCIe card.

Table 5-19 System-Stopped/Hot Addition Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Removing the PCICS from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
5	Removing the PCIe card filler of the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
6	Installing a PCIe card in the PCICS to install it in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
7	Diagnosing the SPARC M12-2/M12-2S with the added PCIe card	"10.5.1 Diagnosing the SPARC M12 Hardware"
8	Confirming that there is no problem with the added PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
9	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
10	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
11	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.5.2 System-Stopped/Hot Addition Workflow of the HDD/SSD

Before adding the HDD/SSD, see "Precautions for HDD/SSD addition" in "7.2 Precautions for FRU Expansion."

Table 5-20 shows the workflow for system-stopped/hot addition of the HDD/SSD.

Table 5-20 System-Stopped/Hot Addition Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Removing the filler unit from the SPARC M12-2/M12-2S	"15.3.2 Removing a Filler Unit"
5	Installing an HDD/SSD in the SPARC M12-2/M12-2S	"15.4.1 Installing an HDD/SSD"
6	Diagnosing the SPARC M12-2/M12-2S with the added HDD/SSD	"10.5.1 Diagnosing the SPARC M12 Hardware"
7	Confirming that there is no problem with the added HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
8	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
9	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
10	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.5.3 System-Stopped/Hot Addition Workflow of the PCI Expansion Unit

Before adding the PCI expansion unit, be sure to check the precautions in "1.7.2 Notes on Adding/Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*. Before adding the PCI expansion unit, mount it in the rack. (See "3.3 Mounting the SPARC M12-2 and the PCI Expansion Unit in a Rack" in the *Fujitsu SPARC M12-2*

Installation Guide or "3.4 Mounting the SPARC M12-2S and the PCI Expansion Unit in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*.)

Table 5-21 shows the workflow for system-stopped/hot addition of a PCI expansion unit.

Table 5-21 System-Stopped/Hot Addition Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Removing the PCICS from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
5	Removing the PCIe card filler from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
6	Installing a link card in the PCICS to install it in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
7	Connecting a PCI expansion unit to the link card	"4.2 Connecting Cables to the PCI Expansion Unit" in the *Fujitsu SPARC M12-2 Installation Guide* or "5.2 Connecting Cables to the PCI Expansion Unit" in the *Fujitsu SPARC M12-2S Installation Guide*
8	Installing a PCIe card in the PCI expansion unit.	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
9	Diagnosing the SPARC M12-2/M12-2S that is connected to the added PCI expansion unit	"10.5.1 Diagnosing the SPARC M12 Hardware"
10	Confirming that there is no problem with the added PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
11	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
12	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
13	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.6 System-Stopped/Cold Addition Workflows

This section describes the workflows for system-stopped/cold addition of FRUs to the SPARC M12-2/M12-2S, and the workflow for system-stopped/cold addition of a SPARC M12-2S to another SPARC M12-2S.
The described procedures are performed after all the SPARC M12-2/M12-2S units are placed in the cold state, without using the maintenance menu.
Note that, in a building block configuration, you can perform maintenance using the maintenance menu when only the SPARC M12-2S requiring maintenance is in the cold state. For work procedures with the maintenance menu, see "5.4 Inactive/Cold Addition Workflows."

Before performing addition work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to system-stopped/cold addition:

- PCIe card
- HDD/SSD
- CMUU
- Memory
- PCI expansion unit
- SPARC M12-2S

5.6.1 System-Stopped/Cold Addition Workflow of a PCIe Card

Before adding the PCIe card, see "Precautions for PCIe card addition" in "7.2 Precautions for FRU Expansion."

Table 5-22 shows the workflow for system-stopped/cold addition of a PCIe card.

Table 5-22 System-Stopped/Cold Addition Procedure of a PCIe Card

Work Order	Task	Reference
1	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
2	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
3	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"

Table 5-22 System-Stopped/Cold Addition Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
4	Removing the PCICS from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
5	Removing the PCIe card filler from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
6	Installing a PCIe card in the PCICS to install it in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
7	Connecting the power cords of all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
8	Diagnosing the SPARC M12-2/M12-2S with the added PCIe card	"10.5.1 Diagnosing the SPARC M12 Hardware"
9	Confirming that there is no problem with the added PCIe card	"10.5.3 Checking the FRU Status After Maintenance"
10	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
11	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
12	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.6.2 System-Stopped/Cold Addition Workflow of the HDD/SSD

Before adding the HDD/SSD, see "Precautions for HDD/SSD addition" in "7.2 Precautions for FRU Expansion."

Table 5-23 shows the workflow for system-stopped/cold addition of the HDD/SSD.

Table 5-23 System-Stopped/Cold Addition Procedure of the HDD/SSD

Work Order	Task	Reference
1	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
2	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
3	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
4	Removing the filler unit from the SPARC M12-2/M12-2S	"15.3.2 Removing a Filler Unit"
5	Installing an HDD/SSD in the SPARC M12-2/M12-2S	"15.4.1 Installing an HDD/SSD"
6	Connecting the power cords of all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
7	Diagnosing the SPARC M12-2/M12-2S with the added HDD/SSD	"10.5.1 Diagnosing the SPARC M12 Hardware"
8	Confirming that there is no problem with the added HDD/SSD	"10.5.3 Checking the FRU Status After Maintenance"
9	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
10	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
11	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.6.3 System-Stopped/Cold Addition Workflow of the CMUU

Before adding the CMUU, see "Precautions for CMUU expansion" in "7.2 Precautions for FRU Expansion."

Table 5-24 shows the workflow for system-stopped/cold addition of the CMUU.

Table 5-24 System-Stopped/Cold Addition Procedure of the CMUU

Work Order	Task	Reference
1	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
2	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
3	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
4	Removing the filler unit from the SPARC M12-2/M12-2S	"17.4 Removing the CMU or Memory"
5	Installing the CMUU in the SPARC M12-2/M12-2S (*1)	"17.5 Installing the CMU and Memory"
6	Connecting the power cords of all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
7	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
8	Confirming that there is no problem with the added CMUU	"10.5.3 Checking the FRU Status After Maintenance"
9	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
10	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
11	Assigning resources to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 If the CMUU has no memory installed, install memory before installing the CMUU in the SPARC M12-2/M12-2S.

5.6.4 System-Stopped/Cold Addition Workflow of Memory

You can perform system-stopped/cold addition of memory in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before adding memory, see "Precautions for memory expansion" in "7.2 Precautions for FRU Expansion."

Table 5-25 shows the workflow for system-stopped/cold addition of memory.

Table 5-25 System-Stopped/Cold Addition Procedure of Memory

Work Order	Task	Reference
1	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
2	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
3	Removing the power cords of all the SPARC M12-2S units	"9.8.2 Removing the Power Cords"
4	Removing the CMU from the SPARC M12-2S	"17.4 Removing the CMU or Memory"
5	Installing memory in the CMU and installing this unit in the SPARC M12-2S	"17.5 Installing the CMU and Memory"
6	Connecting the power cords of all the SPARC M12-2S units	"10.1.1 Installing a Power Cord"
7	Diagnosing all the SPARC M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
8	Confirming that there is no problem with the added memory	"10.5.3 Checking the FRU Status After Maintenance"
9	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
10	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
11	Assigning the resources of the expanded memory to logical domains	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.6.5 System-Stopped/Cold Addition Workflow of the PCI Expansion Unit

Before adding the PCI expansion unit, be sure to check the precautions in "1.7.2 Notes on Adding/Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.
Before adding the PCI expansion unit, mount it in the rack. (See "3.3 Mounting the SPARC M12-2 and the PCI Expansion Unit in a Rack" in the *Fujitsu SPARC M12-2 Installation Guide* or "3.4 Mounting the SPARC M12-2S and the PCI Expansion Unit in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*.)
Table 5-26 shows the workflow for system-stopped/cold addition of a PCI expansion unit.

Table 5-26 System-Stopped/Cold Addition Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
2	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
3	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
4	Removing the PCICS from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
5	Removing the PCIe card filler from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
6	Installing the link card in the PCICS	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
7	Installing the link card in the SPARC M12-2/M12-2S	"12.4.2 Incorporating a PCIe Card Into the System"
8	Connecting a PCI expansion unit to the link card	"4.2 Connecting Cables to the PCI Expansion Unit" in the *Fujitsu SPARC M12-2 Installation Guide* or "5.2 Connecting Cables to the PCI Expansion Unit" in the *Fujitsu SPARC M12-2S Installation Guide*
9	Installing a PCIe card in the PCI expansion unit.	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
10	Connecting the power cords of all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
11	Diagnosing the SPARC M12-2/M12-2S with the added PCI expansion unit	"10.5.1 Diagnosing the SPARC M12 Hardware"
12	Confirming that there is no problem with the added PCI expansion unit	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
14	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
15	Assigning the I/O resource to a logical domain	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

5.6.6 System-Stopped/Cold Addition Workflow of the SPARC M12-2S

You can perform system-stopped/cold addition of the SPARC M12-2S in the following model:

- Building block configuration connecting one or more SPARC M12-2S units

Before adding the SPARC M12-2S, see "Precautions for SPARC M12-2S addition" in "7.2 Precautions for FRU Expansion." To mount the SPARC M12-2S to be added in a rack, see "3.4.1 Mounting the SPARC M12-2S in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*.

Table 5-27 shows the workflow for system-stopped/cold addition of the SPARC M12-2S.

Table 5-27 System-Stopped/Cold Addition Procedure of the SPARC M12-2S

Work Order	Task	Reference
1	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
2	Switching the mode switch on the OPNL to Service (*1)	"2.3.2 OPNL Control Function"
3	Removing the power cords of all the SPARC M12-2S units	"9.8.2 Removing the Power Cords"
4	Connecting the added SPARC M12-2S	"3.4.1 Mounting the SPARC M12-2S in a Rack" in the *Fujitsu SPARC M12-2S Installation Guide*
5	Connecting the XSCF BB control cable and crossbar cable to the added SPARC M12-2S Also connecting the XSCF DUAL control cable if the added SPARC M12-2S will operate as the standby XSCF	"Appendix A Lists of Cable Connections in a Building Block Configuration"
6	Connecting the power cords of all the SPARC M12-2S units (*2)(*3)(*4)	"10.1.1 Installing a Power Cord"
7	Rebooting all the XSCF firmware	rebootxscf(8) in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* (Example: rebootxscf -a)
8	Checking the XCP firmware version	"11.8 Checking the XCP Firmware Version (Building Block Configuration)"
9	Diagnosing all the SPARC M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
10	Confirming that there is no problem with the added SPARC M12-2S	"10.5.3 Checking the FRU Status After Maintenance"

Table 5-27 System-Stopped/Cold Addition Procedure of the SPARC M12-2S *(continued)*

Work Order	Task	Reference
11	Configuring memory mirroring if duplicating memory	"7.6 Configuring Memory Mirroring" in the *Fujitsu SPARC M12-2S Installation Guide*
12	Adding the added SPARC M12-2S to the PPAR configuration list for the physical partition that is the incorporation destination	"7.7 Creating a PPAR Configuration List" in the *Fujitsu SPARC M12-2S Installation Guide*
13	Assigning the SPARC M12-2S (system board) to the physical partition	"7.8.1 Assigning a Physical System Board (PSB) to a Physical Partition (PPAR)" in the *Fujitsu SPARC M12-2S Installation Guide*
14	Switching the mode switch on the OPNL to Locked (*5)	"2.3.2 OPNL Control Function"
15	Registering a CPU Activation key with the system (*6)	"7.10 Registering a CPU Activation Key" in the *Fujitsu SPARC M12-2S Installation Guide*
16	Assigning CPU core resources to the physical partition	"7.11 Assigning CPU Core Resources" in the *Fujitsu SPARC M12-2S Installation Guide*
17	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
18	Assigning the resources of the added SPARC M12-2S to logical domains	"3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

*1 Before adding the SPARC M12-2S, switch the mode switch on its OPNL to Service.
*2 If the XCP firmware version is different between the maintenance part and the existing system, the message "XSCF firmware update now in progress. BB#xx, please wait for XSCF firmware update complete." appears at login to the XSCF. Then, the XCP firmware version will be automatically matched. The version matching takes about 50 minutes. Execute the showlogs monitor command, and check for the "XCP firmware version synchronization completed" message. The displayed message indicates the completion of XCP firmware matching.
*3 If the "SCF:Gaps between BB-ID" message appears in the error log, ignore the message.
*4 If the "SCF:SCF Diagnosis initialize RTC" message appears in the error log, ignore the message.
*5 Also switch the mode switch on the OPNL of the added SPARC M12-2S to Locked.
*6 One CD-ROM disk containing a CPU Activation certificate is provided with the system. The CPU Activation key ordered together with the SPARC M12-2S was registered with the system before shipment.

Chapter 6

FRU Removal Workflows

This chapter describes removal workflows by type of maintenance for FRUs and the PCI expansion unit mounted to the SPARC M12. For the installation and removal procedures of each FRU, see Chapter 11 and subsequent chapters.

- Active/Hot Removal Workflows
- Active/Cold Removal Workflows
- Inactive/Hot Removal Workflows
- Inactive/Cold Removal Workflows
- System-Stopped/Hot Removal Workflows
- System-Stopped/Cold Removal Workflows

6.1 Active/Hot Removal Workflows

This section describes the workflows for active/hot removal of the FRUs mounted in the SPARC M12-2/M12-2S.

Before performing removal work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to active/hot removal:

- PCIe card
- HDD/SSD
- PCI expansion unit

6.1.1 Active/Hot Removal Workflow of a PCIe Card

Before removing a PCIe card, see "Precautions for PCIe card removal" in "7.3 Precautions for FRU Reduction."

Table 6-1 shows the workflow for active/hot removal of a PCIe card using the PCI Hot Plug function.

Table 6-1 Active/Hot Removal Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the usage status of the PCIe card to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"
3	Releasing the I/O resources assigned to the PCIe card to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
4	Confirming that you can release the PCIe card to be removed	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
5	Releasing the PCIe card from the system	"9.4 Enabling the Removal of Hardware"
6	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
7	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
8	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
9	Removing the PCIe card from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
10	Removing the PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
11	Installing a PCIe card filler in the PCICS from which the PCIe card was removed, and installing the PCICS in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

*1 Reassign I/O resources to logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.1.2 Active/Hot Removal Workflow of the HDD/SSD

Before removing the HDD/SSD, see "Precautions for HDD/SSD removal" in "7.3 Precautions for FRU Reduction."

Table 6-2 shows the workflow for active/hot removal of the HDD/SSD.

Table 6-2 Active/Hot Removal Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the usage status of the HDD/SSD to be removed	"9.2.3 Checking the Usage of the HDD/SSD"
3	Releasing the HDD/SSD from the system	"9.4 Enabling the Removal of Hardware"
4	Confirming that you can remove the HDD/SSD to be removed	"9.2.3 Checking the Usage of the HDD/SSD"
5	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Removing the HDD/SSD from the SPARC M12-2/M12-2S	"15.3.1 Removing an HDD/SSD"
8	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
9	Installing the filler unit in the SPARC M12-2/M12-2S	"15.4.2 Installing a Filler Unit"
10	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

*1 Reassign I/O resources to logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

Note - You can perform the active/hot removal work for an HDD/SSD only if the HDD/SSD is not in the boot device.

6.1.3 Active/Hot Removal Workflow of the PCI Expansion Unit

Table 6-3 shows the workflow for active/hot removal of a PCI expansion unit.

Table 6-3 Active/Hot Removal Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the usage status of the PCIe cards mounted in the PCI expansion unit to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"
3	Releasing the I/O resources assigned to the PCIe cards mounted in the PCI expansion unit to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
4	Confirming that you can release the PCI expansion unit to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"
5	Releasing the link card connected to the PCI expansion unit to be removed, from the system	"9.4 Enabling the Removal of Hardware"
6	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
7	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
8	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
9	Releasing the PCI expansion unit to be removed and the link card	"11.3 Removing a Link Cable" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
10	Removing the PCICS in which the link card is mounted from the SPARC M12-2/ M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
11	Removing the link card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
12	Installing a PCIe card filler in the PCICS from which the link card was removed, and installing the PCICS in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

*1 Reassign I/O resources to logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.2 Active/Cold Removal Workflows

This section describes the workflows for active/cold removal of the FRUs mounted in the SPARC M12-2S, and the workflow for active/cold removal of the SPARC M12-2S.

Since active/cold removal uses physical partition (PPAR) DR, it is supported only in a building block configuration connecting two or more SPARC M12-2S units to a physical partition.

Before performing removal work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to active/cold removal:

- PCIe card
- HDD/SSD
- CMUU
- Memory
- PCI expansion unit
- SPARC M12-2S

6.2.1 Active/Cold Removal Workflow of a PCIe Card

You can perform active/cold removal of a PCIe card in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before removing a PCIe card, see "Precautions for PCIe card removal" in "7.3 Precautions for FRU Reduction."

Table 6-4 shows the workflow for active/cold removal of a PCIe card.

Table 6-4 Active/Cold Removal Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of all the PCIe cards and HDD/SSD mounted in the SPARC M12-2S requiring maintenance	"9.3 Releasing I/O Resources From a Logical Domain"

Table 6-4 Active/Cold Removal Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
5	Releasing the PCIe cards and HDD/SSD mounted in the SPARC M12-2S requiring maintenance, from the system	"9.4 Enabling the Removal of Hardware"
6	Confirming that you can release the SPARC M12-2S	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
7	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
8	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
9	Confirming that the physical partition and logical domains continue operating	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
10	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
11	Removing the PCICS in which the PCIe card to be removed is mounted from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
12	Removing the PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
13	Installing a PCIe card filler in the PCICS from which the PCIe card was removed, and installing the PCICS in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
14	Incorporating the SPARC M12-2S from which the PCIe card was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
15	Incorporating the SPARC M12-2S into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
16	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
17	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
18	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reassign I/O resources to logical domains as required. For details, see "3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.2.2 Active/Cold Removal Workflow of the HDD/SSD

You can perform active/cold removal of the HDD/SSD in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before removing the HDD/SSD, see "Precautions for HDD/SSD removal" in "7.3 Precautions for FRU Reduction."

Table 6-5 shows the workflow for active/cold removal of the HDD/SSD.

Table 6-5 Active/Cold Removal Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of all the HDD/SSD and PCIe cards mounted in the SPARC M12-2S requiring maintenance	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the HDD/SSD and PCIe cards mounted in the SPARC M12-2S requiring maintenance, from the system	"9.4 Enabling the Removal of Hardware"
6	Confirming that you can release the SPARC M12-2S	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
7	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
8	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
9	Confirming that the physical partition and logical domains continue operating	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
10	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
11	Removing the HDD/SSD from the SPARC M12-2S	"15.3.1 Removing an HDD/SSD"
12	Installing a filler unit in the SPARC M12-2S	"15.4.2 Installing a Filler Unit"

Table 6-5 Active/Cold Removal Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
13	Incorporating the SPARC M12-2S from which HDD/SSD was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
14	Incorporating the SPARC M12-2S into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
15	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
16	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
17	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reassign I/O resources to logical domains as required. For details, see "3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.2.3 Active/Cold Removal Workflow of the CMUU

You can perform active/cold removal of the CMUU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before removing the CMUU, see "Precautions for CMUU removal" in "7.3 Precautions for FRU Reduction."

Table 6-6 shows the workflow for active/cold removal of the CMUU.

Table 6-6 Active/Cold Removal Procedure of the CMUU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of all the PCIe cards and HDD/SSD mounted in the SPARC M12-2S requiring maintenance	"9.3 Releasing I/O Resources From a Logical Domain"

Table 6-6 Active/Cold Removal Procedure of the CMUU *(continued)*

Work Order	Task	Reference
5	Releasing the HDD/SSD and PCIe cards mounted in the SPARC M12-2S requiring maintenance, from the system	"9.4 Enabling the Removal of Hardware"
6	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
7	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
8	Confirming that the physical partition and logical domains continue operating	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
9	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
10	Enabling the removal of the CMUU	"17.4.1 Enabling the Removal of the CMU"
11	Removing the CMUU from the SPARC M12-2S	"17.4.2 Removing the CMU"
12	Installing a filler unit in the SPARC M12-2S	"17.5.2 Installing the CMU"
13	Assembling the SPARC M12-2S from which the CMUU was removed	"17.5.3 Restoring the Server"
14	Incorporating the SPARC M12-2S from which the CMUU was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
15	Diagnosing the SPARC M12-2S from which the CMUU was removed (*1)	"10.5.1 Diagnosing the SPARC M12 Hardware"
16	Diagnosing the XBU and crossbar cable, in the building block configuration, of the SPARC M12-2S from which the CMUU was removed	"10.5.2 Diagnosing the XBU and Crossbar Cable"
17	Incorporating the SPARC M12-2S into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
18	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
19	Checking the operating condition of the physical partition and logical domains (*2)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
20	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 If the memory was removed from a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).
*2 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide.*

6.2.4 Active/Cold Removal Workflow of Memory

You can perform active/cold removal of memory in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before removing the memory, see "Precautions for memory reduction" in "7.3 Precautions for FRU Reduction."

Table 6-7 shows the workflow for active/cold removal of memory.

Table 6-7 Active/Cold Removal Procedure of Memory

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of all the PCIe cards and HDD/SSD mounted in the SPARC M12-2S requiring maintenance	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the HDD/SSD and PCIe cards mounted in the SPARC M12-2S requiring maintenance, from the system	"9.4 Enabling the Removal of Hardware"
6	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
7	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
8	Confirming that the physical partition and logical domains continue operating	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
9	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
10	Enabling the removal of the CMU of the memory to be removed	"17.4.1 Enabling the Removal of the CMU"
11	Removing the CMU of the memory to be removed from the SPARC M12-2S	"17.4.2 Removing the CMU"
12	Removing the memory from the CMU (*1)	"17.4.3 Removing Memory"

Table 6-7 Active/Cold Removal Procedure of Memory *(continued)*

Work Order	Task	Reference
13	Installing the CMU from which the memory was removed, in the SPARC M12-2S	"17.5.2 Installing the CMU"
14	Assembling the SPARC M12-2S from which the memory was removed	"17.5.3 Restoring the Server"
15	Incorporating the SPARC M12-2S from which the memory was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
16	Diagnosing the SPARC M12-2S from which the memory was removed (*3)	"10.5.1 Diagnosing the SPARC M12 Hardware"
17	Diagnosing the XBU and crossbar cable, in the building block configuration, of the SPARC M12-2S from which the memory was removed	"10.5.2 Diagnosing the XBU and Crossbar Cable"
18	Incorporating the SPARC M12-2S into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
19	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
20	Checking the operating condition of the physical partition and logical domains (*2)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
21	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Observe the installation rules to remove memory. For details, see "2.2 Checking the Memory Configuration Rules."
*2 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.
*3 If the memory was removed from a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).

6.2.5 Active/Cold Removal Workflow of the PCI Expansion Unit

You can perform active/cold removal of a PCI expansion unit in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Table 6-8 shows the workflow for active/cold removal of a PCI expansion unit.

Table 6-8 Active/Cold Removal Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the logical domain assignment status of CPU resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Checking the logical domain assignment status of memory resources mounted in the SPARC M12-2S requiring maintenance	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
4	Releasing the logical domain assignment of all the PCIe cards and HDD/SSD mounted in the SPARC M12-2S requiring maintenance and the PCI expansion unit	"9.3 Releasing I/O Resources From a Logical Domain"
5	Releasing the HDD/SSD and PCIe cards mounted in the SPARC M12-2S requiring maintenance and the PCI expansion unit, from the system	"9.4 Enabling the Removal of Hardware"
6	Releasing the SPARC M12-2S requiring maintenance from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
7	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
8	Confirming that the physical partition and logical domains continue operating	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
9	Releasing the SPARC M12-2S requiring maintenance from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
10	Releasing the PCI expansion unit to be removed and the link card	"11.3 Removing a Link Cable" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
11	Removing the PCICS in which the link card is mounted from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
12	Removing the link card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
13	Installing a PCIe card filler in the PCICS from which the link card was removed, and installing the PCICS in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
14	Incorporating the SPARC M12-2S from which the PCI expansion unit was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"

Table 6-8 Active/Cold Removal Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
15	Incorporating the SPARC M12-2S from which the PCI expansion unit was removed into the physical partition	"10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR"
16	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
17	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
18	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reassign I/O resources to logical domains as required. For details, see "3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.2.6 Active/Cold Removal Workflow of the SPARC M12-2S

You can perform active/cold removal of the SPARC M12-2S in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before removing the SPARC M12-2S, see "Precautions for SPARC M12-2S removal" in "7.3 Precautions for FRU Reduction."

Table 6-9 shows the workflow for active/cold removal of the SPARC M12-2S.

Table 6-9 Active/Cold Removal Procedure of the SPARC M12-2S

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the I/O device usage status of the SPARC M12-2S to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"
3	Checking the HDD/SSD usage status of the SPARC M12-2S to be removed	"9.2.3 Checking the Usage of the HDD/SSD"
4	Checking the assignment status of CPU resources to logical domains	"3.2.4 Checking the Assignment Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
5	Checking the assignment status of memory resources to logical domains	"3.2.5 Checking the Usage Status of Resources" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

Table 6-9 Active/Cold Removal Procedure of the SPARC M12-2S *(continued)*

Work Order	Task	Reference
6	Releasing the logical domain assignment of the I/O resources of the SPARC M12-2S to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
7	Releasing the I/O devices of the SPARC M12-2S to be removed, from the system	"9.4 Enabling the Removal of Hardware"
8	Releasing the assignment, to logical domains, of CPU resources (*1)	"Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
9	Releasing the assignment, to logical domains, of memory resources (*1)	"Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
10	Confirming that you can release the SPARC M12-2S to be removed	"9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris"
11	Releasing the SPARC M12-2S from the physical partition	"9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition"
12	Checking the operating condition of the system after releasing the SPARC M12-2S (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
13	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
14	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
15	Releasing the SPARC M12-2S from the building block configuration	"9.7 Removing the SPARC M12-2S"
16	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

*1 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.3 Inactive/Hot Removal Workflows

This section describes the workflows for inactive/hot removal of the FRUs mounted in the SPARC M12-2S.

Before performing removal work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to inactive/hot removal:

- PCIe card
- HDD/SSD
- PCI expansion unit

6.3.1 Inactive/Hot Removal Workflow of a PCIe Card

You can perform inactive/hot removal of a PCIe card in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before removing a PCIe card, see "Precautions for PCIe card removal" in "7.3 Precautions for FRU Reduction."

Table 6-10 shows the workflow for inactive/hot removal of a PCIe card.

Table 6-10 Inactive/Hot Removal Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the usage status of the PCIe card to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"
3	Releasing the I/O resources assigned to the PCIe card to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
4	Confirming that you can release the PCIe card to be removed	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
5	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
6	Powering off the physical partition containing the SPARC M12-2S from which to remove the PCIe card	"9.5.1 Stopping a Specific Physical Partition"
7	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
8	Removing the PCICS in which the PCIe card to be removed is mounted from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
9	Removing the PCIe card to be removed, from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
10	Installing a PCIe card filler in the PCICS, and installing the PCICS in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"

Table 6-10 Inactive/Hot Removal Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
11	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
12	Confirming that there is no problem with the system from which the PCIe card was removed	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
14	Checking the operating condition of the system (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
15	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reassign I/O resources to logical domains as required. For details, see "3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.3.2 Inactive/Hot Removal Workflow of the HDD/SSD

You can perform inactive/hot removal of the HDD/SSD in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before removing the HDD/SSD, see "Precautions for HDD/SSD removal" in "7.3 Precautions for FRU Reduction."

Table 6-11 shows the workflow for inactive/hot removal of the HDD/SSD.

Table 6-11 Inactive/Hot Removal Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the usage status of the HDD/SSD to be removed	"9.2.3 Checking the Usage of the HDD/SSD"
3	Releasing the HDD/SSD resources assigned to logical domains	"9.3 Releasing I/O Resources From a Logical Domain"
4	Confirming that you can release the HDD/SSD to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
5	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
6	Powering off the physical partition containing the SPARC M12-2S from which to remove the HDD/SSD	"9.5.1 Stopping a Specific Physical Partition"

Table 6-11 Inactive/Hot Removal Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
7	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
8	Removing the HDD/SSD from the SPARC M12-2S	"15.3.1 Removing an HDD/SSD"
9	Installing a filler unit in the SPARC M12-2S	"15.4.2 Installing a Filler Unit"
10	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
11	Confirming that there is no problem with the system from which the HDD/SSD was removed	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
13	Checking the operating condition of the system (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
14	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reassign I/O resources to logical domains as required. For details, see "3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.3.3 Inactive/Hot Removal Workflow of the PCI Expansion Unit

You can perform inactive/hot removal of a PCI expansion unit in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before removing the PCI expansion unit, be sure to check the precautions in "1.7.2 Notes on Adding/Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.
Table 6-12 shows the workflow for inactive/hot removal of a PCI expansion unit.

Table 6-12 Inactive/Hot Removal Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the usage status of the PCI expansion unit to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"

Table 6-12 Inactive/Hot Removal Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
3	Releasing the I/O resources assigned to the PCIe cards mounted in the PCI expansion unit to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
4	Confirming that you can release the PCI expansion unit to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
5	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
6	Powering off the physical partition containing the SPARC M12-2S from which to remove the PCI expansion unit	"9.5.1 Stopping a Specific Physical Partition"
7	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
8	Releasing the PCI expansion unit to be removed and the link card	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
9	Removing the PCICS that houses the link card, from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
10	Removing the link card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
11	Installing a PCIe card filler in the PCICS, and installing the PCICS in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
12	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
13	Confirming that there is no problem with the system from which the PCI expansion unit was removed	"10.5.3 Checking the FRU Status After Maintenance"
14	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
15	Checking the operating condition of the system (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
16	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reassign I/O resources to logical domains as required. For details, see "3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.4 Inactive/Cold Removal Workflows

This section describes the workflows for inactive/cold removal of the FRUs mounted in the SPARC M12-2S, and the workflow for inactive/cold removal of the SPARC M12-2S.

Before performing removal work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to inactive/cold removal:

- PCIe card
- HDD/SSD
- CMUU
- Memory
- PCI expansion unit
- SPARC M12-2S

6.4.1 Inactive/Cold Removal Workflow of a PCIe Card

You can perform inactive/cold removal of a PCIe card in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before removing a PCIe card, see "Precautions for PCIe card removal" in "7.3 Precautions for FRU Reduction."

Table 6-13 shows the workflow for inactive/cold removal of a PCIe card.

Table 6-13 Inactive/Cold Removal Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the assignment of the I/O resources of the PCIe card to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
3	Confirming that you can remove the PCIe card to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
4	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
5	Powering off the physical partition containing the SPARC M12-2S that houses the PCIe card to be removed	"9.5.1 Stopping a Specific Physical Partition"

Table 6-13 Inactive/Cold Removal Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Releasing the SPARC M12-2S that houses the PCIe card to be removed, from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
8	Removing the PCICS in which the PCIe card to be removed is mounted from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
9	Removing the PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
10	Installing a PCIe card filler in the PCICS, and installing the PCICS in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
11	Incorporating the SPARC M12-2S from which the PCIe card was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
12	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
13	Confirming that there is no problem with the system from which the PCIe card was removed	"10.5.3 Checking the FRU Status After Maintenance"
14	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
15	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
16	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*. If you have reconfigured a logical domain, save the logical domain configuration information.

6.4.2 Inactive/Cold Removal Workflow of the HDD/SSD

You can perform inactive/cold removal of the HDD/SSD in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before removing the HDD/SSD, see "Precautions for HDD/SSD removal" in "7.3 Precautions for FRU Reduction."

Table 6-14 shows the workflow for inactive/cold removal of the HDD/SSD.

Table 6-14 Inactive/Cold Removal Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the assignment of the I/O resources of the HDD/SSD to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
3	Confirming that you can remove the HDD/SSD to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
4	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
5	Powering off the physical partition containing the SPARC M12-2S that houses the HDD/SSD to be removed	"9.5.1 Stopping a Specific Physical Partition"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Releasing the SPARC M12-2S that houses the HDD/SSD to be removed, from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
8	Removing the HDD/SSD to be removed from the SPARC M12-2S	"15.3.1 Removing an HDD/SSD"
9	Installing a filler unit in the SPARC M12-2S	"15.4.2 Installing a Filler Unit"
10	Incorporating the SPARC M12-2S from which the HDD/SSD was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
11	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
12	Confirming that there is no problem with the system from which the HDD/SSD was removed	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
14	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
15	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*. If you have reconfigured a logical domain, save the logical domain configuration information.

6.4.3 Inactive/Cold Removal Workflow of the CMUU

You can perform inactive/cold removal of the CMUU in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before removing the CMUU, see "Precautions for CMUU removal" in "7.3 Precautions for FRU Reduction."

Table 6-15 shows the workflow for inactive/cold removal of the CMUU.

Table 6-15 Inactive/Cold Removal Procedure of the CMUU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Powering off the physical partition containing the SPARC M12-2S that houses the CMUU to be removed	"9.5.1 Stopping a Specific Physical Partition"
3	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
4	Releasing the SPARC M12-2S that houses the CMUU to be removed, from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
5	Enabling the removal of the CMUU	"17.4.1 Enabling the Removal of the CMU"
6	Removing the CMUU from the SPARC M12-2S	"17.4.2 Removing the CMU"
7	Installing a filler unit in the SPARC M12-2S	"17.5.2 Installing the CMU"
8	Assembling the SPARC M12-2S from which the CMUU was removed	"17.5.3 Restoring the Server"
9	Incorporating the SPARC M12-2S from which the CMUU was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
10	Diagnosing the SPARC M12-2S from which the CMUU was removed (*1)	"10.5.1 Diagnosing the SPARC M12 Hardware"
11	Diagnosing the XBU and crossbar cable, in the building block configuration, of the SPARC M12-2S from which the CMUU was removed	"10.5.2 Diagnosing the XBU and Crossbar Cable"
12	Confirming that there is no problem with the system from which the CMUU was removed	"10.5.3 Checking the FRU Status After Maintenance"
13	Reconfiguring the I/O bus as required (*2)	"3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*

Table 6-15 Inactive/Cold Removal Procedure of the CMUU *(continued)*

Work Order	Task	Reference
14	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
15	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
16	Checking the operating condition of the physical partition and logical domains (*3)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
17	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 If the CMUU was removed from a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).
*2 When reconfiguring the I/O bus, you may need to reconfigure the logical domains.
*3 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.4.4 Inactive/Cold Removal Workflow of Memory

You can perform inactive/cold removal of memory in the following configuration:

- Configuration connecting two or more SPARC M12-2S units to a physical partition

Before removing the memory, see "Precautions for memory reduction" in "7.3 Precautions for FRU Reduction."

Table 6-16 shows the workflow for inactive/cold removal of memory.

Table 6-16 Inactive/Cold Removal Procedure of Memory

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the assignment of memory resources according to the total capacity of memory after reduction	"Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Confirming that you can remove the CMU from which to remove memory (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
4	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
5	Powering off the physical partition containing the SPARC M12-2S that houses the memory to be removed	"9.5.1 Stopping a Specific Physical Partition"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"

Table 6-16 Inactive/Cold Removal Procedure of Memory *(continued)*

Work Order	Task	Reference
7	Releasing the SPARC M12-2S that houses the memory to be removed, from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
8	Enabling the removal of the CMU	"17.4.1 Enabling the Removal of the CMU"
9	Removing the CMU of the memory to be removed from the SPARC M12-2S	"17.4.2 Removing the CMU"
10	Removing the memory from the CMU (*1)	"17.4.3 Removing Memory"
11	Installing the CMU from which the memory was removed, in the SPARC M12-2S	"17.5.2 Installing the CMU"
12	Assembling the SPARC M12-2S from which the memory was removed	"17.5.3 Restoring the Server"
13	Incorporating the SPARC M12-2S from which the memory was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
14	Diagnosing the SPARC M12-2S from which the memory was removed (*2)	"10.5.1 Diagnosing the SPARC M12 Hardware"
15	Diagnosing the XBU and crossbar cable, in the building block configuration, of the SPARC M12-2S from which the memory was removed	"10.5.2 Diagnosing the XBU and Crossbar Cable"
16	Confirming that there is no problem with the SPARC M12-2S after the removal of the memory	"10.5.3 Checking the FRU Status After Maintenance"
17	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
18	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
19	Checking the operating condition of the physical partition and logical domains (*3)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
20	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Observe the installation rules to remove memory. For details, see "2.2 Checking the Memory Configuration Rules."
*2 If the memory was removed from a SPARC M12-2S with no PCIe cards mounted, no diagnosis is necessary (because diagnosis was performed in the previous step).
*3 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.4.5 Inactive/Cold Removal Workflow of the PCI Expansion Unit

You can perform inactive/cold removal of a PCI expansion unit in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before removing the PCI expansion unit, be sure to check the precautions in "1.7.2 Notes on Adding/Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*.
Table 6-17 shows the workflow for inactive/cold removal of a PCI expansion unit.

Table 6-17 Inactive/Cold Removal Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the assignment of the I/O resources of the PCIe cards mounted in the PCI expansion unit to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
3	Confirming that you can remove the PCIe cards mounted in the PCI expansion unit to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
4	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
5	Powering off the physical partition containing the SPARC M12-2S that is connected to the PCI expansion unit to be removed	"9.5.1 Stopping a Specific Physical Partition"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Releasing the SPARC M12-2S connected to the PCI expansion unit to be removed, from the building block configuration	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
8	Releasing the PCI expansion unit to be removed and the link card	"11.3 Removing a Link Cable" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
9	Removing the PCICS in which the link card is mounted from the SPARC M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
10	Removing the link card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
11	Installing a PCIe card filler in the PCICS, and installing the PCICS in the SPARC M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"

Table 6-17 Inactive/Cold Removal Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
12	Incorporating the SPARC M12-2S from which the PCI expansion unit was removed into the building block configuration	"10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration"
13	Powering on the physical partition containing the SPARC M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
14	Confirming that there is no problem with the system from which the PCI expansion unit was removed	"10.5.3 Checking the FRU Status After Maintenance"
15	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
16	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
17	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.4.6 Inactive/Cold Removal Workflow of the SPARC M12-2S

You can perform inactive/cold removal of the SPARC M12-2S in the following configuration:

- Building block configuration where two or more physical partitions are operating

Before removing the SPARC M12-2S, see "Precautions for SPARC M12-2S removal" in "7.3 Precautions for FRU Reduction."

Table 6-18 shows the workflow for inactive/cold removal of the SPARC M12-2S.

Table 6-18 Inactive/Cold Removal Procedure of the SPARC M12-2S

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the I/O device usage status of the SPARC M12-2S to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"
3	Checking the HDD/SSD usage status of the SPARC M12-2S to be removed	"9.2.3 Checking the Usage of the HDD/SSD"

Table 6-18 Inactive/Cold Removal Procedure of the SPARC M12-2S *(continued)*

Work Order	Task	Reference
4	Powering off the physical partition containing the SPARC M12-2S to be removed	"9.5.1 Stopping a Specific Physical Partition"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S from the building block configuration (*3)	"9.7 Removing the SPARC M12-2S"
7	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
8	Powering on the physical partition of the system after releasing the SPARC M12-2S	"10.9.1 Starting the System With an XSCF Command"
9	Checking the operating condition of the system after releasing the SPARC M12-2S (*2)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
10	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 If the removal of the SPARC M12-2S does not affect logical domains, this work is not required.
*2 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.
*3 Set the physical partition definitions again as required.

6.5 System-Stopped/Hot Removal Workflows

This section describes the workflows for system-stopped/hot removal of the FRUs mounted in the SPARC M12-2/M12-2S.

Before performing removal work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to system-stopped/hot removal:

- PCIe card
- HDD/SSD
- PCI expansion unit

6.5.1 System-Stopped/Hot Removal Workflow of a PCIe Card

Before removing a PCIe card, see "Precautions for PCIe card removal" in "7.3 Precautions for FRU Reduction."

Table 6-19 shows the workflow for system-stopped/hot removal of a PCIe card.

Table 6-19 System-Stopped/Hot Removal Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the usage status of the PCIe card to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"
3	Releasing the I/O resources assigned to the PCIe card to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
4	Confirming that you can release the PCIe card to be removed	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
5	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
6	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
7	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
8	Removing the PCICS in which the PCIe card to be removed is mounted from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
9	Removing the PCIe card to be removed, from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
10	Installing a PCIe card filler in the PCICS, and installing the PCICS in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
11	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
12	Confirming that there is no problem with the system from which the PCIe card was removed	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
14	Checking the operating condition of the system (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

Table 6-19 System-Stopped/Hot Removal Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
15	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reassign I/O resources to logical domains as required. For details, see "3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.5.2 System-Stopped/Hot Removal Workflow of the HDD/SSD

Before removing the HDD/SSD, see "Precautions for HDD/SSD removal" in "7.3 Precautions for FRU Reduction."

Table 6-20 shows the workflow for system-stopped/hot removal of the HDD/SSD.

Table 6-20 System-Stopped/Hot Removal Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the usage status of the HDD/SSD to be removed	"9.2.3 Checking the Usage of the HDD/SSD"
3	Releasing the HDD/SSD resources assigned to logical domains	"9.3 Releasing I/O Resources From a Logical Domain"
4	Confirming that you can release the HDD/SSD to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
5	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
6	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
7	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
8	Removing the HDD/SSD from the SPARC M12-2/M12-2S	"15.3.1 Removing an HDD/SSD"
9	Installing the filler unit in the SPARC M12-2/M12-2S	"15.4.2 Installing a Filler Unit"
10	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
11	Confirming that there is no problem with the system from which the HDD/SSD was removed	"10.5.3 Checking the FRU Status After Maintenance"
12	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"

Table 6-20 System-Stopped/Hot Removal Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
13	Checking the operating condition of the system (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
14	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reassign I/O resources to logical domains as required. For details, see "3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.5.3 System-Stopped/Hot Removal Workflow of the PCI Expansion Unit

Before removing the PCI expansion unit, be sure to check the precautions in "1.7.2 Notes on Adding/Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*. Table 6-21 shows the workflow for system-stopped/hot removal of a PCI expansion unit.

Table 6-21 System-Stopped/Hot Removal Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the usage status of the PCI expansion unit to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"
3	Releasing the I/O resources assigned to the PCIe cards mounted in the PCI expansion unit to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
4	Confirming that you can release the PCI expansion unit to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
5	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
6	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
7	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
8	Releasing the PCI expansion unit to be removed and the link card	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
9	Removing the PCICS in which the link card is mounted from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"

Table 6-21 System-Stopped/Hot Removal Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
10	Removing the link card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
11	Installing a PCIe card filler in the PCICS	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
12	Installing the PCICS with the installed PCIe card filler into the SPARC M12-2/ M12-2S	"12.4.2 Incorporating a PCIe Card Into the System"
13	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Confirming that there is no problem with the system from which the PCI expansion unit was removed	"10.5.3 Checking the FRU Status After Maintenance"
15	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
16	Checking the operating condition of the system (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
17	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reassign I/O resources to logical domains as required. For details, see "3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.6 System-Stopped/Cold Removal Workflows

This section describes the workflows for system-stopped/cold removal of the FRUs mounted in the SPARC M12-2/M12-2S, and the workflow for system-stopped/cold removal of the SPARC M12-2S.
Except for system-stopped/cold removal of the SPARC M12-2S, the described procedures are performed after all the SPARC M12-2/M12-2S units are placed in the cold state, without using the maintenance menu.
Note that, in a building block configuration, you can perform maintenance using the maintenance menu when only the SPARC M12-2S requiring maintenance is in the cold state. For work procedures with the maintenance menu, see the procedures in "6.4 Inactive/Cold Removal Workflows."
To perform system-stopped/cold removal of the SPARC M12-2S, be sure to follow the procedure described in this section.

Before performing removal work, be sure to check the notes on maintenance work in the *Fujitsu SPARC M12 Product Notes* of the XCP version used.

Each of the following sections puts together the order of work and the tasks for each FRU into a table. For details on each task, see the reference shown in the table.

The following FRUs are subject to system-stopped/cold removal:

- PCIe card
- HDD/SSD
- CMUU
- Memory
- PCI expansion unit
- SPARC M12-2S

Note - System-stopped/cold removal of the SPARC M12-2S when all the SPARC M12-2S units are in the cold state is not supported.
Initialization must be done when the SPARC M12-2S to be removed and the SPARC M12-2S where the master XSCF operates are in the hot state. Use the initbb command from the XSCF shell of the master XSCF.
A SPARC M12-2S unit removed without initialization will not operate normally.

6.6.1 System-Stopped/Cold Removal Workflow of a PCIe Card

Before removing a PCIe card, see "Precautions for PCIe card removal" in "7.3 Precautions for FRU Reduction."

Table 6-22 shows the workflow for system-stopped/cold removal of a PCIe card.

Table 6-22 System-Stopped/Cold Removal Procedure of a PCIe Card

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the assignment of the I/O resources of the PCIe card to be removed	"9.3 Releasing I/O Resources From a Logical Domain"
3	Confirming that you can remove the PCIe card to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
4	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
5	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"

Table 6-22 System-Stopped/Cold Removal Procedure of a PCIe Card *(continued)*

Work Order	Task	Reference
8	Removing the PCICS in which the PCIe card to be removed is mounted from the SPARC M12-2/M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
9	Removing the PCIe card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
10	Installing a PCIe card filler in the PCICS, and installing the PCICS in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
11	Installing the power cords of all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
12	Powering on the physical partition containing the SPARC M12-2/M12-2S that underwent maintenance	"10.9.1 Starting the System With an XSCF Command"
13	Confirming that there is no problem with the system from which the PCIe card was removed	"10.5.3 Checking the FRU Status After Maintenance"
14	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
15	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
16	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*. If you have reconfigured a logical domain, save the logical domain configuration information.

6.6.2 System-Stopped/Cold Removal Workflow of the HDD/SSD

Before removing the HDD/SSD, see "Precautions for HDD/SSD removal" in "7.3 Precautions for FRU Reduction."

Table 6-23 shows the workflow for system-stopped/cold removal of the HDD/SSD.

Table 6-23 System-Stopped/Cold Removal Procedure of the HDD/SSD

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the assignment of the I/O resources of the HDD/SSD to be removed	"9.3 Releasing I/O Resources From a Logical Domain"

Table 6-23 System-Stopped/Cold Removal Procedure of the HDD/SSD *(continued)*

Work Order	Task	Reference
3	Confirming that you can remove the HDD/SSD to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
4	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
5	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
8	Removing the HDD/SSD to be removed from the SPARC M12-2/M12-2S	"15.3.1 Removing an HDD/SSD"
9	Installing the filler unit in the SPARC M12-2/M12-2S	"15.4.2 Installing a Filler Unit"
10	Installing the power cords of all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
11	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
12	Confirming that there is no problem with the system from which the HDD/SSD was removed	"10.5.3 Checking the FRU Status After Maintenance"
13	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
14	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
15	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*. If you have reconfigured a logical domain, save the logical domain configuration information.

6.6.3 System-Stopped/Cold Removal Workflow of the CMUU

Before removing the CMUU, see "Precautions for CMUU removal" in "7.3 Precautions for FRU Reduction."

Table 6-24 shows the workflow for system-stopped/cold removal of the CMUU.

Table 6-24 System-Stopped/Cold Removal Procedure of the CMUU

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the assignment of the CPU and memory resources of the CMUU to be removed	"Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
3	Confirming that you can remove the CMUU to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
4	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
5	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
8	Enabling the removal of the CMUU	"17.4.1 Enabling the Removal of the CMU"
9	Removing the CMUU from the SPARC M12-2/M12-2S	"17.4.2 Removing the CMU"
10	Installing the filler unit in the SPARC M12-2/M12-2S	"17.5.2 Installing the CMU"
11	Assembling the SPARC M12-2/M12-2S from which the CMUU was removed	"17.5.3 Restoring the Server"
12	Installing the power cords of all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
13	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
14	Confirming that there is no problem with the system from which the CMUU was removed	"10.5.3 Checking the FRU Status After Maintenance"
15	Reconfiguring the I/O bus as required (*2)	"3.2.18 Configuring an I/O Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*
16	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
17	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
18	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"

Table 6-24 System-Stopped/Cold Removal Procedure of the CMUU *(continued)*

Work Order	Task	Reference
19	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reconfigure logical domains as required. For details, see "Chapter 5 Logical Domain Configuration Example" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.
*2 When reconfiguring the I/O bus, you may need to reconfigure the logical domains.

6.6.4 System-Stopped/Cold Removal Workflow of Memory

Before removing the memory, see "Precautions for memory reduction" in "7.3 Precautions for FRU Reduction."

Table 6-25 shows the workflow for system-stopped/cold removal of memory.

Table 6-25 System-Stopped/Cold Removal Procedure of Memory

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the assignment of memory resources according to the total capacity of memory after reduction	"15.2 Changing the Memory Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*
3	Confirming that you can remove the CMU to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
4	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
5	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
8	Enabling the removal of the CMU	"17.4.1 Enabling the Removal of the CMU"
9	Removing the CMU of the memory to be removed from the SPARC M12-2/M12-2S	"17.4.2 Removing the CMU"
10	Removing the memory from the CMU (*2)	"17.4.3 Removing Memory"
11	Installing the CMU from which the memory was removed, in the SPARC M12-2/M12-2S	"17.5.2 Installing the CMU"

Table 6-25 System-Stopped/Cold Removal Procedure of Memory *(continued)*

Work Order	Task	Reference
12	Assembling the SPARC M12-2/M12-2S from which the memory was removed	"17.5.3 Restoring the Server"
13	Installing the power cords of all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
14	Diagnosing all the SPARC M12-2/M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
15	Confirming that there is no problem with the system from which the memory was removed	"10.5.3 Checking the FRU Status After Maintenance"
16	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
17	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
18	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
19	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reconfigure logical domains as required. For details, see "Chapter 5 Logical Domain Configuration Example" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.
*2 Observe the installation rules to remove memory. For details, see "2.2 Checking the Memory Configuration Rules."

6.6.5 System-Stopped/Cold Removal Workflow of the PCI Expansion Unit

Before removing the PCI expansion unit, be sure to check the precautions in "1.7.2 Notes on Adding/Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*. Table 6-26 shows the workflow for system-stopped/cold removal of a PCI expansion unit.

Table 6-26 System-Stopped/Cold Removal Procedure of a PCI Expansion Unit

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Releasing the assignment of the I/O resources of the PCIe cards mounted in the PCI expansion unit to be removed	"9.3 Releasing I/O Resources From a Logical Domain"

Table 6-26 System-Stopped/Cold Removal Procedure of a PCI Expansion Unit *(continued)*

Work Order	Task	Reference
3	Confirming that you can remove the PCIe cards mounted in the PCI expansion unit to be removed (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
4	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"
5	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
6	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
7	Removing the power cords of all the SPARC M12-2/M12-2S units	"9.8.2 Removing the Power Cords"
8	Releasing the PCI expansion unit to be removed and the link card	*PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*
9	Removing the PCICS in which the link card is mounted from the SPARC M12-2/ M12-2S	"12.3.1 Enabling the Removal of a PCIe Card"
10	Removing the link card from the PCICS	"12.3.2 Removing a PCIe Card or PCIe Card Filler"
11	Installing a PCIe card filler in the PCICS, and installing the PCICS in the SPARC M12-2/M12-2S	"12.4.1 Installing a PCIe Card or PCIe Card Filler"
12	Installing the power cords of all the SPARC M12-2/M12-2S units	"10.1.1 Installing a Power Cord"
13	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
14	Confirming that there is no problem with the system from which the PCI expansion unit was removed	"10.5.3 Checking the FRU Status After Maintenance"
15	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
16	Checking the operating condition of the physical partition and logical domains (*1)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
17	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 Reconfigure logical domains as required. For details, see "Chapter 5 Logical Domain Configuration Example" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

6.6.6 System-Stopped/Cold Removal Workflow of the SPARC M12-2S

You can perform system-stopped/cold removal of the SPARC M12-2S in the following configuration:

- Multiple-BB configuration

Before removing the SPARC M12-2S, see "Precautions for SPARC M12-2S removal" in "7.3 Precautions for FRU Reduction."

Table 6-27 shows the workflow for system-stopped/cold removal of the SPARC M12-2S.

Table 6-27 System-Stopped/Cold Removal Procedure of the SPARC M12-2S

Work Order	Task	Reference
1	Checking the operating condition of the system	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
2	Checking the I/O device usage status of the SPARC M12-2S to be removed	"9.2.2 Checking the Assignment Status of I/O Devices"
3	Checking the HDD/SSD usage status of the SPARC M12-2S to be removed	"9.2.3 Checking the Usage of the HDD/SSD"
4	Powering off all physical partitions	"9.5.2 Stopping All Physical Partitions"
5	Switching the mode switch on the OPNL to Service	"2.3.2 OPNL Control Function"
6	Releasing the SPARC M12-2S to be removed, from the physical partition	"9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration"
7	Releasing the SPARC M12-2S from the building block configuration	"9.7 Removing the SPARC M12-2S"
8	Diagnosing all the connected SPARC M12-2S units	"10.5.1 Diagnosing the SPARC M12 Hardware"
9	Confirming that there is no problem with the SPARC M12-2S released from the physical partition	"10.5.3 Checking the FRU Status After Maintenance"
10	Switching the mode switch on the OPNL to Locked	"2.3.2 OPNL Control Function"
11	Powering on all physical partitions	"10.9.1 Starting the System With an XSCF Command"
12	Checking the operating condition of the system (*2)	"9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains"
13	Saving logical domain configuration information	"9.1.1 Saving Logical Domain Configuration Information"

*1 If the removal of the SPARC M12-2S does not affect logical domains, this work is not required.
*2 Reconfigure logical domains as required. For details, see "Chapter 3 Operations for Domain Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

Chapter 7

FRU Maintenance Precautions

This chapter describes precautions that you should learn before starting maintenance.

7.1 Precautions for FRU Replacement

This section describes the precautions for FRU replacement.
When replacing a FRU, replace it with a part with the same part number or a succeeding part.

Precautions for XSCFU and PSUBP replacement

- You can perform active replacement of the XSCFU only in the SPARC M12-2S in a multiple-BB configuration.
- Do not replace the XSCFU and the PSUBP at the same time. If the XSCFU and the PSUBP are replaced at the same time, the system may fail to operate normally.
- Do not mount and use any of the following SD cards in the XSCFU in another chassis:
  - the one currently mounted in the SPARC M12-2/M12-2S, or
  - one that was once used as a maintenance part

  This is because these SD cards store device identification information.
- Do not mount and use any of the following PSUBP in another chassis:
  - the one currently mounted in the SPARC M12-2/M12-2S, or
  - one that was once used as a maintenance part

  This is because the above PSUBP stores device identification information.
- Before replacing the XSCFU, confirm that the READY LED of the target XSCF is lit in green or off. If the READY LED of the XSCF is blinking, wait until the LED

stays lit or is turned off.

- You cannot replace the master XSCFU. To replace it, switch the master, or remove the power cords of all the BBs.
- If you select the XSCFU in the replacefru command menu, you cannot remove the XSCF DUAL control cable, XSCF BB control cable, or power cord. The only unit that you can remove is the XSCFU.
- During the XSCFU replacement, do not configure the various settings of XSCF reboot, master switching, firmware update, physical partition power-on/power-off/reset, and the XSCF. If any of these processes is in progress, wait for the process to complete before replacing the XSCFU.
- During the active replacement of the XSCFU, the ldm command may cause an error in the control domain where the replacement is performed. Retry after the replacement of the XSCFU is complete. After the replacement is complete, check that the ldmd service in the control domain is running normally.

Precautions for CMU and memory replacement

⚠ **Caution -** Remove the PCICS before removing the CMUL. Replacing the CMUL with the PCICS installed may damage the PCICS or CMUL.

⚠ **Caution -** Before removing the CMUL or CMUU, bundle the PCIe cables of the CMUU in the specified procedure. Removing the CMUL or CMUU without bundling the PCIe cables may damage the CMUL or CMUU.
For details, see "Chapter 17 Maintaining the CPU Memory Unit and Memory."

⚠ **Caution -** Remove the XBU before removing the CMUL or CMUU from the SPARC M12-2S. Replacing the CMUL or CMUU with the XBU installed may damage the CMUL/CMUU or XBU.

⚠ **Caution -** The CMUU weighs 10 kg (22 lb), and the CMUL weighs 13 kg (29 lb). Work must be done by two people if the chassis is mounted at the 24U or higher position of the rack. If the work is done by one person, it may result in an injury or damage to the chassis.

- When remounting memory during the replacement of the CMUL/CMUU or memory, be sure to remount a memory module of the same capacity and the same rank at the same location as before.
- If you have replaced the CMUL that has the hardware RAID function enabled, re-enable the hardware RAID volume.
  For details, see "14.2.11 Re-enabling a Hardware RAID Volume" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Precautions for PSU replacement

Caution - When mounting a PSU in the BPU, make sure that the PSU is oriented so that its power connector is on the left side. Mounting a PSU in the wrong orientation may damage the BPU or PSUBP.

- The power control of the SPARC M12 has a redundant configuration so that the system will continue to run even if one PSU fails. However, avoid running the system for a long time in a faulty condition. Replace the failed PSU.
- When there are multiple PSUs to replace, replace them one by one. If redundancy of the PSUs cannot be secured, system-stopped replacement must be performed.

Precautions for FANU replacement

Caution - Do not forcibly push the FANU when mounting it in the FANBPU. When mounting the FANU, push it at two points at the bottom of its front side. Pushing any points other than the specified ones when mounting the FANU may damage the FANU or FANBPU.

- The cooling fan of the SPARC M12 has a redundant configuration so that the system will continue to run even if one cooling fan of a FANU fails. However, avoid running the system for a long time with a cooling fan failed. Replace the FANU with the failed fan.
- When there are multiple FANUs to replace, replace them one by one. If redundancy of the FANUs cannot be secured, system-stopped replacement must be performed.

Precautions for FANBPU replacement

- Be sure to remove all the FANUs from the FANBPU before removing the FANBPU.

Precautions for HDD/SSD replacement

- When the RAID volume is configured by software, the configuration may need to be changed on the software before and after the replacement of the HDD/SSD. Before starting the work, be sure to see the user manual for the software being used.

Precautions for PCIe card replacement

- To perform active replacement of a PCIe card, the PCIe to be replaced must support PCI Hot Plug. Before performing active replacement, see "Appendix B Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu SPARC M12 PCI Card Installation Guide*.
- Before performing active replacement of a PCIe card having a multipath I/O

configuration, confirm that the target PCIe card can be removed from the multipath I/O configuration. For details, see the manual for the software being used.

- To perform active replacement in combination with the dynamic SR-IOV function or the dynamic reconfiguration function for a PCIe endpoint, the PCIe card to be replaced must support the respective function.
  For details, see "Appendix C Cards/On-Board Devices That Support SR-IOV" and "Appendix D Cards/On-Board Devices That Support Assignment of PCIe End Point Devices (PCIe Cards)" in the *Fujitsu SPARC M12 PCI Card Installation Guide*.

Precautions for OPNL replacement

Caution - Remove all HDDs/SSDs from the HDDBPU. Replacing the OPNL without removing the HDDs/SSDs may damage them.

- When replacing the OPNL in the SPARC M12-2S, set the BB-ID of the OPNL after replacement to the same value as that used before replacement.

7.2 Precautions for FRU Expansion

This section describes the precautions for FRU expansion.

Before performing expansion work, see "(3) Checking the FRU status" in "8.2.2 Identifying a Fault" to confirm that there is no problem with the chassis requiring expansion.

Precautions for CMUU expansion

Caution - The CMUU weighs 10 kg (22 lb). Work must be done by two people if the chassis is mounted at the 24U or higher position of the rack. If the work is done by one person, it may result in an injury or damage to the chassis.

- When adding the CMUU, remove the CMU filler unit. Store the removed CMU filler unit in a safe place.
- Adding the CMUU also adds a root complex. Enabling the I/O bus reconfiguration function increases the I/O bandwidth. Since doing so changes the PCIe card installation rules and the device path of the I/O device, you may need to reconfigure the logical domains.
  For details, see "A.2 SPARC M12-2 Device Paths" or "A.3 SPARC M12-2S Device Paths" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.
- To use the added CPU resources after CMUU addition, you need to assign CPU

Activations. Check the number of CPU Activation keys registered with the device and the number of CPU Activations assigned to the physical partition, before using them.

- To add a CMUU with 64 GB DIMMs mounted, see "Notes on Memory" in the latest version of the *Fujitsu SPARC M12 Product Notes*.

Precautions for memory expansion

Caution - The CMUU weighs 10 kg (22 lb), and the CMUL weighs 13 kg (29 lb). Work must be done by two people if the chassis is mounted at the 24U or higher position of the rack. If the work is done by one person, it may result in an injury or damage to the chassis.

- In memory expansion, observe the memory installation rules.
  For details, see "2.2.1 Memory Installation Rules."
- To mount a 64 GB DIMM, see "Notes on Memory" in the latest version of the *Fujitsu SPARC M12 Product Notes*.

Precautions for HDD/SSD addition

- When adding the HDD/SSD, remove the filler unit from the slot in which the HDD or SSD will be mounted. Store the removed filler unit in a safe place.

Precautions for PCIe card addition

- When performing active addition using PCI Hot Plug, confirm that the PCIe card supports PCI Hot Plug.
  For details, see "Appendix B Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu SPARC M12 PCI Card Installation Guide*.
- To perform active addition in combination with the dynamic SR-IOV function or the dynamic reconfiguration function for a PCIe endpoint, the PCIe card to be added must support the respective function.
  For details, see "Appendix C Cards/On-Board Devices That Support SR-IOV" and "Appendix D Cards/On-Board Devices That Support Assignment of PCIe End Point Devices (PCIe Cards)" in the *Fujitsu SPARC M12 PCI Card Installation Guide*.
- To add a PCIe card, remove the PCIe card filler from the PCICS. Store the removed filler in a safe place.
- If the system is operating in a logical domain configuration other than factory-default when a PCIe card is added, logical domains may not be able to start normally at the next startup of the physical partition (PPAR). Referring to "1.7 Important Information About the XCP Firmware and PCI Expansion Unit" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*, always confirm in advance the logical domain configuration in operation. From the check results, if the system is operating in a logical domain configuration other than factory-default, check the precautions in "1.7.2 Notes on Adding/

Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual* and save/restore the logical domain configuration information and OpenBoot PROM environment variables as required.

Precautions for SPARC M12-2S addition

- The SPARC M12-2S to be added to a building block configuration must have the XSCF settings information initialized. To add a SPARC M12-2S that has been used in another system, initialize the setting information before adding it.
- If you power on the initialized SPARC M12-2S before adding it to a building block configuration, the BB-ID of the OPNL is set in the XSCF, possibly making it unusable for expansion in the building block configuration.
- When adding the SPARC M12-2S to a building block configuration, assign BB-IDs in ascending order without duplication.
- To use the added CPU resources after SPARC M12-2S addition, you need to assign CPU Activations. Check the number of CPU Activation keys registered with the device and the number of CPU Activations assigned to the physical partition, before using them.
  For details, see "Chapter 5 CPU Activation" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.
- To add a SPARC M12-2S with 64 GB DIMMs mounted to a building block configuration, see "Notes on Memory" in the latest version of the *Fujitsu SPARC M12 Product Notes*.

7.3 Precautions for FRU Reduction

This section describes the precautions for FRU reduction.

Before performing reduction work, see "(3) Checking the FRU status" in "8.2.2 Identifying a Fault" to confirm that there is no problem with the chassis requiring reduction.

Precautions for CMUU removal

Caution - The CMUU weighs 10 kg (22 lb). Work must be done by two people if the chassis is mounted at the 24U or higher position of the rack. If the work is done by one person, it may result in an injury or damage to the chassis.

Caution - Be sure to remove the XBU before removing the CMUU from the SPARC M12-2S. Replacing the CMUU with the XBU installed may damage the CMUU or XBU.

Caution - Be sure to bundle PCIe cables in the specified procedure before removing the CMUU. Removing the CMUU without bundling PCIe cables may damage those PCIe cables. For details on the procedure, see "Chapter 17 Maintaining the CPU Memory Unit and Memory."

- To operate the system with the CMUU removed, mount the stored CMU filler unit after removing the CMUU. Not using the CMU filler unit hinders chassis cooling, resulting in unstable system operation.
- If the CMUU in the following system or state is removed, a root complex is also removed and some PCIe slots become unusable:
  - System with a CPU configuration expanded from one CPU at initial installation to two CPUs and with the I/O bus reconfigured
  - State where the I/O bus reconfiguration function is disabled on a system with a CPU configuration of two CPUs at initial installation

  To use all the PCI slots, enable the I/O bus reconfiguration function and change the I/O device path. However, you may need to reconfigure the logical domains because the I/O device path changes.

Precautions for memory reduction

Caution - The CMUU weighs 10 kg (22 lb), and the CMUL weighs 13 kg (29 lb). Work must be done by two people if the chassis is mounted at the 24U or higher position of the rack. If the work is done by one person, it may result in an injury or damage to the chassis.

- In memory reduction, observe the memory installation rules. For details, see "2.2.1 Memory Installation Rules."
- When reducing memory, you may need to reconfigure the logical domains. For details, see "3.2.14 Configuring Virtual Memory" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

Precautions for HDD/SSD removal

- When removing the HDD/SSD, mount the filler unit in the empty slot.

Precautions for PCIe card removal

- When using the PCI Hot Plug function for active removal of a PCIe card having a multipath setting, you may need to release the target PCIe card from the multipath configuration. See the manual for the multipath software being used.
- When performing active removal using PCI Hot Plug, confirm that the PCIe card supports PCI Hot Plug. For details, see "Appendix B Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu SPARC M12 PCI Card Installation Guide*.
- To perform active removal in combination with the dynamic SR-IOV function or

the dynamic reconfiguration function for a PCIE endpoint, confirm that the card supports the respective function. See "Appendix C Cards/On-Board Devices That Support SR-IOV" and "Appendix D Cards/On-Board Devices That Support Assignment of PCIe End Point Devices (PCIe Cards)" in the *Fujitsu M12 PCI Card Installation Guide*.

- After removing the PCIe card, install a PCIe card filler in the PCICS and then mount the PCICS in the SPARC M12-2/M12-2S.
- If the system is operating in a logical domain configuration other than factory-default when a PCIe card is removed, logical domains may not be able to start normally at the next startup of the physical partition (PPAR). Referring to "1.7 Important Information About the XCP Firmware and PCI Expansion Unit" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual*, always confirm in advance the logical domain configuration in operation. From the check results, if the system is operating in a logical domain configuration other than factory-default, check the precautions in "1.7.2 Notes on Adding/Removing the PCI Expansion Unit and PCIe Card" in the *PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual* and save/restore the logical domain configuration information and OpenBoot PROM environment variables as required.

Precautions for SPARC M12-2S removal

- To remove a SPARC M12-2S from a building block configuration, use a method other than system-stopped/cold removal. Performing system-stopped/cold removal for a SPARC M12-2S may make the removed SPARC M12-2S unusable.
- The SPARC M12-2S removed from a building block configuration has the XSCF settings information initialized. To use the removed SPARC M12-2S for another system, initialize the BB-ID and other settings beforehand.
- Suppose you remove a SPARC M12-2S from a building block configuration to use it for another system. In that case, delete as many CPU Activation keys from the original building block configuration as the number of CPU Activations to be used in the other system, and then register these CPU Activation keys in the new system.

Chapter 8

Preparation for Maintenance

This chapter describes the procedure for checking the system configuration and also the troubleshooting methods, as the preparation work required before maintenance.

8.1 Checking the System Configuration

This section describes how to check the hardware, firmware, and software configurations.

The system configuration must be the same before and after maintenance work. For a fault that occurred in the system, check the system configuration and the FRU status before and after maintenance work, and confirm that replacing a FRU has removed the fault from the system.

8.1.1 Checking Logical Domain Configuration Information

This section describes the procedure for checking logical domain configuration information.

To check logical domain configuration information, log in to Oracle Solaris on the control domain or the XSCF shell. For details on the commands used here, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual*.

When checking from Oracle Solaris on the control domain

The following example shows execution of the command for checking logical domain configuration information from Oracle Solaris on the control domain.

```
# ldm list-spconfig
factory-default  (*1)
confirm_service_manual [current]   (*2)
#
```

*1 Factory-default configuration
*2 Configuration of logical domains in operation

When checking from the XSCF shell

The following example shows execution of the command for checking logical domain configuration information from the XSCF shell.

```
XSCF> showdomainconfig -p 0
PPAR-ID     :0
Booting config
 (Current)  :confirm_service_manual   (*1)
 (Next)     :confirm_service_manual
-----------------------------------------------------------------------------
Index       :1
config_name :factory-default          (*2)
domains     :1
date_created:-
-----------------------------------------------------------------------------
Index       :2
config_name :config_develop_env
domains     :3
date_created:'2016-05-24 19:40:55'
XSCF>
```

*1 Configuration of logical domains in operation
*2 Factory-default configuration

8.1.2 Checking Hardware

Log in to the XSCF shell or Oracle Solaris to check the hardware in the system configuration and the hardware RAID volumes.

Checking the SPARC M12-2/M12-2S

To check the system information of the SPARC M12-2/M12-2S and the FRUs mounted in it, log in to the XSCF shell and check the information displayed by the showhardconf command.

The showhardconf command displays the following SPARC M12-2/M12-2S information:

- Model
- System, server, and FRU serial numbers
- Information on the CPU, memory, and other hardware mounted in the SPARC M12-2/M12-2S
- System operation status

Be sure to check and make a note of the hardware configuration before you perform maintenance work.

The following example shows the information you get when you execute the showhardconf command in the SPARC M12-2S.

```
XSCF> showhardconf
SPARC M12-2S; (*1)
    + Serial:PZ51649002; Operator_Panel_Switch:Service; (*2)
    + System_Power:On; System_Phase:Cabinet Power On; (*3)
    Partition#0 PPAR_Status:Running;
    BB#00 Status:Normal; Role:Master; Ver:3015h; Serial:PZ51649002; (*4)
        + FRU-Part-Number:CA20369-B17X 005AC/7341758              ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:2101h; Serial:PP164804GG  ; (*5)
            + FRU-Part-Number:CA07855-D301 A5   /7341541              ;
            + Memory_Size:128 GB; Type: C ;
            CPU#0 Status:Normal; Ver:4242h; Serial:00070051;
                + Freq:4.250 GHz; Type:0x30;
                + Core:12; Strand:8;
            MEM#00A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04E6E;
                + Type:83; Size:16 GB;
            MEM#01A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04ED1;
                + Type:83; Size:16 GB;
            MEM#02A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C0510D;
                + Type:83; Size:16 GB;
            MEM#03A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04F51;
                + Type:83; Size:16 GB;
            MEM#04A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04E6F;
                + Type:83; Size:16 GB;
            MEM#05A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04F50;
                + Type:83; Size:16 GB;
            MEM#06A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04EFB;
                + Type:83; Size:16 GB;
            MEM#07A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C051AE;
                + Type:83; Size:16 GB;
        CMUU Status:Normal; Ver:2101h; Serial:PP164804GN  ;
            + FRU-Part-Number:CA07855-D451 A4   /7341568              ;
            + Memory_Size:128 GB; Type: C ;
```

```
        CPU#0 Status:Normal; Ver:4242h; Serial:00070043;
            + Freq:4.250 GHz; Type:0x30;
            + Core:12; Strand:8;
        MEM#00A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EF7;
            + Type:83; Size:16 GB;
        MEM#01A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C051AB;
            + Type:83; Size:16 GB;
        MEM#02A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EFD;
            + Type:83; Size:16 GB;
        MEM#03A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04ED2;
            + Type:83; Size:16 GB;
        MEM#04A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EF6;
            + Type:83; Size:16 GB;
        MEM#05A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04F57;
            + Type:83; Size:16 GB;
        MEM#06A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EAC;
            + Type:83; Size:16 GB;
        MEM#07A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EA8;
            + Type:83; Size:16 GB;
    PCI#0 Name_Property:network; (*6)
        + Vendor-ID:8086; Device-ID:1521;
        + Subsystem_Vendor-ID:108e; Subsystem-ID:7b18;
        + Model:SUNW,pcie-igb;
    PCI#2 Name_Property:network;
        + Vendor-ID:8086; Device-ID:1528;
        + Subsystem_Vendor-ID:108e; Subsystem-ID:7b15;
        + Model:ATO:7070007, PTO:7070005;
    PCI#4 Name_Property:network;
        + Vendor-ID:8086; Device-ID:10fb;
        + Subsystem_Vendor-ID:108e; Subsystem-ID:7b11;
        + Model:X1109a-z/1109a-z;
    PCI#6 Name_Property:QLGC,qlc;
        + Vendor-ID:1077; Device-ID:2532;
        + Subsystem_Vendor-ID:1077; Subsystem-ID:015d;
        + Model:QLE2562 ;
    XBU#0 Status:Normal; Ver:1101h; Serial:PP164601DU  ;
        + FRU-Part-Number:CA20369-B18X 004AB/7341570              ;
        + Type: C ;
    XBU#1 Status:Normal; Ver:1101h; Serial:PP164601DV  ;
        + FRU-Part-Number:CA20369-B18X 004AB/7341570              ;
        + Type: C ;
    XSCFU Status:Normal; Ver:0101h; Serial:PP164603JA  ;
        + FRU-Part-Number:CA20369-B08X 006AC/7341765              ;
        + Type: A ;
    OPNL Status:Normal; Ver:0101h; Serial:PP164702EE  ;
        + FRU-Part-Number:CA20365-B35X 006AC/7060922              ;
        + Type: A ;
```

```
        PSUBP Status:Normal; Ver:1101h; Serial:PP164603HH  ;
            + FRU-Part-Number:CA20369-B17X 005AC/7341758            ;
            + Type: C ;
        PSU#0 Status:Normal; Ver:303242h; Serial:HWCD1622000551;
            + FRU-Part-Number:CA01022-0850/7334651      ;
            + Power_Status:ON; AC:200 V; Type: C ;
        PSU#1 Status:Normal; Ver:303242h; Serial:HWCD1622000586;
            + FRU-Part-Number:CA01022-0850/7334651      ;
            + Power_Status:ON; AC:200 V; Type: C ;
        PSU#2 Status:Normal; Ver:303242h; Serial:HWCD1622000524;
            + FRU-Part-Number:CA01022-0850/7334651      ;
            + Power_Status:ON; AC:200 V; Type: C ;
        PSU#3 Status:Normal; Ver:303242h; Serial:HWCD1622000496;
            + FRU-Part-Number:CA01022-0850/7334651      ;
            + Power_Status:ON; AC:200 V; Type: C ;
        FANU#0 Status:Normal; Type: C ;
        FANU#1 Status:Normal; Type: C ;
        FANU#2 Status:Normal; Type: C ;
        FANU#3 Status:Normal; Type: C ;
        FANU#4 Status:Normal; Type: C ;
        FANU#5 Status:Normal; Type: C ;
        FANU#6 Status:Normal; Type: C ;
        FANU#7 Status:Normal; Type: C ;
        HDDBP Status:Normal; Type: A ;
XSCF>
```

*1 SPARC M12 model information
*2 System serial number and OPNL mode
*3 System operation status
*4 System information including the serial number, CPU information, and memory capacity of the SPARC M12-2S operating with BB-ID#00
*5 CMUL hardware information
*6 Information on the PCIe card mounted in the SPARC M12-2S with BB-ID#00

Checking hardware RAID volumes

To check the configuration or status of the hardware RAID volumes using the hardware RAID function featured by the SPARC M12-2/M12-2S, log in to Oracle Solaris on the control domain or root domain. Check the contents displayed by the sas2ircu command of the SAS2IRCU utility.

Before performing maintenance on the hardware RAID volumes, be sure to make a note of the hardware RAID setting information and information on the HDD/SSD composing the RAID volumes.
For details on how to obtain the SAS2IRCU utility and the user guide, see "Obtaining SAS-2 Integrated RAID Configuration Utility" in the latest version of the *Fujitsu SPARC M12 Product Notes*.

The following example shows the display by the sas2ircu command.

```
root# ./sas2ircu 1 display
LSI Corporation SAS2 IR Configuration Utility.
Version 20.00.00.00 (2014.09.18)
Copyright (c) 2008-2014 LSI Corporation. All rights reserved.
Read configuration has been initiated for controller 1
------------------------------------------------------------------------
Controller information
------------------------------------------------------------------------
  Controller type                         : SAS2308_2
  BIOS version                            : 0.00.00.00
  Firmware version                        : 20.00.10.00
  Channel description                     : 1 Serial Attached SCSI
  Initiator ID                            : 0
  Maximum physical devices                : 255
  Concurrent commands supported           : 3072
  Slot                                    : Unknown
  Segment                                 : 0
  Bus                                     : 3
  Device                                  : 0
  Function                                : 0
  RAID Support                            : Yes
------------------------------------------------------------------------
IR Volume information
------------------------------------------------------------------------
IR volume 1
  Volume ID                               : 286
  Volume Name                             : RAID1-Vol
  Status of volume                        : Okay (OKY)
  Volume wwid                             : 002c57a43e55a4a6
  RAID level                              : RAID1
  Size (in MB)                            : 571250
  Physical hard disks                     :
  PHY[0] Enclosure#/Slot#                 : 2:4
  PHY[1] Enclosure#/Slot#                 : 2:5
------------------------------------------------------------------------
Physical device information
------------------------------------------------------------------------
Initiator at ID #0
Device is a Enclosure services device
  Enclosure #                             : 2
  Slot #                                  : 0
  SAS Address                             : 500000e-0-e0b0-0a7d
  State                                   : Standby (SBY)
  Manufacturer                            : FUJITSU
  Model Number                            : BBEXP
  Firmware Revision                       : 1303
  Serial No                               : x3601930
  GUID                                    : N/A
  Protocol                                : SAS
  Device Type                             : Enclosure services device
Device is a Hard disk
  Enclosure #                             : 2
  Slot #                                  : 4
  SAS Address                             : 5000039-6-9800-24c2
  State                                   : Optimal (OPT)
```

```
  Size (in MB)/(in sectors)                : 572325/1172123567
  Manufacturer                             : TOSHIBA
  Model Number                             : AL13SEB600AL14SE
  Firmware Revision                        : 37E2
  Serial No                                : X510A007F7TD
  GUID                                     : 50000396980024c1
  Protocol                                 : SAS
  Drive Type                               : SAS_HDD
Device is a Hard disk
  Enclosure #                              : 2
  Slot #                                   : 5
  SAS Address                              : 5000039-6-c828-404e
  State                                    : Optimal (OPT)
  Size (in MB)/(in sectors)                : 572325/1172123567
  Manufacturer                             : TOSHIBA
  Model Number                             : AL13SEB600
  Firmware Revision                        : 3703
  Serial No                                : 16I0A015FW28
  GUID                                     : 50000396c828404c
  Protocol                                 : SAS
  Drive Type                               : SAS_HDD
------------------------------------------------------------------------
Enclosure information
------------------------------------------------------------------------
  Enclosure#                               : 1
  Logical ID                               : 500000e0:e06200a8
  Numslots                                 : 8
  StartSlot                                : 0
  Enclosure#                               : 2
  Logical ID                               : 500000e0:e0b00a7f
  Numslots                                 : 9
  StartSlot                                : 0
------------------------------------------------------------------------
SAS2IRCU: Command DISPLAY Completed Successfully.
SAS2IRCU: Utility Completed Successfully.
```

8.1.3 Checking the XCP Firmware Version

Log in to the XSCF shell to check the version of the XCP firmware operating on the SPARC M12-2/M12-2S.

The XCP firmware version may affect system operation. To investigate the cause when a problem occurs, change the system configuration, or do likewise, check the version of the currently operating XCP firmware.

For details on the commands used here, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XCP firmware version used.

Checking the firmware version

To check the version of the XCP firmware running on the SPARC M12, log in to the XSCF shell and execute the version command.

The following example shows the display by the version command.

```
XSCF> version -c xcp
BB#00-XSCF#0 (Master)
XCP0 (Reserve): 3020     (*1)
XCP1 (Current): 3020     (*2)
BB#01-XSCF#0 (Standby)
XCP0 (Reserve): 3020
XCP1 (Current): 3020
XSCF>
```

*1 Version of the XCP firmware installed at Reserve on the SPARC M12-2S with BB-ID 00
*2 Version of the XCP firmware running on the SPARC M12-2S with BB-ID 00

Checking the PCI expansion unit firmware version

The PCI expansion unit firmware is installed on the link card mounted in the SPARC M12-2/M12-2S and on the I/O board mounted in the PCI expansion unit. You need to check the version on each of them.

To check the PCI expansion unit firmware version, log in to the XSCF shell and execute the ioxadm command.

1. **Identify the mounting locations of the PCI expansion unit and link card.**

```
XSCF> ioxadm list
PCIBOX                    Link
PCIBOX#2007               BB#00-PCI#7    (*1)
PCIBOX#2006               BB#00-PCI#5
PCIBOX#2005               BB#00-PCI#3
PCIBOX#2004               BB#00-PCI#1
```

*1 Mounting locations of the PCI expansion unit and link card

2. **Check the firmware version on the PCI expansion unit and link card.**

```
XSCF> ioxadm -v list
Location           Type    FW Ver Serial Num      Part Num
State
PCIBOX#2007        PCIBOX  -      PZ21242007                                 On
PCIBOX#2007/PSU#0  PSU     -      FEJD1212000521 CA01022-0750-D/7060988      On
PCIBOX#2007/PSU#1  PSU     -      FEJD1201000738 CA01022-0750-D/7060988      On
PCIBOX#2007/IOB    IOBOARD 1310   PP12470297     CA20365-B66X 010AJ/7061033 On
(*1)
PCIBOX#2007/LINKBD BOARD   -      PP1244027P     CA20365-B60X 001AA/7061035 On
PCIBOX#2007/FANBP  FANBP   -      PP12470298     CA20365-B68X 005AD/7061025 On
BB#00-PCI#1        CARD    1310   PP124401LZ     CA20365-B59X 001AA/7061040 On
(*2)
```

*1 Firmware version on the I/O board
*2 Firmware version on the link card

8.1.4 Checking the Software Version

Log in to Oracle Solaris on a logical domain such as the control domain or root domain to check the software version.

The software version may affect system operation. To investigate the cause of a problem, change the system configuration, or do likewise, check the version of the currently operating software in advance.

Table 8-1 lists the commands for checking the software version.

Table 8-1 Commands for Checking the Software Version

Command	Description
uname	Displays the Oracle Solaris version.
pkg	Displays the identification number of the SRU applied to Oracle Solaris 11.
showwrev	Displays the number of the fix/patch applied to Oracle Solaris 10.
ldm	Displays the version of Oracle VM Server for SPARC.

Checking Oracle Solaris version information

- Oracle Solaris 11

```
# uname -a
SunOS 2S-800-D0 5.11 11.3 sun4v sparc sun4v
                     (*1)
```

*1 Oracle Solaris version information

- Oracle Solaris 10

```
# less /etc/release
              Oracle Solaris 10 1/13 s10s_u11wos_24a SPARC
                              (*1)
  Copyright (c) 1983, 2013, Oracle and/or its affiliates. All rights reserved.
                           Assembled 17 January 2013
#
```

*1 Oracle Solaris version and release information

Checking the applied Oracle Solaris fix information

- Oracle Solaris 11

```
# pkg info entire
         Name : entire
      Summary : Incorporation to lock all system packages to the same build
  Description : This package constrains system package versions to the same
                build. WARNING: Proper system update and correct package
                selection depend on the presence of this incorporation.
                Removing this package will result in an unsupported system.
     Category : Meta Packages/Incorporations
        State : Installed
    Publisher : solaris
      Version : 0.5.11 (Oracle Solaris 11.3.17.x.0)
                                         (*1)
Build Release : 5.11
      :
```

*1 SRU identification number (SRU 1.5)

- Oracle Solaris 10

```
# showrev -p
Patch: 800130-03 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWlucfg,
        (*1)
SUNWproduct-registry-root, SUNWwsr2, SUNWwsrv, SUNWjsnmp, SUNWadmj, SUNWwbapi,
      :
Patch: 800214-05 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWlucfg,
SUNWproduct-registry-root, SUNWwsr2, SUNWwsrv, SUNWjsnmp, SUNWadmj, SUNWwbapi,
      :
```

*1 Patch number

Checking the version information for Oracle VM Server for SPARC

```
# ldm -V
Logical Domains Manager (v 3.4.0.3.x)
                           (*1)

      :
```

*1 Version of Oracle VM Server for SPARC

8.1.5 Checking the Operation Status of Physical Partitions

Before changing the physical partition configuration or performing hardware maintenance, log in to the XSCF shell and check the operation status of the target physical partition and the PSB configuration.

The following example shows the information displayed by the command that checks the operation status of a physical partition. For details on the individual commands, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XCP firmware version used.

Checking the operation status of physical partitions

```
XSCF> showpcl -a
PPAR-ID   LSB  PSB    Status
00                    Running  (*1)
          00   00-0            (*2)
          01   01-0
XSCF>
```

*1 Operation status of a physical partition
*2 BB-ID (PSB number) and LSB number of the SPARC M12-2S composing physical partition #00

Checking the PSBs composing a physical partition and their operation status

```
XSCF> showboards -p 0
PSB   PPAR-ID(LSB)  Assignment   Pwr   Conn  Conf  Test     Fault
----  ------------  -----------  ----  ----  ----  -------  --------
00-0  00(00)        Assigned     y     y     y     Passed   Normal   (*1)
01-0  00(01)        Assigned     y     y     y     Passed   Normal
XSCF>
```

*1 The physical partition of PPAR-ID#00 is composed of PSB#00-0 (BB-ID#00) and PSB#01-0 (BB-ID#01), and both are operating normally.

8.1.6 Checking FRU Information

FRU information includes detailed information on hardware. Log in to the XSCF shell and check FRU information when ordering hardware for expansion or replacement. For example, do so when changing the hardware configuration or replacing faulty hardware.

This section shows examples of the display by the commands used to check FRU information. For details on the individual commands, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XCP firmware version used.

Checking the number of mounted FRUs

```
XSCF> showhardconf -u
SPARC M12-2S; Memory_Size:1024 GB; (*1)
    +-----------------------------------+------------+
    |              FRU                  |  Quantity  |
    +-----------------------------------+------------+
    | BB                                |      1     | (*2)
    |     CMUL                          |      1     | (*3)
    |         Type:C                    |  (   1)    |
    |         CPU                       |      1     |
    |             Freq:4.250 GHz;       |  (   1)    |
    |         MEM                       |     16     |
    |             Type:85; Size:32 GB;  |  (  16)    |
    |     CMUU                          |      1     |
    |         Type:C                    |  (   1)    |
    |         CPU                       |      1     |
    |             Freq:4.250 GHz;       |  (   1)    |
    |         MEM                       |     16     |
    |             Type:85; Size:32 GB;  |  (  16)    |
    |     PCICARD                       |      0     |
    |     LINKCARD                      |      0     |
    |     PCIBOX                        |      0     |
    |         IOB                       |      0     |
    |         LINKBOARD                 |      0     |
    |         PCI                       |      0     |
    |         FANBP                     |      0     |
    |         PSU                       |      0     |
    |         FAN                       |      0     |
    |     XBU                           |      2     |
    |         Type:C                    |  (   2)    |
    |     XSCFU                         |      1     |
    |         Type:A                    |  (   1)    |
    |     OPNL                          |      1     |
    |         Type:A                    |  (   1)    |
    |     PSUBP                         |      1     |
    |         Type:A                    |  (   1)    |
    |         PSU                       |      4     |
    |             Type:C                |  (   4)    |
    |     FANU                          |      8     |
    |     HDDBP                         |      1     |
    | XBBOX                             |      0     |
    |     XBU                           |      0     |
    |     XSCFU                         |      0     |
    |     OPNL                          |      0     |
    |     XBBPU                         |      0     |
    |         XSCFIFU                   |      0     |
```

```
        |           PSU                                   |          0       |
        |           FANU                                  |          0       |
        +-------------------------------------------------+------------------+
XSCF>
```

*1 Model information of the system and total capacity of the installed memory
*2 Number of SPARC M12-2/M12-2S units connected inside the system
*3 Number of CMUL units

Checking the FRU type

```
XSCF> showhardconf
SPARC M12-2S;
        :
    BB#00 Status:Normal; Role:Master; Ver:3015h; Serial:PZ51649002;
        :
        CMUL Status:Normal; Ver:2101h; Serial:PP164804GG  ;
            + FRU-Part-Number:CA07855-D301 A5   /7341541              ;
            + Memory_Size:128 GB; Type: C ;
            CPU#0 Status:Normal; Ver:4242h; Serial:00070051;
                + Freq:4.250 GHz; Type:0x30;
                + Core:12; Strand:8;
            MEM#00A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04E6E;
                + Type:83; Size:16 GB;
        :
XSCF>
```

Table 8-2 lists combinations of the FRUs mounted in the SPARC M12 and FRU types.

Table 8-2 Combinations of Servers and FRU Types

Server	Fujitsu Product ID (Oracle Product ID)	FRU	Type Indicator	FRU	Type Indicator
SPARC M12-2	SPNBBAA1xx (7117204)	XSCFU	A	CMUL	E
	SPNBBAA2xx (7602604)		A		C
	SPNBBAA3xx (7605162)		B		F
	SPNBBAA4xx (7605941)		C		G
SPARC M12-2S	SPNCCAA1xx (7117206)	XSCFU	A	CMUL	E
	SPNCCAA2xx (7602605)		A		C
	SPNCCAA3xx (7605163)		B		F
	SPNCCAA4xx (7605942)		C		G

Table 8-3 shows the correspondence between memory mounted in the SPARC M12 and FRU types.

Table 8-3 Correspondence Between Memory and Types

FRU	Type Indicator	Configuration
Memory	81	DDR4 R-DIMM 8 GB 1 Rank
	83	DDR4 R-DIMM 16 GB 1 Rank
	85	DDR4 R-DIMM 32 GB 2 Rank
	87	DDR4 R-DIMM 64 GB 4 Rank
	91	DDR4 R-DIMM 64 GB 2 Rank

Note - The FRU type indicator may vary depending on the hardware configuration. See "Information on SPARC M12 System Hardware" in the *Fujitsu SPARC M12 Product Notes* for the latest XCP version.

8.2 Troubleshooting

This section describes the troubleshooting procedure.

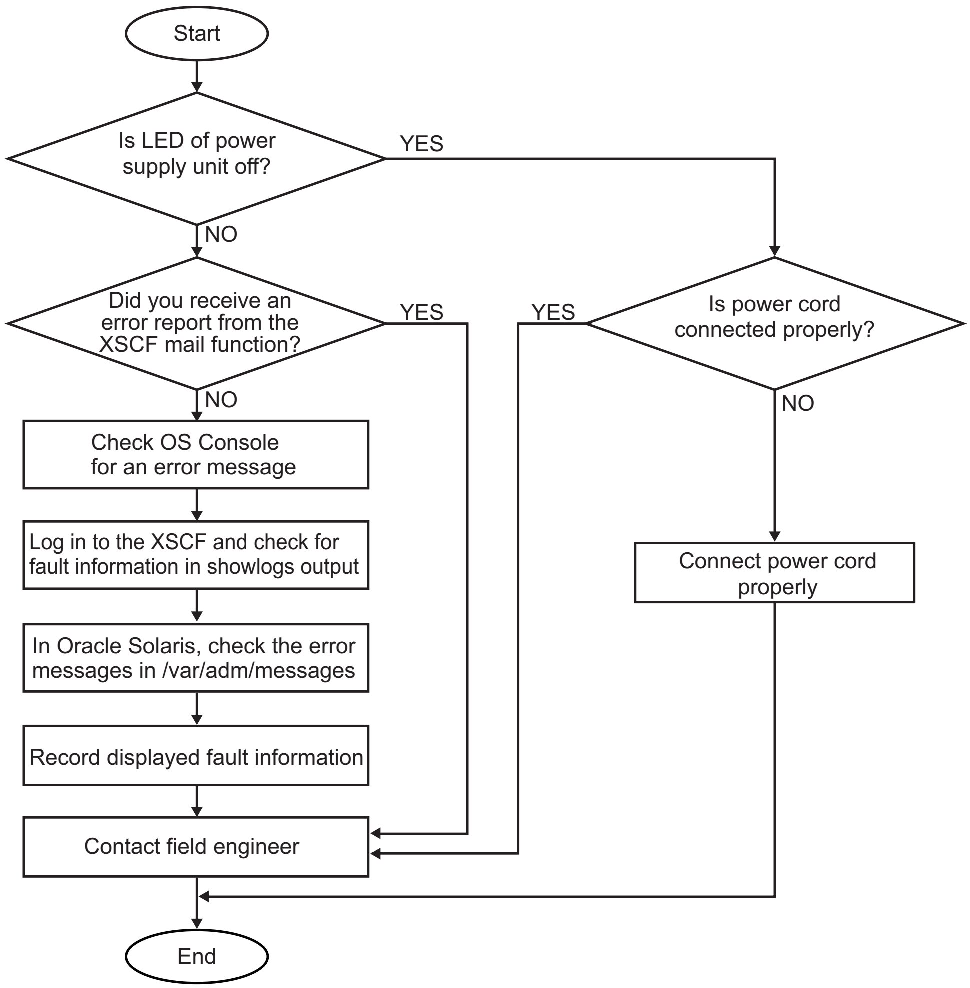
In the following cases with suspected fault conditions, use the troubleshooting flow to identify the fault location. For the troubleshooting flow, see "8.2.1 Confirming Whether There is a Fault."

- When the CHECK LED is on
- When an error message is displayed on the console
- When an error is displayed as a result of executing a command for checking the status
- When an error is displayed in the error log

8.2.1 Confirming Whether There is a Fault

This section describes the flow for confirming whether there is a fault. Apply the flow below for a fault in the PCI expansion unit too.

Figure 8-1 Troubleshooting Flow



8.2.2 Identifying a Fault

This section describes how to identify a fault.

Identify the location of a fault by following the troubleshooting flow in Figure 8-1.

(1) Checking the LED indicators

Check the LEDs on the OPNL, rear panel, and individual units to identify the FRU requiring maintenance. For FRU maintenance, check the status with the LEDs before starting the maintenance.

- LEDs of the OPNL

You can check the system status from the LEDs on the OPNL. For details, see "2.4.1 OPNL LEDs."

- Rear panel LEDs
  As with the CHECK LED on the OPNL, you can also check the system status from the CHECK LED on the rear of the SPARC M12-2/M12-2S. For details, see "2.4.2 System Locator."
- LEDs of individual FRUs
  From the FRU LEDs, you can locate not only any error occurrence in hardware in the SPARC M12-2/M12-2S but also the hardware that caused the error. For details, see "2.4.3 LEDs of Each Unit."

Note - Some FRUs such as memory do not have mounted LEDs. To check the status of a FRU without a mounted LED, use an XSCF command such as the showhardconf command. For details, see "(3) Checking the FRU status" below.

---

(2) Checking error messages

If a failure occurs in the system, analyze the failure cause from the failure occurrence time, abnormal event, and other data obtained from XSCF log information and Oracle Solaris messages.

Checking XSCF log information

The following example shows a check of system operation and failure information from XSCF log information. For details, see "12.1 Checking a Log Saved by the XSCF" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

- Checking monitoring messages

```
XSCF> showlogs monitor
Jan 27 18:42:11 H4U2S115 Event: SCF:System powered on
Jan 27 18:45:41 H4U2S115 Event: SCF:PPAR-ID 0: Reset released
Jan 27 18:45:48 H4U2S115 Event: SCF:POST boot start from PPAR (PPAR ID 0)
Jan 27 18:45:49 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Banner)
Jan 27 18:45:50 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 CPU Check)
Jan 27 18:45:51 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 CPU Register)
Jan 27 18:45:52 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 STICK Increment)
Jan 27 18:45:53 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Extended Instruction)
Jan 27 18:45:54 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 MMU)
Jan 27 18:46:07 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Memory Initialize)
Jan 27 18:46:43 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 MSCAN)
```

```
Jan 27 18:46:54 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Cache)
Jan 27 18:46:59 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Interrupt Queue)
Jan 27 18:47:00 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Floating Point Unit)
Jan 27 18:47:10 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Encryption)
Jan 27 18:47:12 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Random number)
Jan 27 18:47:13 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Cacheable Instruction)
Jan 27 18:47:22 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Softint)
Jan 27 18:47:23 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 CPU Cross Call)
Jan 27 18:47:24 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 CMU-CH)
Jan 27 18:47:26 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 PCI-CH)
Jan 27 18:47:33 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 TOD)
Jan 27 18:47:34 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 MBC Check Before STICK Diag)
Jan 27 18:47:35 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 STICK Stop)
Jan 27 18:47:37 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 STICK Start)
Jan 27 18:47:38 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 CPU Speed Control)
Jan 27 18:47:39 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 SX)
Jan 27 18:47:40 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 RT)
Jan 27 18:47:41 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 RT/SX NC)
Jan 27 18:47:42 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 RT/SX Interrupt)
Jan 27 18:47:45 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 CPU Status Check)
Jan 27 18:47:46 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 System Configuration)
Jan 27 18:47:47 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 System Status Check)
Jan 27 18:47:48 H4U2S115 Event: SCF:Current PPARs' phase (PPARID 0 POST phase:
 Prepare To Start Hypervisor)
Jan 27 18:47:48 H4U2S115 Event: SCF:POST Diag complete from PPAR (PPAR ID 0)
Jan 27 18:47:54 H4U2S115 Event: SCF:SCF sets the active config to PPAR (PPARID
 0 SP-Config:factory-default)
Jan 27 18:48:06 H4U2S115 Event: SCF:HV boot from PPAR (PPAR ID 0)
Jan 27 18:48:13 H4U2S115 Event: SCF:PPARID 0 GID 00000000 state change
(OpenBoot initializing)
Jan 27 18:48:28 H4U2S115 Event: SCF:PPARID 0 GID 00000000 state change
(OpenBoot Running)
Jan 27 18:48:28 H4U2S115 Event: SCF:PPARID 0 GID 00000000 state change
```

```
(OpenBoot Primary Boot Loader)
Jan 27 18:48:46 H4U2S115 Event: SCF:PPARID 0 GID 00000000 state change
(OpenBoot Running OS Boot)
Jan 27 18:49:32 H4U2S115 Event: SCF:PPARID 0 GID 00000000 state change
(Solaris booting)
Jan 27 18:49:32 H4U2S115 Event: SCF:PPARID 0 GID 00000000 state change
(Solaris booting)
Jan 27 18:49:32 H4U2S115 Event: SCF:PPARID 0 GID 00000000 state change
(Solaris running)
XSCF>
```

- Checking error logs

```
XSCF> showlogs error
Date: Jan 11 16:33:43 JST 2017
    Code: 40000000-014f210000ff0000ff-0901010400000000000000000
    Status: Warning               Occurred: Jan 11 16:33:38.921 JST 2017
    FRU: /BB#1/CMUL
    Msg: A:mpt_sas9:mpt_sas:RAID status error
Date: Jan 11 18:06:55 JST 2017
    Code: 80000000-0056000000ff0000ff-01a1000200000000000000000
    Status: Alarm                 Occurred: Jan 11 18:06:52.012 JST 2017
    FRU: /BB#0/XSCFU
    Msg: XSCF hang-up is detected
Date: Jan 11 20:31:31 JST 2017
    Code: 80002000-007c20007811007811-0192040500000000000000000
    Status: Alarm                 Occurred: Jan 11 20:31:25.098 JST 2017
    FRU: /BB#3/XBU#0/CBL#2L,/BB#3/XBU#0,/BB#0/XBU#0
    Msg: XB-XB interface fatal error
XSCF>
```

Checking messages of the predictive self-repairing tool

Check messages of Oracle Solaris Fault Manager, the predictive self-repairing tool, operating on Oracle Solaris. Oracle Solaris Fault Manager has the following functions:

- Receiving telemetry information relating to an error
- Troubleshooting
- Disabling the FRU where an error occurred
- Turning on the LED of the FRU where an error occurred and displaying details in a system console message

Table 8-4 lists typical messages generated at error occurrence. These messages indicate that the fault has already been diagnosed. If corrective actions can be taken, it has already been taken. Also, if the system is in operation, corrective actions continue to be taken.
The messages are displayed on the console and recorded in the /var/adm/messages file.

Table 8-4 Predictive Self-repairing Messages

Displayed Output	Description
EVENT-TIME: Thu Apr 19 10:48:39 JST 2012	EVENT-TIME: Diagnosis time stamp
PLATFORM: ORCL,SPARC64-X, CSN: PP115300MX, HOSTNAME: 4S-LGA12-D0	PLATFORM: Description of the server where the error occurred
SOURCE: eft, REV: 1.16	SOURCE: Information about the diagnosis engine used to identify the error
EVENT-ID: fcbb42a5-47c3-c9c5-f0b0-f782d69afb01	EVENT-ID: Universally unique event ID for this error
DESC: The diagnosis engine encountered telemetry from the listed devices for which it was unable to perform a diagnosis - ereport.io.pciex.rc.epkt@chassis0/cpuboard0/chip0/hostbridge0/pciexrc0 class and path are incompatible.	DESC: Basic description of the error
AUTO-RESPONSE: Error reports have been logged for examination.	AUTO-RESPONSE: Corrective actions taken (if any) by the system to alleviate any subsequent problems
IMPACT: Automated diagnosis and response for these events will not occur.	IMPACT: Description of assumed impact from the fault
REC-ACTION: Use 'fmadm faulty' to provide a more detailed view of this event. Use 'fmdump -eV' to view the unexpected telemetry. Please refer to the associated reference document at http://support.oracle.com/msg/SUNOS-8000-J0 for the latest service procedures and policies regarding this diagnosis.	REC-ACTION: Brief description of the corrective action that the system administrator needs to take

(3) Checking the FRU status

Check the system hardware configuration and status of each FRU. Table 8-5 shows the meaning of each FRU status displayed as a command execution result.

Table 8-5 FRU Status

Display	Description
Normal	Normal status
Faulted	The unit has stopped due to a fault.
Degraded	The unit has a fault somewhere but continues to operate.
Deconfigured	The unit is degraded as a result of the fault or degradation of another unit.
Maintenance	Maintenance work is being performed with the replacefru, addfru, or initbb command.

Checking the hardware configuration and status of each FRU

To check the hardware configuration and FRU status for the entire system, log in to the XSCF shell, and execute the showhardconf command. An asterisk (*) placed at the beginning of an output line indicates a faulty FRU.

```
XSCF> showhardconf
SPARC M12-2S;
    + Serial:PZ51649002; Operator_Panel_Switch:Service;
    + System_Power:On; System_Phase:Cabinet Power On;
    Partition#0 PPAR_Status:Running;
    BB#00 Status:Normal; Role:Master; Ver:3015h; Serial:PZ51649002;
        + FRU-Part-Number:CA20369-B17X 005AC/7341758              ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:2101h; Serial:PP164804GG  ;
            + FRU-Part-Number:CA07855-D301 A5   /7341541              ;
            + Memory_Size:128 GB; Type: C ;
            CPU#0 Status:Normal; Ver:4242h; Serial:00070051;
                + Freq:4.250 GHz; Type:0x30;
                + Core:12; Strand:8;
            MEM#00A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04E6E;
                + Type:83; Size:16 GB;
            MEM#01A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04ED1;
                + Type:83; Size:16 GB;
            MEM#02A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C0510D;
                + Type:83; Size:16 GB;
            MEM#03A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04F51;
                + Type:83; Size:16 GB;
            MEM#04A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04E6F;
                + Type:83; Size:16 GB;
            MEM#05A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04F50;
                + Type:83; Size:16 GB;
            MEM#06A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04EFB;
                + Type:83; Size:16 GB;
            MEM#07A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C051AE;
                + Type:83; Size:16 GB;
        CMUU Status:Normal; Ver:2101h; Serial:PP164804GN  ;
            + FRU-Part-Number:CA07855-D451 A4   /7341568              ;
            + Memory_Size:128 GB; Type: C ;
            CPU#0 Status:Normal; Ver:4242h; Serial:00070043;
                + Freq:4.250 GHz; Type:0x30;
                + Core:12; Strand:8;
            MEM#00A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04EF7;
                + Type:83; Size:16 GB;
            MEM#01A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C051AB;
                + Type:83; Size:16 GB;
            MEM#02A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04EFD;
```

```
            + Type:83; Size:16 GB;
        MEM#03A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04ED2;
            + Type:83; Size:16 GB;
        MEM#04A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EF6;
            + Type:83; Size:16 GB;
        MEM#05A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04F57;
            + Type:83; Size:16 GB;
        MEM#06A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EAC;
            + Type:83; Size:16 GB;
        MEM#07A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EA8;
            + Type:83; Size:16 GB;
    PCI#0 Name_Property:network;
        + Vendor-ID:8086; Device-ID:1521;
        + Subsystem_Vendor-ID:108e; Subsystem-ID:7b18;
        + Model:SUNW,pcie-igb;
    PCI#2 Name_Property:network;
        + Vendor-ID:8086; Device-ID:1528;
        + Subsystem_Vendor-ID:108e; Subsystem-ID:7b15;
        + Model:ATO:7070007, PTO:7070005;
    PCI#4 Name_Property:network;
        + Vendor-ID:8086; Device-ID:10fb;
        + Subsystem_Vendor-ID:108e; Subsystem-ID:7b11;
        + Model:X1109a-z/1109a-z;
    PCI#6 Name_Property:QLGC,qlc;
        + Vendor-ID:1077; Device-ID:2532;
        + Subsystem_Vendor-ID:1077; Subsystem-ID:015d;
        + Model:QLE2562 ;
    XBU#0 Status:Normal; Ver:1101h; Serial:PP164601DU  ;
        + FRU-Part-Number:CA20369-B18X 004AB/7341570              ;
        + Type: C ;
    XBU#1 Status:Normal; Ver:1101h; Serial:PP164601DV  ;
        + FRU-Part-Number:CA20369-B18X 004AB/7341570              ;
        + Type: C ;
    XSCFU Status:Normal; Ver:0101h; Serial:PP164603JA  ;
        + FRU-Part-Number:CA20369-B08X 006AC/7341765              ;
        + Type: A ;
    OPNL Status:Normal; Ver:0101h; Serial:PP164702EE  ;
        + FRU-Part-Number:CA20365-B35X 006AC/7060922              ;
        + Type: A ;
    PSUBP Status:Normal; Ver:1101h; Serial:PP164603HH  ;
        + FRU-Part-Number:CA20369-B17X 005AC/7341758              ;
        + Type: C ;
    PSU#0 Status:Normal; Ver:303242h; Serial:HWCD1622000551;
        + FRU-Part-Number:CA01022-0850/7334651      ;
        + Power_Status:ON; AC:200 V; Type: C ;
    PSU#1 Status:Normal; Ver:303242h; Serial:HWCD1622000586;
        + FRU-Part-Number:CA01022-0850/7334651      ;
        + Power_Status:ON; AC:200 V; Type: C ;
    PSU#2 Status:Normal; Ver:303242h; Serial:HWCD1622000524;
        + FRU-Part-Number:CA01022-0850/7334651      ;
```

```
            + Power_Status:ON; AC:200 V; Type: C ;
        PSU#3 Status:Normal; Ver:303242h; Serial:HWCD1622000496;
            + FRU-Part-Number:CA01022-0850/7334651      ;
            + Power_Status:ON; AC:200 V; Type: C ;
        FANU#0 Status:Normal; Type: C ;
        FANU#1 Status:Normal; Type: C ;
        FANU#2 Status:Normal; Type: C ;
        FANU#3 Status:Normal; Type: C ;
        FANU#4 Status:Normal; Type: C ;
        FANU#5 Status:Normal; Type: C ;
        FANU#6 Status:Normal; Type: C ;
        FANU#7 Status:Normal; Type: C ;
        HDDBP Status:Normal; Type: A ;
XSCF>
```

Checking for faulty FRUs

To check for faulty FRUs, log in to the XSCF shell, and execute the showstatus command. An asterisk (*) placed at the beginning of an output line indicates a faulty FRU.

```
XSCF> showstatus
    BB#00 Status:Normal;
        CMUL Status:Normal;
*           MEM#00A Status:Faulted;
```

Checking the hardware RAID volume status

From the control domain or root domain, execute the sas2ircu command of the SAS2IRCU utility on Oracle Solaris to check for a degraded hardware RAID volume and a faulty HDD/SSD.

```
root# ./sas2ircu 0 display
LSI Corporation SAS2 IR Configuration Utility.
Version 17.00.00.00 (2013.07.19)
      :
------------------------------------------------------------------------
IR Volume information  (*1)
------------------------------------------------------------------------
      :
IR volume 2
Volume ID                                 : 286
Volume Name                               : RAID1-SYS
Status of volume                          : Degraded (DGD)  (*2)
Volume wwid                               : 0aa6d102f1bf517a
RAID level                                : RAID1
Size (in MB)                              : 571250
Physical hard disks                       :
PHY[0] Enclosure#/Slot#                   : 2:0
PHY[1] Enclosure#/Slot#                   : 0:0

------------------------------------------------------------------------
```

```
Physical device information  (*3)
-----------------------------------------------------------------------
Initiator at ID #0

Device is a Hard disk
Enclosure # : 0
Slot # : 0
SAS Address : 0000000-0-0000-0000
State : Failed (FLD)  (*4)
Manufacturer : TOSHIBA
Model Number : MBF2600RC
Firmware Revision : 3706
Serial No : EA25PC700855
GUID : N/A
Protocol : SAS
Drive Type : SAS_HDD
      :
```

*1 RAID volume information
*2 Degraded operation of the RAID volume
*3 Physical device information
*4 Indicating a fault

Checking the PCI expansion unit status

To check for faulty FRUs in the PCI expansion unit, log in to the XSCF shell and execute the showhardconf and ioxadm commands.

```
XSCF> showhardconf
      :
        PCI#0 Status:Normal; Name_Property:pci;
            + Vendor-ID:108e; Device-ID:9020;
            + Subsystem_Vendor-ID:0000; Subsystem-ID:0000;
            + Model:;
            + Connection:2003;
            PCIBOX#2003; Status:Normal; Ver:1150h; Serial:PZ21332003;
                + FRU-Part-Number:;
                IOB Status:Normal; Serial:PP133001CW  ;
                    + FRU-Part-Number:CA20365-B66X 020AM/7061033            ;

                LINKBOARD Status:Normal; Serial:PP140801Z8 ;
                    + FRU-Part-Number:CA20365-B60X 009AD/7061035            ;

                PCI#11 Name_Property:pci;
                    + Vendor-ID:104c; Device-ID:8231;
                    + Subsystem_Vendor-ID:0000; Subsystem-ID:0000;
                    + Model:;
                FANBP Status:Normal; Serial:PP13310038  ;
                    + FRU-Part-Number:CA20365-B68X 005AD/7061025            ;

                PSU#0; Status:Normal; Serial:FEJD1245001507;
                    + FRU-Part-Number:CA01022-0750-D/7060988    ;
```

```
*                PSU#1; Status:Faulted; Serial:FEJD1245001483;     (*1)
                     + FRU-Part-Number:CA01022-0750-D/7060988    ;
                 FAN#0; Status:Normal;
                 FAN#1; Status:Normal;
                 FAN#2; Status:Normal;
      :
```

*1 Failed

```
XSCF> ioxadm -v list
Location             Type     FW Ver Serial Num     Part Num                State
PCIBOX#2003          PCIBOX   -      PZ21332003                                On
PCIBOX#2003/PSU#0    PSU      -      FEJD1245001507 CA01022-0750-D/7060988     On
PCIBOX#2003/PSU#1    PSU      -      FEJD1245001483 CA01022-0750-D/7060988
Off

(*1)
PCIBOX#2003/IOB      IOBOARD 1150    PP133001CW     CA20365-B66X 020AM/7061033 On
PCIBOX#2003/LINKBD BOARD     -       PP140801Z8     CA20365-B60X 009AD/7061035 On
PCIBOX#2003/FANBP    FANBP   -       PP13310038     CA20365-B68X 005AD/7061025 On
BB#00-PCI#00         CARD    1150    PP123300S8     CA20365-B59X 001AA         On
```

*1 Stopped

8.2.3 Gathering XSCF Log Information

XSCF log information includes the system operation status, such as detailed error information for hardware and the firmware operation history. Use the snapshot command of the XSCF shell to gather the log information.

Depending on the system failure status, our service engineer may request you to gather XSCF log information. Follow the procedure below when gathering XSCF log information.

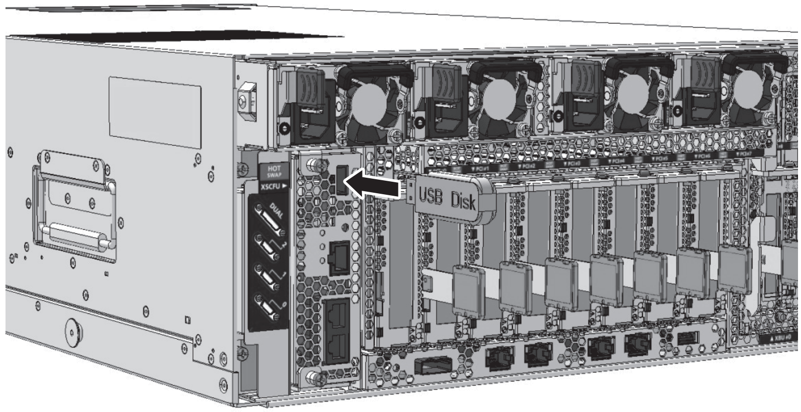
Of the two methods of gathering XSCF log information, one saves the information to USB memory, and the other saves the information to the ftp server in the server installation environment. For details, see "12.1.16 Saving a Log to a Local USB Device," "12.1.17 Saving the Log via the Network on the Terminals That Use XSCF Web," or "12.1.18 Saving the Log via the Network, on the Servers Specified With Snapshot" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Note - By collecting XSCF log information in USB memory, you are deleting all the data previously collected in USB memory.

When collecting data in USB memory

1. **Connect the USB memory to the USB port on the XSCFU.**

Figure 8-2 Connecting the USB Memory



2. **Execute the snapshot command to collect XSCF log information.**
   The following example collects all the XSCF log information for a building block configuration.

```
XSCF> snapshot -d usb0 -L F -r -a -v
Testing writability of USB device....SUCCESS
About to remove all files from device 'usb0'. Continue? [Y|N] : y
BB#00: start to execute snapshot
BB#01: start to execute snapshot
  :
Collecting data into /media/usb_msd/<hostname>_<ipaddress>_<date>.zip
Data collection complete.
```

When collecting information on the SSH server

1. **Execute the snapshot command to collect XSCF log information.**
   Note that the content of the message may differ depending on the firmware version.

```
XSCF> snapshot -t <a>root@ssh_server:/home/snapshot/ -L F -v -a
Downloading Public Key from 'ssh_server'...
Enter ssh password for user 'root' on host 'ssh_server':
Setting up ssh connection to <a>root@ssh_server...
Collecting data into root@ssh_server:/home/snapshot/M12-2S_192.168.1.100_
2016-09-12T06-53-39.zip
BB#00: start to execute snapshot
BB#01: start to execute snapshot
  :
```

```
BB#15: skip to execute snapshot
BB#14: skip to execute snapshot
BB#00: finish to execute snapshot
Sending README File
Sending script file
Collecting file: /ssd/snapshot_col/00/BB#00_M12-2S_192.168.1.100_2016-09-
12T06-53-43.zip - Status: ok
Collecting file: /ssd/snapshot_col/00/BB#00.log - Status: ok
Completing ZIP archive
Closing SSH Target
Data collection complete
Finished with 0 collection errors
XSCF>
```

Chapter 9

Releasing FRUs From the System

This chapter describes the procedures that you may need to perform in the XSCF firmware or Oracle Solaris before removing FRUs from the SPARC M12-2/M12-2S. See this chapter, as required, when performing maintenance work for each FRU described in Chapter 11 or subsequent chapters.

Caution - Do not perform maintenance work while OpenBoot PROM is running (with ok prompt displayed). Perform maintenance work with the physical partition powered off or with Oracle Solaris running.

9.1 Saving Setting Information

This section describes how to save logical domain configuration information and the XSCF firmware setting information.

Be sure to save the setting information before starting system operation or after changing the system configuration (e.g., after setting up the SPARC M12-2/M12-2S or after changing the hardware configuration or domain configuration).

9.1.1 Saving Logical Domain Configuration Information

From Oracle Solaris on the control domain, you can save the logical domain system configuration to the XSCF firmware or an XML file.

This section describes how to save the logical domain system configuration.

For details, see "10.11 Saving/Restoring Logical Domain Configuration Information in the XSCF" or "10.12 Saving/Restoring Logical Domain Configuration Information in an XML File" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Saving the configuration to the XSCF firmware

This section describes an example of saving the logical domain system configuration to the XSCF firmware from Oracle Solaris on the control domain. The configuration is saved with the name "ldom-config1".

```
# ldm list-spconfig
factory-default                          ← (*1)
# ldm add-spconfig ldom-config1          ← (*2)
# ldm list-spconfig
factory-default
ldom-config1 [current]                   ← (*3)
```

*1 There is no information saved on the logical domain system configuration other than the factory-default state.
*2 The currently defined logical domain system configuration is saved with configuration name "ldom-config1".
*3 The currently defined logical domain system configuration is added with configuration name "ldom-config1".

You cannot save the logical domain system configuration with an already existing configuration name. To save the logical domain system configuration with an already existing configuration name, follow the procedure below.

```
primary# ldm list-spconfig
factory-default
ldom-config1 [current]
primary# ldm add-spconfig ldom-config1     ← (*1)
Error: Operation failed because a configuration
named "ldom-config1" already exists on the system controller.
Before being able to save a new configuration with
this name the existing one must be removed
primary# ldm remove-spconfig ldom-config1  ← (*2)
primary# ldm list-spconfig
factory-default
primary# ldm add-spconfig ldom-config1      ← (*3)
primary# ldm list-spconfig
factory-default
ldom-config1 [current]                     ← (*4)
primary#
```

*1 If you attempt to save the configuration with already existing configuration name "ldom-config1", an error message is displayed.
*2 "ldom-config1" is deleted.
*3 The logical domain system configuration is saved with configuration name "ldom-config1".
*4 The logical domain system configuration has been added with configuration name "ldom-donfig1".

Saving the configuration to an XML file

This section describes an example of the operation of saving the logical domain system configuration to the /ldom_config.xml file from Oracle Solaris on the control domain by using the ldm list-constraints -x command.

```
primary# ls /ldom_config.xml                                  ← (*1)

primary# ldm list-constraints -x > /ldom_config.xml         ← (*2)
primary# ls /ldom_config.xml
/ldom_config.xml                                               ← (*3)

primary#
```

*1 Confirm that the logical domain configuration information (/ldom_config.xml) does not exist.
*2 Redirect the command output results to /ldom_config.xml.
*3 Confirm that the logical domain configuration information (/ldom_config.xml) has been created.

9.1.2 Saving XSCF Settings Information

System configuration information, such as the network configuration, CPU Activation settings, and logical domain configuration, is saved in the XSCF firmware as the XSCF settings information. You can save the XSCF settings information to an external file to prepare for system restore from a problem or for a building block configuration change.

This section describes the command examples that save XSCF settings information to a USB device and HTTPS server, respectively, using system.cfg as the file name.

For details on the dumpconfig(8) command used here, see "10.10 Saving/Restoring XSCF Settings Information" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Saving the information to a USB device

```
XSCF> dumpconfig -v -V file:///media/usb_msd/system.cfg
reading
database ...
 ..................................................................
...................................................................
...................................................................
```

```
................................................................................
................................................................................
................................................................................
................................................................................
...............................................*done
creating temporary file ... done
starting file transfer ...transfer from '/ssd/dumpconfig.gDjJdc' to 'file:///
media/usb_msd/system.cfg'
* Closing connection #0
done
removing temporary file ... done
operation completed
XSCF>
```

Saving the information to an HTTPS server

```
XSCF> dumpconfig -v -V -u user_name https://https_server/system.cfg
reading
database ...
 ..............................................................................
................................................................................
................................................................................
................................................................................
................................................................................
................................................................................
................................................................................
...............................................*done
creating temporary file ... done
starting file transfer ...transfer from '/ssd/dumpconfig.Zw77DV' to 'https://
https_server/system.cfg'
Password:  ← (*1)

* About to connect() to https_server port 443 (#0)
*  Trying https_server...
* connected * Connected to https_server (https_server_ip) port 443 (#0)
* Initializing NSS with certpath: /etc/pki/nssdb
*  CAfile: /etc/pki/tls/certs/ca-bundle.crt
 CApath: none
* Remote Certificate has expired.
* SSL certificate verify ok. * SSL connection using TLS_DHE_RSA_WITH_AES_256_
CBC_SHA
* Server certificate:
*       subject: E=root@localhost.localdomain,CN=localhost.localdomain,
OU=SomeOrganizationalUnit,O=SomeOrganization,L=SomeCity,ST=SomeState,C=--
*       start date: Jun 03 12:34:49 2011 GMT
*       expire date: Jun 02 12:34:49 2012 GMT
*       common name: localhost.localdomain
*       issuer: E=root@localhost.localdomain,CN=localhost.localdomain,
OU=SomeOrganizationalUnit,O=SomeOrganization,L=SomeCity,ST=SomeState,C=--
* Server auth using Basic with user 'user_name'
< HTTP/1.1 100 Continue
< HTTP/1.1 201 Created
< Date: Mon, 24 Oct 2016 02:21:16 GMT
```

```
< Server: Apache/2.2.3 (CentOS)
< Location: https://https_server/system.cfg
< Content-Length: 287
< Connection: close
< Content-Type: text/html; charset=UTF-8
<




Created
Resource /system.cfg has been created.




-------------------------------------------------------------------------------
---

Apache/2.2.3 (CentOS) Server at https_server Port 443


* Closing connection #0
done
removing temporary file ... done
operation completed
XSCF>
```

*1 Enter the login password of the HTTPS server.

9.2 Checking the Operation Status and Resource Usage Status of Oracle Solaris

This section describes how to check the operation status of physical partitions and logical domains and the assignment status of I/O devices.

9.2.1 Checking the Operation Status of Physical Partitions and Logical Domains

To check the operation status of physical partitions and logical domains, log in to the XSCF shell.

For details on the commands used here, see the *Fujitsu SPARC M12 and Fujitsu*

M10/SPARC M10 XSCF Reference Manual of the XCP firmware version used.

1. **Confirm that you are logged in to the master XSCF.**
   In the following example, the showbbstatus command checks it.

```
XSCF> showbbstatus
BB#00 (Master) (*1)
```

*1 If Standby is displayed, try logging into the master XSCF again.

2. **Check the operation status of physical partitions.**
   The following example shows the output of the showpparstatus command to check the operation status of physical partitions.

```
XSCF> showpparstatus -p 0
PPAR-ID  PPAR Status
00       Running    (*1)
```

*1 The physical partition of PPAR-ID 00 is operating.

3. **Check the operation status of logical domains.**
   The following example shows the output of the showdomainstatus command to check the operation status of the logical domains defined for the physical partition.

```
XSCF> showdomainstatus -p 0
Logical Domain Name      Status
primary                  Solaris running    (*1)
guest                    Solaris running    (*2)
ldom                     Solaris running    (*3)
```

*1 Oracle Solaris is operating on the control domain.
*2 Oracle Solaris is operating on the logical domain (guest).
*3 Oracle Solaris is operating on the logical domain (ldom).

4. **Check as required the physical address of memory assigned to logical domains.**
   The following example shows the output of the command to check the physical address of memory assigned to logical domains when logged in to Oracle Solaris on the control domain.

```
primary# ldm list-devices -a
CORE
    ID      %FREE   CPUSET
    0       0       (0, 1)
```

```
        :
VCPU
    PID     %FREE   PM
    0       0       no
        :
MEMORY
    PA                    SIZE            BOUND
    0x740000000000         32G             ldom    (*1)
    0x740800000000         32G
        :
```

*1 The space from 0x740000000000 to 0x7407ffffffff (32 GB) is assigned to the logical domain ldom.

9.2.2 Checking the Assignment Status of I/O Devices

Log in to Oracle Solaris on the control domain to check the operation status of logical domains and the assignment status of resources such as I/O devices to logical domains.

For details on the commands used here, see "3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

1. **Check the operation status of logical domains.**
   The following example shows execution of the command for checking the operation status of logical domains defined in the physical partition.

```
primary# ldm list-domain
NAME             STATE      FLAGS   CONS    VCPU  MEMORY   UTIL  NORM  UPTIME
primary          active     -n-cv-  UART    32    16G      0.0%  0.0%  5d 19h
26m    (*1)
guest            active     -n----  5000    32    16G      0.0%  0.0%  5d 18h
12m    (*2)
ldom             active     -n----  5001    64    32G      0.0%  0.0%  5d 19h
29m
primary#
```

*1 The control domain is in operation with 32 cores of virtual CPUs and 16 GB of memory assigned.
*2 The domain (guest) is in operation with 32 cores of virtual CPUs and 16 GB of memory assigned.

2. **Check the virtual services that are configured in the control domain.**
   The following example shows execution of the command for checking the virtual services configured in the control domain.

```
primary# ldm list-services
VCC
    NAME            LDOM      PORT-RANGE
```

```
    primary-vcc0   primary    5000-5100    (*1)
VSW
    NAME         LDOM     MAC               NET-DEV  ID  DEVICE    LINKPROP
DEFAULT-VLAN-ID
    PVID          VID      MTU               MODE     INTER-VNET-LINK
    primary-vsw0  primary 00:14:4f:fb:e1:a8  net0     0   switch@0
 1 (*2)
    1                      1500               on
    primary-vsw4  primary  00:14:4f:f8:42:2f  net4     1   switch@1
 1 (*3)
    1                      1500               on

VDS
    NAME          LDOM     VOLUME  OPTIONS  MPGROUP  DEVICE
    primary-vds0  primary  vdisk00                   /dev/zvol/dsk/rpool/
export/ovm/vdisk00 (*4)
                           disk01                   /dev/zvol/dsk/rpool/
export/ovm/vdisk01
                           vol_iso ro                /export/ovm/sol11u3_iso/
sol-11_3-text-sparc.iso
                           vdisk10                   /dev/zvol/dsk/rpool/
export/ovm/vdisk10
                           vdisk11                   /dev/zvol/dsk/rpool/
export/ovm/vdisk11

#
```

*1 The set port number of a virtual console is in a range of 5000 to 5100.
*2 The physical LAN port net0 is assigned to the virtual switch primary-vsw0.
*3 The physical LAN port net4 is assigned to the virtual switch primary-vsw4.
*4 vdisk00 is assigned to the virtual disk service primary-vds0.

3. **Check the physical locations of the physical LAN ports.**
   The following example shows execution of the command for checking the physical locations of the physical LAN ports.

```
# dladm show-phys -L
LINK              DEVICE       LOC
net0              ixgbe0       /BB0/CMUL    (*1)
net1              ixgbe1       /BB0/CMUL
net2              ixgbe2       /BB0/CMUU
net3              ixgbe3       /BB0/CMUU
 :
```

*1 The location of net0 is the on-board LAN of BB#00.

4. **Check the assignment status of resources to logical domains.**
   The following example shows execution of the command for checking the resources assigned to a logical domain (domain name: guest).

```
# ldm list-bindings guest
NAME    STATE    FLAGS    CONS   VCPU   MEMORY   UTIL   NORM   UPTIME
guest   active   -n----   5000   32     16G      0.0%   0.0%   7d 18h 55m
         :
NETWORK
    NAME   SERVICE               ID DEVICE    MAC               MODE PVID VID
MTU MAXBW LINKPROP
    vnet0  primary-vsw0@primary  0  network@0 00:14:4f:f9:58:4e      1
1500 (*1)
       PEER                    MAC                  MODE  PVID   VID  MTU
MAXBW  LINKPROP
       primary-vsw0@primary    00:14:4f:fb:e1:a8          1           1500
    NAME   SERVICE               ID DEVICE    MAC               MODE PVID VID
MTU MAXBW LINKPROP
    vnet1  primary-vsw4@primary  1  network@1 00:14:4f:fb:4d:fe      1
1500 (*1)
       PEER                    MAC                  MODE  PVID   VID  MTU
MAXBW  LINKPROP
       primary-vsw4@primary    00:14:4f:f8:42:2f          1           1500

DISK
       NAME      VOLUME                  TOUT   ID   DEVICE   SERVER
MPGROUP
       vdisk00   vdisk00@primary-vds0           0    disk@0   primary (*2)
         :
```

*1 The virtual network interfaces vnet0 and vnet1 are assigned as shown.
*2 The virtual disk vdisk00 is assigned as shown.

5. **Check the assignment status of I/O devices.**
The following example shows execution of the command for checking the assignment status of I/O resources to logical domains.

```
# ldm list-io
NAME                                       TYPE   BUS      DOMAIN    STATUS
----                                       ----   ---      ------    ------
PCIE0                                      BUS    PCIE0    primary   IOV
(*1)
          :
/BB0/PCI5                                  PCIE   PCIE3    ldom      OCC
(*2)
          :
/BB0/CMUL/NET0/IOVNET.PF0                 PF     PCIE0    primary
/BB0/CMUL/NET0/IOVNET.PF0.VF0              VF     PCIE0    primary
(*3)
```

*1 The root complex PCIE0 is assigned as shown to the control domain.
*2 The PCIe endpoint of PCI slot #6 of BB#00 is assigned as shown to the logical domain ldom.
*3 An I/O device with the SR-IOV virtual function enabled is assigned as shown to the control domain.

To perform maintenance on a PCIe card, write down the results output by the ldm list-io command, because they will be needed later to restore the system after the maintenance.

9.2.3 Checking the Usage of the HDD/SSD

To check the usage of the HDD/SSD, log in to Oracle Solaris.

This section describes how to check the configuration information for both the ZFS mirror volumes and the RAID volumes using the hardware RAID function of the SPARC M12 server.

For details on the commands for checking the ZFS volumes, see the document concerning ZFS file system management applicable to your Oracle Solaris version. To check the hardware RAID volume, use the sas2ircu command of the SAS2IRCU utility. For details on how to obtain the SAS2IRCU utility and the user guide, see "Obtaining SAS-2 Integrated RAID Configuration Utility" in the latest version of the *Fujitsu SPARC M12 Product Notes*.

Checking ZFS mirror volumes

The following example shows a mirrored ZFS volume.

```
 # zpool status
  pool: rpool
 state: ONLINE
  scan: resilvered 203G in 29m13s with 0 errors on Fri Jan 1 09:00:00 2016

config:
           NAME                          STATE   READ   WRITE   CKSUM
           rpool                         ONLINE     0       0       0
            mirror-0                     ONLINE     0       0       0    (*1)
              c1t50000393D8289242d0      ONLINE     0       0       0    (*2)
              c0t500003942823FC18d0      ONLINE     0       0       0    (*2)
errors: No known data errors
#
```

*1 The state and RAID level of the ZFS volume are displayed.
*2 The physical device with the ZFS volume configuration and its state are displayed.

Checking hardware RAID volumes

The following example shows a RAID volume configured by the hardware RAID function.

```
# ./sas2ircu 0 display
LSI Corporation SAS2 IR Configuration Utility.
Version 17.00.00.00 (2013.07.19)
Copyright (c) 2009-2013 LSI Corporation. All rights reserved.
```

```
Read configuration has been initiated for controller 0
         :
------------------------------------------------------------------------
IR Volume information
------------------------------------------------------------------------
IR volume 1                              (*1)
         :
------------------------------------------------------------------------
Physical device information
------------------------------------------------------------------------
Initiator at ID #0

Device is a Hard disk                    (*2)
         :
Device is a Enclosure services device    (*3)
         :
------------------------------------------------------------------------
Enclosure information                    (*4)
------------------------------------------------------------------------
Enclosure#                           : 1
Logical ID                           : 500000e0:e046ff10
Numslots                             : 8
         :
```

*1 RAID volume 1 information is displayed.
*2 The displayed information is about the physical device mounted in HDD/SSD slot #0.
*3 The displayed information is about the enclosure of HDD/SSD slot #0.
*4 The displayed information is about the SPARC M12 server.

9.3 Releasing I/O Resources From a Logical Domain

Depending on the FRU requiring maintenance and the system configuration, active maintenance is possible in some cases, but it might be necessary to restart or stop Oracle Solaris.

This section describes the procedure for releasing the I/O resources listed below from Oracle Solaris on a logical domain before FRU maintenance on the SPARC M12. Table 9-1 lists the types of I/O resources to be released and their references in this section.

Table 9-1 I/O Resources Released From Logical Domains

I/O Resource	Not Necessary to Restart Oracle Solaris or Stop the Domain	Necessary to Restart Oracle Solaris and Stop the Domain
Virtual I/O	"9.3.1 Dynamically Releasing Virtual I/O From a Logical Domain"	-
SR-IOV virtual function	"9.3.2 Dynamically Releasing the SR-IOV Virtual Function From a Logical Domain"	"9.3.5 Statically Releasing the SR-IOV Virtual Function From a Logical Domain"
PCIe endpoint	"9.3.3 Dynamically Releasing the PCIe Endpoint From a Logical Domain"	"9.3.6 Statically Releasing the PCIe Endpoint From a Logical Domain"
Root complex	"9.3.4 Dynamically Releasing the Root Complex From a Logical Domain"	"9.3.7 Statically Releasing the Root Complex From a Logical Domain"

For details on the commands used here, see "3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide* and the manual for the software being used.

If the hotplug service of Oracle Solaris is disabled, enable it by following the procedure below, and then release the I/O resources.

1. **Check the status of the hotplug service.**

```
# svcs svc:/system/hotplug:default
STATE          STIME    FMRI
disable        16:26:10 svc:/system/hotplug:default
```

2. **Enable the hotplug service.**

```
# svcadm enable svc:/system/hotplug:default
```

3. **Confirm that the hotplug service is enabled.**

```
# svcs svc:/system/hotplug:default
STATE          STIME    FMRI
online         16:26:10 svc:/system/hotplug:default
```

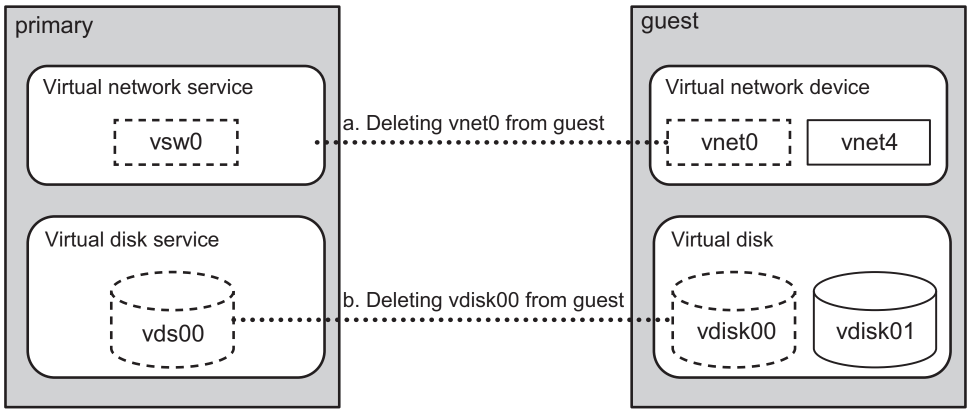
Note - To perform active maintenance on a FANU, a PSU, or the XSCF unit, the work described in this section is not required.

9.3.1 Dynamically Releasing Virtual I/O From a Logical Domain

The operation of dynamically releasing and removing virtual I/O from a logical domain must be performed from the control domain.

Before removing the virtual I/O, confirm that it is not being used by the logical domain. For details, see the manual for the software being used.

Figure 9-1 Removing Virtual I/O



*1: The virtual service is also deleted for PCI Hot Plug.

Table 9-2 lists the procedure for dynamically releasing virtual I/O.

Table 9-2 Procedure for Dynamically Releasing Virtual I/O

Step	Operation Description	Execution Location	Command Used
1	Checking the virtual I/O assigned to a logical domain, in Oracle Solaris on the control domain	Control domain	primary# ldm list-bindings <*domain-name*>
2	Removing the virtual I/O from the logical domain, in Oracle Solaris on the control domain	Control domain	**To remove the virtual network interface** primary# ldm remove-vnet <*if-name*> <*domain-name*> **To remove a virtual disk** primary# ldm remove-vdisk <*if-name*> <*domain-name*>
3	Checking the status of the logical domain from which the virtual I/O was removed, in Oracle Solaris on the control domain	Control domain	primary# ldm list-bindings <*domain-name*>

The following example executes the commands for removing the virtual network interface and virtual disk assigned to a logical domain guest.

1. **Check the resources assigned to the logical domain guest.**

```
primary# ldm list-bindings guest
          :
NETWORK
 NAME  SERVICE               ID  DEVICE     MAC               MODE PVID  VID
 MTU   MAXBW      LINKPROP
 vnet0 primary-vsw0@primary  0   network@0  00:14:4f:f9:58:4e       1
 1500
       PEER                  MAC                 MODE  PVID VID   MTU   MAXBW
   LINKPROP
       primary-vsw0@primary  00:14:4f:fb:e1:a8       1          1500
 NAME  SERVICE               ID  DEVICE     MAC               MODE PVID  VID
 MTU   MAXBW      LINKPROP
 vnet4 rootdom-vsw4@rootdom  1   network@1  00:14:4f:f9:0d:dd       1
 1500
       PEER                  MAC                 MODE  PVID VID   MTU   MAXBW
   LINKPROP
       rootdom-vsw4@rootdom  00:14:4f:f8:42:2f       1          1500
DISK
    NAME             VOLUME                        TOUT ID   DEVICE  SERVER
    MPGROUP
    vdisk00          vdisk00@primary-vds0               0    disk@0  primary
    vdisk01          vdisk01@rootdom-vds1               1    disk@1  primary
VCONS
    NAME             SERVICE                       PORT   LOGGING
    guest            primary-vcc0@primary          5000   on
```

2. **Release virtual I/O from a logical domain guest.**
   a. To release the virtual network interface vnet0

```
primary# ldm remove-vnet vnet0 guest
```

   b. To release the virtual disk vdisk01

```
primary# ldm remove-vdisk vdisk01 guest
```

3. **Check that the virtual I/O has been released from the logical domain guest.**

```
primary# ldm list-bindings guest
          :
NETWORK
 NAME  SERVICE               ID  DEVICE     MAC               MODE PVID  VID
 MTU   MAXBW      LINKPROP
 vnet0 primary-vsw0@primary  0   network@0  00:14:4f:f9:58:4e       1
 1500
       PEER                  MAC                 MODE  PVID VID   MTU   MAXBW
   LINKPROP
       primary-vsw0@primary  00:14:4f:fb:e1:a8       1          1500
DISK
    NAME             VOLUME                        TOUT ID   DEVICE  SERVER
    MPGROUP
    vdisk00          vdisk00@primary-vds0               0    disk@0  primary
```

```
VCONS
    NAME                 SERVICE                      PORT    LOGGING
    guest                primary-vcc0@primary         5000    on
#
```

4. **When removing a PCIe card assigned to virtual services using the PCI Hot Plug function, remove all virtual services that use the PCIe card.**

```
primary# ldm remove-vsw primary-vsw0
primary# ldm remove-vdsdev vdisk00@primary-vds0
primary# ldm rmove-vds primary-vds0
```

9.3.2 Dynamically Releasing the SR-IOV Virtual Function From a Logical Domain

The operation of dynamically releasing the SR-IOV virtual function from a logical domain must be performed from the control domain by executing the ldm command.

Before removing the SR-IOV virtual function, confirm that it is not being used by the logical domain. For details, see "3.2.19 Creating or Destroying the SR-IOV Virtual Function" the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

Figure 9-2 Releasing the Assignment of the SR-IOV Virtual Function

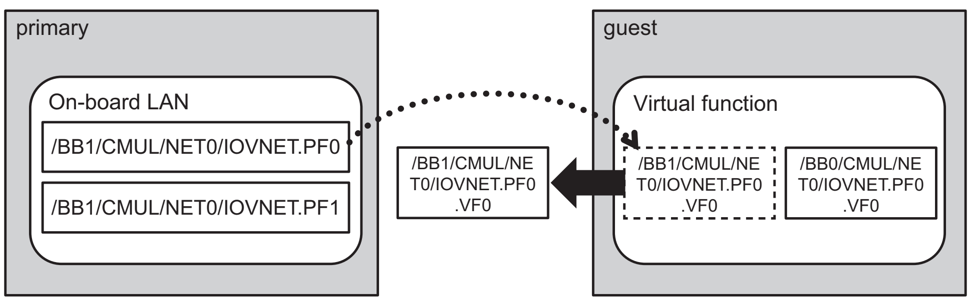


Table 9-3 lists the procedure for dynamically releasing the SR-IOV virtual function.

Table 9-3 Procedure for Dynamically Releasing the SR-IOV Virtual Function

Step	Operation Description	Execution Location	Command Used
1	Checking the assignment status of the SR-IOV virtual function	Control domain	primary# ldm list-io
2	Releasing the SR-IOV virtual function from a logical domain	Control domain	primary# ldm remove-io <*vf-name*> <*domain-name*>
3	Confirming that the SR-IOV virtual function was released from the logical domain	Control domain	primary# ldm list-io
4	Destroying the SR-IOV virtual function	Control domain	primary# ldm destroy-vf <*vf-name*>
5	Confirming that the SR-IOV virtual function was destroyed	Control domain	primary# ldm list-io

The following example executes the commands for removing the SR-IOV virtual function assigned to the logical domain guest, from the control domain or root domain.

1. **Check the assignment status of the SR-IOV virtual function to a logical domain.**
   In this example, the SR-IOV virtual function created on the SPARC M12-2S on-board LANs of BB-ID#00 and BB-ID#01 is assigned to the logical domain guest.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
----                                        ----   ---      ------    ------
         :
/BB1/CMUL/NET2/IOVNET.PF0                   PF     PCIE8    primary
/BB1/CMUL/NET2/IOVNET.PF1                   PF     PCIE8    primary
/BB0/CMUL/NET0/IOVNET.PF0.VF0               VF     PCIE0    guest
/BB1/CMUL/NET0/IOVNET.PF0.VF0               VF     PCIE8    guest
```

2. **Release the SR-IOV virtual function from the logical domain.**
   Release the SR-IOV virtual function created on the SPARC M12-2S on-board LAN of BB-ID#01, from the logical domain guest.

```
primary# ldm remove-io /BB1/CMUL/NET0/IOVNET.PF0.VF0 guest
```

3. **Confirm that the SR-IOV virtual function is not assigned.**
   Confirm that the SR-IOV virtual function created on the SPARC M12-2S on-board LAN of BB-ID#01 was released from the logical domain guest.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
----                                        ----   ---      ------    ------
         :
/BB1/CMUL/NET2/IOVNET.PF0                   PF     PCIE8    primary
/BB1/CMUL/NET2/IOVNET.PF1                   PF     PCIE8    primary
```

```
/BB0/CMUL/NET0/IOVNET.PF0.VF0                VF      PCIE0     guest
/BB1/CMUL/NET0/IOVNET.PF0.VF0                VF      PCIE8
```

4. **Destroy the SR-IOV virtual function.**
   Destroy the SR-IOV virtual function created on the SPARC M12-2S on-board LAN of BB-ID#01.

```
primary# ldm destroy-vf /BB1/CMUL/NET0/IOVNET.PF0.VF0
```

5. **Confirm that the SR-IOV virtual function was destroyed.**
   The SR-IOV virtual function created on the SPARC M12-2S on-board LAN of BB-ID#01 has now been deleted.

```
primary# ldm list-io
NAME                                         TYPE    BUS       DOMAIN     STATUS
----                                         ----    ---       ------     ------
          :
/BB1/CMUL/NET2/IOVNET.PF0                    PF      PCIE8     primary
/BB1/CMUL/NET2/IOVNET.PF1                    PF      PCIE8     primary
/BB0/CMUL/NET0/IOVNET.PF0.VF0                VF      PCIE0     guest
#
```

9.3.3 Dynamically Releasing the PCIe Endpoint From a Logical Domain

The operation of dynamically releasing the PCIe endpoint from a logical domain must be performed from the control domain.

Before removing the PCIe endpoint, confirm that it is not being used by the logical domain. For details, see the manual for the software being used.

Figure 9-3 Releasing the Assignment of a PCIe Endpoint

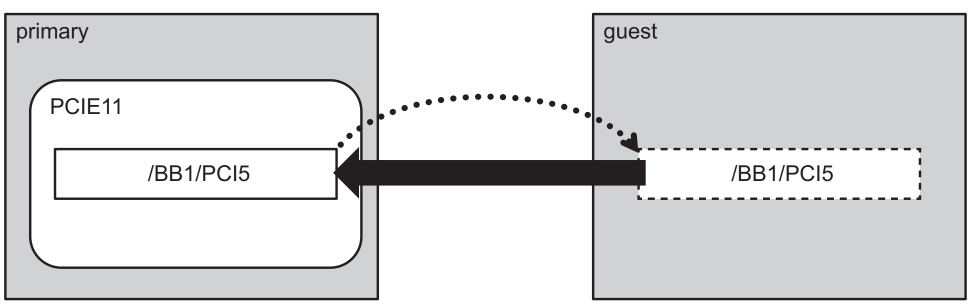


Table 9-4 lists the procedure for dynamically releasing a PCIe endpoint.

Table 9-4 Procedure for Dynamically Releasing a PCIe Endpoint

Step	Operation Description	Execution Location	Command Used
1	Checking the assignment status of PCIe endpoints	Control domain	primary# ldm list-io
2	Releasing the PCIe endpoint assigned to a logical domain	Control domain	primary# ldm remove-io <*device*> <*domain-name*>
3	Returning the PCIe endpoint to the control domain or root domain	Control domain	primary# ldm add-io <*device*> <*domain-name*>
4	Confirming that the PCIe endpoint has been returned to the control domain or root domain	Control domain	primary# ldm list-io

The following example executes the commands for releasing the PCIe endpoint from logical domain guest to allow the PCIe card to be replaced.

1. **Check the assignment status of PCIe endpoints to logical domains.**
   In this example, PCI slot #5 of the SPARC M12-2S of BB-ID#01 is assigned to the logical domain guest.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
----                                        ----   ---      ------    ------
         :
/BB1/PCI0                                   PCIE   PCIE9    primary   EMP
/BB1/PCI1                                   PCIE   PCIE15   primary   EMP
/BB1/PCI2                                   PCIE   PCIE8    primary   EMP
/BB1/PCI3                                   PCIE   PCIE14   primary   EMP
/BB1/PCI4                                   PCIE   PCIE13   primary   EMP
/BB1/PCI5                                   PCIE   PCIE11   guest     OCC
/BB1/PCI6                                   PCIE   PCIE12   primary   EMP
         :
```

2. **Release the PCIe endpoint from the logical domain.**
   Release PCI slot #5 of the SPARC M12-2S of BB-ID#01 from the logical domain guest.

```
primary# ldm remove-io /BB1/PCI5 guest
```

3. **Return the released PCIe endpoint to the control domain or root domain.**
   To remove a PCIe card or release a root complex by the PCI Hot Plug function, you need to return the PCIe endpoint to the control domain or the root domain beforehand.

   Return PCI slot #5 of the SPARC M12-2S of BB-ID#01 to the control domain.

```
primary# ldm add-io /BB1/PCI5 primary
```

4. **Confirm that the target PCIe endpoint has been returned to the control**

domain or root domain.
Confirm that PCI slot #5 of the SPARC M12-2S of BB-ID#01 has been returned to the control domain.

```
primary# ldm list-io
NAME                                         TYPE   BUS      DOMAIN    STATUS
----                                         ----   ---      ------    ------
         :
/BB1/PCI0                                    PCIE   PCIE9    primary   EMP
/BB1/PCI1                                    PCIE   PCIE15   primary   EMP
/BB1/PCI2                                    PCIE   PCIE8    primary   EMP
/BB1/PCI3                                    PCIE   PCIE14   primary   EMP
/BB1/PCI4                                    PCIE   PCIE13   primary   EMP
/BB1/PCI5                                    PCIE   PCIE11   primary   OCC
/BB1/PCI6                                    PCIE   PCIE12   primary   EMP
         :
```

9.3.4 Dynamically Releasing the Root Complex From a Logical Domain

The operation of dynamically releasing the root complex from a logical domain must be performed from the control domain.

Before releasing the root complex, confirm that none of the devices in it is being used by the logical domain. For details, see the manual for the software being used.

Figure 9-4 Releasing the Assignment of a Root Complex

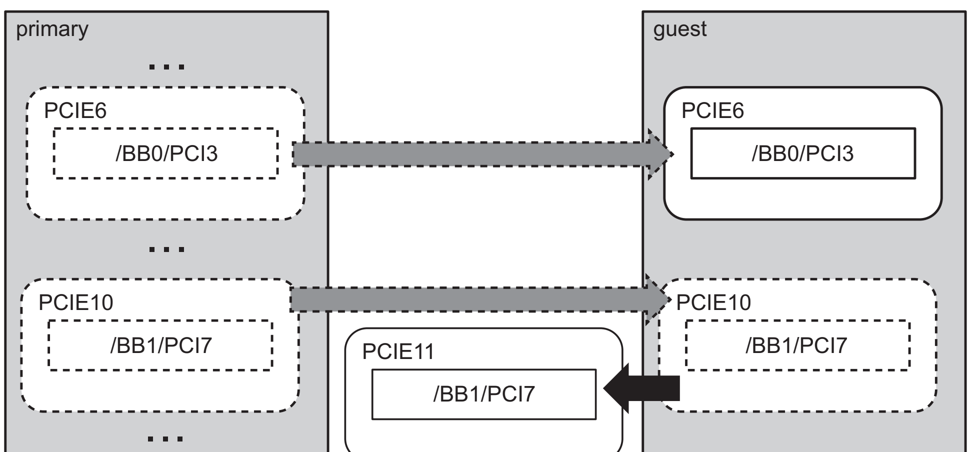


Table 9-5 lists the procedure for dynamically releasing a root complex.

Table 9-5 Procedure for Dynamically Releasing a Root Complex

Step	Operation Description	Execution Location	Command Used
1	Checking the assignment status of root complexes, in Oracle Solaris on the control domain	Control domain	primary# ldm list-io
2	Releasing the root complex assigned to a logical domain, in Oracle Solaris on the control domain	Control domain	primary# ldm remove-io *<bus>* *<domain-name>*
3	Confirming that the root complex was released from the logical domain, in Oracle Solaris on the control domain	Control domain	primary# ldm list-io

The following example executes the commands for releasing a root complex from the logical domain guest.

1. **Check the assignment status of root complexes to logical domains.**
   In this example, the root complex PCIE10 is assigned to the logical domain guest.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
----                                        ----   ---      ------    ------
PCIE0                                       BUS    PCIE0    primary   IOV
PCIE1                                       BUS    PCIE1    primary   IOV
PCIE2                                       BUS    PCIE2    primary   IOV
PCIE3                                       BUS    PCIE3    primary   IOV
PCIE4                                       BUS    PCIE4    primary   IOV
PCIE5                                       BUS    PCIE5    primary   IOV
PCIE6                                       BUS    PCIE6    guest     IOV
PCIE7                                       BUS    PCIE7    primary   IOV
PCIE8                                       BUS    PCIE8    primary   IOV
PCIE9                                       BUS    PCIE9    primary   IOV
PCIE10                                      BUS    PCIE10   guest     IOV
PCIE11                                      BUS    PCIE11   primary   IOV
         :
```

2. **Release the root complex from a logical domain.**
   Release the root complex PCIE10 from the logical domain guest.

```
primary# ldm remove-io PCIE10 guest
```

3. **Confirm that the root complex was released.**
   The root complex PCIE10 is not assigned to the logical domain.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
----                                        ----   ---      ------    ------
PCIE0                                       BUS    PCIE0    primary   IOV
PCIE1                                       BUS    PCIE1    primary   IOV
PCIE2                                       BUS    PCIE2    primary   IOV
```

```
PCIE3                                              BUS     PCIE3     primary    IOV
PCIE4                                              BUS     PCIE4     primary    IOV
PCIE5                                              BUS     PCIE5     primary    IOV
PCIE6                                              BUS     PCIE6     guest      IOV
PCIE7                                              BUS     PCIE7     primary    IOV
PCIE8                                              BUS     PCIE8     primary    IOV
PCIE9                                              BUS     PCIE9     primary    IOV
PCIE10                                             BUS     PCIE10
PCIE11                                             BUS     PCIE11    primary    IOV
          :
```

9.3.5 Statically Releasing the SR-IOV Virtual Function From a Logical Domain

The operation of statically releasing the SR-IOV virtual function from a logical domain must be performed from the control domain.

Before removing the SR-IOV virtual function, confirm that it is not being used by the logical domain. For details, see the manual for the software being used.

For information on how resources are moved when the assignment of the SR-IOV virtual function is statically released, see Figure 9-2.

Table 9-6 lists the procedure for statically releasing the SR-IOV virtual function.

Table 9-6 Procedure for Statically Releasing the SR-IOV Virtual Function

Step	Operation Description	Execution Location	Command Used
1	Checking the assignment status of the SR-IOV virtual function	Control domain	primary# ldm list-io
2	Stopping the logical domain to which the SR-IOV virtual function is assigned	Control domain	primary# ldm stop-domain <*domain-name*>
3	Releasing the SR-IOV virtual function from the logical domain	Control domain	primary# ldm remove-io <*vf-name*> <*d omain-name*>
4	Confirming that the SR-IOV virtual function was released from the logical domain	Control domain	primary# ldm list-io
5	Setting delayed reconfiguration for the control domain or root domain	Control domain	primary# ldm start-reconf <*domain-name*>
6	Destroying the SR-IOV virtual function	Control domain	primary# ldm destroy-vf <*vf-name*> or primary# ldm destroy-vf -n <*number*> | max <*pf-name*>
7	Restarting Oracle Solaris on the control domain or root domain	Control domain	**When delayed reconfiguration has been set for the control domain** primary# shutdown -i6 -g0 -y **When delayed reconfiguration has been set for the root domain** primary# ldm stop-domain -r <*domain-name*>
8	Confirming that the SR-IOV virtual function was deleted	Control domain	primary# ldm list-io

The following example executes the commands for releasing the SR-IOV virtual function assigned to the logical domain guest.

1. **Check the assignment status of the SR-IOV virtual function to a logical domain.**
   In this example, the SR-IOV virtual function created on the SPARC M12-2S on-board LAN of BB-ID#00 is assigned to the logical domain guest.

```
primary# ldm list-io
NAME                                         TYPE   BUS      DOMAIN    STATUS
         :
/BB0/CMUL/NET2/IOVNET.PF0.VF0                VF     PCIE4    guest
/BB0/CMUL/NET2/IOVNET.PF0.VF1                VF     PCIE4
```

2. **Stop the logical domain to which the SR-IOV function is assigned.**
   Stop the logical domain guest.

```
primary# ldm stop-domain guest
LDom guest stopped
```

3. **Release the SR-IOV virtual function from the logical domain.**
   Release the SR-IOV virtual function from the logical domain guest.

```
primary# ldm remove-io /BB0/CMUL/NET2/IOVNET.PF0.VF0 guest
```

4. **Confirm that the SR-IOV virtual function was released.**
   Confirm that the released SR-IOV virtual function is not assigned to the logical domain.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
         :
/BB0/CMUL/NET2/IOVNET.PF0.VF0               VF     PCIE4
/BB0/CMUL/NET2/IOVNET.PF0.VF1               VF     PCIE4
```

5. **Set delayed reconfiguration for the control domain or root domain.**
   In this example, delayed reconfiguration is set for the control domain.

```
primary# ldm start-reconf primary
Initiating a delayed reconfiguration operation on the primary domain.
All configuration changes for other domains are disabled until the primary
domain reboots, at which time the new configuration for the primary domain
will also take effect.
```

6. **Destroy the SR-IOV virtual function.**

```
primary# ldm destroy-vf -n 2 /BB0/CMUL/NET2/IOVNET.PF0
------------------------------------------------------------------------------
Notice: The primary domain is in the process of a delayed reconfiguration.
Any changes made to the primary domain will only take effect after it reboots.
------------------------------------------------------------------------------
```

7. **Restart Oracle Solaris on the control domain or root domain.**

```
primary# shutdown -i6 -g0 -y
```

8. **Confirm that the SR-IOV virtual function was destroyed.**

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
         :
/BB1/CMUL/NET2/IOVNET.PF0                   PF     PCIE8    primary
/BB1/CMUL/NET2/IOVNET.PF1                   PF     PCIE8    primary
#
```

9.3.6 Statically Releasing the PCIe Endpoint From a Logical Domain

The operation of statically releasing the PCIe endpoint from a logical domain must be performed from the control domain.

Before removing the PCIe endpoint, confirm that it is not being used by the logical domain. For details, see the manual for the software being used.

For information on how resources are moved when the assignment of the PCIe endpoint is statically released, see Figure 9-3.

Table 9-7 lists the procedure for statically releasing a PCIe endpoint.

Table 9-7 Procedure for Statically Releasing a PCIe Endpoint

Step	Operation Description	Execution Location	Command Used
1	Checking the assignment status of PCIe endpoints	Control domain	primary# ldm list-io
2	Stopping the I/O domain assigned the PCIe endpoint to be released	Control domain	primary# ldm stop-domain <*domain-name*>
3	Releasing the PCIe endpoint assigned to the I/O domain	Control domain	primary# ldm remove-io <*device*> <*domain-name*>
4	Setting delayed reconfiguration for the control domain or root domain	Control domain	primary# ldm start-reconf <*domain-name*>
5	Assigning the released PCIe endpoint to the control domain or root domain	Control domain	primary# ldm add-io <*device*> <*domain-name*>
6	Restarting Oracle Solaris on the domain (control domain or root domain) that is set for delayed reconfiguration	Control domain	**When delayed reconfiguration has been set for the control domain** primary# shutdown -i6 -g0 -y **When delayed reconfiguration has been set for the root domain** primary# ldm stop-domain -r <*domain-name*>
7	Confirming that the PCIe endpoint was released from the I/O domain	Control domain	primary# ldm list-io

The following example executes the commands for releasing the PCIe endpoint assigned to the logical domain io-domain.

1. **Check the assignment status of PCIe endpoints to logical domains.**
   In this example, PCI slot #5 of the SPARC M12-2S of BB-ID#01 is assigned to the logical domain guest.

```
primary# ldm list-io
NAME                                          TYPE   BUS      DOMAIN    STATUS
----                                          ----   ---      ------    ------
        :
/BB1/PCI4                                     PCIE   PCIE13   primary   EMP
/BB1/PCI5                                     PCIE   PCIE11   guest     OCC
```

```
/BB1/PCI6                                    PCIE   PCIE12   primary   EMP
        :
```

2. **Stop the I/O domain assigned the PCIe endpoint to be released.**
   Stop the I/O domain guest.

```
primary# ldm stop-domain guest
LDom guest stopped
```

3. **Release the PCIe endpoint from the I/O domain.**
   Release PCI slot #5 of the SPARC M10-2S of BB-ID#01 from the I/O domain guest.

```
primary# ldm remove-io /BB1/PCI5 guest
```

4. **Set delayed reconfiguration for the control domain or root domain.**
   In this example, delayed reconfiguration is set for the control domain.

```
primary# ldm start-reconf primary
Initiating a delayed reconfiguration operation on the primary domain.
All configuration changes for other domains are disabled until the primary
domain reboots, at which time the new configuration for the primary domain
will also take effect.
```

5. **Assign the released PCIe endpoint to the control domain or root domain.**
   Assign PCI slot #5 of the SPARC M12-2S of BB-ID#01 to the control domain.

```
primary# ldm add-io /BB1/PCI5 primary
```

6. **Restart Oracle Solaris on the control domain or root domain (the one set for delayed reconfiguration in step 4).**

```
primary# shutdown -i6 -g0 -y
```

7. **Confirm that the PCIe endpoint was released from the I/O domain.**
   Confirm that PCI slot #5 of the SPARC M12-2S of BB-ID#01 has been assigned to the control domain.

```
primary# ldm list-io
NAME                                         TYPE   BUS      DOMAIN    STATUS
----                                         ----   ---      ------    ------
         :
/BB1/PCI4                                    PCIE   PCIE13   primary   EMP
/BB1/PCI5                                    PCIE   PCIE11   primary   OCC
/BB1/PCI6                                    PCIE   PCIE12   primary   EMP
         :
```

9.3.7 Statically Releasing the Root Complex From a Logical Domain

The operation of statically releasing the root complex from a logical domain must be performed from the control domain.

Before releasing the root complex, confirm that none of the devices in it is being used by the logical domain. For details, see the manual for the software being used.

For information on how resources are moved when the assignment of the root complex is statically released, see Figure 9-4.

Table 9-8 lists the procedure for statically releasing a root complex.

Table 9-8 Procedure for Statically Releasing a Root Complex

Step	Operation Description	Execution Location	Command Used
1	Checking the assignment status of root complexes	Control domain	primary# ldm list-io
2	Setting delayed reconfiguration for the control domain or root domain releasing the root complex	Control domain	primary# ldm start-reconf <*domain-name*>
3	Releasing the root complex from the control domain or root domain	Control domain	primary# ldm remove-io <*bus*> <*domain-name*>
4	Restarting Oracle Solaris on the control domain or root domain	Control domain	**When delayed reconfiguration has been set for the control domain** primary# shutdown -i6 -g0 -y **When delayed reconfiguration has been set for the root domain** primary# ldm stop-domain -r <*domain-name*>
5	Confirming that the root complex was released from the logical domain	Control domain	primary# ldm list-io

The following example executes the commands for releasing the root complex from the logical domain guest.

1. **Check the assignment status of root complexes to logical domains.**
   In this example, the root complex PCIE10 is assigned to the logical domain guest.

```
primary# ldm list-io
NAME                                         TYPE   BUS      DOMAIN    STATUS
----                                         ----   ---      ------    ------
      :
PCIE9                                        BUS    PCIE9    primary   IOV
PCIE10                                       BUS    PCIE10   guest     IOV
PCIE11                                       BUS    PCIE11   primary   IOV
      :
```

2. **Set delayed reconfiguration for the control domain or root domain releasing**

the root complex.
In this example, delayed reconfiguration is set for the root domain guest.

```
primary# ldm start-reconf guest
Initiating a delayed reconfiguration operation on the ldom domain.
All configuration changes for other domains are disabled until the ldom
domain reboots, at which time the new configuration for the ldom domain
will also take effect.
```

3. **Release the root complex from the control domain or root domain.**
Release the assignment of the root complex PCIE10 from the root domain guest.

```
primary# ldm remove-io PCIE10 guest
-------------------------------------------------------------------------------
Notice: The ldom domain is in the process of a delayed reconfiguration.
Any changes made to the ldom domain will only take effect after it reboots.
-------------------------------------------------------------------------------
```

4. **Restart Oracle Solaris on the control domain or root domain that is set for delayed reconfiguration.**
In this example, Oracle Solaris on the root domain guest is restarted.

```
primary# ldm stop-domain -r guest
-------------------------------------------------------------------------------
Notice: The ldom domain is in the process of a delayed reconfiguration.
Any changes made to the ldom domain will only take effect after it reboots.
-------------------------------------------------------------------------------
Reboot request sent to ldom
```

5. **Confirm that the root complex was released from the logical domain.**
Confirm that the root complex PCIE10 was released from guest.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
----                                        ----   ---      ------    ------
        :
PCIE8                                       BUS    PCIE8    primary   IOV
PCIE9                                       BUS    PCIE9    primary   IOV
PCIE10                                      BUS    PCIE10
PCIE11                                      BUS    PCIE11   primary   IOV
        :
```

9.4 Enabling the Removal of Hardware

This section describes the procedure for releasing an I/O device from the Oracle Solaris device configuration and enabling the removal of the I/O device from the SPARC M12 while Oracle Solaris is operating.

For details on the cfgadm command used here, see "Dynamically Configuring Devices" in the *Managing Devices in Oracle Solaris* for the Oracle Solaris version used.

When using the cfgadm command, log in to Oracle Solaris with administrative authority on the control domain or root domain. When using the PCI Hot Plug function, confirm that the hotplug service of Oracle Solaris is enabled.

Note - When using the PCI Hot Plug function, confirm that the target PCIe card supports the PCI Hot Plug function. For details, see "Appendix B Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu SPARC M12 PCI Card Installation Guide*.

9.4.1 Dynamically Releasing a PCIe Card From a Logical Domain

This section describes the procedure for enabling the removal of a PCIe card from the SPARC M12 by using the PCI Hot Plug function.

When using the PCI Hot Plug function for a PCIe card mounted in the PCI expansion unit, confirm that the direct I/O function is disabled for the PCI slot that houses the target PCIe card. For details on the direct I/O function for the PCI expansion unit, see "Chapter 15 Expanding the System Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Table 9-9 lists the procedure for dynamically releasing a PCIe card.

Table 9-9 Procedure for Dynamically Releasing a PCIe Card

Step	Operation Description	Execution Location	Command Used
1	Checking the mounting location of the target PCIe card (Ap_Id)	Control domain Root domain	# cfgadm -a
2	Releasing the target PCIe card from the Oracle Solaris device configuration	Control domain Root domain	# cfgadm -c unconfigure <*Ap_Id*>
3	Powering off the PCIe card slot that houses the PCIe card released from the device configuration	Control domain Root domain	# cfgadm -c disconnect <*Ap_Id*>
4	Confirming that you can remove the target PCIe card	Control domain Root domain	# cfgadm -a
5 (*1)	Having the ATTENTION LED (amber) of the PCIe card slot housing the target PCIe card blink	Control domain Root domain	# cfgadm -x led=attn,mode=blink <*Ap_Id*>
6 (*2)	Turning off the ATTENTION LED on the PCIe card slot by mounting the PCICS from which the PCIe card was removed	Control domain Root domain	# cfadm -x led=attn,mode=off <*Ap_Id*>

*1 Before removing the PCICS from the PCI slot, check the PCIe card slot to see that the POWER LED is off and that the ATTENTION LED (amber) is blinking.
*2 When replacing a PCIe card, incorporate the PCIe card into the Oracle Solaris device configuration and then turn off the ATTENTION LED. For details, see "Dynamically Configuring Devices" in the *Managing Devices in Oracle Solaris* for the Oracle Solaris version used, and the man page of the cfgadm_pci command.

Note - For the locations of the LEDs on PCIe card slots, see "PCIe card slot" in "2.4.3 LEDs of Each Unit."

The following example executes the commands for enabling the removal of the PCIe card mounted in PCI slot #0 of the SPARC M12 by using the PCI Hot Plug function.

1. **Check the status of the PCIe card to be removed.**
   The following example confirms that the PCIe card to be removed using the control domain is incorporated in the Oracle Solaris device configuration.

```
primary# cfgadm -a
Ap_Id          Type           Receptable     Occupant       Condition
BB#0-PCI#0     pci-pci/hp     connected      configured     ok
         :
```

2. **Release the target PCIe card from the Oracle Solaris device configuration.**
   The following example releases the PCIe card mounted in PCI slot #0 from the Oracle Solaris device configuration by using the control domain.

```
primary# cfgadm -c unconfigure BB#0-PCI#0
```

3. **Power off the PCIe card released from the Oracle Solaris device configuration.**
   The following example powers off the PCIe card mounted in PCI slot #0 by using

the control domain.

```
primary# cfgadm -c disconnect BB#0-PCI#0
```

4. **Confirm that you can remove the PCIe card.**
   The following example confirms that the PCIe card mounted in PCI slot #0 was released from the Oracle Solaris device configuration and powered off by using the control domain.

```
primary# cfgadm -a
Ap_Id          Type          Receptable    Occupant      Condition
BB#0-PCI#0     unknown       disconnected  unconfigured  unknown
         :
```

5. **Have the ATTENTION LED (amber) of the PCIe card slot housing the PCIe card to be removed blink.**
   The following example turns off the POWER LED on the PCIe card slot and blinks the ATTENTION LED (amber) before removing the PCIe card by using the control domain. Before removing the PCIe card, check the LEDs on that card.

```
primary# cfgadm -x led=attn,mode=blink BB#0-PCI#0
```

9.4.2 Dynamically Releasing the HDD/SSD From a Logical Domain

This section describes the procedure for enabling the removal of an HDD/SSD from the SPARC M12 by using the PCI Hot Plug function.

To remove an HDD/SSD composing the RAID volumes using the hardware RAID function of the SPARC M12, this procedure is not required.

Note - When the target HDD/SSD has a RAID volume configuration generated by software, you need to enable the release of the HDD/SSD from the Oracle Solaris device configuration. Before releasing the HDD/SSD from the Oracle Solaris device configuration, be sure to see the manual for the software or application being used.

Table 9-10 lists the procedure for dynamically releasing an HDD/SSD.

Table 9-10 Procedure for Dynamically Releasing an HDD/SSD From Oracle Solaris

Step	Operation Description	Execution Location	Command Used
1 (*1)	Checking the device path of the target HDD/SSD	primary domain Root domain	**Oracle Solaris 11** # diskinfo **Oracle Solaris 10** (*2) # diskinfo -ap
2 (*1)	Checking the BB-ID of the SPARC M12-2S that houses the target HDD/SSD	XSCF shell	**Oracle Solaris 11** XSCF> showhardconf **Oracle Solaris 10** XSCF> showboards -a
3	Checking the mounting location of the target HDD/SSD (Ap_Id)	primary domain Root domain	# cfgadm -al
4	Releasing the target HDD/SSD from the Oracle Solaris device configuration	primary domain Root domain	# cfgadm -c unconfigure <*Ap_Id*>
5	Confirming that you can remove the target HDD/SSD	primary domain Root domain	# cfgadm -al
6	Having the CHECK LED (amber) of the HDD/SSD released from the Oracle Solaris device configuration blink (*3) (*4)	primary domain Root domain	# cfgadm -x led=fault,mode=blink <*Ap_Id*>
7 (*5)	Turning off the CHECK LED	primary domain Root domain	# cfgadm -x led=fault,mode=off <*Ap_Id*>

*1 When using only one SPARC M12-2 or SPARC M12-2S, skip this operation.
*2 Check the device path of the target HDD/SSD and the LSB number of the SPARC M12-2S that houses the HDD/SSD, according to "Appendix A Lists of SPARC M12/M10 System Device Paths" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.
*3 Before removing the HDD/SSD, confirm that the CHECK LED (amber) is blinking.
*4 When removing a hard disk, pull it out slightly from its slot, wait for 10 seconds, and then remove it from the slot.
*5 When replacing the HDD/SSD, incorporate it into the Oracle Solaris device configuration and then turn off the CHECK LED. For details, see Table 2-22.

The following example executes the commands for enabling the removal of an HDD/SSD by using the PCI Hot Plug function.

Confirming the HDD/SSD to be released

[Oracle Solaris 11 with SRU 11.4.27.82.1 or later applied]

1. **Use the diskinfo command to check the device pathname and BB-ID.**

```
# diskinfo
       D:devchassis-path              c:occupant-compdev
       ------------------------------  ---------------------
       /dev/chassis/SYS/BB0/HDD0      -
       /dev/chassis/SYS/BB0/HDD1      -
       /dev/chassis/SYS/BB0/HDD2      -
       /dev/chassis/SYS/BB0/HDD3      -
       /dev/chassis/SYS/BB0/HDD4/disk  c5t50000393D82954D6d0
       /dev/chassis/SYS/BB0/HDD5      -
       /dev/chassis/SYS/BB0/HDD6      -
       /dev/chassis/SYS/BB0/HDD7/disk  c5t50000393B81B2446d0
```

[Oracle Solaris 11 without SRU 11.4.27.82.1 or later applied]

1. **Check the device path of the target HDD/SSD. (Take this step only for a building block configuration connecting two or more SPARC M12-2S units.)**
   The following example assumes that the user logs in to Oracle Solaris on the control domain and identifies the device path from the logical device name of the HDD/SSD. Write down the character string (three or four characters) in the "****" part of ".../****_HDDxx/..." contained in the identified device path.

```
primary# diskinfo
D:devchassis-path                                         c:occupant-compdev
--------------------------------------------------------- ------------------
/dev/chassis/SYS/BB0/CMUL/HDD0                            -
/dev/chassis/SYS/BB0/CMUL/HDD1                            -
         :
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/04GG_HDD00/disk
c4t50000394281B5312d0
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/04GG_HDD01/disk
c4t50000394281B59D6d0
         :
```

2. **Check the BB-ID of the SPARC M12-2S that houses the target HDD/SSD. (Take this step only for a building block configuration connecting two or more SPARC M12-2S units.)**
   The following example assumes that the user logs in to the XSCF shell and checks for a SPARC M12-2S BB-ID where the character string written down in step 1 matches the last four digits of the CMUL serial number. If the character string written down in step 1 consists of three characters, add "0" at the beginning of the character string to make it four characters long for matching purposes.

```
XSCF> showhardconf
         :
    BB#00 Status:Normal; Role:Master; Ver:3015h; Serial:PZ51649002;
        + FRU-Part-Number:CA20369-B17X 005AC/7341758              ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:2101h; Serial:PP164804GG  ;
         :
    BB#01 Status:Normal; Role:Standby; Ver:2290h; Serial:2081236002;
        + FRU-Part-Number:CA07361-D202 A0   /NOT-FIXD-P2          ;
        + Power_Supply_System: ;
        + Memory_Size:128 GB;
        CMUL Status:Normal; Ver:0101h; Serial:PP1231043X  ;
         :
```

[Oracle Solaris 10]

1. **Check the LSB number of the SPARC M12-2S that houses the target HDD/SSD. (Take this step only for a building block configuration connecting two or more SPARC M12-2S units.)**
   The following example assumes that the user logs in to Oracle Solaris on the control domain and checks the LSB number of the SPARC M12-2S that houses

the HDD/SSD based on the device path identified from the logical device name of the HDD/SSD. For details on device paths, see "Appendix A Lists of SPARC M12/M10 System Device Paths" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

```
primary# diskinfo -ap
         :
Label     Disk name                Vendor    Product         Vers
--------  ----------------------  --------  --------------  ----
HDD_0     c0t50000393D8289180d0    TOSHIBA   MBF2600RC       3706
  Physical path
  --------------------------------
  0: /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000393D8289180,0
         :
```

2. **Check the BB-ID of the SPARC M12-2S that houses the target HDD/SSD. (Take this step only for a building block configuration connecting two or more SPARC M12-2S units.)**
   The following example assumes that the user logs in to the XSCF shell and checks the BB-ID of the SPARC M12-2S from the LSB number identified in step 1.

```
XSCF> showboards -a
PSB     PPAR-ID(LSB)  Assignment   Pwr   Conn  Conf  Test     Fault
----    ------------  -----------  ----  ----  ----  -------  --------
00-0    00(00)        Assigned     y     y     y     Passed   Normal
01-0    00(01)        Assigned     y     y     y     Passed   Normal
```

Releasing the HDD/SSD from the Oracle Solaris device configuration

3. **Check the mounting location of the target HDD/SSD (Ap_Id).**
   The following example checks the Ap_Id, including the logical device name of the target HDD/SSD, from Oracle Solaris on the control domain.

```
primary# cfgadm -al
Ap_Id                           Type      Receptacle  Occupant      Condition
         :
c2                              scsi-sas  connected   configured    unknown
c2::dsk/c2t50000394281B59D6d0   disk      connected   configured    unknown
c2::es/ses0                     ESI       connected   configured    unknown
c2::smp/expd0                   smp       connected   configured    unknown
c3                              scsi-sas  connected   unconfigured  unknown
c4                              scsi-sas  connected   unconfigured  unknown
c5                              fc        connected   unconfigured  unknown
c6                              fc        connected   unconfigured  unknown
c7                              scsi-sas  connected   unconfigured  unknown
         :
```

4. **Release the HDD/SSD from the Oracle Solaris device configuration.**

The following example assumes that the user logs in to Oracle Solaris on the control domain and releases the HDD/SSD from the Oracle Solaris device configuration by using the Ap_Id checked in step 3.

```
primary# cfgadm -c unconfigure c2::dsk/c2t50000394281B59D6d0
```

5. **Confirm that you can remove the HDD/SSD.**
   The following example assumes that the user logs in to Oracle Solaris on the control domain and confirms that the HDD/SSD has been released from the Oracle Solaris device configuration.

```
primary# cfgadm -al
Ap_Id                          Type      Receptacle  Occupant      Condition
         :
c2                             scsi-sas  connected   configured    unknown
c2::dsk/c2t50000394281B59D6d0  disk      connected   unconfigured  unknown
c2::es/ses0                    ESI       connected   configured    unknown
c2::smp/expd0                  smp       connected   configured    unknown
c3                             scsi-sas  connected   unconfigured  unknown
c4                             scsi-sas  connected   unconfigured  unknown
c5                             fc        connected   unconfigured  unknown
c6                             fc        connected   unconfigured  unknown
c7                             scsi-sas  connected   unconfigured  unknown
         :
```

6. **Have the CHECK LED (amber) of the HDD/SSD to be removed blink.**
   The following example assumes that the user logs in to Oracle Solaris on the control domain, causing the CHECK LED (amber) of the HDD/SSD to blink. Check the LEDs on the HDD/SSD, and then remove it. When removing a hard disk, pull it out slightly from its slot, wait for 10 seconds, and then remove it.

```
primary# cfgadm -x led=fault,mode=blink c2::dsk/c2t50000394281B59D6d0
```

9.4.3 Dynamically Releasing the SPARC M12-2S From the Physical Partition

PPAR DR can be used in a building block configuration connecting two or more SPARC M12-2S units to a physical partition. By using PPAR DR, you can release the SPARC M12-2S from the physical partition without stopping Oracle Solaris on the logical domain.

This section describes the procedure for releasing the SPARC M12-2S by using PPAR DR in a building block configuration connecting two or more SPARC M12-2S units.

Note - The precautions for PPAR DR may vary depending on the versions of the XSCF firmware, Oracle Solaris, and Oracle VM for SPARC used and the version of the SRU applied. Before using PPAR DR, be sure to see the latest version of *Fujitsu SPARC M12 Product Notes*.

Note - To use PPAR DR, you need to configure the system with guaranteed availability according to "2.5 Dynamic Reconfiguration Conditions and Settings" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

Note - The procedure described in this section assumes that -m unbind=resource is not used in the deleteboard command. In this case, before executing the deleteboard command, you need to remove resources assigned to logical domains, in addition to removing physical I/O devices, to ensure that enough BBs will be left for the number of CPUs and the memory size. For details, see "2.5.2 Considerations in System Operation for Dynamic Reconfiguration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

Table 9-11 lists the procedure for dynamically releasing the SPARC M12-2S from the physical partition.

Table 9-11 Procedure for Dynamically Releasing the SPARC M12-2S From the Physical Partition

Step	Operation Description	Execution Location	Command Used
1	Checking the physical partition configuration and the operation status of the target SPARC M12-2S	XSCF shell	XSCF> showpcl -a XSCF> showboards -p <*ppar_id*>
2	Logging in to the XSCF shell and confirming that the XSCF of the target SPARC M12-2S is in the standby state or is the slave XSCF. (*1)	XSCF shell	XSCF> showhardconf
3	Checking the operation status of logical domains	primary domain	primary# ldm list-domain
4	Checking the connected virtual services in the control domain	primary domain	primary# ldm list-services
5	Checking the mounting locations of the physical LAN ports	Service domain	# dladm show-phys -L
6	Checking the virtual services and hardware resources assigned to logical domains	primary domain	primary# ldm list-bindings <*domain-name*> primary# ldm list-socket
7	Checking the assignment status of I/O devices from the control domain in the physical partition to which the target SPARC M12-2S belongs	primary domain	primary# ldm list-io
8	Releasing the assignment of I/O devices of the target SPARC M12-2S from the control domain in the physical partition to which the target SPARC M12-2S belongs	primary domain	**When releasing a virtual disk** primary# ldm remove-vdisk <*disk-name*> <*domain-name*> **When releasing a virtual network** primary# ldm remove-vnet <*if-name*> <*domain-name*> primary# ldm remove-vsw <*vswitch-name*> **When releasing an I/O device** primary# ldm remove-io <*bus/device/vf-name*> <*domain-name*>
9	Confirming that the I/O devices are not assigned to logical domains, from the control domain in the physical partition to which the target SPARC M12-2S belongs	primary domain	primary# ldm list-io
10	Using the XSCF shell to release the target SPARC M12-2S from the physical partition	XSCF shell	**For maintenance on the target SPARC M12-2S** XSCF> deleteboard -c disconnect <*psb*> **For changing the physical partition configuration** XSCF> deleteboard -c unassign <*psb*>
11	Checking the release process end status from the XSCF shell	XSCF shell	XSCF> showresult
12	Checking the status of the released SPARC M12-2S from the XSCF shell	XSCF shell	XSCF> showboards -va

*1 If the XSCF of the SPARC M12-2S to be released is the master XSCF, switch it to the standby state with the switchscf command. For details, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XCP version used.

The following example executes the commands for releasing BB#01 in the 2BB configuration. To restore the system after maintenance on the SPARC M12-2S, write down the status checked in steps 1 to 7.

First, log in to the XSCF shell, and check the hardware configuration information for the SPARC M12-2S to be released.

1. **Check the PSB configuration and operation status of the physical partition.**
   The following example assumes that the user logs in to the master XSCF, checks the PSB configuration, LSB number, and operation status of PPAR ID#00, and then checks the operation status of the PSB. Here, it is assumed that BB#01 (PSB#01-0) will be released.

```
XSCF> showpcl -p 0
PPAR-ID  LSB   PSB    Status
00                    Running (*1)
         00    00-0 (*2)
         01    01-0 (*3)

XSCF> showboards -p 0
PSB  PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
---- ------------ ----------- ---- ---- ---- ------- --------
00-0 00(00)       Assigned    y    y    y    Passed  Normal (*3)
01-0 00(01)       Assigned    y    y    y    Passed  Normal (*3)
```

*1 PPAR ID#00 is running.
*2 LSB#00 is defined for PSB#00-0 of PPAR ID#00, and LSB#01 is defined for PSB#01-0.
*3 PSB#00-0 and PSB#01-0 are assigned to PPAR ID#00, and both are running.

2. **Check the status of the XSCF of the SPARC M12-2S to be released.**
   The following example assumes that the user logs in to the master XSCF and confirms that the XSCF of the SPARC M12-2S to be released is in the standby state or is the slave XSCF.

```
XSCF> showhardconf
SPARC M12-2S;
    + Serial:PZ51652009; Operator_Panel_Switch:Locked;
    + System_Power:On; System_Phase:Cabinet Power On;
    Partition#0 PPAR_Status:Running;
    BB#00 Status:Normal; Role:Master; Ver:4016h; Serial:PZ51652009;
        + FRU-Part-Number:CA20369-B17X 005AC/9999999              ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
         :
    BB#01 Status:Normal; Role:Standby; Ver:4016h; Serial:PZ51651016; (*1)
        + FRU-Part-Number:CA20369-B17X 005AC/9999999              ;
        + Power_Supply_System: ;
        + Memory_Size:1024 GB;
         :
```

*1 The XSCF of BB#01 is in the standby state.

Next, log in to Oracle Solaris on the control domain in the physical partition containing the SPARC M12-2S to be released. Then, check the operation status of logical domains and the assignment status of resources.

3. **Check the operation status of the logical domains defined in PPAR ID#00.**
   The following example assumes that the user logs in to Oracle Solaris on the control domain and checks the defined logical domains and operation status.

```
primary# ldm list-domain
NAME             STATE      FLAGS   CONS    VCPU  MEMORY    UTIL  NORM  UPTIME
primary          active     -n-cv-  UART    32    16G       1.3%  1.3%  7d 17h
26m (*1)
guest            active     -n----  5000    32    16G       0.0%  0.0%  7d 16h
(*2)
ldom             active     -n----  5001    32    32G       0.0%  0.0%  7d 14h
17m (*3)
```

4. **Check the list of the set virtual services for the control domain.**
   - Virtual console service: The port numbers that the guest domain can use for primary-vcc0 for the virtual console service range from 5000 to 5100.
   - Virtual switch: Physical LAN ports net0 and net4 are assigned to virtual switches primary-vsw0 and primary-vsw4, respectively.
   - Virtual disk service: vdisk00, vdisk01, vdisk10, vdisk11, and vol_iso are assigned to primary-vds0 for the virtual disk service.

```
primary# ldm list-services
VCC
    NAME             LDOM             PORT-RANGE
    primary-vcc0     primary          5000-5100
VSW
  NAME             LDOM      MAC                  NET-DEV     ID        DEVICE
           LINKPROP
  DEFAULT-VLAN-ID  PVID      VID                  MTU         MODE
INTER-VNET-LINK
  primary-vsw0     primary   00:14:4f:fb:e1:a8    net0        0
switch@0
  1                1                              1500        on
  primary-vsw4     primary   00:14:4f:f8:42:2f    net4        1
switch@1
  1                1                              1500        on
VDS
  NAME           LDOM     VOLUME    OPTIONS  MPGROUP  DEVICE
  primary-vds0   primary  vdisk00                     /dev/zvol/dsk/rpool/
export/ovm/vdisk00
                          vdisk01                     /dev/zvol/dsk/rpool/
export/ovm/vdisk01
                          vol_iso   ro                /export/ovm/sol11u3_
iso/sol-11_3-text-sparc.iso
                          vdisk10                     /dev/zvol/dsk/rpool/
```

```
export/ovm/vdisk10
                           vdisk11                    /dev/zvol/dsk/rpool/
export/ovm/vdisk11
```

5. **Check the mounting locations of the physical LAN ports.**
   This example checks in advance that Oracle Solaris on the control domain does not use net4 to net7, to release BB#01 using PPAR DR.

Physical LAN Port	Mounting Location
net0 to net3	BB#00 on-board LAN
net4 to net7	BB#01 on-board LAN

```
primary# dladm show-phys -L
LINK              DEVICE       LOC
net0              ixgbe0       /BB0/CMUL
net1              ixgbe1       /BB0/CMUL
net2              ixgbe2       /BB0/CMUU
net3              ixgbe3       /BB0/CMUU
net4              ixgbe4       /BB1/CMUL
net5              ixgbe5       /BB1/CMUL
net6              ixgbe6       /BB1/CMUL
net7              ixgbe7       /BB1/CMUL
          :
```

6. **Check the resources assigned to the logical domain guest and the logical domain ldom.**
   The virtual network devices vnet0 and vnet1 are assigned to the logical domain guest. From the results of steps 4 to 6, you can also see that vnet0 uses the physical LAN port net0 of BB#00 and vnet1 uses the physical LAN port net4 of BB#01. In this example, the assignment of vnet1 is released from the logical domain guest beforehand in order to use the physical partition dynamic reconfiguration (PPAR DR) function to release BB#01.

   From the assigned I/O resources, you can see that the logical domain ldom is the root domain configured by the root complexes of BB#00 and BB#01. In this example, the assignment of PCIE10 (pci@8a00) is released from the logical domain ldom beforehand in order to use the physical partition dynamic reconfiguration (PPAR DR) function to release BB#01.

```
primary# ldm list-bindings guest
          :
NETWORK
  NAME   SERVICE                ID   DEVICE       MAC                MODE    PVID
     VID    MTU
  MAXBW  LINKPROP
  vnet0  primary-vsw0@primary   0    network@0    00:14:4f:f9:58:4e          1
            1500
     PEER                   MAC                   MODE  PVID   VID   MTU   MAXBW
   LINKPROP
```

```
    primary-vsw0@primary   00:14:4f:fb:e1:a8       1             1500
  NAME   SERVICE               ID  DEVICE      MAC                MODE    PVID
     VID    MTU
  MAXBW  LINKPROP
  vnet1  primary-vsw4@primary  1   network@1   00:14:4f:fb:4d:fe         1
     1500
     PEER                   MAC                MODE  PVID   VID   MTU   MAXBW
   LINKPROP
     primary-vsw4@primary   00:14:4f:f8:42:2f       1      1500
DISK
  NAME     VOLUME                   TOUT  ID  DEVICE   SERVER    MPGROUP
  vdisk00  vdisk00@primary-vds0           0   disk@0   primary
         :

primary# ldm list-bindings ldom
         :
IO
 DEVICE                          PSEUDONYM OPTIONS
 pci@8600                        PCIE6
 pci@8a00                        PCIE10
 pci@8600/pci@4/pci@0/pci@9      /BB0/PCI5
 pci@8600/pci@4/pci@0/pci@11     /BB0/PCI6
 pci@8a00/pci@4/pci@0/pci@0      /BB1/PCI3
 pci@8a00/pci@4/pci@0/pci@8      /BB1/PCI4
 pci@8a00/pci@4/pci@0/pci@9      /BB1/PCI5
 pci@8a00/pci@4/pci@0/pci@11     /BB1/PCI6
DISK
  NAME     VOLUME                   TOUT  ID  DEVICE   SERVER    MPGROUP
  vdisk10  vdisk10@primary-vds0           0   disk@0   primary
  vdisk11  vdisk11@primary-vds0           1   disk@1   primary
  vol_iso  vol_iso@primary-vds0           2   disk@2   primary
         :
```

Check whether CPU socket constraints are used.

The CPU socket constraint settings are not restored even if addboard -m bind=resource is executed. Therefore, you need to set the constraints again by using the ldm command after executing addboard.

```
# ldm list-socket
CONSTRAINTS
    DOMAIN                      SOCKET_ID                          STATE
    primary                     0, 2                               active
...
```

CPU socket constraints are used if the domain information is output below CONSTRAINTS.

7. **Check the assignment status of I/O devices.**
   Check I/O devices and assigned logical domain names. In this example, the I/O devices of BB#01 were not assigned to the logical domain beforehand to use the physical partition dynamic reconfiguration (PPAR DR) function to release BB#01.

```
# ldm list-io
NAME                          TYPE         BUS        DOMAIN        STATUS
----                          ----         ---        ------        ------
PCIE0                         BUS          PCIE0      primary       IOV
PCIE1                         BUS          PCIE1      primary       IOV
PCIE2                         BUS          PCIE2      primary       IOV
PCIE3                         BUS          PCIE3      primary       IOV
PCIE4                         BUS          PCIE4      primary       IOV
PCIE5                         BUS          PCIE5      primary       IOV
PCIE6                         BUS          PCIE6      ldom          IOV
PCIE7                         BUS          PCIE7      primary       IOV
PCIE8                         BUS          PCIE8      primary       IOV
PCIE9                         BUS          PCIE9      primary       IOV
PCIE10                        BUS          PCIE10     ldom          IOV
PCIE11                        BUS          PCIE11     primary       IOV
/BB0/CMUL/NET0                PCIE         PCIE0      primary       OCC
/BB0/CMUL/SASHBA              PCIE         PCIE0      primary       OCC
/BB0/PCI0                     PCIE         PCIE1      primary       EMP
/BB0/PCI3                     PCIE         PCIE2      primary       EMP
/BB0/PCI4                     PCIE         PCIE2      primary       EMP
/BB0/PCI7                     PCIE         PCIE3      primary       EMP
/BB0/PCI8                     PCIE         PCIE3      primary       EMP
/BB0/CMUL/NET2                PCIE         PCIE4      primary       OCC
/BB0/PCI1                     PCIE         PCIE5      primary       EMP
/BB0/PCI2                     PCIE         PCIE5      primary       EMP
/BB0/PCI5                     PCIE         PCIE6      ldom          OCC
/BB0/PCI6                     PCIE         PCIE6      ldom          EMP
/BB0/PCI9                     PCIE         PCIE7      primary       EMP
/BB0/PCI10                    PCIE         PCIE7      primary       EMP
/BB1/CMUL/NET0                PCIE         PCIE8      primary       OCC
/BB1/CMUL/NET2                PCIE         PCIE8      primary       OCC
/BB1/CMUL/SASHBA              PCIE         PCIE8      primary       OCC
/BB1/PCI0                     PCIE         PCIE9      primary       EMP
/BB1/PCI1                     PCIE         PCIE9      primary       EMP
/BB1/PCI2                     PCIE         PCIE9      primary       EMP
/BB1/PCI3                     PCIE         PCIE10     ldom          EMP
/BB1/PCI4                     PCIE         PCIE10     ldom          EMP
/BB1/PCI5                     PCIE         PCIE10     ldom          OCC
/BB1/PCI6                     PCIE         PCIE10     ldom          EMP
/BB1/PCI7                     PCIE         PCIE11     primary       EMP
/BB1/PCI8                     PCIE         PCIE11     primary       EMP
/BB1/PCI9                     PCIE         PCIE11     primary       EMP
/BB1/PCI10                    PCIE         PCIE11     primary       EMP
/BB0/CMUL/NET0/IOVNET.PF0     PF           PCIE0      primary
/BB0/CMUL/NET0/IOVNET.PF1     PF           PCIE0      primary
/BB0/CMUL/NET2/IOVNET.PF0     PF           PCIE4      primary
/BB0/CMUL/NET2/IOVNET.PF1     PF           PCIE4      primary
/BB1/CMUL/NET0/IOVNET.PF0     PF           PCIE8      primary
/BB1/CMUL/NET0/IOVNET.PF1     PF           PCIE8      primary
/BB1/CMUL/NET2/IOVNET.PF0     PF           PCIE8      primary
/BB1/CMUL/NET2/IOVNET.PF1     PF           PCIE8      primary
#
```

8. **Release the I/O devices assigned to the logical domain, from Oracle Solaris**

on the control domain.

If a mirror volume is configured between multiple SPARC M12-2S units, release the HDD/SSD mounted in the target SPARC M12-2S from the mirror beforehand.

a. Release the virtual network device vnet1 assigned to the logical domain guest.

```
# ldm remove-vnet vnet1 guest
# ldm list-bindings guest
        :
NETWORK
    NAME   SERVICE               ID   DEVICE     MAC               MODE   PVID
 VID    MTU
    MAXBW  LINKPROP
    vnet0  primary-vsw0@primary  0    network@0  00:14:4f:f9:58:4e        1
        1500
      PEER                 MAC                 MODE    PVID    VID    MTU    MAXBW
 LINKPROP
      primary-vsw0@primary 00:14:4f:fb:e1:a8        1            1500
        :
```

b. Delete primary-vsw4, which is set for the physical LAN port net4.

```
# ldm remove-vsw primary-vsw4
# ldm list-bindings primary
        :
VSW
  NAME            MAC                NET-DEV  ID   DEVICE    LINKPROP
DEFAULT-VLAN-ID PVID VID
  MTU             MODE               INTER-VNET-LINK
  primary-vsw0    00:14:4f:fb:e1:a8  net0     0    switch@0           1
        1
  1500            on
    PEER           MAC                PVID        VID     MTU    MAXBW
LINKPROP  INTERVNETLINK
    vnet0@guest    00:14:4f:f9:58:4e  1                   1500
        :
```

c. Release the assignment of PCIE10 (pci@8a00) from the logical domain ldom.

```
# ldm remove-io PCIE10 ldom
# ldm list-bindings ldom
        :
IO
    DEVICE                        PSEUDONYM    OPTIONS
    pci@8600                      PCIE6
    pci@8600/pci@4/pci@0/pci@9    /BB0/PCI5
    pci@8600/pci@4/pci@0/pci@11   /BB0/PCI6
        :
```

d. Release the I/O devices of BB#01.

```
# ldm remove-io PCIE8 primary
# ldm remove-io PCIE9 primary
# ldm remove-io PCIE11 primary
```

9. **Confirm that none of the I/O devices of BB#01 is assigned.**

```
# ldm list-io
NAME                 TYPE    BUS          DOMAIN    STATUS
----                 ----    ---          ------    ------
        :
PCIE8                BUS     PCIE8
PCIE9                BUS     PCIE9
PCIE10               BUS     PCIE10
PCIE11               BUS     PCIE11
        :
/BB1/CMUL/NET0       PCIE    PCIE8                  UNK
/BB1/CMUL/NET2       PCIE    PCIE8                  UNK
/BB1/CMUL/SASHBA     PCIE    PCIE8                  UNK
/BB1/PCI0            PCIE    PCIE9                  UNK
/BB1/PCI1            PCIE    PCIE9                  UNK
/BB1/PCI2            PCIE    PCIE9                  UNK
/BB1/PCI3            PCIE    PCIE10                 UNK
/BB1/PCI4            PCIE    PCIE10                 UNK
/BB1/PCI5            PCIE    PCIE10                 UNK
/BB1/PCI6            PCIE    PCIE10                 UNK
/BB1/PCI7            PCIE    PCIE11                 UNK
/BB1/PCI8            PCIE    PCIE11                 UNK
/BB1/PCI9            PCIE    PCIE11                 UNK
/BB1/PCI10           PCIE    PCIE11                 UNK
```

Log in to the XSCF shell, and release the SPARC M12-2S from the physical partition.

10. **Release the SPARC M12-2S of BB-ID#01 from PPAR ID#01.**

```
XSCF> deleteboard -y -c unassign 01-0
PSB#01-0 will be unconfigured from PPAR immediately. Continue?[y|n] :y
Start unconfigure preparation of PSB. [1200sec]
  0end
Unconfigure preparation of PSB has completed.
Start unconfiguring PSB from PPAR. [7200sec]
  0|
Processing of the incoming DR request by the LDoms Manager is pendingIncoming
DR request is being processed by the LDoms ManagerDR sequence started
(sequence#=2, message#=3)
Suspending the guest domain (ldom2)
Suspending the guest domain (ldom1)
Suspending the guest domain (ldom0)
\
Resumed the guest domain (ldom0)
Resumed the guest domain (ldom1)
|
Resumed the guest domain (ldom2)
../
```

```
DR sequence finished (sequence#=2, message#=3)
..
Processing of the incoming DR request by the LDoms Manager is pendingIncoming
DR request is being processed by the LDoms ManagerDR sequence started
(sequence#=3, message#=2)
DR sequence finished (sequence#=3, message#=2)
.end
Unconfigured PSB from PPAR.
PSB power off sequence started. [1200sec]
  0..... 30..... 60..... 90.....120.....150...end
Operation has completed.
```

Note - You may need to assign command options depending on how the DR is used and the logical domain system configuration.
For details on command options, see "3.1.16 Deleting a System Board From a Building Block Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

11. **Check the end code of the deleteboard command.**
    If the end code is not 0, the deleteboard command ended abnormally. Eliminate the cause of the failure, and then execute the deleteboard command again.

    In the following example, "0" is returned as the end status, so you can see that the execution of the deleteboard command has completed correctly.

```
XSCF> showresult
0
```

Note - For information on the action to take if the deleteboard command ends abnormally, see "3.1.16 Deleting a System Board From a Building Block Configuration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

12. **Confirm that the SPARC M12-2S of BB-ID#01 has been powered off and that the system board is in the pool state.**
    Since the SPARC M12-2S has been released with the disconnect option, incorporation into PPAR ID#00 is reserved.

```
XSCF> showboards -va
PSB  R PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
---- - ------------ ----------- ---- ---- ---- ------- --------
00-0   00(00)       Assigned    y    y    y    Passed  Normal
01-0 * 00(01)       Assigned    n    n    n    Passed  Normal
XSCF>
```

9.5 Stopping the System

For hardware maintenance and for changing the hardware configuration, it is necessary to stop the system depending on the FRU requiring maintenance and the system configuration.

This section describes the following procedures for stopping the system:

- Stopping a Specific Physical Partition
- Stopping All Physical Partitions

Note - Before stopping the system, check with the system administrator or the logical domain administrator about whether you can stop the logical domain.

9.5.1 Stopping a Specific Physical Partition

This section describes the procedure for stopping a specific physical partition in a system with a building block configuration.

The operations described here are possible only from the XSCF shell. Table 9-12 lists the procedure after login to the master XSCF.

Note - From the OPNL, you cannot instruct the system to stop a specific physical partition.

Table 9-12 Procedure for Stopping a Specific Physical Partition

Step	Operation Description	Command Used
1	Checking the operation status of physical partitions	XSCF> showpparstatus -a
2	Checking the operation status of the logical domains on the target physical partition	XSCF> showdomainstatus -p <*ppar_id*>
3	Checking the status of the SPARC M12-2S requiring maintenance	XSCF> showboards -p <*ppar_id*>
4	Stopping the physical partition	XSCF> poweroff -p <*ppar_id*>
5	Checking the stop processing status of the physical partition	XSCF> showpparprogress -p <*ppar_id*>
6	Confirming that the target physical partition has stopped	XSCF> showpparstatus -a

The following example executes the commands for stopping PPAR-ID#00.

1. **Check the operation status of physical partitions.**
   The following example checks the operation status of the physical partition of

PPAR-ID#00.

```
XSCF> showpparstatus -a
PPAR-ID         PPAR Status
00              Running
01              Running
02              Running
03              Running
```

2. **Check the operation status of the logical domains on the target physical partition.**
   The following example checks the operation status of the logical domains defined in PPAR ID#00.

```
XSCF> showdomainstatus -p 0
Logical Domain Name     Status
primary                 Solaris Running
guest00                 Solaris Running
guest01                 Solaris Running
iodomain                Solaris Running
```

3. **Check the status of the SPARC M12-2S requiring maintenance.**
   The following example checks the operation status of the PSB assigned to PPAR ID#00.

```
XSCF> showboards -p 0
PSB   PPAR-ID(LSB)  Assignment   Pwr   Conn  Conf  Test     Fault
----  ------------  -----------  ----  ----  ----  -------  --------
00-0  00(00)        Assigned     y     y     y     Passed   Normal
01-0  01(01)        Assigned     y     y     y     Passed   Normal
02-0  02(02)        Assigned     y     y     y     Passed   Normal
03-0  03(03)        Assigned     y     y     y     Passed   Normal
```

4. **Stop the target physical partition.**
   The following example instructs PPAR-ID#00 to stop.

```
XSCF> poweroff -p 0
PPAR-IDs to power off:00
Continue? [y|n] :y
00 : Powering off

 *Note*
This command only issues the instruction to power-off.
The result of the instruction can be checked by the "showpparprogress".
```

The showpparprogress command lets you check the progress of the process of stopping the physical partition. When a command prompt is returned, it means that he process of stopping the physical partition is complete.

```
XSCF> showpparprogress -p 0
PPAR Power Off                     PPAR#0    [ 1/ 3]
CPU Stop                           PPAR#0    [ 2/ 3]
PSU Off                            PPAR#0    [ 3/ 3]
The sequence of power control is completed
XSCF>
```

5. **Confirm that the target physical partition has stopped.**
   The following example checks that only PPAR-ID#00 is stopped while the other physical partitions are running.

```
XSCF> showpparstatus -a
PPAR-ID         PPAR Status
00              Powered Off
01              Running
02              Running
03              Running
XSCF>
```

9.5.2 Stopping All Physical Partitions

This section describes the procedure for stopping all physical partitions.

You can stop all physical partitions by using either the XSCF commands or the OPNL.

Stopping all physical partitions from the XSCF shell

Log in to the master XSCF, and stop all physical partitions by following the procedure in Table 9-13.

Table 9-13 Procedure for Stopping All Physical Partitions by Using the XSCF Commands

Step	Operation Description	Command Used
1	Checking the operation status of physical partitions	XSCF> showpparstatus -a
	As required, checking the operation status of the logical domains on the physical partitions	XSCF> showdomainstatus -p <*ppar_id*>
2	Checking the status of each SPARC M12-2S	XSCF> showboards -a
3	Stopping all physical partitions	XSCF> poweroff -a
	As required, checking the stop processing status of the physical partitions	XSCF> showpparprogress -p <*ppar_id*>
4	Confirming that all physical partitions have stopped	XSCF> showpparstatus -a

The following example executes the XSCF commands to stop all physical partitions.

1. **Check the operation status of all physical partitions.**

```
XSCF> showpparstatus -a
PPAR-ID         PPAR Status
00              Running
01              Running
        :
```

2. **Check the status of each SPARC M12-2S.**

```
XSCF> showboards -a
PSB   PPAR-ID(LSB)  Assignment   Pwr   Conn  Conf  Test     Fault
----  ------------  -----------  ----  ----  ----  -------  --------
00-0  00(00)        Assigned     y     y     y     Passed   Normal
01-0  01(01)        Assigned     y     y     y     Passed   Normal
        :
```

3. **Stop all physical partitions.**

```
XSCF> poweroff -a
PPAR-IDs to power off:00,01,02,03
Continue? [y|n] :y
00 : Powering off
01 : Powering off
        :

*Note*
This command only issues the instruction to power-off.
The result of the instruction can be checked by the "showpparprogress".
```

4. **Confirm that all physical partitions have stopped.**

```
XSCF> showpparstatus -a
PPAR-ID         PPAR Status
00              Powered Off
01              Powered off
02              Powered off
03              Powered off
XSCF>
```

Stopping all physical partitions by operating the OPNL

In the building block configuration, operate the OPNL of the SPARC M12-2S that is running as the master XSCF. Table 9-14 lists the procedure for stopping all physical partitions by operating the OPNL.

Table 9-14 Procedure for Stopping All Physical Partitions With the OPNL

Step	Operation Description	Command Used
1	Checking the operation status of physical partitions	XSCF> showpparstatus -a
	Checking the operation status of a specific physical partition or the operation status of the logical domains on a physical partition, as required	[Checking the operation status of a specific physical partition] XSCF> showpparstatus -p <*ppar_id*> [Checking the operation status of logical domains] XSCF> showdomainstatus -p <*ppar_id*>
2	Checking the status of each SPARC M12-2S	XSCF> showboards -a
3	Switching the mode switch on the OPNL to Service mode	
4	Pressing down the POWER switch on the OPNL for 4 seconds or longer	
5	Confirming the power-off instruction	XSCF> showlogs event
6	Confirming that all physical partitions have stopped	XSCF> showpparstatus -a

The following describes the procedure for stopping all physical partitions with the OPNL.

1. **Check the operation status of all physical partitions.**

```
XSCF> showpparstatus -a
PPAR-ID          PPAR Status
00               Running
01               Running
         :
```

2. **Check the status of each SPARC M12-2S.**

```
XSCF> showboards -a
PSB   PPAR-ID(LSB)  Assignment   Pwr   Conn  Conf  Test     Fault
----  ------------  -----------  ----  ----  ----  -------  --------
00-0  00(00)        Assigned     y     y     y     Passed   Normal
01-0  01(01)        Assigned     y     y     y     Passed   Normal
          :
```

3. **Switch the mode switch on the OPNL to Service mode.**
   For details on the mode switch, see "2.3.2 OPNL Control Function."

You can log in to the XSCF and check the status of the mode switch using the showhardconf command.

```
XSCF> showhardconf
SPARC M12-2S;
    + Serial:2081232002; Operator_Panel_Switch:Service;
    + System_Power:On; System_Phase:Cabinet Power On;
    Partition#0 PPAR_Status:Running;
        :
```

4. **Press down the POWER switch on the OPNL for 4 seconds or longer.**
   For details on the POWER switch, see "2.3.2 OPNL Control Function."
5. **Confirm the instruction to stop the physical partitions.**
   If you do not push down the POWER switch long enough, the message "power switch pushed (short)" appears. If so, try again to press down the POWER switch for 4 seconds or longer.

```
XSCF> showlogs event
May 30 14:00:13 JST 2016      power switch pushed (short)
May 30 14:01:13 JST 2016      power switch pushed (long)
May 30 14:01:16 JST 2016      PPAR-ID 0:shutdown started
        :
```

6. **Confirm that all physical partitions have stopped.**

```
XSCF> showpparstatus -a
PPAR-ID          PPAR Status
00               Powered Off
01               Powered Off
02               Powered Off
03               Powered Off
XSCF>
```

9.6 Releasing FRUs From the System

This section describes the procedure for releasing a FRU from the system.

- Releasing the SPARC M12-2S From the Building Block Configuration
- Releasing the FANU
- Releasing the PSU
- Releasing the XSCFU

9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration

This section describes the procedure for releasing the SPARC M12-2S from the system in a building block configuration.

For the procedure for incorporating the SPARC M12-2S with a replacement unit into a building block configuration after releasing the SPARC M12-2S by using this procedure, see "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration."

Confirm that the XSCF of the target SPARC M12-2S is in the standby state or is the slave XSCF. If the XSCF of the SPARC M12-2S to be released is the master XSCF, switch it to the standby state with the switchscf command. For details on the command, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XCP version used.

In this section, power off the SPARC M12-2S requiring maintenance by using the replacefru command.
In the following example, maintenance is performed on an abnormal (Degraded) BB#0 chassis with four SPARC M12-2S units in a building block configuration.
Even in cases where the status of the SPARC M12-2S requiring maintenance is not abnormal (Degraded), perform the same procedure.

1. **Log in to the XSCF shell.**
2. **Execute the replacefru command to display the maintenance menu.**

```
XSCF> replacefru
```

3. **With a number key, select the FRU requiring maintenance.**
   Enter "1" since BB#0 is shown as "Degraded."

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the chassis including replaced FRU.

No. FRU                  Status
--- -------------------- --------------
 1  /BB#0                Degraded
 2  /BB#1                Normal
 3  /BB#2                Normal
 4  /BB#3                Normal
------------------------------------------------------------------------------
Select [1-4|c:cancel] :1
```

4. **With a number key, select the FRU requiring maintenance.**
   Enter "1" to release BB#0 for maintenance.

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the BB or a type of FRU to be replaced.
1. BB itself (*1)
2. FAN          (Fan Unit)
3. PSU          (Power Supply Unit)
4. XSCFU        (Extended System Control Facility Unit)
5. Crossbar cable
--------------------------------------------------------------------------------
Select [1-5|c:cancel] :1
```

*1 This cannot be done with the SPARC M12-2.

5. **With a number key, select the faulty FRU.**

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select a FRU to be replaced.

No. FRU                 Status
--- ------------------- --------------
 1  /BB#0               Degraded
--------------------------------------------------------------------------------
Select [1|b:back] :1
```

6. **Confirm that the FRU requiring maintenance is displayed, and then enter "r".**

```
You are about to replace BB#0.
Do you want to continue?[r:replace|c:cancel] :r
```

7. **Confirm that the CHECK LED of the FRU is on or blinking.**
   To release the SPARC M12-2S, confirm that the system locator is blinking.

   For the LED location, see "2.4.2 System Locator" and "2.4.3 LEDs of Each Unit."

```
Please execute the following steps:
1) Confirm the XSCF STANDBY LED of BB#0 is not lit.
2) Turn off the breaker of BB#0.
3) Remove BB#0.
4) Execute either the following:
  4-1) After the exchanged device is connected with the system,
       turn on the breaker of BB#0, and please select 'finish'.
  4-2) If you want to suspend the maintenance without exchanging device,
       please select 'cancel'.
[f:finish|c:cancel] :
```

As instructed in the above messages, confirm that the XSCF STANDBY LED of the BB#0 is off. After removing the power cord of BB#0, release the SPARC M12-2S from the building block configuration for maintenance. After connecting the cables of the SPARC M12-2S that has undergone maintenance to the building block configuration, connect the power cord. Do not enter "f" before the READY LED on the XSCFU begins to blink.

For the location of the XSCF STANDBY LED on the operation panel, see "2.4.1 OPNL LEDs."

After performing maintenance on the SPARC M12-2S, incorporate it into the building block configuration by using the procedure described in "10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration."

9.6.2 Releasing the FANU

This section describes the procedure for releasing the FANU of the SPARC M12.

1. **Log in to the XSCF shell.**
2. **Execute the replacefru command to display the maintenance menu.**

```
XSCF> replacefru
```

3. **With a number key, select the FRU requiring maintenance.**
   Enter "1" to perform maintenance on the FANU of the SPARC M12-2 (BB#0).

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the chassis including replaced FRU.

No. FRU                   Status
--- ------------------- --------------
 1  /BB#0                 Normal
 2  /BB#1                 Unmount
 3  /BB#2                 Unmount
 4  /BB#3                 Unmount
------------------------------------------------------------------------------
Select [1-4|c:cancel] :1
```

4. **With a number key, select the FRU requiring maintenance.**
   Enter "2" to perform maintenance on the FANU of the SPARC M12-2.

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the BB or a type of FRU to be replaced.
1. BB itself
2. FAN         (Fan Unit)
3. PSU         (Power Supply Unit)
4. XSCFU       (Extended System Control Facility Unit)
5. Crossbar cable
------------------------------------------------------------------------------
Select [1-5|c:cancel] :2
```

5. **With a number key, select the faulty FRU.**
   Enter "1" since a fault has been confirmed in FANU#0 of BB#0.

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select a FRU to be replaced.
No. FRU                 Status
--- ------------------- --------------
 1  /BB#0/FANU#0        Faulted
 2  /BB#0/FANU#1        Normal
 3  /BB#0/FANU#2        Normal
 4  /BB#0/FANU#3        Normal
 5  /BB#0/FANU#4        Normal
 6  /BB#0/FANU#5        Normal
 7  /BB#0/FANU#6        Normal
 8  /BB#0/FANU#7        Normal
------------------------------------------------------------------------------
Select [1-8|b:back] :1
```

6. **Confirm that the selected FRU is displayed, and then enter "r".**

```
You are about to replace BB#0/FANU#0.
Do you want to continue?[r:replace|c:cancel] :r
```

7. **Remove the FANU to be replaced, as instructed in the output message.**

```
Please execute the following steps:
1) Confirm the Check LED is blinking.
2) Remove BB#0/FANU#0.
3) Execute either the following:
  3-1) After installing the exchanged device, please select 'finish'.
  3-2) If you want to suspend the maintenance without exchanging device,
       please select 'cancel'.
[f:finish|c:cancel] :
```

Do not enter "f" until you mount the replacement FANU.

After mounting the replacement FANU, incorporate it into the SPARC M12-2/M12-2S by using the procedure described in "10.4.2 Incorporating the FANU."

9.6.3 Releasing the PSU

This section describes the procedure for releasing the PSU of the SPARC M12.

1. **Log in to the XSCF shell.**
2. **Execute the replacefru command to display the maintenance menu.**

```
XSCF> replacefru
```

3. **With a number key, select the FRU requiring maintenance.**
   Enter "1" to perform maintenance on the PSU of the SPARC M12-2 (BB#0).

```
-------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the chassis including replaced FRU.

No. FRU                   Status
--- ------------------- --------------
 1  /BB#0               Normal
 2  /BB#1               Unmount
 3  /BB#2               Unmount
 4  /BB#3               Unmount
-------------------------------------------------------------------------------
Select [1-4|c:cancel] :1
```

4. **With a number key, select the FRU requiring maintenance.**
   Enter "3" to perform maintenance on the PSU of the SPARC M12-2.

```
-------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the BB or a type of FRU to be replaced.
1. BB itself
2. FAN         (Fan Unit)
3. PSU         (Power Supply Unit)
4. XSCFU       (Extended System Control Facility Unit)
5. Crossbar cable
-------------------------------------------------------------------------------
Select [1-5|c:cancel] :3
```

5. **With a number key, select the faulty FRU.**
   Enter "1" since a fault has been confirmed in PSU#0 of BB#0.

```
-------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select a FRU to be replaced.
No. FRU                   Status
--- ------------------- --------------
 1  /BB#0/PSU#0         Faulted
 2  /BB#0/PSU#1         Normal
 3  /BB#0/PSU#2         Normal
 4  /BB#0/PSU#3         Normal
-------------------------------------------------------------------------------
Select [1-4|b:back] :1
```

6. **Confirm that the selected FRU is displayed, and then enter "r".**

```
You are about to replace BB#0/PSU#0.
Do you want to continue?[r:replace|c:cancel] :r
```

7. **Remove the PSU, as instructed in the output message.**

```
Please execute the following steps:
1) Remove BB#0/PSU#0.
2) Execute either the following:
  2-1) After installing the exchanged device, please select 'finish'.
  2-2) If you want to suspend the maintenance without exchanging device,
       please select 'cancel'.
[f:finish|c:cancel] :
```

Do not enter "f" until you mount the replacement PSU.

After mounting the replacement PSU, incorporate it into the SPARC M12-2/M12-2S by using the procedure described in "10.4.3 Incorporating the PSU."

9.6.4 Releasing the XSCFU

This section describes the procedure for releasing the XSCFU of the SPARC M12-2S. Note that you can replace the XSCFU using the replacefru command only in a 2BB or larger configuration.

1. **Log in to the XSCF shell.**
2. **Execute the replacefru command to display the maintenance menu.**

```
XSCF> replacefru
```

3. **With a number key, select the FRU requiring maintenance.**
   Enter "1" to perform maintenance on the XSCFU of the SPARC M12-2 (BB#0).

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the chassis including replaced FRU.
No. FRU                   Status
--- ------------------- --------------
 1  /BB#0                 Normal
 2  /BB#1                 Normal
 3  /BB#2                 Unmount
 4  /BB#3                 Unmount
------------------------------------------------------------------------------
Select [1-4|c:cancel] :1
```

4. **With a number key, select the FRU requiring maintenance.**
   Enter "4" to perform maintenance on the XSCFU of the SPARC M12-2.

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the BB or a type of FRU to be replaced.
1. BB itself
2. FAN        (Fan Unit)
```

```
3. PSU         (Power Supply Unit)
4. XSCFU       (Extended System Control Facility Unit)
------------------------------------------------------------------------------
Select [1-4|c:cancel] :4
```

5. **With a number key, select the faulty FRU.**
   Enter "1" since a fault has been confirmed in XSCFU of BB#0.

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select a FRU to be replaced.
No. FRU                 Status
--- ------------------- --------------
 1  /BB#0/XSCFU         Degrade
------------------------------------------------------------------------------
Select [1|b:back] :1
```

6. **Confirm that the selected FRU is displayed, and then enter "r".**

```
You are about to replace BB#0/XSCFU.
Do you want to continue?[r:replace|c:cancel] :r
```

7. **A message is output about replacing the FRU to be replaced. Begin replacement.**

```
Communicate connection between the OS and XSCF might be disconnected.
When disconnect occurs, OS/ldmd's opereation that use connection will fail.
Do you want to continue?[y:yes|n:no] :y
Starting the preparation for shutting down XSCF [1/3]
   0 done
Stopping the system control                      [2/3]
   0 done
Shutting down XSCF                               [3/3]
   0. done
Please execute the following steps:
1) Confirm the XSCF STANDBY LED of BB#0/XSCFU is not lit.
2) Remove BB#0/XSCFU.
3) After installing the exchanged device, please select [f:finish] :
```

After that, start the maintenance work for the XSCFU. Do not enter "f" until you complete the maintenance work.

After replacing the XSCFU, perform the work in "10.4.4 Incorporating the XSCFU" to incorporate it into the system.

9.7 Removing the SPARC M12-2S

Note - When removing the SPARC M12-2S due to a change in the building block configuration, be sure to perform the procedure described below.

This section describes the procedure for releasing the SPARC M12-2S from a building block configuration.
Before removing the SPARC M12-2S, make sure that it is not assigned to any physical partition.
For details on the commands used here, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XCP version used.

1. **Log in to the master XSCF.**
   After logging in to the XSCF shell, you can check whether it is in the master state, by using the showbbstatus command.

```
XSCF> showbbstatus
BB#00 (Master)  ←(*1)
XSCF>
```

*1 If the XSCF you have logged in to is in the standby state, Standby is displayed.

2. **Check the status of the target SPARC M12-2S.**
   Log in to the master XSCF, and check that the target SPARC M12-2S is not used.

```
XSCF> showboards -a -v
PSB  R PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
---- - ------------ ----------- ---- ---- ---- ------- --------
00-0   00(00)       Assigned    y    y    y    Passed  Normal
01-0   00(01)       Assigned    y    y    y    Passed  Normal
02-0   SP           Available   n    n    n    Passed  Normal  ←(*1)
XSCF>
```

*1 If Available or Unavailable is not displayed under Assignment, release the PSB from the physical partition.

3. **Delete the CPU Activation key.**
   Delete the CPU Activation key of the target SPARC M12-2S.

   Regarding CPU resources assigned to logical domains, release from the logical domains the assignment of as many CPU resources as the number of CPU Activation keys to be deleted. After that, delete the CPU Activation keys.

   For details, see "Chapter 5 CPU Activation" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

4. **Release the SPARC M12-2S from the building block configuration.**

```
XSCF> initbb -b 2
You are about to initialize BB/XB-Box.
NOTE the following.

   1. BB/XB-Box is exclueded from the system and halted.
   2. PPAR-ID of the same value as BB-ID becomes invalid.

Continue? [y|n] :y
XSCF>
```

5. **Check that the LEDs of the released SPARC M12-2S are off.**
   Wait for the READY, CHECK, and MASTER LEDs on the XSCFU to turn off. (Approx. 10 minutes)

   For the LEDs on the XSCFU, see "Figure 2-11."

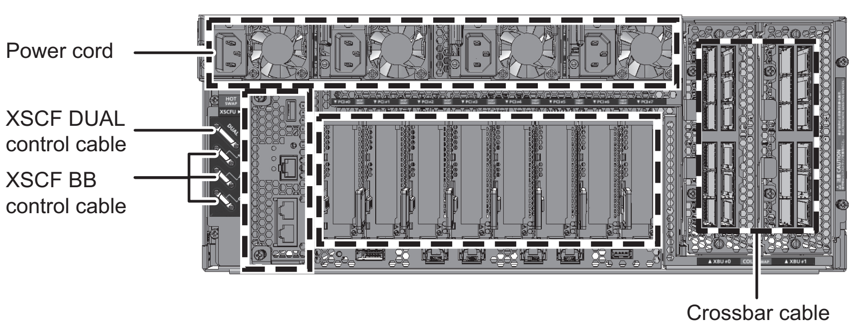
6. **Check the status of the building block configuration.**
   Check that the released SPARC M12-2S is not displayed.

```
XSCF> showboards -a -v
PSB  R PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
---- - ------------ ----------- ---- ---- ---- ------- --------
00-0   00(00)       Assigned    y    y    y    Passed  Normal
01-0   00(01)       Assigned    y    y    y    Passed  Normal
XSCF>
```

7. **Disconnect the power cord, crossbar cable, XSCF BB control cable, and XSCF DUAL control cable.**
   Disconnect all the cables connected to the locations enclosed in dotted lines.

   Note that, when the XSCFU is the slave XSCF, the XSCF DUAL control cable is not connected.

Figure 9-5 Disconnecting Cables



8. **Set the BB-ID of the released SPARC M12-2S.**
   To release the SPARC M12-2S and use it as another system, set the BB-ID as appropriate for the system configuration.

For the position of the BB-ID switch, see Figure 2-8.

9.8 Accessing a FRU

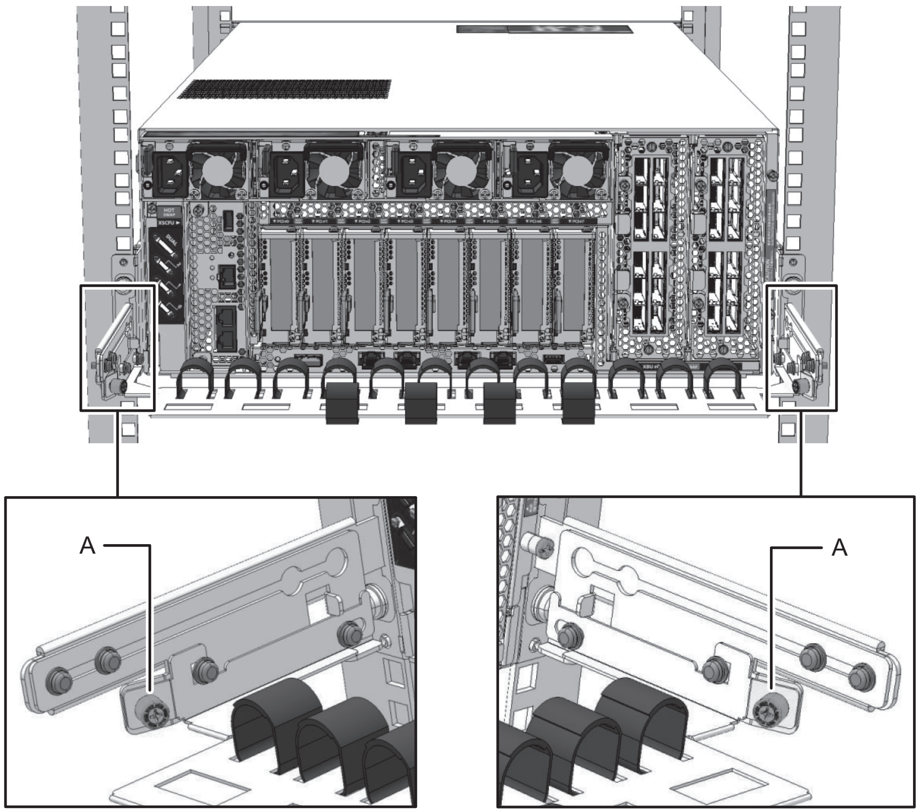
This section describes the procedure that must be done before accessing the FRU requiring maintenance in the SPARC M12 mounted in a rack.

9.8.1 Lowering the Cable Support

Lower the cable support before starting maintenance work for the following FRUs, which are accessed from the rear of the SPARC M12-2/M12-2S:
- XSCFU
- PCIe card
- CMU
- Memory
- BPU
- PSUBP
- XBU (SPARC M12-2S only)

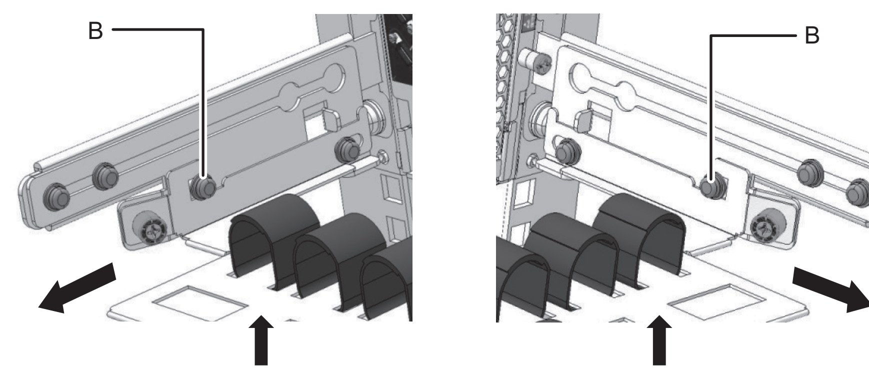
1. **Loosen the left- and right-side screws securing the cable support (A in Figure 9-6).**

Figure 9-6 Cable Support Screw Locations



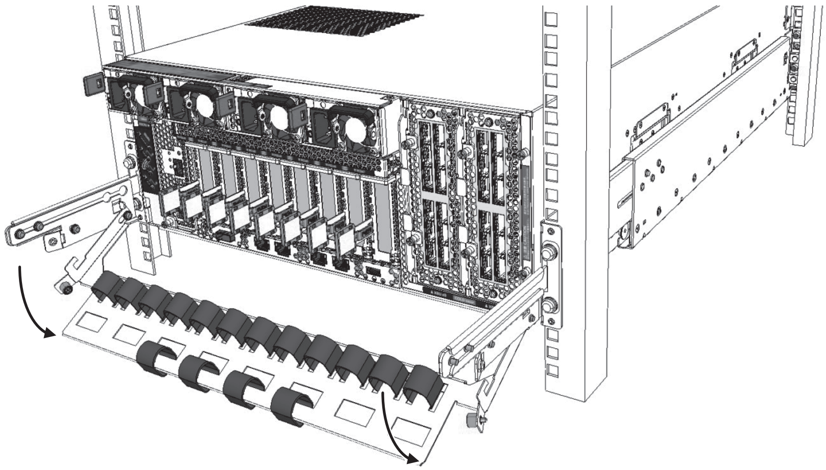
2. **Lift the cable support to release the hook (B in Figure 9-7), and pull the cable support toward you.**

Figure 9-7 Releasing the Cable Support



3. **Lower the cable support.**

Figure 9-8 Manipulating the Cable Support

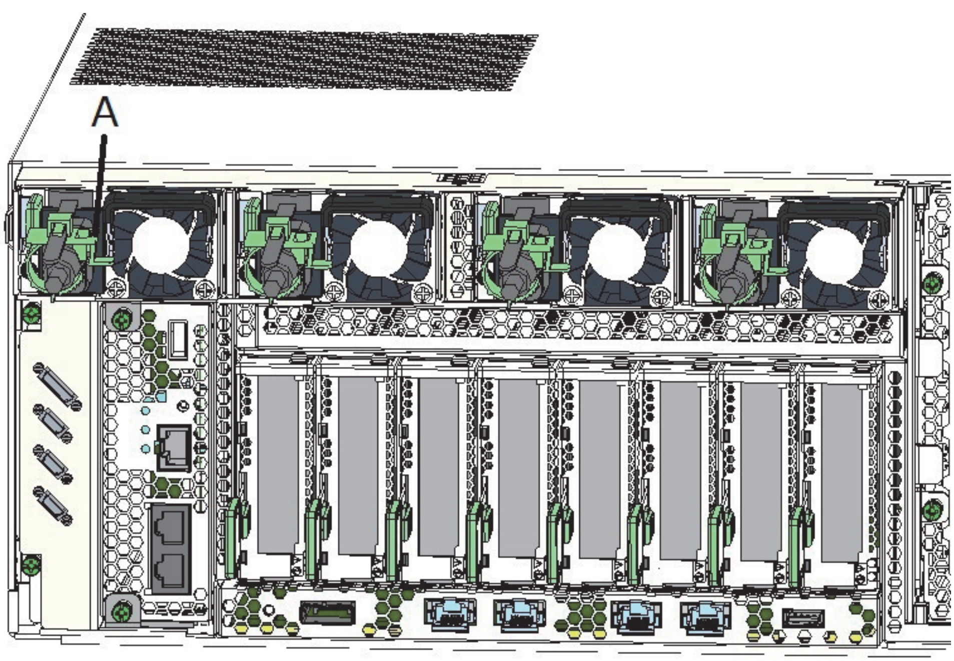


9.8.2 Removing the Power Cords

Remove the power cords from the SPARC M12 to perform work. After removing the cable clamps from the power cords, remove the power cords.

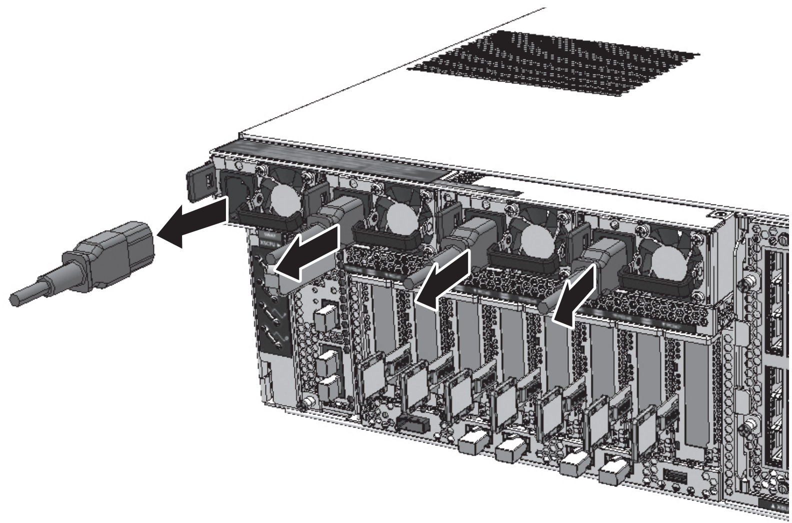
1. **Release the tab of the cable clamp (A in Figure 9-9).**

Figure 9-9 Releasing a Cable Clamp



2. **Remove the power cords from the PSU.**

Figure 9-10 Removing the Power Cords



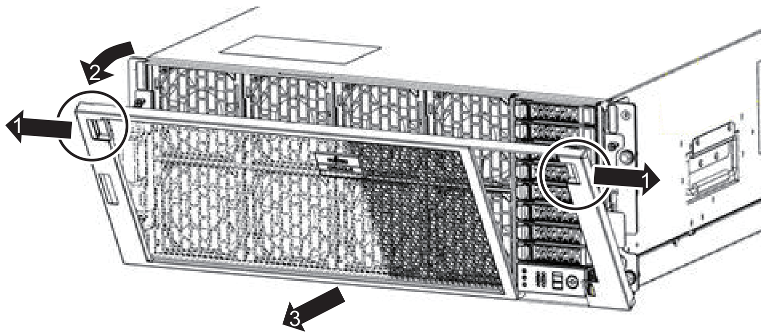
9.8.3 Removing the Front Cover

Remove the front cover before starting maintenance work for the following FRUs, which are accessed from the front of the chassis:

- FANU
- FANBPU
- HDD/SSD
- HDDBPU
- OPNL
- CMUL/CMUU
- BPU
- PSUBP

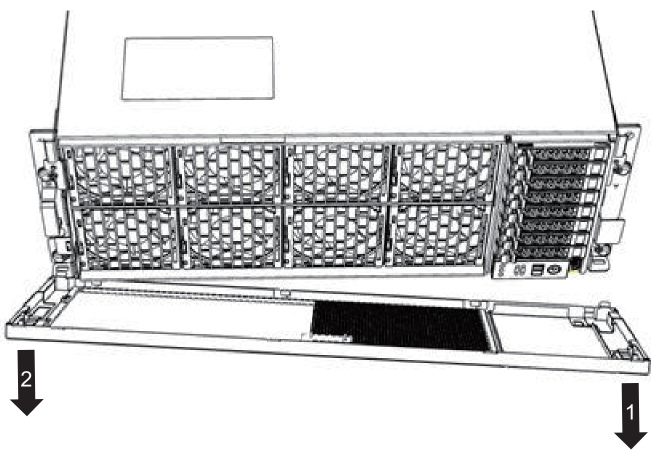
1. **Release the slide locks on the left and right sides of the front cover (1 in Figure 9-11). Tilt back the top of the front cover (2 in Figure 9-11), and pull out the front cover to remove it (3 in Figure 9-11).**

Figure 9-11 Removing the Front Cover



Note - If it is difficult to pull out the front cover at 3 in Figure 9-11, pull out the right side (1 in Figure 9-12) first and then the left side (2 in Figure 9-12) to remove it.

Figure 9-12 Removing the Front Cover (Note)



Chapter 10

Setting Up the System

This chapter describes the system setup work to be done after a FRU is replaced, added, or removed or after the building block configuration is changed. See this chapter, as required, after replacing, adding, or removing a FRU.

- Preparing Hardware
- Restoring Setting Information
- Adding the SPARC M12-2S to a Building Block Configuration
- Incorporating a FRU Into the System
- Diagnosing a Replacement FRU
- Incorporating the SPARC M12-2S or an I/O Device Into the PPAR
- Incorporating I/O Resources Into a Logical Domain
- Powering on a Physical Partition
- Starting the System

10.1 Preparing Hardware

This section describes the following procedures required for setting up the hardware.

- Installing a Power Cord
- Securing the Cable Support
- Installing the Front Cover

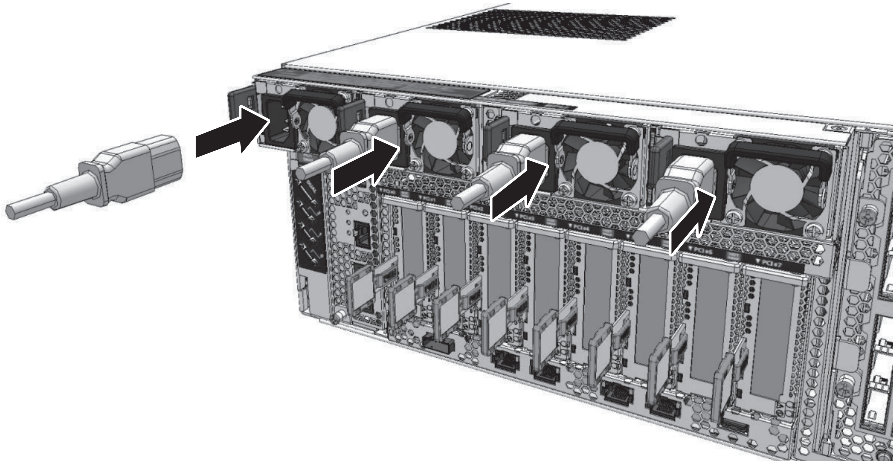
10.1.1 Installing a Power Cord

If you have removed the power cord from the PSU to perform the maintenance work, connect the power cord to the PSU and then attach the power cord to the cable clamp.

1. **Connect the power cord to the PSU.**

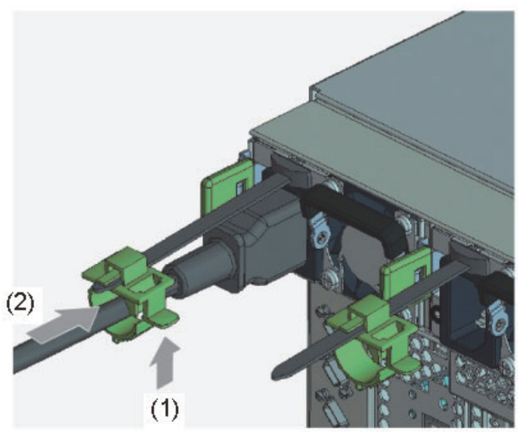
Insert the power cord all the way straight into the PSU.

Figure 10-1 Installing the Power Cord



2. **Bundle the power cords with the cable clamp, and then secure the cable clamp.**
   Bundle the power cords with the cable clamp, and then slide the cable clamp toward the PSU to firmly secure the power cords.

Figure 10-2 Securing the Power Cords



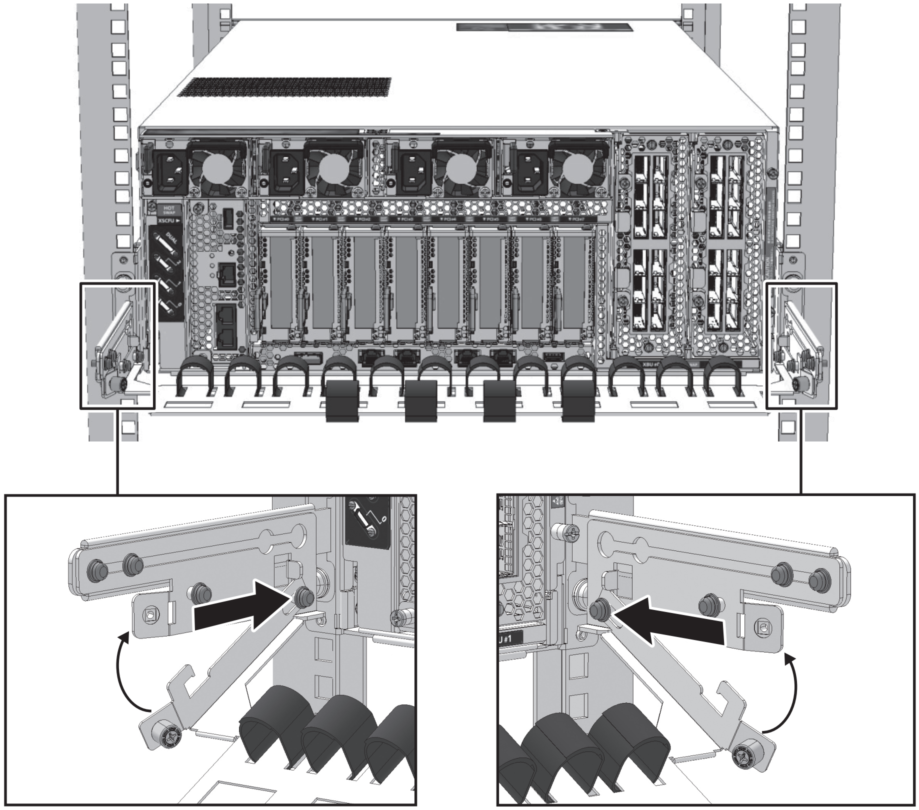
10.1.2 Securing the Cable Support

After completing the FRU maintenance at the rear of the SPARC M12, lift and secure the cable support.

1. **Lift the cable support, and push (in the directions of the arrows) the brackets**

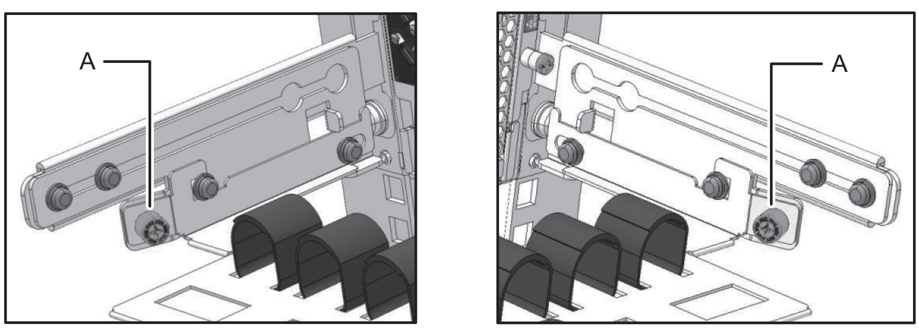
above and below the screws to lock the cable support.

Figure 10-3 Locking the Cable Support



2. **Tighten the left and right screws (A in Figure 10-4) to secure the cable support.**

Figure 10-4 Securing the Cable Support



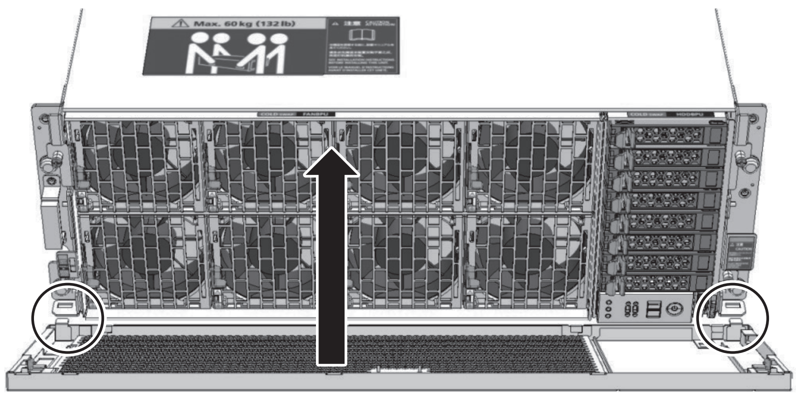
Note - Confirm that the cable support is firmly installed and secured.

10.1.3 Installing the Front Cover

This section describes the procedure for installing the front cover on the SPARC M12. Install the front cover before putting the SPARC M12 into operation.

1. **Insert the tabs on the front cover into the slots on the bottom front of the chassis to install the front cover.**
   A label on which a serial number is printed is affixed both at the lower front right of the front cover and on the right side of the front of the chassis. Before installing the front cover, check that the serial numbers match.

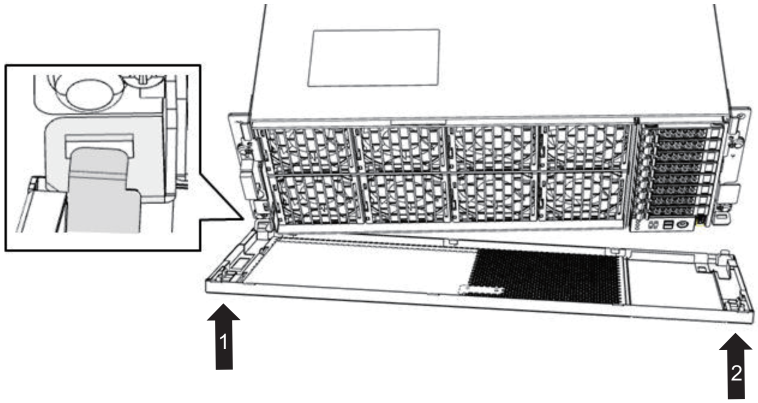
Figure 10-5 Installing the Front Cover



Note - Confirm that the front cover is firmly installed and secured.

Note - If it is difficult to install the front cover, insert the left tab of the front cover into the slot first (1 in Figure 10-6), and then insert the right tab (2 in Figure 10-6) to install the front cover.

Figure 10-6 Installing the Front Cover (Note)



10.2 Restoring Setting Information

10.2.1 Restoring the Logical Domain System Configuration

You can restore the logical domain system configuration from the configuration information saved in the XSCF firmware or an XML file.

This section describes how to restore the logical domain system configuration.

For details, see "10.11 Saving/Restoring Logical Domain Configuration Information in the XSCF" or "10.12 Saving/Restoring Logical Domain Configuration Information in an XML File" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Restoring the configuration from the XSCF firmware

This section describes an example of the operation of logging in to the XSCF shell, with the physical partition (PPAR-ID#00) stopped, and restoring the logical domain configuration from the factory-default state to the state of "ldom-config1".
If the physical partition is in operation, the system configuration is applied after the physical partition is stopped.

```
XSCF> setdomainconfig -p 0
PPAR-ID     :0
Booting config                    ← (*1)
 (Current)  :factory-default
 (Next)     :factory-default
-----------------------------------------------------------------------------
Index       :1
config_name :factory-default
domains     :1
date_created:-
-----------------------------------------------------------------------------
Index       :2
config_name :ldom-config1
domains     :12
date_created:'2016-09-29 18:30:00'
-----------------------------------------------------------------------------
Index       :3
config_name :ldom-config2
domains     :12
date_created:'2016-10-03 20:53:03'
-----------------------------------------------------------------------------
Select Index of Using config_name :2   ← (*2)
PPAR-ID of PPAR that will be affected :00
Logical domain config_name will be set to "ldom-config1".
Continue? [y|n] :y                  ← (*3)
Configuration complete.

XSCF>
```

*1 The logical domain system configuration is in the factory-default state.
*2 The index number is entered for which the system configuration name of the logical domain is "ldom-config1".
*3 If you enter "y", the physical partition starts with the system configuration of the logical domain selected in (*2).

Restoring the configuration from an XML file

This section describes an example of the operation of restoring the logical domain system configuration by using the ldm init-system command to read the /ldom_config.xml file from Oracle Solaris on the control domain.

```
primary# ldm init-system -i /ldom_config.xml  ← (*1)
Aug 7 11:22:41 primary syseventd[183]: error restarting syseventconfd - No
child processes
Initiating a delayed reconfiguration operation on the primary domain.
All configuration changes for other domains are disabled until the primary
domain reboots, at which time the new configuration for the primary domain
will also take effect.
primary# shutdown -i6 -g0 -y                          ← (*2)

Shutdown started. Friday, August  7, 2015 12:49:46 PM JST

Changing to init state 6 - please wait
```

```
Broadcast Message from root (console) on primary Fri Aug  7 12:49:46...
THE SYSTEM PRIMARY IS BEING SHUT DOWN NOW ! ! !
Log off now or risk your files being damaged

primary# svc.startd: The system is coming down.  Please wait.
svc.startd: 143 system services are now being stopped.
syncing file systems... done
rebooting...
Resetting...
```

*1 Read the logical domain configuration information (/ldom_config.xml).
*2 Restart the control domain so that the logical domain configuration information read in (*1) is applied.

10.2.2 Restoring XSCF Settings Information

This section describes the procedure for restoring the XSCF settings information that was saved on a USB device in "9.1.2 Saving XSCF Settings Information."

To restore the XSCF settings information, use the restoreconfig command. This section describes the command examples that restore the XSCF settings information (file name: system.cfg) saved in a USB device or HTTPS server.

For details, see "10.10 Saving/Restoring XSCF Settings Information" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Restoring the information from a USB device

```
XSCF> restoreconfig -v -V file:///media/usb_msd/system.cfg
initiating file transfer from 'file:///media/usb_msd/system.cfg' ... transfer
from 'file:///media/usb_msd/system.cfg' to '/ssd/transferred_file.bin'
* Closing connection #0
done
file decoding done.
Configuration backup created on Thu Nov 17 07:28:33 2016
 from system 'model_name' with serial number 'serial_number', version '0001'
validating backup configuration data
*** You will need to power-cycle the entire system after
  this operation is completed
*** The system data are overwrited in the backup data.
*** Do you want to restore this configuration to your system? [y/n]:y  ← (*1)
obtaining lock ... done
requesting XSCF reboot to perform restore ... requested
XSCF>
```

*1 Enter "y" to restore the XSCF settings information. The XSCF is automatically rebooted to apply the restored setting information to the firmware.

Restoring the information from an HTTPS server

```
XSCF> restoreconfig -v -V -u user_name https://https_server/system.cfg
initiating file transfer from 'https://https_server/system.cfg' ... transfer
from 'https://https_server/system.cfg' to '/ssd/transferred_file.bin'
Password:  ← (*1)

* About to connect() to https_server port 443 (#0)
* Trying https_server... * connected
* Connected to https_server (https_server_ip) port 443 (#0)
* Initializing NSS with certpath: /etc/pki/nssdb
*  CAfile: /etc/pki/tls/certs/ca-bundle.crt
 CApath: none
* Remote Certificate has expired.
* SSL certificate verify ok.
* SSL connection using TLS_DHE_RSA_WITH_AES_256_CBC_SHA
* Server certificate:
*       subject: E=root@localhost.localdomain,CN=localhost.localdomain,
OU=SomeOrganizationalUnit,O=SomeOrganization,L=SomeCity,ST=SomeState,C=--
*       start date: Jun 03 12:34:49 2011 GMT
*       expire date: Jun 02 12:34:49 2012 GMT
*       common name: localhost.localdomain
*       issuer: E=root@localhost.localdomain,CN=localhost.localdomain,
OU=SomeOrganizationalUnit,O=SomeOrganization,L=SomeCity,ST=SomeState,C=--
* Server auth using Basic with user 'user_name'
< HTTP/1.1 200 OK
< Date: Mon, 24 Oct 2016 02:28:46 GMT
< Server: Apache/2.2.3 (CentOS)
< Last-Modified: Mon, 24 Oct 2016 02:21:16 GMT
< ETag: "108887c-34a3a-be73f00"
< Accept-Ranges: bytes
< Content-Length: 215610
< Connection: close
< Content-Type: text/plain; charset=UTF-8
<
* Closing connection #0
done

file decoding done.
Configuration backup created on Mon Oct 24 11:21:03 2016
 from system 'model_name' with serial number 'server_serial', version '0001'
validating backup configuration data
*** You will need to power-cycle the entire system after
  this operation is completed
*** The system data are overwrited in the backup data.
*** Do you want to restore this configuration to your system? [y/n]:y
obtaining lock ... done
requesting XSCF reboot to perform restore ...

requested
XSCF>
```

*1 Enter the login password of the HTTPS server.

10.3 Adding the SPARC M12-2S to a Building Block Configuration

---

Note - When adding the SPARC M12-2S due to a change in the building block configuration, be sure to perform the procedure described below.

Note - To add a SPARC M12-2S with 64 GB DIMMs mounted, see "Notes on Memory" in the latest version of the *Fujitsu SPARC M12 Product Notes*.

This section describes the procedure for adding the SPARC M12-2S to BB#2 of the building block configuration.
The added SPARC M12-2S is incorporated into the building block configuration in the factory-default state. When you add a newly purchased SPARC M12-2S, do not connect power cords until instructed so. If the SPARC M12-2S to be added has been used in another system, be sure to reset it to its factory-default state by using the restoredefaults or initbb command and do not connect power cords until instructed so.
To perform system-stopped/cold addition of the SPARC M12-2S to a building block configuration, see "5.6.6 System-Stopped/Cold Addition Workflow of the SPARC M12-2S."

For details on the commands used here, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XCP version used.

1. **Check the operation status of the building block configuration.**
   Log in to the master XSCF, and check the operation status of the building block configuration by using the showboards command.

   The following example shows that BB#00 and BB#01 are connected to the building block configuration.

```
XSCF> showboards -a -v
PSB  R PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
---- - ------------ ----------- ---- ---- ---- ------- --------
00-0   00(00)       Assigned    y    y    y    Passed  Normal
01-0   00(01)       Assigned    y    y    y    Passed  Normal

XSCF>
```

2. **Set a BB-ID for the SPARC M12-2S.**

Based on the check result in step 1, set the BB-ID of the SPARC M12-2S to be added to "02". For details on how to set a BB-ID, see "2.3 Understanding the OPNL Functions."

3. **Prepare for the addition of the SPARC M12-2S.**
   Log in to the master XSCF, and add the SPARC M12-2S to the building block configuration by using the addfru command.

```
XSCF> addfru

------------------------------------------------------------------------------

Maintenance/Addition Menu
Please select the chassis including added FRU.

No. FRU                 Status
--- ------------------- --------------
 1  /BB#0               Normal
 2  /BB#1               Normal
 3  /BB#2               Unmount
 4  /BB#3               Unmount
------------------------------------------------------------------------------
Select [1-4|c:cancel] :3                      ← (*1)


------------------------------------------------------------------------------

Maintenance/Addition Menu
Please select the BB or a type of FRU to be added.

1. BB itself
2. PSU       (Power Supply Unit)
------------------------------------------------------------------------------
Select [1,2|c:cancel] :1                      ← (*2)


------------------------------------------------------------------------------

Maintenance/Addition Menu
Please select a FRU to be added.

No. FRU                 Status
--- ------------------- --------------
 1  /BB#2               Unmount
------------------------------------------------------------------------------
Select [1|b:back] :1                          ← (*3)

You are about to add BB#2.
Do you want to continue?[a:add|c:cancel] :a  ← (*4)

Please execute the following steps:
1) After the added device is connected with the system,
   please turn on the breaker of the BB#2.
2) Please select[f:finish] :                  ← (*5)
```

*1 Select the BB-ID to be added. Here, select BB#2.
*2 To add the SPARC M12-2S, select "BB itself".
*3 Check that the SPARC M12-2S is not connected to BB#2.
*4 Enter "a" to start the operation of adding the SPARC M12-2S to BB#2.
*5 Do not enter anything until step 4 is complete.

4. **Connect the cables to the SPARC M12-2S to be added.**
   Connect the XSCF BB control cable and crossbar cable to the SPARC M12-2S to be added. If the added SPARC M12-2S will operate as the standby XSCF, also connect the XSCF DUAL control cable.

   After connecting the XSCF BB control cable, XSCF DUAL control cable, and crossbar cable, connect the power cord and start the XSCF. When you have done this, check that the READY LED on the XSCFU is blinking. For details, see the part about the XSCF unit in "2.4.3 LEDs of Each Unit."

Note - For information on the connection of the various cables, see "Appendix A Lists of Cable Connections in a Building Block Configuration."

---

5. **Incorporate the SPARC M12-2S into the building block configuration.**
   When you have the cables and power cord connected to the SPARC M12-2S to be added and the READY LED blinking on the XSCFU, continue the operation of step 3.

   Note that incorporating the SPARC M12-2S into the building block configuration makes the READY LED on the XSCFU stay lit.

```
Please execute the following steps:
1) After the added device is connected with the system,
   please turn on the breaker of the BB#2.
2) Please select[f:finish] :f                              ← (*6)

Waiting for BB#2 to enter install state.
[This operation may take up to 20 minute(s)]
(progress scale reported in seconds)
   0..... 30..... 60..... 90..... 120..... 150..... 180..... 210.....
 240..... 270..... 300..... 330..... 360..... 390..... 420..... 450.....
 480..... 510..... 540..... 570..... 600..... 630. done

Waiting for BB#2 to enter ready state.
[This operation may take up to 45 minute(s)]
(progress scale reported in seconds)
   0..... 30..... 60..... 90..... 120..... 150..... 180..... 210.....
 240.... done

Do you want to start to diagnose BB#2?[s:start|c:cancel] :s  ← (*7)

Diagnostic tests for BB#2 have started.
Initial diagnosis is about to start, Continue?[y|n] :y      ← (*8)
PSB#02-0 power on sequence started.
  0..... 30....end
Initial diagnosis started. [1 / 2] [7200sec]
  0..... 30..... 60..... 90.....120.....150.....180.....210.....240...../
```

```
270.....300.....330....end
Initial diagnosis has completed.
PSB power off sequence started. [1200sec]
  0..... 30..... 60...end
PSB powered off.
PSB#02-0 power on sequence started.
  0..... 30...end
Initial diagnosis started. [2 / 2] [7200sec]
  0..... 30..... 60..... 90.....120.....150.....180.....210.....240...../
270..end
Initial diagnosis has completed.
PSB power off sequence started. [1200sec]
  0..... 30..... 60...end
PSB powered off.
PSB  Test    Fault
---- ------- --------
02-0 Passed Normal
done


------------------------------------------------------------------------------
 Maintenance/Addition Menu
Please select the chassis including added FRU.
No. FRU                 Status
--- ------------------- --------------
 1  /BB#0               Normal
 2  /BB#1               Normal
 3  /BB#2               Normal
 4  /BB#3               Unmount
------------------------------------------------------------------------------
Select [1-4|c:cancel] :c                                           ← (*9)
```

*6 Enter "f" to start the operation of incorporating the SPARC M12-2S into the building block configuration.
*7 Check whether to perform the hardware diagnosis on the added SPARC M12-2S. If the added SPARC M12-2S has a PCIe card mounted, cancel the hardware diagnosis, and temporarily complete the incorporation process. If you cancel the hardware diagnosis, see "10.5.1 Diagnosing the SPARC M12 Hardware" and perform the diagnosis before incorporating the added SPARC M12-2S into the physical partition.
*8 Enter "y" to start the hardware diagnosis.
*9 Enter "c" to end the addfru command.

6. **Check the status of the building block configuration.**
From the master XSCF, check the status of the building block configuration by using the showboards command. If you cancel the hardware diagnosis in step 5, "Unknown" is displayed in the Test column.

```
XSCF> showboards -a -v
PSB  R PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
---- - ------------ ----------- ---- ---- ---- ------- --------
00-0   00(00)       Assigned    y    y    y    Passed  Normal
01-0   00(01)       Assigned    y    y    y    Passed  Normal
02-0   SP           Available   n    n    n    Passed  Normal
```

```
XSCF>
```

7. **Check the hardware configuration information.**
   From the master XSCF, check the hardware configuration of the SPARC M12-2S added to the building block configuration, by using the showhardconf command.

   If there is a hardware error, an asterisk (*) appears in front of the corresponding FRU name. Remove the cause of the error by using the replacefru or other appropriate command, before proceeding with the system operation.

```
XSCF> showhardconf
SPARC M12-2S;
    + Serial:PZ51618004; Operator_Panel_Switch:Locked;
    + System_Power:On; System_Phase:Cabinet Power On;
    Partition#0 PPAR_Status:Running;
    BB#00 Status:Normal; Role:Master; Ver:300ch; Serial:PZ51618004;
        + FRU-Part-Number:CA20369-B17X 003AB/9999999            ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:1101h; Serial:PP16170119  ;
            + FRU-Part-Number:CA07855-D201 A1   /9999999              ;
            + Memory_Size:128 GB; Type: C ;
         :
    BB#01 Status:Normal; Role:Standby; Ver:300ch; Serial:PZ51617007;
        + FRU-Part-Number:CA20369-B17X 003AB/9999999              ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:1101h; Serial:PP1617010X  ;
            + FRU-Part-Number:CA07855-D201 A1   /9999999              ;
            + Memory_Size:128 GB; Type: C ;
         :
    BB#02 Status:Normal; Role:Slave; Ver:300ch; Serial:PZ51617011;
        + FRU-Part-Number:CA20369-B17X 003AB/9999999              ;
        + Power_Supply_System: ;
        + Memory_Size:128 GB;
        CMUL Status:Normal; Ver:1101h; Serial:PP1617010U  ;
            + FRU-Part-Number:CA07855-D201 A1   /9999999              ;
            + Memory_Size:128 GB; Type: C ;
            CPU#0 Status:Normal; Ver:4241h; Serial:00000056;
                + Freq:4.250 GHz; Type:0x30;
                + Core:12; Strand:8;
         :
```

8. **Assign the CPU core resources.**
   Assign the CPU core resources of the added SPARC M12-2S to physical partitions.

   If you cannot assign the CPU core resources, check whether a CPU Activation key is registered. For details, see "Chapter 5 CPU Activation" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

10.4 Incorporating a FRU Into the System

This section describes the following procedures:

- Incorporating the SPARC M12-2S Into a Building Block Configuration
- Incorporating the FANU
- Incorporating the PSU
- Incorporating the XSCFU

10.4.1 Incorporating the SPARC M12-2S Into a Building Block Configuration

This section describes the procedure for incorporating the SPARC M12-2S that has undergone maintenance into a building block configuration. This procedure is done after the one described in "9.6.1 Releasing the SPARC M12-2S From the Building Block Configuration."

Note - This procedure assumes that the cables are connected to the SPARC M12-2S that has undergone maintenance and that the READY LED on the XSCFU is blinking.

1. **Incorporate the SPARC M12-2S.**
   Return to the operation screen of the replacefru command of the XSCF shell, and enter "f".

```
Please execute the following steps:
1) Confirm the XSCF STANDBY LED of BB#0 is not lit.
2) Turn off the breaker of BB#0.
3) Remove BB#0.
4) Execute either the following:
  4-1) After the exchanged device is connected with the system,
       turn on the breaker of BB#0, and please select 'finish'.
  4-2) If you want to suspend the maintenance without exchanging device,
       please select 'cancel'.
[f:finish|c:cancel] :f
```

   The following screen appears when you enter "f". Wait for the processing to finish.

```
Waiting for BB#0 to enter install state.
[This operation may take up to 20 minute(s)]
(progress scale reported in seconds)
    0..... 30..... 60..... 90..... 120..... 150..... 180..... 210.....
  240..... 270..... 300..... 330..... 360..... done

Waiting for BB#0 to enter ready state.
```

```
[This operation may take up to 45 minute(s)]
(progress scale reported in seconds)
   0..... 30..... 60..... 90..... 120..... 150..... 180..... 210.....
 240..... 270..... 300..... done

Do you want to start to diagnose BB#0?[s:start|c:cancel] :
```

2. **Diagnose the hardware of the SPARC M12-2S that has undergone maintenance.**
   When the following message appears, enter "s." If you cancel the diagnosis, Unknown will be displayed under Status in step 4.

```
Do you want to start to diagnose BB#0?[s:start|c:cancel] :s
```

Note - If the CMUL has been replaced, select "c" (cancel) in step 2 to end the replacefru command. Then, confirm that the combination of the CMUL and XSCFU types is correct by using the showhardconf command. After that, run a diagnosis with the testsb command. For details on the showhardconf and testsb commands, see "10.5.1 Diagnosing the SPARC M12 Hardware."

Note - The hardware diagnosis in step 2 does not cover PCIe cards, HDDs/SSDs, and PCI expansion units.
In the following cases, select "c" (cancel) in step 2 to end the replacefru command. Then, run a diagnosis with the testsb command. For details on the testsb command, see "10.5.1 Diagnosing the SPARC M12 Hardware."
- You have performed maintenance on a PCIe card, HDD/SSD, or PCI expansion unit with the SPARC M12-2S released.
- You have performed CMUU, memory, BPU, or PSUBP maintenance in the SPARC M12-2/M12-2S with a PCIe card mounted.

Note - For the XSCF DUAL control cable and the XSCF BB control cable, select "c" (cancel) in step 2.

When the following message appears, check that the diagnosis target is BB#0 and then enter "y" to start the hardware diagnosis.

```
Diagnostic tests for BB#0 have started.
Initial diagnosis is about to start, Continue?[y|n] :y
```

During the hardware diagnosis, the following is displayed to let you check the status of the diagnosis.

```
PSB#00-0 power on sequence started.
  0....end
Initial diagnosis started. [7200sec]
  0..... 30..... 60..... 90.....120.....150.....180.....210.....240...../
270.....300.....330.....360.....390.....420.....450.....480.....510.....-
540.end
```

```
Initial diagnosis has completed.
PSB power off sequence started. [1200sec]
  0..... 30.....end
PSB powered off.
PSB  Test    Fault
---- ------- --------
00-0 Passed  Normal
done
```

3. **Check the hardware diagnosis result.**
   Check that Normal is displayed under Status. Then, enter "f" to finish the maintenance of the SPARC M12-2S.

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Status of the replaced FRU.

FRU                 Status
------------------- --------------
/BB#0               Normal
------------------------------------------------------------------------------
The replacement of BB#0 has completed normally.[f:finish] :f
```

If the displayed status is abnormal (Degrade or Fault), finish the maintenance of the SPARC M12-2S and return to the maintenance start screen. Perform maintenance on the SPARC M12-2S again, and check whether the replaced FRU is correctly mounted.

4. **End the replacefru command.**
   When the maintenance start screen appears, enter "c" to end the replacefru command.

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the chassis including replaced FRU.
No. FRU                 Status
--- ------------------- --------------
1   /BB#0               Normal
2   /BB#1               Normal
3   /BB#2               Normal
4   /BB#3               Normal
------------------------------------------------------------------------------
Select [1-4|c:cancel] :c
XSCF>
```

10.4.2 Incorporating the FANU

This section describes the procedure for incorporating the FANU into the system.

This procedure is done after the faulty FANU is removed, as described in "9.6.2 Releasing the FANU," and the replacement FANU is mounted.

1. **Incorporate the FANU into the system.**
   After mounting the replacement FANU, return to the operation screen of the replacefru command and enter "f".

```
lease execute the following steps:
1) Confirm the Check LED is blinking.
2) Remove BB#0/FANU#0.
3) Execute either the following:
  3-1) After installing the exchanged device, please select 'finish'.
  3-2) If you want to suspend the maintenance without exchanging device,
       please select 'cancel'.
[f:finish|c:cancel] :f
```

   During the incorporation process, the following screen is displayed to let you check the status.

```
Waiting for BB#0/FANU#0 to enter install state.
[This operation may take up to 1 minute(s)]
(progress scale reported in seconds)
   0 done

Initializing for BB#0/FANU#0 have started.
[This operation may take up to 6 minute(s) 30 second(s)]
(progress scale reported in seconds)
   0 done
```

2. **Check the result of incorporating the FANU.**
   Check that Normal is displayed under Status. Then, enter "f" to finish the maintenance of the FANU.

```
-------------------------------------------------------------------------------
Maintenance/Replacement Menu
Status of the replaced FRU.

FRU                  Status
------------------- --------------
/BB#0/FANU#0         Normal
-------------------------------------------------------------------------------
The replacement of BB#0/FANU#0 has completed normally.[f:finish] :f
```

   If the displayed status is abnormal (Degrade or Fault), finish the maintenance of the FANU and return to the maintenance start screen. Perform maintenance on the FANU again, and check whether the FANU is correctly mounted.

3. **End the replacefru command.**
   When the maintenance start screen appears, enter "c" to end the replacefru command.

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the chassis including replaced FRU.

No. FRU                 Status
--- ------------------- --------------
 1  /BB#0               Normal
 2  /BB#1               Unmount
 3  /BB#2               Unmount
 4  /BB#3               Unmount
--------------------------------------------------------------------------------
Select [1-4|c:cancel] :c
```

10.4.3 Incorporating the PSU

This section describes the procedure for incorporating the replacement PSU into the system. This procedure is done after the faulty PSU is removed, as described in "9.6.3 Releasing the PSU," and the replacement PSU is mounted.

1. **Incorporate the PSU into the system.**
   Mount the replacement PSU, and connect the power cord to it. After connecting the power cord, wait for at least 10 seconds. Then, return to the operation screen of the replacefru command and enter "f".

```
Please execute the following steps:
1) Remove BB#0/PSU#0.
2) Execute either the following:
  2-1) After installing the exchanged device, please select 'finish'.
  2-2) If you want to suspend the maintenance without exchanging device,
       please select 'cancel'.
[f:finish|c:cancel] :f
```

   During the incorporation process, the following screen is displayed to let you check the status.

```
Waiting for BB#0/PSU#0 to enter install state.
[This operation may take up to 1 minute(s)]
(progress scale reported in seconds)
   0 done

Diagnostic tests for BB#0/PSU#0 have started.
[This operation may take up to 2 minute(s)]
(progress scale reported in seconds)
   0.....  30.... done
```

2. **Check the result of incorporating the PSU.**
   Check that Normal is displayed under Status. Then, enter "f" to finish the maintenance of the PSU.

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Status of the replaced FRU.

FRU                   Status
-------------------   --------------
/BB#0/PSU#0           Normal
--------------------------------------------------------------------------------
The replacement of BB#0/PSU#0 has completed normally.[f:finish] :f
```

If the displayed status is abnormal (Degrade or Fault), finish the maintenance of the PSU and return to the maintenance start screen. Perform maintenance on the PSU again, and check whether the PSU is correctly mounted.

3. **End the replacefru command.**
When the maintenance start screen appears, enter "c" to end the replacefru command.

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the chassis including replaced FRU.

No. FRU                   Status
--- -------------------   --------------
 1  /BB#0                 Normal
 2  /BB#1                 Unmount
 3  /BB#2                 Unmount
 4  /BB#3                 Unmount
--------------------------------------------------------------------------------
Select [1-4|c:cancel] :c
```

10.4.4 Incorporating the XSCFU

This section describes the procedure for incorporating the replacement XSCFU into the SPARC M12-2S. This procedure is done after the faulty XSCFU is removed, as described in "9.6.4 Releasing the XSCFU," and the replacement XSCFU is mounted.

1. **Incorporate the XSCFU into the system.**
After mounting the replacement XSCFU, wait at least 10 seconds. Then, return to the operation screen of the replacefru command and enter "f".

```
Please execute the following steps:
1) Confirm the XSCF STANDBY LED of BB#0/XSCFU is not lit.
2) Remove BB#0/XSCFU.
3) After installing the exchanged device, please select [f:finish] :f
```

During the incorporation process, the following screen is displayed to let you check the status.

```
Waiting for BB#0/XSCFU to enter install state.
[This operation may take up to 20 minute(s)]
(progress scale reported in seconds)
   0.....  30.....  60.....  90..... 120..... 150..... 180..... 210.....
 240.. Done
Waiting for BB#0/XSCFU to enter ready state.
[This operation may take up to 90 minute(s)]
(progress scale reported in seconds)
   0.....  30.....  60.....  90..... 120..... 150..... 180..... 210.....
 240..... 270..... 300..... 330..... 360..... 390..... 420..... 450.....
 480..... 510..... 540..... 570..... 600..... 630..... 660..... 690.....
 710..... 740..... 770..... 800..... 830..... 860..... 890..... 920.....
 950..... 980.....1010... done
```

2. **Check the result of incorporating the XSCFU.**
   Check that Normal is displayed under Status. Then, enter "f" to finish the maintenance of the XSCFU.

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Status of the replaced FRU.
FRU                 Status
------------------- --------------
/BB#0/XSCFU         Normal
------------------------------------------------------------------------------
Please confirm the error(s) by "showlogs error".
In addition, please confirm the hardware configuration by "showhardconf".
The replacement of BB#0/XSCFU has completed normally.[f:finish] :f
```

If the displayed status is abnormal (Degrade or Fault), finish the maintenance of the XSCFU and return to the maintenance start screen. Perform maintenance on the XSCFU again, and check whether the XSCFU is correctly mounted.

3. **End the replacefru command.**
   When the maintenance start screen appears, enter "c" to end the replacefru command.

```
------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select the chassis including replaced FRU.
No. FRU                 Status
--- ------------------- --------------
 1  /BB#0               Normal
 2  /BB#1               Normal
 3  /BB#2               Unmount
 4  /BB#3               Unmount
------------------------------------------------------------------------------
Select [1-4|c:cancel] :c
XSCF>
```

The action to take if the command does not end normally is as follows.

replacefru failed with [Warning:051] as the response.

The unit cannot be replaced because the XSCF is running as master switching, power-on, reset, or the like is in progress. Wait a moment, and then retry.

replacefru failed with [Warning:042] as the response.
One of the commands listed below is running. Wait for the command to end, and then retry.

- addboard(8)
- addfru(8)
- addpowerschedule(8)
- clearremotepwrmgmt(8)
- deleteboard(8)
- deletepowerschedule(8)
- diagxbu(8)
- flashupdate(8)
- initbb(8)
- ioxadm(8)
- poweroff(8)
- poweron(8)
- rebootxscf(8)
- reset(8)
- restoreconfig(8)
- setcod(8)
- setdate(8)
- setpowerschedule(8)
- setpparmode(8)
- setremotepwrmgmt(8)
- setupfru(8)
- testsb(8)
- setinterimpermit(8)
- sethsmode(8)

While the XSCFU was being replaced, the replacefru command was aborted because the XSCF was rebooted due to an XSCF panic or other cause.
Wait for the XSCF reboot to complete. Then, execute replacefru again to resume the replacement work.

Active replacement of the XSCFU failed because of a defective part (XSCFU).
Prepare a new replacement part (XSCFU) immediately to complete the replacement. If left unfinished, the failed replacement work may have a serious effect on the system.

If you cannot prepare a new replacement part (XSCFU) immediately, release the target SPARC M12-2S from the system by following the procedure below.

1. Shut down Oracle Solaris on all the PPARs and domains.

2. Execute the poweroff -f command to forcibly power off all the PPARs.

3. Remove the power cords of every SPARC M12-2S.

4. Release the target SPARC M12-2S from the system.

5. Install the power cords of every SPARC M12-2S.

During the active replacement of the XSCFU, the physical partition was restarted because the hardware of another SPARC M12-2S failed.
After completing the XSCFU replacement work, execute the showboards command to check the status of the target PSB. If Pwr is y, Conn is n, and Conf is n for the target PSB, restore the system by performing the procedure below.

```
XSCF> showboards -av
PSB  R PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
---- - ------------ ----------- ---- ---- ---- ------- --------
00-0   00(00)       Assigned    y    y    y    Passed  Normal ← PPAR reset
completed
01-0   00(01)       Assigned    y    y    y    Passed  Normal ← PPAR reset
completed
02-0   00(02)       Assigned    y    y    y    Passed  Normal ← PPAR reset
completed
03-0   00(03)       Assigned    y    n    n    Passed  Normal ← During XSCFU
replacement, PPAR configuration is released.
```

Restoration procedure:

1. Shut down Oracle Solaris on all the PPARs and domains.

2. Execute the poweroff -f command to forcibly power off all the PPARs.

3. Remove the power cords of every SPARC M12-2S.

4. Replace faulty parts if any.

5. Install the power cords of every SPARC M12-2S.

10.5 Diagnosing a Replacement FRU

This section describes the diagnosis function for checking whether a replacement FRU is operating normally. For details on the commands, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XCP firmware version used.

- Diagnosing the SPARC M12 Hardware
- Diagnosing the XBU and Crossbar Cable
- Checking the FRU Status After Maintenance

10.5.1 Diagnosing the SPARC M12 Hardware

This section describes the procedure for performing a hardware diagnosis on the SPARC M12.

If the CMUL has been replaced, confirm that the combination of the CMUL and XSCFU types is correct by using the showhardconf command, before performing step (1) or (2) below. For details, see Table 8-2 in "8.1.6 Checking FRU Information."

Select either step (1) or (2) below to perform a hardware diagnosis on the SPARC M12 with the testsb command.
(1) Diagnosing the SPARC M12 by specifying its PSB
(2) Diagnosing all the SPARC M12 units
For a configuration with only one SPARC M12-2 or SPARC M12-2S, either of steps (1) and (2) can be selected for the diagnosis.

<Description of options>
-v: Displays a detailed message on the hardware diagnosis.
-p: Displays the storage connected to the SPARC M12.
-s: Displays the device tree.
-a: Diagnoses all the mounted SPARC M12 units.
If you do not specify -a, you need to specify the PSB of the SPARC M12-2S to be diagnosed.

(1) Diagnosing the SPARC M12 by specifying its PSB

The following example runs the hardware diagnosis on the SPARC M12-2S with PSB 01-0 and checks the I/O connections.

```
XSCF> testsb -v -p -s -y 01-0
Initial diagnosis is about to start, Continue?[y|n] :y
PSB#01-0 power on sequence started.
:
/pci@8500/pci@4/pci@0/pci@0/scsi@0
FCode Version 1.00.56, MPT Version 2.00, Firmware Version 20.00.10.00
Target a
Unit 0 Encl Serv device FUJITSU BBEXP 1303
SASAddress 500000e0e0b0117d PhyNum 14
/pci@8100/pci@4/pci@0/pci@0/scsi@0
FCode Version 1.00.56, MPT Version 2.00, Firmware Version 20.00.10.00
Target a
Unit 0 Disk TOSHIBA AL13SEB600 3703 1172123568 Blocks, 600 GB
SASDeviceName 50000396f8120578 SASAddress 50000396f812057a PhyNum 0
Target b
Unit 0 Disk TOSHIBA AL13SEB600 3703 1172123568 Blocks, 600 GB
SASDeviceName 50000396f8120498 SASAddress 50000396f812049a PhyNum 1
Target c
Unit 0 Encl Serv device FUJITSU BBEXP 1303
SASAddress 500000e0e0b0117d PhyNum 14
:
/pci@8700/pci@4
/pci@8700/pci@4/pci@0
```

```
/pci@8700/pci@4/pci@0/pci@10
/pci@8600/pci@4
/pci@8600/pci@4/pci@0
/pci@8600/pci@4/pci@0/pci@10
/pci@8600/pci@4/pci@0/pci@1
/pci@8500/pci@4
/pci@8500/pci@4/pci@0
/pci@8500/pci@4/pci@0/pci@1
/pci@8500/pci@4/pci@0/pci@0
/pci@8500/pci@4/pci@0/pci@0/scsi@0
/pci@8500/pci@4/pci@0/pci@0/scsi@0/disk
/pci@8500/pci@4/pci@0/pci@0/scsi@0/tape
/pci@8400/pci@4
/pci@8400/pci@4/pci@0
/pci@8400/pci@4/pci@0/pci@1
/pci@8400/pci@4/pci@0/pci@0
/pci@8400/pci@4/pci@0/pci@0/network@0,1
/pci@8400/pci@4/pci@0/pci@0/network@0
:
{0} ok
PSB power off sequence started. [1200sec]
0..... 30..... 60..end
PSB powered off.
PSB Test Fault
---- ------- --------
01-0 Passed Normal
XSCF>
```

(2) Diagnosing all the SPARC M12 units

The following example runs the hardware diagnosis on all the connected SPARC M12 units and checks the I/O connections.

```
XSCF> testsb -v -p -s -a -y
Initial diagnosis is about to start, Continue?[y|n] :y
PSB power on sequence started.
    :
/pci@8500/pci@4/pci@0/pci@0/scsi@0
FCode Version 1.00.56, MPT Version 2.00, Firmware Version 20.00.07.00
Target a
  Unit 0   Encl Serv device   FUJITSU  BBEXP            1303
  SASAddress 500000e0e0b0103d  PhyNum 14
/pci@8100/pci@4/pci@0/pci@0/scsi@0
FCode Version 1.00.56, MPT Version 2.00, Firmware Version 20.00.07.00
Target a
  Unit 0   Disk   TOSHIBA  AL13SEB600AL14SE 3702 1172123568   Blocks, 600 GB
  SASDeviceName 50000397682141a1  SASAddress 50000397682141a2 PhyNum 0
Target b
  Unit 0   Disk   TOSHIBA  AL13SEB600AL14SE 3702 1172123568   Blocks, 600 GB
  SASDeviceName 5000039768215115  SASAddress 5000039768215116 PhyNum 1
Target c
  Unit 0   Encl Serv device   FUJITSU  BBEXP            1303
  SASAddress 500000e0e0b0103d  PhyNum 14
    :
```

```
/pci@8700/pci@4
/pci@8700/pci@4/pci@0
/pci@8700/pci@4/pci@0/pci@10
/pci@8600/pci@4
/pci@8600/pci@4/pci@0
/pci@8600/pci@4/pci@0/pci@10
/pci@8600/pci@4/pci@0/pci@1
/pci@8600/pci@4/pci@0/pci@10/pci@0
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@8
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@1
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@0
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0/pci@11
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0/pci@10
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0/pci@1
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0/pci@0
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@11
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@10
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@1
/pci@8600/pci@4/pci@0/pci@10/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@0
    :
{0} ok
-----------------------------------------------------------------------------
---
[PCIBOX Versions]
  PCIBOX                        Ver         Link                          Ver
      Info
  PCIBOX#1001                   1307        BB#00-PCI#03                  1307
      equal
-----------------------------------------------------------------------------
---
[PCIBOX Informations]
Location                      Type        FW Ver       Serial Num        Part
Num
                                    State
PCIBOX#1001                   PCIBOX      -            2121231001
                                    On
PCIBOX#1001/PSU#0             PSU         -            FEJD1212000616
CA01022-0750-D/                              On
PCIBOX#1001/PSU#1             PSU         -            FEJD1212000621
CA01022-0750-D/                              On
PCIBOX#1001/IOB               IOBOARD     1310         PP123701KU
CA20365-B66X 009AH                           On
PCIBOX#1001/LINKBD            BOARD       -            PP140801ZC
CA20365-B60X 009AD/7061035                   On
PCIBOX#1001/FANBP             FANBP       -            PP1229015U
CA20365-B68X 004AC                           On
BB#00-PCI#03                  CARD        1310         PP13490468
```

```
CA20365-B59X 012AD/9999999                    On
-----------------------------------------------------------------------------
---
PSB power off sequence started. [1200sec]
  0..... 30..... 60..end
PSB powered off.
PSB Test Fault
---- ------- --------
00-0 Passed Normal
```

10.5.2 Diagnosing the XBU and Crossbar Cable

This section describes the procedure for diagnosing the XBU and crossbar cable in a building block configuration.

<Description of options>
-b: Specify the BB-ID of the released SPARC M12-2S (communication source).
-t: Specify the BB-ID of the released SPARC M12-2S (communication destination).
-p: Specify the PPAR-ID (communication destination).

(1) Communication destination PPAR is running (active addition)

The following execution example diagnoses the XBU and crossbar cable between the SPARC M12-2S of BB#1 and the SPARC M12-2S operating in PPAR#0.

```
XSCF> diagxbu -y -b 01 -p 0
XBU diagnosis is about to start, Continue?[y|n] :y
Power on sequence started. [7200sec]
0..... 30..... 60..... 90..end
XBU diagnosis started. [7200sec]
0..... 30..... 60..... 90.....120.....150.....180.....210.....240.....|
270.....300.....330.....360.....390.....420...end
completed.
Power off sequence started. [1200sec]
0..... 30..... 60..... 90.....120end
completed.
*Note*
Please confirm the error of XBU by "showlogs error".
In addition, please confirm the degraded of XBU by "showstatus".
```

(2) Incorporation destination PPAR is stopped (inactive addition)

The following execution example diagnoses the XBU and crossbar cable between the SPARC M12-2S of BB#3 and the SPARC M12-2S of BB#1 and BB#2 contained in PPAR#1, which is the incorporation destination.

```
XSCF> showpcl -p 1
PPAR-ID LSB PSB Status
01 Powered Off
00 01-0
```

```
01 02-0
XSCF> diagxbu -y -b 03 -t 01 -t 02
XBU diagnosis is about to start, Continue?[y|n] :y
Power on sequence started. [7200sec]
  0..... 30..... 60..... 90.....120end
XBU diagnosis started. [7200sec]
  0..... 30..... 60..... 90.....120end
completed.
Power off sequence started. [1200sec]
  0..... 30..... 60..... 90.....120end
completed.
*Note*
Please confirm the error of XBU by "showlogs error".
In addition, please confirm the degraded of XBU by "showstatus".
```

The hardware diagnosis that is run during the execution of the replacefru command does not cover the crossbar cable. If you have released the SPARC M12-2S from the building block configuration by using the replacefru command, wait until the replacefru command ends, and then diagnose the crossbar cable by using the diagxbu command.

10.5.3 Checking the FRU Status After Maintenance

This section describes the procedure for confirming that the FRU is operating normally after the completion of maintenance.

1. **Log in to the XSCF shell.**
2. **Check the hardware status.**
   The following execution example checks the result output by the showstatus command. If the hardware is normal, the command displays nothing.

```
XSCF> showstatus
XSCF>
```

3. **Confirm that no error is displayed.**
   In the following execution example, the showlogs command is entered with the error option to check that no error has occurred in the target SPARC M12-2/M12-2S since the start of maintenance.

```
XSCF> showlogs error
```

4. **Check the hardware configuration.**
   Enter the showhardconf command to check that the replacement FRU has been incorporated into the system. If there is an error, an asterisk (*) appears at the beginning of the line on which the corresponding FRU name is shown.

   If the XSCFU has been replaced, confirm that the combination of the XSCFU and CMUL types is correct. For details, see Table 8-2 in "8.1.6 Checking FRU Information."

```
XSCF> showhardconf
SPARC M12-2S;
    + Serial:PZ51649002; Operator_Panel_Switch:Service;
    + System_Power:On; System_Phase:Cabinet Power On;
    Partition#0 PPAR_Status:Running;
    BB#00 Status:Normal; Role:Master; Ver:3015h; Serial:PZ51649002;
        + FRU-Part-Number:CA20369-B17X 005AC/7341758              ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:2101h; Serial:PP164804GG  ;
            + FRU-Part-Number:CA07855-D301 A5   /7341541              ;
            + Memory_Size:128 GB; Type: C ;
            CPU#0 Status:Normal; Ver:4242h; Serial:00070051;
                + Freq:4.250 GHz; Type:0x30;
                + Core:12; Strand:8;
            MEM#00A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04E6E;
                + Type:83; Size:16 GB;
            MEM#01A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04ED1;
                + Type:83; Size:16 GB;
            MEM#02A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C0510D;
                + Type:83; Size:16 GB;
            MEM#03A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04F51;
                + Type:83; Size:16 GB;
            MEM#04A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04E6F;
                + Type:83; Size:16 GB;
            MEM#05A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04F50;
                + Type:83; Size:16 GB;
            MEM#06A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04EFB;
                + Type:83; Size:16 GB;
            MEM#07A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C051AE;
                + Type:83; Size:16 GB;
        CMUU Status:Normal; Ver:2101h; Serial:PP164804GN  ;
            + FRU-Part-Number:CA07855-D451 A4   /7341568              ;
            + Memory_Size:128 GB; Type: C ;
            CPU#0 Status:Normal; Ver:4242h; Serial:00070043;
                + Freq:4.250 GHz; Type:0x30;
                + Core:12; Strand:8;
            MEM#00A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04EF7;
                + Type:83; Size:16 GB;
            MEM#01A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C051AB;
                + Type:83; Size:16 GB;
            MEM#02A Status:Normal;
                + Code:ce8002M393A2K40BB1-CRC    00-31C04EFD;
                + Type:83; Size:16 GB;
            MEM#03A Status:Normal;
```

```
            + Code:ce8002M393A2K40BB1-CRC    00-31C04ED2;
            + Type:83; Size:16 GB;
        MEM#04A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EF6;
            + Type:83; Size:16 GB;
        MEM#05A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04F57;
            + Type:83; Size:16 GB;
        MEM#06A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EAC;
            + Type:83; Size:16 GB;
        MEM#07A Status:Normal;
            + Code:ce8002M393A2K40BB1-CRC    00-31C04EA8;
            + Type:83; Size:16 GB;
    PCI#0 Name_Property:network;
        + Vendor-ID:8086; Device-ID:1521;
        + Subsystem_Vendor-ID:108e; Subsystem-ID:7b18;
        + Model:SUNW,pcie-igb;
    PCI#2 Name_Property:network;
        + Vendor-ID:8086; Device-ID:1528;
        + Subsystem_Vendor-ID:108e; Subsystem-ID:7b15;
        + Model:ATO:7070007, PTO:7070005;
    PCI#4 Name_Property:network;
        + Vendor-ID:8086; Device-ID:10fb;
        + Subsystem_Vendor-ID:108e; Subsystem-ID:7b11;
        + Model:X1109a-z/1109a-z;
    PCI#6 Name_Property:QLGC,qlc;
        + Vendor-ID:1077; Device-ID:2532;
        + Subsystem_Vendor-ID:1077; Subsystem-ID:015d;
        + Model:QLE2562 ;
    XBU#0 Status:Normal; Ver:1101h; Serial:PP164601DU  ;
        + FRU-Part-Number:CA20369-B18X 004AB/7341570              ;
        + Type: C ;
    XBU#1 Status:Normal; Ver:1101h; Serial:PP164601DV  ;
        + FRU-Part-Number:CA20369-B18X 004AB/7341570              ;
        + Type: C ;
    XSCFU Status:Normal; Ver:0101h; Serial:PP164603JA  ;
        + FRU-Part-Number:CA20369-B08X 006AC/7341765              ;
        + Type: A ;
    OPNL Status:Normal; Ver:0101h; Serial:PP164702EE  ;
        + FRU-Part-Number:CA20365-B35X 006AC/7060922              ;
        + Type: A ;
    PSUBP Status:Normal; Ver:1101h; Serial:PP164603HH  ;
        + FRU-Part-Number:CA20369-B17X 005AC/7341758              ;
        + Type: C ;
    PSU#0 Status:Normal; Ver:303242h; Serial:HWCD1622000551;
        + FRU-Part-Number:CA01022-0850/7334651      ;
        + Power_Status:ON; AC:200 V; Type: C ;
    PSU#1 Status:Normal; Ver:303242h; Serial:HWCD1622000586;
        + FRU-Part-Number:CA01022-0850/7334651      ;
        + Power_Status:ON; AC:200 V; Type: C ;
    PSU#2 Status:Normal; Ver:303242h; Serial:HWCD1622000524;
        + FRU-Part-Number:CA01022-0850/7334651      ;
        + Power_Status:ON; AC:200 V; Type: C ;
    PSU#3 Status:Normal; Ver:303242h; Serial:HWCD1622000496;
```

```
            + FRU-Part-Number:CA01022-0850/7334651      ;
            + Power_Status:ON; AC:200 V; Type: C ;
        FANU#0 Status:Normal; Type: C ;
        FANU#1 Status:Normal; Type: C ;
        FANU#2 Status:Normal; Type: C ;
        FANU#3 Status:Normal; Type: C ;
        FANU#4 Status:Normal; Type: C ;
        FANU#5 Status:Normal; Type: C ;
        FANU#6 Status:Normal; Type: C ;
        FANU#7 Status:Normal; Type: C ;
        HDDBP Status:Normal; Type: A ;
XSCF>
```

10.6 Incorporating the SPARC M12-2S or an I/O Device Into the PPAR

This section describes the following procedures:

- Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR
- Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function

10.6.1 Incorporating the SPARC M12-2S Into the Physical Partition Using PPAR DR

The operation described in this section is available only with the SPARC M12-2S.

1. **Log in to the XSCF shell.**
2. **Incorporate the SPARC M12-2S into the physical partition.**
   The following execution example incorporates the SPARC M12-2S of BB#00 into PPAR-ID#0 by using the addboard command.

```
XSCF> addboard -y -c configure -p 0 00-0
PSB#00-0 will be configured into PPAR-ID 0. Continue?[y|n] :y
Start connecting PSB to PPAR. [3600sec]
  0..... 30..../
PSU On (BB#00)
. 60...../
CMU Reset Start (BB#00)
 90.-
XB Reset 1 (BB#00)
...\
XB Reset 2 (BB#00)
.120.|
XB Reset 3 (BB#00)
```

```
....150.....180.....210.....240...../
270....-
CPU Reset 1 (BB#00)
.300.....330|
CPU Reset 2 (BB#00)
.....360.....390..\
Reset released (BB#00)
..
POST Sequence Start (BB#00)
.420.....450.....480.....510.
POST Sequence Complete (BB#00)
..end
Connected PSB to PPAR.
Start configuring PSB to Logical Domains (LDoms) Manager. [1800sec]
  0|
Processing of the incoming DR request by the LDoms Manager is pendingIncoming
DR request is being processed by the LDoms ManagerDR sequence started
(sequence#=4, message#=2)
DR sequence finished (sequence#=4, message#=2)
../
Processing of the incoming DR request by the LDoms Manager is pendingIncoming
DR request is being processed by the LDoms ManagerDR sequence started
(sequence#=5, message#=6)
../
Restoring primary succeeded, PCIE16 was assigned
. 30.
Restoring primary succeeded, PCIE17 was assigned
....-
Restoring primary succeeded, PCIE18 was assigned
 60..../
Restoring primary succeeded, PCIE19 was assigned
. 90
Restoring primary succeeded, PCIE20 was assigned
../
Restoring primary succeeded, PCIE21 was assigned
...120.
Restoring primary succeeded, PCIE22 was assigned
.
Restoring primary succeeded, PCIE23 was assigned
...150.-
Restoring primary succeeded, 24 core(s) were assigned
....180.....210..-
Restoring primary succeeded, 163208757248 byte memory were assigned
DR sequence finished (sequence#=5, message#=6)
end
Configured PSB to Logical Domains (LDoms) Manager.
Operation has completed.
```

Note - During the maintenance using PPAR DR, you cannot restore CPU socket constraints even if you execute the addboard command with bind=resource specified in the operation mode option (-m option). Set the constraints again using the ldm command. For details on CPU socket constraints, see "8.14 Managing Logical Domain Resources Associated with CPU Sockets" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and*

Administration Guide and the *Oracle VM Server for SPARC Reference Manual* of the version used. If resource assignments other than the CPU constraints cannot be restored, use the ldm command as well to set them again.

3. **Execute the showresult command to check the end status of the previously executed addboard command.**
   If the end code is not 0, the addboard command ended abnormally. Eliminate the cause of the failure, and then execute the addboard command again.

   In the following example, "0" is returned as the end status, so you can see that the execution of the addboard command has completed correctly.

```
XSCF> showresult
0
```

Note - For information on the action to take if the addboard command ends abnormally, see "Appendix C Meanings of Messages and Corresponding Corrective Action" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

4. **Check the PSB configuration of the physical partition.**
   The following example executes the showboards command to check that PSB#00-0 (BB#00) has been added to PPAR-ID#00 and is running normally.

```
XSCF> showboards -a
PSB  PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
---- ------------ ----------- ---- ---- ---- ------- --------
00-0 00(00)       Assigned    y    y    y    Passed  Normal
01-0 00(01)       Assigned    y    y    y    Passed  Normal
02-0 00(02)       Assigned    y    y    y    Passed  Normal
03-0 00(03)       Assigned    y    y    y    Passed  Normal
```

5. **Check the hardware status.**
   The following execution example checks the result output by the showstatus command. If the hardware is normal, the command displays nothing.

```
XSCF> showstatus
XSCF>
```

6. **Check the hardware configuration.**
   Enter the showhardconf command to check that the replacement FRU has been incorporated into the system. If there is an error, an asterisk (*) appears at the beginning of the line on which the corresponding FRU name is shown.

```
XSCF> showhardconf
```

Hereinafter, perform the procedure described in "10.7 Incorporating I/O Resources Into a Logical Domain" to assign I/O resources to logical domains.

If you have replaced a FRU with the SPARC M12-2S released from the building block configuration, return the I/O configuration of the logical domains to the state it was in before maintenance.
If you have added the SPARC M12-2S to the building block configuration, assign the CPU resources, memory resources, and I/O resources as appropriate for the system configuration of the logical domains.

10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function

This section describes the flow of the procedure for incorporating an I/O device by using the hot plug function.
To use the hot plug function, the hotplug service of Oracle Solaris must be enabled. Check the status of the hotplug service. If it is disabled, perform the following step to enable the service. You can use the hot plug function only on the control domain and root domain.

```
# svcs hotplug ← If the STATE is disabled, enable the service.
# svcadm enable hotplug ← Enables the hotplug service.
```

For details on cfgadm used here, see "Dynamically Configuring Devices" in the *Managing Devices in Oracle Solaris* for the Oracle Solaris version used.

Note - To perform maintenance on a PCIe card by using the hot plug function, see "Appendix B Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu SPARC M12 PCI Card Installation Guide* to check whether the card can use PCI Hot Plug.

When incorporating a PCIe card

Install a PCIe card in the target PCI slot, and perform the following procedure to incorporate it into a logical domain.

1. **Log in to Oracle Solaris.**
   Log in to the logical domain (control domain or root domain) into which the target PCIe card will be incorporated.

   The following steps are not necessary when you are replacing the PCIe card.

   When adding a PCIe card, see the following example of the command executed to blink the ATTENTION LED of the PCI slot into which the PCIe card will be mounted.

```
# cfgadm -x led=attn,mode=blink BB#0-PCI#0 (*1)
#
```

*1 The ATTENTION LED on BB#0-PCI#0 is blinking.

2. **Mount the PCIe card in the SPARC M12-2/M12-2S.**
Mount the PCIe card in the SPARC M12-2/M12-2S by using the procedure described in "Chapter 12 Maintaining PCIe Cards."

3. **From Oracle Solaris, check the mounting status of the PCIe card.**
The following example checks that the PCIe card is mounted in BB#0-PCI#0.

```
# cfgadm -a
Ap_Id                   Type         Receptacle   Occupant     Condition
BB#0-PCI#0              unknown      disconnected unconfigured unknown
```

4. **Supply power to the mounted PCIe card.**
The following example executes the cfgadm command with the connect option in Oracle Solaris on the control domain or root domain, to start power supply to the PCIe card mounted in BB#0-PCI#0.

```
# cfgadm -c connect BB#0-PCI#0
#
```

5. **Incorporate the PCIe card into the logical domain.**
The following example executes the cfgadm command with the configure option in Oracle Solaris on the control domain or root domain, to incorporate the PCIe card mounted in BB#0-PCI#0 into the Oracle Solaris device configuration.

```
# cfgadm -c configure BB#0-PCI#0
#
```

6. **Confirm that the PCIe card has been incorporated into the device configuration.**
The following example executes the cfgadm command with the -a option in Oracle Solaris on the control domain or root domain, to confirm that the PCIe card mounted in BB#0-PCI#0 has been incorporated into the Oracle Solaris device configuration.

```
# cfgadm -a
Ap_Id                   Type         Receptacle   Occupant     Condition
BB#0-PCI#0              pci-pci/hp   connected    configured   ok
```

7. **Turn off the ATTENTION LED.**
The following example turns off the ATTENTION LED of BB#-PCI#0.

```
# cfgadm -x led=attn,mode=off BB#0-PCI#0
#
```

Hereinafter, assign the I/O resources of the PCIe card to the guest domain or I/O domain. Assign the I/O resources as appropriate for the I/O configuration of the target logical domain, by referencing "10.7 Incorporating I/O Resources Into a Logical Domain."

Note - Dynamic reconfiguration of the PCIe endpoint device is supported by the combination of XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later.

When incorporating the HDD/SSD

1. **Log in to Oracle Solaris.**
   Log in to the logical domain (control domain or root domain) into which the HDD/SSD will be incorporated.
2. **Mount the HDD/SSD in the SPARC M12-2/M12-2S.**
   Mount the HDD/SSD in the SPARC M12-2/M12-2S, by using the procedure described in "Chapter 15 Maintaining Internal Storage."

   After mounting the HDD/SSD, wait until the READY LED on the HDD/SSD starts to blink and then comes on.
3. **Check the status of the mounted HDD/SSD.**
   In Oracle Solaris on the control domain or root domain, execute the cfgadm command with the -al option to check the status of the mounted HDD/SSD. If the HDD/SSD has failed to be incorporated and configured is not shown, perform step 4.

   The following example checks that the HDD/SSD whose Ap_Id is c2::dsk/c2t500003294281B50C6d0 is mounted.

```
# cfgadm -al
Ap_Id                          Type      Receptacle Occupant    Condition
         :
c2                             scsi-sas  connected  configured   unknown
c2::dsk/c2t50000394281B50C6d0  disk      connected  configured   unknown
c2::es/ses0                    ESI       connected  configured   unknown
c2::smp/expd0                  smp       connected  configured   unknown
c3                             scsi-sas  connected  unconfigured unknown
c4                             scsi-sas  connected  unconfigured unknown
c5                             fc        connected  unconfigured unknown
c6                             fc        connected  unconfigured unknown
c7                             scsi-sas  connected  unconfigured unknown
         :
```

4. **Incorporate the mounted HDD/SSD into Oracle Solaris.**
   a. The following example executes the cfgadm command with the -c configure option in Oracle Solaris on the control domain or root domain, to incorporate the mounted HDD/SSD into the Oracle Solaris device configuration.

```
# cfgadm -c configure <Ap_Id>
```

b. Execute the cfgadm command with the -al option to check that the mounted HDD/SSD is recognized in the Oracle Solaris device configuration.

5. **Check that the mounted HDD/SSD's CHECK LED is turned off.**
   Execute the cfgadm command to turn off the mounted HDD/SSD's CHECK LED if the CHECK LED is still blinking.

```
# cfgadm -x led=fault,mode=off <Ap_Id>
```

Hereinafter, assign the I/O resources of the HDD/SSD to the guest domain or I/O domain. Assign the I/O resources of the HDD/SSD as appropriate for the disk configuration of the target logical domain.

10.7 Incorporating I/O Resources Into a Logical Domain

This section describes the procedure for incorporating I/O resources into a logical domain. When restoring the I/O configuration of a logical domain after maintenance work or reconfiguring the I/O configuration of a logical domain after adding or removing a hardware resource, perform this procedure as appropriate for the system environment of the logical domain.
For details on the procedure and the commands used, see "3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*, as well as the *Oracle VM Server for SPARC Administration Guide* and *Oracle VM Server for SPARC Reference Manual* of the version used.

Note - If you have replaced the CMUL in a system with the HDD having a hardware RAID configuration, you need to re-enable the hardware RAID volume. For details, see "14.2.11 Re-enabling a Hardware RAID Volume" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

10.7.1 Incorporating the Root Complex Into the Control Domain or Root Domain

The work procedure varies depending on whether dynamic PCIe bus assignment is used. For details, see Table 10-1.

Table 10-1 Procedure for Incorporating the Root Complex

-: Unnecessary

Item	Task	Command	Dynamic PCIe Bus Assignment Used (*1)	Dynamic PCIe Bus Assignment Not Used)
1	Setting the delayed reconfiguration mode for the logical domain into which the root complex is incorporated	ldm start-reconf <*domain-name*>	-	Necessary
2	Incorporating the root complex into the logical domain	ldm add-io <*bus*> <*domain-name*>	Necessary	Necessary
3	Restarting Oracle Solaris on the control domain or root domain that is set for delayed reconfiguration	shutdown -i6 -g0 -y	-	Necessary

*1 Dynamic reconfiguration of the root complex is supported by the combination of XCP 2240 or later and Oracle VM Server for SPARC 3.2 or later. In addition, the control domain must be running Oracle Solaris 11.2 SRU 11.2.8 or later.

1. **Set the delayed reconfiguration mode for the logical domain into which the root complex is incorporated.**
   From Oracle Solaris on the control domain, set the delayed reconfiguration mode for the logical domain into which the root complex is incorporated. In this example, the delayed reconfiguration mode is set for the control domain.

   Note that this step is not necessary when Dynamic PCIe bus assignment is used.

```
primary# ldm start-reconf primary
Initiating a delayed reconfiguration operation on the primary domain.
All configuration changes for other domains are disabled until the primary
domain reboots, at which time the new configuration for the primary domain
will also take effect.
primary#
```

2. **Incorporate the root complex into the logical domain.**
   In this example, the root complex of PCIE10 is incorporated into the control domain. If the root complex is incorporated in another logical domain, execute the remove-io subcommand so that the target root complex is not incorporated in any logical domain.

```
primary# ldm add-io PCIE10 primary
primary#
```

3. **Restart Oracle Solaris on the control domain or root domain for which the delayed reconfiguration mode has been set.**

Restart Oracle Solaris on the control domain or root domain for which the delayed reconfiguration mode has been set.

In this example, Oracle Solaris on the control domain is restarted.

Note that this step is not necessary when the root complex has been assigned to the logical domain using dynamic PCIe bus assignment.

```
primary# shutdown -i6 -g0 -y
```

Note - If the delayed reconfiguration mode is set for the control domain, the ldm command cannot be used for any logical domain other than the control domain. When you have set the delayed reconfiguration mode for the control domain, restart the control domain immediately after changing the control domain setting.

10.7.2 Incorporating the Root Complex Into the Stopped Root Domain

Incorporate the physical I/O device (root complex) released from the root domain into the stopped root domain.

Table 10-2 Procedure for Incorporating the Root Complex Into the Stopped Root Domain

Item	Task	Command
1	Assigning the physical I/O device (root complex) to the root domain	ldm add-io
2	Starting the root domain	ldm start-domain

The procedure for statically reconfiguring a root complex is described below.

1. **Reassign the I/O device (PCIe root complex) released from the root domain to the root domain.**

```
# ldm add-io <root complex name> <root domain name>
```

2. **Start the root domain.**
   This step is unnecessary when the root complex is reconfigured dynamically.

```
# ldm start-domain <root domain name>
```

10.7.3 Incorporating the PCIe Endpoint Into the Logical Domain

A PCIe card that is a PCIe endpoint is incorporated into the control domain or the root domain just after replacement by the PCI Hot Plug function or other means. After releasing the PCIe endpoint from the root domain, assign it to the logical domain.
Note that the procedure for assigning the PCIe endpoint differs depending on whether it is performed dynamically or statically. For details, see Table 10-3.

Table 10-3 Procedure for Incorporating the PCIe Endpoint

-: Unnecessary

Item	Task	Command	Assigned Dynamically (*1)	Assigned Statically
1	Setting the delayed reconfiguration mode for the control domain or root domain to which the PCIe endpoint is assigned	ldm start-reconf <*domain-name*>	-	Necessary
2	Releasing a PCIe endpoint	ldm remove-io <*name*> <*domain-name*>	Performed	Performed
3	Restarting Oracle Solaris on the control domain or the root domain from which the PCIe endpoint has been released	**For the control domain** shutdown -i6 -g0 -y **For the root domain** ldm stop-domain -r <*domain-name*>	-	Necessary
4	Incorporating the released PCIe endpoint into the logical domain	ldm add-io <*name*> <*domain-name*>	Performed	Performed

*1 Dynamic reconfiguration of the PCIe endpoint device is supported by the combination of XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later.

The hotplug service needs to be enabled both in the I/O domain to which the PCIe endpoint will be assigned and in Oracle Solaris on the control domain or the root domain from which the PCIe endpoint will be released. Enable the hotplug service by using the following command.

```
# svcadm enable hotplug
```

1. **Set the delayed reconfiguration mode for the control domain or root domain.**
   Set the delayed reconfiguration mode for the control domain or root domain to which the PCIe endpoint is assigned. In this example, the delayed reconfiguration mode is set for the control domain. This step is not necessary when you change the configuration dynamically.

```
primary# ldm start-reconf primary
```

2. **Release the PCIe endpoint from the control domain or the root domain.**
   This example releases the PCIe endpoint of /BB1/PCI5 from the control domain.

```
primary# ldm remove-io /BB1/PCI5 primary
```

3. **Restart Oracle Solaris on the control domain or the root domain from which the PCIe endpoint has been released.**
   This step is not necessary when you release the PCIe endpoint dynamically.

```
# shutdown -i6 -g0 -y
```

4. **Incorporate the PCIe endpoint into the logical domain.**
   This example incorporates the PCIe endpoint of /BB1/PCI5 into the logical domain guest.

   When setting the delayed reconfiguration mode for the logical domain guest, do so before incorporating the PCIe endpoint.

```
# ldm add-io /BB1/PCI5 guest
```

10.7.4 Incorporating the SR-IOV Virtual Function

For the procedure for creating the SR-IOV virtual function, see Table 10-4.

Table 10-4 Procedure for Incorporating the SR-IOV Virtual Function (VF)

-: Unnecessary

Item	Task	Command	Dynamic SR-IOV Function Used	Static SR-IOV Function Used
1	Checking whether the SR-IOV virtual function can be created	ldm list-io		
2	Setting the delayed reconfiguration mode for the control domain or root domain to which the physical function (PF) of SR-IOV is assigned	ldm start-reconf <*domain-name*>	-	Necessary
3	Creating the SR-IOV virtual function	ldm create-vf <*pf_name*>	Necessary	Necessary
4	Confirming that the SR-IOV virtual function was created	ldm list-io		
5	Restarting Oracle Solaris on the control domain or service domain for which the delayed reconfiguration mode has been set	**For the control domain** shutdown -i6 -g0 -y **For the root domain** ldm stop-domain -r <*domain-name*>	-	Necessary
6	Stopping the logical domain to which the SR-IOV virtual function is assigned	ldm stop-domain <*domain-name*>	-	Necessary
7	Assigning the SR-IOV virtual function to a logical domain	ldm add-io <*vf_name*> <*domain_name*>	Necessary	Necessary
8	Starting the logical domain to which the SR-IOV virtual function was assigned	ldm start-domain <*domain-name*>	-	Necessary
9	Confirming that the SR-IOV virtual function is assigned to the logical domain	ldm list-io		

1. **Check whether the SR-IOV virtual function can be created.**
   This example checks that the SR-IOV virtual function can be created with the PCIe card mounted in PCI#5 of BB#00.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
----                                        ----   ---      ------    ------
 :
/BB0/PCI5/IOVNET.PF0                        PF     PCIE3    primary
^^^^^^^^^^^^^^^^^^^^^^^^^^^^
/BB0/PCI5/IOVNET.PF1                        PF     PCIE3    priamry
/BB0/PCI5/IOVNET.PF2                        PF     PCIE3    primary
/BB0/PCI5/IOVNET.PF3                        PF     PCIE3    primary
 :
primary#
```

2. **Set the delayed reconfiguration mode for the control domain or root domain to which the physical function (PF) of SR-IOV is assigned.**
In this example, the delayed reconfiguration mode is set for the control domain.

```
primary# ldm start-reconf primary
```

3. **Create the SR-IOV virtual function.**
Create the SR-IOV virtual function in Oracle Solaris on the control domain.

This example creates the SR-IOV virtual function with the PCIe card mounted in PCI#5 of BB#00.

```
primary# ldm create-vf /BB0/PCI5/IOVNET.PF0
```

4. **Confirm that the SR-IOV virtual function was created.**
This example confirms the SR-IOV virtual function created in step 3 in Oracle Solaris on the control domain.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
----                                        ----   ---      ------    ------
 :
/BB0/PCI5/IOVNET.PF0.VF0                    VF     PCIE3
primary#
```

5. **Restart Oracle Solaris on the control domain or service domain for which the delayed reconfiguration mode has been set.**
In this example, the control domain is restarted.

```
primary# shutdown -i6 -g0 -y
```

6. **Stop the logical domain to which the SR-IOV virtual function is assigned.**
This example stops logical domain guest to which the SR-IOV virtual function is assigned.

```
primary# ldm stop-domain guest
```

7. **Assign the SR-IOV virtual function to a logical domain.**
This example assigns the SR-IOV virtual function created in step 3 to the logical domain guest in Oracle Solaris on the control domain.

```
primary# ldm add-io /BB0/PCI5/IOVNET.PF0.VF0 guest
```

8. **Start the logical domain to which the SR-IOV virtual function was assigned.**
This example starts logical domain guest.

```
primary# ldm start-domain guest
```

9. **Confirm that the SR-IOV virtual function is assigned to the logical domain.**
   This example confirms that the SR-IOV virtual function created in step 3 is assigned to the logical domain guest.

```
primary# ldm list-io
NAME                                        TYPE   BUS      DOMAIN    STATUS
----                                        ----   ---      ------    ------
 :
/BB0/PCI5/IOVNET.PF0.VF0                    VF     PCIE3   guest
primary#
```

10.7.5 Incorporating Virtual I/O Devices Into a Logical Domain

This section describes the procedure for incorporating a virtual I/O device into a logical domain.
For details on how to set the virtual service, see "3.2.12 Setting the Default Services" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

1. **Check the virtual service.**
   This example checks that the virtual service is set in Oracle Solaris on the control domain.

```
primary# ldm list-services
 :
VSW
    NAME         LDOM         MACADDRESS          NET-DEV   DVID|PVID|VIDs
    ----         ----         ----------          -------   --------------
    primary-vsw  primary      00:14:4f:f9:00:e8   net0      1|1|--
VDS
    NAME         LDOM         VOLUME        OPTIONS   MPGROUP        DEVICE
    primary-vds  primary      vol                                    /dev/
zvol/dsk/rpool/guest
primary#
```

2. **Incorporate virtual devices into a logical domain.**
   This example incorporates virtual network device vnet0 and virtual disk vdisk0 into the logical domain guest in Oracle Solaris on the control domain.

```
primary# ldm add-vnet vnet0 primary-vsw guest
primary# ldm add-vdisk vdisk0 vol@primary-vds guest
```

3. **Confirm that the virtual devices are incorporated in the logical domain.**
   This example confirms that virtual network device vnet0 and virtual disk vdisk0

are incorporated in the logical domain guest.

```
primary# ldm list-bindings guest
NAME STATE FLAGS CONS VCPU MEMORY UTIL NORM UPTIME
guest inactive ------4 8G
UUID
d1055960-a4d0-4650-89ae-ae741b9fa2b8
 :
VARIABLES
auto-boot?=false
boot-device=vdisk0
NETWORK
NAME SERVICE ID DEVICE MAC MODE PVID VID MTU MAXBW LINKPROP
vnet0 primary-vsw0 0 00:14:4f:f8:48:67
DISK
NAME VOLUME TOUT ID DEVICE SERVER MPGROUP
vdisk0 vol0@primary-vds0 0
```

10.8 Powering on a Physical Partition

This section describes the procedure for powering on a physical partition.

1. **Switch the mode switch on the OPNL to Locked mode.**
   In a building block configuration connecting multiple SPARC M12-2S units, switch the mode switch to Locked mode on the SPARC M12-2S units that house the master XSCF and the standby XSCF, respectively.

2. **Check the operation status of the physical partition.**
   Log in to the XSCF shell, and check the operation status of the physical partition by using the showpparstatus command.

   This example checks that PPAR-ID#00 is powered off.

```
XSCF> showpparstatus -a
PPAR-ID PPAR Status
00          Powered Off
XSCF>
```

3. **Power on the physical partition.**
   From the XSCF shell, execute the poweron command to power on the physical partition.

   This example powers on PPAR-ID#0.

```
XSCF> poweron -p 0
```

4. **Check the operation status of the physical partition.**
   Check the operation status of the physical partition. This example checks that

PPAR-ID#00 is running.

```
XSCF> showpparstatus -a
PPAR-ID PPAR Status
00          Running
XSCF>
```

For details on the operation status, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XSCF firmware version used.

10.9 Starting the System

This section describes the procedure for starting all the physical partitions of the system.

You can start the system in the following two ways:

- Starting the System With an XSCF Command
- Starting the System From the OPNL

10.9.1 Starting the System With an XSCF Command

This procedure assumes that you start the system from a remote location or in some other environment where you cannot check the status with the LEDs.
For details on the commands used here, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XSCF firmware version used.

1. **Check the operation status of the physical partitions.**
   Log in to the XSCF shell, and check the operation status of the physical partition by using the showpparstatus command.

   This example checks that PPAR-ID#00 and PPAR-ID#01 are powered off.

```
XSCF> showpparstatus -a
PPAR-ID PPAR Status
00              Powered Off
01              Powered Off
XSCF>
```

2. **Power on all the physical partitions.**
   From the XSCF shell, enter the poweron command. In this example, the poweron command is entered for all the physical partitions and "y" is entered for the confirmation query.

```
XSCF> poweron -a
PPAR-IDs to power on:00,01
Continue? [y|n] :y
00 : Powering on
01 : Powering on

*Note*
This command only issues the instruction to power-on.
The result of the instruction can be checked by the
 "showpparprogress".
XSCF>
```

The showpparprogress command lets you check the power-on status of the physical partitions. For details, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* of the XSCF firmware version used.

3. **Check the operation status of all the physical partitions.**
   From the XSCF shell, execute the showpparstatus command to check the status of the physical partitions.

   This example checks that PPAR-ID#00 and PPAR-ID#01 are running.

```
XSCF> showpparstatus -a
PPAR-ID PPAR Status
00           Running
01           Running
XSCF>
```

4. **Execute the fmadm faulty command on the logical domains where an error was detected to confirm that no errors remain.**

```
# fmadm faulty
```

If any error remains, see "Appendix L How to Clear Hardware Error Information in Oracle Solaris Administration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide* and execute the fmadm command to clear the error.

10.9.2 Starting the System From the OPNL

This procedure assumes that you start the system in a server room or other environment where you can directly check the LEDs of the SPARC M12-2/M12-2S. For information on the LEDs you check here, see "2.4 Understanding the LED Indications."

1. **Check the LEDs on the OPNL.**
   See the OPNL to check that its POWER LED is off and that its XSCF STANDBY LED is on.

2. **Check the mode switch on the OPNL.**

Check that the mode switch on the OPNL is set to Locked. In a building block configuration connecting multiple SPARC M12-2S units, set the mode switch to Locked on the SPARC M12-2S units that house the master XSCF and the standby XSCF, respectively.

3. **Press the POWER switch on the OPNL to start the system.**
   Press the POWER switch on the SPARC M12-2/M12-2S that houses the master XSCF. The command to start the system is issued when you hold down the POWER switch for more than 1 second and less than 4 seconds.

   For details, see "2.3.2 OPNL Control Function."

Note - For a building block configuration, press down the POWER switch on the master chassis. The POWER switches on the other chassis are disabled.

---

4. **Check the operation status of the system.**
   See the POWER LED on the OPNL to check the operation status. When the POWER LED turns on, it means that the system is running. Note that, in a building block configuration connecting multiple SPARC M12-2S units, the POWER LED for each physical partition turns on or blinks individually.

5. **Execute the fmadm faulty command on the logical domains where an error was detected to confirm that no errors remain.**

```
# fmadm faulty
```

   If any error remains, see "Appendix L How to Clear Hardware Error Information in Oracle Solaris Administration" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide* and execute the fmadm command to clear the error.

Chapter 11

Maintaining the XSCF Unit

This section describes the maintenance procedures for the XSCFU mounted in the SPARC M12-2/M12-2S.

Note - The hot replacement of the XSCFU is possible only in a building block configuration connecting multiple SPARC M12-2S units. When maintaining the XSCFU in a configuration using only one SPARC M12-2 or SPARC M12-2S, remove the power cord and perform system-stopped/cold replacement.

11.1 Maintenance Precautions

Note the following points when you maintain the XSCFU.

- Do not replace the XSCFU and the PSUBP at the same time. If the XSCFU and the PSUBP are replaced at the same time, the system may fail to operate normally.
- Do not mount and use any of the following SD cards in the XSCFU in another chassis:
  - the one currently mounted in the SPARC M12-2/M12-2S, or
  - one that was once used as a maintenance part

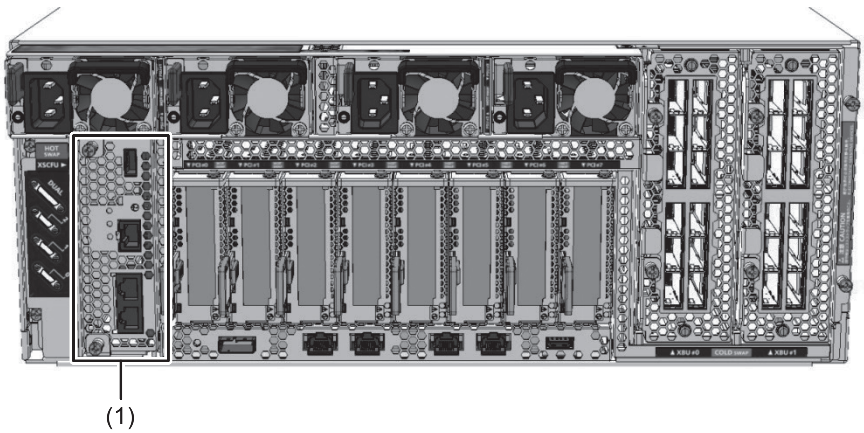
  This is because these SD cards store device identification information.

- If you replace the SD card along with the XSCFU, dispose of the SD card mounted on the old XSCFU by appropriate means such as cutting it with cutting pliers. The old SD card stores the user information, IP address, and other information set in the XSCF firmware.

11.2 Location of the XSCFU

The XSCFU is mounted at the rear of the SPARC M12-2/M12-2S. Figure 11-1 shows the mounting location of the XSCFU.

Figure 11-1 Location of the XSCFU



Location No.	Unit
1	XSCF unit (XSCFU)

11.3 Before Maintenance on the XSCFU

When replacing the XSCFU with the server in the hot state, perform one of the maintenance procedures listed below.

[When replacing the XSCFU with the server in the hot state]
- 4.1.1 Active/Hot Replacement Workflow of the XSCFU
- 4.3.1 Inactive/Hot Replacement Workflow of the XSCFU
- 4.5.1 System-Stopped/Hot Replacement Workflow of the XSCFU

[When replacing the XSCFU with the server in the cold state]

- 4.2.1 Active/Cold Replacement Workflow of the XSCFU
- 4.4.1 Inactive/Cold Replacement Workflow of the XSCFU
- 4.6.1 System-Stopped/Cold Replacement Workflow of the XSCFU

Note that, when replacing the XSCFU with the server in the cold state, you cannot replace the XSCFU and PSUBP at the same time. That would cause the system to malfunction.

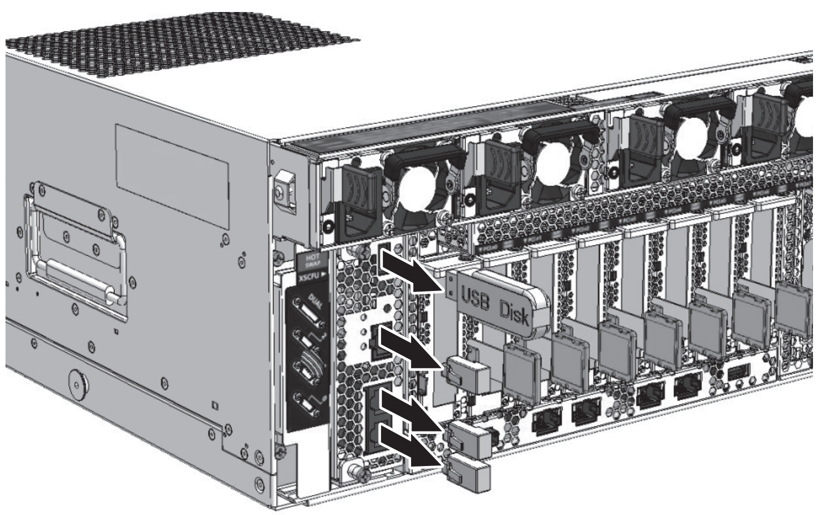
Caution - Before you handle any unit, be sure to wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be seriously damaged. For details, see "1.5 Precautions on Static Electricity."

11.4 Removing the XSCFU

This section describes the procedure for removing the XSCFU.

1. **Remove the LAN cables, USB memory, and other components connected to the XSCFU.**
   Remove the LAN cable, serial cable, and USB memory from the XSCFU.

Figure 11-2 Removing Cables and USB Memory



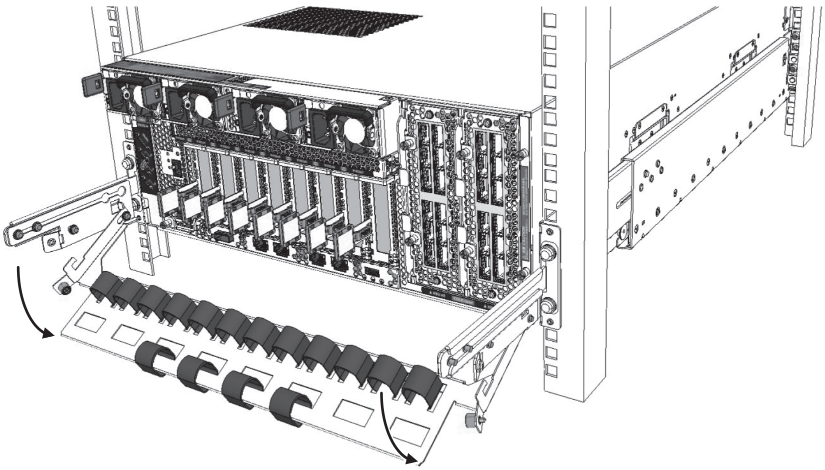
Note - When removing the XSCFU of the SPARC M12-2S in a building block configuration, do not remove the power cord, XSCF DUAL control cable, or XSCF BB control cable.

2. **Lower the cable support.**
Loosen the screws securing the cable support, and then pull out the cable support to lower it.

For details on handling the cable support, see "9.8.1 Lowering the Cable Support."

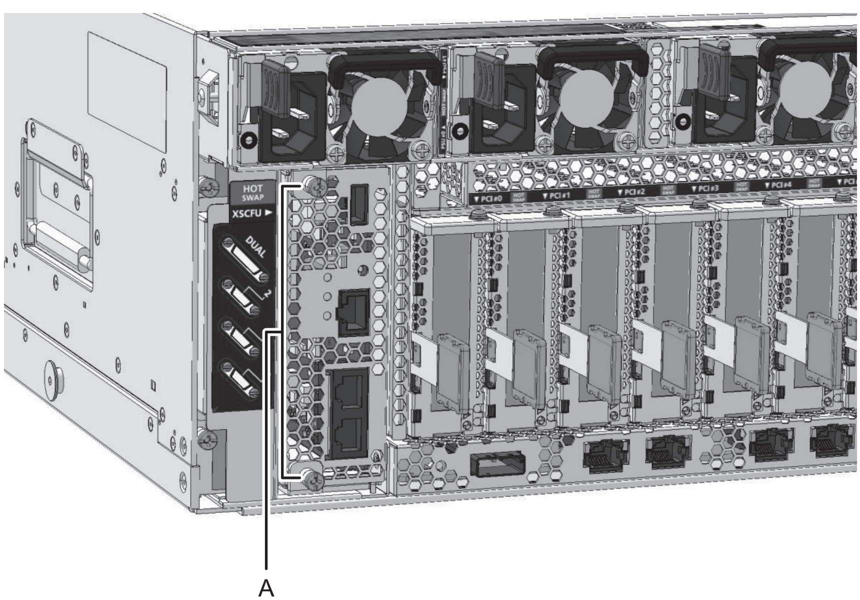
If the cable support is not installed, this work is not required. Proceed to step 3.

Figure 11-3 Lowering the Cable Support



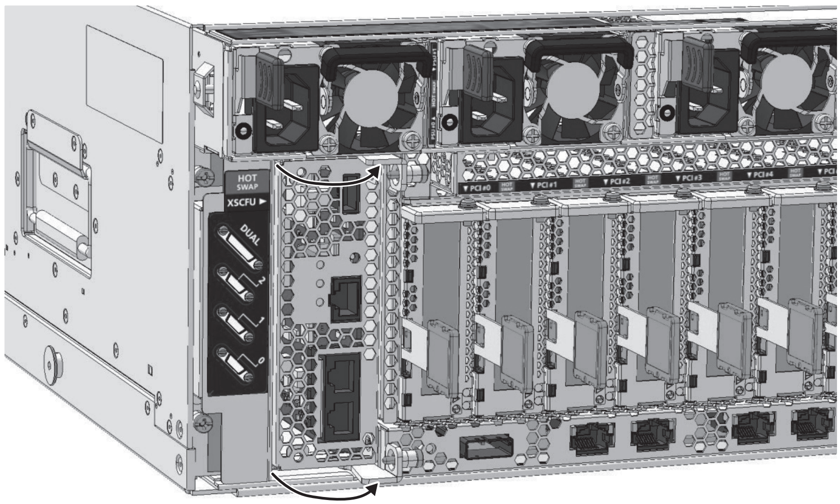
3. **Release the XSCFU.**
Loosen the two fixing screws (A in Figure 11-4) of the XSCFU to release the levers.

Figure 11-4 Locations of the Fixing Screws in the Levers



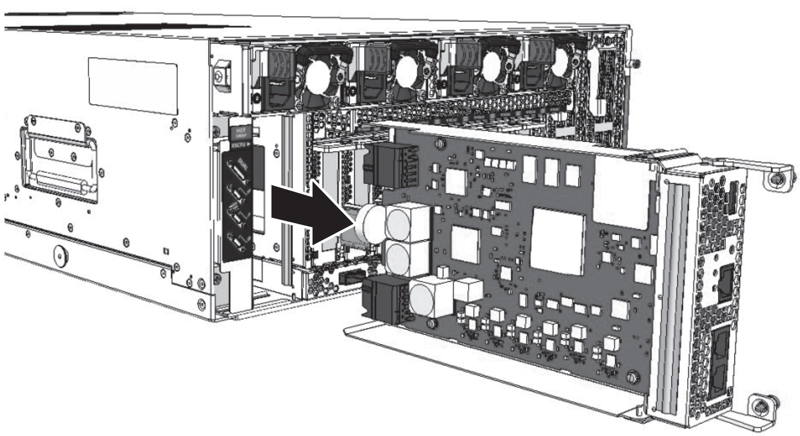
4. **Disconnect the XSCFU from the BPU.**
   Open the two levers of the XSCFU to the right to disconnect it from the BPU.

Figure 11-5 Disconnecting the Connector of the XSCFU



5. **Remove the XSCFU.**
   Remove the XSCFU with its levers open.

Figure 11-6 Removing the XSCFU



11.5 Switching an SD Card

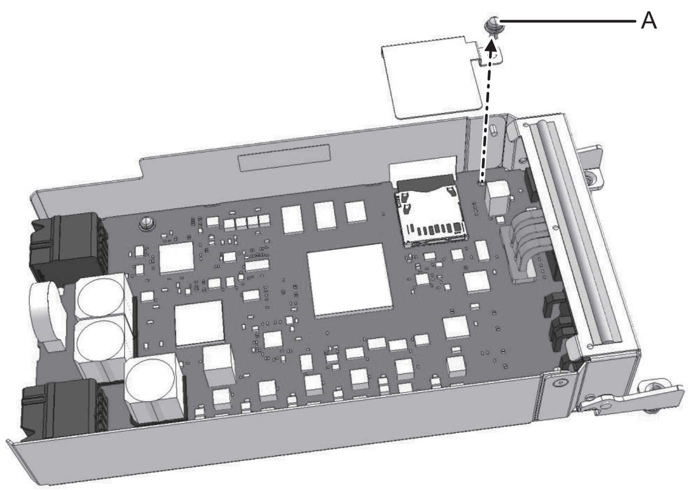
This section describes the procedure for switching the SD card mounted in the XSCFU. When you do not switch the SD card, skip this work and perform the work described in "11.6 Installing the XSCFU."

Note - After switching the SD card, return the SD card that is installed in the replacement XSCFU. Install the card in the faulty XSCFU, and return both the card and the unit together.

11.5.1 Removing an SD Card

1. **Remove the SD card protection cover.**
   Remove the fixing screw (A in Figure 11-7) of the protection cover, and remove the cover from the XSCFU.

Figure 11-7 Removing the SD Card Protection Cover

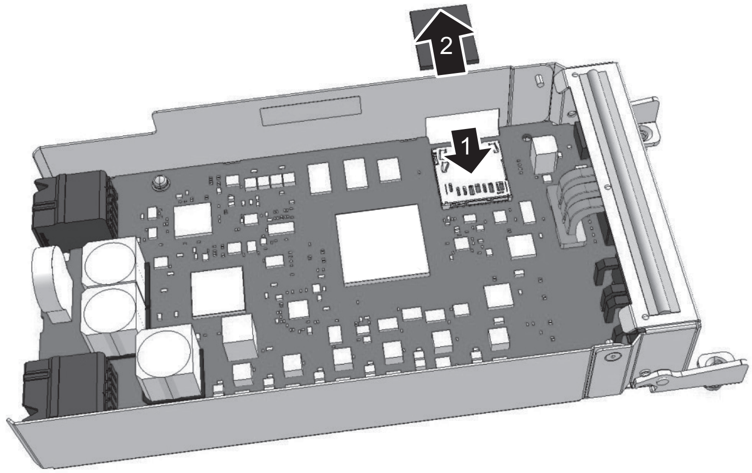


Note - Be careful not to drop the fixing screw of the protection cover onto the board. Also, store the protection cover and the fixing screw in a safe place.

---

2. **Remove the SD card.**
   Release the lock by pressing the SD card (1 in Figure 11-8), and then remove the card from the XSCFU (2 in Figure 11-8).

Figure 11-8 Removing the SD Card

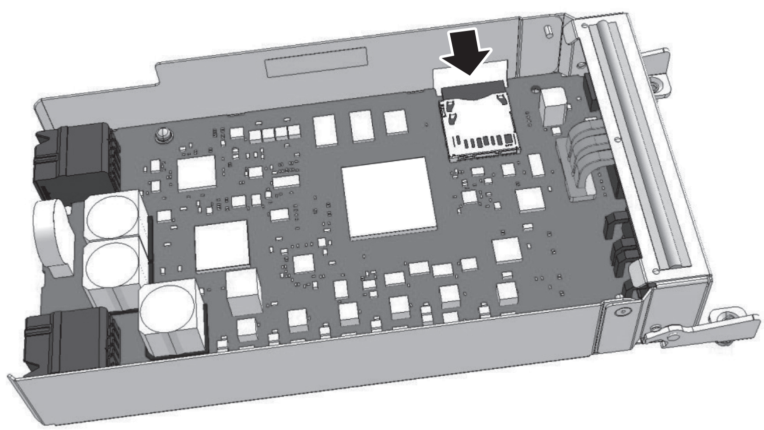


Note - Be careful not to mix up the removed SD card with the SD card installed in the replacement part.

11.5.2 Installing an SD Card

1. **Install an SD card.**
   Insert the SD card in which the XSCF firmware to be used is installed into the socket of the XSCFU. Secure the SD card by pushing it until its latch locks into place.

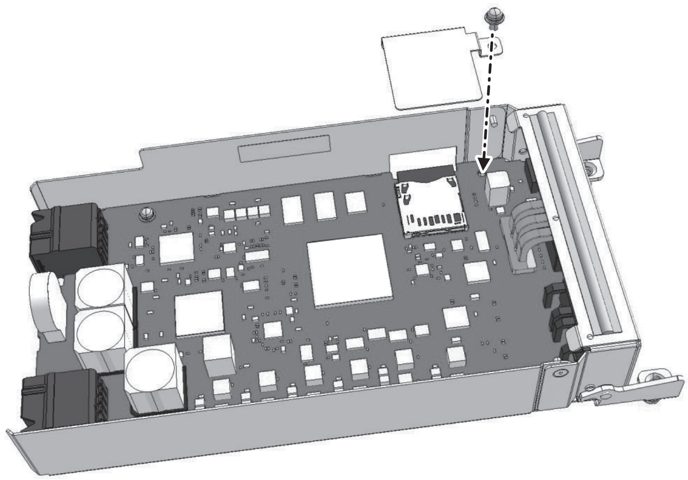
Figure 11-9 Installing the SD Card



Caution - Be careful not to damage the SD card connector by pushing in the SD card too hard.

2. **Install the SD card protection cover.**
   Install the protection cover on the XSCFU, and secure it with the screw.

Figure 11-10 Installing the SD Card Protection Cover



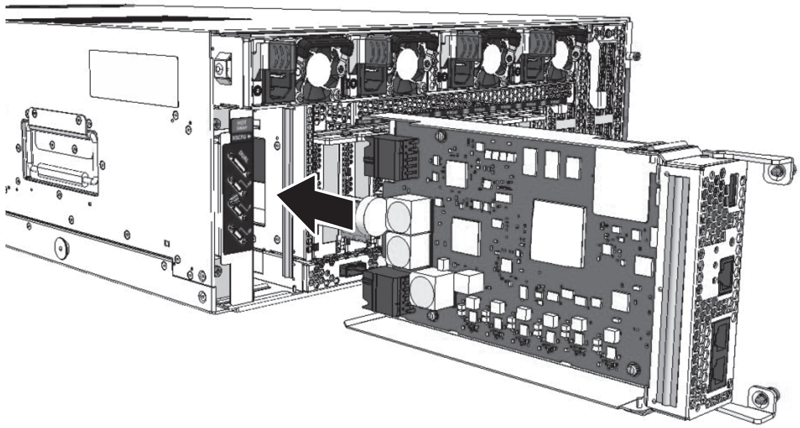
Note - Be sure to install the SD card protection cover. The SD card protection cover prevents the lock of the SD card from being released due to a fault in the SD card socket, which makes you unable to remove the XSCFU.

11.6 Installing the XSCFU

This section describes the procedure for installing the XSCFU in the SPARC M12-2/ M12-2S.

1. **Insert the XSCFU.**
   Insert the XSCFU into the server with the XSCFU levers open.

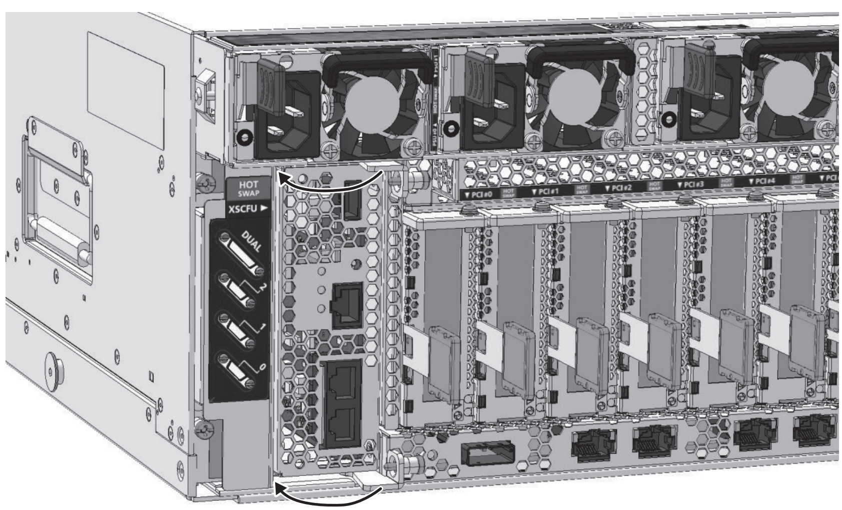
Figure 11-11 Inserting the XSCFU Into the Server



Caution - When inserting the XSCFU into the server, make sure that no cable or other foreign matter is caught between the two units. If so, the connector may be damaged.

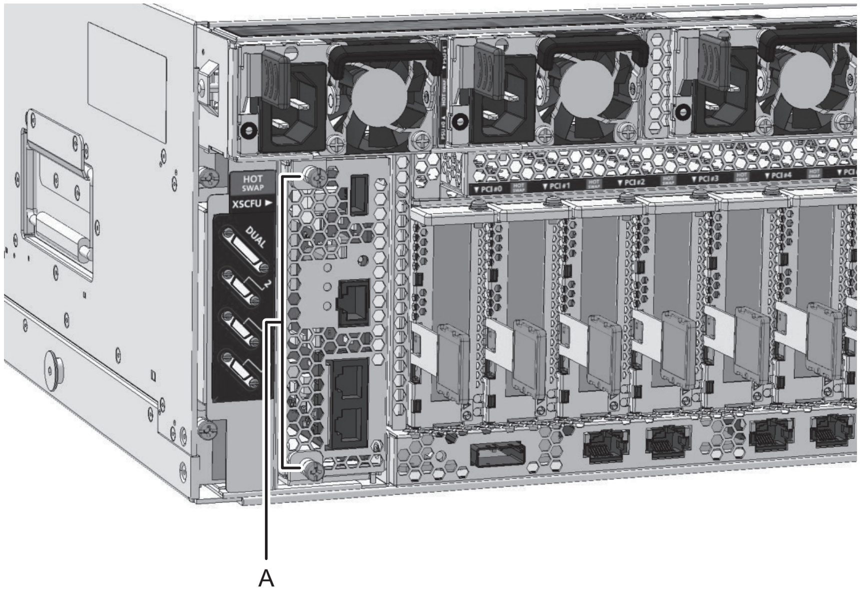
2. **Connect the XSCFU to the BPU.**
   Close the XSCFU levers to connect the XSCFU to the BPU.

Figure 11-12 Connector Connection of the XSCFU and BPU



3. **Secure the XSCFU.**
   Tighten the fixing screws in the levers (A in Figure 11-13) to secure the XSCFU.

Figure 11-13 Securing the XSCFU to the BPU



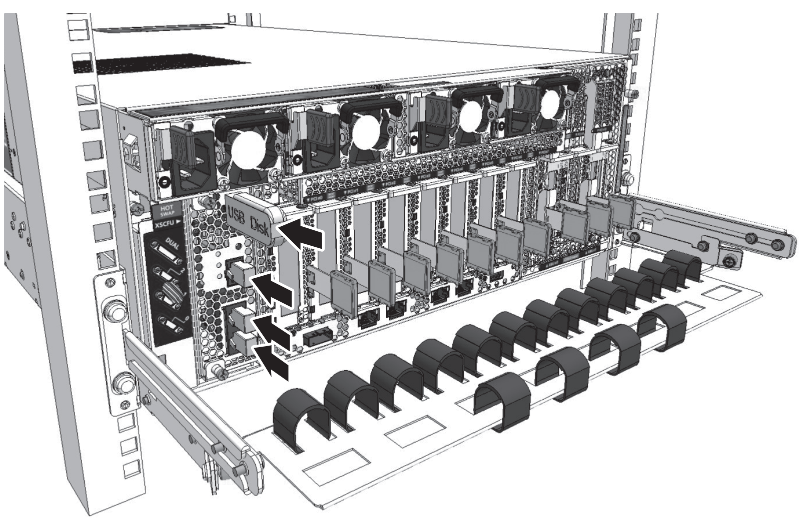
Note - Be sure to secure the levers of the XSCFU by tightening the screws. Securing the levers by tightening the screws prevents poor connection between the XSCFU and BPU.

---

4. **Connect the LAN cables and other components to the XSCFU.**
   Connect the LAN cables to the XSCFU to return it to the state it was in before the maintenance work. Then, return the cable support to its original position.

   This completes the installation of the XSCFU.

Figure 11-14 Returning to the Pre-Maintenance State



11.7 Checking the XCP Firmware Version

This section describes the procedure for checking the XCP firmware version after XSCFU maintenance work.
The XCP firmware version may be different from that before XSCFU replacement. It must match the pre-replacement version.

1. **Log in to the XSCF, and confirm that the XCP firmware version is the same as before XSCFU replacement.**
   If "XCP version of XSCF and Back-Panel mismatched!" is displayed at login to the XSCF, perform steps 2 and later to match the XCP firmware version because the version is not the same after XSCFU replacement.

   If it is not displayed, no work to match the pre-replacement version is necessary. Proceed to step 5.

```
password:*****
XCP version of XSCF and Back-Panel mismatched!
XSCF=XCP3060, Back-Panel=XCP3062.
XSCF>
```

2. **If the XCP firmware version is not the same, execute the getflashimage -l command to check whether the XCP image file of the version before XSCFU replacement is saved on the replacement XSCFU.**
   If not saved, import the XCP image file.

   The following example imports the XCP image file of the version before XSCFU replacement.

```
XSCF> getflashimage -l
Existing versions:
        Version                 Size  Date
        BBXCP3060.tar.gz   107650264  Thu Aug 06 08:54:02 JST 2020
XSCF> getflashimage file:///media/usb_msd/xxxx/BBXCP3062.tar.gz
```

3. **If the XCP firmware version is different from that before XSCFU replacement, execute the flashupdate -c update command to match the version.**
   The XCP firmware version will be matched to the Back-Panel version (the version before XSCFU replacement).

```
XSCF> flashupdate -c update -m xcp -f -s 3062
The XSCF will be reset. Continue? [y|n] :y
XCP update is started. [3600sec]
  0..... 30..... 60..... 90.....120.....150.....180.....210.....240.....
270.....300.....330.....360.....390.....420.....450.....480.....510.....
```

4. **Execute the showlogs monitor command, and check for the "XCP update has been completed" message. The displayed message indicates the completion**

of the XCP firmware update.

```
XSCF> showlogs monitor
Mar 15 15:29:34 SPARCM12 Event: SCF:XCP update is started (XCP version=3062:
last version=3060)
 :
Mar 15 16:08:31 SPARCM12 Event: SCF:XCP update has been completed (XCP
version=3062: last version=3060)
```

5. **Execute the version command, and confirm that the XCP firmware version is correct.**

```
XSCF> version -c xcp
BB#00-XSCF#0 (Master)
XCP0 (Current): xxxx
XCP1 (Reserve): xxxx
```

11.8 Checking the XCP Firmware Version (Building Block Configuration)

This section describes the procedure for checking the XCP firmware version after XSCFU maintenance work.
In a SPARC M12-2S building block configuration, the version must match the XCP version on each chassis.

1. **Log in to the XSCF, and confirm that the XCP firmware version is the same as before XSCFU replacement.**
   If the XCP firmware version is different between the maintenance part and the existing system, the message "XSCF firmware update now in progress. BB#xx, please wait for XSCF firmware update complete." appears at login to the XSCF. Then, the XCP firmware version will be automatically matched.

```
Password: *****
XSCF firmware update now in progress. BB#00,
please wait for XSCF firmware update complete.
XSCF>
```

   The version matching takes about 50 minutes.

   If the above message appears, execute the showlogs monitor, and check for the "XCP firmware version synchronization completed" message. The message indicates the completion of XCP firmware matching. Then, perform the work below.

```
XSCF> showlogs monitor
Sep 7 14:51:43 SPARCM12 Event: SCF:XCP firmware version synchronization
started
Sep 7 14:51:43 SPARCM12 Event: SCF:XSCF firmware update is started (BB#00)
Sep 7 14:51:43 SPARCM12 Information: /BB#00/XSCFU:SCF:SCF Diagnosis initialize
 RTC (*1)
Sep 7 14:51:43 SPARCM12 Alarm: :SCF:Gaps between BB-ID (*2)
Sep 7 14:51:44 SPARCM12 Event: SCF:XSCF ready
Sep 7 15:28:25 SPARCM12 Event: SCF:Standby XSCF Ready(BB#00)
 :
Sep 7 15:40:17 SPARCM12 Event: SCF:XSCF update has been completed (BBID=0,
bank=0)
Sep 7 15:40:18 SPARCM12 Event: SCF:XCP update has been completed (XCP
version=3080:last version=3090)
Sep 7 15:40:18 SPARCM12 Event: SCF:XSCF firmware update has been completed
(BB#00)
Sep 7 15:40:18 SPARCM12 Event: SCF:XCP firmware version synchronization
completed
```

*1 If the "SCF:SCF Diagnosis initialize RTC" message appears, ignore the message.
*2 f the "SCF:Gaps between BB-ID" message appears, ignore the message.

2. **Execute the version command to check the firmware version on all SPARC M12-2S units.**
   The versions of all the XCP firmware are displayed.

   In a building block configuration, you can check the Master/Standby versions.

   Confirm that the XCP firmware version on each SPARC M12-2S unit is the same as the master XSCF version.

   If they are the same, steps 3 and later are not necessary. If they are not the same, perform steps 3 and later.

```
XSCF> version -c xcp
BB#00-XSCF#0 (Master)
XCP0 (Current): xxxx
XCP1 (Reserve): xxxx
BB#01-XSCF#0 (Standby)
XCP0 (Current): xxxx
XCP1 (Reserve): xxxx
BB#02-XSCF#0
XCP0 (Current): xxxx
XCP1 (Reserve): xxxx
BB#03-XSCF#0
XCP0 (Reserve): xxxx
XCP1 (Current): xxxx
```

3. **If the XCP firmware version is not the same, execute the getflashimage -l command to check whether the XCP image file of the version before XSCFU replacement is saved on the master XSCF.**
   If not saved, import the XCP image file.

The following example imports the XCP image file of the version before XSCFU replacement.

```
XSCF> getflashimage -l
Existing versions:
        Version                 Size  Date
        BBXCP3060.tar.gz   107650264  Thu Aug 06 08:54:02 JST 2020
XSCF> getflashimage file:///media/usb_msd/xxxx/BBXCP3062.tar.gz
```

4. **Execute the flashupdate -c sync command to match the XCP firmware version on each SPARC M12-2S unit.**
   The XCP firmware version will be matched to the master XSCF version.

```
XSCF> flashupdate -c sync
XCP update is started. [3600sec]
0..... 30..... 60..... 90.....120.....150.....180.....210.....240.....
Ò70.....300.....330.....360.....390.....420.....450.....480.....510.....
```

5. **Execute the showlogs monitor command, and check for the "XCP update has been completed" message. The displayed message indicates the completion of the XCP firmware update.**

```
XSCF> showlogs monitor
Sep 8 13:39:31 SPARCM12 Event: SCF:XCP update is started (XCP version=3080:
last version=3080)
Sep 8 13:41:55 SPARCM12 Event: SCF:Updating XCP:Preparing to update XSCF
(BBID=1, bank=1)
Sep 8 13:42:20 SPARCM12 Event: SCF:Updating XCP:Updating XSCF (BBID=1, XSCF
version=03080000)
Sep 8 13:46:35 SPARCM12 Event: SCF:Updating XCP:XSCF updated (BBID=1, bank=1)
Sep 8 13:46:35 SPARCM12 Event: SCF:Updating XCP:XSCF bank has changed (BBID=1,
 bank=1, XCP version=3080:last version=3090)
Sep 8 13:52:32 SPARCM12 Event: SCF:Standby XSCF Ready(BB#01)
Sep 8 13:53:16 SPARCM12 Event: SCF:Updating XCP:Preparing to update XSCF
(BBID=1, bank=0)
Sep 8 13:53:39 SPARCM12 Event: SCF:Updating XCP:Updating XSCF (BBID=1, XSCF
version=03080000)
Sep 8 13:57:35 SPARCM12 Event: SCF:Updating XCP:XSCF updated (BBID=1, bank=0)
Sep 8 13:58:22 SPARCM12 Event: SCF:Updating XCP:Preparing to update CMU
(BBID=1)
Sep 8 13:58:24 SPARCM12 Event: SCF:Updating XCP:Updating CMU (BBID=1, CMU
version=03080000)
Sep 8 14:02:34 SPARCM12 Event: SCF:Updating XCP:CMU updated (BBID=1)
Sep 8 14:03:16 SPARCM12 Event: SCF:XCP update has been completed (XCP
version=3080:last version=3080)
```

6. **Execute the version command, and confirm that the XCP firmware version on each SPARC M12-2S unit is correct.**

```
XSCF> version -c xcp
BB#00-XSCF#0 (Master)
XCP0 (Current): xxxx
XCP1 (Reserve): xxxx
BB#01-XSCF#0 (Standby)
XCP0 (Current): xxxx
XCP1 (Reserve): xxxx
BB#02-XSCF#0
XCP0 (Current): xxxx
XCP1 (Reserve): xxxx
BB#03-XSCF#0
XCP0 (Reserve): xxxx
XCP1 (Current): xxxx
```

Chapter 12

Maintaining PCIe Cards

This chapter describes the maintenance procedures for the PCIe cards mounted in the SPARC M12 and the PCI expansion unit.

- Locations of PCIe Cards
- Before Maintenance on a PCIe Card
- Removing a PCIe Card
- Installing a PCIe Card

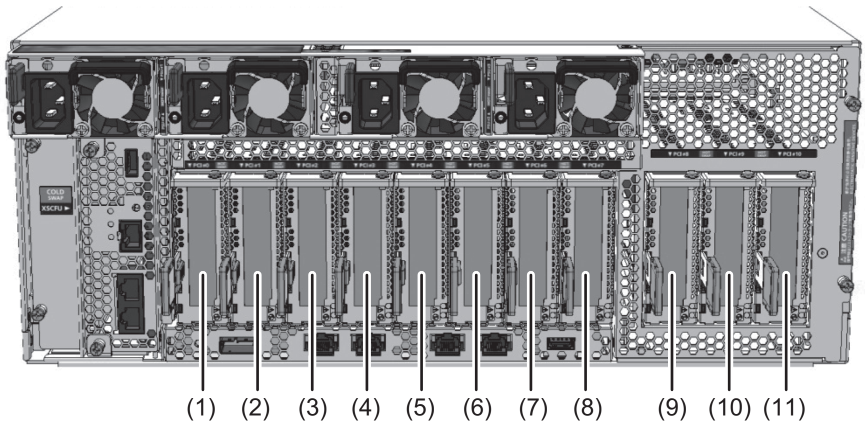
Note - You can replace, add, and remove PCIe cards.

12.1 Locations of PCIe Cards

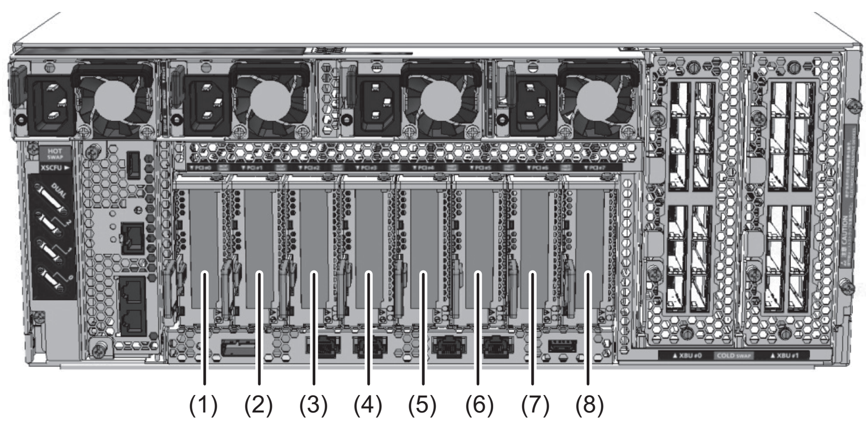
The SPARC M12-2 can house up to 11 PCIe cards, and the SPARC M12-2S can house up to 8 cards. Figure 12-1 shows the mounting locations of PCIe cards.

Figure 12-1 Mounting Locations of PCIe Cards in the SPARC M12

SPARC M12-2



SPARC M12-2S



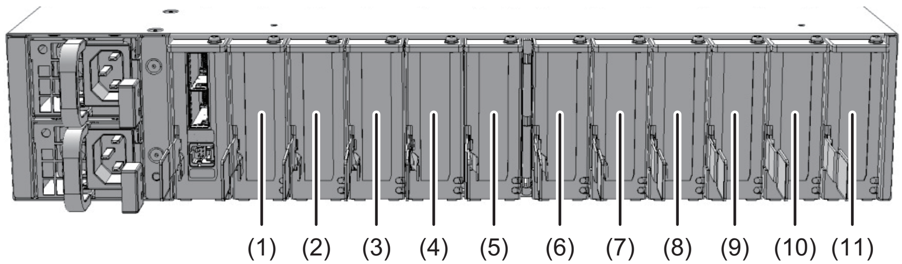
Location No.	Unit	Slot
1	PCIe card	PCI#0
2	PCIe card	PCI#1
3	PCIe card	PCI#2
4	PCIe card	PCI#3
5	PCIe card	PCI#4
6	PCIe card	PCI#5
7	PCIe card	PCI#6
8	PCIe card	PCI#7
9 (*1)	PCIe card	PCI#8
10 (*1)	PCIe card	PCI#9

Location No.	Unit	Slot
11 (*1)	PCIe card	PCI#10

*1 This card can be mounted only in the SPARC M12-2.

The PCI expansion unit can house up to 11 PCIe cards. Figure 12-2 shows the mounting locations of PCIe cards in the PCI expansion unit.

Figure 12-2 Mounting Locations of PCIe Cards in the PCI Expansion Unit



Location No.	Unit	Slot
1	PCIe card	PCIECS#1
2	PCIe card	PCIECS#2
3	PCIe card	PCIECS#3
4	PCIe card	PCIECS#4
5	PCIe card	PCIECS#5
6	PCIe card	PCIECS#6
7	PCIe card	PCIECS#7
8	PCIe card	PCIECS#8
9	PCIe card	PCIECS#9
10	PCIe card	PCIECS#10
11	PCIe card	PCIECS#11

Note - Only the link board connected to the SPARC M12-2/M12-2S can be mounted in the leftmost PCI slot as seen from the rear of the PCI expansion unit.

12.2 Before Maintenance on a PCIe Card

When replacing a PCIe card, perform one of the maintenance procedures listed below.

[When replacing a PCIe card with the server in the hot state]
- 4.1.2 Active/Hot Replacement Workflow of a PCIe Card
- 4.3.2 Inactive/Hot Replacement Workflow of a PCIe Card
- 4.5.2 System-Stopped/Hot Replacement Workflow of a PCIe Card

[When replacing a PCIe card with the server in the cold state]
- 4.2.2 Active/Cold Replacement Workflow of a PCIe Card
- 4.4.2 Inactive/Cold Replacement Workflow of a PCIe Card
- 4.6.2 System-Stopped/Cold Replacement Workflow of a PCIe Card

When adding a PCIe card, perform one of the maintenance procedures listed below.

[When adding a PCIe card with the server in the hot state]
- 5.1.1 Active/Hot Addition Workflow of a PCIe Card
- 5.3.1 Inactive/Hot Addition Workflow of a PCIe Card
- 5.5.1 System-Stopped/Hot Addition Workflow of a PCIe Card

[When adding a PCIe card with the server in the cold state]
- 5.2.1 Active/Cold Addition Workflow of a PCIe Card
- 5.4.1 Inactive/Cold Addition Workflow of a PCIe Card
- 5.6.1 System-Stopped/Cold Addition Workflow of a PCIe Card

When removing a PCIe card, perform one of the maintenance procedures listed below.

[When removing a PCIe card with the server in the hot state]
- 6.1.1 Active/Hot Removal Workflow of a PCIe Card
- 6.3.1 Inactive/Hot Removal Workflow of a PCIe Card
- 6.5.1 System-Stopped/Hot Removal Workflow of a PCIe Card

[When removing a PCIe card with the server in the cold state]
- 6.2.1 Active/Cold Removal Workflow of a PCIe Card
- 6.4.1 Inactive/Cold Removal Workflow of a PCIe Card
- 6.6.1 System-Stopped/Cold Removal Workflow of a PCIe Card

Caution - Before you handle any unit, be sure to wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be seriously damaged. For details, see "1.5 Precautions on Static Electricity."

12.3 Removing a PCIe Card

This section describes the procedure for removing a PCIe card.

Note - Unless otherwise noted, the model used in the figures shown in the following procedures is the SPARC M12-2S.

12.3.1 Enabling the Removal of a PCIe Card

1. **Release the PCIe card from the system.**

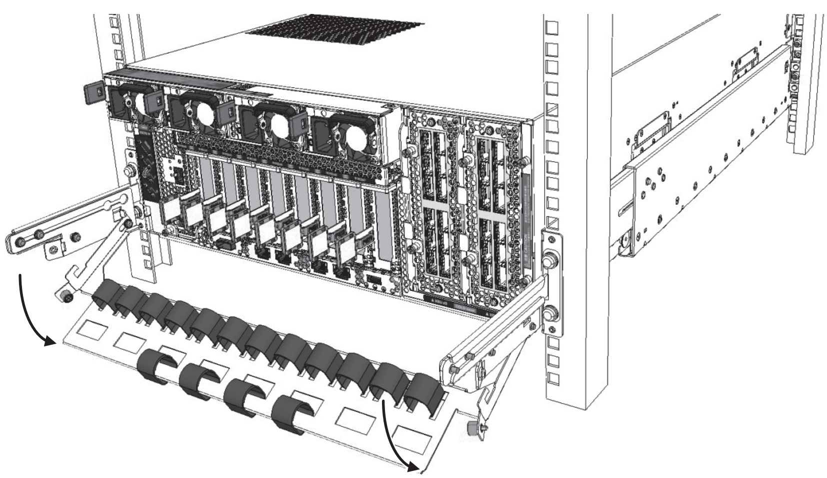
Note - When you add a PCIe card or perform maintenance in the inactive or system-stopped state, this step is not necessary.

Note - To release a PCIe card from an active system by using PCI Hot Plug or PPAR DR, you need to make sure that the I/O resource of the PCIe card to be released or the I/O resource of the SPARC M12-2S to be released is not assigned to a logical domain. For details, see "9.3 Releasing I/O Resources From a Logical Domain" or "3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/ SPARC M10 Domain Configuration Guide*.

---

2. **Lower the cable support.**
   For details on handling the cable support, see "9.8.1 Lowering the Cable Support."

Figure 12-3 Lowering the Cable Support



3. **Remove the cable connected to the PCIe card.**

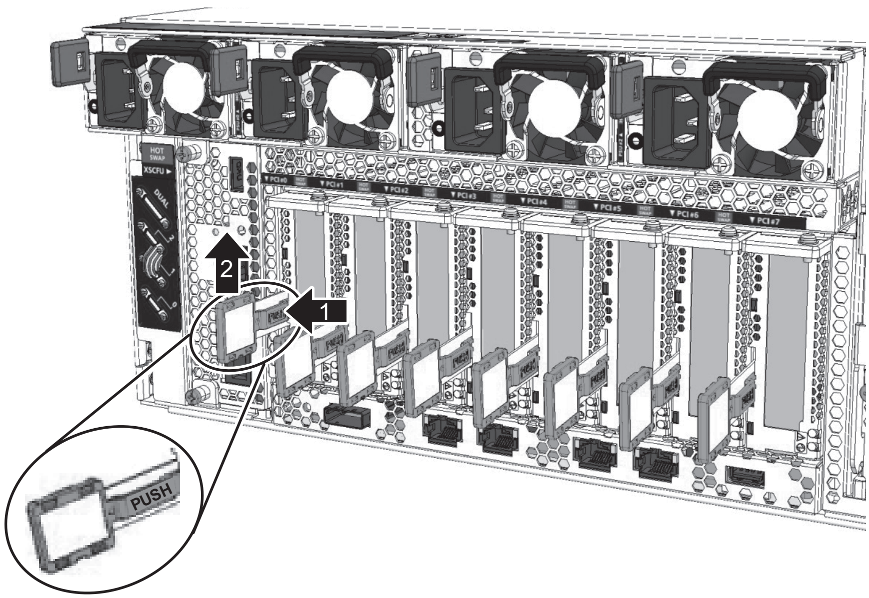
Remove the cable connected to the PCIe card requiring maintenance. Record the cable connection locations before removing the cable to ensure that the system will be restored correctly.

Note - When you add a PCIe card, this step is not necessary. Proceed to step 4.

---

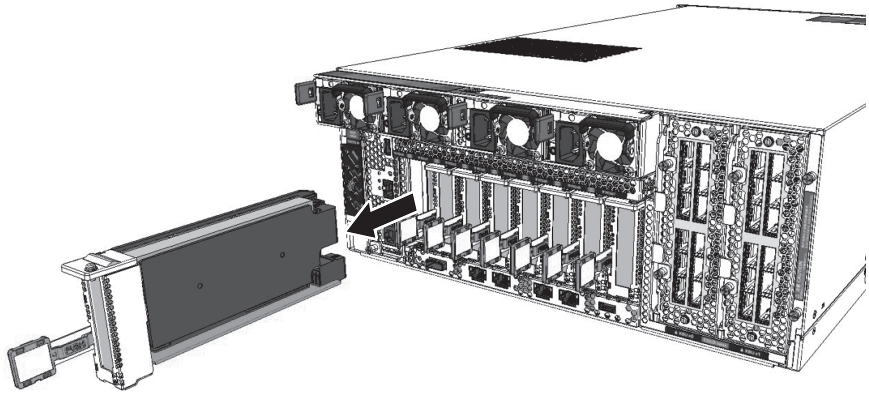
4. **Release the lock of the PCICS.**
   Release the lock of the PCICS by lifting the removal lever while pushing the latch at the base of the lever.

Figure 12-4 Releasing the Lock of the PCICS



5. **Remove the PCIe card.**
   Hold the removal lever of the PCICS and remove the cassette.

Figure 12-5   Removing the PCIe Card



Caution - When removing the PCICS, be careful not to bend its lever. If the lever is bent, you may not be able to secure the PCICS to the server or PCI expansion unit.

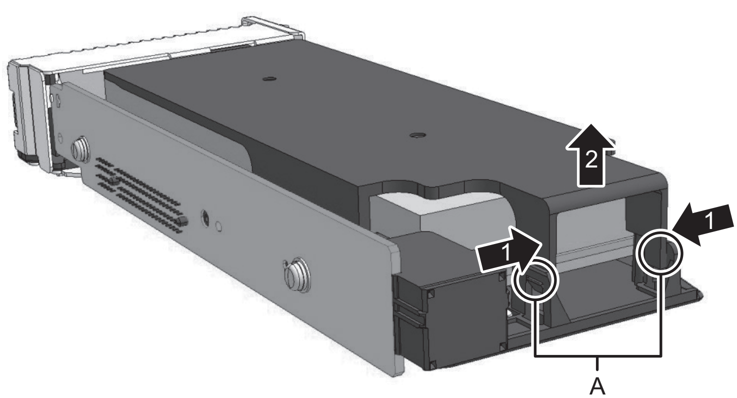
Note - Place the removed PCICS on the grounded ESD mat to ground any static electricity.

12.3.2 Removing a PCIe Card or PCIe Card Filler

This section describes the procedure for removing a PCIe card or PCIe card filler mounted in the PCICS.

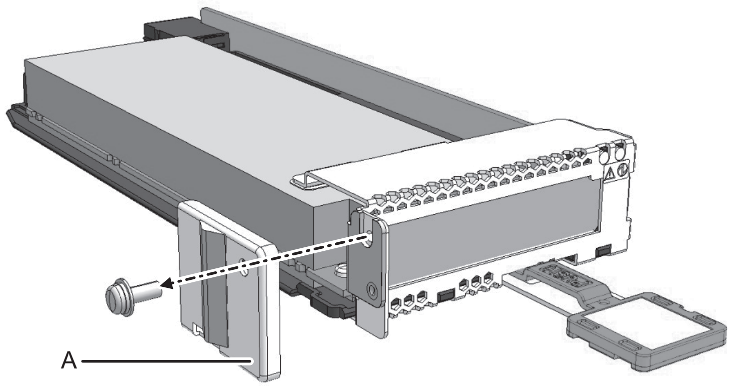
1. **Remove the PCIe card cover.**
   Remove the PCIe card cover by pinching its lock (A in Figure 12-6) with your fingers and lifting the cover while pushing the lock inside.

Figure 12-6   Removing the PCIe Card Cover



2. **Remove the fixing bracket of the PCIe card.**
Remove the screw of the fixing bracket (A in Figure 12-7) of the PCIe card, and then remove the fixing bracket.

Figure 12-7 Removing the Fixing Bracket of the PCIe Card

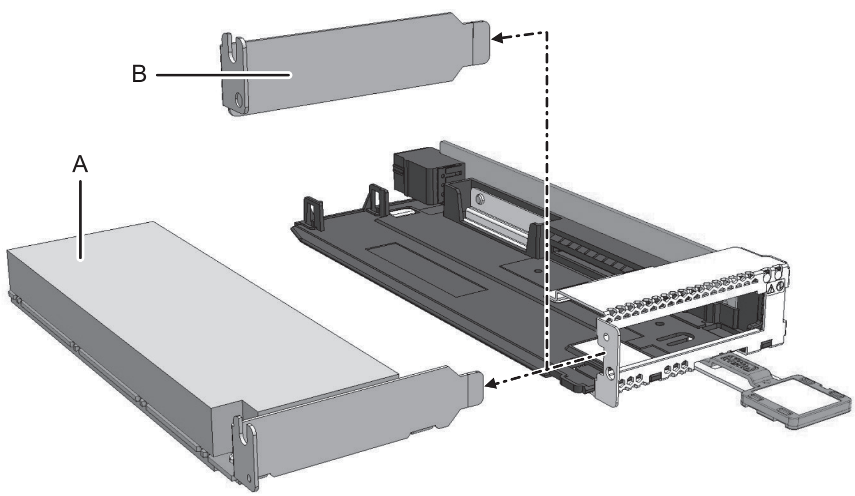


Note - Store the fixing bracket and screw of the PCIe card in a safe place.

---

3. **Remove the PCIe card.**
Remove the PCIe card (A in Figure 12-8) or the PCIe card filler (B in Figure 12-8) from the PCICS.

Figure 12-8 Removing the PCIe Card



Note - After removing the PCIe card filler, store it in a safe place.

12.4 Installing a PCIe Card

This section describes the procedure for installing a PCIe card.

Note - Unless otherwise noted, the model used in the figures shown in the following procedures is the SPARC M12-2S.

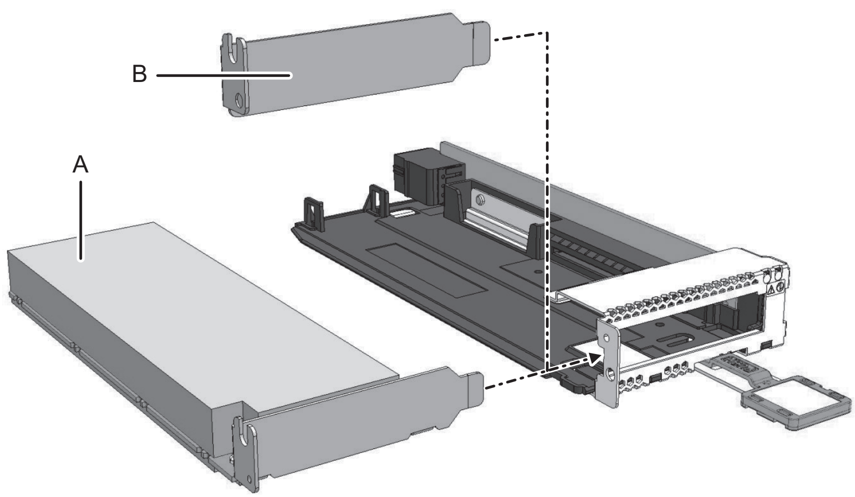
12.4.1 Installing a PCIe Card or PCIe Card Filler

This section describes the procedure for installing a PCIe card or PCIe card filler in the PCICS.

Note - Perform this work with the PCIe card cover and the fixing bracket of the PCIe card removed from the PCICS.

1. **Install the PCIe card (A in Figure 12-9) or the PCIe card filler (B in Figure 12-9).**

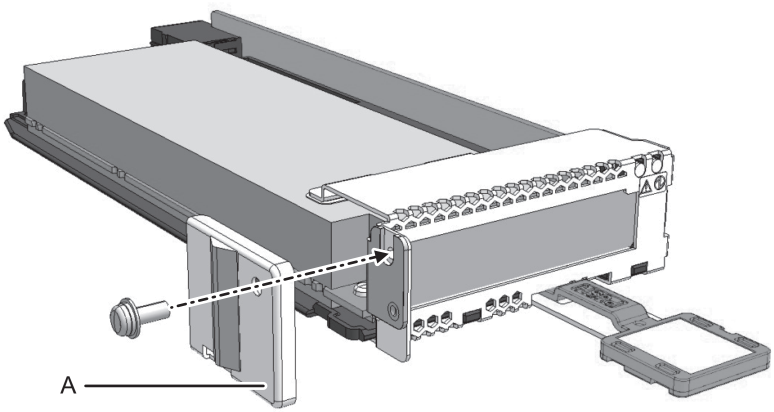
Figure 12-9 Installing a PCIe Card or PCIe Card Filler



Note - Install a PCIe card filler in the PCICS when you have removed a PCIe card.

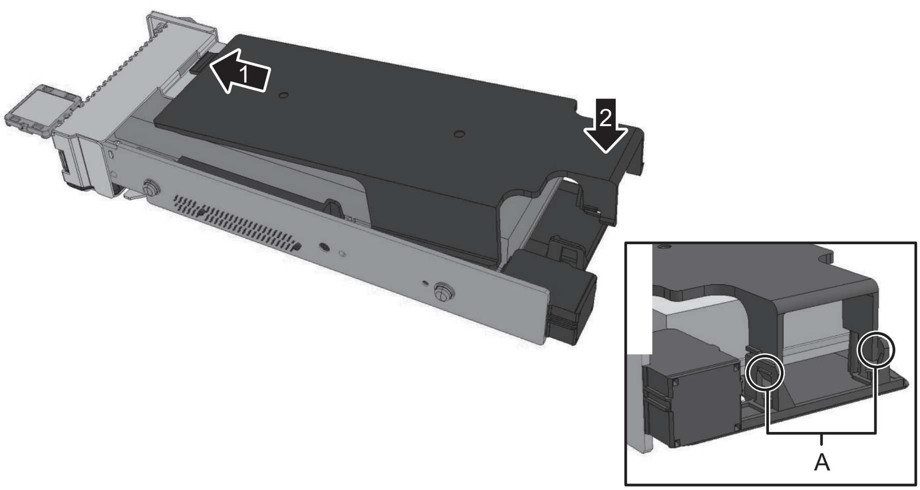
2. **Secure the PCIe card or PCIe card filler.**
   Install the fixing bracket (A in Figure 12-10) to the PCICS, and secure it with the screw.

Figure 12-10 Securing the PCIe Card or PCIe Card Filler



3. **Install the PCIe card cover.**
Insert the PCIe card cover into the fixing guide of the PCICS (1 in Figure 12-11), and then push the rear part of the cover (2 in Figure 12-11) to secure it.

Figure 12-11 Installing the PCIe Card Cover



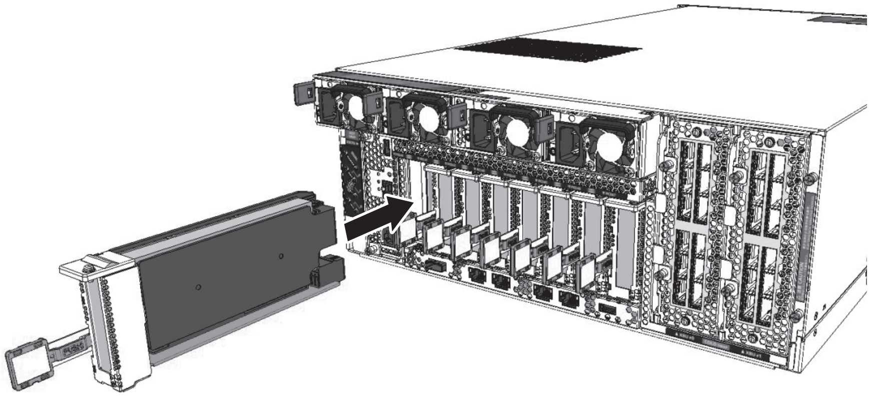
Note - Confirm that the lock of the PCIe card cover (A in Figure 12-11) firmly fits into the PCICS.

Note - Be sure to install the PCIe card cover. This cover serves as a guide when you insert the PCICS into the server.

---

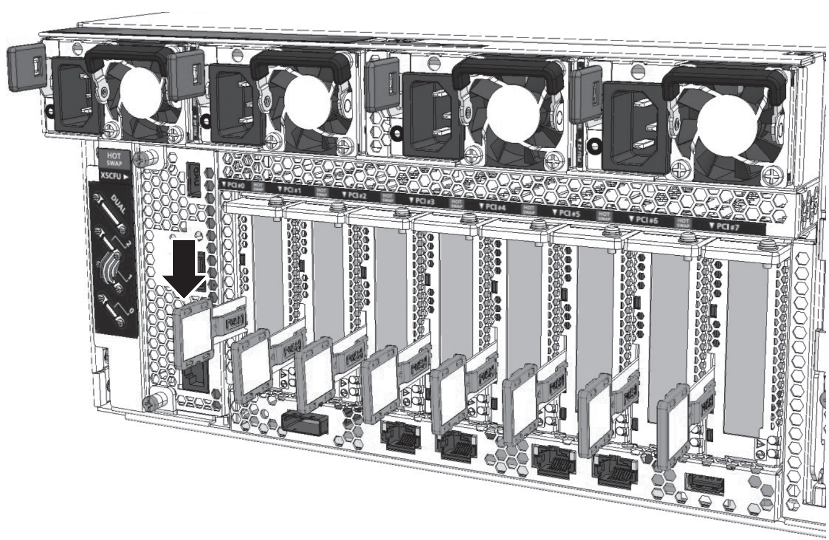
4. **Install the PCIe card.**
Insert the PCICS into the server or PCI expansion unit, with the removal lever of the PCICS pushed up.

Figure 12-12 Installing the PCIe Card



5. **Secure the PCICS.**
Lower the removal lever while pushing the latch of the PCICS to secure the PCICS to the server or PCI expansion unit.

Figure 12-13 Securing the PCICS



Note - Securing the PCICS to the server or PCI expansion unit prevents the PCICS from being shaken off by an unexpected vibration or shock.

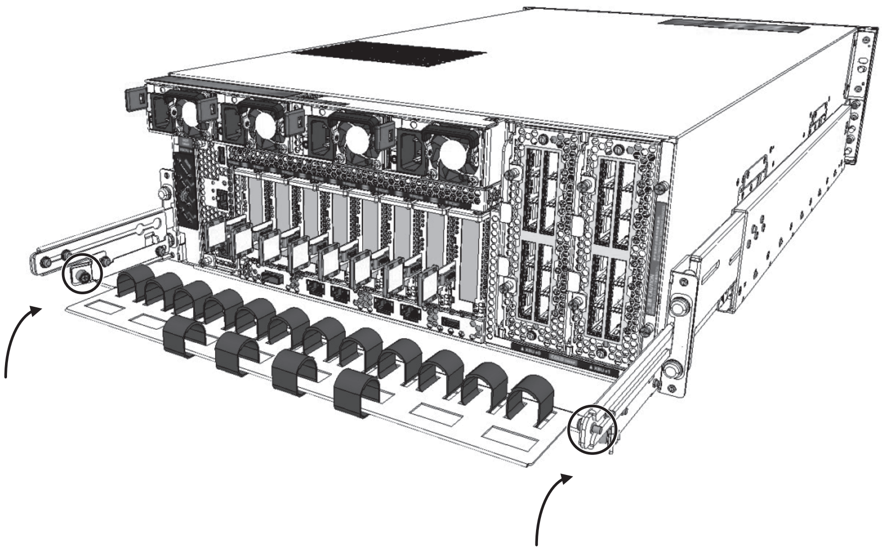
---

6. **Connect the cables.**
Connect the cable to the replacement or added PCIe card, and bundle the cables using the hook-and-loop fastener.

Note - When you have removed a PCIe card, this step is not necessary.

7. **Return the cable support to the original position.**
   Return the cable support to the original position, and then secure it with two screws.

Figure 12-14 Securing the Cable Support



12.4.2 Incorporating a PCIe Card Into the System

This section provides an overview of the procedure for incorporating a PCIe card into the system after PCIe card replacement or addition. For details, see "10.6 Incorporating the SPARC M12-2S or an I/O Device Into the PPAR" or "3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

1. **Incorporate the PCIe card into the physical partition.**
   When incorporating the PCIe card in the active state, use PCI Hot Plug. For details, see "10.6.2 Incorporating an I/O Device Into the Physical Partition by Using the Hot Plug Function."

2. **Assign the I/O resource to a logical domain.**
   Assign the I/O resource as appropriate for the I/O configuration of the logical domain used. For details, see "10.7 Incorporating I/O Resources Into a Logical Domain."

3. **Save the configuration information of the logical domain.**
   If there has been any change to the I/O resources of the logical domain in such a case as when you have added or removed a PCIe card or changed the mounting location of a PCIe card, be sure to save the logical domain configuration

information. For details, see "9.1.1 Saving Logical Domain Configuration Information."

Chapter 13

Maintaining the Power Supply Units

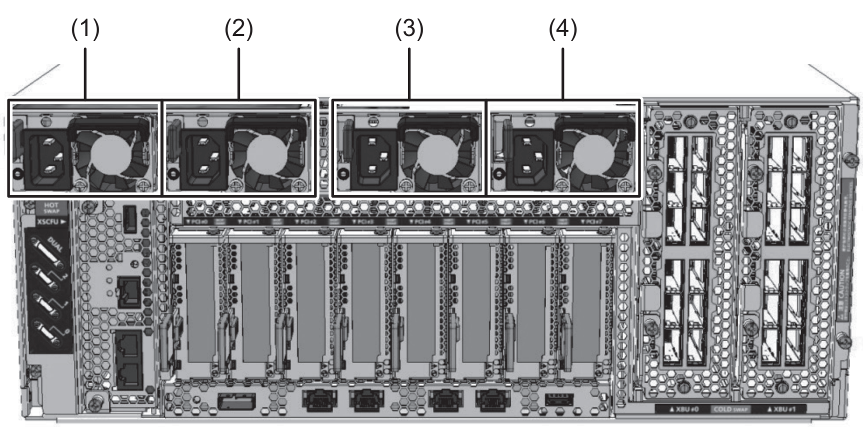
This section describes the maintenance procedures for the PSUs mounted in the SPARC M12.

13.1 Locations of PSUs

The PSUs supply power to the individual units. The components have the 2+2 redundant configuration, enabling active/hot maintenance.

Figure 13-1 shows the mounting locations of the PSUs.

Figure 13-1 Locations of PSUs



Location No.	Unit	Slot
1	PSU	PSU#0
2	PSU	PSU#1
3	PSU	PSU#2
4	PSU	PSU#3

13.2 Before Maintenance on a PSU

When replacing a PSU, perform one of the maintenance procedures listed below.

[When replacing a PSU with the server in the hot state]
- 4.1.3 Active/Hot Replacement Workflow of the Power Supply Unit (PSU)
- 4.3.3 Inactive/Hot Replacement Workflow of the PSU
- 4.5.3 System-Stopped/Hot Replacement Workflow of the PSU

[When replacing a PSU with the server in the cold state]
- 4.2.3 Active/Cold Replacement Workflow of the PSU
- 4.4.3 Inactive/Cold Replacement Workflow of the PSU
- 4.6.3 System-Stopped/Cold Replacement Workflow of the PSU

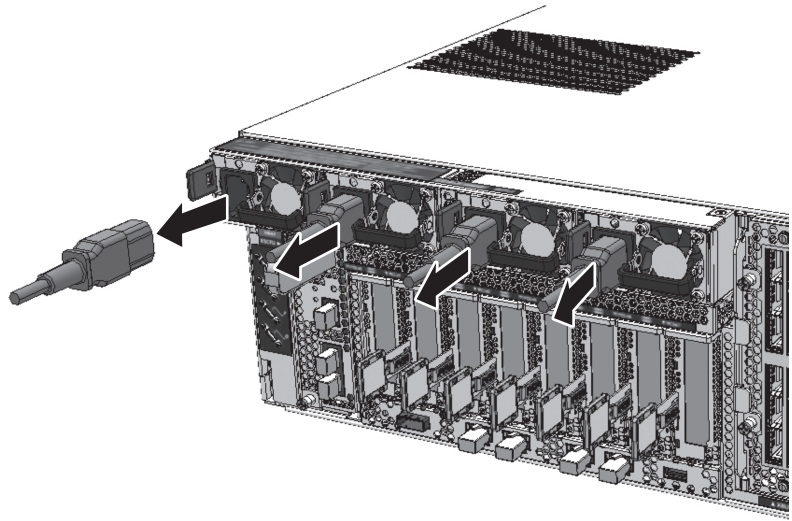
Caution - Before you handle any unit, be sure to wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be seriously damaged. For details, see "1.5 Precautions on Static Electricity."

13.3 Removing a PSU

This section describes the procedure for removing a PSU.

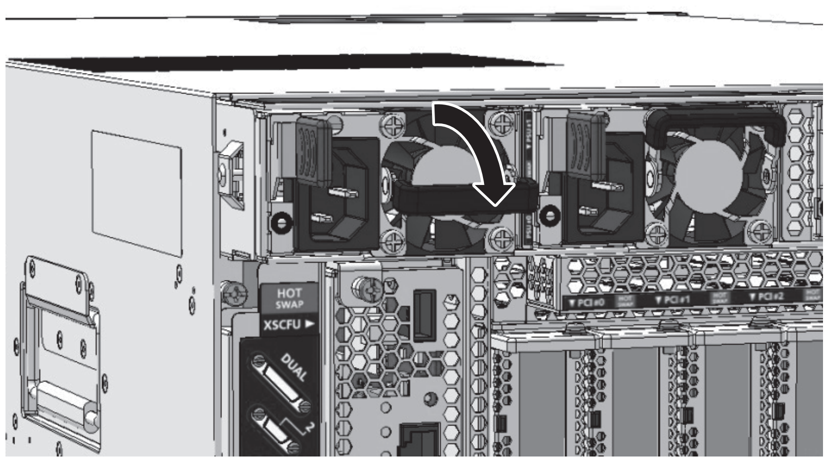
1. **Remove the power cord.**
   Remove the power cord from the cable clamp of the PSU requiring maintenance, and then remove the power cord from the PSU. For details on removing the power cord from a PSU, see "9.8.2 Removing the Power Cords."

Figure 13-2 Removing a Power Cord



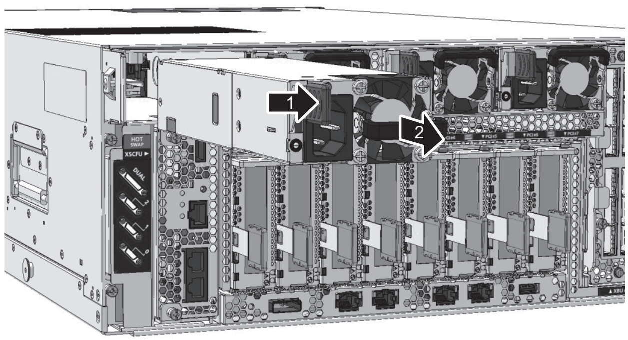
2. **Pull down the handle of the PSU.**

Figure 13-3 Handle of the PSU



3. **Remove the PSU from the server.**
Hook your finger around the handle of the PSU and pull out the PSU while pushing its latch (1 in Figure 13-4).

Figure 13-4 Removing a PSU



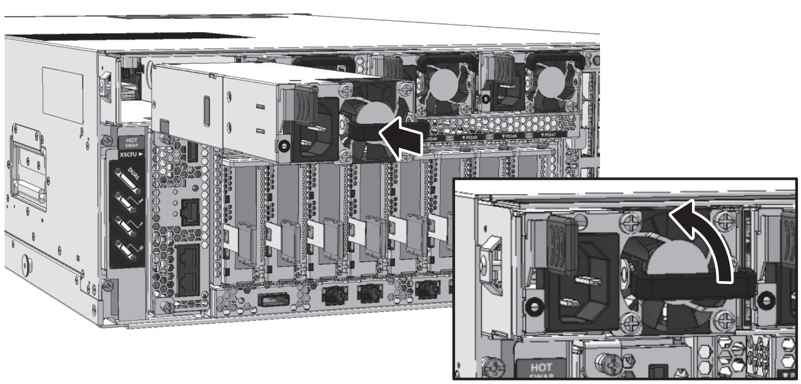
Note - For your safety, remove the power cord from the PSU before removing the PSU from the server.

13.4 Installing a PSU

This section describes the procedure for installing a PSU in the server.

1. **Install a PSU in the server.**
   Insert the PSU into the server, push it until its latch locks, and then push up the handle of the PSU.

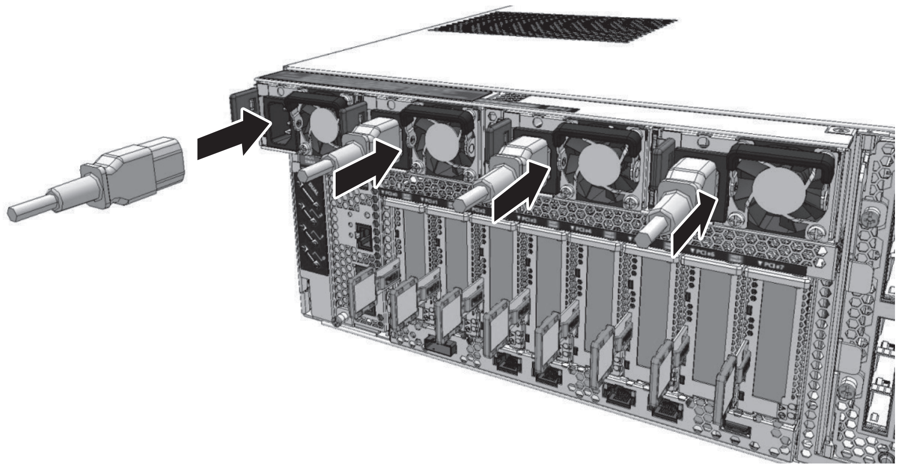
Figure 13-5 Installing a PSU



Note - When inserting the PSU into the server, make sure that the PSU power outlet is on the left side.

2. **Install the power cord on the PSU.**
   Connect the power cord to the PSU and then secure the cord with the cable clamp. For details on installing the power cord on the PSU, see "10.1.1 Installing a Power Cord."

Figure 13-6 Installing the Power Cord



Chapter 14

Maintaining the Fan Units and Fan Backplane Unit

This chapter describes the maintenance procedures for the FANUs and FANBPU mounted in the SPARC M12.

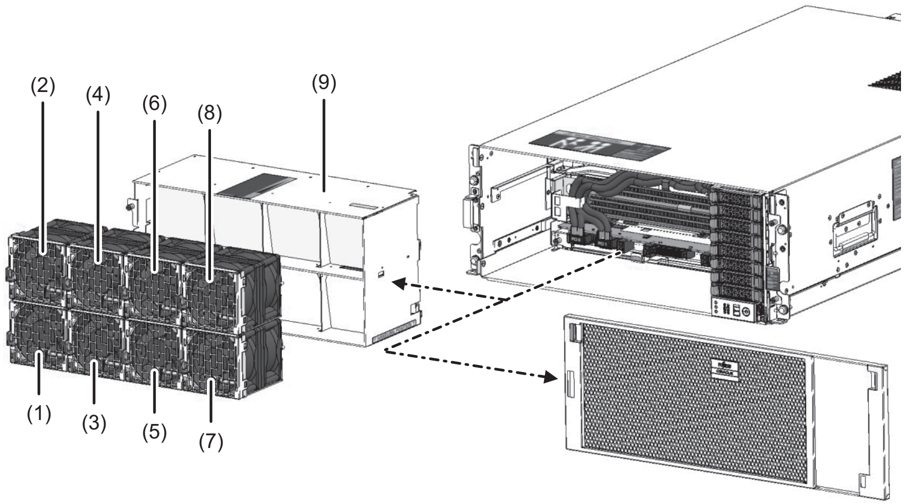
14.1 Locations of the FANUs and FANBPU

A FANU consists of two cooling fans, and a FANBPU houses eight FANUs.

If one of the cooling fans fails during system operation, the redundant configuration enables the system to continue operation, and the XSCF firmware detects the failure.

Figure 14-1 shows the mounting locations of the FANUs and FANBPU.

Figure 14-1 Locations of FANUs



Location No.	Unit	Slot
1	Fan unit	FANU#0
2	Fan unit	FANU#1
3	Fan unit	FANU#2
4	Fan unit	FANU#3
5	Fan unit	FANU#4
6	Fan unit	FANU#5
7	Fan unit	FANU#6
8	Fan unit	FANU#7
9	Fan backplane unit	FANBPU

14.2 Before Maintenance on a FANU or the FANBPU

When replacing the FANBPU, perform one of the maintenance procedures listed below.

- 4.2.5 Active/Cold Replacement Workflow of the FANBPU
- 4.4.5 Inactive/Cold Replacement Workflow of the FANBPU
- 4.6.5 System-Stopped/Cold Replacement Workflow of the FANBPU

When replacing a FANU, perform one of the maintenance procedures listed below.
[When replacing a FANU with the server in the hot state]
- 4.1.4 Active/Hot Replacement Workflow of the FANU
- 4.3.4 Inactive/Hot Replacement Workflow of the FANU
- 4.5.4 System-Stopped/Hot Replacement Workflow of the FANU

[When replacing a FANU with the server in the cold state]
- 4.2.4 Active/Cold Replacement Workflow of the FANU
- 4.4.4 Inactive/Cold Replacement Workflow of the FANU
- 4.5.4 System-Stopped/Hot Replacement Workflow of the FANU

14.3 Removing a FANU or the FANBPU

This section describes the procedure for removing a FANU or FANBPU.

Note - You can remove a FANU in the active state.

Note - You can remove the FANBPU only when the server is in the cold state.

14.3.1 Removing a FANU

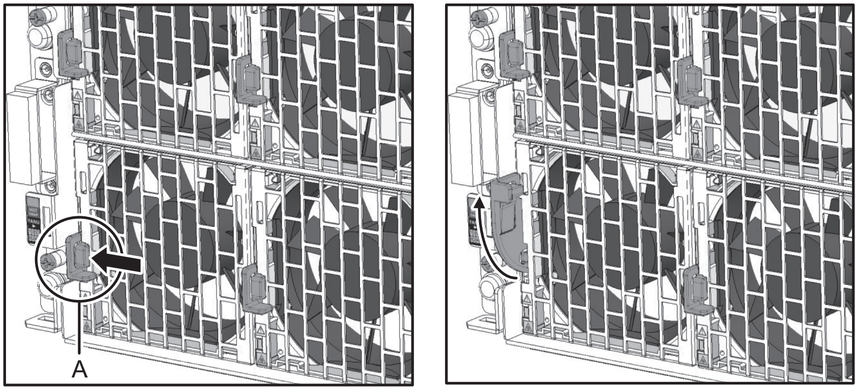
This section describes the procedure for removing a FANU.

1. **Remove the front cover.**
   For the procedure for removing the front cover, see "9.8.3 Removing the Front Cover."

Note - The serial number of the server is printed on a label affixed on the front cover. Store this cover such that it is not mixed up with the front covers of other SPARC M12 units.

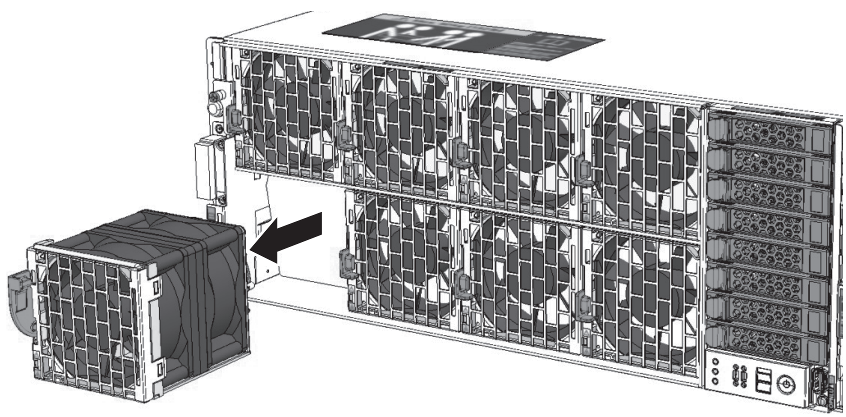
2. **Pull up the latch of the FANU.**
   Pinch the latch of the FANU (A in Figure 14-2) and pull it up.

Figure 14-2 Latch of the FANU



3. **Remove the FANU.**
   Hold the latch of the FANU, and pull out the FANU from the FANBPU.

Figure 14-3 Removing a FANU



14.3.2 Removing the FANBPU

This section describes the procedure for removing the FANBPU.

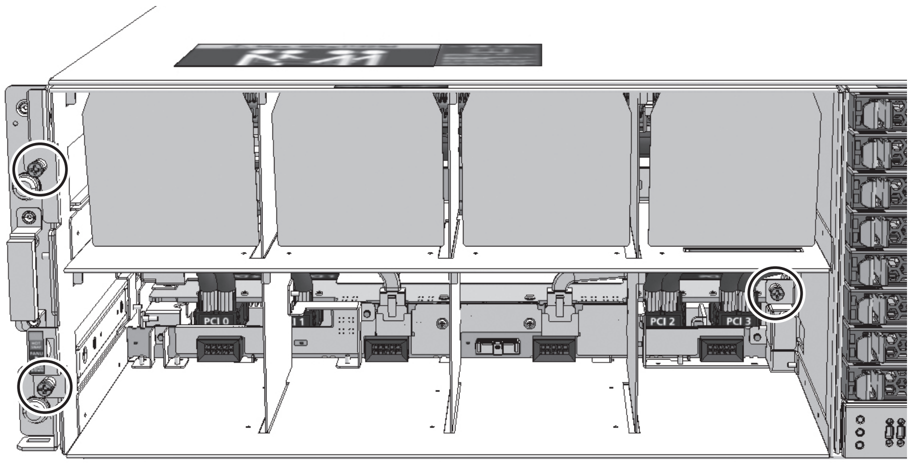
Note - If you are replacing only a FANU, this step is not necessary.

Note - Before removing the FANBPU, remove all the FANUs from it.

---

1. **Loosen the three fixing screws of the FANBPU.**

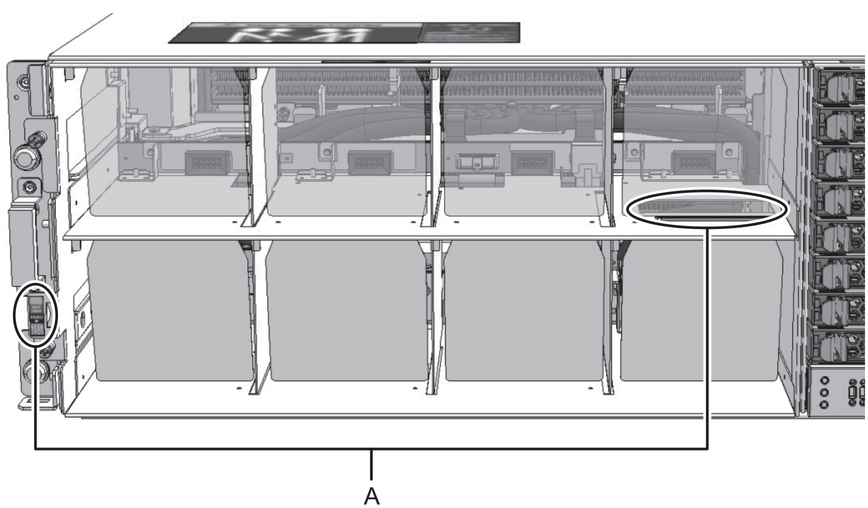
Figure 14-4 Fixing Screws of the FANBPU



Caution - When loosening the fixing screws, work carefully with the screwdriver so as not to damage the PCIe cables, radiator cores (heat exchanging parts), and board substrates inside.

2. **Remove the FANBPU.**
   Hold the FANBPU by the parts indicated by A in Figure 14-5, and pull it out from the server. When you see the "HANDLING POSITION" labels on the sides of the FANBPU, hold the FANBPU by its sides and remove it from the server.

Figure 14-5 Removing the FANBPU



14.4 Installing a FANU or the FANBPU

This section describes the procedure for installing a FANU or FANBPU.

14.4.1 Installing the FANBPU

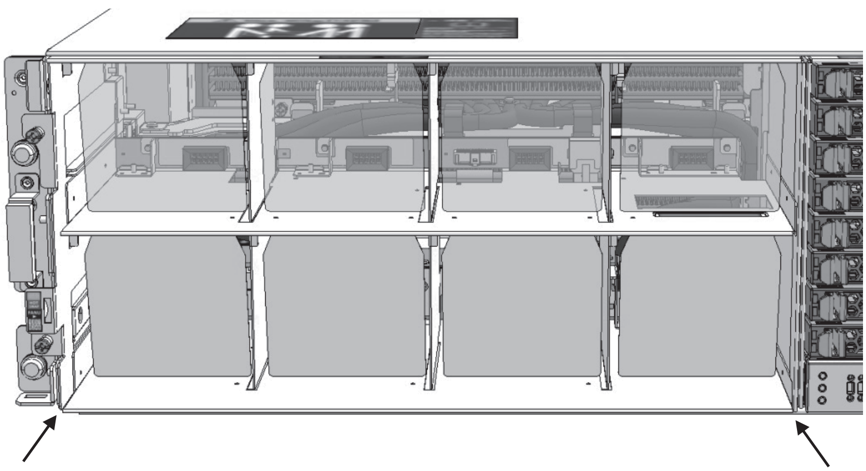
Install the FANBPU when the server is in the cold state.

Note - If you are replacing only a FANU, this step is not necessary.

1. **Insert the FANBPU into the server.**
   Align the bottom left and right corners of the FANBPU with its slot inside the server, and insert the FANBPU along the slot.

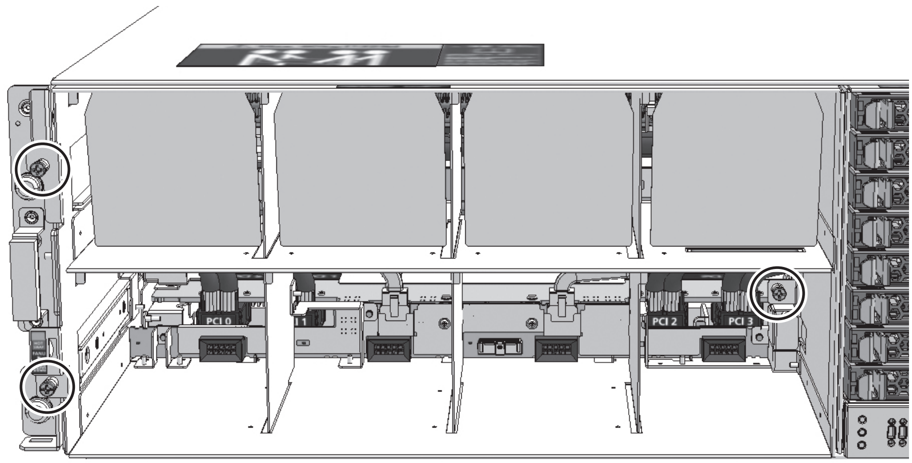
Note - Make sure that the FANBPU has no FANUs in it when you insert it into the server.

Figure 14-6 Installing the FANBPU



2. **Secure the FANBPU.**
   Tighten the three fixing screws to secure the FANBPU.

Figure 14-7 Securing the FANBPU



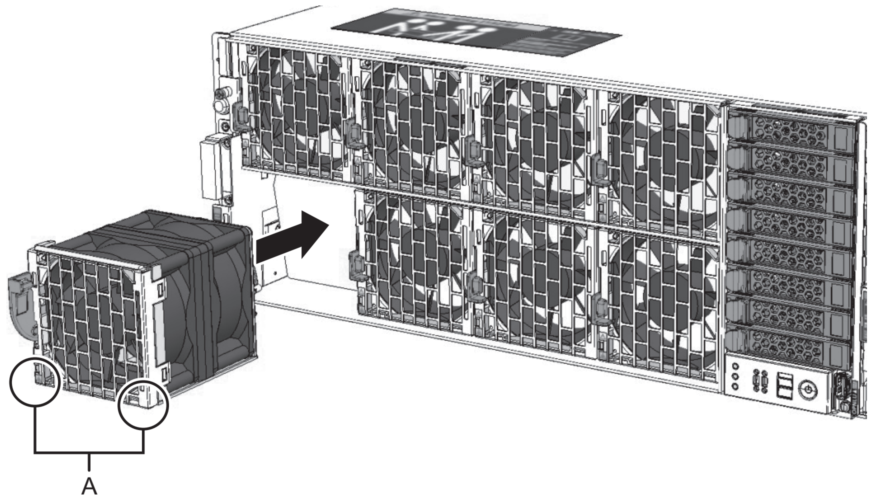
Caution - When tightening the fixing screws, work carefully with the screwdriver so as not to damage the PCIe cables, radiator cores (heat exchanging parts), and board substrates inside.

14.4.2 Installing a FANU

This section describes the procedure for installing a FANU.

1. **Insert the FANU into the FANBPU.**
   Insert the FANU into the FANBPU, with the latch pulled up, and connect the FANU to the FANBPU connector.

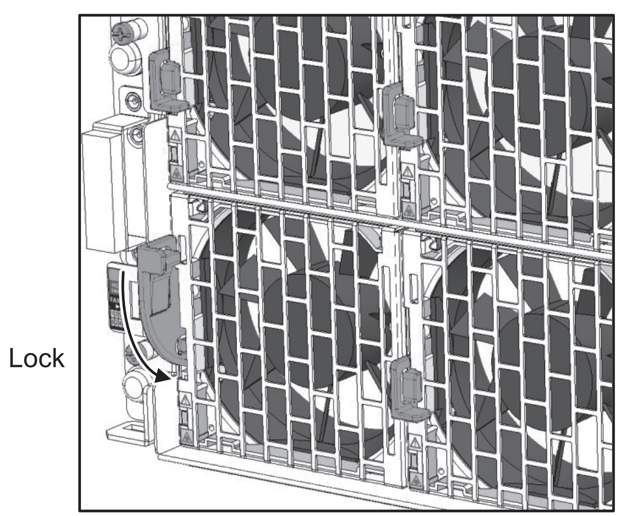
Figure 14-8 Inserting a FANU



Caution - To connect a FANU to the FANBPU, push the FANU at two places at the bottom at the front (A in Figure 14-8). Pushing the latch of the FANU or the meshed section in front may cause a connector connection problem or the contact of the meshed section with the cooling fans inside, resulting in the FANU malfunctioning.

2. **Secure the FANU.**
   Insert the FANU into the FANBPU and fold back the latch of the FANU to secure the FANU. (Figure 14-9)

Figure 14-9 Securing a FANU



3. **Incorporate the FANU into the system.**

If you have performed maintenance on the FANU when the server was in the hot state, incorporate the FANU into the system as instructed in "10.4.2 Incorporating the FANU."

4. **Install the front cover.**
   For the procedure for installing the front cover to the front of the server, see "10.1.3 Installing the Front Cover."

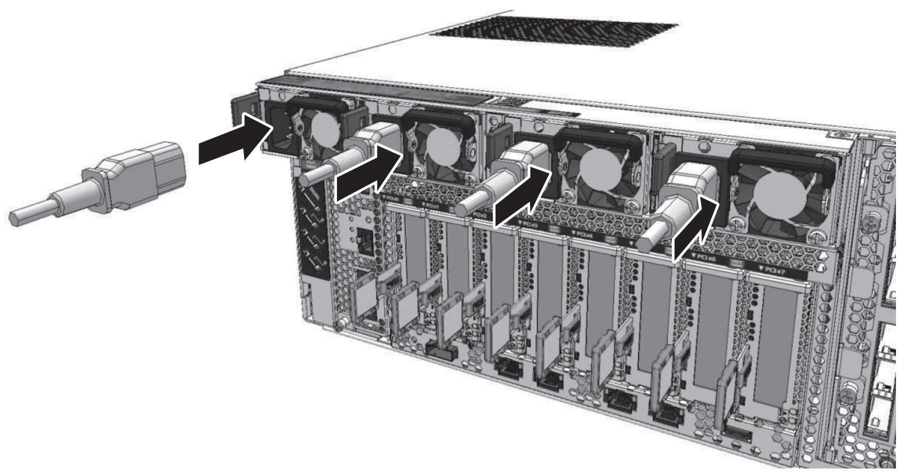
Note - The serial number of the server is printed on a label affixed on the front cover. Store this cover such that it is not mixed up with the front covers of other SPARC M12 units.

If you have performed maintenance on the FANU when the server was in the hot state, the following step is not necessary.

5. **Place the server in the hot state.**

Power on the server to place it in the hot state. For details on installing the power cord on the PSU, see "10.1.1 Installing a Power Cord."

Figure 14-10 Installing the Power Cord



Chapter 15

Maintaining Internal Storage

This section describes the maintenance procedures for the HDDs/SSDs mounted in the SPARC M12.

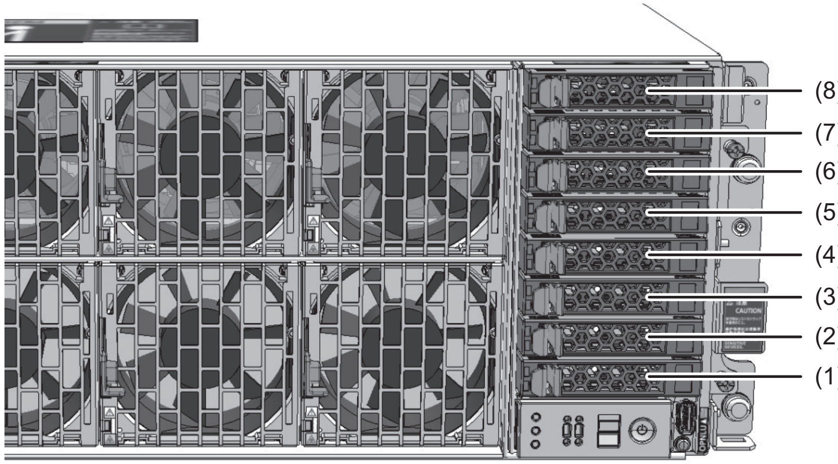
Note - You can replace, add, and remove HDDs/SSDs.

15.1 Locations of HDDs/SSDs

You can install eight HDDs/SSDs in the server.

Figure 15-1 shows the mounting locations of the HDDs/SSDs.

Figure 15-1 Locations of HDDs/SSDs



Location No.	Unit	Slot
1	HDD/SSD	HDD#0
2	HDD/SSD	HDD#1
3	HDD/SSD	HDD#2
4	HDD/SSD	HDD#3
5	HDD/SSD	HDD#4
6	HDD/SSD	HDD#5
7	HDD/SSD	HDD#6
8	HDD/SSD	HDD#7

15.2 Before Maintenance on an HDD/SSD

When replacing an HDD/SSD, perform one of the maintenance procedures listed below.

[When replacing an HDD/SSD with the server in the hot state]
- 4.1.5 Active/Hot Replacement Workflow of the HDD/SSD
- 4.3.5 Inactive/Hot Replacement Workflow of the HDD/SSD
- 4.5.5 System-Stopped/Hot Replacement Workflow of the HDD/SSD

[When replacing an HDD/SSD with the server in the cold state]
- 4.2.6 Active/Cold Replacement Workflow of the HDD/SSD
- 4.4.6 Inactive/Cold Replacement Workflow of the HDD/SSD

- 4.6.6 System-Stopped/Cold Replacement Workflow of the HDD/SSD

[When adding an HDD/SSD with the server in the hot state]
- 5.1.2 Active/Hot Addition Workflow of the HDD/SSD
- 5.3.2 Inactive/Hot Addition Workflow of the HDD/SSD
- 5.5.2 System-Stopped/Hot Addition Workflow of the HDD/SSD

[When adding an HDD/SSD with the server in the cold state]
- 5.2.2 Active/Cold Addition Workflow of the HDD/SSD
- 5.4.2 Inactive/Cold Addition Workflow of the HDD/SSD
- 5.6.2 System-Stopped/Cold Addition Workflow of the HDD/SSD

[When removing an HDD/SSD with the server in the hot state]
- 6.1.2 Active/Hot Removal Workflow of the HDD/SSD
- 6.3.2 Inactive/Hot Removal Workflow of the HDD/SSD
- 6.5.2 System-Stopped/Hot Removal Workflow of the HDD/SSD

[When removing an HDD/SSD with the server in the cold state]
- 6.2.2 Active/Cold Removal Workflow of the HDD/SSD
- 6.4.2 Inactive/Cold Removal Workflow of the HDD/SSD
- 6.6.2 System-Stopped/Cold Removal Workflow of the HDD/SSD

Caution - Before you handle any unit, be sure to wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be seriously damaged. For details, see "1.5 Precautions on Static Electricity."

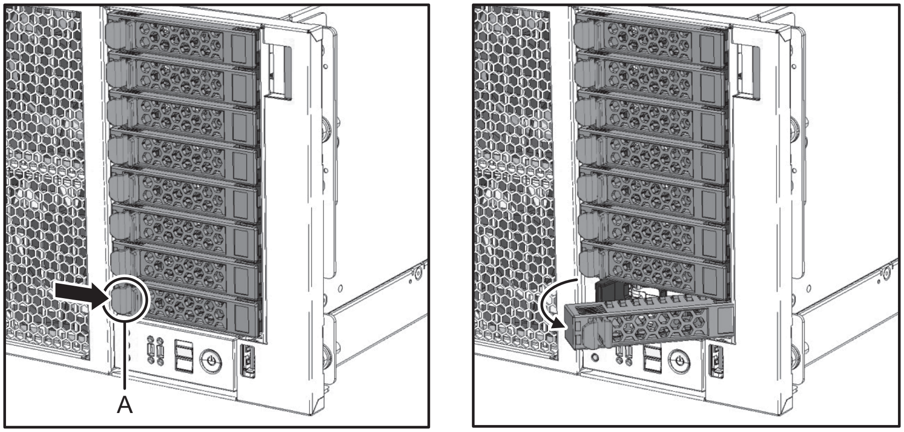
15.3 Removing an HDD/SSD or Filler Unit

This section describes the procedure for removing an HDD/SSD or an HDD/SSD filler unit. To remove an HDD/SSD, use the same procedure.

15.3.1 Removing an HDD/SSD

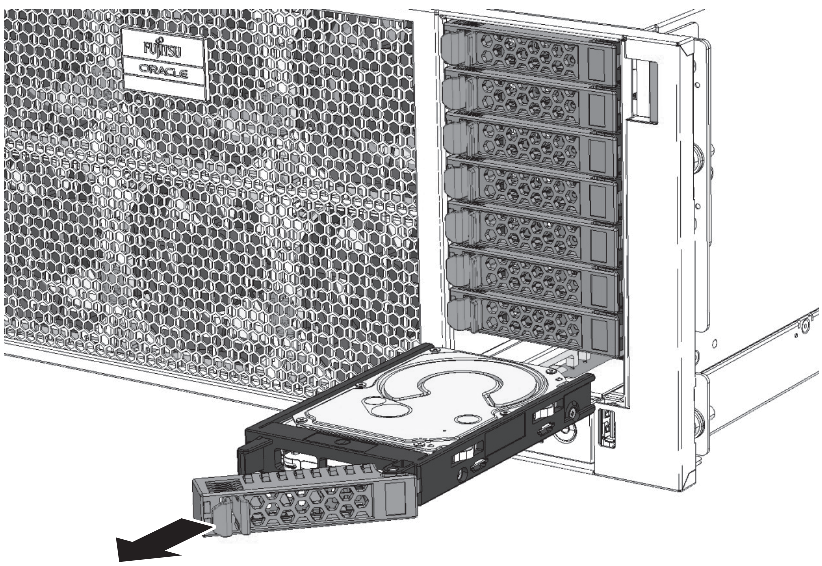
1. **Open the removal lever of the HDD/SSD.**
   Pinch the latch (A in Figure 15-2), and open the removal lever of the HDD/SSD.

Figure 15-2 Opening the Removal Lever of the HDD/SSD



2. **Remove the HDD/SSD.**
   Hold the removal lever, and remove the HDD/SSD from the HDDBPU.

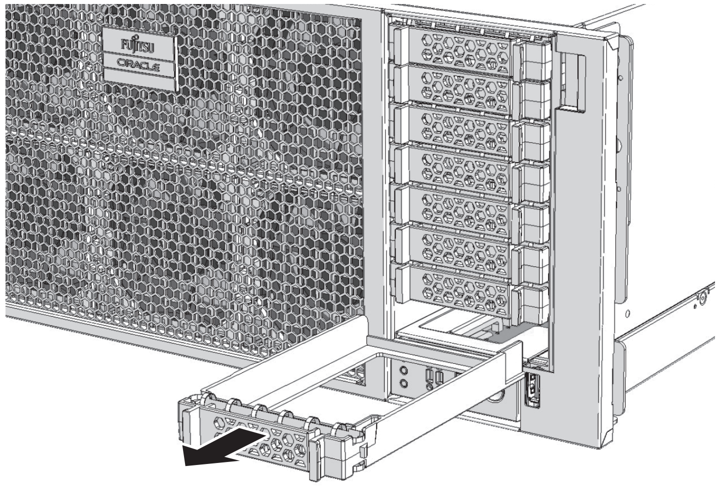
Figure 15-3 Removing an HDD/SSD



15.3.2 Removing a Filler Unit

1. **Remove a filler unit.**
   Pinch the latches on both sides to remove the filler unit from the HDDBPU.

Figure 15-4 Removing the Filler Unit



15.4 Installing an HDD/SSD or Filler Unit

This section describes the procedure for installing an HDD/SSD or an HDD/SSD filler unit. To add an HDD/SSD, use the same procedure.

15.4.1 Installing an HDD/SSD

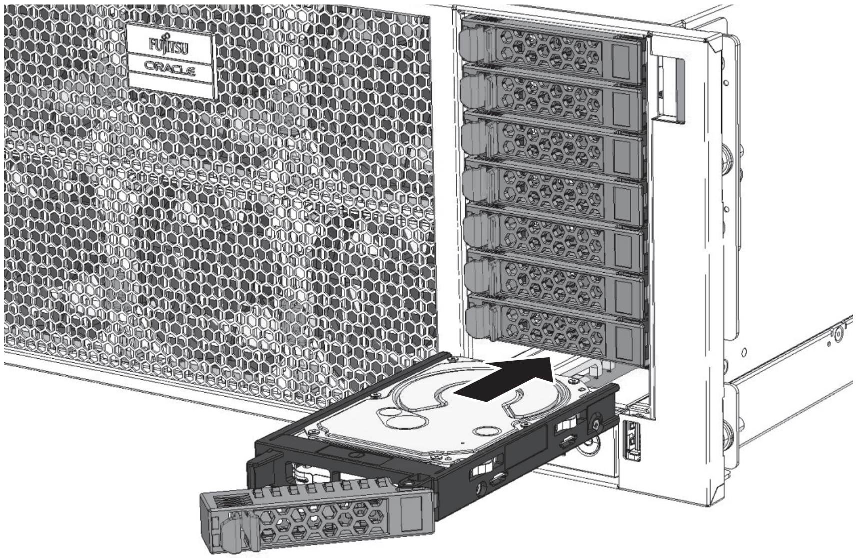
1. **Remove a filler unit.**

Note - If you are replacing an HDD/SSD, this step is not necessary.

To add an HDD/SSD, remove the filler unit mounted in the HDDBPU in which to install the HDD/SSD. For the removal procedure, see "15.3.2 Removing a Filler Unit."

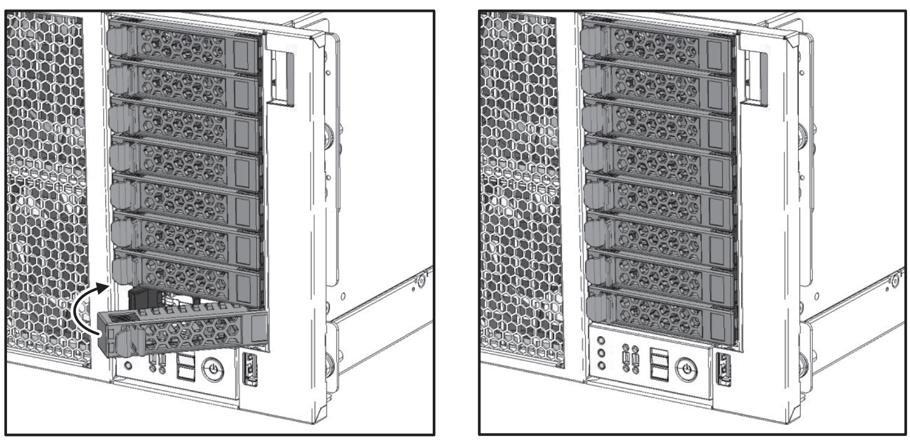
2. **Insert the HDD/SSD into the HDDBPU.**
Install the HDD/SSD in the HDDBPU, with the removal lever open.

Figure 15-5 Inserting an HDD/SSD



3. **Secure the HDD/SSD.**
   Secure the HDD/SSD by closing the removal lever.

Figure 15-6 Securing an HDD/SSD

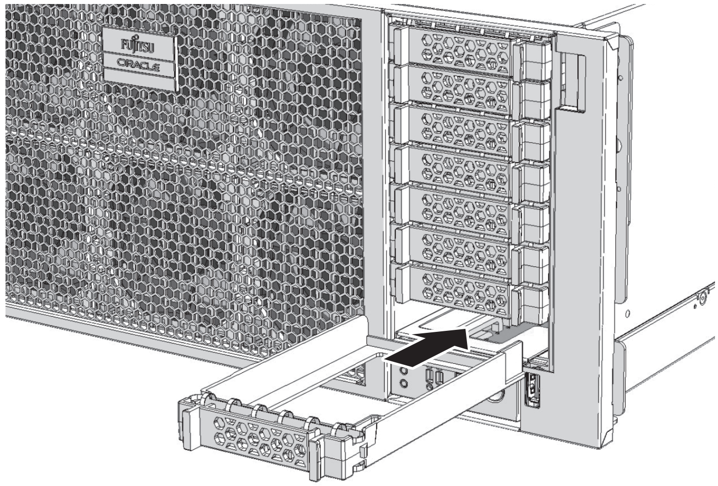


15.4.2 Installing a Filler Unit

1. **Install a filler unit.**

Note - Before operating the system, be sure to install a filler unit in each disk slot that does house an HDD/SSD.

Figure 15-7 Installing the Filler Unit



Chapter 16

Maintaining the HDD Backplane Unit and Operation Panel

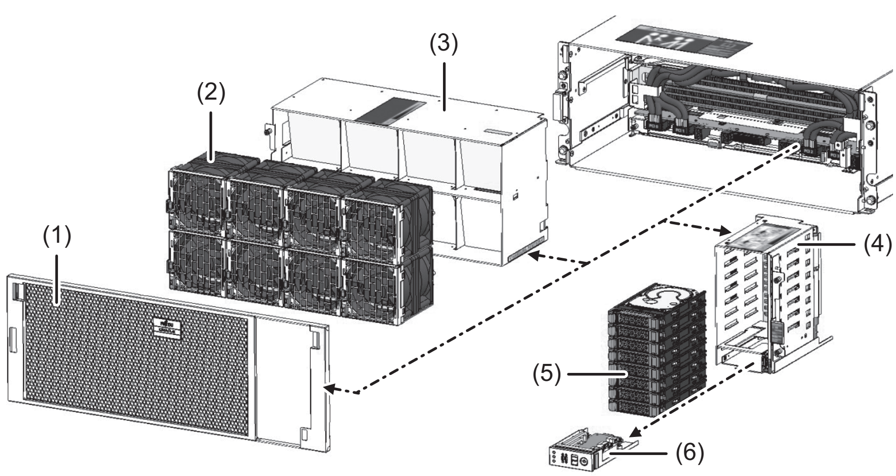
This chapter describes the maintenance procedures for the HDDBPU and OPNL mounted in the SPARC M12.

- Locations of the HDDBPU and OPNL
- Before Maintenance on the HDDBPU and OPNL
- Removing the HDDBPU or OPNL
- Installing the HDDBPU or OPNL

16.1 Locations of the HDDBPU and OPNL

Figure 16-1 shows the mounting locations of the HDDBPU and OPNL.

Figure 16-1 Locations of the HDDBPU and OPNL



Location No.	Unit
1	Front cover
2	FANU
3	FANBPU
4	HDDBPU
5	HDD/SSD
6	OPNL (*1)

*1 The OPNL is installed in the HDDBPU.

16.2 Before Maintenance on the HDDBPU and OPNL

When replacing the HDDBPU, perform one of the maintenance procedures listed below.
- 4.2.7 Active/Cold Replacement Workflow of the HDDBPU
- 4.4.7 Inactive/Cold Replacement Workflow of the HDDBPU
- 4.6.7 System-Stopped/Cold Replacement Workflow of the HDDBPU

When replacing the OPNL, perform one of the maintenance procedures listed below.
- 4.2.8 Active/Cold Replacement Workflow of the OPNL
- 4.4.8 Inactive/Cold Replacement Workflow of the OPNL
- 4.6.8 System-Stopped/Cold Replacement Workflow of the OPNL

Caution - Before you handle any unit, be sure to wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be seriously damaged. For details, see "1.5 Precautions on Static Electricity."

16.3 Removing the HDDBPU or OPNL

This section describes the procedure for removing the HDDBPU or OPNL.

16.3.1 Enabling the Removal of the HDDBPU or OPNL

Before removing the HDDBPU or OPNL, you need to remove the FANUs and

FANBPU. This section describes the procedure for removing the FANUs and FANBPU.

1. **Place the server in the cold state.**
   Stop the power supply to the server to place it in the cold state. For the procedure for removing the power cords, see "9.8.2 Removing the Power Cords."

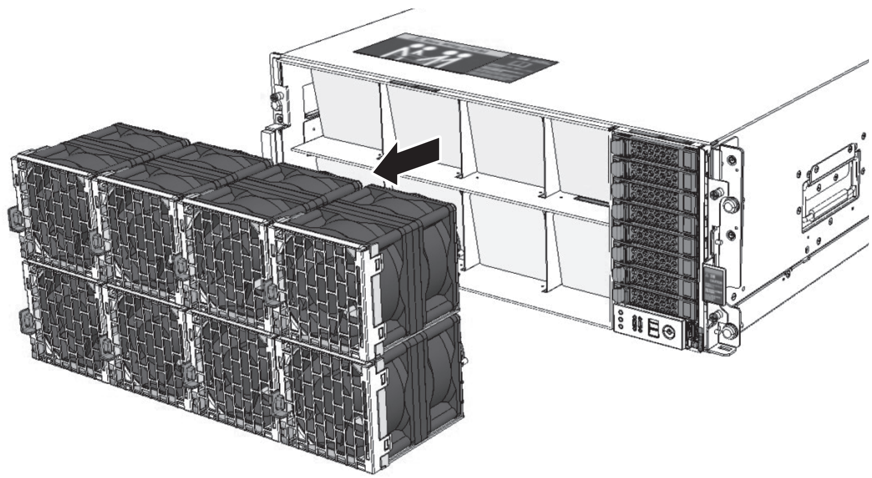
2. **Remove the front cover.**
   For the procedure for removing the front cover, see "9.8.3 Removing the Front Cover."

Note - The serial number of the server is printed on a label affixed on the front cover. Store this cover such that it is not mixed up with the front covers of other SPARC M12 units.

---

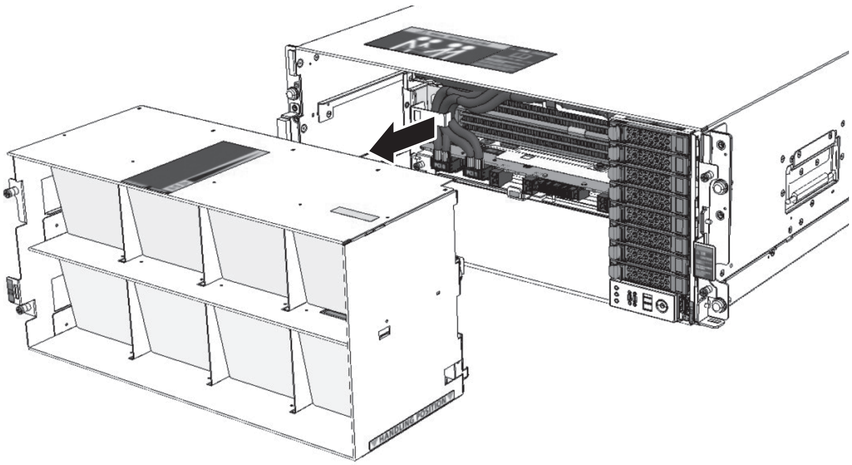
3. **Remove all the FANUs**.
   Remove all the FANUs mounted in the FANBPU. For details on the procedure, see "14.3.1 Removing a FANU."

Figure 16-2 Removing the FANUs



4. **Remove the FANBPU.**
   Loosen the three fixing screws, and remove the FANBPU. For details, see "14.3.2 Removing the FANBPU."

Figure 16-3 Removing the FANBPU

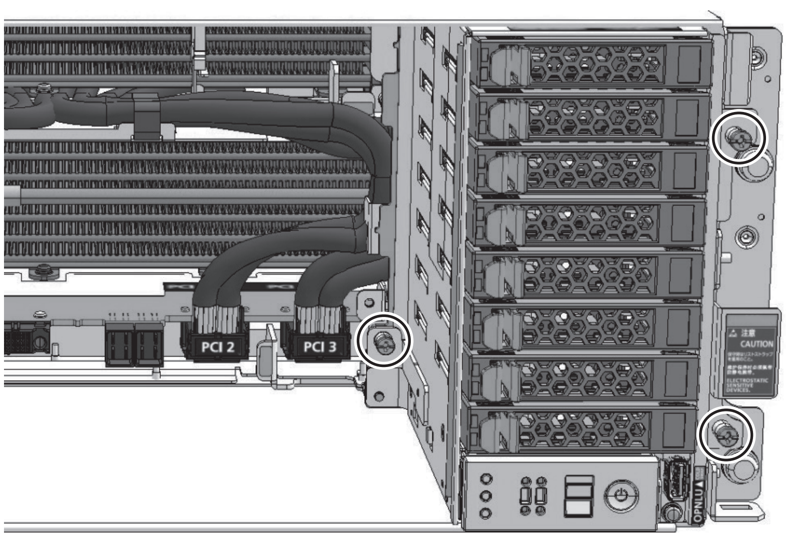


16.3.2 Removing the HDDBPU

This section describes the procedure for removing the HDDBPU.

1. **Loosen the three fixing screws of the HDDBPU.**

Figure 16-4 Fixing Screws of the HDDBPU

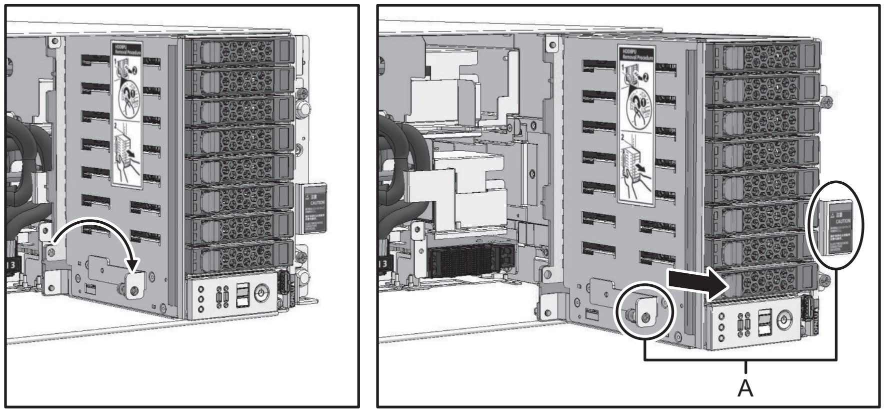


Caution - When loosening the fixing screws, be careful not to damage the PCIe cables or radiator cores (heat exchanging parts) with the screwdriver, which may come into contact with these components.

2. **Remove the HDDBPU.**
   Pull down the removal lever of the HDDBPU toward you, and pull out the HDDBPU while holding its handle (A in Figure 16-5).

Note - When pulling out the HDDBPU, put your hand under it to prevent it from falling.

Figure 16-5 Removing the HDDBPU



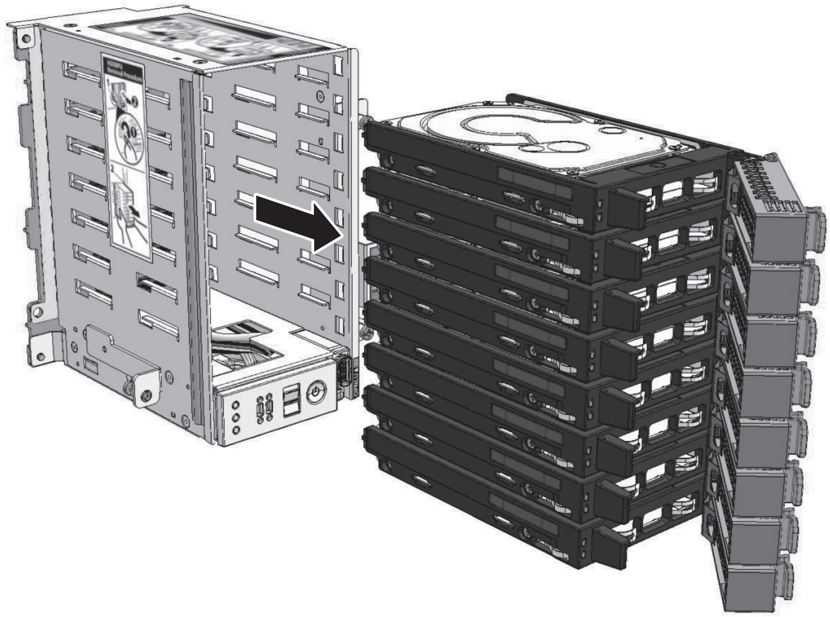
16.3.3 Removing the OPNL

This section describes the procedure for removing the OPNL mounted in the HDDBPU.

Note - If you are replacing the OPNL of the SPARC M12-2S, make a note of the set BB-ID value.

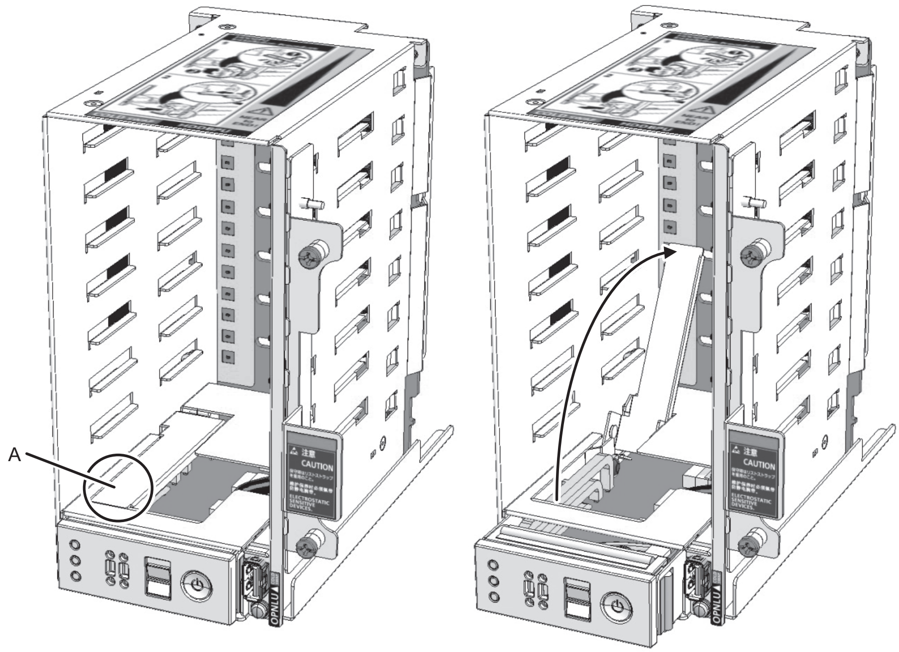
1. **Remove the HDDs/SSDs.**
   Remove all the HDDs/SSDs mounted in the HDDBPU. If any filler units are mounted, remove them too. For details, see "15.3 Removing an HDD/SSD or Filler Unit."

Figure 16-6 Removing the HDD/SSD and Filler Units



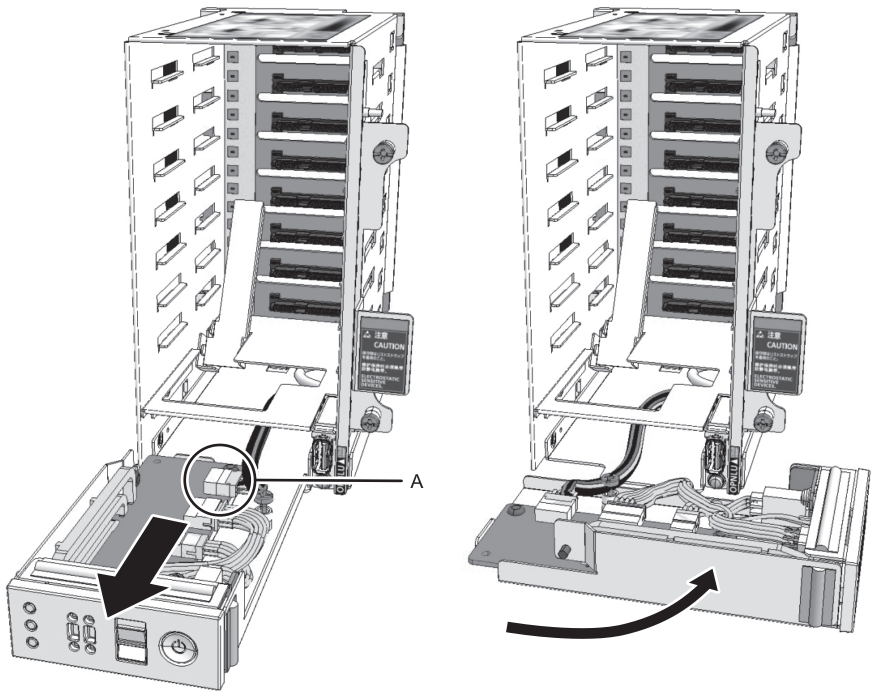
2. **Pull up the removal lever of the OPNL.**
   Pull up the removal lever of the OPNL (A in Figure 16-7), and pull the OPNL out from the HDDBPU.

Figure 16-7 Releasing the OPNL



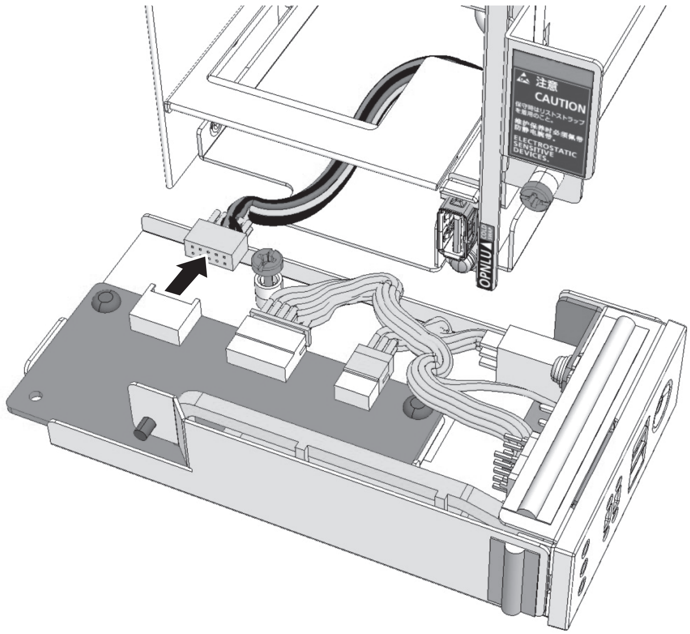
3. **Remove the OPNL.**
   Disconnect the connector (A in Figure 16-8) that connects the HDDBPU and OPNL. Disconnecting the connector completes the removal of the OPNL.

Figure 16-8 Pulling out the OPNL



Caution - Do not pull the connector cable that connects the HDDBPU and OPNL. Pulling the connector cable forcibly may break it, in which case the cable cannot be used normally.

Figure 16-9 Removing the OPNL



16.4 Installing the HDDBPU or OPNL

This section describes the procedure for installing the OPNL or HDDBPU.

16.4.1 Installing the OPNL

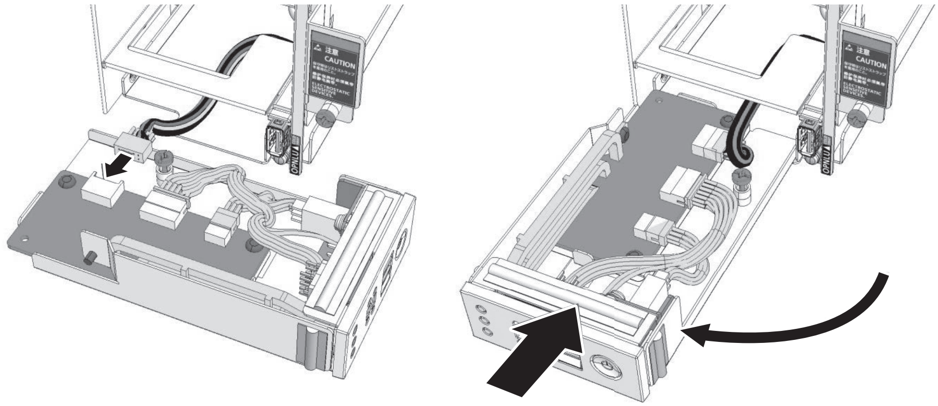
Note - If you are replacing the OPNL of the SPARC M12-2S, first set the BB-ID value from the note made in "16.3.3 Removing the OPNL," and then install the OPNL.

Note - In the case of the SPARC M12-2, you cannot set a BB-ID value for the OPNL.

---

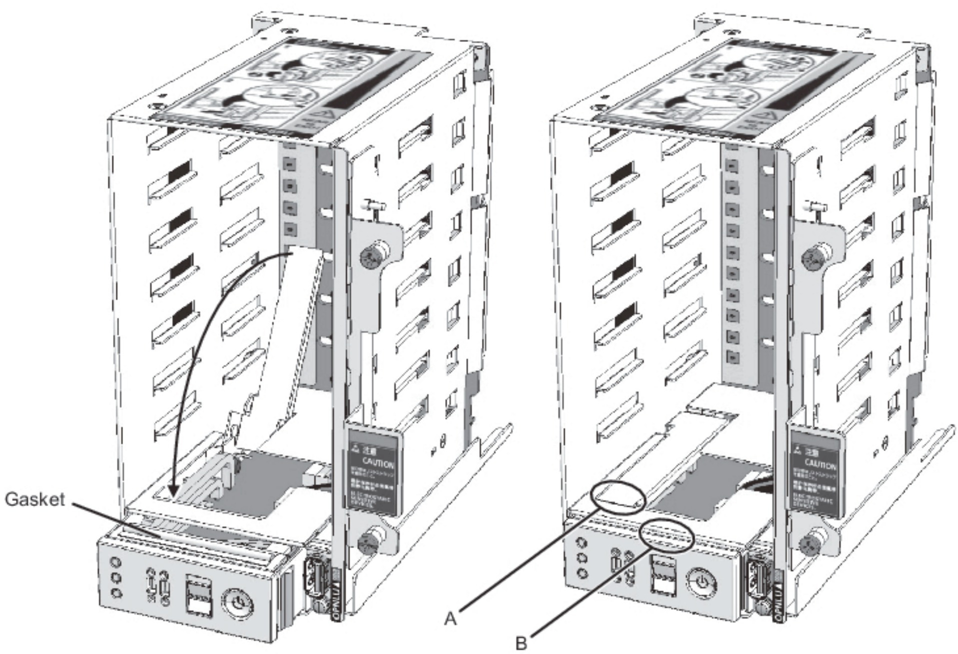
1. **Connect the OPNL and HDDBPU.**
   After connecting the OPNL and HDDBPU via the connector, insert the OPNL into the HDDBPU.

Figure 16-10 Installing the OPNL



2. **Check that the OPNL is installed properly.**
   a. Make sure that the tip of the removal lever (A in Figure 16-11) is securely fitted.
   b. Make sure that the gasket is pushed in all the way so that no part of it is seen (B in Figure 16-11).

Figure 16-11 Securing the OPNL

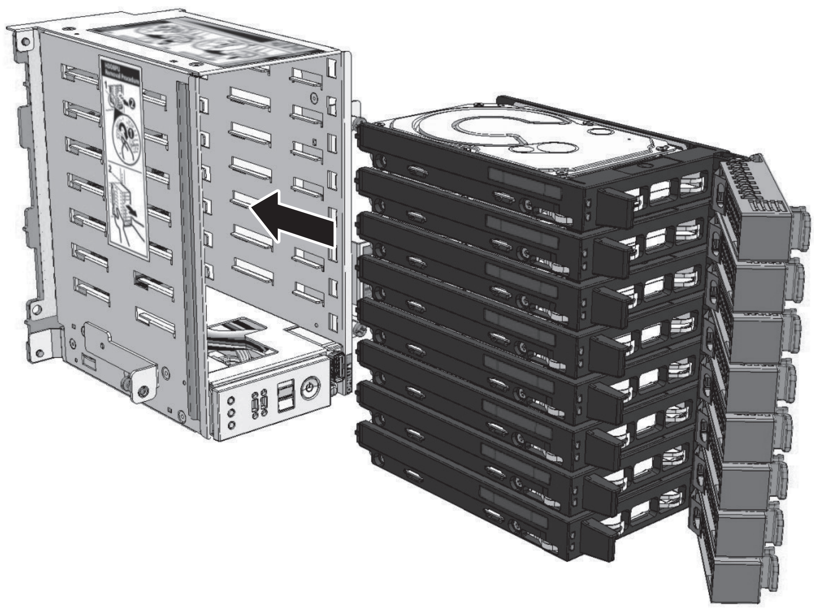


Note - If the tip of the removal lever is not securely fitted or part of the gasket is seen, pull out the OPNL. Check whether the cables are stored properly, and then repeat step 1.

---

3. **Install the HDD/SSD and filler units.**
   Install the removed HDD/SSD and filler units. For details, see "15.4 Installing an HDD/SSD or Filler Unit."

Figure 16-12 Installing the HDD/SSD and Filler Units

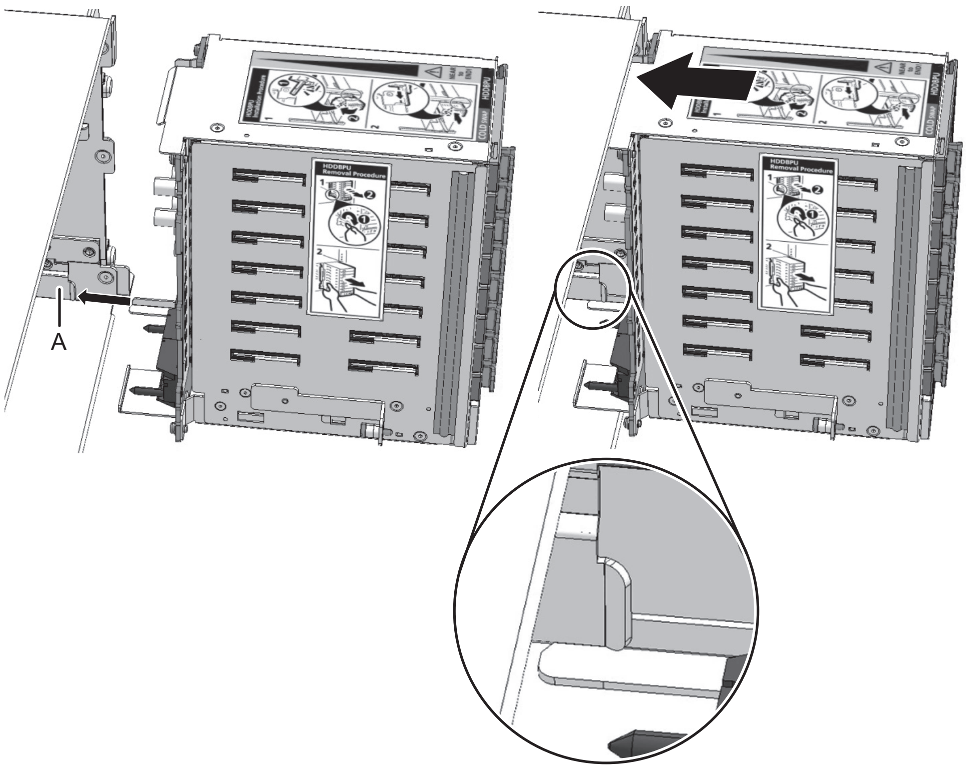


16.4.2 Installing the HDDBPU in the Server

This section describes the procedure for installing the HDDBPU to the server, with the OPNL mounted in it.

1. **Insert the HDDBPU into the server.**
   Fit the HDDBPU to the positioning guide (A in Figure 16-13), and insert it into the server.

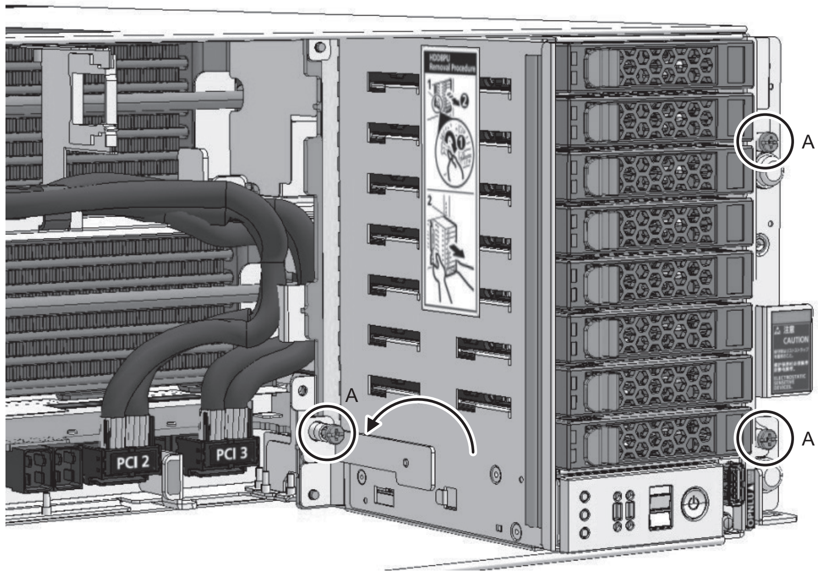
Figure 16-13 Inserting the HDDBPU



Caution - Before connecting the HDDBPU to the connector of the CMU, confirm that the HDDBPU is fitted to the positioning guide and does not move left or right. Inserting the HDDBPU when it is not fitted to the positioning guide may damage the connector.

2. **Secure the HDDBPU to the server.**
   Return the removal lever of the HDDBPU to the state it was in before the HDDBPU was removed. Then, tighten the three fixing screws shown in A in Figure 16-14 to secure the HDDBPU.

Figure 16-14 Securing the HDDBPU

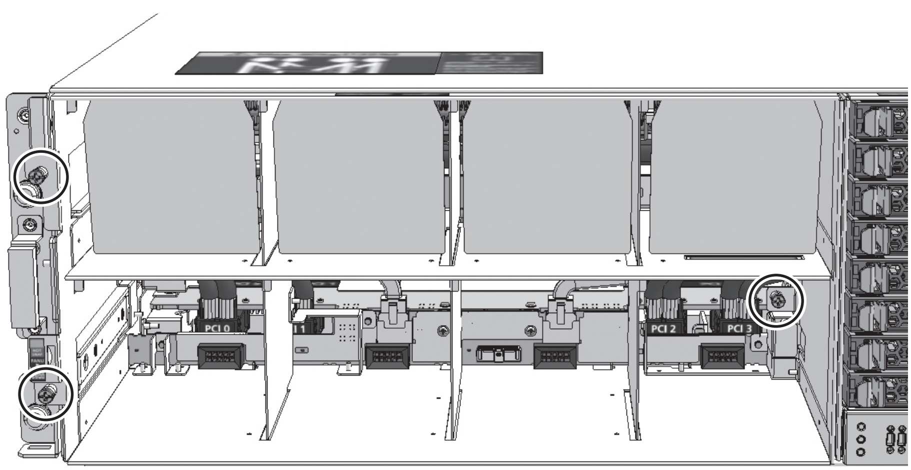


16.4.3 Restoring the Server

This section describes the procedure for restoring the server after performing maintenance on the HDDBPU or OPNL.

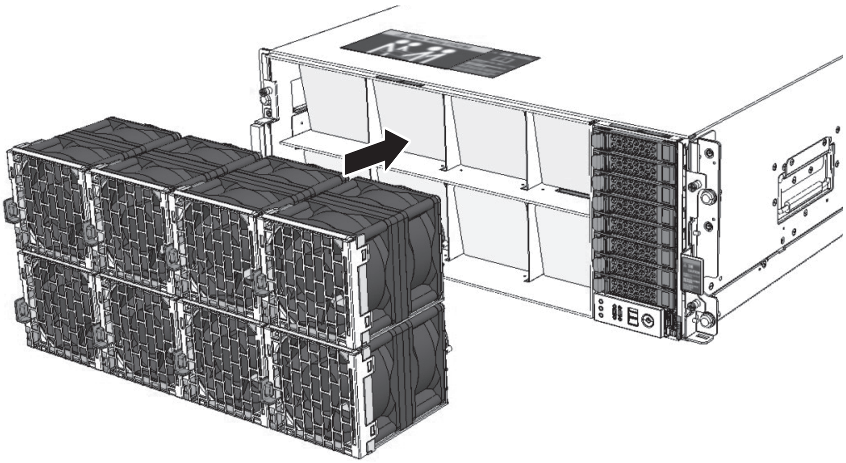
1. **Install the FANBPU.**
   Install the FANBPU to the server. For details, see "14.4.1 Installing the FANBPU."

Figure 16-15 Securing the FANBPU



2. **Install the FANUs.**
   Install the FANUs to the server. For details, see "14.4.2 Installing a FANU."

Figure 16-16 Installing the FANUs



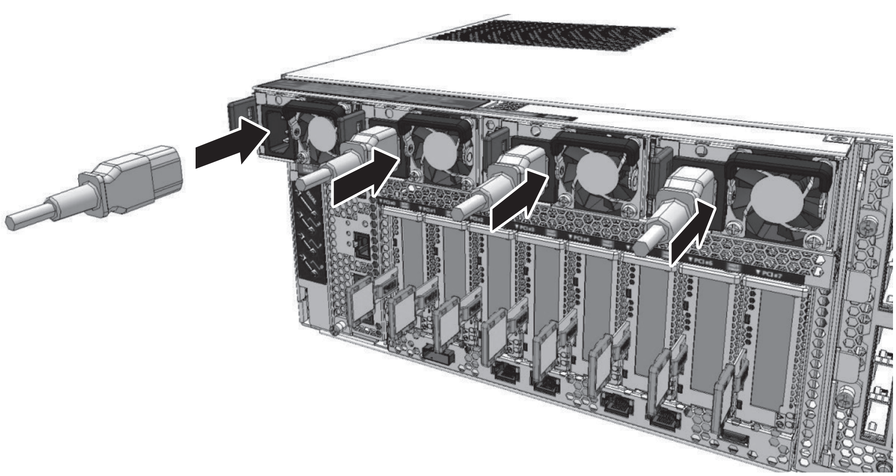
3. **Install the front cover.**
   For the procedure for installing the front cover, see "10.1.3 Installing the Front Cover."

Note - The serial number of the server is printed on a label affixed on the front cover. Store this cover such that it is not mixed up with the front covers of other SPARC M12 units.

---

4. **Place the server in the hot state.**
   Power on the server to place it in the hot state. For details on installing the power cord on the PSU, see "10.1.1 Installing a Power Cord."

Figure 16-17 Installing the Power Cord



Chapter 17

Maintaining the CPU Memory Unit and Memory

This section describes the maintenance procedures for the CMU and memory mounted in the SPARC M12.

- Maintenance Precautions
- Locations of the CMU and Memory
- Before Maintenance on the CMU and Memory
- Removing the CMU or Memory
- Installing the CMU and Memory

Note - You can replace the CMUL and replace, add, and remove CMUU units.

17.1 Maintenance Precautions

Note the following points when you maintain the CMU.

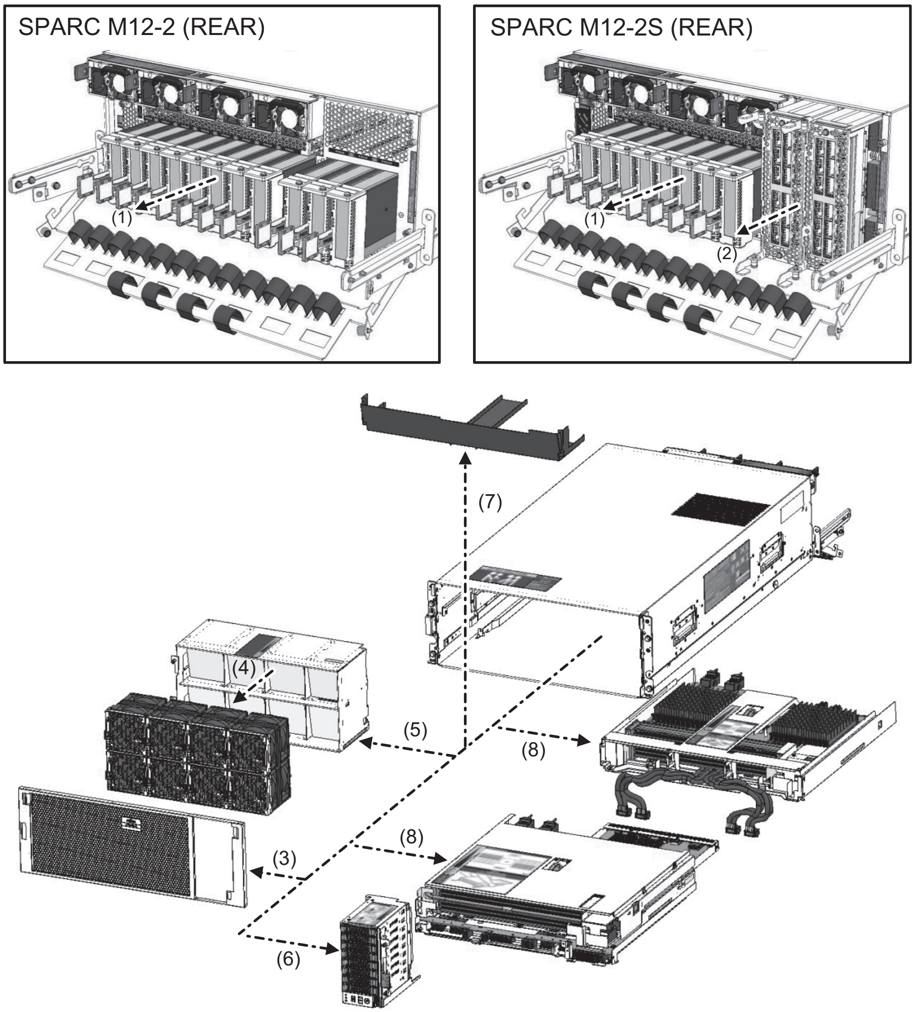
Caution - The CMUU weighs 10 kg (22 lb), and the CMUL weighs 13 kg (29 lb). Work must be done by two people if the server is mounted at the 24U or higher position of the rack. If the work is done by one person, it may result in an injury or damage to the server.

- If you have replaced the CMUL that has the hardware RAID function enabled, re-enable the hardware RAID volume. For details, see "14.2.11 Re-enabling a Hardware RAID Volume" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.
- When you add or remove a CMUU, a root complex is also added or removed. As a result, the PCIe card installation rules and the physical device paths may change, making it necessary to reconfigure the logical domains. For details, see "7.2 Precautions for FRU Expansion" or "7.3 Precautions for FRU Reduction."

17.2 Locations of the CMU and Memory

Figure 17-1 and Figure 17-2 show the mounting locations of the CMU and memory. The numbers in the figure represent the order in which the units are to be removed.

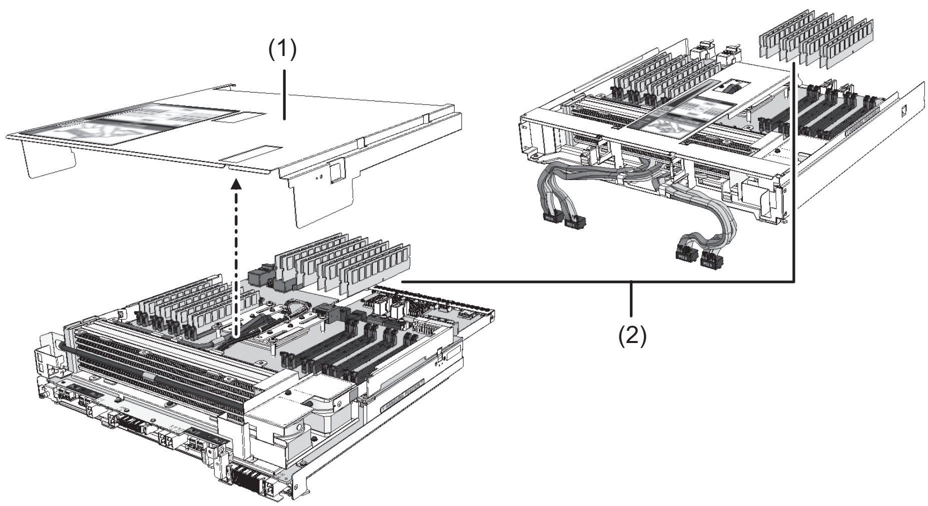
Figure 17-1 Location of the CMU



Location No.	Unit
1	PCIe card (*1)
2	XBU (*2)
3	Front cover
4	FANU
5	FANBPU
6	HDDBPU
7	CMU filler unit (*3)
8	CMU

*1 The SPARC M12-2 houses 11 cassettes, and the SPARC M12-2S houses 8 cassettes.
*2 This unit is mounted only in the SPARC M12-2S.
*3 This unit is mounted in a system that has only the CMUL when purchased.

Figure 17-2 Locations of Memory



Location No.	Unit
1	CMUL top cover
2	Memory

17.3 Before Maintenance on the CMU and Memory

When replacing the CMU, perform one of the maintenance procedures listed below.

- 4.2.9 Active/Cold Replacement Workflow of the CMU
- 4.4.9 Inactive/Cold Replacement Workflow of the CMU
- 4.6.9 System-Stopped/Cold Replacement Workflow of the CMU

When adding a CMUU, perform one of the maintenance procedures listed below.

- 5.2.3 Active/Cold Addition Workflow of the CMUU
- 5.4.3 Inactive/Cold Addition Workflow of the CMUU
- 5.6.3 System-Stopped/Cold Addition Workflow of the CMUU

When removing a CMUU, perform one of the maintenance procedures listed below.

- 6.2.3 Active/Cold Removal Workflow of the CMUU
- 6.4.3 Inactive/Cold Removal Workflow of the CMUU
- 6.6.3 System-Stopped/Cold Removal Workflow of the CMUU

When replacing memory, perform one of the maintenance procedures listed below.

- 4.2.10 Active/Cold Replacement Workflow of Memory
- 4.4.10 Inactive/Cold Replacement Workflow of Memory
- 4.6.10 System-Stopped/Cold Replacement Workflow of Memory

When adding memory, perform one of the maintenance procedures listed below.

- 5.2.4 Active/Cold Addition Workflow of Memory
- 5.4.4 Inactive/Cold Addition Workflow of Memory
- 5.6.4 System-Stopped/Cold Addition Workflow of Memory

When removing memory, perform one of the maintenance procedures listed below.

- 6.2.4 Active/Cold Removal Workflow of Memory
- 6.4.4 Inactive/Cold Removal Workflow of Memory
- 6.6.4 System-Stopped/Cold Removal Workflow of Memory

Caution - Before you handle any unit, be sure to wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be seriously damaged. For details, see "1.5 Precautions on Static Electricity."

17.4 Removing the CMU or Memory

This section describes the procedure for removing the CMU or memory.

17.4.1 Enabling the Removal of the CMU

To enable the removal of the CMU, you need to remove the FANBPU, HDDBPU, PCIe cards, and XBU from the server. This section describes the procedure for removing the other units from the server before removing the CMU.

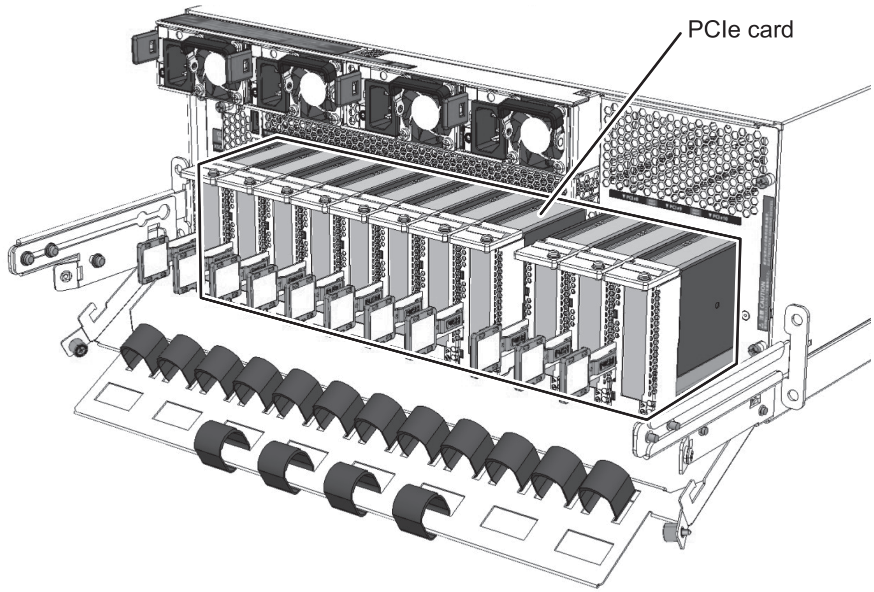
1. **Place the server in the cold state.**
   For details on handling power cords, see "9.8.2 Removing the Power Cords."
2. **Lower the cable support.**
   For details on handling the cable support, see "9.8.1 Lowering the Cable Support."
3. **The CMUL may have a LAN cable, SAS cable, USB cable, or other cable connected to it. Remove them all.**

Caution - Pulling out the CMUL with these cables (LAN, SAS, USB, or other cables) connected may damage the connectors.

---

4. **Pull out the PCIe card from the server.**
   For details on handling the PCIe card, see "12.3.1 Enabling the Removal of a PCIe Card."

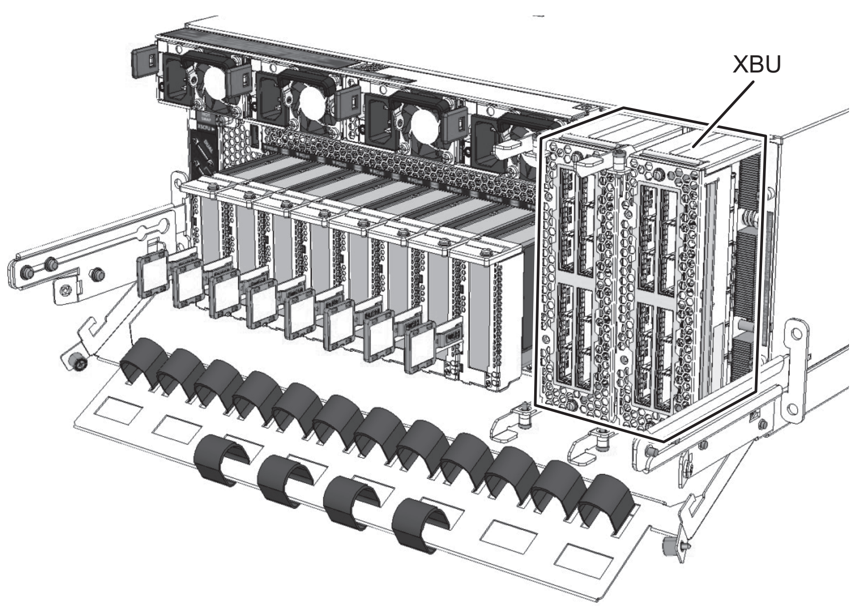
Figure 17-3 Pulling Out the PCIe Card



5. **Pull out the XBU from the server.**
   You can pull the XBU out of the CMU when you open its removal lever. For details on handling the XBU, see "20.3 Removing an XBU."

   Note that, for the SPARC M12-2, this step is not necessary. Proceed to step 6.

Figure 17-4 Pulling Out the XBU



6. **Remove the front cover.**
   For the procedure for removing the front cover, see "9.8.3 Removing the Front Cover."

Note - The serial number of the server is printed on a label affixed on the front cover. Store this cover such that it is not mixed up with the front covers of other SPARC M12 units.

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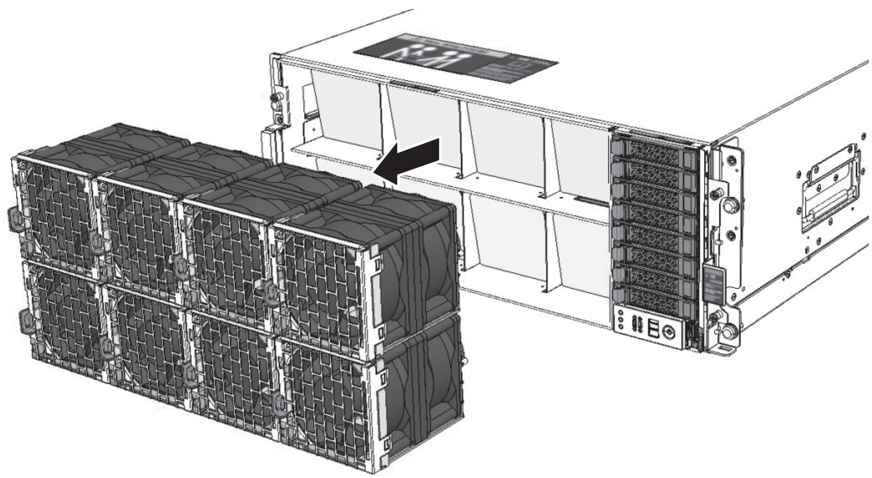
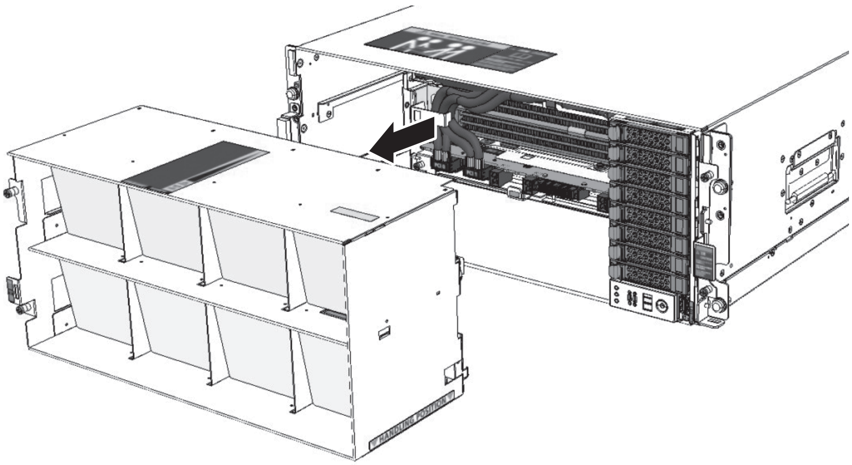
7. **Remove the FANUs.**
   For the procedure for removing the FANUs, see "14.3.1 Removing a FANU."

Figure 17-5 Removing the FANUs



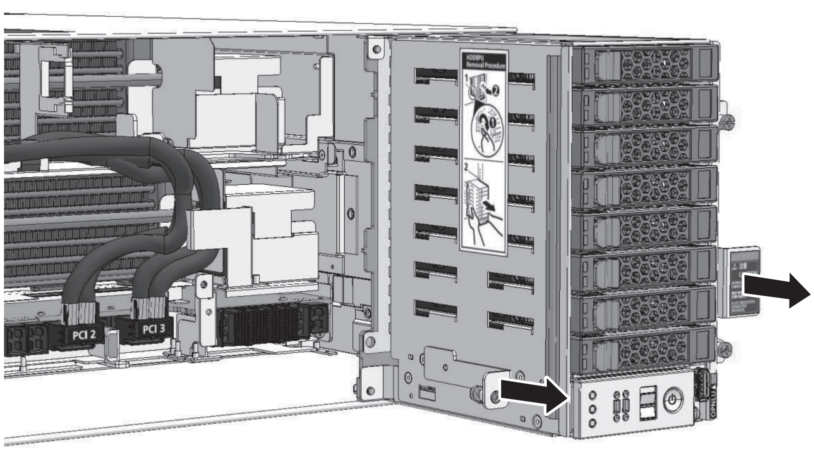
8. **Remove the FANBPU.**
   For the procedure for removing the FANBPU, see "14.3.2 Removing the FANBPU."

Figure 17-6 Removing the FANBPU



9. **Remove the HDDBPU.**
For the procedure for removing the HDDBPU, see "16.3.2 Removing the HDDBPU."

Figure 17-7 Removing the HDDBPU

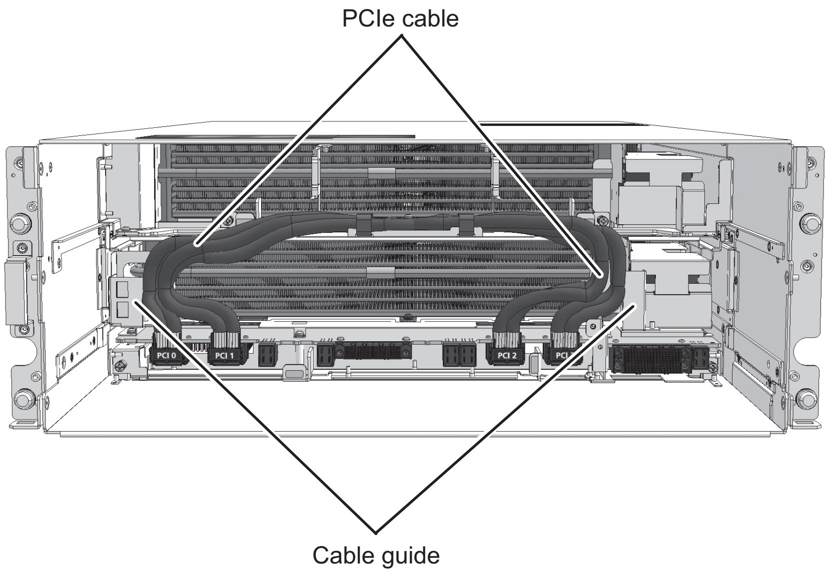


17.4.2 Removing the CMU

This section describes the procedure for removing the CMU.

1. **Remove the PCIe cables from the cable guide.**
Remove the PCIe cables from the cable guide. When the CMUU is not mounted, this step is not necessary. Proceed to step 6.

Figure 17-8 Removing the PCIe Cables From the Cable Guide



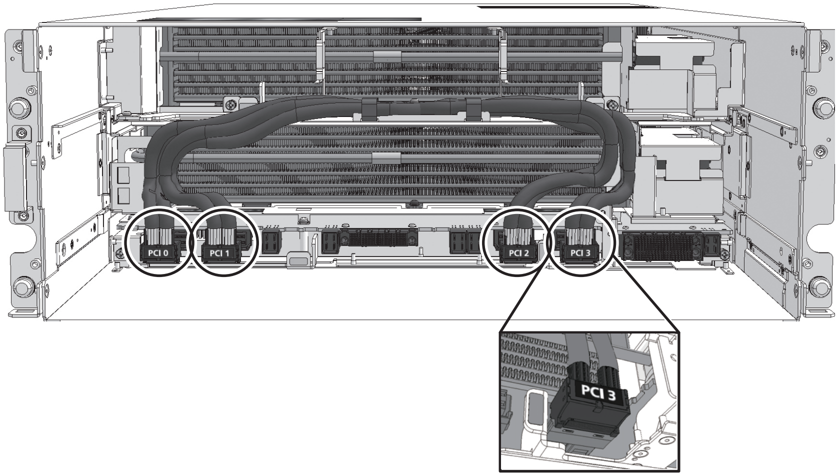
Caution - Hold the PCIe cables with both hands to carefully remove the cables from the cable guide. If excessive force is used to pull out the PCIe cables, the cables may break or the connectors may be damaged.

---

2. **Remove the PCIe cables from the CMUL.**
   The latch of the PCIe cable connector is located on the underside of the connector. Pull out the connector by pinching the connector hood while pushing the latch.

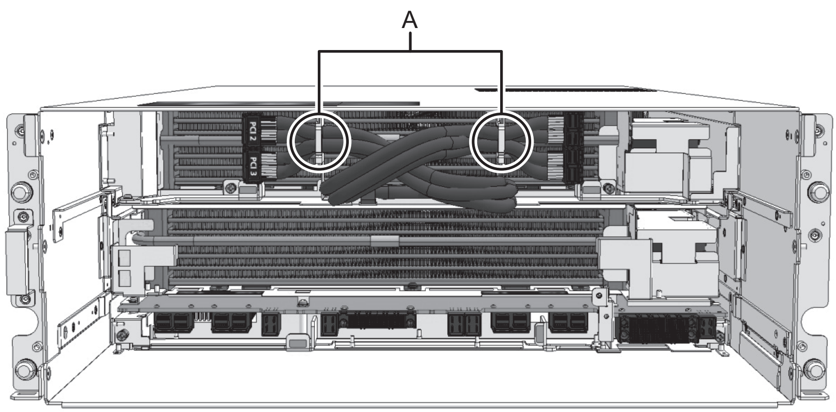
Caution - Remove the PCIe cable connectors carefully. If you roughly remove them, the PCIe cable may break or the connector may be damaged.

Figure 17-9 Removing the PCIe Cable Connectors



3. **Bundle the PCIe cables using the cable clamps of the CMUU.**
Bundle the PCI0 and PCI1 cables and the PCI2 and PCI3 cables into pairs respectively using the cable clamps (A in Figure 17-10) in such a way that they cross each other.

Figure 17-10 Securing the PCIe Cables With the Cable Clamp

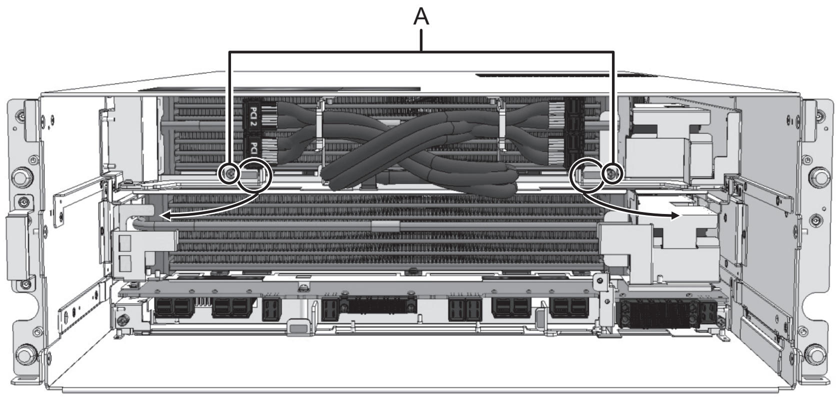


Caution - When removing either the CMUL or CMUU or both, be sure to bundle the PCIe cables using the cable clamps. Removing the CMU without bundling PCIe cables may damage the cables due to interference with the internal components.

4. **Loosen the fixing screws of the CMUU levers.**
Loosen the fixing screws (A in Figure 17-11) of the CMUU levers.

Note that, if you do not remove the CMUU, this step is not necessary. Proceed to step 6.

Figure 17-11 Fixing Screws of the CMUU Levers



Caution - Loosen the fixing screws carefully with the screwdriver so as not to damage the PCIe cables or the radiator located behind the PCIe cables.

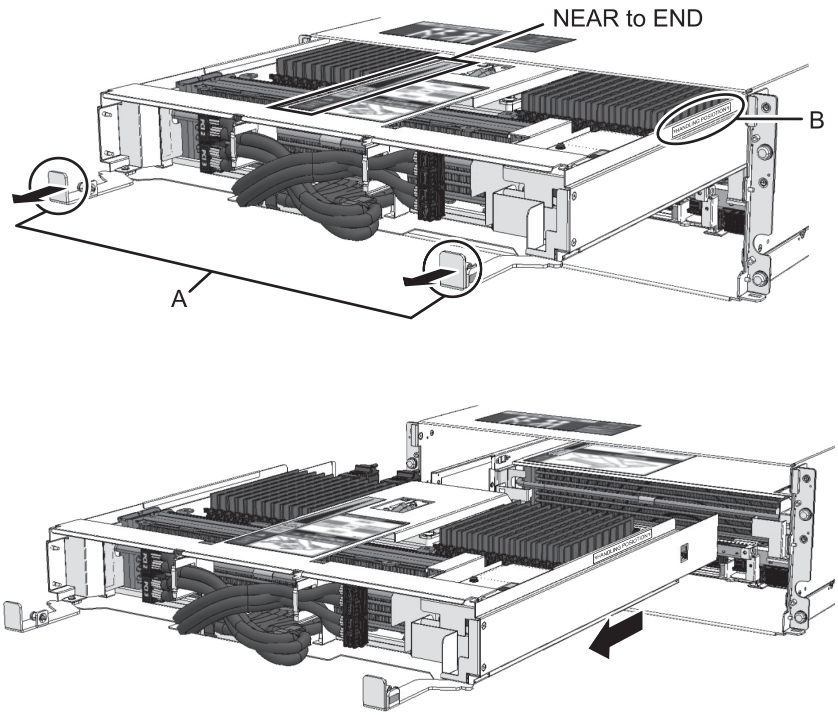
5. **Remove the CMUU.**

Note - To remove the CMU filler unit, proceed to step 6.

a. Hold the CMUU levers (A in Figure 17-12), pull out the CMUU to the tip of "NEAR to END", and then hold it at "HANDLING POSITION" (B in Figure 17-12) on its side.

b. Hold the CMUU at HANDLING POSITION, and remove it from the server.

Figure 17-12 Removing the CMUU



Note - When removing the CMUU, be sure to bundle the PCIe cables using the cable clamps.

Note - If you do not remove the CMUL, the following steps are not necessary.

---

6. **Remove the filler unit.**
   When the filler unit is not mounted, this step is not necessary. Proceed to step 7.
   a. Hook your fingers over the top part of the CMU filter unit (A in Figure 17-13) by inserting them into the gap there.
   b. Pull out the CMU filler unit by pulling it toward you.

Figure 17-13 Gap in the Top Part of the CMU Filler Unit

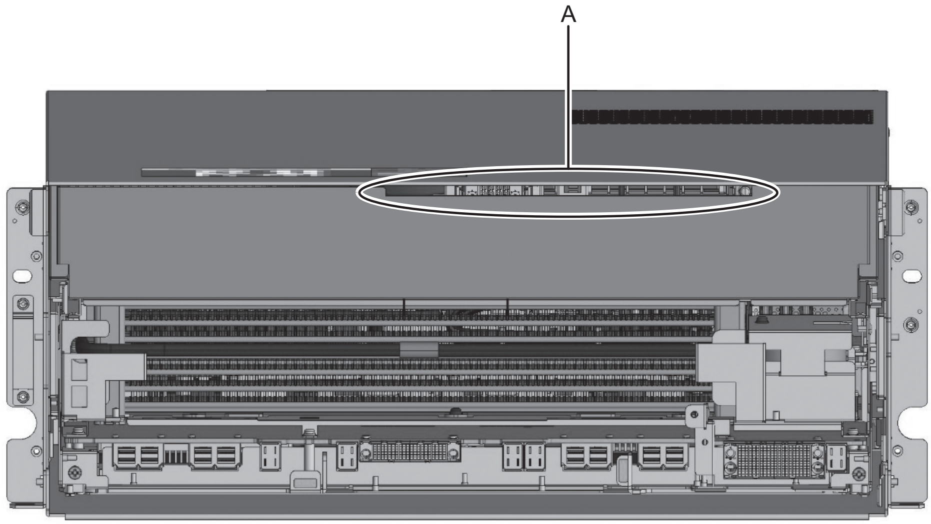
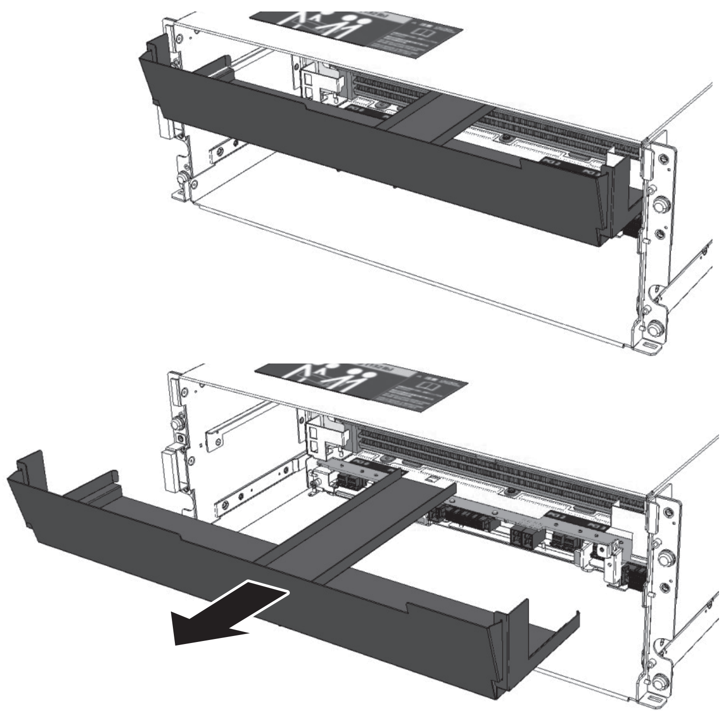


Figure 17-14 Removing the CMU Filler Unit

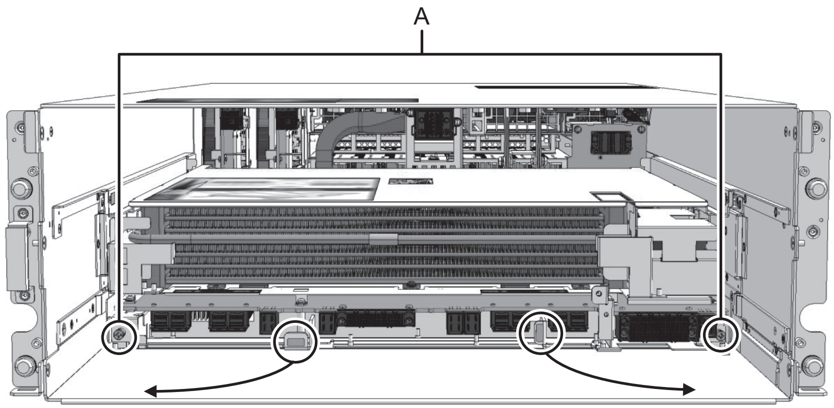


Note - When removing the CMU filler unit, hold it with both hands so that you do not drop it.

Note - If you do not remove the CMUL, the following steps are not necessary.

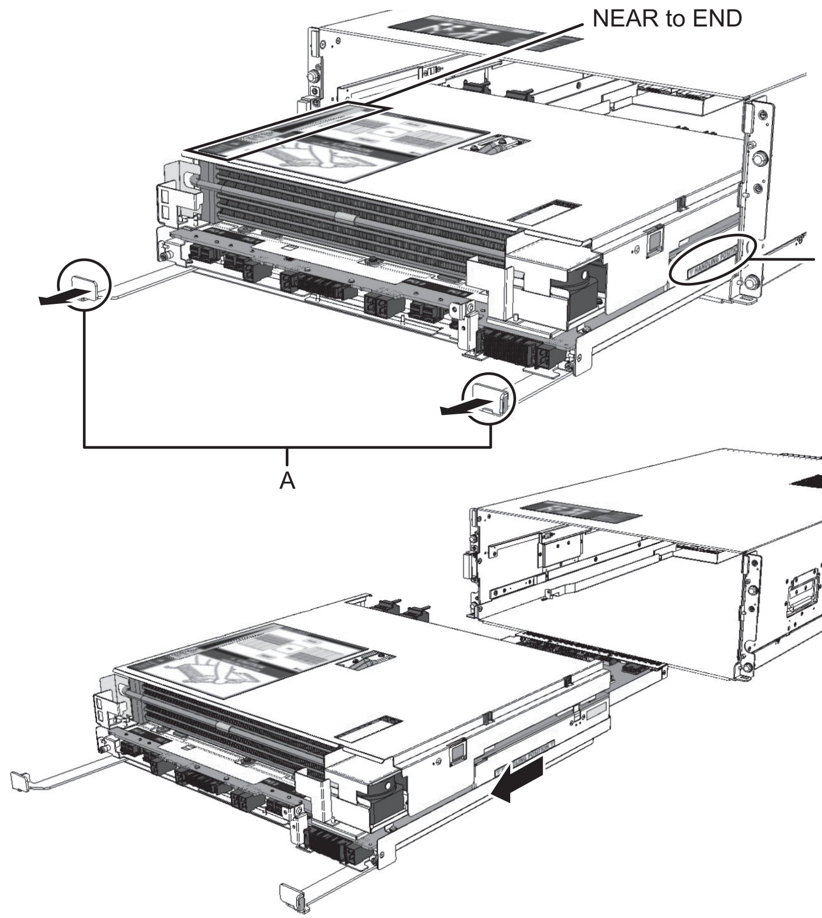
7. **Loosen the fixing screws of the CMUL levers.**
   Loosen the fixing screws (A in Figure 17-15) of the CMUL levers.

Figure 17-15 Fixing Screws of the CMUL Levers



8. **Remove the CMUL.**
   a. Hold the CMUL levers (A in Figure 17-16), pull out the CMUL to the tip of "NEAR to END", and then hold it at "HANDLING POSITION" (B in Figure 17-16) on its side.
   b. Hold the CMUL at HANDLING POSITION, and remove it from the server.

Figure 17-16 Removing the CMUL



Caution - You need to pull out the CMUL completely from the server before lifting it up. Lifting up the CMUL before pulling it out completely may damage the CMUL due to interference with the internal components.

Note - After removing the CMUL from the server, place it horizontally on the workbench gently to avoid mechanical shock.

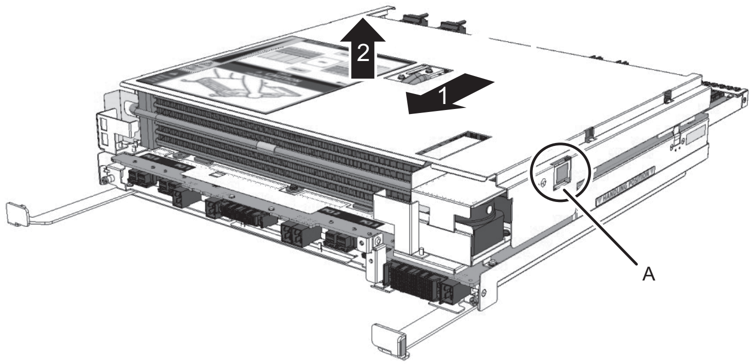
17.4.3 Removing Memory

This section describes the procedure for removing the memory mounted in the CMU. Unless otherwise noted, the description provided herein applies to both the CMUL and CMUU.

1. **Remove the top cover of the CMUL.**
   Remove the top cover by sliding it in the direction of the arrow while pushing the latches on both sides of the CMUL (A in Figure 17-17).

   To remove memory from the CMUU, proceed to step 2.

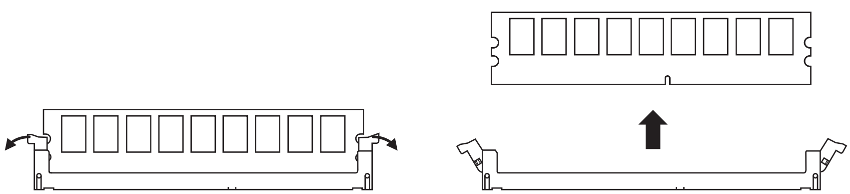
Figure 17-17 Removing the CMUL Top Cover



2. **Remove memory.**
   After opening the latches on both sides of the memory slot, remove the memory.

Note - To operate the system after removing memory, follow the instructions in "2.2.1 Memory Installation Rules."

Figure 17-18 Removing Memory



17.5 Installing the CMU and Memory

This section describes the procedures for installing memory and the CMU. To add a CMUU, perform the procedure described in this section as well.

17.5.1 Installing Memory

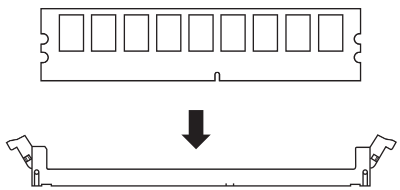
This section describes the procedure for installing memory in the CMU.

Note - To add memory or change the type of memory installed, follow the instructions in "2.2.1 Memory Installation Rules."

Note - When replacing only the CMU, make sure that the memory mounting position is the same before and after the replacement of the CMU.

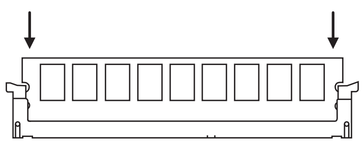
1. **Install the memory.**
   Check that the latches on both sides of the memory slot into which to install memory are open. Align the memory key grooves with the memory slot key, and place the memory in the memory slot.

Figure 17-19 Installing Memory



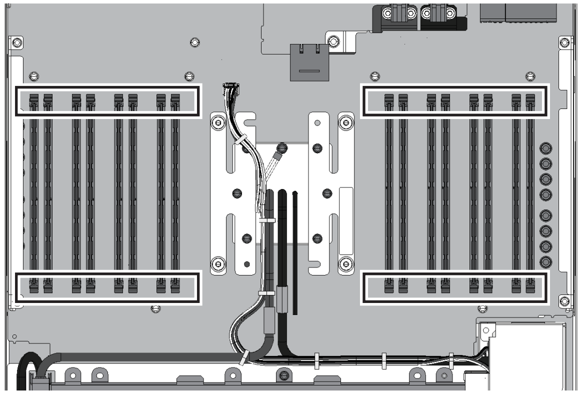
2. **Secure the memory.**
   Push both ends of the memory until the latches of the memory slot close.

Figure 17-20 Securing the Memory



Note - Confirm that the latches on both ends of the memory slot are closed. You need to make sure that there is no unevenness (Figure 17-21) between the latches when seen from directly above. If the latches are not closed, remove the memory and try installing it again.

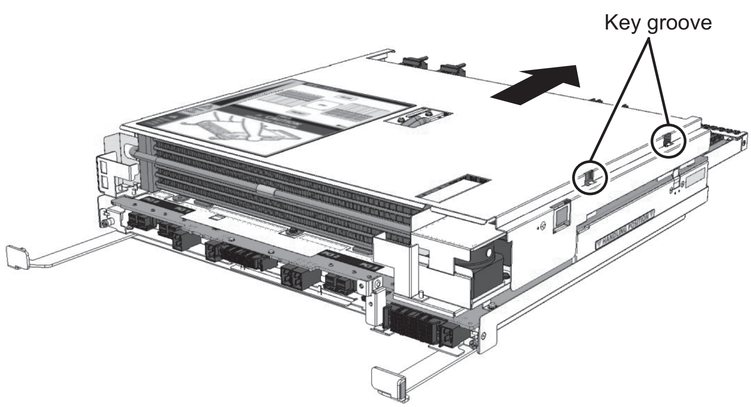
Figure 17-21 Installing Memory (No Unevenness)



3. **Install the to cover to the CMUL.**
Place the top cover on the CMUL with its key aligned with the key grooves on both sides of the CMUL. Then, slide the top cover in the direction of the arrow shown in Figure 17-22, and lock the latch to secure the cover. When locked, the latch "clicks".

Note that this step is not necessary for the CMUU.

Figure 17-22 Installing the Top Cover on the CMUL



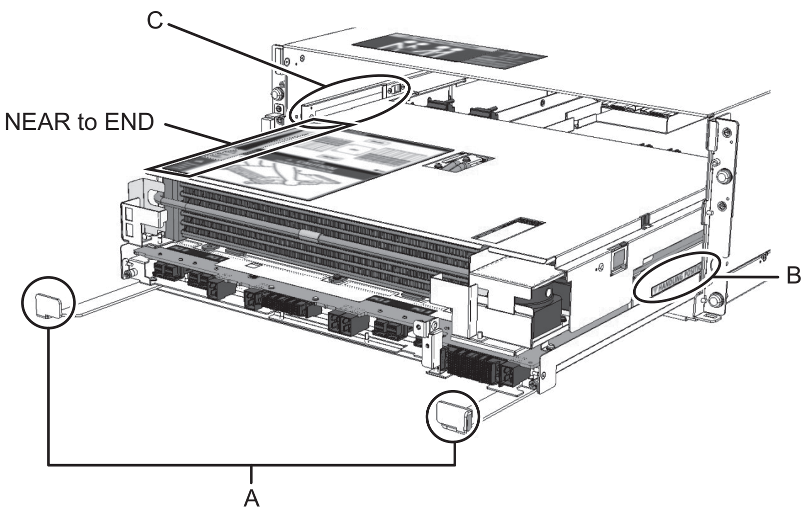
17.5.2 Installing the CMU

1. **Insert the CMUL into the server.**
Hold the CMUL at "HANDLING POSITION" (B in Figure 17-23), insert it to the tip of "NEAR to END". Then, hold the CMUL levers (A in Figure 17-23) and insert the CMUL into the server.

Insert the CMUL into the server while taking care not to apply a load on the rear part of the CMUL.

If you have not removed the CMUL, proceed to step 3.

Figure 17-23 Inserting the CMUL

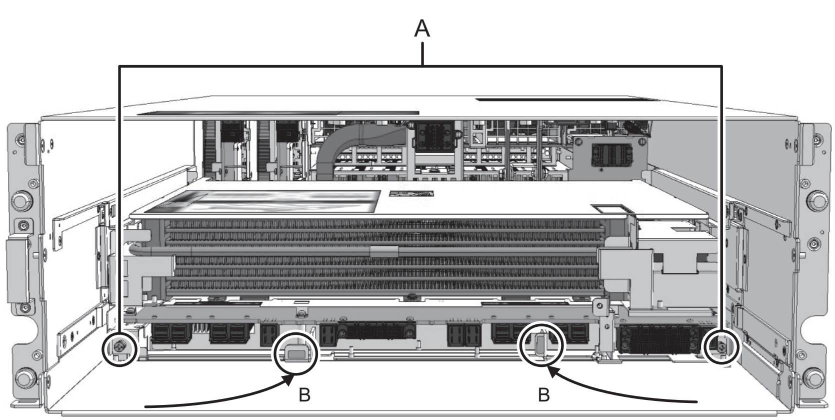


Caution - Check that the CMUL is fitted to the guide (C in Figure 17-23) in the server before holding it by other parts. If the CMUL is not fitted to the guide, it may fall and be damaged.

2. **Secure the CMUL.**
   Insert the CMUL slowly, with its levers open, until it sops inside the server. When inserting the CMUL, push the flat part of each CMUL lever (B in Figure 17-24).

   When the CMUL stops inside the server, close the CMUL levers and tighten the fixing screws (A in Figure 17-24) to secure the CMUL to the server.

Figure 17-24 Connector Connection of the CMUL and BPU



Note - When inserting the CMUL into the server, do not push any part other than the flat parts of the CMUL levers. Pushing any other part may damage the CMUL.

3. **Insert the CMUU into the server.**

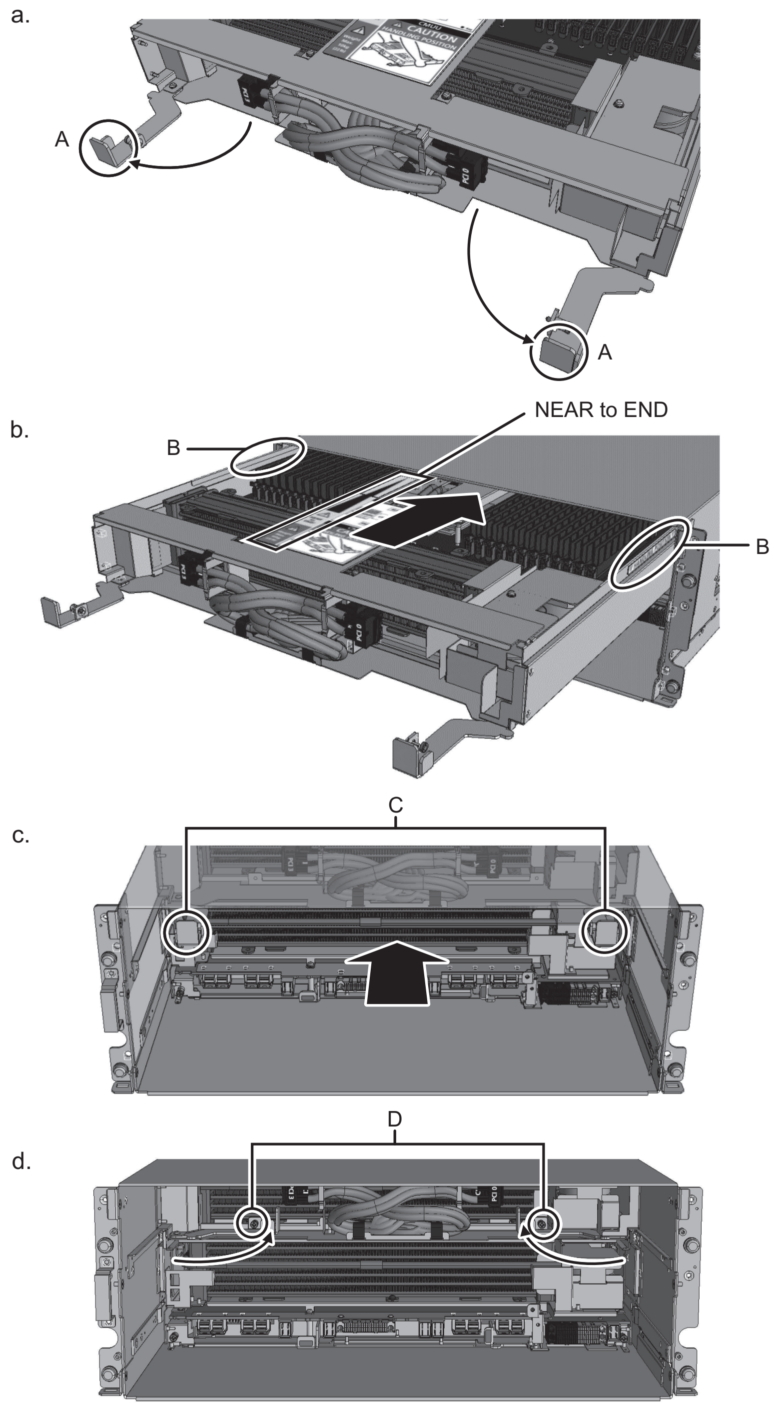
   a. When you insert the CMUU, open the CMUU levers (A in Figure 17-25) while the PCIe cables are bundled with cable clamps.

   b. Hold "HANDLING POSITION" (B in Figure 17-25) on the sides of the CMUU, and insert it to the server up to the tip of the "NEAR to END" display on the top panel.

   c. Then, push the flat tips of the CMUU levers (C in Figure 17-25) to insert the CMUU into the server until it stops.

   d. When the CMUU stops, close the CMUU levers to connect the CMUU to the server. When the CMUU levers are closed completely, tighten the fixing screws (D in Figure 17-25) to secure the CMUU to the server.

Figure 17-25 Inserting the CMUU Into the Server



4. **Connect the PCIe cables.**
Remove the PCIe cables of the CMUU from the cable clamps and connect them

to the CMUL.

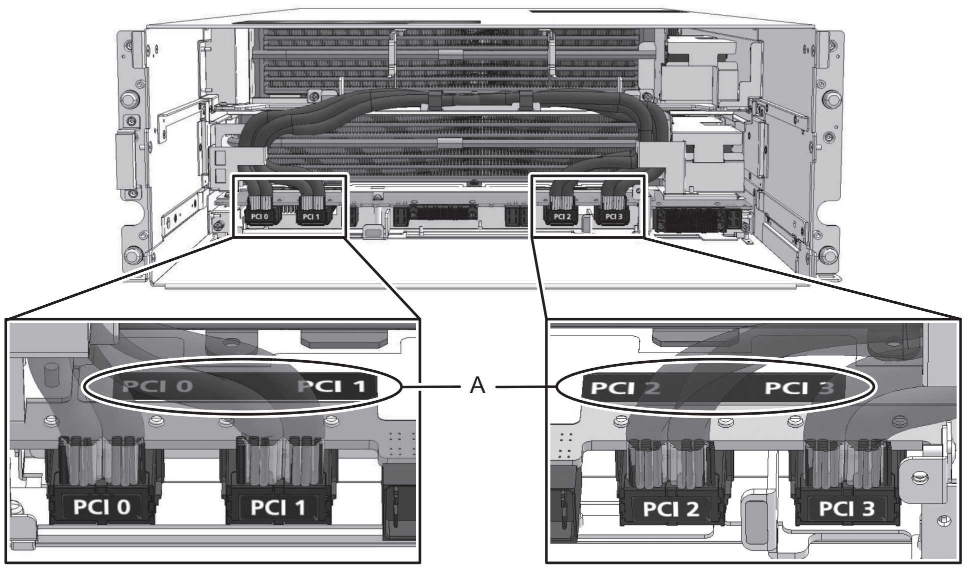
Labels showing the connection destinations are affixed on the PCIe cables and CMUL (A in Figure 17-26). Connect the PCIe cable connectors according to these labels.

After connecting the PCIe cable connectors, route the PCIe cables through the cable guide inside the server.

Note - The connection destinations of the PCIe cables are shown on the label affixed to the CMUL. (A in Figure 17-26)

Note - When connecting a PCIe cable connector, push it in all the way and make sure that it does not come off.

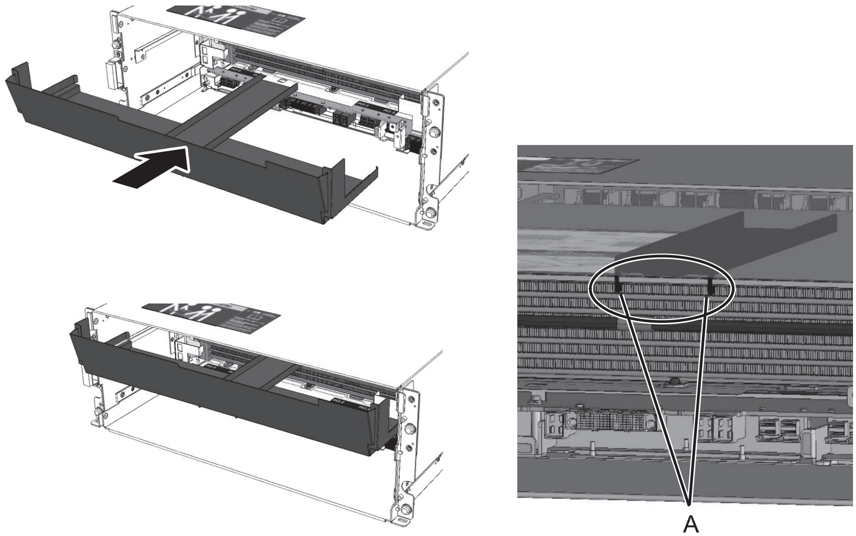
Figure 17-26 Connecting the PCIe Cables and CMUL



5. **Insert the CMU filler unit.**
   Insert the CMU filler unit into the server. Hook the claws at the bottom of the CMU filler unit (A in Figure 17-27) onto the top cover of the CMUL.

   When the CMUU is mounted, this step is not necessary.

Figure 17-27 Inserting the CMU Filler Unit

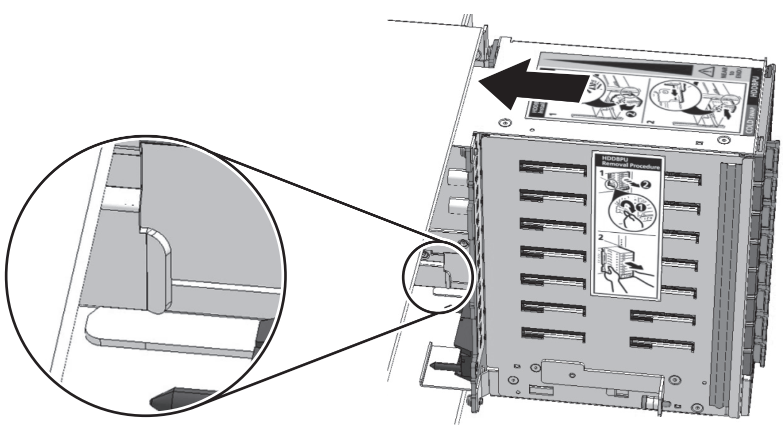


17.5.3 Restoring the Server

This section describes the procedure for restoring the server after performing maintenance on the CMU.

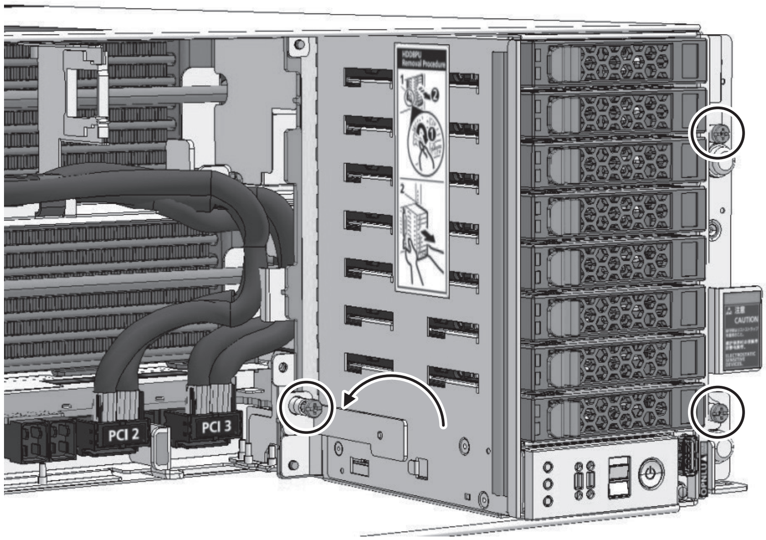
1. **Install the HDDBPU.**
   For details, see "16.4.2 Installing the HDDBPU in the Server."

Figure 17-28 Installing the HDDBPU



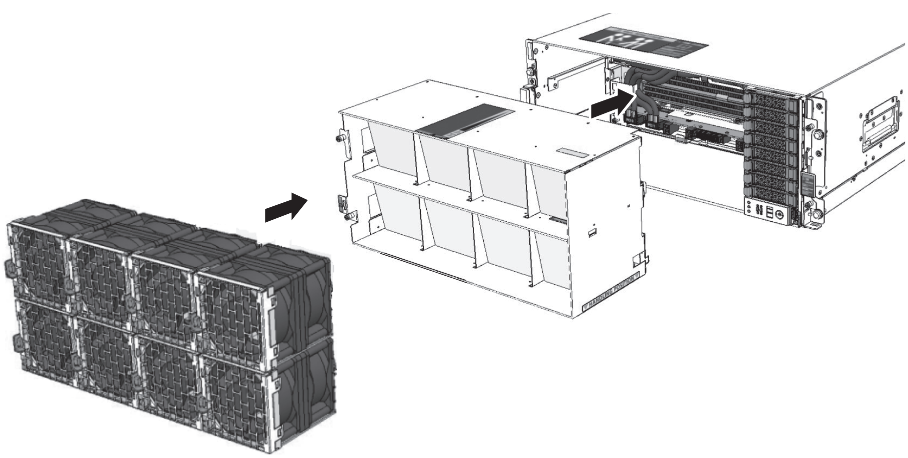
Caution - When installing the HDDBPU, make sure that it is fitted to the positioning guide inside the chassis. If you install the HDDBPU in an improper position, the HDDBPU may be damaged.

Figure 17-29 Securing the HDDBPU



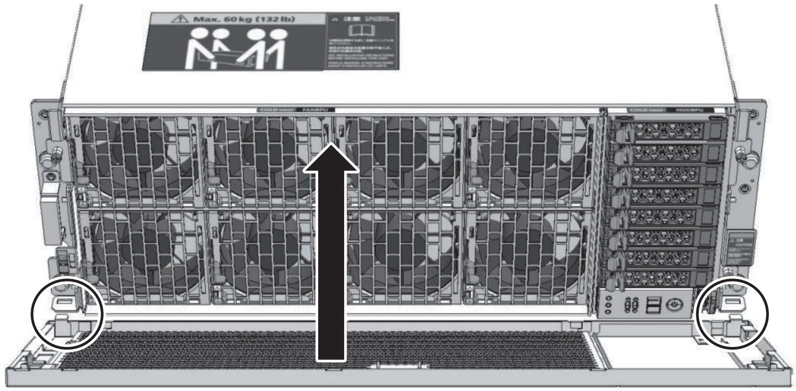
2. **Install the FANBPU and FANUs.**
   Install the FANBPU and secure it to the server. Then, install all the FANUs. For details, see "14.4.1 Installing the FANBPU" and "14.4.2 Installing a FANU."

Figure 17-30 Installing the FANBPU



3. **Install the front cover.**

Figure 17-31 Installing the Front Cover

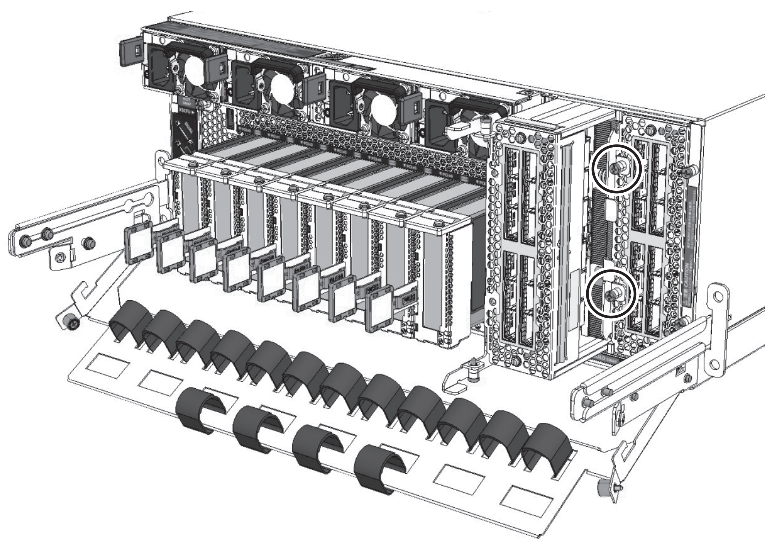


4. **Install the XBU.**

Note - For the SPARC M12-2, this step is not necessary.

Install the XBU in the server and secure it by tightening the fixing screws. For details, see "20.4 Installing an XBU." Note that, for the SPARC M12-2, this step is not necessary. Proceed to step 5.

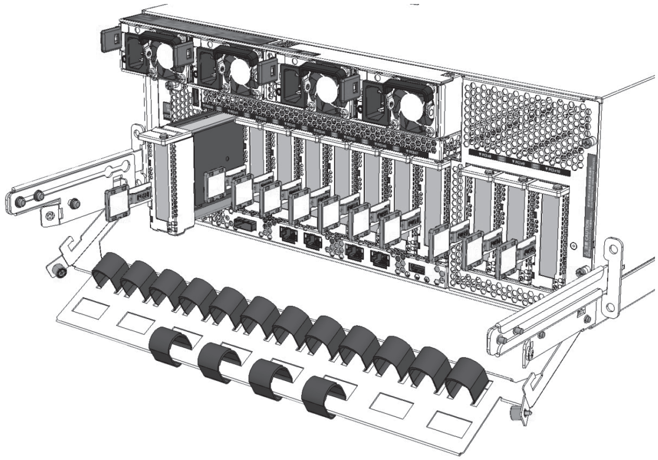
Figure 17-32 Installing the XBU



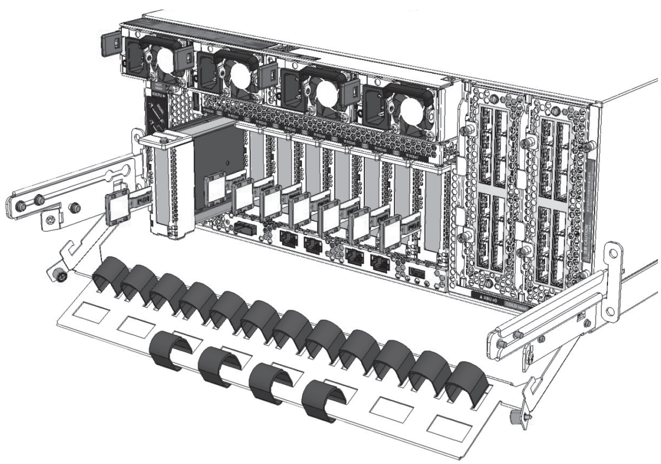
5. **Install the PCIe card.**
Install the PCICS to the server, and secure it by pushing down its removal levers. Then, lower the cable support to secure the PCICS. For details, see "12.4.1 Installing a PCIe Card or PCIe Card Filler."

Figure 17-33 Installing the PCICS

SPARC M12-2



SPARC M12-2S

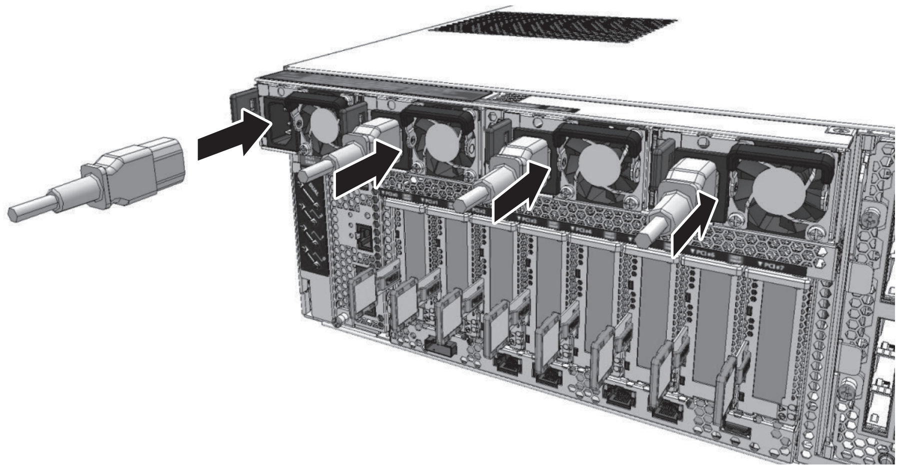


6. **Place the server in the hot state.**

   Connect the power cord to place the server in the hot state.

   For details on installing the power cord on the server, see "10.1.1 Installing a Power Cord."

Figure 17-34 Installing a Power Cord



Chapter 18

Maintaining the Backplane Unit and PSU Backplane Unit

This section describes the maintenance procedures for the BPU and PSUBP mounted in the SPARC M12.

18.1 Maintenance Precautions

This section describes precautions for maintenance on the BPU and the PSUBP.

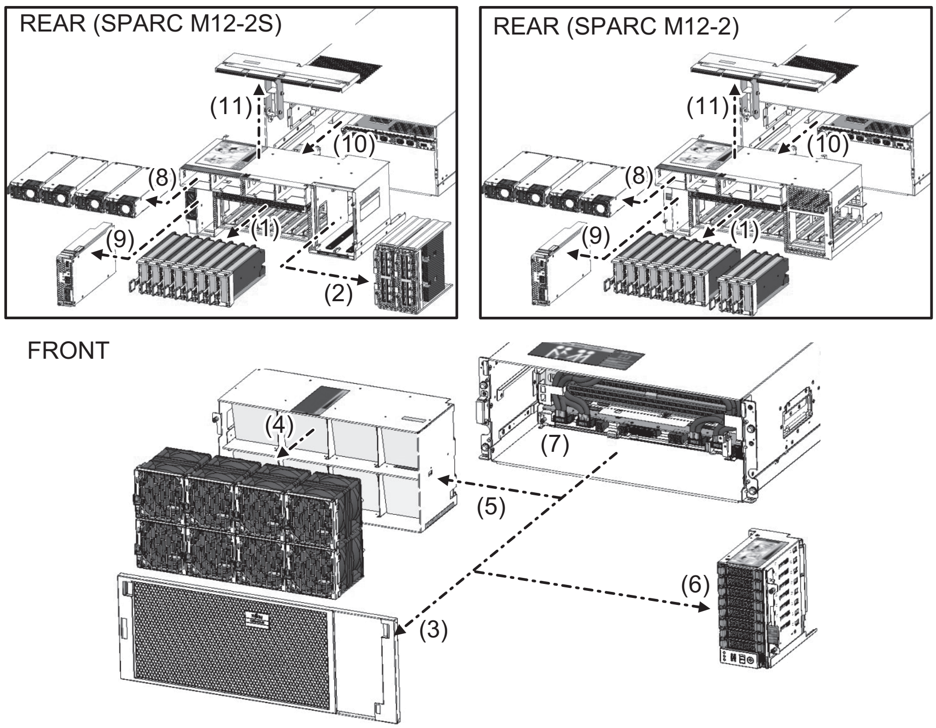
- Do not replace the PSUBP and the XSCFU at the same time. If the PSUBP and the XSCFU are replaced at the same time, the system may fail to operate normally. When you need to replace the PSUBP and XSCFU, replace one of the units first. Then, after the XSCF firmware starts up, power it off again and replace the other unit.
- Do not mount and use any of the following PSUBP in another chassis:
  - the one currently mounted in the SPARC M12-2/M12-2S, or
  - one that was once used as a maintenance part

  This is because the above PSUBP stores device identification information.
- Before removing the BPU, remove the XSCFU, PCICS, PSU, FAN, FANBPU, HDDBPU, CMU, XBU, XSCF DUAL control cable, and XSCF BB control cable from the BPU.

18.2 Locations of the BPU and PSUBP

Figure 18-1 shows the mounting locations of the BPU and PSUBP. The numbers in the figure represent the order in which the units are to be removed.

Figure 18-1 Locations of the BPU and PSUBP



Location No.	Unit
1	PCICS (*1)
2	XBU (*2)
3	Front cover
4	FANU
5	FANBPU
6	HDDBPU
7	CMU
8	PSU
9	XSCFU
10	BPU

Location No.	Unit
11	PSUBP

*1 The SPARC M12-2S houses 8 PCICSs, and the SPARC M12-2 houses 11 PCICSs.
*2 This unit is mounted only in the SPARC M12-2S.

18.3 Before Maintenance on the BPU and PSUBP

When replacing the BPU, perform one of the maintenance procedures listed below. Note that active/cold replacement and inactive/cold replacement are possible only in a multiple-BB configuration.
- 4.2.11 Active/Cold Replacement Workflow of the BPU
- 4.4.11 Inactive/Cold Replacement Workflow of the BPU
- 4.6.11 System-Stopped/Cold Replacement Workflow of the BPU

When replacing the PSUBP, perform one of the maintenance procedures listed below. Note that active/cold replacement and inactive/cold replacement are possible only in a multiple-BB configuration.
- 4.2.12 Active/Cold Replacement Workflow of the PSUBP
- 4.4.12 Inactive/Cold Replacement Workflow of the PSUBP
- 4.6.12 System-Stopped/Cold Replacement Workflow of the PSUBP

Caution - Before you handle any unit, be sure to wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be seriously damaged. For details, see "1.5 Precautions on Static Electricity."

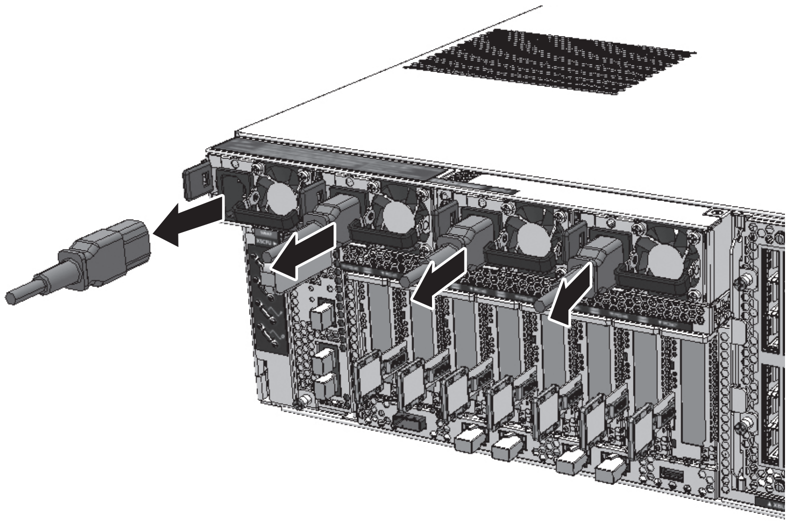
18.4 Removing the BPU and PSUBP

18.4.1 Enabling the Removal of the BPU

To enable the removal of the BPU, you need to remove the FRUs other than the BPU. This section describes the procedure for removing the FRUs other than the BPU.

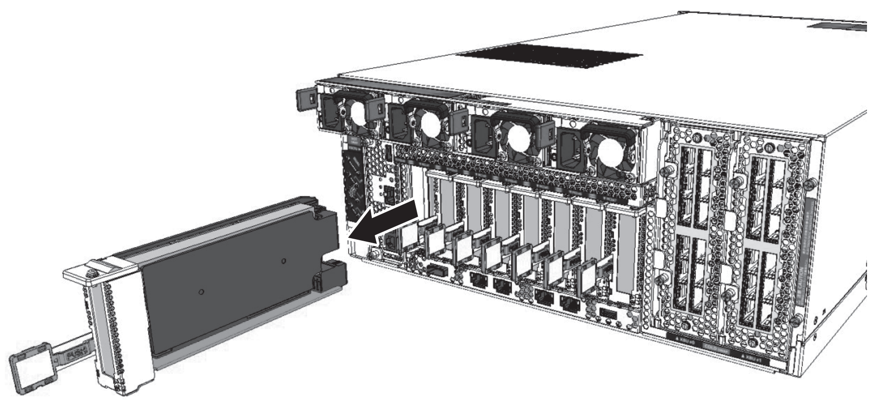
1. **Place the server in the cold state.**
   Remove the power cords from the PSUs to place the server in the cold state. For details on handling power cords, see "9.8.2 Removing the Power Cords."

Figure 18-2 Removing a Power Cord



2. **Remove the PCICSs from the server.**
Remove all the PCICSs from the server. For details, see "12.3.1 Enabling the Removal of a PCIe Card." You do not need to remove the PCIe cards from the PCICSs.

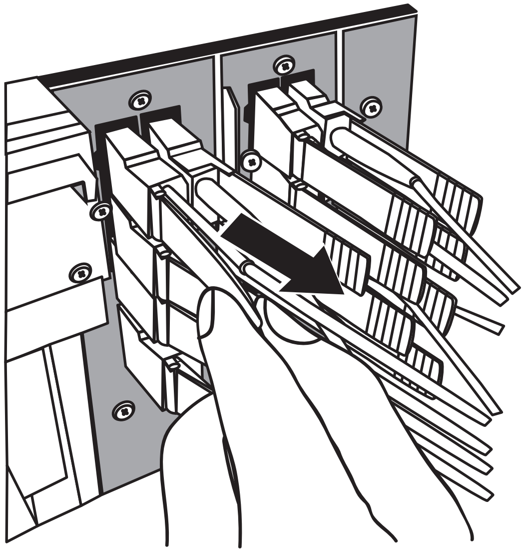
Figure 18-3 Removing the PCICS



3. **Remove the crossbar cables.**
Remove all the crossbar cables connected to the XBU. For details, see "19.3 Removing the Crossbar Cable." Note that, when you use only one SPARC M12-2 or SPARC M12-2S unit, this step is not necessary.

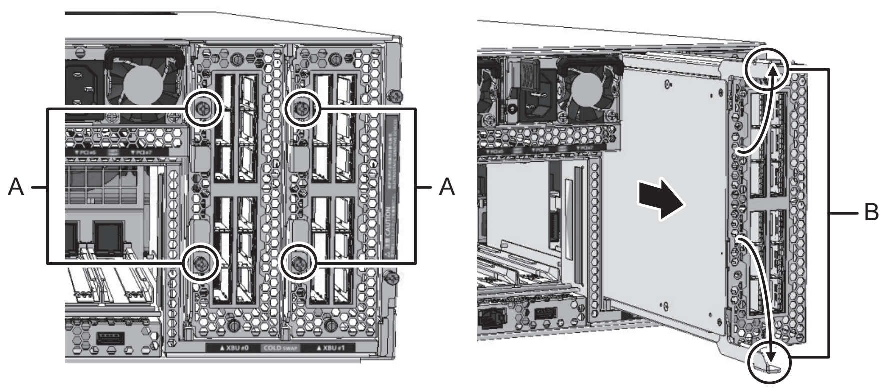
When using only one SPARC M12-2S unit, proceed to step 4. When using only one SPARC M12-2 unit, proceed to step 5.

Figure 18-4 Removing the Crossbar Cable



4. **Remove the XBU.**
   Loosen the two fixing screws (A in Figure 18-5) of the removal levers, and remove the XBU from the server with the removal levers (B in Figure 18-5) open. For details, see "20.3 Removing an XBU."

Figure 18-5 Removing the XBU



5. **Remove the front cover.**
   For the procedure for removing the front cover, see "9.8.3 Removing the Front Cover."

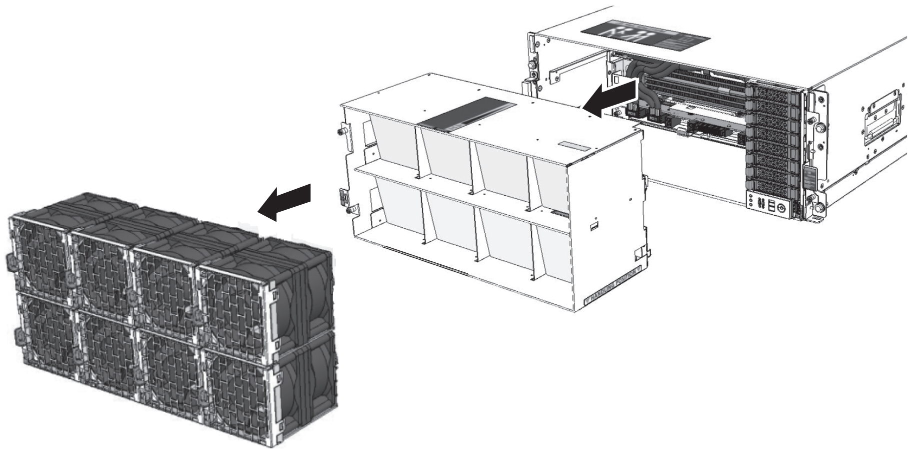
Note - The serial number of the server is printed on a label affixed on the front cover. Store this cover such that it is not mixed up with the front covers of other SPARC M12 units.

---

6. **Remove the FANUs and FANBPU.**

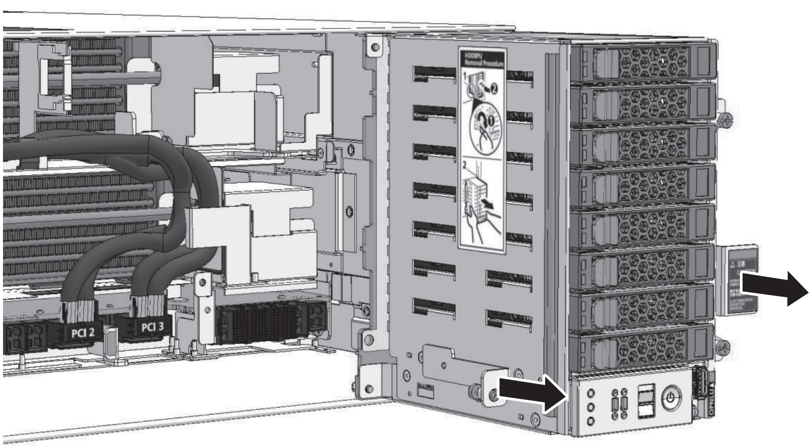
Remove all the FANUs from the FANBPU, and then remove the FANBPU from the server. For details, see "14.3 Removing a FANU or the FANBPU."

Figure 18-6 Removing the FANUs and FANBPU



7. **Remove the HDDBPU.**
Remove the HDDBPU from the server. For details, see "16.3 Removing the HDDBPU or OPNL."

Figure 18-7 Removing the HDDBPU



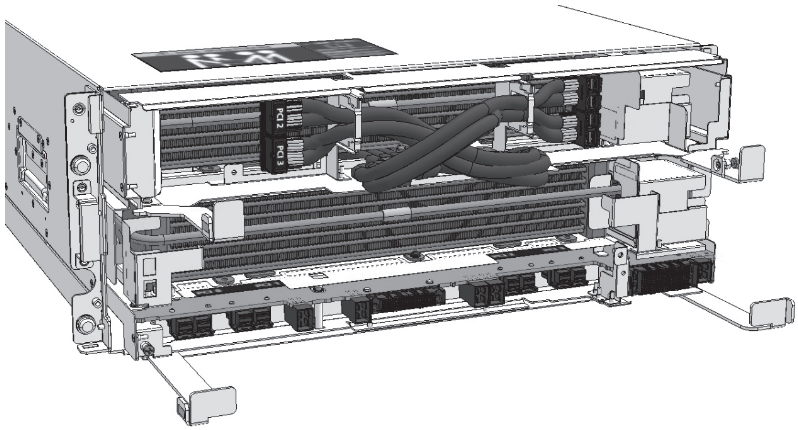
8. **The CMUL may have a LAN cable, SAS cable, USB cable, or other cable connected to it. Remove them all.**

Caution - Pulling out the CMUL with these cables (LAN, SAS, USB, or other cables) connected may damage the connectors.

---

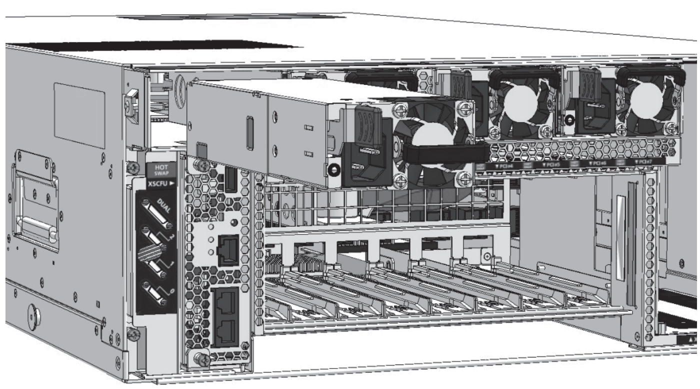
9. **Disconnect the CMUL and CMUU from the BPU.**
Loosen the fixing screws of the CMUL and CMUU, and pull them out to the opening of the server. For details, see "17.4.2 Removing the CMU." When the CMU filler unit is mounted, remove it from the server.

Figure 18-8 Pulling Out the CMU



10. **Remove the PSUs.**
Remove all the PSUs from the server. For details, see "13.3 Removing a PSU."

Figure 18-9 Removing a PSU

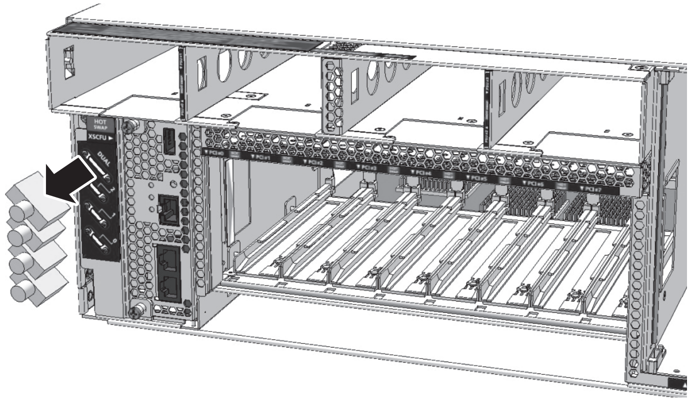


11. **Remove the XSCF DUAL control cable and XSCF BB control cable.**
Remove the XSCF DUAL control cable and XSCF BB control cable from the server. For details, see "21.3 Removing the XSCF DUAL Control Cable" and "22.3 Removing the XSCF BB Control Cable."

Note that, for a configuration that uses only one SPARC M12-2 or SPARC M12-2S unit, this step is not necessary. Proceed to step 12.

Note - The XSCF DUAL control cable is connected only to the SPARC M12-2S that houses the master XSCF or standby XSCF.

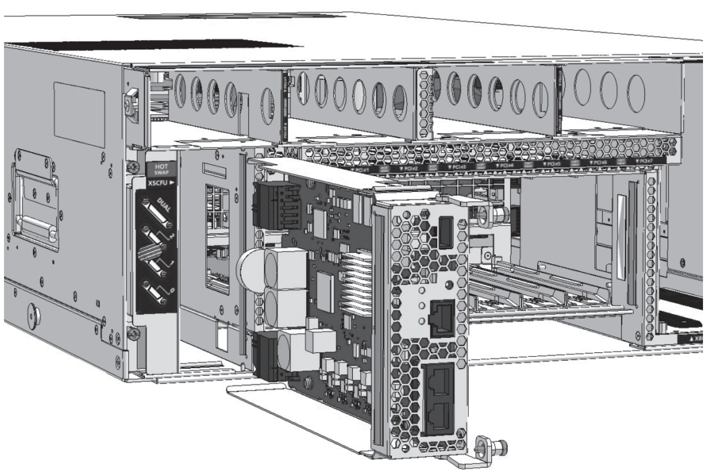
Figure 18-10 Removing the XSCF DUAL Control Cable/XSCF BB Control Cable



Caution - When removing the XSCF DUAL control cable or XSCF BB control cable, keep the latches on both sides of the connector hood pressed. Removing the cable forcibly may damage it.

12. **Remove the XSCFU.**
    The XSCFU may have a LAN cable, a serial cable, and USB memory connected to it. Remove them all. Then, loosen the fixing screws of the XSCFU, and remove the XSCFU from the server. For details, see "11.4 Removing the XSCFU."

Figure 18-11 Removing the XSCFU



18.4.2 Removing the BPU

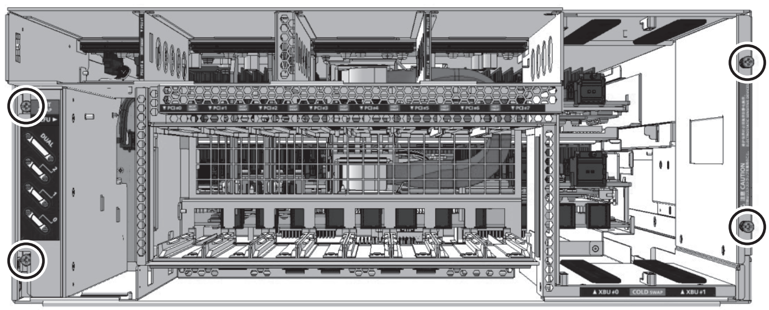
This section describes the procedure for removing the BPU from the server.

Note - The system shown in the illustrations provided herein is the SPARC M12-2S. Unless otherwise noted, the locations of the fixing screws and other details are common to the SPARC M12-2.

---

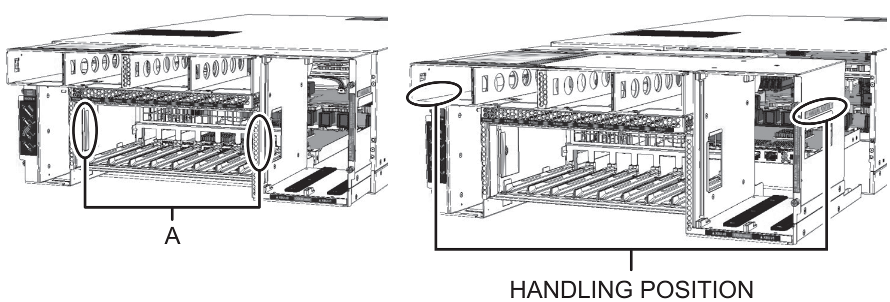
1. **Enable the removal of the BPU from the server.**
   Loosen the four fixing screws of the BPU.

Figure 18-12 Fixing Screws of the BPU



2. **Remove the BPU.**
   Hold the BPU by the parts indicated in A of Figure 18-13, and pull it out from the server. When you see the "HANDLING POSITON" labels on the sides of the BPU, hold the BPU by its sides and remove it from the server.

Figure 18-13 Removing the BPU



Caution - Remove the BPU slowly. Applying great shock to the server may cause the CMU to fall and be damaged.

18.4.3 Removing the PSUBP From the BPU

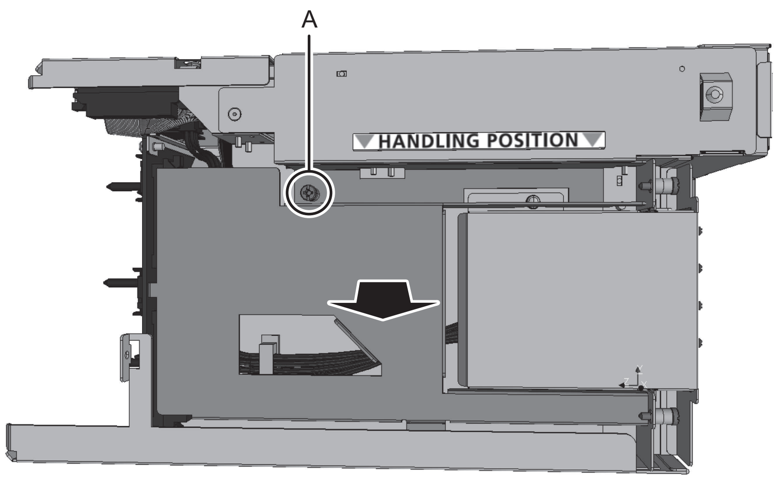
This section describes the procedure for removing the PSUBP from the BPU.

Note - The system shown in the illustrations provided herein is the SPARC M12-2S. Unless otherwise noted, the locations of the fixing screws and other details are common to the SPARC M12-2.

---

1. **Remove the connector cover.**
   To remove the connector cover, loosen the fixing screw of the connector cover (A in Figure 18-14) on the left side of the BPU and slide the connector cover toward you.

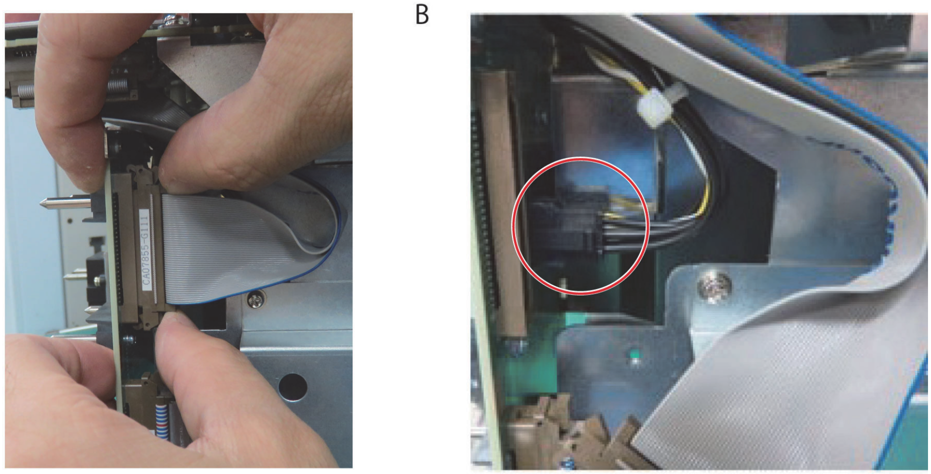
Figure 18-14 Removing the Connector Cover



2. **Remove the PSUBP and BPU connectors.**
   There are two connectors that connect the BPU and PSUBP. First, close the latches on both sides of the connector (brown) shown in A of Figure 18-15, and remove the connector. Next, pull out the connector (black) shown in B of Figure 18-15 while pressing its latches.

Figure 18-15 Removing the Connectors

A B



Caution - Do not pull the cable when removing a connector. The cable may break.

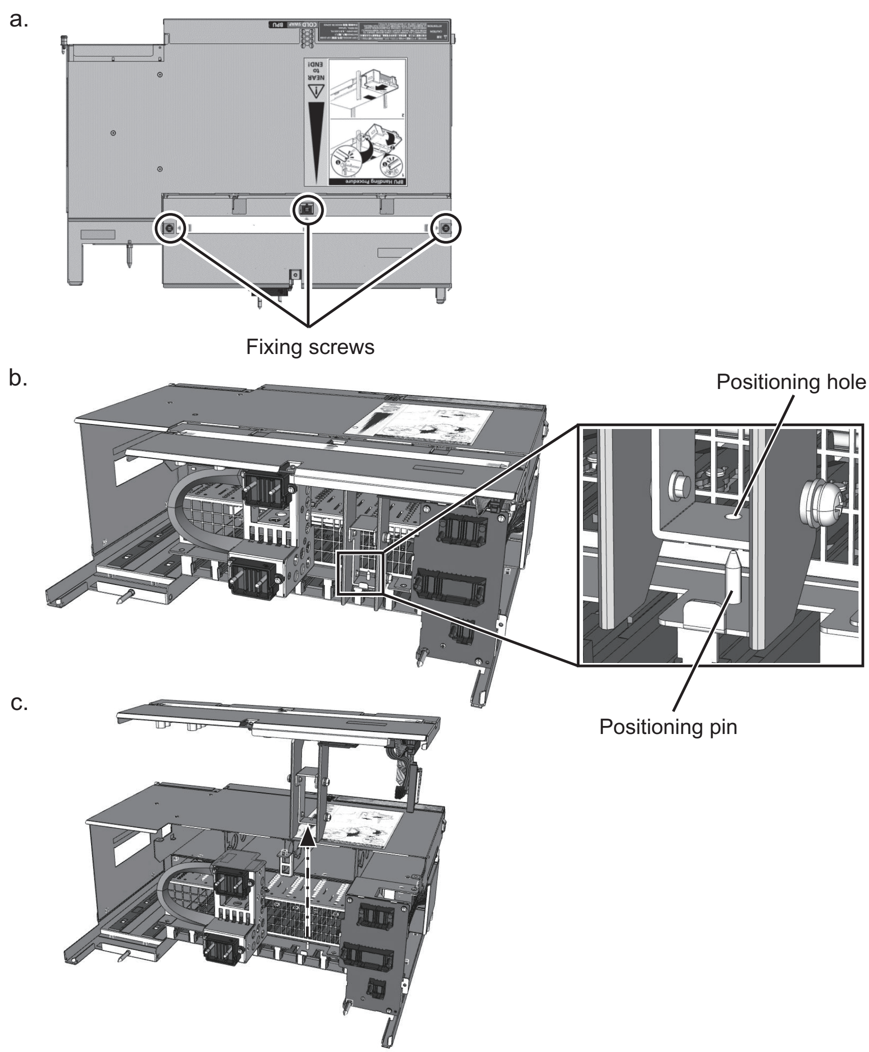
3. **Remove the PSUBP.**

   a. Remove the three fixing screws. Store the removed fixing screws in a safe place.

   b. Keeping the PSUBP horizontal, lift it straight up until the positioning pin of the BPU is out of the positioning hole of the PSUBP.

   c. Remove the PSUBP from the BPU while taking care not to get caught on the connectors removed in step 2.

Figure 18-16 Removing the PSUBP



Note - When you place the removed PSUBP on the workbench, make sure that its top side faces down.

18.5 Installing the BPU and PSUBP

This section describes the procedures for installing the BPU and PSUBP and restoring the server.

18.5.1 Installing the PSUBP in the BPU

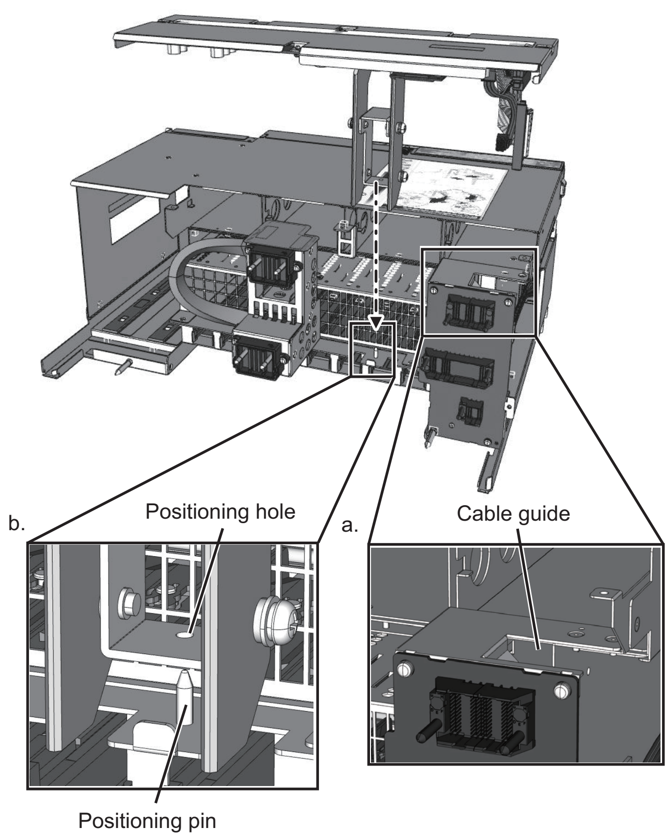
This section describes the procedure for installing the PSUBP in the BPU.

Note - The system shown in the illustrations provided herein is the SPARC M12-2S. Unless otherwise noted, the locations of the fixing screws and other details are common to the SPARC M12-2.

---

1. **Install the PSUBP in the BPU.**
   a. Hold the PSUBP horizontal and route the cable through the cable guide of the BPU.
   b. While holding the PSUBP horizontal, lower it straight with the positioning hole of the PSUBP aligned with the positioning pin of the BPU. Install the PSUBP in the BPU. Make sure that the fixing screw holes of the PSUBP are aligned with those of the BPU.

Figure 18-17 Installing the PSUBP

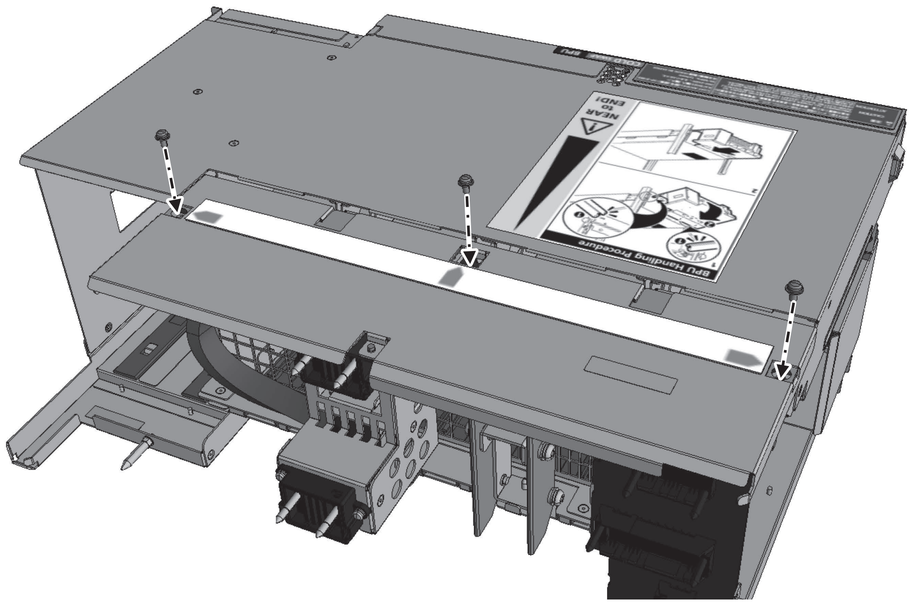


Caution - When installing the PSUBP, make sure that it is kept horizontal and perform the work carefully. Installing the PSUBP while it is tilted may damage the PSUBP due to interference from the BPU components.

---

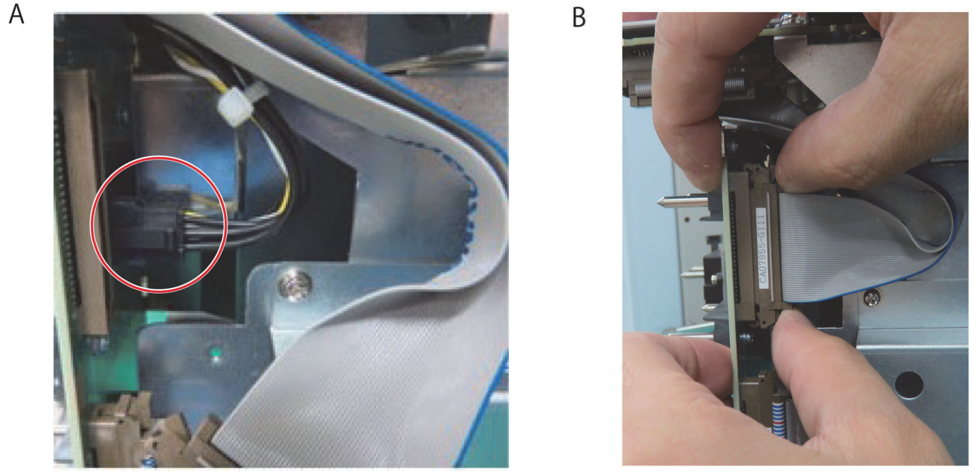
2. **Secure the PSUBP.**
   Tighten the three fixing screws to secure the PSUBP to the BPU.

Figure 18-18 Securing the PSUBP



3. **Connect the PSUBP to the BPU.**
   There are two connectors that connect the PSUBP and BPU. Install the connector (black) shown in A of Figure 18-19 first and then the connector (brown) shown in B of Figure 18-19. To install the connector shown in B of Figure 18-19, insert it into the connector slot on the BPU side, with the latches closed, and then push it. Once the connector is secured, the latches open.

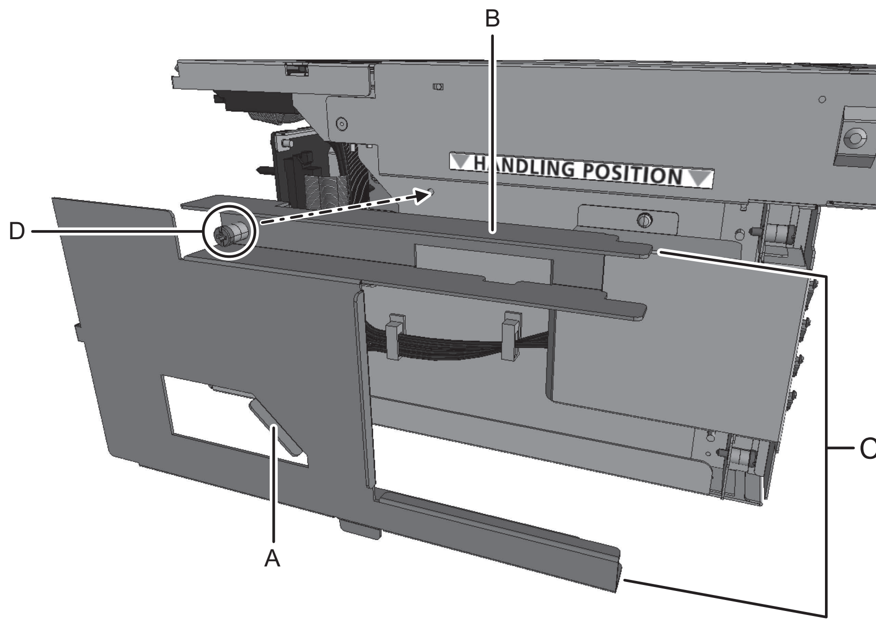
Figure 18-19 Connector Connection of the PSUBP and BPU



Caution - Do not pull the cable when connecting a connector. The cable may break.

4. **Install the connector cover.**
   Hold the tab of the connector cover (A in Figure 18-20) to press the top surface (B in Figure 18-20) and the right ends (C in Figure 18-20) of the connector cover on to the BPU. Next, tighten the fixing screw (D in Figure 18-20) to secure the connector cover to the BPU.

Figure 18-20 Installing the Connector Cover



18.5.2 Installing the BPU

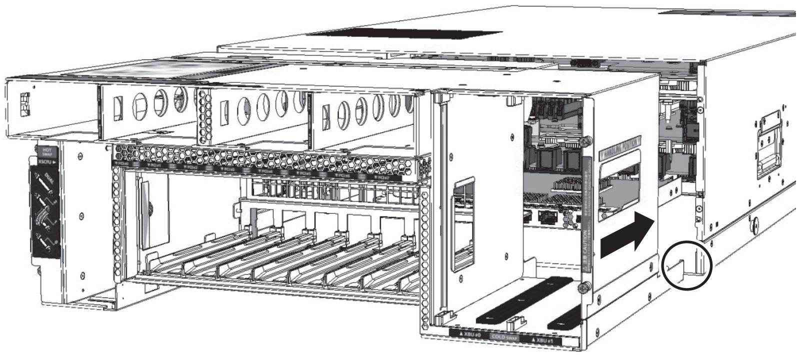
This section describes the procedure for installing the BPU.

Note - The system shown in the illustrations provided herein is the SPARC M12-2S. Unless otherwise noted, the locations of the fixing screws and other details are common to the SPARC M12-2.

---

1. **Install the BPU.**
   Insert the BPU while aligning the guides on the both sides of its bottom to the both sides of the inside of the server.

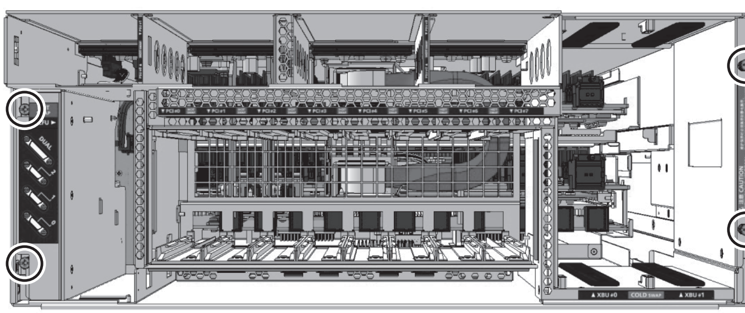
Figure 18-21 Installing the BPU



Caution - Insert the BPU slowly into the server. If a large vibration is applied, the CMU may be damaged.

2. **Secure the BPU.**
   Tighten the four fixing screws shown in Figure 18-22 to secure the BPU.

Figure 18-22 Securing the BPU

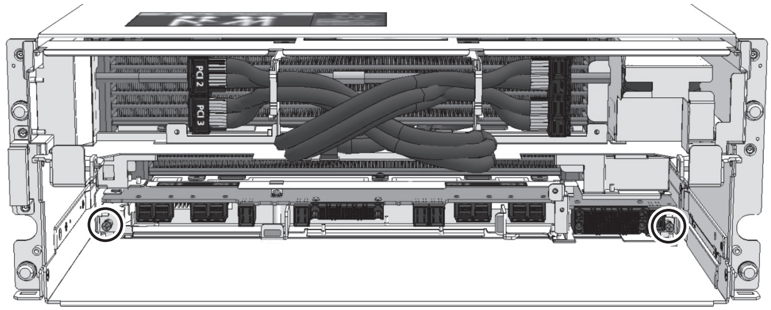


18.5.3 Restoring the Server

This section describes the procedure for restoring the server after performing maintenance on the BPU.

1. **Install the CMUL.**
   Insert the CMUL into the server, with the CMUL levers open. Then, tighten the two fixing screws to secure the CMUL to the server. For details, see "17.5.2 Installing the CMU."

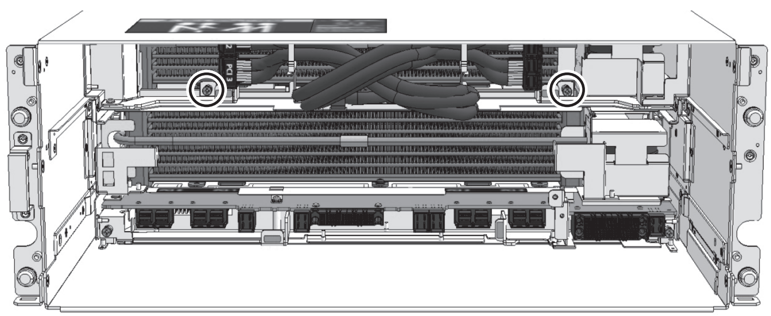
Figure 18-23 Connecting the CMUL to the BPU



2. **Secure the CMUU.**
Insert the CMUU into the server, with the CMUU levers open. Then, tighten the two fixing screws to secure the CMUU to the server. For details, see "17.5.2 Installing the CMU."

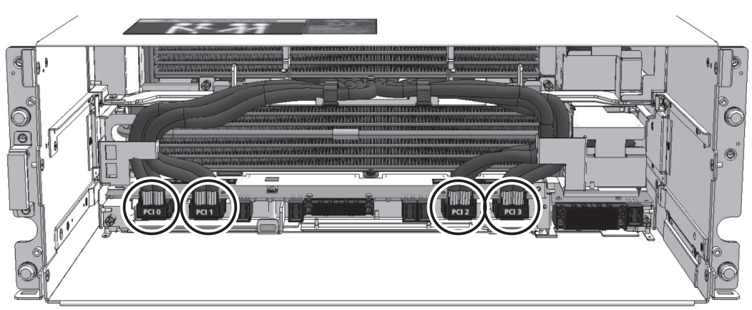
When the CMUU is not mounted, this step is not necessary. Proceed to step 4.

Figure 18-24 Connecting the CMUU to the BPU



3. **Connect the PCIe cables.**
Remove the PCIe cables from the cable clamps and connect them to the CMUL. For details, see step 4 in "17.5.2 Installing the CMU."

Figure 18-25 Connecting the PCIe Cables

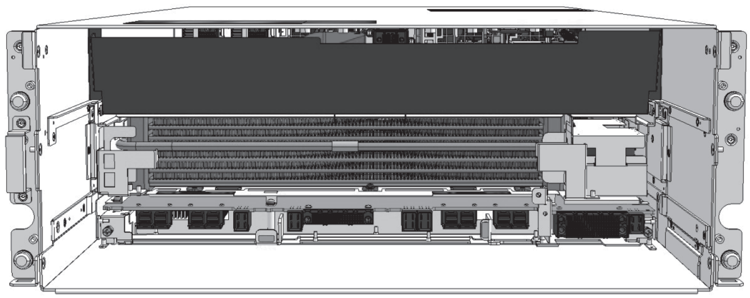


4. **Install the CMU filler unit.**

Note - If the CMUU is mounted or the CMU filler unit is not mounted, this step is not necessary. Proceed to step 5.

Install the CMU filler unit. For details, see step 5 in "17.5.2 Installing the CMU."

Figure 18-26 Securing the Filler Unit



5. **Install the HDDBPU.**
   Align the positioning guide of the HDDBPU with the guide on the front right side inside the server. Then, install the HDDBPU in the server and tighten the fixing screws to secure it. For details, see "16.4.2 Installing the HDDBPU in the Server."

Figure 18-27 Connecting the CMU While Keeping It Aligned with the Positioning Guide of the HDDBPU

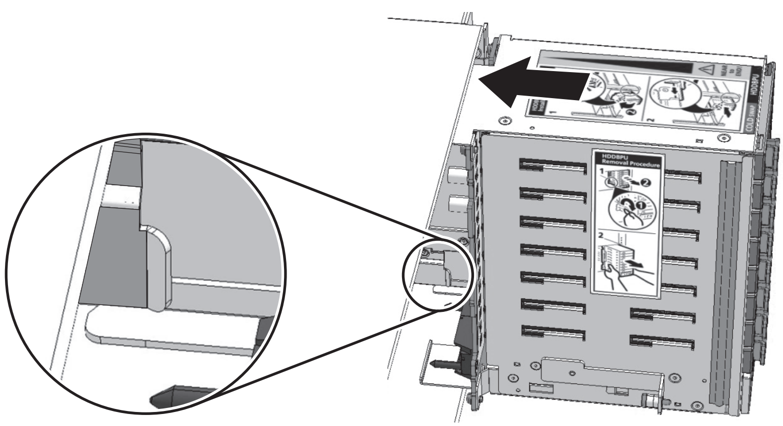
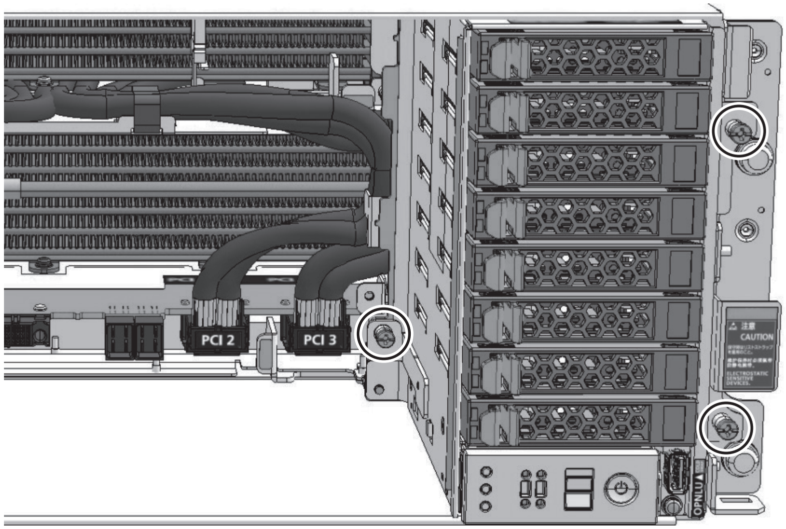


Figure 18-28 Securing the HDDBPU



6. **Install the FANBPU and FANUs.**
Install the FANBPU in the server, and then install the FANUs. For details, see "14.4.1 Installing the FANBPU" and "14.4.2 Installing a FANU."

Figure 18-29 Securing the FANBPU

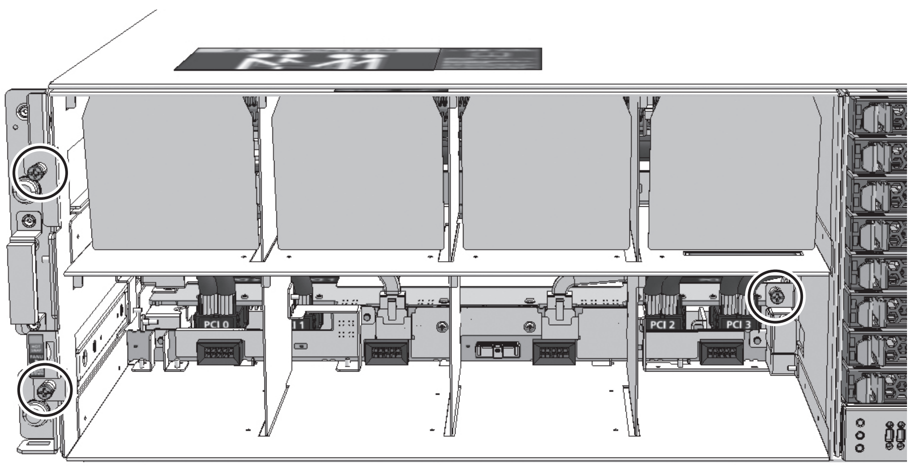
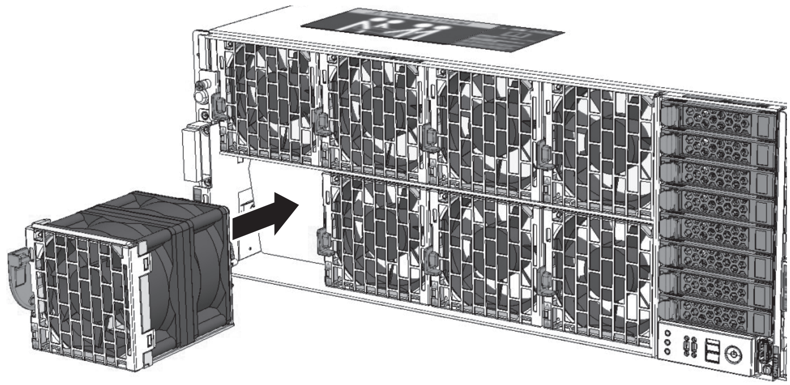
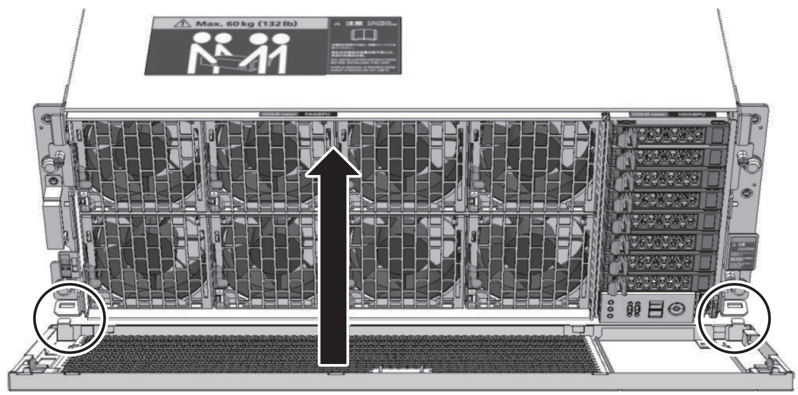


Figure 18-30 Installing the FANUs



7. **Install the front cover.**

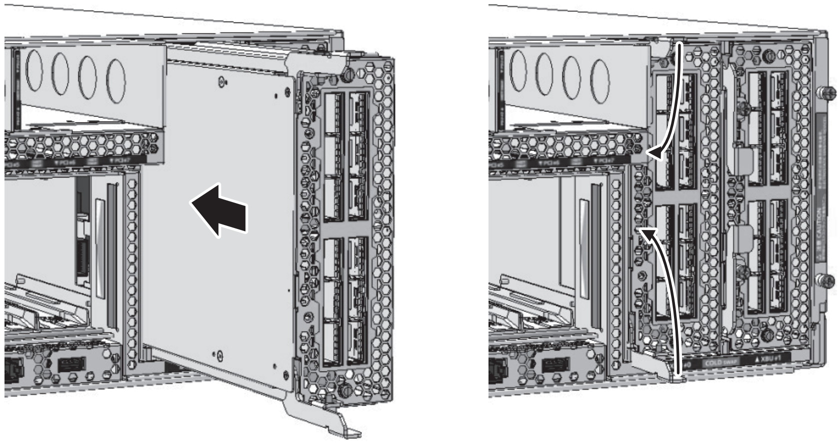
Figure 18-31 Installing the Front Cover



8. **Install the XBU.**
   Install the XBU in the server, and secure it to the server by tightening the fixing screws. For details, see "20.4 Installing an XBU."

   Note that, when you use the SPARC M12-2, this step is not necessary. Proceed to step 10.

Figure 18-32 Installing the XBU



9. **Connect the crossbar cables.**
Connect the crossbar cables to the XBU. For details, see "19.4 Installing the Crossbar Cable."

Caution - When connecting the crossbar cable, do not hold the pull-tab but hold the connector part to insert it into the port for the connection, and push in the connector part. If you hold the pull-tab when connecting the crossbar cable, it may become impossible to remove the cable from the XBU.

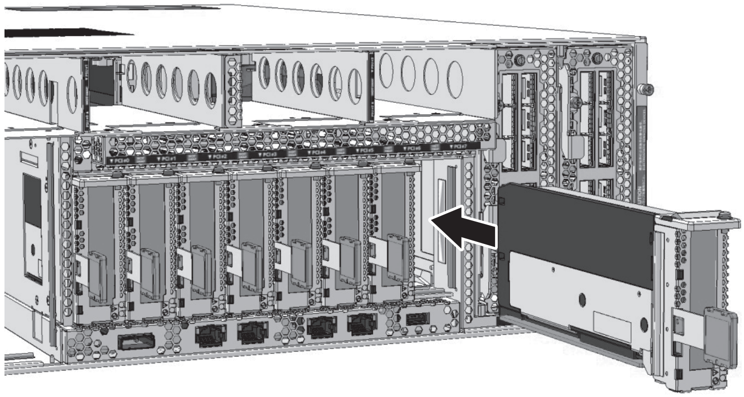
Caution - A loose crossbar cable connection may, on rare occasions, cause an error due to poor connection. After connecting a crossbar cable, push it in again so that it is tightly in place to prevent any improper connection. Do not hold only the cable when performing the work at this time. Otherwise, the cable may bend out of shape. For details, see step 4 in "19.4 Installing the Crossbar Cable."

Note - The destination port for the XBU is described on a label affixed to the crossbar cable. Check the label first and connect the cable to the port of the XBU. For crossbar cable connection destinations, see "4.3 Connecting Crossbar Cables" in the *Fujitsu SPARC M12-2S Installation Guide*.

---

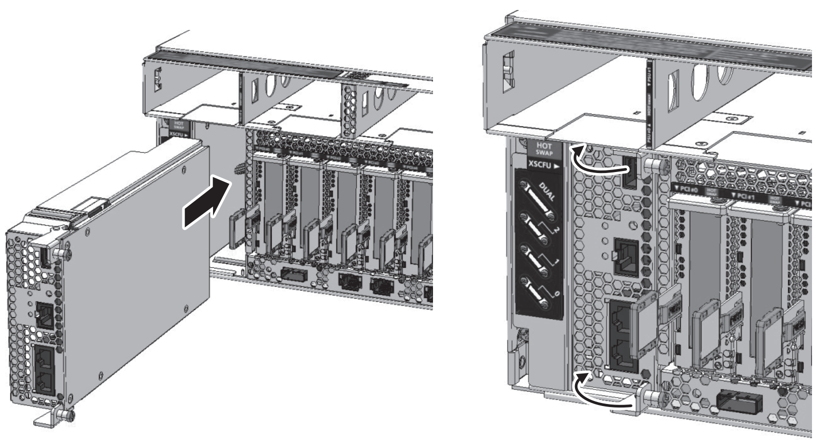
10. **Install the PCICS.**
Install the PCICS in the server, and then secure the PCICS. For details, see "12.4 Installing a PCIe Card."

Figure 18-33 Installing the PCICS



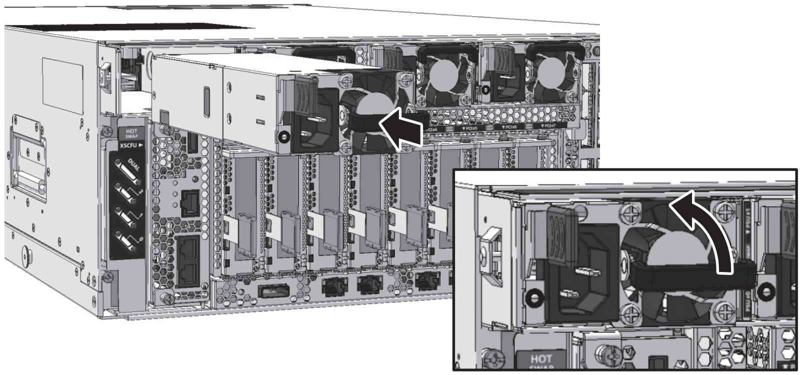
11. **Install the XSCFU.**
    Install the XSCFU in the server, and secure it by tightening the two fixing screws. For details, see "11.6 Installing the XSCFU."

Figure 18-34 Installing the XSCFU



12. **Install the PSUs.**
    Install the PSUs to the server. Do not install the power cords yet. For details, see "13.4 Installing a PSU."

Figure 18-35 Installing the PSUs

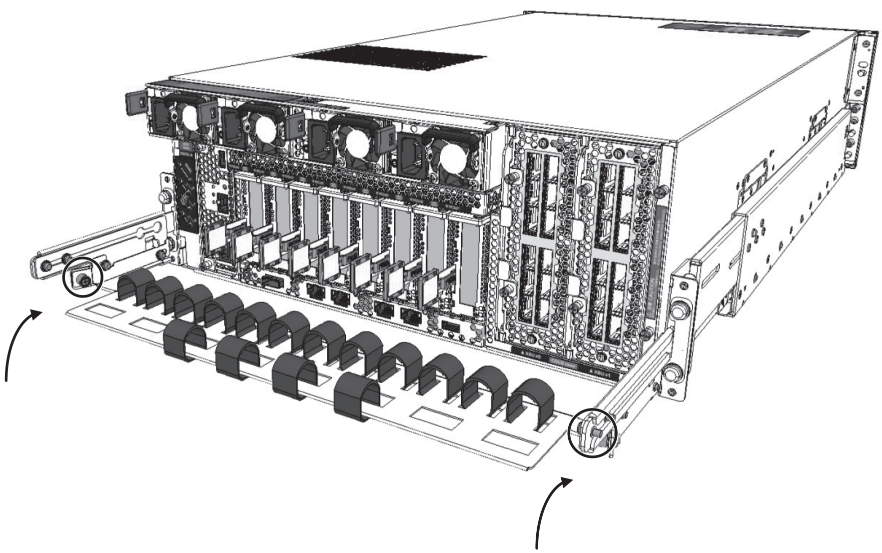


Note - Install all of the four PSUs in the server.

13. **Connect the cables.**
    Connect the cables to the XSCFU, PCIe cards, and on-board I/Os. For the SPARC M12-2S in a multiple-BB configuration, connect the XSCF DUAL control cable and XSCF BB control cable.

14. **Secure the cable support.**
    Return the cable support to the original position and tighten the two screws to secure it.

Figure 18-36 Securing the Cable Support



15. **Start the XSCF.**

Connect the power cords to the PSUs and start the XSCF. XSCF startup completes when the READY LED of the XSCFU is lit. For details, see "XSCFU" in "2.4.3 LEDs of Each Unit." After the XSCF starts up, perform the work required after maintenance such as restoring the logical domain.

Chapter 19

Maintaining the Crossbar Cable

This chapter describes the maintenance procedures for the crossbar cable.

- Ports for Crossbar Cable Connection
- Before Maintenance on the Crossbar Cable
- Removing the Crossbar Cable
- Installing the Crossbar Cable

19.1 Ports for Crossbar Cable Connection

Use either crossbar cables (optical) or crossbar cables (electrical) exclusively for the connections of each SPARC M12-2S. Use only crossbar cables (optical) for the connections between a crossbar box and the SPARC M12-2S.
When there is the need for crossbar cable replacement, replace crossbar cables in pairs, with each cable connected to a port assigned the same port number.

- SPARC M12-2S
  A crossbar cable is connected to a crossbar cable connection port of the XBU in the SPARC M12-2S.

  Every two adjacent crossbar cable connection ports of the XBU make up a pair, and the same port number is assigned to these two ports.

- Crossbar box
  A crossbar cable is connected to a crossbar cable connection port of the crossbar box.

  Every two vertically adjacent crossbar cable connection ports make up a pair, and the same port number is assigned to these two ports.

Figure 19-1 and Figure 19-2 show the locations and configurations of the ports for crossbar cable connection.

Figure 19-1 Ports for Crossbar Cable Connection (SPARC M12-2S)

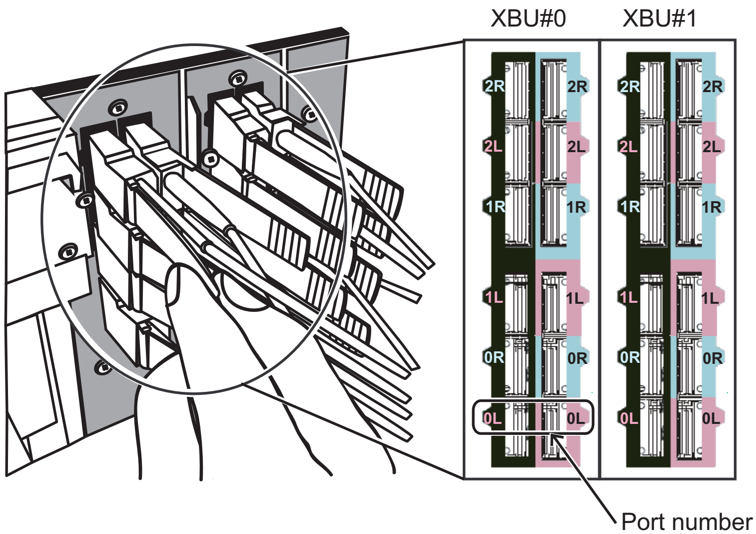
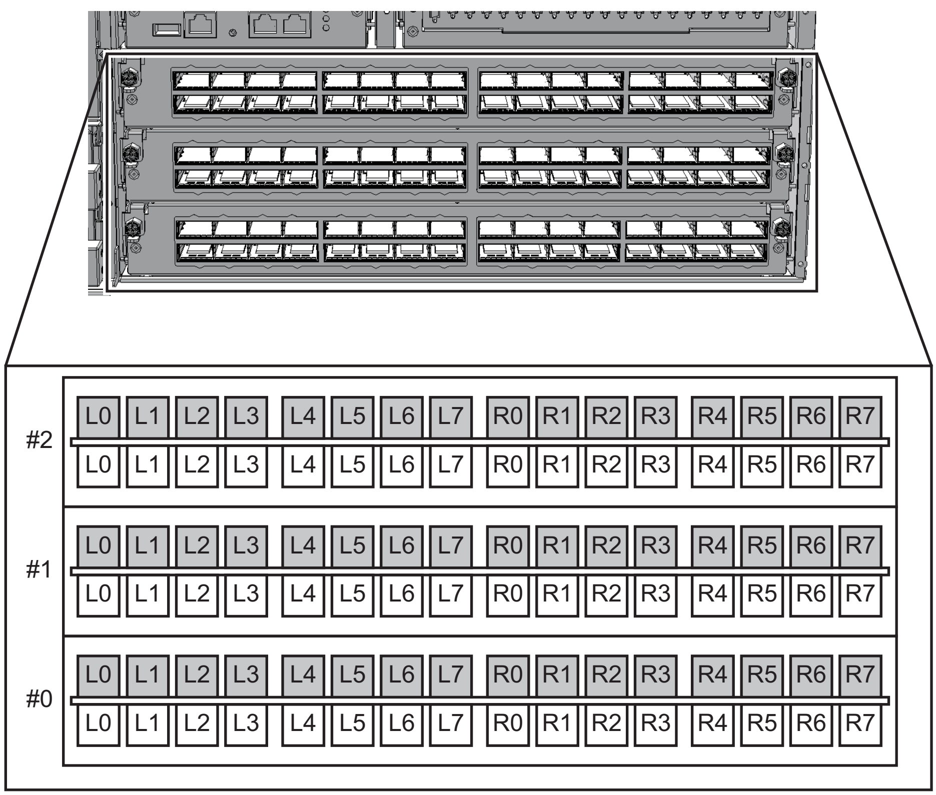


Figure 19-2 Ports for Crossbar Cable Connection (Crossbar Box)



19.2 Before Maintenance on the Crossbar Cable

When replacing crossbar cables, perform one of the maintenance procedures listed below.

- 4.4.13 Inactive/Cold Replacement Workflow of the Crossbar Cable
- 4.6.13 System-Stopped/Cold Replacement Workflow of the Crossbar Cable

When adding crossbar cables (SPARC M12-2S), perform one of the maintenance procedures listed below.

- 5.2.6 Active/Cold Addition Workflow of the SPARC M12-2S
- 5.4.6 Inactive/Cold Addition Workflow of the SPARC M12-2S
- 5.6.6 System-Stopped/Cold Addition Workflow of the SPARC M12-2S

When removing crossbar cables (SPARC M12-2S), perform one of the maintenance procedures listed below.

- 6.2.6 Active/Cold Removal Workflow of the SPARC M12-2S
- 6.4.6 Inactive/Cold Removal Workflow of the SPARC M12-2S
- 6.6.6 System-Stopped/Cold Removal Workflow of the SPARC M12-2S

Caution - Before you handle any unit, be sure to wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be seriously damaged. For details, see "1.5 Precautions on Static Electricity."

19.3 Removing the Crossbar Cable

This section describes the procedure for removing the crossbar cable.

Note - The crossbar cables can be removed only in two cases. The first is when the physical partition dynamic reconfiguration (PPAR DR) function releases the SPARC M12-2S from a building block configuration, placing the server in the cold state. The second is when the SPARC M12-2S in a building block configuration is placed in the cold state.

---

1. **Confirm the crossbar cable to be replaced.**
   Log in to the XSCF and execute the showstatus command or showlogs error command. Then, confirm the ports connected to the crossbar cables to be replaced. For details on the commands, see "8.2.2 Identifying a Fault."

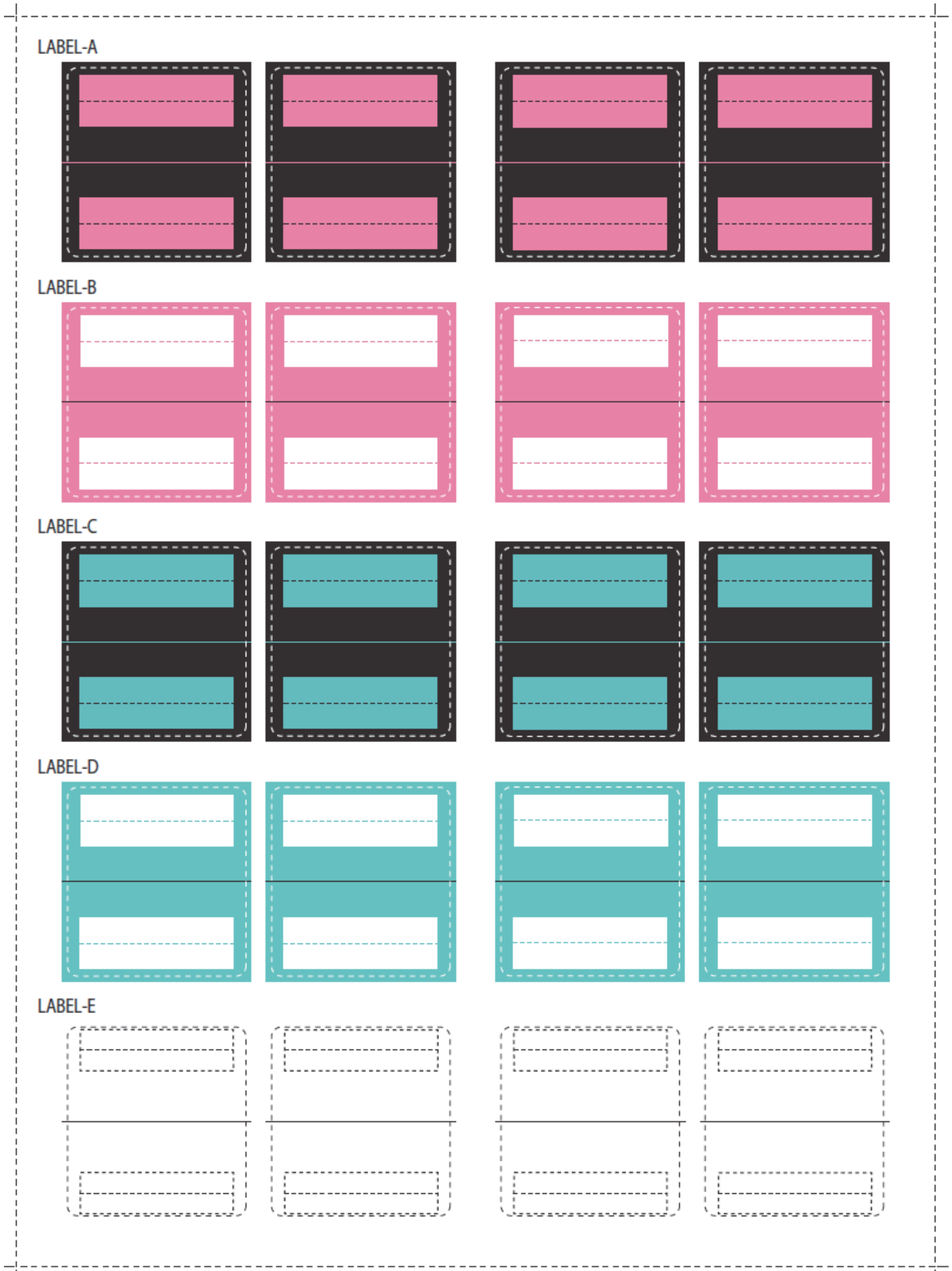
   The underlined part in the error example below indicates that an error has been found in the crossbar cable connected to port number 0R of XBU#0 mounted in BB#1.

```
Date: Sep 08 14:10:25 JST 2016
    Code: 80002100-007d20007811007811-150650000130049a00313000
    Status: Alarm                  Occurred: Sep 08 14:10:12.925 JST 2016
    FRU: /BB#1/XBU#0/CBL#0R,/BB#1/XBU#0,/BB#0/XBU#0
    Msg: XB-XB interface link-up error
```

From the above error message and "Appendix A Lists of Cable Connections in a Building Block Configuration," identify the port number at the other end of the connection of the target crossbar cable.
In this example, "BB00-XBU0-0R" is the port number at the other end.

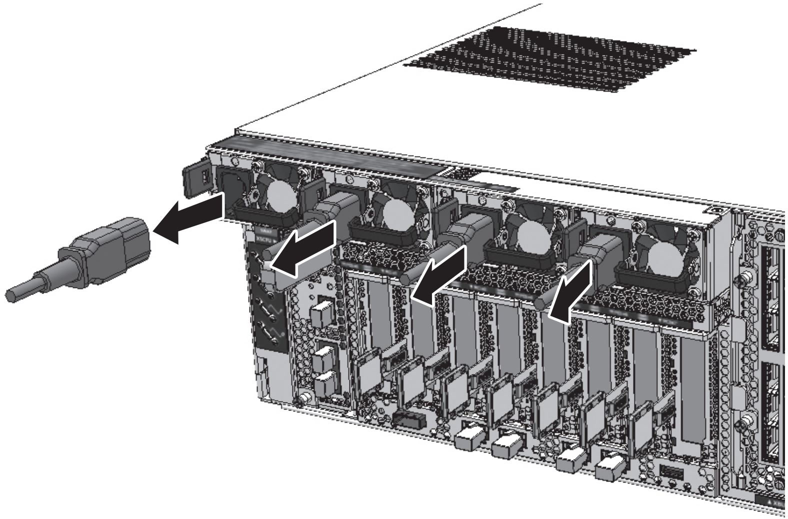
2. **Affix labels to the crossbar cable.**
   The replacement crossbar cable comes with the labels shown in Figure 19-3. Write the connected port on these labels. For the crossbar cable, use LABEL-A to LABEL-D.

Figure 19-3 Labels on Which to Write the Connected Port



3. **Place the server in the cold state.**
   To perform maintenance after every SPARC M12-2S was placed in the cold state without using the maintenance menu, remove the power cords of every SPARC M12-2S. For details on handling power cords, see "9.8.2 Removing the Power Cords."

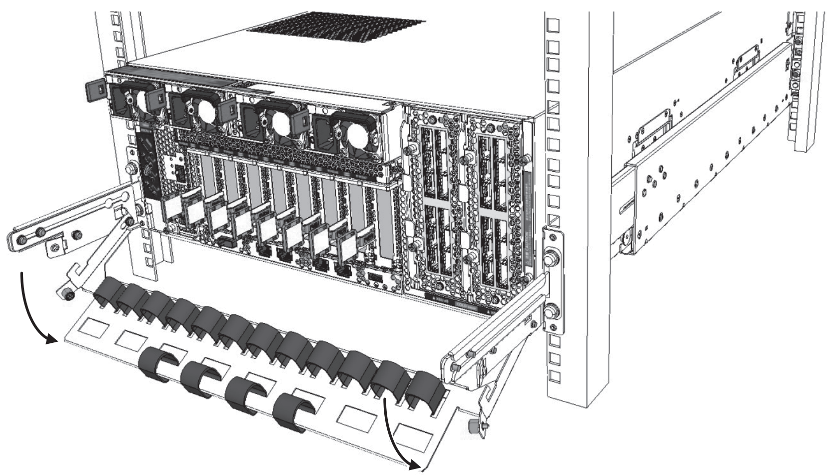
Figure 19-4 Removing a Power Cord



4. **Unbundle the crossbar cable.**
Release the crossbar cable to be replaced, by removing the hook-and-loop fastener that bundles the crossbar cable.

5. **Lower the cable support.**
Loosen the fixing screws, pull out the cable support, and lower the cable support.

Figure 19-5 Lowering the Cable Support



6. **Remove the crossbar cable.**
Pull the pull-tab (Figure 19-6 and A in Figure 19-7) of the crossbar cable to release the lock of the connector and the XBU, and remove the crossbar cable.

The pull-tab differs in shape according to the type of crossbar cable. For details, see Figure 19-9 and Figure 19-10.

Note - Remove crossbar cables one by one.

Note - When you maintain the crossbar box, you may remove the crossbar cables with the power on.

Note - The cables at the rear of the crossbar box are bundled together and fastened to the right-hand cable support with a hook-and-loop fastener. To remove the crossbar cables, remove the hook-and-loop fastener from the cable support.

Figure 19-6 Removing the Crossbar Cable (SPARC M12-2S)

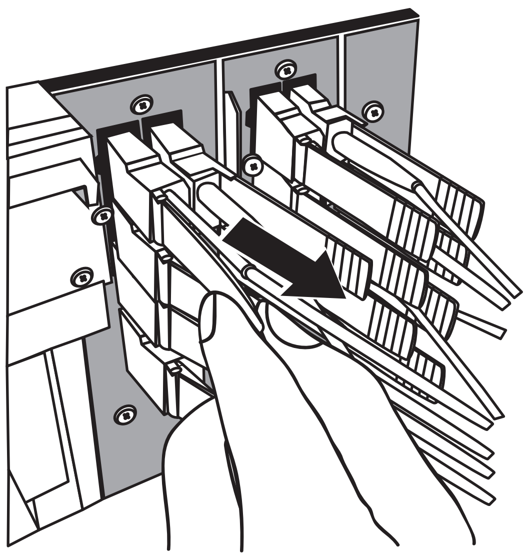
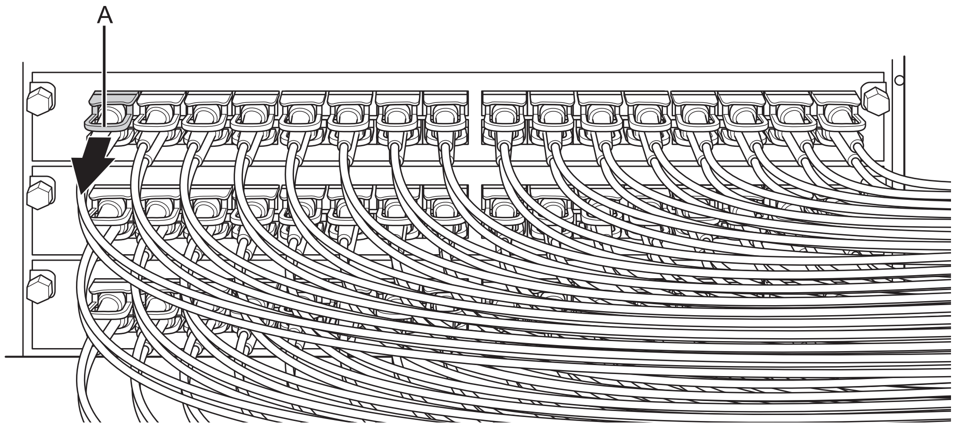


Figure 19-7 Removing the Crossbar Cable (Crossbar Box)



Caution - When pulling out to remove the crossbar cable, do not hold the cable itself. Doing so may damage the crossbar cable.

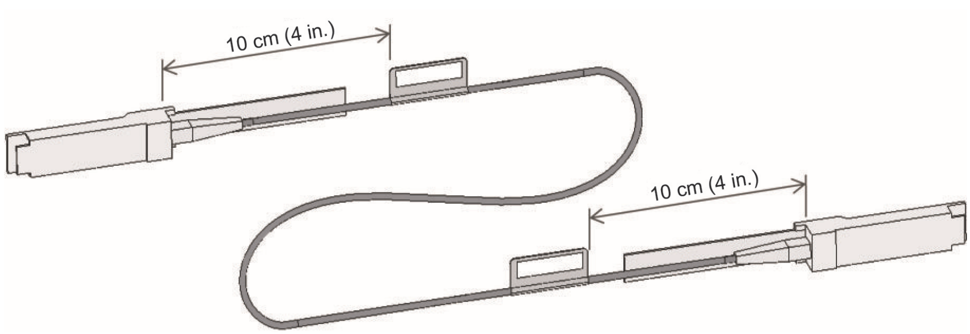
19.4 Installing the Crossbar Cable

This section describes the procedure for connecting the crossbar cable to XBUs.

1. **Affix labels to the crossbar cable.**
   Affix the labels filled out in step 2 in "19.3 Removing the Crossbar Cable" to the replacement crossbar cable.

   For a crossbar cable (optical), affix them according to Figure 19-8. For a crossbar cable (electrical), affix them at the same locations as on the replaced cable.

Figure 19-8 Label Affixing Positions on the Crossbar Cable



Note - Affix a label 10 cm (4 in.) away from the crossbar cable connector.

2. **Connect the crossbar cable to the XBUs.**

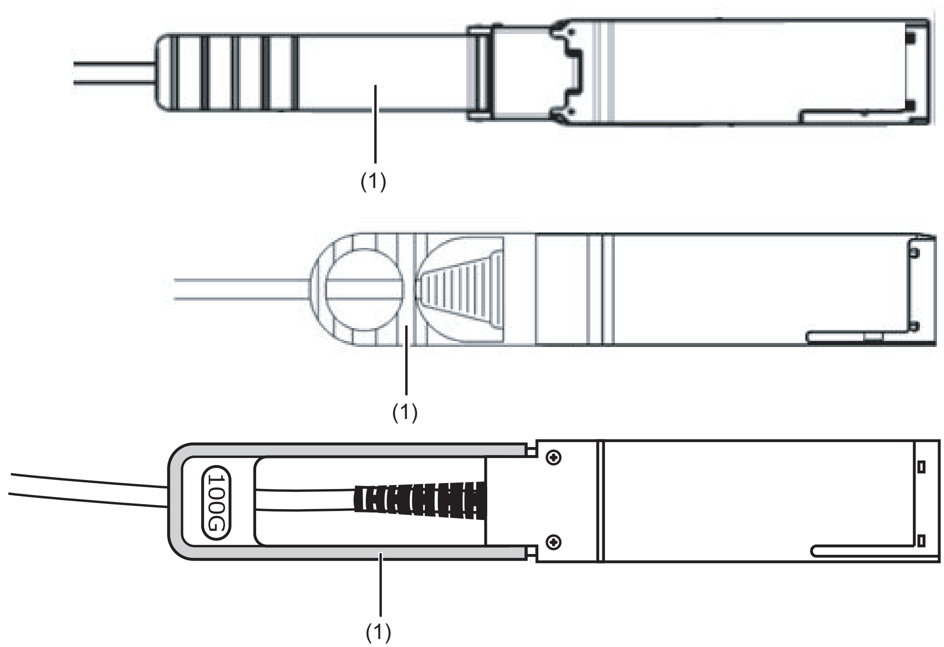
   Connect the crossbar cable to the XBU ports at the locations written on the labels.

   There are four types of crossbar cables. Use only crossbar cables (optical) in maintenance/expansion of a SPARC M12-2S that uses crossbar cables (optical). Use only crossbar cables (electrical) in maintenance/expansion of a SPARC M12-2S that uses crossbar cables (electrical).

   Connect crossbar cables of the same type to the same port numbers.

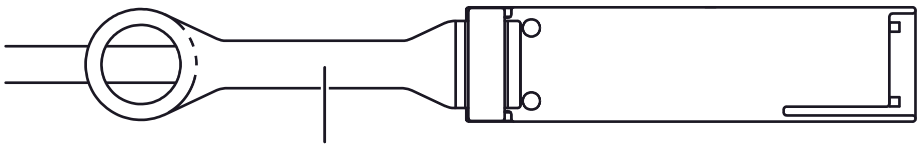
   You can distinguish the type of crossbar cable by the pull-tab shape. (See Figure 19-9 and Figure 19-10.)

Figure 19-9 Crossbar Cable (Optical) Shapes and Pull-Tabs



Number in Figure	Description
1	Pull-tab

Figure 19-10 Crossbar Cable (Electrical) Shape and Pull-Tab



Number in Figure	Description
1	Pull-tab

Caution - When connecting the crossbar cable, do not hold the pull-tab but hold the connector part to insert it into the port for the connection, and push in the connector part. If you hold the pull-tab when connecting the crossbar cable, it may become impossible to remove the cable from the XBU.

Note - On the crossbar box side, you may connect the crossbar cables with the power on.

---

3. **Bundle the crossbar cables.**
   Bundle the crossbar cables with the hook-and-loop fastener.

4. **Confirm that the crossbar cables are correctly and firmly connected.**
   With the crossbar cables connected to their ports, push in each cable while holding the joint (A in Figure 19-11 and Figure 19-12) at the base of the crossbar cable connector.

Caution - A loose crossbar cable connection may, on rare occasions, cause an error due to poor connection. After connecting a crossbar cable, push it in again so that it is tightly in place to prevent any improper connection. Do not hold only the cable when performing the work at this time. Otherwise, the cable may bend out of shape.

Figure 19-11 Part to Hold When Checking a Crossbar Cable (Optical) Connection

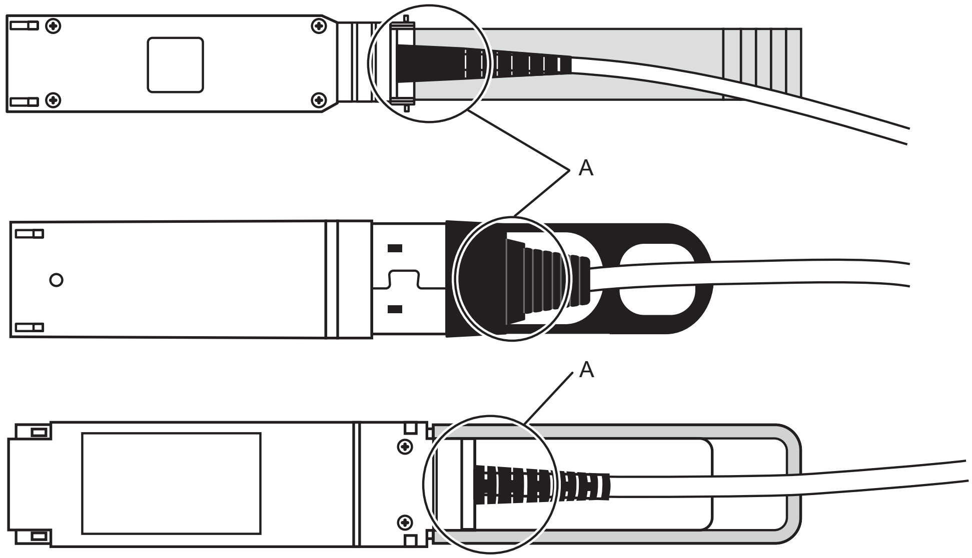
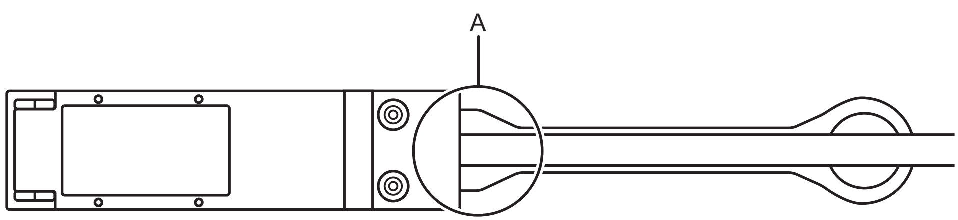
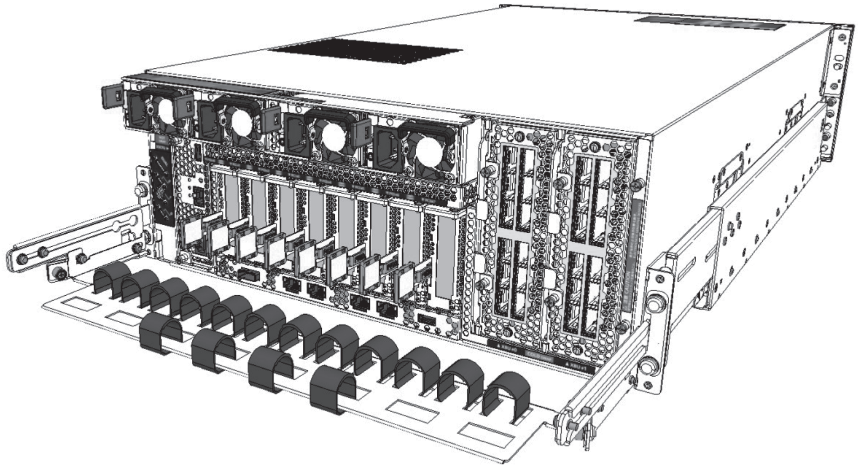


Figure 19-12 Part to Hold When Checking a Crossbar Cable (Electrical) Connection



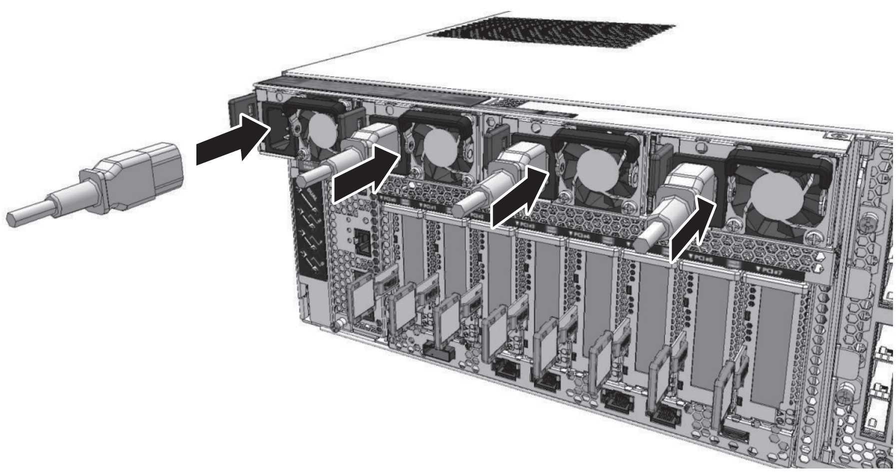
5. **Return the cable support to the original position.**
   Return the cable support to the pre-maintenance position.

Figure 19-13 Returning to the Pre-Maintenance State



6. **Place the server in the hot state.**
   To perform maintenance after every SPARC M12-2S was placed in the cold state without using the maintenance menu, install the power cords of every SPARC M12-2S. For details on installing the power cord on the server, see "10.1.1 Installing a Power Cord."

Figure 19-14 Installing the Power Cord



Chapter 20

Maintaining the Crossbar Unit

This chapter describes the maintenance procedures for XBUs.

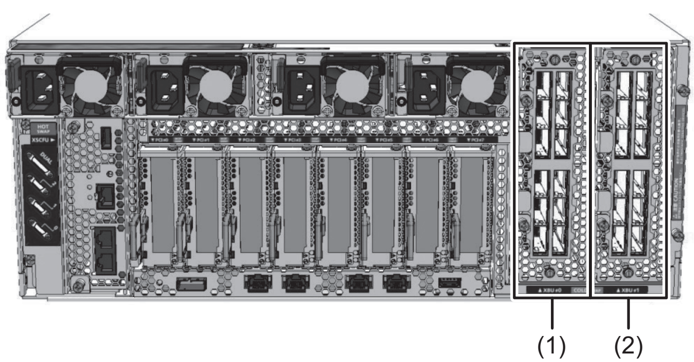
Note - XBUs are used in the SPARC M12-2S.

20.1 Locations of the XBU

Two XBUs are mounted in the SPARC M12-2/M12-2S.

Figure 20-1 shows the mounting locations of the XBUs.

Figure 20-1 Locations of the XBU



Location No.	Unit	Slot
1	XBU	XBU#0
2	XBU	XBU#1

20.2 Before Maintenance on an XBU

When replacing an XBU, perform one of the maintenance procedures listed below.

- 4.4.14 Inactive/Cold Replacement Workflow of the XBU
- 4.6.14 System-Stopped/Cold Replacement Workflow of the XBU

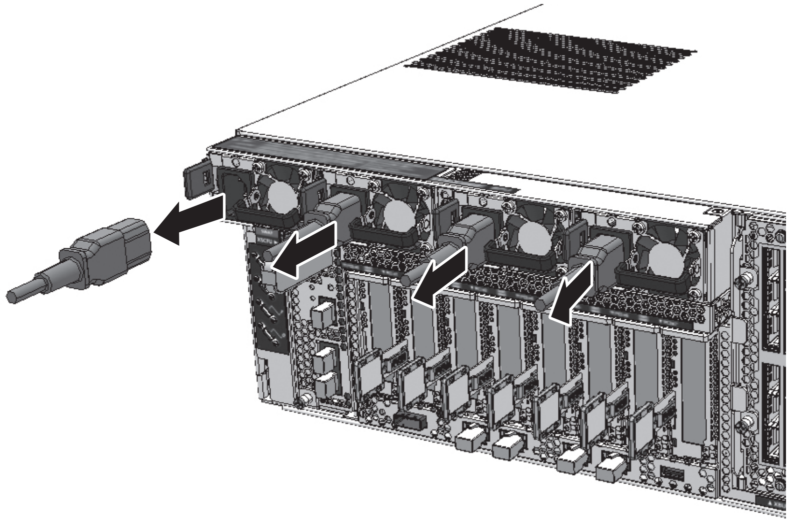
Caution - Before you handle any unit, be sure to wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be seriously damaged. For details, see "1.5 Precautions on Static Electricity."

20.3 Removing an XBU

This section describes the procedure for removing an XBU.

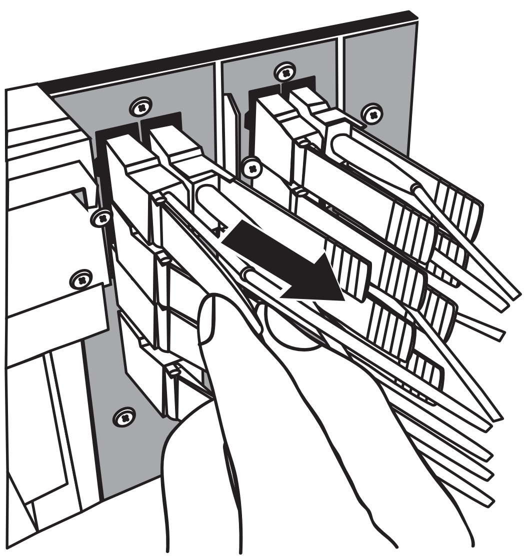
1. **Place the server in the cold state.**
   For details on handling power cords, see "9.8.2 Removing the Power Cords."

Figure 20-2 Removing a Power Cord



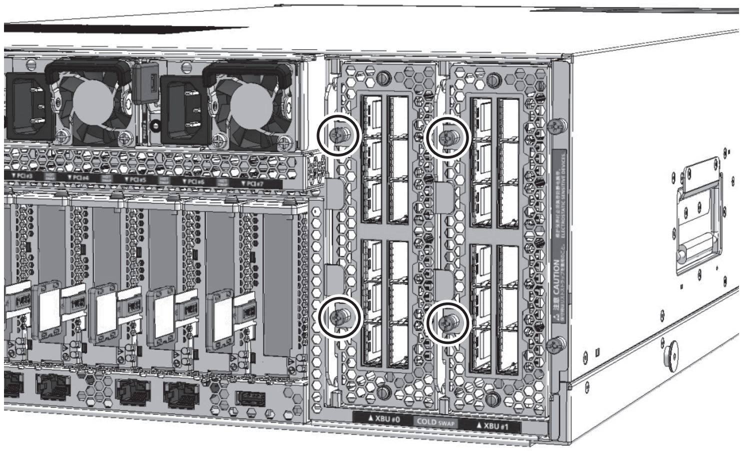
2. **Remove the crossbar cables.**
Remove all the crossbar cables from the XBU to be replaced. For the procedure for removing the crossbar cables, see "19.3 Removing the Crossbar Cable."

Figure 20-3 Removing the Crossbar Cable



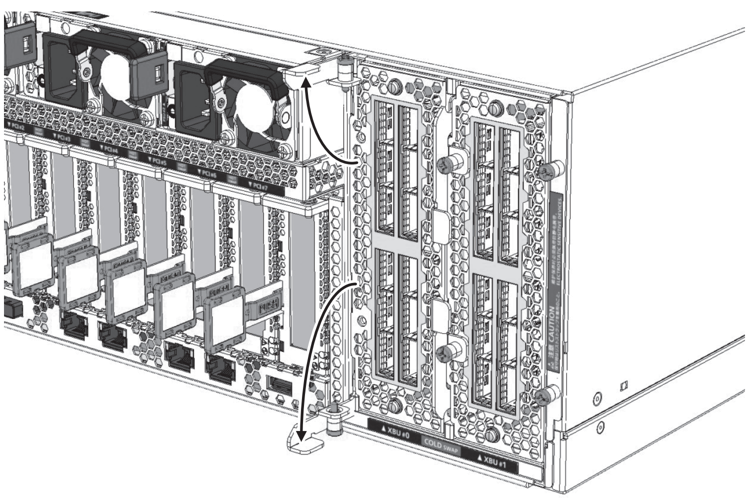
3. **Loosen the fixing screws of the XBU.**
Loosen the two fixing screws of the XBU to release the removal levers.

Figure 20-4 Fixing Screws of the XBU



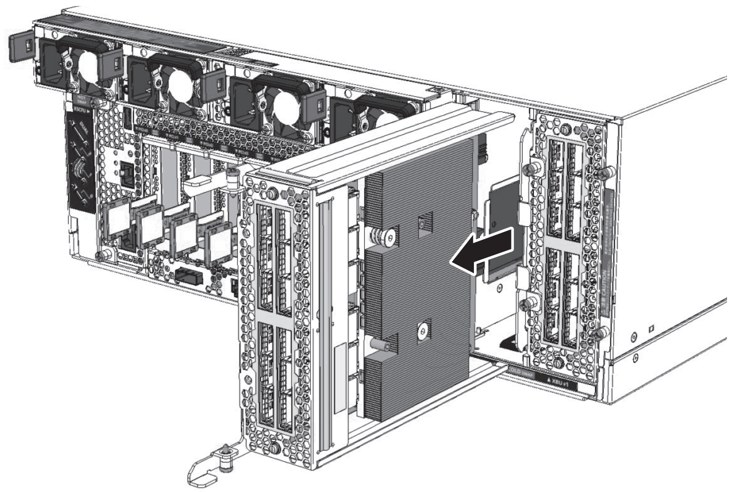
4. **Open the removal levers of the XBU.**
Open the removal levers of the XBU, and disconnect the connector from the CPU memory unit.

Figure 20-5 Opening the Removal Levers of the XBU



5. **Remove the XBU.**
Hold the top and bottom of the XBU with both hands, and remove the unit from the server carefully to avoid mechanical shock.

Figure 20-6 Removing the XBU



Note - If the cable support is used, remove the XBU with the cable support lowered.

Note - Place the removed XBU on the ESD mat to ground any static electricity.

20.4 Installing an XBU

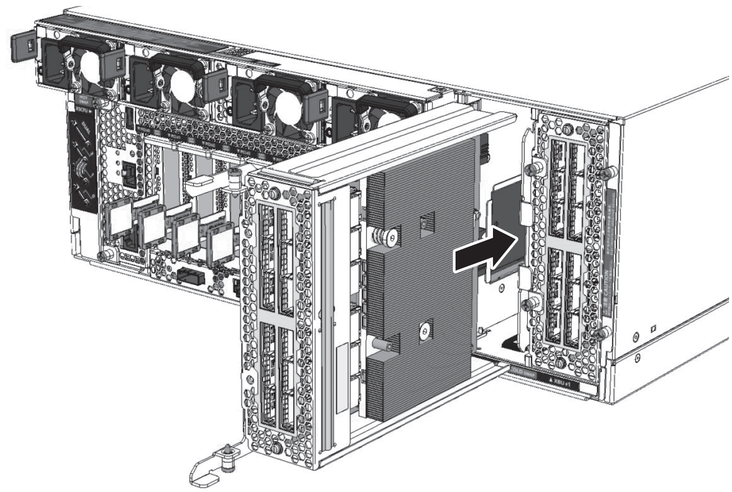
This section describes the procedure for installing an XBU.

Caution - When installing an XBU, check the connectors on the CPU memory unit and XBU beforehand to confirm that none of the pins are bent and that all the pins are neatly arranged in lines. If the XBU is installed with a bent pin in a connector, the CPU memory unit or XBU may be damaged. When installing a unit, insert it carefully so as not to bend any pins.

---

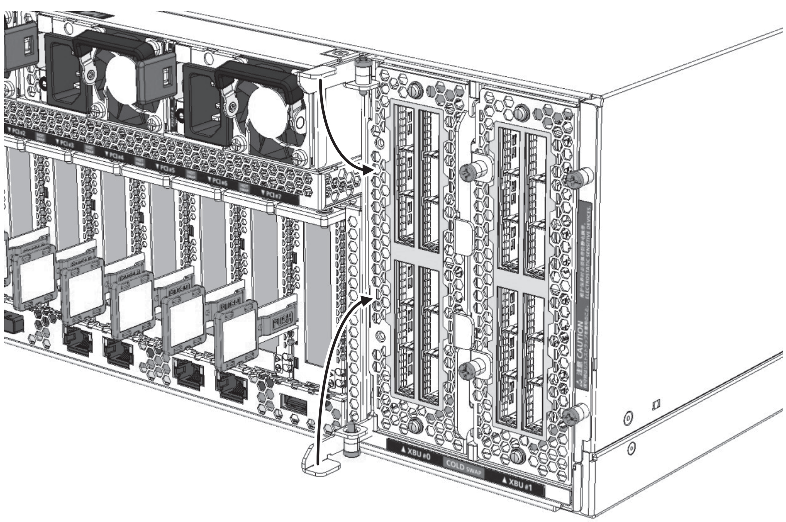
1. **Install the XBU.**
   Insert the XBU into the server gently to avoid mechanical shock, with the XBU removal levers open.

Figure 20-7 Inserting the XBU



2. **Close the removal levers of the XBU.**
   Close the removal levers of the XBU, and connect the connector to the CPU memory unit.

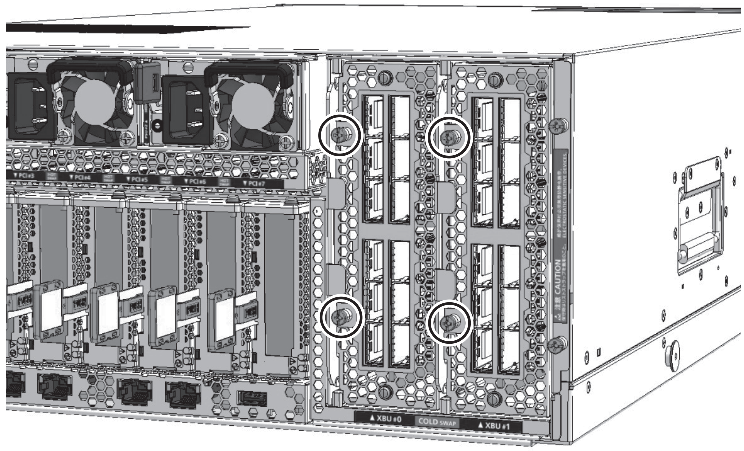
Figure 20-8 Connecting the XBU



3. **Secure the XBU.**
   Tighten the two fixing screws to secure the XBU.

Note - When installing the XBU, insert it all the way into the chassis, with its removal levers open upward and downward. If you close the removal levers before inserting the XBU, you cannot install it. The removal levers will move in the closing direction as you insert the XBU all the way into the chassis. Push the removal levers manually to close them completely.

Figure 20-9 Securing the XBU



4. **Install the crossbar cables.**
   Install the crossbar cables to the XBU. For details, see "19.4 Installing the Crossbar Cable."

Note - The destination port for the XBU is described on a label affixed to the crossbar cable. Check the label first and connect the cable to the port of the XBU. For crossbar cable connection destinations, see "4.3 Connecting Crossbar Cables" in the *Fujitsu SPARC M12-2S Installation Guide*.

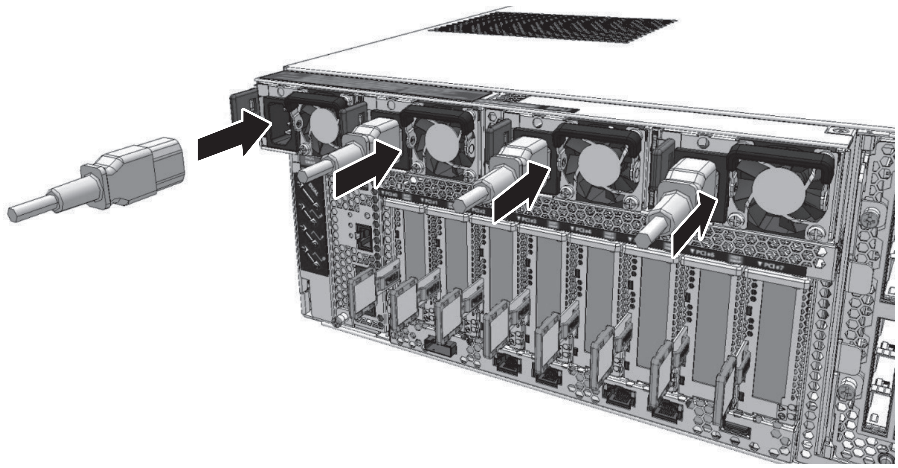
Caution - When connecting the crossbar cable, do not hold the pull-tab but hold the connector part to insert it into the port for the connection, and push in the connector part. If you hold the pull-tab when connecting the crossbar cable, it may become impossible to remove the cable from the XBU.

Caution - A loose crossbar cable connection may, on rare occasions, cause an error due to poor connection. After connecting a crossbar cable, push it in again so that it is tightly in place to prevent any improper connection. Do not hold only the cable when performing the work at this time. Otherwise, the cable may bend out of shape. For details, see step 4 in "19.4 Installing the Crossbar Cable."

---

5. **Place the server in the hot state.**
   For details on installing the power cord on the server, see "10.1.1 Installing a Power Cord."

Figure 20-10 Installing the Power Cord



Chapter 21

Maintaining the XSCF DUAL Control Cable

This chapter describes the maintenance procedures for the XSCF DUAL control cable.

Note - The XSCF DUAL control cable is used in a building block configuration consisting of multiple SPARC M12-2S units.

21.1 XSCF DUAL Control Port

The XSCF DUAL control cable is used to connect a SPARC M12-2S that houses the master XSCF or a crossbar box to a SPARC M12-2S that houses the standby XSCF or a crossbar box.

Connect the XSCF DUAL control cable to the XSCF DUAL control port on the rear of the SPARC M12-2S or crossbar box. Figure 21-1 shows the location of the XSCF DUAL control port.

Figure 21-1 Location of the XSCF DUAL Control Port (SPARC M12-2S)

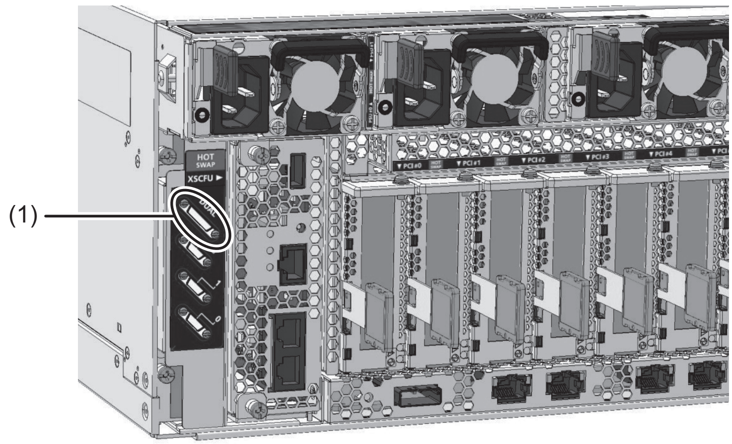
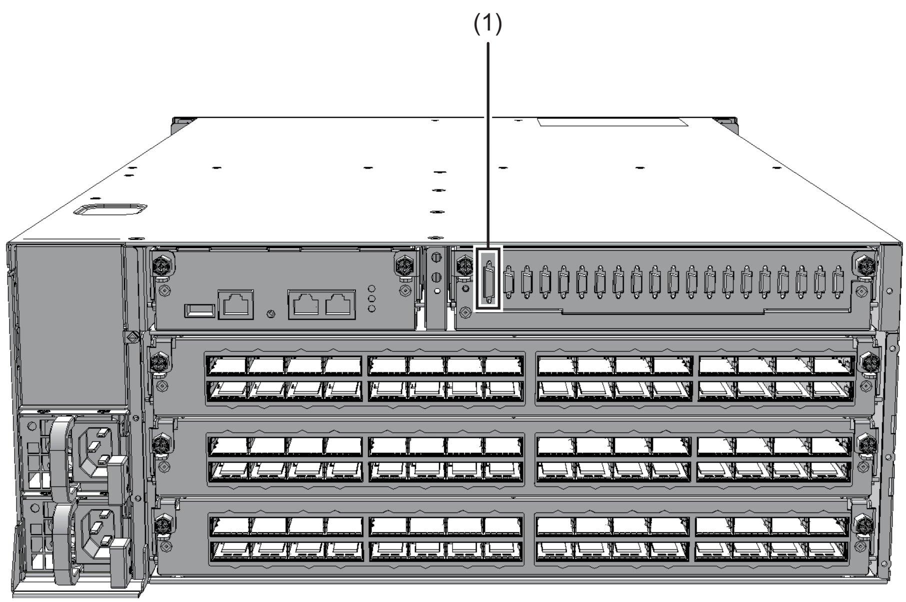


Figure 21-2 Location of the XSCF DUAL Control Port (Crossbar Box)



Location No.	Unit
1	XSCF DUAL control port

21.2 Before Maintenance on the XSCF DUAL Control Cable

When replacing the XSCF DUAL control cable, perform the maintenance procedure listed below.

- 4.2.14 Active/Cold Replacement Workflow of the XSCF DUAL Control Cable
- 4.4.16 Inactive/Cold Replacement Workflow of the XSCF DUAL Control Cable
- 4.6.15 System-Stopped/Cold Replacement Workflow of the XSCF DUAL Control Cable

Note that a system that uses one SPARC M12-2S may be in a building block configuration connected with another SPARC M12-2S. If so, be sure to connect the SPARC M12-2S that houses the master XSCF to the SPARC M12-2S that houses the standby XSCF by using the XSCF DUAL control cable.

21.3 Removing the XSCF DUAL Control Cable

This section describes the procedure for removing the XSCF DUAL control cable.

1. **Make a note of the XSCF DUAL control cable to be replaced.**
   Log in to the XSCF and execute the showstatus command or showlogs error command. Then, make a note of the ports connected to the XSCF DUAL control cable to be replaced. For details on the commands, see "8.2.2 Identifying a Fault."

   The underlined part in the error example below indicates that an error has been found in the XSCF DUAL control cable connected to BB#00 and BB#01.

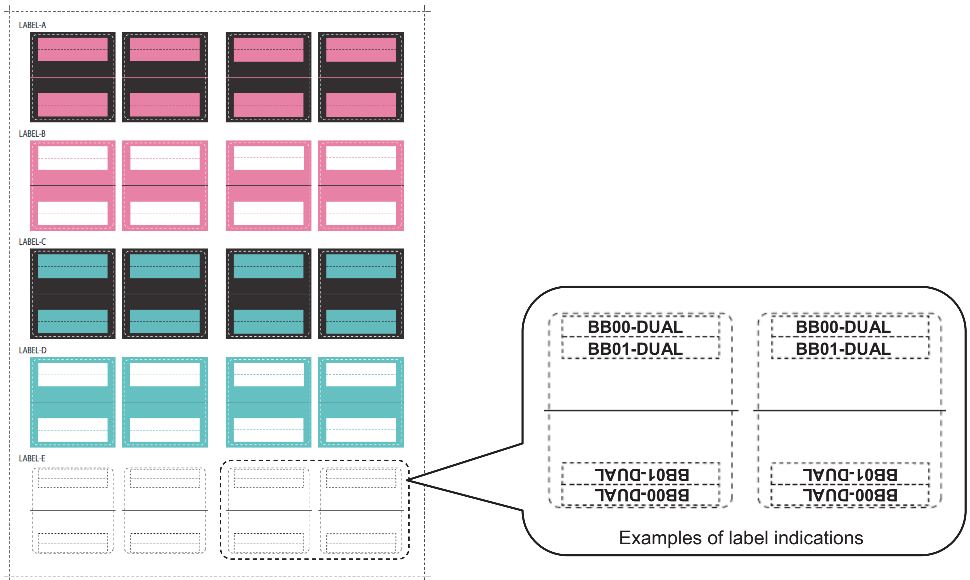
```
XSCF> showlogs error
Date: Jan 30 07:25:35 UTC 2016
    Code: 40000000-00b8ff0000ff0000ff-01a100210000000000000000
    Status: Warning                Occurred: Jan 30 07:25:31.377 UTC 2016
    FRU: /BB#00/SCF_DUAL
    Msg: Board control error (MBC link error)
```

   From the above error message and "Appendix A Lists of Cable Connections in a Building Block Configuration," identify the port number at the other end of the connection of the target XSCF DUAL control cable.

   In this example, "BB01-DUAL" is the port number at the other end.

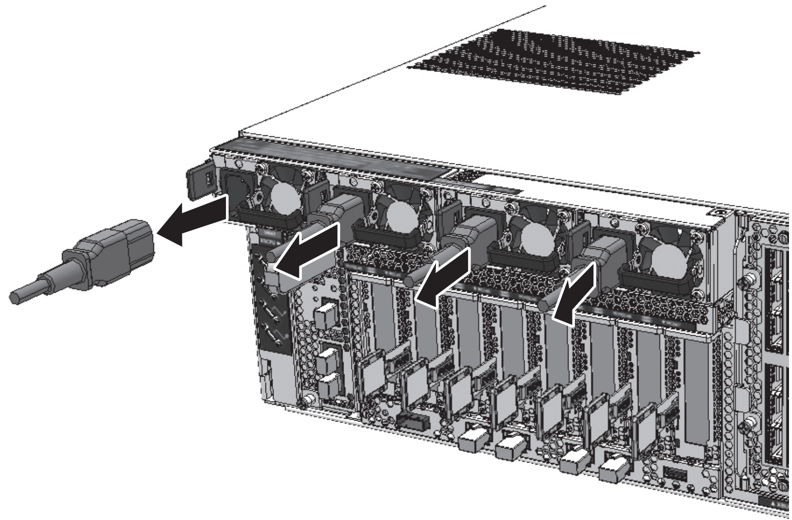
2. **Write the port number on labels.**
The replacement XSCF DUAL control cable comes with the labels shown in Figure 21-3. Write the connected port on these labels. For the XSCF DUAL control cable, use LABEL-E. As in the example shown in Figure 21-3, write the port number identified in step 1 on two labels.

Figure 21-3 Accompanying Labels and Examples of Label Indications



3. **Place the server in the cold state.**
To perform maintenance after every SPARC M12-2S was placed in the cold state without using the maintenance menu, remove the power cords of every SPARC M12-2S. For details on handling power cords, see "9.8.2 Removing the Power Cords."

Figure 21-4 Removing the Power Cord



4. **Remove the XSCF DUAL control cable.**
Pull out the XSCF DUAL control cable (in the direction of arrow 2 in Figure 21-5) while pushing in the latches on both sides of the cable connector (in the directions of the arrows marked 1 in Figure 21-5).

Figure 21-5 Removing the XSCF DUAL Control Cable (SPARC M12-2S)

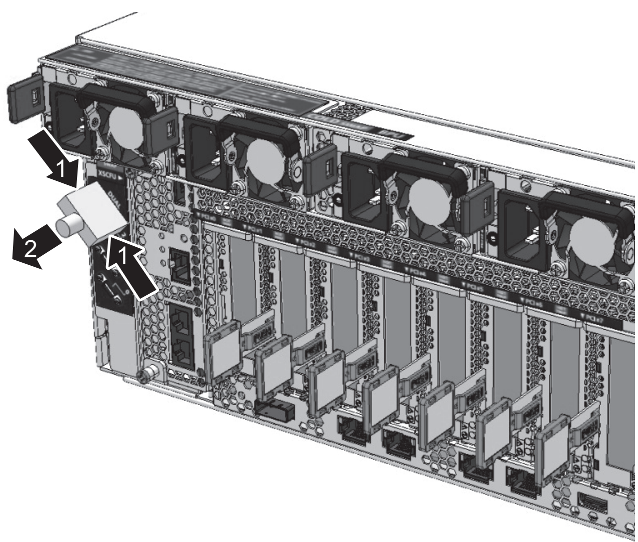
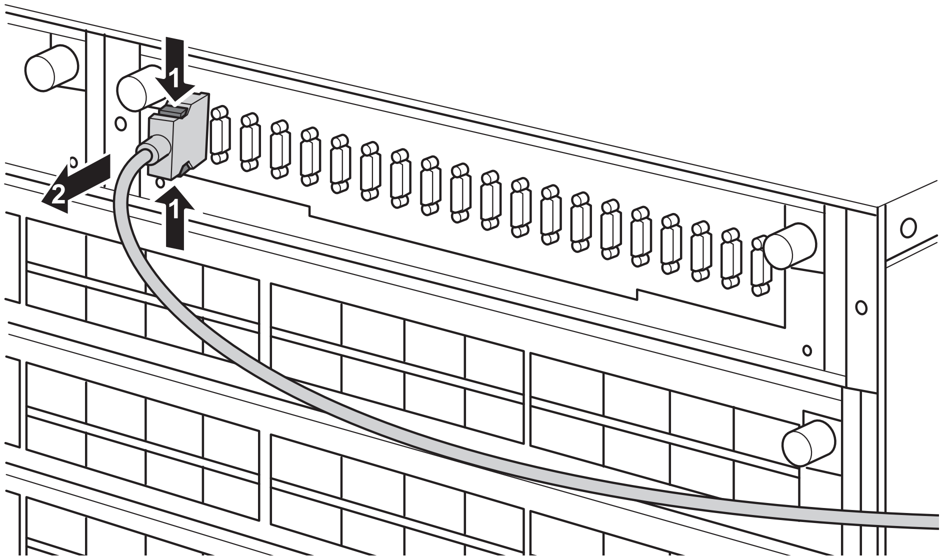


Figure 21-6 Removing the XSCF DUAL Control Cable (Crossbar Box)



Caution - Do not pull the XSCF DUAL control cable itself. Otherwise, the cable may be damaged and the system may fail to operate normally.

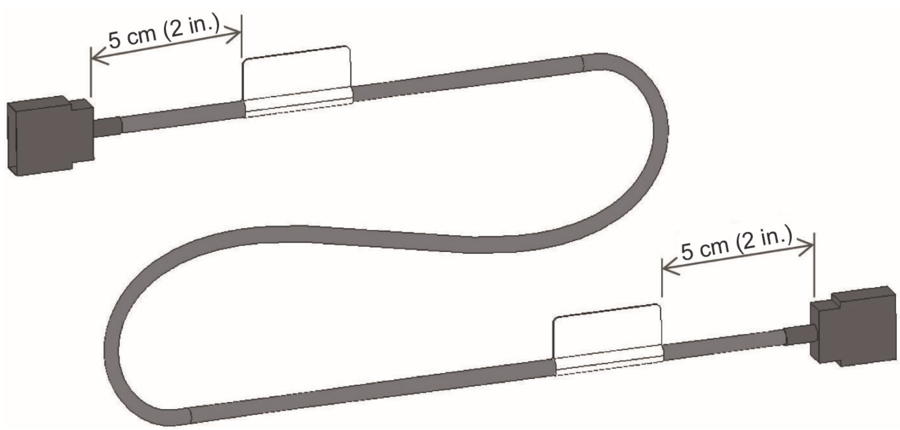
5. **Remove the XSCF DUAL control cable from the other chassis.**
   Pull out the XSCF DUAL control cable (in the direction of arrow 2 in Figure 21-6) while pushing in the latches on both sides of the cable (in the directions of the arrows marked 1 in Figure 21-6).

21.4 Installing the XSCF DUAL Control Cable

This section describes the procedure for installing the XSCF DUAL control cable.

1. **Affix labels to the XSCF DUAL control cable.**
   Affix the labels filled out in step 2 of "21.3 Removing the XSCF DUAL Control Cable" to the XSCF DUAL control cable (Figure 21-7).

Figure 21-7 Label Affixing Positions on the XSCF DUAL Control Cable

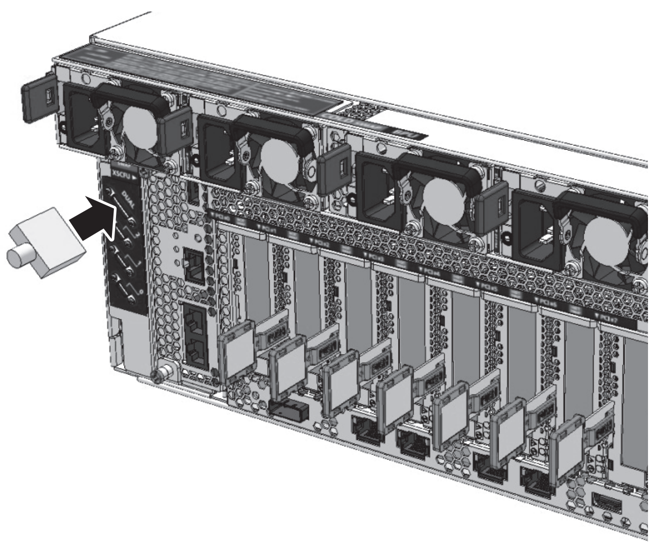


Note - Affix a label 5 cm (2 in.) away from the XSCF DUAL control cable connector.

---

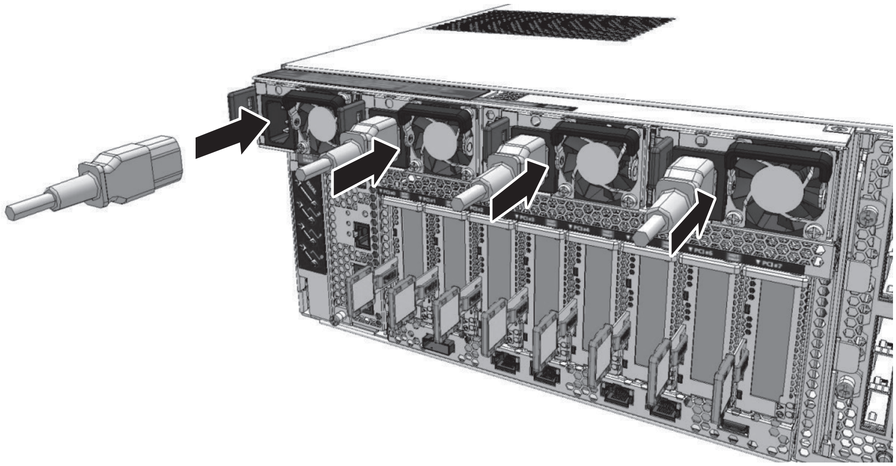
2. **Connect the XSCF DUAL control cable.**

Figure 21-8 Connecting the XSCF DUAL Control Cable



3. **Place the server in the hot state.**
   To perform maintenance after every SPARC M12-2S was placed in the cold state without using the maintenance menu, install the power cords of every SPARC M12-2S. For details on installing the power cord on the PSU, see "10.1.1 Installing a Power Cord."

Figure 21-9 Installing the Power Cord



Chapter 22

Maintaining the XSCF BB Control Cable

This chapter describes the maintenance procedures for the XSCF BB control cable.

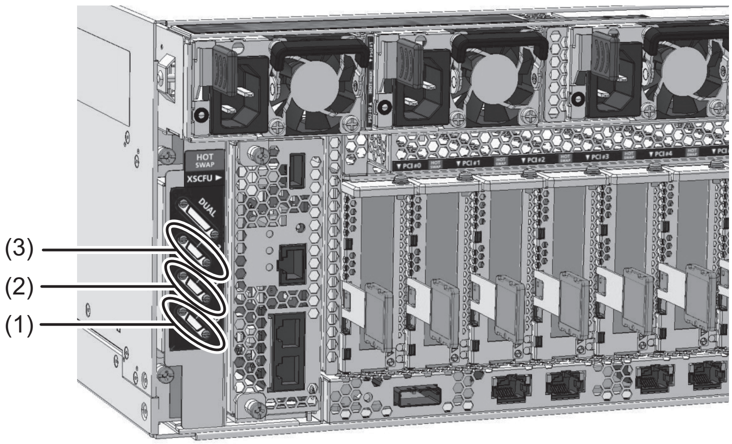
Note - The XSCF BB control cable is used in a building block configuration consisting of multiple SPARC M12-2S units.

22.1 XSCF BB Control Port

The XSCF BB control cable is used in a building block configuration consisting of multiple SPARC M12-2S units to connect the XSCFs of those SPARC M12-2S units.

Connect the XSCF BB control cable to the XSCF BB control port on the rear of the server. Figure 22-1 shows the locations of the XSCF BB control ports.

Figure 22-1 Location of the XSCF BB Control Port (SPARC M12-2S)



Location No.	Unit
1	XSCF BB control port (XSCF0)
2	XSCF BB control port (XSCF1)
3	XSCF BB control port (XSCF2)

22.2 Before Maintenance on the XSCF BB Control Cable

When replacing the XSCF BB control cable, perform one of the maintenance procedures listed below.

- 4.2.15 Active/Cold Replacement Workflow of the XSCF BB Control Cable
- 4.4.17 Inactive/Cold Replacement Workflow of the XSCF BB Control Cable
- 4.6.16 System-Stopped/Cold Replacement Workflow of the XSCF BB Control Cable

When implementing a building block configuration by connecting multiple SPARC M12-2S units for a system that uses only one SPARC M12-2S unit, check the connection destinations of the XSCF BB control cable in "Appendix A Lists of Cable Connections in a Building Block Configuration."

22.3 Removing the XSCF BB Control Cable

This section describes the procedure for removing the XSCF BB control cable.

1. **Make a note of the XSCF BB control cable to be replaced.**
   Log in to the XSCF and execute the showstatus command or showlogs error command. Then, make a note of the ports connected to the XSCF BB control cable to be replaced. For details on the commands, see "8.2.2 Identifying a Fault."

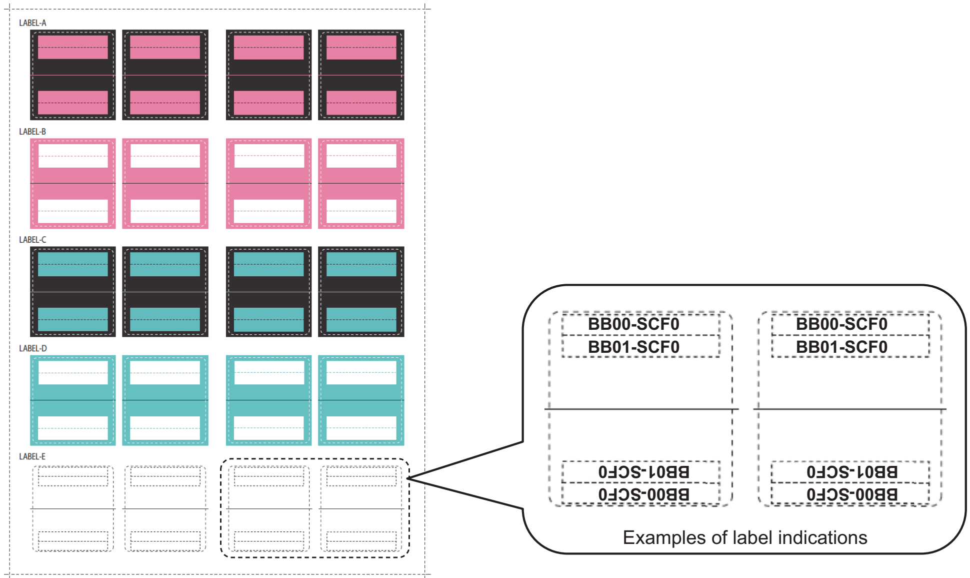
   The underlined part in the error example below indicates that an error has been found in the XSCF BB control cable connected to BB#00 and BB#01.

```
XSCF> showlogs error
Date: Feb 12 20:23:38 JST 2016
    Code: 80000080-00b00000b7ff00b001-01a1002700000000000000000
    Status: Alarm                    Occurred: Feb 12 20:23:38.337 JST 2016
    FRU: /BB#00/XSCFU,/BB#00/SCF_CBL#0,/BB#01/XSCFU,*
    Msg: XSCF data synchronization failed
```

From the above error message and "Appendix A Lists of Cable Connections in a Building Block Configuration," identify the port number at the other end of the connection of the target XSCF BB control cable.
In this example, "BB01-XSCF0" is the port number at the other end.

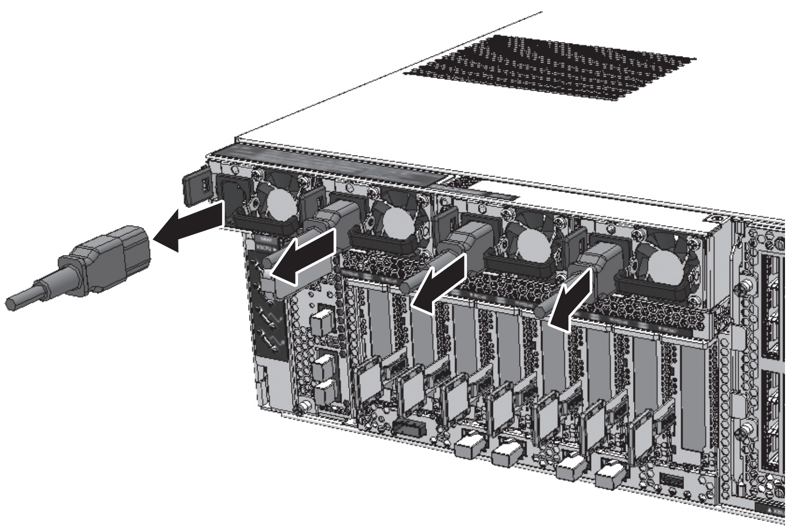
2. **Write the port number on labels.**
   The replacement XSCF BB control cable comes with the labels shown in Figure 22-2. Write the connected port on these labels. For the XSCF BB control cable, use LABEL-E. As in the example shown in Figure 22-2, write the connected port number identified in step 1 on two labels.

Figure 22-2 Accompanying Labels and Examples of Label Indications



3. **Place the server in the cold state.**
   To perform maintenance after every SPARC M12-2S was placed in the cold state without using the maintenance menu, remove the power cords of every SPARC M12-2S. For details on handling power cords, see "9.8.2 Removing the Power Cords."

Figure 22-3 Removing the Power Cord



4. **Remove the XSCF BB control cable.**
   Pull out the XSCF BB control cable (in the direction of arrow 2 in Figure 22-4 and

Figure 22-5) while pushing in the latches on both sides of the cable connector (in the directions of the arrows marked 1 in Figure 22-4 and Figure 22-5).

Figure 22-4 Removing the XSCF BB Control Cable (SPARC M12-2S)

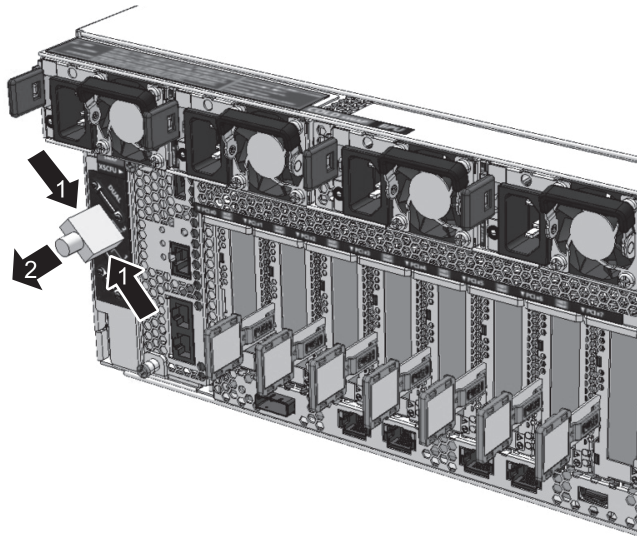
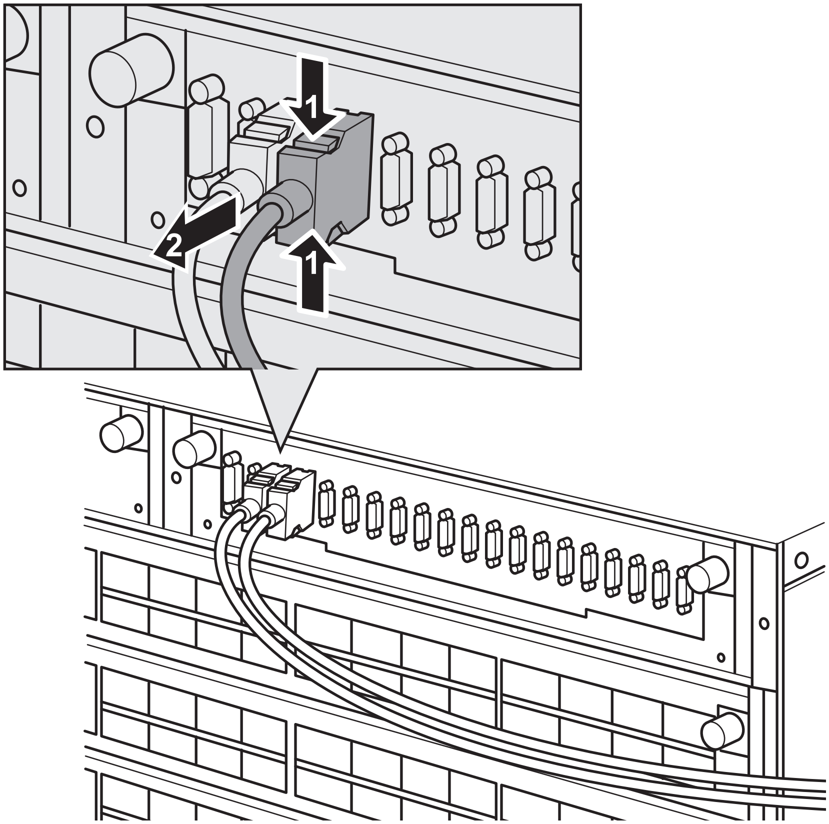


Figure 22-5 Removing the XSCF BB Control Cable (Crossbar Box)



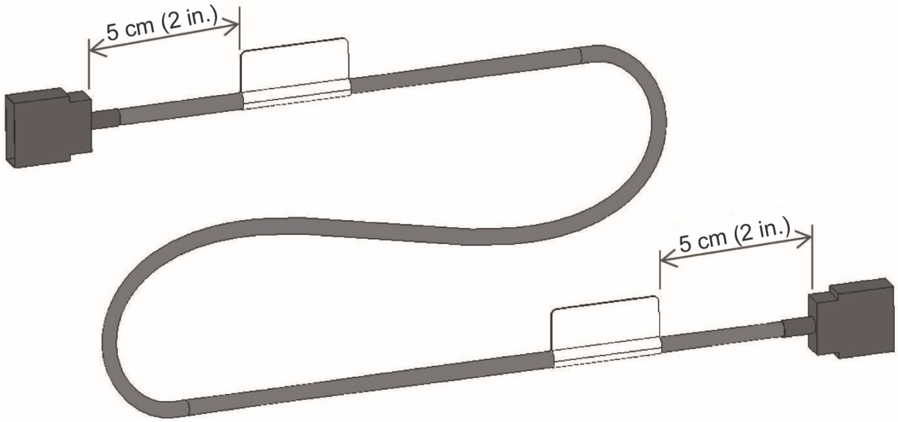
Caution - Do not pull the XSCF BB control cable itself. Otherwise, the cable may be damaged and the system may fail to operate normally.

22.4 Installing the XSCF BB Control Cable

This section describes the procedure for installing the XSCF BB control cable.

1. **Affix labels to the XSCF BB control cable.**
   Affix the labels filled out in step 2 of "22.3 Removing the XSCF BB Control Cable" to the XSCF BB control cable (Figure 22-6).

Figure 22-6 Label Affixing Positions on the XSCF BB Control Cable

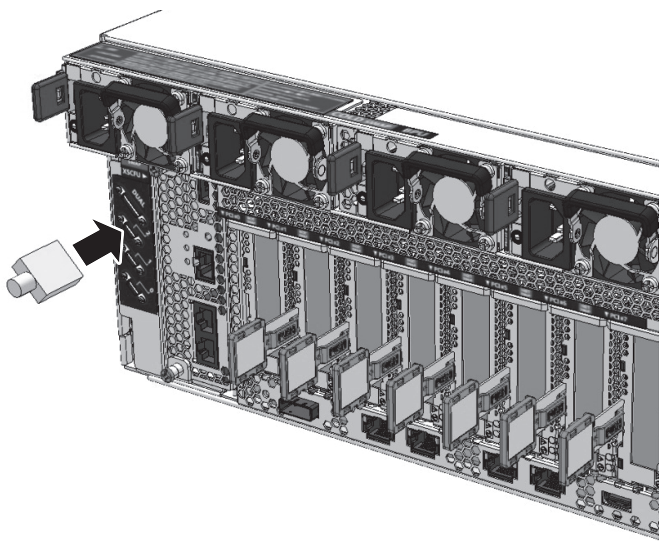


Note - Affix a label 5 cm (2 in.) away from the XSCF BB control cable connector.

---

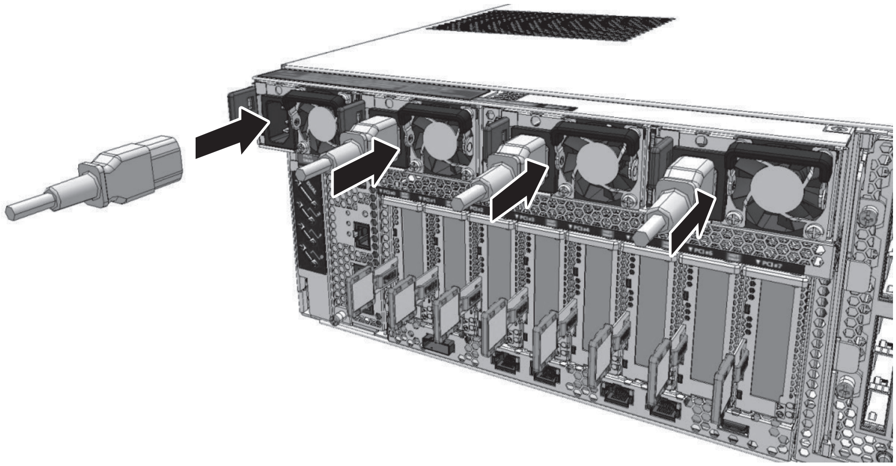
2. **Connect the XSCF BB control cable.**

Figure 22-7 Connecting the XSCF BB Control Cable



3. **Place the server in the hot state.**
   To perform maintenance after every SPARC M12-2S was placed in the cold state without using the maintenance menu, install the power cords of every SPARC M12-2S. For details on installing the power cord on the PSU, see "10.1.1 Installing a Power Cord."

Figure 22-8 Installing the Power Cord



Appendix A

Lists of Cable Connections in a Building Block Configuration

This appendix contains the connection diagrams and cable configuration lists of the XSCF cables and crossbar cables in a 4BB configuration.

Figure A-1 shows the connection diagram of the XSCF cables. For details on XSCF cables, see "Table A-1."

Figure A-1 Connection Diagram of the XSCF Cables

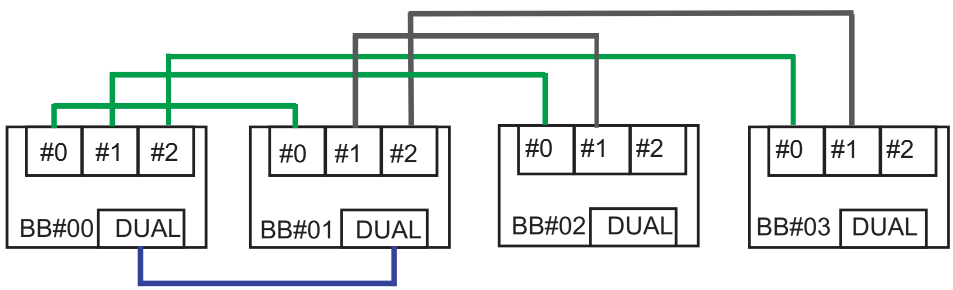


Table A-1 Correspondence Table of XSCF DUAL Control Cable and XSCF BB Control Cable Connections

Connection Order	Combination of Connection Ports			2BB Configuration	3BB Configuration	4BB Configuration
1	/BB#00/XSCFU-DUAL	---	/BB#01/XSCFU-DUAL	Available	Available	Available
	/BB#00/XSCFU#0	---	/BB#01/XSCFU#0	Available	Available	Available
2	/BB#00/XSCFU#1	---	/BB#02/XSCFU#0		Available	Available
	/BB#01/XSCFU#1	---	/BB#02/XSCFU#1		Available	Available
3	/BB#00/XSCFU#2	---	/BB#03/XSCFU#0			Available
	/BB#01/XSCFU#2	---	/BB#03/XSCFU#1			Available

Figure A-2 shows the connection diagram of the crossbar cables. The numbers in the parentheses indicate the order in which the cables are to be connected. For information on crossbar cables, see "Table A-2."

Figure A-2 Connection Diagram of the Crossbar Cables

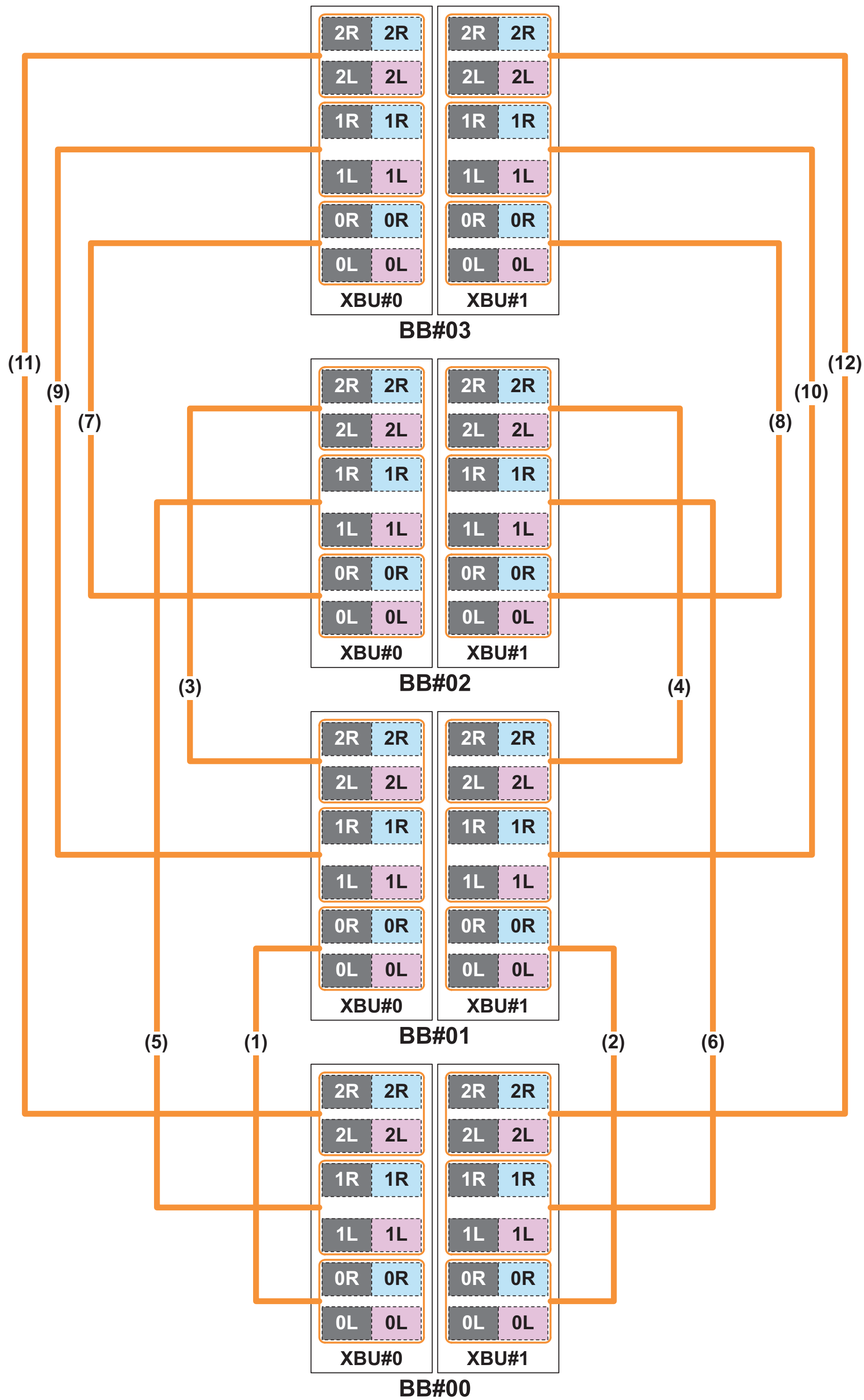


Table A-2 Correspondence Table of the Crossbar Cable Connections

Connection Order	Combination of Connection Ports			2BB Configuration	3BB Configuration	4BB Configuration
1	/BB#00/XBU#0 - 0L (pink)	---	/BB#01/XBU#0 - 0L (pink)	Available	Available	Available
	/BB#00/XBU#0 - 0L (black)	---	/BB#01/XBU#0 - 0L (black)	Available	Available	Available
	/BB#00/XBU#0 - 0R (light blue)	---	/BB#01/XBU#0 - 0R (light blue)	Available	Available	Available
	/BB#00/XBU#0 - 0R (black)	---	/BB#01/XBU#0 - 0R (black)	Available	Available	Available
2	/BB#00/XBU#1 - 0L (pink)	---	/BB#01/XBU#1 - 0L (pink)	Available	Available	Available
	/BB#00/XBU#1 - 0L (black)	---	/BB#01/XBU#1 - 0L (black)	Available	Available	Available
	/BB#00/XBU#1 - 0R (light blue)	---	/BB#01/XBU#1 - 0R (light blue)	Available	Available	Available
	/BB#00/XBU#1 - 0R (black)	---	/BB#01/XBU#1 - 0R (black)	Available	Available	Available
3	/BB#01/XBU#0 - 2L (pink)	---	/BB#02/XBU#0 - 2L (pink)		Available	Available
	/BB#01/XBU#0 - 2L (black)	---	/BB#02/XBU#0 - 2L (black)		Available	Available
	/BB#01/XBU#0 - 2R (light blue)	---	/BB#02/XBU#0 - 2R (light blue)		Available	Available
	/BB#01/XBU#0 - 2R (black)	---	/BB#02/XBU#0 - 2R (black)		Available	Available
4	/BB#01/XBU#1 - 2L (pink)	---	/BB#02/XBU#1 - 2L (pink)		Available	Available
	/BB#01/XBU#1 - 2L (black)	---	/BB#02/XBU#1 - 2L (black)		Available	Available
	/BB#01/XBU#1 - 2R (light blue)	---	/BB#02/XBU#1 - 2R (light blue)		Available	Available
	/BB#01/XBU#1 - 2R (black)	---	/BB#02/XBU#1 - 2R (black)		Available	Available
5	/BB#00/XBU#0 - 1L (pink)	---	/BB#02/XBU#0 - 1L (pink)		Available	Available
	/BB#00/XBU#0 - 1L (black)	---	/BB#02/XBU#0 - 1L (black)		Available	Available
	/BB#00/XBU#0 - 1R (light blue)	---	/BB#02/XBU#0 - 1R (light blue)		Available	Available
	/BB#00/XBU#0 - 1R (black)	---	/BB#02/XBU#0 - 1R (black)		Available	Available
6	/BB#00/XBU#1 - 1L (pink)	---	/BB#02/XBU#1 - 1L (pink)		Available	Available
	/BB#00/XBU#1 - 1L (black)	---	/BB#02/XBU#1 - 1L (black)		Available	Available
	/BB#00/XBU#1 - 1R (light blue)	---	/BB#02/XBU#1 - 1R (light blue)		Available	Available
	/BB#00/XBU#1 - 1R (black)	---	/BB#02/XBU#1 - 1R (black)		Available	Available
7	/BB#02/XBU#0 - 0L (pink)	---	/BB#03/XBU#0 - 0L (pink)			Available
	/BB#02/XBU#0 - 0L (black)	---	/BB#03/XBU#0 - 0L (black)			Available
	/BB#02/XBU#0 - 0R (light blue)	---	/BB#03/XBU#0 - 0R (light blue)			Available
	/BB#02/XBU#0 - 0R (black)	---	/BB#03/XBU#0 - 0R (black)			Available
8	/BB#02/XBU#1 - 0L (pink)	---	/BB#03/XBU#1 - 0L (pink)			Available

Table A-2 Correspondence Table of the Crossbar Cable Connections *(continued)*

Connection Order	Combination of Connection Ports			2BB Configuration	3BB Configuration	4BB Configuration
	/BB#02/XBU#1 - 0L (black)	---	/BB#03/XBU#1 - 0L (black)			Available
	/BB#02/XBU#1 - 0R (light blue)	---	/BB#03/XBU#1 - 0R (light blue)			Available
	/BB#02/XBU#1 - 0R (black)	---	/BB#03/XBU#1 - 0R (black)			Available
9	/BB#01/XBU#0 - 1L (pink)	---	/BB#03/XBU#0 - 1L (pink)			Available
	/BB#01/XBU#0 - 1L (black)	---	/BB#03/XBU#0 - 1L (black)			Available
	/BB#01/XBU#0 - 1R (light blue)	---	/BB#03/XBU#0 - 1R (light blue)			Available
	/BB#01/XBU#0 - 1R (black)	---	/BB#03/XBU#0 - 1R (black)			Available
10	/BB#01/XBU#1 - 1L (pink)	---	/BB#03/XBU#1 - 1L (pink)			Available
	/BB#01/XBU#1 - 1L (black)	---	/BB#03/XBU#1 - 1L (black)			Available
	/BB#01/XBU#1 - 1R (light blue)	---	/BB#03/XBU#1 - 1R (light blue)			Available
	/BB#01/XBU#1 - 1R (black)	---	/BB#03/XBU#1 - 1R (black)			Available
11	/BB#00/XBU#0 - 2L (pink)	---	/BB#03/XBU#0 - 2L (pink)			Available
	/BB#00/XBU#0 - 2L (black)	---	/BB#03/XBU#0 - 2L (black)			Available
	/BB#00/XBU#0 - 2R (light blue)	---	/BB#03/XBU#0 - 2R (light blue)			Available
	/BB#00/XBU#0 - 2R (black)	---	/BB#03/XBU#0 - 2R (black)			Available
12	/BB#00/XBU#1 - 2L (pink)	---	/BB#03/XBU#1 - 2L (pink)			Available
	/BB#00/XBU#1 - 2L (black)	---	/BB#03/XBU#1 - 2L (black)			Available
	/BB#00/XBU#1 - 2R (light blue)	---	/BB#03/XBU#1 - 2R (light blue)			Available
	/BB#00/XBU#1 - 2R (black)	---	/BB#03/XBU#1 - 2R (black)			Available

Appendix B

External Interface Specifications

This appendix provides the specifications of the external interface connectors and XSCF switch mounted on the SPARC M12-2/M12-2S.

The following external interface connectors are mounted on the SPARC M12-2/M12-2S:

- Serial Port
- USB Port
- SAS Port

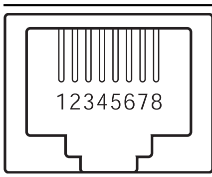
The following XSCF switch is mounted on the SPARC M12-2/M12-2S:

- RESET Switch

B.1 Serial Port

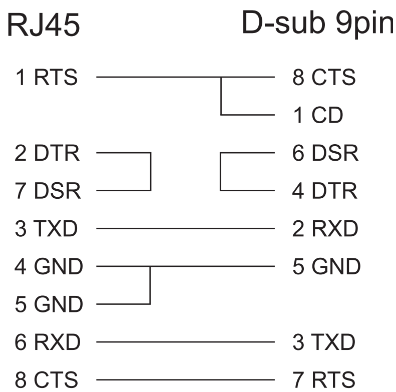
Table B-1 lists the specifications of the serial port on the SPARC M12-2/M12-2S.

Table B-1 Serial Port

Pin Arrangement	Pin Number	Signal Name	Input/Output	Description
	1	RTS	Output	Transmission request
	2	DTR	Output	Data terminal ready
	3	TXD	Output	Transmitted data
	4	GND	---	Ground
	5	GND	---	Ground
	6	RXD	Input	Received data
	7	DSR	Input	Data set ready
	8	CTS	Input	Transmission possible

B.1.1 Wire Connection Chart for Serial Cables

Figure B-1 Wire Connection Chart for Serial Cables



B.2 USB Port

Table B-2, Table B-3, and Table B-4 list the specifications of the USB port on the SPARC M12-2/M12-2S.

Table B-2 USB 2.0 Port (Front)

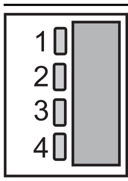
Pin Arrangement	Pin Number	Signal Name	Input/Output	Description
	1	VBUS	Output	Power supply
	2	-DATA	Input/ Output	Data
	3	+DATA	Input/ Output	Data
	4	GND	---	Ground

Table B-3 USB 3.0 Port (Rear)

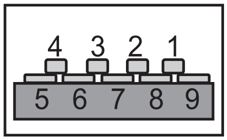
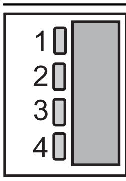
Pin Arrangement	Pin Number	Signal Name	Input/Output	Description
	1	VBUS	Output	Power supply
	2	-DATA	Input/ Output	Data
	3	+DATA	Input/ Output	Data
	4	GND	---	Ground
	5	-SSRX	Input	SuperSpeed data
	6	+SSRX	Input	SuperSpeed data
	7	GND	---	Ground
	8	-SSTX	Output	SuperSpeed data
	9	+SSTX	Output	SuperSpeed data

Table B-4 USB Port for Maintenance (Rear)

Pin Arrangement	Pin Number	Signal Name	Input/Output	Description
	1	VBUS	Output	Power supply
	2	-DATA	Input/ Output	Data
	3	+DATA	Input/ Output	Data
	4	GND	---	Ground

B.3 SAS Port

The SAS port on the SPARC M12-2/M12-2S is used to connect external devices that have an SAS interface, such as a tape drive. The chassis has one SAS port on the rear. Consult our service engineer about compatible equipment.

B.4 RESET Switch

The RESET switch on the SPARC M12-2/M12-2S is an emergency switch for rebooting the XSCF. For details on how to use the RESET switch, see "18.2 Precautions Concerning Using the RESET Switch" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

The following diagrams show the location of the RESET switch: Figure B-2 for the SPARC M12-2, and Figure B-3 for the SPARC M12-2S. The RESET switch (A in Figure B-2 and Figure B-3) is mounted on the rear of the chassis.

Figure B-2 Location of the RESET Switch (SPARC M12-2)

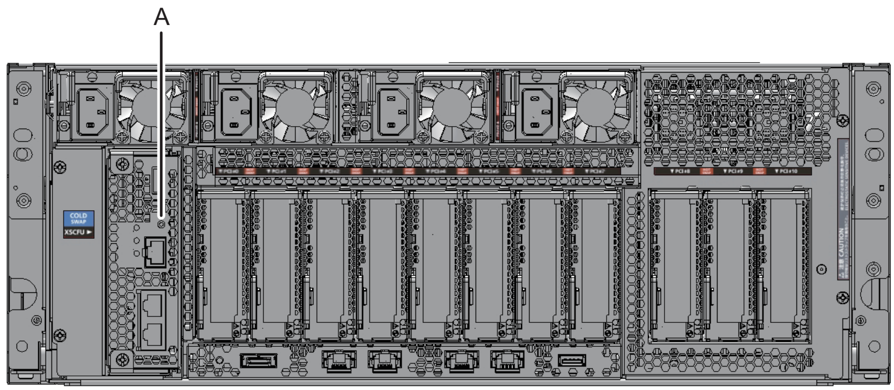
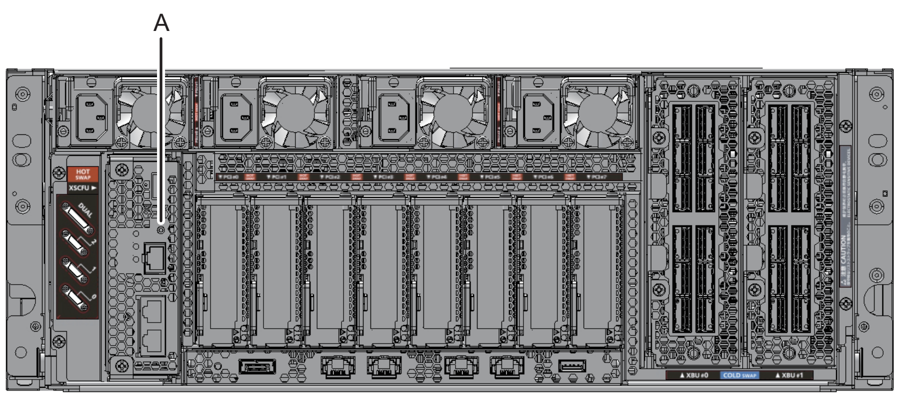


Figure B-3 Location of the RESET Switch (SPARC M12-2S)



Appendix C

Removing the Lithium Battery

This appendix describes the procedure for removing the lithium battery mounted in the XSCF unit.

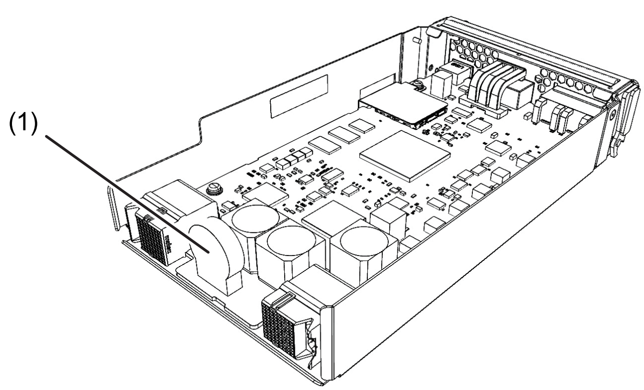
Note - Perform this work only when disassembling the product for disposal or recycling.

- Location of the Lithium Battery
- Removing the Lithium Battery

C.1 Location of the Lithium Battery

This section describes the location of the lithium battery.
One lithium battery is mounted in the SPARC M12-2/M12-2S XSCF unit.
For details on removing the XSCF unit, see "11.4 Removing the XSCFU."

Figure C-1 Location of the Lithium Battery



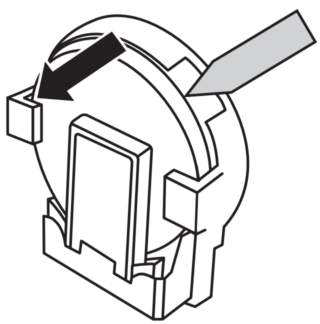
Location No.	Component
1	Lithium battery

C.2 Removing the Lithium Battery

This section describes the procedure for removing the lithium battery.

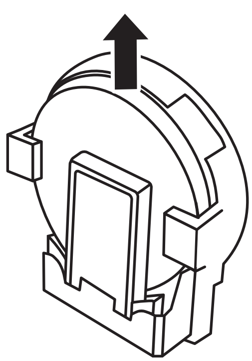
1. **Insert a flathead screwdriver or another fine-tipped tool between the lithium battery and battery holder, and pry the battery from the holder.**

Figure C-2 Removing the Lithium Battery (1)



2. **Gripping the lithium battery at the top with needle-nose pliers or another fine-tipped tool, pull up the lithium battery to remove it.**

Figure C-3 Removing the Lithium Battery (2)



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