Fujitsu M10-4/Fujitsu M10-4S/ SPARC M10-4/SPARC M10-4S

Service Manual

FUJITSU

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Contents

Preface

This document describes the maintenance procedure for Oracle or Fujitsu SPARC M10-4/M10-4S.
This 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.
See the *Crossbar Box for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual* for the procedures for maintaining the crossbar box.

Fujitsu M10 is sold as SPARC M10 by Fujitsu in Japan.
Fujitsu M10 and SPARC M10 are identical products.

Audience

This document is intended for service engineers and field engineers who perform maintenance work on the system.

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

The following table lists documents related to SPARC M10 Systems.

Documentation Related to the SPARC M10

Manual Names (*1)
Fujitsu M10/SPARC M10 Systems Product Notes
Fujitsu M10/SPARC M10 Systems Getting Started Guide (*2)
Fujitsu M10/SPARC M10 Systems Quick Guide
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
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Security Guide
Software License Conditions for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10
Fujitsu SPARC Servers/SPARC Enterprise/PRIMEQUEST Common Installation Planning Manual
Fujitsu M10-1/SPARC M10-1 Installation Guide
Fujitsu M10-4/SPARC M10-4 Installation Guide
Fujitsu M10-4S/SPARC M10-4S 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 M10-1/SPARC M10-1 Service Manual
Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S 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 M10/SPARC M10 Systems PCI Card Installation Guide
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 RCIL User Guide (*3)
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF MIB and Trap Lists
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 M10 Systems.

- *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 M10-1/SPARC M10-1 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 starting any maintenance work.
Note the meanings of each of the following symbols and labels to ensure that the work is done correctly.

- Warning/Caution Indications
- Warning Labels
- Labels/Tags
- Safety Precautions
- Precautions on Static Electricity
- Other Precautions
- Emergency Power Off

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 or other property may occur if the user does not perform the procedure correctly.

1.2 Warning Labels

Observe the warning labels (A in Figure 1-1) affixed on the SPARC M10-4/M10-4S during the maintenance work.

Caution - Never peel off the labels.

Figure 1-1   Location of warning labels
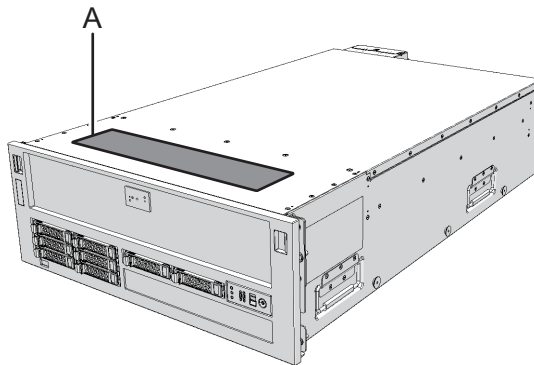
1.3 Labels/Tags

This section describes the labels and tags attached to the SPARC M10-4/M10-4S. For warning labels, see "1.2   Warning Labels."

Note - The contents of the labels and tags may differ from those that are actually affixed.

- The system name plate label (A in Figure 1-2) describes the model number, serial number, manufacture date, rated voltage/current, number of phases, frequency, and weight for maintenance and management.
- The standard label (B in Figure 1-2) describes the following certification standards.
  - Safety: NRTL/C, BIS
  - Radio wave: VCCI-A, FCC-A, ICES, and KCC
  - Safety and radio wave: CE, BSMI, RCM, and EAC

Figure 1-2   Location of the system name plate label and standard label
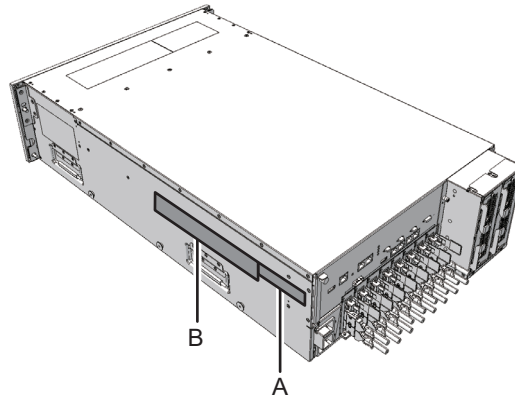
- The RFID tag (Figure 1-3) carries an Asset ID. The RFID tag of the SPARC M10-4/ M10-4S is affixed on the front cover.

Figure 1-3   RFID tag
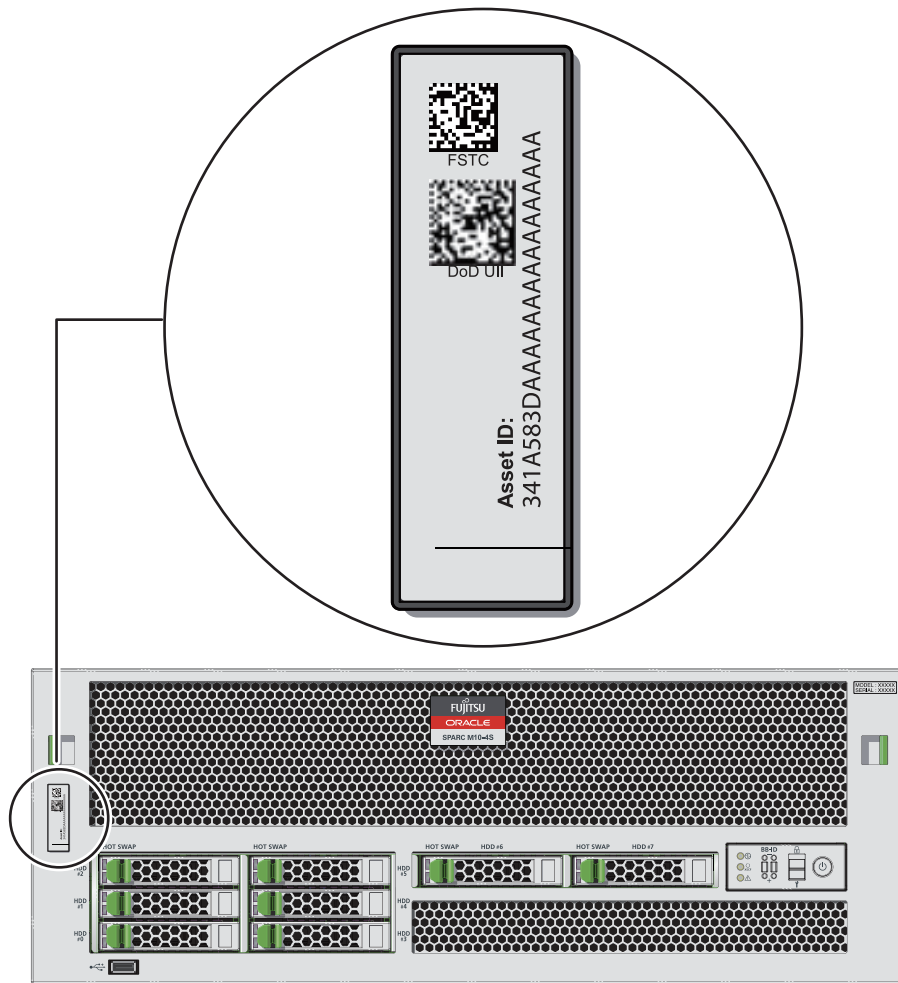
1.4   Safety Precautions

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

- Observe all the precautions, warnings, and instructions described on the chassis.
- Do not insert foreign objects into the openings in the chassis. Any such foreign object could come into contact with high-voltage circuitry or could short circuit

the components, causing a fire or an electric shock.

- Contact a service engineer to inspect the chassis.

Safety precautions on electricity

- Confirm that the voltage and frequency of your input power supply match the electric rating described on the system name plate label affixed on the chassis.
- Wear a wrist strap when handling a hard disk drive, CPU memory unit, or other printed boards.
- Use grounded power outlets.
- Do not attempt to make any mechanical or electrical modifications. Fujitsu shall not be responsible for the regulatory compliance of a chassis that has been modified.

Rack-related safety precautions

- The racks should be fixed on the floor, ceiling, or the adjacent frame.
- The racks may be supplied with a quakeresistant options kit. The use of the quakeresistant options kit prevents the racks from falling over during installation or maintenance service on the chassis.
- Prior to installation or maintenance, a safety assessment should be conducted by a service engineer in the following cases:
  - When the quakeresistant options kit is not supplied and the rack is not fixed on the floor with bolts: Check for the safety such as whether the rack should not fall over.
- If multiple chassis are mounted in a rack, perform maintenance for each of the chassis.

For details of the racks, see "Planning and Preparing for System Installation" in the *Installation Guide* for your server.

1.5 Precautions on Static Electricity

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

Table 1-1   ESD precautions

Item	Precaution
Wrist strap	Wear an antistatic wrist strap when handling printed boards and components containing electronic components.
ESD mat	An approved ESD mat provides protection from static damage when used together with a wrist strap. The mat also acts as a cushion to protect the small parts that are attached to printed boards.
Antistatic bag/ ESD safe packaging box	After removing a printed board or component, 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 1-4) of the wrist strap band is in contact with your skin. Connect the clip (B in Figure 1-4) directly to the chassis.

Caution - Do not connect the wrist strap clip to the ESD mat. By connecting the wrist strap clip to the chassis, the operator and components have the same electrical potential, thus eliminating the danger of static damage.

Figure 1-4   Wrist strap connection destination
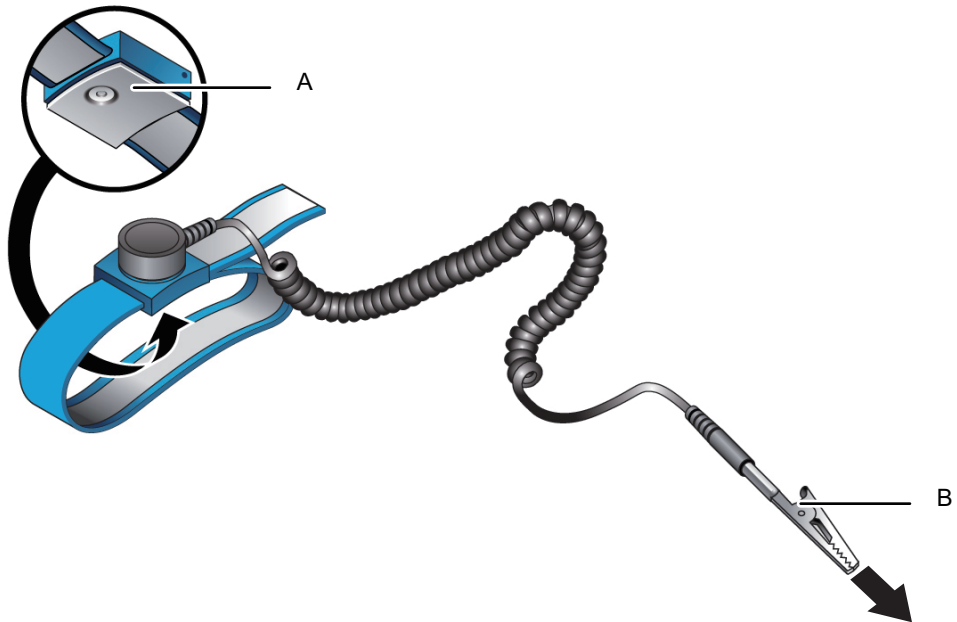
1.6 Other Precautions

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

- The printed boards in a chassis can be easily damaged by static electricity. To prevent damage to printed boards, wear a wrist strap and ground it to the chassis prior to starting maintenance.

- When mounting any component in the chassis, check the connectors on both of the chassis and component beforehand to confirm that none of the pins are bent and that all the pins are neatly arranged in lines. If a component is mounted with a bent pin in a connector, the chassis or component may be damaged. Also, carefully proceed with the work to prevent any pin from being bent.

- If excessive force is applied to the CPU memory unit, the components mounted on printed boards may be damaged. When handling the CPU memory unit, observe the following precautions:
  - Hold the CPU memory unit by the metal frame.
  - When removing the CPU memory unit from the packaging, keep the CPU memory unit horizontal until you lay it on the cushioned ESD mat.
  - Connectors and components on the CPU memory unit have thin pins that bend easily. Therefore, do not place the CPU memory unit on a hard surface.
  - Be careful not to damage the small parts located on both sides of the CPU memory unit.

- The heat sinks can be damaged by incorrect handling. Do not touch the heat sinks with your hands or other objects while replacing or removing CPU memory units. If a heat sink is disconnected or broken, 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 the LAN cable, if you cannot reach the latch lock of the connector, use a flat headed 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 (PCIe) cards may be damaged.

- Do not use any power cord other than the specified one.

- 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 M10-4/M10-4S.

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 chassis), immediately stop using the unit and turn off the power supply. Regardless of the operation you are performing, give top priority to fire prevention.

1. **Remove all the power cords.**
    For details, see "5.9.4   Removing the power cord."

Figure 1-5   Removing the power cords
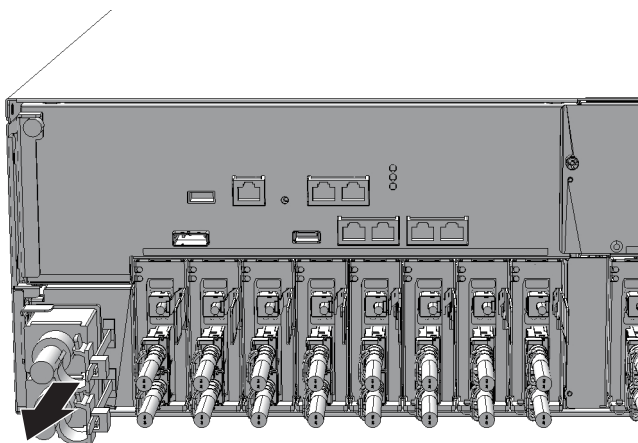
Chapter 2

Understanding the System Components

This section describes the components mounted on the SPARC M10-4/M10-4S.
It is necessary to confirm and fully understand the configurations of the components mounted in the chassis as well as the LED indications before starting any maintenance work.

- Identifying the Names and Locations of Components
- Checking the Memory Configuration Rules
- Confirming the Functions of the Operation Panel
- Checking the LED Indications
- Confirming the Types of Cable

For the specifications of each component, see "Appendix B   Component Specifications."

2.1   Identifying the Names and Locations of Components

This section describes the names and locations of the components mounted in the SPARC M10-4/M10-4S.

Components that can be accessed from the front

You can access the fan unit and power supply unit only after removing the front cover.

Figure 2-1   Locations of components that can be accessed from the front
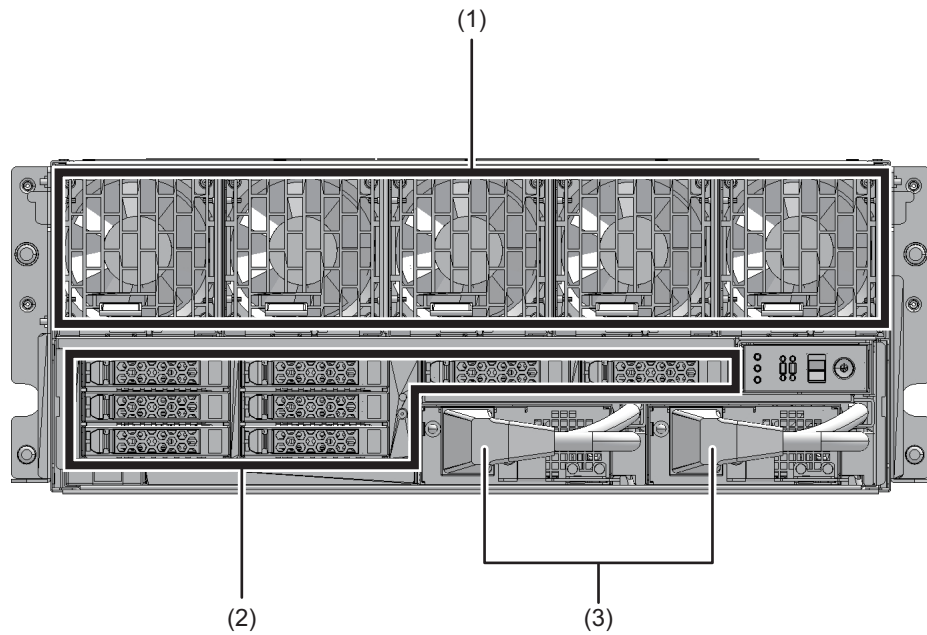
Location number	Component
1	Fan unit
2	Internal disk
3	Power supply unit

Components that can be accessed from the rear

Figure 2-2   Locations of components that can be accessed from the rear

(1)   (2)
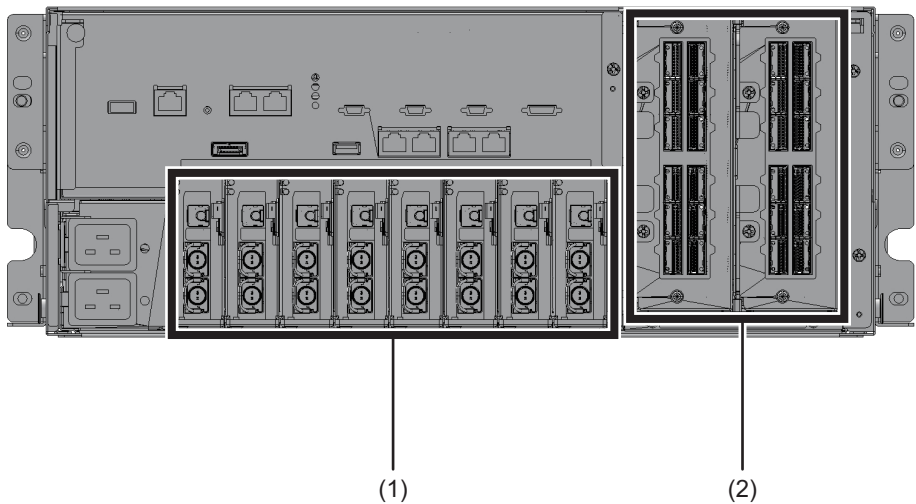
Location number	Component
1	PCI-Express (PCIe) card cassette
2	Crossbar unit (Only for the SPARC M10-4S. The SPARC M10-4 incorporates three PCIe card cassettes.)

Internal components

To access internal components, remove the CPU memory unit from the chassis.

Figure 2-3　　　Locations of internal components
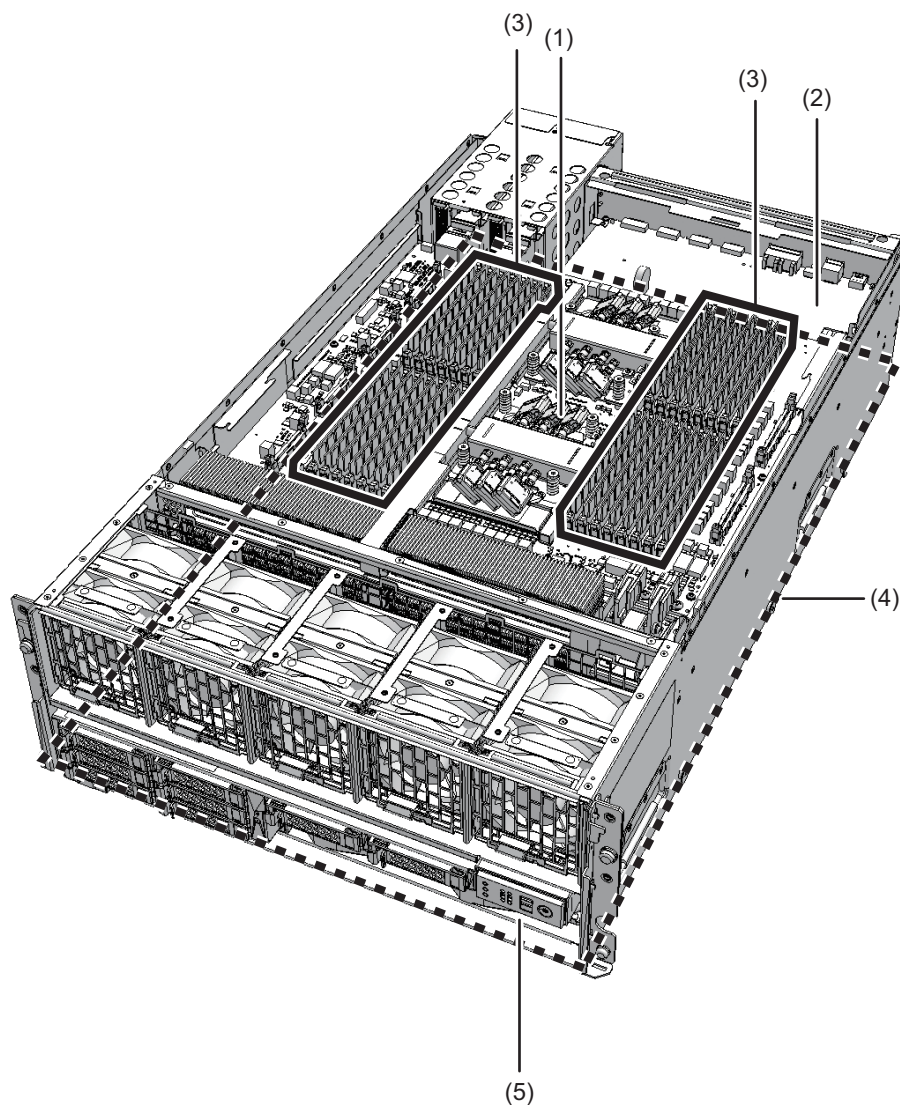
Figure 2-4   CPU memory unit removed from the chassis
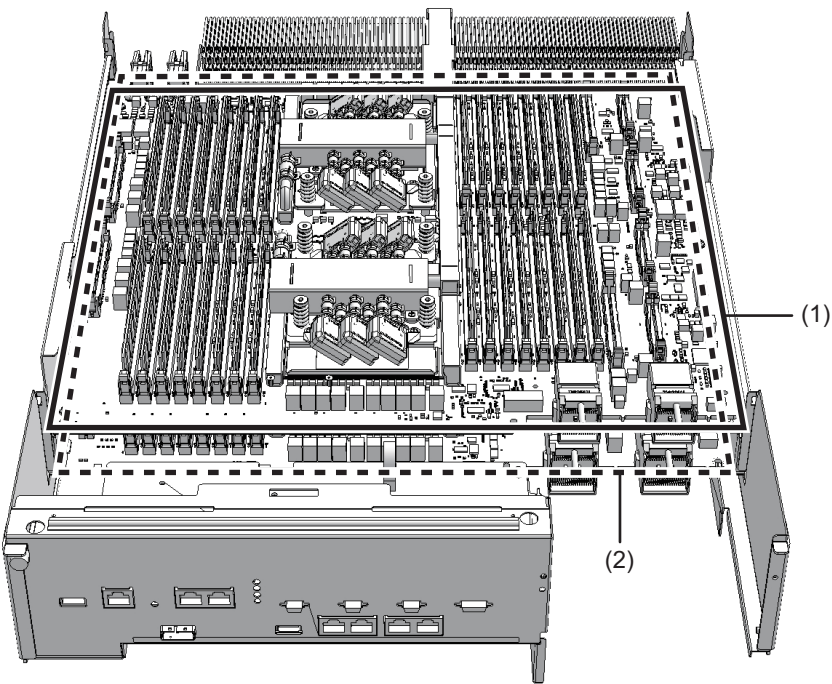
Location number	Component
1	CPU memory unit upper
2	CPU memory unit lower
3	Memory (CPU memory unit upper)
4	PSU backplane unit
5	Operation panel

Note - Two CPUs are directly installed on each of the CPU memory unit upper and CPU memory unit lower. Thus you cannot replace the CPUs individually.

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 the memory in accordance with the following rules:

- Install the memory in units of eight modules.
- When the memory is mounted in units of eight modules, all of the memory modules must be of the same capacity and rank.
- The mounted memory must correspond to each CPU. For the memory for one CPU, use only R-DIMM (Registered DIMM: 8 GB/16 GB/32 GB) or only LR-DIMM (Load Reduced DIMM: 64 GB).
- You can mount memory modules of different capacities in the same system. However, when memory modules of 512 GB (64 GB DIMM x 8) are mounted in the 16 DIMM slots under a CPU, memory modules of different capacities cannot be mounted together with them. For uniformity, be sure to use only memory modules of 512 GB (64 GB DIMM x 8).
- First mount memory group A and then mount memory group B.
- To use the memory mirror function, mount eight DIMMs of the same capacity/ rank in each of memory group A and memory group B.

Figure 2-5 shows the mounting locations of all the memory modules. Each eight-module unit of mounted memory is indicated by letters a to f. Table 2-1, Table 2-2, and Table 2-3 list the supported memory installation configurations. The memory mounting locations may vary depending on the number of mounted CPU memory units. Refer to this figure and table when you expand or reduce memory. As for the mounting order of memory group B, give priority to using a uniform memory type of either R-DIMM or LR-DIMM for one CPU over the memory mounting patterns in Table 2-1, Table 2-2, and Table 2-3.

You can set memory for each CPU when configuring memory in the mirror configuration. In such a case, mount all the memory in group A and group B for the corresponding CPU. Figure 2-5 shows a combination of mirrored memory in a unit of eight modules on each of the right and left sides.

For example, in the memory on the right side of CMUL CPU#0 in Figure 2-5, the four-module set of MEM#00B, MEM#00A, MEM#01B, and MEM#01A mirrors the four-module set of MEM#04B, MEM#04A, MEM#05B, and MEM#05A.

Figure 2-5   Mounting locations and units of memory
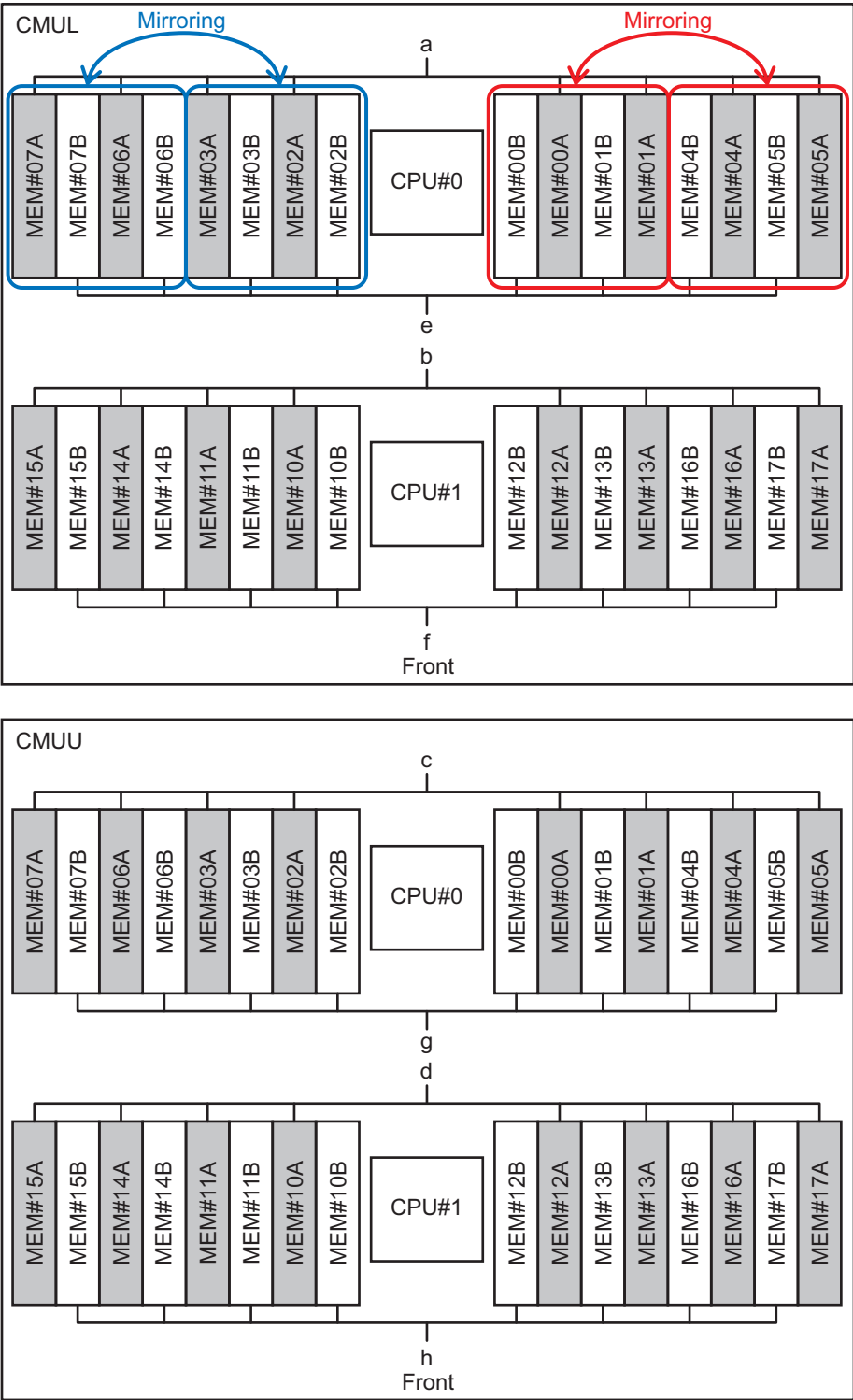
When only the CPU memory unit lower is mounted

Table 2-1   Memory mounting configurations (CMUL only)

Memory module count	Mounted 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	e in Figure 2-5	-
32	a in Figure 2-5	b in Figure 2-5	e in Figure 2-5	f in Figure 2-5

When both the CPU memory unit lower and the CPU memory unit upper are mounted

Table 2-2   Memory mounting patterns (CMUL and CMUU)

Number of memory modules	Mounted 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	-	-	-	-
40	a in Figure 2-5	b in Figure 2-5	c in Figure 2-5	d in Figure 2-5	e in Figure 2-5	-	-	-
48	a in Figure 2-5	b in Figure 2-5	c in Figure 2-5	d in Figure 2-5	e in Figure 2-5	f in Figure 2-5	-	-
56	a in Figure 2-5	b in Figure 2-5	c in Figure 2-5	d in Figure 2-5	e in Figure 2-5	f in Figure 2-5	g in Figure 2-5	-
64	a in Figure 2-5	b in Figure 2-5	c in Figure 2-5	d in Figure 2-5	e in Figure 2-5	f in Figure 2-5	g in Figure 2-5	h in Figure 2-5

When expanding a CPU memory unit upper to a chassis in which only a CPU memory unit lower is mounted

If you mount memory by expanding a CPU memory unit upper to a chassis in which only a CPU memory unit lower is mounted, you do not have to remove the memory mounted on the CPU memory unit lower.
Install it by observing the mounting configurations shown in either Table 2-3 or

Table 2-2.

Table 2-3   Memory mounting configurations (CMUL and expanded CMUU)

Number of memory modules	Mounted 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	e in Figure 2-5	-	-	-	-	-
32	a in Figure 2-5	b in Figure 2-5	e in Figure 2-5	f in Figure 2-5	-	-	-	-
40	a in Figure 2-5	b in Figure 2-5	e in Figure 2-5	f in Figure 2-5	c in Figure 2-5	-	-	-
48	a in Figure 2-5	b in Figure 2-5	e in Figure 2-5	f in Figure 2-5	c in Figure 2-5	d in Figure 2-5	-	-
56	a in Figure 2-5	b in Figure 2-5	e in Figure 2-5	f in Figure 2-5	c in Figure 2-5	d in Figure 2-5	g in Figure 2-5	-
64	a in Figure 2-5	b in Figure 2-5	e in Figure 2-5	f in Figure 2-5	c in Figure 2-5	d in Figure 2-5	g in Figure 2-5	h in Figure 2-5

2.2.2   Checking memory information

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

1. **Log in to the XSCF shell.**

2. **Execute the showhardconf command to check the memory information.**
   The capacity and rank of the memory are displayed.

```
XSCF> showhardconf
---------------------Omitted-----------------------
    BB#00 Status:Normal; Role:Slave; Ver:2003h; Serial:2081231002;
        + FRU-Part-Number:CA07361-D202 A1 ;
        + Power_Supply_System:Single;
        + Memory_Size:256 GB;
            CMUL Status:Normal; Ver:0101h; Serial:PP123002Z4 ;
            + FRU-Part-Number:CA07361-D941 A8 ;
            + Memory_Size:128 GB; Type: B ;
                CPU#0 Status:Normal; Ver:4142h; Serial:00010448;
                    + Freq:3.700 GHz; Type:0x20;
                    + Core:16; Strand:2;
                CPU#1 Status:Normal; Ver:4142h; Serial:00010418;
                    + Freq:3.700 GHz; Type:0x20;
```

```
                   + Core:16; Strand:2;
            MEM#00A Status:Normal;
                   + Code:ce8002M393B5270DH0-YK0 0000-85D0AD54;
                   + Type:01; Size:4 GB;
            MEM#01A Status:Normal;
                   + Code:ce8002M393B5270DH0-YK0 0000-85D0AD67;
                   + Type:01; Size:4 GB;
----------------------Omitted----------------------
```

Figure 2-6   How to read the memory information
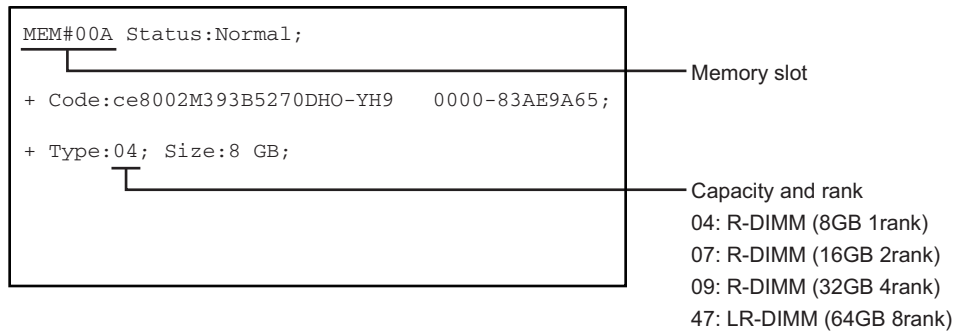
2.3   Confirming the Functions of the Operation Panel

This section describes the functions of the operation panel mounted on the SPARC M10-4/M10-4S.
The operation panel provides the system's display and control functions. The field engineer and system administrator can specify the operation mode or control start/stop of the system while checking the LEDs indicating the system operation status.

Note - In a building block configuration with a crossbar box connected, only the operation panel of the crossbar box that is the master XSCF can have all the operation panel functions enabled.

Figure 2-7   Location of the operation panel
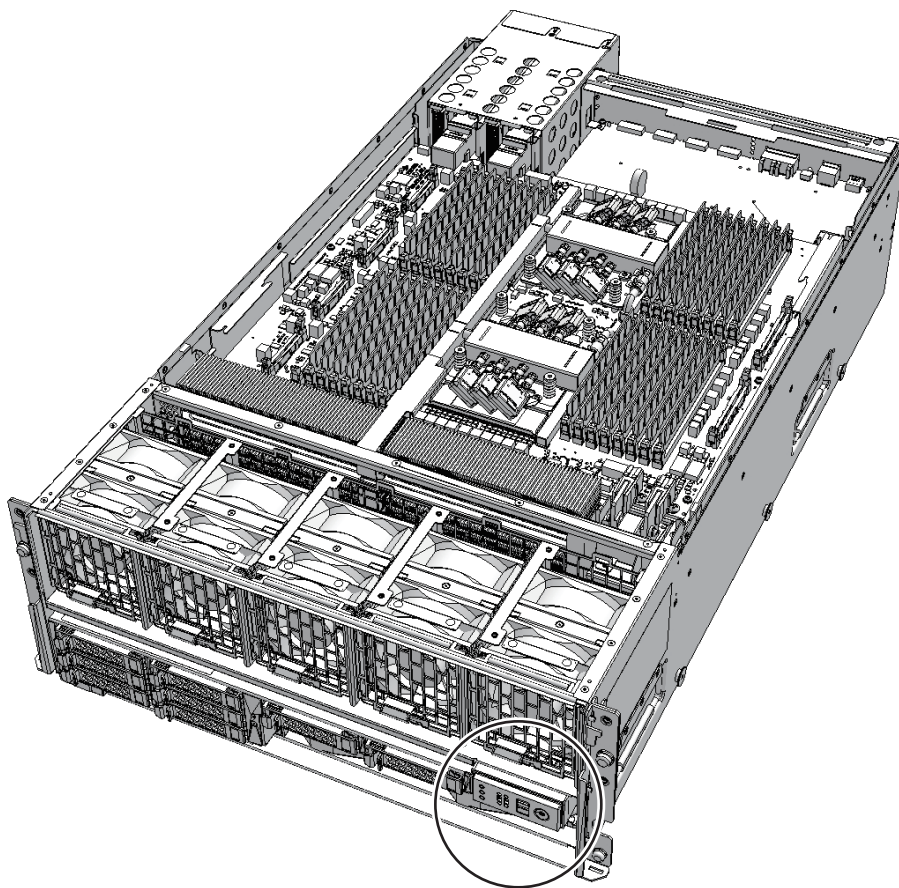
Figure 2-8   Appearance of operation panel
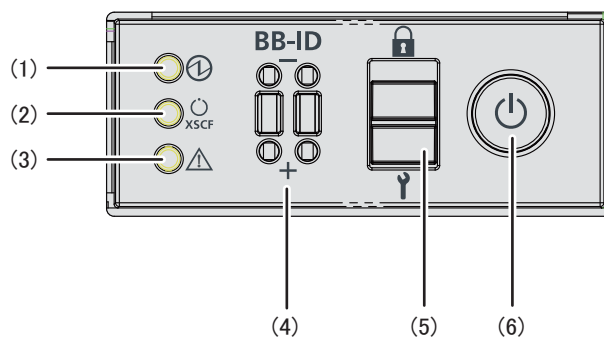
Location number	LED/switch
1	POWER LED
2	XSCF STANDBY LED
3	CHECK LED
4	BB-ID switch (SPARC M10-4S only)
5	Mode switch
6	Power switch

For a building block configuration, an operation panel is mounted in each chassis of the SPARC M10-4S. However, the only operation panel on which all of the LEDs and switches are enabled is that of the chassis housing the master XSCF.
Table 2-4 shows the display and operation status of the operation panel.

Table 2-4   Display and operation status of operation panel

LEDs/switches on operation panel	SPARC M10-4S is master XSCF	SPARC M10-4S is not master XSCF
POWER LED	Enabled (Indicates the start/stop state of the SPARC M10-4S)	Enabled (Indicates the start/stop state of the SPARC M10-4S)
XSCF STANDBY LED	Enabled (Displays the XSCF status of the system)	Enabled (Displays the XSCF status of the SPARC M10-4S)
CHECK LED	Enabled (Indicates the SPARC M10-4S error state)	Enabled (Indicates the SPARC M10-4S error state)
BB-ID switch	Enabled (Registers a BB-ID number)	Enabled (Registers a BB-ID number)
Mode switch (*1)	Enabled (Mode operation of the system)	Disabled
Power switch	Enabled (Start/stop operation of the system)	Disabled

*1 Set the same mode for the SPARC M10-4S systems with the master XSCF and the XSCF in the standby state. If the settings are different, an asterisk (*) is displayed beside the components in the output of the showhardconf or showstatus command.

2.3.1   Display function of the operation panel

The operation panel has three LED indicators as a display function. The LED indicators indicate the following. For details, see 2.4.1   Operation panel LEDs.

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

Figure 2-9   Operation panel LEDs
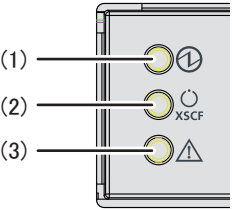
Location number	LED
1	POWER LED
2	XSCF STANDBY LED
3	CHECK LED

2.3.2   Control function of the operation panel

The operation panel has the following switches to implement its control function:

- BB-ID switch
  Identifies the SPARC M10-4S.

- Mode switch (slide switch)
  Specifies the operation or maintenance mode.

- Power switch
  Controls start/stop of the system.

Figure 2-10   Operation panel switches
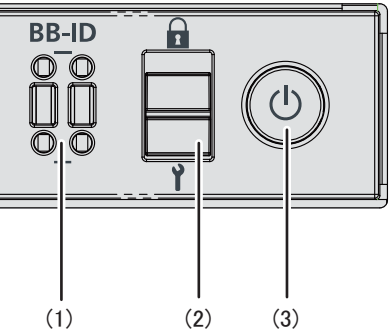
Location number	Switch
1	BB-ID switch (SPARC M10-4S only)
2	Mode switch
3	Power switch

BB-ID switch

Use the BB-ID switch to set the BB-ID number of the SPARC M10-4S. Set #0 to #15 for the SPARC M10-4S. Table 2-5 describes how to operate the BB-ID switch.

Table 2-5   How to operate the BB-ID switch

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. The Locked and Service operation modes can be switched by sliding the mode switch.

Note - Set the same operation mode for both the SPARC M10-4S of the master XSCF and that of the standby XSCF.

Table 2-6 describes the difference between the modes.

Table 2-6   System operation modes

Icon	Operation mode	Description
🔒	Locked mode	Mode used for normal operation - The power switch can be used to start the system but not to stop it.
🔧	Service mode	Mode used for maintenance - The power switch cannot be used to start the system but can be used to stop it. - Place the system in Service mode to perform maintenance work with the system stopped.

Power switch

Use the power switch to start or stop the system. The system starts/stops differently depending on how the power switch is pressed.
Table 2-7 describes how system starts/stops vary depending on how the power switch is pressed.

Table 2-7   Functions of the power switch

Icon	Operation	Description	
⏻	Brief press (For 1 second or more and less than 4 seconds)	If the system has been started in Service mode (*1):	Operation is ignored.
		If the system is stopped in Service mode:	Operation is ignored.
		If the system has been started in Locked mode (*1):	Operation is ignored.
		If the system is stopped in Locked mode:	Starts the system. If a wait time for the air conditioning facilities or a warm-up time is set on the XSCF, the processing for waiting for the power-on of the air conditioning facilities and the completion of warm-up is omitted.
	Long press (For 4 seconds or more)	If the system has been started in Service mode (*1):	Perform the system shutdown process to stop the system.
		If the system startup process is in progress in Service mode:	Cancels the system startup process and stops the system.
		If the system stop process is in progress in Service mode:	Continues the system stop process.
		If the system is stopped in Service mode:	Operation is ignored. Even a long press does not start the system.
		If the system is stopped in Locked mode:	Starts the system. If a wait time for the air conditioning facilities or a warm-up time is set on the XSCF, the processing for waiting for the power-on of the air conditioning facilities and the completion of warm-up is omitted.
		If the system is not stopped in Locked mode:	Operation is ignored.

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

Table 2-8 describes the functions of the mode switch.

Table 2-8 Functions of the mode switch

Function	Mode switch	
	Locked	**Service**
Start/stop of the system by the power switch	Only system startup is enabled.	A long press powers off the system.
Inhibition of break signal reception	Enabled. Using the setpparmode command, you can specify whether to receive break signals or inhibit their reception for each physical partition.	Disabled

2.4   Checking the LED Indications

This section describes the indications given by LEDs mounted on the SPARC M10-4/M10-4S.
LEDs are mounted on the operation panel on the front of the chassis, on the rear panel of the chassis, and on each component that can be maintained. If an error occurs, the LED indication enables you to determine the system that requires maintenance.

2.4.1   Operation panel LEDs

The three LEDs on the operation panel indicate the operation status of the entire system. In addition, the LEDs enable you to check the system status by their combination of being on, blinking, or off.
Table 2-9 lists the system operation status indicated by the LEDs, while Table 2-10 lists the system status indicated by the combination of LEDs.
For the locations of the LEDs, see Figure 2-9.

Table 2-9   System operation status indicated by LEDs

Icon	Name	Color	Description
①	POWER	Green	Indicates the startup or stop status of the system for each chassis. • On: System is started. • Blinking: System is being stopped. • Off: System is stopped.
⏻ XSCF	XSCF STANDBY	Green	Indicates the status of the XSCF for the entire system or for each chassis. • On: XSCF is functioning normally. • Blinking: XSCF is being initialized. • Off: XSCF is stopped. Alternatively, it has been disconnected from the building block configuration.

Table 2-9 System operation status indicated by LEDs *(continued)*

Icon	Name	Color	Description
⚠	CHECK	Amber	Indicates the system operation status for each chassis. • On: Hardware has detected an error. • Blinking: Chassis specified at execution of the XSCF command instructing the blinking. This (locator) is used to identify the location of the chassis requiring maintenance. • Off: Normal, or the power is disconnected or not being supplied.

Table 2-10 System status indicated by combination of LEDs

LED state			Description
POWER	**XSCF STANDBY**	**CHECK**	
①	⟳ XSCF	⚠	
Off	Off	Off	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. 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. System startup processing is in progress. The system is operating.
On	On	On	Although the system is operating normally, an error has been detected.
Blinking	On	Off	System stop processing is in progress. After the end of processing, the fan unit stops.

2.4.2 LEDs on the rear panel (System locator)

The field engineer or system administrator can identify the chassis requiring maintenance by noting the CHECK LED (A in Figure 2-11) on the rear panel. The CHECK LED on the rear panel is referred to as the system locator, and has the same function as the CHECK LED on the operation panel.

Figure 2-11   Location of the system locator
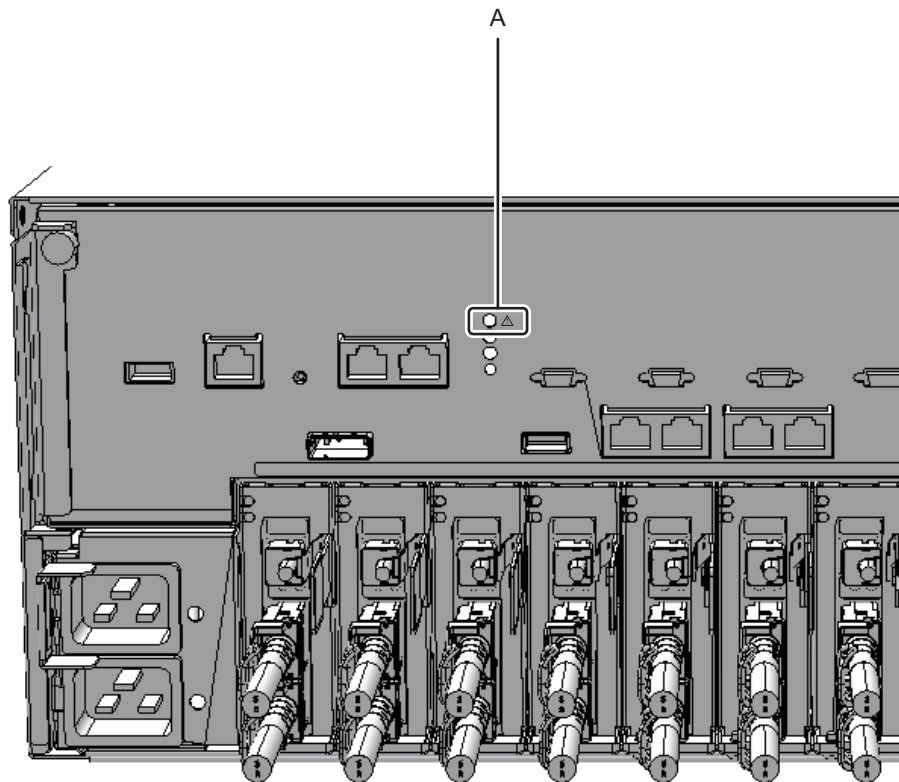
Table 2-11   Status of the system locator

Icon	Name	Color	Description
⚠	CHECK	Amber	Indicates the system operation status for each chassis. ● On: Hardware has detected an error. ● Blinking: Chassis specified at execution of the XSCF command instructing the blinking. This (locator) is used to identify the location of the chassis requiring maintenance. ● Off: Normal, or the power is disconnected or not being supplied.

2.4.3   LEDs on each component

Each component of the SPARC M10-4/M10-4S has a mounted LED. If a component experiences an error, check the LEDs to see which component requires maintenance. Check the LEDs before starting maintenance work.

The LEDs on each component and the states that they indicate are as follows.

Figure 2-12   Locations of XSCF LEDs
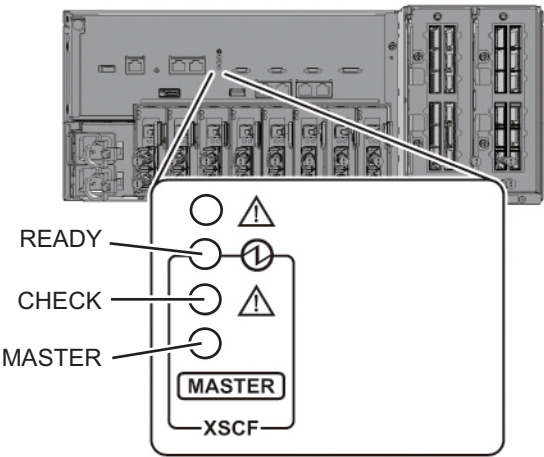
Table 2-12   XSCF LEDs and their states

Name	Color	State	Description
READY	Green	On	The XSCF is running.
		Blinking	The XSCF is being started.
		Off	The XSCF is stopped. Alternatively, it has been disconnected from the building block configuration.
CHECK	Amber	On	Indicates that an error has occurred. Normal if the LED is turned off after it is on for a few seconds when the power is turned on
		Off	Indicates the normal state.
MASTER (SPARC M10-4S only)	Green	On	Master chassis
		Off	The XSCF is in the state of being started. Alternatively, the XSCF is in the standby state or operating as a slave XSCF.

Figure 2-13   Locations of LAN port LEDs

XSCF-LAN ports
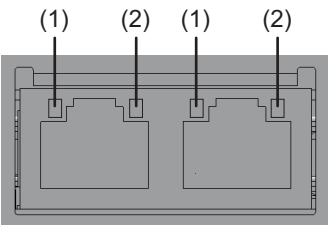
GbE LAN ports
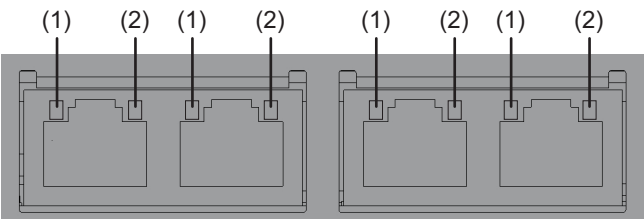
Table 2-13   LEDs on the LAN port and their states

Location number	Name	Color	Status	Description
1	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.
2	ACT	Green	Blinking	Indicates that communication is being performed.
			Off	Indicates that communication is not being performed.

Figure 2-14　　Location of the fan unit LED

LED
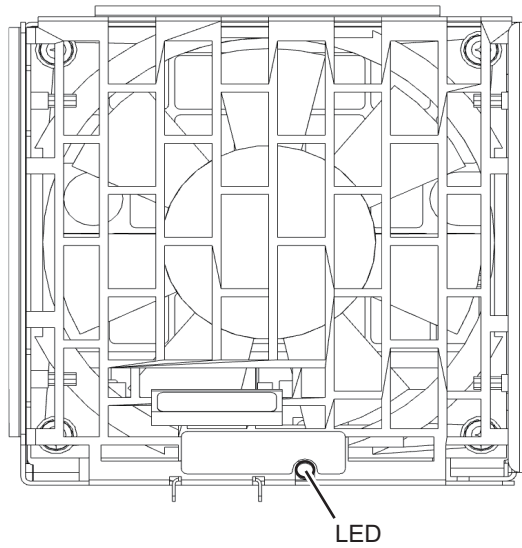
Table 2-14　　LED on the fan unit and its states

Name	Color	State	Description
CHECK	Amber	On	Indicates that an error has occurred.
		Blinking	Indicates that the component requires maintenance. (This function is also referred to as the locator.)
		Off	Indicates the normal state.

Figure 2-15　　Location of the power supply unit LED

LED
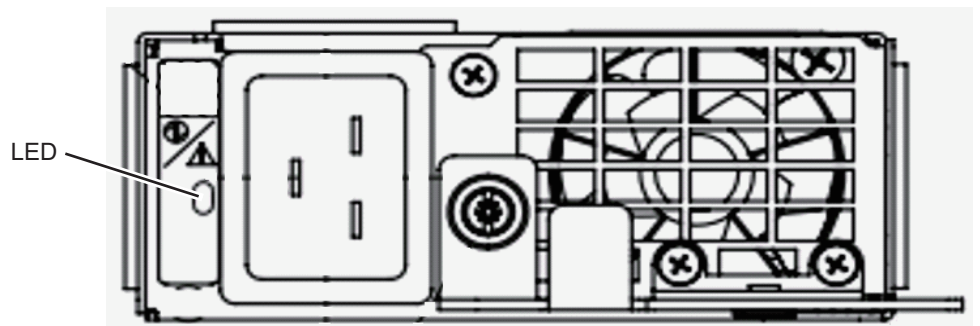
Table 2-15   LED on the power supply unit and its states

Name	Color	State	Description
CHECK ① / ⚠	Green	On	Indicates that the input power is turned on and being supplied normally.
		Blinking	Indicates that the input power is being disconnected.
	Amber	On	Indicates that an error has occurred. Indicates that the input power to this power supply unit is turned off in redundant operation.
		Blinking	Indicates the warning status (an error has occurred but the power supply unit is operating).
		Off	Indicates that power is not being supplied.

Figure 2-16   Locations of PCIe card slot LEDs
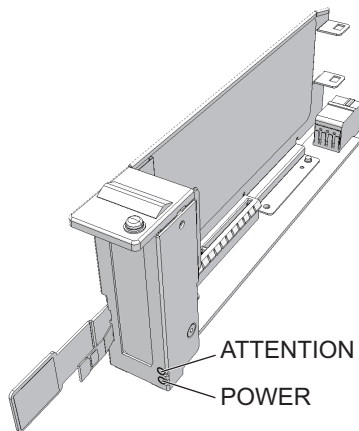
Table 2-16   LEDs on the PCIe card slot and their states

Name	Color	State	Description
POWER	Green	On	Indicates that power is being supplied.
		Off	Indicates that power is not being supplied.
ATTENTION	Amber	On	Indicates that an error has occurred.
		Blinking	Indicates that the component requires maintenance. (This function is also referred to as the locator.)
		Off	Indicates the normal state.

Figure 2-17   Locations of internal disk LEDs

READY

CHECK
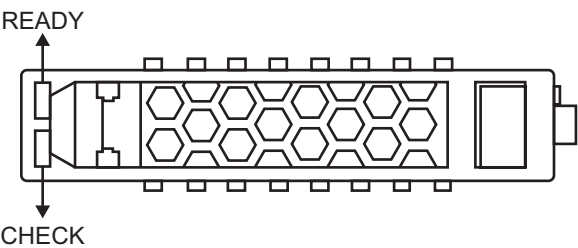
Table 2-17   LEDs on the internal disk and their states

Name	Color	State	Description
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.
CHECK	Amber	On	Indicates that an error has occurred.
		Blinking	Indicates that the component requires maintenance. (This function is also referred to as the locator.)
		Off	Indicates the normal state.

2.5   Confirming the Types of Cable

This section describes the types of cables that connect SPARC M10-4S units to each other or a crossbar box to the SPARC M10-4S and the locations of the ports.
The types and number of the cables to be used vary depending on the configuration.

2.5.1   Types of cable

In a building block configuration, the following cables are used for making a connection between the SPARC M10-4S systems and between the SPARC M10-4S and the crossbar box:

- Crossbar cable
  In a building block configuration, this is used to connect the SPARC M10-4S units to each other or to connect the SPARC M10-4S to a crossbar box.

- XSCF BB control cable
  This is used to connect the XSCFs mounted in the SPARC M10-4S or crossbar box chassis.

  An XSCF mounted in a chassis becomes the master XSCF and monitors or controls the entire system. XSCFs other than the master XSCF act as slaves and monitor or control each chassis.

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

  One of the slave XSCFs functions as the standby XSCF. If an abnormality occurs with the master XSCF, the standby XSCF becomes the master XSCF and continues the monitoring or control of the system.

Each table has a tag that is used for maintenance recording and management.

2.5.2 Cable connection ports

Figure 2-18 shows the locations of the ports for SPARC M10-4S cable connections. See the following chapters for the procedures for maintaining the cables:

- Chapter 14   Maintaining the Crossbar Cables
- Chapter 16   Maintaining the XSCF BB Control Cables
- Chapter 17   Maintaining the XSCF DUAL Control Cables

Figure 2-18   Locations of cable connection ports
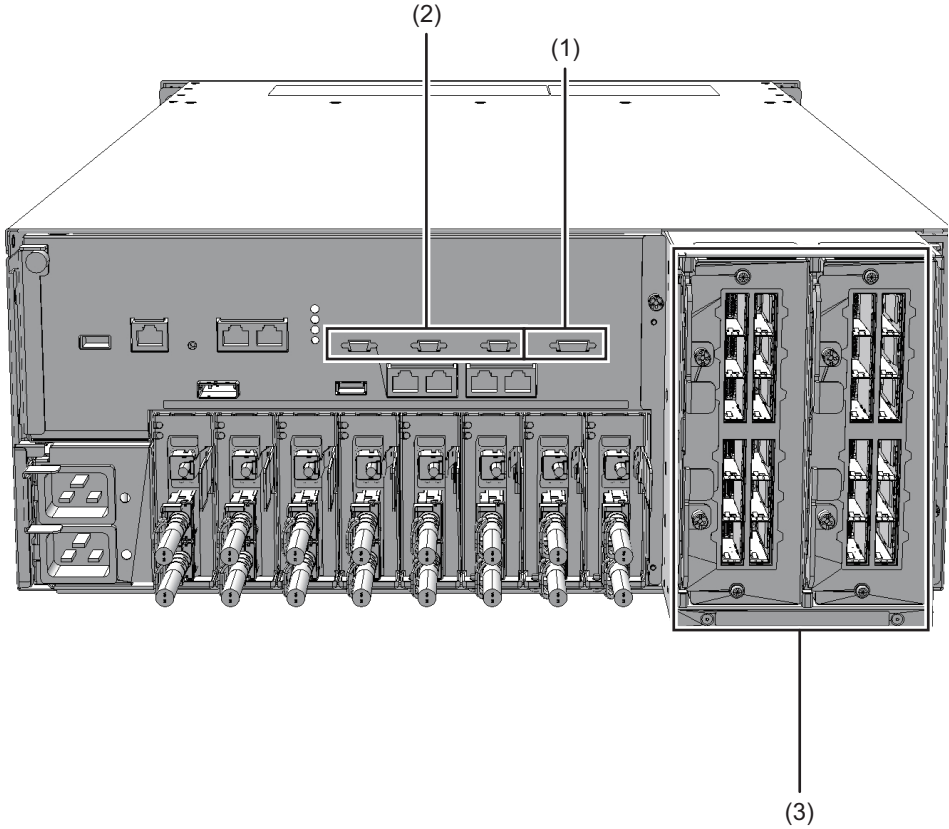
Location number	Connection port
1	XSCF DUAL control port
2	XSCF BB control port
3	Crossbar cable connection port

Chapter 3

Types of Maintenance

This chapter describes the types of maintenance performed on the SPARC M10-4 and SPARC M10-4S.

- Types of Maintenance Supported in the SPARC M10-4/M10-4S
- Active Maintenance
- Inactive Maintenance
- System-stopped Maintenance

Note that the terms used in this manual are defined as follows.

Table 3-1   Definitions of terms

Term	Definition
Physical partition requiring maintenance	Physical partition to which the SPARC M10-4 or SPARC M10-4S containing the mounted Field Replaceable Unit (FRU) requiring maintenance belongs
Chassis requiring maintenance	Chassis of the SPARC M10-1 or SPARC M10-4S containing the mounted Field Replaceable Unit (FRU) requiring maintenance

3.1   Types of Maintenance Supported in the SPARC M10-4/M10-4S

The types of maintenance supported in the SPARC M10-4 and SPARC M10-4S depend on the system operation status during maintenance. The supported maintenance is divided into three types: active maintenance, inactive maintenance, and system-stopped maintenance.

- Active Maintenance
  Maintenance is performed while the physical partition of a FRU requiring maintenance is operating.

- Inactive maintenance
  Maintenance is performed while the physical partition of a FRU requiring maintenance is stopped.

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

  Therefore, regarding the SPARC M10-4 and also the SPARC M10-4S 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.

Each of the three maintenance types is further divided into two types: hot maintenance and cold maintenance.

- Hot maintenance
  Maintenance is performed with the power cord of the FRU requiring maintenance connected.

- Cold maintenance
  Maintenance is performed with the power cord of the FRU requiring maintenance removed.

The FRUs for which hot maintenance or cold maintenance is enabled differ between a configuration using one SPARC M10-4 or SPARC M10-4S unit and a building block configuration using two or more SPARC M10-4S units.
For example, active/cold maintenance can be performed on a CPU memory unit only if it is in a building block configuration. In this state, the physical partition to which the target CPU memory unit belongs is operating (active). This means that maintenance is performed after this CPU memory unit (PSB) is dynamically released from the physical partition and the power cord of the CPU memory unit is removed.

Furthermore, system-stopped/cold maintenance for a building block configuration is divided into the following two types:

- Maintenance performed with the maintenance menu when only the SPARC M10-4S requiring maintenance is in the cold state
- Maintenance performed without using the maintenance menu when every SPARC M10-4S is in the cold state

The latter is called "system-stopped/all power-off cold maintenance" to distinguish it from the maintenance performed with the maintenance menu.

Table 3-2 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 3-2   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	|	|	|

Table 3-2 Characteristics of each type of maintenance *(continued)*

Type of maintenance	System availability	Time required for maintenance	Difficulty level of maintenance work
Inactive/Cold maintenance	|	|	|
System-stopped/hot maintenance	|	|	|
System-stopped/cold maintenance	Lower	Longer	Lower

3.2 Active Maintenance

The type of maintenance performed with Oracle Solaris operating on the physical partition is referred to as active maintenance. Note that active/cold maintenance is not supported in a system that uses one SPARC M10-4 or SPARC M10-4S unit.

Table 3-3 shows whether active maintenance is enabled for each FRU.

Table 3-3 Whether active maintenance (replacement/addition/removal) is enabled for each FRU

-: Maintenance cannot be performed.

FRU	Single-chassis configuration	Building block configuration	
	Active/hot maintenance	Active/hot maintenance	Active/cold maintenance (*6)
CPU memory unit	-	-	OK
Memory	-	-	OK
Crossbar unit (*1)	-	-	-
Power supply unit	OK (*3)	OK (*3)	OK
Fan unit	OK (*3)	OK (*3)	OK
Internal disk	OK (*4)	OK (*4)	OK
PCIe card	OK (*5)	OK (*5)	OK
PSU backplane unit	-	-	OK
Operation panel	-	-	OK
Crossbar cable (*2)	-	-	-
XSCF BB control cable (*2)	-	-	OK

Table 3-3   Whether active maintenance (replacement/addition/removal) is enabled for each FRU *(continued)*

-: Maintenance cannot be performed.

FRU	Single-chassis configuration	Building block configuration	
	Active/hot maintenance	Active/hot maintenance	Active/cold maintenance (*6)
XSCF DUAL control cable (*2)	-	-	OK

*1 The unit is mounted only in the SPARC M10-4S.

*2 The cable is mounted only in a building block configuration using the SPARC M10-4S.

*3 This is enabled only if the target FRU is in a redundant configuration. For the redundant configuration, we recommend active/hot maintenance that has a short work time.

*4 If the target internal disk is the boot device, you cannot use this form of maintenance when the configuration is not a redundant configuration (RAID configuration). If it is not the boot device, or if even the boot device is redundantly configured, we recommend active/hot maintenance that has a short work time.

*5 Maintenance work is performed using PCI hot plug (PHP). Combined with dynamic SR-IOV or the dynamic reconfiguration function for PCIe end point devices, it also enables active maintenance of a PCIe card assigned as the SR-IOV virtual function or PCIe end point, to an I/O domain.

*6 All FRUs are subject to this maintenance. It is necessary to use dynamic reconfiguration (DR) to disconnect the chassis requiring maintenance from the physical partition.

3.3   Inactive Maintenance

The type of maintenance performed with the physical partition stopped--the one to which the chassis requiring maintenance belongs--is referred to as inactive maintenance. You can perform inactive maintenance only for a system that uses the SPARC M10-4S in a building block configuration.

Table 3-4 shows whether inactive maintenance is enabled for each FRU.

Table 3-4   Whether inactive maintenance (replacement/addition/removal) is enabled for each FRU

-: Maintenance cannot be performed.

FRU	Building block configuration	
	Inactive/hot maintenance	Inactive/cold maintenance
CPU memory unit	-	OK
Memory	-	OK
Crossbar unit	-	OK
Power supply unit	OK	OK
Fan unit	OK	OK
Internal disk	OK	OK
PCIe card	OK	OK
PSU backplane unit	-	OK
Operation panel	-	OK
Crossbar cable	-	OK

Table 3-4 Whether inactive maintenance (replacement/addition/removal) is enabled for each FRU *(continued)*

-: Maintenance cannot be performed.

FRU	Building block configuration	
	Inactive/hot maintenance	Inactive/cold maintenance
XSCF BB control cable	-	OK
XSCF DUAL control cable	-	OK

3.4 System-stopped Maintenance

The type of maintenance performed with all physical partitions on the system stopped is referred to as system-stopped maintenance.

Table 3-5 shows whether system-stopped maintenance is enabled for each FRU.

Table 3-5 Whether system-stopped maintenance (replacement/addition/removal) is enabled for each FRU

-: Maintenance cannot be performed.

FRU	Single-chassis configuration		Building block configuration		
	System-stopped/ hot maintenance	System-stopped/ cold maintenance	System-stopped/ hot maintenance	System-stopped/ cold maintenance	System-stopped/ all power-off cold maintenance
CPU memory unit	-	OK	-	OK	OK
Memory	-	OK	-	OK	OK
Crossbar unit (*1)	-	OK	-	OK	OK
Power supply unit	OK	OK	OK	OK	OK
Fan unit	OK	OK	OK	OK	OK
Internal disk	OK	OK	OK	OK	OK
PCIe card	OK	OK	OK	OK	OK
PSU backplane unit	-	OK	-	OK	OK
Operation panel	-	OK	-	OK	OK
Crossbar cable (*2)	-	-	-	OK	OK
XSCF BB control cable (*2)	-	-	-	OK	OK
XSCF DUAL control cable (*2)	-	-	-	OK	OK

*1 The unit is mounted only in the SPARC M10-4S.
*2 The cable is mounted only in a building block configuration using the SPARC M10-4S.

Chapter 4

Preparation and Precautions for Maintenance

This chapter describes preparations that must be completed prior to maintenance and the precautions for various work and maintenance.

- Confirming the System Configuration
- Troubleshooting
- Maintenance Precautions

4.1 Confirming the System Configuration

This section describes how to check the hardware and software configurations. The system configuration must be the same before and after maintenance work. If an error occurs in the system, record the system configuration and the FRU state before starting maintenance. After maintenance, confirm that the system configuration is the same as that before maintenance.

4.1.1 Confirming the hardware configuration

Execute the showhardconf command to confirm the configuration and status of the FRU mounted in the chassis. Also confirm the hardware RAID volume.
Before performing any maintenance work, check and record the hardware configuration of the chassis.

1. **Log in to the XSCF shell.**

2. **Execute the showhardconf command to check the hardware configuration information.**

The following information appears:

- Current configuration and status
- Number of mounted FRUs
- Status of the unit in which a physical partition error or degradation occurred
- Information on the PCI expansion unit

■ Name properties of the PCI Express (PCIe) card

The following is an execution example of the showhardconf command.

```
XSCF> showhardconf -M
SPARC M10-4 ;
    + Serial:2081230012; Operator_Panel_Switch:Service;
    + System_Power:Off; System_Phase:Cabinet Power Off;
    BB#00 Status:Normal; Role:Master; Ver:2209h; Serial:2081231002;
        + FRU-Part-Number:CA07361-D203 A2   /9999999              ;
        + Power_Supply_System:Single;
        + Memory_Size:512 GB;
        CMUL Status:Normal; Ver:0301h; Serial:PP140601D9 ;
            + FRU-Part-Number:CA07361-D251 A4   /9999999                ;
            + Memory_Size:256 GB; Type: B ;    (*1)
            CPU#0 Status:Normal; Ver:4142h; Serial:00020203;
                + Freq:3.200 GHz; Type:0x20;   (*2)
                + Core:16; Strand:2;           (*3)
                    (Omitted)
```

*1 Type: B is displayed for a CMU that has the SPARC64 X+ processor mounted. Type: A is displayed for a CMU that has the SPARC64 X processor mounted.
*2 If the SPARC64 X+ processor is mounted, 3.200 GHz or 3.700 GHz; Type:0x20 is displayed. If the SPARC64 X processor is mounted, 3.000 GHz; Type:0x10 is displayed.
*3 If the SPARC64 X+ (3.7 GHz (eight-core)) processor is mounted, "Core:8" is displayed.

3. **Check the hardware RAID volume.**

    To use the hardware RAID function installed in the SPARC M10-4/M10-4S to check the configuration and status of the hardware RAID volume, log in to Oracle Solaris on the control domain or root domain. Check the contents displayed by the sas2ircu command of the SAS-2 Integrated RAID Configuration Utility (referred to below as the SAS2IRCU utility).

    Before performing hardware RAID volume maintenance, be sure to write down the information on hardware RAID settings and the information on the HDD/SSD components of the RAID volume.

    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 M10/SPARC M10 Systems Product Notes*.

    The following is an example of what the sas2ircu command displays.

```
root# ./sas2ircu 0 display
LSI Corporation SAS2 IR Configuration Utility.
Version 19.00.00.00 (2014.03.17)
Copyright (c) 2008-2014 LSI Corporation. All rights reserved.
Read configuration has been initiated for controller 0
------------------------------------------------------------------------
Controller information  (*1)
------------------------------------------------------------------------
  Controller type                         : SAS2308_2
  BIOS version                            : 0.00.00.00
```

```
   Firmware version                      : 13.00.66.00
   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  (*2)
------------------------------------------------------------------------
IR volume 1
   Volume ID                             : 285
   Volume Name                           : raid10
   Status of volume                      : Okay (OKY)
   Volume wwid                           : 0bff050b918f7d4d
   RAID level                            : RAID10
   Size (in MB)                          : 1713750
   Physical hard disks                   :
   PHY[0] Enclosure#/Slot#               : 2:2
   PHY[1] Enclosure#/Slot#               : 2:3
   PHY[2] Enclosure#/Slot#               : 2:4
   PHY[3] Enclosure#/Slot#               : 2:5
   PHY[4] Enclosure#/Slot#               : 2:6
   PHY[5] Enclosure#/Slot#               : 2:7
IR volume 2
   Volume ID                             : 286
   Volume Name                           : 0
   Status of volume                      : Okay (OKY)
   Volume wwid                           : 01a0a262cfe15e62
   RAID level                            : RAID1
   Size (in MB)                          : 571250
   Physical hard disks                   :
   PHY[0] Enclosure#/Slot#               : 2:0
   PHY[1] Enclosure#/Slot#               : 2:1
------------------------------------------------------------------------
Physical device information  (*3)
------------------------------------------------------------------------
Initiator at ID #0
Device is a Enclosure services device
   Enclosure #                           : 2
   Slot #                                : 0
   SAS Address                           : 500000e-0-e06d-307d
   State                                 : Standby (SBY)
   Manufacturer                          : FUJITSU
   Model Number                          : BBEXP
   Firmware Revision                     : 0d32
   Serial No                             : x3625413500
   GUID                                  : N/A
   Protocol                              : SAS
   Device Type                           : Enclosure services device
Device is a Hard disk
```

```
  Enclosure #                            : 2
  Slot #                                 : 0
  SAS Address                            : 5000039-7-584a-dada
  State                                  : Optimal (OPT)
  Size (in MB)/(in sectors)              : 572325/1172123567
  Manufacturer                           : TOSHIBA
  Model Number                           : AL13SEB600AL14SE
  Firmware Revision                      : 3703
  Serial No                              : X6N0A01PF7TD
  GUID                                   : 50000397584adad9
  Protocol                               : SAS
  Drive Type                             : SAS_HDD
Device is a Hard disk
  Enclosure #                            : 2
  Slot #                                 : 1
  SAS Address                            : 5000039-7-0830-e08a
  State                                  : Optimal (OPT)
  Size (in MB)/(in sectors)              : 572325/1172123567
  Manufacturer                           : TOSHIBA
  Model Number                           : AL13SEB600AL14SE
  Firmware Revision                      : 3702
  Serial No                              : 56F0A08HF7TD
  GUID                                   : 500003970830e089
  Protocol                               : SAS
  Drive Type                             : SAS_HDD
Device is a Hard disk
  Enclosure #                            : 2
  Slot #                                 : 2
  SAS Address                            : 5000039-4-281b-4eaa
  State                                  : Optimal (OPT)
  Size (in MB)/(in sectors)              : 572325/1172123567
  Manufacturer                           : TOSHIBA
  Model Number                           : MBF2600RC
  Firmware Revision                      : 3706
  Serial No                              : EA25PC7007KR
  GUID                                   : 50000394281b4ea8
  Protocol                               : SAS
  Drive Type                             : SAS_HDD
Device is a Hard disk
  Enclosure #                            : 2
  Slot #                                 : 3
  SAS Address                            : 5000039-4-281a-9072
  State                                  : Optimal (OPT)
  Size (in MB)/(in sectors)              : 572325/1172123567
  Manufacturer                           : TOSHIBA
  Model Number                           : MBF2600RC
  Firmware Revision                      : 3706
  Serial No                              : EA25PC7007GR
  GUID                                   : 50000394281a9070
  Protocol                               : SAS
  Drive Type                             : SAS_HDD
Device is a Hard disk
  Enclosure #                            : 2
  Slot #                                 : 4
  SAS Address                            : 5000039-4-6810-716e
```

```
    State                           : Optimal (OPT)
    Size (in MB)/(in sectors)       : 572325/1172123567
    Manufacturer                    : TOSHIBA
    Model Number                    : MBF2600RC
    Firmware Revision               : 3706
    Serial No                       : EA25PCB009C6
    GUID                            : 500003946810716c
    Protocol                        : SAS
    Drive Type                      : SAS_HDD
Device is a Hard disk
    Enclosure #                     : 2
    Slot #                          : 5
    SAS Address                     : 5000039-4-7811-a90a
    State                           : Optimal (OPT)
    Size (in MB)/(in sectors)       : 572325/1172123567
    Manufacturer                    : TOSHIBA
    Model Number                    : MBF2600RC
    Firmware Revision               : 3706
    Serial No                       : EA25PCC00A9L
    GUID                            : 500003947811a908
    Protocol                        : SAS
    Drive Type                      : SAS_HDD
Device is a Hard disk
    Enclosure #                     : 2
    Slot #                          : 6
    SAS Address                     : 5000039-4-0820-09fe
    State                           : Optimal (OPT)
    Size (in MB)/(in sectors)       : 572325/1172123567
    Manufacturer                    : TOSHIBA
    Model Number                    : MBF2600RC
    Firmware Revision               : 3706
    Serial No                       : EA25PC50077P
    GUID                            : 50000394082009fc
    Protocol                        : SAS
    Drive Type                      : SAS_HDD
Device is a Hard disk
    Enclosure #                     : 2
    Slot #                          : 7
    SAS Address                     : 5000039-4-8822-6226
    State                           : Optimal (OPT)
    Size (in MB)/(in sectors)       : 572325/1172123567
    Manufacturer                    : TOSHIBA
    Model Number                    : MBF2600RC
    Firmware Revision               : 3706
    Serial No                       : EA25PD100AVW
    GUID                            : 5000039488226224
    Protocol                        : SAS
    Drive Type                      : SAS_HDD
--------------------------------------------------------------------------
Enclosure information  (*4)
--------------------------------------------------------------------------
    Enclosure#                      : 1
    Logical ID                      : 500000e0:e0450000
    Numslots                        : 8
    StartSlot                       : 0
```

```
  Enclosure#                                   : 2
  Logical ID                                   : 500000e0:e06d307f
  Numslots                                     : 9
  StartSlot                                    : 0
----------------------------------------------------------------------
SAS2IRCU: Command DISPLAY Completed Successfully.
SAS2IRCU: Utility Completed Successfully.
```

*1 SAS controller information
*2 RAID volume information
*3 Physical device information
*4 Information about the body of the SPARC M10 server

4.1.2 Confirming the software and firmware configurations

The software and firmware configurations and versions affect system operation. To change the configuration or investigate a problem, check the latest state and check for any problems in the software.

Confirming the software configuration

Use Oracle Solaris commands to check the software configuration.
If you are logged in to the XSCF console, switch to the control domain console by executing the console command beforehand.
Table 4-1 lists the commands used for checking the software configuration.

Table 4-1   Commands for checking the software configuration

Command	Description
pkg (Oracle Solaris 11) showrev (Oracle Solaris 10)	Displays the Oracle Solaris patch information and version.
ldm	Displays logical domain configuration information.

1. **Log in to the control domain console of the physical partition where the FRU requiring maintenance is mounted.**
   For details on how to log in to the control domain console, see "8.3   Switching to the Control Domain Console From the XSCF Shell" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

2. **Execute the pkg command to display the Oracle Solaris patch information and version.**
   - For Oracle Solaris 11, execute the pkg command.

```
# pkg info entire
          Name: entire
       Summary: entire incorporation including Support Repository Update
                (Oracle Solaris 11.1.12.5.0).
                                  * SRU version
```

- For Oracle Solaris 10, execute the showrev command.

```
# showrev -p
```

To check the Oracle VM Server for SPARC version, execute the ldm command.

```
# ldm -V
Logical Domains Manager (v 3.1)
                              * Version of Oracle VM Server for SPARC
        Hypervisor control protocol v 1.9
        Using Hypervisor MD v 1.3
```

The following is examples of executing commands to check logical domain configuration information.

When checking from Oracle Solaris on the control domain

```
# ldm list-spconfig
factory-default (*1)
confirm_service_manual [current] (*2)
#
```

*1 factory-default configuration

*2 Currently running logical domain configuration

When checking 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>
```

Confirming the firmware configuration

Check the XCP firmware version by using the version command, which is an XSCF shell command.

1. **Log in to the XSCF shell.**

2. **Execute the version command to check the firmware version information.**
   In the following example, "-c xcp" is entered to confirm the overall XCP version.

```
XSCF> version -c xcp
BB#00-XSCF#0 (Master)
XCP0 (Reserve): 2360    (*1)
XCP1 (Current): 2360    (*2)
BB#01-XSCF#0 (Standby)
XCP0 (Reserve): 2360
XCP1 (Current): 2360
```

*1 Version of the XCP firmware installed at Reserve on the SPARC M10-4S with BB-ID 00
*2 Version of the XCP firmware running on the SPARC M10-4S with BB-ID 00

Check the firmware version of the PCI expansion unit by using the ioxadm command, which is an XSCF shell command.

1. **Log in to the XSCF shell.**

2. **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

3. **Execute the ioxadm command to check the firmware version information for 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     -       FEJD1212000530  CA01022-0750-D/
 On
PCIBOX#2007/PSU#1 PSU     -       FEJD1212000529  CA01022-0750-D/
 On
PCIBOX#2007/IOB   IOBOARD 1330    PP123300E5      CA20365-B66X 008AG
 On (*1)
PCIBOX#2007/LINKBD BOARD  -       PP141900V0      CA20365-B60X 008AD/7061035
 On
PCIBOX#2007/FANBP FANBP   -       PP123203NT      CA20365-B68X 004AC
 On
BB#00-PCI#07      CARD    1330    PP133200UF      CA20365-B59X 008AD/7061040
 On (*2)
```

*1 Firmware version on the I/O board
*2 Firmware version on the link card

4.1.3 Confirming the FRU information and resource information

Use XSCF shell commands to check the FRU information and resource information.

Table 4-2 lists the commands used for checking the FRU information and resource information. For details on each command, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* for the XCP firmware version being used.

Table 4-2   Commands for checking FRU information and resource information

Command	Description
showstatus	Displays the FRU status. Out of the FRUs in the system configuration, this command displays information on a faulty or degraded unit or FRU.
showboards	Displays information on a physical system board (PSB). Displays information on a physical system board that belongs to the specified physical partition and information on all the physical system boards that are mounted.
showpcl	Displays the configuration information for a physical partition (hardware resource information).
showfru	Displays the setting information for a device.

4.2 Troubleshooting

This section describes the troubleshooting procedure.

In the following cases, which are suspected failure conditions, use the troubleshooting flow to identify the failure location. For details on the troubleshooting flow, see "4.2.1   Confirming whether there is a failure."

- 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

4.2.1 Confirming whether there is a failure

This section describes the flow for confirming whether there is a failure. Also apply this flow to identify failures in the PCI expansion unit.

Figure 4-1   Troubleshooting flow
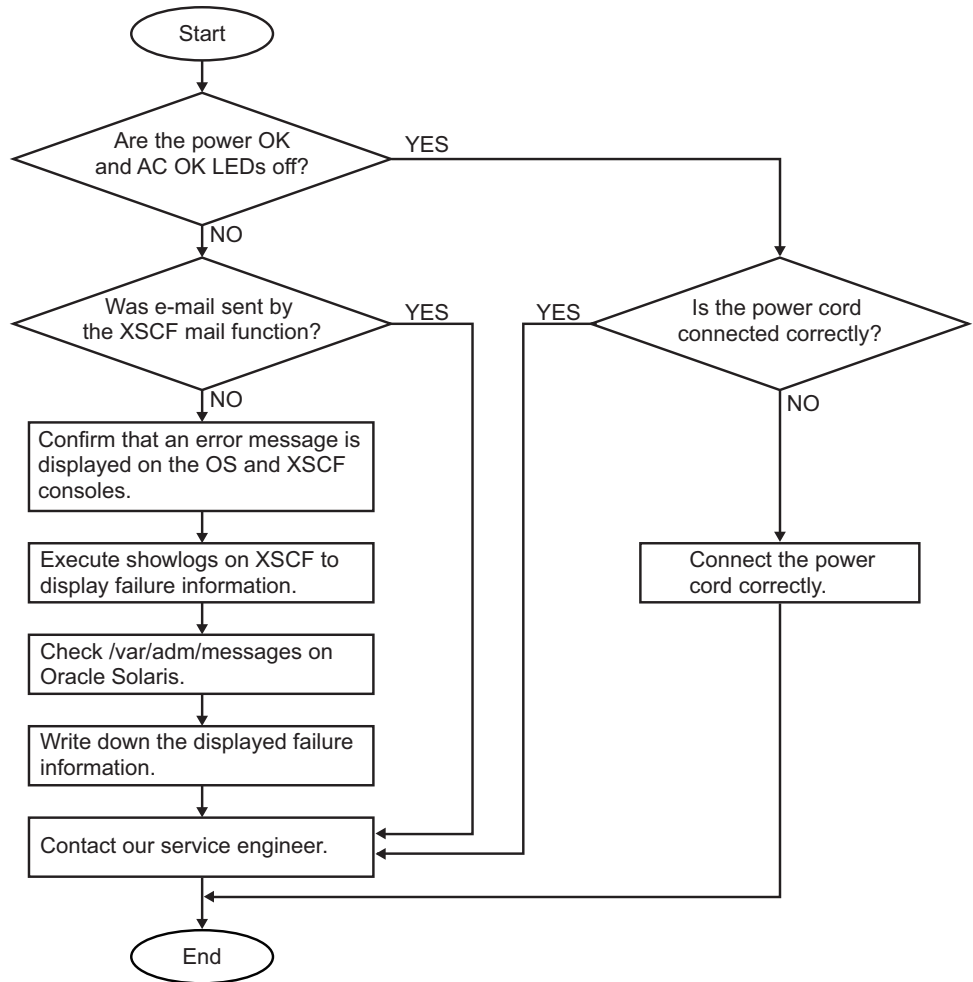
4.2.2   Identifying a failure

This section describes how to identify a failure. Use the troubleshooting flow described in "4.2.1   Confirming whether there is a failure" to determine an appropriate way to check the failure.

Checking the LED indications

Check the LEDs on the operation panel, rear panel, and each component to identify the FRU requiring maintenance. Check the status of a FRU from its LED before starting maintenance work on the FRU.

- Operation panel LEDs

You can determine the status of the system by checking the LEDs on the operation panel. For details, see "2.4.1   Operation panel LEDs."

- Rear panel LED
You can determine the status of the system by checking the CHECK LED on the rear panel of the chassis, which duplicates the CHECK LED on the operation panel. For details, see "2.4.2   LEDs on the rear panel (System locator)."

- LED of each FRU
If an error occurs in the hardware in the chassis, you can determine the location of the error by checking the LED of the FRU that incorporates the failed hardware. For details, see "2.4.3   LEDs on each component."

Note that some FRUs, such as memory, do not have mounted LEDs. To check the status of a FRU that does not have an LED, execute XSCF shell commands such as the showhardconf command from the maintenance terminal. For details, see "Checking the FRU status" below.

Checking error messages

Display error messages to check log information and an error overview.
You can use either of the following two methods to check the error messages:

- Checking error log information with the XSCF shell
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 messages with Oracle Solaris
For details, see "12.2   Checking Warning and Notification Messages" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Checking the FRU status

Execute XSCF firmware commands to determine the system hardware configuration and the status of each FRU.

- showhardconf command

Execute the showhardconf command to check the information on the FRU list.
1. **Log in to the XSCF shell.**
2. **Execute the showhardconf command to check the FRU list.**
   A faulty FRU is indicated by an asterisk (*) at the beginning of the line.

```
XSCF> showhardconf
SPARC M10-4S;
    + Serial:2081229003; Operator_Panel_Switch:Service;
    + System_Power:On; System_Phase:Cabinet Power On;
    Partition#0 PPAR_Status:Running;
    BB#00 Status:Normal; Role:Master; Ver:2050h; Serial:2081229003;
        + FRU-Part-Number:CA07361-D202 A0                        ;
```

```
        + Power_Supply_System: ;
        + Memory_Size:320 GB;
-----------------------Omitted-----------------------
       PCI#0 Status:Normal; Name_Property:pci;
           + Vendor-ID:108e; Device-ID:9020;
           + Subsystem_Vendor-ID:0000; Subsystem-ID:0000;
           + Model:;
           + Connection:7001;
*          PCIBOX#7001; Status:Faulted; Ver:1110h; Serial:2121237001;
               + FRU-Part-Number:;
               IOB Status:Normal; Serial:PP123403JE  ;
                   + FRU-Part-Number:CA20365-B66X 008AG     ;
               LINKBOARD Status:Normal; Serial:PP1234026P  ;
                   + FRU-Part-Number:CA20365-B60X 001AA     ;
               PCI#1 Name_Property:ethernet;
                   + Vendor-ID:1077; Device-ID:8000;
                   + Subsystem_Vendor-ID:1077; Subsystem-ID:017e;
                   + Model:;
-----------------------Omitted-----------------------
```

- showstatus command

Execute the showstatus command to check the FRU status.

1. **Log in to the XSCF shell.**

2. **Execute the showstatus command to check the status.**
   A faulty FRU is indicated by an asterisk (*) at the beginning of the line.

```
XSCF> showstatus
    MBU Status:Normal;
*       MEM#0A Status:Faulted;
```

The FRU status is displayed after the "Status:" string.
Table 4-3 describes the FRU status.

Table 4-3   FRU status

Display	Description
Normal	The unit is in the normal state.
Faulted	The unit is faulty and is not operating.
Degraded	A part of the unit has failed or degraded, but the unit is running.
Deconfigured	Due to the failure or degradation of another unit, the target unit and components of its underlying layer has been degraded, though there is no problem in them.
Maintenance	Maintenance is being performed. The replacefru, addfru, or initbb command is being executed.

Checking the hardware RAID volume status

Check 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 19.00.00.00 (2014.03.17)
   (Omitted)
--------------------------------------------------------------------
IR Volume information  (*1)
--------------------------------------------------------------------
   (Omitted)
IR volume 2
  Volume ID                             : 286
  Volume Name                           : 0
  Status of volume                      : Degraded (DGD) (*2)
  Volume wwid                           : 01a0a262cfe15e62
  RAID level                            : RAID1
  Size (in MB)                          : 571250
  Physical hard disks                   :
  PHY[0] Enclosure#/Slot#               : 2:0
  PHY[1] Enclosure#/Slot#               : 2:1
--------------------------------------------------------------------
Physical device information  (*3)
--------------------------------------------------------------------
Initiator at ID #0
   (Omitted)
Device is a Hard disk
  Enclosure #                           : 2
  Slot #                                : 0
  SAS Address                           : 5000039-7-584a-dada
  State                                 : Failed (FLD) (*4)
  Size (in MB)/(in sectors)             : 572325/1172123567
  Manufacturer                          : TOSHIBA
  Model Number                          : AL13SEB600AL14SE
  Firmware Revision                     : 3703
  Serial No                             : X6N0A01PF7TD
  GUID                                  : 50000397584adad9
  Protocol                              : SAS
  Drive Type                            : SAS_HDD
   (Omitted)
```

*1 RAID volume information
*2 Degraded RAID volume
*3 Physical device information
*4 Indicates a failure

Checking the status of a PCI expansion unit

If a PCI expansion unit is connected, execute the ioxadm command from the XSCF shell to check the status of the PCI expansion unit.

- ioxadm command

Execute the ioxadm command to check the environmental conditions (temperature, voltage, etc.) or LED indications for the PCI expansion unit.

1. **Log in to the XSCF shell.**

2. **Execute the ioxadm command to check the environmental conditions of the specified PCI expansion unit.**
   To specify a PCI expansion unit, enter the serial number of the PCI expansion unit after determining it by executing the ioxadm list command.

   The following example shows the environmental conditions for the PCIBOX#2008 "2008" are the last four digits of the serial number of the PCI expansion unit.

```
XSCF> ioxadm env -te PCIBOX#2008
Location                      Sensor          Value  Resolution Units
PCIBOX#2008                   AIRFLOW        180.000      0.000 CHM
PCIBOX#2008                   P_CONSUMPTION   68.000      0.000 W
PCIBOX#2008/PSU#0             FAN           3936.000      0.000 RPM
PCIBOX#2008/PSU#1             FAN           3584.000      0.000 RPM
PCIBOX#2008/FAN#0             FAN           3374.000      0.000 RPM
PCIBOX#2008/FAN#1             FAN           3374.000      0.000 RPM
PCIBOX#2008/FAN#2             FAN           3374.000      0.000 RPM
PCIBOX#2008/IOBT             T_INTAKE        26.000      0.000 C
PCIBOX#2008/IOBT             T_PART_NO0      31.500      0.000 C
PCIBOX#2008/IOBT             T_PART_NO1      30.750      0.000 C
PCIBOX#2008/IOBT             T_PART_NO2      31.500      0.000 C
PCIBOX#2008/IOBT             V_12_0V         12.069      0.000 V
PCIBOX#2008/IOBT             V_3_3_NO0        3.293      0.000 V
PCIBOX#2008/IOBT             V_3_3_NO1        3.295      0.000 V
PCIBOX#2008/IOBT             V_3_3_NO2        3.291      0.000 V
PCIBOX#2008/IOBT             V_3_3_NO3        3.300      0.000 V
PCIBOX#2008/IOBT             V_1_8V           1.804      0.000 V
PCIBOX#2008/IOBT             V_0_9V           0.900      0.000 V
```

Checking log information

Execute the showlogs command to check error log information.

1. **Log in to the XSCF shell.**

2. **Execute the showlogs command to check the log information.**
   The log information is listed in the order of date, with the oldest appearing first.

   The following example shows that an Alarm occurred in PSU#1 at 12:45:31 on Oct 20, and the status changed to Warning at 15:45:31 on the same day.

```
XSCF> showlogs error
Date: Oct 20 12:45:31 JST 2012
    Code: 00112233-445566778899aabbcc-8899aabbcceeff0011223344
    Status: Alarm                    Occurred: Oct 20 12:45:31.000 JST 2012
    FRU: /PSU#1
    Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
Date: Oct 20 15:45:31 JST 2012
    Code: 00112233-445566778899aabbcc-8899aabbcceeff0011223344
    Status: Warning                  Occurred: Oct 20 15:45:31.000 JST 2012
    FRU: /PSU#1
    Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
```

Table 4-4 lists the logs that can be displayed by the showlogs command with an operand specified.

Table 4-4   Operands of the showlogs command and the log to be displayed

Operand	Description
error	Lists the error log.
event	Lists the event log.
power	Lists the power log.
env	Lists the temperature history.
monitor	Lists the monitoring message log.
console	Lists the console message log.
ipl	Lists the IPL message log.
panic	Lists the panic message log.

Checking the messages output by the predictive self-repairing tool

Check the messages output from the Oracle Solaris Fault Manager predictive self-repairing tool, running on Oracle Solaris. Oracle Solaris Fault Manager supports the following functions:

- Receives telemetry information about errors.

- Performs troubleshooting.

- Disables the FRUs that have experienced errors.

- Turns on the LED of a FRU that has experienced an error and displays the details in a system console message.

Table 4-5 lists typical messages that are generated if an error occurs. These messages indicate that the fault has already been diagnosed. If corrective actions can be taken by the system, this indicates that they have already been taken. In addition, if the system is running, corrective actions continue to be applied.
Messages are displayed on the console and are recorded in the /var/adm/messages file.

Table 4-5   Predictive self-repairing messages

Output Displayed	Description
EVENT-TIME: Thu Apr 19 10:48:39 JST 2012	EVENT-TIME: Time stamp of the diagnosis
PLATFORM: ORCL,SPARC64-X, CSN: PP115300MX, HOSTNAME: 4S-LGA12-D0	PLATFORM: Description of the chassis in which the error occurred
SOURCE: eft, REV: 1.16	SOURCE: Information on 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: What the system has done (if anything) to alleviate any subsequent problems
IMPACT: Automated diagnosis and response for these events will not occur.	IMPACT: Description of the assumed impact of the failure
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 the system administrator should apply

Identifying the location of the chassis requiring maintenance

Execute the setlocator command to identify the location of the chassis requiring maintenance by causing the CHECK LED on the operation panel and the CHECK LED (locator) on the rear panel to blink.

1. **Log in to the XSCF shell.**

2. **Execute the setlocator command to identify the location of the chassis requiring maintenance, by causing the CHECK LED of the chassis to blink.**
   The CHECK LEDs on the operation and rear panels blink.

   The chassis requiring maintenance in the following execution example is the master chassis.

```
XSCF> setlocator blink
```

If the chassis requiring maintenance is not the master chassis, set "setlocator -b *bb_id* blink".

For the locations of the CHECK LEDs and details on how to check them, see "2.4 Checking the LED Indications."

4.2.3　Downloading error log information

This section describes the operations for downloading error log information.
To download error log information, use the XSCF log fetch function. The XSCF unit has a maintenance USB port so that maintenance information such as error logs can be obtained easily. (The port is marked as MAINTENANCE on the rear panel.) For details, see "12.1.15　Saving a Log to a File With Snapshot" and "12.1.16　Saving a Log to a Local USB Device" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

In the following example, detailed information on the error logs of all chassis in the system in a building block configuration is downloaded to the USB memory connected to the USB port.

```
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.
```

4.3　Maintenance Precautions

This section describes the precautions for maintenance.

4.3.1　Precautions for replacement

This section describes the precautions for replacement.

Precautions for CPU memory unit, PSU backplane unit, and memory replacement

⚠ **Caution -** The weight of the CPU memory unit is 17 kg (37.4 lb). If the mounting location in the rack is 24U or higher, the maintenance work must be done by two people. If you attempt to perform the maintenance work alone, you may injure yourself or cause damage to the chassis.

- Do not replace the CPU memory unit lower at the same time as the PSU backplane unit. If the CPU memory unit lower and the PSU backplane unit are replaced at

the same time, the system may fail to operate normally. Replace either of the CPU memory unit lower and PSU backplane unit, and confirm that the replacement part operates normally by executing the showhardconf or showstatus command. Then, replace the other FRU.

- Do not mount and use any of the following microSD cards in the CPU memory unit lower in another chassis:
  - the one currently mounted in the SPARC M10-4/M10-4S, or
  - one that was once used as a maintenance part

  This is because these microSD cards store device identification information.

- Do not mount and use any of the following PSU backplane units in another chassis:
  - the one currently mounted in the SPARC M10-4/M10-4S, or
  - one that was once used as a maintenance part

  This is because these PSU backplane units store device identification information.

- The XSCF mounted in the CPU memory unit lower is not a FRU (field replaceable unit). When replacing the CPU memory unit lower, do not switch the XSCF units.

- When remounting memory during the replacement of the CPU memory unit or memory, be sure to remount the memory in it's original location before the replacement.

- To use the hardware RAID function, after replacing the CPU memory unit lower, you need to reactivate 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*.

- Before replacing the CPU memory unit lower, execute the dumpconfig command to save the system setting information. If you replace the CPU memory unit lower, the CPU Activation setting information and CPU Activation key may be erased. To return the CPU Activation setting information and CPU Activation key to their original states, execute the restoreconfig command to restore the CPU Activation setting information and CPU Activation key saved beforehand using the dumpconfig command. 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*.

- If you switch the microSD card when replacing the CPU memory unit lower, the maintenance time is shorter since the XSCF setting information is inherited. A check of the XCP firmware version after diagnosis of the system board may find that the CMU firmware versions do not match between the current XCP and reserve XCP. However, this does not affect system operation. If you start the system when the current and reserve XCPs have been switched, the CMU firmware stored on the microSD card is automatically applied.

- If you replace the microSD card along with the CPU memory unit lower, dispose of the microSD card mounted on the old CPU memory unit lower by appropriate means such as cutting it with cutting pliers. The old microSD card stores the user information, IP address, and other information set in the XSCF firmware.

- The type of CPU memory unit varies depending on the number of CPU clocks.

Precautions for power supply unit and fan unit replacement

⚠ **Caution -** Do not force the power supply unit or fan unit into its slot. Using excessive force may damage the FRU and chassis.

- The power supply units and cooling fans have redundant configurations. The system can operate even if one power supply unit or one cooling fan in a fan unit experiences a failure. However, avoid operating the system with a faulty power supply unit or a faulty cooling fan in one of the fan units for an extended period. Replace the unit containing the faulty power supply or faulty fan.
- When replacing multiple power supply units or fan units, replace one unit at a time. If redundancy of the power supply units or fan units cannot be secured, perform maintenance with the system stopped.
- The type of power supply unit or fan unit varies depending on the number of CPU clocks.

Precautions for PCIe card replacement

- For active maintenance using PHP, a multipath setting is necessary depending on the use of the PCIe cards.
- For active maintenance using PHP, confirm that the card supports PHP as described in "Appendix A   Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*. For active replacement combined with dynamic SR-IOV and the dynamic reconfiguration function for the PCIe end point, confirm the supported card as described in "Appendix B   Cards That Support SR-IOV" and "Appendix D Cards That Support the Dynamic Reassignment Function for the PCIe End Point Device (PCIe Card)" in the same manual.

Precautions for operation panel replacement

- To replace the operation panel, remove the PSU backplane from the chassis.
- To replace the operation panel, set the BB-ID of the replacement operation panel to the same value as that before replacement.

4.3.2   Precautions for installation

Before performing installation work, see "Checking the FRU status" in "4.2.2 Identifying a failure" to confirm that there is no problem with the chassis requiring installation.

Precautions for expansion of the CPU memory unit upper

- When installing a CPU memory unit upper, remove the filler unit. Store the removed filler unit in a safe place because it will be needed if you subsequently

remove the CPU memory unit upper.

- If PCI Express cables are not connected to the CPU memory unit lower, you need to add PCI Express cables.
- If PCI Express cables are connected to the CPU memory unit lower, you need to add only one PCI Express cable.
- If the CPU memory unit upper for the 2CPU configuration of the SPARC M10-4/M10-4S is installed, the root complex is also installed. Then, by enabling the I/O bus reconfiguration function(*1), the I/O bandwidth increases, and the PCIe card installation rules(*2) change. In addition, the I/O bus reconfiguration also changes the device path of the I/O device(*3), so you may have to reconfigure the logical domains.
- The type of CPU memory unit varies depending on the number of CPU clocks. They cannot be mixed in the same device, but they can be mixed in a system with a building block configuration.

---

*1 For details, see the section describing the setpparmode command in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual*.
*2 For details, see the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.
*3 For details, see "A.5   SPARC M10-4 Device Paths" or "A.6   SPARC M10-4S Device Paths" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

Precautions for memory expansion

- Observe the memory installation rules when you expand memory. For details, see "2.2.1   Memory installation rules."
- When you expand memory by 64 GB, apply XCP 2090 or later.
- Unless memory modules of 512 GB (64 GB DIMM x 8) are mounted in the 16 DIMM slots under a CPU, memory modules of up to two different capacities can be mounted together. In this case, use the same type within each memory group.

Note - When you expand memory with a different capacity, apply XCP 2052 or later.

Precautions for internal disk expansion

- To expand an internal disk, remove the hard disk drive filler unit from the slot in which you will install the internal disk. Store the removed filler unit in a safe place because it will be needed if you subsequently remove the internal disk.

Precautions for PCIe card expansion

- Set a multipath depending on the use of the PCIe card when performing active/hot maintenance or active/cold maintenance with PHP.
- For active addition using PHP, confirm that the card supports PHP as described in "Appendix A   Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*. For active

addition combined with dynamic SR-IOV and the dynamic reconfiguration function for the PCIe end point, confirm the supported card as described in "Appendix B   Cards That Support SR-IOV" and "Appendix D   Cards That Support the Dynamic Reassignment Function for the PCIe End Point Device (PCIe Card)" in the same manual.

- When performing PCIe card expansion, remove the PCIe card filler from the PCIe card cassette. Store the removed filler in a safe place because it will be needed if you subsequently remove the PCIe card.

4.3.3   Precautions for reduction

Before performing reduction work, see "Checking the FRU status" in "4.2.2 Identifying a failure" to confirm that there is no problem with the chassis that is the reduction target.

Precautions for CPU memory unit upper or memory reduction

- When removing a CPU memory unit upper, mount the stored filler unit after removing the CPU memory unit upper.
- Remove the shortest PCIe cable that connects the CPU memory unit upper and CPU memory unit lower. However, you do not need to remove the three PCIe cables that are connected to the CPU memory unit lower.
- Removal of the CPU memory unit upper in a system where the I/O bus was reconfigured eliminates the root complex used in the CPU memory unit upper. Also, some PCIe slots can no longer be used. To enable use of the PCIe slots, "activate" the I/O bus reconfiguration function (*1). However, the I/O device path changes as a result, so you may need to reconfigure the logical domains.
- Observe the memory installation rules when you remove memory. For details, see "2.2.1   Memory installation rules."

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*1 For details, see the section describing the setpparmode command in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual*.

Precautions for internal disk reduction

- When removing an internal disk, remove the internal disk and then mount the filler unit that has been stored in a safe place onto the empty slot.

Precautions for PCIe card reduction

- Release the multipath depending on the use of a PCIe card when performing active/hot maintenance or active/cold maintenance with PHP.
- For active removal using PHP, confirm that the card supports PHP as described in "Appendix A   Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*. For active removal combined with dynamic SR-IOV and the dynamic reconfiguration

function for the PCIe end point, confirm the supported card as described in "Appendix B   Cards That Support SR-IOV" and "Appendix D   Cards That Support the Dynamic Reassignment Function for the PCIe End Point Device (PCIe Card)" in the same manual.

- When performing PCIe card removal, remove the PCIe card from the PCIe card cassette and then attach the filler that has been stored in a safe place.

Chapter 5

Preparations Required for Maintenance

This chapter describes the procedures for preparations to be done before physically removing a FRU. See this chapter, as required, when performing maintenance on each FRU described in Chapter 8 onward.

- Preparing Tools Required for Maintenance
- Switching the Mode Switch to Service Mode
- Checking the Operating Condition and Resource Usage Status
- Preparations for Enabling Active Maintenance
- Powering Off the Physical Partition Requiring Maintenance
- Stopping the Entire System
- Saving XSCF Setting Information
- Releasing a SPARC M10-4/M10-4S FRU from the System with the replacefru Command
- Accessing a FRU

Caution - Do not operate the target FRU while OpenBoot PROM is running (the ok prompt is displayed). After powering off the physical partition or starting Oracle Solaris, operate the target FRU.

5.1 Preparing Tools Required for Maintenance

Table 5-1 lists the tools required for FRU maintenance.

Table 5-1   Maintenance tools

Item	Use
Phillips screwdriver (No.2)	For removing or installing screws
Flathead screwdriver (small)	Used when installing the CPU memory unit upper
Wrist strap	For static grounding
ESD mat	For static grounding
SAS-2 Integrated RAID Configuration Utility (*1)	Hardware RAID volume maintenance

*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 M10/SPARC M10 Systems Product Notes.*

5.2   Switching the Mode Switch to Service Mode

Note - The mode switch on the operation panel does not need to be changed in active maintenance.

1. **Switch the mode switch on the operation panel to Service mode.**
    For a building block configuration, switch the mode switches of the master chassis and those chassis (BB-ID#00, #01) whose XSCFs are in the standby state to Service mode.

    For details, see "2.3.2   Control function of the operation panel."

Remarks - For a building block configuration with a connected crossbar box, switch the mode switches of BB-ID#80 and #81 of the crossbar box.

5.3   Checking the Operating Condition and Resource Usage Status

This section describes the checking of the operating condition of the logical domains and the resource usage status before maintenance is performed on each FRU.

5.3.1 Checking the operating condition of the physical partition or logical domain

In the following execution example, the operating condition of the physical partition and logical domains is checked from firmware.

1. **Log in to the XSCF shell.**

2. **Confirm that you are logged in to the master XSCF.**
   In the following example, the showbbstatus command checks that.

```
XSCF> showbbstatus
BB#00 (Master) (*1)
```

*1 If Standby is displayed, try logging into the master XSCF again.

3. **Execute the showpparstatus command to check the operating condition of the physical partition.**
   In the following example, [PPAR Status] of PPAR-ID 00 displays "Running", which indicates that the physical partition is operating.

```
XSCF> showpparstatus -p 0
PPAR-ID        PPAR Status
00             Running
```

4. **Execute the showdomainstatus command to check the operating condition of the logical domains.**
   In the following example, [Status] of the logical domains of PPAR-ID 00 displays "Solaris running," which indicates that Oracle Solaris is operating.

```
XSCF> showdomainstatus -p 0
Logical Domain Name    Status
primary                Solaris running
guest0                 Solaris running
guest1                 Solaris running
iodom0                 Solaris running
iodom1                 Solaris running
sdiodomain             Solaris running
sr-iodomain            Solaris running
```

5.3.2 Checking the assignment status of I/O devices

In the following execution example, the operating condition of the logical domains, the resource usage status, and the assignment status of I/O devices are checked from

Oracle Solaris on the control domain. For details, 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. **Log in to Oracle Solaris on the control domain.**

2. **Execute the following ldm command to check the operating condition of the logical domains.**

```
# ldm list-domain
```

3. **Execute the following ldm command to check the resource usage status.**

```
# ldm list-devices -a
```

4. **Execute the following ldm command to check the assignment status of I/O devices.**

```
# ldm list-io
```

For maintenance on a PCIe card, retain the output data of the ldm list-io command, since you will need it later when restoring the original configuration ("6.5.3   Restoring a logical domain to the pre-maintenance state") after maintenance.

5.3.3   Checking the usage status of the internal disk

In the following execution example, the configurations and states of devices in pools and errors generated from the devices are checked.

1. **Log in to Oracle Solaris on the control domain.**

2. **Execute the zpool status command to check the configuration and operating condition of devices.**
   The following example shows that the system volume of the control domain has a mirror configuration.

```
# zpool status rpool
   pool: rpool
  state: ONLINE
   scan: resilvered 28.7M in 0h0m with 0 errors on Tue Jan 21 10:10:01 2014
 config:
         NAME                            STATE   READ   WRITE   CKSUM
         rpool                           ONLINE    0       0       0
           mirror-0                      ONLINE    0       0       0
             c2t50000393E802CCE2d0s0     ONLINE    0       0       0
             c3t50000393A803B13Ed0s0     ONLINE    0       0       0
 errors: No known data errors
```

3. **Check the hardware RAID volume.**
   The following example indicates a RAID volume configuration with the hardware RAID function.

```
root# ./sas2ircu 0 display
LSI Corporation SAS2 IR Configuration Utility.
Version 19.00.00.00 (2014.03.17)
Copyright (c) 2008-2014 LSI Corporation. All rights reserved.
Read configuration has been initiated for controller 0
    (Omitted)
--------------------------------------------------------------------------
IR Volume information
--------------------------------------------------------------------------
IR volume 1      (*1)
    (Omitted)
--------------------------------------------------------------------------
Physical device information
--------------------------------------------------------------------------
Initiator at ID #0
Device is a Enclosure services device   (*2)
    (Omitted)
Device is a Hard disk    (*3)
    (Omitted)
--------------------------------------------------------------------------
Enclosure information     (*4)
--------------------------------------------------------------------------
  Enclosure#                             : 1
  Logical ID                             : 500000e0:e0450000
  Numslots                               : 8
    (Omitted)
```

*1 Displays information on RAID volume 1
*2 Displays enclosure information for HDD/SSD slot #0
*3 Displays information on the physical device mounted in HDD/SSD slot #0
*4 Displays information about the body of the SPARC M10 server

5.4 Preparations for Enabling Active Maintenance

This section describes the flow of work to be performed in Oracle Solaris on the control domain in active maintenance. For details on the work 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* and the manual for the application being used.

5.4.1   Releasing the assignment of I/O devices

This section describes the work to be done before maintenance using PCI hot plug (PHP) or dynamic reconfiguration (PPAR DR) of the physical partition.

- **When using PCI hot plug (PHP)**
  If the PCIe end point of the PCIe card requiring maintenance is assigned to an I/O domain or if the SR-IOV virtual function is assigned, return the PCIe end point to the root or control domain.

  (1) Stopping the use of an I/O device

  (2) Deleting the assignment of an I/O device

- **When using dynamic reconfiguration (PPAR DR) for the physical partition**
  If the PCIe end point of the PCIe card in the chassis requiring maintenance is assigned to an I/O domain or if the SR-IOV virtual function is assigned, return the PCIe end point to the root or control domain. Then, remove the root complex from the root or control domain.

  (1) Stopping the use of an I/O device

  (2) Deleting the assignment of an I/O device

  (3) Deleting the root complex

(1) Stopping the use of an I/O device

If there is any logical domain that is physically or virtually using the PCIe card mounted in the chassis requiring maintenance, stop the use of the I/O device to keep it unused.

With a redundant configuration, use the duplication function to release the target I/O device so that it will not be used. For details on the work, see the manual for the application being used.

With a non-redundant configuration, place the I/O device in the unused state, such as by deactivating the network or unmounting the disk to stop the use. For details on the work, see the Oracle Solaris documents and the manual for the application being used.

(2) Deleting the assignment of an I/O device

When using virtual I/O

When using a virtual I/O service, delete the virtual I/O device. For details, see the *Oracle VM Server for SPARC Administration Guide* from Oracle.

The following is a command execution example for deleting the virtual disk (vdisk11) and virtual network device (vnet10) that use the virtual I/O service of the control domain or root domain.

```
# ldm remove-vdisk vdisk11 guest0
# ldm remove-vnet vnet10 guest0
```

When using PCIe end point assignment

If the PCIe end point device of the chassis requiring maintenance is assigned to an I/O domain, delete the PCIe end point device from the I/O domain and return it to the root domain (includes the control domain). The work procedure varies depending on whether the dynamic reconfiguration function for the PCIe end point device is used. For details, see Table 5-2.

Table 5-2   Procedure that depends on whether the dynamic reconfiguration function for the PCIe end point device is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration function used (*1)	Dynamic reconfiguration function not used (*2)
1	Enable the hotplug service.	svcadm enable hotplug	Yes	Yes (*3)
2	Stop the I/O domain.	ldm stop-domain	-	Yes
3	Delete the PCIe end point device from the I/O domain.	ldm remove-io	Yes	Yes
4	Set the root domain to delayed reconfiguration.	ldm start-reconf	-	Yes
5	Assign the PCIe end point device to the root domain.	ldm add-io	Yes	Yes
6	Restart the root domain.	shutdown -i6 -g0 -y	-	Yes
7	Disable the hotplug service.	svcadm disable hotplug	Yes	Yes (*3)

*1 Dynamic reconfiguration of the PCIe end point device is supported by XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later.
*2 If dynamic reconfiguration of the PCIe end point devices is not used, stop the I/O domain, delete the physical I/O device, and then return the physical I/O device to the root domain.
*3 If dynamic reconfiguration of the PCIe end point device is not used, the hotplug service operates regardless of its enable/disable setting.

Note - Note the following when deleting the physical I/O device (PCIe end point device) of the boot disk.
If the boot disk of the I/O domain is in a redundant configuration, you need to stop the I/O domain on Oracle VM Server for SPARC 3.1.1 or earlier. However, you do not need to stop it on Oracle VM Server for SPARC 3.1.1.1 or later.

---

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Stop the I/O domain.**
   If you are using the dynamic reconfiguration function for the PCIe end point device, this step is unnecessary. Go to step 3.

```
# ldm stop-domain <I/O domain name>
```

3. **Delete the physical I/O device from the I/O domain.**

```
# ldm remove-io <device name> <I/O domain name>
```

4. **Transition the root domain to delayed reconfiguration mode.**
   If you are using the dynamic reconfiguration function for the PCIe end point device, this step is unnecessary. Go to step 5.

```
# ldm start-reconf <root domain name>
```

5. **Reassign the physical I/O device deleted in step 3 to the root domain.**

```
# ldm add-io <device name> <root domain name>
```

6. **Log in to the root domain, and restart Oracle Solaris.**
   If you are using the dynamic reconfiguration function for the PCIe end point device, this step is unnecessary. Go to step 7.

```
# telnet localhost <port number>
...
# shutdown -i6 -g0 -y
```

7. **If you need to disable the hotplug service for the I/O and root domains, disable the hotplug service.**

```
# svcadm disable hotplug
```

When using the SR-IOV virtual function

Suppose that a virtual function (VF) using the SR-IOV function on the PCIe card mounted in the PCI expansion unit requiring maintenance was created and assigned to a domain. In this case, delete and discard the virtual function from the control domain by using the ldm command. The work procedure differs between the dynamic SR-IOV function and the static SR-IOV function. For details, see Table 5-3. For details on the procedure, see the *Oracle VM Server for SPARC Administration Guide* from Oracle.

Table 5-3   Release procedure that depends on the function: dynamic SR-IOV function or
               static SR-IOV function

-: Unnecessary

Item	Task	Command	Dynamic SR-IOV function used (*1)	Static SR-IOV function used
1	Enable the hotplug service.	svcadm enable hotplug	Yes	Yes (*2)
2	Stop the I/O domain.	ldm stop-domain	-	Yes
3	Delete the virtual function (VF) from the I/O domain.	ldm remove-io	Yes	Yes
4	Set the root domain of the physical function (PF) to delayed reconfiguration.	ldm start-reconf	-	Yes
5	Discard the virtual function (VF).	ldm destroy-vf	Yes	Yes
6	Restart the root domain.	shutdown -i6 -g0 -y	-	Yes
7	Disable the hotplug service.	svcadm disable hotplug	Yes	Yes (*2)

*1 Dynamic reconfiguration for the SR-IOV virtual function is supported by XCP 2210 or later and Oracle VM
Server for SPARC 3.1 or later.
*2 If static reconfiguration for the SR-IOV virtual function is used, the hotplug service operates regardless of its
enable/disable setting.

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Stop the I/O domain.**
   If the dynamic SR-IOV function is used, this step is unnecessary. Go to step 3.

```
# ldm stop-domain <I/O domain name>
```

3. **The virtual function (VF) has been assigned to an I/O domain. Delete it from the I/O domain.**
   Execute the ldm remove-io command to delete the virtual function (VF) assigned to the I/O domain from the I/O domain. If multiple VFs are assigned from the physical function (PF) of a single PCIe card, delete all the VFs corresponding to that PF from the I/O domain.

```
# ldm remove-io <VF name> <I/O domain name>
```

4. **Transition the root domain that has the assigned physical function (PF) to delayed reconfiguration mode.**
   If the dynamic SR-IOV function is used, this step is unnecessary. Go to step 5.

```
# ldm start-reconf <root domain name>
```

5. **Discard the virtual function (VF).**
   Execute the ldm destroy-vf command to discard the virtual function (VF).
   However, the VF needs to be discarded in the reverse order to that in which it
   was created.

```
# ldm destroy-vf <VF name>
```

6. **Log in to the root domain, and restart Oracle Solaris.**
   If the dynamic SR-IOV function is used, this step is unnecessary. Go to step 7.

```
# telnet localhost <port number>
...
# shutdown -i6 -g0 -y
```

7. **If you need to disable the hotplug service for the I/O and root domains,
   disable the hotplug service.**

```
# svcadm disable hotplug
```

(3) Deleting the root complex

Deleting the root complex from the root domain

If the I/O device of the chassis requiring maintenance is assigned to the root domain,
delete the physical I/O device (root complex) from the root domain. The work
procedure varies depending on whether the dynamic reconfiguration function
(Dynamic PCIe bus assignment) for the root complex is used. For details, see Table
5-4.

Table 5-4   Procedure that depends on whether the dynamic reconfiguration function
              (Dynamic PCIe bus assignment) for the root complex is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration function used (*1)	Dynamic reconfiguration function not used (*2)
1	Stop the root domain.	ldm stop-domain	-	Yes

Table 5-4 Procedure that depends on whether the dynamic reconfiguration function (Dynamic PCIe bus assignment) for the root complex is used *(continued)*

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration function used (*1)	Dynamic reconfiguration function not used (*2)
2	Delete the physical I/O device (root complex) from the root domain.	ldm remove-io	Yes	Yes

*1 Dynamic reconfiguration of the root complex is supported by XCP 2240 or later and Oracle VM Server for SPARC 3.2 or later. In addition, the root domain must be Oracle Solaris 11.2 SRU 11.2.8 or later.
*2 If dynamic reconfiguration of the root complex is not used, stop the root domain, and then delete the physical I/O device.

1. **Stop the root domain.**
   If you are dynamically reconfiguring the root complex, this step is unnecessary. Go to step 2.

```
# ldm stop-domain <root domain name>
```

2. **Delete the physical I/O device (root complex) from the root domain.**

```
# ldm remove-io <physical I/O device name> <root domain name>
```

3. **Confirm that the I/O device of the chassis to be released is unused and unassigned.**

```
# ldm list-io
```

Deleting the root complex from the control domain

If the I/O device of the chassis requiring maintenance is assigned to the control domain, delete the physical I/O device (root complex) from the control domain. The work procedure varies depending on whether the dynamic reconfiguration function (Dynamic PCIe bus assignment) for the root complex is used. For details, see Table 5-5.

Table 5-5　　Procedure that depends on whether the dynamic reconfiguration function (Dynamic PCIe bus assignment) for the root complex is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration function used (*1)	Dynamic reconfiguration function not used (*2)
1	Set the control domain to delayed reconfiguration.	ldm start-reconf	-	Yes
2	Delete the physical I/O device from the control domain.	ldm remove-io	Yes	Yes
3	Restart the control domain.	shutdown -i6 -g0 -y	-	Yes

*1 Dynamic reconfiguration of the root complex is supported by XCP 2240 or later and Oracle VM Server for SPARC 3.2 or later. In addition, the control domain must be Oracle Solaris 11.2 SRU 11.2.8 or later.
*2 If dynamic reconfiguration of the root complex is not used, set the control domain to delayed reconfiguration, and then delete the physical I/O device.

1. **Transition the control domain to delayed reconfiguration mode.**
   If you are dynamically reconfiguring the root complex, this step is unnecessary. Go to step 2.

   ```
   # ldm start-reconf <control domain name>
   ```

2. **Delete the physical I/O device from the control domain.**

   ```
   # ldm remove-io <physical I/O device name> <control domain name>
   ```

3. **Restart the control domain.**
   If you are dynamically reconfiguring the root complex, this step is unnecessary.

   ```
   # shutdown -i6 -g0 -y
   ```

Note - When set to delayed reconfiguration mode, the control domain does not have control over the guest domains. If you have set the control domain to delayed reconfiguration mode, restart the control domain as soon as possible.

5.4.2　Enabling the removal of an I/O device

This section describes the procedure for enabling the removal of an I/O device by using the hot plug function.
To use the hot plug function, the hotplug service of Oracle Solaris needs to be enabled. Check the status of the service. If it is disabled, enable the hotplug service in the following procedure. The hot plug function is available 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 the cfgadm command used here, see "2 Dynamically Configuring Devices" in the *Managing Devices in Oracle Solaris 11.2* or "Dynamically Configuring Devices (Tasks)" in the *Oracle Solaris Administration: Devices and File Systems*.

Note - To perform PCI Express card maintenance using the hot plug function, confirm that the card is hot-pluggable. To do so, check "Appendix A   Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.

Enabling the removal of a PCI Express card

1. **Log in as a super-user to Oracle Solaris on the logical domain (control domain or root domain) to which the target PCI Express card is assigned.**

2. **Check the mounting position (Ap_Id) of the target PCI Express card from the logical domain (control domain or root domain).**

```
# cfgadm -a
Ap_Id              Type         Receptacle   Occupant     Condition
BB#0-PCI#0         pci-pci/hp   connected    configured   ok
```

3. **Release the target PCI Express card from the logical domain (control domain or root domain).**

```
# cfgadm -c unconfigure <Ap_Id>
```

4. **Stop the power supply to the target PCI Express card.**

```
# cfgadm -c disconnect <Ap_Id>
```

5. **Confirm that the PCI Express card has been released from the logical domain.**

```
# cfgadm -a
Ap_Id              Type         Receptacle   Occupant     Condition
BB#0-PCI#0         unknown      disconnected unconfigured unknown
```

In the above example, [Receptacle] and [Occupant] display "disconnected" and "unconfigured," respectively, which indicates that the PCI Express card mounted at BB#0-PCI#0 has been released from the logical domain.

6. **Set the ATTENTION LED of the target PCI Express card cassette to blink.**

For removal, this work is not required.

```
# cfgadm -x led=attn,mode=blink <Ap_Id>
```

7. **Check the following LEDs to determine whether the PCI Express card can be removed.**
   - The ATTENTION LED (amber) of the PCI Express card is blinking.

   - The POWER LED of the PCI Express card is off.

   For removal, the ATTENTION LED (amber) does not blink. Make sure that the POWER LED is off.

Enabling the removal of an internal disk

(1) Identifying the disk slot

To perform active replacement of an internal disk drive, you need to know the physical device name or logical device name of a drive to be installed or removed. If a disk error occurs in the system, from the system console, you can normally check for messages regarding a disk that is likely to fail or that has already failed. This information is also recorded in the /var/adm/messages file.

In these error messages, a failed internal disk drive is normally indicated with a physical device name or logical device name. In addition, depending on the application, the slot number of the disk may be reported.

Procedure to confirm the mounting position information on the HDD varies depending on the operating system.
- For Oracle Solaris 11 with SRU 11.4.27.82.1 or later applied
For details, see "Using the diskinfo Command (Oracle Solaris 11 with SRU 11.4.27.82.1 or later applied)."
- For Oracle Solaris 11 without SRU 11.4.27.82.1 or later applied
For details, see "Using the format command (Oracle Solaris 11 without SRU 11.4.27.82.1 or later applied)" or "Using the diskinfo command (Oracle Solaris 11 without SRU 11.4.27.82.1 or later applied)."
- For Oracle Solaris 10
For details, see "Using the diskinfo command (Oracle Solaris 10)."

Using the diskinfo Command (Oracle Solaris 11 with SRU 11.4.27.82.1 or later applied)

1. **Execute the diskinfo command to check the physical disk slot and BB-ID.**
   (1) The device name and logical path name of the disk installed in the HDD4 of BB#00

   (2) The device name and logical path name of the disk installed in the HDD7 of BB#00

```
# 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  (1)
      /dev/chassis/SYS/BB0/HDD5          -
      /dev/chassis/SYS/BB0/HDD6          -
      /dev/chassis/SYS/BB0/HDD7/disk   c5t50000393B81B2446d0  (2)
```

Using the format command (Oracle Solaris 11 without SRU 11.4.27.82.1 or later applied)

1. **Execute the showhardconf command to check the CMUL serial numbers, which show mounting position information, of the chassis.**

```
XSCF> showhardconf
SPARC M10-4S;
    + Serial:2081238017; Operator_Panel_Switch:Service;
    + System_Power:Off; System_Phase:Cabinet Power Off;
    Partition#0 PPAR_Status:Powered Off;
    Partition#1 PPAR_Status:Powered Off;
    BB#00 Status:Normal; Role:Master; Ver:2044h; Serial:2081238017;
        + FRU-Part-Number:CA07361-D202 A1                         ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:0101h; Serial:PP123001Y1  ;
                                            * BB#00 CMUL serial
            + FRU-Part-Number:CA07361-D941 C3   /7060911              ;
            + Memory_Size:128 GB; Type: A ;
            CPU#0 Status:Normal; Ver:4142h; Serial:00321144;
                + Freq:3.000 GHz; Type:0x10;
                + Core:16; Strand:2;
            CPU#1 Status:Normal; Ver:4142h; Serial:00322957;
                + Freq:3.000 GHz; Type:0x10;
                + Core:16; Strand:2;
-----------------------Omitted------------------------
    BB#01 Status:Normal; Role:Standby; Ver:2044h; Serial:2081230011;
        + FRU-Part-Number:CA07361-D202 A1                         ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:0101h; Serial:PP123203N0  ;
                                            * BB#01 CMUL serial
            + FRU-Part-Number:CA07361-D941 C3   /7060911              ;
            + Memory_Size:128 GB; Type: A ;
            CPU#0 Status:Normal; Ver:4142h; Serial:00320804;
                + Freq:3.000 GHz; Type:0x10;
                + Core:16; Strand:2;
            CPU#1 Status:Normal; Ver:4142h; Serial:00321030;
                + Freq:3.000 GHz; Type:0x10;
                + Core:16; Strand:2;
```

```
                MEM#00A Status:Normal;
                    + Code:2c800118KSF1G72PZ-1G6E1 4531-1A94229F;
                    + Type:04; Size:8 GB;
-----------------------Omitted-----------------------
```

2. **Execute the format command to confirm the physical disk slot.**

(1) to (5) in the following example specify the following:

(1): Logical path name of the disk

(2): The disk is mounted in the HDD00 slot of BB#01.

(3): The disk is mounted in the HDD01 slot of BB#01.

(4): The disk is mounted in the HDD00 slot of BB#00.

(5): The disk is mounted in the HDD01 slot of BB#00.

```
# format
Searching for disks...done

AVAILABLE DISK SELECTIONS:
    0. c2t50000394281B5312d0 <TOSHIBA-MBF2600RC-3706 cyl 64986 alt 2 hd 27 sec
 668> <-- (1)
       /pci@8800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000394281b5312,0
       /dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD00/disk <-- (2)
                                              * The last four digits of
the BB#1_CMUL serial number
    1. c2t50000394281B59D6d0 <TOSHIBA-MBF2600RC-3706 cyl 64986 alt 2 hd 27 sec
 668> <-- (1)
       /pci@8800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000394281b59d6,0
       /dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD01/disk <-- (3)
    2. c0t500003942823C8C6d0 <TOSHIBA-MBF2600RC-3706 cyl 64986 alt 2 hd 27 sec
 668> <-- (1)
       /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w500003942823c8c6,0
       /dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD00/disk <-- (4)
                                              * The last four digits of
the BB#0_CMUL serial number
    3. c0t50000394281B517Ad0 <TOSHIBA-MBF2600RC-3706 cyl 64986 alt 2 hd 27 sec
 668> <-- (1)
       /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000394281b517a,0
       /dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD01/disk <-- (5)
Specify disk (enter its number):
```

Using the diskinfo command (Oracle Solaris 11 without SRU 11.4.27.82.1 or later applied)

1. **Execute the showhardconf command to check the CMUL serial numbers, which show mounting position information, of the chassis.**

```
XSCF> showhardconf
SPARC M10-4S;
    + Serial:2081238017; Operator_Panel_Switch:Service;
    + System_Power:Off; System_Phase:Cabinet Power Off;
```

```
    Partition#0 PPAR_Status:Powered Off;
    Partition#1 PPAR_Status:Powered Off;
    BB#00 Status:Normal; Role:Master; Ver:2044h; Serial:2081238017;
        + FRU-Part-Number:CA07361-D202 A1                          ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:0101h; Serial:PP123001Y1  ;
                                            * BB#00 CMUL serial
            + FRU-Part-Number:CA07361-D941 C3   /7060911              ;
            + Memory_Size:128 GB; Type: A ;
            CPU#0 Status:Normal; Ver:4142h; Serial:00321144;
                + Freq:3.000 GHz; Type:0x10;
                + Core:16; Strand:2;
            CPU#1 Status:Normal; Ver:4142h; Serial:00322957;
                + Freq:3.000 GHz; Type:0x10;
                + Core:16; Strand:2;
-----------------------Omitted------------------------
    BB#01 Status:Normal; Role:Standby; Ver:2044h; Serial:2081230011;
        + FRU-Part-Number:CA07361-D202 A1                          ;
        + Power_Supply_System: ;
        + Memory_Size:256 GB;
        CMUL Status:Normal; Ver:0101h; Serial:PP123203N0  ;
                                            * BB#01 CMUL serial
            + FRU-Part-Number:CA07361-D941 C3   /7060911              ;
            + Memory_Size:128 GB; Type: A ;
            CPU#0 Status:Normal; Ver:4142h; Serial:00320804;
                + Freq:3.000 GHz; Type:0x10;
                + Core:16; Strand:2;
            CPU#1 Status:Normal; Ver:4142h; Serial:00321030;
                + Freq:3.000 GHz; Type:0x10;
                + Core:16; Strand:2;
            MEM#00A Status:Normal;
                + Code:2c800118KSF1G72PZ-1G6E1 4531-1A94229F;
                + Type:04; Size:8 GB;
-----------------------Omitted------------------------
```

2. **Execute the diskinfo command to confirm the physical disk slot.**

   (1) to (4) in the example below specify the following:

   (1): The device path name and logical path name of the disk mounted on the HDD0 of BB#01.

   (2): The device path name and logical path name of the disk mounted on the HDD1 of BB#01.

   (3): The device path name and logical path name of the disk mounted on the HDD0 of BB#00.

   (4): The device path name and logical path name of the disk mounted on the HDD1 of BB#00.

```
# diskinfo
D:devchassis-path                                              c:occupant-compdev
-------------------------------------------------------------- ------------------
/dev/chassis/SYS/BB0/CMUL/HDD0                                       -
```

```
/dev/chassis/SYS/BB0/CMUL/HDD1                                    -
/dev/chassis/SYS/BB0/CMUL/HDD2                                    -
/dev/chassis/SYS/BB0/CMUL/HDD3                                    -
/dev/chassis/SYS/BB0/CMUL/HDD4                                    -
/dev/chassis/SYS/BB0/CMUL/HDD5                                    -
/dev/chassis/SYS/BB0/CMUL/HDD6                                    -
/dev/chassis/SYS/BB0/CMUL/HDD7                                    -
/dev/chassis/SYS/BB1/CMUL/HDD0                                    -
/dev/chassis/SYS/BB1/CMUL/HDD1                                    -
/dev/chassis/SYS/BB1/CMUL/HDD2                                    -
/dev/chassis/SYS/BB1/CMUL/HDD3                                    -
/dev/chassis/SYS/BB1/CMUL/HDD4                                    -
/dev/chassis/SYS/BB1/CMUL/HDD5                                    -
/dev/chassis/SYS/BB1/CMUL/HDD6                                    -
/dev/chassis/SYS/BB1/CMUL/HDD7                                    -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD00/disk
c4t50000394281B5312d0 <-- (1)
                                 * The last four digits of the BB#01_CMUL
serial number
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD01/disk
c4t50000394281B59D6d0 <-- (2)
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD02     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD03     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD04     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD05     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD06     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d31bf/03N0_HDD07     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD00/disk
c2t500003942823C8C6d0 <-- (3)
                                 * The last four digits of the BB#00_CMUL
serial number
/dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD01/disk
c2t50000394281B517Ad0 <-- (4)
/dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD02     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD03     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD04     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD05     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD06     -
/dev/chassis/FUJITSU-BBEXP.500000e0e06d237f/01Y1_HDD07     -
```

Using the diskinfo command (Oracle Solaris 10)

1. **Execute the diskinfo command to confirm the physical disk slot and logical system board (LSB).**

   (1) to (4) in the example below specify the following:

   (1): The logical path name of the disk mounted on the HDD0.

   (2): The device path of the disk mounted on the HDD0 of LSB#0.

   (3): The logical path name of the disk mounted on the HDD1.

   (4): The device path of the disk mounted on the HDD1 of LSB#0.

```
# diskinfo -ap

Enclosure path:        2081210007-physical-hba-0
Chassis Serial Number: 2081210007-physical-hba-0
Chassis Model:         ORCL,SPARC64-X

Enclosure path:        /dev/es/ses0
Chassis Serial Number: 500000e0e06d233f
Chassis Model:         FUJITSU-BBEXP

Label    Disk name                   Vendor    Product          Vers
-------- ----------------------      --------  -------------- ----
HDD_0    c0t50000393D8289180d0   TOSHIBA   MBF2600RC        3706 <-- (1)
  Physical path
  ------------------------------
  0: /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000393D8289180,0<-- (2)
       * LSB#0
HDD_1    c0t50000393D82891D0d0   TOSHIBA   MBF2600RC        3706 <-- (3)
  Physical path
  ------------------------------
  0: /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000393D82891D0,0<-- (4)
       * LSB#0
```

Device paths differ depending on the system configuration.

Table 5-6 lists examples of the device paths displayed for logical system boards (LSBs) in a SPARC M10 system.

This table can be used for mapping of the device paths of internal disk drives and the logical system board (LSB) numbers. The letters "WWN" in the table represent the WWN assigned to the disk.

Table 5-6   Disk slot number

LSB No.	Device path
LSB#0	/pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#1	/pci@8800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#2	/pci@9000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#3	/pci@9800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#4	/pci@a000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#5	/pci@a800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#6	/pci@b000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#7	/pci@b800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#8	/pci@c000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#9	/pci@c800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#10	/pci@d000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#11	/pci@d800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#12	/pci@e000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0

Table 5-6	Disk slot number *(continued)*
LSB No.	**Device path**
LSB#13	/pci@e800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#14	/pci@f000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0
LSB#15	/pci@f800/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@wWWN,0

2. **Execute the showboards command to confirm the BB-ID of the chassis in which the disk requiring maintenance is mounted.**
   Identify the BB-ID from the LSB number confirmed in step 1. The BB-ID of the chassis requiring maintenance is indicated by the system board (PSB) number.

```
XSCF> showboards -a
PSB    PPAR-ID(LSB)  Assignment   Pwr   Conn  Conf  Test     Fault
----   ------------  -----------  ----  ----  ----  -------  --------
00-0   00(00)        Assigned     y     y     y     Passed   Normal
* BB#0   * LSB#0
01-0   00(01)        Assigned     y     y     y     Passed   Normal
```

(2) Releasing an internal disk from the system

1. **Execute the cfgadm command to check the configuration of the internal disk.**
   To replace or remove an internal disk, use the cfgadm -al command to check the Ap_ID of the disk requiring maintenance and make a note of it.

   If multiple internal disks are mounted, check for the disk that matches the physical device name confirmed in "(1) Identifying the disk slot."

   In the following execution example, Ap_ID is "c2::dsk/c2t50000394281B59D6d0".

```
# cfgadm -al
Ap_Id                           Type       Receptacle Occupant    Condition
 <Omitted>
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
 <Omitted>
```

2. **Stop all applications from using the internal disk.**
3. **Execute the cfgadm command to release the internal disk requiring maintenance from the system.**
   Enter the Ap_ID you noted in advance.

```
# cfgadm -c unconfigure <Ap_Id>
```

4. **Execute the cfgadm command to confirm that the internal disk requiring maintenance is disconnected.**
   The disconnected internal disk is displayed as "unconfigured."

```
# cfgadm -al
Ap_Id                            Type      Receptacle Occupant    Condition
 <Omitted>
c2                               scsi-sas  connected configured   unknown
c2::dsk/c2t50000394281B4D9Ad0 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
 <Omitted>
```

5. **Execute the cfgadm command to identify the location of the internal disk requiring maintenance by causing the CHECK LED of the disk to blink.**
   Enter the Ap_ID you noted in advance.

```
# cfgadm -x led=fault,mode=blink <Ap_ID>
```

6. **Check the following LEDs to determine whether the internal disk requiring maintenance can be removed:**
   - READY LED (green) of the internal disk: On
   - CHECK LED (amber) of the internal disk: Blinking

5.4.3 Releasing a chassis requiring maintenance from the physical partition

This section describes the procedure for releasing a chassis requiring maintenance by using dynamic reconfiguration (PPAR DR) for the physical partition. The procedure described here is applicable only to a system with a building block configuration.

Note - For the versions of XCP and Oracle VM Server for SPARC/SRU that support dynamic reconfiguration (PPAR DR) of a physical partition, see the latest *Product Notes*.

Note - To use the dynamic reconfiguration (PPAR DR) function for physical partitions, you need configure the logical domains in advance according to "2.5 Dynamic Reconfiguration Conditions and Settings" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

1. **Confirm that the logical domains are not using the I/O devices in the chassis requiring maintenance.**
   For details, see "5.3.1 Checking the operating condition of the physical partition or logical domain" to "5.4.1 Releasing the assignment of I/O devices."

2. **Log in to the XSCF shell.**

3. **If the server requiring maintenance is operating as the master chassis, execute the switchscf command to switch the master XSCF to the standby XSCF.**
   Enter "y" in response to the confirmation message.

   If the chassis requiring maintenance is the slave XSCF, go to step 5.

   ```
   XSCF> switchscf -t Master
   The XSCF unit switch between the Master and Standby states.
   Continue? [y|n] :y
   ```

4. **Log in to the XSCF again.**

5. **Execute the showboards command to check the status of the server connected to the chassis requiring maintenance.**
   The BB-ID of the chassis requiring maintenance is indicated by the system board (PSB) number.

   In the following example, the [Fault] column displays "Degraded" for PSB 00-0, indicating that the system board is operating with some faulty parts.

   ```
   XSCF> showboards -va
   PSB   PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
   ----  ------------ ----------- ---- ---- ---- ------- --------
   00-0 00(00)        Assigned    y    y    y    Passed  Degraded
   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
   ```

6. **Execute the deleteboard command with the -c disconnect option specified to release the chassis requiring maintenance from the physical partition.**
   If you have not manually released any of the following resources beforehand, be sure to specify the "-m unbind=resource" option: CPU core, memory, and PCIe root complex. With this option specified, the command automatically deletes the resource and then releases the system board.

   Note - The -m unbind=resource option of the deleteboard command is supported by Oracle VM Server for SPARC 3.2 or later.

   In the following example, PSB 00-0 is released from the physical partition.

   ```
   XSCF> deleteboard -c disconnect 00-0
   ```

7. **Execute the showresult command to check the end status of the deleteboard**

command that was just executed.
The following example shows that "0" was returned as the end status since the execution of the deleteboard command completed successfully.

```
XSCF> showresult
0
```

8. **Execute the showboards command to confirm that the chassis requiring maintenance has been released from the physical partition.**
In the following example, the [Pwr], [Conn], and [Conf] columns all display "n" for PSB 00-0, indicating that PSB 00-0 has been released.

```
XSCF> showboards -a
PSB   PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
----  ------------ ----------- ---- ---- ---- ------- --------
00-0  00(00)       Assigned    n    n    n    Passed  Degraded
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
```

9. **Execute the ldm list-domain command from the control domain console of the physical partition to check for any change in the operating condition of the logical domains after the deletion of the system board.**

5.5 Powering Off the Physical Partition Requiring Maintenance

This section describes the procedure for powering off the physical partition requiring maintenance. This applies if the system has a building block configuration and is operating in multiple physical partitions.

Note - Before stopping physical partitions, inform the users of those physical partitions that the physical partitions will be stopped.

Note - When a physical partition is stopped by the operation of the XSCF command or the operation panel, all the logical domains on the physical partition are stopped. Stop applications as required.

1. **Log in to the XSCF shell.**

2. **If the chassis requiring maintenance is operating as the master chassis, execute the switchscf command to switch the master XSCF to the standby XSCF.**
Enter "y" in response to the confirmation message.

If the chassis requiring maintenance is the slave XSCF, go to step 4.

```
XSCF> switchscf -t Master
The XSCF unit switch between the Master and Standby states.
 Continue? [y|n] :y
```

3. **Log in to the master XSCF again.**

4. **Execute the showpparstatus command to check the operating condition of the physical partition.**
   In the following example, [PPAR STATUS] displays "Running" for PPAR-ID 00, indicating that the physical partition is operating.

```
XSCF> showpparstatus -p 0
PPAR-ID        PPAR Status
00             Running
```

5. **Execute the showdomainstatus command to check the operating condition of the logical domains.**
   In the following example, [Status] of the logical domain displays "Solaris running", which indicates that Oracle Solaris is operating.

```
XSCF>  showdomainstatus -p 0
Logical Domain Name    Status
primary                Solaris running
4S-159-D0-G0           Solaris running
4S-159-D0-G1           Solaris running
4S-159-D0-G2           Solaris running
```

6. **Execute the showboards command to check the status of the chassis requiring maintenance.**
   The BB-ID of the chassis requiring maintenance is indicated by the system board (PSB) number.

   In the following example, we can see that [PPAR-ID] of PSB 00-0 is "00."

```
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
```

7. **Execute the poweroff command to stop all the logical domains on the physical partition requiring maintenance.**
   Enter "y" in response to the confirmation message.

```
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".
```

8. **Execute the showpparstatus command to confirm that the power to the physical partition has been turned off.**
   In the following example, [PPAR Status] of PPAR-ID 00 displays "Powered Off", which indicates that the power to the physical partition has been turned off.

```
XSCF> showpparstatus -p 0
PPAR-ID        PPAR Status
00             Powered Off
```

5.6 Stopping the Entire System

This section describes the procedure for stopping the entire system. To undertake system-stopped maintenance, power off all the physical partitions to stop the entire system before physically removing any FRU.
Stop the system in either of the following two ways.

- Stopping the system with the XSCF command
- Stopping the system from the operation panel

Note - Before stopping the system, inform the users that the system will be stopped.

Note - When a physical partition is stopped by the operation of the XSCF command or the operation panel, all the logical domains on the physical partition are stopped. Stop applications as required.

5.6.1 Stopping the system with the XSCF command

1. **Confirm that the mode switch on the operation panel is in Service mode.**

2. **Log in to the XSCF shell.**

3. **Execute the poweroff command.**
   Enter "y" in response to the confirmation message.

   In the following example, the displayed status of PPAR-IDs 00, 01, and 02 is

"Powering off," so you can see that the power-off instruction for the physical partition completed successfully.

```
XSCF> poweroff -a
PPAR-IDs to power off:00,01,02
Continue? [y|n] :y
00 : Powering off
01 : Powering off
02 : Powering off
```

The following processes are performed.

- Oracle Solaris is completely shut down.

- The system stops and enters the POWERON READY state (The XSCF is running).

Note - The order in which logical domains shut down depends on the shut-down group setting of Oracle VM Server for SPARC.

4. **Confirm that the POWER LED on the operation panel is off.**

Note - For a building block configuration, check the POWER LEDs on all the chassis that make up the system.

5. **Execute the showpparstatus command to confirm that the power to the physical partition has been turned off.**
   In the following example, [PPAR Status] displays "Powered Off" for PPAR-IDs 00, 01, and 02, indicating that the power to all the physical partitions has been turned off.

```
XSCF> showpparstatus -a
PPAR-ID        PPAR Status
00             Powered Off
01             Powered Off
02             Powered Off
```

6. **Execute the showdomainstatus command to check the operating condition of the logical domains.**
   In the following example, [Status] of the logical domain displays "Solaris powering down", which indicates that Oracle Solaris is powering off.

```
XSCF> showdomainstatus -p 0
Logical Domain Name   Status
primary               Solaris powering down
4S-159-D0-G0          Solaris powering down
4S-159-D0-G1          Solaris powering down
4S-159-D0-G2          Solaris powering down
```

5.6.2 Stopping the system from the operation panel

1. **Confirm that the mode switch on the operation panel is in Service mode.**

2. **Press the power switch on the operation panel for 4 seconds or more.**
   For details, see "2.3.2   Control function of the operation panel."

Note - For a building block configuration, press the power switch on the master chassis. The power switches of the other chassis are disabled.

---

3. **Confirm that the POWER LED on the operation panel is off.**

Note - For a building block configuration, check the POWER LEDs on all the chassis that make up the system.

---

4. **Execute the showpparstatus command to confirm that the power to the physical partition has been turned off.**
   In the following example, [PPAR Status] displays "Powered Off" for PPAR-IDs 00, 01, and 02, indicating that the power to all the physical partitions has been turned off.

```
XSCF> showpparstatus -a
PPAR-ID         PPAR Status
00              Powered Off
01              Powered Off
02              Powered Off
```

5. **Execute the showdomainstatus command to check the operating condition of the logical domains.**
   In the following example, [Status] of the logical domain displays "Solaris powering down", which indicates that Oracle Solaris is powering off.

```
XSCF> showdomainstatus -p 0
Logical Domain Name   Status
primary               Solaris powering down
4S-159-D0-G0          Solaris powering down
4S-159-D0-G1          Solaris powering down
4S-159-D0-G2          Solaris powering down
```

5.7   Saving XSCF Setting Information

This section describes how to save the following XSCF setting information:

- Network configuration information, advanced setting information, guest domain configuration information, etc.
- CPU Activation key, CPU Activation assignment, etc.
- PPAR operation mode, time zone setting, user information, etc.

The following example shows the command for saving the XSCF setting information on the USB device. 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*.

```
XSCF> dumpconfig -v -V file:///media/usb_msd/system.cfg
```

5.8 Releasing a SPARC M10-4/M10-4S FRU from the System with the replacefru Command

The FRUs subject to the operation described here are as follows:
- Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)
- Releasing of the power supply unit and fan unit of the SPARC M10-4/M10-4S

5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)

In this section, power off the SPARC M10-4S requiring maintenance by using the replacefru command.

In the following execution example, maintenance is performed on an abnormal (Degraded) BB#0 chassis with four SPARC M10-4S units in a building block configuration.

Even in cases where the status of the SPARC M10-4S 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. **From the numeric keypad, select the FRU requiring maintenance.**
   Since BB#0 is "Degraded," "1" is entered.

```
--------------------------------------------------------------------------------
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. **From the numeric keypad, select the FRU requiring maintenance.**
   Since the SPARC M10-4S chassis itself is to be maintained, "1" is entered.

```
--------------------------------------------------------------------------------
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)
--------------------------------------------------------------------------------
Select [1-3|c:cancel] :1
```

*1 The above "1. BB itself" is also displayed for the SPARC M10-4. However, the replacefru command cannot be used for maintenance of the chassis itself in the SPARC M10-4, so the maintenance work will be interrupted.

5. **From the numeric keypad, select the faulty FRU.**
   Since BB#0 was confirmed faulty in step 3, "1" is also entered here.

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select a FRU to be replaced.

No. FRU                 Status
--- ------------------- --------------
 1  /BB#0               Degraded
--------------------------------------------------------------------------------
Select [1|b:back] :1
```

6. **After confirming that the selected FRU is displayed, 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 a SPARC M10-4S chassis itself, confirm that the system locator on the

chassis is blinking.

For details on the locations of LEDs, see "2.4.2   LEDs on the rear panel (System locator)" and "2.4.3   LEDs on each component."

```
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] :
```

You can now start FRU maintenance. Do not enter "f" until you complete the maintenance work.

After replacing the FRU, perform the work in "6.2.1   Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)" to incorporate the FRU into the system.

5.8.2 Releasing of the power supply unit and fan unit of the SPARC M10-4/M10-4S

In the following execution example, maintenance is performed on the power supply unit (PSU) of the SPARC M10-4/M10-4S.

1. **Log in to the XSCF shell.**

2. **Execute the replacefru command to display the maintenance menu.**

```
XSCF> replacefru
```

3. **From the numeric keypad, select the FRU requiring maintenance.**
   Since the power supply unit (PSU) of the SPARC M10-4 (BB#0) is to be maintained, "1" is entered.

```
-----------------------------------------------------------------------------
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. **From the numeric keypad, select the FRU requiring maintenance.**
   Since the power supply unit (PSU) of the SPARC M10-4 is to be maintained, "3"
   is entered.

```
--------------------------------------------------------------------------------
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)
--------------------------------------------------------------------------------
Select [1-3|c:cancel] :3
```

5. **From the numeric keypad, select the faulty FRU.**
   Since PSU#0 of BB#0 was confirmed faulty, "1" is entered.

```
--------------------------------------------------------------------------------
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
--------------------------------------------------------------------------------
Select [1|b:back] :1
```

6. **After confirming that the selected FRU is displayed, enter "r".**

```
You are about to replace BB#0/PSU#0.
Do you want to continue?[r:replace|c:cancel] :r
```

7. **Replace the target FRU when a message is output about replacing the FRU.**

```
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] :
```

You can now start FRU maintenance. Do not enter "f" until you complete the
maintenance work.

After replacing the FRU, perform the work in "6.2.2   Incorporation of the power supply unit and fan unit of the SPARC M10-4/M10-4S" to incorporate the FRU into the system.

5.9   Accessing a FRU

This section describes the operations that must be completed before access to the FRU requiring maintenance.

5.9.1   Removing the crossbar cables from the cable support

Perform these operations when the SPARC M10-4S has a building block configuration and when maintaining any of the following FRUs:
- CPU memory unit
- Memory
- PSU backplane unit
- Operation panel

1. **Remove the crossbar cables from the cable support.**
    Perform this procedure only when using equipment rack model 26xx or equipment rack model 16xx. The procedure may vary depending on the model of the equipment rack.

    If you are not using 19-inch rack model 26xx or 19-inch rack model 16xx, this work is not required.

    Procedure when equipment rack model 26xx is used

    a. Remove all the crossbar cables from the crossbar unit.

    Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

    ---

    b. Remove the hook-and-loop fastener (A in the figure) of the cable support, securing the crossbar cables.

Figure 5-1   Hook-and-loop fastener of the cable support

A
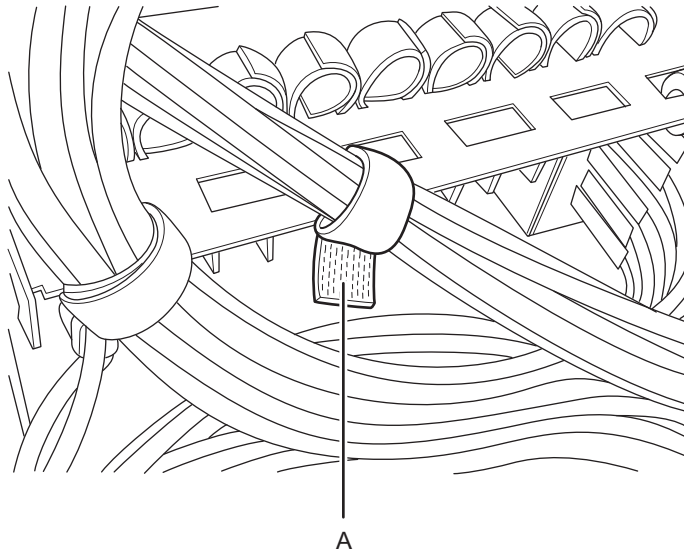
c. Remove the screw securing the cable holder (A in Figure 5-2) that is fixed to the supporting column at the rear of the rack. Then, install the cable holder by rotating it 180 degrees.

Figure 5-2   Cable holder screw

A
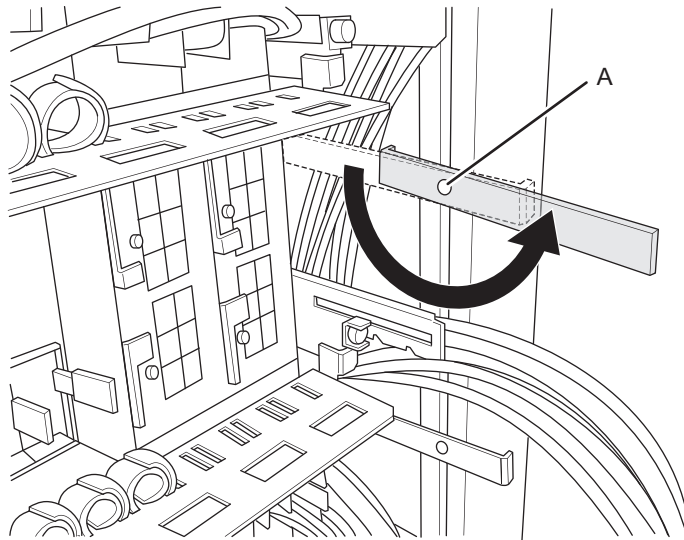
d. Use the hook-and-loop fastener to secure the crossbar cables to the cable holder.

Figure 5-3   Fixing crossbar cables
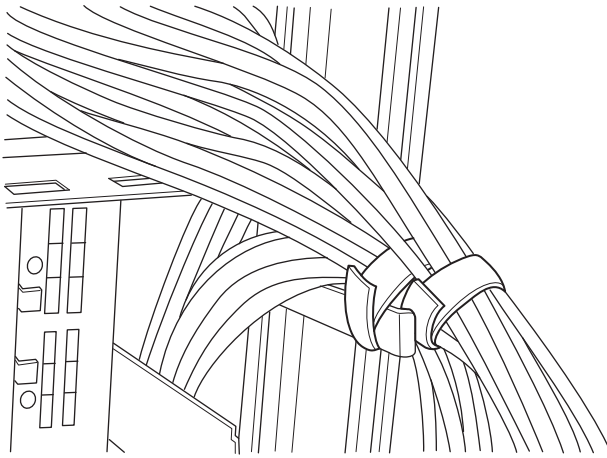
Procedure when equipment rack model 16xx is used

a. Remove all the crossbar cables from the crossbar unit.

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

b. Remove the hook-and-loop fastener (A in Figure 5-4) of the cable support, securing the crossbar cables.

Figure 5-4   Hook-and-loop fastener of the cable support

A
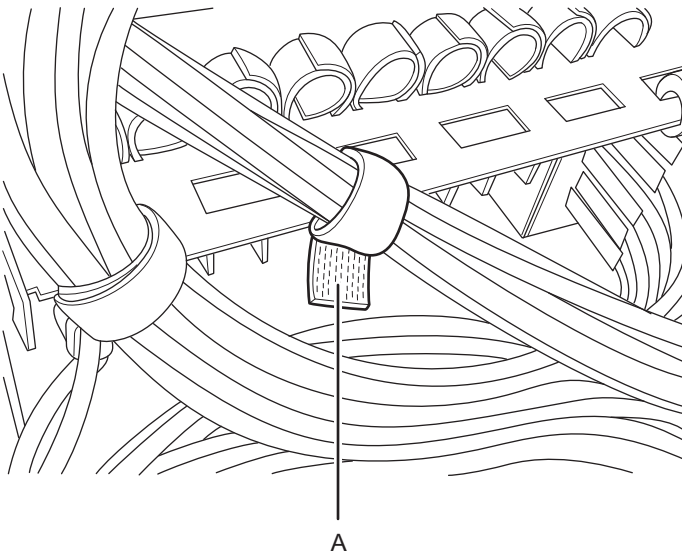
c. Use the hook-and-loop fastener to secure the crossbar cables to the cable holder installed on the supporting column at the rear of the rack.

Figure 5-5   Fixing crossbar cables
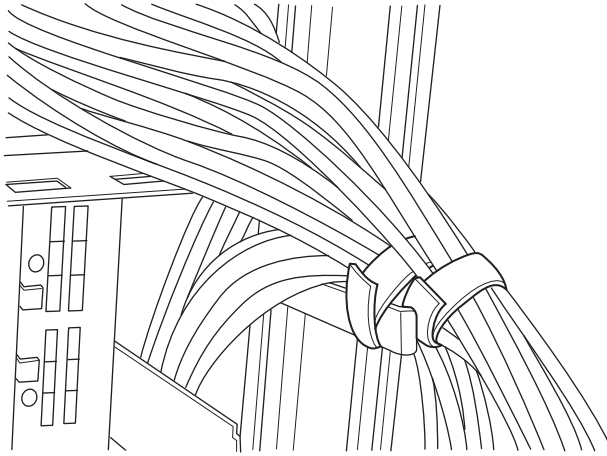
5.9.2   Lowering the cable support

To perform maintenance on the following FRUs from the rear of the chassis, lower the cable support before starting the work:
- PCI Express card
- CPU memory unit
- Memory
- PSU backplane unit
- Operation panel
- Crossbar unit

1. **Loosen the right and left screws securing the cable support, and unlock it by pulling the upper and lower metal fittings toward yourself (in the direction of the arrow).**

Figure 5-6   Locations of screws holding the cable support
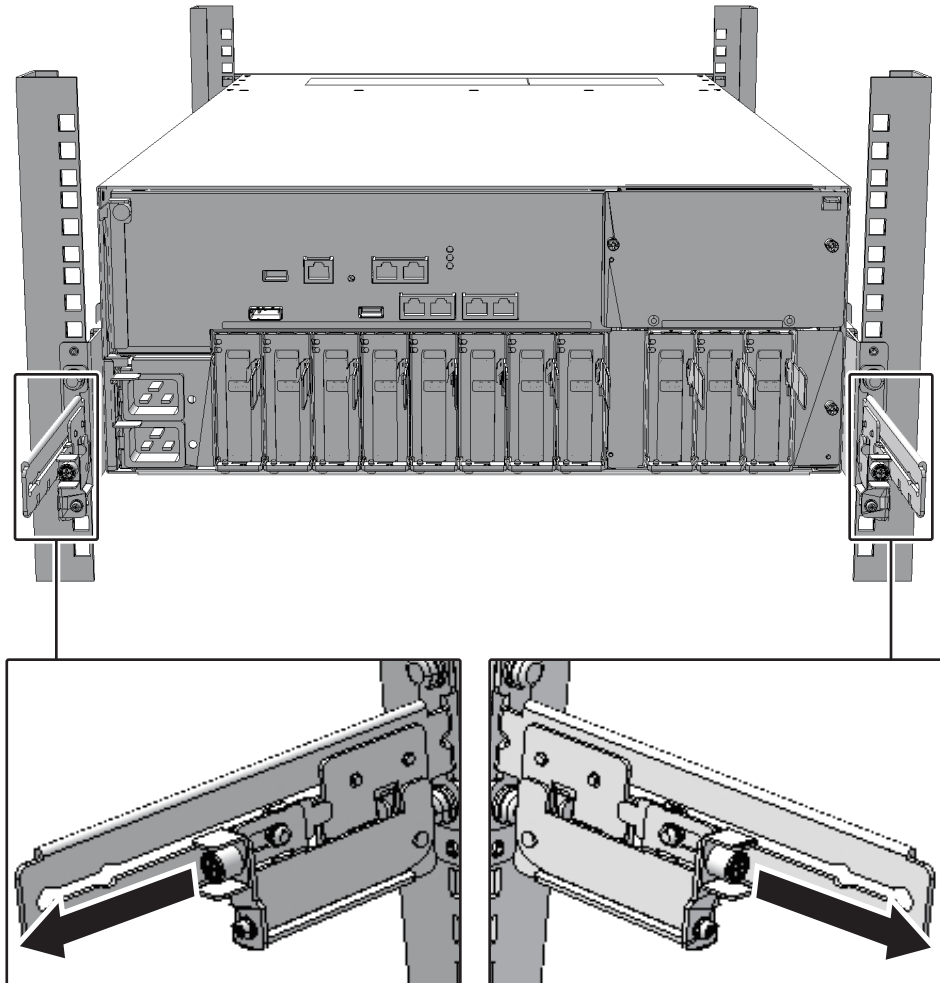
2.   **Lower the cable support.**

5.9.3   Lowering the cable support (if it is a new model)

To perform maintenance on the following FRUs from the rear of the chassis, lower the cable support before starting the work:
- PCI Express card
- CPU memory unit
- Memory
- PSU backplane unit
- Operation panel
- Crossbar unit

1.   **Loosen the right and left screws (A in Figure 5-7) securing the cable support.**

Figure 5-7   Locations of screws holding the cable support
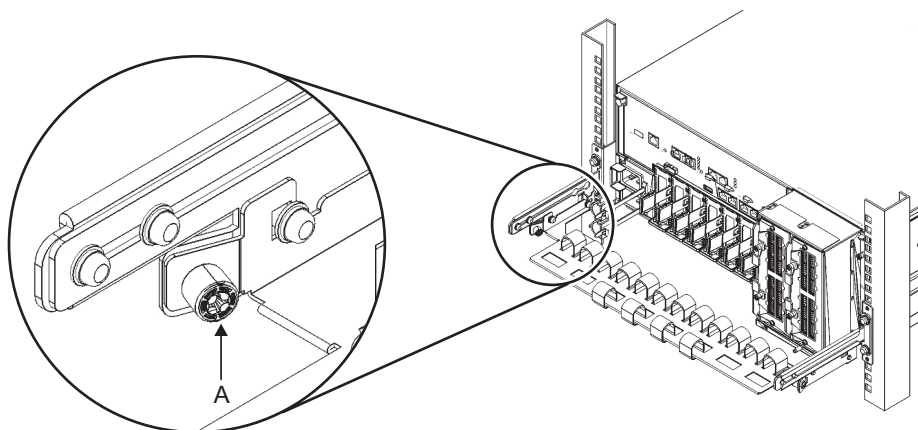
2. **Lift the cable support to release the hooks (B in Figure 5-8), and pull the cable support toward you.**

Figure 5-8   Releasing the cable support
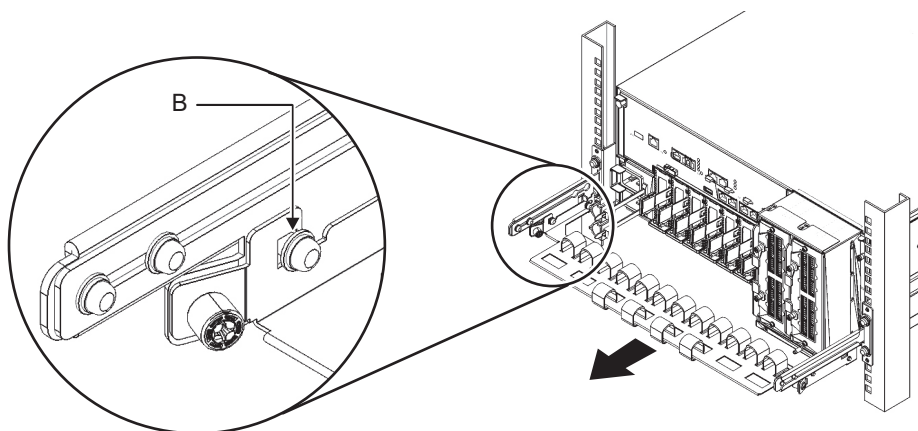
3. **Lower the cable support.**

Figure 5-9   Handling the cable support
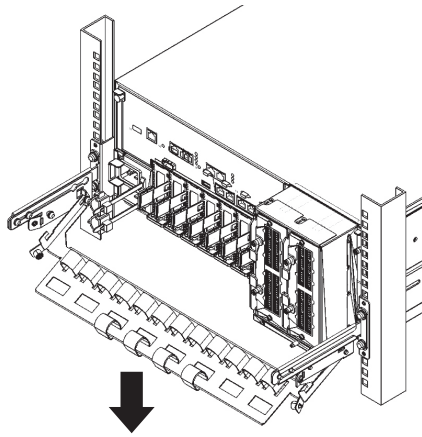
5.9.4   Removing the power cord

To perform work in cold maintenance, remove the power cord of the SPARC M10-4/
M10-4S. Remove the cable clamp from each power cord, and then remove the power
cords.
For system-stopped/all power-off cold maintenance, remove all the SPARC M10-4S
power cords.

1.   **Release the latch (A in Figure 5-10) of the cable clamp.**

Figure 5-10   Removing the cable clamp
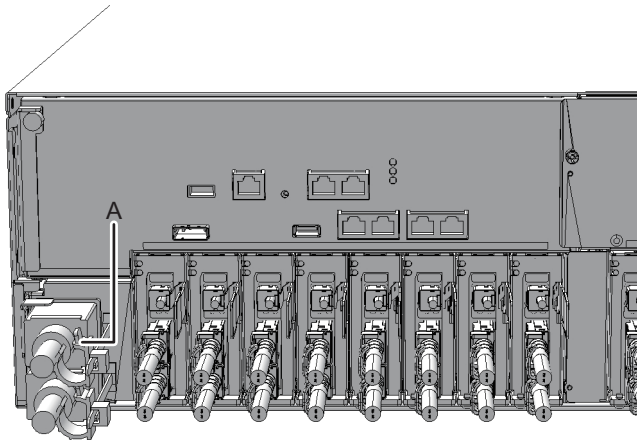
2.   **Remove the power cord from the PSU backplane unit.**

Figure 5-11   Removing the power cord
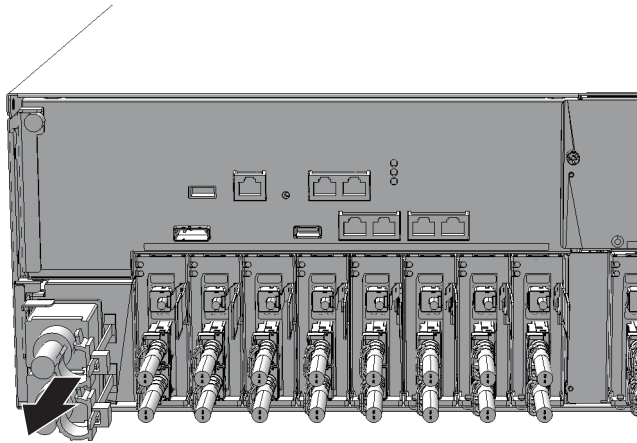
5.9.5   Removing the front cover

To perform maintenance on the following FRUs from the front of the chassis, remove the front cover before starting the work:
- Fan unit
- Power supply unit
- PSU backplane unit
- Operation panel

1. **Release the right and left slide locks of the front cover and pull it toward the front.**

Figure 5-12   Releasing the slide locks of the front cover
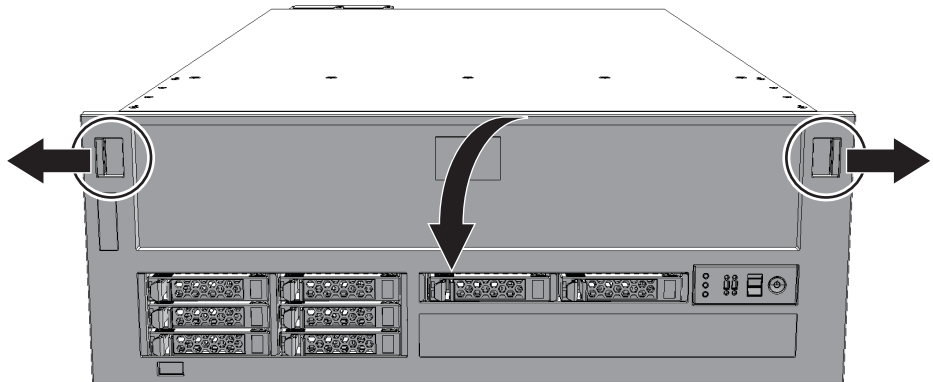
2. **Lift the front cover upward to remove it.**

Chapter 6

Restoring the System

This chapter describes the procedures required to restore the system after FRU maintenance. See this chapter, as required, when performing maintenance on each FRU described in Chapter 8 onward.

- Restoring the Chassis
- Incorporating a SPARC M10-4/M10-4S FRU into the System with the replacefru Command
- Diagnosing a Replacement FRU
- Restoring XSCF Setting Information
- Incorporating a Chassis and I/O Device into a Physical Partition
- Returning the Mode Switch to Locked Mode
- Powering On the Physical Partition Requiring Maintenance
- Starting the Entire System

6.1   Restoring the Chassis

This section describes operations required to restore the chassis.

6.1.1   Installing the power cord

If the power cord of the SPARC M10-4/M10-4S was removed to perform the maintenance work, connect the power cord and then attach the cable clamp to the power cord.
For system-stopped/all power-off cold maintenance, install all the SPARC M10-4S power cords.

1. **Connect the power cord to the PSU backplane unit.**
    Insert the power cord straight into the PSU backplane unit all the way.

Figure 6-1   Installing the power cord
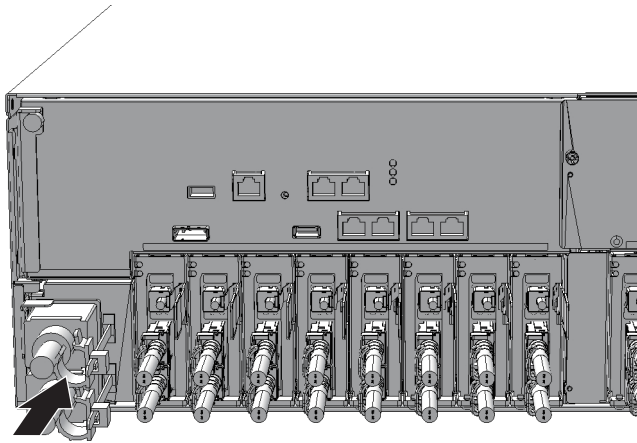
2. **Clip the power cords with the cable clamp, and secure the cable clamp.**
    Lock the latch (A in Figure 6-2) and then push the cable clamp toward the front
    of the chassis to firmly secure the cable clamp.

Figure 6-2   Locking the cable clamp
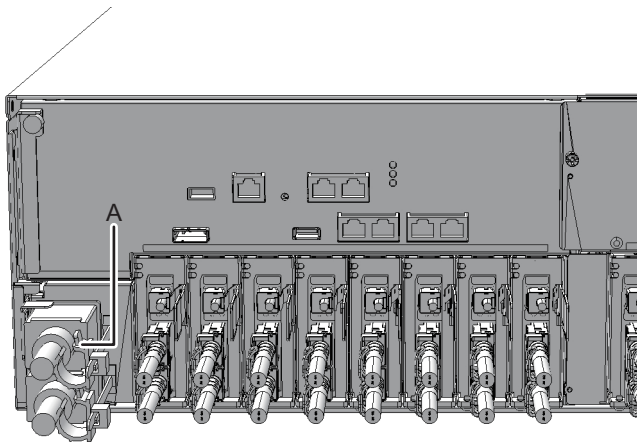
6.1.2   Fixing the cable support

After performing maintenance on a FRU at the rear of the SPARC M10-4/M10-4S, lift
the cable support and fix it in place.

1. **Lift the cable support and lock it in place by pushing the upper and lower
    screw fittings toward the back (direction of the arrow).**

Figure 6-3   Locking the cable support
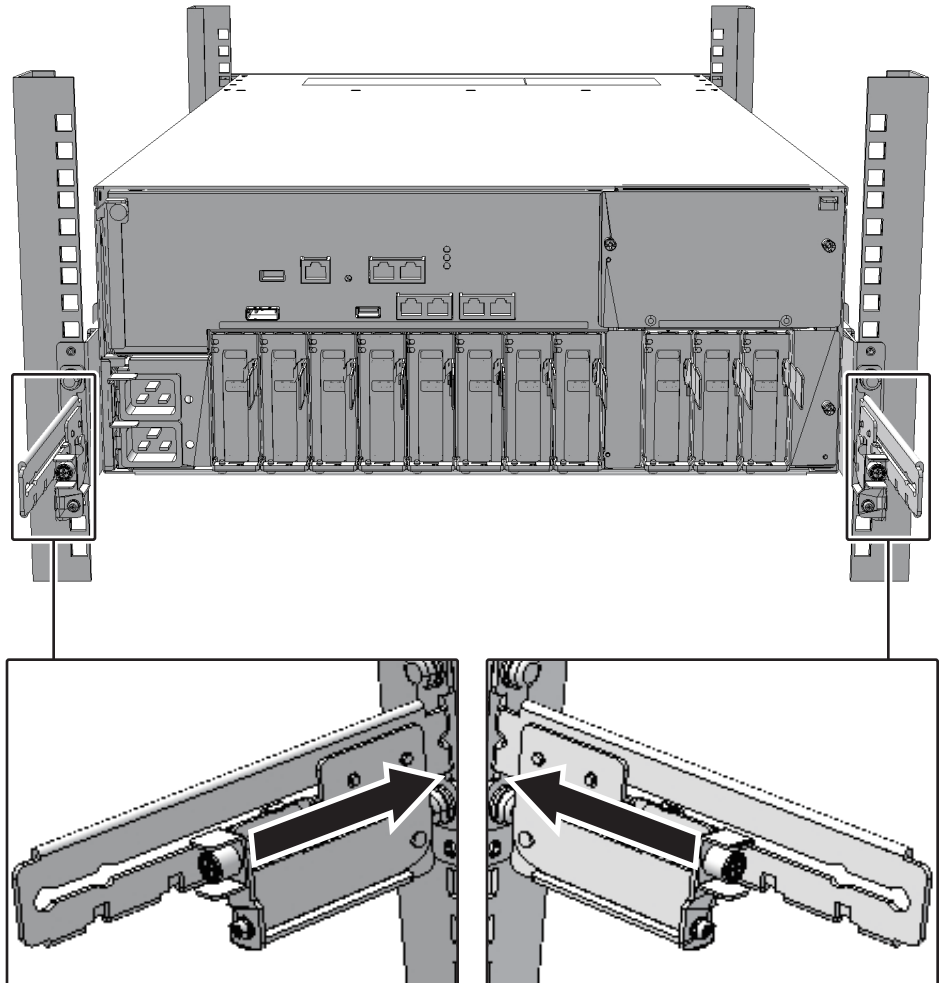
2.   **Tighten the right and left screws to fix the cable support in place.**

Note - Check that the cable support is firmly attached and fixed.

6.1.3   Fixing the cable support (if it is a new model)

After performing maintenance on a FRU at the rear of the SPARC M10-4/M10-4S, lift the cable support and fix it in place.

1.   **Lift the cable support and fasten the hooks (B in Figure 6-4) on the screws (C in Figure 6-4).**

Figure 6-4   Handling the cable support
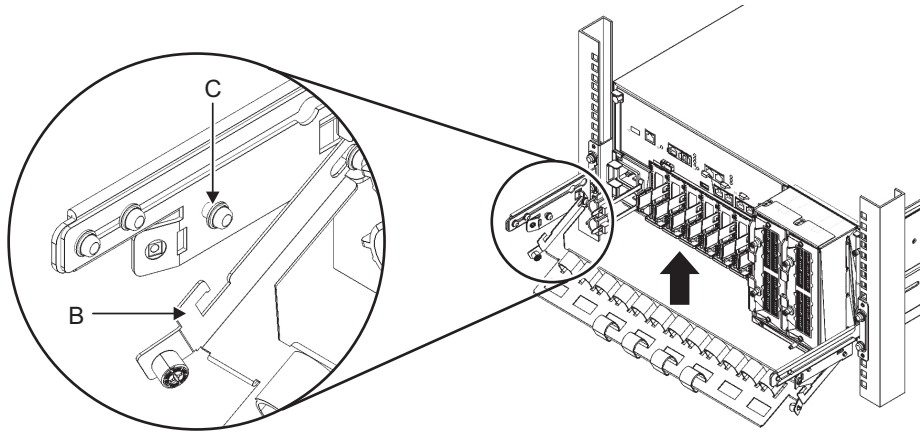
2. **Tighten the right and left screws (A in Figure 6-5) to fix the cable support in place.**

Figure 6-5   Locking the cable support
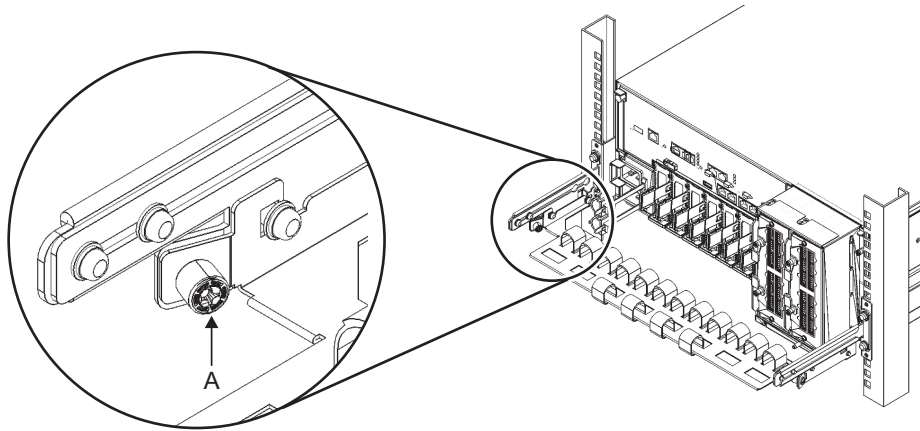
6.1.4   Attaching the crossbar cables to the cable support

After maintenance with the crossbar cables removed is done in a building block configuration of the SPARC M10-4S, restore the cables to their original state.

1. **Connect the crossbar cables to the cable support.**
    Perform this procedure only when equipment rack model 26xx or equipment rack model 16xx is used. The procedure may vary depending on the model of the equipment rack.

    Procedure when equipment rack model 26xx is used

    a. Remove the hook-and-loop fastener of the crossbar cables from the cable

holder.

b. Remove the screw securing the cable holder, and then rotate the cable holder by 180 degrees to install it on the supporting column at the rear of the rack.

c. Connect all the crossbar cables to the crossbar unit.
For details, see "14.4   Installing the Crossbar Cables."

d. Use the hook-and-loop fastener to fix the crossbar cables in place to the cable support.

Procedure when equipment rack model 16xx is used

a. Remove the crossbar cables from the hook-and-loop fastener installed on the supporting column at the rear of the rack.

b. Connect all the crossbar cables to the crossbar unit.
For details, see "14.4   Installing the Crossbar Cables."

c. Use the hook-and-loop fastener to fix the crossbar cables in place to the cable support.

Note - Connect the crossbar cables in their original positions by referring to the notes that you made before the start of maintenance.

6.1.5   Installing the front cover

If the front cover of the SPARC M10-4/M10-4S was removed for maintenance to install a FRU at the front of or inside the chassis, install the front cover after installing the FRU.

1. **To install the front cover, insert the tabs of the front cover into the notches at the bottom front of the chassis.**

Figure 6-6   Installing the front cover
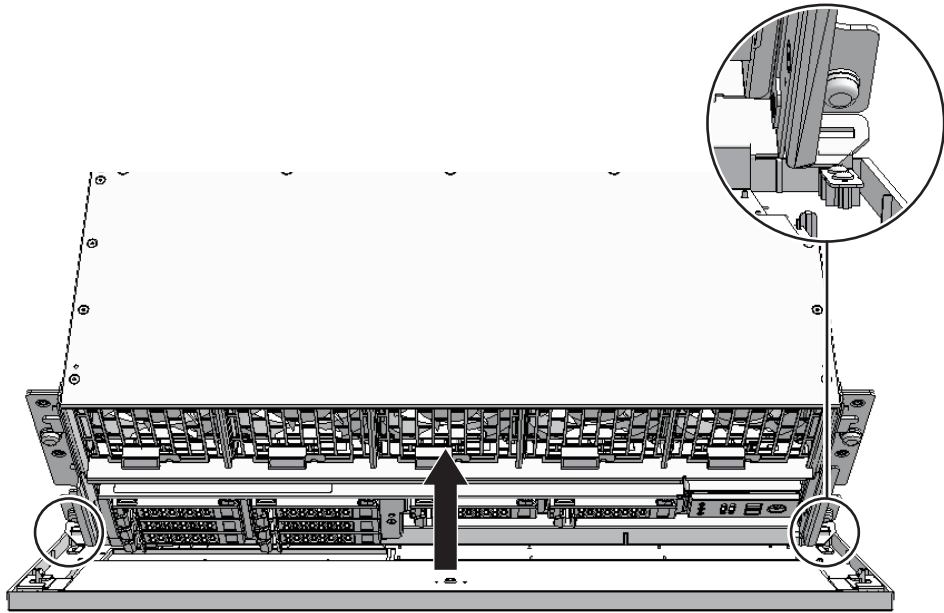
Note - Check that the front cover is firmly attached and fixed.

6.2   Incorporating a SPARC M10-4/M10-4S FRU into the System with the replacefru Command

The FRUs subject to the operation described here are as follows:

- Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)
- Incorporation of the power supply unit and fan unit of the SPARC M10-4/M10-4S

6.2.1   Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)

This section describes the procedure for incorporating a FRU into the system after

maintenance.

After replacing the FRU in step 7 in "5.8.1   Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)," continue here.

1. **After completing maintenance of the target FRU, return to the replacefru command operation of the XSCF firmware, 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
```

Entering "f" displays the following screen. Wait until the processing has completed.

```
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. **After confirming that the FRU to be diagnosed is displayed, enter "s".**

```
Do you want to start to diagnose BB#0?[s:start|c:cancel] :s
```

Note - If you are replacing the PCI Express card or internal disk, enter "c" to cancel the SPARC M10-4S diagnosis. After finishing the steps described in this section, see "6.3.1 Diagnosing the system board," and perform a diagnosis by executing the testsb command with the -v, -p, or -s option specified.

3. **After confirming again that the FRU to be diagnosed is displayed, enter "y".**

```
Diagnostic tests for BB#0 have started.
Initial diagnosis is about to start, Continue?[y|n] :y
```

The following screen is displayed. Wait until the processing has completed.

```
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
```

4. **Confirm that the status is normal ("Normal") after the replacement, and then enter "f".**

```
-------------------------------------------------------------------------------
Maintenance/Replacement Menu
Status of the replaced FRU.

FRU                 Status
------------------- --------------
/BB#0               Normal
-------------------------------------------------------------------------------
The replacement of BB#0 has completed normally.[f:finish] :f
```

5. **When the maintenance menu appears, enter "c" to exit the operation.**

```
-------------------------------------------------------------------------------
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
```

6.2.2 Incorporation of the power supply unit and fan unit of the SPARC M10-4/M10-4S

This section describes the procedure for incorporating a FRU into the system after

maintenance.

After replacing the FRU in step 7 in "5.8.2   Releasing of the power supply unit and fan unit of the SPARC M10-4/M10-4S," continue here.

1. **After completing maintenance of the target FRU, return to the replacefru command operation of the XSCF firmware, and enter "f".**
   After maintenance on the power supply unit (PSU), connect the power cord. Then, after 10 seconds elapse, 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
```

Entering "f" displays the following screen. Wait until the processing has completed.

```
Waiting for BB#0/PSU#0 to enter install state.
[This operation may take up to 10 second(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..done
```

2. **Confirm that the status is normal ("Normal") after the replacement, and then enter "f".**

```
-------------------------------------------------------------------------------
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
```

3. **When the maintenance menu appears, enter "c" to exit the operation.**

```
-------------------------------------------------------------------------------
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
```

6.3 Diagnosing a Replacement FRU

This section describes the diagnosis function for checking whether a replacement FRU is operating normally. For details on the command, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual* for the XCP firmware version being used.

6.3.1 Diagnosing the system board

This section shows an example of the command for diagnosing the system board. Use the testsb command to diagnose the system board.

In the following example, an initial diagnosis of the system board for PSB 01-0 and a check of the connected I/O are performed.

<Description of options>
-v: Additionally displays a detailed message from the initial diagnosis.
-p: During diagnosis processing, executes the "probe-scsi-all" command of the OpenBoot PROM and displays the result.
-s: During diagnosis processing, executes the "show-devs" command of the OpenBoot PROM and displays the result.

```
XSCF> testsb -v -p -s 01-0
Initial diagnosis is about to start, Continue? [y|n] :y
PSB#01-0 powered on sequence started.
...
<<xxxxxxxx>>
...
{0} ok
...
<<xxxxxxxx>>
...
<<xxxxxxxx>>
...
SB powered off.
PSB  Test     Fault
---- -------  --------
01-0 Passed   Normal
```

Typically, a diagnosis of the system board is performed arbitrarily after it is

incorporated into the system in maintenance of the SPARC M10-4S chassis (including the CPU memory unit) with the replacefru command.

6.3.2 Diagnosing the crossbar unit and crossbar cables

This section shows an example of the command for diagnosing the crossbar unit mounted in the SPARC M10-4S chassis in a system with a building block configuration. The command also diagnoses the crossbar cables in the chassis and their connection status.

The following example shows the command for diagnosing the crossbar cable between PPAR-ID 0 and BB-ID#1, and the crossbar unit.

<Description of options>
-b: Specifies the BB-ID of the SPARC M10-4S chassis for which bb_id diagnosis is started.
   bb_id can be an integer from 0 to 3 for the SPARC M10-4S (without the crossbar box) or 0 to 15 for the SPARC M10-4S (with a crossbar box). This option can be specified with -t or -p.
-p: Specifies the PPAR-ID of the physical partition on which the SPARC M10-4S chassis that is the destination of ppar_id communication is operating. An integer from 0 to 15 can be specified as the ppar_id, depending on the system configuration.

```
XSCF> diagxbu -b 1 -p 0
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".
```

Even during maintenance on the SPARC M10-4S chassis (including the CPU memory unit) with the replacefru command, the diagxbu command is not executed. After SPARC M10-4S maintenance work with the crossbar unit and crossbar cables removed, use the diagxbu command to diagnose the condition of the crossbar unit and crossbar cables and the crossbar cable connection status.

6.3.3 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. **Execute the showstatus command.**
   Nothing is displayed when it is normal.

```
XSCF> showstatus
```

3. **Execute the showlogs error command.**
   Confirm that no new errors are displayed.

```
XSCF> showlogs error
```

4. **Execute the showhardconf command.**
   Confirm that no asterisk (*) is displayed in front of any FRU.

```
XSCF> showhardconf
SPARC M10-4;
    + Serial:2081230012; Operator_Panel_Switch:Service;
    + System_Power:Off; System_Phase:Cabinet Power Off;
    BB#00 Status:Normal; Role:Master; Ver:2209h; Serial:2081231002;
        + FRU-Part-Number:CA07361-D203 A2   /9999999               ;
        + Power_Supply_System:Single;
        + Memory_Size:512 GB;
    CMUL Status:Normal; Ver:0301h; Serial:PP140601D9  ;
            + FRU-Part-Number:CA07361-D251 A4   /9999999                ;
            + Memory_Size:256 GB; Type: B ;  (*1)
        CPU#0 Status:Normal; Ver:4142h; Serial:00020203;
                + Freq:3.700 GHz; Type:0x20; (*2)
                + Core:16; Strand:2;         (*3)
-----------------------Omitted-----------------------
        PCI#0 Status:Normal; Name_Property:pci;
            + Vendor-ID:108e; Device-ID:9020;
            + Subsystem_Vendor-ID:0000; Subsystem-ID:0000;
            + Model:;
            + Connection:7001;
            PCIBOX#7001; Status:Faulted; Ver:1110h; Serial:2121237001;
                + FRU-Part-Number:;
                IOB Status:Normal; Serial:PP123403JE ;
                    + FRU-Part-Number:CA20365-B66X 008AG ;
                LINKBOARD Status:Normal; Serial:PP1234026P ;
                    + FRU-Part-Number:CA20365-B60X 001AA ;
                PCI#1 Name_Property:ethernet;
                    + Vendor-ID:1077; Device-ID:8000;
                    + Subsystem_Vendor-ID:1077; Subsystem-ID:017e;
                    + Model:;
-----------------------Omitted---------------------
```

*1 Type: B is displayed for a CMU that has the SPARC64 X+ processor mounted. Type: A is displayed for a CMU that has the SPARC64 X processor mounted.
*2 If the SPARC64 X+ processor is mounted, 3.700 GHz; Type:0x20 is displayed. If the SPARC64 X processor is mounted, 3.000 GHz; Type:0x10 is displayed.
*3 If the SPARC64 X+ (3.7 GHz (eight-core)) processor is mounted, "Core:8" is displayed.

6.4 Restoring XSCF Setting Information

This section describes how to restore the XSCF setting information saved on the USB device in "5.7   Saving XSCF Setting Information."

To restore the XSCF setting information, use the restoreconfig command as shown in the following example.

```
XSCF> restoreconfig -V file:///media/usb_msd/system.cfg
```

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*.

6.5 Incorporating a Chassis and I/O Device into a Physical Partition

This section describes the procedure for incorporating a chassis into a physical partition by using dynamic reconfiguration (PPAR DR) for the physical partition after chassis maintenance. The procedure described here is applicable only to a system with a building block configuration.

6.5.1 Incorporating a chassis into a physical partition

1. **Log in to the XSCF shell.**
2. **Execute the addboard command with the -c configure option specified to incorporate the target chassis into the physical partition.**
   Enter "y" in response to the confirmation message.

Note - In system board (PSB) incorporation using the addboard command, the target system board (PSB) is incorporated into the physical partition after a hardware diagnosis of the PSB. Therefore, it may take time for the command execution to complete.

In the following example, PSB 00-0 is incorporated into PPAR-ID 0.

```
XSCF> addboard -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..... 60..... 90.....120.....150.....180.....210.....240.....
270.....300.....330.....360.....390.....420.....450.....480.....510.....
540.....570.....end
Connected PSB to PPAR.
```

```
Start configuring PSB to Logical Domains (LDoms) Manager. [1800sec]
  0.....end
Configured PSB to Logical Domains (LDoms) Manager.
Operation has completed.
```

> **Note -** If you execute the addboard command without specifying the -m option or with
> bind=resource specified for the -m option, the resource assignment state before deleteboard
> command execution may not be restored.
> If the amount of system board (PSB) resources, such as CPUs and memory, before
> replacement differs from that after replacement, you cannot restore the original resource
> assignment state to the original state. If the resource assignment state is not restored to the
> original state, the resources are placed in the free resource state. In this case, execute the ldm
> command to assign the resources to the logical domain again.

3. **Execute the showresult command to check the end status of the addboard command that was just executed.**
   The following example shows that "0" is returned as the end status and the execution of the addboard command has been completed successfully.

```
XSCF> showresult
0
```

4. **Execute the showboards command to confirm that the chassis requiring maintenance has been incorporated into the physical partition.**
   The BB-ID of the server requiring maintenance is indicated by the system board (PSB) number.

   In the following example, [Fault] of PSB 00-0 displays "Normal", which indicates that the system board is operating 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. **Execute the showstatus command to confirm that the FRU is operating normally after the completion of maintenance.**
   Nothing is displayed when it is normal.

```
XSCF> showstatus
```

6. **Execute the showhardconf command to check the hardware configuration and the status of each FRU.**
   Confirm that no asterisk (*) is displayed in front of any FRU.

```
XSCF> showhardconf
```

7. **If the state of the master chassis requiring maintenance has been switched to the standby state before maintenance, execute the switchscf command to switch the chassis to the master XSCF.**

```
XSCF> switchscf -t Standby
```

8. **Add the root complex that was deleted from the control domain before maintenance.**
   For details, see "Returning the root complex to the control domain."

9. **Restore the root domain to which the root complex was assigned before maintenance.**
   For details, see "Returning the root complex to the root domain."

10. **If you have released the I/O device assigned to an I/O domain before maintenance, restore the physical I/O device (PCIe end point device) to its original status.**
    For details, see "Returning the physical I/O device to the I/O domain."

11. **Suppose that the SR-IOV function was used to delete and discard a virtual function (VF) before maintenance. In this case, create the virtual function again and assign it to the domain based on the retained output results from the idm list-io command.**
    For details, see "Restoring the SR-IOV function."

12. **If a virtual device (vnet, vdisk) of a guest domain has been kept unused before maintenance, return it to its original status.**
    For details, see "Restoring a virtual device."

6.5.2 Incorporating an I/O device

This section describes the procedure (workflow) for incorporating an I/O device by using the hot plug function.
To use the hot plug function, the hotplug service of Oracle Solaris needs to be enabled. Check the status of the service. If it is disabled, enable the hotplug service in the following procedure. The hot plug function is available 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 the cfgadm command used here, see "2 Dynamically Configuring Devices" in the *Managing Devices in Oracle Solaris 11.2* or "Dynamically Configuring Devices (Tasks)" in the *Oracle Solaris Administration: Devices and File Systems*.

Note - To perform PCIe card maintenance using the hot plug function, confirm that the card

is PHP enabled. To do so, check "Appendix A   Cards That Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.

Incorporation of a PCI Express card

Mount the PCI Express card in the target PCI slot. Then, incorporate it into a logical domain in the following procedure.

1. **Log in as a super-user to Oracle Solaris on the logical domain (control domain or root domain) into which the target PCI Express card is to be incorporated.**

2. **Check the mounting position Ap_Id of the target PCI Express card.**

```
# cfgadm -a
Ap_Id              Type          Receptacle   Occupant     Condition
BB#0-PCI#0         unknown       disconnected unconfigured unknown
```

3. **Start the power supply to the target PCI Express card.**

```
# cfgadm -c connect <Ap_Id>
```

4. **Incorporate the target PCI Express card into the logical domain.**

```
# cfgadm -c configure <Ap_Id>
```

5. **Confirm that the target PCI Express card has been incorporated into the logical domain.**

```
# cfgadm -a
Ap_Id              Type          Receptacle   Occupant     Condition
BB#0-PCI#0         pci-pci/hp    connected    configured   ok
```

6. **If the ATTENTION LED of the target cassette is blinking when you replace the PCI Express card, turn off the ATTENTION LED.**

```
# cfgadm -x led=attn,mode=off <Ap_Id>
```

7. **If you have enabled the hotplug service, execute the svcadm command to disable the hotplug service.**

8. **Assign the I/O device of the incorporated PCIe card to the logical domain.**
   a. If you have released the I/O device assigned to an I/O domain before maintenance, restore the physical I/O device (PCIe end point device) to its original status.
   For details, see "Returning the physical I/O device to the I/O domain."

b. Suppose that the SR-IOV function was used to delete and discard a virtual function (VF) before maintenance. In this case, create the virtual function again and assign it to the domain based on the retained output results from the idm list-io command.
For details, see "Restoring the SR-IOV function."

c. If a virtual device (vnet, vdisk) of a guest domain has been kept unused before maintenance, return it to its original status.
For details, see "Restoring a virtual device."

9. **If you have added a new PCI Express card, see the following manual to perform appropriate operations:**
   - When using dynamic reconfiguration of the PCIe end point device
   See "15.3.1 Adding a Physical I/O Device to an I/O Domain" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

   - When not using dynamic reconfiguration of the PCIe end point device
   See "3.2.18 Configuring an I/O Device" and "3.2.19 Creating or Destroying the SR-IOV Virtual Function" in the *Fujitsu SPARC M12 and Fujitsu M10/ SPARC M10 Domain Configuration Guide*.

Note - Dynamic reconfiguration of the PCIe end point device is supported by XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later.

Incorporation of an internal disk

1. **Log in as a super-user to Oracle Solaris on the logical domain (control domain or root domain) into which the target internal disk is to be incorporated.**

2. **Execute the cfgadm command to check the status of the incorporated internal disk.**
   With the cfgadm -al command, confirm that AP_ID of the replacement internal disk has been changed.

   Confirm that Occupant shows "configured." If it does not show "configured," perform step 3.

```
# cfgadm -al
Ap_Id                           Type      Receptacle Occupant    Condition
 <Omitted>
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
 <Omitted>
```

3. **If the system does not recognize the incorporated internal disk, make it recognized in the system.**
   a. Execute the cfgadm -c configure command to incorporate the target internal disk into the logical domain.

```
# cfgadm -c configure <Ap_Id>
```

   b. With the cfgadm -al command, check the status of the internal disk.

4. **If the CHECK LED on the mounted internal disk is not off, execute the cfgadm -x command to turn off the CHECK LED on that internal disk.**

```
# cfgadm -x led=fault,mode=off <Ap_Id>
```

5. **If you have enabled the hotplug service, execute the svcadm command to disable the hotplug service.**

```
# svcadm disable hotplug
```

6. **Assign the I/O device of the incorporated internal disk to the logical domain.**
   - If you have replaced a faulty internal disk, proceed to "6.5.3   Restoring a logical domain to the pre-maintenance state."
   - If you have added a new internal disk, perform operations according to the descriptions in "14.2   Configuring Hardware RAID" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*.

6.5.3   Restoring a logical domain to the pre-maintenance state

This section describes the flow of work in restoring a logical domain after FRU maintenance to the pre-maintenance state. For details on the work 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* and the *Oracle VM Server for SPARC Reference Manual* for the version you are using.

Note - If you have replaced the CPU memory unit lower in a system that has internal disks in a hardware RAID configuration, you need to reactivate 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*.

The following procedure returns a logical domain to the state in the ldm list-io output results that were checked in step 4 in "5.3.2   Checking the assignment status of I/O devices."

Returning the root complex to the control domain

Return the root complex that was released from the control domain to the control domain.
The work procedure varies depending on whether the dynamic reconfiguration function (Dynamic PCIe bus assignment) for the root complex is used. For details, see Table 6-1.

Table 6-1   Procedure that depends on whether the dynamic reconfiguration function (Dynamic PCIe bus assignment) for the root complex is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration function used (*1)	Dynamic reconfiguration function not used (*2)
1	Set the control domain to delayed reconfiguration.	ldm start-reconf	-	Yes
2	Assign the physical I/O device to the control domain.	ldm add-io	Yes	Yes
3	Restart the control domain.	shutdown -i6 -g0 -y	-	Yes

*1 Dynamic reconfiguration of the root complex is supported by XCP 2240 or later and Oracle VM Server for SPARC 3.2 or later. In addition, the control domain must be Oracle Solaris 11.2 SRU11.2.8 or later.
*2 If dynamic reconfiguration of the root complex is not used, set the control domain to delayed reconfiguration, and then assign the physical I/O device.

1. **Log in to Oracle Solaris on the control domain of the physical partition.**

2. **Transition the control domain to delayed reconfiguration mode.**
   If you are dynamically reconfiguring the root complex, this step is unnecessary. Go to step 3.

   ```
   # ldm start-reconf <control domain name>
   ```

3. **Reassign the physical I/O device to the control domain.**

   ```
   # ldm add-io <physical I/O device name> <control domain name>
   ```

4. **Restart Oracle Solaris on the control domain.**
   If you are dynamically reconfiguring the root complex, this step is unnecessary.

   ```
   # shutdown -i6 -g0 -y
   ```

Note - When set to delayed reconfiguration mode, the control domain does not have control over the guest domains. If you have set the control domain to delayed reconfiguration mode,

restart the control domain as soon as possible.

Returning the root complex to the root domain

Return the physical I/O device (root complex) that was released from the root domain to the root domain.
The work procedure varies depending on whether the dynamic reconfiguration function (Dynamic PCIe bus assignment) for the root complex is used. For details, see Table 6-2.

Table 6-2   Procedure that depends on whether the dynamic reconfiguration function (Dynamic PCIe bus assignment) for the root complex is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration function used (*1)	Dynamic reconfiguration function not used (*2)
1	Assign the physical I/O device (root complex) to the root domain.	ldm add-io	Yes	Yes
2	Start the root domain.	ldm start-domain	-	Yes

*1 Dynamic reconfiguration of the root complex is supported by XCP 2240 or later and Oracle VM Server for SPARC 3.2 or later. In addition, the root domain must be Oracle Solaris 11.2 SRU11.2.8 or later.
*2 If dynamic reconfiguration of the root complex is not used, assign the physical I/O device (root complex), and then start the root domain.

1. **Reassign the I/O device (PCIe root complex) released from the root domain to the root domain.**

```
# ldm add-io <physical I/O device name> <root domain name>
```

2. **Start the root domain.**
    If you are dynamically reconfiguring the root complex, this step is unnecessary.

```
# ldm start-domain <root domain name>
```

Returning the physical I/O device to the I/O domain

If you released the I/O device assigned to an I/O domain before maintenance according to "When using virtual I/O" in "5.4.1   Releasing the assignment of I/O devices," restore the physical I/O device (PCIe end point device) to its original status. PCIe slots are automatically assigned to the root domain. Therefore, to reassign them to I/O domains, they must be released from the root domain and then reassigned.

The work procedure varies depending on whether the dynamic reconfiguration function for the PCIe end point device is used. For details, see Table 6-3.

Table 6-3   Procedure that depends on whether the dynamic reconfiguration function for the PCIe end point device is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration function used (*1)	Dynamic reconfiguration function not used
1	Enable the hotplug service.	svcadm enable hotplug	Yes	Yes (*2)
2	Set the root domain to delayed reconfiguration.	ldm start-reconf	-	Yes
3	Delete the physical IO from the root domain.	ldm remove-io	Yes	Yes
4	Restart the root domain.	shutdown -i6 -g0 -y	-	Yes
5	Assign physical I/O to the root domain.	ldm add-io	Yes	Yes
6	Start the I/O domain.	ldm start-domain	-	Yes
7	Disable the hotplug service.	svcadm disable hotplug	Yes	Yes (*2)

*1 Dynamic reconfiguration of the PCIe end point device is supported by XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later.
*2 If dynamic reconfiguration of the PCIe end point device is not used, the hotplug service operates regardless of its enable/disable setting.

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Transition the root domain to delayed reconfiguration mode.**
   If you are using the dynamic reconfiguration function for the PCIe end point device, this step is unnecessary. Go to step 5.

```
# ldm start-reconf <root domain name>
```

3. **Delete the physical I/O device from the root domain.**

```
# ldm remove-io <device name> <root domain name>
```

4. **Log in to the root domain, and restart Oracle Solaris on the root domain.**
   If you are using the dynamic reconfiguration function for the PCIe end point device, this step is unnecessary. Go to step 5.

```
# telnet localhost <port number>
...
# shutdown -i6 -g0 -y
```

5. **Assign the physical I/O device to the I/O domain.**

```
# ldm add-io <device name> <I/O domain name>
```

6. **Start the I/O domain.**
   If you are using the dynamic reconfiguration function for the PCIe end point
   device, this step is unnecessary. Go to step 7.

```
# ldm start <I/O domain name>
```

7. **If you need to disable the hotplug service for the I/O and root domains,**
   disable the hotplug service.

```
# svcadm disable hotplug
```

Restoring the SR-IOV function

Suppose that the SR-IOV function was used to delete and discard a virtual function
(VF) before maintenance, according to "When using the SR-IOV virtual function" in
"5.4.1   Releasing the assignment of I/O devices." In this case, create the virtual
function again and assign it to the domain based on the retained output results from
the idm list-io command.

The work procedure differs between the dynamic SR-IOV function and the static
SR-IOV function. For details, see Table 6-4.

Table 6-4   Procedure that depends on the function: dynamic SR-IOV function or static
SR-IOV function

-: Unnecessary

Item	Task	Command	Dynamic SR-IOV function used (*1)	Static SR-IOV function used
1	Enable the hotplug service.	svcadm enable hotplug	Yes	Yes (*2)
2	Set the PF root domain to delayed reconfiguration.	ldm start-reconf	-	Yes
3	Create a VF.	ldm create-vf	Yes	Yes
4	Assign the VF to the I/O domain.	ldm add-io	Yes	Yes
5	Restart the root domain.	shutdown -i6 -g0 -y	-	Yes

Table 6-4 Procedure that depends on the function: dynamic SR-IOV function or static SR-IOV function *(continued)*

-: Unnecessary

Item	Task	Command	Dynamic SR-IOV function used (*1)	Static SR-IOV function used
6	Start the I/O domain.	start-domain	-	Yes
7	Disable the hotplug service.	svcadm disable hotplug	Yes	Yes (*2)

*1 Dynamic reconfiguration for the SR-IOV virtual function is supported by XCP 2210 or later and Oracle VM Server for SPARC 3.1 or later.
*2 If static reconfiguration for the SR-IOV virtual function is used, the hotplug service operates regardless of its enable/disable setting.

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Transition the root domain that has the assigned physical function (PF) to delayed reconfiguration mode.**
   If the dynamic SR-IOV function is used, this step is unnecessary. Go to step 3.

```
# ldm start-reconf <root domain name>
```

3. **Create the virtual function.**

```
# ldm create-vf <PF name>
```

4. **Assign the virtual function (VF) to the I/O domain.**

```
# ldm add-io <VF name> <I/O domain name>
```

5. **Log in to the root domain, and restart Oracle Solaris.**
   If the dynamic SR-IOV function is used, this step is unnecessary. Go to step 7.

```
# telnet localhost <port name>
...
# shutdown -i6 -g0 -y
```

6. **Start the I/O domain.**

```
# ldm start <I/O domain name>
```

7. **If you need to disable the hotplug service for the I/O and root domains, disable the hotplug service.**

```
# svcadm disable hotplug
```

8. **If a virtual device of a guest domain has been kept unused or the redundant configuration was released in "5.4.1　Releasing the assignment of I/O devices," resume the use of the virtual device or set the redundant configuration again.**
For details on the work, see the manual for the application being used.

9. **Confirm that the status of the physical I/O device is the same as before maintenance.**

```
# ldm list-io
```

10. **Confirm that the operating condition of the logical domain remains unchanged.**

```
# ldm list-domain
```

Restoring a virtual device

If a virtual device (vnet, vdisk) of a guest domain has been kept unused before maintenance, return it to its original status.

1. **If a virtual device of a guest domain has been kept unused or the redundant configuration was released, resume the use of the virtual device or set the redundant configuration again.**
For details on the work, see the manual for the application being used.

   The following is a command execution example for configuring the virtual disk (vdisk11) and virtual network device (vnet10) in a logical domain.

```
# ldm add-vdisk vdisk11 guest0
# ldm add-vnet vnet10 guest0
```

2. **Confirm that the status of the virtual device is the same as before maintenance.**

```
# ldm list-domain -l
```

3. **Confirm that the operating condition of the logical domain remains unchanged.**

```
# ldm list-domain
```

6.6 Returning the Mode Switch to Locked Mode

1. **Return the mode switch of the operation panel to Locked mode.**
   For a building block configuration, return the mode switches of the master chassis and those chassis (BB-ID#00, #01) whose XSCFs are in the standby state to Locked mode.

   For details, see "2.3.2   Control function of the operation panel."

Remarks - For a building block configuration with a connected crossbar box, return the mode switches of BB-ID#80 and #81 of the crossbar box to Locked mode.

6.7 Powering On the Physical Partition Requiring Maintenance

This section describes the procedure for powering on a physical partition requiring maintenance.

1. **Switch the mode switches of the master chassis and those chassis (BB-ID#00, #01) whose XSCFs are in the standby state to Locked mode.**

2. **Log in to the XSCF shell.**

3. **Execute the showstatus command to confirm that the FRU is operating normally after the completion of maintenance.**
   Nothing is displayed when it is normal.

```
XSCF> showstatus
```

4. **Execute the showhardconf command to check the hardware configuration and the status of each FRU.**

```
XSCF> showhardconf
```

5. **If the state of the master chassis requiring maintenance has been switched to the standby state before maintenance, execute the switchscf command to switch the chassis to the master XSCF.**

```
XSCF> switchscf -t Standby
```

6. **Execute the poweron command to power on the stopped physical partition.**
    In the following example, PPAR-ID 0 is specified.

```
XSCF> poweron -p 0
```

6.8 Starting the Entire System

This section describes the procedure for starting the entire system.
The system can be started in either of the following two ways:

- Starting the system with an XSCF command
- Starting the system from the operation panel

6.8.1 Starting the system with an XSCF command

1. **Check that the XSCF STANDBY LED on the operation panel is on.**

2. **Log in to the XSCF shell.**

3. **Execute the poweron command.**
    Enter "y" in response to the confirmation message.

```
XSCF> poweron -a
PPAR-IDs to power on:00,01
Continue? [y|n] :y
00 : Powering on
01 : Powering on
```

4. **Confirm that the POWER LED on the operation panel is on.**

5. **Execute the showpparstatus command to confirm that the power to all the
    physical partitions in the system is turned on.**

6. **Confirm that no error remains by using the fmadm faulty command in the
    logical domain in which an error was detected.**

```
# fmadm faulty
```

If any error remains, clear the error by using the fmadm repaired command.

6.8.2 Starting the system from the operation panel

1. **Check that the XSCF STANDBY LED on the operation panel is on.**

2. **Press the power switch on the operation panel for 1 second or more (less than 4 seconds).**
   For details, see "2.3.2   Control function of the operation panel."

Note - For a building block configuration, press the power switch on the master chassis. The power switches of the other chassis are disabled.

---

3. **Confirm that the POWER LED on the operation panel is on.**
4. **Execute the showpparstatus command to confirm that the power to all the physical partitions in the system is turned on.**
5. **Confirm that no error remains by using the fmadm faulty command in the logical domain in which an error was detected.**

```
# fmadm faulty
```

If any error remains, clear the error by using the fmadm repaired command.

Chapter 7

Maintenance Flow

This chapter describes the maintenance workflow.

Be sure to check the notes on FRUs requiring maintenance in the *Fujitsu M10/SPARC M10 Systems Product Notes* for the latest XCP version.

- Maintenance Workflow
- FRU Replacement Workflow
- FRU Installation Workflow
- FRU Removal Workflow

7.1 Maintenance Workflow

Figure 7-1   Maintenance Workflow
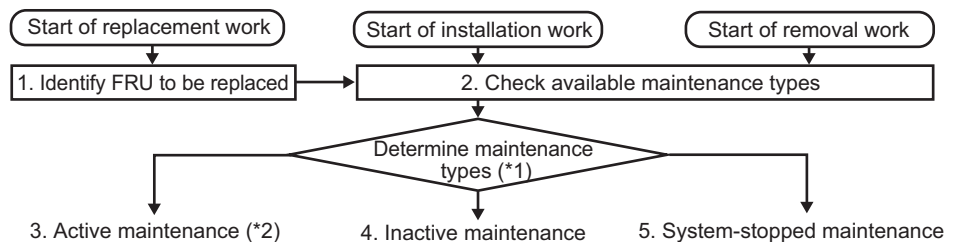
Table 7-1   Maintenance workflow

Item	Procedure	Reference
1	Identifying the FRU to be replaced	"4.2.2 Identifying a failure"
2	Checking the available maintenance types (*1)	"Table 7-2 List of available maintenance types by FRU"
3	Active maintenance (*2)	
3-a	Active replacement	"7.2.1 Active replacement"
3-b	Active addition	"7.3.1 Active addition"
3-c	Active removal	"7.4.1 Active removal"
4	Inactive maintenance	
4-a	Inactive replacement	"7.2.2 Inactive replacement"
4-b	Inactive addition	"7.3.2 Inactive addition"
4-c	Inactive removal	"7.4.2 Inactive removal"
5	System-stopped maintenance	
5-a	System-stopped replacement	"7.2.3 System-stopped replacement"
5-b	System-stopped addition	"7.3.3 System-stopped addition"
5-c	System-stopped removal	"7.4.3 System-stopped removal"

*1 The configuration of the system requiring maintenance and the FRU to be replaced may affect system operation, such as in maintenance time and in stopping the logical domains. Consult with the system administrator to decide the maintenance type to be used.
*2 To perform PCIe card maintenance using PHP, confirm that the card is PHP enabled. To do so, check "Appendix A Cards that Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.

Table 7-2 List of available maintenance types by FRU

For a single-chassis configuration/building block configuration, -: Maintenance cannot be performed

FRU	Active		Inactive		System stopped	
	Hot maintenance	Cold maintenance (*7)	Hot maintenance	Cold maintenance	Hot maintenance	Cold maintenance
CPU memory unit (*1)	- / -	- / OK	- / -	- / OK	- / -	OK / OK
Memory	- / -	- / OK	- / -	- / OK	- / -	OK / OK
Crossbar unit (*2)	- / -	- / -	- / -	- / OK	- / -	OK / OK
Power supply unit (*3)	OK / OK	- / OK	OK / OK	- / OK	OK / OK	OK / OK
Fan unit (*3)	OK / OK	- / OK	OK / OK	- / OK	OK / OK	OK / OK
Internal disk (*4)	OK / OK	- / OK	OK / OK	- / OK	OK / OK	OK / OK
PCI Express card (*5)	OK / OK	- / OK	OK / OK	- / OK	OK / OK	OK / OK
PSU backplane unit	- / -	- / OK	- / -	- / OK	- / -	OK / OK
Operation panel	- / -	- / OK	- / -	- / OK	- / -	OK / OK
Crossbar cable (*6)	- / -	- / -	- / -	- / OK	- / -	- / OK
XSCF BB control cable (*6)	- / -	- / OK	- / -	- / OK	- / -	- / OK
XSCF DUAL control cable (*6)	- / -	- / OK	- / -	- / OK	- / -	- / OK

*1 You can shorten the work time for replacing the CPU memory unit lower by performing the work in "9.7　Switching the microSD Card."
*2 The unit is mounted only in the SPARC M10-4S.
*3 Active/hot maintenance is supported only if the target FRU is in a redundant configuration. We recommend active/hot maintenance that has a short work time.
*4 This is supported only when used for an internal disk that is not a boot device or for a boot device that has a redundant configuration (RAID configuration). We recommend active/hot maintenance that has a short work time.
*5 Maintenance work is performed using PHP. If the direct I/O function is set, the PCI Express card cannot use PHP.
*6 The cable is mounted only with a configuration of two or more building blocks.
*7 This method of maintenance uses the dynamic reconfiguration (PPAR DR) function to disconnect the chassis requiring maintenance from the physical partition. It is available only for a system with a configuration of two or more building blocks.

7.2 FRU Replacement Workflow

This section describes the replacement workflow for the following FRUs of the SPARC M10-4/M10-4S:

- PCI Express card
- CPU memory unit (upper/lower)
- Memory
- Internal disk
- Fan unit
- Power supply unit
- PSU backplane unit
- Operation panel
- Crossbar cable
- Crossbar unit
- XSCF BB control cable
- XSCF DUAL control cable

7.2.1 Active replacement

This section describes the workflows for active/hot and active/cold FRU replacement. References to detailed descriptions are written in the work procedure tables. See any of them as required. You can perform active/cold replacement only for a system with a building block configuration.

Active replacement has the following patterns:

- Active/hot replacement (for a power supply unit or fan unit)
- Active/hot replacement (for an internal disk in a RAID configuration)
- Active/hot replacement (for an internal disk not in a RAID configuration)
- Active/hot replacement (for a PCI Express card)
- Active/cold replacement (building block configuration only)

Active/hot replacement (for a power supply unit or fan unit)

Active/hot replacement can be performed on a power supply unit and a fan unit. Perform the following procedure to replace the unit.

Figure 7-2   Active/hot replacement flow (for a power supply unit or fan unit)

```
┌──────────────────────────────────────────┐
│ 1. Open rack door                        │
└──────────────────────────────────────────┘
                    │
                    ▼
┌──────────────────────────────────────────┐
│ 2. Check operating condition of system   │
└──────────────────────────────────────────┘
                    │
                    ▼
┌──────────────────────────────────────────┐
│ 3. Release faulty FRU from system        │
└──────────────────────────────────────────┘
                    │
                    ▼
┌──────────────────────────────────────────┐
│ 4. Remove front cover                    │
└──────────────────────────────────────────┘
                    │
                    ▼
┌──────────────────────────────────────────┐
│ 5. Replace faulty FRU                    │
└──────────────────────────────────────────┘
                    │
                    ▼
┌──────────────────────────────────────────┐
│ 6. Install front cover                   │
└──────────────────────────────────────────┘
                    │
                    ▼
┌──────────────────────────────────────────┐
│ 7. Incorporate replacement FRU into system│
└──────────────────────────────────────────┘
                    │
                    ▼
┌──────────────────────────────────────────┐
│ 8. Confirm that there is no problem with │
│    replacement FRU                       │
└──────────────────────────────────────────┘
                    │
                    ▼
┌──────────────────────────────────────────┐
│ 9. Close rack door                       │
└──────────────────────────────────────────┘
                    │
                    ▼
        ╭──────────────────────────╮
        │   Maintenance complete   │
        ╰──────────────────────────╯
```
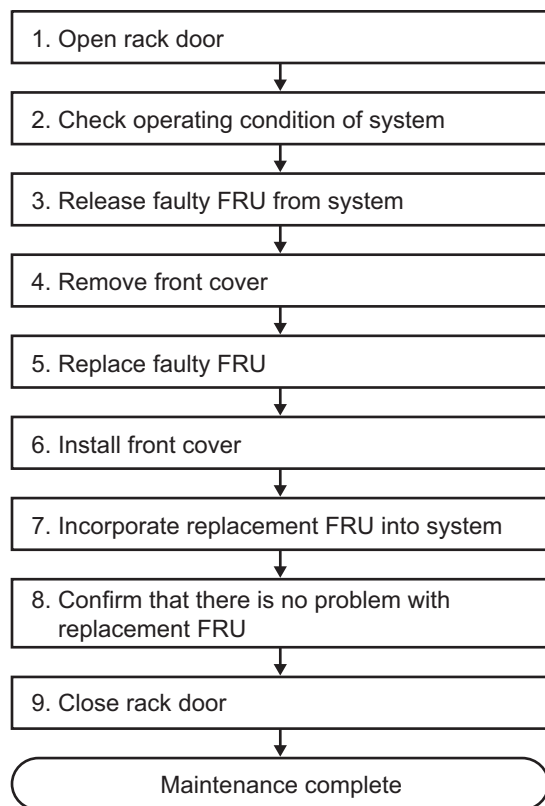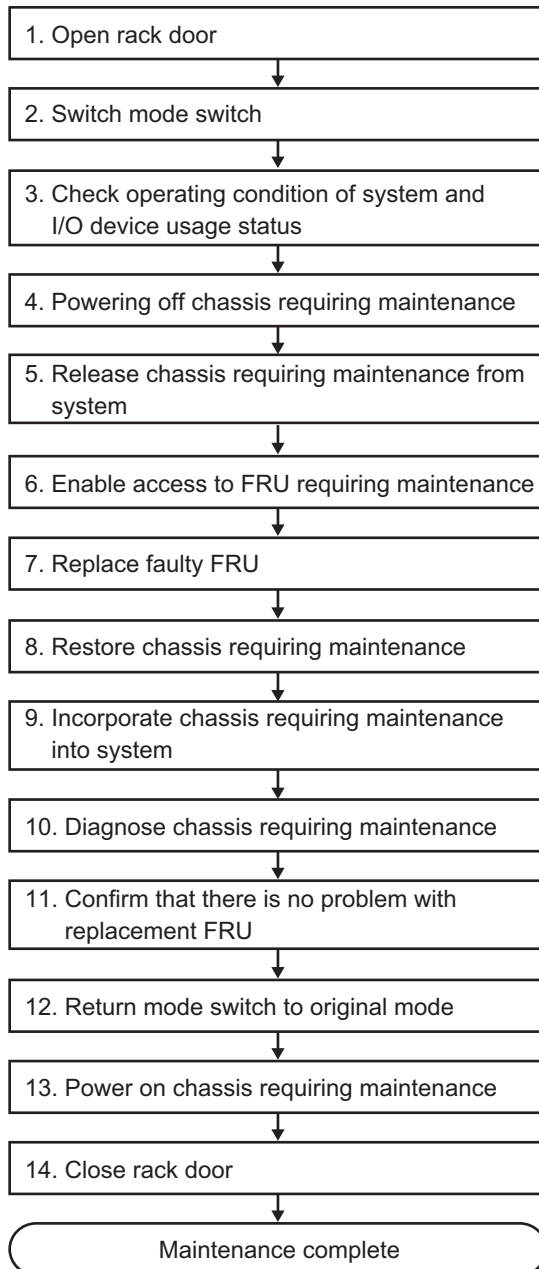
Table 7-3   Active/hot replacement work procedure (for a power supply unit or fan unit)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system	"5.3.1 Checking the operating condition of the physical partition or logical domain"
3	Releasing a faulty FRU from the system	"5.8.2 Releasing of the power supply unit and fan unit of the SPARC M10-4/M10-4S"
4	Removing the front cover	"5.9.5 Removing the front cover"
5	Replacing a faulty FRU	"Chapter 12 Maintaining the Power Supply Units" "Chapter 11 Maintaining the Fan Units"
6	Installing the front cover	"6.1.5 Installing the front cover"
7	Incorporating the replacement FRU into the system	"6.2.2 Incorporation of the power supply unit and fan unit of the SPARC M10-4/M10-4S"
8	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
9	Closing the rack door	

Active/hot replacement (for an internal disk in a RAID configuration)

Active/hot replacement can be performed on an internal disk. If the internal disk is in a RAID configuration, perform the following procedure to replace it.

Figure 7-3   Active/hot replacement flow (for an internal disk in a RAID configuration)

Table 7-4   Active/hot replacement work procedure (for an internal disk in a RAID configuration)

Item	Work procedure	Reference
1	Opening the rack door	
2	Identifying a faulty internal disk	"14.2.9 Checking for a Failed Disk Drive" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*
3	Replacing a faulty internal disk	"Chapter 10 Maintaining the Internal Disks"
4	Incorporating the replacement internal disk into the system	"14.2.10 Replacing a Failed Disk Drive" in the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide*
5	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
6	Closing the rack door	

Active/hot replacement (for an internal disk not in a RAID configuration)

Active/hot replacement can be performed on an internal disk. If the internal disk is not in a RAID configuration, perform the following procedure to replace it.

Figure 7-4   Active/hot replacement flow (for an internal disk not in a RAID configuration)

```
┌─────────────────────────────────────────────────┐
│ 1. Open rack door                               │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 2. Check operating condition of system and I/O   │
│    device usage status                           │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 3. Release faulty internal disk from system      │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 4. Replace faulty internal disk                  │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 5. Incorporate replacement internal disk into system │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 6. Confirm that there is no problem with         │
│    replacement FRU                               │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 7. Close rack door                              │
└─────────────────────────────────────────────────┘
                        ↓
        (        Maintenance complete        )
```

Table 7-5   Active/hot replacement work procedure (for an internal disk not in a RAID configuration)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
3	Releasing a faulty internal disk from the system	"Enabling the removal of an internal disk" in "5.4.2 Enabling the removal of an I/O device"
4	Replacing a faulty internal disk	"Chapter 10 Maintaining the Internal Disks"
5	Incorporating the replacement internal disk	"6.5.2 Incorporating an I/O device"
6	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
7	Closing the rack door	

Active/hot replacement (for a PCI Express card)

Active/hot replacement can be performed on a PCI Express card. Perform the following procedure to replace the unit.

Figure 7-5   Active/hot replacement flow (for a PCI Express card)

```
┌─────────────────────────────────────────────┐
│ 1. Open rack door                            │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 2. Check operating condition of system and I/O│
│    device usage status                        │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 3. Release assignment of PCIe card           │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 4. Enable removal of faulty PCIe card        │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 5. Lower cable support                       │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 6. Replace faulty PCIe card                  │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 7. Fix cable support                         │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 8. Incorporate replacement PCIe card         │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 9. Confirm that there is no problem with     │
│    replacement FRU                            │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 10. Close rack door                          │
└─────────────────────────────────────────────┘
                      │
                      ▼
          (    Maintenance complete    )
```
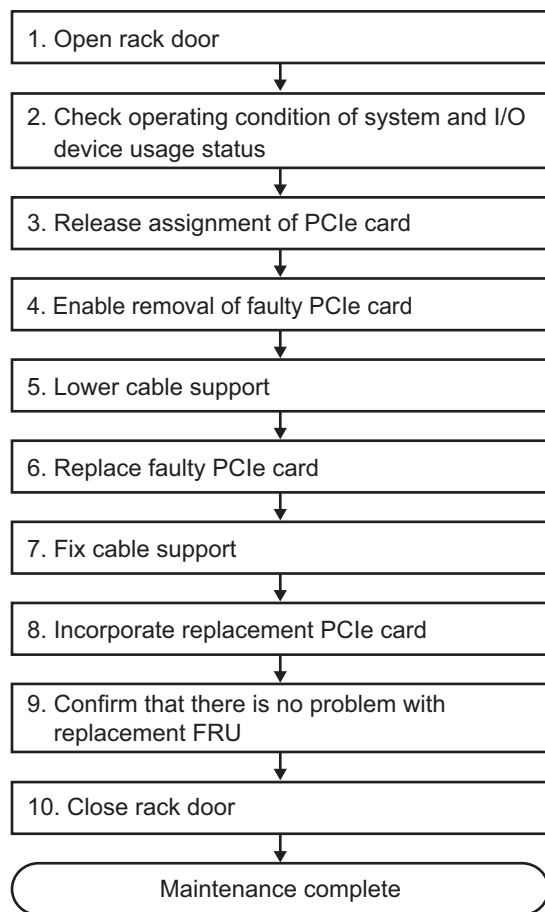
Table 7-6 Active/hot replacement work procedure (for a PCI Express card)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
3	Releasing the assignment of a PCIe card	"5.4.1 Releasing the assignment of I/O devices"
4	Enabling the removal of a faulty PCIe card	"5.4.2 Enabling the removal of an I/O device"
5	Lowering the cable support	"5.9.2 Lowering the cable support"
6	Replacing a faulty PCIe card	"Chapter 8 Maintaining the PCI Express Cards"
7	Fixing the cable support	"6.1.2 Fixing the cable support"
8	Incorporating the replacement PCIe card	"6.5.2 Incorporating an I/O device"
9	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
10	Closing the rack door	

Active/cold replacement (building block configuration only)

Active/cold replacement can be performed on each FRU in a building block configuration. Perform the following procedure to replace the unit.

Figure 7-6 Active/cold replacement flow (building block configuration only)

```
┌─────────────────────────────────────────┐
│ 1. Open rack door                        │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 2. Check operating condition of system and│
│    I/O device usage status               │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 3. Release assignment of PCIe card       │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 4. Release chassis requiring maintenance │
│    from partition                        │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 5. Release chassis requiring maintenance from│
│    system                                │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 6. Enable access to FRU requiring maintenance│
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 7. Replace faulty FRU                    │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 9. Incorporate chassis requiring maintenance│
│    into system                           │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 10. Diagnose chassis requiring maintenance│
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 11. Incorporate chassis requiring maintenance│
│     into partition                       │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 12. Confirm that there is no problem with │
│     replacement FRU                      │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 13. Close rack door                      │
└─────────────────────────────────────────┘
                    │
                    ▼
         (  Maintenance complete  )
```

Table 7-7 Active/cold replacement work procedure (building block configuration only)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
3	Releasing the assignment of a PCIe card	"5.4.1 Releasing the assignment of I/O devices"
4	Releasing the chassis requiring maintenance from the partition	"5.4.3 Releasing a chassis requiring maintenance from the physical partition"
5	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
6	Enabling access to the FRU requiring maintenance	"5.9 Accessing a FRU"
7	Replacing a faulty FRU	See the removal and installation procedures in the maintenance procedures for each FRU. "Chapter 8 Maintaining the PCI Express Cards" "Chapter 9 Maintaining the CPU Memory Unit/Memory" (*1)(*2) "Chapter 10 Maintaining the Internal Disks" "Chapter 11 Maintaining the Fan Units" "Chapter 12 Maintaining the Power Supply Units" "Chapter 13 Maintaining the PSU Backplane Unit/ Operation Panel" (*1) "Chapter 16 Maintaining the XSCF BB Control Cables" "Chapter 17 Maintaining the XSCF DUAL Control Cables"
8	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
9	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
10	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board" (*3) "6.3.2 Diagnosing the crossbar unit and crossbar cables"
11	Incorporating the chassis requiring maintenance into a partition	"6.5.1 Incorporating a chassis into a physical partition"
12	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
13	Closing the rack door	

*1 Simultaneous replacement of the CPU memory unit and PSU backplane unit is prohibited. To replace the CPU memory unit and PSU backplane unit, first replace either of the units and perform the work in "9. Incorporating the chassis requiring maintenance into the system." Then, return to "5. Releasing the chassis requiring maintenance from the system," and replace the other unit. Lastly, restore the system.
*2 If a CPU memory unit lower is replaced in the system of the hardware RAID volume in a hardware RAID configuration using internal disks, you need to reactivate the hardware RAID volume before starting Oracle Solaris. Start Oracle Solaris on the control domain as described in "11. Incorporating the chassis requiring maintenance into a partition." 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*.
*3 Normally, the testsb command is executed during replacefru command processing. However, if that is canceled, diagnose the system board before incorporating the chassis requiring maintenance into the physical partition.

7.2.2   Inactive replacement

This section describes the workflows for inactive/hot and inactive/cold FRU replacement. References to detailed descriptio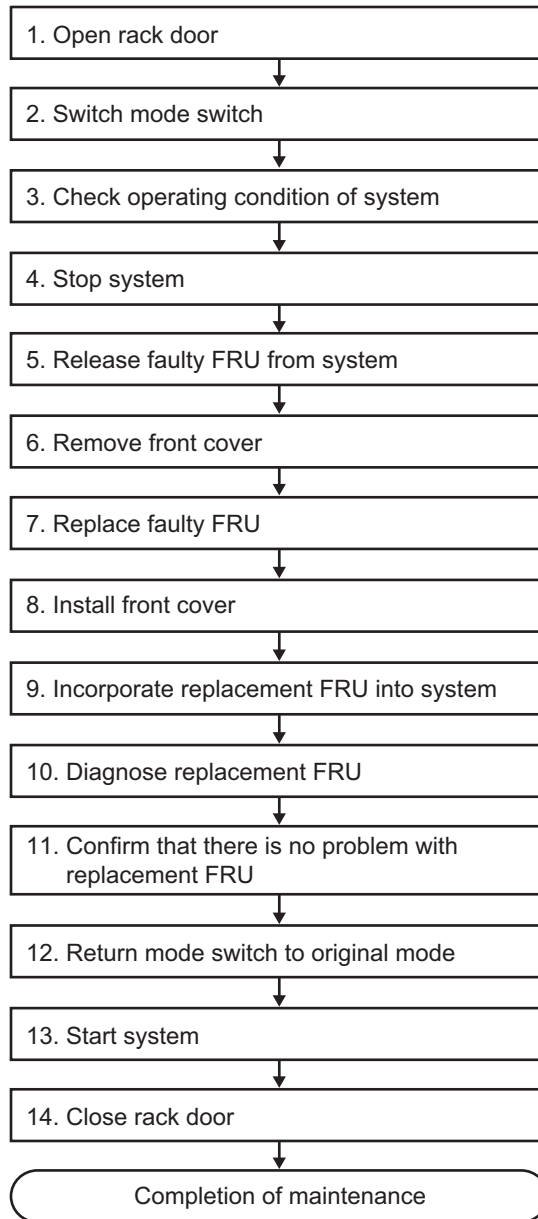ns are written in the workflow. See any of them as required. You can perform the operations here only for a system with a building block configuration.

Inactive replacement has the following patterns:

- Inactive/hot replacement (for a power supply unit or fan unit)
- Inactive/hot replacement (for an internal disk or PCIe card)
- Inactive/cold replacement (building block configuration only)

Inactive/hot replacement (for a power supply unit or fan unit)

Inactive/hot replacement can be performed on a power supply unit and a fan unit. Perform the following procedure to replace the unit.

Figure 7-7   Inactive/hot replacement flow (for a power supply unit or fan unit)

```
┌─────────────────────────────────────────────┐
│ 1. Open rack door                           │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 2. Switch mode switch                       │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 3. Check operating condition of chassis     │
│    requiring maintenance                    │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 4. Power off chassis requiring maintenance  │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 5. Release FRU requiring maintenance from   │
│    system                                   │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 6. Remove front cover                       │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 7. Replace faulty FRU                       │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 8. Install front cover                      │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 9. Incorporate replacement FRU into system  │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 10. Diagnose replacement FRU                │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 11. Confirm that there is no problem with   │
│     replacement FRU                         │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 12. Return mode switch to original mode     │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 13. Power on chassis requiring maintenance  │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 14. Close rack door                         │
└─────────────────────────────────────────────┘
                      ↓
(          Maintenance complete          )
```

Table 7-8   Inactive/hot replacement work procedure (for a power supply unit or fan unit)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the chassis requiring maintenance	"5.3.1 Checking the operating condition of the physical partition or logical domain"
4	Powering off the chassis requiring maintenance	"5.5 Powering Off the Physical Partition Requiring Maintenance"
5	Releasing a faulty FRU from the system	"5.8.2 Releasing of the power supply unit and fan unit of the SPARC M10-4/M10-4S"
6	Removing the front cover	"5.9.5 Removing the front cover"
7	Replacing a faulty FRU	"Chapter 11 Maintaining the Fan Units" "Chapter 12 Maintaining the Power Supply Units"
8	Installing the front cover	"6.1.5 Installing the front cover"
9	Incorporating the replacement FRU into the system	"6.2.2 Incorporation of the power supply unit and fan unit of the SPARC M10-4/M10-4S"
10	Diagnosing the replacement FRU	"6.3.1 Diagnosing the system board"
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
13	Powering on the chassis requiring maintenance	"6.7 Powering On the Physical Partition Requiring Maintenance"
14	Closing the rack door	

Inactive/hot replacement (for an internal disk or PCIe card)

Inactive/hot replacement can be performed on an internal disk and a PCIe card.
Perform the following procedure to replace the unit.

Figure 7-8   Inactive/hot replacement flow (for an internal disk or PCIe card)

```
┌─────────────────────────────────────────────────┐
│ 1. Open rack door                               │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 2. Switch mode switch                           │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 3. Check operating condition of system and I/O  │
│    device usage status                          │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 4. Power off chassis requiring maintenance      │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 5. Lower cable support for maintenance on       │
│    PCIe card                                    │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 6. Replace faulty FRU                           │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 7. Secure cable support after maintenance on    │
│    PCIe card                                    │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 8. Diagnose replacement FRU                     │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 9. Confirm that there is no problem with        │
│    replacement FRU                              │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 10. Return mode switch to original mode         │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 11. Power on chassis requiring maintenance      │
└─────────────────────────────────────────────────┘
                        ↓
┌─────────────────────────────────────────────────┐
│ 12. Close rack door                             │
└─────────────────────────────────────────────────┘
                        ↓
        (      Maintenance complete      )
```

Table 7-9 Inactive/hot replacement work procedure (for an internal disk or PCIe card)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Powering off the chassis requiring maintenance	"5.5 Powering Off the Physical Partition Requiring Maintenance"
5	Lowering the cable support for maintenance on a PCIe card	"5.9.2 Lowering the cable support"
6	Replacing a faulty FRU	"Chapter 8 Maintaining the PCI Express Cards" "Chapter 10 Maintaining the Internal Disks"
7	Securing the cable support after maintenance on a PCIe card	"6.1.2 Fixing the cable support"
8	Diagnosing the replacement FRU	"6.3.1 Diagnosing the system board"
9	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
10	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
11	Powering on the chassis requiring maintenance	"6.7 Powering On the Physical Partition Requiring Maintenance"
12	Closing the rack door	

Inactive/cold replacement (building block configuration only)

Inactive/cold replacement can be performed on each FRU in a building block configuration. Perform the following procedure to replace the unit.

Figure 7-9   Inactive/cold replacement flow (building block configuration only)

```
┌─────────────────────────────────────────────┐
│ 1. Open rack door                            │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 2. Switch mode switch                        │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 3. Check operating condition of system and   │
│    I/O device usage status                   │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 4. Powering off chassis requiring maintenance│
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 5. Release chassis requiring maintenance from│
│    system                                    │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 6. Enable access to FRU requiring maintenance│
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 7. Replace faulty FRU                        │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance     │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 9. Incorporate chassis requiring maintenance │
│    into system                               │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 10. Diagnose chassis requiring maintenance   │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 11. Confirm that there is no problem with    │
│     replacement FRU                          │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 12. Return mode switch to original mode      │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 13. Power on chassis requiring maintenance   │
└─────────────────────────────────────────────┘
                       │
                       ▼
┌─────────────────────────────────────────────┐
│ 14. Close rack door                          │
└─────────────────────────────────────────────┘
                       │
                       ▼
         (    Maintenance complete    )
```

Table 7-10   Inactive/cold replacement work procedure (building block configuration only)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Powering off the chassis requiring maintenance	"5.5 Powering Off the Physical Partition Requiring Maintenance"
5	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
6	Enabling access to the FRU requiring maintenance	"5.9 Accessing a FRU"
7	Replacing a faulty FRU	See the removal and installation procedures in the maintenance procedures for each FRU. "Chapter 8 Maintaining the PCI Express Cards" "Chapter 9 Maintaining the CPU Memory Unit/Memory" (*1)(*2) "Chapter 10 Maintaining the Internal Disks" "Chapter 11 Maintaining the Fan Units" "Chapter 12 Maintaining the Power Supply Units" "Chapter 13 Maintaining the PSU Backplane Unit/ Operation Panel" (*1) "Chapter 14 Maintaining the Crossbar Cables" "Chapter 15 Maintaining the Crossbar Units" "Chapter 16 Maintaining the XSCF BB Control Cables" "Chapter 17 Maintaining the XSCF DUAL Control Cables"
8	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
9	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
10	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board" (*3) "6.3.2 Diagnosing the crossbar unit and crossbar cables"
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
13	Powering on the chassis requiring maintenance	"6.7 Powering On the Physical Partition Requiring Maintenance"

Item	Work procedure	Reference
14	Closing the rack door	

*1 Simultaneous replacement of the CPU memory unit and PSU backplane unit is prohibited. To replace the CPU memory unit and PSU backplane unit, first replace either of the units and perform the work up to "9. Incorporating the chassis requiring maintenance into the system." Then, return to "5. Releasing the chassis requiring maintenance from the system," and replace the other unit.

*2 If a CPU memory unit lower is replaced in the system of the hardware RAID volume in a hardware RAID configuration using internal disks, you need to reactivate the hardware RAID volume before starting Oracle Solaris. Start Oracle Solaris on the control domain as described in "13. Powering on the chassis requiring maintenance." 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.*

*3 The testsb command is executed during replacefru command processing. However, if that is canceled, diagnose the system board before incorporating the chassis requiring maintenance into the physical partition.

7.2.3   System-stopped replacement

This section describes the workflows for system-stopped/hot and system-stopped/cold FRU replacement. References to detailed descriptions are written in the workflow. See any of them as required.

System-stopped replacement has the following patterns:

- System-stopped/hot replacement (for a power supply unit or fan unit)
- System-stopped/hot replacement (for an internal disk or PCIe card)
- System-stopped/cold replacement (for a single-chassis configuration)
- System-stopped/cold replacement (for a building block configuration)
- System-stopped/all power-off cold replacement (for a building block configuration)

System-stopped/hot replacement (for a power supply unit or fan unit)

System-stopped/hot replacement can be performed on a power supply unit and a fan unit. Perform the following procedure to replace the unit.

Figure 7-10   System-stopped/hot replacement flow (for a power supply unit or fan unit)

```
┌────────────────────────────────────────────┐
│ 1. Open rack door                          │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 2. Switch mode switch                      │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 3. Check operating condition of system     │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 4. Stop system                             │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 5. Release faulty FRU from system          │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 6. Remove front cover                      │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 7. Replace faulty FRU                      │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 8. Install front cover                     │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 9. Incorporate replacement FRU into system │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 10. Diagnose replacement FRU               │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 11. Confirm that there is no problem with  │
│     replacement FRU                        │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 12. Return mode switch to original mode    │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 13. Start system                           │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 14. Close rack door                        │
└────────────────────────────────────────────┘
                      ↓
╭────────────────────────────────────────────╮
│        Completion of maintenance           │
╰────────────────────────────────────────────╯
```

Table 7-11   System-stopped/hot replacement work procedure (for a power supply unit or fan unit)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Releasing a faulty FRU from the system	"5.8.2 Releasing of the power supply unit and fan unit of the SPARC M10-4/M10-4S"
6	Removing the front cover	"5.9.5 Removing the front cover"
7	Replacing a faulty FRU	"Chapter 11 Maintaining the Fan Units" "Chapter 12 Maintaining the Power Supply Units"
8	Installing the front cover	"6.1.5 Installing the front cover"
9	Incorporating the replacement FRU into the system	"6.2.2 Incorporation of the power supply unit and fan unit of the SPARC M10-4/M10-4S"
10	Diagnosing the replacement FRU	"6.3.1 Diagnosing the system board"
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
13	Starting the system	"6.8 Starting the Entire System"
14	Closing the rack door	

System-stopped/hot replacement (for an internal disk or PCIe card)

System-stopped/hot replacement can be performed on an internal disk and a PCIe card. Perform the following procedure to replace the unit.

Figure 7-11   System-stopped/hot replacement flow (for an internal disk or PCIe card)

```
┌─────────────────────────────────────────┐
│ 1. Open rack door                        │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 2. Switch mode switch                    │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 3. Check operating condition of system and│
│    I/O device usage status               │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 4. Stop system                           │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 5. Lower cable support for maintenance on │
│    PCIe card                             │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 6. Replace faulty FRU                    │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 7. Secure cable support after maintenance on│
│    PCIe card                             │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 8. Diagnose replacement FRU              │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 9. Confirm that there is no problem with the│
│    replacement FRU                       │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 10. Return mode switch to original mode  │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 11. Start system                         │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 12. Close rack door                      │
└─────────────────────────────────────────┘
                    │
                    ▼
        (    Maintenance complete    )
```

Table 7-12   System-stopped/hot replacement work procedure (for an internal disk or PCIe card)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Lowering the cable support for maintenance on a PCIe card	"5.9.2 Lowering the cable support"
6	Replacing a faulty FRU	"Chapter 8 Maintaining the PCI Express Cards" "Chapter 10 Maintaining the Internal Disks"
7	Securing the cable support after maintenance on a PCIe card	"6.1.2 Fixing the cable support"
8	Diagnosing the replacement FRU	"6.3.1 Diagnosing the system board"
9	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
10	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
11	Starting the system	"6.8 Starting the Entire System"
12	Closing the rack door	

System-stopped/cold replacement (for a single-chassis configuration)

System-stopped/cold replacement can be performed on each FRU in a single-chassis configuration. Perform the following procedure to replace the unit.

Figure 7-12   System-stopped/cold replacement flow (for a single-chassis configuration)

```
┌─────────────────────────────────────────────┐
│ 1. Open rack door                           │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 2. Switch mode switch                       │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 3. Check operating condition of system and I/O │
│    device usage status                      │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 4. Stop system                              │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 5. Enable access to FRU requiring maintenance │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 6. Replace faulty FRU                       │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 7. Restore chassis requiring maintenance    │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 8. Check the XCP firmware version           │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 9. Perform diagnosis test                   │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 10. Confirm that there is no problem with the │
│     replacement FRU                         │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 11. Return mode switch to original mode     │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 12. Start system                            │
└─────────────────────────────────────────────┘
                      ↓
┌─────────────────────────────────────────────┐
│ 13. Close rack door                         │
└─────────────────────────────────────────────┘
                      ↓
          (  Maintenance complete  )
```

Table 7-13   System-stopped/cold replacement work procedure (for a single-chassis configuration)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Enabling access to the FRU requiring maintenance	"5.9 Accessing a FRU"
6	Replacing a faulty FRU	See the removal and installation procedures in the maintenance procedures for each FRU. "Chapter 8 Maintaining the PCI Express Cards" "Chapter 9 Maintaining the CPU Memory Unit/Memory" (*1)(*2) "Chapter 10 Maintaining the Internal Disks" "Chapter 11 Maintaining the Fan Units" "Chapter 12 Maintaining the Power Supply Units" "Chapter 13 Maintaining the PSU Backplane Unit/Operation Panel" (*1) "Chapter 15 Maintaining the Crossbar Units"
7	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
8	Checking the XCP firmware version (*3)	"9.11 Checking the XCP Firmware Version"
9	Performing a diagnosis test	"6.3.1 Diagnosing the system board"
10	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
11	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
12	Starting the system	"6.8 Starting the Entire System"
13	Closing the rack door	

*1 Simultaneous replacement of the CPU memory unit lower and PSU backplane unit is prohibited. To replace the CPU memory unit lower and PSU backplane unit, first replace either of the units and perform the work up to "10. Confirming that there is no problem with the replacement FRU." Then, return to "5. Enabling access to the FRU requiring maintenance," and replace the other unit.
*2 If a CPU memory unit lower is replaced in the system of the hardware RAID volume in a hardware RAID configuration using internal disks, you need to reactivate the hardware RAID volume before performing the work in "12. Starting the system." 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.*
*3 In replacement of a FRU other than the CPU memory unit lower in "6. Replacing a faulty FRU," this work is not required. Even if you switched the microSD card when replacing the CPU memory unit lower, this work is not required.

System-stopped/cold replacement (for a building block configuration)

System-stopped/cold replacement can be performed on each FRU in a building block configuration. Perform the following procedure to replace the unit.

Figure 7-13   System-stopped/cold replacement flow (for a building block configuration)

```
┌────────────────────────────────────────────┐
│ 1. Open rack door                          │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 2. Switch mode switch                      │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 3. Check operating condition of system and │
│    I/O device usage status                 │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 4. Stop system                             │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 5. Release chassis requiring maintenance   │
│    from system                             │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 6. Enable access to FRU requiring maintenance │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 7. Replace faulty FRU                      │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance   │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 9. Incorporate chassis requiring maintenance │
│    into system                             │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 10. Diagnose replacement FRU               │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 11. Confirm that there is no problem with  │
│     replacement FRU                        │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 12. Return mode switch to original mode    │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 13. Start system                           │
└────────────────────────────────────────────┘
                      ↓
┌────────────────────────────────────────────┐
│ 14. Close rack door                        │
└────────────────────────────────────────────┘
                      ↓
        (  Maintenance complete  )
```

Table 7-14 System-stopped/cold replacement work procedure (for a building block configuration)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
6	Enabling access to the FRU requiring maintenance	"5.9 Accessing a FRU"
7	Replacing a faulty FRU	See the removal and installation procedures in the maintenance procedures for each FRU. "Chapter 8 Maintaining the PCI Express Cards" "Chapter 9 Maintaining the CPU Memory Unit/Memory" (*1)(*2) "Chapter 10 Maintaining the Internal Disks" "Chapter 11 Maintaining the Fan Units" "Chapter 12 Maintaining the Power Supply Units" "Chapter 13 Maintaining the PSU Backplane Unit/Operation Panel" (*1) "Chapter 14 Maintaining the Crossbar Cables" "Chapter 15 Maintaining the Crossbar Units" "Chapter 16 Maintaining the XSCF BB Control Cables" "Chapter 17 Maintaining the XSCF DUAL Control Cables"
8	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
9	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
10	Diagnosing the replacement FRU	"6.3.1 Diagnosing the system board" "6.3.2 Diagnosing the crossbar unit and crossbar cables"
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
13	Starting the system	"6.8 Starting the Entire System"
14	Closing the rack door	

*1 Simultaneous replacement of the CPU memory unit lower and PSU backplane unit is prohibited. To replace the CPU memory unit lower and PSU backplane unit, first replace either of the units and perform the work up to "11. Confirming that there is no problem with the replacement FRU." Then, return to "6. Enabling access to the FRU requiring maintenance," and replace the other unit.
*2 If a CPU memory unit lower is replaced in the system of the hardware RAID volume in a hardware RAID configuration using internal disks, you need to reactivate the hardware RAID volume before performing the work in "13. Starting the system." 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*.

System-stopped/all power-off cold replacement (for a building block configuration)

System-stopped/all power-off cold replacement can be performed on each FRU in a building block configuration. Perform the following procedure to replace the unit.

Figure 7-14   System-stopped/all power-off cold replacement flow (for a building block configuration)

```
┌─────────────────────────────────────────────┐
│ 1. Open rack door                            │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 2. Switch mode switch                        │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 3. Check operating condition of system and I/O│
│    device usage status                       │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 4. Stop system                               │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 5. Turn off input power for all chassis      │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 6. Enable access to FRU requiring maintenance│
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 7. Replace faulty FRU                        │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance and │
│    connect input power for all chassis       │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 9. Check the XCP firmware version            │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 10. Diagnose replacement FRU                 │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 11. Confirm that there is no problem with    │
│     replacement FRU                          │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 12. Return mode switch to original mode      │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 13. Start system                             │
└─────────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────────┐
│ 14. Close rack door                          │
└─────────────────────────────────────────────┘
                     │
                     ▼
        (  Maintenance complete  )
```

Table 7-15 System-stopped/all power-off cold replacement work procedure (for a building block configuration)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Turning off the input power for all chassis	"5.9.4 Removing the power cord"
6	Enabling access to the FRU requiring maintenance	"5.9 Accessing a FRU"
7	Replacing a faulty FRU	See the removal and installation procedures in the maintenance procedures for each FRU. "Chapter 8 Maintaining the PCI Express Cards" "Chapter 9 Maintaining the CPU Memory Unit/Memory" (*1)(*2) "Chapter 10 Maintaining the Internal Disks" "Chapter 11 Maintaining the Fan Units" "Chapter 12 Maintaining the Power Supply Units" "Chapter 13 Maintaining the PSU Backplane Unit/Operation Panel" (*1) "Chapter 14 Maintaining the Crossbar Cables" "Chapter 15 Maintaining the Crossbar Units" "Chapter 16 Maintaining the XSCF BB Control Cables" "Chapter 17 Maintaining the XSCF DUAL Control Cables"
8	Restoring the chassis requiring maintenance and connecting the input power for all chassis (*3)(*4)(*5)	"6.1 Restoring the Chassis"
9	Checking the XCP firmware version (*6)	"9.12 Checking the XCP Firmware Version (Building Block Configuration)"
10	Diagnosing the replacement FRU	"6.3.1 Diagnosing the system board" "6.3.2 Diagnosing the crossbar unit and crossbar cables"
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
13	Starting the system	"6.8 Starting the Entire System"

Table 7-15 System-stopped/all power-off cold replacement work procedure (for a building block configuration) *(continued)*

Item	Work procedure	Reference
14	Closing the rack door	

*1 Simultaneous replacement of the CPU memory unit and PSU backplane unit is prohibited. To replace the CPU memory unit and PSU backplane unit, first replace either of the units and perform the work up to "11. Confirming that there is no problem with the replacement FRU." Then, return to "6. Enabling access to the FRU requiring maintenance," and replace the other unit.

*2 If a CPU memory unit lower is replaced in the system of the hardware RAID volume in a hardware RAID configuration using internal disks, you need to reactivate the hardware RAID volume before performing the work in "13. Starting the system." 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*.

*3 If you have replaced the CPU memory unit lower and 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.

*4 If you have replaced the CPU memory unit lower using the replacement microSD card in "7. Replacing a faulty FRU," the "SCF:Gaps between BB-ID" message may appear in the error log. If so, ignore the message.

*5 If you have replaced the CPU memory unit lower in "7. Replacing a faulty FRU," the "SCF:SCF Diagnosis initialize RTC" message may appear in the error log. If so, ignore the message.

*6 In replacement of a FRU other than the CPU memory unit lower in "7. Replacing a faulty FRU," this work is not required. Even if you switched the microSD card when replacing the CPU memory unit lower, this work is not required.

7.3 FRU Installation Workflow

This section describes the installation workflow for the following FRUs of the SPARC M10-4/M10-4S:

- CPU memory unit upper
- PCI Express card
- Memory
- Internal disk
- SPARC M10-4S chassis (Note)

Note - When installing the SPARC M10-4S chassis for a SPARC M10-4S with a building block configuration or single-chassis configuration, see "Chapter 9　Expanding a System with a Building Block Configuration" in the *Fujitsu M10-4S/SPARC M10-4S Installation Guide*.

7.3.1 Active addition

This section describes the workflows for active/hot and active/cold FRU installation. References to detailed descriptions are written in the workflow. See any of them as required. You can perform active/cold addition only for a system with a building block configuration.

Active addition has the following patterns:

- Active/hot addition (for a PCIe card)
- Active/hot addition (for an internal disk)
- Active/cold addition (building block configuration only)

Active/hot addition (for a PCIe card)

Active/hot addition can be performed on a PCIe card. Perform the following procedure to install the unit.
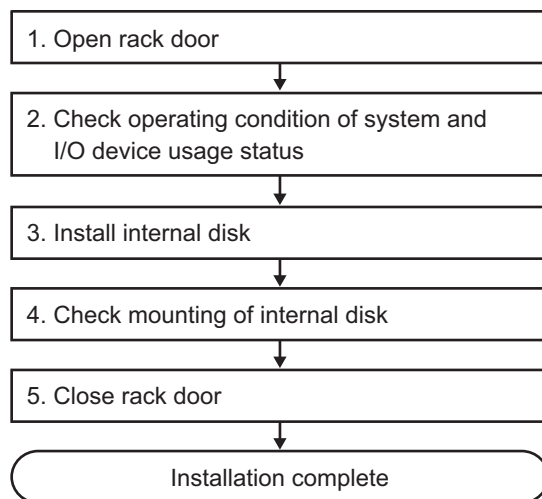
Figure 7-15   Active/hot addition flow (for a PCIe card)

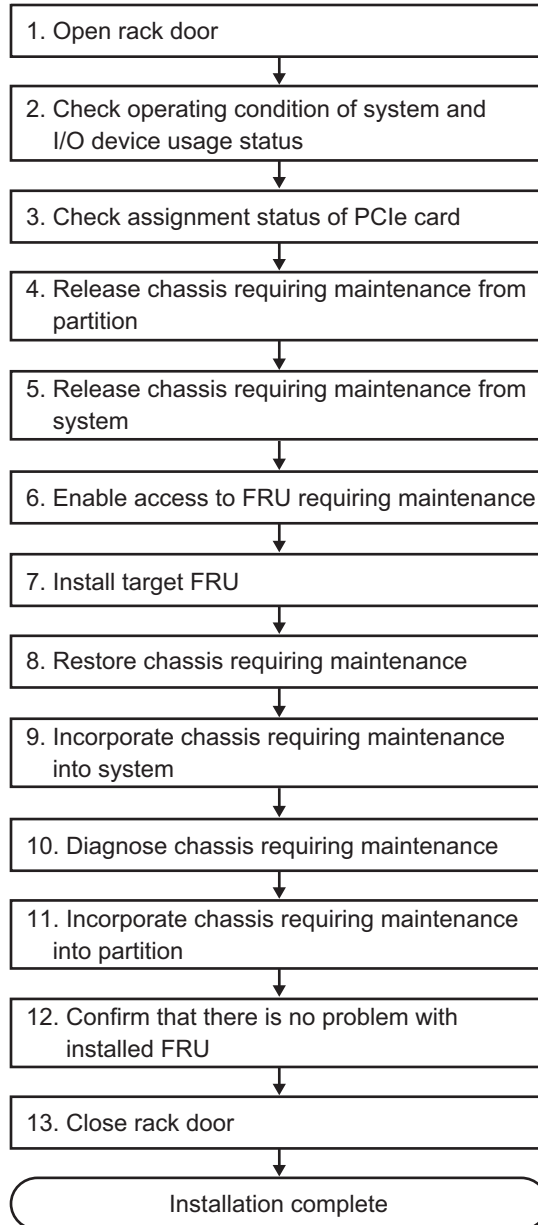Table 7-16   Active/hot addition work procedure (for a PCIe card)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
3	Lowering the cable support	"5.9.2 Lowering the cable support"
4	Installing a PCIe card	"8.3 FRU Removal and Installation Flow"
5	Fixing the cable support	"6.1.2 Fixing the cable support"
6	Incorporating the PCIe card	"Incorporation of a PCI Express card" in "6.5.2 Incorporating an I/O device"
7	Confirming that there is no problem with the installed FRU	"6.3.3 Checking the FRU status after maintenance"
8	Closing the rack door	

Active/hot addition (for an internal disk)

Active/hot addition can be performed on an internal disk. Perform the following procedure to install the unit.

Figure 7-16   Active/hot addition flow (for an internal disk)


```
┌─────────────────────────────────────┐
│ 1. Open rack door                   │
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│ 2. Check operating condition of system and │
│    I/O device usage status          │
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│ 3. Install internal disk            │
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│ 4. Check mounting of internal disk  │
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│ 5. Close rack door                  │
└─────────────────────────────────────┘
                 │
        ( Installation complete )
```

Table 7-17   Active/hot addition work procedure (for an internal disk)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
3	Installing an internal disk	"10.3 FRU Removal and Installation Flow"
4	Checking the mounting of the internal disk	"Incorporation of an internal disk" in "6.5.2 Incorporating an I/O device"
5	Closing the rack door	

Active/cold addition (building block configuration only)

Active/cold addition can be performed on the CPU memory unit upper, a PCI Express card, memory, and an internal disk in a building block configuration. Perform the following procedure to install the unit.

Figure 7-17   Active/cold addition flow (building block configuration only)

```
┌─────────────────────────────────────────────┐
│ 1. Open rack door                            │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 2. Check operating condition of system and   │
│    I/O device usage status                   │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 3. Check assignment status of PCIe card      │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 4. Release chassis requiring maintenance from│
│    partition                                 │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 5. Release chassis requiring maintenance from│
│    system                                    │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 6. Enable access to FRU requiring maintenance│
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 7. Install target FRU                        │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance     │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 9. Incorporate chassis requiring maintenance │
│    into system                               │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 10. Diagnose chassis requiring maintenance   │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 11. Incorporate chassis requiring maintenance│
│     into partition                           │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 12. Confirm that there is no problem with    │
│     installed FRU                            │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 13. Close rack door                          │
└─────────────────────────────────────────────┘
                      │
                      ▼
         ╭─────────────────────────────╮
         │   Installation complete     │
         ╰─────────────────────────────╯
```

Table 7-18 Active/cold addition work procedure (building block configuration only)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
3	Releasing the assignment of a PCIe card	"5.4.1 Releasing the assignment of I/O devices"
4	Releasing the chassis requiring maintenance from the partition	"5.4.3 Releasing a chassis requiring maintenance from the physical partition"
5	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
6	Enabling access to the FRU requiring maintenance	"5.9 Accessing a FRU"
7	Installing the target FRU	See the installation work procedures for each FRU. "8.3 FRU Removal and Installation Flow" "9.4 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
8	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
9	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
10	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board" (*1) "6.3.2 Diagnosing the crossbar unit and crossbar cables"
11	Incorporating the chassis requiring maintenance into a partition	"6.5.1 Incorporating a chassis into a physical partition"
12	Confirming that there is no problem with the installed FRU	"6.3.3 Checking the FRU status after maintenance"
13	Closing the rack door	

*1 Normally, the testsb command is executed during replacefru command processing. However, if that is canceled, diagnose the system board before incorporating the chassis requiring maintenance into the physical partition.

7.3.2   Inactive addition

This section describes the workflows for inactive/hot and inactive/cold FRU installation. References to detailed descriptions are written in the workflow. See any of them as required. You can perform inactive addition work only for a system with a building block configuration.

Inactive addition has the following patterns:

- Inactive/hot addition (for an internal disk or PCIe card)
- Inactive/cold addition (building block configuration only)

Inactive/hot addition (for an internal disk or PCIe card)

Inactive/hot addition can be performed on an internal disk and a PCIe card. Perform the following procedure to install the unit.

Figure 7-18   Inactive/hot addition flow (for an internal disk or PCIe card)

```
┌─────────────────────────────────────────────┐
│ 1. Open rack door                           │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 2. Switch mode switch                       │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 3. Check operating condition of system and  │
│    I/O device usage status                  │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 4. Power off chassis requiring maintenance  │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 5. Lower cable support for maintenance on   │
│    PCIe card                                │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 6. Install target FRU                       │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 7. Secure cable support after maintenance   │
│    on PCIe card                             │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 8. Diagnose installed FRU                   │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 9. Confirm that there is no problem with    │
│    installed FRU                            │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 10. Return mode switch to original mode     │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 11. Power on chassis requiring maintenance  │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 12. Close rack door                         │
└─────────────────────────────────────────────┘
                      │
                      ▼
        (      Installation complete      )
```

Table 7-19　　Inactive/hot addition work procedure (for an internal disk or PCIe card)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2　Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3　Checking the Operating Condition and Resource Usage Status"
4	Powering off the chassis requiring maintenance	"5.5　Powering Off the Physical Partition Requiring Maintenance"
5	Lowering the cable support for maintenance on a PCIe card	"5.9.2　Lowering the cable support"
6	Installing the target FRU	See the installation procedures for each FRU. "8.3　FRU Removal and Installation Flow" "10.3　FRU Removal and Installation Flow"
7	Securing the cable support after maintenance on a PCIe card	"6.1.2　Fixing the cable support"
8	Diagnosing the installed FRU	"6.3.1　Diagnosing the system board"
9	Confirming that there is no problem with the installed FRU	"6.3.3　Checking the FRU status after maintenance"
10	Returning the mode switch on the operation panel to Locked mode	"6.6　Returning the Mode Switch to Locked Mode"
11	Powering on the chassis requiring maintenance	"6.7　Powering On the Physical Partition Requiring Maintenance"
12	Closing the rack door	

Inactive/cold addition (building block configuration only)

Inactive/cold addition can be performed on the CPU memory unit upper, a PCI Express card, memory, and an internal disk in a building block configuration. Perform the following procedure to install the unit.

Figure 7-19   Inactive/cold addition flow (building block configuration only)

```
┌──────────────────────────────────────────────┐
│ 1. Open rack door                            │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 2. Switch mode switch                        │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 3. Check operating condition of system and   │
│    I/O device usage status                   │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 4. Power off chassis requiring maintenance   │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 5. Release chassis requiring maintenance from│
│    system                                    │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 6. Enable access to FRU requiring maintenance│
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 7. Install target FRU                        │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance     │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 9. Incorporate chassis requiring maintenance │
│    into system                               │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 10. Diagnose chassis requiring maintenance   │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 11. Confirm that there is no problem with    │
│     installed FRU                            │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 12. Switch mode switch                       │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 13. Power on chassis requiring maintenance   │
└──────────────────────────────────────────────┘
                        ↓
┌──────────────────────────────────────────────┐
│ 14. Close rack door                          │
└──────────────────────────────────────────────┘
                        ↓
(            Installation complete            )
```

Table 7-20   Inactive/cold addition work procedure (building block configuration only)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2　Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3　Checking the Operating Condition and Resource Usage Status"
4	Powering off the chassis requiring maintenance	"5.5　Powering Off the Physical Partition Requiring Maintenance"
5	Releasing the chassis requiring maintenance from the system	"5.8.1　Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
6	Enabling access to the FRU requiring maintenance	"5.9　Accessing a FRU"
7	Installing the target FRU	See the installation work procedures for each FRU. "8.3　FRU Removal and Installation Flow" "9.4　FRU Removal and Installation Flow" "10.3　FRU Removal and Installation Flow"
8	Restoring the chassis requiring maintenance	"6.1　Restoring the Chassis"
9	Incorporating the chassis requiring maintenance into the system	"6.2.1　Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
10	Diagnosing the chassis requiring maintenance	"6.3.1　Diagnosing the system board" (*1) "6.3.2　Diagnosing the crossbar unit and crossbar cables"
11	Confirming that there is no problem with the installed FRU	"6.3.3　Checking the FRU status after maintenance"
12	Returning the mode switch on the operation panel to Locked mode	"6.6　Returning the Mode Switch to Locked Mode"
13	Powering on the chassis requiring maintenance	"6.7　Powering On the Physical Partition Requiring Maintenance"
14	Closing the rack door	

*1 The testsb command is executed during replacefru command processing. However, if that is canceled, diagnose the system board before incorporating the chassis requiring maintenance into the physical partition.

7.3.3 System-stopped addition

This section describes the workflows for system-stopped/hot and system-stopped/ cold FRU installation. References to detailed descriptions are written in the workflow. See any of them as required.

System-stopped addition has the following patterns:
- System-stopped/hot addition (for an internal disk or PCIe card)
- System-stopped/cold addition (for a single-chassis configuration)
- System-stopped/cold addition (for a building block configuration)

System-stopped/hot addition (for an internal disk or PCIe card)

System-stopped/hot addition can be performed on a PCI Express card and an internal disk. Perform the following procedure to install the unit.

Figure 7-20   System-stopped/hot addition flow (for an internal disk or PCIe card)

```
┌─────────────────────────────────────────┐
│ 1. Open rack door                        │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 2. Switch mode switch                    │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 3. Check operating condition of system and│
│    I/O device usage status               │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 4. Stop system                           │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 5. Lower cable support for maintenance on │
│    PCIe card                             │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 6. Install target FRU                    │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 7. Secure cable support after maintenance on│
│    PCIe card                             │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 8. Diagnose installed FRU                │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 9. Confirm that there is no problem with │
│    installed FRU                         │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 10. Return mode switch to original mode  │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 11. Start system                         │
└─────────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────────┐
│ 12. Close rack door                      │
└─────────────────────────────────────────┘
                  │
                  ▼
         (  Installation complete  )
```
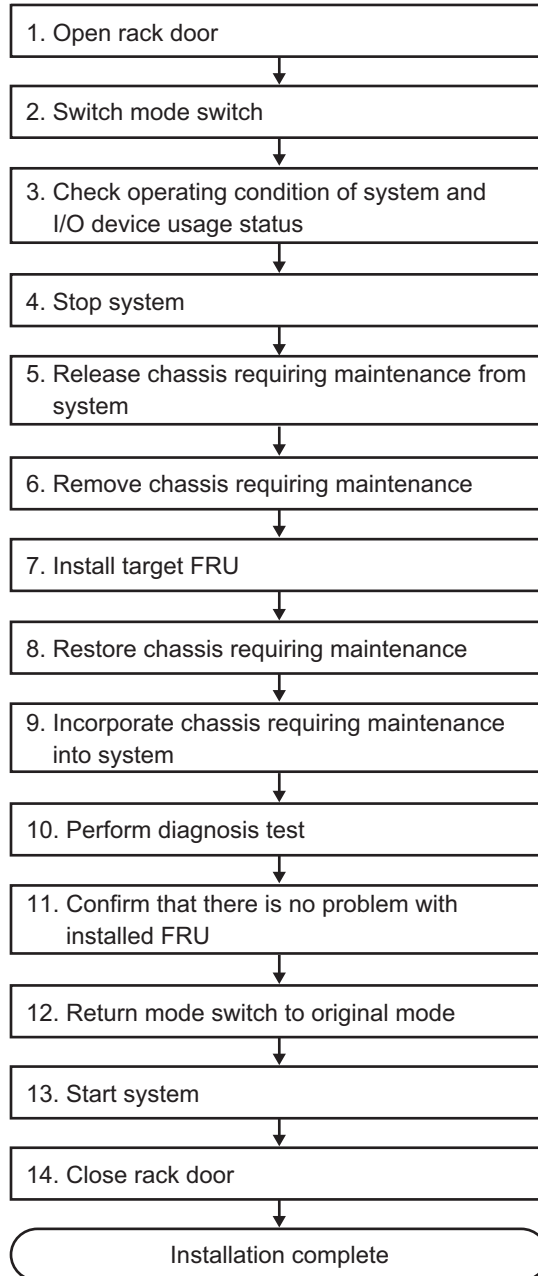
Table 7-21   System-stopped/hot addition work procedure (for an internal disk or PCIe card)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Lowering the cable support for maintenance on a PCIe card	"5.9.2 Lowering the cable support"
6	Installing the target FRU	See the installation procedures for each FRU. "8.3 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
7	Securing the cable support after maintenance on a PCIe card	"6.1.2 Fixing the cable support"
8	Diagnosing the installed FRU	"6.3.1 Diagnosing the system board"
9	Confirming that there is no problem with the installed FRU	"6.3.3 Checking the FRU status after maintenance"
10	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
11	Starting the system	"6.8 Starting the Entire System"
12	Closing the rack door	

System-stopped/cold addition (for a single-chassis configuration)

System-stopped/cold addition can be performed on the CPU memory unit upper, a PCI Express card, memory, and an internal disk in a single-chassis configuration. Perform the following procedure to install the unit.

Figure 7-21   System-stopped/cold addition flow (for a single-chassis configuration)

```
┌─────────────────────────────────────────┐
│ 1. Open rack door                        │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 2. Switch mode switch                    │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 3. Check operating condition of system and│
│     I/O device usage status              │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 4. Stop system                           │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 5. Enable maintenance of chassis requiring│
│     maintenance                          │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 6. Install target FRU                    │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 7. Restore chassis requiring maintenance │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 8. Perform diagnosis test                │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 9. Confirm that there is no problem with │
│     installed FRU                        │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 10. Return mode switch to original mode  │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 11. Start system                         │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 12. Close rack door                      │
└─────────────────────────────────────────┘
                    ↓
╭─────────────────────────────────────────╮
│           Installation complete          │
╰─────────────────────────────────────────╯
```

Table 7-22   System-stopped/cold addition work procedure (for a single-chassis configuration)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Enabling maintenance of the chassis requiring maintenance	"5.9 Accessing a FRU"
6	Installing the target FRU	See the installation procedures for each FRU. "8.3 FRU Removal and Installation Flow" "9.4 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
7	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
8	Performing a diagnosis test	"6.3.1 Diagnosing the system board"
9	Confirming that there is no problem with the installed FRU	"6.3.3 Checking the FRU status after maintenance"
10	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
11	Starting the system	"6.8 Starting the Entire System"
12	Closing the rack door	

System-stopped/cold addition (for a building block configuration)

System-stopped/cold addition can be performed on the CPU memory unit upper, a PCI Express card, memory, and an internal disk in a building block configuration. Perform the following procedure to install the unit.

Figure 7-22   System-stopped/cold addition flow (for a building block configuration)

```
┌──────────────────────────────────────────┐
│ 1. Open rack door                        │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 2. Switch mode switch                    │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 3. Check operating condition of system and│
│      I/O device usage status             │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 4. Stop system                           │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 5. Release chassis requiring maintenance from│
│      system                              │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 6. Remove chassis requiring maintenance  │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 7. Install target FRU                    │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 9. Incorporate chassis requiring maintenance│
│      into system                         │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 10. Perform diagnosis test               │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 11. Confirm that there is no problem with│
│       installed FRU                      │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 12. Return mode switch to original mode  │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 13. Start system                         │
└──────────────────────────────────────────┘
                      │
┌──────────────────────────────────────────┐
│ 14. Close rack door                      │
└──────────────────────────────────────────┘
                      │
           (  Installation complete  )
```

Table 7-23 System-stopped/cold addition work procedure (for a building block configuration)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
6	Removing the chassis requiring maintenance	"5.9 Accessing a FRU"
7	Installing the target FRU	See the installation procedures for each FRU. "8.3 FRU Removal and Installation Flow" "9.4 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
8	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
9	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
10	Performing a diagnosis test	"6.3.1 Diagnosing the system board" (*1) "6.3.2 Diagnosing the crossbar unit and crossbar cables"
11	Confirming that there is no problem with the installed FRU	"6.3.3 Checking the FRU status after maintenance"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
13	Starting the system	"6.8 Starting the Entire System"
14	Closing the rack door	

*1 The testsb command is executed during replacefru command processing. However, if that is canceled, diagnose the system board before incorporating the chassis requiring maintenance into the physical partition.

7.4   FRU Removal Workflow

This section describes the removal workflow for the following FRUs of the SPARC M10-4/M10-4S:

- CPU memory unit upper
- PCI Express card
- Memory
- Internal disk

- SPARC M10-4S chassis (Note)

Note - When removing the SPARC M10-4S chassis from a SPARC M10-4S with a building block configuration, see "Chapter 10   Removing a System with a Building Block Configuration" in the *Fujitsu M10-4S/SPARC M10-4S Installation Guide.*

7.4.1   Active removal

This section describes the workflows for active/hot and active/cold FRU removal. References to detailed descriptions are written in the workflow. See any of them as required. You can perform active/cold removal only for a system with a building block configuration.

Active removal has the following patterns:

- Active/hot removal (for a PCIe card)
- Active/hot removal (for an internal disk)
- Active/cold removal (building block configuration only)

Active/hot removal (for a PCIe card)

Active/hot removal can be performed on a PCIe card. Perform the following procedure to remove the unit.

Figure 7-23   Active/hot removal flow (for a PCIe card)

```
┌─────────────────────────────────────┐
│ 1. Open rack door                   │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────┐
│ 2. Check operating condition of system and │
│    I/O device usage status          │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────┐
│ 3. Release assignment of PCIe card  │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────┐
│ 4. Enable removal of a PCIe card for removal │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────┐
│ 5. Lower cable support              │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────┐
│ 6. Remove PCIe card for removal     │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────┐
│ 7. Fix cable support                │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────┐
│ 8. Confirm that there is no problem with chassis │
│    after removal                    │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────┐
│ 9. Close rack door                  │
└─────────────────────────────────────┘
                  ↓
        ╭─────────────────────╮
        │  Removal complete   │
        ╰─────────────────────╯
```
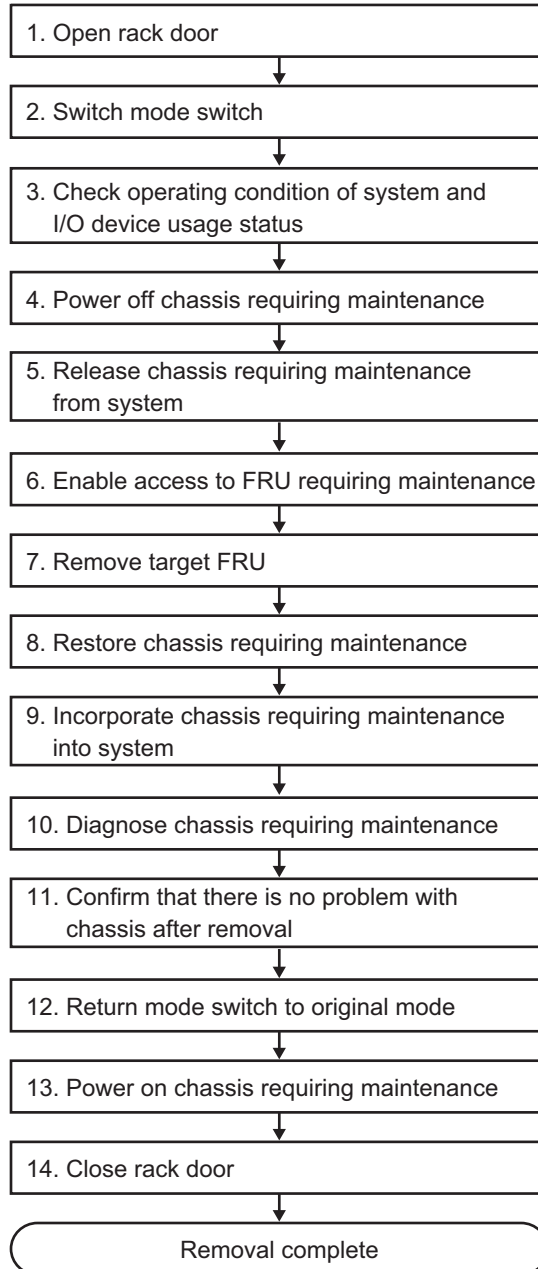
Table 7-24   Active/hot removal work procedure (for a PCIe card)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
3	Releasing the assignment of a PCIe card	"5.4.1 Releasing the assignment of I/O devices"
4	Enabling the removal of a PCIe card for removal	"Enabling the removal of a PCI Express card" in "5.4.2 Enabling the removal of an I/O device"
5	Lowering the cable support	"5.9.2 Lowering the cable support"
6	Removing the PCIe card for removal	"8.3 FRU Removal and Installation Flow"
7	Fixing the cable support	"6.1.2 Fixing the cable support"
8	Confirming that there is no problem with the chassis after the removal	"6.3.3 Checking the FRU status after maintenance"
9	Closing the rack door	

Active/hot removal (for an internal disk)

Active/hot removal can be performed on an internal disk. Perform the following procedure to remove the unit.

Figure 7-24   Active/hot removing flow (for an internal disk)
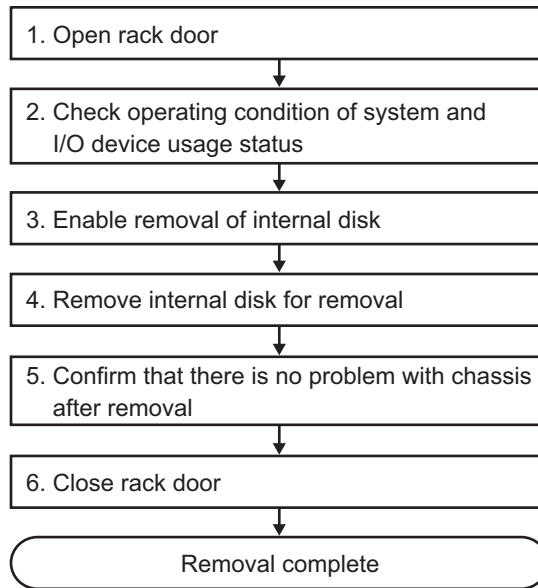
Table 7-25   Active/hot removal work procedure (for an internal disk)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
3	Enabling the removal of an internal disk	"Enabling the removal of an internal disk" in "5.4.2 Enabling the removal of an I/O device"
4	Removing an internal disk for removal	"10.3 FRU Removal and Installation Flow"
5	Confirming that there is no problem with the chassis after the removal	"6.3.3 Checking the FRU status after maintenance"
6	Closing the rack door	

Note - You can perform the active/hot removal work for an internal disk only in a RAID configuration.

Active/cold removal (building block configuration only)

Active/cold removal can be performed on the CPU memory unit upper, a PCI Express card, memory, and an internal disk in a building block configuration. Perform the following procedure to remove the unit.

Figure 7-25   Active/cold removal flow (building block configuration only)

```
┌─────────────────────────────────────────┐
│ 1. Open rack door                        │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 2. Check operating condition of system and│
│    I/O device usage status               │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 3. Release assignment of PCIe card       │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 4. Release chassis requiring maintenance from│
│    partition                             │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 5. Release chassis requiring maintenance from│
│    system                                │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 6. Enable access to FRU requiring maintenance│
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 7. Remove FRU for removal                │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 9. Incorporate chassis requiring maintenance│
│    into system                           │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 10. Diagnose chassis requiring maintenance│
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 11. Incorporate chassis requiring maintenance│
│     into partition                       │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 12. Confirm that there is no problem with│
│     chassis after removal                │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 13. Close rack door                      │
└─────────────────────────────────────────┘
                    ↓
        (    Removal complete    )
```

Table 7-26   Active/cold removal work procedure (building block configuration only)

Item	Work procedure	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
3	Releasing the assignment of a PCIe card	"5.4.1 Releasing the assignment of I/O devices"
4	Releasing the chassis requiring maintenance from the partition	"5.4.3 Releasing a chassis requiring maintenance from the physical partition"
5	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
6	Enabling access to the FRU requiring maintenance	"5.9 Accessing a FRU"
7	Removing a FRU for removal	See the removal procedure for each FRU "8.3 FRU Removal and Installation Flow" "9.4 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
8	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
9	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
10	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board" (*1) "6.3.2 Diagnosing the crossbar unit and crossbar cables"
11	Incorporating the chassis requiring maintenance into a partition	"6.5.1 Incorporating a chassis into a physical partition"
12	Confirming that there is no problem with the chassis after the removal	"6.3.3 Checking the FRU status after maintenance"
13	Closing the rack door	

*1 Normally, the testsb command is executed during replacefru command processing. However, if that is canceled, diagnose the system board before incorporating the chassis requiring maintenance into the physical partition.

7.4.2   Inactive removal

This section describes the workflows for inactive/hot and inactive/cold FRU removal. References to detailed descriptions are written in the workflow. See any of them as required. You can perform inactive removal work only for a system with a building block configuration.

Inactive removal has the following patterns:

- Inactive/hot removal (for an internal disk or PCIe card)
- Inactive/cold removal (building block configuration only)

Inactive/hot removal (for an internal disk or PCIe card)

Inactive/hot removal can be performed on an internal disk and a PCIe card. Perform the following procedure to remove the unit.

Figure 7-26   Inactive/hot removal flow (for an internal disk or PCIe card)

```
┌─────────────────────────────────────────────────┐
│ 1. Open rack door                               │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 2. Switch mode switch                           │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 3. Check operating condition of system and      │
│    I/O device usage status                      │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 4. Power off chassis requiring maintenance      │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 5. Lower cable support for maintenance on       │
│    PCIe card                                    │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 6. Remove target FRU                            │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 7. Secure cable support after maintenance       │
│    on PCIe card                                 │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 8. Diagnose chassis requiring maintenance       │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 9. Confirm that there is no problem with chassis│
│    after removal                                │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 10. Return mode switch to original mode         │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 11. Power on chassis requiring maintenance      │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ 12. Close rack door                             │
└─────────────────────────────────────────────────┘
                        │
                        ▼
          (    Removal complete    )
```
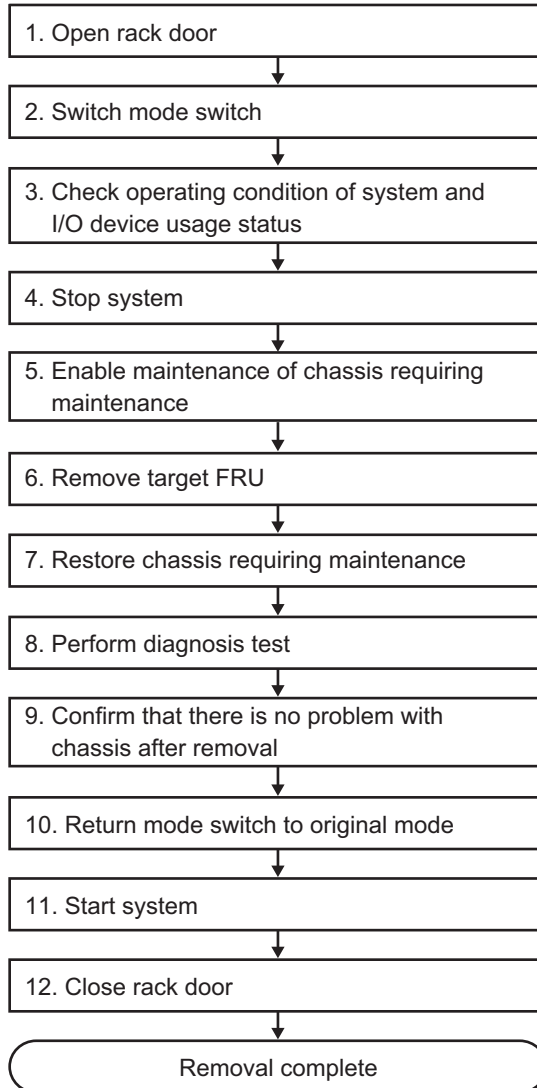
Table 7-27   Inactive/hot removal work procedure (for an internal disk or PCIe card)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Powering off the chassis requiring maintenance	"5.5 Powering Off the Physical Partition Requiring Maintenance"
5	Lowering the cable support for maintenance on a PCIe card	"5.9.2 Lowering the cable support"
6	Removing the target FRU	See the removal procedure for each FRU "8.3 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
7	Securing the cable support after maintenance on a PCIe card	"6.1.2 Fixing the cable support"
8	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board"
9	Confirming that there is no problem with the chassis after the removal	"6.3.3 Checking the FRU status after maintenance"
10	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
11	Powering on the chassis requiring maintenance	"6.7 Powering On the Physical Partition Requiring Maintenance"
12	Closing the rack door	

Inactive/cold removal (building block configuration only)

Inactive/cold removal can be performed on the CPU memory unit upper, a PCI Express card, memory, and an internal disk in a building block configuration. Perform the following procedure to remove the unit.

Figure 7-27   Inactive/cold removal flow (building block configuration only)

```
┌─────────────────────────────────────────────┐
│ 1. Open rack door                           │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 2. Switch mode switch                       │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 3. Check operating condition of system and  │
│     I/O device usage status                 │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 4. Power off chassis requiring maintenance  │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 5. Release chassis requiring maintenance    │
│     from system                             │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 6. Enable access to FRU requiring maintenance│
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 7. Remove target FRU                        │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance    │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 9. Incorporate chassis requiring maintenance│
│     into system                             │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 10. Diagnose chassis requiring maintenance  │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 11. Confirm that there is no problem with   │
│      chassis after removal                  │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 12. Return mode switch to original mode     │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 13. Power on chassis requiring maintenance  │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ 14. Close rack door                         │
└─────────────────────────────────────────────┘
                      │
                      ▼
         (      Removal complete      )
```

Table 7-28   Inactive/cold removal work procedure (building block configuration only)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Powering off the chassis requiring maintenance	"5.5 Powering Off the Physical Partition Requiring Maintenance"
5	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
6	Enabling access to the FRU requiring maintenance	"5.9 Accessing a FRU"
7	Removing the target FRU	See the removal procedure for each FRU "8.3 FRU Removal and Installation Flow" "9.4 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
8	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
9	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
10	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board" (*1) "6.3.2 Diagnosing the crossbar unit and crossbar cables"
11	Confirming that there is no problem with the chassis after the removal	"6.3.3 Checking the FRU status after maintenance"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
13	Powering on the chassis requiring maintenance	"6.7 Powering On the Physical Partition Requiring Maintenance"
14	Closing the rack door	

*1 The testsb command is executed during replacefru command processing. However, if that is canceled, diagnose the system board before incorporating the chassis requiring maintenance into the physical partition.

7.4.3　System-stopped removal

This section describes the workflows for system-stopped/hot and system-stopped/
cold FRU removal. References to detailed descriptions are written in the workflow.
See any of them as required.

Note - System-stopped/cold removal of the SPARC M10-4S when every SPARC M10-4S is in
the cold state is not supported.
Initialization must be done when the SPARC M10-4S to be removed and the SPARC M10-4S
where the master XSCF operates are in the hot state. Use the initbb command from the XSCF
shell of the master XSCF.
A SPARC M10-4S removed without initialization will not operate normally.

System-stopped removal has the following patterns:

- System-stopped/hot removal (for an internal disk or PCIe card)
- System-stopped/cold removal (for a single-chassis configuration)
- System-stopped/cold removal (for a building block configuration)

System-stopped/hot removal (for an internal disk or PCIe card)

System-stopped/hot removal can be performed on an internal disk and a PCIe card. Perform the following procedure to remove the unit.

Figure 7-28   System-stopped/hot removal flow (for an internal disk or PCIe card)

```
┌─────────────────────────────────────────┐
│ 1. Open rack door                        │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 2. Switch mode switch                    │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 3. Check operating condition of system and│
│    I/O device usage status               │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 4. Stop system                           │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 5. Lower cable support for maintenance on│
│    PCIe card                             │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 6. Remove target FRU                     │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 7. Secure cable support after maintenance on│
│    PCIe card                             │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 8. Diagnose chassis requiring maintenance│
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 9. Confirm that there is no problem with chassis│
│    after removal                         │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 10. Return mode switch to original mode  │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 11. Start system                         │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│ 12. Close rack door                      │
└─────────────────────────────────────────┘
                    ↓
╭─────────────────────────────────────────╮
│         Removal complete                 │
╰─────────────────────────────────────────╯
```

Table 7-29   System-stopped/hot removal work procedure (for an internal disk or PCIe card)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Lowering the cable support for maintenance on a PCIe card	"5.9.2 Lowering the cable support"
6	Removing the target FRU	See the removal procedure for each FRU "8.3 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
7	Securing the cable support after maintenance on a PCIe card	"6.1.2 Fixing the cable support"
8	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board"
9	Confirming that there is no problem with the chassis after the removal	"6.3.3 Checking the FRU status after maintenance"
10	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
11	Starting the system	"6.8 Starting the Entire System"
12	Closing the rack door	

System-stopped/cold removal (for a single-chassis configuration)

System-stopped/cold removal can be performed on the CPU memory unit upper, a PCI Express card, memory, and an internal disk in a single-chassis configuration. Perform the following procedure to remove the unit.

Figure 7-29　　System-stopped/cold removal flow (for a single-chassis configuration)

```
┌─────────────────────────────────────────┐
│ 1. Open rack door                        │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 2. Switch mode switch                    │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 3. Check operating condition of system and│
│    I/O device usage status               │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 4. Stop system                           │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 5. Enable maintenance of chassis requiring│
│    maintenance                           │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 6. Remove target FRU                     │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 7. Restore chassis requiring maintenance │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 8. Perform diagnosis test                │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 9. Confirm that there is no problem with │
│    chassis after removal                 │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 10. Return mode switch to original mode  │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 11. Start system                         │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ 12. Close rack door                      │
└─────────────────────────────────────────┘
                    │
                    ▼
       ╭─────────────────────────────╮
       │     Removal complete        │
       ╰─────────────────────────────╯
```

Table 7-30   System-stopped/cold removal work procedure (for a single-chassis configuration)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Enabling maintenance of the chassis requiring maintenance	"5.9 Accessing a FRU"
6	Removing the target FRU	See the removal procedure for each FRU "8.3 FRU Removal and Installation Flow" "9.4 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
7	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
8	Performing a diagnosis test	"6.3.1 Diagnosing the system board"
9	Confirming that there is no problem with the chassis after the removal	"6.3.3 Checking the FRU status after maintenance"
10	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
11	Starting the system	"6.8 Starting the Entire System"
12	Closing the rack door	

System-stopped/cold removal (for a building block configuration)

System-stopped/cold removal can be performed on the CPU memory unit upper, a PCI Express card, memory, and an internal disk in a building block configuration. Perform the following procedure to remove the unit.

Figure 7-30   System-stopped/cold removal flow (for a building block configuration)

```
┌──────────────────────────────────────────┐
│ 1. Open rack door                        │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 2. Switch mode switch                    │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 3. Check operating condition of system and│
│    I/O device usage status               │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 4. Stop system                           │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 5. Release chassis requiring maintenance │
│    from system                           │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 6. Remove chassis requiring maintenance  │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 7. Remove target FRU                     │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 8. Restore chassis requiring maintenance │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 9. Incorporate chassis requiring maintenance│
│    into system                           │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 10. Perform diagnosis test               │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 11. Confirm that there is no problem with│
│     chassis after removal                │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 12. Return mode switch to original mode  │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 13. Start system                         │
└──────────────────────────────────────────┘
                   │
┌──────────────────────────────────────────┐
│ 14. Close rack door                      │
└──────────────────────────────────────────┘
                   │
        (  Removal complete  )
```

Table 7-31   System-stopped/cold removal work procedure (for a building block configuration)

Item	Work procedure	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel to Service mode	"5.2 Switching the Mode Switch to Service Mode"
3	Checking the operating condition of the system and the I/O device usage status	"5.3 Checking the Operating Condition and Resource Usage Status"
4	Stopping the system	"5.6 Stopping the Entire System"
5	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
6	Removing the chassis requiring maintenance	"5.9 Accessing a FRU"
7	Removing the target FRU	See the removal procedure for each FRU "8.3 FRU Removal and Installation Flow" "9.4 FRU Removal and Installation Flow" "10.3 FRU Removal and Installation Flow"
8	Restoring the chassis requiring maintenance	"6.1 Restoring the Chassis"
9	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)"
10	Performing a diagnosis test	"6.3.1 Diagnosing the system board" (*1) "6.3.2 Diagnosing the crossbar unit and crossbar cables"
11	Confirming that there is no problem with the chassis after the removal	"6.3.3 Checking the FRU status after maintenance"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode"
13	Starting the system	"6.8 Starting the Entire System"
14	Closing the rack door	

*1 The testsb command is executed during replacefru command processing. However, if that is canceled, diagnose the system board before incorporating the chassis requiring maintenance into the physical partition.

Chapter 8

Maintaining the PCI Express Cards

This chapter describes the procedure for maintaining a PCI Express (PCIe) card mounted in a SPARC M10-4/M10-4S. A PCIe card can be replaced, expanded, and reduced.

- Before Maintaining a PCI Express Card
- PCI Express Card Configuration
- FRU Removal and Installation Flow
- Removing a PCI Express Card
- Installing a PCI Express Card

8.1   Before Maintaining a PCI Express Card

This chapter only has descriptions of the PCI Express card configuration and the work of removing and installing PCI Express cards.
Before removing a FRU, see "Chapter 7   Maintenance Flow" and perform the necessary work items.
For the types of maintenance on PCI Express cards, also see "PCI Express card" in "Table 7-2   List of available maintenance types by FRU."

8.2   PCI Express Card Configuration

This section describes the configuration and location of the PCIe cards.
Up to eight PCIe cards can be mounted in a SPARC M10-4S with a crossbar unit. Up to 11 PCIe cards can be mounted in a SPARC M10-4 without a crossbar unit.

Figure 8-1   Location of the PCIe card
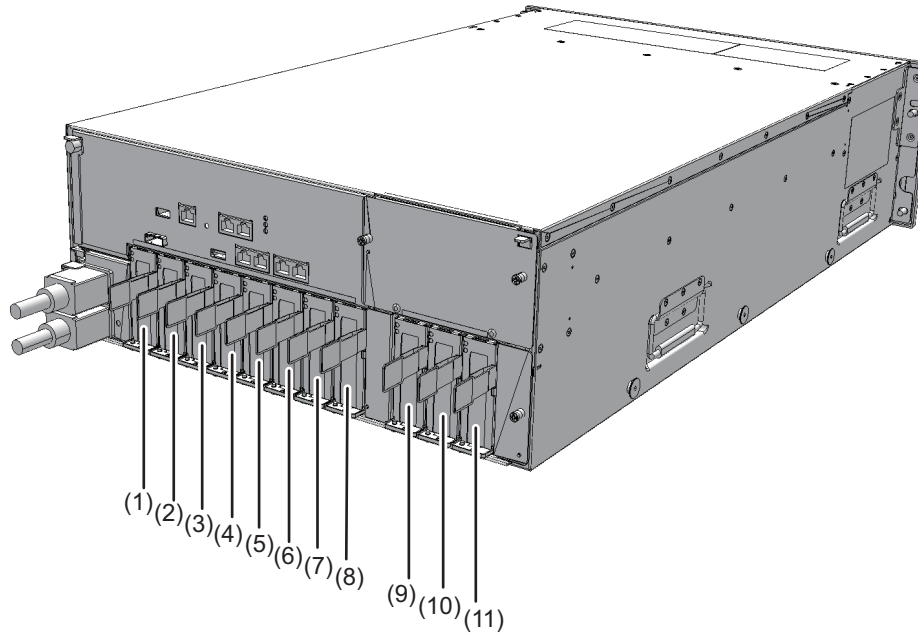
Location number	Component
1	PCIe card (PCI#0)
2	PCIe card (PCI#1)
3	PCIe card (PCI#2)
4	PCIe card (PCI#3)
5	PCIe card (PCI#4)
6	PCIe card (PCI#5)
7	PCIe card (PCI#6)
8	PCIe card (PCI#7)
9	PCIe card (PCI#8) (*1)
10	PCIe card (PCI#9) (*1)
11	PCIe card (PCI#10) (*1)

*1 Can be mounted only on a SPARC M10-4.

8.3 FRU Removal and Installation Flow

Perform maintenance work on PCI Express cards by following the procedures shown in Figure 8-2, Table 8-1, Table 8-2, and Table 8-3.

Figure 8-2   Maintenance workflow

Replacement	Installation	Removal
1. Remove PCI Express card cassette	1. Remove PCI Express card cassette	1. Remove PCI Express card cassette
2. Remove PCI Express card	2. Remove PCIe card filler	2. Remove PCI Express card
3. Install PCI Express card	3. Install PCI Express card	3. Install PCIe card filler
4. Install PCI Express card cassette	4. Install PCI Express card cassette	4. Install PCI Express card cassette
(Go to "7.2 FRU Replacement Workflow")	(Go to "7.3 FRU Installation Workflow")	(Go to "7.4 FRU Removal Workflow")

Table 8-1   Replacement workflow and procedures

Item	Replacement work procedure	Reference
1	Removing a PCI Express card cassette	"8.4.1 Removing a PCI Express card cassette"
2	Removing a PCI Express card	"8.4.2 Removing a PCI Express card"
3	Installing a PCI Express card	"8.5.2 Installing a PCI Express card"
4	Installing a PCI Express card cassette	"8.5.3 Installing a PCI Express card cassette"

Table 8-2   Installation workflow and procedures

Item	Installation work procedure	Reference
1	Removing a PCI Express card cassette	"8.4.1 Removing a PCI Express card cassette"
2	Removing a PCI Express card filler	"8.5.1 Removing a PCI Express card filler"
3	Installing a PCI Express card	"8.5.2 Installing a PCI Express card"
4	Installing a PCI Express card cassette	"8.5.3 Installing a PCI Express card cassette"

Table 8-3   Removal workflow and procedures

Item	Replacement work procedure	Reference
1	Removing a PCI Express card cassette	"8.4.1 Removing a PCI Express card cassette"
2	Removing a PCI Express card	"8.4.2 Removing a PCI Express card"
3	Installing a PCI Express card filler	"8.4.3 Installing a PCI Express card filler"
4	Installing a PCI Express card cassette	"8.5.3 Installing a PCI Express card cassette"

8.4   Removing a PCI Express Card

This section describes the procedure for removing a PCIe card. Enable removal of the PCIe card before attempting to remove it. For details, follow the procedure in "Chapter 7   Maintenance Flow."

⚠ **Caution -** Before you handle any components, 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 damaged. For details, see "1.5   Precautions on Static Electricity."

8.4.1   Removing a PCI Express card cassette

There are two types of PCIe card cassette. The shapes of the latch (A in the figure) and lever (B in the figure) vary depending on the type of the PCIe card cassette, but the same removal procedure applies. For the types of PCIe card cassettes, see "Figure 8-3."
Unless otherwise specified, the figures explained in this section use Type-1.

Figure 8-3   Types of PCIe card cassettes
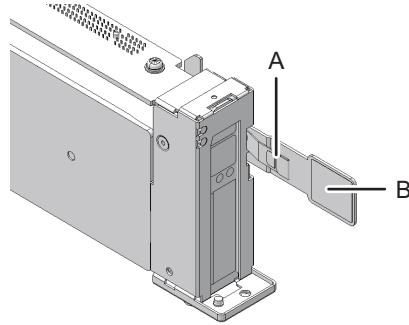
Type-1   Type-2
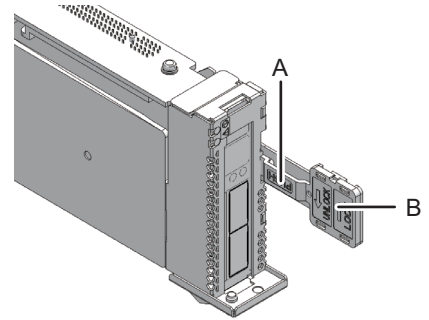
1.   **If the crossbar cables are fixed to the cable support with the hook-and-loop fastener, remove the hook-and-loop fastener.**

2.   **Remove the cables connected to the PCIe card cassette requiring maintenance.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

---

3.   **Lower the lever (B in the figure) of the PCIe card cassette while pushing the latch (A in the figure).**

Figure 8-4   Lever of PCIe card cassette
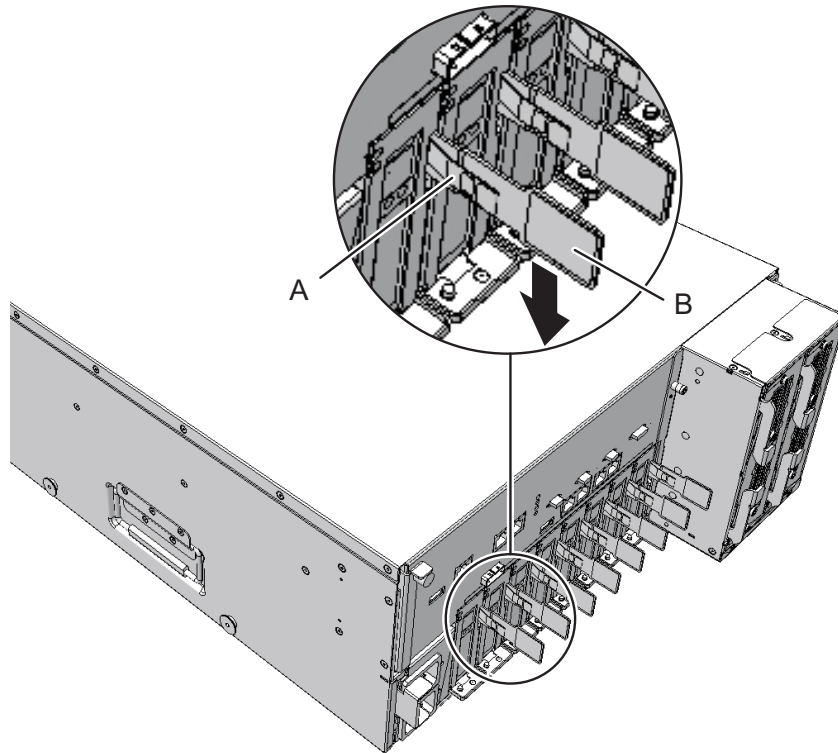
4. **Hold the lever and carefully pull the PCIe card cassette out of the PCI slot to remove it.**

Note - Place the removed PCIe card cassette on a grounded antistatic ESD mat.

Figure 8-5   Removing the PCIe card cassette
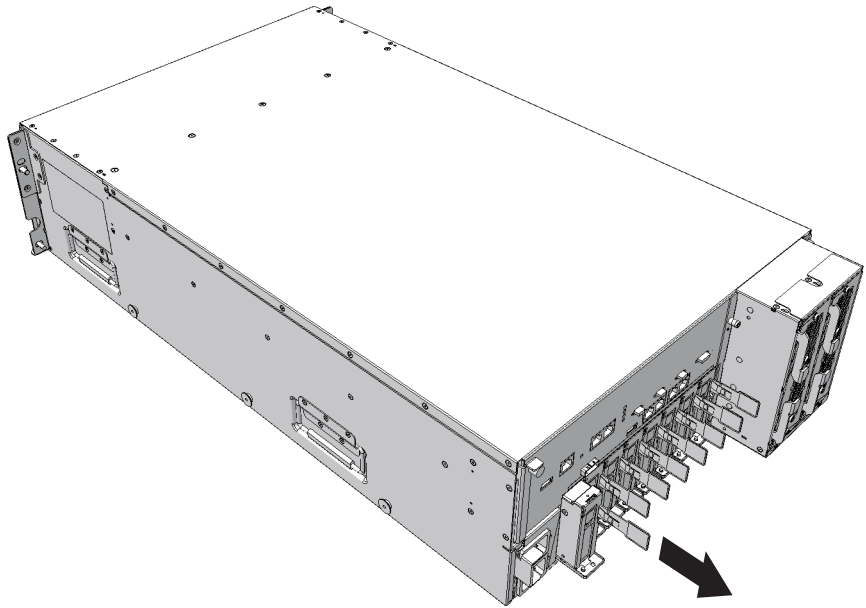
8.4.2   Removing a PCI Express card

1. **Remove the cover by lifting it up while pushing the clip (A in the figure) of the cover inwards.**

Figure 8-6   Clip at rear of cover
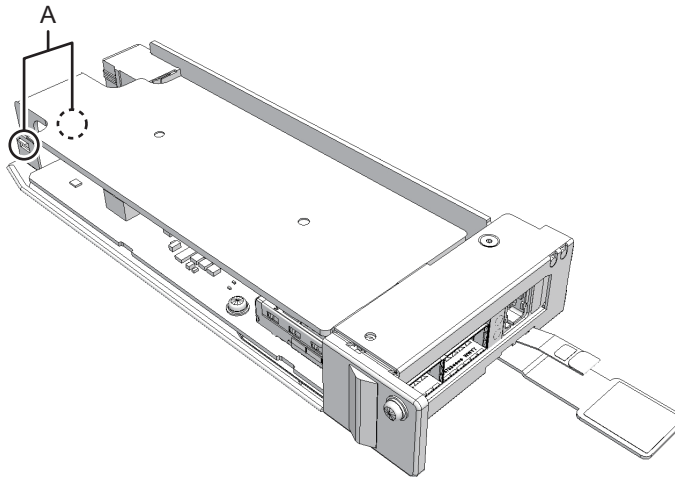
2. **Remove the screw securing the PCIe card cassette.**

Figure 8-7   Removing the screw
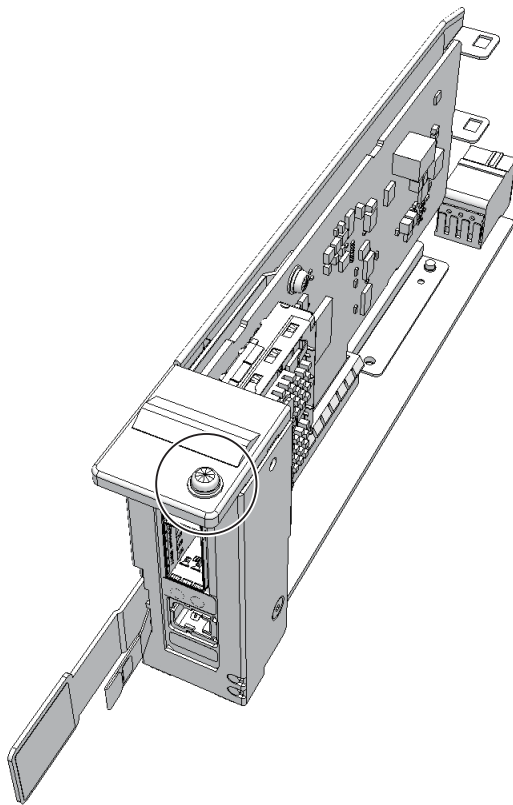
3.   **Remove the bracket (A in the figure) from the PCIe card.**

Figure 8-8   Removing the bracket

A
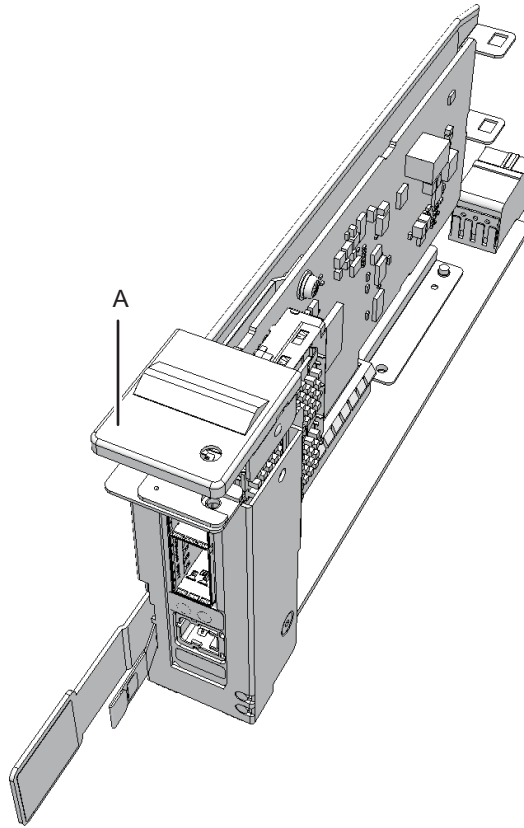
4.   **Remove the PCIe card from the PCIe card cassette.**

⚠ **Caution -** Do not forcibly remove the PCIe card from the PCIe card cassette. If excessive force is used to remove the PCIe card, it may be damaged.

Note - Place the removed PCIe card on a grounded antistatic ESD mat.

Figure 8-9   Removing a PCIe card
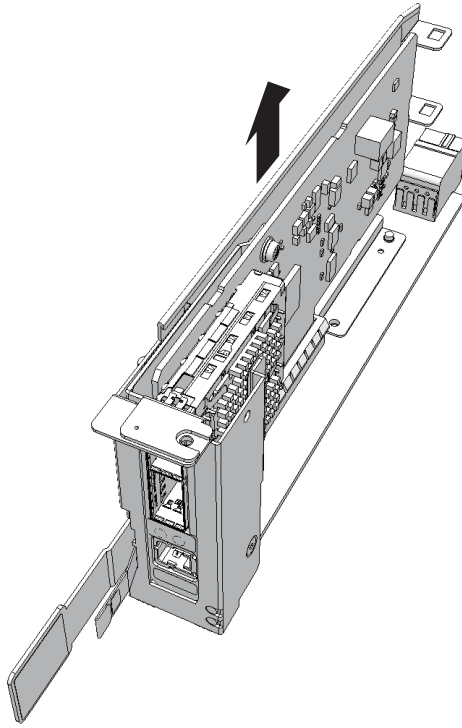
8.4.3   Installing a PCI Express card filler

1. **Mount the PCIe card filler on the outside (A in the figure) of the PCIe card cassette.**

Figure 8-10   Installing the PCIe card filler
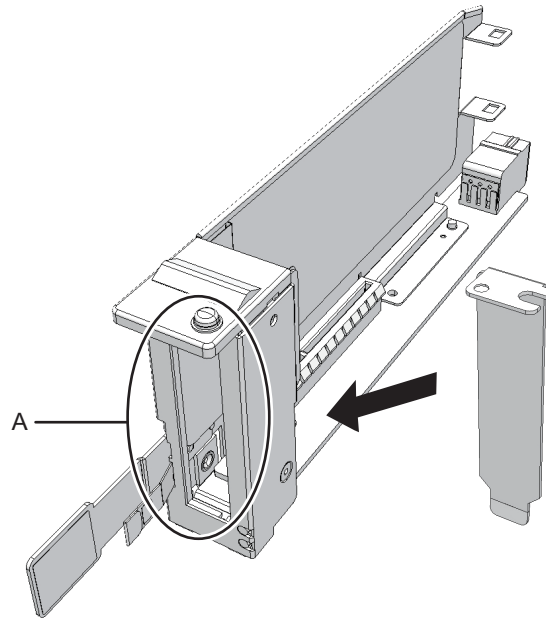
2.   **Fix the installed PCIe card filler.**

Figure 8-11   Fixing the PCIe card filler
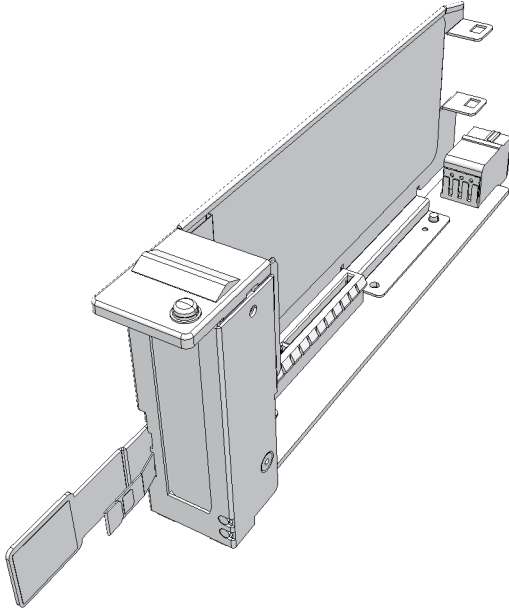
8.5   Installing a PCI Express Card

This section describes the procedure for installing a PCIe card.

8.5.1   Removing a PCI Express card filler

1. **Remove the PCIe card filler (A in the figure) from the PCIe card cassette.**

Figure 8-12   Removing the PCIe filler
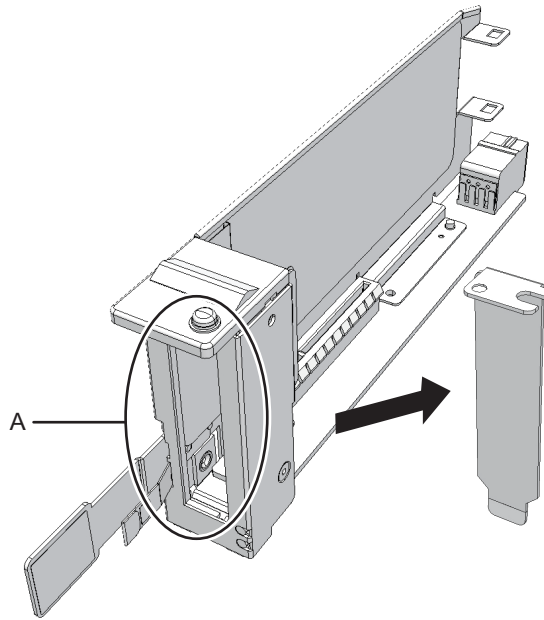
8.5.2   Installing a PCI Express card

1. **Install the PCIe card by inserting it into the connector of the PCIe card cassette.**

Note - Confirm that the tab of the PCIe card or the tab (A in the figure) of the filler for the PCIe card is inserted in the notch (B in the figure) of the PCIe card cassette.

Figure 8-13　Installing a PCIe card
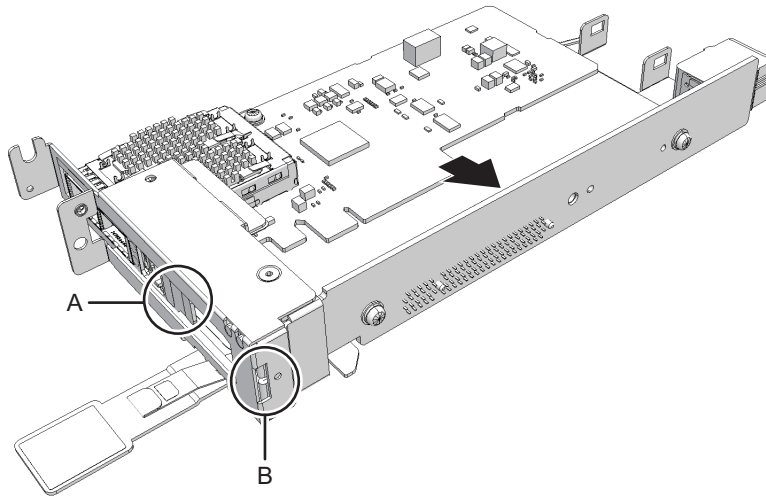
2.　**Install the bracket for the PCIe card, and secure it with the one screw.**

Figure 8-14　Installing the bracket
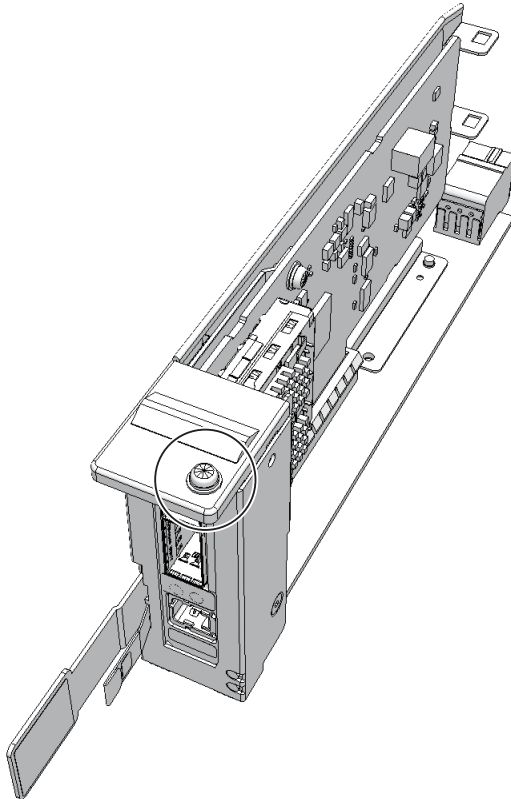
3. **Mount the cover on the PCIe card cassette.**

8.5.3   Installing a PCI Express card cassette

⚠ **Caution -** When installing a PCIe card cassette, confirm that the connectors on both the chassis and PCIe card cassette do not have any bent pins, and that the pins are aligned correctly. If you attempt to install a PCIe card cassette while any of the connector pins are bent, the chassis or the PCIe card cassette may be damaged. When performing installation, perform the work carefully so as not to bend any pins.

1. **Hold the lever of the PCIe card cassette and carefully insert the cassette into the PCIe slot.**

Note - Before installing the PCIe card cassette, confirm that the lever of the PCIe card cassette is lowered.

Note - Slide the PCIe card cassette along the rail at the bottom of the PCIe slot.

⚠ **Caution -** Do not forcibly push the PCIe card cassette into the PCIe slot. Using excessive force may damage the component or the chassis.

2. **Raise the lever of the PCIe card cassette while pushing the latch and secure it.**

Note - Ensure that the PCIe card cassette is firmly inserted and secured.

3. **Connect the cables to the PCIe card cassette.**

Note - Reinstall the cables of the PCIe card cassettes in their original positions by referring to notes that you made prior to the start of maintenance.

The FRU installation work is completed. See "Chapter 7   Maintenance Flow" to continue maintenance work.

Chapter 9

Maintaining the CPU Memory Unit/Memory

This chapter describes the procedures for maintaining the CPU memory unit and memory mounted in the SPARC M10-4/M10-4S. The CPU memory unit lower can only be replaced. The CPU memory unit upper can be replaced, expanded, and reduced.

- Before Maintaining a CPU Memory Unit/Memory
- Configuration of the CPU Memory Unit and Memory
- Maintenance Precautions
- FRU Removal and Installation Flow
- Removing a CPU Memory Unit
- Installing a PCI Express Cable
- Switching the microSD Card
- Removing Memory
- Installing Memory
- Installing a CPU Memory Unit
- Checking the XCP Firmware Version
- Checking the XCP Firmware Version (Building Block Configuration)

9.1 Before Maintaining a CPU Memory Unit/Memory

This chapter only has descriptions of the CPU memory unit/memory configuration and the work of removing and installing a CPU memory unit/memory.
Before removing a FRU, see "Chapter 7   Maintenance Flow" and perform the necessary work items.
For the types of maintenance on a CPU memory unit/memory, also see "CPU memory unit" and "Memory" in "Table 7-2   List of available maintenance types by FRU."

9.2 Configuration of the CPU Memory Unit and Memory

This section describes the configuration and locations of the CPU memory unit and memory.

9.2.1 Configuration of the CPU memory unit

A CPU memory unit is composed of the following two parts: the CPU memory unit lower and the CPU memory unit upper.

Figure 9-1   Location of CPU memory unit
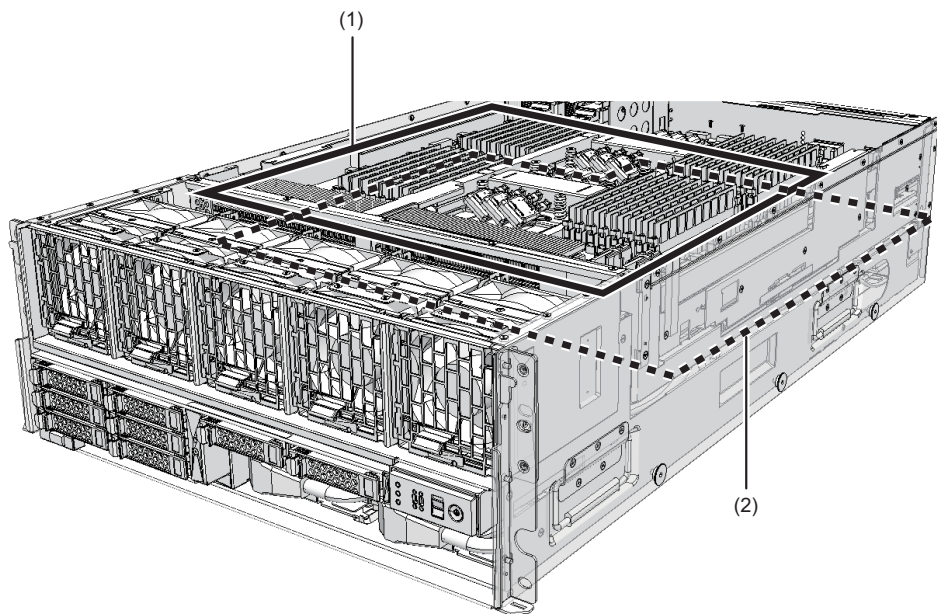
Location number	Component
1	CPU memory unit upper (CMUU)
2	CPU memory unit lower (CMUL)

There are two types of CPU memory units: FRAME-A and FRAME-B. The type of CPU memory unit can be determined from the indication on the label (A in Figure 9-2). If a CPU memory unit does not have the "FRAME-B" indication, it is a FRAME-A unit.

Figure 9-2   Type of CPU memory unit
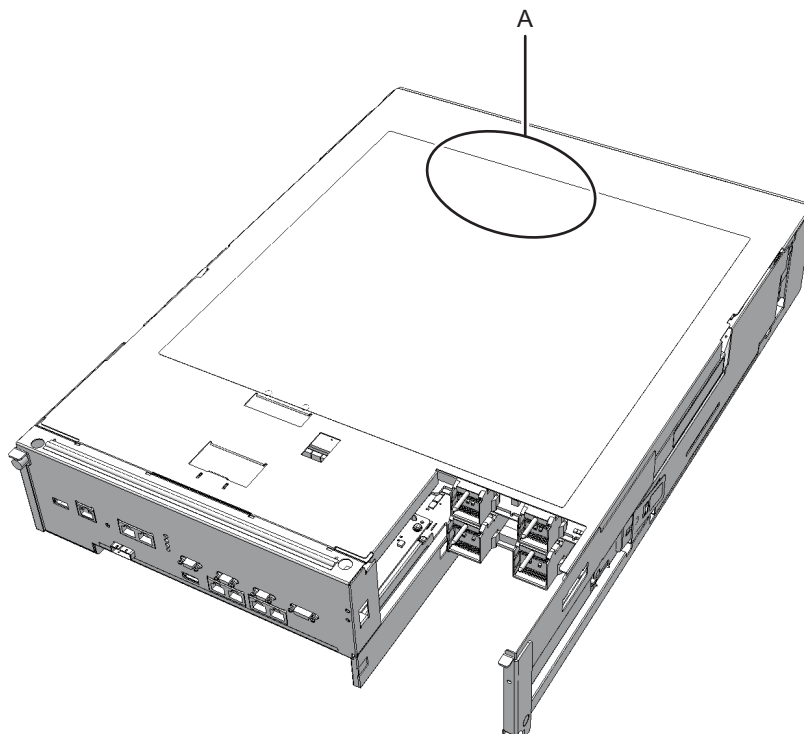
9.2.2   Memory configuration

A maximum of 32 memory modules can be implemented in one CPU memory unit. One chassis can contain two CPU memory units; the CPU memory unit upper and lower. Therefore, the maximum number of memory modules that can be implemented in one chassis is 64.
For the memory installation rules and the method for checking memory information, see "2.2   Checking the Memory Configuration Rules."

9.3 Maintenance Precautions

Note the following points when you maintain the CPU memory unit:

⚠️ **Caution -** The weight of the CPU memory unit is 17 kg (37.4 lb). If the mounting location in the rack is 24U or higher, the maintenance work must be done by two people. If you attempt to perform the maintenance work alone, you may injure yourself or cause damage to the chassis.

- Do not replace the CPU memory unit lower at the same time as the PSU backplane unit. If you replace them at the same time, the system may fail to operate normally.
- Do not mount and use any of the following microSD cards in the CPU memory unit lower in another chassis:
  - the one currently mounted in the SPARC M10-4/M10-4S, or
  - one that was once used as a maintenance part

  This is because these microSD cards store device identification information.
- The XSCF mounted in the CPU memory unit lower is not a FRU (field replaceable unit). When replacing the CPU memory unit lower, do not switch the XSCF units.
- If you switch the microSD card when replacing the CPU memory unit lower, the maintenance time is shorter since the XSCF setting information is inherited.
- If you replace the microSD card along with the CPU memory unit lower, dispose of the microSD card mounted on the old CPU memory unit lower by appropriate means such as cutting it with cutting pliers. The old microSD card stores the user information, IP address, and other information set in the XSCF firmware.
- If the device uses the hardware RAID function, after replacing the CPU memory unit lower, you need to reactivate 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 installing the CPU memory unit upper, you need to perform the work of adding PCIe cables. For details, see "9.6 Installing a PCI Express Cable."
- When you install/remove the CPU memory unit upper, the root complex is also installed/removed. As a result, the PCIe card installation rules, etc. may change and the logical domains may need to be reconfigured. For details, see "4.3.2 Precautions for installation" or "4.3.3 Precautions for reduction."

9.4 FRU Removal and Installation Flow

Perform maintenance work on the CPU memory unit by following the procedures shown in Figure 9-3 and Table 9-1.

Perform maintenance work on memory by following the procedures shown in Figure 9-4 and Table 9-4.

Maintenance workflow of the CPU memory unit

Figure 9-3   Maintenance workflow of the CPU memory unit

(Enable access to FRU requiring maintenance)

1. Access CPU memory unit

2. Remove CPU memory unit from chassis

Replacement

3. Remove CPU memory unit upper or filler unit

4. Switch micro SD card (*1)

5. Remove memory

6. Install memory

7. Install CPU memory unit upper or filler unit

8. Install CPU memory unit in chassis

(Go to "7.2 FRU Replacement Workflow")

Installation

3. Removing a filler unit

4. Installing a PCI Express cable

5. Install memory

6. Install CPU memory unit upper

7. Install CPU memory unit in chassis

(Go to "7.3 FRU Installation Workflow")

Removal

3. Remove CPU memory unit upper

4. Install filler unit

5. Install CPU memory unit in chassis

(Go to "7.4 FRU Removal Workflow")

*1: Perform this work only when replacing CPU memory unit lower.

Table 9-1   CPU memory unit replacement workflow and procedures

Item	Maintenance work procedure	Reference
1	Accessing a CPU memory unit	"9.5.1 Accessing a CPU memory unit"
2	Removing a CPU memory unit from the chassis	"9.5.2 Removing a CPU memory unit from the chassis"
3	Removing the CPU memory unit upper or filler unit	"9.5.3 Removing the CPU memory unit upper"
4	Switching the microSD card (*1)	"9.7 Switching the microSD Card"
5	Removing memory	"9.8 Removing Memory"
6	Installing memory (*2)	"9.9 Installing Memory"
7	Installing the CPU memory unit upper or filler unit	"9.10.1 Installing the CPU memory unit upper"
8	Installing the CPU memory unit in the chassis	"9.10.2 Installing the CPU memory unit in the chassis"

*1 You can shorten the maintenance time by switching the microSD card when replacing the CPU memory unit lower. You do not need to switch the microSD card when replacing the CPU memory unit upper.
*2 When replacing the CPU memory unit, mount memory in the same mounting locations as in the replaced unit.

Table 9-2   CPU memory unit upper installation workflow and procedures

Item	Maintenance work procedure	Reference
1	Accessing a CPU memory unit	"9.5.1 Accessing a CPU memory unit"
2	Removing a CPU memory unit from the chassis	"9.5.2 Removing a CPU memory unit from the chassis"
3	Removing the filler unit	"9.5.3 Removing the CPU memory unit upper"
4	Installing a PCI Express cable (*1)	"9.6 Installing a PCI Express Cable"
5	Installing memory	"9.9 Installing Memory"
6	Installing the CPU memory unit upper	"9.10.1 Installing the CPU memory unit upper"
7	Installing the CPU memory unit in the chassis	"9.10.2 Installing the CPU memory unit in the chassis"

*1 If the PCI Express cables have been installed, skip this procedure.

Table 9-3   CPU memory unit upper removal workflow and procedures

Item	Maintenance work procedure	Reference
1	Accessing a CPU memory unit	"9.5.1 Accessing a CPU memory unit"
2	Removing a CPU memory unit from the chassis	"9.5.2 Removing a CPU memory unit from the chassis"
3	Removing the CPU memory unit upper	"9.5.3 Removing the CPU memory unit upper"
4	Installing a filler unit	"9.10.1 Installing the CPU memory unit upper"
5	Installing the CPU memory unit in the chassis	"9.10.2 Installing the CPU memory unit in the chassis"

Maintenance workflow of memory

Figure 9-4   Maintenance workflow of memory
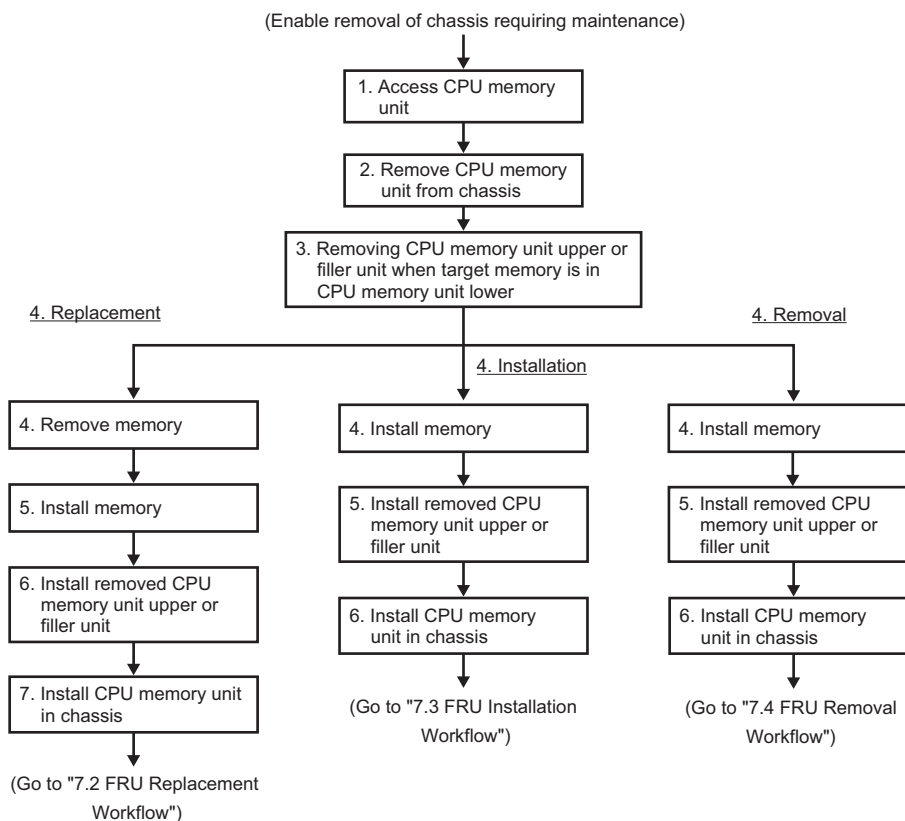
Table 9-4   Memory replacement workflow and procedures

Item	Maintenance work procedure	Reference
1	Accessing the CPU memory unit	"9.5.1 Accessing a CPU memory unit"
2	Removing a CPU memory unit from the chassis	"9.5.2 Removing a CPU memory unit from the chassis"
3	Removing the CPU memory unit upper when the target memory is in the CPU memory unit lower.	"9.5.3 Removing the CPU memory unit upper"
4	Removing memory	"9.8 Removing Memory"
5	Installing memory	"9.9 Installing Memory"
6	Installing the removed CPU memory unit upper	"9.10.1 Installing the CPU memory unit upper"
7	Installing the CPU memory unit in the chassis	"9.10.2 Installing the CPU memory unit in the chassis"

Table 9-5　　Memory installation workflow and procedures

Item	Maintenance work procedure	Reference
1	Accessing the CPU memory unit	"9.5.1　Accessing a CPU memory unit"
2	Removing a CPU memory unit from the chassis	"9.5.2　Removing a CPU memory unit from the chassis"
3	Removing the CPU memory unit upper when the target memory is in the CPU memory unit lower.	"9.5.3　Removing the CPU memory unit upper"
4	Installing memory	"9.9　Installing Memory"
5	Installing the removed CPU memory unit upper	"9.10.1　Installing the CPU memory unit upper"
6	Installing the CPU memory unit in the chassis	"9.10.2　Installing the CPU memory unit in the chassis"

Table 9-6　　Memory removal workflow and procedures

Item	Maintenance work procedure	Reference
1	Accessing the CPU memory unit	"9.5.1　Accessing a CPU memory unit"
2	Removing a CPU memory unit from the chassis	"9.5.2　Removing a CPU memory unit from the chassis"
3	Removing the CPU memory unit upper when the target memory is in the CPU memory unit lower.	"9.5.3　Removing the CPU memory unit upper"
4	Removing memory	"9.8　Removing Memory"
5	Installing the removed CPU memory unit upper	"9.10.1　Installing the CPU memory unit upper"
6	Installing the CPU memory unit in the chassis	"9.10.2　Installing the CPU memory unit in the chassis"

9.5　Removing a CPU Memory Unit

This section describes the procedure for removing a CPU memory unit. Enable the removal of the CPU memory unit before attempting to remove it. For details, follow the procedure in "Chapter 7　Maintenance Flow."
Unless otherwise specified, the figures explained in this section use the SPARC M10-4S with a FRAME-A CPU memory unit.

⚠ **Caution -** Before you handle any components, 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 damaged. For details, see "1.5　Precautions on Static Electricity."

9.5.1 Accessing a CPU memory unit

1. **For a building block configuration of the SPARC M10-4S, remove the crossbar cables from the cable support.**
   For details, see "5.9.1 Removing the crossbar cables from the cable support."

2. **Lower the cable support.**
   For details, see "5.9.2 Lowering the cable support."

3. **Remove all the cables connected to the external interfaces on the rear of the chassis.**
   The cables to be removed are as follows.
   - Interface cable connected to the PCI Express (PCIe) card
   - Crossbar cables (They may have been removed in step 1.)
   - XSCF BB control cable (only for a building block configuration of the SPARC M10-4S)
   - XSCF DUAL control cable (only for a building block configuration of the SPARC M10-4S)
   - XSCF-LAN cable
   - Serial cable
   - LAN cable
   - SAS cable
   - USB cable

   Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

4. **Remove all the PCIe card cassettes.**
   For details, see "8.4.1 Removing a PCI Express card cassette."

   Note - Make a note of the locations of the PCIe card cassettes before removing them to ensure that they are reinstalled correctly.

5. **If any crossbar units are mounted, remove them.**
   For details, see "15.3 Removing a Crossbar Unit."

6. **Loosen the three screws holding the mounting frame and then remove it.**

Figure 9-5　　Screws securing the mounting frame
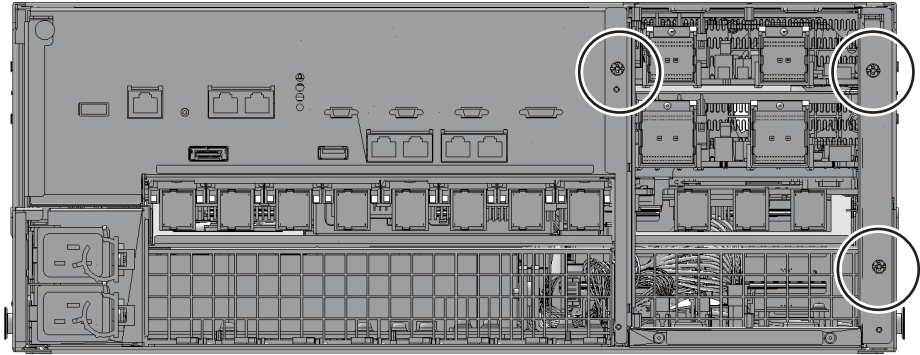
9.5.2　　Removing a CPU memory unit from the chassis

This section describes the procedure for removing a CPU memory unit.

Note - To install or remove a CPU memory unit upper, it is necessary to remove the CPU memory unit from the chassis.

1. **Loosen the one screw securing the lever of the CPU memory unit (rear left side) and then lower the right and left levers of the CPU memory unit to the horizontal position.**

Figure 9-6　　Locations of the screw and the levers of the CPU memory unit
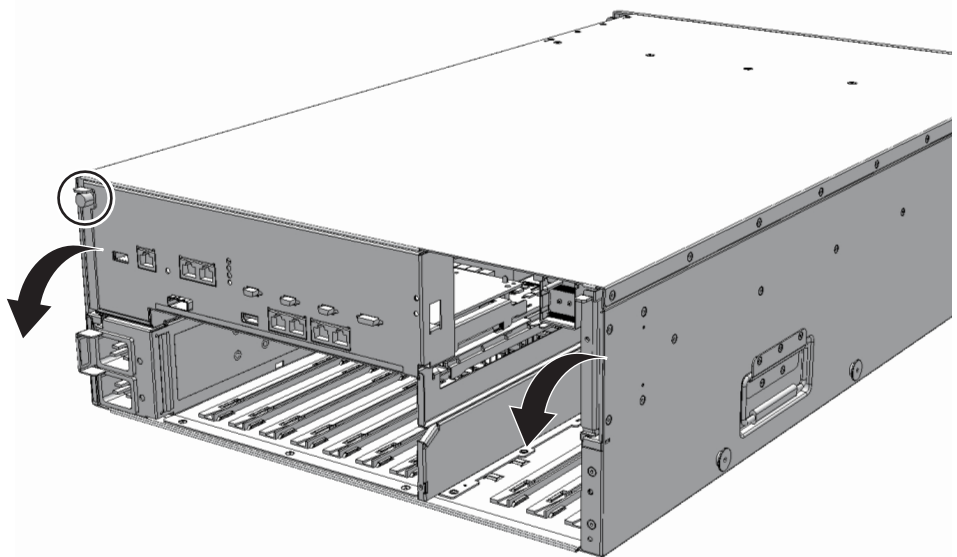
2. **Hold the right and left levers of the CPU memory unit and pull out the CPU memory unit about 10 cm (3.9 in.)**

Figure 9-7   Pulling out the CPU memory unit
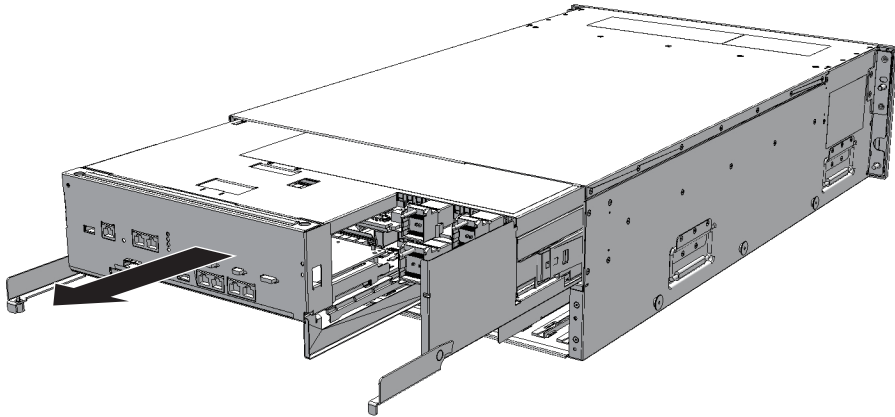
3. **With your hands at Handling Position on both sides of the CPU memory unit, hold and remove the CPU memory unit.**

9.5.3   Removing the CPU memory unit upper

Remove the CPU memory unit upper after removing the CPU memory unit from the chassis. Perform reduction using the same procedure. For installation or for a system where the CPU memory unit upper is not mounted, remove the filler unit of the CPU memory unit upper.

1. **Unlock (push) the top cover of the CPU memory unit, and remove the cover by sliding it in the direction of the arrow.**

Figure 9-8   Releasing the lock
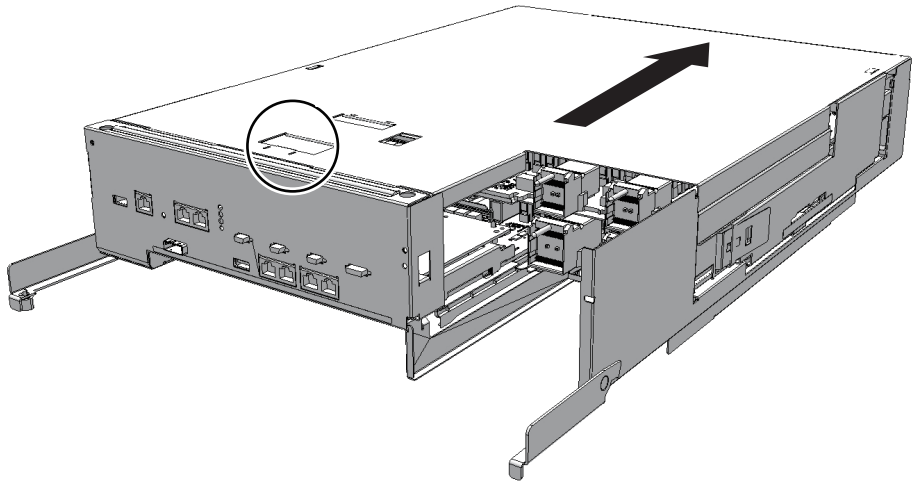
2. **Unlock (push) the right-side guide (when viewed from the rear) and remove it by sliding it in the direction of the arrow.**

Figure 9-9   Removing right-side guide
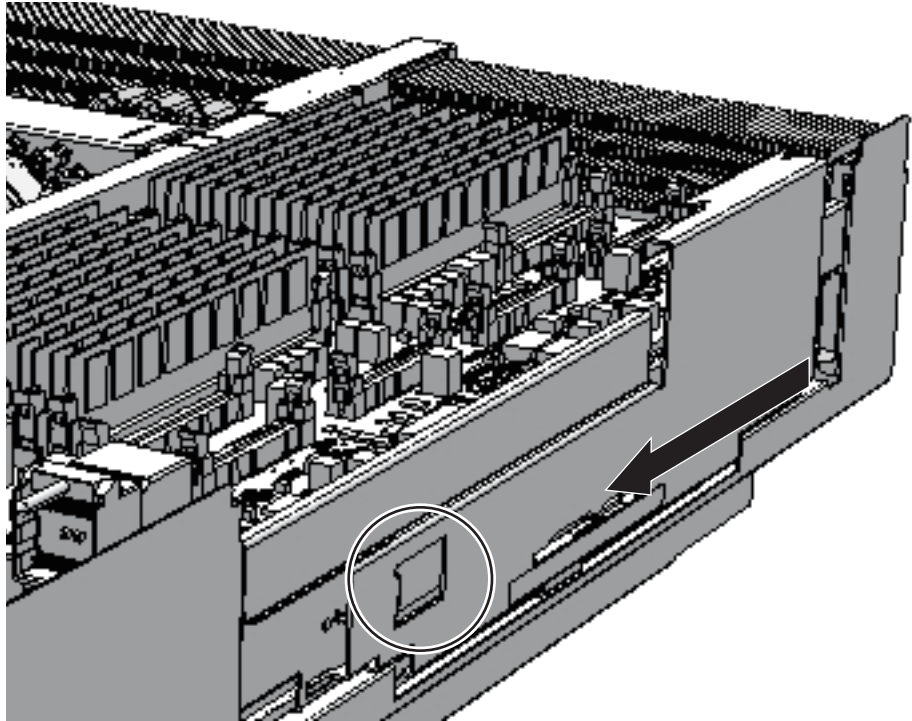
3. **Unlock (push) the left-side guide (when viewed from the rear) and remove it**

by sliding it in the direction of the arrow.

Figure 9-10   Removing left-side guide
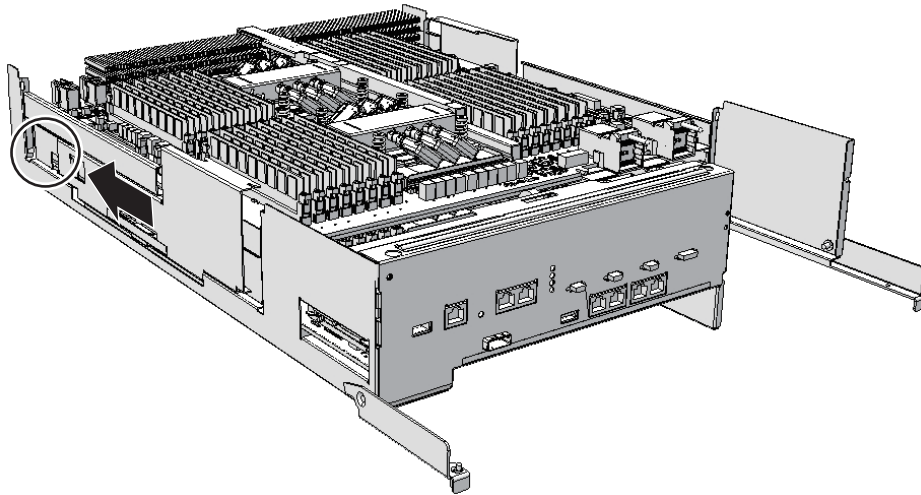
4. **Two PCIe cables (A in Figure 9-11) on the right side connect the CPU memory units upper and lower. Remove these cables from the CPU memory unit upper, and push them toward the outside of the chassis.**
    When removing the filler unit for the CPU memory unit upper, you do not need to remove the PCIe cables. Proceed to step 10.

Figure 9-11   Removing the right-side PCIe cables
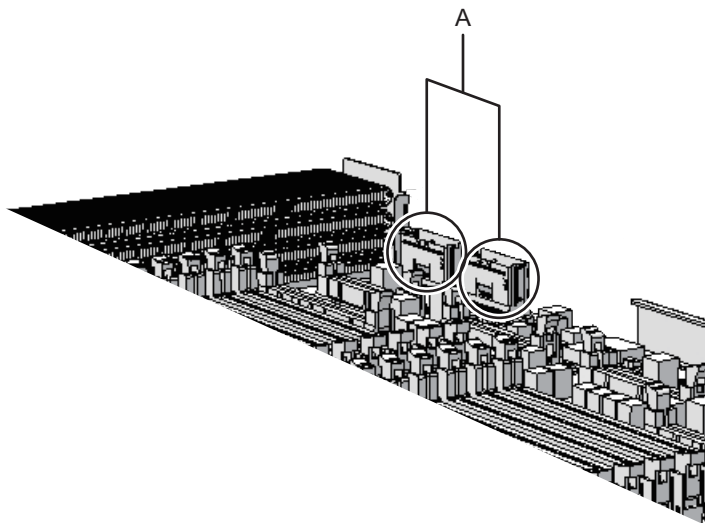
5. **Two PCIe cables (A in Figure 9-12) on the left side connect the CPU memory units upper and lower. Remove these cables from the CPU memory unit**

upper, and push the longer one at the front toward the outside of the chassis.

Figure 9-12   Removing the left-side cables
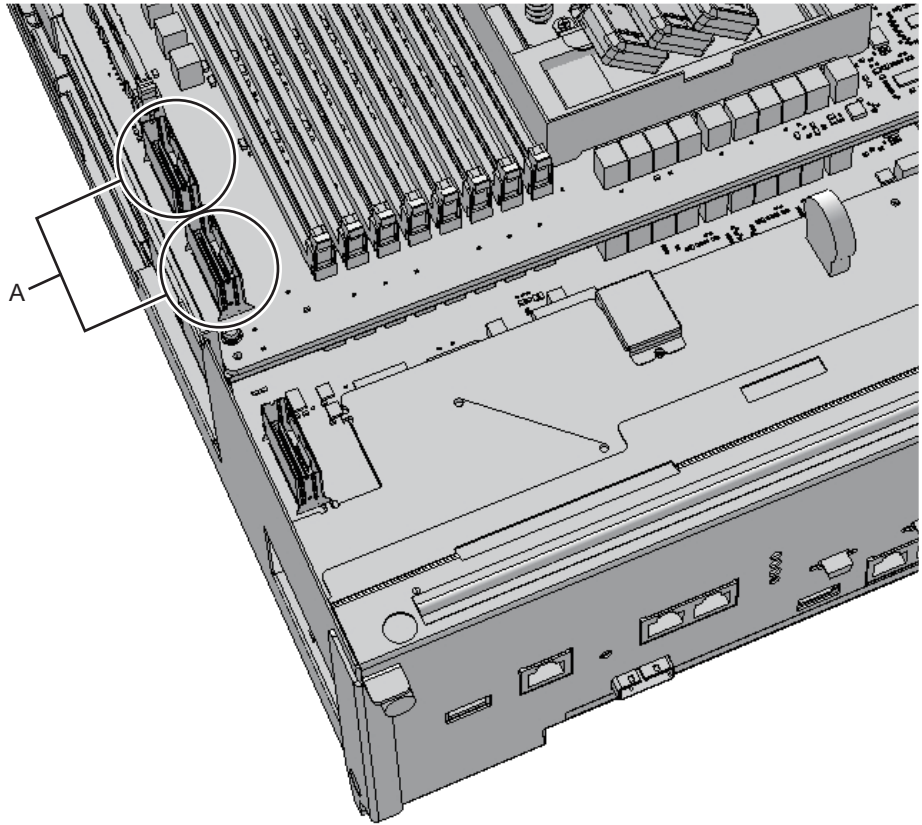
6. **Of the two PCIe cables on the left side, remove the rear one from the CPU memory unit lower too since it is short.**

Figure 9-13   Removing the PCIe cable from the left side rear
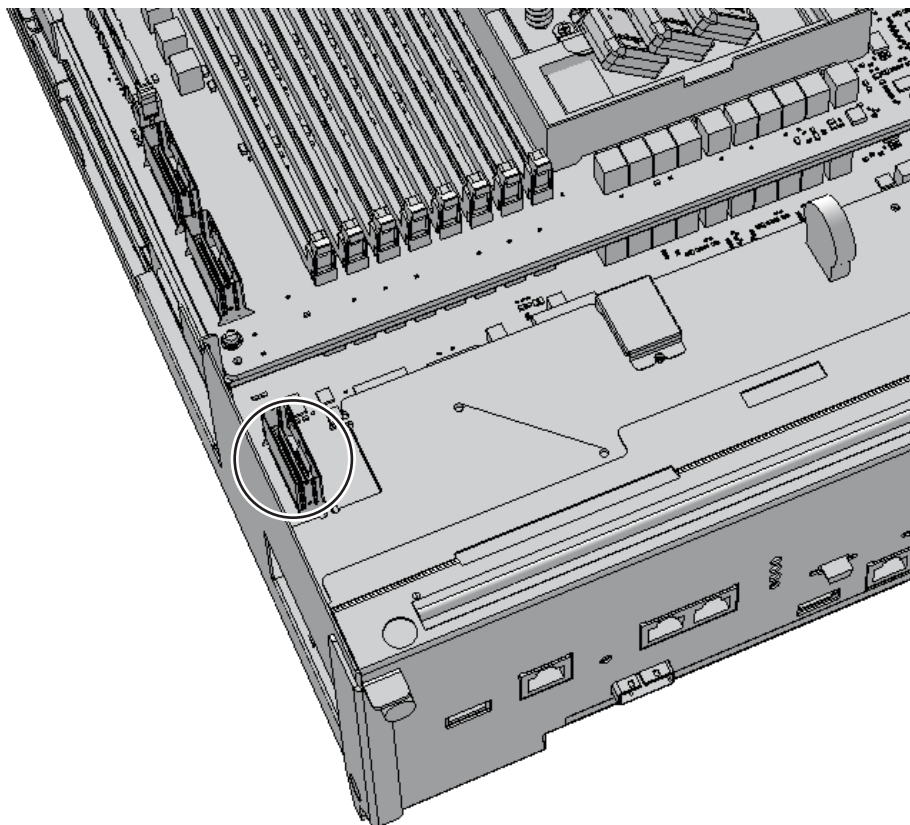
Perform the following work from the rear of the chassis. A in shows the standing position of a field engineer.

Figure 9-14   Standing position of a field engineer

A
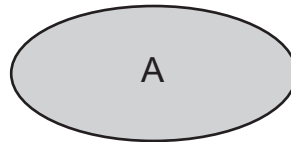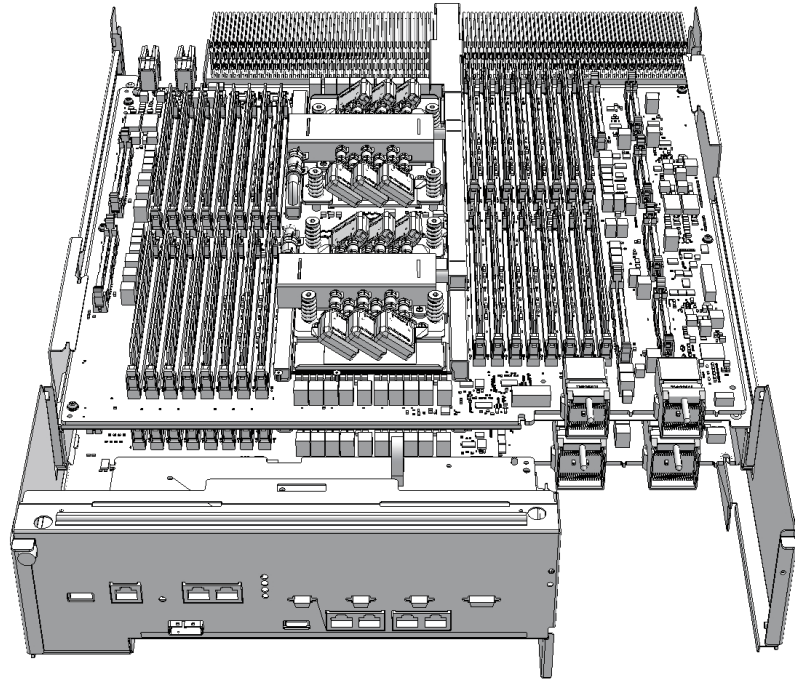
7. **Raise the levers (A in Figure 9-15) on the right and left sides to release the CPU memory unit upper.**

Figure 9-15　　Positions of right and left levers
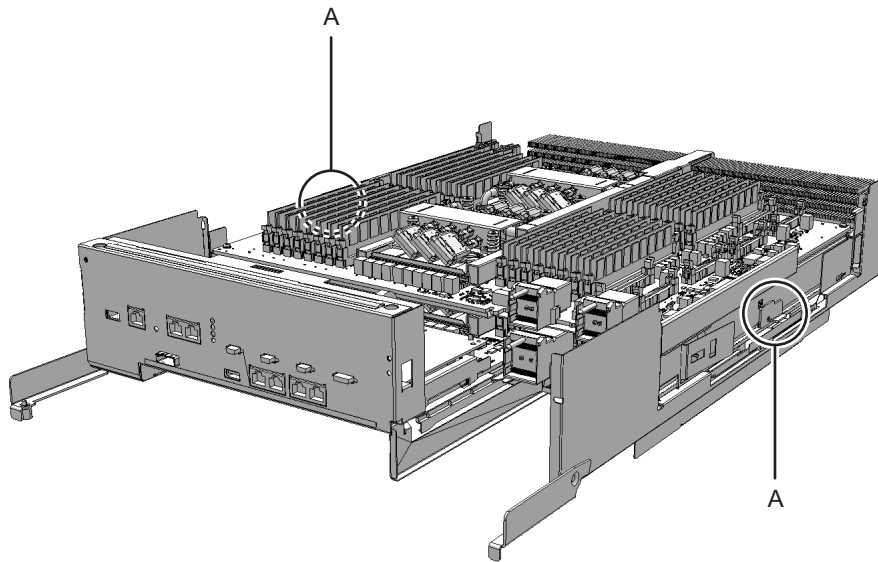
8. **While holding the levers, lift the CPU memory unit upper slightly.**
9. **If PCIe cables are connected to the CPU memory unit lower that has a filler unit mounted, push the PCIe cables (A and B in Figure 9-16) toward the outside of the chassis.**

Figure 9-16   How to push PCIe cables toward the outside
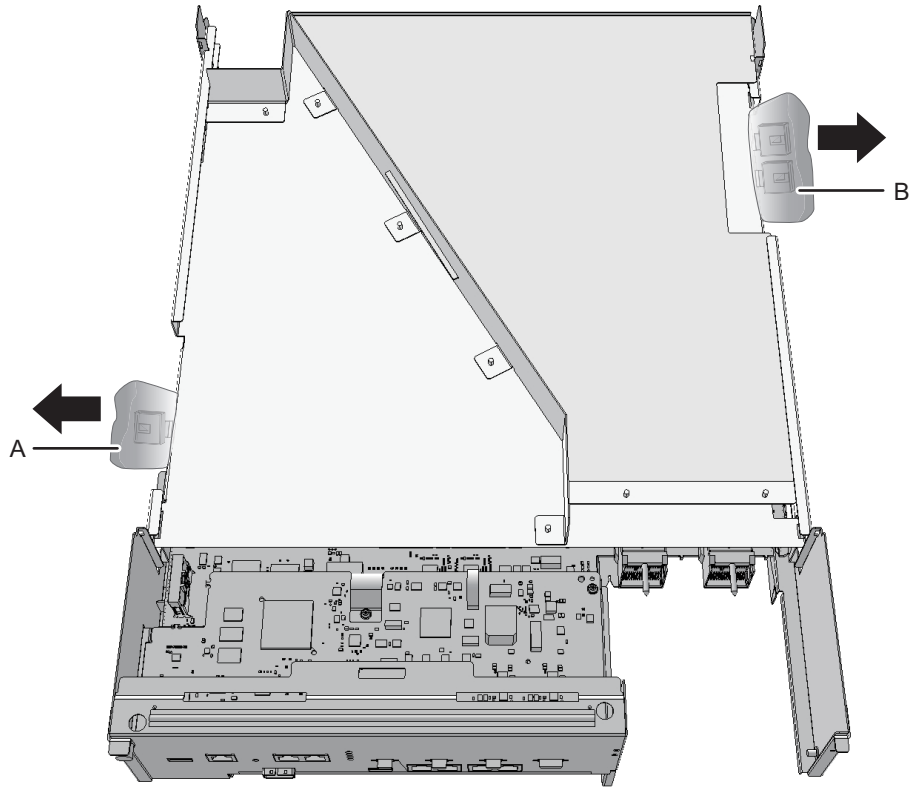
10. **With your hands at Handling Position on both sides of the CMUU, hold and lift the CPU memory unit upper or filler unit, and then remove it carefully.**

Note - Be careful when removing the CPU memory unit upper or the filler unit so that it does not catch on any PCIe cable.

Note - Place the removed CPU memory unit upper on a grounded antistatic ESD mat.

Figure 9-17   Removing CPU memory unit upper
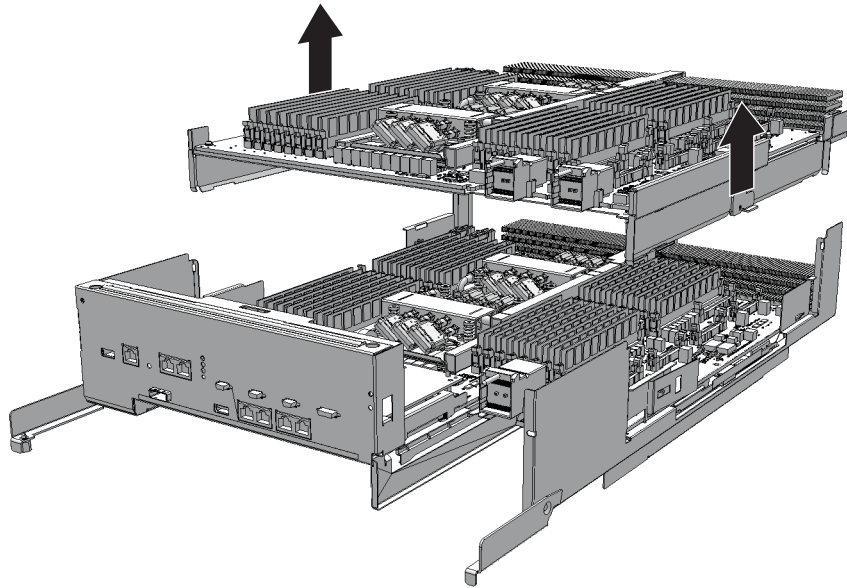
9.6   Installing a PCI Express Cable

Note - A part of the procedure varies depending on the CPU memory unit type. To determine the CPU memory unit type, check the label in Figure 9-2.

Connect the CPU memory unit lower and CPU memory unit upper with a PCIe cable.
Before installing a CPU memory unit upper, confirm that PCIe cables are connected to the CPU memory unit lower.
If PCIe cables have not been connected to the CPU memory unit lower, remove the CPU memory unit board (lower) once, and connect PCIe cables.
If PCIe cables are connected to the CPU memory unit lower, this work is not required.

Note - If PCIe cables have not been connected to the CPU memory unit lower when you are installing a CPU memory unit upper, use the PCIe cables supplied with the CPU memory unit upper.
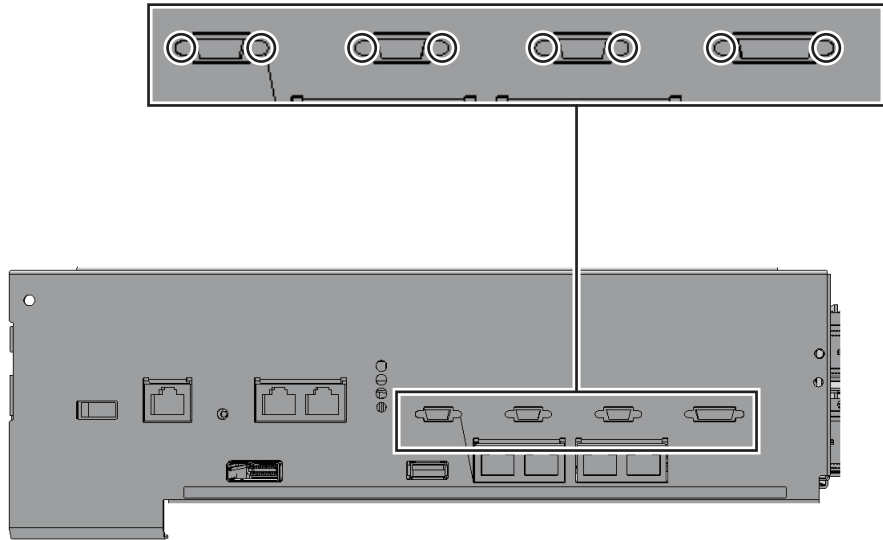
1. **Remove the eight screws from both sides of the XSCF cable connection ports on the rear of the CPU memory unit lower.**
   Use a flathead screwdriver (small) to remove them.

   For the SPARC M10-4 with a FRAME-A CPU memory unit and the SPARC M10-4/M10-4S with a FRAME-B CPU memory unit, this step is not necessary.

Figure 9-18   Screws for both ends of the XSCF cable connection ports (for the
                SPARC M10-4S with a FRAME-A CPU memory unit)

2.   **Loosen the two screws holding the upper part of the rear of the CPU memory
     unit lower. Then, remove the rear cover (A in Figure 9-19) by pulling it in the
     direction of the arrow.**

Figure 9-19   Removing the rear cover
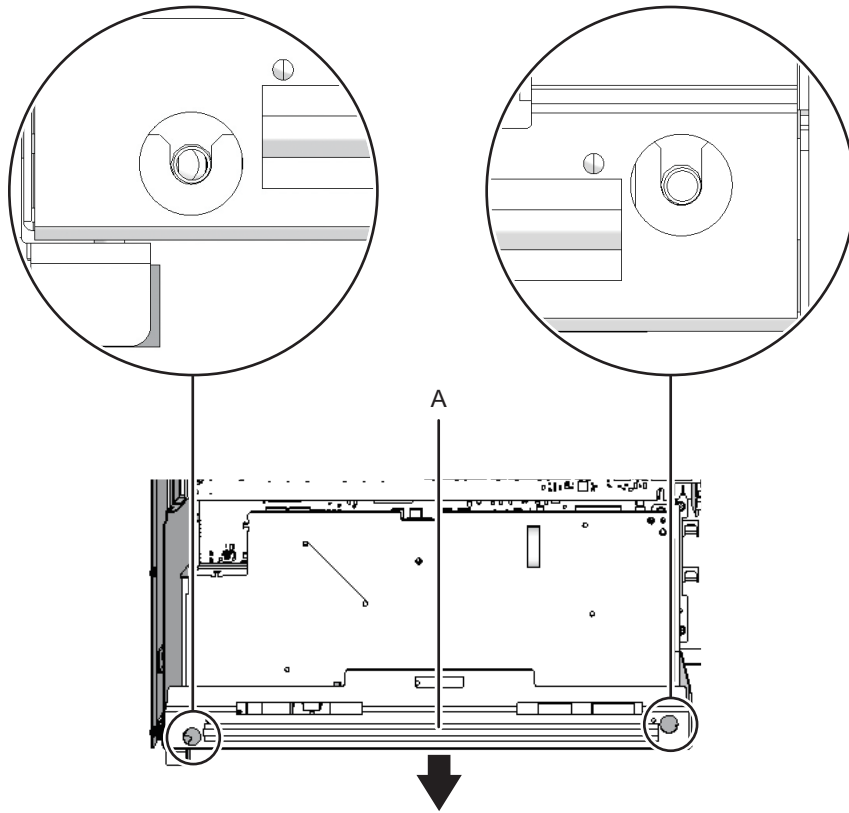
3. **Remove and pull out the XSCF board.**
    - **For the SPARC M10-4 with a FRAME-A/FRAME-B CPU memory unit**
      Remove the three screws securing the XSCF board (A in Figure 9-20) and rear
      cover. Tilt the right lever of the XSCF mount with your fingers by about 5 mm
      (0.2 in.) to the right (B in Figure 9-20). Lift the right side of the XSCF board to
      release the connection of the connector (C in Figure 9-20).

Figure 9-20   Releasing a connected XSCF board (for SPARC M10-4 with a
               FRAME-A CPU memory unit)
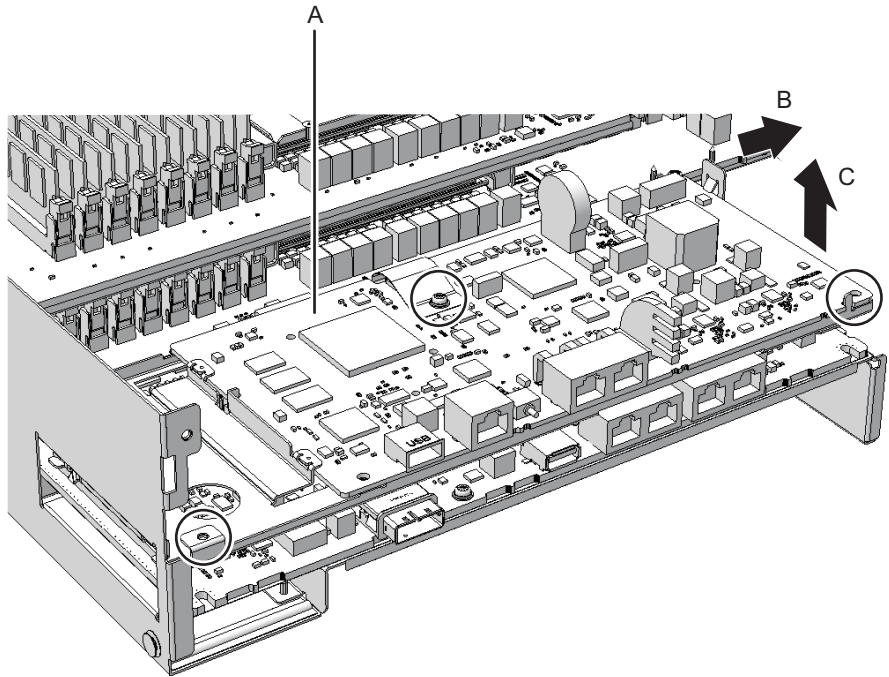
- **For the SPARC M10-4S with a FRAME-A/FRAME-B CPU memory unit**
  Remove the four screws securing the XSCF board (A in Figure 9-21). Then, lift
  the right side of the XSCF board to release the connection of the connector.

Figure 9-21   Releasing a connected XSCF board (for the SPARC M10-4S with a FRAME-A/FRAME-B CPU memory unit)
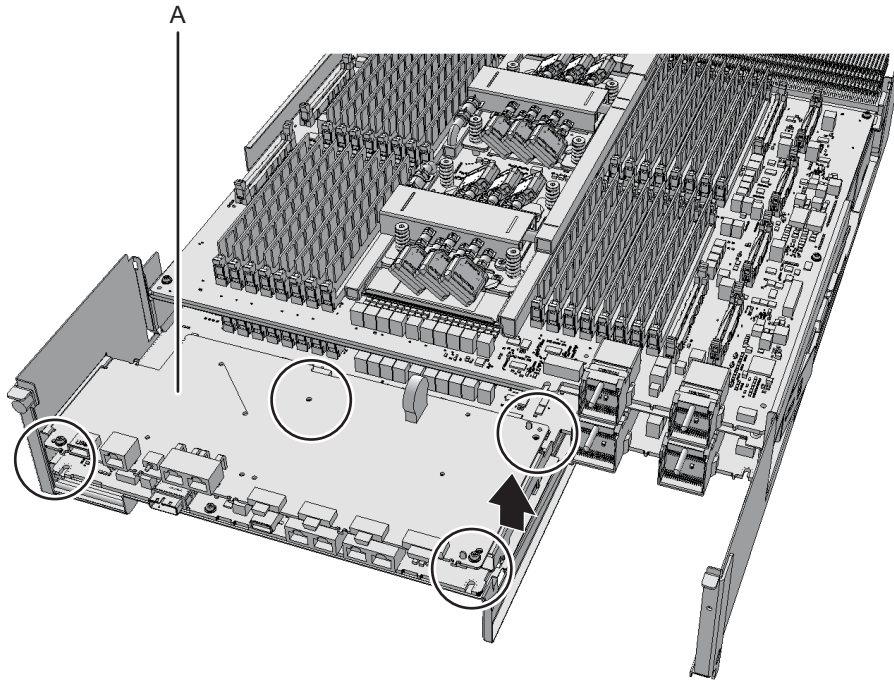
4. **Pull out the XSCF board diagonally to the right (arrow).**

Note - Place the removed XSCF board on a grounded antistatic ESD mat.

Figure 9-22   Pulling out an XSCF board (for the SPARC M10-4 with a FRAME-A/ FRAME-B CPU memory unit)
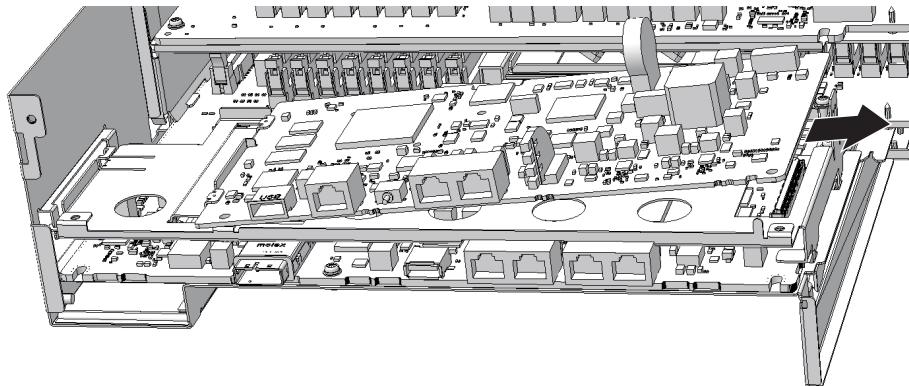
Figure 9-23   Pulling out an XSCF board (for the SPARC M10-4S with a FRAME-A/
              FRAME-B CPU memory unit)
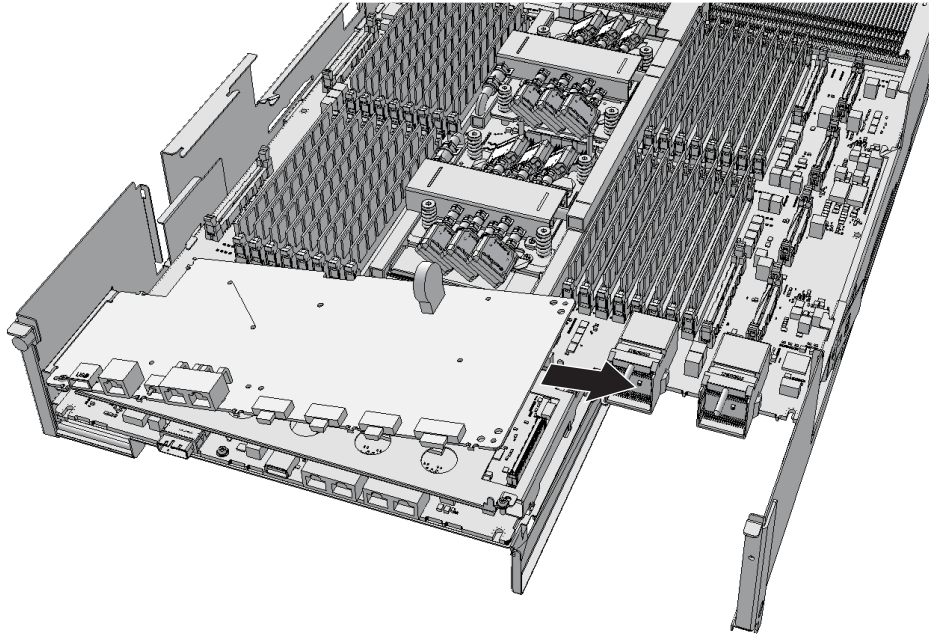
5.   **Remove the screw securing the XSCF mount.**
     -   **For the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit**
         Remove the one screw securing the XSCF mount (A in Figure 9-24 and Figure 9-25).

Figure 9-24   Screw for the XSCF mount (for the SPARC M10-4 with a FRAME-A/
FRAME-B CPU memory unit)

A
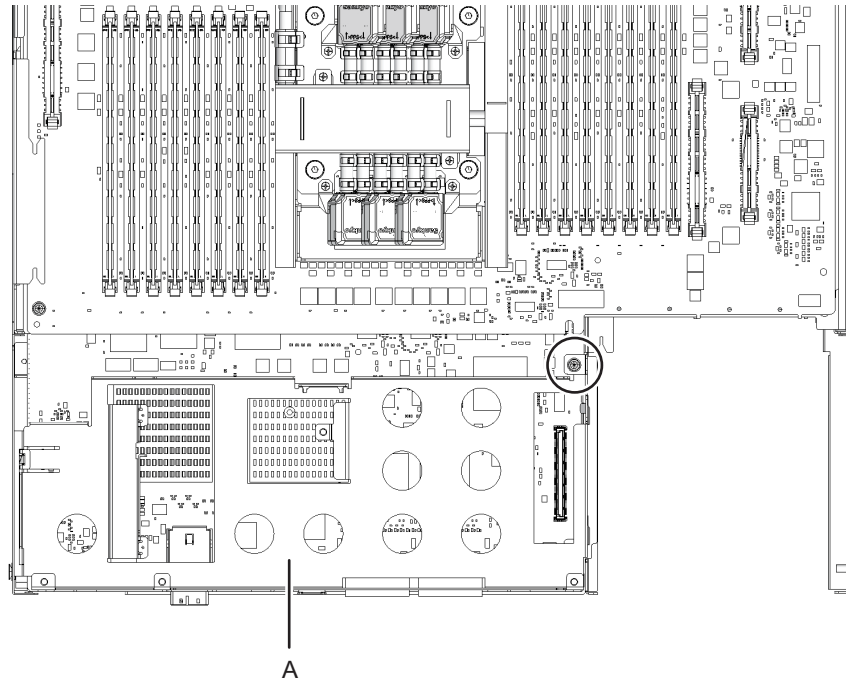
Figure 9-25   Screw for the XSCF mount (for the SPARC M10-4S with a FRAME-A CPU memory unit)
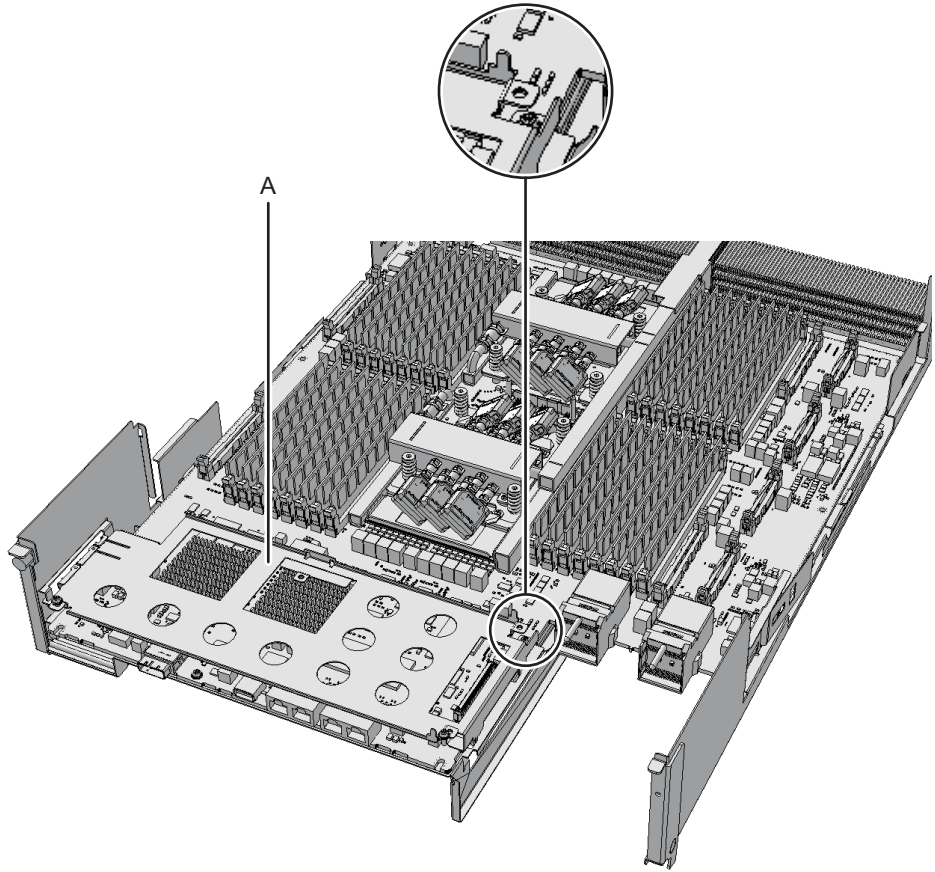
- **For the SPARC M10-4S with a FRAME-B CPU memory unit**
  Remove the two screws securing the XSCF mount (A in Figure 9-26).

Figure 9-26   Screw for the XSCF mount (for the SPARC M10-4S with a FRAME-B CPU memory unit)
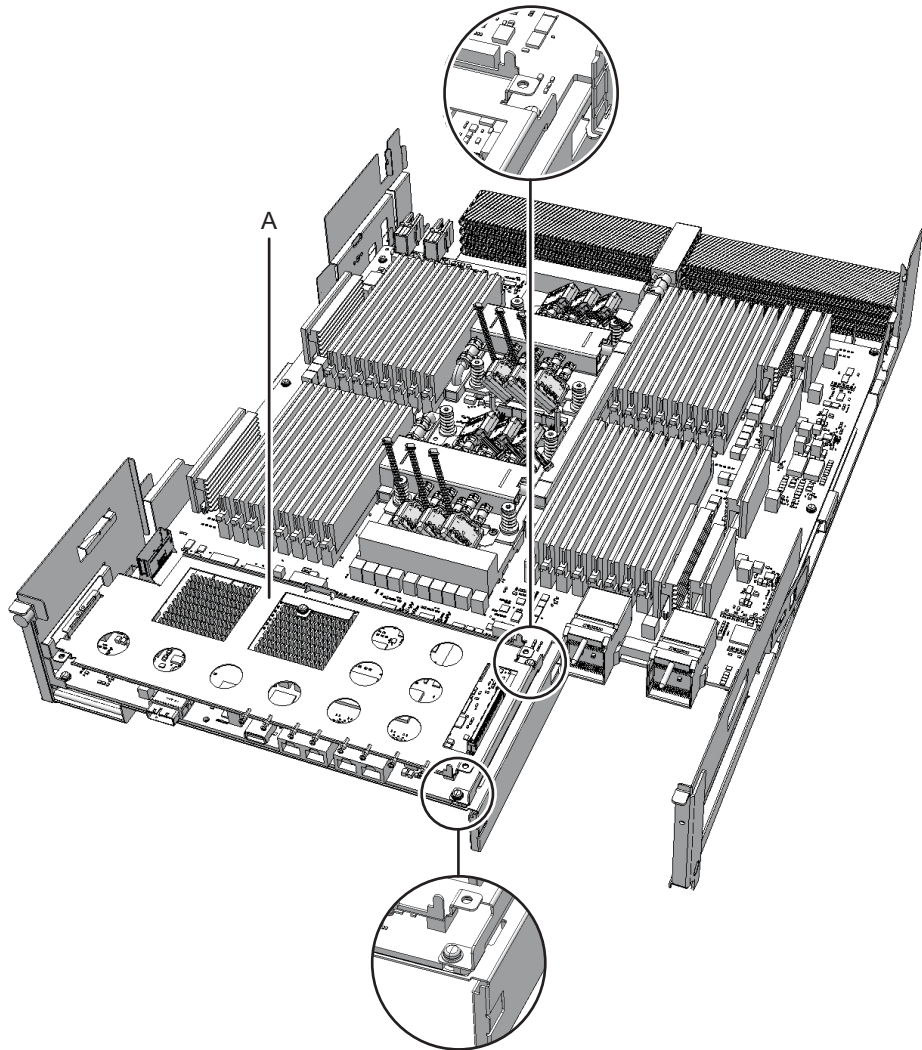
6.   **Remove the XSCF mount.**
      - **For the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit**
        Lift the protruding left lever (B in Figure 9-27 and Figure 9-28) of the XSCF mount (A in Figure 9-27 and Figure 9-28) by about 2 mm (0.1 in.) with your fingers, and slide it about 8 mm (0.4 in.) toward the front (C in Figure 9-27 and Figure 9-28). Then, pull it upward to remove it (D in Figure 9-27 and Figure 9-28).

Figure 9-27   Removing the XSCF mount (for the SPARC M10-4 with a FRAME-A CPU memory unit)
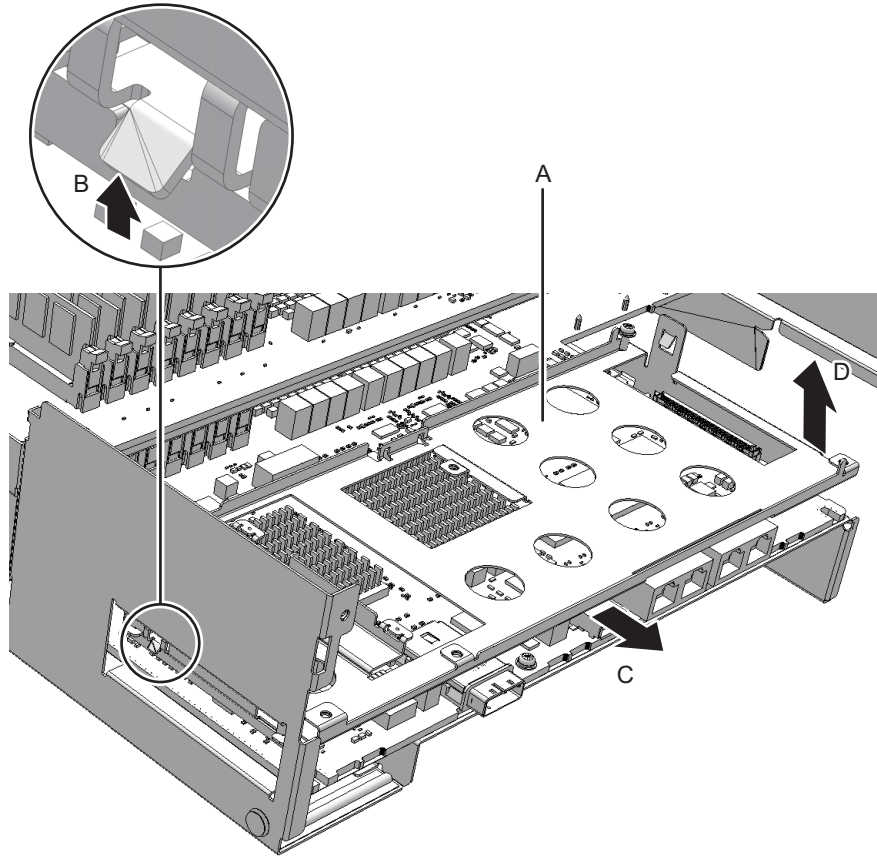
Figure 9-28   Removing the XSCF mount (for the SPARC M10-4S with a FRAME-A CPU memory unit)
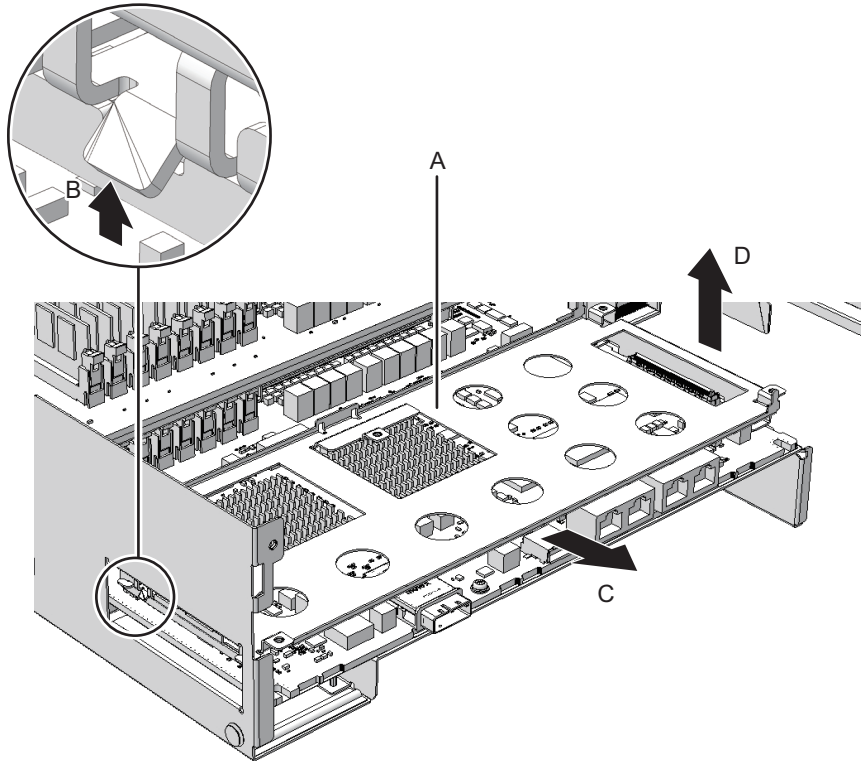
- **For the SPARC M10-4 with a FRAME-B CPU memory unit**
  Slide the right side of the XSCF mount (A in Figure 9-29) by about 8 mm (0.4 in.) toward the front (B in Figure 9-29). Then, pull it upward to remove it (C in Figure 9-29).
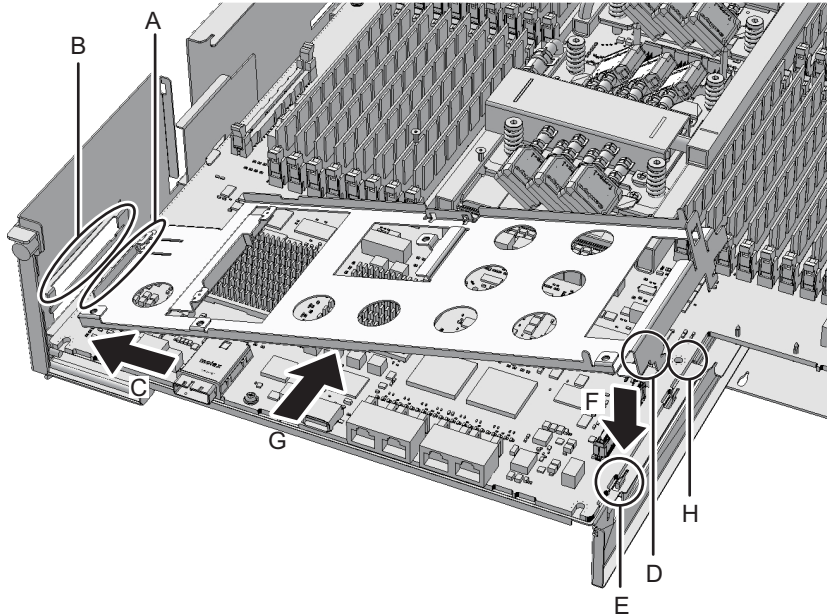
Figure 9-29   Removing the XSCF mount (for the SPARC M10-4 with a FRAME-B
CPU memory unit)
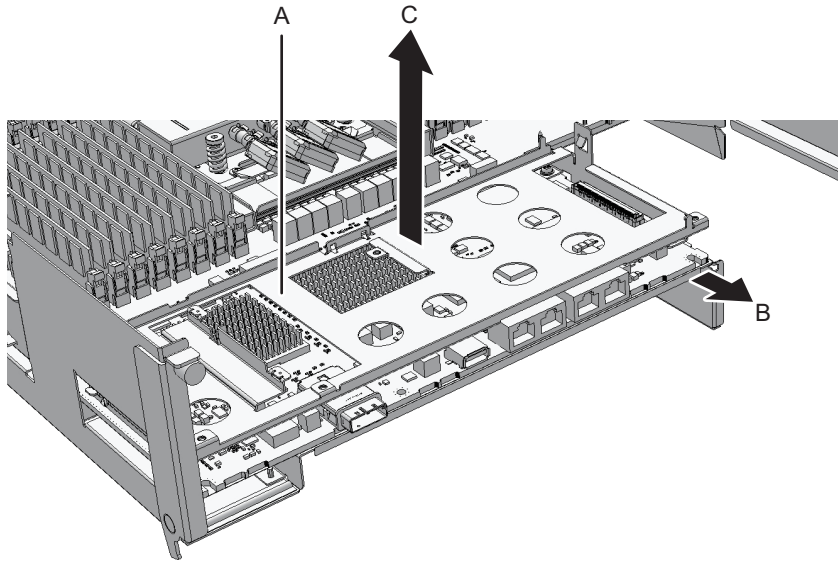
- **For the SPARC M10-4S with a FRAME-B CPU memory unit**
  Pull the XSCF mount upward (A in Figure 9-30) to remove it (B in Figure 9-30).

Figure 9-30   Removing the XSCF mount (for the SPARC M10-4S with a FRAME-B
CPU memory unit)
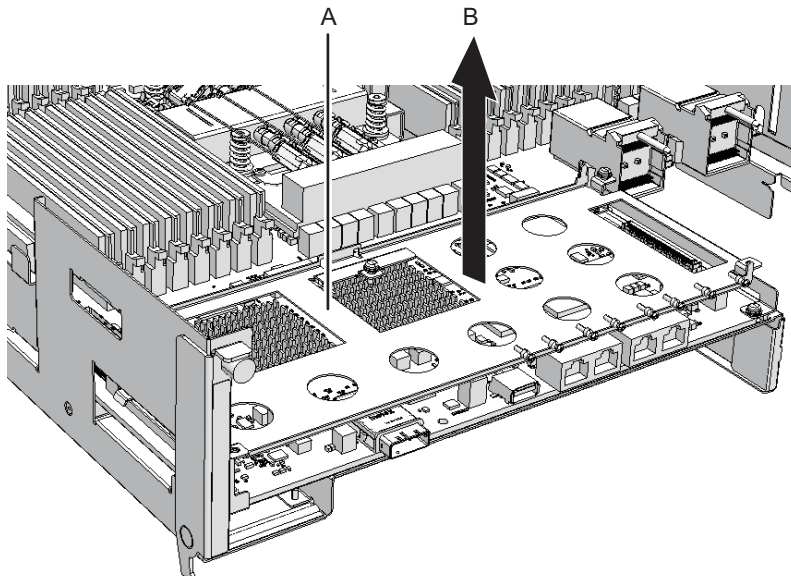
7. **Remove the screws securing the CPU memory unit board.**

- **For the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit**
  Remove the one black screw (A in Figure 9-31) securing the center part of the
  radiator on the front and the four screws securing the CPU memory unit board
  (B in Figure 9-31).

Figure 9-31   Screws on the CPU memory unit board (for the SPARC M10-4/
               M10-4S with a FRAME-A CPU memory unit)
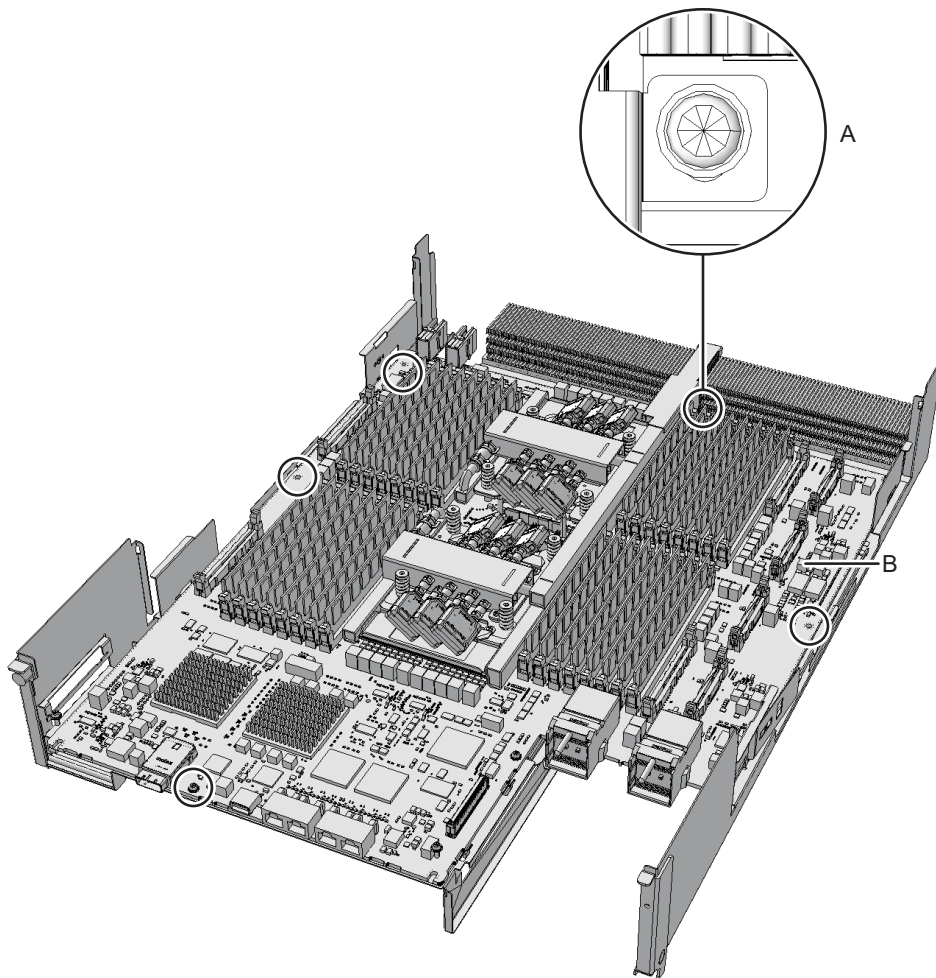
- **For the SPARC M10-4/M10-4S with a FRAME-B CPU memory unit**
  Remove the one black screw (A in Figure 9-32) securing the center part of the
  radiator on the front and the six screws securing the CPU memory unit board
  (B in Figure 9-32).

Figure 9-32   Screws on the CPU memory unit board (for the SPARC M10-4/
M10-4S with a FRAME-B CPU memory unit)
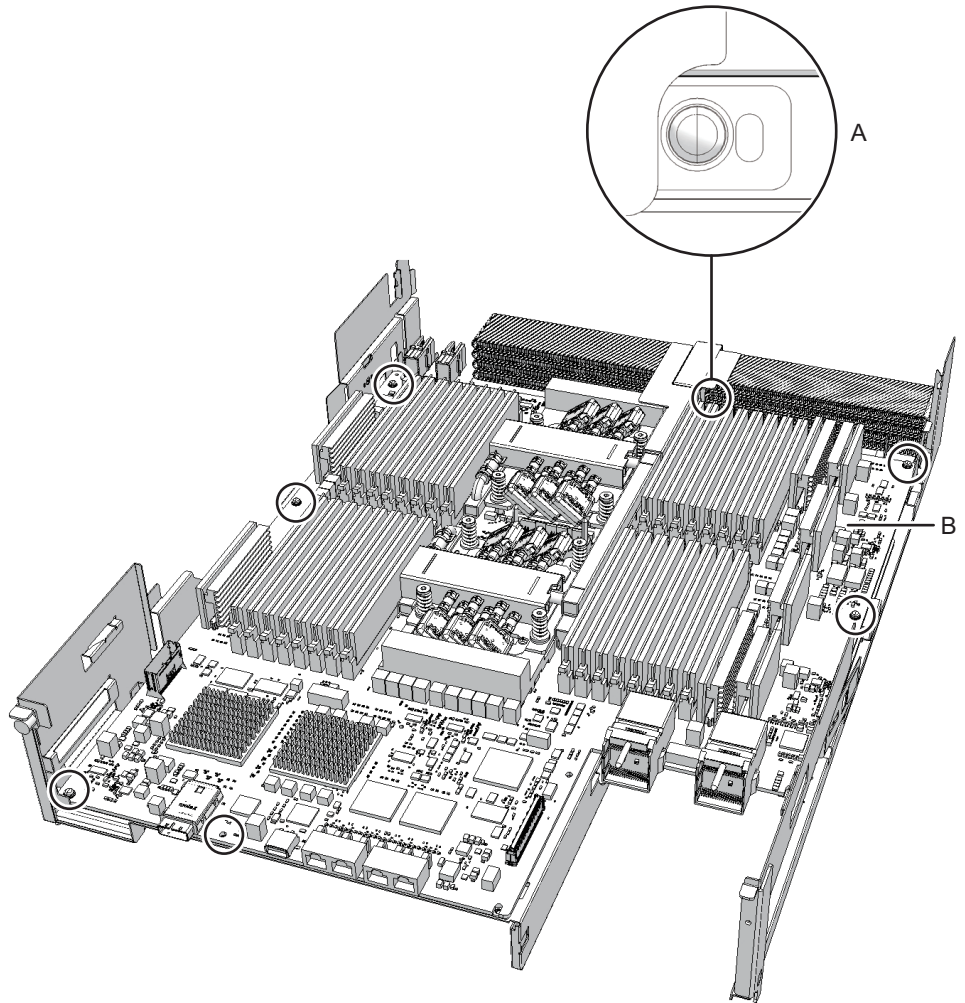
8.   **Place your thumbs on the frame, at the center on the right and left sides of the
CPU memory unit board (A in Figure 9-33), and insert your fingers under the
CPU memory unit board (B in Figure 9-34) from the sides of the connector
unit.**

Note - Be careful not to touch or catch your clothes or wrist strap on a connector pin located
on the back of the CPU memory unit board.

Note - Hard objects such as a machine tools should not come in contact with the connector
located on the back side of the CPU memory unit board.

Figure 9-33   Finger position when releasing the connection of the connector (surface)

Left   Right
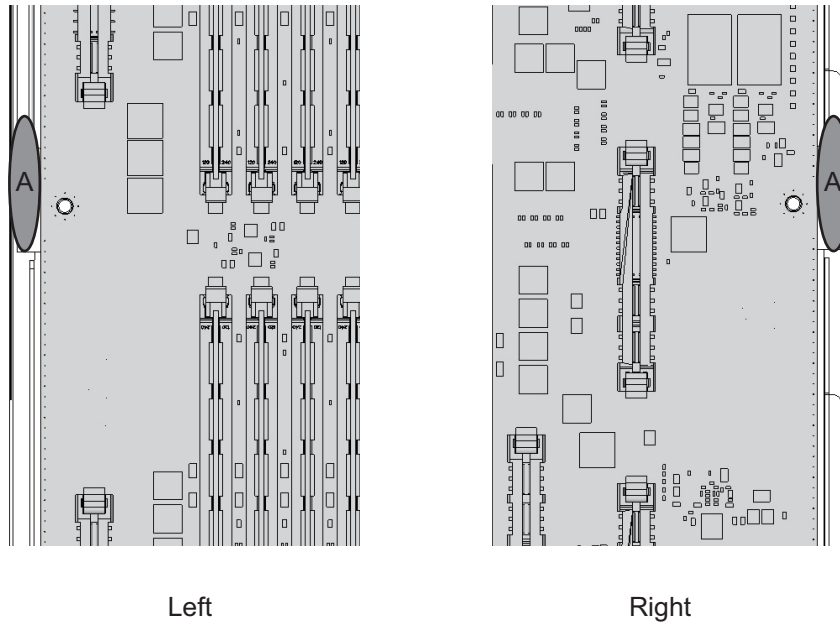
Figure 9-34   Finger position when releasing the connection of the connector (back)

Right   Left
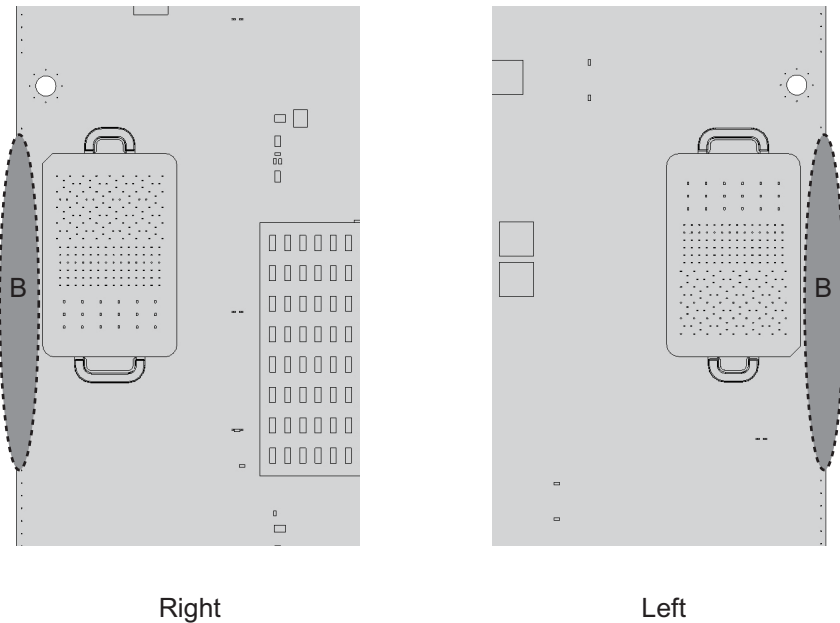
9. **Supporting the frame with your thumbs (A in Figure 9-35), disconnect the connector by pushing up the left and right sides at the same time with the fingers that are inserted under the CPU memory unit board (B in Figure 9-35).**

Figure 9-35   How to disconnect the connector
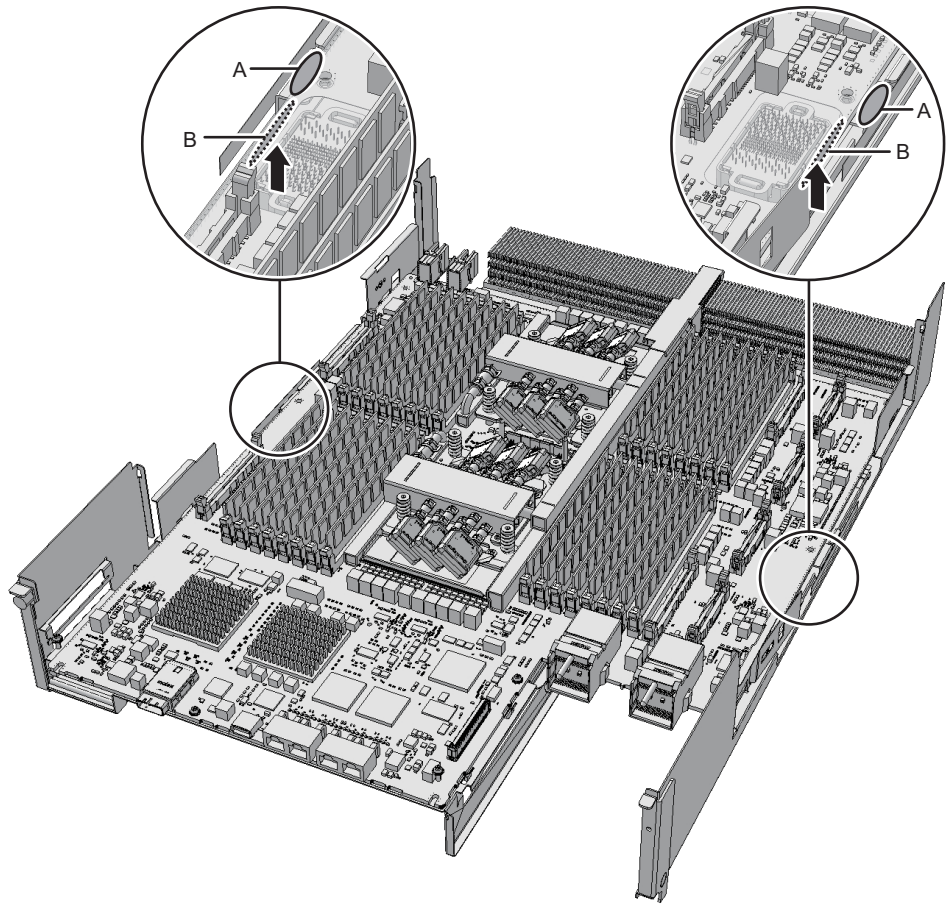
10. **Place your thumbs on the connector unit at the center on the right and left sides of the CPU memory unit board (A in Figure 9-36) and hold the board by inserting your fingers under the CPU memory unit board (B in Figure 9-37) from the sides of the connector unit.**

Note - Place the removed CPU memory unit board on a grounded antistatic ESD mat.

Figure 9-36   Finger position when holding the board (surface)

Left   Right
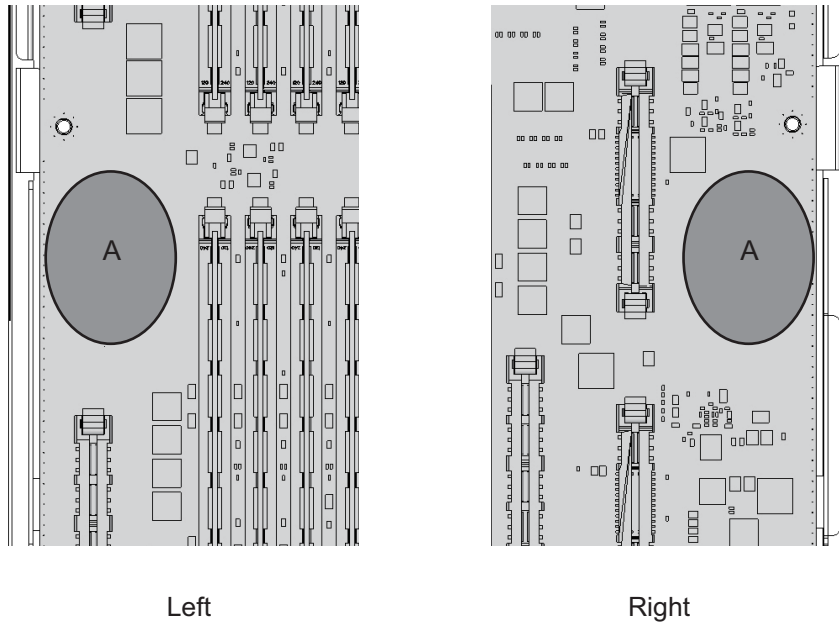
Figure 9-37   Finger position when holding the board (back)

Right   Left
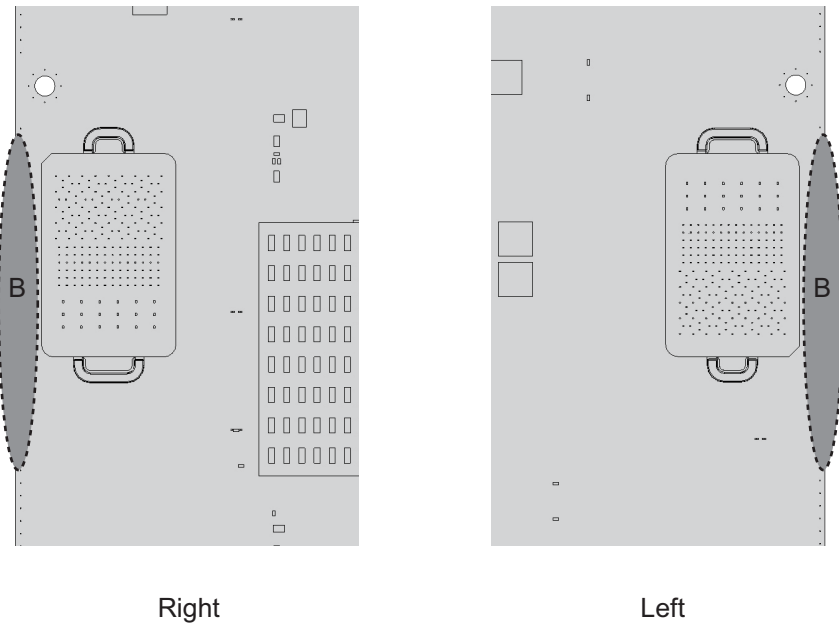
11. **Lift the CPU memory unit board in the horizontal position, and remove it from the frame.**

Figure 9-38   Removing the CPU memory unit board
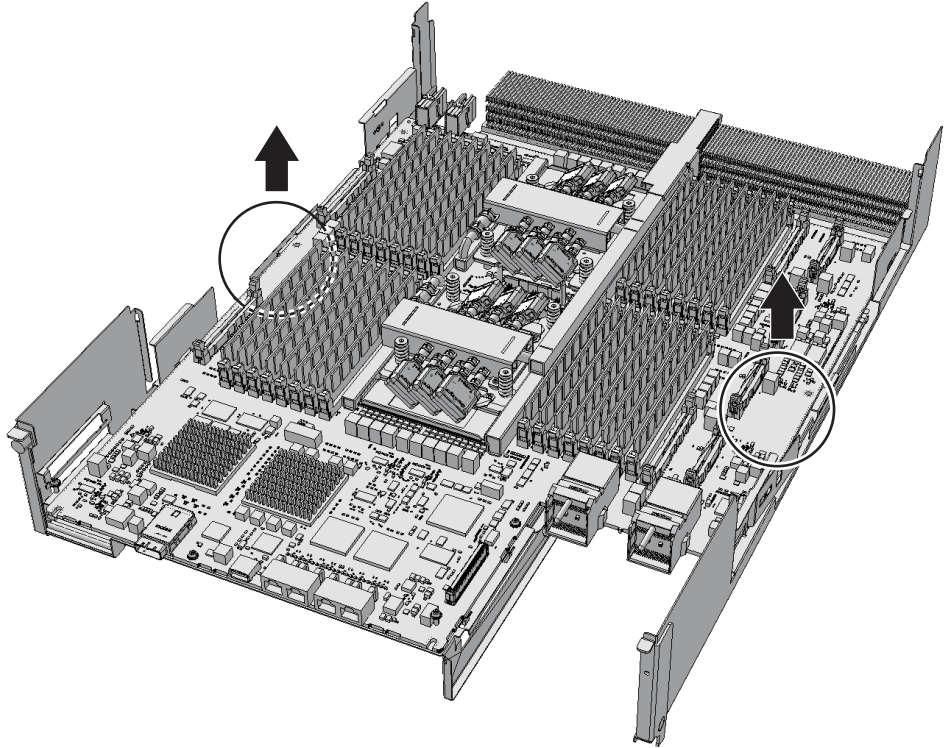
12. **Remove the sheet (A in Figure 9-39).**
    You can expand the CPU memory unit upper by performing the above
    procedure. You do not have to perform step 13.

Figure 9-39   Removing the sheet
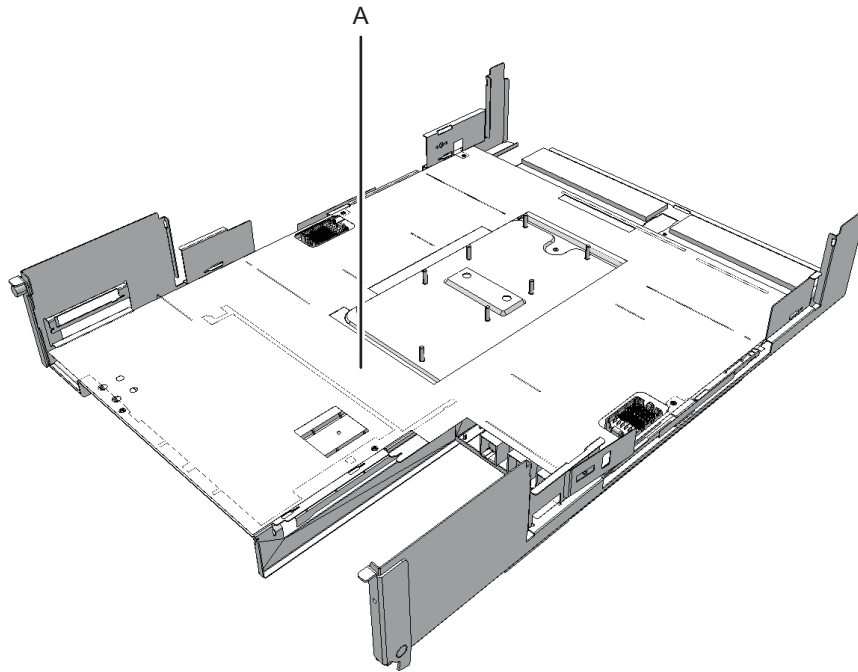
13. **Remove the three PCIe cables.**
    The direction in which the PCIe cables are removed varies depending on the
    type of the CPU memory unit.

Caution - Do not attempt to remove a PCIe cable in the wrong direction. If excessive
force is used to remove a PCIe cable, it may be damaged.

- **The connectors for the three PCIe cables facing the outside of the CPU memory unit**

Figure 9-40   Removing the PCIe cables (with the connectors for the three PCIe cables facing the outside of the CPU memory unit)
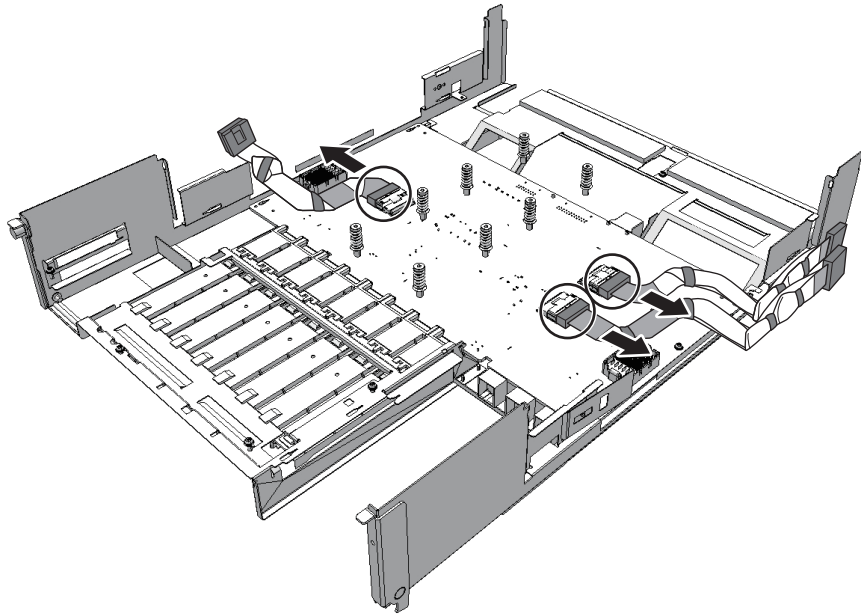
- **The connector for one PCIe cable facing the outside of the CPU memory unit and the other two facing the front of the CPU memory unit**

Figure 9-41   Removing the PCIe cables (with the connector for one PCIe cable facing the outside and the other two facing the front of the CPU memory unit)
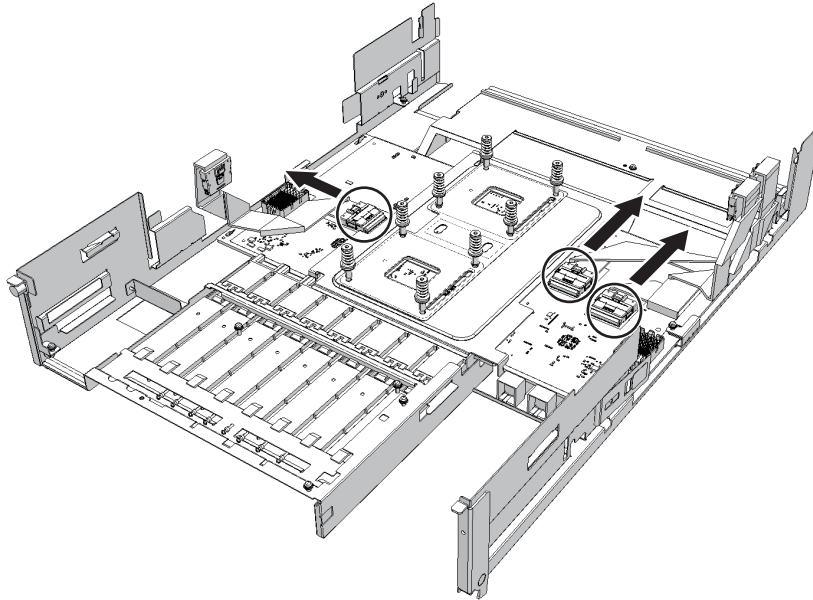
14. **Install the PCIe cables on the PCIBP board.**
    Connect the three PCIe cables by matching the PCIe cable position labels with the corresponding position marks on the PCIBP board (A in Figure 9-42 and Figure 9-43).

    The direction in which the PCIe cables are installed varies depending on the type of the CPU memory unit.

⚠ **Caution -** Do not attempt to install a PCIe cable in the wrong direction. If excessive force is used to install a PCIe cable, it may be damaged.

Note - Ensure that the PCIe cables are firmly connected and secure.

- **The connectors for the three PCIe cables facing the outside of the CPU memory unit**

Figure 9-42   Installing the PCIe cables (with the connectors for the three PCIe cables facing the outside of the CPU memory unit)
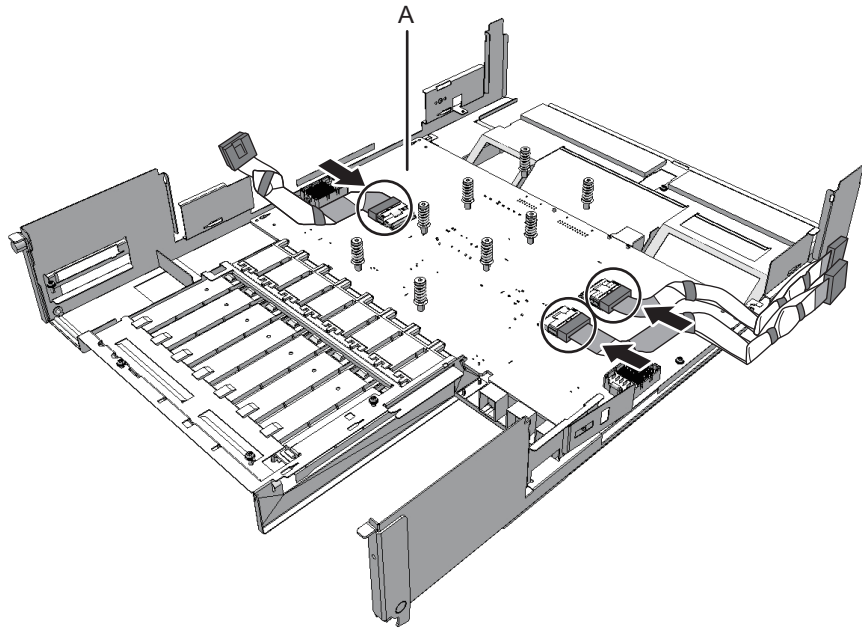
- **The connector for one PCIe cable facing the outside of the CPU memory unit and the other two facing the front of the CPU memory unit**

Figure 9-43   Installing the PCIe cables (with the connector for one PCIe cable facing the outside and the two facing the front of the CPU memory unit)
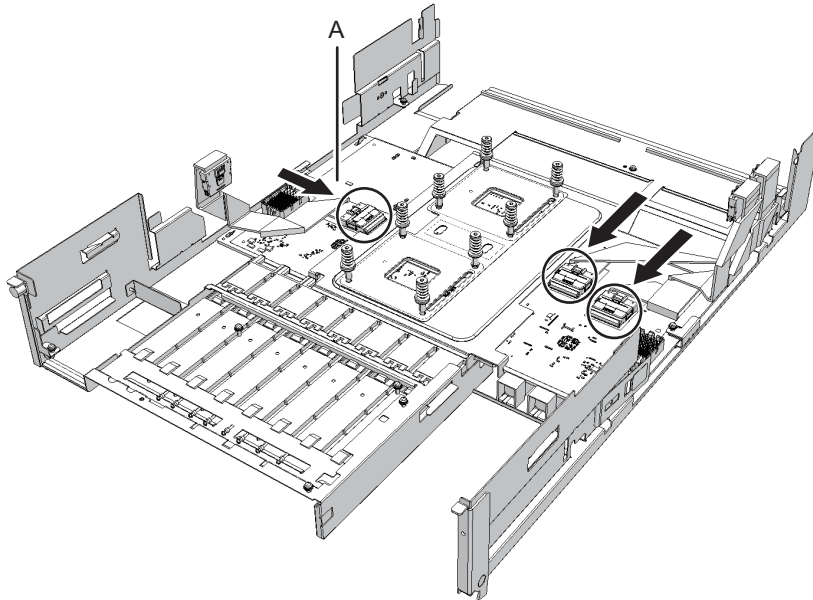
15. **Install the sheet (A in Figure 9-44).**

Figure 9-44   Installing sheet
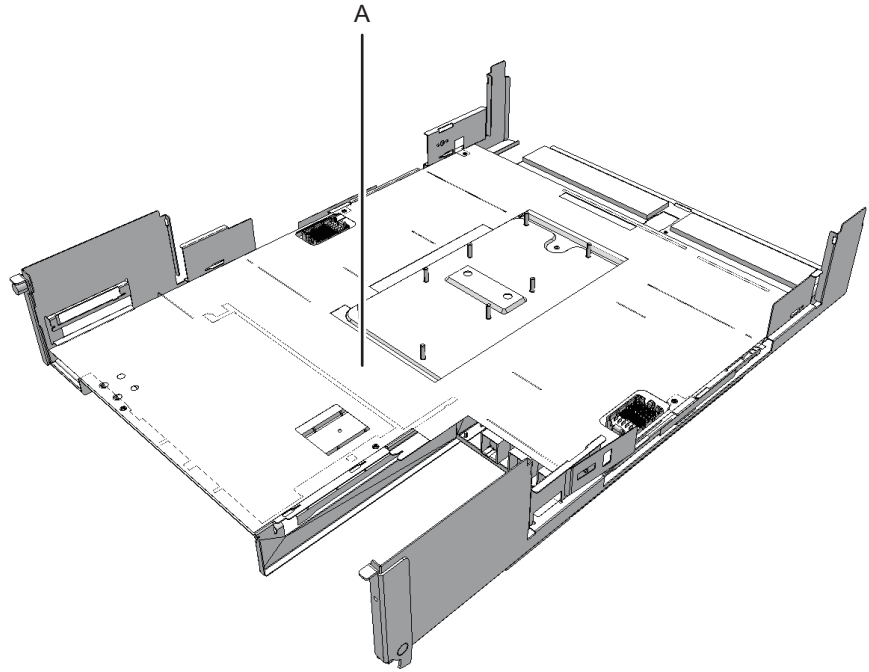
16. **Install the CPU memory unit board and secure it to the frame with screws.**
     Hold the connector unit at the center of the CPU memory unit board and install
     it on the frame in the horizontal position.

     For how to hold the CPU memory unit board, see Figure 9-45 and Figure 9-46.

Caution - Do not tilt the CPU memory unit board when installing it. The board may
be damaged by hitting the back side of the board against a protruding part or the
frame guide.

Figure 9-45   Correct position of the CPU memory unit board
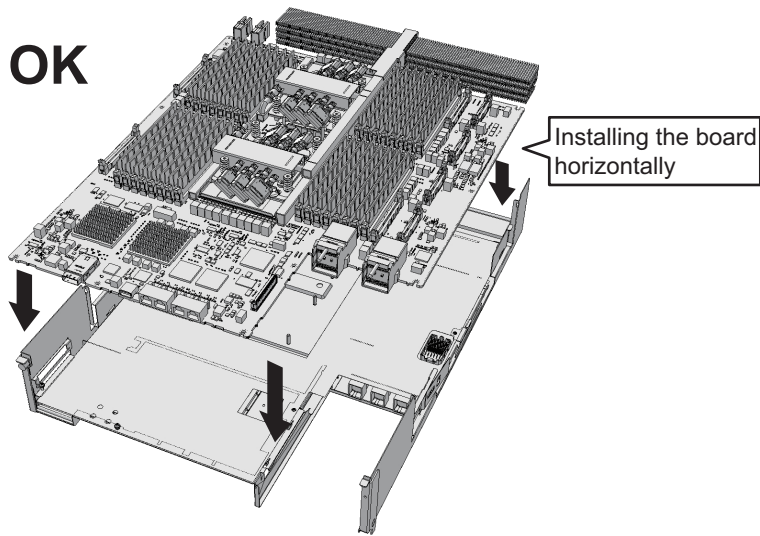
Figure 9-46   Wrong position of the CPU memory unit board
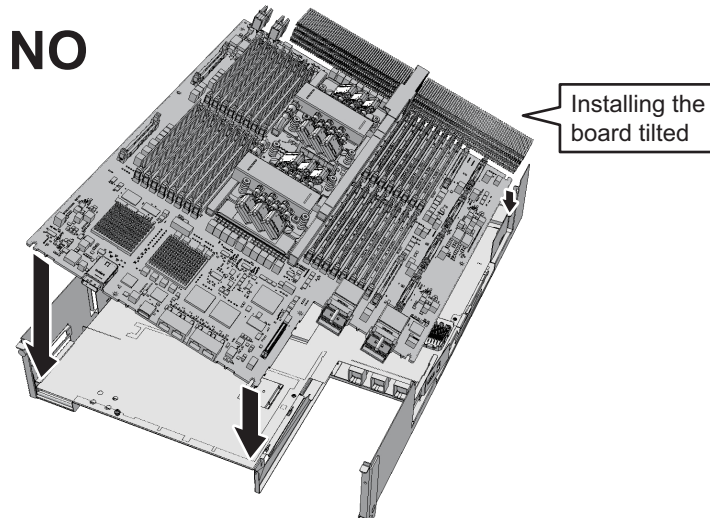
- **For the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit**
  Install the board so that the bent tip of the frame (C in Figure 9-47) can be inserted into the space (B in Figure 9-47) between the end face on the far side of the CPU memory unit board and the radiator (A in Figure 9-47).

  a. Insert the board carefully into the frame, keeping it horizontal.

  b. If the threaded hole of the board and the threaded hole of the frame (D in Figure 9-47) do not match when you are inserting the board, place the board

by adjusting the position of the board so that the outer circumference of the threaded hole of the frame is visible (E in Figure 9-47).

c. Attach the connector by pressing down the connector units (F and G in Figure 9-47) at the center on the right and left sides of the board at the same time.

Figure 9-47   Installing the CPU memory unit board (for the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit)
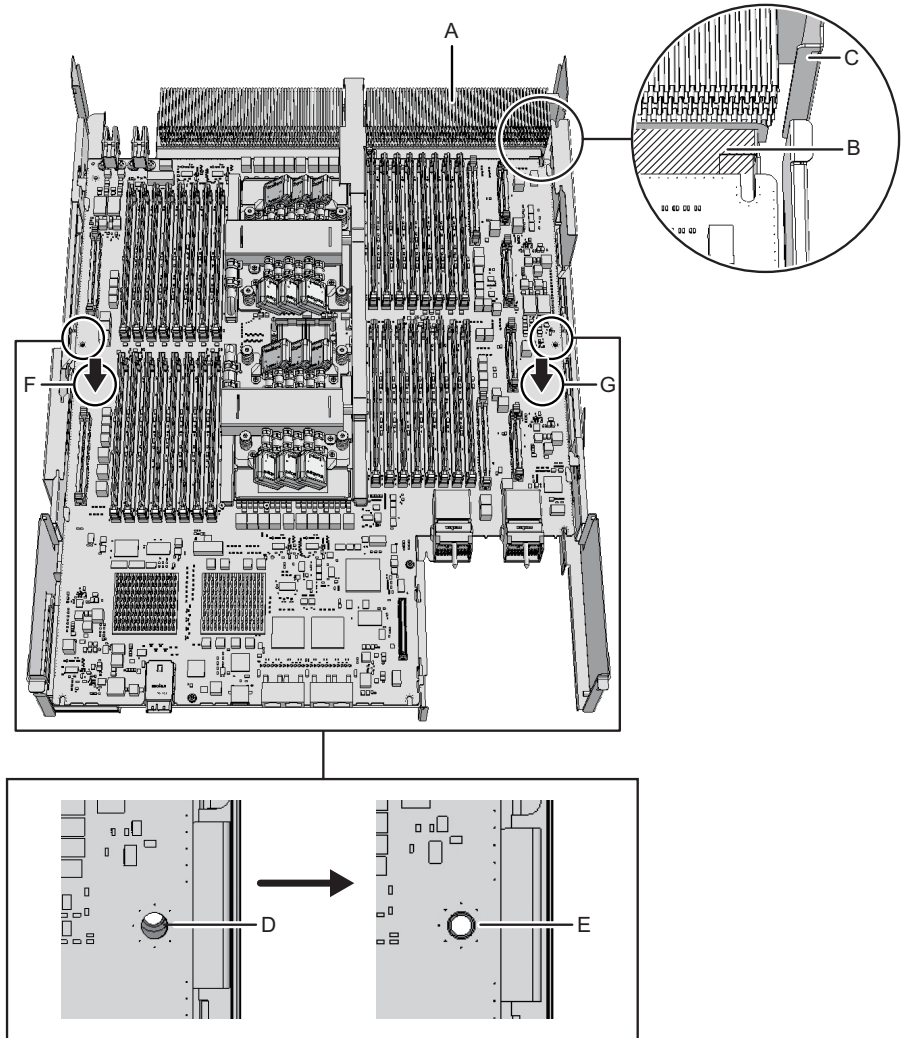
- **For the SPARC M10-4/M10-4S with a FRAME-B CPU memory unit**
  Install the CPU memory unit board, with the left and right guides (A and B in Figure 9-48) and the left guide on the board (C in Figure 9-48) as guides.

  a. Insert the board carefully into the frame, keeping it horizontal.

  b. Attach the connector by pressing down the connector units (D and E in

) at the center on the right and left sides of the board at the same time.

Figure 9-48   Installing the CPU memory unit board (for the SPARC M10-4/M10-4S with a FRAME-B CPU memory unit)
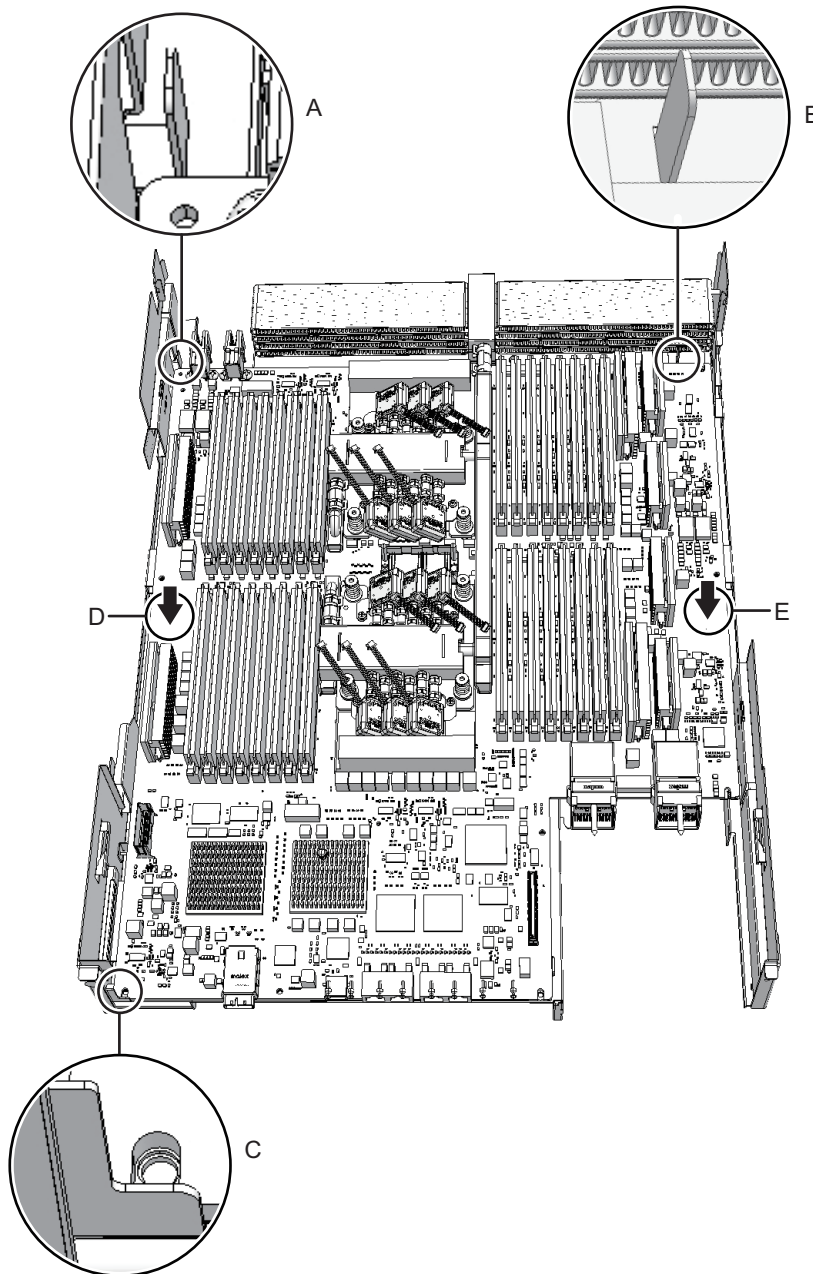
17. **Secure the CPU memory unit board with screws.**
    - **For the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit**

Secure the CPU memory unit board with four screws and the center part of the radiator on the front with one black screw.

- **For the SPARC M10-4/M10-4S with a FRAME-B CPU memory unit**
Secure the CPU memory unit board with six screws.

18. **Install the XSCF mount and secure it with screws.**
- **For the SPARC M10-4/SPARC M10-4S with a FRAME-A CPU memory unit**
Insert the left side (A in Figure 9-49) of the XSCF mount into the opening (B in Figure 9-49) in the frame of the CPU memory unit lower. Next, insert the two guides (C in Figure 9-49) on the right side of the mount into the openings (D in Figure 9-49) in the frame. Then, install the XSCF mount by sliding it to the front (E in Figure 9-49) and securing it with one screw.

Note - After sliding the XSCF mount to the front, confirm that the mount at part F in Figure 9-49 engages the frame guide.

Figure 9-49 Installing the XSCF mount (for the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit)
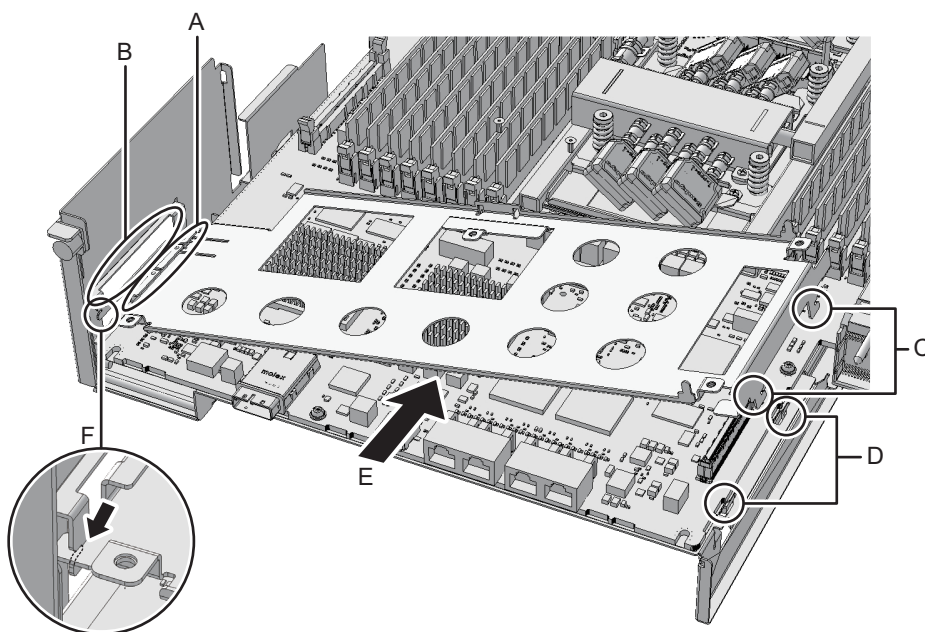
- **For the SPARC M10-4 with a FRAME-B CPU memory unit**
Insert the left protruding part (A in Figure 9-50) of the XSCF mount diagonally from above (C in Figure 9-50) into the opening (B in Figure 9-50) in the frame of the CPU memory unit lower. Next, insert the right protruding part (D in Figure 9-50) of the mount from above (F in Figure 9-50) into the opening (E in Figure 9-50) in the frame. Then, slide the XSCF mount to the front (G in Figure 9-50), and secure it with one screw (H in Figure 9-50).

Figure 9-50   Installing the XSCF mount (for the SPARC M10-4 with a FRAME-B
                CPU memory unit)

- **For the SPARC M10-4S with a FRAME-B CPU memory unit**
  Insert the left protruding part (A in Figure 9-51) of the XSCF mount from
  above into the opening (B in Figure 9-51) in the frame of the CPU memory unit
  lower. Then, secure it with two screws (C in Figure 9-51).

Figure 9-51   Installing the XSCF mount (for the SPARC M10-4S with a FRAME-B
                CPU memory unit)
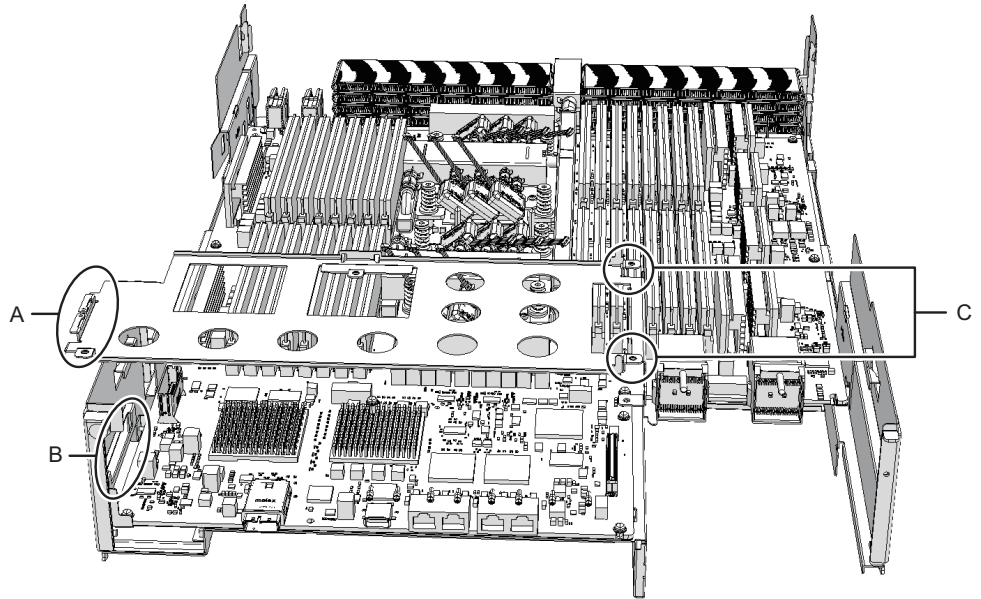
19.   **Install the XSCF board.**
      - **For the SPARC M10-4 with a FRAME-A/FRAME-B CPU memory unit**
        Insert the XSCF board into guides at two locations (A in Figure 9-52) on the
        mount (B in Figure 9-52), and push the right lever of the mount by about 5 mm
        (0.2 in.) to the right (C in Figure 9-52) to attach (E in Figure 9-52) the connector
        unit (D in Figure 9-52). Then, secure it with one screw (F in Figure 9-52).

Figure 9-52   Installing the XSCF board (for the SPARC M10-4 with a FRAME-A/
FRAME-B CPU memory unit)
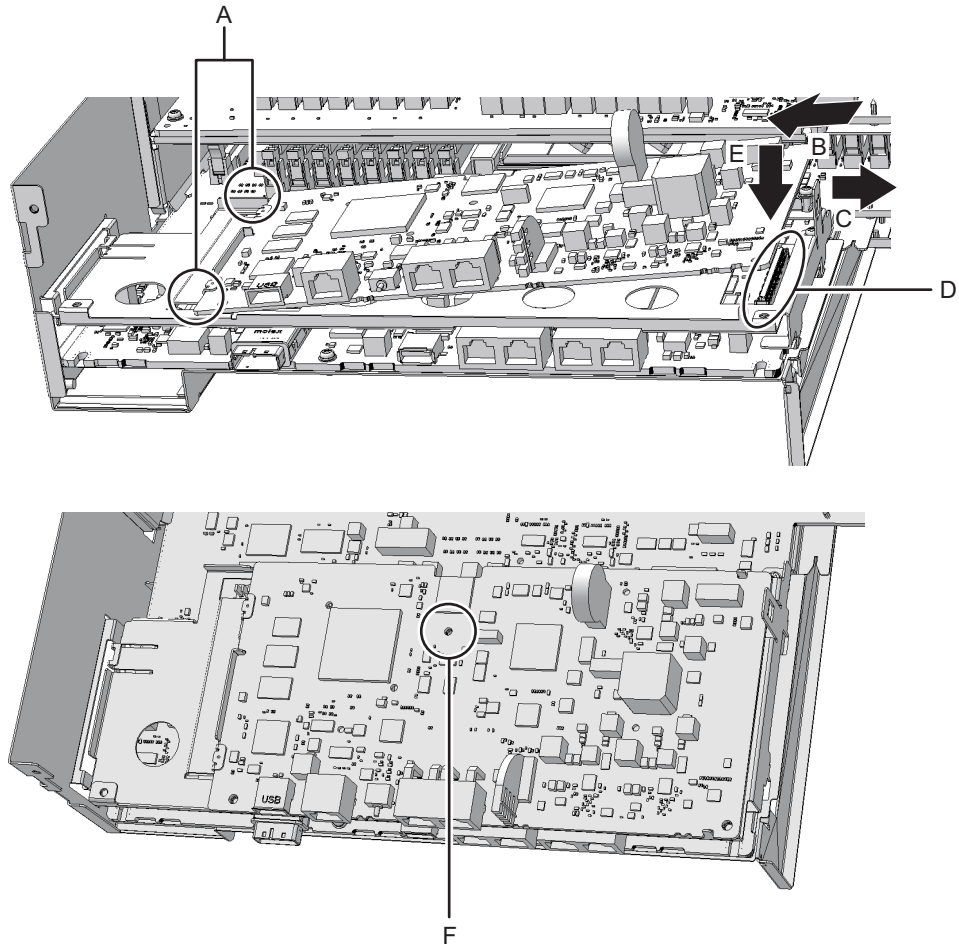
- **For the SPARC M10-4S with a FRAME-A/FRAME-B CPU memory unit**
  Insert the XSCF board into the left guide (A in Figure 9-53), and press down
  the right connector unit (B in Figure 9-53) to attach the connector. Then, secure
  it with two screws.

Figure 9-53   Installing the XSCF board (for the SPARC M10-4S with a FRAME-A/
FRAME-B CPU memory unit)

A

B
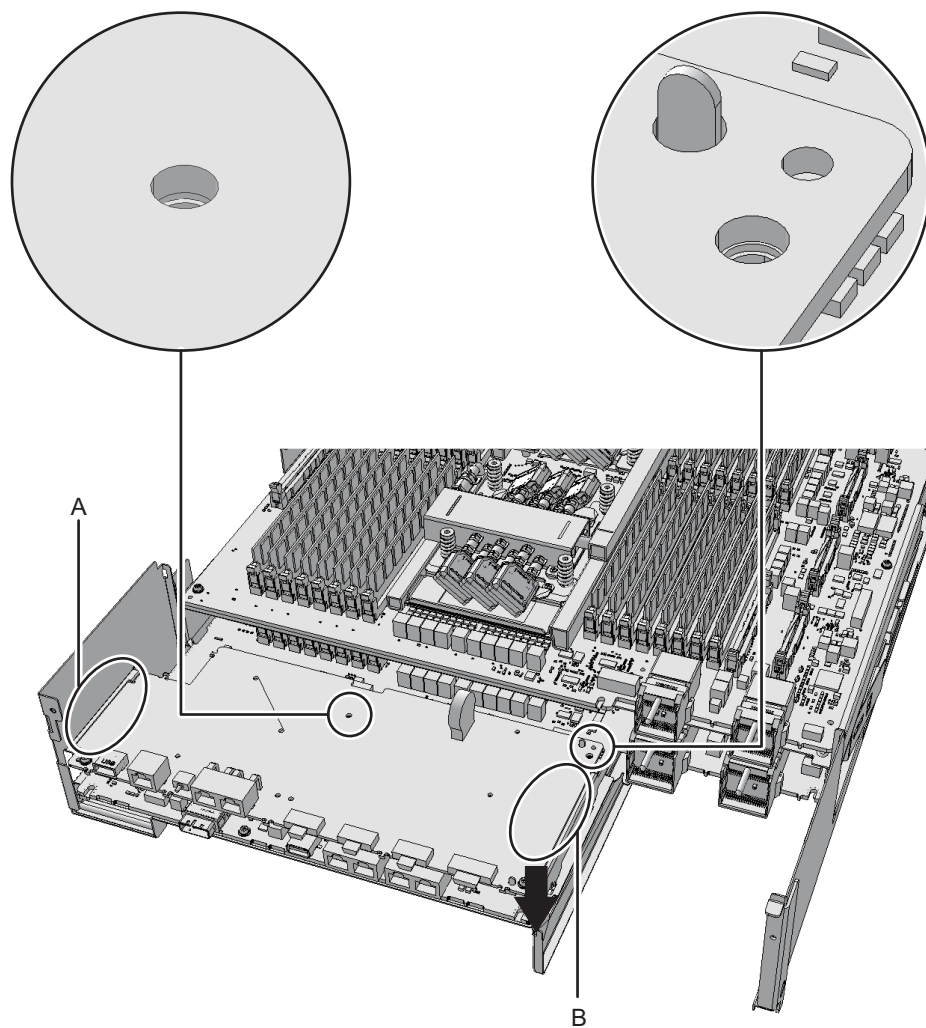
20. **Attach the rear cover with two screws from the upper part of the rear of the CPU memory unit lower.**

Figure 9-54   Screws for rear cover
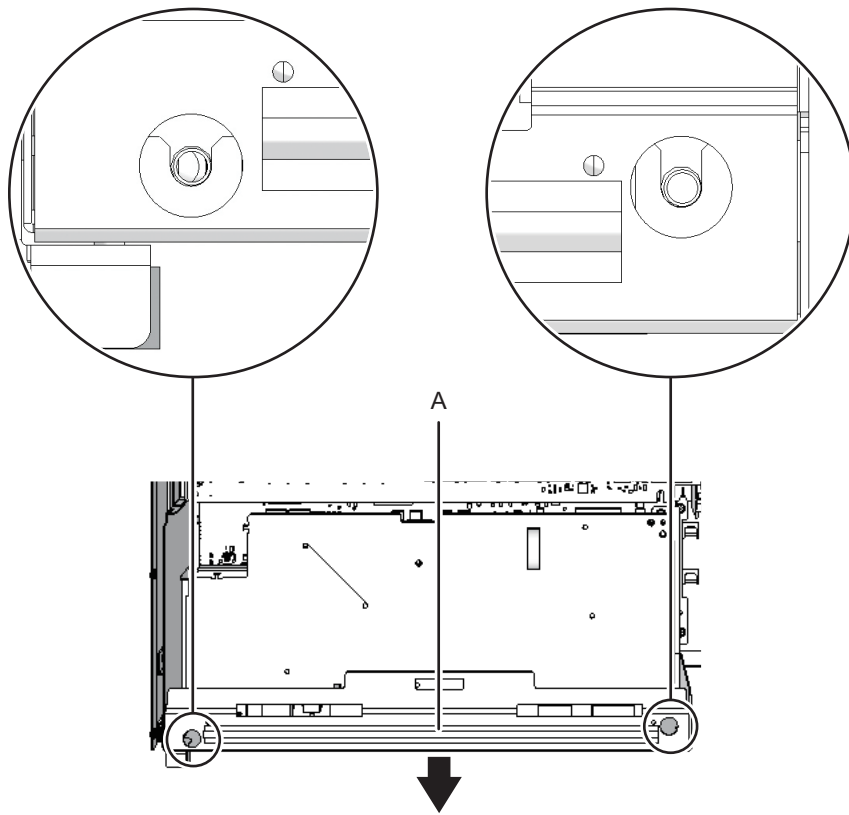
21. **Install the eight screws on both sides of the XSCF cable connection ports on the rear of the CPU memory unit lower.**
For the SPARC M10-4 with a FRAME-A CPU memory unit and the SPARC M10-4/M10-4S with a FRAME-B CPU memory unit, this step is not necessary.

Figure 9-55   Screws for both ends of the XSCF cable connection ports (for the
SPARC M10-4S with a FRAME-A CPU memory unit)

9.7   Switching the microSD Card

After replacement of the CPU memory unit lower, the firmware version may be
different from the one before the replacement. To use the same firmware version as
that used before the replacement, remove the microSD card from the CPU memory
unit lower being replaced, and then install it in the replacement CPU memory unit
lower.

1.   **Remove the screw (A in Figure 9-56) securing the microSD card protective
     tape to the removed CPU memory unit lower.**

Note - Be careful not to drop the removed screw onto the board of the CPU memory unit
lower.

Figure 9-56   Screw for protective tape
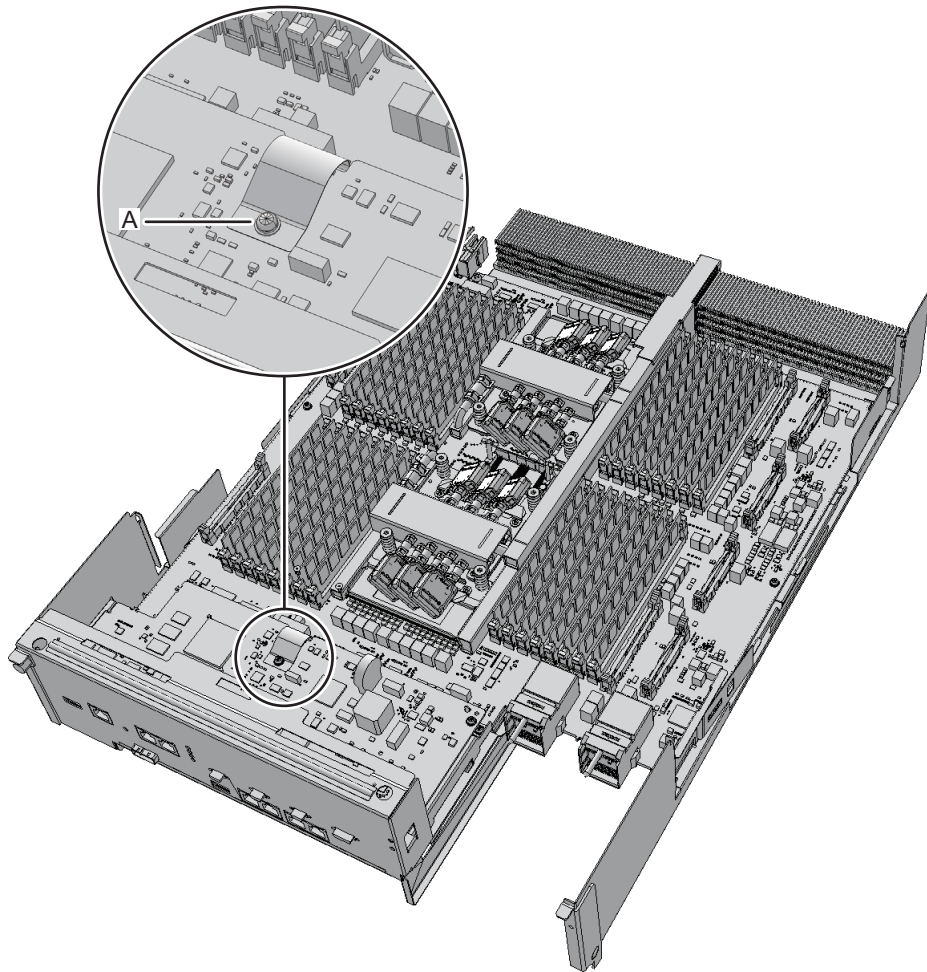
2.   **Peel off the adhesive part (A in Figure 9-57) of the protective tape, and remove the protective tape.**

Figure 9-57   Removing the protective tape
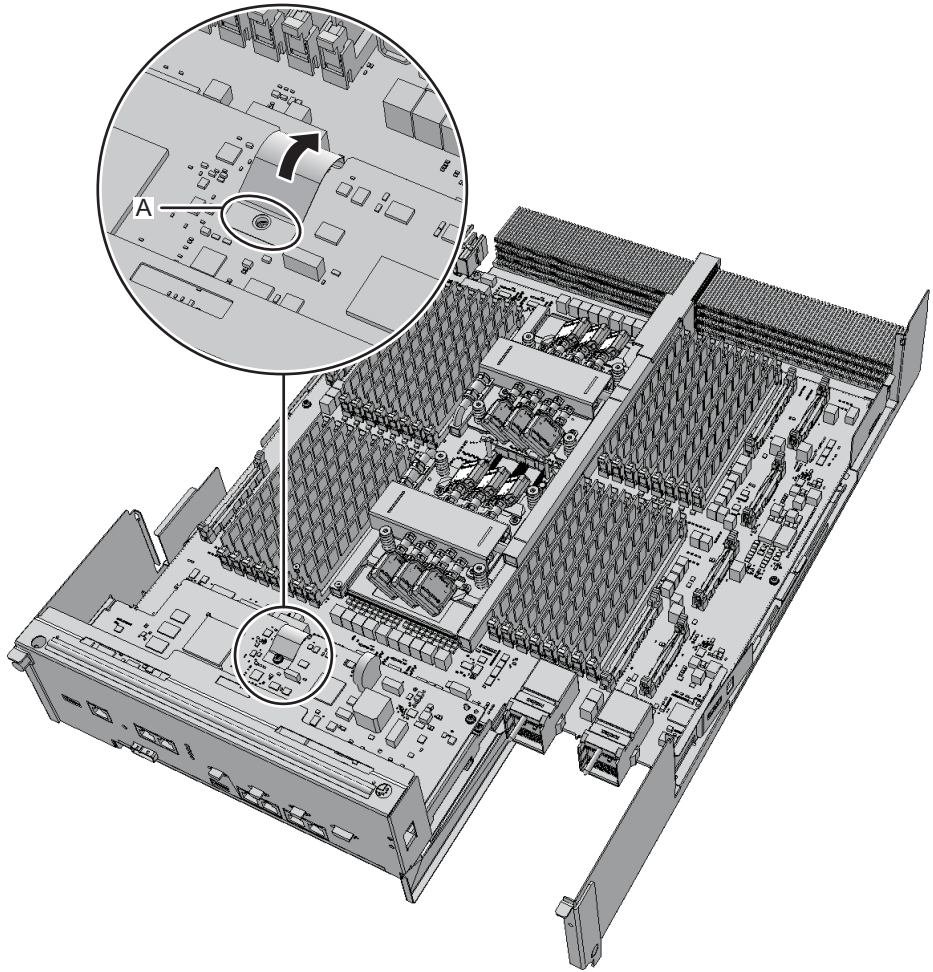
3. **Push in the microSD card slightly with your finger to release it.**
    The microSD card pops up slightly.

4. **Pull out the microSD card horizontally.**

Figure 9-58   Removing a microSD card
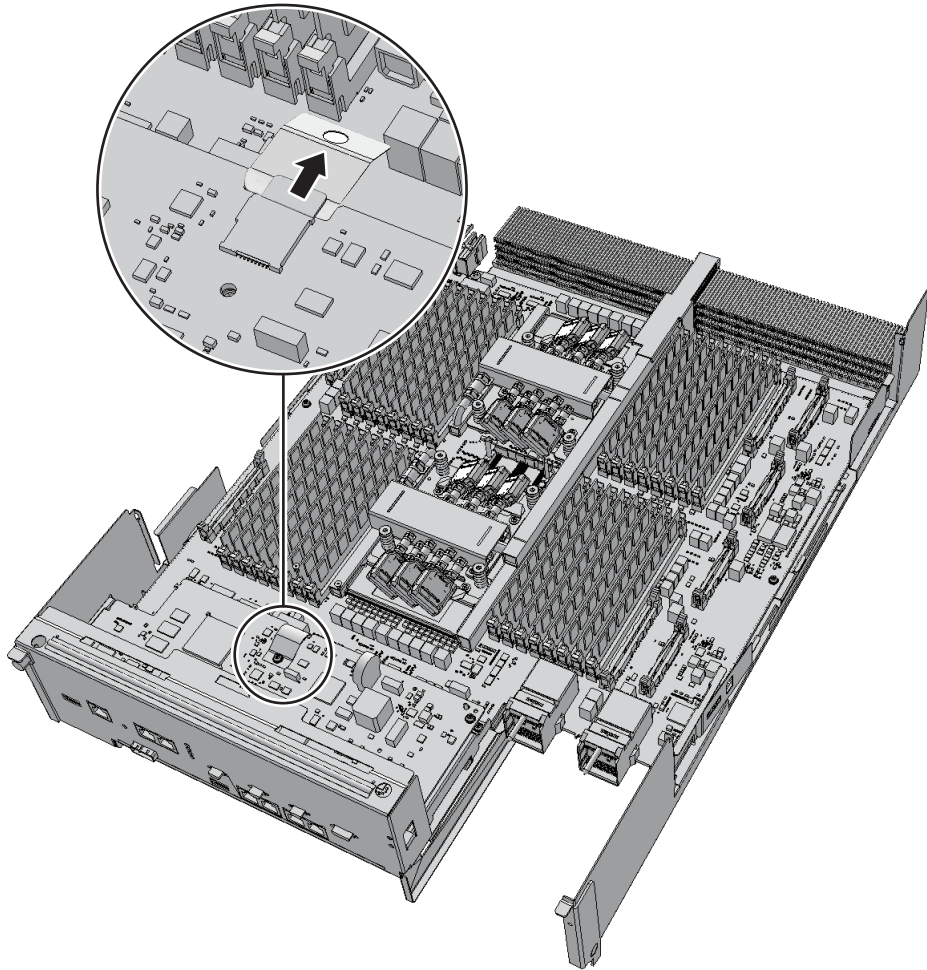
5. **Remove the microSD card from the new CPU memory unit lower.**
   Perform the same procedure as steps 1 to 4.

6. **Insert the microSD card that was removed in step 4 into the microSD card slot of the new CPU memory unit lower. Then, push it in with your finger until it locks in place.**

Note - With the pin surface of the microSD card facing downward, insert the card.

Note - Push in the microSD card firmly until you feel it lock in place.

Figure 9-59   Installing a microSD card
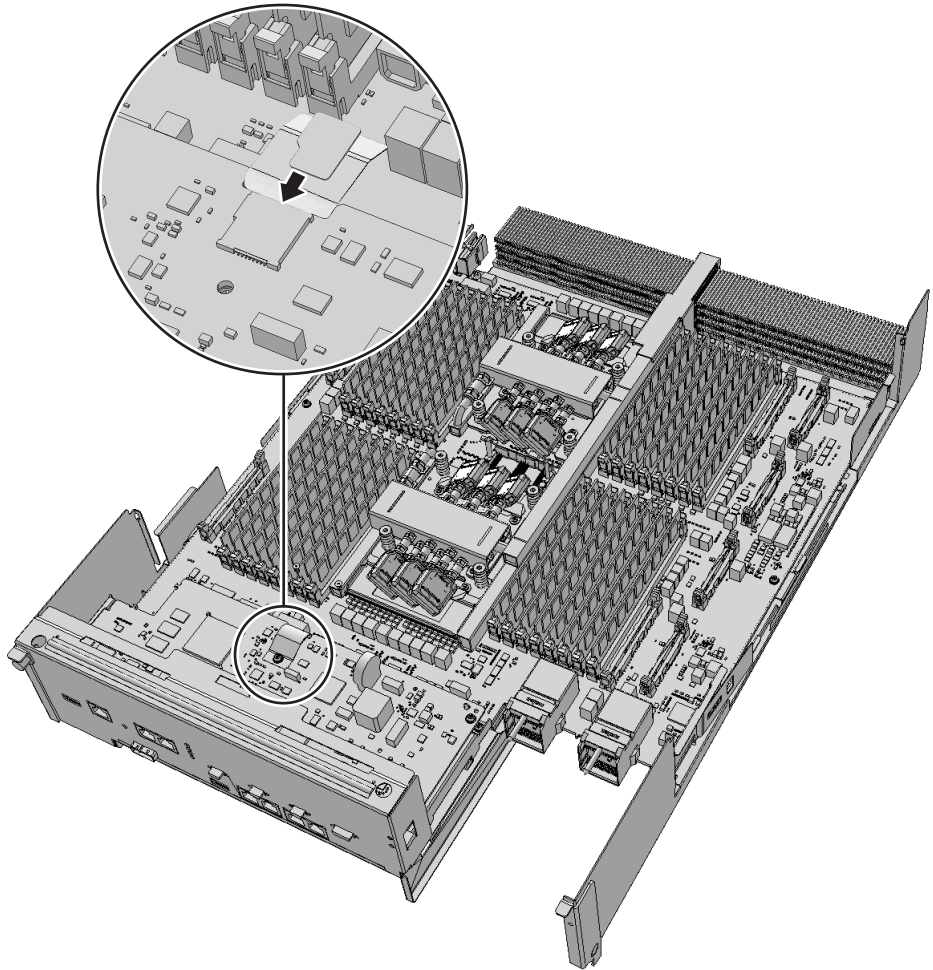
7. **Place the microSD card protective tape back in place, and attach the adhesive part. Then, secure it with the screw.**

Note - Be careful not to drop the screw being installed onto the board of the CPU memory unit lower.

Note - Install the microSD card that was supplied with the new CPU memory unit lower in the removed CPU memory unit, and return them together.

9.8 Removing Memory

This section describes the procedure for removing memory.
When replacing a CPU memory unit, you need to remount the memory. Mount the memory in the same mounting locations as in the replaced unit.
For memory removal, see "2.2   Checking the Memory Configuration Rules," and remove memory accordingly.

⚠️ **Caution -** Before you handle any components, 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 damaged. For details, see "1.5   Precautions on Static Electricity."

1. **Move the latch of the memory slot outward, and then remove the memory by pulling it straight up.**

Note - Place the removed memory on a grounded static-removal ESD mat.

Figure 9-60   Removing memory
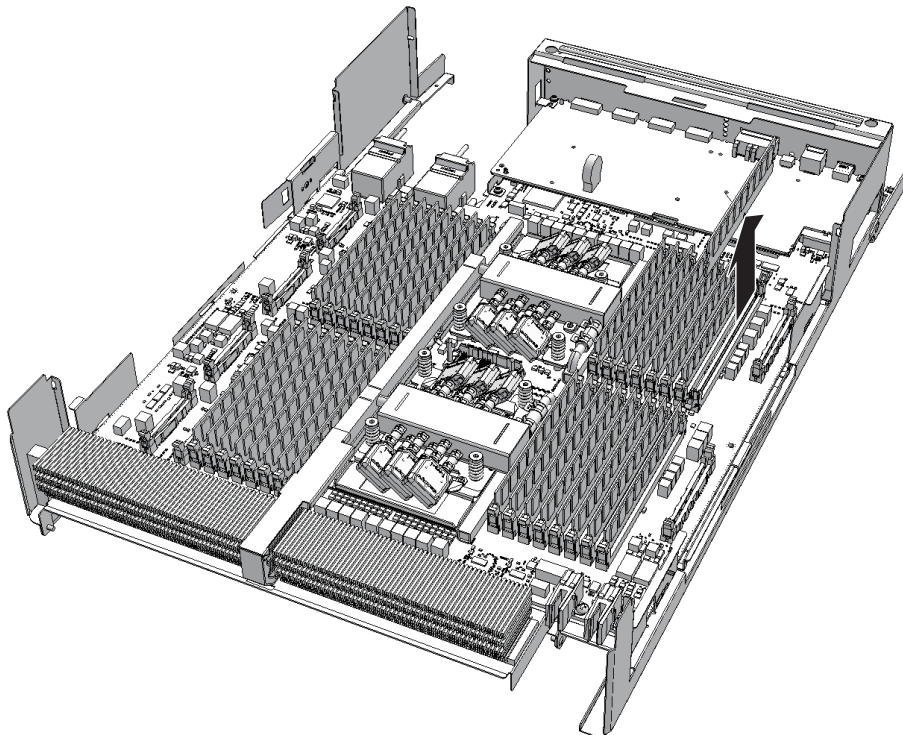
9.9 Installing Memory

This section describes the procedure for installing memory. For memory installation, see "2.2 Checking the Memory Configuration Rules," and install memory accordingly.

1. **Fit the notched section of the memory into the corresponding position of the connector of the memory slot.**

2. **Push the memory module evenly into the slot.**

Note - Confirm that the latch of the memory slot has returned to its original position.

9.10 Installing a CPU Memory Unit

This section describes the procedure for installing a CPU memory unit.
Unless otherwise specified, the figures explained in this section use the SPARC M10-4S with a FRAME-A CPU memory unit.

⚠ **Caution -** When mounting a CPU memory unit board, check the connectors on both of the CPU memory unit board and frame beforehand to confirm that no pin is bent and all the pins are neatly arranged in lines. If there is a bent pin in a connector, mounting a CPU memory unit board may damage the CPU memory unit or frame. Also, carefully proceed with the work to prevent any pin from being bent.

9.10.1 Installing the CPU memory unit upper

Note - A part of the procedure varies depending on the CPU memory unit type. To determine the CPU memory unit type, check the label in Figure 9-2.

Install the CPU memory unit upper on the CPU memory unit lower. When replacing the CPU memory unit lower, install the CPU memory unit upper on the new CPU memory unit lower.
For expansion of a CPU memory unit upper, perform the same procedure. When removing the CPU memory unit upper, install a filler unit in its place.

1. **When installing a filler unit for the CPU memory unit lower connected to PCIe cables, push the PCIe cables (A and B in Figure 9-61) toward the outside of the chassis.**

Note - Be careful when removing the filler unit so that it does not catch on any PCIe cable.

Note - Use PCIe cables without removing the packaging material covering the connector part of the cable.

Note - The shortest PCIe cable is no longer necessary during maintenance. Connect it to the removed CPU memory unit, and return them together.

Figure 9-61   How to push PCIe cables toward the outside
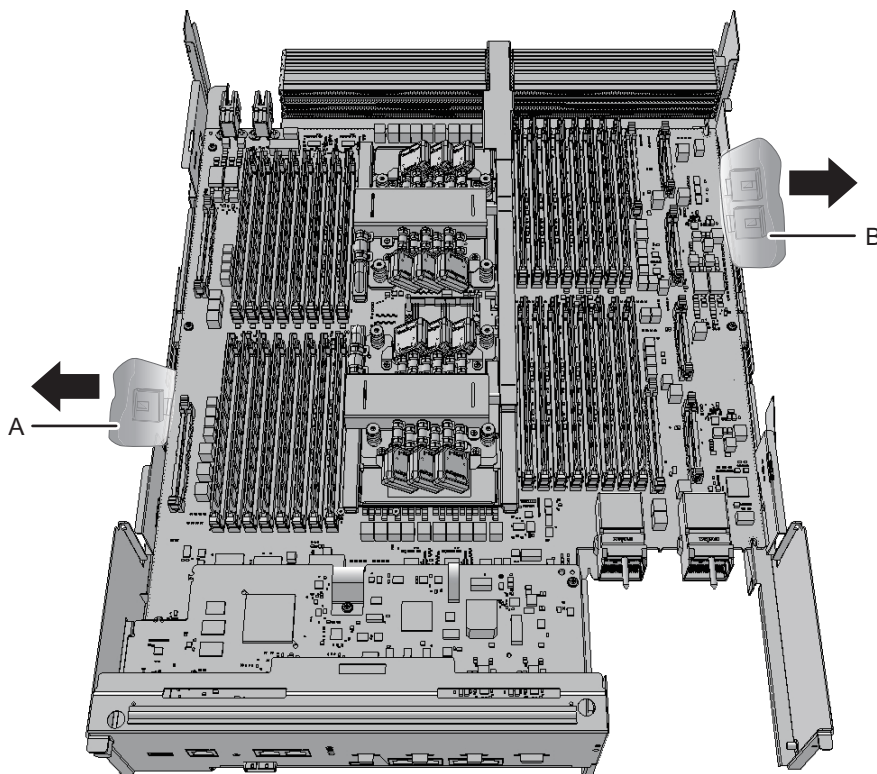
2. **Install the CPU memory unit upper or filler unit on the CPU memory unit lower.**
   - **When installing the CPU memory unit upper**
     Carefully install the CPU memory unit upper by setting the four guides (A in Figure 9-62) of the CPU memory unit upper into the grooves (B in Figure 9-62) of the CPU memory unit lower.

Note - Confirm that the levers on the left and right sides of the CPU memory unit upper are closed.

Figure 9-62   Guide positions of the CPU memory unit upper
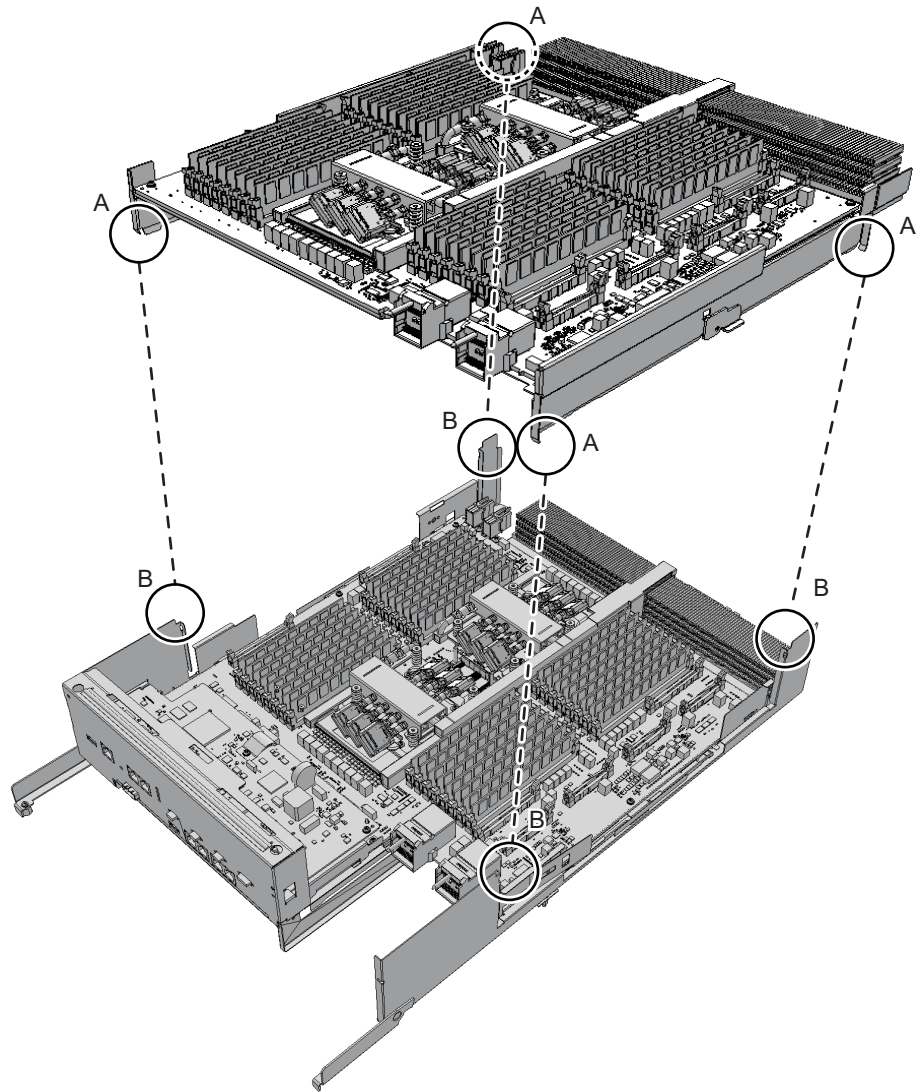
- **When installing a filler unit**
  Install the filler unit by setting the two guides (A in Figure 9-63) of the filler
  unit into the grooves (B in Figure 9-63) of the CPU memory unit lower.

Figure 9-63   Filler unit guide locations
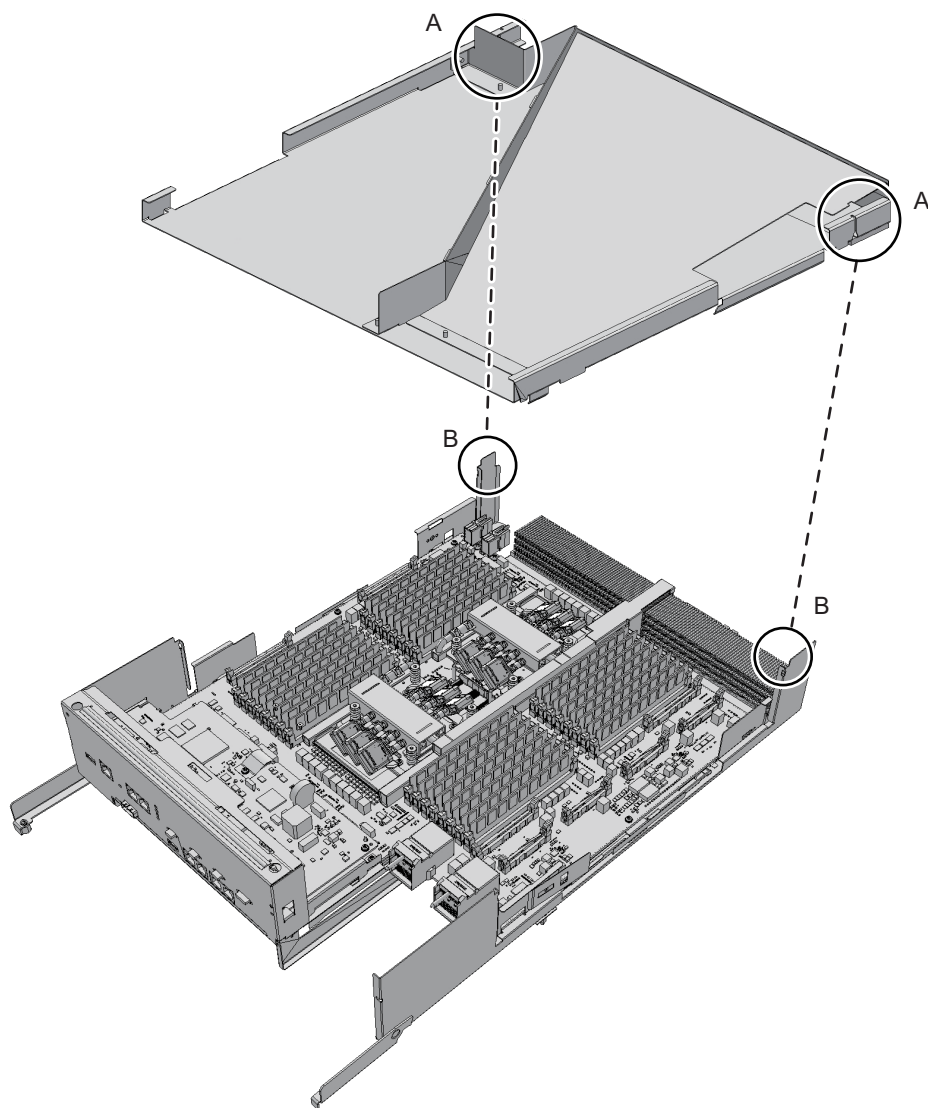
3. **Install the CPU memory unit upper by holding it down from the center where the label "PUSH" is applied and then pushing it into place.**

Figure 9-64   Position where the CPU memory unit upper is pushed
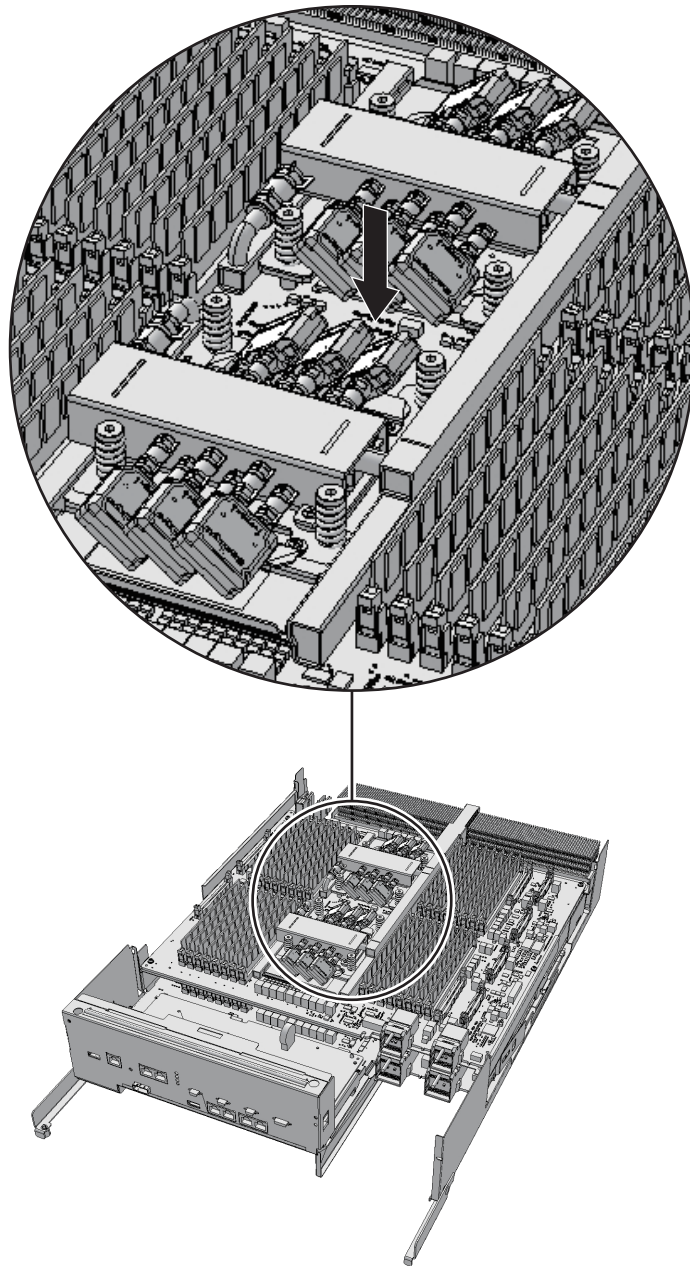
4. **To connect the CPU memory units upper and lower, connect four PCIe cables (two each on the right and left sides) to the CPU memory unit upper.**
    Position the PCIe cable so that its locking bracket (A in Figure 9-65) is on the memory slot side of the CPU memory unit upper. While pressing the PCIe cable locking bracket ((1) in Figure 9-65), insert the cable straight down all the way ((2) in Figure 9-65).

- Inserting the PCIe cable connector

Figure 9-65   Correctly inserted PCIe cable connector
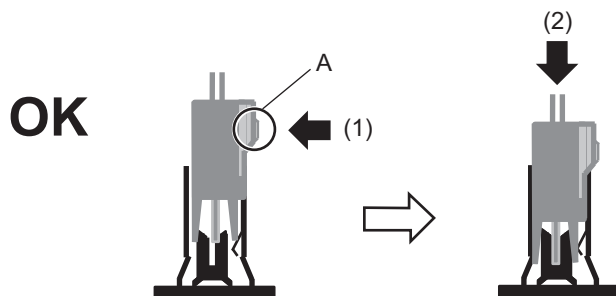
⚠ **Caution -** Do not insert the PCIe cable connector at an angle (Figure 9-66) or in the wrong orientation, such as flipped (Figure 9-67). If not correctly inserted, the PCIe cable connector along with the CPU memory unit connector will be damaged.

Figure 9-66   Wrongly inserted PCIe cable connector (at an angle)
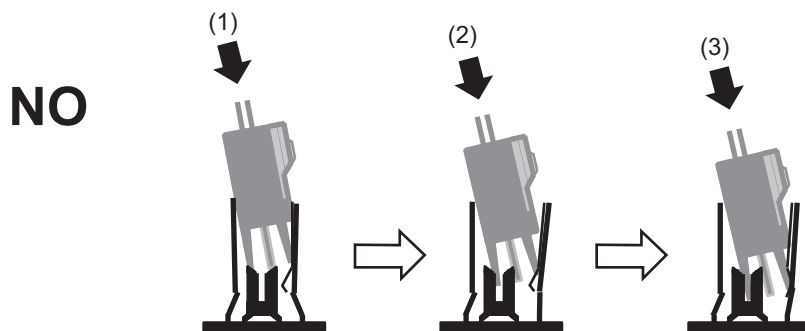
Figure 9-67   Wrongly inserted PCIe cable connector (flipped)
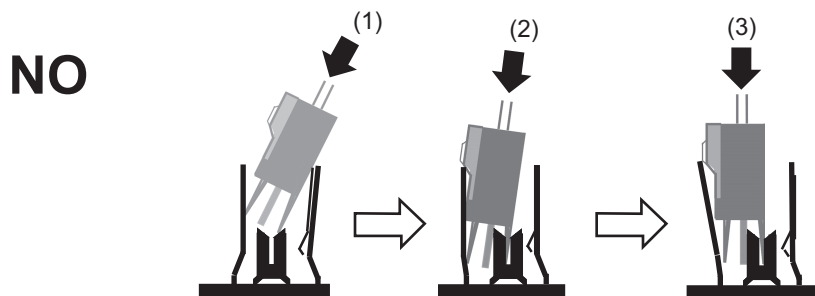
-   Connecting the PCIe cable

Note - Of the four PCIe cables, three are already connected to the CPU memory unit lower (C in Figure 9-68). Just connect these three cables to the CPU memory unit upper. On the left side as viewed from the rear, also connect the nearest PCIe cable (short) (A in Figure 9-68) of the two PCIe cables on this side to the CPU memory unit lower. One end of this PCIe cable (short) has the connector that covers the folded cable (B in Figure 9-68, shown as PCIE0 on the label). Connect this end to the CPU memory unit upper, and the other end to the CPU memory unit lower.

Figure 9-68   PCIe cable (short) connection
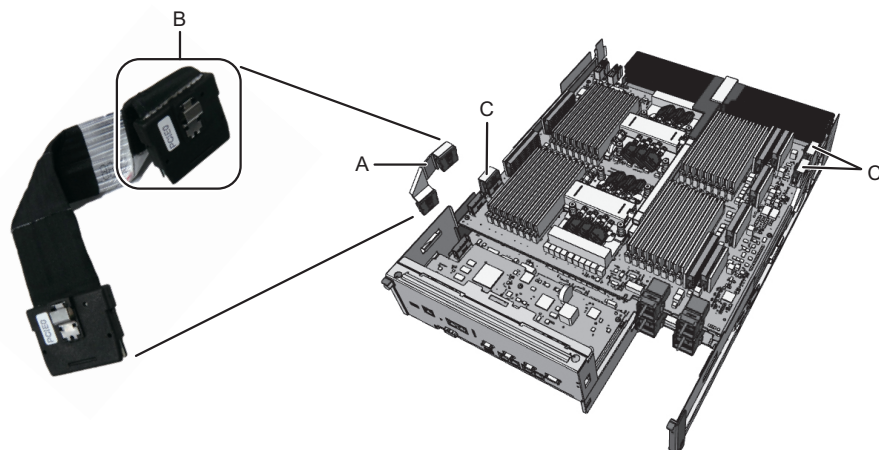
Confirm that all the PCIe cables are firmly connected.

-   The PCIe cable locking bracket is facing the memory slots on the CPU memory unit upper.
-   The PCIe cable locking bracket (A in Figure 9-69) is secured.
-   After implementation, the PCIe cable connector is vertically connected. (No depression or protrusion is visible on the side of the joined PCIe cable connector and CPU memory unit upper connector (B in Figure 9-69).)

Figure 9-69   Checking a PCIe cable connection
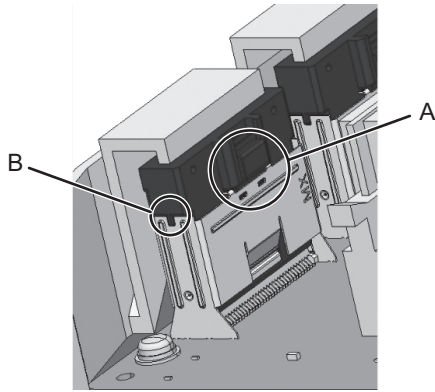
5.   **If a filler unit for the CPU memory unit upper has been installed, hold the packaging material (A and B in Figure 9-70) of the PCIe cable connector part over the top of the left- and right-side guides (C and D in Figure 9-70).**

Figure 9-70   Packaging material of the PCIe cable connector part
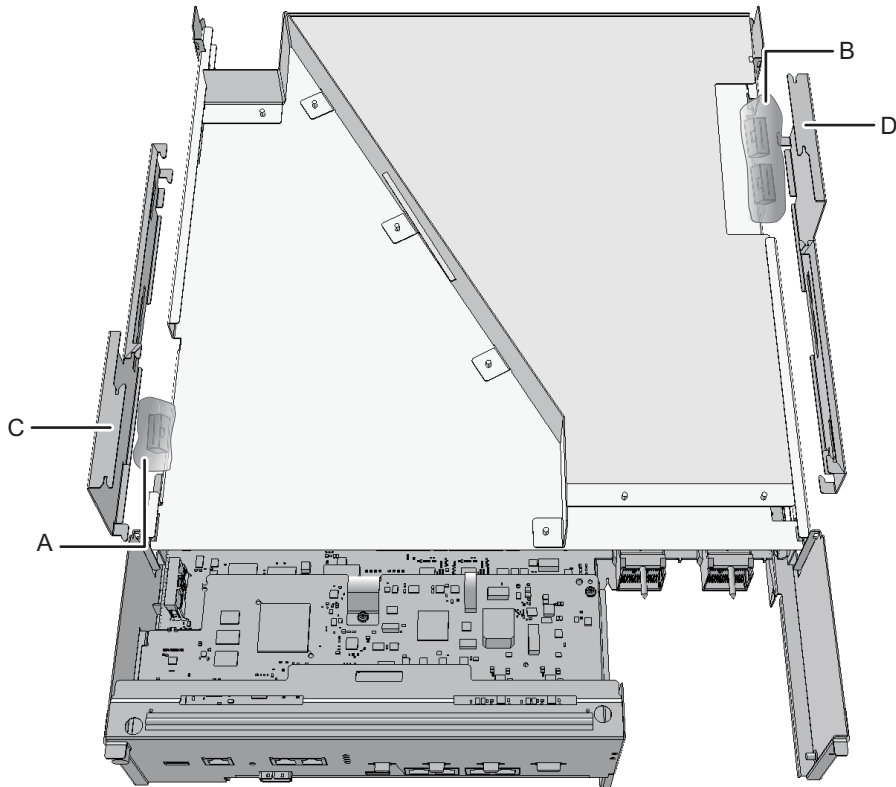
6.   **Align the four clips on each of the left- and right-side guides to the grooves in**

the frame of the CPU memory unit lower to install them. Slide in the guides to lock them.

Note - When replacing the CPU memory unit lower, use the left- and right-side guides supplied with the new CPU memory unit lower.

Note - Be careful not to damage any PCIe cable when installing the left- and right-side guides. Also be careful not to pinch the packaging material of the PCIe cable connector part with any clip on the left- and right-side guides.

Figure 9-71   Locations of the clips on the left- and right-side guides (for the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit)
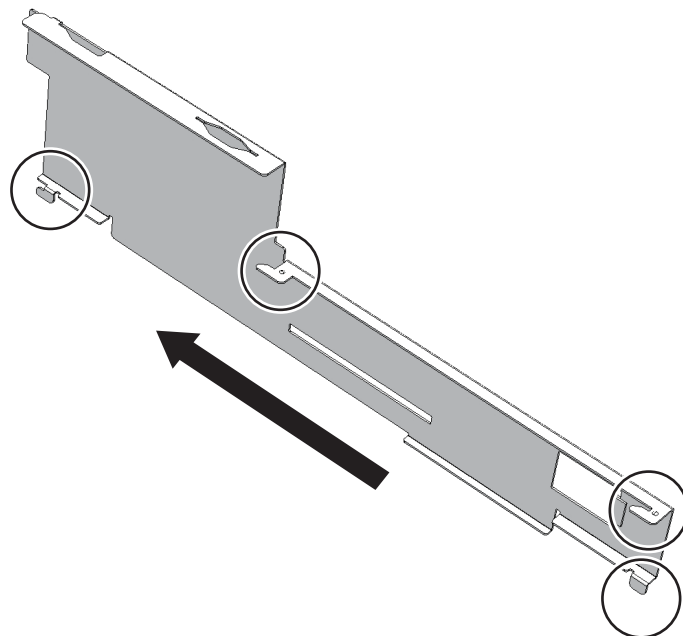
Figure 9-73 CPU memory unit upper and locations of the clips on the side guide (for the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit)
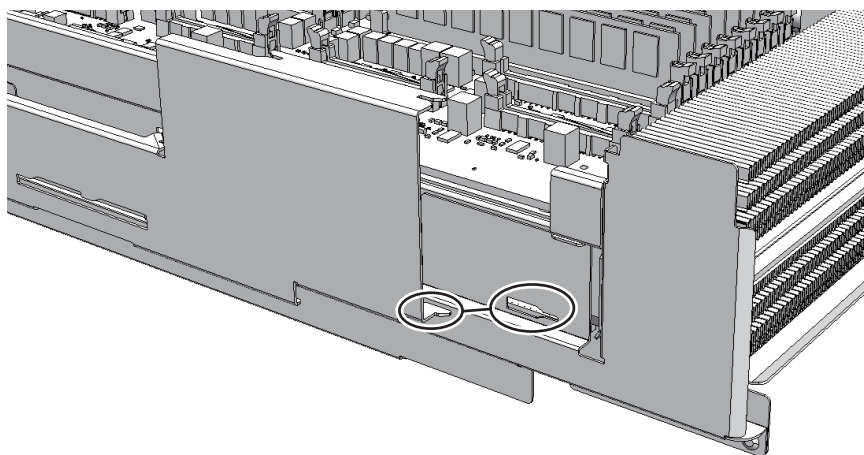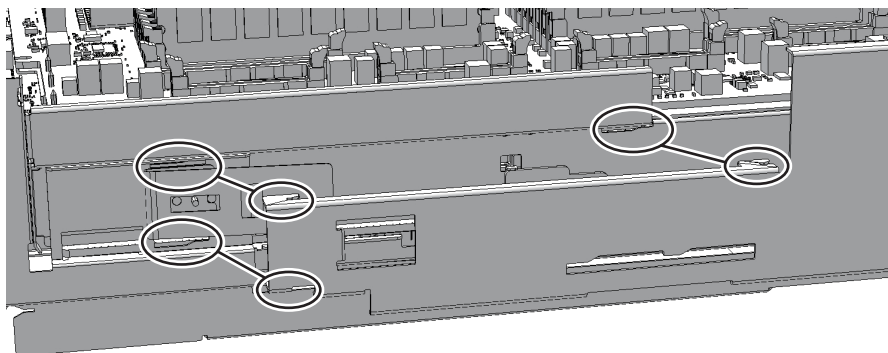
Figure 9-74   CPU memory unit upper and locations of the clips on the side guide
(for the SPARC M10-4/M10-4S with a FRAME-B CPU memory unit)
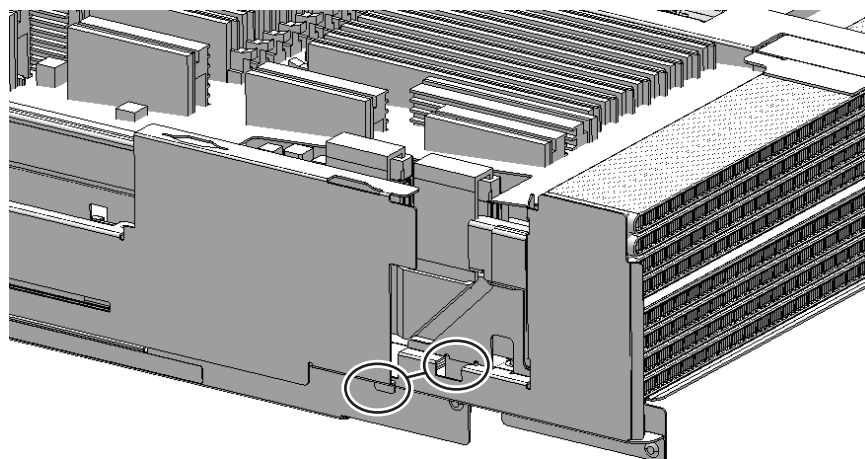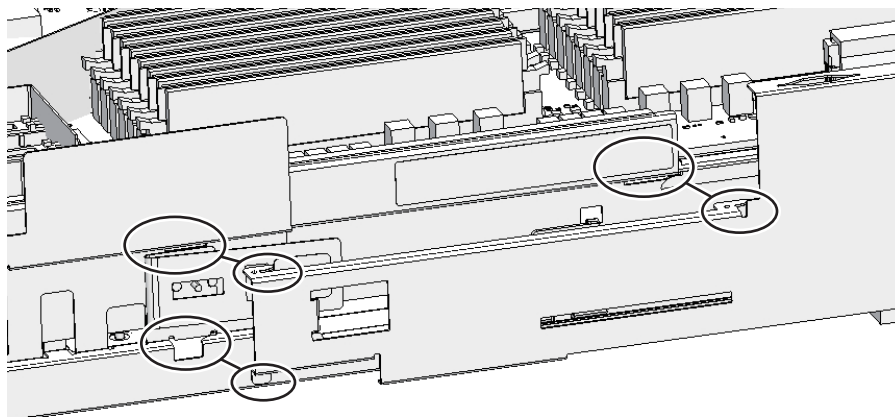
Figure 9-75   Filler unit of the CPU memory unit upper and locations of the clips on the side guide (for the SPARC M10-4/M10-4S with a FRAME-A CPU memory unit)
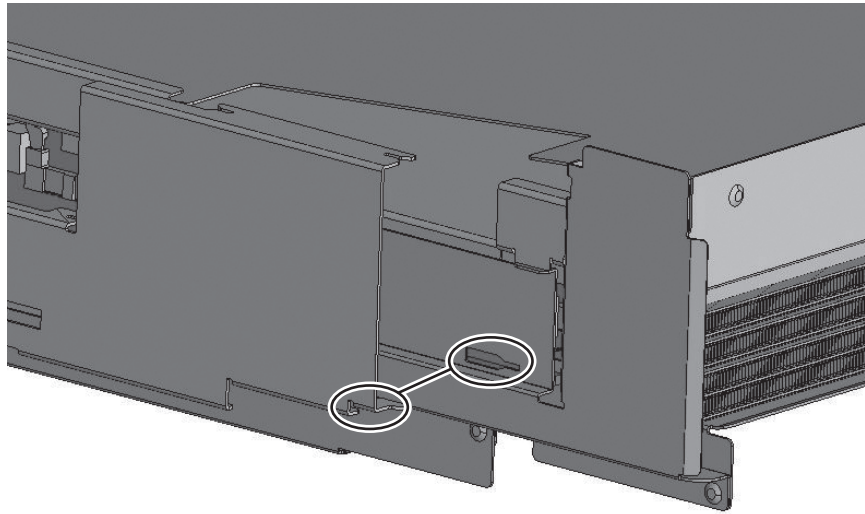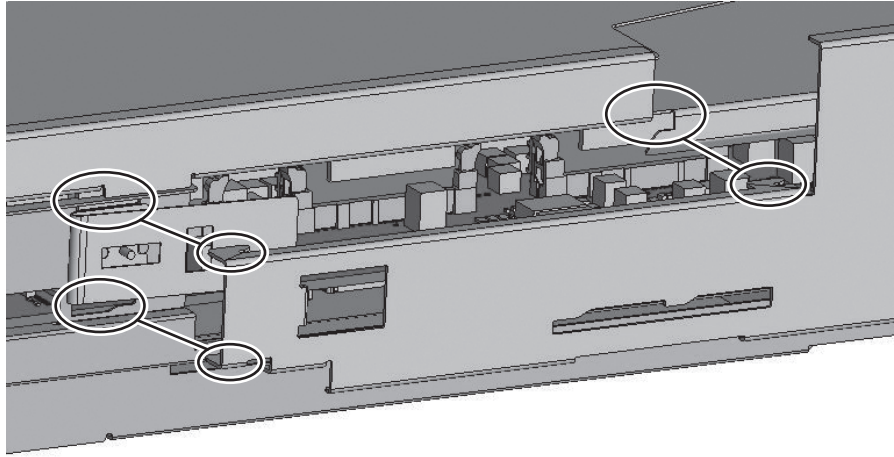
Figure 9-76   Filler unit of the CPU memory unit upper and locations of the clips on the side guide (for the SPARC M10-4/M10-4S with a FRAME-B CPU memory unit)
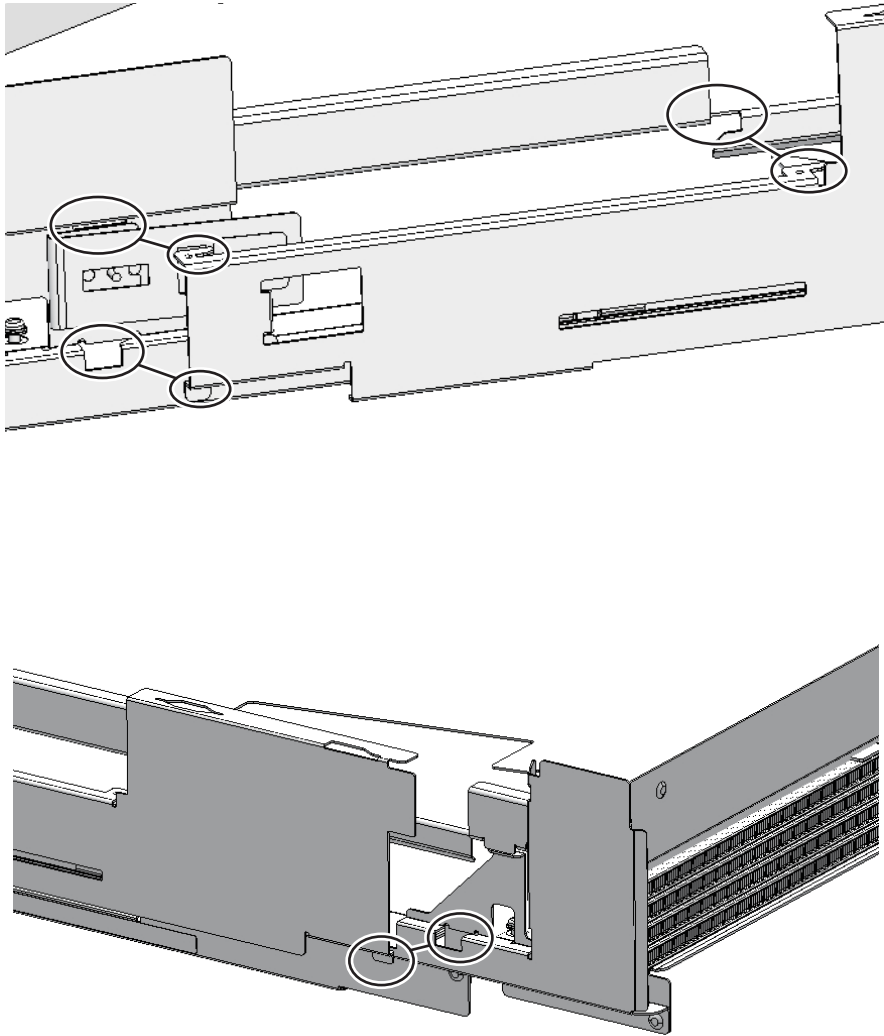
7. **Unlock (push) the top cover of the CPU memory unit, and install the cover by sliding it.**

Note - When replacing the CPU memory unit lower, use the top cover supplied with the new CPU memory unit lower.

9.10.2 Installing the CPU memory unit in the chassis

1. **With your hands at Handling Position on both sides of the CPU memory unit, insert the CPU memory unit into the chassis.**

2. **Raise the right and left levers of the CPU memory unit to secure it.**

Note - If the CPU memory unit is inserted into the chassis as far as it will go, it may not be possible to lift the lever. Lift the lever just before the CPU memory unit lower hits the rear and then push it fully home.

---

3. **If a crossbar unit was mounted, install the mounting frame and then tighten the three screws.**

4. **If crossbar units were mounted, install all of these crossbar units.**
   For details, see "15.4   Installing a Crossbar Unit."

5. **Install all the PCIe card cassettes.**
   For details, see "8.5.3   Installing a PCI Express card cassette."

Note - Reinstall the PCIe card cassettes in their original locations by referring to the notes that you made prior to the start of maintenance.

---

6. **Lift the cable support to fix it in place.**
   For details, see "6.1.2   Fixing the cable support."

7. **For a building block configuration of the SPARC M10-4S, connect the crossbar cables to the cable support.**
   For details, see "6.1.4   Attaching the crossbar cables to the cable support."

8. **Connect all the cables of the external interface.**
   The cables to be connected are as follows.

   - Interface cable connected to the PCIe card
   - Crossbar cables (If equipment rack model 26xx or equipment rack model 16xx is used, connect them in step 7.)
   - XSCF BB control cable (only for a building block configuration of the SPARC M10-4S)
   - XSCF DUAL control cable (only for a building block configuration of the SPARC M10-4S)
   - XSCF-LAN cable
   - Serial cable
   - LAN cable
   - SAS cable
   - USB cable

Note - Reinstall the cables in the correct positions by referring to the notes you made before

starting maintenance.

The FRU installation work is completed. See "Chapter 7   Maintenance Flow" to continue maintenance work.

9.11   Checking the XCP Firmware Version

This section describes the procedure for checking the XCP firmware version after maintenance work on the CPU memory unit lower.
The XCP firmware version may be different from that before replacement of the CPU memory unit lower. 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 replacement of the CPU memory unit lower.**
    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 replacement of the CPU memory unit lower.

    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=XCP2360, Back-Panel=XCP2362.
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 replacement of the CPU memory unit lower is saved on the replacement CPU memory unit lower.**
    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
       BBXCP2360.tar.gz   101544408   Thu Aug 06 08:54:02 JST 2020
XSCF> getflashimage file:///media/usb_msd/xxxx/BBXCP2362.tar.gz
```

3. **If the XCP firmware version is different from that before replacement of the CPU memory unit lower, 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 replacement of the CPU memory unit lower).

```
XSCF> flashupdate -c update -m xcp -f -s 2362
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 M10-4-0 Event: SCF:XCP update is started (XCP version=2362:
last version=2360)
 :
Mar 15 16:08:31 M10-4-0 Event: SCF:XCP update has been completed (XCP
version=2362: last version=2360)
```

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
```

9.12 Checking the XCP Firmware Version (Building Block Configuration)

This section describes the procedure for checking the XCP firmware version after maintenance work on the CPU memory unit lower.
In a SPARC M10-4S 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 replacement of the CPU memory unit lower.**
   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
Jul 7 14:51:43 SPARCM10 Event: SCF:XCP firmware version synchronization
started
Jul 7 14:51:43 SPARCM10 Event: SCF:XSCF firmware update is started (BB#00)
Jul 7 14:51:43 SPARCM10 Information:/BB#00/CMUL:SCF:SCF Diagnosis initialize
RTC (*1)
Jul 7 14:51:43 SPARCM10 Alarm: :SCF:Gaps between BB-ID (*2)
Jul 7 14:51:44 SPARCM10 Event: SCF:XSCF ready
Jul 7 15:28:25 SPARCM10 Event: SCF:Standby XSCF Ready(BB#00)
 :
Jul 7 15:40:17 SPARCM10 Event: SCF:XSCF update has been completed (BBID=0,
bank=0)
Jul 7 15:40:18 SPARCM10 Event: SCF:XCP update has been completed (XCP
version=2362:last version=2360)
Jul 7 15:40:18 SPARCM10 Event: SCF:XSCF firmware update has been completed
(BB#00)
Jul 7 15:40:18 SPARCM10 Event: SCF:XCP firmware version synchronization
completed
```

*1 If the "SCF:SCF Diagnosis initialize RTC" message appears, ignore the message.
*2 If the "SCF:Gaps between BB-ID" message appears, ignore the message.

2. **Execute the version command to check the firmware version on all SPARC M10-4S 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 M10-4S 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 replacement of the CPU memory unit lower 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
        BBXCP2360.tar.gz   107690100  Wed Sep 08 11:09:52 JST 2021
XSCF> getflashimage file:///media/usb_msd/xxxx/BBXCP2362.tar.gz
```

4. **Execute the flashupdate -c sync command to match the XCP firmware version on each SPARC M10-4S 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.....
270.....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 SPARCM10 Event: SCF:XCP update is started (XCP version=2362:
last version=2362)
Sep 8 13:41:55 SPARCM10 Event: SCF:Updating XCP:Preparing to update XSCF
(BBID=1, bank=1)
Sep 8 13:42:20 SPARCM10 Event: SCF:Updating XCP:Updating XSCF (BBID=1, XSCF
version=02360002)
Sep 8 13:46:35 SPARCM10 Event: SCF:Updating XCP:XSCF updated (BBID=1, bank=1)
Sep 8 13:46:35 SPARCM10 Event: SCF:Updating XCP:XSCF bank has changed (BBID=1,
 bank=1, XCP version=2362:last version=2360)
Sep 8 13:52:32 SPARCM10 Event: SCF:Standby XSCF Ready(BB#01)
Sep 8 13:53:16 SPARCM10 Event: SCF:Updating XCP:Preparing to update XSCF
(BBID=1, bank=0)
Sep 8 13:53:39 SPARCM10 Event: SCF:Updating XCP:Updating XSCF (BBID=1, XSCF
version=02360002)
Sep 8 13:57:35 SPARCM10 Event: SCF:Updating XCP:XSCF updated (BBID=1, bank=0)
Sep 8 13:58:22 SPARCM10 Event: SCF:Updating XCP:Preparing to update CMU
(BBID=1)
Sep 8 13:58:24 SPARCM10 Event: SCF:Updating XCP:Updating CMU (BBID=1, CMU
version=02360002)
Sep 8 14:02:34 SPARCM10 Event: SCF:Updating XCP:CMU updated (BBID=1)
Sep 8 14:03:16 SPARCM10 Event: SCF:XCP update has been completed (XCP
```

```
version=2362:last version=2362)
```

6. **Execute the version command, and confirm that the XCP firmware version on each SPARC M10-4S 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 10

Maintaining the Internal Disks

This chapter describes the procedure for maintaining the internal disks mounted in the SPARC M10-4/M10-4S. An internal disk can be replaced, expanded, or reduced.

- Before Maintaining an Internal Disk
- Configuration of the Internal Disks
- FRU Removal and Installation Flow
- Removing an Internal Disk
- Installing an Internal Disk

10.1 Before Maintaining an Internal Disk

This chapter only has descriptions of the internal disk configuration and the work of removing and installing internal disks.
Before removing a FRU, see "Chapter 7 Maintenance Flow" and perform the necessary work items.
For the types of maintenance on internal disks, also see "Internal disk" in "Table 7-2 List of available maintenance types by FRU."

10.2 Configuration of the Internal Disks

This section describes the configuration and locations of the internal disks.
The chassis has eight slots for mounting internal disks. The system memory storage can be expanded by installing extra hard disk drives (HDDs) or solid state drives (SSDs) in these slots.

Figure 10-1   Location of internal disks
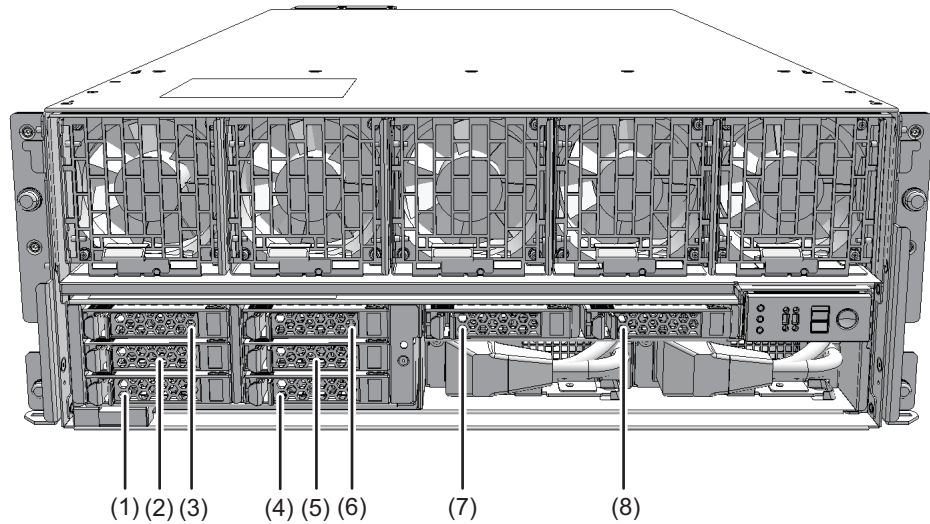
Location number	Component
1	Internal disk (HDD#0)
2	Internal disk (HDD#1)
3	Internal disk (HDD#2)
4	Internal disk (HDD#3)
5	Internal disk (HDD#4)
6	Internal disk (HDD#5)
7	Internal disk (HDD#6)
8	Internal disk (HDD#7)

10.3   FRU Removal and Installation Flow

Perform maintenance work on internal disks by following the procedures shown in Figure 10-2, Table 10-1, Table 10-2, and Table 10-3.

Figure 10-2　　Maintenance workflow
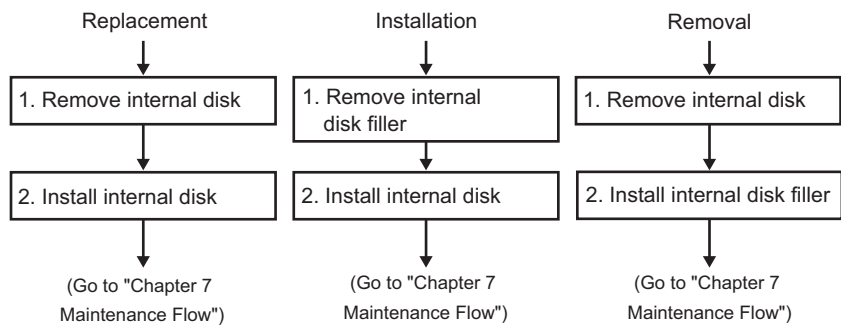
Table 10-1　　Internal disk replacement workflow and procedures

Item	Replacement work procedure	Reference
1	Removing an internal disk	"10.4　Removing an Internal Disk"
2	Installing an internal disk	"10.5　Installing an Internal Disk"

Table 10-2　　Internal disk installation workflow and procedures

Item	Replacement work procedure	Reference
1	Removing a filler unit and installing an internal disk	"10.5　Installing an Internal Disk"

Table 10-3　　Internal disk removal workflow and procedures

Item	Replacement work procedure	Reference
1	Removing an internal disk and installing a filler unit	"10.4　Removing an Internal Disk"

10.4　Removing an Internal Disk

This section describes the procedure for removing an internal disk. Perform reduction using the same procedure.
Make the internal disk ready for removal before attempting to remove it. For details, follow the procedure in "Chapter 7　Maintenance Flow."

Caution - Before you handle any components, 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 damaged. For details, see "1.5　Precautions on Static Electricity."

1. **Push the knob on the internal disk to unlock it and then raise the lever to a 45-degree angle.**

Figure 10-3   Knob on internal disk
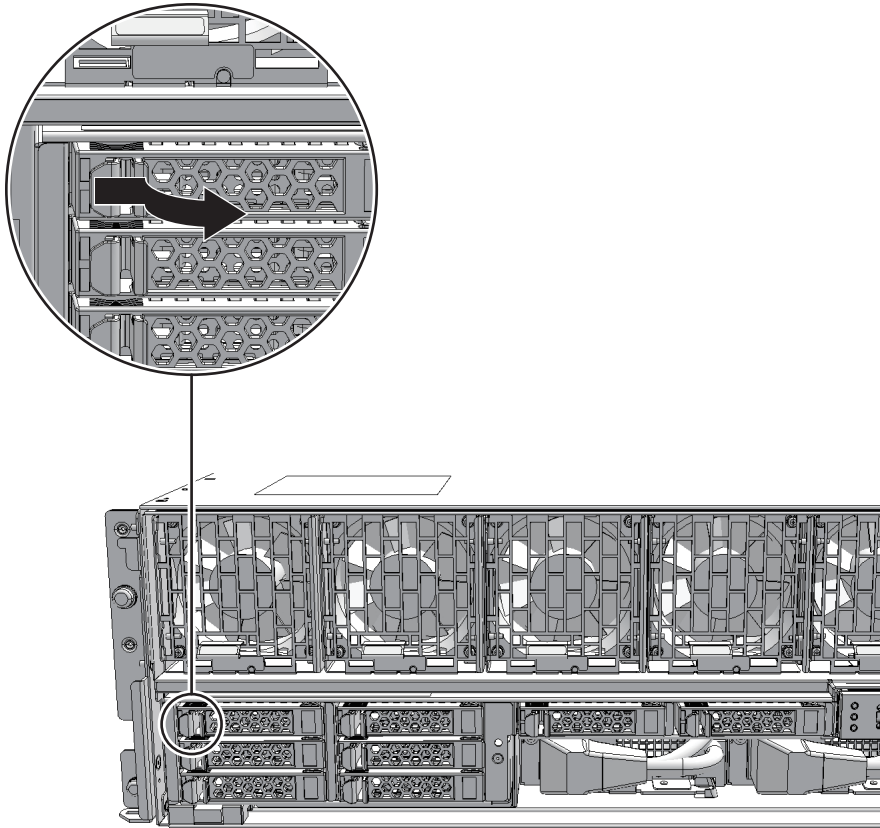
2. **Hold the lever and pull out the internal disk by about 3 cm (1.2 in.)**

Note - When performing active/hot maintenance, at this point wait until the motor stops rotating (about 1 minute).

Figure 10-4   Removing an internal disk
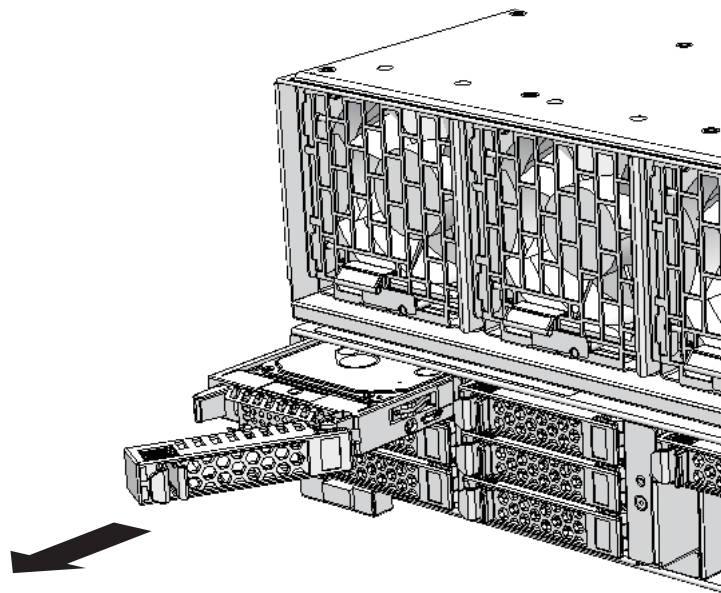
3. **Carefully remove the internal disk from its slot.**

Note - Place the removed internal disk on the grounded antistatic ESD mat.

---

4. **When reducing an internal disk, install the internal disk filler unit in the slot from which the disk was removed.**

Figure 10-5   Installing the disk filler
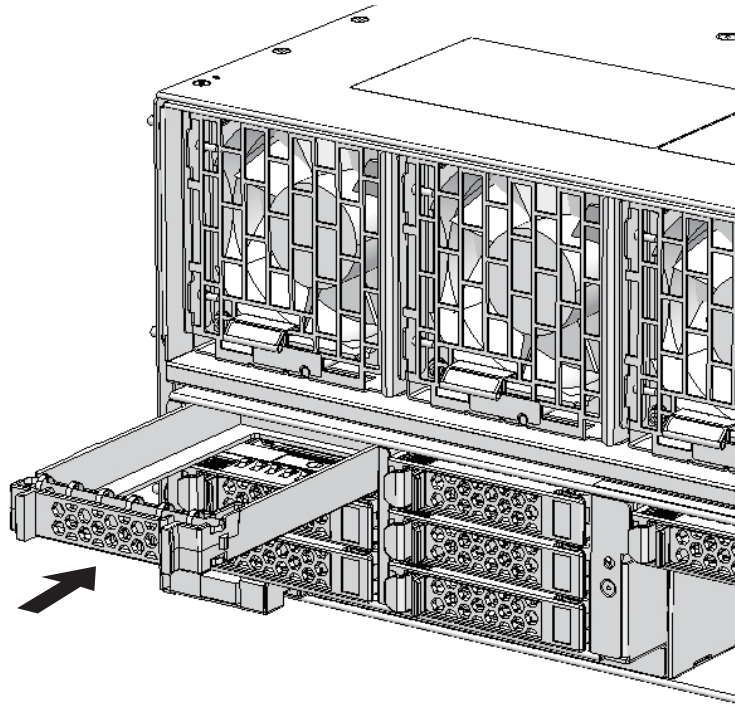
10.5   Installing an Internal Disk

This section describes the procedure for installing an internal disk. Perform expansion using the same procedure.

1. **When expanding an internal disk, remove the internal disk filler unit from the slot in which the disk is to be installed.**

2. **With the lever opened, hold the internal disk.**

3. **Carefully insert the internal disk into the slot.**

⚠ **Caution -** Do not force the internal disk into the slot. Using excessive force may damage the component or the chassis.

4. **Close the lever to secure the internal disk.**

Note - Ensure that the internal disks are firmly inserted and secured.

The FRU installation work is completed. See "Chapter 7   Maintenance Flow" to continue maintenance work.

Chapter 11

Maintaining the Fan Units

This chapter describes the procedure for maintaining the fan units mounted in the SPARC M10-4/M10-4S.

- Before Maintaining a Fan Unit
- Configuration of the Fan Units
- Removing a Fan Unit
- Installing a Fan Unit

11.1 Before Maintaining a Fan Unit

This chapter only has descriptions of the fan unit configuration and the work of removing and installing fan units.
Before removing a FRU, see "Chapter 7   Maintenance Flow" and perform the necessary work items.
For the types of maintenance on fan units, also see "Fan unit" in "Table 7-2   List of available maintenance types by FRU."

11.2 Configuration of the Fan Units

This section describes the configuration and the locations of the fan units.
Five fan units are mounted in each chassis. Each fan unit has two cooling fans that cool the components in the chassis.
If a fault occurs with a cooling fan during system operation, the XSCF detects the error. However, the system can continue operating because the fans have a redundant configuration.

Figure 11-1　　Location of fan units
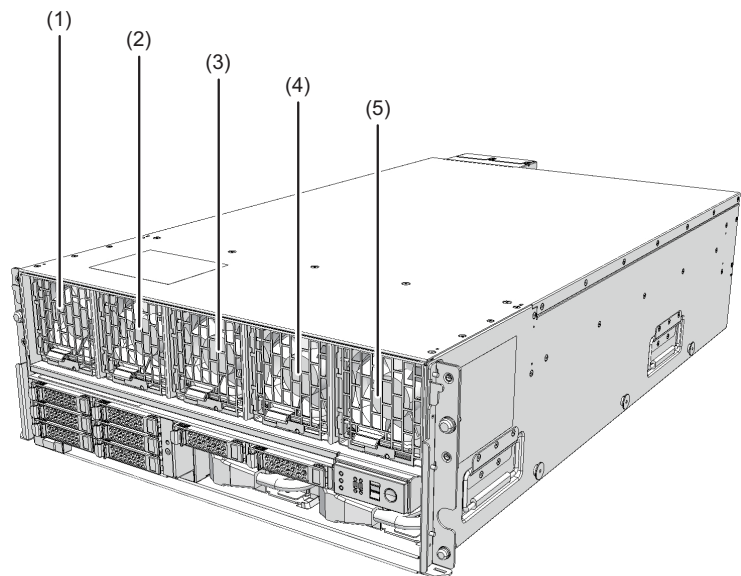
Location number	Component
1	Fan unit (FANU#0)
2	Fan unit (FANU#1)
3	Fan unit (FANU#2)
4	Fan unit (FANU#3)
5	Fan unit (FANU#4)

11.3　Removing a Fan Unit

This section describes the procedure for removing a fan unit. Enable the removal of the fan unit before attempting to remove it. For details, follow the procedure in "Chapter 7　Maintenance Flow."

Caution - Before you handle any components, 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 damaged. For details, see "1.5　Precautions on Static Electricity."

1. **Pull out the fan unit while raising its lever.**

Figure 11-2   Lever of fan unit
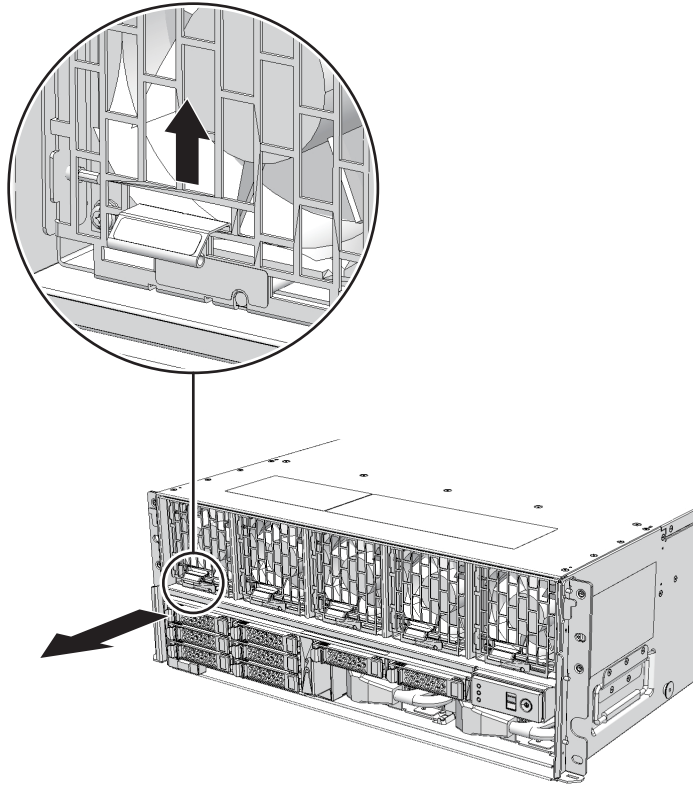
2. **Carefully remove the fan unit from its slot.**

Note - Place the removed fan unit on a grounded antistatic ESD mat.

11.4   Installing a Fan Unit

This section describes the procedure for installing a fan unit.

1. **Carefully insert the fan unit into its slot.**

Caution - Do not force the fan unit into the slot. Using excessive force may damage the component or the chassis.

2.   **Push the fan unit fully home.**

Note - Check that the fan unit is fully inserted and secured.

The FRU installation work is completed. See "Chapter 7   Maintenance Flow" to continue maintenance work.

Chapter 12

Maintaining the Power Supply Units

This chapter describes the procedure for maintaining the power supply units mounted in the SPARC M10-4/M10-4S.

- Before Maintaining a Power Supply Unit
- Configuration of the Power Supply Units
- Removing a Power Supply Unit
- Installing a Power Supply Unit

12.1 Before Maintaining a Power Supply Unit

This chapter only has descriptions of the power supply unit configuration and the work of removing and installing power supply units.
Before removing a FRU, see "Chapter 7   Maintenance Flow" and perform the necessary work items.
For the types of maintenance on power supply units, also see "Power supply unit" in "Table 7-2   List of available maintenance types by FRU."

12.2 Configuration of the Power Supply Units

This section describes the configuration and the locations of the power supply units. The power supply units feed power to the individual components. The components can have the 1+1 redundant configuration. Active/hot maintenance can be performed.

Figure 12-1   Location of power supply unit
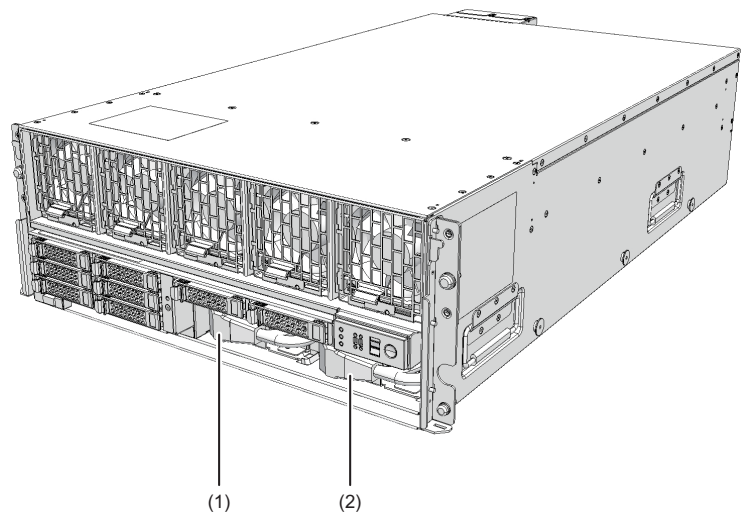
Location number	Component
1	Power supply unit (PSU#0)
2	Power supply unit (PSU#1)

12.3   Removing a Power Supply Unit

This section describes the procedure for removing a power supply unit. Enable the removal of the power supply unit before attempting to remove it. For details, follow the procedure in "Chapter 7   Maintenance Flow."

⚠ **Caution -** Before you handle any components, 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 damaged. For details, see "1.5   Precautions on Static Electricity."

1. **Remove the power cord from the power supply unit requiring maintenance.**
2. **Loosen the screws securing the power supply unit and open the lever.**

Figure 12-2　　Screws securing power supply unit
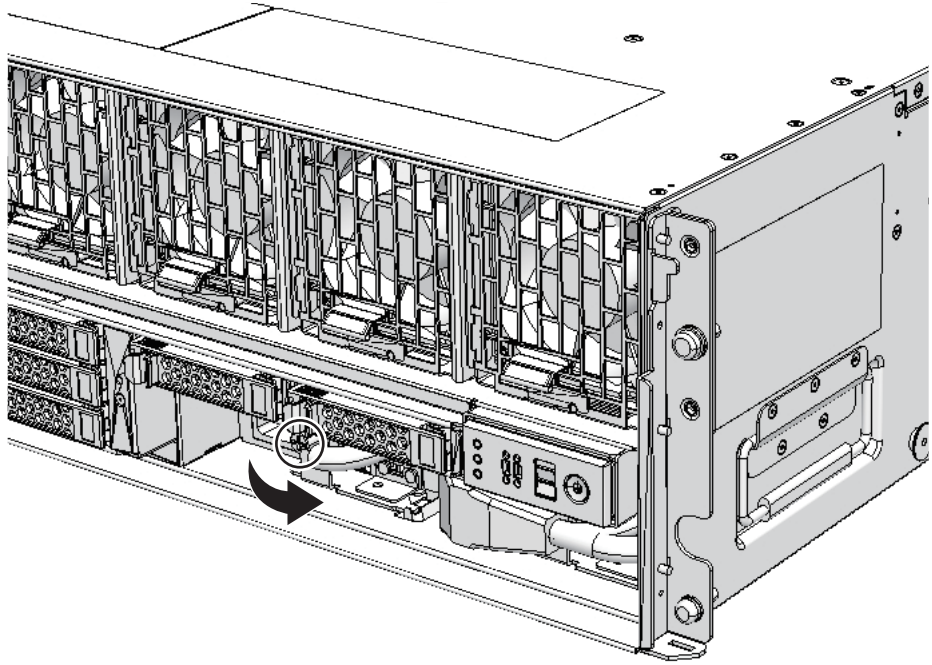
3.　**Hold the lever and pull the power supply unit out of the chassis.**

4.　**Support the power supply unit from below with one hand and remove it carefully from its slot.**

Note - Place the removed power supply unit on a grounded antistatic ESD mat.

12.4　Installing a Power Supply Unit

This section describes the procedure for installing a power supply unit.

1.　**Support the power supply unit from below with one hand and insert it carefully into its slot.**

⚠ **Caution -** Do not forcibly push the power supply unit into its slot. Using excessive force may damage the component or the chassis.

2.　**Firmly push the power supply unit into its mounting position.**

3.　**Close the lever and then tighten the screws.**

4. **Insert the power cords all the way in the power supply unit.**

The FRU installation work is completed. See "Chapter 7   Maintenance Flow" to continue maintenance work.

Chapter 13

Maintaining the PSU Backplane Unit/Operation Panel

This chapter describes the procedures for maintaining the PSU backplane unit and operation panel mounted in the SPARC M10-4/M10-4S.

- Before Maintaining the PSU Backplane Unit/Operation Panel
- Locations of the PSU Backplane Unit and Operation Panel
- Maintenance Precautions
- FRU Removal and Installation Flow
- Removing the PSU Backplane Unit/Operation Panel
- Installing the PSU Backplane Unit/Operation Panel

13.1 Before Maintaining the PSU Backplane Unit/Operation Panel

This chapter only has descriptions of the PSU backplane unit/operation panel location and the work of removing and installing the PSU backplane unit/operation panel.

Before removing a FRU, see "Chapter 7 Maintenance Flow" and perform the necessary work items.

For the types of maintenance on the PSU backplane unit/operation panel, also see "PSU backplane unit" and "Operation panel" in "Table 7-2 List of available maintenance types by FRU."

13.2 Locations of the PSU Backplane Unit and Operation Panel

This section describes the locations of the PSU backplane unit and operation panel.

The PSU backplane unit has connectors for connecting multiple power supply units.

⚠ **Caution -** Do not replace a PSU backplane unit at the same time as a CPU memory unit. If you replace a PSU backplane unit at the same time as a CPU memory unit, the system may fail to operate normally. Replace either the PSU backplane unit or the CPU memory unit, and confirm that the newly installed part is normal by using the showhardconf or showstatus command. Then, replace the other FRU.

Figure 13-1   Location of the PSU backplane unit
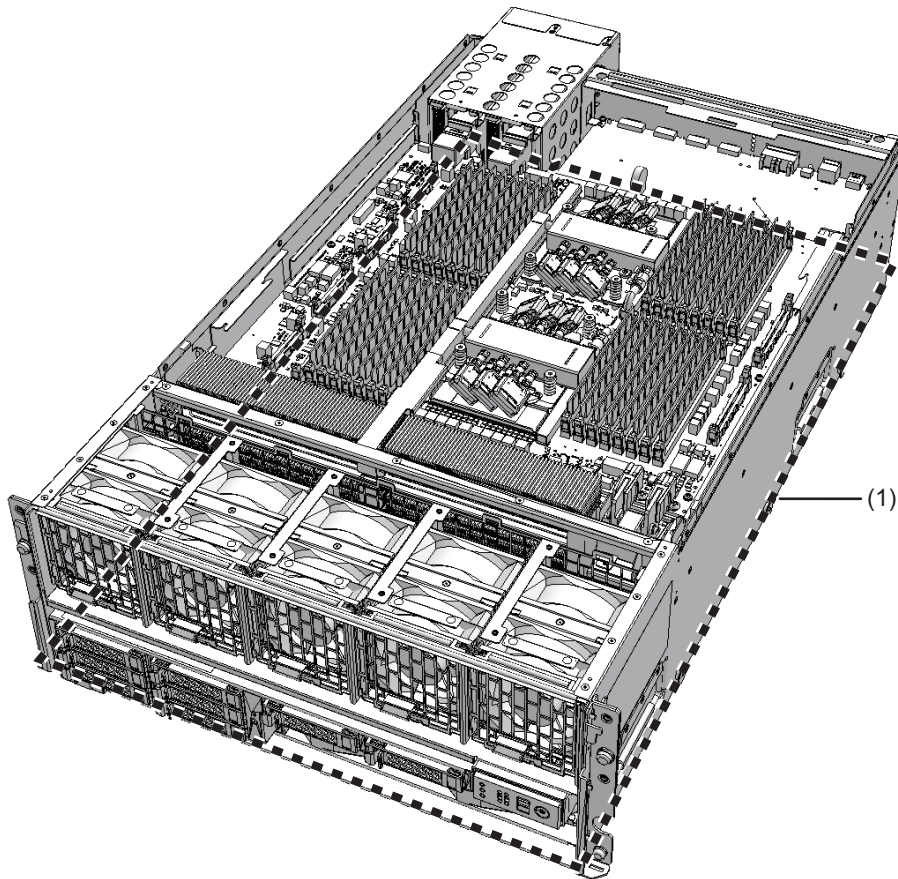
Location number	Component
1	PSU backplane unit (PSUBP)

Figure 13-2　　　Location of the operation panel

(1)
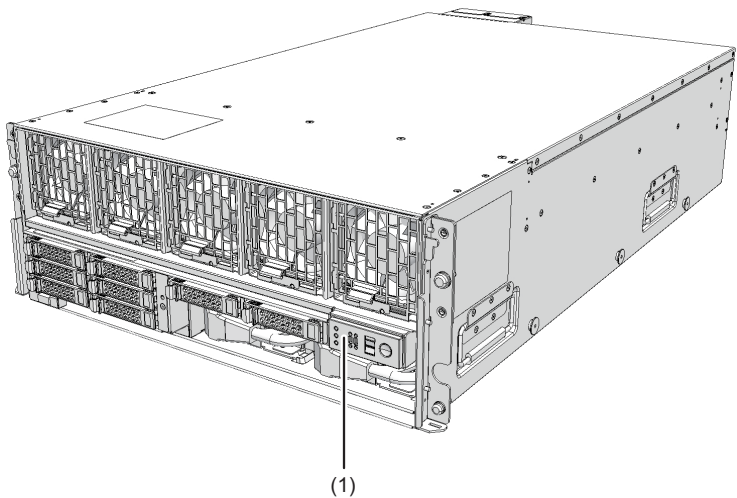
Location number	Component
1	Operation panel (OPNL)

13.3　Maintenance Precautions

This section describes precautions for maintaining the PSU backplane unit and operation panel.

- Do not replace a PSU backplane unit at the same time as a CPU memory unit. If you replace a PSU backplane unit at the same time as a CPU memory unit, the system may fail to operate normally. Replace either the PSU backplane unit or the CPU memory unit, and confirm that the newly installed part is normal by using the showhardconf or showstatus command. Then, replace the other FRU.

- Do not mount and use any of the following PSU backplane units in another chassis:
  - the one currently mounted in the SPARC M10-4/M10-4S, or
  - one that was once used as a maintenance part

  This is because these PSU backplane units store device identification information.

- To replace the operation panel, remove the PSU backplane from the chassis.

- To replace the operation panel on the SPARC M10-4S, you need to set the BB-ID of

the replacement operation panel to the same value as that before maintenance.

13.4 FRU Removal and Installation Flow

Perform maintenance work on the PSU backplane unit and operation panel by following the procedures shown in Figure 13-3 and Table 13-1.
The workflow assumes that the chassis requiring maintenance has been removed in "7.2   FRU Replacement Workflow."

Figure 13-3   Maintenance workflow

(Remove chassis requiring maintenance)

↓

| 1. Enable removal of PSU backplane unit |

↓

| 2. Remove PSU backplane unit |

↓

| 3. Remove operation panel |

↓

| 4. Install operation panel |

↓

| 5. Install PSU backplane unit |

↓

(Restore chassis requiring maintenance)
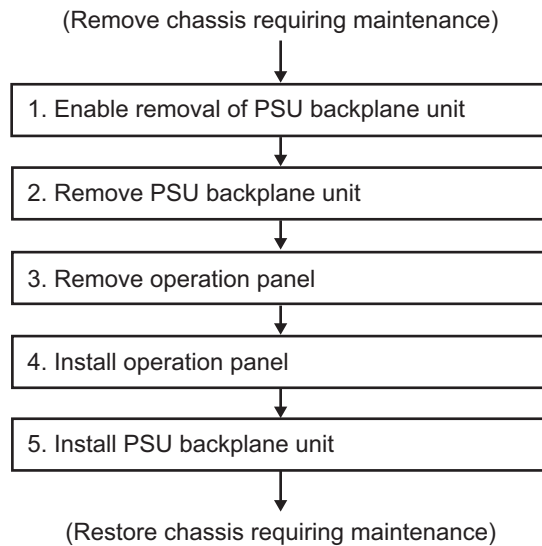
Table 13-1   Maintenance workflow and procedures

Item	Maintenance work procedure	Reference
1	Accessing a CPU memory unit	9.5.1 Accessing a CPU memory unit
2	Removing a CPU memory unit from the chassis	9.5.2 Removing a CPU memory unit from the chassis
3	Removing an internal disk	10.4 Removing an Internal Disk
4	Removing all the fan units	11.3 Removing a Fan Unit
5	Removing a power supply unit	12.3 Removing a Power Supply Unit
6	Removing the PSU backplane unit	13.5.1 Removing the PSU backplane unit
7	Removing the operation panel	13.5.2 Removing the operation panel
8	Installing the operation panel	13.6.1 Installing the operation panel
9	Installing the PSU backplane unit	13.6.2 Installing the PSU backplane unit
10	Installing a power supply unit	12.4 Installing a Power Supply Unit
11	Installing all the fan units	11.4 Installing a Fan Unit
12	Installing an internal disk	10.5 Installing an Internal Disk
13	Installing the CPU memory unit in the chassis	9.10.2 Installing the CPU memory unit in the chassis

13.5   Removing the PSU Backplane Unit/Operation Panel

13.5.1   Removing the PSU backplane unit

This section describes the procedure for removing the PSU backplane unit from the SPARC M10-4/M10-4S. Enable the removal of the PSU backplane unit before attempting to remove it. For details, see "Chapter 7   Maintenance Flow."

⚠ **Caution -** Before you handle any components, 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 damaged. For details, see "1.5   Precautions on Static Electricity."

1. **Loosen the two screws in the fan slot and then remove the fan shelf.**

Figure 13-4   Screws in the fan slot
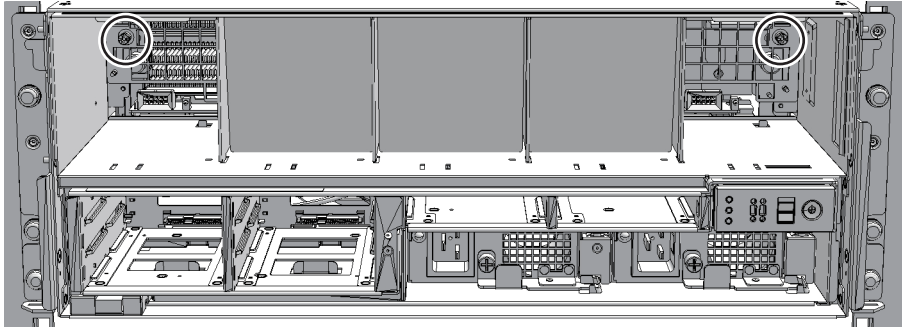
2. **Loosen the two screws securing the PSU backplane unit and then partially pull out the PSU backplane unit.**

Figure 13-5   Screws securing the PSU backplane unit
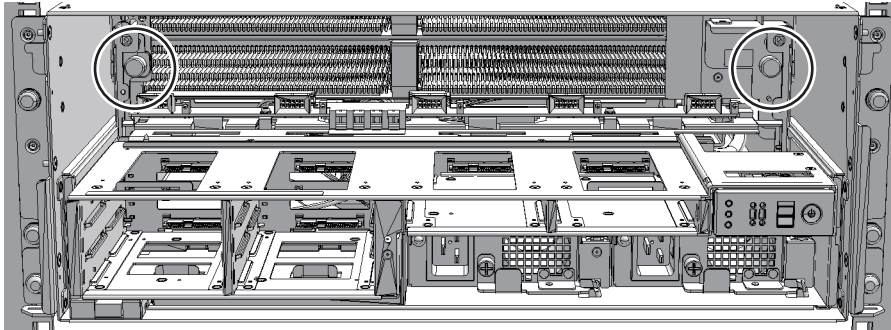
3. **Pull the PSU backplane unit out a little more. Then, remove the unit by holding its handle.**

Note - Place the removed PSU backplane unit on a grounded antistatic ESD mat.

Figure 13-6   Handle of PSU backplane unit
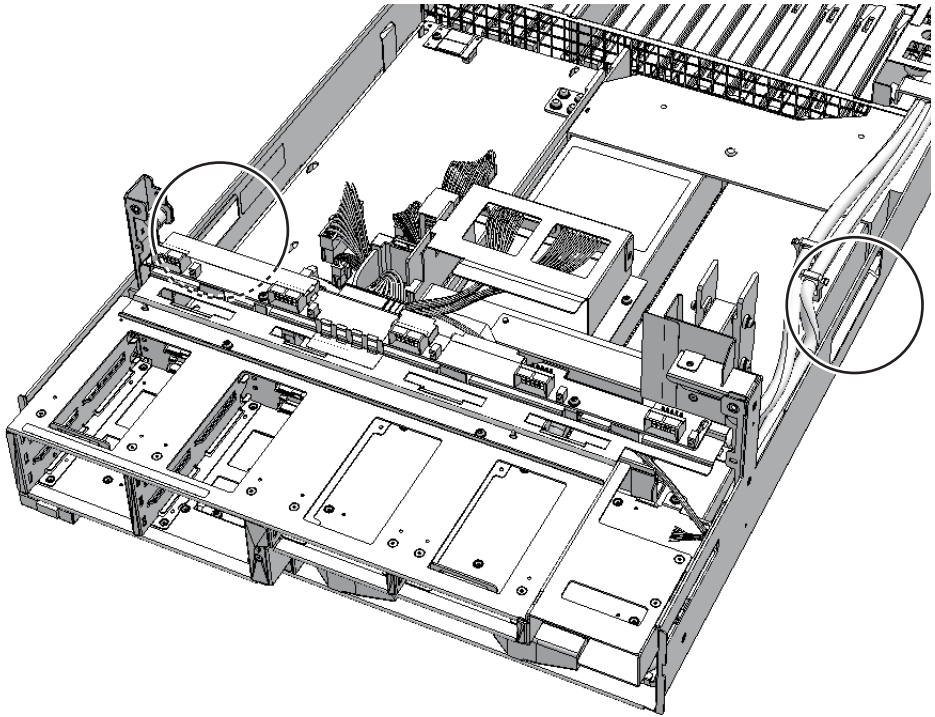
13.5.2   Removing the operation panel

1. **Check the BB-ID switch on the operation panel, and record the set BB-ID of the chassis requiring maintenance.**

2. **Remove the cable from the operation panel and loosen one screw (A in the figure).**

Figure 13-7   Cables and screws of the operation panel
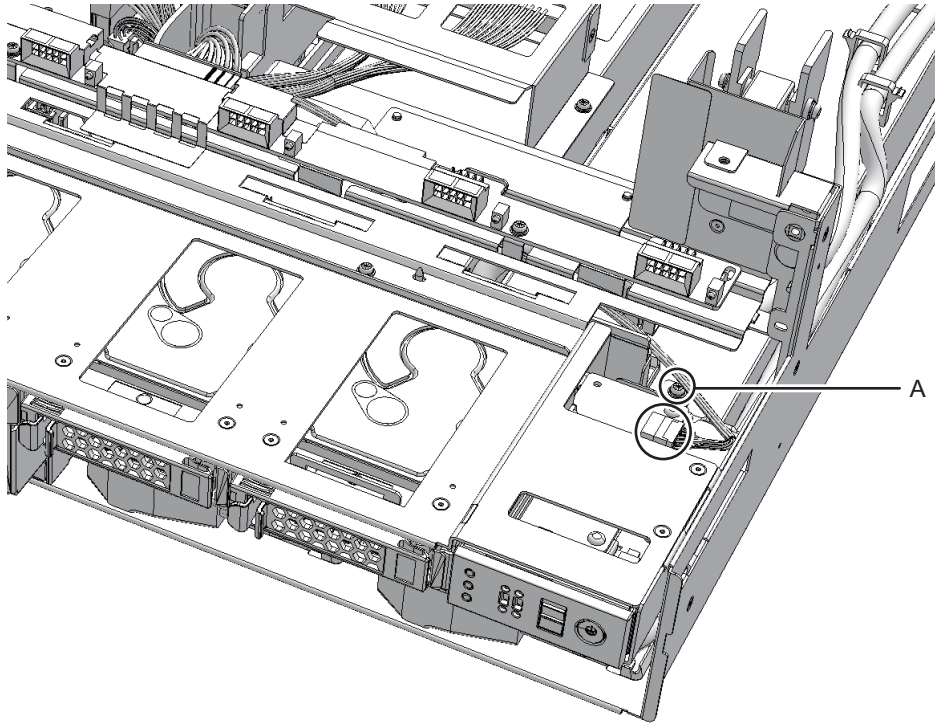
3.   **Pull the operation panel forward to remove it.**

Note - Place the removed operation panel on a grounded antistatic ESD mat.

13.6   Installing the PSU Backplane Unit/Operation Panel

13.6.1   Installing the operation panel

1.   **Set the BB-ID of the operation panel to the value prior to the start of maintenance.**
2.   **Insert the operation panel at the installation location, and connect one cable to the operation panel.**

3. **Tighten the screws on the operation panel to secure it to the PSU backplane unit.**

13.6.2　Installing the PSU backplane unit

This section describes the procedure for installing the PSU backplane unit.

1. **Insert the PSU backplane unit into the chassis by holding the handle.**

2. **Tighten the two screws on the PSU backplane unit to secure it to the chassis.**

3. **Reinstall the fan shelf and then tighten the two screws in the fan slot.**

The FRU installation work is completed. See "Chapter 7　Maintenance Flow" to continue maintenance work.

Chapter 14

Maintaining the Crossbar Cables

This chapter describes the procedures for maintaining the crossbar cables.

- Before Maintaining a Crossbar Cable
- Configuration of the Crossbar Cable Connection Ports
- Removing the Crossbar Cables
- Installing the Crossbar Cables

14.1 Before Maintaining a Crossbar Cable

This chapter only has descriptions of the configuration of the crossbar cable connection ports and the work of removing and installing crossbar cables.
Before removing a FRU, see "Chapter 7 Maintenance Flow" and perform the necessary work items.
For the types of maintenance on crossbar cables, also see "Crossbar cable" in "Table 7-2 List of available maintenance types by FRU."

14.2 Configuration of the Crossbar Cable Connection Ports

This section describes the configuration and locations of the crossbar cable connection ports.
The crossbar cables are used to connect the SPARC M10-4S units to one another or to connect the SPARC M10-4S to a crossbar box in a building block configuration (with a crossbar box).
Each crossbar cable has a number that corresponds to a port number on the chassis. A port number is assigned to each pair of ports. So crossbar cables should be replaced as a pair.

Figure 14-1   Crossbar cable connection port (SPARC M10-4S)
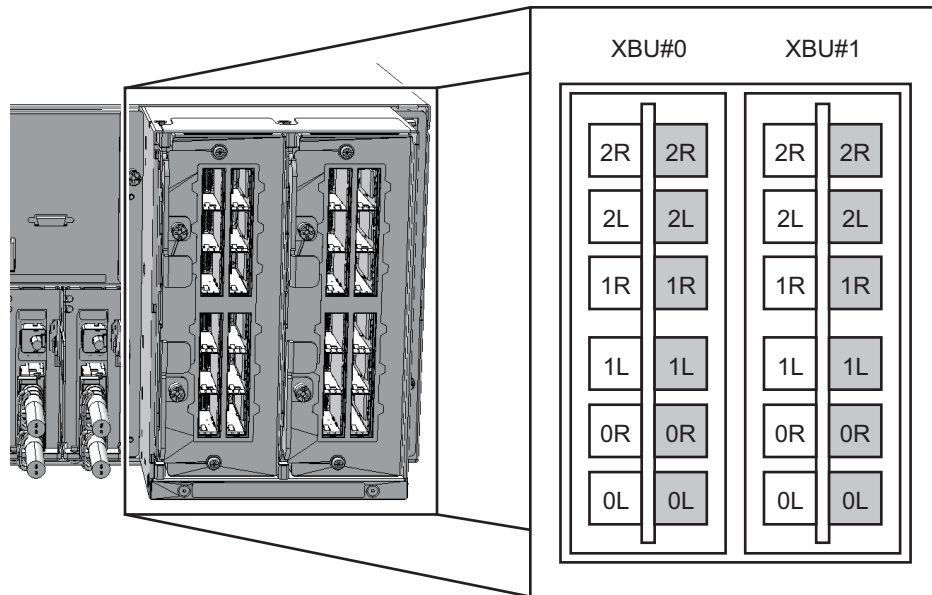
Figure 14-2   Crossbar cable connection port (crossbar box)
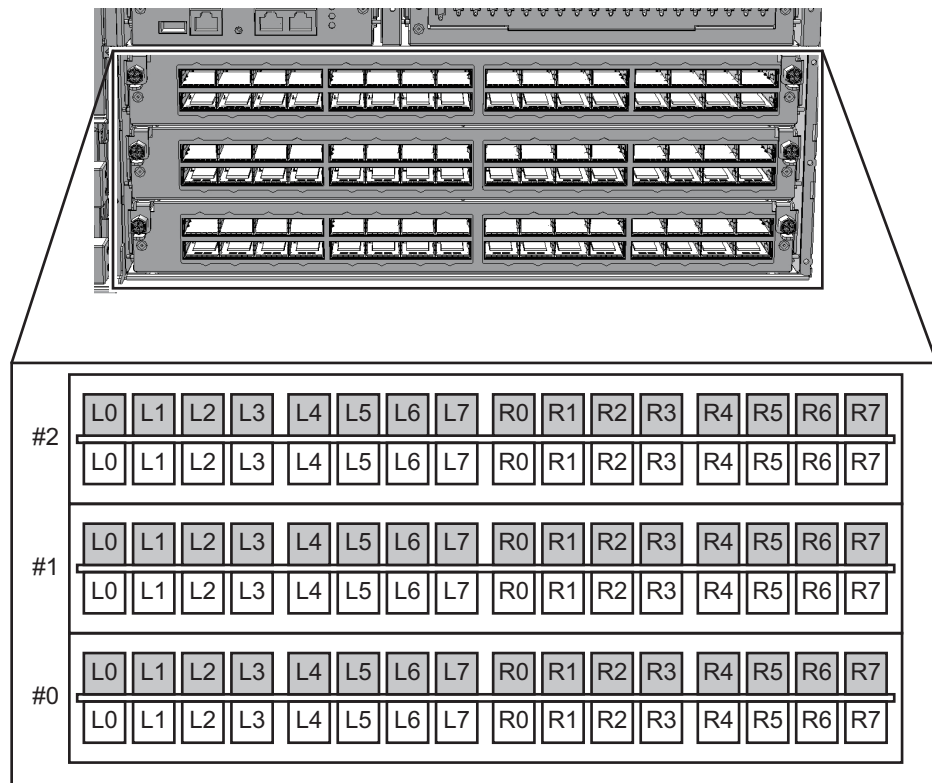
Figure 14-3   Crossbar cables (electrical)
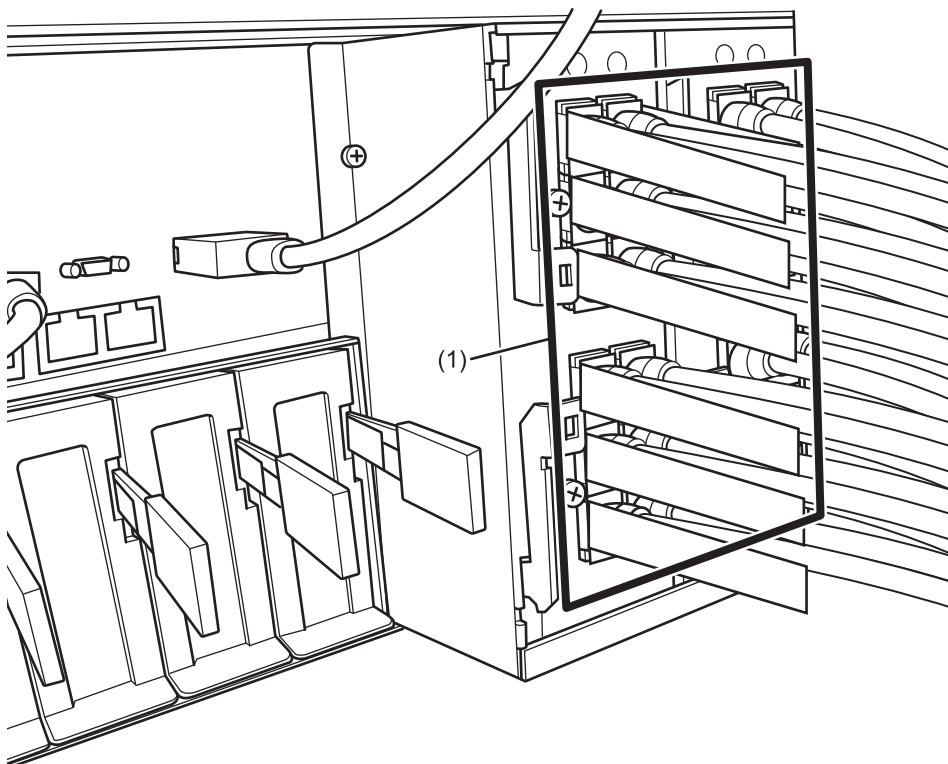
Location number	Component
1	Crossbar cables (electrical) (CBL)

Figure 14-4   Crossbar cables (optical) (SPARC M10-4S)

(1)
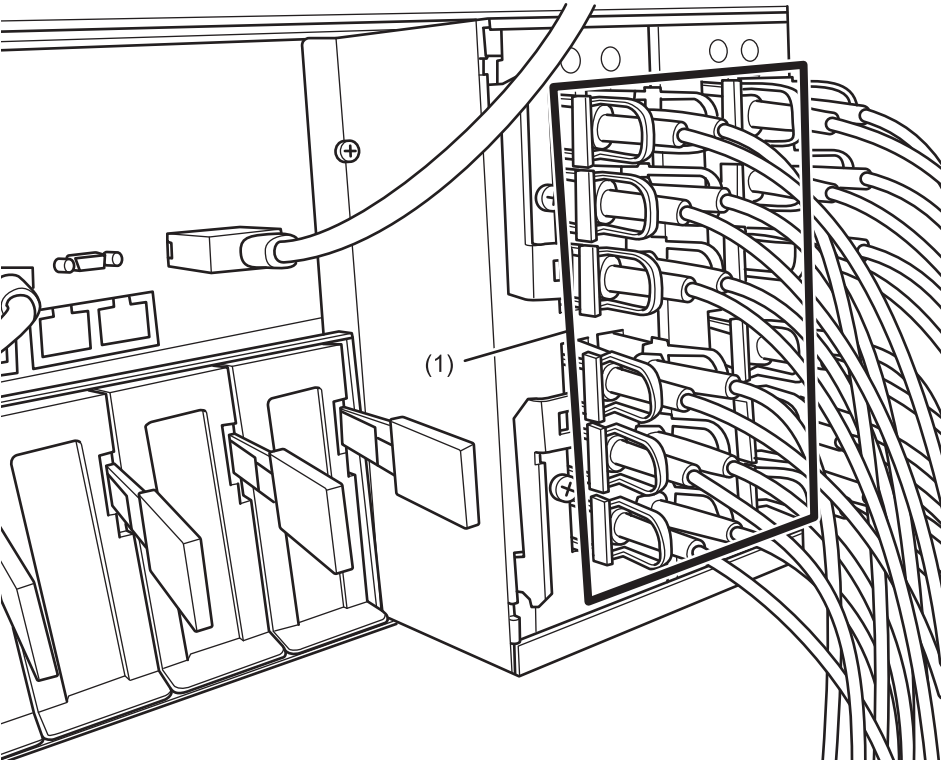
Figure 14-5   Crossbar cables (optical) (crossbar box)

(1)
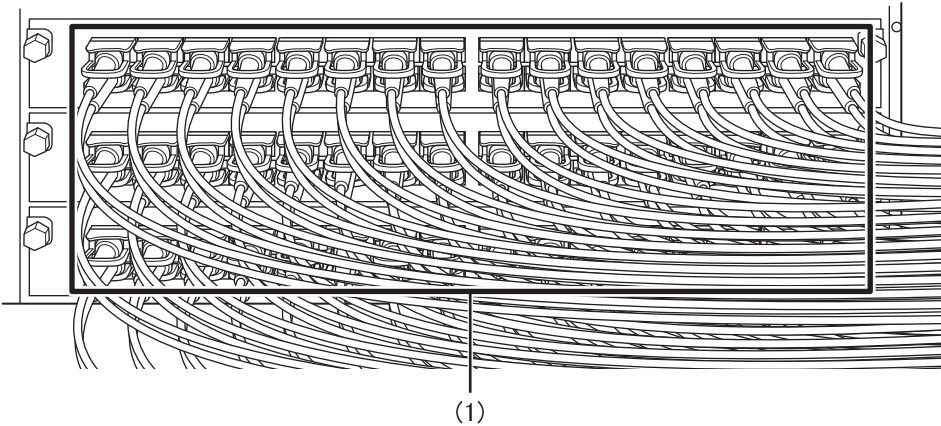
Location number	Component
1	Crossbar cables (optical) (CBL)

14.3 Removing the Crossbar Cables

This section describes the procedure for removing the crossbar cables. Enable the removal of the crossbar cables before attempting to remove them. For details, follow the procedure in "Chapter 7   Maintenance Flow."

⚠ **Caution -** Before you handle any components, 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 damaged. For details, see "1.5   Precautions on Static Electricity."

1. **Remove the two crossbar cables from the SPARC M10-4S.**
   Remove each crossbar cable by holding the tab (A in Figure 14-6 and Figure 14-7) of the cable and pulling it straight out in the direction of the arrow. At this time, do not hold the cable part when pulling out the crossbar cable. Pulling the cable part without the connector lock completely released may cause damage.

⚠ **Caution -** Pulling the cable part without the connector lock completely released may cause damage.

Figure 14-6   Removing the crossbar cables (electrical)
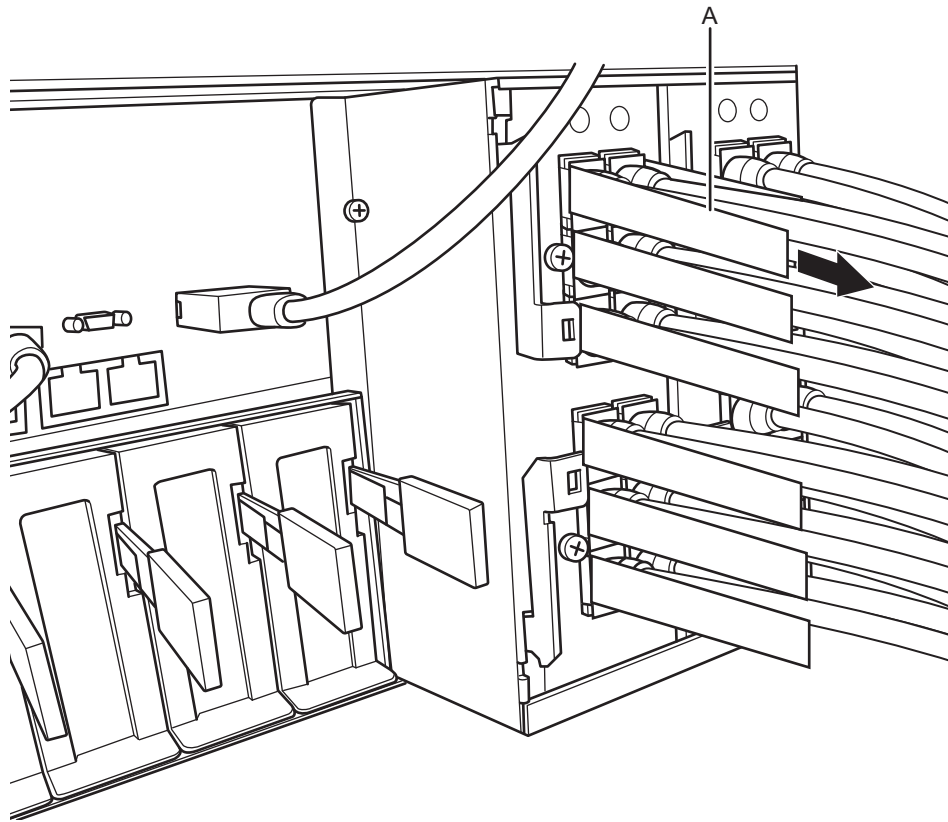
Figure 14-7 Removing the crossbar cables (optical)
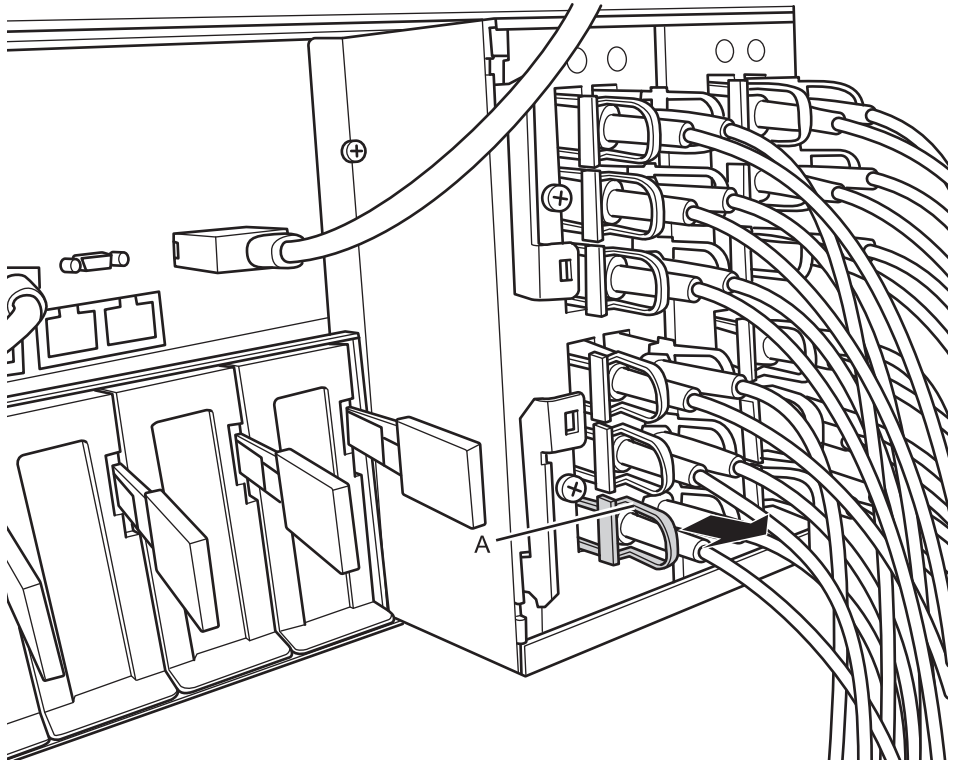
2. **Remove the two crossbar cables from the other chassis.**
   Remove each crossbar cable by holding the tab of the cable and pulling it straight out in the direction of the arrow. At this time, do not hold the cable part when pulling out the crossbar cable. Pulling the cable part without the connector lock completely released may cause damage.

⚠ **Caution -** Pulling the cable part without the connector lock completely released may cause damage.

Note - There is no problem if you remove the crossbar cables from the crossbar box while electricity is supplied.

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. Therefore, to remove the crossbar cables, remove the hook-and-loop fastener from the cable support.

Figure 14-8   Removing the crossbar cables (crossbar box)
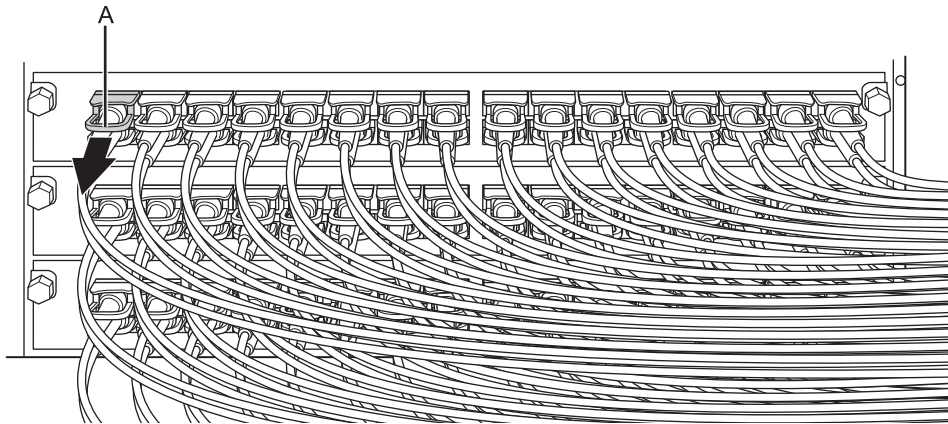
14.4   Installing the Crossbar Cables

This section describes the procedure for connecting the crossbar cables.

1. **Attach the supplied connection destination label to the new replacement crossbar cable.**
    For the new crossbar cable, use the same type of label as the one on the cable requiring maintenance and write the same port number on it.

2. **Connect a pair of crossbar cables to each chassis.**
    Insert each crossbar cable by holding the connector part of the cable and inserting it straight into the opening. Do not hold the cable part or the tab part when inserting the cable.

Caution - If you insert a connector with the tab pulled, the connector may be damaged.

Note - There is no problem if you connect the crossbar cables (optical) at the crossbar box while electricity is supplied.

Note - Confirm that the crossbar cables are correctly connected and firmly secured.

Note - After installing the crossbar cables, use the hook-and-loop fastener to bundle the cables on the rear side together and secure them to the cable support.

Note - There are three types of crossbar cables (optical). You can distinguish the type of crossbar cable (optical) by the tab shape.

3. **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 14-9) 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 work at this time. Otherwise, the cable may bend out of shape.

Figure 14-9   Part to Hold When Checking a Crossbar Cable Connection
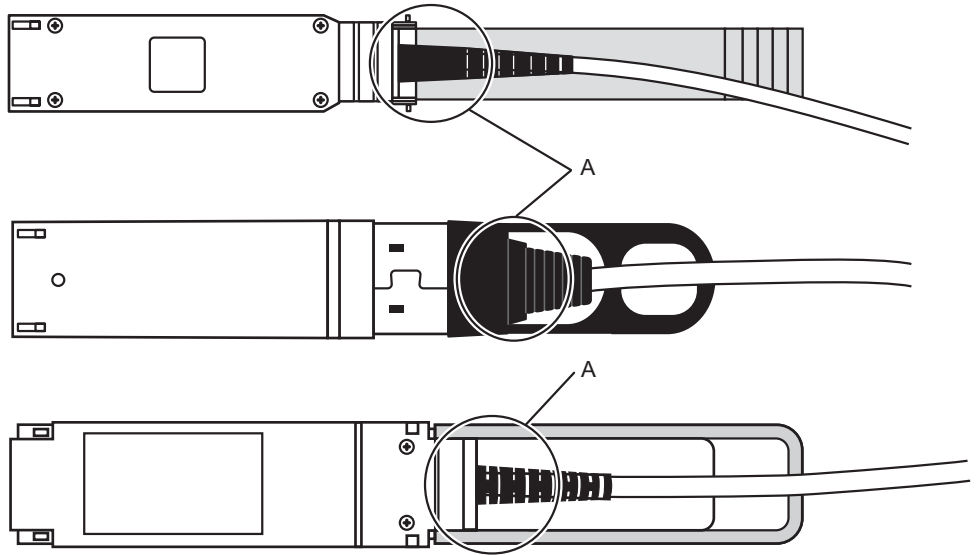
The FRU installation work is completed. See "Chapter 7   Maintenance Flow" to
continue maintenance work.

Chapter 15

Maintaining the Crossbar Units

This chapter describes the procedure for maintaining the crossbar units mounted on a SPARC M10-4S.

- Before Maintaining a Crossbar Unit
- Configuration of the Crossbar Units
- Removing a Crossbar Unit
- Installing a Crossbar Unit

15.1 Before Maintaining a Crossbar Unit

This chapter only has descriptions of the crossbar unit configuration and the work of removing and installing crossbar units.
Before removing a FRU, see "Chapter 7   Maintenance Flow" and perform the necessary work items.
For the types of maintenance on crossbar units, also see "Crossbar unit" in "Table 7-2 List of available maintenance types by FRU."

15.2 Configuration of the Crossbar Units

This section describes the configuration and the locations of the crossbar units.
The crossbar units of the SPARC M10-4S are connected to the crossbar units of other SPARC M10-4S units or to a crossbar box for system extension. Two crossbar units are mounted on a SPARC M10-4S. When performing maintenance, perform the work one unit at a time.

Figure 15-1　　Location of crossbar units
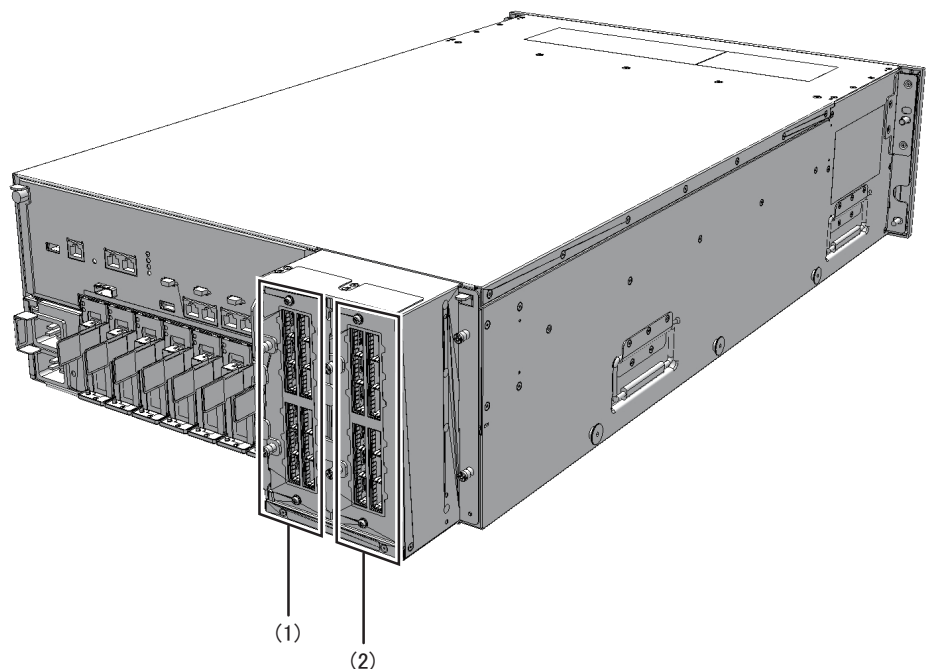
Location number	Component
1	Crossbar unit (XBU#0)
2	Crossbar unit (XBU#1)

15.3　Removing a Crossbar Unit

This section describes the procedure for removing a crossbar unit. Enable the removal of the crossbar unit before attempting to remove it. For details, follow the procedure in "Chapter 7　Maintenance Flow."

⚠ **Caution -** Before you handle any components, 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 damaged. For details, see "1.5　Precautions on Static Electricity."

1. **If the crossbar cables are fixed to the cable support with the hook-and-loop fastener, remove the hook-and-loop fastener.**

2. **Remove all the crossbar cables connected to the crossbar units requiring maintenance.**

3. **Loosen the two screws securing the crossbar unit.**

Figure 15-2   Location of screws securing crossbar units
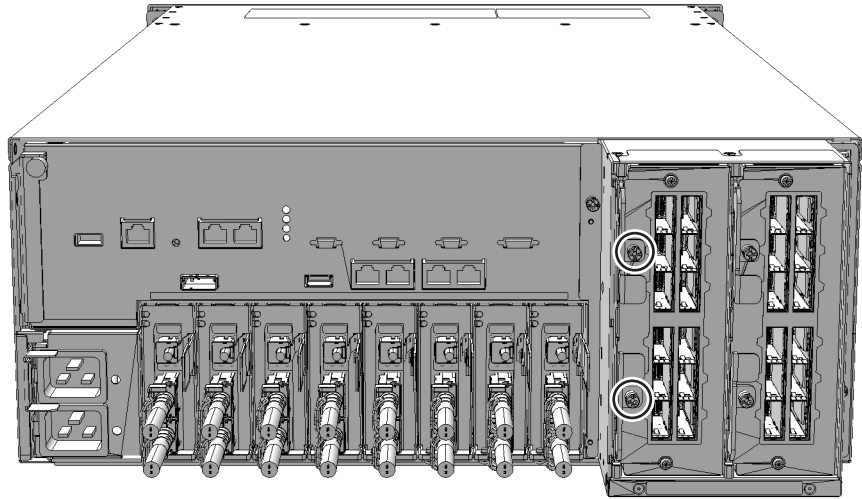
4. **Open the eject levers (A in Figure 15-3) upward and downward, respectively, and then pull the crossbar unit out of the CPU memory unit.**

Figure 15-3   Opening the eject levers

A
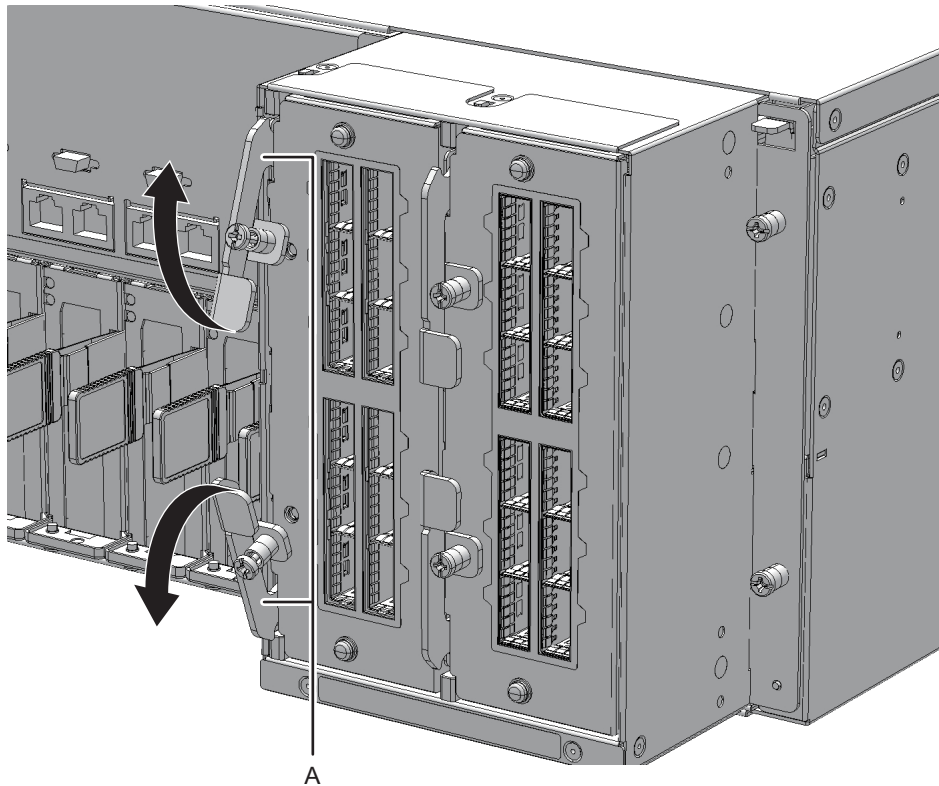
5.   **Support the crossbar unit from below with one hand and carefully remove it from the mounting frame.**

Note - Place the removed crossbar unit on a grounded antistatic ESD mat.

15.4   Installing a Crossbar Unit

This section describes the procedure for installing a crossbar unit.

Caution - When mounting a crossbar unit, check the connectors on both of the chassis and crossbar unit beforehand to confirm that no pin is bent and all the pins are neatly arranged in lines. If a crossbar unit is mounted with a bent pin in a connector, the chassis or crossbar unit may be damaged. Also, carefully proceed with the work to prevent any pin from being bent.

---

1. **Open the eject levers of the crossbar unit.**
2. **Support the crossbar unit from below with one hand and then carefully insert it into the mounting frame.**
3. **Close the eject levers and tighten the two screws securing the crossbar unit.**

Note - When installing a crossbar unit, insert it to the back of the device with the eject levers kept open. That is, leave the levers in their up and down positions. If you close the eject levers before inserting the crossbar unit, you cannot install it.
Once you insert the crossbar unit to the back of the device, the eject levers move in the directions of their closed positions. Push the eject levers by hand to securely close them.

---

4. **Connect all the crossbar cables to the crossbar unit.**
   For details, see "14.4   Installing the Crossbar Cables."

**Note -** Connect the crossbar cables correctly according to the corresponding cable position labels.

The FRU installation work is completed. See "Chapter 7   Maintenance Flow" to continue maintenance work.

Chapter 16

Maintaining the XSCF BB Control Cables

This chapter describes the procedure for maintaining the XSCF BB control cables.

- Before Maintaining an XSCF BB Control Cable
- Configuration of the XSCF BB Control Ports
- Removing an XSCF BB Control Cable
- Installing an XSCF BB Control Cable

16.1 Before Maintaining an XSCF BB Control Cable

This chapter only has descriptions of the XSCF BB control port configuration and the work of removing and installing XSCF BB control cables.
Before removing a FRU, see "Chapter 7   Maintenance Flow" and perform the necessary work items.
For the types of maintenance on XSCF BB control cables, also see "XSCF BB control cable" in "Table 7-2   List of available maintenance types by FRU."

16.2 Configuration of the XSCF BB Control Ports

This section describes configuration and location of the XSCF BB control ports.
The XSCF BB control cables are used to connect the XSCFs mounted in the SPARC M10-4S or crossbar box chassis.

Figure 16-1   Location of XSCF BB control port (SPARC M10-4S)
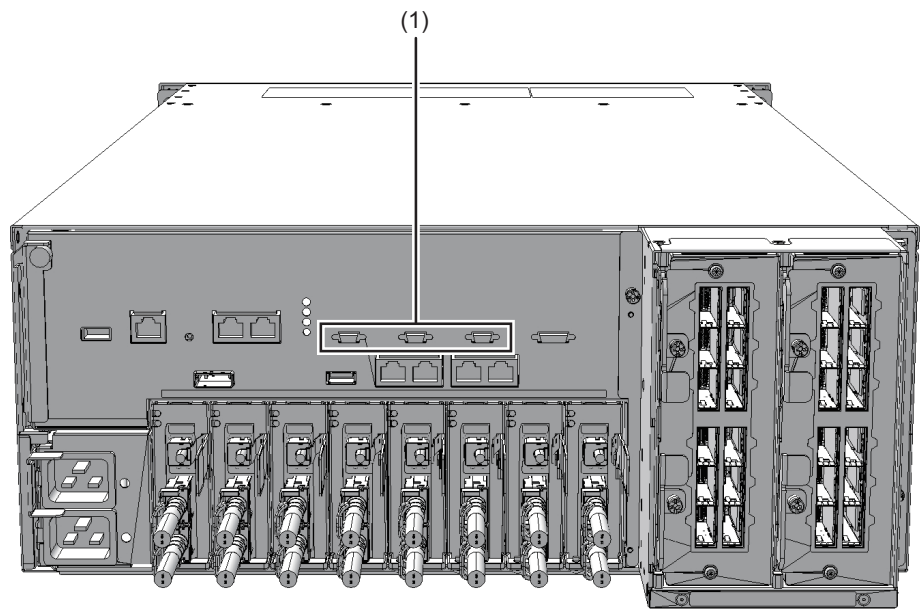
Figure 16-2   Location of XSCF BB control port (crossbar box)
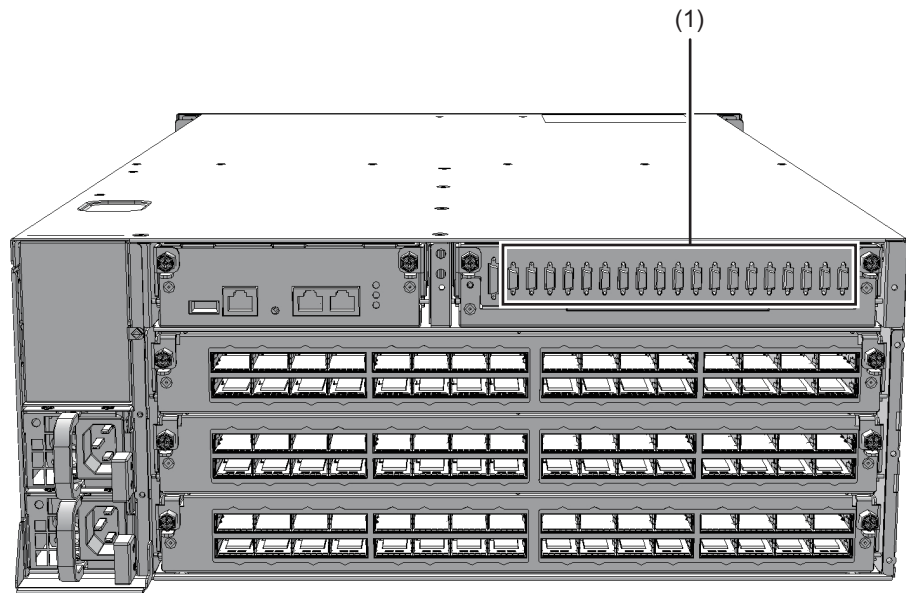
Location number	Connection port
1	XSCF BB control port

16.3 Removing an XSCF BB Control Cable

This section describes the procedure for removing the XSCF BB control cables. Enable removal of the XSCF BB control cables before attempting to remove them. For details, see "Chapter 7   Maintenance Flow."

Caution - Before you handle the XSCF BB control cables, 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 damaged. For details, see "1.5   Precautions on Static Electricity."

1. **Remove the XSCF BB control cable from the SPARC M10-4S or the crossbar box.**
   Pull out an XSCF BB control cable while pushing the lock release buttons (A in the figure) on the both sides of the cable.

Note - The cables on the rear of the crossbar box are bundled together and fastened to the right-hand cable support with a hook-and-loop fastener. When removing the XSCF BB control cables, remove the hook-and-loop fastener from the cable support.

Figure 16-3   Removing the XSCF BB control cables (SPARC M10-4S)
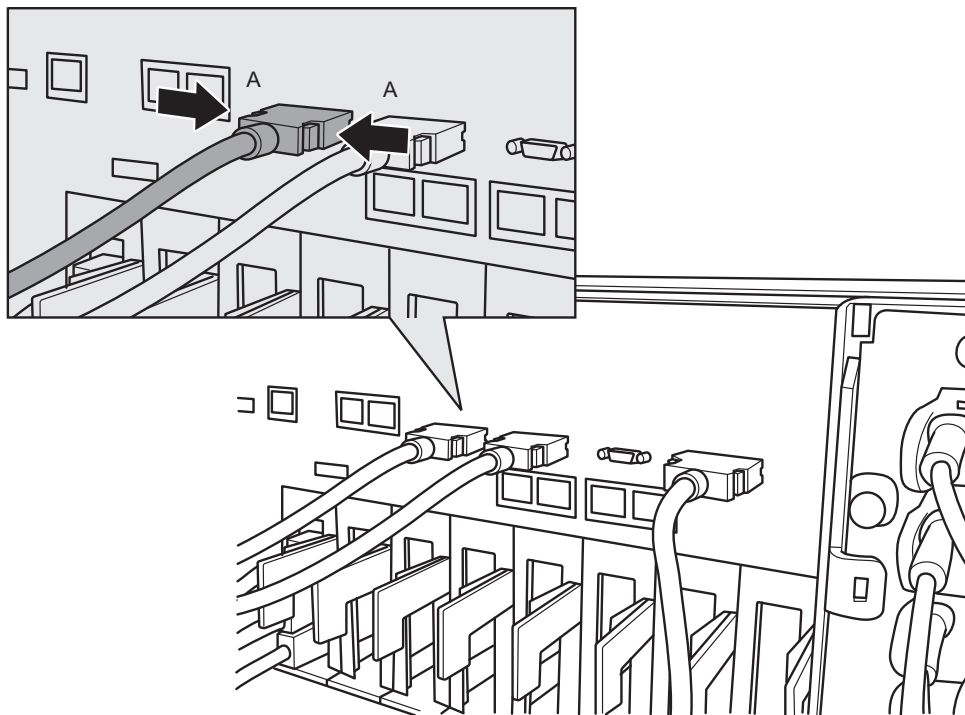
Figure 16-4　　Removing the XSCF BB control cables (crossbar box)
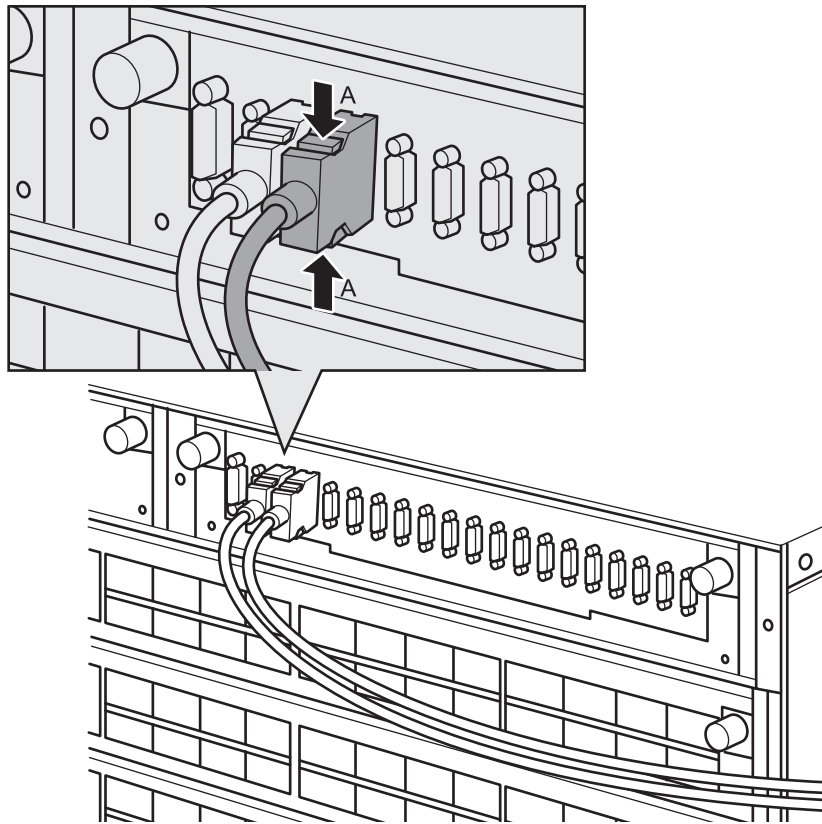
2. **Remove the XSCF BB control cables from the other chassis.**
   Pull out an XSCF BB control cable while pushing the lock release buttons on the both sides of the cable.

16.4 Installing an XSCF BB Control Cable

This section describes the procedure for installing the XSCF BB control cables.

1. **Attach the supplied connection destination label to the new replacement XSCF BB control cable.**
   For the new XSCF BB control cable, use the same type of label as the one on the cable requiring maintenance and write the same port number on it.

2. **Connect the XSCF BB control cable to SPARC M10-4S or the crossbar box.**

Note - Check that the XSCF BB control cables are correctly connected and secure.

> **Note -** After connecting the XSCF BB control cable, use the hook-and-loop fastener to bundle the cables together and secure them to the rear cable support.

The FRU installation work is completed. See "Chapter 7   Maintenance Flow" to continue maintenance work.

Chapter 17

Maintaining the XSCF DUAL Control Cables

This chapter describes the procedure for maintaining the XSCF DUAL control cables.

- Before Maintaining an XSCF DUAL Control Cable
- Configuration of the XSCF DUAL Control Ports
- Removing an XSCF DUAL Control Cable
- Installing an XSCF DUAL Control Cable

17.1 Before Maintaining an XSCF DUAL Control Cable

This chapter only has descriptions of the XSCF DUAL control port configuration and the work of removing and installing XSCF DUAL control cables.
Before removing a FRU, see "Chapter 7   Maintenance Flow" and perform the necessary work items.
For the types of maintenance on XSCF DUAL control cables, also see "XSCF DUAL control cable" in "Table 7-2   List of available maintenance types by FRU."

17.2 Configuration of the XSCF DUAL Control Ports

This section describes configuration and location of the XSCF DUAL control ports. The XSCF DUAL control cable is used to connect the master XSCF and a standby XSCF that are mounted on a SPARC M10-4S or crossbar box so as to duplicate the XSCF.

Figure 17-1   Location of XSCF DUAL control port (SPARC M10-4S)
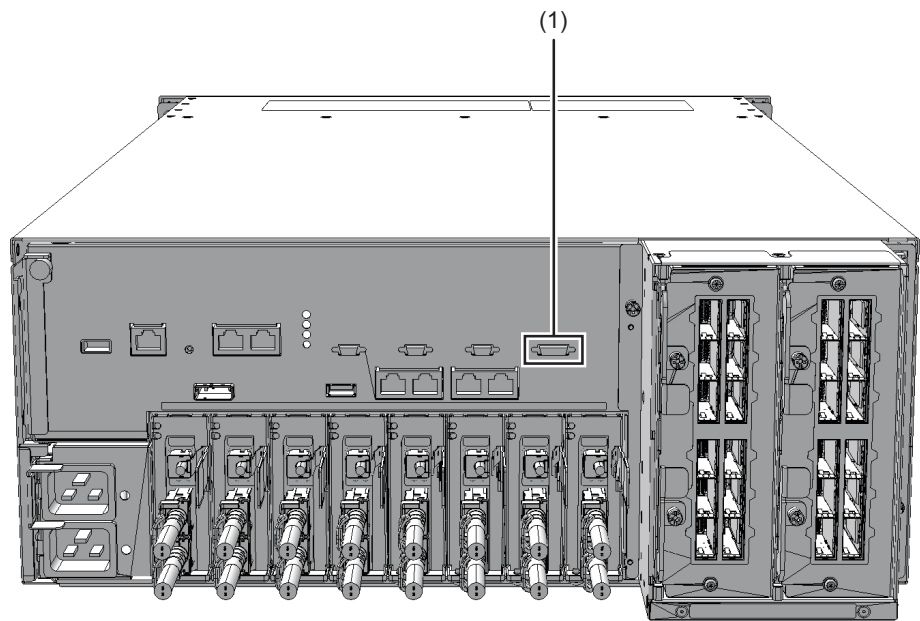
Figure 17-2   Location of XSCF DUAL control port (crossbar box)
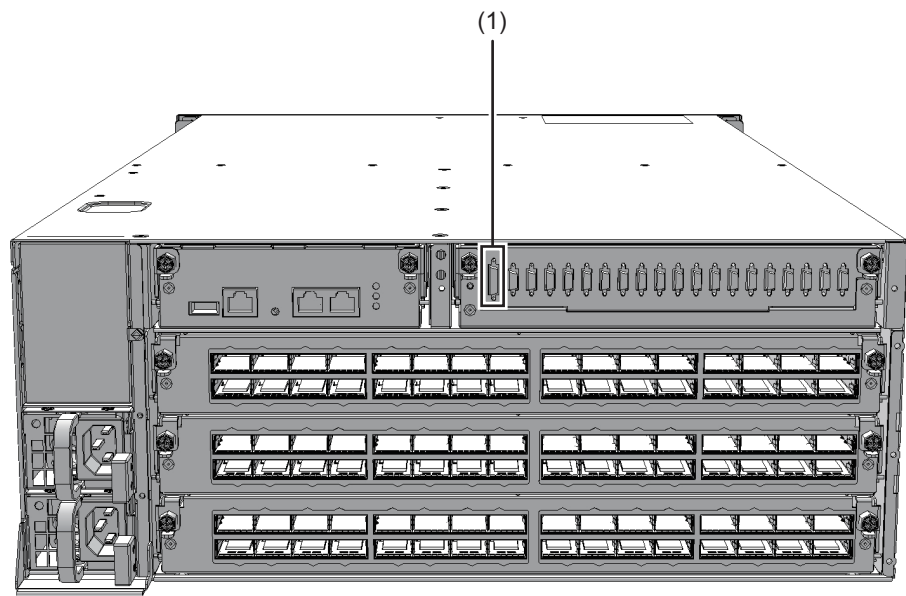
Location number	Connection port
1	XSCF DUAL control port

17.3   Removing an XSCF DUAL Control Cable

This section describes the procedure for removing an XSCF DUAL control cable. Enable the removal of the XSCF DUAL control cables before attempting to remove them. For details, see "Chapter 7   Maintenance Flow."

Caution - Before you handle the XSCF DUAL control cables, 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 damaged. For details, see "1.5 Precautions on Static Electricity."

1. **Remove the XSCF DUAL control cables from the SPARC M10-4S or the crossbar box.**
   Pull out the XSCF DUAL control cable while pushing the lock release buttons (A in the figure) on the both sides of the cable.

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 XSCF DUAL control cables, therefore, remove the hook-and-loop fastener from the cable support.

Figure 17-3   Removing the XSCF DUAL control cables (SPARC M10-4S)
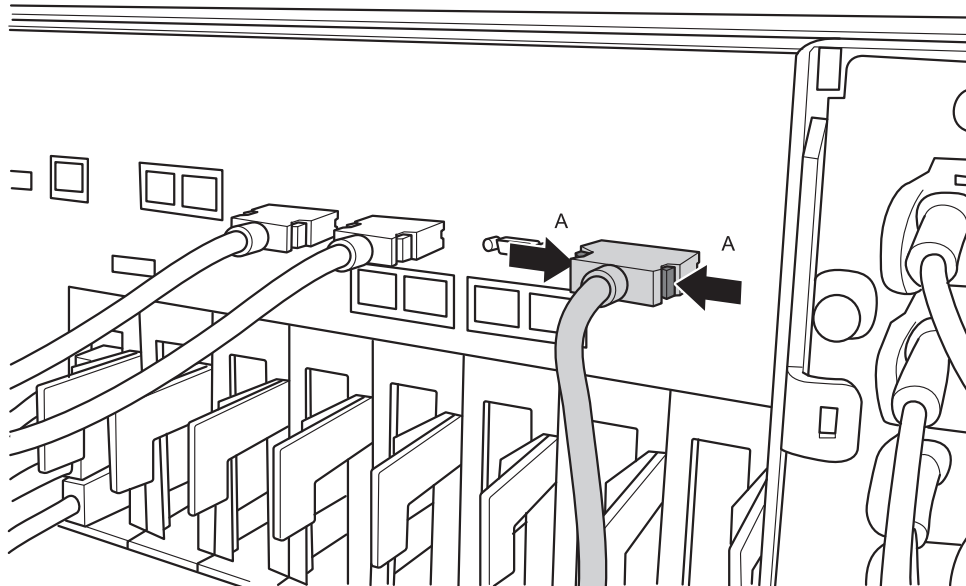
Figure 17-4   Removing the XSCF DUAL control cables (crossbar box)
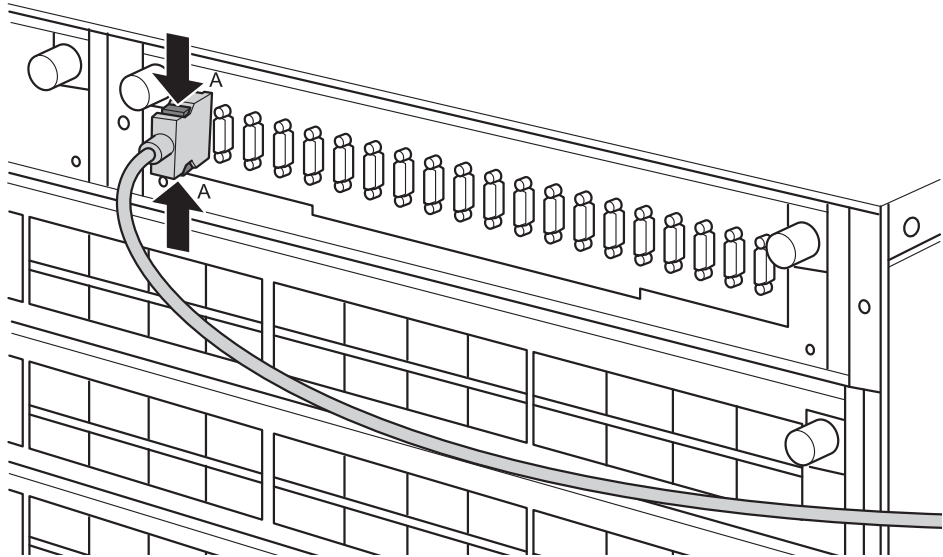
2. **Remove the XSCF DUAL control cables from the other chassis.**
    Pull out the XSCF DUAL control cable while pushing the lock release buttons on
    the both sides of the cable.

17.4   Installing an XSCF DUAL Control Cable

This section describes the procedure for installing an XSCF DUAL control cable.

1. **Attach the supplied connection destination label to the replacement XSCF
    DUAL control cable.**
    For the new XSCF DUAL control cable, use the same type of label as the one on
    the cable requiring maintenance and write the same port number on it.

2. **Connect the XSCF DUAL control cable to SPARC M10-4S or the crossbar box.**

Note - Check that XSCF DUAL control cable is correctly connected and secure.

Note - After connecting the XSCF DUAL control cable, use the hook-and-loop fastener to
bundle the cables together and fasten them to rear cable support.

The FRU installation work is completed. See "Chapter 7   Maintenance Flow" to
continue maintenance work.

Appendix A

Component List

This appendix describes the components in the SPARC M10-4/M10-4S configuration.

Figure A-1   Locations of components of SPARC M10-4/M10-4S
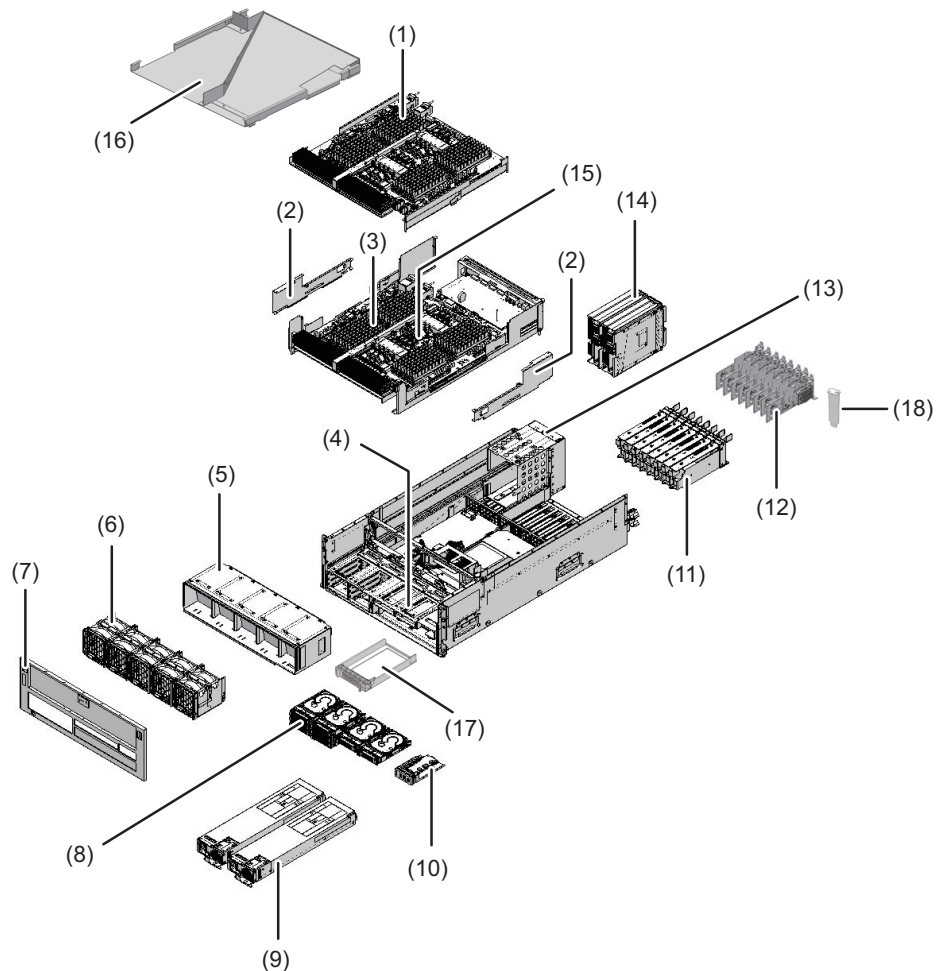
Location number	Component
1	CPU memory unit upper
2	Side cover
3	Memory
4	PSU backplane unit
5	Fan shelf
6	Fan unit
7	Front cover
8	Internal disk
9	Power supply unit
10	Operation panel
11	PCI Express card cassette
12	PCI Express card
13	Crossbar unit mounting frame (*1)
14	Crossbar unit (*1)
15	CPU memory unit lower
16	CMU filler unit
17	Disk filler
18	PCIe card filler

*1 Not mounted on the SPARC M10-4.

Appendix B

Component Specifications

This appendix provides the specifications of the components.
The components that constitute the SPARC M10-4/M10-4S and the crossbar box are as follows.

Components that constitute the SPARC M10-4/M10-4S

- CPU Memory Unit
- Crossbar Unit
- Power Supply Unit
- Fan Unit
- Internal Disk Drive
- PCI Express Card
- Backplanes
- Operation Panel

B.1 CPU Memory Unit

The CPU memory unit of the SPARC M10-4/M10-4S consists of two units: the upper unit and lower unit.
The CPU memory unit lower consists of the following components.

- CPU
- Memory
- XSCF
- PCI Express (PCIe) backplane

The CPU memory unit upper consists of the following components.

- CPU
- Memory

CPU and XSCF are directly installed on the CPU memory unit. Thus you cannot

replace the CPU and XSCF individually.

Each CPU memory unit upper and CPU memory unit lower is available in eight different types based on the combination of CPU type and the number of memory slots.

Table B-1 lists the specifications of the CPU memory unit.

Table B-1   Specifications of CPU memory unit (SPARC M10-4/M10-4S)

Item	Description
Maximum number of CPU memory units	2
Location	Inside of chassis
Type of maintenance	See "Table 7-2 List of available maintenance types by FRU."
Maintenance category	Replacement, expansion, and reduction

For the maintenance procedure, see "Chapter 9   Maintaining the CPU Memory Unit/Memory."

B.2   Crossbar Unit

The crossbar units of the SPARC M10-4S and the crossbar box are crossbar switches that logically connect the CPU memory unit and I/O unit. The crossbar unit has two operation modes. One is normal mode that provides 2-way operation. The other is degraded mode that provides 1-way operation, which is half of normal mode.

Table B-2 lists the specifications of the crossbar units in the SPARC M10-4S.

Table B-2   Specifications of crossbar unit (SPARC M10-4/M10-4S)

Item	Description
Number of crossbar units	2
Location	Rear of chassis
Type of maintenance	See "Table 7-2 List of available maintenance types by FRU."
Maintenance category	Replacement

For the maintenance procedure, see "Chapter 15   Maintaining the Crossbar Units."

B.3   Power Supply Unit

The power supply units of the SPARC M10-4/M10-4S and the crossbar box take power from the input power and supply it to the system. The redundant

configuration of the power supply units allows the system to continue operating even if one of the units fails during operation.
Table B-3 lists the specifications of the power supply units in the SPARC M10-4/M10-4S.

Table B-3   Specifications of the power supply unit (SPARC M10-4/M10-4S)

Item	Description
Number of power supply units	2
Location	Front of chassis
Type of maintenance	See "Table 7-2 List of available maintenance types by FRU."
Maintenance category	Replacement

For the maintenance procedure, see "Chapter 12   Maintaining the Power Supply Units."

B.4   Fan Unit

Five fan units are mounted on the SPARC M10-4/M10-4S and four on the crossbar box. They provide a flow of air to cool the inside of the chassis. Each fan unit has two cooling fans.
Table B-4 lists the specifications of the fan units in the SPARC M10-4/M10-4S.

Table B-4   Specifications of fan unit (SPARC M10-4/M10-4S)

Item	Description
Number of fan units	5
Location	Front of chassis
Type of maintenance	See "Table 7-2 List of available maintenance types by FRU."
Maintenance category	Replacement

For the maintenance procedure, see "Chapter 11   Maintaining the Fan Units."

B.5   Internal Disk Drive

Up to eight hard disks or solid state disks can be mounted as internal disks on SPARC M10-4/M10-4S.
Table B-5 lists the specifications of the internal disk drive.

Table B-5   Specifications of the internal disk drive (SPARC M10-4/M10-4S)

Item	Description
Maximum number of internal disk drives	8
Interface	SAS
Location	Front of chassis
Type of maintenance	See "Table 7-2 List of available maintenance types by FRU."
Maintenance category	Replacement, expansion, and reduction

For the maintenance procedure, see "Chapter 10   Maintaining the Internal Disks."

B.6   PCI Express Card

Up to eight PCIe cards can be mounted in a SPARC M10-4S with a crossbar unit mounted. For a SPARC M10-4 with no crossbar unit mounted, up to 11 PCIe cards can be mounted.
Table B-6 lists the specifications of the PCIe card.

Table B-6   Specifications of PCIe card (SPARC M10-4/M10-4S)

Item	Description
Maximum number of PCIe cards	11 (*1)
Location	Rear of chassis
Type of maintenance	See "Table 7-2 List of available maintenance types by FRU."
Maintenance category	Replacement, expansion, and reduction

*1 Can be mounted only on a SPARC M10-4.

For the maintenance procedure, see "Chapter 8   Maintaining the PCI Express Cards."

B.7   Backplanes

The backplane of the SPARC M10-4/M10-4S is a unit with connectors for connecting replaceable units in the chassis. The PSU backplane unit of SPARC M10-4/M10-4S mounts the memory that stores the identification information and the user setting information.

The backplane of the SPARC M10-4/M10-4S is shown below.
- PSU backplane (A in the figure)

Figure B-1   Location of backplane of SPARC M10-4/M10-4S
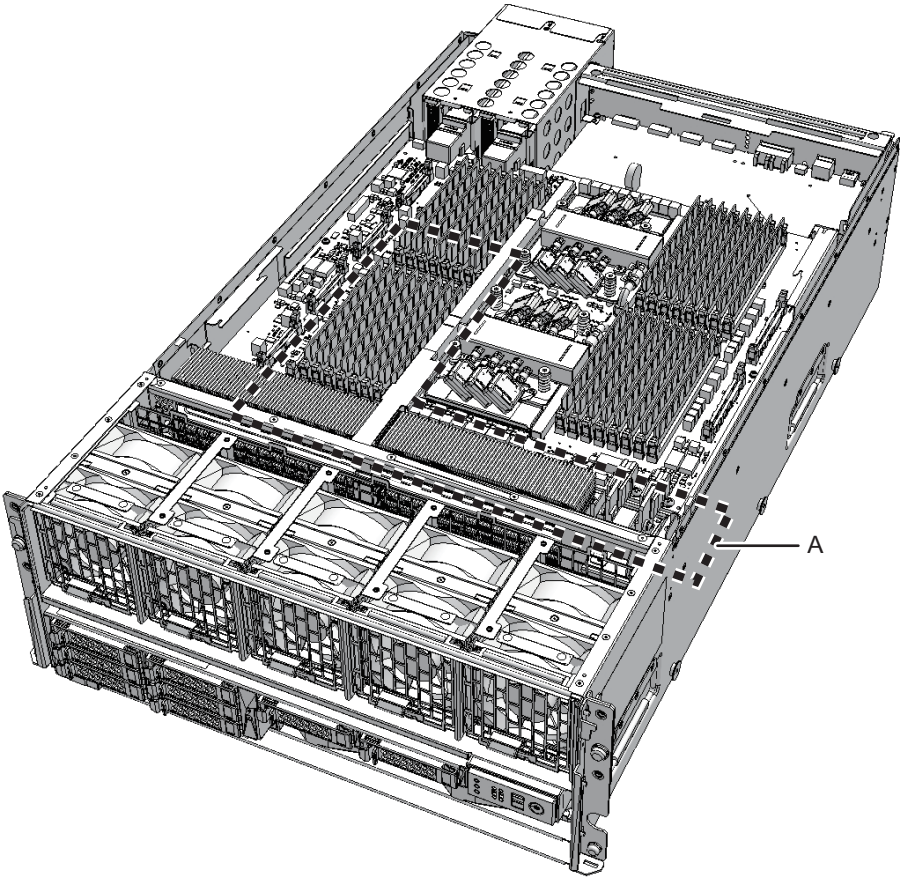
The PSU backplane is installed on the PSU backplane unit. The PSU backplane alone cannot be replaced. Replace it together with the PSU backplane unit.
Table B-7 lists the specifications of the PSU backplane unit.

Table B-7   Specifications of PSU backplane unit (SPARC M10-4/M10-4S)

Item	Description
Number of PSU backplane units	1
Location	Inside of chassis
Type of maintenance	See "Table 7-2 List of available maintenance types by FRU."
Maintenance category	Replacement

For the maintenance procedure, see "Chapter 13   Maintaining the PSU Backplane Unit/Operation Panel."

B.8 Operation Panel

The operation panel of the SPARC M10-4/M10-4S is installed on the front of the chassis. This panel displays the system status and is used for operation.
Table B-8 lists the specifications of the operation panel of the SPARC M10-4/M10-4S.

Table B-8   Specifications of operation panel (SPARC M10-4/M10-4S)

Item	Description
Number of operation panels	1
Location	Front of chassis
Type of maintenance	See "Table 7-2 List of available maintenance types by FRU."
Maintenance category	Replacement

For the maintenance procedure, see "Chapter 13   Maintaining the PSU Backplane Unit/Operation Panel."

Appendix C

Oracle Solaris Troubleshooting Commands

This appendix describes how to use Oracle Solaris commands to display fault diagnosis information and to take countermeasures. The commands listed here are useful for determining whether there are problems in the system, the network, or some other system connected through the network.

- iostat Command
- prtdiag Command
- prtconf Command
- netstat Command
- ping Command
- ps Command
- prstat Command

C.1   iostat Command

The iostat command is used to regularly report the CPU usage status, as well as the terminal status, the drive status, and the I/O status.
Table C-1 lists the options of the iostat command and how those options can be applied to solving system issues.

Table C-1   iostat command options

Option	Description	Application
No options	Reports the status of the local I/O device.	Allows you to view the device status concisely in 3 lines.
-c	Reports, as ratios, the length of time that the system has been in user mode, in system mode, waiting for I/O, and idling.	Allows you to view the CPU status as a concise report.

Table C-1 iostat command options *(continued)*

Option	Description	Application
-e	Displays a summary of statistics on device errors. The displayed items are the total number of errors, hardware errors, software errors, and transfer errors.	Allows you to view the accumulated number of errors as a concise table and to identify potentially failed I/O devices.
-E	Displays statistics on all the device errors.	Allows you to view device information (manufacturer, model number, serial number, size, and errors).
-n	Displays the names in a descriptive form.	Allows you to identify devices with a descriptive display.
-x	Reports the extended drive statistics of individual drives. Statistics are displayed in a table format. Similar to the -e option, but differs in that it provides rate information.	Allows you to find internal devices and other I/O devices on the network whose performance is low.

The following example shows the output from the iostat command.

```
# iostat -En
c5t50000393D85129FAd0 Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: TOSHIBA  Product: MBF2300RC      Revision: 3706 Serial No:
EB25PC201AL6
Size: 300.00GB <300000000000 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
c3t50000393D851FDAAd0 Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: TOSHIBA  Product: MBF2300RC      Revision: 3706 Serial No:
EB25PC201AMS
Size: 300.00GB <300000000000 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
c4t50000393D822D2B6d0 Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: TOSHIBA  Product: MBF2300RC      Revision: 3706 Serial No:
EB25PC2015P8
Size: 300.00GB <300000000000 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
c2t50000393E8001BB6d0 Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: TOSHIBA  Product: MBF2300RC      Revision: 3706 Serial No:
EB25PC301AV6
Size: 300.00GB <300000000000 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
#
```

C.2 prtdiag Command

The prtdiag command displays the system settings and diagnosis information. The diagnosis information shows FRUs in the system that experienced errors.
The prtdiag command is in the following directory: /usr/platform/platform-name/sbin/.
The prtdiag command may display a slot number different from what is supposed to be displayed according to other parts of this manual. This does not indicate a fault.
Table C-2 lists the options of the prtdiag command and how those options are useful for troubleshooting.

Table C-2   prtdiag command options

Option	Description	Application
No options	Displays a list of components.	Allows you to check the CPU information, the memory configuration, the mounted PCI Express (PCIe) cards, the OpenBoot PROM version, the mode switch status, and the CPU operational mode.
-v	Displays information in detailed (Verbose) mode.	In addition to the content displayed when no option is specified, this option allows you to check detailed information of the PCIe card.

The following example shows the output from the prtdiag command.

```
# prtdiag -v
System Configuration:  Oracle Corporation  sun4v SPARC M10-4
Memory size: 64000 Megabytes

=============================== Virtual CPUs ===============================


CPU ID Frequency Implementation         Status
------ --------- ---------------------- -------
0      3000 MHz  SPARC64-X              on-line
1      3000 MHz  SPARC64-X              on-line
2      3000 MHz  SPARC64-X              on-line
3      3000 MHz  SPARC64-X              on-line
4      3000 MHz  SPARC64-X              on-line
5      3000 MHz  SPARC64-X              on-line
6      3000 MHz  SPARC64-X              on-line
7      3000 MHz  SPARC64-X              on-line
8      3000 MHz  SPARC64-X              on-line
9      3000 MHz  SPARC64-X              on-line
10     3000 MHz  SPARC64-X              on-line
11     3000 MHz  SPARC64-X              on-line
-----------------------Omitted-----------------------
59     3000 MHz  SPARC64-X              on-line
```

```
60     3000 MHz  SPARC64-X             on-line
61     3000 MHz  SPARC64-X             on-line
62     3000 MHz  SPARC64-X             on-line
63     3000 MHz  SPARC64-X             on-line

===================== Physical Memory Configuration =======================
Segment Table:
--------------------------------------------------------------
Base            Segment  Interleave  Bank     Contains
Address         Size     Factor      Size     Modules
--------------------------------------------------------------
0x0             32 GB    4           8 GB     /BB0/CMUL/CMP0/MEM00A
                                              /BB0/CMUL/CMP0/MEM01A
                                     8 GB     /BB0/CMUL/CMP0/MEM02A
                                              /BB0/CMUL/CMP0/MEM03A
                                     8 GB     /BB0/CMUL/CMP0/MEM04A
                                              /BB0/CMUL/CMP0/MEM05A
                                     8 GB     /BB0/CMUL/CMP0/MEM06A
                                              /BB0/CMUL/CMP0/MEM07A

0x20000000000   32 GB    4           8 GB     /BB0/CMUL/CMP1/MEM10A
                                              /BB0/CMUL/CMP1/MEM11A
                                     8 GB     /BB0/CMUL/CMP1/MEM12A
                                              /BB0/CMUL/CMP1/MEM13A
                                     8 GB     /BB0/CMUL/CMP1/MEM14A
                                              /BB0/CMUL/CMP1/MEM15A
                                     8 GB     /BB0/CMUL/CMP1/MEM16A
                                              /BB0/CMUL/CMP1/MEM17A


============================ IO Devices ================================
Slot +          Bus   Name +                        Model     Speed
Status          Type  Path
--------------------------------------------------------------------------
/BB0/CMUL/SASHBA  PCIE  scsi-pciex1000,87           LSI,2308_2 5.0GTx8
                        /pci@8000/pci@4/pci@0/pci@0/scsi@0
/BB0/CMUL/NET0    PCIE  network-pciex14e4,1656                 2.5GTx1
                        /pci@8000/pci@4/pci@0/pci@9/network@0
/BB0/CMUL/NET1    PCIE  network-pciex14e4,1656                 2.5GTx1
                        /pci@8000/pci@4/pci@0/pci@9/network@0,1
/BB0/CMUL/NET2    PCIE  network-pciex14e4,1656                 2.5GTx1
                        /pci@8000/pci@4/pci@0/pci@a/network@0
/BB0/CMUL/NET3    PCIE  network-pciex14e4,1656                 2.5GTx1
                        /pci@8000/pci@4/pci@0/pci@a/network@0,1
/BB0/PCI0         PCIE  ethernet-pciex1077,8000                5.0GTx4
                        /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@0/ethernet@0
/BB0/PCI0         PCIE  ethernet-pciex1077,8000                5.0GTx4
                        /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@0/ethernet@0,1
/BB0/PCI0         PCIE  QLGC,qlc-pciex1077,8001      QLE8152   5.0GTx4
                        /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@0/QLGC,qlc@0,2
/BB0/PCI0         PCIE  QLGC,qlc-pciex1077,8001      QLE8152   5.0GTx4
                        /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
```

```
pci@0/pci@0/QLGC,qlc@0,3
/BB0/PCI0          PCIE  emlx-pciex10df,f100                LPe12002-M8-FJ2.
5GTx8
                       /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@10/pci@0/pci@0/emlx@0
/BB0/PCI0          PCIE  emlx-pciex10df,f100                LPe12002-M8-FJ2.
5GTx8
                       /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@10/pci@0/pci@0/emlx@0,1
/BB0/PCI0          PCIE  network-pciex108e,abcd            SUNW,pcie-qgc2.5GTx8
                       /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@11/pci@0/pci@0/network@0
/BB0/PCI0          PCIE  network-pciex108e,abcd            SUNW,pcie-qgc2.5GTx8
                       /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@11/pci@0/pci@0/network@0,1
/BB0/PCI0          PCIE  network-pciex108e,abcd            SUNW,pcie-qgc2.5GTx8
                       /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@11/pci@0/pci@0/network@0,2
/BB0/PCI0          PCIE  network-pciex108e,abcd            SUNW,pcie-qgc2.5GTx8
                       /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@11/pci@0/pci@0/network@0,3
MB                 PCIX  usb-pciclass,0c0310                         --
                       /pci@8000/pci@4/pci@0/pci@1/pci@0/usb@4
MB                 PCIX  usb-pciclass,0c0320                         --
                       /pci@8000/pci@4/pci@0/pci@1/pci@0/usb@4,1


=========================== Environmental Status ============================

=========================== FRU Status ============================
Location                           Name      Status
-------------------------------------------------------
                                   SYS       enabled


=========================== FW Version ============================
Version
-------------------------------------------------------------
2002

==================== System PROM revisions =====================
Version
-------------------------------------------------------------
OBP 4.34.0 2012/08/15 17:56

Chassis Serial Number
--------------------
2081203001
#
```

C.3 prtconf Command

The prtconf command displays the configured devices.
The prtconf command identifies hardware units recognized by Oracle Solaris.
When a software application experiences a hardware-related issue even though there
is no hardware error, this command allows you to check whether Oracle Solaris
recognizes the hardware and whether the hardware drivers are loaded.
Table C-3 lists the options of the prtconf command and how those options are useful
for troubleshooting.

Table C-3   prtconf command options

Option	Description	Application
No options	Displays the device tree for the devices recognized by Oracle Solaris.	A hardware device is regarded as operating normally if it is recognized. If the message "(driver not attached)" is displayed for a device or a sub-device, the driver for the device is corrupted or does not exist.
-D	Outputs content similar to that of no options but differs in that the displayed content contains device driver names.	Allows you to check the driver necessary for Oracle Solaris to enable the device, or to view a list of drivers to be used.
-p	Outputs content similar to that of no options but differs in that the display is simpler.	Allows you to view the devices as a simple list.
-V	Displays the version and date of the OpenBoot PROM firmware.	Allows you to quickly check the firmware version.

The following example shows the output from the prtconf command.

```
# prtconf
System Configuration:  Oracle Corporation  sun4v
Memory size: 131304 Megabytes
System Peripherals (Software Nodes):

ORCL,SPARC64-X
    scsi_vhci, instance #0
    packages (driver not attached)
        SUNW,builtin-drivers (driver not attached)
        SUNW,probe-error-handler (driver not attached)
        deblocker (driver not attached)
        disk-label (driver not attached)
        terminal-emulator (driver not attached)
        dropins (driver not attached)
        SUNW,asr (driver not attached)
        kbd-translator (driver not attached)
        obp-tftp (driver not attached)
```

```
        zfs-file-system (driver not attached)
        hsfs-file-system (driver not attached)
    chosen (driver not attached)
    openprom (driver not attached)
        client-services (driver not attached)
    options, instance #0
    aliases (driver not attached)
    memory (driver not attached)
    virtual-memory (driver not attached)
    iscsi-hba (driver not attached)
        disk (driver not attached)
    virtual-devices, instance #0
        console, instance #0
        rtc (driver not attached)
        flashprom (driver not attached)
        console (driver not attached)
        channel-devices, instance #0
            virtual-channel, instance #0
            virtual-channel, instance #3
            virtual-console-concentrator, instance #0
            virtual-network-switch, instance #0
            virtual-disk-server, instance #0
            virtual-channel-client, instance #1
            virtual-channel-client, instance #2
            pciv-communication, instance #0
            virtual-domain-service, instance #0
    cpu (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
-----------------------Omitted-----------------------
    cpu (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
    pci, instance #0
        pci, instance #0
            pci, instance #1
                pci, instance #2
                    scsi, instance #0
                        iport, instance #8
                            smp, instance #3
                            disk, instance #8
                            enclosure, instance #3
                        iport, instance #11
                pci, instance #3
                    pci, instance #5
                        usb, instance #0
                        usb, instance #0
                            hub, instance #0
                pci, instance #4
                    network, instance #0
                    network, instance #1
                pci, instance #6
                    network, instance #2
```

```
                             network, instance #3
     pci, instance #1
         pci, instance #7
             pci, instance #8
                 pci, instance #9
                 pci, instance #10
                 pci, instance #11
     pci, instance #2
         pci, instance #12
             pci, instance #13
                 pci, instance #14
                 pci, instance #15
                 pci, instance #16
                 pci, instance #17
     pci, instance #3
         pci, instance #18
             pci, instance #19
                 pci, instance #20
                 pci, instance #21
                 pci, instance #22
                 pci, instance #23
     pci, instance #4
         pci, instance #24
             pci, instance #25
                 pci, instance #26
                     scsi, instance #1
                         iport, instance #6
                             smp, instance #1
                             disk, instance #6
                             enclosure, instance #1
                         iport, instance #9
                 pci, instance #27
                     pci, instance #29
                         usb, instance #1
                         usb, instance #1
                             hub, instance #2
                 pci, instance #28
                     network, instance #4
                     network, instance #5
                 pci, instance #30
                     network, instance #6
                     network, instance #7
------------------------Omitted------------------------
     pci, instance #22
         pci, instance #101
             pci, instance #102
                 pci, instance #103
                 pci, instance #104
     pci, instance #19
         pci, instance #105
     pci, instance #23
         pci, instance #106
             pci, instance #107
                 pci, instance #108
                 pci, instance #109
```

```
      pci-performance-counters, instance #0
      pci-performance-counters, instance #1
      pci-performance-counters, instance #2
      pci-performance-counters, instance #3
      pci-performance-counters, instance #4
      pci-performance-counters, instance #5
      pci-performance-counters, instance #6
      pci-performance-counters, instance #7
      pci-performance-counters, instance #8
      pci-performance-counters, instance #9
      pci-performance-counters, instance #10
      pci-performance-counters, instance #11
      pci-performance-counters, instance #12
      pci-performance-counters, instance #13
      pci-performance-counters, instance #14
      pci-performance-counters, instance #15
      pci-performance-counters, instance #16
      pci-performance-counters, instance #20
      pci-performance-counters, instance #17
      pci-performance-counters, instance #21
      pci-performance-counters, instance #18
      pci-performance-counters, instance #22
      pci-performance-counters, instance #19
      pci-performance-counters, instance #23
      ramdisk-root (driver not attached)
      os-io (driver not attached)
      fcoe, instance #0
      iscsi, instance #0
      pseudo, instance #0
  #
```

C.4   netstat Command

The netstat command displays the network status and the protocol statistics.
This command allows you to view a list of connections maintained by the host and
their status. The command also allows you to check the IP, TCP, and UDP packet
statistics and error conditions.
Table C-4 lists the options of the netstat command and how those options are useful
for troubleshooting.

Table C-4   netstat command options

Option	Description	Application
-i	Displays the interface status. The displayed content includes information on incoming and outgoing packets, incoming and outgoing errors, collisions, and queues.	Allows you to view a concise overview of the network status.

Table C-4   netstat command options *(continued)*

Option	Description	Application
-i interval	Executes the netstat command at the interval of the number of seconds specified with a numeric value after the -i option.	Identifies intermittent or long-term network events. You can view nighttime events at a glance by piping the netstat output to a file.
-p	Displays the media table.	Allows you to check the MAC addresses of the host on the subnetwork.
-r	Displays the routing table.	Allows you to check the routing information.
-n	Converts a host name into an IP address and then displays it.	Allows you to check the IP address instead of the host name.

The following example shows the output from the netstat command.

```
# netstat -p
Net to Media Table: IPv4
Device   IP Address                   Mask        Flags      Phys Addr
------ ------------------- --------------- -------- ---------------
net0   4S-111-D0                255.255.255.255 SPLA     b0:99:28:98:30:36
net0   10.24.187.1              255.255.255.255          00:0a:b8:50:cd:42
net0   224.0.0.22               255.255.255.255 S        01:00:5e:00:00:16

Net to Media Table: IPv6
 If    Physical Address    Type      State       Destination/Mask
----- ----------------- ------- ------------ --------------------------
net0  33:33:00:00:00:01  other    REACHABLE    ff02::1
net0  33:33:00:00:00:02  other    REACHABLE    ff02::2
net0  33:33:00:01:00:02  other    REACHABLE    ff02::1:2
net0  33:33:00:00:00:16  other    REACHABLE    ff02::16
net0  b0:99:28:98:30:36  local    REACHABLE    fe80::b299:28ff:fe98:3036
net0  33:33:ff:98:30:36  other    REACHABLE    ff02::1:ff98:3036

#
```

C.5   ping Command

The ping command sends the ICMP ECHO_REQUEST packet to network hosts. In certain configurations of the ping command, the command output allows you to identify a network link or a node that has experienced a problem. The destination host is specified by the variable: *hostname*.
Table C-5 lists the options of the ping command and how those options are useful for troubleshooting.

Table C-5   ping command options

Option	Description	Application
hostname	When you send a probe packet to *hostname*, a message is returned.	Allows you to confirm that a host is active on the network.
-g *hostname*	Forces the probe packet to go through the specified gateway.	Allows you to test the quality of individual routes by sending packets to the target host via the various specified routes.
-i *interface*	Specifies the interface to be used for sending and receiving a probe packet.	Allows you to easily check the secondary network interface.
-n	Converts a host name into an IP address and then displays it.	Allows you to check the IP address instead of the host name.
-s	ping is repeated at intervals of 1 second. Pressing the [Ctrl] + [C] keys stops ping, and then displays the statistics.	Allows you to check intermittent or long-term network events. You can view nighttime network events at a glance by piping the ping output to a file.
-svR	Displays the routes that probe packets have passed through at an interval of 1 second.	Displays the routes and hop counts of probe packets, allowing you to compare multiple routes to identify any bottleneck.

The following example shows the output from the ping command.

```
# ping -s 10.24.187.50
PING 10.24.187.50: 56 data bytes
64 bytes from 10.24.187.50: icmp_seq=0. time=0.555 ms
64 bytes from 10.24.187.50: icmp_seq=1. time=0.400 ms
64 bytes from 10.24.187.50: icmp_seq=2. time=0.447 ms
^C
----10.24.187.50 PING Statistics----
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms)  min/avg/max/stddev = 0.400/0.467/0.555/0.079
#
```

C.6   ps Command

The ps command displays a list of process statuses. When no options are specified, the command outputs information on those processes that have the same execution user ID as the user executing the command and the same control terminal.
If you specify an option, output information is controlled by the option.
Table C-6 lists the options of the ps command and how those options are useful for troubleshooting.

Table C-6   ps command options

Option	Description	Application
-e	Displays information on various processes.	Allows you to view the process IDs and files that can be executed.
-f	Generates a complete list.	Allows you to view process information such as the user ID, the parent process ID, the execution time, and the paths to the executed files.
-o *option*	Selects any items from those that can be configured as outputs. The pid, pcpu, pmem, and comm options display the process ID, CPU usage, memory usage, and corresponding executable files, respectively.	Allows you to check only the most important information. By determining the resource usage rate, you can identify those processes that could potentially affect the system performance or even cause a hang up.

The following example shows the output from the ps command.

```
# ps -eo pcpu,pid,comm|sort -rn
%CPU   PID COMMAND
 0.0   674 sort
 0.0   673 ps
 0.0   637 -bash
 0.0   636 login
 0.0   634 /usr/sbin/in.telnetd
 0.0   629 -bash
 0.0   613 /usr/bin/login
 0.0   602 /usr/lib/devchassis/devchassisd
 0.0   600 /opt/SUNWldm/bin/ldmd
 0.0   581 /usr/lib/inet/in.ndpd
 0.0   580 /sbin/dhcpagent
 0.0   577 /usr/lib/rmvolmgr
 0.0   548 /usr/sbin/auditd
 0.0   519 /usr/sbin/syslogd
 0.0   508 /usr/lib/ssh/sshd
 0.0   497 /usr/lib/fm/fmd/fmd
 0.0   487 /usr/lib/hal/hald-addon-cpufreq
 0.0   472 /usr/lib/autofs/automountd
 0.0   470 /usr/lib/autofs/automountd
 0.0   468 /usr/lib/inet/inetd
 0.0   458 hald-runner
 0.0   453 /usr/lib/hal/hald
 0.0   450 /usr/sbin/rpcbind
 0.0   421 /usr/lib/inet/proftpd
 0.0   413 /usr/sbin/cron
 0.0   382 /lib/svc/method/iscsid
 0.0   369 /usr/lib/efcode/sparcv9/efdaemon
 0.0   332 /usr/sbin/nscd
 0.0   297 /usr/lib/picl/picld
 0.0   272 /lib/inet/nwamd
 0.0   179 /usr/lib/devfsadm/devfsadmd
```

```
0.0     176 /usr/lib/zones/zonestatd
0.0     171 /usr/lib/ldoms/drd
0.0     164 /usr/lib/ldoms/ldmad
0.0     161 /usr/lib/utmpd
0.0     158 /usr/lib/dbus-daemon
0.0     128 /usr/lib/sysevent/syseventd
0.0     112 /usr/lib/pfexecd
0.0      98 /lib/inet/in.mpathd
0.0      74 /lib/crypto/kcfd
0.0      73 /lib/inet/ipmgmtd
0.0      59 /usr/sbin/dlmgmtd
0.0      38 /lib/inet/netcfgd
0.0      13 /lib/svc/bin/svc.configd
0.0      11 /lib/svc/bin/svc.startd
0.0       8 vmtasks
0.0       7 intrd
0.0       6 kmem_task
0.0       5 zpool-rpool
0.0       3 fsflush
0.0       2 pageout
0.0       1 /usr/sbin/init
0.0       0 sched
#
```

C.7   prstat Command

The prstat command repeatedly tests all the active processes on the system, and provides statistics based on the specified output mode and sorting order. The output from the prstat command is similar to that from the ps command.
Table C-7 lists the options of the prstat command and how those options are useful for troubleshooting.

Table C-7   prstat command options

Option	Description	Application
No options	Displays a list of processes sorted in descending order of CPU resource consumption. The list is restricted by the height of the terminal window and the number of processes. The output is automatically updated every 5 seconds, and is stopped by pressing the [Ctrl] + [C] keys.	The output allows you to view process IDs, the User IDs, memory usage, status, CPU usage, and command names.
-n *number*	Restricts the number of lines in the output.	Limits the amount of displayed data, so that you can identify those processes that are consuming excessive amounts of resources.

Table C-7	prstat command options *(continued)*	
Option	**Description**	**Application**
-s *key*	Sorts the list by key parameter.	The list can be sorted by cpu (default), time, and size.
-v	Displays the information in detailed mode.	Allows you to view other parameters.

The following example shows the output from the prstat command.

```
# prstat -n 5 -s size
   PID USERNAME  SIZE   RSS STATE   PRI NICE      TIME  CPU PROCESS/NLWP
   497 root       55M   49M sleep    59    0   0:01:12 0.0% fmd/37
   600 root       41M   36M sleep    59    0   0:09:13 0.0% ldmd/13
    11 root       37M   33M sleep    59    0   0:00:17 0.0% svc.startd/12
   468 root       24M   12M sleep    59    0   0:00:00 0.0% inetd/4
    13 root       20M   19M sleep    59    0   0:00:37 0.0% svc.configd/24
Total: 49 processes, 669 lwps, load averages: 0.05, 0.05, 0.04
#
```

Appendix D

External Interface Specifications

This appendix describes the specifications of the external interface connectors and the switch for the XSCF provided on the SPARC M10-4/M10-4S and the crossbar box.

The external interface connectors provided on the SPARC M10-4/M10-4S are as follows.

- Serial Port
- USB Port
- SAS Port

The external interface connectors provided on the crossbar box are as follows.

- Serial Port
- USB Port

The switch for the XSCF that is provided on the SPARC M10-4/M10-4S will be as follows:

- RESET Switch

D.1 Serial Port

Table D-1 lists the specifications of the serial ports of the SPARC M10-4/M10-4S and the crossbar box.

Table D-1   Serial port
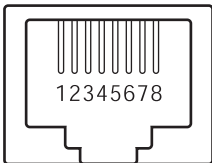
Pin arrangement	Pin number	Signal name	Input/output	Description
	1	RTS	Output	Transmission request
	2	DTR	Output	Data terminal ready
	3	TXD	Output	Transmitted data
	4	GND	---	Ground
	5	GND	---	Ground

Pin arrangement	Pin number	Signal name	Input/output	Description
	6	RXD	Input	Received data
	7	DSR	Input	Data set ready
	8	CTS	Input	Transmission possible

D.1.1   Wire connection chart for serial cables

Figure D-1   Wire connection chart for serial cables

RJ45   D-sub 9pin

1 RTS ——————— 8 CTS
                           1 CD

2 DTR ——————— 6 DSR
7 DSR ——————— 4 DTR
3 TXD ——————— 2 RXD
4 GND ——————— 5 GND
5 GND
6 RXD ——————— 3 TXD
8 CTS ——————— 7 RTS
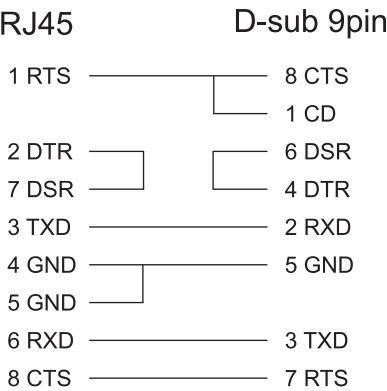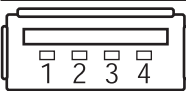
D.2   USB Port

Table D-2 lists the specifications of the USB port of the SPARC M10-4/M10-4S and the crossbar box.

Table D-2   USB port

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

D.3   SAS Port

The SAS port of the SPARC M10-4/M10-4S is used to connect external devices with an SAS interface, such as a tape drive. The chassis has one SAS port on the rear. Consult a service engineer for more information about compatible devices.

D.4   RESET Switch

The RESET switch of the SPARC M10-4/M10-4S is an emergency switch to restart the XSCF. For 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*.
Figure D-2 indicates the RESET switch location of the SPARC M10-4 while Figure D-3 indicates the RESET switch location of the SPARC M10-4S. The RESET switch (A in the figure) is located on the rear of the chassis.

Figure D-2   RESET switch location (SPARC M10-4)
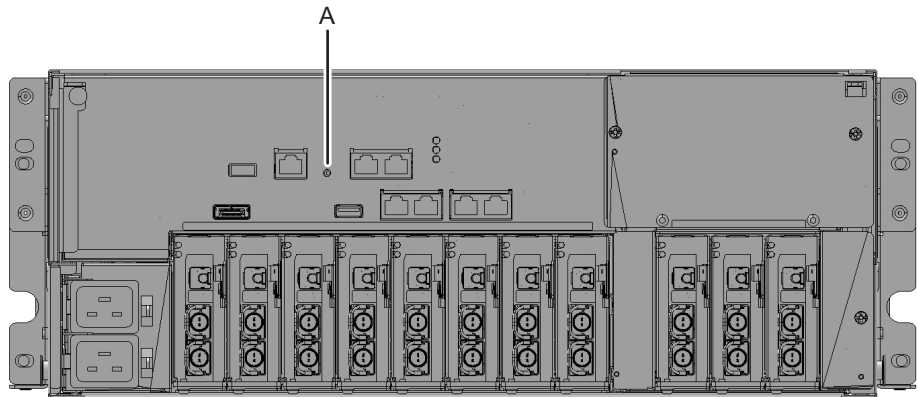
Figure D-3   RESET switch location (SPARC M10-4S)
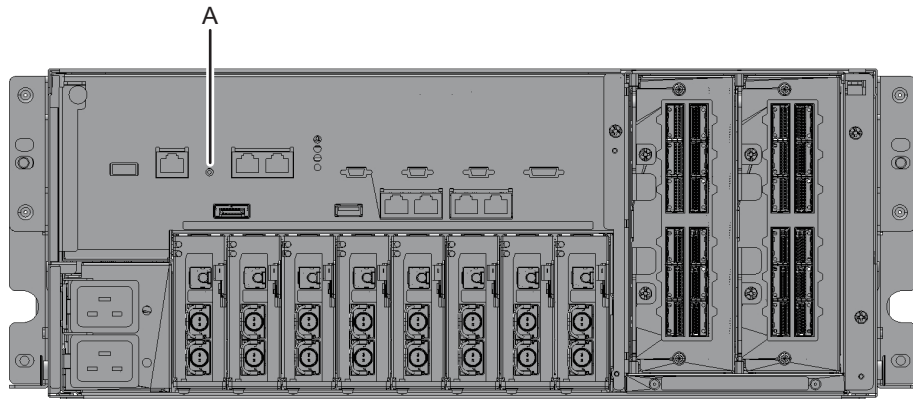
Appendix E

Removing the Lithium Battery

This appendix describes the procedure for removing the lithium battery mounted in the CPU memory unit.

Note - Perform this work only when disassembling the product for disposal or recycling.

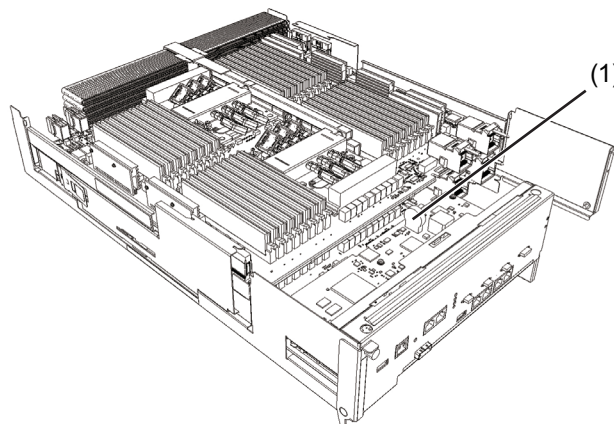- Location of the Lithium Battery
- Removing the Lithium Battery

E.1 Location of the Lithium Battery

This section describes the location of the lithium battery.
One lithium battery is mounted in the SPARC M10-4/M10-4S CPU memory unit.
For details on removing the CPU memory unit and top cover, see "9.5 Removing a CPU Memory Unit."

Figure E-1 Location of the lithium battery

Location No.	Component
1	Lithium battery

E.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 E-2   Removing the lithium battery (1)
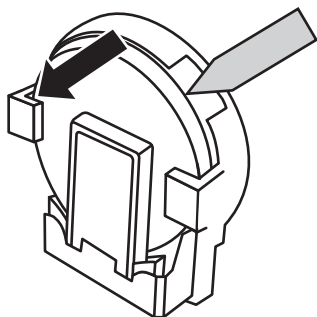
2. **Gripping the lithium battery at the top with needle-nose pliers or another fine-tipped tool, pull up the lithium battery to remove it.**

Figure E-3   Removing the lithium battery (2)

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