SPARC Enterprise M8000/M9000 Servers

Installation Guide

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Contents

Preface

This manual explains how to install and set up the SPARC Enterprise M8000/M9000 servers from Oracle and Fujitsu. The manual assumes that system components have already been unpacked. References herein to the M8000 server or M9000 server are references to the SPARC Enterprise M8000 or SPARC Enterprise M9000 server.

This chapter includes the following sections:

Audience

The manual is written for the authorized service personnel and field engineers who perform maintenance work on the system.

Related Documentation

All documents for your sever are available online at the following locations:

Documentation	Link
Sun Oracle software-related manuals (Oracle Solaris OS, and so on)	http://www.oracle.com/documentation
Fujitsu documents	http://www.fujitsu.com/sparcenterprise/manual/
Oracle M-series server documents	http://www.oracle.com/technetwork/documentation/sparc-mseries-servers-252709.html

The following table lists titles of related documents.

Related SPARC Enterprise M8000/M9000 Servers Documents
SPARC Enterprise M8000/M9000 Servers Site Planning Guide
SPARC Enterprise M8000/M9000 Servers Getting Started Guide[*]
SPARC Enterprise M8000/M9000 Servers Overview
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Important Legal and Safety Information [*]
SPARC Enterprise M8000/M9000 Servers Safety and Compliance Guide
External I/O Expansion Unit Safety and Compliance Guide
SPARC Enterprise M8000/M9000 Servers Unpacking Guide[*]
SPARC Enterprise M8000/M9000 Servers Installation Guide
SPARC Enterprise M8000/M9000 Servers Service Manual
External I/O Expansion Unit Installation and Service Manual
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Administration Guide
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF Reference Manual
SPARC Enterprise M4000/M5000/M8000/M9000 Servers Dynamic Reconfiguration (DR) User's Guide
SPARC Enterprise M4000/M5000/M8000/M9000 Servers Capacity on Demand (COD) User's Guide
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Product Notes[†]
SPARC Enterprise M8000/M9000 Servers Product Notes
External I/O Expansion Unit Product Notes
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Glossary

* This is a printed document.

† Beginning with the XCP 1100 release.

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 represents the example of command input in the frame.	XSCF> **adduser jsmith**
AaBbCc123	The names of commands, files, and directories; on-screen computer output. This font represents the example of command output in the frame.	XSCF> **showuser -P** User Name: jsmith Privileges: useradm auditadm
Italic	Indicates the name of a reference manual, a variable, or user-replaceable text.	See the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.
" "	Indicates names of chapters, sections, items, buttons, or menus.	See Chapter 2, "System Features."

Notes on Safety

Read the following documents thoroughly before using or handling any SPARC Enterprise M8000/M9000 server.

- *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Important Legal and Safety Information*
- *SPARC Enterprise M8000/M9000 Servers Safety and Compliance Guide*

Syntax of the Command-Line Interface (CLI)

The command syntax is as follows:

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

Documentation Feedback

If you have any comments or requests regarding this document, go to the following websites:

- For Oracle users:

http://www.oracle.com/goto/docfeedback

Include the title and part number of your document with your feedback:

SPARC Enterprise M8000/M9000 Servers Installation Guide, part number E27052-01

- For Fujitsu users:

http://www.fujitsu.com/global/contact/computing/sparce_index.html

CHAPTER 1

Installation Workflow

This chapter describes the work required in the workflow from the server installation to hardware operation verification. For details, see TABLE 1-1.

TABLE 1-1 Installation Workflow

Installation Stage	Workflow Task
Preliminary checks	Before installing the server, check the environmental requirements. See Section 2.2.1, "Checking Environmental Requirements" on page 2-2.
↓	Check the input power supply specifications for the server, and prepare an appropriate power supply. See Section 2.2.2, "Facility Power Requirements" on page 2-4.
↓	Check the service areas of the server. See Section 2.2.3, "Checking the Installation Location" on page 2-12.
↓	Prepare the required tools and instruments for the server installation. See Section 2.3, "Requirements for Server Installation" on page 2-13.
Installing and connecting the servers	Check components and accessories. See Section 3.1, "Checking Components" on page 3-1.
↓	If the server includes a SPARC Enterprise M9000 server expansion cabinet, or the power cabinet, combine this component and the base cabinet. See Section 3.3, "Connecting the Expansion Cabinet and Power Cabinet" on page 3-3.
↓	Connect the input power supply cables, UPS cables, and console cable. See Section 3.4, "Connecting Cables" on page 3-24.
↓	Before connecting the power supply unit, verify the input voltage. See Section 3.5, "Checking the Input Power" on page 3-48.
Verifying settings and powering on the server	Access the XSCF Shell to verify the public key of the XSCF host, register a user account, and perform the time setting and altitude setting. See Section 3.6, "Setting and Checking the Required Information for the Servers" on page 3-49.
↓	Power on the system using the operator panel. Check the server configuration and verify the operation in dual feed mode before powering off the system. See Section 3.7, "Powering On/Off the System" on page 3-53.

TABLE 1-1 Installation Workflow *(Continued)*

Installation Stage	Workflow Task
↓	Connect the Ethernet port of the XSCF unit to the system control network. Verify that you can log into the XSCF Shell through the LAN. See Section 3.7.3, "Connecting an Ethernet Port" on page 3-57.
↓	Add peripheral devices. See Section 3.8, "Connecting Additional Peripheral Devices" on page 3-60.
Configuring the test environment and verifying the server operation	Connect the LAN port of the IOUA to the user network. See Section 4.2, "Connecting the System to Each Network" on page 4-4.
↓	Verify network connections. See Section 4.3, "Verifying a Network Connection" on page 4-6.
↓	Start the Oracle Solaris Operating System. See Section 4.4, "Starting the Oracle Solaris Operating System" on page 4-6.
↓	Install the Oracle VTS software and use it to verify the hardware operation. See Section 4.5, "Verifying the Operation Using the Oracle VTS Software" on page 4-8.
→	From here, perform the setup required for the operation of the system. See the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Administration Guide*.

CHAPTER 2

Preparing to Install the System

This chapter describes preparations for installation.

2.1 Safety Precautions

Observe the following precautions when setting up the high-end servers.

Otherwise, the equipment may be damaged or a malfunction may result.

- Do not block any ventilation holes.
- Do not install the server in a location exposed to direct sunlight or near a device that may become hot.
- Do not install the server in a location that has a lot of dust or that is exposed to corrosive gases or air with a high salt concentration.
- Do not install the server in a location exposed to frequent vibrations. Install the server on a flat and level surface.
- The grounding resistance must not be greater than 10Ω. The grounding method varies by the building where you install the server. Make sure that the facility administrator or a qualified electrician verifies the grounding method for the building and performs the grounding work.
- Be sure each grounding wire used for the server is used exclusively. Also be sure to observe the precautions, warnings, and notes on handling shown on the equipment.
- Do not place cables under the equipment or have cables stretched tight. Also, do not disconnect a power cord from the equipment while its power is on.

- When disconnecting a LAN cable, you may not be able to reach the connector lock with your fingers. If that is the case, press the connector lock with a flathead screwdriver to disconnect the cable. You could damage the PCI card if you force your fingers into the gap rather than use a flathead screwdriver.
- Do not place anything on the server or perform any work directly above it.
- Do not allow the ambient temperature to rise sharply in winter. Such a sudden temperature change would cause condensation to form inside the server. Allow for a sufficient warm-up period prior to server operation.
- Do not install the server near a copy machine, air conditioner, welding machine, or any other loud equipment generating electronic noise.
- Take measures to prevent static electricity from being generated at the installation location. Note especially that static electricity is likely to be generated on carpets, and this could lead to a malfunction.
- Confirm that the supply voltage and frequency match the electrical ratings indicated on the equipment.
- Do not insert anything into any opening in the equipment. The equipment contains high-voltage parts. If a metal object or another conductor were inserted into an opening in the equipment, it may cause a short circuit that could cause fire, electric shock, or equipment damage.
- For details on maintenance of the server, contact a certified service engineer.

2.2 Before Installing the Server

Before installing the server, you must know the system configuration and obtain all the prerequisite information for system installation. For details, see “Before Setting Up the System,” in the *SPARC Enterprise M8000/M9000 Servers Site Planning Guide*.

2.2.1 Checking Environmental Requirements

This section describes the ambient environmental requirements included in the installation specifications of the server.

The environmental requirements vary depending on the sea level altitude at the installation site, as indicated in TABLE 2-1.

TABLE 2-1 Ambient Environmental Requirements

	Operating Range	Non-Operating Range	Optimum
Ambient temperature	5°C to 32°C (41°F to 89.6°F)	Unpacked: 0°C to 50°C (32°F to 122°F) Packed: -20°C to 60°C (-4°F to 140°F)	21°C to 23°C (70°F to 74°F)
Relative humidity *	20% RH to 80% RH	to 93% RH	45% RH to 50% RH
Altitude restriction †	3,000 m (10,000 ft)	12,000 m (40, 000 ft)	
Temperature conditions	5°C to 32°C (41°F to 89.6°F) at an installation altitude ranging from 0 to less than 1500 m (4921 ft) above sea level 5°C to 30°C (41°F to 86°F) at an installation altitude ranging from 1500 m (4921 ft) to less than 2000 m (6562 ft) above sea level 5°C to 28°C (41°F to 82.4°F) at an installation altitude ranging from 2000 m (6562 ft) to less than 2500 m (8202 ft) above sea level 5°C to 26°C (41°F to 78.8°F) at an installation altitude ranging from 2500 m (8202 ft) to 3000 m (9843 ft) above sea level		

* There is no condensation regardless of the temperature and humidity.

† All altitudes are above sea level.

TABLE 2-2 lists recommended temperatures and humidities for computer rooms.

TABLE 2-2 Recommended Temperatures and Humidities for Computer Rooms

Air Conditioning Setup	Near the Underfloor Air Outlet			Detection and Regulation Point			
	Temperature		Humidity	Temperature		Humidity	Remarks
	°C	°F	%	°C	°F	%	
Direct blowing or duct blowing	-	-	-	24±2	75±4	45±5	-
Underfloor ventilation	18±1	64±2	65±5	Target temperature 24°C	Target temperature 75°F	About 45% at 24 °C	The room temperature and humidity fluctuate, without control, according to the thermal load in the room.
Direct blowing or duct blowing and underfloor ventilation combined	18±1	64±2	65±5	24±2	75±4	45±5	-

2.2.2 Facility Power Requirements

This section describes the M8000/M9000 Server's power supply connection specifications, power supply requirements, and the configurations of power distribution.

The two types of power supply that the M8000/M9000 servers can use are single-phase power supplies and three-phase power supplies. Redundant power cords are supported only on servers with the dual power feed option installed. By default, the dual power feed option is installed on servers that use three-phase power supplies.

2.2.2.1 Power Supply Connection Specifications

TABLE 2-3 lists power cord connection specifications for single-phase power supplies.

TABLE 2-3 Power Supply Connection Specifications

Name	Destination	Power Cord Length*	Plug Type	Number of Plugs‡	Outlet in Facility**
M8000 Server	Japan	3.0 m (9.8 ft)	30 A-250 V 3P, locking type plug (NEMA L6-30P)	3 (single-power feed) 6 (dual-power feed)	30 A-250 V 3P, locking type (NEMA L6-30R) Embedded type: 3320-L6 <American Denki> Exposed type: 3321-L6 <American Denki>
	North America, General Overseas	3.0 m (9.8 ft)	NEMA L6-30P†	3 (single-power feed) 6 (dual-power feed)	NEMA L6-30R (North America only)
	Europe	3.0 m (9.8 ft)	EN60309 (32 A)	3 (single-power feed) 6 (dual-power feed)	EN60309 (32 A)
M9000 Server	Japan	3.0 m (9.8 ft)	30A-250V 3P, locking type plug (NEMA L6-30P)	Base cabinet 5 (single-power feed) 10 (dual-power feed) Base cabinet + expansion cabinet 10 (single-power feed) 20 (dual-power feed)	30 A-250 V 3P, locking type (NEMA L6-30R) Embedded type: 3320-L6 <American Denki> Exposed type: 3321-L6 <American Denki>
	North America	3.0 m (9.8 ft)	NEMA L6-30P†	Base cabinet 5 (single-power feed) 10 (dual-power feed) Base cabinet + expansion cabinet 10 (single-power feed) 20 (dual-power feed)	NEMA L6-30R (North America only)
	General Overseas	3.0 m (9.8 ft)	EN60309 (32A)	Base cabinet 5 (single-power feed) 10 (dual-power feed) Base cabinet + expansion cabinet 10 (single-power feed) 20 (dual-power feed)	EN60309 (32 A)

* The power cord length is the length from the cord port on the cabinet to the outlet plug.

† The plugs for the North America and general overseas markets may be replaced locally as required. Make sure that the facility administrator or a qualified electrical engineer performs the replacement work.

‡ A primary power feed server without the dual power feed option does not have a redundant power cord. All power cords in the primary power feed server must be kept connected and under power.

**For the servers that have the plug with lock function, confirm that a 30A overcurrent protection device is available outside the server. If one is not available, prepare an external 30A overcurrent protection that can be achieved by means of no-fuse breakers (NFBs) or fuses. The plug with lock function refers to plugs other than grounding-type ones with two parallel blades, such as the NEMA L6-30, L6-20, L6-15, and L5-15.

2.2.2.2 Power Supply Requirements

The following figures show the input power systems for the high-end servers:

- Single-phase power supply system (M8000 server) (FIGURE 2-1)
- Single-phase power supply system (M9000 server) (FIGURE 2-2)
- Three-phase delta power supply system (FIGURE 2-3)
- Three-phase star power supply system (FIGURE 2-4)

Single-Phase Power Supply

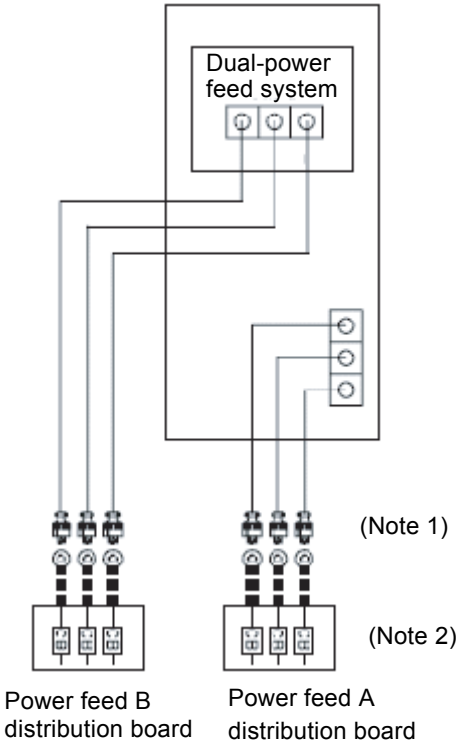
TABLE 2-4 Single-Phase Power Supply

Device name	Voltage [V]	Phases	Frequency
M8000/M9000	200 to 240 VAC±10%	Single	50/60 Hz +2% to -4%
Power Cabinet*	200 to 240 VAC±10%	Single	50/60 Hz +2% to -4%
Rack-mountable dual-power feed†	200 to 240 VAC±10%	Single	50/60 Hz +2% to -4%

* Power is supplied with at least one or two power cabinets.

† The rack-mountable dual-power feed (DPF) is a device that enables the M8000 server to have a redundant power source (single-phase dual-power feed).

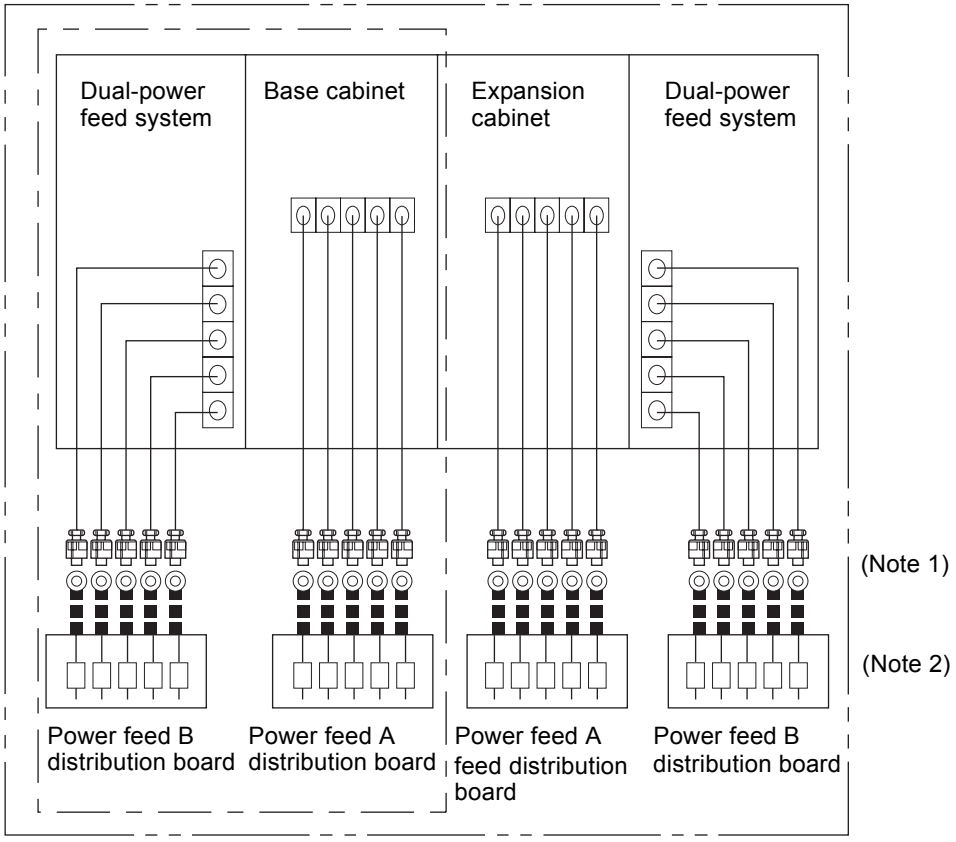
FIGURE 2-1 Single-Phase Power Supply System (M8000 Server)



Note – (1) To connect multiple input cords of the server to the customer's distribution panel, the input cords must be independently connected to outlets on the basis of a one-to-one correspondence as shown in FIGURE 2-1.

Note – (2) Connect the power feed A and the power feed B (for dual-power feed) to a separate AC power supply from each other.

FIGURE 2-2 Single-Phase Power Supply System (M9000 Server)



Note – (1) To connect multiple input cords of the server to the customer's distribution panel, the input cords must be independently connected to outlets on the basis of a one-to-one correspondence as shown in FIGURE 2-2.

Note – (2) Connect the power feed A and the power feed B (for dual-power feed) to a separate AC power supply from each other.

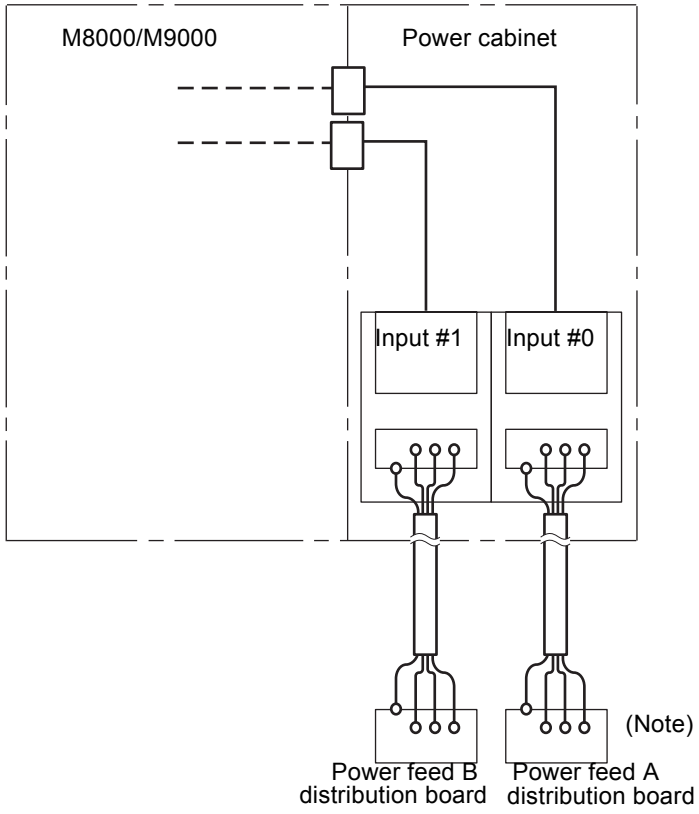
Three-Phase Delta Power Input

TABLE 2-5 Three-Phase Delta Power Input

Device Name	Voltage [V]	Phases	Frequency
M8000 + Power Cabinet	200 to 240 VAC±10%	Three-phase delta	50/60 Hz +2% to -4%
M9000 + Power Cabinet	200 to 240 VAC±10%	Three-phase delta	50/60 Hz +2% to -4%

Note – For three-phase power feed, the power cabinet is mandatory equipment and the dual-power feed function is included in the standard configuration.

FIGURE 2-3 Three-Phase Delta Power Supply System - Rear View



Note – Connect the power feed A and the power feed B (for dual-power feed) to a separate AC power supply from each other.

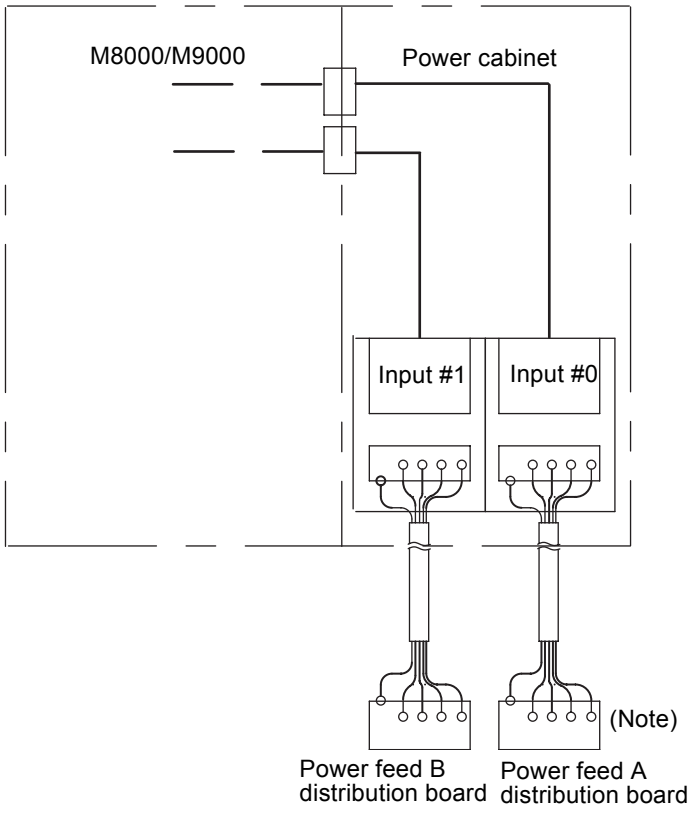
Three-Phase Star Power Input

TABLE 2-6 Three-Phase Star Power Input

Device Name	Voltage [V]	Phases	Frequency
M8000 + Power Cabinet	380 to 415 VAC±10%	Three-phase star	50/60 Hz +2% to -4%
M9000 + Power Cabinet	380 to 415 VAC±10%	Three-phase star	50/60 Hz +2% to -4%

Note – For a three-phase power feed, the power cabinet is mandatory equipment and the dual-power feed function is included in the standard configuration.

FIGURE 2-4 Three-Phase Star Power Supply System - Rear View



Note – Connect the power feed A and the power feed B (for dual-power feed) to a separate AC power supply from each other.

2.2.2.3 Grounding

Grounding for Single-phase Power Supply

The single-phase power supply M8000/M9000 servers are shipped with a grounded (three-wire) power cord.

The power cord must always be connected to a power outlet that has a grounding receptacle. When you connect the power cord to the power outlet, the server grounding completes.

Grounding for Three-phase Power Supply

The power cable is not supplied with the three-phase power supply M8000/M9000 servers.

Ensure that the power cable wiring includes a ground wire from the distribution board to the terminal board of the power cabinet, as a part of the on-site electrical work.

For the installation positions, see FIGURE 3-27 and FIGURE 3-28.

This server allows the use of grounding wire with another grounding wire for shared grounding; however, the grounding methods may vary by the building where the system is installed.

Check the related standards in order to use the correct grounding method.

The grounding resistance must not be greater than 10 Ω. The grounding method varies by the building where you install the server. Make sure that the facility administrator or a qualified electrical engineer verifies the grounding method for the building and performs the grounding work.

2.2.3 Checking the Installation Location

For the high-end servers installation, secure a service area (maintenance area) that is large enough for each system (cabinet).

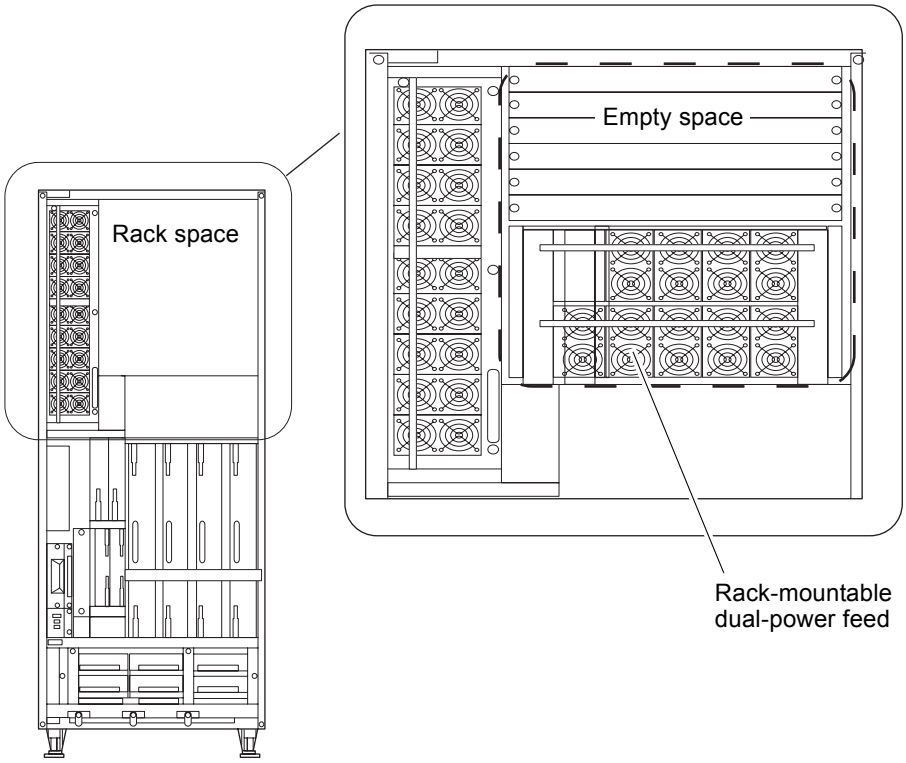
For details, see the *SPARC Enterprise M8000/M9000 Servers Site Planning Guide*.

2.2.4 Rack Space for the M8000 Server

A 12-pitch sized rack space (12U) is provided in the upper part of the cabinet of the M8000 server.

In this rack space for a M8000 server, the rack-mountable dual-power feed uses 6U of rack space, and the rest of the space can be used for the customer external devices.

FIGURE 2-5 Rack Space for the M8000 Server



2.3 Requirements for Server Installation

This section lists the items and information required for installation work. Prepare these items in advance.

- Administration console

  obtain any of the following from the customer

  - ASCII terminal
  - Workstation
  - Terminal server (or patch panel connected to the terminal server)
  - PC
- XSCF-LAN configuration information

  See the *SPARC Enterprise M8000/M9000 Servers Site Planning Guide*.

- Console configuration information

  See the *SPARC Enterprise M8000/M9000 Servers Site Planning Guide.*

- No. 2 Phillips screwdriver

  Used to remove and mount power cord covers.

- Flathead screwdriver

  Used to secure cables between cabinets if the expansion cabinet of the M9000 server is mounted.

- Torque screwdriver and slotted bit (0.2 Nm; 2.0 kgfcm).

  Used to secure the clock cables between the cabinets if the expansion cabinet of the M9000 server is mounted.

- 30-mm wrench

  Used to secure the server legs.

- 13-mm nut driver

  Used to connect the optional expansion cabinet of the M9000 server.

- Torque wrench and socket for 13 mm torque wrench (8.24 N·m; 84 kgf·cm).

  Used to connect the power cabinet.

- Antistatic wrist strap

  When the expansion cabinet of the M9000 server is attached, two persons are required for the installation and two wrist straps are required for them.

- Multimeter

  Used to check the input AC voltage power cord.

- Shipping list

  Used to confirm high-end servers configuration.

CHAPTER 3

Installing the Server

This chapter explains how to make preparations for connecting the server to a network:

3.1 Checking Components

This section explains how to check the server components.

1. **Check the components against the List of Attachments supplied with the server.**
2. **Check for a model name, power cabinet, and input format on the shipping list.**
3. **Check for incomplete connection or engagement of parts and loosened screws or bolts due to vibration during transportation and relocation.**

TABLE 3-1 List of the Units That Need to be Checked

Unit Name	Abbreviation	Note
CPU memory board unit	CMU	
I/O unit	IOU	
Crossbar unit	XBU	
Clock control unit	CLKU	
eXtended System Control Facility unit	XSCFU	
FAN unit	FAN	
Power supply unit	PSU	
Hard disk drive	HDD	
DC-DC converter	DDC_A	M8000 server only

Note – For information about the mounting location for each unit, please refer to Appendix A.

Note – Check the parts visually and also by pressing the ejector levers and handles on each part.

Note – If an incomplete connection or engagement of parts is found, connect or engage such parts securely.

Note – If any of the items are missing, incorrect or damaged, contact your sales representative.

3.2 Securing the Base Cabinet

This section explains how to secure the base cabinet.

1. **To prevent the product from toppling as a result of motion from an earthquake, see the *SPARC Enterprise M8000/M9000 Site Planning Guide*, and secure the server.**

Note – The bolts required for securing the system vary depending on the installation location. Select the appropriate bolts for the location.

Note – If the server is not secured to the floor at the installation location, see Step 2, and lower the legs so that the server does not move.

2. **Use the 30-mm wrench, and lower the legs (4 locations) of the base cabinet.**

   Lower these four legs until the cabinet is level.

Note – Attach an accessory foot stand to each leveling foot.

Note – Lower the legs until the weight of the cabinet is not supported by the castors.

Note – The procedures for securing the expansion cabinet of the M9000 server and the power cabinet are explained in Section 3.3, "Connecting the Expansion Cabinet and Power Cabinet" on page 3-3.

3.3 Connecting the Expansion Cabinet and Power Cabinet

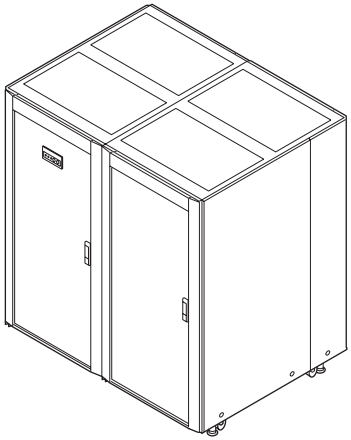
This section explains the procedure for connecting the expansion cabinet and Power cabinet.

The expansion cabinet is a M9000 server option and would be connected to the base cabinet of the M9000 server.

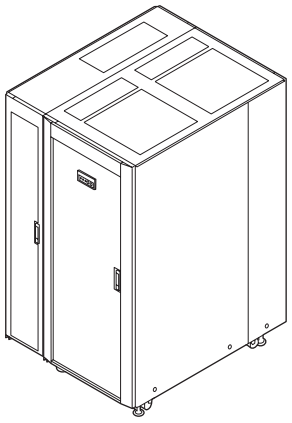
The power cabinet is an additional cabinet for mounting the dual-power feed option or three-phase power feed option. One power cabinet can be connected to the M8000 server, and up to two power cabinets can be connected to the M9000 server. For details, see FIGURE 3-1.

The expansion cabinet and power cabinet are not connected at the time of shipment.

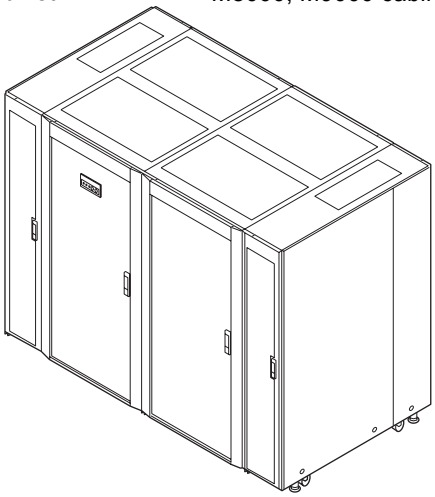
FIGURE 3-1 Connection Patterns



M9000 with expansion cabinet



M8000, M9000 cabinet + Power cabinet



M9000 with expansion cabinet + Power cabinet

3.3.1 Connecting the Optional Expansion Cabinet

Connect the M9000 server base cabinet and M9000 server expansion cabinet by following the procedure below.

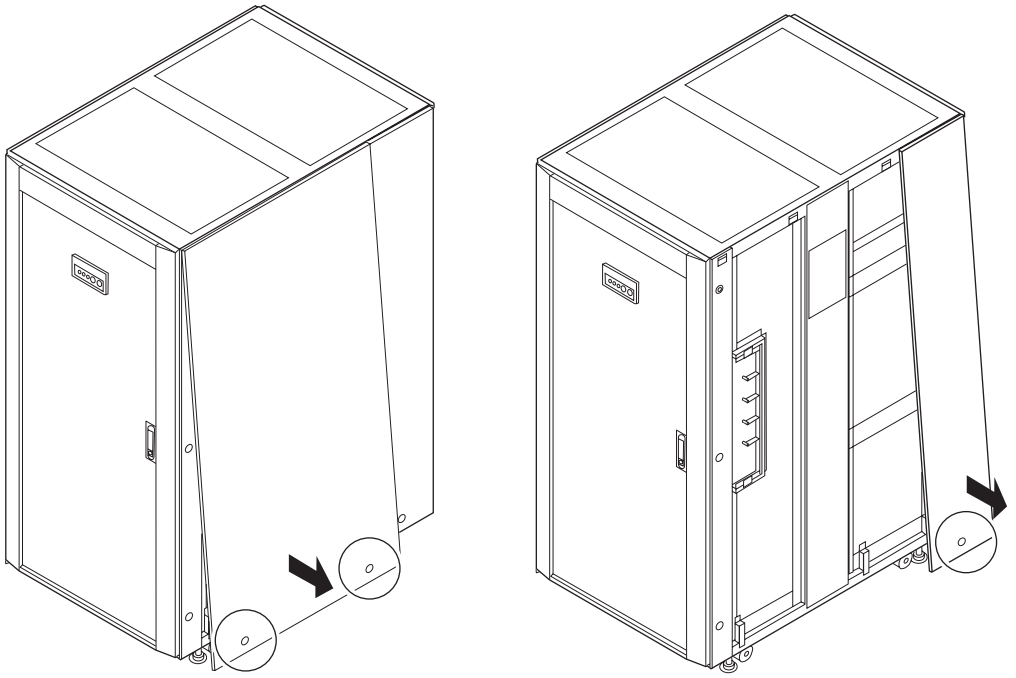
When the base cabinet and expansion cabinet are connected to each other, the side panels on the connection side of the base cabinet must be moved to the expansion cabinet. If the server has been shipped with the side panels already moved to the expansion cabinet, start the work at Step 3.

1. **Loosen the three screws securing the two right side panels on the base cabinet and remove the panels.**

   A side panel can be removed by slightly raising it. The removed side panels will be mounted in the Step 2.

Note – Unless otherwise stated, assume that you are facing the front of the base cabinet when you perform the work. There is a panel on the front of the base cabinet.

FIGURE 3-2 Removing the Right Side Panels From the Base Cabinet

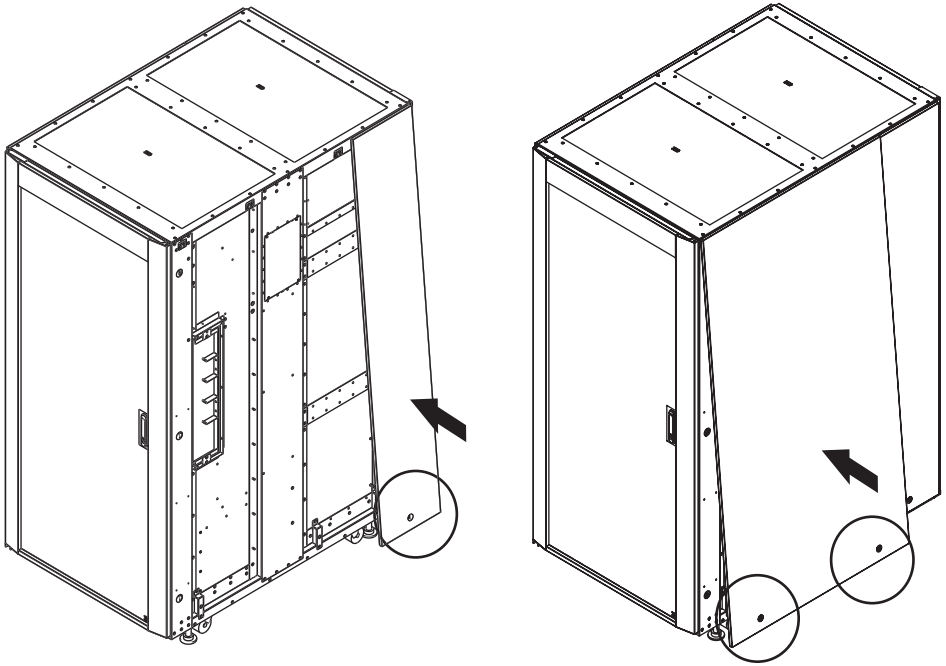


2. **On the right side of the expansion cabinet, mount the right side panels that were removed in the Step 1.**

Note – Unless otherwise stated, assume that you are facing the front of the expansion cabinet when you perform the work. The CD-RW/DVD-RW drive unit is equipped on the front of the expansion cabinet. For information on the mounting location of the CD-RW/DVD-RW drive unit, see FIGURE A-3.

Note – If the power cabinet is connected, a side panel is mounted on the power cabinet side. See Section 3.3.2, "Connecting the Power Cabinet" on page 3-10.

FIGURE 3-3 Attaching the Right Side Panels to the Expansion Cabinet



3. **To remove the front cover on the expansion cabinet side, use the following procedure, considering workability.**

   a. **Remove the cabinet-side screw (1) connecting the grounding wire to the door.**

   b. **Loosen the left-side securing screw of the hinge bracket.**

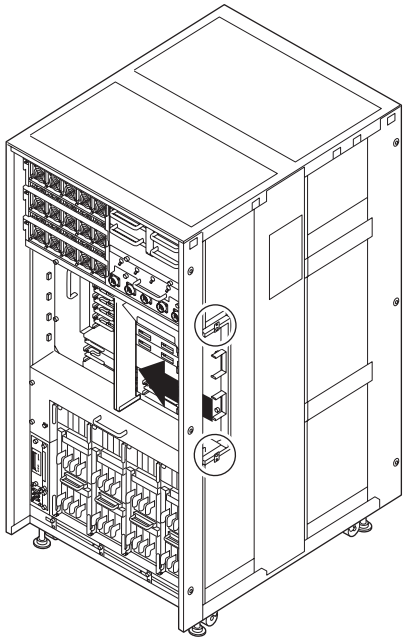
   c. **Raise the cover and remove it from the lower-side hinge bracket.**

Note – Attach the removed front cover after the operation in Section 3.4.3, "Cable Connection Between the Base and Expansion Cabinets of the M9000 Server" on page 3-34 is finished.

4. **Remove the two (2) screws securing the right side cover of the base cabinet and remove the cover.**

Note – Be sure to remove the cover here because it cannot be removed after the units are connected.

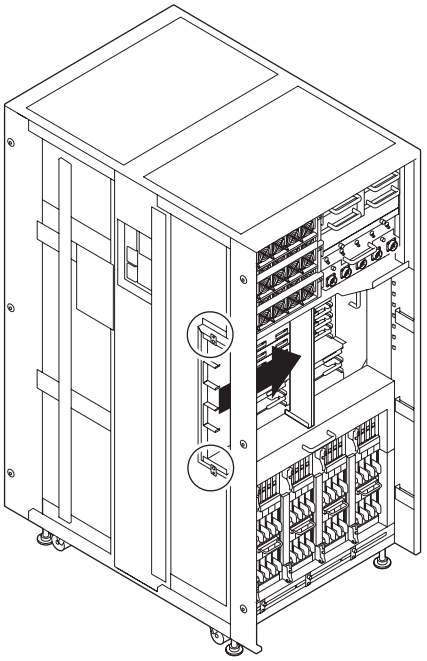
FIGURE 3-4 Removing the Right Side Cover of the Base Cabinet



5. **Remove the two (2) screws securing the left side cover of the expansion cabinet and remove the cover.**

Note – Be sure to remove the cover here because it cannot be removed after the units are connected.

FIGURE 3-5 Removing the Left Side Cover of the Expansion Cabinet

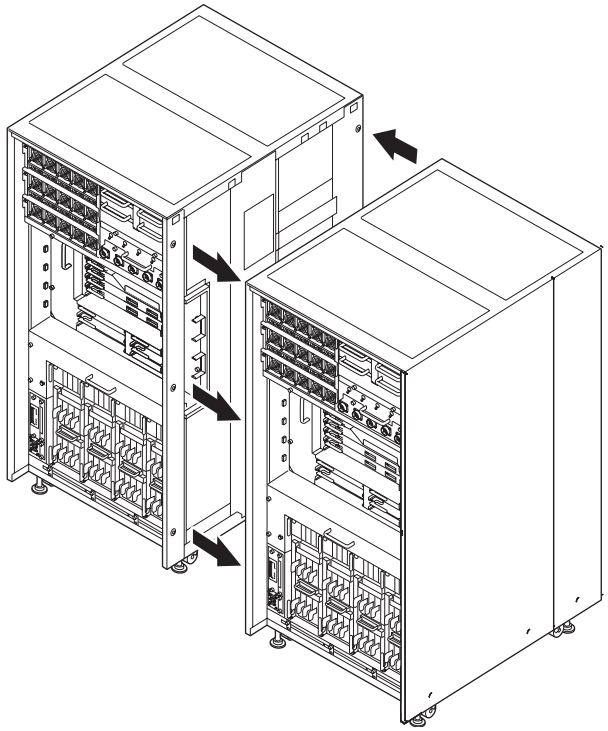


6. **Connect the base cabinet and expansion cabinet by using the six (6) bolts supplied as accessories.**

   Mount the connecting bolts in the directions indicated by the arrows in FIGURE 3-6.

Note – If the bolt holes are vertically misaligned, adjust their height by lowering the leveling feet of the base or power cabinet.

FIGURE 3-6 Connecting the Base and Expansion Cabinets



7. Secure the expansion cabinet.

For details on how to secure the expansion cabinet, see Section 3.2, "Securing the Base Cabinet" on page 3-2.

Lower the four leveling feet adjusting them so that the cabinet can be level.

Note – Attach an accessory foot stand to each leveling foot.

Note – Lower the leveling feet until the weight of the cabinet is no longer supported by the castors.

3.3.2 Connecting the Power Cabinet

Connect the server and power cabinet following the procedure below.

3.3.2.1 Connecting the Base Cabinet and Power Cabinet

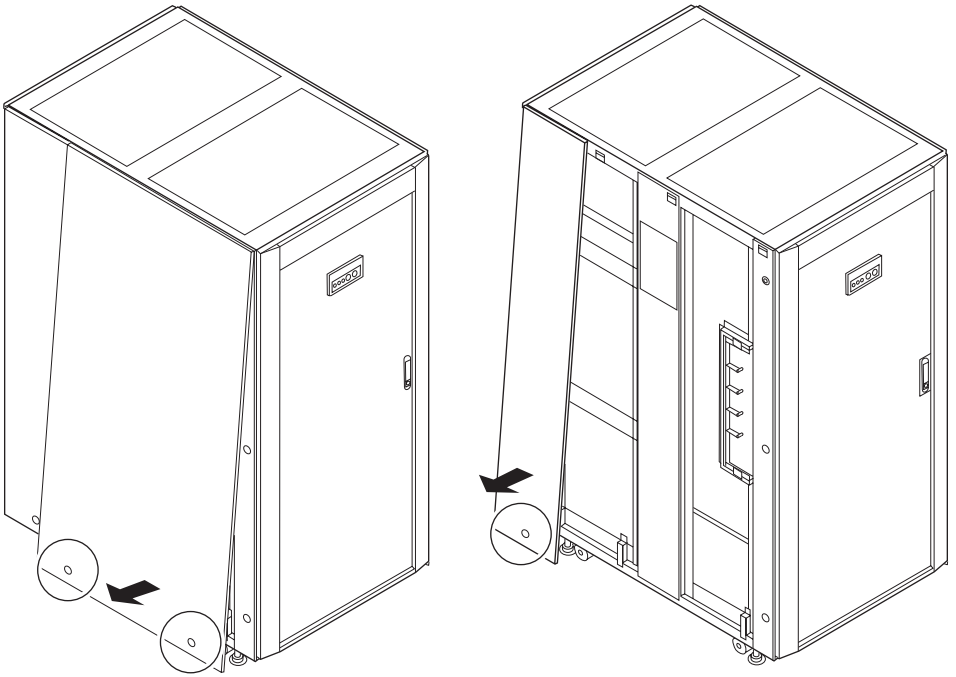
When the base cabinet and power cabinet are connected to each other, the side panels on the connection side of the base cabinet must be moved to the power cabinet. If the server has been shipped with the side panels already moved to the power cabinet, start the work from Step 2.

1. **Loosen the three (3) screws in the two left side panels on the base cabinet.**

   A side panel can be removed by slightly raising it. Remove the side panels, which will be mounted in Step 13.

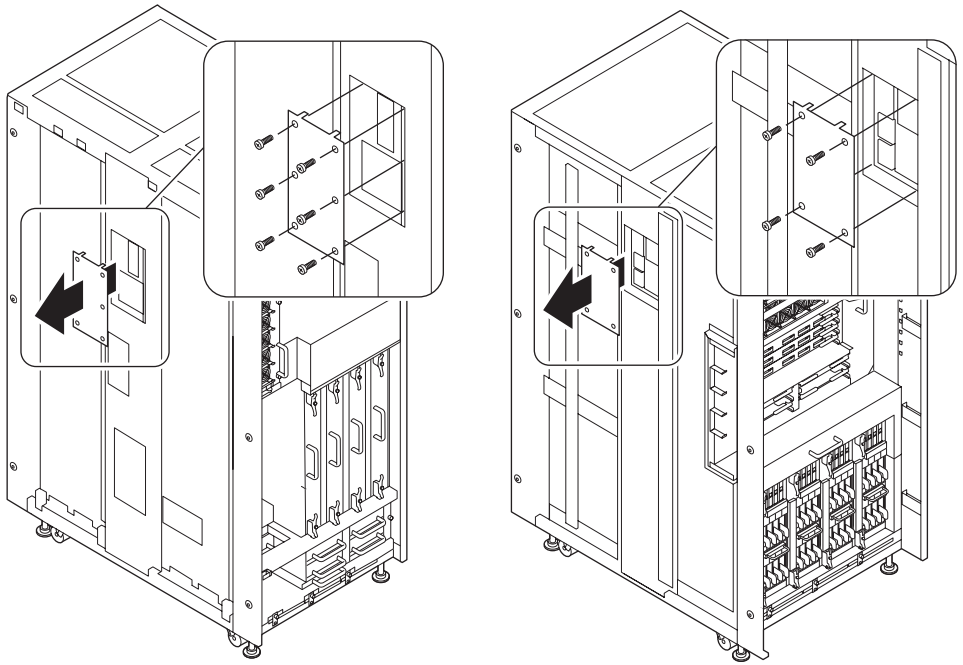
Note – Unless otherwise stated, it is assumed that you will perform the work facing the front of the base cabinet. There is a panel on the front of the base cabinet.

FIGURE 3-7 Removing the Side Panels



2. **Remove the screws securing the left side bus bar cover of the base cabinet and remove the cover.**

FIGURE 3-8 Removing the Bus Bar Cover

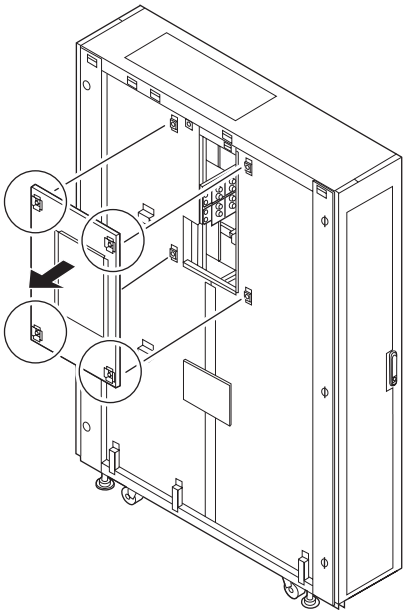


3. **Remove the four (4) screws securing the left side cover of the power cabinet and remove the cover.**

   The removed cover will be remounted in Step 12.

Note – Unless otherwise stated, assume that you are facing the front of the power cabinet when you perform the work. There is a power supply unit (PSU) on the front of the power cabinet. For information on the mounting location, see FIGURE A-5 and FIGURE A-7.

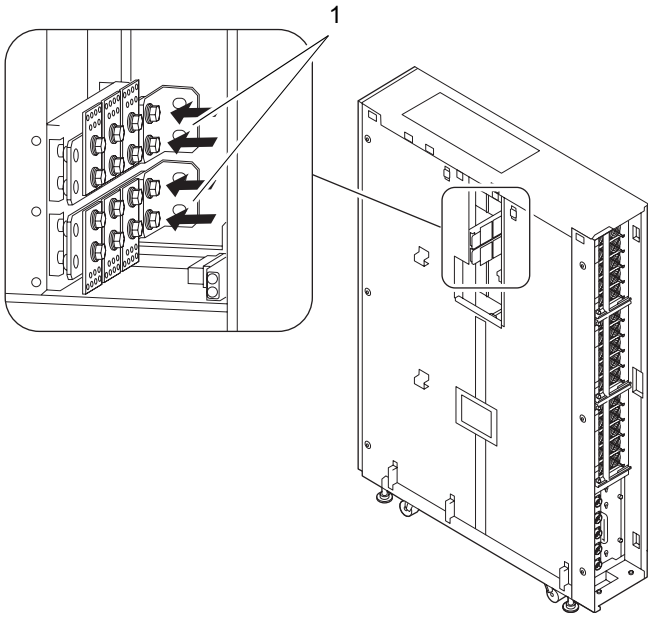
FIGURE 3-9 Removing the Left Side Cover from the Power Cabinet



4. **On the bus bar of the power cabinet, attach two bus bar brackets supplied as accessories (1) with four bolts, and tighten the bolts temporarily.**

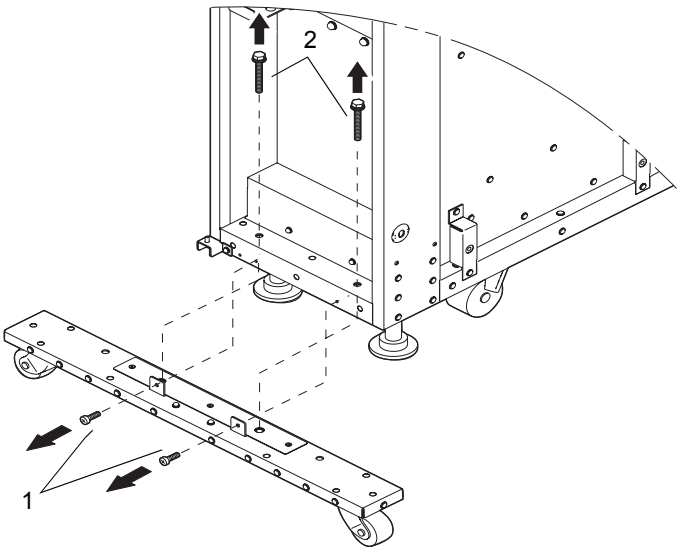
Note – Temporary tightening of bus bar brackets makes it easier to perform Step 10.

FIGURE 3-10 Mounting Bus Bar Brackets (Temporary Tightening on the Power Cabinet Side)



5. **Move the power cabinet so that it is on the left side of the base cabinet.**
6. **Remove the stabilizing attachments that are mounted on the bottom at the front and rear of the power cabinet.**
   a. **Remove the two screws (1) securing the stabilizing attachment.**
   b. **Remove the two bolts (2) securing the stabilizing attachment.**

FIGURE 3-11 Removing a Stabilizing Attachment

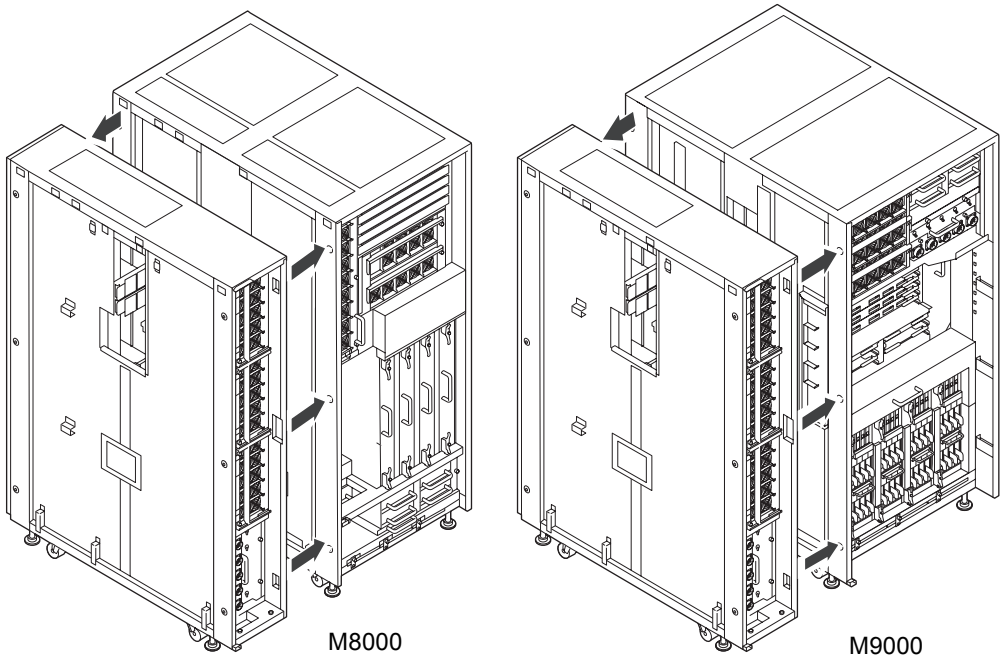


7. **Connect the server and power cabinet using the six (6) bolts supplied as accessories.**

   Mount the connecting bolts in the direction indicated by the arrows in FIGURE 3-12.

Note – If the bolt holes are vertically misaligned, adjust their height by lowering the leveling feet of the power cabinet.

FIGURE 3-12 Connecting the Base Cabinet and Power Cabinet



8. **Refer to** Section 3.2, "Securing the Base Cabinet" on page 3-2**, and secure the power cabinet.**

   Lower the four leveling feet adjusting them so that the cabinet can be level.

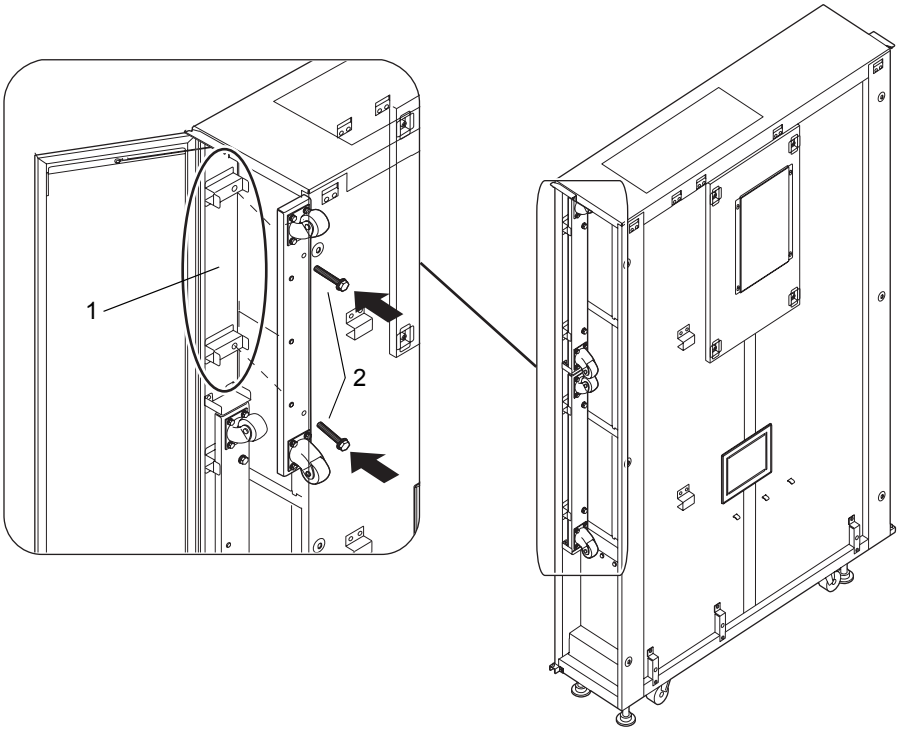
Note – Attach an accessory foot stand to each leveling foot.

Note – Lower the leveling feet until the weight of the cabinet is no longer supported by the castors.

---

9. **Using the two bolts (2), mount each stabilizing attachment (1) removed in** Step 6 **to the inside of the power cabinet so that both attachments are housed in the cabinet. They can be mounted on the rear of the power cabinet. The stabilizing attachments are stored at the top and bottom, above and below each other.**

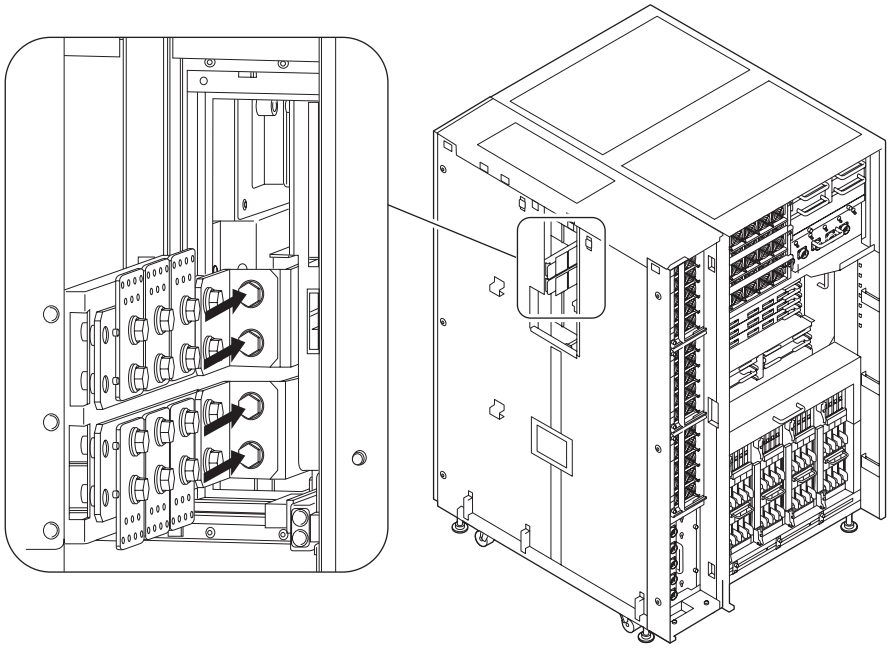
FIGURE 3-13 Housing the Stabilizing Attachments Inside the Power Cabinet



10. **Securely tighten the four bolts that were temporarily tightened in** Step 4 **and secure the bus bar brackets on the power cabinet to the base cabinet.**

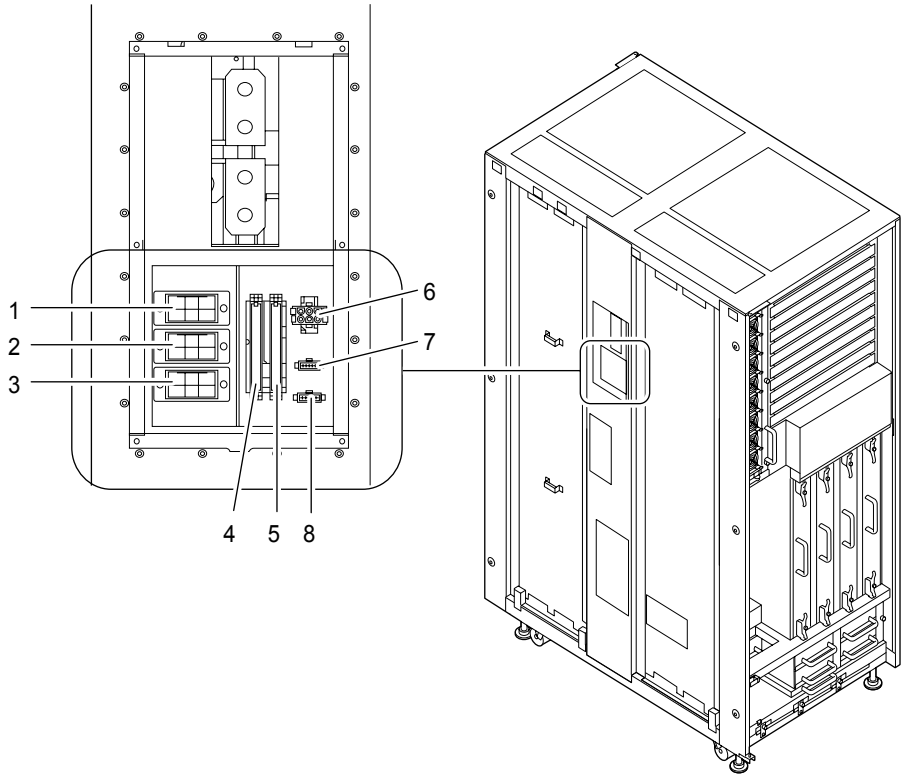
    Use a torque wrench to secure the bus bar (fixed at 8.24 N·m; 84 kgf·cm).

FIGURE 3-14 Mounting the Bus Bar Brackets



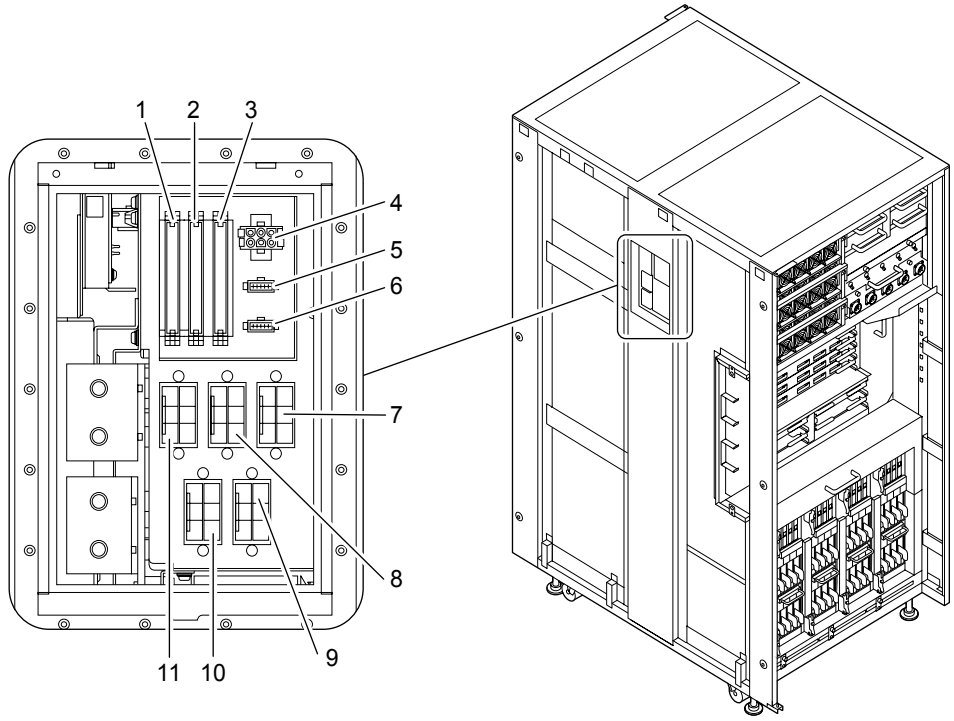
11. Connect the connectors between the base cabinet and power cabinet.

FIGURE 3-15 Connecting the Connectors (M8000 Server)



No.	Single-phase	Three-phase
1	None	AC2
2	None	AC1
3	None	AC0
4	PSU#2	PSU#2
5	PSU#3	PSU#3
6	DPF 12V	DPF 12V
7	ACS0-CB	ACS0-CB
8	ACS1-CB	ACS1-CB

FIGURE 3-16 Connecting the Connectors (M9000 Server)

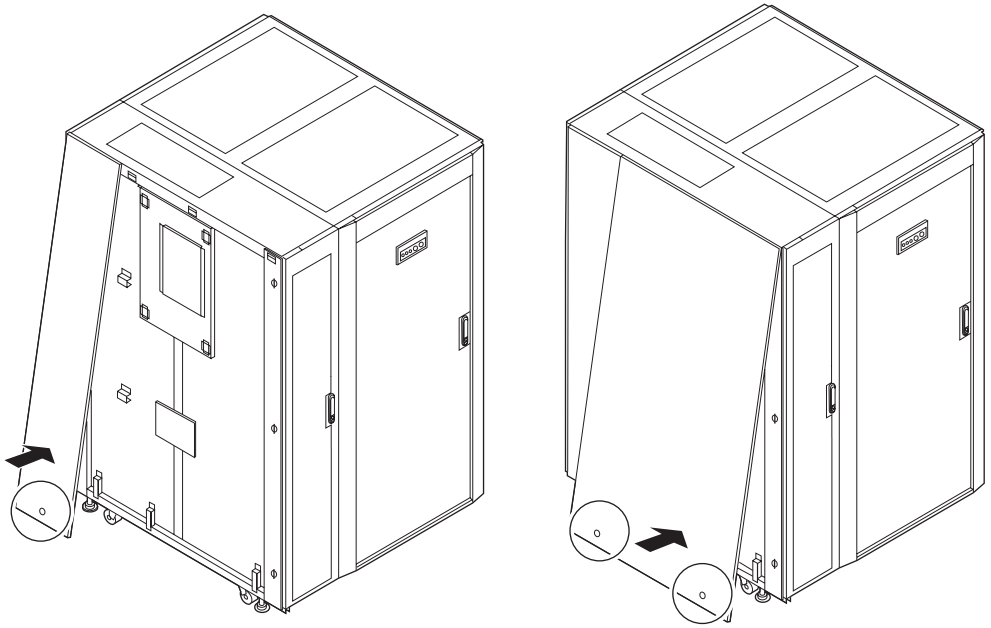


No.	Single-phase	Three-phase
1	PSU#3	PSU#3
2	PSU#4	PSU#4
3	PSU#5	PSU#5
4	DPF 12V	DPF 12V
5	None	ACS0-CB
6	ACS1-CB	ACS1-CB
7	None	AC4
8	None	AC3
9	None	AC1
10	None	AC0
11	None	AC2

12. Attach the side cover that was removed in Step 3 to the left side of the power cabinet.

13. **On the left side of the power cabinet, mount the side panels that were removed in Step 1.**

FIGURE 3-17 Mounting the Bus Bar Cover and Side Panels



3.3.2.2 Connecting the M9000 Server Expansion Cabinet and the Power Cabinet

When the expansion cabinet and power cabinet are connected to each other, the side panels on the connection side of the expansion cabinet must be moved to the power cabinet. If the server has been shipped with the side panels already moved to the power cabinet, start the work from Step 2.

1. **Loosen the three screws securing the two right side panels on the expansion cabinet and remove the panels.**

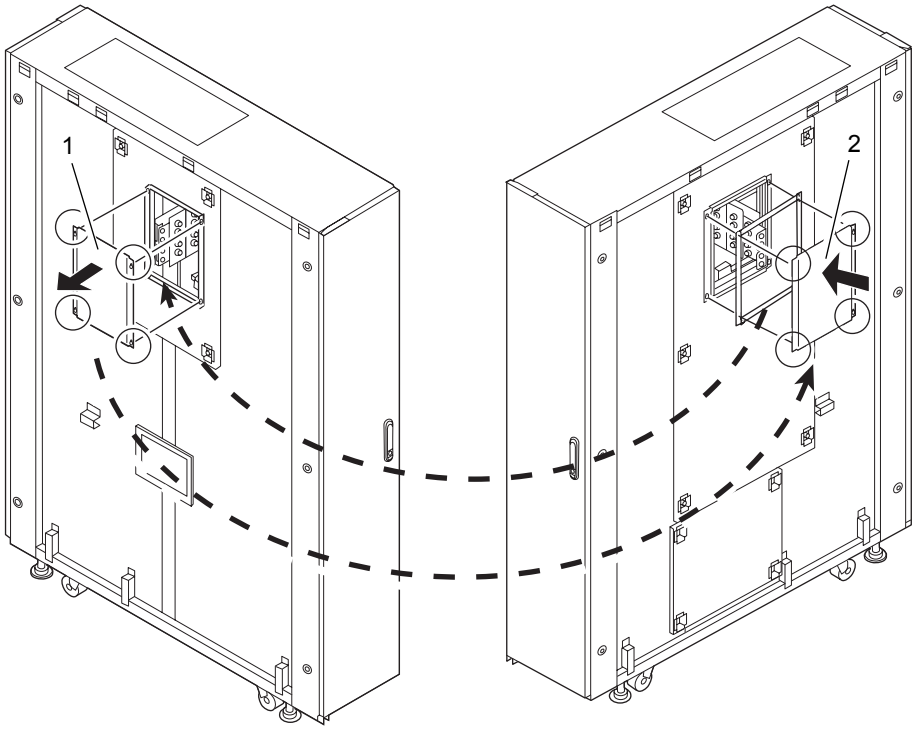
   A side panel can be removed by slightly raising it. The removed side panels will be mounted in Step 14.

2. **Remove the screws securing the right side bus bar cover of the expansion cabinet and remove the cover.**

3. **Remove the left side board (1) and right side bracket (2) of the power cabinet and interchange them.**

Note – Unless otherwise stated, assume that you are facing the front of the power cabinet when you perform the work. There is a power supply unit (PSU) on the front of the power cabinet. For information on the mounting location, see FIGURE A-5 and FIGURE A-7.

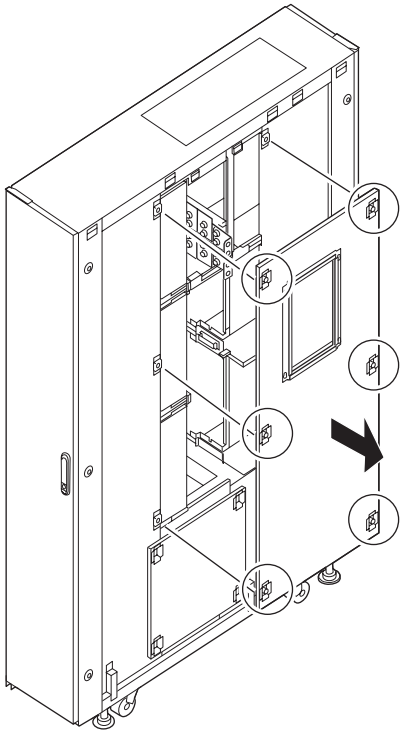
FIGURE 3-18 Moving the Filler Panel of the Power Cabinet



4. **Remove the six (6) screws securing the right side cover of the power cabinet and remove the cover.**

   The removed cover will be remounted in Step 13.

FIGURE 3-19 Removing the Right Side Cover From the Power Cabinet



5. **On the bus bar of the power cabinet, attach two bus bar brackets supplied as accessories (1) with four bolts, and tighten the bolts temporarily.**

Note – Temporary tightening of bus bar brackets makes it easier to perform Step 11.

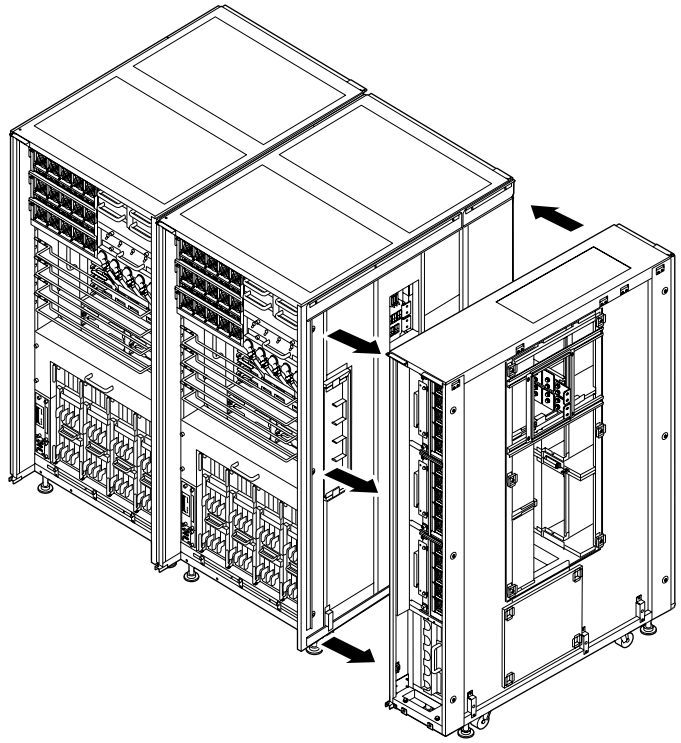
---

6. **Move the power cabinet so that it is on the right side of the expansion cabinet.**
7. **Remove the stabilizing attachments that are mounted on the bottom at the front and rear of the power cabinet (see FIGURE 3-11).**
   a. **Remove the two screws (1) securing the stabilizing attachment.**
   b. **Remove the two bolts (2) securing the stabilizing attachment.**
8. **Connect the expansion cabinet and power cabinet using the six (6) bolts supplied as accessories.**

   Mount the connecting bolts in the direction indicated by the arrows in FIGURE 3-20.

Note – If the bolt holes are vertically misaligned, adjust their height by lowering the leveling feet of the power cabinet.

FIGURE 3-20 Connecting the Expansion Cabinet and the Power Cabinet



9. **Referring to** Section 3.2, "Securing the Base Cabinet" on page 3-2**, secure the expansion cabinet.**

   Lower the four leveling feet adjusting them so that the cabinet can be level.

Note – Attach an accessory foot stand to each leveling foot.

Note – Lower the leveling foot until the weight of the cabinet is no longer supported by the castors.

10. **Using the two bolts (2), mount each stabilizing attachment (1) removed in Step 7 to the inside of the power cabinet so that both attachments are housed in the cabinet (see FIGURE 3-13).**

    They can be mounted on the rear of the power cabinet. The stabilizing attachments are stored at the top and bottom, above and below each other.

11. **Fully tighten the four bolts that were temporarily tightened in Step 5 and secure the bus bar brackets on the expansion cabinet to the base cabinet.**

    Use a torque wrench to secure the bus bar (fixed at 8.24 N·m; 84 kgf·cm).

12. **Connect the connectors between the expansion cabinet and power cabinet (see FIGURE 3-16).**

13. **Attach the side cover that was removed in Step 4 to the power cabinet.**

14. **Attach the side cover that was removed in Step 1 to the right side of the power cabinet.**

3.4 Connecting Cables

This section explains how to connect cables.

3.4.1 Connecting the power cords

Connect the input power cords to the server.

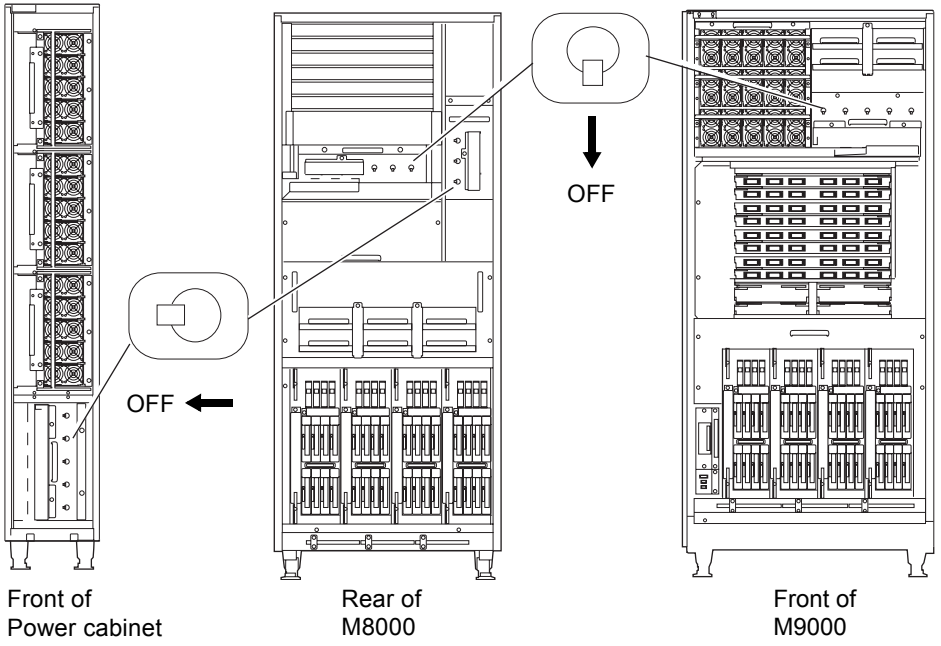
Note – The connection procedure for the input power cords for the single-phase power feed differs from the three-phase power feed. Follow the appropriate procedure for connecting the cords.

Note – If the three-phase power feed is used, connect the input power cable from the customer's distribution board directly to the power cabinet, as part of the on-site electrical work. This electrical work must be performed by the facility administrator or a qualified electrical engineer.

3.4.1.1 Single-Phase Power Feed

1. Confirm that all main line switches are switched off.

FIGURE 3-21 Switching off the Main Line Switches



2. Remove the connector cover of the AC section.

FIGURE 3-22 Removing the Connector Cover of the AC Section: M8000 Server

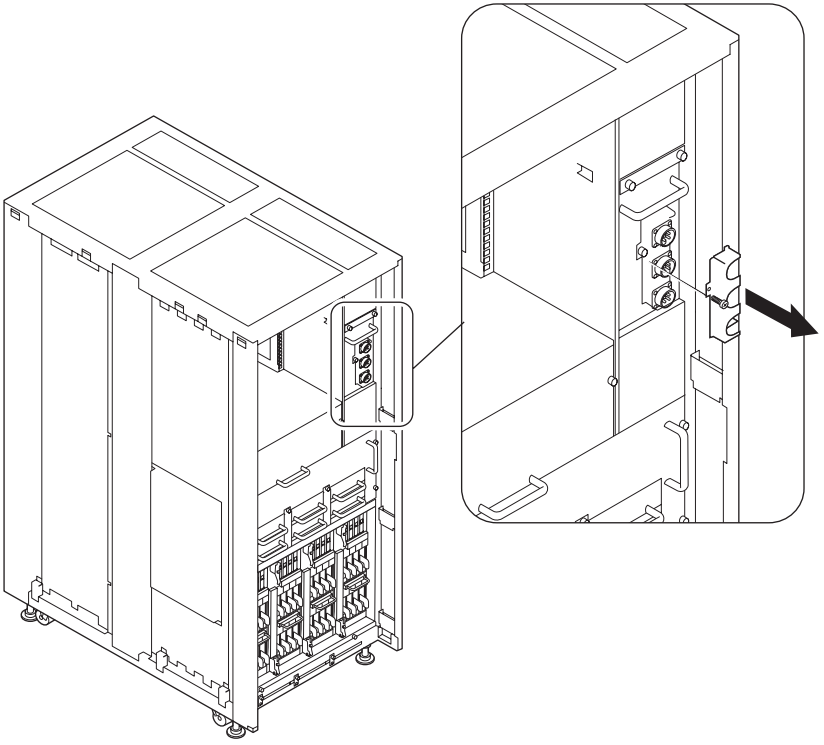
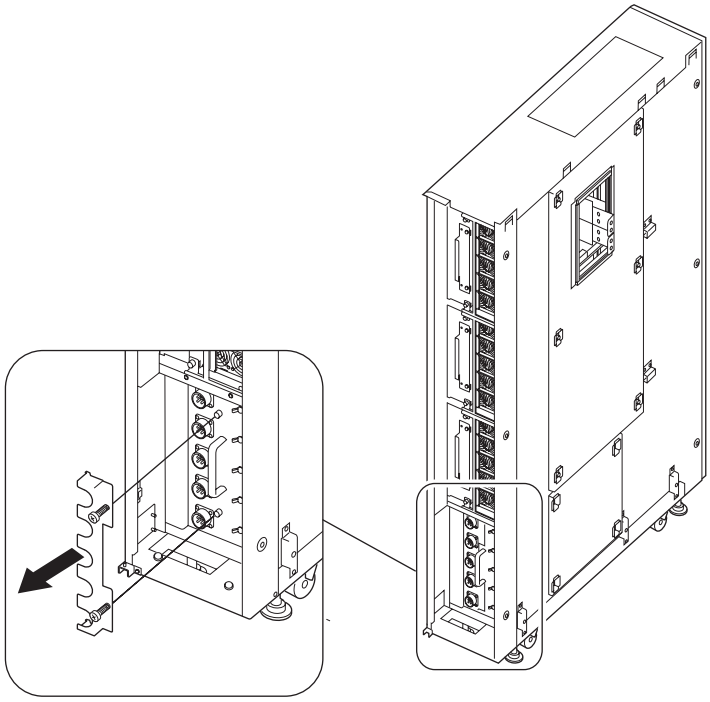
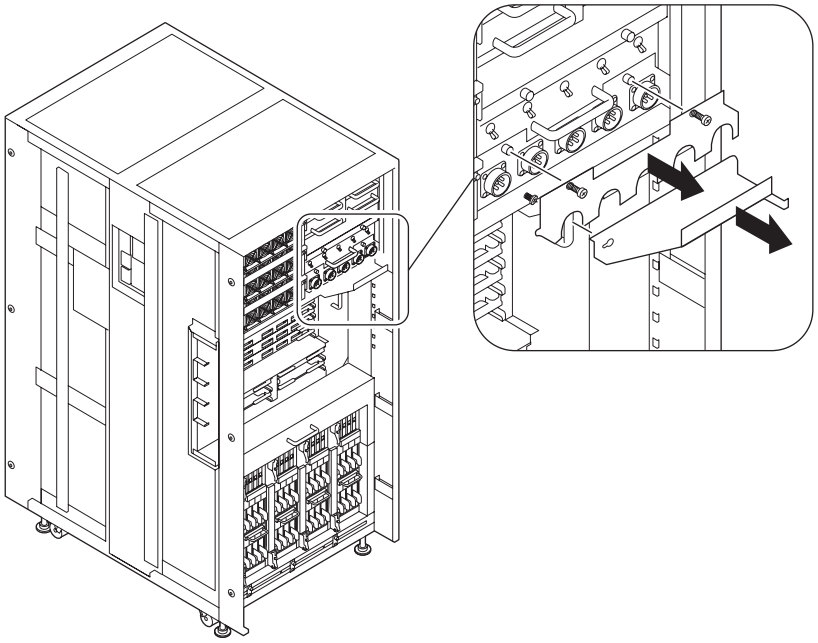


FIGURE 3-23 Removing the Connector Cover of the AC Section: Power Cabinet



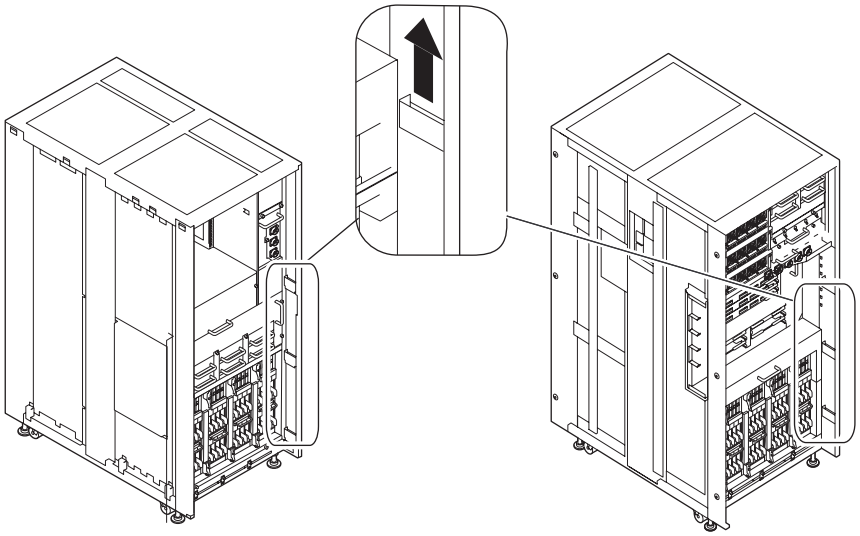
3. **If the M9000 server is used, remove the connector cover and the cable tray of the AC section.**

FIGURE 3-24 Removing the AC Connector Cover and Cable Tray: M9000 Server



4. **Lift up the cable holder, and remove the holder.**

FIGURE 3-25 Removing the Cable Holders

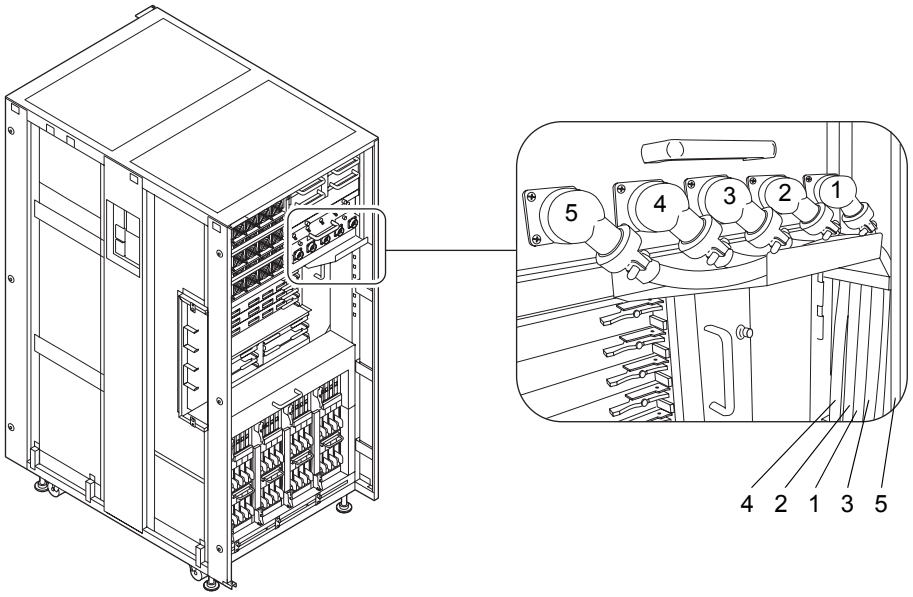


5. **Connect the power cord to the AC connector on the AC section.**

   The power cord is supplied with the server.

Note – If you are installing the M9000 server, the power cords should be connected in order, from 1 to 5, as shown in FIGURE 3-26.

FIGURE 3-26 Routing the Power Cords



6. **Mount the connector cover of the AC section.**
7. **If you are installing the M9000 server, mount the cable tray of the AC section while lifting the power cords.**
8. **Route the power cords inside the frame, and attach and lower the cable holder while holding the cord and secure it.**

3.4.1.2 Three Phase Power Feed

1. **Confirm that all main line switches are switched off.**

2. **Connect the power cables to the three-phase input section of the power cabinet.**

Note – If the three-phase power feed is used, connect the power input cable from the customer's distribution board directly to the power cabinet, as part of on-site electrical work. This electrical work must be performed by the facility administrator or a qualified electrician.

FIGURE 3-27 Connecting the Power Cables: Three Phase Delta

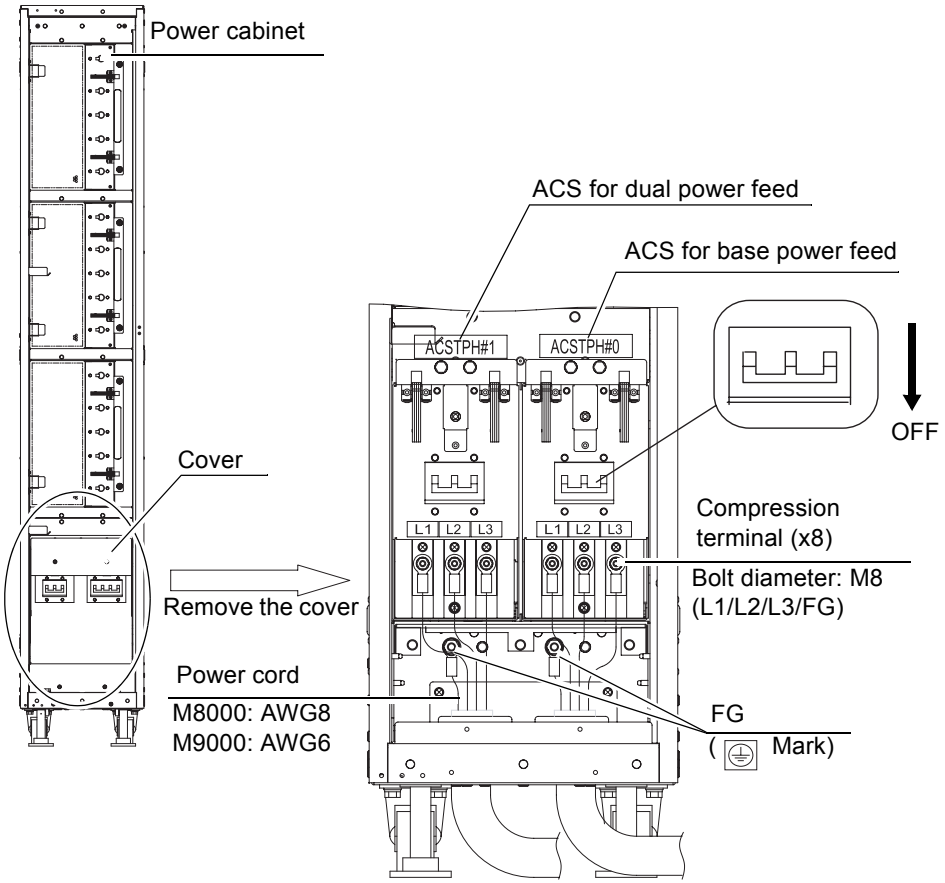
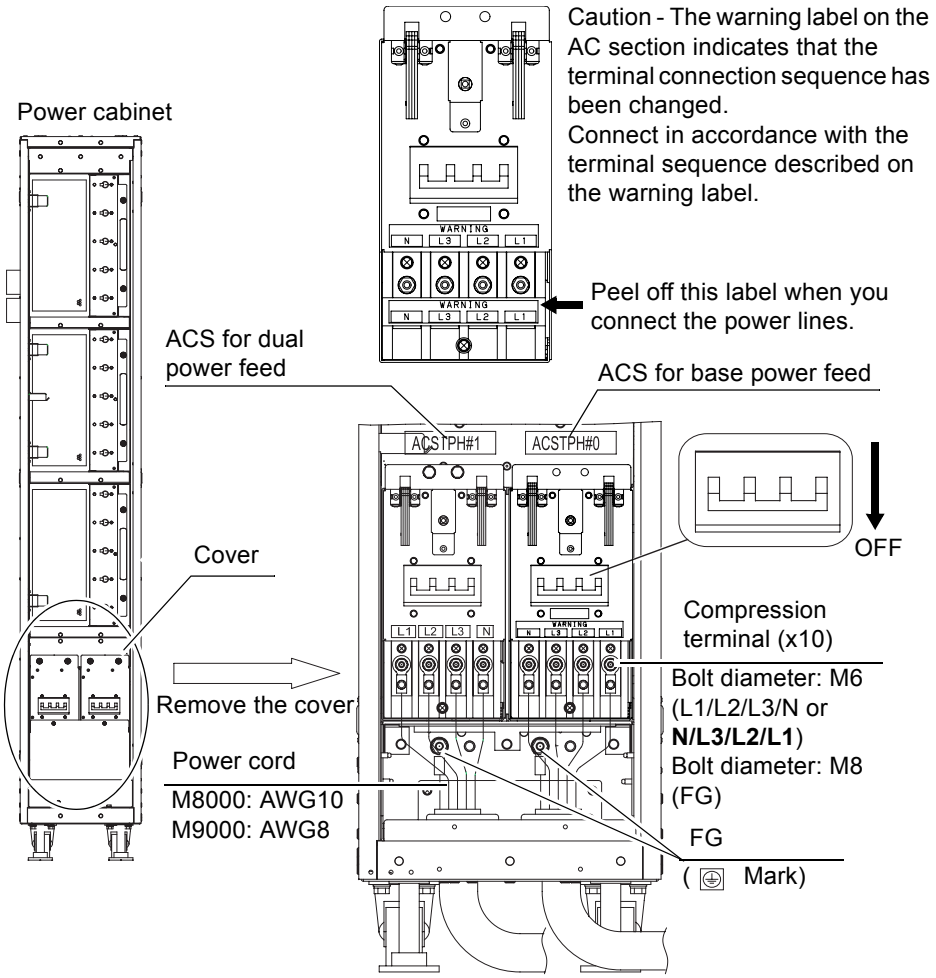


FIGURE 3-28 Connecting the Power Cables: Three-Phase Star



3.4.2 Connecting a UPS Unit

An uninterruptible power supply (UPS) unit is used to provide a stable supply of power to the system in the event of a power failure or an extensive power interruption.

You can execute emergency shutdown processing by connecting the UPC port and a UPS which has a UPC interface.

When using UPSs with the dual power feed option, each AC power source must be completely isolated from one another and need separate UPSs.

Note – Only UPC#0 is used for the primary power feed.

Note – UPC#0 and UPC#1 are used for dual power feed.

The base cabinet has two UPS interface ports. Connect the base power feed to UPC#0 and connect the other UPSs to UPC#1.

Refer to the *SPARC Enterprise M8000/M9000 Servers Service Manual* for the interface specifications of the UPC port.

FIGURE 3-29 Example of Connecting UPS: Dual Power Feed

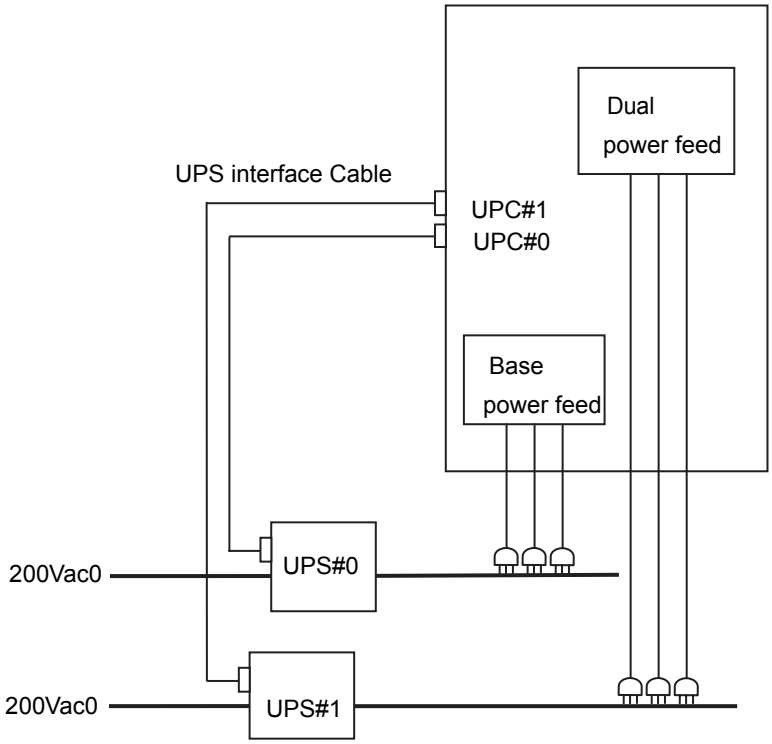
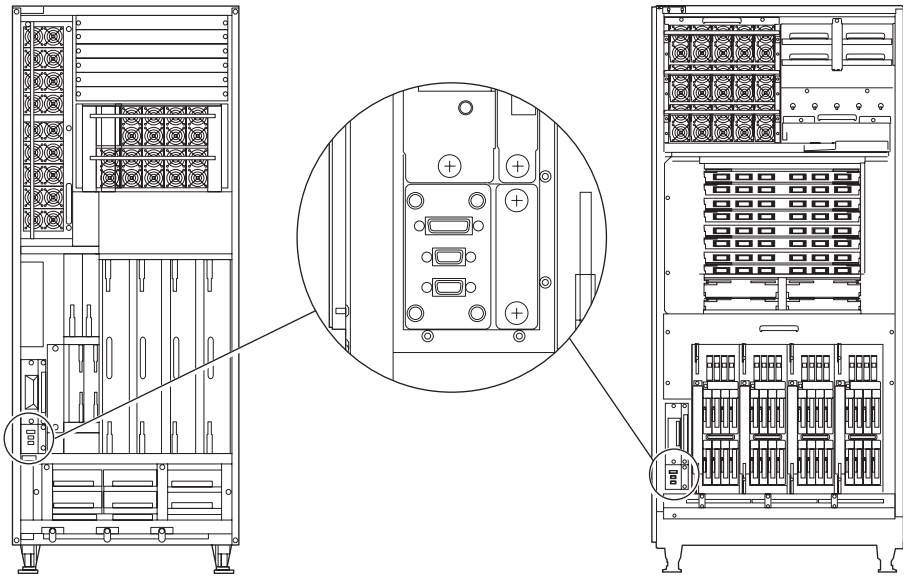


FIGURE 3-30 UPC Ports



3.4.3 Cable Connection Between the Base and Expansion Cabinets of the M9000 Server

If the system includes the M9000 server expansion cabinet, connect the necessary cables between the base cabinet and expansion cabinet. The cables come with the product.

TABLE 3-2 Cable Types and Quantities

Cable Type	Quantity
Inter-XSCF unit data cable	2
Inter-CLK unit data cable	2
Inter-CLK unit clock cable	4
Inter-XB unit data cable	48
Inter-XB unit clock cable	8

Note – The cable connection should be performed by at least two persons; one person working on the base cabinet side and the other person working on the expansion cabinet side.

3.4.3.1 Connecting Cables Between XSCF Units

1. **Connect the XSCF units in the base and the expansion cabinets using a clock cable.**

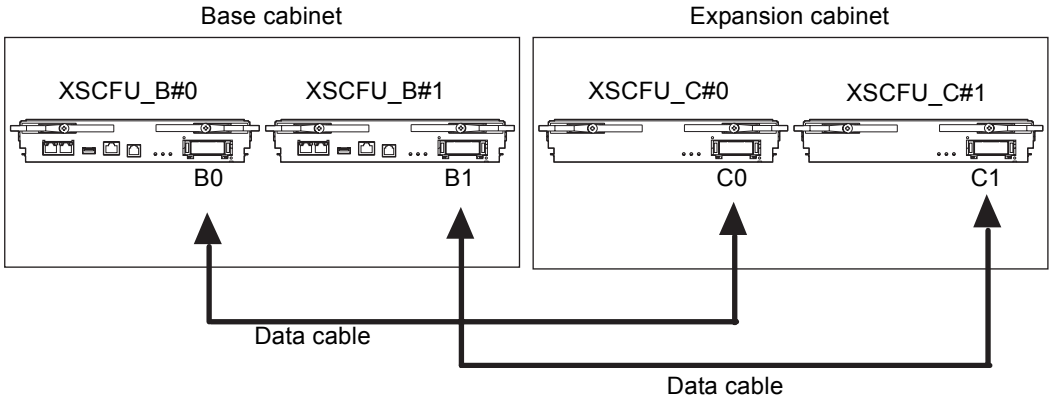
   Connect them so that the label on each XSCF unit matches the label on the connector of the cable.

2. **Use a flathead screwdriver to secure the data cable connectors.**

TABLE 3-3 Cable Correspondence

Cable Type	Base Cabinet	Expansion Cabinet
Data cable	XSCFU_B#0	XSCFU_C#0
Data cable	XSCFU_B#1	XSCFU_C#1

FIGURE 3-31 Connecting Cables Between XSCF Units



3.4.3.2 Connecting Cables Between CLKUs

1. **Connect the Clock control units (CLKUs) in the base cabinet and the expansion cabinet using a clock cable and data cable.**

   When the cables are connected, each label on the CLK unit must match the label of each cable.

Note – Refer to Section A.2, “M9000 Server Views” on page A-4 for the location of the CLK unit.

---

2. **Use a flathead screwdriver to secure the data cable connector.**

   Use a torque screwdriver to secure the clock cable connector with the torque of 0.2 N·m; 2.0 kgf·cm.

Note – If you are unable to obtain a torque screwdriver, finger tighten the clock cable connectors. Do not secure them with a regular screwdriver.

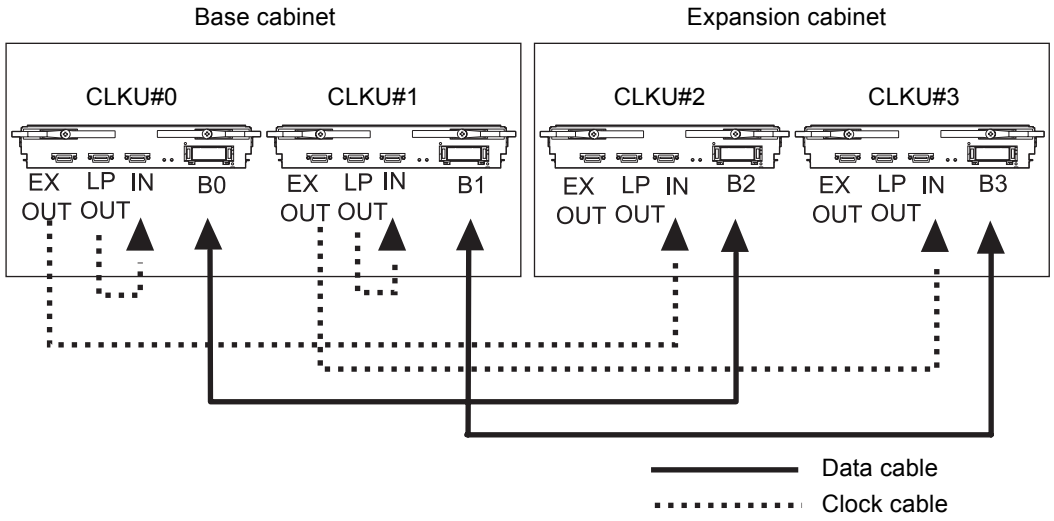
Caution – Do not hang or yank the cable, especially while one side is connected.

Caution – Tighten or remove the cable screws evenly on both sides.

TABLE 3-4 Cable Correspondence

Cable Type	Base Cabinet		Expansion Cabinet
Data cable	CLKU_B#0		CLKU_B#2
Data cable	CLKU_B#1		CLKU_B#3
Clock cable	CLKU_B#0-EX-OUT		CLKU_B#2-IN
Clock cable	CLKU_B#0-LP-OUT	CLKU_B#0-IN	
Clock cable	CLKU_B#1-EX-OUT		CLKU_B#3-IN
Clock cable	CLKU_B#1-LP-OUT	CLKU_B#1-IN	

FIGURE 3-32 Connecting Cables Between CLKUs



3.4.3.3 Connecting Cables Between XB Units

Perform the steps below to connect the cross bar units (XB units) of the base cabinet to those of the expansion cabinet with cables.

Start the connecting of the cables from the lowest shelf of the XB unit. When cables are connected, each label on an XB unit must match the label of each cable.

Note – Please refer to Section A.2, “M9000 Server Views” on page A-4 for the location of XB unit.

Note – Each cable has a color TY-Rap cable tie for identification of the connection location of the connector.

Note – The hook and loop fasteners used to secure the cables are server accessories.

Note – Before connecting the clock cable, remove the black cap attached to the clock cable connector for the XB unit.

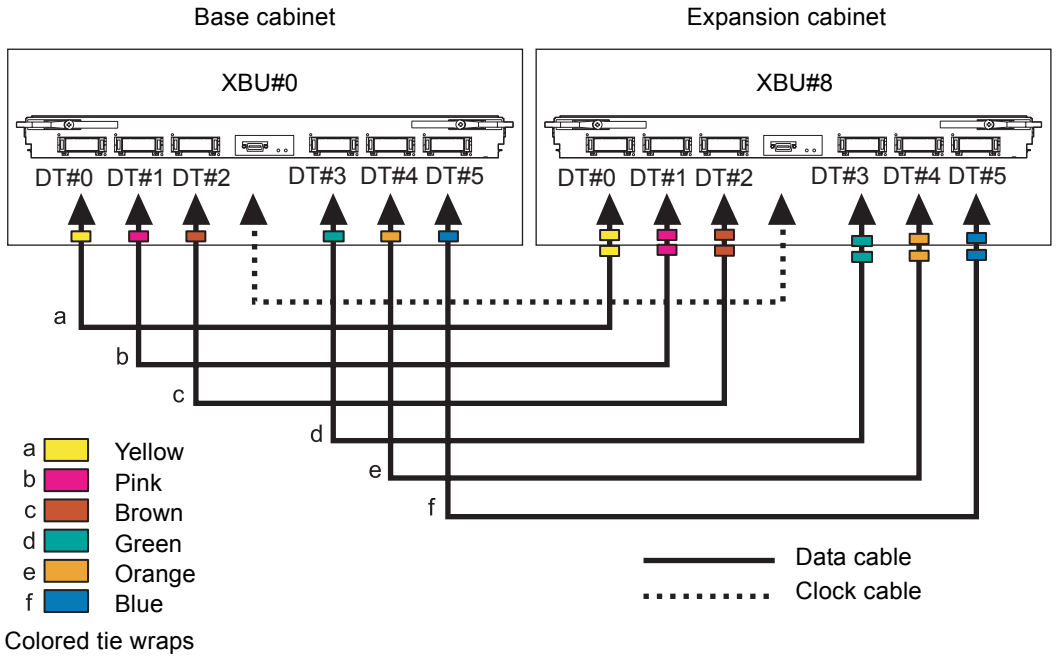
TABLE 3-5 Cable Correspondence (For One Pair Of XB Units)

Cable Type	Base Cabinet	Expansion Cabinet	Expansion Cabinet
Data cable	XBU_B#0 * -DT#0	XBU_B#8 † -DT#0	Yellow
Data cable	XBU_B#0 * -DT#1	XBU_B#8 † -DT#1	Pink
Data cable	XBU_B#0 * -DT#2	XBU_B#8 † -DT#2	Brown
Data cable	XBU_B#0 * -DT#3	XBU_B#8 † -DT#3	Green
Data cable	XBU_B#0 * -DT#4	XBU_B#8 † -DT#4	Orange
Data cable	XBU_B#0 * -DT#5	XBU_B#8 † -DT#5	Blue
Clock cable	XBU_B#0 * -CL	XBU_B#8 † -CL	-----

* Indicates a slot number (#0 to #7) of the XB unit of the base cabinet.

† Indicates a slot number (#8 to #15) of the XB unit of the expansion cabinet.

FIGURE 3-33 Connecting Cables Between XB Units (For Example, For One Pair)



Note the following points when connecting the cable:

Note – When connecting the cables between the XB units, hold the cables by the connector covers and insert the connectors at a 90-degree angle to the front plate so that the connectors are completely flush against the front plate. Lift up on the cables if necessary to keep the weight of the cables from dropping the connectors down to an incorrect angle, and use a flathead screwdriver to secure the data cable connector or a torque screwdriver to secure the clock cable connector. Connectors attached to the front plate at an incorrect angle could lead to communication failure, so verify that each connector is flush against the front plate and is not slanted at an incorrect angle before securing the cable connectors to the front plate.

Caution – Do not hang or yank the cable, especially while one side is connected.

Caution – Tighten or remove the cable screws evenly on both sides.

1. **Attach the cable holder that comes with the product to the second notches from the bottom in the base cabinet and expansion cabinet.**

   For the installation position, see (1) in FIGURE 3-34.

Note – The data cables for two XB units are to be secured with one cable holder.

FIGURE 3-34 Connecting Cables Between XB Units: Base Cabinet

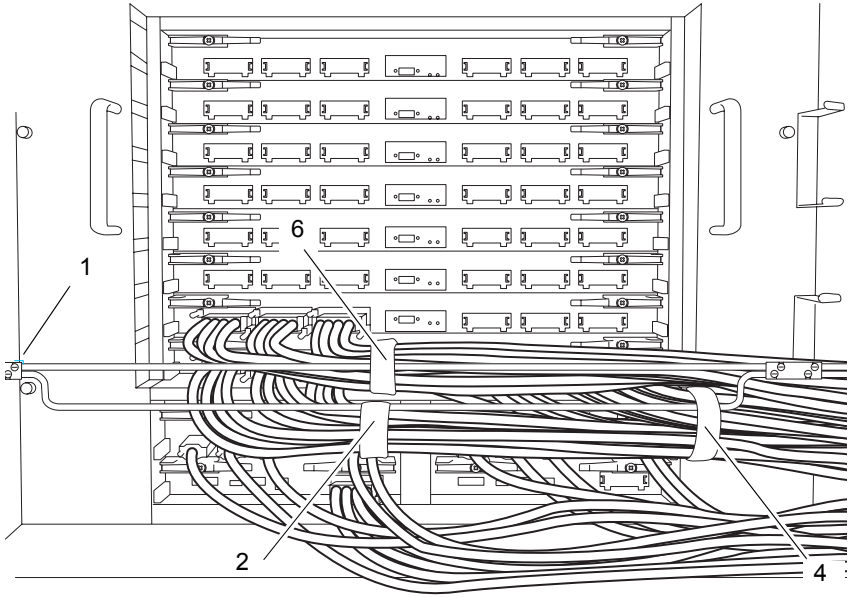
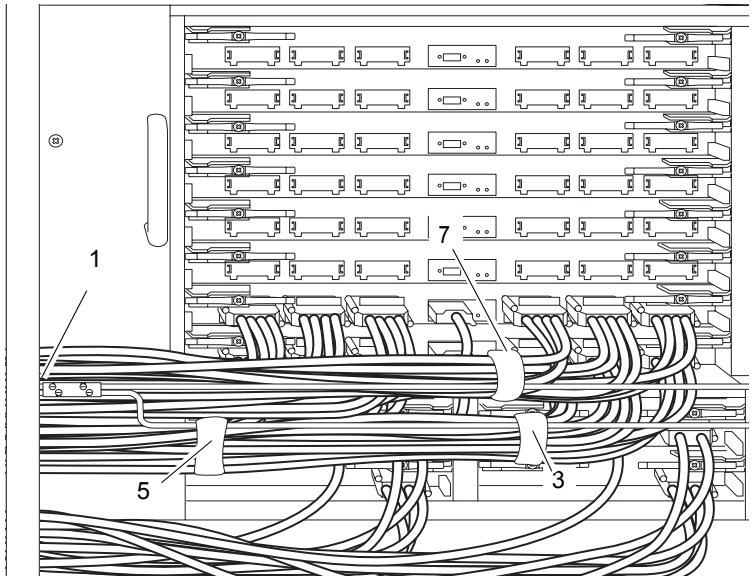


FIGURE 3-35 Connecting Cables Between XB Units: Expansion Cabinet



2. **Connect XBU#0 and XBU#8 with the DT#0, DT#1, and DT#2 cables in this order. Use a flathead screwdriver to secure the data cable connectors.**

Note – Refer to the Note located before Step 1 when you connect the cable.

---

3. **Using hook and loop fasteners, secure the DT#0, DT#1, and DT#2 cables to the cable holder on the side of the base cabinet.**

   For the position to fix, see (2) in FIGURE 3-34.

Note – For XBU#0, giving consideration to facilitating CLKU maintenance, raise the cable a little before securing it in position.

---

4. **Connect XBU#0 and XBU#8 with the DT#3, DT#4, and DT#5 cables in this order. Use a flathead screwdriver to secure the data cable connectors.**

Note – Refer to the Note located before Step 1 when you connect the cable.

---

5. **Using hook and loop fasteners, secure the DT#3, DT#4, and DT#5 cables to the cable holder on the side of the expansion cabinet.**

   For the position to fix, see (3) in FIGURE 3-35.

Note – For XBU#8, giving consideration to facilitating CLKU maintenance, raise the cable a little before securing it in position.

---

6. **Using hook and loop fasteners, secure the six connected data cables to the cable holder along the side of the base cabinet.**

   For the locations of the securing fasteners, see (4) in FIGURE 3-34.

Note – Secure the cables for XBU#0 while lifting them up slightly, in consideration of CLKU maintenance.

---

7. **Using hook and loop fasteners, secure the six connected data cables to the cable holder along the side of the expansion cabinet.**

   For the locations of the securing fasteners, see (5) in FIGURE 3-35.

Note – For XBU#8, giving consideration to facilitating CLKU maintenance, raise the cable a little before securing it in position.

---

8. **Connect XBU#0 and XBU#8 with the clock cable. Use a torque screwdriver to secure the clock cable connector with the torque of 0.2 N·m; 2.0 kgf·cm, and lay the clock cables on the data cables.**

Note – If you are unable to obtain a torque screwdriver, finger tighten the clock cable connectors. Do not secure them with a regular screwdriver.

Note – Do not secure the clock cables to the cable folder along with the data cables.

Note – Refer to the Note located before Step 1 when you connect the cable.

---

9. **Connect XBU#1 and XBU#9 with the DT#0, DT#1, and DT#2 cables in this order. Use a flathead screwdriver to secure the data cable connectors.**

Note – Refer to the Note located before Step 1 when you connect the cable.

---

10. **Using hook and loop fasteners, secure the DT#0, DT#1, and DT#2 cables to the cable holder along the side of the base cabinet.**

    For the secured fastener location, see (6) of FIGURE 3-34.

11. **Connect XBU#1 and XBU#9 with the DT#3, DT#4, and DT#5 cables in this order. Use a flathead screwdriver to secure the data cable connectors.**

Note – Refer to the Note located before Step 1 when you connect the cable.

---

12. **Using a hook and loop fastener, secure the DT#3, DT#4, and DT#5 cables to the cable holder along the side of the expansion cabinet.**

    For the secured fastener location, see (7) in FIGURE 3-35.

13. **Connect XBU#1 and XBU#9 with the clock cable. Use a torque screwdriver to secure the clock cable connector with the torque of 0.2 N·m; 2.0 kgf·cm, and lay the clock cables on the data cables.**

Note – If you are unable to obtain a torque screwdriver, finger tighten the clock cable connectors. Do not secure them with a regular screwdriver.

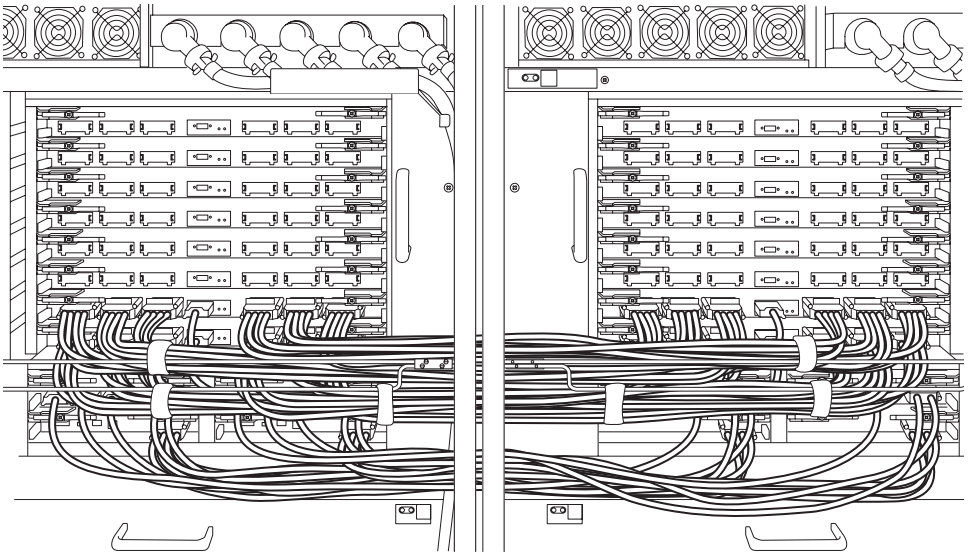
Note – Do not secure the clock cables to the cable folder along with the data cables.

Note – Refer to the Note located before Step 1 when you connect the cable.

---

14. **Set the data cables and the clock cables on the brackets between the base cabinet and the expansion cabinet.**

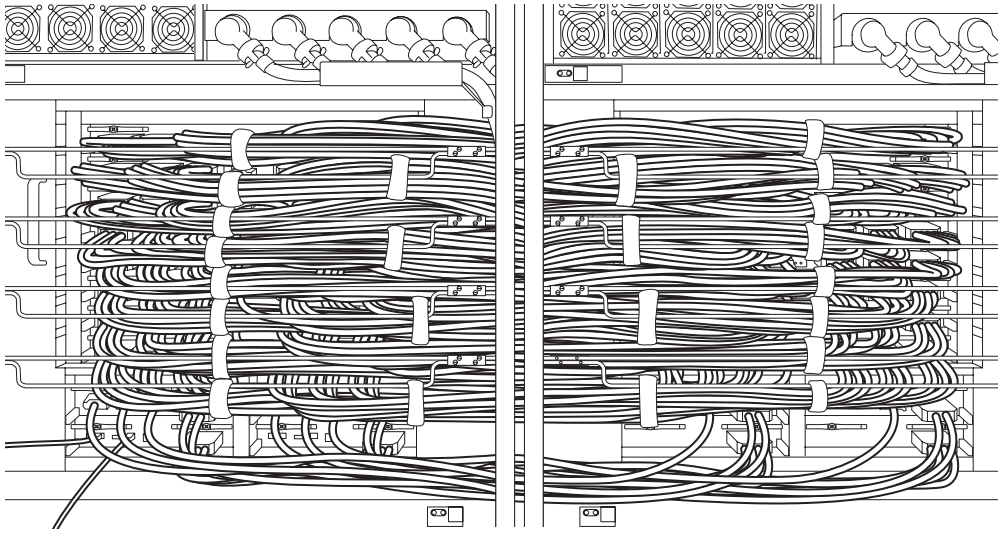
FIGURE 3-36 View After Completing Step 8 to Step 14



15. **Attach the next cable holder above the current cable holder, leaving one notch open between them.**

16. **Repeat Step 2 to Step 14 to connect the cables between XBU#2 and XBU#10, and secure the cable with the cable holder (see FIGURE 3-37).**

FIGURE 3-37 Close-Up View of the Cable Connections



Note – If the front cover of the expansion cabinet has been removed, attach it at this point.

3.4.4 Connecting the Administration Console

The serial port of the eXtended System Control Facility (XSCF) unit is an RJ-45 interface port, which is used to monitor the boot process and make default settings. This port is monitored and configured with the administration console connected to the serial port by an RS232C cable (serial cable), which is a server accessory.

If the administration console is any of the following, it can be used as an XSCF Shell console.

- ASCII terminal
- Workstation
- Terminal server (or patch panel connected to the terminal server)
- Personal computer

The connection of the administration console is described below.

1. **Use the administration console software to verify that the following settings have been made.**

TABLE 3-6 Settings of Terminal Software

	Setting item	Value
1	Baud rate	9600
2	Data length	8 bits
3	Parity None	None
4	Stop bit	1 bit
5	Flow control	None
6	Delay	Not 0

2. **Prepare a serial cable.**

   The serial cable is a server accessory.

3. **Connect the console to the XSCFU#0 serial port.**

Note – The XSCF unit serial port is a port used for setting up the server and displaying the status of the system through the XSCF Shell.

FIGURE 3-38 Serial Port on the XSCF Unit of the M8000 Server

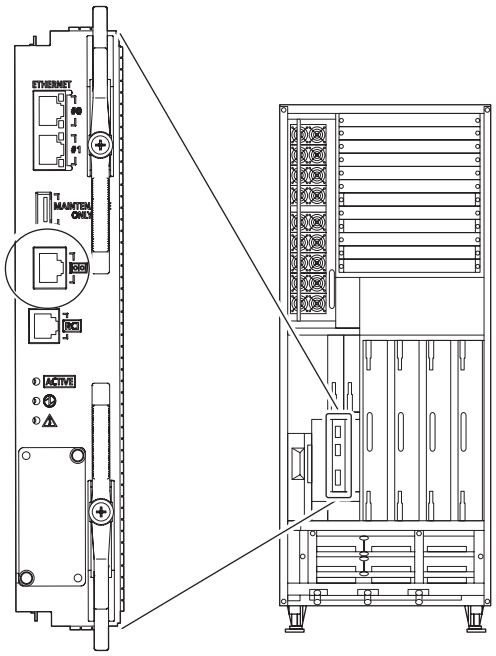
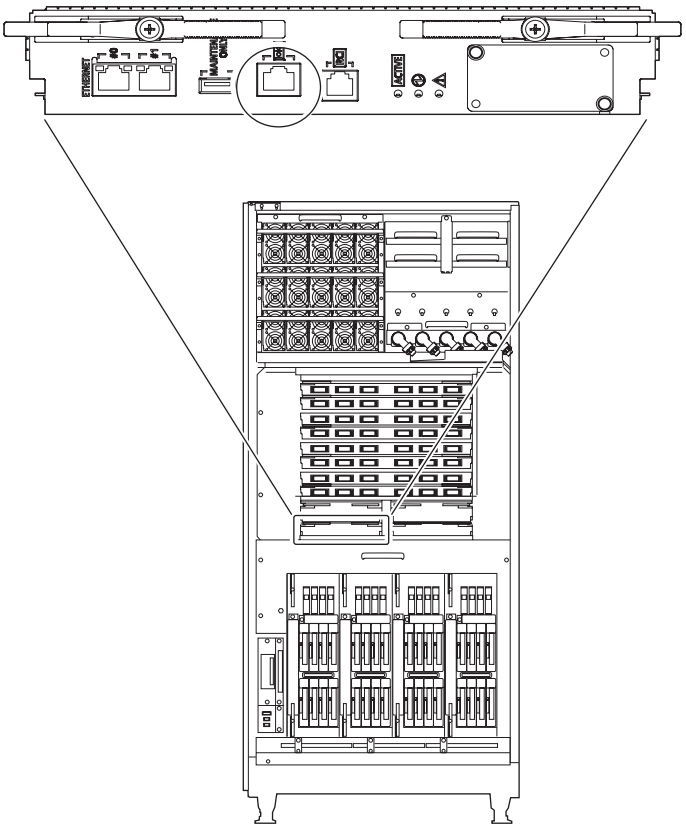


FIGURE 3-39 Serial Port on the XSCF Unit of the M9000 Server



3.5 Checking the Input Power

This section explains how to check the input power.

3.5.1 Single-Phase Power

Caution – Equipment damage – Each outlet must be in a circuit ranging from 200 to 240 VAC (30 A) and only be used for a power cord. An outlet to which a power cord is connected must be grounded.

1. **Before connecting a power cord, confirm that the main line switch on the ACS of the server is switched off.**
2. **Using a multimeter, verify that the input power fulfills power requirements.**

   For details, see Section 2.2.2.2, “Power Supply Requirements” on page 2-6.
3. **Connect the plug of each power cord to a dedicated outlet.**

3.5.2 Three-Phase Power

Using a multimeter, verify that the input power fulfills power requirements.

For details, see Section 2.2.2.2, “Power Supply Requirements” on page 2-6.

3.6 Setting and Checking the Required Information for the Servers

Before powering on the server, perform the initial setting of XSCF.

This section explains how to specify and check the required server information.

Note – To operate the XSCF Shell, use the console that was connected following the steps indicated in Section 3.4.4, “Connecting the Administration Console” on page 3-46.

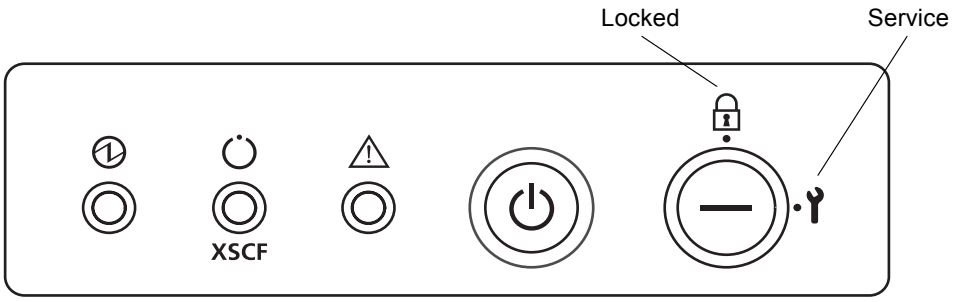
3.6.1 Switch On the Main Line Switches

The main line switch is the input power switch for the server. This section explains how to switch on the main line switches.

1. Set the mode switch on the operator panel to Service.

Note – The mode switching key on the operator panel is a server accessory.

FIGURE 3-40 Operator Panel



2. Switch on all the main line switches in the AC section on the equipment.

Note – Please wait at least 30 seconds before turning on the system power that you turned off, by using the main line switch or the circuit breakers on the distribution board.

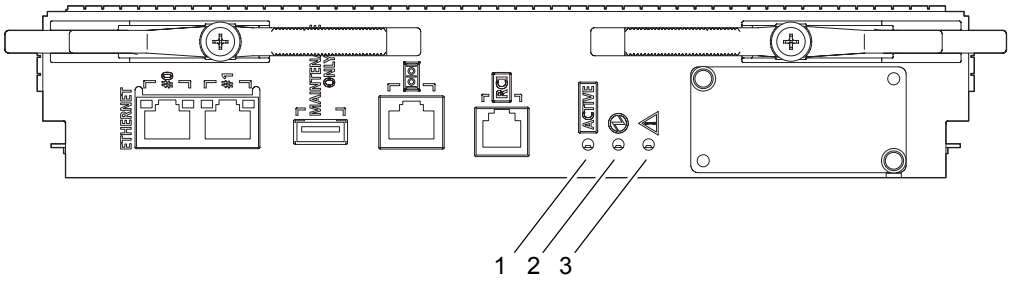
---

a. If the M9000 server has an expansion cabinet, turn on all the main line switches located on the expansion cabinet and the power cabinet connected to the expansion cabinet first.

b. Turn on all the main line switches located on the base cabinet and the power cabinet connected to the base cabinet.

Note – The CHECK LED (3) on the XSCF unit lights momentarily immediately after turning on the main line switch. The READY LED (green) (2) on the XSCF unit blinks when initialization starts, and it stays on when initialization is completed.

FIGURE 3-41 XSCF Unit LEDs



3. Confirm that the ACTIVE LED (1) and READY LED (2) on the XSCFU#0 are lit.

3.6.2 Logging Into the XSCF Shell

To make the initial setting of the XSCF, first use the default user account of the XSCF. Before an appropriate user account for the user environment is registered, log in by using the default user account and password. The default user privileges are `useradm` and `platadm`.

Log into the XSCF Shell by following the procedure below.

1. When the Login window is displayed, enter the default login name.

```
login: default
```

2. When the message to prompt for key switch operation is displayed, perform the following operations in accordance with the messages.

a. Change the key switch to “Locked” position.

```
Change the panel mode switch to Locked and press return...
```

b. Maintain the key switch in the “Locked” position for 5 seconds.

```
Leave it in that position for at least 5 seconds.
```

c. Set the key switch back to “Service” position.

```
Change the panel mode switch to Service and press return...
```

Note – In the case that Step c is not performed within 1 minute, the login certification will expire.

3. Confirm that the XSCF Shell prompt is displayed.

```
XSCF>
```

3.6.3 Initializing the XSCF

Before each XSCF function is used, configurations and checks must be performed. This section explains the settings and checks concerning the items listed below. For detailed procedures for these settings and checks, see "Setup For Using XSCF" section in the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide* and the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*.

- Registration of user accounts, passwords, and user privileges (`adduser`, `password`, and `setprivileges`) (Note 1)
- Time setting (`setdate`, `settimezone`)
- SSH/telnet setting (`setssh`, `settelnet`)
- Confirmation of the XSCF host public key (`showssh`)
- Network interface, routing, and DNS-related settings (`setnetwork`, `setroute`, `setnameserver`, and so on) (Note 2, Note 3)
- Domain to Service Processor Communications Protocol (DSCP) configuration (`setdscp`) (Note 3)
- Altitude setting (`setaltitude`) (Note 4)
- CD-RW/DVD-RW drive unit/Tape drive unit setting (`cfgdevice`)

Note – (1) In preparation for maintenance work, also prepare a user account for a field engineer (FE).

Note – (2) To apply the settings, the XSCF unit must be reset with the `applynetwork` and `rebootxscf` commands.

Note – (3) The same procedures are used to make network interface (XSCF-LAN, Domain to Service Processor Communications Protocol (DSCP), and so on), routing, and DNS-related settings after logging into the XSCFU#1 through a serial connection.

Note – (4) To apply the specified configuration, execute the `rebootxscf` command and reset XSCF.

3.6.4 Checking for a Capacity on Demand (COD) Board

If there is a COD board installed, run a diagnostic test on it.

Note – When a COD board is installed, you can not use the CPU before you install the COD hardware activation key (COD key).

For COD settings and command information, see the *SPARC Enterprise M4000/M5000/M8000/M9000 Servers Capacity on Demand (COD) User's Guide* and the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*.

1. **Check for a COD label on all CMUs mounted in the server.**

   A COD label is affixed on the front of a CMU that uses a COD board.

2. **Enter the `showboards -va` command in the XSCF Shell to check for a COD board.**

3. **If there is a COD board, enter the `testsb` command in the XSCF Shell to test the COD board.**

4. **Enter the `showboards` command in the XSCF Shell to check the test results.**

3.7 Powering On/Off the System

This section explains the following processes.

3.7.1 Powering On the System

To power on the system, follow the procedure below using the operator panel.

Note – For details about each command, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*

---

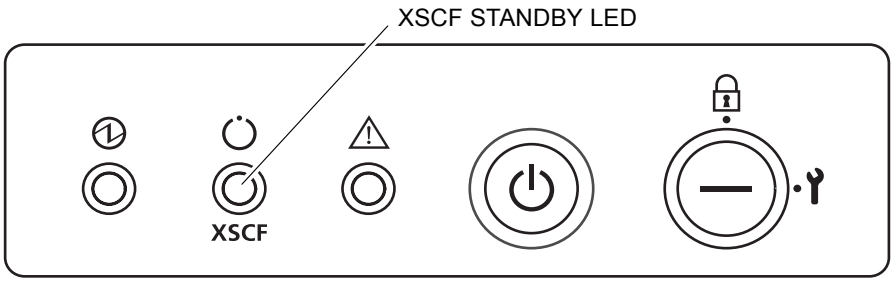
1. **Type the `console -d 0` command at the XSCF Shell.**

   This command switches the prompt from the XSCF console (`XSCF>`) to the domain console (`#`, the OS console).

```
XSCF> console -d domain_ID  (In this example, replace domain_ID with 0)
#
```

2. **Confirm that the mode switch on the operator panel is set to Service.**
3. **Confirm that the XSCF STANDBY LED (green) on the operator panel is lit.**

FIGURE 3-42 LEDs on the Operator Panel



4. **Press the POWER switch on the operator panel.**

   The server starts and the POST diagnostics begin.

5. **Confirm that `ok` is displayed on the domain console (OS console).**
6. **Check the Power LED on each unit.**

   When the system has normally powered on, the power LED will be on.

   If the above description differs from the actual LED indication, see Section B.1, “Actions to Take for Common Problems” on page B-1.

7. **Press the Enter, “#” (default escape character) , and “.” (period) keys.**

   These key combinations switch you from the domain console to the XSCF console.

8. **Type the `fmdump` or `showlogs` commands at the XSCF Shell.**

9. **Confirm that no error is displayed on the XSCF console as a result of the execution of either the `fmdump` or the `showlogs` command.**

   When an error is displayed, see Section B.2, "Using Troubleshooting Commands" on page B-2.

3.7.2 Confirming XSCF Redundancy

There are two XSCF units in the M8000/M9000 servers, and normally one of them is active and the other is on standby. The server is shipped from the factory with XSCFU#0 set as active.

Follow the instructions in this section to confirm that the active and standby XSCF units can be switched.

1. **Confirm that the ACTIVE LED on XSCFU#0 is on and the ACTIVE LED on XSCFU#1 is off.**

2. **Enter the `switchscf` command in the XSCF Shell to switch XSCFU#0 from active to standby.**

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

Note – Entering the `switchscf` command reboots the XSCF being switched from active to standby.

---

3. **Confirm that "XSCF Initial Complete" is displayed after the completion of rebooting of XSCFU#0.**

4. **Confirm that the ACTIVE LED on XSCFU#0 is off and the ACTIVE LED on XSCFU#1 is on.**

5. **Change the connection of the administration console to the serial port of XSCFU#1.**

6. **Log into the XSCF Shell from the administration console via the serial port.**

7. **Enter the `version` command in the XSCF Shell to confirm that XSCF#0 is on standby and XSCF#1 is active.**

```
XSCF> version -c xcp
<Display example: XCP1060>
XSCF#0 (Standby)
XCP0 (Reserve):1060
XCP1 (Current):1060
XSCF#1 (Active)
XCP0 (Reserve):1060
XCP1 (Current):1060
```

8. **Enter the** `switchscf` **command in the XSCF Shell to switch XSCFU#1 from active back to standby.**

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

9. **Confirm that "XSCF Initial Complete" is displayed after the completion of rebooting of XSCFU#1.**
10. **Confirm that the ACTIVE LED on XSCFU#0 is on and the ACTIVE LED on XSCFU#1 is off.**
11. **Change the connection of the administration console to the serial port of XSCFU#0.**
12. **Log into the XSCF Shell from the administration console via the serial port.**
13. **Enter the** `version` **command in the XSCF Shell to confirm that XSCF#0 is on standby and XSCF#1 is active.**

```
XSCF> version -c xcp
<Display example: XCP1060>
XSCF#0 (Active)
XCP0 (Reserve):1060
XCP1 (Current):1060
XSCF#1 (Standby)
XCP0 (Reserve):1060
XCP1 (Current):1060
```

3.7.3 Connecting an Ethernet Port

The system control network enables you to connect the administration console to the XSCF unit. A direct connection can be established for this purpose. However, this type of connection is usually made through a hub or switch that is unique to the system control network.

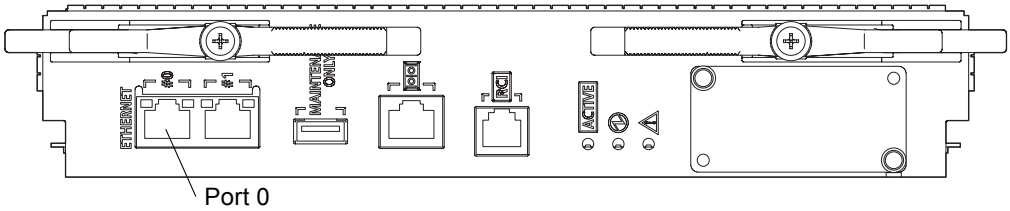
Note – The XSCF Ethernet port is IEEE 802.3i and IEEE 802.3u compliant. This requires auto-negotiation for the port into which it terminates.

For information on network connection patterns, see Section 4.1, "Network Connection Outline" on page 4-1.

1. **Use an Ethernet cable to connect Ethernet port 0 on the XSCF unit (XSCF-LAN) to the hub or the LAN port of the administration console.**

For connection examples for the administration console, see FIGURE 4-1 and FIGURE 4-2.

FIGURE 3-43 Ethernet Port 0 of the XSCF Unit



2. **From a telnet or a secure shell (SSH) client, specify the IP address and host name of the XSCF, and the port number if necessary, and establish a connection to the XSCF Shell via the XSCF-LAN.**

Note – The default port number for telnet is 23, and the default port number for SSH is 22.

---

3. **Log into the XSCF Shell at the administration console via the serial port.**

For information on the logging-in procedure, see Section 3.6.3, "Initializing the XSCF" on page 3-52.

Note – During login using SSH, you are prompted to confirm the authenticity of the fingerprint of the host public key. The reply is *yes* because no spoofing is assumed in this one-to-one connection.

---

4. **Confirm that the XSCF Shell prompt (`XSCF>`) is displayed.**

3.7.4 Verifying the Configuration

Verify the hardware configuration by following the procedure below on the administration console.

Note – For details of each command, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*.

---

1. **Type the `showhardconf` command at the XSCF Shell.**

   All the components mounted in the OPL system and their status information is displayed. For details on the `showhardconf` command and its output, see Section B.2.1, "Using the `showhardconf` Command" on page B-3.

2. **Confirm for each unit name that an asterisk (*) is not displayed on the left of the unit name.**

3. **Confirm that XSCFU#0 is Active, XSCFU#1 is Standby.**

4. **See the list of pre-mounted components and check the information.**

5. **Type the `showhardconf -u` command at the XSCF Shell.**

   The number of installed FRUs is displayed. For details on the `showhardconf` command and its output, see Section B.2.1, "Using the `showhardconf` Command" on page B-3.

6. **Check that the configuration displayed is equivalent to the shipping list.**

7. **Type the `console -d 0` command from the XSCF Shell.**

   This command switches the prompt from the XSCF console (`XSCF>`) to the domain console (the OS console) and the `ok` prompt is displayed.

8. **Type the `probe-scsi-all` command at the `ok` prompt.**

9. **Verify that the installed CD-RW/DVD-RW drive unit, tape drive unit, and hard disk units are recognized.**

10. **Type the `show-devs` command at the `ok` prompt.**

11. **Confirm that the installed PCI card has been recognized.**

12. **Press the Enter, "#" (default escape character) , and "." (period) keys.**

    The `#.` key sequence switches the prompt from the domain console to the XSCF console.

3.7.5 Checking the Dual-Power Feed

If the dual-power feed option is used, follow the procedure below to confirm that the system can operate even if one power feed is stopped.

1. **Confirm that the system is powered on by checking the output of the `showdomainstatus -a` command from the XSCF Shell..**
2. **Confirm that all main line switches of the single power feed are switched off.**
   - If you installed a M8000 server, switch off main line switches ACS_A#0 to ACS_A#2.
   - If you installed a M9000 server, switch off all the main line switches of the server.
3. **Confirm that the POWER LED on the operator panel is lit.**
4. **From the XSCF Shell, verify Power failure with the `showlogs event` command.**
5. **Switch on all the main line switches that were switched off in Step 2.**
6. **From the XSCF Shell, confirm a power recovery by executing the showlogs event command.**
7. **Confirm that the LED on each PSU stops blinking and remains lit.**
8. **From the XSCF Shell, confirm a Power Status is `On` by executing the `showhardconf` command.**
9. **Confirm that all main line switches of the dual-power feed system are switched off.**
   - If you installed a M8000 server, switch off the circuit breakers of the rack-mountable dual-power feed (ACS_A#20 to ACS_A#22).
   - If you installed a M9000 server, switch off all ACSs of the power cabinet.
10. **Confirm that the POWER LED on the operator panel is lit.**
11. **From the XSCF Shell, verify Power failure with the `showlogs event` command.**
12. **Switch on all the main line switches that were switched off in Step 9.**
13. **From the XSCF Shell, verify power recovery with the `showlogs event` command.**

3.7.6 Powering Off the System

To power off the system, follow the procedure below on the administration console.

1. **Type the `poweroff -d 0` command at the XSCF Shell.**

```
XSCF> poweroff -d domain_ID  (In this example, replace domain_ID with 0)
```

2. Check the POWER LED on the operator panel.

When the POWER LED is off and XSCF STANDBY LED is on, the system has been normally powered off.

If the above description differs from the actual LED indication, see Section B.1, “Actions to Take for Common Problems” on page B-1.

3.8 Connecting Additional Peripheral Devices

To add an External I/O Expansion Unit, a storage product, or any other peripheral devices, see the installation manual for the device.

For details on how to add PCI cards, see the *SPARC Enterprise M8000/M9000 Servers Service Manual*.

CHAPTER 4

Connecting Your Domains to the Network and Running the Oracle VTS Software

This chapter explains the following items which shows continuum of flow from a network connection for domain to a confirmation of hardware operation capabilities in Oracle VTS.

4.1 Network Connection Outline

This section provides an overview of the domain network connections.

A server can be connected to a network through the LAN port of an IOU onboard device card_A (IOUA) that is mounted in an I/O unit. Moreover, a user-prepared LAN card can be installed in the I/O unit, and the system can use this LAN card to connect to the network. The user network displayed in FIGURE 4-1 and FIGURE 4-2 shows how you can access the domain.

FIGURE 4-1 Network Connections

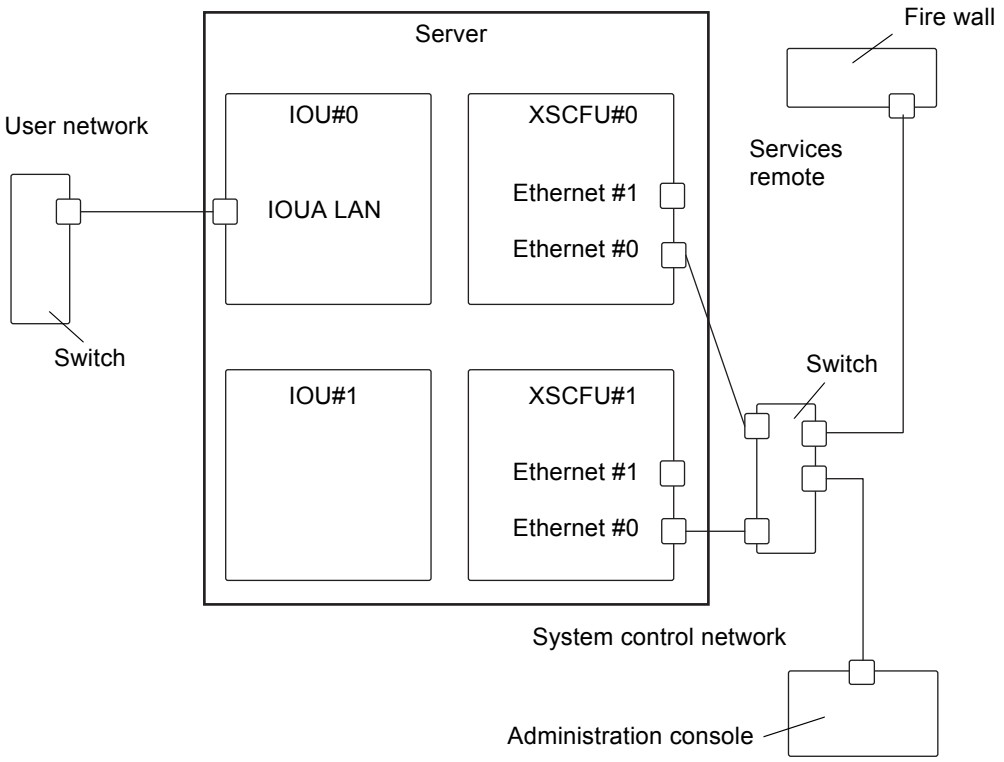
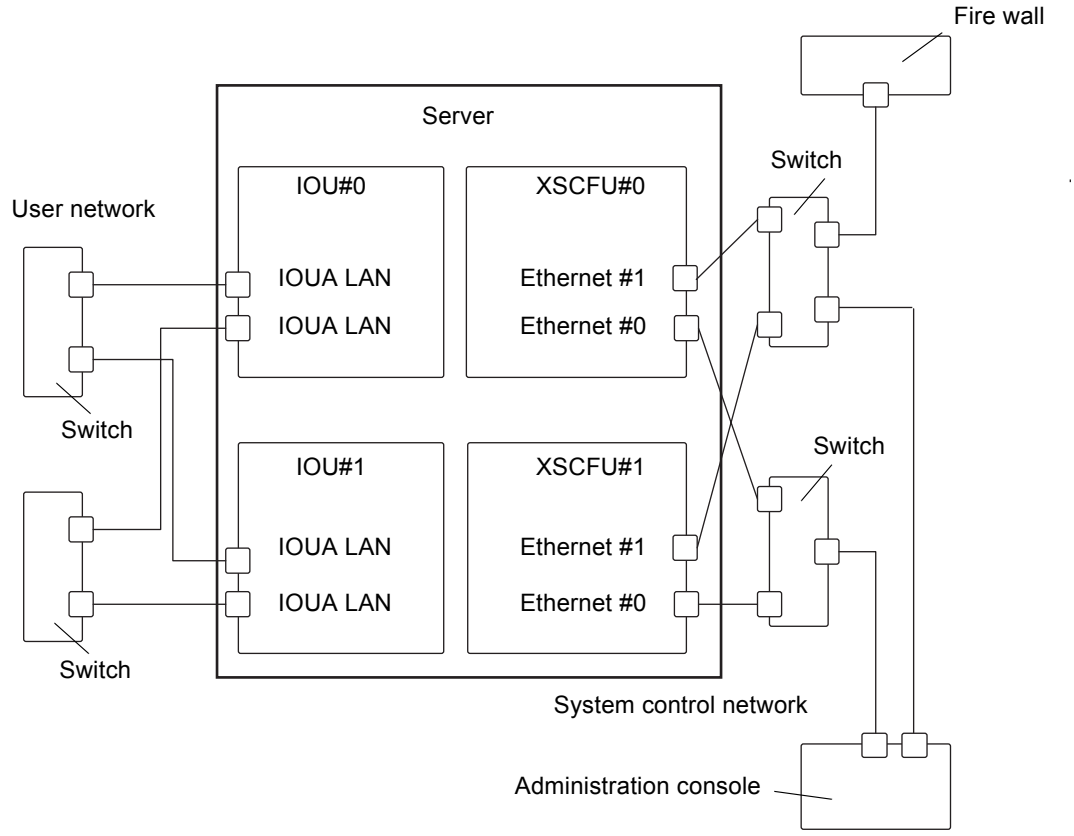


FIGURE 4-2 Network Connections



4.2 Connecting the System to Each Network

This section describes how the SPARC Enterprise M8000/M9000 servers from Oracle and Fujitsu connect to each network.

To connect the server to the network, prepare one or more of the hubs, switches, and LAN cables required.

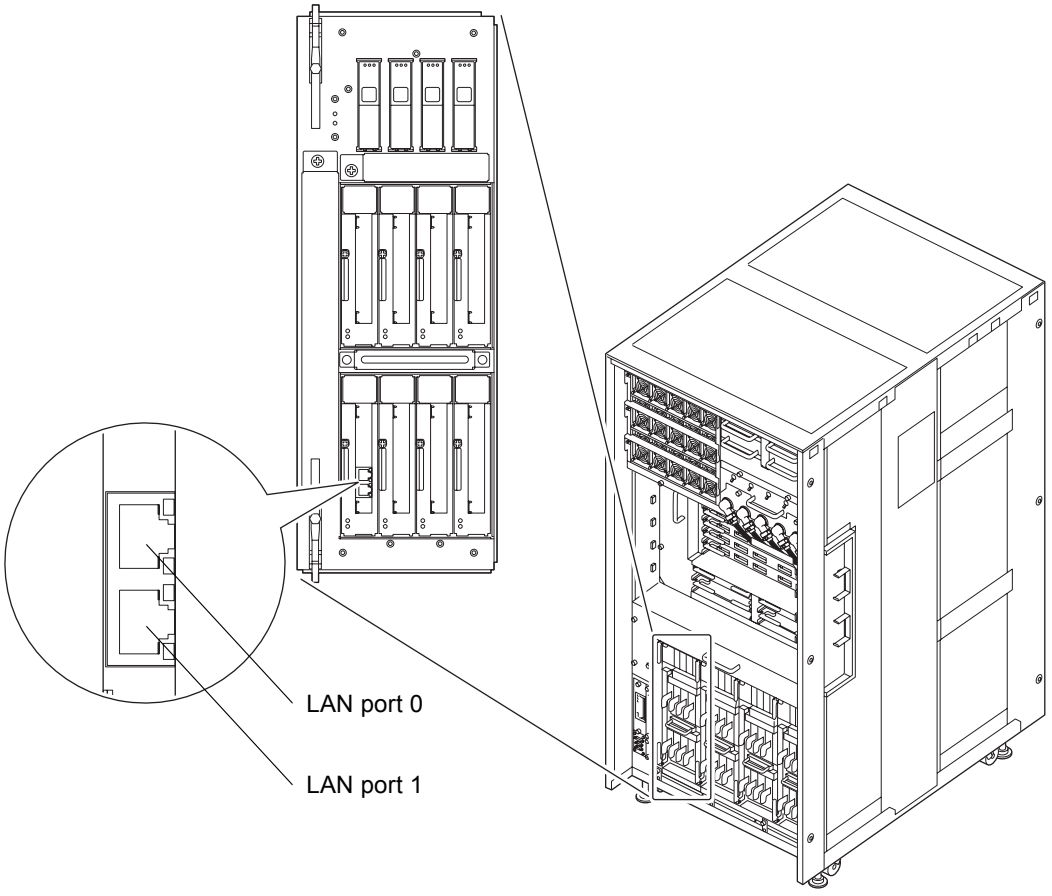
1. **Connect one end of the Ethernet cable to the I/O unit.**

   The Ethernet cable can be connected to either the LAN port of the IOUA or the LAN port of a LAN card installed in the I/O unit.

2. **Connect the other end of the Ethernet cable to the customer network.**

Note – By connecting the LAN port on the I/O unit to the customer network, the network can be accessed from the domain. Skip this step if the domain is to be isolated from the network.

FIGURE 4-3 IOUA LAN Port (Example)



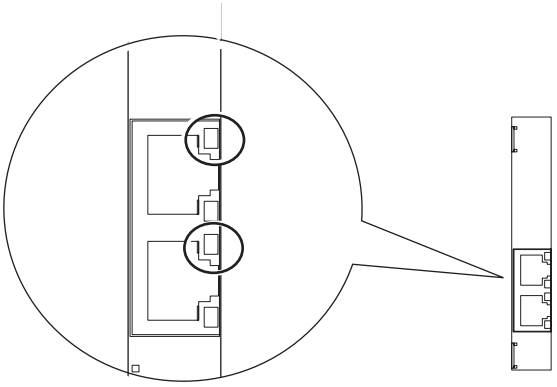
4.3 Verifying a Network Connection

This section explains how to confirm the connection of the user network in Section 4.2, “Connecting the System to Each Network” on page 4-4.

1. **Set the mode switch on the operator panel to Service.**
2. **Press the POWER switch on the operator panel to power on the system.**
3. **Confirm that the LINK SPEED LED on the LAN port, which has been connected to the I/O unit in Section 4.2, “Connecting the System to Each Network” on page 4-4 remains on.**

- When it is on in amber, the communication speed of LAN port is 1 G bps.
- When it is on in green, the communication speed of LAN port is 100 M bps.
- When it is off, the communication speed of LAN port is 10 M bps.

FIGURE 4-4 LINK SPEED LED on the LAN Port



4.4 Starting the Oracle Solaris Operating System

Use this procedure to start the Oracle Solaris operating system.

To start this procedure immediately after the procedure described in Section 4.3, “Verifying a Network Connection” on page 4-6, begin with Step 3.

Note – Oracle Solaris OS is pre-installed on the slot 0 of the hard disk drive (HDD) installed on I/O unit in slot 0. When you start Oracle Solaris OS from this HDD, a message appears to configure the Oracle Solaris OS in line with the environment in use.

1. **Set the mode switch on the operator panel to Service.**
2. **Press the POWER switch on the operator panel to power on the system.**
3. **Log into the XSCF Shell from the administration console.**
4. **Type the `console -d 0` command from the XSCF Shell.**

   This command switches the prompt from the XSCF console (`XSCF>`) to the domain console (`#`, the OS console).

```
XSCF> console -d domain_ID  (In this example, replace domain_ID with 0)
#
```

5. **Type the `boot` command at the `ok` prompt of the domain console (OS console).**

```
ok boot
```

6. **During the boot process, pay attention to whether any error message is displayed on the domain console (OS console).**

   If an error message is displayed, see Section B.1, “Actions to Take for Common Problems” on page B-1

7. **At the login prompt, log in by using the root privilege.**

4.5 Verifying the Operation Using the Oracle VTS Software

The Oracle VTS diagnostic software can be used to verify the hardware operation and to check the device connection status.

This section explains how to verify operation by using Oracle VTS.

Note – Oracle VTS is installed in the Oracle Solaris OS pre-installed version. For details, see the Oracle VTS user's guide.

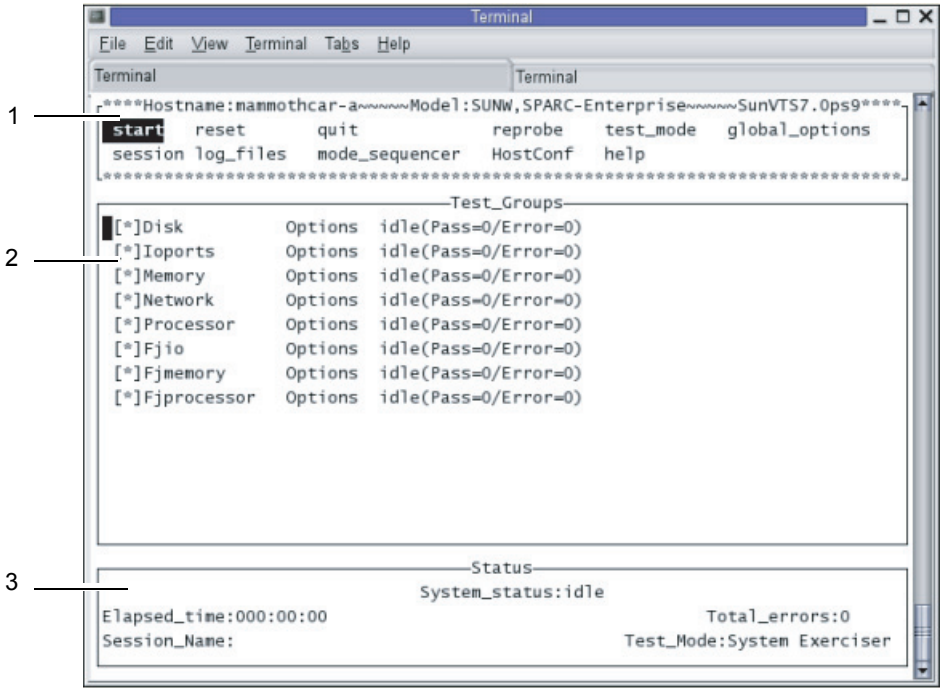
This section explains how to run the Oracle VTS 7.0ps9 software from the TTY user interface.

1. **Type the `sunvts` command to start the Oracle VTS software.**

```
# cd /usr/sunvts/bin
# ./startsunvts -t
```

2. **The Oracle VTS TTY main window appears.**

FIGURE 4-5 The Oracle VTS TTY Main Window



No.	Window Item
1	Control panel
2	Test_Groups panel
3	Status panel

TABLE 4-1 Description of the TTY Keyboard

Key	Description of Operation
Tab key	Shifts the focus to another window. For example, when you press the tab key on the Control panel, the focus (highlighted part) is shifted to the Status panel, which is then framed by asterisks (*).
Arrow keys	Moves between options in the panel.
Return	Displays the menu. This selects and applies an option or command on the menu.
Spacebar	Checks or unchecks the check box of an option in the test panel. [*]: Selected [ ]: Not selected
Backspace key	Deletes text in a text field.
Escape	Discards a pop-up menu or window.
Control-F	Scrolls forward in a scrollable window.
Control-B	Scrolls backward in a scrollable window.
Control-X	Quits the TTY user interface but leaves the Oracle VTS kernel running.
Control-L	Refreshes the TTY window.

3. **Select an item to be tested.**

   a. **Use the tab key to move to the Test_Groups panel.**

   b. **Use the arrow keys to select the item.**

4. **Run the test program.**

   a. **Use the tab key to move to the Control panel.**

   b. **Use the arrow keys to highlight `start`, and press the Return key.**

      A diagnosis begins.

   c. **Confirm that no Error is displayed in the Status panel or Message panel.**

5. **Stop the test program.**

   a. **Use the tab key to move to the Control panel.**

   b. **Use the arrow keys to highlight `stop`, and press the Return key.**

6. **Check the test results.**

   When the test program is stopped, the number of test loops executed and the number of errors are displayed.

   Confirm that there is no error.

7. **Press the Enter key, and then press the "#" and "." (period) keys.**

   This key combination switches you from the domain console to the XSCF console.

8. **Type the `fmdump` command or the `showlogs error` command at the XSCF Shell.**

9. **Confirm that no errors are displayed in the XSCF console after using the `fmdump` or the `showlogs error` commands.**

   If an error is displayed, see Section B.2, “Using Troubleshooting Commands” on page B-2.

10. **Type the `poweroff -d 0` command at the XSCF Shell to power off the system.**

```
XSCF> poweroff -d 0  (In this example, the domain ID is 0)
```

11. **Set the mode switch on the operator panel back to Locked, and hand the key to the system administrator.**

12. **Close the door of the cabinet and hand the door key to the system administrator.**

APPENDIX **A**

System Views

This appendix provides views of each model.

A.1 M8000 Server Views

FIGURE A-1 M8000 Server - Front View

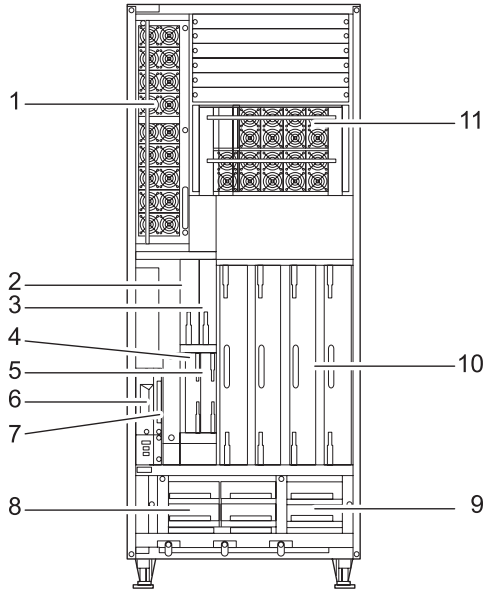


TABLE A-1 M8000 Server Unit Names

No.	Name	Abbreviation
1	Power supply unit	PSU#0 to #8
2	DC-DC converter	DDC_A#0
3	DC-DC converter	DDC_A#1
4	eXtended System Control Facility unit	XSCFU_B#0
5	eXtended System Control Facility unit	XSCFU_B#1
6	Tape drive unit	TAPEU*
7	CD-RW/DVD-RW drive unit	DVDU
8	2 FAN unit	FAN_B#0,#1

TABLE A-1 M8000 Server Unit Names *(Continued)*

No.	Name	Abbreviation
9	3 FAN unit	FAN_A#0 to #3
10	CPU memory board unit	CMU#0 to #3
11	Power supply unit (for DPF)	PSU#40 to #48

* Contact your sales representative for tape drive unit options on M8000/M9000 servers.

FIGURE A-2 M8000 Server - Rear View

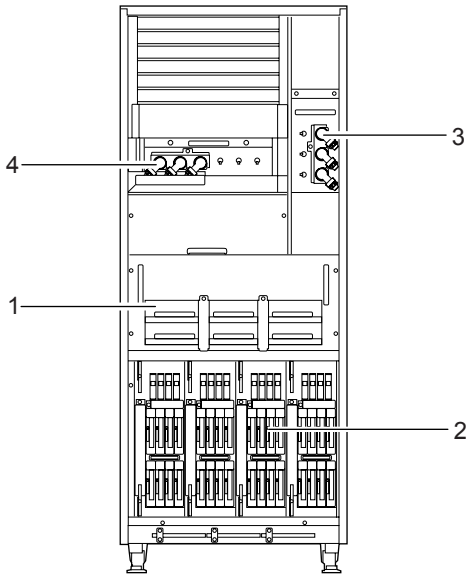


TABLE A-2 M8000 Server Unit Names

No.	Name	Abbreviation
1	2 FAN unit	FAN_B#2 to #7
2	I/O unit	IOU#0 to #3
3	AC section	ACS_A#0
4	AC section (for DPF)	ACS_C#0

A.2 M9000 Server Views

FIGURE A-3 M9000 Server - Front View

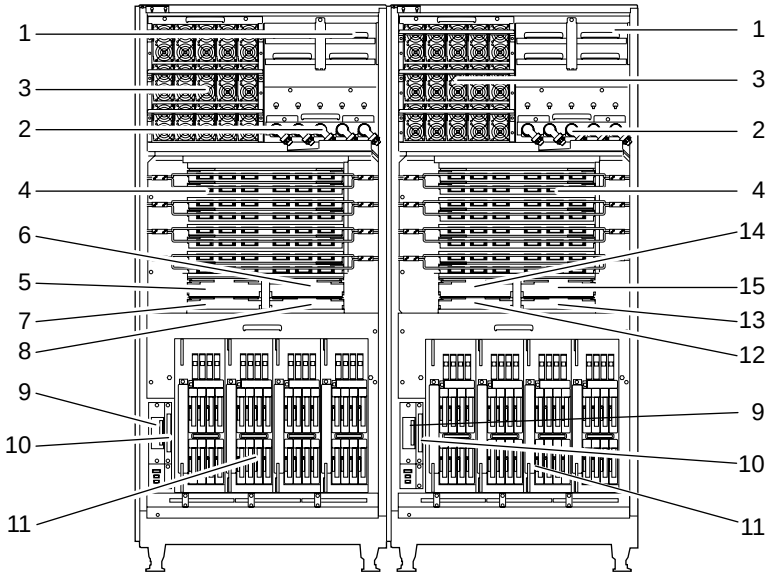


TABLE A-3 M9000 Server Unit Names

No.	Name	Abbreviation
1	2 FAN unit	FAN_A#0 to #3, #20 to #23
2	AC section	ACS_B#0, ACS_B#1
3	Power supply unit	PSU#0 to #14, #20 to #34
4	Crossbar unit (for base cabinet)	XBU_B#0 to #7, #8 to #15
5	Clock control unit (M8000, M9000 for base cabinet)	CLKU_B#0
6	Clock control unit (M8000, M9000 for base cabinet)	CLKU_B#1
7	eXtended System Control Facility unit (M8000, M9000 for base cabinet)	XSCFU_B#0

TABLE A-3 M9000 Server Unit Names *(Continued)*

No.	Name	Abbreviation
8	eXtended System Control Facility unit (M8000, M9000 for base cabinet)	XSCFU_B#1
9	Tape drive unit	TAPEU*
10	CD-RW/DVD-RW drive unit	DVDU
11	I/O unit	IOU#0, #2, #4, #6, #8, #10, #12, #14
12	eXtended System Control Facility unit (For M9000 Expansion cabinet)	XSCFU_C#0
13	eXtended System Control Facility unit (For M9000 Expansion cabinet)	XSCFU_C#1
14	Clock control unit (For M9000 Expansion cabinet)	CLKU_B#2
15	Clock control unit (For M9000 Expansion cabinet)	CLKU_B#3

* Contact your sales representative for tape drive unit options on M8000/M9000 servers.

FIGURE A-4 M9000 Server - Rear View

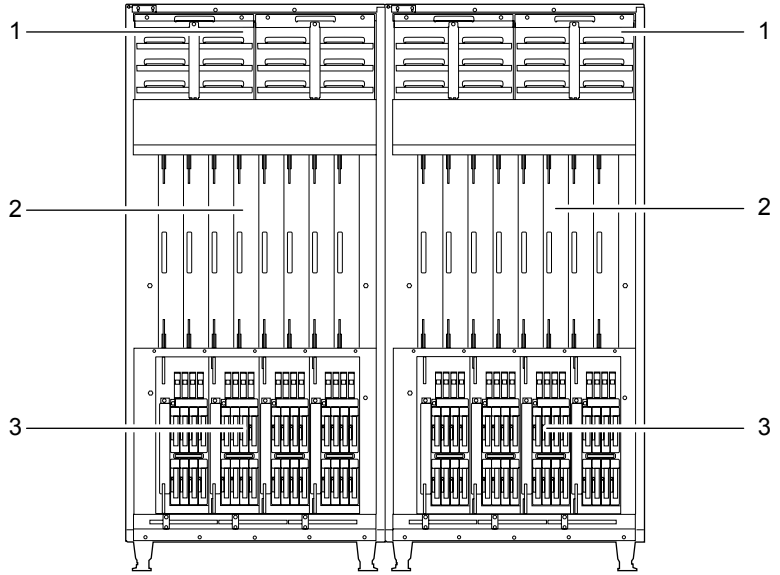


TABLE A-4 M9000 Server Unit Names

No.	Name	Abbreviation
1	2 FAN unit	FAN_A#4 to #15, #24 to #35
2	CPU memory board unit	CMU#0 to #7, #8 to #15
3	I/O unit	IOU#9, #11, #13, #15, #1, #3, #5, #7

A.3 Power Cabinet Views

A.3.1 M8000 Server + Power Cabinet

FIGURE A-5 M8000 Server + Power Cabinet - Front View

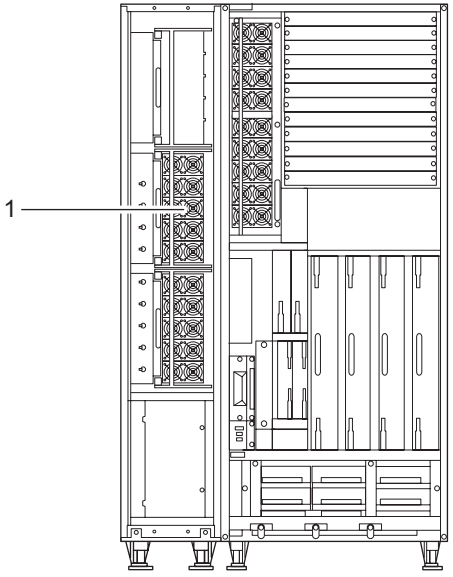


TABLE A-5 M8000 Server + Power Cabinet Unit Names

No.	Name	Abbreviation
1	Power supply unit	PSU#40 to #48

FIGURE A-6 M8000 Server + Power Cabinet - Rear View

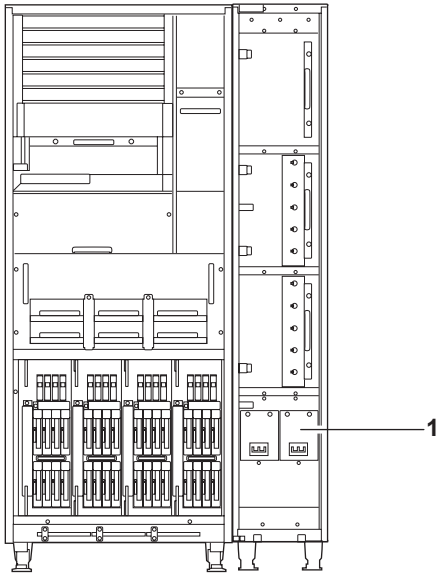


TABLE A-6 M8000 Server + Power Cabinet Unit Name

No.	Name	Abbreviation
1	AC section	ACSTPH#0, ACSTPH#1

A.3.2 M9000 Server + Power Cabinet

FIGURE A-7 M9000 Server + Power Cabinet - Front View

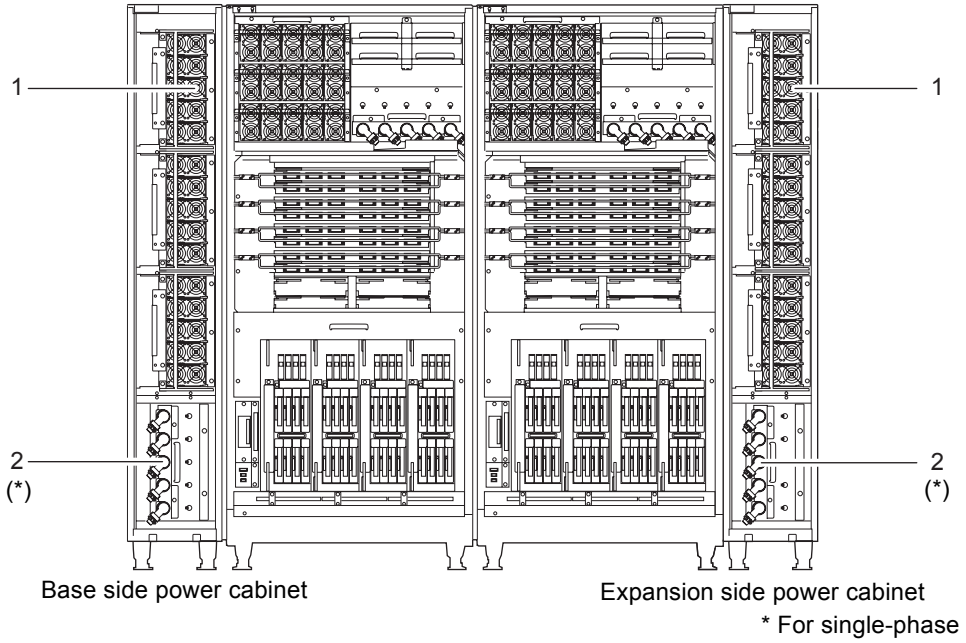


TABLE A-7 M9000 Server + Power Cabinet Unit Names

No.	Name	Abbreviation
1	Power supply unit	PSU#40 to #54, #60 to #74
2	AC section	ACS_B#2, ACS_B#3 (for single-phase)

FIGURE A-8 M9000 Server + Power Cabinet - Rear View

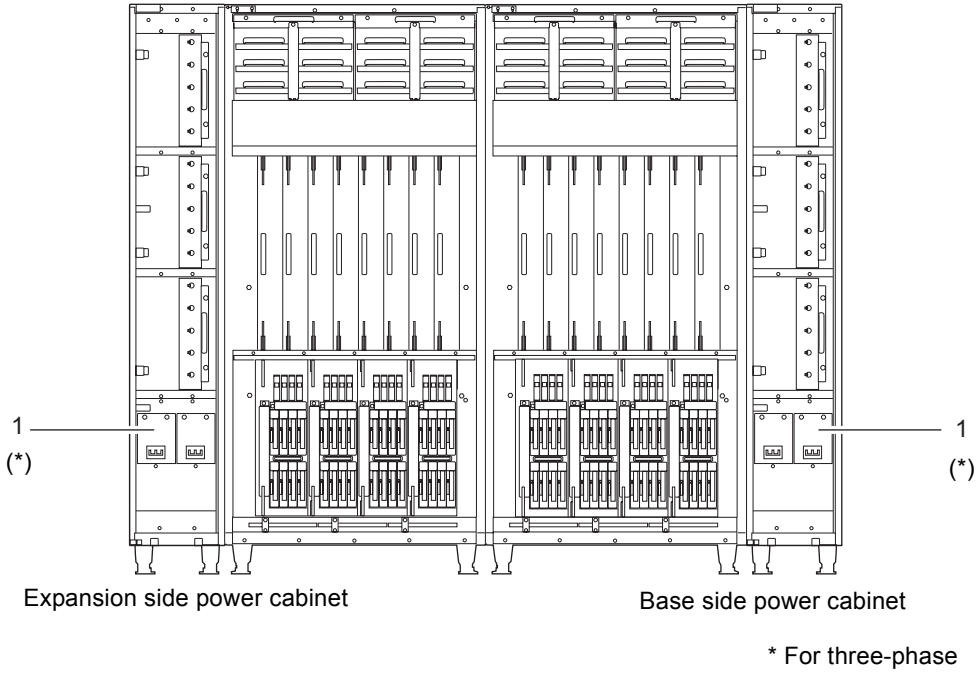


TABLE A-8 M9000 Server + Power Cabinet Unit Name

No.	Name	Abbreviation
1	AC section	ACSTPH#0, ACSTPH#1 (for three-phase)

A.4 Operator Panel Overview

You can use the operator panel to view the operating status of the server as a whole and perform operations such as system power operations. You can use it while the cabinet doors are closed.

The following figure shows the appearance of the operator panel.

FIGURE A-9 Operator Panel

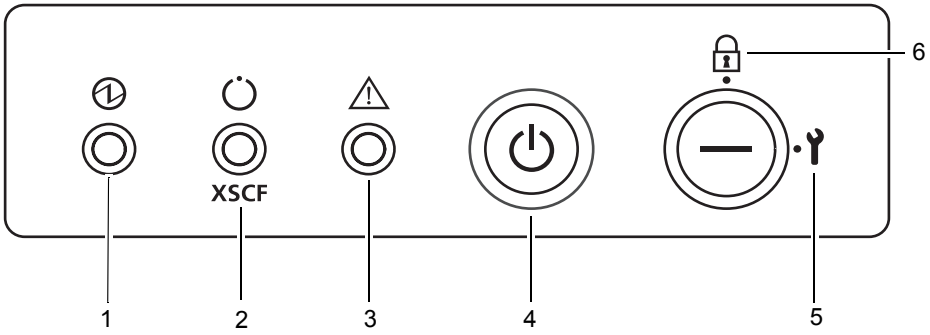


TABLE A-9 LEDs and Switches on the Operator Panel

No.	Icon	Name	Description
1		POWER LED (Green)	Indicates the server power status. • On: Server has power. • Off: Server is without power. • Blinking: The power-off sequence is in progress.
2		XSCF STANDBY LED (Green)	Indicates the readiness of the XSCF. • On: XSCF unit is functioning normally. • Off: XSCF unit is stopped. • Blinking: Under system initialization after NFB on, or under system power-on process.
3		CHECK LED (Amber)	Indicates that server detected a fault. • On: Error detected that disables the startup. • Off: Normal, or the breaker is off (power failure). • Blinking: Indicates the position of fault.

TABLE A-9 LEDs and Switches on the Operator Panel *(Continued)*

No.	Icon	Name	Description
4		POWER switch	Switch to direct server power on/power off.
5		Mode switch	The Locked setting: Normal operation mode • The system can be powered on with the POWER switch, but it cannot be powered off with the POWER switch. • The key can be pulled out at this key position.
			The Service setting: Mode for maintenance • The system can be powered on and off with the POWER switch. • The key cannot be pulled out at this key position. • Maintenance is performed in Service mode while the server is stopped.

TABLE A-10 Function of the Mode Switch

Function State Definition	Mode Switch Locked	Service
Inhibition of Break Signal Reception	Enabled. Reception of the break signal can be enabled or disabled for each domain using `setdomainmode`.	Disabled
Power On/Off by power switch	Only power on is enabled	Enabled

APPENDIX **B**

Troubleshooting

This appendix explains how to deal with possible problems during system installation.

B.1 Actions to Take for Common Problems

This section describes the more common problems in installation and solutions to the problems.

TABLE B-11 Types of Troubleshooting Methods

Problem	Solution
The system cannot be powered on.	• Confirm that the power cords are connected. • Confirm that the ACS for the input power supply is on. • If a UPS is connected, confirm that the server and the UPS are correctly connected, the UPS is powered on, and the LED on the UPS indicates the normal state. • Confirm that the distribution panel for the device is on.

Caution – Please do not make any repairs to the system by yourself. Contact us and ensure that repair of the system will be performed by a certified service engineer. When the authorized service personnel perform their work on your system, they may need to log into the system with the `domainadm` privilege for the administration of a specific domain, the

platadm privilege for management of the entire system, or the fieldeng privilege for the maintenance work. If our engineer asks you to supply this permission, please take appropriate action to ensure that the engineer can perform the required work.

In the event that problems occur, the methods of troubleshooting may vary depending on the server operating status and the nature of the problem. The following table outlines different types of troubleshooting methods.

TABLE B-12 Types of Troubleshooting Methods

Troubleshooting Method	Explanation
Checking LEDs	The system LEDs on the operation panel indicate the system or hardware error that has been detected during an initial diagnosis or system operation. Also, the LEDs on a FRU, such as an XSCFU, PSU, or fan, identify a faulty device or indicate the device status. For details on types of LEDs and error indications of LEDs, see the *SPARC Enterprise M8000/M9000 Servers Service Manual*.
Checking from the XSCF Shell	Detailed error status and the history of device conditions can be checked from the XSCF Shell. For details, see the *XSCF User's Guide* for your server.
Checking the system log file	The system log file (/var/adm/messages) can be checked to find a message for the error or panic detected by the OS. For details, see the *SPARC Enterprise M8000/M9000 Servers Service Manual*.

B.2 Using Troubleshooting Commands

The following commands are detailed in this section.

B.2.1 Using the showhardconf Command

The showhardconf command displays information about each FRU, including the following information:

- Current configuration and status
- Number of installed FRUs
- Domain information
- External I/O Expansion Unit information
- Name properties of PCI cards

CODE EXAMPLE B-1 displays example showhardconf command output, and. CODE EXAMPLE B-2 displays example showhardconf -u command output.

CODE EXAMPLE B-1 Example showhardconf Command Output

```
XSCF> showhardconf
SPARC Enterprise M9000;
   + Serial:PA30601004; Operator_Panel_Switch:Locked;
    + Power_Supply_System:Single-1Phase; Ex:Single-1Phase; SCF-ID:XSCF#0;
   + System_Power:On; System_Phase:Cabinet Power On;
   Domain#0 Domain_Status:Running;

  CMU#0 Status:Normal; Ver:8301h; Serial:PP0616B579  ;
      + FRU-Part-Number:CA06620-D004 B0   /371-4930-02          ;
      + Memory_Size:128 GB;
      + Type:C;
      CPUM#0-CHIP#0 Status:Normal; Ver:0a01h; Serial:PP091505ZY  ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
      CPUM#1-CHIP#0 Status:Normal; Ver:0a01h; Serial:PP091505ZW  ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:2.280 GHz; Type:16;
          + Core:2; Strand:2;
       CPUM#2-CHIP#0 Status:Normal; Ver:0a01h; Serial:PP0915060H  ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
      CPUM#3-CHIP#0 Status:Normal; Ver:0a01h; Serial:PP09150603  ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
      MEM#00A Status:Normal;
          + Code:7f7ffe00000000004aEBE41RE4ABHA-5C-E 3020-22211d88;
          + Type:4B; Size:4 GB;
      MEM#00B Status:Normal;
```

CODE EXAMPLE B-1 Example `showhardconf` Command Output *(Continued)*

```
          + Code:7f7ffe00000000004aEBE41RE4ABHA-5C-E 3020-2a002a55;
          + Type:4B; Size:4 GB;
                  :
       MEM#33A Status:Normal;
          + Code:ce0000000000000001M3 93T5168AZ0-CD5 3041-741a8ea1;
          + Type:4B; Size:4 GB;
       MEM#33B Status:Normal;
          + Code:ce0000000000000001M3 93T5168AZ0-CD5 3041-741a8ea1;
          + Type:4B; Size:4 GB;
                  :
    CMU#2 Status:Normal; Ver:8301h; Serial:PP0618K472  ;
       + FRU-Part-Number:CA06620-D004 B0   /371-4930-02          ;
       + Memory_Size:32 GB;
       + Type:C;
       CPUM#0-CHIP#0 Status:Normal; Ver:0a01h; Serial:PP0608J517
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
       CPUM#1-CHIP#0 Status:Normal; Ver:0a01h; Serial:PP0620P552  ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
       CPUM#2-CHIP#0 Status:Normal; Ver:0a01h; Serial:PP0631Q396  ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
       CPUM#3-CHIP#0 Status:Normal; Ver:0a01h; Serial:PP0629H443  ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
       MEM#00A Status:Normal;
          + Code:7f7ffe00000000004aEBE10RD4AGFA-5C-E 3020-221d6855;
          + Type:1A; Size:1 GB;
       MEM#00B Status:Normal;
          + Code:7f7ffe00000000004aEBE10RD4AGFA-5C-E 3020-221fcdb7;
          + Type:1A; Size:1 GB;
                :
       MEM#33A Status:Normal;
          + Code:7f7ffe00000000004aEBE10RD4AGFA-5C-E 3020-221d678b;
          + Type:1A; Size:1 GB;
       MEM#33B Status:Normal;
          + Code:2cffffffffffffff0818HTF12872Y-53EB3 0300-69aedd7a;
          + Type:1A; Size:1 GB;
    CMU#3 Status:Normal; Ver:8301h; Serial:PP0638F192 ;
       + FRU-Part-Number:CA06620-D004 A0 /371-4930-01    ;
       + Memory_Size:64 GB;
       + Type:C;
```

CODE EXAMPLE B-1 Example `showhardconf` Command Output *(Continued)*

```
      CPUM#0-CHIP#0 Status:Normal; Ver:0901h; Serial:PP0631P606 ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
      CPUM#1-CHIP#0 Status:Normal; Ver:0901h; Serial:PP0630M355 ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
      CPUM#2-CHIP#0 Status:Normal; Ver:0901h; Serial:PP0628D036 ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
      CPUM#3-CHIP#0 Status:Normal; Ver:0901h; Serial:PP0630M365  ;
          + FRU-Part-Number:CA06620-D061 B1   /371-4929-02          ;
          + Freq:3.000 GHz; Type:48;
          + Core:4; Strand:2;
      MEM#00A Status:Normal;
          + Code:7f7ffe00000000004aEBE10RD4AGFA-5C-E 3020-221d6855;
          + Type:1A; Size:1 GB;
      MEM#00B Status:Normal;
          + Code:7f7ffe00000000004aEBE10RD4AGFA-5C-E 3020-221fcdb7;
          + Type:1A; Size:1 GB;
                :
      MEM#33A Status:Normal;
          + Code:7f7ffe00000000004aEBE10RD4AGFA-5C-E 3020-221d678b;
          + Type:1A; Size:1 GB;
      MEM#33B Status:Normal;
          + Code:2cffffffffffffff0818HTF12872Y-53EB3 0300-69aedd7a;
          + Type:1A; Size:1 GB;
                :
   IOU#0 Status:Normal; Ver:0101h; Serial:PP072102UN  ; ;
      + FRU-Part-Number:CA06620-D102 B1   /371-2217-02        ;
      + Type:A;
      PCI#0 Name_Property:pci; Card_Type:IOUA;
          + Serial:PP0611T826 ; Type:2;
          + FRU-Part-Number: CA21138-B84X 010AE/371-5000-05 ;
        PCI#1 Status:Normal; Name_Property:LSILogic,sas; Card_Type:Other;
          + Serial:0000004; Type:F20
          + FRU-Part-Number:5111500-01
   IOU#1 Status:Normal; Ver:0101h; Serial:PP072102UM    ;
      + FRU-Part-Number:CA06620-D102 B1   /371-2217-02         ;
      + Type:A;
      PCI#0 Name_Property:pci; Card_Type:IOUA;
          + Serial:PP0611T825 ; Type:2;
          + FRU-Part-Number: CA21138-B84X 010AE/371-5000-05
   IOU#2 IOU#2 Status:Normal; Ver:4201h; Serial:PP0727053S;
      + FRU-Part-Number:CA06620-D103 A0 /371-4931-01        ;
```

CODE EXAMPLE B-1 Example `showhardconf` Command Output *(Continued)*

```
      + Type:B;
      PCI#4 Name_Property:pci; Card_Type:IOUA;
          + Serial:PP0611T823 ; Type:2;
          + FRU-Part-Number: CA21138-B84X 010AE/371-5000-05  ;
                :
   XSCFU_B#0 Status:Normal,Active; Ver:0201h; Serial:PP080600DW  ;
       + FRU-Part-Number:CA06620-D342 C0   /371-2228-02          ;
                :
   XBU_B#0 Status:Normal; Ver:0201h; Serial:PP0641X324  ;
       + FRU-Part-Number:CA06620-D302 C1   /371-2240-03          ;
                :
   CLKU_B#0 Status:Normal; Ver:0201h; Serial:PP0542M679  ;
       + FRU-Part-Number:CA06620-D322 C1   /371-2230-03          ;
                :
   OPNL#0 Status:Normal; Ver:0101h; Serial:PP06058246  ;
       + FRU-Part-Number:CA06620-D382 A2   /371-2239-01          ;
   PSU#0 Status:Normal; Serial:FA11155187;
       + FRU-Part-Number:CA01022-0690 20H  /371-2219-08   ;
       + Power_Status:On;
                :
   FANBP_A#0 Status:Normal; Ver:0101h; Serial:PP0607D266  ;
       + FRU-Part-Number:CA21128-B71X 011AE/371-2222-05          ;
       FAN_A#0 Status:Normal; Serial:PA0605B287;
           + FRU-Part-Number:CA06622-D012 A5   /371-2237-01          ;
                :
       FAN_A#15 Status:Normal; Serial:PA0605B303;
           + FRU-Part-Number:CA06622-D012 A5   /371-2237-01          ;
                :
   FANBP_B#0 Status:Normal; Ver:0201h; Serial:PP0607D270  ;
       + FRU-Part-Number:CA21128-B72X 011AE/371-2223-05          ;
       FAN_A#4 Status:Normal; Serial:PA0605B297;
           + FRU-Part-Number:CA06622-D012 A5   /371-2237-01         ;
                :
       FAN_A#9 Status:Normal; Serial:PA0605B300;
           + FRU-Part-Number:CA06622-D012 A5   /371-2237-01          ;
                :
   SWBP#0 Status:Normal; Ver:0101h; Serial:PP0607E759  ;
       + FRU-Part-Number:CA20397-B57X 022AG/371-2243-01          ;
   MEDBP#0 Status:Normal; Ver:0101h; Serial:PP06058497  ;
       + FRU-Part-Number:CA20397-B56X 005AA/371-2244-01          ;
```

Refer to the `showhardconf`(8) man page for more information.

CODE EXAMPLE B-2 Example `showhardconf -u` Command Output

```
XSCF> showhardconf -u
SPARC Enterprise M9000; Memory_Size:240 GB;
    +-------------------------------------+------------+
    |      FRU                            |  Quantity  |
    +-------------------------------------+------------+
    | CMU                                 |        4   |
    |     Type:C;                         |    (   4)  |
    |     CPUM                            |       16   |
    |         Freq:3.000 GHz;             |    (  16)  |
    |     MEM                             |      112   |
    |         Type:1A; Size:1 GB;         |    (  48)  |
    |         Type:2B; Size:2 GB;         |    (  32)  |
    |         Type:4B; Size:4 GB;         |    (  32)  |
    | IOU                                 |        8   |
    |     Type:A;                         |    (   6)  |
    |     Type:B;                         |    (   2)  |
    | XSCFU_B                             |        2   |
    | XBU_B                               |        8   |
    | CLKU_B                              |        2   |
    | OPNL                                |        1   |
    | PSU                                 |       15   |
    | FANBP_A                             |        1   |
    | FANBP_B                             |        1   |
    |     FAN_A                           |       16   |
    | SWBP                                |        1   |
    | MEDBP                               |        1   |
    +-------------------------------------+------------+
```

B.2.2 Using the `showlogs` Command

The `showlogs` command will display the contents of a specified log file in the order of the timestamp, starting with the oldest date. The `showlogs` command can display the following logs:

- Error log
- Power log
- Event log
- Temperature and humidity record
- Monitoring message log
- Console message log
- Panic message log
- IPL message log

```
XSCF> showlogs error
Date: Mar 30 12:45:31 JST 2005 Code: 00112233-44556677-8899aabbcceeff0
Status: Warning Occurred: Mar 30 17:45:31.000 JST 2005
FRU: PSU#1,PSU#2
Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
Date: Mar 30 17:45:31 JST 2005 Code: 00112233-44556677-8899aabbcceeff00
Status: Alarm Occurred: Mar 30 17:45:31.000 JST 2005
FRU: PSU#1,PSU#2,*
Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
XSCF>0
```

B.2.3 Using the `showstatus` Command

Displays the information concerning the units failed or degraded and the units on the next upper layer, among the FRUs composing the system. An asterisk (*) indicating abnormal unit is displayed along with any of the following the "`Status:`":

- Normal
- Faulted
- Degraded
- Deconfigured
- Maintenance

In this example, a CPU module and memory module in a CPU memory unit are degraded.

```
XSCF> showstatus
    CMU#0;
*       CPUM#0-CHIP#0 Status:Faulted;
*       MEM#00A Status:Faulted;
XSCF>
```

B.2.4 Using the fmdump Command

The fmdump command can be used to display the contents of any log files associated with the Oracle Solaris fault manager.

This example assumes there is only one fault.

```
# fmdump
TIME UUID SUNW-MSG-ID
Nov 02 10:04:15.4911 0ee65618-2218-4997-c0dc-b5c410ed8ec2 SUN4-8000-0Y
```

B.2.4.1 Using the fmdump -V Command

You can obtain more details by using the -V option with the fmdump command.

```
# fmdump -V -u  0ee65618-2218-4997-c0dc-b5c410ed8ec2
TIME                 UUID                                 SUNW-MSG-ID
Nov 02 10:04:15.4911 0ee65618-2218-4997-c0dc-b5c410ed8ec2  SUN4-8000-0Y
100% fault.io.fire.asic
FRU: hc://product-id=SUNW,A70/motherboard=0
rsrc: hc:///motherboard=0/hostbridge=0/pciexrc=0
```

At least three lines of new output are delivered to the user with the -V option.

- The first line is a summary of information you have seen before in the console message but includes the timestamp, the UUID, and the Message-ID.
- The second line is a declaration of the certainty of the diagnosis. In this case we are 100% sure the failure is in the ASIC described. If the diagnosis involves multiple components you might see two lines here with 50% in each (for example)
- The FRU line declares the part which needs to be replaced in order to return the server to a fully operational state.
- The rsrc line describes what component was taken out of service as a result of this fault.

B.2.4.2 Using the `fmdump -e` Command

To get information about the errors that caused this failure, use the `-e` option with the `fmdump` command.

```
# fmdump -e
TIME                 CLASS
Nov 02 10:04:14.3008 ereport.io.fire.jbc.mb_per
```

B.2.5 Using the `fmadm faulty` Command

The `fmadm faulty` command can be used by administrators and service personnel to view and modify system configuration parameters that are maintained by the Oracle Solaris Fault Manager. The `fmadm faulty` command is primarily used to determine the status of a component involved in a fault.

```
# fmadm faulty
STATE    RESOURCE / UUID
--------------------------------------------------------------------
degraded dev:////pci@1e,600000
                0ee65618-2218-4997-c0dc-b5c410ed8ec2
```

The PCI device is degraded and is associated with the same UUID as seen above. You might also see “faulted” states.

B.2.5.1 Using the `fmadm config` Command

The `fmadm config` command output shows you the version numbers of the diagnosis engines in use by your server, as well as their current state. You can check these versions against information on the My Oracle Support website to determine if you are running the latest diagnostic engines.

```
# fmadm config
MODULE              VERSION  STATUS   DESCRIPTION
cpumem-diagnosis    1.5      active   UltraSPARC-III/IV CPU/Memory Diagnosis
cpumem-retire       1.0      active   CPU/Memory Retire Agent
eft                 1.13     active   eft diagnosis engine
fmd-self-diagnosis  1.0      active   Fault Manager Self-Diagnosis
io-retire           1.0      active   I/O Retire Agent
syslog-msgs         1.0      active   Syslog Messaging Agent
```

B.2.6 Using the `fmstat` Command

The `fmstat` command can report statistics associated with the Oracle Solaris fault manager. The `fmstat` command shows information about DE performance. In the example below, the `eft` DE (also seen in the console output) has received an event which it accepted. A case is "opened" for that event and a diagnosis is performed to "solve" the cause for the failure.

```
# fmstat
module          ev_recv ev_acpt wait  svc_t   %w  %b  open solve  memsz bufsz
cpumem-diagnosis   0       0    0.0   0.0     0   0    0     0      3.0   K0
cpumem-retire      0       0    0.0   0.0     0   0    0     0      0     0
eft                1       1    0.0   1191.8  0   0    1     1      3.3M  11K
fmd-self-diagnosis 0       0    0.0   0.0     0   0    0     0      0     0
io-retire          1       0    0.0   32.4    0   0    0     0      37b   0
syslog-msgs        1       0    0.0   0.5     0   0    0     0      32b   0
```

B.3 Traditional Oracle Solaris Troubleshooting Commands

These superuser commands can help you determine if you have issues in your workstation, in the network, or within another server that you are networking with.

The following commands are described in this section:

- Section B.3.1, "`iostat` Command" on page B-11
- Section B.3.2, "`prtdiag` Command" on page B-13
- Section B.3.3, "`prtconf` Command" on page B-15
- Section B.3.4, "`netstat` Command" on page B-16
- Section B.3.5, "`ping` Command" on page B-17
- Section B.3.6, "`ps` Command" on page B-18
- Section B.3.7, "`prstat` Command" on page B-19

Most of these commands are located in the `/usr/bin` or `/usr/sbin` directories.

B.3.1 `iostat` Command

The `iostat` command iteratively reports terminal, drive, and tape I/O activity, as well as CPU utilization.

B.3.1.1 `iostat` Command Options

TABLE B-13 describes options for the `iostat` command and how those options can help troubleshoot the server.

TABLE B-13 Options for `iostat`

Option	Description	How It Can Help
No option	Reports status of local I/O devices.	A quick three-line output of device status.
`-c`	Reports the percentage of time the system has spent in user mode, in system mode, waiting for I/O, and idling.	Quick report of CPU status.
`-e`	Displays device error summary statistics. The total errors, hard errors, soft errors, and transport errors are displayed.	Provides a short table with accumulated errors. Identifies suspect I/O devices.
`-E`	Displays all device error statistics.	Provides information about devices: manufacturer, model number, serial number, size, and errors.
`-n`	Displays names in descriptive format.	Descriptive format helps identify devices.
`-x`	For each drive, reports extended drive statistics. The output is in tabular form.	Similar to the `-e` option, but provides rate information. This helps identify poor performance of internal devices and other I/O devices across the network.

The following example shows output for one `iostat` command.

```
# iostat -En
c0t0d0    Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Model: ST3120026A    Revision: 8.01  Serial No: 3JT4H4C2
Size: 120.03GB <120031641600 bytes>
Media Error: 0 Device Not Ready: 0  No Device: 0 Recoverable: 0
Illegal Request: 0
c0t2d0    Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: LITE-ON  Product: COMBO SOHC-4832K Revision: O3K1 Serial No:
Size: 0.00GB <0 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
```

B.3.2 `prtdiag` Command

The `prtdiag` command displays configuration and diagnostic information. The diagnostic information identifies any failed component.

The `prtdiag` command is located in the `/usr/platform/platform-name/sbin/` directory.

Note – The `prtdiag` command might indicate a slot number different than that identified elsewhere in this document. This is normal.

B.3.2.1 `prtdiag` Command Options

TABLE B-14 describes options for the `prtdiag` command and how those options can help troubleshooting.

TABLE B-14 Options for `prtdiag`

Option	Description	How It Can Help
No option	Lists components.	Identifies CPU timing and PCI cards installed.
`-v`	Verbose mode. Displays the time of the most recent AC power failure and the most recent hardware fatal error information.	Provides the same information as no option. Additionally lists fan status, temperatures, ASIC, and PROM revisions.

The following example shows output for the `prtdiag` command in verbose mode.

```
# prtdiag
System Configuration:  Sun Microsystems  sun4u XXXX SPARC Enterprise
M8000 Server
System clock frequency: 960 MHz
Memory size: 8192 Megabytes

================================= CPUs ================================
     CPU                CPU                     Run   L2$  CPU    CPU
LSB  Chip                ID                     MHz    MB  Impl. Mask
---  ---- ----------------------------------  ----  --- ---- ----
 00   0   0,   1,   2,   3,   4,   5,   6,   7   3000  12.0  7  192
 01   1  40,  41,  42,  43,  44,  45,  46,  47   3000  12.0  7  192
 02   2  80,  81,  82,  83,  84,  85,  86,  87   3000  12.0  7  192
============================ Memory Configuration ====================

     Memory  Available     Memory    DIMM    # of  Mirror  Interleave
LSB  Group   Size          Status    Size    DIMMs Mode    Factor
---  ------  ------------  -------   ------  ----- ------- ----------
 01    A     4096MB         okay     1024MB   4      no       2-way
 02    A     4096MB         okay     1024MB   4      no       2-way

=========================  IO Cards =========================

LSB    Name           Model
----  ------   -------------------------
 00    scsi           LSI,1064
 00    network        N/A
 00    network        N/A

==================== Hardware Revisions ====================
System PROM revisions:
----------------------
OBP 4.24.13 2010/02/08 13:17

=================== Environmental Status ===================
Mode switch is in UNLOCK mode

=================== System Processor Mode ===================
SPARC64-VII mode
```

B.3.3 `prtconf` Command

Similar to the `show-devs` command run at the `ok` prompt, the `prtconf` command displays the devices that are configured.

The `prtconf` command identifies hardware that is recognized by the Oracle Solaris OS. If hardware is not suspected of being bad yet software applications are having trouble with the hardware, the `prtconf` command can indicate if the Oracle Solaris software recognizes the hardware, and if a driver for the hardware is loaded.

B.3.3.1 `prtconf` Command Options

TABLE B-15 describes options for the `prtconf` command and how those options can help troubleshooting.

TABLE B-15 Options for `prtconf`

Option	Description	How It Can Help
No option	Displays the device tree of devices recognized by the OS.	If a hardware device is recognized, then it is probably functioning properly. If the message "(driver not attached)" is displayed for the device or for a sub-device, then the driver for the device is corrupt or missing.
`-D`	Similar to the output of no option, however the device driver is listed.	Lists the driver needed or used by the OS to enable the device.
`-p`	Similar to the output of no option, yet is abbreviated.	Reports a brief list of the devices.
`-V`	Displays the version and date of the OpenBoot PROM firmware.	Provides a quick check of firmware version.

The following example shows output for the `prtconf` command.

```
# prtconf
System Configuration: Sun Microsystems sun4u
Memory size: 8192 Megabytes
System Peripherals (Software Nodes):

SUNW,SPARC-Enterprise
    scsi_vhci, instance #0
    packages (driver not attached)
        SUNW,builtin-drivers (driver not attached)
        SUNW,builtin-drivers (driver not attached)
        deblocker (driver not attached)
        disk-label (driver not attached)
        terminal-emulator (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)
    pseudo-console, instance #0
    nvram (driver not attached)
    pseudo-mc, instance #0
    pseudo-mc, instance #1
    pseudo-mc, instance #4

    cmp (driver not attached)
        core (driver not attached)
             cpu (driver not attached)
             cpu (driver not attached)
(The rest is omitted.)
```

B.3.4 `netstat` Command

The `netstat` command displays the network status.

B.3.4.1 `netstat` Command Options

TABLE B-16 describes options for the `netstat` command and how those options can help troubleshooting.

TABLE B-16 Options for `netstat`

Option	Description	How It Can Help
`-i`	Displays the interface state, including packets in/out, error in/out, collisions, and queue.	Provides a quick overview of the network status.
`-i` *interval*	Providing a trailing number with the `-i` option repeats the `netstat` command every interval seconds.	Identifies intermittent or long duration network events. By piping `netstat` output to a file, overnight activity can be viewed all at once.
`-p`	Displays the media table.	Provides MAC address for hosts on the subnet.
`-r`	Displays the routing table.	Provides routing information.
`-n`	Replaces host names with IP addresses.	Used when an address is more useful than a host name.

The following example shows output for the `netstat -p` command.

```
# netstat -p
Net to Media Table: IPv4
Device   IP Address               Mask      Flags   Phys Addr
------ -------------------- --------------- ----- ---------------
bge0   phatair-46           255.255.255.255       08:00:20:92:4a:47
bge0   ns-umpk27-02-46      255.255.255.255       08:00:20:93:fb:99
bge0   moreair-46           255.255.255.255       08:00:20:8a:e5:03
bge0   fermpk28a-46         255.255.255.255       00:00:0c:07:ac:2e
bge0   fermpk28as-46        255.255.255.255       00:50:e2:61:d8:00
bge0   kayakr               255.255.255.255       08:00:20:d1:83:c7
bge0   matlock              255.255.255.255 SP    00:03:ba:27:01:48
bge0   toronto2             255.255.255.255       08:00:20:b6:15:b5
bge0   tocknett             255.255.255.255       08:00:20:7c:f5:94
bge0   mpk28-lobby          255.255.255.255       08:00:20:a6:d5:c8
bge0   efyinisedeg          255.255.255.255       08:00:20:8d:6a:80
bge0   froggy               255.255.255.255       08:00:20:73:70:44
bge0   d-mpk28-46-245       255.255.255.255       00:10:60:24:0e:00
bge0   224.0.0.0             240.0.0.0       SM    01:00:5e:00:00:00
```

B.3.5 `ping` Command

The `ping` command sends ICMP ECHO_REQUEST packets to network hosts. Depending on how the `ping` command is configured, the output displayed can identify troublesome network links or nodes. The destination host is specified in the variable hostname.

B.3.5.1 `ping` Command Options

TABLE B-17 describes options for the `ping` command and how those options can help troubleshooting.

TABLE B-17 Options for `ping`

Option	Description	How It Can Help
hostname	The probe packet is sent to *hostname* and returned.	Verifies that a host is active on the network.
`-g` *hostname*	Forces the probe packet to route through a specified gateway.	By identifying different routes to the target host, those individual routes can be tested for quality.
`-i` *interface*	Designates which interface to send and receive the probe packet through.	Enables a simple check of secondary network interfaces.
`-n`	Replaces host names with IP addresses.	Used when an address is more beneficial than a host name.
`-s`	Pings continuously in one-second intervals. Ctrl-C aborts. Upon abort, statistics are displayed.	Helps identify intermittent or long-duration network events. By piping `ping` output to a file, activity overnight can later be viewed at once.
`-svR`	Displays the route the probe packet followed in one second intervals.	Indicates probe packet route and number of hops. Comparing multiple routes can identify bottlenecks.

The following example shows output for the `ping -s` command.

```
# ping -s teddybear
PING teddybear: 56 data bytes
64 bytes from teddybear (192.146.77.140): icmp_seq=0. time=1. ms
64 bytes from teddybear (192.146.77.140): icmp_seq=1. time=0. ms
64 bytes from teddybear (192.146.77.140): icmp_seq=2. time=0. ms
^C
----teddybear PING Statistics----
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 0/0/1
```

B.3.6 `ps` Command

The `ps` command lists the status of processes. Using options and rearranging the command output can assist in determining the resource allocation.

B.3.6.1 `ps` Command Options

TABLE B-18 describes options for the `ps` command and how those options can help troubleshooting.

TABLE B-18 Options for `ps`

Option	Description	How It Can Help
`-e`	Displays information for every process.	Identifies the process ID and the executable.
`-f`	Generates a full listing.	Provides the following process information: user ID, parent process ID, time when executed, and the path to the executable.
`-o` *option*	Enables configurable output. The `pid`, `pcpu`, `pmem`, and `comm` options display process ID, percent CPU consumption, percent memory consumption, and the responsible executable, respectively.	Provides only most important information. Knowing the percentage of resource consumption helps identify processes that are affecting performance and might be hung.

The following example shows output for one `ps` command.

```
# ps -eo pcpu,pid,comm|sort -rn
1.4 100317 /usr/openwin/bin/Xsun
0.9 100460 dtwm
0.1 100677 ps
0.1 100600 ksh
0.1 100591 /usr/dt/bin/dtterm
0.1 100462 /usr/dt/bin/sdtperfmeter
0.1 100333 mibiisa
%CPU   PID COMMAND
0.0 100652 /bin/csh
. . .
```

Note – When using sort with the `-r` option, the column headings are printed so that the value in the first column is equal to zero.

B.3.7 `prstat` Command

The `prstat` utility iteratively examines all active processes and reports statistics based on the selected output mode and sort order. The `prstat` command provides output similar to the `ps` command.

B.3.7.1 `prstat` Command Options

TABLE B-19 describes options for the `prstat` command and how those options can help troubleshooting.

TABLE B-19 Options for `prstat`

Option	Description	How It Can Help
No option	Displays a sorted list of the top processes that are consuming the most CPU resources. List is limited to the height of the terminal window and the total number of processes. Output is automatically updated every five seconds. Ctrl-C aborts.	Output identifies process ID, user ID, memory used, state, CPU consumption, and command name.
`-n` *number*	Limits output to number of lines.	Limits amount of data displayed and identifies primary resource consumers.
`-s` *key*	Permits sorting list by key parameter.	Useful keys are `cpu` (default), `time`, and `size`.
`-v`	Verbose mode.	Displays additional parameters.

The following example shows output for the `prstat` command.

```
# prstat -n 5 -s size
PID     USERNAME  SIZE   RSS STATE  PRI  NICE TIME    CPU   PROCESS/NLWP
100524  mm39236    28M   21M sleep   48    0   0:00.26 0.3%  maker6X.exe/1
100317  root       28M   69M sleep   59    0   0:00.26 0.7%  Xsun/1
100460  mm39236    11M 8760K sleep   59    0   0:00.03 0.0%  dtwm/8
100453  mm39236  8664K 4928K sleep   48    0   0:00.00 0.0%  dtsession/4
100591  mm39236  7616K 5448K sleep   49    0   0:00.02 0.1%  dtterm/1
Total: 65 processes, 159 lwps, load averages: 0.03, 0.02, 0.04
```