SPARC Enterprise
Equipment Rack Mounting Guide

Fujitsu 19-inch Rack

FUJITSU

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Contents

Preface

This manual describes the installation requirements and items for consideration when installing the equipment rack. Before using the rack, be sure follow the instructions in this manual and consult with a certified service engineer regarding its proper use.

This manual is intended for persons who are engaged in computer system installation site planning, persons who are actually installing computer systems, or persons who operate or administrate such systems. Readers are assumed to have some knowledge and experience involving installation site planning for computer systems.

References herein to the M3000 server, M4000 server, or M5000 server are references to the SPARC Enterprise M3000 server, SPARC Enterprise M4000 server, or SPARC Enterprise M5000 server.

This section includes:

Related Documentation

All documents for SPARC Enterprise M3000/M4000/M5000 servers are available online at the following locations.

- Sun Oracle software-related manuals (Oracle Solaris OS, and so on):

  `http://www.oracle.com/technetwork/documentation/index.html`

- Fujitsu documents:

  http://www.fujitsu.com/sparcenterprise/manual/

Related SPARC Enterprise M3000/M4000/M5000 Servers Documentation
SPARC Enterprise M3000 Server Site Planning Guide
SPARC Enterprise M4000/M5000 Servers Site Planning Guide
SPARC Enterprise Equipment Rack Mounting Guide
SPARC Enterprise M3000 Server Getting Started Guide[*]
SPARC Enterprise M4000/M5000 Servers Getting Started Guide[*]
SPARC Enterprise M3000 Server Overview Guide
SPARC Enterprise M4000/M5000 Servers Overview Guide
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Important Legal and Safety Information[*]
SPARC Enterprise M3000 Server Safety and Compliance Guide
SPARC Enterprise M4000/M5000 Servers Safety and Compliance Guide
External I/O Expansion Unit Safety and Compliance Guide
SPARC Enterprise M4000 Server Unpacking Guide[*]
SPARC Enterprise M5000 Server Unpacking Guide[*]
SPARC Enterprise M3000 Server Installation Guide
SPARC Enterprise M4000/M5000 Servers Installation Guide
SPARC Enterprise M3000 Server Service Manual
SPARC Enterprise M4000/M5000 Servers Service Manual
External I/O Expansion Unit Installation and Service Manual
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers RCI Build Procedure
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 RCI User's Guide
SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Product Notes[†]
SPARC Enterprise M3000 Server Product Notes
SPARC Enterprise M4000/M5000 Servers Product Notes

Related SPARC Enterprise M3000/M4000/M5000 Servers Documentation

External I/O Expansion Unit Product Notes

SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Glossary

SPARC Enterprise/PRIMEQUEST Common Installation Planning Manual

* 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.

Fonts/symbols	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 input in the frame.
		`XSCF> showuser -P`
		`User Name: jsmith`
		`Privileges: useradm`
		`auditadm`

Italic	Indicates the name of a reference manual	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, "Overview of Hardware Units to Be Mounted."

Notes on Safety

Read the following documents thoroughly before using or handling any SPARC Enterprise M3000/M4000/M5000 server.

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

- *SPARC Enterprise M3000 Server Safety and Compliance Guide*
- *SPARC Enterprise M4000/M5000 Servers Safety and Compliance Guide*
- *External I/O Expansion Unit Safety and Compliance Guide*

Documentation Feedback

If you have any comments or requests regarding this document, go to the following web sites.

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

CHAPTER 1

Rack Overview

This chapter contains information on the equipment racks, on which the SPARC Enterprise M3000/M4000/M5000 Servers are mounted. Rack types, appearance views, and floor plans are shown below.

This chapter contains the following sections:

1.1 Equipment Rack Types

TABLE 1-1 to TABLE 1-4 show the equipment racks on which M3000/M4000/M5000 servers can be mounted.

TABLE 1-1 Equipment Rack Types for SPARC Enterprise Servers

Item	Model Name*	Rack Types	Rack Size [mm (in.)] Width	Depth	Height	Weight [kg (lb.)] Total Mountable Weight‡	Rack Alone	Total Weight of the Rack	Remarks
1	SE-R7RC11 *	40U base rack	700 (27.6)	1050 (41.3)	2000 (78.8)	800 (1760)	200 (440)**	1000 (2200)	With a side panel With a quake-resistant options kit
2	SE-R7RC21 *	40U system cabinet†	700 (27.6)	1050 (41.3)	2000 (78.8)	800 (1760)	165 (363)**	965 (2123)	Without a side panel With a quake-resistant options kit
3	SE-R8RC11 *	36U base rack	700 (27.6)	1050 (41.3)	1800 (70.9)	720 (1584)	180 (396)**	900 (1980)	With a side panel With a quake-resistant options kit
4	SE-R8RC21 *	36U system cabinet†	700 (27.6)	1050 (41.3)	1800 (70.9)	720 (1584)	155 (341)**	875 (1925)	Without a side panel With a quake-resistant options kit
5	SE-R7RC12 *	40U base rack	700 (27.6)	1050 (41.3)	2000 (78.8)	800 (1760)	200 (440)	1000 (2200)	With a side panel Without a quake-resistant options kit

TABLE 1-1 Equipment Rack Types for SPARC Enterprise Servers *(Continued)*

Item	Model Name*	Rack Types	Rack Size [mm (in.)] Width	Depth	Height	Weight [kg (lb.)] Total Mountable Weight‡	Rack Alone	Total Weight of the Rack	Remarks
6	SE-R7RC22 *	40U system cabinet†	700 (27.6)	1050 (41.3)	2000 (78.8)	800 (1760)	165 (363)	965 (2123)	Without a side panel Withuot a quake-resistant options kit
7	SE-R8RC12 *	36U base rack	700 (27.6)	1050 (41.3)	1800 (70.9)	720 (1584)	180 (396)	900 (1980)	With a side panel Without a quake-resistant options kit
8	SE-R8RC22 *	36U system cabinet†	700 (27.6)	1050 (41.3)	1800 (70.9)	720 (1584)	155 (341)	875 (1925)	Without a side panel Without a quake-resistant options kit

* n model names, * is any letter from A to Z.

† When a system cabinet is used, it is connected with the base rack. Also, system cabinets can be interconnected. (The interconnected cabinets must be of the same height.)

‡ The value does not include the weight of the rack itself.

** The weight of the rack alone includes the weight of the tip-resistant quake-resistant options kits.

TABLE 1-2 Equipment Rack Model 1640 Types

Item	Model Name*	Rack Types	Rack Size [mm (in.)] Width	Depth	Height	Weight [kg (lb.)] Total Mountable Weight‡	Rack Alone	Total Weight of the Rack	Remarks
1	19R-164A1 *	40U base rack	600 (23.6)	1050 (41.3)	2000 (78.8)	800 (1760)	126 (277)**	926 (2037)	With a side panel With a quake-resistant options kit
2	19R-164B1 *	40U system cabinet†	600 (23.6)	1050 (41.3)	2000 (78.8)	800 (1760)	94 (206)**	894 (1966)	Without a side panel With a quake-resistant options kit
3	19R-164A2 *	40U base rack	600 (23.6)	1050 (41.3)	2000 (78.8)	800 (1760)	118 (256)	918 (2019)	With a side panel Without a quake-resistant options kit
4	19R-164B2 *	40U system cabinet†	600 (23.6)	1050 (41.3)	2000 (78.8)	800 (1760)	86 (189)	886 (1949)	Without a side panel Without a quake-resistant options kit

* In model names, * is any letter from A to Z.

† When a system cabinet is used, it is connected with the base rack. Also, system cabinets can be interconnected. (The interconnected cabinets must be of the same height.)

‡ The value does not include the weight of the rack itself.

** The weight of the rack alone includes the weight of the tip-resistant quake-resistant options kits.

TABLE 1-3 Equipment Rack Model 1624 Types

Item	Model Name*	Rack Types	Rack Size [mm (in.)] Width	Depth	Height	Weight [kg (lb.)] Total Mountable Weight‡	Rack Alone	Total Weight of the Rack	Remarks
1	19R-162A1 *	24U base rack	600 (23.6)	1050 (41.3)	1264 (49.7)	480 (1056)	94 (206)**	574 (1262)	With a side panel With a quake-resistant options kit
2	19R-162B1 *	24U system cabinet†	600 (23.6)	1050 (41.3)	1264 (49.7)	480 (1056)	75 (165)**	555 (1221)	Without a side panel With a quake-resistant options kit
3	19R-162A2 *	24U base rack	600 (23.6)	1050 (41.3)	1264 (49.7)	480 (1056)	86 (189)	566 (1245)	With a side panel Without a quake-resistant options kit
4	19R-162B2 *	24U system cabinet†	600 (23.6)	1050 (41.3)	1264 (49.7)	480 (1056)	67 (147)	547 (1203)	Without a side panel Without a quake-resistant options kit

* In model names, * is any letter from A to Z.

† When a system cabinet is used, it is connected with the base rack. Also, system cabinets can be interconnected. (The interconnected cabinets must be of the same height.)

‡ The value does not include the weight of the rack itself.

** The weight of the rack alone includes the weight of the tip-resistant quake-resistant options kits.

TABLE 1-4 Model 1740 Rack Types

Item	Model Name	Rack Types	Rack Size [mm (in.)] Width	Depth	Height	Weight [kg (lb.)] Total Mountable Weight†	Rack Alone	Total Weight of the Rack	Remarks
1	19R-174A1	40U base rack	700 (27.6)	1050 (41.3)	2000 (78.8)	800 (1760)	143 (315)‡	943 (2075)	With a side panel With a quake-resistant options kit
2	19R-174B1	40U system cabinet*	700 (27.6)	1050 (41.3)	2000 (78.8)	800 (1760)	110 (242)‡	910 (2002)	Without a side panel With a quake-resistant options kit
3	19R-174A2	40U base rack	600 (23.6)	1050 (41.3)	2000 (78.8)	800 (1760)	135 (297)	935 (2057)	With a side panel With a quake-resistant options kit
4	19R-174B2	40U system cabinet*	600 (23.6)	1050 (41.3)	2000 (78.8)	800 (1760)	102 (224)	902 (1984)	Without a side panel With a quake-resistant options kit

* When a system cabinet is used, it is connected with the base rack. Also, system cabinets can be interconnected. (The interconnected cabinets must be of the same height.)

† The value does not include the weight of the rack itself.

‡ The weight of the rack alone includes the weight of the tip-resistant quake-resistant options kits.

1.2 Equipment Rack Selection Procedure

1.2.1 Consideration of Rack fixation for Quake Resistance

Before you select the equipment rack, make sure whether or not you take measures to fixate the rack for quake resistance, depending on the level of customer's requirement for quake resistance and the conditions of the building.

When you take measures to fixate the rack, it withstands the acceleration of up to 1,000 gal at the time of earthquake in general buildings.

When you do not take measures to fixate the rack, select the rack to which the tip-resistance quake-resistant options kit attached. When you perform maintenance on the server mounted on the rack, use the quake-resistant options kit to prevent the rack from toppling over. In this case, it withstands the acceleration of up to 250 gal at the time of earthquake in general buildings.

1.2.2 Selection of Equipment Rack

When you take measures to fixate the rack, select the rack to which the tip-resistance quake-resistant options kit not attached, and see Section 1.2.3, “Selection of Rack Fixation Method” on page 1-8.

When you do not take measures to fixate the rack, select the rack to which the tip-resistance quake-resistant options kit attached, and see Section 1.2.5, “Arrangements for Equipment Rack Installation” on page 1-9.

Note – Regardless of whether or not the building or the floor is quake-resistant (seismic isolated), when you do not take measures to fixate the rack, do not fail to select the rack to which the tip-resistance quake-resistant options kit attached. When you perform maintenance on the server mounted on the rack, use the quake-resistant options kit to prevent the rack from toppling over.

1.2.3 Selection of Rack Fixation Method

To fixate the equipment rack, there are two methods; the method which uses the quake-resistant options kit, and the method which uses the level feet. Consider the conditions such as the floor on which the rack installed, and select either one method which is appropriate.

When you fixate the rack by using the quake-resistant options kit, see Section 1.2.4, "Quake-resistant Options Kit" on page 1-8.

When you fixate the rack by using the level feet, see Section 1.2.5, "Arrangements for Equipment Rack Installation" on page 1-9.

Note – It is not permitted to operate the rack to which the tip-resistance quake-resistant options kit not attached, without taking measures to fixate it. When you perform maintenance on the server mounted on the rack, it is mandatory to take measures to fixate the rack, in order to prevent the rack from toppling over.

1.2.4 Quake-resistant Options Kit

When you use the quake-resistant options kit, arrange the kit which is appropriate for each type of the rack.

- Options kit for the base rack of the equipment rack for the SPARC Enterprise servers: MC-R1ST11
- Options kit for the system cabinet of the equipment rack for the SPARC Enterprise servers: MC-R1ST21
- Options kit for the base rack of the equipment rack model 1640/1624: 19R-16ST1
- Options kit for the system cabinet of the equipment rack model 1640/1624: 19R-16ST2
- Options kit for the base rack of the equipment rack model 1740: 19R-17ST1
- Options kit for the system cabinet of the equipment rack model 1740: 19R-17ST2

1.2.5 Arrangements for Equipment Rack Installation

TABLE 1-5 Arrangements for Equipment Rack Installation

1. Consideration of the Fixation of the Rack	2. Selection of the Rack	3. Selection of the Fixation Method	4. Arrangement of the Options
When you fixate the equipment rack	You can select the rack to which the tip-resistance quake-resistant options kit not attached.	Fixate the rack by using the quake-resistant options kit.	Quake-resistant options kit. ‡ **(See *1 and *2.)
		Fixate the rack by using the level feet.	None.‡
When you do not fixate the equipment rack	You must select the rack to which the tip-resistance quake-resistant options kit attached.	- * †	None.

* You can select the rack to which the tip-resistant quake-resistant options kit attached and use the quake-resistant options kit to fixate it. However, there are limitations as follows.
- When the tip-resistant quake-resistant options kit is the pull-out quake-resistant options kit: You can't attach the quake-resistant options kit and the pull-out quake-resistant options kit at the same time. You need to detach the pull-out quake-resistant options kit before you attach the quake-resistant options kit.
- When the tip-resistant quake-resistant options kit is the bolt-on quake-resistant options kit: Among the components included in the quake-resistant options kit, the parts for the front of the rack (front parts) become redundant.

† You can select the rack to which the tip-resistant quake-resistant options kit attached and use the level feet to fixate it with the quake-resistant options kit remain attached. In this case, the quake-resistant options kit becomes functionally unnecessary.

‡ The bolts to fixate the rack to the building are supposed to be arranged by the constructors.

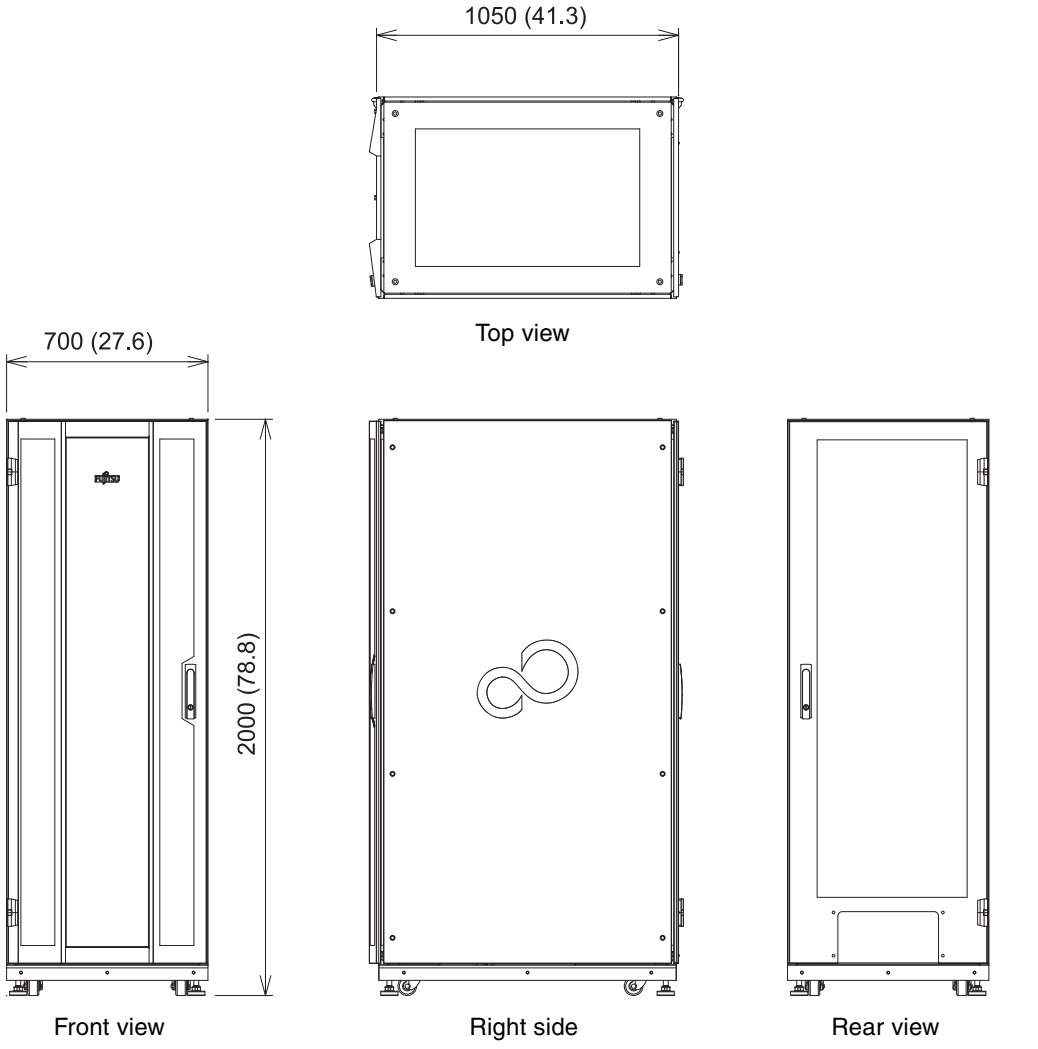
** There are two kinds of quake-resistant options kit; the kit for the base rack and the kit for the system cabinet.
- Options kit for the base rack: Parts for the front (x1), parts for the rear (x1), parts for the side (x2), set of fixing bolts
- Options kit for the system cabinet: Parts for the front (x1), parts for the rear (x1), set of fixing bolts
When the quake-resistant options kit for the base rack applied to the system cabinet, the parts for the side of the rack become redundant.
When the quake-resistant options kit for the base rack applied to the system cabinet, the parts for the side of the rack become redundant.

1.3 Appearance of the Equipment Rack

FIGURE 1-1 to FIGURE 1-4 show each appearance of the Equipment Rack model for the SPARC Enterprise Servers. This section provides the following illustrations:

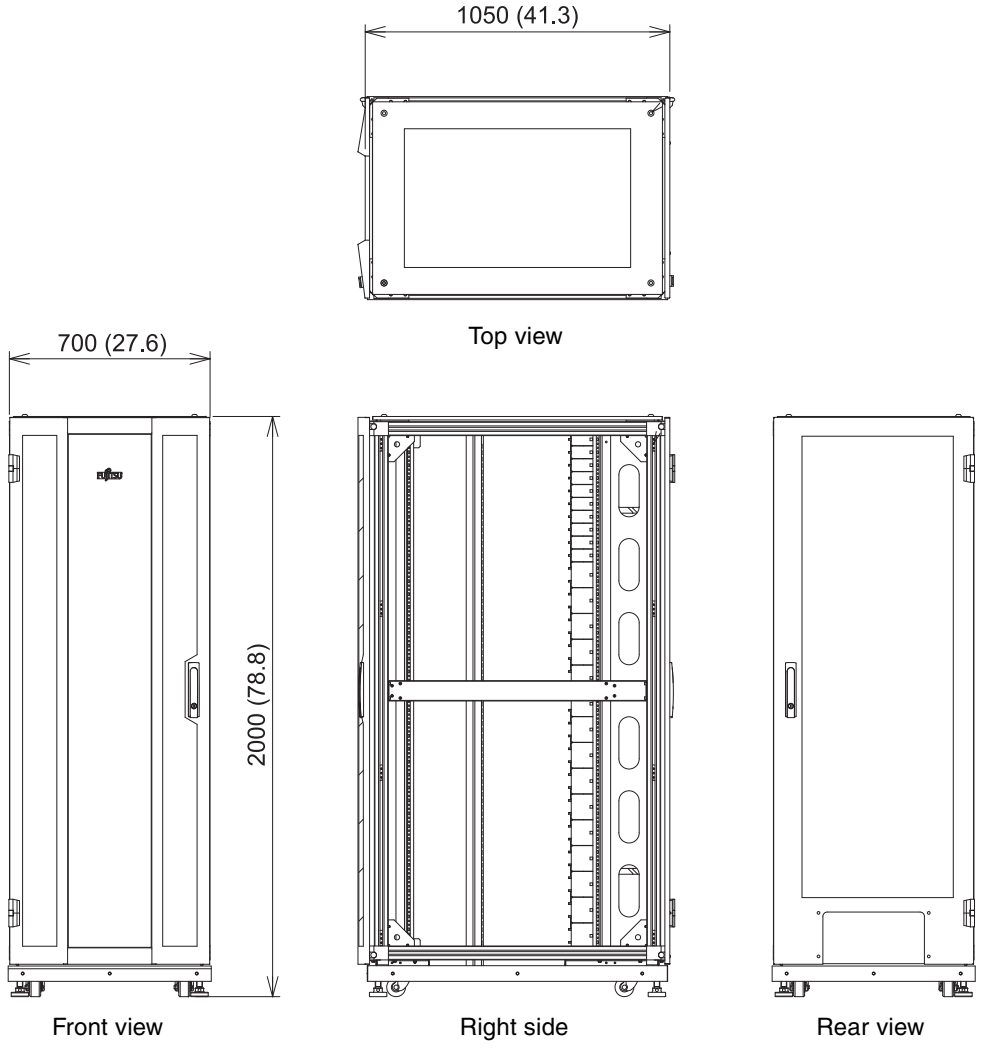
- Base Rack of the Equipment Rack for the SPARC Enterprise Servers Model Name: SE-R7RC11

FIGURE 1-1 Appearance of Base Rack of the Equipment Rack for the SPARC Enterprise Servers (Model Name: SE-R7RC11)



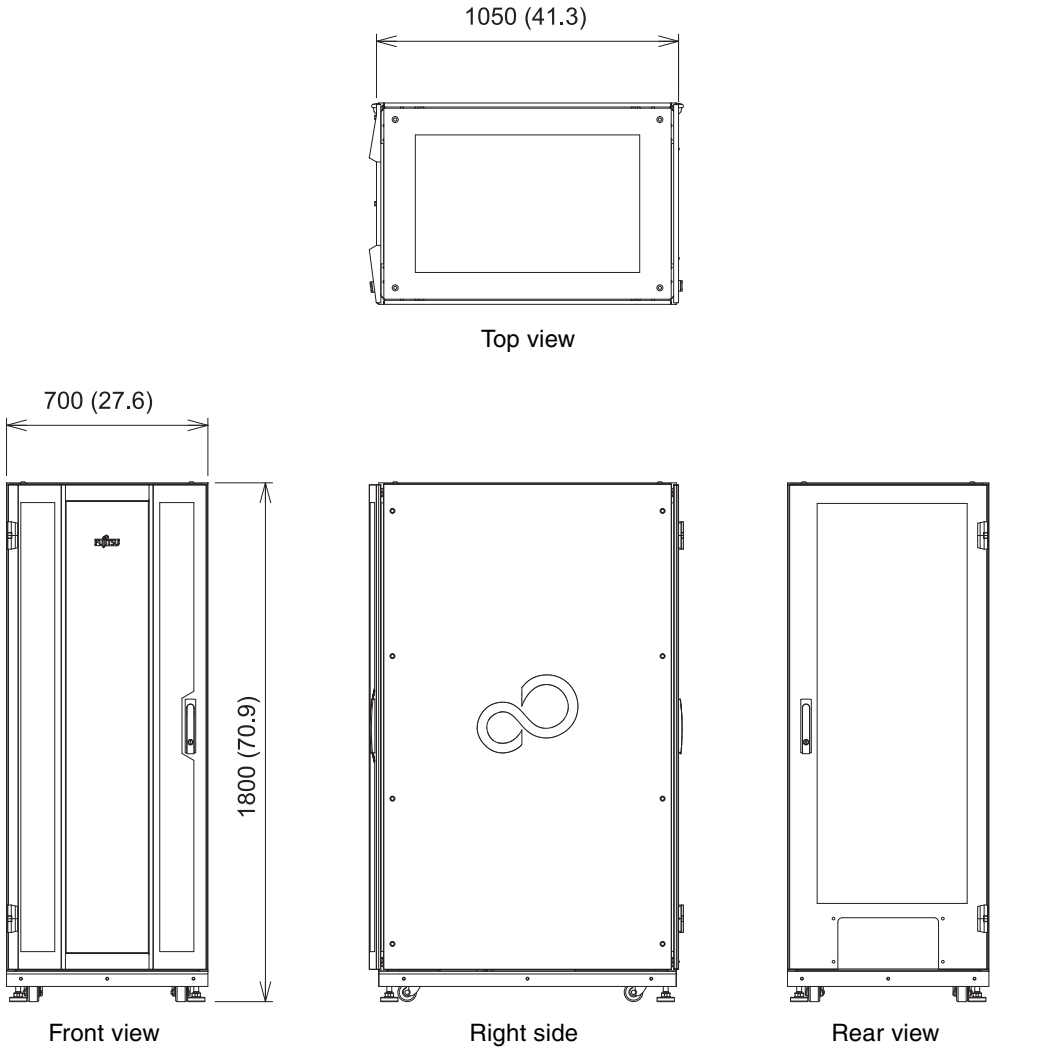
- System Cabinet of the Equipment Rack for the SPARC Enterprise Servers Model Name: SE-R7RC21

FIGURE 1-2 Appearance of System Cabinet of the Equipment Rack for the SPARC Enterprise Servers (Model Name: SE-R7RC21)



- Base Rack of the Equipment Rack for the SPARC Enterprise Servers Model Name: SE-R8RC11

FIGURE 1-3 Appearance of Base Rack of the Equipment Rack for the SPARC Enterprise Servers (Model Name: SE-R8RC11)



- System Cabinet of the Equipment Rack for the SPARC Enterprise Servers Model Name: SE-R8RC21

FIGURE 1-4 Appearance of System Cabinet of the Equipment Rack for the SPARC Enterprise Servers (Model Name: SE-R8RC21)

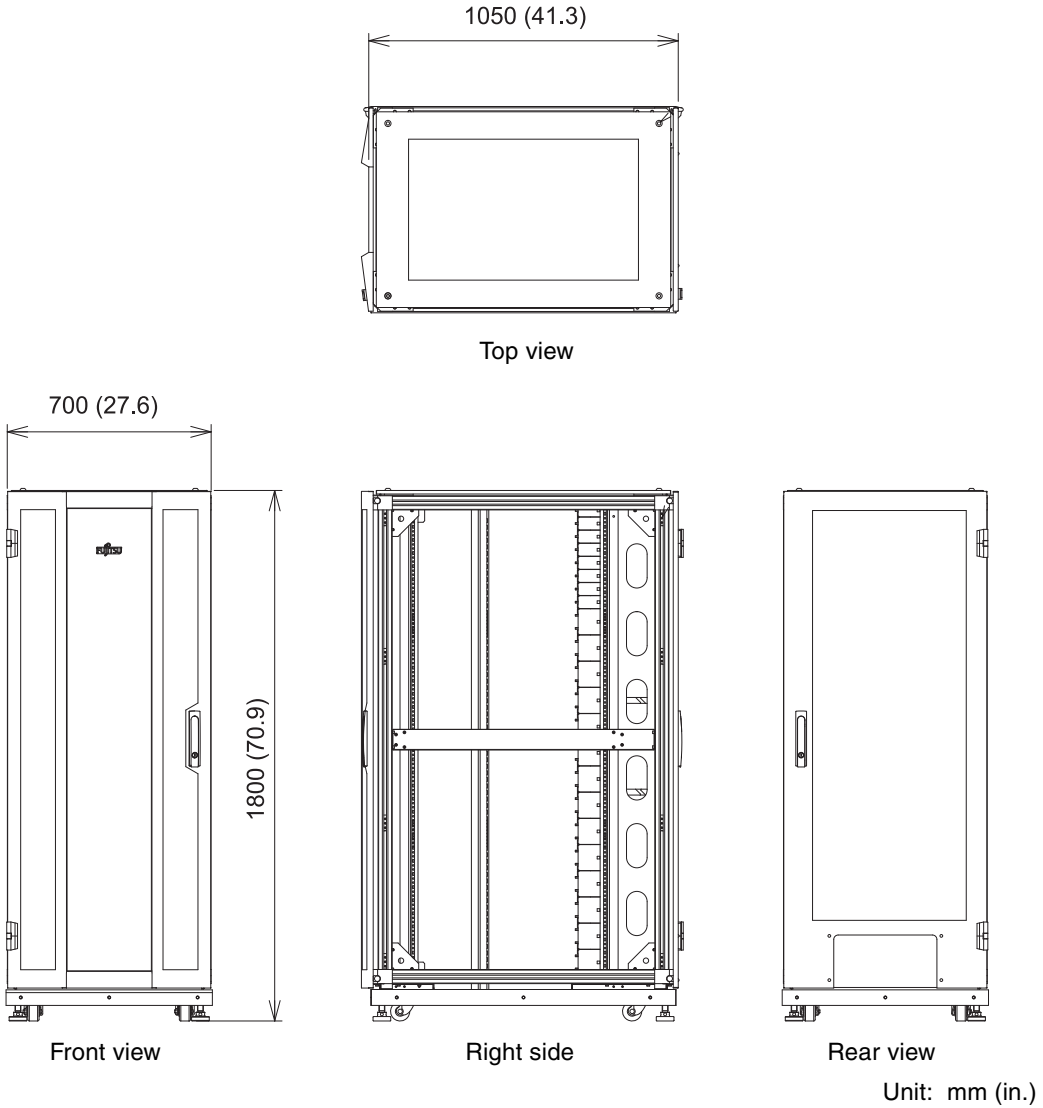
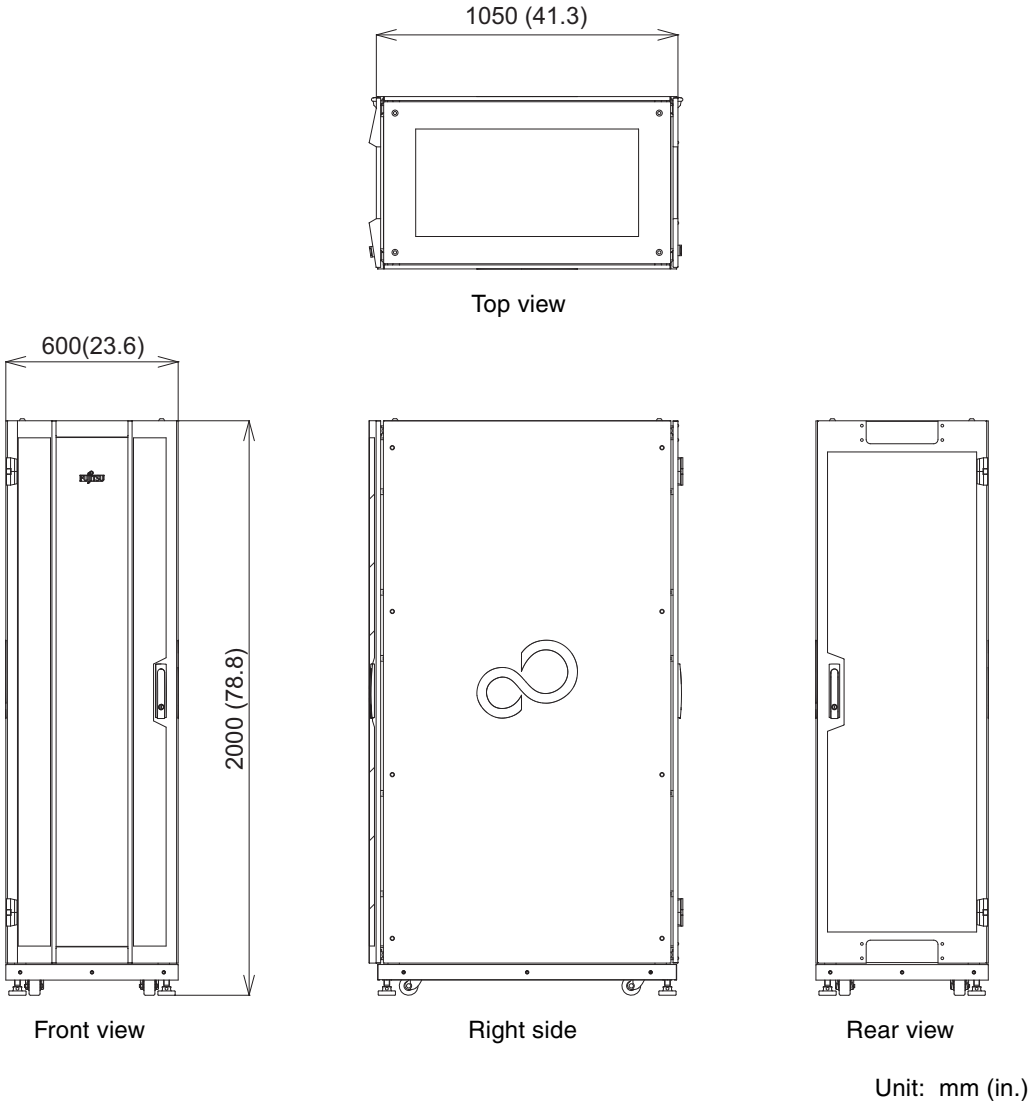


FIGURE 1-5 to FIGURE 1-6 show each appearance of the Equipment Rack Model 1640 models.

- Base Rack of the Equipment Rack Model 1640 Model Name: 19R-164A1/19R-164A2

FIGURE 1-5 Appearance of Base Rack of the Equipment Rack Model 1640 (Model Name: 19R-164A1/19R-164A2)



- System Cabinet of the Equipment Rack Model 1640 Model Name: 19R-164B1/19R-164B2

FIGURE 1-6 Appearance of System Cabinet of the Equipment Rack Model 1640 (Model Name: 19R-164B1/19R-164B2)

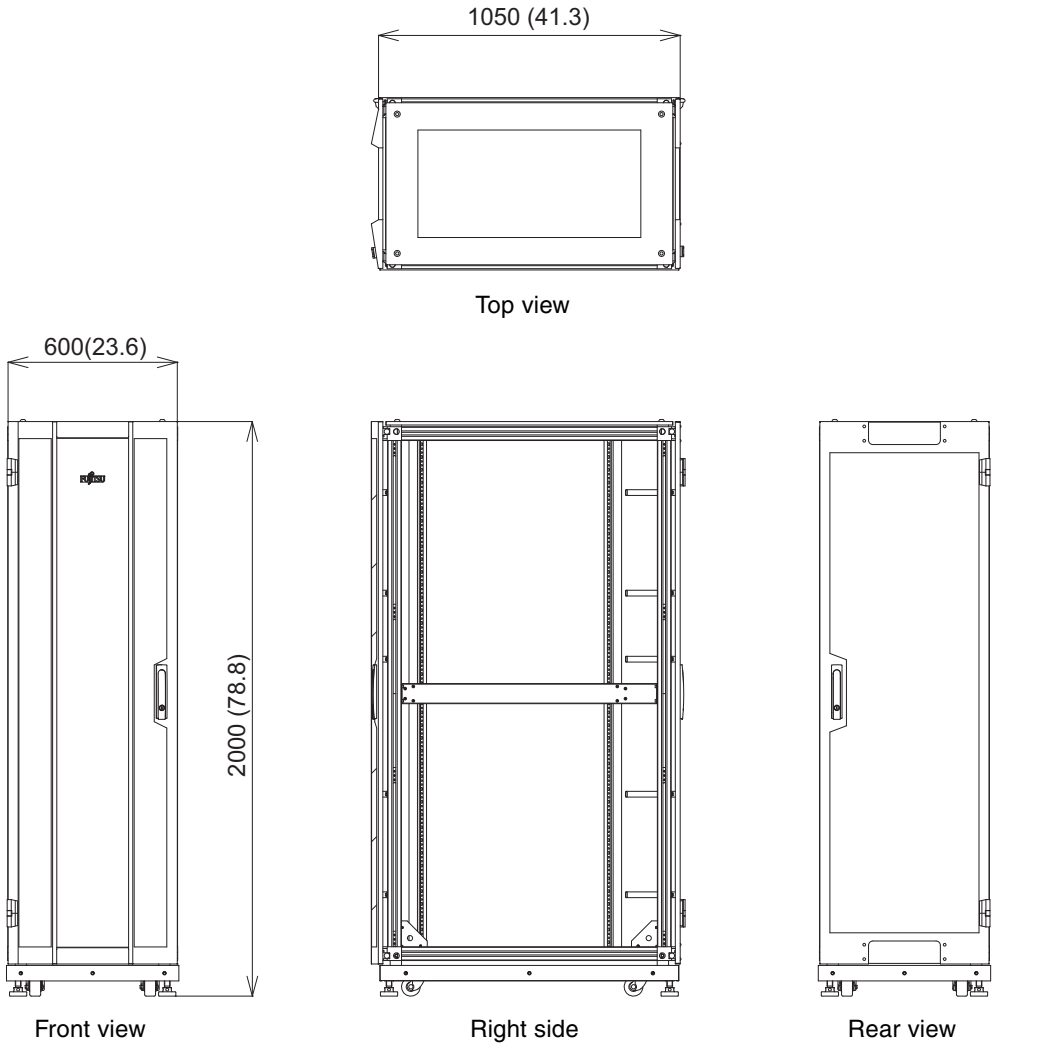
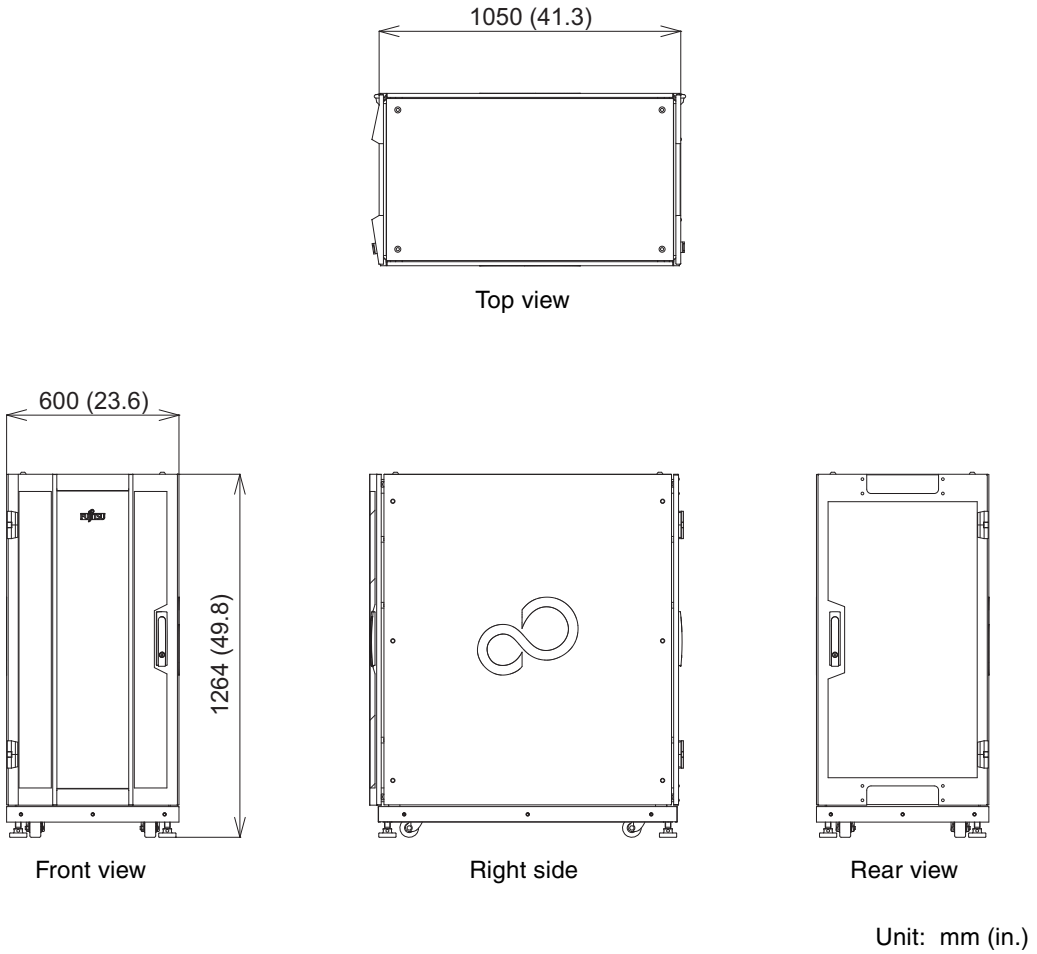


FIGURE 1-7 to FIGURE 1-8 show each appearance of the Equipment Rack Model 1624 models.

- Base Rack of the Equipment Rack Model 1624 Model Name: 19R-162A1/19R-162A2

FIGURE 1-7 Appearance of Base Rack of the Equipment Rack Model 1624 (Model Name: 19R-162A1/19R-162A2)



- System Cabinet of the Equipment Rack Model 1624 Model Name: 19R-162B1/19R-162B2

FIGURE 1-8 Appearance of System Cabinet of the Equipment Rack Model 1624 (Model Name: 19R-162B1/19R-162B2)

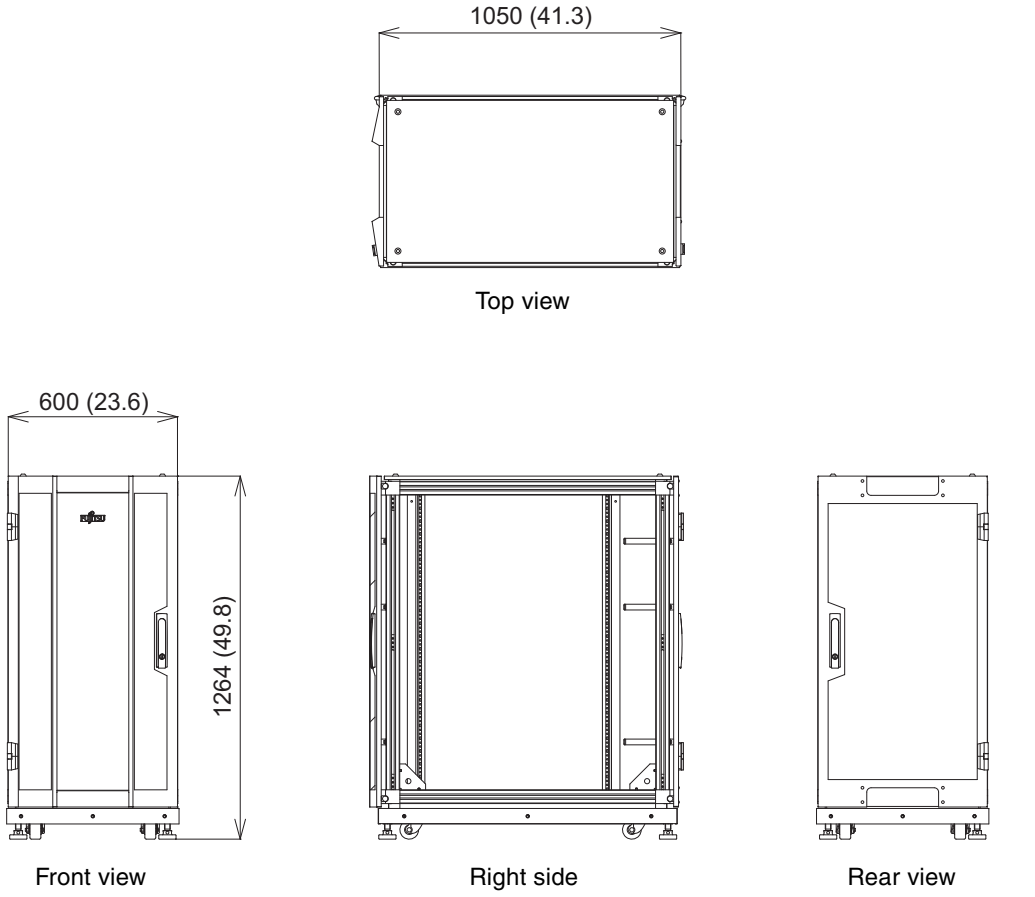
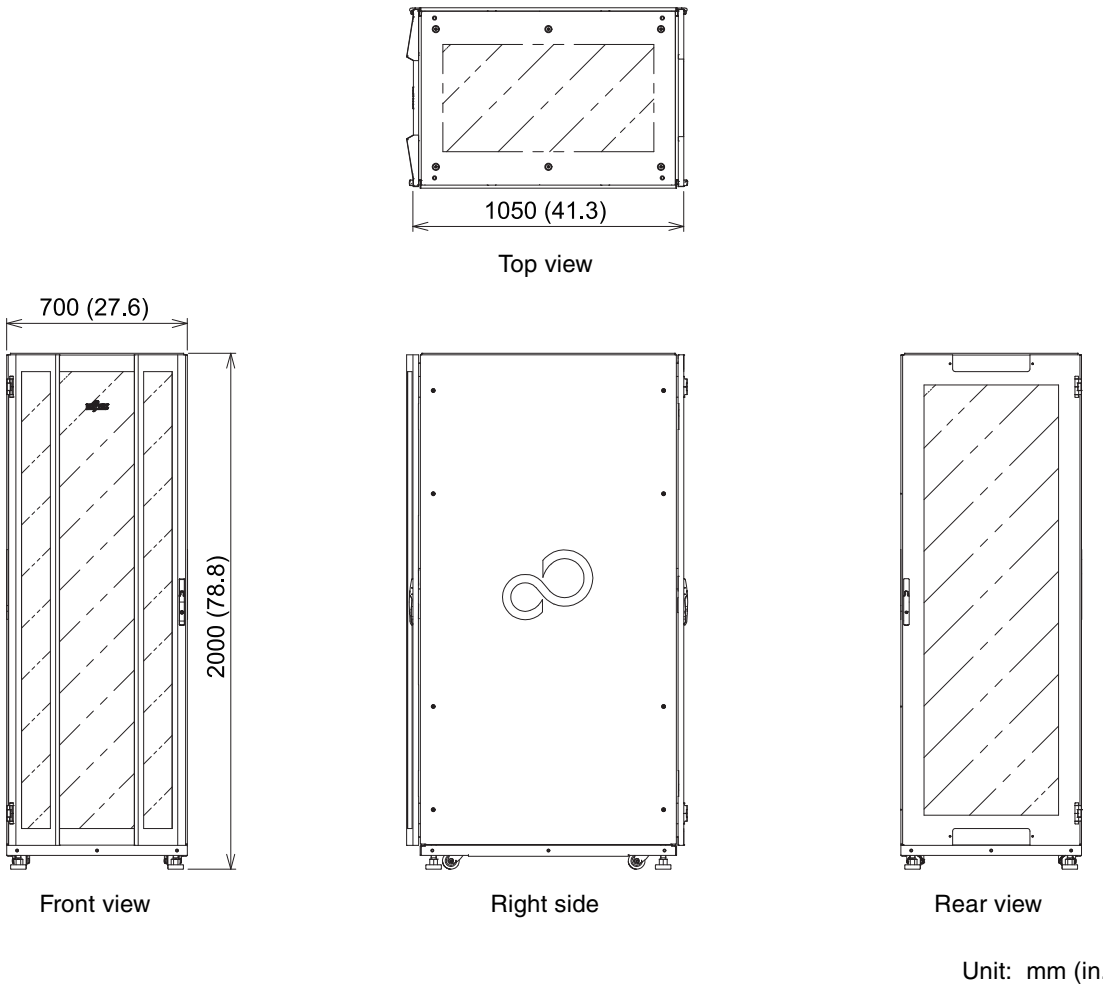


FIGURE 1-9 to FIGURE 1-10 show each appearance of the Equipment Rack Model 1740 models.

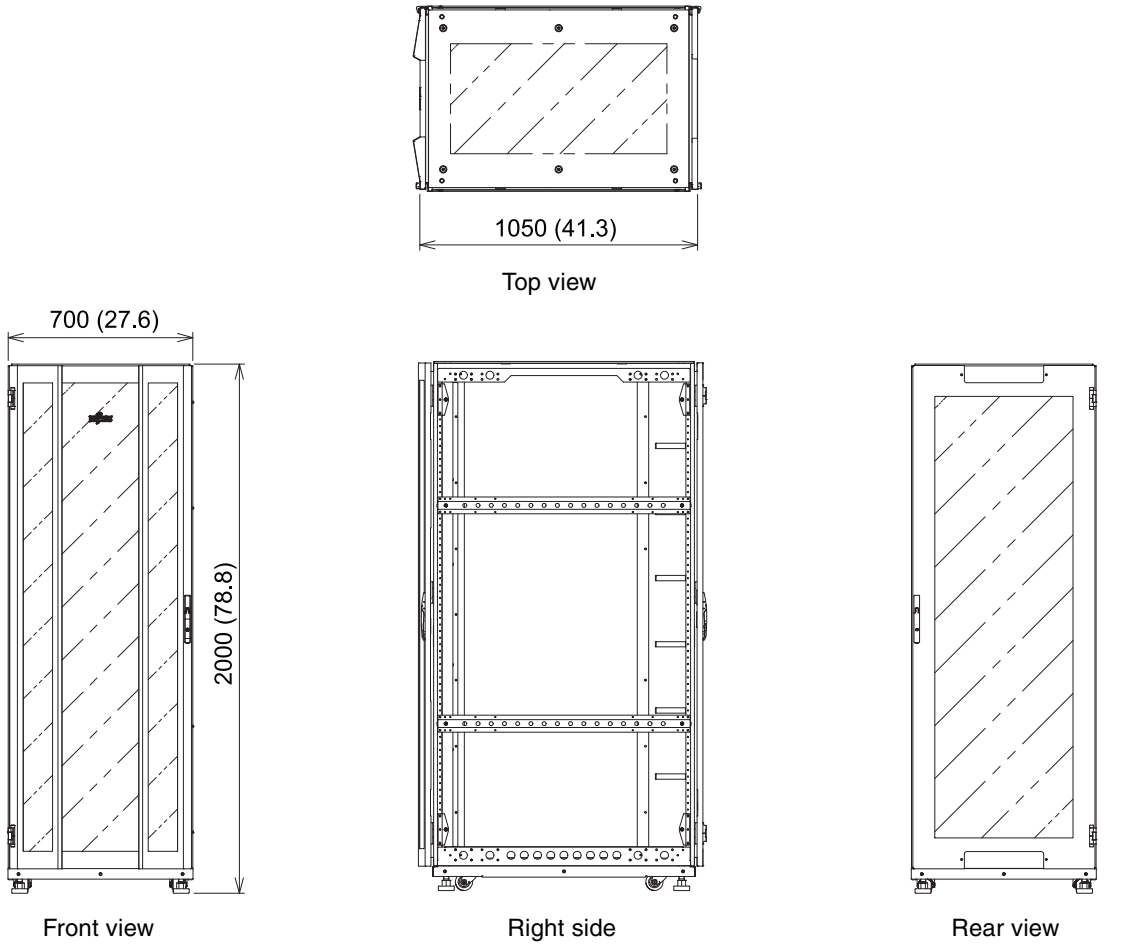
- Base Rack of the Equipment Rack Model 1740 Model Name: 19R-174A1/19R-174A2

FIGURE 1-9 Appearance of Base Rack of the Equipment Rack Model 1740 (Model Name: 19R-174A1/19R-174A2)



- System Cabinet of the Equipment Rack Model 1740 Model Name: 19R-174B1/19R-174B2

FIGURE 1-10 Appearance of System Cabinet of the Equipment Rack Model 1740 (Model Name: 19R-174B1/19R-174B2)

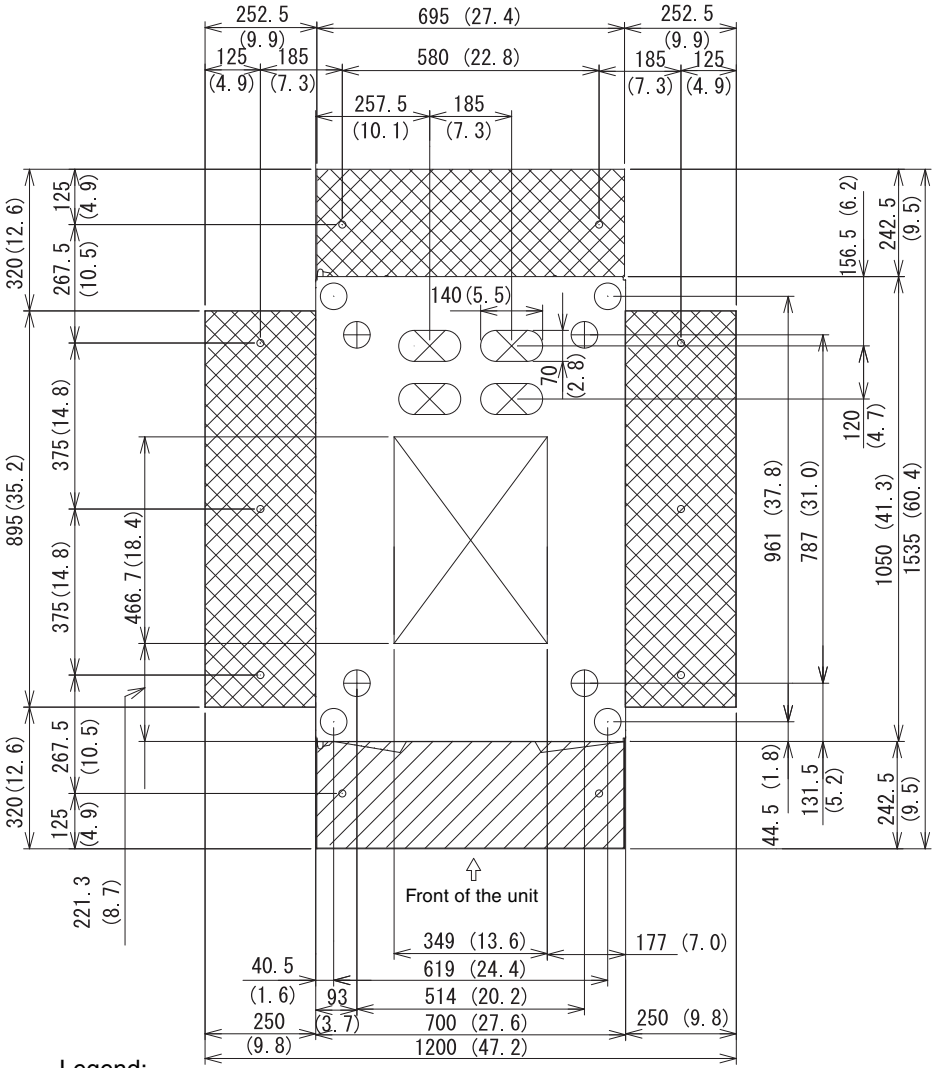


1.4 Floor Plans of the Equipment Rack

This section provides the floor plans of the equipment rack.

■ Floor Plan of Equipment Racks

FIGURE 1-11 Floor Plan of the Equipment Rack for SPARC Enterprise Servers

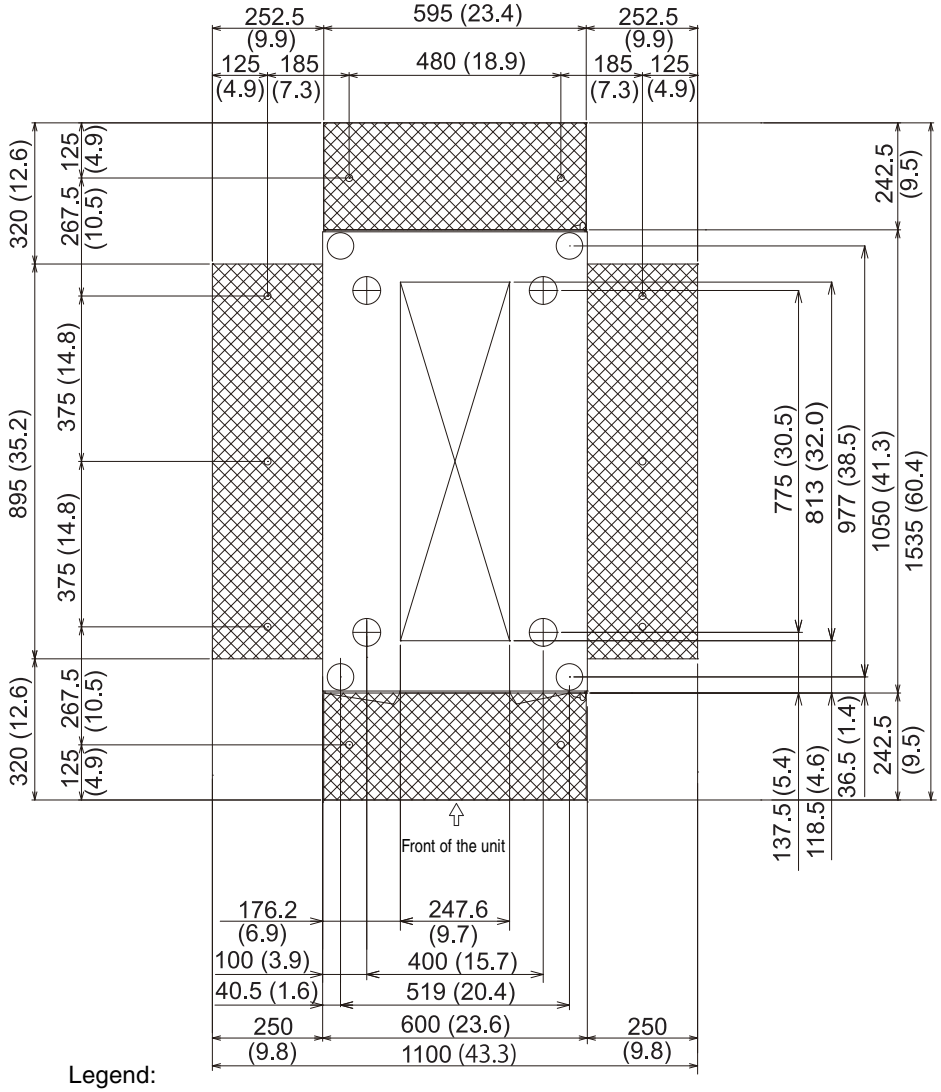


Legend:

- Cable extraction (insertion) hole
- Caster
- Level feet
  (At the center of the level foot, there is a 17 mm-deep, M20-size screw hole used for securing the rack in position.)
- Floor hole for securing the quake-resistant options kit
- Quake-resistant options kit (for tip-resistance)
- Quake-resistant options kit (for unit securing and earthquake-proofing)

Unit: mm (in.)

FIGURE 1-12 Floor Plan of the Equipment Rack Model 1640/1624



Legend:

Cable extraction (insertion) hole

Caster

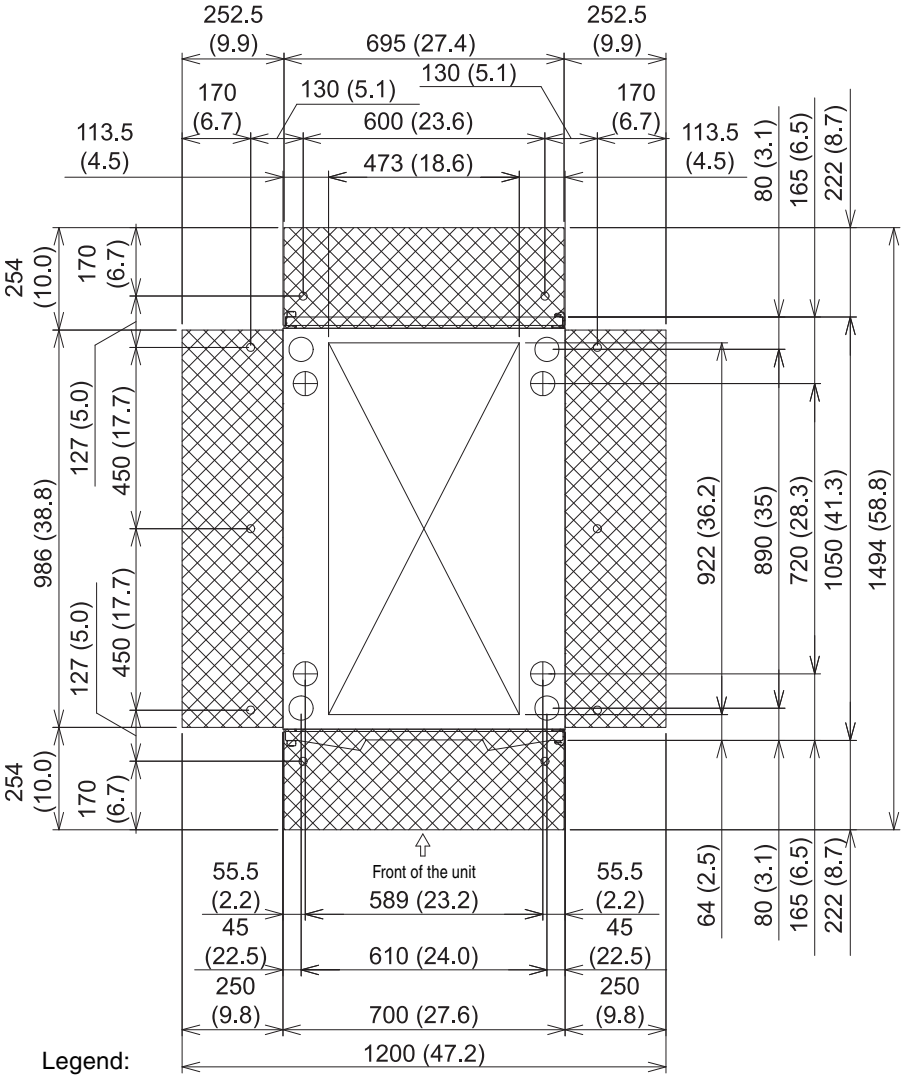
Quake-resistant options kit

level feet
(At the center of the level foot, there is a 17 mm-deep, M20-size screw hole used for securing the rack in position.)

Floor hole for securing the quake-resistant options kit

Unit: mm (in.)

FIGURE 1-13 Floor Plan of the Equipment Rack Model 1740



Legend:

Cable extraction (insertion) hole

Caster

Quake-resistant options kit

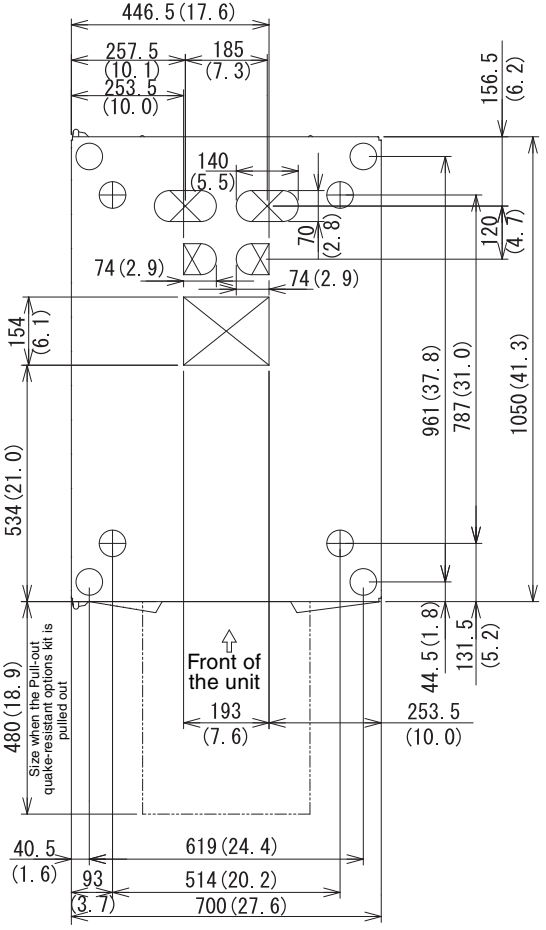
level feet
(At the center of the level foot, there is a 17 mm-deep, M20-size screw hole used for securing the rack in position.)

Floor hole for securing the quake-resistant options kit

Unit: mm (in.)

■ Floor Plan of the Equipment Rack with the Pull-out Quake-Resistant Options Kit Mounted

FIGURE 1-14 Floor Plan of the Equipment Rack with the Pull-out Quake-Resistant Options Kit Mounted



Legend:

Cable extraction (insertion) hole

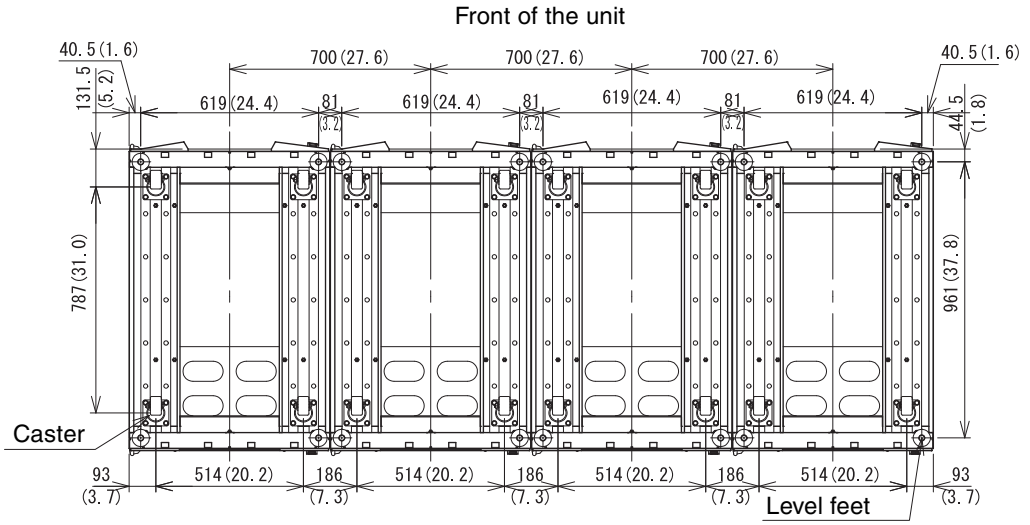
Caster

level feet
(At the center of the level foot, there is a 17 mm-deep, M20-size screw hole used for securing the rack in position.)

Unit: mm (in.)

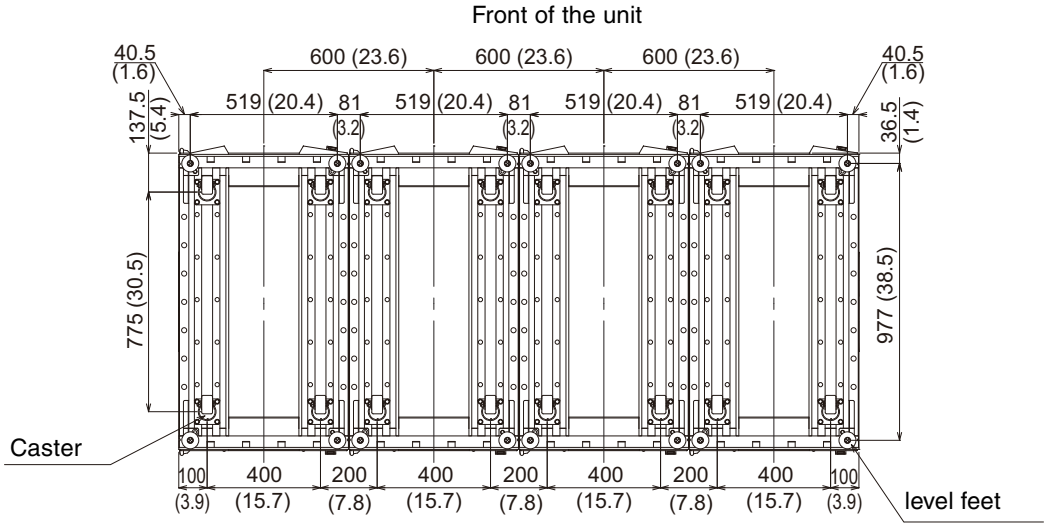
■ Floor Plan of Interconnected Equipment Racks

FIGURE 1-15 Floor Plan of Interconnected Equipment Racks for SPARC Enterprise Servers



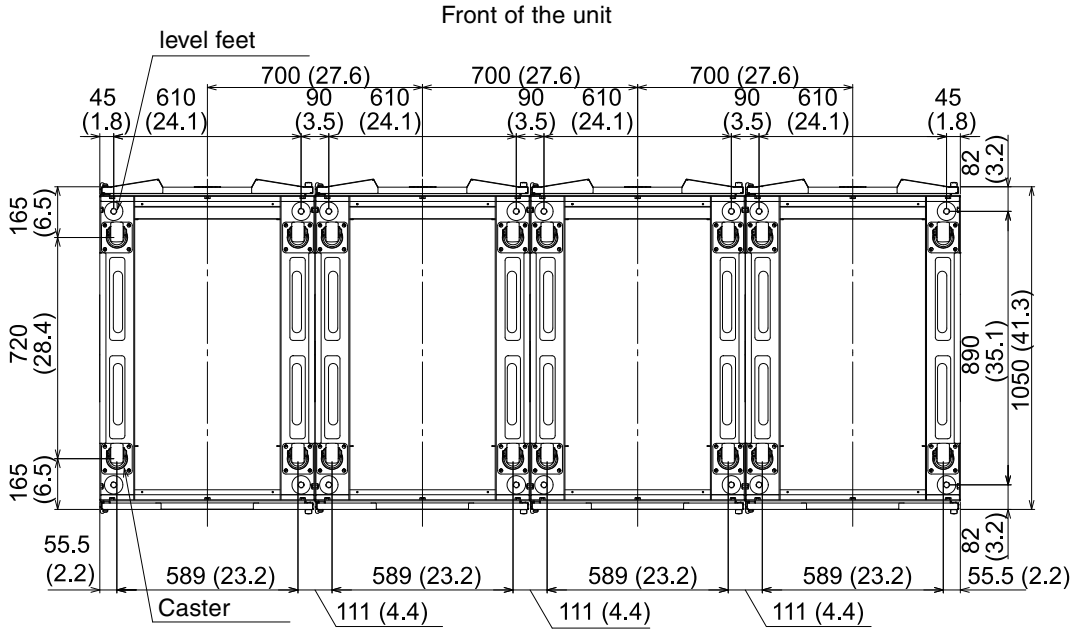
Unit: mm (in.)

FIGURE 1-16 Floor Plan of Interconnected Equipment Racks Model 1640/1624



Unit: mm (in.)

FIGURE 1-17 Floor Plan of Interconnected Equipment Racks Model 1740



Unit: mm (in.)

CHAPTER 2

Overview of Hardware Units to Be Mounted

This chapter contains the following sections:

2.1 Outline of Hardware Units That Can Be Mounted

The M3000/M4000/M5000 servers and the External I/O Expansion Unit can be mounted in the equipment rack.

This chapter provides an overview of each unit.

TABLE 2-1 Hardware Units That Can Be Mounted

Product Name	External Dimensions [mm (in.)] Width	Depth	Height	Weight† [kg (lb.)]	Remarks
M3000 server	440 (17.4)	657 (25.9)	87 (3.4) 2U	22 (48.5)	Equipment rack-mountable server. Up to 1 CPU can be mounted in the 2U-size server.
M4000 server	444 (17.5)	810 (31.9)	263 (10.35) 6U	84 (185)	Equipment rack-mountable server. Up to 4 CPUs can be mounted in the 6U-size server.
M5000 server	444 (17.5)	810 (31.9)	440 (17.32) 10U	125 (275)	Equipment rack-mountable server. Up to 8 CPUs can be mounted in the 10U-size server.
External I/O Expansion Unit	440 (17.32)	1000 (39.4)*	175 (6.9) 4U	37 (81)	Unit for expanding the PCI slots. Up to 12 PCI-X or PCI Express slots can be installed per unit. Up to two units can be connected to the M4000 server and up to four units can be connected to the M5000 server.

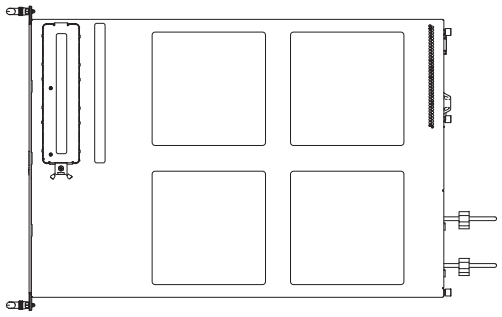
* The value indicates the depth including the cable management arm.

† The value indicates the weight for when all options are mounted.

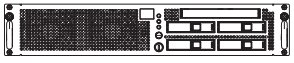
2.2 Appearance of Units

This section provides the appearance of the M3000/M4000/M5000 servers and External I/O Expansion Unit.

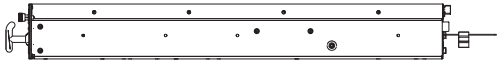
FIGURE 2-1 M3000 Server Appearance



Top view

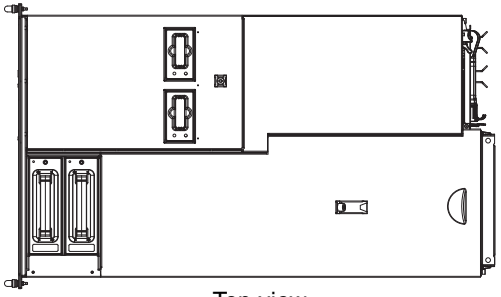


Front view

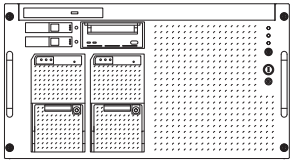


Right side

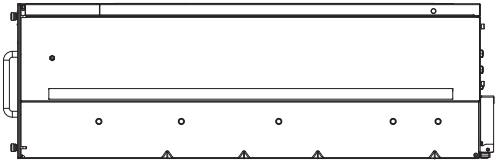
FIGURE 2-2 M4000 Server Appearance



Top view

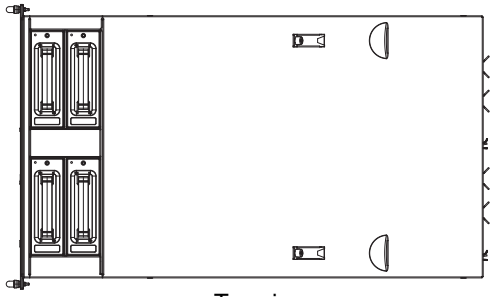


Front view

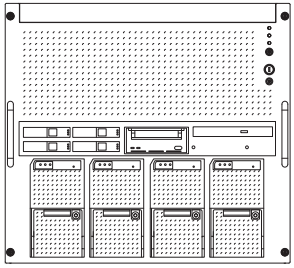


Right side

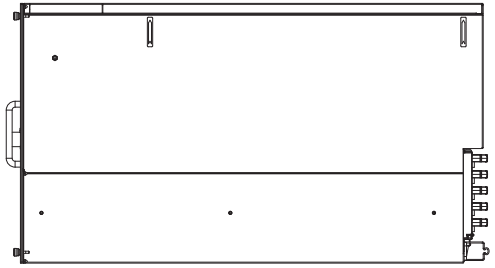
FIGURE 2-3 M5000 Server Appearance



Top view

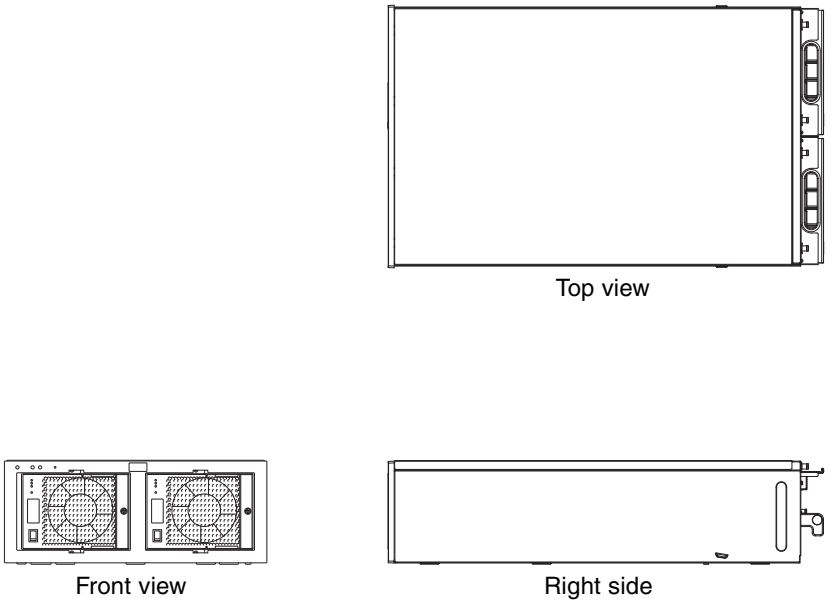


Front view



Right side

FIGURE 2-4 Appearance of the External I/O Expansion Unit



2.3 Power Supply Connection

This section provides input power system diagrams for individual hardware units as well as the power cord and outlet specifications of the units.

Caution – Use only the power cords supplied with this product to connect this product. Do not to use these power cords with other products.

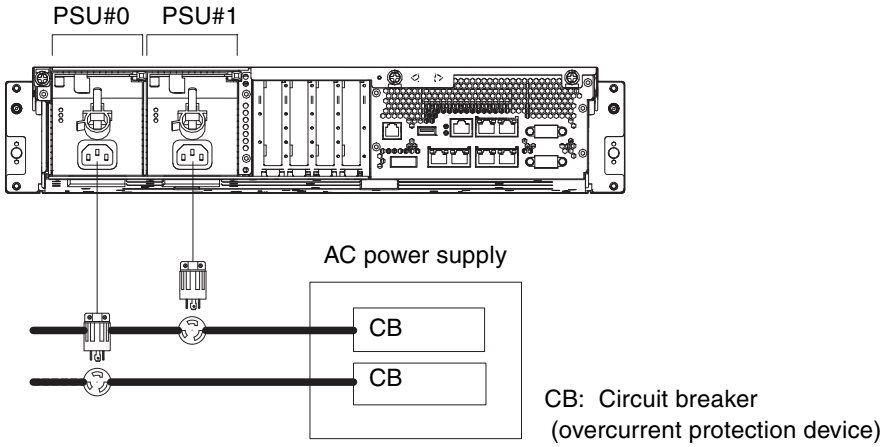
2.3.1 M3000 Server

This section explains the power supply connections of the M3000 server.

- Power supply system diagram with redundant PSU connection

  To connect the power cords in a redundant PSU connection to the same AC power supply, connect each power cord independently to its own outlet.

FIGURE 2-5 Power Supply System Diagram with Redundant PSU Connection

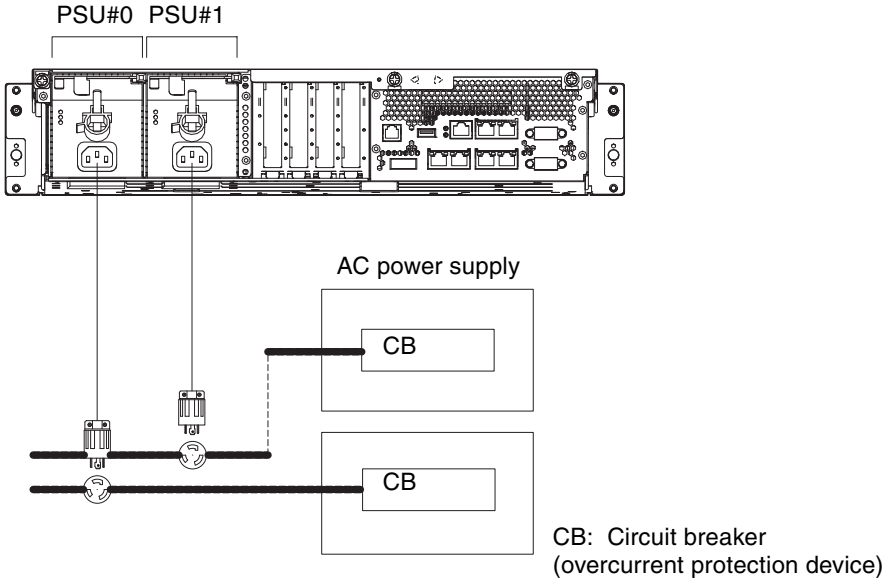


Note – If connected to uninterruptible power supply (UPS) or the power distribution box, you do not have to connect the power cords one-on-one but can connect the cords in a collective form within the range of current capacity of UPS or the power distribution box.

- Power supply system diagram with dual power feed connection

  For a dual-power feed connection, connect each power cord separately to each AC power supply system.

FIGURE 2-6 Power Supply System Diagram with Dual Power Feed Connection



Note – If more than one power cord of this server is connected directly to the customer's distribution panel, connect the power cords to outlets independently using one cable per power feed as shown in FIGURE 2-6.

TABLE 2-2 Power Cord Outlet Specifications of M3000 Server

Delivery Destination	Plug Type Specifications	Shape	Outlet Type Specifications	Shape
Japan and outside Japan, 100 VAC	Two-parallel-prong plug with grounding electrode (15A-125V) [NEMA standard type name: 5-15P]		Connect it to the power distribution box, or prepare an outlet for the unit. Receptacle for parallel two-prong plug with grounding electrode (15A-125V) [NEMA 5-15R]	
Japan and outside Japan, 200 VAC (Option)	Three-prong twist-lock plug with grounding electrode (15A-250V) [NEMA standard type name: L6-15P]		Connect it to the power distribution box, or prepare an outlet for the unit. Receptacle for three-prong hook type plug with grounding electrode (15A-250V) [NEMA L6-15R]	

Note – For the servers that have the plug with lock function, confirm that a 15A overcurrent protection device is available outside the server. If one is not available, prepare an external 15A 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.

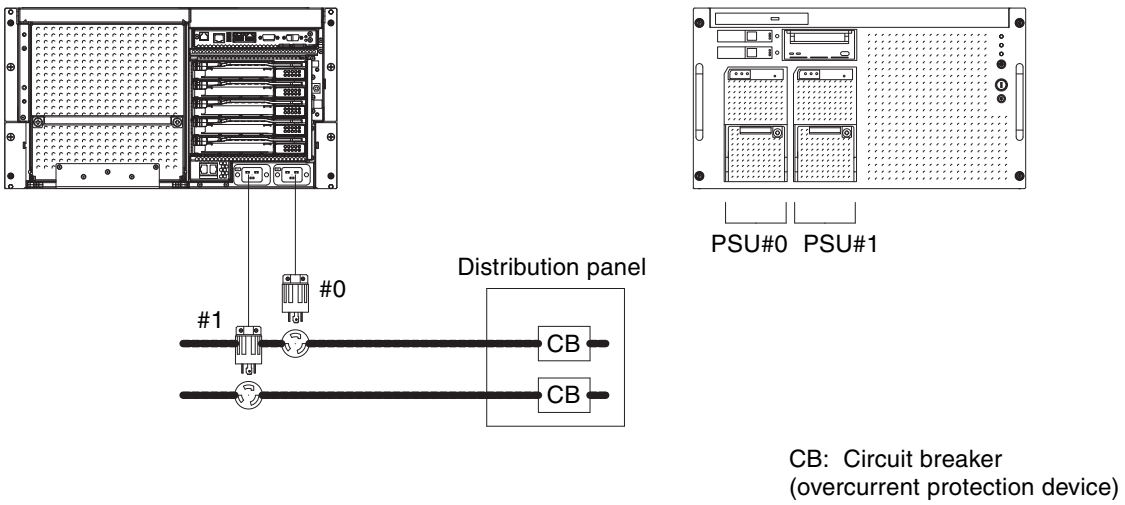
2.3.2 M4000 Server

This section explains the power supply connections of the M4000 server.

- Power supply system diagram with redundant PSU connection

  If more than one power cord of this server is connected directly to the same facility power source distribution panel, connect the power cords to outlets independently using one cable per power feed.

FIGURE 2-7 Power Supply System Diagram with Redundant PSU Connection

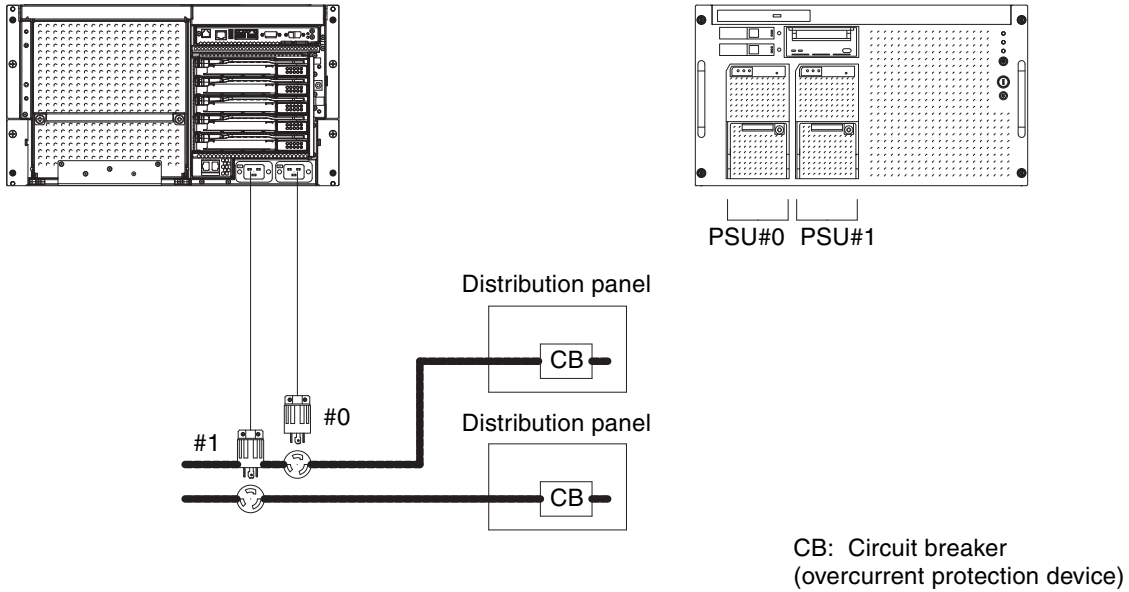


Note – If connected to uninterruptible power supply (UPS) or the power distribution box, you do not have to connect the power cords one-on-one but can connect the cords in a collective form within the range of current capacity of UPS or the power distribution box.

- Power supply system diagram with dual power feed connection

  For a dual-power feed connection, connect the individual power cords separately to each distribution panel.

FIGURE 2-8 Power Supply System Diagram with Dual Power Feed Connection



Note – If more than one power cord of this server is connected directly to the customer's distribution panel, connect the power cords to outlets independently using one cable per power feed as shown in FIGURE 2-8.

TABLE 2-3 Power Cord Outlet Specifications of M4000 Server

Delivery Destination	Plug Type Specifications	Shape	Outlet Type Specifications	Shape
For use in Japan/For general use outside Japan 200 VAC	Three-prong hook type plug with grounding electrode (20A-250V) [NEMA L6-20P]		Prepare the outlet for an outlet for the unit. Receptacle for three-prong hook type plug with grounding electrode (20A-250V) [NEMA L6-20R] 3220-L6 (American Denki) or other	
China / Korea / Hong Kong 200 VAC (Option)	Three-prong hook type plug with grounding electrode (13A-250V) [IEC60320-C14]		Prepare the outlet for an outlet for the unit. Receptacle for three-prong hook type plug with grounding electrode (13A-250V) [IEC60320-C13]	

Note – The plug (NEMA L6-20) of the power cords supplied with the M4000/M5000 servers has the following dimensions. Confirm in advance that the plug does not become an obstruction when plugged into the input power source at the installation site.
- Outside diameter of the connector part of the plug: 50 mm
- Maximum outside diameter of the plug cover: 57 mm
- Plug cover length from the connector end: 69.9 mm

Note – For the servers that have the plug with lock function, confirm that a 20A overcurrent protection device is available outside the server. If one is not available, prepare an external 20A 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.

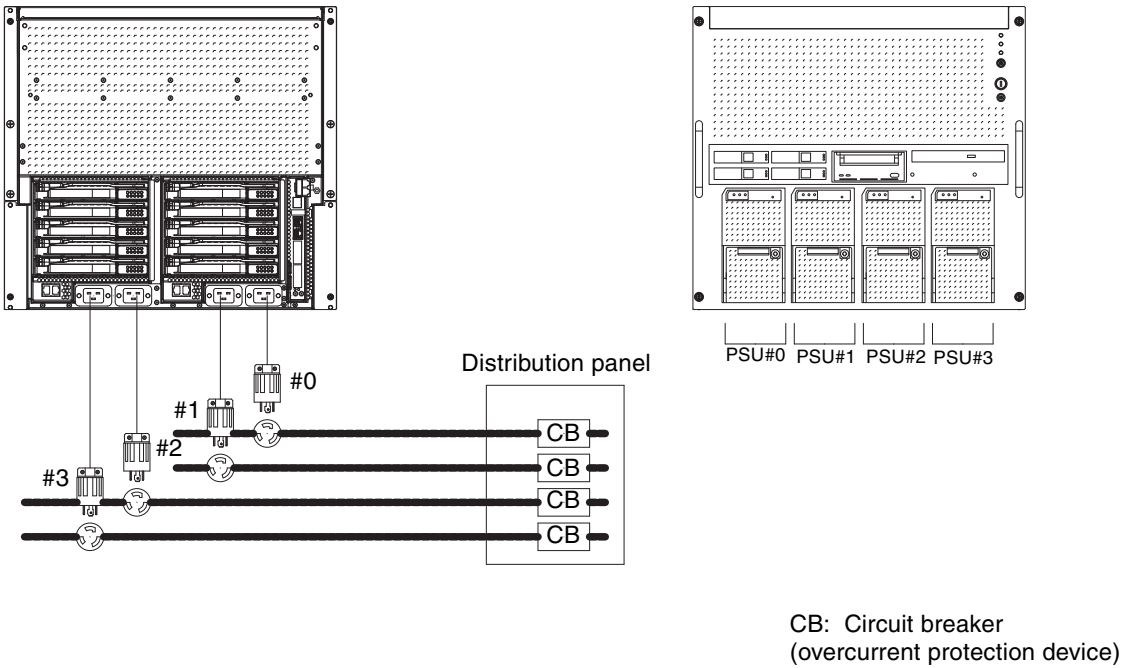
2.3.3 M5000 Server

This section explains the power supply connections of the M5000 server.

- Power supply system diagram with redundant PSU connection

  If more than one power cord of this server is connected directly to the same facility power source distribution panel, connect the power cords to outlets independently using one cable per power feed.

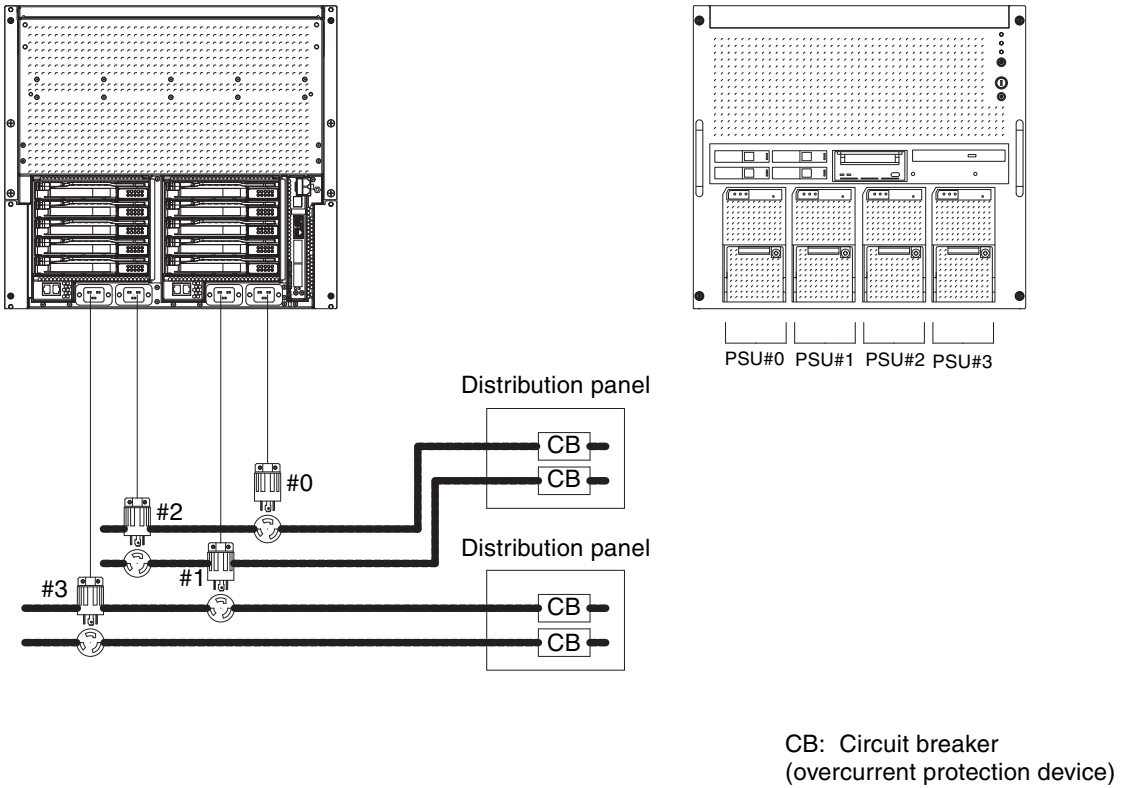
FIGURE 2-9 Power Supply System Diagram with Redundant PSU Connection



Note – If connected to uninterruptible power supply (UPS) or the power distribution box, you do not have to connect the power cords one-on-one but can connect the cords in a collective form within the range of current capacity of UPS or the power distribution box.

■ Power supply system diagram with dual power feed connection

FIGURE 2-10 Power Supply System Diagram with Dual Power Feed Connection



Note – If more than one power cord of this server is connected directly to the customer's distribution panel, connect the power cords to outlets independently using one cable per power feed as shown in FIGURE 2-10.

TABLE 2-4 Power Cord Outlet Specifications of M5000 Server

Delivery Destination	Plug Type Specifications	Shape	Receptacle Type Specifications	Shape
For use in Japan/For general use outside Japan 200 VAC	Three-prong hook type plug with grounding electrode (20A-250V) [NEMA L6-20P]		Prepare the outlet for an outlet for the unit. Receptacle for three-prong hook type plug with grounding electrode (20A-250V) [NEMA L6-20R] 3220-L6 (American Denki) or other	
China / Korea / Hong Kong 200 VAC (Option)	Three-prong hook type plug with grounding electrode (13A-250V) [IEC60320-C14]		Prepare the outlet for an outlet for the unit. Receptacle for three-prong hook type plug with grounding electrode (13A-250V) [IEC60320-C13]	

Note – The plug (NEMA L6-20) of the power cords supplied with the M4000/M5000 servers has the following dimensions. Confirm in advance that the plug does not become an obstruction when plugged into the input power source at the installation site.
- Outside diameter of the connector part of the plug: 50 mm
- Maximum outside diameter of the plug cover: 57 mm
- Plug cover length from the connector end: 69.9 mm

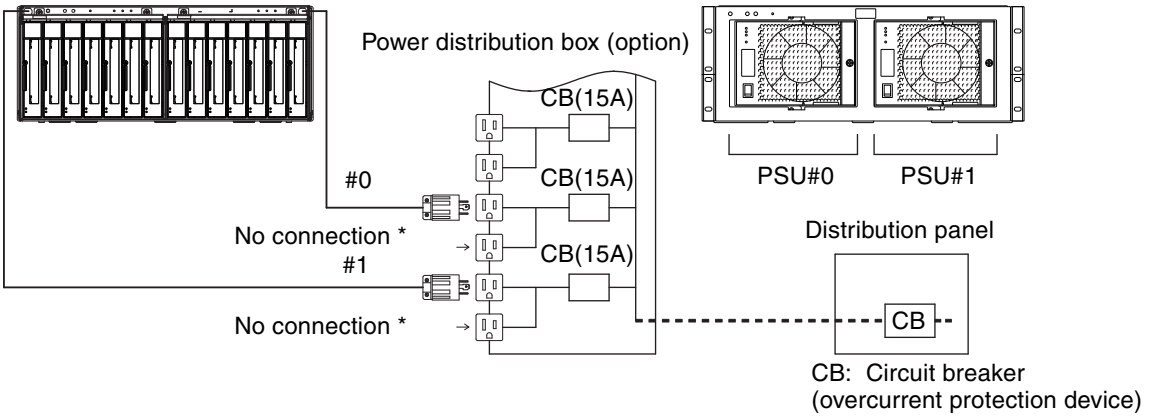
Note – For the servers that have the plug with lock function, confirm that a 20A overcurrent protection device is available outside the server. If one is not available, prepare an external 20A overcurrent protection that can be achieved by means of no-fuse breakers (NFBs) or fuses. The plug with lock 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.

2.3.4 External I/O Expansion Unit

This section explains the power supply connections of the External I/O Expansion Unit.

- Power system in a redundant power supply configuration

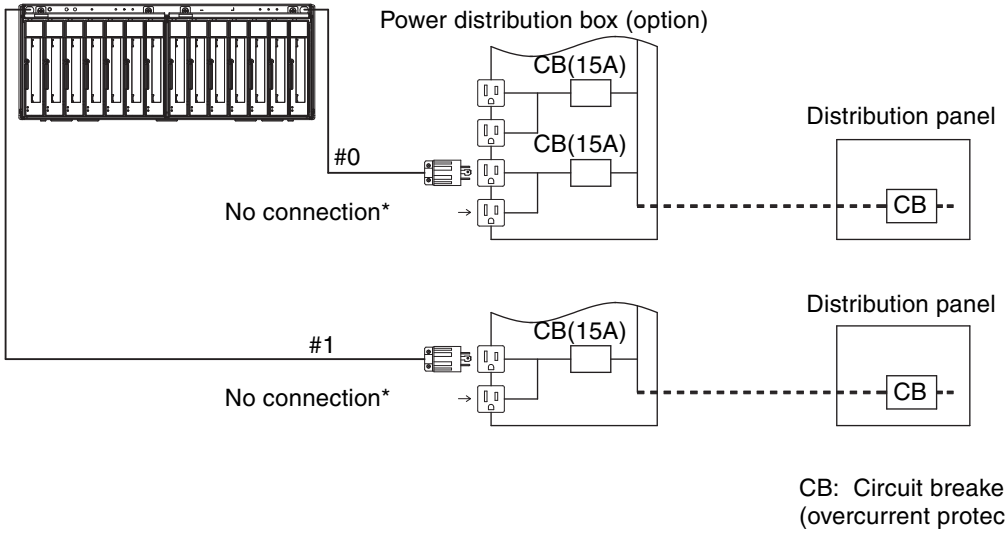
FIGURE 2-11 Power System in a Redundant Power Supply Configuration



*: Connect one power cord to each output group (one circuit breaker [CB] with two outlets) of the power distribution box. To maintain redundancy, connect no peripheral to the other outlet.

■ Power system in a dual-power supply configuration

FIGURE 2-12 Power System in a Dual-power Supply Configuration



*: Connect one power cord to each output group (one circuit breaker [CB] with two outlets) of the power distribution box. To maintain redundancy, connect no peripheral to the other outlet.

TABLE 2-5 Power Cord and Outlet Specifications of the External I/O Expansion Unit

Delivery Destination	Plug Type Specifications	Shape	Receptacle Type Specifications	Shape
Japan and outside Japan, 100 VAC	Two-parallel-prong plug with grounding electrode (15A-125V) [NEMA 5-15P]		Connect it to the power distribution box, or prepare an outlet for the unit. Receptacle for parallel two-prong plug with grounding electrode (15A-250V) [NEMA 5-15R]	
Japan and outside Japan, 200 VAC (Option)	Three-prong twist-lock plug with grounding electrode (15A-250V) [NEMA L6-15P]		Connect it to the power distribution box, or prepare an outlet for the unit. Receptacle for three-prong hook type plug with grounding electrode (15A-250V) [NEMA L6-15R] Embedded type: 3120/3120-P/3120-D (American Denki) Exposed type: 3121 (American Denki)	

Note – For the servers that have the plug with lock function, confirm that a 15A overcurrent protection device is available outside the server. If one is not available, prepare an external 15A 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.

2.3.5 Power Distribution Box

This section explains the power supply connections of the power distribution box.

- For 100V for use in Japan (Model name: SE-R7CB11)

FIGURE 2-13 For 100V for Use in Japan (Model Name: SE-R7CB11)

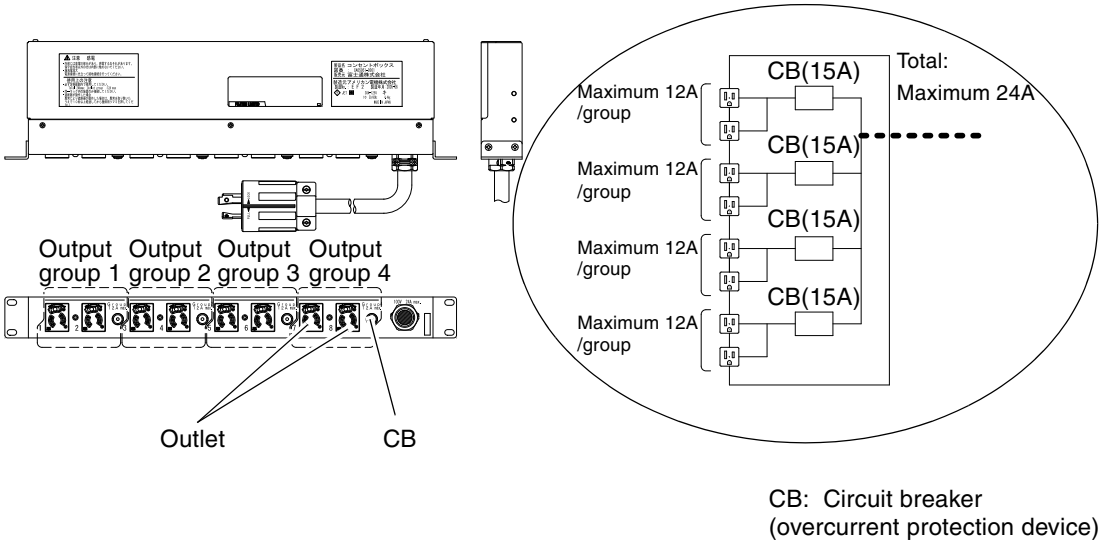


TABLE 2-6 Power Cord and Outlet Specifications of the Power Distribution Box

Delivery Destination	Output Receptacle Type		Input Plug Type		Receptacle Type on Equipment	
	Specifications	Shape	Specifications	Shape	Specifications	Shape
Japan, 100 VAC (Option)	Outlet for two-parallel-prong plug with grounding electrode (15A-125V) (lock mechanism) [NEMA 5-15R]		Three-prong twist-lock plug with grounding electrode (30A-125V) [NEMA L5-30P]		Outlet for three-prong twist-lock plug with grounding electrode (30A-125V) [NEMA L5-30R] Embedded type: 3310-L5 (American Denki) Exposed type: 3311-L5(American Denki)	

■ For 200V for use in Japan (Model name: SE-R7CB21)

FIGURE 2-14 For 200V for Use in Japan (Model Name: SE-R7CB21)

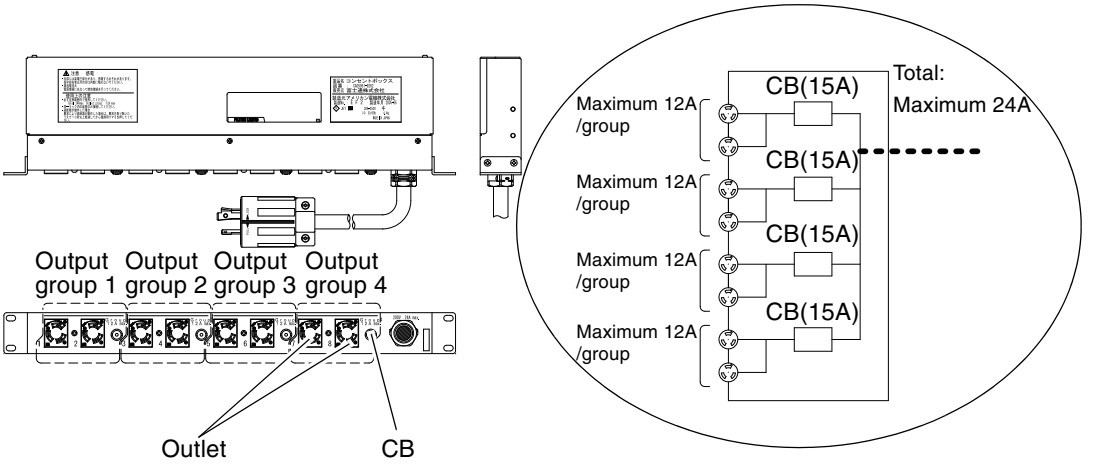


TABLE 2-7 Power Cord and Outlet Specifications of the Power Distribution Box

Delivery Destination	Output Receptacle Type		Input Plug Type		Receptacle Type on Equipment	
	Specifications	Shape	Specifications	Shape	Specifications	Shape
Japan, 200 VAC (Option)	Outlet for three-prong twist-lock plug with grounding electrode (15A-250V) [NEMA L6-15R]		Three-prong twist-lock plug with grounding electrode (30A-250V) [NEMA L6-30P]		* Outlet for three-prong twist-lock plug with grounding electrode (30A-250V) [NEMA L6-30R] Embedded type: 3320-L6 (American Denki) Exposed type: 3321-L6 (American Denki)	

Note – 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.

■ For 100V for use outside Japan (Model name: SE-R7CB11X)

FIGURE 2-15 For 100V for Use outside Japan (Model Name: SE-R7CB11X)

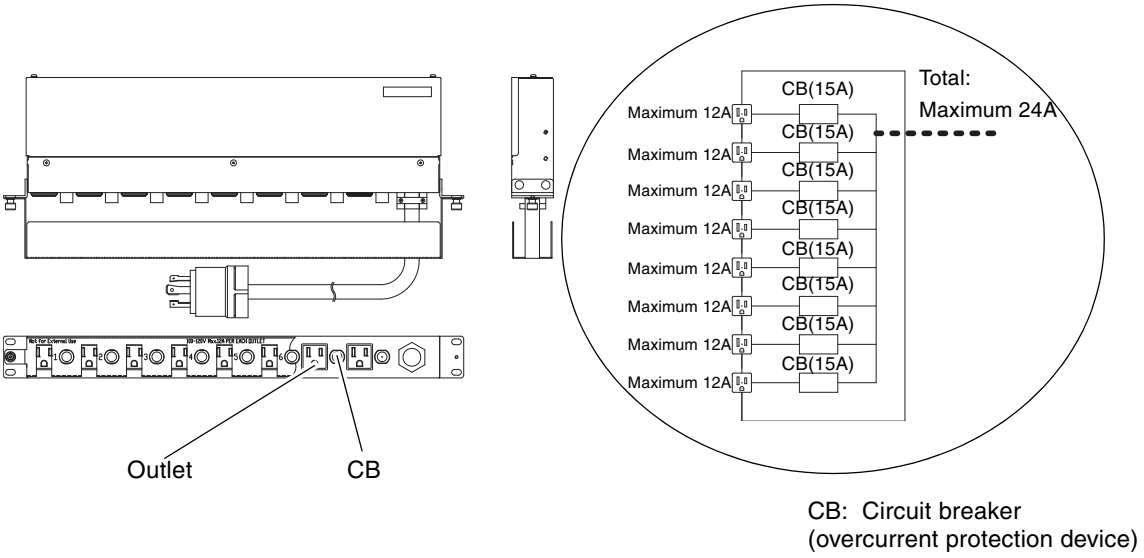


TABLE 2-8 Power Cord and Outlet Specifications of the Power Distribution Box

Delivery Destination	Output Receptacle Type		Input Plug Type		Receptacle Type on Equipment	
	Specifications	Shape	Specifications	Shape	Specifications	Shape
Outside Japan, 100 VAC (Option)	Outlet for two-parallel-prong plug with grounding electrode (15A-125V) [NEMA 5-15R]		Three-prong twist-lock plug with grounding electrode (30A-125V) [NEMA L5-30P]		Outlet for three-prong twist-lock plug with grounding electrode (30A-125V) [NEMA L5-30R]	

■ For 200V for use outside Japan (Model name: SE-R7CB21X)

FIGURE 2-16 For 200V for Use outside Japan (Model Name: SE-R7CB21X)

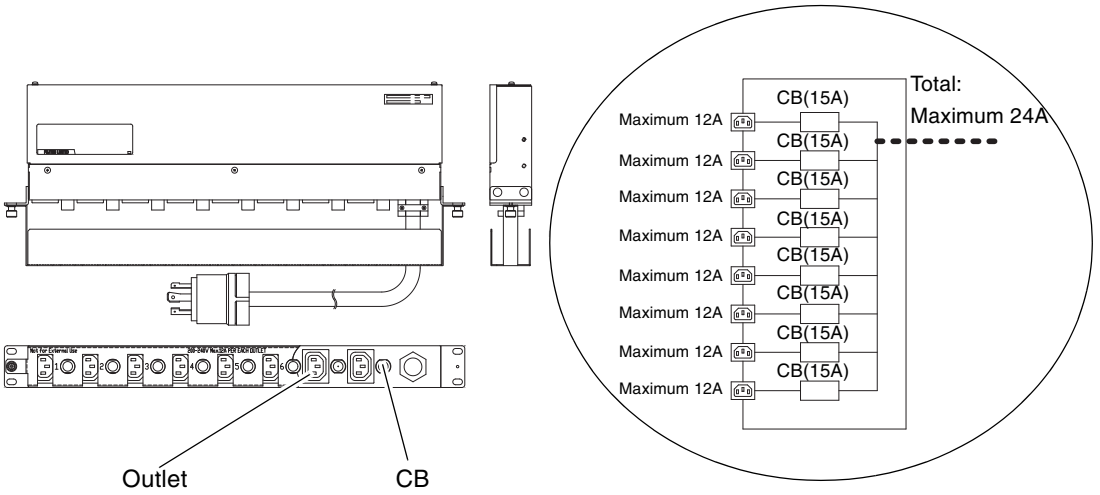


TABLE 2-9 Power Cord and Outlet Specifications of the Power Distribution Box

Delivery Destination	Output Receptacle Type		Input Plug Type		Receptacle Type on Equipment	
	Specifications	Shape	Specifications	Shape	Specifications	Shape
Outside Japan, 200 VAC (Option)	IEC320-C13 type		Three-prong twist-lock plug with grounding electrode (30A-250V) [NEMA L6-30P]		Outlet for three-prong twist-lock plug with grounding electrode (30A-250V) [NEMA L6-30R]	

Note – 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.

CHAPTER 3

Mounting Units in the Rack

This chapter contains the following sections:

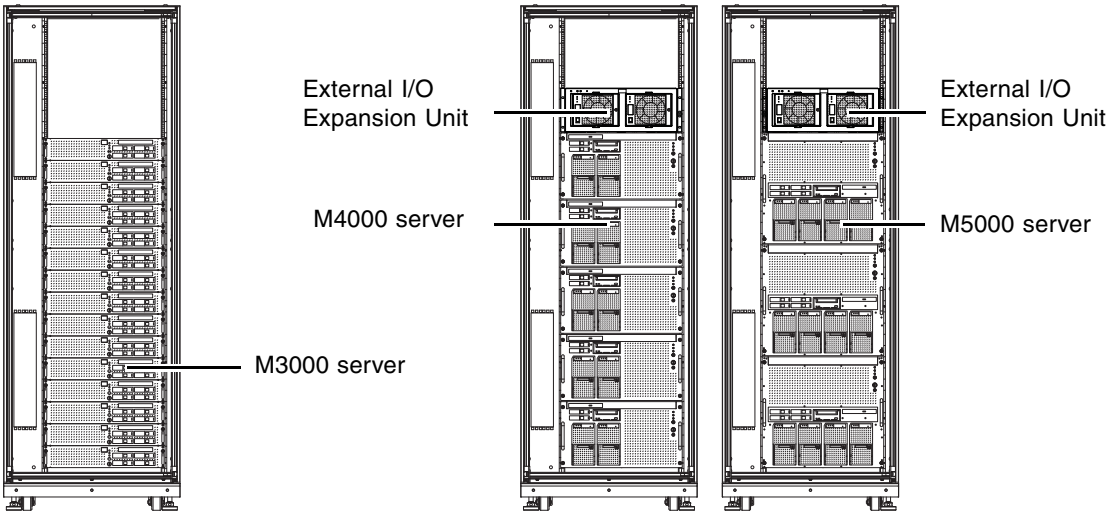
3.1 Rack Mounting Examples

Up to twenty M3000 servers, five M4000 servers, or three M5000 servers can be mounted in the equipment rack. An External I/O Expansion Unit added to an M4000/M5000 server must be mounted in the same rack. The equipment rack can also be used as an I/O expansion rack for the M8000/M9000 server.

FIGURE 3-1 shows mounting examples.

The left shows the case when fifteen M3000 servers. The center shows the case when five M4000 servers and an External I/O Expansion Unit mounted in the equipment rack, and the right shows the case when three M5000 servers and an External I/O Expansion Unit mounted.

FIGURE 3-1 Equipment Rack Mounting Examples



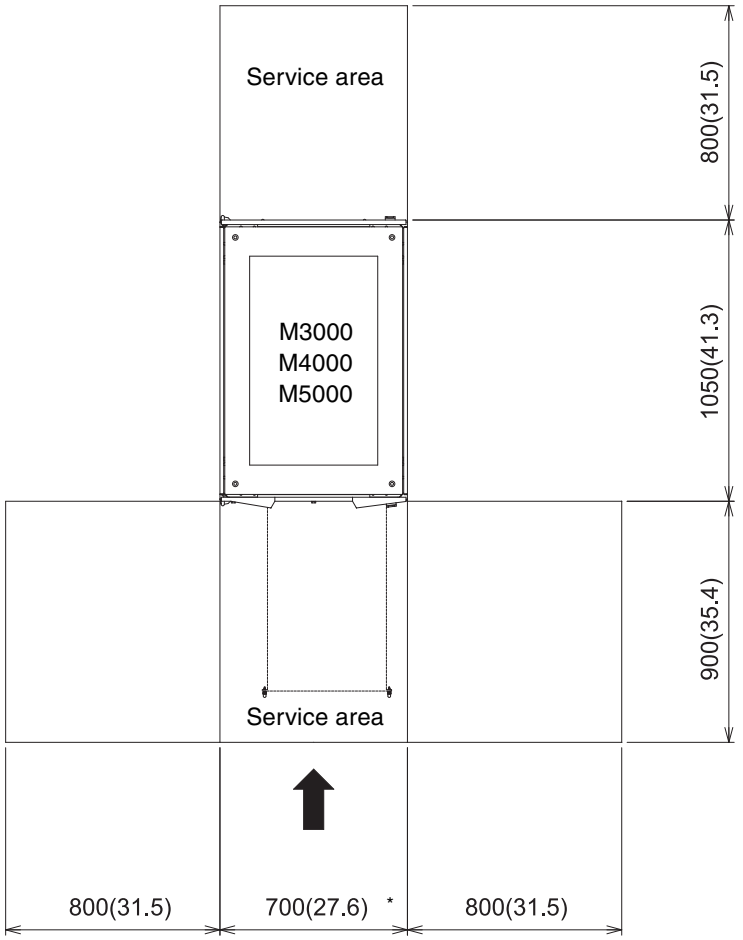
3.2 Service Area

The M3000/M4000/M5000 servers are accessed from the top surfaces. A stepladder may be required for maintenance depending upon the height these servers are mounted in the rack. Secure an adequate service area for maintenance work depending upon the height the server is mounted in the rack. For information on mounting locations in a rack that require use of a stepladder, see Section 3.3, "Restriction on Mounting and Requirements for Maintenance" on page 3-5.

3.2.1 When a Stepladder Is Not Used

FIGURE 3-2 shows the service area for cases where a stepladder is not used.

FIGURE 3-2 Service Area for Cases Where a Stepladder Is Not Used



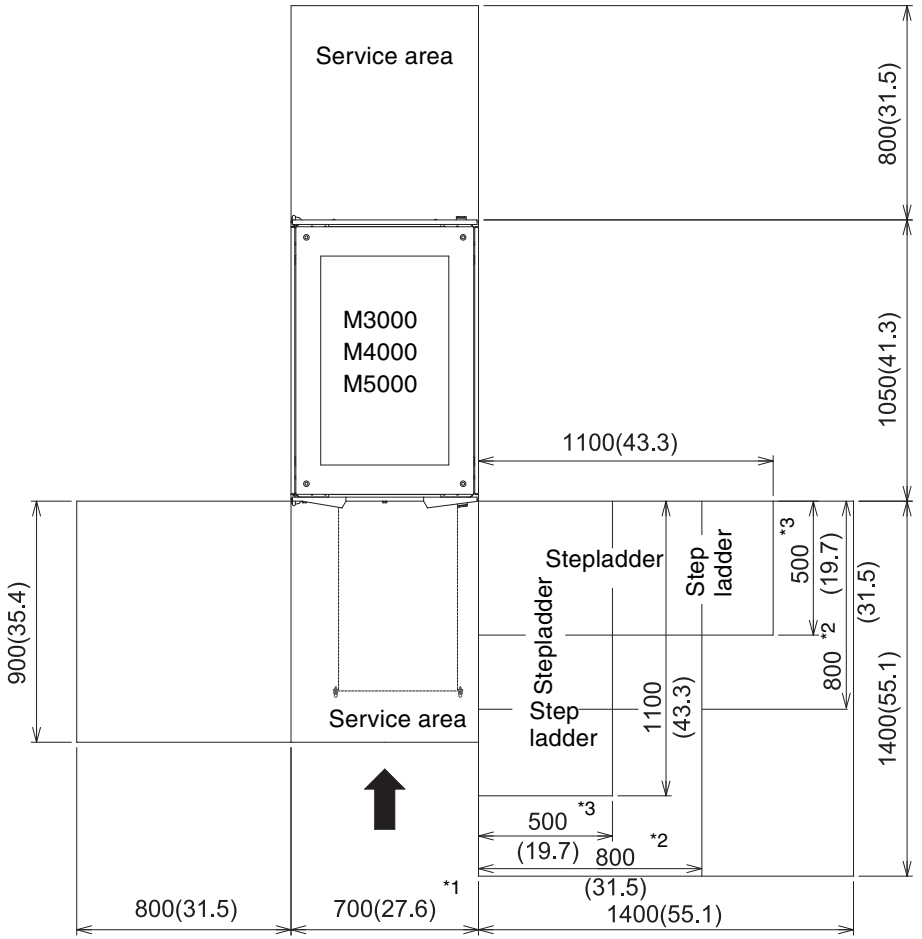
*: When the equipment rack model 1640/1624 is used : 600 (23.6)

Unit: mm (in.)

3.2.2 When a Stepladder Is Used

FIGURE 3-3 shows the service area for when a stepladder is used. When a stepladder is used, the area must be secured so that the stepladder can be oriented both perpendicularly to and in parallel with the server.

FIGURE 3-3 Service Area in Cases Where a Stepladder Is Used



Unit: mm (in.)

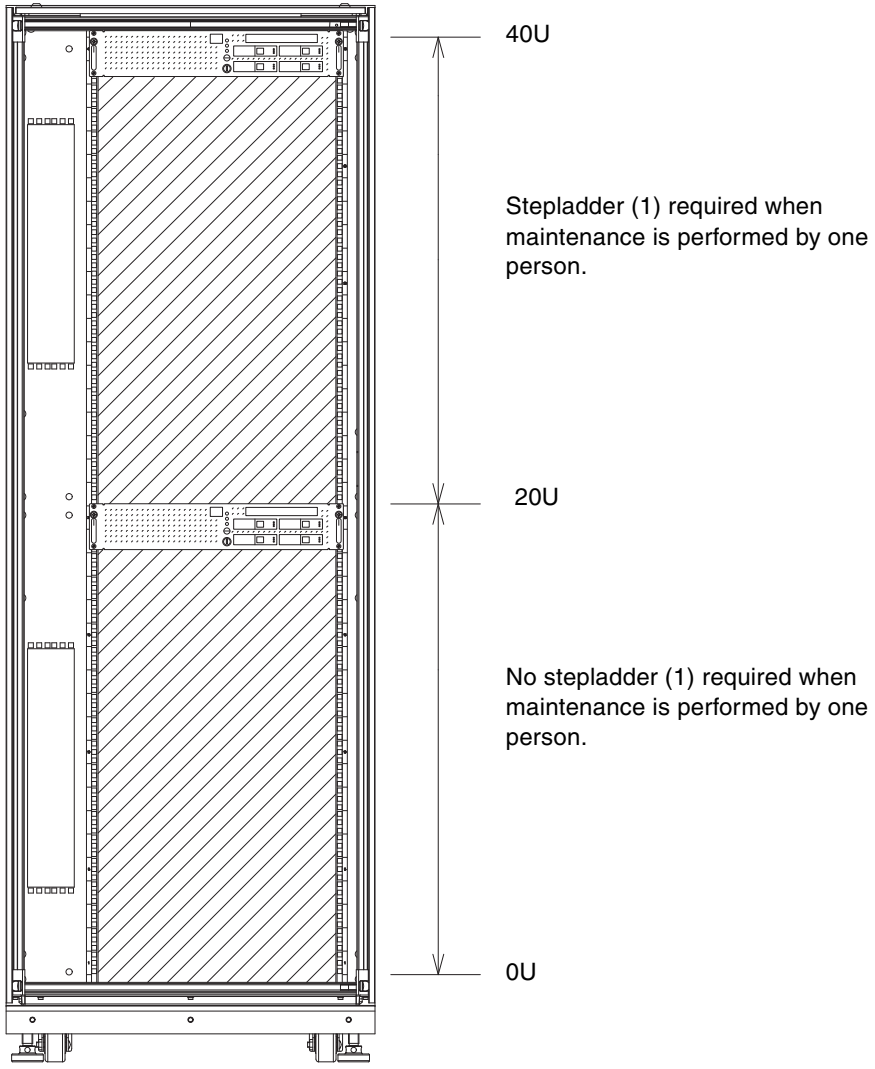
*1: When the equipment rack model 1640/1624 is used : 600 (23.6)
*2: When the M3000 server is mounted : 800 (31.5)
*3: When the M4000 or M5000 server is mounted : 500 (19.7)

3.3 Restriction on Mounting and Requirements for Maintenance

3.3.1 Mounting Restriction and Requirements for Maintenance of the M3000 Server

The mounting locations, and number of persons required for maintenance of the M3000 server where a stepladder is required are indicated in FIGURE 3-4. You can mount up to twenty M3000 servers, which is 2U-size, under the 40U location.

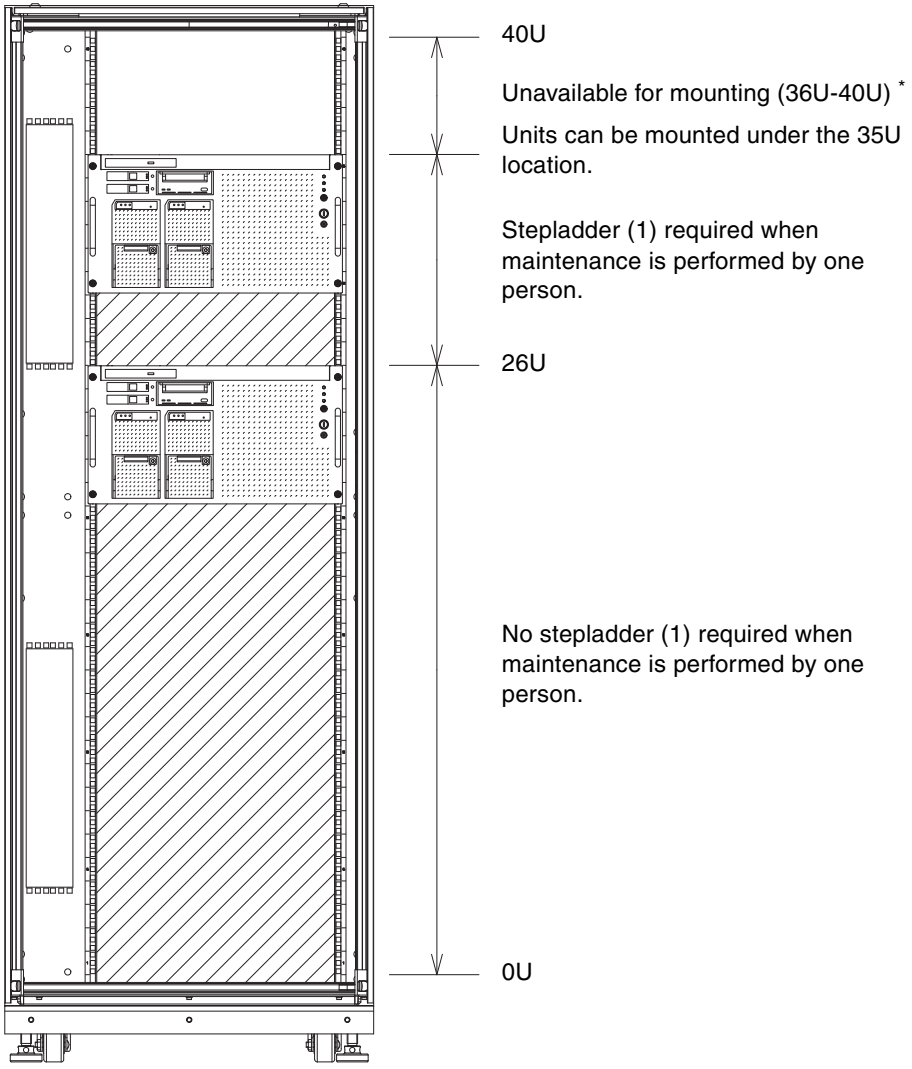
FIGURE 3-4 Mounting Restriction and Requirements for Maintenance of the M3000 Server (when the 40U rack is used)



3.3.2 Mounting Restriction and Requirements for Maintenance of the M4000 Server

The mounting locations, and number of persons required for maintenance of the M4000 server where a stepladder is required are indicated in FIGURE 3-5. You can mount up to five M4000 servers, which is 6U-size, under the 35U location. The M4000 server cannot be mounted at or above the 36U location.

FIGURE 3-5 Mounting Restriction and Requirements for Maintenance of the M4000 Server (when the 40U rack is used)

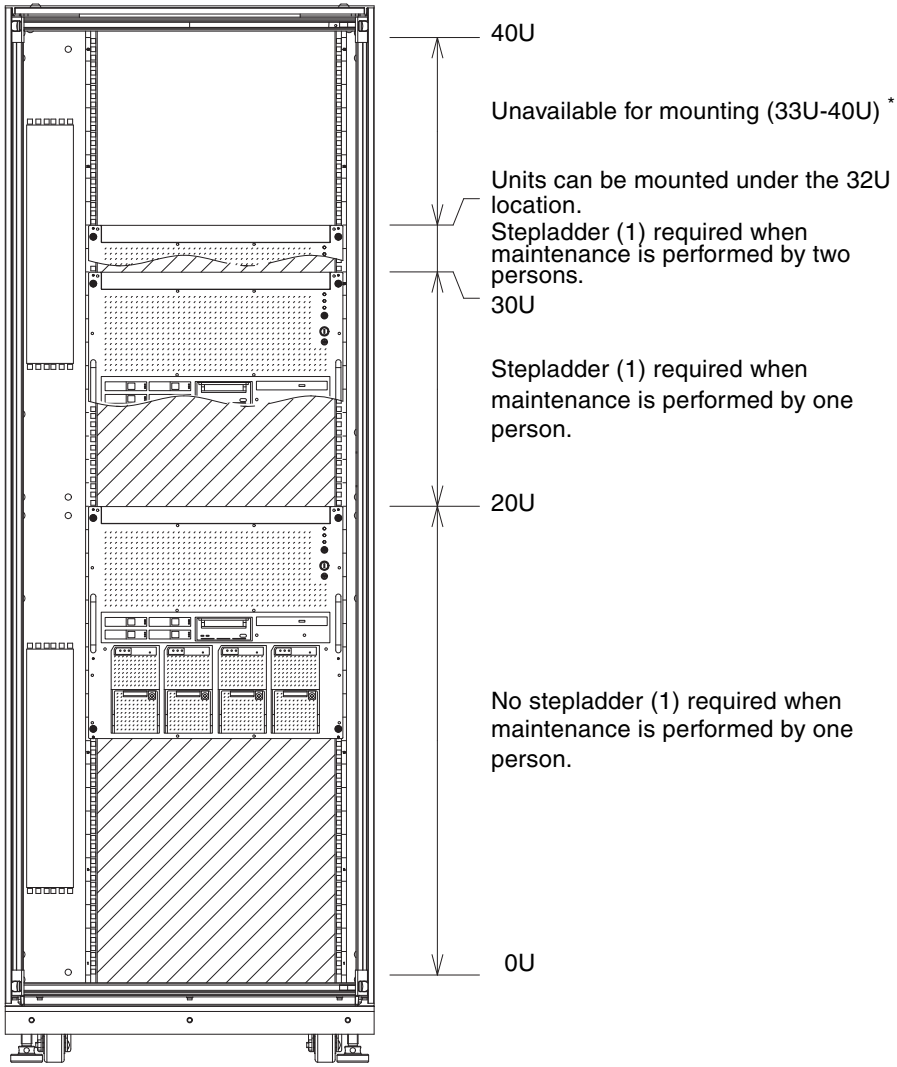


*: In the above figure, the number indicating the space that is not available for mounting the server is for cases when the 40U rack is used. When the server is mounted on a rack having space less than 40U, the topmost 5U space is not available. (When the 36U rack is used, the space from 32U to 36U is not available.)

3.3.3 Mounting Restriction and Requirements for Maintenance of the M5000 Server

The mounting locations, and number of persons required for maintenance of the M5000 server where a stepladder is required are indicated in FIGURE 3-6. If a server is mounted at a location between 21U and 24U, a stepladder is not required when two persons perform the maintenance. You can mount up to three M5000 servers, which is 10U-size, under the 32U location. The M5000 server cannot be mounted at or above the 33U location.

FIGURE 3-6 Mounting Restriction and Requirements for Maintenance of the M5000 Server (when the 40U rack is used)

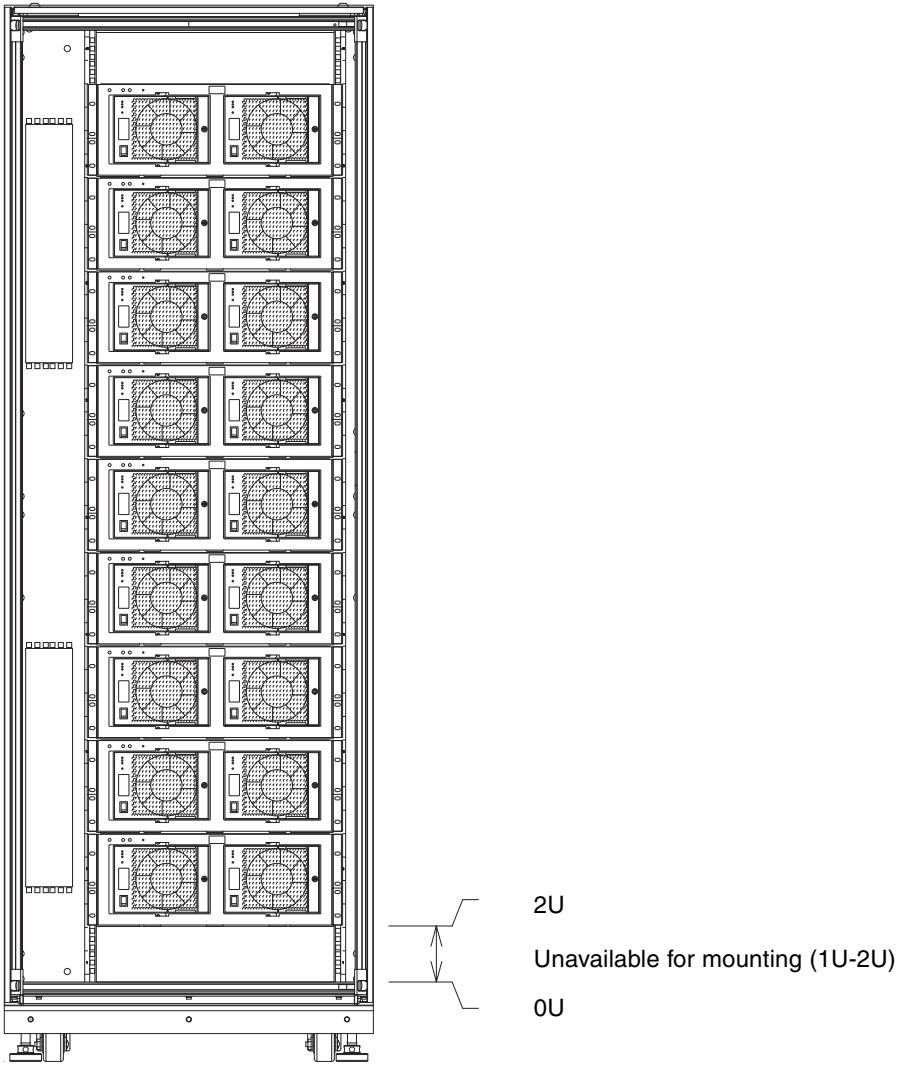


*: In the above figure, the number indicating the space that is not available for mounting the server is for cases when the 40U rack is used. When the server is mounted on a rack having space less than 40U, the topmost 8U space is not available. (When the 36U rack is used, the space from 29U to 36U is not available.)

3.3.4 External I/O Expansion Unit Mounting Restriction

The 1U and 2U rack spaces are not available for mounting the External I/O Expansion Unit.

FIGURE 3-7 External I/O Expansion Unit Mounting Restriction



3.4 Equipment Rack Mounting Requirements

The M3000/M4000/M5000 servers (including peripherals) are developed and their operation is assured on the basic assumption that they are mounted in the equipment rack designed for SPARC Enterprise.

Although they can also be mounted in the equipment rack provided by other company (a rack manufactured by a company other than Fujitsu), you need to give sufficient consideration to the points such as physical specification or environmental requirements of the rack and make a judgment on whether or not the rack is appropriate to install the M3000/M4000/M5000 servers on your own responsibility. In addition, when you consider the use, be sure to satisfy the requirements described in Section 3.9, "Mounting the Server in a Rack Produced by a Company Other Than Fujitsu" on page 3-108.

If the server is not mounted in an equipment rack when shipped, mount the server in an equipment rack by using proper computer-lifting equipment to prevent personal injury or damage to the server.

- When you use the rack to which the tip-resistance quake-resistant options kit attached; you need to attach the quake-resistant options kit to prevent the rack from toppling over.

  You can select the rack to which the tip-resistant quake-resistant options kit attached and use the leveling feet to fixate it with the quake-resistant options kit remain attached.

  For details, see Section 3.4.1, "When Using the Pull-out Quake-Resistant Options Kit" on page 3-13, or Section 3.4.2, "When Using the Bolt-on Quake-Resistant Options Kit" on page 3-13.

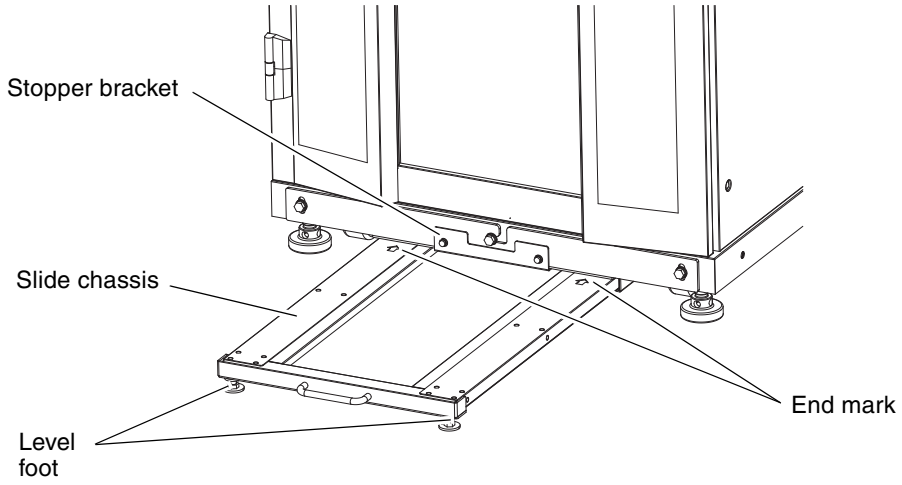
- When you use the rack to which the tip-resistance quake-resistant options kit not attached; you must take measures to fixate the rack.

  Before you perform maintenance, do not fail to confirm that the appropriate measures taken for fixation.

  For details, see Section 3.4.3, "When You Take Measures to Fixate the Rack for Quake Resistance" on page 3-14.

3.4.1 When Using the Pull-out Quake-Resistant Options Kit

FIGURE 3-8 Pulling Out the Pull-out Quake-Resistant Options Kit



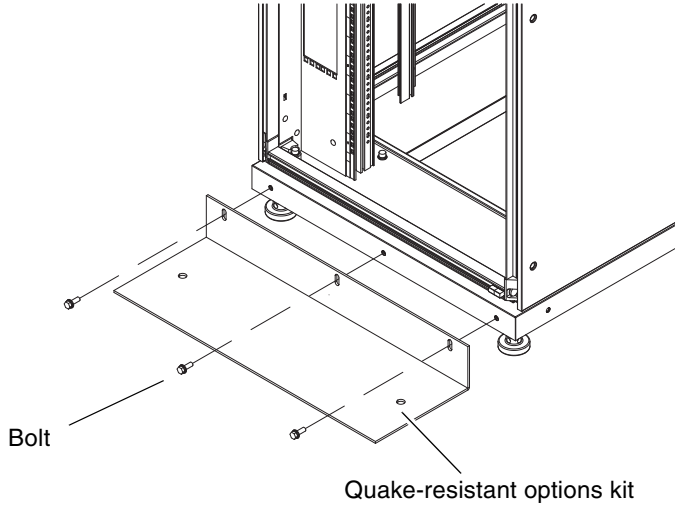
Caution – Be sure to pull the slide chassis all the way out to the point indicated by the end mark. If the slide chassis is not pulled all the way out to the end mark point, the equipment rack may topple over when drawing a server out from a rack.

Caution – Make sure that there is no unevenness between the level feet of the slide chassis where they come into contact with the floor surface. If there is any unevenness between them where they come into contact with the floor surface, the equipment rack may topple over.

3.4.2 When Using the Bolt-on Quake-Resistant Options Kit

In principle, Fujitsu recommends affixing the rack to the floor in a way similar to the case of Section 3.4.3, "When You Take Measures to Fixate the Rack for Quake Resistance" on page 3-14. However, if the rack cannot be affixed to the floor, attach the Bolt-on quake-resistant options kit to it to prevent it from toppling over.

FIGURE 3-9 Attaching the Bolt-on Quake-Resistant Options Kit

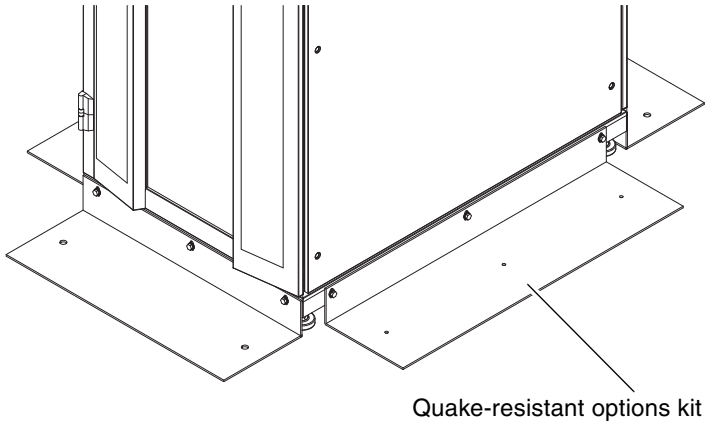


3.4.3 When You Take Measures to Fixate the Rack for Quake Resistance

Use either of the methods below to affix the rack to the floor.

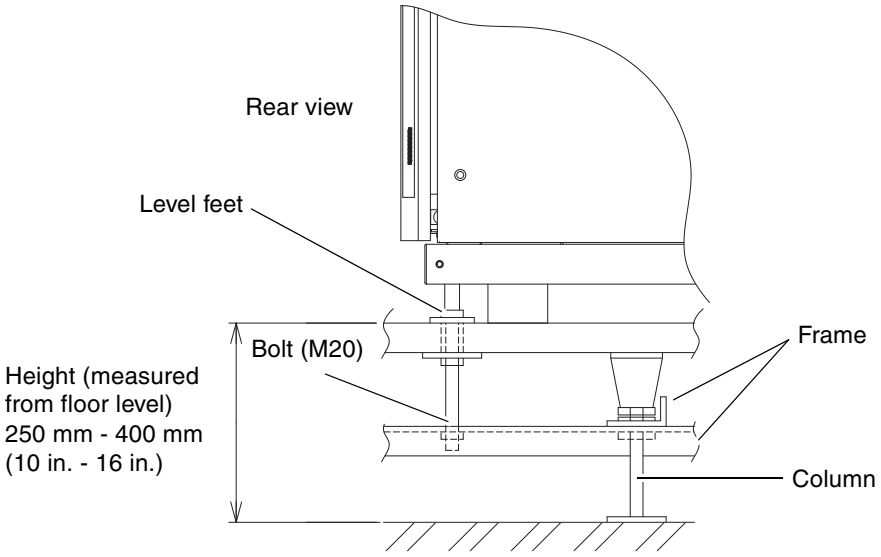
3.4.3.1 Method with Quake-Resistant Options Kits Mounted to the Front, Rear, Right side, and Left Side of the Rack and the Quake-Resistant Options Kits Anchored to the Floor

FIGURE 3-10 Anchoring Quake-Resistant Options Kits to the Floor



3.4.3.2 Method for Anchoring the Level Feet of the Rack to the Floor

FIGURE 3-11 Example of the Affixing Rack with Level Foot



3.4.4 Cable Routing Inside the Rack

The M3000/M4000/M5000 servers come by default with the cable management arm (CMA) used when drawing out servers during maintenance or for installing options. With excess length of cables processed by the CMA, servers can easily be drawn out, with cables connected to them, from the rack. Cable length of about 2 m is required for using the CMA. Decide the length of each interface cable by considering this length.

3.4.5 Other Requirements

Blank panels are supplied with the equipment rack. These panels are used to cover the space at the front of the rack where no units are mounted, If warm air exhausted from units flows to the front and is re-introduced into the units, a temperature alarm may be triggered and a problem may result. Be sure to use the blank panels to cover the front of the rack where no units are mounted.

3.5 Mounting the M3000 Server in the Rack

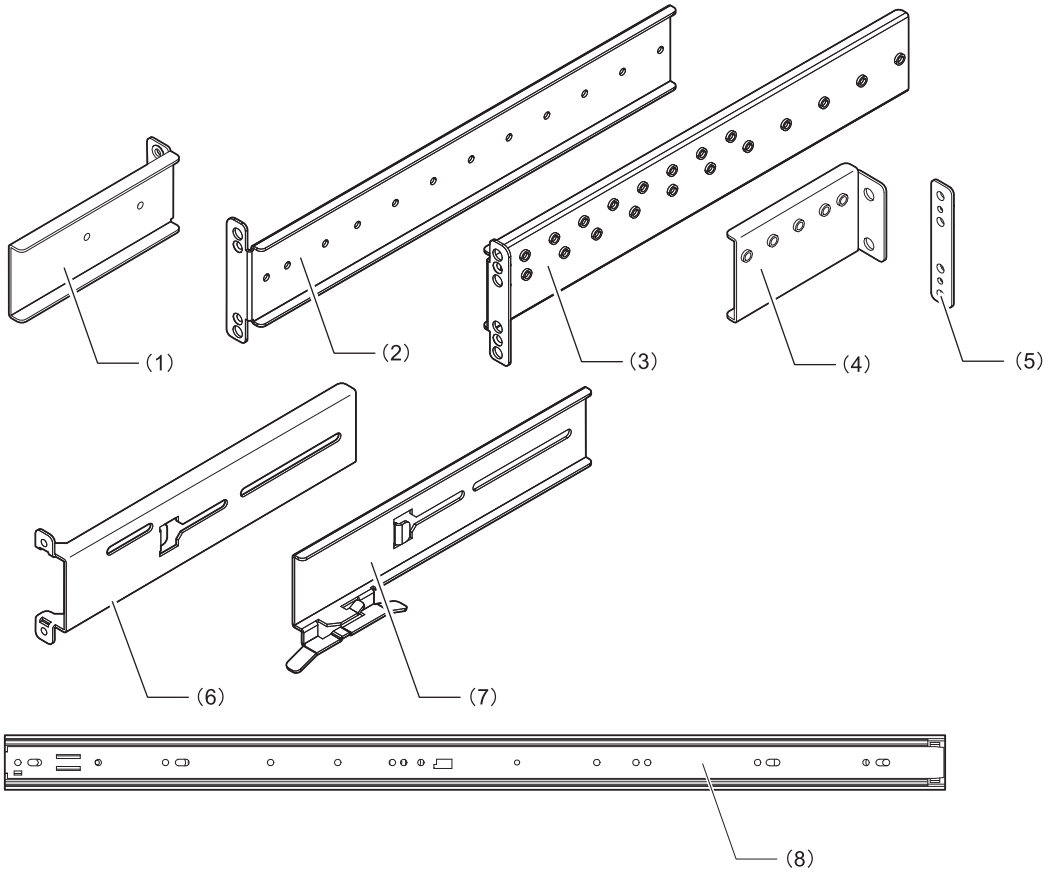
To mount the M3000 server in the equipment rack, use the mount kit for the M3000 server.

3.5.1 Components Check List

The mount kit for the M3000 server includes the slide rail kit and the cable management arm kit.

- Slide rail kit for the M3000 server

FIGURE 3-12 Slide Rail Kit for the M3000 Server

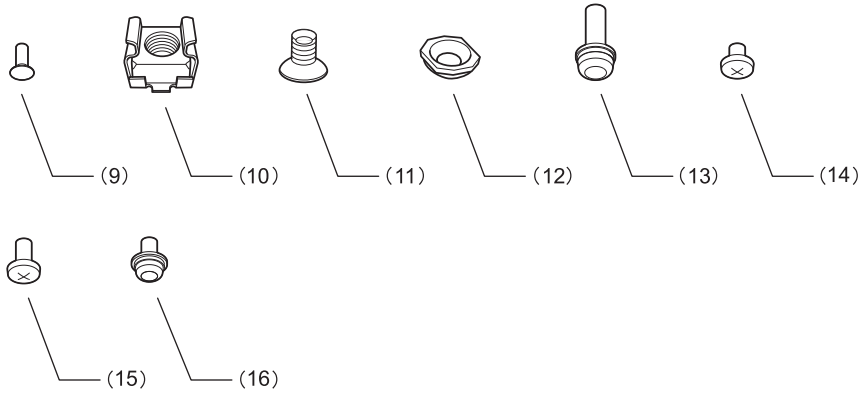


No.	Parts Name / CA Drawing Number	Parts Position	Required Number	Remarks
1	Middle-sized bracket / CA32476-Y701	Front	2	Same articles for right and left
2	Large-sized bracket / CA32476-Y715	Right rear	1	
3	Large-sized bracket / CA32476-Y713	Left rear	1	
4	Small-sized bracket / CA32476-Y705	Left rear	1	
5	Screw plate / CA32476-Y714	Rear	2	Same articles for right and left

No.	Parts Name / CA Drawing Number	Parts Position	Required Number	Remarks
6	Bracket -1 attachment / CA32476-Y700	Left rear	1	
7	Bracket -2 attachment / CA32476-Y703	Right rear	1	
8	Slide rail / CA82254-0015	Side surface	2	Same articles for right and left

■ Slide rail kit for the M3000 server (screws)

FIGURE 3-13 Slide Rail Kit for the M3000 Server (Screws)

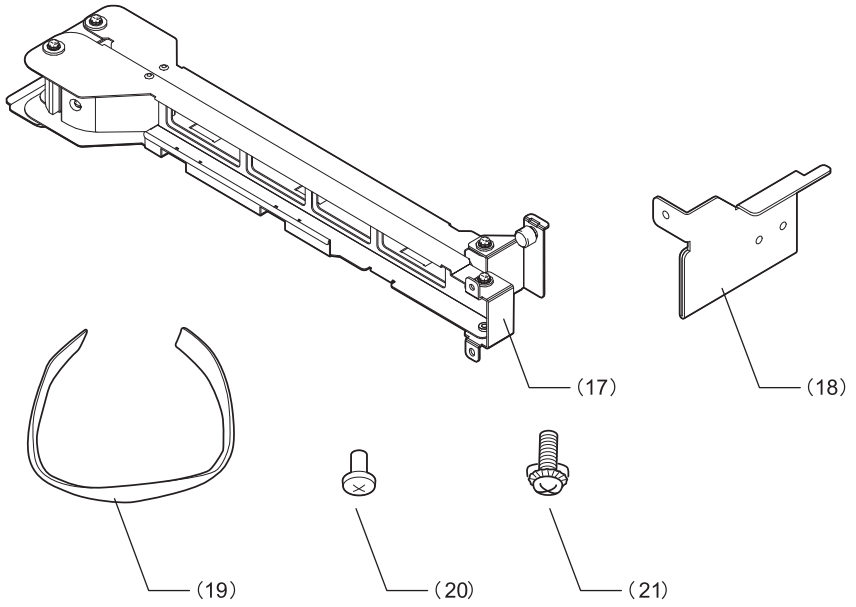


No.	Parts Name / CA Drawing Number	Required Number	Remarks
9	M3 flathead screw / F6-SSA3-08121	4	M3 x 8 mm
10	M5 cage nut / CA30205-0392	2	
11	M5 flathead screw / F6-SSA5-10121	8	M5 x 10 mm
12	Washer / CA82224-Y021	8	
13	M5 screw / F6-SW2N5-16121	2	M5 x 16 mm
14	M4 bind screw (short type) / F6-SBD4-05121	12	M4 x 5 mm
15	M4 bind screw (long type) / F6-SBD4-08121	4	M4 x 8 mm
16	M4 screw / F6-SW2N4-08121	1	M4 x 8 mm

Caution – Before installing the server in the rack, make certain that all screws are properly tightened.

■ Cable management arm kit for the M3000 server

FIGURE 3-14 Cable Management Arm Kit for the M3000 Server



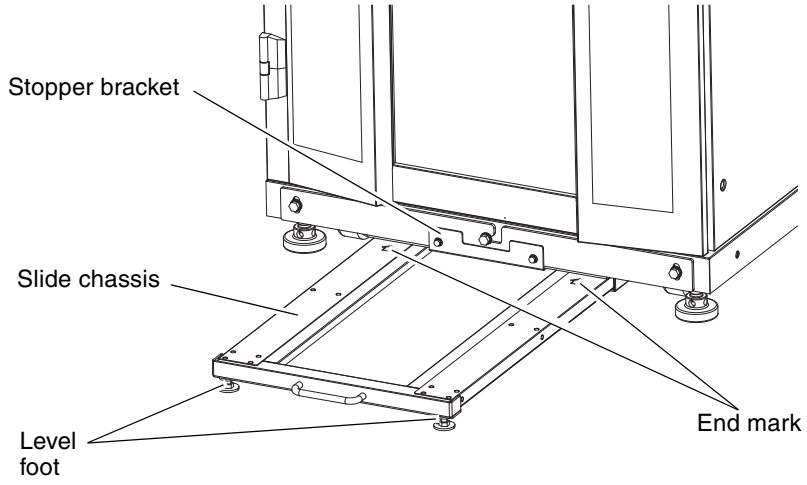
No.	Parts Name / CA Drawing Number	Parts Position	Required Number	Remarks
17	Cable management arm / CA32476-C750		1	
18	Inner slide rail holding bracket / CA32476-Y763	Left rear	1	
19	Velcro fastener / CA32476-Y764		6	
20	M4 bind screw (long type) / F6-SBD4-08121		2	M4 x 8 mm
21	M4 screw / F6-SW2N4-08121		2	M4 x 8 mm

3.5.2 Safety Against Overturning

1. **Take appropriate measures to prevent the rack from toppling over.**

   For details, see Section 3.4, "Equipment Rack Mounting Requirements" on page 3-12. As an example, the procedure for attaching the quake-resistant options kit to the rack is shown below.

FIGURE 3-15 Pulling Out the Pull-out Quake-Resistant Options Kit



Caution – Be sure to pull the slide chassis all the way out to the point indicated by the end mark. If the slide chassis is not pulled all the way out to the end mark point, the equipment rack may topple over when drawing a server out from a rack.

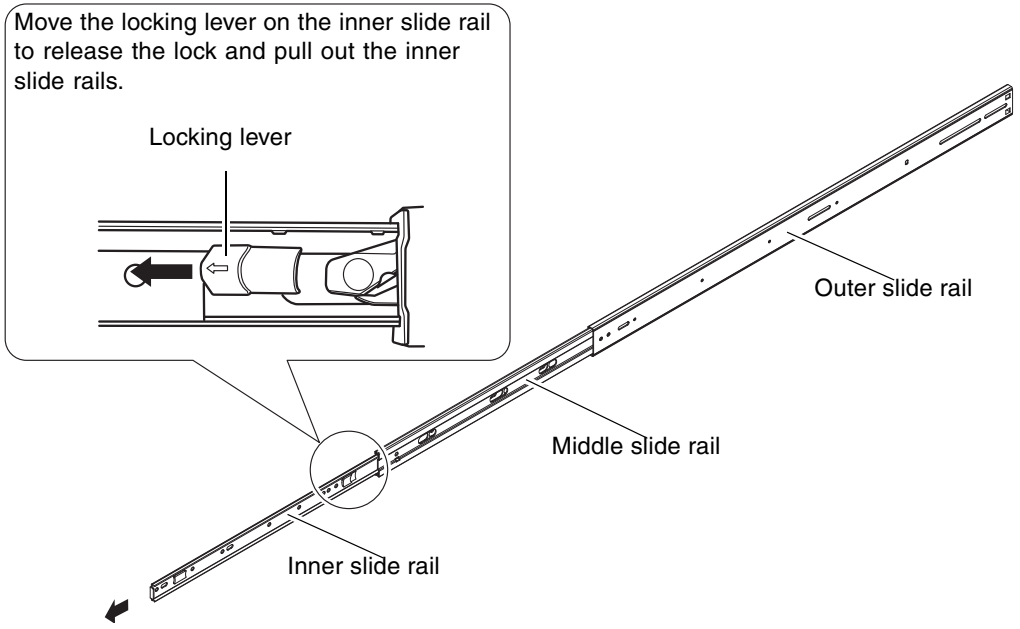
Caution – Make sure that there is no unevenness between the level feet of the slide chassis where they come into contact with the floor surface. If there is any unevenness between them where they come into contact with the floor surface, the equipment rack may topple over.

3.5.3 Attaching the Slide Rails

1. **Draw out the inner slide rails from the slide rails.**

   The slide rail consists of outer slide rail, middle slide rail, and inner slide rail. Inner slide rails are to be attached to both side surfaces of the server.

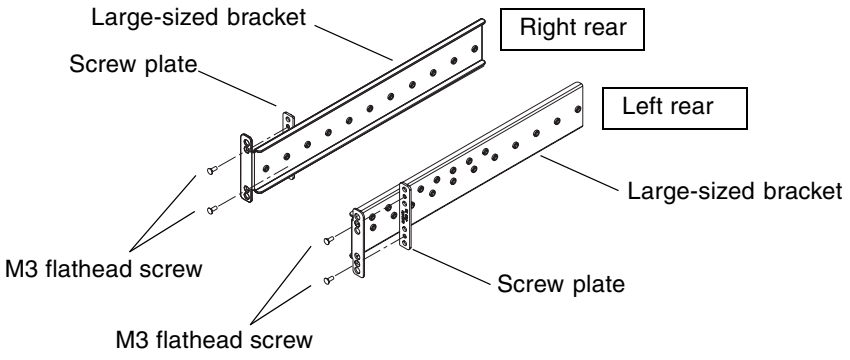
FIGURE 3-16 Drawing Out the Inner Slide Rails



2. Attach the large, middle and small-sized brackets to the rack columns.

a. Attach the screw plate to the large-sized bracket.

FIGURE 3-17 Attaching the Screw Plate



b. Attach the middle-sized brackets to the front columns.

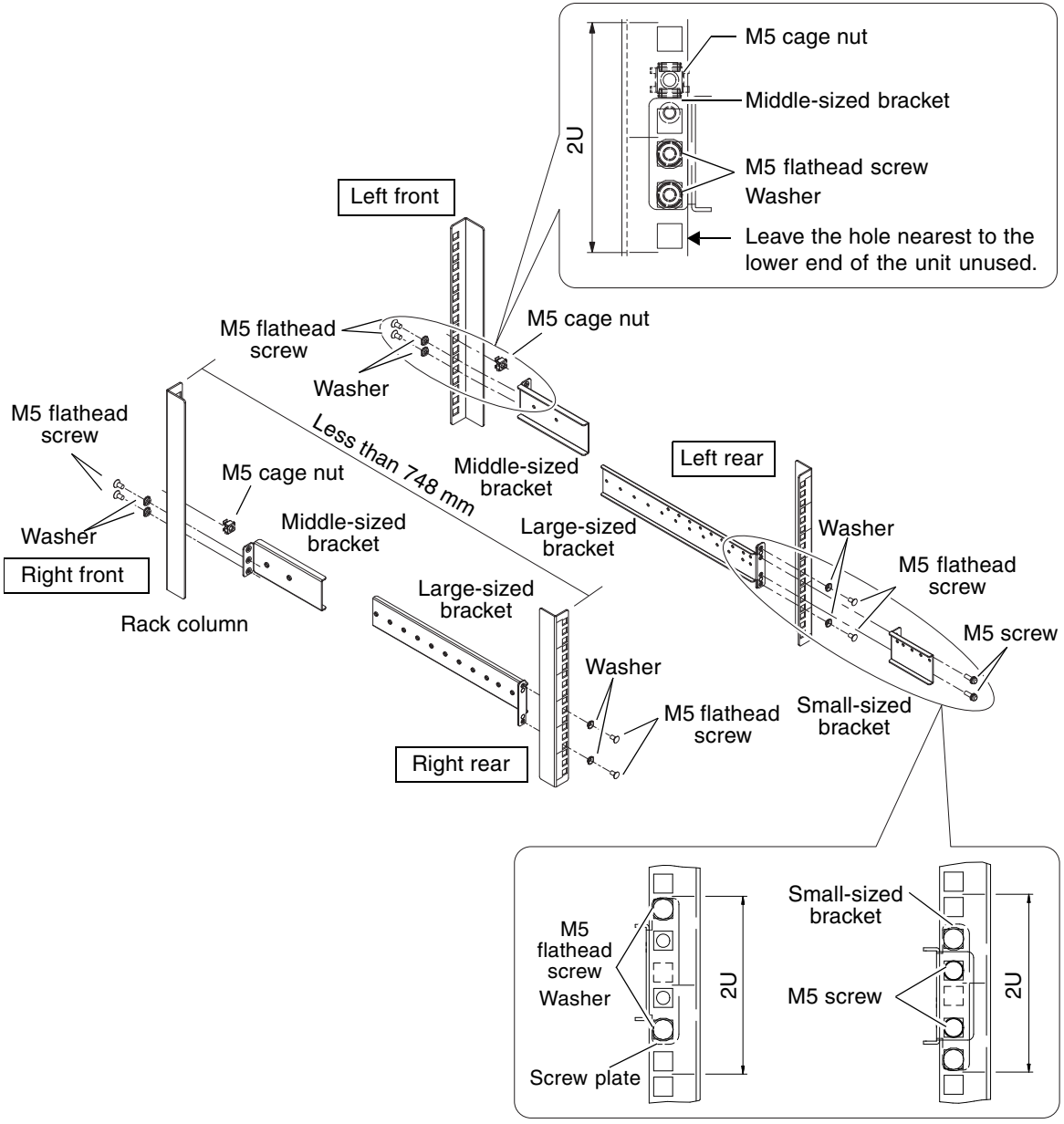
c. Attach the large-sized brackets to the rear columns.

Note – The right and left large-sized brackets have different shapes. Each bracket must be installed in the proper position.

d. Attach the small-sized bracket to the left rear column.

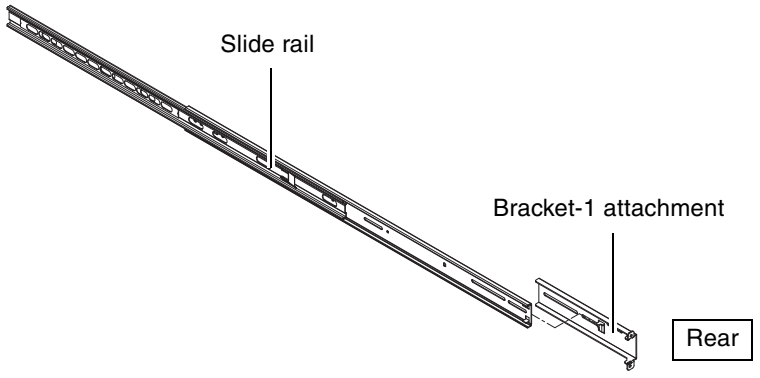
Note – Use the small-sized bracket in case the distance between the front and the rear columns is less than 748 mm.

FIGURE 3-18 Attaching the Brackets



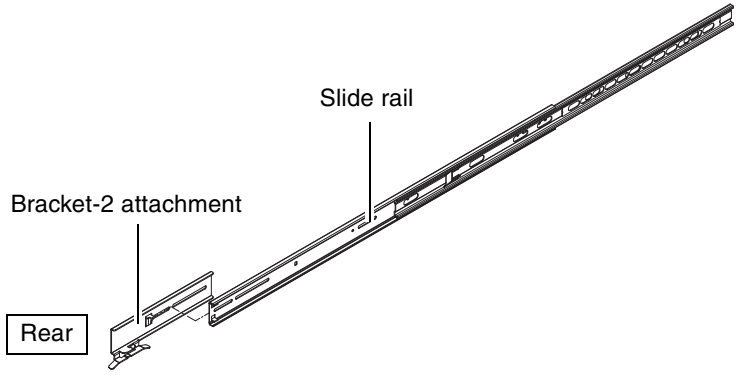
3. **Attach the bracket-1 attachment to the end of the right slide rail, as viewed from the rear of the rack.**

FIGURE 3-19 Attaching the Bracket-1 Attachment



In the same manner, attach the bracket-2 attachment to the end of the left slide rail, as viewed from the rear of the rack.

FIGURE 3-20 Attaching the Bracket-2 Attachment



Note – The left and right brackets are different in shape. Each bracket must be installed in its proper position.

---

4. **Attach the slide rail fitted with the bracket-1 attachment to the middle and large-sized brackets that are secured to the right column, as viewed from the rear.**

   a. Attach the slide rails to the middle-sized brackets.

Note – To secure the slide rail to the middle-sized bracket, first secure the anterior round hole, then slide the slide rail while holding down the locking lever and secure the center of the oval hole to the posterior round hole of the bracket.

---

   b. Attach the slide rails to the large-sized brackets.

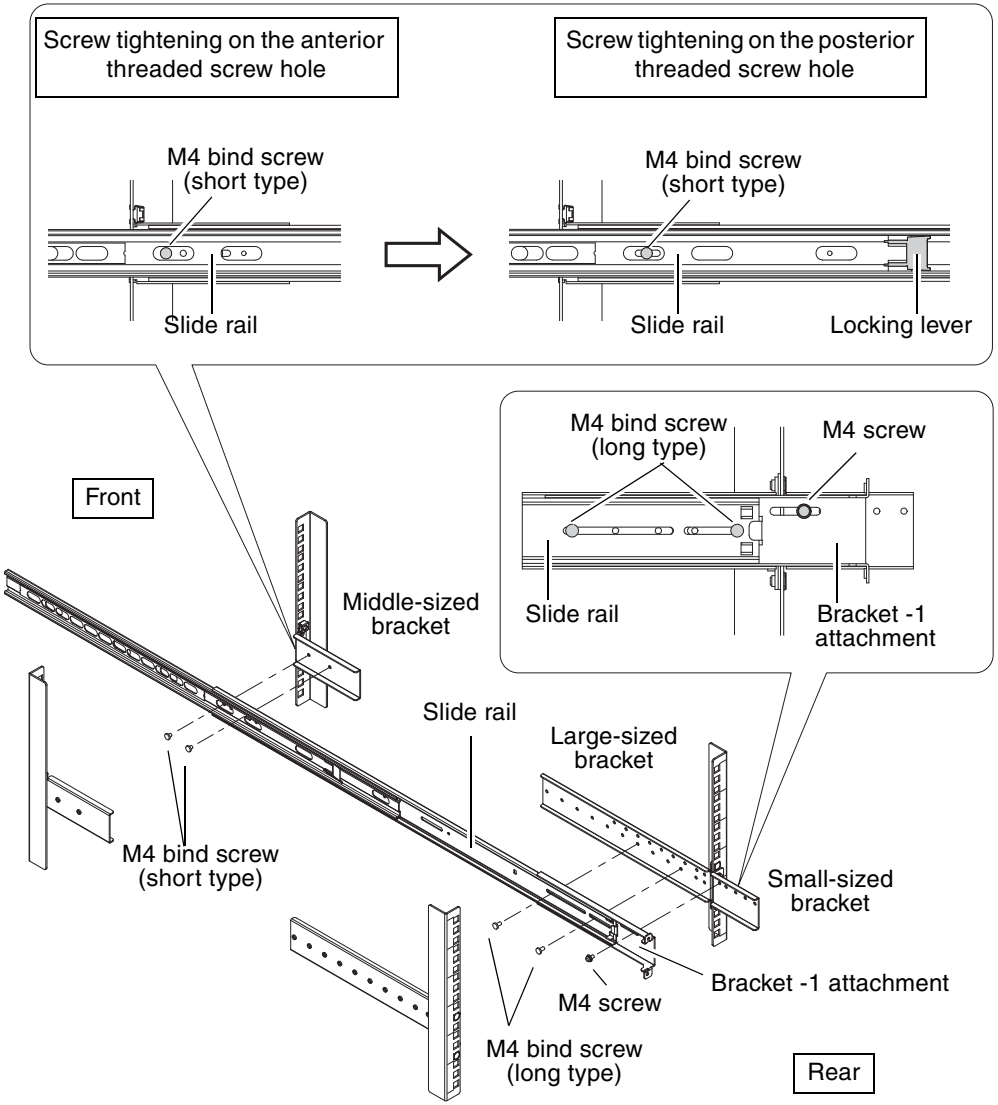
Note – When multiple screw holes are available on the large-sized bracket, use the holes that are nearest to and farthest from the rear column.

---

   c. To attach the small-sized bracket, use M4 screw to the bracket-1 attachment.

Note – Use the small-sized bracket in case the distance between the front and the rear columns is less than 748 mm.

FIGURE 3-21 Attaching the Slide Rail Fitted with the Bracket-1 Attachment



5. **Attach the slide rail fitted with the bracket-2 attachment to the middle and large-sized brackets that are secured to the left column, as viewed from the rear.**

   a. Attach the slide rails to the middle-sized brackets.

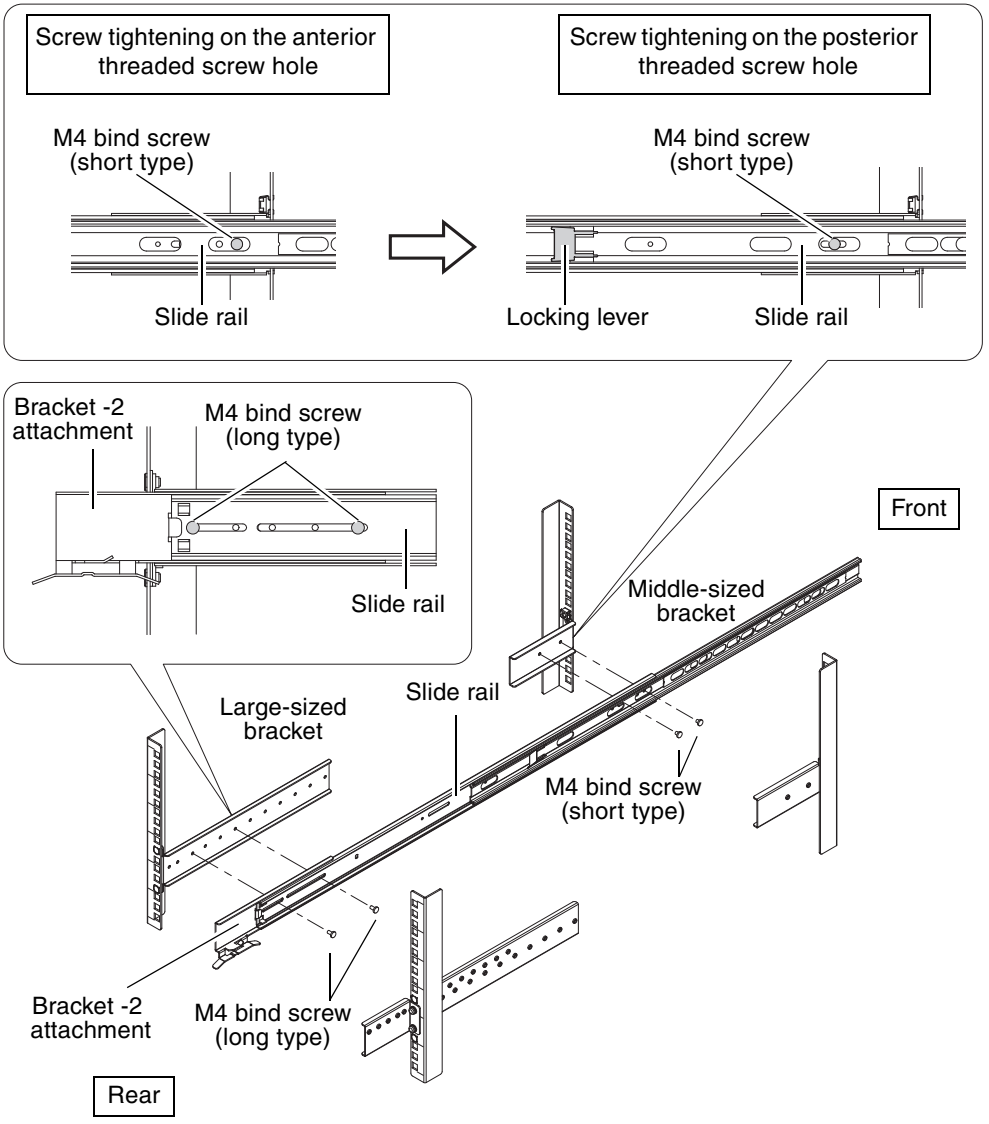
Note – To secure the slide rail to the middle-sized bracket, first secure the anterior round hole, then slide the slide rail while holding down the locking lever and secure the center of the oval hole to the posterior round hole of the bracket.

---

   b. Attach the slide rails to the large-sized brackets.

Note – When multiple screw holes are available on the large-sized bracket, use the holes that are nearest to and farthest from the rear column.

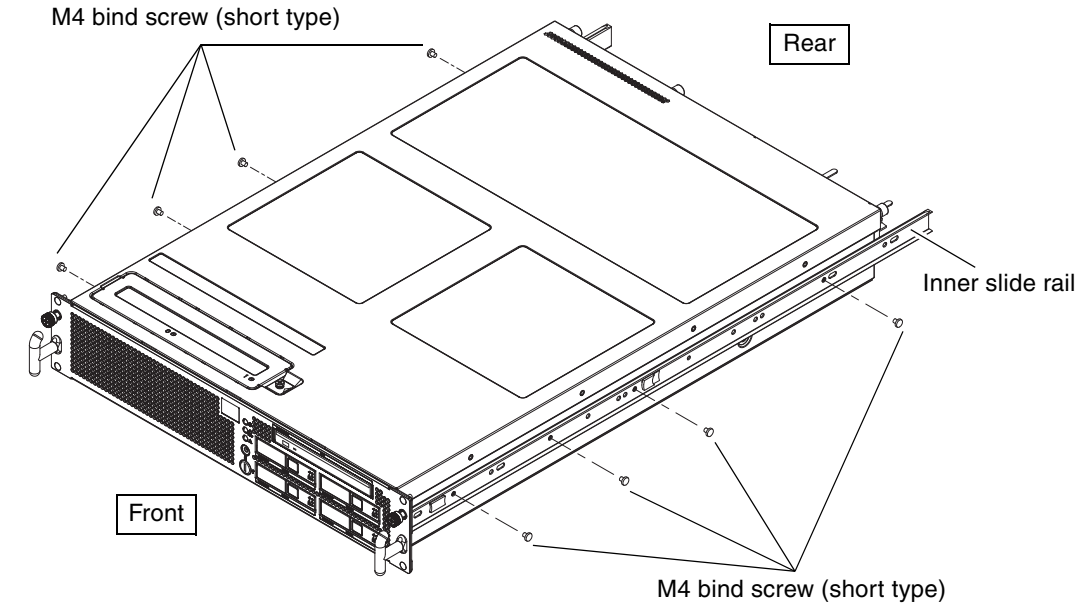
FIGURE 3-22 Attaching the Slide Rail Fitted with the Bracket-2 Attachment

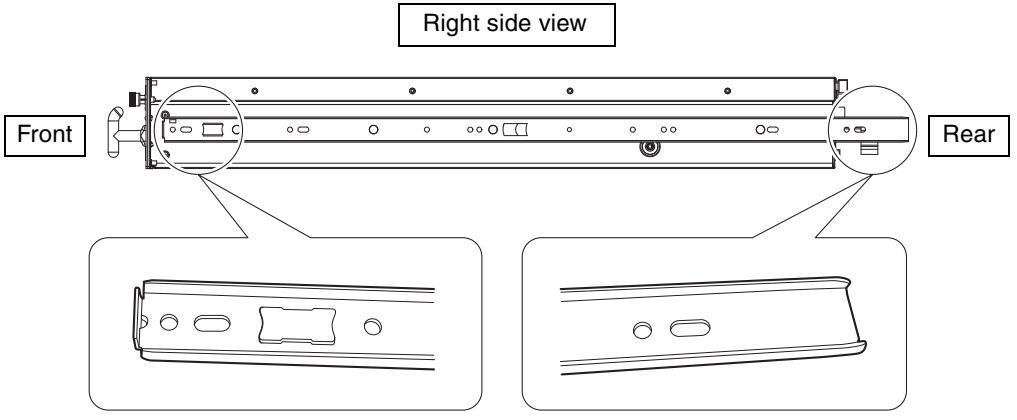


6. **Attach the inner slide rails in place on the server.**

   To attach the inner slide rail, use four M4 bind screws (short type) on each side surface of the server.

FIGURE 3-23 Attaching the Inner Slide Rails on the Server

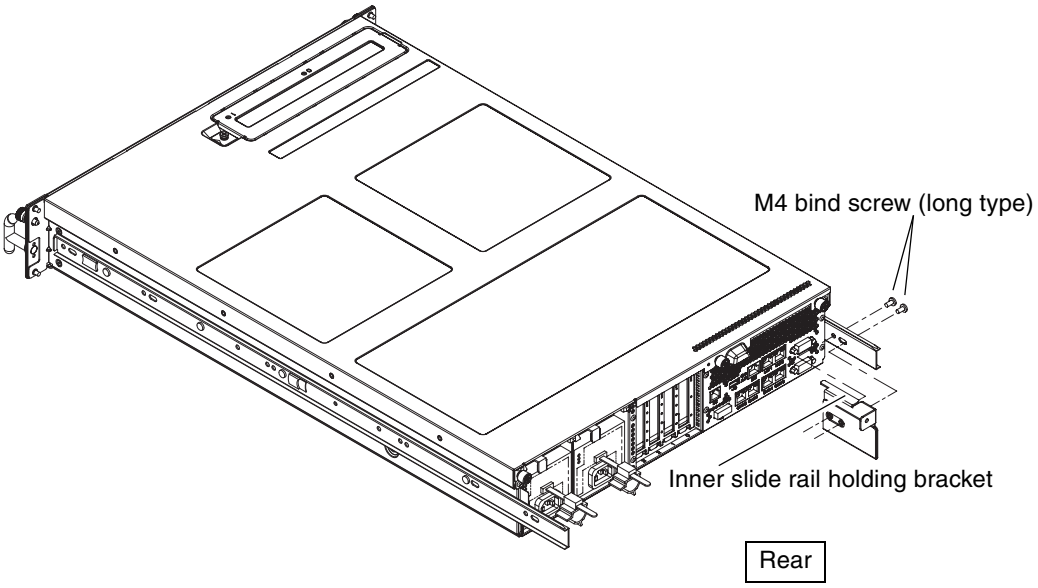




7. **Attach the inner slide rail holding bracket to the inner slide rail.**

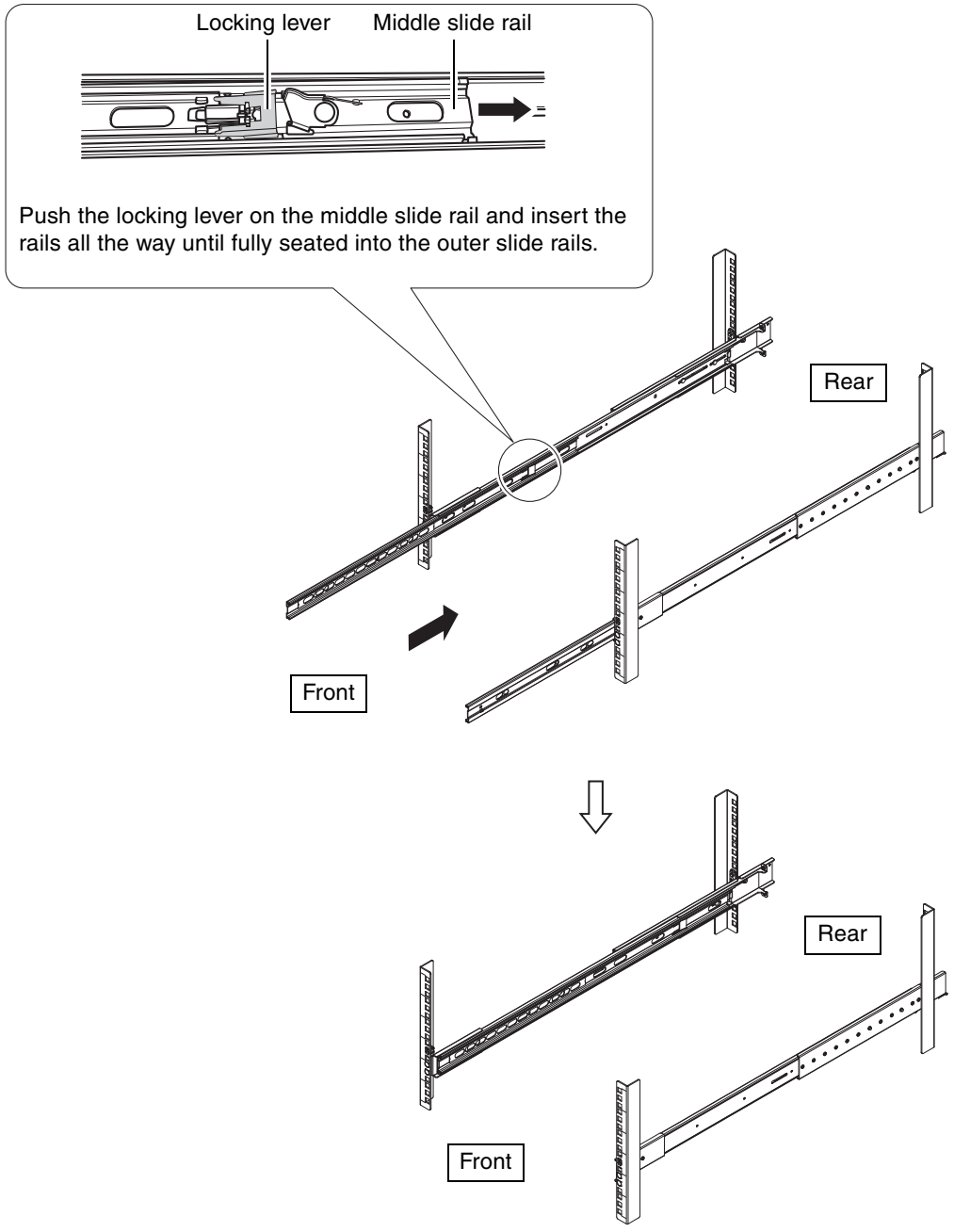
   To secure the inner slide rail holding bracket, attach two M4 bind screws (long type) on the inner slide rail and tighten up toward the server.

FIGURE 3-24 Attaching the Inner Slide Rail Holding Bracket to the Inner Slide Rail



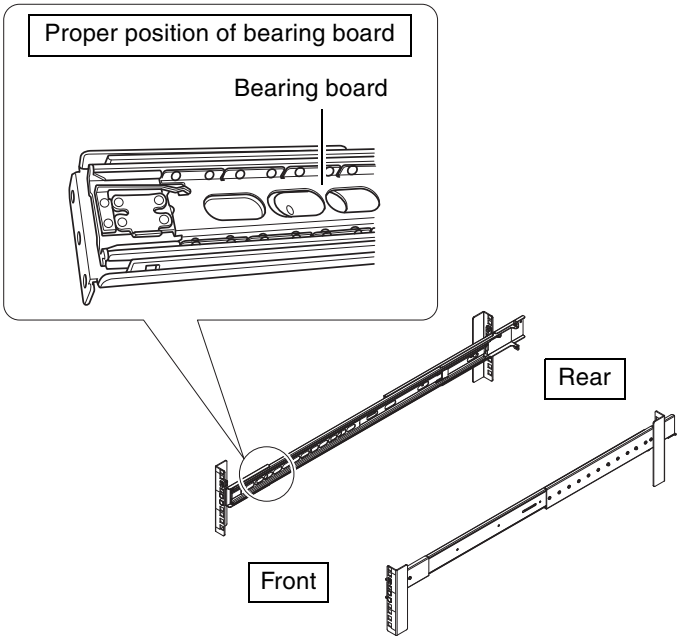
8. Insert the middle slide rail into the outer slide rails until fully seated.

FIGURE 3-25 Inserting the Middle Slide Rail into the Outer Slide Rails



9. **Make sure that the bearing board (thin metal sheet with oval holes) that is housed in the rails is at the front end of the rail.**

FIGURE 3-26 Sliding the Bearing Board

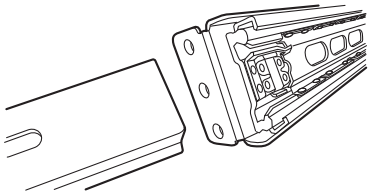


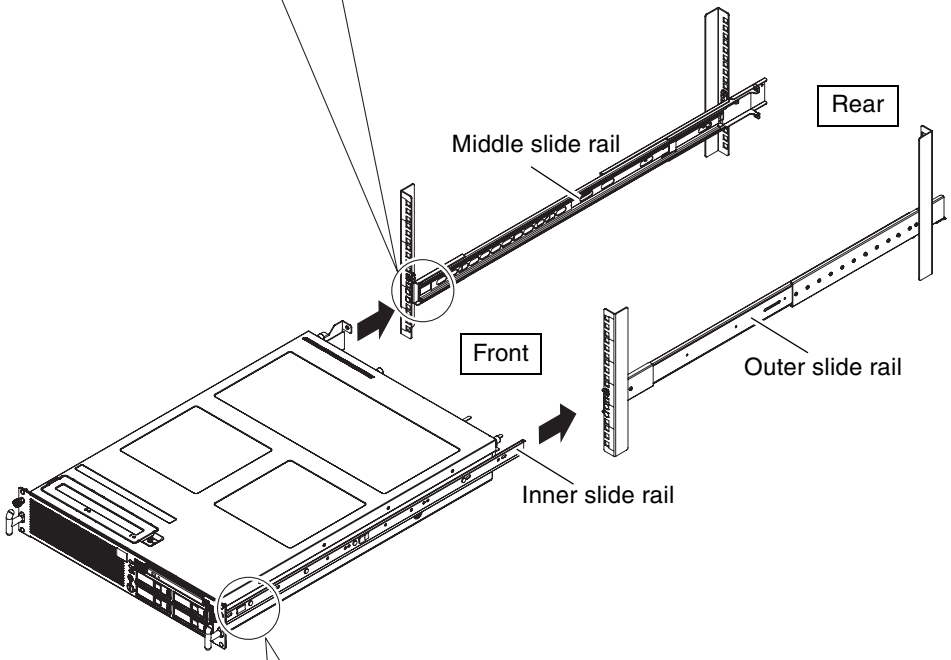
10. **Release the locking lever on the inner slide rails and insert the server into the rack.**

Caution – Prior to installing a server in the equipment rack, deploy the anti-tilt feature for your rack.

FIGURE 3-27 Inserting the Server into the Rack

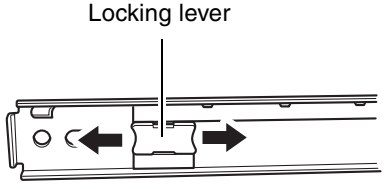
a. Place the tip of the inner slide rail to the groove on the middle slide rail and insert the server into the rack.





b. While inserting the server in the rack, a click should be heard to indicate the server is in locked position.

c. Move the locking lever on the inner slide rail backwards or forwards to release the lock, and continue to carefully insert the server in the rack until fully seated.



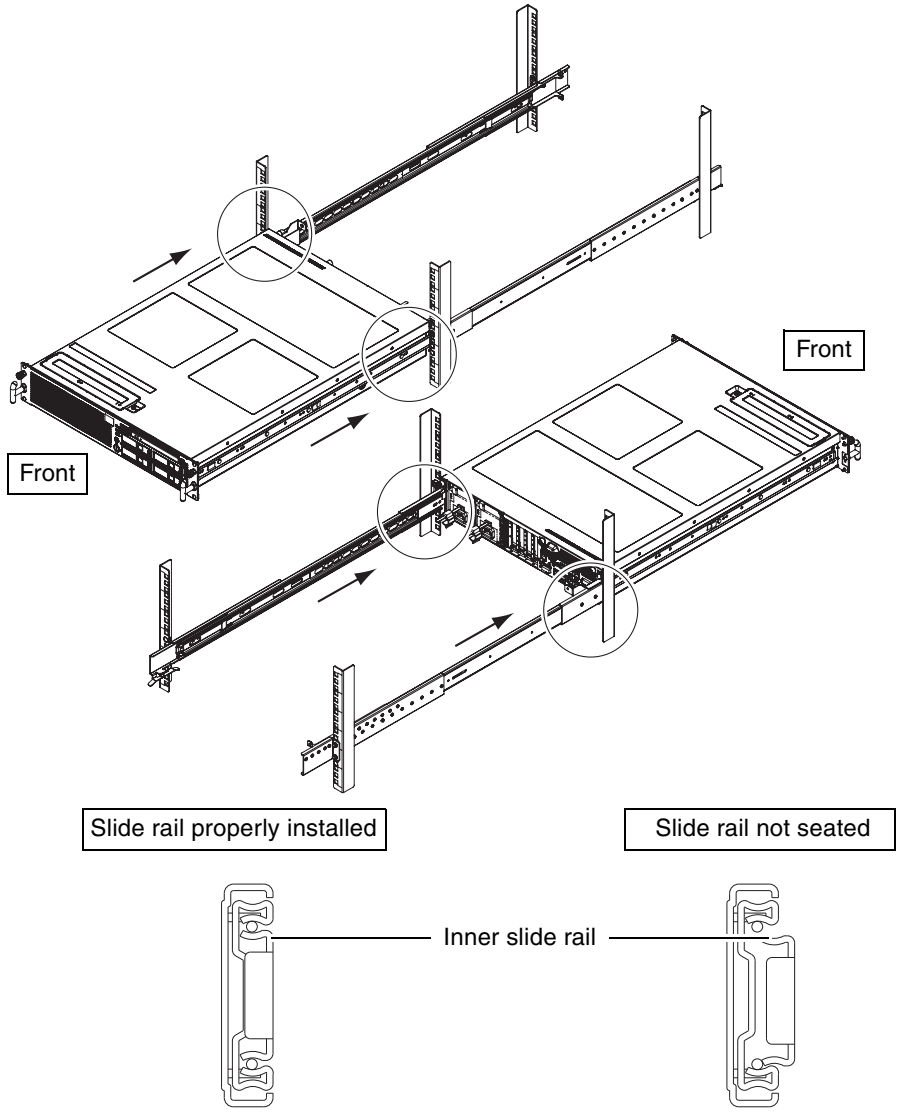
Caution – With the server extended fully out on the rails, make sure that the slide rails are locked. If not locked, the server may come off from the slide rails and may be damaged.

3.5.4 Checking of Installed Slide Rails

Caution – To avoid possible damage to the server, follow these procedures carefully.

1. **Check the placement of the slide rails at four places from the direction of the arrow.**

FIGURE 3-28 Checking the Placement of the Slide Rails

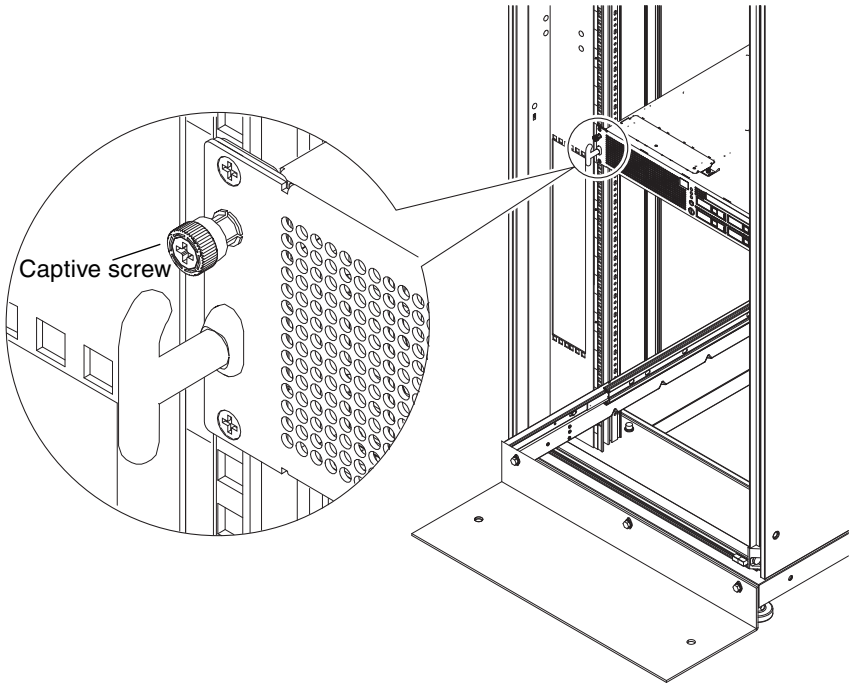


Note – With the server extended fully out on the rails and firmly supported by two people, gently shake it to make sure the server does not come off from the slide rails.

2. **In case the slide rails are not properly installed, rework from Step 8 in Section 3.5.3 “Attaching the Slide Rails” on page 3-32.**

3. **Tighten the two captive screws on the front bezel to secure the server to the rack.**

FIGURE 3-29 Securing the Server to the Rack



3.5.5 Attaching the Cable Management Arm

1. **Place the arm end of the CMA into the bracket-1 attachment.**

   At the same time, hook the hinge part of the CMA to the bracket-2 attachment.

2. **Use two M4 screws to secure the CMA to the bracket-1 attachment.**

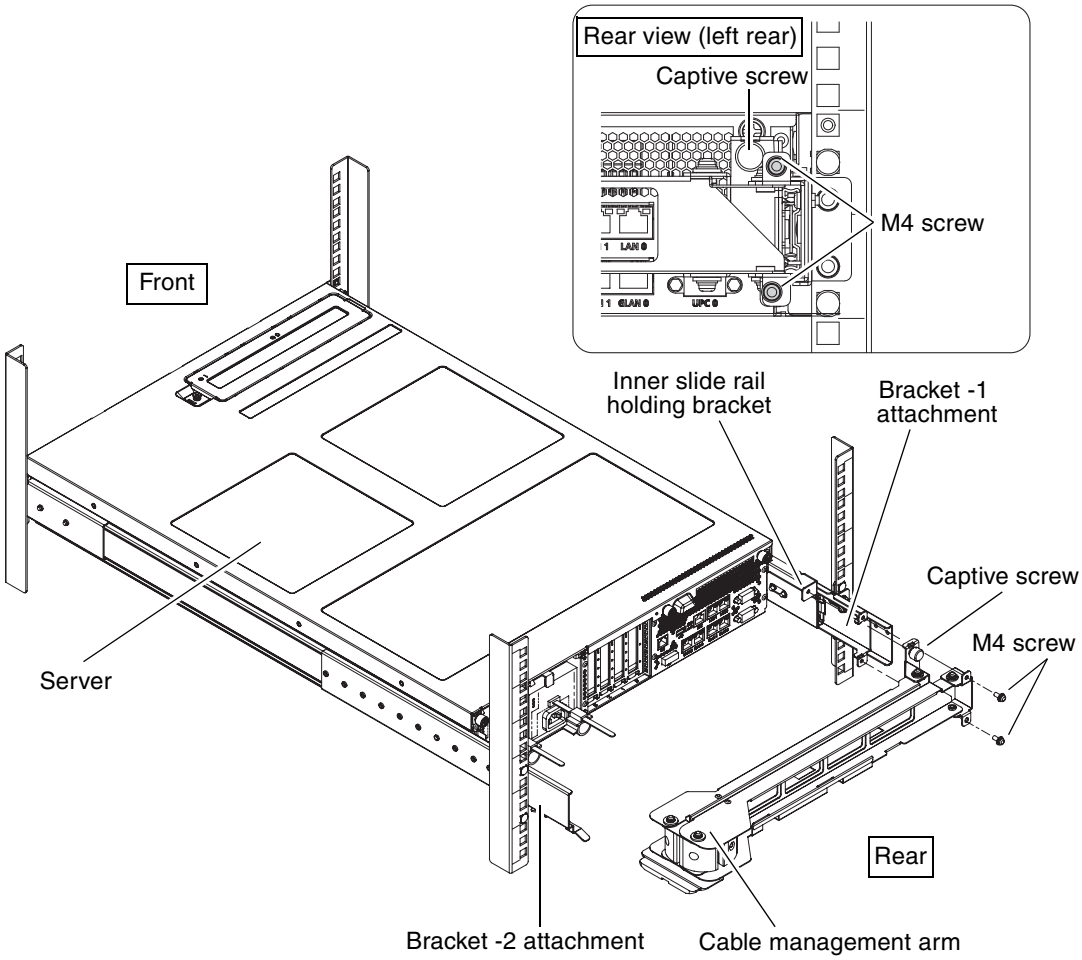
   a. **Attach the upper screw and tighten it temporarily.**

   b. **Before tightening the lower screw, move the CMA away from the bracket-2 attachment and adjust the position of the holes. Adjust the tilt of the CMA so that you can hook the hinge part of it on the bracket-2 attachment, then tighten the upper and the lower screws.**

3. **Slide the CMA to move it into the bracket-2 attachment.**

4. **Attach the captive screw of the CMA to the inner slide rail holding bracket that is secured to right rear inner slide rail, as viewed from the rear of the rack.**

FIGURE 3-30 Attaching the Cable Management Arm

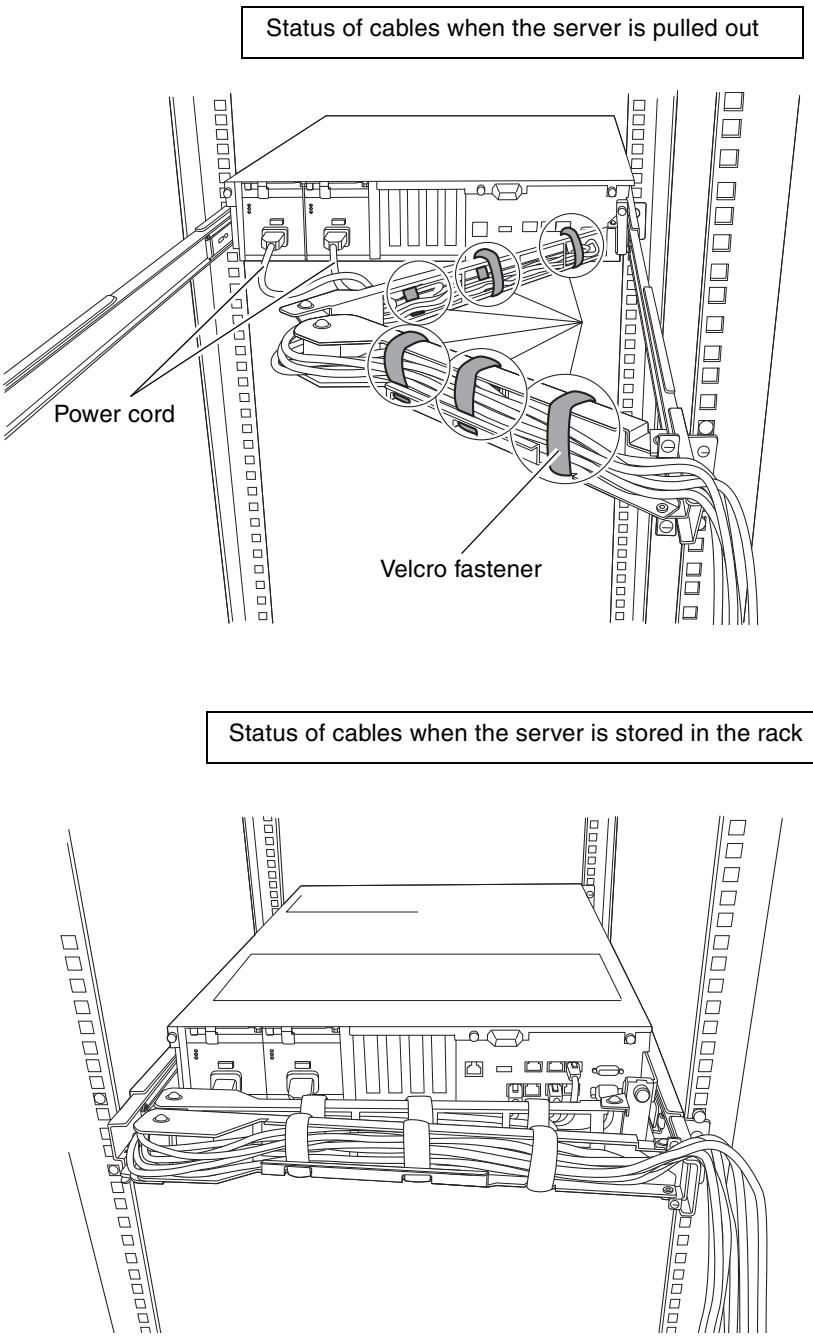


5. **Connect the power cord to the rear of the server.**

6. **Pass the Velcro fasteners through the six cut-outs on the CMA to secure the cables such as power cord and LAN cables in a bundle.**

   In so doing, pull the server out to the front to give the cables the excess length.

FIGURE 3-31 Securing the Cables



3.6 Mounting the M4000 Server in the Rack

To mount the M4000 server in the equipment rack, use either of the following mount kits:

- Mount kit for the M4000 server
- Version 2 mount kit for the M4000 server

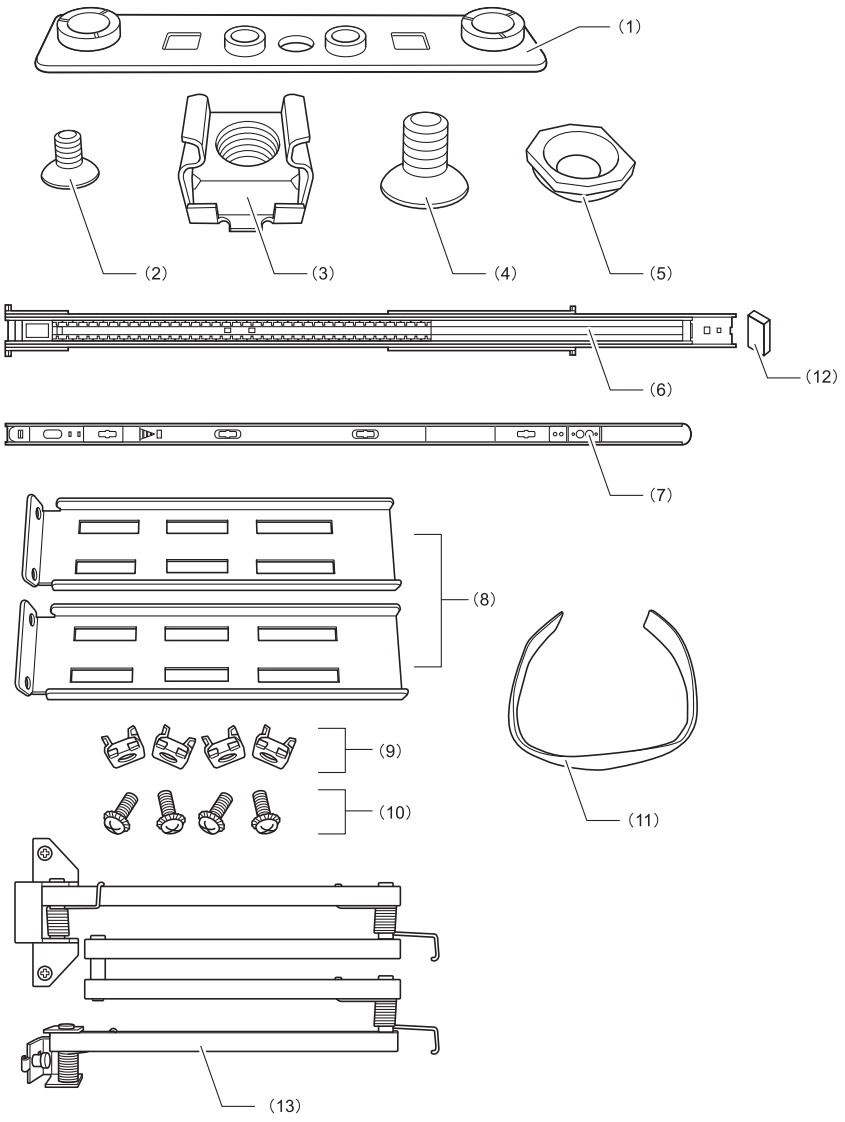
3.6.1 Components Check List

The followings list the components for each mount kit.

- Mount kit for the M4000 server

Note – Do not use any component which is not included in the mount kit.

FIGURE 3-32 Mount Kit for the M4000 Server



No.	Parts name	Required number
1	Bracket	4
2	M2.5 flathead screw	8
3, 9	M5 cage nut	8

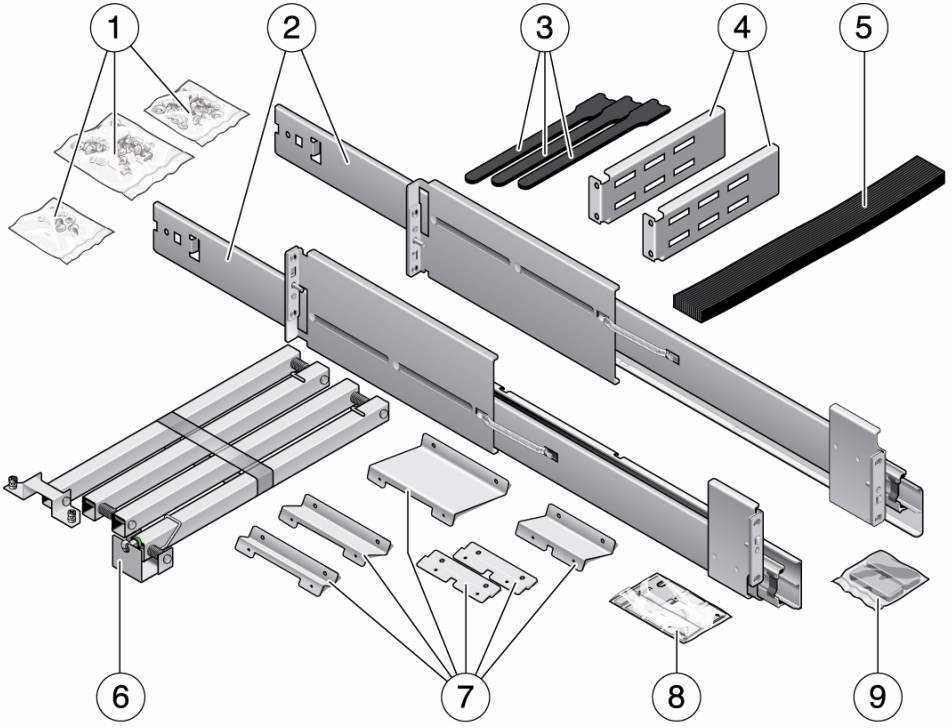
No.	Parts name	Required number
4	M5 flathead screw	8
5	Washer	8
6	Slide rail	2
7	Inner slide rail	2
8	Cable bracket*	2
10	M5 screw	4
11	Velcro fastener	10
12	End cap	2
13	Cable management arm (CMA) *	1

* About the cable management of M4000 server

The parts to secure the cables vary depending on whether or not the copper link cables or the optical fiber cables connected. (See FIGURE 3-1.)

■ Version 2 mount kit for the M4000 server

FIGURE 3-33 Version 2 Mount Kit for the M4000 Server



No.	Parts Name	Required Number
1	Bags of parts (spacers, screws, washers, cage nuts)	
2	Slide rail	2
3	Hook and loop fasteners (small)	3
4	Cable holding bracket	2
5	Hook and loop fasteners (large)	1
6	Cable management arm (CMA)	1
7	Shipping bracket	6
8	Slide rail template	2
9	End caps	2

Note – Some parts are designed for specific racks, and might not be needed for your rack.

3.6.2 Proper Securing of Cables for Server Mount Conditions

TABLE 3-1 describes the methods of securing the cables, each of which is appropriate to the specific conditions to install the server in the rack. Confirm the mounting conditions of your server and refer to the procedures in the appropriate section.

TABLE 3-1 Conditions for Rack Mounting and Methods for Securing Cables

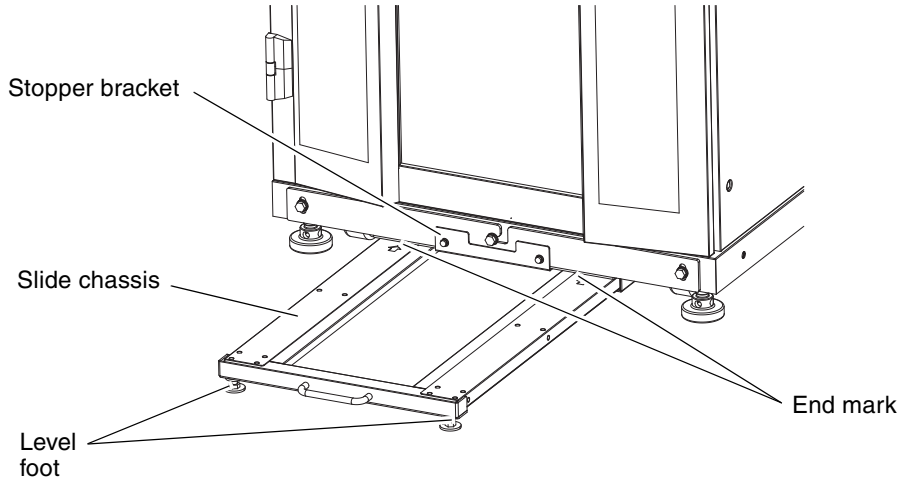
Mounting Conditions		Securing Method	Reference
Cable other than copper link cable or optical fiber cable	CMA available	CMA	Section 3.6.6, "Attaching the Cable Management Arm" on page 3-59
	No CMA available	Cable bracket	Section 3.6.7, "Attaching the Cable Bracket" on page 3-66
	For mounting multiple M4000 servers	Cable bracket	"Securing Cables Other Than the Copper Link Cables" on page 3-72
Copper link cable or optical fiber cable	-	Cable bracket	Section 3.6.7, "Attaching the Cable Bracket" on page 3-66 "Securing the Copper Link Cables" on page 3-74

3.6.3 Safety Against Overturning

1. **Take appropriate measures to prevent the rack from toppling over.**

   For details, see Section 3.4, "Equipment Rack Mounting Requirements" on page 3-12. As an example, the procedure for attaching the quake-resistant options kit to the rack is shown below.

FIGURE 3-34 Pulling Out the Pull-out Quake-Resistant Options Kit



Caution – Be sure to pull the slide chassis all the way out to the point indicated by the end mark. If the slide chassis is not pulled all the way out to the end mark point, the equipment rack may topple over when drawing a server out from a rack.

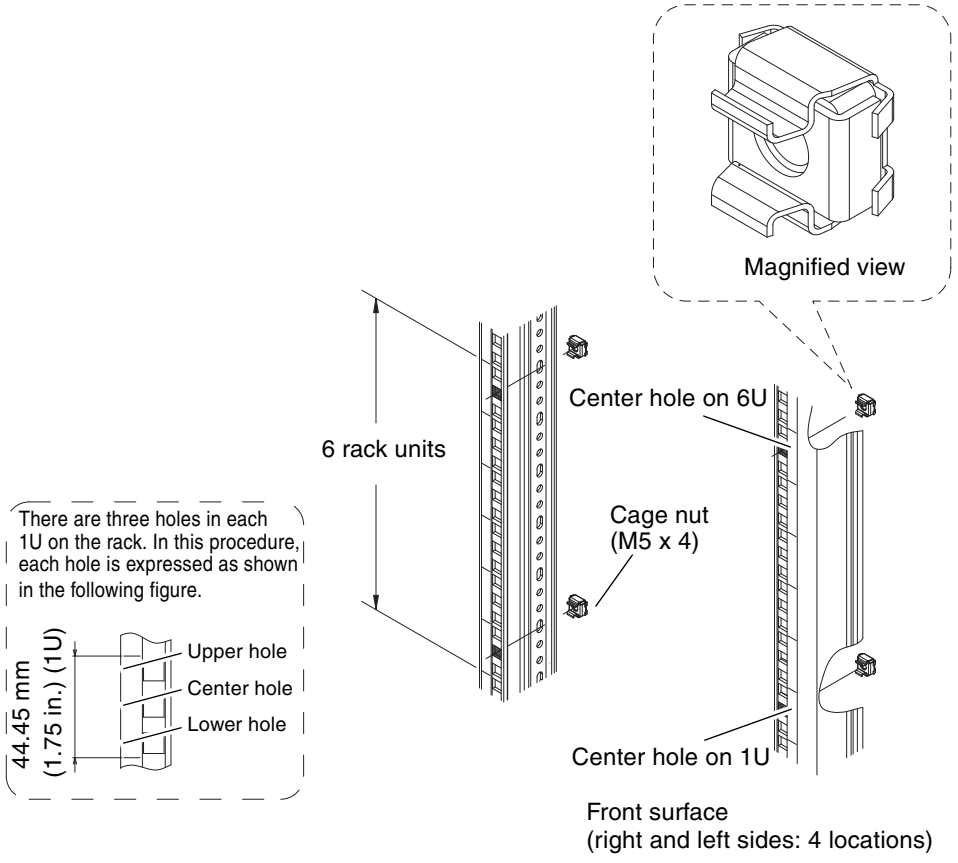
Caution – Make sure that there is no unevenness between the level feet of the slide chassis where they come into contact with the floor surface. If there is any unevenness between them where they come into contact with the floor surface, the equipment rack may topple over.

3.6.4 Attaching the Rail and Mounting the M4000 Server Using Mount Kit for the M4000 Server

3.6.4.1 Attaching the Slide Rail

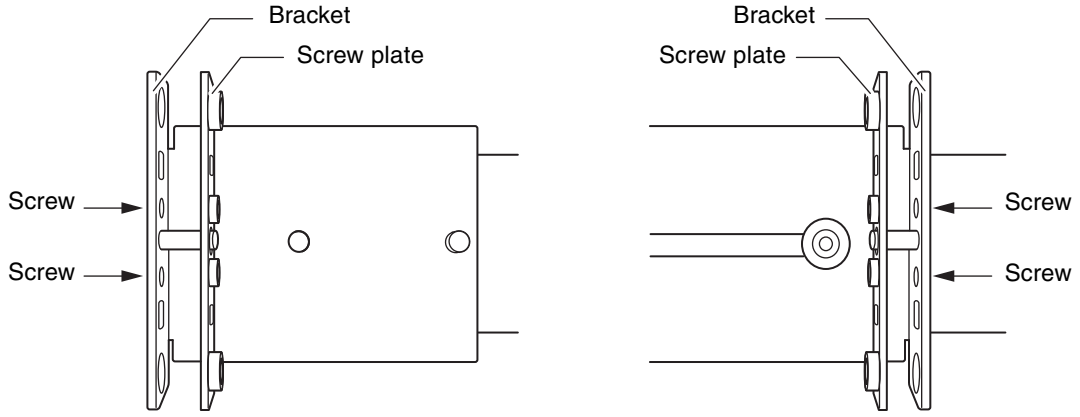
1. **Attach cage nuts to the specified locations on the rack columns.**

FIGURE 3-35 Attaching the Cage Nuts



2. **Attach four screw plates to their corresponding locations on the slide rails (front right, front left, rear right, and rear left) with two M2.5 flathead screws at each location.**

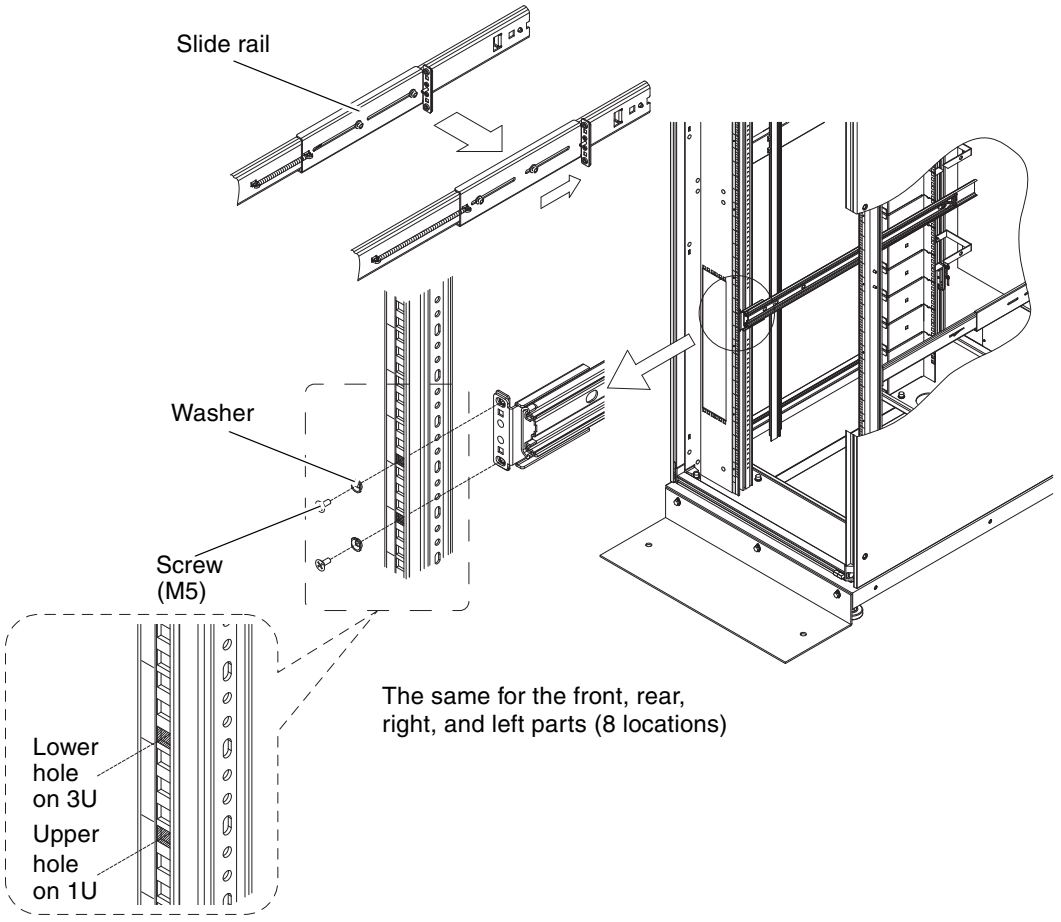
FIGURE 3-36 Attaching the Screw Plates



3. **Secure the slide rails to the rack with screws (two M5 flathead screws at each of four locations) and washers (two at each of the four locations).**

   The same type of rail is used on both the right and left sides, and the rail can be fixed in position on either side. The bracket parts on the rear side are movable with the help of the springs, and the brackets must be fixed in position while opened.

FIGURE 3-37 Fixing the Slide Rails in Position on the Rack



4. **Secure the inner parts of the slide rails in place on the server.**

   a. **Confirm the inner slide rail attachment orientation.**

   b. **Align the center holes in the inner slide rails with the pins on the server.**

FIGURE 3-38 Securing the Inner Slide Rails in Place

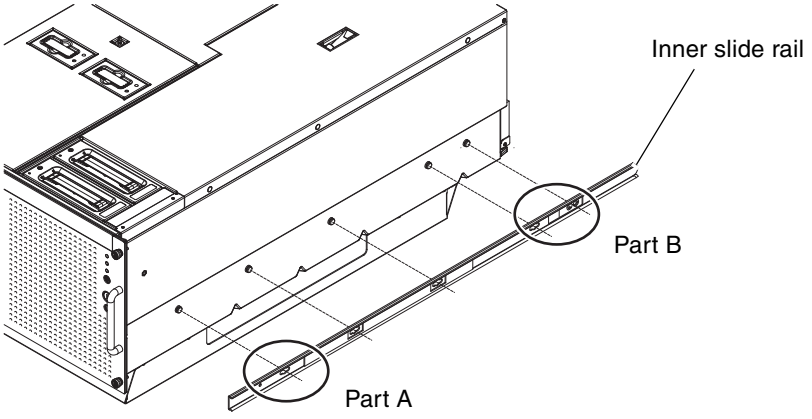
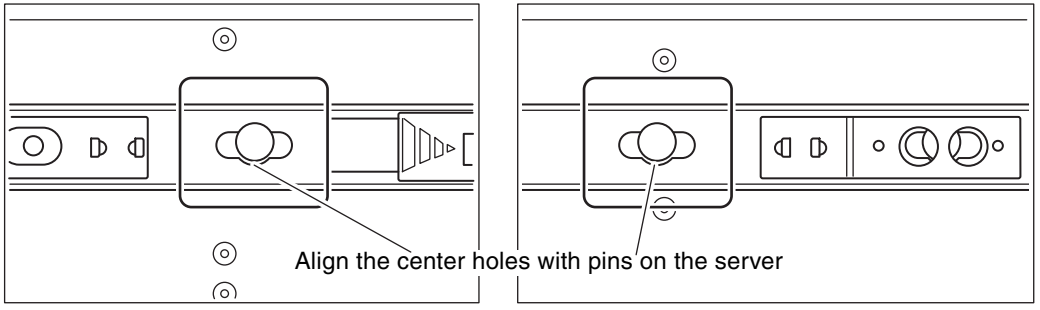
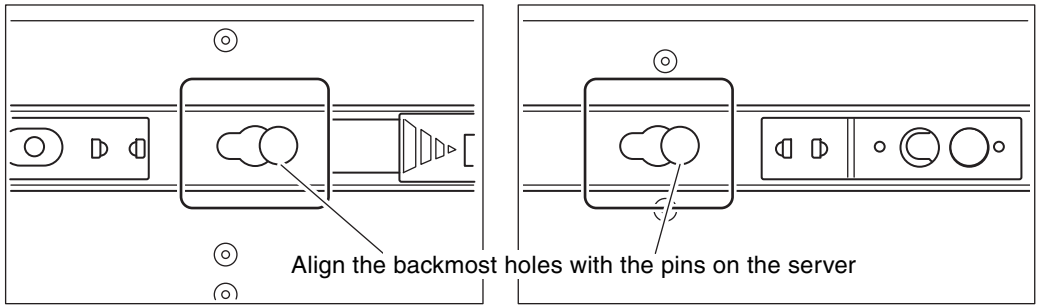


FIGURE 3-39 Magnified view of Part A and Part B (Unlocked)



c. Slide the inner slide rails toward the front of the server (set the rails such that they are locked in place by the holes at the rear of the lock mechanism).

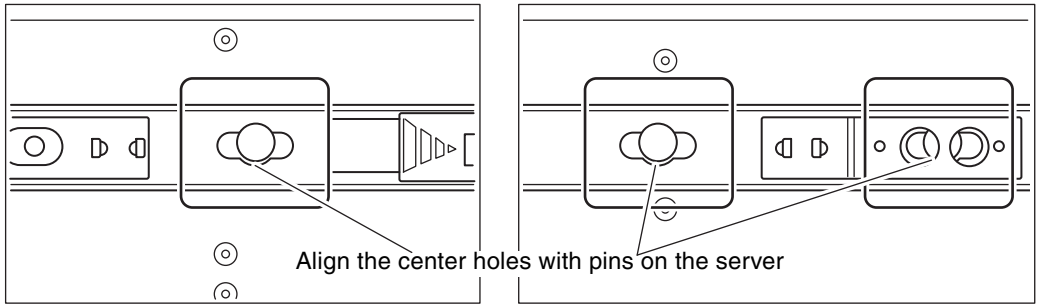
FIGURE 3-40 Magnified view of Part A and Part B (Locked)



- **Removing the inner slide rails**

  To remove an inner slide rail, slide the rail to align the center holes on the rail with the pins on the server and then remove the rail.

FIGURE 3-41 Magnified view of Part A and Part B (Unlocked)

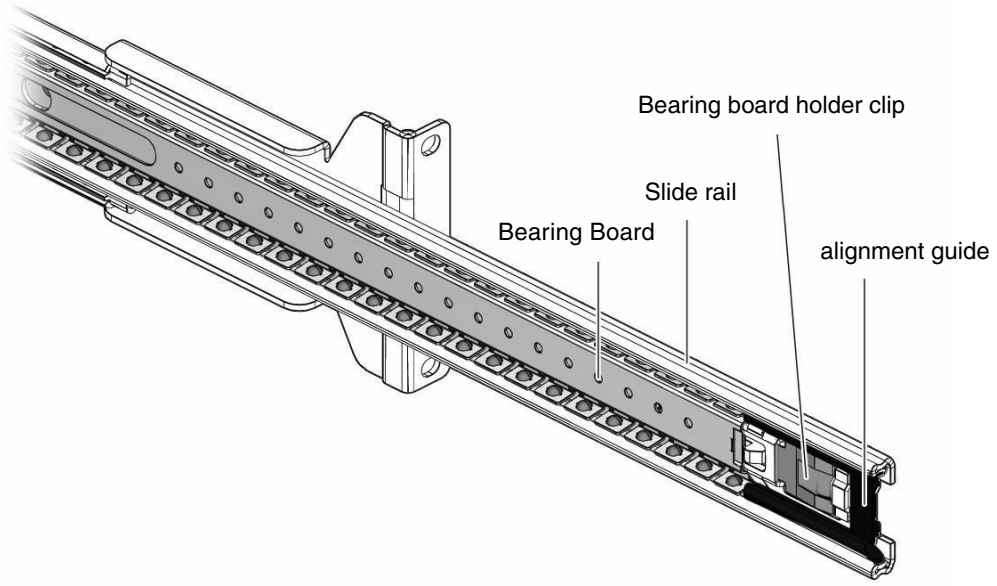


3.6.4.2 Mounting the M4000 Server

1. Extend the slide rails from the slide assemblies.

2. **Position the bearing boards on the interior of the slide rails in full forward position until they are stopped by the black plastic alignment guides.**

FIGURE 3-42 Bearing Board in Full Forward Position Inside the Slide Rail



Caution – For safe rack mounting, ensure that the bearing boards are all the way forward inside the slide rails. Also ensure the black plastic rail alignment guides are securely attached at the end of the inside of the slide rails. These guides will assist in the initial mating of the inner rails attached to the sides of the server.

Caution – Do not use the handles on the front of the server to lift the server. The front handles are designed for sliding the server in and out of the equipment cabinet. The handles will not support the weight of the server.

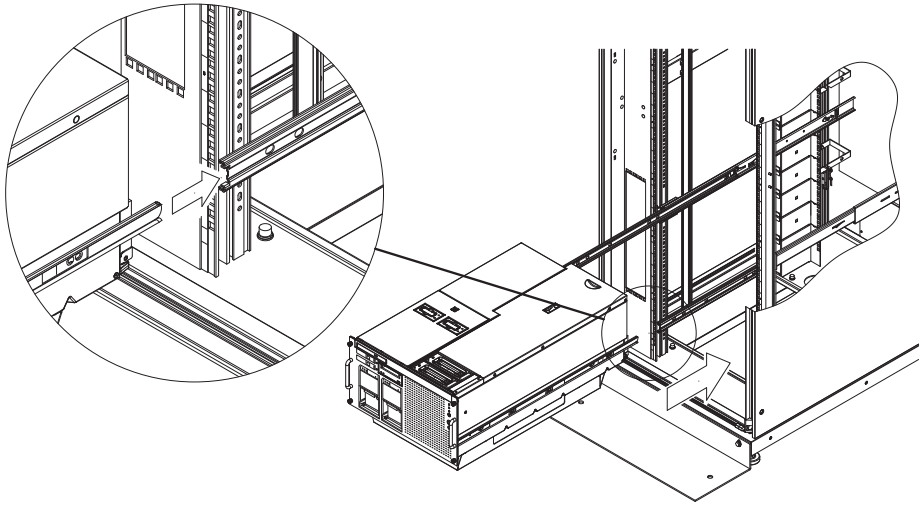
3. **Using the lifter to raise the server, adjust its height to the height of the slide rails. Slide the server toward the rack, and insert the inner slide rails of the server into the slide rails.**

   Depending on the specifications and mounting location of the lifter, Step 5 (removing the pedestal at the bottom of the server) may need to be done beforehand.

Caution – When you perform Step 3, keep the inner slide rails of the server and the slide rails of the rack in a horizontal position. If you forcibly insert, the rails may be damaged.

Caution – When raising the server, do not grab the handle on the front. The handle on the front is to be used for pushing in or drawing out the server in the rack, and it is not designed to bear the weight of the server.

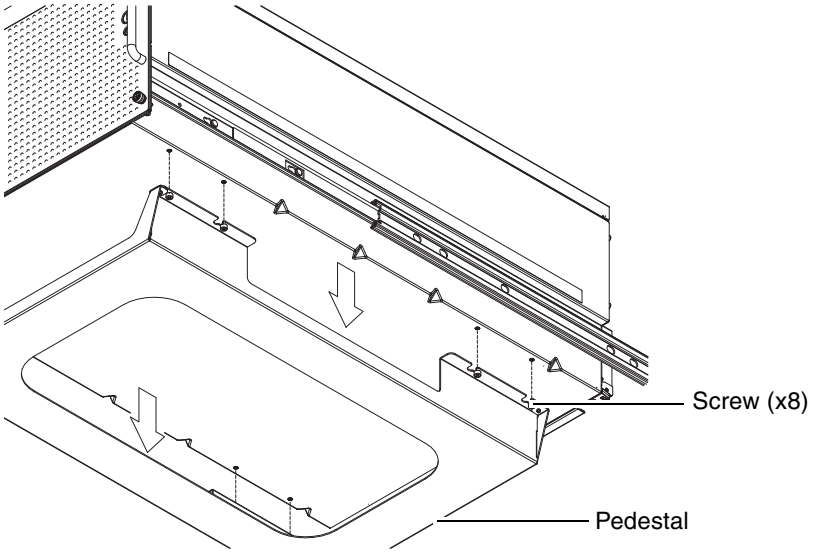
FIGURE 3-43 Inserting the Inner Slide Rails



4. **Remove the lifter from the server.**

5. **Loosen the eight screws securing the pedestal to the bottom of the server, and remove the two screws on the front. Slide the pedestal toward the rear and remove the pedestal.**

FIGURE 3-44 Removing the Pedestal from the Bottom of the Server



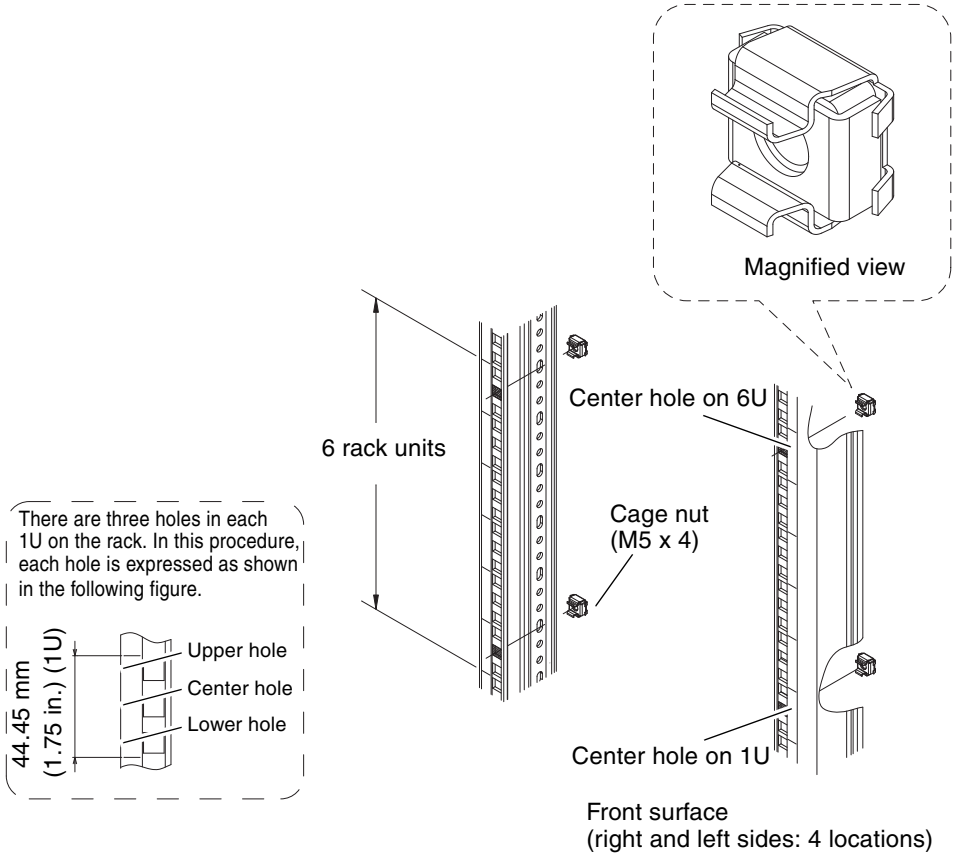
6. **Remove the remaining six screws that were loosened in** Step 5**.**

3.6.5 Attaching the Rail and Mounting the M4000 Server Using Version 2 Mount Kit for the M4000 Server

3.6.5.1 Installing the Slide Rails

1. Attach cage nuts to the specified locations on the rack columns.

FIGURE 3-45 Attaching the Cage Nuts



2. Attach the rear of a slide rail on the rear rack column.

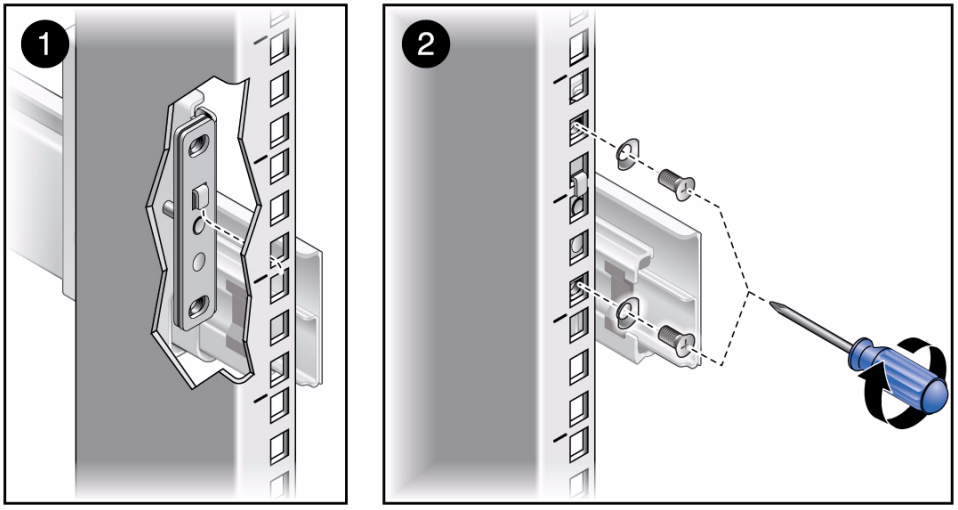
Note – For ease of installation, start with the rear of the slide rail.

The slide rails are labeled Right and Left. You can start with either side.

a. Insert the rail flange hook through the lower hole on rack unit number 3.

b. Ensure that the screw holes on the flange are aligned in the centers of the square holes on the rack column.

FIGURE 3-46 Attaching the Slide Rail to the Rack Column



c. **Secure the slide rail with two M6 screws and beveled washers.**

   Install the upper M6 screw and beveled washer. If necessary, push the rail of the slide assembly out for easier installation of the lower M6 screw and beveled washer.

3. **Repeat** Step 2 **for the front of the slide rail.**
4. **Install the remaining slide rail in the same manner.**

3.6.5.2 Mounting the M4000 Server Into the Rack

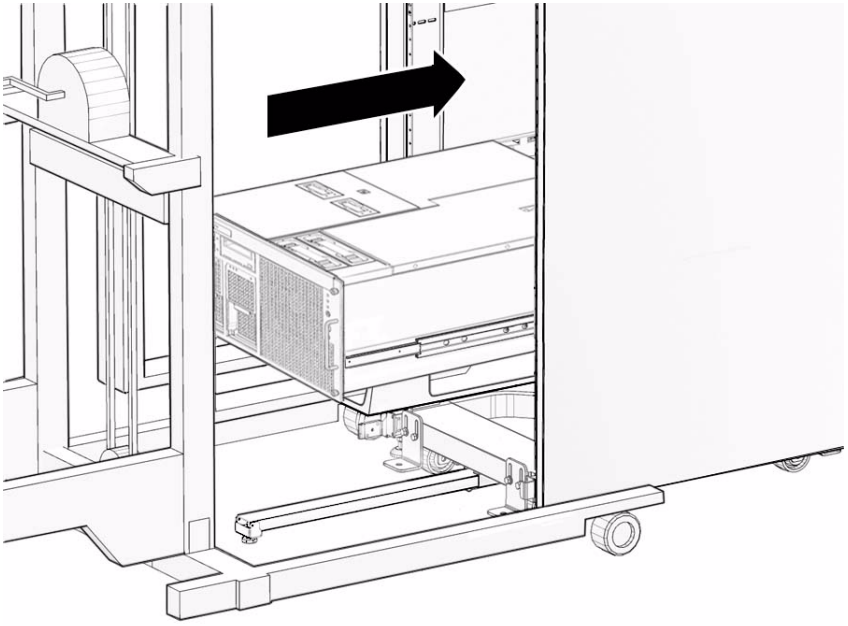
Caution – Do not use the handles on the front of the server to lift the server. The handles will not support the weight of the server. The front handles are designed only for sliding the server in and out of the equipment rack.

1. **Completely extend the internal slide parts of the slide rails.**
2. **Place the forks of the lifter inside the plinth on the underside of the system.**

   The plinth protects the underside of the system and keeps the system from sliding off the lifter.

3. **Raise the server and gently push it towards the equipment rack until the pins on the side of the server align with the keyholes on the extended slide rails.**

FIGURE 3-47 Example of Mating the Server on Slide Rails



4. **Lower the server so that the pins enter the keyholes, then slide the server backward approximately 6 mm (0.25 in.) so that the holes in the rails align with the screw holes on the sides of the server.**
5. **Secure the server to the slides.**
6. **Push the slides towards the rear of the server to lock the pins in place.**

Note – Labels are located on the side of each server to help identify the mounting points based on the type of equipment rack being used.

---

7. **Withdraw the lifter.**

8. **Remove the plinth from the bottom of the server (**FIGURE 3-48**).**

Caution – The plinth weighs 2 kg (5 lb.). To prevent injury, support the plinth upon release from the screws.

Eight screws secure the plinth to the bottom of the server.

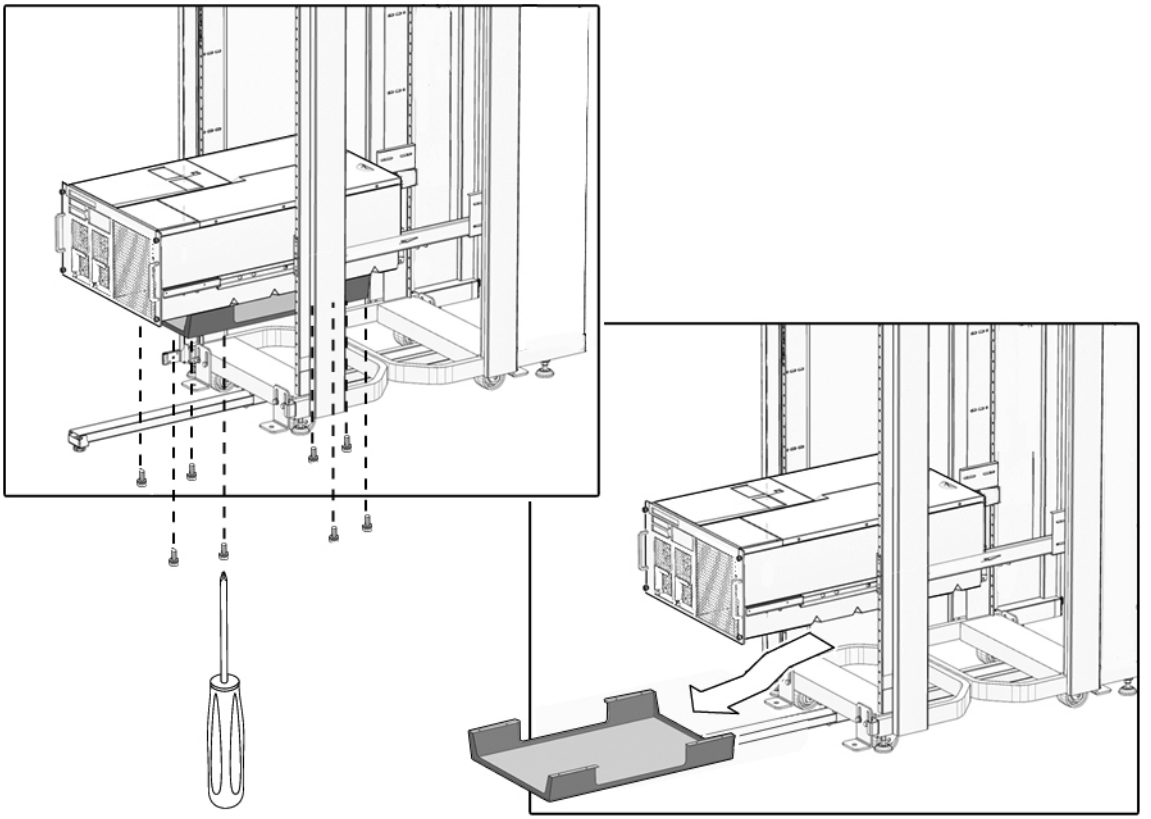
a. **Remove the two front screws.**

b. **Loosen the remaining six screws.**

c. **Slide the plinth toward the rear of the server less than 2.5 mm (1 in.) until the plinth is released from the screws.**

d. **Completely remove the six loosened screws.**

FIGURE 3-48 Example of Removing the Plinth



3.6.6 Attaching the Cable Management Arm

Use this procedure when the copper link cables or the optical fiber cables are not used.

1. **Attach the one end of the CMA to the server with two knob screws. (See (1) in** FIGURE 3-49**.)**

2. **Turn the CMA counterclockwise. (See** FIGURE 3-49**.)**

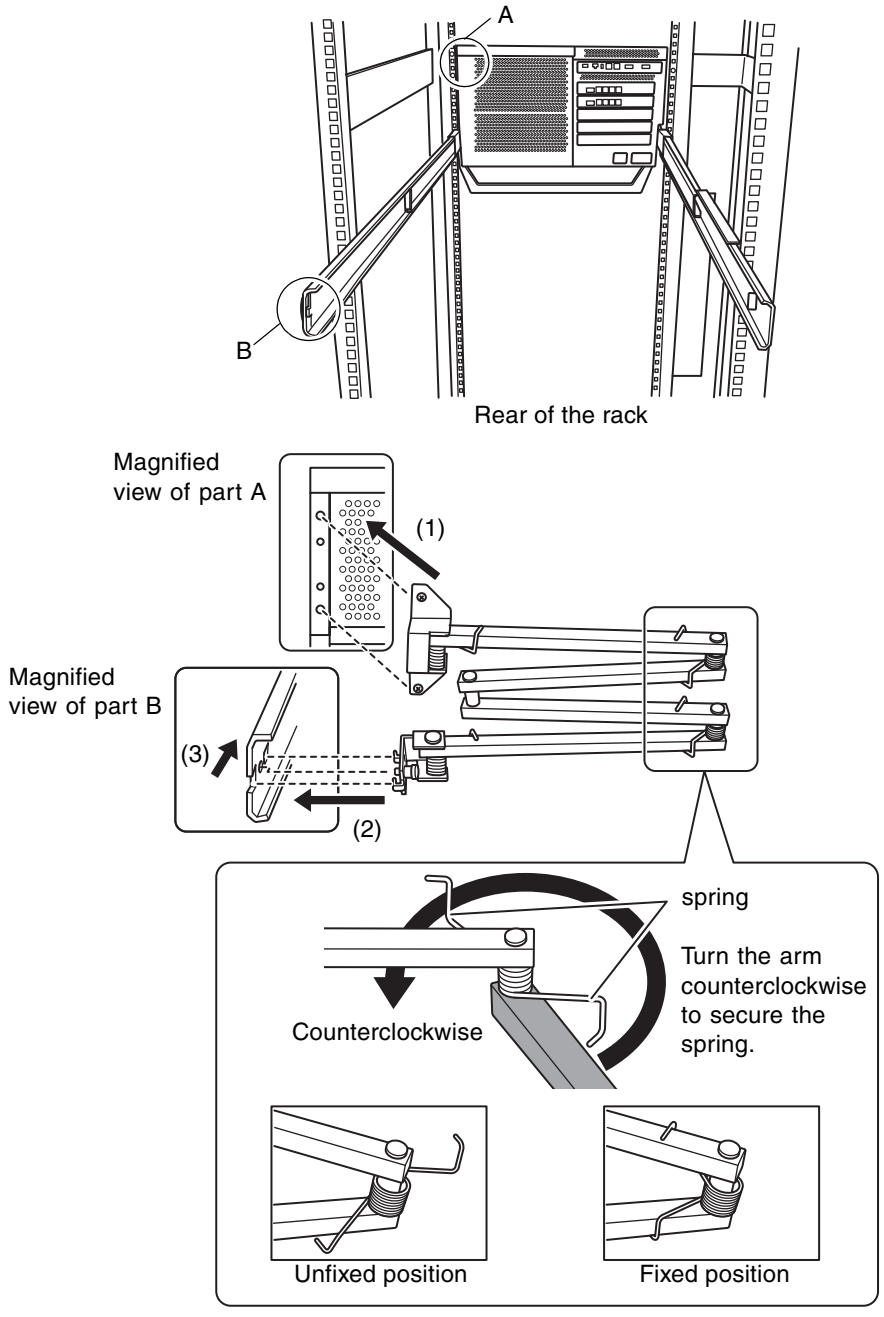
Note – Secure the spring to the joint part of the CMA.

---

3. **Secure the other end of the CMA to the rail (on the left as viewed from the rear of the rack).**

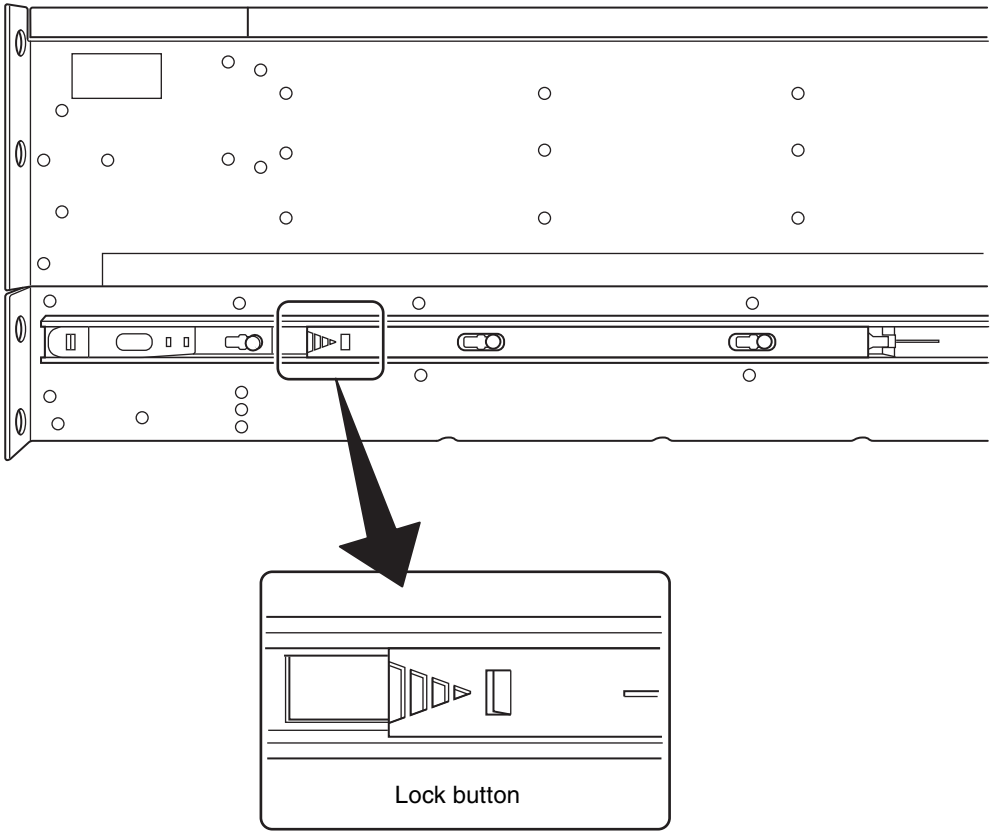
   Slide the CMA from the rear to move the two tabs on the rail into proper position, and tighten the one knob screw to secure the arm to the rail. (See (2) and (3) in FIGURE 3-49.)

FIGURE 3-49 Securing the Cable Management Arm with Screws



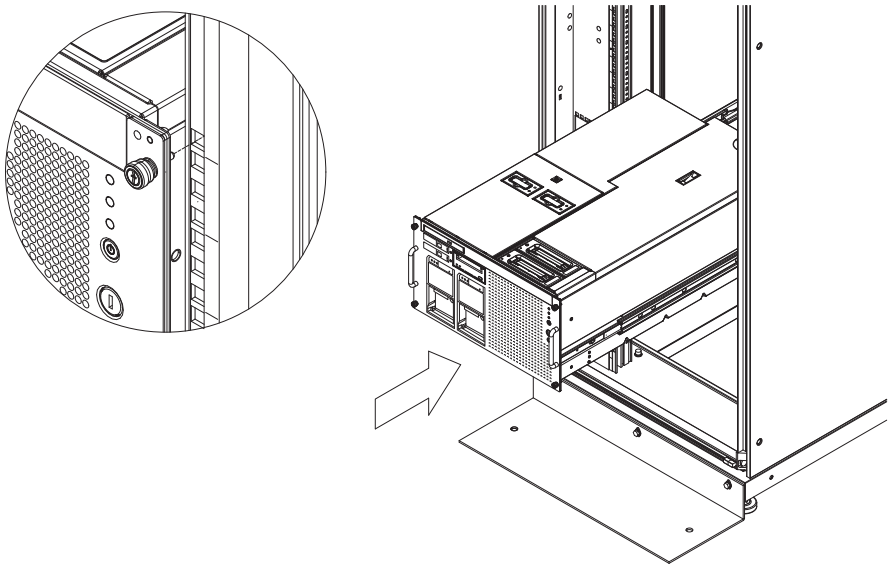
4. **Press the lock buttons on the slide rails to unlock the rails and insert the server into the rack.**

FIGURE 3-50 Unlock the Slide Rail



5. **Tighten four screws on the front to secure the server to the rack.**

FIGURE 3-51 Securing the Server to the Rack

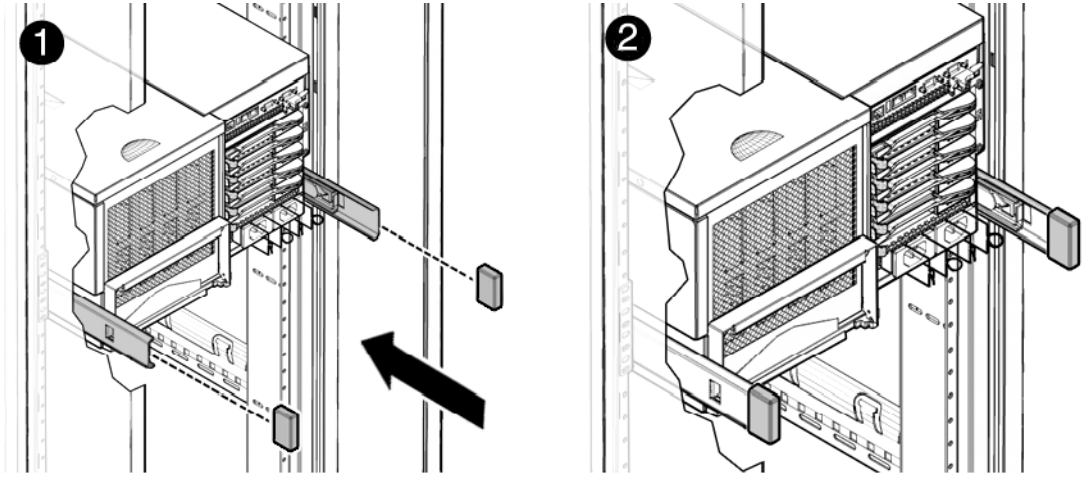


6. **Attach the end caps onto the slide rails.**

   For the M4000 server, an end cap is attached to both the right and left rear rails.

Note – The M4000 server uses two end caps.

FIGURE 3-52 Installing End Caps on the M4000 Server Slide Rails



7. **Connect the power cord to the rear of the server.**

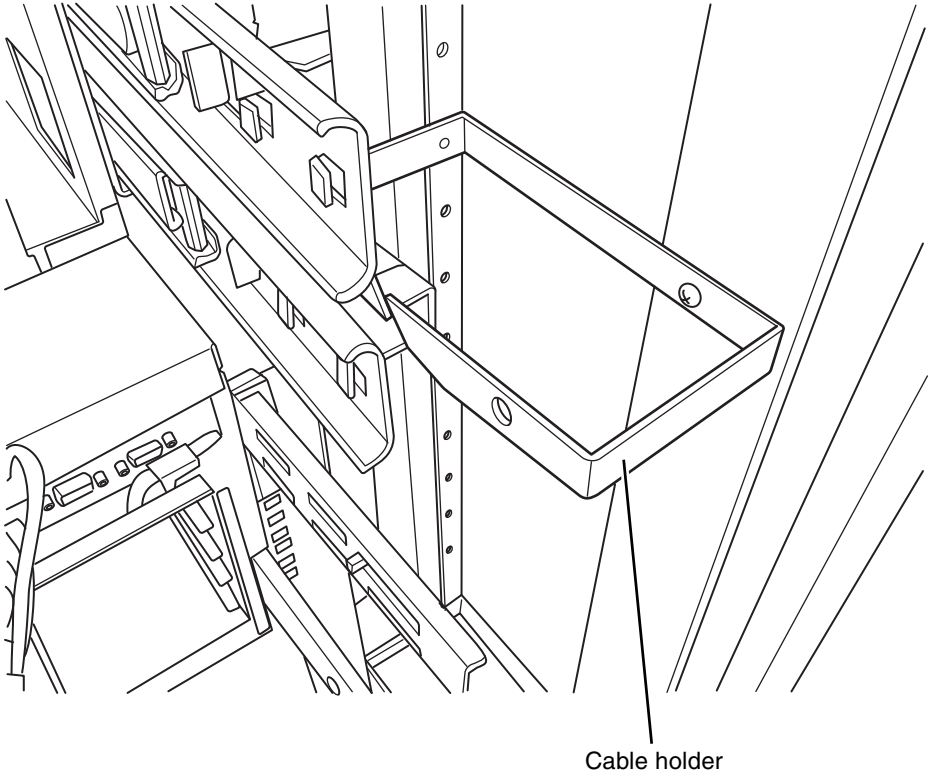
Caution – At this time, do not connect the power plug to an outlet.

---

8. **Pass the power cord, which was connected in Step 7, through the cable holder on the rear right of the rack.**

Note – When it is the equipment rack model 1640/1624/1740, the shape of the cable holder differs from the figure below; however, pass the power cord through the cable holder.

FIGURE 3-53 Cable Holder on the Rear Right of the Rack



Securing the Cables to Cable Management Arm

Bundle and fasten the cables to the CMA with velcro fasteners at regular intervals. (See (1) in FIGURE 3-54.) In doing so, pull the server out to the front to give the cables the excess length.

FIGURE 3-54 Status of Cables When the Server Pulled Out

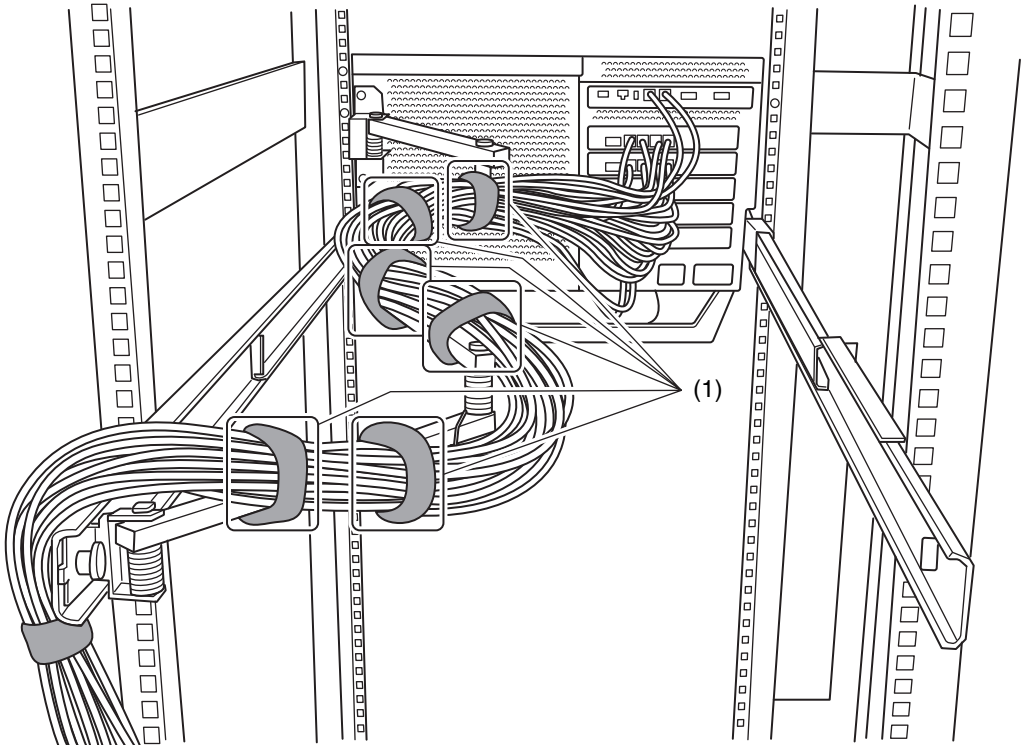
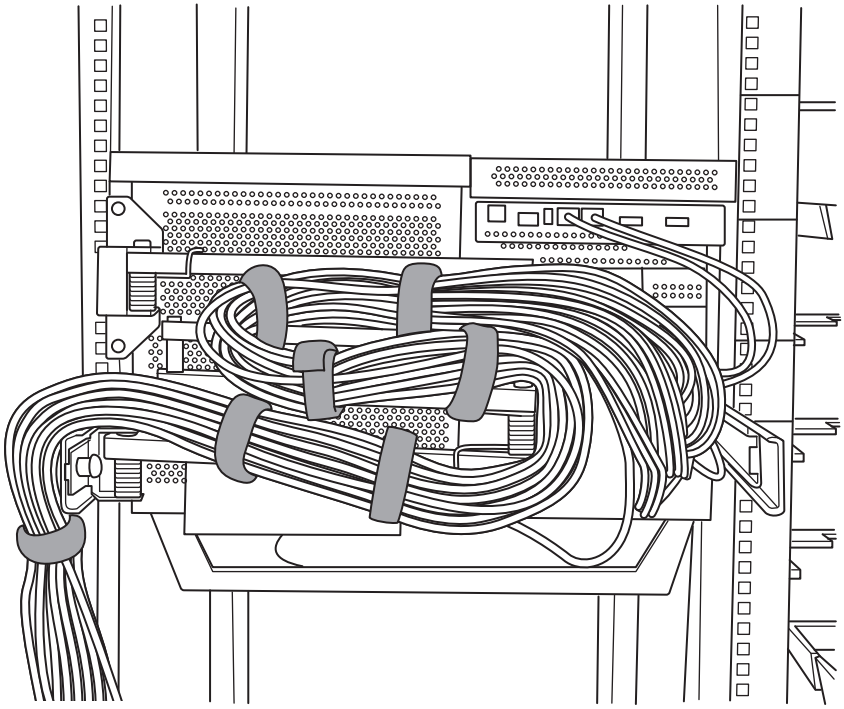


FIGURE 3-55 Status of Cables When the Server Secured to the Rack



3.6.7 Attaching the Cable Bracket

If no CMA is available, or when using a copper link cable or optical fiber cable, secure the cable using a cable bracket.

Moreover, if multiple M4000 servers are to be mounted in the rack, and no space is available to store the cable in the left side of the rack, use a cable bracket even if the cables are not copper link cables or optical fiber cables.

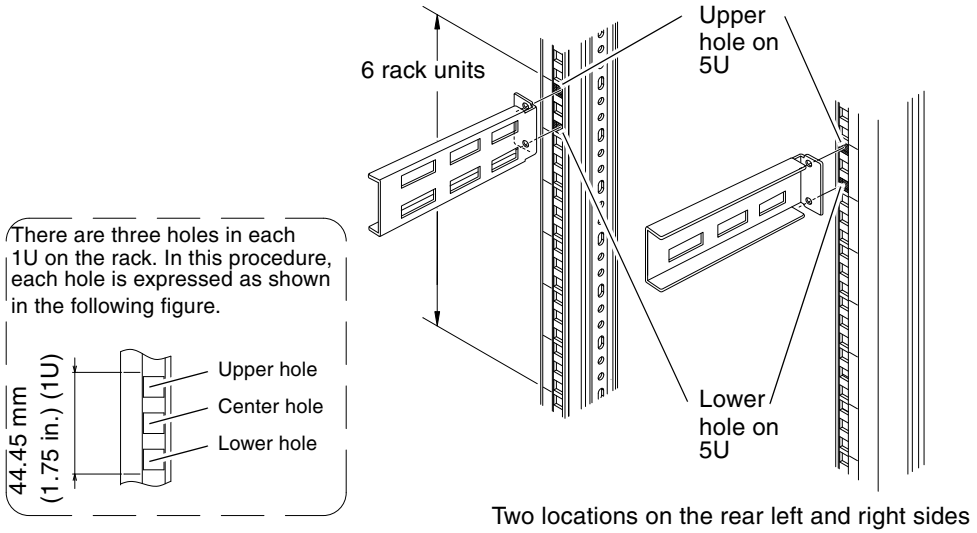
Note – Remove the CMA if it is secured.

---

1. **Attach the cable holding brackets in position on the rack columns.**

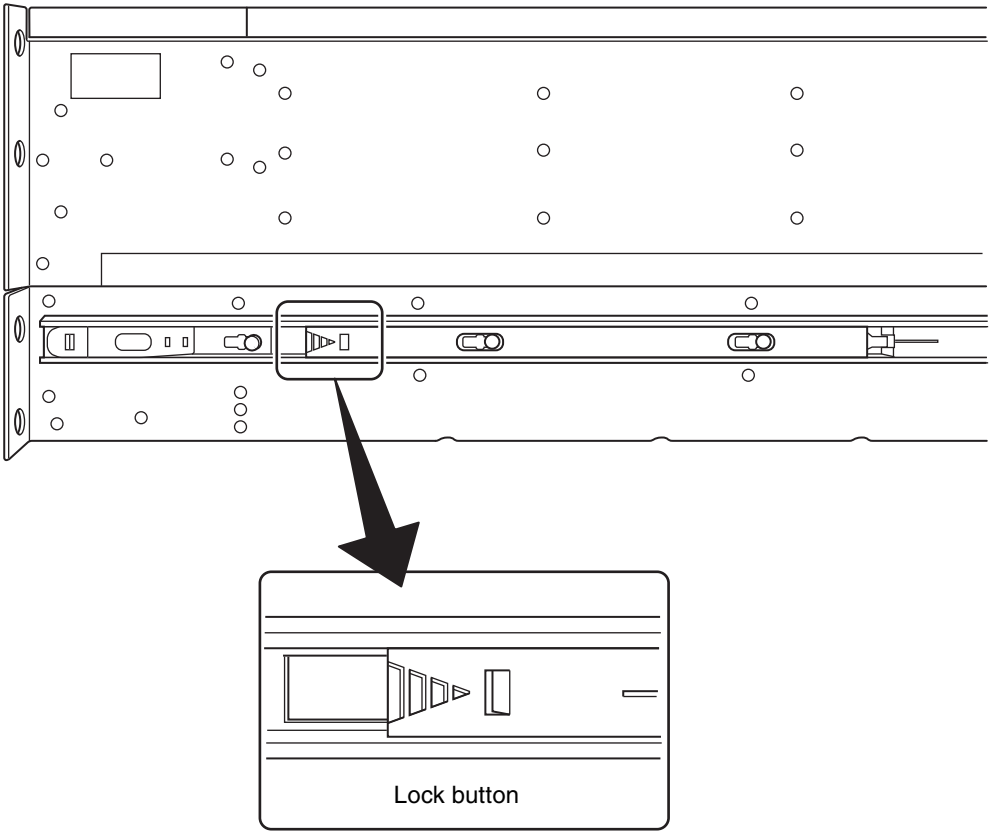
   Secure the cable holding brackets using M5 screws and M5 cage nuts.

FIGURE 3-56 Attaching the Cable Holding Brackets



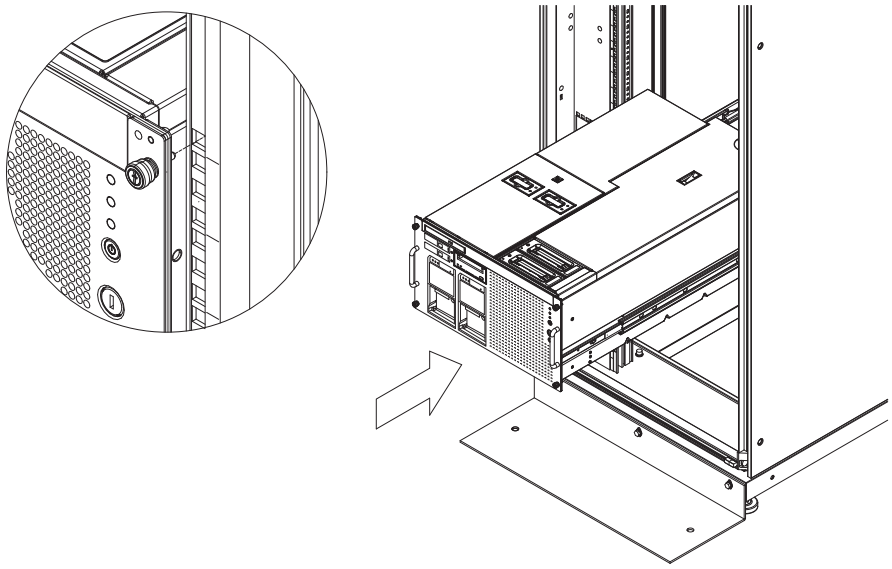
2. **Press the lock buttons on the slide rails to unlock the rails and insert the server into the rack.**

FIGURE 3-57 Unlock the Slide Rail



3. **Tighten four screws on the front to secure the server to the rack.**

FIGURE 3-58 Securing the Server to the Rack

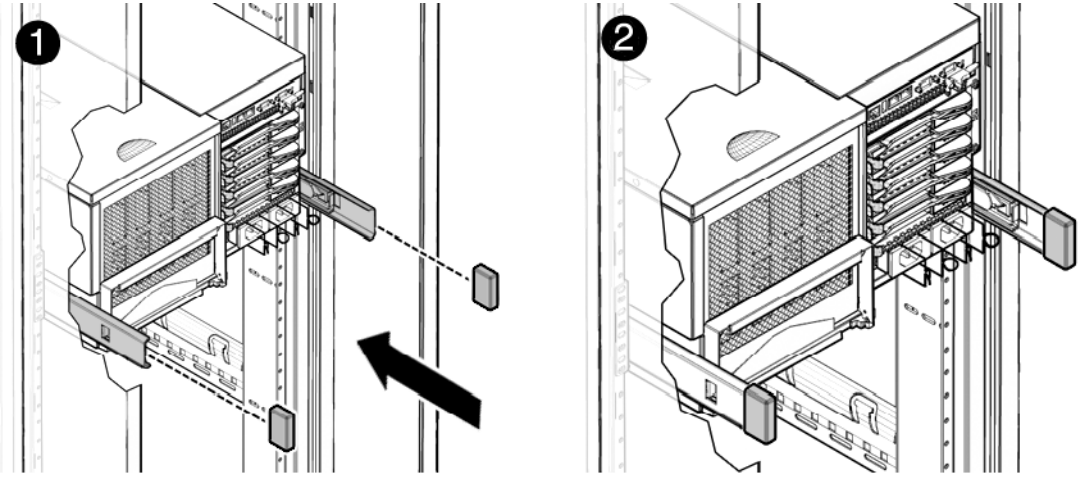


4. **Attach the end caps onto the slide rails.**

   For the M4000 server, an end cap is attached to both the right and left rear rails.

Note – The M4000 server uses two end caps.

FIGURE 3-59 Installing End Caps on the M4000 Server Slide Rails



5. **Connect the power cord to the rear of the server.**

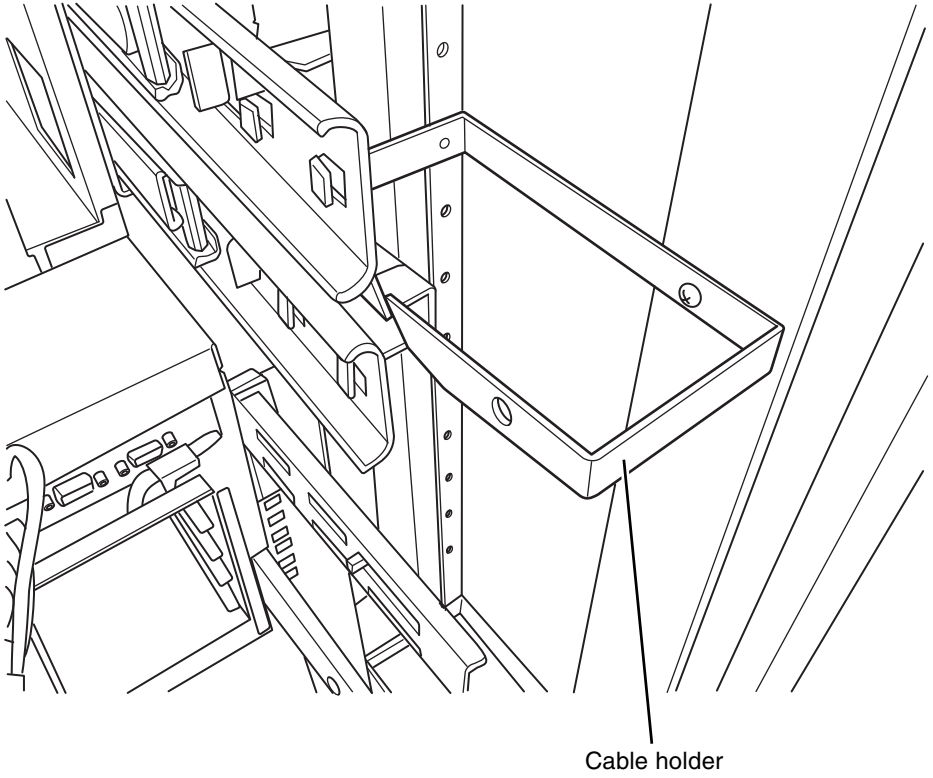
Caution – At this time, do not connect the power plug to an outlet.

---

6. **Pass the power cord, which was connected in Step 5, through the cable holder on the rear right of the rack.**

Note – When it is the equipment rack model 1640/1624/1740, the shape of the cable holder differs from the figure below; however, pass the power cord through the cable holder.

FIGURE 3-60 Cable Holder on the Rear Right of the Rack



Securing Cables Other Than the Copper Link Cables

Use this method when copper link cables are not connected.

1. **Bundle the cables with velcro fasteners at regular intervals. (See (1) in FIGURE 3-61.)**
2. **Move the cable holder on the rear right of the rack to the upper right of the server. (See FIGURE 3-62.)**
3. **Secure the cables with the cable holding brackets on the left and right sides. (See (3) and (4) in FIGURE 3-61.)**

Note – When drawing out the M4000 server to the front, release the velcro fastener holding the PCI cables on the rear of the server. (See (3) in FIGURE 3-61.)

FIGURE 3-61 Securing Cables Other Than the Copper Link Cables

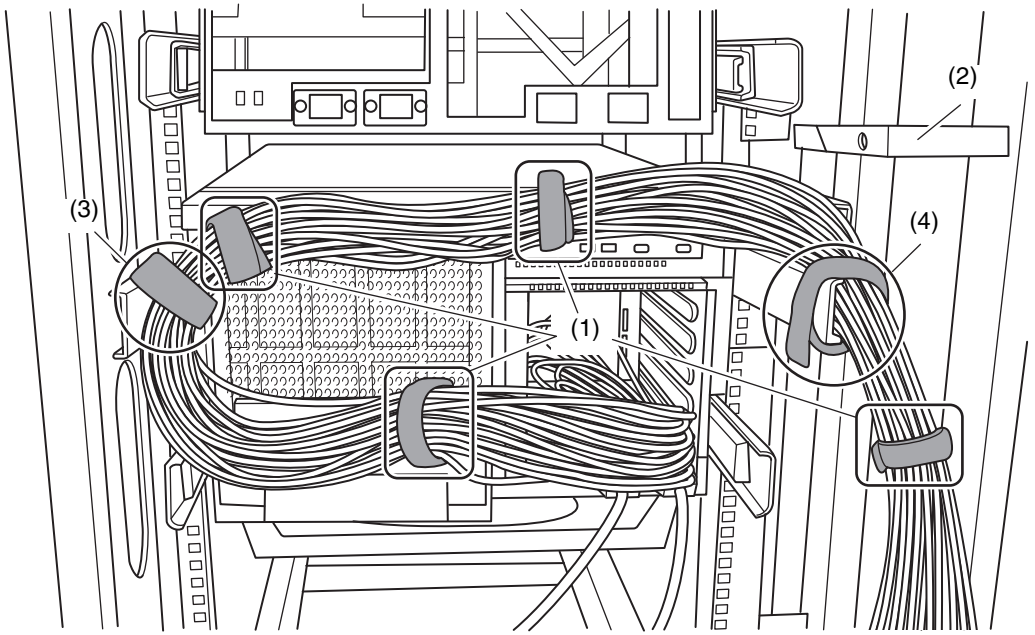
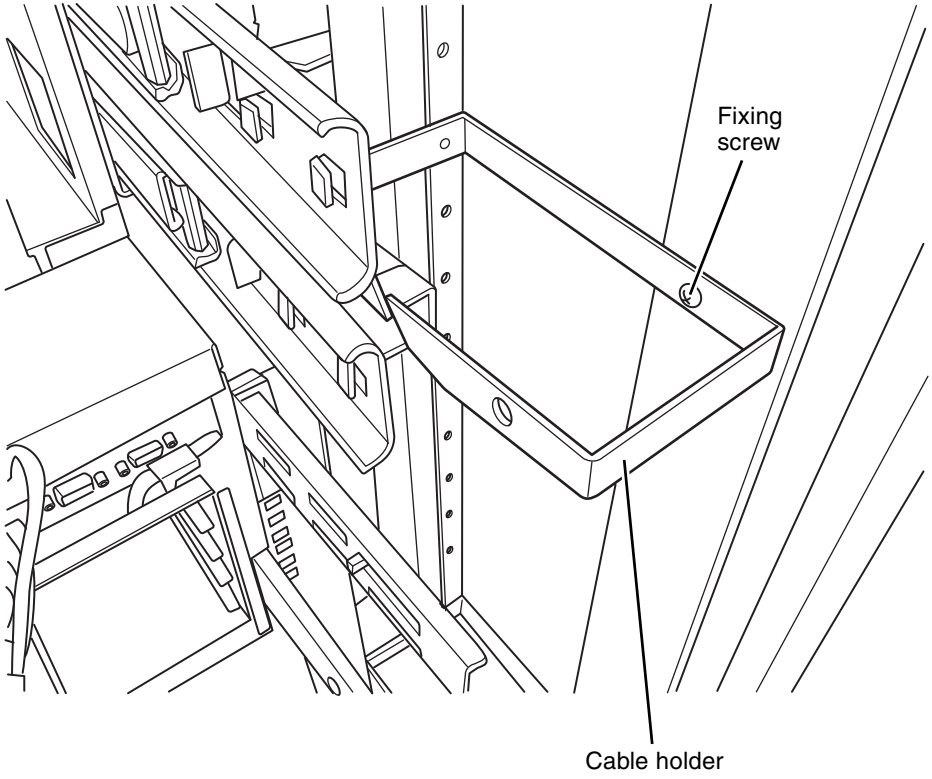


FIGURE 3-62 Moving the Cable Holder



Securing the Copper Link Cables

Use this method when the copper link cables or the optical fiber cables are used.

1. **Bundle the copper link cables with velcro fasteners at regular intervals. (See (1) in FIGURE 3-63.)**
2. **Move the cable holder on the rear right of the rack to the upper right of the server. (See FIGURE 3-64.)**
3. **Secure the cables with the cable holding bracket on the left side. (See (3) in FIGURE 3-63.)**
4. **Secure the cables with the cable holder. (See (4) in FIGURE 3-63.)**

Note – When drawing out the M4000 server to the front, release the velcro fastener holding the PCI cables on the rear of the server. (See (3) in FIGURE 3-63.)

FIGURE 3-63 Securing the Copper Link Cables

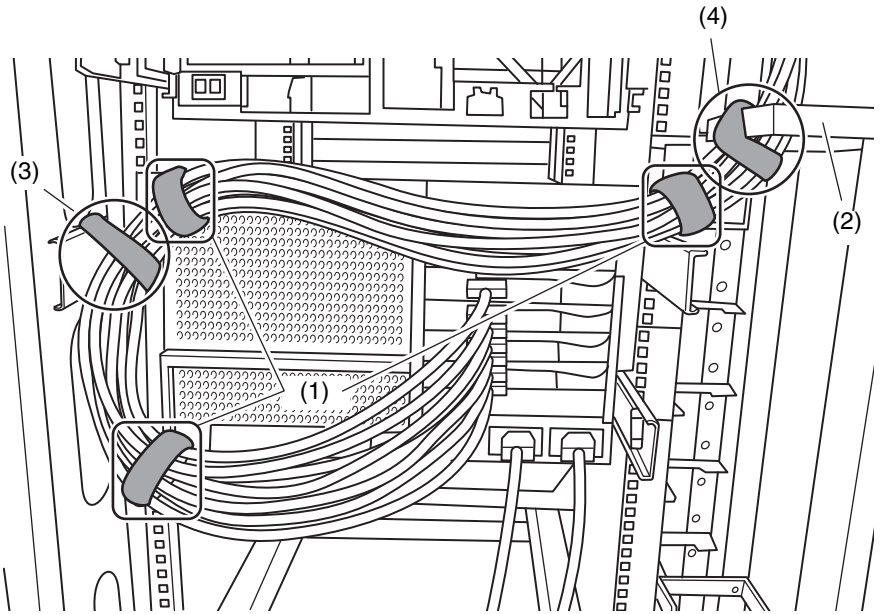
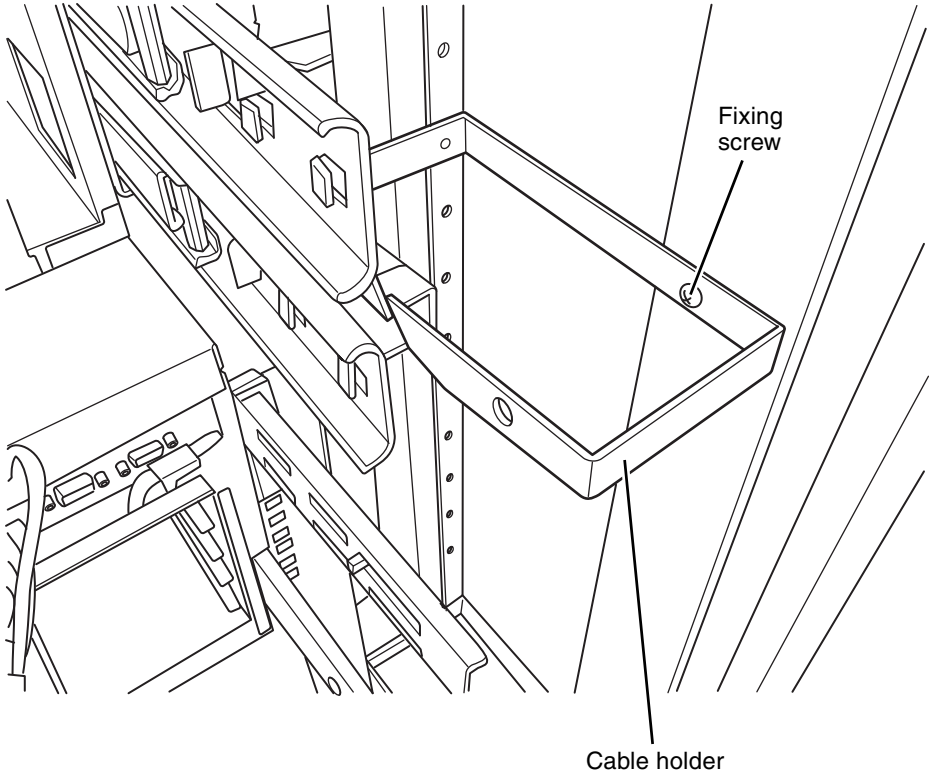


FIGURE 3-64 Moving the Cable Holder



3.7 Mounting the M5000 Server in the Rack

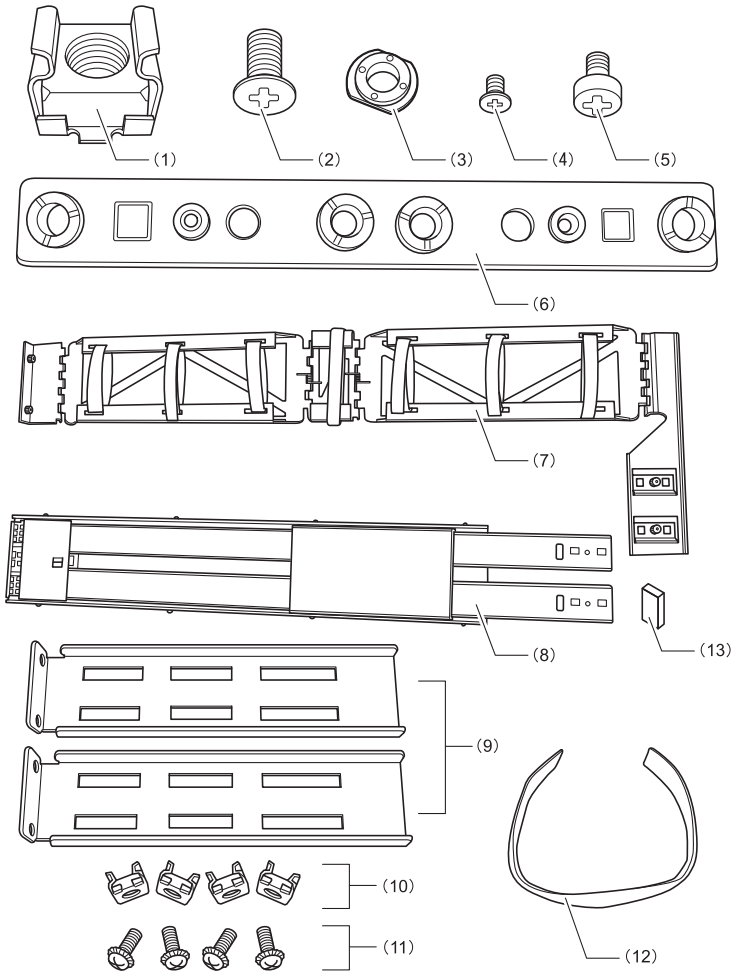
To mount the M5000 server in the equipment rack, use the mount kit for the M5000 server.

3.7.1 Components Check List

The followings list the components for the mount kit for the M5000 server.

- Mount kit for the M5000 server

FIGURE 3-65 Mount Kit for the M5000 Server



No.	Parts Name	Required Number
1, 10	M5 cage nut	8
2	M5 flathead screw	16
3	washer	16
4	M2.5 flathead screw	8
5	M4 screw	6
6	bracket	4

No.	Parts Name	Required Number
7	cable management arm (CMA)*	1
8	slide rail	2
9	cable bracket*	2
11	M5 screw	4
12	velcro fastener	14
13	end cap	4

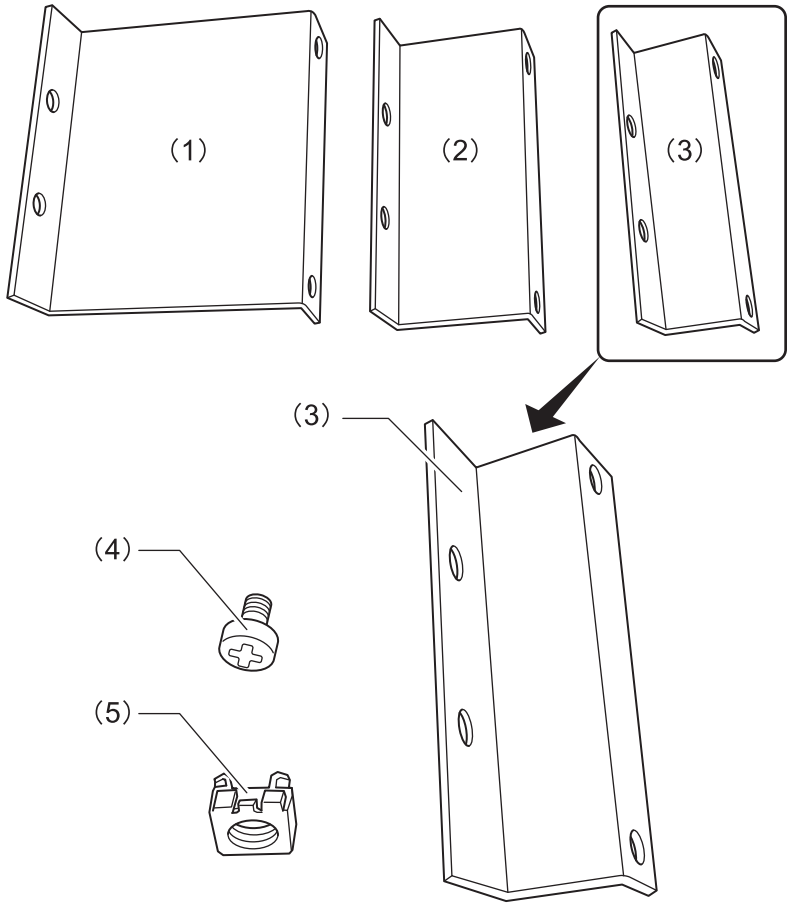
* If you connect copper link cables, you do not need to install the cable management arm. Store the cable management arm so as not to be missing.

- Attaching brackets to the right column on the rear of the rack

  Depending on the positions where slide rails are attached, brackets may be attached to the right column on the rear of the rack. For details, see a. "Attaching brackets to the right column on the rear of the rack (Equipment rack for SPARC Enterprise servers only)" on page 3-83.

  The relevant bracket kit is shown below:

FIGURE 3-66 Bracket Kit That Is Attached to the Right Column on the Rear of the Rack



No.	Parts Name	Required Number
1	Large-sized bracket	Not used

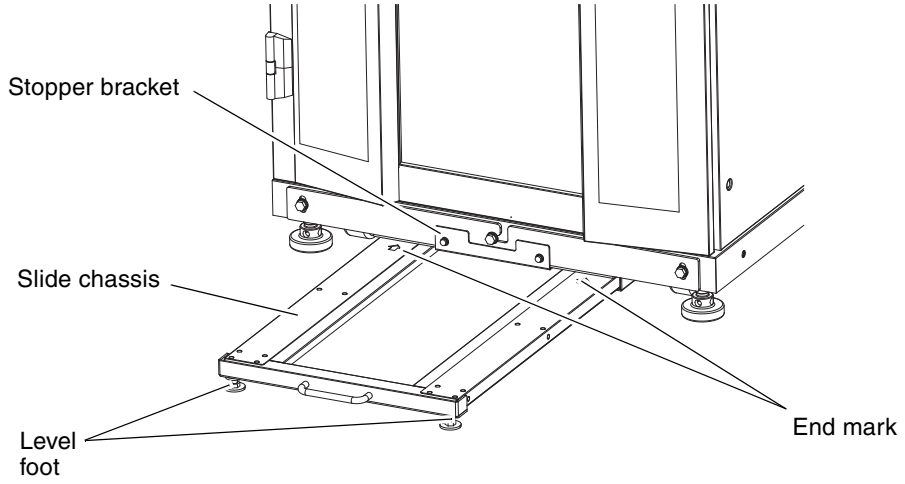
No.	Parts Name	Required Number
2	Middle-sized bracket	Not used
3	Small-sized bracket	1
4	M5 screw	2
5	M5 cage nut	2

3.7.2 Safety Against Overturning

1. **Take appropriate measures to prevent the rack from toppling over.**

   For details, see Section 3.4, "Equipment Rack Mounting Requirements" on page 3-12. As an example, the procedure for attaching the quake-resistant options kit to the rack is shown below.

FIGURE 3-67 Pulling Out the Pull-out Quake-Resistant Options Kit



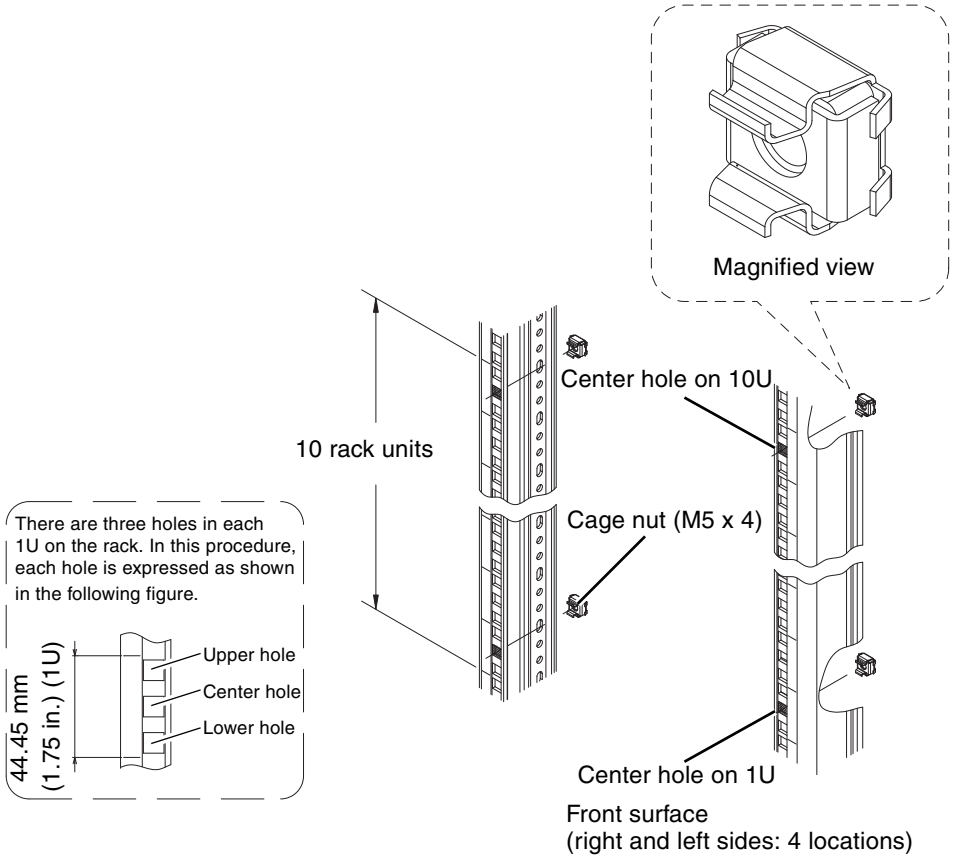
Caution – Be sure to pull the slide chassis all the way out to the point indicated by the end mark. If the slide chassis is not pulled all the way out to the end mark point, the equipment rack may topple over when drawing a server out from a rack.

Caution – Make sure that there is no unevenness between the level feet of the slide chassis where they come into contact with the floor surface. If there is any unevenness between them where they come into contact with the floor surface, the equipment rack may topple over.

3.7.3 Attaching the Slide Rails

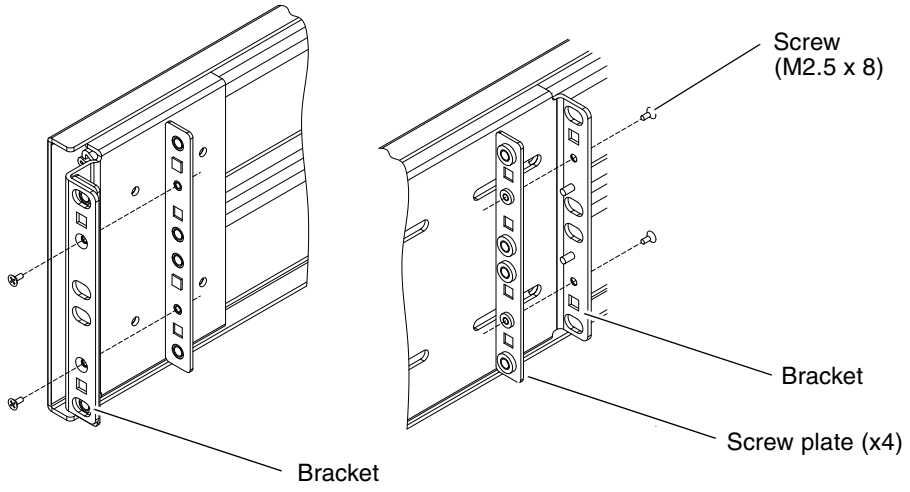
1. **Attach cage nuts to the specified locations on the rack columns.**

FIGURE 3-68 Attaching the Cage Nuts



2. **Attach four screw plates to their corresponding locations on the slide rails (front right, front left, rear right, and rear left) with two M2.5 flathead screws at each location.**

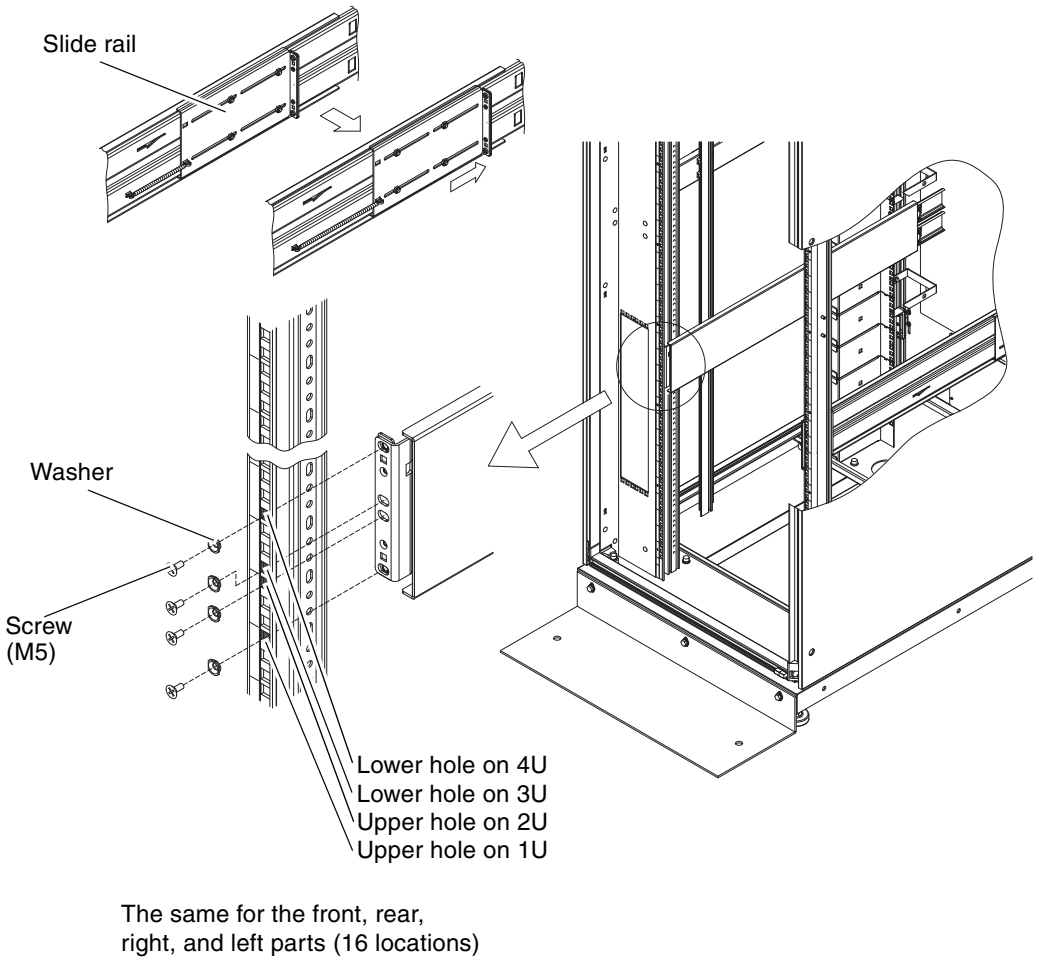
FIGURE 3-69 Attaching Screw Plates



3. **Secure the slide rails to the rack with screws (four M5 flathead screws at each of four locations) and washers (four at each of four locations).**

   The same type of rail is used on both the right and left sides, and the rail can be fixed in position on either side. The bracket parts on the rear side are movable with the help of the springs, and the brackets must be fixed in position while opened.

FIGURE 3-70 Fixing the Slide Rails in Position on the Rack

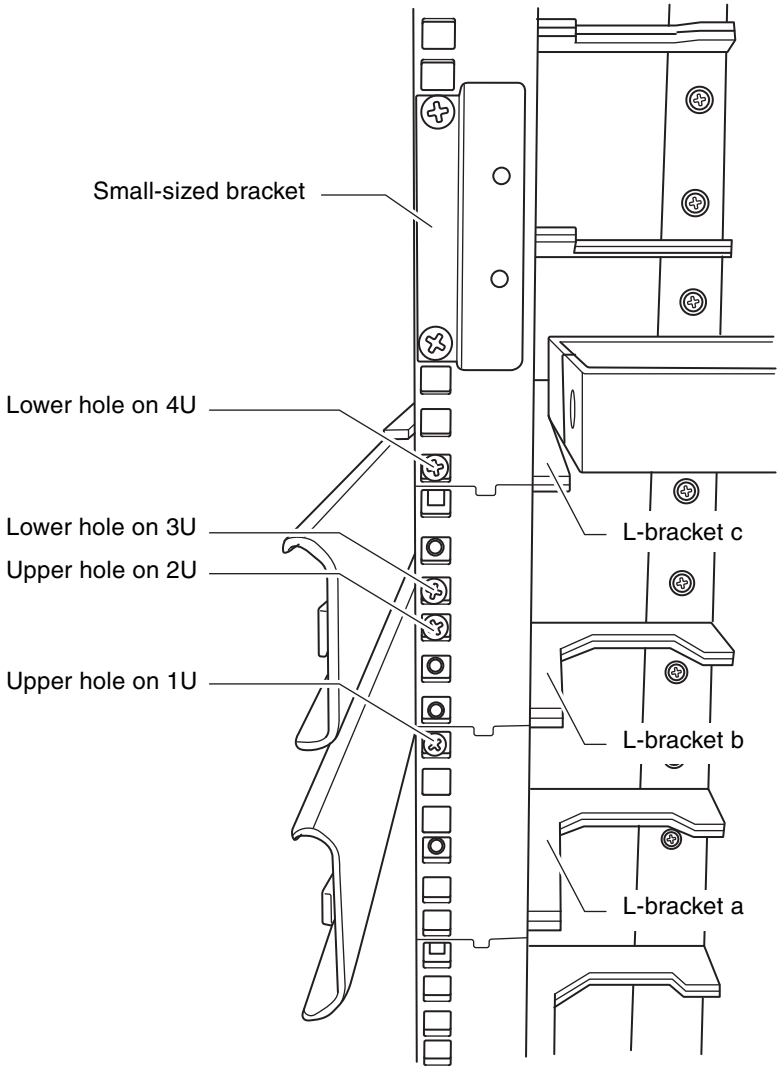


   a. **Attaching brackets to the right column on the rear of the rack (Equipment rack for SPARC Enterprise servers only)**

Check the right column on the rear of the rack with the rails attached to the rack.

If the slide rails secured previously go across three L-brackets on the right column (L-bracket a, L-bracket b, and L-bracket c) as shown in the figure below, attach a small-sized bracket. For the attachment procedure, see b. "Attaching a small-sized bracket (Equipment rack for SPARC Enterprise servers only)" on page 3-85.

FIGURE 3-71 Rear Right Column of the Rack

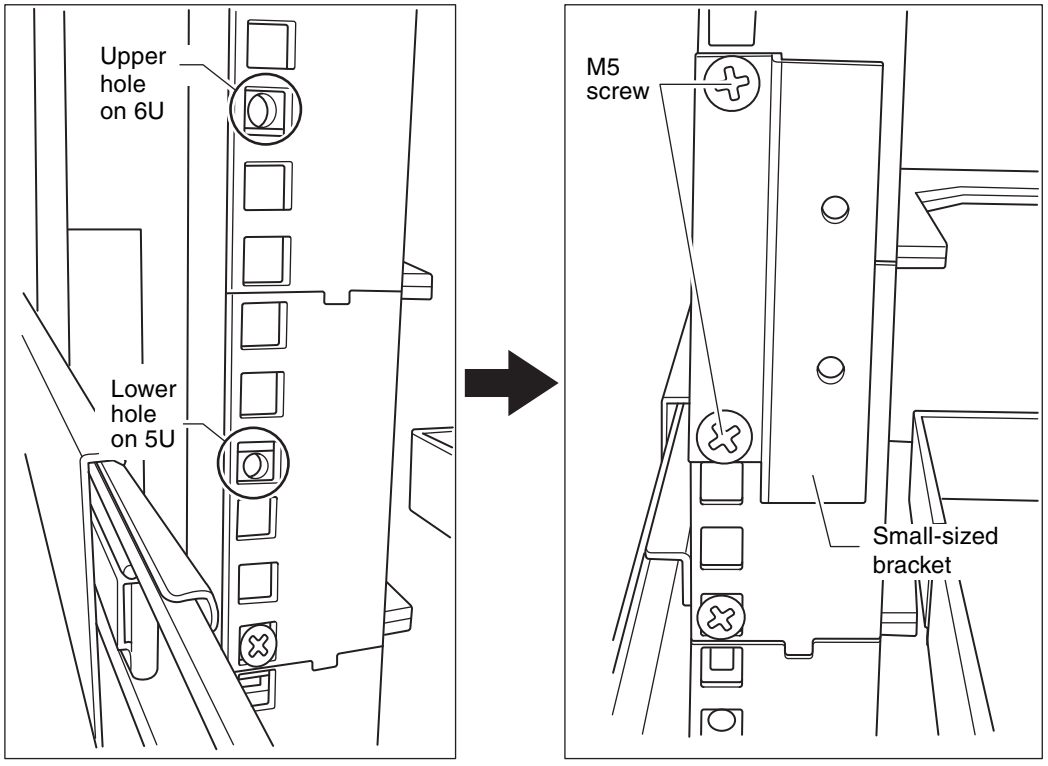


b. Attaching a small-sized bracket (Equipment rack for SPARC Enterprise servers only)

i. Attach two M5 cage nuts to the lower hole on 5U and the upper hole on 6U on the right column of the rear of the rack.

ii. Attach a small-sized bracket to the right column of the rear of the rack using two M5 screws.

FIGURE 3-72 Attaching the Cage Nuts/Brackets



Attaching cage nuts

Attaching brackets

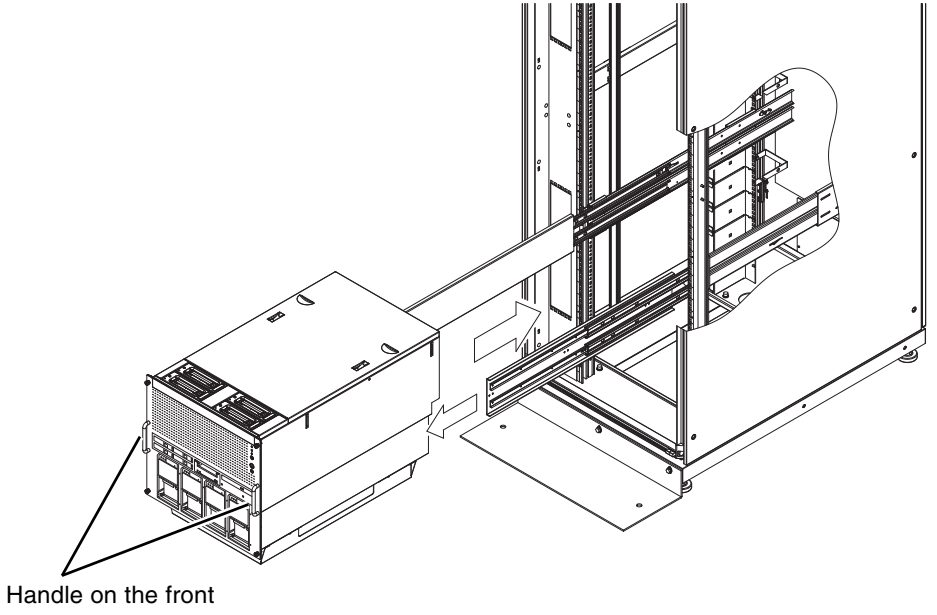
4. Extend the slide rails from the slide assemblies.

5. **Using the lifter to raise the server, align its height with the height of the slide rails. Slide the server in until the holes indicated as (1) in the server come into contact with pins on the slide rails. (See (1) in** FIGURE 3-74**.)**

   Depending on the specifications and mounting location of the lifter, Step 9 (removing the pedestal at the bottom of the server) may need to be done beforehand.

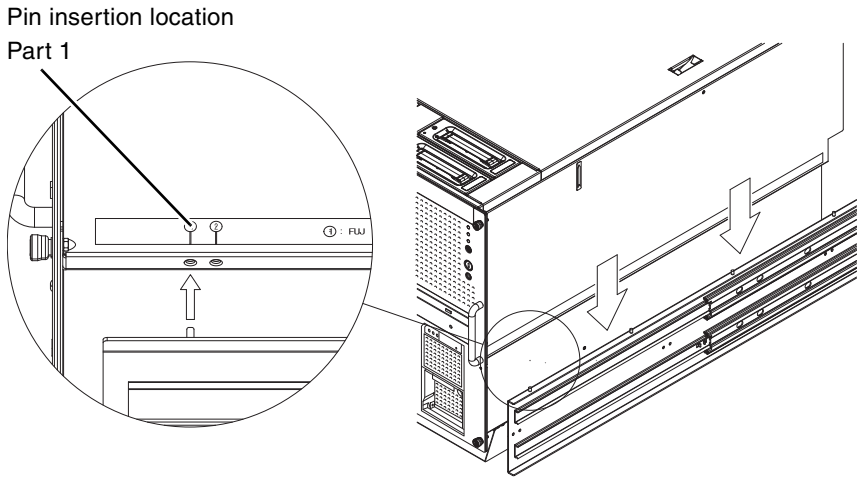
Caution – When raising the server, do not grab the handle on the front. The handle on the front is to be used for pushing in or drawing out the server in the rack, and it is not designed to bear the weight of the server.

FIGURE 3-73 Sliding the Server



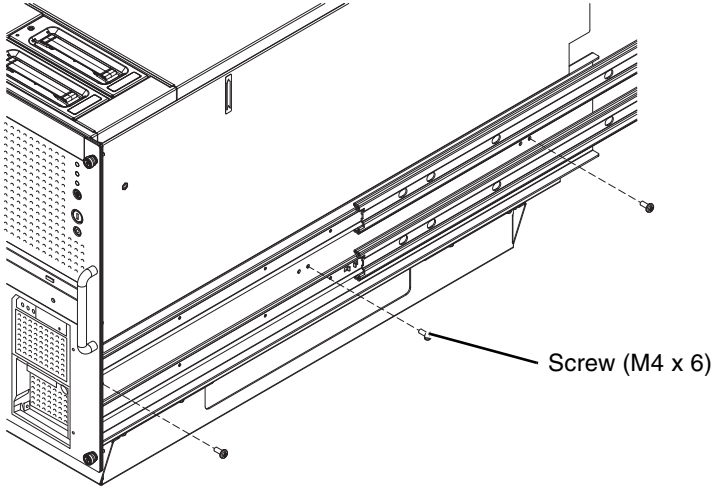
6. **When the pins are at the correct locations, slowly lower the server to set the pins in the holes.**

FIGURE 3-74 Setting the Pins in the Holes



7. **Secure each slide rail with three M4 screws (total of six screws for both the right and left rails).**

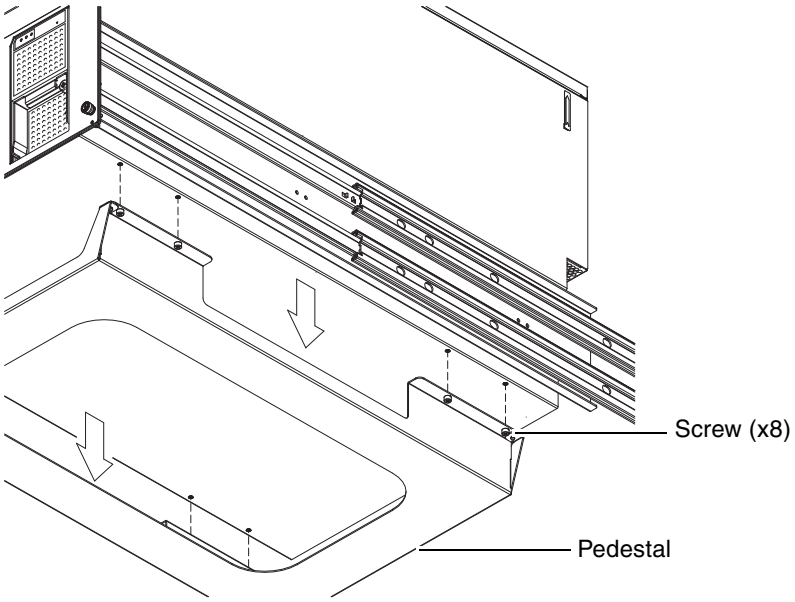
FIGURE 3-75 Securing the Slide Rails



8. **Remove the lifter from the server.**

9. **Loosen the eight screws securing the pedestal to the bottom of the server, and remove the two screws on the front. Slide the pedestal toward the rear and remove the pedestal.**

FIGURE 3-76 Removing the Pedestal from the Bottom of the Server



10. **Remove the remaining six screws that were loosened in** Step 9**.**

3.7.4 Attaching the Cable Management Arm and Cable Bracket

Note – To secure the cables on the M5000 server, prepare the appropriate apparatus depending on whether or not the copper link cables connected.
•If you do not use the copper link cables, install the cable management arm and the cable bracket.
•If you use copper link cables, install the cable bracket only.

TABLE 3-2 Required Apparatus

Use of Copper Link Cables	Apparatus Required
Not used	cable management arm and cable bracket
Used	cable bracket

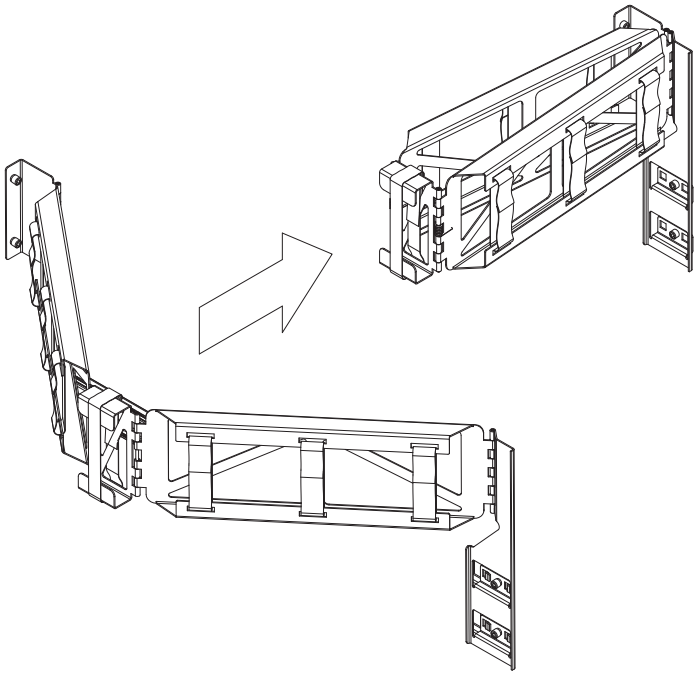
Note – If you connect copper link cables, you do not need to install the cable management arm. Store the cable management arm so as not to be missing.

3.7.4.1 Installing the Cable Management Arm

1. **Attach the CMA.**

   Fold the CMA in such a way that the spring part is on the outside the arm and it generates force to unfold the arm.

FIGURE 3-77 Folding the Cable Management Arm

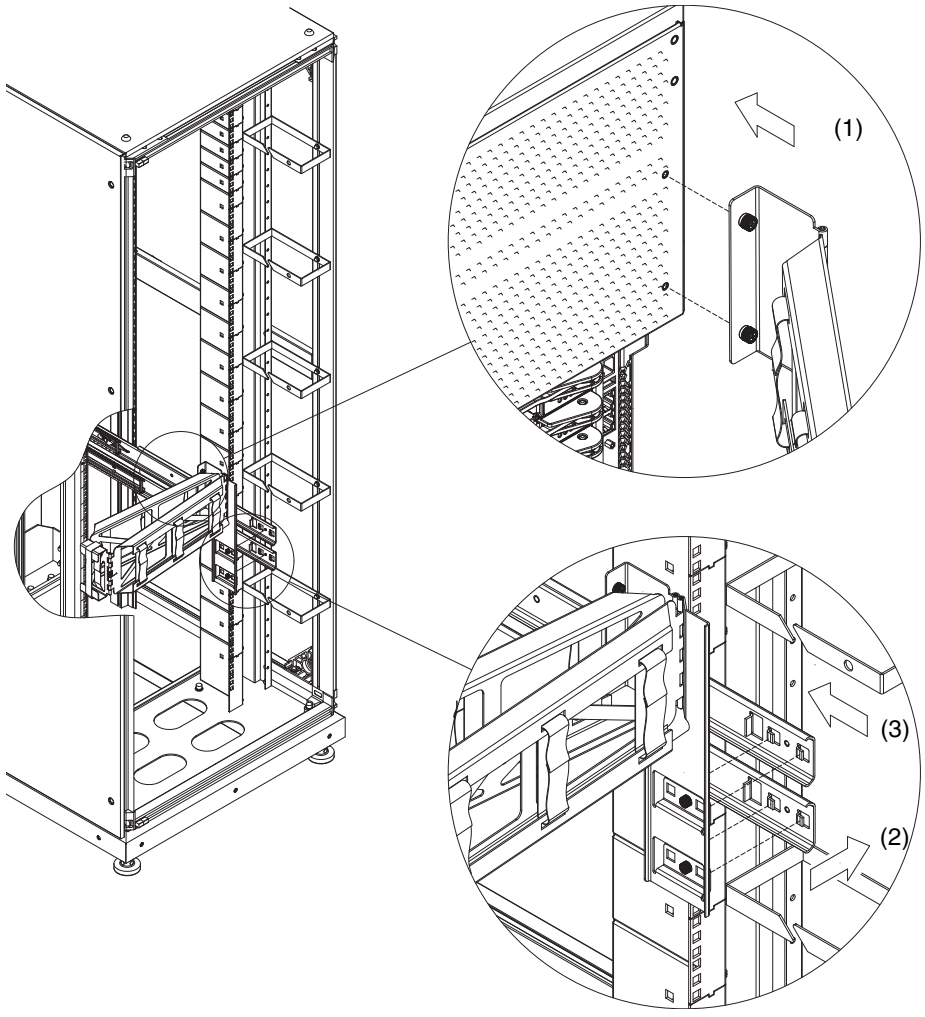


2. **As shown in the figure, attach the one end of the CMA to the server with two knob screws.**

3. **Secure the other end of the CMA to the rail (on the right as viewed from the rear of the rack).**

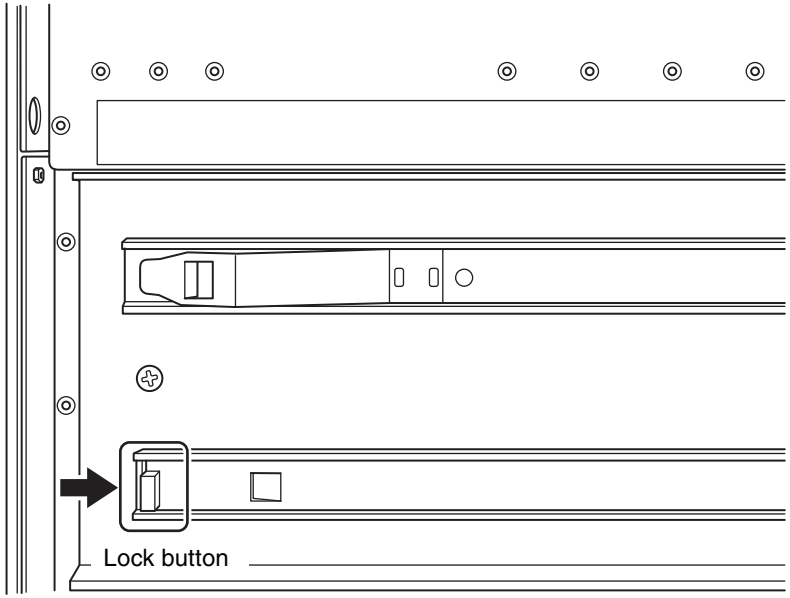
   Slide the CMA from the rear to move the four tabs on the rail into proper position, and tighten the two knob screws to secure the arm to the rail.

FIGURE 3-78 Securing the Cable Management Arm with Screws



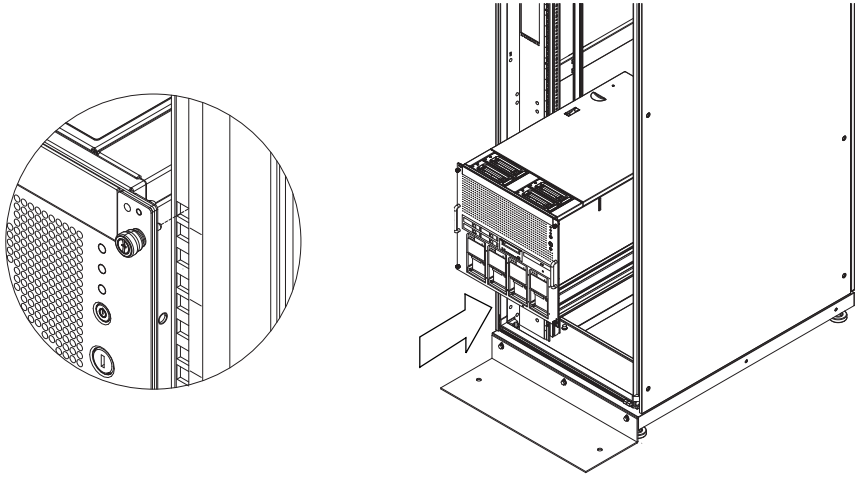
4. **Press the lock button on the slide rail in the direction indicated by the arrow to unlock the rail and insert the server into the rack.**

FIGURE 3-79 Unlocking



5. **Tighten four screws on the front to secure the server to the rack.**

FIGURE 3-80 Securing the Server to the Rack

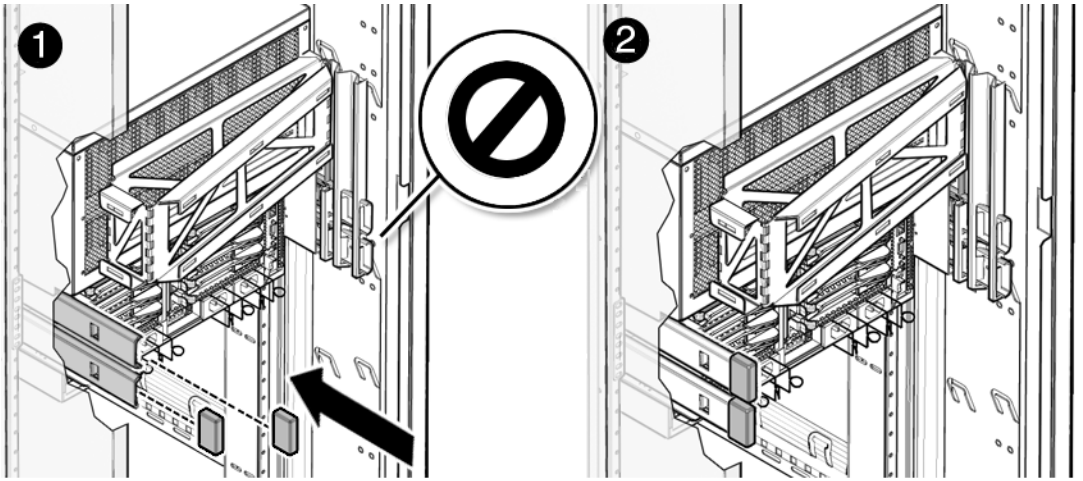


6. **Attach the end caps onto the slide rails.**

   For the M5000 server, two end caps are attached to the rails on which the CMA is not attached.

Note – If the CMA is not used, attach all end caps to the rails of the server. The M5000 server uses four end caps.

FIGURE 3-81 Installing End Caps on the Left Rear of the M5000 Server Slide Rails



7. **Connect the power cord to the rear of the server.**

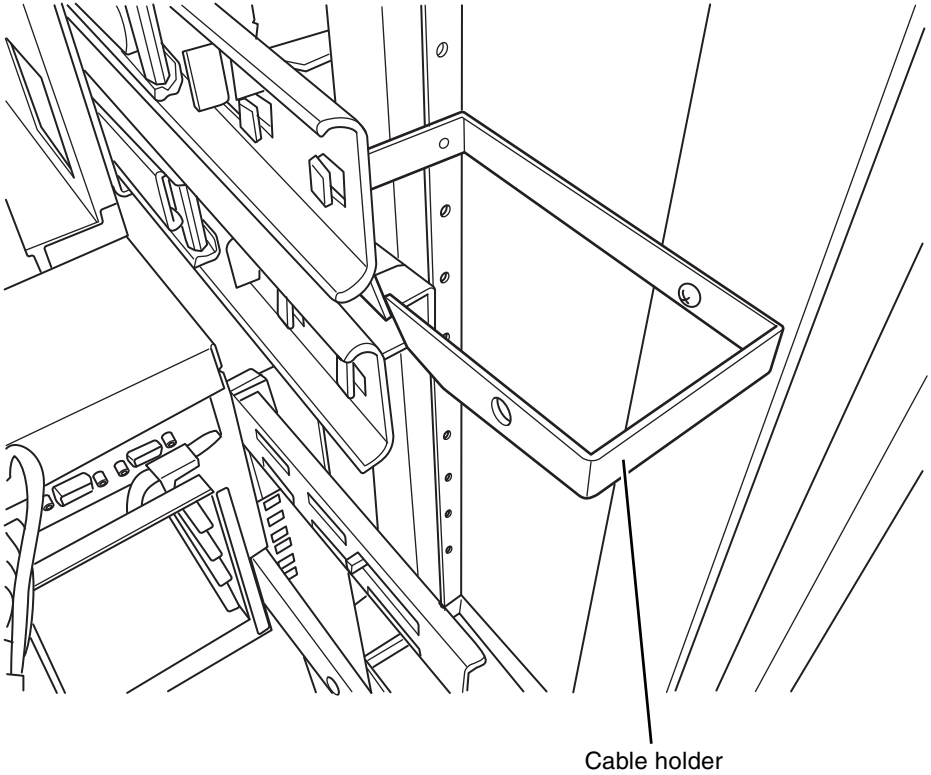
Caution – At this time, do not connect the power plug to an outlet.

---

8. **Pass the power cord, which was connected in Step 7, through the cable holder on the rear right of the rack.**

Note – When it is the equipment rack model 1640/1624/1740, the shape of the cable holder differs from the figure below; however, pass the power cord through the cable holder.

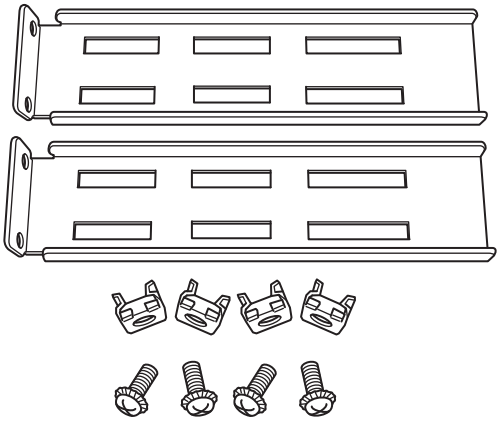
FIGURE 3-82 Cable Holder on the Rear Right of the Rack



3.7.4.2 Installing the Cable Bracket

Install the cable bracket to the prescribed position on the rack column.

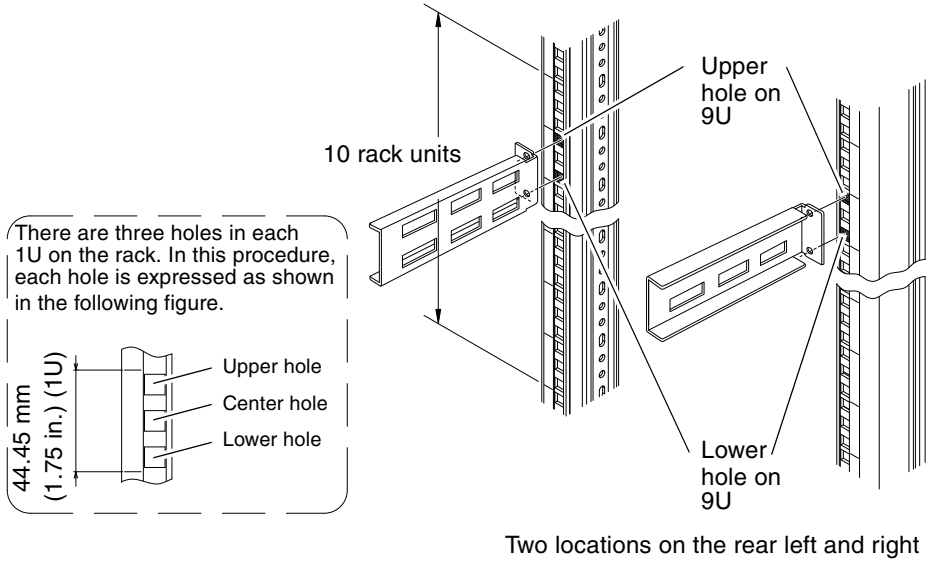
FIGURE 3-83 Cable Bracket Kit



1. **Attach the cable holding brackets in position on the rack columns.**

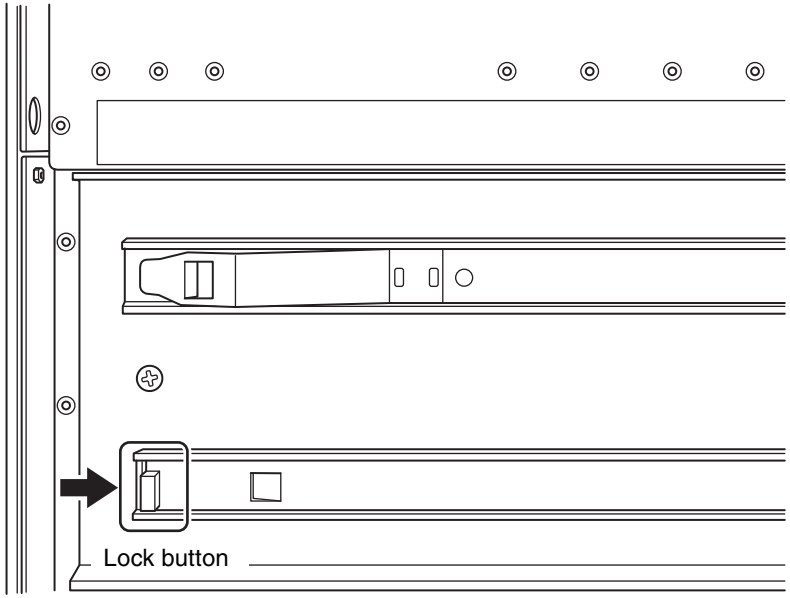
   Attach the cable holding brackets using M5 screws and M5 cage nuts.

FIGURE 3-84 Attaching the Cable Holding Brackets



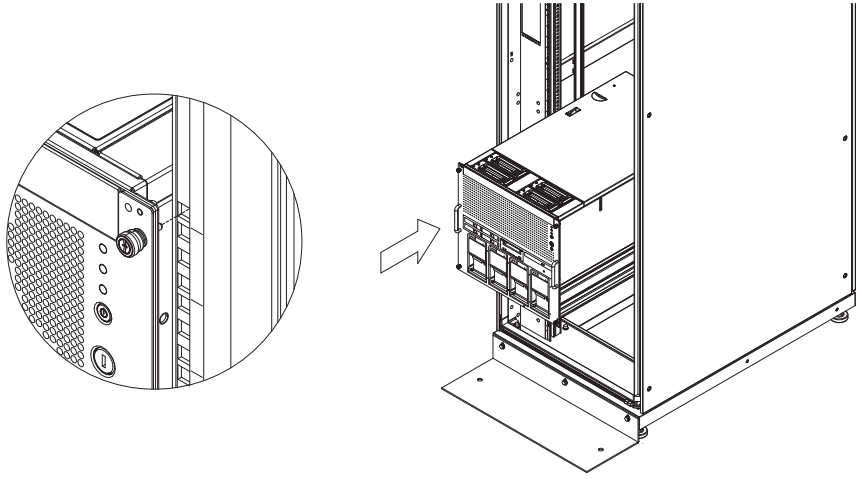
2. Press the lock button on the slide rail in the direction indicated by the arrow to unlock the rail and insert the server into the rack.

FIGURE 3-85 Unlocking



3. Tighten the four screws on the front to secure the server to the rack.

FIGURE 3-86 Securing the Server to the Rack

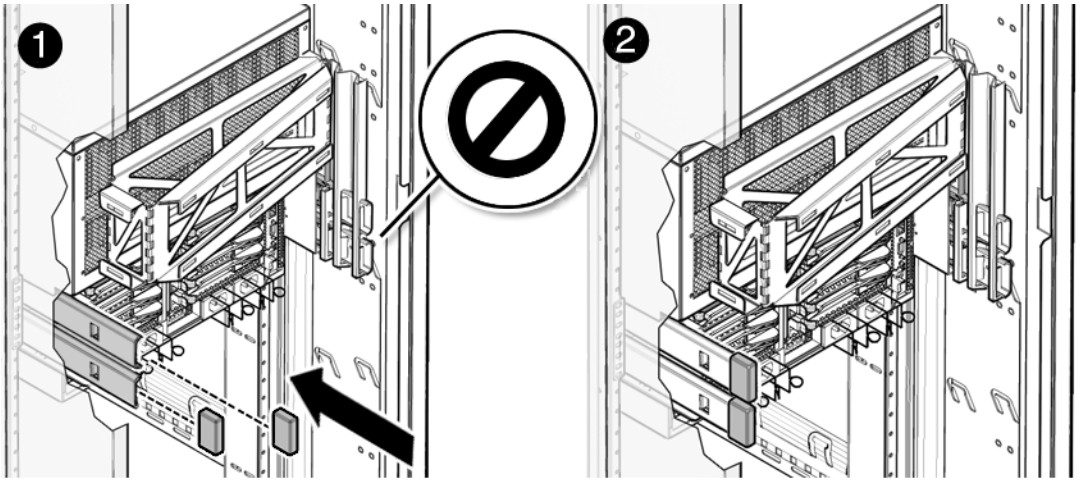


4. **Attach the end caps onto the slide rails.**

   For the M5000 server, two end caps are attached to the rails on which the CMA is not attached.

Note – If the CMA is not used, attach all end caps to the rails of the server. The M5000 server uses four end caps.

FIGURE 3-87 Installing End Caps on the Left Rear of the M5000 Server Slide Rails



5. **Connect the power cord to the rear of the server.**

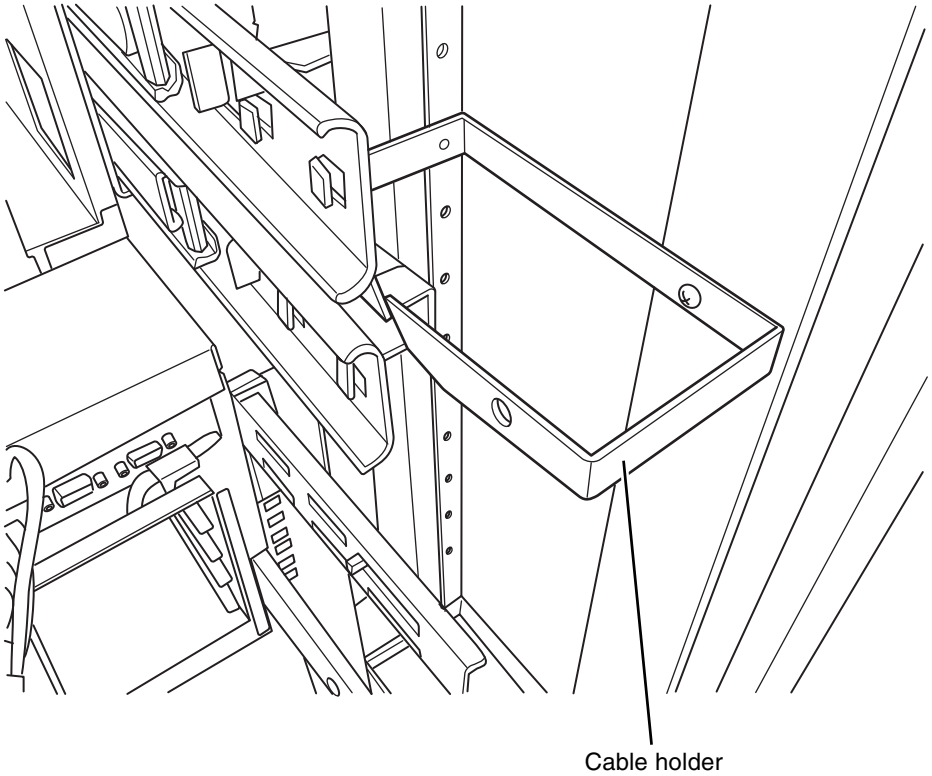
Note – At this time, do not connect the power plug to an outlet.

---

6. **Pass the power cord, which was connected in Step 5, through the cable holder on the rear right of the rack.**

Note – When it is the equipment rack model 1640/1624/1740, the shape of the cable holder differs from the figure below; however, pass the power cord through the cable holder.

FIGURE 3-88 Cable Holder on the Rear Right of the Rack



3.7.5 Securing the Cables

3.7.5.1 Securing the Copper Link Cables

1. **Bundle the copper link cables at regular intervals using velcro fasteners.**
2. **Move the cable holder on the right rear of the rack to a position where cables can be secured easily. (See** FIGURE 3-89 **and (1) in** FIGURE 3-90**.)**
3. **Secure the cables to the cable brackets on the right and on the left. (See (2) and (3) in** FIGURE 3-90**.)**
4. **Secure the cables to the cable holder. (See (4) in** FIGURE 3-90**.)**

Note – To draw the server out from the rack, release the fixation at (2) and (3) in FIGURE 3-90 and pull the server forward.

FIGURE 3-89 Moving the Cable Holder

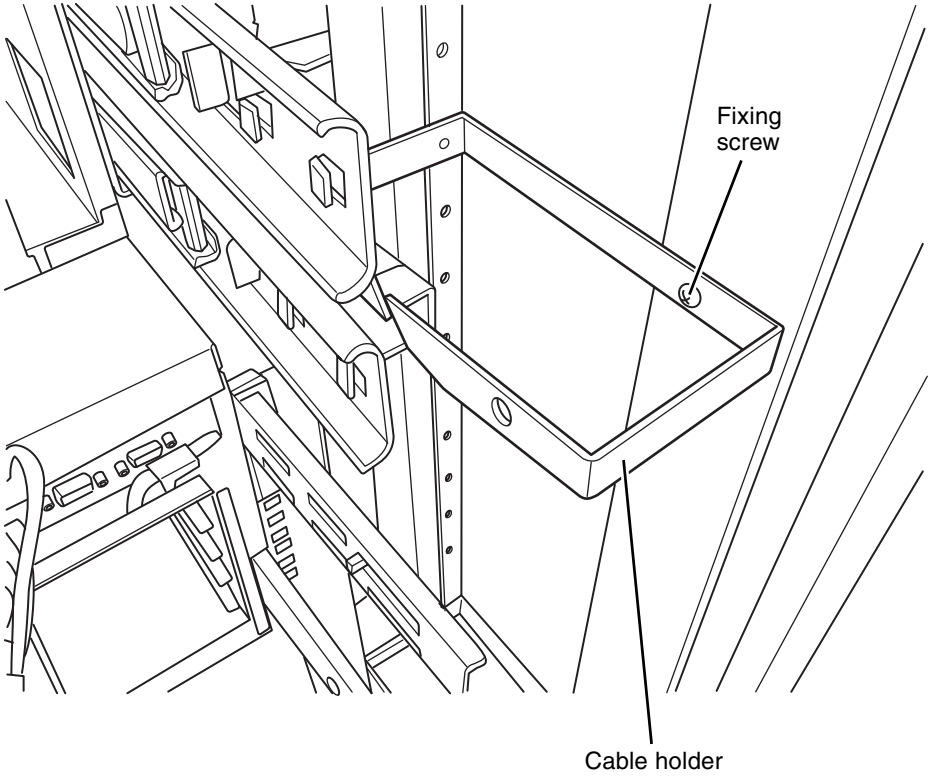
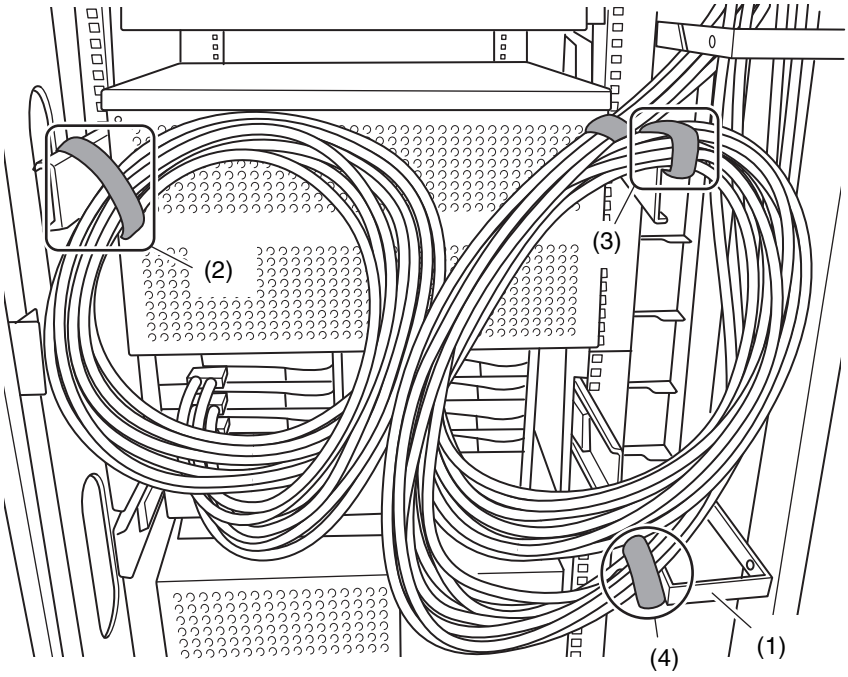


FIGURE 3-90 Securing Copper Link Cables



3.7.5.2 Securing the Optical Fiber Cables

1. **Bundle the optical fiber cables at regular intervals using velcro fasteners.**
2. **Tie the excess length of the optical fiber cables in a bundle and secure it to the lower part of the cable management arm using velcro fasteners. (See (1) in** FIGURE 3-91**.)**

Note – To draw the server out from the rack, release the velcro fasteners which securing the cables to the lower part of the cable management arm and pull the server forward. (See (1) in FIGURE 3-92.)

FIGURE 3-91 Securing the Optical Fiber Cables

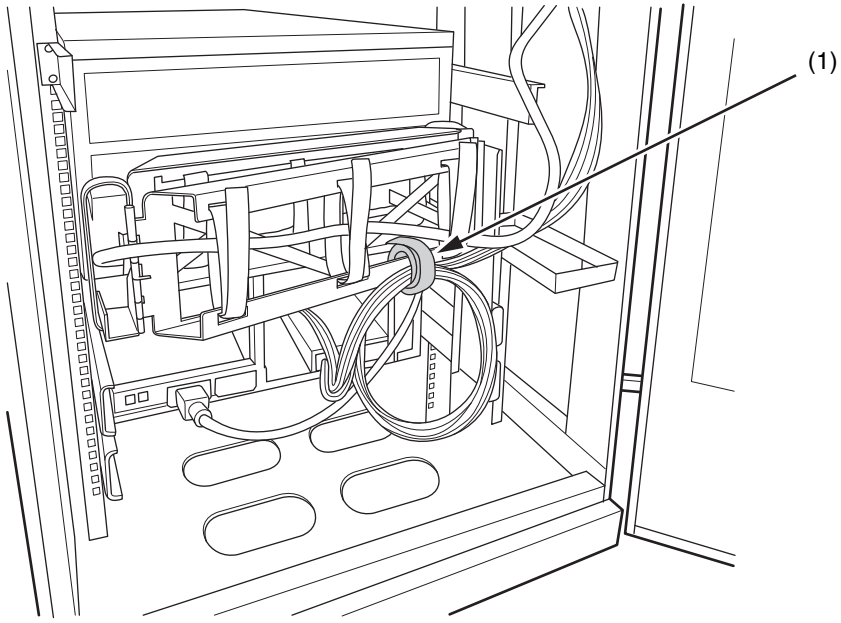
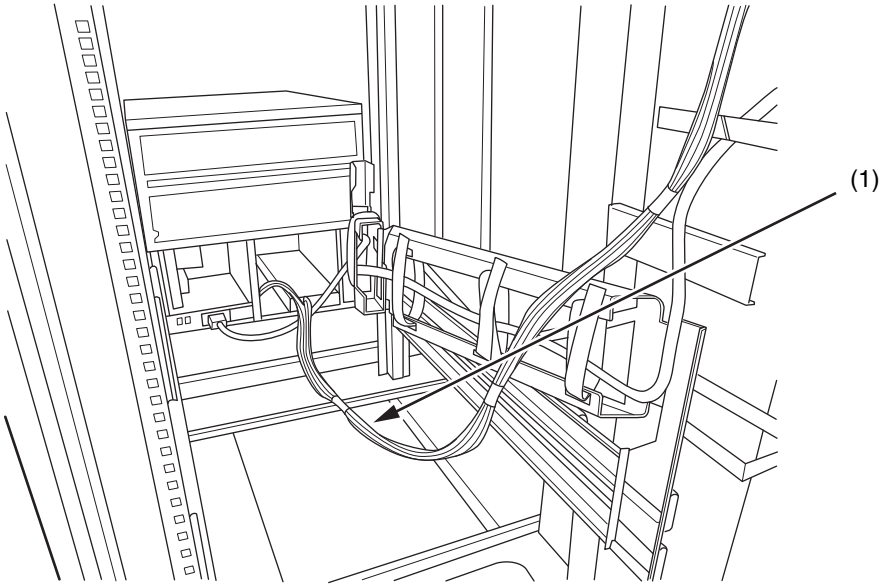


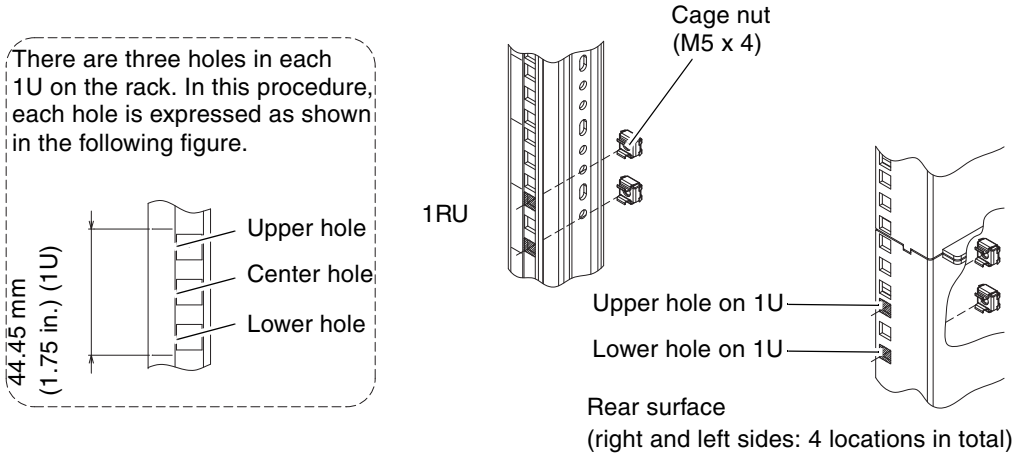
FIGURE 3-92 Drawing Out the Server



3.8 Mounting the Power Distribution Box in the Rack

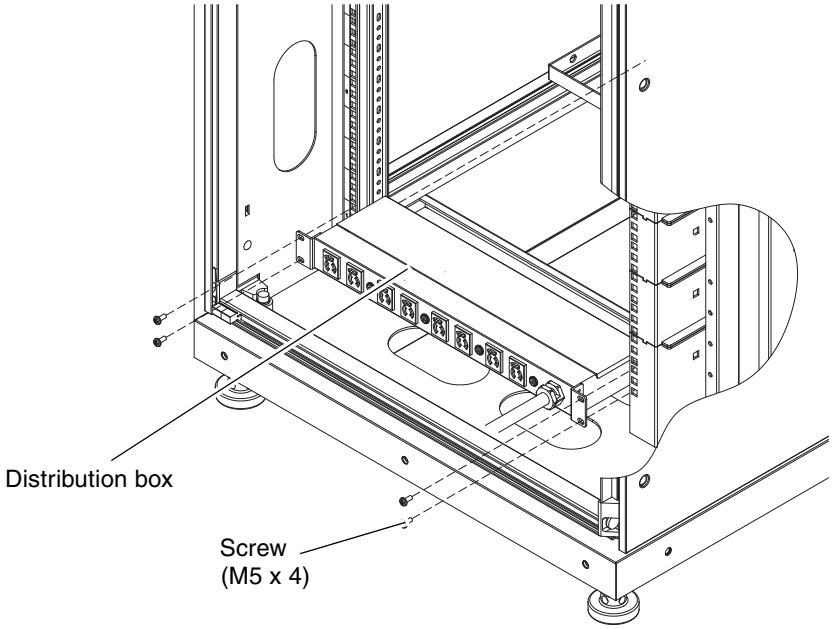
1. Attach cage nuts to the specified locations on the rack columns.

FIGURE 3-93 Attaching the Cage Nuts



2. **Insert the power distribution box through the rear of the rack, and secure it with four screws.**

FIGURE 3-94 Securing the Distribution Box



3.9 Mounting the Server in a Rack Produced by a Company Other Than Fujitsu

The M3000/M4000/M5000 servers (including peripherals) are developed and their operation is assured on the basic assumption that they are mounted in the equipment rack designed for SPARC Enterprise.

Although they can also be mounted in the equipment rack provided by other company (a rack manufactured by a company other than Fujitsu), you need to give sufficient consideration to the points such as physical specification or environmental requirements of the rack and make a judgment on whether or not the rack is appropriate to install the M3000/M4000/M5000 servers on your own responsibility. In addition, when you consider the use, be sure to satisfy the requirements described below.

3.9.1 Rack Stability Requirements

To maintain the SPARC Enterprise Servers or to add optional components to them, the servers must be drawn out on the front of the rack. An appropriate measure such as affixing the rack to the floor must be taken to prevent the rack from toppling over when the servers are drawn out.

3.9.2 Requirements Concerning Rack Depth

The servers are mounted in a rack by using the slide rails (which come with the M3000/M4000/M5000 servers). Therefore, it is necessary to satisfy the requirements stipulated below concerning (1) the rack depth measured as the length between the front and rear columns, (2) the length from the inside surface of the front rack cover to the front of the front rack columns, (3) the length from the front of the front columns to the inside surface of the rear rack cover, and (4) the length from the front of the rear columns to the inside surface of the rear rack cover.

(1) The length between the inside surfaces of the front and rear columns

M3000 server: 690 mm (27.2 in.) to 760 mm (29.9 in.)

M4000 server: 690 mm (27.2 in.) to 760 mm (29.9 in.)

M5000 server: 690 mm (27.2 in.) to 760 mm (29.9 in.)

External I/O Expansion Unit: 740 mm (29.1 in.) (fixed)

(2) Length from the inside surface of the front rack cover to the front rack columns

M3000 server: 40 mm (1.6 in.) or more

M4000 server: 40 mm (1.6 in.) or more

M5000 server: 40 mm (1.6 in.) or more

External I/O Expansion Unit: 40 mm (1.6 in.) or more

(3) Length from the front rack columns to the inside surface of the rear rack cover

M3000 server: 930 mm (36.6 in.) or more (tentative)

M4000 server: 930 mm (36.6 in.) or more (tentative)

M5000 server: 930 mm (36.6 in.) or more (tentative)

(4) Length from the rear rack columns to the inside surface of the rear rack cover

External I/O Expansion Unit: 190 mm (7.5 in.) or more

FIGURE 3-95 Requirements Concerning Rack Depth

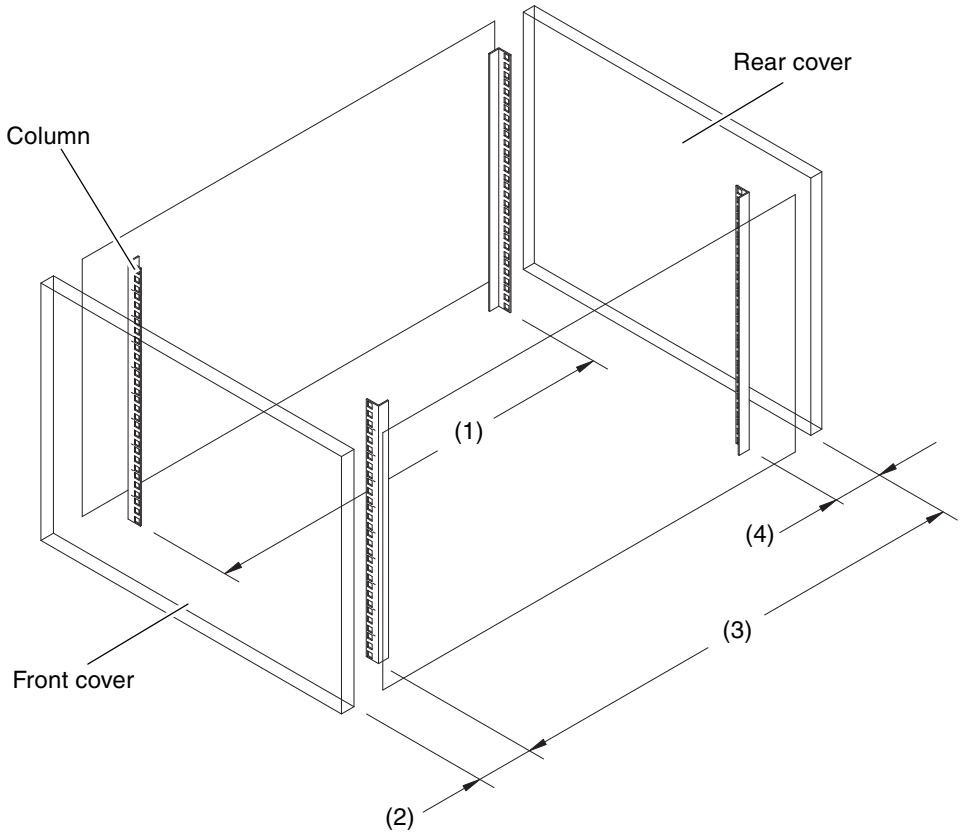


FIGURE 3-96 Detailed Figure of the Slide Rail of the M3000 Server

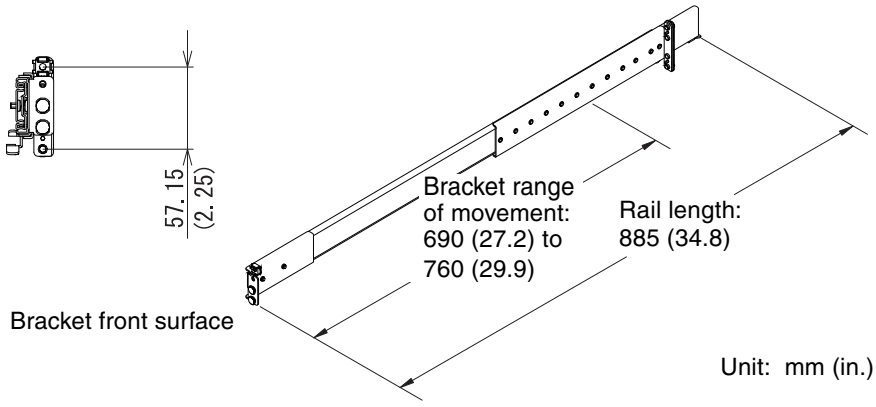


FIGURE 3-97 Detailed Figure of the Slide Rail of the M4000 Server

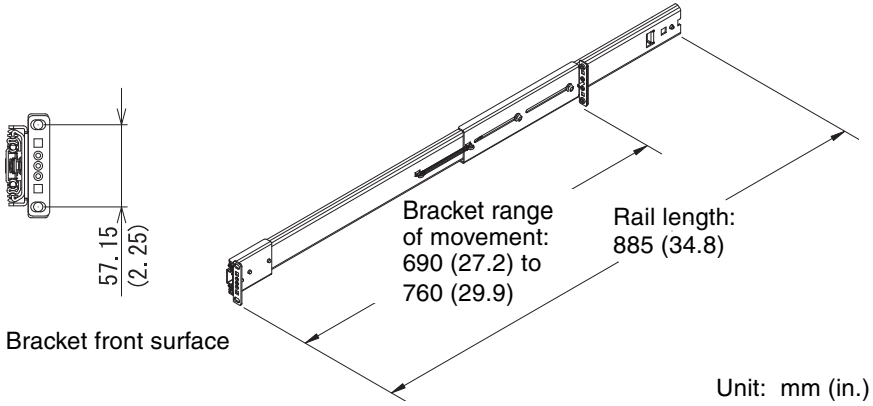


FIGURE 3-98 Detailed Figure of the Slide Rail of the M5000 Server

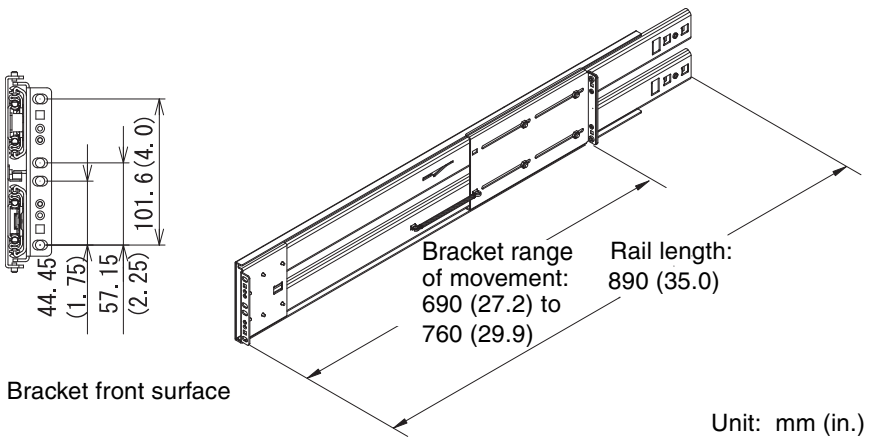
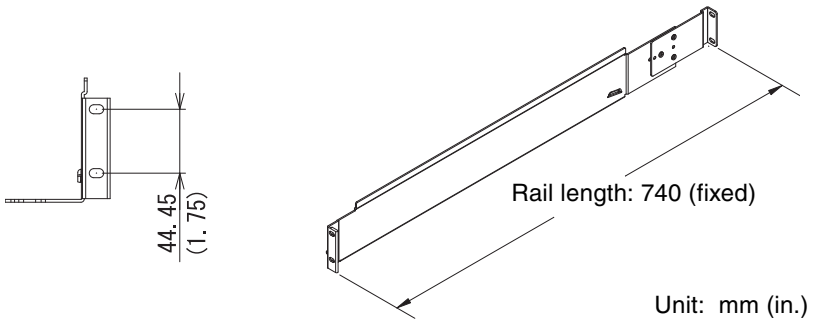


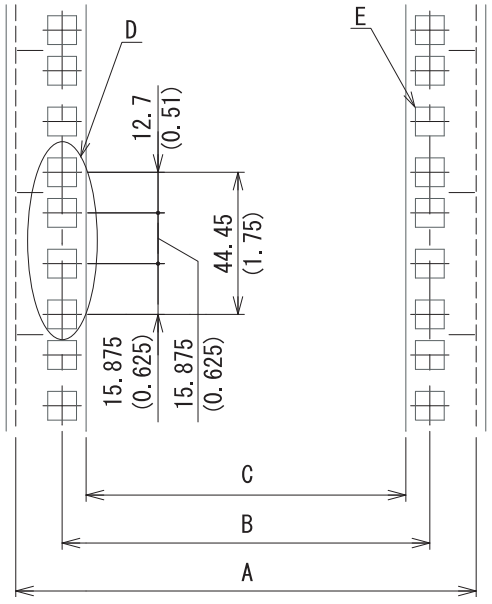
FIGURE 3-99 Detailed Figure of the External I/O Expansion Unit Rack Mounting Rail



3.9.3 Rack Column Requirements

FIGURE 3-100 shows the rack column requirements.

FIGURE 3-100 Rack Column Requirements



A: Space for affixing device front panel
483 mm (19.0 in.) or more

B: Space between right and left holes for affixing devices
465 mm (18.3 in.) or more

C: Space between right and left columns (same for front and rear columns)
450 mm (17.7 in.) or more

D: EIA Standard, universal pitch

E: Side of square hole
9 mm - 9.5 mm (0.354 in. - 0.374 in.)

Unit: mm (in.)

3.9.4 Cable Routing inside the Rack

To maintain the M3000/M4000/M5000 servers or add optional components to them, the servers must be drawn out from the front of their respective racks. The CMA may not attach to servers mounted in non-Fujitsu racks; or even if the mechanism is attached, it may not function normally. Drawing out mounted servers with cables connected to them is not supported without the CMA. In such a case, after powering off the server, disconnect the cable and then draw out the server.

3.9.5 Other Requirements

In addition to structural requirements, the following requirements must be taken into consideration:

3.9.5.1 Equipment Cooling when the Server Is Mounted in the Rack

When installing the rack, be sure that the temperature inside the rack satisfies the temperature requirements described in the installation specifications. For details, see the Installation Specifications of the relevant device. Particularly, make sure that exhaust air from servers does not enter the air intake side of any unit by taking such measure as covering the front and rear of vacant spaces inside the rack.

CHAPTER 4

Considerations Regarding Carrying-in and Installation

This chapter contains the following sections:

4.1 Load Requirements of an Elevator

When rack-mounted servers are carried in, the carry-in route must be wider than when the unmounted ordinary servers are carried in. Therefore, sometimes side panels or doors must be removed to load the rack in an elevator. When using an elevator for carrying in the rack, see the elevator load requirements shown in TABLE 4-1, and check the method for loading the rack on the elevator.

TABLE 4-1 Elevator Load Requirements

Elevator Code	Live Load [kg (lb.)]	Internal Dimensions of the Cage [mm (in.)]			Effective Door Way [mm (in.)]		Rack SE-R7RC11 / SE-R7RC21 SE-R8RC11 / SE-R8RC21 19R-164A1 / 19R-164A2 19R-164B1 / C19R-164B2 19R-162A1 / 19R-162A2 19R-162B1 / 19R-162B2 19R-174A1 / 19R-174B1 19R-174A2 / 19R-174B2
		Width	Depth	Height	Width	Height	
P-6-C0	400	1150	900	2300	800	2100	Not loadable
P-9-C0	600	1400	1100	2300	800	2100	Not loadable
P-11-C0	750	1400	1350	2300	800	2100	Loadable
P-13-C0	900	1600	1350	2300	900	2100	Loadable

TABLE 4-1 Elevator Load Requirements *(Continued)*

Elevator Code	Live Load [kg (lb.)]	Internal Dimensions of the Cage [mm (in.)] Width	Depth	Height	Effective Door Way [mm (in.)] Width	Height	Rack SE-R7RC11 / SE-R7RC21 SE-R8RC11 / SE-R8RC21 19R-164A1 / 19R-164A2 19R-164B1 / C19R-164B2 19R-162A1 / 19R-162A2 19R-162B1 / 19R-162B2 19R-174A1 / 19R-174B1 19R-174A2 / 19R-174B2
P-15-C0	1000	1600 1800	1500 1300	2300	900 1000	2100	Loadable
P-17-C0	1150	1800 2000	1500 1350	2300	1000 1100	2100	Loadable
P-20-C0	1350	1800 2000	1700 1500	2300	1000 1100	2100	Loadable
P-24-C0	1600	2000 2150	1750 1600	2300	1100	2100	Loadable

4.2 Earthquake Preparedness Measures

Earthquake preparedness measures for racks are intended to prevent racks from falling over and being damaged, to ensure the safety of operators, and to enable the quick recovery of systems when earthquakes occur. Fujitsu offers the following earthquake preparedness construction techniques to prevent damage to computer systems resulting from an earthquake:

- Fixing method: Method for preventing the equipment from falling over by fixing the equipment in position

Whether the method above must be used is determined depending on the following factors:

- The degree of floor vibration at the installation site
- Whether a free access floor is used
- Equipment structure

When selecting an earthquake preparedness method and undertaking construction, consult with the construction department of Fujitsu.