Hardware Maintenance Manual

IBM PC Server/Enterprise Racks

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Note:

Before using this information and the product it supports, be sure to read the general information under “Notices” on page 195.

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About this supplement

This supplement contains diagnostic and service information for the IBM PC Server Rack Enclosure and the IBM Rack enclosures:

IBM PC Server Rack Enclosure models:

- Type 9306 19-inch and 24-inch Models:
  - 4QS, 4QX, 9QS
  - 9QX, 9TS, 9TX
- IBM Rack enclosure models:
  - Type 9306 Models 200, 900
  - Type 9308 Models 42P, 42X, 42S, 42E, 4SA, 4SB (NetBAY42 Enterprise)
- IBM NetBAY3 enclosure
- IBM NetBAY3E enclosure

This supplement should be used with the related service information in the IBM PC Servers Hardware Maintenance Manual (part number 70H0751, form number S30H-2501-01).

Important: This manual is intended for trained servicers who are familiar with IBM PC Server and IBM Server products.

Before servicing an IBM product, be sure to review “Safety information” on page 183.

Related publications

The following publications are available for IBM products. For more information, contact IBM or an IBM Authorized Dealer.

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For information about	See publication
PC Servers	IBM PC Servers Hardware Maintenance Manual (S30H-2501)
PS/2 Computers	IBM Personal System/2 Hardware Maintenance Manual (S52G-9971)
PS/ValuePoint Computers	IBM PS/ValuePoint Hardware Maintenance Service and Reference (S61G-1423)
Laptop, Notebook, Portable, and ThinkPad Computers (L40, CL57, N45, N51, P70/P75, ThinkPad 300, 350, 500, 510, 710T, Expansion Unit, Dock I, Dock II)	IBM Mobile Systems Hardware Maintenance Manual Volume 1 (S82G-1501)
ThinkPad Computers (ThinkPad 340, 355, 360, 370, 700, 701, 720, 750, 755)	IBM Mobile Systems Hardware Maintenance Manual Volume 2 (S82G-1502)
ThinkPad Computers (ThinkPad 365, 760)	IBM Mobile Systems Hardware Maintenance Manual Volume 3 (S82G-1503)
Monitors (Displays) (February 1993)	IBM PS/2 Display HMM Volume 1 (SA38-0053)
Monitors (December 1993)	IBM Color Monitor HMM Volume 2 (S71G-4197)
IBM Monitors (P Series) (February 1996)	IBM Monitor HMM Volume 3 (S52H-3679)
IBM 2248 Monitor (February 1996)	IBM Monitor HMM Volume 4 (S52H-3739)
Disk Array technology overview and using the IBM RAID Configuration Program	Configuring Your Disk Array booklet (S82G-1506)
Installation Planning for Personal System/2 computers	Personal System/2 Installation Planning and Beyond (G41G-2927)
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IBM PC Server/Enterprise rack enclosures

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General checkout

Use the following procedure for diagnosing keyboard, mouse, and video problems for the IBM PC Server Rack Enclosure and the IBM Rack enclosures (Type 9306 and Type 9308).

For power problems, see “Power checkout” on page 2.

Attention:

- For Models 4QS, 4QX, 9QS, 9QX, 9TS, 9TX only:

  Ensure that the voltage selector switch on each server installed in the server rack is set to 230 V ac.

- For Models 200, 900 only:

  Ensure that the voltage selector switch on each server installed in the server rack is set to the proper voltage as supplied by the Power Distribution Unit, PDU.

1. Check the following:
   - Ensure the external power cord is in good condition and properly connected to a known-good power source.
   - Ensure the internal power cables are in good condition and properly connected. (The internal power cables connect between the power distribution unit and the servers installed in the server rack.)
   - Ensure the following devices are powered on.
     a. Power distribution unit
     b. Server selector unit
     c. All system units
     d. Display
2. If the items/conditions specified in step 1. are not okay, correct the problem and verify that the server rack is operating correctly.
3. If the items/conditions specified in step 1. are okay, then, using the server selector keypad buttons, check the operation of the failing device for all of the servers that are installed in the rack.
4. Did the failure occur on more than one server?
   - **NO:** Go to the Hardware Maintenance manual for the server that was selected when the failure occurred. Disconnect the keyboard and mouse from the server selector unit and connect them directly to the failing server. Then, run the server diagnostic programs on the failing server.

     If the problem still remains, disconnect the keyboard and mouse from the failing server and reconnect them to the server selector unit. Then, replace the server rack components in the following order until the problem goes away.

     a. Device cable (connects between the server selector unit and the server that was selected when the failure occurred).

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b. Server selector cable (connects between the server selector keypad and the server selector unit).

c. Server selector keypad.

d. Server selector unit.

- **YES:** Power-off the server rack and replace the server rack components in the following order until the problem goes away. See "Powering off the rack" on page 3.

  a. Device extender cable (connects between the device and the server selector unit)

  b. Failing device

  c. Server selector cable (connects between the server selector keypad and the server selector unit)

  d. Server selector keypad

  e. Server selector unit

Power checkout

Use the following procedure for diagnosing power problems for the IBM PC Server Rack Enclosure and IBM Rack enclosure (Type 9306).

Attention:

- For Models 4QS, 4QX, 9QS, 9QX, 9TS, 9TX only:

  Ensure that the voltage selector switch on each server installed in the server rack is set to 230 V ac.

- For Models 200, 900 only:

  Ensure that the voltage selector switch on each server installed in the server rack is set to the proper voltage as supplied by the Power Distribution Unit, PDU.

1. Check the following:
   - Ensure the external power cord is in good condition and properly connected to a known-good power source.
   - Ensure the internal power cables are in good condition and properly connected. (The internal power cables connect between the power distribution unit and the servers installed in the server rack.)
   - Ensure the following devices are powered on.

     a. Power distribution unit

     b. Server selector unit

     c. All system units

     d. Display
2. If the items / conditions in step 1. are not okay, correct the problem and verify correct operation of the server rack.
3. If the items / conditions specified in step 1. are okay, then, using the server selector keypad buttons, check for correct operation of all the servers installed in the rack.
4. Did the failure occur on more than one server?
   - No: Go to the Hardware Maintenance manual for the server that was selected when the failure occurred and run the server diagnostic programs. If the problem still remains, replace the power distribution unit.

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- Yes: Power-off the server rack and replace the server rack components in the following order until the problem goes away. See “Powering off the rack” on page 3.
  a. Power distribution unit fuse.
  b. Power distribution unit.

Powering off the rack

Before performing service on the rack, follow this procedure to prevent personal injury and to avoid damaging the rack and the installed servers.

To power-off the IBM PC Server Rack:

1. Shut down and power-off all installed servers.
2. Power-off the server selector unit.
3. If a UPS system is installed in the rack, power-off the UPS system.
4. Disconnect power from the IBM PC Server Rack.
   - If the rack is plugged into a wall-mounted power supply, disconnect the power cord plug from the wall socket.
   - If the power cord is wired directly into the installed location's power supply, open the rear door of the rack cabinet and disconnect the power plug from the base of the power distribution unit.

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Features

The 9306 IBM PC Server Rack Enclosure, models 4QS, 9QS, 9TS come in three primary models.

- 19-inch Quad Primary Server Rack, Model 9QS
- 19-inch Tri Primary Server Rack, Model 9TS
- 24-inch Quad Primary Server Rack, Model 4QS

A Quad Primary Server Rack can house up to four IBM PC Servers. The Tri Primary Server Rack can house up to three IBM PC Servers.

Both Quad and Tri Primary Server Racks provide a built in server selector which connects to one set of console devices (monitor, keyboard, and mouse.) The server selector works independently from the server's operating systems, enabling the connected servers to run different operating systems.

These IBM 9306 PC Server Rack Enclosure models are shipped preassembled and pre-cabled.

IBM PC Server expansion rack models

Three optional IBM PC Server Rack Expansion models are available to expand the capacity of the IBM PC Server Rack Primary Enclosure. The optional IBM PC Server Rack Expansion models are:

- 19-inch Quad Expansion Rack, Model 9QX
- 19-inch Tri Expansion Rack, Model 9TX
- 24-inch Quad Expansion Rack, Model 4QX

The IBM PC Server Rack Expansion models allow the installation of up to four more servers using the Primary IBM PC Server Rack monitor, keyboard, and mouse.

Locations

The following sections contain information on specific equipment locations.

Note: For instructions on how to power-off the rack, see “Powering off the rack” on page 3.

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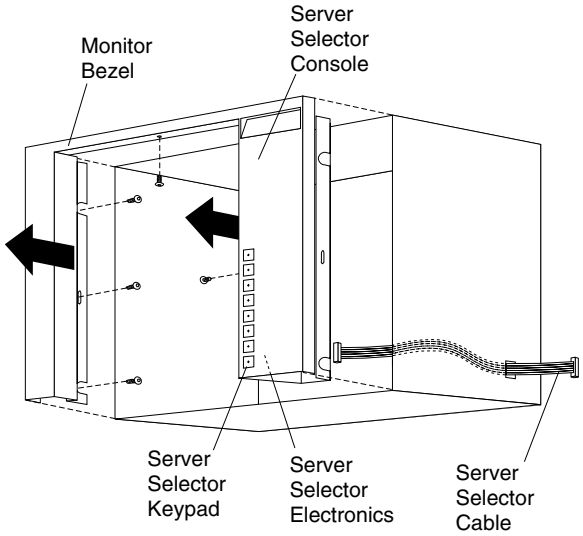
Server selector console

To remove the Server Selector Console:

1. Power-off the rack.
2. Use an 1/8-inch allen wrench to remove screws.
3. Disconnect the server selector cable from the back of the server selector console.
4. Remove the server selector console from the cabinet.



Server selector unit

The server selector unit is located in the upper rear of the rack cabinet. The server selector unit can only be accessed or removed from the rear of the IBM Rack cabinet.

CAUTION:
The server selector unit is heavy. You will need two people to safely remove the server selector unit. See "Safety notice (multi-lingual translations)" on page 191.

To remove the server selector unit:

1. Power-off the rack.
2. Unplug the keyboard, mouse, video cables, and the power cord.
3. Remove the server selector console.
4. With one person bracing the server selector unit from below, have the second person use a 5/16-inch wrench to remove the four nuts that secure the server selector unit to the rack cabinet.
5. Remove the server selector unit from the cabinet.

Note: When replacing the server selector unit, be sure that the Server Selector cable is fed through the indentation along the left side of the server selector unit.

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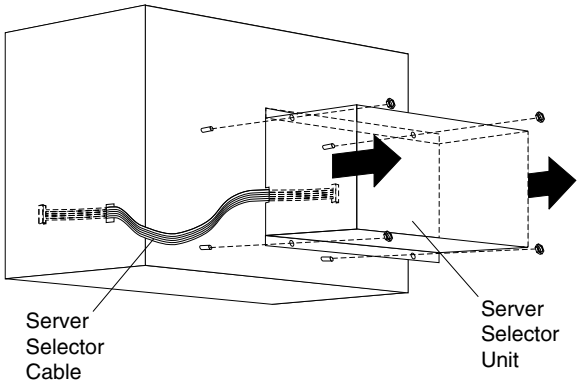
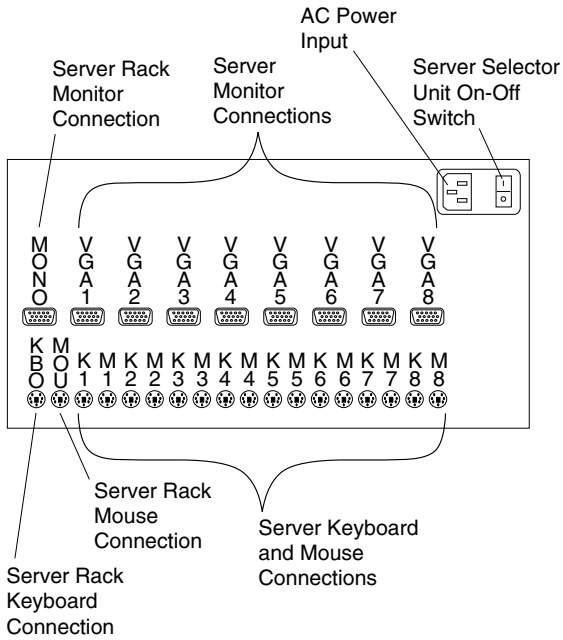


Connections



Power distribution unit

Note: For information and installation instructions for the IBM NetBAY Rack Power Distribution Units, see “NetBAY Power Distribution Units” on page 141".

Note: To remove the power distribution unit, you might need to remove the right side cabinet panel, the server installed in sliding tray 2 (in the primary IBM PC Server Rack), or sliding tray 5 (in the IBM PC Server Expansion Rack).

To remove the power distribution unit:

1. Power-off the rack.
2. Disconnect all power plugs from the power distribution unit.
3. Using a Phillips screwdriver, remove the four screws from the front of the power distribution unit.

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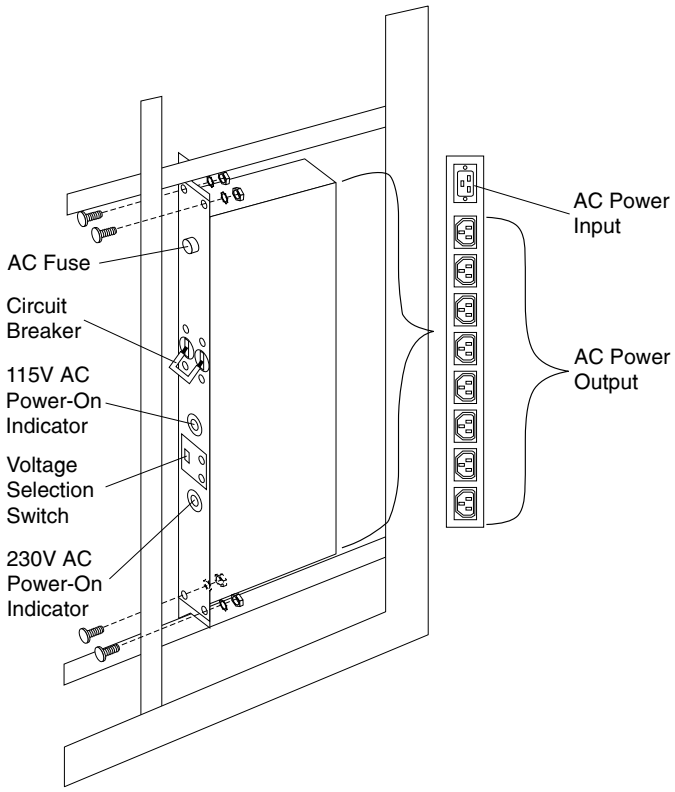
Note: These screws are held in place by nuts and washers. Hold the nut while you are unscrewing the screw to prevent the nut and washer from falling into the bottom of the cabinet.

4. Remove the power distribution unit from the cabinet.



Cooling fan

To remove the cooling fan:

1. Power-off the rack.
2. Open the rear door of the rack cabinet.
3. Disconnect the power plug from the rear of the cooling fan.
4. Use a 5/16-inch wrench to remove the eight nuts that secure the cooling fan to the top of the rack cabinet.
5. Remove the cooling fan from the cabinet.

Note: When installing the fan, make sure that the green and yellow ground wire is attached to one of the top fan mounting screws and that the strain-relieving clamp is attached to another. The power cable should be secured by the strain-relieving clamp.

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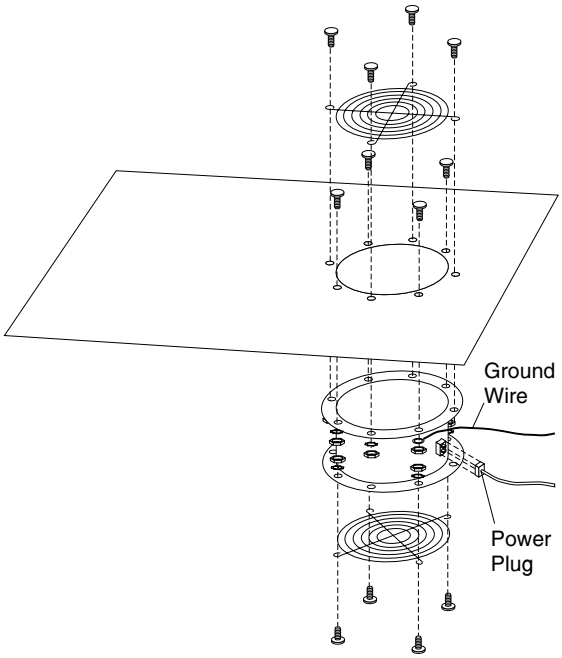

Sliding trays

Models 4QS and 4QX come with either single latch slide rails or dual latch slide rails. Single latch slide rails have a front latch release on the right rail only. Dual latch slide rails have a front latch release on both rails. The slide rail FRU number for the 24-inch rack replaces the single latch slide rail with the dual latch slide rail.

Note: If a server is installed on a tray being removed, first remove the server.

Single latch rail tray

To remove a sliding tray with single latch rails:

1. Power-off the rack.
2. Open the rear door of the rack cabinet and remove the pin 1 that secures the sliding tray to the cable management arm
3. Loosen the thumbscrews 2 on the sliding tray and fully extend the sliding tray.
4. Use a 3/32-inch allen wrench to remove the five screws 3 from the left side of the sliding tray.
5. Lift the rear locking tab 4 and push the sliding tray approximately two inches into the cabinet.
6. Release the forward locking tab 5. Then, while holding the sliding tray in place, use your other hand to grasp the outside sliding rail 6 and push it into the rack cabinet until it disconnects from the sliding tray.

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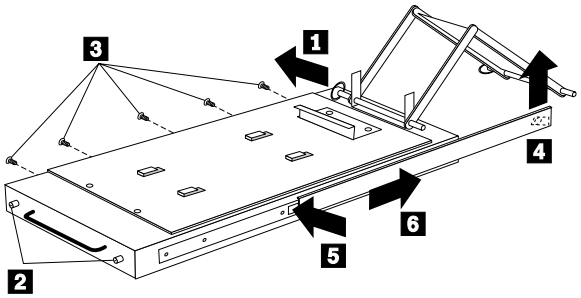
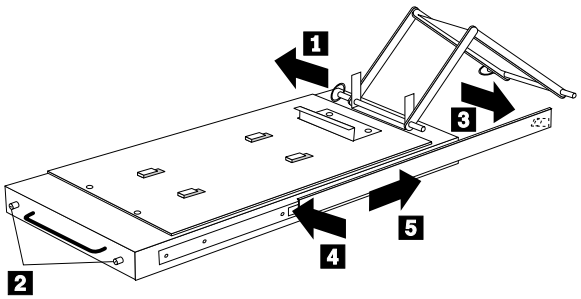


Dual latch rail tray

To remove a sliding tray with dual latch rails:

1. Power-off the rack.
2. Open the rear door of the rack cabinet and remove the pin 1 that secures the sliding tray to the cable management arm.
3. Loosen the thumbscrews 2 on the sliding tray and fully extend the sliding tray.
4. Push in on the spring of the right rear locking tab 3 and push the sliding tray approximately two inches into the cabinet.
5. Release both left and right forward locking tabs 4. Then, while holding the sliding tray in place, push both left and right outside sliding rails 5 into the rack cabinet until it disconnects from the sliding tray.

Note: Left side view for 4 and 5 are not shown.



Sliding rails

This procedure is for single latch sliding rails and dual latch sliding rails.

For single latch sliding rails, the right rail is the one that has the front latch. The left rail does not have a front latch.

For dual latch sliding rails, the right rail is the one that has the rear latch. The left rail does not have a rear latch.

To remove the sliding rails:

1. Power-off the rack.
2. Remove the sliding tray that is attached to the sliding rails that you want to remove. See “Sliding trays” on page 9.
3. Use a 3/32-inch allen wrench to remove the four screws that secure each of the sliding rails to the rack cabinet.

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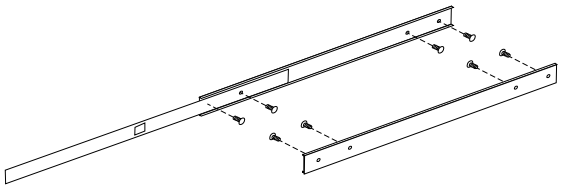
Note: You will need to adjust the position of the sliding rail in order to line up the access holes over the locations of the screws.



Keyboard tray

To remove the keyboard tray:

1. Power-off the rack.
2. Disconnect the keyboard and mouse cables from the keyboard and mouse extension cables.
3. Remove the keyboard and mouse from the keyboard tray.
4. Pull the keyboard tray straight out of the rack cabinet.

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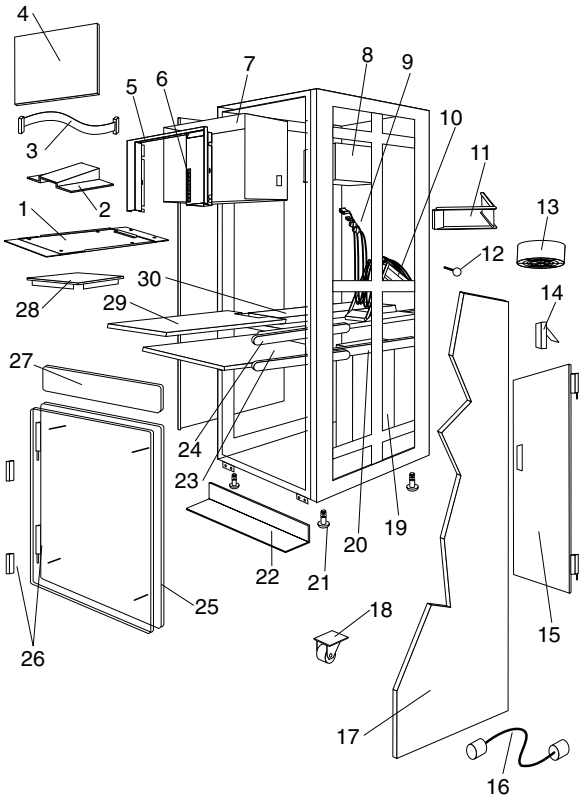
Parts listing (Type 9306 – 19-inch) Models 9QS, 9TS and 9QX, 9TX

This parts listing is for Models 9QS, 9TS and 9QX, 9TX



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4	Blank Bezel (9QX, 9TX Expansion units only)	76H0379
5	Monitor Bezel with button label	76H0378
6	Server Selector Keypad	07H0097
7	Monitor Housing (19-inch)	76H0377
8	Server Selector Unit Electronics See “Safety inspection guide” on page 192.	07H0034
9	Internal Cables See Cable Kit Shelf Server	06P6007
10	Cable Management Arm	76H0386
11	Cable Management Arm Single Server Tray	76H0387
12	Pin, Cable Management Arm	07H0089
13	Fan 220 V ac with Power Cord	07H0063
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19	NetBAY Rack Power Distribution Unit	09N9668
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	Rack Mouse Cable (connects from Keyboard Drawer to Server Selector Unit)	07H0069

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Rack Enclosure Kits (Type 9306)	FRU
Bolt-Together Kit (19-Inch to 24-Inch, 24-Inch to 19-Inch) • 19-Inch Attachment Bracket (2 each) • Screw 1/4-20 x 1/2 Button Head Socket Cap Allen (8 each) • Screw 1/4-20 x 1-1/4 Socket Cap (4 each) • Flanged Nut 1/4-20 (12 each) • 24-Inch Attachment Bracket (4 each)	76G3627
Cable Kit Shelf Server (12- foot cables) • Monitor Cable • Keyboard Cable • Mouse Cable • Internal Power Cable	06P6007
Cable Kit Top Shelf Server (7-foot cables) • Monitor Cable • Keyboard Cable • Mouse Cable • Internal Power Cable	06P6006

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Rack Enclosure Kits (Type 9306)	FRU
Miscellaneous Parts Kit	07H0057

- Rack Nut / Holder 10-32 (8 each)
- Keeper Nut 8-32 Zinc (8 each)
- Keeper Nut 10-32 (6 each)
- Screw 6-32 x 5 / 16 (2 each)
- Screw 6-32 x 1 / 4 Button Head Socket Cap Allen (8 each)
- Screw 10-32 x 3 / 8 Button Head Socket Cap (8 each)
- Screw 6-32 x 3 / 8 Button Head Socket Cap (2 each)
- Screw 1 / 4-20 x 1 / 2 Button Head Socket Cap (2 each)
- Screw 8-32 x 1 / 4 Button Head Socket Cap Allen (4 each)
- Screw 10-32 x 1 / 4 Button Head Socket Cap (2 each)
- Screw 8-32 x 1 / 4 Button Head Socket Cap (8 each)
- Pull-ring, 3-Inch (2 each)
- Shoulder Screw 8-32 x 3 / 8 (2 each)
- Standoff,.25 Hex, 6-32 FF,.5-Inch (2 each)
- Screw 8-32 x 3 / 8 Button Head Socket cap (2 each)
- Screw 10-24 x 1 / 4 Button Head Socket Allen (2 each)
- Screw 10-24 x 5 / 16 Button head Socket Allen (2 each)
- Keeper Nut 8-32 (2 each)
- Nut 8-32 (2 each)
- Captive Weld Nut (2 each)
- Whiz-Lock Flange Nut 1 / 4-20 (2 each)
- Keeper Nut 10-32 (2 each)
- Bumpers (2 each)
- Cable Ties (8 each)

Server Tray Interlock Kit	07H0091

- Cam (1 each)
- Spring (1 each)

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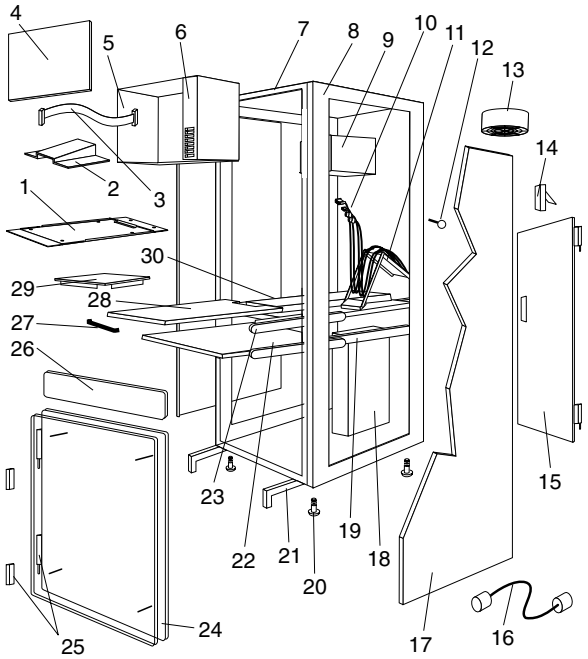
Parts listing (Type 9306 – 24-inch) Models 4QS, 4QX

This parts listing is for Models 4QS and 4QX.



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Index	24-Inch Rack Enclosure (Type 9306)	FRU
1	Adapter Plate Options:	
	PS/2 Server 85/95	76H3733
	Model 300	76H3734
	Model 500, 700	76H3735
2	Monitor Stand	07H0061
3	Server Selector Cable	07H0036
4	Blank Bezel (4QX Only)	07H0066
5	Monitor Housing (24-Inch)	07H0065
6	Server Selector Keypad	07H0097
7	Rack Frame	N/A
8	Spacer (see Spacer Kit, right side at end of this FRU list)	07H0059
9	Server Selector Unit Electronics See "Safety Notice (Multi-lingual Translations) See “Safety notice (multi-lingual translations)” on page 191.	07H0034
10	Internal Cables (see Cable Kit Top Shelf Server and Cable Kit Bottom Shelf Server)	
11	Cable Management Arm	07H0087
12	Pin, Cable Management Arm	07H0089
13	Fan 220 V ac with Power Cord	07H0063
14	Rear Door Latch/Lock with Key and Bracket	07H0055
15	Rear Door (24-Inch)	07H0047
16	External Power Cord:	
	Australia	14F1559
	Europe	14F1554
	Israel	14F1561
	Italy	14F1560
	New Zealand	14F1558
	South America, India	14F1557
	U.K./Denmark	14F1555
	USA	14F1553
	External Power Cord Option - 6 Ft.	07H0094
17	Left/Right Side Panel	07H0049
18	NetBAY Rack Power Distribution Unit	09N9668
18	NetBAY Front-end Power Distribution Unit	09N9670
18	NetBAY Server Dual-cord Power Distribution Unit	09N9669
	Hardware Kit for NetBAY Power Distribution Units	09N9671
18	Power Distribution Unit	07H0424
	250 V Slow Blow Fuse	0303549
19	Keyboard Slides, 24-Inch (one pair)	07H0038

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Index	24-Inch Rack Enclosure (Type 9306)	FRU
20	Leveling Feet (Qty. 4)	07H0053
21	Stabilizing Leg	07H0051
22	Keyboard Drawer, 24-Inch (with Slides and Brackets)	07H0077
23	Slide Rails, Server Tray (one pair)	07H0083
24	24-Inch Front Compartment Door (24-Inch by 26-Inch)	07H0058
25	Door Hinge Set	07H0045
26	Door Valance (4QX Only)	07H0068
27	Handle, Server / Keyboard Tray	07H0085
28	Server Tray	07H0081
29	Mouse Table	07H0079
30	Shelf, Server Tray, 24-Inch	07H0093
	Cable, SVGA-Video (15 Feet)	76H3736
	Monitor Power Cable (connects from monitor to Power Distribution Unit)	07H0075
	Rack Keyboard Cable (connects from Keyboard Drawer to Server Selector Unit)	07H0067
	Rack Mouse Cable (connects from Keyboard Drawer to Server Selector Unit)	07H0069

Rack Enclosure Kits 24-inch (Type 9306)	FRU
Bolt-Together Kit (19-Inch to 24-Inch, 24-Inch to 19-Inch) – includes: 19-Inch Attachment Bracket (2 each); Screw 1 / 4-20 x 1 / 2 Button Head Socket Cap; Allen (8 each); Screw 1 / 4-20 x 1-1 / 4 Socket Cap (4 each); Flanged Nut 1 / 4-20 (12 each); 24-Inch Attachment Bracket (4 each)	76G3627
Cable Kit Shelf Server (12 foot cables) – includes: Monitor Cable; Keyboard Cable; Mouse Cable; Internal Power Cable	07H0073
Cable Kit Top Shelf Server (7 foot cables) – includes: Monitor Cable; Keyboard Cable; Mouse Cable; Internal Power Cable	07H0071
Miscellaneous Parts Kit – includes: Rack Nut / Holder 10-32 (8 each); Keeper Nut 8-32 Zinc (8 each); Keeper Nut 10-32 (6 each); Screw 6-32 x 5 / 16 (2 each); Screw 6-32 x 1 / 4 Button Head Socket Cap; Allen (8 each); Screw 10-32 x 3 / 8 Button Head Socket Cap; (8 each); Screw 6-32 x 3 / 8 Button Head Socket Cap; (2 each); Screw 1 / 4-20 x 1 / 2 Button Head Socket Cap; (2 each); Screw 8-32 x 1 / 4 Button Head Socket Cap; Allen (4 each); Screw 10-32 x 1 / 4 Button Head Socket Cap; (2 each); Screw 8-32 x 1 / 4 Button Head Socket Cap; (8 each); Pull-ring, 3-Inch (2 each); Shoulder Screw 8-32 x 3 / 8 (2 each); Standoff, .25 Hex, 6-32 FF, .5-Inch (2 each); Screw 8-32 x 3 / 8 Button Head Socket cap; (2 each); Screw 10-24 x 1 / 4 Button Head Socket Allen; (2 each); Screw 10-24 x 5 / 16 Button head Socket Allen; (2 each); Keeper Nut 8-32 (2 each); Nut 8-32 (2 each); Captive Weld Nut (2 each); Whiz-Lock Flange Nut 1 / 4-20 (2 each); Keeper Nut 10-32 (2 each); Bumpers (2 each); Cable Ties (8 each)	07H0057
Server Tray Interlock Kit – includes: Cam (1 each); Spring (1 each)	07H0091
Spacer Kit, Right Side – includes: Rack Joiner (8 each); Spacer, Top and Bottom, 34-Inch (1 each); Spacer, Body 70-Inch (2 each); Screw 10-32 x 3 / 8 Button Head Socket cap; (8 each); Screw 1 / 4-20 x 1 / 2 Button Head Socket cap; (8 each); Whiz-Lock Flange Nut 1 / 4-20 (8 each); Screw 6-32 x 3 / 8 Button Head Socket Cap; (6 each)	07H0059

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Type 9306 Model 200

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Features

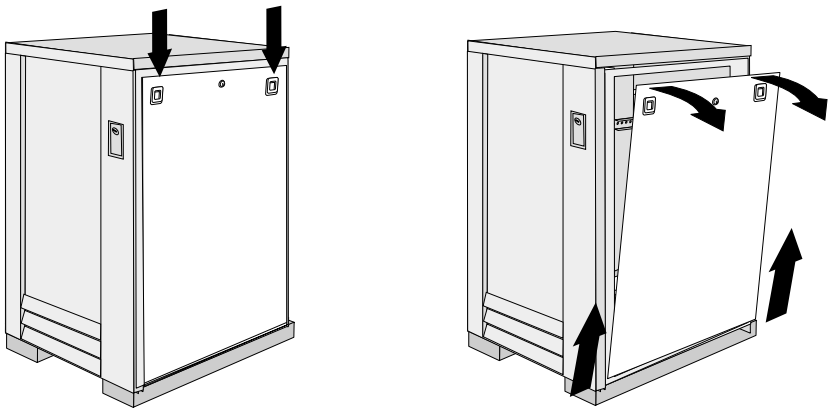
The IBM NetBAY22, Type 9306, Model 200 Rack enclosure is a 22-U high (38.5-inch) industry-standard, 19-inch rack that houses and controls multiple IBM PC Servers/IBM Servers and related equipment.

Locations

The following sections contain information on specific equipment locations.

Note: For instructions on how to power-off the rack, see "Powering off the rack" on page 3.

Side panel



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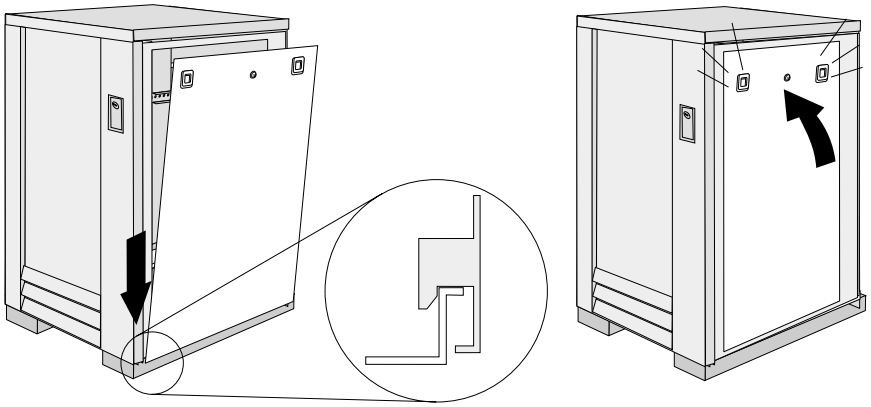

Selector switch locations

Note: For information about the IBM NetBAY Console Switch, see "IBM NetBAY console switch" on page 129.

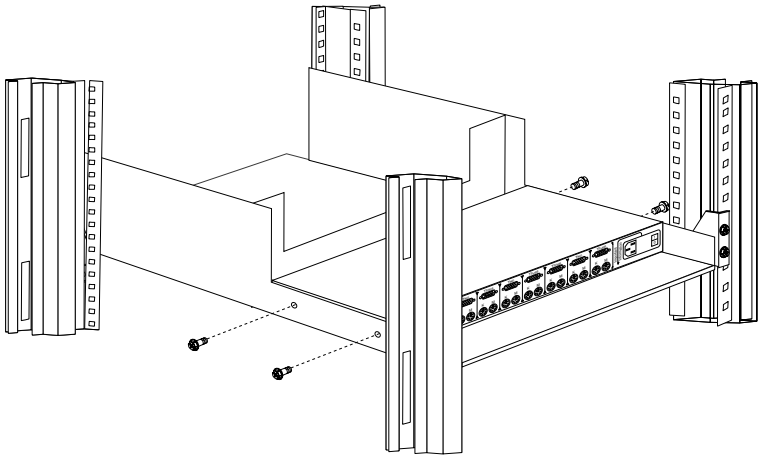

Figure 1. Selector switch in monitor compartment

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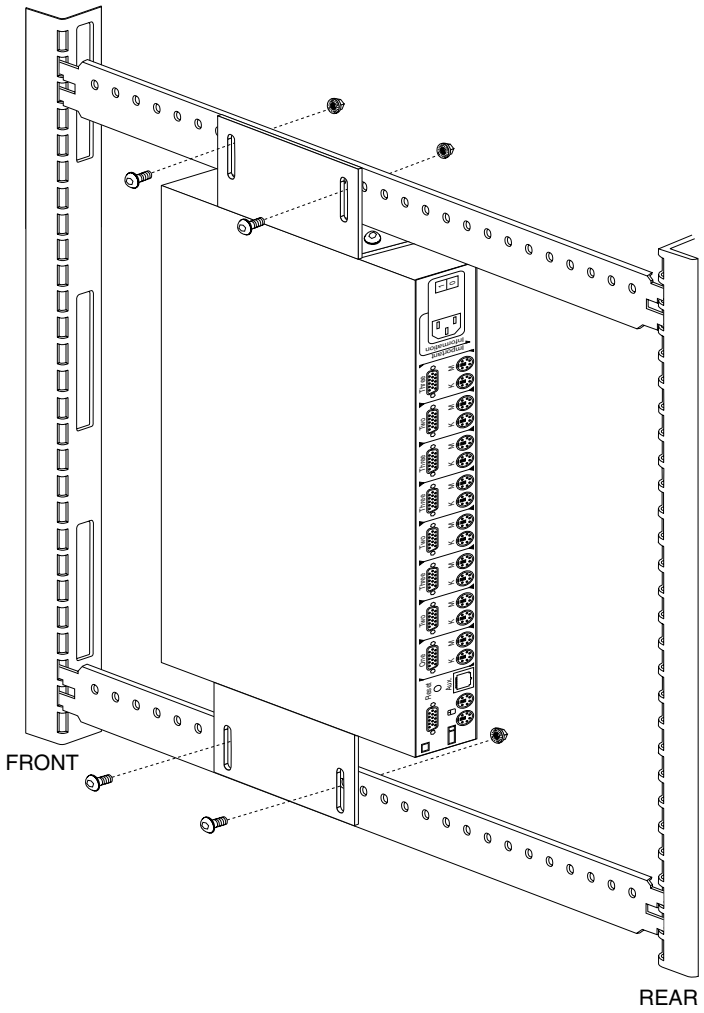

Figure 2. Selector switch between side panels

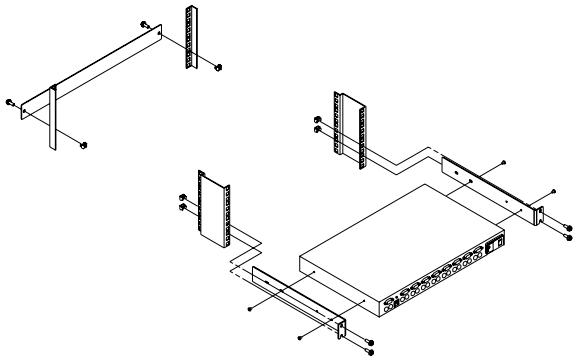

Figure 3. Selector switch rear of rack with blank panel front of rack

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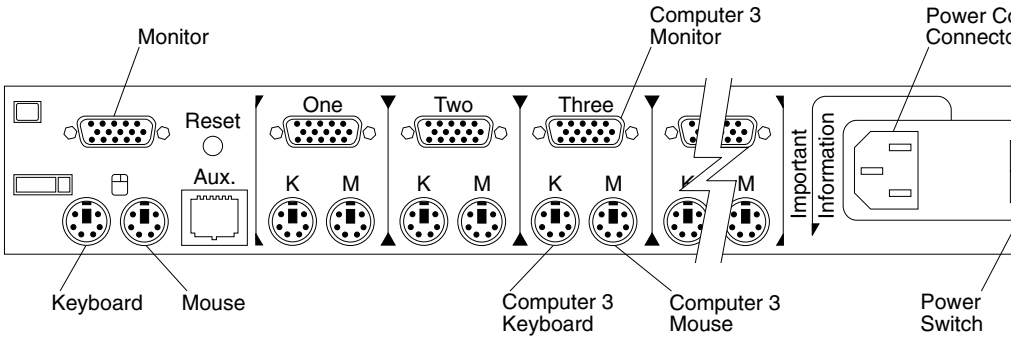
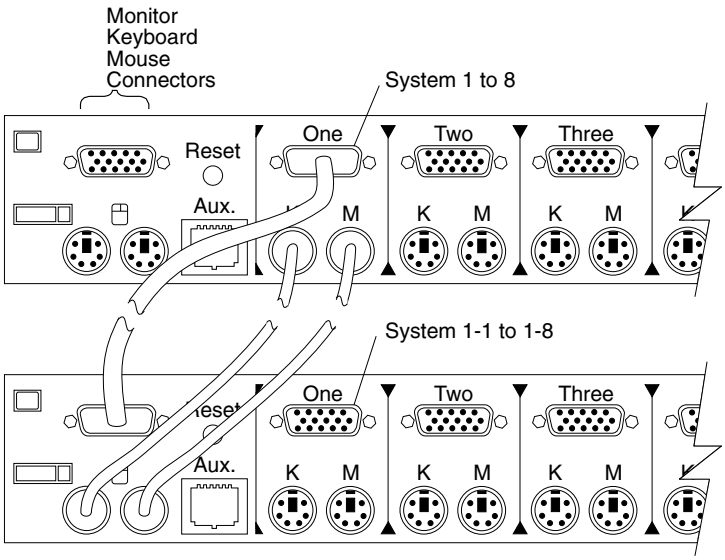
Selector switch cable connections



Tiered switch configuration



One eight-port primary selector switch can accommodate up to eight secondary selector switches which can then support up to 64 servers.

Note:

There are two types of selector switches available:

- 4 port
- 8 port

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Selector switch environment

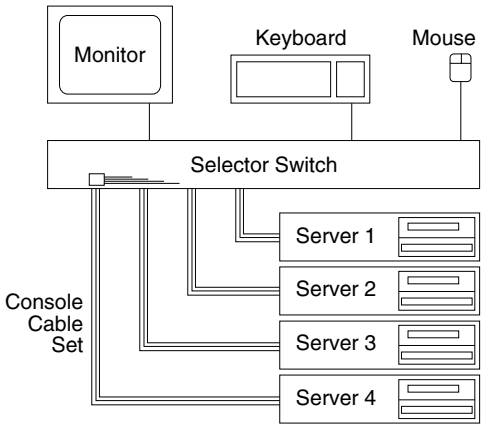

Figure 4. Single selector switch

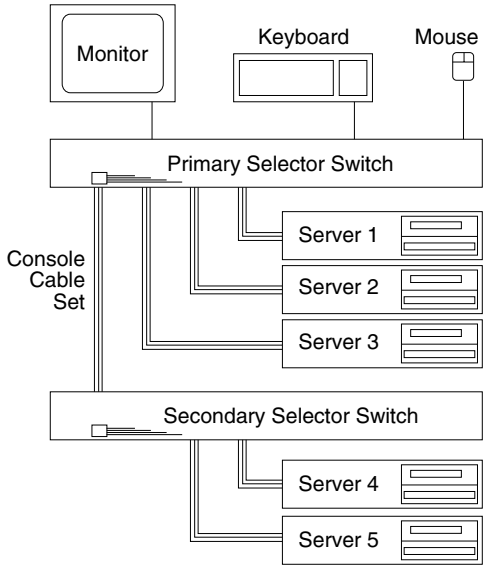

Figure 5. Multiple selector switch

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Power Distribution Unit

Note: For information and installation instructions for the IBM NetBAY Rack Power Distribution Units, see "NetBAY Power Distribution Units" on page 141.

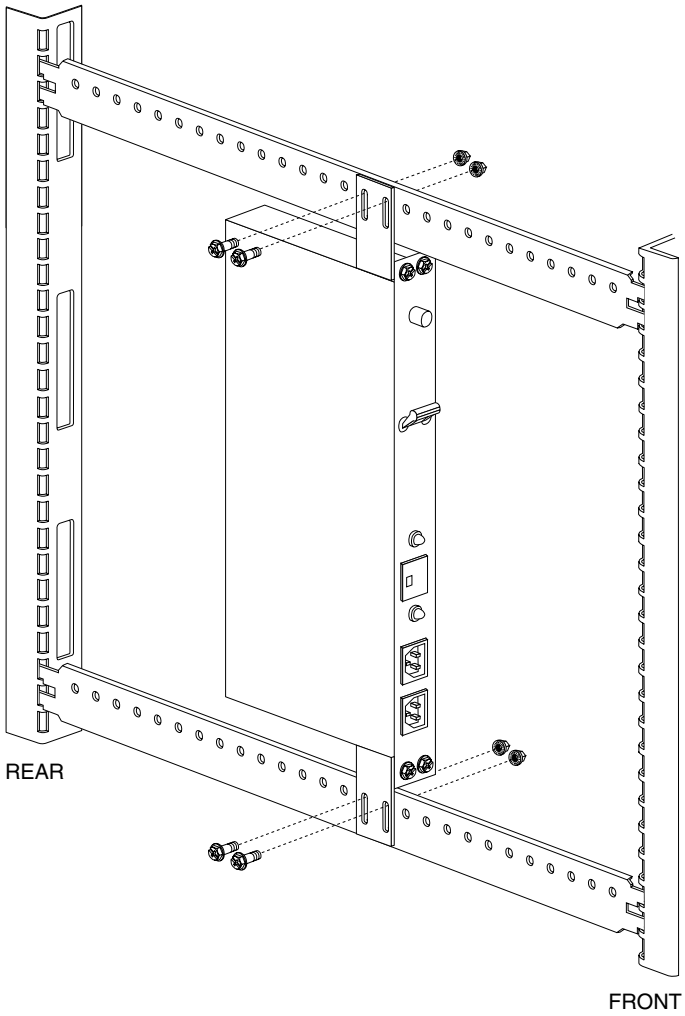

Figure 6. Power Distribution vertical installation

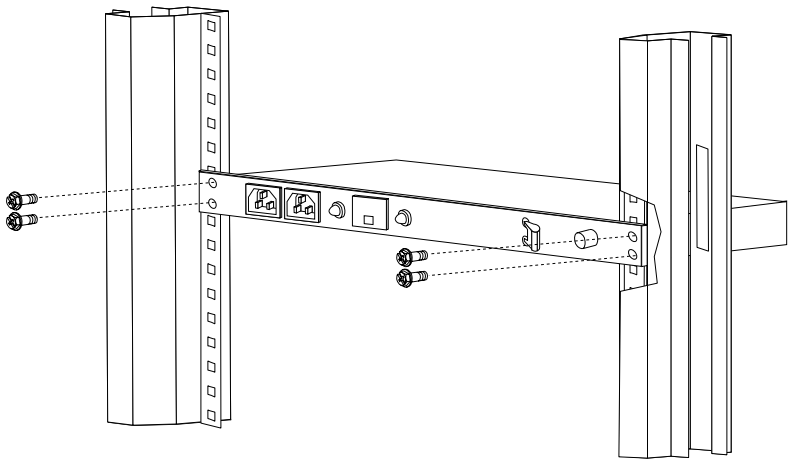

Figure 7. Power distribution horizontal installation

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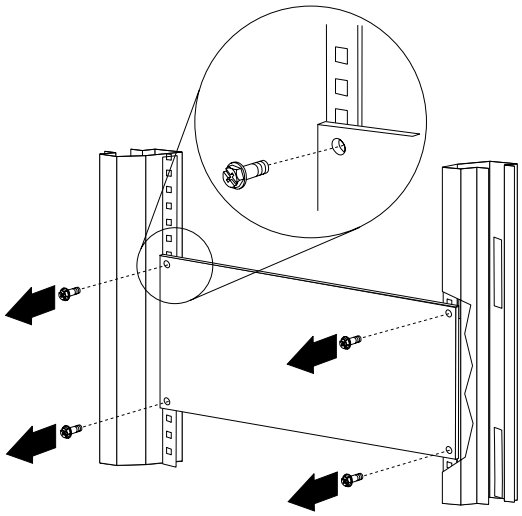
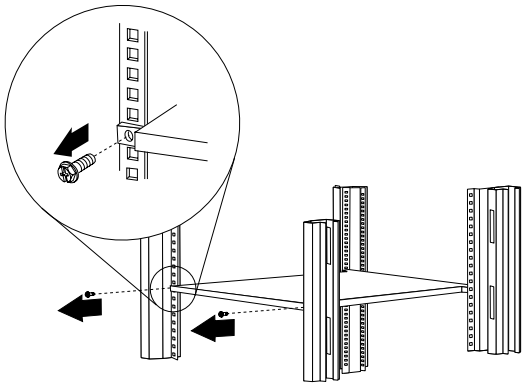
Note: There are two types of Power distribution units available:

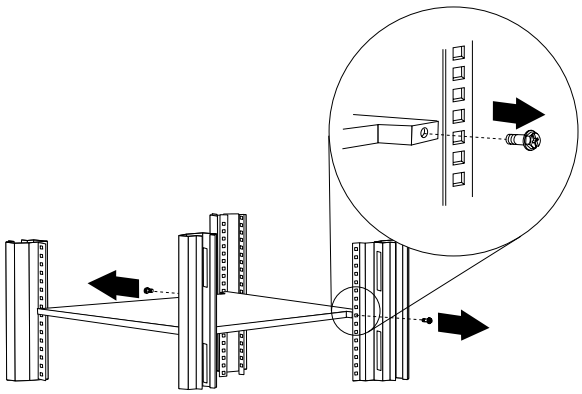
- High voltage
- Low voltage

Blank bezel



Fixed shelf





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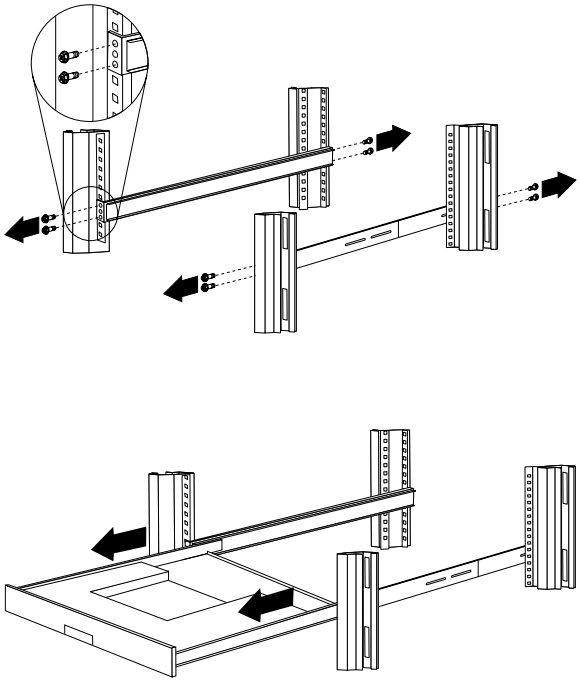
Keyboard tray



To remove the tray from the side rails, pull up on the left rail tab and push down on the right rail tab.

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Installing a flat panel monitor rack mount kit

You can store a T54 or T55 Flat Panel Monitor in a keyboard tray with the flat panel monitor rack mount kit. This kit requires an additional 2U of space above an installed keyboard tray in your rack cabinet. See the documentation that comes with the flat panel monitor rack mount kit for detailed installation instructions. Use the following general procedure to install a flat panel monitor in your rack cabinet:

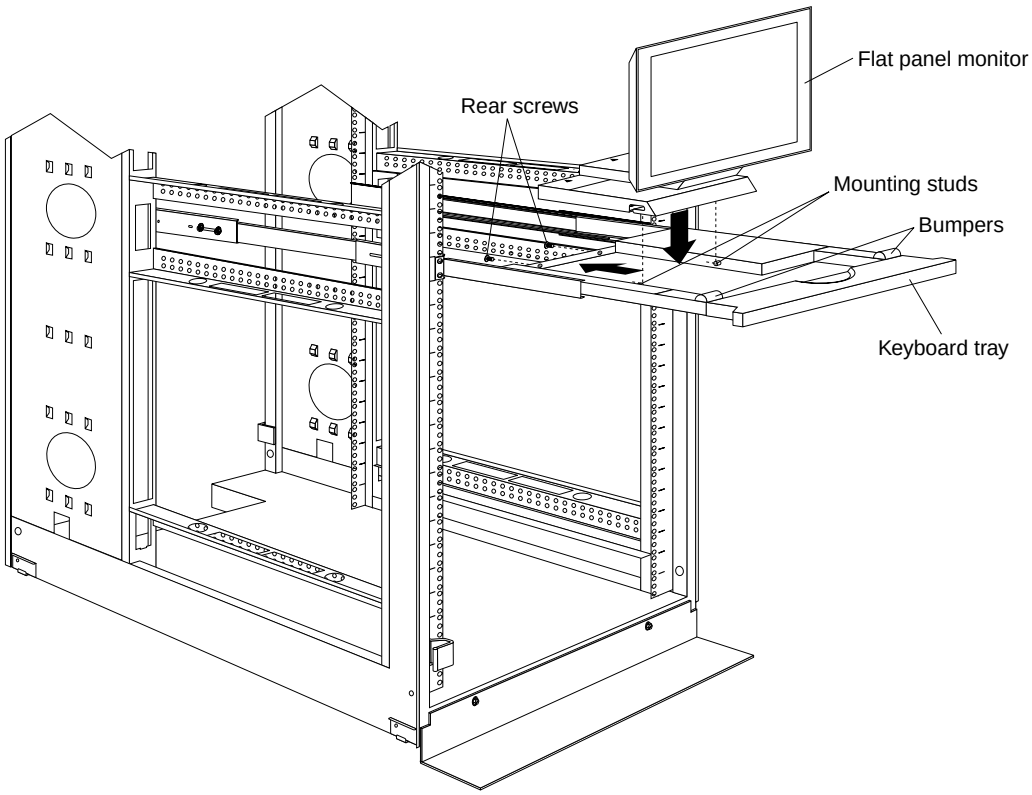

Figure 8. Installing a flat panel monitor rack mount kit

1. Ensure that a keyboard tray is properly installed in your rack cabinet (see “Keyboard tray” on page 28) with at least 2U of clearance above the keyboard tray.
2. Install the flat panel monitor base on the flat panel monitor. See the documentation that comes with your flat panel monitor rack mount kit for detailed installation instructions.
3. Install the mounting studs and bumpers on the keyboard tray.
4. Attach the monitor base to the inside of the keyboard tray using the screws that come with the rack mount kit.
5. Fold the monitor all the way down against the bumpers; then, slide the keyboard tray into the rack cabinet to ensure that there is proper clearance.
6. See the documentation that comes with your flat panel monitor for information on how to connect power and how to connect the monitor to a server or console switch.

Removing the existing flat panel monitor stand

Use the following steps to remove the existing flat panel monitor stand from your monitor:

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1. Unplug the flat panel monitor and disconnect the power cord from the flat panel monitor power supply.
2. Carefully use a flat-blade screwdriver to pry the bottom of the cable cover **1** up and remove it. Save the cable cover for later reinstallation.

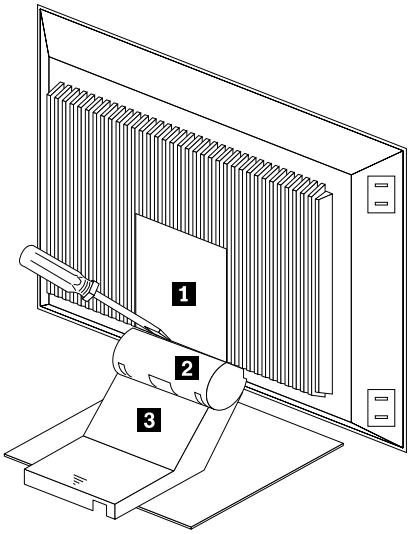

Figure 9. Removing the cable cover, hinge cover, and stand cover

3. Squeeze the sides of the hinge cover **2** and remove it.

   Note: Even though this hinge cover is not used with the Flat Panel Monitor Rack Mount Kit, do not discard it. Store it with the other monitor stand parts you remove for possible future use.
4. Gently push the stand cover **3** and slide it backwards until it is completely off the stand.
5. Disconnect the signal cable and power cord from the flat panel monitor. Carefully remove and save the plastic cable clamp to free the power cord.

   Note: The plastic cable clamp is reusable and is needed to secure the power cord after installing the Flat Panel Monitor Rack Mount Kit on the flat panel monitor.

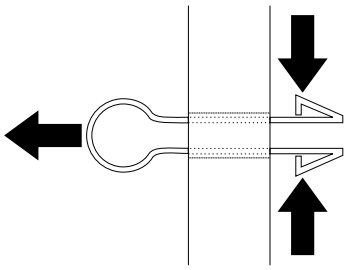

Figure 10. Removing the plastic cable clamp

6. Lay the monitor facedown on a cushioned surface and remove the six screws that secure the hinges to the flat panel monitor.

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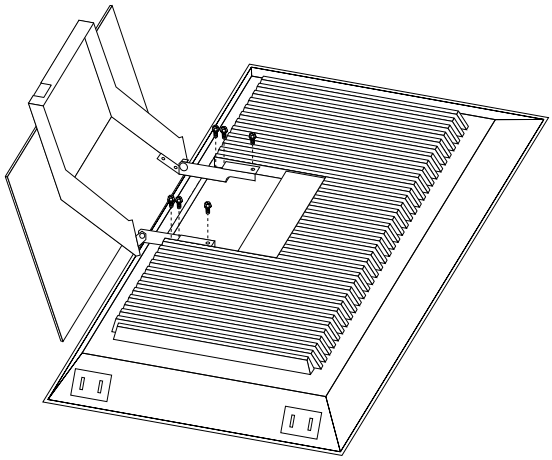

Figure 11. Removing the existing monitor stand from the monitor

7. Lift off the hinge and monitor stand assembly. Store this assembly in a safe place for possible future use.

Installing the new monitor stand

Refer to “Removing the existing flat panel monitor stand” on page 29 for instructions on how to remove the existing stand from the flat panel monitor. Before installing the new stand, install the keyboard tray in the rack according to the instructions that come with the rack or the keyboard tray option.

Note: The Flat Panel Monitor Rack Mount Kit and keyboard tray require 3U of rack mounting space. If the keyboard tray does not have at least 2U of clearance above it, relocate the keyboard tray within the rack.

Use the following steps to install the Flat Panel Monitor Rack Mount Kit:

1. Remove the cable cover **1** from the new monitor stand; then, remove the four screws (two per hinge) that secure the hinges **2** to the stand.

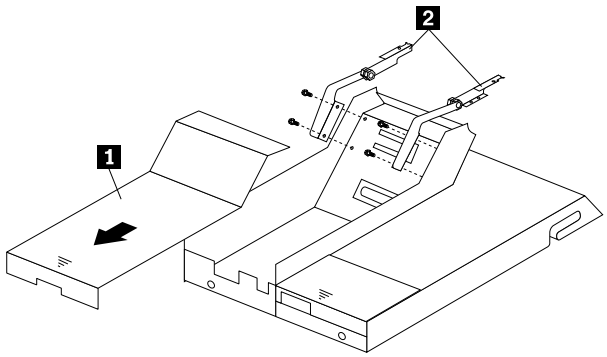

Figure 12. Removing the hinges from the new monitor stand

2. Install the hinges on the flat panel monitor, using the six screws that you removed from the old monitor stand.

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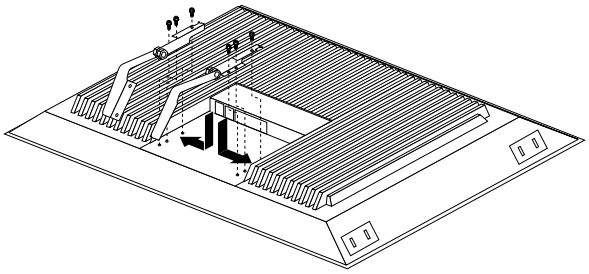

Figure 13. Installing the hinges on the flat panel monitor

Note: Be sure to slide each hinge into place on the back of the monitor and align the holes in the hinges with holes on the monitor.

3. Lower the flat panel monitor onto the new monitor stand, making sure that you align the holes in the stand with holes in the hinges; then, secure the flat panel monitor to the monitor stand with the four screws that you removed earlier.

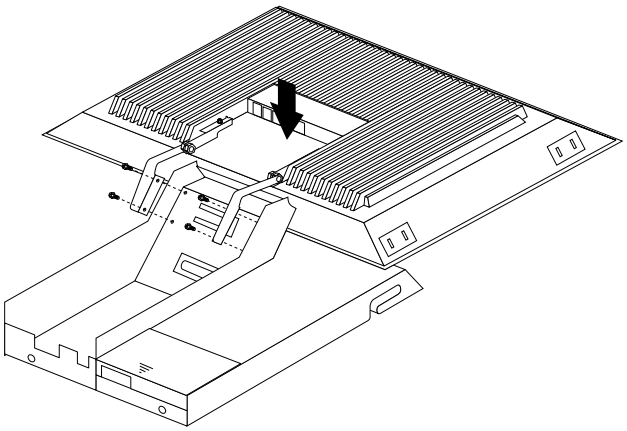

Figure 14. Installing the monitor on the new monitor stand

You have now finished attaching the flat panel monitor to its stand. The rest of the installation process involves preparing the keyboard tray for storage and routing cables.

Notes:

a. You must remove any keyboard or mouse that is already in the keyboard tray before continuing.

b. You will not be able to store a mouse in the keyboard tray after installing the Flat Panel Monitor Rack Mount Kit.

c. You can only store a space-saver keyboard in the keyboard tray.

4. Install the mounting studs **2** and bumpers **3** that come in the monitor mounting hardware package.

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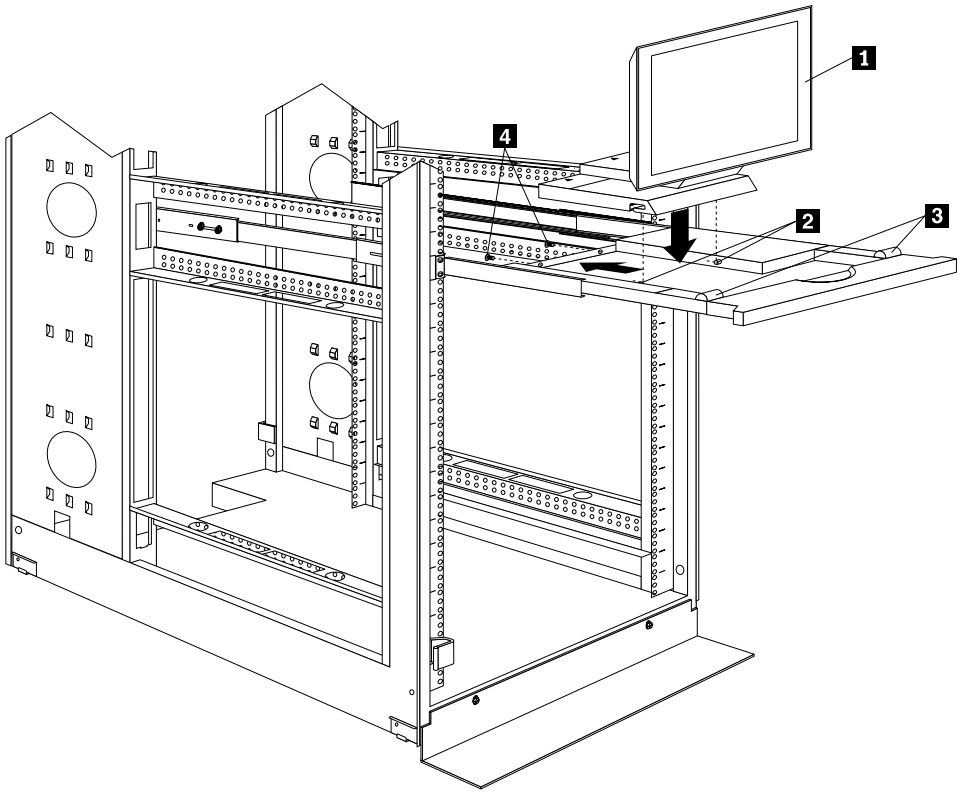

Figure 15. Installing the flat panel monitor in the keyboard tray

Note: Clean the installation area on the keyboard tray with a suitable cleaning agent, such as alcohol, before installing the rubber bumpers on the front of the keyboard tray.

5. Open the flat panel monitor **1** to its full upright position and align the grooves in the stand with the mounting studs **2** in the keyboard tray. When the monitor stand is sitting inside the keyboard tray, slide it towards the back until it stops.

   Note: Install or remove the flat panel monitor only when the display is in its upright position.

6. Secure the monitor stand in the back of the keyboard tray with the two provided screws **4** .

7. Place the flat panel monitor power supply, which came with your flat panel monitor, inside the monitor stand. If necessary, insert the power supply spacer **3** behind the power supply and over the cable to keep the power supply in place.

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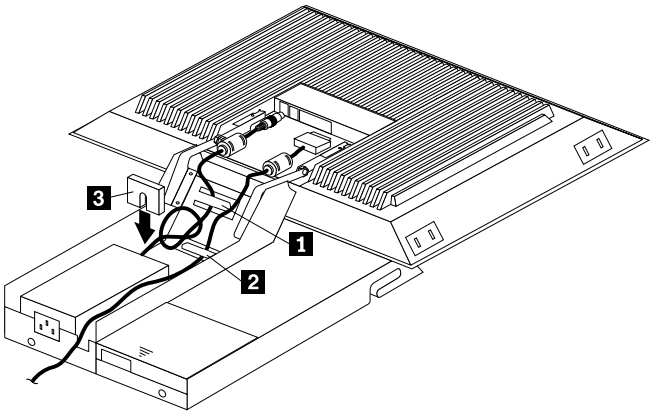


Figure 16. Storing the power supply and routing cables

8. Connect the power supply to the monitor and route the cable under the tab near the top of the monitor stand **1** ; then, secure the power cable with the cable clamp you removed from the original stand and coil excess cable inside the monitor stand.
9. Connect the monitor signal cable to the monitor and route it under the tab in the bottom of the monitor stand **2** and out the back of the stand through the hole provided.
10. Replace the monitor stand cover **1** .

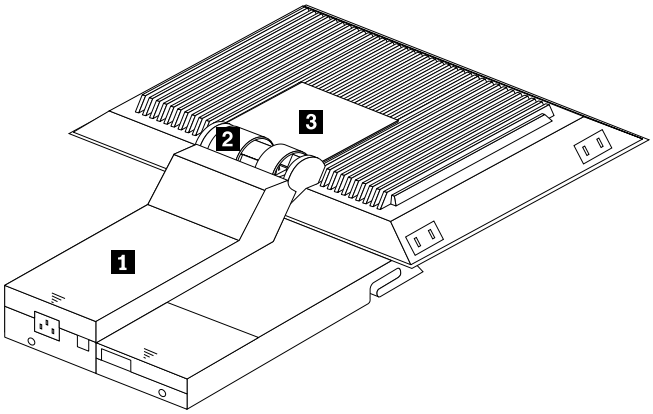
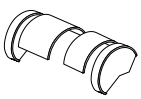


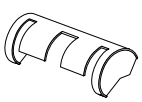
Figure 17. Installing the cable cover, hinge cover, and stand cover

11. Snap the new hinge cover **2** into place over the hinge assembly.

    Note: Be sure to use the new hinge cover that comes with the Flat Panel Monitor Rack Mount Kit because it has deeper grooves to accommodate the new hinge assembly.



New hinge cover



Old hinge cover

12. Snap the cable cover **3** into place on the back of the flat panel monitor.
13. Fold the flat panel monitor down until it rests on the rubber bumpers; then, gently push back and remove the small cable exit cover **1** on the monitor stand.

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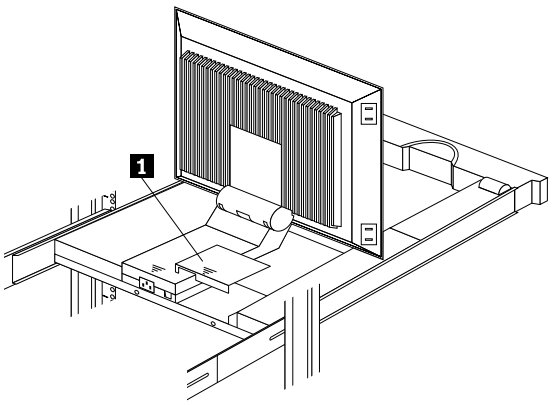

Figure 18. Routing the keyboard cable

14. Route the space-saver keyboard cable through the hole in the front of the base and out the opening in the back where you removed the small cover; then, place the keyboard (with its adjustable feet fully down) inside the keyboard tray.

    Note: You must open the flat panel monitor to its full upright position so that you can install the keyboard and route its cable.

15. Fold the flat panel monitor down again until it rests on the rubber bumpers; then, reinstall the small cable exit cover **1** .

16. Slide the keyboard tray into the rack; then, neatly route and secure all cables in the rack using the provided cable straps.

    You can now connect the power cord to the flat panel monitor and connect the display to a server.

Starting the system

Start the system by:

1. Power-on the selector switch(s).
2. Power-on the monitor.
3. Power-on the servers.

Note: The selector switch must be powered on first, then the servers. This is to assure that the device drivers for the servers send device settings to the selector switch.

When the selector switch is powered on, it:

- Identifies the mouse and keyboard and puts them into default status.
- Switches to port 1 by default, and displays the number '1' in the status flag field on the monitor.

Configuring the selector switch

Note: For information about the IBM NetBAY Console Switch, see “IBM NetBAY console switch” on page 129.

Note: Some selector switch units have different functions and displays. Refer to the Apex PC Solutions® Outlook™ Concentrator User Guide. This guide is shipped with the Selector Switch Unit.

No configuration is necessary for normal switch operation.

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Switch configuration can be performed to:

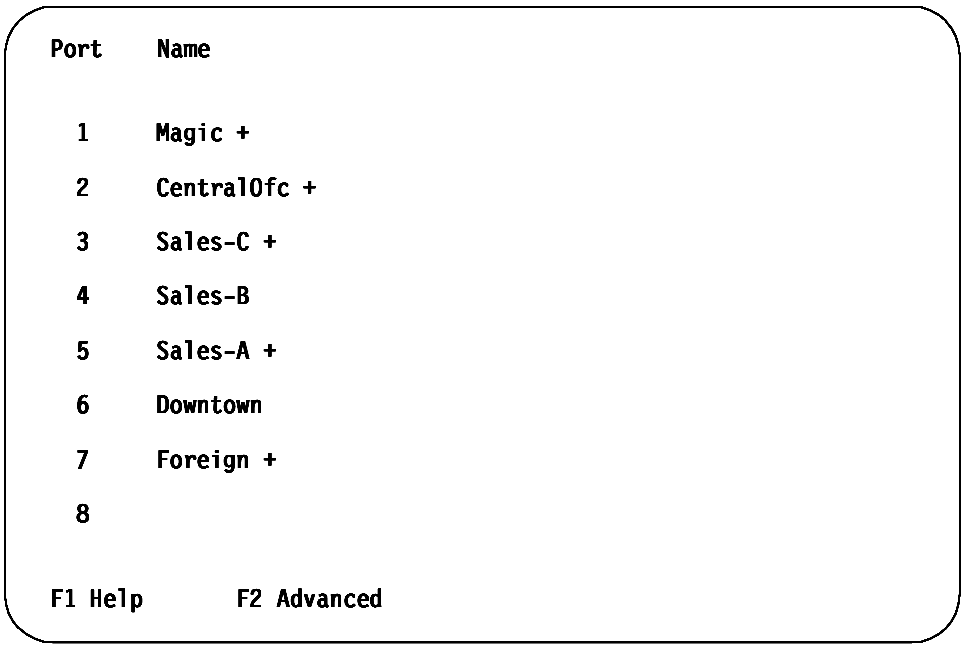
- Assign unique names to servers.
- Display servers by their assigned port names and port numbers.

Switching among servers

To switch among servers:

- Press the **Print Screen** key.
- Type the port number of the server to be switched.
- Press **Enter**.

  Note: One depression of the Print Screen key starts the switching process. To print a screen, depress the **Print Screen** key twice.



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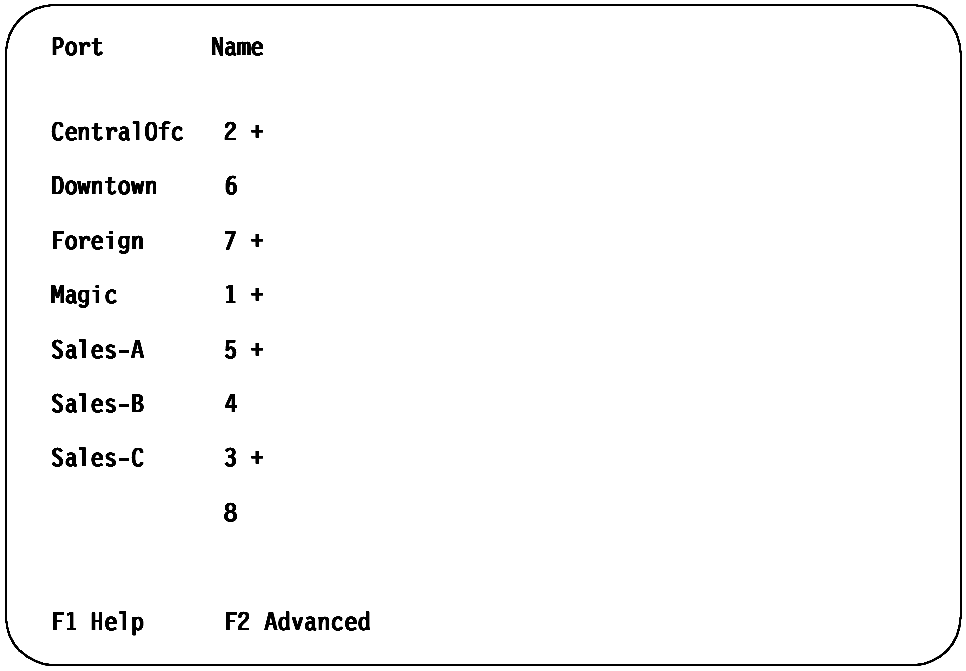

- Using the Up Arrow (↑) and Down Arrow (↓), select the server you want to switch to, or press the numeric key that corresponds to the server's port number and then press Enter.

The symbols after the Port or Name columns on the menu show the status of the port as follows:

Type of Symbol	Symbol	Meaning
Plus	+	Server connected and running
Asterisk	*	Secondary selector switch connected and running

Advanced selector switch functions

System configuration is performed through the keyboard and menus to include these Advanced selector switch functions:

- Scanning the servers
- Displaying server BIOS versions and settings
- Saving the Hardware Configuration
- Resetting the mouse and keyboard
- Setting a scan pattern
- Assigning unique names to the servers
- Listing servers by name or port number (Changing Menu Attributes)
- Changing the position and color of the operation menus and windows (Changing Flag Attributes)
- Assigning a specific monitor type to a certain port (server)

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Scanning the servers

To place the selector switch in scan mode:

- Press the **Print Screen** key
- Press the **F2** key to display the Advanced Menu screen.
- Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Scan** and press **Enter**. The selector switch enters the scan mode and the display returns to the status flag. To cancel the operation, press Esc any time before you press Enter.
- To cancel the scan mode, press any key or move the mouse. The scan stops at the currently connected server.

Displaying version information and device settings

The selector switch BIOS version number along with keyboard and mouse information can be displayed for the currently selected server.

- Press the **Print Screen** key.
- Press the **F2** key to display the Advanced Menu screen.
- Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Version** and press **Enter**.

```
Version

BIOS          X.XX
Hardware      X X
Port 1        Magic 1

Keyboard      Mouse
Enabled       Enabled
Rate  2C      Rate  100
LEDs  2       Res  2
Mode  2
Type  101     Type  Gen
```

- Keyboard information includes:
  - — Enabled or disabled
  - — Typematic rate
  - — LED settings
  - — Port mode
  - — Keyboard type.
- Mouse information includes:

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  - — Enabled or disabled
  - — Sample rate
  - — Resolution
  - — Mouse type
- Press **Esc** to remove the Version menu.

Saving Hardware Configuration

Whenever servers are added to or removed from the configuration, or whenever there is a change in the mouse or monitor, save the hardware configuration setting by:

1. Press the **Print Screen** key.
2. Press the **F2** key to display the Advanced Menu screen.
3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Snapshot** and press the **Enter** key. The hardware settings are saved to memory.

Important: If the settings are not saved and the selector switch power is lost, it might be necessary to restart each server in the configuration to reestablish keyboard and mouse communications.

Resetting the mouse and keyboard

Resetting the mouse and keyboard restores the default setting for the selected server.

- Press the **Print Screen** key.
- Press the **F2** key to display the Advanced Menu screen.
- Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Reset** and press the **Enter** key. The mouse and keyboard are now reset.

Setting a scan pattern

The selector switch has a standard scan routine for sequentially connecting each server to the monitor, keyboard, and mouse. The scan routine can be configured to scan all or any of the servers in a particular pattern. To create a scan pattern, do the following.

1. Press the **Print Screen** key.
2. Press the **F2** key to display the Advanced Menu screen. Press the Right Arrow (→) key to move the highlight to the **Setup Menu**.
3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Scan** and press the **Enter** key. The Scan Pattern Setup menu appears with the first port position or server name highlighted. The following example screen displays when the port order mode is selected.

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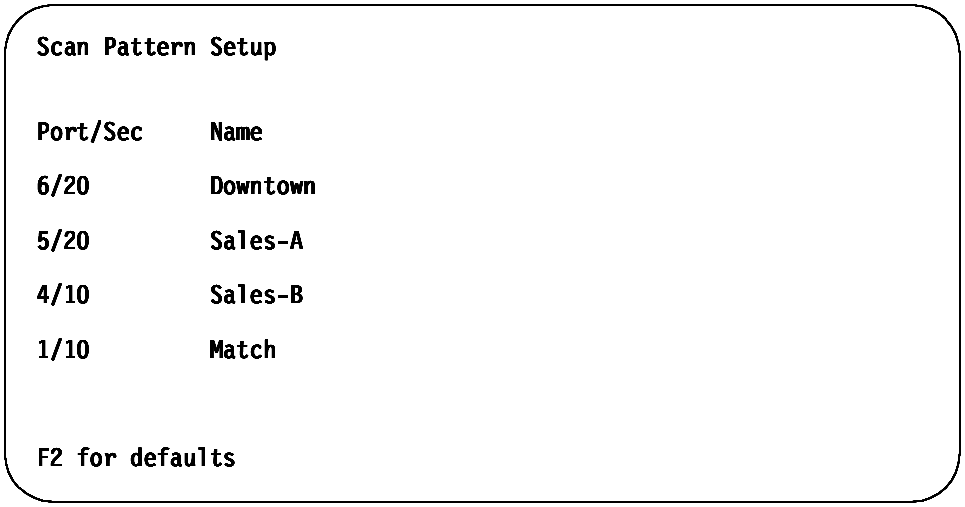

If Name order was selected, the Port and Name columns will be reversed.

4. Using the keyboard keys, select the port number of the first server to be included in the scan. Note that the server name, if any is assigned, appears in the far right column on the menu.
5. Press the Tab key or Right Arrow (→) key to move the highlighting to the Sec column. Then, use the keyboard keys to enter a time value, in seconds, for the length of time you want this server to be connected to the monitor and keyboard, before switching to the next server in the scan.
6. Press the Down Arrow (↓) key to move the highlighting to the next port in the Port column and repeat step 5. To delete unwanted ports from the scan list in the Scan Pattern Setup window, place the highlighting on the top-most port to be removed and press the **Delete** key (not the Del key on the numeric keypad).
7. When you have finished setting the scan pattern, press the **Enter** key. Press Esc at any time before pressing Enter to retain the previous scan pattern.

   Note: Pressing the F2 key will return all Port and Sec values to the factory defaults.
8. To exit, press **Esc**.

Assigning Unique Names to Servers

Unique names can be given to servers and secondary selector switches. To assign names:

1. Press the **Print Screen** key
2. Press the **F2** key to display the Advanced Menu screen.

   Press the Right Arrow (→) key to move the highlight to the **Setup Menu**.
3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Names** and press the **Enter** key. The Port Naming menu appears, as shown below.

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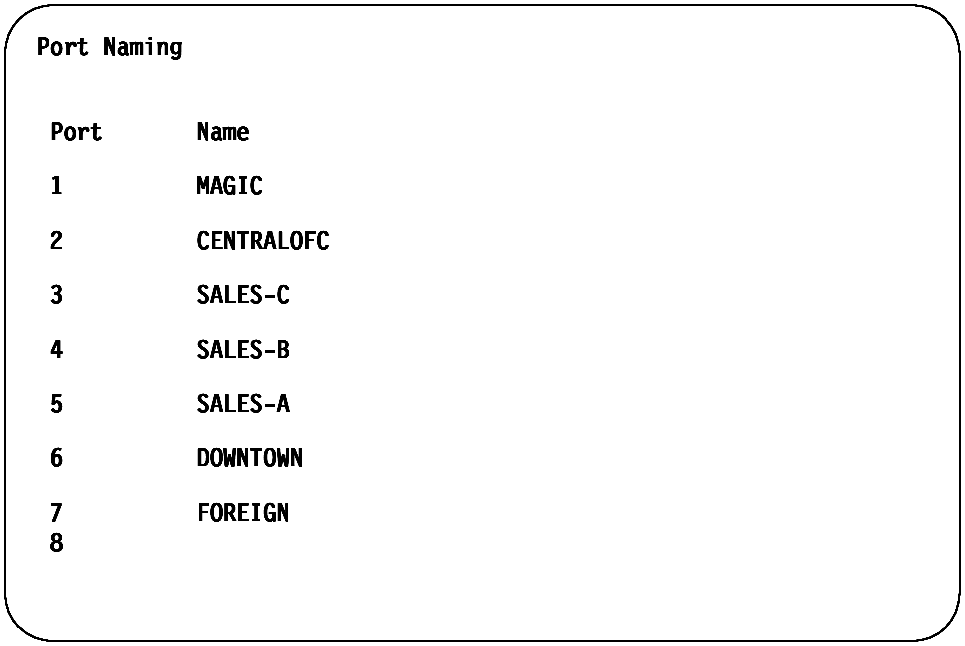

4. Move the highlighting to the Port entry for which the server name is to be entered or changed. Type in the name of the server using up to 12 alphanumeric characters.

   Note: Legal characters are A-Z, 0-9, and the dash character. Lowercase letters are converted to uppercase. Press the Backspace key to delete an incorrect entry.

5. If necessary, repeat step 4 for each of the servers that are to be named.
6. Press the **Enter** key to save the server names in nonvolatile RAM. Press Esc at any time before pressing Enter to cancel the operation.
7. To exit, press **Esc**.

Changing menu attributes

The menus displayed on the monitor can be altered in visual appearance to suit the particular use of the system. You can:

- Position the menu in a convenient location on the display.
- List servers by port or by name, whichever is desired, in the appropriate menus.
- Adjust character height.
- Change colors.
- Display the selection menu for a certain period.

To change the menu attributes, do the following:

- Press the **Print Screen** key.
- Press the **F2** key to display the Advanced Menu screen. Press the Right Arrow (→) key to move the highlighting to the Setup list.
- Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **OSCAR**™. (On Screen Configuration and Activity Reporting) and press the **Enter** key. The following Attribute menu appears.

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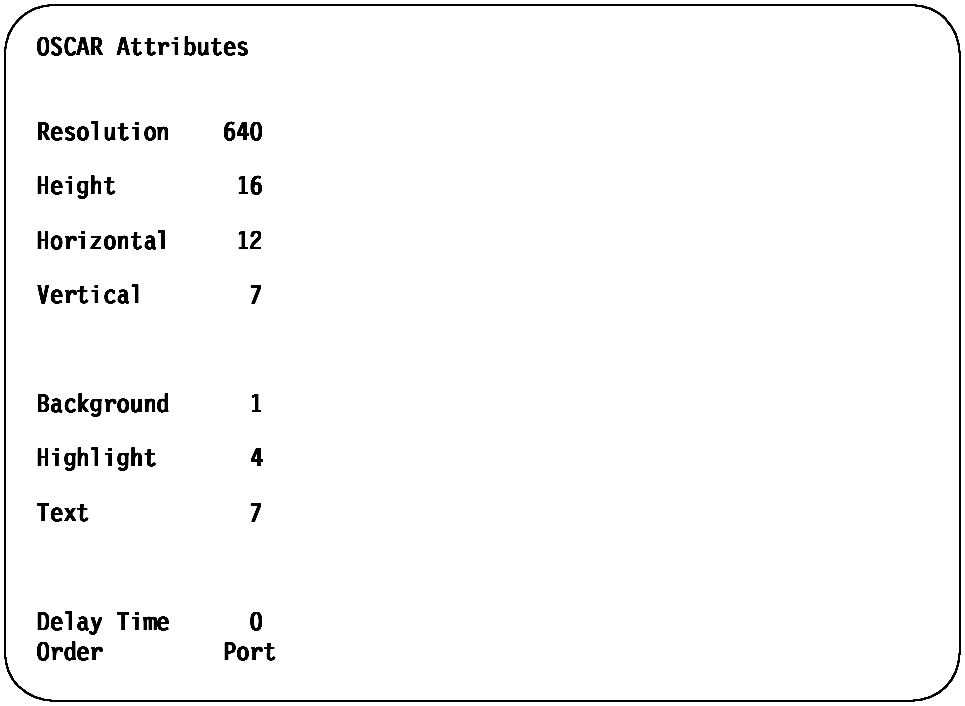

- Highlight the settings you want to change and use the + or - keys to change the values. As you select different values, the effect of the changes is reflected immediately on the display.
- When all changes are completed, press the **Enter** key to save the changes to nonvolatile RAM. Press Esc at any time before pressing Enter to cancel the operation and retain the previous settings.

  Note: It is possible, while changing the attributes, to garble the menu and windows, making it difficult to correct. If this occurs, reset the selector switch to its default values by pressing the following keys in this order:

  1. Esc
  2. Esc
  3. Print Screen
  4. F10
  5. Y
  6. Enter

Available menu attributes:

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Setting	Effect on Menu or Window Appearance
Resolution	Affects the size of the menu and windows as they appear on the display. Choose from values of 320, 480, and 640. The lower the value, the larger the size.
Height	Affects the size of the text in the menu and windows. The larger the value, the larger the text.
Horizontal/Vertical	Determines the position of the menu or window on the screen.
Background	Determines the menu or window background color.
Highlight	Determines the menu or window highlight bar color.
Text	Determines the menu or window text color.
Delay Time	Sets the time in seconds that the OSCAR selection window is delayed before appearing after the Print Screen key is pressed. This delay may be increased so that the menu is not a distraction when performing simple server switching operations at the keyboard.
Order	Determines the order which the servers are listed, numerically by port or alphabetically by assigned name.

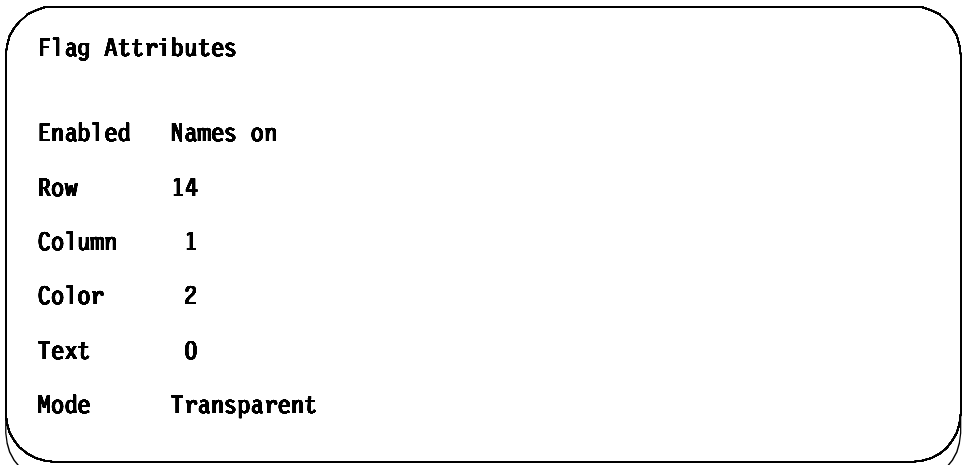
Changing the status flag attributes

The status flag shows the currently connected server and can be set to appear on the screen whenever the system is operating. You can alter how and where the flag appears on the screen by changing one or more of the following attributes:

- Appearance on the screen: none, timed, or constant
- Position on the screen
- Color and opaqueness

To change the flag attributes, do the following:

1. Press the **Print Screen** key.
2. Press the**F2** key to display the Advanced Menu screen. Press the Right Arrow (→) key to move the highlighting to the **Setup** menu.
3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlight to **Flag** and press the **Enter** key.



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4. Highlight the setting to be changed and use the + and - keys to adjust the values. The following table describes each of the available menu attributes:

Setting	Values and Effect on Flag Appearance
Enabled	Flags Off = Flag does not appear Ports On = Flag shows the connected port number Names On = Flag shows the connected server by name Ports Timed = Port number displays for five seconds after connection Names Timed = Name displays for five seconds after connection
Row	Select values from 0–14 to position the flag vertically on the screen
Column	Select values from 0–25 to position the flag horizontally on the screen
Color	Select values from 0–7 for the flag color.
Text	Select values from 0–7 for the flag text color
Mode	Choose between Opaque and Transparent

5. Press the **Enter** key to save the settings. Press Esc at anytime before pressing Enter to cancel the operation and save the previous settings.
6. Press **Esc** to exit.

Assigning specific device types

In situations where one or more servers need a special type of monitor device, it might be necessary to assign that device type to the port number associated with the server.

Note: When tiering, you must make the primary selector switch aware of the secondaries through the assignment.

Assign a device type as follows:

1. Press the **Print Screen** key.
2. Press the **F2** key to display the Advanced Menu screen. Press the Right Arrow (→) key to move the highlighting to the Setup menu.
3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Devices** and press the **Enter** key. The following menu appears:

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```
Device Settings

 Port      Monitor
 1         SVGA
 2         SVGA
 3         8515
 4         SVGA
 5         Default
 6         Default
 7         Default
 8         8port
```

4. To assign a monitor type, highlight the port you want and use the + or - keys to select the value that corresponds to the particular monitor.

   To assign a secondary selector switch to a port, highlight the port and use the + or - keys to obtain the appropriate port value.

5. Press the **Enter** key to save the settings. Press Esc at any time before pressing Enter to cancel the operation.
6. Press **Esc** to remove the Advanced Menu from the screen.

Resetting the selector switch

The selector switch can be reset by depressing the Reset button on the back panel of the selector switch.

Note: Pressing the reset button might recover the device settings without having to power-off, then power-on all the servers.

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Making connections under power

Additional servers, can be connected to the selector switch while the selector switch is running.

Failed devices such as a keyboard or mouse can be connected to a running selector switch.

Note: When new devices are connected, the selector switch recognizes it and configures it to the settings of the currently selected server.

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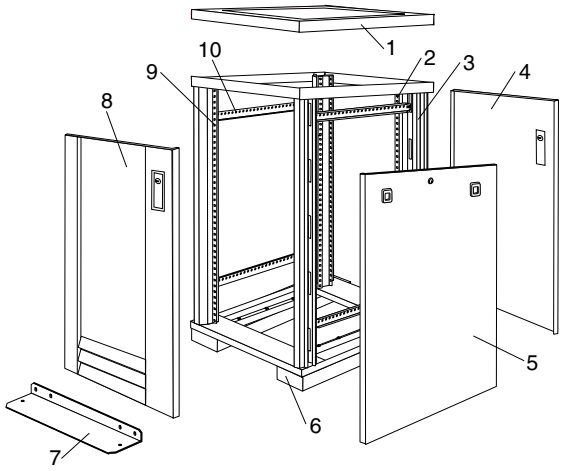
Parts Listing (Type 9306 Model 200)



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Index	Rack Enclosure (Type 9306 Model 200)	FRU
1	Top Cover including cover standoffs and screws	28L0548
2	Rear EIA Rail (1) includes mounting hardware	28L0547
3	Rack Frame	28L0550
	Caster (1)	12J4466
	Leveler (1)	76H4960
4	Rear Door Assembly including latch and lock	28L0545
5	Side Panel Assembly with Latches and Lock	28L0549
	Side Panel Latches	12J4468
	Side Panel Lock with Keys	76H4965
6	Caster Extension Plinth (1)	12J4482
7	Stabilizer	12J4485
8	Front Door Assembly including latch and lock	28L0544
9	Front EIA Rail (1) includes mounting hardware	28L0546
10	Side Brace (1)	12J4477
	Front/Rear Door Hinge with Pin (1)	76H4966
	Front/Rear Door Latch with Lock and Keys (1)	76H4967
	Front/Rear Door Striker Plate (1) includes mounting hardware	12J4465
	Front/Rear Door Hinge Pin (1)	12J4469
	Grommet, Cable Exit	28L0553
	Label, EIA Unit Numbers	28L0551
	Miscellaneous Parts Kit - Includes: M6X25 Pan Head Screw (1), M6 Caged Nut (6), M6X16 Combination Head Screw (6), 10-32 Flat Washer (6), M6X12 Button Socket Head Cap Screw (5), 12mm Open End Wrench (1), M6 Tinnerman Clip (2), M6 Threaded Hex Spacer (1), M6 Dome Nut (2), M6 Flange Nut (5), Soft Tie Wraps (10)	76H4950

	Rack Enclosure (Type 9306 Model 200) Options	FRU
	Monitor Housing	76H4947
	Filler Panels: 1U, 3U, and 5U - with hardware	12J4473
	Keyboard Tray	76H4958
	Keyboard Tray II	28L0562
	Keyboard Tray II filler block	28L0567
	Keyboard Slides (set) with Hardware	76H4961
	Fixed Shelf with Hardware	76H4963
	C13 - C14 Power Cable	07H0075
	C19 - C14 Power Cable	76H4964
	C13 - NEMA 5-15P Power Cable	76H4962
	C19 - NEMA 5-15P Power Cable	12J4479
	Video, Mouse, Keyboard Cable (7 feet)	06P6006

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Rack Enclosure (Type 9306 Model 200) Options	FRU
Video, Mouse, Keyboard Cable (12 feet)	06P6007
Video, Mouse, Keyboard Power Cable (25 feet)	12J4484
Mouse Extension Cable	07H0069
Keyboard Extension Cable	07H0067
Concentrator (4 port) with Hardware	28L0543
Concentrator (8 port) with Hardware	76H4948
1x4 switch	06P6003
2x8 switch	06P6004
NetBAY Rack Power Distribution Unit	09N9668
NetBAY Front-end Power Distribution Unit	09N9670
3-phase NEMA L21-30P line cord (200-250 Vac) for NetBAY Front-end PDU	24P6844
3-phase IEC 309-3P+N+Gnd line cord (380-415 Vac) for NetBAY Front-end PDU	24P6845
1-phase NEMA L5-30P line cord (100-127 Vac) for NetBAY Front-end PDU	24P6846
1-phase NEMA L6-30P line cord (200-240 Vac) for NetBAY Front-end PDU	24P6847
1-phase IEC 309-2P+Gnd line cord (200-240 Vac) for NetBAY Front-end PDU	24P6848
NetBAY Server Dual-cord Power Distribution Unit	09N9669
Hardware Kit for NetBAY Power Distribution Units	09N9671
Flat Panel Monitor Rack Mount Kit (T54A, models AG1, AW1; T55)	37L6888
Flat Panel Adapter Hinge - R.H. & L.H. (T54A, T55)	09N9678
Flat Panel Adapter Misc. Hardware Kit – Includes: Hinge Cover (1), Power Supply Cover (1), Mounting Stud (1), Bumper (2), Cable Access Cover (1), M4 X 12 Screw (4), M4 X 8 Screw (2), 14 inch Soft Tie Wrap (1), T54A power supply spacer (1)	00N8693
Flat Panel Adapter Display Housing – Includes: Power Supply Cover (1), Base Housing (1), Cable Access Cover (1), Bottom Stand	00N8694

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Type 9306 Model 900/910

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Features

The IBM Server 9306-900/910 Rack enclosure is an industry-standard, 19-inch rack that houses and controls multiple IBM PC Servers/IBM Servers and related equipment.

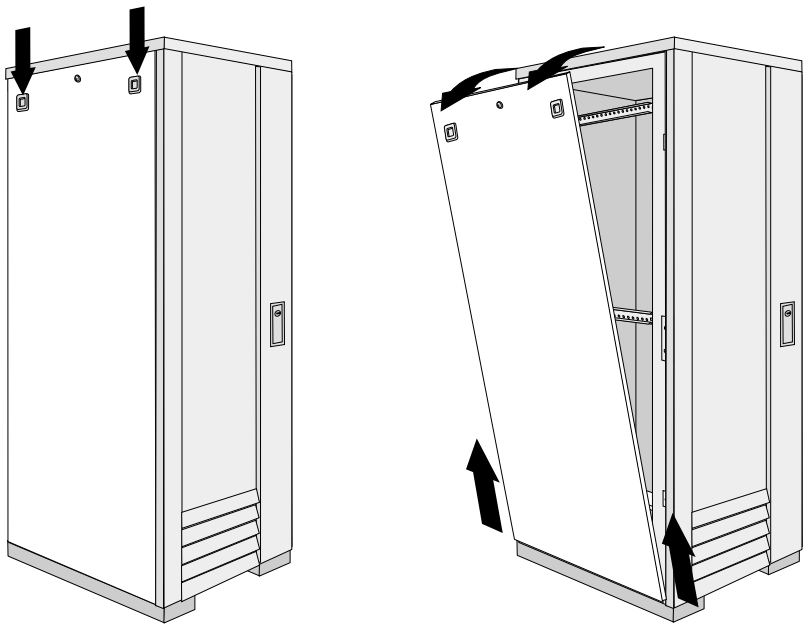
- Model 900 has optional side panels, solid front door, and perforated rear door.
- Model 910 has side panels and perforated front and rear doors.

Locations

The following sections contain information on specific equipment locations.

Note: For instructions on how to power-off the rack, see "Powering off the rack" on page 3.

Side Panel



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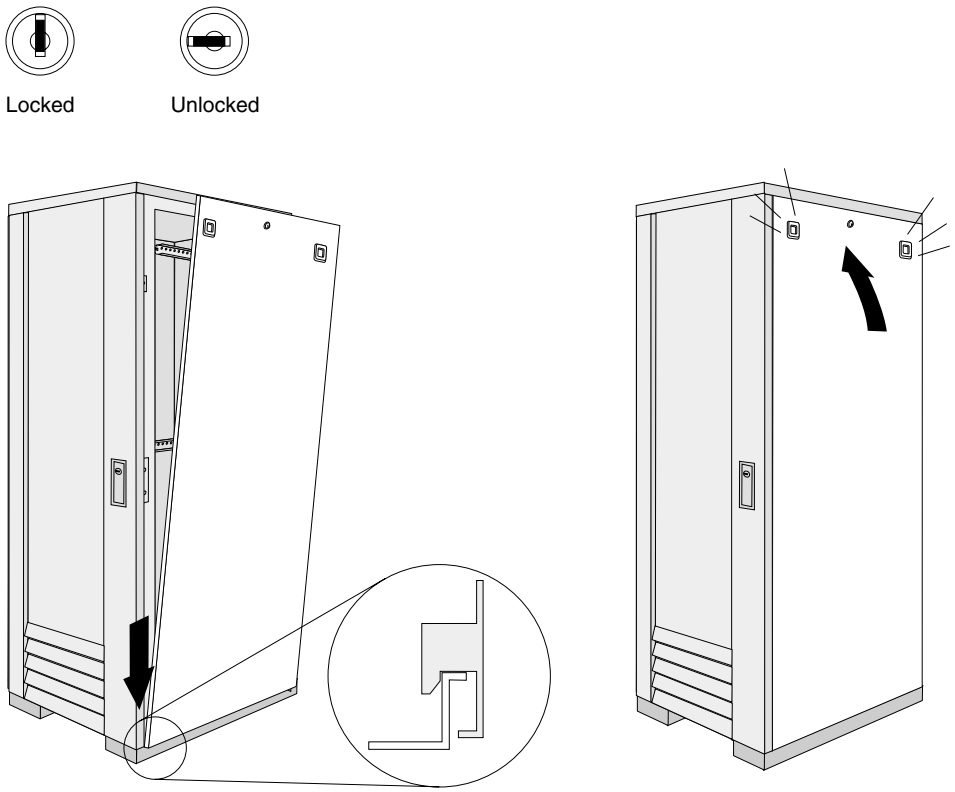
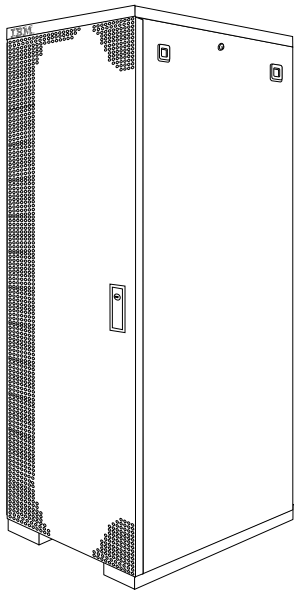


Perforated Doors (model 910)

The Type 9306 Model 910 Rack comes with front and rear perforated doors that provide enhanced cooling and airflow for components you install in your rack cabinet. The 9306 Model 910 Rack also comes with side panels already installed.



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Refer to installation instructions in this document if you have a 9306 Model 900 Rack and are installing a new perforated front door.

Note: The illustrations in this documentation might be slightly different from your hardware.

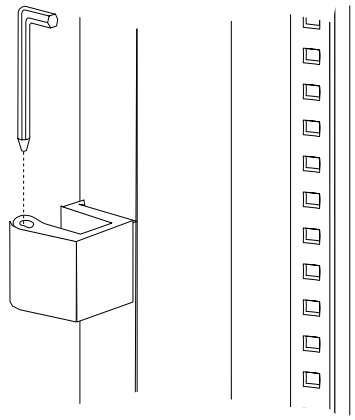
Installing the new door on a model 900 rack cabinet

Use the following steps to remove your existing front door and install the new perforated door:

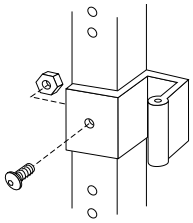
1. Refer to the rack documentation for information on removing side panels; then, remove the left side panel on the rack and set it aside.
2. If the front door is locked, unlock it; then, open the front door.

3. While supporting the door, remove all four hinge pins that hold the front door in place; then, store the door in a safe place for possible future use.

   Note: Save three of the hinge pins for later installation.



4. Remove the screw and nut that holds the hinge bracket **1** in place; then, move the hinge bracket three mounting spaces downward and reinstall it at the new center location.



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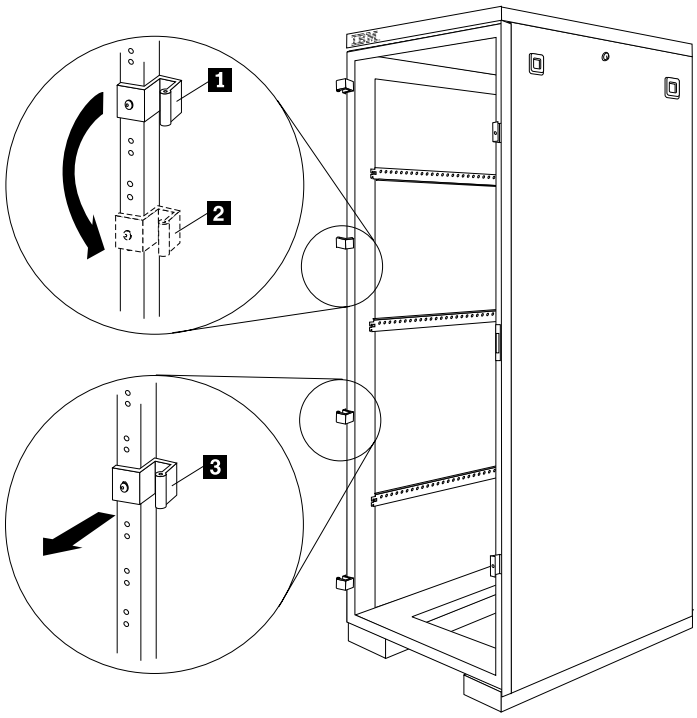

Note: Insert the screw through the bracket and into the lower of the two holes in the new center location.

5. Remove the other hinge bracket **3** and store it with the old door that you removed earlier.
6. While supporting the new door, use three of the hinge pins that you removed from the old door to attach the new door to your rack cabinet. Store the fourth hinge pin with the old door and hinge bracket.
7. Reinstall the left side panel that you removed earlier.

Selector switch locations

Note: For information about the IBM NetBAY Console Switch, see "IBM NetBAY console switch" on page 129.

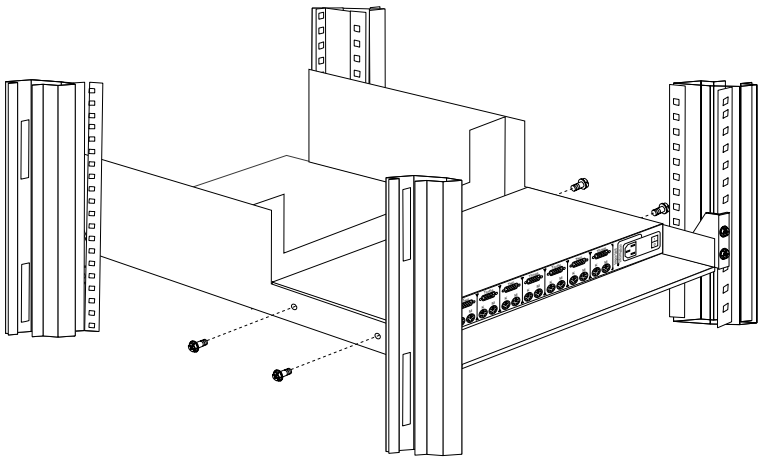

Figure 19. Selector switch in monitor compartment

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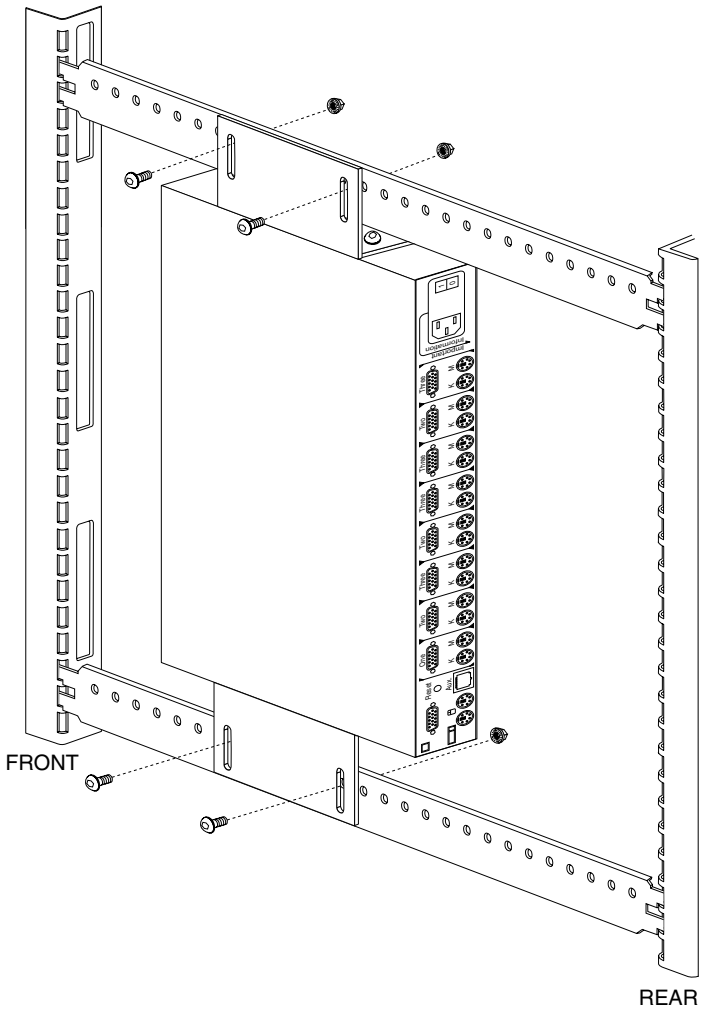

Figure 20. Selector switch between side panels

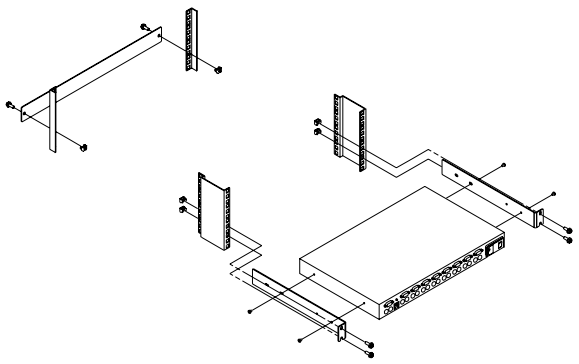

Figure 21. Selector switch rear of rack with blank panel front of rack

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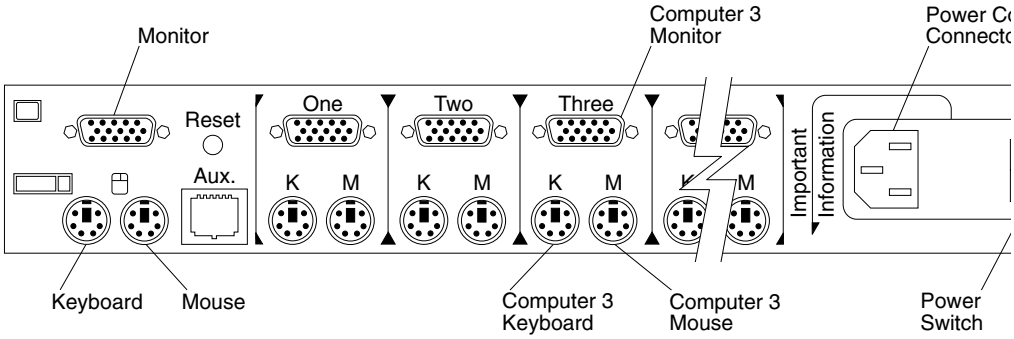
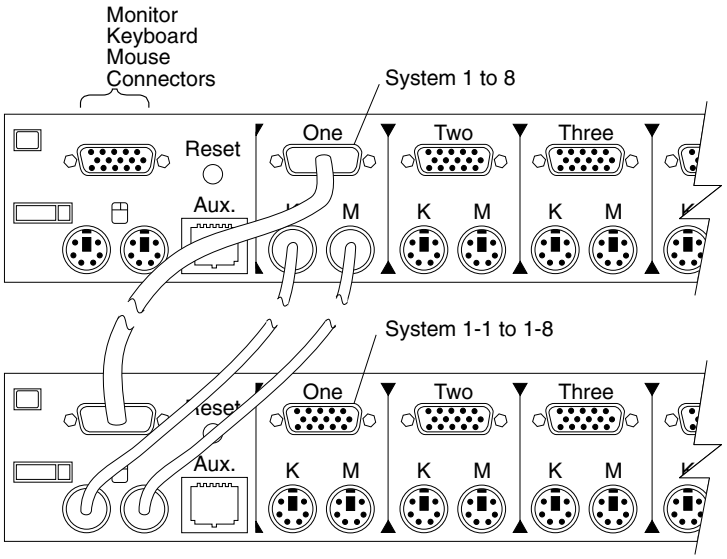
Selector switch cable connections:



Tiered switch configuration:



One eight-port primary selector switch can accommodate up to eight secondary selector switches which can then support up to 64 servers.

Note: There are two types of selector switches available:

- 4 port
- 8 port

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Selector switch environment:

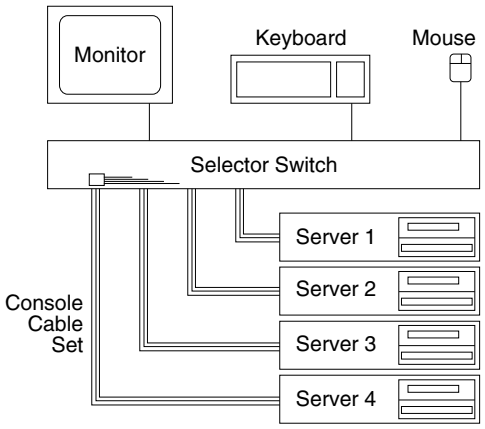

Figure 22. Single selector switch

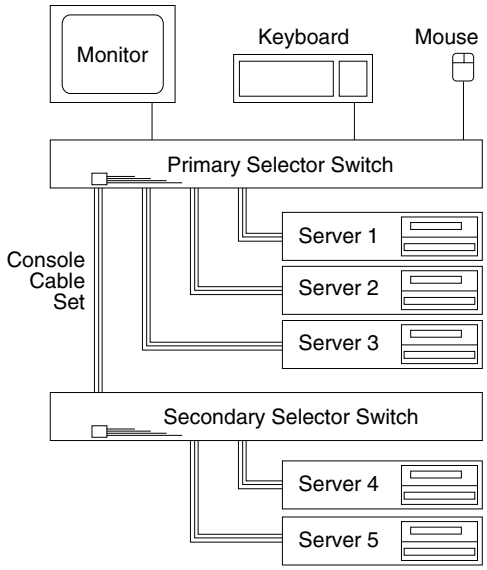

Figure 23. Multiple selector switch

Power Distribution Unit

Note: For information and installation instructions for the IBM NetBAY Rack Power Distribution Units, see “NetBAY Power Distribution Units” on page 141.

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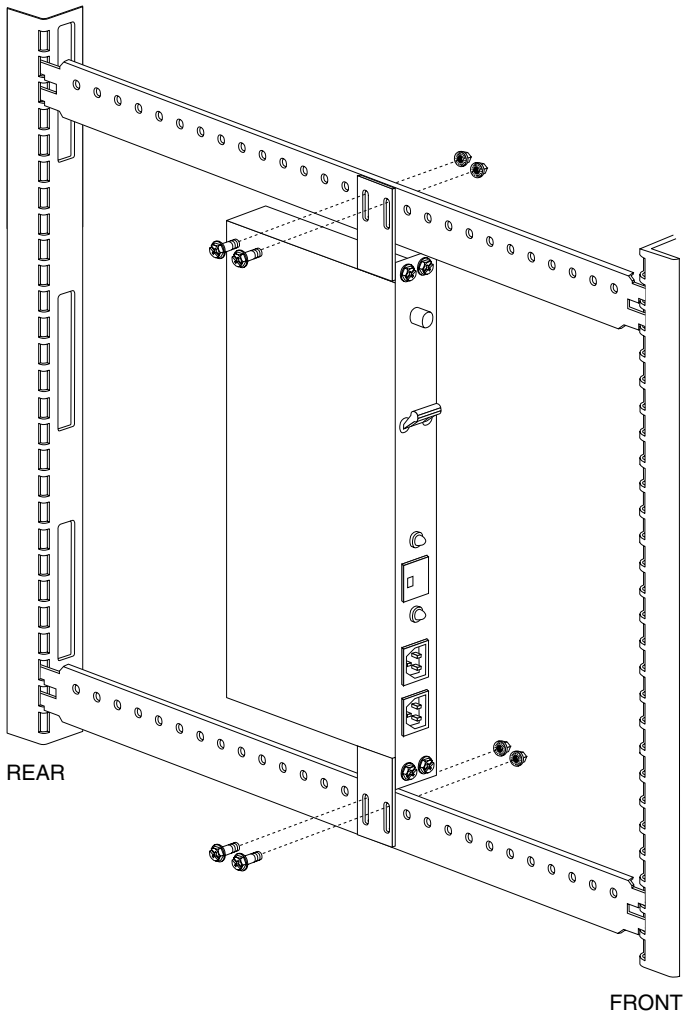

Figure 24. Power Distribution installation

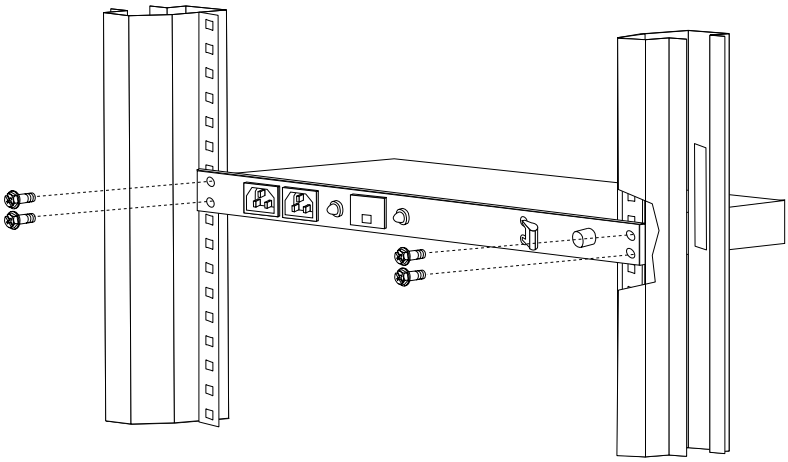

Figure 25. Power Distribution horizontal installation

Note: There are two types of Power distribution units available:

- High voltage
- Low voltage

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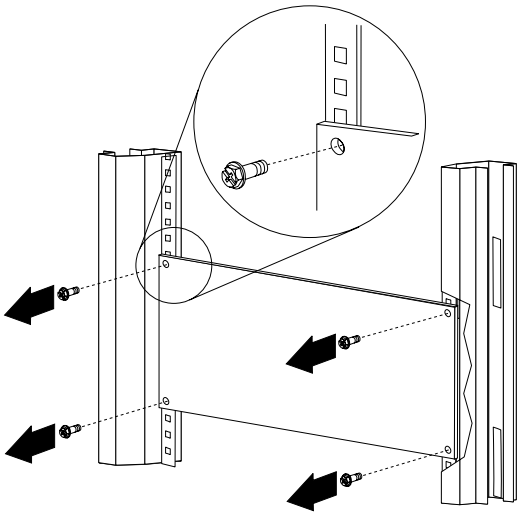
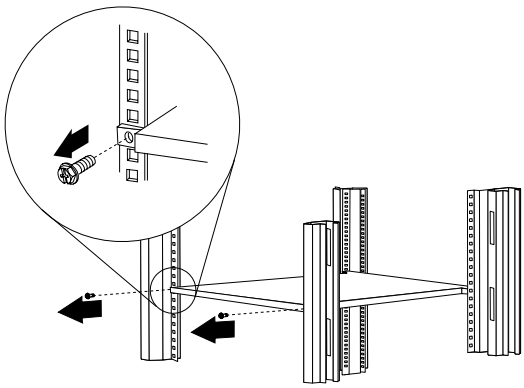
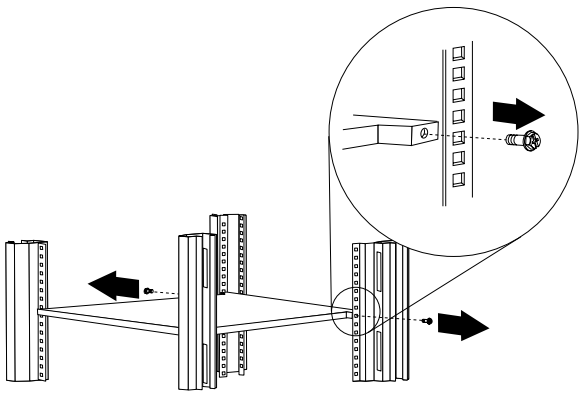
Blank bezel



Fixed shelf





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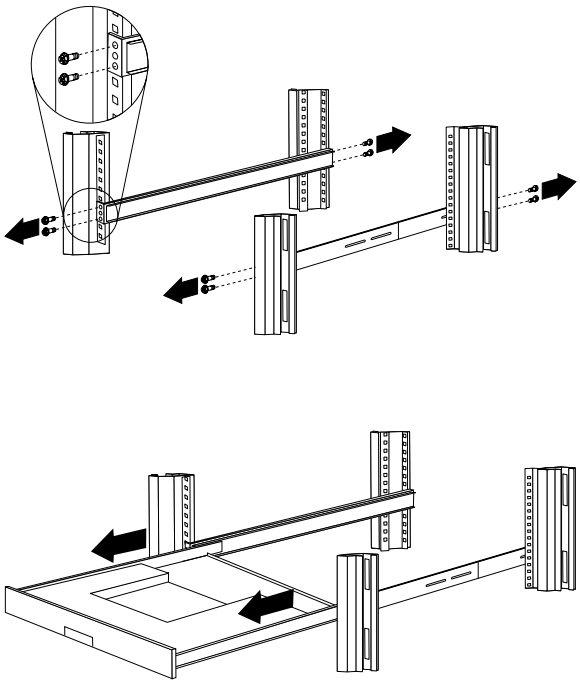
Keyboard tray



To remove the tray from the side rails, pull up on the left rail tab and push down on the right rail tab.

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Installing a flat panel monitor rack mount kit

You can store a T54 or T55 Flat Panel Monitor in a keyboard tray with the flat panel monitor rack mount kit. This kit requires an additional 2U of space above an installed keyboard tray in your rack cabinet. See the documentation that comes with the flat panel monitor rack mount kit for detailed installation instructions. Use the following general procedure to install a flat panel monitor in your rack cabinet:

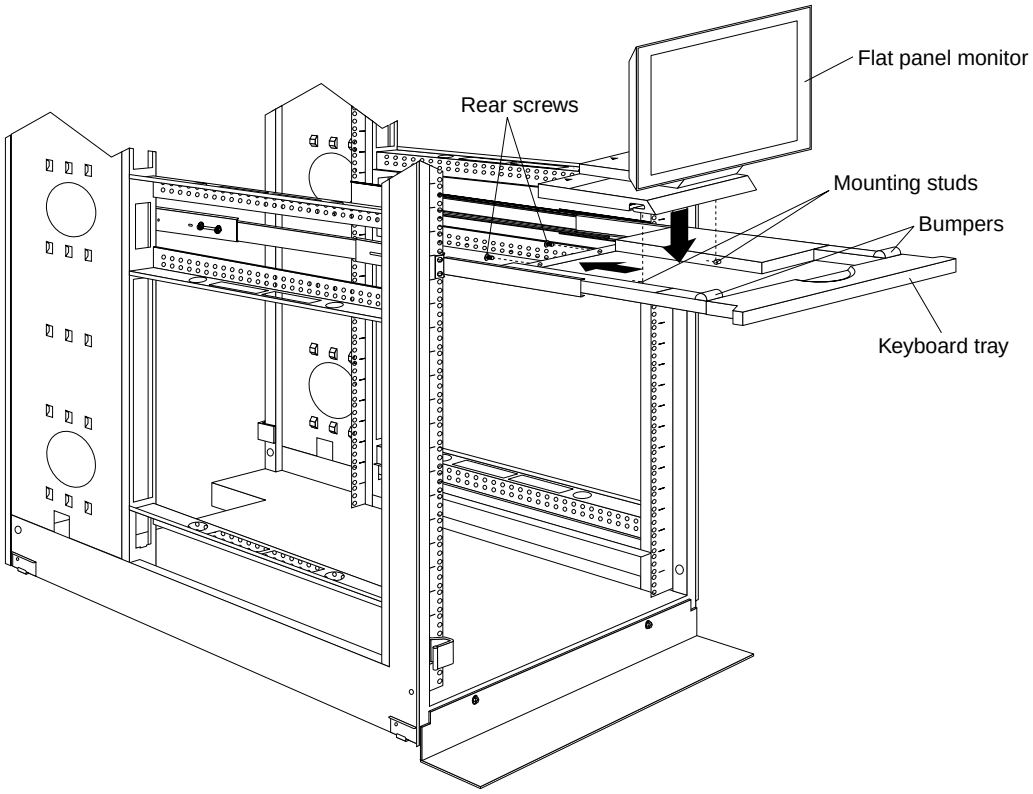

Figure 26. Installing a flat panel monitor rack mount kit

1. Ensure that a keyboard tray is properly installed in your rack cabinet (see “Keyboard tray” on page 60) with at least 2U of clearance above the keyboard tray.
2. Install the flat panel monitor base on the flat panel monitor. See the documentation that comes with your flat panel monitor rack mount kit for detailed installation instructions.
3. Install the mounting studs and bumpers on the keyboard tray.
4. Attach the monitor base to the inside of the keyboard tray using the screws that come with the rack mount kit.
5. Fold the monitor all the way down against the bumpers; then, slide the keyboard tray into the rack cabinet to ensure that there is proper clearance.
6. See the documentation that comes with your flat panel monitor for information on how to connect power and how to connect the monitor to a server or console switch.

Removing the existing flat panel monitor stand

Use the following steps to remove the existing flat panel monitor stand from your monitor:

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1. Unplug the flat panel monitor and disconnect the power cord from the flat panel monitor power supply.
2. Carefully use a flat-blade screwdriver to pry the bottom of the cable cover **1** up and remove it. Save the cable cover for later reinstallation.

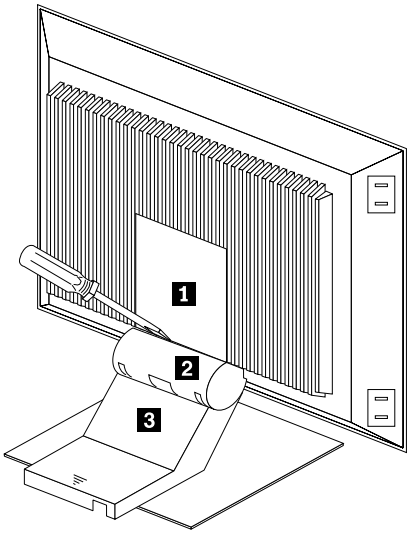

Figure 27. Removing the cable cover, hinge cover, and stand cover

3. Squeeze the sides of the hinge cover **2** and remove it.

   Note: Even though this hinge cover is not used with the Flat Panel Monitor Rack Mount Kit, do not discard it. Store it with the other monitor stand parts you remove for possible future use.
4. Gently push the stand cover **3** and slide it backwards until it is completely off the stand.
5. Disconnect the signal cable and power cord from the flat panel monitor. Carefully remove and save the plastic cable clamp to free the power cord.

   Note: The plastic cable clamp is reusable and is needed to secure the power cord after installing the Flat Panel Monitor Rack Mount Kit on the flat panel monitor.

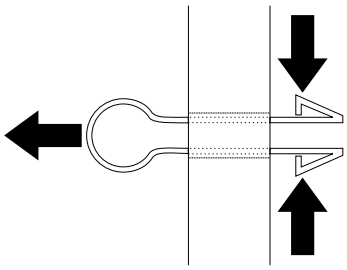

Figure 28. Removing the plastic cable clamp

6. Lay the monitor facedown on a cushioned surface and remove the six screws that secure the hinges to the flat panel monitor.

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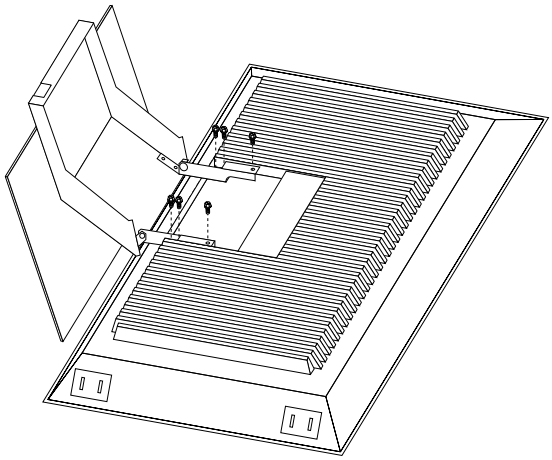

Figure 29. Removing the existing monitor stand from the monitor

7. Lift off the hinge and monitor stand assembly. Store this assembly in a safe place for possible future use.

Installing the new monitor stand

Refer to "Removing the existing flat panel monitor stand" on page 61 for instructions on how to remove the existing stand from the flat panel monitor. Before installing the new stand, install the keyboard tray in the rack according to the instructions that come with the rack or the keyboard tray option.

Note: The Flat Panel Monitor Rack Mount Kit and keyboard tray require 3U of rack mounting space. If the keyboard tray does not have at least 2U of clearance above it, relocate the keyboard tray within the rack.

Use the following steps to install the Flat Panel Monitor Rack Mount Kit:

1. Remove the cable cover **1** from the new monitor stand; then, remove the four screws (two per hinge) that secure the hinges **2** to the stand.

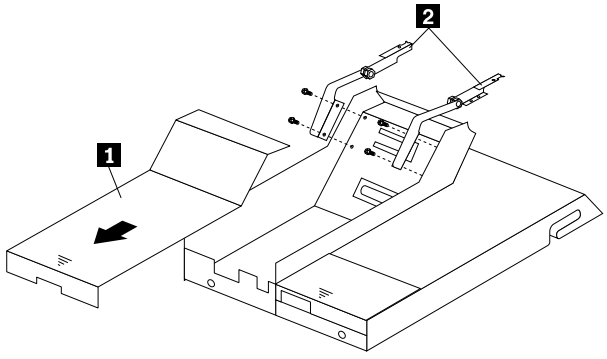

Figure 30. Removing the hinges from the new monitor stand

2. Install the hinges on the flat panel monitor, using the six screws that you removed from the old monitor stand.

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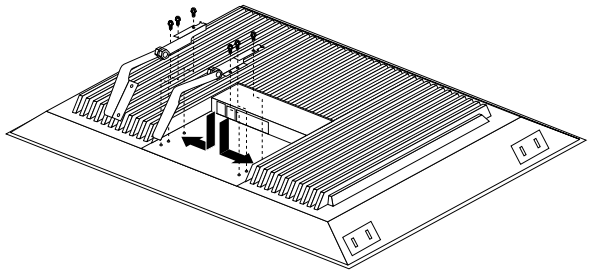

Figure 31. Installing the hinges on the flat panel monitor

Note: Be sure to slide each hinge into place on the back of the monitor and align the holes in the hinges with holes on the monitor.

3. Lower the flat panel monitor onto the new monitor stand, making sure that you align the holes in the stand with holes in the hinges; then, secure the flat panel monitor to the monitor stand with the four screws that you removed earlier.

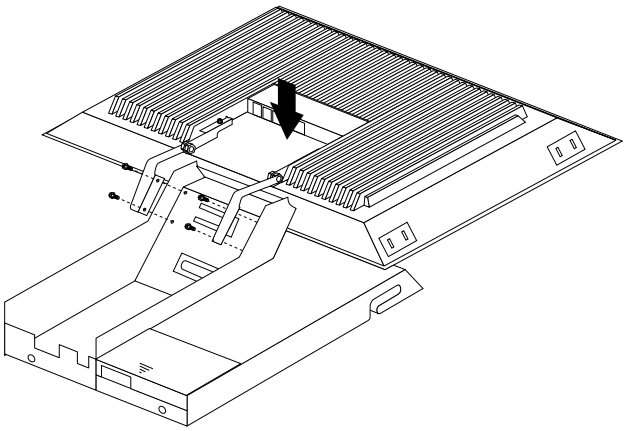

Figure 32. Installing the monitor on the new monitor stand

You have now finished attaching the flat panel monitor to its stand. The rest of the installation process involves preparing the keyboard tray for storage and routing cables.

Notes:

a. You must remove any keyboard or mouse that is already in the keyboard tray before continuing.

b. You will not be able to store a mouse in the keyboard tray after installing the Flat Panel Monitor Rack Mount Kit.

c. You can only store a space-saver keyboard in the keyboard tray.

4. Install the mounting studs **2** and bumpers **3** that come in the monitor mounting hardware package.

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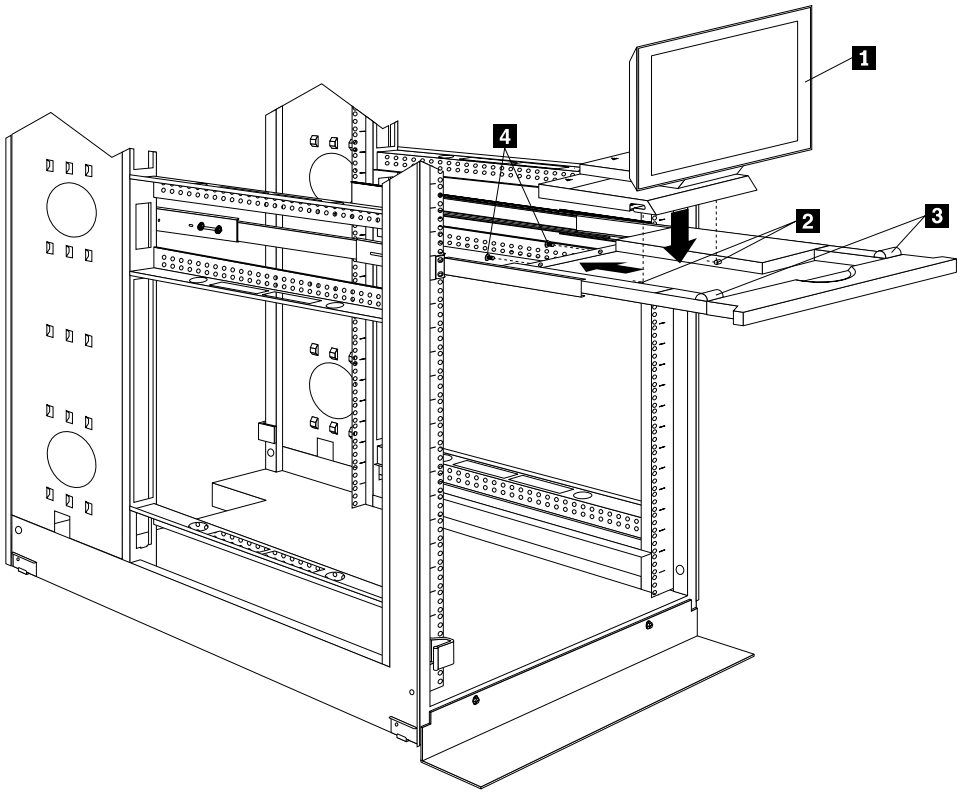

Figure 33. Installing the flat panel monitor in the keyboard tray

Note: Clean the installation area on the keyboard tray with a suitable cleaning agent, such as alcohol, before installing the rubber bumpers on the front of the keyboard tray.

5. Open the flat panel monitor 1 to its full upright position and align the grooves in the stand with the mounting studs 2 in the keyboard tray. When the monitor stand is sitting inside the keyboard tray, slide it towards the back until it stops.

   Note: Install or remove the flat panel monitor only when the display is in its upright position.

6. Secure the monitor stand in the back of the keyboard tray with the two provided screws 4 .

7. Place the flat panel monitor power supply, which came with your flat panel monitor, inside the monitor stand. If necessary, insert the power supply spacer 3 behind the power supply and over the cable to keep the power supply in place.

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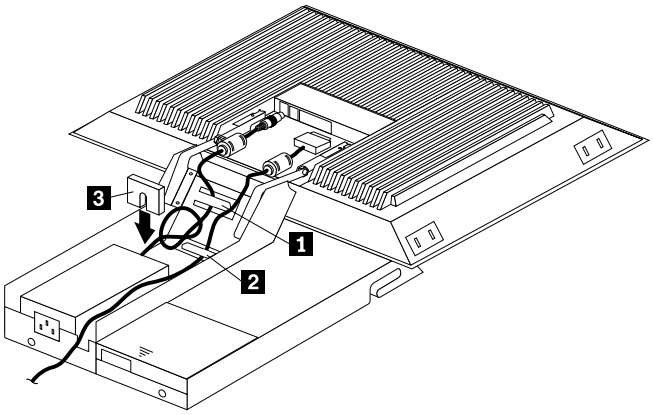


Figure 34. Storing the power supply and routing cables

8. Connect the power supply to the monitor and route the cable under the tab near the top of the monitor stand **1** ; then, secure the power cable with the cable clamp you removed from the original stand and coil excess cable inside the monitor stand.
9. Connect the monitor signal cable to the monitor and route it under the tab in the bottom of the monitor stand **2** and out the back of the stand through the hole provided.
10. Replace the monitor stand cover **1** .

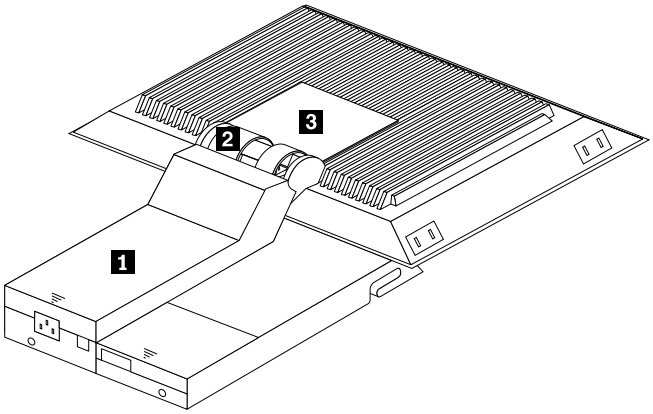
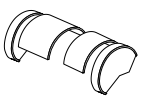


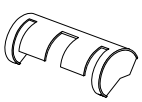
Figure 35. Installing the cable cover, hinge cover, and stand cover

11. Snap the new hinge cover **2** into place over the hinge assembly.

    Note: Be sure to use the new hinge cover that comes with the Flat Panel Monitor Rack Mount Kit because it has deeper grooves to accommodate the new hinge assembly.



New hinge cover



Old hinge cover

12. Snap the cable cover **3** into place on the back of the flat panel monitor.
13. Fold the flat panel monitor down until it rests on the rubber bumpers; then, gently push back and remove the small cable exit cover **1** on the monitor stand.

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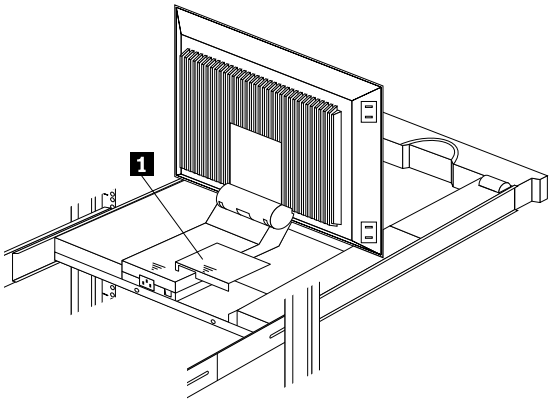

Figure 36. Routing the keyboard cable

14. Route the space-saver keyboard cable through the hole in the front of the base and out the opening in the back where you removed the small cover; then, place the keyboard (with its adjustable feet fully down) inside the keyboard tray.

    Note: You must open the flat panel monitor to its full upright position so that you can install the keyboard and route its cable.

15. Fold the flat panel monitor down again until it rests on the rubber bumpers; then, reinstall the small cable exit cover **1** .

16. Slide the keyboard tray into the rack; then, neatly route and secure all cables in the rack using the provided cable straps.

    You can now connect the power cord to the flat panel monitor and connect the display to a server.

Starting the system

Start the system by:

1. Power-on the selector switch(s).
2. Power-on the monitor.
3. Power-on the servers.

Note: The selector switch must be powered on first, then the servers. This is to assure that the device drivers for the servers send device settings to the selector switch.

When the selector switch is powered on, it:

- Identifies the mouse and keyboard and puts them into default status.
- Switches to port 1 by default, and displays the number '1' in the status flag field on the monitor.

Configuring the selector switch

Note: For information about the IBM NetBAY Console Switch, see “IBM NetBAY console switch” on page 129.

Note: Some selector switch units have different functions and displays. Refer to the Apex PC Solutions® Outlook™ Concentrator User Guide. This guide is shipped with the selector switch unit.

No configuration is necessary for normal switch operation.

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Switch configuration can be performed to:

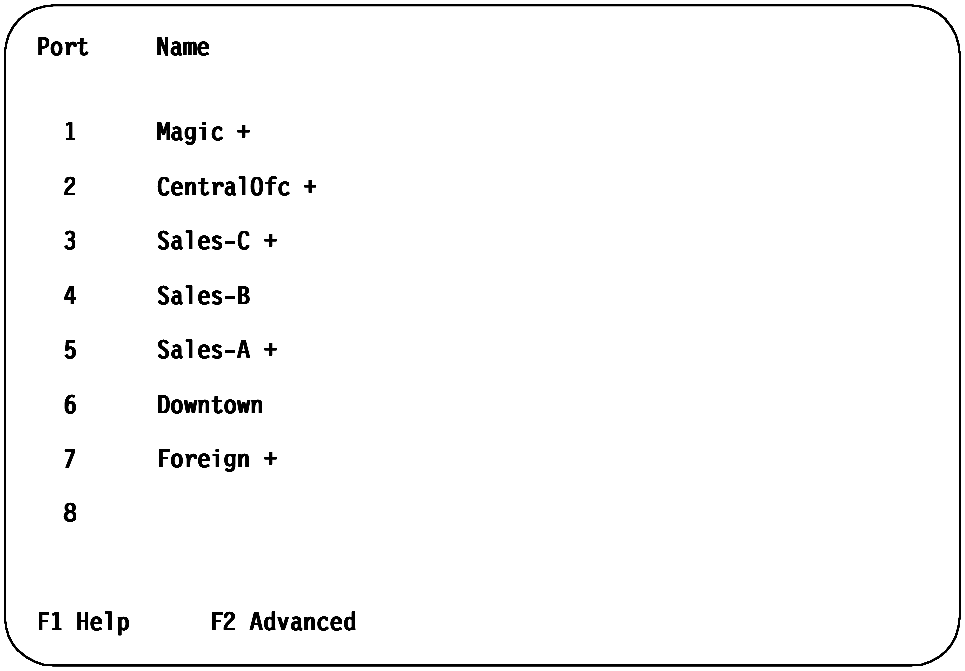
- Assign unique names to servers.
- Display servers by their assigned port names and port numbers.

Switching among servers

To switch among servers:

- Press the **Print Screen** key.
- Type the port number of the server to be switched.
- Press **Enter**.

  Note: One depression of the Print Screen key starts the switching process. To print a screen, depress the **Print Screen** key twice.



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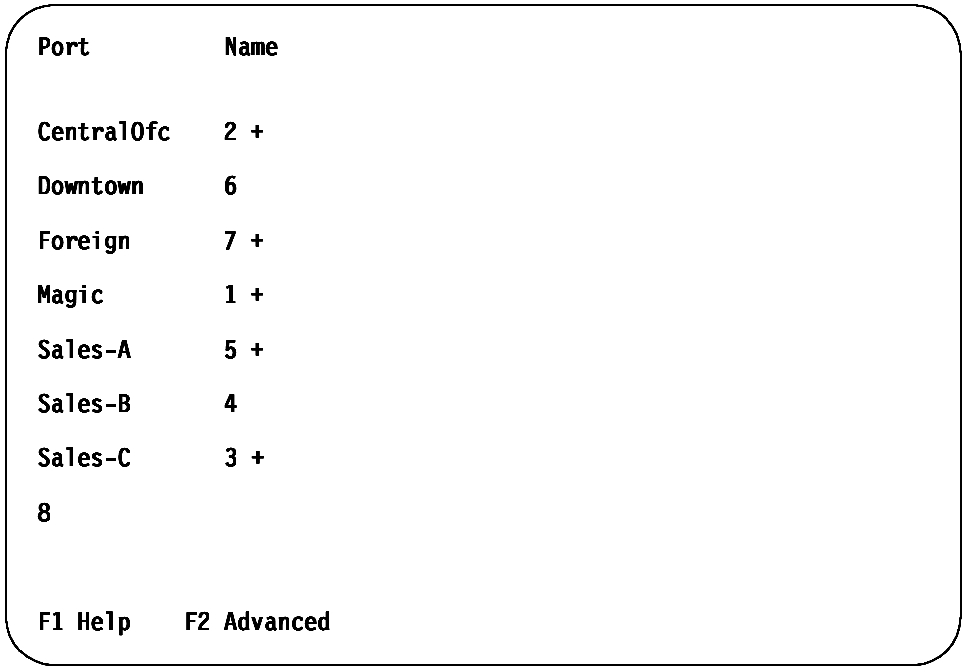

- Using the Up Arrow (↑) and Down Arrow (↓), select the server you want to switch to, or press the numeric key that corresponds to the server's port number and then press Enter.

The symbols after the Port or Name columns on the menu show the status of the port as follows:

Type of Symbol	Symbol	Meaning
Plus	+	Server connected and running
Asterisk	*	Secondary selector switch connected and running

Advanced selector switch functions

System configuration is performed through the keyboard and menus to include these advanced selector switch functions:

- Scanning the servers
- Displaying server BIOS versions and settings
- Saving the hardware configuration
- Resetting the mouse and keyboard
- Setting a scan pattern
- Assigning unique names to the servers
- Listing servers by name or port number (Changing Menu Attributes)
- Changing the position and color of the operation menus and windows (Changing Flag Attributes)
- Assigning a specific monitor type to a certain port (server)

Scanning the servers: To place the selector switch in scan mode:

- Press the **Print Screen** key.

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- Press the **F2** key to display the Advanced Menu screen.
- Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Scan** and press **Enter**. The selector switch enters the scan mode and the display returns to the status flag. To cancel the operation, press Esc any time before you press Enter.
- To cancel the scan mode, press any key or move the mouse. The scan stops at the currently connected server.

Displaying version information and device settings: The selector switch BIOS version number along with keyboard and mouse information can be displayed for the currently selected server.

- Press the **Print Screen** key.
- Press the **F2** key to display the Advanced Menu screen.
- Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Version** and press **Enter**.

```
Version

BIOS       X.XX
Hardware   X X
Port 1     Magic 1


Keyboard   Mouse
Enabled    Enabled
Rate  2C   Rate  100
LEDs  2    Res  2
Mode  2
Type  101  Type  Gen
```

Keyboard information includes:

— Enabled or disabled
— Typematic rate
— LED settings
— Port mode
— Keyboard type.

Mouse information includes:

— Enabled or disabled
— Sample rate
— Resolution
— Mouse type

- Press **Esc** to remove the Version menu.

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Saving hardware configuration: Whenever servers are added to or removed from the configuration, or whenever there is a change in the mouse or monitor, save the hardware configuration setting by:

1. Press the **Print Screen** key.
2. Press the **F2** key to display the Advanced Menu screen.
3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Snapshot** and press the **Enter** key. The hardware settings are saved to memory.

Important: If the settings are not saved and the selector switch power is lost, it might be necessary to restart each server in the configuration to reestablish keyboard and mouse communications.

Resetting the mouse and keyboard: Resetting the mouse and keyboard restores the default setting for the selected server.

- Press the **Print Screen** key.
- Press the **F2** key to display the Advanced Menu screen.
- Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Reset** and press the **Enter** key. The mouse and keyboard are now reset.

Setting a scan pattern: The selector switch has a standard scan routine for sequentially connecting each server to the monitor, keyboard, and mouse. The scan routine can be configured to scan all or any of the servers in a particular pattern. To create a scan pattern, do the following.

1. Press the **Print Screen** key.
2. Press the **F2** key to display the Advanced Menu screen. Press the Right Arrow (→) key to move the highlight to the **Setup Menu**.
3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Scan** and press the **Enter** key. The Scan Pattern Setup menu appears with the first port position or server name highlighted. The following example screen displays when the port order mode is selected.

```
Scan Pattern Setup

Port/Sec    Name
6/20        Downtown
5/20        Sales-A
4/10        Sales-B
1/10        Match


F2 for defaults
```

   If Name order was selected, the Port and Name columns will be reversed.

4. Using the keyboard keys, select the port number of the first server to be included in the scan. Note that the server name, if any is assigned, appears in the far right column on the menu.
5. Press the Tab key or Right Arrow (→) key to move the highlighting to the Sec column. Then, use the keyboard keys to enter a time value, in seconds, for the

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length of time you want this server to be connected to the monitor and keyboard, before switching to the next server in the scan.

6. Press the Down Arrow (↓) key to move the highlighting to the next port in the Port column and repeat step 5.

   To delete unwanted ports from the scan list in the Scan Pattern Setup window, place the highlighting on the top-most port to be removed and press the **Delete** key (not the Del key on the numeric keypad).

7. When you have finished setting the scan pattern, press the **Enter** key. Press Esc at any time before pressing Enter to retain the previous scan pattern.

   Note: Pressing the F2 key will return all Port and Sec values to the factory defaults.

8. To exit, press **Esc**.

Assigning unique names to servers: Unique names can be given to servers and secondary selector switches. To assign names:

1. Press the **Print Screen** key.
2. Press the **F2** key to display the Advanced Menu screen.

   Press the Right Arrow (→) key to move the highlight to the **Setup Menu**.

3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Names** and press the **Enter** key. The Port Naming menu appears, as shown below.

```
Port Naming

Port        Name
1           MAGIC
2           CENTRALOFC
3           SALES-C
4           SALES-B
5           SALES-A
6           DOWNTOWN
7           FOREIGN
8
```

4. Move the highlighting to the Port entry for which the server name is to be entered or changed. Type in the name of the server using up to 12 alphanumeric characters.

   Note: Legal characters are A-Z, 0-9, and the dash character. Lowercase letters are converted to uppercase. Press the Backspace key to delete an incorrect entry.

5. If necessary, repeat step 4 for each of the servers that are to be named.
6. Press the **Enter** key to save the server names in nonvolatile RAM. Press Esc at any time before pressing Enter to cancel the operation.
7. To exit, press **Esc**.

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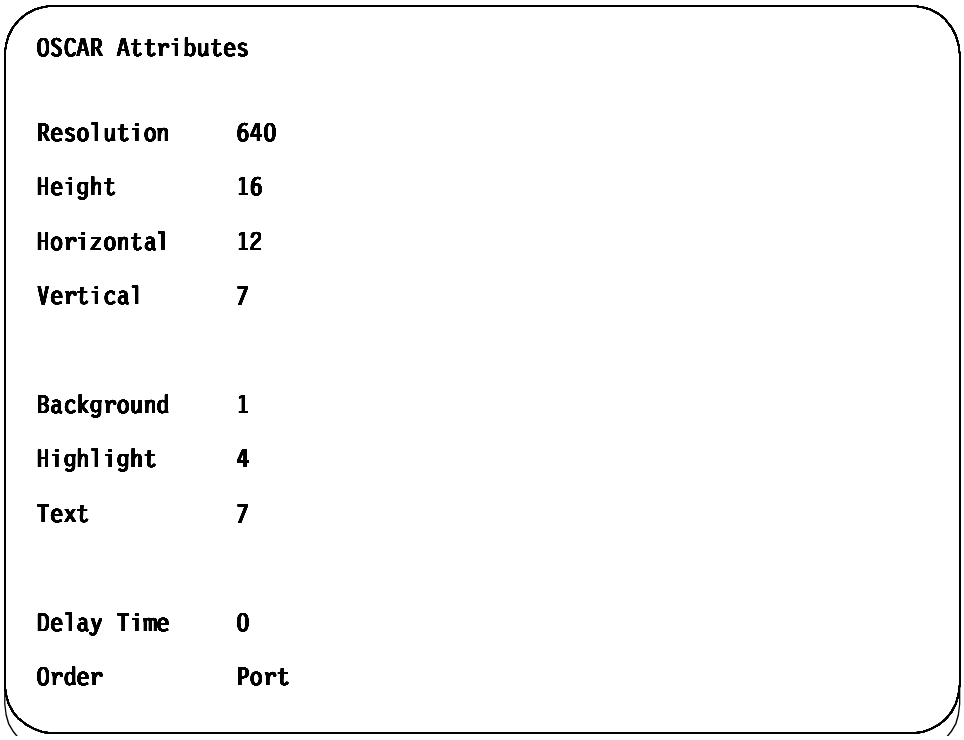
Changing menu attributes: The menus displayed on the monitor can be altered in visual appearance to suit the particular use of the system. You can:

- Position the menu in a convenient location on the display.
- List servers by port or by name, whichever is desired, in the appropriate menus.
- Adjust character height.
- Change colors.
- Display the selection menu for a certain period.

To change the menu attributes, do the following:

- Press the **Print Screen** key.
- Press the **F2** key to display the Advanced Menu screen. Press the Right Arrow (→) key to move the highlighting to the Setup list.
- Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **OSCAR**™. (On Screen Configuration and Activity Reporting) and press the **Enter** key. The following Attribute menu appears.



- Highlight the settings you want to change and use the + or - keys to change the values. As you select different values, the effect of the changes is reflected immediately on the display.
- When all changes are completed, press the **Enter** key to save the changes to nonvolatile RAM. Press Esc at any time before pressing Enter to cancel the operation and retain the previous settings.

  Note: It is possible, while changing the attributes, to garble the menu and windows, making it difficult to correct. If this occurs, reset the selector switch to its default values by pressing the following keys in this order:

  1. Esc
  2. Esc
  3. Print Screen

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4. F10
5. Y
6. Enter

Available menu attributes:

Setting	Effect on Menu or Window Appearance
Resolution	Affects the size of the menu and windows as they appear on the display. Choose from values of 320, 480, and 640. The lower the value, the larger the size.
Height	Affects the size of the text in the menu and windows. The larger the value, the larger the text.
Horizontal/Vertical	Determines the position of the menu or window on the screen.
Background	Determines the menu or window background color.
Highlight	Determines the menu or window highlight bar color.
Text	Determines the menu or window text color.
Delay Time	Sets the time in seconds that the OSCAR selection window is delayed before appearing after the Print Screen key is pressed. This delay may be increased so that the menu is not a distraction when performing simple server switching operations at the keyboard.
Order	Determines the order which the servers are listed, numerically by port or alphabetically by assigned name.

Changing the status flag attributes: The status flag shows the currently connected server and can be set to appear on the screen whenever the system is operating. You can alter how and where the flag appears on the screen by changing one or more of the following attributes:

- Appearance on the screen: none, timed, or constant
- Position on the screen
- Color and opaqueness

To change the flag attributes, do the following:

1. Press the **Print Screen** key.
2. Press the**F2** key to display the Advanced Menu screen. Press the Right Arrow (→) key to move the highlighting to the **Setup** menu.
3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlight to **Flag** and press the **Enter** key.

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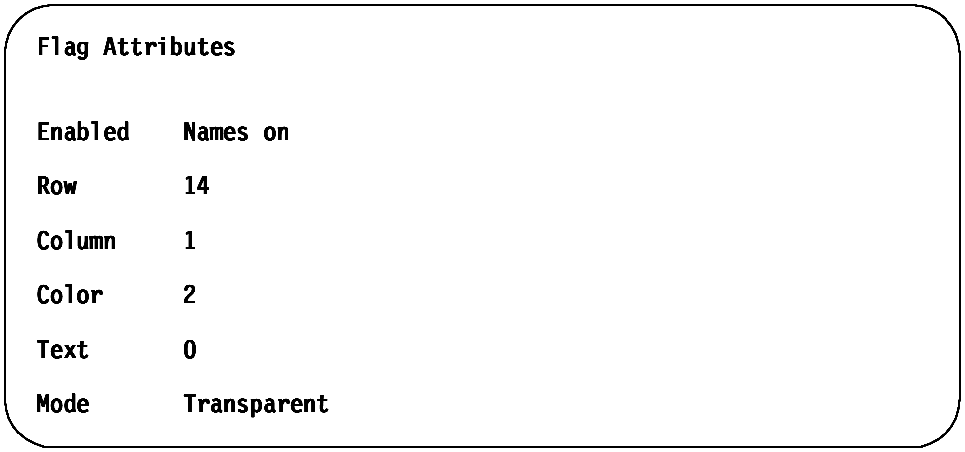

4. Highlight the setting to be changed and use the + and - keys to adjust the values. The following table describes each of the available menu attributes:

Setting	Values and Effect on Flag Appearance
Enabled	Flags Off = Flag does not appear
	Ports On = Flag shows the connected port number
	Names On = Flag shows the connected server by name
	Ports Timed = Port number displays for five seconds after connection
	Names Timed = Name displays for five seconds after connection
Row	Select values from 0–14 to position the flag vertically on the screen
Column	Select values from 0–25 to position the flag horizontally on the screen
Color	Select values from 0–7 for the flag color.
Text	Select values from 0–7 for the flag text color
Mode	Choose between Opaque and Transparent

5. Press the **Enter** key to save the settings. Press Esc at anytime before pressing Enter to cancel the operation and save the previous settings.
6. Press **Esc** to exit.

Assigning specific device types: In situations where one or more servers need a special type of monitor device, it might be necessary to assign that device type to the port number associated with the server.

Note: When tiering, you must make the primary selector switch aware of the secondaries through the assignment.

Assign a device type as follows:

1. Press the **Print Screen** key.
2. Press the **F2** key to display the Advanced Menu screen. Press the Right Arrow (→) key to move the highlighting to the Setup menu.
3. Using the Up Arrow (↑) and Down Arrow (↓) keys, move the highlighting to **Devices** and press the **Enter** key. The following menu appears:

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```
Device Settings

Port      Monitor
1         SVGA
2         SVGA
3         8515
4         SVGA
5         Default
6         Default
7         Default
8         8port
```

4. To assign a monitor type, highlight the port you want and use the + or - keys to select the value that corresponds to the particular monitor.

   To assign a secondary selector switch to a port, highlight the port and use the + or - keys to obtain the appropriate 8port value.

5. Press the **Enter** key to save the settings. Press Esc at any time before pressing Enter to cancel the operation.

6. Press **Esc** to remove the Advanced Menu from the screen.

Resetting the selector switch

The selector switch can be reset by depressing the Reset button on the back panel of the selector switch.

Note: Pressing the reset button might recover the device settings without having to power-off, then power-on all the servers.

Making connections under power

Additional servers, can be connected to the selector switch while the selector switch is running.

Failed devices such as a keyboard or mouse can be connected to a running selector switch.

Note: When new devices are connected, the selector switch recognizes it and configures it to the settings of the currently selected server.

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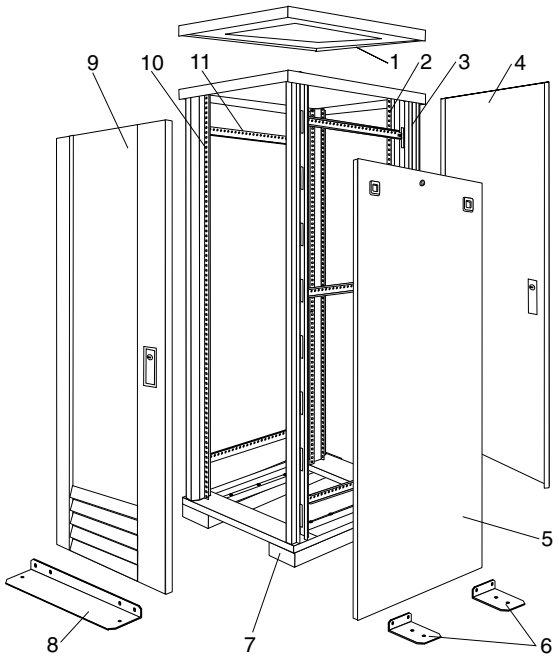
Parts listing (Type 9306 Model 900/910)



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Index	Rack Enclosure (Type 9306 Model 900/910)	FRU
1	Top Cover including cover standoffs and screws	12J4481
2	Rear EIA Rail (1) includes mounting hardware	76H4956
3	Rack Frame	76H4959
	Caster (1)	12J4466
	Leveler (1)	76H4960
4	Rear Door Assembly including latch and lock	12J4478
5	Side Panel Assembly (option for model 900, standard for model 910) including latches and lock	76H4949
6	Stabilizer Bar (1)	12J4467
7	Caster Extension Plinth (1)	12J4482
8	Front Stabilizer (1)	12J4485
9	Front Door Assembly (model 900 only) including latch and lock	76H4942
9	Front Door Assembly (model 910 only) including latch and lock	12J4478
10	Front EIA Rail (1) includes mounting hardware	76H4951
11	Side Brace (1)	12J4477
	Front/Rear Door Hinge with Pin (1)	76H4966
	Front/Rear Door Latch with Lock and Keys	76H4967
	Front/Rear Door Striker Plate (1) includes mounting hardware	12J4465
	Front/Rear Door Hinge Pin (1)	12J4469
	Label, EIA Unit Numbers	12J4471
	Miscellaneous Parts Kit - Includes:	76H4950
	M6X25 Pan Head Screw (1)	
	M6 Caged Nut (6)	
	M6X16 Combination Head Screw (6)	
	10-32 Flat Washer (6)	
	M6X12 Button Socket Head Cap Screw (5)	
	12mm Open End Wrench (1)	
	M6 Tinnerman Clip (2)	
	M6 Threaded Hex Spacer (1)	
	M6 Dome Nut (2)	
	M6 Flange Nut (5)	
	Soft Tie Wraps (10)	

Rack Enclosure (Type 9306 Model 900/910) Options	FRU
Monitor Housing	76H4947
Side Panel Lock with Keys	76H4965
Side Panel Latch	12J4468

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Rack Enclosure (Type 9306 Model 900/910) Options	FRU
Filler Panels: 1U, 3U, and 5U - with Hardware	12J4473
Keyboard Tray	76H4958
Keyboard Tray II	28L0562
Keyboard Tray II filler block	28L0567
Keyboard Slides (set) with Hardware	76H4961
Fixed Shelf with Hardware	76H4963
Rack to Rack Mounting Kit - Includes: Horizontal Trim (1); Vertical Trim (2); M6x16 Screws (12); M6 Cage Nuts (4); M6 Whiz nuts (10); Brackets, Rack Mounting (4)	12J4476
C13 - C14 Power Cable	07H0075
C19 - C14 Power Cable	76H4964
C13 - NEMA 5-15P Power Cable	76H4962
C19 - NEMA 5-15P Power CablE	12J4479
Video, Mouse, Keyboard Cable (7 feet)	06P6006
Video, Mouse, Keyboard Cable (12 feet)	06P6007
Video, Mouse, Keyboard Power Cable (25 feet)	12J4484
Mouse Extension Cable	07H0069
Keyboard Extension Cable	07H0067
Concentrator with Hardware (8 port)	76H4948
Concentrator with Hardware (4 port)	28L0543
1x4 switch	06P6003
2x8 switch	06P6004
NetBAY Rack Power Distribution Unit	09N9668
NetBAY Front-end Power Distribution Unit	09N9670
3-phase NEMA L21-30P line cord (200-250 Vac) for NetBAY Front-end PDU	24P6844
3-phase IEC 309-3P+N+Gnd line cord (380-415 Vac) for NetBAY Front-end PDU	24P6845
1-phase NEMA L5-30P line cord (100-127 Vac) for NetBAY Front-end PDU	24P6846
1-phase NEMA L6-30P line cord (200-240 Vac) for NetBAY Front-end PDU	24P6847
1-phase IEC 309-2P+Gnd line cord (200-240 Vac) for NetBAY Front-end PDU	24P6848
NetBAY Server Dual-cord Power Distribution Unit	09N9669
Hardware Kit for NetBAY Power Distribution Units	09N9671
Flat Panel Monitor Rack Mount Kit (T54A, models AG1, AW1; T55)	37L6888
Flat Panel Adapter Hinge - R.H. & L.H. (T54A, T55)	09N9678
Flat Panel Adapter Misc. Hardware Kit – Includes: Hinge Cover (1); Power Supply Cover (1); Mounting Stud (1); Bumper (2); Cable Access Cover (1); M4 X 12 Screw (4); M4 X 8 Screw (2); 14 inch Soft Tie Wrap (1); T54A power supply spacer (1)	00N8693
Flat Panel Adapter Display Housing – Includes: Power Supply Cover (1); Base Housing (1); Cable Access Cover (1); Bottom Stand	00N8694

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NetBAY 42 Enterprise Rack (Type 9308 Models 42P, 42X, 4SA, 4SB, 42S, 42E)

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Features

The IBM NetBAY 42 Enterprise Rack (Type 9308 – Models 42P, 42X, 4SA, 4SB, 42S, 42E) enclosure is an industry-standard, 19-inch rack cabinet that houses multiple IBM servers and related equipment.

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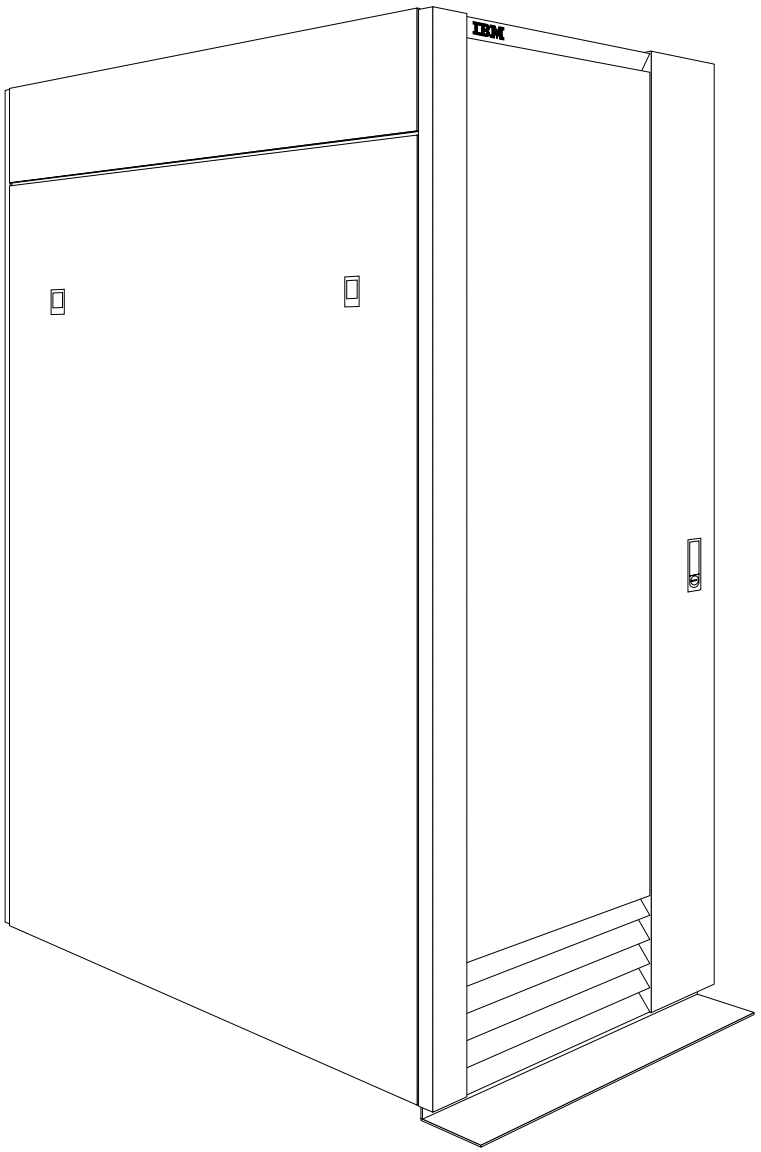
Primary Rack (Model 42P)



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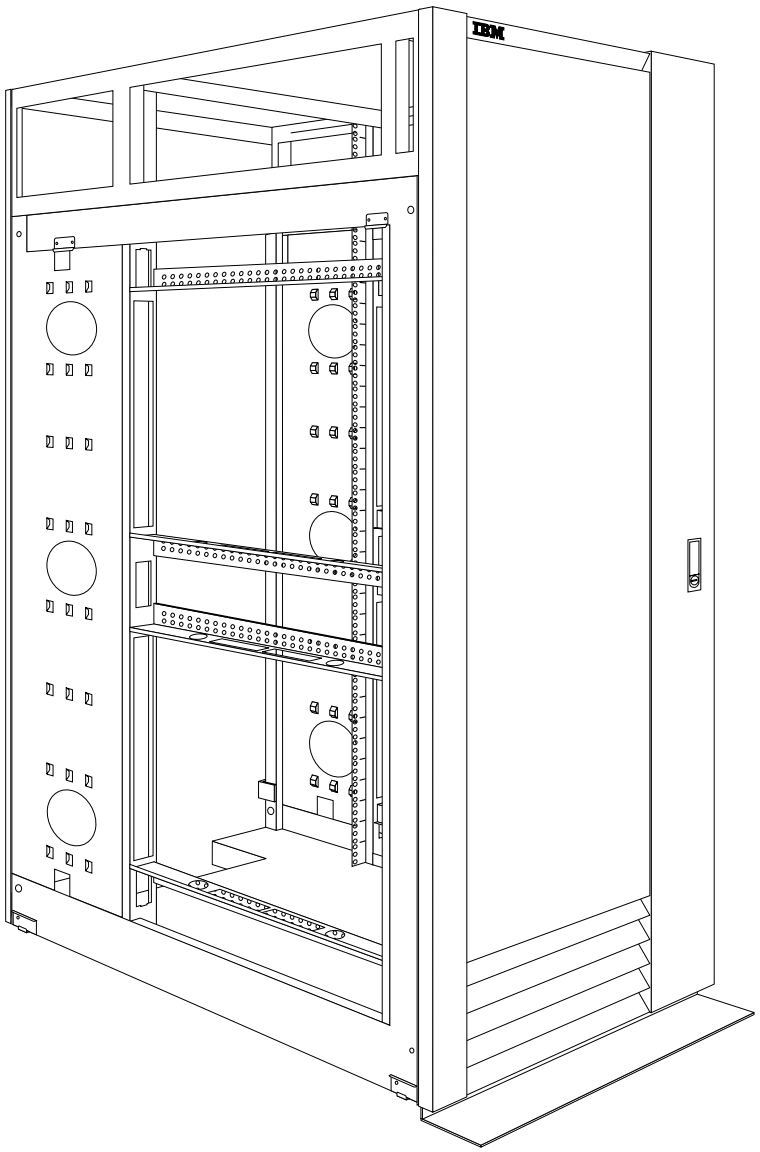
Extension Rack (Model 42X)



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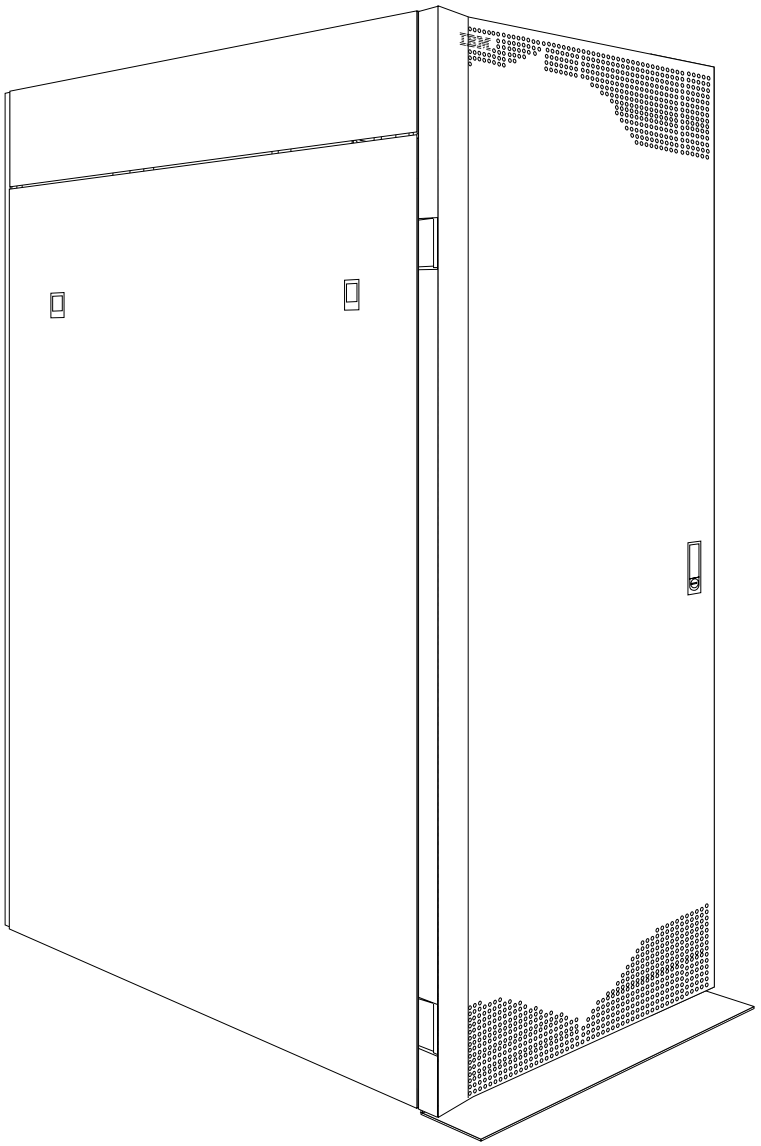
Primary Rack (42S)



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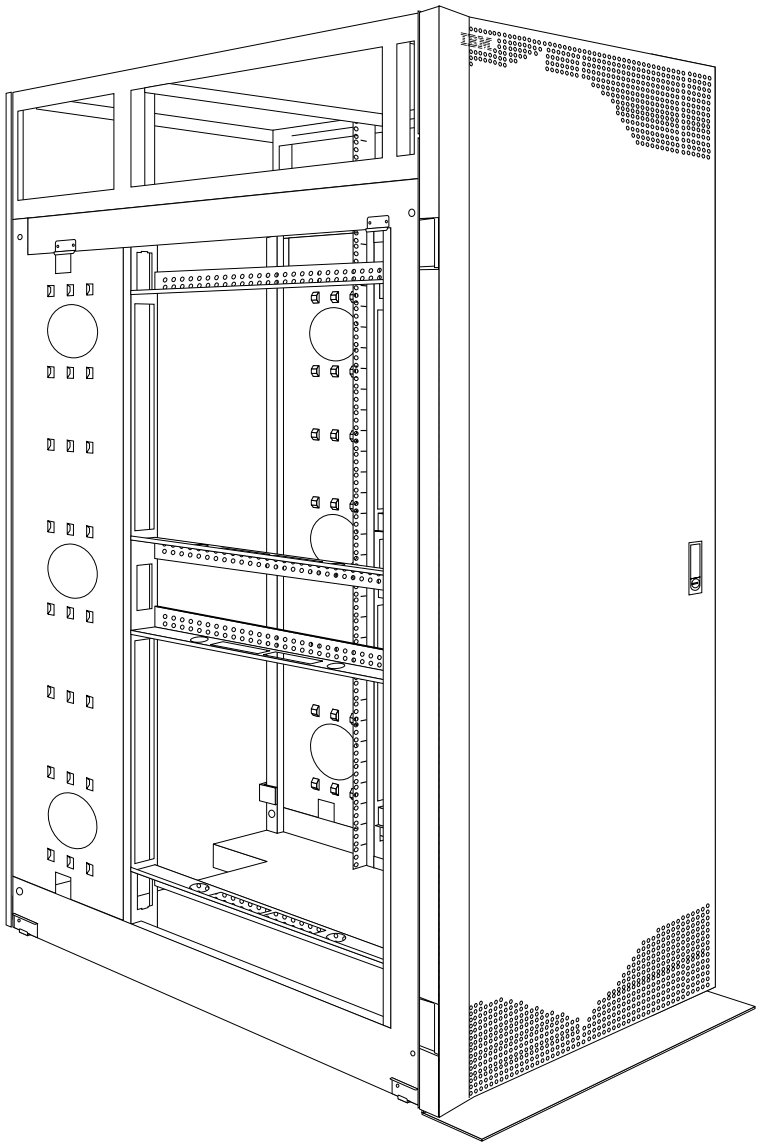
Expansion Rack (42E)



Locations

The following sections contain information on specific equipment locations.

Removing and installing panels

The primary rack cabinet comes with side panels installed. Remove the side panels from a primary rack cabinet, or the outermost rack cabinets in a suite, before you install or remove optional devices.

Note: You do not need to remove the top 6U side panels unless you are removing the top 6U portion of the rack cabinet.

Removing and installing the side panels

Use the following procedure to remove the rack side panels:

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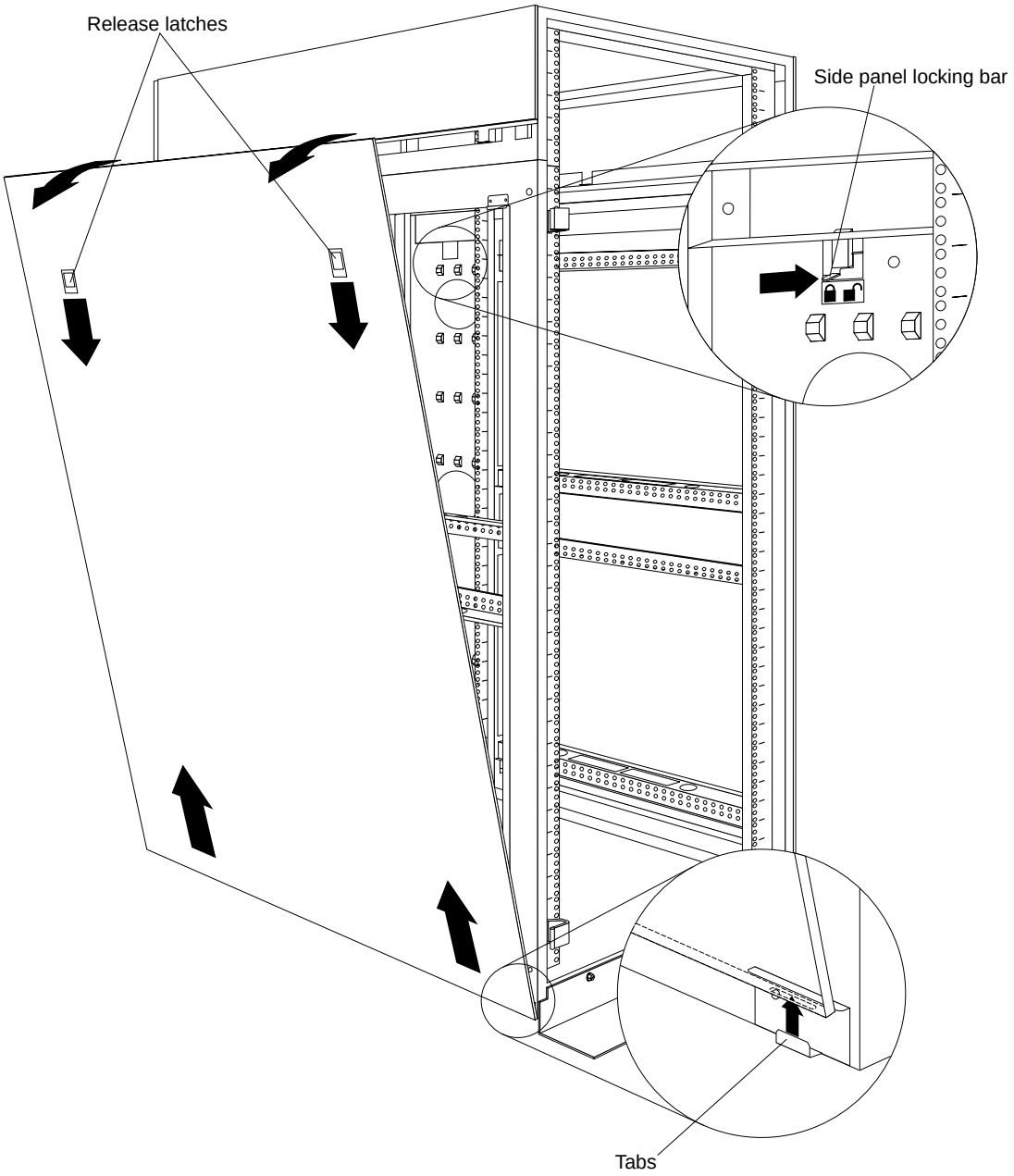

Figure 37. Removing the rack side panels

1. From the inside of the rear of the rack cabinet, slide the side panel locking bar toward the unlocked position.
2. Push down the release latches and tilt the side panel slightly toward you; then, lift the side panel away from the tabs on the bottom of the rack cabinet.
3. Repeat this procedure to remove both side panels.

Reverse this procedure to install the rack side panels. Slide the locking bar to the locked position to secure the side panel to the rack cabinet.

Removing and installing the top 6U side panels

Use the following procedure to remove the top 6U side panels from the rack cabinet:

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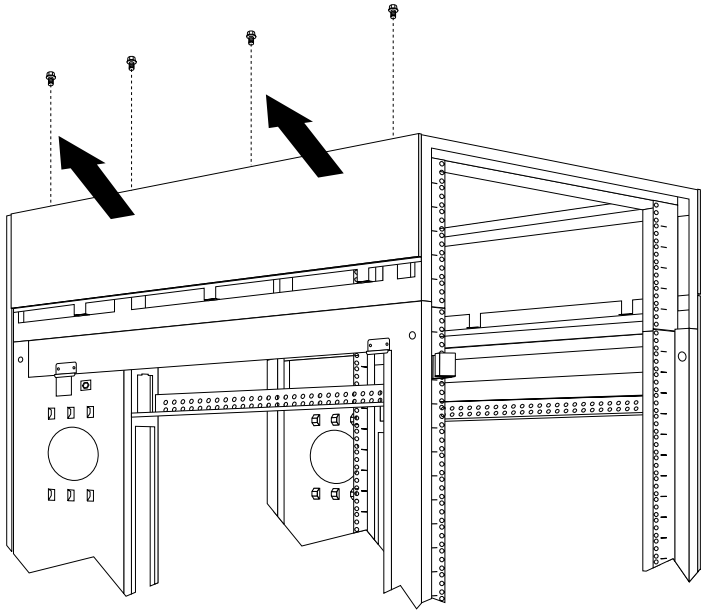

Figure 38. Removing the top 6U side panels from the rack cabinet

1. On the top of the rack cabinet, loosen the four screws that hold each side panel in place.
2. Tilt the side panel slightly toward you; then, remove it from the rack cabinet.
3. Repeat this procedure to remove both side panels.

Reverse this procedure to install the top 6U side panels on the rack cabinet.

Doors

The following instructions describe how to remove and install front and rear doors on the NetBAY42 Enterprise Rack (Type 9308 Models 42P, 42X, 4SA, 4SB, 42S, 42E):

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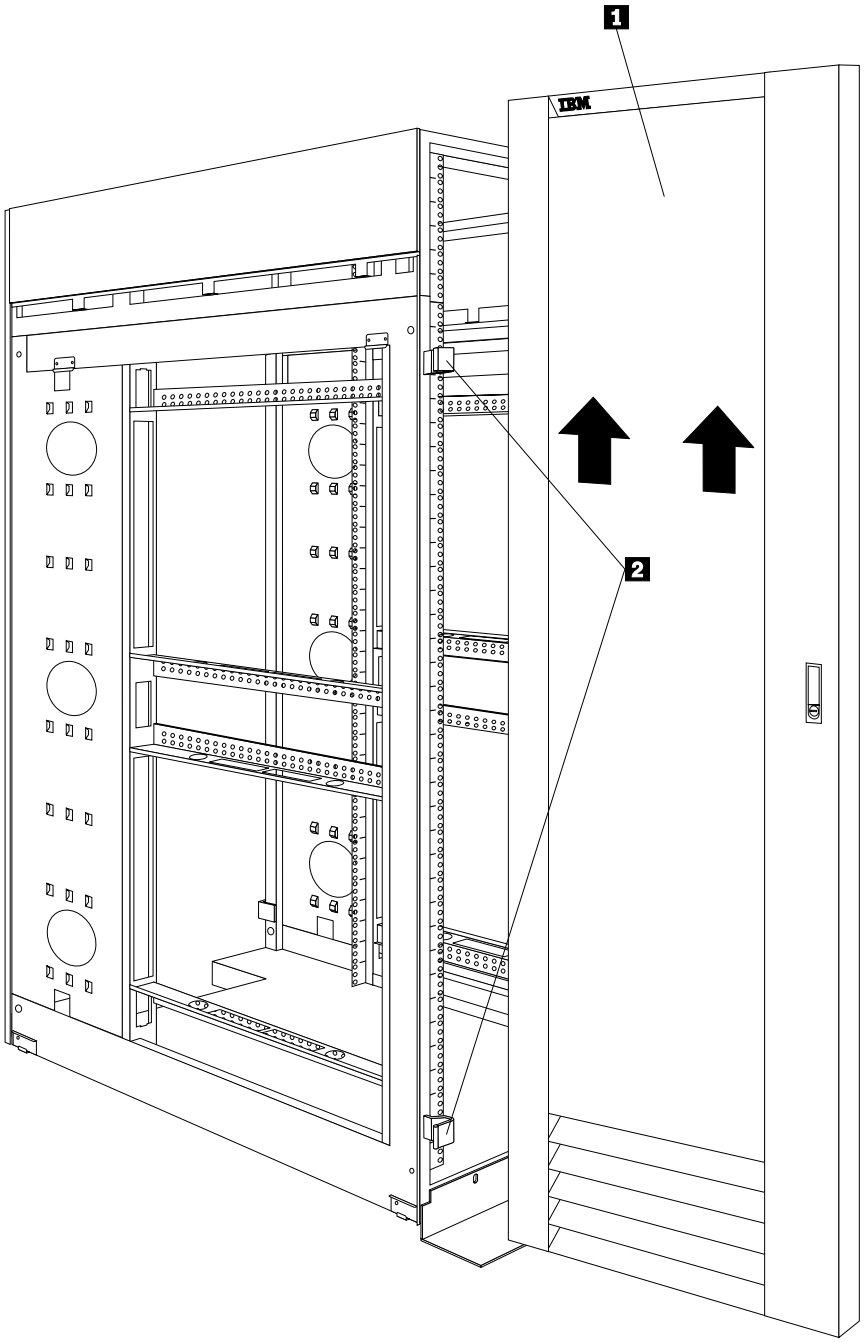
Front and rear doors – Models 42P, 42X, 4SA, 4SB



To remove a door:

1. Unlock the door and open it fully.
2. Grasp the door **1** firmly with both hands and lift it upwards until it is fully off of the hinges **2**.

Notes:

1. Reverse this procedure to reinstall front and rear doors.
2. The top hinge pin is longer than the bottom; engage it first when you reinstall doors.

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Rear door – Models 42S, 42E

Use the following procedure to remove a rear door from the rack cabinet:

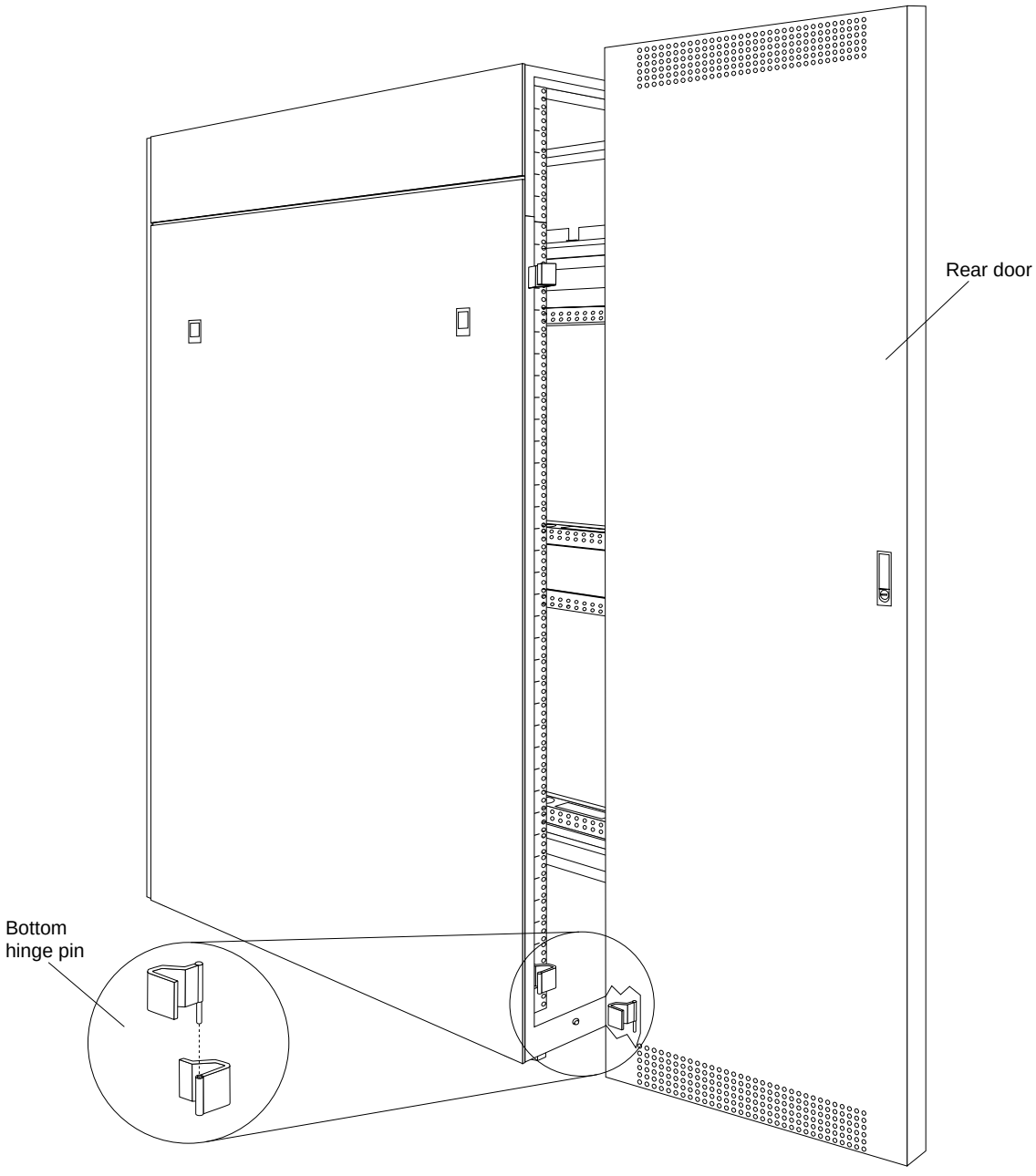

Figure 39. Removing a rear door from the rack cabinet

1. Unlock and open the rear door.
2. Grasp the door firmly with both hands and lift it upward and away from the hinges; then, set the door aside.

Reverse this procedure to install the rear door on the rack cabinet.

Attention: The bottom hinge pin on the rear door is longer than the top hinge pin. Ensure that you engage the bottom hinge pin first when you install a rear door on your rack cabinet.

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Front door – Models 42S, 42E

Use the following procedure to remove a front door from the rack cabinet:

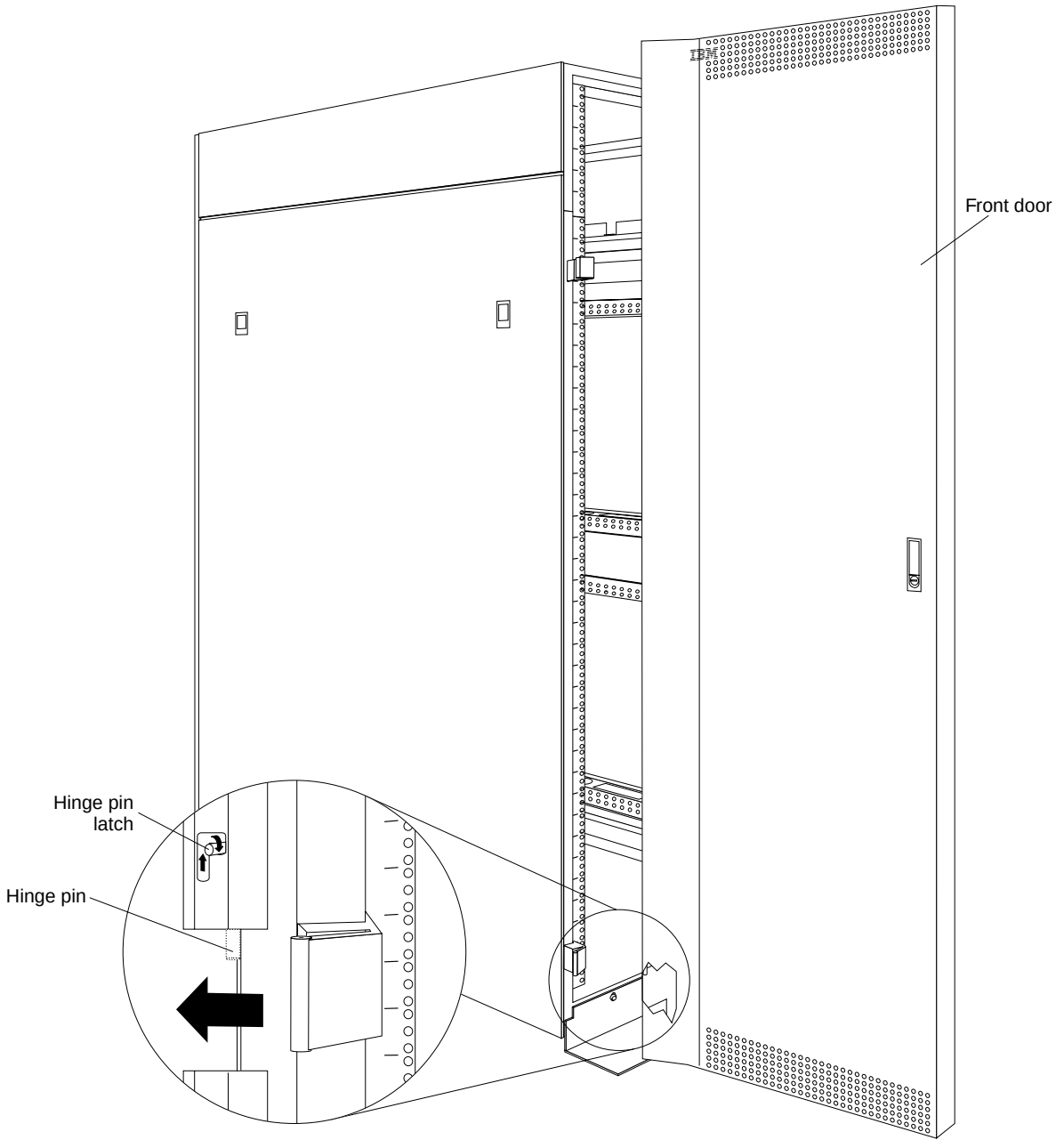

Figure 40. Removing a front door from the rack cabinet

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1. Unlock and open the front door.
2. While supporting the door, lift the bottom hinge-pin latch and move it clockwise to unlock the bottom hinge pin; then, unlock the top hinge pin.
3. Pull the door away from the rack cabinet; then, set the door aside.

Reverse this procedure to install the front door on the rack cabinet.

Attention: When you install the front door, ensure that you align the hinge pins with the hinges on the rack cabinet before you lock the hinge pins into place.

Removing and installing the top 6U portion of the rack

You can temporarily remove the top 6U portion (including the top cover) of the rack cabinet while you move the rack cabinet through some nonstandard doorways. You must first remove both doors according to “Doors” on page 87.

You will need two people to remove and install the top 6U portion of the rack cabinet according to the following procedure:

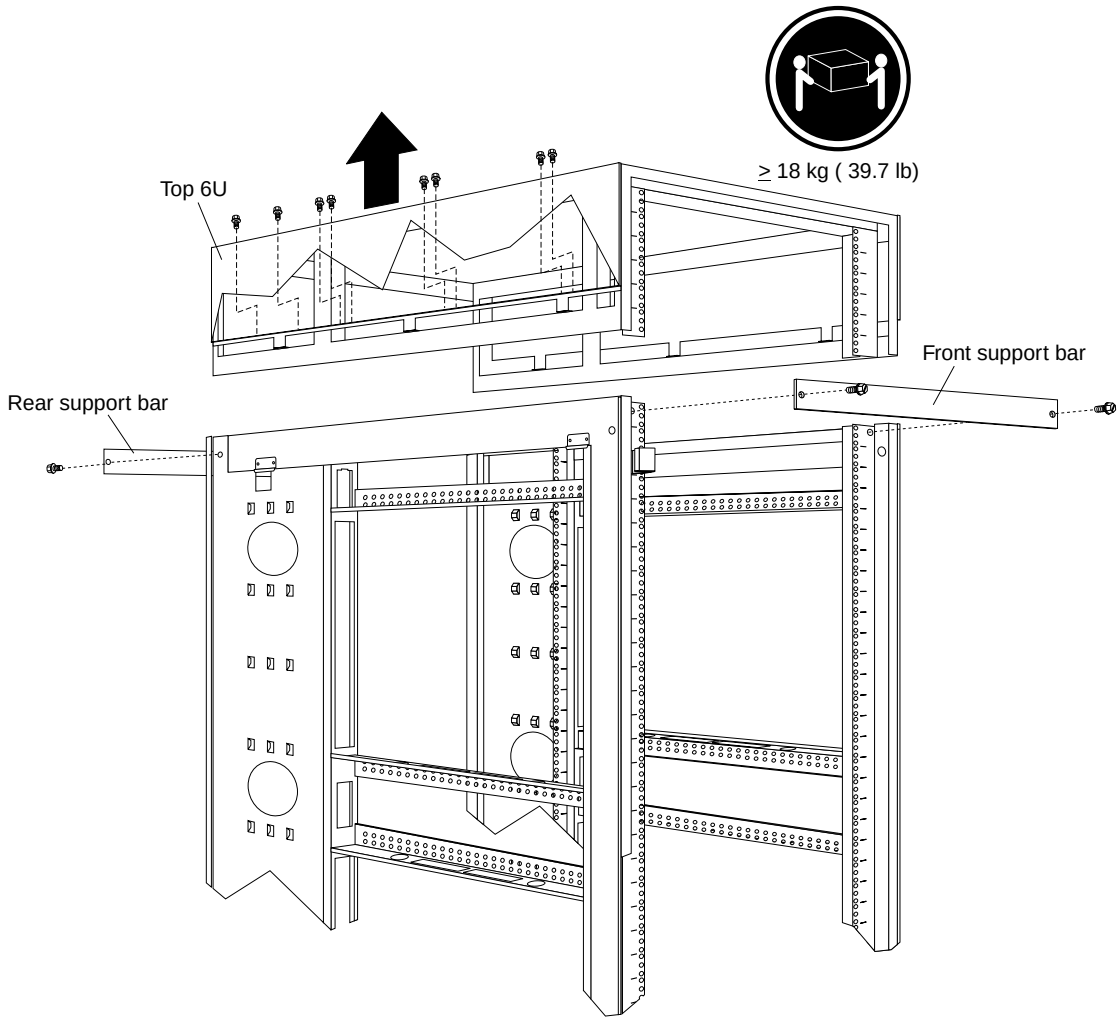

Figure 41. Removing the top 6U portion of the rack cabinet

1. Install support bars on the front and rear of the rack cabinet, using two screws per support bar.

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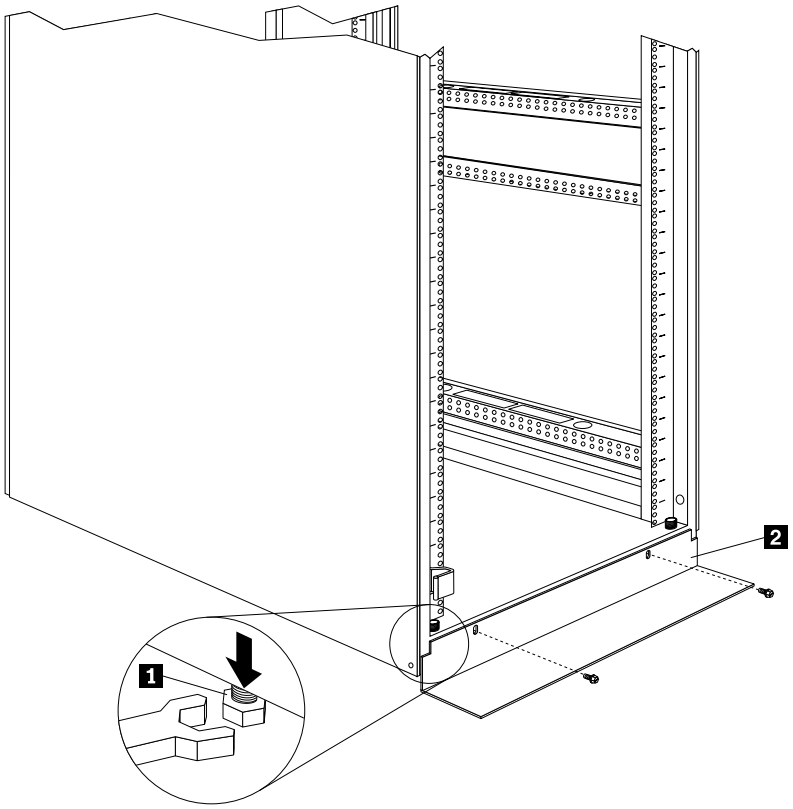
2. Remove the 16 screws (eight per side) that hold the top 6U portion of the rack cabinet in place.
3. Relocate your rack cabinet; then, install the top 6U portion of the rack cabinet using all 16 of the screws that you removed.
4. Remove both support bars from the rack cabinet.

Installing the stabilizer bracket



To lower the leveling feet and install the stabilizer bracket:

1. Lower each of the four feet **1** just enough so that they touch the floor.

   Note: The rack casters will support the weight of the 9308 rack. The feet prevent the rack from rolling.
2. Secure the stabilizer bracket **2** to the front of the rack with the screws that come with the rack.

Attaching rack cabinets in a suite

Expansion rack cabinets come with all the hardware required for you to attach rack cabinets together and form a suite. Use the following procedure to attach rack cabinets together in a suite:

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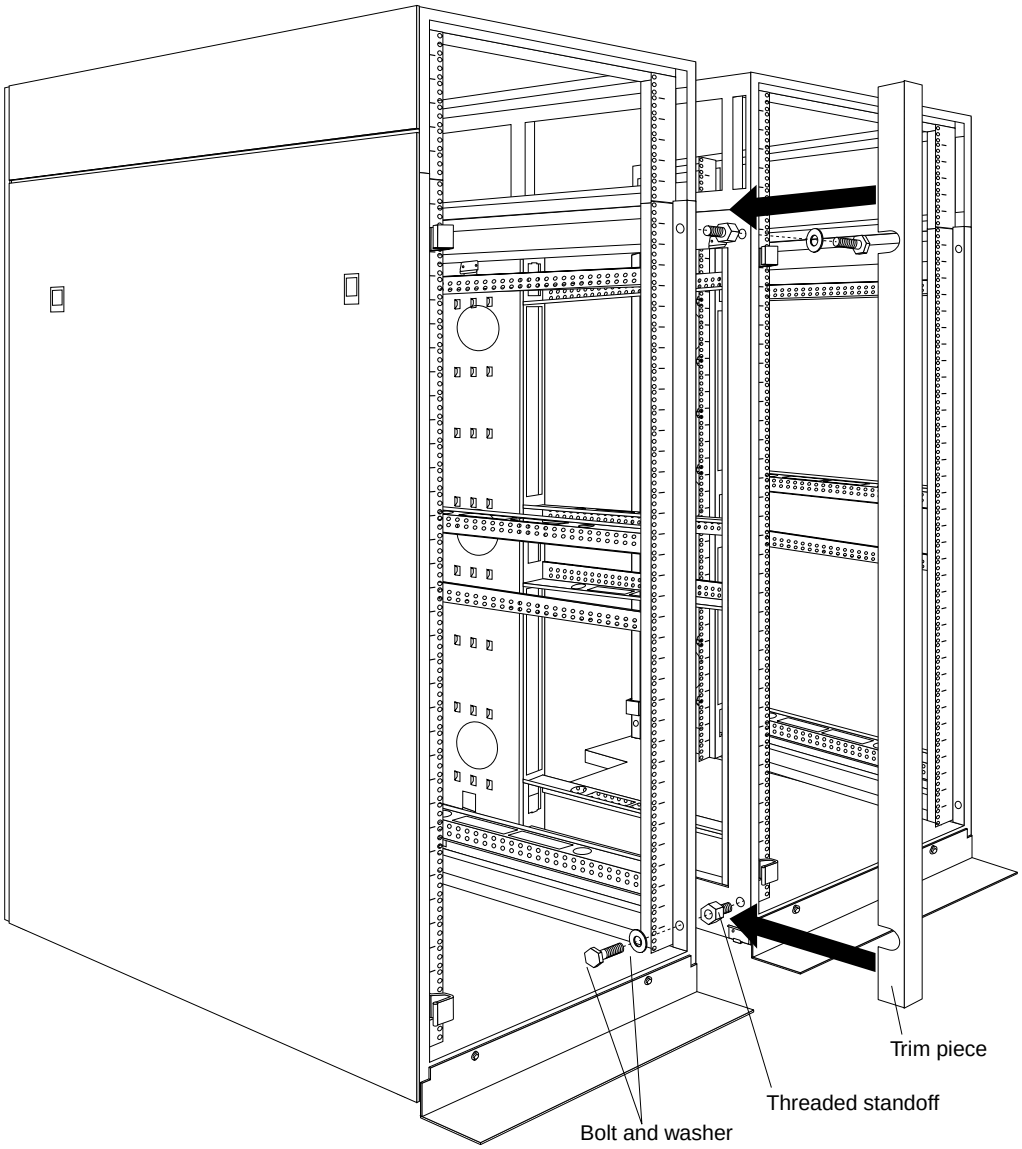

Figure 42. Attaching two adjacent rack cabinets to each other to form a suite

1. Remove both side panels (see “Removing and installing the side panels” on page 85) from the side of a primary rack cabinet that is adjacent to an expansion rack in a suite.
2. Remove the front and rear doors (see “Doors” on page 87) from all rack cabinets.
3. On the outside of two adjacent rack cabinets, install the four threaded standoffs that come with the expansion rack cabinet:
   a. Install two threaded standoffs on the rack cabinet to the left, one on the top-front and one on the bottom-rear.
   b. Install the other two threaded standoffs on the rack cabinet to the right, one on the bottom-front and one on the top-rear.
4. Attach the rack cabinets together, using four bolts and washers that come with the expansion rack cabinet.

   Note: You must install the top-front and bottom-rear bolts from right-to-left; then, install the bottom-front and top-rear bolts from left-to-right.

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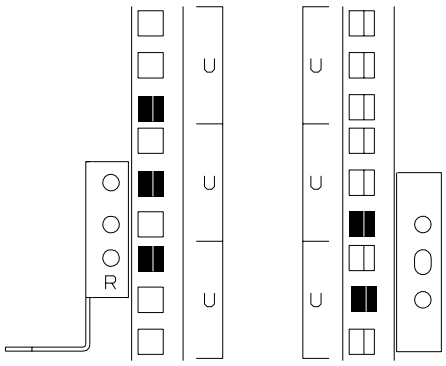
5. Snap the trim pieces into place between the adjacent rack cabinets. Install one trim piece in the front and one in the rear.
6. Repeat step 3 through step 5 for all other adjacent rack cabinets in the suite.
7. On the outside of the outermost expansion rack cabinets in the suite, install the side panels that you removed in step 1.
8. Install the front and rear doors on all rack cabinets.

Installing L-channel support rails to rack mounting brackets

1. Use the following illustration of the front and rear rack mounting flanges to determine the appropriate rack-mounting holes for installing cage nuts or clip nuts to secure the rails. From left to right, the illustration shows the front and rear flanges respectively.



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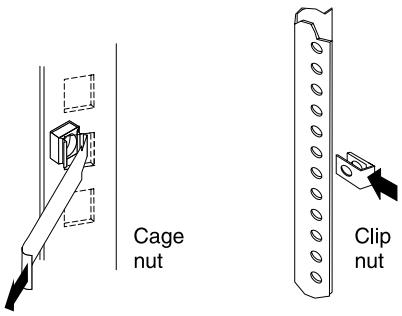
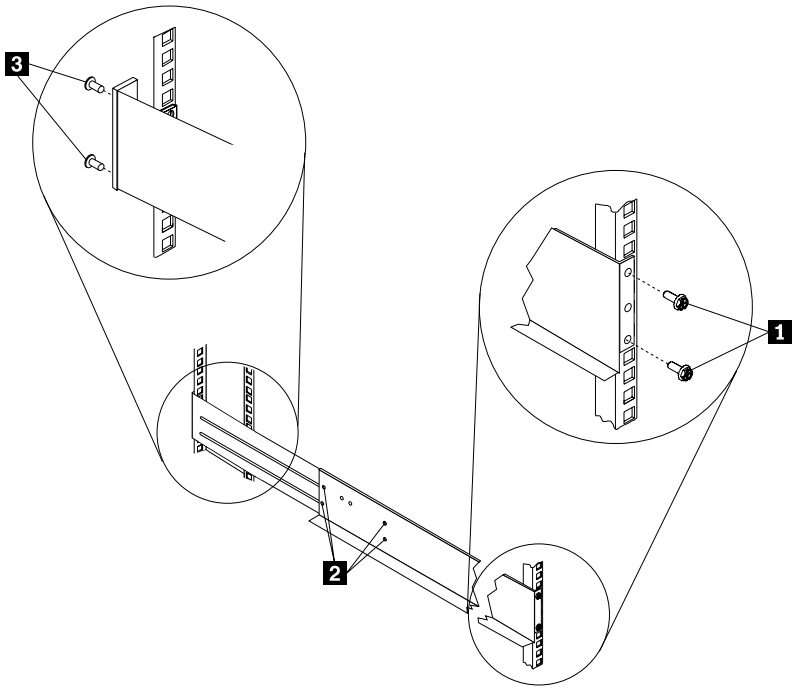
Note: Use clip nuts if your rack has holes. If your rack has square holes, you can use the rack-insertion tool or a flat-blade screwdriver to install cage nuts.



2. On the rail marked *R*, loosen the four screws **2** .
3. Hold the rail against the outside of the right rack-mounting flange, and loosely insert the two front M6 screws **1** .
4. Extend the rail outside of the rear rack-mounting flange; then, install and tighten two rear M6 screws **3** .
5. Tighten the two front screws **1** ; then, tighten the four screws **2** .

Repeat step 2 through step 5 to install the rail marked *L* on the left side of the rack.



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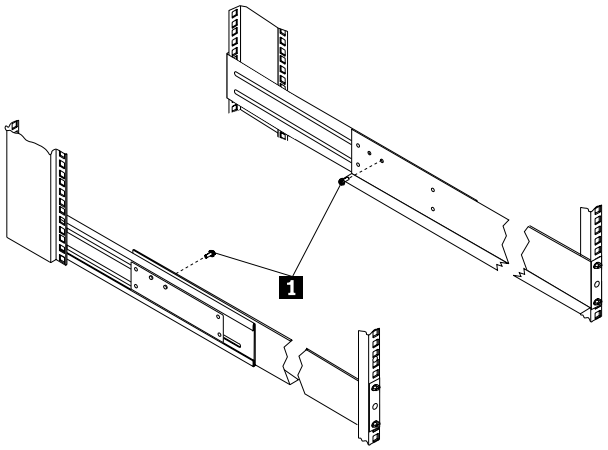
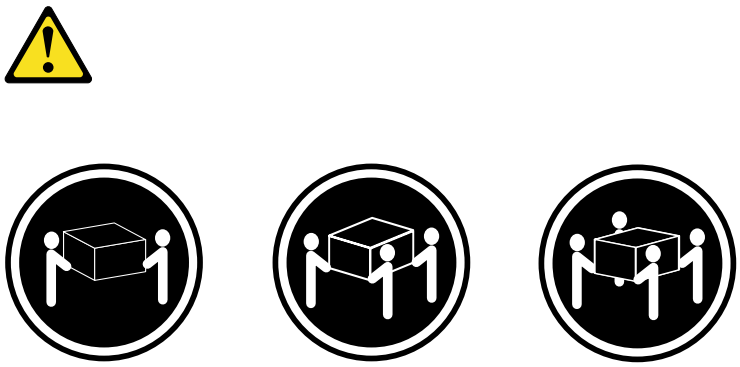
6. Loosely insert one M5 screw 1 into each rail.



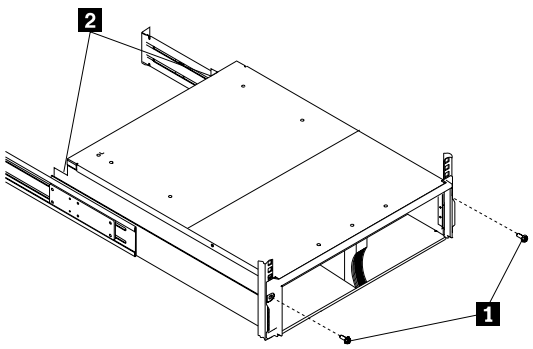
Statement 4



≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

CAUTION:
Use safe practices when lifting.

7. Slide the expansion unit into the rack, and insert the M6 screws 1. Do not overtighten the M6 1 screws.



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8. Tighten the rear screws **2**.

Installing a server

A small server can occupy from 1U to 5U of rack mounting space. A large server can occupy 8U or more of rack mounting space. Most servers also come with cable-management arms so that you can neatly route any cables that you attach to your server. See the documentation that comes with your server for detailed installation instructions.

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Installing a large server

Use the following general procedure to install a large server in your rack cabinet:

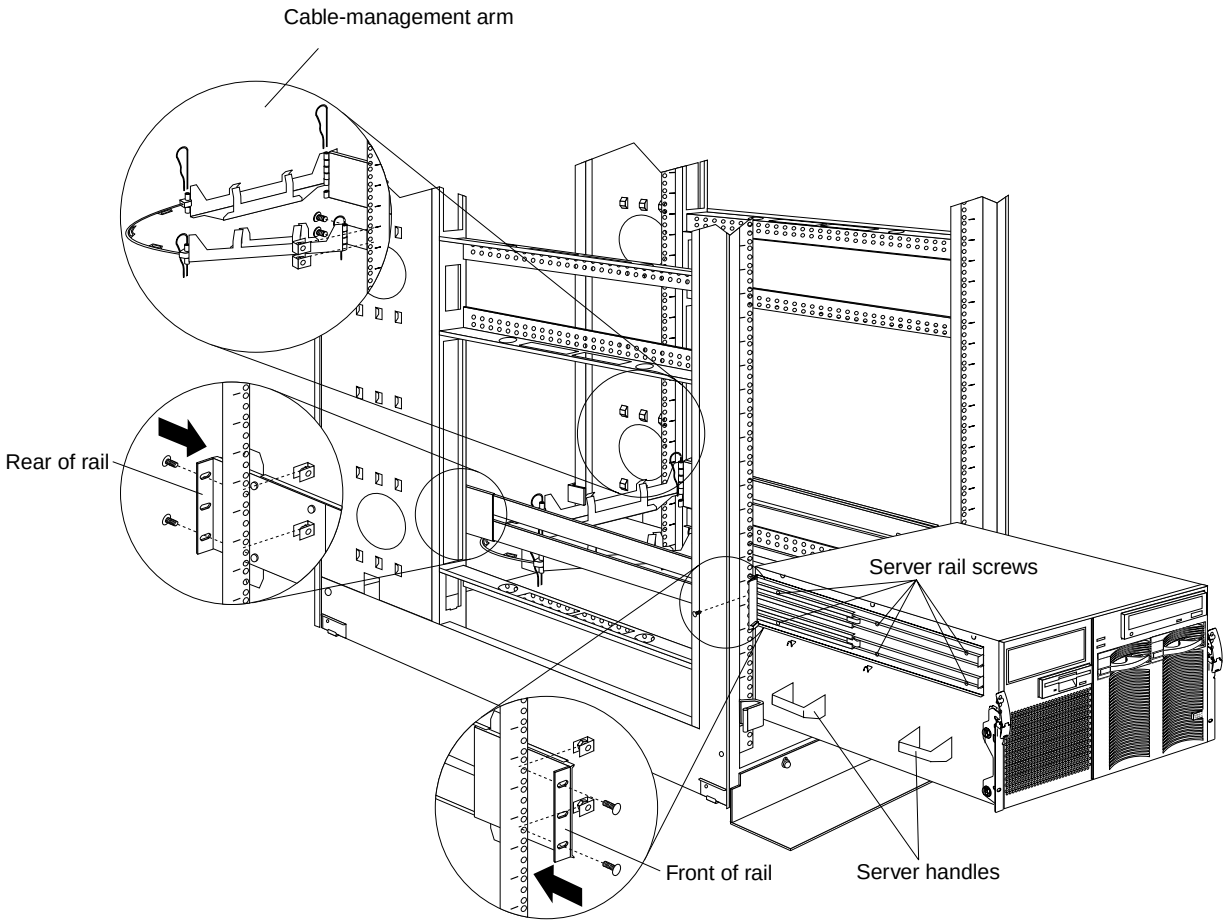

Figure 43. Installing a large server

1. See the server documentation for detailed installation and configuration information.
2. Use the template and rack mounting instructions that come with your server to determine where to install clip nuts.
3. Install the slide rails and cable-management arm that come with your server, using the provided screws and clip nuts.

   Note: If required, adjust the length of the slide rails to fit the depth of your rack cabinet.
4. Install the server handles; then, lift the server and place it on the extended slide rails.
5. Attach the server to the slide rails with the provided screws; then, remove the server handles and slide the server into the rack cabinet.
6. See your server documentation for information on how to connect power and other device cables.

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Installing a small server

Use the following general procedure to install a small server in your rack cabinet:

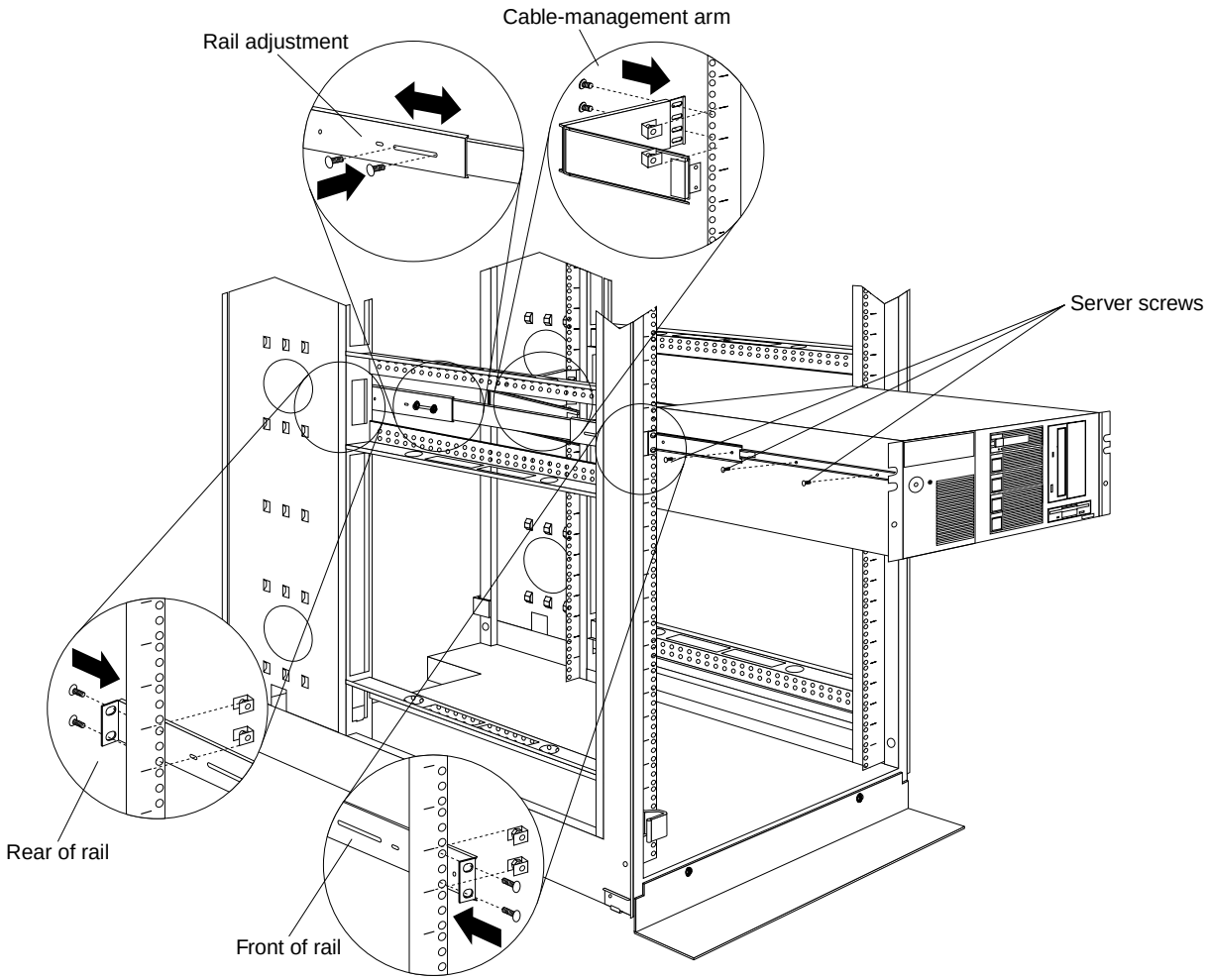

Figure 44. Installing a small server

1. See the server documentation for detailed installation and configuration information.
2. Use the template and rack mounting instructions that come with your server to determine where to install clip nuts.
3. Install the slide rails and cable-management arm that come with your server, using the provided screws and clip nuts.

   Note: If required, adjust the length of the slide rails to fit the depth of your rack cabinet.
4. Lift the server and place it on the extended slide rails; then, attach the server to the slide rails with the provided screws.
5. See your server documentation for information on how to connect power and other device cables.

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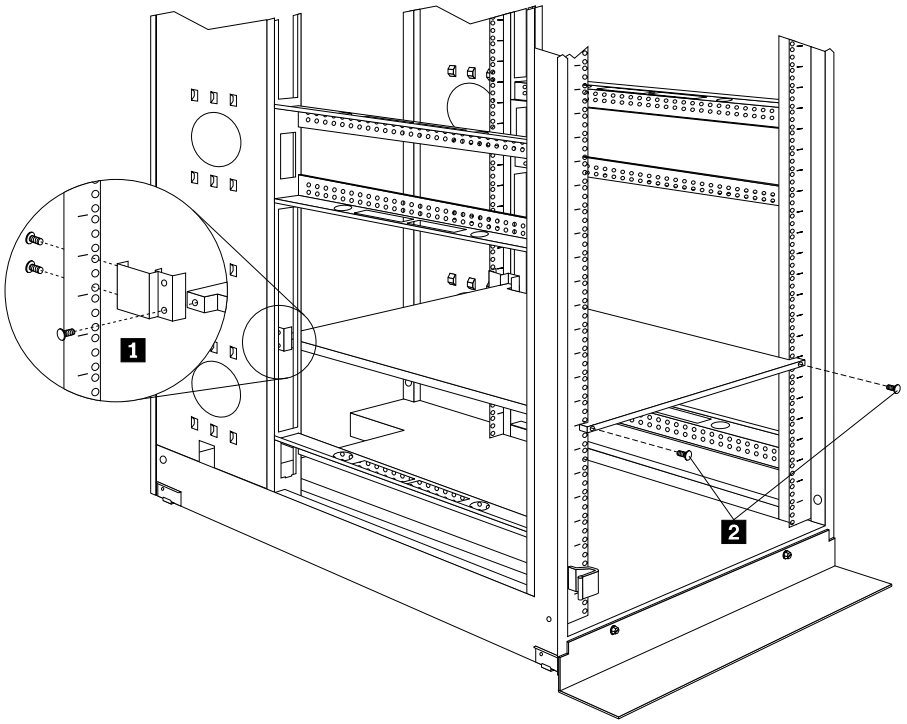
Fixed shelf



Note: A fixed shelf can support a device or option weighing up to 45kg (100 lbs).

To install a fixed shelf:

1. Determine the location for the fixed shelf within the rack.
2. Secure the threaded mounting brackets **1** to the rear of the shelf; then, secure the brackets to the rack with two screws and clip nuts per bracket.
3. Secure the front of the shelf **2** with two screws and clip nuts.

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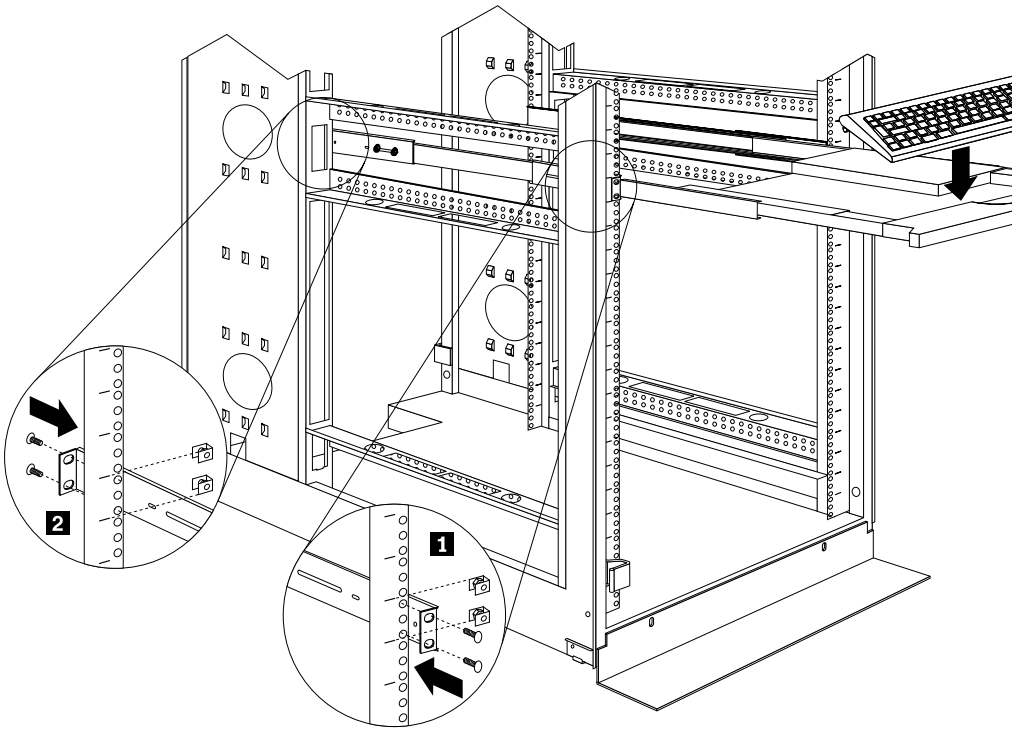
Keyboard tray



To install a keyboard tray:

1. Secure the slide rails to the front **1** and rear **2** of the rack, adjusting them as needed.
2. Slide the keyboard tray onto the rails and store the keyboard **3** in the area provided.

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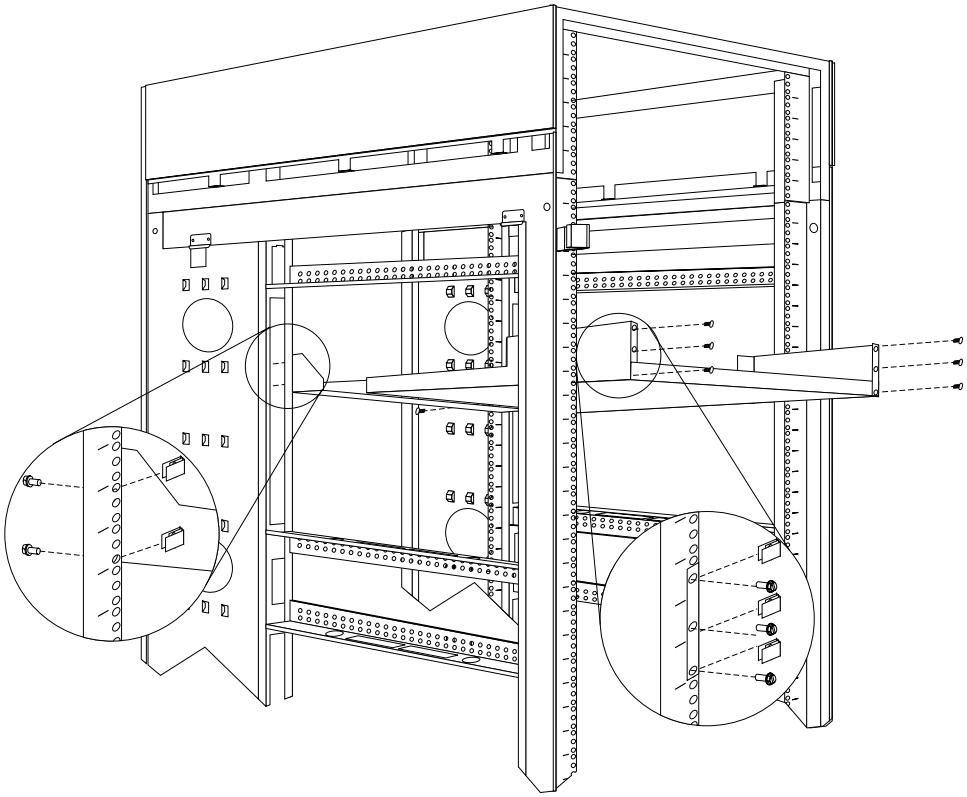
Monitor shelf



To install a monitor shelf:

1. Secure the rear monitor shelf bracket in the rear of the rack **1** with two screws per side.
2. Place the monitor shelf inside of the rack, resting on the rear bracket; then, secure it to the front of the rack **2** with three screws and clip nuts per side.

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Installing a flat panel monitor rack mount kit

You can store a T54 or T55 Flat Panel Monitor in a keyboard tray with the flat panel monitor rack mount kit. This kit requires an additional 2U of space above an installed keyboard tray in your rack cabinet. See the documentation that comes with the flat panel monitor rack mount kit for detailed installation instructions. Use the following general procedure to install a flat panel monitor in your rack cabinet:

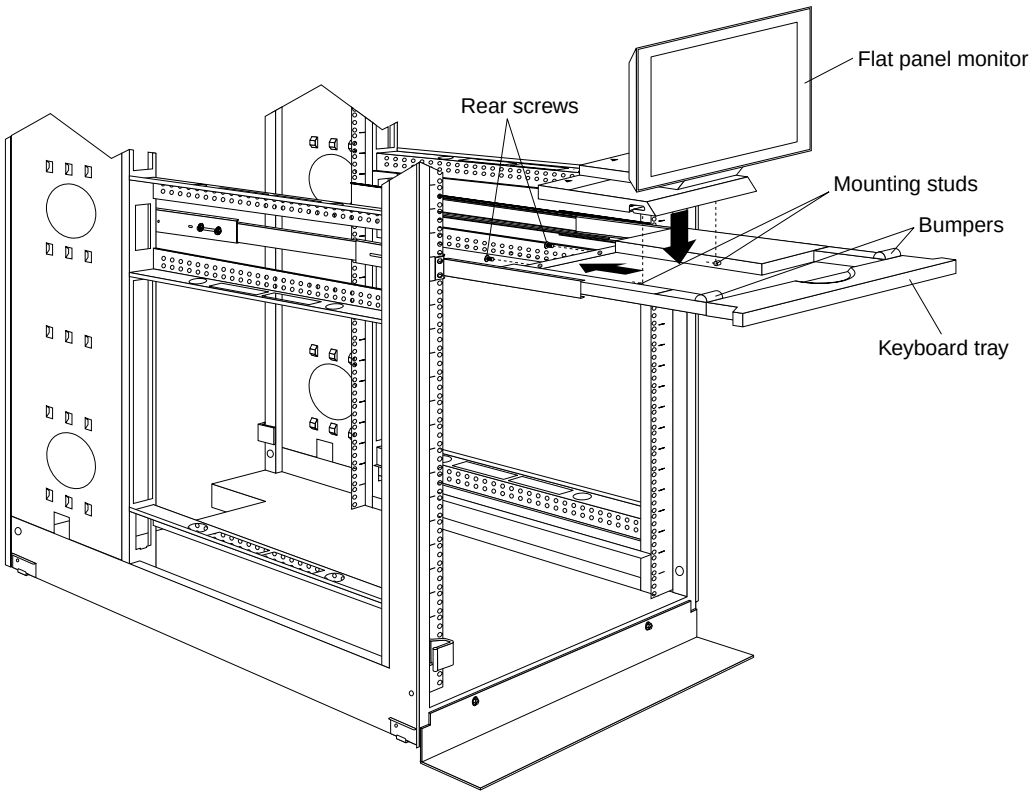

Figure 45. Installing a flat panel monitor rack mount kit

1. Ensure that a keyboard tray is properly installed in your rack cabinet (see “Keyboard tray” on page 101) with at least 2U of clearance above the keyboard tray.
2. Install the flat panel monitor base on the flat panel monitor. See the documentation that comes with your flat panel monitor rack mount kit for detailed installation instructions.
3. Install the mounting studs and bumpers on the keyboard tray.
4. Attach the monitor base to the inside of the keyboard tray using the screws that come with the rack mount kit.
5. Fold the monitor all the way down against the bumpers; then, slide the keyboard tray into the rack cabinet to ensure that there is proper clearance.
6. See the documentation that comes with your flat panel monitor for information on how to connect power and how to connect the monitor to a server or console switch.

Removing the existing flat panel monitor stand

Use the following steps to remove the existing flat panel monitor stand from your monitor:

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1. Unplug the flat panel monitor and disconnect the power cord from the flat panel monitor power supply.
2. Carefully use a flat-blade screwdriver to pry the bottom of the cable cover **1** up and remove it. Save the cable cover for later reinstallation.

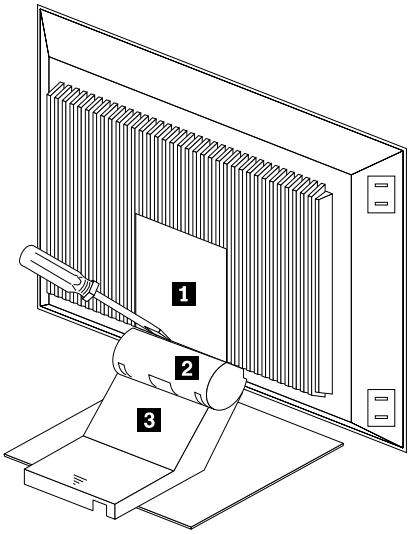

Figure 46. Removing the cable cover, hinge cover, and stand cover

3. Squeeze the sides of the hinge cover **2** and remove it.

   Note: Even though this hinge cover is not used with the Flat Panel Monitor Rack Mount Kit, do not discard it. Store it with the other monitor stand parts you remove for possible future use.
4. Gently push the stand cover **3** and slide it backwards until it is completely off the stand.
5. Disconnect the signal cable and power cord from the flat panel monitor. Carefully remove and save the plastic cable clamp to free the power cord.

   Note: The plastic cable clamp is reusable and is needed to secure the power cord after installing the Flat Panel Monitor Rack Mount Kit on the flat panel monitor.

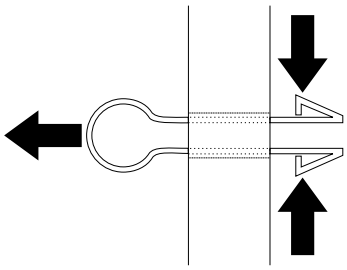

Figure 47. Removing the plastic cable clamp

6. Lay the monitor facedown on a cushioned surface and remove the six screws that secure the hinges to the flat panel monitor.

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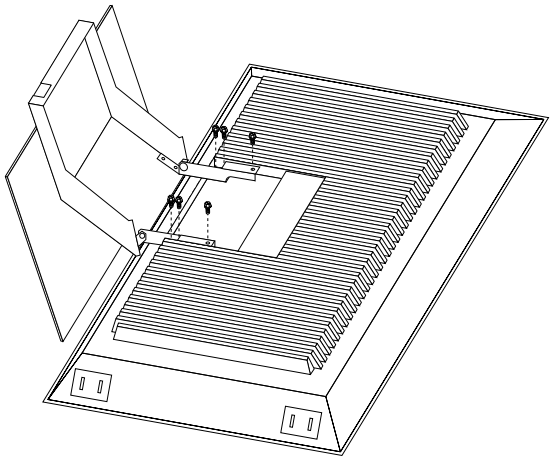

Figure 48. Removing the existing monitor stand from the monitor

7. Lift off the hinge and monitor stand assembly. Store this assembly in a safe place for possible future use.

Installing the new monitor stand

Refer to “Removing the existing flat panel monitor stand” on page 103 for instructions on how to remove the existing stand from the flat panel monitor. Before installing the new stand, install the keyboard tray in the rack according to the instructions that come with the rack or the keyboard tray option.

Note: The Flat Panel Monitor Rack Mount Kit and keyboard tray require 3U of rack mounting space. If the keyboard tray does not have at least 2U of clearance above it, relocate the keyboard tray within the rack.

Use the following steps to install the Flat Panel Monitor Rack Mount Kit:

1. Remove the cable cover **1** from the new monitor stand; then, remove the four screws (two per hinge) that secure the hinges **2** to the stand.

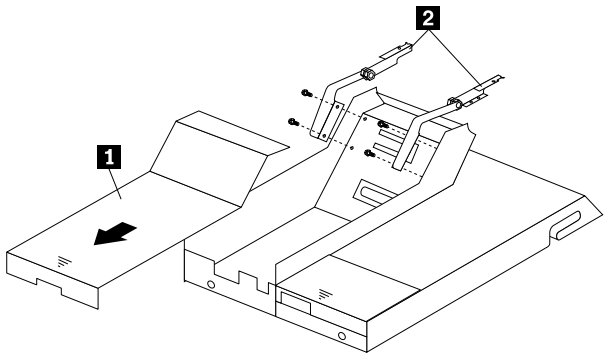

Figure 49. Removing the hinges from the new monitor stand

2. Install the hinges on the flat panel monitor, using the six screws that you removed from the old monitor stand.

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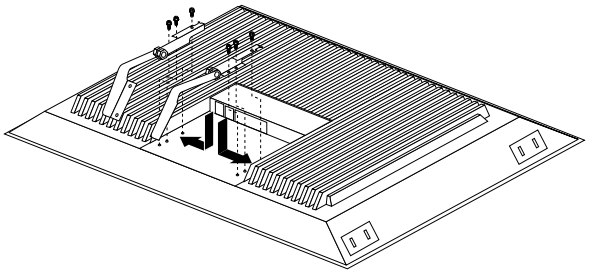

Figure 50. Installing the hinges on the flat panel monitor

Note: Be sure to slide each hinge into place on the back of the monitor and align the holes in the hinges with holes on the monitor.

3. Lower the flat panel monitor onto the new monitor stand, making sure that you align the holes in the stand with holes in the hinges; then, secure the flat panel monitor to the monitor stand with the four screws that you removed earlier.

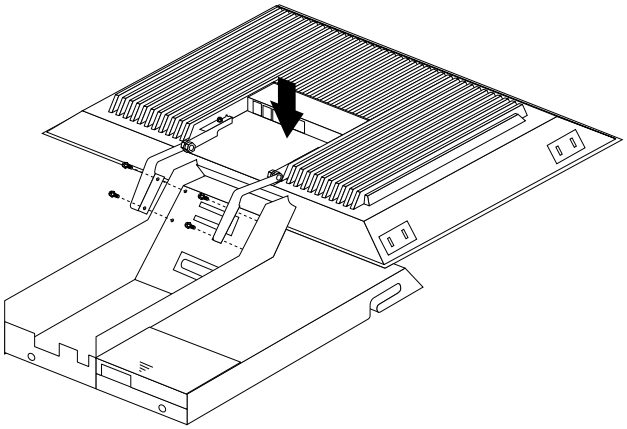

Figure 51. Installing the monitor on the new monitor stand

You have now finished attaching the flat panel monitor to its stand. The rest of the installation process involves preparing the keyboard tray for storage and routing cables.

Notes:

a. You must remove any keyboard or mouse that is already in the keyboard tray before continuing.

b. You will not be able to store a mouse in the keyboard tray after installing the Flat Panel Monitor Rack Mount Kit.

c. You can only store a space-saver keyboard in the keyboard tray.

4. Install the mounting studs 2 and bumpers 3 that come in the monitor mounting hardware package.

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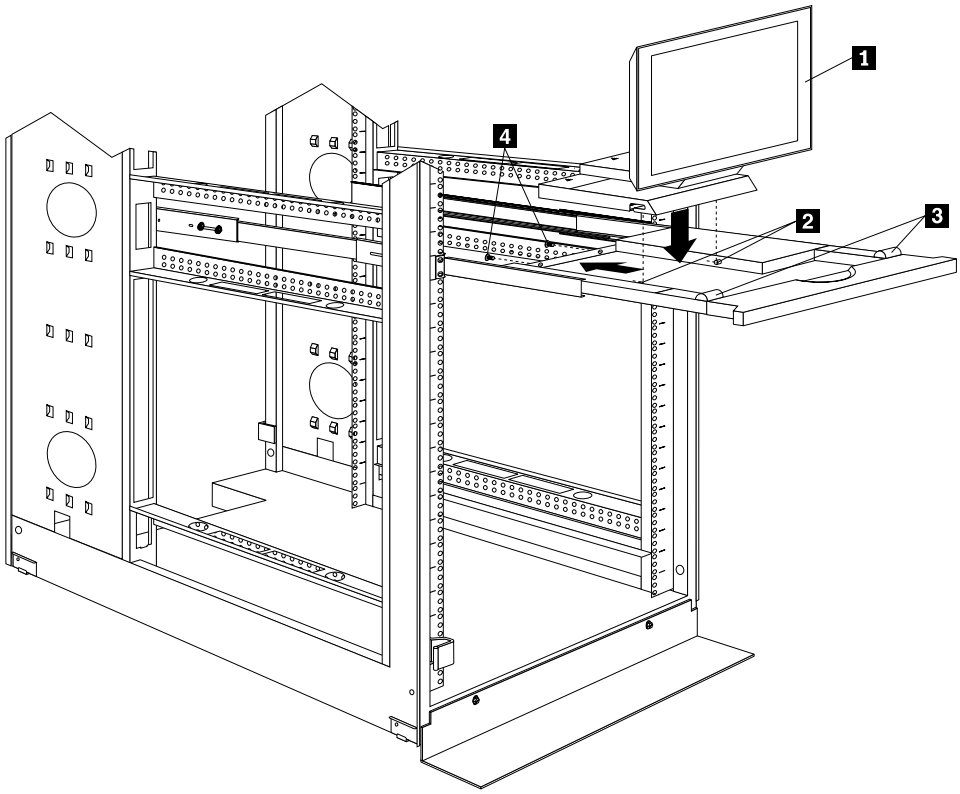

Figure 52. Installing the flat panel monitor in the keyboard tray

Note: Clean the installation area on the keyboard tray with a suitable cleaning agent, such as alcohol, before installing the rubber bumpers on the front of the keyboard tray.

5. Open the flat panel monitor 1 to its full upright position and align the grooves in the stand with the mounting studs 2 in the keyboard tray. When the monitor stand is sitting inside the keyboard tray, slide it towards the back until it stops.

   Note: Install or remove the flat panel monitor only when the display is in its upright position.

6. Secure the monitor stand in the back of the keyboard tray with the two provided screws 4 .

7. Place the flat panel monitor power supply, which came with your flat panel monitor, inside the monitor stand. If necessary, insert the power supply spacer 3 behind the power supply and over the cable to keep the power supply in place.

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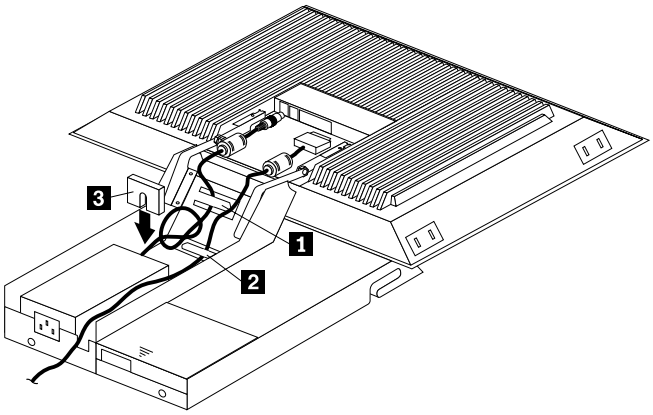


Figure 53. Storing the power supply and routing cables

8. Connect the power supply to the monitor and route the cable under the tab near the top of the monitor stand **1** ; then, secure the power cable with the cable clamp you removed from the original stand and coil excess cable inside the monitor stand.
9. Connect the monitor signal cable to the monitor and route it under the tab in the bottom of the monitor stand **2** and out the back of the stand through the hole provided.
10. Replace the monitor stand cover **1** .

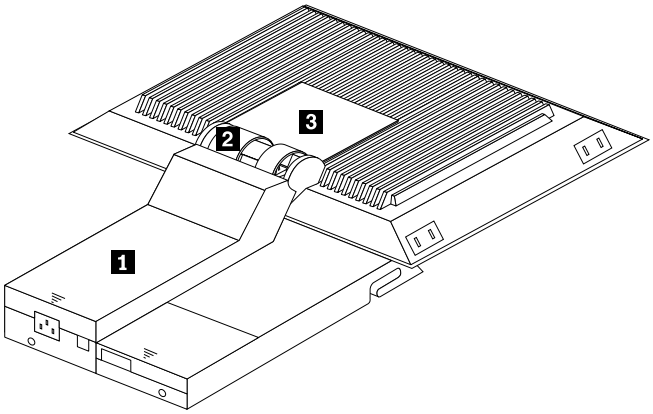
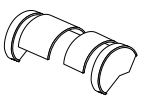


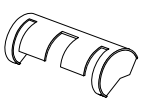
Figure 54. Installing the cable cover, hinge cover, and stand cover

11. Snap the new hinge cover **2** into place over the hinge assembly.

    Note: Be sure to use the new hinge cover that comes with the Flat Panel Monitor Rack Mount Kit because it has deeper grooves to accommodate the new hinge assembly.



New hinge cover



Old hinge cover

12. Snap the cable cover **3** into place on the back of the flat panel monitor.
13. Fold the flat panel monitor down until it rests on the rubber bumpers; then, gently push back and remove the small cable exit cover **1** on the monitor stand.

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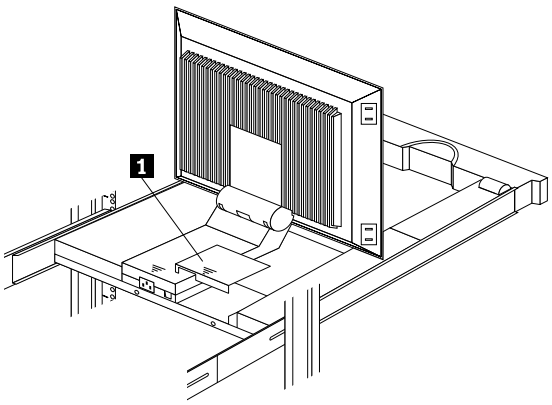

Figure 55. Routing the keyboard cable

14. Route the space-saver keyboard cable through the hole in the front of the base and out the opening in the back where you removed the small cover; then, place the keyboard (with its adjustable feet fully down) inside the keyboard tray.

    Note: You must open the flat panel monitor to its full upright position so that you can install the keyboard and route its cable.

15. Fold the flat panel monitor down again until it rests on the rubber bumpers; then, reinstall the small cable exit cover **1** .

16. Slide the keyboard tray into the rack; then, neatly route and secure all cables in the rack using the provided cable straps.

    You can now connect the power cord to the flat panel monitor and connect the display to a server.

Blank filler panel

Blank filler panels can occupy 1U, 3U, or 5U of space on a rack.

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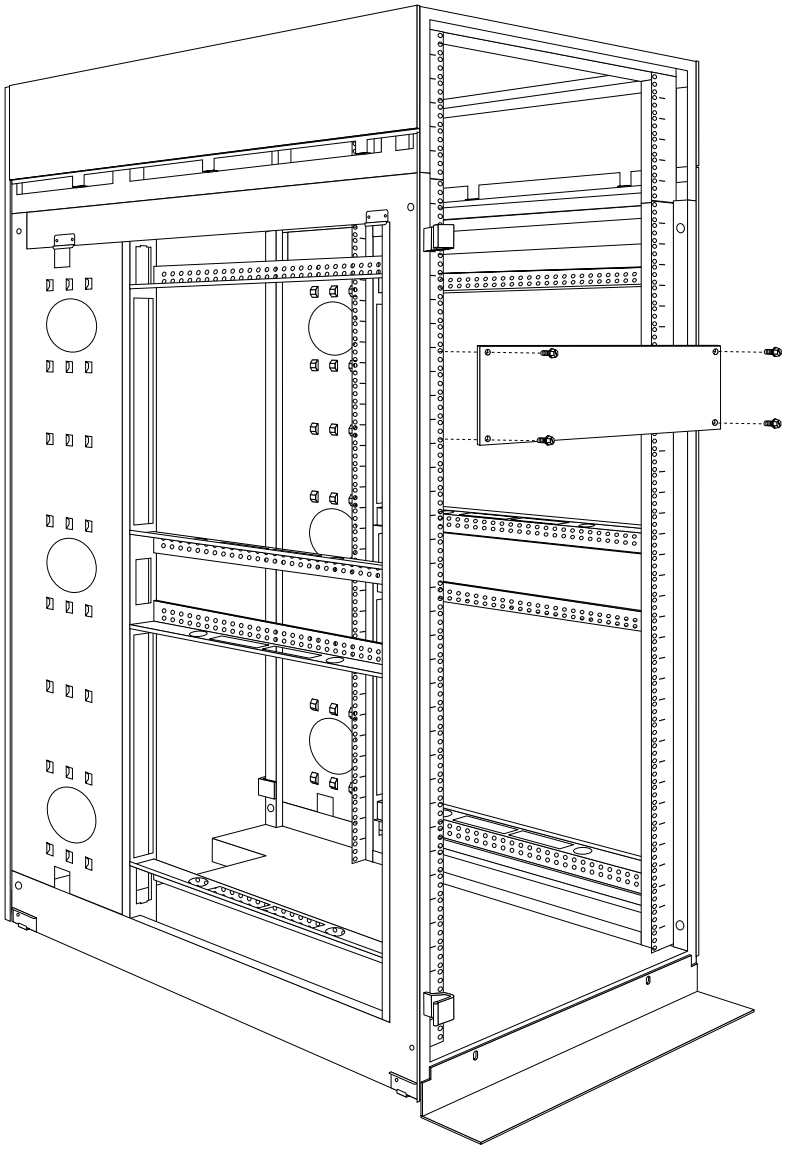

To install a blank filler panel:

1. Determine the size (1U, 3U, or 5U) panel you need.
2. Secure the blank filler panel in place with four screws and clip nuts.

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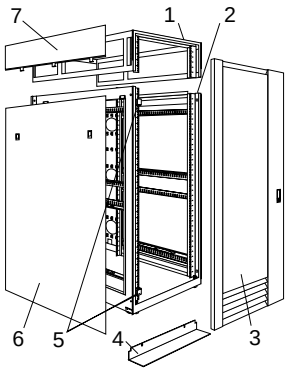
Parts listing (Type 9308 Model 42P, 42X)



Index	Rack Enclosure (Type 9308 Model 42P, 42X, 4SA, 4SB, 42S, 42E)	FRU
1	Top Cover Assembly including cover standoffs and screws (All models)	05N4896
2	Cabinet Frame (All models)	05N4895
3	Front Door w / Lock (Models 42P, 42X)	05N4897
	Rear Door w / Lock (Models 42P, 42X)	05N4899
	Front Door w / Lock (Models 42S, 42E)	09N9694
	Rear Door w / Lock (Models 42S, 42E)	06P6047
	Front Door (Models 4SA, 4SB)	05N4899
	Rear Door (Models 4SA, 4SB)	05N4899
4	Stabilizer Foot, Black (All models)	05N4920
5	Door Hinges (50mm) (Models 42P, 42X)	05N4901
	Front Door Hinge (Models 42S, 42E)	09N9695
	Rear Door Hinges (20mm) (All models)	05N4902
	Door Hinge (Models 4SA, 4SB)	05N4902
6	Lower Side Cover (Models 42P, 4SA, 42S)	05N4905
7	Upper Side Cover (Models 42P, 4SA, 42S)	05N4906
	Caster, Fixed (1) w / mounting hardware (All models)	05N4915
	Caster, Swivel (1) w / mounting hardware (All models)	05N4916
	Door Latch w / Lock (All models)	05N4903
	Front Door Striker (2) w / mounting screws (Models 42P, 42X, 42S, 42E)	05N4904
	EIA Mounting Flange Label,1-42U, Decorative (All models)	05N4917
	EIA Mounting Flange Label, 1-36U, Plain (All models)	05N4918
	EIA Mounting Flange Label, 37-42U, Plain (All models)	05N4919
	Leveler Foot (4) w / jam nut (All models)	05N4914
	Miscellaneous Hardware Kit - Includes: clip nut (25); screw, M6 Hex Head (25); tie - soft (15) (All models)	05N4922
	Rack to Rack Mounting Kit, Black (Models 42X, 4SB, 42E)	05N4908

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Rack Enclosure (Type 9308 Model 42P, 42X, 4SA, 4SB, 42S, 42E)	FRU
Leveling foot wrench (All models)	05N4927

Rack Enclosure (Type 9308 Model 42P, 42X, 4SA, 4SB, 42S, 42E) Options	FRU
Monitor Housing	76H4947
Side Panel Latch	12J4468
Filler Panels: 1U, 3U, and 5U - with Hardware	12J4473
Keyboard Tray	76H4958
Keyboard Tray II	28L0562
Keyboard Tray II filler block	28L0567
Keyboard Slides (set) with Hardware	76H4961
Fixed Shelf with Hardware	76H4963
C13 - C14 Power Cable	07H0075
C19 - C14 Power Cable	76H4964
C13 - NEMA 5-15P Power Cable	76H4962
C19 - NEMA 5-15P Power Cable	12J4479
Video, Mouse, Keyboard Cable (7 feet)	06P6006
Video, Mouse, Keyboard Cable (12 feet)	06P6007
Video, Mouse, Keyboard Power Cable (25 feet)	12J4484
Mouse Extension Cable	07H0069
Keyboard Extension Cable	07H0067
Concentrator with Hardware (8 port)	76H4948
Concentrator with Hardware (4 port)	28L0543
1x4 switch	06P6003
2x8 switch	06P6004
NetBAY Rack Power Distribution Unit	09N9668
NetBAY Front-end Power Distribution Unit	09N9670
3-phase NEMA L21-30P line cord (200-250 Vac) for NetBAY Front-end PDU	24P6844
3-phase IEC 309-3P+N+Gnd line cord (380-415 Vac) for NetBAY Front-end PDU	24P6845
1-phase NEMA L5-30P line cord (100-127 Vac) for NetBAY Front-end PDU	24P6846
1-phase NEMA L6-30P line cord (200-240 Vac) for NetBAY Front-end PDU	24P6847
1-phase IEC 309-2P+Gnd line cord (200-240 Vac) for NetBAY Front-end PDU	24P6848
NetBAY Server Dual-cord Power Distribution Unit	09N9669
Hardware Kit for NetBAY Power Distribution Units	09N9671
Flat Panel Monitor Rack Mount Kit Option (T54A, T55)	37L6888
Flat Panel Adapter Hinge - R.H. & L.H. (T54A, models AG1, AW1; T55)	09N9678
Flat Panel Adapter Misc. Hardware Kit – Includes: Hinge Cover (1); Power Supply Cover (1); Mounting Stud (1); Bumper (2); Cable Access Cover (1); M4 X 12 Screw (4); M4 X 8 Screw (2); 14 inch Soft Tie Wrap (1); T54A power supply spacer (1)	00N8693

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Rack Enclosure (Type 9308 Model 42P, 42X, 4SA, 4SB, 42S, 42E) Options	FRU
Flat Panel Adapter Display Housing – Includes: Power Supply Cover (1); Base Housing (1); Cable Access Cover (1); Bottom Stand	00N8694

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NetBAY3 enclosure

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Features

The IBM NetBAY3 enclosure provides a convenient 3-U high by 24-inch deep storage cabinet for the installation of computer devices.

Note: Vertical measurements are given in rack units (U). One U is equal to 4.45 cm (1.75-inches).

Up to three NetBAY3 enclosures can be stacked under certain IBM servers. Devices such as the IBM EXP10, an uninterruptable power supply (UPS), or various telecommunications equipment can also be installed in a NetBAY3 enclosure.

Locations

The following sections contain information on specific equipment locations.

Important:

- The maximum server weight is 77 kg (170 lb.).
- Refer to the latest IBM Server Hardware Maintenance Manual when servicing the server.
- Assure all power and signal cables are routed properly and are not pinched.
- Make sure NetBAY3 enclosures in a stack are securely fastened together.
- Servers are lifted onto and off of the NetBAY3 enclosure. Make sure you have help when lifting.
- Servers are lifted onto and off of the NetBAY3 enclosure. Make sure you have help when lifting.

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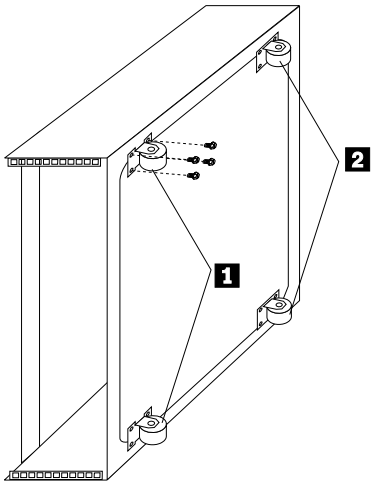
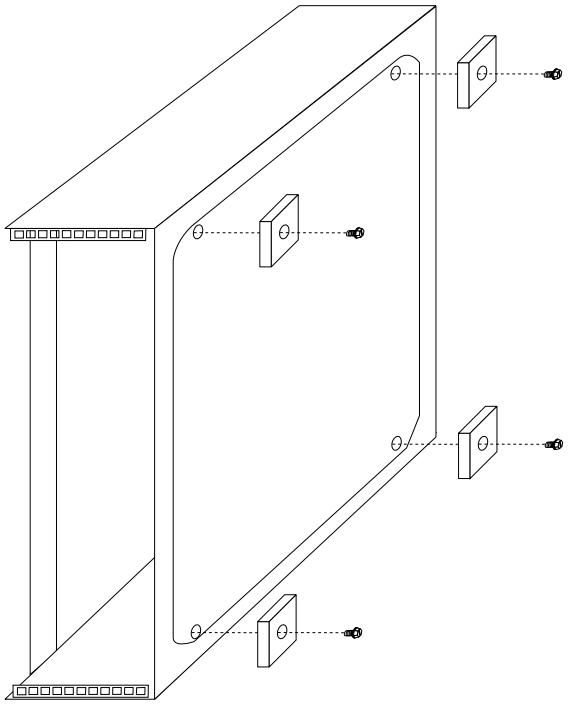
Casters



- Two fixed casters **1** at the front of the NetBAY3 enclosure.
- Two swivel casters **2** at the rear of the NetBAY3 enclosure.

Foot pads



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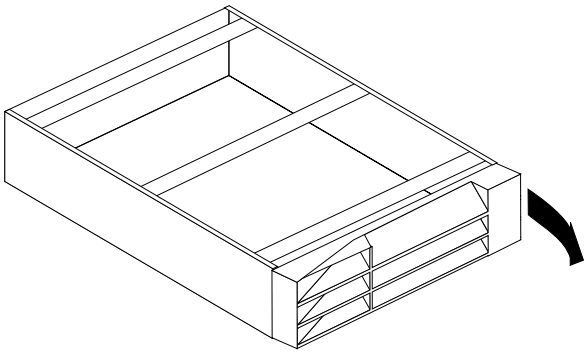
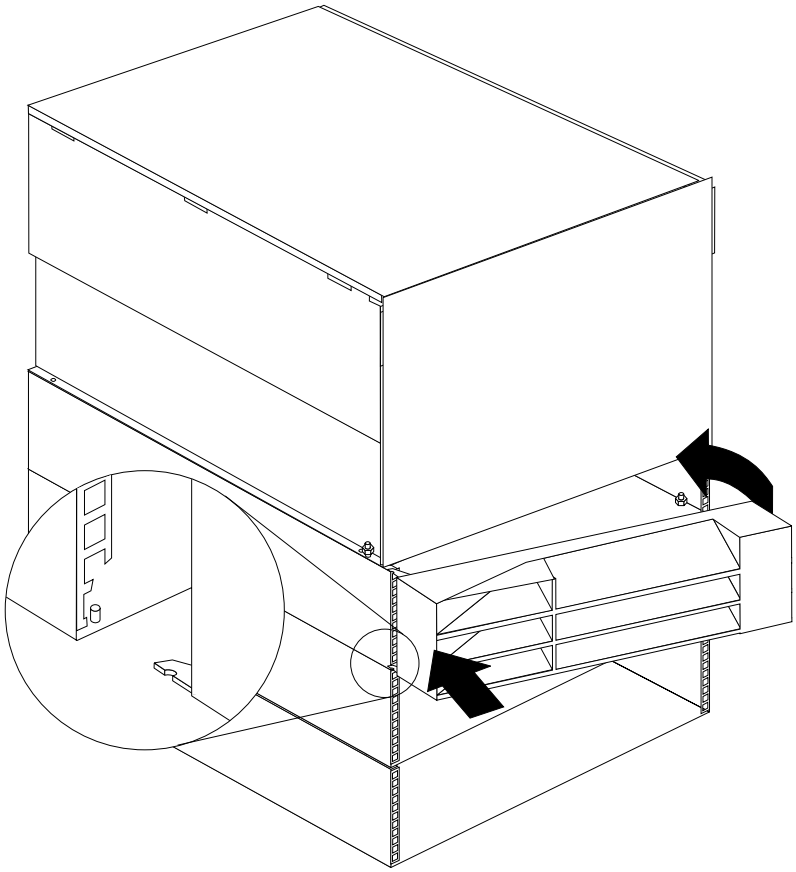
Front cover





Rear panel

Note: Make sure empty NetBAY3 enclosures (no devices installed) have the rear cover securely attached.

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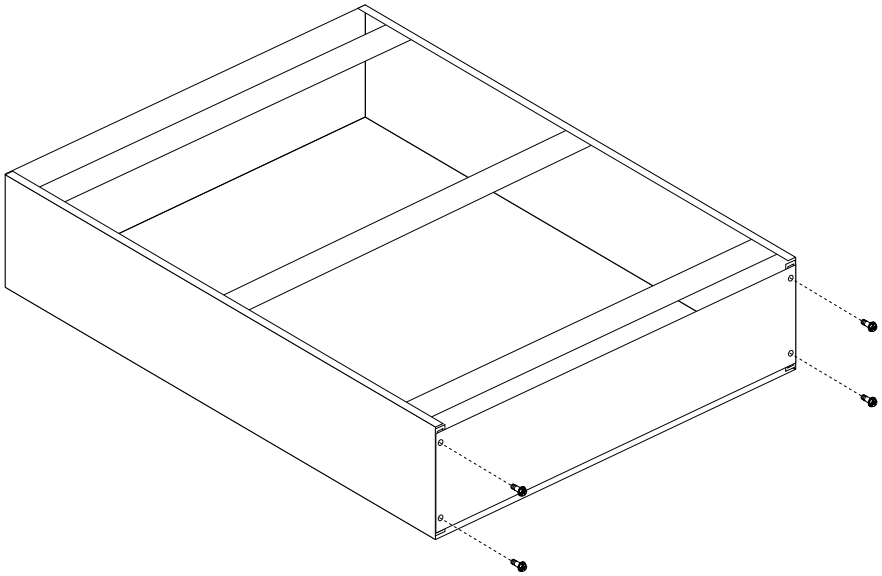
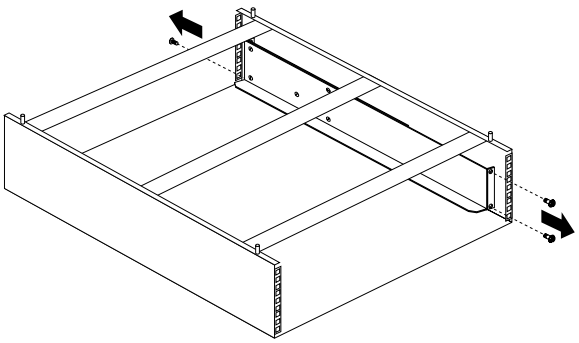


Device side rails



Stacking NetBAY3 enclosures

Note: Make sure NetBAY3 enclosures in a stack are securely fastened together.

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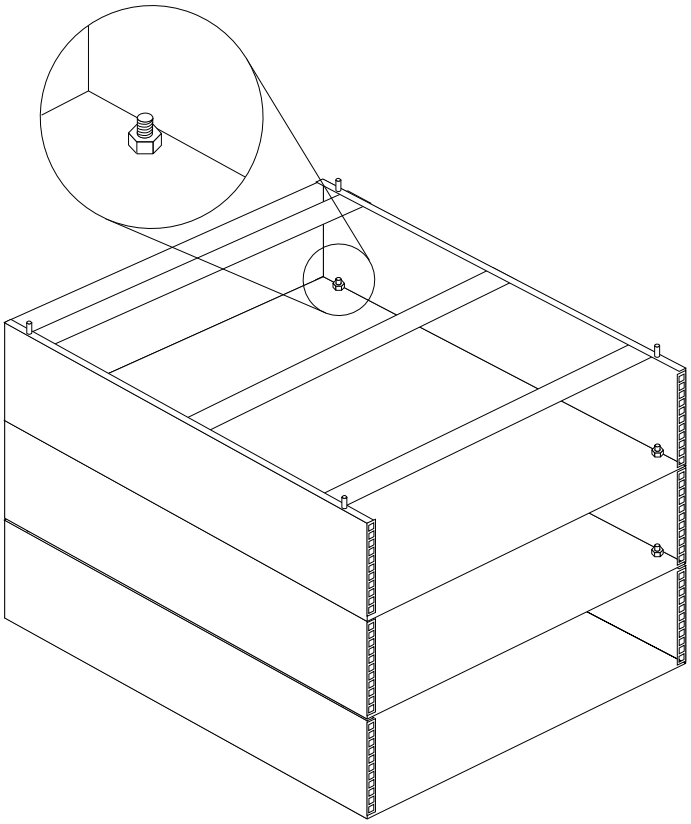

Note: The maximum server weight is 77 kg (170 lb.).

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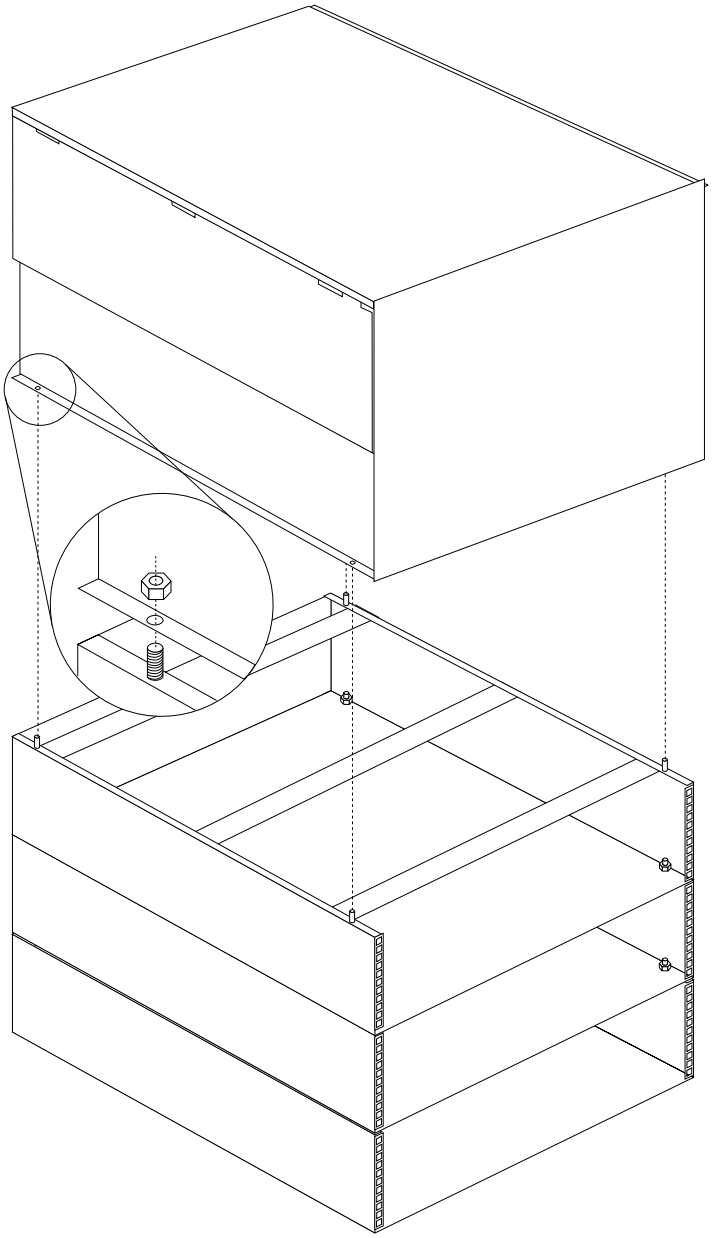

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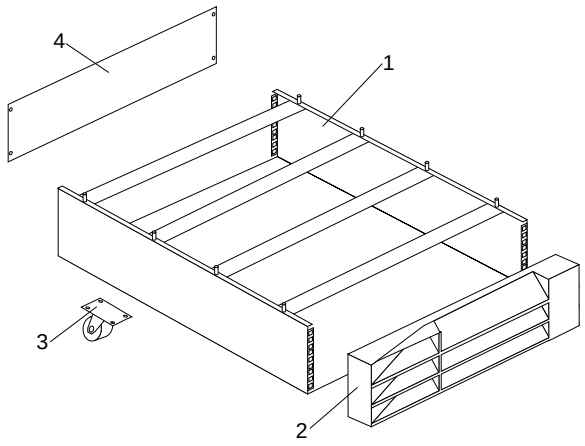
Parts Listing (NetBAY3)



Index	NetBAY3 Enclosure (NetBAY3)	FRU
1	3-U Enclosure Frame	03K8797
2	Front Bezel Assembly with Lock and Keys	03K8798
3	Foot Pads Qty. 4	03K8800
4	Casters Fixed, Front, Qty. 2	12J3279
4	Casters Swivel, Rear, Qty. 2	12J3283
5	3-U Blank Panel	03K8799
	Miscellaneous Parts Kit - Includes: • M6 Caged Nuts (2) • M6X16 Combination Head Screw (2) • M6X14 Flanged Hex Head Screw (2) • M5 Flange Nut (2)	03K9056

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NetBAY3E enclosure

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Features

The IBM NetBAY3E enclosure provides a convenient 3-U high by 28-inch deep storage cabinet for the installation of computer devices.

Note: Vertical measurements are given in rack units (U). One U is equal to 4.45 cm (1.75-inches).

Up to three NetBAY3E enclosures can be stacked under certain IBM servers. Devices such as the IBM EXP10, an uninterruptable power supply (UPS), or various telecommunications equipment can also be installed in a NetBAY3E enclosure.

Important:

- The maximum server weight is 77 kg (170 lb.).
- Refer to the latest IBM Server Hardware Maintenance Manual when servicing the server.
- Assure all power and signal cables are routed properly and are not pinched.
- Make sure NetBAY3E enclosures in a stack are securely fastened together.
- Make sure empty NetBAY3E enclosures (no devices installed) have the rear cover securely attached.
- Servers are lifted onto and off of the NetBAY3E enclosure. Make sure you have help when lifting.

Locations

The following sections contain information on specific equipment locations.

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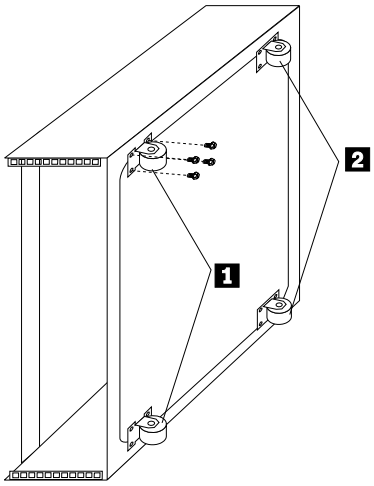
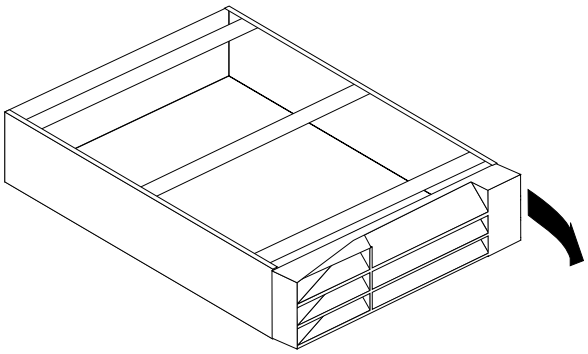
Casters



- Two fixed casters 1 at the front of the NetBAY3E enclosure.
- Two swivel casters 2 at the rear of the NetBAY3E enclosure.

Front cover



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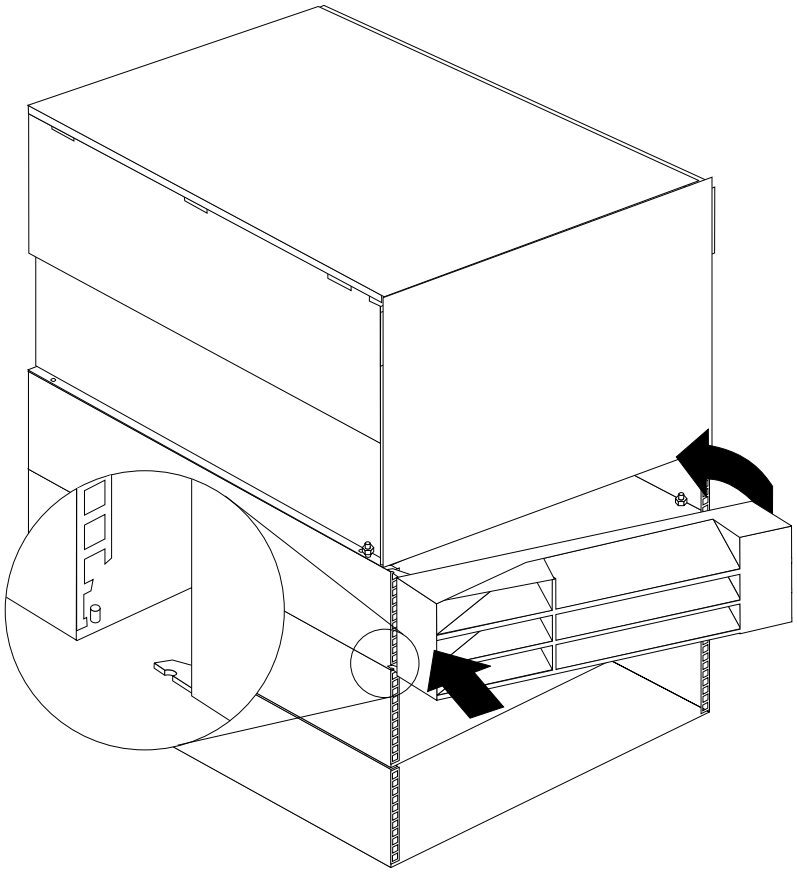
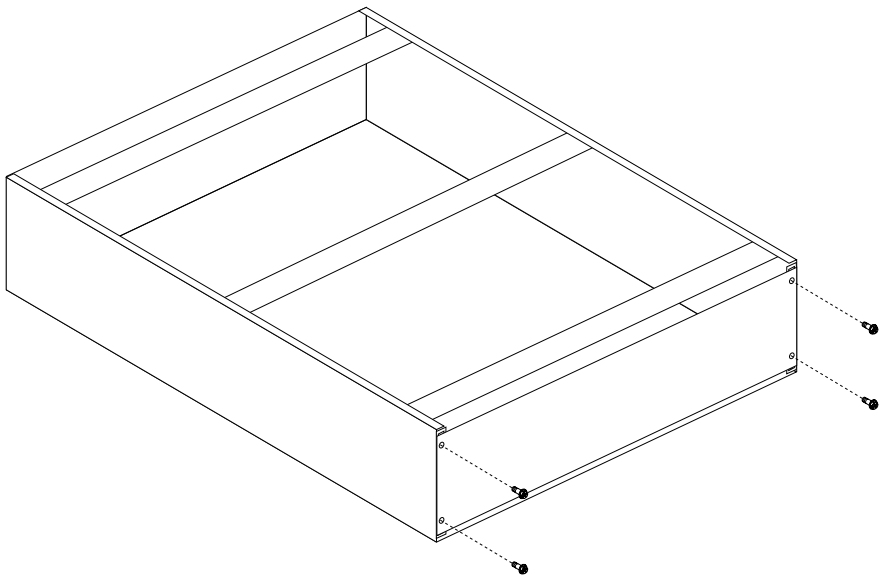


Rear panel

Note: Make sure empty NetBAY3E enclosures (no devices installed) have the rear cover securely attached.



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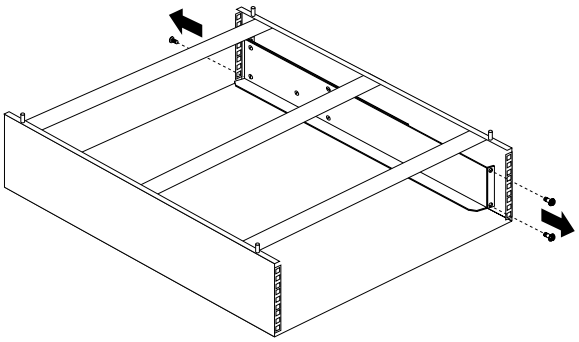
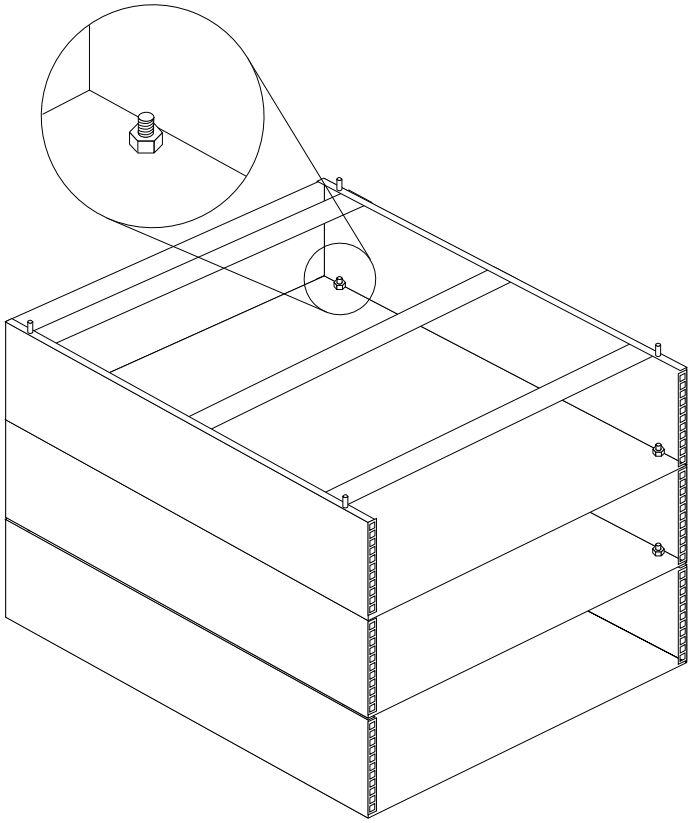
Device side rails



Stacking NetBAY3E enclosures

Notes:

1. Make sure NetBAY3E enclosures in a stack are securely fastened together.
2. When stacking an enclosure on top of another, you must attach them together before you install any device in the upper enclosure.



Important:

- Always lock the casters with the caster stabilizer bar before removing or installing any devices in or on the enclosure.
- Always use the caster stabilizer when multiple NetBAY3E enclosures are stacked under a server.

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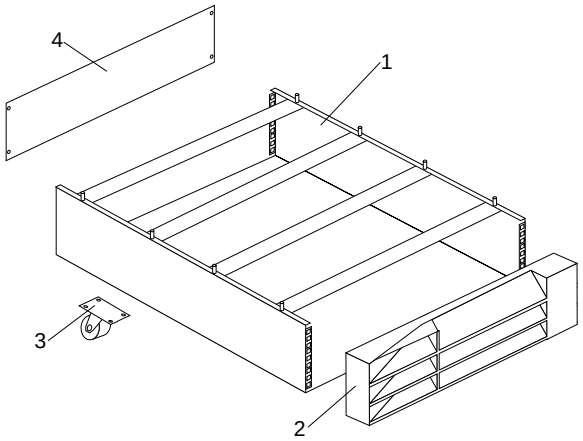
Notes:

1. The maximum server weight is 77 kg (170 lb.).
2. Always install a server on the top enclosure in a stack.

Carefully lift the server by its handles and align its mounting holes 1 with the NetBAY3E enclosure mounting studs 2.

Parts listing (NetBAY3E)



Index	NetBAY3E Enclosure (NetBAY3E)	FRU
1	3-U Enclosure Frame	28L0571
2	Front Bezel Assembly with Lock and Keys	03K8798
3	Casters Fixed, Front, Qty. 2	12J3279
3	Casters Swivel, Rear, Qty. 2	12J3283
4	3-U Blank Panel	03K8799
	Caster Stabilizer	09N7417
	Miscellaneous Parts Kit - Includes:	28L0574
	• Hotswap Planar Clamp (1)	
	• M6 Caged Nut (2)	
	• M6X16 Combination Head Screw (2)	
	• M4X6 Slotted Pan Head Screw (2)	
	• M6X10 Flanged Hex Head Screw (2)	
	• Cage Nut Insertion Tool (1)	
	• M5 Flange Nut (1)	
	• M3.5X7 Flanged Hex Head Screw (1)	

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IBM NetBAY console switch

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The IBM NetBAY 1x4 Console Switch allows you to connect up to four servers to a single monitor, mouse, and keyboard.

The IBM NetBAY 2x8 Console Switch allows you to connect up to eight servers to a primary and secondary monitor, mouse, and keyboard.

You can also connect multiple console switches to each other in a tiered configuration. The Apex User Guide CD contains configuration information about your console switch.

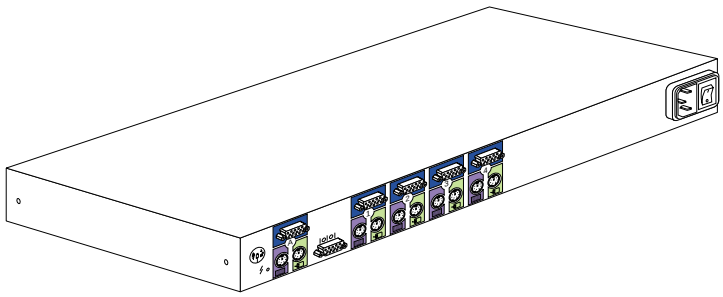

Figure 56. 1x4 console switch

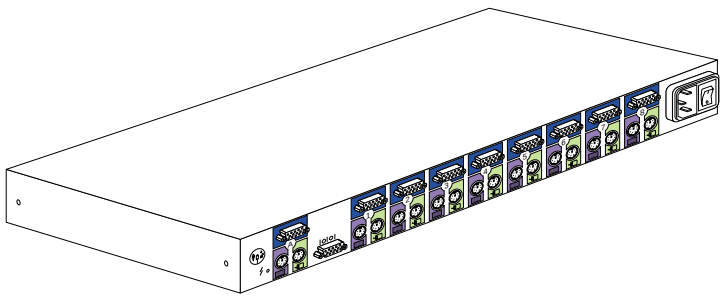

Figure 57. 2x8 console switch

You can install a console switch inside the rear storage compartment NetBAY monitor shelf, vertically in the side of your rack cabinet, or horizontally within 1U of EIA mounting space in your rack cabinet.

Note: If you install a 2x8 Console Switch inside the monitor shelf, you will not be able to use the **B** port on the console switch to connect a second monitor, keyboard, and mouse.

The following parts come with the console switch:

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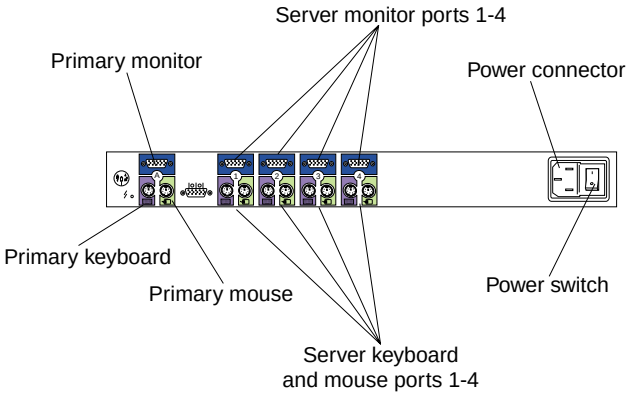
1x4 Console Switch	2x8 Console Switch
Two vertical mounting brackets	Two vertical mounting brackets
Miscellaneous hardware kit (for attaching brackets and installing the console switch in a rack cabinet)	Two horizontal mounting brackets, marked 'L' and 'R' (Left and Right)
One 1.8 m (6 ft) power cord	Miscellaneous hardware kit (for attaching brackets and installing the console switch in a rack cabinet)
One 1.5 m (4.9 ft) IEC connector power cable	One 1.8 m (6 ft) power cord
Apex User Guide CD	One 1.5 m (4.9 ft) IEC connector power cable
IBM NetBAY Console Switch Installation Instructions Manual	Apex User Guide CD
	IBM NetBAY Console Switch Installation Instructions Manual

Note: A NetBAY Console Cable Set is required for each server that you will connect to a console switch, or for each console switch you will connect to another console switch in a tiered configuration. Console cable sets are available in different lengths, and are color-coded the same as the ports on the console switch.

Features

The 1x4 Console Switch allows you to connect up to four servers to a single monitor, keyboard, and mouse. Port **A** is located on the rear of the console switch and is where you connect the monitor, mouse, and keyboard. Ports **1** through **4** are where you connect each of your servers.



The 2x8 Console Switch allows you to connect up to eight servers to a primary and secondary monitor, mouse, and keyboard. Port **A** is located on the rear of the console switch and is where you connect your primary monitor, mouse, and keyboard. Port **B** is located on the front of the console switch and is where you connect your secondary monitor, mouse, and keyboard. Ports **1** through **8** are where you connect each of your servers.

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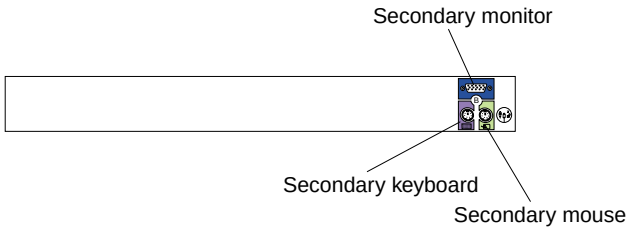
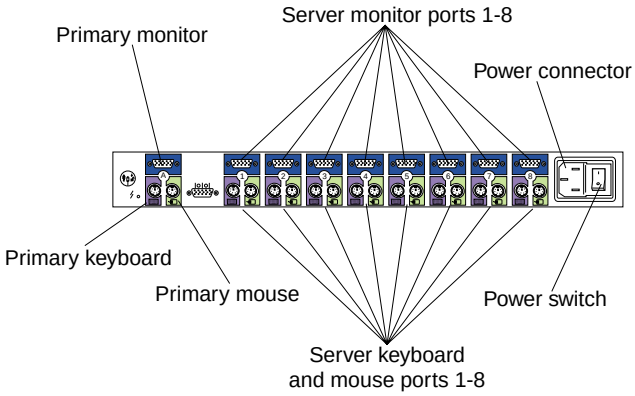
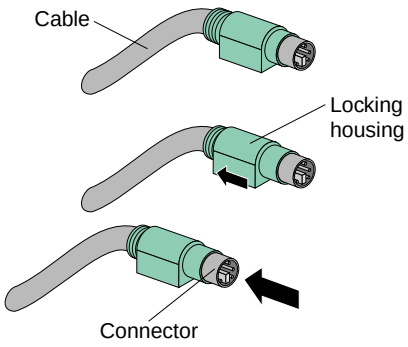




You can connect multiple console switches to each other in a tiered configuration. If you use a 1x4 Console Switch as the primary switch, you can connect up to four additional console switches and 32 servers. If you use a 2x8 Console Switch as the primary switch, you can connect up to eight console switches and 64 servers. The user interface of the primary switch will control all of the console switches in the tier.

The NetBAY Console Cable Set is available separately to connect servers to your console switch. The console cables are available in different lengths, and are color-coded in the same manner as the ports on the console switch.

The locking keyboard and mouse connectors automatically lock when you connect them to prevent accidental disconnection. To disconnect one of these cables, grasp the color-coded housing on the connector; then, pull the housing away from the console switch to unlock the connector and disconnect the cable.



Tool requirements

You will need the following tools to install the console switch:

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- A Phillips screwdriver
- A 10mm nut driver or 10mm open-end or box wrench

Specifications

The following table contains the product specifications for the 1x4 Console Switch and the 2x8 Console Switch:

	1x4 Console Switch	2x8 Console Switch
Height	4.3 cm (1.7 in.)	4.3 cm (1.7 in.)
Depth	20.3 cm (8.0 in.)	20.3 cm (8.0 in.)
Width	43.2 cm (17 in.)	43.2 cm (17 in.)
Weight	2.38 kg (5.25 lbs)	2.59 kg (5.7 lbs)
Rated voltage	100 240 V ac	100 240 V ac
Rated frequency	50 60 Hz	50 60 Hz
Rated input current	1.0 A maximum	1.0 A maximum
Operating temperature at 0914 m (03000 ft)	10° 35°C (50° 95°F)	10° 35°C (50° 95°F)
Operating temperature at 914-2133 m (3000-7000 ft)	10° 32°C (50° 90°F)	10° 32°C (50° 90°F)
Operating humidity (non-condensing)	8% 80%	8% 80%
Video modes supported	VGA, SVGA, XGA	VGA, SVGA, XGA

Installation overview

Use the following general steps to install your console switch:

1. Install the console switch in your rack cabinet:
   - Install a console switch inside the rear storage compartment of a NetBAY monitor shelf according to Chapter 2, Installing a console switch in a monitor shelf, on page 5 **OR**
   - Install a console switch vertically in the side of your rack cabinet according to Chapter 3, Installing a console switch vertically in a rack, on page 9, **OR**
   - Install a console switch horizontally in 1U of EIA rack mounting space in your rack cabinet according to Chapter 4, Installing a console switch horizontally in a rack, on page 13.
2. If you have more than one console switch to install in your rack cabinet repeat step 1 for each console switch.
3. Refer to the Apex User Guide CD for operation and configuration information.

Installing a console switch in a monitor shelf

Use the following procedure to install the console switch in the rear compartment of a NetBAY monitor shelf:

1. Refer to the documentation that comes with your rack cabinet for additional information.

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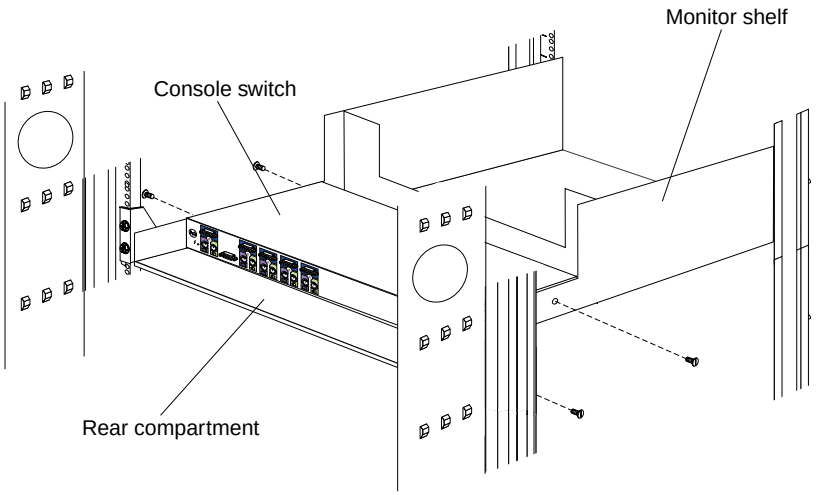
Note: Removing the rack doors and side panels might make your console switch installation easier.

2. If the monitor shelf is not already installed, install the monitor shelf according to its documentation.
3. Place the console switch in the rear compartment of the monitor shelf; then, install and tighten the four M3x5 screws.

   Notes:

   a. Make sure that the rear of the console switch is facing the back of your rack cabinet.

   b. If you install a 2x8 Console Switch inside the monitor shelf, you will not be able to use the **B** port on the console switch to connect a second monitor, keyboard, and mouse.



Continue with the rest of the procedure to cable your console switch.

Note: Refer to the Apex User Guide CD for additional information if you are configuring a tiered installation.

4. Verify that the power switch on the rear of the console switch is in the **Off** position before connecting any cables.
5. Route your mouse cable neatly toward the rear of the console switch; then, connect it to the appropriate mouse connector on Port **A** of the console switch.

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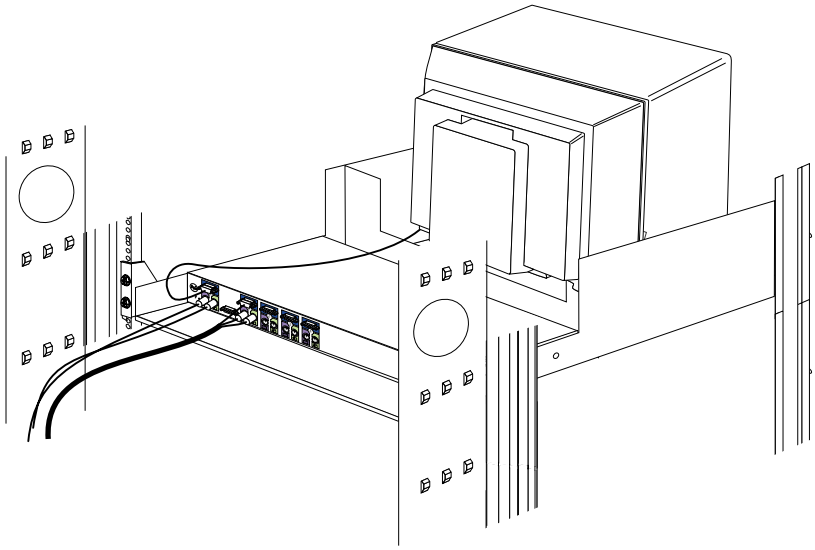

6. Connect the monitor signal cable from your monitor to the blue monitor connector on Port **A** of the console switch; then, tighten the screws on the monitor signal cable.
7. Route your keyboard cable neatly toward the rear of the console switch; then, connect it to the appropriate keyboard connector on Port **A** of the console switch.
8. Connect one end of a console cable set to one of the numbered ports on the rear of the console switch.
9. Route the console cable set toward the rear of your rack cabinet, and up or down toward your server. Use the cable straps that come with this option to secure the console cable set along the way.
10. Connect the other end of the console cable set to the appropriate monitor, mouse, and keyboard connectors on your server.
11. Repeat step 8. to step 10. for all servers that you need to connect to your console switch.
12. Connect the power cord that comes with the console switch to the power connector on the rear of the console switch.
13. Route the power cord toward the rear of your rack cabinet, and either up or down toward a properly wired and grounded power source such as an uninterruptable power supply (UPS), a power distribution unit (PDU), or an electrical outlet. Use the cable straps that come with this option to secure the power cord along the way, and use the openings in your rack cabinet if you must exit the rack to connect to your power source.
14. Refer to the Apex User Guide CD for configuration and operation information about your console switch.

Installing a console switch vertically in a rack

Use the following procedure to install the console switch vertically in the side of your rack cabinet:

Note: The mounting holes on upper and lower side braces in a rack side compartment must be between 50.8 cm (20.0 in.) and 57.3 cm (22.6 in.) apart. If your rack cabinet has movable side braces, refer to your rack documentation for information about relocating your side braces if they are not already spaced for this installation.

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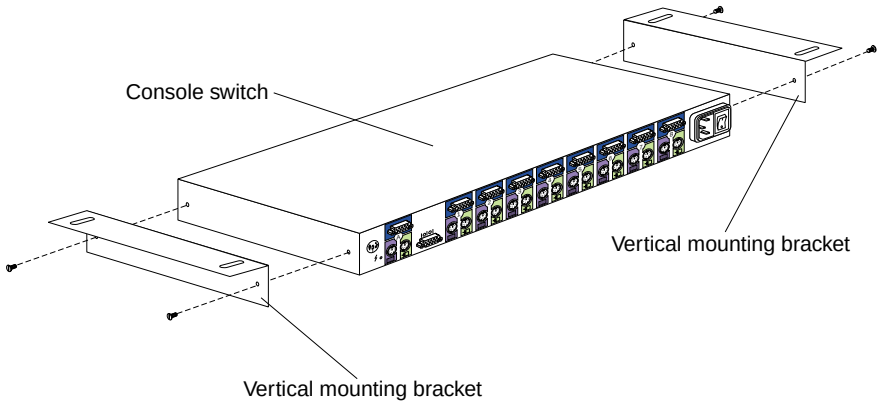
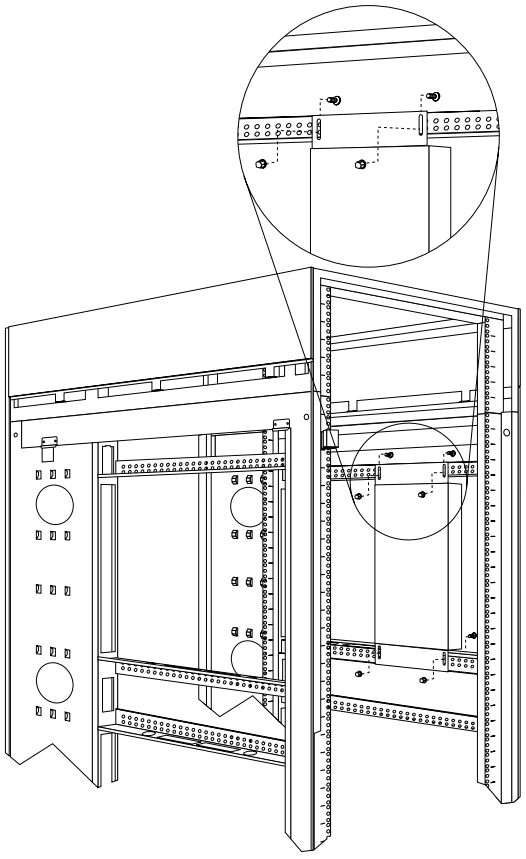
1. Refer to the documentation that comes with your rack cabinet for additional information.

   Note: Removing the rack doors and side panels might make your console switch installation easier.

2. Attach one vertical mounting bracket to each side of the console switch using two 8-32 screws per bracket.



3. Hold the console switch against the side braces, with the rear of the console switch facing the back of your rack cabinet; then, use four M6 screws and nuts to attach the console switch to the side braces.



Continue with the rest of the procedure to cable your console switch.

Note: Refer to the Apex User Guide CD for additional information if you are configuring a tiered installation.

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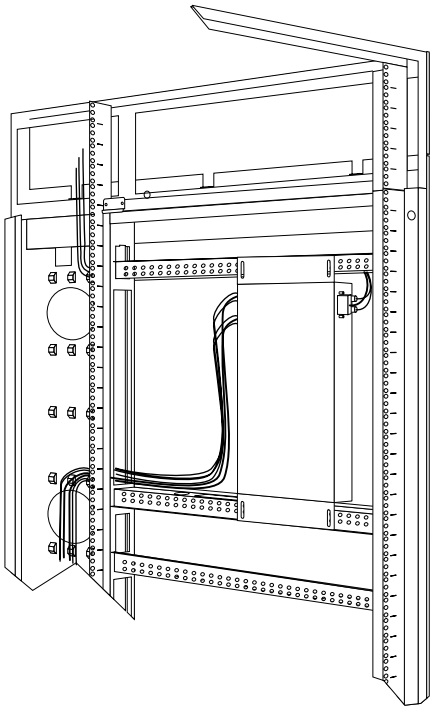
4. Verify that the power switch on the rear of the console switch is in the **Off** position before connecting any cables.
5. Route your mouse cable neatly toward the rear of the console switch; then, connect it to the appropriate mouse connector on Port **A** of the console switch.



6. Connect the monitor signal cable from your monitor to the blue monitor connector on Port **A** of the console switch; then, tighten the screws on the monitor signal cable.
7. Route your keyboard cable neatly toward the rear of the console switch; then, connect it to the appropriate keyboard connector on Port **A** of the console switch.
8. If you have a 2x8 Console Switch, repeat step 5. to step 7. and connect a second monitor, mouse, and keyboard to Port **B** on the front of your console switch.
9. Connect one end of a console cable set to one of the numbered ports on the rear of the console switch.
10. Route the console cable set toward the rear of your rack cabinet, and up or down toward your server. Use the cable straps that come with this option to secure the console cable set along the way.
11. Connect the other end of the console cable set to the appropriate monitor, mouse, and keyboard connectors on your server.
12. Repeat step 9. to step 11. for all servers that you need to connect to your console switch.
13. Connect the power cord that comes with the console switch to the power connector on the rear of the console switch.
14. Route the power cord toward the rear of your rack cabinet, and either up or down toward a properly wired and grounded power source such as an uninterruptable power supply (UPS), a power distribution unit (PDU), or an electrical outlet. Use the cable straps that come with this option to secure the power cord along the way, and use the openings in your rack cabinet if you must exit the rack to connect to your power source.

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15. Refer to the Apex User Guide CD for configuration and operation information about your console switch.

Installing a console switch horizontally in a rack

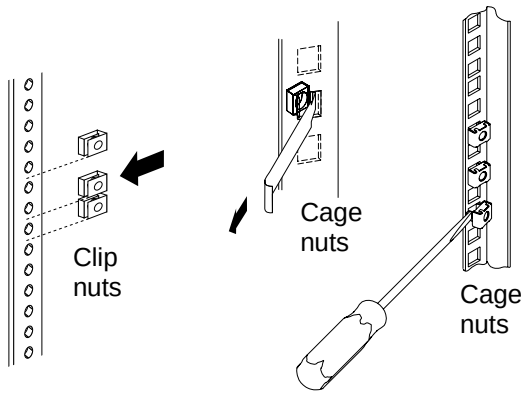
Use the following procedure to install the console switch horizontally in 1U of EIA rack mounting space in your rack cabinet:

1. Refer to the documentation that comes with your rack cabinet for additional information.

   Notes:

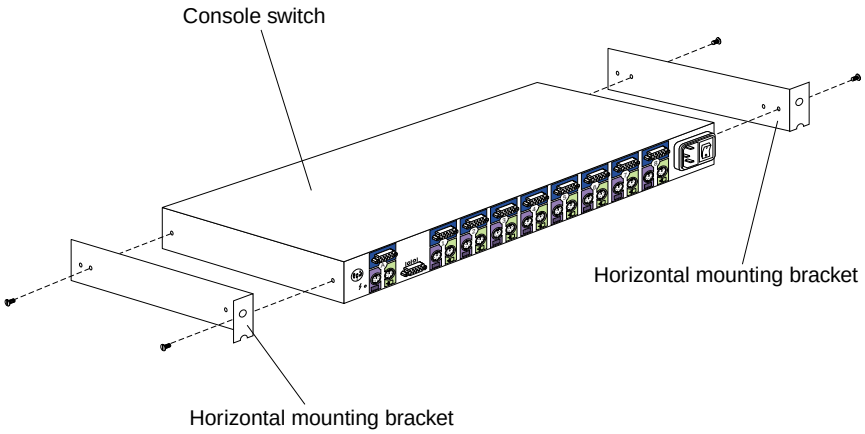
   a. Removing the rack doors and side panels might make your console switch installation easier.

   b. Use cage nuts for rack cabinets with square holes, or clip nuts for rack cabinets with round holes.



2. Attach one horizontal mounting bracket to each side of the console switch using two 8-32 screws per bracket. Make sure that the notched hole on the bracket is toward the bottom of the console switch.

   Note: There are two sets of mounting holes on the brackets. You can install the console switch even with the EIA mounting flanges of the rack cabinet or recessed, depending on how you install the brackets.



3. Determine the appropriate U level within the EIA mounting space; then, install the console switch in the rear of your rack cabinet using four M6 screws and either cage nuts or clip nuts.

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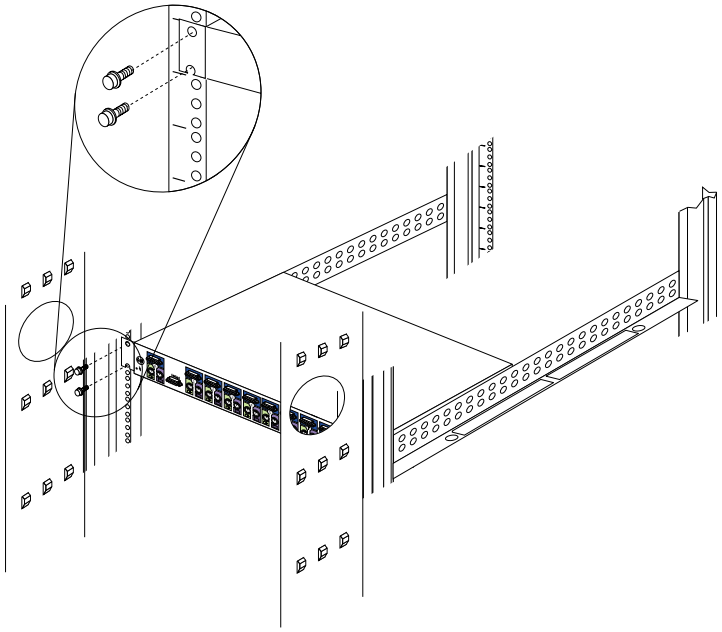
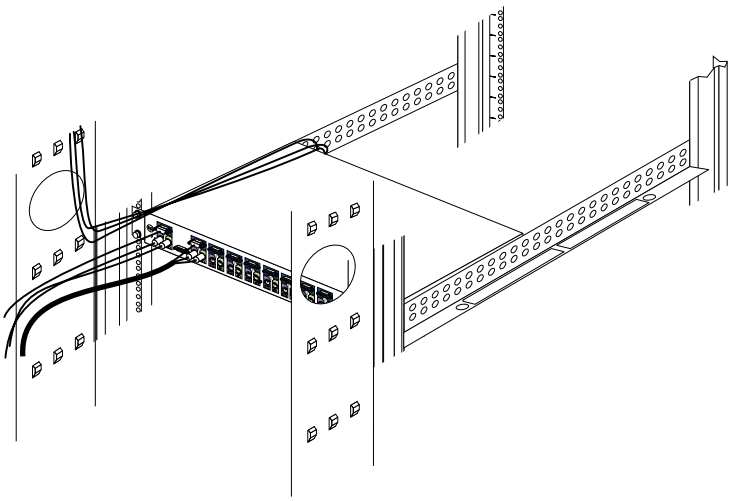


Continue with the rest of the procedure to cable your console switch.

Note: Refer to the Apex User Guide CD for additional information if you are configuring a tiered installation.

4. Verify that the power switch on the rear of the console switch is in the **Off** position before connecting any cables.
5. Route your mouse cable neatly toward the rear of the console switch; then, connect it to the appropriate mouse connector on Port **A** of the console switch.



6. Connect the monitor signal cable from your monitor to the blue monitor connector on Port **A** of the console switch; then, tighten the screws on the monitor signal cable.
7. Route your keyboard cable neatly toward the rear of the console switch; then, connect it to the appropriate keyboard connector on Port **A** of the console switch.
8. If you have a 2x8 Console Switch, repeat step 5. to step 7. and connect a second monitor, mouse, and keyboard to Port **B** on the front of your console switch.

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9. Connect one end of a console cable set to one of the numbered ports on the rear of the console switch.
10. Route the console cable set toward the rear of your rack cabinet, and up or down toward your server. Use the cable straps that come with this option to secure the console cable set along the way.
11. Connect the other end of the console cable set to the appropriate monitor, mouse, and keyboard connectors on your server.
12. Repeat step 9. to step 11. for all servers that you need to connect to your console switch.
13. Connect the power cord that comes with the console switch to the power connector on the rear of the console switch.
14. Route the power cord toward the rear of your rack cabinet, and either up or down toward a properly wired and grounded power source such as an uninterruptable power supply (UPS), a power distribution unit (PDU), or an electrical outlet. Use the cable straps that come with this option to secure the power cord along the way, and use the openings in your rack cabinet if you must exit the rack to connect to your power source.
15. Refer to the Apex User Guide CD for configuration and operation information about your console switch.

Parts listing (NetBAY Console Switch)

NetBAY (Console Switch)	FRU
1x4 switch	06P6003
2x8 switch	06P6004
7-foot locking console cable	06P6006
12-foot locking console cable	06P6007

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NetBAY Power Distribution Units

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The IBM NetBAY Rack Power Distribution Units are part of the Rack Modular Power Distribution Unit (M/PDU) family.

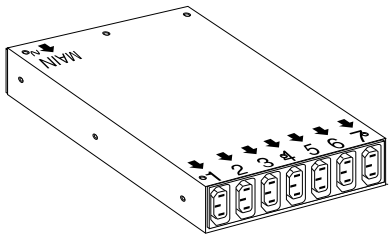
These Rack PDUs are used in all models of the IBM 9306 and 9308 racks.

The Rack PDUs come in three types:

- NetBAY Rack Power Distribution Unit
- NetBAY Front-end Power Distribution Unit
- NetBAY Server Dual-cord Power Distribution Unit

NetBAY rack Power Distribution Unit introduction

The IBM NetBAY Rack Power Distribution Unit is part of the Rack Modular Power Distribution Unit (M/PDU) family and enables you to connect up to seven devices to a single dedicated power source, such as an electrical outlet or an uninterruptable power supply (UPS). The Rack PDU has one power inlet and seven IEC standard power outlets.



Notes:

1. Power cables for devices that you will connect to the Rack PDU do not come with the Rack PDU.
2. You will have some unused parts depending upon how you install the Rack PDU.
3. When you install two Rack PDUs you will need some parts from both devices.

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4. You can install other M/PDU family devices next to your Rack PDU using mounting hardware from both devices.

You can install the Rack PDU vertically in the side of your rack cabinet, or horizontally within 1U of EIA mounting space in your rack cabinet. The mounting hardware that comes with this option enables you to install one Rack PDU next to another in the same mounting space within your rack cabinet.

The following parts come with the Rack PDU:

- One Rack PDU
- One line cord (Some models include both a high voltage and a low voltage line cord)
- One vertical mounting plate
- One vertical-mounting cable-management bracket
- One horizontal mounting bracket
- One single-device attachment bracket (for horizontal-mount installations)
- One dual-device attachment bracket (for horizontal-mount installations)
- One 1U blank filler panel (for horizontal-mount installations)
- Miscellaneous hardware kit (for attaching brackets and installing the device in a rack cabinet)
- Cable straps
- Installation documentation

Note: The illustrations in this documentation might be slightly different from your hardware.

Tool requirements

You will need the following tools to install the Rack PDU:

- A Phillips screwdriver
- A 10-mm nut driver or 10-mm open-end or box wrench

Installation overview

Use the following general steps to install your Rack PDU:

1. Install one or two devices in your rack cabinet
   - Install devices vertically in the side of your rack cabinet according to“Installing devices vertically”, **OR**
   - Install a single device horizontally in your rack cabinet in 1U of available EIA mounting space according to “Installing a single device horizontally” on page 144, **OR**
   - Install two devices horizontally in your rack cabinet in 1U of available EIA mounting space according to “Installing two devices horizontally” on page 171.
2. Connect line cords and cables according to “Cabling your PDUs” on page 148.

Installing devices vertically

Use the following procedure to mount the Rack PDU in the side of your rack cabinet:

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Note: The mounting holes on the upper and lower side braces in a rack side compartment must be between 48.6 cm (19.1 in.) and 56.9 cm (22.4 in.) apart. If your rack cabinet has movable side braces, refer to your rack documentation for information about relocating your side braces if they are not already spaced for this installation.

1. Refer to the documentation that comes with your rack cabinet for additional information.

   Note: Removing the rack doors and side panels might make your Rack PDU installation easier.

2. Verify that the circuit breaker switch is in the Off position before installing your Rack PDU.

3. Install the Rack PDU **3** to the vertical mounting plate **2** with four M3x5 screws **1** that come with this option. Make sure that the countersink holes in the vertical mounting plate are facing away from the device.

   Note: Align the Rack PDU to one end or the other of the vertical mounting plate to leave room for a second device.

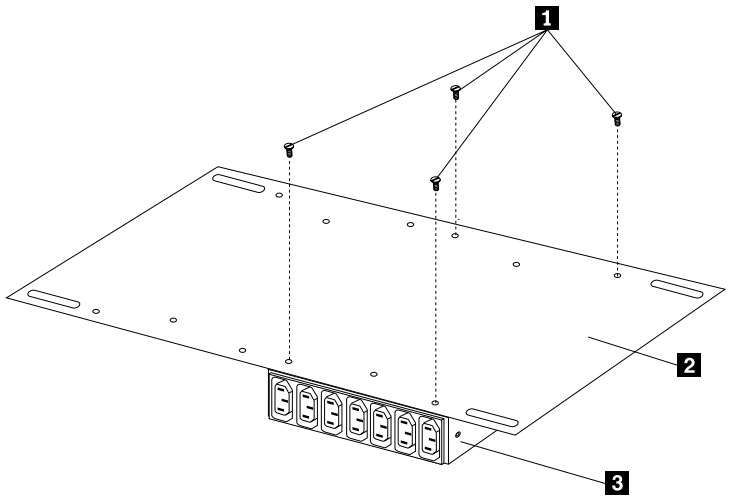

Figure 58. Installing the Rack PDU on the vertical mounting plate

4. If you have a second M/PDU device to install, install it on the vertical mounting plate with four M3x5 screws that come with the second device.

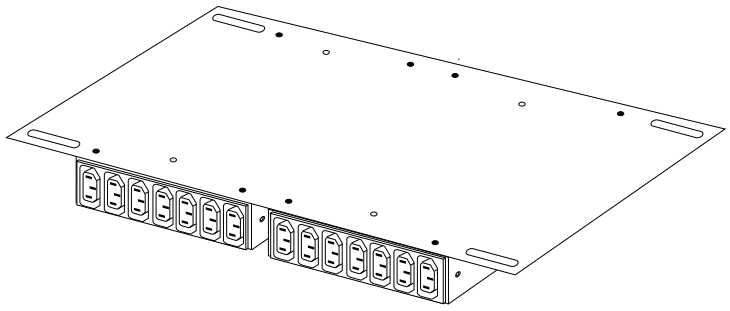

Figure 59. Installing a second Rack PDU

5. Install the vertical mounting plate **2** in the side of your rack cabinet with four M6 screws and nuts that come with this option. Make sure that the seven-connector side of the Rack PDU is facing the rear of your rack cabinet, and leave room between the vertical mounting plate and the rear EIA mounting flanges for the cable-management bracket **1**.

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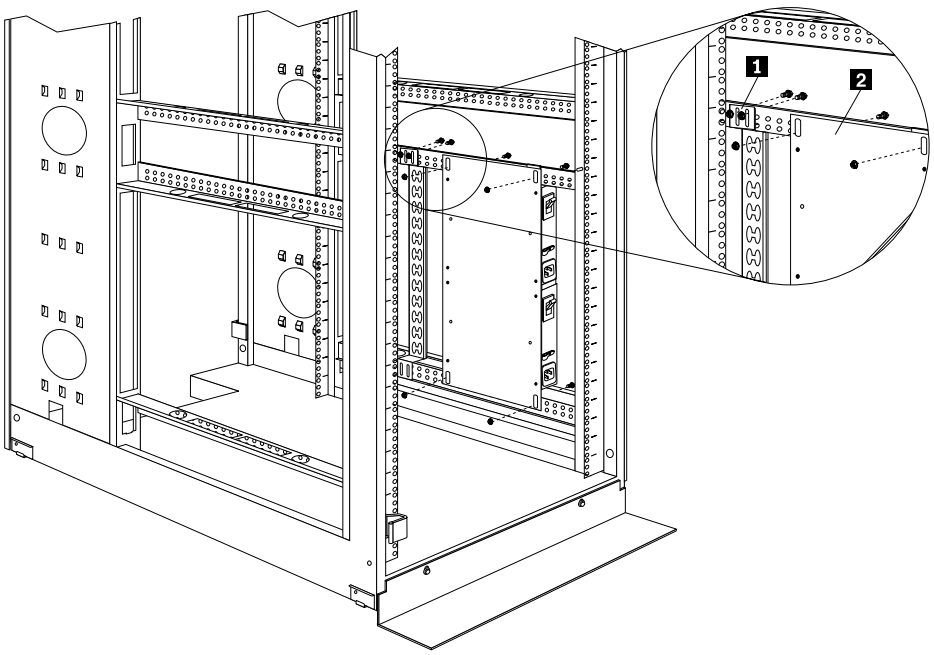


Figure 60. Installing the vertical mounting plate and cable-management bracket

6. Install the cable-management bracket **1** beside the vertical mounting plate with four M6 screws and nuts that come with this option.

   Proceed to"Cabling your PDUs" on page 148 for instructions on how to cable your Rack PDU.

Installing a single device horizontally

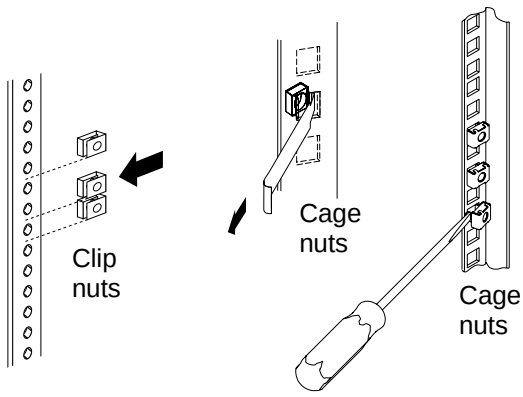
Use the following procedure to mount a single Rack PDU horizontally in your rack cabinet:

1. Refer to the documentation that comes with your rack cabinet for additional information.

   Notes:

   a. Removing the rack doors and side panels might make your Rack PDU installation easier.

   b. Use clip nuts for rack cabinets with round holes; use cage nuts for rack cabinets with square holes.



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2. Verify that the circuit breaker switch is in the Off position before installing your Rack PDU.
3. Install the horizontal mounting bracket **3** on one side of the Rack PDU **5** with M3x5 screws **4** .

   Note: There are two sets of mounting holes on the bracket. You can align the Rack PDU to be even with the back of the rack cabinet or recessed inside, depending on how you install the bracket.

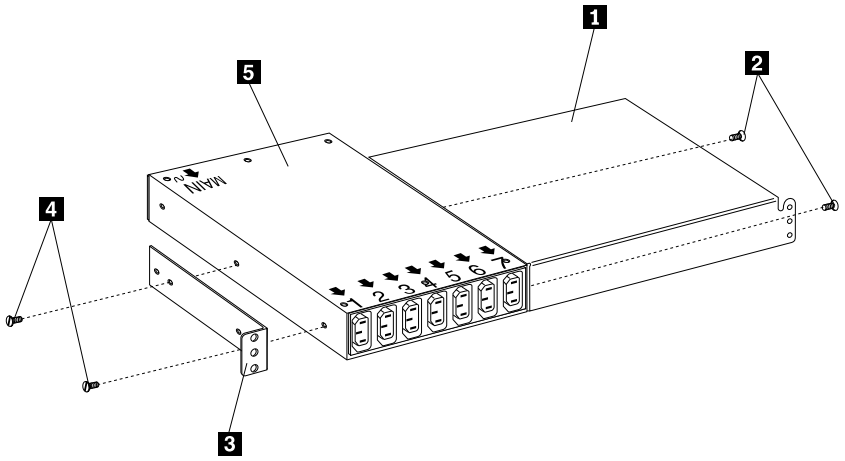

Figure 61. Installing the mounting brackets for a single device

4. Install the single-device attachment bracket **1** on the other side of the Rack PDU **5** with two M3x5 screws **2** . Make sure that you use the same set of mounting holes on this bracket as you used on the bracket in the previous step.
5. Determine the U level within your rack cabinet where you are going to install the Rack PDU; then, install the Flat Panel Monitor Rack Mount Kit and bracket assembly **2** in the rear of the rack cabinet with four M6 screws and clip nuts or cage nuts (two screws and nuts per bracket).

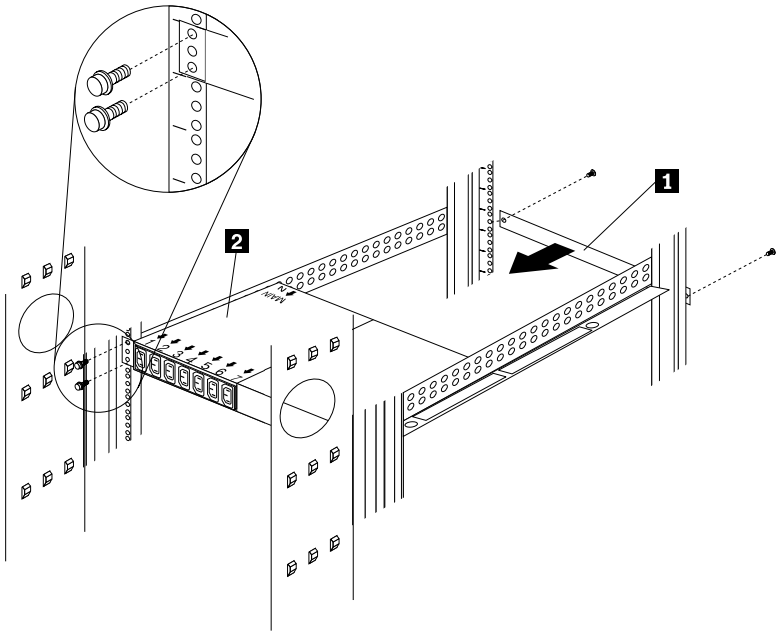

Figure 62. Installing the Rack PDU and the blank filler panel

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6. Install the 1U blank filler panel 1 on the front of the rack cabinet at the same U level as the Rack PDU. Use two M6 screws that come with this option.

   Proceed to "Cabling your PDUs" on page 148 for instructions on how to cable your Rack PDU.

Installing two devices horizontally

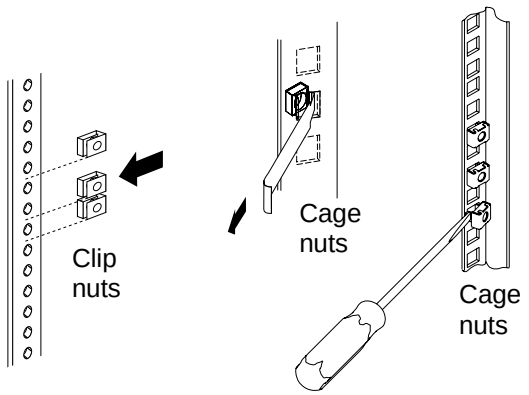
Use the following procedure to mount two Rack PDUs horizontally in your rack cabinet:

1. Refer to the documentation that comes with your rack cabinet for additional information.

   Notes:

   a. Removing the rack doors and side panels might make your Rack PDU installation easier.

   b. Use clip nuts for rack cabinets with round holes; use cage nuts for rack cabinets with square holes.



2. Verify that the circuit breaker switch is in the Off position before installing your Rack PDU.
3. Attach a dual-device attachment bracket 6 to the right side of one of the Rack PDUs with two M3x5 screws; then, attach another dual-device attachment bracket 5 to the left side of the other Rack PDU with two M3x5 screws.

   Notes:

   a. When you install two Rack PDUs next to each other, you will need some parts from both options.

   b. Turn the second dual-device attachment bracket 5 so that the threaded holes are on the opposite side of the device as the holes on the other attachment bracket 6 .

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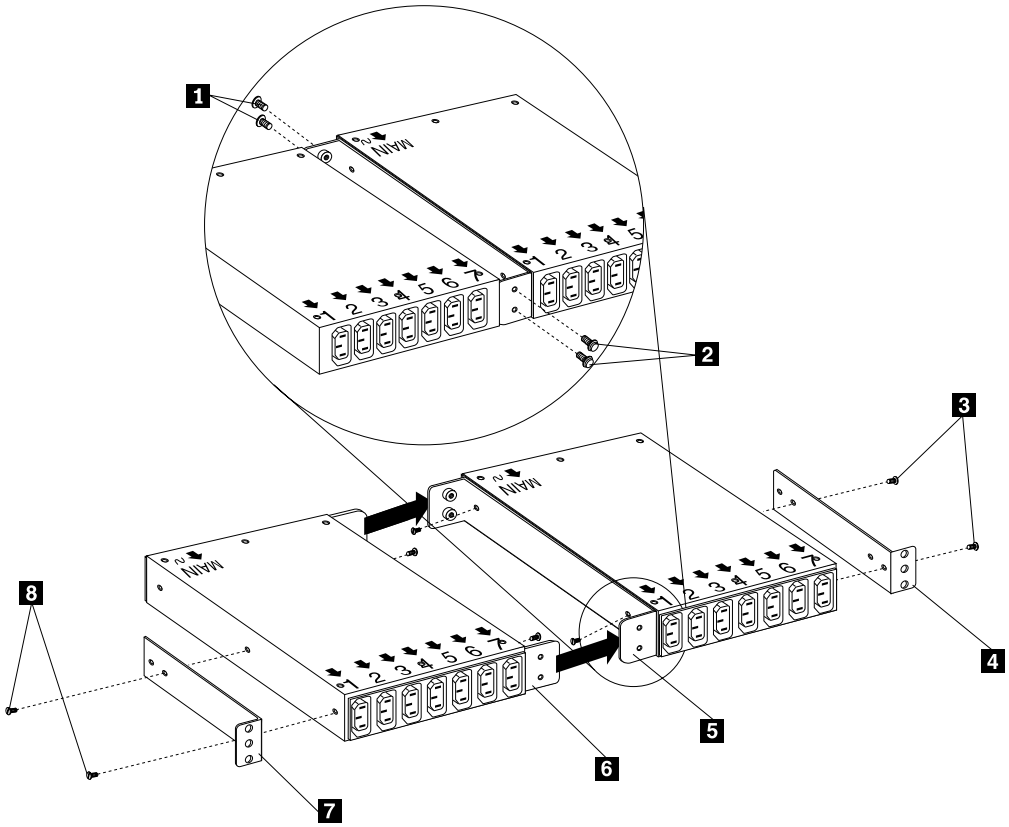

Figure 63. Installing the mounting brackets for two devices

4. Push the two Rack PDUs together, aligning the holes on the dual-device attachment brackets; then, use four M6 screws to secure the front 1 and rear 2 of the brackets to each other.

5. Install a horizontal mounting bracket 4 on the Rack PDU on the right with two M3x5 screws 3 ; then, install the other horizontal mounting bracket 7 on the Rack PDU on the left with two M3x5 screws 8 .

   Note: There are two sets of mounting holes on the brackets. You can align the Rack PDU to be even with the back of the rack cabinet or recessed inside, depending on how you install the brackets.

6. Determine the U level within your rack cabinet where you are going to install the Rack PDUs; then, install both Flat Panel Monitor Rack Mount Kits 2 in the rear of the rack cabinet with four M6 screws and clip nuts or cage nuts (two screws and nuts per bracket).

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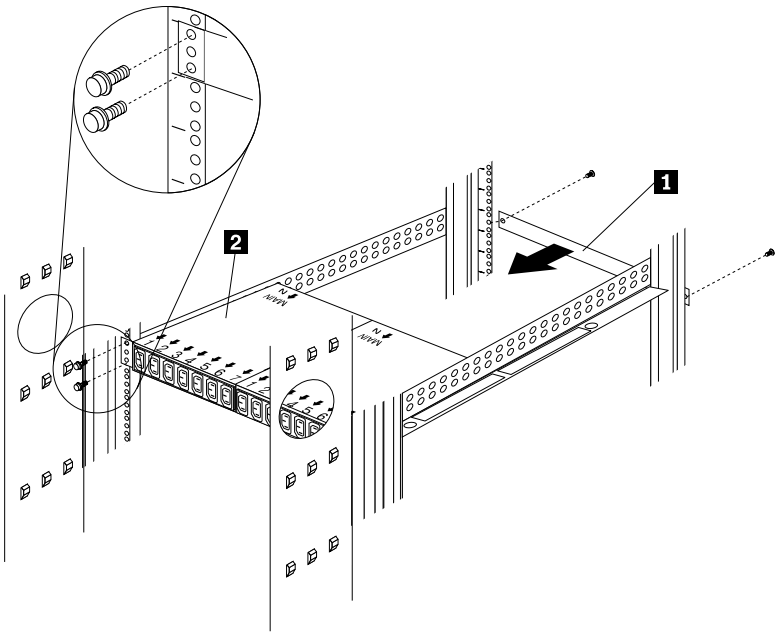

Figure 64. Installing two Rack PDUs and the blank filler panel

7. Install the 1U blank filler panel **1** on the front of the rack cabinet at the same U level as the Rack PDU. Use two M6 screws that come with this option.

   Proceed to "Cabling your PDUs" on page 173 for instructions on how to cable your Rack PDU.

Cabling your PDUs

Cable routing differs between horizontal and vertical Rack PDU installations. Refer to "Cabling instructions for vertical-mount PDUs" on page 150 or "Cabling instructions for horizontal-mount PDUs" on page 151 as appropriate for your installation.

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Statement 1

DANGER

Electrical current from power, telephone, and communication cables is hazardous. To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**

To connect:	To disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

Statement 13

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DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your IBM device for electrical specifiacations. Also adhere to the following statements:

1. **If you are connecting to a 120-127 V ac power source, connect each power cord to a separate branch circuit.**
2. **If you are connecting to a 200-240 V ac power source and the branch circuit rating is:**
   a. **13 amps or less, connect each power cord to a separate branch circuit.**
   b. **14 amps to 19 amps, do not connect more than two power cords to the same branch circuit.**
   c. **20 amps or greater, you may connect up to three power cords to the same branch circuit.**

Cabling instructions for vertical-mount PDUs

If your Rack PDU came with more than one line cord, select either the high-voltage cord or the low-voltage cord for your installation. Use the following procedure to connect and route cables for Rack PDUs that you mounted vertically in the side of your rack cabinet:

1. Connect the line cord that comes with this option to the inlet on the Rack PDU; then, remove the screw on the cable clamp **1** and route the line cord through the clamp.

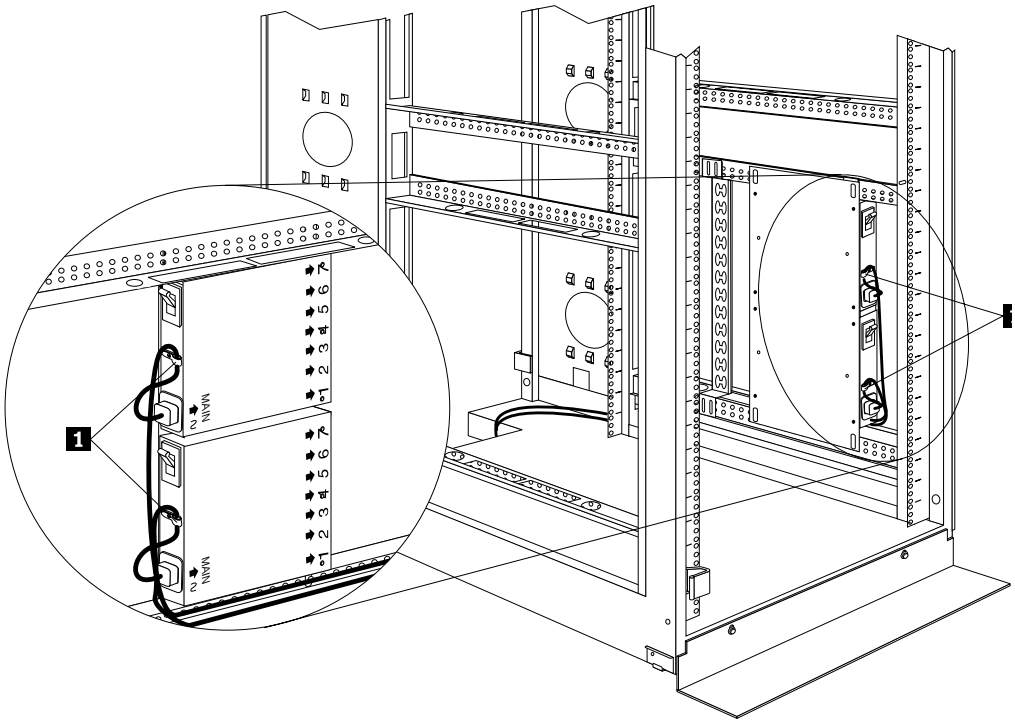

Figure 65. Connecting and routing the line cord

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2. Reinstall the screw on the cable clamp **1** and repeat step 1 for the other device if you installed two devices.
3. Route the line cords down and toward the rack side braces; then, route the line cords along the side brace towards the back of the rack cabinet and secure them with the cable straps that come with this option.
4. Route the line cords toward a dedicated power source, such as a UPS or electrical outlet. Use the provided cable straps to secure the line cords along the way. Use the openings in your rack cabinet, if you must exit the rack cabinet to connect to your power source.
5. After you connect the line cords to properly wired and grounded dedicated power sources, you can turn on the circuit breaker; then, connect other devices in your rack cabinet to the seven power outlets on the Rack PDU. Route all other power cables neatly, and use the cable-management bracket to secure the cables that you plug into the outlets on the Rack PDU.

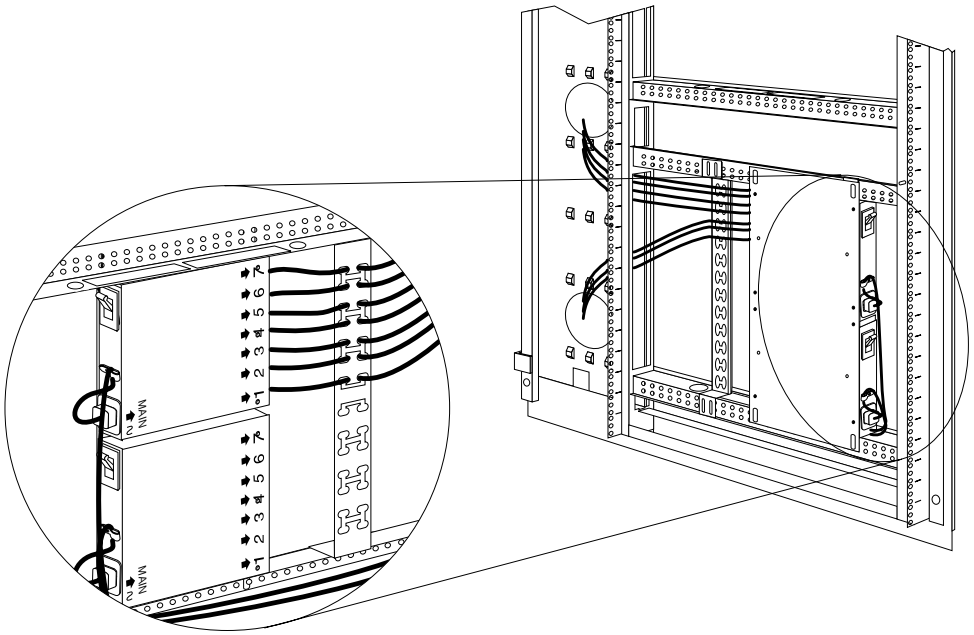

Figure 66. Connecting and routing other power cables to the outlets

Cabling instructions for horizontal-mount PDUs

If your Rack PDU came with more than one line cord, select either the high-voltage cord or the low-voltage cord for your installation. Use the following procedure to connect and route cables for Rack PDUs that you mounted in the horizontal EIA space of your rack cabinet:

1. Connect the line cord that comes with this option to the inlet on a Rack PDU; then, remove the screw on the cable clamp and route the line cord through the clamp.

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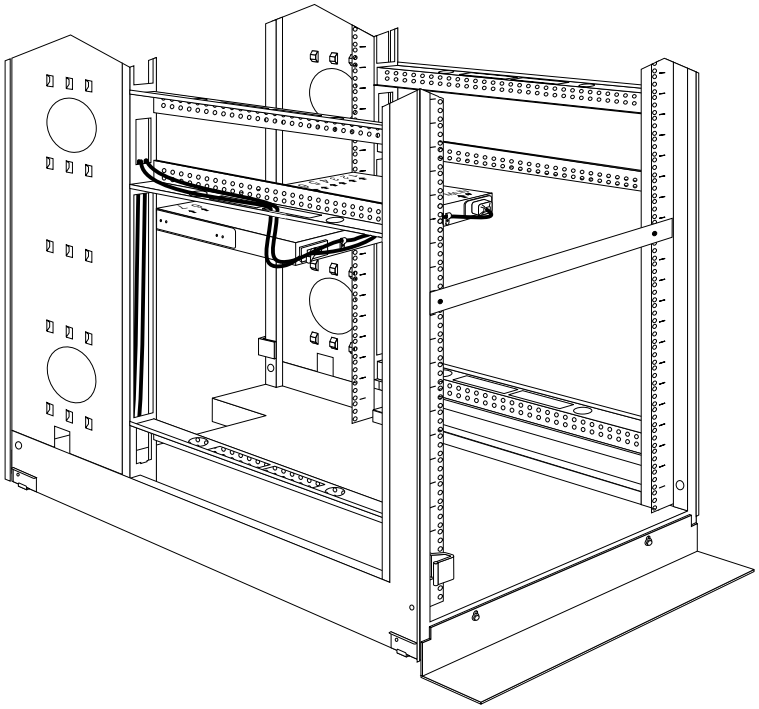

Figure 67. Connecting and routing the line cord

Reinstall the screw on the cable clamp and repeat this step for the other device, if you installed two devices.

2. Route the line cords left or right, toward the side of the rack cabinet; then, route the line cords along the side brace towards the back of the rack cabinet and secure them with the cable straps that come with this option.
3. Route the line cords toward a dedicated power source, such as a UPS or electrical outlet. Use the provided cable straps to secure the line cords along the way. Use the openings in your rack cabinet, if you must exit the rack cabinet to connect to your power source.
4. After you connect the line cords to properly wired and grounded dedicated power sources, you can turn on the circuit breaker; then, connect other devices in your rack cabinet to the seven power outlets on the Rack PDU. Route all other power cables neatly, and use cable straps to secure the cables that you plug into the outlets on the Rack PDU.

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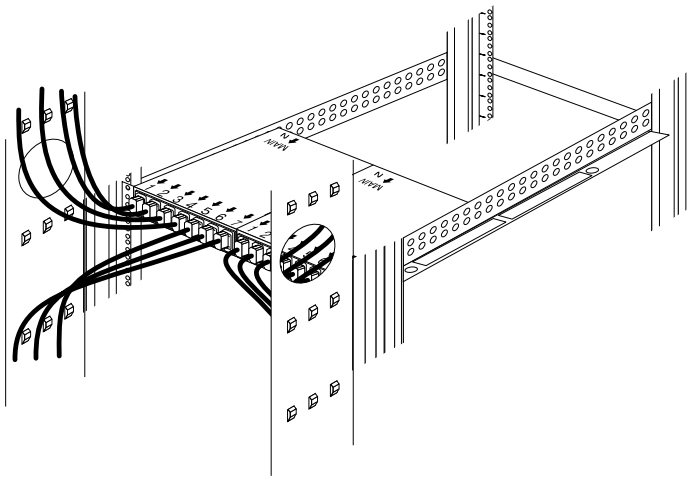

Figure 68. Connecting and routing other power cables to the outlets

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Rack PDU specifications

When connected to a dedicated power source, the Rack PDU conforms to UL950, CSA 22.0-950, EN-60950, and IEC-950 standards. The following table contains the product specifications for the Rack PDU:

Height	43 mm (1.7 in.)
Width	192 mm (7.5 in.)
Depth	221 mm (8.7 in.)
Weight	1.5 kg (3.2 lbs)
Operating temperatures	10°C–35°C (50°F–95°F) at 0–914 m (0–3000 ft) 10°C–32 °C (50°F–90°F°) at 914–2133 m (3000–7000 ft)
Operating humidity	8–80% (non-condensing)
Rated voltage	100–240 V ac, 15 A, single-phase
Rated frequency	50–60 Hz
Maximum power rating	3600 VA
Circuit breaker	Two-pole, 15 A with time-delay protection for up to 600 A input current without nuisance tripping.
Power inlet	IEC 320-C20 inlet rated at 16 A (VDE) / 20 A (UL/CSA)
Power outlets	Seven IEC 320-C13 outlets rated at 10 A (VDE) / 15 A (UL/CSA)

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Power cables

Power cables that you use to connect a system, storage expansion unit, and other devices to the Rack PDU usually come with those devices. The following table contains a list of power cables that you can use with the Rack PDU:

Length	Cable rating	Plug type	Cable part #
2.8 m (9.2 ft)	250 V, 10 A	IEC 320-C13 to IEC 320-C14	36L8886
4.3 m (14 ft)	250 V, 10 A	IEC 320-C13 to IEC 320-C14	94G7448

Power cables that you use to connect your Rack PDU to a UPS or Front-end PDU come with those devices as indicated in the following table:

Length	Cable rating	Plug type	Cable part #	Comes with:
2 m (6.6 ft)	250 V, 16 A	IEC 320-C19 to IEC 320-C20	00N7700	APC SU-5000 RMB UPS (2 cables)
1 m (3.3 ft)	250 V, 16 A	IEC 320-C19 to IEC 320-C20	00N7698	Front-end PDU (3 cables)

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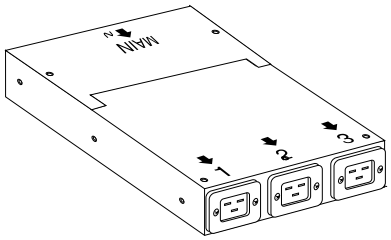
Line cords

A 4.3 m (14 ft) country-specific line cord that you use to connect your Rack PDU to a properly wired, grounded, and dedicated power source comes with the Rack PDU. The following table contains a list of line cords that you can use with the Rack PDU:

Power Source	Line cord rating	Plug type	Line cord part #
100–127 V ac, 20 A	127 V ac, 18 A	IEC 320-C19 to NEMA L5-20P	12J5117
200–240 V ac, 20 A	250 V ac, 18 A	IEC 320-C19 to NEMA L6-20P	14F1553
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to CEE7-VII	14F1554
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to IEC 309-2P + Gnd	36L8823
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to SII 32	14F1561
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to CEI 23-16	14F1560
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to SABS 164	14F1557
220–240 V ac, 13 A	250 V ac, 13 A	IEC 320-C19 to BS 1363/A	12J5988
220–240 V ac, 15 A	250 V ac, 15 A	IEC 320-C19 to AS/NZ 3112	14F1559
220–240 V ac, 15 A	250 V ac, 15 A	IEC 320-C19 to GB 2099.1	01K9852
220–240 V ac, 15 A	250 V ac, 15 A	IEC 320-C19 to IRAM 2063	36L8885

NetBAY front-end Power Distribution Unit introduction

The IBM NetBAY Single-phase and Three-phase Front-end Power Distribution Units are part of the Rack Modular Power Distribution Unit (M/PDU) family and enable you to connect a single-phase or three-phase dedicated power source to three different single-phase PDUs in the M/PDU family. The Rack PDU has one power source inlet and three IEC standard power outlets.



Notes:

1. You will have some unused parts depending upon how you install the Rack PDU.
2. You can install other M/PDU family devices next to your Rack PDU using mounting hardware from both devices.

You must install the Rack PDU vertically in the side of your rack cabinet with the provided mounting hardware. The following parts come with the Rack PDU:

The following parts come with the Rack PDU:

- One 1P Rack PDU with a fixed line cord or one 3P Flat Panel Monitor Rack Mount Kit with a fixed line cord
- Three power cables (for connecting other M/PDU family devices)

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- One vertical mounting plate
- One vertical-mounting cable-management bracket
- Miscellaneous hardware kit (for attaching brackets and installing the device in a rack cabinet)
- Cable straps
- Installation documentation

Note: The illustrations in this documentation might be slightly different from your hardware.

Tool requirements

You will need the following tools to install the Rack PDU:

- A Phillips screwdriver
- A 10-mm nut driver or 10-mm open-end or box wrench

Installation overview

Use the following general steps to install your Rack PDU:

1. Install one or two devices in your rack cabinet:
   - Install a single device vertically in the side of your rack cabinet according to "Installing a single device vertically", **OR**
   - Install two devices vertically in the side of your rack cabinet according to "Installing two devices vertically" on page 160.
2. Connect line cords and cables as appropriate for your installation.

Installing a single device vertically

Use the following procedure to mount a single Rack PDU in the side of your rack cabinet:

Note: The mounting holes on the upper and lower side braces in a rack side compartment must be between 48.6 cm (19.1 in.) and 56.9 cm (22.4 in.) apart. If your rack cabinet has movable side braces, refer to your rack documentation for information about relocating your side braces if they are not already spaced for this installation.

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Statement 1

DANGER

Electrical current from power, telephone, and communication cables is hazardous. To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To connect:	To disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

1. Refer to the documentation that comes with your rack cabinet for additional information.

   Note: Removing the rack doors and side panels might make your Rack PDU installation easier.

2. Install the Rack PDU on the center of the vertical mounting plate **2** with four M3x5 screws **1** that come with this option. Make sure that the countersink holes in the vertical mounting plate are facing away from the device.

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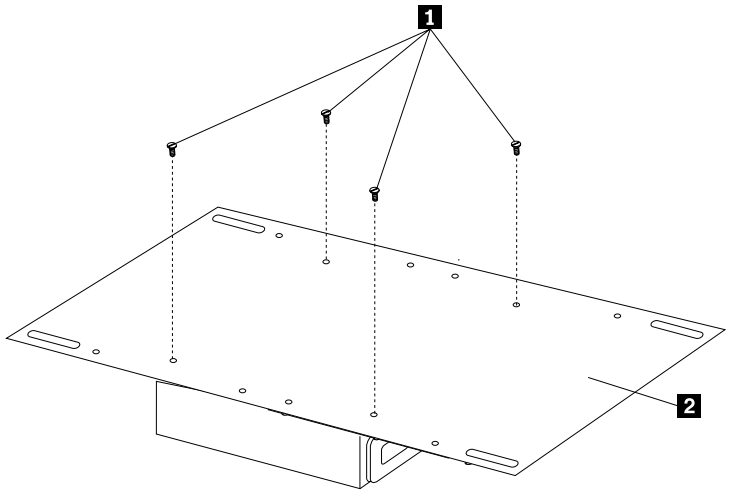

Figure 69. Installing the Rack PDU on the vertical mounting plate

3. Install the vertical mounting plate in the side of your rack cabinet with four M6 screws and nuts that come with this option. Make sure that the three-connector side of the Rack PDU is facing up.

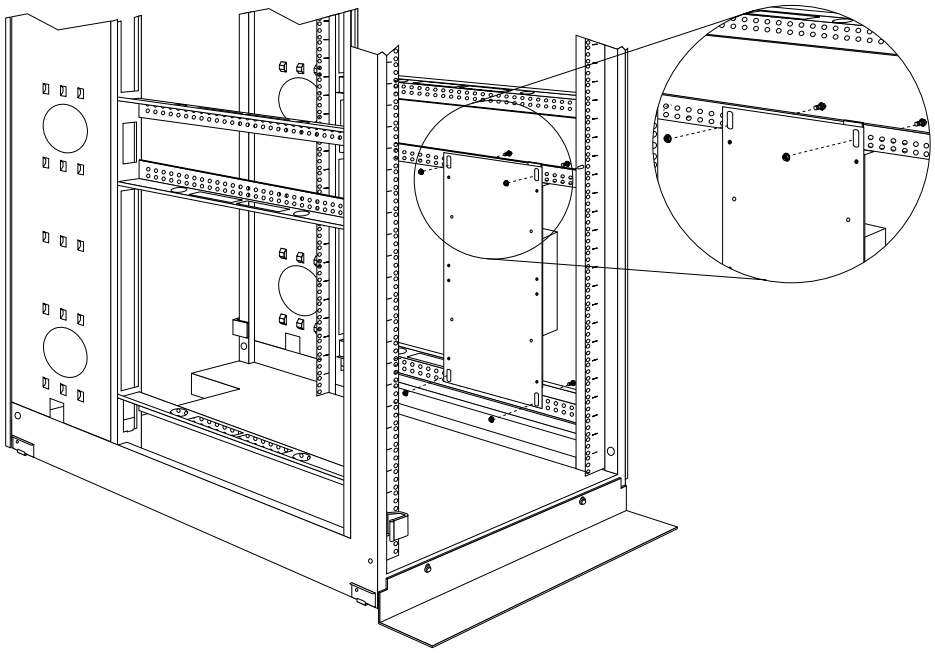

Figure 70. Installing the vertical mounting plate

4. Route the fixed line cord down, towards the rack side braces; then, route the line cord along the side brace towards the back of the rack cabinet and secure it with the cable straps that come with this option.

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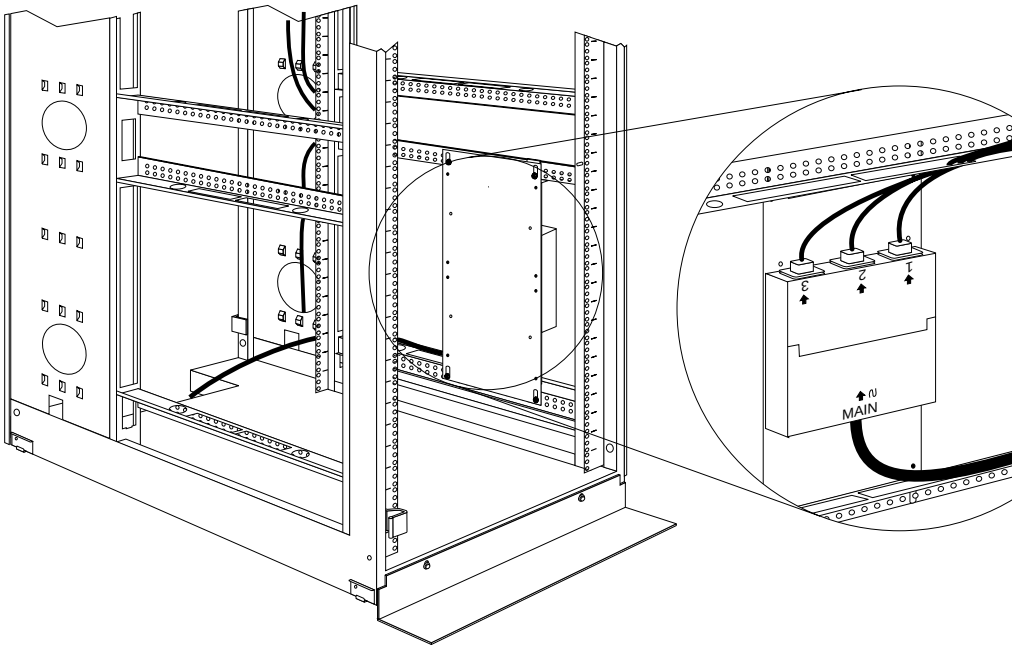

Figure 71. Routing the fixed line cord and power cables

5. Route the line cord towards a dedicated power source. Use the provided cable straps to secure the line cord along the way. Use the openings in your rack cabinet, if you must exit the rack cabinet to connect to your power source.
6. After you connect the line cord to a properly wired and grounded dedicated power source, you can connect up to three other M/PDU family devices to the three power outlets on the Rack PDU. Route all other power cables neatly, and use the provided cable straps to secure the cables that you plug into the outlets on the Rack PDU.

Installing two devices vertically

Use the following procedure to mount two Rack PDUs in the side of your rack cabinet:

Note: The mounting holes on the upper and lower side braces in a rack side compartment must be between 48.6 cm (19.1 in.) and 56.9 cm (22.4 in.) apart. If your rack cabinet has movable side braces, refer to your rack documentation for information about relocating your side braces if they are not already spaced for this installation.

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Statement 1

DANGER

Electrical current from power, telephone, and communication cables is hazardous. To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To connect:	To disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

1. Refer to the documentation that comes with your rack cabinet for additional information.

   Note: Removing the rack doors and side panels might make your Rack PDU installation easier.

2. Install the Rack PDU 3 on the vertical mounting plate 2 with four M3x5 screws 1 that come with this option. Make sure that the countersink holes in the vertical mounting plate are facing away from the device.

   Note: Align the Rack PDU to one end or the other of the vertical mounting plate to leave room for a second device.

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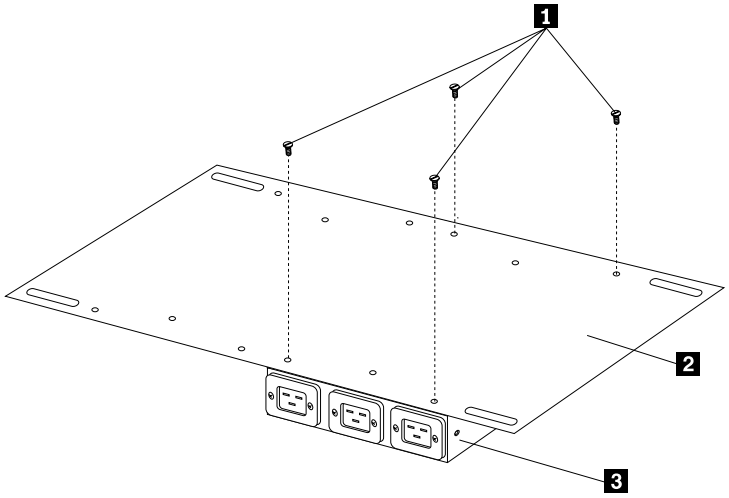

Figure 72. Installing the Rack PDU on the vertical mounting plate

3. If you have a second M/PDU device to install, install it on the vertical mounting plate with four M3x5 screws that come with the second device.

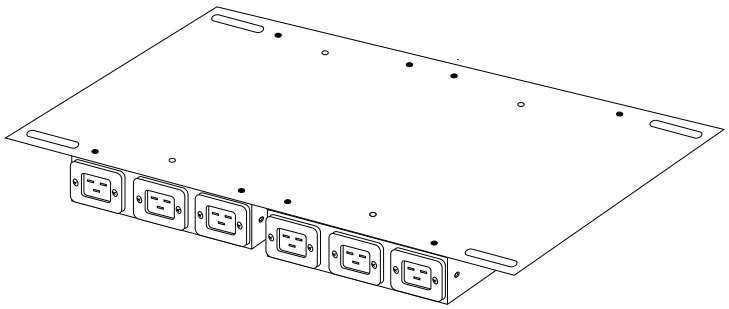

Figure 73. Installing a second Rack PDU

4. Install the vertical mounting plate **2** in the side of your rack cabinet with four M6 screws and nuts that come with this option. Make sure that the three-connector side of the Rack PDU is facing the rear of your rack cabinet, and leave room between the vertical mounting plate and the rear EIA mounting flanges for the cable-management bracket **1**.

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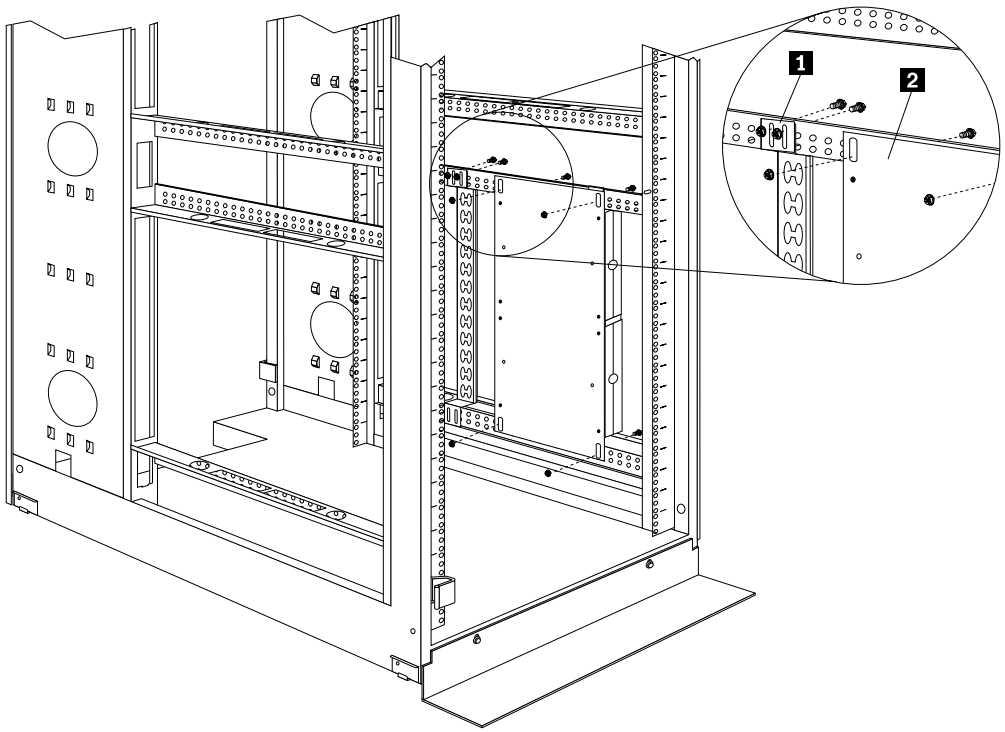

Figure 74. Installing the vertical mounting plate and cable-management bracket

5. Install the cable-management bracket **1** beside the vertical mounting plate with four M6 screws and nuts that come with this option.
6. Route the fixed line cords down, towards the rack side braces; then, route the line cords along the side brace towards the back of the rack cabinet and secure them with the cable straps that come with this option.

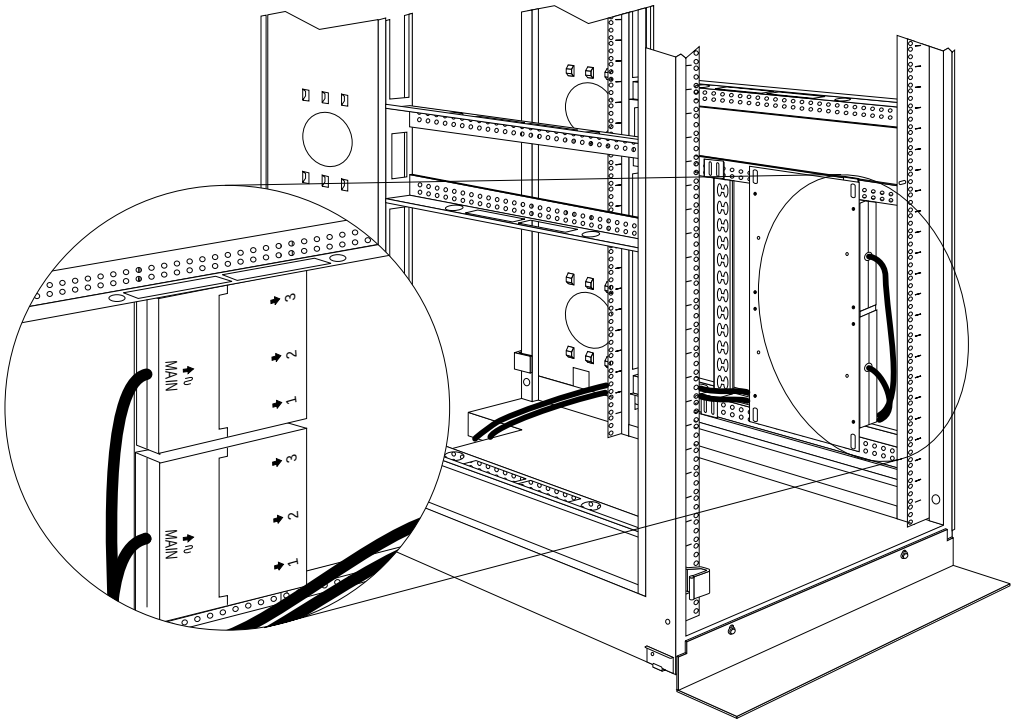

Figure 75. Routing the fixed line cords

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7. Route each line cord towards a dedicated power source. Use the provided cable straps to secure the line cords along the way. Use the openings in your rack cabinet, if you must exit the rack cabinet to connect to your power source.
8. After you connect both line cords to properly wired and grounded dedicated power sources, you can connect up to three other M/PDU family devices to the three power outlets on each Rack PDU. Route all other power cables neatly, and use the cable-management bracket to secure the cables that you plug into the outlets on the Rack PDU.

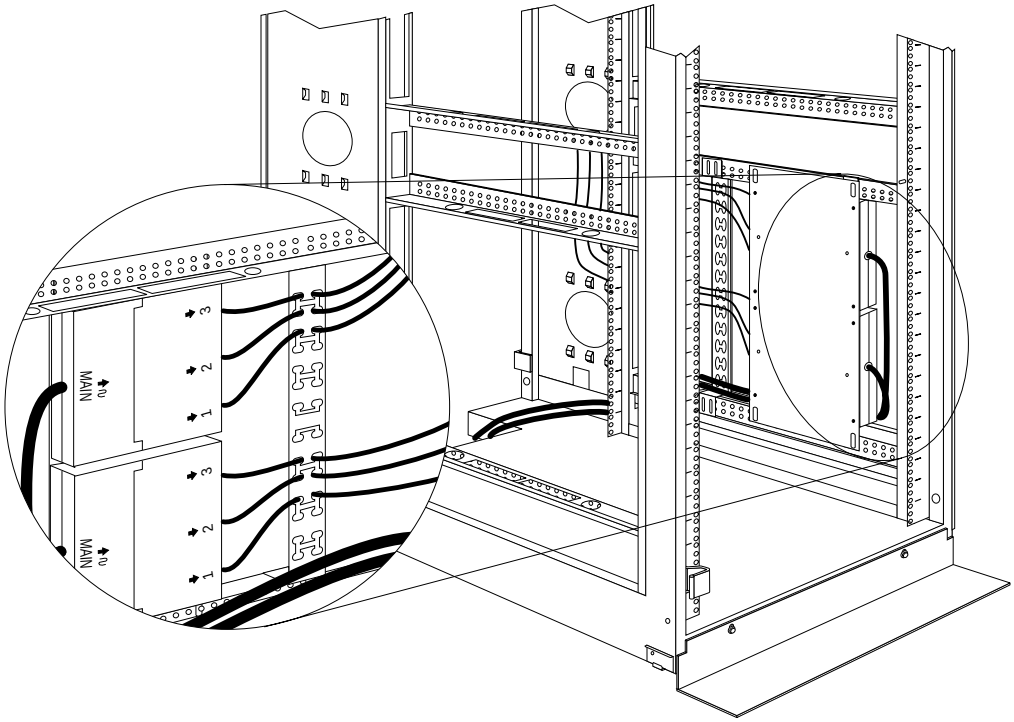

Figure 76. Connecting and routing other power cables to the outlets

Rack PDU specifications

When connected to a properly wired, grounded, and dedicated power source, the Rack PDU conforms to UL950, CSA 22.0-950, EN-60950, and IEC-950 standards. The following table contains the product specifications for the Rack PDU:

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Height	43 mm (1.7 in.)
Width	192 mm (7.5 in.)
Depth	221 mm (8.7 in.)
Weight	1.6 kg (3.5 lbs)
Operating temperatures	10°C–35°C (50°F–95°F) at 0–914 m (0–3000 ft) 10°C–32 °C (50°F–90°F°) at 914–2133 m (3000–7000 ft)
Operating humidity	8–80% (non-condensing)
Rated voltage	100–120 V ac, 30 A, single-phase 200–240 V ac, 30 A, single-phase 200–240 V ac, 32 A, single-phase 200–240 V ac, 30 A, single-phase 380–415 V ac, 32 A, single-phase
Rated frequency	50–60 Hz
Maximum power rating	4800-6000 VA
Power inlet	One fixed line cord
Power outlets	Three IEC 320-C19 outlets rated at 16 A (VDE) / 20 A (UL/CSA)

Line cords

The 2.5 m (8.2 ft) fixed line cord on the Rack PDU determines the connectivity of the Rack PDU. The following table contains a list of the line cords that you can use with the Rack PDU:

Power Source	Line cord rating	Plug type	Line cord part #
100-127 V ac, 30 A, single-phase	127 V, 30 A	NEMA L5-30P	24P6846
200-240 V ac, 30 A, single-phase	250 V, 30 A	NEMA L6-30P	24P6847
200-240 V ac, 32 A, single-phase	250 V, 32 A	IEC 309-2P + Gnd	24P6848
200-240 V ac, 30 A, three-phase	250 V, 30 A	NEMA L21-30P	24P6844
380-415 V ac, 32 A, three-phase	415 V, 32 A	IEC 309-3P + N + Gnd	24P6845

Power cables

The Rack PDU comes with three power cables, that you use to connect to other M/PDU family devices, as listed in the following table:

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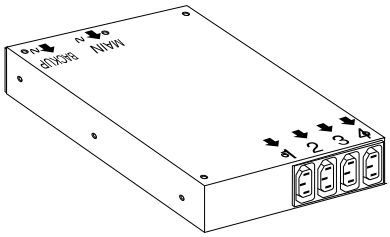
Length	Cable rating	Plug type	Cable part #
1 m (3.3 ft)	250 V, 16 A	IEC 320-C19 to IEC 320-C20	00N7698

NetBAY server dual-cord Power Distribution Unit introduction

The IBM NetBAY Server Dual-cord Power Distribution Unit is part of the Rack Modular Power Distribution Unit (M/PDU) family and enables you to connect one server to two dedicated, independent, and redundant power sources, such as an electrical outlet and an uninterruptable power supply (UPS). The Rack PDU has two power inlets, for Main and Backup power connections, and four IEC standard power outlets.



Notes:

1. You will have some unused parts depending upon how you install the Rack PDU.
2. When you install two Rack PDUs you will need some parts from both options.
3. You can install other M/PDU family devices next to your Rack PDU using mounting hardware from both devices.

You can install the Rack PDU vertically in the side of your rack cabinet, or horizontally within 1U of EIA mounting space in your rack cabinet. The mounting hardware that comes with this option enables you to install one Rack PDU next to another in the same mounting space within your rack cabinet.

The following parts come with the Rack PDU:

- One Rack PDU
- Two line cord (some models come with two high voltage and two low voltage line cords)
- One vertical mounting plate
- One vertical-mounting cable-management bracket
- One horizontal mounting bracket
- One single-device attachment bracket (for horizontal-mount installations)
- One dual-device attachment bracket (for horizontal-mount installations)
- One 1U blank filler panel (for horizontal-mount installations)
- Miscellaneous hardware kit (for attaching brackets and installing the device in a rack cabinet)
- Cable straps
- Installation documentation

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Note: The illustrations in this documentation might be slightly different from your hardware.

Tool requirements

You will need the following tools to install the Rack PDU:

- A Phillips screwdriver
- A 10-mm nut driver or 10-mm open-end or box wrench

Installation overview

Use the following general steps to install your Rack PDU:

1. Install one or two devices in your rack cabinet:
   - Install devices vertically in your rack cabinet according to "Installing a single device vertically" on page 157, **OR**
   - Install a single device horizontally in your rack cabinet in 1U of available EIA mounting space according to "Installing a single device horizontally" on page 169, **OR**
   - Install two devices horizontally in your rack cabinet in 1U of available EIA mounting space according to "Installing two devices horizontally" on page 171.
2. Connect line cords and cables according to "Cabling your PDUs" on page 173.

Installing devices vertically

Use the following procedure to mount the Rack PDU in the side of your rack cabinet:

Note: The mounting holes on the upper and lower side braces in a rack side compartment must be between 48.6 cm (19.1 in.) and 56.9 cm (22.4 in.) apart. If your rack cabinet has movable side braces, refer to your rack documentation for information about relocating your side braces if they are not already spaced for this installation.

1. Refer to the documentation that comes with your rack cabinet for additional information.

   Note: Removing the rack doors and side panels might make your Rack PDU installation easier.

2. Install the Rack PDU **3** on the vertical mounting plate **2** with four M3x5 screws **1** that come with this option. Make sure that the countersink holes in the mounting plate are facing away from the device.

   Note: Align the Rack PDU to one end or the other of the vertical mounting plate to leave room for a second device.

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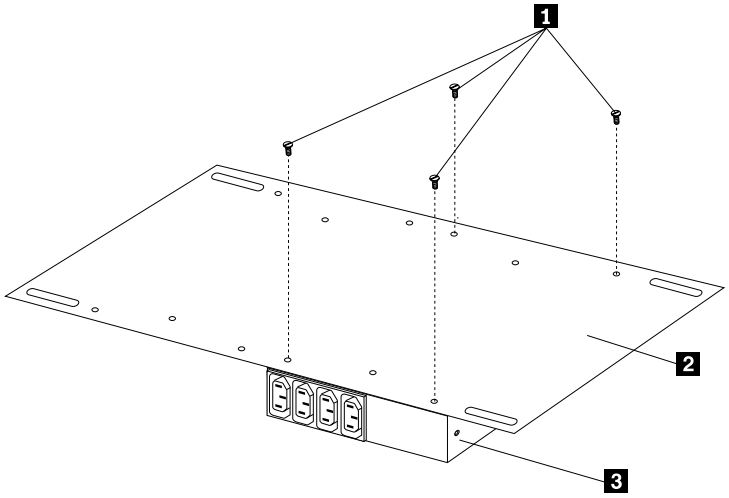

Figure 77. Installing the Rack PDU on the vertical mounting plate

3. If you have a second M/PDU device to install, install it on the vertical mounting plate with four M3x5 screws that come with the second device.

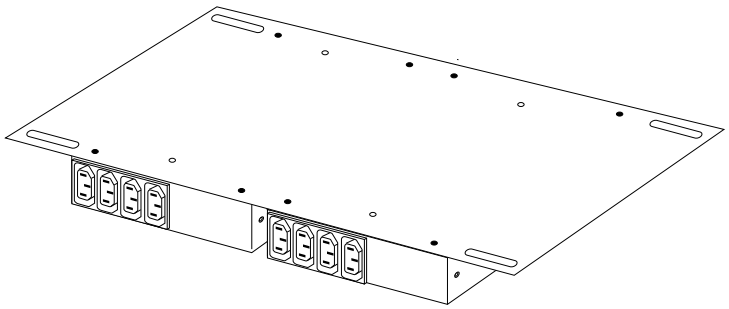

Figure 78. Installing a second Rack PDU

4. Install the vertical mounting plate **2** in the side of your rack cabinet with four M6 screws and nuts that come with this option. Make sure that the four-connector side of the Rack PDU is facing the rear of your rack cabinet, and leave room between the vertical mounting plate and the rear EIA mounting flanges for the cable-management bracket **1**.

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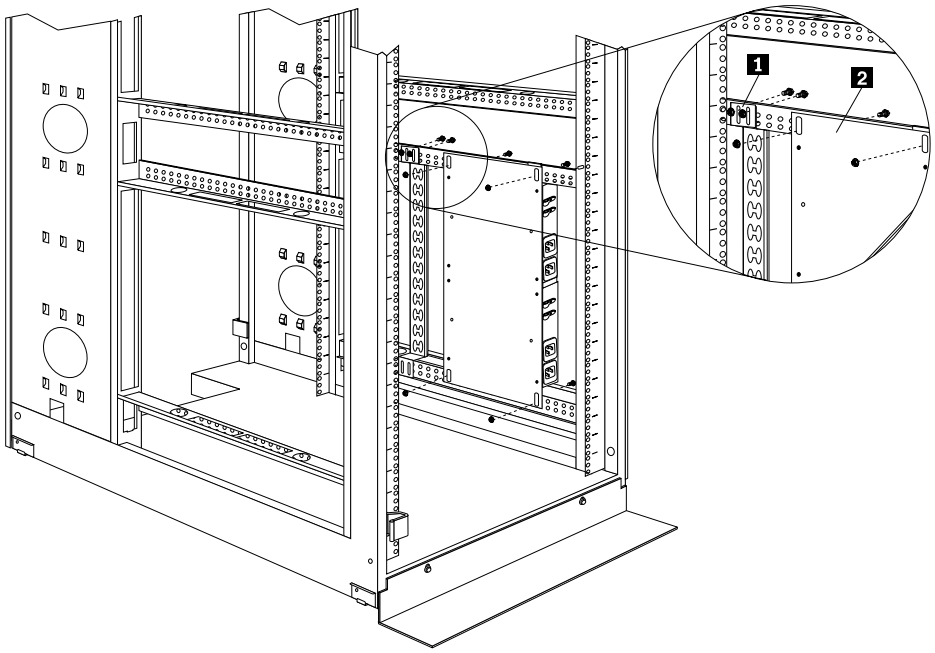


Figure 79. Installing the vertical mounting plate and cable-management bracket

5. Install the cable-management bracket 1 beside the vertical mounting plate with four M6 screws and nuts that come with this option.

   Proceed to "Cabling your PDUs" on page 173 for instructions on how to cable your Rack PDU.

Installing a single device horizontally

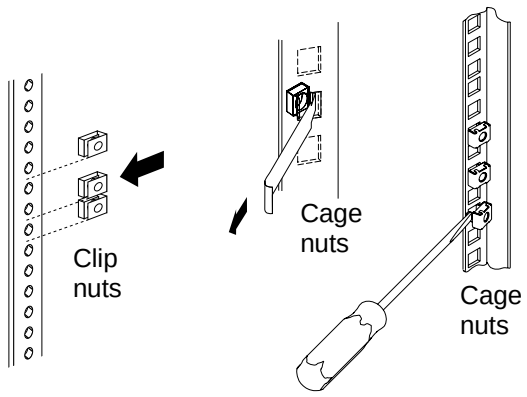
Use the following procedure to mount a single Rack PDU horizontally in your rack cabinet:

1. Refer to the documentation that comes with your rack cabinet for additional information.

   Notes:

   a. Removing the rack doors and side panels might make your Rack PDU installation easier.

   b. Use clip nuts for rack cabinets with round holes; use cage nuts for rack cabinets with square holes.



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2. Install the horizontal mounting bracket 3 on one side of the Rack PDU 5 with M3x5 screws 4 .

   Note: There are two sets of mounting holes on the bracket. You can align the Rack PDU to be even with the back of the rack cabinet or recessed inside, depending on how you install the bracket.

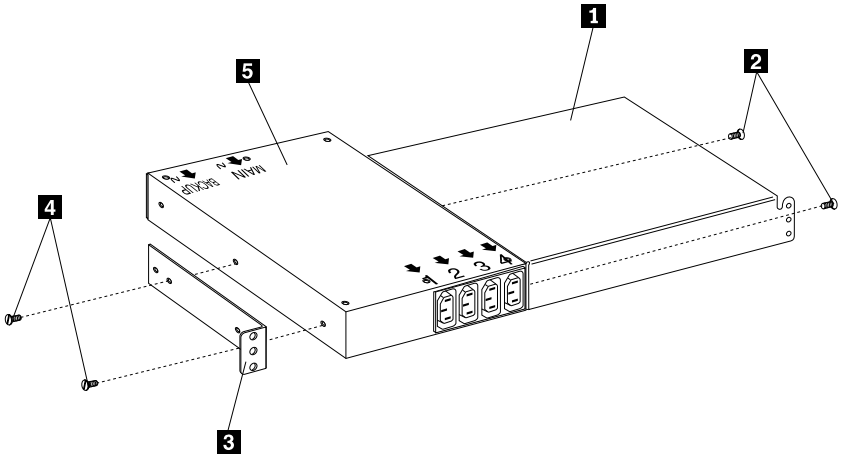

Figure 80. Installing the mounting brackets for a single device

3. Install the single-device attachment bracket 1 on the other side of the Rack PDU 5 with two M3x5 screws 2 . Make sure that you use the same set of mounting holes on this bracket as you used on the bracket in the previous step.

4. Determine the U level within your rack cabinet where you are going to install the Rack PDU; then, install the Flat Panel Monitor Rack Mount Kit and bracket assembly 2 in the rear of the rack cabinet with four M6 screws and clip nuts or cage nuts (two screws and nuts per bracket).

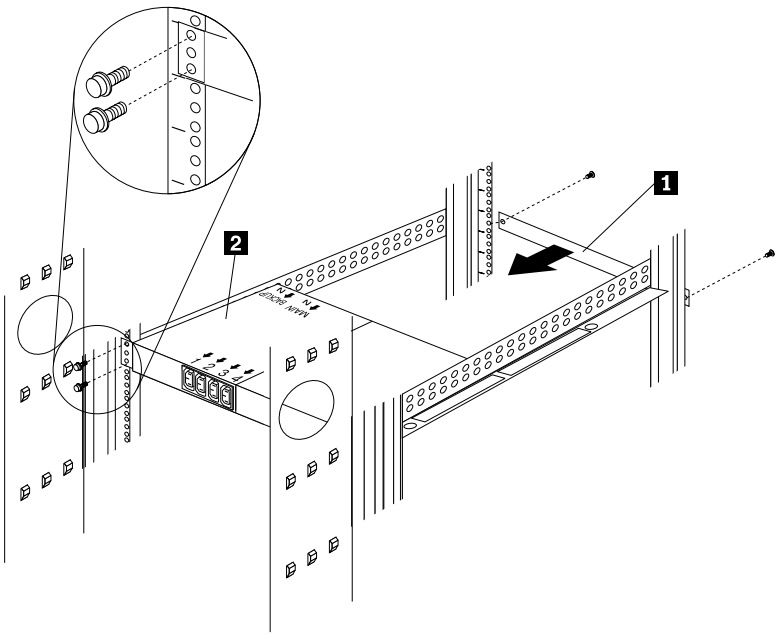

Figure 81. Installing the Rack PDU and blank filler panel

5. Install the 1U blank filler panel 1 on the front of the rack cabinet at the same U level as the Rack PDU. Use two M6 screws that come with this option.

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Installing two devices horizontally

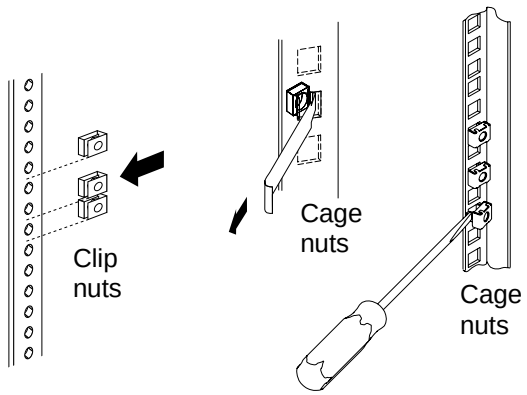
Use the following procedure to mount two Rack PDUs horizontally in your rack cabinet:

1. Refer to the documentation that comes with your rack cabinet for additional information.

   Notes:

   a. Removing the rack doors and side panels might make your Rack PDU installation easier.

   b. Use clip nuts for rack cabinets with round holes; use cage nuts for rack cabinets with square holes.



2. Attach a dual-device attachment bracket 6 to the right side of one of the Rack PDUs with two M3x5 screws; then, attach another dual-device attachment bracket 5 to the left side of the other Rack PDU with two M3x5 screws.

   Notes:

   a. When you install two Rack PDUs next to each other, you will need some parts from both options.

   b. Turn the second dual-device attachment bracket **5** so that the threaded holes are on the opposite side of the device as the holes on the other attachment bracket **6** .

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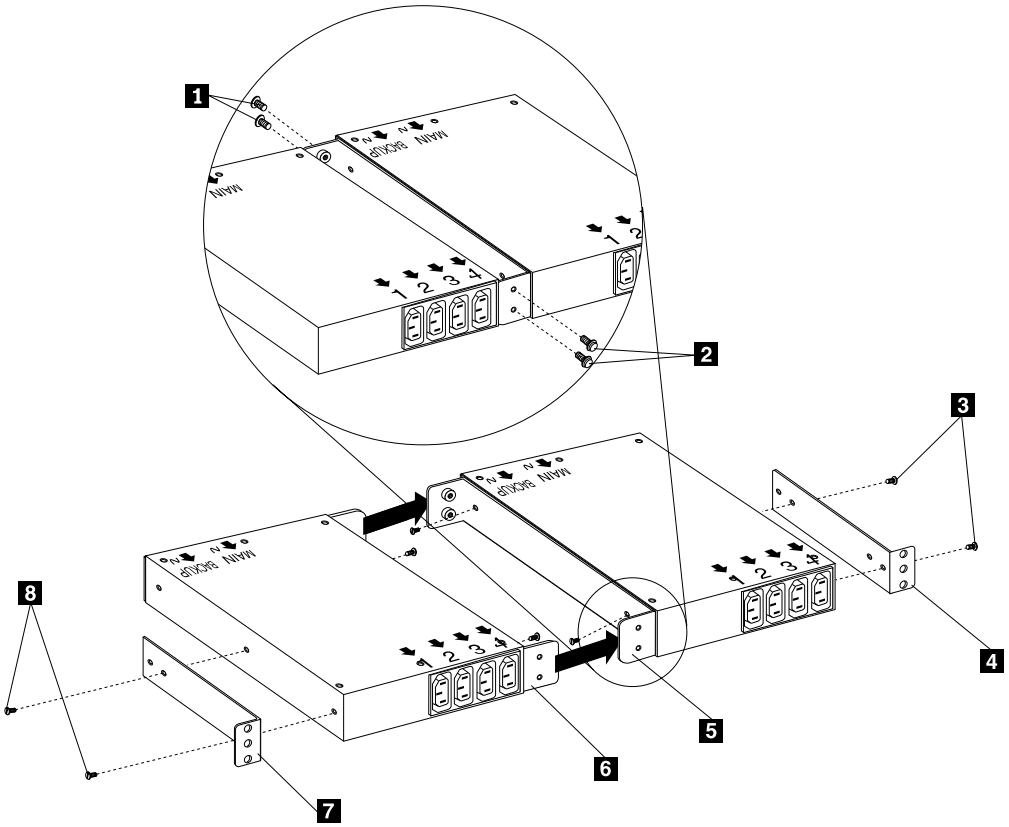

Figure 82. Installing the mounting brackets for two devices

3. Push the two Rack PDUs together, aligning the holes on the dual-device attachment brackets; then, use four M6 screws to secure the front 1 and rear 2 of the brackets to each other.
4. Install a horizontal mounting bracket 4 on the Rack PDU on the right with two M3x5 screws 3 ; then, install the other horizontal mounting bracket 7 on the Rack PDU on the left with two M3x5 screws 8 .

   Note: There are two sets of mounting holes on the brackets. You can align the Rack PDU to be even with the back of the rack cabinet or recessed inside, depending on how you install the brackets.
5. Determine the U level within your rack cabinet where you are going to install the Rack PDUs; then, install both Flat Panel Monitor Rack Mount Kits 2 in the rear of the rack cabinet with four M6 screws and clip nuts or cage nuts (two screws and nuts per bracket).

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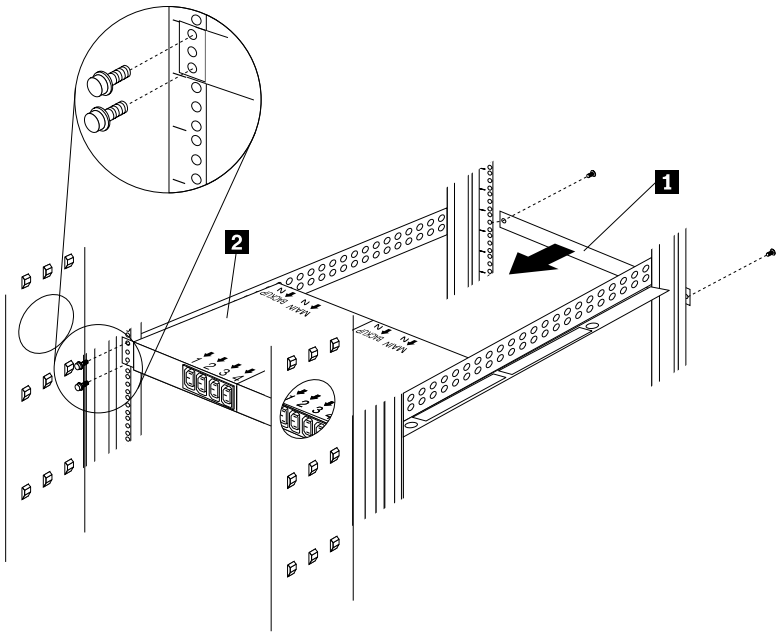

Figure 83. Installing the Rack PDUs and the blank filler panel

6. Install the 1U blank filler panel **1** on the front of the rack cabinet at the same U level as the Rack PDU. Use two M6 screws that come with this option.

Cabling your PDUs

Cable routing differs between horizontal and vertical Rack PDU installations. Refer to "Cabling instructions for vertical-mount PDUs" on page 175 or "Cabling instructions for horizontal-mount PDUs" on page 176 as appropriate for your installation.

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Statement 1

DANGER

Electrical current from power, telephone, and communication cables is hazardous. To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To connect:	To disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

Statement 5

CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might

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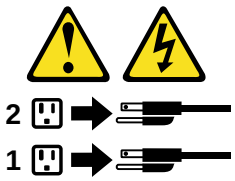
have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Cabling instructions for vertical-mount PDUs

If your Rack PDU came with more than two line cords, select either the high-voltage cords or the low-voltage cords for your installation. Use the following procedure to connect and route cables for Rack PDUs that you mounted vertically in the side of your rack cabinet:

1. Connect one of the line cords to the main inlet on the Rack PDU. Use the line cord that you will connect to your primary power source.

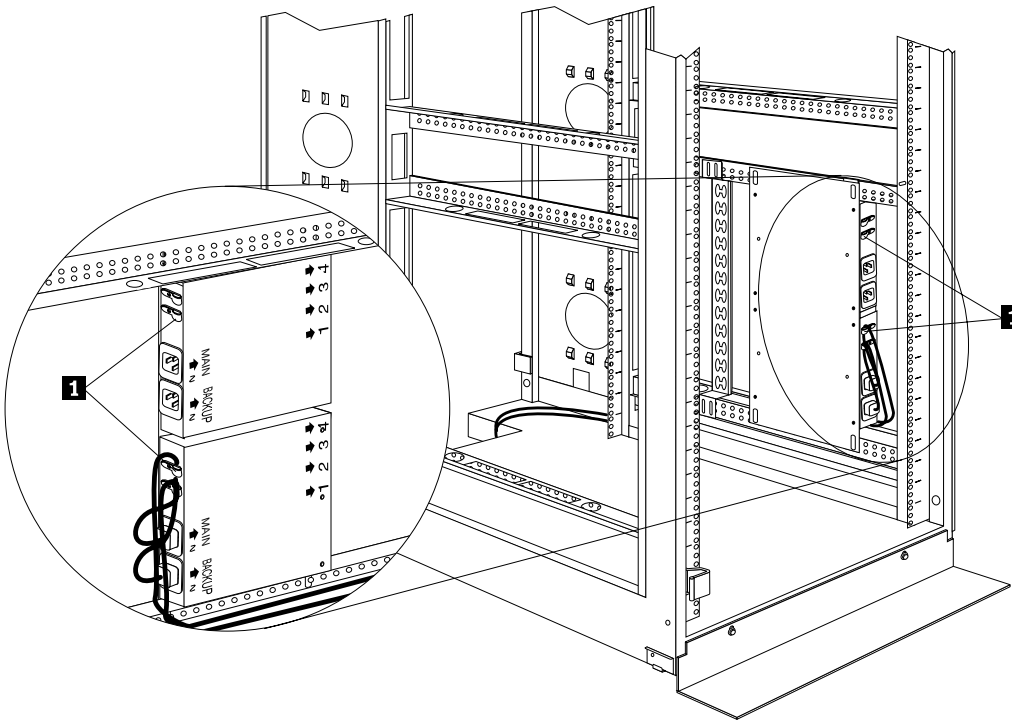


Figure 84. Connecting and routing the line cords

2. Connect the other line cord to the Backup inlet on the Rack PDU. Use the line cord that you will connect to your backup power source.
3. Remove the screws on the cable clamps **1** and route the line cords through the clamps; then, reinstall the screws on the cable clamps **1** and repeat step 1. and step 2. for the other device if you installed two devices.
4. Route the line cords down and toward the rack side braces; then, route the line cords along the side brace towards the back of the rack cabinet and secure them with the cable straps that come with this option.
5. Route each line cord towards a dedicated independent power source, such as a UPS or electrical outlet. Use the provided cable straps to secure the line cords

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along the way. Use the openings in your rack cabinet, if you must exit the rack cabinet to connect to your power source.

6. After you connect both line cords to properly wired and grounded dedicated independent power sources, you can connect one server (having up to four line cords) to the four power outlets on the Rack PDU. Route all other power cables neatly, and use the cable-management bracket to secure the cables that you plug into the outlets on the Rack PDU.

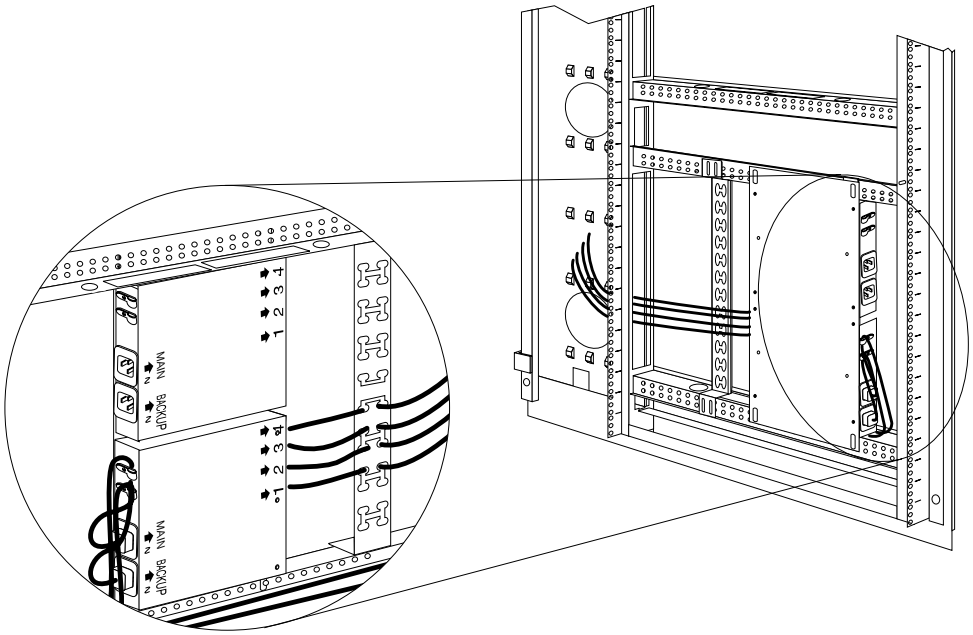

Figure 85. Connecting and routing other power cables to the outlets

Cabling instructions for horizontal-mount PDUs

If your Rack PDU came with more than two line cords, select either the high-voltage cords or the low-voltage cords for your installation. Use the following procedure to connect and route cables for Rack PDUs that you mounted in the horizontal EIA space of your rack cabinet:

1. Connect one of the line cords to the Main inlet on the Rack PDU. Use the line cord that you will connect to your primary power source.

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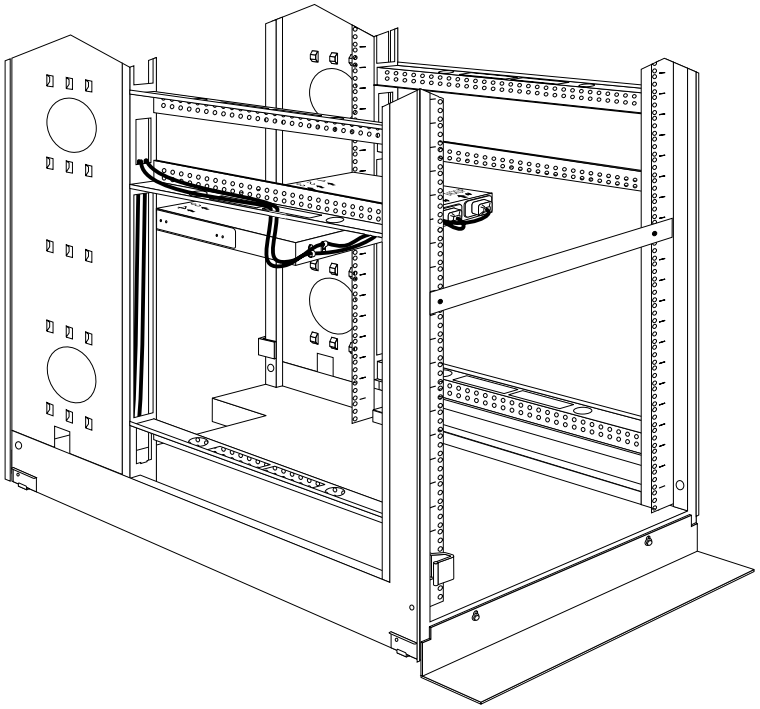

Figure 86. Connecting and routing the line cords

2. Connect the other line cord to the Backup inlet on the Rack PDU. Use the line cord that you will connect to your backup power source.
3. Remove the screws on the cable clamps and route the line cords through the clamps; then, reinstall the screws on the cable clamps and repeat step 1 and step 2 for the other device, if you installed two devices.
4. Route the line cords left or right, toward the side of the rack cabinet; then, route the line cords along the side brace towards the back of the rack cabinet and secure them with the cable straps that come with this option.
5. Route each line cord toward a dedicated independent power source, such as a UPS or electrical outlet. Use the provided cable straps to secure the line cords along the way. Use the openings in your rack cabinet, if you must exit the rack cabinet to connect to your power source.
6. After you connect both line cords to properly wired and grounded dedicated independent power sources, you can connect one server (having up to four line cords) to the four power outlets on the Rack PDU. Route all other power cables neatly, and use cable straps to secure the cables that you plug into the outlets on the Rack PDU.

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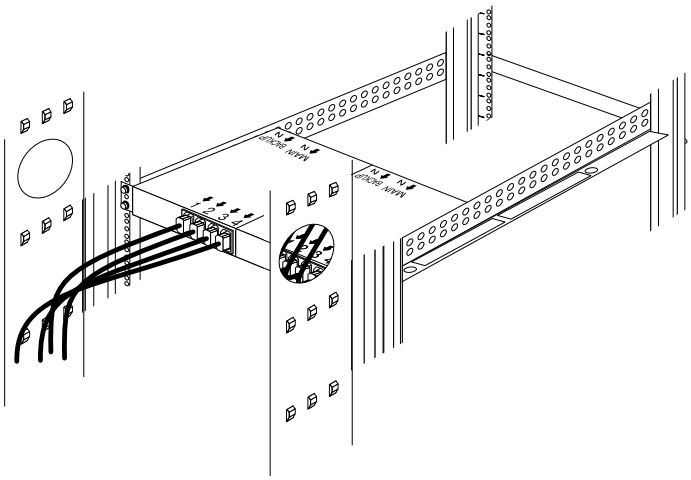

Figure 87. Connecting and routing other power cables to the outlets

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Rack PDU specifications

When connected to a dedicated power source, the Rack PDU conforms to UL950, CSA 22.0-950, EN-60950, and IEC-950 standards. The following table contains the product specifications for the Rack PDU:

Height	43 mm (1.7 in.)
Width	192 mm (7.5 in.)
Depth	221 mm (8.7 in.)
Weight	2.4 kg (5.4 lbs)
Operating temperatures	10°C–35°C (50°F–95°F) at 0–914 m (0–3000 ft) 10°C–32 °C (50°F–90°F°) at 914–2133 m (3000–7000 ft)
Operating humidity	8–80% (non-condensing)
Rated voltage	100–127 V ac, 15 A, single-phase 200-240 V ac, 10 A, single-phase
Rated frequency	50–60 Hz
Maximum power rating	2400 VA
Power inlet	Two IEC 320-C20 inlets rated at 16 A (VDE) / 20 A (UL/CSA)
Transfer time	<35 ms from main to backup power
Power outlets	Four IEC 320-C13 outlets rated at 10 A (VDE) / 15 A (UL/CSA)

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Power cables

Power cables that you use to connect a server (with more than one power supply) to the Rack PDU usually come with the server. The following table contains a list of power cables that you can use with the Rack PDU:

Length	Cable rating	Plug type	Cable part #
2.8 m (9.2 ft)	250 V, 10 A	IEC 320-C13 to IEC 320-C14	36L8886
4.3 m (14 ft)	250 V, 10 A	IEC 320-C13 to IEC 320-C14	94G7448

Power cables that you use to connect your Rack PDU to a UPS or Front-end PDU come with those devices as indicated in the following table:

Length	Cable rating	Plug type	Cable part #	Comes with:
2 m (6.6 ft)	250 V, 16 A	IEC 320-C19 to IEC 320-C20	00N7700	APC SU-5000 RMB UPS (2 cables)
1 m (3.3 ft)	250 V, 16 A	IEC 320-C19 to IEC 320-C20	00N7698	Front-end PDU (3 cables)

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Line cords

Two 4.3 m (14 ft) country-specific line cords that you use to connect your Rack PDU to properly wired, grounded, and dedicated power sources come with the Rack PDU. One line cord is for the Main inlet (primary power source), and the other line cord is for the Backup inlet (backup power source). The following table contains a list of line cords that you can use with the Rack PDU:

Power Source	Line cord rating	Plug type	Line cord part #
100–127 V ac, 20 A	127 V ac, 18 A	IEC 320-C19 to NEMA L5-20P	12J5117
200–240 V ac, 20 A	250 V ac, 18 A	IEC 320-C19 to NEMA L6-20P	14F1553
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to CEE7-VII	14F1554
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to IEC 309-2P + Gnd	36L8823
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to SII 32	14F1561
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to CEI 23-16	14F1560
220–240 V ac, 16 A	250 V ac, 16 A	IEC 320-C19 to SABS 164	14F1557
220–240 V ac, 13 A	250 V ac, 13 A	IEC 320-C19 to BS 1363/A	12J5988
220–240 V ac, 15 A	250 V ac, 15 A	IEC 320-C19 to AS/NZ 3112	14F1559
220–240 V ac, 15 A	250 V ac, 15 A	IEC 320-C19 to GB 2099.1	01K9852
220–240 V ac, 15 A	250 V ac, 15 A	IEC 320-C19 to IRAM 2063	36L8885

Parts listing (Power Distribution Units)

Power Distribution Unit	FRU
Rack PDU	09N9668
Server PDU	09N9669
Front End PDU	09N9670
Common Mounting Hardware Kit	09N9671
3-Phase NEMA L21-30P Line Cord (200-250 V ac)	24P6844
3-Phase IEC 309-3P+N+Gnd Line Cord (380-415 V ac)	24P6845
1-Phase NEMA L5-30P Line Cord (100-127 V ac)	24P6846
1-Phase NEMA L6-30P Line Cord (200-240 V ac)	24P6847
1-Phase IEC 309-2P+Gnd Line Cord (200-240 V ac)	24P6848

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Related service information

These procedures are written with the assumption that you have model-specific training on all computers, or that are familiar with the computers, functions, terminology, and service information provided in this manual.

Safety information

The following section contains the safety information that you need to know before servicing an IBM server or IBM supporting equipment such as the Type 9306 IBM PC Server Rack Enclosure and Type 9306 IBM Rack.

1.

   DANGER

   - **The maximum allowable weight for devices mounted on slides is 80 Kg (176 lbs). Do not install sliding devices exceeding this weight.**
   - **The center of gravity for an extended unit cannot exceed 362 mm (14.25 in.) from the face of the rack. If an extended device exceeds this distance, the configured rack might be unstable.**

2.

   DANGER

   - **Always install servers and power devices in the rack from the bottom to the top.**
   - **Always install the heaviest equipment in the bottom of the rack.**
   - **Always install the UPS (uninterruptible power supply) in the bottom of the rack.**
   - **Always install the stabilizer bracket.**
   - **Do not extend more than one sliding device at a time.**

3.

   DANGER
   Plug rack power cords into electrical outlets that are located near the rack and are easily accessible.

4.

DANGER
Connect all devices installed in a rack to power devices installed in the same rack. Do not plug the power cord from a device installed in one rack into a power device installed in a different rack.

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1.

   PERIGO

   - **O peso máximo permitido para dispositivos montados em trilhos é de 80 kg (176 lbs). Não instale dispositivos em trilhos que excedam este peso.**
   - **O centro de gravidade para uma unidade estendida não pode exceder 362 mm (14.25 in.) da frente do rack. Se um dispositivo estendido exceder esta distância, o rack configurado pode se tornar instñÚÝÝável.**

2.

   PERIGO

   - **Instale sempre os servidores e dispositivos de alimentação no rack de baixo para cima.**
   - **Sempre instale o equipamento mais pesado na parte inferior do rack.**
   - **Sempre instale a fonte de alimentação contínua (UPS) na parte inferior do rack.**
   - **Sempre instale o suporte do estabilizador.**
   - **Não estenda mais de um dispositivo com trilho de uma vez.**

3.

   PERIGO
   Conecte os cabos de alimentação do rack em saídas elétricas localizadas perto do rack e de fácil acesso.

4.

   .

   PERIGO
   Conecte todos os dispositivos de um rack aos dispositivos de energia instalados no mesmo rack. Não conecte um cabo de alimentação de um dispositivo instalado em um rack a um dispositivo de energia instalado em um rack diferente.

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1.

DANGER

危险

- 在滑面上安装的设备其最大允许重量是80千克（176磅），超过该值的滑动设备不允许安装。
- 一个展开的零件其重心从机架表面上看不能超过362mm（14.25英寸）。展开的设备如果超过了该距离，已构架的机架将可能不稳定。

2.

DANGER

危险

- **请务必在机架中自下而上安装服务器和电源设备。**
- **请务必在机架底部安装最重的设备。**
- **请务必在机架底部安装 UPS（不间断电源）。**
- **请务必安装固定设备托架。**
- **一次最多展开一个滑动设备。**

3.

DANGER

危险

将机架电源插头就近插入电源插座。

4.

DANGER

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危险

将机架内安装的所有设备都连接到同一机架中安装的电源设备，不要将电源插头从一个机架的安装设备插到其他机架中安装的电源设备。

1.

DANGER

- **Le poids maximal d'une unité montée sur glissières est de 80 kg ; n'installez pas d'unités dont le poids est supérieur.**
- **Le centre de gravité d'une unité tirée hors de son logement ne doit pas être éloigné de plus de 362 mm de la face avant de l'armoire. Sinon, l'armoire configurée risque de ne pas être stable.**

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2.

DANGER

- **Commencez toujours par installer les serveurs et les blocs d’alimentation dans la partie inférieure de l'armoire.**
- **Installez toujours les composants les plus lourds dans la partie inférieure de l'armoire.**
- **Installez toujours les blocs d'alimentation (UPS) dans la partie inférieure de l'armoire.**
- **Installez toujours les stabilisateurs.**
- **Certaines unités sont installées sur des tiroirs coulissants. N'ouvrez pas plusieurs de ces tiroirs à la fois.**

3.

DANGER
Branchez les cordons d'alimentation sur des socles de prises de courant proches de l'armoire et facilement accessibles.

4.

DANGER
Toutes les unités installées dans une armoire doivent être reliées à des unités d'alimentation situées dans la même armoire. Ne branchez jamais le cordon d'alimentation d'une unité installée dans une armoire sur une unité d'alimentation installée dans une autre armoire.

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1.

VORSICHT

- **Das zulässige Höchstgewicht für auf Schienen montierte Einheiten beträgt 80 kg. Keine Einheiten mit höheren Gewicht einbauen.**
- **Der Schwerpunkt einer ausgefahrenen Einheit darf nicht mehr als 362 mm von der Frontseite des Gehäuse entfernt liegen. Liegt der Schwerpunkt weiter entfernt, kann das konfigurierte Gehäuse instabil werden.**

2.

VORSICHT

- **Server und Netzeinheiten immer von unten nach oben im Gehäuse installieren.**
- **Die schwersten Einheiten unten installieren.**
- **Die USV (Unterbrechungsfreie Stromversorgung) immer unten installieren.**
- **Immer die Kippsicherung anbringen.**
- **Nie mehr als jeweils eine Einschubeinheit herausziehen.**

3.

VORSICHT
Die Netzkabel des Gehäuses an Steckdosen anschlieβen, die sich in der Nähe des Gehäuses befinden und gut zugänglich sind.

4.

VORSICHT
Alle in einem Gehäuse installierten Einheiten an Netzeinheiten in einem Gehäuse anschlieβen. Nicht das Netzkabel einer in einem Gehäuse befindlichen Einheit an eine Netzeinheit in einem anderen Gehäuse anschlieβen.

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1.

PERICOLO

- **Il peso massimo consentito per i dispositivi montati su slitte è di 80 kg. Non installare dispositivi scorrevoli che hanno un peso superiore a quello sopra citato.**
- **Il centro di gravità di un'unità estratta non puòsuperare i 362 mm dalla superficie del rack. In caso contrario, il rack configurato potrebbe essere instabile.**

2.

PERICOLO

- **Installare sempre i serventi e gli alimentatori nel rack dal basso verso l'alto.**
- **Installare sempre il componente più pesante nella parte inferiore del rack.**
- **Installare sempre l'UPS (uninterruptible power supply) nella parte inferiore del rack.**
- **Installare sempre il supporto stabilizzatore.**
- **Non aprire più di un'unità scorrevole alla volta.**

3.

PERICOLO
Inserire i cavi di alimentazione del rack in prese elettriche situate vicino al rack e di facile accesso.

4.

PERICOLO
Collegare tutte le unità installate nel rack ai dispositivi di alimentazione installati nello stesso rack. Non collegare il cavo di alimentazione di un'unità installata in un rack al dispositivo di alimentazione di un differente rack.

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1.

위험

슬라이드에 장착할 수 있는 장치의 최대 가용 무게는 80 kg(176 lbs)입니다. 이 무게를 넘는 슬라이딩 장치들은 설치하지 마십시오.

확장된 단위에 대한 중력의 중심은 RACK의 앞면으로부터 362 mm(14.25 in)를 넘을 수 없습니다. 만약 확장된 장치가 이 거리를 넘는다면, 배치된 RACK은 불안정하게 됩니다.

2.

위험

- 항상 랙의 바닥부터 위까지 서버와 전원 장치를 설치하십시오.
- 항상 랙의 바닥에 가장 무거운 장치를 설치하십시오.
- 항상 랙의 바닥에 UPS(무정전 전원 장치)를 설치하십시오.
- 항상 안정 브래킷을 설치하십시오.
- 한번에 두 개 이상의 슬라이딩 장치를 확장하지 마십시오.

3.

위험

RACK 근처에 있고 쉽게 접근할 수 있는 전기 아웃렛에 RACK의 전원 코드를 꽂으십시오.

4.

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위험

동일 RACK에 전원 장치를 설치하기 위해서, RACK에 설치된 모든 장치를 연결하십시오.
한 RACK에 설치된 장치의 전원 코드를 다른 RACK에 설치된 전원 장치에 꽂지마십시오.

1.

PELIGRO

- El peso máximo permitido para los dispositivos montados en correderas es de 80 Kg (176 lbs). No instale dispositivos deslizantes que excedan este peso.
- El centro de gravedad de una unidad extendida no puede exceder los 362 mm (14,25 pgda.) desde la parte frontal del bastidor. Si un dispositivo extendido excede esta distancia, el bastidor que lo contuviese podría ser poco estable.

2.

PELIGRO

- Instale siempre los servidores y dispositivos de alimentación en el bastidor de abajo a arriba.
- Instale siempre el equipo más pesado en la parte baja del bastidor.
- Instale siempre los UPS (fuentes de alimentación ininterrumpible) en la parte baja del bastidor.
- **Instale siempre la pestaña estabilizadora.**
- **No extienda más de un dispositivo deslizante a la vez**.

3.

PELIGRO

- **Enchufe los cables de alimentación del bastidor en tomas eléctricas que estén situadas cerca de éste y a las que se pueda acceder fácilmente.**

4.

PELIGRO
Conecte todos los dispositivos instalados en un bastidor a los dispositivos de alimentación instalados en dicho bastidor. No enchufe el cable de alimentación de un dispositivo instalado en un bastidor en un dispositivo de alimentación instalado en un bastidor diferente.

Safety notice (multi-lingual translations)

This safety notice for (Type 9306 models 4QS, 4QX, 9QS, 9QX, 9TS, and 9TX) is provided in the following languages:

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- English
- Brazilian / Portuguese
- Chinese
- French
- German
- Italian
- Spanish

CAUTION:

The server selector unit is heavy. You will need two people to safely remove the server selector unit.

A unidade seletora do servidor é pesada. Você irá precisar de duas pess oas para remover com segurança esta unidade.

此伺服器選擇裝置非常的重。您將需要二個人小心地移動此伺服器選擇裝置。

Le bloc sélecteur est lourd. Faites-vous aider pour le retirer en toute.

Die Server Selektor Einheit ist schwer. Um sie zu transportieren, sind mindestens zwei Personen erforderlich.

L'unità per la selezione dei serventi è pesante ed occorrono due persone per rimuoverla in maniera sicura.

La unidad de selector del servidor es pesada. Se necesitan dos personas para extraer la unidad de selector del servidor sin peligro.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

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Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
   a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
   b. The power cord should be the appropriate type as specified in the parts listings.
   c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

  Note: The use of a grounding system is desirable but not required to protect against ESD damage.

  — Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.

  — Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.

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— Use the round ground-prong of the ac plug on ac-operated computers.

Grounding requirements

Electrical grounding of the PC Server Rack and computers is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Problem determination tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Processor or hard disk upgrades
- Failure symptom
  - — Do diagnostics fail?
  - — What, when, where, single, or multiple systems?
  - — Is the failure repeatable?
  - — Has this configuration ever worked?
  - — If it has been working, what changes were made prior to it failing?
  - — Is this the original reported failure?
- Reference / Diagnostics diskette version
  - — Type and version level
- Hardware configuration
  - — Print (print screen) configuration currently in use
  - — BIOS level
- Operating system software
  - — Type and version level

CAUTION:
Important:
To eliminate confusion, identical systems are considered *identical* only if they:

1. **Are the exact machine type and model**
2. **Have the same BIOS level**
3. **Have the same adapters/attachments in the same locations**
4. **Have the same address jumpers/terminators/cabling**
5. **Have the same software versions and levels**
6. **Have the same Reference/Diagnostics Diskette (version)**
7. **Have the same configuration options set in the system**
8. **Have the same setup for the operation system control files**

Comparing the configuration and software set-up between "working and non-working" systems will often lead to problem resolution.

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GHz, MHz only measures microprocessor internal clock speed, not application performance. Many factors affect application performance.

When referring to hard disk drive capacity, GB equals one billion bytes. Total user-accessible capacity may vary depending on operating environments.

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   _____

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   _____

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   _____

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