Hardware Maintenance Manual

IBM PC Server/Enterprise Racks Types 9306, 9308

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Note:

Before using this information and the product it supports, be sure to read the general information under "Safety information" on page 187.

Sixth Edition (November 1999) Updated April and October 2001

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Contents

About this manual

This manual contains diagnostic information, a Symptom-to-FRU index, service information, error codes, error messages, and configuration information.

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

Important safety information

Be sure to read all caution and danger statements in this book before performing any of the instructions.

Leia todas as instruções de cuidado e perigo antes de executar qualquer operação.

注意和危险声明(简体中文)

重要事项：

本书中的所有注意和危险声明之前都有编号。该编号用于英语的注意或危险声明与 *Safety Information* 一书中可以找到的翻译版本的注意或危险声明进行交叉引用。

例如，如果一个注意声明以编号 1 开始，那么对该注意声明的翻译出现在 *Safety Information* 一书中的声明 1 中。

在按说明执行任何操作前，请务必阅读所有注意和危险声明。

注意及危險聲明（中文）

重要資訊：

本書中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在「安全資訊」(Safety Information) 一書中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在「安全資訊」(Safety Information) 一書的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di pericolo prima di effettuare qualsiasi operazione.

주의 및 위험 경고문(한글)

중요:

이 책에 나오는 모든 주의 및 위험 경고문은 번호로 시작됩니다. 이 번호는 *Safety Information* 책에 나오는 영문판 주의 및 위험 경고문과 한글판 주의 및 위험 경고문을 상호 참조하는데 사용됩니다.

예를 들어 주의 경고문이 번호 1로 시작되면 *Safety Information* 책에서 이 주의 경고문은 경고문 1번 아래에 나옵니다.

지시를 따라 수행하기 전에 먼저 모든 주의 및 위험 경고문을 읽도록 하십시오.

Lea atentamente todas las declaraciones de precaución y peligro ante de llevar a cabo cualquier operación.

Online support

Use the World Wide Web (WWW) to download Diagnostic, BIOS Flash, and device driver files.

File download address is:

http://www.ibm.com/pc/support

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).
     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.
   - 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.

Type 9306 Model 250/420/421

Features

The IBM NetBAY 42, Type 9306, Model 420 with side panels, Model 421 without side panels and the IBM NetBAY 25, Type 9306, Model 250.

NetBAY 42 and NetBAY 25 Cabinets

This documentation contains general installation instructions for the IBM®® NetBAY25 and NetBAY42 Rack cabinets, and many of the common optional devices that you can install in a rack cabinet. Always read the documentation that comes with your server or optional device for detailed installation instructions.

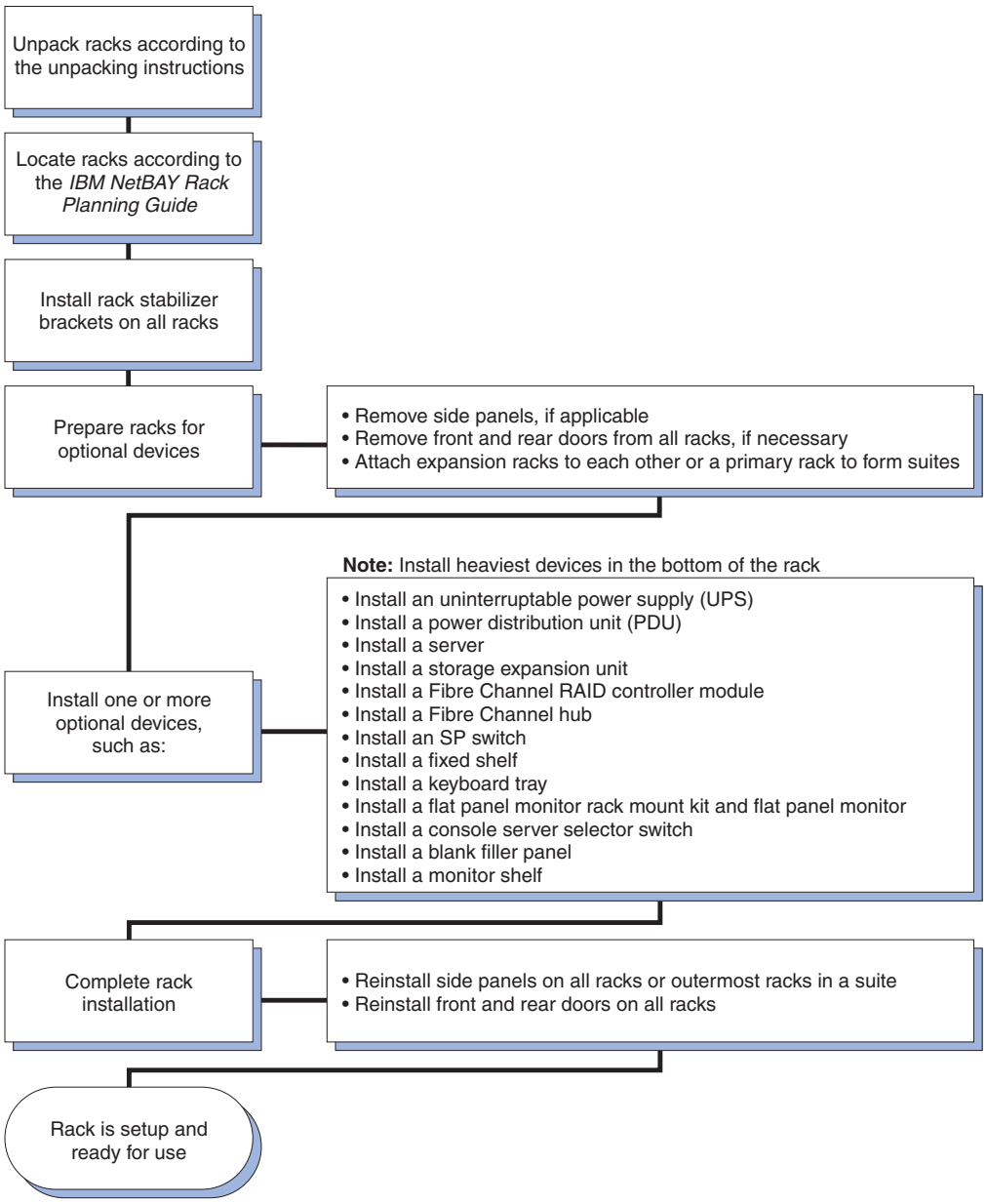


Figure 1. Installing the rack cabinet and devices overview

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

Installing a rack cabinet

The NetBAY25 Rack cabinet is a 25U-high rack cabinet[1], while the NetBAY42 Rack cabinet is a 42U-high rack cabinet. NetBAY25 and primary NetBAY42 Rack cabinets come with side panels installed. Expansion NetBAY42 Rack cabinets do not come with side panels, but do include the required hardware for building a suite of rack cabinets. The rack cabinets conform to the Electronic Industries Association (EIA) standard *EIA-310-D Cabinets, Racks, Panels, and Associated Equipment (1992).*

1. One U is equal to 4.45 cm (1.75 in.)

Note: You need only one primary rack cabinet per suite.

Statement 1:

CAUTION:
To ensure safety, all configurations of the rack cabinet must be certified by a nationally recognized testing laboratory in order to verify compliance with country-specific safety regulations. This process ensures that the end product remains safe for the operator and service personnel under normal and forseeable misuse conditions.

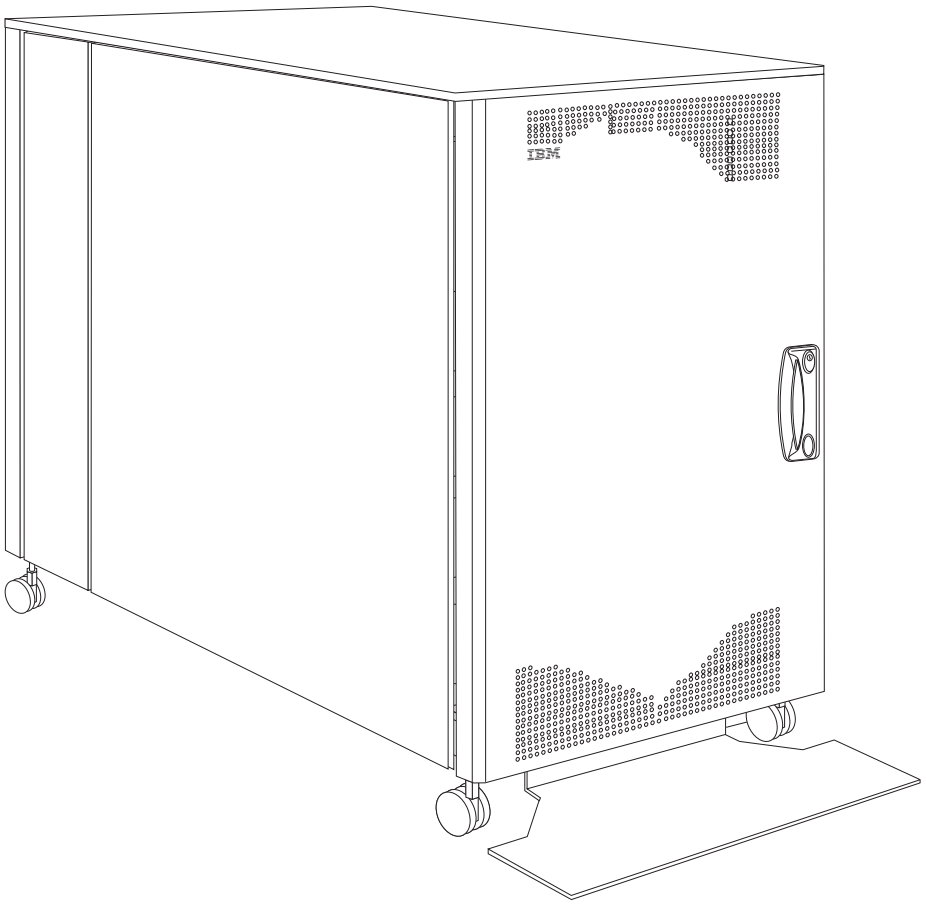


Figure 2. NetBAY25 Rack cabinet

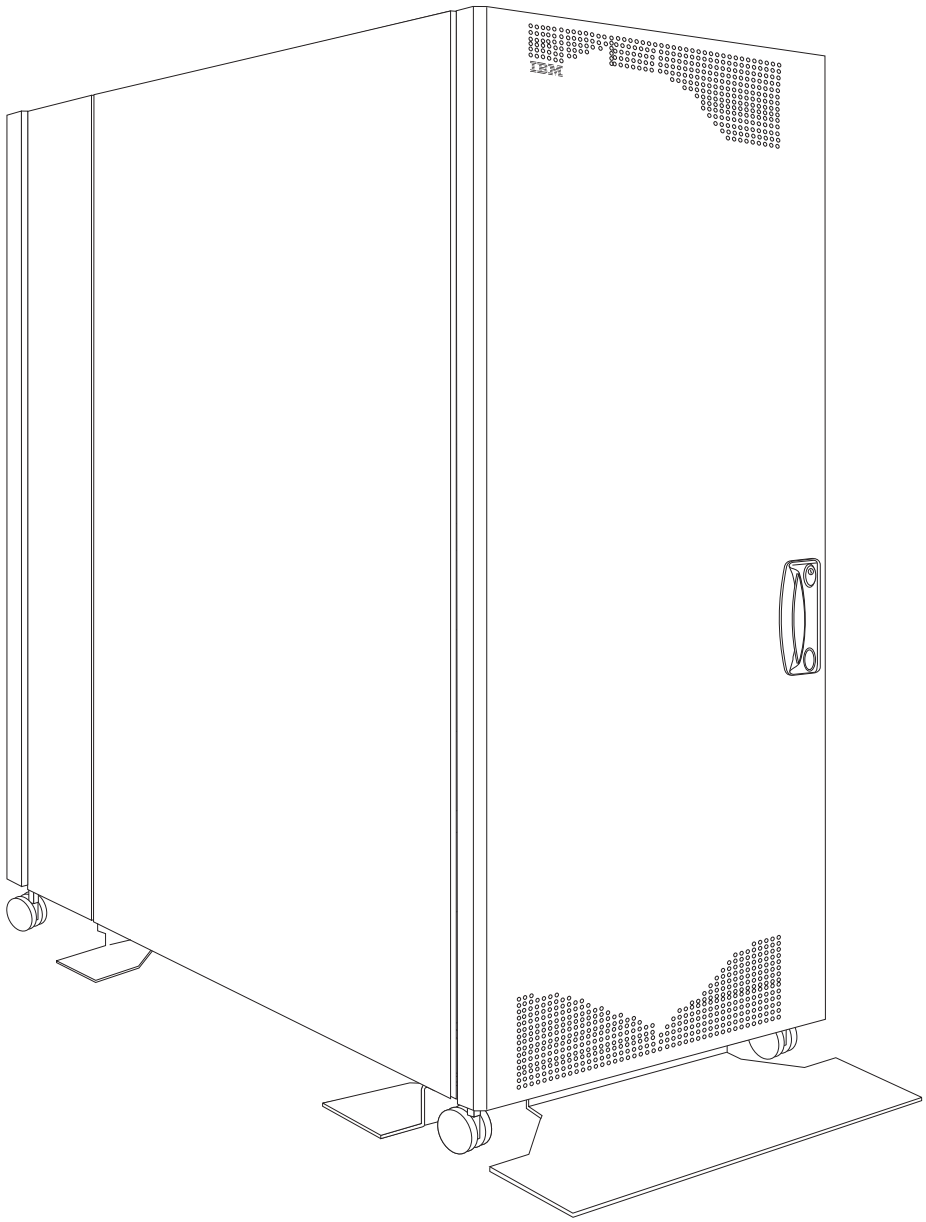


Figure 3. Primary NetBAY42 Rack cabinet with side panels

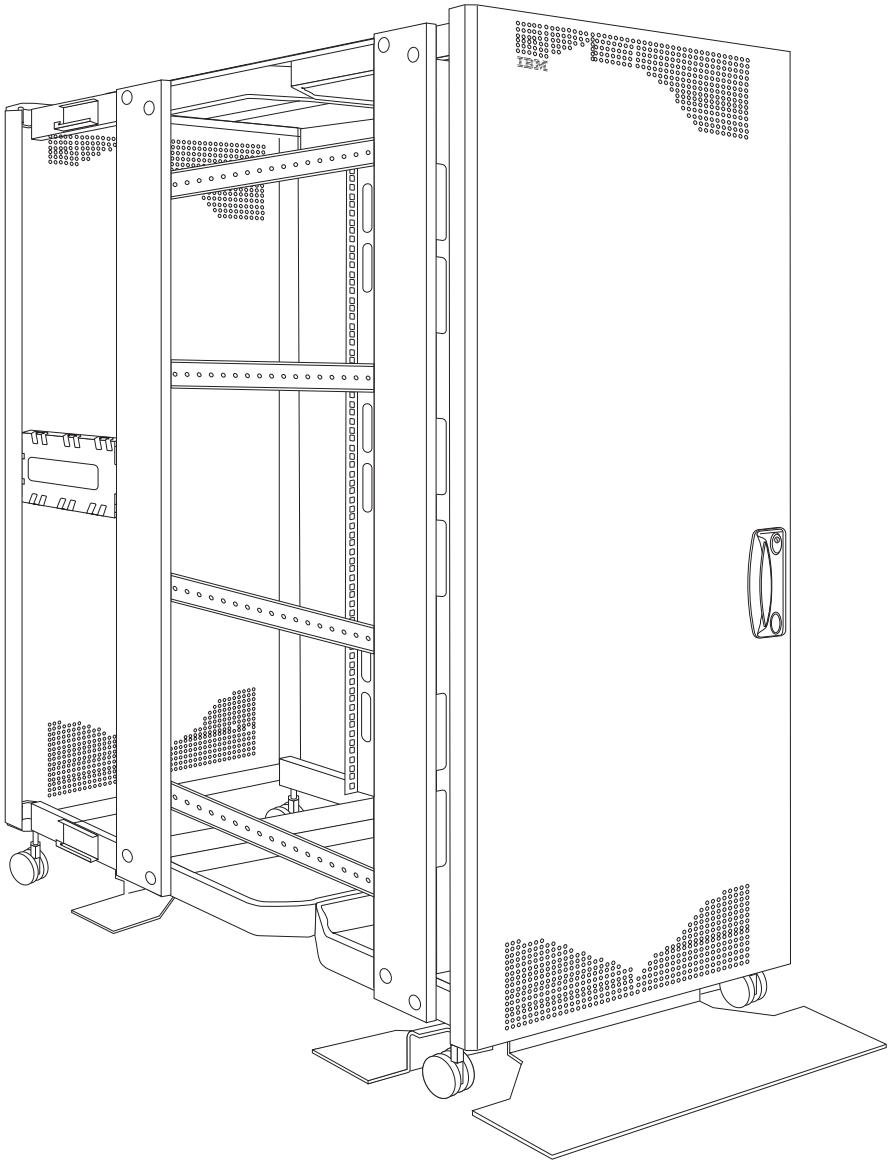


Figure 4. Expansion NetBAY42 Rack cabinet without side panels

Installing stabilizer brackets

See the unpacking instructions that come with the rack cabinet for information on how to unpack and locate the rack cabinet; then, lower the rack leveling pads and install the stabilizer brackets for added stability.

Note: NetBAY25 Rack cabinets have only a front stabilizer bracket. NetBAY42 Rack cabinets have one front and four side stabilizer brackets.

Statement 2:

DANGER

- **Always lower the leveling pads on the rack cabinet.**
- **Always install stabilizer brackets on the rack cabinet.**
- **Always install servers and optional devices starting from the bottom of the rack cabinet.**
- **Always install the heaviest devices in the bottom of the rack cabinet.**

Installing the NetBAY25 stabilizer bracket:

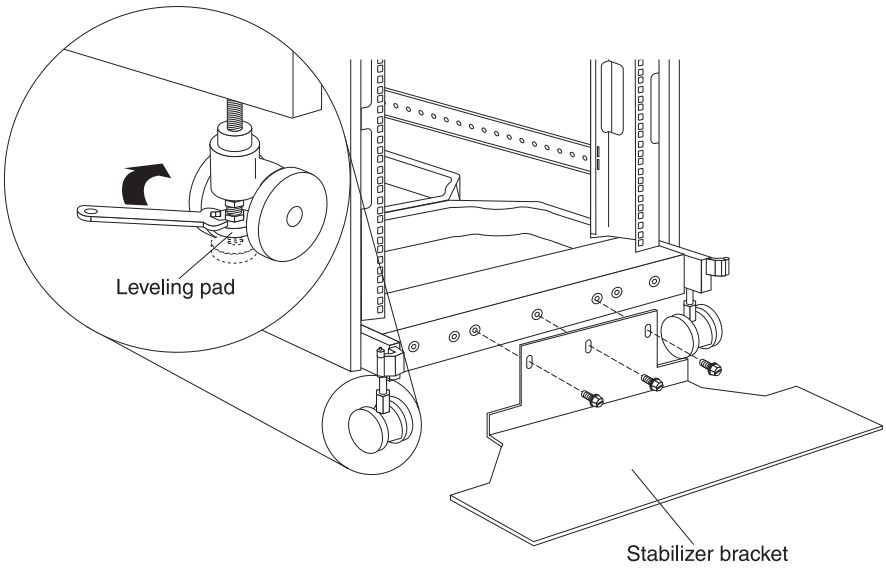


Figure 5. Lowering the NetBAY25 leveling pads and installing the stabilizer bracket

1. Use a 12 mm open-end wrench to lower each of the four leveling pads just enough so that they touch the floor. The rack casters support the weight of the rack cabinet. The pads prevent the rack from rolling.
2. Attach the stabilizer bracket to the front of the rack cabinet with the screws that come with the bracket.
3. If necessary, bolt the rack cabinet to the floor through the provided holes in the stabilizer bracket.

Installing the NetBAY42 stabilizer brackets:

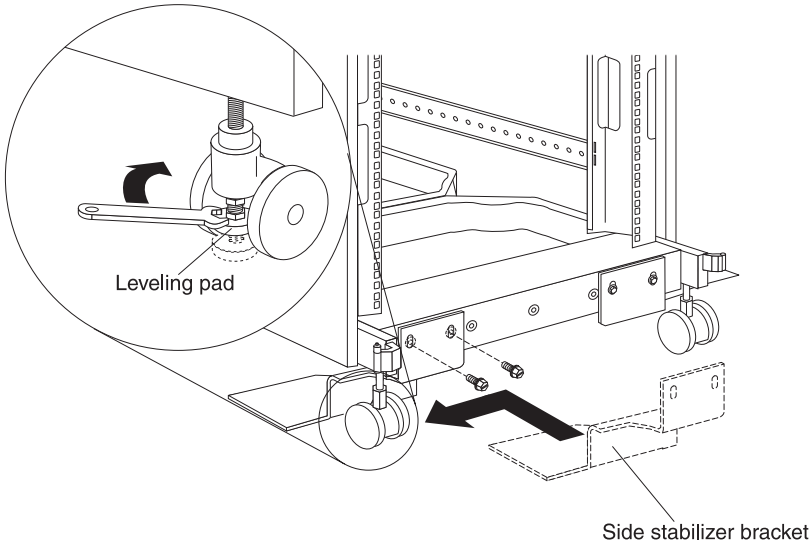


Figure 6. Lowering the NetBAY42 leveling pads and installing the side stabilizer brackets

1. Use a 12 mm open-end wrench to lower each of the four leveling pads just enough so that they touch the floor. The rack casters support the weight of the rack cabinet. The pads prevent the rack from rolling.
2. Attach a side stabilizer bracket to the front of the rack cabinet with the screws that come with the bracket; then, attach the other three side stabilizer brackets.

   Note: You must install the side stabilizer brackets so that they extend outward from the rack cabinet, just behind the casters, as shown in Figure 6.

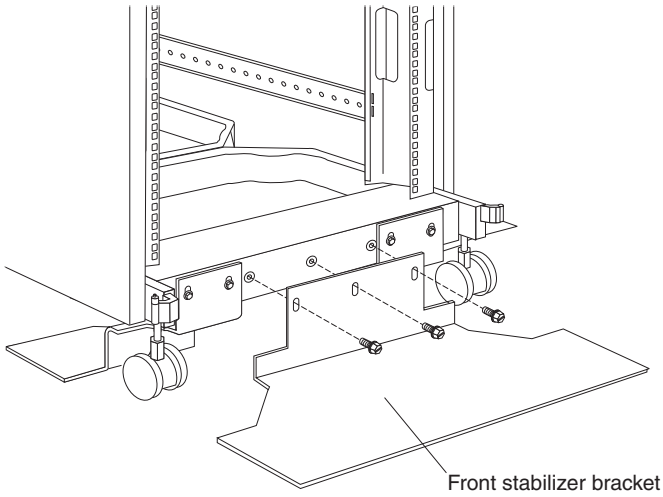


Figure 7. Installing the NetBAY42 front stabilizer bracket

3. Attach the front stabilizer bracket to the front of the rack cabinet with the screws that come with the bracket.

4. If necessary, bolt the rack cabinet to the floor through the provided holes in the stabilizer brackets.

Removing and installing NetBAY25 panels

The NetBAY25 Rack cabinet comes with side panels installed. Remove the side panels from a rack cabinet before you install or remove optional devices.

Removing and installing side panels: Use the following procedure to remove the NetBAY25 side panels:

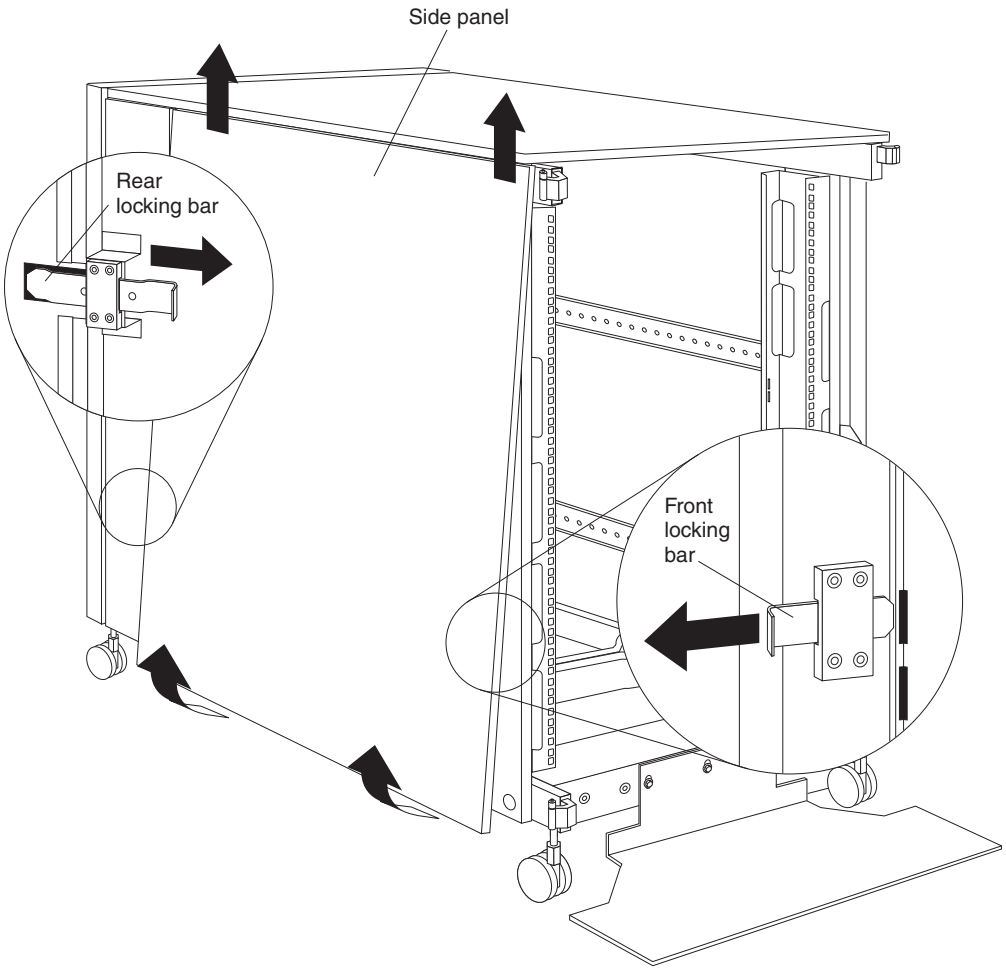


Figure 8. Removing the NetBAY25 side panels

1. From the inside rear of the rack cabinet, slide the side panel locking bar into the unlocked position; then, slide the front side panel locking bar into the unlocked position.
2. Tilt the bottom of the side panel slightly toward you; then, lift the side panel away from the tabs on the top of the rack cabinet.
3. Repeat this procedure to remove both side panels.

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

Removing rear filler panels: Use the following procedure to remove the rear filler panels from the rack cabinet:

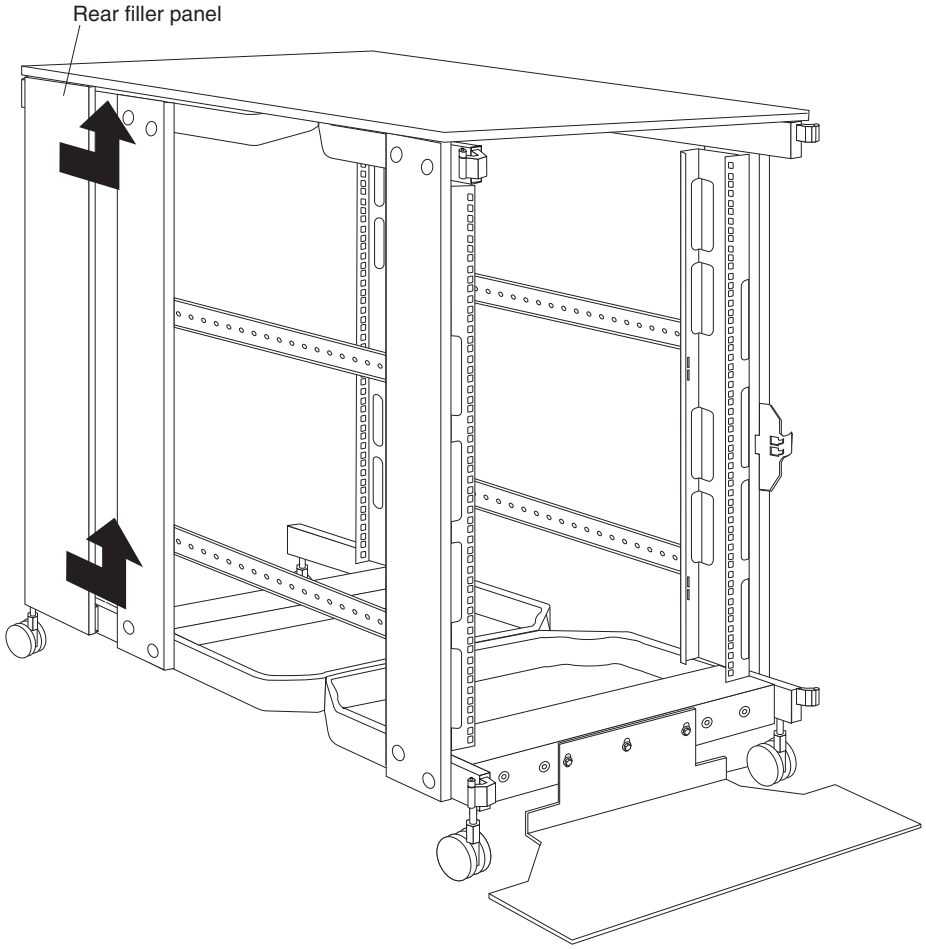


Figure 9. Removing the NetBAY25 rear filler panels

1. Grasp the rear filler panel firmly and slide it slowly toward the front of the rack cabinet.
2. Lift the filler panel and remove it from the rack cabinet.
3. Repeat this procedure to remove both filler panels.

Installing rear filler panels: Use the following procedure to install the rear filler panels on the rack cabinet:

1. Align the bottom of the rear filler panel with the tab on the bottom rear of the rack cabinet.
2. Hold the filler panel fully against the side of the rack cabinet; then, slide the filler panel toward the rear of the rack cabinet. Ensure that both the top and bottom tabs are engaged by the filler panel.
3. Repeat this procedure to install both filler panels.

Removing and installing NetBAY42 panels

The primary NetBAY42 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 rear filler panels unless you are attaching the rack cabinets to form a suite of rack cabinets.

Removing and installing side panels: Use the following procedure to remove the NetBAY42 side panels:

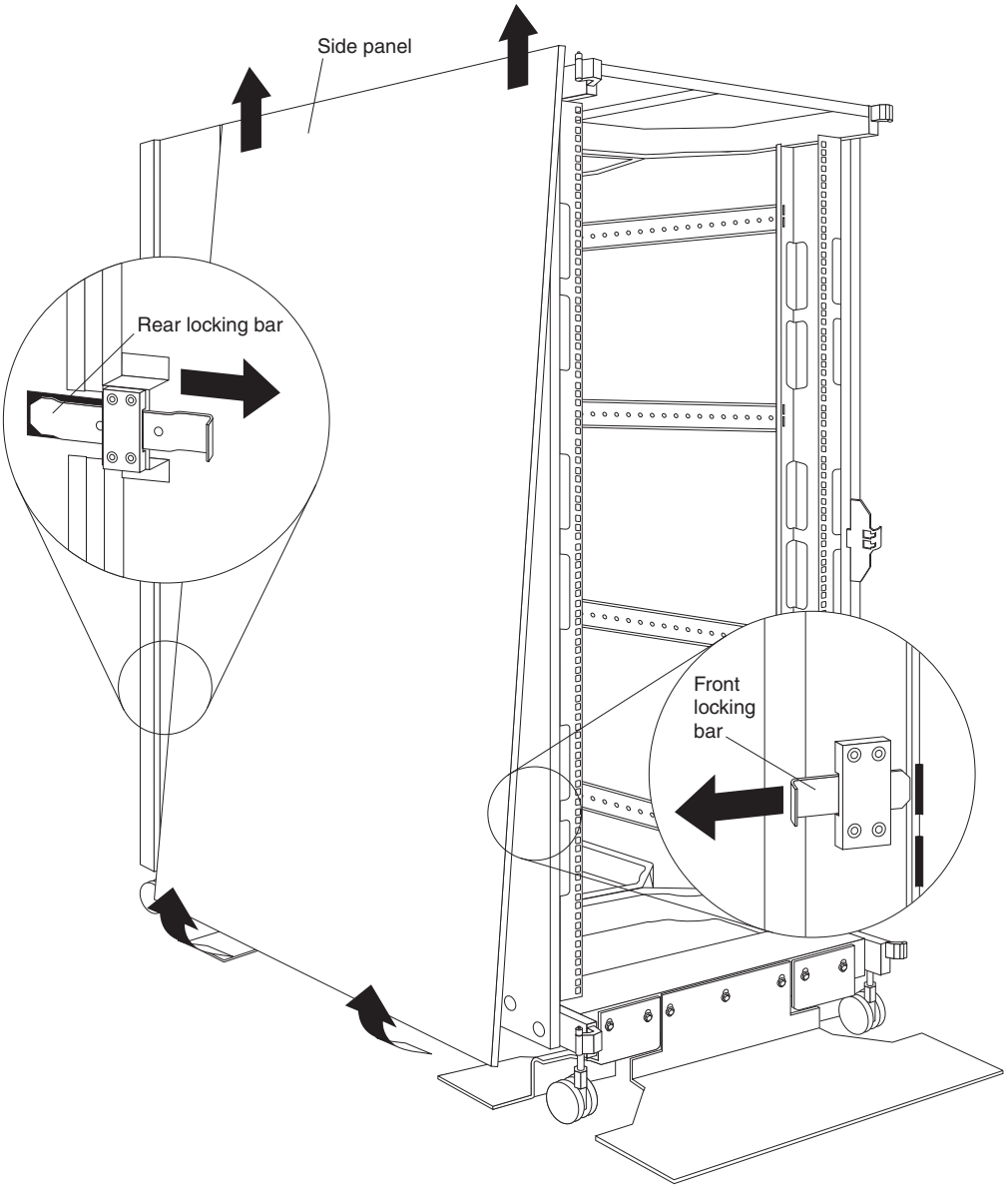


Figure 10. Removing the NetBAY42 side panels

1. From the inside rear of the rack cabinet, slide the side panel locking bar into the unlocked position; then, slide the front side panel locking bar into the unlocked position.
2. Tilt the bottom of the side panel slightly toward you; then, lift the side panel away from the tabs on the top of the rack cabinet.
3. Repeat this procedure to remove both side panels.

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

Removing rear filler panels: Use the following procedure to remove the rear filler panels from the rack cabinet:

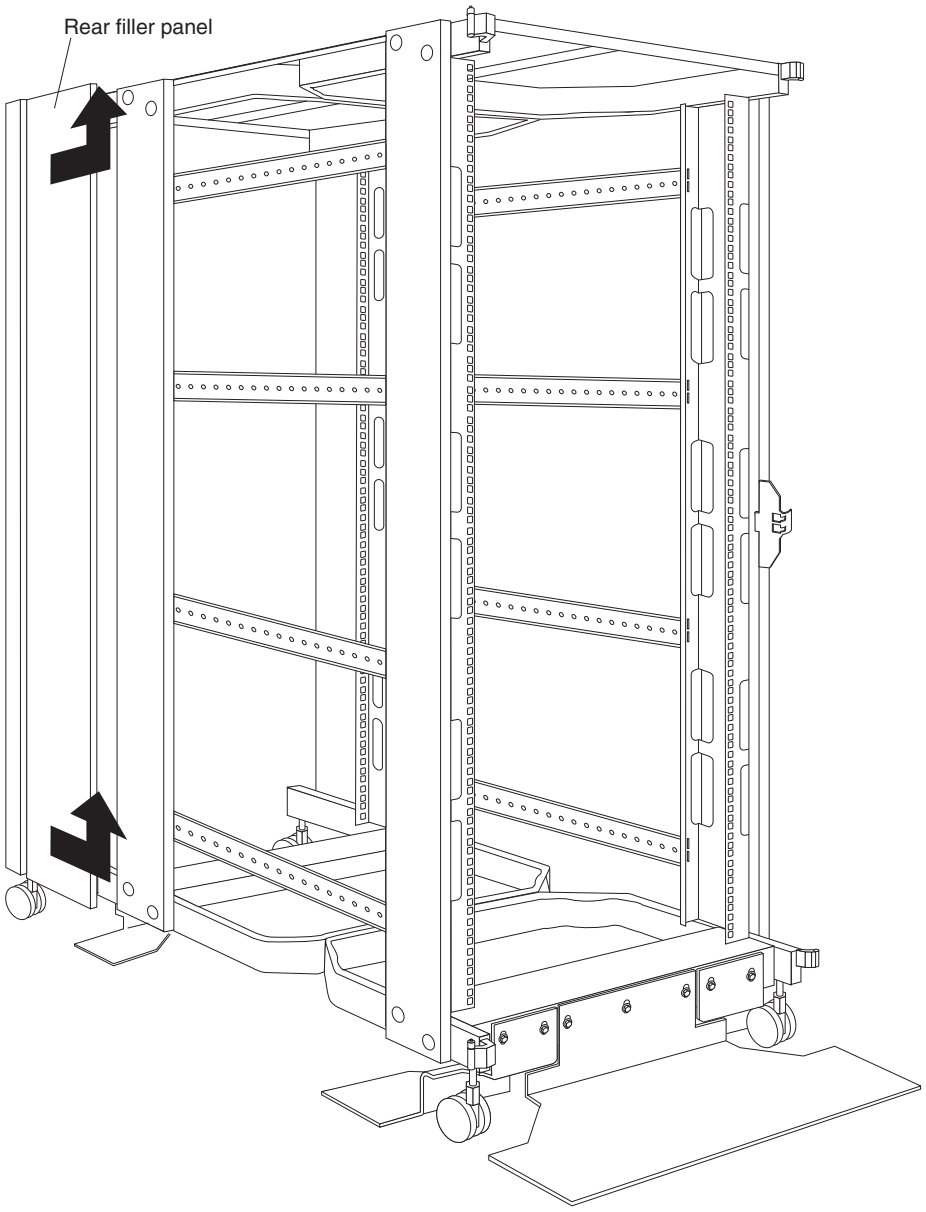


Figure 11. Removing the NetBAY42 rear filler panels

1. Grasp the rear filler panel firmly and slide it slowly toward the front of the rack cabinet.
2. Lift the filler panel and remove it from the rack cabinet.
3. Repeat this procedure to remove both filler panels.

Reverse this procedure to install the rear side panels on the rack cabinet.

Installing rear filler panels: Use the following procedure to install the rear filler panels on the rack cabinet:

1. Align the bottom of the rear filler panel with the tab on the bottom rear of the rack cabinet.

2. Hold the filler panel fully against the side of the rack cabinet; then, slide the filler panel toward the rear of the rack cabinet. Ensure that both the top and bottom tabs are engaged by the filler panel.
3. Repeat this procedure to install both filler panels.

Removing and installing rack doors

Remove the rack doors when installing and removing options in the rack cabinet. All rack cabinets come with front and rear doors installed.

Note: You only need to remove a door if part of the rack cabinet is obstructed by the door as you install the optional device.

Removing and installing a NetBAY25 door: Use the following procedure to remove a front or rear door from the rack cabinet:

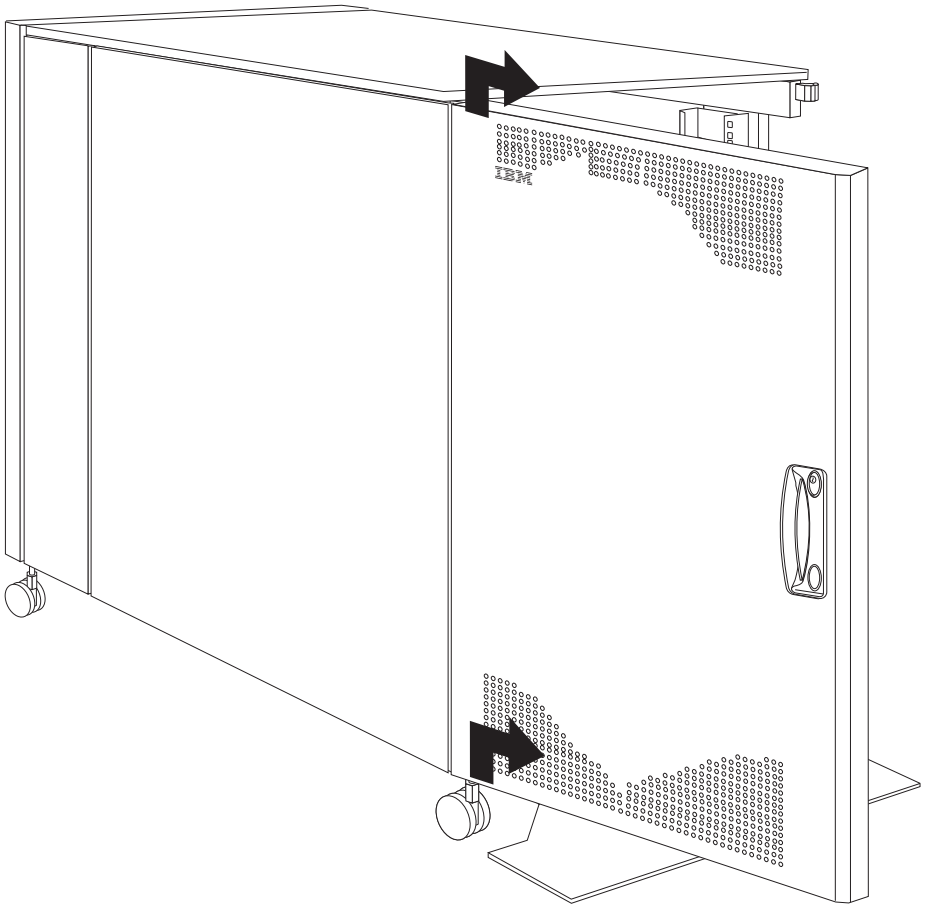


Figure 12. Removing a front door from the NetBAY25 rack cabinet

1. Unlock and open the 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 door on the rack cabinet.

Removing and installing a NetBAY42 door: Use the following procedure to remove a front or rear door from the rack cabinet:

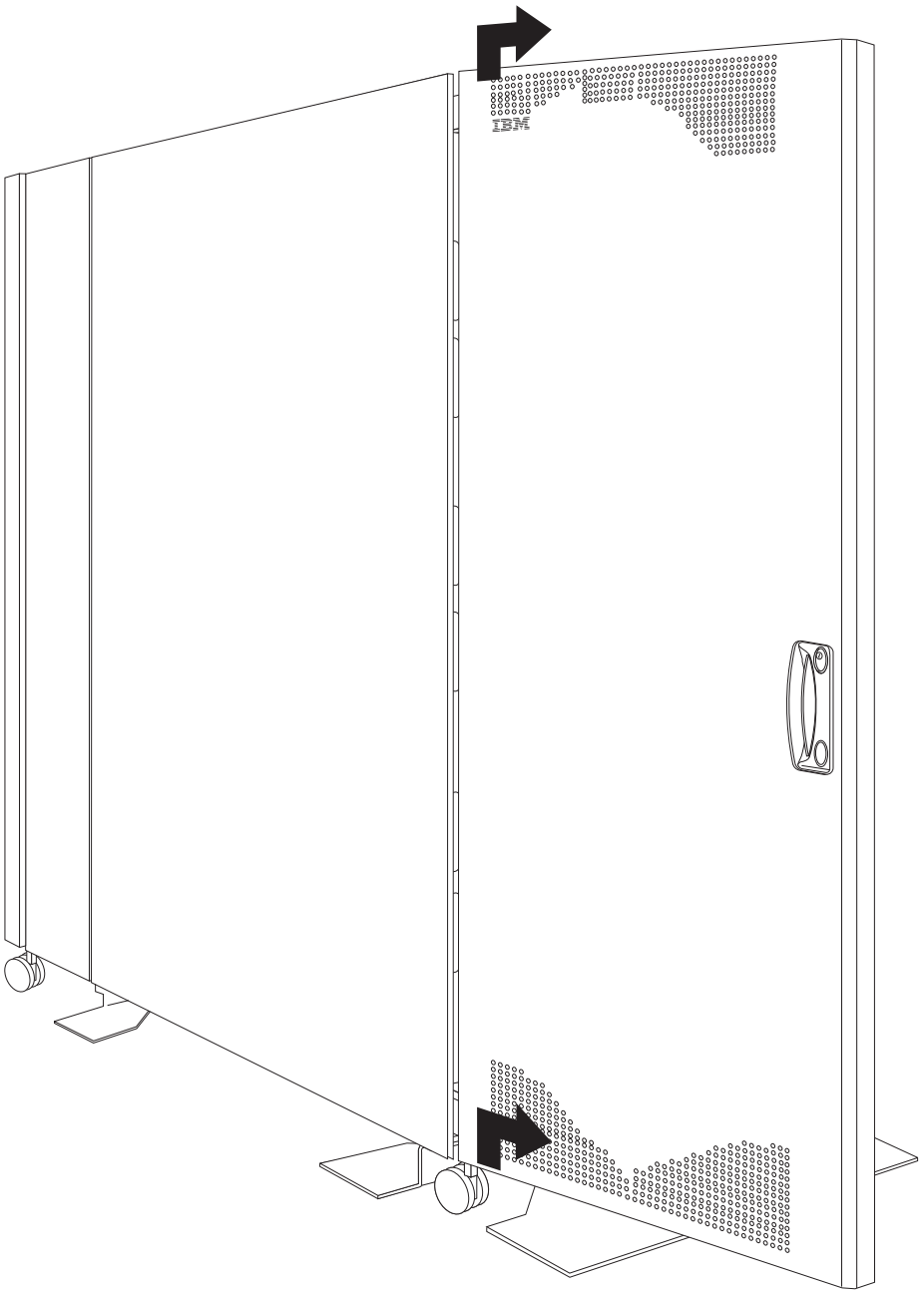


Figure 13. Removing a front door from the NetBAY42 rack cabinet

1. Unlock and open the 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 door on the rack cabinet.

Reversing a front or rear door: Use the following procedure to reverse a front or rear door on the rack cabinet so that it opens in the opposite direction:

Note: The illustrations in this procedure are of a NetBAY42 rack cabinet. The same procedure applies to the NetBAY25 rack cabinet.

1. Remove the door according to "Removing and installing a NetBAY42 door" on page 18 or "Removing and installing a NetBAY25 door" on page 17.
2. Remove the top and bottom hinge pins from the rack cabinet; then, install the hinge pins on the other side of the rack cabinet.

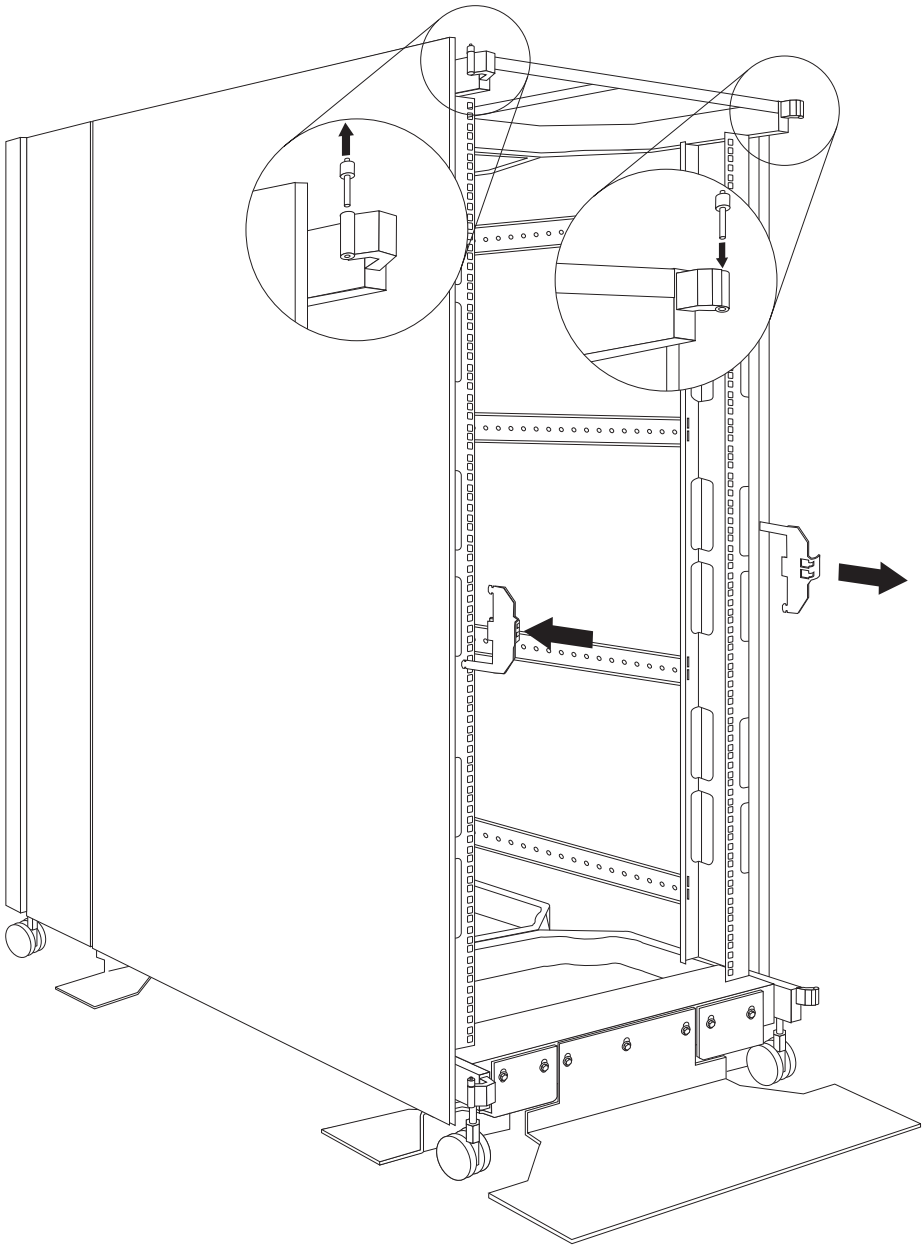


Figure 14. Moving the hinge pins and front door latch

3. Remove the front door latch and attach it to the other side of the rack cabinet.

   Note: The rear door latch is built-in to both rear filler panels, so there is nothing to move when reversing the rear door on the rack cabinet.

4. Carefully rotate the door 180°; then, install the door on the other side of the rack cabinet.

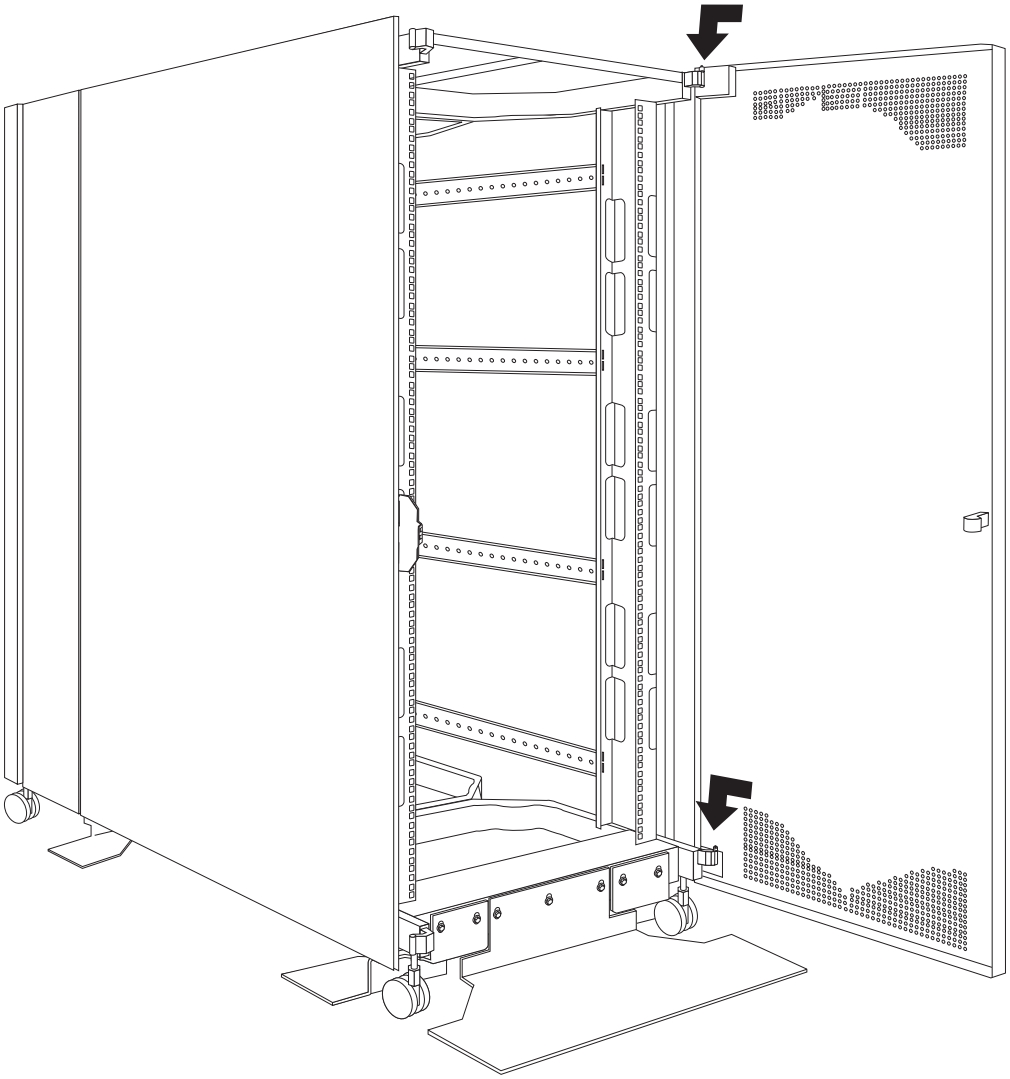


Figure 15. Rotating and installing the door

5. Remove the IBM logo from the bottom of the door; then, snap it into place near the top of the perforated section of the door.

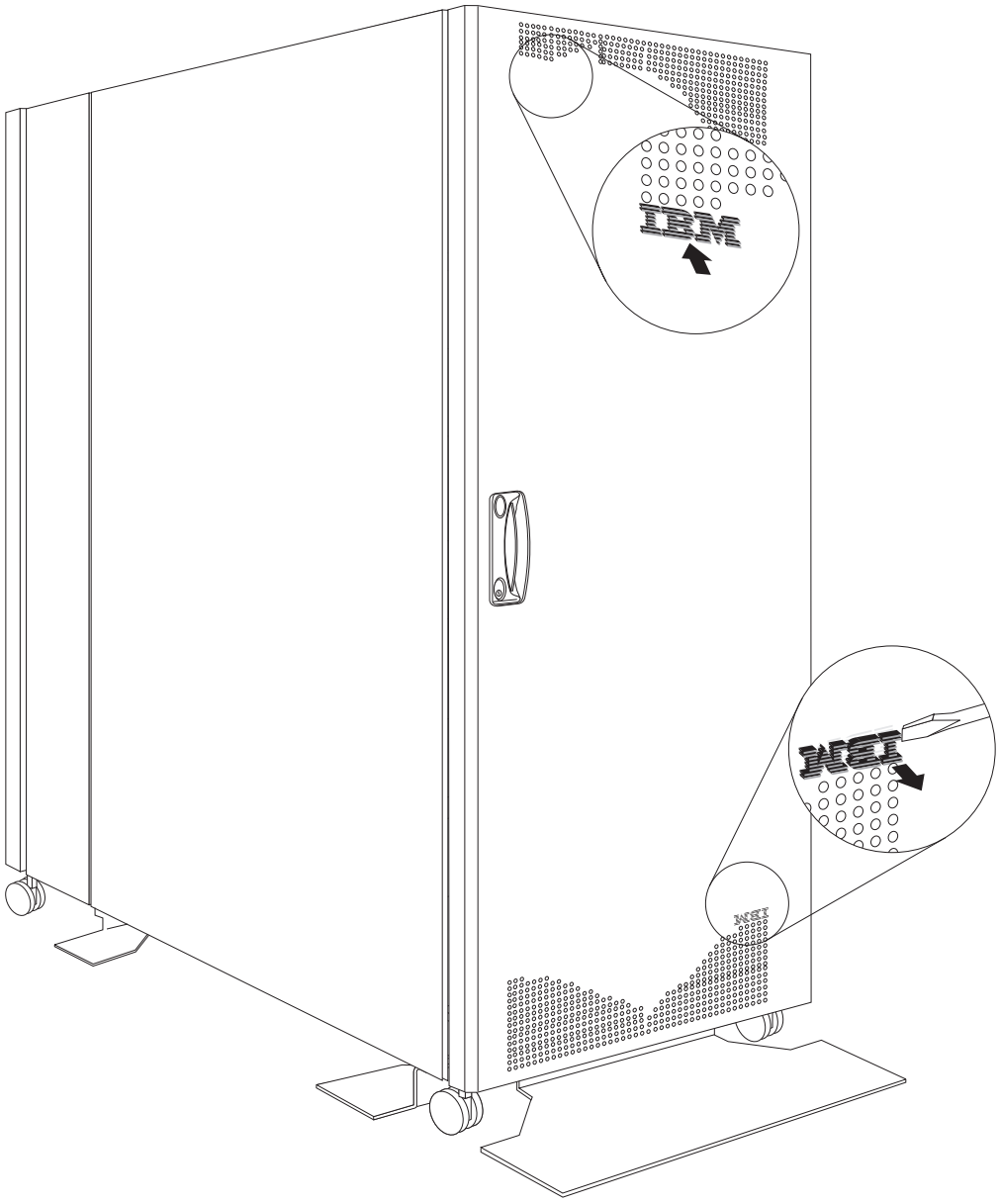


Figure 16. Moving the IBM logo

Attaching NetBAY42 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:

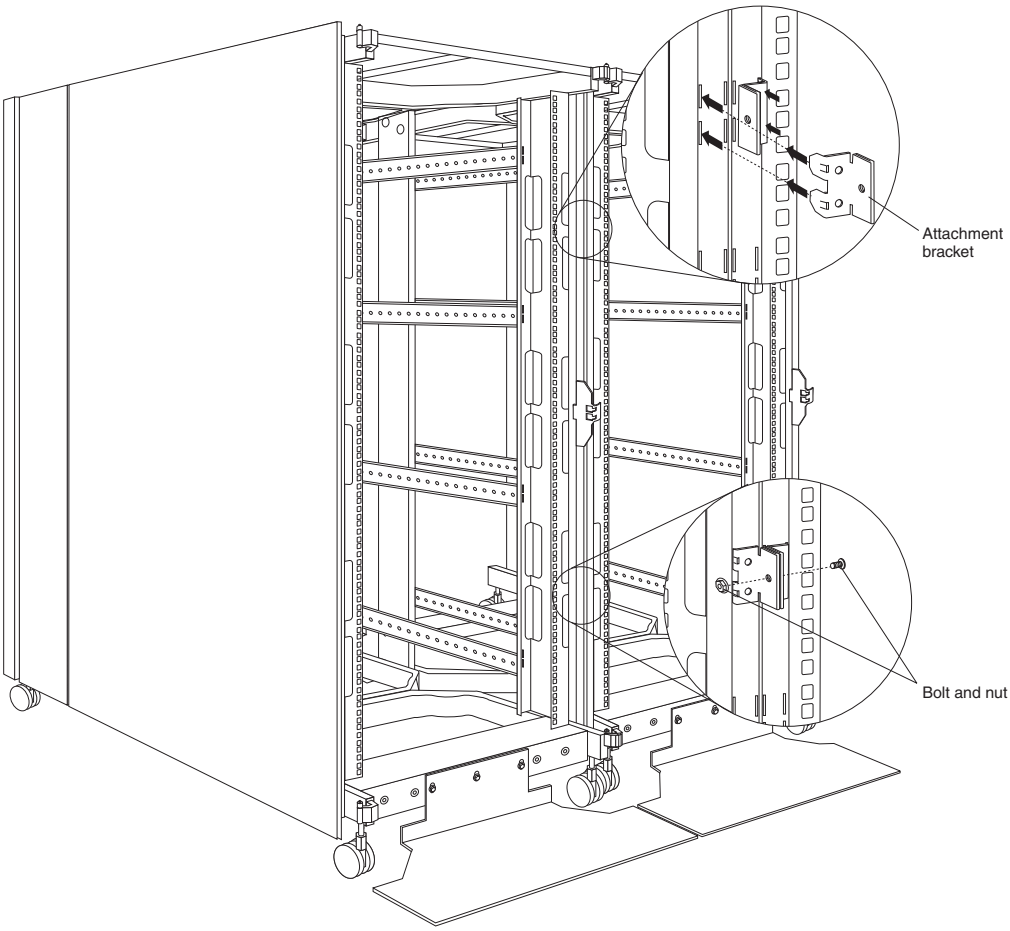


Figure 17. Attaching two adjacent NetBAY42 Rack cabinets to each other to form a suite

1. Remove the side panel and rear filler panel (see "Removing and installing NetBAY42 panels" on page 13) 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 "Removing and installing a NetBAY42 door" on page 18) from both rack cabinets.
3. Install the attachment brackets that come with the expansion rack cabinet on the front and rear of the two adjacent rack cabinets:
   a. Insert an attachment bracket into the slots on the front of one of the rack cabinets as shown in Figure 17; then, insert an attachment bracket into the slots on the front of the other rack cabinet so that the holes in each bracket are aligned.
   b. Repeat step 3a to install four sets of attachment brackets on the front and rear of both rack cabinets. Install attachment bracket pairs near the top and bottom of the rack cabinets.
   c. Use the bolts and nuts that come with the expansion rack cabinet to attach the rack cabinets to each other.
4. Install the panels that you removed in step 1 on the expansion rack cabinet.

5. If required, move the rear-door-latch-bracket from the expansion rack cabinet to the right side of a rack cabinet that does not have a rear filler panel installed.

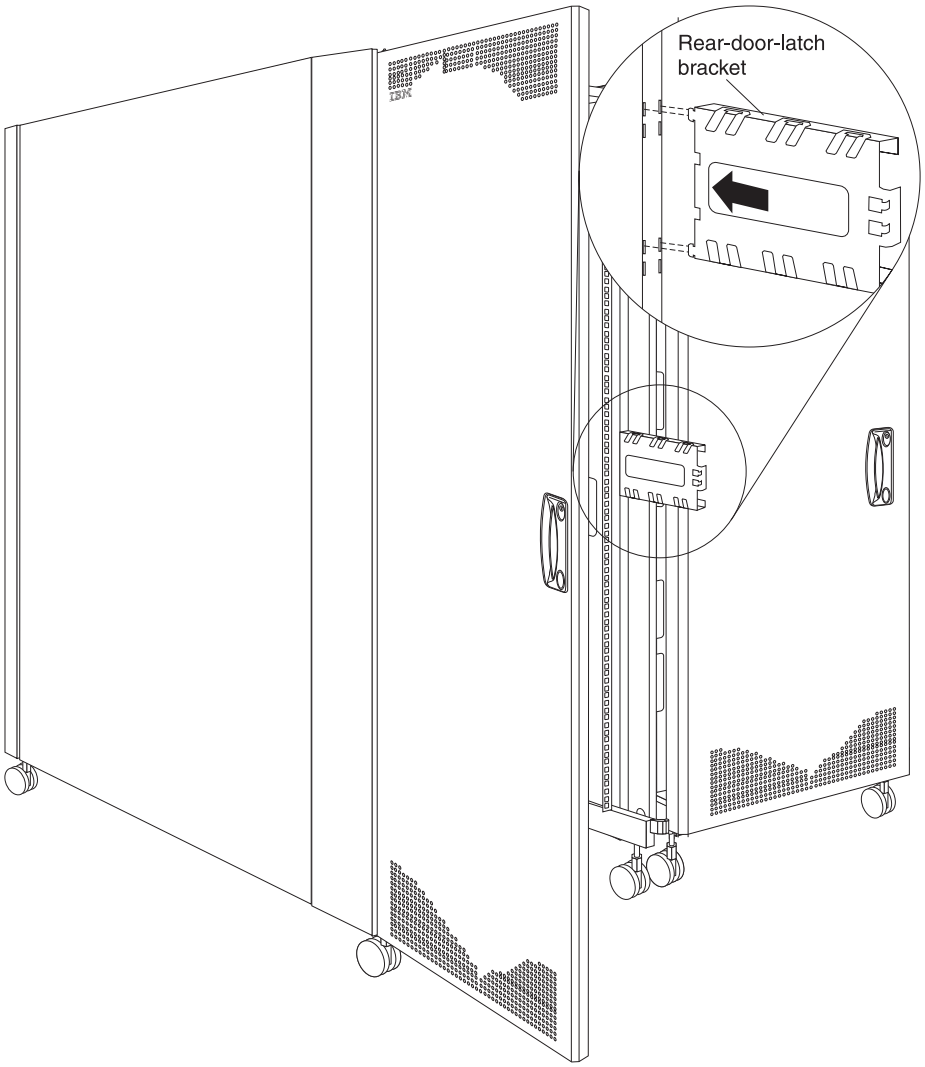


Figure 18. Installing the rear-door-latch-bracket on a rack cabinet

6. Install the front and rear doors on both rack cabinets.

Repeat this procedure if you have other rack cabinets to attach together in a suite.

Managing cables

Always read the instructions that come with your server or optional device for detailed cable-management information. Use the following general guidelines when cabling servers or optional devices that you install in a rack cabinet:

Statement 8:

DANGER

- **Plug power cords from devices in the rack cabinet into electrical outlets that are located near the rack cabinet and are easily accessible.**
- **Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet before servicing any device in the rack cabinet.**
- **Install an emergency-power-off switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in the same rack cabinet.**
- **Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.**

- Do not run cables in front of or behind other devices that will prevent service access to those devices.
- Do not bend fiber-optic cable beyond its limited specifications.
- Label all cables so that they are clearly distinguishable from each other.
- When installing devices mounted on slide rails, such as servers:
  - Run the cables neatly along equipment cable-management arms and secure the cables to the arms using provided cable straps.
  - Leave enough extra cable so that the device can fully extend without straining the cables.
  - Secure the cables so that the device can retract without pinching or cutting the cables.
- When installing devices mounted on fixed rails:
  - Run the cables neatly along the posts or side rails in the rack cabinet out of the way of other installed devices.
  - Secure the cables with the provided cable straps.
- Ensure that the cables cannot be pinched or cut by the rack cabinet rear door or other devices.
- Run internal cables that connect devices in adjoining rack cabinets through the large openings provided in the rear of the rack cabinet.
- Run external cables through the bottom of the rack cabinet or through the removable section in the top of the rack cabinet.

Moving a rack cabinet

Fully populated NetBAY25 and NetBAY42 Rack cabinets have been evaluated and found to meet UL-1950, CSA-950, and IEC-950 stability test standards. Because these standards apply only to a rack cabinet in an installed location, IBM enforces additional standards to ensure stability when rolling the rack cabinet on its casters. See Table 1 for empty and fully populated rack cabinet weights.

Table 1. NetBAY25 and NetBAY42 Rack cabinet weights

	NetBAY25	Primary NetBAY42	Expansion NetBAY42
Empty	81 kg (177 lb)	117 kg (258 lb)	92 kg (202 lb)
Populated	466 kg (1027 lb)	763 kg (1678 lb)	737 kg (1622 lb)

When you move a rack cabinet, adhere to the following standards:

Statement 8:

DANGER

- **Plug power cords from devices in the rack cabinet into electrical outlets that are located near the rack cabinet and are easily accessible.**
- **Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet before servicing any device in the rack cabinet.**
- **Install an emergency-power-off switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in the same rack cabinet.**
- **Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.**

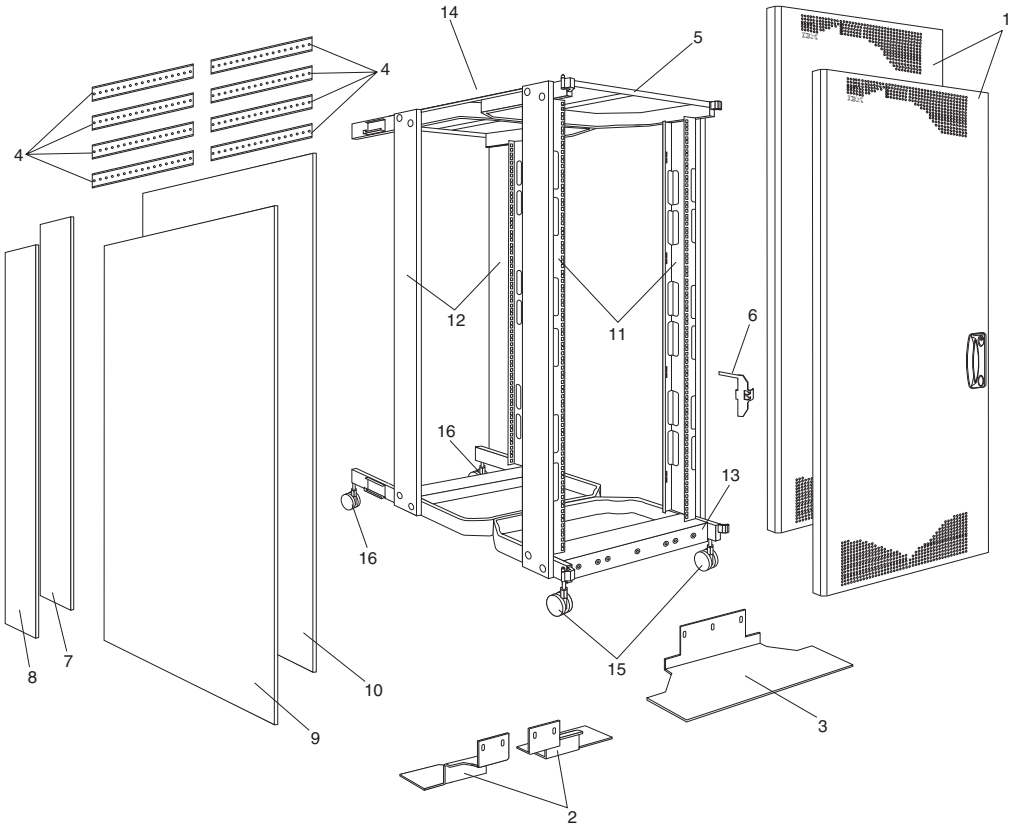
Statement 11:

CAUTION:
Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building:

- **Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must do the following:**
  - **Remove all devices in the 22U position and above.**
  - **Ensure that the heaviest devices are installed in the bottom of the rack cabinet.**
  - **Ensure that there are no empty U-levels between devices installed in the rack cabinet below the 22U level.**
- **If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.**
- **Inspect the route that you plan to take to eliminate potential hazards.**
- **Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.**
- **Verify that all door openings are at least 760 x 2083 mm (30 x 82 in.)**
- **Ensure that all devices, shelves, drawers, doors, and cables are secure.**
- **Ensure that the four leveling pads are raised to their highest position.**
- **Ensure that there is no stabilizer bracket installed on the rack cabinet.**
- **Do not use a ramp inclined at more than ten degrees.**
- **Once the rack cabinet is in the new location, do the following:**
  - **Lower the four leveling pads.**
  - **Install stabilizer brackets on the rack cabinet.**
  - **If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.**

If a long distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also, lower the leveling pads to raise the casters off of the pallet and strap the rack cabinet to the pallet.

Part Listing (Type 9306)



Index	Rack Enclosure (Type 9306)	FRU
1	42U Door (Models 420, 421)	06P6074
1	25U Door (Model 250)	32P1008
2	Left Hand and Right Hand Side Stabilizer (Models 420, 421)	06P6077
3	Front Stabilizer (Models 250, 420, 421)	06P6076
4	Braces (Models 250, 420, 421)	06P6063
5	42U - 900 Front Top Cover (Models 420, 421)	06P6064
5	42U -100 Rear Top Cover (Models 420, 421)	06P6065
5	42U - Top Side Gland Plate (Models 420, 421)	06P6066
5	25U - Top Cover (Model 250)	32P1003
6	Front Door Striker Plate (Models 250, 420, 421)	06P6067
7	Left Hand 25U x 200 Single Side Panel (Model 250)	32P1006
7	Right Hand 42U x 200 Single Side Panel (Models 420, 421)	32P1016
8	Left Hand 42U x 200 Single Side Panel (Models 420, 421)	06P6072
8	Right Hand 25U x 200 Single Side Panel (Model 250)	32P1007
9	Left Hand 42U x 800 Single Side Panel (Models 420, 421)	06P6070
9	Left Hand 25U x 800 Single Side Panel (Model 250)	32P1004
10	Right Hand 42U x 800 Single Side Panel (Model 420, 421)	32P1000
10	Right Hand 25U x 800 Single Side Panel (Model 250)	32P1005
11	42U Symm Front Panel MTG. MBR (Models 420, 421)	06P6059
11	25U Symm Front Panel MTG. MBR (Model 250)	32P1009
12	42U Rear Symm Front Panel MTG. MBR (Models 420, 421)	06P6061
12	25U Rear Symm Front Panel MTG. MBR (Model 250)	32P1011
13	42U Base Cross Box (Models 420, 421)	32P1015
13	25U Base Cross Box (Model 250)	32P1013
14	42U x 600 x 1000 Rack Framework Only (Models 420, 421)	06P6054

Index	Rack Enclosure (Type 9306)	FRU
14	25U x 600 x 1000 Rack Framework Only (Model 250)	32P1010
15	Swivel Caster (Models 250, 420, 421)	06P6055
16	Swivel Caster (Models 250, 420, 421)	06P6055
	Rear Door Striker (Models 250, 420, 421)	06P6068
	42U Two Color Unit Identification Strip (Models 420, 421)	06P6069
	25U Two Color Unit Identification Strip (Model 250)	32P1012
	Side Panel Sliding Latch (Models 250, 420, 421)	06P6071
	Hinge Pin (Models 250, 420, 421)	06P6073
	Door Lock Assembly (Models 250, 420, 421)	06P6075
	Fixings and Tools (Models 250, 420, 421)	06P6079
	42U Baying Bracket (Models 420, 421)	06P6080
	25U Top Cover Cable Access Hole Cover (Model 250)	28L0553
	25U Top Cover MTG. Bracket Kit (Model 250)	32P1014
	Door Keys (Models 250, 420, 421)	32P1002
	25U Single Color Unit Identification Strip (Model 250)	32P1034
	42U Single Color Unit Identification Strip (Models 420, 421)	32P1035

Type 9306 Models 200/900/910

Type 9306 Models 900/910

Features

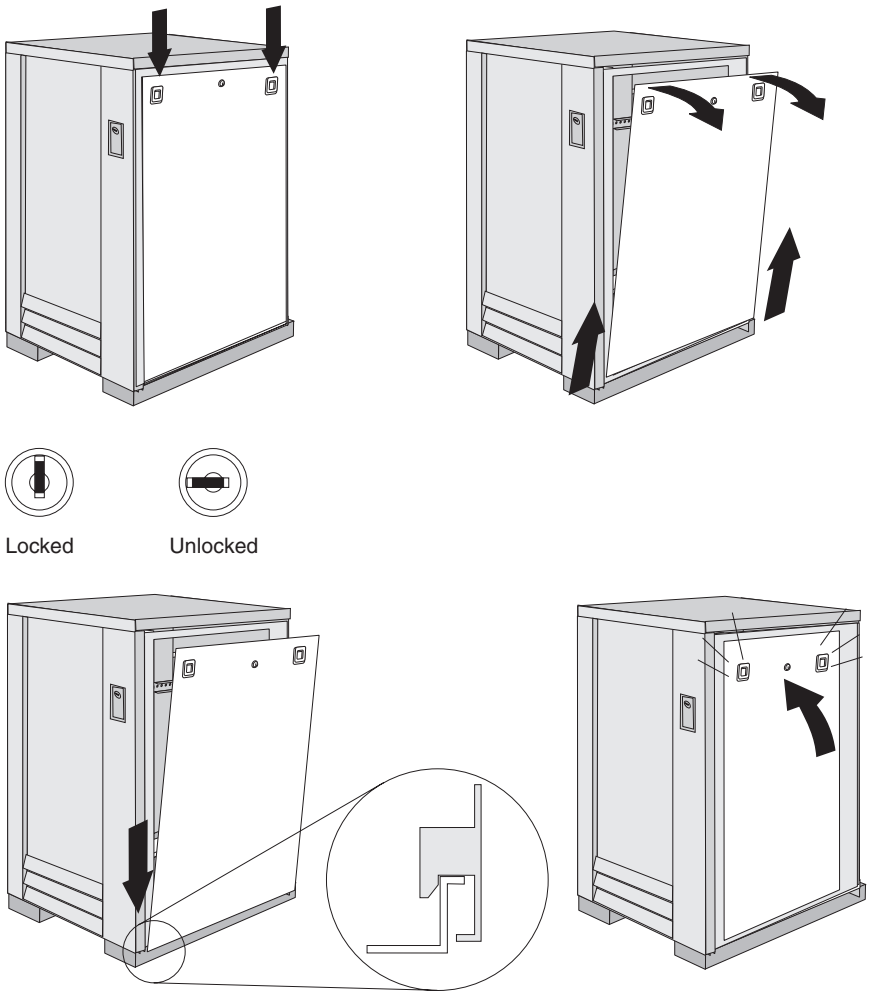
The IBM NetBAY22, Type 9306, Model 200 Rack enclosure is a 22-U (1-U = 1.75 inch) industry-standard, 19-inch rack that houses and controls multiple IBM PC Servers/IBM Servers and related equipment.

Locations

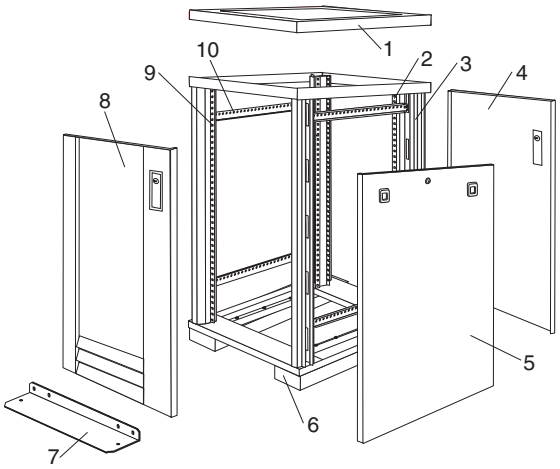
The following sections contain information on specific equipment locations.

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

Side panel



Parts Listing (Type 9306 Model 200)



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
	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

Rack Enclosure (Type 9306 Model 200) Options	FRU
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

Type 9306 Model 900/910

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.

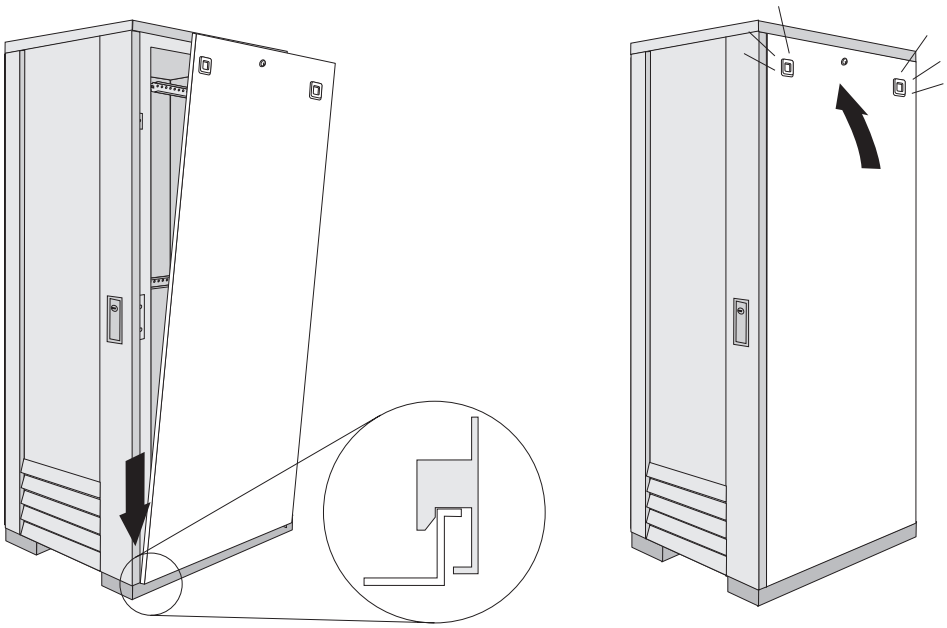
- Model 900 has optional side panels, solid front door, and perforated rear door.
- Model 910 has side panels and perforated front and rear doors.

Locations

The following sections contain information on specific equipment locations.

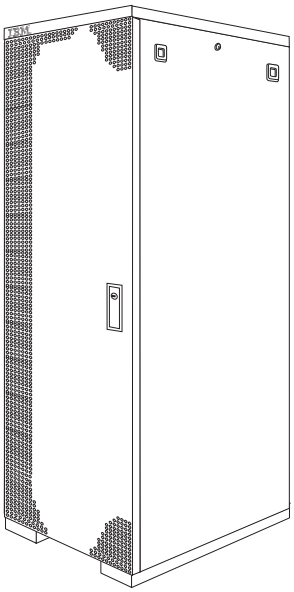
Note: For instructions on how to power-off the rack, see "Powering off the rack" on page 3.

Side Panel



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.



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

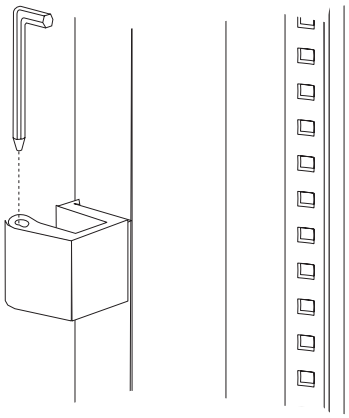
Use the following steps to remove your existing front door and install the new perforated door:

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.

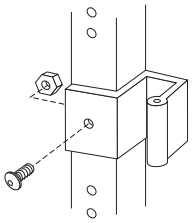
2. If the front door is locked, unlock it; then, open the front door.

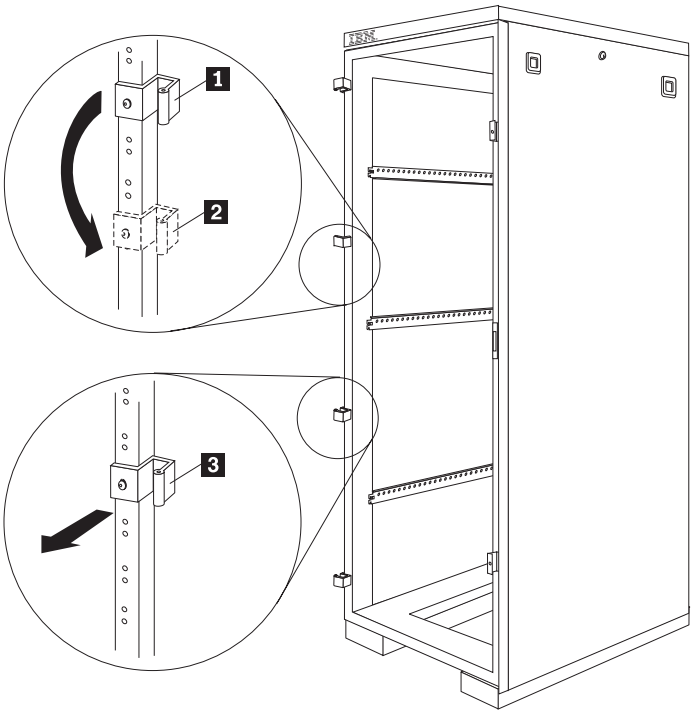
3. While supporting the door, remove all four hinge pins that hold the front door in place; then, store the door in a safe place for possible future use.

   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 2 three mounting spaces downward and reinstall it at the new center location.

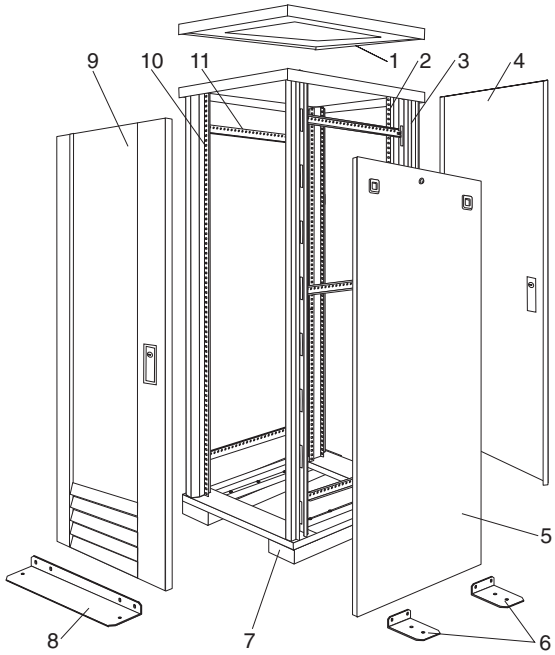




Note: Insert the screw through the bracket and into the lower of the two holes in the new center location.

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.

Parts listing (Type 9306 Model 900/910)



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
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

Rack Enclosure (Type 9306 Model 900/910) Options	FRU
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

Type 9306 Models 4QS, 4QX, 9QS, 9QX, 9TS, 9TX

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

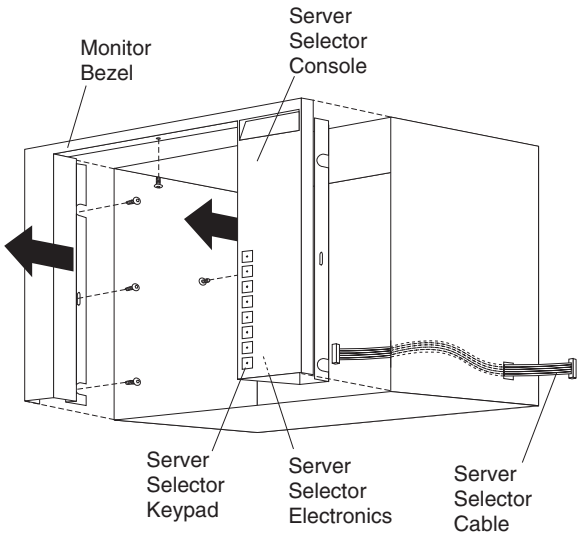
The following sections contain information on specific equipment locations.

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

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

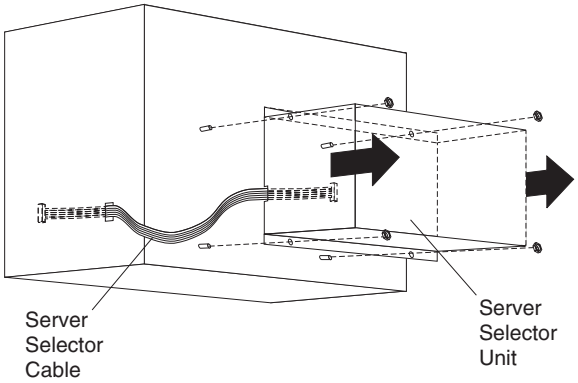
The server selector unit is located in the upper rear of the rack cabinet. The server selector unit can only be accessed or removed from the rear of the IBM Rack cabinet.

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 195.

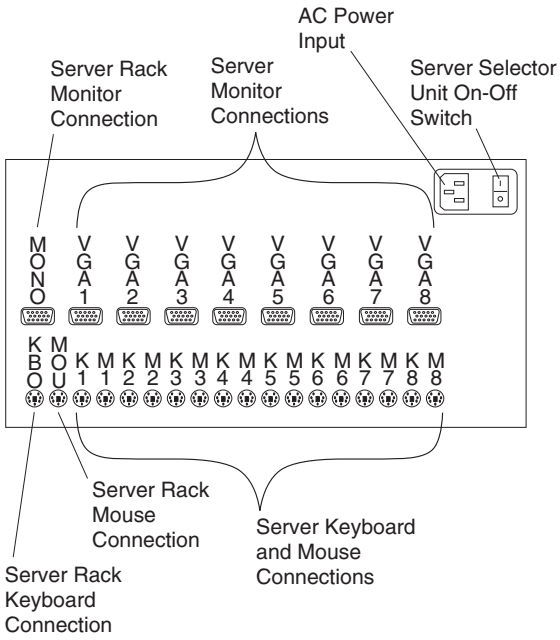
To remove the server selector unit:

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.



Connections



Power distribution unit

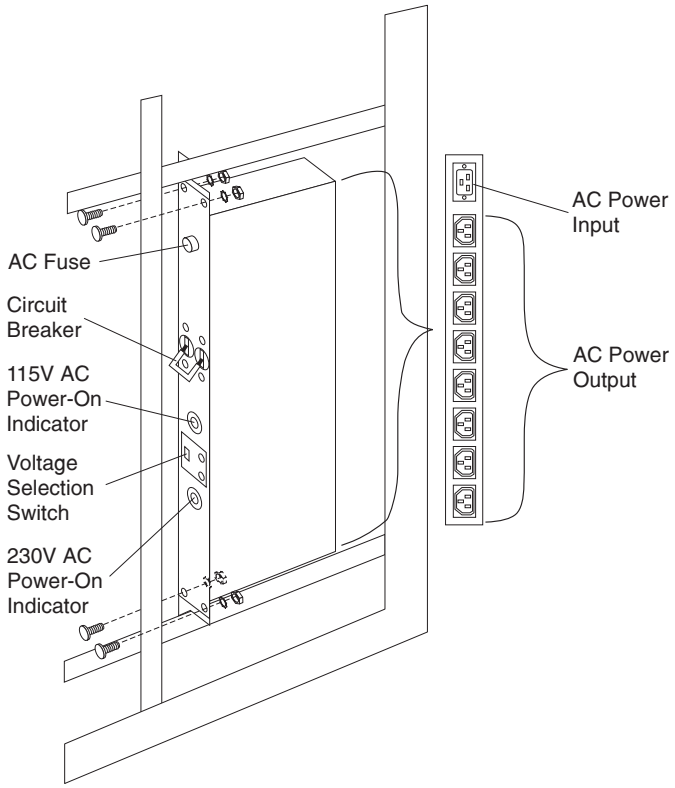
Note: For information and installation instructions for the IBM NetBAY Rack Power Distribution Units, see "Installing Optional Devices" on page 97".

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.

   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.



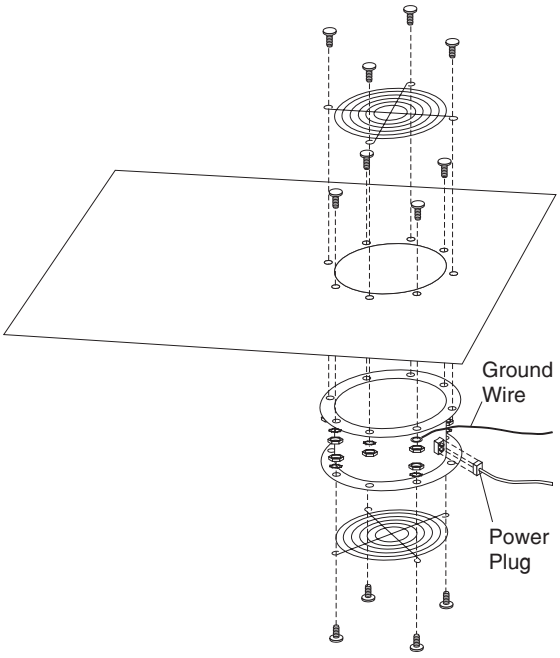
Cooling fan

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.



Sliding trays

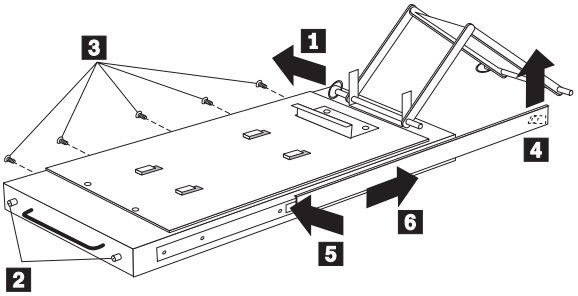
Models 4QS and 4QX come with either single latch slide rails or dual latch slide rails. Single latch slide rails have a front latch release on the right rail only. Dual latch slide rails have a front latch release on both rails. The slide rail FRU number for the 24-inch rack replaces the single latch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

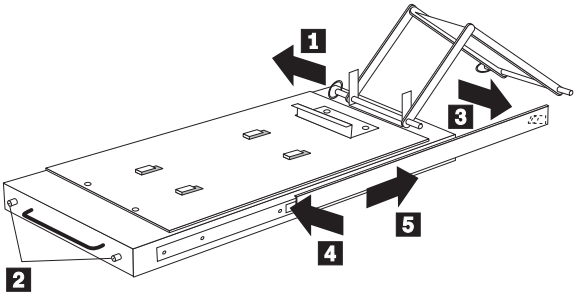


Dual latch rail tray

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.

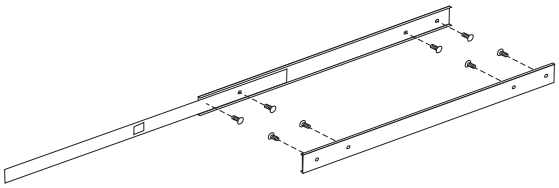
For single latch sliding rails, the right rail is the one that has the front latch. The left rail does not have a front latch.

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 43.
3. Use a 3/32-inch allen wrench to remove the four screws that secure each of the sliding rails to the rack cabinet.

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.



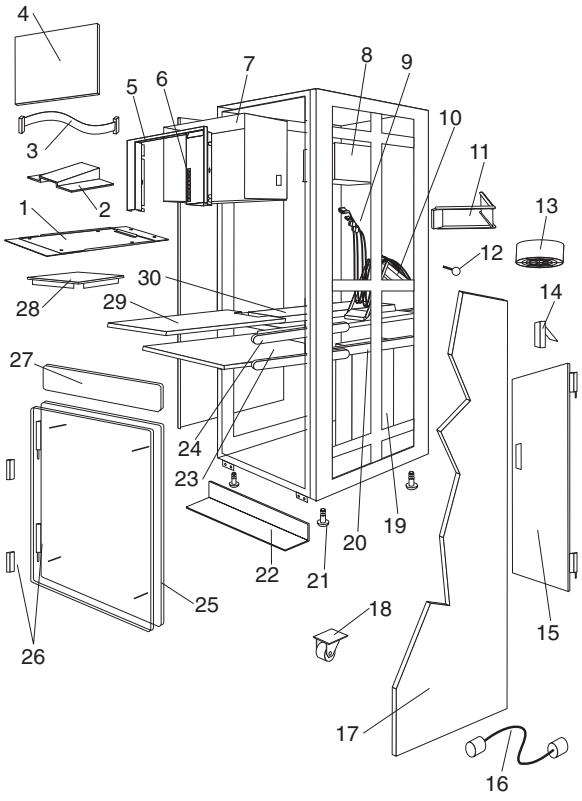
Keyboard tray

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.

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

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



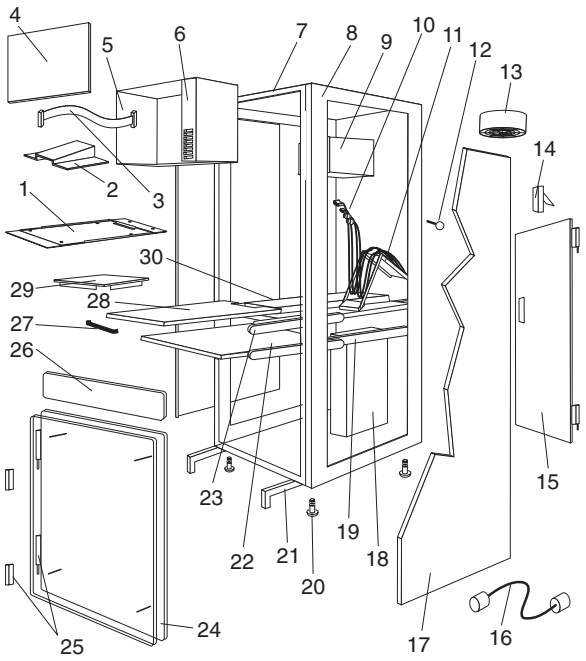
Index	19-Inch Rack Enclosure (Type 9306)	FRU
1	Adapter Plate Options:	
	PS/2 Server 85/95	76H3733
	Model 300	76H3734
	Model 500, 700	76H3734
2	Monitor Stand	07H0061
3	Server Selector Cable	07H0036
4	Blank Bezel (9QX, 9TX Expansion units only)	76H0379
5	Monitor Bezel with button label	76H0378
6	Server Selector Keypad	07H0097
7	Monitor Housing (19-inch)	76H0377
8	Server Selector Unit Electronics See “Safety inspection guide” on page 196.	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
14	Latch, Rear Door	76H0376
15	Rear Door (19-Inch)	76H0373
15	Hinge Set for Rear Door	76H0389
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	76H0374
18	Caster	76H3626
19	NetBAY Rack Power Distribution Unit	09N9668
19	NetBAY Front-end Power Distribution Unit	09N9670
	3-phase NEMA L21-30P line cord (200-250 Vac) for NetBAY Front-end PDU	00N7720
	3-phase IEC 309-3P+N+Gnd line cord (380-415 Vac) for NetBAY Front-end PDU	00N7721
	1-phase NEMA L5-30P line cord (100-127 Vac) for NetBAY Front-end PDU	00N7722
	1-phase NEMA L6-30P line cord (200-240 Vac) for NetBAY Front-end PDU	00N7723
	1-phase IEC 309-2P+Gnd line cord (200-240 Vac) for NetBAY Front-end PDU	00N7724
19	NetBAY Server Dual-cord Power Distribution Unit	09N9669
	Hardware Kit for NetBAY Power Distribution Units	09N9671
	Power Distribution Unit	07H0424
19	250 V Slow Blow Fuse	0303549
20	Keyboard Slides, (one pair)	07H0038
21	Leveling Foot (Qty. 1)	76H0390
22	Stabilizing Bar	76H0375
23	Keyboard Tray, 19-Inch	76H0381
24	Slide Rails, Server Tray (one pair)	07H0083
24	Slide Rails, Dual Tray (one pair)	76H0383
25	19-inch Front Compartment Door (19-Inch by 26-Inch) Includes Hinge Set and Screws	76H0371
26	Door Hinge Set	76H0372
27	Door Valance (9QX, 9TX, Expansion units only)	76H0380
28	Mouse Table	07H0079
29	Dual Server Tray	76H0382

Index	19-Inch Rack Enclosure (Type 9306)	FRU
29	Dual Server Shelf	76H0385
30	Single Server Tray	76H0384
	19-Inch Single Slide Shelf for an Industry Standard 19-Inch Rack.	76H3628
	Cable, SVGA-Video (15 Feet) Option	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 (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
Miscellaneous Parts Kit • 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 • Cam (1 each) • Spring (1 each)	07H0091

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

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



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 195.	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
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

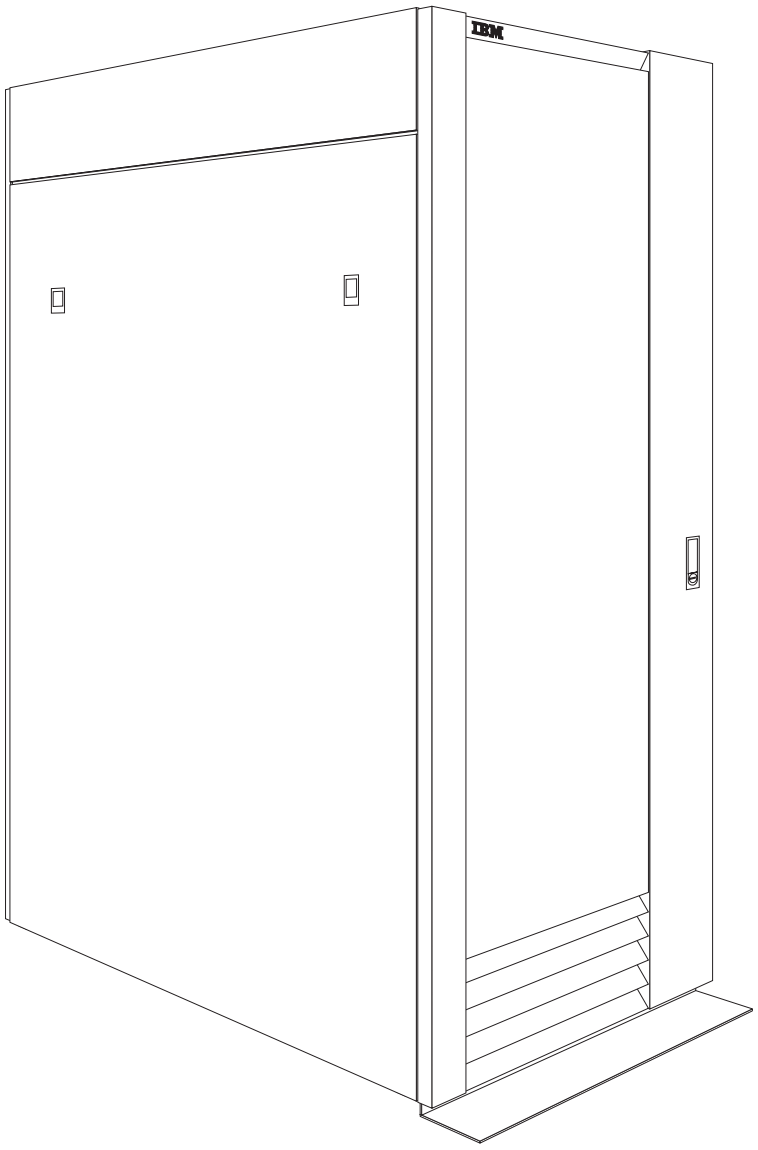
Rack Enclosure Kits 24-inch (Type 9306)	FRU
Bolt-Together Kit (19-Inch to 24-Inch, 24-Inch to 19-Inch) – includes: 19-Inch Attachment Bracket (2 each); Screw 1/4-20 x 1/2 Button Head Socket Cap; Allen (8 each); Screw 1/4-20 x 1-1/4 Socket Cap (4 each); Flanged Nut 1/4-20 (12 each); 24-Inch Attachment 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

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

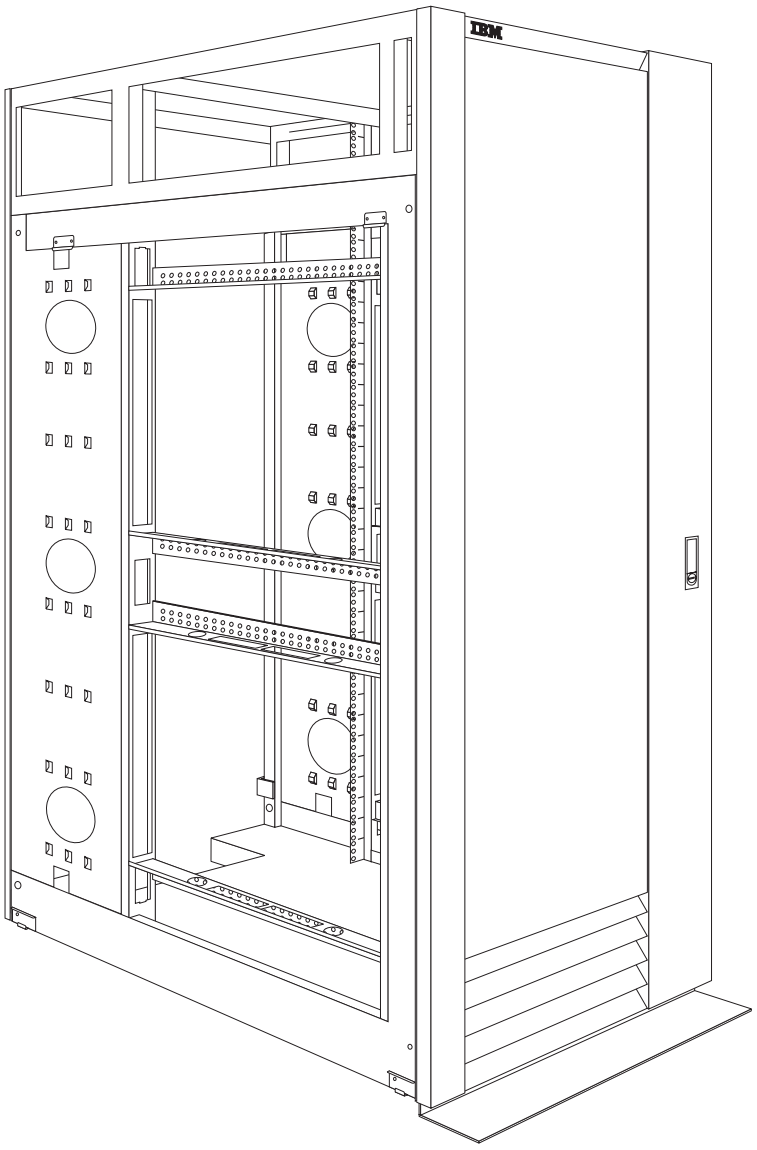
Features

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.

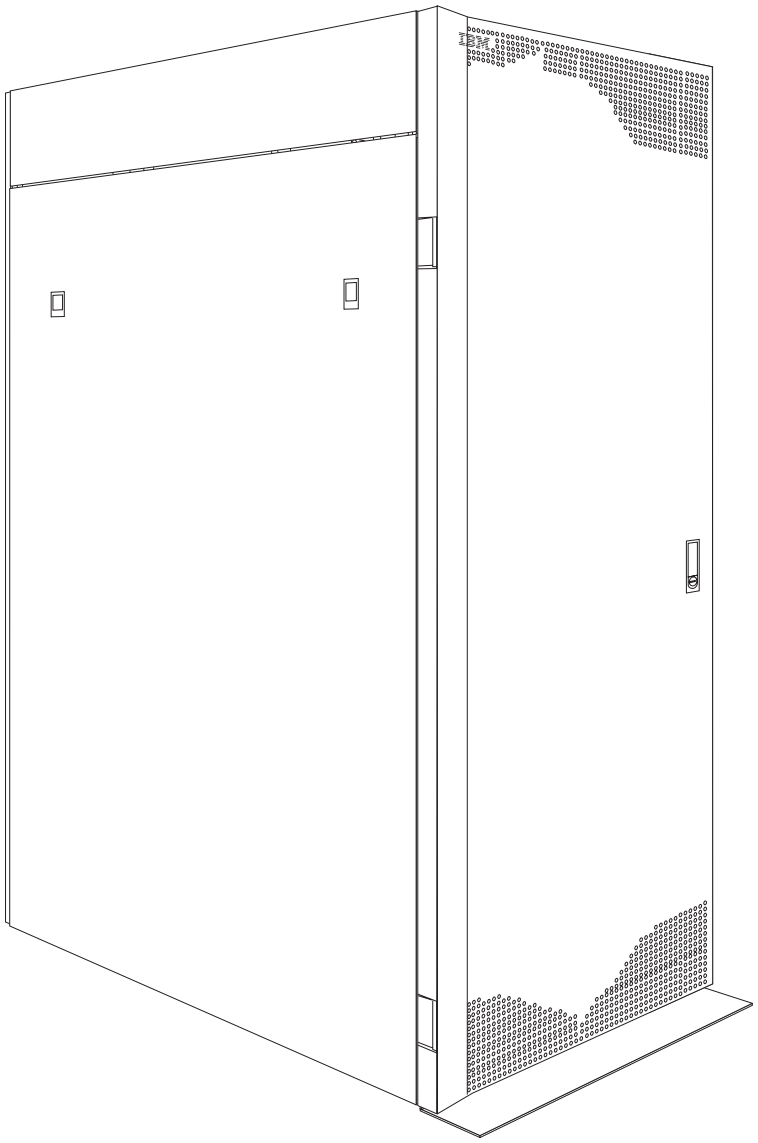
Primary Rack (Model 42P)



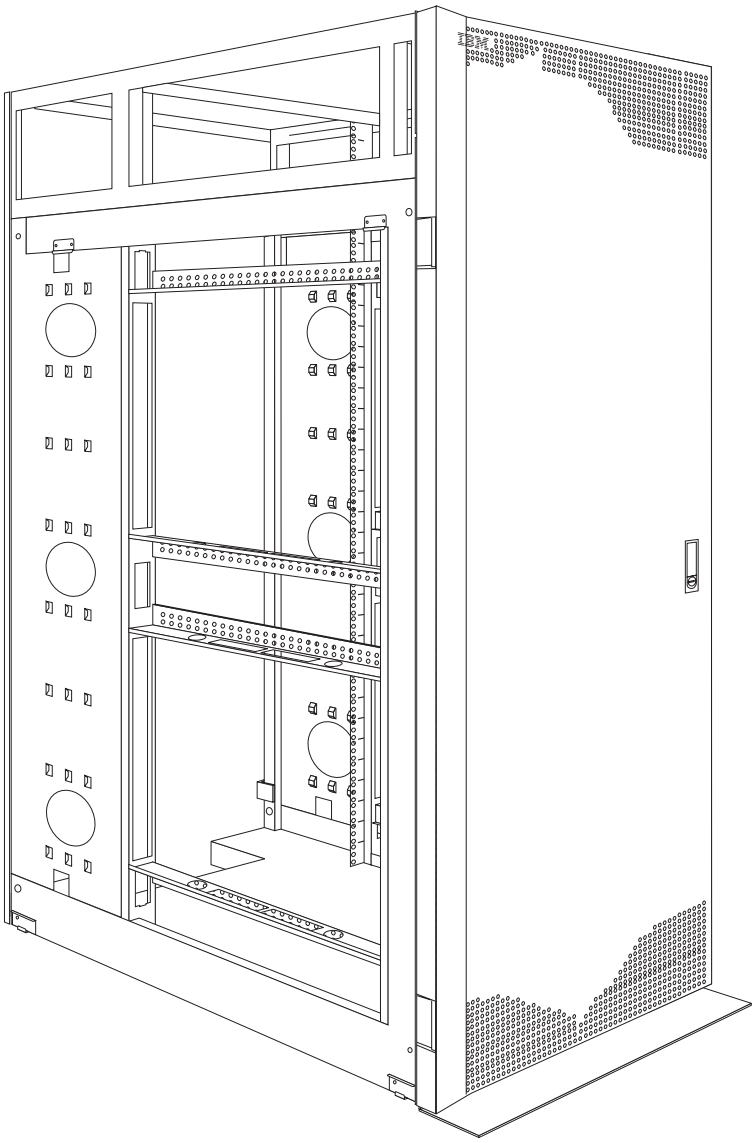
Extension Rack (Model 42X)



Primary Rack (42S)



Expansion Rack (42E)



Locations

The following sections contain information on specific equipment locations.

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 panels

Removing and installing the side panels

Use the following procedure to remove the rack side panels:

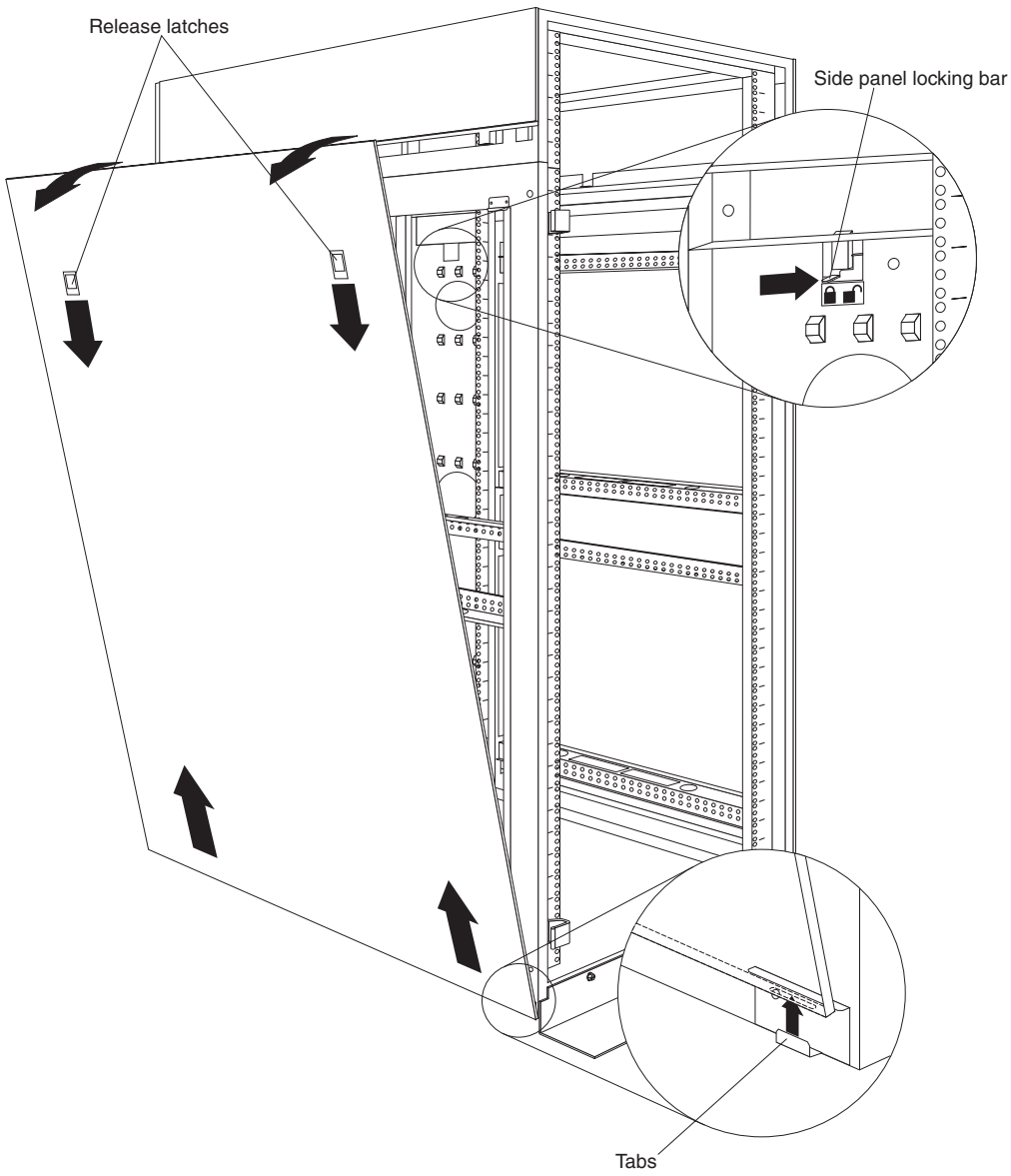


Figure 19. Removing the rack side panels

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:

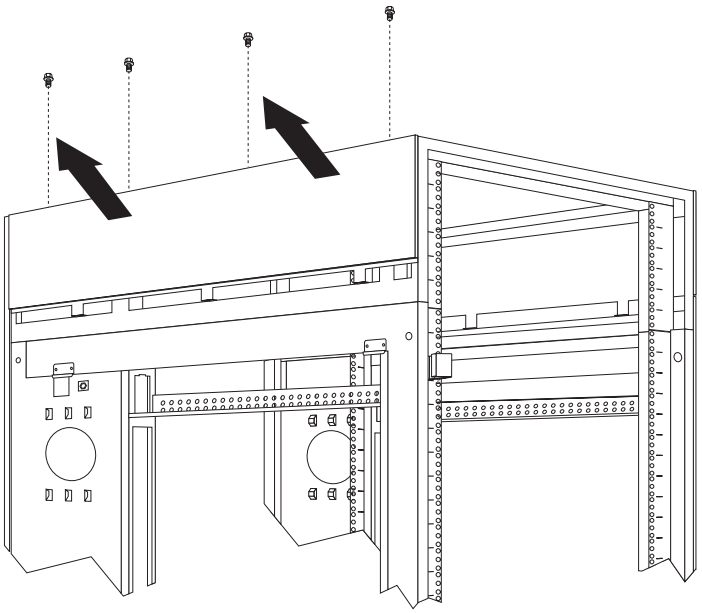


Figure 20. Removing the top 6U side panels from the rack cabinet

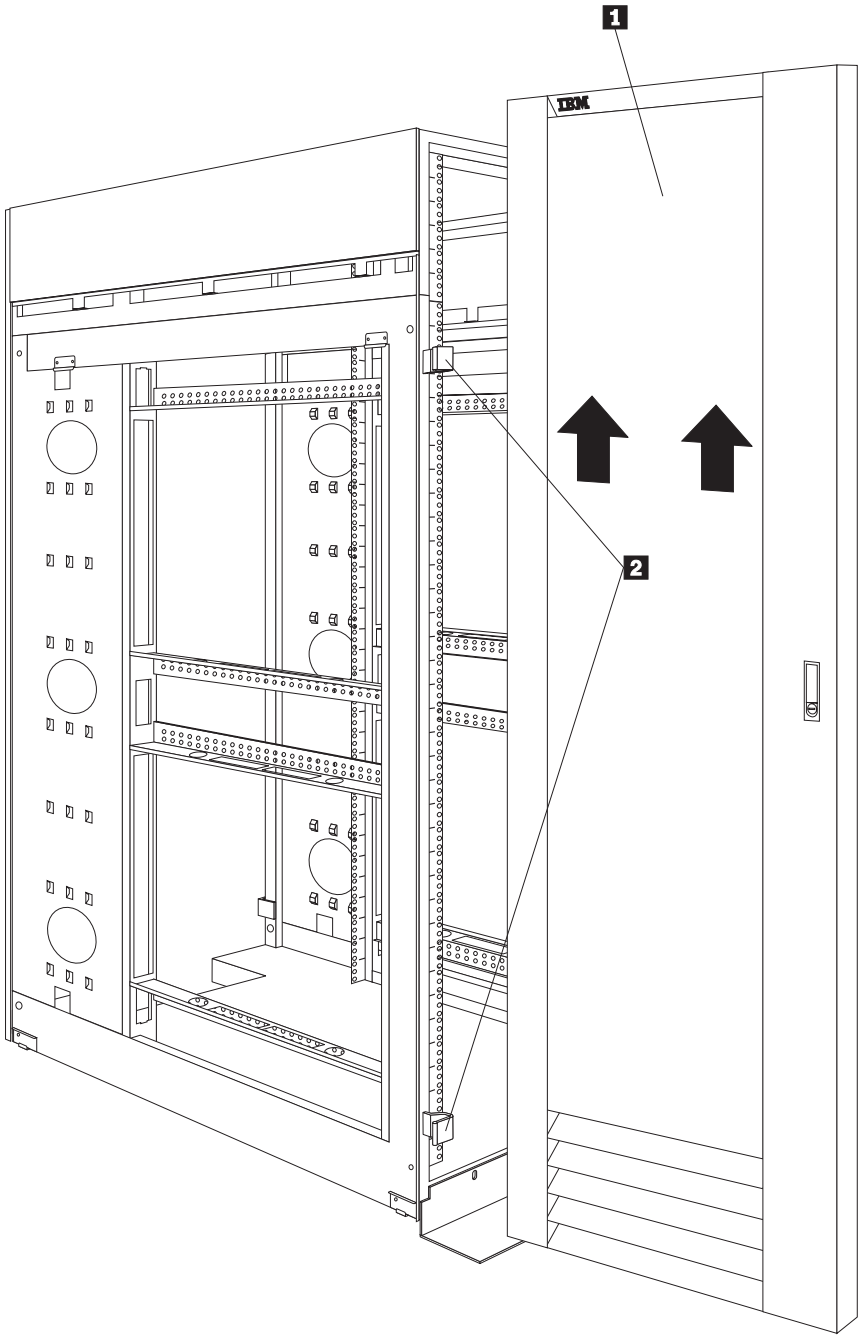
1. On the top of the rack cabinet, loosen the four screws that hold each side panel in place.
2. Tilt the side panel slightly toward you; then, remove it from the rack cabinet.
3. Repeat this procedure to remove both side panels.

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):

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.

Rear door – Models 42S, 42E

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

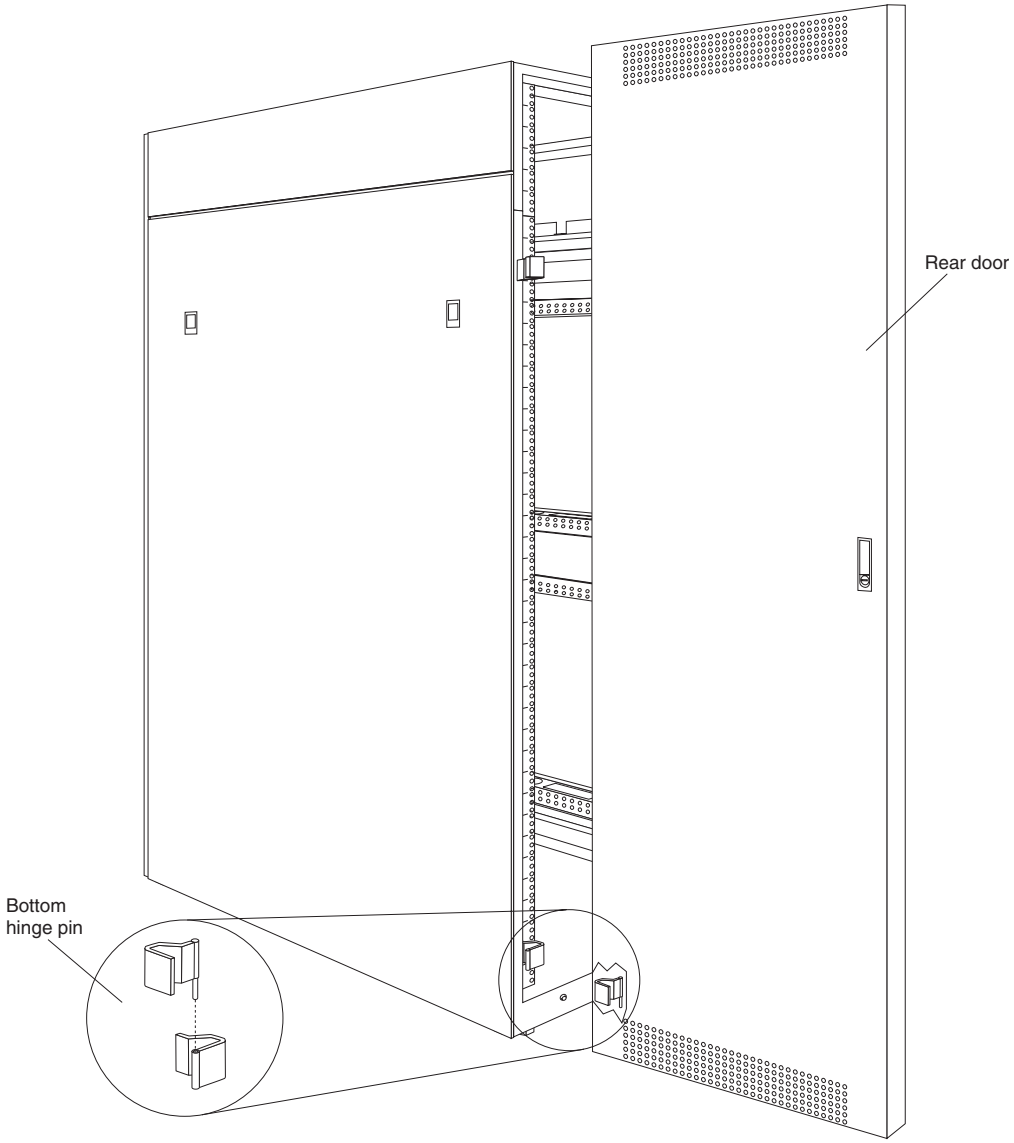


Figure 21. Removing a rear door from the rack cabinet

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.

Front door – Models 42S, 42E

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

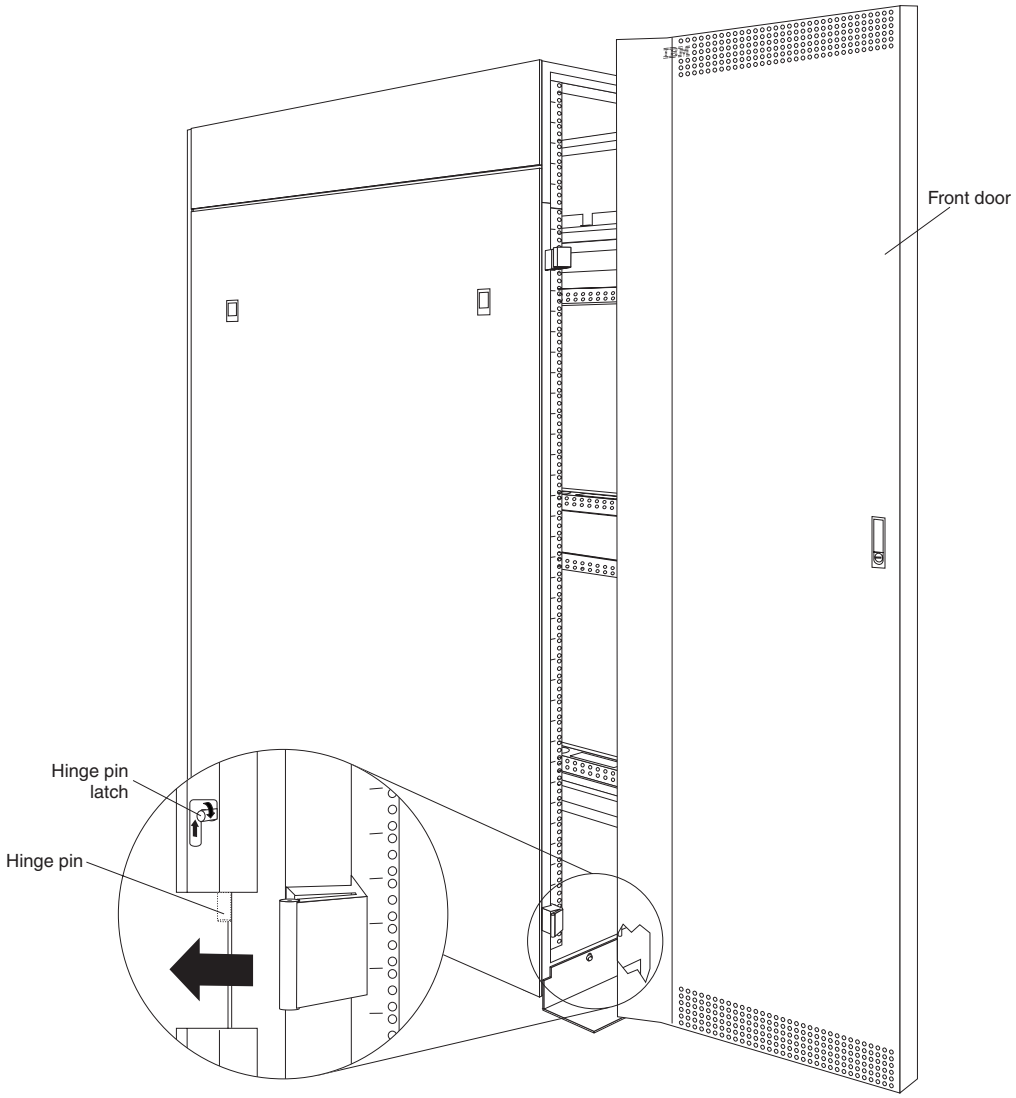


Figure 22. Removing a front door from the rack cabinet

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 59.

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

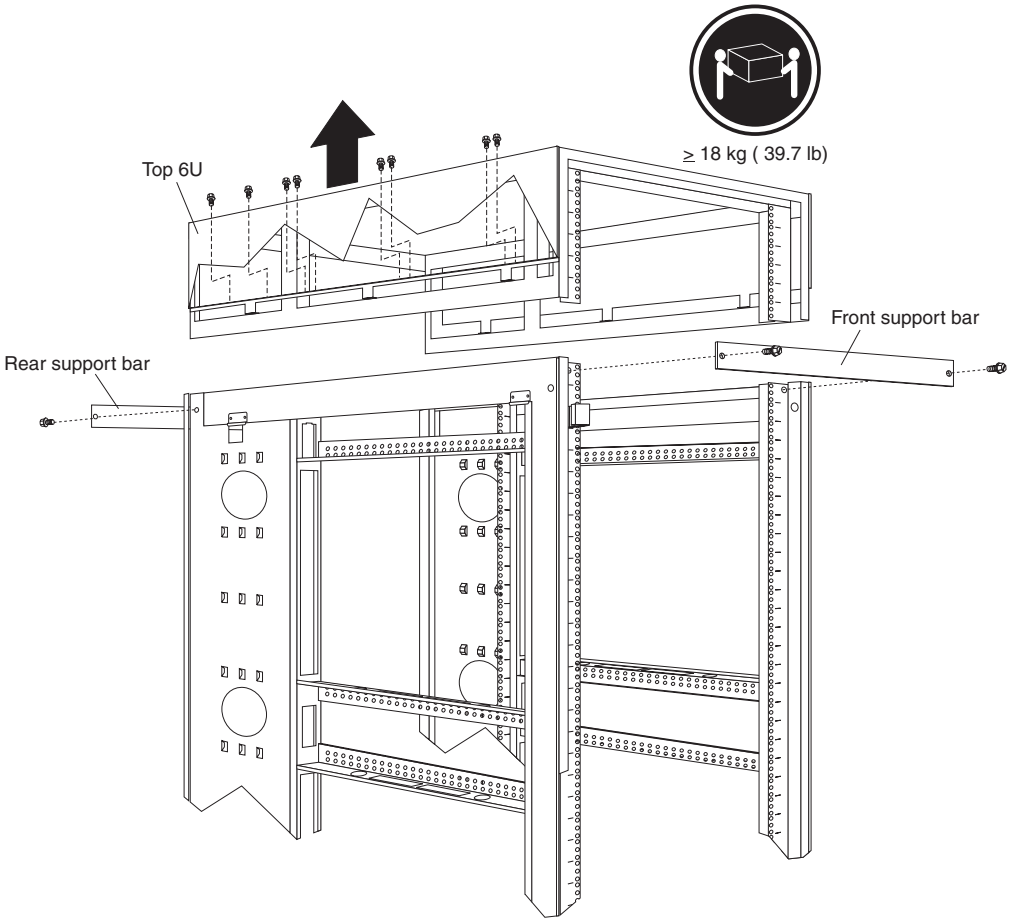
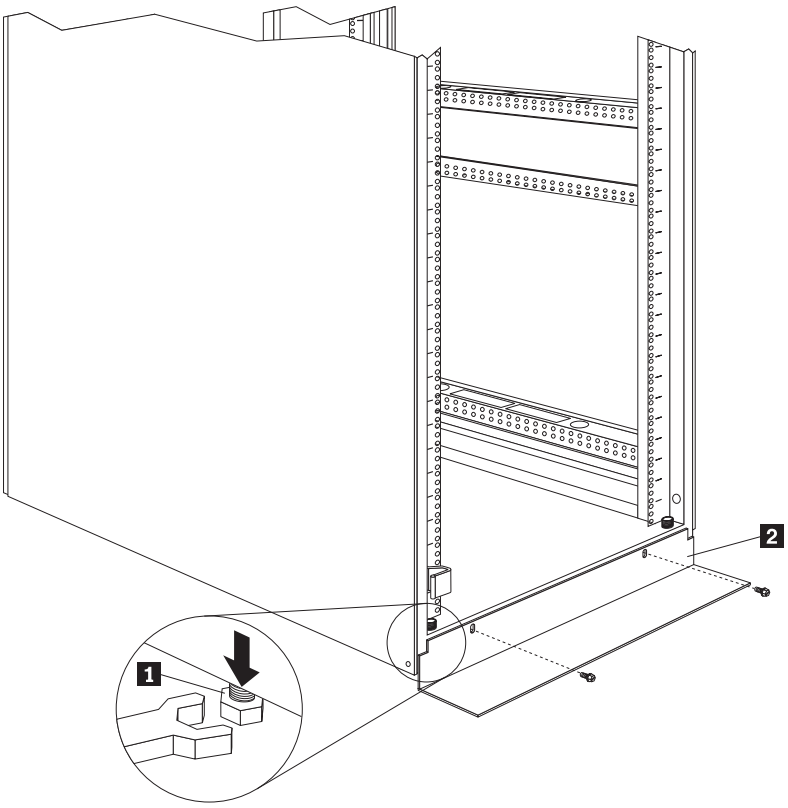


Figure 23. Removing the top 6U portion of the rack cabinet

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

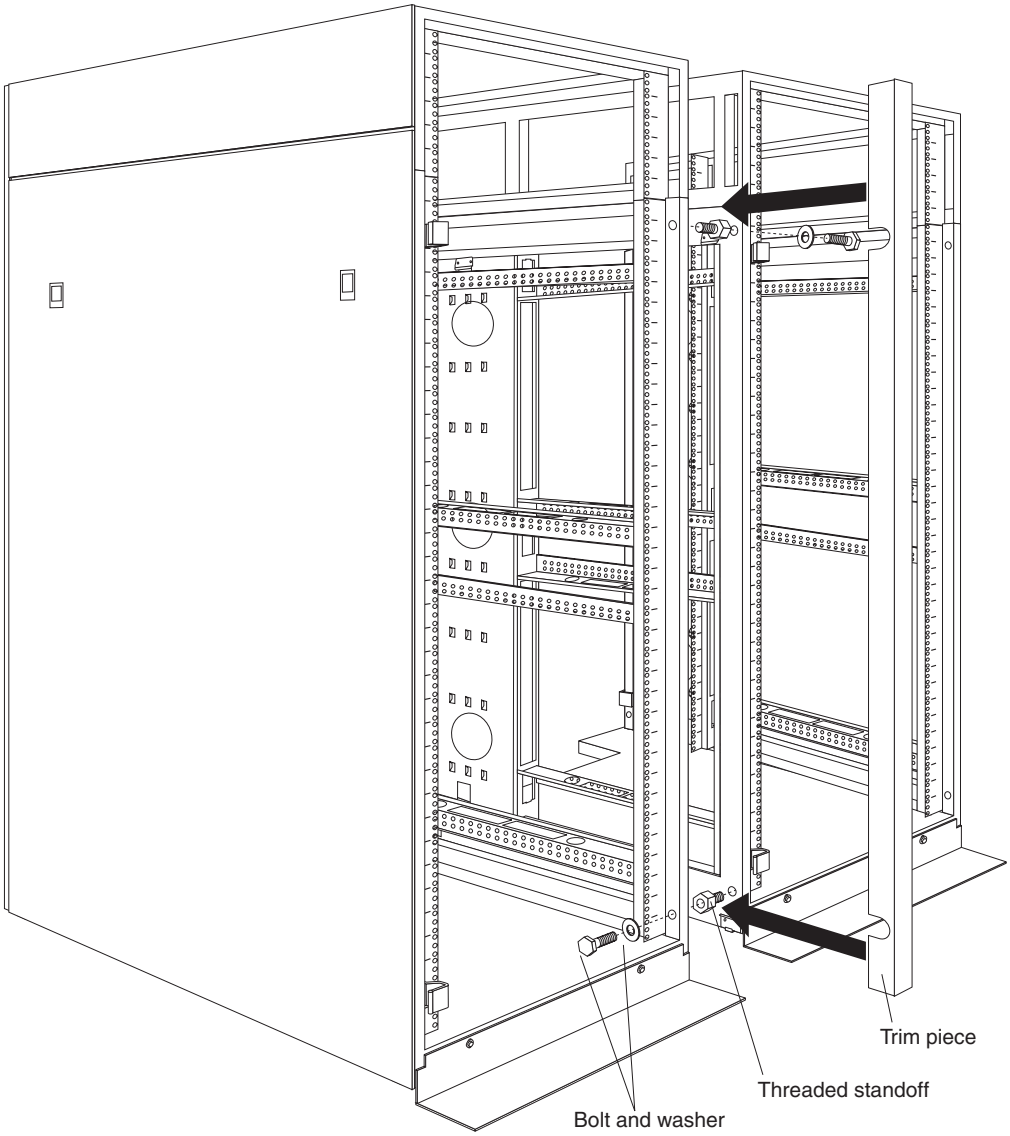


Figure 24. Attaching two adjacent rack cabinets to each other to form a suite

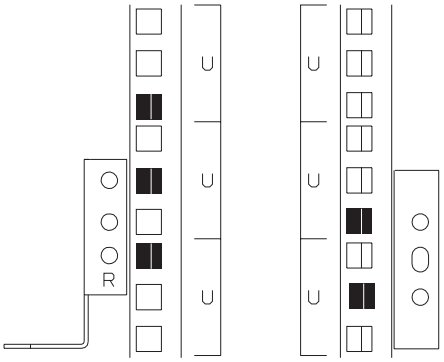
1. Remove both side panels (see "Removing and installing the side panels" on page 57) from the side of a primary rack cabinet that is adjacent to an expansion rack in a suite.
2. Remove the front and rear doors (see "Doors" on page 59) from all rack cabinets.
3. On the outside of two adjacent rack cabinets, 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.

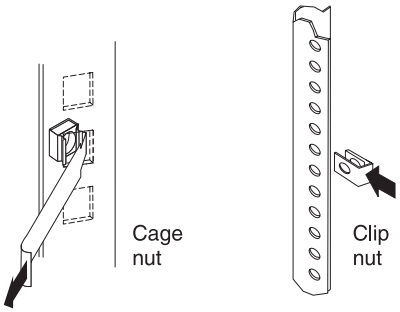
5. Snap the trim pieces into place between the adjacent rack cabinets. Install one trim piece in the front and one in the rear.
6. Repeat step 3 through step 5 for all other adjacent rack cabinets in the suite.
7. On the outside of the outermost expansion rack cabinets in the suite, install the side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

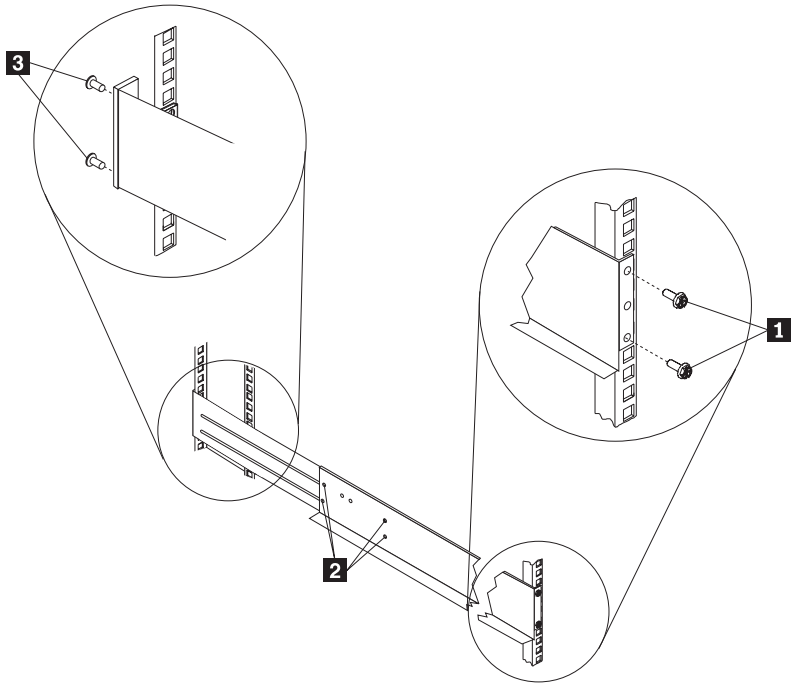


Note: Use clip nuts if your rack has circular holes. If your rack has square holes, you can use the rack-insertion tool or a flat-blade screwdriver to install cage nuts.

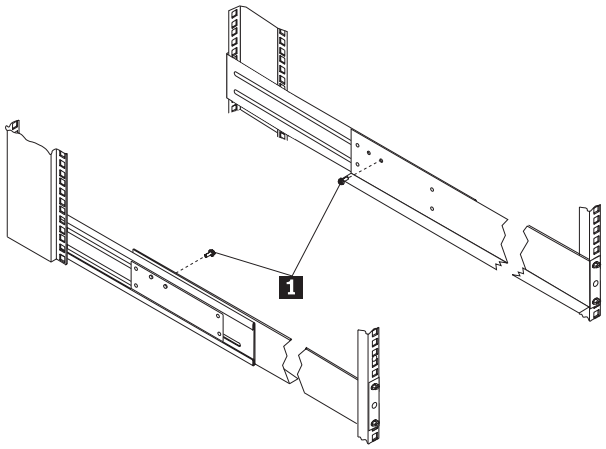


2. On the rail marked *R*, loosen the four screws **2** .
3. Hold the rail against the outside of the right rack-mounting flange, and loosely insert the two front M6 screws **1** .
4. Extend the rail outside of the rear rack-mounting flange; then, install and tighten two rear M6 screws **3** .
5. Tighten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



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

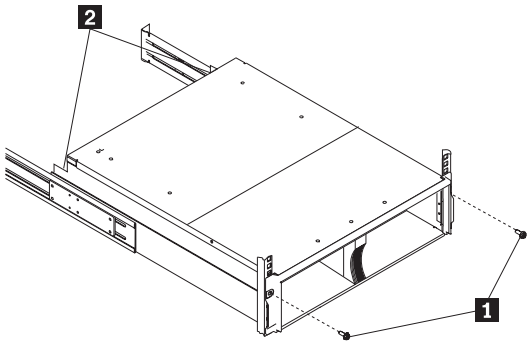


Statement 5

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

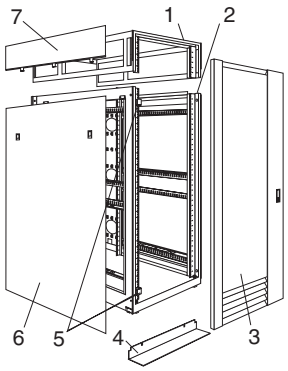
CAUTION:
Use safe practices when lifting.

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



8. Tighten the rear screws 2.

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
	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

Rack Enclosure (Type 9308 Model 42P, 42X, 4SA, 4SB, 42S, 42E) Options	FRU
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, non-locking)	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 II (Option) T540 - 9511 - AG4(15″ Analog Monitor, Stealth Black), 9511 - AW4 (15″ Analog Monitor, White) T54A- 9511 - AG1(15″ Analog Monitor, Stealth Black), 9511 - AW1 (15″ Analog Monitor, White) T55A-9513 -AG1(15″ Analog Monitor, Stealth Black), 9513 - AW1 (15″ Analog Monitor, White)	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

NetBAY3 enclosure

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.

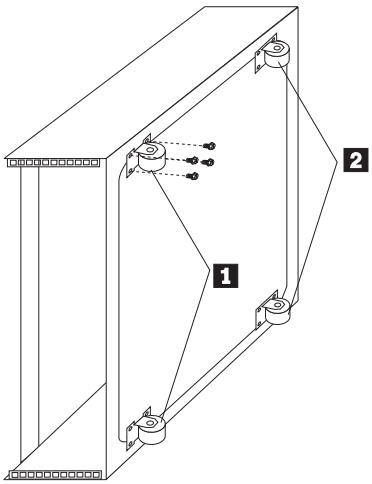
Locations

The following sections contain information on specific equipment locations.

Important:

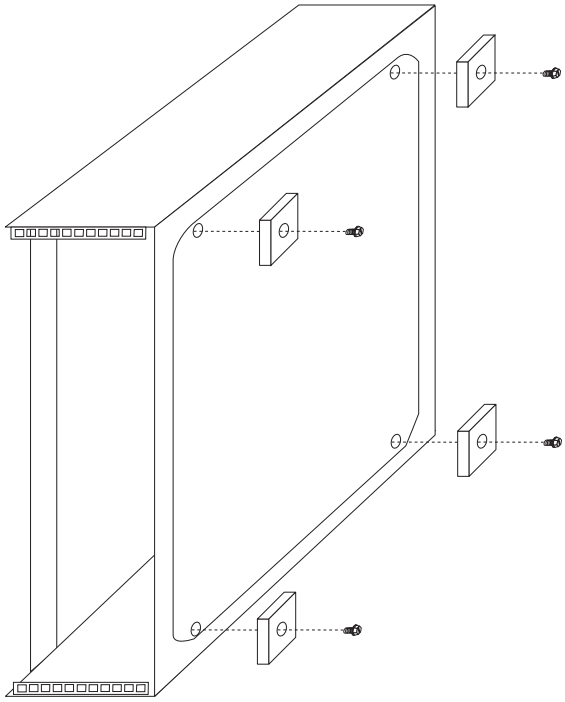
- The maximum server weight is 77 kg (170 lb.).
- Refer to the latest IBM Server Hardware Maintenance Manual when servicing the server.
- Assure all power and signal cables are routed properly and are not pinched.
- Make sure NetBAY3 enclosures in a stack are securely fastened together.
- Servers are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

Casters

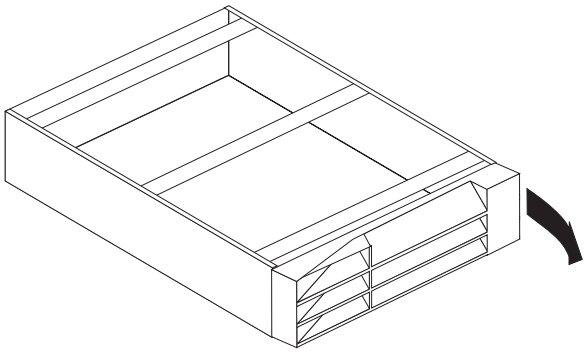


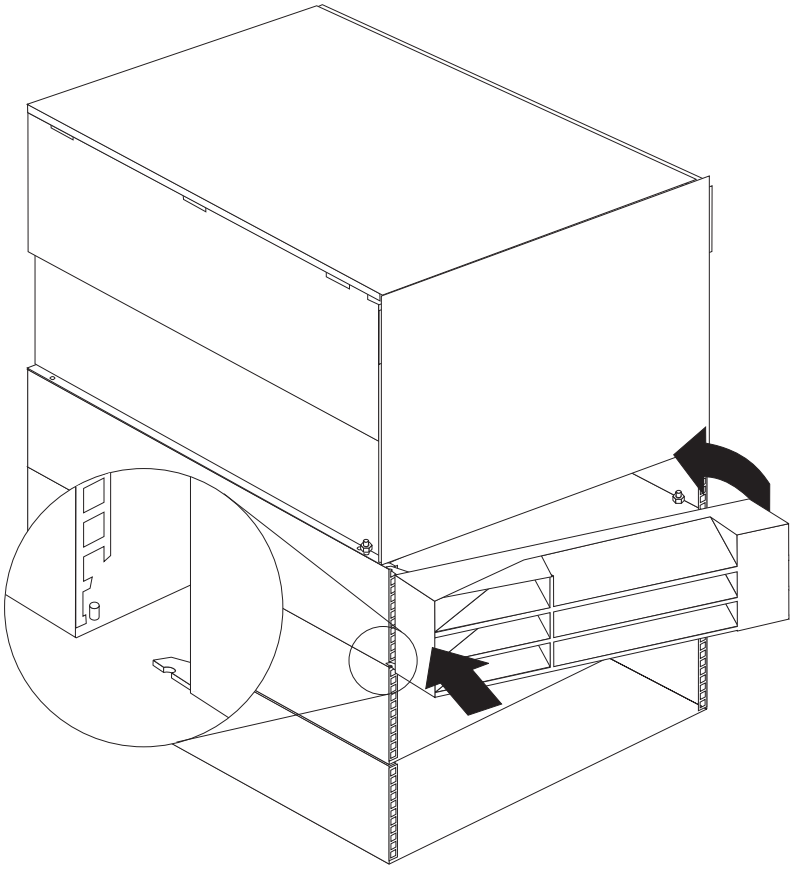
- Two fixed casters **1** at the front of the NetBAY3 enclosure.
- Two swivel casters **2** at the rear of the NetBAY3 enclosure.

Foot pads



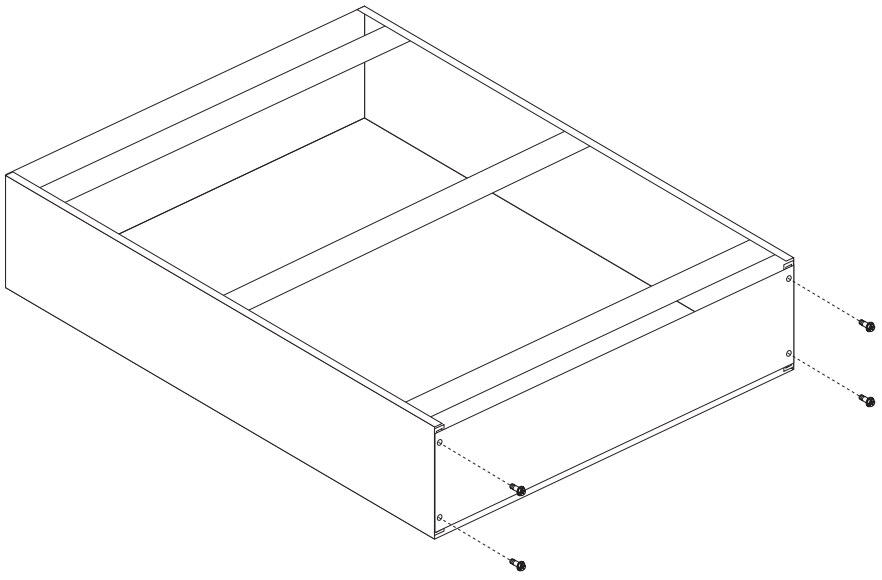
Front cover



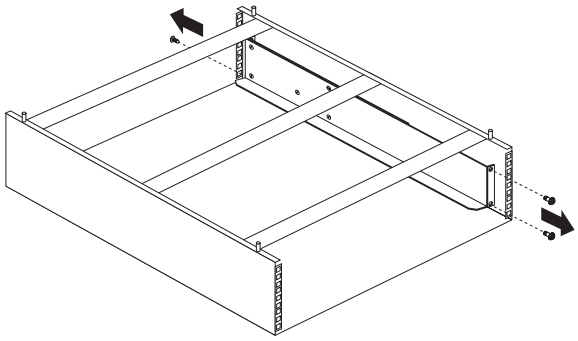


Rear panel

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

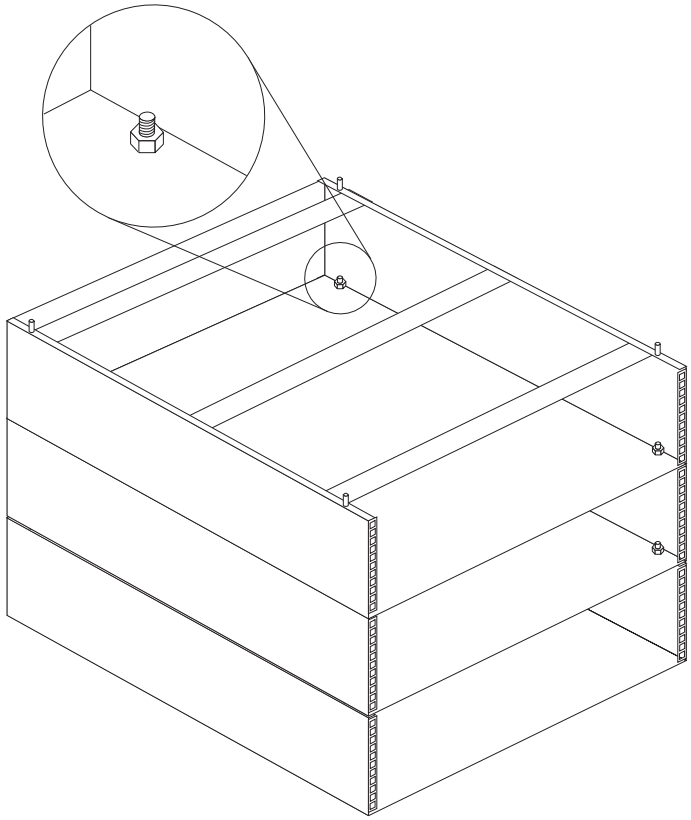


Device side rails

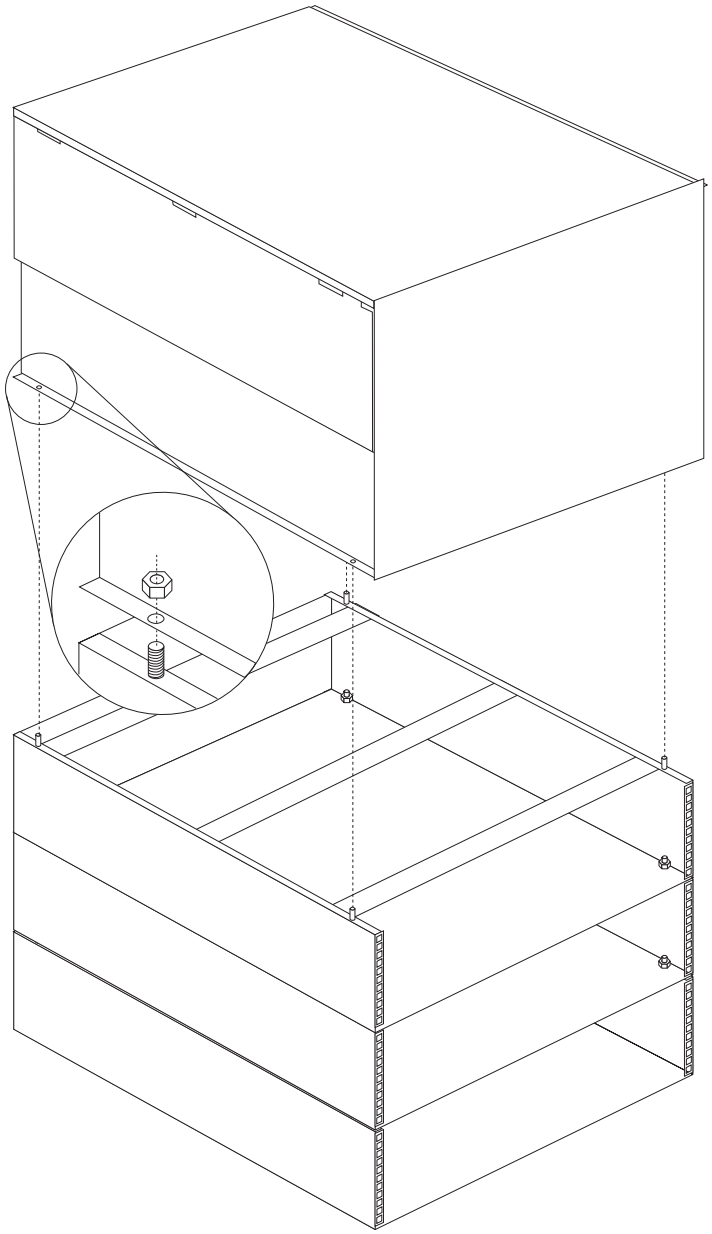


Stacking NetBAY3 enclosures

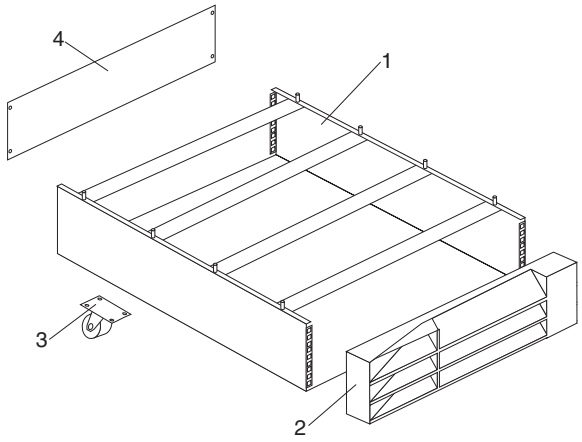
Note: Make sure NetBAY3 enclosures in a stack are securely fastened together.



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



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

NetBAY3E enclosure

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.

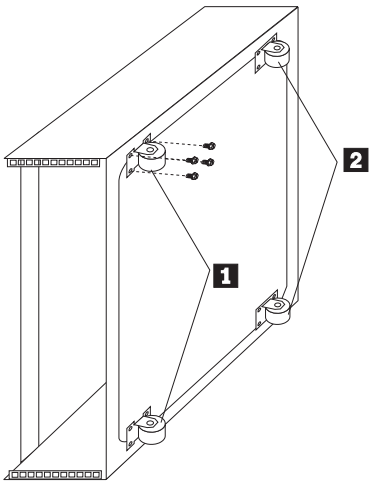
Important:

- 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.

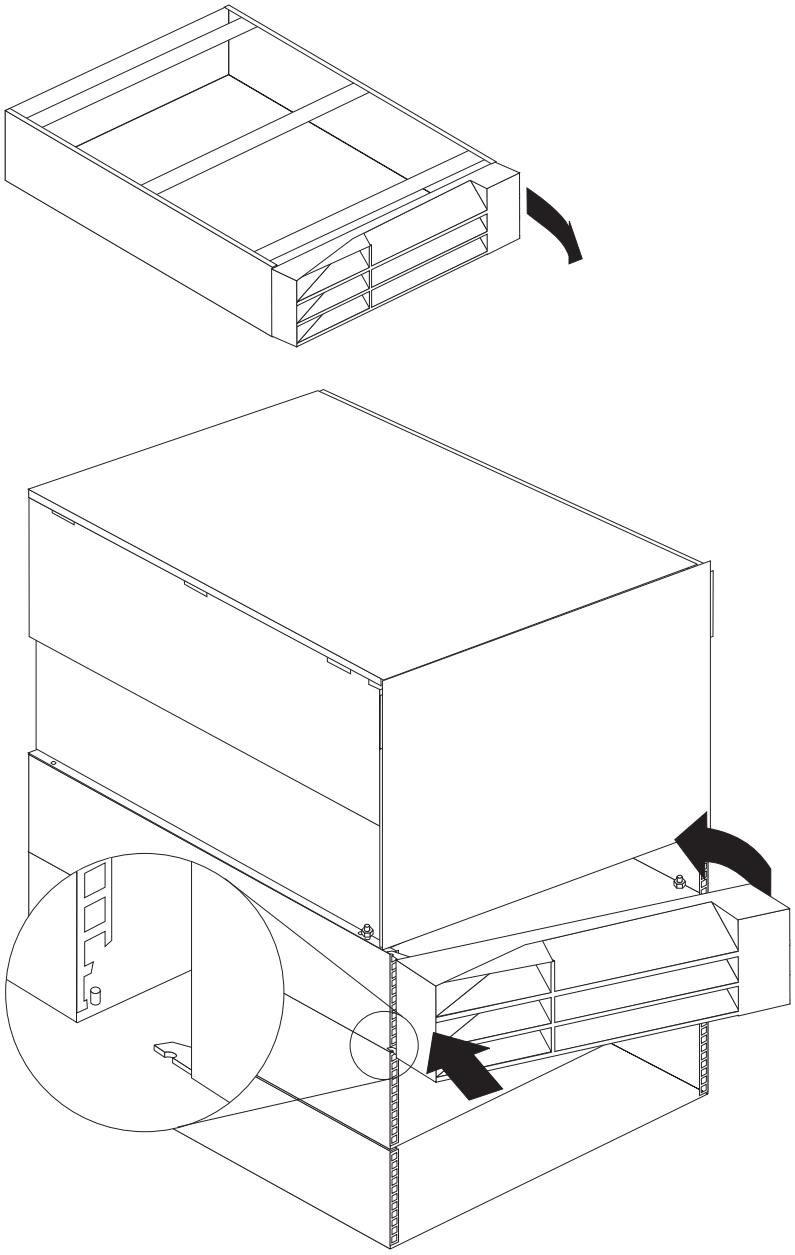
Casters



- Two fixed casters **1** at the front of the NetBAY3E enclosure.

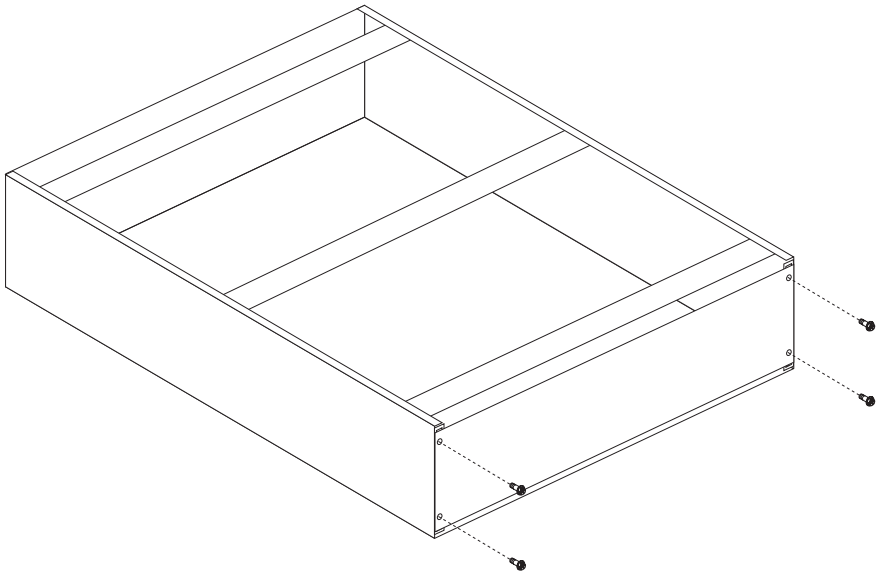
- Two swivel casters **2** at the rear of the NetBAY3E enclosure.

Front cover

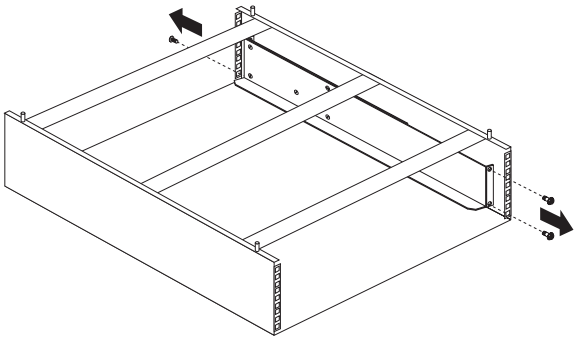


Rear panel

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



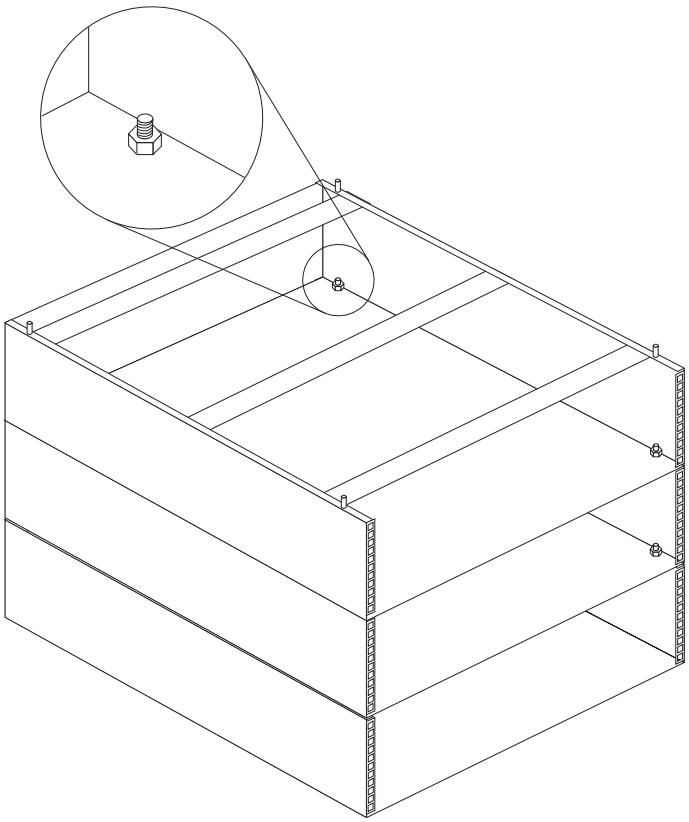
Device side rails



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:

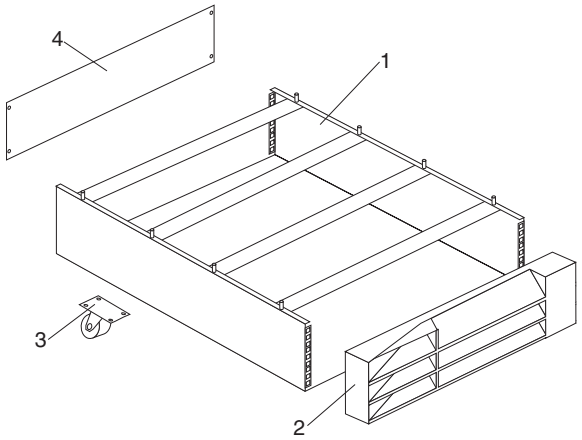
- Always lock the casters with the caster stabilizer bar before removing or installing any devices in or on the enclosure.
- Always use the caster stabilizer when multiple NetBAY3E enclosures are stacked under a server.

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)	

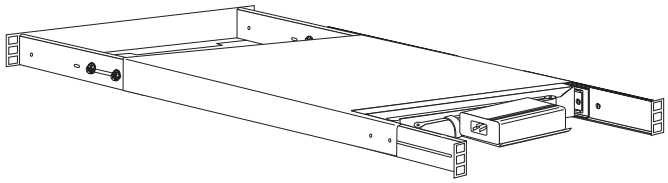
1U Flat Panel Monitor Console Kit

The IBM® NetBAY™ Flat Panel Monitor Console Kit is a flat panel monitor and keyboard tray in one solution. An optional space-saver keyboard fits inside the front of the keyboard tray. The monitor and keyboard tray occupy only 1U of rack mounting space inside of a rack cabinet. You can also install a console switch behind the tray to attach more than one server to the flat panel monitor and keyboard.

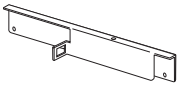
Note: There is no room to store a mouse in the keyboard tray. A mouse is not required, because the space-saver keyboard has a built-in pointing device.

The Flat Panel Monitor Console Kit comes with the following items:

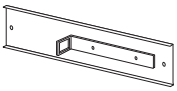
- One keyboard tray with built-in flat panel monitor



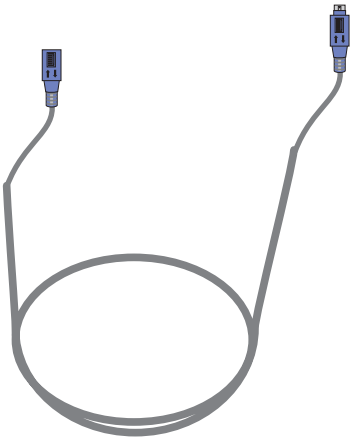
- One left-side console switch mounting bracket



- One right-side console switch mounting bracket



- Two keyboard or mouse extension cable

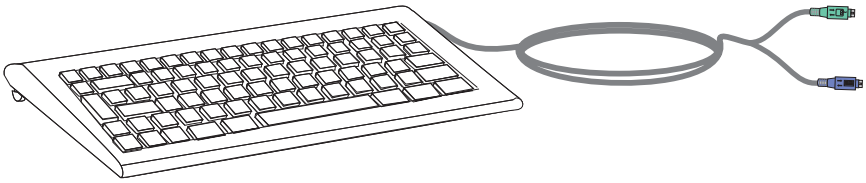


- One 2.8 m (9 ft.) power cord

- One 2.4 m (8 ft.) IEC connector power cable

- Miscellaneous hardware kit (for attaching console switch brackets and installing the keyboard tray in a rack cabinet)
- Two self-adhesive hook-and-loop-fastener strips
- Cable straps
- One CD containing monitor drivers
- Monitor documentation
- *IBM NetBAY Rack Safety Information* book
- This documentation

Note: Some kits come with an optional space-saver keyboard, keyboard documentation and CD containing keyboard and mouse drivers.



You will need the following tools to install the Flat Panel Monitor Console Kit:

- One utility knife or scissors
- One number 2 Phillips screwdriver

Refer to the documentation that comes with your rack cabinet or console switch for further information about those products.

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

Installing the Flat Panel Monitor Console Kit

The Flat Panel Monitor Console Kit occupies 1U of rack mounting space in a rack cabinet. You can install an optional console switch, using the brackets that come with this kit, in the same 1U of rack mounting space.

Attention: The Flat Panel Monitor Console Kit comes already assembled. You must have at least 3U of rack mounting space available in your rack cabinet to install the kit. After you install the Flat Panel Monitor Console kit, you can install other devices in your rack cabinet above or below the kit.

Installing the flat panel monitor and keyboard tray

Two people are required to install the flat panel monitor and keyboard tray. Use the following procedure to install the kit in a rack cabinet:

Statement 4:

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.**

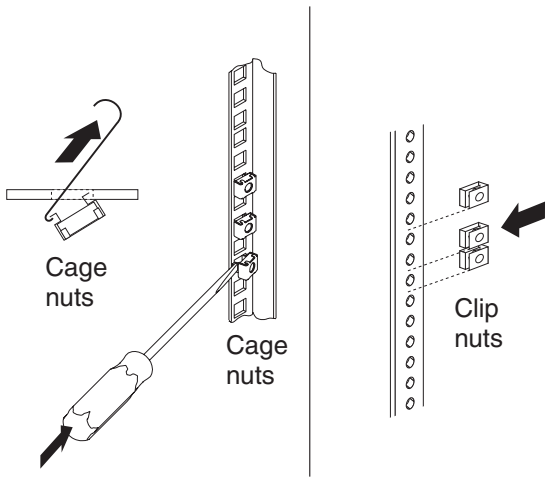
To Connect:	To Disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.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

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

   Notes:

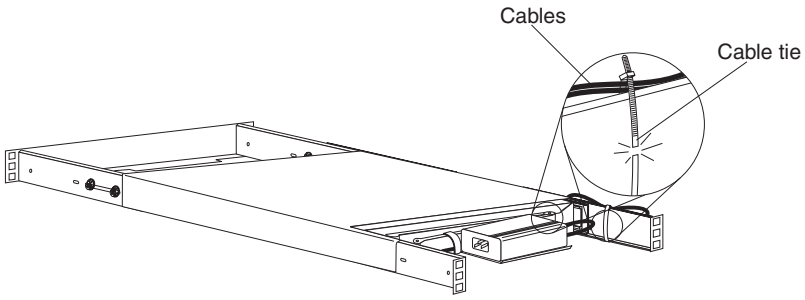
   a. Removing rack doors and side panels might make installation easier.

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

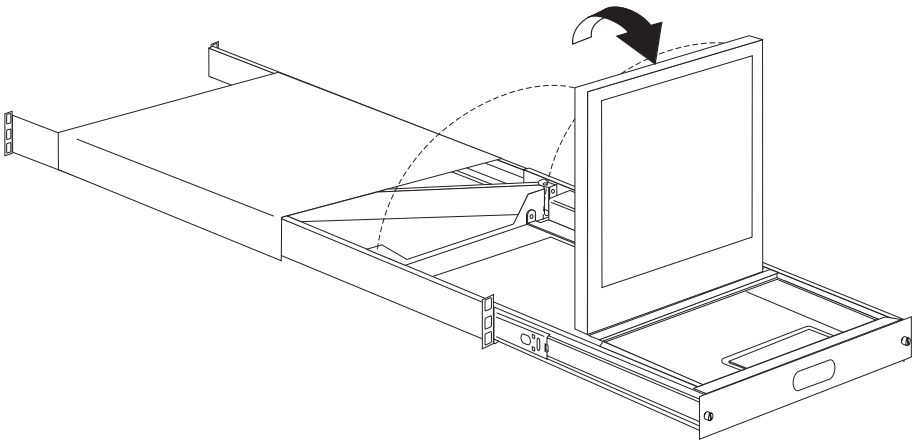


2. Place the tray on a stable flat surface; then, carefully cut the cable straps on the cable-management arm and slide rail to release the bundled cables. Move the power cords out of the way, but keep them nearby for later in the installation procedure.

   Attention: The video cable is already connected to the flat panel monitor. Be careful as you install the tray in the rack cabinet that you do not pinch or cut the video cable.

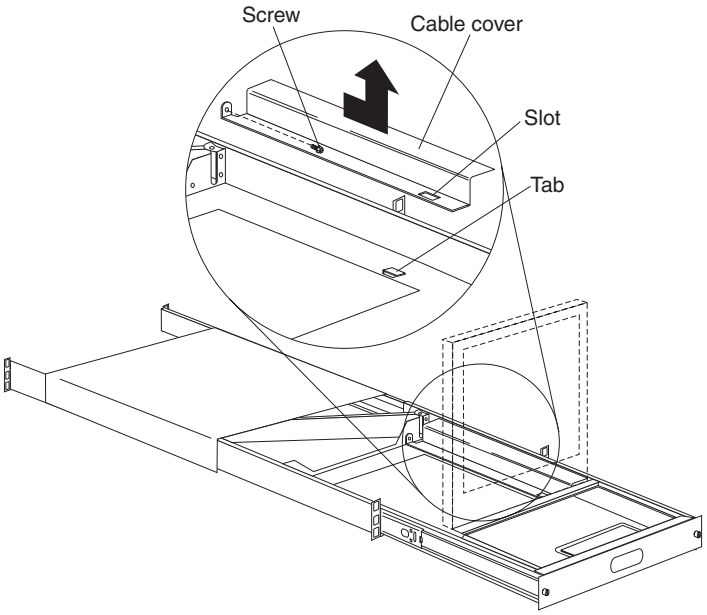


3. Fully extend the tray; then, carefully lift the rear of the flat panel monitor and raise the monitor to the full upright position.

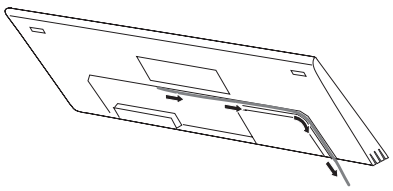


4. To remove the cable cover from the tray, remove the cable-cover screw; then, slide the cover toward the front of the tray until the tab on the tray can fit through the slot on the cover. Lift the cable cover from the tray and set it

aside to install later in this procedure.

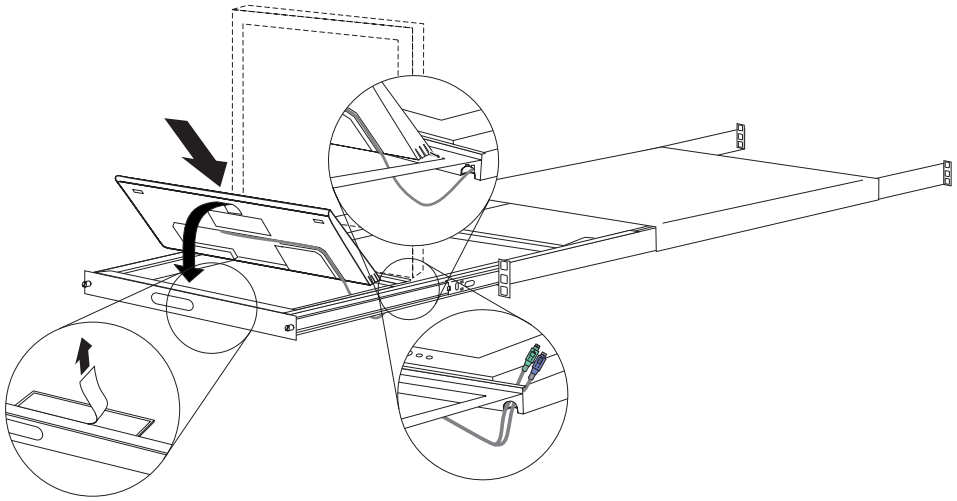


5. Ensure that the keyboard and mouse cable is routed through the slots on the bottom of the keyboard.



6. Peel the protective strip from the hook-and-loop fastener strip inside the keyboard storage area; then, route the keyboard and mouse connectors through the small round opening on the right side of the tray.

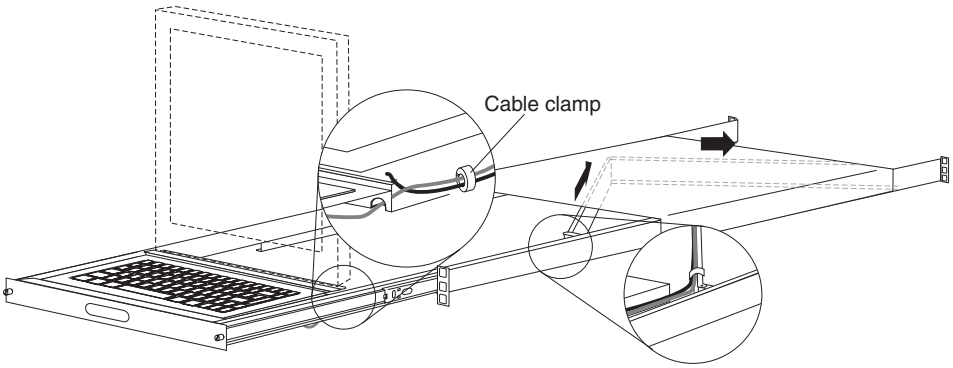
   Note: Pull the full length of the cable through the opening.



7. To install the keyboard in the tray, align the top slot on the rear of the keyboard with the back edge of the large rectangular opening in the front of the tray; then, carefully rotate the front of the keyboard down and into the tray.

   Note: When the keyboard is installed correctly, it will sit flat inside of the tray and not extend above or below the 1U height of the tray.

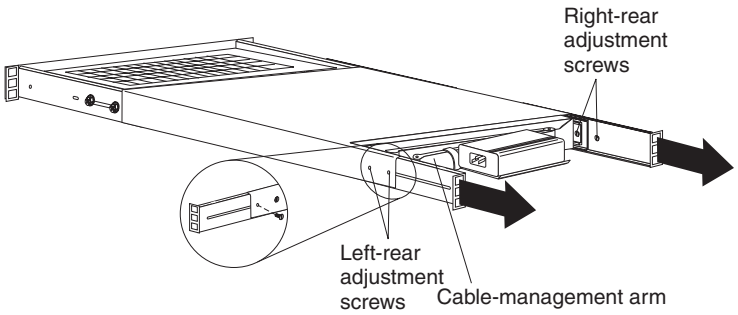
8. Route the keyboard and mouse cable beside the video cable and towards the cable-management arm. Route both cables through the cable clamp.



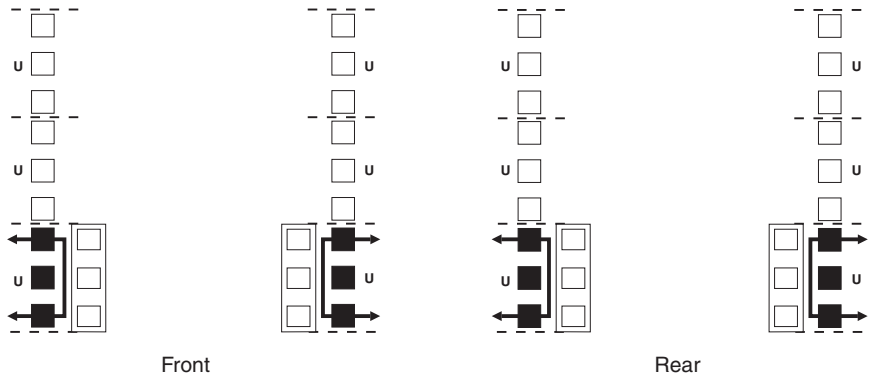
9. Secure the keyboard and mouse cable to the cable-management arm using the existing cable straps; then, install the cable cover that you removed earlier.
10. Carefully push the flat panel monitor down to the storage position; then, slide the tray halfway inward.

11. Loosen the four rail-adjustment screws on both rear slide-rail brackets; then, extend the brackets to their maximum outward adjustment.

    Note: You must remove the screw that attaches the cable-management arm to the left-rear bracket in order to adjust the left slide rail.

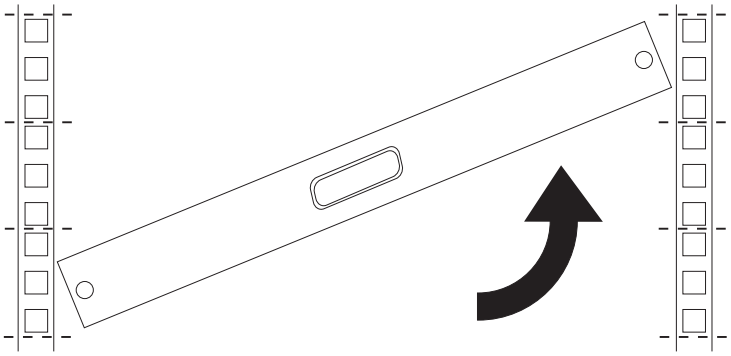


12. Use the following illustration to guide you as you install either cage nuts or clip nuts for the 1U location that you chose to install your flat panel monitor and keyboard tray. Use the cage nuts or clip nuts from the miscellaneous hardware kit.



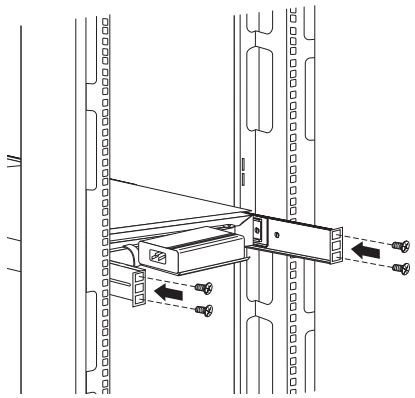
13. Slide the tray all the way inward; then, with one person at the front of the rack cabinet, and one person at the rear of the rack cabinet, carefully tilt the flat panel monitor and keyboard tray at an angle and slide it into the rack cabinet.

    Note: Ensure that the rear slide-rail brackets extend outside of the rear rack cabinet mounting flanges, and the front slide-rail brackets are outside of the front rack cabinet mounting flanges.

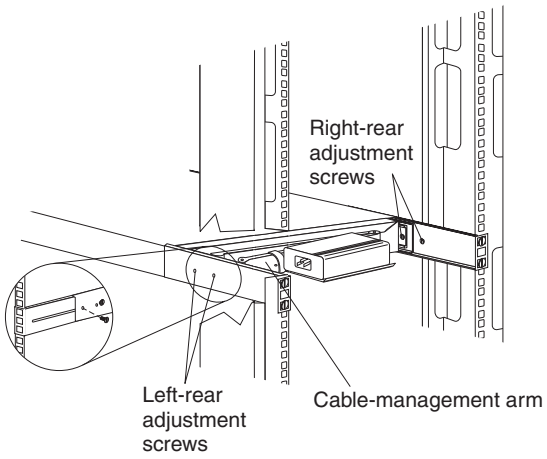


14. Adjust the rear slide-rail brackets to fit the depth of your rack cabinet; then, attach the brackets to the rack cabinet using four screws from the miscellaneous hardware kit.

    Note: Do not install screws in the slide-rail middle holes. These holes are for the optional console switch mounting bracket.

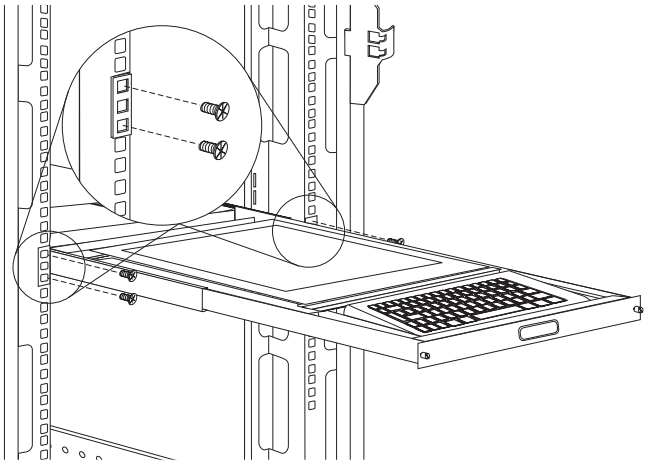


15. Install the screw that attaches the cable-management arm to the left slide-rail bracket; then, tighten all four slide-rail-adjustment screws.



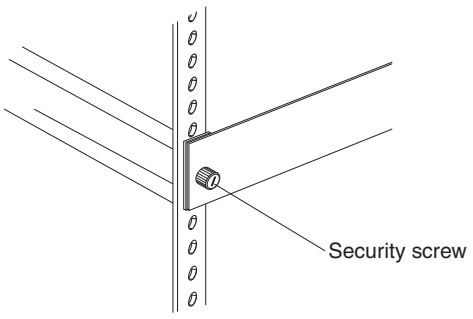
16. To attach the front of the tray to the rack cabinet, pull the tray halfway out of the rack cabinet so that you can access the front of the rails; then, use four of the screws from the miscellaneous hardware kit to secure the slide-rail brackets to the rack cabinet.

    Note: Do not install screws in the slide-rail middle holes. These holes are for the security screws on the front of the tray.



17. Connect the keyboard and mouse connectors to the extension cables that come with this kit; then, connect a power cord to the power supply.
18. Connect the keyboard, video, and mouse connectors to either a server or a console switch in your rack cabinet; then, connect the power cord to a properly grounded electrical outlet. Neatly route cables within your rack cabinet and secure them with cables straps along the way.
19. Refer to the flat panel monitor documentation that comes with this kit for information about operating your monitor. Refer to the space-saver keyboard documentation for information about operating your keyboard.

Note: When the monitor and keyboard are not in use, or if your rack cabinet is in a vibration-prone area, tighten the security screws on the front of the tray to secure the tray inside the rack cabinet.



If you are installing an optional console switch continue to “Installing an optional console switch” on page 92.

Installing an optional console switch

You can use a console switch to attach more than one server to a single monitor and space-saver keyboard. The console switch option is available separately, but custom mounting brackets come with this kit. You can use the brackets and instructions that come with the console switch for other installation options.

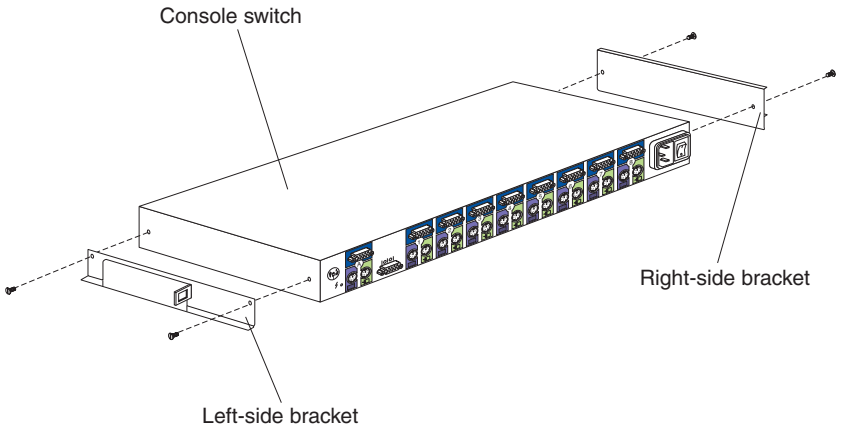
Installing the console switch behind the Flat Panel Monitor Console Kit is an alternative that allows you to store the console switch in the same 1U space as the flat panel monitor and keyboard tray. You must use the brackets that come with this kit to install the console switch behind the tray.

Attention: The console switch will extend beyond the rear rack mounting flanges when you install the switch behind the tray. You must have a NetBAY25, NetBAY42, NetBAY42 Enterprise, NetBAY22 with Rack Extension Kit, Netfinity® 9306 Model 900 with Rack Extension Kit, or similar rack cabinet.

Use the following procedure to install a console switch behind the tray:

1. Attach the left-side bracket to the left side of the console switch using two 8-32 screws; then, attach the right-side bracket to the right side of the console switch. Ensure that the brackets are installed as shown in the following illustration.

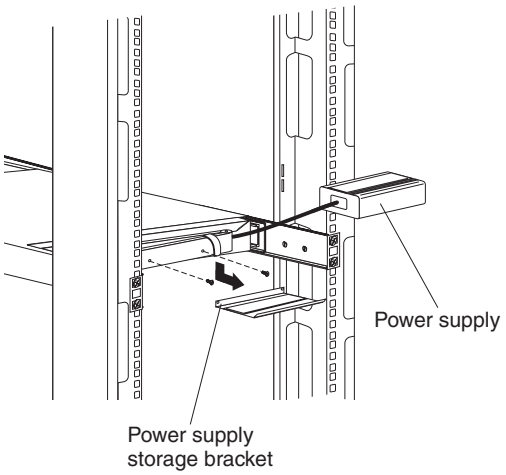
   Note: The left-side bracket has a channel for you to route the keyboard, video, and mouse cables. Ensure that you attach the brackets to the console switch so that the channel on the left-side bracket faces upward.



2. Lift the power supply from the power supply storage bracket; then, use one of the self-adhesive hook-and-loop fastener strips to attach the power supply to your rack cabinet.

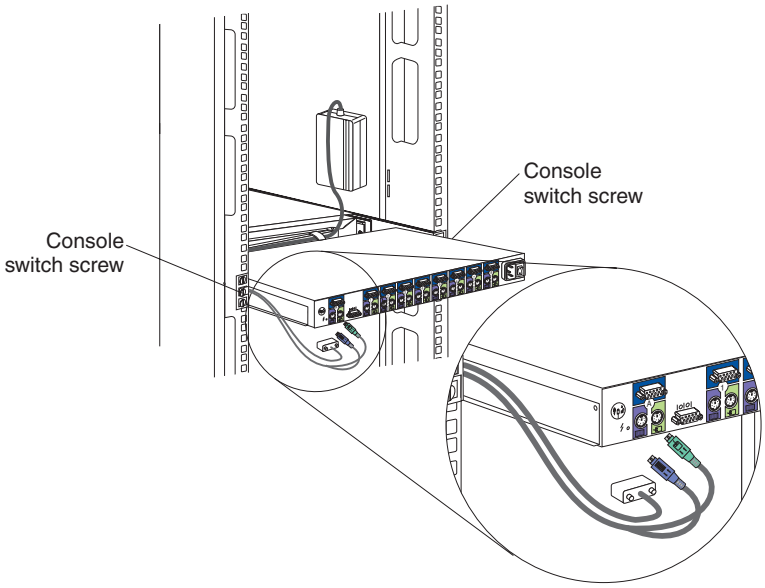
   Note: The power supply cable is already connected to the flat panel monitor and routed through the cable-management arm. There is extra cable so

that you can move the power supply over a short distance.



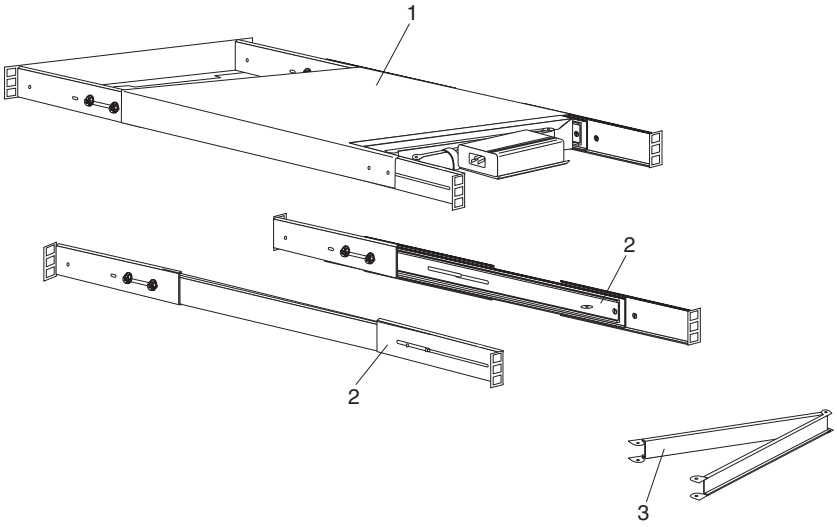
3. To remove the power supply storage bracket from the cable-management arm, remove the two screws and pull the bracket away from the arm. Store the parts in a safe place for possible future use.

4. Install the console switch behind the flat panel monitor and keyboard tray using two screws from the miscellaneous hardware kit.



5. Route the keyboard, video, and mouse cables through the slot in the left-side bracket on the console switch; then, connect the keyboard, video, and mouse connectors to the console switch.
6. Refer to the documentation that comes with your console switch for information about connecting your flat panel monitor, space-saver keyboard, and servers to the console switch.

Parts listing (Type 9306 Model OPT)



Index	Rack Enclosure (Type 9306 Model OPT)	FRU
1	1U Rack Mount Monitor without Keyboard (Optional)	32P1098
2	Slides, with Mounting Bracket (Optional)	32P1099
3	Cable Management Bracket (Optional)	32P1601

Installing Optional Devices

There are many servers and optional devices that you can install in your NetBAY25 or NetBAY42 Rack cabinet. Always read the documentation that comes with your server or optional device for detailed installation instructions.

Note: You can install many optional devices using the general instructions provided in this chapter. All illustrations in this chapter are of NetBAY42 Rack cabinets, but the same procedures apply to NetBAY25 Rack cabinets. Some devices might require more detailed information contained in the documentation that comes with the optional device.

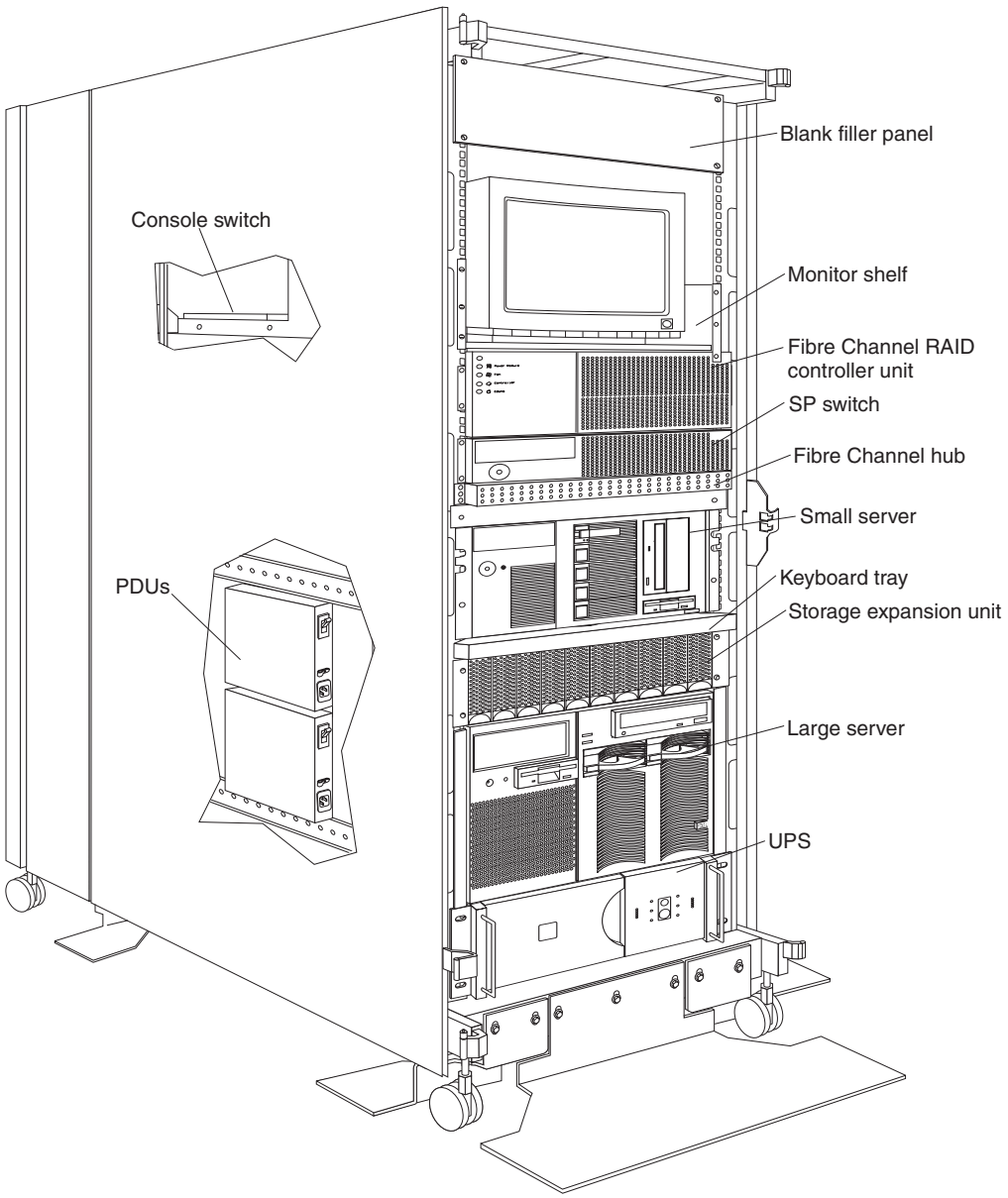


Figure 25. Installing optional devices in the NetBAY42 Rack cabinet

Installing devices on the rack cabinet mounting flanges

When you install optional devices in the rack cabinet, secure the device on rack mounting flanges. Some devices come with threaded rails or threaded bars for the rails. Other devices require that you use cage nuts to install the device in your rack cabinet.

When you install optional devices in the rack cabinet, use the following standards:

Statement 2:

DANGER

- **Always lower the leveling pads on the rack cabinet.**
- **Always install stabilizer brackets on the rack cabinet.**
- **Always install servers and optional devices starting from the bottom of the rack cabinet.**
- **Always install the heaviest devices in the bottom of the rack cabinet.**

Statement 3:

DANGER

- **Do not extend more than one sliding device at a time.**
- **The maximum allowable weight for devices on slide rails is 80 kg (176 lb). Do not install sliding devices that exceed this weight.**

Statement 4:

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:

≥ 18 kg (39.7 lb)

≥ 32 kg (70.5 lb)

≥ 55 kg (121.2 lb)

CAUTION:
Use safe practices when lifting.

Statement 6:

CAUTION:
Do not place any object on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf.

Installing threaded rails or bars

You must install devices that have threaded holes or devices rails that have threaded holes on the inside of the rack mounting flanges. You can, however, install devices or device rails that come with threaded bars on the inside or the outside of the rack mounting flanges. See the device documentation for detailed information on how to use threaded rails or bars.

Installing cage nuts

You must use cage nuts for all optional devices that do not have threaded holes. Cage nuts install on the inside of the rack mounting flanges with either the cage-nut-insertion tool or a flat-blade screwdriver. The cage-nut-insertion tool comes with the rack cabinet and some optional devices.

Note: The rack cabinet comes with a supply of cage nuts that you can use to install optional devices. Most devices that require them will come with cage nuts.

Some devices might require that you install clip nuts on the rail instead of cage nuts on the rack mounting flanges. See the device documentation for information on when you must install the clip nuts.

Using the cage-nut-insertion tool

Use the following procedure to install a cage nut with the cage-nut-insertion tool:

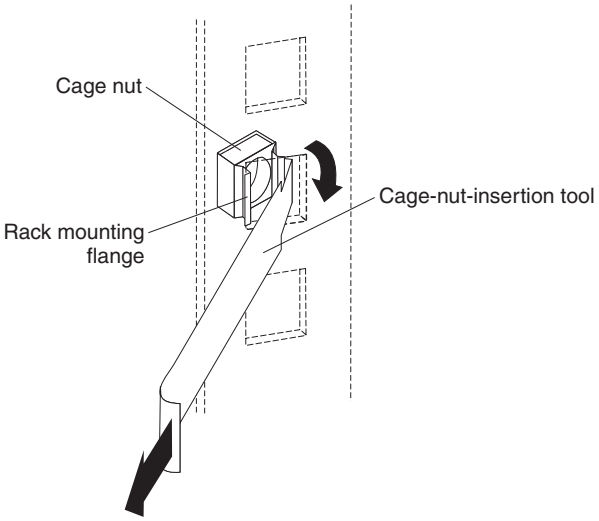


Figure 26. Installing cage nuts with the cage-nut-insertion tool

1. Determine the hole in which you want to install the cage nut.
2. From the inside of the rack mounting flange, insert one edge of the cage nut into the hole.
3. Push the tool through the hole and hook the other edge of the cage nut.
4. Pull the tool and the cage nut back through the hole to complete the installation of the cage nut.

Using a flat-blade screwdriver

Use the following procedure to install a cage nut with a flat-blade screwdriver:

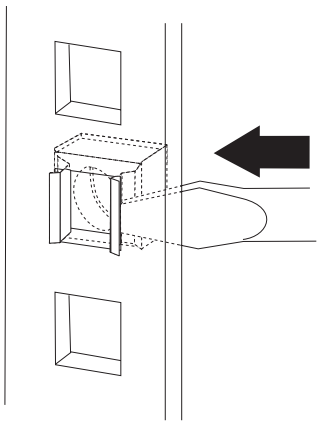
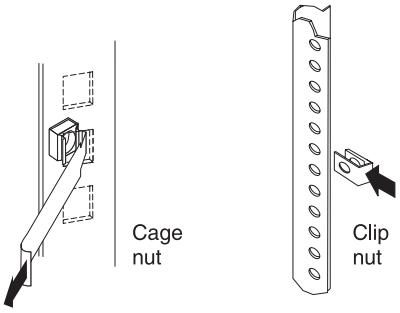


Figure 27. Installing cage nuts with a flat-blade screwdriver

1. Determine the hole in which you want to install the cage nut.
2. Hold the cage nut in one hand and compress the cage nut clip with a flat-blade screwdriver.
3. With the clip compressed, push the edge of the cage nut fully into the hole from the inside of the rack mounting flange.
4. Release the screwdriver pressure on the clip to lock the cage nut into place.

Clip Nuts

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



Installing an uninterruptible power supply

The uninterruptible power supply (UPS) comes with standard rack mounting brackets installed and can occupy either 3U or 5U of space in your rack cabinet, depending upon the UPS model. Support rails also come with some UPS models. See the documentation that comes with the UPS for detailed installation instructions.

Attention: The batteries inside of the UPS are disconnected before packaging the UPS. In some UPS models, the batteries are also not installed. See the documentation that comes with your UPS for detailed instructions on how to install and connect the batteries before you turn on or install the UPS in your rack cabinet.

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

Statement 8:

DANGER

- **Plug power cords from devices in the rack cabinet into electrical outlets that are located near the rack cabinet and are easily accessible.**
- **Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet before servicing any device in the rack cabinet.**
- **Install an emergency-power-off switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in the same rack cabinet.**
- **Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.**

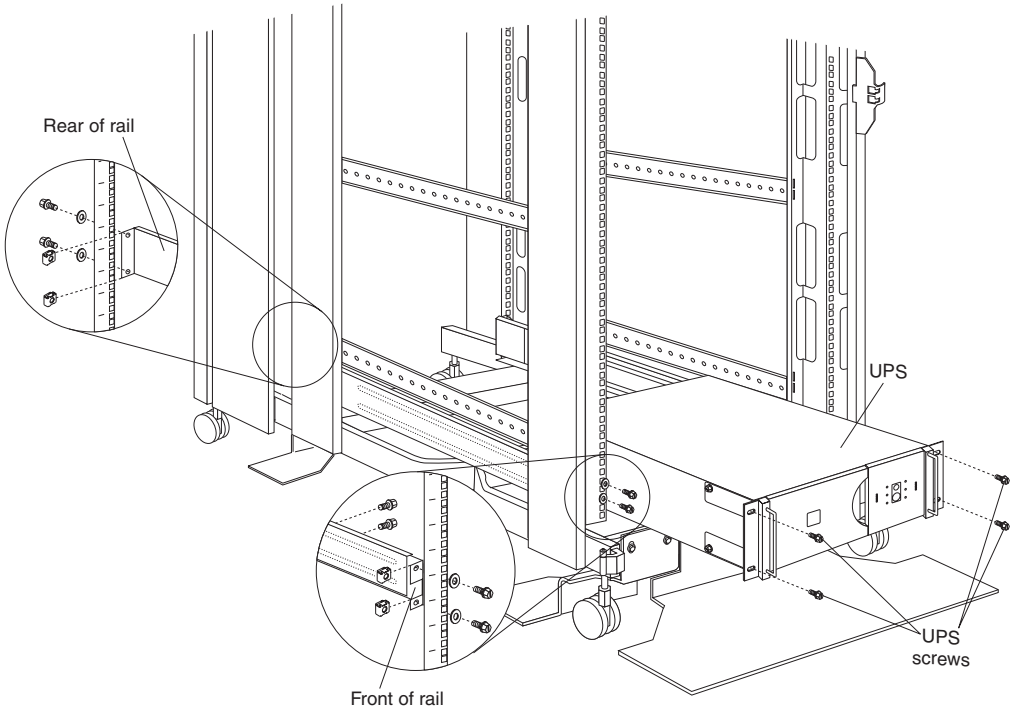


Figure 28. Installing a UPS

1. Use the template that comes with the UPS to determine where to install clip nuts that come with the UPS.
2. If you are installing rails, do the following:
   a. Adjust the length of the rails to fit the depth of the rack cabinet.
   b. Install clip nuts on the rail instead of the rack mounting flanges.
   c. Install the rails on each side of the rack cabinet, using the screws and washers that come with the UPS.
3. Slide the UPS into the bottom of your rack cabinet; then, attach the UPS to the rack mounting flanges using clip nuts and M6 screws.
4. See the UPS and other optional device documentation for information on how to connect cables.

Installing a power distribution unit

The power distribution unit (PDU) comes with mounting brackets so that you can install it vertically in the side of your rack cabinet, or horizontally in 1U of rack mounting space. When choosing an installation location, ensure that power cables from other devices can reach the PDU. See the documentation that comes with the PDU for detailed installation instructions.

Statement 8:

DANGER

- **Plug power cords from devices in the rack cabinet into electrical outlets that are located near the rack cabinet and are easily accessible.**
- **Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet before servicing any device in the rack cabinet.**
- **Install an emergency-power-off switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in the same rack cabinet.**
- **Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.**

Power Distribution Unit

Note: For information and installation instructions for the IBM NetBAY Rack Power Distribution Units, see "Installing Optional Devices" on page 97.

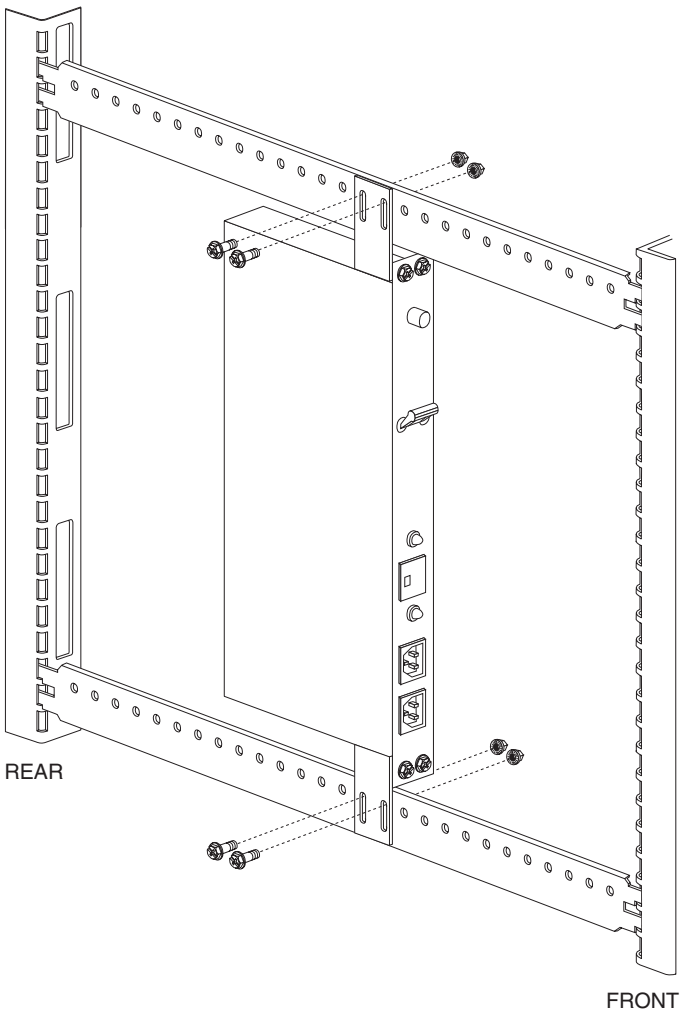


Figure 29. Power Distribution vertical installation

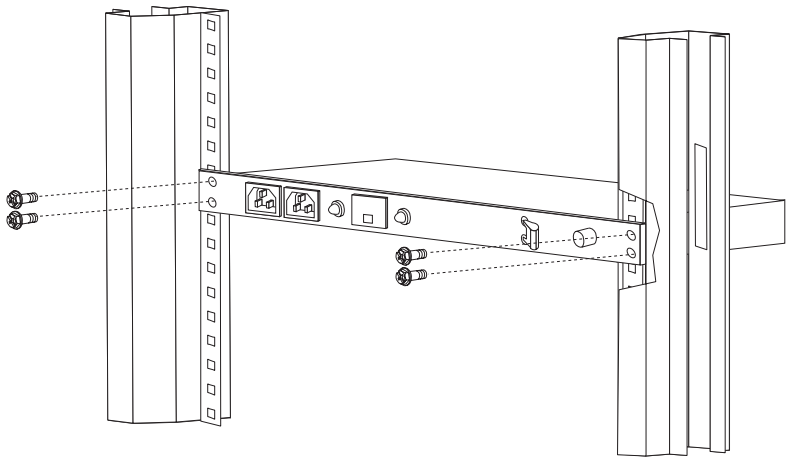


Figure 30. Power distribution horizontal installation

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

- High voltage
- Low voltage

Installing a PDU vertically

Use the following general procedure to install a PDU vertically in the side of your rack cabinet:

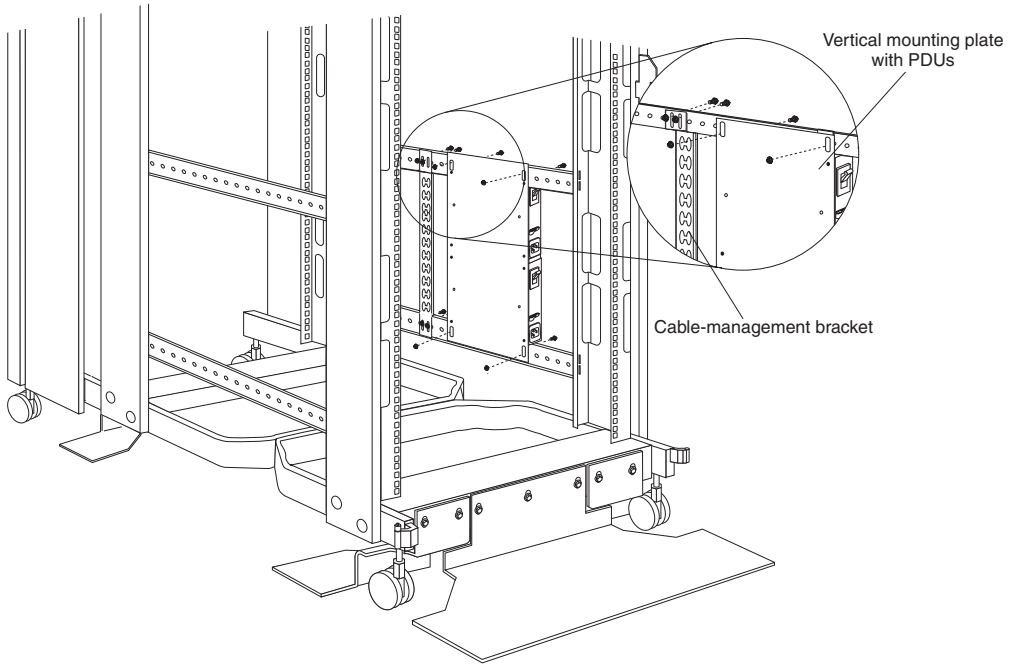


Figure 31. Installing a PDU vertically in a rack cabinet

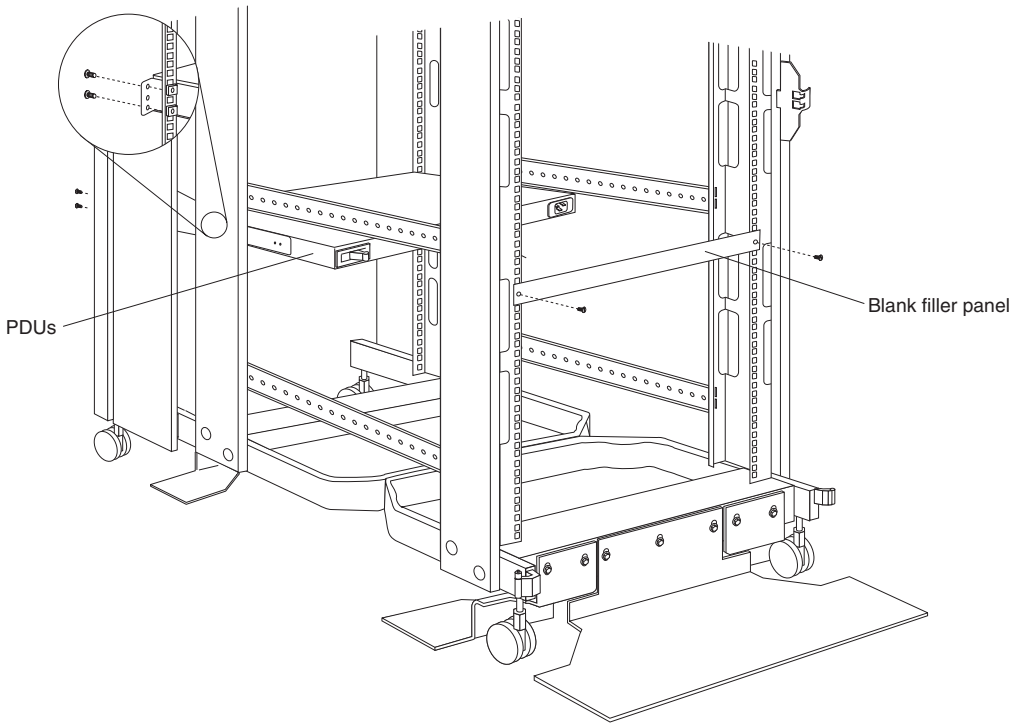
1. See the PDU documentation for detailed installation information.

   Note: If the PDU has a circuit breaker switch, verify that the switch is in the Off position before you install the PDU in your rack cabinet.

2. Attach PDUs to the vertical mounting plate that comes with the PDU.
3. Install the vertical mounting plate in the side of your rack cabinet with the M6 screws and nuts that come with the PDU.
4. If the PDU comes with a cable-management bracket, install the bracket beside the vertical mounting plate with the M6 screws that come with the PDU.
5. See the PDU documentation for information on how to connect cables.

Installing a PDU horizontally

Use the following general procedure to install a PDU horizontally in a rack cabinet:



1. See the PDU documentation for detailed installation information.

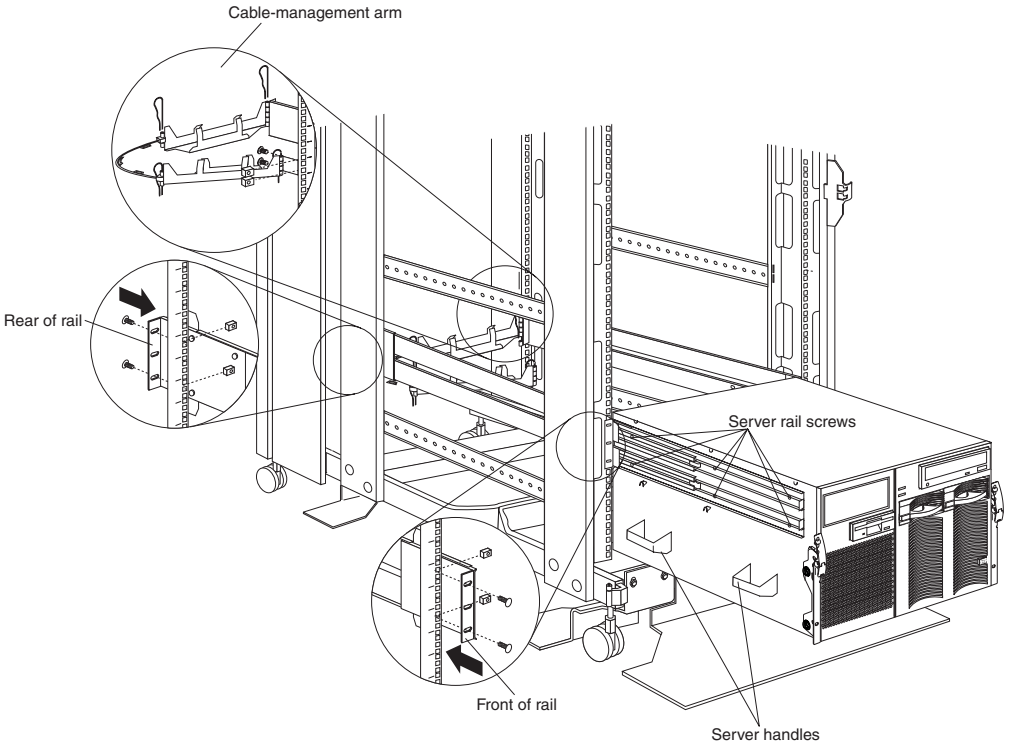
   Note: If the PDU has a circuit breaker switch, verify that the switch is in the Off position before you install the PDU in your rack cabinet.
2. Attach PDUs to the horizontal mounting brackets that come with the PDU.
3. Install the horizontal bracket and PDU assembly in your rack cabinet with the M6 screws and cage nuts that come with the PDU.
4. If the PDU comes with a blank filler panel, install the filler panel on the front of the rack cabinet with the M6 screws that come with the PDU.
5. See the PDU documentation for information on how to connect cables.

Installing a server

A small server can occupy up 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.

Installing a large server

Use the following general procedure to install a PDU horizontally in a rack cabinet:



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

   Note: If required, adjust the length of the rails to fit the depth of your rack cabinet.
4. Install the server handles; then, lift the server and place it on the extended 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 cables.

Installing a small server

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

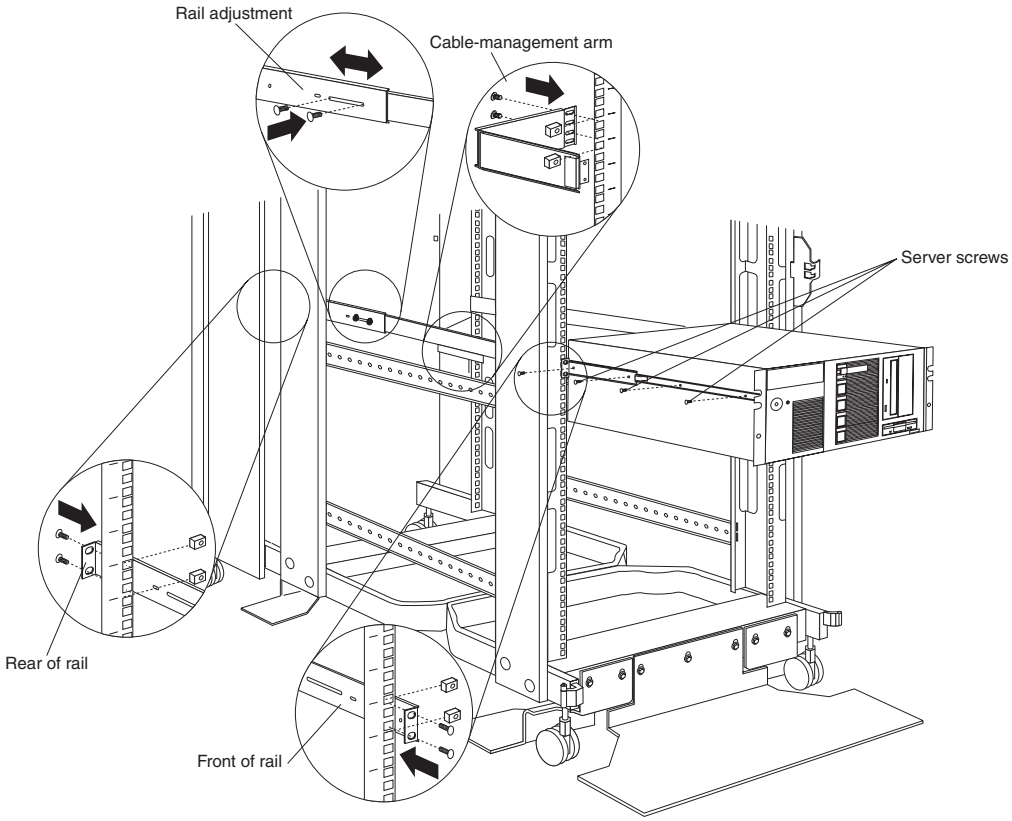


Figure 32. Installing a small server

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

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

Installing a storage expansion unit

Storage expansion units install on fixed rails in your rack cabinet and occupy 3U of rack mounting space. See the documentation that comes with your expansion unit for detailed installation instructions. Use the following general procedure to install a storage expansion unit in your rack cabinet:

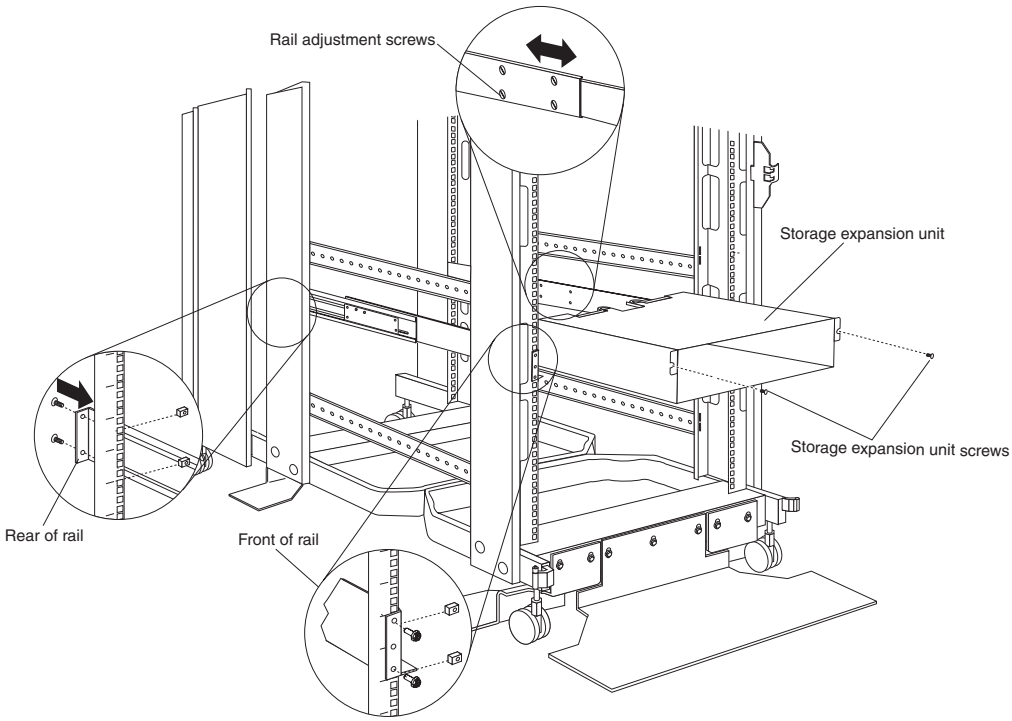


Figure 33. Installing a storage expansion unit

1. See the expansion unit documentation for detailed installation information.
2. Attach the rails to the front and rear of the rack cabinet, adjusting the length of the rails to fit the depth of your rack cabinet, if required.

   Note: You might need to install rails for some expansion units on the inside of the rack mounting flanges.
3. Slide the expansion unit onto the rails; then, attach the front of the expansion unit to the rack mounting flanges with cage nuts and M6 screws.

   Note: Some expansion units have a separate front bezel that you must install before attaching the front of the expansion unit to the rack cabinet.
4. Attach the rear of the expansion unit to the rails, using the screws that come with the expansion unit.
5. See your expansion unit documentation for information on how to connect cables.

Installing a Fibre Channel RAID controller unit

The Fibre Channel RAID controller unit installs on fixed rails in the rack cabinet and occupies 4U of rack mounting space. See the documentation that comes with your controller for detailed installation instructions. Use the following general procedure to install a Fibre Channel RAID controller unit in your rack cabinet:

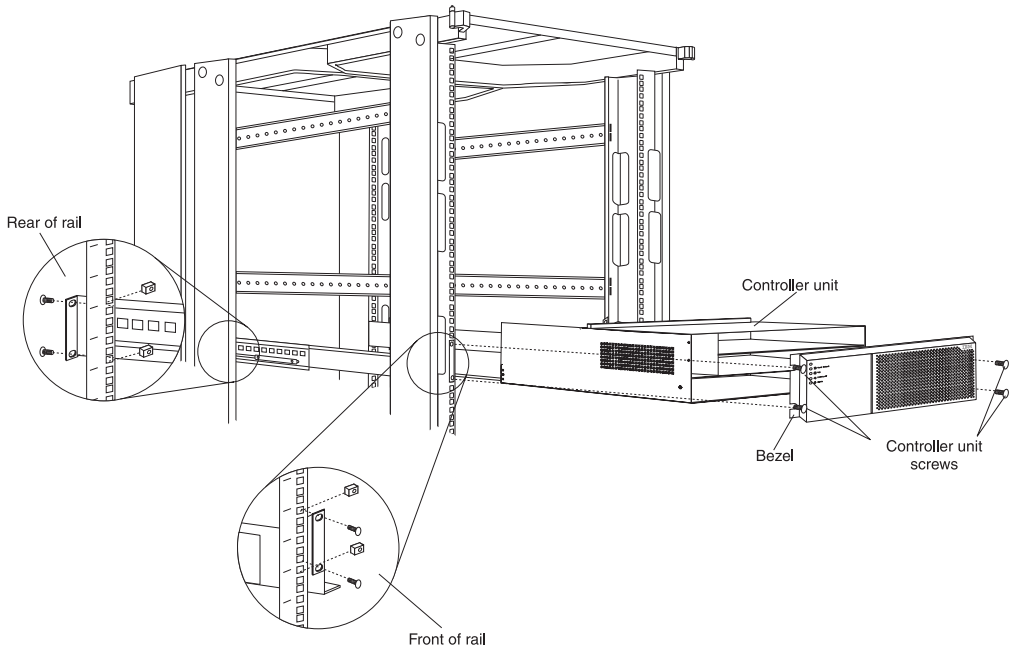


Figure 34. Installing a Fibre Channel RAID controller unit

1. See the controller unit documentation for detailed installation information.
2. Attach the rails to the front and rear of the rack cabinet, adjusting the length of the rails to fit the depth of your rack cabinet, if required.

   Note: You might need to install rails for some controller units on the inside of the rack mounting flanges.
3. Remove the front bezel from the controller unit.
4. Remove all drives, fans, and power supplies to reduce the weight of the controller unit; then, slide the empty controller unit onto the rails.
5. Attach the controller unit to the rack mounting flanges using cage nuts and M6 screws; then, reinstall the drives, fans, and power supplies.
6. Snap the front bezel back into place on the controller unit.
7. See the controller unit documentation for information on how to connect cables.

Installing a Fibre Channel hub

The Fibre Channel hub and fixed mounting tray occupies 1U of space in your rack cabinet. See the documentation that comes with your hub for detailed installation instructions. Use the following general procedure to install a Fibre Channel hub in your rack cabinet:

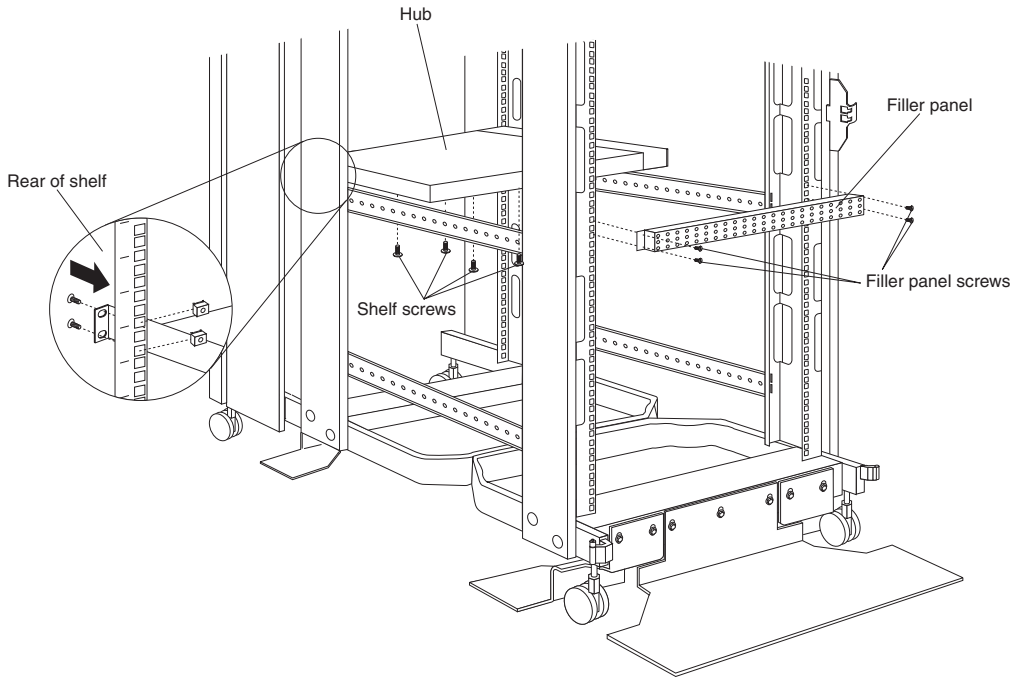


Figure 35. Installing a Fibre Channel hub

1. See the hub documentation for detailed installation information.
2. Attach the hub to its mounting tray with the four screws provided.
3. Install the tray and hub in the rear of the rack cabinet, using M6 screws and cage nuts that come with the hub.
4. Attach the filler panel to the front of the rack cabinet, using M6 screws and cage nuts that come with the hub.
5. See the hub documentation for information on how to connect cables.

Installing an SP switch

The SP™ switch installs on fixed rails in your rack cabinet and occupies 2U of rack mounting space. See the documentation that comes with the switch for detailed installation instructions. Use the following general procedure to install an SP switch in a rack cabinet:

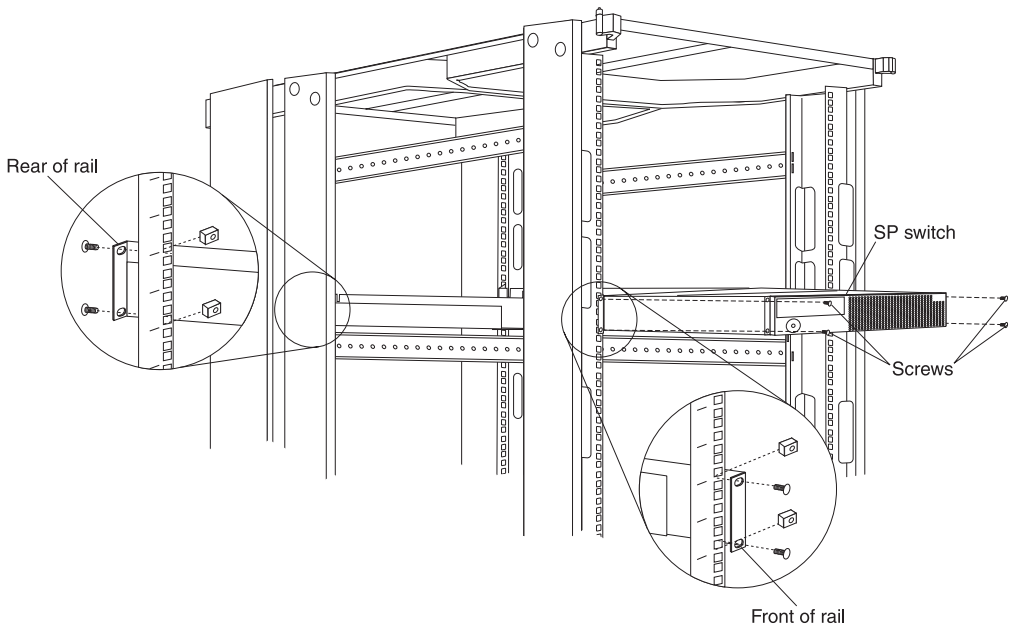


Figure 36. Installing an SP switch

1. See the switch documentation for detailed installation information.
2. Attach the rails to the front and rear of the rack, adjusting the length of the rails to fit the depth of your rack cabinet if required.
3. Slide the switch onto the rails and attach the switch to the rack mounting flanges, using the M6 screws and cage nuts that come with the switch.
4. See the switch documentation for information on how to connect cables.

Installing a fixed shelf

You can install a fixed shelf inside of your rack cabinet to hold some devices. A fixed shelf can support a device that weighs up to 45 kg (100 lb), and occupies only 1/2U of space in your rack cabinet.

Note: The actual amount of space you use in your rack cabinet depends on the height of the optional device that you put on the shelf, in addition to the space taken by the shelf itself.

Use the following general procedure to install a fixed shelf in your rack cabinet:

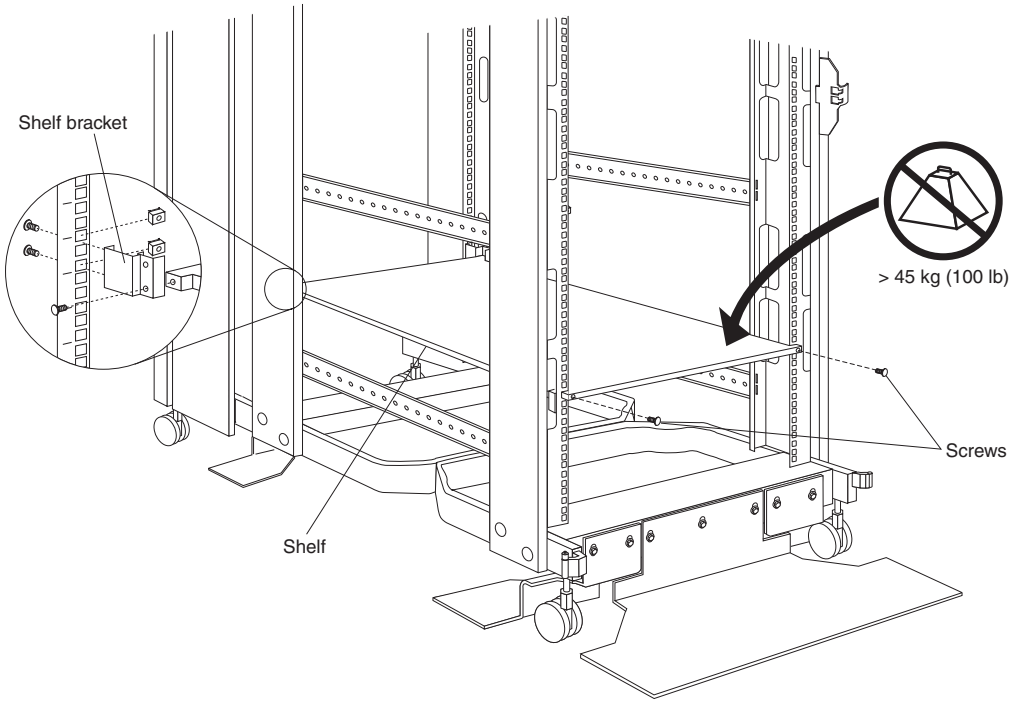


Figure 37. Installing a fixed shelf

1. Determine the location for the fixed shelf within the rack cabinet.
2. Attach the shelf brackets that come with the rack cabinet to the rear of the shelf (one on the left-side, and one on the right-side); then, attach the brackets to the rear of the rack cabinet using two screws per bracket.
3. Attach the front of the shelf to the rack mounting flanges using M6 screws and cage nuts.
4. See the documentation that comes with the optional device that you want to put on the shelf to ensure that it does not exceed the 45 kg (100 lb) weight limit for this shelf.

Installing a keyboard tray

The keyboard tray can hold a standard keyboard or a space-saver keyboard, and occupies 1U of space in your rack cabinet. With a space-saver keyboard, there is also room for a flat panel monitor and the optional flat panel monitor rack mount kit as shown in "Installing a flat panel monitor rack mount kit".

The keyboard tray can support up to 11 kg (24 lb). See the documentation that comes with your keyboard tray for detailed installation instructions. Use the following general procedure to install a keyboard tray and keyboard in your rack cabinet:

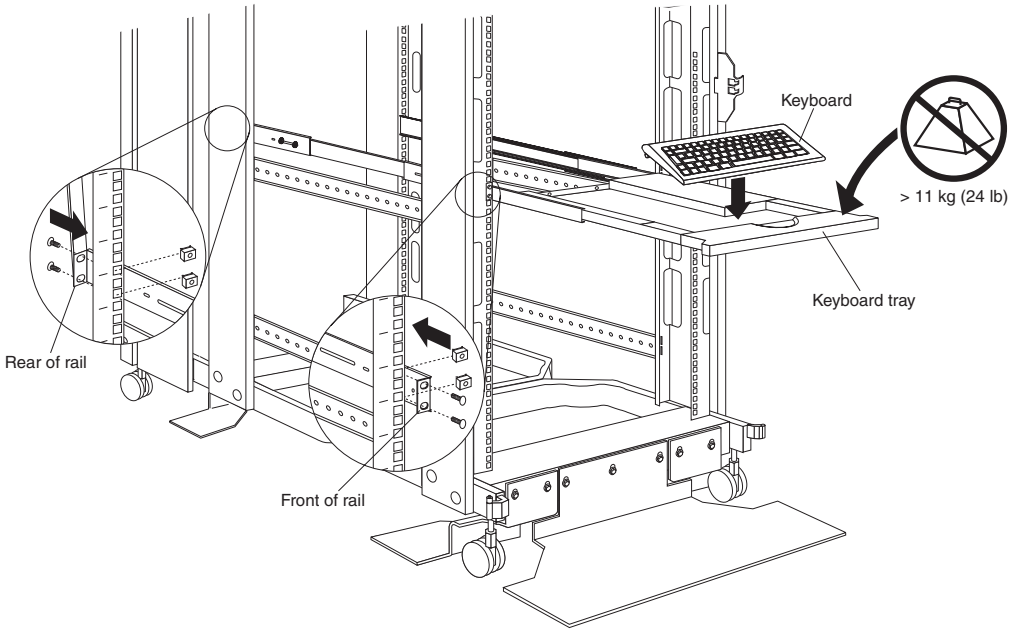


Figure 38. Installing a keyboard tray and keyboard

1. Determine the location for the keyboard tray within the rack cabinet.
2. Attach the rails to the front and rear of the rack cabinet, adjusting the length of the rails to fit the depth of the rack cabinet if required.
3. Slide the keyboard tray onto the rails; then, store the keyboard in the area provided.
4. See the keyboard documentation for information on how to connect it to a server or console switch.

Installing a flat panel monitor rack mount kit

You can store a T540, 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:

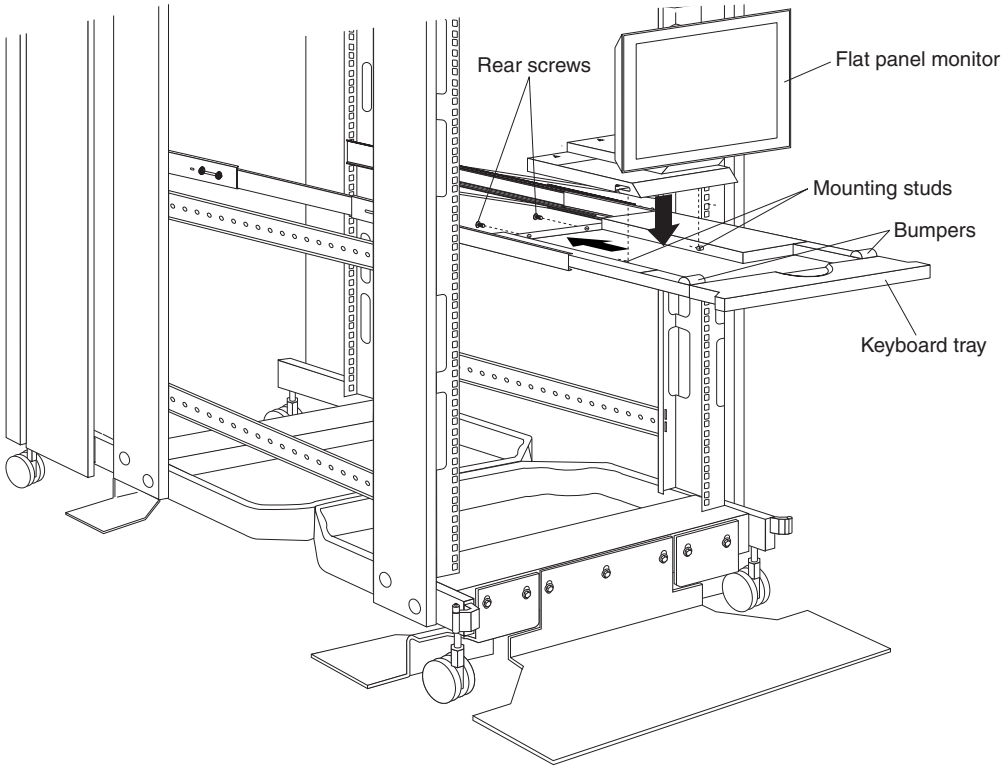


Figure 39. Installing a flat panel monitor rack mount kit

1. Ensure that a keyboard tray is properly installed in your rack cabinet (see "Installing a keyboard tray" on page 115) 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 flat panel monitor documentation for information on how to connect power, and how to connect the monitor to a server or console switch.

Installing a monitor shelf

The monitor shelf can support a monitor that weighs up to 34 kg (75 lb), and occupies 4U of space in your rack cabinet. Space is provided in the rear of the monitor shelf so that you can install a console switch according to "IBM NetBAY Console Switch" on page 117.

Note: The actual amount of space used in your rack cabinet depends on the height of the monitor that you put on the shelf, in addition to the space taken by the shelf itself. Some monitors might require up to 10U of space in your rack cabinet.

See the documentation that comes with your monitor shelf for detailed installation instructions. Use the following general procedure to install a monitor shelf in your rack cabinet:

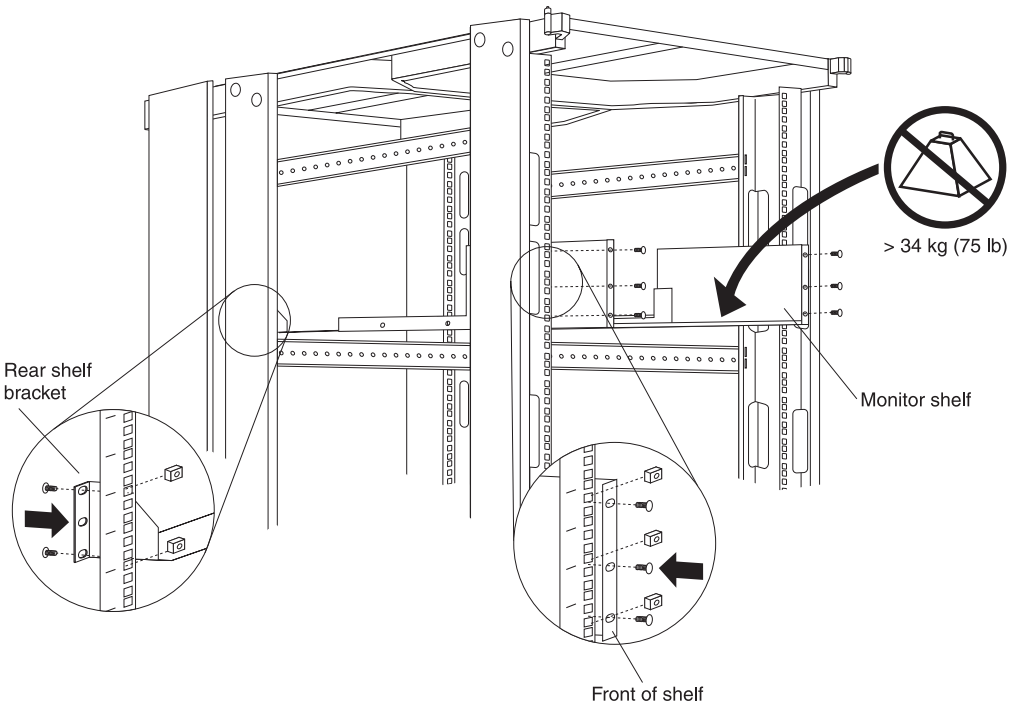


Figure 40. Installing a monitor shelf

1. Determine the location for the monitor shelf in your rack cabinet.
2. Attach the rear shelf bracket to the rear of the rack cabinet using two M6 screws and cage nuts per side.
3. Place the monitor shelf inside the rack cabinet resting on the rear shelf bracket; then, attach the front of the monitor shelf to the front of the rack cabinet using three M6 screws and cage nuts per side.
4. Place a monitor inside the monitor shelf.
5. See the monitor documentation for information on how to connect power, and how to connect the monitor to a server or console switch.

IBM NetBAY Console Switch

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

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.

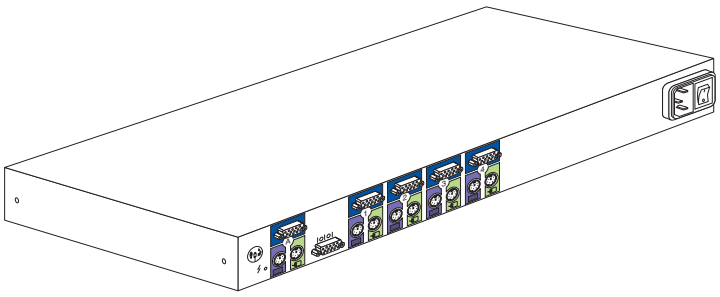


Figure 41. 1x4 console switch

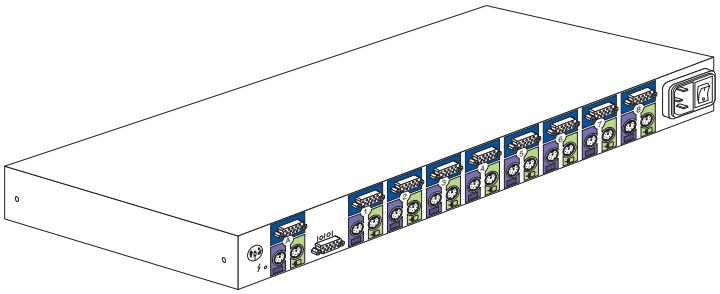


Figure 42. 2x8 console switch

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:

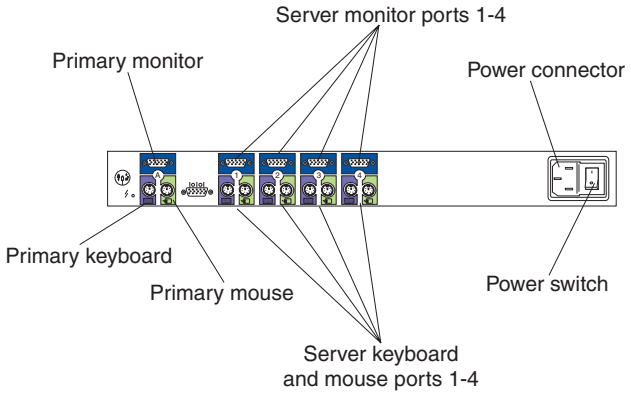
1x4 Console Switch	**2x8 Console Switch**
Two vertical mounting brackets	Two vertical mounting brackets
Miscellaneous hardware kit (for attaching brackets and installing the console switch in a rack cabinet)	Two horizontal mounting brackets, marked 'L' and 'R' (Left and Right)
One 1.8 m (6 ft) power 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

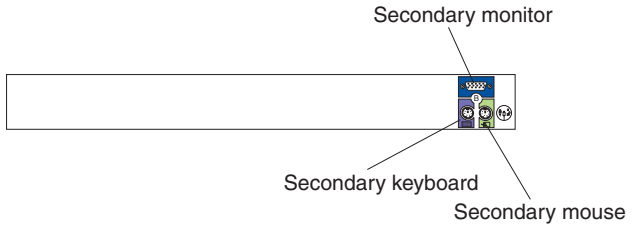
another console switch in a tiered configuration. Console cable sets are available in different lengths, and are color-coded the same as the ports on the console switch.

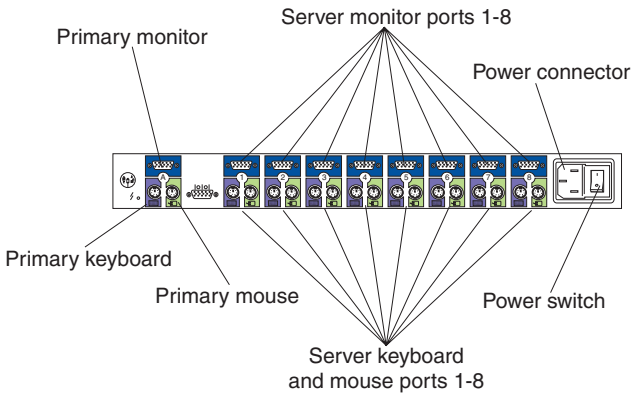
Features

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.



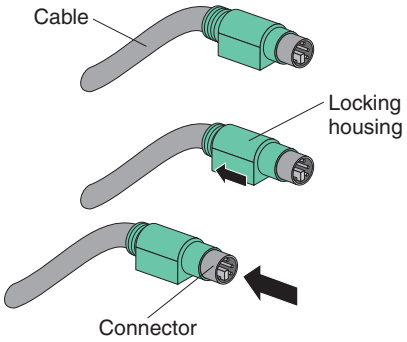


You can connect multiple console switches to each other in a tiered configuration. If you use a 1x4 Console Switch as the primary switch, you can connect up to four additional console switches and 32 servers. If you use a 2x8 Console Switch as the

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:

- 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, "Installing a console switch horizontally in a rack" on page 124
     OR
   - Install a console switch vertically in the side of your rack cabinet according to "Installing a console switch vertically in a rack", **OR**
   - Install a console switch horizontally in 1U of EIA rack mounting space in your rack cabinet.
2. If you have more than one console switch to install in your rack cabinet repeat step 1 for each console switch see, "Installation overview" on page 142.
3. Refer to the Apex User Guide CD for operation and configuration information.

Installing a console switch vertically in a rack

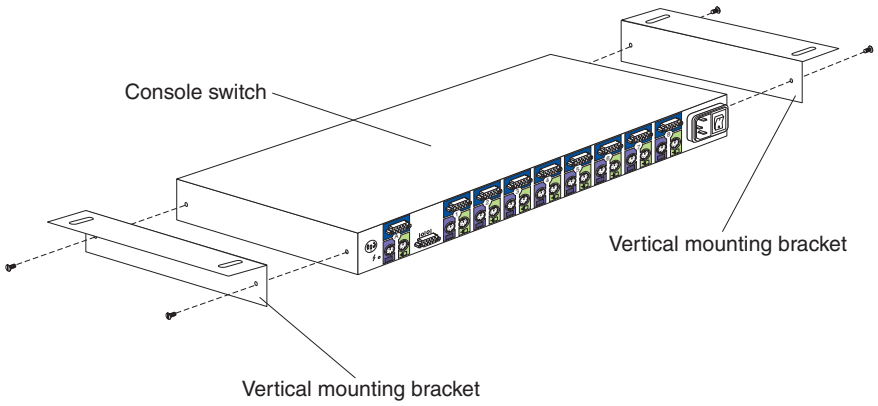
Use the following procedure to install the console switch vertically in the side of your rack cabinet:

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.

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

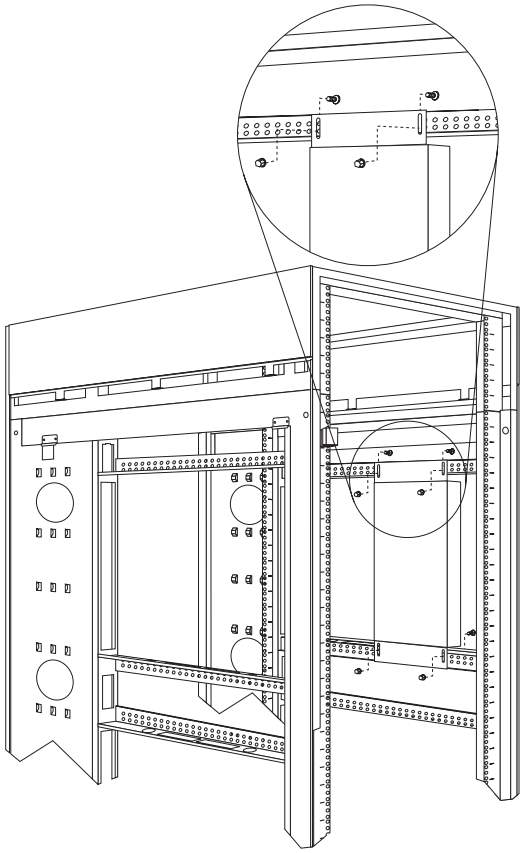
   Note: Removing the rack doors and side panels might make your console switch installation easier.

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.

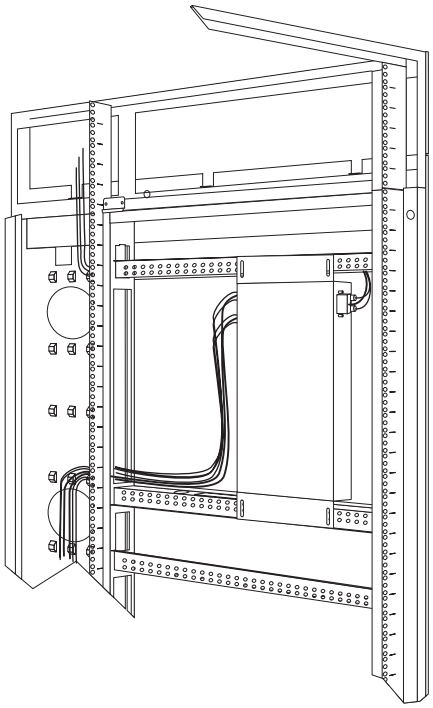


Continue with the rest of the procedure to cable your console switch.

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

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 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.

Installing a console switch horizontally in a rack

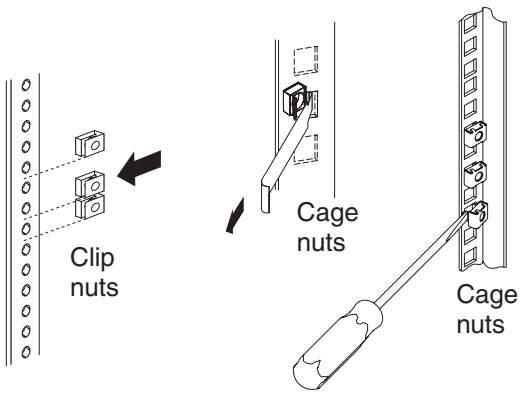
Use the following procedure to install the console switch horizontally in 1U of EIA rack mounting space in your rack cabinet:

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

   Notes:

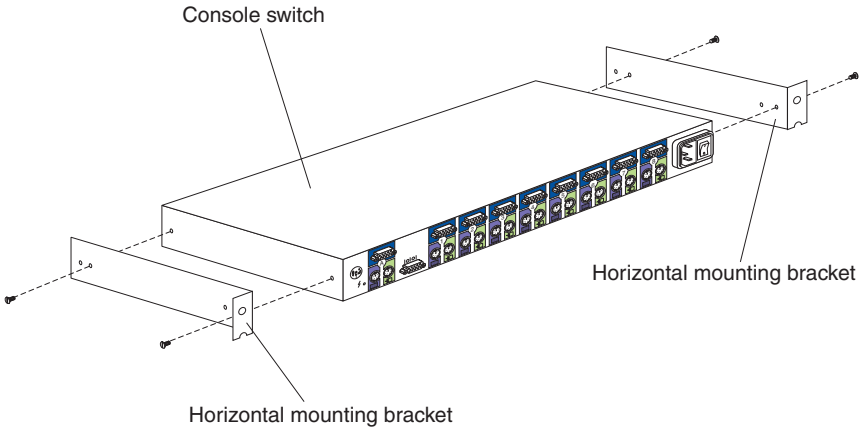
   a. Removing the rack doors and side panels might make your console switch installation easier.

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



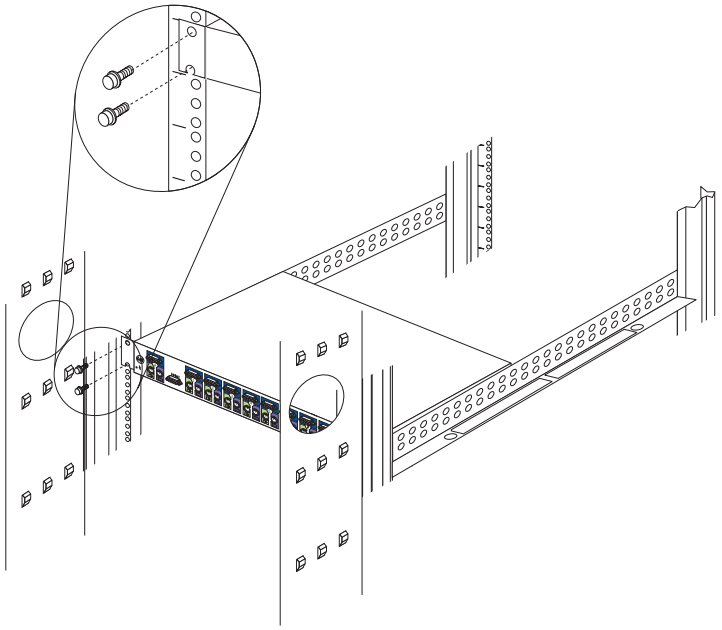
2. Attach one horizontal mounting bracket to each side of the console switch using two 8-32 screws per bracket. Make sure that the notched hole on the bracket is toward the bottom of the console switch.

   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

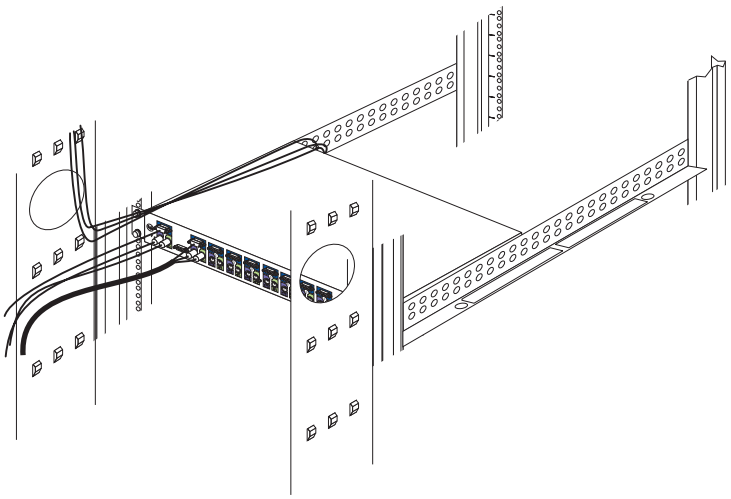
screws and either cage nuts or clip nuts.



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 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 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

NetBAY Power Distribution Units

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.

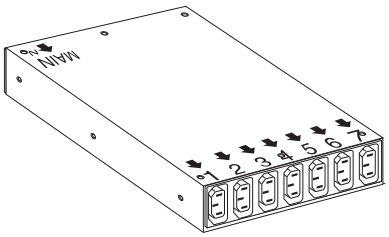
The Rack PDUs come in three types:

- 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.
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" on page 153, **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 154, **OR**
- Install two devices horizontally in your rack cabinet in 1U of available EIA mounting space according to "Installing two devices horizontally" on page 156.

2. Connect line cords and cables according to "Cabling your PDUs" on page 133.

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. 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.

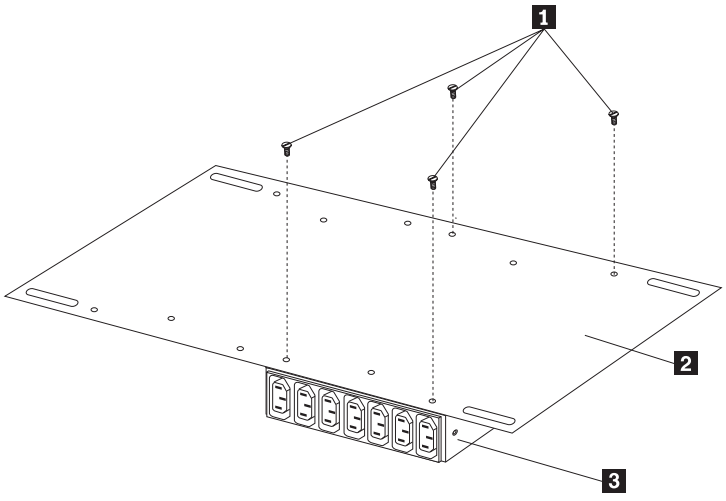


Figure 43. Installing the Rack PDU on the vertical mounting plate

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.

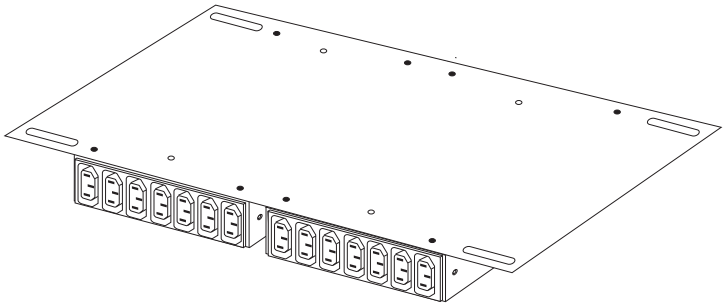


Figure 44. Installing a second Rack PDU

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**.

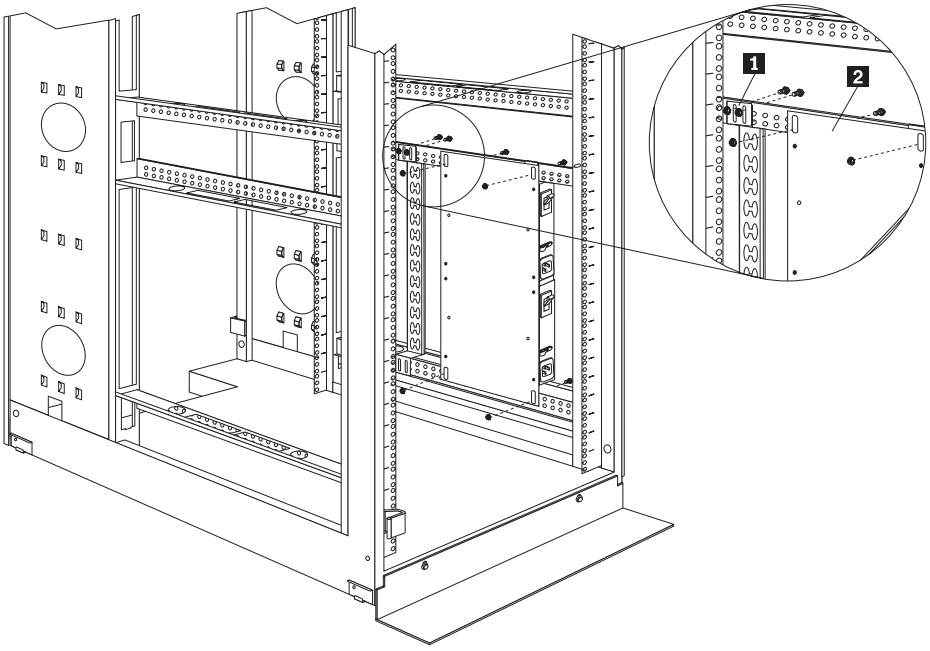


Figure 45. Installing the vertical mounting plate and cable-management bracket

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 133 for instructions on how to cable your Rack PDU.

Installing a single device horizontally

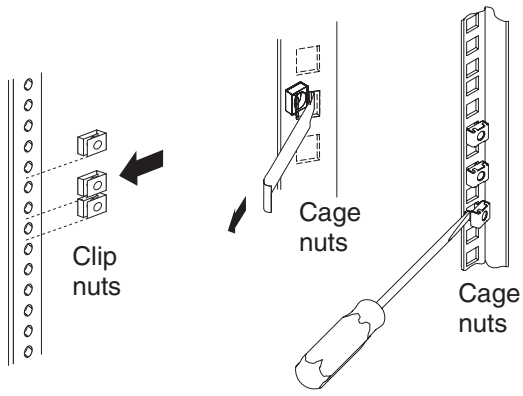
Use the following procedure to mount a single Rack PDU horizontally in your rack cabinet:

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.



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.

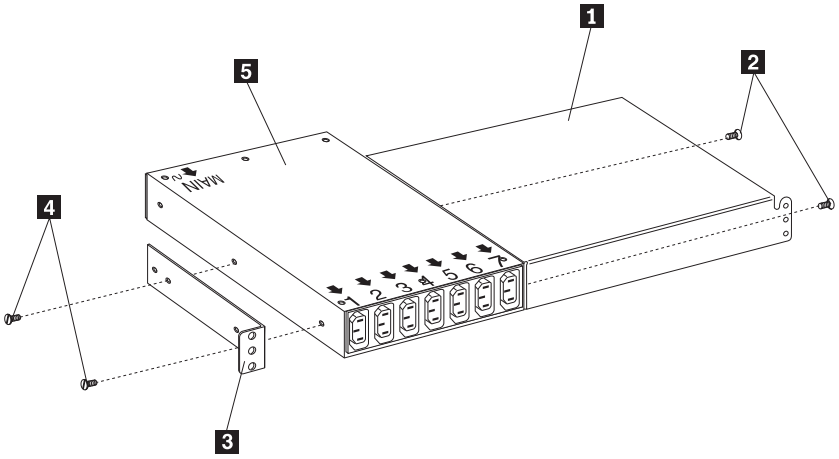


Figure 46. Installing the mounting brackets for a single device

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).

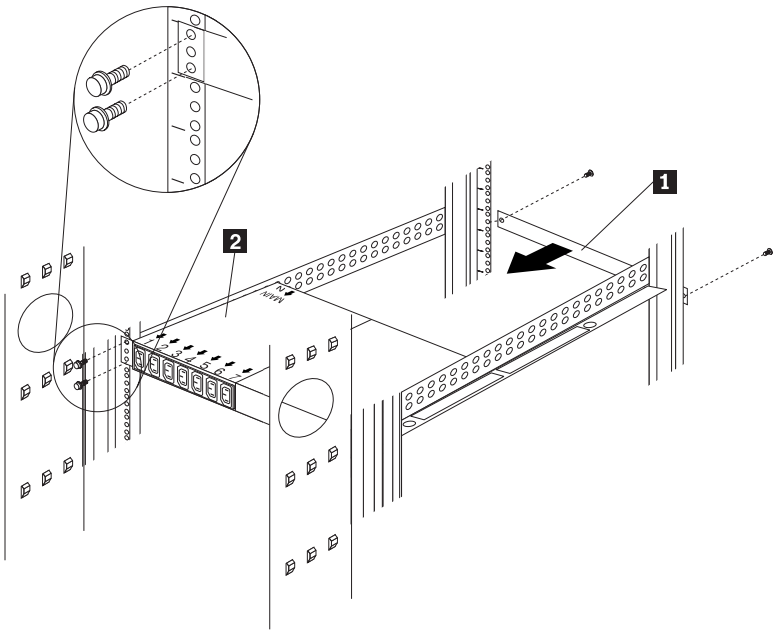


Figure 47. Installing the Rack PDU and the blank filler panel

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.

   Proceed to "Cabling your PDUs" on page 158 for instructions on how to cable your Rack PDU.

Installing two devices horizontally

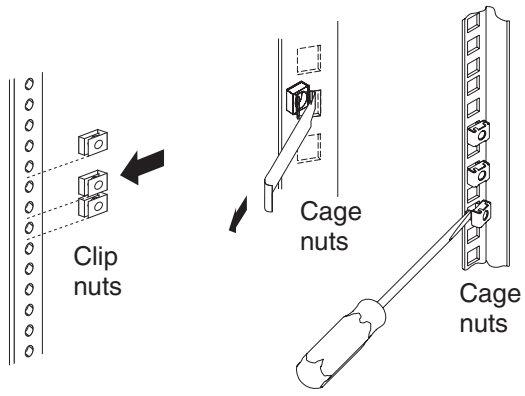
Use the following procedure to mount two Rack PDUs horizontally in your rack cabinet:

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**.

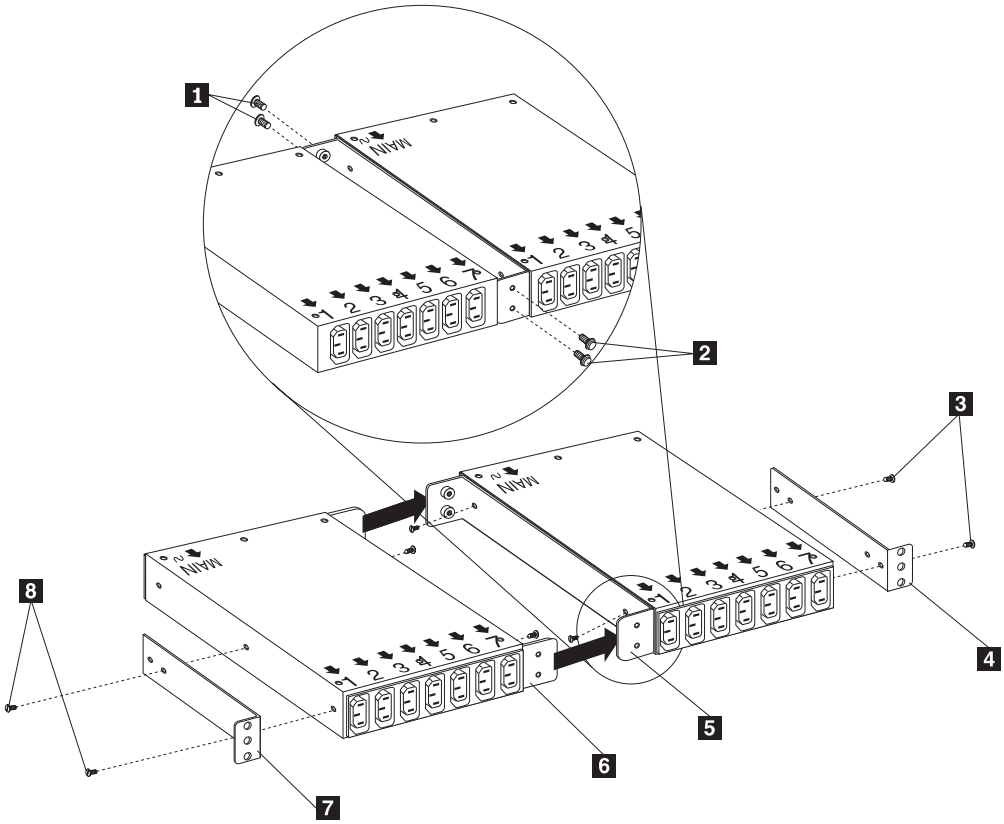


Figure 48. Installing the mounting brackets for two devices

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).

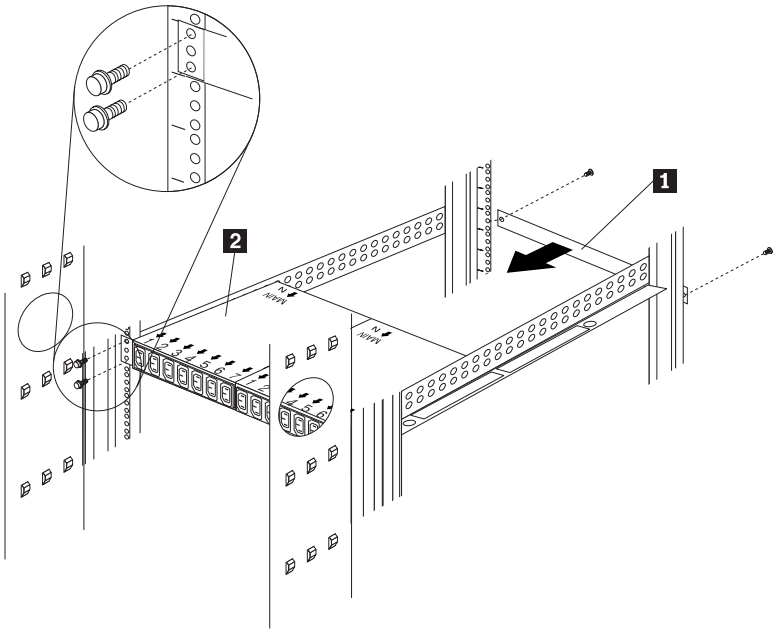


Figure 49. Installing two Rack PDUs and the blank filler panel

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 158 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 160 or "Cabling instructions for horizontal-mount PDUs" on page 162 as appropriate for your installation.

Statement 1:

CAUTION:
To ensure safety, all configurations of the rack cabinet must be certified by a nationally recognized testing laboratory in order to verify compliance with country-specific safety regulations. This process ensures that the end product remains safe for the operator and service personnel under normal and forseeable misuse conditions.

Statement 13:

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.

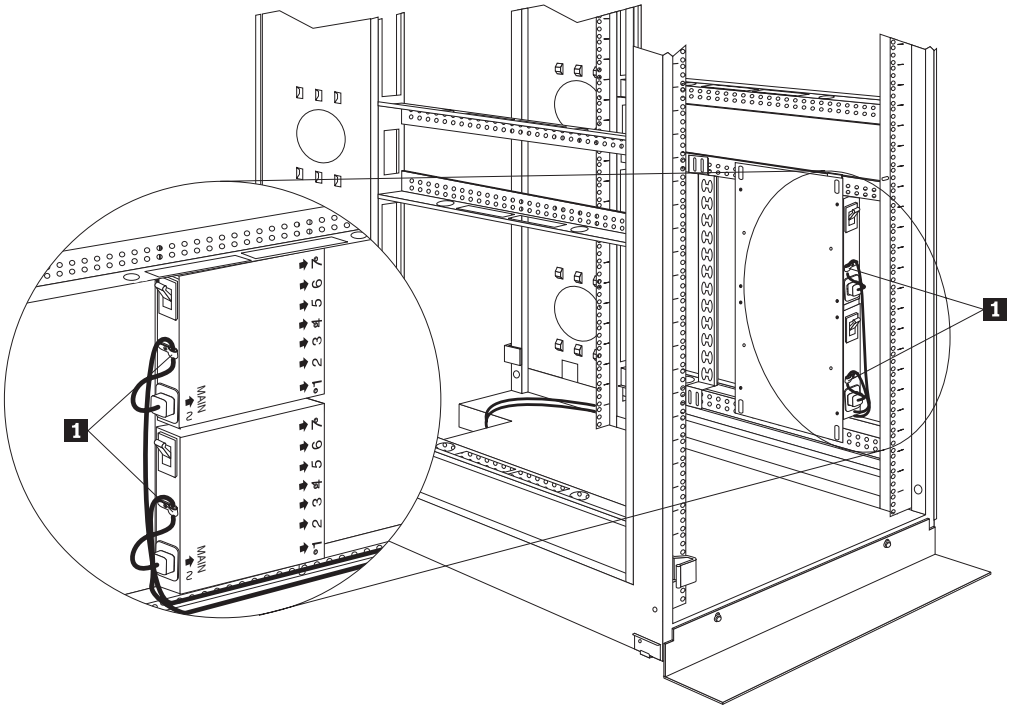


Figure 50. Connecting and routing the line cord

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.

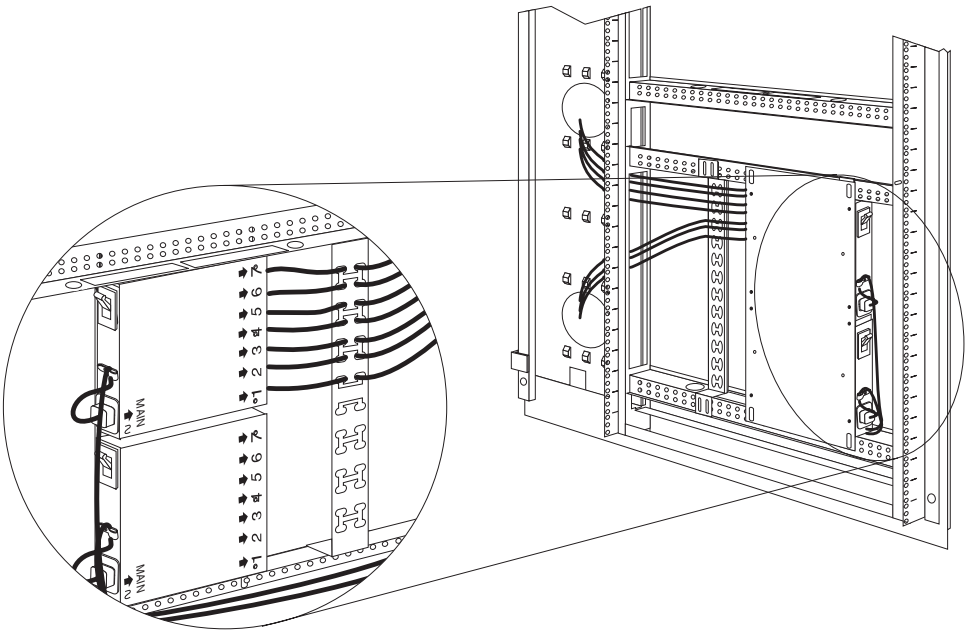


Figure 51. Connecting and routing other power cables to the outlets

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.

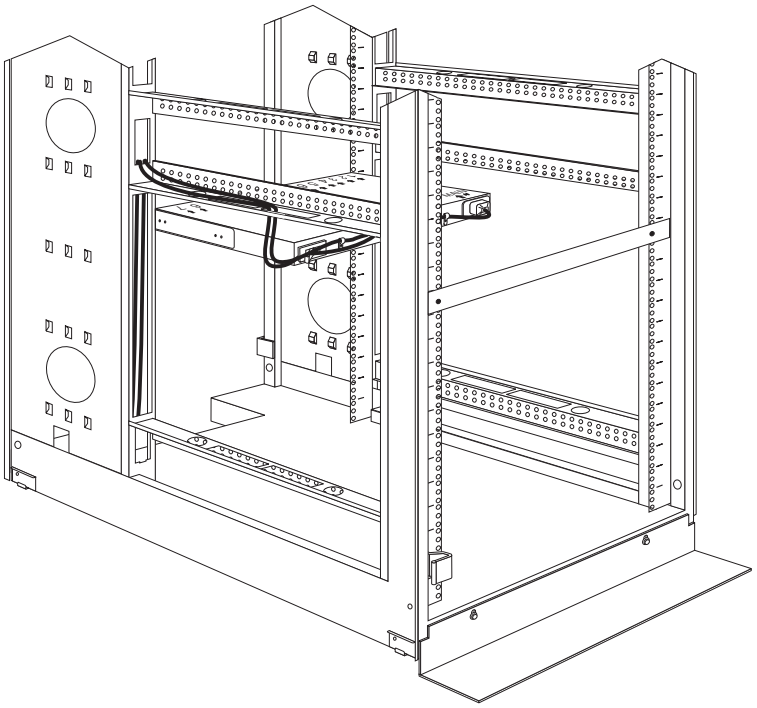


Figure 52. Connecting and routing the line cord

   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.

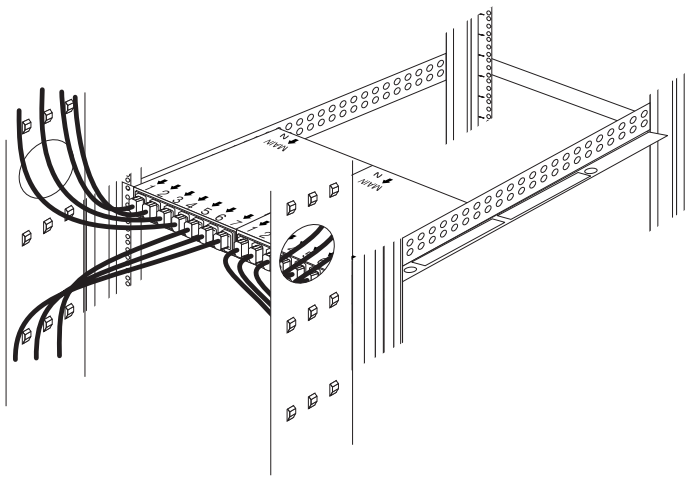


Figure 53. Connecting and routing other power cables to the outlets

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)

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)

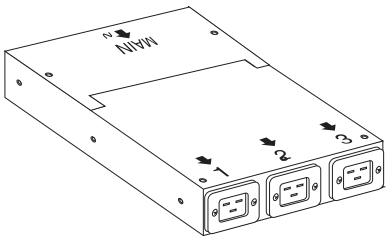
Line cords

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)
- 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 horizontally" on page 129, **OR**
   - Install two devices vertically in the side of your rack cabinet according to "Installing two devices vertically" on page 145.
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.

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.

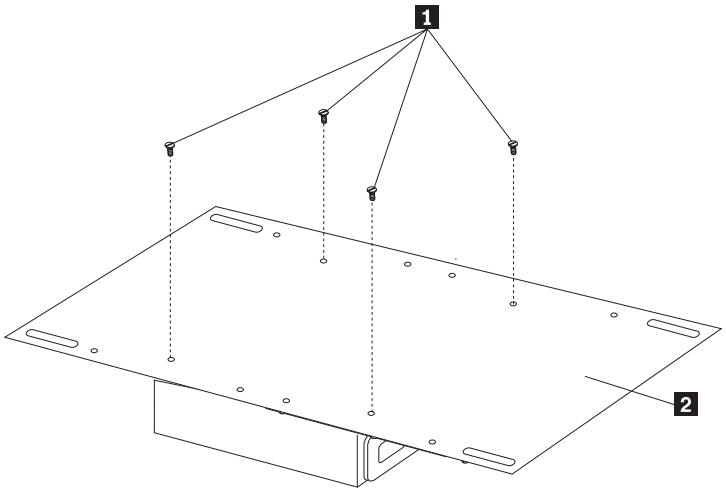


Figure 54. Installing the Rack PDU on the vertical mounting plate

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.

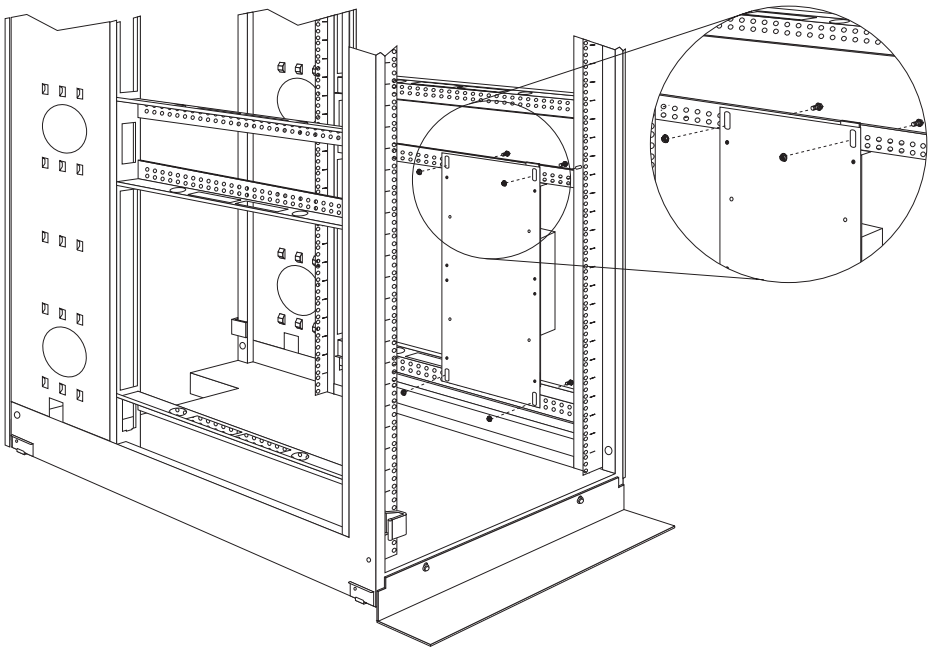


Figure 55. Installing the vertical mounting plate

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.

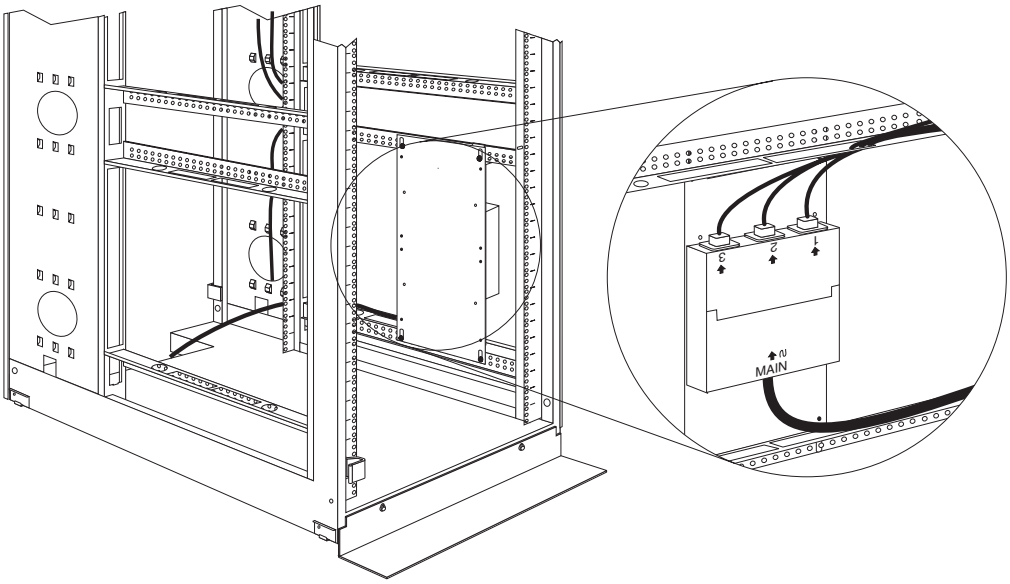


Figure 56. Routing the fixed line cord and power cables

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.

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.

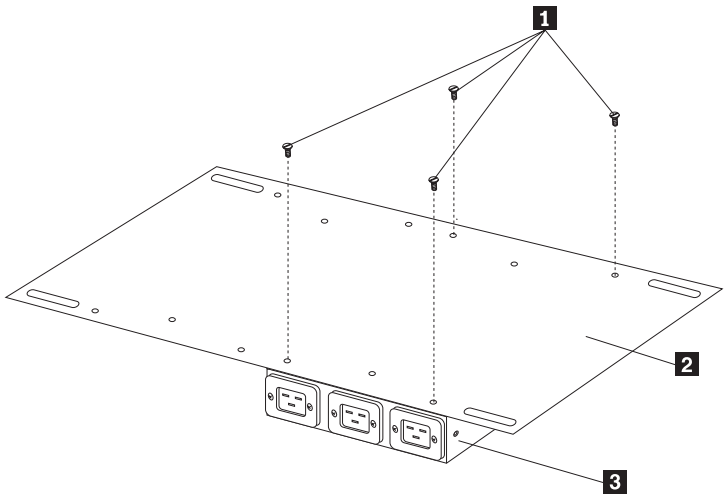


Figure 57. Installing the Rack PDU on the vertical mounting plate

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.

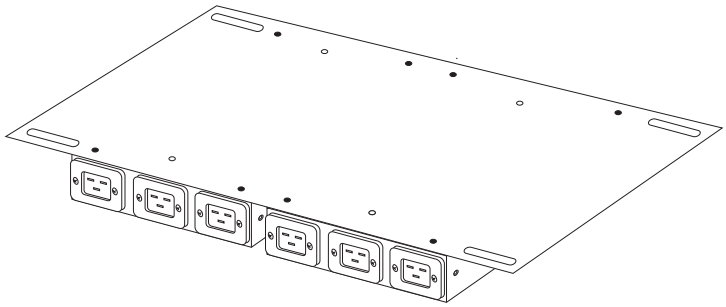


Figure 58. Installing a second Rack PDU

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**.

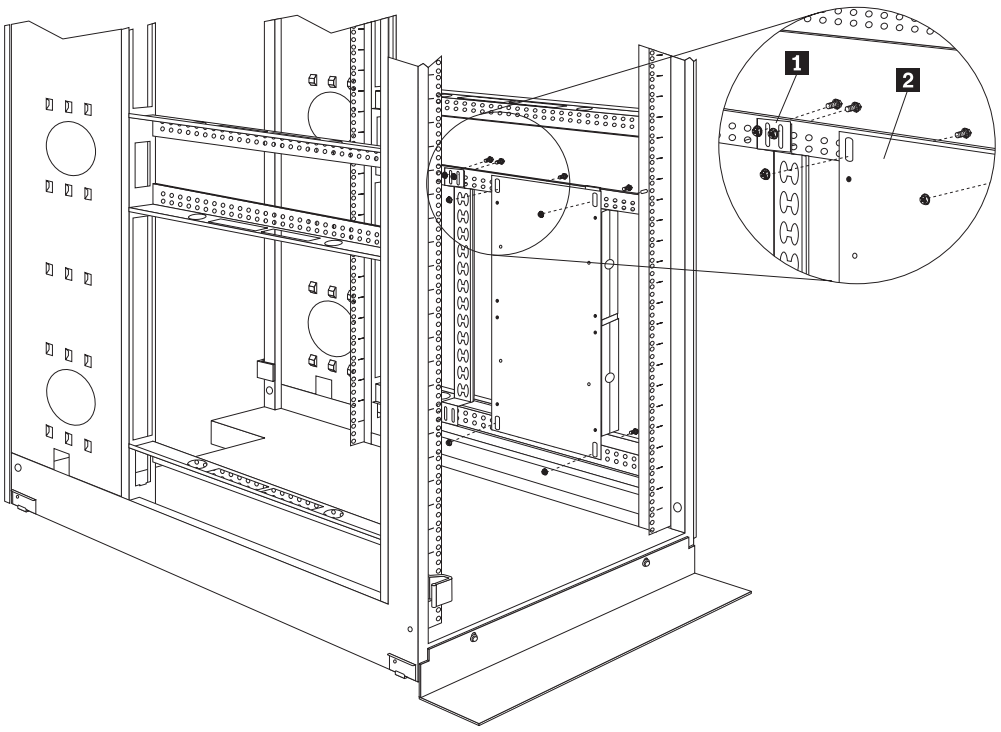


Figure 59. Installing the vertical mounting plate and cable-management bracket

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.

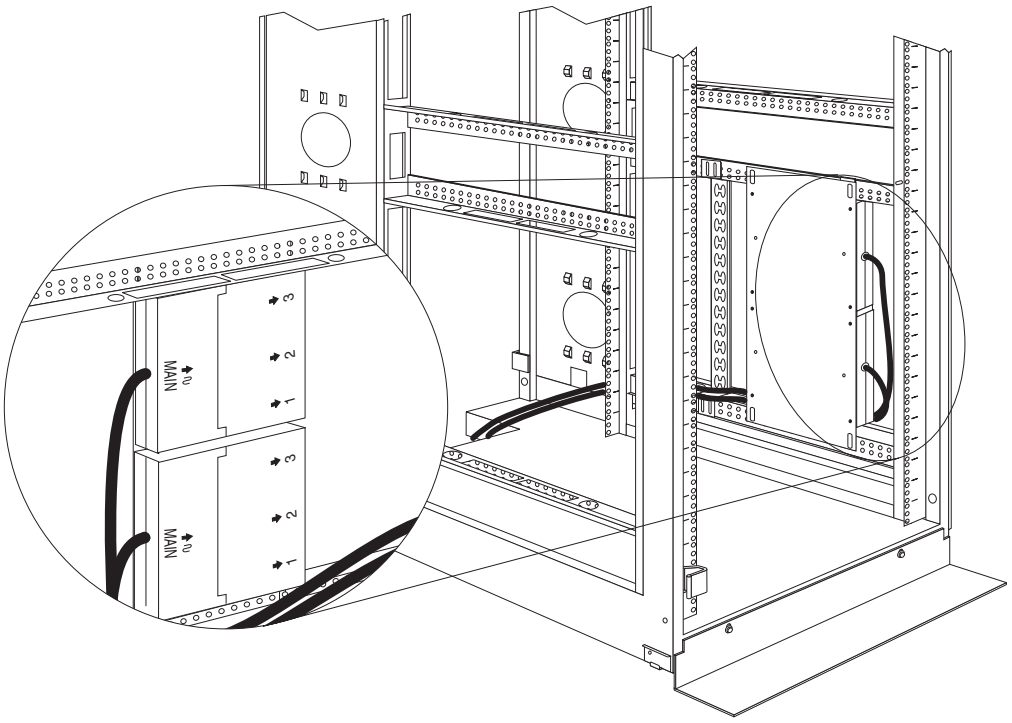


Figure 60. Routing the fixed line cords

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.

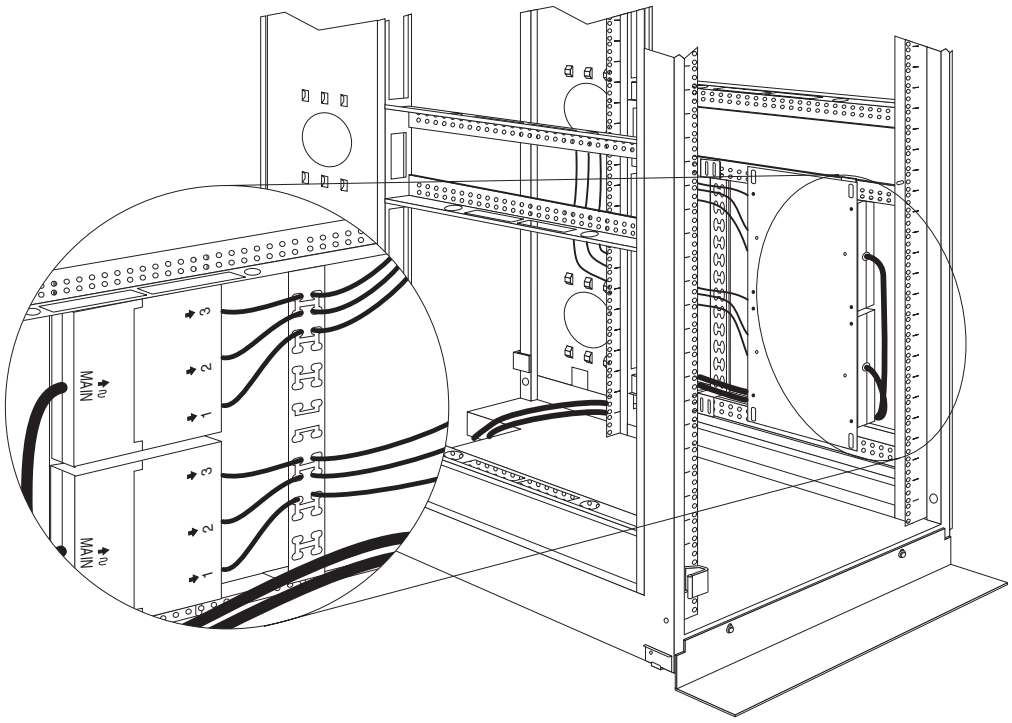


Figure 61. Connecting and routing other power cables to the outlets

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:

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

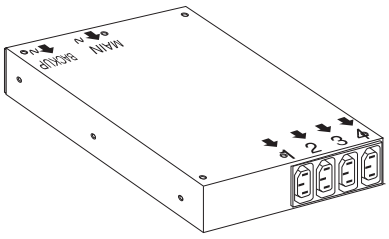
Power cables

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:

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

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 142, **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 129, **OR**
   - Install two devices horizontally in your rack cabinet in 1U of available EIA mounting space according to "Installing two devices horizontally" on page 156.
2. Connect line cords and cables according to "Cabling your PDUs" on page 158.

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.

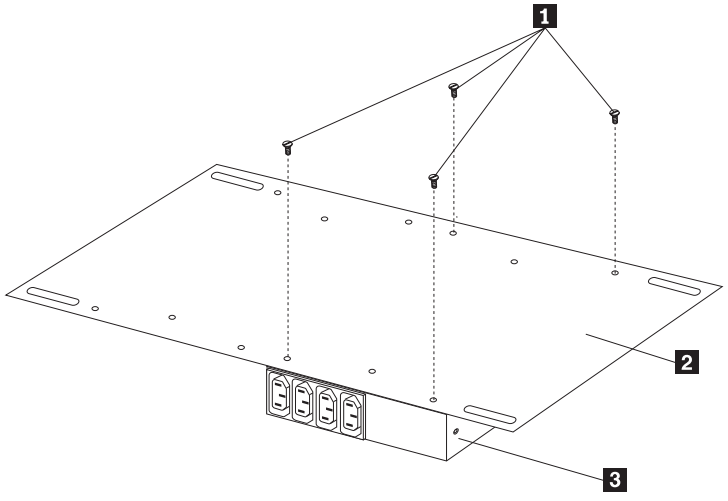


Figure 62. Installing the Rack PDU on the vertical mounting plate

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.

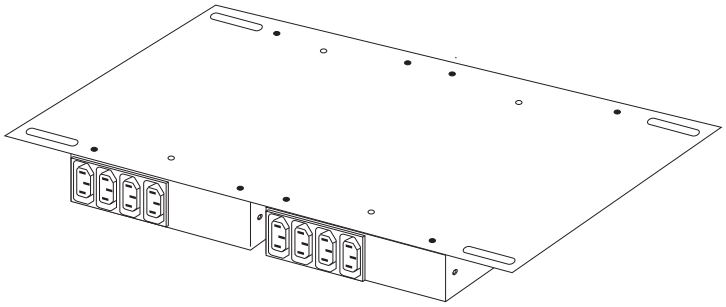


Figure 63. Installing a second Rack PDU

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**.

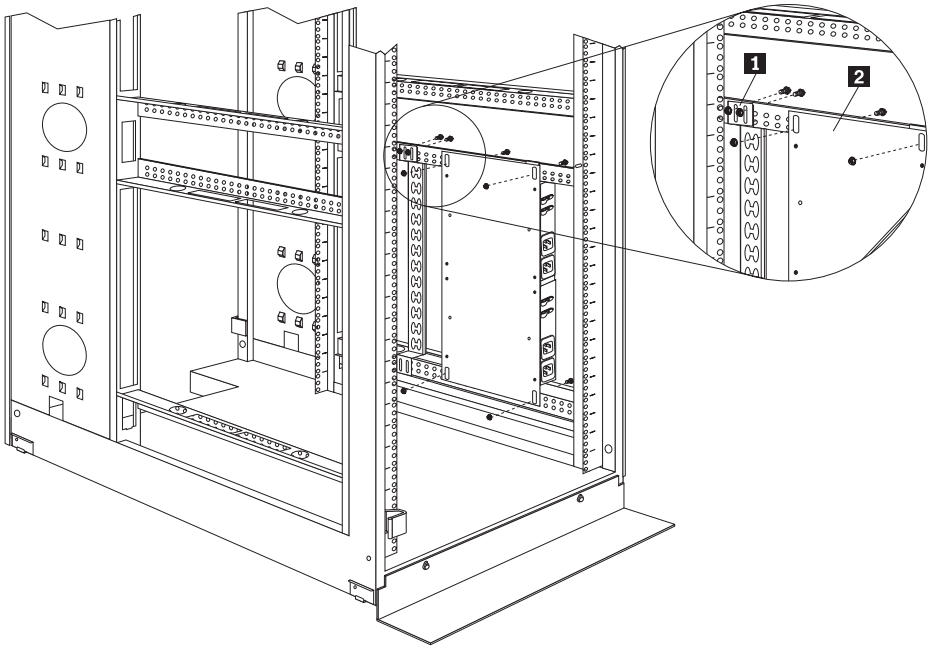


Figure 64. Installing the vertical mounting plate and cable-management bracket

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 158 for instructions on how to cable your Rack PDU.

Installing a single device horizontally

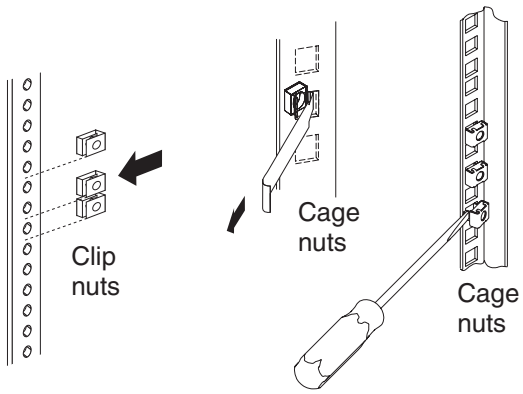
Use the following procedure to mount a single Rack PDU horizontally in your rack cabinet:

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.



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.

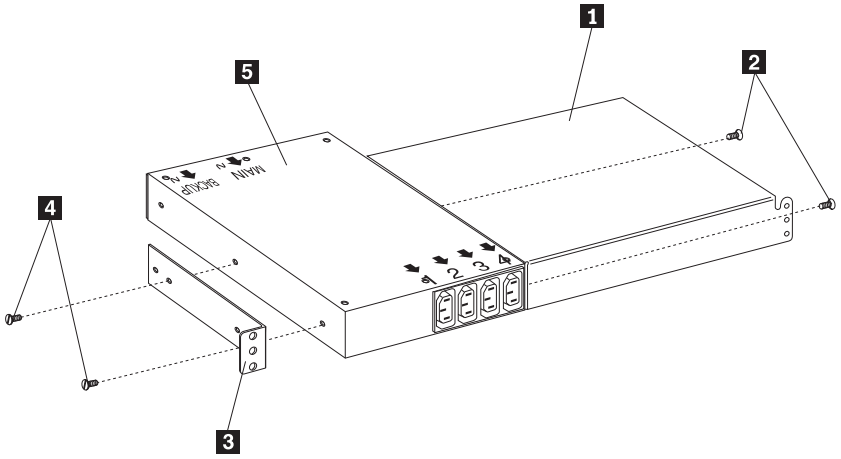


Figure 65. Installing the mounting brackets for a single device

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).

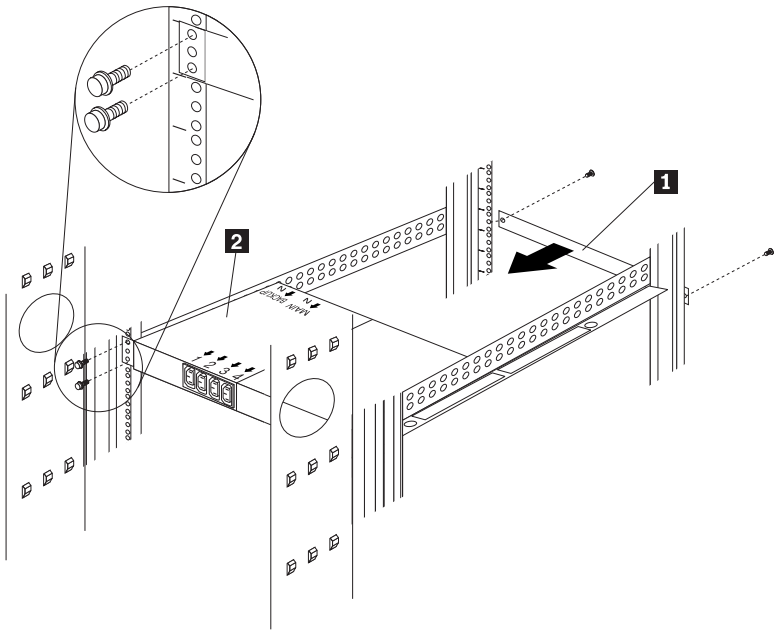


Figure 66. Installing the Rack PDU and blank filler panel

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.

Installing two devices horizontally

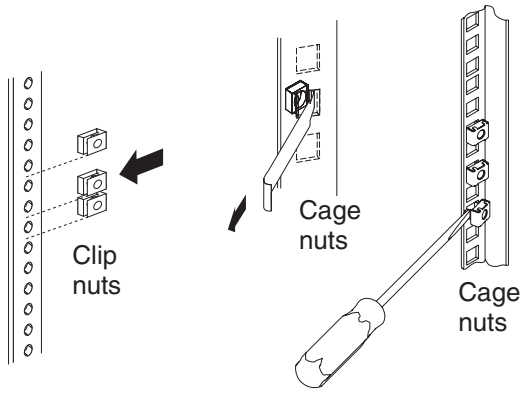
Use the following procedure to mount two Rack PDUs horizontally in your rack cabinet:

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** .

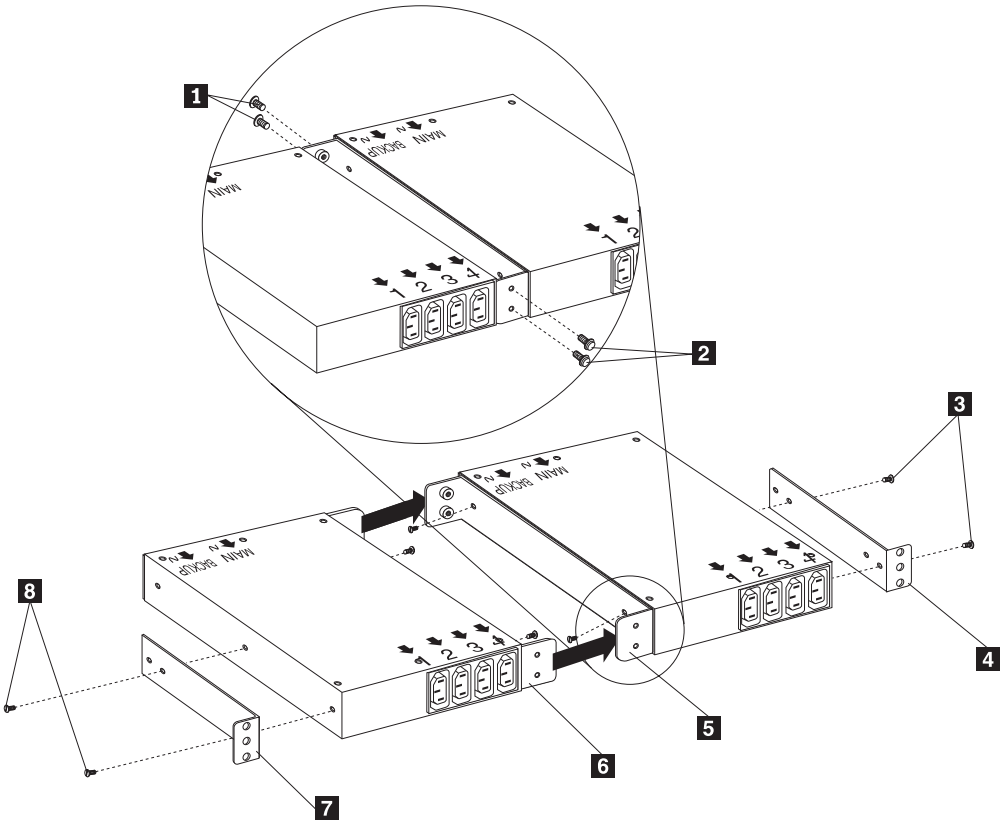


Figure 67. Installing the mounting brackets for two devices

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).

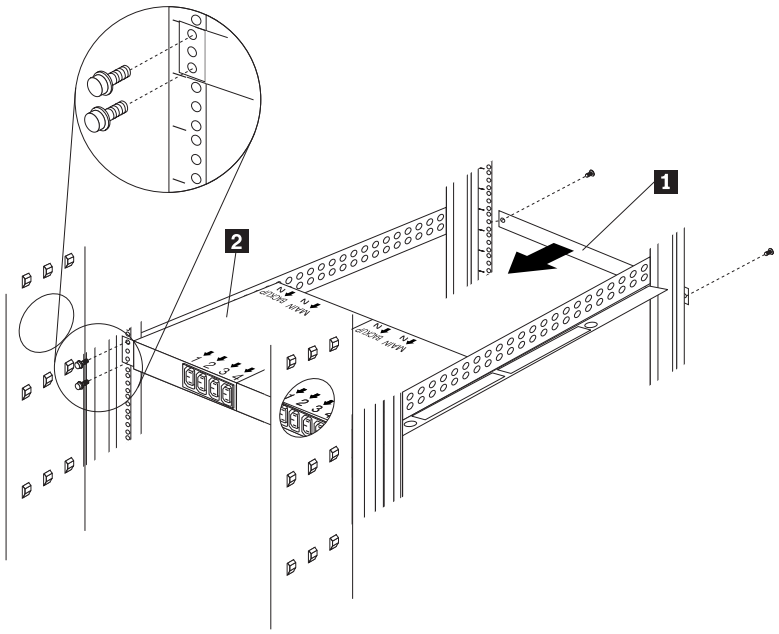


Figure 68. Installing the Rack PDUs and the blank filler panel

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 160 or "Cabling instructions for horizontal-mount PDUs" on page 137 as appropriate for your installation.

Statement 1:

DANGER

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

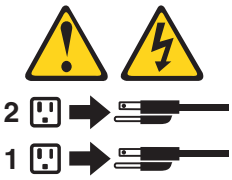
- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached 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 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.

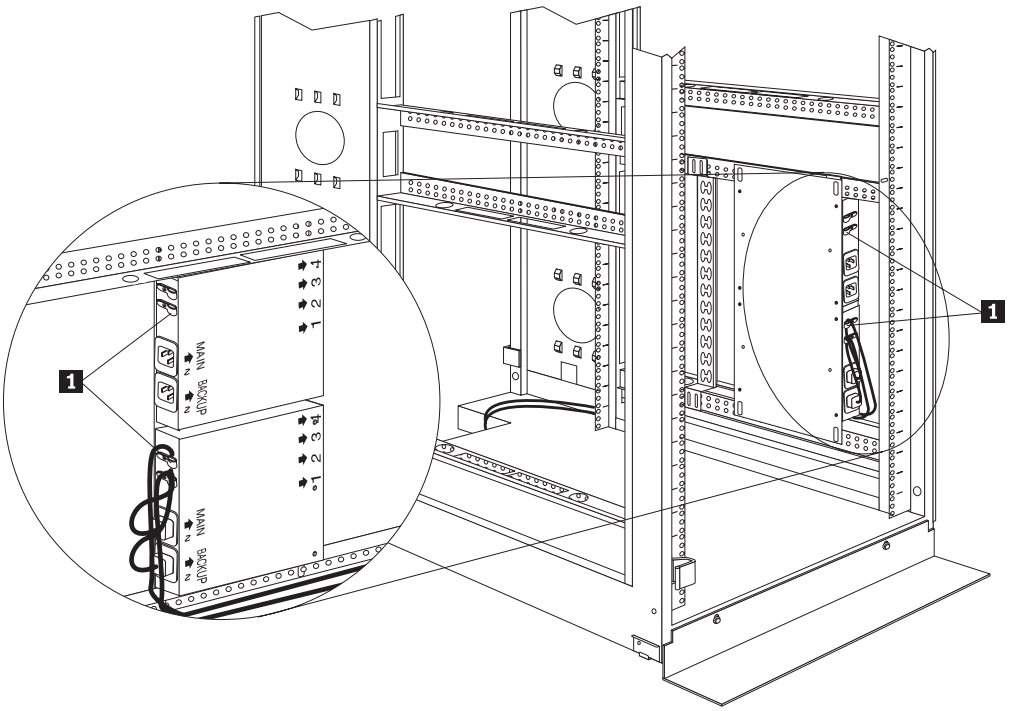


Figure 69. Connecting and routing the line cords

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 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.

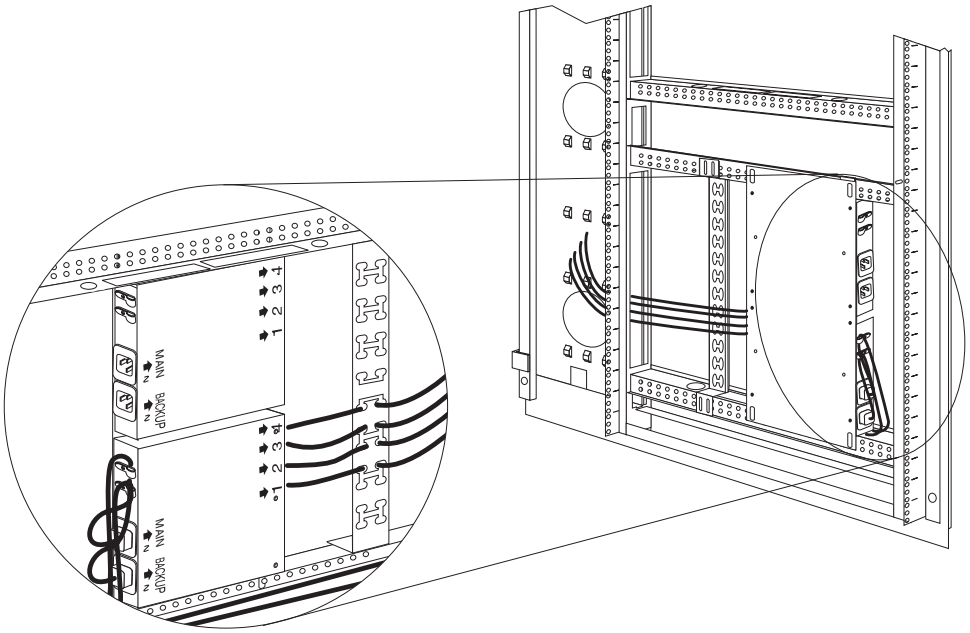


Figure 70. Connecting and routing other power cables to the outlets

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.

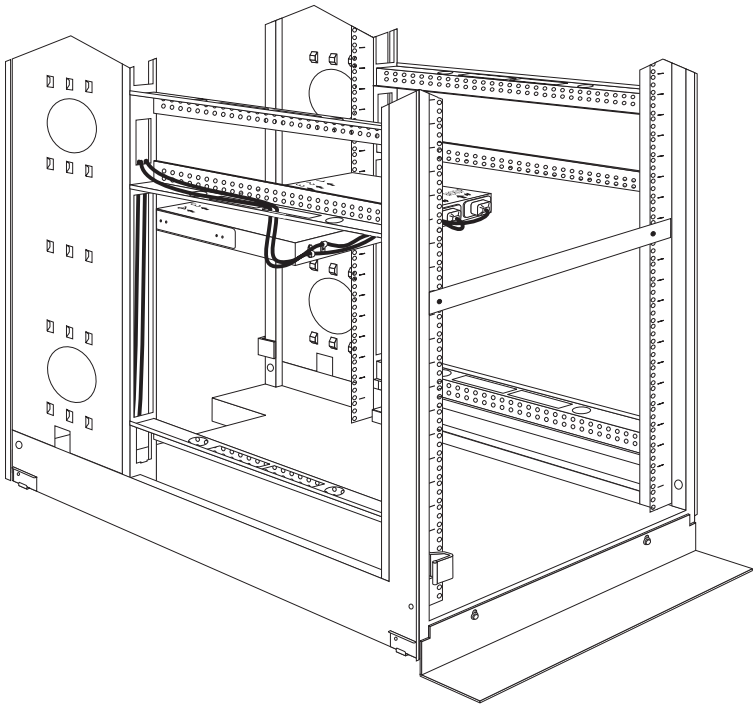


Figure 71. Connecting and routing the line cords

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.

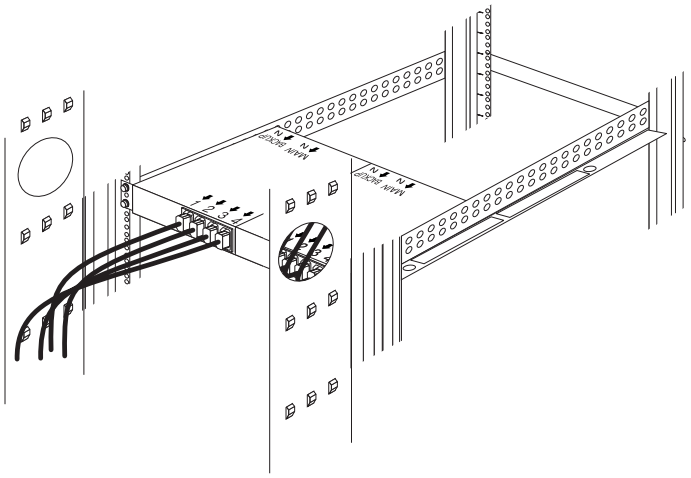


Figure 72. Connecting and routing other power cables to the outlets

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)

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)

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

Selector switch locations

Note: For information about the IBM NetBAY Console Switch, see “IBM NetBAY Console Switch” on page 117.

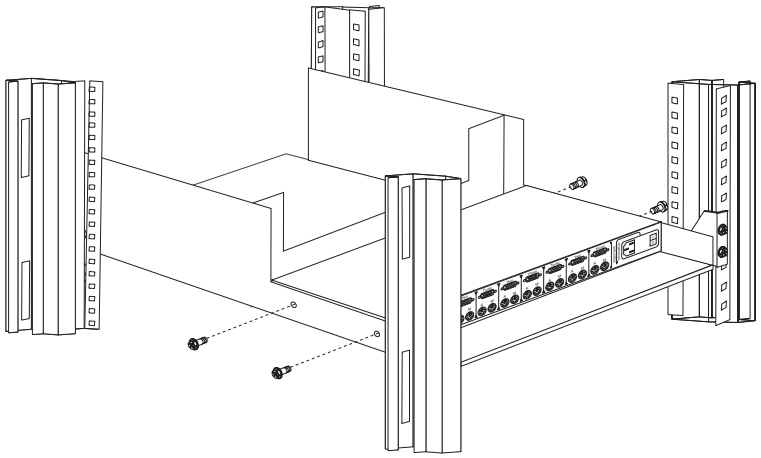


Figure 73. Selector switch in monitor compartment

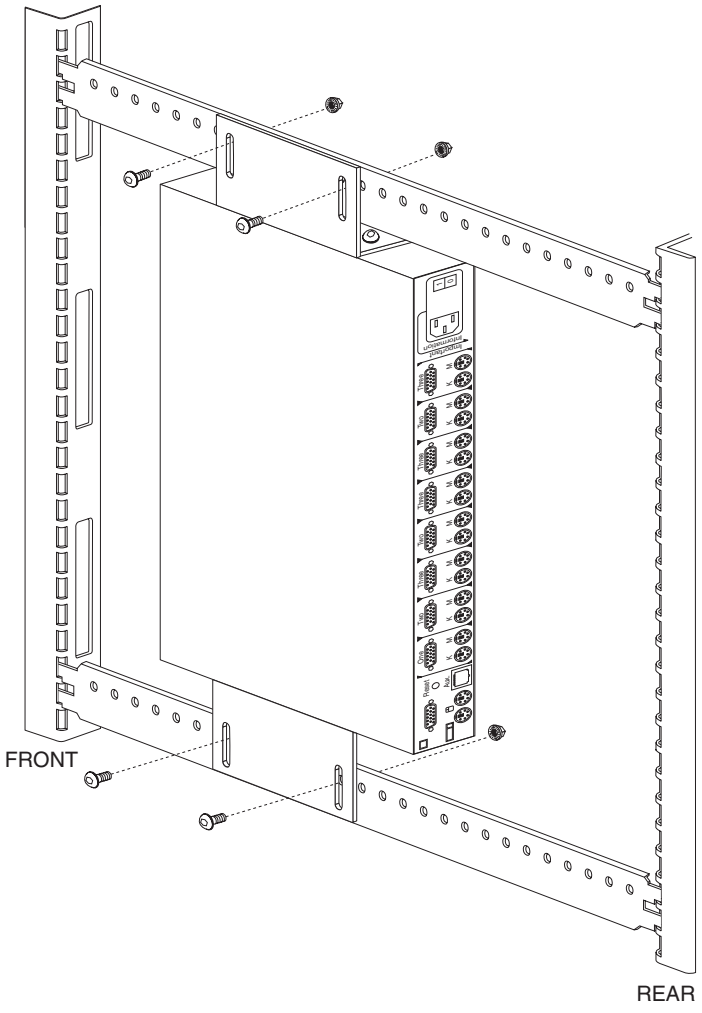


Figure 74. Selector switch between side panels

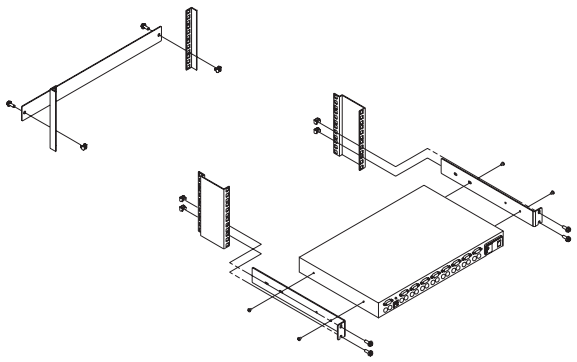
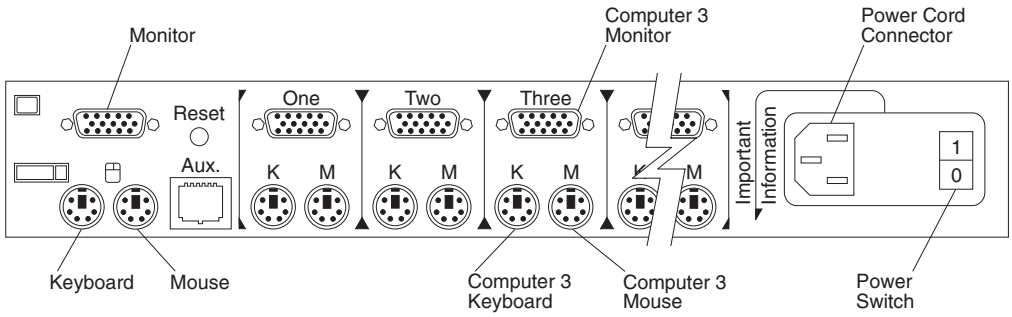
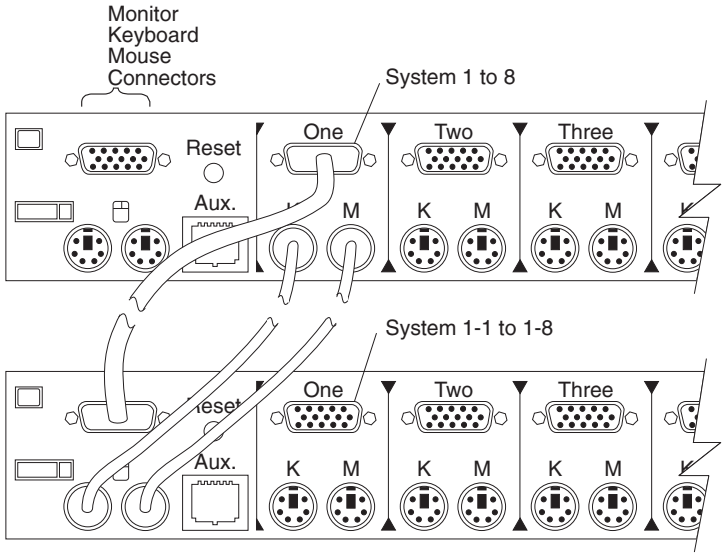


Figure 75. Selector switch rear of rack with blank panel front of rack

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

Selector switch environment

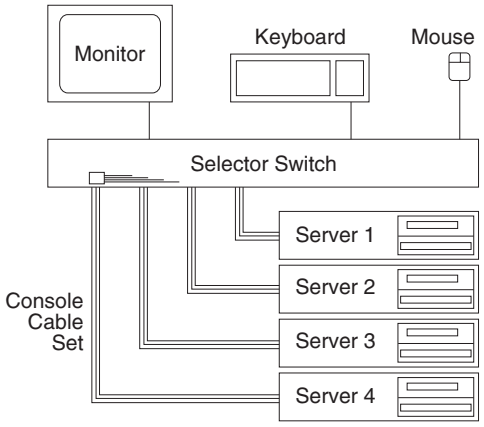


Figure 76. Single selector switch

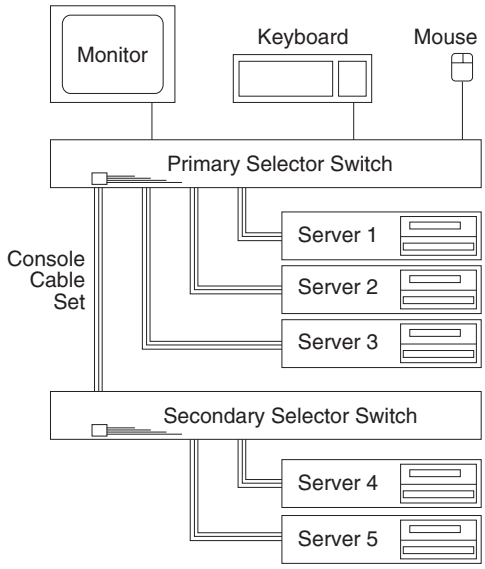


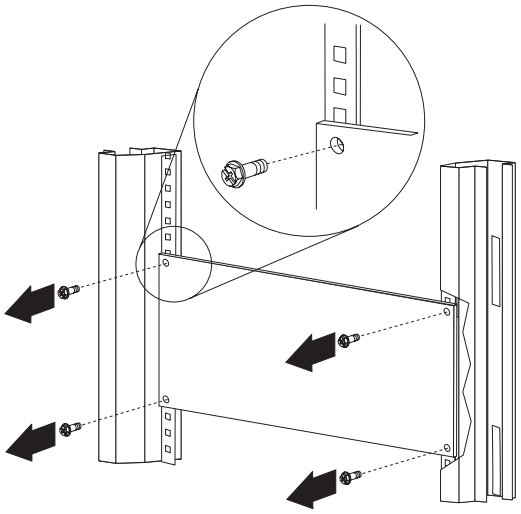
Figure 77. Multiple selector switch

Resetting the selector switch

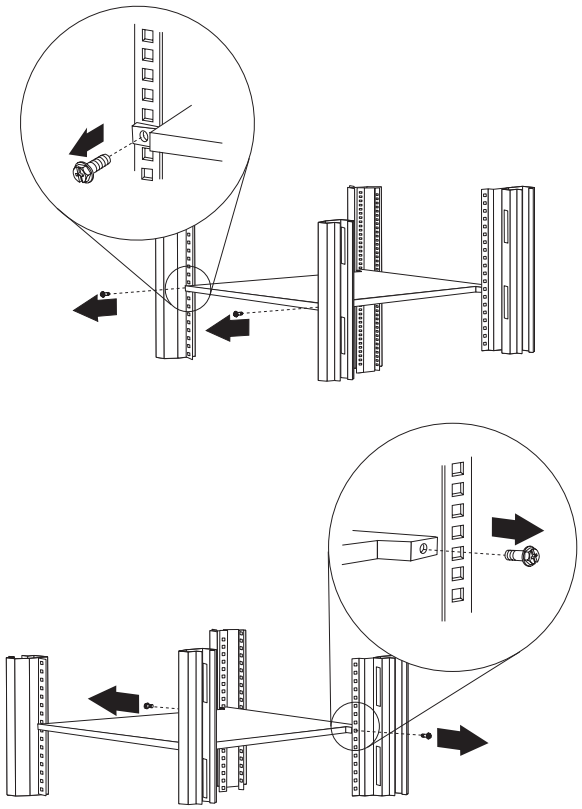
The selector switch can be reset by depressing the Reset button on the back panel of the selector switch.

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

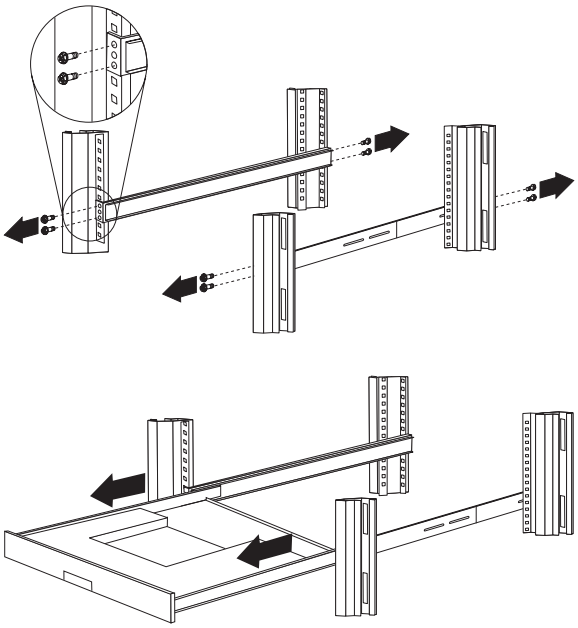
Blank bezel



Fixed shelf



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.

Removing the existing flat panel monitor stand

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

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.

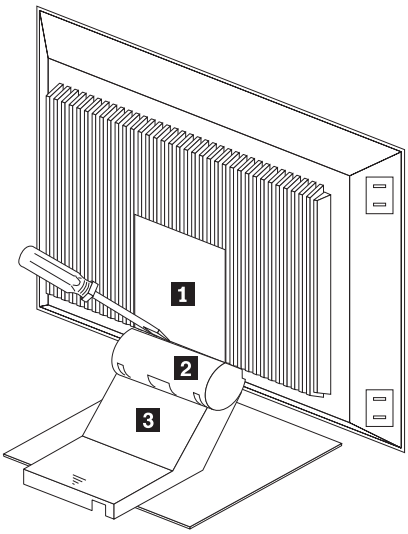


Figure 78. Removing the cable cover, hinge cover, and stand cover

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.

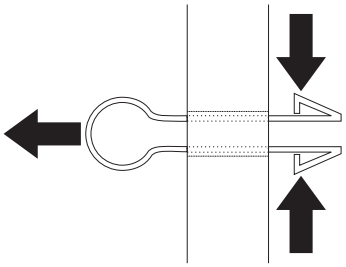


Figure 79. Removing the plastic cable clamp

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

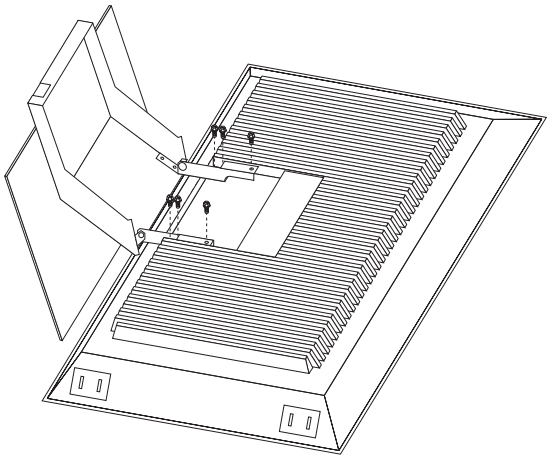


Figure 80. Removing the existing monitor stand from the monitor

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 171 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.

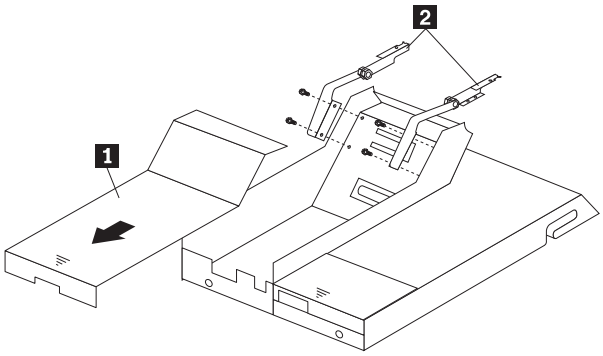


Figure 81. Removing the hinges from the new monitor stand

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

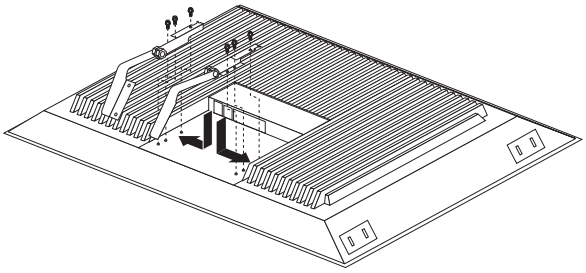


Figure 82. Installing the hinges on the flat panel monitor

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.

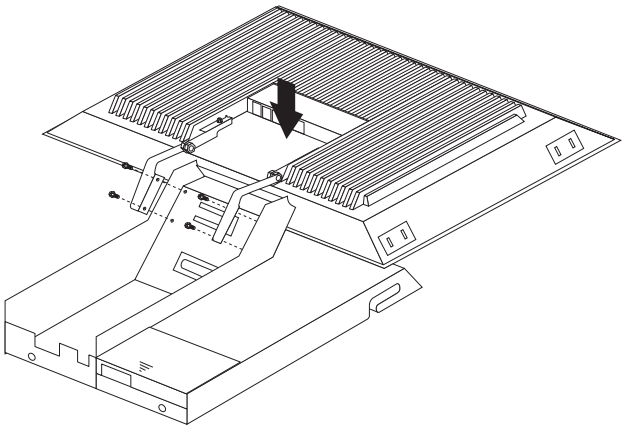


Figure 83. Installing the monitor on the new monitor stand

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.

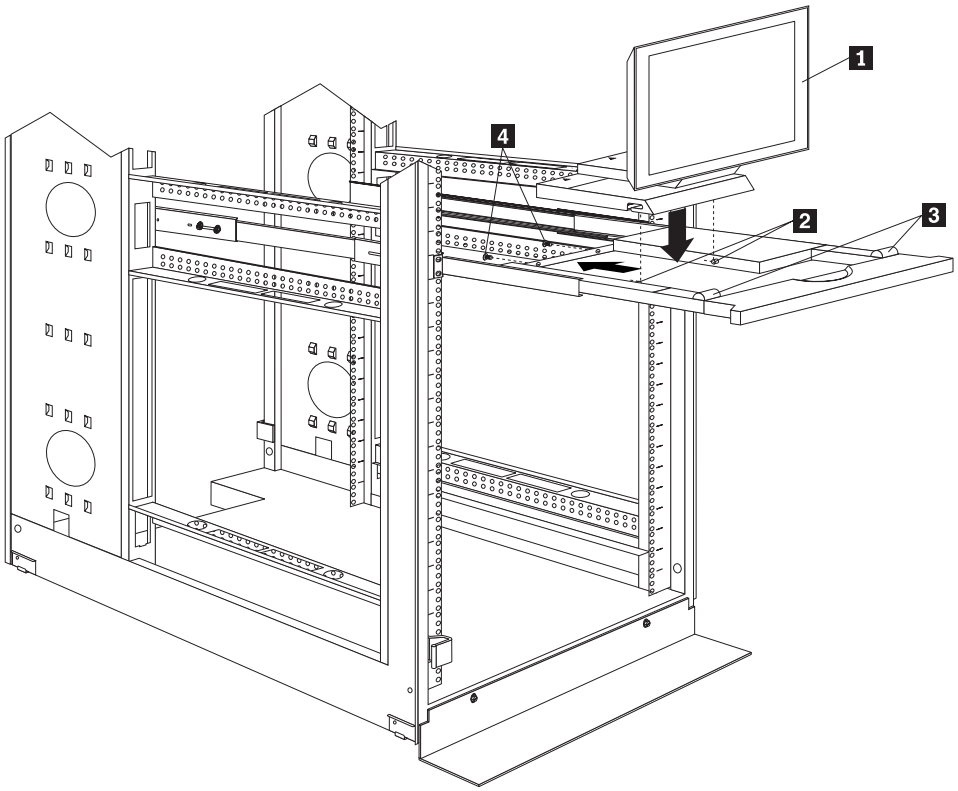


Figure 84. Installing the flat panel monitor in the keyboard tray

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.

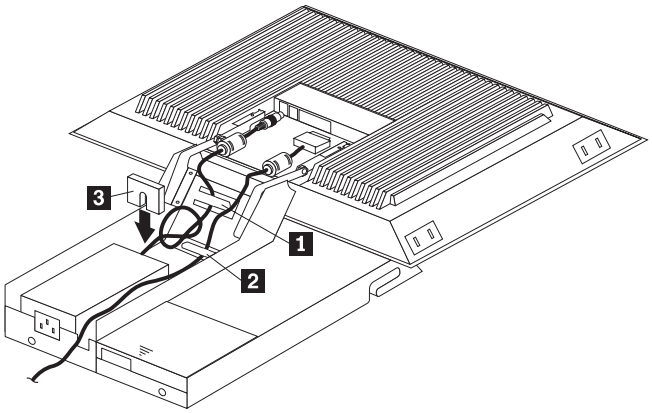


Figure 85. Storing the power supply and routing cables

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**.

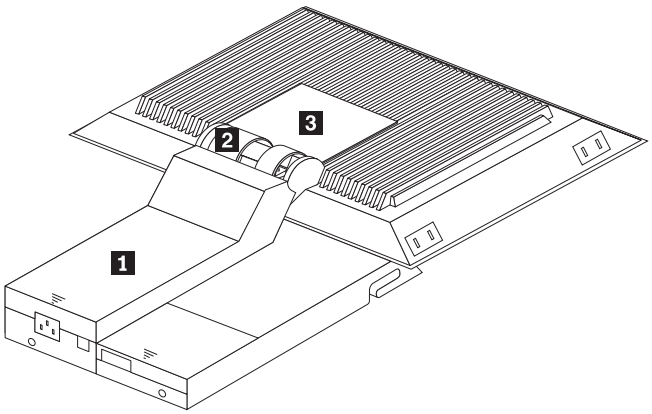
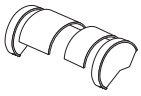


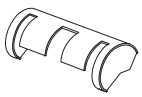
Figure 86. Installing the cable cover, hinge cover, and stand cover

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.

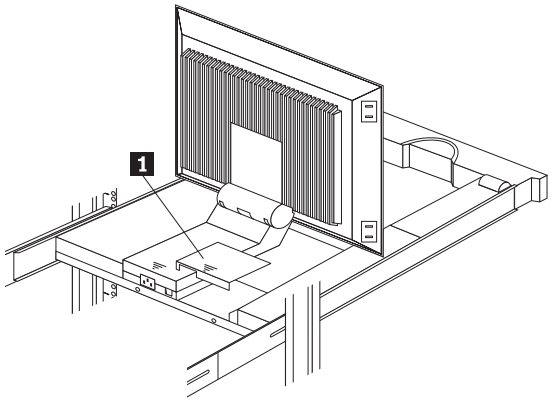


Figure 87. Routing the keyboard cable

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 117.

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.

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.

```
Port    Name

  1     Magic +
  2     CentralOfc +
  3     Sales-C +
  4     Sales-B
  5     Sales-A +
  6     Downtown
  7     Foreign +
  8

F1 Help       F2 Advanced
```

```
Port        Name

CentralOfc   2 +
Downtown     6
Foreign      7 +
Magic        1 +
Sales-A      5 +
Sales-B      4
Sales-C      3 +
             8

F1 Help      F2 Advanced
```

- 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
- 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.

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 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**.

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.

```
OSCAR Attributes

Resolution    640
Height         16
Horizontal     12
Vertical        7

Background      1
Highlight       4
Text            7

Delay Time      0
Order         Port
```

- 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:

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.

```
Flag Attributes

Enabled   Names on
Row       14
Column     1
Color      2
Text       0
Mode      Transparent
```

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:

```
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.

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.

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.

DANGERConnect 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.

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 instñÚÝável.**

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.

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

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.**

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.

1.

VORSICHT

- **Das zulässige H÷chstgewicht für auf Schienen montierte Einheiten beträgt 80 kg. Keine Einheiten mit h÷heren 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 anschlie*ß*en, 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 anschlie*ß*en. Nicht das Netzkabel einer in einem Gehäuse befindlichen Einheit an eine Netzeinheit in einem anderen Gehäuse anschlie*ß*en.

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.

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 아웃릿에 RACK의 전원 코드를 꽂으십시오.

4.

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:

- 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.

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.
- 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.

Part Number: 10K2658

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