

Power Systems

*Installing the 7953-94X and 7965-94Y
rack and features*

IBM

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Note

Before using this information and the product it supports, read the information in “Safety notices” on page v, “Notices” on page 37, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125-5823.

This edition applies to IBM Power Systems™ servers that contain the POWER8 processor and to all associated models.

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Safety notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, safety information documentation is included in the publications package (such as in printed documentation, on DVD, or as part of the product) shipped with the product. The documentation contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information documentation. You should also refer to the safety information documentation any time you do not clearly understand any safety information in the U.S. English publications.

Replacement or additional copies of safety information documentation can be obtained by calling the IBM Hotline at 1-800-300-8751.

German safety information

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

Laser safety information

IBM® servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

Laser compliance

IBM servers may be installed inside or outside of an IT equipment rack.

DANGER

When working on or around the system, observe the following precautions:

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

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- 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 procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices.

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- 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.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

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 observe the following precautions:
 - Remove all devices in the 32U 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 32U 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 230 mm (30 x 80 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 during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
 - 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 bolt the rack cabinet to the pallet.

(R002)

(L001)

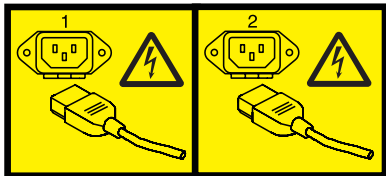


DANGER: Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)

(L002)



(L003)



or



or



DANGER: Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)

(L008)



CAUTION: Hazardous moving parts nearby. (L008)

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:

This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

(C026)

CAUTION:

Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

CAUTION:

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

CAUTION:

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

CAUTION:

The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

Do Not:

- ___ Throw or immerse into water
- ___ Heat to more than 100°C (212°F)
- ___ Repair or disassemble

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)

Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE

The following comments apply to the IBM servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metalically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metalically to OSP wiring.

Note: All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

Installing the 7953-94X and 7965-94Y rack and features

Use this information to install the 7953-94X and 7965-94Y racks and to install the related components of the rack system.

Installing a rack cabinet

The standard and expansion rack cabinets are 42U-high racks. The standard rack cabinet comes with side covers installed. The expansion rack cabinet does not come with side covers but includes the required hardware for building a suite of racks. You need one standard rack cabinet per suite.

Notes:

1. If required by local building codes, each stand-alone rack can be bolted to the floor with a fastener in each corner.
2. The illustrations provided in this information might differ slightly from your hardware.

Statement 1:



CAUTION: To ensure safety, all applicable components 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 foreseeable misuse conditions.

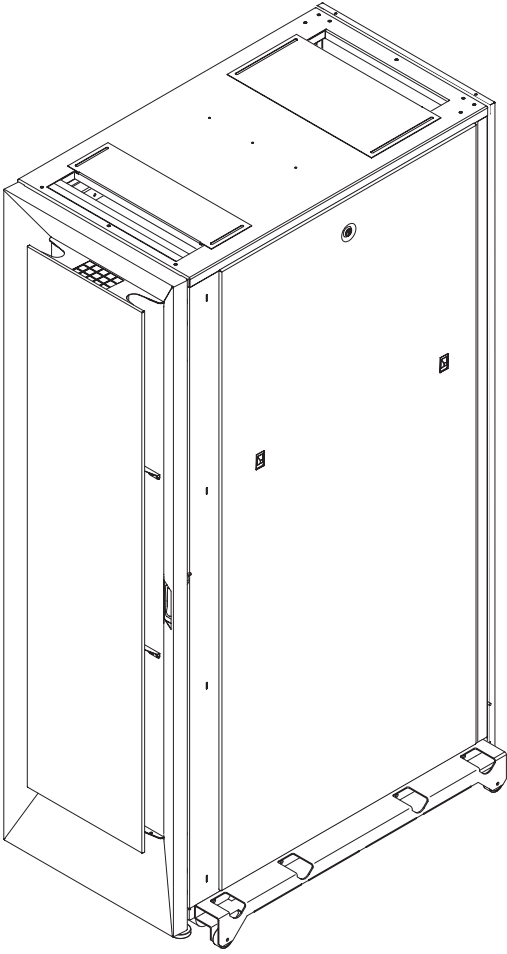


Figure 1. 7953-94X and 7953-94Y

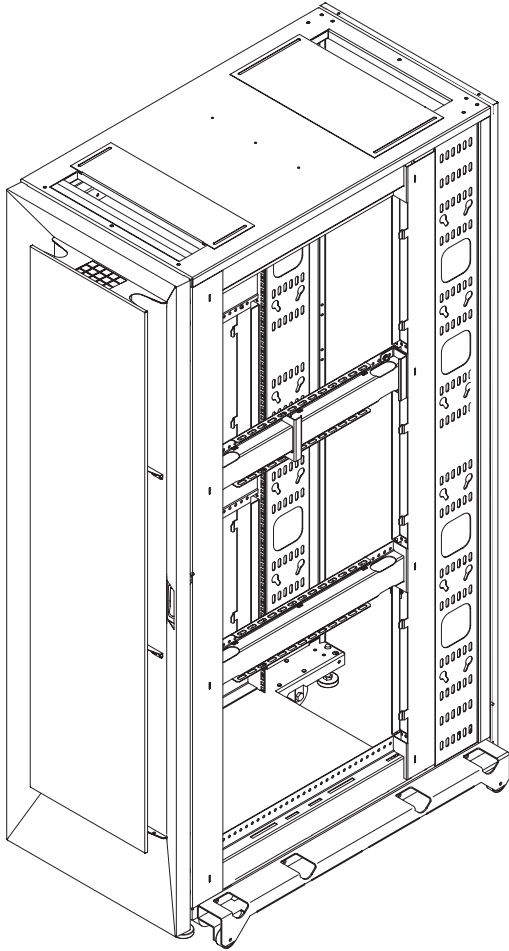


Figure 2. 7953-94X and 7953-94Y (comes without side covers)

Size and weight specifications

Learn about the size and weight specifications for your racks.

The 42U racks and 42U expansion racks conform to the Electronic Industries Association (EIA) standard *EIA-310-D Cabinets, Racks, Panels, and Associated Equipment (1992)*. For the rack cabinet dimensions and weights, see the following tables.

Table 1. 42U rack physical dimensions

Configuration	Dimensions
7953-94X and 7953-94Y without outriggers	2009 mm x 604 mm ¹ x 1177 mm (79.1 in. x 23.8 in. x 46.3 in.)
7953-94X and 7953-94Y with outriggers	2009 mm x 780 mm x 1177 mm (79.1 in. x 30.7 in. x 46.3 in.)
7953-94X and 7953-94Y without outriggers	2009 mm x 600 mm x 1177 mm (79.1 in. x 23.6 in. x 46.3 in.)
7953-94X and 7953-94Y with outriggers	2009 mm x 780 mm x 1177 mm (79.1 in. x 30.7 in. x 46.3 in.)

¹Includes side cover latches. When the side covers are removed, the rack width is 600 mm (23.6 in.).

Table 2. IBM PureFlex System 42U Rack and Expansion Rack weights

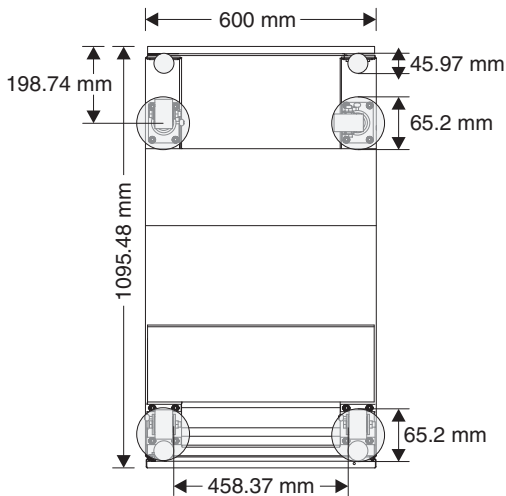
Model	Description	Approximate weight
7953-94X and 7953-94Y	With side panels, with outriggers	179 kg (394 lb)
7953-94X and 7953-94Y	With side panels, without outriggers	167 kg (367 lb)
7953-94X and 7953-94Y	Without side panels, with outriggers	142 kg (314 lb)
7953-94X and 7953-94Y	Without side panels, without outriggers	130 kg (287 lb)

Planning the floor layout

Learn more about how to plan your floor layout for this rack.

For planning purposes, use the floor layout that is shown in the following illustration as a guide for cutting holes in the floor tiles to run cables for the devices in the rack cabinet.

The circles in the illustration represent the area where the casters and leveling feet might touch the ground. Ensure that there are no holes in the floor tiles that are too close to these circles.



Front of Rack

Figure 3. Floor layout for cutting holes in the floor tiles

Removing and installing the outriggers (side stabilizers)

The outriggers are the stabilizers with wheels that are installed on the sides of the rack cabinet. After the rack is in its final location and will not be moved more than 2 m (6 ft.), you can remove the outriggers.



DANGER:

Always relocate the rack cabinet with the outriggers installed. Keep the outriggers and install them if you need to move the rack to another location in the future.

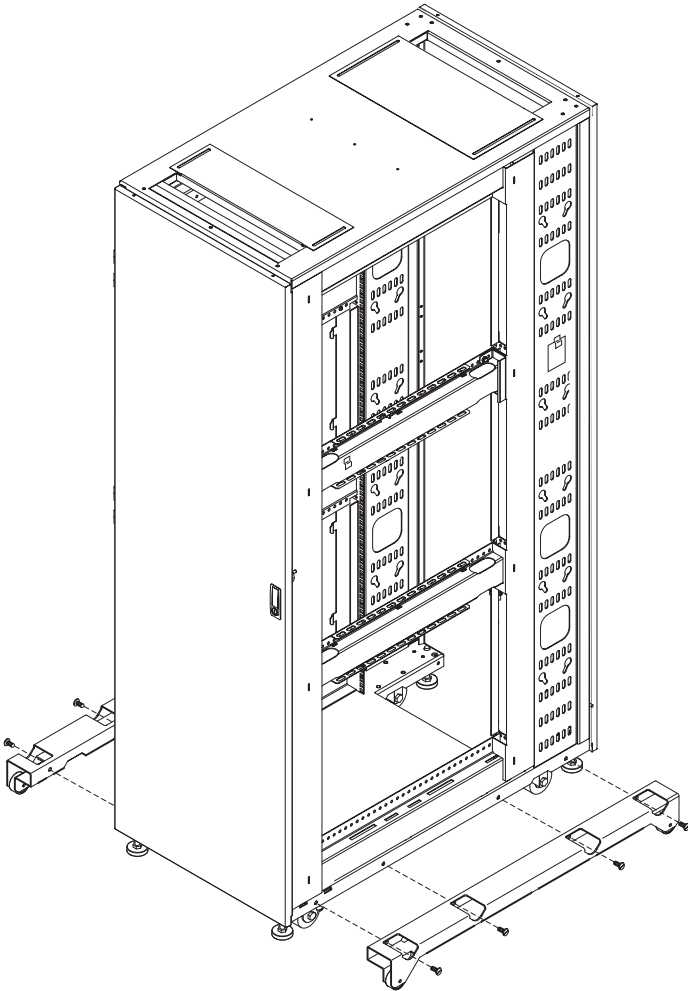
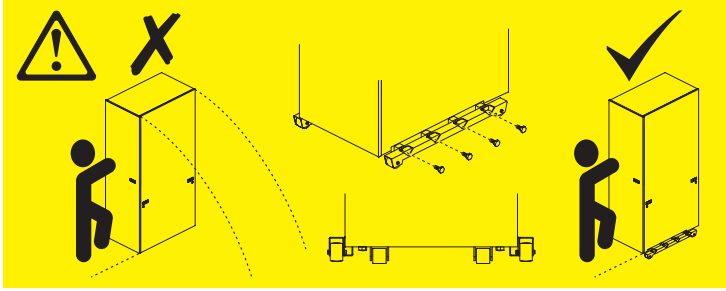


Figure 4. Removing and installing the outriggers

To remove the outriggers, use the 6 mm hex wrench that comes in the hardware kit to remove the four bolts that attach each outrigger to the rack cabinet. Keep the outriggers and bolts for future use if you need to move the rack.

Note:

1. Before you attach an expansion rack to a standard rack or another expansion rack, you must remove the outriggers from the racks so that the racks fit together correctly.
2. You can install or remove the outriggers on a rack cabinet with or without side covers.

Install the outriggers before you move the rack cabinet to another location. Use the 6 mm hex wrench that comes in the hardware kit to install the four bolts that attach each outrigger to the rack cabinet.

Installing the front stabilizer bracket, recirculation prevention plate (optional) and securing the rack to the floor surface

Learn about how to install the recirculation prevention plate, front stabilizer bracket, and to bolt the rack to the floor surface.

See the unpacking instructions that come with the rack cabinet for information about how to unpack and locate the rack.

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.

This procedure describes the following tasks:

- Lowering the leveling pads
- Installing the recirculation prevention plate (optional)
- Installing the front stabilizer bracket
- Bolting the rack cabinet to the floor surface for added stability

To install the recirculation prevention plate, front stabilizer bracket, and to bolt the rack to the floor surface, complete the following steps:

1. Use the open-end wrench that comes with the hardware kit 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.

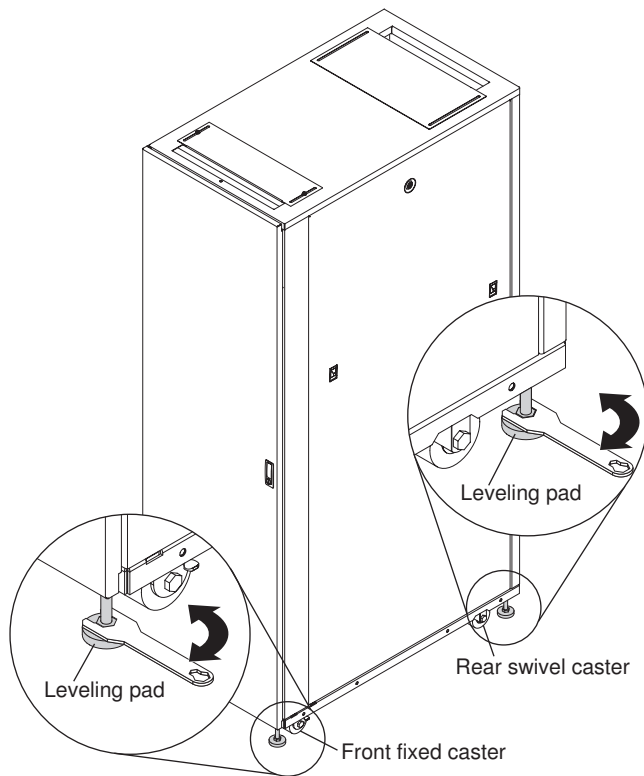


Figure 5. Lowering the leveling pads

2. Hand-tighten the thumbscrews on the front fixed casters.
3. Remove both outriggers from the sides of the rack by removing the four bolts on each side with a 6 mm hex wrench. Save the outriggers for use in the future if you need to move the rack cabinet to another location.

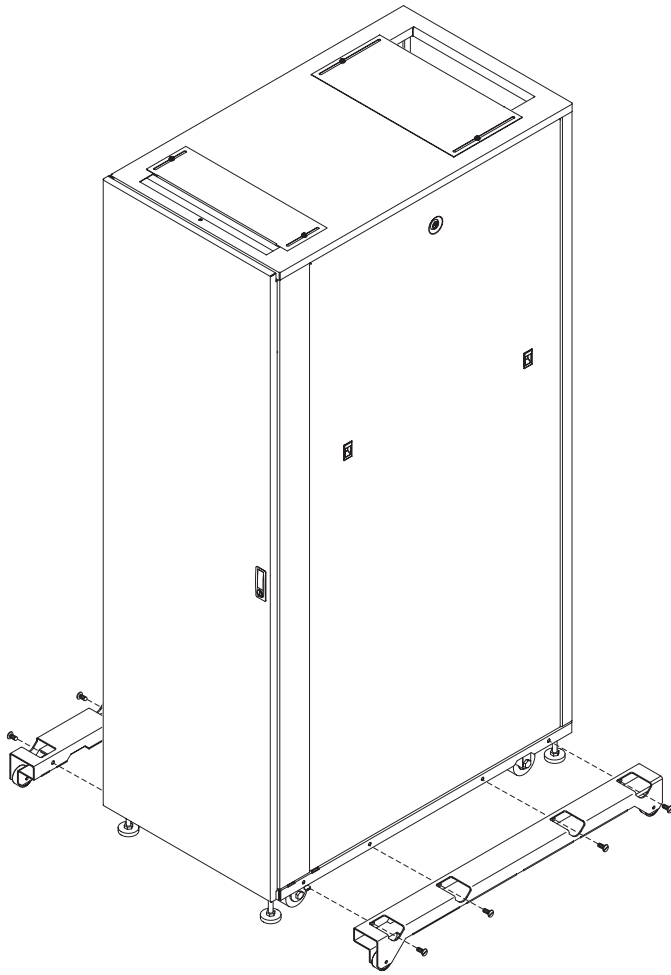


Figure 6. Removing the outriggers

4. Remove the front door if you are installing the recirculation prevention plate or front stabilizer bracket. For more information about removing the front door, see “Removing and installing a front door” on page 14.
5. Optional: **For rack cabinet 7953-94X and 7953-94Y:**
If this is not a stand-alone rack and you are not installing the front stabilizer bracket, attach the recirculation prevention plate with the four screws and hex wrench from the hardware kit.

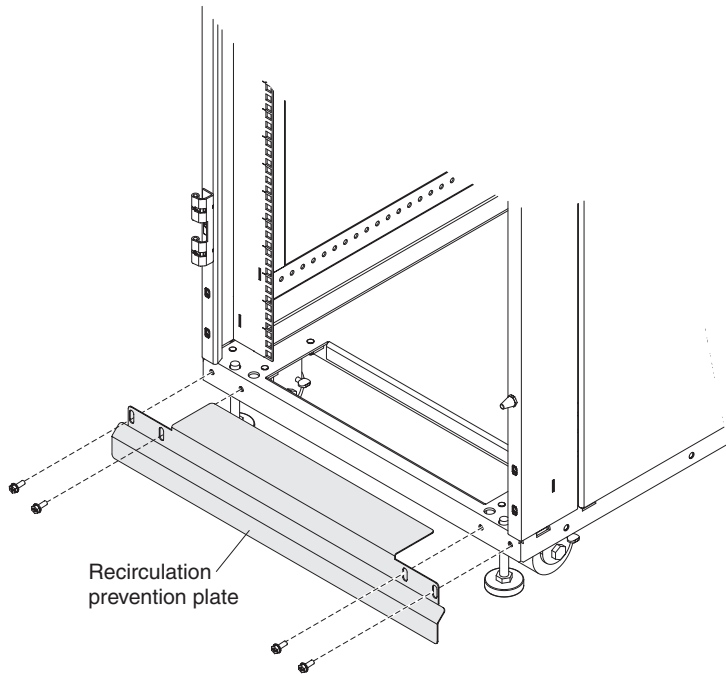


Figure 7. Installing the recirculation prevention plate and no front stabilizer bracket

For a stand-alone rack cabinet, 7953-94X and 7953-94Y:

- a. Align the four holes in the recirculation prevention plate with the four holes in the rack cabinet.

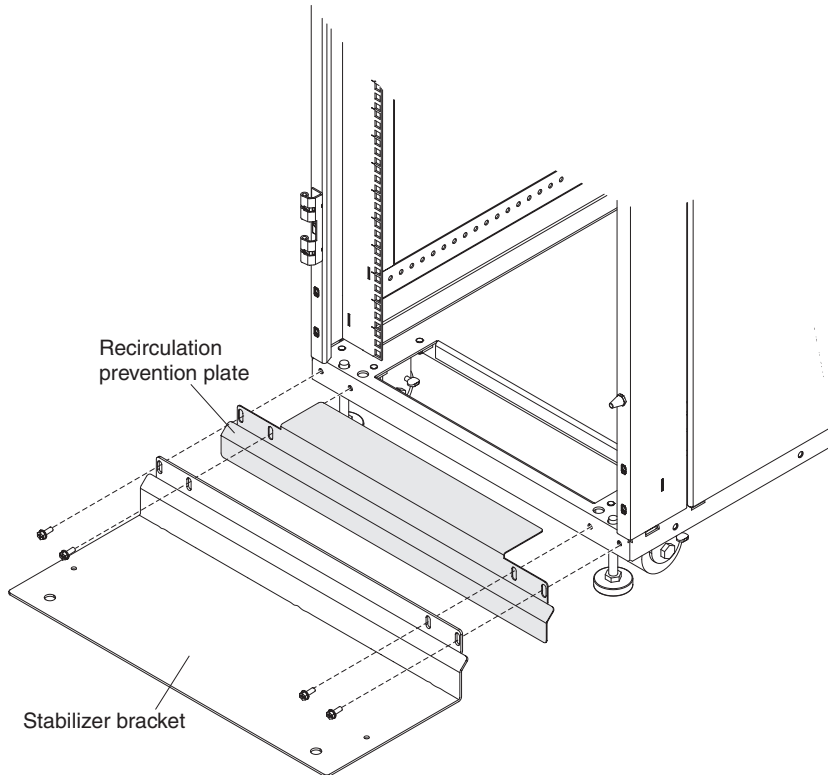


Figure 8. Installing the recirculation prevention plate and the front stabilizer bracket

- b. Position the front stabilizer bracket in front of the recirculation prevention plate and align the screw holes.
 - c. Use the four screws and the hex wrench that come in the hardware kit to secure the front stabilizer bracket and recirculation prevention plate to the rack cabinet.
 - d. Tighten the screws until the stabilizer bracket is flush against the recirculation prevention plate (if it is used) or flush against the rack (if the recirculation prevention plate is not used).
6. **For stand-alone rack cabinet 7953-94X and 7953-94Y:**

If you are not installing the recirculation prevention plate, attach the front stabilizer to the front of the rack cabinet with the screws and hex wrench that come with the hardware kit.

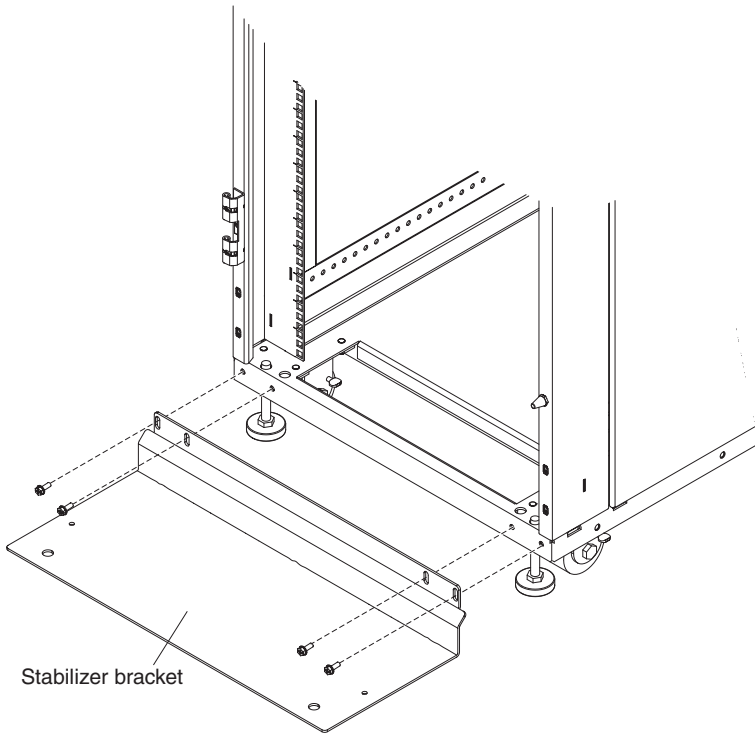


Figure 9. Installing the front stabilizer and no recirculation prevention plate

Note: If required by local building codes, each standalone rack can be bolted to the floor with a fastener in each corner.

7. Bolt the rack to the floor surface by using the following methods:
 - **If a front stabilizer bracket or stabilizer plate is installed**, bolt the rack to the floor surface through the holes in the front stabilizer by using two bolts and washers.

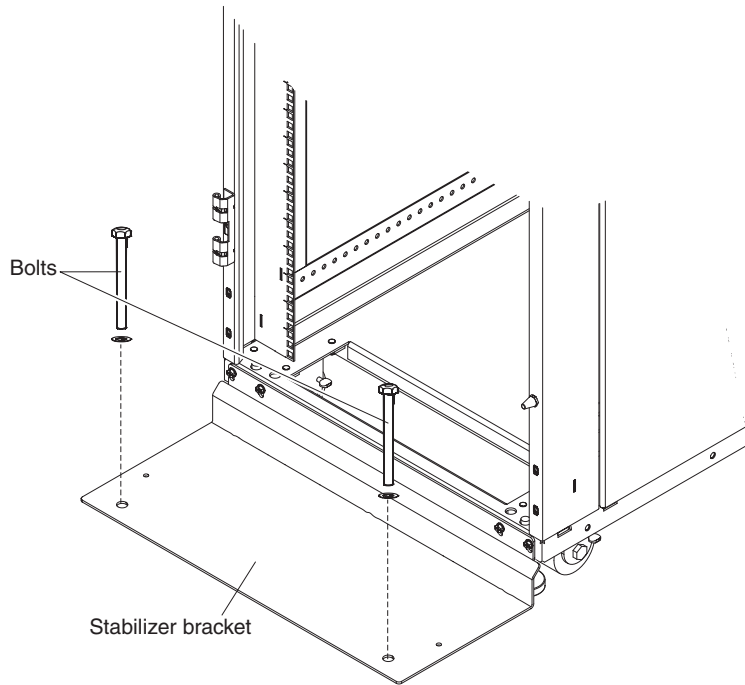


Figure 10. Bolting the front stabilizer to the floor surface

Bolt the rear of the rack to the floor surface through the holes in the lower frame by using two bolts and washers.

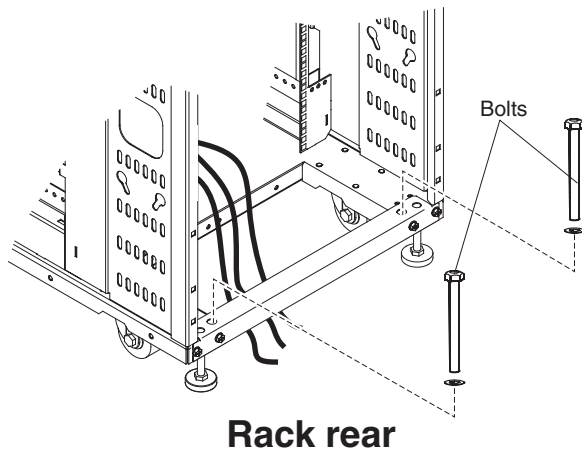


Figure 11. Bolting the rear of the rack to the floor surface

- **If a front stabilizer bracket or stabilizer plate is not installed**, bolt the front of the rack to the floor surface through the holes in the lower frame by using two bolts and washers.

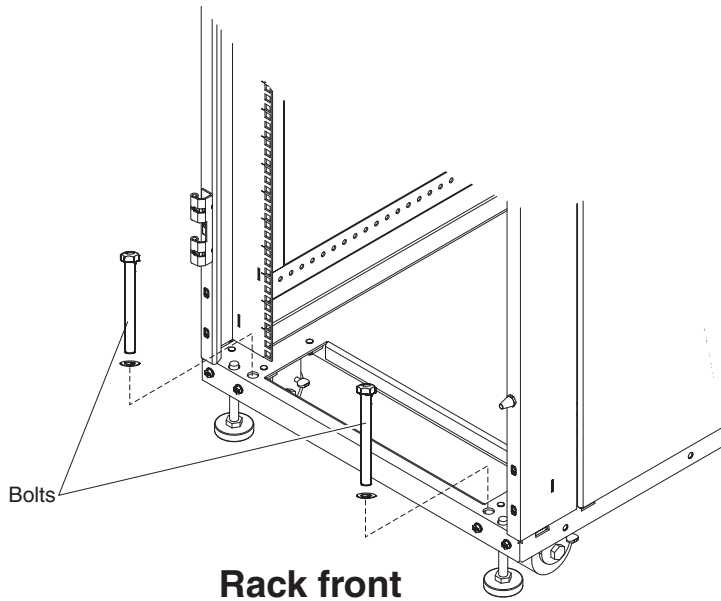


Figure 12. Bolting the front of the rack to the floor surface

Bolt the rear of the rack to the floor surface through the holes in the lower frame by using two bolts and washers. See Figure 11 on page 11.

8. Reinstall the front door if you removed it in step 4 on page 8.

Removing and installing the side covers

Learn how to remove the side covers from a standard rack.

The standard rack comes with the side covers installed. Remove the side covers from the rack before you install or remove optional devices.

To remove the side covers from a standard rack, complete the following steps:

1. Unlock the button lock on the top of a side cover.

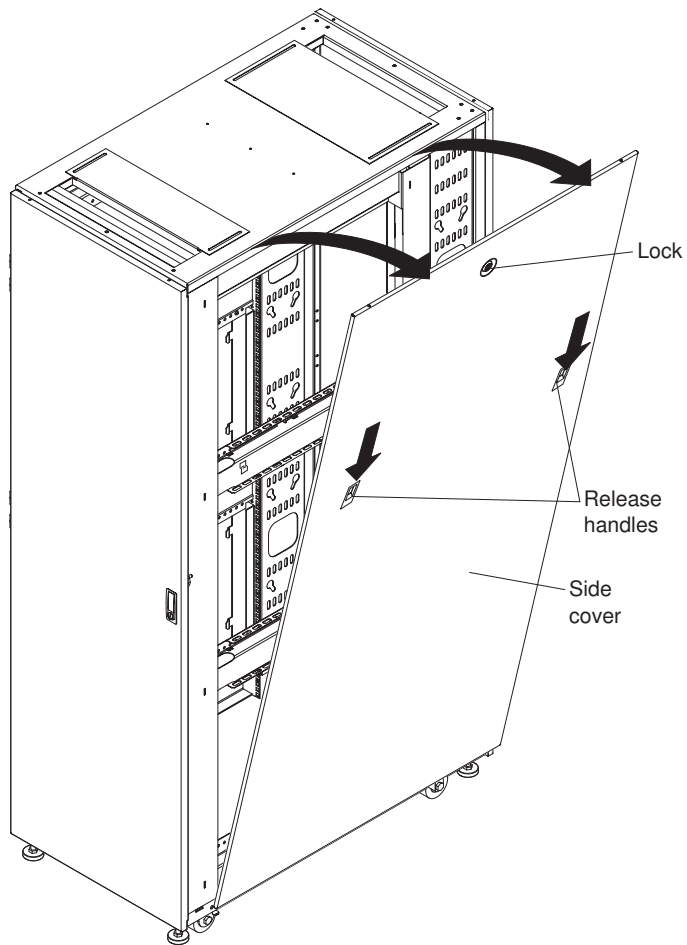


Figure 13. Removing a side cover

2. Press down on both release handles and tilt the top of the side cover slightly toward you; then, lift the side cover up and away from the ridge on the bottom of the rack cabinet.
3. Repeat this procedure to remove the second side cover.

Installing the side covers

4. To install a side cover, align the side cover with the ridge in the bottom side of the rack cabinet and press down. Press in on both release handles and then rotate the top of the side cover toward the rack. Lock the side cover to secure it to the rack cabinet.

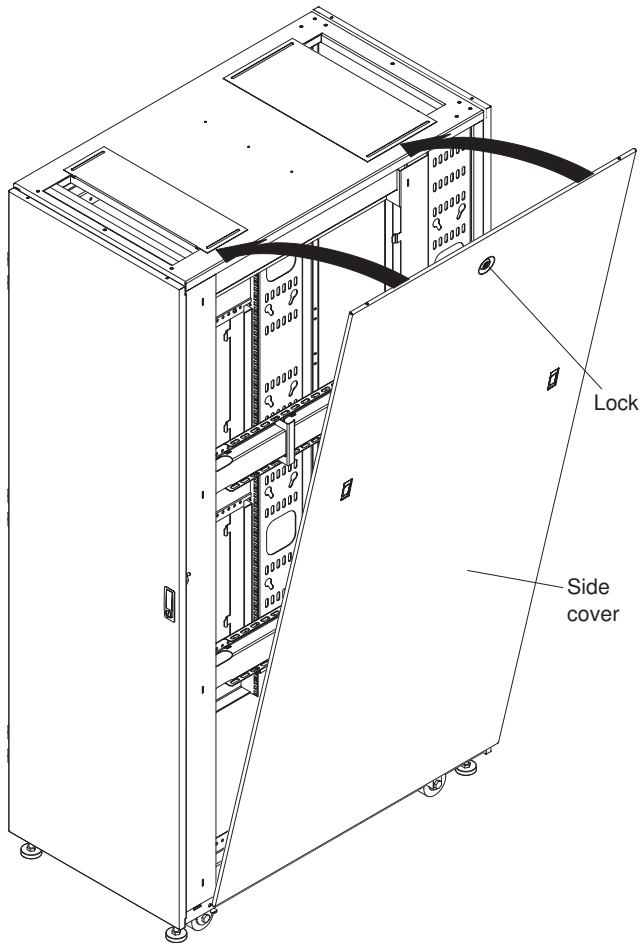


Figure 14. Installing a side cover

Removing and installing a front door

Learn how to remove and install a front door on your rack.

1. Unlock and open the door.

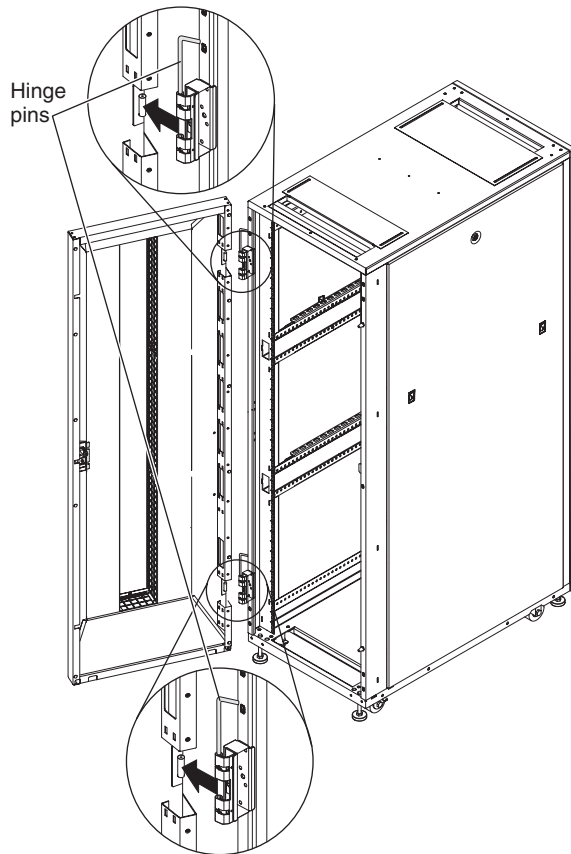


Figure 15. Removing a front door

2. Holding the door firmly with one hand, lift both hinge pins until they lock in the open position. This releases the door from the hinges.
3. Grasp the door firmly with both hands and pull it away from the hinges; then, set the door aside.

Installing a front door on the rack cabinet

To install a front door on the rack cabinet, complete the following steps:

1. Grasp the door firmly with both hands, align the door with the hinges, and slide the door into place.
2. Holding the door with one hand, push the hinge pins down to the closed position.

Removing and installing a rear door

Learn how to remove a rear door from the rack cabinet.

All racks come with the rear door installed. Remove the rear door when you install and remove devices in the rack, if part of the rack is obstructed by the door as you install devices.

To remove a rear door from the rack cabinet, complete the following steps:

1. Unlock and open the door.

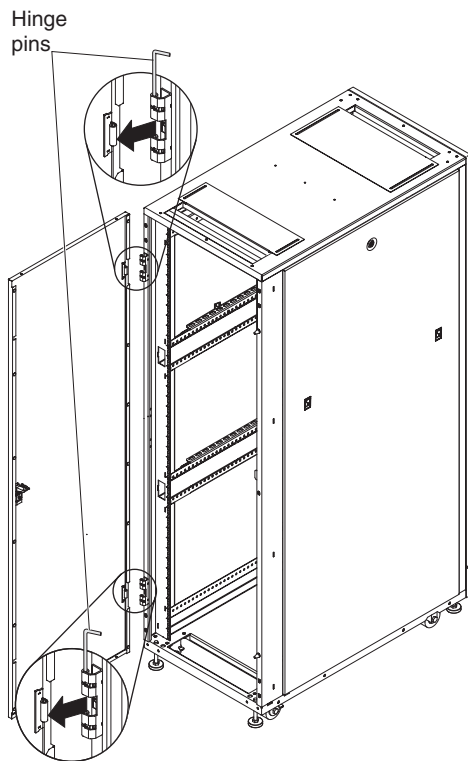


Figure 16. Removing a rear door

2. Holding the door firmly with one hand, lift both hinge pins until they lock in the open position. This releases the door from the hinges.
3. Grasp the door firmly with both hands and pull it away from the hinges; then, set the door aside.

Installing a rear door

To install a rear door on the rack cabinet, complete the following steps:

1. Grasp the door firmly with both hands, align the door with the hinges, and slide the door into place.
2. Holding the door with one hand, push the hinge pins down to the closed position.

Attaching racks in a suite

Learn how to attach an expansion rack to a standard rack or another expansion rack.

1. Before you attach an expansion rack to a standard rack or another expansion rack, you must remove the outriggers from the racks so that the racks fit together correctly.
2. You *cannot* install the front upper attachment bracket on the following rack models:
 - 7953-94X with Feature Code EU21
 - 7953-94Y with Feature Code EU21
3. For rack models 7953-94X and 7953-94Y with Feature Code EU21, when you attach racks together, make sure that you leave the maximum gap allowed by the baying kit so there is ample door clearance.

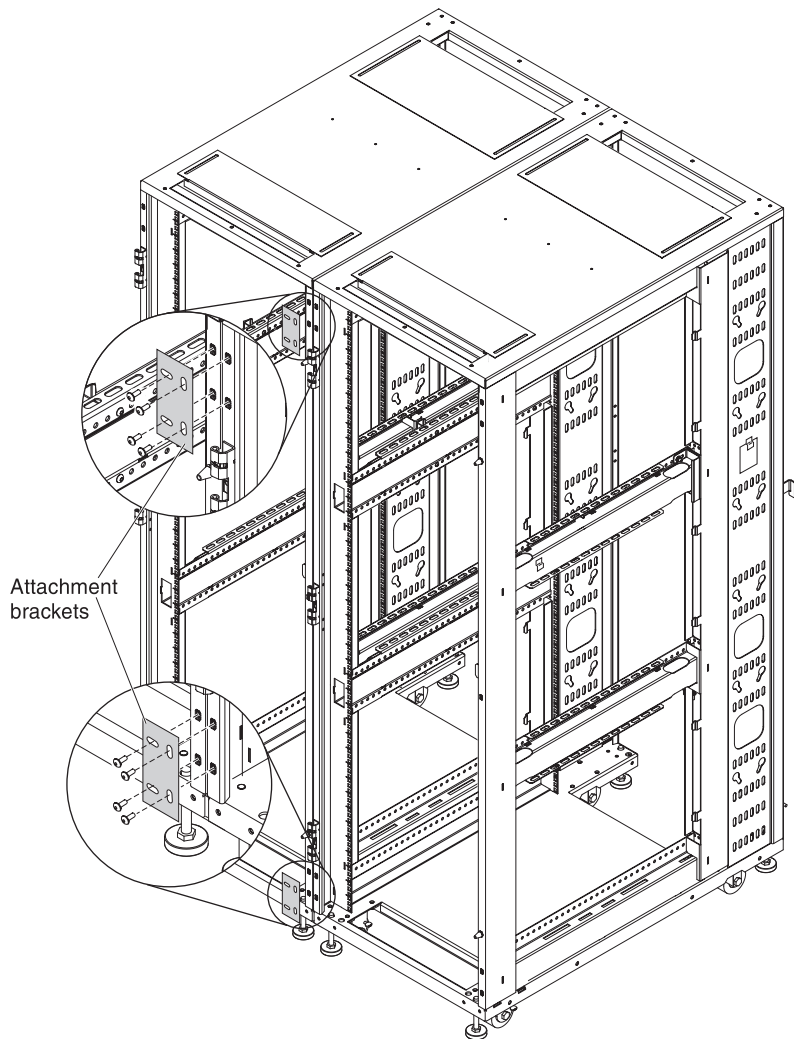


Figure 17. Attaching standard and expansion racks to each other to form a suite

Expansion racks come with all the hardware that is required for you to attach racks together and form a suite. A hex wrench and screws come with the expansion-rack hardware kit. You need one standard rack to form a suite.

To attach racks together in a suite, complete the following steps:

1. Remove the front and rear doors.
2. On the side of the standard rack cabinet where you are attaching the expansion rack, remove the side cover. For more information, see “Removing and installing the side covers” on page 12.
3. Where the two racks come together at the top front, align the screw holes of an attachment bracket (which comes with the expansion rack cabinet) with the holes in the standard rack and expansion rack (see the illustration). Secure the bracket to the racks with four screws. Do not fully tighten the screws. Repeat this step for the bottom front attachment bracket. Then, tighten all of the bracket screws.
4. Repeat step 3 to attach the rear top and bottom attachment brackets.

Repeat this procedure to attach additional expansion racks to the suite.

Installing optional devices

There are many servers and optional devices that you can install in the standard and expansion racks. Always read the documentation that comes with your server or optional device for detailed installation instructions.

Installation guidelines

When you install optional devices in the rack cabinet, follow these safety guidelines.

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 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:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

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.

Make sure that you install filler panels over all unoccupied bays.

Always install the heaviest devices in the bottom of the rack cabinet. A configurator tool is available at <http://www.ibm.com/systems/x/configtools.html> to assist you with determining where to install optional devices in the rack.

For more information about rack cabinets and optional devices, see <http://www.ibm.com/systems/xbc/cog/rackcabinetsoptions/rackcabinetsoptions.html>.

Installing devices on the rack-mounting flanges

For optional devices that require threaded holes for mounting, you must install either cage nuts or clip nuts.

Use cage nuts in the square mounting holes provided in the rack-mounting flanges in the main horizontal 42U compartment. Use clip nuts in the round holes provided in the six 1U rear vertical-mounting compartments. For detailed information about the mounting requirements for a device, see the instructions that come with the device.

Note: The rack cabinet comes with a supply of cage nuts and clip nuts, and devices that require them come with the applicable cage nuts or clip nuts.

Installing threaded rails

Learn to install threaded rails.

If a device has threaded holes or device rails that have threaded holes, you must install the device on the rail-mounting flanges on the inside of the rack-mounting flanges. For detailed information about how to use threaded rails, see the device documentation.

Installing cage nuts

Learn how to install cage nuts.

Install cage nuts in 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 and some optional devices.

Using the cage-nut-insertion tool:

The cage-nut insertion tool is used to install cage nuts.

To install a cage nut with the cage-nut-insertion tool, complete the following steps.

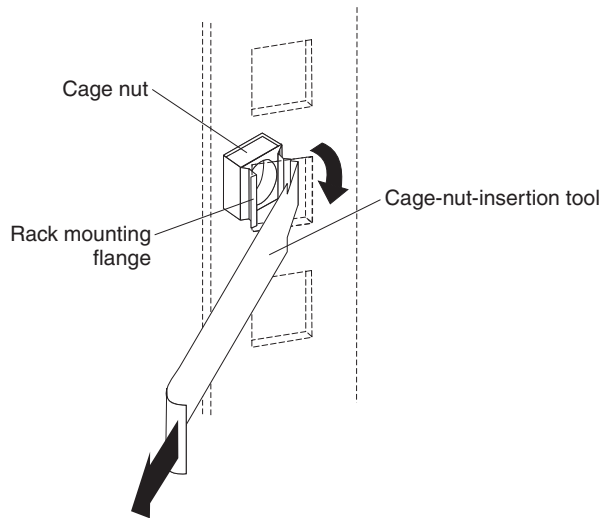


Figure 18. Installing cage nuts with the cage-nut-insertion tool

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: To install a cage nut with a flat-blade screwdriver, complete the following steps.

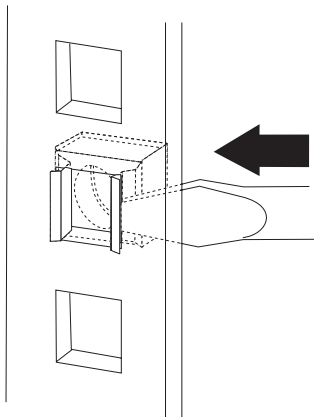


Figure 19. Installing cage nuts with a flat-blade screwdriver

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.

Installing clip nuts

Learn to install clip nuts.

Install clip nuts by sliding them over the mounting holes in the rear vertical 1U mounting compartments as shown in the following illustration.

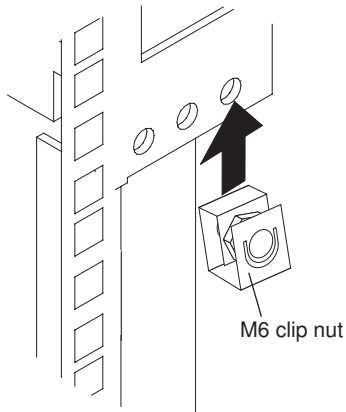


Figure 20. Installing clip nuts on the rack-mounting flanges

Installing devices vertically in the rack cabinet

You can use the space on the sides and in the rear of the rack cabinet to vertically mount power distribution units (PDUs) and console switches.

For more information about installing a device vertically in the rack cabinet, see the documentation that comes with your PDU or console switch.

Installing a 1U PDU or console switch vertically in the rack side area

Learn to install a 1U power distribution unit or console switch vertically in a rack side area.

The rack cabinet comes with space on the sides to vertically mount power distribution units (PDUs) and console switches. Each rack has six locations, three on each side of the rack cabinet. To install a device in the side area, you must use flange nuts and the M6 button-head cap screws that come in the hardware kit.

To install a 1U PDU or console switch vertically in the rack side area, complete the following steps:

1. Attach the two mounting brackets to the sides of the PDU or console switch. For more information, see the documentation that comes with the device.
2. Align the holes in the mounting bracket with the holes in the rack flange.

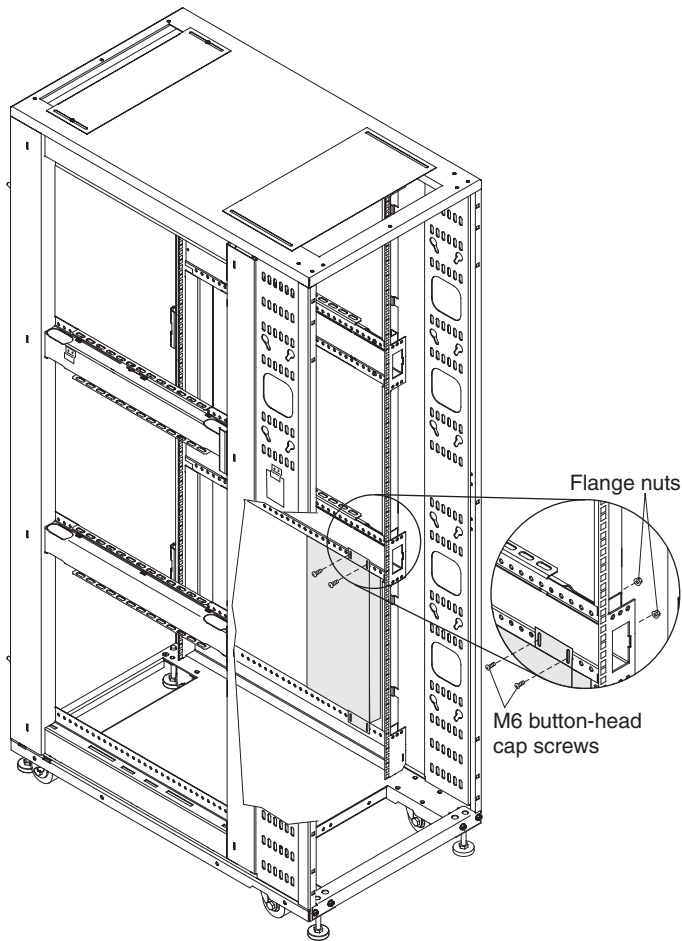


Figure 21. Installing a 1U PDU or console switch vertically in the rack side area

3. Secure the PDU or console switch to the rack with four flange nuts on the rack flange and four M6 button-head cap screws on the mounting bracket side.

Installing a 1U PDU or console switch vertically in a rack side pocket

Learn to install a 1U power distribution unit or console switch vertically in a rack side pocket.

The rack cabinet comes with rear vertical side pockets that you can use to vertically mount power distribution units (PDUs) and console switches. Each rack has six locations, three on each side of the rack cabinet. The rear vertical side pockets have round holes in the rack-mounting flanges. You must install clip nuts in the holes before you install a device.

To install 1U PDU or console switch vertically in a rack side pocket, complete the following steps:

1. Attach the two mounting brackets to the sides of the PDU or console switch. For more information, see the documentation that comes with the device.
2. Install four clip nuts on the rack flanges as shown in the illustration.

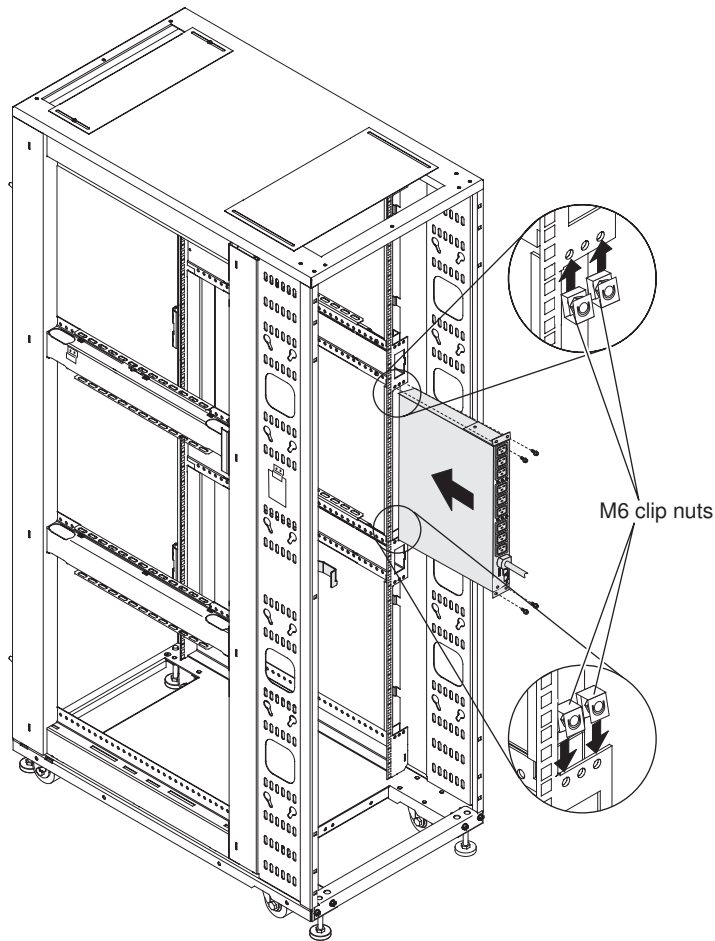


Figure 22. Installing a 1U PDU or console switch vertically in a rack side pocket

- Carefully slide the PDU or console switch into the side pocket and secure the device with four M6 screws.

Installing a 0U PDU vertically in the rear of a rack cabinet

Learn to install a 0U power distribution unit vertically in the rear of a rack cabinet.

The following illustration shows one way to install a 0U PDU in the rear of the rack cabinet. You can install up to four 0U PDUs vertically in the rack cabinet, depending on your rack configuration.

To install a 0U PDU vertically in the rear of a rack cabinet, orient the PDU vertically and insert the two pegs on the PDU into the keyhole slots in the side of the rack cabinet (see the following illustration). Push down to secure the PDU in position.

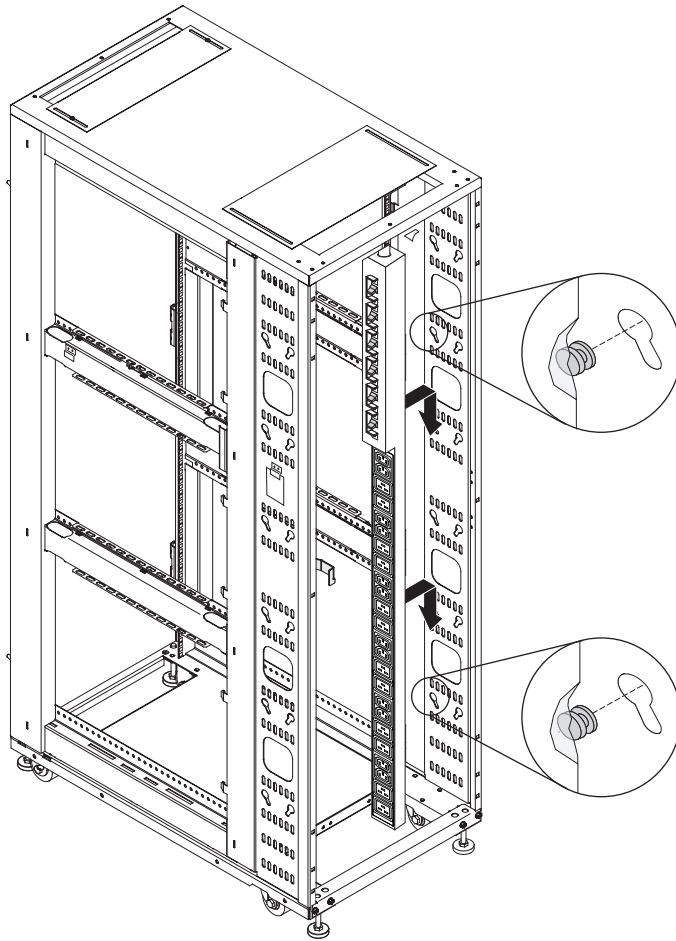


Figure 23. Installing a 0U PDU vertically in the rear of the rack cabinet

Managing cables

Use these guidelines when you cable servers or other devices that you install in a rack cabinet.

Always read the instructions that come with your server or optional device for detailed cable-management information.

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 cables beyond the specified limits.
- Label all cables so that they are clearly distinguishable from each other.
- When you install devices that are mounted on slide rails, such as servers, observe the following precautions:
 - 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 you can fully extend the device without straining the cables.
 - Secure the cables so that you can retract the device without pinching or cutting the cables.
- When you install devices that are mounted on fixed rails, observe the following precautions:
 - 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.
- Make sure 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 racks through the large openings in the rear of the rack cabinet.
- Run external cables through the bottom of the rack cabinet or through the cable-access opening in the top of the rack.

Front-to-rear cable channels

You can route cables from the front to the rear of the rack cabinet by using the cable channels on the sides of the rack. There are two cable channels on each side of the rack cabinet.

Before you use a cable channel, remove the cable channel cap. You can use a flat-blade screwdriver or a similar tool to pry the cap off the end of the channel. If a cable channel is not being used, keep the cap in place to prevent hot air recirculation from the rear of the rack to the front of the rack.

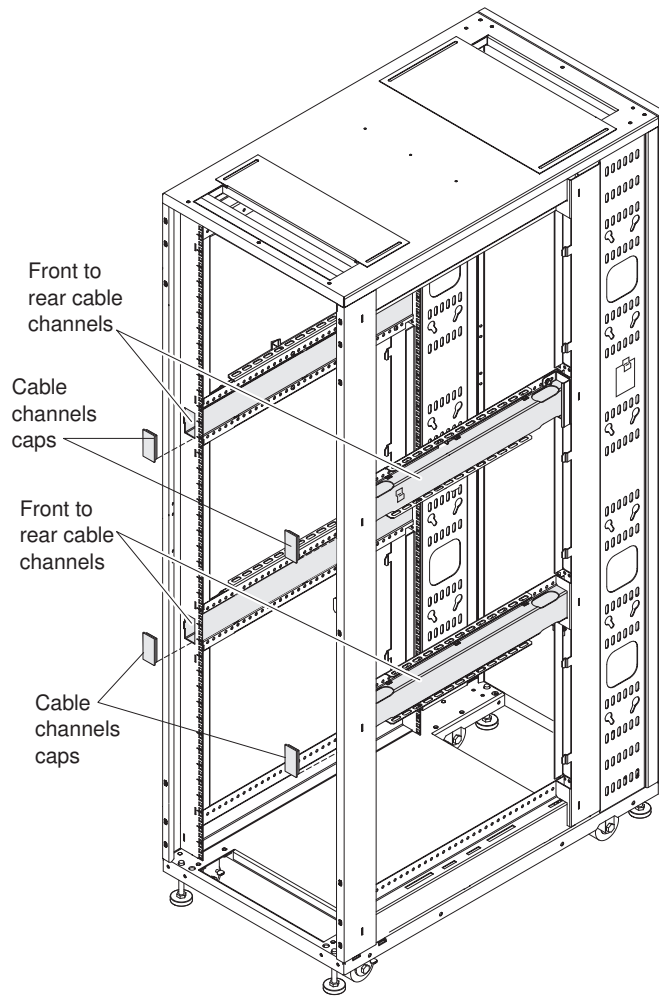


Figure 24. Removing the caps from the front-to-rear cable channels

Using the cable-access bar in the bottom of the rack cabinet

The cable-access bar on the bottom rear of the rack cabinet keeps the external cables in place.

To route external cables through the opening in the bottom rear of the rack, complete the following steps:

1. Remove the four screws that attach the cable-access bar to the rack cabinet, as shown in the following illustration.

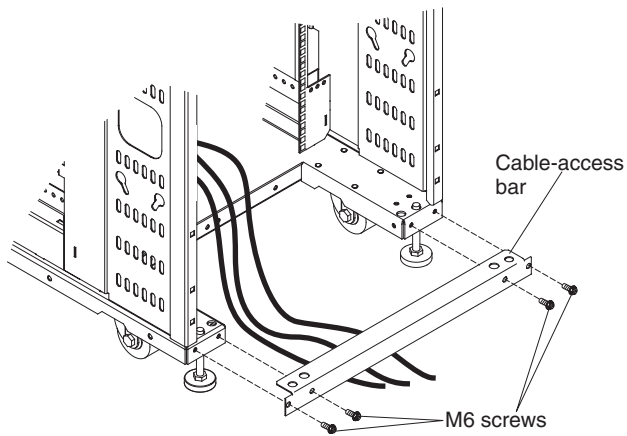


Figure 25. Routing cables using the cable-access bar

2. Route the cables through the opening.
3. Reattach the cable-access bar to the rack cabinet with the four screws that you removed in step 1. Make sure that you do not pinch or cut any cables.

Using the cable-access openings in the top of the rack

Route cables through the cable-access openings.

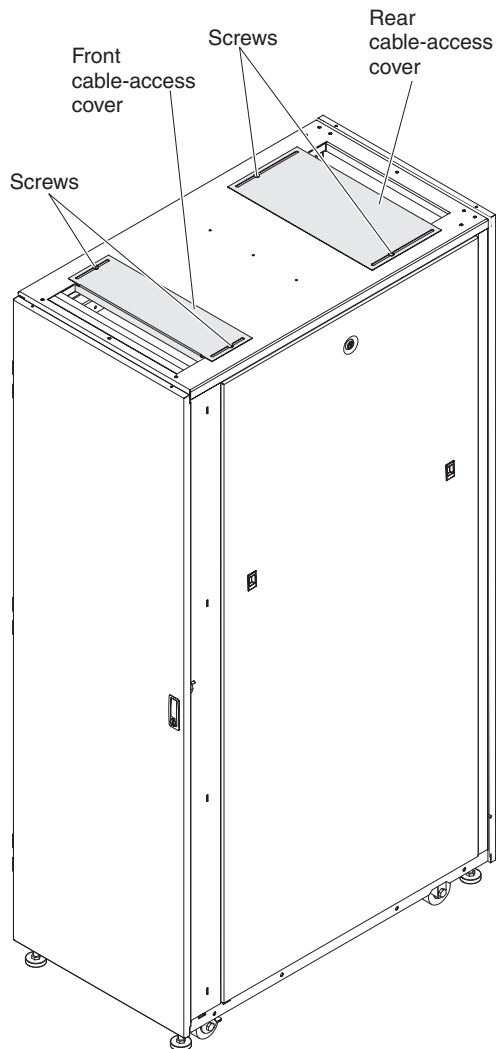


Figure 26. Location of the cable-access openings

Use the front and rear rectangular cable-access openings on the top of the rack cabinet to route external cables and to control the flow of air inside the rack.

To adjust a cable-access cover, use a Phillips or flat-blade screwdriver to loosen the two screws on the sides of the cover. Then, slide the cable-access cover to the position that you want, based on the requirements for your rack configuration. Use the following guidelines to adjust the size of the cable-access openings:

- **Top front cable-access opening:** Slide the cable-access cover as far forward as possible to close off the open area so no hot exhaust air can recirculate back through the rack and exhaust out the top of the rack. The front opening is very close to the front of the rack and the air inlet to the servers in the rack.
- **Top rear cable-access opening:** Slide the cover all the way open or closed, or in any intermediate position. Leaving the cover open provides extra exhaust area for components near the top and bottom of the rack; however, in some configurations, this shortens the hot air recirculation path from the rear to the front.

For information about adjusting the air flow in the rack if an IBM Rear Door Heat eXchanger is installed on the rack cabinet, see the *Installation and Maintenance Guide* that comes with the heat exchanger.

Mounting an overhead cable tray

The rack cabinet comes with pre-drilled holes in the top that you can use to attach an overhead cable tray (not provided by IBM) to the top of the rack suite.

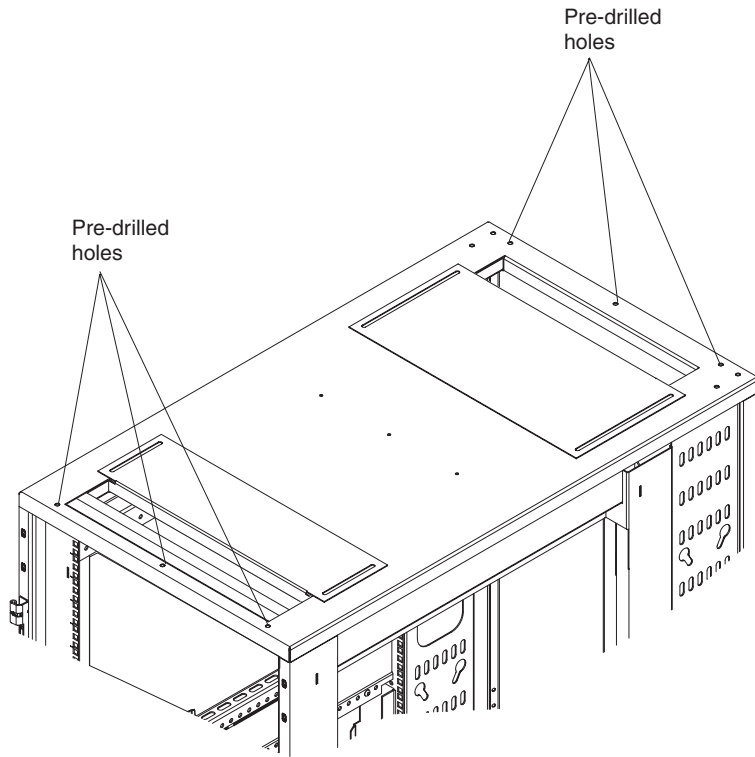


Figure 27. Pre-drilled holes in the top of the rack cabinet

Moving a rack cabinet

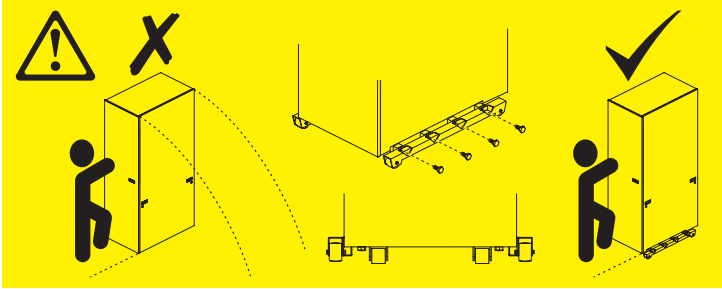
Learn how to move a rack cabinet between locations.

Before you move the rack cabinet to another location, ensure that you have read the guidelines provided.

When you move a rack cabinet, observe the following safety guidelines.

  > 500 lbs. (> 227 kg.)	<p>Use Only Professional Movers!</p> <p>يجب الاستعانة بخبرات نقل متدربة</p> <p>Utilizar somente transportadores profissionais</p> <p>Faire appel à des professionnels seulement pour déplacer l'équipement.</p> <p>只能使用专业搬运机</p> <p>Maak gebruik van professionele verhuizers</p> <p>Faites exclusivement appel à des déménageurs professionnels.</p> <p>Nur professionelle Transportunternehmen mit der Durchführung beauftragen.</p> <p>Να μετακινείται μόνο από επαγγελματίες μεταφορείς</p> <p>העזרו במובילים מקצועיים בלבד</p> <p>Csak hivatásos szállítóval költöztessze</p> <p>Avvalersi solo di trasportatori esperti</p> <p>機器を移動するには専門の業者に依頼してください。</p> <p>전문 운송 인력만이 이동시킬 수 있습니다.</p> <p>Należy korzystać wyłącznie z usług wyspecjalizowanych firm.</p> <p>El traslado del equipo debe realizarlo personal especializado</p> <p>Trebaju raditi samo profesionalni transportni radnici</p> <p>Použite pouze profesionální stěhováky</p> <p>Brug kun professionelle flyttefolk.</p> <p>Käytä vain ammattitaitoista kuljetusliikettä</p> <p>Utstyret må kun flyttes av godkjent flyttepersonell</p> <p>Contacte apenas transportadoras profissionais</p> <p>Используйте только профессиональных грузчиков</p> <p>Na presun použite len profesionálov</p> <p>Använd endast professionell flyttpersonal</p>
  Use Only Professional Movers!	





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.

Make sure that a load of 75 kg (165 lb) or more is placed at the bottom of a configured rack that is not bolted to the floor.

To move the rack cabinet to another location, complete the following general steps:

1. Follow all the safety guidelines.
2. Know the weight of the rack cabinet. A general guideline is to assume a weight of 23 kg (50 lb) per rack U-space.
3. Use the following weight limit guidelines:
 - If the rack cabinet is empty, at least two people are required to move the rack.
 - If the rack cabinet weight is between 142 and 227 kg (between 313 and 500 lb), three or four people are required to move the rack.
 - If the rack cabinet weight is greater than 227 kg (500 lb), professional movers are required to move the rack.
4. Install the outriggers on both sides of the rack cabinet.



DANGER

Always relocate the rack cabinet with the outriggers installed. Keep the outriggers and install them if you need to move the rack to another location in the future.

Use the 6 mm hex wrench that comes in the hardware kit to install the four bolts that attach each outrigger to the rack cabinet. Ensure that you tighten the bolts securely.

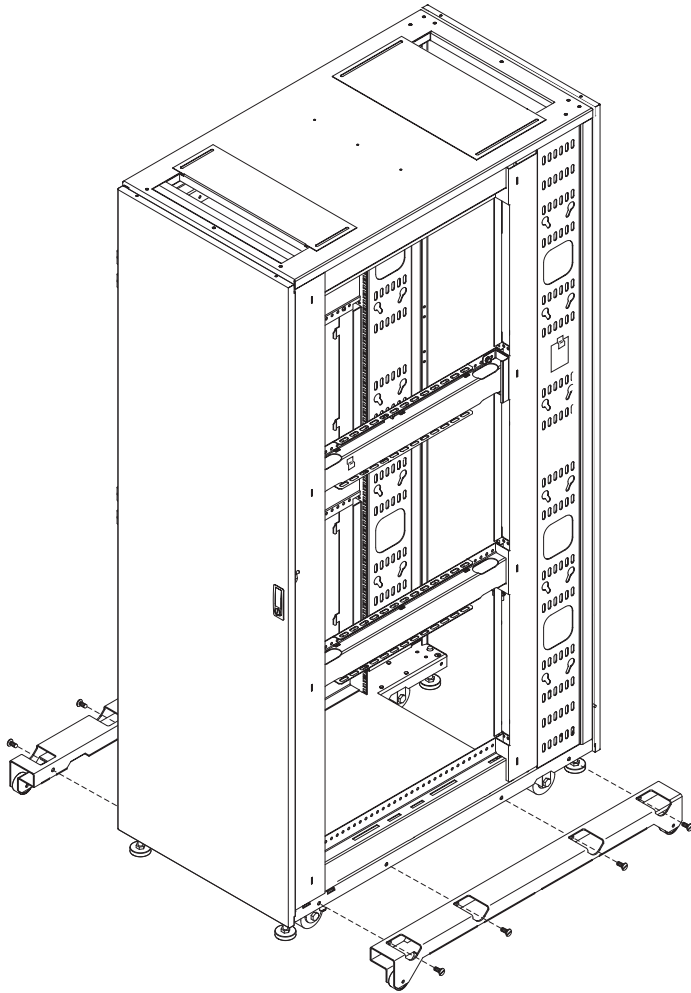


Figure 28. Installing the outriggers

5. Carefully move the rack cabinet to the new location by using the specified safety guidelines.

Parts listing

The parts listing includes all replaceable components that are available for the racks.

For an updated parts listing, go to <http://www.ibm.com/supportportal/>.

Field replaceable units (FRUs) must be replaced only by a trained service technician, unless they are classified as customer replaceable units (CRUs).

Tier 1 CRU: Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request without a service contract, you will be charged for the installation.

Tier 2 CRU: You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your product.

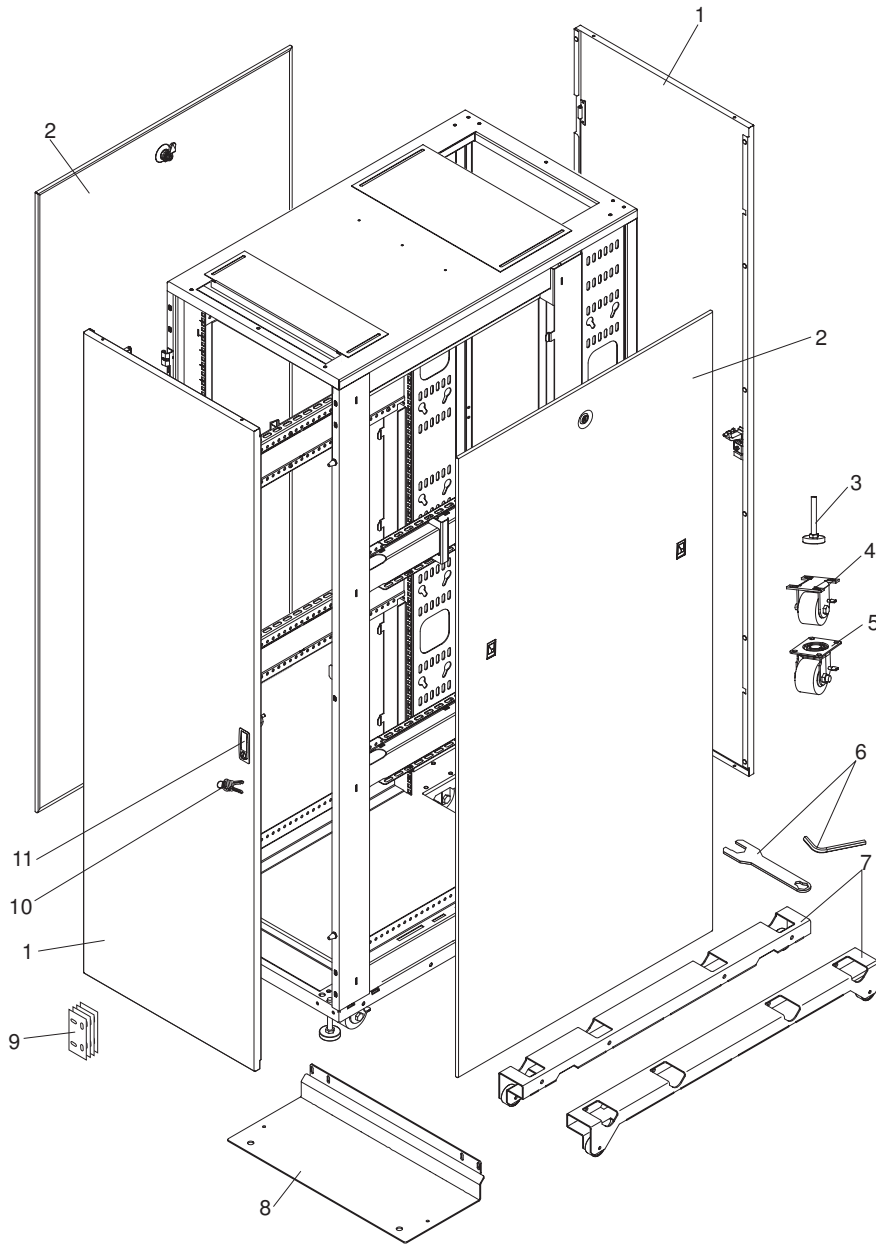


Figure 29. IBM 42U rack and expansion rack parts

Table 3. Parts listing for IBM PureFlex System 42U Rack, 7953-94X and 7953-94Y

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number (trained service technician only)
	IBM PureFlex™ System 42U rack front door	00D7661		
1	Rear door	90Y3056		
2	Side cover	90Y3065		
3	Adjustable foot			90Y3063
4	Fixed caster, front			90Y3061
5	Swivel caster, rear			90Y3062

Table 3. Parts listing for IBM PureFlex System 42U Rack, 7953-94X and 7953-94Y (continued)

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number (trained service technician only)
6	Hardware and tool kit (includes tools, screws, washers, cage nuts, and fasteners)	90Y3064		
7	Outrigger (side stabilizer)		90Y3066	
8	Front stabilizer		90Y3059	
9	Baying kit	90Y3060		
10	Keys, door and side cover	90Y3058		
11	Latch, door	90Y3057		
	IBM Rear Door Heat eXchanger V2			95Y2284

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This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

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IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
email: halloibm@de.ibm.com

Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

VCCI Statement - Japan

この装置は、クラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A

The following is a summary of the VCCI Japanese statement in the box above:

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)

高調波ガイドライン適合品

Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline with Modifications (products greater than 20 A per phase)

高調波ガイドライン準用品

Electromagnetic Interference (EMI) Statement - People's Republic of China

声 明

此为 A 级产品, 在生活环境中, 该产品可能会造成无线电干扰。在这种情况下, 可能需要用户对其干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용(A급)으로 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Germany Compliance Statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:
"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Regulations, Abteilung M372
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
email: halloibm@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

Electromagnetic Interference (EMI) Statement - Russia

**ВНИМАНИЕ! Настоящее изделие относится к классу А.
В жилых помещениях оно может создавать
радиопомехи, для снижения которых необходимы
дополнительные меры**

Class B Notices

The following Class B statements apply to features designated as electromagnetic compatibility (EMC) Class B in the feature installation information.

Federal Communications Commission (FCC) statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM-authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication equipment.

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
email: halloibm@de.ibm.com

VCCI Statement - Japan

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取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

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IBM Taiwan Contact Information

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台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

Electromagnetic Interference (EMI) Statement - Korea

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Germany Compliance Statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse B EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse B ein.

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Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse B

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Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
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Tel: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
email: halloibm@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse B.

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