

42U 1200 mm Deep Static and Expansion Racks and  
47U 1200 mm Deep Static and Expansion Racks



# Installation Guide



42U 1200 mm Deep Static and Expansion Racks and  
47U 1200 mm Deep Static and Expansion Racks



# Installation Guide

**Note:** Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 37, the *Rack Safety Information* and *Environmental Notices and User Guide* documents on the IBM *Documentation* CD, and the *Important Notices and Warranty Information* document that comes with the product.

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# Contents

<b>Safety</b>	v
<b>Chapter 1. Introduction</b>	1
The IBM Documentation CD	2
Hardware and software requirements	2
Using the Documentation Browser	2
Notices and statements in this document	3
<b>Chapter 2. Installing a rack</b>	5
Installing the front stabilizer bracket	7
Removing and installing side covers	9
Removing and installing rack doors	11
Removing and installing a front door	11
Removing and installing rear doors	12
Reversing a front door	13
Attaching racks in a suite	16
<b>Chapter 3. Installing optional devices</b>	17
Installation guidelines	17
Installing devices on the rack-mounting flanges	20
Installing threaded rails	20
Installing cage nuts	20
Installing devices vertically in the rack	21
<b>Chapter 4. Managing cables</b>	23
Cable-routing brackets	24
Using the cable-access bar in the bottom of the rack	25
Using the cable-access opening in the top of the racks	26
<b>Chapter 5. Moving a rack</b>	27
<b>Chapter 6. Parts listing (42U and 47U deep static and expansion racks)</b>	29
Replaceable rack components	29
42U deep static standard and expansion racks	30
47U deep static standard and expansion racks	32
<b>Appendix A. Getting help and technical assistance</b>	35
Before you call	35
Using the documentation	35
Getting help and information from the World Wide Web	35
Software service and support	36
Hardware service and support	36
IBM Taiwan product service	36
<b>Appendix B. Notices</b>	37
Trademarks	37
Important notes	38
Particulate contamination	39
Documentation format	39
Electronic emission notices	40
Federal Communications Commission (FCC) statement	40
Industry Canada Class A emission compliance statement	40
Avis de conformité à la réglementation d'Industrie Canada	40

Australia and New Zealand Class A statement . . . . .	40
European Union EMC Directive conformance statement. . . . .	40
Germany Class A statement . . . . .	41
Japan VCCI Class A statement . . . . .	42
Korea Communications Commission (KCC) statement . . . . .	42
Russia Electromagnetic Interference (EMI) Class A statement. . . . .	42
People's Republic of China Class A electronic emission statement . . . . .	42
Taiwan Class A compliance statement . . . . .	43

## Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφαλείας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

**Important:**

Each caution and danger statement in this document is labeled with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Rack Safety Information* document.

For example, if a caution statement is labeled “Statement 1,” translations for that caution statement are in the *Rack Safety Information* document under “Statement 1.”

Be sure to read all caution and danger statements in this document before you perform the procedures. Read any additional safety information that comes with the server or optional device before you install the device.

**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 foreseeable misuse conditions.

**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.

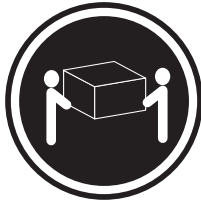
**To Connect:**

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.

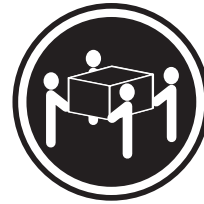
**Statement 5:**



≥ 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.

**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.

**United Kingdom - Notice to Customers:**

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.



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## Chapter 1. Introduction

This document contains general installation instructions for the IBM® 42U 1200 mm Deep Static and Expansion Racks and the IBM 47U 1200 mm Deep Static and Expansion Racks. Always read the documentation that comes with your server or optional device for detailed installation instructions.

Installing the rack cabinet consists of the following tasks:

1. Unpack the rack according to the *IBM 42U and 47U 1200 mm Deep Static and Expansion Racks Rack Unpacking Instructions* document that comes with the rack cabinet.
2. Locate the rack according to the *IBM eServer Rack Planning Guide*.
3. Install rack stabilizer brackets on all racks.
4. Prepare the rack for optional devices:
  - Remove the side covers, if applicable.
  - Remove the front and rear doors from all racks, if necessary.
  - Attach expansion racks to a standard rack or to each other to form suites.
5. Install one or more optional devices.

**Note:** Install the heaviest devices in the bottom of the rack cabinet.

6. Complete the rack cabinet installation:
  - Reinstall side covers on all racks or on the outermost racks in a suite.
  - Reinstall front and rear doors on all racks.

If documentation updates are available, you can download them from the IBM Web site. The rack might have features that are not described in the documentation that comes with the rack, and the documentation might be updated occasionally to include information about those features, or technical updates might be available to provide additional information that is not included in the rack documentation. To check for updates, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. Procedures for locating documentation might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x®**.
3. In the **Product family** field, select **Rack/Storage Enclosures**.
4. In the **Type** field, select **9361** or **9362**.
5. Under **Support & downloads**, click **Documentation**.

---

## The IBM Documentation CD

The IBM *Documentation* CD contains documentation for the rack in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

## Hardware and software requirements

The IBM *Documentation* CD requires the following minimum hardware and software:

- Microsoft Windows XP, Windows 2000, or Red Hat Linux
- 100 MHz microprocessor
- 32 MB of RAM
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems

## Using the Documentation Browser

Use the Documentation Browser to browse the contents of the CD, read brief descriptions of the documents, and view documents, using Adobe Acrobat Reader or xpdf. The Documentation Browser automatically detects the regional settings in your computer and displays the documents in the language for that region (if available). If a document is not available in the language for that region, the English-language version is displayed.

Use one of the following procedures to start the Documentation Browser:

- If Autostart is enabled, insert the CD into the CD or DVD drive. The Documentation Browser starts automatically.
- If Autostart is disabled or is not enabled for all users, use one of the following procedures:
  - If you are using a Windows operating system, insert the CD into the CD or DVD drive and click **Start --> Run**. In the **Open** field, type  
`e:\win32.bat`

where *e* is the drive letter of the CD or DVD drive, and click **OK**.

- If you are using Red Hat Linux, insert the CD into the CD or DVD drive; then, run the following command from the /mnt/cdrom directory:

```
sh runlinux.sh
```

Select the rack from the **Product** menu. The **Available Topics** list displays all the documents for the rack. Some documents might be in folders. A plus sign (+) indicates each folder or document that has additional documents under it. Click the plus sign to display the additional documents.

When you select a document, a description of the document is displayed under **Topic Description**. To select more than one document, press and hold the Ctrl key while you select the documents. Click **View Book** to view the selected document or documents in Acrobat Reader or xpdf. If you selected more than one document, all the selected documents are opened in Acrobat Reader or xpdf.

To search all the documents, type a word or word string in the **Search** field and click **Search**. The documents in which the word or word string appears are listed in order of the most occurrences. Click a document to view it, and press Ctrl+F to use the Acrobat search function, or press Alt+F to use the xpdf search function within the document.

Click **Help** for detailed information about using the Documentation Browser.

---

## Notices and statements in this document

The caution and danger statements in this document are also in the multilingual *IBM Rack Safety Information* document that comes with the rack cabinet. Each statement is numbered for reference to the corresponding statement in your language in the *Rack Safety Information* document.

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage might occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.





---

## Chapter 2. Installing a rack

The IBM 42U 1200 mm Deep Static and Expansion Racks are 42U high<sup>1</sup> and the IBM 47U 1200 mm Deep Static and Expansion Racks are 47U high. The 42U and 47U deep static racks come with side covers installed. The 42U and 47U expansion racks do not come with side covers but include the required hardware for building a suite of racks. You will need one standard rack per suite.

The racks conform to the Electronic Industries Association (EIA) standard *EIA-310-D Cabinets, Racks, Panels, and Associated Equipment (1992)*.

### 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 foreseeable misuse conditions.

**Note:** The illustrations in this document might differ slightly from your hardware.

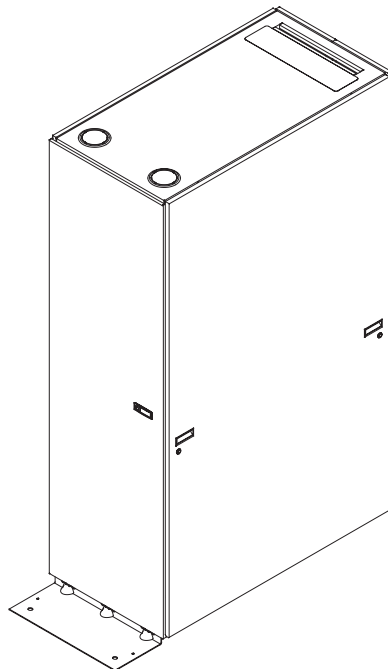
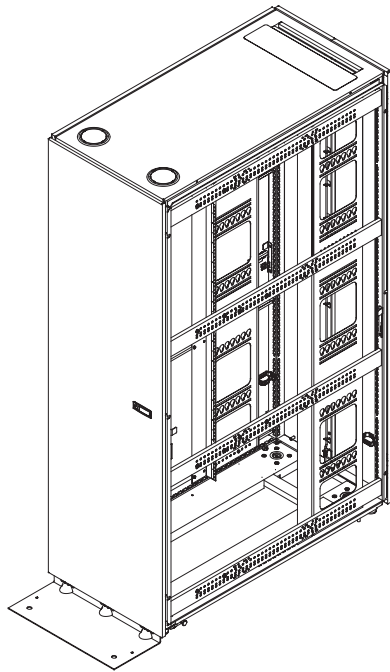


Figure 1. IBM 42U or 47U Deep Static Rack

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



*Figure 2. IBM 42U or 47U Deep Static Expansion Rack without side covers*

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## Installing the front stabilizer bracket

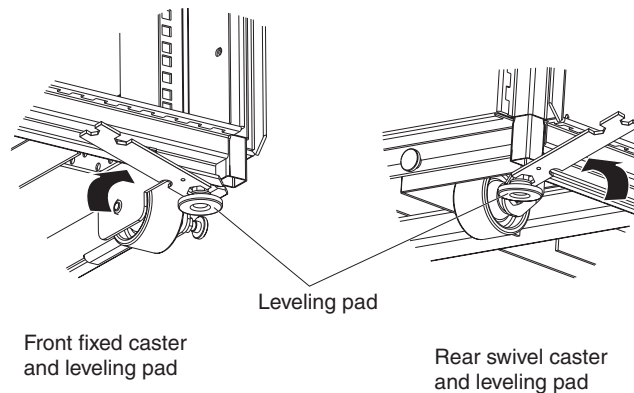
See the unpacking instructions that come with the rack for information about how to unpack and locate the rack; then, lower the rack-leveling pads and install the front stabilizer bracket for added stability.

### 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.**

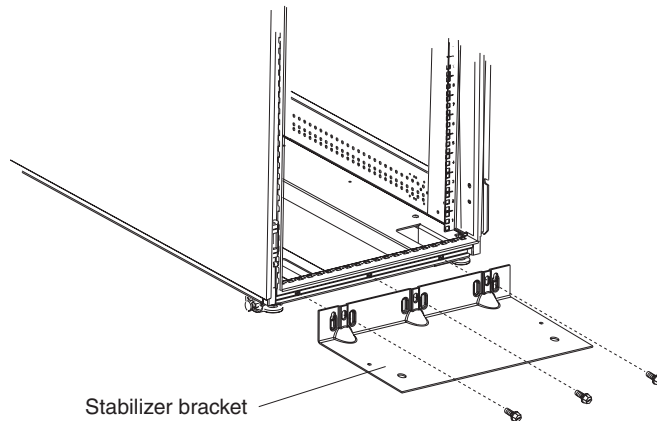


*Figure 3. Lowering the leveling pads*

Complete the following steps to lower the leveling pads and install the front stabilizer bracket:

1. Use the smaller end of 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. The pads prevent the rack from rolling.

2. Hand tighten the thumbscrews on the front-fixed casters.



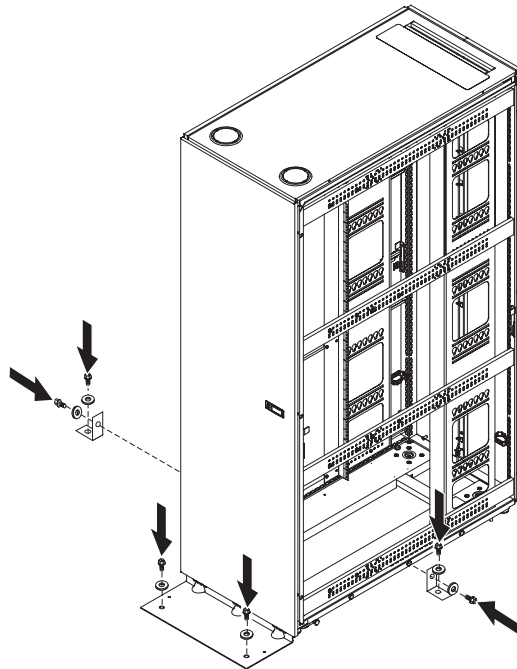
*Figure 4. Installing the front stabilizer bracket*

3. Attach the front stabilizer bracket to the front of the rack with the screws and hex wrench that come with the hardware kit.



**DANGER:**

All stand-alone rack configurations must be equipped with anti-tip plates on both sides and bolted to the floor surface.



*Figure 5. Installing the side stabilizer brackets and bolting the rack to the floor surface*

4. If you are installing a stand-alone rack that will be loaded with less than 68 kg (150 lb) of equipment, complete the following steps to install the side stabilizer brackets:
  - a. Remove the side covers (see “Removing and installing side covers” on page 9 for instructions).

- b. Attach the side stabilizer brackets to the center cage nut on each side of the rack with the hex bolts and washers (see Figure 5 on page 8). The stabilizer brackets, bolts, and washers come in the hardware kit.
5. Bolt the rack to the floor surface through the holes in the front and side stabilizer brackets (see Figure 5 on page 8) and reinstall the side covers.

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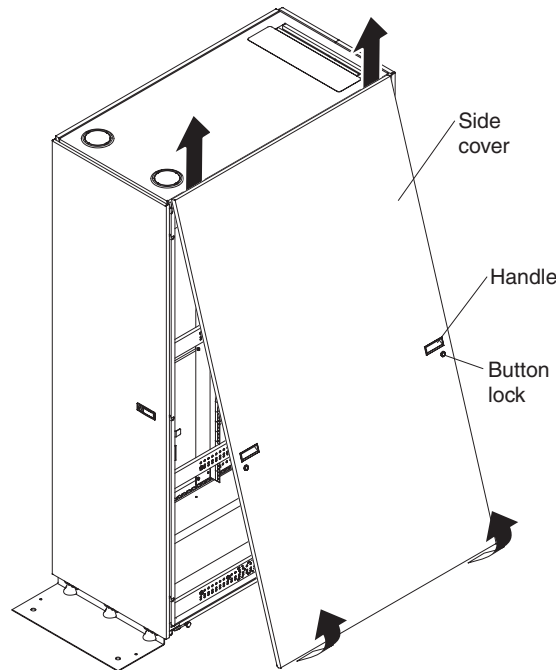
## Removing and installing side covers

The deep static standard racks come with side covers installed. Remove the side covers from a rack before you install or remove optional devices.

**Note:** The 42U and 47U deep static expansion racks do not come with side covers.

Complete the following steps to remove the side covers from a deep static standard rack.

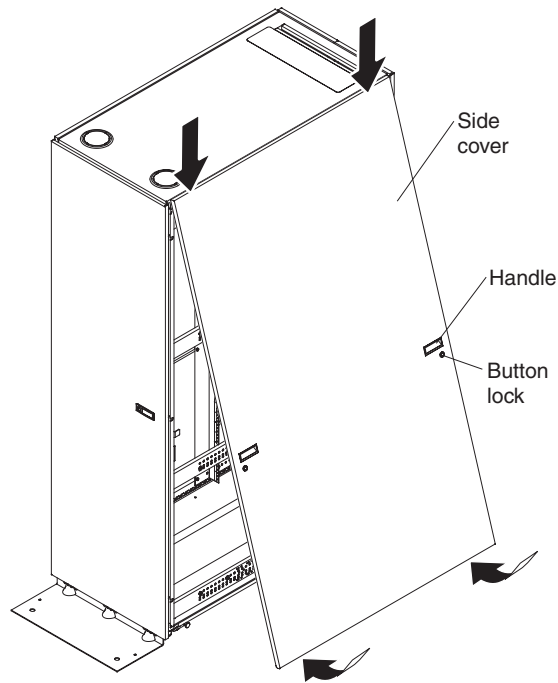
**Note:** The illustrations in this procedure show the removal of a side cover from a 42U standard rack. The same procedure applies to a 47U standard rack.



*Figure 6. Removing a side cover*

1. Unlock both button locks on a side cover.
2. Using the recessed handles, tilt the bottom of the side cover slightly toward you; then, lift the side cover away from the ridge on the top of the rack.
3. Repeat this procedure to remove the second side cover.

To install the side covers, reverse this procedure. Lock each side cover to secure it to the rack.



*Figure 7. Installing a side cover*

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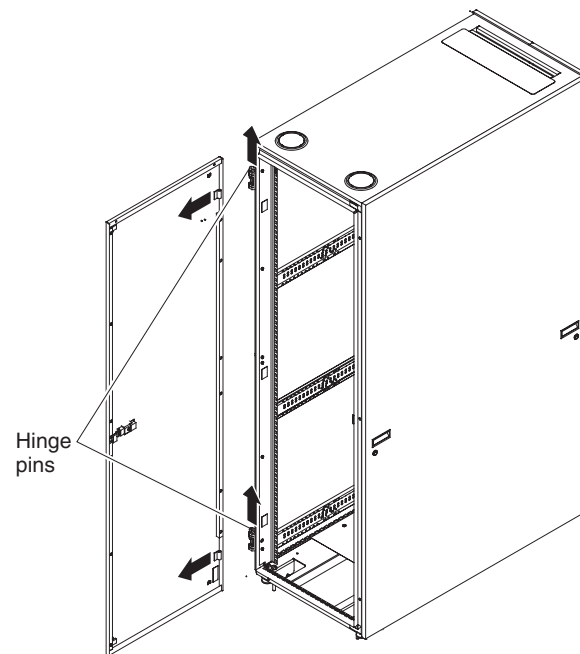
## Removing and installing rack doors

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

### Removing and installing a front door

Complete the following steps to remove a front door from the rack.

**Note:** The illustration in this procedure shows the removal of a front door from a 42U standard or expansion rack. The same procedure applies to the 47U standard or expansion rack.



*Figure 8. Removing a front door*

1. Unlock and open the 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.

Complete the following steps to install a front door on the rack:

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

## Removing and installing rear doors

Complete the following steps to remove the rear doors from the rack.

**Note:** The illustration in this procedure shows the removal of the rear doors from a 42U standard or expansion rack. The same procedure applies to removal of the rear doors from a 47U standard or expansion rack.

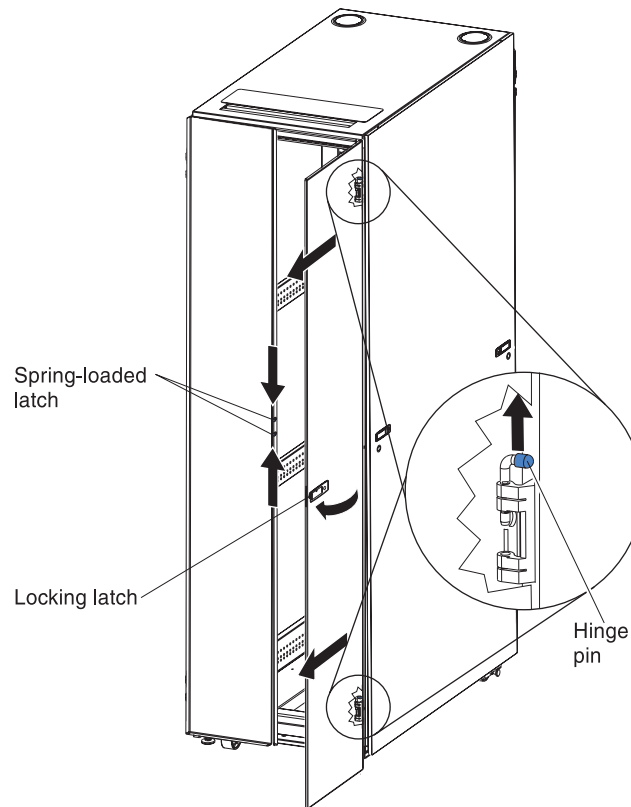


Figure 9. Opening and removing the rear doors

1. Unlock and open the right-side door.
2. Hold the door firmly with one hand; then, lift both hinge pins on the inside of the door 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.
4. Open the left-side door by squeezing the blue handles on the spring-loaded latch and pulling the door open.
5. Hold the left-side door firmly with one hand; then, lift both hinge pins on the inside of the door until they lock in the open position. This releases the door from the hinges.
6. Grasp the door firmly with both hands and pull it away from the hinges; then, set the door aside.

Reverse this procedure to install the rear doors on the rack. Make sure that the door with the spring-loaded latch is installed on the left side.



## Reversing a front door

Complete the following steps to reverse a front door on a rack so that it opens in the opposite direction.

**Note:** The illustrations in this procedure show a 42U standard or expansion rack. The same procedure applies to a 47U standard or expansion rack.

1. Remove the door according to “Removing and installing a front door” on page 11.

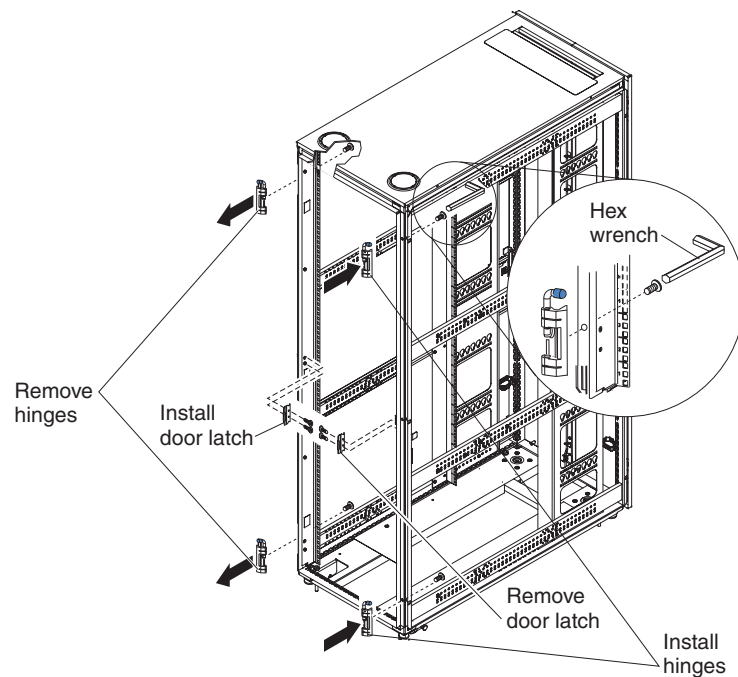
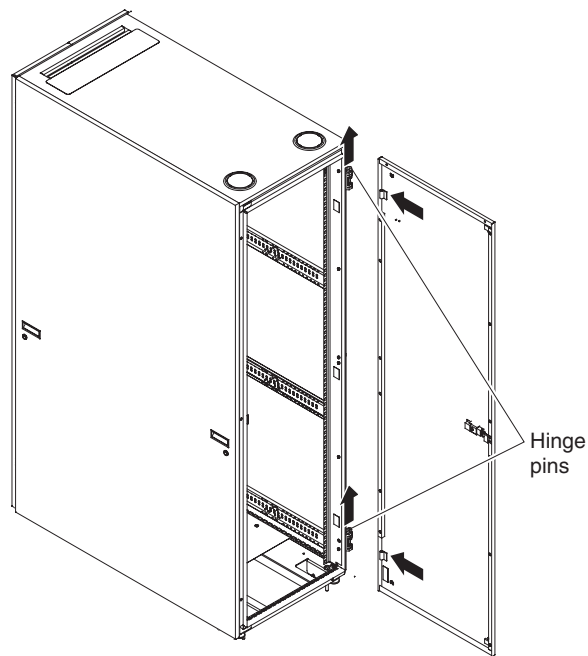


Figure 10. Moving the door hinges and front door latch

2. Use a hex wrench to remove the top and bottom hinges from the rack; then, install the hinges on the other side of the rack.

**Note:** There are extra screws in the hardware kit in case you drop one into the rack channel.

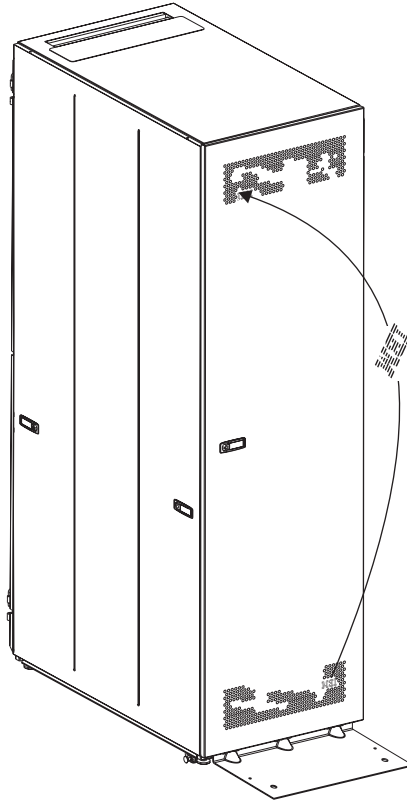
3. Remove the front door latch and attach it to the other side of the rack.



*Figure 11. Rotating and installing the door*

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

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.

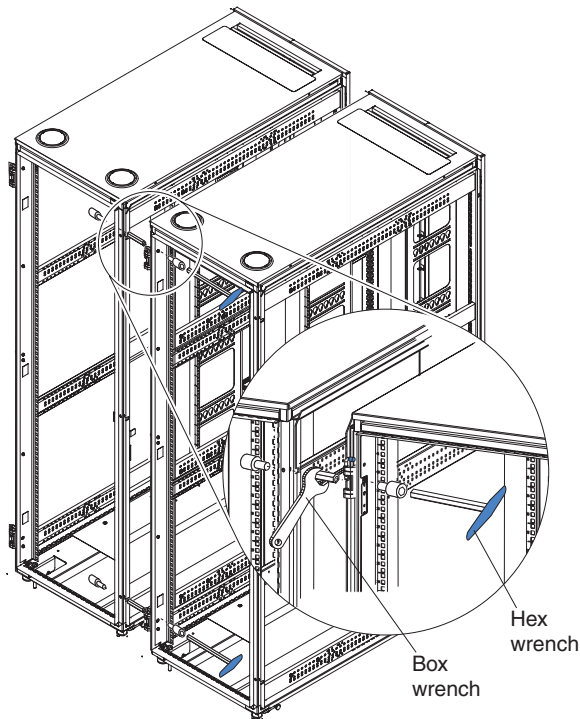


*Figure 12. Moving the IBM logo*

---

## Attaching racks in a suite

Expansion racks come with all the hardware that is required for you to attach racks together and form a suite. A box wrench, hex wrench, and screws are provided with the expansion-rack hardware kit. You need one 42U or 47U deep standard rack to form a suite. You do not have to remove the doors to attach the racks together. Complete the following steps to attach racks together in a suite.



*Figure 13. Attaching 42U deep static standard and expansion racks to each other to form a suite*

1. Apply the strip of gasket that comes with the hardware kit to the outside, front and rear vertical edges of the expansion rack to prevent the two racks from rubbing against each other.
2. Insert an attachment pin that comes with the expansion rack through the top slot on the front of the standard and expansion racks as shown in Figure 13. The slot is behind the top hinge.
3. Hold the attachment pin in place with the box wrench and use the hex wrench to tighten a screw on each side of the attachment pin.
4. Install a second attachment pin in the slot near the bottom hinge of the rack.
5. Hold the attachment pin in place with the box wrench and use the hex wrench to tighten a screw on each side of the attachment pin.
6. Repeat this procedure to attach the back of the racks together with two attachment pins.

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

---

## Chapter 3. Installing optional devices

There are many servers and optional devices that you can install in the standard rack or 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, 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 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.**

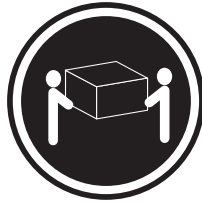
**To Connect:**

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.

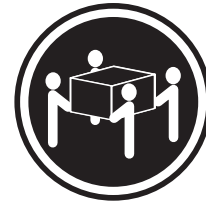
**Statement 5:**



≥ 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.**

Always install the heaviest devices in the bottom of the rack. 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 information about optional, compatible devices that you can install in the rack, go to the ServerProven® Web site at <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

---

## Installing devices on the rack-mounting flanges

When you install devices in the rack, secure each device or the rails for that device on rack-mounting flanges. Some devices come with threaded holes on the rail-mounting flanges. Other devices require that you use cage nuts to install them in the rack.

### Installing threaded rails

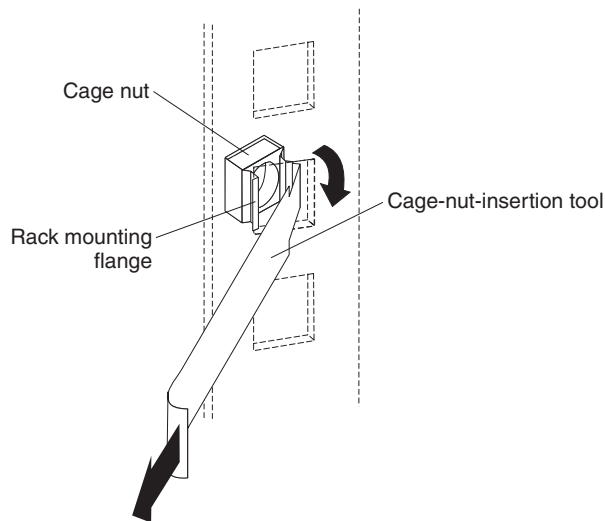
If a device has threaded holes or device rails that have threaded holes, you must install the device on the rail-mounting flanges on the inside of the rack-mounting flanges. See the device documentation for detailed information about how to use threaded rails.

### Installing cage nuts

You must use cage nuts for all optional devices that do not have threaded holes. The rack comes with a supply of cage nuts, and devices that require them come with cage nuts. Cage nuts are installed 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 and some optional devices.

#### Using the cage-nut-insertion tool

Complete the following steps to install a cage nut with the cage-nut-insertion tool.



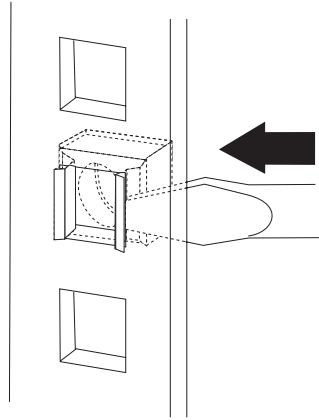
*Figure 14. Installing cage nuts with the cage-nut-insertion tool*

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

Complete the following steps to install a cage nut with a flat-blade screwdriver.



*Figure 15. 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 devices vertically in the rack

The racks come with space on the sides that can be used to vertically mount power distribution units (PDUs) and console switches. The 42U and 47U racks come with six locations, three on each side of the rack. See the documentation that comes with your PDU or console switch for detailed instructions for installing a device vertically in a rack.



---

## Chapter 4. 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 you cable servers or other devices that you install in a rack.

### Statement 8:



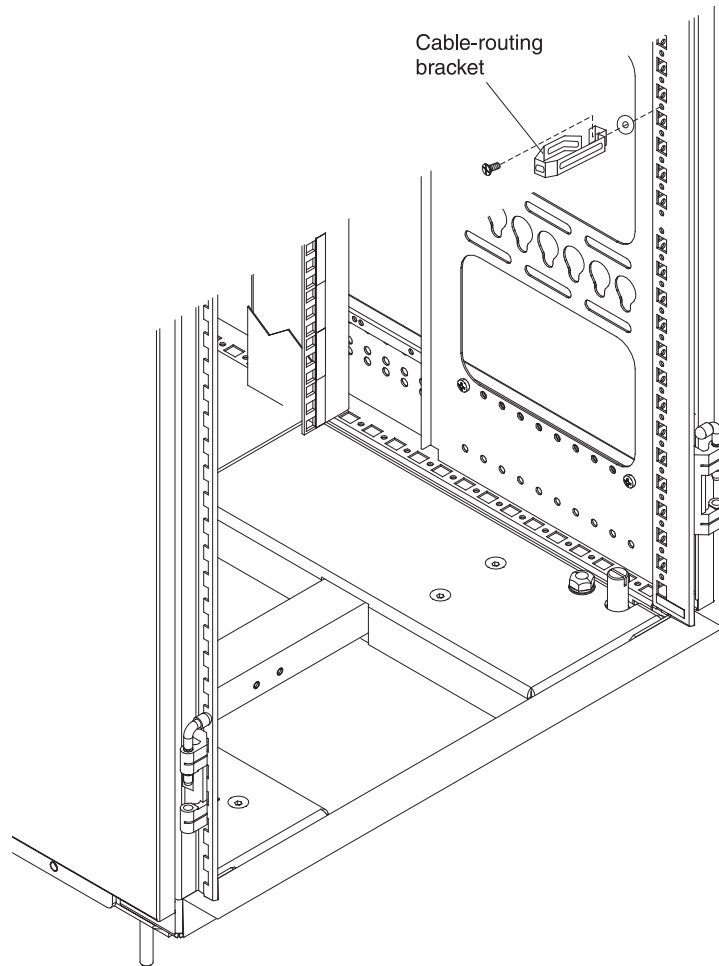
### DANGER

- **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 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 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 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 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 rear door or other devices.
  - Run internal cables that connect devices in adjoining racks through the large openings in the rear of the rack.
  - Run external cables through the bottom of the rack or through the cable-access opening in the top of the rack.

---

## Cable-routing brackets

To route cables neatly in the rear of the rack, use the cable-routing brackets that come in the hardware kit. The rack comes with eight cable-routing brackets. Use a screwdriver to install or remove a bracket on the rack-mounting flange in the rear of the rack.

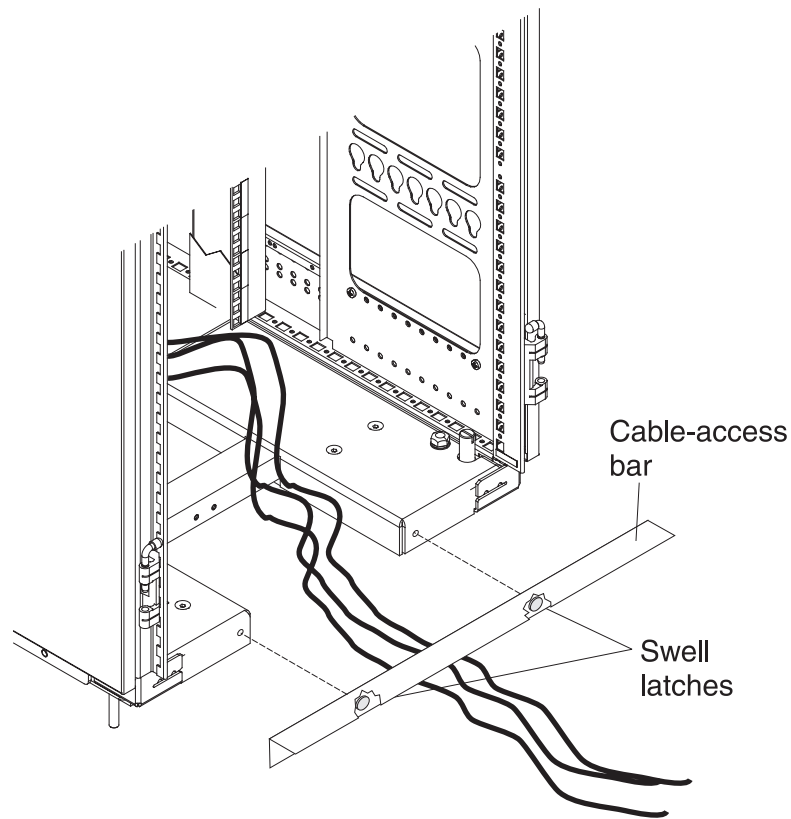


*Figure 16. Installing and removing a cable-routing bracket*

---

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

Complete the following steps to route external cables through the opening in the bottom rear of the racks.

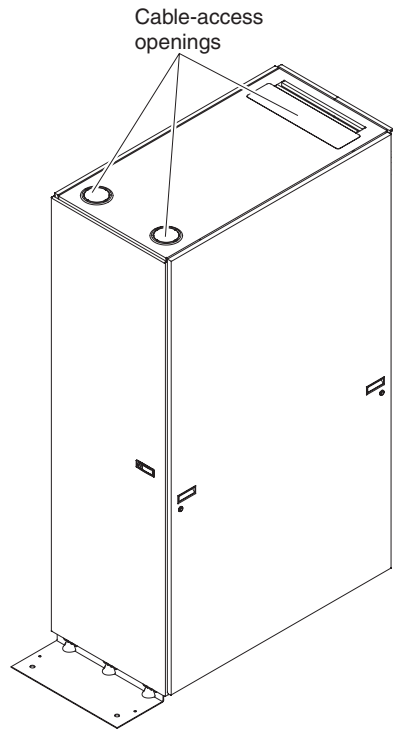


*Figure 17. Routing cables using the cable-access bar*

1. Release the two swell latches connecting the cable-access bar to the rear of the rack.
2. Route the cables through the opening.
3. Attach the cable-access bar to the rack by tightening the swell latches. Make sure that you do not pinch or cut any cables.

---

## Using the cable-access opening in the top of the racks



*Figure 18. Location of the cable-access opening*

Complete the following steps to route external cables through the rectangular cable-access opening in the top rear of the standard or expansion rack:

1. Loosen the two wing nuts on the cable-access panel inside the top of the rack; then, slide the cable-access panel toward the front of the rack.
2. Route the cables through the opening.
3. Slide the cable-access panel toward the back of the rack. Make sure that you do not pinch or cut any cables.
4. Tighten the two wing nuts.

Complete the following steps to route external cables through the two round cable-access openings in the top front of the standard or expansion rack.

1. Use a flat-blade screwdriver to pry the round cable-access cover off the rack.
2. Snap out and discard the center of the cable-access cover.
3. Replace the outer ring of the cable-access cover in the cable-access opening.
4. Route the cables through the opening.

## Chapter 5. Moving a rack

Table 1 provides the rack weights for the 42U and 47U racks.

**Note:** The rack weights in the following table do not include the packaging, accessories, or side panels.

*Table 1. 42U standard and expansion racks and 47U standard and expansion rack weights*

	42U deep static rack	42U deep static expansion rack	47U deep static rack	47U deep static expansion rack
<b>Empty</b>	141 kg (310 lb)	104 kg (229 lb)	150 kg (331 lb)	110 kg (243 lb)

When you move a rack, follow these safety guidelines.

**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.



---

## Chapter 6. Parts listing (42U and 47U deep static and expansion racks)

The replaceable components that are available for the xSeries® 42U Deep Static and Expansion Racks and IBM 47U Deep Static and Expansion Racks are described in this chapter. To check for an updated parts listing on the Web, complete the following steps:

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Parts documents lookup**.
4. From the **Product family** menu, select **Rack/Storage Enclosures**, and click **Continue**.

---

### Replaceable rack components

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** 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 server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about getting service and assistance, see Appendix A, “Getting help and technical assistance,” on page 35. For information about the terms of the warranty, see the *Important Notices and Warranty Information* document that comes with the rack.

## 42U deep static standard and expansion racks

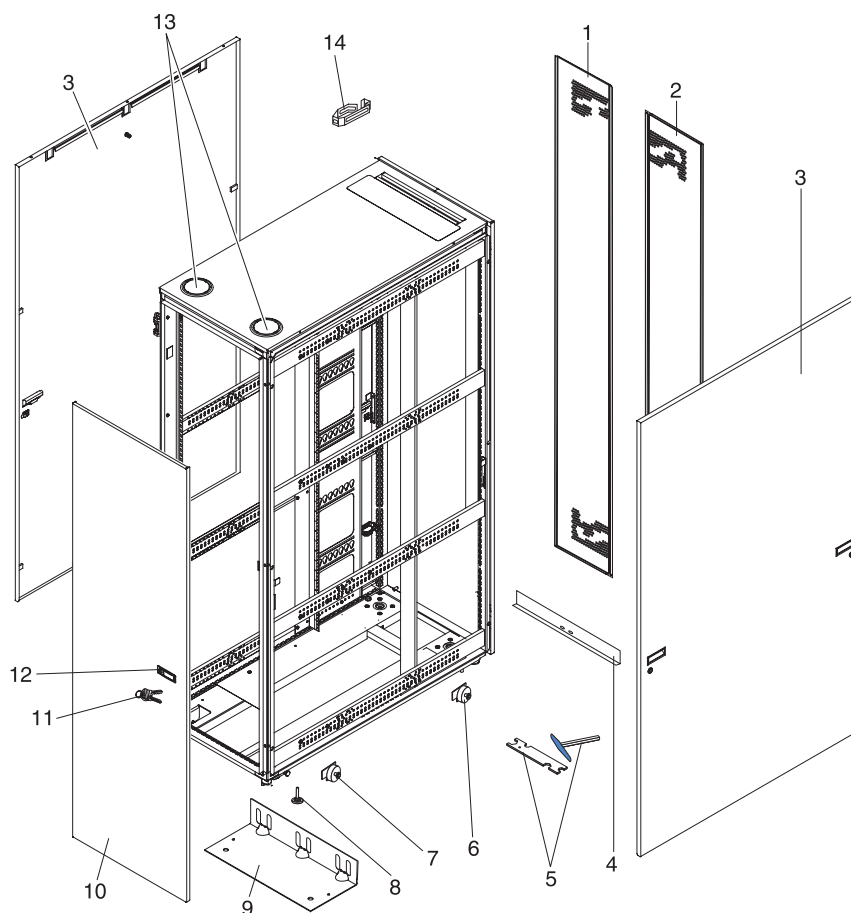


Table 2. Parts listing for IBM 42U Deep Static Standard and Expansion Racks, Type 9361-4PX and 9361-4EX

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
1	Split rear door, right	13N2058		
2	Split rear door, left	13N2059		
3	Side cover	69Y6024		
4	Cable-access bar	32R0711		
5	Hardware and tool kit (includes tools, screws, washers, cage nuts and fasteners)		81Y2392	
6	Swivel caster, rear			16R1493
7	Fixed caster, front			16R1492
8	Adjustable foot			16R1494
9	Front stabilizer	39M6739		
10	Front door	16R1485		
11	Keys, door and side cover	16R1497		
12	Latch, door	16R1496		
13	Cover, top front cable access	69Y6067		

*Table 2. Parts listing for IBM 42U Deep Static Standard and Expansion Racks, Type 9361-4PX and 9361-4EX (continued)*

<b>Index</b>	<b>Description</b>	<b>CRU part number (Tier 1)</b>	<b>CRU part number (Tier 2)</b>	<b>FRU part number</b>
14	Cable management kit		39M6653	
	Baying kit		39M6741	

## 47U deep static standard and expansion racks

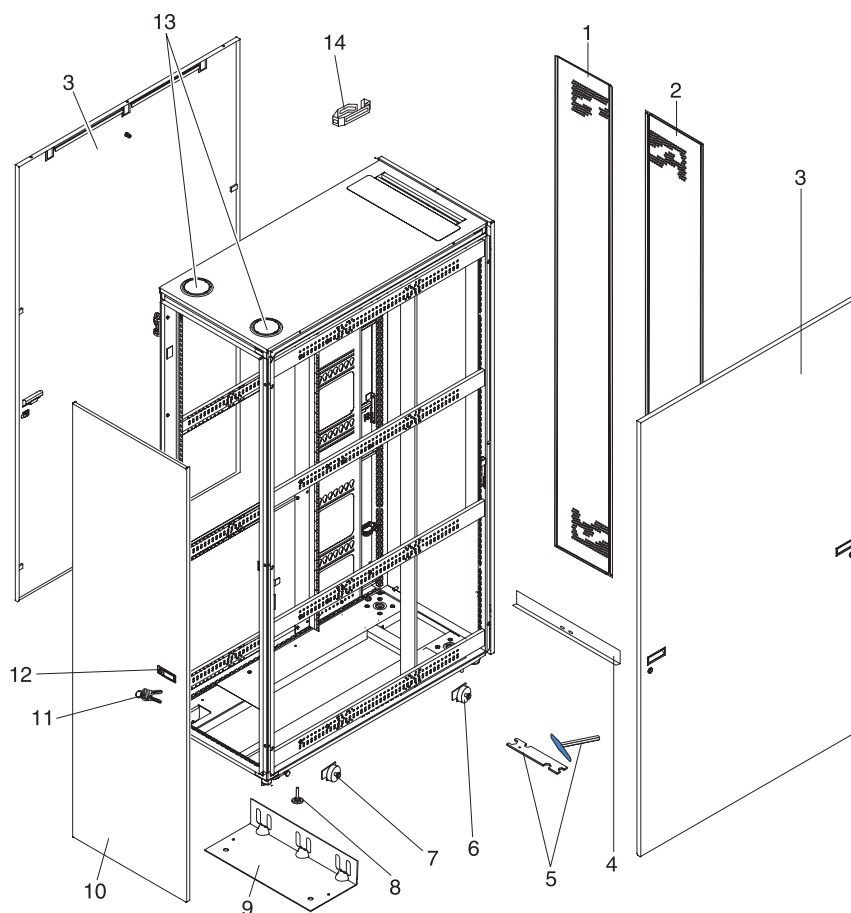


Table 3. Parts listing for IBM 47U Deep Static Standard and Expansion Racks, Type 9362-4PX and 9362-4EX

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
1	Split rear door, right	69Y6035		
2	Split rear door, left	69Y6036		
3	Side cover	69Y6038		
4	Cable-access bar	32R0711		
5	Hardware and tool kit (includes tools, screws, washers, cage nuts and fasteners)		81Y2392	
6	Swivel caster, rear			16R1493
7	Fixed caster, front			16R1492
8	Adjustable foot			16R1494
9	Front stabilizer	39M6739		
10	Front door	69Y6037		
11	Keys, door and side cover	16R1497		
12	Latch, door	16R1496		
13	Cover, top front cable access	69Y6067		

*Table 3. Parts listing for IBM 47U Deep Static Standard and Expansion Racks, Type 9362-4PX and 9362-4EX (continued)*

<b>Index</b>	<b>Description</b>	<b>CRU part number (Tier 1)</b>	<b>CRU part number (Tier 2)</b>	<b>FRU part number</b>
14	Cable management kit		39M6653	
	Baying kit		39M6741	



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## Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your system, and whom to call for service, if it is necessary.

---

### Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the IBM Documentation CD that comes with your system.
- Go to the IBM support website at <http://www.ibm.com/systems/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

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### Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/systems/support/> and follow the instructions. Also, some documents are available through the IBM Publications Center at <http://www.ibm.com/shop/publications/order/>.

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### Getting help and information from the World Wide Web

On the World Wide Web, the IBM website has up-to-date information about IBM systems, optional devices, services, and support. The address for IBM System x and xSeries information is <http://www.ibm.com/systems/x/>. The address for IBM BladeCenter® information is <http://www.ibm.com/systems/bladecenter/>. The address for IBM IntelliStation® information is <http://www.ibm.com/intellistation/>.

You can find service information for IBM systems and optional devices at <http://www.ibm.com/systems/support/>.

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## Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with System x and xSeries servers, BladeCenter products, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, see <http://www.ibm.com/services/sl/products/>.

For more information about Support Line and other IBM services, see <http://www.ibm.com/services/>, or see <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

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## Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to <http://www.ibm.com/partnerworld/> and click **Find Business Partners** on the right side of the page. For IBM support telephone numbers, see <http://www.ibm.com/planetwide/>. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

---

## IBM Taiwan product service

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

IBM Taiwan product service contact information:

IBM Taiwan Corporation  
3F, No 7, Song Ren Rd.  
Taipei, Taiwan  
Telephone: 0800-016-888



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## Appendix B. Notices

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## Important notes

Processor speed indicates the internal clock speed of the microprocessor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives that are available from IBM.

Maximum memory might require replacement of the standard memory with an optional memory module.

IBM makes no representation or warranties regarding non-IBM products and services that are ServerProven, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

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## Particulate contamination

**Attention:** Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the device that is described in this document. Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the device to malfunction or cease functioning altogether. This specification sets forth limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits, because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer. In the absence of specific limits that are set forth in this document, you must implement practices that maintain particulate and gas levels that are consistent with the protection of human health and safety. If IBM determines that the levels of particulates or gases in your environment have caused damage to the device, IBM may condition provision of repair or replacement of devices or parts on implementation of appropriate remedial measures to mitigate such environmental contamination. Implementation of such remedial measures is a customer responsibility.

*Table 4. Limits for particulates and gases*

Contaminant	Limits
Particulate	<ul style="list-style-type: none"><li>• The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2<sup>1</sup>.</li><li>• Air that enters a data center must be filtered to 99.97% efficiency or greater, using high-efficiency particulate air (HEPA) filters that meet MIL-STD-282.</li><li>• The deliquescent relative humidity of the particulate contamination must be more than 60%<sup>2</sup>.</li><li>• The room must be free of conductive contamination such as zinc whiskers.</li></ul>
Gaseous	<ul style="list-style-type: none"><li>• Copper: Class G1 as per ANSI/ISA 71.04-1985<sup>3</sup></li><li>• Silver: Corrosion rate of less than 300 Å in 30 days</li></ul>

<sup>1</sup> ASHRAE 52.2-2008 - *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

<sup>2</sup> The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.

<sup>3</sup> ANSI/ISA-71.04-1985. *Environmental conditions for process measurement and control systems: Airborne contaminants*. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.

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## Documentation format

The publications for this product are in Adobe Portable Document Format (PDF) and should be compliant with accessibility standards. If you experience difficulties when you use the PDF files and want to request a web-based format or accessible PDF document for a publication, direct your mail to the following address:

*Information Development  
IBM Corporation  
205/A015*

3039 E. Cornwallis Road  
P.O. Box 12195  
Research Triangle Park, North Carolina 27709-2195  
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In the request, be sure to include the publication part number and title.

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## Electronic emission notices

### Federal Communications Commission (FCC) statement

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the 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 Class A emission compliance statement

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

### Avis de conformité à la réglementation d'Industrie Canada

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

### Australia and New Zealand Class A statement

**Attention:** 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.

### European Union EMC Directive conformance 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 nonrecommended modification of the product, including the fitting of non-IBM option cards.

**Attention:** This is an EN 55022 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.

Responsible manufacturer:

International Business Machines Corp.  
New Orchard Road  
Armonk, New York 10504  
914-499-1900

European Community contact:

IBM Technical Regulations, Department M456  
IBM-Allee 1, 71137 Ehningen, Germany  
Telephone: +49 7032 15-2937  
E-mail: tjahn@de.ibm.com

## Germany Class A 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 der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der 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  
914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland  
Technical Regulations, Department M456  
IBM-Allee 1, 71137 Ehningen, Germany  
Telephone: +49 7032 15-2937  
E-mail: tjahn@de.ibm.com

#### Generelle Informationen:

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

### Japan VCCI Class A statement

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

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI). 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.

### Korea Communications Commission (KCC) statement

이 기기는 업무용으로 전자파 적합등록을 받은 기기  
이오니, 판매자 또는 사용자는 이점을 주의하시기  
바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에  
서 비업무용으로 교환하시기 바랍니다.

Please note that this equipment has obtained EMC registration for commercial use. In the event that it has been mistakenly sold or purchased, please exchange it for equipment certified for home use.

### Russia Electromagnetic Interference (EMI) Class A statement

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

### People's Republic of China Class A electronic emission statement

中华人民共和国“A类”警告声明

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，  
可能需要用户对干扰采取切实可行的措施。

## Taiwan Class A compliance statement

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。









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