IBM 5U Tower-to-Rack Conversion Kit

Installation Instructions

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Installation Instructions

Note::

Before using this information and the product it supports, read the general information in Appendix B, “Notices,” on page 31, the *IBM Safety Information* and *Environmental Notices* and *User Guide* documents on the IBM *Documentation* CD, and the *Warranty Information* document.

The most recent version of this document is available at http://www.ibm.com/supportportal/.

First Edition (March 2012)

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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 ασφάλειας
(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 pečítaje 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 *IBM Safety Information* book.

For example, if a caution statement is labeled "Statement 1", translations for that caution statement are in the *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:

DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

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

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

Statement 3:

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- **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 controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Statement 4:

≥ 18 kg (39.7 lb)

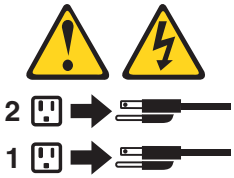
≥ 32 kg (70.5 lb)

≥ 55 kg (121.2 lb)

CAUTION:
Use safe practices when lifting.

Statement 5:

CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 6:

CAUTION:
If you install a strain-relief bracket option over the end of the power cord that is connected to the device, you must connect the other end of the power cord to an easily accessible power source.

Statement 7:

CAUTION:
If the device has doors, be sure to remove or secure the doors before moving or lifting the device to avoid personal injury. The doors will not support the weight of the device.

Statement 8:

CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.

Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Statement 11:

CAUTION:
The following label indicates sharp edges, corners, or joints nearby.

Statement 12:

CAUTION:
The following label indicates a hot surface nearby.

Statement 13:

DANGER

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

Statement 15:

CAUTION:
Make sure that the rack is secured properly to avoid tipping when the server unit is extended.

Statement 17:

CAUTION:
The following label indicates moving parts nearby.

Statement 26:

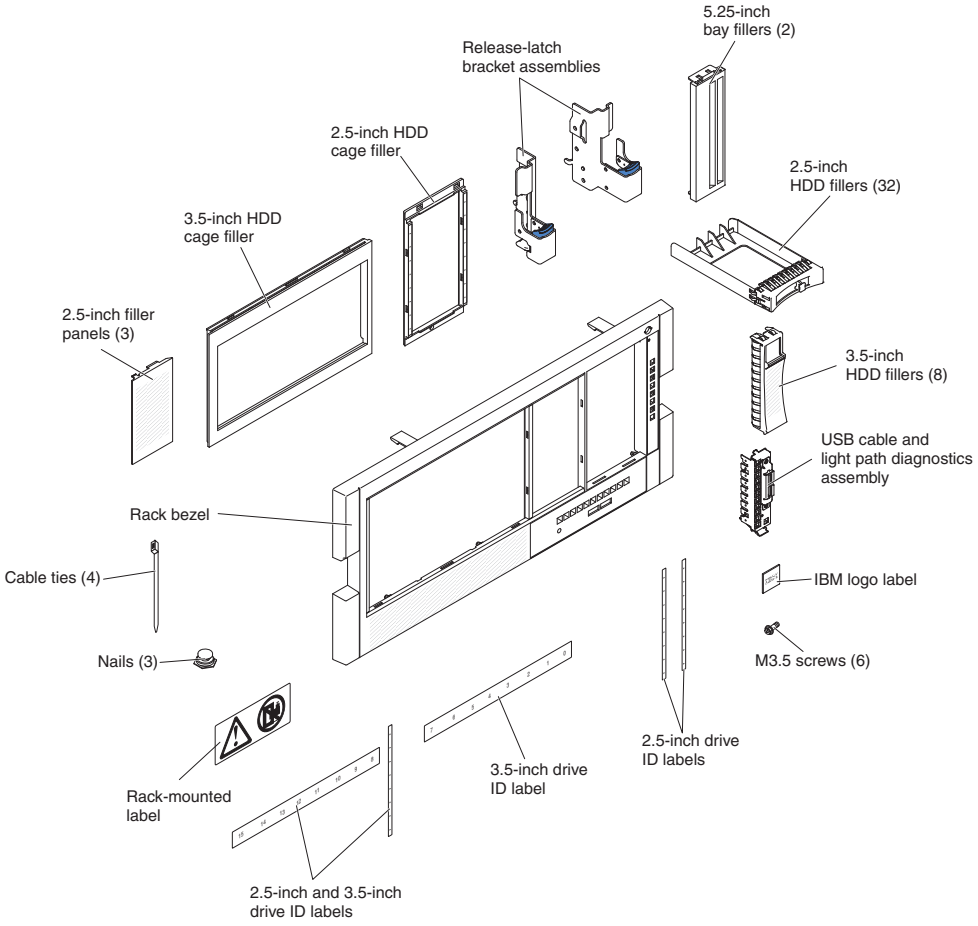
CAUTION:
Do not place any object on top of rack-mounted devices.

Chapter 1. The 5U Tower-to-Rack conversion kit

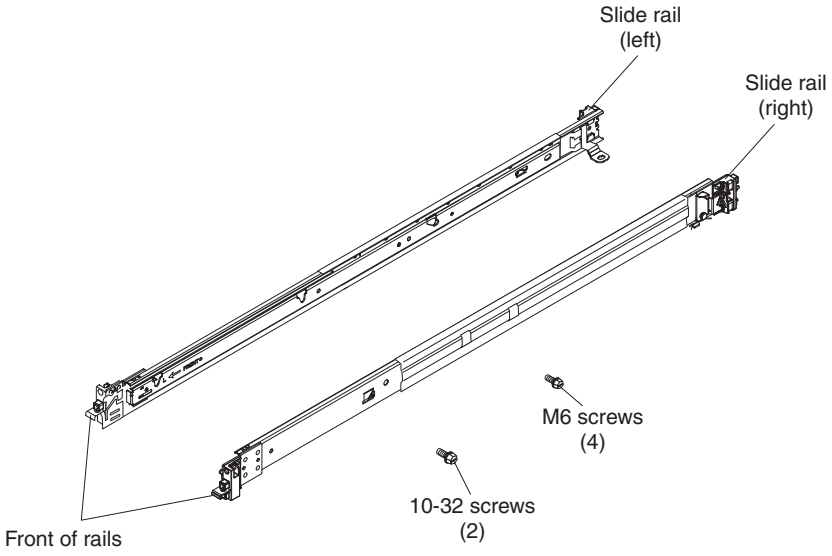
The IBM® 5U Tower-to-Rack Conversion Kit contains the parts that you need to convert a 5U server that is 70.2 cm (27.6 in.) deep from a tower model to a rack model. You can then install the server into a rack cabinet that is at least 70.2 cm (27.6 in.) deep.

The following parts come with the Tower-to-rack conversion kit:

- One chassis conversion package

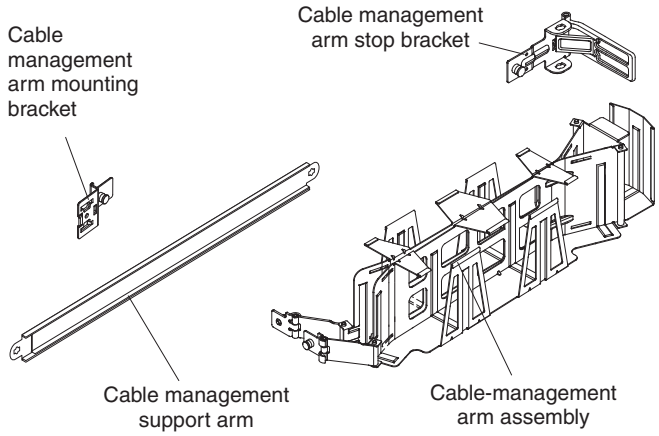


- One rack-mounting kit (includes rack-mounting instructions, template, and the following hardware)



Note: The illustration of the rack-mounting kit in this document might be slightly different from your hardware.

- One cable management arm (CMA) kit



- IBM warranty information document
- Important notices document
- This document

What you will need

You will need the following tools to install the Tower-to-Rack Conversion Kit:

- A small flat-blade screwdriver
- A medium Phillips screwdriver
- An 8 mm open-end or box wrench
- A 12 mm nut driver or a 12 mm open-end or box wrench
- Pliers

Installation guidelines

Before you install the Tower-to-Rack Conversion Kit, read the following information:

- Read the safety information that comes with your server.
- Read these instructions and the rack installation instructions to familiarize yourself with the installation procedures.
- Inventory the kit items as listed in the parts list that begins on page 1.
- Remove all media (diskettes, CDs, optical discs, or tapes) from the drives of your server.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices and your server. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Wear an electrostatic-discharge wrist strap, if one is available.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the server for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Chapter 2. Installing the Tower-to-Rack conversion kit

This section provides the information for converting your tower model server to a rack-mounted server.

Note: This kit is designed for converting several different server models. Your server might look different from the servers that are illustrated, and some parts of the kit might not be used.

Preparing the server

To prepare the server, complete the following steps:

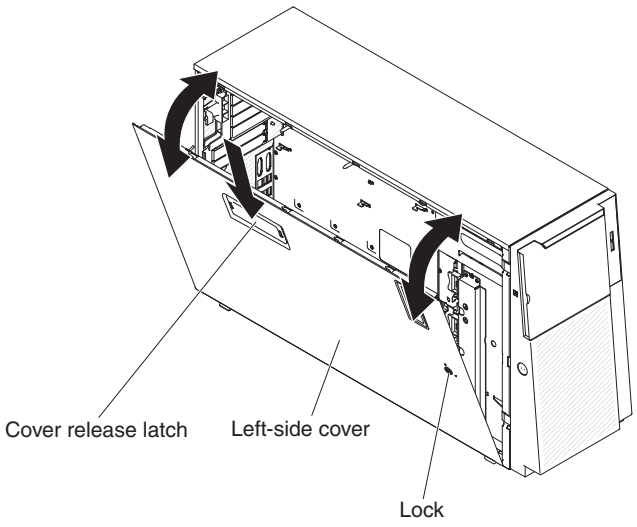
1. Read the safety information that begins on page v, “Installation guidelines” on page 3, and “Handling static-sensitive devices” on page 3.
2. Shut down the server operating system.
3. Turn off the server and disconnect all cables.
4. Remove all drives and drive bay filler panels from the server.

Note: For instructions for turning off the server, see the documentation that comes with the server.

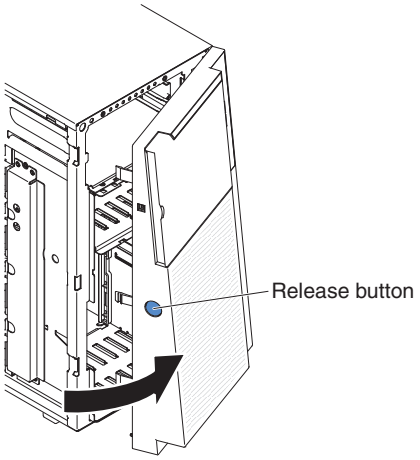
Removing the covers, bezel, and feet

To remove the covers, bezel, and feet from the server, complete the following steps:

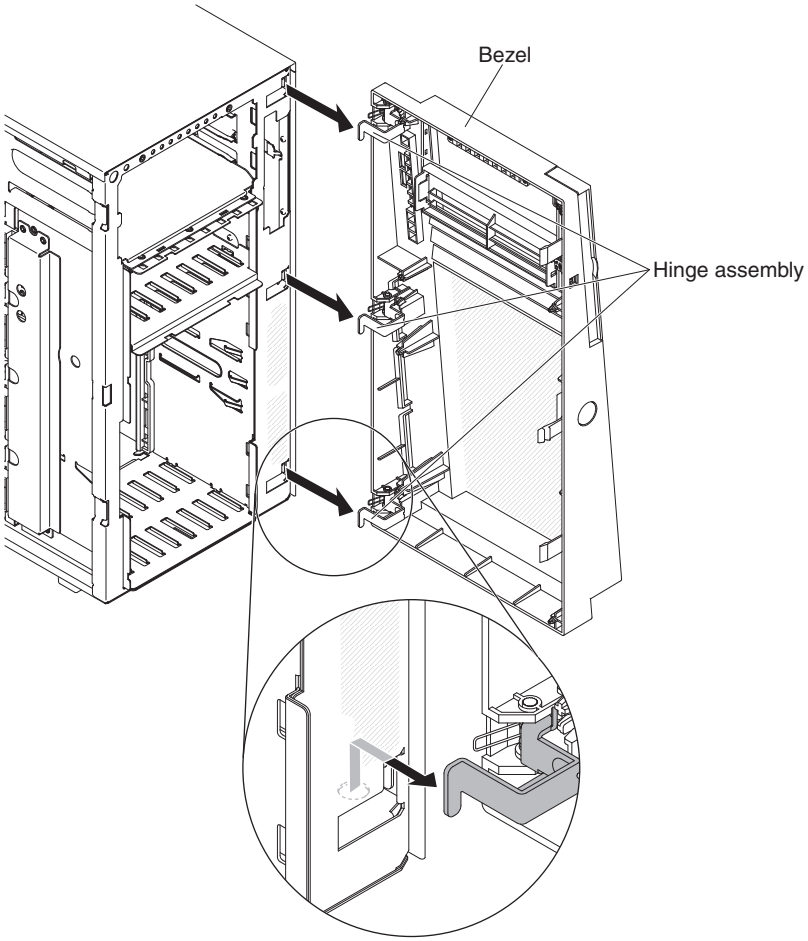
1. Unlock the left-side cover, using the key that comes with the server. Pull the cover-release latch down while you rotate the top edge of the cover away from the server; then, lift the cover off the server. Save the cover for use as the top cover in the rack configuration.



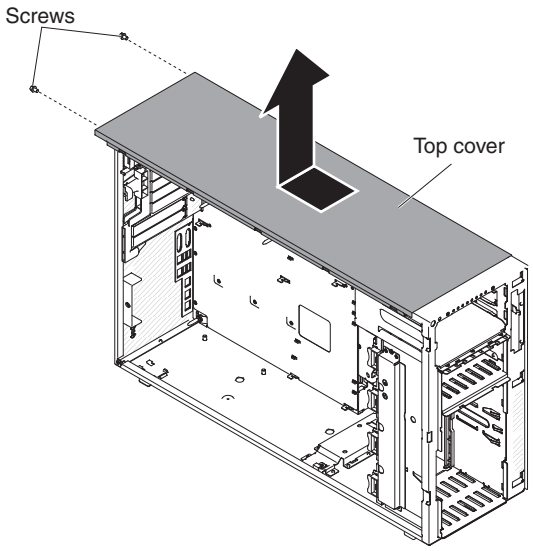
2. Open the bezel by pressing the button on the left edge of the bezel, and rotate the left side of the bezel away from the server.



3. Pull the hinge assemblies upward and release the bezel out of the chassis.



4. Remove the top cover:
   a. From the rear of the server, remove the two screws that hold the top cover in place.



   b. Lift the top cover away from the server and set it aside.
   c. Store the top cover and the screws for potential future use.
5. If you have not done so already, remove the hard disk drives and all the filler panels from the server bays and set them aside.

   Important: Make a note of which drives are in which bays before you remove the drives.
6. Carefully turn the server on its side so that it is lying flat.

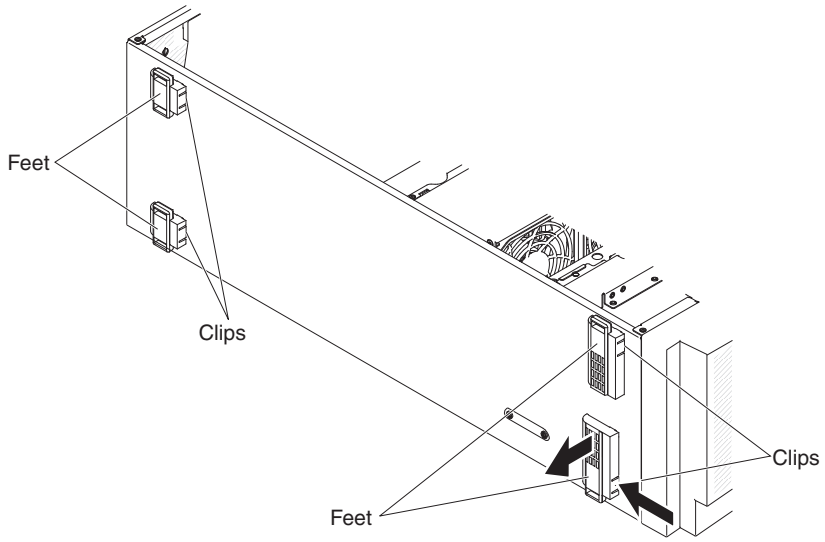
   Statement 4:

≥ 18 kg (39.7 lb)

≥ 32 kg (70.5 lb)

≥ 55 kg (121.2 lb)

   CAUTION:
   Use safe practices when lifting.
7. Remove the four feet from the bottom of the server.
   a. Carefully position the server on a flat surface as shown in the following illustration. The feet should hang over the edge of the flat surface to ease removal.
   b. Press in on the clips that hold the feet in place; then, pry the feet away from the server. In some cases, you might need a screwdriver to press in on the clips.

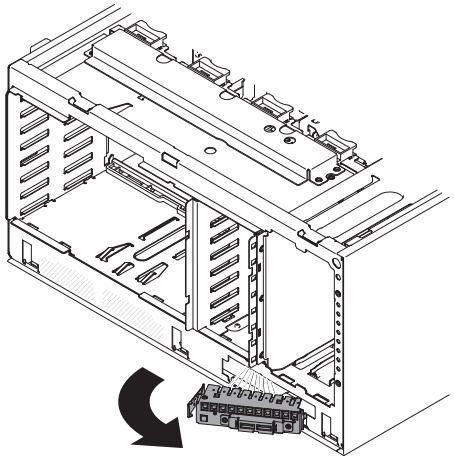

Feet
Clips
Clips
Feet

Relocating and installing hardware, covers, and bezel

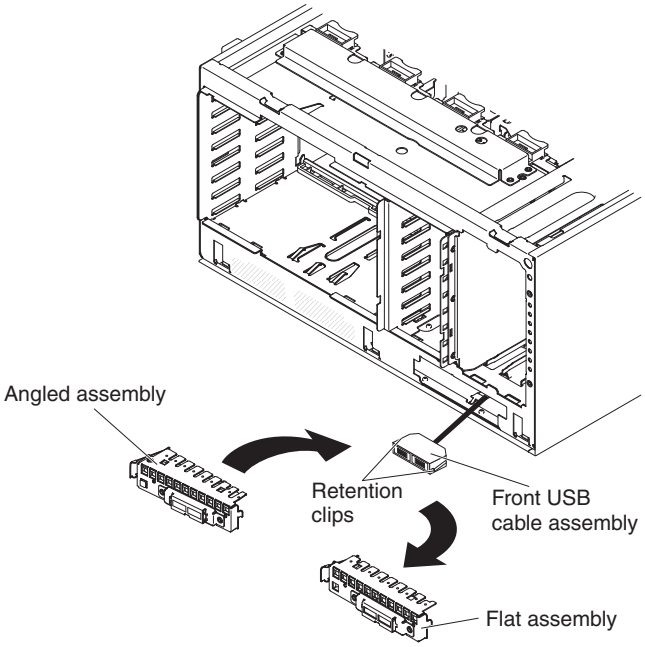
Complete the steps in this section to:

- Remove the angled USB cable and light path diagnostics assembly bracket
- Install the new (flat) USB cable and light path diagnostics assembly bracket
- Install the new bezel
- Install the top cover
- Install the nails
- Install the release-latch-bracket assemblies

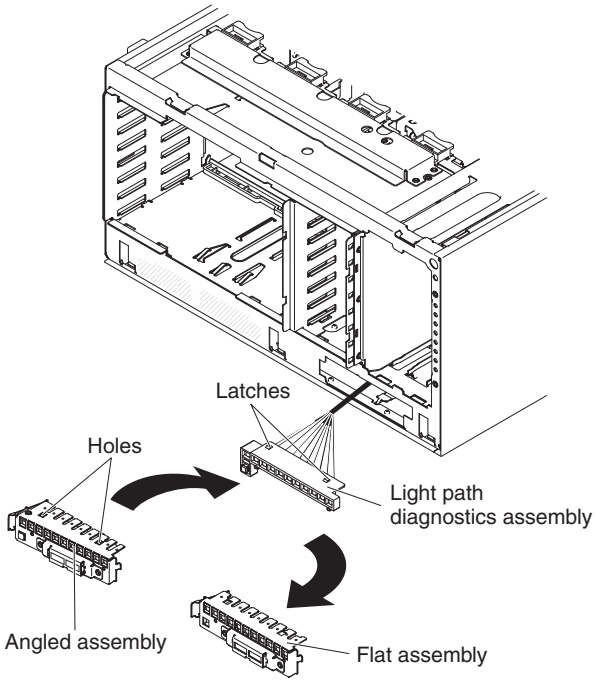
1. Remove the USB cable and light path diagnostics assembly:
   a. Depending on your server model, disconnect the USB cable and the light path diagnostics cable from the system board (refer to the documentation that comes with your server).
   b. Press down on the release latch on the bottom of the USB cable and light path diagnostics assembly bracket; then, rotate the top of the mounting bracket away from the server.



c. Squeeze the sides of the USB connector and remove it from the angled assembly. To install the flat assembly, squeeze the sides of the USB connector and connect it to the flat assembly.

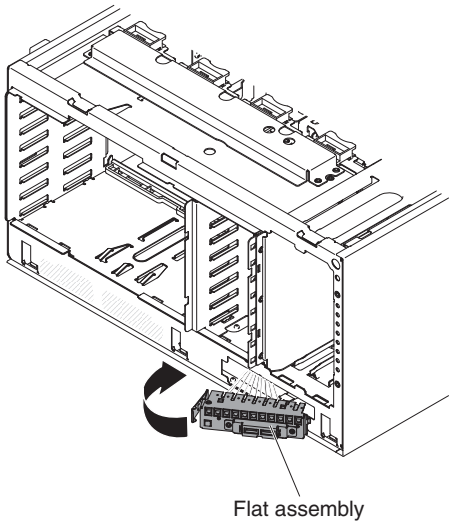


d. Use a flat-blade screwdriver to pry the holes on the angled assembly to release the light path diagnostics assembly. Remove the light path diagnostics assembly from the angled assembly. To install the flat assembly, push the light path diagnostics assembly and secure it to the flat assembly.

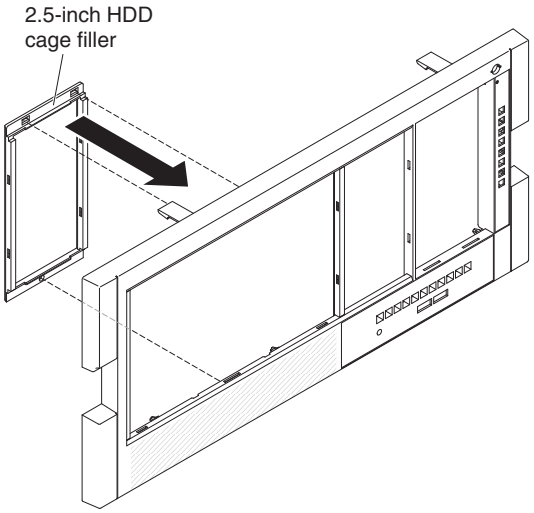


2. Install the new USB cable assembly:
   a. Insert the assembly tab into the slot on the server and rotate the flat USB assembly into the chassis.

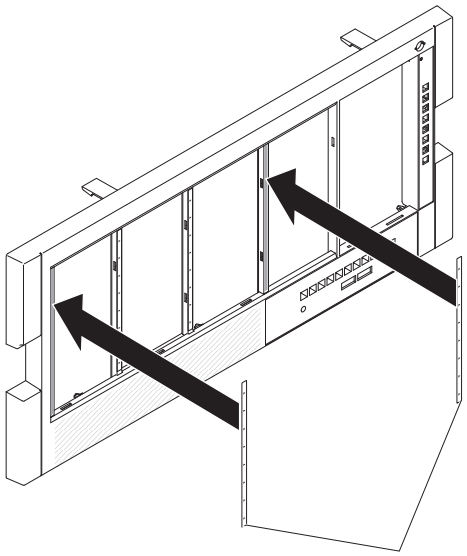
      Note: The connector is keyed and fits in the assembly only one way.

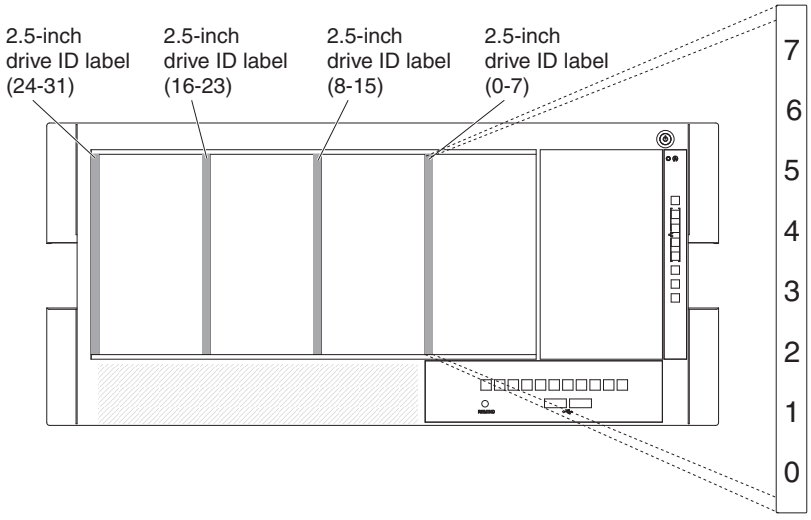


   b. Depending on your server model, connect the USB and the light path diagnostics cable to the system board (refer to the documentation that comes with your server).
3. Preparing the new bezel:
   a. Remove the 5.25-inch bay fillers from the bezel if necessary.
   b. Install the cage fillers and attach the drive ID labels:
      1) For models with 2.5-inch hard disk drives:
         a) Install the 2.5-inch cage filler.

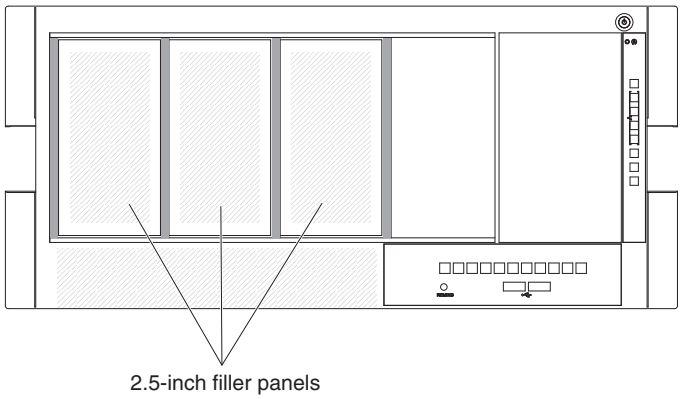


b) Attach the 2.5-inch drive ID labels on the bezel.

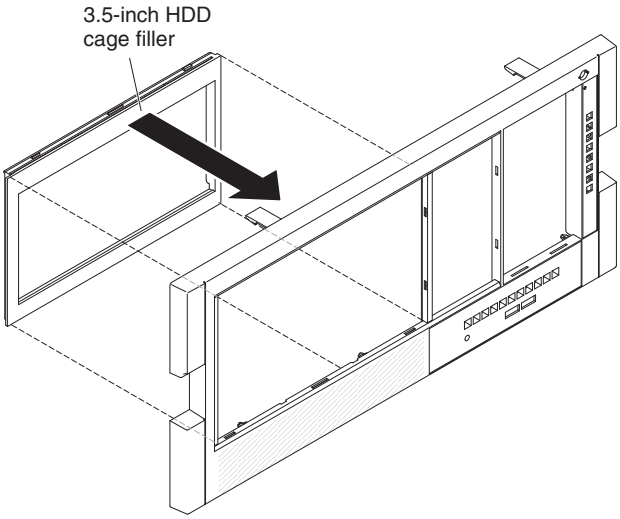




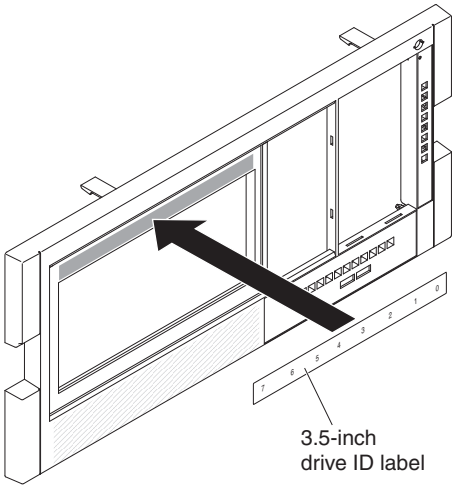
c) Install the 2.5-inch filler panels if necessary.

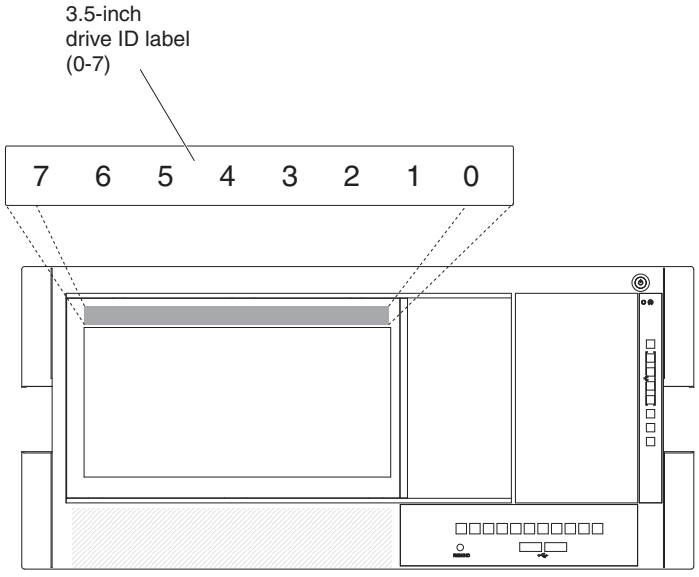


2) For models with 3.5-inch hard disk drives:
   a) Install the 3.5-inch cage filler.

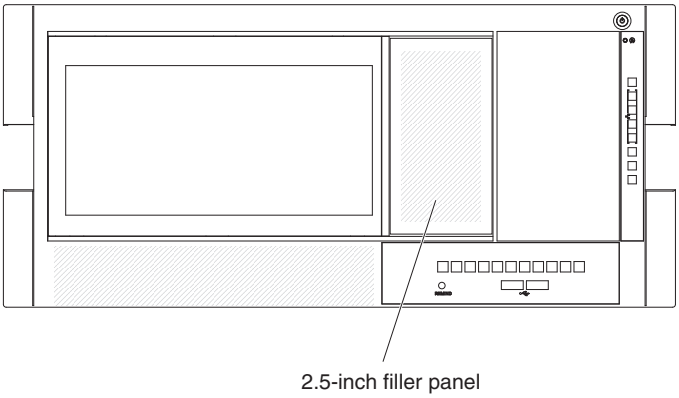


   b) Attach the 3.5-inch drive ID label on the bezel.

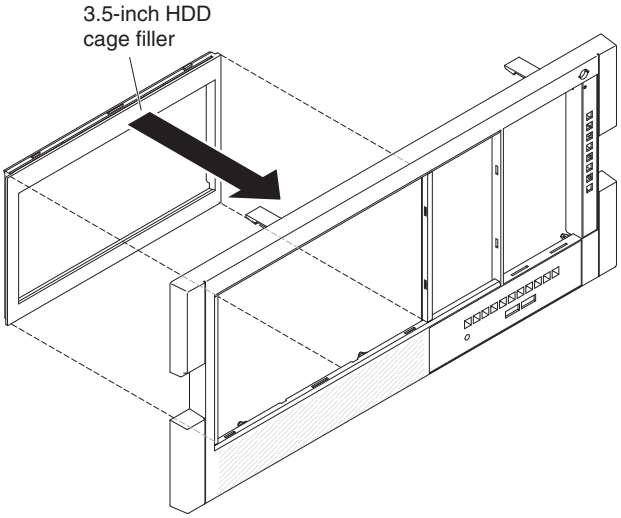




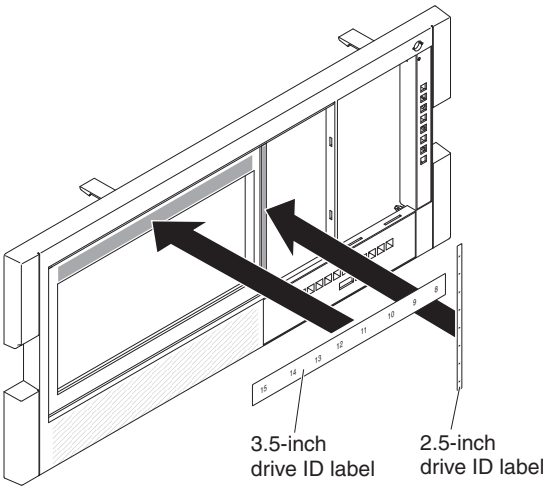
c) Install the 2.5-inch filler panel.

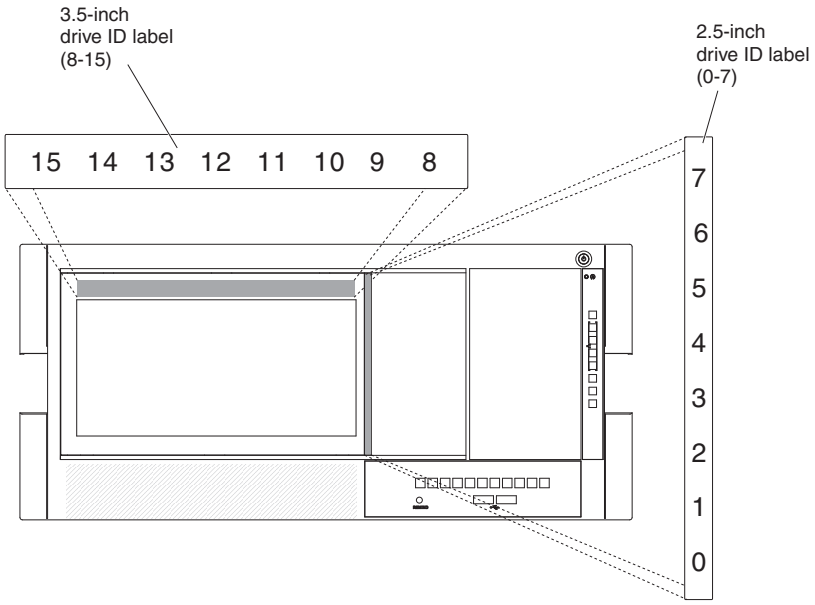


3) For models with 2.5-inch hard disk drives and 3.5-inch hard disk drives:
   a) Install the 3.5-inch cage filler.



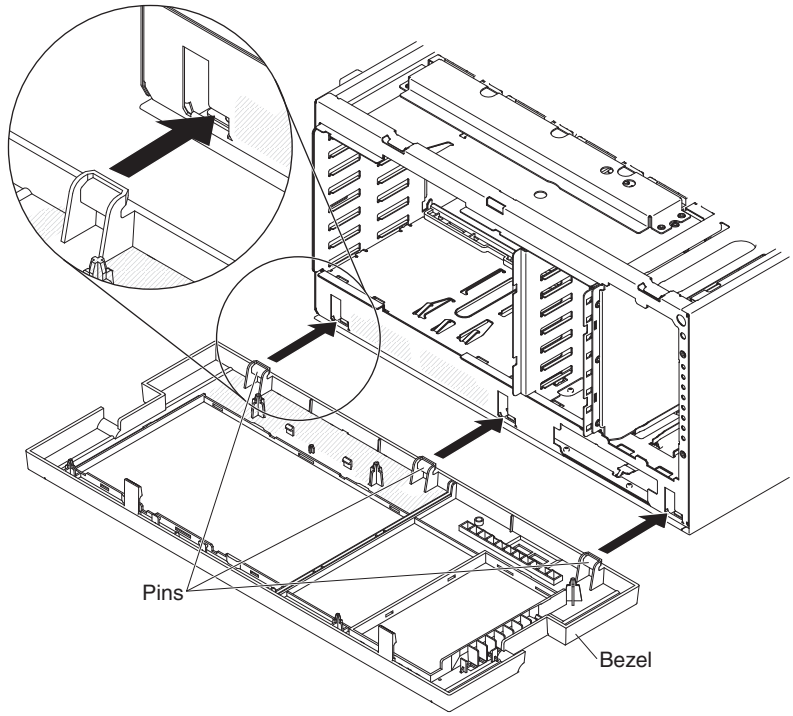
   b) Attach the 2.5-inch and 3.5-inch drive ID labels on the bezel.



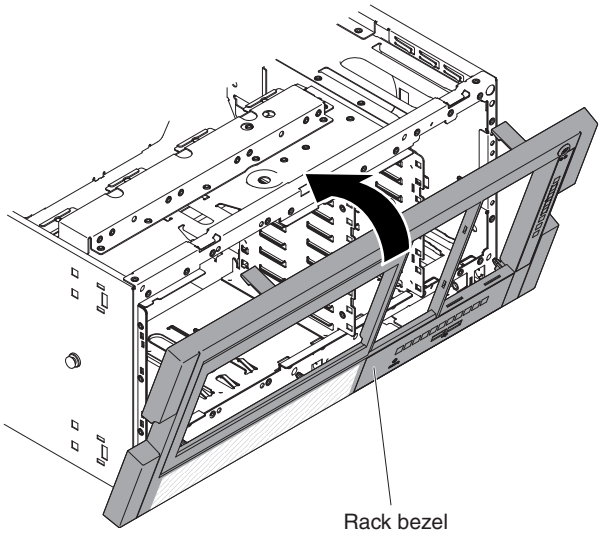


c. Install the new bezel:

1) Align the hinge assemblies with the hinge holes on the chassis. Push the hinges into the holes on the chassis until they snap into place.

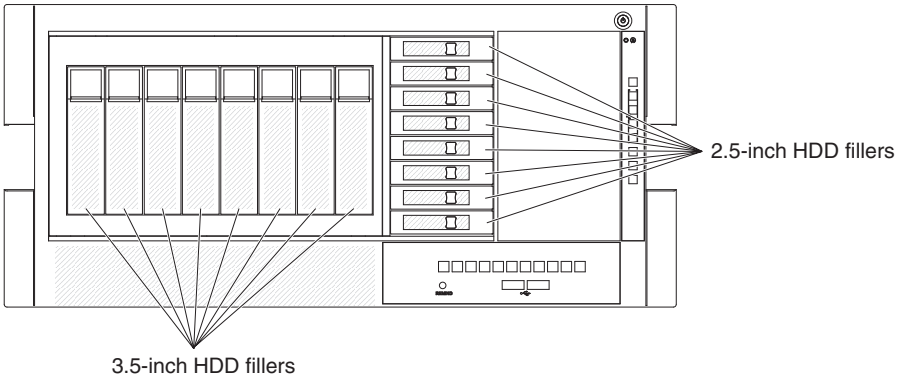


2) Rotate the bezel toward the server and press until it snaps into place.



4. Reinstall the hard disk drives that you removed in step 5 on page 7.

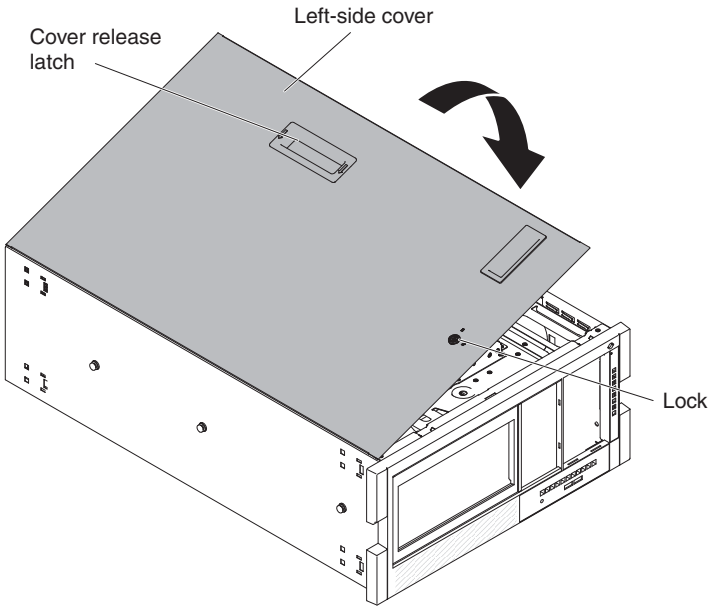
   Note: Install the 2.5-inch HDD fillers and 3.5-inch HDD fillers if necessary.



5. Install the left-side cover:

   Note: The cover that you removed in step 1 on page 5 is now the top cover. The cover-release latch must be in the unlocked (opened) position before you install the top cover.

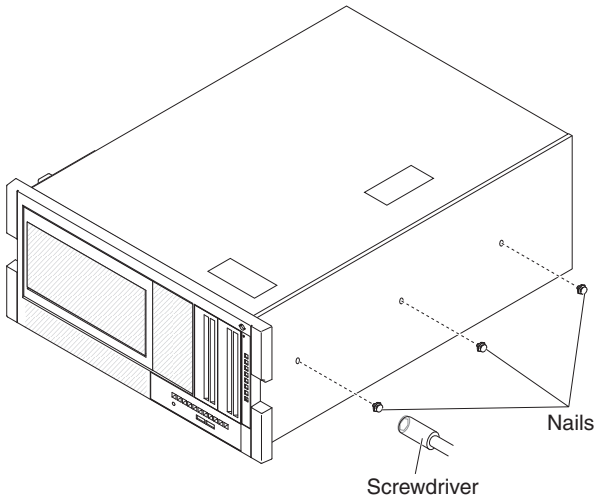
a. Set the bottom edge of the left-side cover on the bottom ledge of the server.



b. Rotate the top edge of the cover toward the server and press inward on the cover until it clicks into place.

c. Lock the cover, using the key that comes with the server.

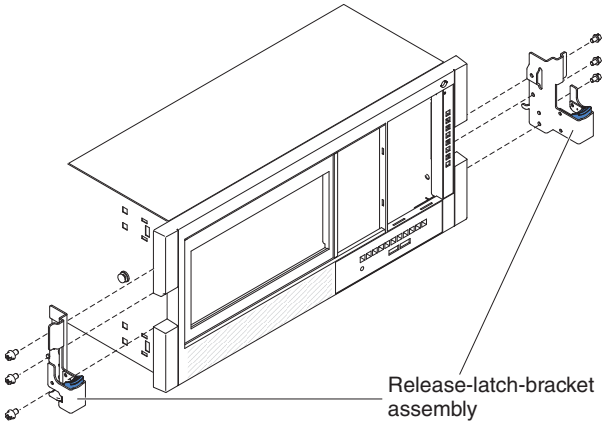
6. Install the three nails on the right side of the server.



Note: You might need a screwdriver to fasten the nails.

7. Install the release-latch bracket assembly:
   a. Align the left bracket tab with the side of the server.

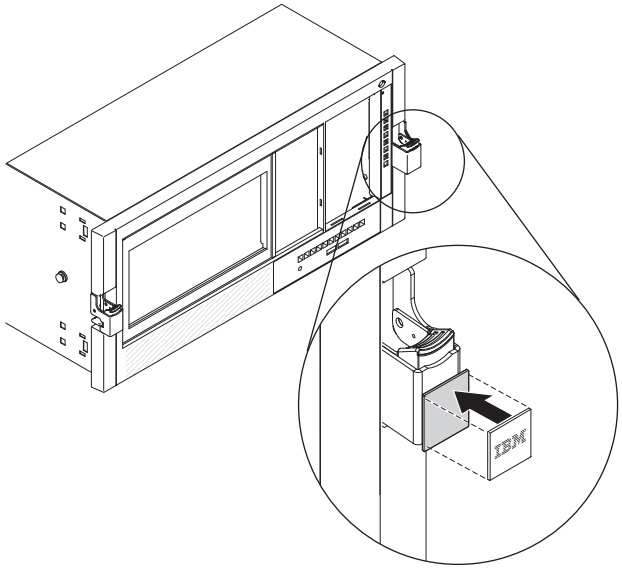
      Note: The left bracket is marked “L,” and the right bracket is marked “R.”



   b. Secure the bracket with three M3.5 screws that come with this kit.

      Note: The self-threading screws might require some effort to install.

   c. Repeat steps 7a and 7b to install the right-side release-latch bracket assembly.
8. Attach the IBM logo to the release-latch bracket assemblies on the right.



9. Store the parts that you removed during the conversion in a safe place for potential future use.
10. Attach the rack-mounted label on the chassis.
11. Follow the instructions in Chapter 3, “Rack installation instructions,” on page 19 and use the template that comes with this kit to install the server into a rack cabinet.

Chapter 3. Rack installation instructions

Review the documentation that comes with the rack cabinet for safety and cabling information. Before you install the server in a rack cabinet, review the following guidelines:

- Two or more people are required to install devices 2U or larger in a rack cabinet.
- Make sure that the room air temperature is below 35°C (95°F).
- Do not block any air vents; usually 15 cm (6 in.) of space provides proper airflow.
- Do not leave open spaces above or below an installed server in your rack cabinet. To help prevent damage to server components, always install a blank filler panel to cover the open space and to help ensure proper air circulation.
- Install the server only in a rack cabinet with perforated doors.
- Plan the device installation starting from the bottom of the rack cabinet.
- Install the heaviest device in the bottom of the rack cabinet.
- Always install the tip plates on the rack.
- Do not extend more than one device out of the rack cabinet at the same time.
- Remove the rack doors and side panels to provide easier access during installation.
- Connect the server to a properly grounded outlet.
- Do not overload the power outlet when you install multiple devices in the rack cabinet.
- Install the server in a rack that meets the following requirements:
  - Minimum depth of 70 mm (2.76 in.) between the front mounting flange and inside of the front door.
  - Minimum depth of 157 mm (6.18 in.) between the rear mounting flange and inside of the rear door.
  - Minimum depth of 718 mm (28.27 in.) and maximum depth of 762 mm (30 in.) between the front and rear mounting flanges to support the use of the cable-management arm.
  - Maximum thickness of 4.65 mm (0.18 in.) of the rack mounting flanges
  - Nominal square hole dimension of 9.5 mm (0.375 in.) for racks with square mounting holes
  - Nominal round hole diameter of 7.1 mm (0.28 in.) for racks with round mounting holes
- Racks with threaded mounting holes are not supported with these slide rails.

Statement 4:

Caution: Use safe practices when lifting.

≥18 kg (39.7 lb)

≥32 kg (70.5 lb)

≥55 kg (121.2 lb)

Statement 26:

Caution: Do not place any objects on top of rack-mounted devices.

Statement 36:

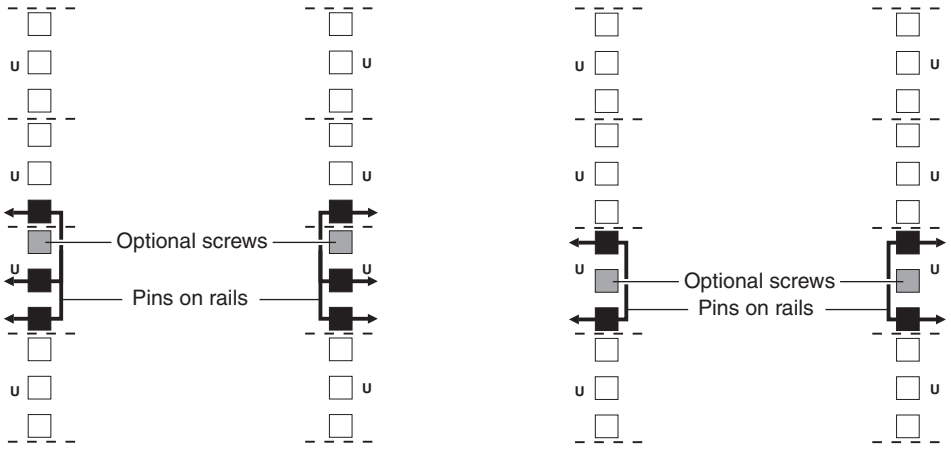
Caution: Always install the slide retention screw.

Notes:

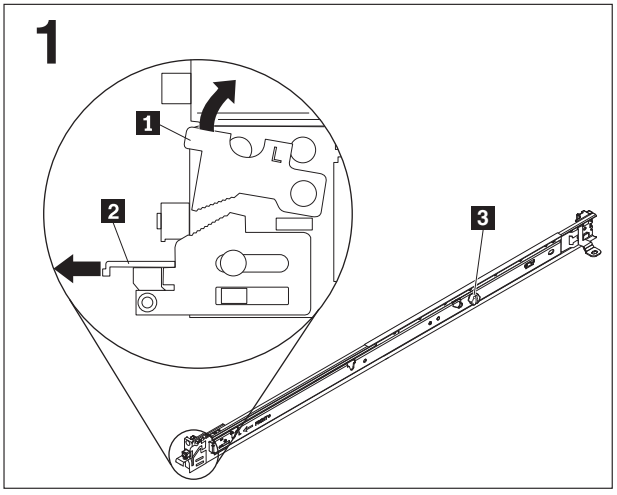
1. If you are scaling this server as part of a multinode system, see the rack installation instructions that come with the option kit for instructions on installing the extra hardware required in the multinode setup.

2. You can install the cable-management arm on either side of the server. The installation instructions in this document can be reversed if you are installing the cable-management arm on the side of the server that is not shown.

Use the following illustration of the front and rear rack-mounting flanges to determine the appropriate rack-mounting holes for installing the slide rails.

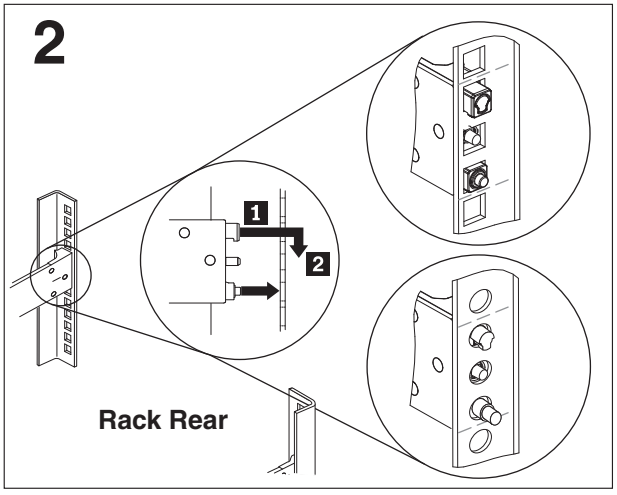


Front **Rear**



Open the front slide rail latches.

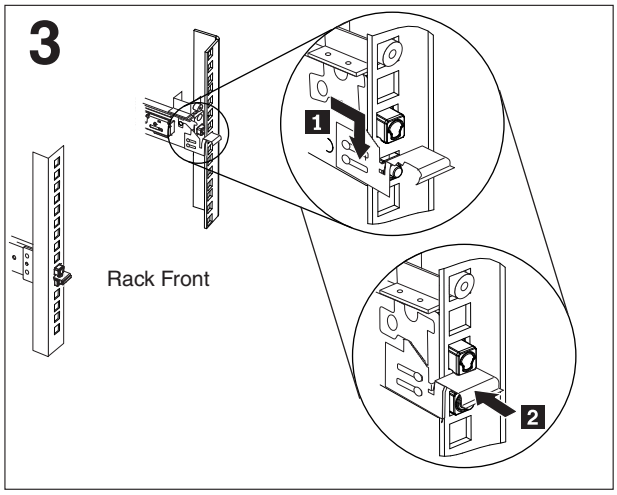
Each slide rail is marked with either an R (right) or an L (left). Select one of the slide rails and push up on the front moveable tab **1** ; then, pull out the front latch **2** . If a thumbscrew is installed in the slide rail **3** , remove it.



Install the rear end of the slide rails.
Note: When you install a 5U server, be sure to install the slide rails in the third U from the bottom of the 5U area in the rack.

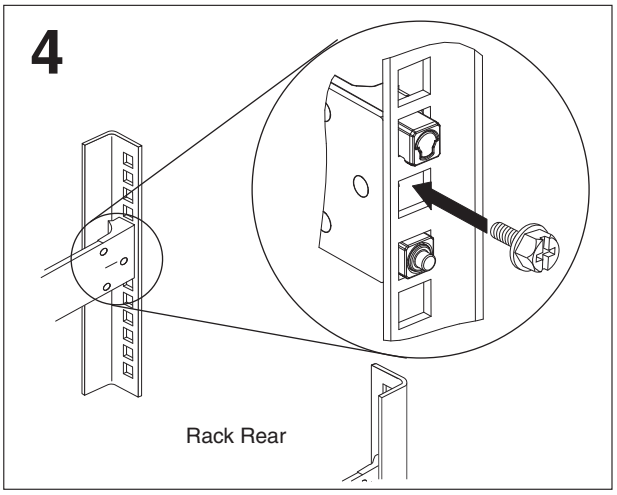
From the front of the rack, line up the three pins on the rear of the slide rail with the three holes in the selected U on the rear of the rack. Push the rails so that the pins go into the holes **1** , and drop the slide rail down **2** until it latches into place.

If there is a screw with a tag attached installed in the middle hole in the rear bracket, remove the tag and screw and keep the screw for a later step.



Install the front end of the slide rails.

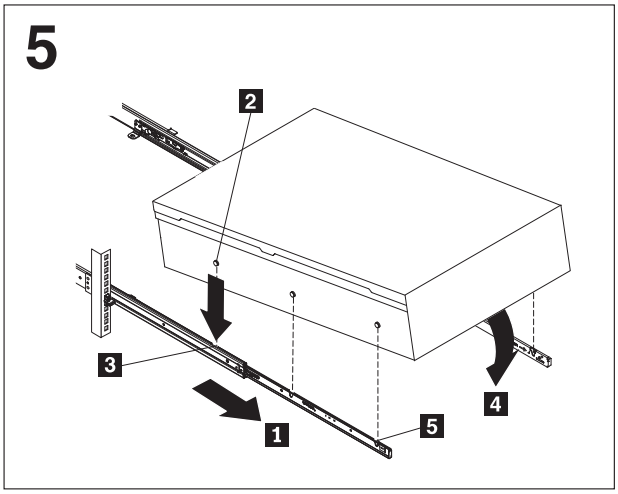
Pull the slide rail forward and insert the two lower pins **1** on the front of the rail into the two lower holes in the U on the front of the rack. Drop the rail into place until it clicks. Push the front latch **2** in all the way with one hand while you pull on the rail assembly with your other hand. Make sure that the front of the rail flange is in contact with the EIA flange.



Secure the server in the rear of the rack.

Install the screws you removed in step two in the middle hole in the rear of the rack.

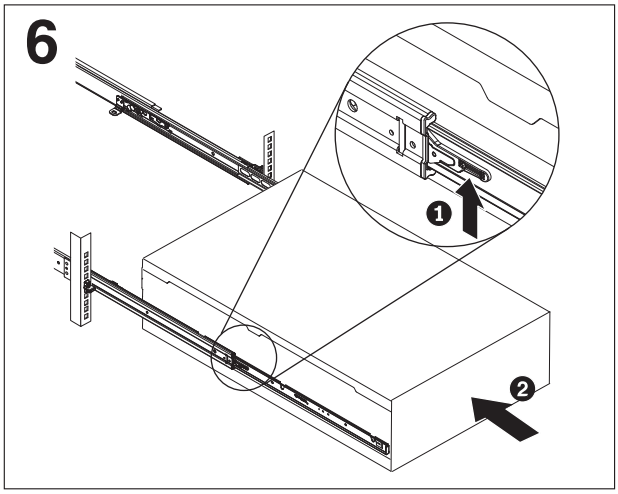
Repeat steps 1 through 4 to install the other rail into the rack. Make sure that each front latch is fully engaged.



Install the server on the slide rails.

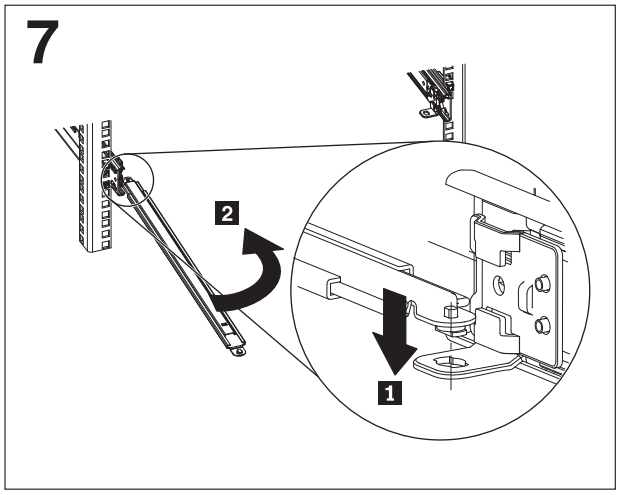
Pull the slide rails forward 1 until they click, two times, into place. Carefully lift the server and tilt it into position over the slide rails so that the rear nail heads 2 on the server line up with the rear slots 3 on the slide rails. Slide the server down until the rear nail heads slip into the two rear slots, and then slowly lower the front of the server 4 until the other nail heads slip into the other slots on the slide rails. Make sure that the front latch 5 slides over the nail heads.

It is possible to install the server horizontally, but it is easier to install when the server is tilted.



Slide the server into the rack.

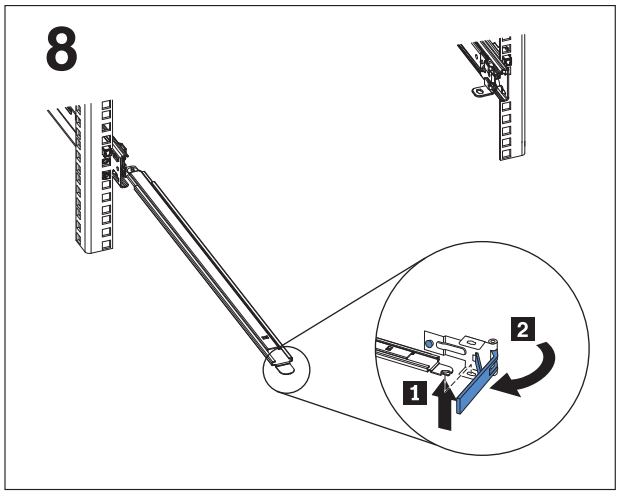
Lift the locking levers 1 on the slide rails and push the server 2 all the way into the rack until it clicks into place.



Install the cable management support arm.

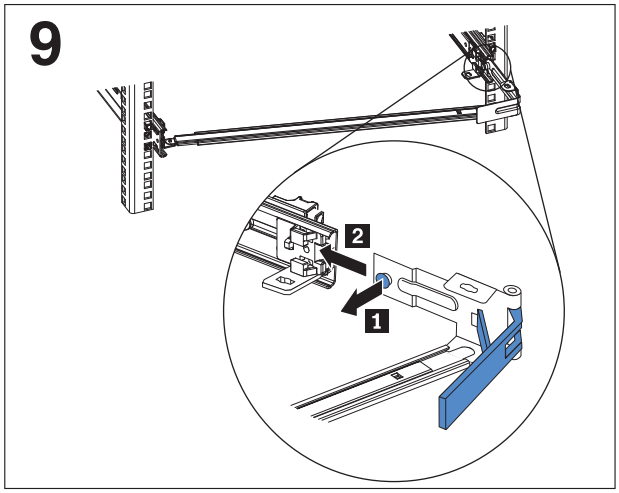
The cable-management arm can be installed on either side of the server. This document shows it being installed on the left side. To install the cable-management arm on the right side, follow the instructions and install the hardware on the opposite side.

Connect one end of the support arm **1** to the same slide rail to which you plan to attach the cable-management arm so that you can swing the other end of the support arm **2** toward the rack. Make sure the shiny bar is on top, as shown in the illustration.



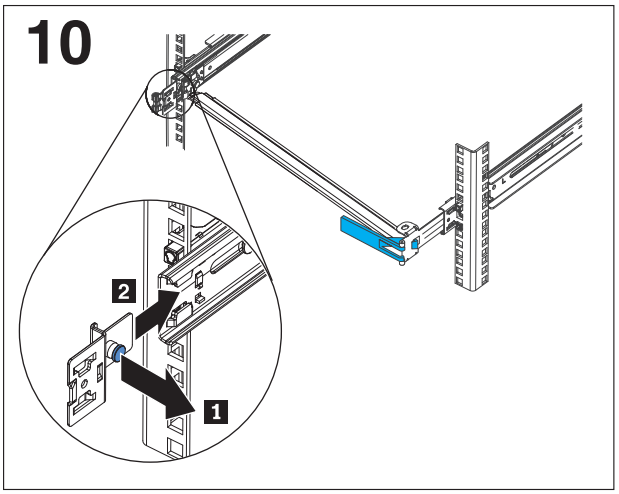
Install the cable management arm stop bracket.

Install the L-shaped cable-management stop bracket **1** on the unattached end of the support arm. Turn the bracket **2** to secure it to the support arm.



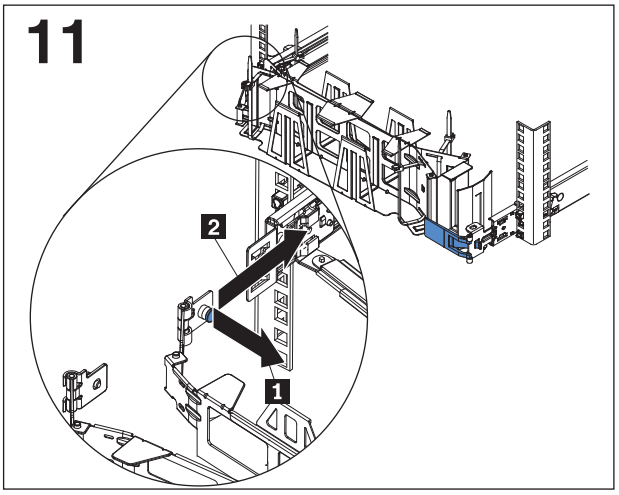
Connect the stop bracket to the slide rail.

To attach the other side of the support arm to the rear of the slide rail, pull the pin out 1, and then slide the bracket 2 into the slide rail.



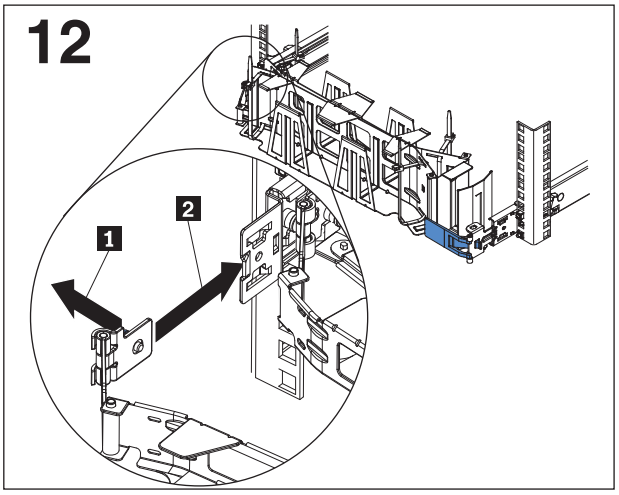
Install the cable management arm mounting bracket.

Pull out the mounting bracket pin 1 and slide the mounting bracket 2 into the slide rail onto which you are installing the cable-management arm. Push the bracket into the slide rail until the spring-loaded pin snaps into place.



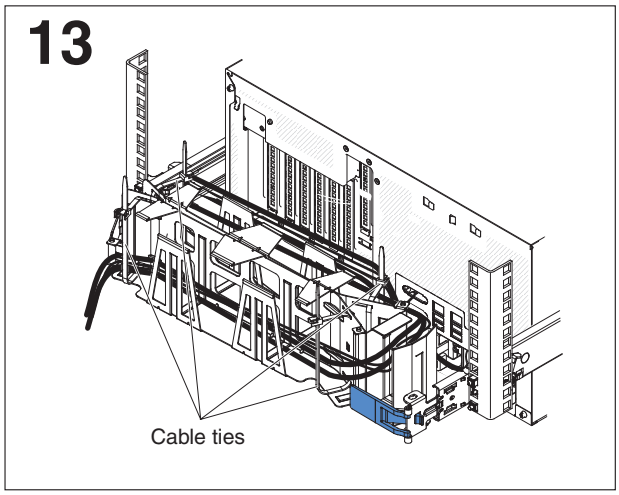
Install the cable management arm.

Place the cable-management arm on the support arm. Pull out the cable-management arm pin 1, and then slide the cable-management arm tab 2 into the slide rail. Push the tab until it snaps into place.



Install the cable management arm.

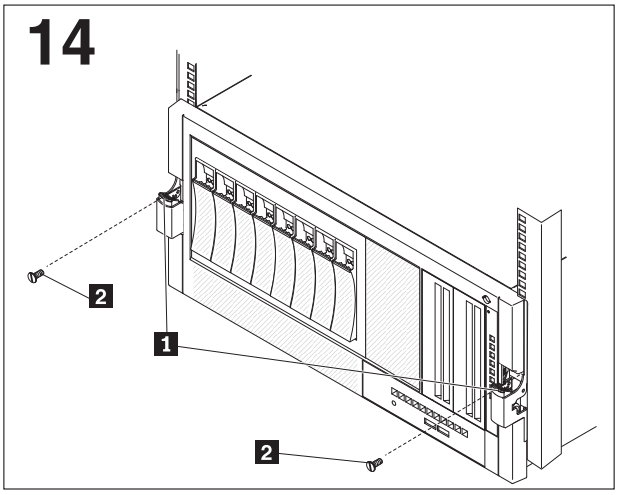
Pull out the other cable-management arm pin 1, and then slide that cable management arm tab into the slot 2 on the outside of the slide rail. Push the tab until it snaps into place.



Connect and route the cables.

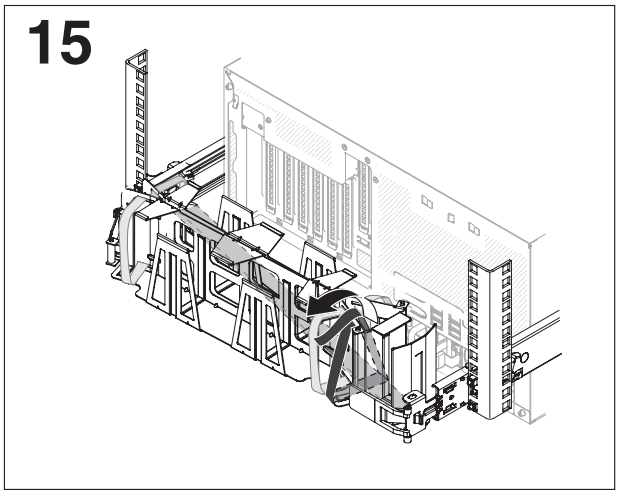
Attach the power cords and other cables to the rear of the server (including keyboard, monitor, and mouse cables, if required). (To access the rear of the server, lift the cable management arm above the stop bracket and rotate it out of the way.)

Route the cables and power cords in the cable-management arm and secure them with cable ties or hook-and-loop fasteners. Thread a cable tie through the loop on the rear of the server and secure the cables in place so that they do not drop below the cable management arm.
Note: Allow slack in all cables to avoid tension in the cables as the cable-management arm moves in the extended position.



Install the front screws, if necessary.

Slide the server into the rack until it snaps into place. To slide the server out of the rack, press on the release latches **1** .
Note: When you move the rack cabinet, or if you install the rack cabinet in a vibration-prone area, insert the optional M6 screws **2** in the front of the server.

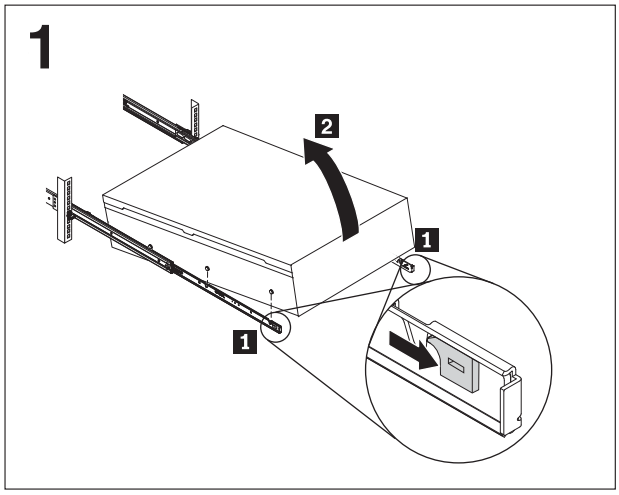


Secure the cable management arm if you are shipping the server in a rack.

If you are moving the server in a rack, you must secure the cable management arm first.

Use a cable tie to secure the free end of the cable management arm to the cable management support arm.

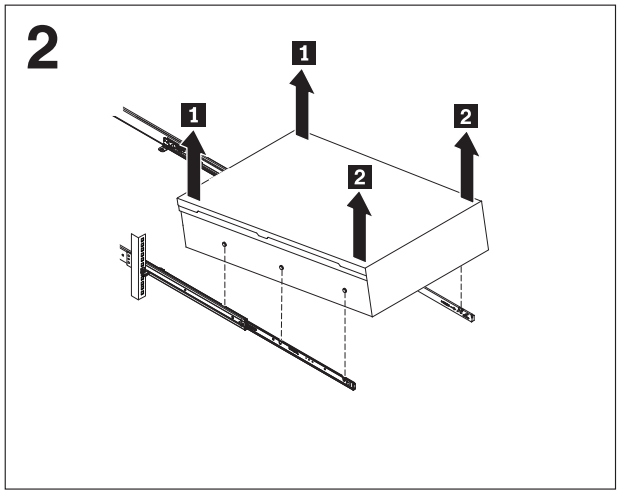
Removing the server from the rack



Unlatch and rotate the front of the server.

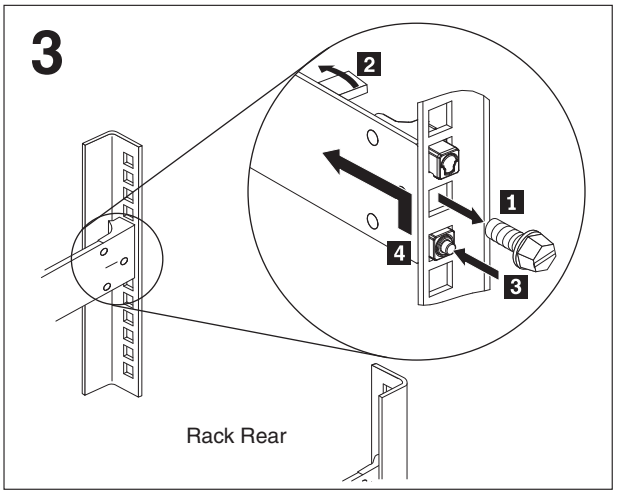
To remove the server from the rack, disconnect the cables from the rear of the server. Remove the cable management arm by pulling the pins out while sliding the tabs out of the mounting location.

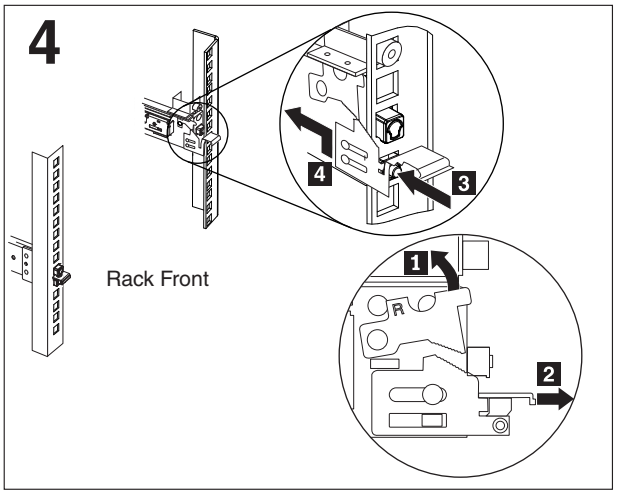
Pull the locking levers **1** forward, while supporting the rear of the server, and lift the front of the server up slightly **2** to clear the nailhead from the slot.



Lift the server off of the slide rails.

After the front nailheads clear the latches, lift up on the rear **1** of the server to level the server. Lift the server out of the rack **2** and place it on a sturdy surface.





Remove the rear end of the slide rails.

To disengage the slide rails from the rear of the rack, remove the retention screw **1** if one is installed, then rotate the latch **2** toward the front of the rack. Push the pin **3** in toward the rack, and then lift and push the end of the rail **4** toward the front of the rack.

Remove the front end of the slide rails.

To remove the slide rails from the front of the rack, push up the front tab **1** and slide out the front latch **2** . Push in the lower pin **3** and lift up slightly on the front of the slide rail **4** . Remove the slide rail from the rack.

Store this information with your server documentation for future use.

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/supportportal/ 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.

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/supportportal/ and follow the instructions. Also, some documents are available through the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

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/supportportal/.

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).

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 a Business Partner** 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

Appendix B. Notices

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Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

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.

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 server 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 server 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 server, IBM may condition provision of repair or replacement of servers or parts on implementation of appropriate remedial measures to mitigate such environmental contamination. Implementation of such remedial measures is a customer responsibility.

Table 1. Limits for particulates and gases

Contaminant	Limits
Particulate	• The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2[1]. • 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. • The deliquescent relative humidity of the particulate contamination must be more than 60%[2]. • The room must be free of conductive contamination such as zinc whiskers.
Gaseous	• Copper: Class G1 as per ANSI/ISA 71.04-1985[3] • Silver: Corrosion rate of less than 300 Å in 30 days

[1] 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.

[2] 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.

[3] 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.

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

U.S.A.

In the request, be sure to include the publication part number and title.

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

Telecommunication regulatory statement

This product is not intended to be connected directly or indirectly by any means whatsoever to interfaces of public telecommunications networks, nor is it intended to be used in a public services network.

Electronic emission notices

When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

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
Email: 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
Email: tjahn@de.ibm.com

Generelle Informationen:

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

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.

Japan Electronics and Information Technology Industries Association (JEITA) statement

高調波ガイドライン適合品

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

Korea Communications Commission (KCC) statement

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

This is electromagnetic wave compatibility equipment for business (Type A). Sellers and users need to pay attention to it. This is for any areas other than home.

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

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。

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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