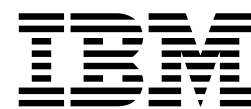IBM NetBAY42 Enterprise Rack

Installation Guide

IBM NetBAY42 Enterprise Rack

Installation Guide

NOTE

Before using this information and the product it supports, be sure to read the general information in Appendix B, "Product warranties and notices," on page 41.

Safety

Before installing this product, read the Safety Information book.

مج، يجب قراءة   دات السلامة

Antes de instalar este produto, leia o Manual de Informações sobre Segurança.

安装本产品前请先阅读《安全信息》手册。

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs hæftet med sikkerhedsforskrifter, før du installerer dette produkt.

Lue Safety Information -kirjanen, ennen kuin asennat tämän tuotteen.

Avant de procéder à l'installation de ce produit, lisez le manuel Safety Information.

Vor Beginn der Installation die Broschüre mit Sicherheitshinweisen lesen.

Πριν εγκαταστήσετε αυτό το προϊόν, διαβάστε το εγχειρίδιο Safety Information.

Prije instalacije ovog proizvoda pročitajte priručnik sa sigurnosnim uputama.

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

Przed zainstalowaniem tego produktu należy przeczytać broszurę Informacje Dotyczące Bezpieczeństwa.

Prima di installare questo prodotto, leggere l'opuscolo contenente le informazioni sulla sicurezza.

本製品を導入する前に、安全情報資料を御読みください。

이 제품을 설치하기 전에, 안전 정보 책자를 읽어보십시오.

Пред да го инсталирате овој производ прочитајте ја книгата со безбедносни информации.

Lees voordat u dit product installeert eerst het boekje met veiligheidsvoorschriften.

Les heftet om sikkerhetsinformasjon (Safety Information) før du installerer dette produktet.

Antes de instalar este produto, leia o folheto Informações sobre Segurança.

Перед установкой продукта прочтите брошюру по технике безопасности (Safety Information).

Pred inštaláciou tohto produktu si prečítajte Informačnú brožúrku o bezpečnosti.

Preden namestite ta izdelek, preberite knjižico Varnostne informacije.

Antes de instalar este producto, lea la Información de Seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

在安裝本產品之前，也請先閱讀「安全性資訊」小冊子。

Installálás elött olvassa el a Biztonsági elöírások kézikönyvét !

Important:

> All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in the *IBM NetBAY Rack Safety Information* book.
>
> For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *IBM NetBAY Rack Safety Information* book under statement 1.
>
> Be sure to read all caution and danger statements before performing the instructions.

1

CAUTION:

To ensure safety, all configurations of the rack must be Listed in the U.S.A. and Certified in Canada by a nationally recognized testing laboratory such as Underwriters Laboratory (UL), Canadian Standards Association (CSA), or ETL Testing Laboratories.

2

DANGER

> • **The maximum allowable weight for devices on slides is 80 kg (176 lb). Do not install sliding devices exceeding this weight.**
>
> • **The center of gravity for an extended unit cannot exceed 407 mm (16 in.) from the face of the rack. If an extended device exceeds this distance, the configured rack might be unstable.**

3

⚠

DANGER

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

4

⚡

DANGER

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

5

⚡

DANGER

Each rack might have more than one power cord. Be sure to disconnect all power cords in the rack before servicing any device in the rack.

6

DANGER

Install an emergency power off (EPO) switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in one rack.

7

DANGER

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

8

CAUTION:

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

- **Reduce the weight of the rack by removing equipment starting at the top of the rack. When possible, restore the rack to the configuration of the rack cabinet as you received it. If this is not possible or this configuration is not known, remove all devices in the 32U position and above before moving the rack.**

- **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, which can be up to 930 kg (2045 lb).**

- **Verify that all door openings are at least a standard 760 x 2030 mm (30 x 80 in.) size.**

- **Ensure that all devices, drawers, doors, and cables are secure.**

- **Ensure that the four levelling pads are raised to their highest position.**

- **Ensure that the stabilizer bracket is removed.**

- **Do not use a ramp inclined at more than ten degrees.**

- **Once the rack is in its new location, repopulate the rack from the lowest position to the highest position.**

If a long distance relocation is required, pack the rack in the original packaging material, or equivalent. Also, lower the levelling pads to raise the casters off of the pallet and bolt the rack to the pallet

Contents

Figures

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Chapter 1. Introduction

This documentation contains general installation instructions for the IBM® NetBAY42 Enterprise Rack cabinet and many of the common optional devices that you can install in the rack cabinet. Always read the documentation that comes with your server or optional device for detailed installation instructions. Figure 1 shows an overview of how to install your rack cabinet.
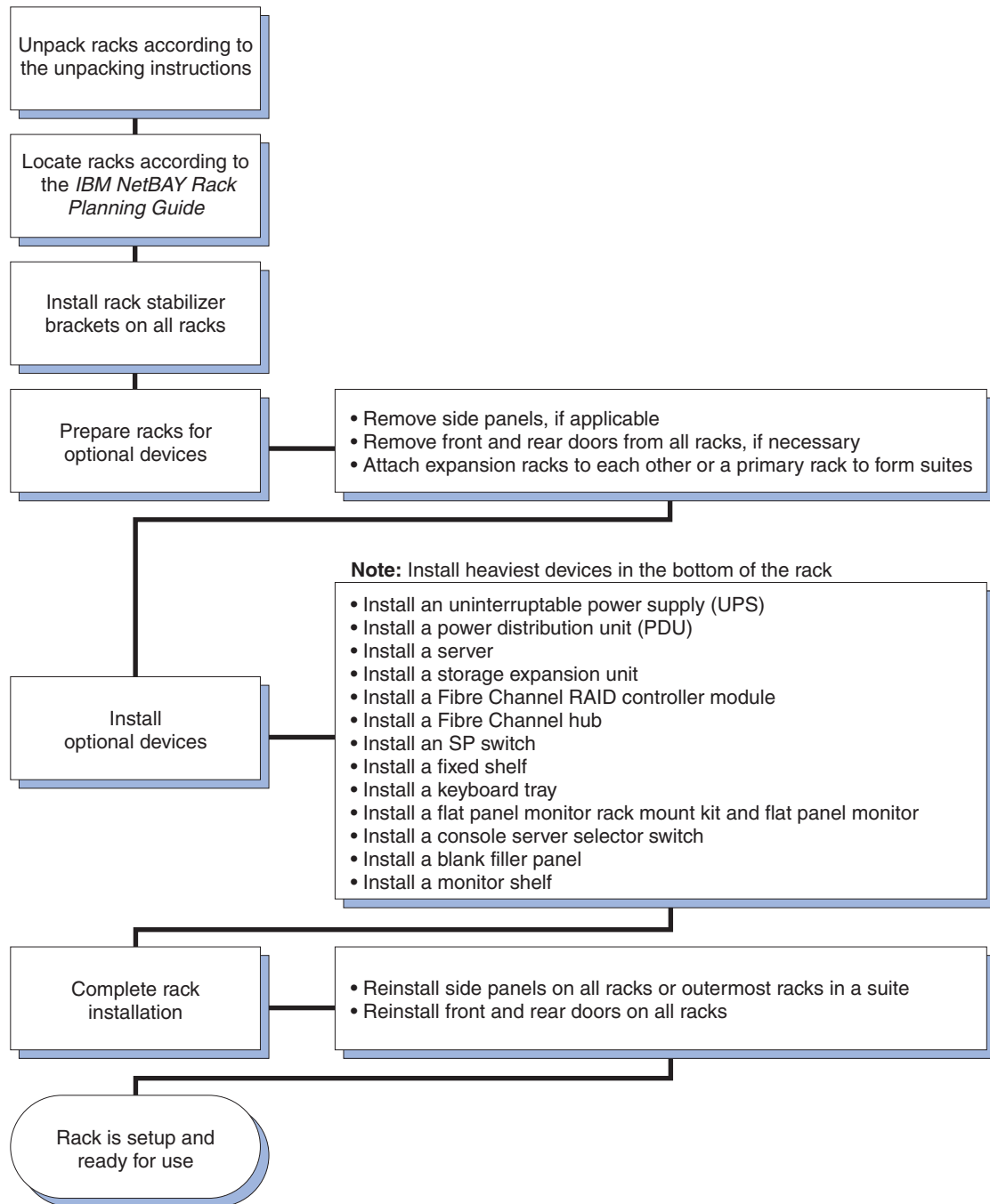
```
┌─────────────────────────┐
│ Unpack racks according to│
│ the unpacking instructions│
└─────────────────────────┘
            │
┌─────────────────────────┐
│ Locate racks according to│
│ the IBM NetBAY Rack      │
│ Planning Guide           │
└─────────────────────────┘
            │
┌─────────────────────────┐
│ Install rack stabilizer  │
│ brackets on all racks    │
└─────────────────────────┘
            │
┌─────────────────────────┐   ┌──────────────────────────────────────────────────────────┐
│ Prepare racks for        │───│ • Remove side panels, if applicable                        │
│ optional devices         │   │ • Remove front and rear doors from all racks, if necessary  │
└─────────────────────────┘   │ • Attach expansion racks to each other or a primary rack to form suites │
                              └──────────────────────────────────────────────────────────┘
```

Note: Install heaviest devices in the bottom of the rack

```
┌─────────────────────────┐   ┌──────────────────────────────────────────────────────────┐
│                          │   │ • Install an uninterruptable power supply (UPS)            │
│                          │   │ • Install a power distribution unit (PDU)                  │
│                          │   │ • Install a server                                         │
│                          │   │ • Install a storage expansion unit                         │
│                          │   │ • Install a Fibre Channel RAID controller module          │
│        Install           │───│ • Install a Fibre Channel hub                              │
│     optional devices     │   │ • Install an SP switch                                     │
│                          │   │ • Install a fixed shelf                                     │
│                          │   │ • Install a keyboard tray                                   │
│                          │   │ • Install a flat panel monitor rack mount kit and flat panel monitor │
│                          │   │ • Install a console server selector switch                 │
│                          │   │ • Install a blank filler panel                             │
│                          │   │ • Install a monitor shelf                                  │
└─────────────────────────┘   └──────────────────────────────────────────────────────────┘
```

```
┌─────────────────────────┐   ┌──────────────────────────────────────────────────────────┐
│ Complete rack            │───│ • Reinstall side panels on all racks or outermost racks in a suite │
│ installation             │   │ • Reinstall front and rear doors on all racks             │
└─────────────────────────┘   └──────────────────────────────────────────────────────────┘
            │
     ╭─────────────────╮
     │ Rack is setup and│
     │ ready for use    │
     ╰─────────────────╯
```

Figure 1. Installing the rack cabinet and devices overview

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

1

Chapter 2. Installing a rack cabinet

The primary rack cabinet comes with side panels installed. The expansion rack cabinet does not come with side panels, but does include the required hardware for attaching the rack cabinet to a suite of rack cabinets. Both rack cabinets conform to Electronic Industries Association (EIA) standard *EIA-310-D Cabinets, Racks, Panels, and Associated Equipment (1992)*.

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

1

CAUTION:

To ensure safety, all configurations of the rack must be Listed in the U.S.A. and Certified in Canada by a nationally recognized testing laboratory such as Underwriters Laboratory (UL), Canadian Standards Association (CSA), or ETL Testing Laboratories.
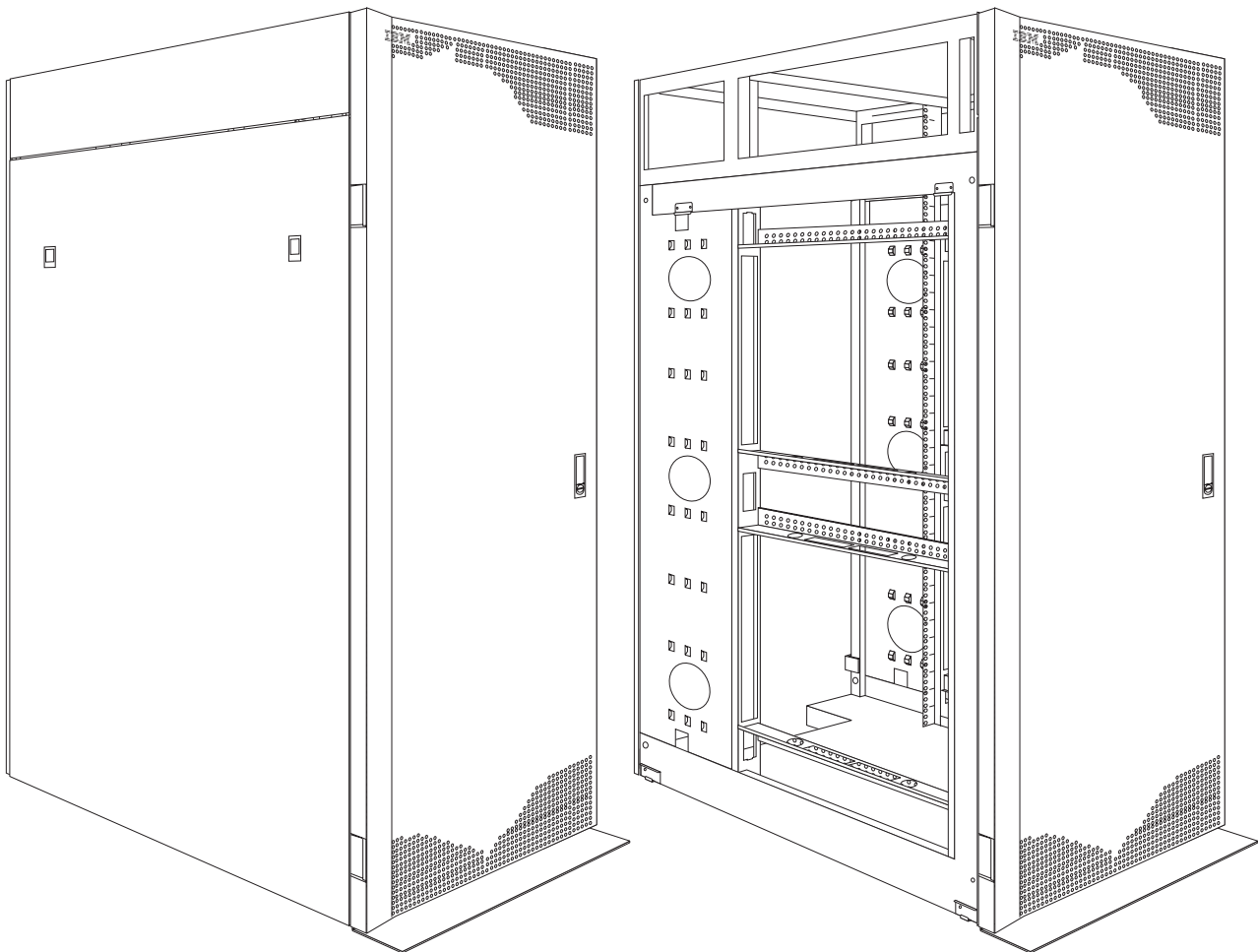
Figure 2. Primary rack cabinet with side panels and Expansion rack cabinet without side panels

Installing the stabilizer bracket

See the unpacking instructions that come with your rack cabinet for information on how to unpack and locate your rack cabinet; then, lower the rack leveling feet and install the stabilizer bracket for added stability according to the following procedure:

3

DANGER

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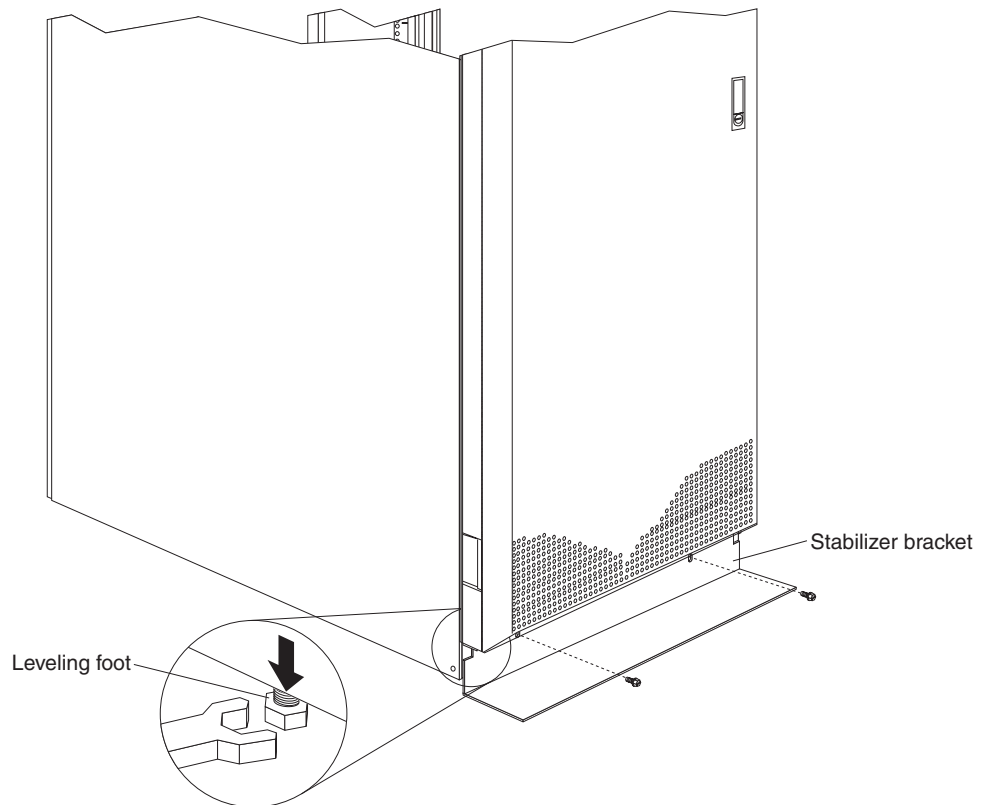- **Do not extend more than one sliding device at a time.**

Stabilizer bracket

Leveling foot

Figure 3. Lowering the leveling feet and installing the stabilizer bracket

1. Using the wrench that comes with the rack cabinet, lower each of the four leveling feet just enough so that they touch the floor. The rack casters will support the weight of the rack cabinet. The feet prevent the rack from rolling.

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

Removing and installing panels

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

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

Removing and installing the side panels

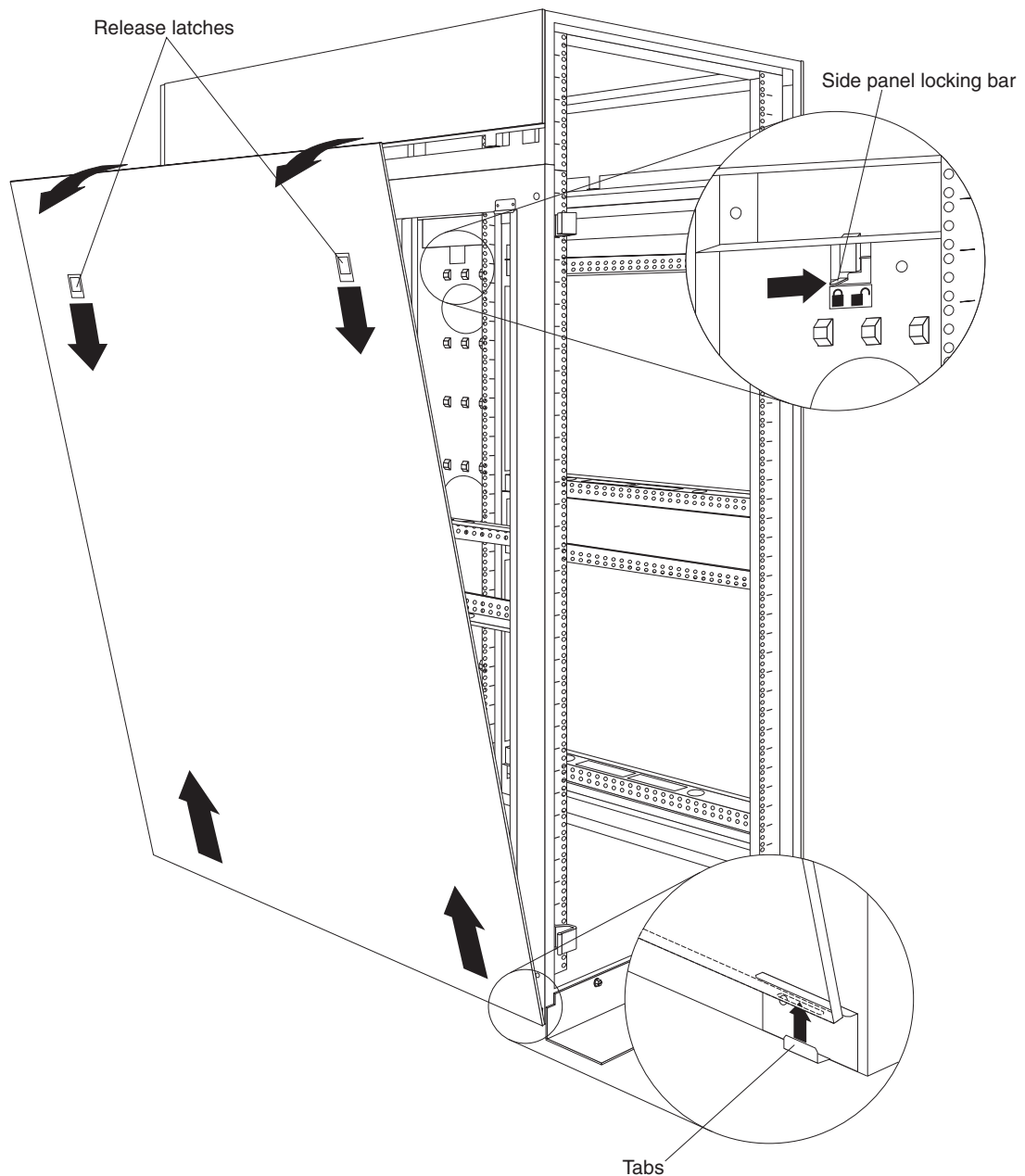Use the following procedure to remove the rack side panels:

Figure 4. Removing the rack side panels

1. From the inside of the rear of the rack cabinet, slide the side panel locking bar toward the unlocked position.

2. Push down the release latches and tilt the side panel slightly toward you; then, lift the side panel away from the tabs on the bottom of the rack cabinet.

3. Repeat this procedure to remove both side panels.

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

Removing and installing the top 6U side panels

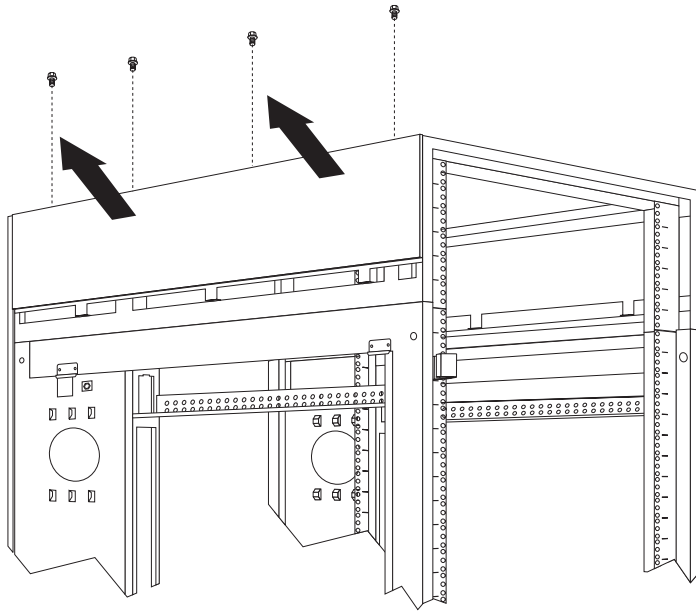Use the following procedure to remove the top 6U side panels from the rack cabinet:

Figure 5. Removing the top 6U side panels from the rack cabinet

1. On the top of the rack cabinet, loosen the four screws that hold each side panel in place.

2. Tilt the side panel slightly toward you; then, remove it from the rack cabinet.

3. Repeat this procedure to remove both side panels.

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

Removing and installing rack doors

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

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

Removing and installing the front door

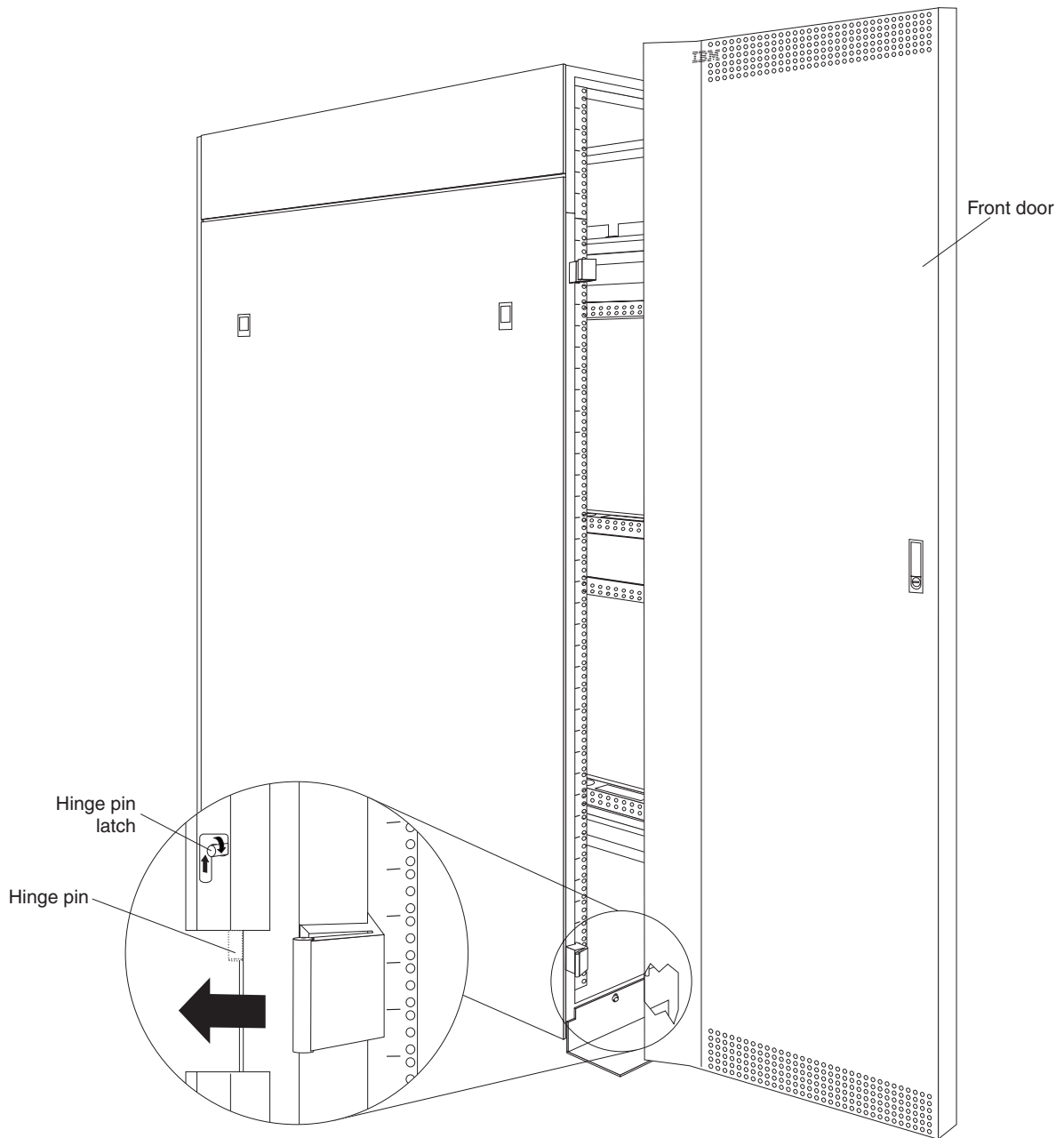Use the following procedure to remove a front door from the rack cabinet:

Figure 6. Removing a front door from the rack cabinet

1. Unlock and open the front door.

2. While supporting the door, lift the bottom hinge-pin latch and move it clockwise to unlock the bottom hinge pin; then, unlock the top hinge pin.

3. Pull the door away from the rack cabinet; then, set the door aside.

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

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

Removing and installing the rear door

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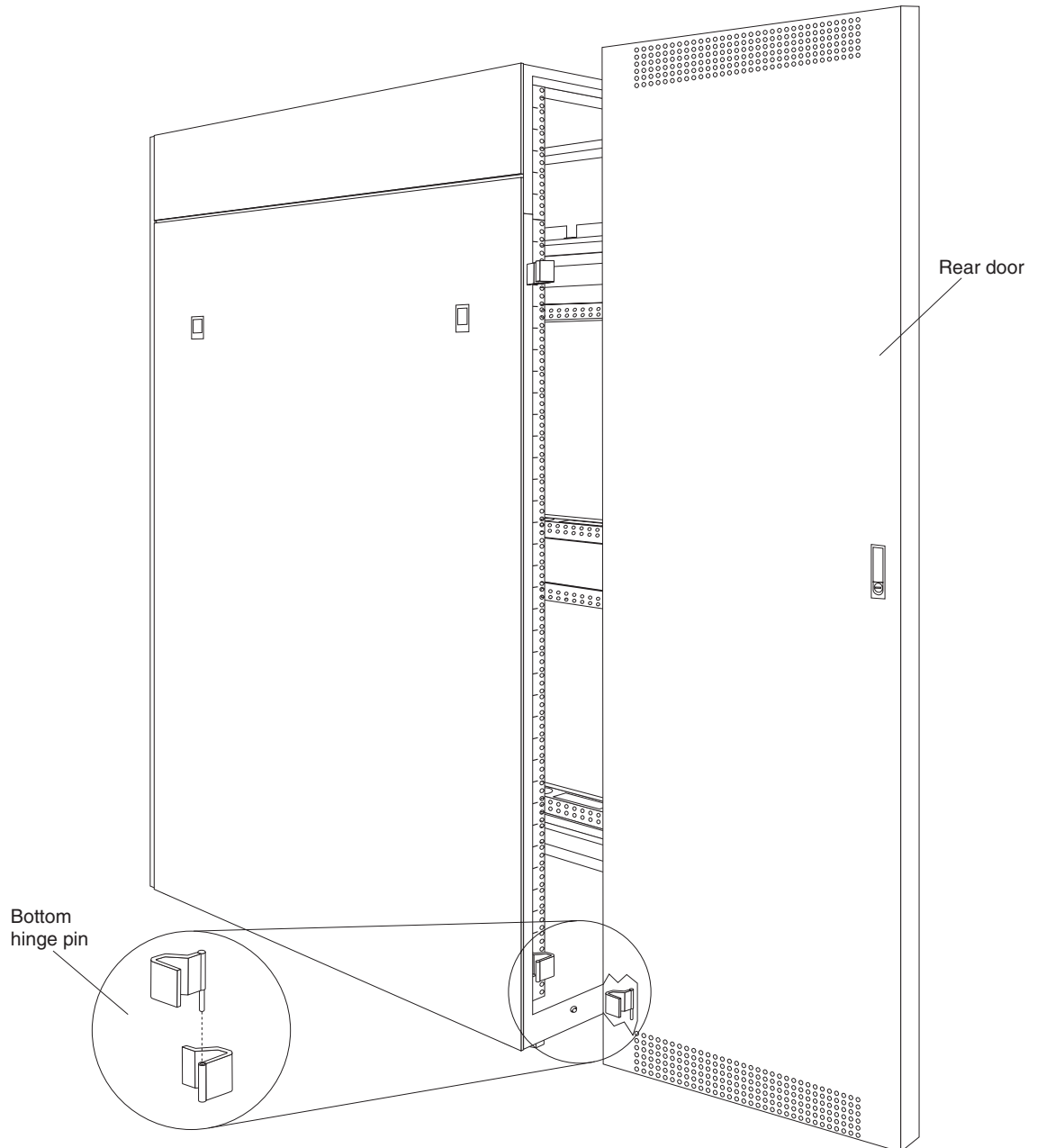
Rear door

Bottom
hinge pin

Figure 7. Removing a rear door from the rack cabinet

1. Unlock and open the rear door.

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

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

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

Removing and installing the top 6U portion of the rack

You can temporarily remove the top 6U portion (including the top cover) of the rack cabinet while you move the rack cabinet through some nonstandard doorways. You must first remove both doors according to "Removing and installing rack doors" on page 7.

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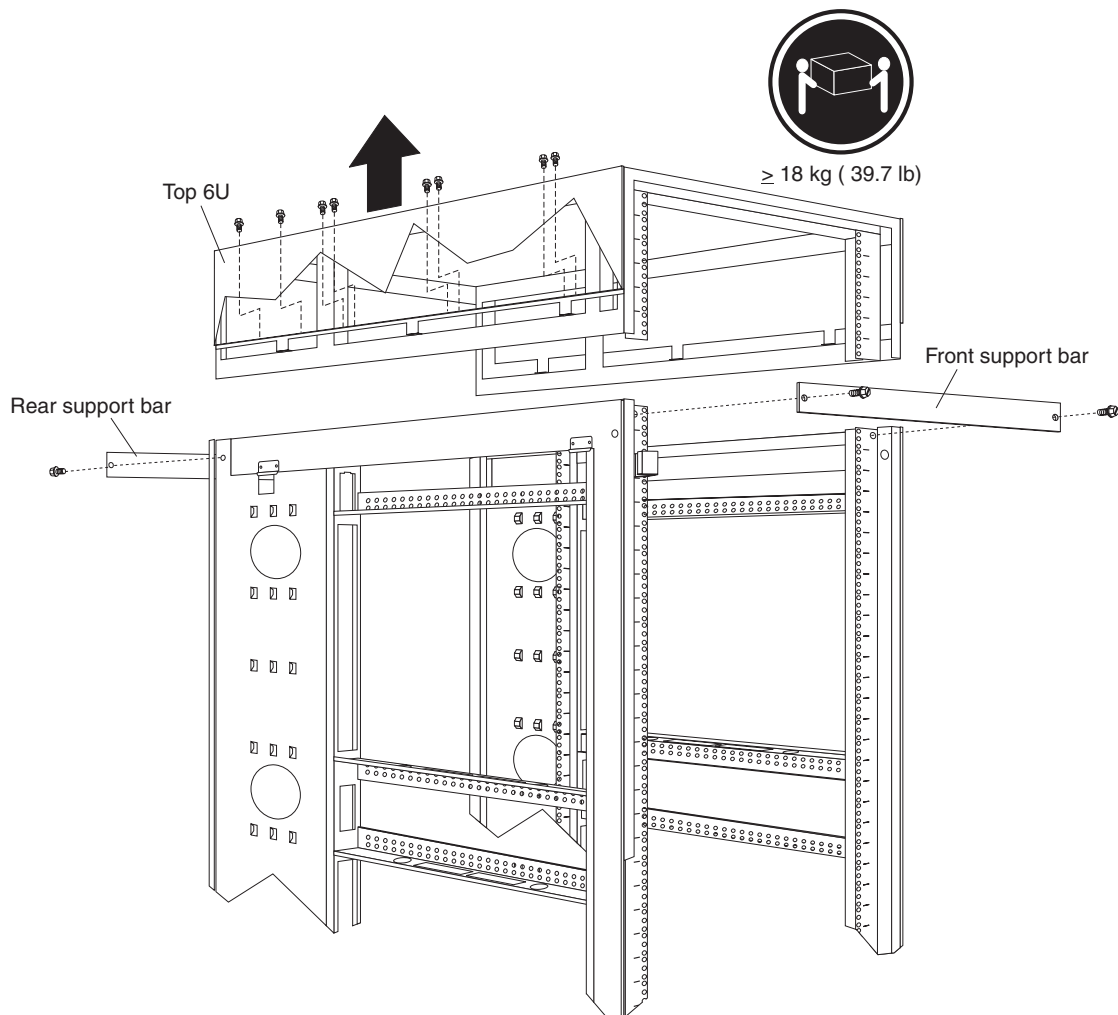

Figure 8. Removing the top 6U portion of the rack cabinet

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

2. Remove the 16 screws (eight per side) that hold the top 6U portion of the rack cabinet in place.

3. Relocate your rack cabinet; then, install the top 6U portion of the rack cabinet using all 16 of the screws that you removed.

4. Remove both support bars from the rack cabinet.

Attaching rack cabinets in a suite

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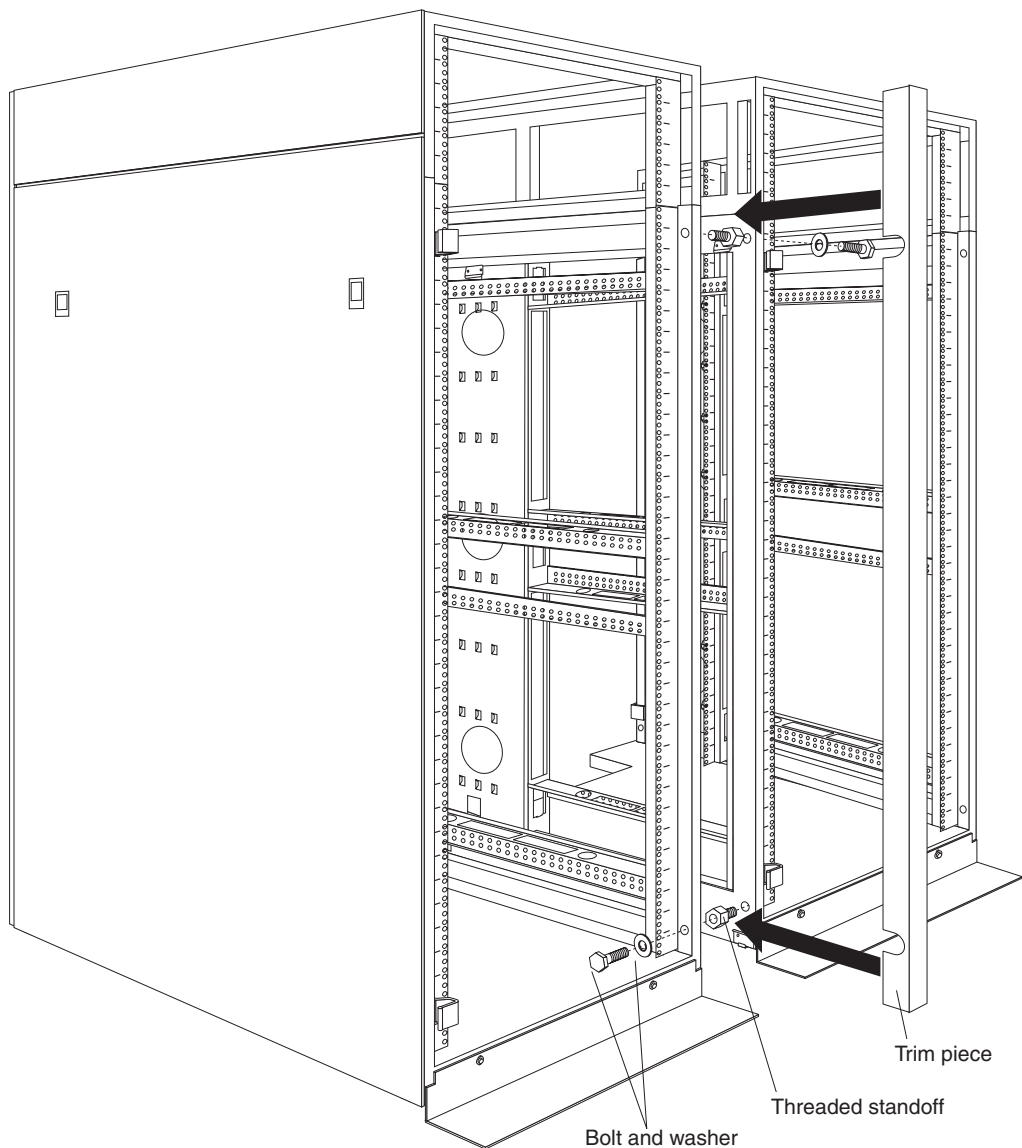
Trim piece

Threaded standoff

Bolt and washer

Figure 9. Attaching two adjacent rack cabinets to each other to form a suite

1. Remove both side panels (see "Removing and installing panels" on page 5) from the side of a primary rack cabinet that is adjacent to an expansion rack in a suite.

2. Remove the front and rear doors (see "Removing and installing rack doors" on page 7) from all rack cabinets.

3. On the outside of two adjacent rack cabinets, install the four threaded standoffs that come with the expansion rack cabinet:

   a. Install two threaded standoffs on the rack cabinet to the left, one on the top-front and one on the bottom-rear.

   b. Install the other two threaded standoffs on the rack cabinet to the right, one on the bottom-front and one on the top-rear.

4. Attach the rack cabinets together, using four bolts and washers that come with the expansion rack cabinet.

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

5. Snap the trim pieces into place between the adjacent rack cabinets. Install one trim piece in the front and one in the rear.

6. Repeat step 3 through step 5 for all other adjacent rack cabinets in the suite.

7. On the outside of the outermost expansion rack cabinets in the suite, install the side panels that you removed in step 1.

8. Install the front and rear doors on all rack cabinets.

Chapter 3. Installing optional devices

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

Note: You can install many optional devices using the general instructions provided in this chapter. Some devices might require more detailed information contained in the documentation that comes with the optional device.

Console switch

PDUs

Blank filler panel

Monitor shelf

Fibre Channel RAID controller unit

SP switch

Fibre Channel hub

Small server

Keyboard tray

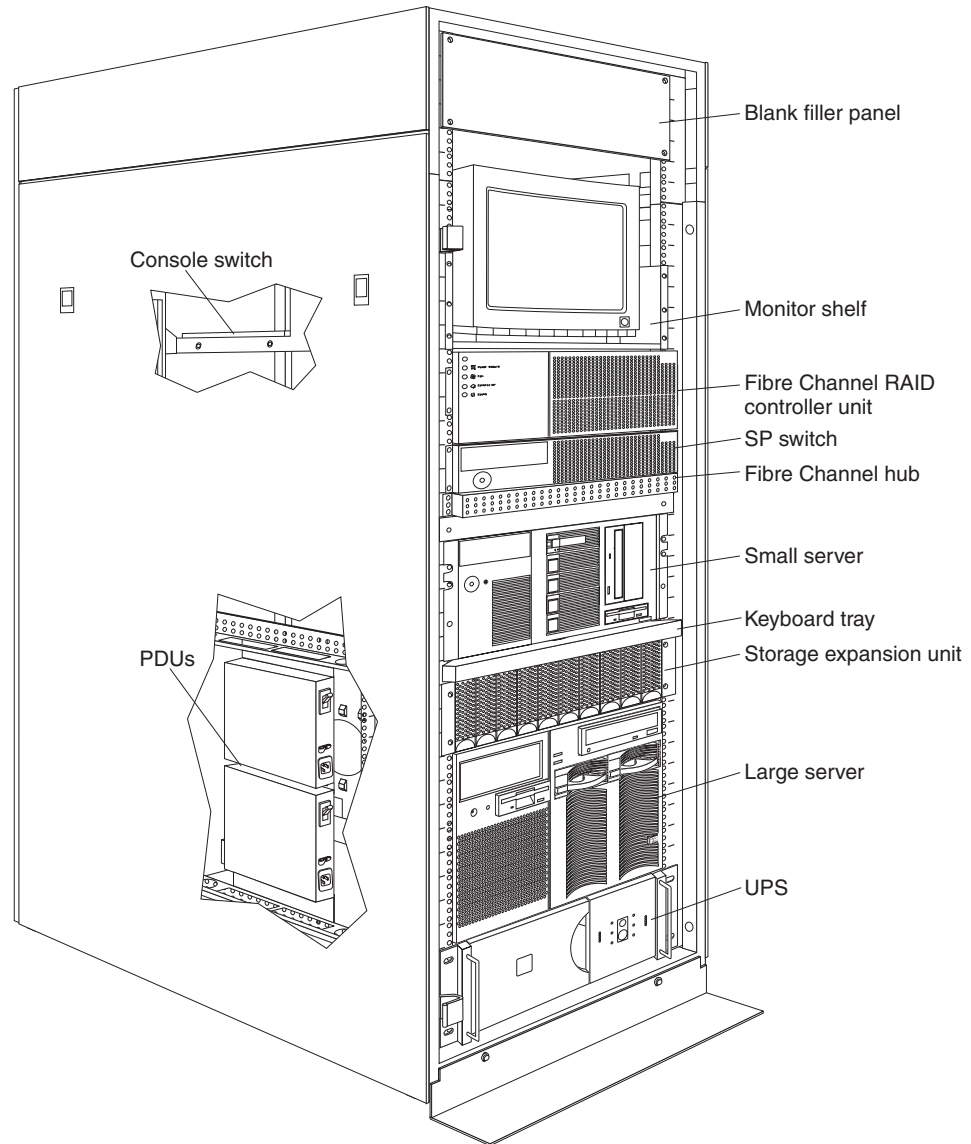Storage expansion unit

Large server

UPS

Figure 10. Installing optional devices in the rack cabinet

Using the rack cabinet mounting flanges

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

2

DANGER

> •   **The maximum allowable weight for devices on slides is 80 kg (176 lb). Do not install sliding devices exceeding this weight.**
>
> •   **The center of gravity for an extended unit cannot exceed 407 mm (16 in.) from the face of the rack. If an extended device exceeds this distance, the configured rack might be unstable.**

3

DANGER

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

Installing threaded rails or bars

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

Installing clip nuts

You must use clip nuts for all optional devices that do not have threaded holes. Clip nuts install on the rack mounting flanges as shown in Figure 11. Some devices might require that you install the clip nuts on the rail instead of the rack mounting flanges. See the device documentation for information on where you must install the clip nuts.
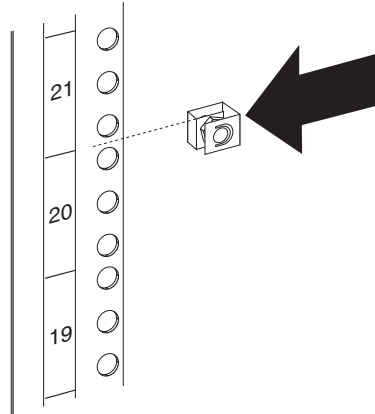

Figure 11. Installing clip nuts on the rack mounting flanges

Note: Your rack cabinet comes with a supply of clip nuts that you can use to install optional devices. Most devices will also come with clip nuts that you can use.

Installing an uninterruptible power supply

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

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

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

6

DANGER

> **Install an emergency power off (EPO) switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in one rack.**
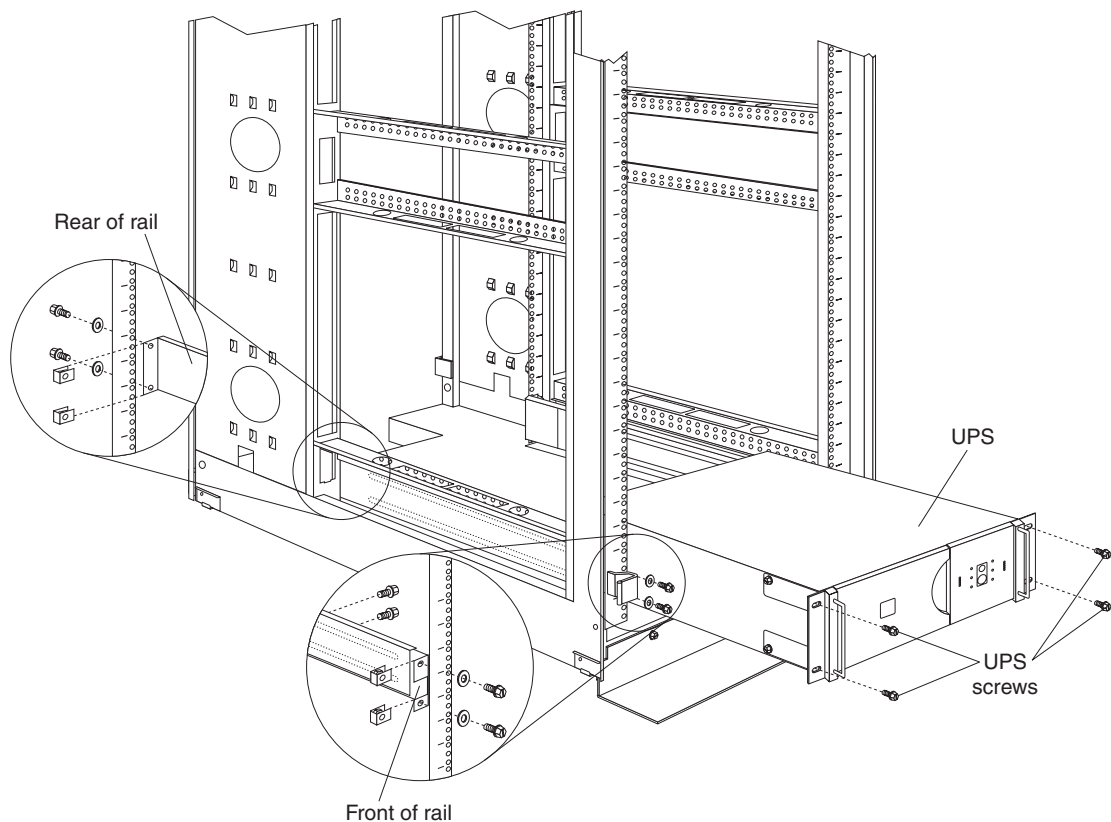
Figure 12. Installing a UPS

1. Use the template that comes with the UPS to determine where to install clip nuts.
2. If you are installing L-channel support brackets, do the following:
   a. Adjust the length of the brackets to fit the depth of the rack cabinet.
   b. Install clip nuts on the bracket instead of the rack mounting flanges.
   c. Install the L-channel support brackets on each side of the rack cabinet, using the screws and washers that come with the UPS.
3. Slide the UPS into the bottom of your rack cabinet; then, attach the UPS to the rack mounting flanges using clip nuts and M6 screws.

Installing a power distribution unit

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

6

DANGER

Install an emergency power off (EPO) switch if more than one power device (power distribution unit or uninterruptible power supply) is installed in one rack.

Installing a PDU vertically

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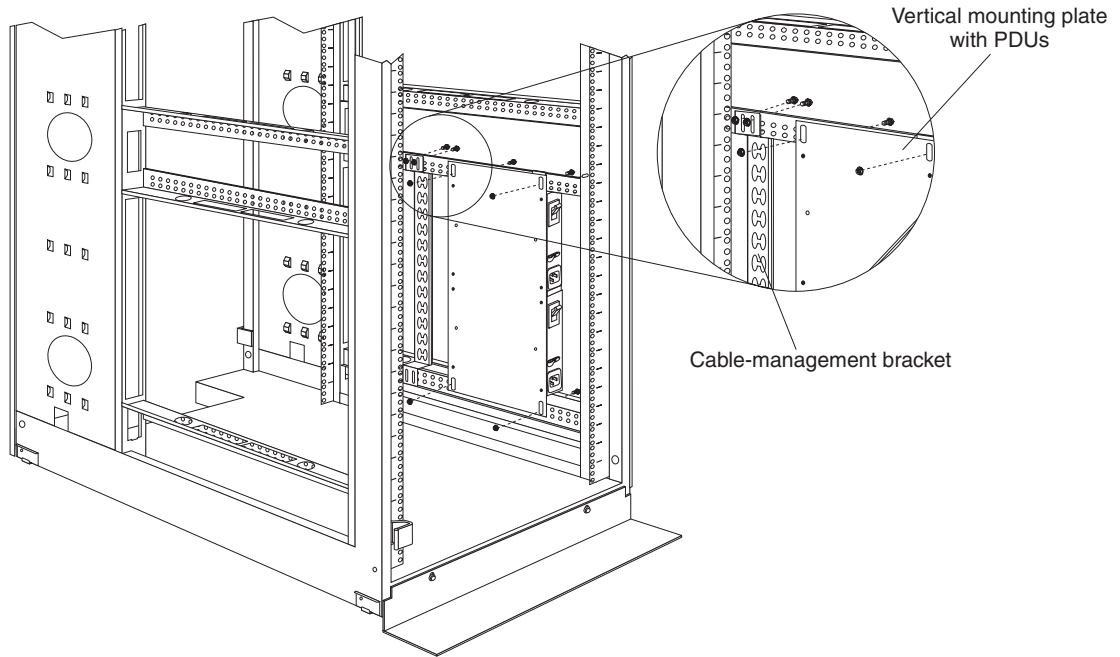

Figure 13. Installing a PDU vertically in a rack cabinet

1. See the PDU documentation for detailed installation information.

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

2. Attach one or two PDUs to the vertical mounting plate that comes with the PDU.

3. Install the vertical mounting plate in the side of your rack cabinet with the M6 screws and nuts that come with the PDU.

4. If the PDU comes with a cable-management bracket, install the bracket beside the vertical mounting plate with the M6 screws that come with the PDU.

5. See the PDU and other optional device documentation for information on how to connect power and other device cables.

Installing a PDU horizontally

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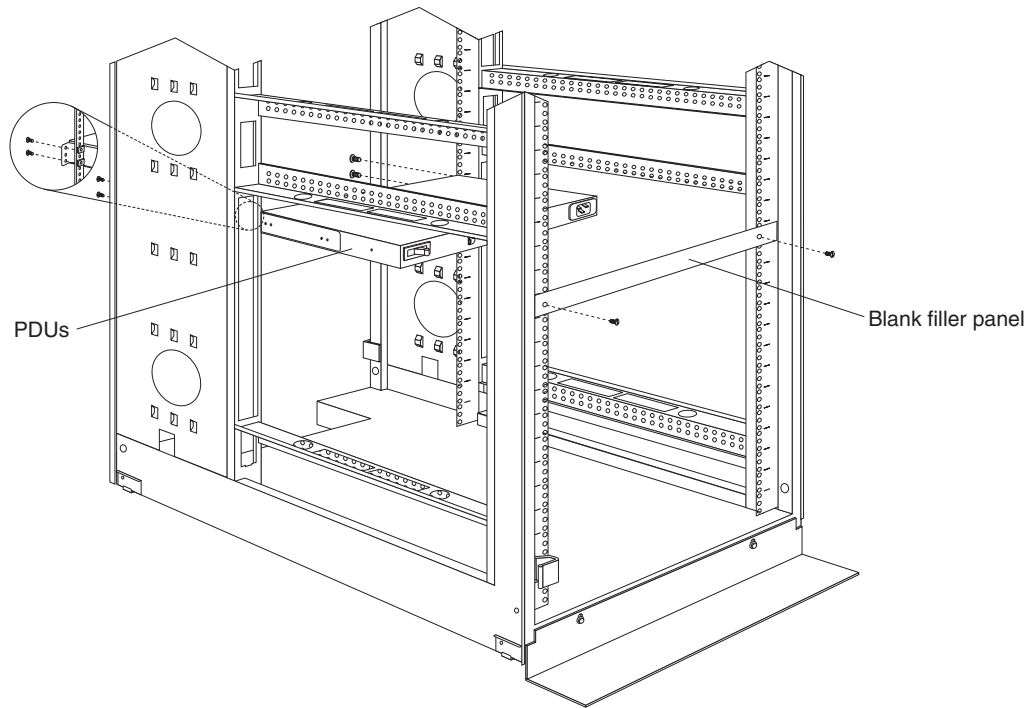

Figure 14. Installing a PDU horizontally in a rack cabinet

1. See the PDU documentation for detailed installation information.

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

2. Attach one or two PDUs to the horizontal mounting brackets that come with the PDU.

3. Install the horizontal bracket and PDU assembly in your rack cabinet with the M6 screws and clip nuts that come with the PDU.

4. If the PDU comes with a blank filler panel, install the filler panel on the front of the rack cabinet with the M6 screws that come with the PDU.

5. See the PDU and other optional device documentation for information on how to connect power and other device cables.

Installing a server

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

Installing a large server

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

Figure 15. Installing a large server

1. See the server documentation for detailed installation and configuration information.

2. Use the template and rack mounting instructions that come with your server to determine where to install clip nuts.

3. Install the slide rails and cable-management arm that come with your server, using the provided screws and clip nuts.

   Note: If required, adjust the length of the slide rails to fit the depth of your rack cabinet.

4. Install the server handles; then, lift the server and place it on the extended slide rails.

5. Attach the server to the slide rails with the provided screws; then, remove the server handles and slide the server into the rack cabinet.

6. See your server documentation for information on how to connect power and other device cables.

Installing a small server

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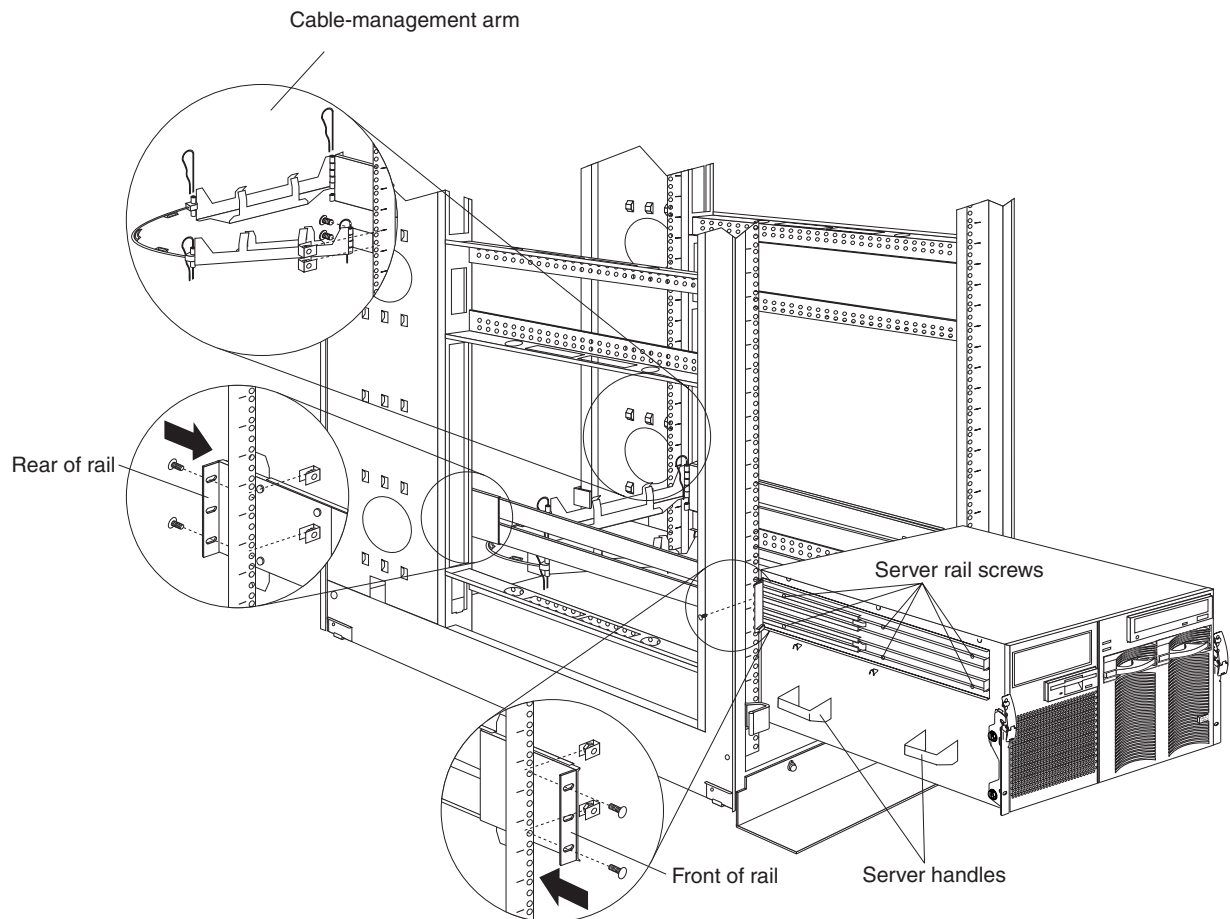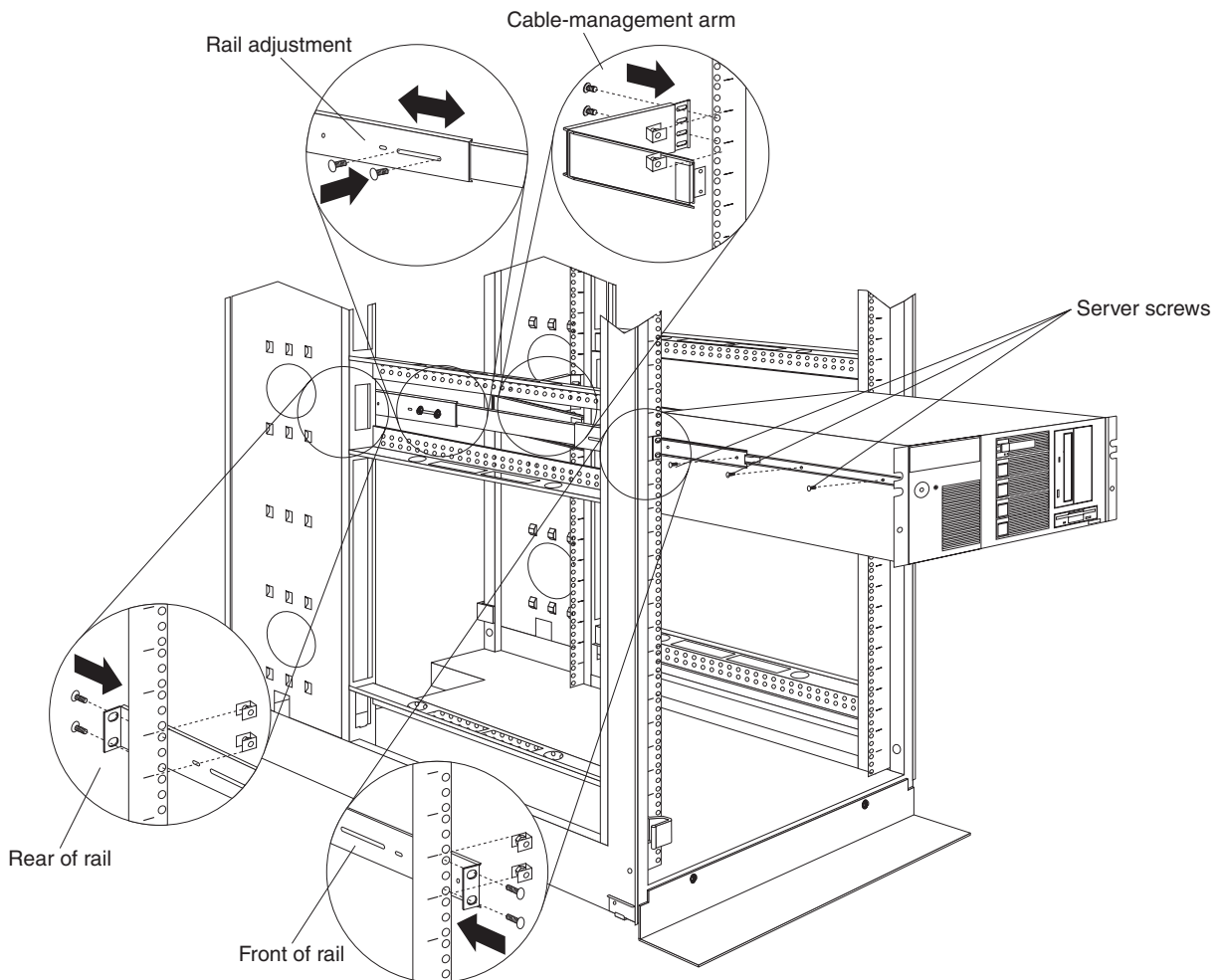

Figure 16. Installing a small server

1. See the server documentation for detailed installation and configuration information.

2. Use the template and rack mounting instructions that come with your server to determine where to install clip nuts.

3. Install the slide rails and cable-management arm that come with your server, using the provided screws and clip nuts.

   Note: If required, adjust the length of the slide rails to fit the depth of your rack cabinet.

4. Lift the server and place it on the extended slide rails; then, attach the server to the slide rails with the provided screws.

5. See your server documentation for information on how to connect power and other device cables.

Installing a storage expansion unit

Storage expansion units install on fixed rails in your rack cabinet and occupy 3U of rack mounting space. See the documentation that comes with your expansion unit for detailed installation instructions. Use the following general procedure to install a storage expansion unit in your rack cabinet:
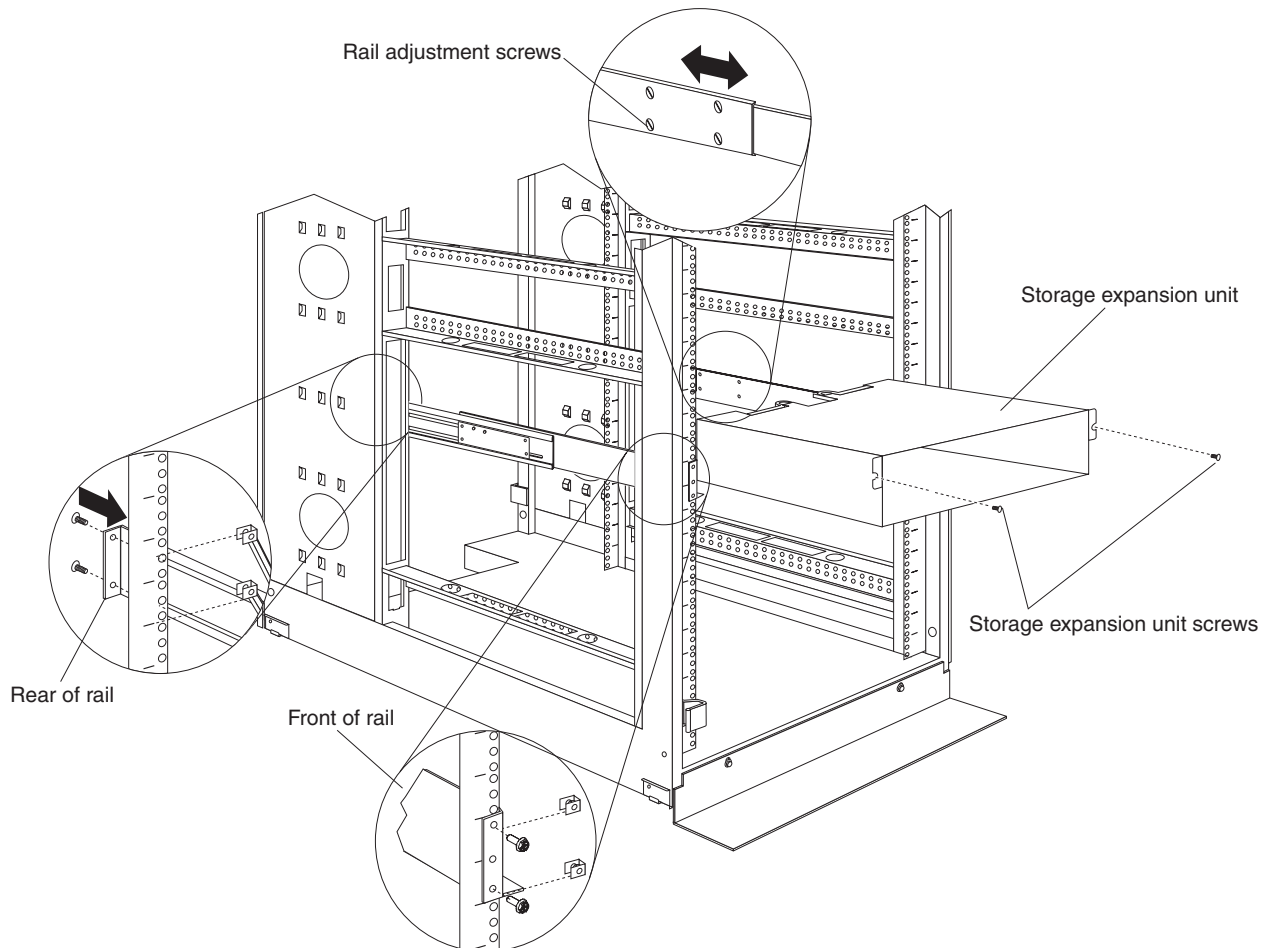
Figure 17. Installing a storage expansion unit

1. See the expansion unit documentation for detailed installation and configuration information.

2. Attach the rails to the front and rear of the rack cabinet, adjusting the length of them to fit the depth of your rack cabinet if required.

   Note: You might need to install rails for some expansion units on the inside of the rack mounting flanges.

3. Slide the expansion unit onto the rails; then, attach the front of the expansion unit to the rack mounting flanges with clip nuts and M6 screws.

   Note: Some expansion units have a separate front bezel that you must install before attaching the front of the expansion unit to the rack cabinet.

4. Attach the rear of the expansion unit to the rails, using screws that come with the expansion unit.

5. See your expansion unit documentation for information on how to connect power and other device cables.

Installing a Fibre Channel RAID controller unit

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

Figure 18. Installing a Fibre Channel RAID controller unit

1. See the documentation that comes with your controller unit for detailed installation and configuration information.

2. Attach the rails to the front and rear of the rack cabinet, adjusting the length of them to fit the depth of your rack cabinet if required.

   Note: You might need to install some rails on the inside of the rack mounting flanges.

3. Remove the front bezel from the controller unit.

4. Remove all drives, fans, and power supplies to reduce the weight of the controller unit; then, slide the empty controller unit onto the rails.

5. Attach the controller unit to the rack mounting flanges using clip nuts and M6 screws; then, reinstall the drives, fans, and power supplies.

6. Snap the front bezel back into place on the controller unit.

7. See the documentation that comes with your controller unit for information on how to connect power and other device cables.

Installing a Fibre Channel hub

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

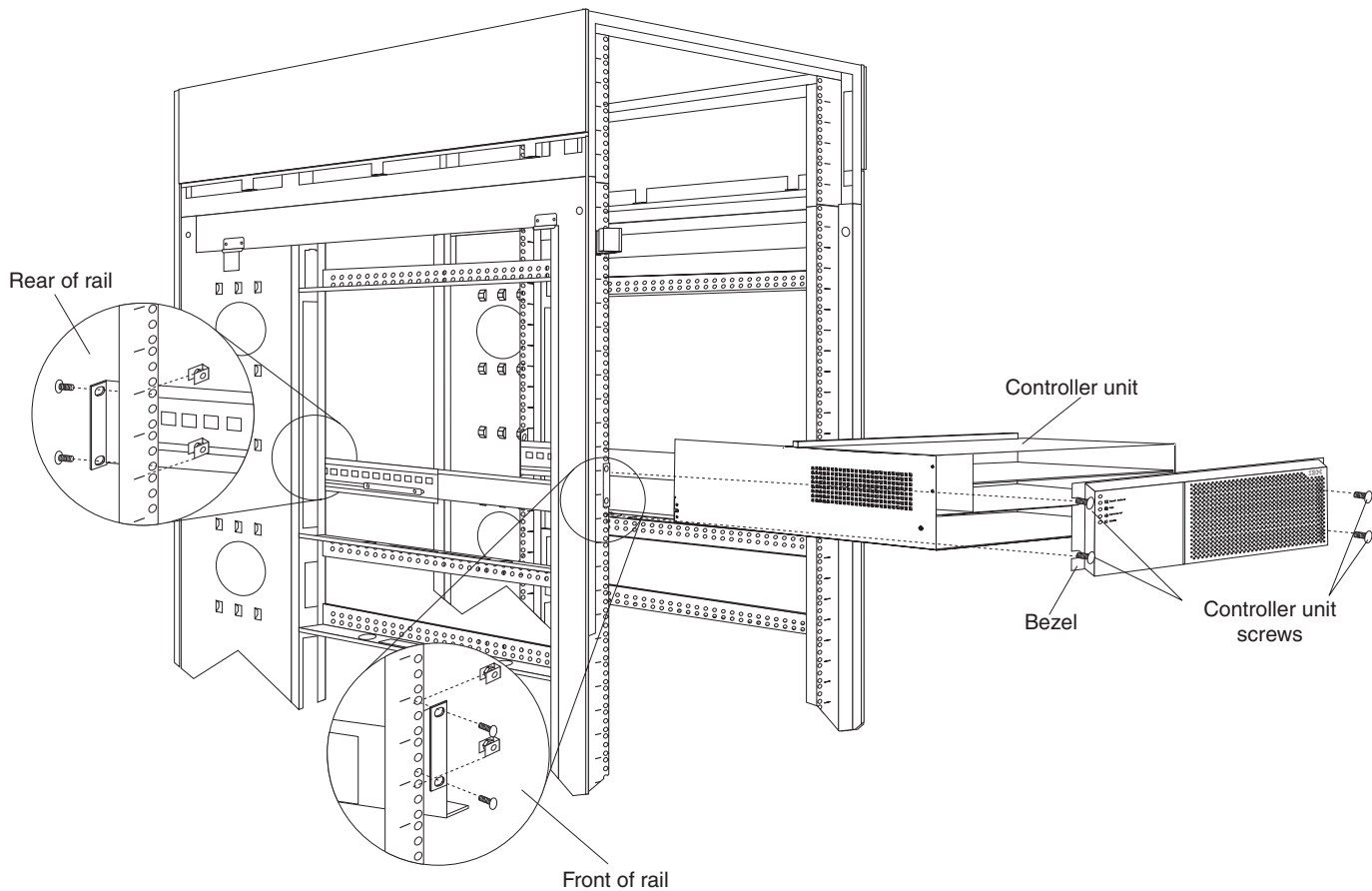*Figure 19. Installing a Fibre Channel hub*

1. See the documentation that comes with your hub for detailed installation and configuration information.

2. Attach the hub to its mounting tray with the four screws provided.

3. Install the tray and hub in the rear of the rack cabinet, using M6 screws and clip nuts that come with the hub.

4. Attach the filler panel to the front of the rack cabinet, using M6 screws and clip nuts that come with the hub.

5. See the documentation that comes with your hub for information on how to connect power and other device cables.

Installing an SP switch

The SP switch installs on fixed rails in your rack cabinet and occupies 2U of rack mounting space. See the documentation that comes with your switch for detailed installation instructions. Use the following general procedure to install an SP switch in your rack cabinet:
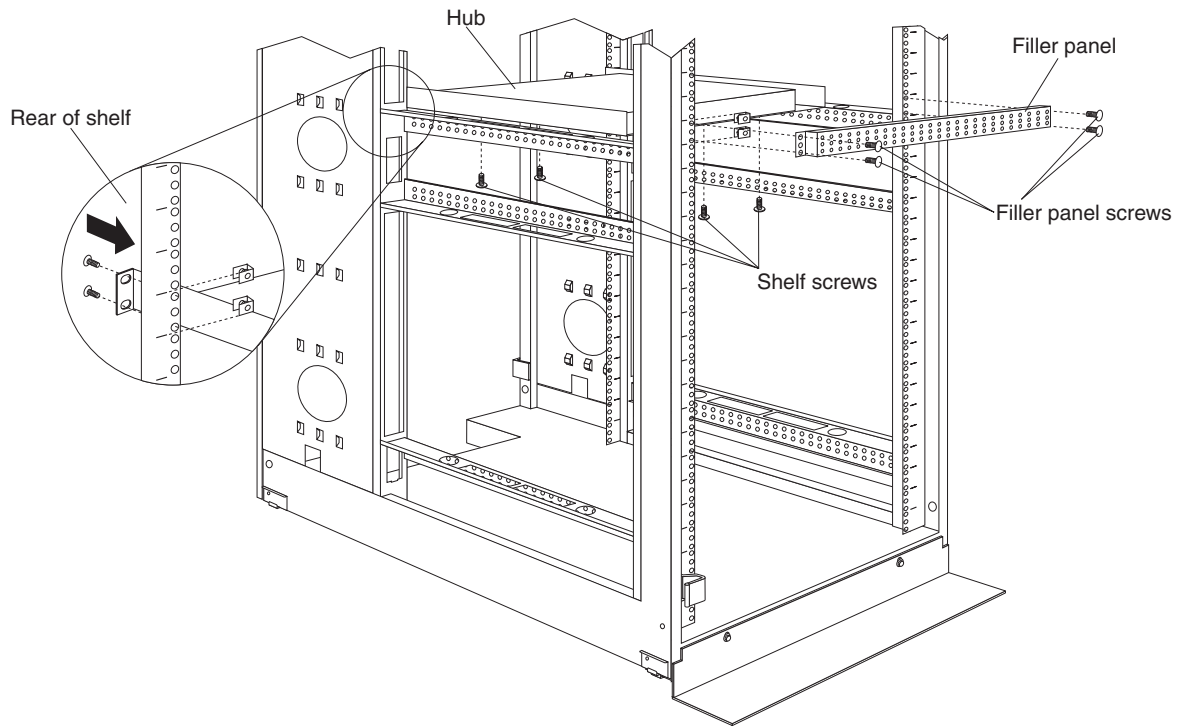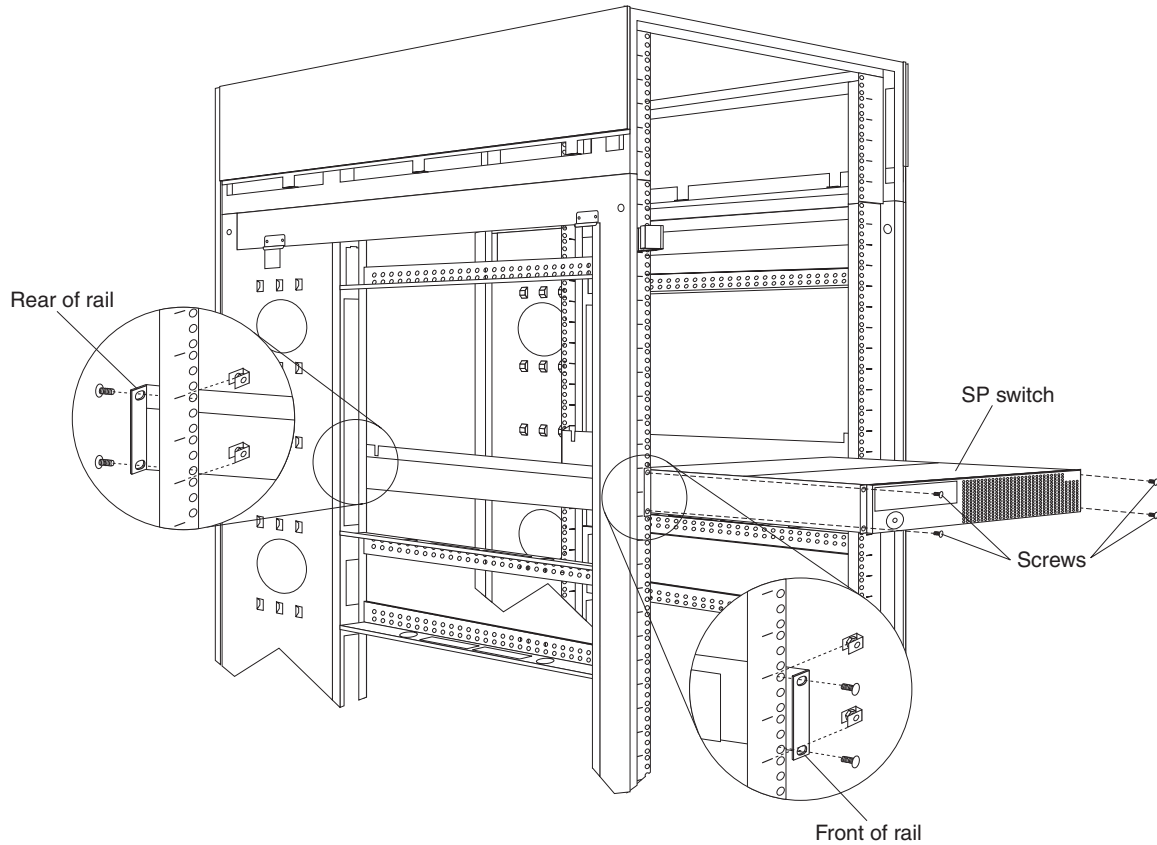
Figure 20. Installing an SP switch

1. See the documentation that comes with your switch for detailed installation and configuration information.

2. Attach the rails to the front and rear of the rack, adjusting the length of the rails to fit the depth of your rack cabinet if required.

3. Slide the switch onto the rails and attach the switch to the rack mounting flanges, using the M6 screws and clip nuts that come with the switch.

4. See the documentation that comes with your switch for information on how to connect power and other device cables.

Installing a fixed shelf

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

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

Use the following general procedure to install a fixed shelf in your rack cabinet:
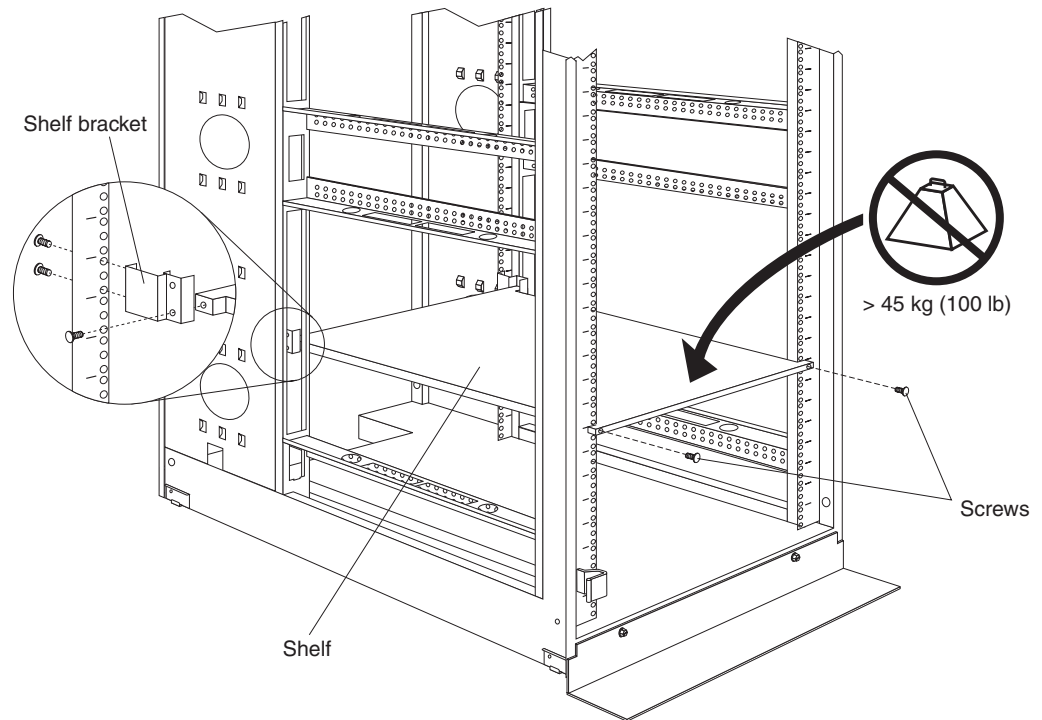
Figure 21. Installing a fixed shelf

1. Determine the location for the fixed shelf within the rack cabinet.

2. Attach the shelf brackets that come with the rack cabinet to the rear of the shelf (one on the left-side, and one on the right-side); then, attach the brackets to the rear of the rack cabinet using two screws per bracket.

3. Attach the front of the shelf to the rack mounting flanges using M6 screws and clip nuts.

4. See the documentation that comes with the optional device that you want to put on the shelf to ensure that it does not exceed the 45 kg (100 lb) weight limit for this shelf.

Installing a keyboard tray

The keyboard tray can hold a standard keyboard or a space-saver keyboard, and occupies 1U of space in your rack cabinet. With a space-saver keyboard, there is also room for a flat panel monitor and the optional flat panel monitor rack mount kit as shown in "Installing a flat panel monitor rack mount kit" on page 28.

The keyboard tray can support up to 11 kg (24 lb). See the documentation that comes with your keyboard tray for detailed installation instructions. Use the following general procedure to install a keyboard tray and keyboard in your rack cabinet:
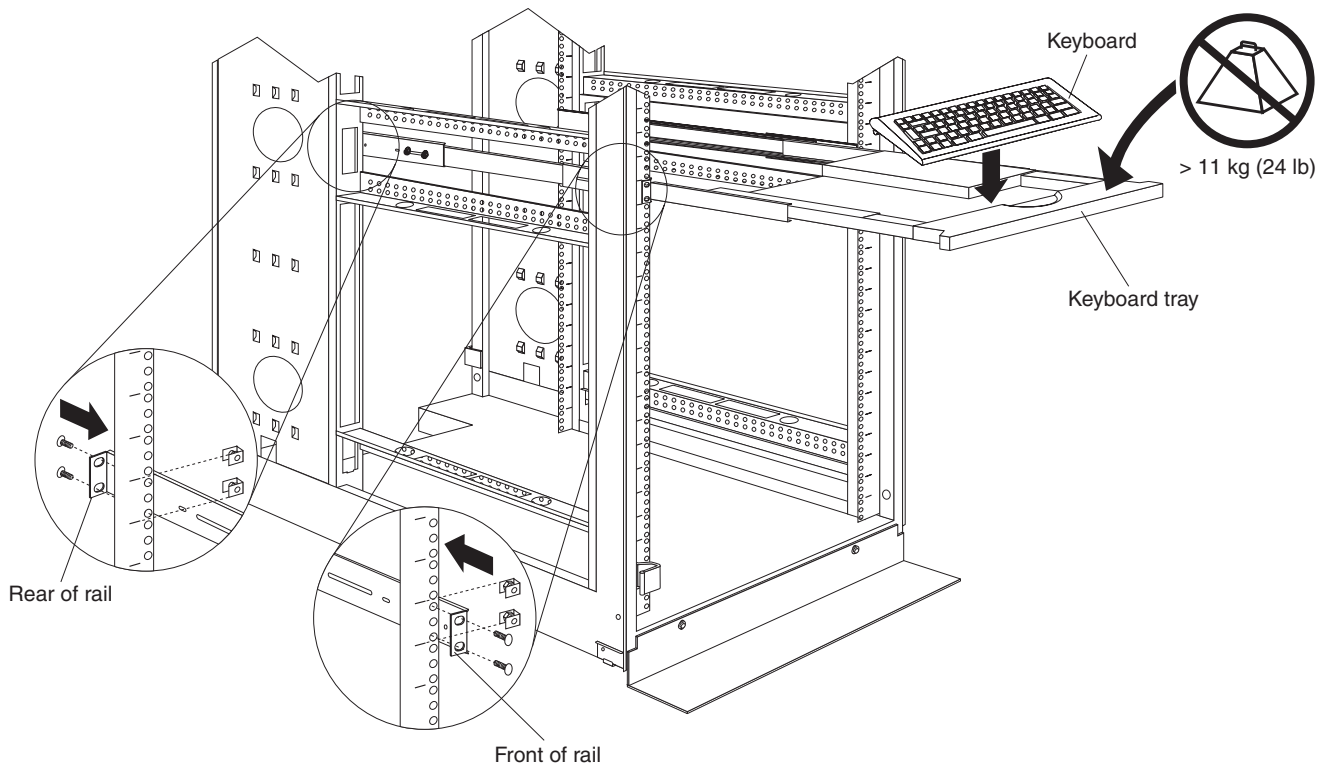
Figure 22. Installing a keyboard tray and keyboard

1. Determine the location for the keyboard tray within the rack cabinet.

2. Attach the rails to the front and rear of the rack cabinet, adjusting the length of the rails to fit the depth of the rack cabinet if required.

3. Slide the keyboard tray onto the rails; then, store the keyboard in the area provided.

4. See the documentation that comes with your keyboard for information on how to connect it to a server or console switch.

Installing a flat panel monitor rack mount kit

You can store a T54 or T55 Flat Panel Monitor in a keyboard tray with the flat panel monitor rack mount kit. This kit requires an additional 2U of space above an installed keyboard tray in your rack cabinet. See the documentation that comes with the flat panel monitor rack mount kit for detailed installation instructions. Use the following general procedure to install a flat panel monitor in your rack cabinet:
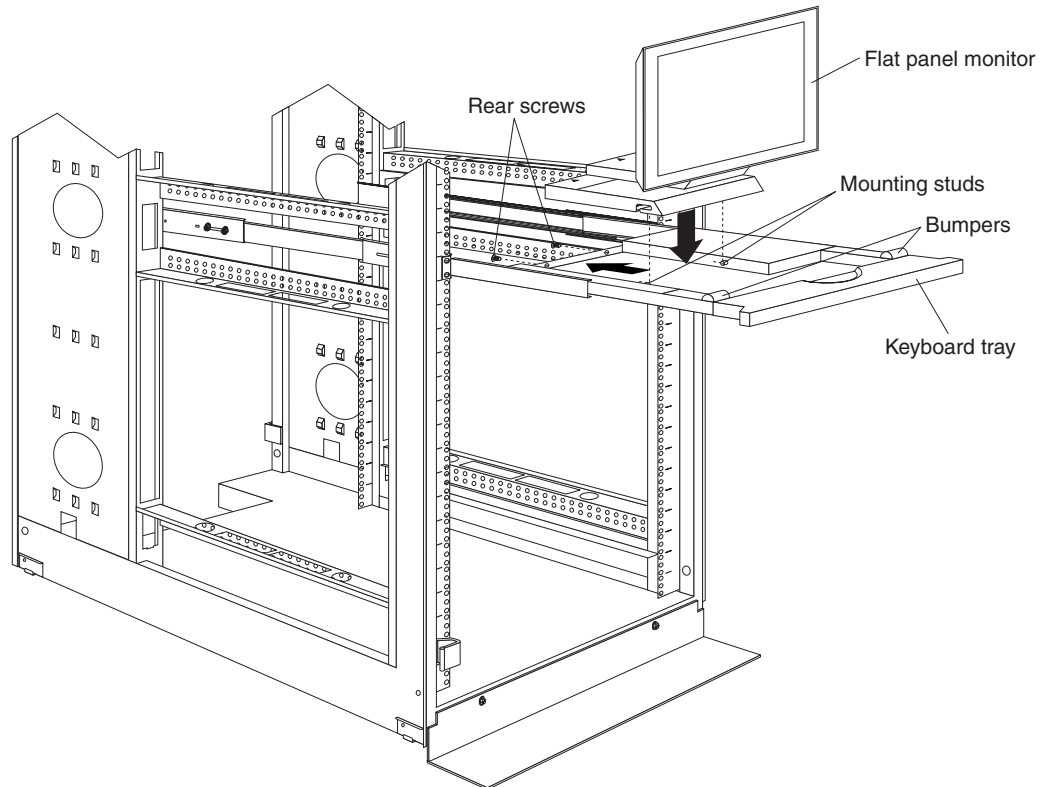
Figure 23. Installing a flat panel monitor rack mount kit

1. Ensure that a keyboard tray is properly installed in your rack cabinet (see "Installing a keyboard tray" on page 27) with at least 2U of clearance above the keyboard tray.

2. Install the flat panel monitor base on the flat panel monitor. See the documentation that comes with your flat panel monitor rack mount kit for detailed installation instructions.

3. Install the mounting studs and bumpers on the keyboard tray.

4. Attach the monitor base to the inside of the keyboard tray using the screws that come with the rack mount kit.

5. Fold the monitor all the way down against the bumpers; then, slide the keyboard tray into the rack cabinet to ensure that there is proper clearance.

6. See the documentation that comes with your flat panel monitor for information on how to connect power and how to connect the monitor to a server or console switch.

Installing a monitor shelf

The monitor shelf can support a monitor that weighs up to 34 kg (75 lb), and occupies 4U of space in your rack cabinet. Space is provided in the rear of the monitor shelf so that you can install a console switch according to "Installing a console switch" on page 30.

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

See the documentation that comes with your monitor shelf for detailed installation instructions. Use the following general procedure to install a monitor shelf in your rack cabinet:
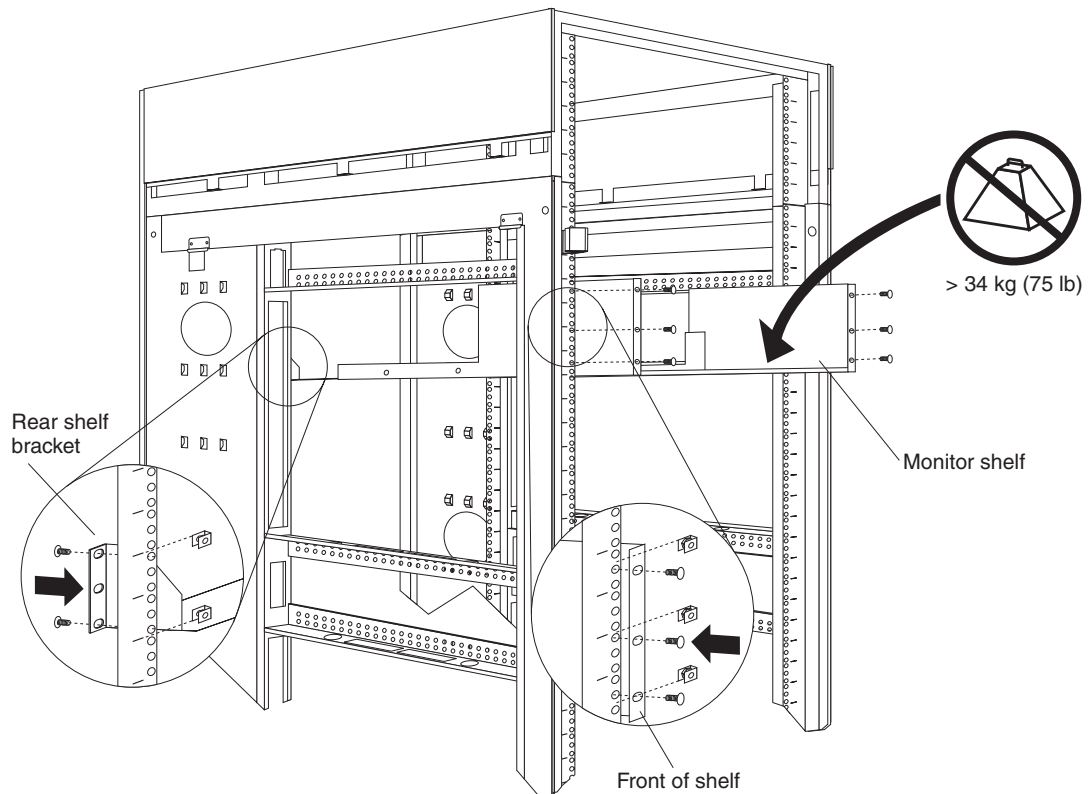
*Figure 24. Installing a monitor shelf*

1. Determine the location for the monitor shelf in your rack cabinet.

2. Attach the rear shelf bracket to the rear of the rack cabinet using two M6 screws and clip nuts per side.

3. Place the monitor shelf inside of the rack cabinet, resting on the rear shelf bracket; then, attach the front of the monitor shelf to the front of the rack cabinet using three M6 screws and clip nuts per side.

4. Place your monitor inside the monitor shelf.

5. See the documentation that comes with your monitor for information on how to connect power and how to connect the monitor to a server or console switch.

Installing a console switch

You can install a console switch in a monitor shelf, vertically in the side of your rack cabinet, or horizontally in 1U of space in your rack cabinet. See the documentation that comes with the console switch for detailed installation instructions.

Installing a console switch in a monitor shelf

Use the following general procedure to install a console switch in a monitor shelf installed in your rack cabinet:

Figure 25. Installing a console switch in a monitor shelf

1. See the documentation that comes with your console switch for detailed installation and configuration information.

2. If the monitor shelf is not already installed in your rack cabinet, see "Installing a monitor shelf" on page 29 to install the monitor shelf first.

3. Place the console switch in the rear compartment of the monitor shelf. Ensure that the rear of the console switch is facing the rear of your rack cabinet.

4. Secure the console switch to the monitor shelf with the screws that come with the console switch.

5. See the documentation that comes with your console switch for information on how to connect power and how to connect a monitor, keyboard, mouse, and servers to the console switch.

Installing a console switch vertically

Use the following general procedure to install a console switch vertically in the side of your rack cabinet:
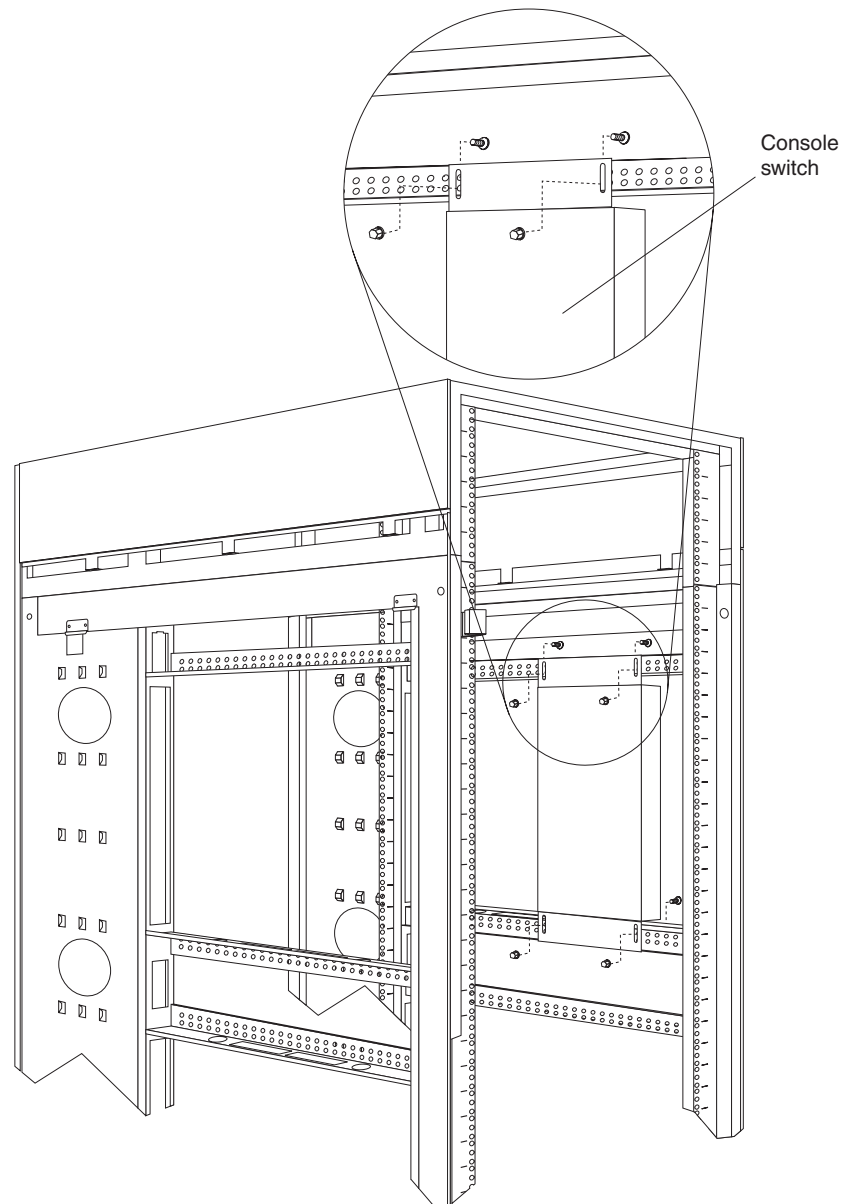
Figure 26. Installing a console switch vertically

1. See the documentation that comes with your console switch for detailed installation and configuration information.

2. Attach the vertical mounting brackets to the console switch with the screws provided.

3. Determine the location for the console switch in either side of the rack cabinet.

4. Install the console switch in the side of your rack cabinet with the M6 screws and nuts that come with the console switch.

5. See the documentation that comes with your console switch for information on how to connect power and how to connect a monitor, keyboard, mouse, and servers to the console switch.

Installing a console switch horizontally

Use the following general procedure to install a console switch horizontally in your rack cabinet:
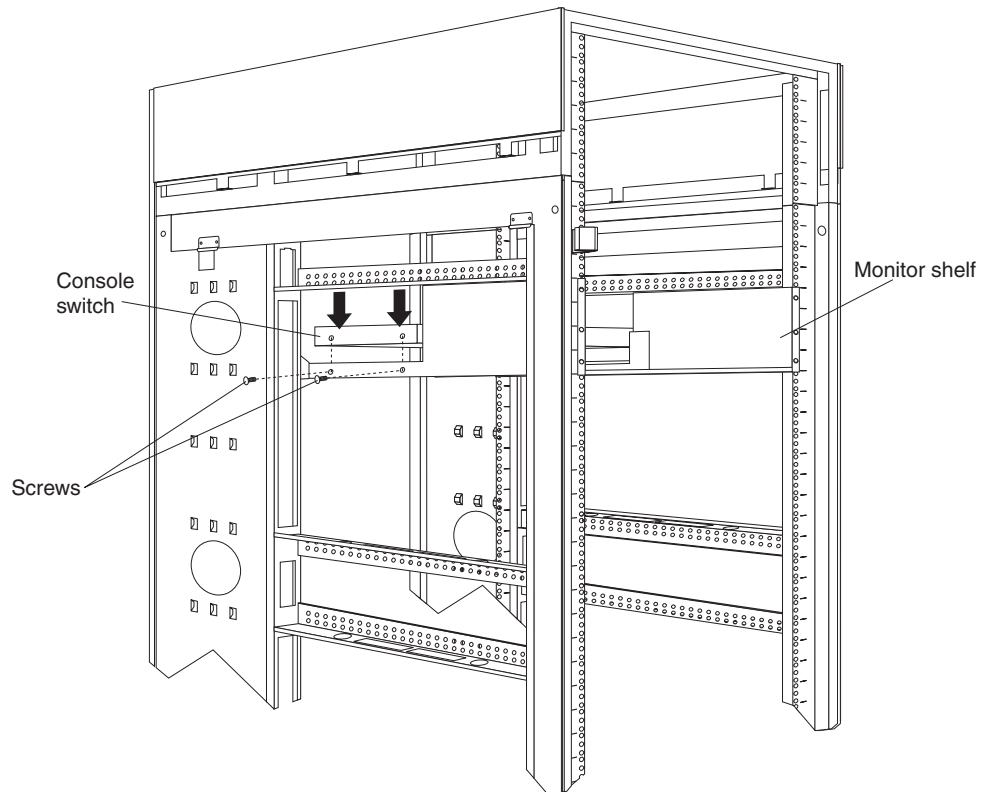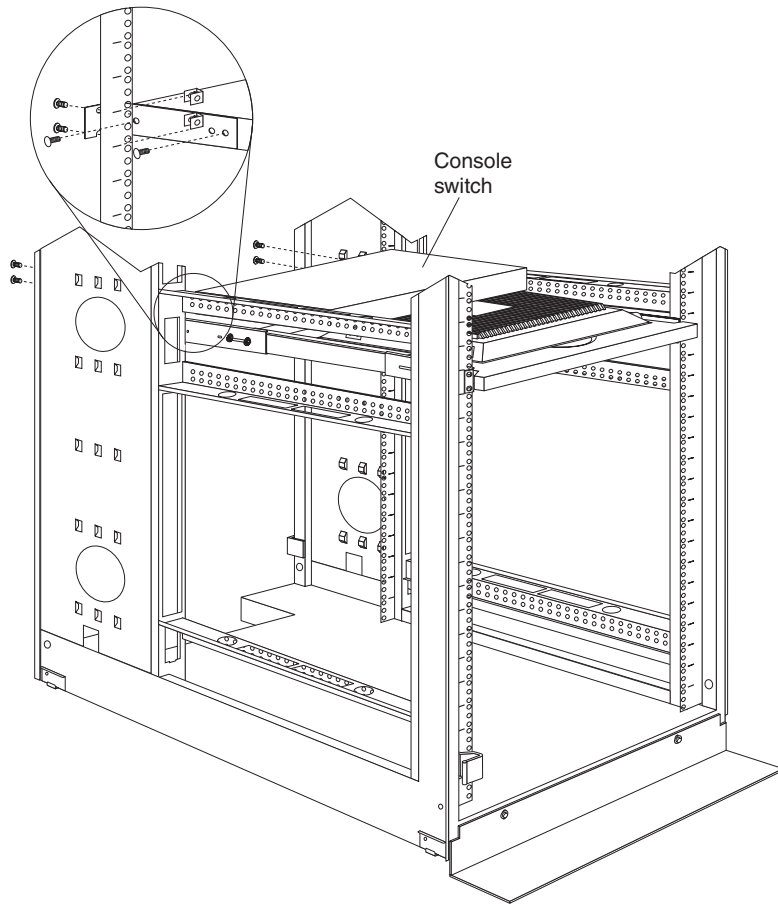

Console switch

Figure 27. Installing a console switch horizontally

1. See the documentation that comes with your console switch for detailed installation and configuration information.

2. Attach the horizontal mounting brackets to the console switch with the screws provided.

3. Determine the location for the console switch within the rack cabinet

4. Attach the console switch to your rack cabinet with the M6 screws and clip nuts that come with the console switch.

5. See the documentation that comes with your console switch for information on how to connect power and how to connect a monitor, keyboard, mouse, and servers to the console switch.

Installing a blank filler panel

Blank filler panels come in 1U, 3U, and 5U sizes. The blank filler panel kit comes with panels of each size so that you can cover the front of your rack cabinet and conceal unused rack mounting space. See the documentation that comes with your blank filler panel kit for detailed installation instructions. Use the following general procedure to install a blank filler panel on your rack cabinet:
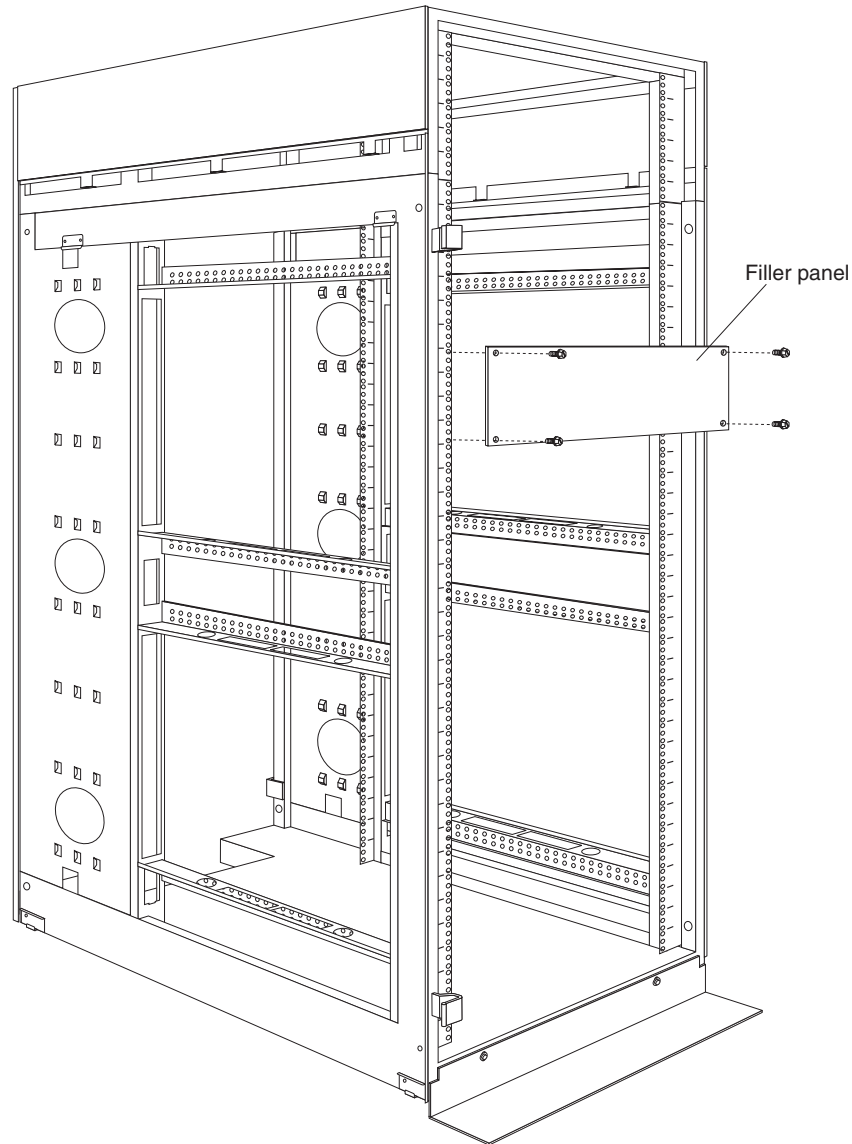
Filler panel

Figure 28. Installing a blank filler panel

1. Determine the filler panel size (1U, 3U, or 5U) that you need and the location on your rack cabinet where you will install the filler panel.

2. Attach the blank filler panel with M6 screws and clip nuts.

   Note: Larger filler panels might require more M6 screws and clip nuts than smaller filler panels.

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 cabling servers or optional devices that you install in your rack cabinet:

4

DANGER

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

5

DANGER

> **Each rack might have more than one power cord. Be sure to disconnect all power cords in the rack before servicing any device in the rack.**

7

DANGER

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

- Do not run cables in front of or behind other devices that will prevent service access to those devices.
- Do not bend fiber-optic cable beyond its limited specifications.
- Label all cables so that they are clearly distinguishable from each other.
- When installing devices mounted on slide rails, such as servers:
  — Run the cables neatly along equipment cable-management arms and secure the cables to the arms using provided cable straps.
  — Leave enough extra cable so that the device can fully extend without putting a strain on the cables.

- — Secure the cables so that the device can retract without pinching or cutting the cables.

- When installing devices mounted on fixed rails:
  - — Run the cables neatly along the posts or side rails in the rack cabinet out of the way of other installed devices.
  - — Secure the cables with the provided cable straps.

- Ensure that the cables cannot be pinched or cut by the rack cabinet rear door or other devices.

- Run internal cables that connect devices in adjoining rack cabinets through the large round openings provided in the rear of the rack cabinet.

- Run external cables through the holes in the bottom of the rack cabinet or through the removable section in the top of the rack cabinet.

Chapter 5. Moving a rack cabinet

The fully populated NetBAY42 Enterprise Rack cabinet has been evaluated and found to meet UL-1950, CSA-950, and IEC-950 stability test standards. Since these standards apply only to a rack cabinet in an installed location, IBM enforces additional standards to ensure stability when rolling the rack cabinet on its casters.

You can move a rack cabinet as long as you adhere to the following standards:

5

DANGER

> **Each rack might have more than one power cord. Be sure to disconnect all power cords in the rack before servicing any device in the rack.**

8

CAUTION:

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

- **Reduce the weight of the rack by removing equipment starting at the top of the rack. When possible, restore the rack to the configuration of the rack cabinet as you received it. If this is not possible or this configuration is not known, remove all devices in the 32U position and above before moving the rack.**

- **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, which can be up to 930 kg (2045 lb).**

- **Verify that all door openings are at least a standard 760 x 2030 mm (30 x 80 in.) size.**

- **Ensure that all devices, drawers, doors, and cables are secure.**

- **Ensure that the four levelling pads are raised to their highest position.**

- **Ensure that the stabilizer bracket is removed.**

- **Do not use a ramp inclined at more than ten degrees.**

- **Once the rack is in its new location, repopulate the rack from the lowest position to the highest position.**

If a long distance relocation is required, pack the rack in the original packaging material, or equivalent. Also, lower the levelling pads to raise the casters off of the pallet and bolt the rack to the pallet.

Appendix A. Getting help, service, and information

If you need help, service, technical assistance, or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you.

With the original purchase of an IBM hardware product, you have access to extensive support coverage. During the IBM hardware product warranty period, you may call the IBM Personal Computer HelpCenter (1-800-772-2227 in the U.S.) for hardware product assistance covered under the terms of the IBM Statement of Limited Warranty.

The following services are available during the warranty period:

- Problem Determination - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.

- IBM Hardware Repair - If the problem is determined to be caused by IBM hardware under warranty, trained service personnel are available to provide the applicable level of service.

- Engineering Change Management - Occasionally, there might be changes that are required after a product has been sold. IBM or your reseller, if authorized by IBM, will make Engineering Changes (ECs) available that apply to your hardware.

Be sure to retain your proof of purchase to obtain warranty service. Refer to the IBM hardware warranty for a full explanation of IBM's warranty terms.

Please have the following information ready when you call:

- Machine type and model
- Serial numbers of your IBM hardware products
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information

On the World Wide Web, the IBM Personal Computing Web site has up-to-date information about IBM Personal Computer products and support.

Some helpful addresses are:

Table 1. IBM Personal Computing Web sites.

World Wide Web site URL	Description
http://www.ibm.com	Main IBM home page
http://www.ibm.com/pc	IBM Personal Computing
http://www.ibm.com/pc/support	IBM Personal Computing Support
http://www.ibm.com/pc/us/accessories	Options by IBM (U.S.)
http://www.ibm.com/pc/us/eserver/xseries	IBM xSeries Servers (U.S.)
http://www.ibm.com/pc/techconnect	IBM TechConnect

You can select a country-specific Web site from these pages.

If you select Profile from the support page, you can create a customized support page that is specific to your hardware, complete with Frequently Asked Questions, Parts Information, Technical Hints and Tips, and Downloadable Files. You will have the information you need, all in one place. In addition, you can choose to receive e-mail notifications whenever new information becomes available about your registered products. You can also access online support forums, which are community sites monitored by IBM support staff.

Appendix B. Product warranties and notices

This chapter contains warranty and emission notices. It also contains trademarks and general-information notices.

Warranty Information

Warranty Period

> **Machine** - IBM NetBAY42 Enterprise Rack
>
> **Warranty Period*** - Three Years
>
> ** Contact your place of purchase for warranty service information. Some IBM Machines are eligible for On-site warranty service depending on the country where service is performed.*

IBM Statement of Limited Warranty

Z125-4753-06 8/2000

Part 1 - General Terms

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. The terms of Part 2 replace or modify those of Part 1. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications ("Specifications"). The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation unless IBM or your reseller informs you otherwise.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded.

Extent of Warranty

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty

IBM does not warrant uninterrupted or error-free operation of a Machine.

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service

To obtain warranty service for a Machine, contact IBM or your reseller. If you do not register your Machine with IBM, you may be required to present proof of purchase.

During the warranty period, IBM or your reseller, if approved by IBM to provide warranty service, provides without charge certain types of repair and exchange service to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. At its discretion, IBM or your reseller will 1) either repair or exchange the failing Machine and 2) provide the service either at your location or a service center. IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Some parts of IBM Machines are designated as Customer Replaceable Units (called "CRUs"), e.g., keyboards, memory, or hard disk drives. IBM ships CRUs to you for replacement by you. You must return all defective CRUs to IBM within 30 days of your receipt of the replacement CRU. You are responsible for downloading designated Machine Code and Licensed Internal Code updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and

3. where applicable, before service is provided:

   a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides;
   b. secure all programs, data, and funds contained in a Machine;
   c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations; and
   d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Limitation of Liability

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), except for any liability that cannot be waived or limited by applicable laws, IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and

2. the amount of any other actual direct damages, up to the charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

   This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES, LOST PROFITS OR LOST SAVINGS, EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Governing Law

Both you and IBM consent to the application of the laws of the country in which you acquired the Machine to govern, interpret, and enforce all of your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Part 2 - Country-unique Terms
AMERICAS

BRAZIL

Governing Law: *The following is added after the first sentence:*
Any litigation arising from this Agreement will be settled exclusively by the court of Rio de Janeiro.

NORTH AMERICA

Warranty Service: *The following is added to this Section:*
To obtain warranty service from IBM in Canada or the United States, call 1-800-IBM-SERV (426-7378).

CANADA

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws in the Province of Ontario.

UNITED STATES

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State of New York.

ASIA PACIFIC

AUSTRALIA

The IBM Warranty for Machines: *The following paragraph is added to this Section:*
The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other similar legislation and are only limited to the extent permitted by the applicable legislation.

Limitation of Liability: *The following is added to this Section:*
Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974 or other similar legislation, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State or Territory.

CAMBODIA, LAOS, AND VIETNAM

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State of New York.

The following is added to this Section:
Disputes and differences arising out of or in connection with this Agreement shall be finally settled by arbitration which shall be held in Singapore in accordance with the rules of the International Chamber of Commerce (ICC). The arbitrator or arbitrators designated in conformity with those rules shall have the power to rule on their own

competence and on the validity of the Agreement to submit to arbitration. The arbitration award shall be final and binding for the parties without appeal and the arbitral award shall be in writing and set forth the findings of fact and the conclusions of law.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator.

The two arbitrators appointed by the parties shall appoint a third arbitrator before proceeding upon the reference. The third arbitrator shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the ICC. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

The English language version of this Agreement prevails over any other language version.

HONG KONG AND MACAU

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of Hong Kong Special Administrative Region.

INDIA

Limitation of Liability: *The following replaces items 1 and 2 of this Section:*
1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Limited Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

JAPAN

Governing Law: *The following sentence is added to this Section:*
Any doubts concerning this Agreement will be initially resolved between us in good faith and in accordance with the principle of mutual trust.

NEW ZEALAND

The IBM Warranty for Machines: *The following paragraph is added to this Section:*
The warranties specified in this Section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: *The following is added to this Section:*

Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

PEOPLE'S REPUBLIC OF CHINA (PRC)

Governing Law: *The following replaces this Section:*
Both you and IBM consent to the application of the laws of the State of New York (except when local law requires otherwise) to govern, interpret, and enforce all your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Any disputes arising from or in connection with this Agreement will first be resolved by friendly negotiations, failing which either of us has the right to submit the dispute to the China International Economic and Trade Arbitration Commission in Beijing, the PRC, for arbitration in accordance with its arbitration rules in force at the time. The arbitration tribunal will consist of three arbitrators. The language to be used therein will be English and Chinese. An arbitral award will be final and binding on all the parties, and will be enforceable under the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (1958).

The arbitration fee will be borne by the losing party unless otherwise determined by the arbitral award.

During the course of arbitration, this Agreement will continue to be performed except for the part which the parties are disputing and which is undergoing arbitration.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES:
The terms of this Statement of Limited Warranty apply to Machines purchased from IBM or an IBM reseller.

Warranty Service:

If you purchase an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM. If you purchase an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchase an IBM Machine in a Middle Eastern or African country, you may obtain warranty service for that Machine from the IBM entity within the country of purchase, if that IBM entity provides warranty service in that country, or from an IBM reseller, approved by IBM to perform warranty service on that Machine in that country. Warranty service in Africa is available within 50 kilometers of an IBM authorized service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM authorized service provider.

Governing Law:

The applicable laws that govern, interpret and enforce rights, duties, and obligations of each of us arising from, or relating in any manner to, the subject matter of this Statement, without regard to conflict of laws principles, as well as Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided, except that in 1) Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Hungary, Former Yugoslav Republic of Macedonia, Romania,

Slovakia, Slovenia, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan, the laws of Austria apply; 2) Estonia, Latvia, and Lithuania, the laws of Finland apply; 3) Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Djibouti, Democratic Republic of Congo, Equatorial Guinea, France, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Mali, Mauritania, Morocco, Niger, Senegal, Togo, and Tunisia, this Agreement will be construed and the legal relations between the parties will be determined in accordance with the French laws and all disputes arising out of this Agreement or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 4) Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe, this Agreement will be governed by English Law and disputes relating to it will be submitted to the exclusive jurisdiction of the English courts; and 5) in Greece, Israel, Italy, Portugal, and Spain any legal claim arising out of this Statement will be brought before, and finally settled by, the competent court of Athens, Tel Aviv, Milan, Lisbon, and Madrid, respectively.

THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:

AUSTRIA AND GERMANY

The IBM Warranty for Machines: *The following replaces the first sentence of the first paragraph of this Section:*
The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:

The minimum warranty period for Machines is six months. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

Extent of Warranty: *The second paragraph does not apply.*

Warranty Service: *The following is added to this Section:*
During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Limitation of Liability: *The following paragraph is added to this Section:*
The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2:
IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

EGYPT

Limitation of Liability: *The following replaces item 2 in this Section:*
as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

Applicability of suppliers and resellers (unchanged).

FRANCE

Limitation of Liability: *The following replaces the second sentence of the first paragraph of this Section:*
In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: *(items 1 and 2 unchanged).*

IRELAND

Extent of Warranty: *The following is added to this Section:*
Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: *The following replaces items one and two of the first paragraph of this Section:*
1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and
2. the amount of any other actual direct damages, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY

Limitation of Liability: *The following replaces the second sentence in the first paragraph:*
In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than:
1. *(unchanged)*
2. as to any other actual damage arising in all situations involving nonperformance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim.
Applicability of suppliers and resellers (unchanged).

The following replaces the third paragraph of this Section:
Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: *(items 1 and 2 unchanged)* 3) indirect damages, even if IBM or your reseller is informed of their possibility.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND

Limitation of Liability: *The following is added to this Section:*
IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

UNITED KINGDOM

Limitation of Liability: *The following replaces items 1 and 2 of the first paragraph of this Section:*

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;
2. the amount of any other actual direct damages or loss, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim;

The following item is added to this paragraph:
3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

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