

SC450NX MP Server Rack/Pedestal Kit Installation Guide

Order Number: 711917-001a

Intel Corporation (Intel) makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Intel assumes no responsibility for any errors that may appear in this document. Intel makes no commitment to update nor to keep current the information contained in this document. No part of this document may be copied or reproduced in any form or by any means without prior written consent of Intel.

† Brands, names, or trademarks are the property of their respective owners.

Copyright © 1998, Intel Corporation. All Rights Reserved.

Safety Guidelines

Before you remove a server cover, observe these safety guidelines:

- Only technically qualified personnel should integrate the server.
- Turn off all peripheral devices connected to the server.
- Turn off the server using the push-button on/off power switch on the front panel of the server, and unplug the AC power cord from each power supply or wall outlet.
- Label and disconnect all peripheral cables attached to the I/O panel on the back of the server.
- Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the server—any unpainted metal surface—when handling components.

Server Precautions



WARNINGS

SERVER POWER ON/OFF: The push-button on/off power switch on the front panel of the server **does not** turn off the AC power. To remove AC power from the server, you must unplug each AC power cord from each power supply or wall outlet.

HAZARDOUS CONDITIONS—POWER SUPPLY AND POWER SHARE BACKPLANE: Hazardous voltage, current, and energy levels are present inside the power supply and the power share backplane enclosures. There are no user-serviceable parts inside them; servicing should only be done by technically qualified personnel.

HAZARDOUS CONDITIONS—DEVICES AND CABLES: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect telecommunications systems, networks, modems, and each power cord attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

AVOID INJURY: To avoid personal injury when unpacking the server, use only a mechanical assist unit to lift it off the shipping pallet. The minimum server configuration weighs 38 kg (85 lbs); the maximum weighs 45 kg (100 lbs).

Do not attempt to lift or move the server by the handles on the power supplies.

Use only a hand-truck or other mechanical assist unit to move the server from one location to another.



CAUTIONS

ELECTROSTATIC DISCHARGE (ESD) AND ESD PROTECTION: ESD can damage disk drives, add-in boards, and other components. This server can withstand normal levels of environmental ESD while hot-swapping SCSI hard disk drives. However, we recommend doing all procedures in this manual only at an ESD-protected workstation. If one is not available, you can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground of the server—any unpainted metal surface—when handling components.

HANDLING BOARDS AND MODULES: Boards and modules can be extremely sensitive to ESD and always require careful handling. After removing a board or module from its protective wrapper or from the server, place it component-side up on a nonconductive, static-free surface. If you place the baseboard on a conductive surface, the battery leads can short out. If they do, this will result in a loss of CMOS data and will drain the battery. Do not slide a board or module over any surface.

SERVER COOLING AND AIRFLOW: Operating the server with the covers removed can damage the server components. For proper cooling and airflow, always replace the covers before turning on the server.

Equipment Rack Precautions



WARNINGS

ANCHOR THE EQUIPMENT RACK: The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of it on slide assemblies. The anchors must be able to withstand a force of up to 113 kg (250 lbs). You must also consider the weight of any other device installed in the rack.

MAIN AC POWER DISCONNECT: You are responsible for installing an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the server(s).

GROUNDING THE RACK INSTALLATION: To avoid the potential for an electrical shock hazard, you must include a third wire safety grounding conductor with the rack installation. If server power cords are plugged into AC outlets that are part of the rack, then you must provide proper grounding for the rack itself. If server power cords are plugged into wall AC outlets, the safety grounding conductor in each power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

Overcurrent protection: The server is designed for an AC line voltage source with up to 20 amperes of overcurrent protection. If the power system for the equipment rack is installed on a branch circuit with more than 20 amperes of protection, you must provide supplemental protection for the server. If more than one server is installed in the rack, the power source for each server must be from a separate branch circuit. The overall current rating of a server configured with three power supplies is under 12 amperes.



CAUTIONS

Temperature: The operating temperature of the server, when installed in an equipment rack, must not go below 5 °C (41 °F) or rise above 35 °C (95 °F). Extreme fluctuations in temperature can cause a variety of problems in your server.

Ventilation: The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling. It must also include ventilation sufficient to exhaust a maximum of 4,100 Btu's per hour for the server. The rack selected and the ventilation provided must be suitable to the environment in which the server will be used.

Contents

Safety Guidelines

Server Precautions	v
Equipment Rack Precautions	vii

Introduction

Tools You Need	12
----------------------	----

Configuring for Rack Mount

Prepare the Slide Assemblies.....	13
Prepare the Server	14
Attaching the Bezel Frame and Door	14
Attach the Chassis Handles.....	14
Attach the Small Bar of the Slide Assembly to the Server	15
Prepare the Equipment Rack.....	16
Attach the Right-angle Extension Brackets to the Equipment Rack.....	16
Attach the Center Bar and Large Outer Bar Assemblies to the Equipment Rack	17
Install the Server in the Rack.....	18

Configuring for Pedestal Mount

Install Chassis Feet	21
Install the Top and Side Covers.....	21
Install Bezel Frame and Door	22

Changing from Pedestal to Rack

Prepare the Slide Assemblies.....	23
Remove the Covers	23
Exchange the Bezel Frame	24

Figures

1. Equipment Rack with Three Servers.....	12
2. Single Server in Pedestal Mode.....	12
3. Slide Assembly	13
4. Small Bar of the Slide Assembly.....	15
5. Right-angle Bracket and Vertical Rail	16
6. Center Bar and Large Outer Bar Assembly	17
7. Server and Rack.....	19
8. Installing Chassis Feet.....	21
9. Screw Locations, Top and Side Covers	23

Introduction

The SC450NX MP server is designed to either stand upright (pedestal mode) or be mounted in a rack (rack mode). Figures 1 and 2 on page 12 show examples of these configurations. Before operation, you must purchase an adapter kit to configure the server for one of the two modes. If you have already created a pedestal server but now want to install it in a rack, you will also need an adapter kit.

If you have not already purchased a kit for your particular task, contact your customer service representative for details.

This guide explains three processes:

1. Installing your server in an EIA-compatible 19-inch equipment rack
2. Mounting your server in a pedestal configuration
3. Changing from pedestal to rack mode

Before starting, please read “Safety Guidelines” on page v.

Table 1. SC450NX MP Server Physical Specifications

Specification	Pedestal Mode	Rack Mode
Height	48.26 cm (19 inches)	7u
Width	31.12cm (12.25 inches)	19 inch rack
Depth	63.5cm (25 inches)	25 inches
Weight	38.25 kg (85 lbs) minimum configuration 45 kg (100 lbs) maximum configuration	38.25 kg (85 lbs) minimum configuration 45 kg (100 lbs) maximum configuration
Required front clearance	10 inches (inlet airflow <35 °C / 95 °F)	10 inches (inlet airflow <35 °C / 95 °F)
Required rear clearance	8 inches (no airflow restriction)	8 inches (no airflow restriction)
Required side clearance	0.0 inches (additional side clearance required for service)	N/A

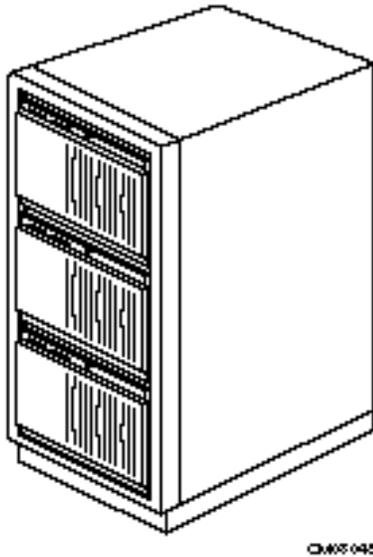


Figure 1. Equipment Rack with Three Servers

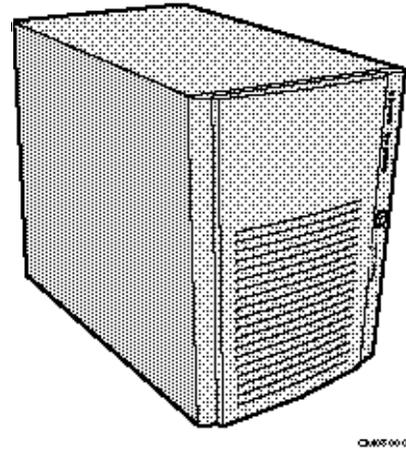


Figure 2. Single Server in Pedestal Mode

Tools You Need

- Phillips (cross-head) screwdriver (#1 and #2 bits)
- Pencil

Configuring for Rack Mount

Before starting, please read “Safety Guidelines” on page v.

Prepare the Slide Assemblies

See Figure 3.

1. Remove the slide assemblies from the kit.
2. Orient a slide assembly so that the smallest outer bar is facing down.
3. Fully extend the telescoping slide assembly until the center bar hits the safety latch on the small outer bar (all three overlapping bars will be visible).
4. Grasp the small outer bar with your right hand so that your thumb is on the safety latch of the small outer bar.
5. Press and hold the safety latch down, and at the same time, grasp the large outer bar with your left hand.
6. Pull the small bar out of the center bar; this takes a little force to separate them. Set the small bar aside to attach to the chassis in a later step.
7. Orient the center bar and large outer bar assembly so that the center bar is facing up.
8. Grasp the center bar with your right hand and the large outer bar with your left hand so that your left-hand thumb is on the safety latch of the center bar.
9. Press the safety latch, and slide the bars together. Set the center bar and large outer bar assembly aside to attach to the equipment rack in a later step.
10. Prepare the other slide assembly by repeating steps 2–9 above.

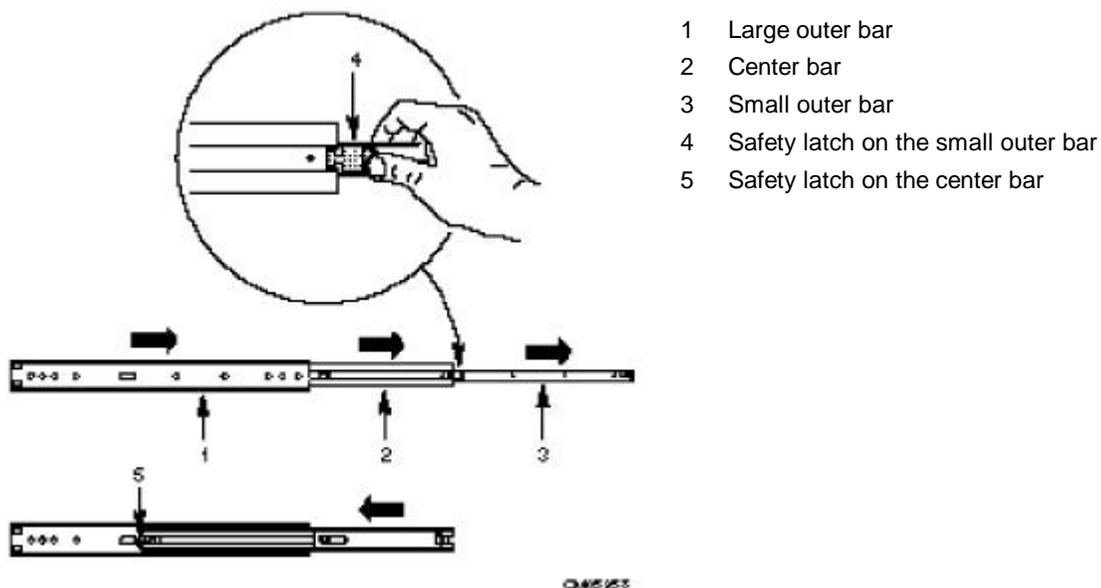


Figure 3. Slide Assembly

Prepare the Server

Before you can install the server in the 19-inch equipment rack, you must install a bezel, handles, and the small bars of the slide assemblies onto the sides of the server.

Attaching the Bezel Frame and Door

To be installed in a rack, the server needs a bezel frame with rectangular cutouts where the chassis handles fit.

1. Attach the bezel frame by inserting the tabs at the corner of the frame into their corresponding rectangular slots on the chassis.
2. Attach the bezel door: with the door all the way open (down, as the server lay as it would when inserted in a rack), align the tabs on the door with their corresponding hinge loops on the chassis; slide the door to the right to engage the tabs in the loops.

Attach the Chassis Handles

Before you can attach the chassis handles, the server must be on its side, in the horizontal position in which you will slide it into the rack. If the server is not already in the proper position, you must move it. See step one, below.



WARNING

AVOID INJURY: To avoid personal injury when unpacking the server, use only a mechanical assist unit to lift it off the shipping pallet. The minimum server configuration weighs 38 kg (85 lbs); the maximum weighs 45 kg (100 lbs).

Do not attempt to lift or move the server by the handles on the power supplies.

Use only a hand-truck or other mechanical assist unit to move the server from one location to another.

1. If the server is not already in the proper position, then face the front of the server and, with the help of a mechanical assist unit, carefully tip it onto its side. The long front edges (19 inches) should now be horizontal; the short front edges (12.25 inches) should now be vertical, with the front-panel LEDs at the top left and the hard drive bays at the bottom right of the front panel. The bezel frame has rectangular cutouts on its edges where the chassis handles fit; you should be able to see two threaded holes in that cut-out space where the handles attach to the chassis.
2. Orient each handle so the two screw holes on the long edge of each handle align with the threaded holes in the chassis. Because the bezel frame's cutouts act as guides, the handles can be installed in only one way.
3. Use four screws from the kit to attach the handles to the chassis.

Attach the Small Bar of the Slide Assembly to the Server

See Figure 4.

1. Remove four screws from the kit.
2. While facing the side of the server, orient the small bar so that the flat side faces the top and the right-angle end faces the front of the server.
3. Align the first hole in the right-angle end of the bar with the first threaded hole in the side of the chassis.
4. Insert a screw through the hole in the bar and into the chassis wall. Then loosely tighten the screw.
5. Align the rest of the holes in the bar with the remaining three threaded holes along the side of the chassis.
6. Insert three more screws through the bar and into the threaded holes in the chassis wall. Then tighten all four screws firmly (6.0 inch-pounds).
7. Install the remaining small bar on the other side of the chassis by repeating steps 1–6 above.

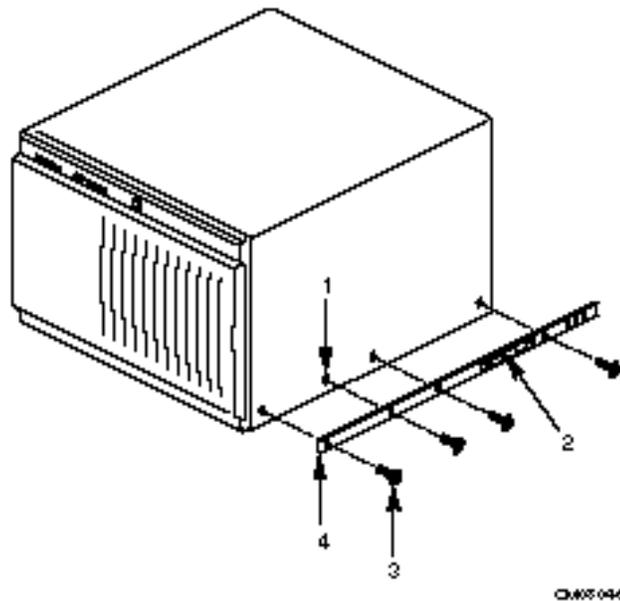


Figure 4. Small Bar of the Slide Assembly

- 1 Threaded hole in chassis
- 2 Safety latch
- 3 Screw
- 4 Small outer bar (right-angle end)

Prepare the Equipment Rack

Before you can install the server in the 19-inch equipment rack, you must attach the center bar and large outer bar assemblies to the vertical rails of the rack.

Attach the Right-angle Extension Brackets to the Equipment Rack

➤ NOTE

Mounting holes in the vertical rails of equipment racks are commonly spaced in a 5/8 x 5/8 x 1/2-inch sequence. Perform the following steps carefully; brackets must be mounted with precision to allow room for the next server you install in a rack.

See Figure 5.

1. Remove a right-angle extension bracket, two screws, and a bar nut from the kit.
2. While facing the front or back of the rack, orient the right-angle extension bracket so that the short side with the four mounting holes is facing toward the outside edge of the vertical rail.
3. Position the bracket behind the mounting holes in the vertical rail.

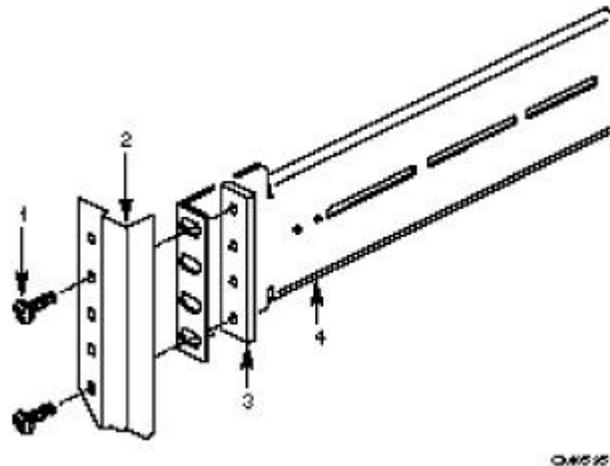


Figure 5. Right-angle Bracket and Vertical Rail

- 1 Screw
- 2 Vertical rail
- 3 Bar nut
- 4 Right-angle extension bracket

4. With a pencil, mark the top and bottom hole locations of the bracket on both sides of the vertical rail; no hole numbers are printed on the rail.
5. Insert a screw through the marked top hole in the rail and through the top hole in the bracket. Place a bar nut on the screw and loosely tighten it. Repeat for the marked bottom hole.
6. Install the three remaining right-angle extension brackets on the other three vertical rails by repeating steps 1–5 above.

Attach the Center Bar and Large Outer Bar Assemblies to the Equipment Rack

See Figure 6.

1. Orient a center bar and large outer bar assembly so that the flat side is facing toward the brackets attached to the vertical rails and the safety latch on the center bar is near the back of the rack.
2. Press the flat side of the outer bar into the U-shaped sections of the brackets.
3. Slide the assembly toward the front of the rack until the end of the outer bar is flush with the end of the U-shaped section of the front bracket.
4. Gently slide the center bar toward the front of the rack, and position the oblong slot in it over the first hole in the large outer bar. Insert a screw through the hole in the bar and the first hole in the front bracket. Place a lock washer and a nut on the screw, and loosely tighten it.
5. Position the oblong slot in the center bar over the third hole back from the front of the large outer bar. Insert an 8-32 screw through the hole and the oblong slot in the front bracket. Place a lock washer and an 8-32 nut on the screw, and loosely tighten it.
6. The back bracket has two holes and three slots in it. This end of the outer bar has four holes in it. Which holes and slots you use depend on the depth of the equipment rack. After fitting the bar into the bracket, insert two screws through the holes in the bar and the appropriate oblong slots in the bracket. Place a lock washer and a nut on each screw, and loosely tighten them.
7. Ensure that the brackets and bars are positioned correctly in the rack. Then tighten all screws firmly (6.0 inch-pounds).

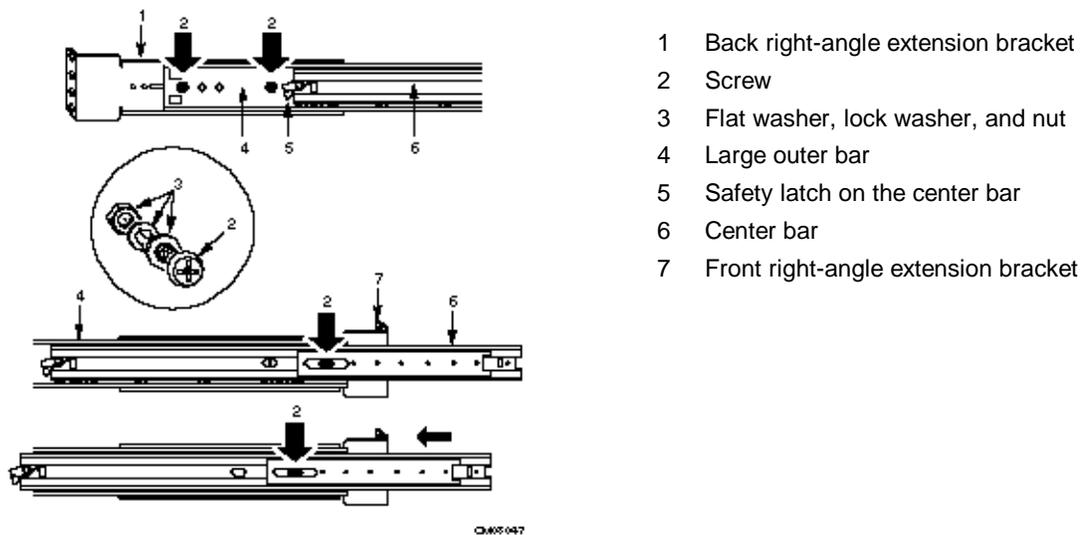


Figure 6. Center Bar and Large Outer Bar Assembly

Install the Server in the Rack



WARNINGS

ANCHOR THE EQUIPMENT RACK: The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of it on slide assemblies. The anchors must be able to withstand a force of up to 113 kg (250 lbs). You must also consider the weight of any other device installed in the rack.

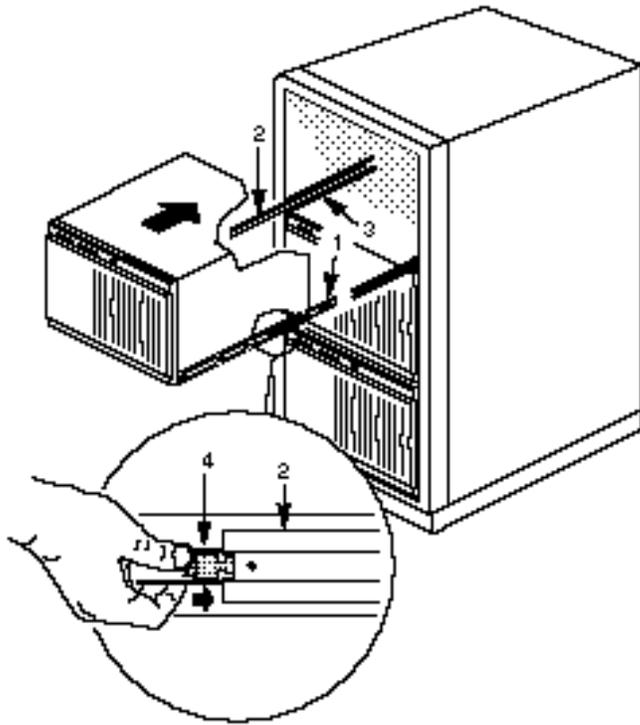
AVOID INJURY: To avoid personal injury when unpacking the server, use only a mechanical assist unit to lift it off the shipping pallet. The minimum server configuration weighs 38 kg (85 lbs); the maximum weighs 45 kg (100 lbs).

Do not attempt to lift or move the server by the handles on the power supplies.

Use only a hand-truck or other mechanical assist unit to move the server from one location to another.

See Figure 7.

1. Pull the telescoping center bars out of the large outer bars until they are fully extended and locked in place.
2. Use a mechanical assist unit to carefully pick up the server; gently slide the small bars attached to each side of the server into the extended center bars.
3. When the server stops, press in on the safety latches on the small bars and gently slide the server into the rack.
4. Connect all external cables and the power cord(s) to the server.



- 1 Small outer bar
- 2 Center bar
- 3 Large outer bar
- 4 Safety latch

CM05045

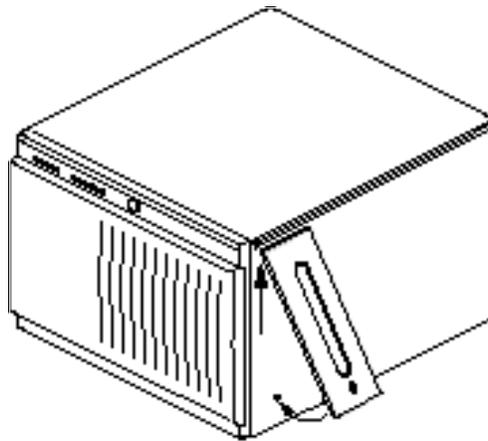
Figure 7. Installing the Server in the Rack

Configuring for Pedestal Mount

Install Chassis Feet

See Figure 8.

1. Remove two system feet and two screws from the kit.
2. Each system foot has one screw hole and, on the opposite end, two slots that fit two tabs extending from the chassis wall. Orient the chassis foot to align these features with their corresponding parts of the chassis wall.
3. Insert the end of the foot with the two slots under the lip at the edge of the chassis.
4. Swing the end of the foot with the screw hole to the chassis wall; attach that end of the foot with one screw.
5. Repeat for the second chassis foot.



CM083-44

Figure 8. Installing Chassis Feet

Install the Top and Side Covers

1. Observe the safety guidelines on page v.
2. Orient the top cover over the server so that the built-in handle faces the rear panel.
3. The cover has a row of tabs that fit a row of slots in the chassis. With the front edge of the cover approximately one inch behind the front of the chassis, push the cover straight down so the cover's tabs fit into the chassis' slots.
4. With an even push, slide the cover forward to engage the tabs in their slots until the cover stops. The back of the cover should be flush with the back of the server.
5. Fasten the top cover with one screw; the side cover requires two screws.
6. Repeat these steps to install the side cover.

Install Bezel Frame and Door

1. Attach the bezel frame by inserting the tabs at the corner of the frame into their corresponding rectangular slots on the chassis.
2. Attach the bezel door: with the door all the way open (left, as it stands upright in a pedestal mount), align the tabs on the door with their corresponding hinge loops on the chassis; slide the door down to engage the tabs in the loops.

Changing from Pedestal to Rack

To change your server from pedestal mode to rack mode, you must complete two basic steps: removing the components of the pedestal mount, then configuring the server for a rack mount. Because configuring for a rack mount was described in an earlier section (page 13), this section covers only a few details unique to your task and refers you to the earlier section for the rest of the required information.

Before starting, please read “Safety Guidelines” on page v.

Prepare the Slide Assemblies

See page 13.

Remove the Covers

1. Observe the safety guidelines on page v.
2. Turn off all peripheral devices connected to the server.
3. Turn the server power off with the on/off power switch on the front of the server AND unplug all AC power cords.
4. Label and disconnect all peripheral cables attached to the I/O panel on the back of the server.

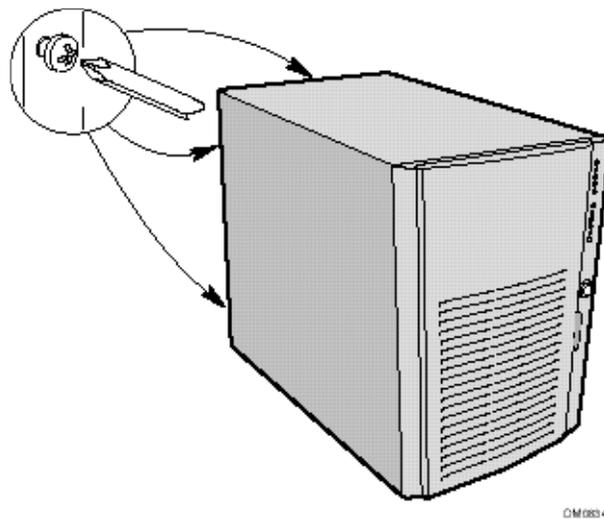


Figure 9. Screw Locations, Top and Side Covers

5. Remove and save the single screw from the back of the TOP cover.
6. Place the fingertips of your hand under the built-in handle on the back of the cover.
7. Using an even pull, slide the cover backward, about an inch, until it stops.
8. Pull the entire cover upward, straight away from the chassis, to disengage the rows of tabs from the notches in the chassis. Set the cover aside.
9. Remove and save the two screws from the back of the SIDE cover.
10. Remove the side cover in the same manner as the top and access covers: pull the cover back using the built-in handle, then lift it away.

Exchange the Bezel Frame

To be installed in a rack, the server needs a new bezel frame with rectangular cutouts where the chassis handles fit. You need to remove the old bezel frame and install the new one from the rack kit.

1. Remove the bezel door: with the door open all the way (to the left), lift it upward to release it from its hinges on the chassis.
2. Remove the bezel frame: disengage the tabs that attach the bezel frame to the chassis by pressing each tab toward the center of the chassis while pulling the frame away.
3. Attach the new bezel frame by reinserting the tabs into their corresponding rectangular slots on the chassis.
4. Reattach the bezel door to its hinges on the chassis.
5. Continue the procedures beginning with “Attach the Chassis Handles” (page 14) through “Install the Server in the Rack” (page 18).