Gateway®

User Guide

Gateway 9415 Server

Contents

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Checking Out Your Gateway Server

- Locating drives, ports, jacks, and controls
- Locating system board components
- Available help resources

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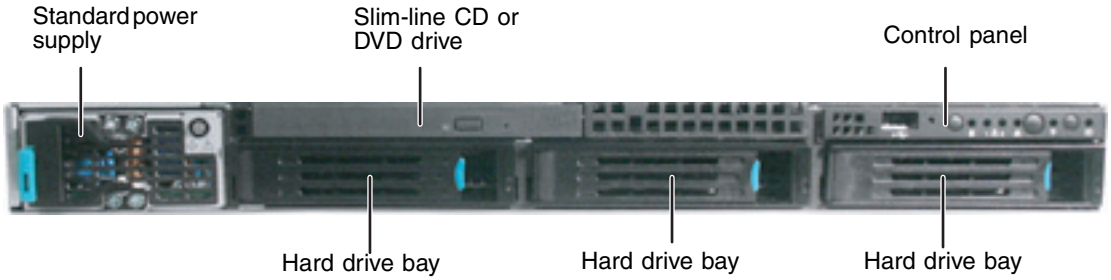
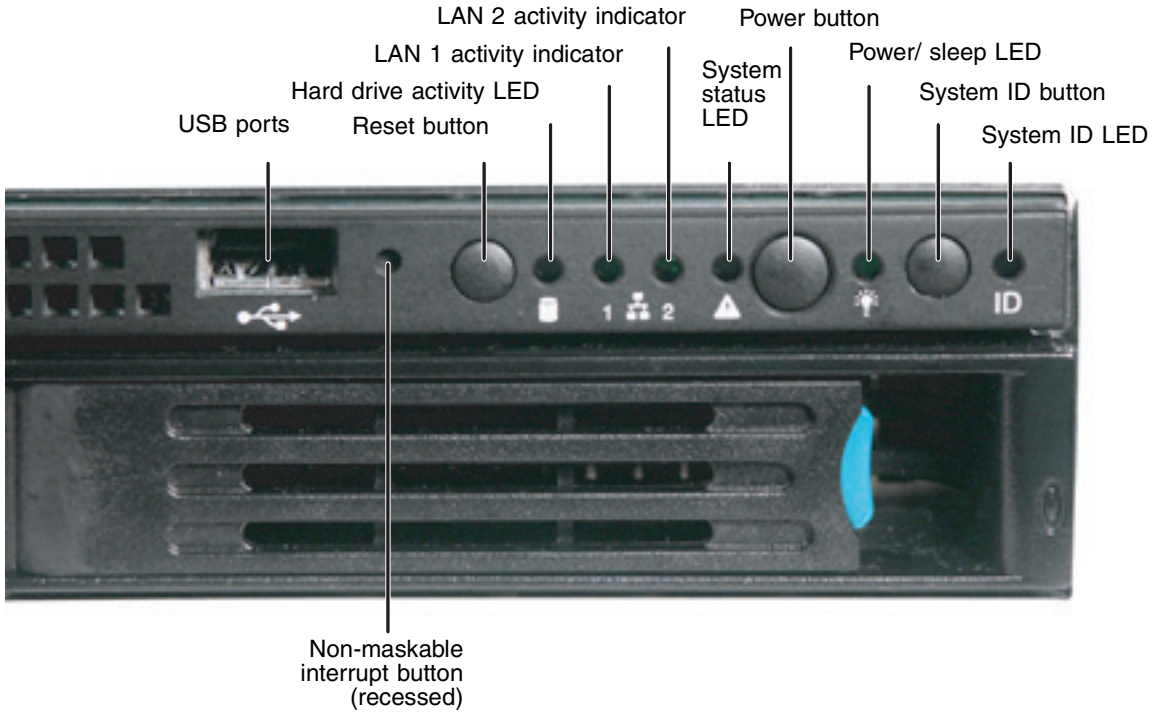
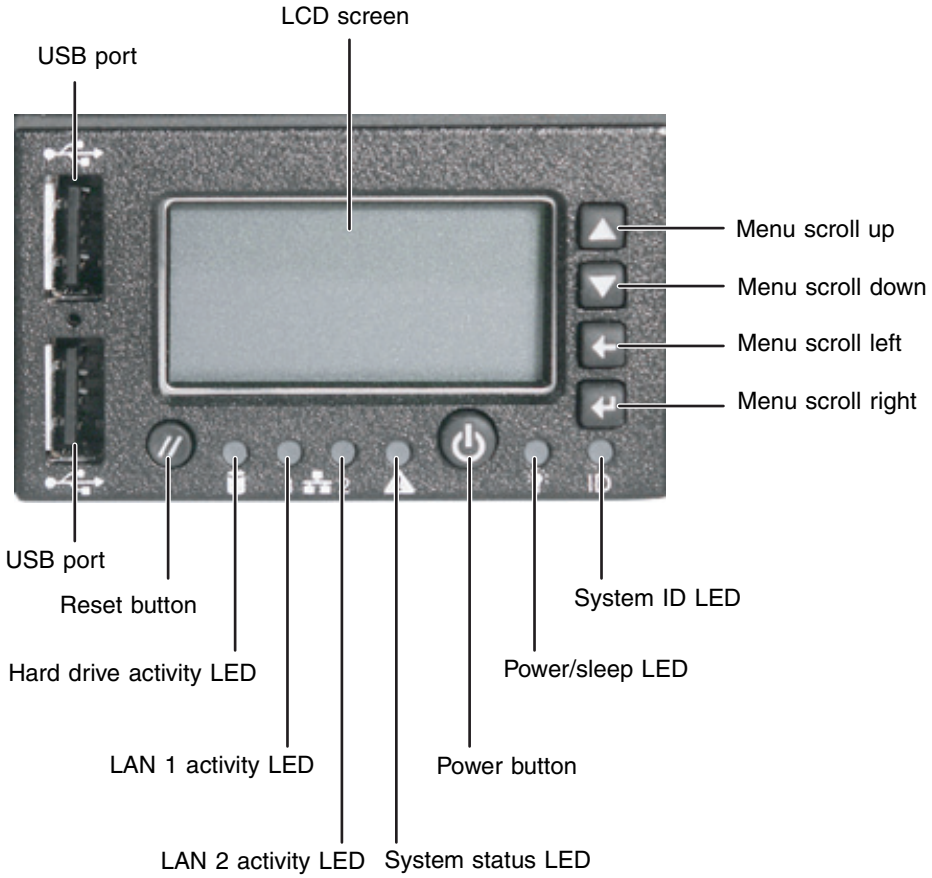


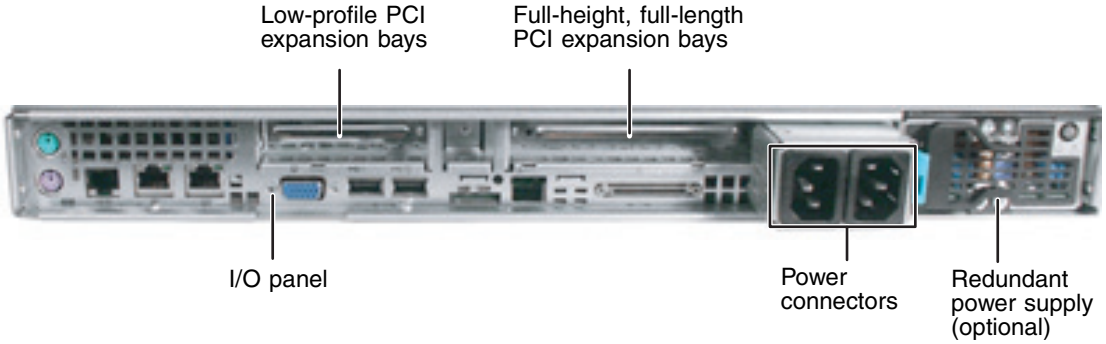
Control panel



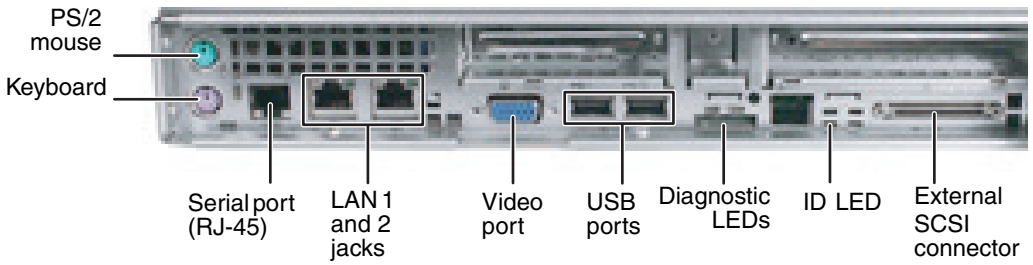
Local Control Panel (LCP) with LCD screen (optional)



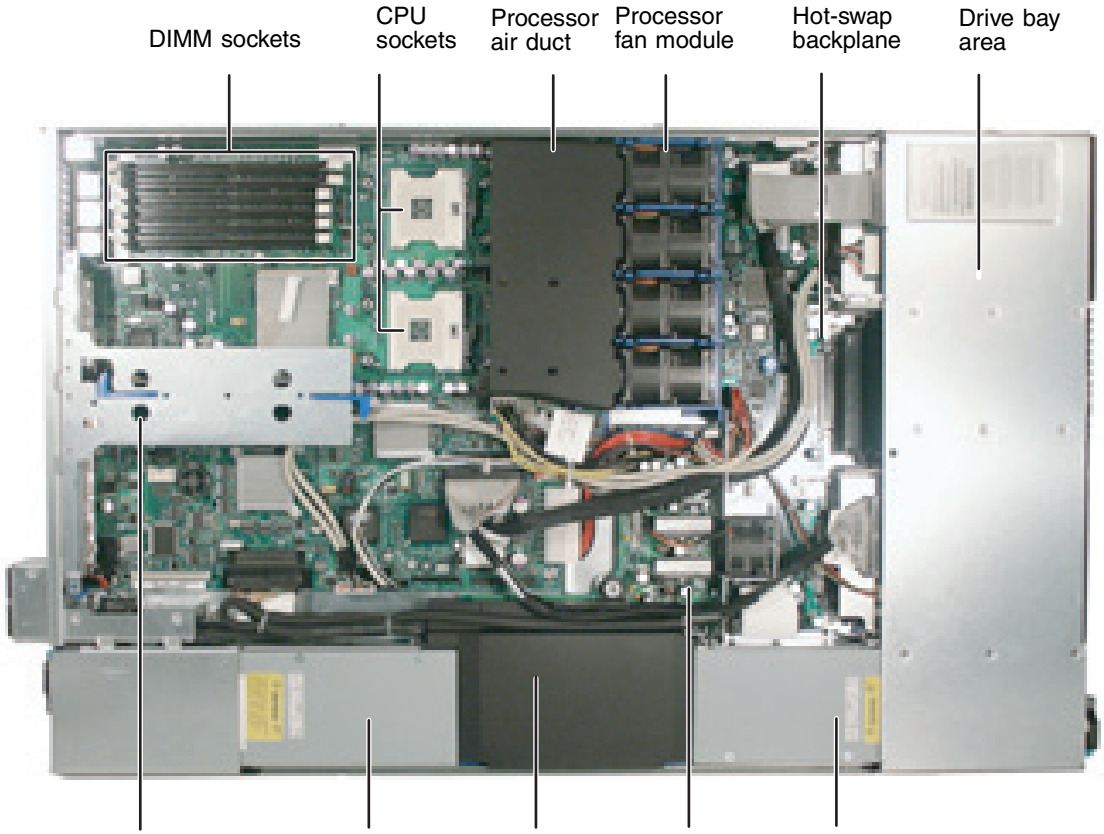
Back



I/O panel



Interior


DIMM sockets
CPU sockets
Processor air duct
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Drive bay area
PCI riser assembly
Redundant power supply (optional)
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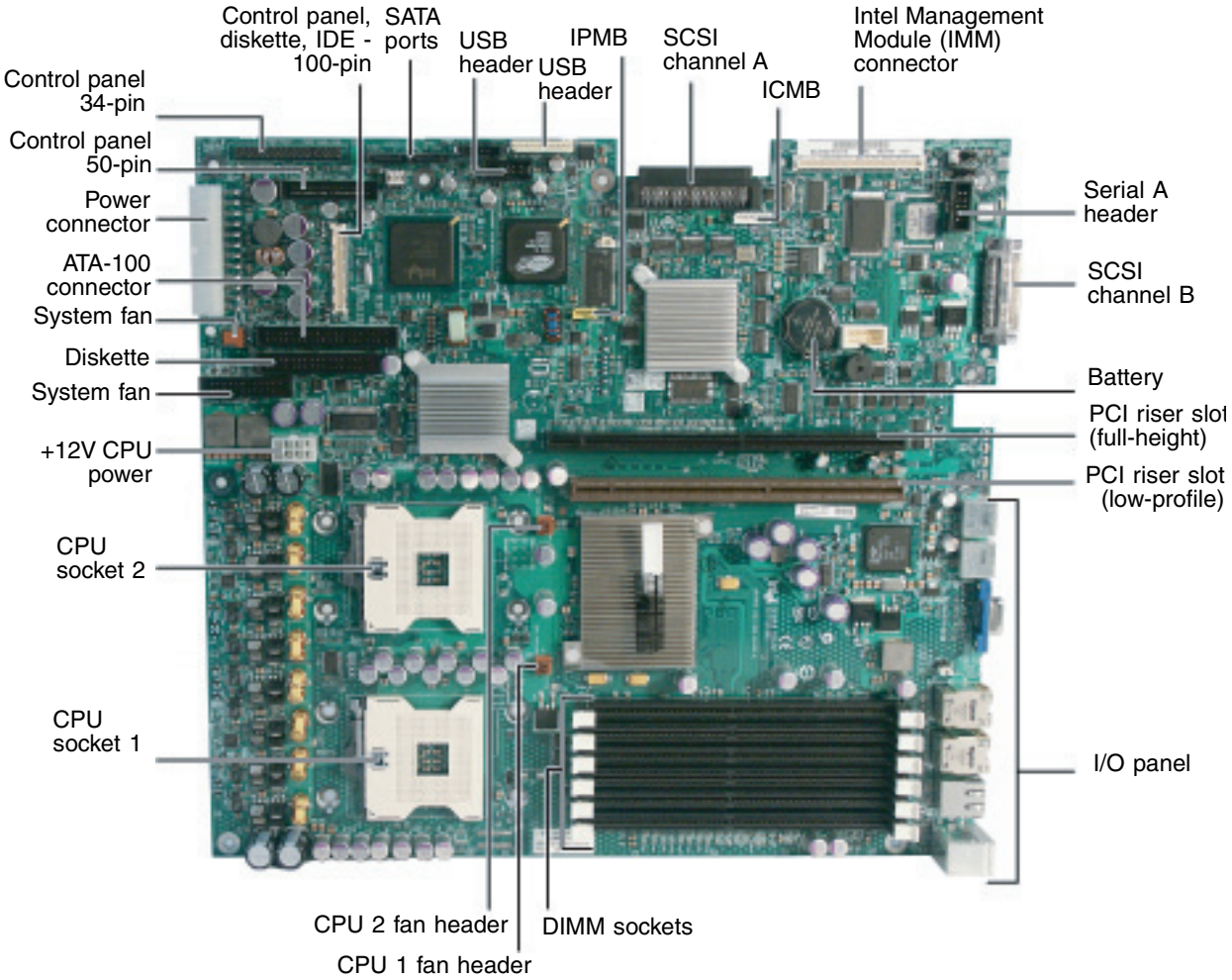
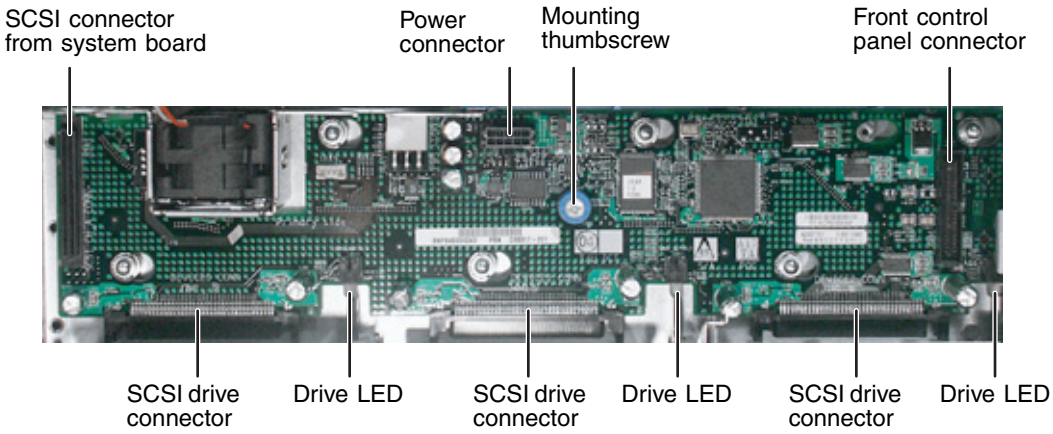


Hot-swap backplanes

SCSI backplane



Getting Help

In addition to your operating system's documentation, you can use the following information resources to help you use your server.

System Companion CD

Use the *System Companion CD* to access file utilities, Windows Server 2003 drivers, and documentation for your server and its components. For instructions, see *Using Your System Companion CD*.

Gateway Web site

Gateway provides a variety of information on its Web site to help you use your server.

Visit the Gateway Web site at support.gateway.com for:

- Technical documentation and product guides
- Technical tips and support
- Updated hardware drivers
- Order status
- Frequently asked questions (FAQs)

Telephone support

You can access a wide range of services through your telephone, including customer service, technical support, and information services. For more information, see "Telephone support" on page 118.

Chapter 2

Setting Up Your Server

- Using your server safely
- Installing your server into a cabinet
- Starting and turning off your server
- Setting up your operating system

Setting up the hardware

To make sure that your working environment is safe:

- Use a clean, dry, flat, stable surface for your server. Allow at least 6 inches at the back of the server for cabling and air circulation.
- Use the instructions on your server's setup poster to set up your hardware.
- Use a grounded (three-prong) surge protector. A surge protector helps protect against AC power fluctuations. For additional protection from power outages, we recommend that you use an uninterruptible power supply (UPS).

Caution

Your server comes with 3-wire AC power cords fitted with the correct plug style for your region. If this plug does not match the connector on your surge protector, UPS, or wall outlet, do not attempt to modify the plug in any way. Use a surge protector, UPS, or wall outlet that is appropriate for the supplied AC power cords.

- Avoid subjecting your server to extreme temperature changes. Do not expose your server to direct sunlight, heating ducts, or other heat-generating objects. Damage caused by extreme temperatures is not covered by your warranty. As a general rule, your server is safest at temperatures that are comfortable for you.
- Keep your server and magnetic media away from equipment that generates magnetic fields, such as unshielded stereo speakers. Strong magnetic fields can erase data on both diskettes and hard drives. Even a telephone placed too close to the server may cause interference.

Important

Keep the server boxes and packing material in case you need to ship the server.

Protecting from power source problems

Surge protectors, line conditioners, and uninterruptible power supplies can help protect your server against power source problems.

Surge protectors

During a power surge, the voltage level of electricity coming into your server can increase to far above normal levels and cause data loss or server damage. Protect your server and peripheral devices by connecting them to a surge protector, which absorbs voltage surges and prevents them from reaching your server.

Caution

High voltages can enter your server through the power cord and the modem and network connections. Protect your server by using a surge protector. If you have a modem, use a surge protector that has the appropriate type of modem jack. During an electrical storm, unplug the surge protector and the modem and network cables.

When you purchase a surge protector:

- Make sure that the surge protector meets the appropriate product safety certification for your location, such as Underwriters Laboratories (UL).
- Check the maximum amount of voltage the protector allows to pass through the line. The lower the voltage, the better the protection for your server.
- Check the energy absorption (*dissipation)* rating. The higher the energy absorption rating, the better the protection for your server.

Line conditioners

A line conditioner protects your server from the small fluctuations in voltage from an electrical supply. Most servers can handle this variation, called *line noise,* without problems. However, some electrical sources include more line noise than normal. Line noise can also be a problem if your server is located near, or shares a circuit with, a device that causes electromagnetic interference, such as a television or a motor.

Some surge protectors and uninterruptible power supplies include simple line-conditioning capabilities.

Uninterruptible power supplies

Use an uninterruptible power supply (UPS) to protect your server from data loss during a total power failure. A UPS uses a battery to keep your server running temporarily during a power failure and lets you save your work and shut down your server. You cannot run your server for an extended period of time while using only the UPS. To buy a UPS, visit accessories.gateway.com.

Mounting your server into a cabinet

The cabinet mounting hardware included with your server should be used with standard 4-post cabinets that have front and back vertical posts. If your cabinet is a different type, obtain mounting hardware from the cabinet manufacturer.

Caution

Before attaching cabinet accessories, make sure that the server is turned off and all power cords are unplugged.

Caution

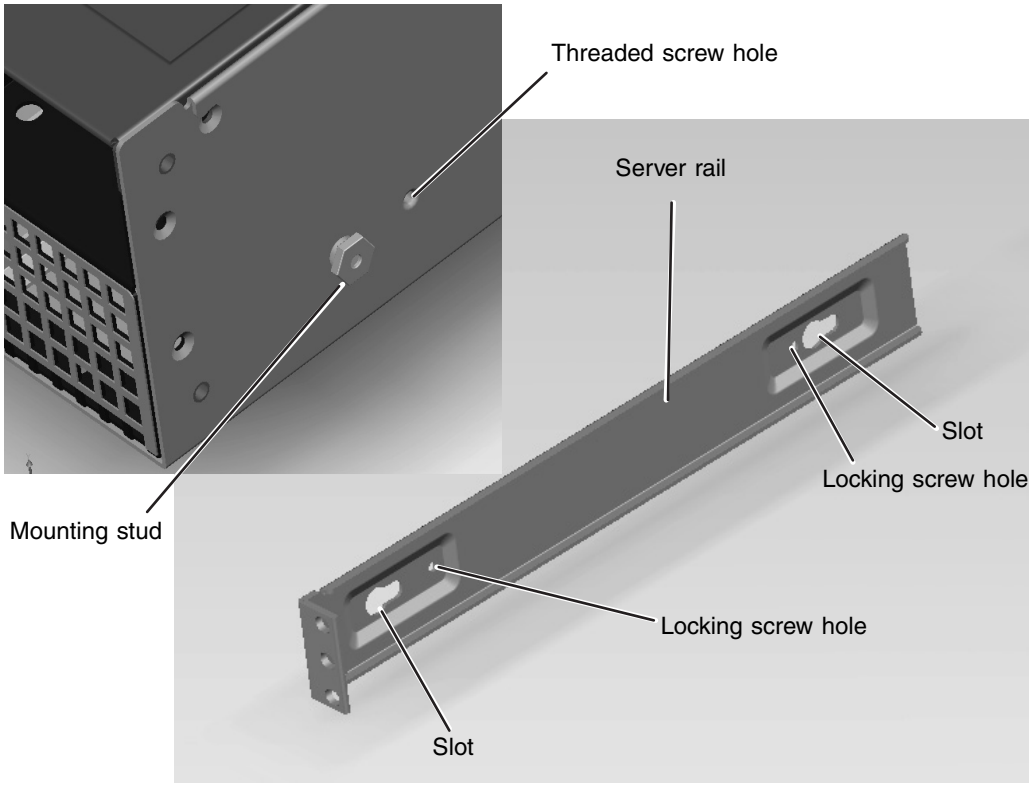
The cabinet must provide sufficient airflow to the front of the server to maintain correct cooling.

Rackmount kit contents:

- Server rails (2)
- Cabinet rails (2)
- L brackets (2, not used for this type of installation)
- Fastener pack (1)
  - Small screws (4, #6-32 × 3/16-inch)
  - Medium screws (8, #10-32 × ½-inch)
  - Large screws (2, #10-32 × 7/8-inch)
  - Disk guides (2)
  - Handle spacers (2)
  - Nut bars (4)

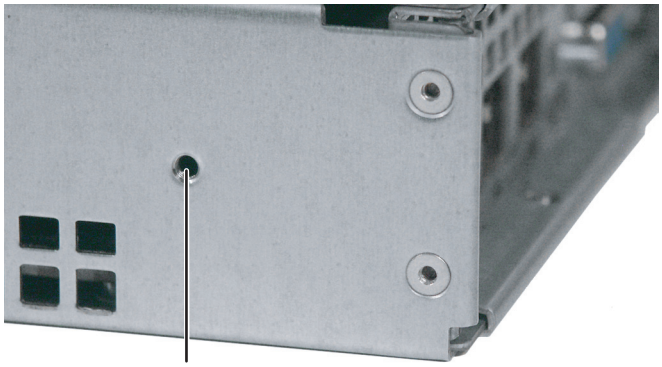
To mount your server in a cabinet:

1. Remove the two screws from each handle, then set the handles and screws aside.
2. Align the slots in a server rail with the studs on the side of the server, then engage the slots with the studs and slide the rail back until it stops. (Your server may be different than the server shown in the example.)

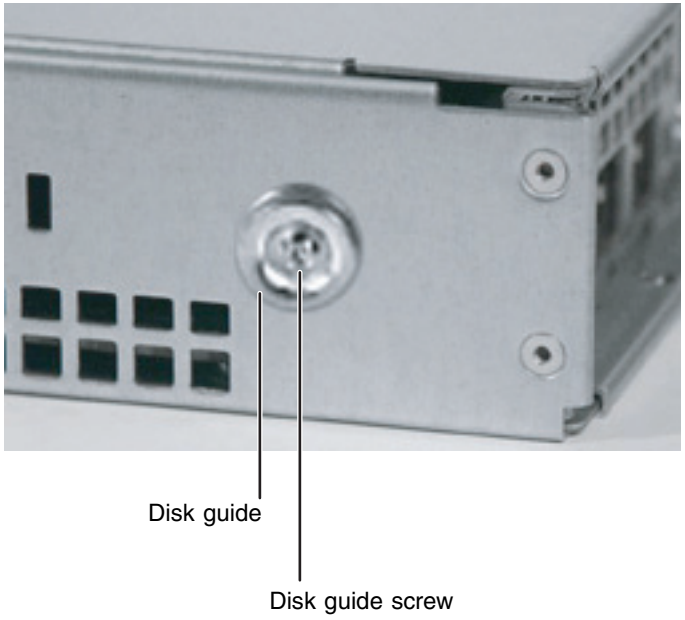


3. Align the locking screw holes in the rails with the threaded screw holes in the server, then install two locking screws through the each rail.

4 Place a disk guide over the disk guide screw hole towards the back of the server.



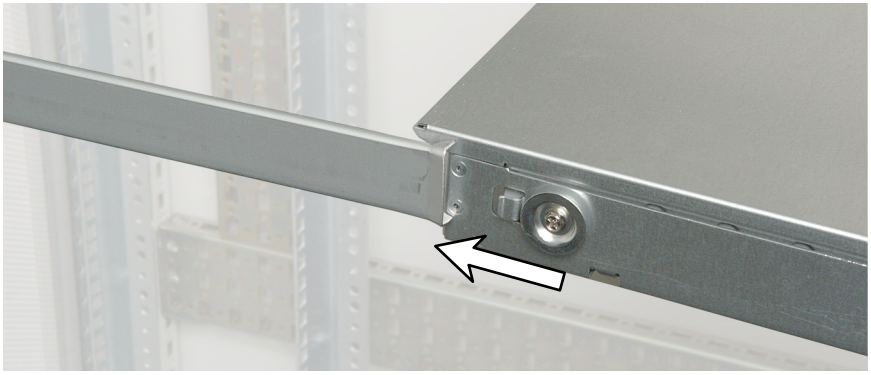
5 Insert a small screw through the disk guide, then tighten the screw. Attach the remaining disk guide on the other side of the server.



6 Attach a nut bar to the inside of the two back cabinet posts using medium screws, but do not completely tighten the screws (leave them loose enough to allow insertion of the cabinet rail in the next step).

7 Insert the slotted foot at the back of each cabinet rail between the nut bar and the post, then tighten the screws.

8 With the front of the server facing you, lift the server and insert it into the cabinet from the front, then position the disk guides so they fit in the cabinet rails. (Your server may be different than the server shown in the example.)



9 Install a nut bar or mounting nuts on the front cabinet posts.

10 Push the server toward the back of the cabinet until the front of the server rails touch the front cabinet posts, then secure with two screws through each server rail.

- OR -

Follow the instructions in "Installing the bezel" on page 17 to attach both handles and secure the server into the cabinet.

Warning

You must support the server while installing or removing the front screws and while sliding the server on or off the cabinet rails. If the server is not supported, damage to the server or injury may result.

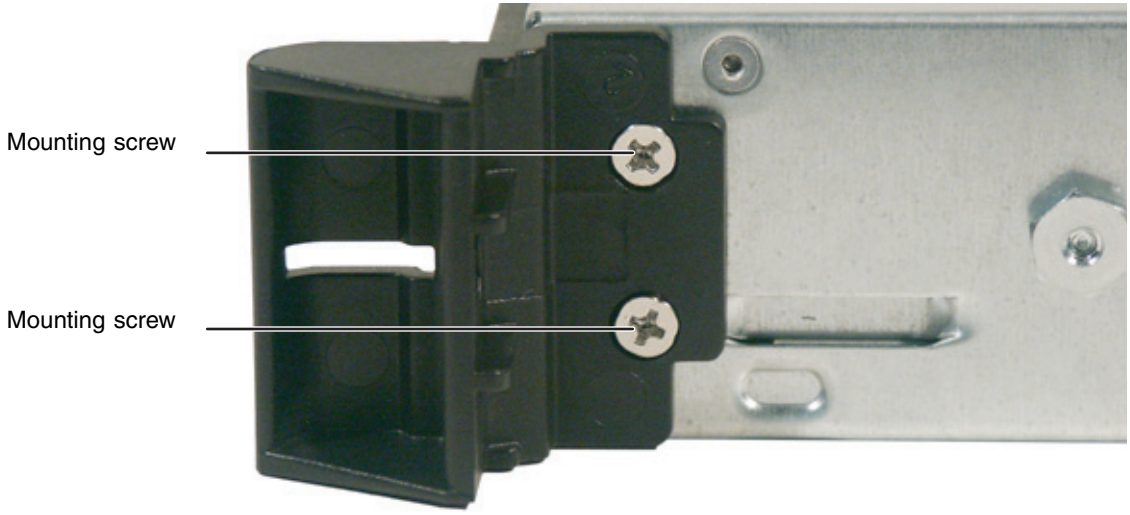
Installing the bezel

Important

The bezel is held in place by the server handles. If you are not installing the bezel, you do not need to install the handles.

To install the bezel:

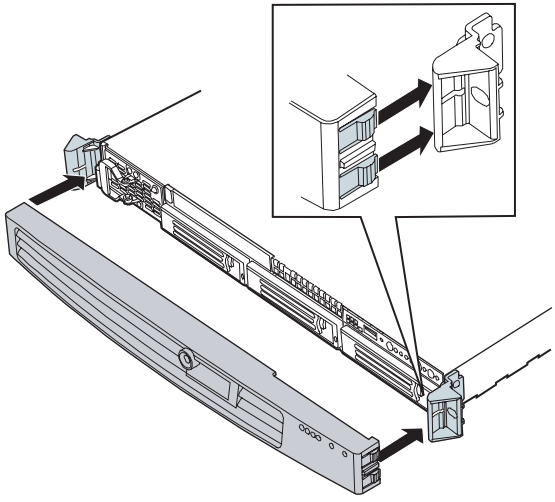
1. With the server pulled out from the cabinet, align the holes in the handle with the holes in the front side of the server.
2. Attach the handles to the sides of the server with two mounting screws on each side. (Your server may be different than the servers shown in the examples.)



3. Push the server, with the handles attached, into the cabinet to determine which holes in the front posts of the cabinet that the holes in the handles will line up with.
4. Pull the server back out of the cabinet.
5. Install the mounting nuts (nuts equipped with spring clips that come with most server cabinets) into the holes in the front posts of the cabinet.
6. Push the server into the cabinet again.

7 Use a screw through each handle to secure the server to the cabinet posts.

8 Remove the bezel lock keys from the inside of the bezel, then snap on the bezel with the control panel area at the right.



9 To lock the bezel, insert the key into the lock and rotate it ¼ turn clockwise. To unlock it, rotate the key ¼ turn counter-clockwise.

Removing the server from a cabinet

To remove the server from a cabinet:

Warning

Screws are required to support the front of the server. You must support the server while removing the front screws and while sliding the server off the cabinet rails. If the server is not supported, damage to the server or injury may result.

1. Remove the screws through the handles that hold the server in the cabinet.
2. While supporting the server, slide the server out from the cabinet.

Starting your server

Before you start your server for the first time:

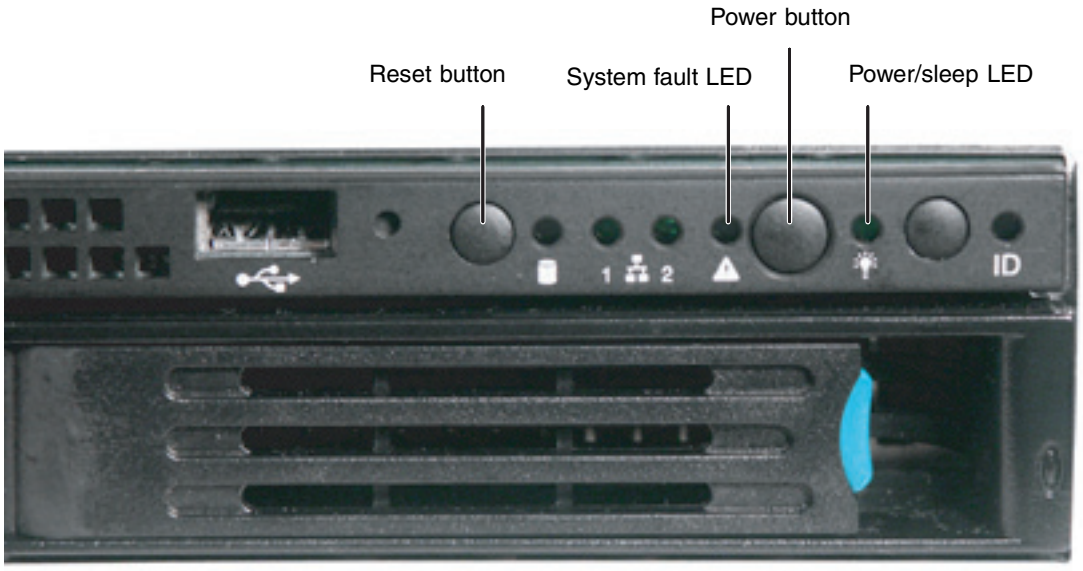
- Make sure that the server and monitor are plugged into a power outlet or surge protector and that the surge protector (if you are using one) is turned on.
- Make sure that all cables are connected securely to the correct ports and jacks on the back of the server.

Caution

When you connect peripheral devices to the server, make sure that your server and devices are turned off and the power cords are unplugged.

To start the server:

1. Turn on any peripheral devices connected to the server.
2. Press the power button.



When the power/sleep LED is…	It means…
Green (steady on)	The server is turned on.
Green (blinking)	The server is in sleep mode.
Off	The server is turned off.

When the system fault LED is…	It means…
Green (steady on)	The server is operating normally.
Green (blinking)	The server is operating in a degraded condition.
Orange (blinking)	The server is in a noncritical condition.
Orange (steady on)	The server is in a critical or unrecoverable condition.
Off	POST failure or full system stop.

If nothing happens when you press the power button:

- Make sure that the power cable(s) is plugged in securely and that your surge protector (if you are using one) is plugged in and turned on.
- Make sure that the monitor is connected to the server, plugged into the power outlet or surge protector, and turned on. You may also need to adjust the monitor's brightness and contrast controls.
- If you cannot find the cause of the power loss, contact Gateway Customer Care. For more information, see "Getting Help" on page 8.

3 The first time you turn on the server, any pre-installed operating system may begin asking you for configuration settings. See your operating system's documentation for instructions on configuring advanced settings for your specific network.

Understanding the power-on self-test

When you turn on your server, the power-on self-test (POST) routine checks the server memory and components. If POST finds any problems, the server displays error messages. Write down any error messages that you see, then see "Error messages" on page 121 and "Beep codes" on page 124 for troubleshooting information.

Turning off your server

Every time you turn off your server, first shut down the operating system. You may lose data if you do not follow the correct procedure.

To turn off the server:

1. See the operating system's documentation or online help for instructions on shutting down the operating system. Whenever possible, you should use the operating system's shut down procedure instead of pressing the power button.

Caution

The power button on the server does not turn off server AC power. To remove AC power from the server, you must unplug the AC power cords from the wall outlet or power source. The power cords are considered the disconnect device to the main (AC) power.

2. If your server did not turn off automatically, press the power button.

   - OR -

   Press the reset button to reset the server.

Configuring the RJ-45 serial port

The RJ-45 serial port connector can be configured to support either a Data Set Ready (DSR), or a Data Carrier Detect (DCD) signal. The default configuration for your server supports DSR signals. To change the configuration from DSR to DCD signal support, a jumper (J7A1) must be changed on the system board.

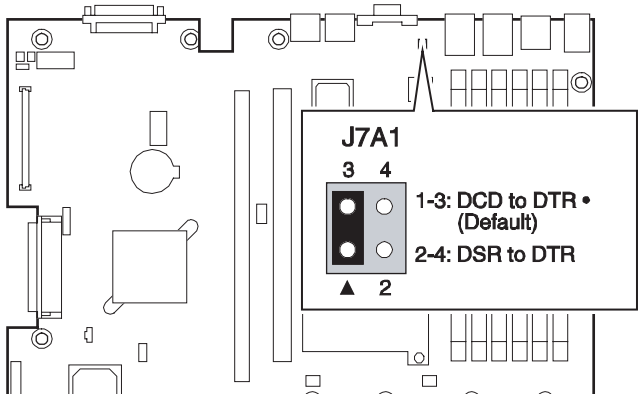
To change the RJ-45 serial port configuration to DCD signal support:

1. Turn off the server, then disconnect the power cords and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.

Caution

Moving the jumper while the power is on can damage your server. Always turn off the server and unplug the power cords and all other cables before changing the jumper.

3. Remove the PCI riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.
4. Remove the jumper across pins 1-3 of jumper J7A1, then place the jumper across pins 2-4.



5. Reinstall the PCI riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.
6. Follow the instructions in "Closing the server case" on page 44.

Setting up the operating system

If you ordered your server with the operating system already installed by Gateway, in most cases it is completely installed and the basic settings are already configured. The Windows Small Business Server operating system may require additional installation, depending on the version you ordered. See your operating system's documentation for instructions on completing the installation or configuring advanced settings for your specific network.

If you are installing an operating system because it was not already installed by Gateway, see the appropriate installation guide for instructions.

Initial hardware settings

Your server comes from the manufacturer with the correct initial hardware settings to operate your server as configured. However, at some point you might want to change settings to reflect a tasking change, a change in security requirements, or the addition of new resources to your server.

General hardware settings, as well as enabling or disabling the onboard LSI RAID solution, can be changed by using the BIOS Setup utility. The RAID solution can be configured by using the RAID BIOS console (or the specific RAID console which accompanied a customized, add-in RAID solution).

For information on the BIOS Setup utility, see "Using the BIOS Setup Utility" on page 107. For information on BIOS settings, see "BIOS Settings" on page 149. For information on the RAID BIOS console utility, see "Configuring your onboard RAID solutions" on page 62. For information on a specific RAID console for an add-in RAID solution, see the documentation on that hardware which came with your server.

Chapter 3

Maintaining Your Server

- Caring for your server
- Recording the BIOS configuration
- Managing your server and network

Caring for your server

To extend the life of your server:

- Be careful not to bump or drop your server.
- When transporting your server, we recommend that you put it in the original packaging materials.
- Keep your server and magnetic media away from equipment that generates magnetic fields, such as unshielded speakers.
- Avoid subjecting your server to extreme temperatures. Do not expose your server to heating ducts or other heat-generating objects. Damage caused by extreme temperatures is not covered by your warranty. As a general rule, your server is safest at temperatures that are comfortable for you.
- Keep all liquids away from your server. When spilled onto server components, almost any liquid can result in extremely expensive repairs that are not covered under your warranty.
- Avoid dusty or dirty work environments. Dust and dirt can clog the internal mechanisms and can cause the server to overheat.

Cleaning your server

Keeping your server clean and the vents free from dust helps keep your server performing at its best. Your server cleaning kit could include:

- A soft, lint-free cloth
- Glass cleaner
- An aerosol can of air with a narrow, straw-like extension
- Isopropyl alcohol
- Cotton swabs
- A tape drive cleaning cartridge (if a tape drive is installed)
- A CD drive cleaning kit

Cleaning tips

- Always turn off your server and other peripheral devices before cleaning any components.

Warning

When you shut down your server, the power turns off, but some electrical current still flows through your server. To avoid possible injury from electrical shock, unplug the power cord and all other cables connected to the server.

- Use a damp, lint-free cloth to clean your server and other parts of your server system. Do not use abrasive or solvent cleaners because they can damage the finish on components.
- Keep the cooling vents free of dust. With your server turned off and unplugged, brush the dust away from the vents with a damp cloth, but be careful not to drip any water into the vents.

Cleaning the keyboard

You should clean the keyboard occasionally by using an aerosol can of air with a narrow, straw-like extension to remove dust and lint trapped under the keys.

If you spill liquid on the keyboard, turn off your server and turn the keyboard upside down to let the liquid drain. Let the keyboard dry completely before trying to use it again. If the keyboard does not work after it dries, you may need to replace it. Keyboard damage resulting from spilled liquids is not covered by your warranty.

Cleaning the screen

If your computer screen is a flat panel display, use only a damp, soft cloth to clean it. Never spray water directly onto the screen.

Caution

The computer screen is made of specially coated glass and can be scratched or damaged by abrasive or ammonia-based glass cleaners.

- OR -

If your computer screen is not a flat panel display, use a soft cloth dampened with glass cleaner to clean the screen. Never spray cleaner directly onto the screen.

Cleaning the tape drive

If you use a tape drive to back up your files, regular maintenance will lengthen the life of the drive. To maintain the drive's reliability:

- Clean the drive monthly with the cleaning cartridge included with the drive.
- Remove the tape from the drive whenever the drive is not in use.

Preparing for system recovery

If your system files are corrupted, you may not be able to start the server from the hard drive. *Startup diskettes* are diskettes that let you start the server and attempt to fix the problem. See your operating system's documentation or online help for instructions on creating startup diskettes.

Some operating systems also let you create an emergency repair diskette to back up critical operating system files. See your operating system's documentation or online help for instructions on creating and using an emergency repair diskette.

Recording the BIOS configuration

To help keep track of your custom changes to BIOS settings and to prepare for system recovery, you should record your BIOS configuration after you have your server set up and working.

To record your BIOS configuration:

1. Print the appendix for "BIOS Settings" on page 149.
2. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
3. Record the BIOS settings on your printout.

System administration

Gateway Server Manager

Gateway Server Manager lets you manage multiple computers on a Windows network from a single window, then implement commands and policies across the network with a single action. With Gateway Server Manager, you can run system management tasks which are triggered by certain events or conditions.

Printed documentation comes with the *Gateway Server Manager* CD. You can find additional documentation in the program's online help.

Server security

Locking the server

To lock the server:

1. Remove the bezel lock keys from the inside of the bezel, then snap on the bezel. The handles must be installed for the bezel to snap on. For instructions, see "Installing the bezel" on page 17.
2. Insert the key into the lock and rotate it ¼ turn clockwise. To unlock it, rotate the key ¼ turn counter-clockwise.

Using BIOS security passwords

To prevent unauthorized use of the server, you can set server startup passwords. Set an administrator password to prevent unauthorized access to the BIOS Setup utility.

To set the BIOS security passwords:

1. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
2. Select the **Security** menu.
3. Select **Administrator Password**.
4. Type the password and press ENTER, then type it again and press ENTER.
5. Save your changes and close the BIOS Setup utility.

To remove a BIOS security password:

1. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
2. Select the **Security** menu, then select the password to remove.
3. Enter the current password, then press **ENTER**.
4. For the new password, leave the password field blank, then press **ENTER**. The password is removed.

Tips & Tricks

Passwords can also be cleared using jumpers on the system board. For instructions, see "Resetting BIOS passwords" on page 114.

Local control panel

The optional Local Control Panel (LCP) provides an intelligent front panel for the server and lets you configure the server, monitor system status, and control the server from the panel. The LCD panel has its own microcontroller and is independent of the operating system. Its 4×20 display provides information directly from the Baseboard Management Controller (BMC) using the IPMB bus.

Interactions

The LCP can:

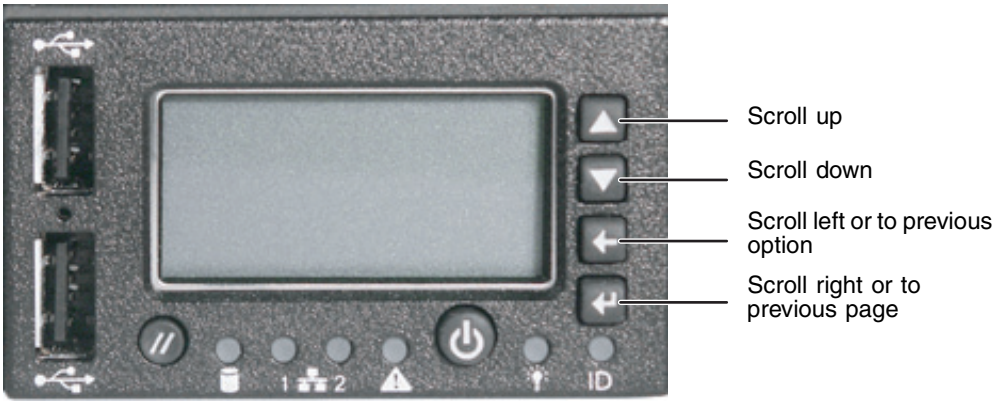
- Poll the BMC to determine alert conditions
- Query the BMC for system event log entries
- Display and control the power state of the server
- Query the BMC for field replaceable units (FRUs)
- Read BMC sensors
- Retrieve BIOS POST progress codes
- Issue IPMI commands to the BMC
- Obtain BIOS-specific information from the BMC

In addition to the above, system software can also interact with the LCP to:

- Write characters to the LCP
- Read characters from the LCP

- Read the state of the LCP buttons
- Control the LCP buttons
- Change LCP menus
- Read information from the LCP microcontroller
- Update the LCP firmware

Navigation



The following table shows the LCP menu options:

Menu	Options	Description
Configure the server	Network (LAN channel 1 to 3) ▪ IP address (BMC) ▪ Netmask ▪ Gateway address ▪ Enable LAN channel	Configure TCO NIC
	Inventory ▪ CPUs ▪ DIMMs ▪ Drives ▪ Power supplies ▪ System fans	View system inventory
	Server name	View server name
	Asset tab information	View asset tag
	Server GUID	View server GUID

Menu	Options	Description
Configure the server (cont'd)	BIOS revision	View BIOS revision
	BMC firmware revision	View BMC firmware revision
	Local Control Panel firmware revision	View LCP firmware revision
	HSC firmware revision	View HSC firmware revision
	HSC2 firmware revision	View HSC2 firmware revision
Monitor the server	POST progress codes	View POST progress codes
	Server health (drill down to subsystem(s) at fault)	View the health of the system
	System event log	View the system event log
	CPU sensors (CPU 1 to n) ▪ Presence ▪ Over temperature ▪ On/off line	View CPU related status
	Chassis status Intrusion status Power supply 1 to n ▪ Presence ▪ Status Fan 1 to n ▪ Presence ▪ Status ▪ Speed HSC 1 to 2 ▪ Presence ▪ Status	View chassis related status
	Temperatures (all available temperature sensors)	View all available temperature sensor status

Menu	Options	Description
Control the server	Boot flags (select from available boot flags) ▪ Set the flag — one time reboot ▪ Reboot the system	Configure boot order
	Power control ▪ Power on ▪ Power off	Power control Control the power state by creating button pushes — as if performed on the front panel.
	Reset	Power control
	IPMI control ▪ Power on ▪ Power off	IPMI control Send the chipset a power control command. The same functionality as if done over LAN or by GSM.
	IPMI command screen ▪ Issue an IPMI command (text or hex)	Issue an IPMI command
Set up the server	Language selection (display loaded language files)	Select the LCP display language
	Status setup ▪ Interval timing (set time to retrieve status) ▪ Subsystem mask (mask off subsystems)	Set sensor refresh interval
	Password setup ▪ Password exists/does not exist ▪ Create/change password	Password setup
	Remote access rights ▪ View (grant or deny) ▪ Write (grant or deny) ▪ Buttons (grant or deny)	Remote access control

Identifying your server

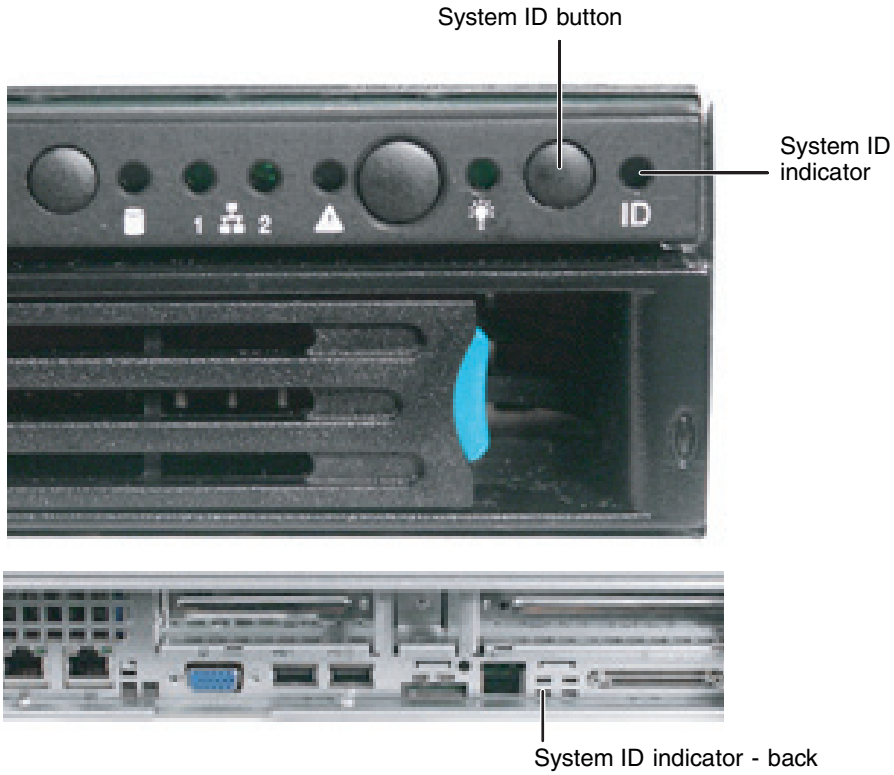
While you are working on a cabinet that contains several slim servers, it can be difficult to keep track of which server or servers you are currently working on. The System ID indicator is a blue LED that you can turn on to help you locate the correct server. For the System ID indicator to turn on, the server does not need to be turned on, but it does need to be plugged in.

Important

If your server has an Intel IMM module installed, the system ID LED will turn on or off when the System ID button is pressed. If no IMM Module is installed, the system ID LED will blink when the System ID button is pressed.

To turn on the System ID indicator:

1 Press the System ID button. The two blue System ID LED indicators turn on.



2 To turn off the indicator, press the System ID button.

Updating the baseboard management controller firmware

The baseboard management controller (BMC) performs several system management functions such as:

- Monitoring server components (FRU) and sensor data records (SDR) (the information provided depends on the option selected)
- Managing non-volatile storage for the system event log and sensor data records
- Interfacing with the emergency management port to send alerts and interact with remote management systems
- Fault resilient booting (the extent depends on the option selected)

You should update the BMC firmware when Gateway Customer Care has instructed you to update it. The initial firmware update after installing the IMM Module also requires a boot block update, but subsequent firmware updates do not.

To update the BMC firmware without boot block update:

1. Create a DOS-bootable USB *Disk-on-key* device or a DOS-bootable CD.
2. Download the BMC update file from support.gateway.com.
3. Follow the instructions included with the update file.
4. Turn off the server, then disconnect the power cord(s) and wait for the Standby power LED to turn off.

To update the BMC firmware with boot block update:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you disconnect the power cord(s), and wait until the Standby power LED turns off.
2. Follow the instructions in "Opening the server case" on page 42.

Caution

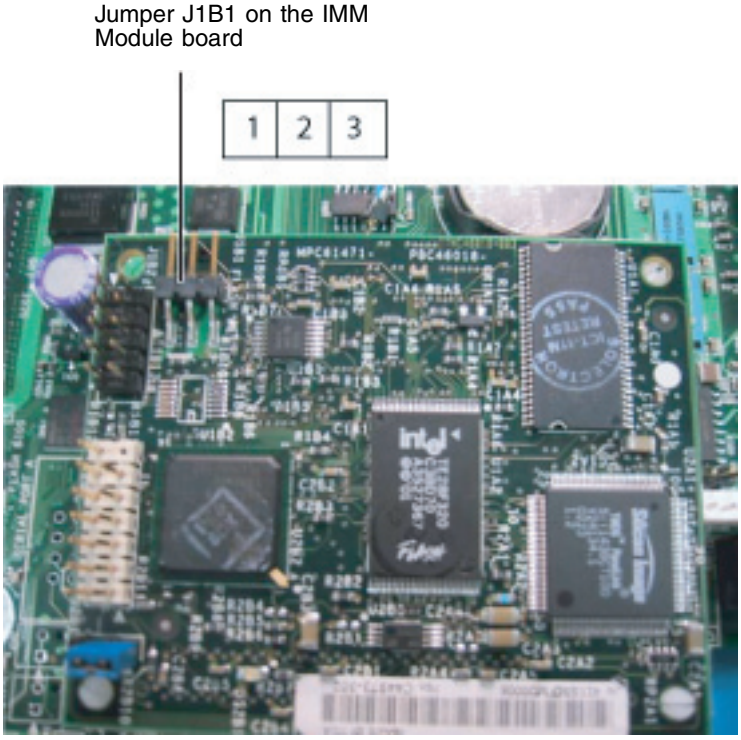
If you do not disconnect the power cords when instructed to in this procedure, the BMC firmware will not update.

3. Remove the PCI riser assembly. For instructions, see "Installing and removing PCI expansion cards" on page 69.

4 Move the shorting block from pins 2-3 to pins 1-2 on the Boot Block Update jumper (J1B1) on the IMM module.

Important

Jumper J1B1 is located on the IMM Module board.



5 Replace the PCI riser assembly.

6 Follow the instructions in "Closing the server case" on page 44, then reconnect the power cord.

7 Create a DOS-bootable USB *Disk-on-key* device or DOS-bootable CD.

8 Download the BMC update file from support.gateway.com.

9 Follow the instructions included with the update file.

10 Turn off the server, then disconnect the power cord(s) and wait for the Standby power LED to turn off.

11 Follow the instructions in "Opening the server case" on page 42.

12 Remove the PCI riser assembly.

13 Move the shorting block on the Boot Block jumper (J1B1) back to pins 2-3.

14 Replace the PCI riser assembly.

15 Follow the instructions in "Closing the server case" on page 44.

Updating the FRU/SDR

The FRU/SDR must be updated whenever you add additional hardware to your server that must be monitored by the BMC. This includes adding a redundant power supply module, adding redundant hot-swap fans, or adding an Intel Management Module (IMM). The FRU/SDR must also be updated whenever you update the BIOS.

Each time you update the FRU/SDR, we recommend that you check support.gateway.com for the most current version of the utility. If a newer version is available than the one included on the SCCD, download the newer version and use it instead of the SCCD in the following procedure.

To update the FRU/SDR:

1 Boot your server to DOS (using a DOS-bootable diskette, CD, or USB disk on key).

2 Put the *System Companion CD* in the CD drive and change directories (to the CD drive) to access it.

3 When the System Companion CD menu opens, select the FRU/SDR utility.

4 Select one of the following options (if in doubt, choose the second option and update both):

Update just the SDR repository - Select this option when sensor information needs to be changed (for example, if the CPU is upgraded to a higher speed or if memory is replaced).

-OR-

Update the FRUs and the SDR repository (and mBMC TBLs - if the IMM module is not present) - Select this option if have installed additional hardware (for example, a redundant power supply or system fans, or additional memory).

5 When you are asked if you have an optional cooling kit installed, type **Y** if your system has redundant fans installed or **N** if you system has only the basic fans installed.

6 Exit the utility, remove the System Companion CD, and reboot your server.

Using your System Companion CD

You can use your *System Companion CD* to:

- Install hardware drivers
- Install programs
- View server documentation

Instructions for using the CD are provided in *Using Your System Companion CD*.

Chapter 4

Installing Components

- Opening and closing the server case
- Installing and replacing major components

You must open your server case to install components. If you are not comfortable with these procedures, get help from a computer service technician or contact Gateway Customer Care.

Preparing to install components

Selecting a place to work

Work on your server in an area that:

- Is clean (avoid dusty areas).
- Is a low-static environment (avoid carpeted areas).
- Has a stable surface on which to set your server.
- Has enough room to place all of your server parts.
- Is near a grounded outlet so you can test your server after installation.
- Is near a telephone (in case you need help from Gateway Customer Care). The telephone must be directly connected to a telephone jack and cannot be connected to your server.

Gathering the tools you need

Some tools and supplies that you may need to work on your server are:

- A notebook to take notes
- A Phillips screwdriver
- A small flat-blade screwdriver
- Small containers to store various types of screws
- A grounding wrist strap (available at most electronic stores)

Tips & Tricks

Blue latches, thumbscrews, or connectors indicate tool-less components.

Green latches and connectors indicate hot-swappable components.

Getting Help

If you have questions about performing any of these procedures, contact Gateway Customer Care. For more information, see “Getting Help” on page 8.

Preventing static electricity discharge

The components inside your server are extremely sensitive to static electricity, also known as *electrostatic discharge* (ESD).

Warning

To avoid exposure to dangerous electrical voltages and moving parts, turn off your server and unplug the power cords and modem cable before opening the server case.

Caution

ESD can permanently damage electrostatic discharge-sensitive components in the server. Prevent ESD damage by following ESD guidelines every time you open the server case.

Before working with server components, follow these guidelines:

- Turn off the server, then unplug the power cords and all other cables.
- Press the power button to drain any residual power from the server.
- Wear a grounding wrist strap (available at most electronics stores) and attach it to a bare metal part of the server. You can also touch a bare metal surface on the back of the server with your finger.

Warning

To prevent risk of electric shock, do not insert any object into the vent holes of the power supply.

- Avoid static-causing surfaces such as carpeted floors, plastic, and packing foam.
- Avoid working on the server when your work area is extremely humid.
- Remove components from their antistatic bags only when you are ready to use them. Do not lay components on the outside of antistatic bags because only the inside of the bags provide electrostatic protection.
- Always hold expansion cards by their edges or their metal mounting brackets. Avoid touching the edge connectors and components on the cards. Never slide expansion cards or components over any surface.

Opening the server case

Because the components inside your server are extremely sensitive to static electricity, make sure that you follow the instructions at the beginning of this chapter to avoid static electricity damage.

Caution

For correct cooling and air flow, always reinstall the top panel before you turn on the server. Operating the server without the panel in place will cause the server to overheat.

To open the server:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

Warning

This server has two power cords. To disconnect internal AC power, you must unplug both power cords.

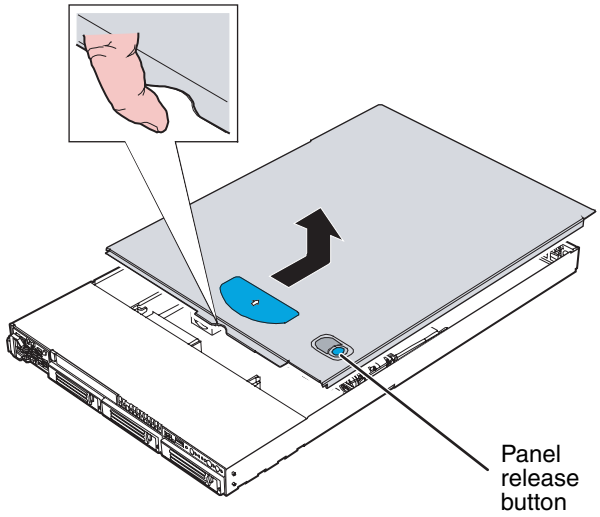
2. If the bezel is installed, unlock it, then pull it off.
3. If the server is mounted in a cabinet, remove the server from the cabinet. For instructions, see "Removing the server from a cabinet" on page 19.

Warning

Screws are required to support the front of the server when using the standard cabinet rails. You must support the server while removing the front screws and while sliding the server off the cabinet rails. If the server is not supported, damage to the server or injury may result.

4. Place the server on a stable, non-skid surface.
5. Remove the shipping screw (if installed).

6 Press and hold the panel release button, then slide the top panel toward the back of the server about ½ inch.

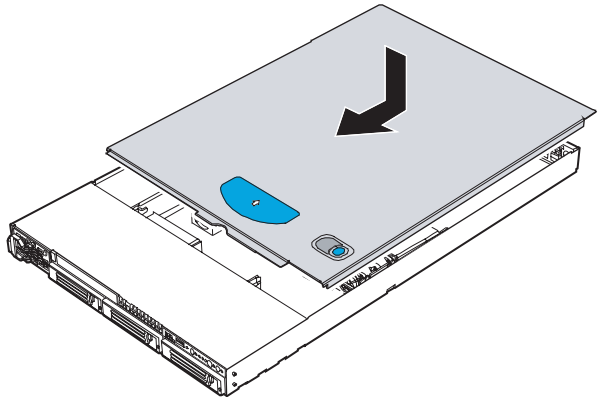


7 Lift the top panel away from the server.

Closing the server case

To close the server case:

1. Make sure that all of the internal cables are arranged inside the case so they will not be pinched when you close the case.
2. Slide the top panel onto the server.
3. Slide the top panel toward the front of the server until it clicks into place.



4. Replace the shipping screw (if necessary).
5. Reconnect the power cords and all other cables.

Removing and installing air ducts and air dams

Your server has been engineered to provide correct airflow in the chassis for sufficient cooling of drives, processors, and power supplies. As your server configuration changes, the airflow within the chassis will need to be modified to accommodate those changes.

Caution

To ensure continued, reliable operation, always operate your server with the appropriate air ducts and air dams in place. Failure to do this could result in equipment damage.

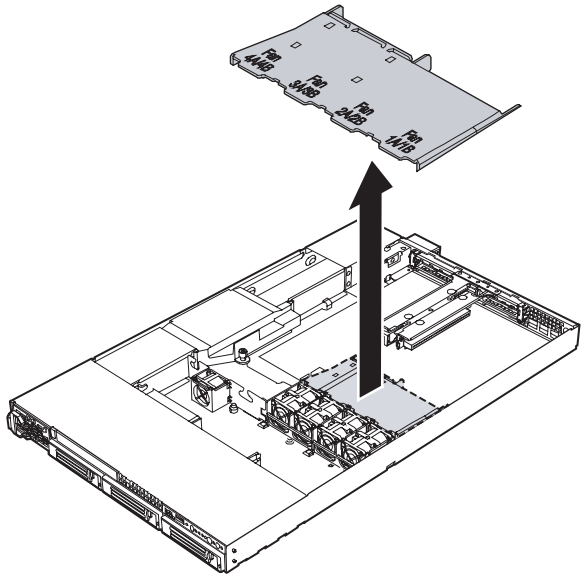
Removing the processor air duct

The processor air duct normally covers the portion of the system board that includes only the processor(s). The air duct will need to be removed if you need to add or remove a processor in your system or if you need to replace the system board.

To remove the processor air duct:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.

3 Lift the processor air duct from the chassis.



Removing the processor air dam

If you are adding a second processor to a single processor system, you need to remove the air dam located on the underside of the processor air duct.

Caution

If you add a second processor to your server, you must remove the processor air dam or the processor may overheat, causing possible data loss and damage to the processor.

To remove the processor air dam:

1 Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

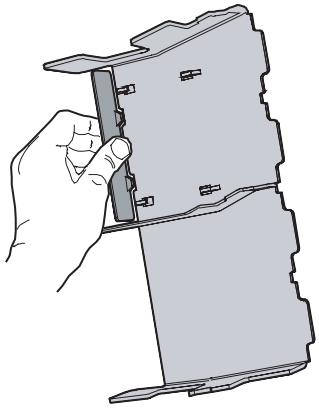
2 Follow the instructions in "Opening the server case" on page 42.

3 Follow the instructions in "Removing the processor air duct" on page 45.

4 Turn the processor air duct over, then remove the air dam from the underside of the air duct.

Important

This procedure requires that the air dam be broken off the air duct. After this is done, the air duct is no longer suitable for use with only a single processor installed.



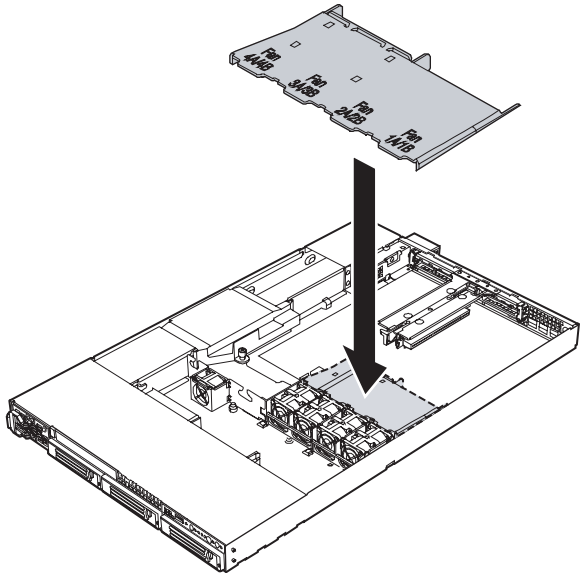
5 Follow the instructions in "Installing the processor air duct" on page 48.

6 Follow the instructions in "Closing the server case" on page 44.

Installing the processor air duct

To install the processor air duct:

1 Place the processor air duct over the processor sockets. The front edge of the air duct should contact the fan module, and the top of the installed air duct should be flush with the top of the fan module.



2 Follow the instructions in "Closing the server case" on page 44.

Removing the power supply air duct

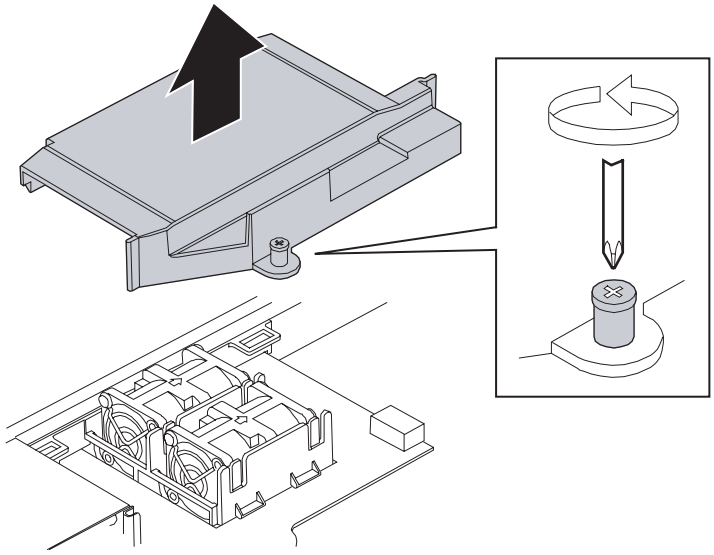
Your server is equipped with a power supply fan module and a power supply air duct to direct the airflow and ensure proper cooling.

Caution

To ensure continued, reliable operation, always operate your server with the appropriate air ducts and air dams in place. Failure to do this could result in equipment damage.

To remove the power supply air duct:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.
3. Move cables out of the way.
4. Unscrew the phillips screw holding the power supply air duct in place.



5. Pull up on the air duct to remove it from the server chassis.

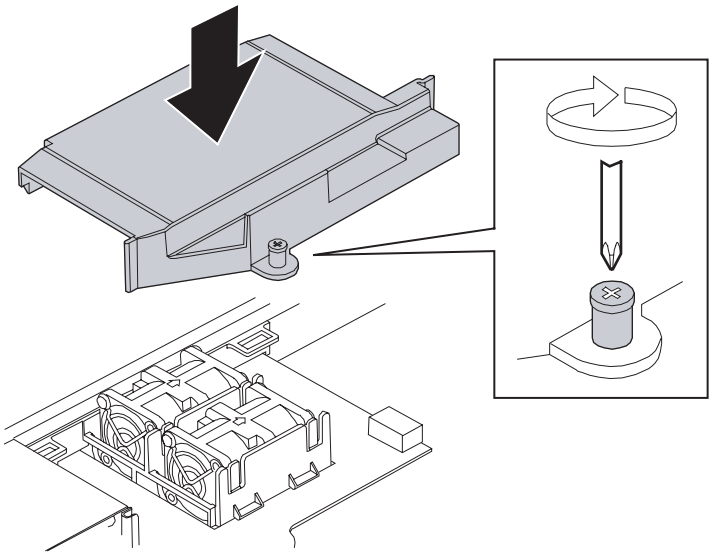
Installing the power supply air duct

Caution

To ensure continued, reliable operation, always operate your server with the appropriate air ducts and air dams in place. Failure to do this could result in equipment damage.

To install the power supply air duct:

1. Place the power supply air duct into the chassis over the power supply fan module and in front of the back power supply (between the power supplies if the second power supply is installed).



2. Tighten the mounting screw to hold the power supply air duct in place.

Caution

Make sure you do not pinch any cables under the air duct as you are reinstalling it. Failure to do this could result in misalignment of the duct and incorrect airflow in the server.

3. Rearrange cables as they were prior to removal of the air duct.
4. Follow the instructions in "Closing the server case" on page 44.

Installing and removing drives

Your server's basic configuration includes one CD or DVD drive and as many as three SCSI hot-swap hard drives. An optional diskette drive can also be added in place of the center hard drive.

As you prepare to install drives, remember:

- If you need to install a diskette drive and a CD or DVD drive is installed in the slim-line drive bay, you must install the diskette drive in a converted hard drive bay.
- Before you install a drive, see the drive's documentation for information on configuring the drive, setting drive jumpers, and attaching cables.
- You may need to configure the drives you install using the BIOS Setup utility. Press **F2** at startup to open the BIOS Setup utility.

Installing a diskette in a converted hard drive bay

If you need to install a slim-line diskette drive into your server, you must install the diskette drive in the center hard drive bay.

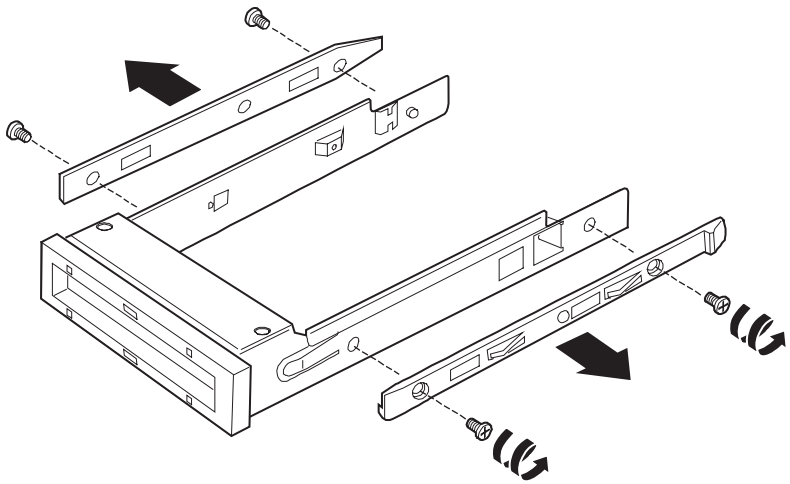
To install a diskette drive in a converted hard drive bay:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

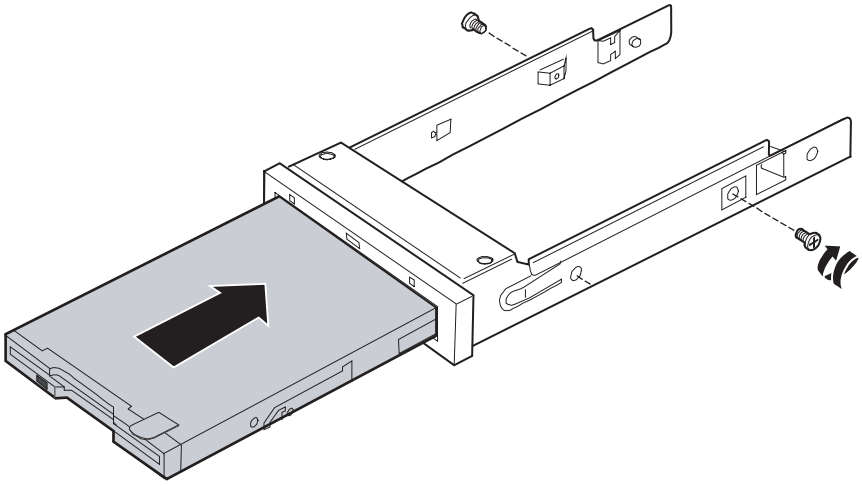
Caution

The diskette drive is not hot-swappable. Before installing or removing the drive, make sure that power is turned off and the power cord is unplugged.

2. Follow the instructions in "Opening the server case" on page 42.
3. Unlock the bezel (if necessary) and remove it by pulling it from the chassis.
4. Remove the center hot-swap hard drive carrier from the server.
5. xxxRemove the rails from the diskette drive conversion kit carrier by removing the four screws that secure the rails to the carrier.

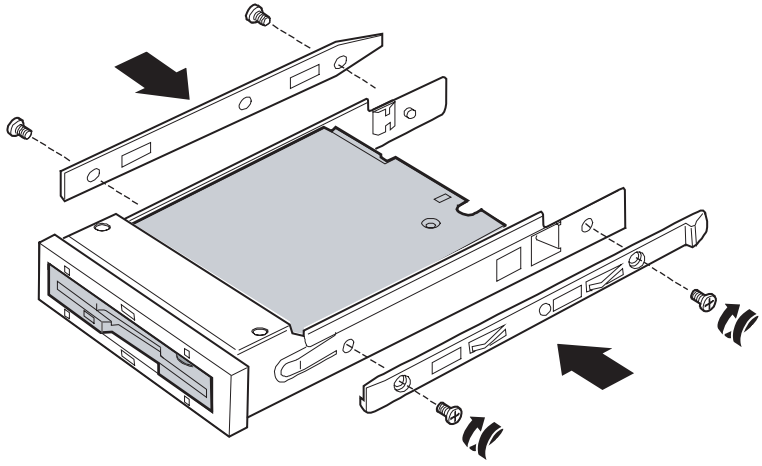


6 Slide the diskette drive into the drive carrier. The back of the drive should go into the carrier first with the bottom of the drive (drivelight down) facing down.

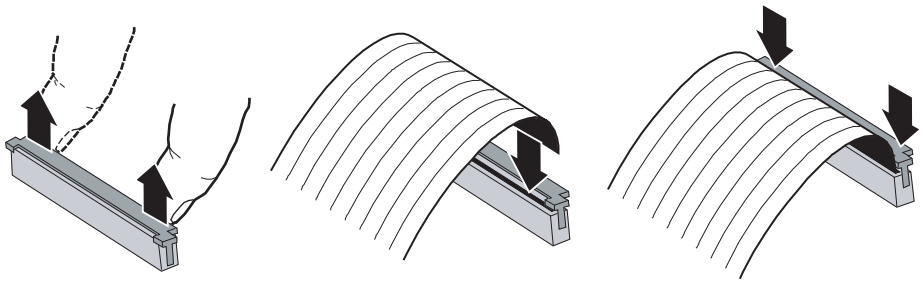


7 Align the holes in the sides of the diskette drive with the holes in the carrier and attach the drive to the carrier with the two screws that came with the diskette drive conversion kit.

8 Reattach the rails to the sides of the carrier with the four screws you previously removed.

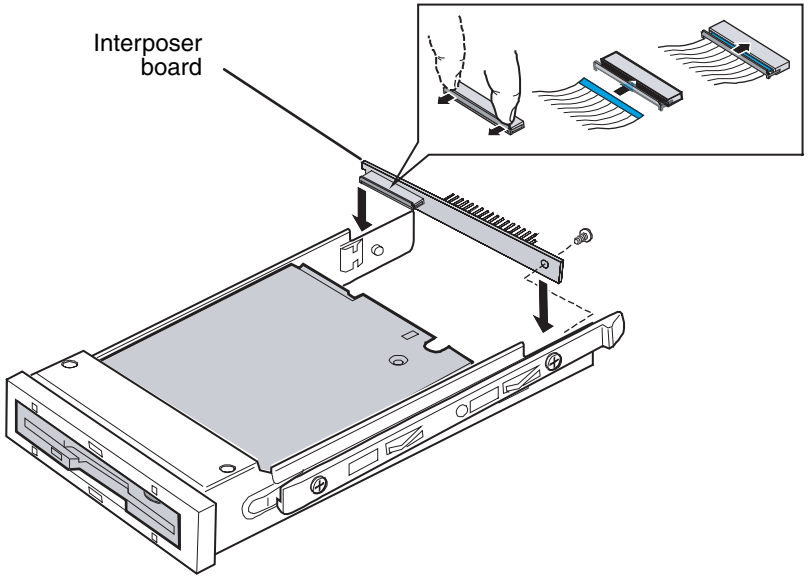


9 Open the connector on the back of the diskette drive by pulling up on the connector cover.



10 Insert one end of the 26-pin diskette drive flat flex cable into the connector, then push down on the connector cover to lock it into place.

11 Install the other end of the flat flex cable to the interposer board included in the diskette drive conversion kit.



12 Install the interposer board on the diskette drive carrier with one screw on the right side.

13 Connect the data and power cables to the interposer board.

14 While guiding the cables, insert the new drive assembly into the center hard drive bay until it clicks into place.

15 Connect the other end of the data cable to the system board. See “System board” on page 6 for the location of the connectors on the system board.

16 Reinstall the bezel, if required, by snapping it into place on the front of the chassis.

17 Follow the instructions in “Closing the server case” on page 44.

18 Reconnect all power cords and peripheral device cables, then turn on the server.

Removing a diskette drive from the converted hard drive bay

To remove a diskette drive from the converted drive bay:

1 Follow the instructions in “Preventing static electricity discharge” on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

Caution

The diskette drive is not hot-swappable. Before installing or removing the drive, make sure that power is turned off and the power cord is unplugged.

2 Follow the instructions in “Opening the server case” on page 42.

3 Unlock the bezel (if necessary) and remove it by pulling it from the chassis.

4 Disconnect the data cable from the system board. See “System board” on page 6 for the location of the connectors on the system board.

5 Disconnect the power cable from the back of the interposer board.

6 Push in on the blue lever at the back of the drive carrier to release the drive carrier from the drive bay, then slide the diskette drive carrier and cables out through the front of the server.

7 Remove the cables from the interposer board.

8 Remove the single screw securing the interposer board to the drive carrier, then remove the interposer board.

9 Remove the four screws securing the rails to the carrier, then remove the rails. (See the illustration on page 52.)

10 Remove the two screws securing the diskette drive in the carrier, then slide the drive out of the carrier.

11 If you are replacing the drive, follow the instructions in "Installing a diskette in a converted hard drive bay" on page 52.

- OR -

Install an empty hard drive carrier into the empty hard drive bay.

12 Reinstall the bezel, if required, by snapping it into place on the front of the chassis.

13 Follow the instructions in "Closing the server case" on page 44.

14 Reconnect all power cords and peripheral device cables, then turn on the server.

Removing a CD or DVD drive

To remove a CD or DVD drive:

1 Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

Caution

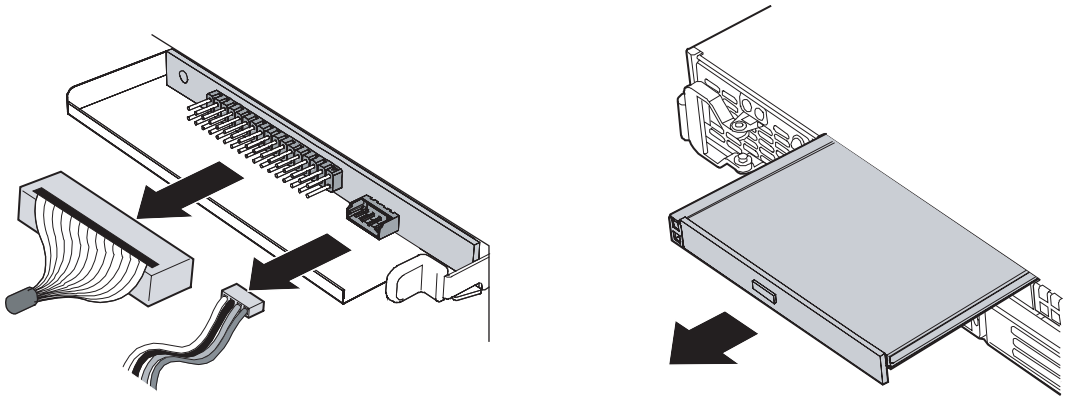
The CD or DVD drive is not hot-swappable. Before installing or removing the drive, make sure that power is turned off and the power cord is unplugged.

2 Unlock the bezel (if necessary) and remove it by pulling it from the chassis.

3 Follow the instructions in "Opening the server case" on page 42.

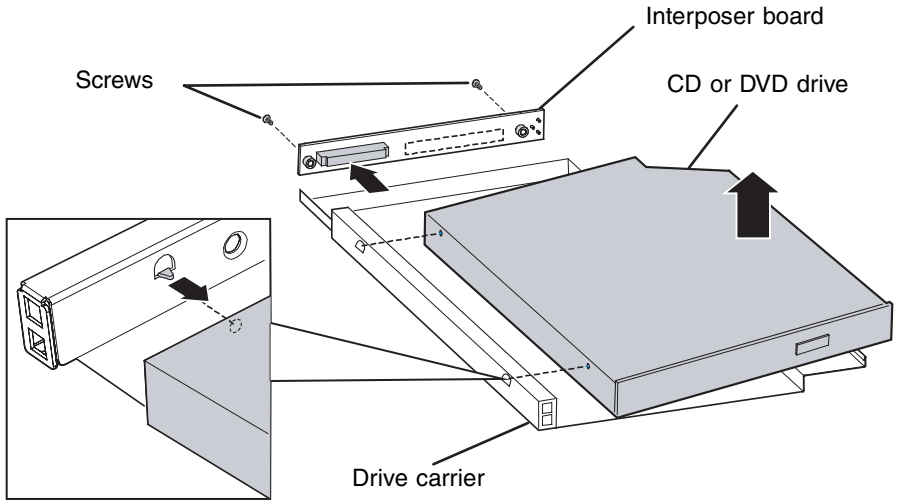
4 Disconnect the 44-pin CD drive cable from the system board. See "System board" on page 6 for the location of the connectors on the system board.

5 Disconnect the data and power cables from the interposer board.



6 Push in on the blue lever at the back of the drive carrier to release the drive carrier from the drive bay, then slide the drive carrier out through the front of the server.

7 Press down on the side of the drive carrier to release the drive from the carrier.



8 Disconnect the 44-pin CD drive cable from the back of the interposer board.

9 Pull up on the top of the connector on the back of the CD or DVD drive and remove the flat flex cable.

10 Remove the four screws securing the rails to the carrier, then remove the rails.

11 Remove the two screws securing the interposer board to the back of the CD or DVD drive, then remove the interposer board.

12 Follow the instructions in "Installing a CD or DVD drive" on page 58.

- OR -

Install a slim-line drive bay filler panel into the empty bay.

13 Reinstall the bezel, if required, by snapping it into place on the front of the chassis.

14 Follow the instructions in "Closing the server case" on page 44.

15 Reconnect all power cords and peripheral device cables, then turn on the server.

Installing a CD or DVD drive

To install a CD or DVD drive:

1 Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

Caution

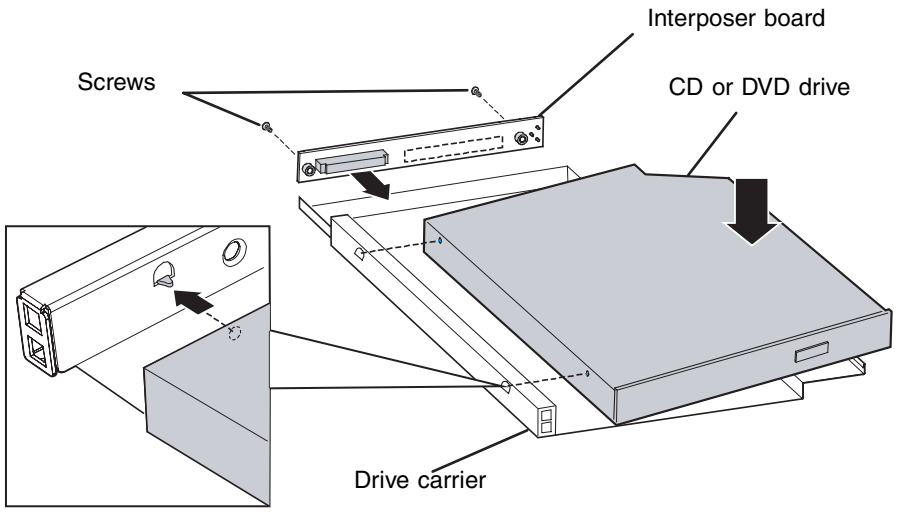
The CD or DVD drive is not hot-swappable. Before installing or removing the drive, make sure that power is turned off and the power cord is unplugged.

2 Follow the instructions in "Opening the server case" on page 42.

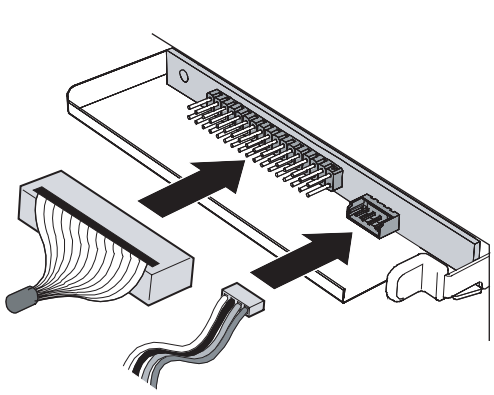
3 Unlock the bezel (if necessary) and remove it by pulling it from the chassis.

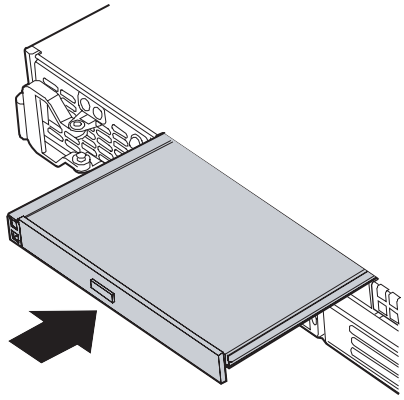
4 Remove the CD/DVD drive carrier by pressing the blue lever at the back of the carrier and pushing the carrier out the front of the server.

5 Place the CD or DVD drive in the drive carrier (included with your server) by aligning the two holes in the left side of the drive with the two alignment pins in the carrier, then lowering the right side of the drive into the carrier until it clicks into place.



6 Align the connector on the interposer board with the connector on the back of the CD or DVD drive, then attach the board to the drive with two screws (included with your server).





7 Attach the 44-pin CD drive cable to the back of the interposer board.

8 Slide the CD or DVD drive assembly into the slim-line bay until it clicks into place.

9 Connect the other end of the 44-pin cable into the connector on the system board. See "System board" on page 6 for the location of the connectors on the system board.

10 Reinstall the bezel, if required, by snapping it into place on the front of the chassis.

11 Follow the instructions in "Closing the server case" on page 44.

12 Reconnect all power cords and peripheral device cables, then turn on the server.

Installing a hard drive

Use this procedure to add or replace a hard drive in a hot-swap bay. Your server supports as many as three 1-inch high, 3.5-inch hot-swap SCSI hard drives. You can purchase additional drives through your Gateway Sales or Customer Care representative.

Important

Gateway tests and verifies the operation and compatibility of the drives it sells. Especially in a hot-swap or mission-critical environment, additional or replacement drives must conform to Gateway standards.

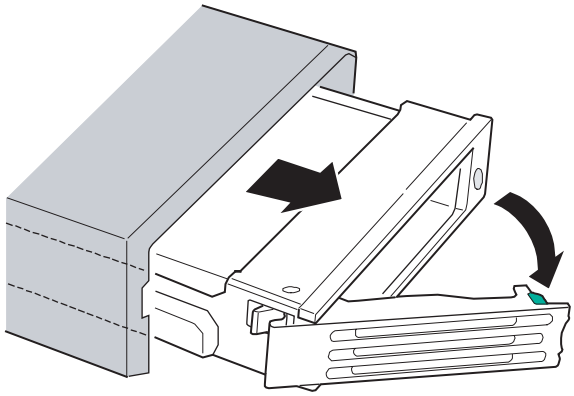
To install a hot-swap hard drive:

1 Unlock the bezel (if necessary) and remove it by pulling it from the chassis.

Caution

Before you remove a failed drive, use the appropriate software and utilities installed on the server to stop all activity on the failed drive. Instructions for using the software are provided by the software manufacturer. Failure to do so may destroy the data on the drive.

2 Press the green release button on the hot-swap tray lever, then swing the lever open all the way.

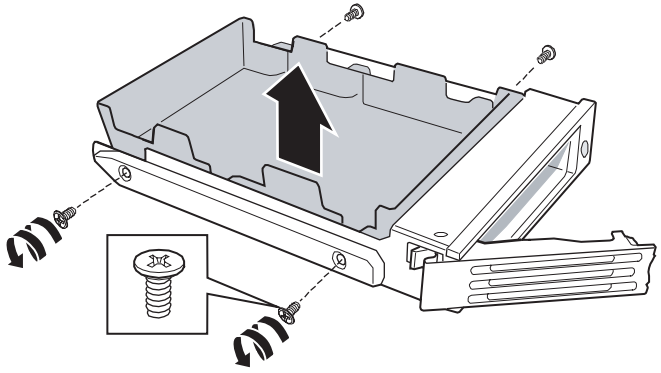


3 Pull the drive carrier straight out of the server.

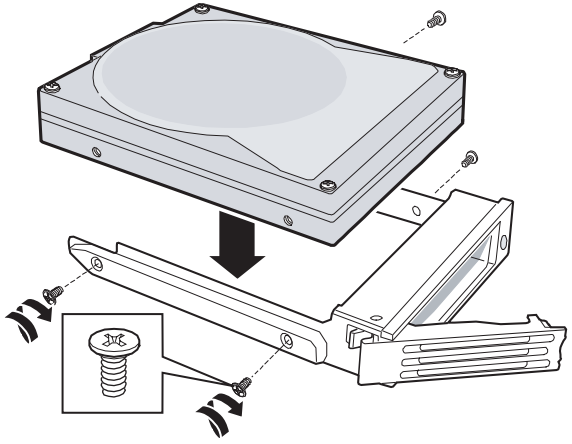
4 If you are replacing a hard drive, remove the four screws that secure the old hard drive to the drive tray, then remove the drive from the tray.

- OR -

If you are adding a new drive, remove the four screws that secure the hard drive spacer to the drive tray, then remove the spacer from the tray.



5 Line up the screw holes in the new drive with the holes in the side of the drive tray, then secure the drive to the tray with the four screws you removed in Step 4.



6 Make sure that the tray's release lever is open, then slide the new drive into the empty hot-swap bay.

7 When the drive carrier lever begins to close by itself, push on the lever to lock the drive assembly into the drive bay.

8 Reinstall the bezel, if required, by snapping it into place on the front of the chassis.

Filling empty drive bays

Empty drive bays in the server must be filled by empty drive carriers or empty drive trays, as appropriate. With the bezel removed, install the appropriate carrier, then replace the bezel by snapping it into place on the front of the server. Empty drive carriers for unused drive bays are included with your server.

Configuring your onboard RAID solutions

Your server comes equipped with an onboard, chipset SCSI RAID solution, which supports RAID levels 0 (striping) and 1 (mirroring). The onboard RAID solutions can be enabled in the BIOS (page 154) and configured by launching the appropriate RAID BIOS console during the boot process.

Level	Description and use	Pros	Cons	Number of drives	Fault Tolerant
0	Data divided into blocks and distributed sequentially (pure striping). Use for non-critical data that requires high performance	High data throughput for large files	No fault tolerance. Data is lost if a drive fails.	One or two	No
1	Data duplicated on another disk (mirroring). Use for read-intensive, fault-tolerant systems.	100 percent data redundancy, providing fault tolerance.	More disk space required. Reduces usable disk space to the size of the smallest drive. Reduced performance during rebuilds.	Two	Yes

Configuring the onboard SCSI RAID solution

To launch the SCSI RAID BIOS console:

1. Restart your server.
2. Press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
3. From the **Main** BIOS menu, select the **Advanced** menu.
4. Select the **PCI Configuration** sub-menu.
5. For the **Onboard SCSI** option, click **Enabled**.
6. Exit the BIOS Setup utility.
7. Restart your server.

During the boot process you will see the following message:

Press <Ctrl>-<C> for BIOS Console

8 Press and hold the CTRL key, then press the C key. The RAID BIOS console will open.

9 Configure the RAID options, then exit the RAID BIOS console.

10 Reboot the server.

Integrated Mirroring configuration

The following must be considered when configuring the onboard SCSI RAID solution for Integrated Mirroring:

- The BIOS-based CU lets you create one mirrored volume per Fusion-MPT controller.
- Disks in an IM volume must be non-removable, single-LUN disks that support 512-byte sectors, wide synchronous transfers, Qtag'd I/Os, and a unit serial number. The disks must support SMART, and they must be minimally compliant with the SCSI-2 standard.
- Disks of different size are allowed in mirrored volumes, but the smallest disk determines the "logical" size of each disk in the volume.
- The excess space of larger member disks is not used.

To configure the onboard SCSI RAID solution for Integrated Mirroring:

1 Open the BIOS Setup utility as described in the previous procedure.

2 On the Main menu screen, use the arrow keys to select an adapter, then press ENTER. The *Adapter Properties* screen opens.

3 Use the arrow keys to select **RAID Properties**, then press ENTER. The *RAID Properties* screen opens.

4 To configure a two-disk mirrored volume, with an optional hot spare disk:

a In the *RAID Properties* screen, use the arrow keys to select the primary disk for the IM volume (the disk with the data you want to mirror).

b Use the arrow keys to move to the **Array Disk** column for this disk, then use the + and - keys to select **Yes** as the value.

c When the **Keep Data/Erase Disk** message appears, press **F3** to keep the data that is currently on this disk. The value in the **Array Disk** column changes to **Primary**.

d Use the arrow keys to select the secondary (mirrored) disk for the IM volume, then select **Yes** as the value for the **Array Disk** column.

If partitions are defined on this disk, a message warns you that data on the disk will be lost when the mirrored volume is created. Press **Delete** to confirm erasing data from the disk, or press any other key to deselect the disk. Continue with Step 5.

5. (Optional) Use the arrow keys to select a hot spare disk for the IM volume. Select **Yes** as the value for the **Hot Spare** column.

6. When you have selected all disks for the IM volume, press ESC and select **Save changes, then exit this menu.** (If you do not want to create the IM volume, select **Discard changes, then exit this menu**.)

   The IM volume exists as soon as you save the changes. The *RAID Properties* screen now displays the IM volume properties and status.

Integrated Striping configuration

The following must be considered when configuring the onboard SCSI RAID solution for Integrated Striping:

- The BIOS-based CU lets you create one Integrated Striped volume per controller.
- An IS volume can have two or three disks.
- Disks in an IS volume must be non-removable, single-LUN disks that support 512-byte sectors, wide synchronous transfers, Qtag'd I/Os, and a unit serial number. The disks must support SMART, and they must be minimally compliant with the SCSI-2 standard.
- Disks of different size are allowed in IS volumes, but the smallest disk determines the "logical" size of each disk in the volume. The excess space of larger member disks is not used.
- Usable disk space for each IS member disk is adjusted down to leave room for Meta data. Usable disk space may be further reduced to maximize the ability to interchange disks in the same size classification.
- The supported stripe size is 64 Kb.

To configure the onboard SCSI RAID solution for Integrated Striping:

1. Open the BIOS Setup utility as described in the previous procedure.
2. On the Main menu screen, use the arrow keys to select an adapter, then press ENTER. The *Adapter Properties* screen opens.
3. Use the arrow keys to select **RAID Properties**, then press ENTER. The *RAID Properties* screen opens.

4 Use the arrow keys to select the first disk for the IS volume, use the arrow keys to move to the **Array Disk** column for this disk, then use the + and - keys to select **Yes** as the value for this column.

If partitions are defined on the selected disk, a message appears warning you that data on the disk will be lost when the striped volume is created. You can then deselect that disk or erase the disk and continue.

5 Repeat the previous step to select as many as two more disks for the striped volume.

If partitions are defined on the selected disks, a message appears warning you that data on the disk will be lost when the striped volume is created. You can then deselect that disk or erase the disk and continue.

6 When you have selected all disks for the IS volume, press Esc and select **Save changes**, then exit this menu. (If you do not want to create the volume, select **Discard changes**, then exit this menu.)

The IS volume exists as soon as you save the changes. The *RAID Properties* screen now displays the IS volume properties and status.

Installing memory

Your server supports from 256 MB to 16 GB of total memory. Supported DIMM sizes include 256 MB, 512 MB, 1 GB, 2 GB, and 4 GB.

Caution

Modules must be installed in banks in identical pairs. Use only DDR2-400 compliant, 240-pin, SDRAM registered ECC, DIMM memory modules.

Memory modules must be installed in pairs to completely fill each bank and the banks must be filled in order. If memory is installed incorrectly, your server will not start.

Caution

When using Dual Rank (double row) DIMMs, a maximum of four loads per memory channel is supported. This means a maximum of four dual rank DIMMs can be populated on this system board.

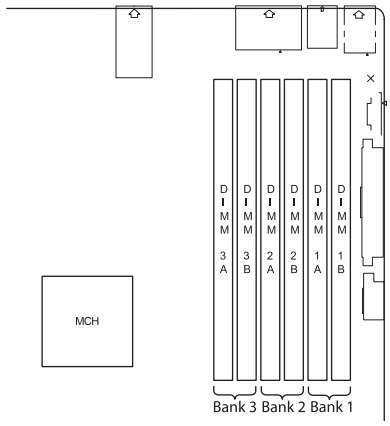
The BIOS configures the memory controller to run in either single channel or dual channel mode, depending on the following:

- If one or more fully populated DIMM banks are detected, the memory controller will run in dual channel mode.
- If only a single DIMM is present, the memory controller will run in single channel mode.

DIMM banks must be populated using the following guidelines:

- DIMM banks must be populated in order, starting with Bank 1.
- Dual rank (double row) DIMMs must be populated before single rank DIMMs.

- A maximum of four DIMMs can be populated when all four DIMMs are dual rank (double row) DIMMs.



Supported DDR2-400 DIMM populations

Bank 1 - DIMMs 1A and 1B	Bank 2 - DIMMs 2A and 2B	Bank 3 - DIMMs 3A and 3B
Single row	Single row	Single row
Single row	Single row	Empty
Single row	Empty	Empty
Double row	Double row	Empty
Double row	Empty	Empty
Double row	Single row	Empty
Double row	Single row	Single row

Memory online sparing

The chipset on the system board in your Gateway server supports memory online sparing, which can provide a way to prevent data loss in case of DIMM failure. Memory online sparing is configured in the BIOS.

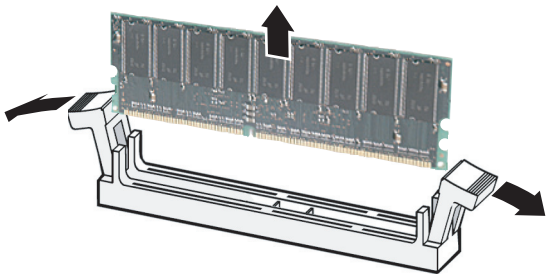
Using memory online sparing, one DIMM per channel (selectable in the BIOS setup utility) is used as a memory spare (the spare DIMM must be equal to, or larger than, the largest DIMM in that channel). If a DIMM begins to fail, the contents of the failing DIMM is copied to the spare DIMM in that channel. When all of the data is copied, the primary DIMM is automatically removed from service. Since one DIMM per channel is always

maintained as a spare, only 75% of the installed memory is usable. For example, if six 1 GB DIMMs are installed, only four are actively used (the other two are used as spares), so the maximum usable memory in this example is 4 GB.

In case of DIMM failure, a DIMM fault LED adjacent to the DIMM slot will light orange to indicate the failed memory module.

To install or replace memory:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.
3. Pull the plastic tabs away from the sides of the memory module slot. If you are replacing a memory module, lift the old module out of the slot.



4. Align the notch on the new module with the notch in the memory module slot and press the module firmly into the slot. The tabs on the sides of the memory slot should secure the memory module automatically.
5. Follow the instructions in "Closing the server case" on page 44.
6. Turn on the server and open the BIOS setup utility. Verify the **System Memory** listed in the Main menu. When you exit the BIOS setup utility make sure that the operating system completely loads. If you receive an error, see "Memory" on page 137.
7. Follow the instructions in "Updating the FRU/SDR" on page 37.

Installing and removing PCI expansion cards

Caution

Always operate your server with the PCI riser assembly in place. The PCI riser assembly is important for correct airflow within the server. Operating the server without the PCI riser assembly in place could result in overheating and possible data loss or equipment damage.

Caution

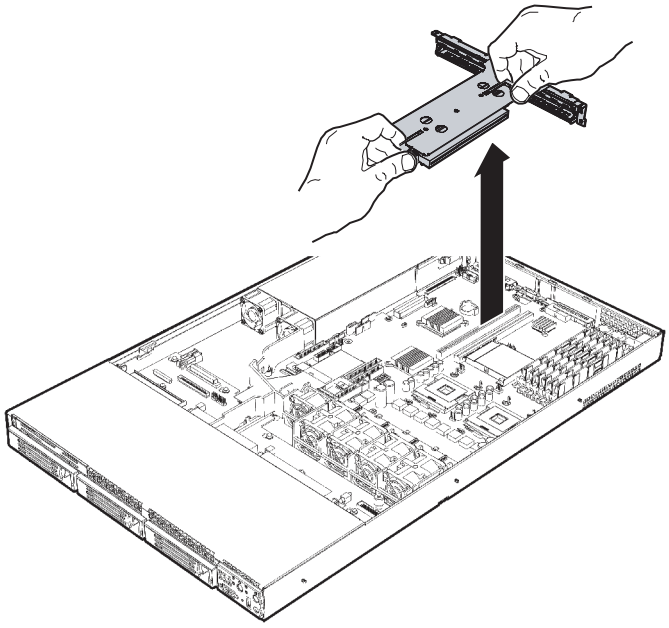
The PCI riser assembly and individual PCI expansion cards are not hot-swappable. Before installing or removing any part of the assembly, make sure that power is turned off and the power cords are unplugged.

Removing and installing the PCI riser assembly

To remove and reinstall the PCI riser assembly:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.
3. If you are replacing a card, disconnect any cables that are attached to the old card.

4 Lift up on the two, blue latches on the PCI riser assembly, then lift the assembly out of the chassis.



5 Place the PCI riser assembly on a stable, static-free surface. If you are removing or installing a PCI expansion card, follow the instructions in "Removing and installing a PCI expansion card" on page 73.

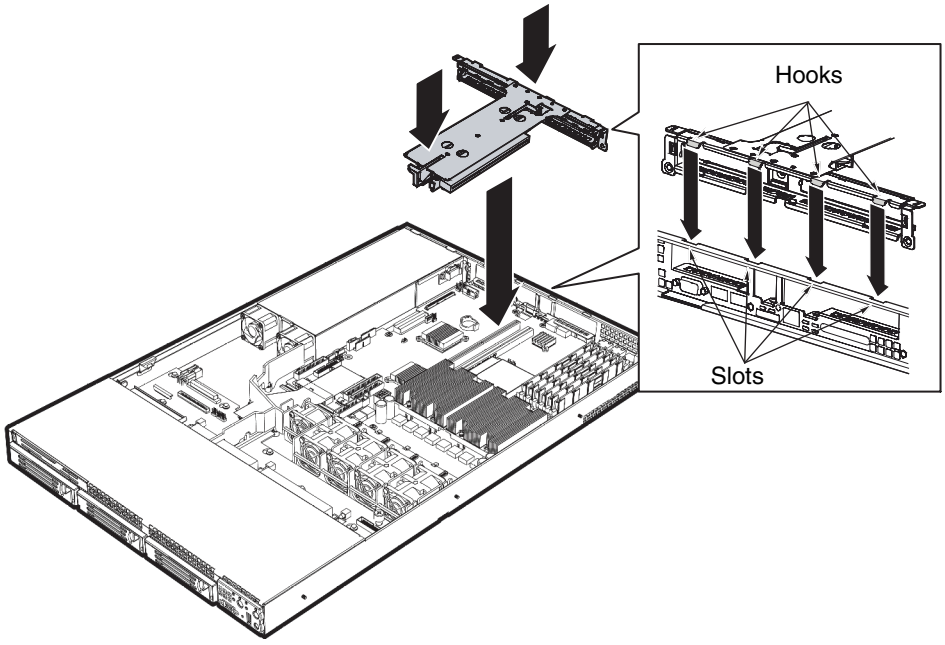
Caution

Do not touch the contacts on the bottom part of the expansion card. Touching the contacts can cause electrostatic damage to the card.

- OR -

If you are installing or replacing the PCI riser connector, follow the instructions in "Removing and installing a PCI riser connector" on page 71.

6 Position the PCI riser assembly over the PCI sockets on the server board, lining up the four hooks at the back of the riser assembly with the four slots in the back of the chassis.



7 Press the PCI riser assembly into the PCI sockets.

8 Follow the instructions in "Closing the server case" on page 44.

9 See the card's documentation for software installation instructions.

Removing and installing a PCI riser connector

Included with your server were two full-height PCI riser connectors, only one of which can be used at a time:

- A full-height PCI-Express riser with one PCI-Express x8 slot
- A full-height PCI-X riser with one PCI-X slot

A full-height PCI riser connector can be replaced if it fails or if you require a different option. The other slot is always a low-profile PCI-X riser.

Important

To eliminate the possibility of installing the replacement connectors on the wrong side of the PCI riser assembly, replace one PCI riser connector at a time.

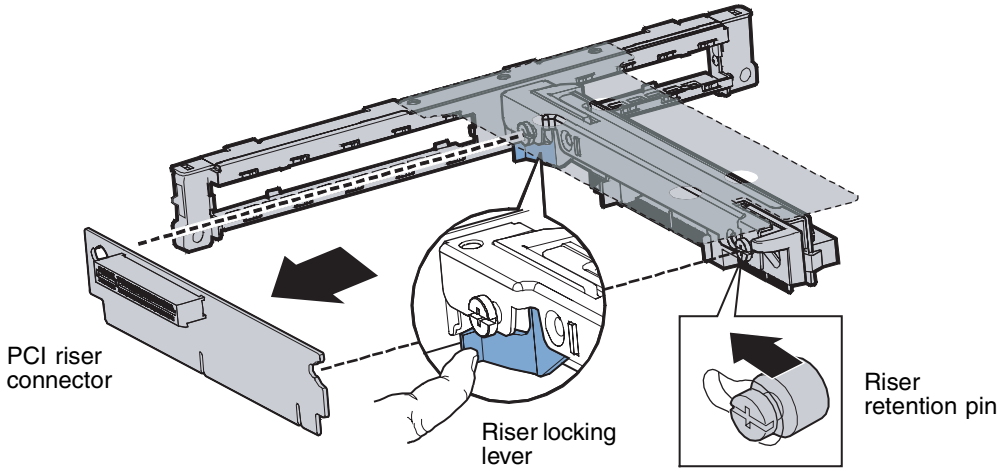
To remove and install a PCI riser connector:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.
3. Remove the PCI riser assembly from the server by following the instructions in "Removing and installing the PCI riser assembly" on page 69.
4. Remove any installed PCI expansion cards by following the instructions in "Removing and installing a PCI expansion card" on page 73.

Caution

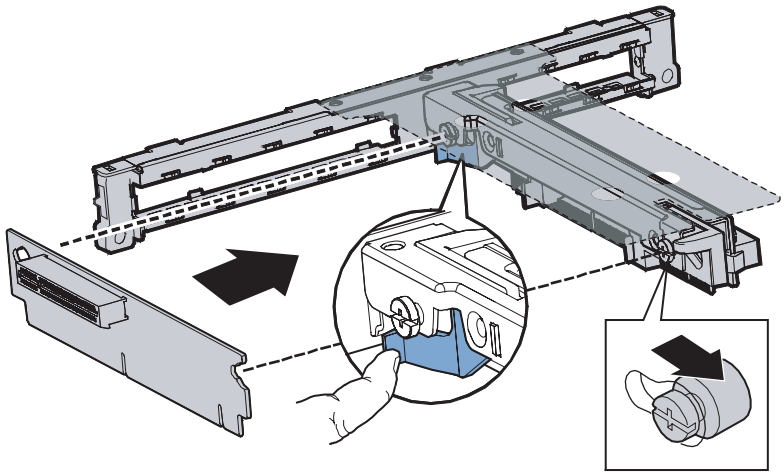
Do not touch the contacts on the bottom part of the expansion card. Touching the contacts can cause electrostatic damage to the card.

5. Push back on the blue riser locking lever at the end of the PCI riser connector.



6. While holding the lever in, push firmly on the other edge of the PCI riser connector to disengage the connector from the riser retention pins.
7. Place the PCI riser connector in a static-free bag to store it for future use.

8 Line up the screws on the riser assembly with the slot and large hole in the replacement PCI riser connector.



9 Press and hold the blue riser locking lever, then place the PCI riser connector onto the retention pins.

10 Slide the PCI riser connector toward the right to lock it into place, then release the blue lever.

11 Follow the instructions in "Removing and installing a PCI expansion card" on page 73.

12 Replace the PCI riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.

13 Follow the instructions in "Closing the server case" on page 44.

14 See the card's documentation for software installation instructions.

Removing and installing a PCI expansion card

To remove and install a PCI expansion card:

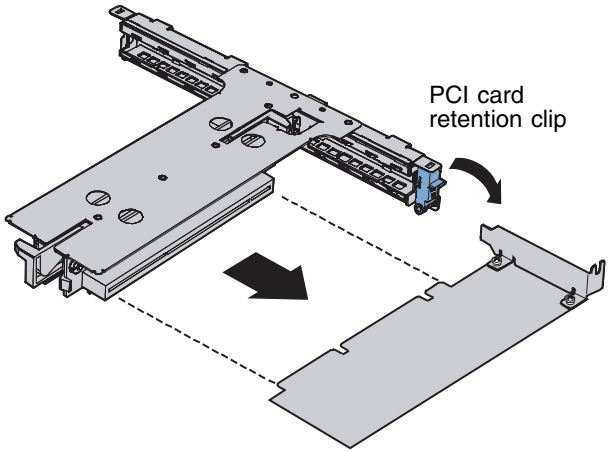
1 Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

2 Follow the instructions in "Opening the server case" on page 42.

3 Disconnect any cables that are attached to the card you are removing.

4 Remove the PCI riser assembly from the server by following the instructions in "Removing and installing the PCI riser assembly" on page 69.

5 Open the PCI retention clip on the PCI riser card assembly.



6 Remove the PCI expansion card and place it in a static-free bag for storage. You can gently rock the card end-to-end to loosen and remove the card (do not bend the card sideways), then proceed to Step 7.

Caution

Do not touch the contacts on the bottom part of the expansion card. Touching the contacts can cause electrostatic damage to the card.

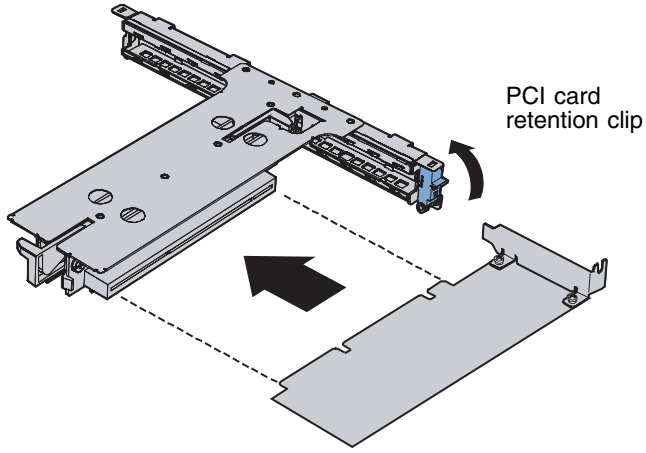
- OR -

If you need to change out the PCI riser connector, follow the instructions in "Removing and installing a PCI riser connector" on page 71.

7 Insert the PCI expansion card into the card slot, pressing on it with firm, even pressure until it seats completely. Make sure that the bracket inserts into the matching slot. If you are installing a card for the first time, first remove the EMI filler panel at the back of the PCI riser assembly for the card you are installing.

Important

If you are installing a low-profile PCI expansion card in the full-height slot, make sure that the card is equipped with a standard, full-height PCI mounting bracket.



8 Close the PCI card retention clip.

9 Connect any required cables to the card by following the instructions in the card's documentation.

10 Install the PCI riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.

11 Follow the instructions in "Closing the server case" on page 44.

12 See the card's documentation for software installation procedures.

Replacing fans and fan modules

Your server comes equipped with several cooling fans and fan modules designed to provide sufficient airflow to keep your server running without overheating. These include:

- A system fan module with four, dual-rotor multi-speed fans to cool the processors, the memory, and the second and third hard drive bays (redundant when running low voltage processors).
- A single-rotor system fan to cool components in the full-height PCI zone, the power distribution board and the first hard drive bay.
- Two dual-rotor power supply fans to cool the power supply modules (redundant in the 1+1 power supply configuration)

Caution

System fans are not hot-swappable. Before removing or replacing a fan, you must first turn off the server and all peripheral devices attached to the server, and remove the AC power cord(s) from the power supply or wall outlet.

System fans

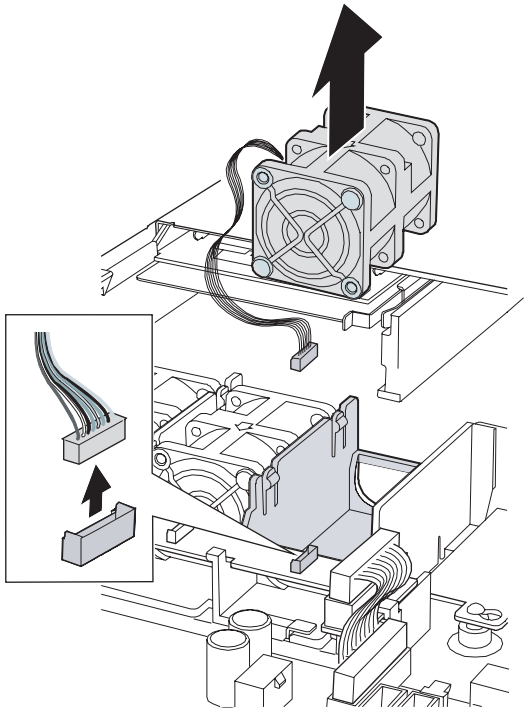
System fans are monitored by the Gateway Server Manager (*GSM*), the mini-Baseboard Management Controller (*BMC*), and the Intel Management Module (*IMM*). All three reporting entities use a different numbering system to flag individual fans for attention.

Individual system fan module fan numbers are indicated on the top of the processor air duct. The first number in the pair is for the fan closest to the front of the server.

Processor fan duct number	GSM	Mini-BMC System Event Log	IMM System Event Log
1A	1A	1B	40
1B	1B	1C	41
2A	2A	1F	44
2B	2B	20	45
3A	3A	21	46
3B	3B	22	47
4A	4A	1D	42
4B	4B	1E	43
(none)	PCI Fan	23	48

To replace a fan in the fan module:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.
3. Follow the instructions in "Removing the processor air duct" on page 45.
4. Trace the cable from the failed fan to the connector on the fan distribution board, then disconnect the cable.



5. Lift the fan from the fan module in the chassis.
6. Insert the replacement fan into the fan module.

Important

Make sure that the arrows on top of the fans indicating airflow point to the back of the chassis. The fan cable should exit the fan mudule toward the back of the chassis.

7. Connect the fan cable to the connector on the fan distribution board.

8 Follow the instructions in "Installing the processor air duct" on page 48..

9 Follow the instructions in "Closing the server case" on page 44.

Caution

System fans are not hot-swappable. Before removing or replacing a fan, you must first turn off the server and all peripheral devices attached to the server, and remove the AC power cord(s) from the power supply or wall outlet.

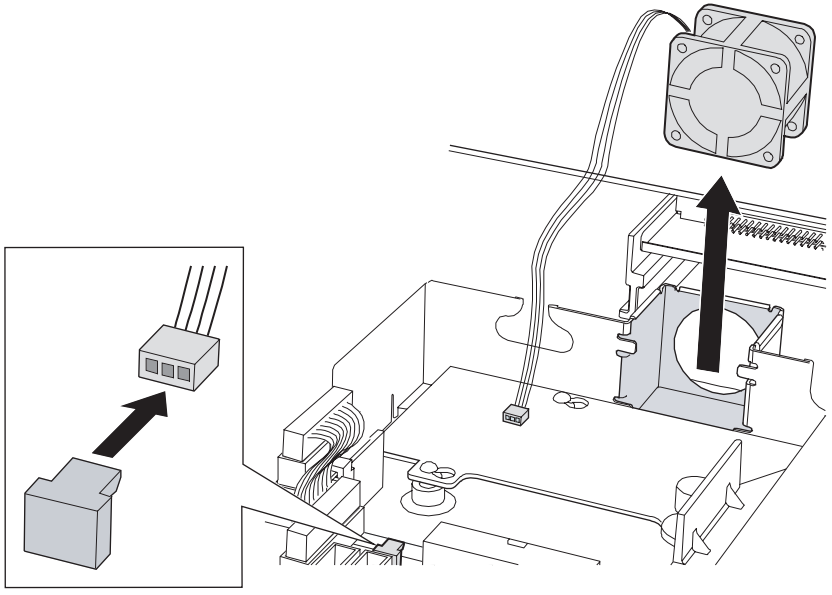
To replace the system (PCI) fan:

1 Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

2 Follow the instructions in "Opening the server case" on page 42.

3 Disconnect the fan cable from the connector on the power distribution board.

4 Lift the failed fan from the fan bracket.



5 Insert the replacement fan into the fan bracket.

Important

Make sure the arrow on top of the fan indicating airflow points to the back of the chassis. The fan cable should exit the fan mudule toward the back of the chassis.

6 Connect the fan cable to the connector on the power distribution board.

7 Follow the instructions in "Closing the server case" on page 44.

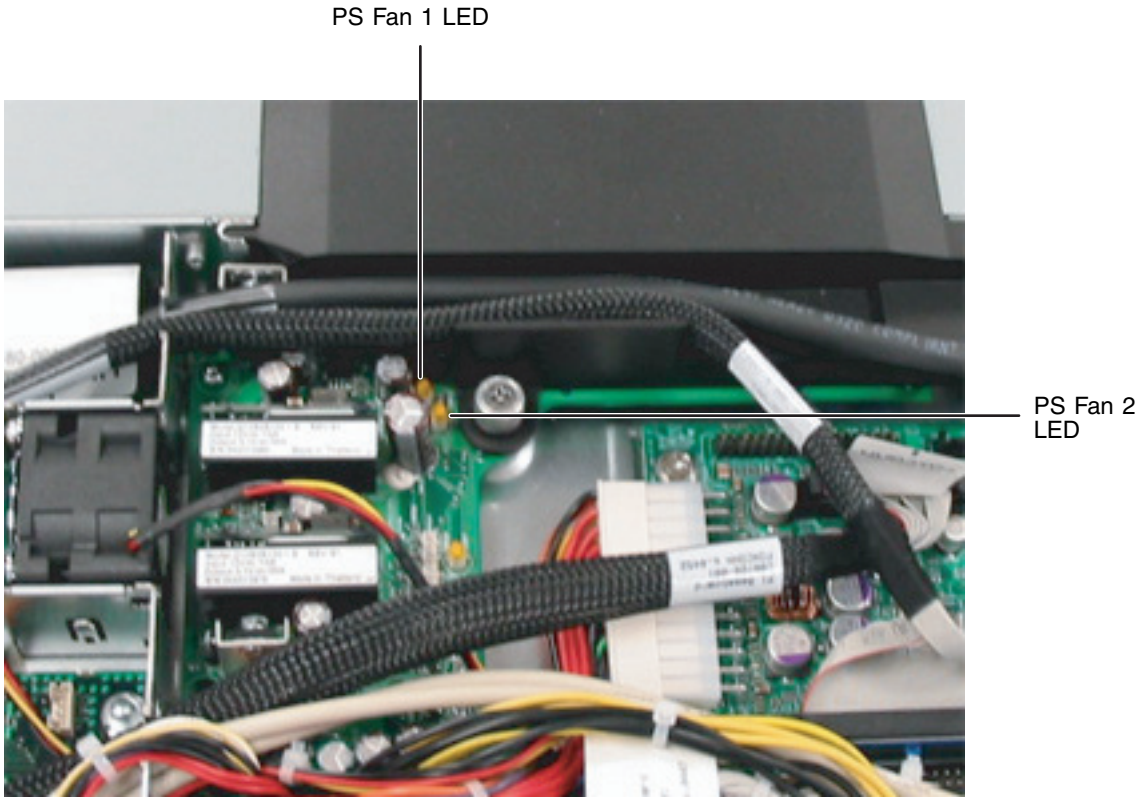
Caution

System fans are not hot-swappable. Before removing or replacing a fan, you must first turn off the server and all peripheral devices attached to the server, and remove the AC power cord(s) from the power supply or wall outlet.

Power supply fans

Power supply fans are monitored and controlled by the power subsystem. A fan failure (predicted or current) will show up in the IMM System Event Log (*SEL*) as a "Power Unit 0x01h" failure event and a GSM event will show up as "Power Unit Failure Detected." Power supply fans are not monitored by the mini-BMC, therefore no SEL or GSM events will be reported with the mini-BMC configuration.

When a predicted or current fan failure is reported, the server must be opened to determine which fan is having problems. LEDs on the power distribution board will indicate which fan requires attention. The appropriate LED will blink to indicate a slow fan and light to show a failed fan. The PS Fan 1 is on the left side of the module.

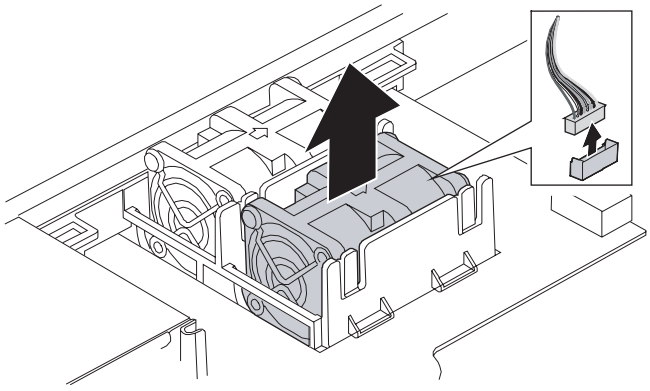


To replace a power supply fan:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.

3 Follow the instructions in “Removing the power supply air duct” on page 49.

4 Disconnect the fan cable from the connector on the power distribution board.



5 Lift the fan from the power supply fan module assembly in the chassis.

6 Insert the replacement fan into the power supply fan module assembly.

Important

Make sure the arrows on top of the fans indicating airflow point to the back of the chassis.The fan cable should exit the fan mudule toward the back of the chassis.

7 Connect the fan cable to the connector on the power distribution board.

8 Follow the instructions in “Installing the power supply air duct” on page 50..

9 Follow the instructions in “Closing the server case” on page 44.

Installing a processor

The server is compatible with Intel® Xeon processors with an 800 MHz front side bus speed and a processor speed of 2.8 MHz or faster. The server automatically detects the processors each time you turn on the server. Whenever you install new processors, you should first install the most current version of the BIOS. For instructions, see "Updating the BIOS" on page 109.

Warning

Processors and heat sinks may be hot if the computer has been running. Before replacing a processor or heat sink, allow them to cool for several minutes.

Caution

A heat sink must be installed on the processor. Installing a processor without a heat sink could damage the processor.

Important

You must have a processor in the Processor 1 socket, or your server will not start.

If you are upgrading your server from one processor to two, you may need to reconfigure your operating system so it can recognize the additional processor. For instructions, see your operating system's documentation.

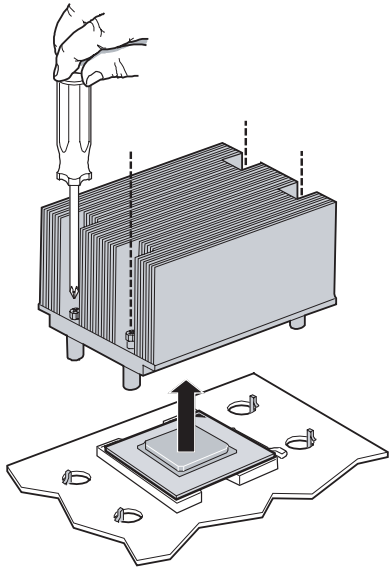
Important

If you install two processors onto the system board, the processors must be the same speeds, revision, core voltage, and bus speed.

To replace a processor:

1. Install the most current BIOS version. For instructions, see "Updating the BIOS" on page 109.
2. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
3. Follow the instructions in "Opening the server case" on page 42.
4. Follow the instructions in "Removing the processor air duct" on page 45.

5 Loosen the four captive screws (one on each corner of the heatsink).

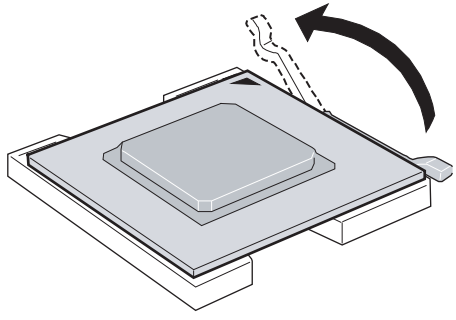


6 Remove the heat sink. If the heatsink sticks to the processor, rotate the heatsink slightly to loosen it.

Caution

The heat sink has Thermal Interface Material (TIM) on the bottom. Be careful not to damage this material when you remove the heat sink from the processor. If removing the heat sink also pulls the processor out of the processor socket, the processor could be damaged.

7 Rotate the processor release lever a full 135° to release the processor, then lift the processor out of the socket.



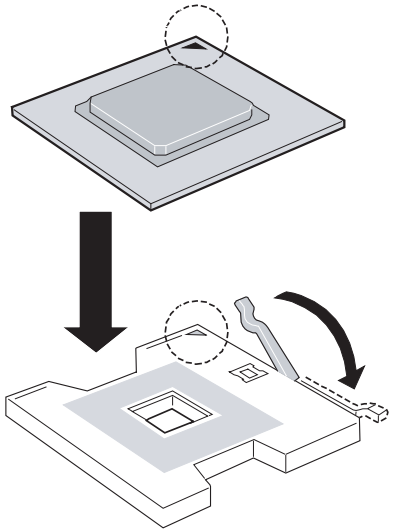
8 If you are installing a second processor in your server, follow the instructions in "Removing the processor air dam" on page 46 to remove the processor air dam in the processor air duct.

Caution

If you add a second processor to your server, you must remove the processor air dam or the processor may overheat, causing possible data loss and damage to the processor.

9 Before inserting the processor into the socket, make sure that:

- The processor release lever is open all the way (135° from the closed position)
- The triangular arrow on the corner of the processor aligns with the triangular icon on the corner of the processor socket

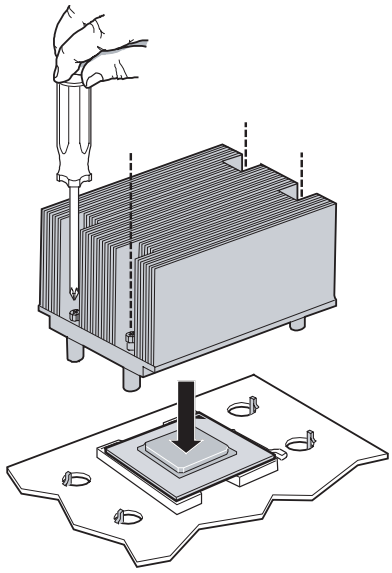


10 Install the new processor into the processor socket, then press the processor locking lever down until it lays flat against the processor socket.

11 Place the heat sink over the processor, lining up the four captive screws with the four posts surrounding the processor.

Caution

The heat sink has Thermal Interface Material (TIM) located on the bottom of it. Use caution when you unpack the heat sink so you do not damage the TIM.



12 Loosely screw in the captive screws on the corners of the heat sink, gently tightening diagonal screws (screw in one screw, then the screw located diagonally to the first screw). Do not fully tighten one screw before tightening another.

13 Gradually and equally tighten each captive screw until each is firmly tightened. Do not over-tighten the screws.

14 Follow the instructions in "Installing the processor air duct" on page 48.

15 Follow the instructions in "Closing the server case" on page 44.

Installing an Intel Management Module (IMM)

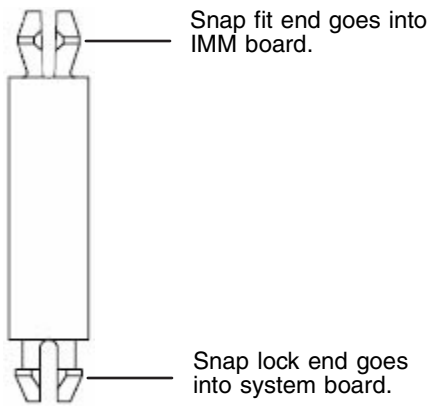
The optional Intel Management Module (IMM) provides enhanced levels of server functionality over the standard baseboard management controller (BMC). Several additional features become available with the IMM installed, including memory mirroring and sparing, redundant hot-swap chassis fans, and the local control panel (LCP).

To install an Intel Management Module (IMM):

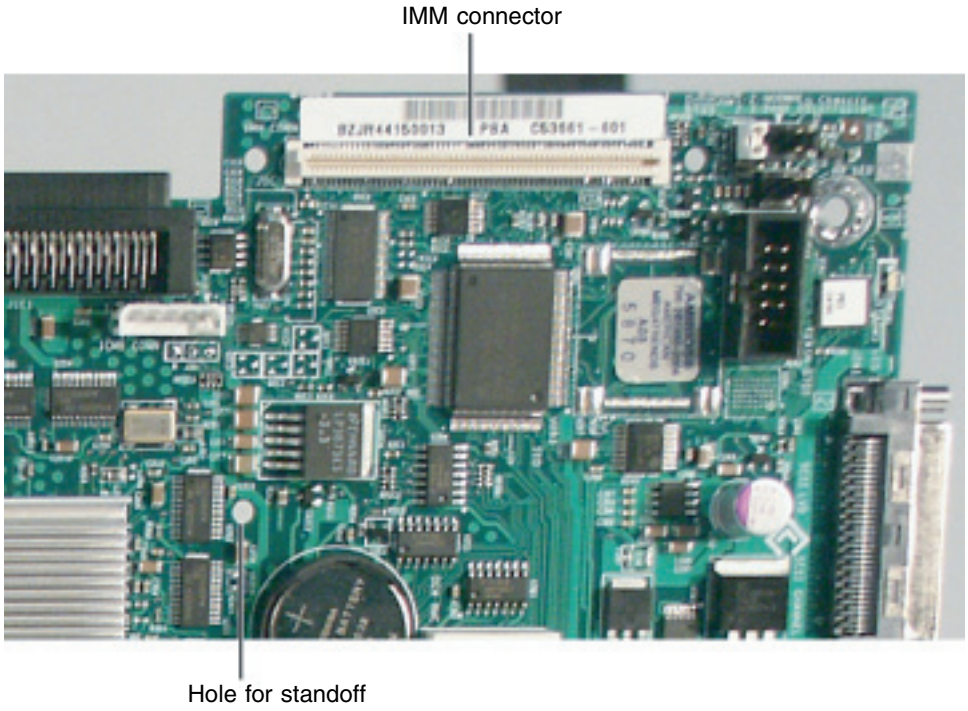
1. If Gateway Server Manager (GSM) software is installed in your server, uninstall it prior to installing the IMM module.
2. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
3. Follow the instructions in "Opening the server case" on page 42.
4. Remove the riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.
5. Install the nylon standoff into the corner hole in the IMM module board which corresponds to one of the holes in the system board (see the illustration on page 87).

Important

The snap fit end of the standoff goes into the hole in the IMM module board. The snap lock end of the standoff goes into the hole in the system board.



6 Find the IMM connector on the left back portion of the system board.



7 Grasp the module by the edges, close to the mounting connector, align the module with the IMM connector on the system board, then gently apply pressure to seat the module.

Caution

Exercise extreme caution when installing the IMM module. The module is fragile and can be damaged easily.

Make sure the module is fully seated and the nylon standoff is inserted into the corresponding hole in the system board.

8 Replace the riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.

9 Follow the instructions in "Closing the server case" on page 44.

10 Following the installation of a new IMM module, reinstall the GSM software (supplied on a CD with your server) and update the FRU/SDR (see "Updating the FRU/SDR" on page 37). When you subsequently reboot your server, the GSM software will take over management of the server.

Replacing a power supply module

Your server uses as many as two 520 W hot-swappable power supply modules. If your server has both power supply modules installed, the modules act as redundant, hot-swappable power supplies. If one of the two power supplies fails, the other power supply supports the server while you replace the failed power supply. You do not need to turn off the server or disconnect peripheral devices to replace a failed redundant power supply.

If your server is only equipped with a single power supply, the server must be turned off and the AC power cord removed before replacing it.

Caution

The power supplies in this server contain no user-serviceable parts. Only a qualified computer technician should service the power supplies.

Your server comes with 3-wire AC power cords fitted with the correct plug style for your region. If this plug does not match the connector on your surge protector, UPS, or wall outlet, do not attempt to modify the plug in any way. Use a surge protector, UPS, or wall outlet that is appropriate for the supplied AC power cords.

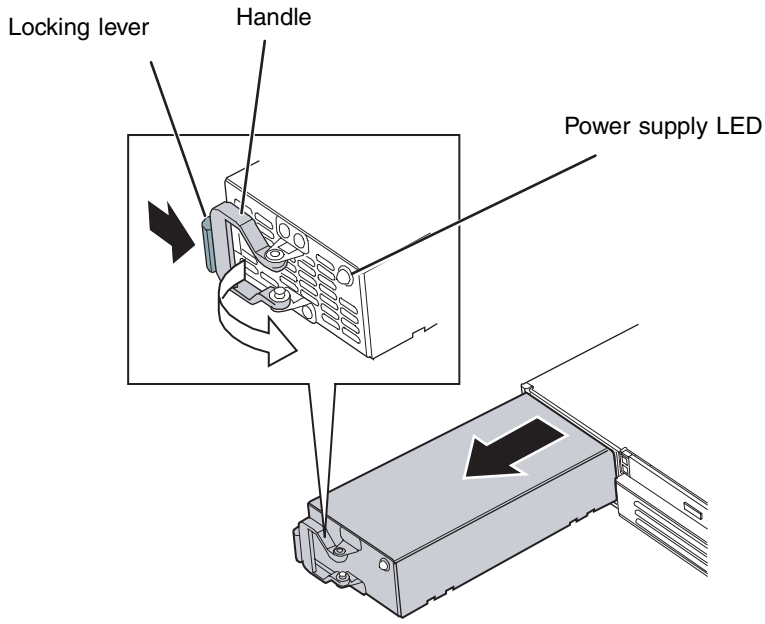
To replace a power supply module:

1. If your server is equipped with more than one power supply module, determine which power supply module has failed (the LED on the power supply will be orange).
2. If your server has only one power supply module installed, disconnect the AC power cord before continuing.

   - OR -

   If your server has two power supply modules installed, you do not need to turn off the power to the server before continuing.

3 Fold out the handle and push the green locking lever to the right to release the power supply module from the chassis (front or back, whichever is applicable).



4 Pull the power supply module straight out of the server with the handle.

5 Insert the new power supply module into the server, with the green locking lever to the left, until it locks into place, then fold the handle flat.

6 Reconnect the AC power cord for the new power supply module.

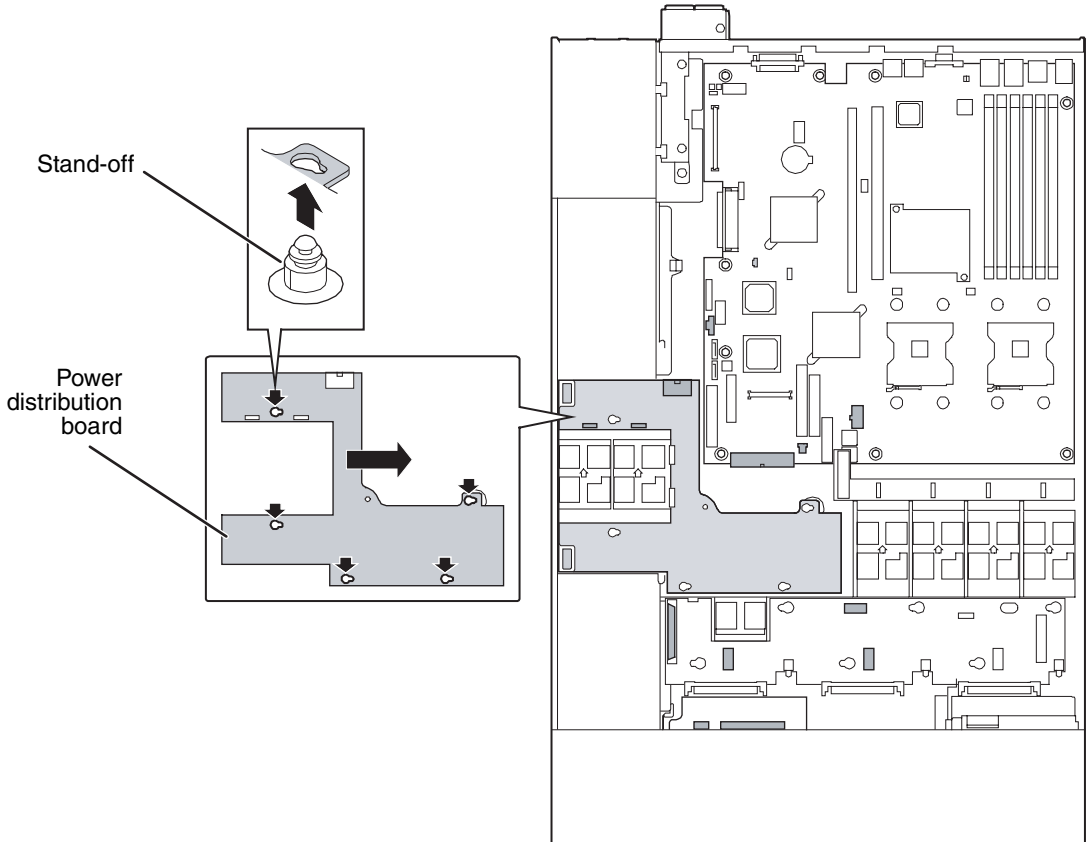
7 If you added a redundant power supply module, see "Updating the FRU/SDR" on page 37.

Replacing the power distribution board

To replace the power distribution board:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.
3. Follow the instructions in "Removing the power supply air duct" on page 49.
4. Remove the power supply modules by following the instructions in "Replacing a power supply module" on page 88.
5. Disconnect the main power, CPU power, and power signal cables from the system board. See "System board" on page 6 for the location of the connectors on the system board.
6. Disconnect the PCI fan from the power distribution board.
7. Disconnect the power cables from the power distribution board and the hot-swap backplane.
8. Disconnect the drive cables and drive power cables from the backplane.

9 Slide the power distribution board to the right to release it from the stand-offs, then lift it out of the chassis.



10 Align the new power distribution board with the stand-offs on the chassis, then place it on the stand-offs and slide it to the left until it is firmly mounted.

11 Reconnect the main power, CPU power, and power signal cables from the power distribution board to the system board. See "System board" on page 6 for the location of the connectors on the system board.

12 Reconnect the PCI fan to the power distribution board.

13 Reconnect the power cables to the power distribution board and the hot-swap backplane.

14 Reconnect the drive cables and drive power cables to the hot-swap backplane.

15 Reinstall the power supply modules by following the instructions in "Replacing a power supply module" on page 88.

16 Reinstall the power supply air duct by following the instructions in “Installing the power supply air duct” on page 50.

17 Follow the instructions in “Closing the server case” on page 44.

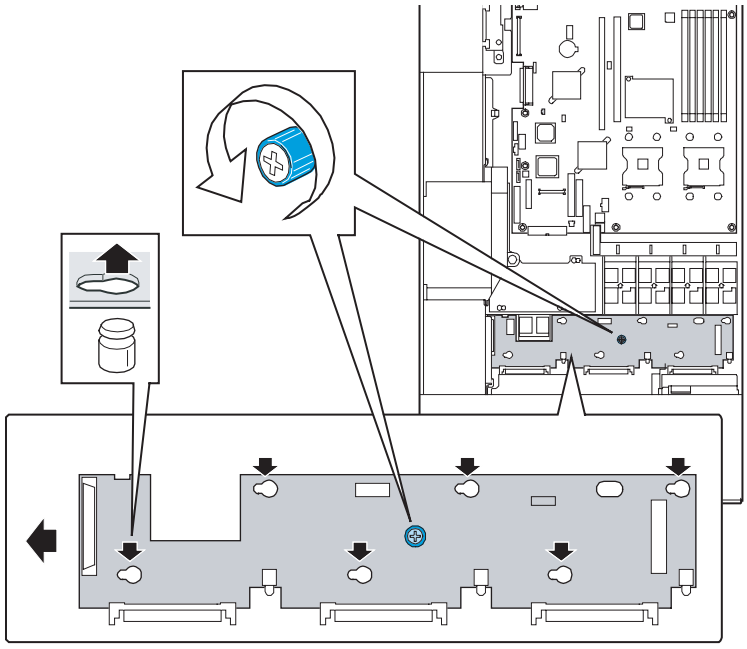
Replacing the hot-swap backplane

Caution

The hot-swap backplane is not hot-swappable. Before removing or replacing the backplane, you must first turn off the server and all peripheral devices attached to the server, and remove the AC power cord(s) from the power supply or wall outlet.

To replace the hot-swap backplane:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Unlock the bezel (if necessary) and remove it by pulling it straight off the front of the server.
3. Follow the instructions in "Opening the server case" on page 42.
4. Remove all of the hot-swap drive carriers from the server and make note of which bay you remove each drive from. For instructions, see "Installing a hard drive" on page 60.
5. Disconnect all cables from the backplane.
6. Loosen the blue captive thumbscrew in the middle of the backplane.



7 Slide the backplane to the left until it stops.

8 Holding the backplane by the edges only, lift it from the chassis.

Caution

Pressing or pulling on any components on the backplane could result in damage to the backplane.

9 Place the backplane in a static-free bag to store it for future use.

10 Holding the new backplane by the edges only, align it with the stand-offs on the chassis, then place it on the stand-offs and slide it to the right until it stops.

Caution

Pressing or pulling on any components on the backplane could result in damage to the backplane.

Caution

Make sure you do not pinch, bind, or damage any cables as you install the backplane.

11 Tighten the blue captive thumbscrew in the center of the backplane.

12 Reconnect all cables to the backplane.

13 Follow the instructions in "Closing the server case" on page 44.

14 Reinstall the hot-swap drives back into the server. Make sure that you install the drives into the same bays you removed them from in Step 4. For instructions see "Installing a hard drive" on page 60.

15 Replace the bezel by snapping it into place on the front of the server.

Replacing the CMOS battery

If the server clock does not keep time or the settings in the BIOS Setup utility are not saved when you turn off the server, replace the CMOS battery with an equivalent battery.

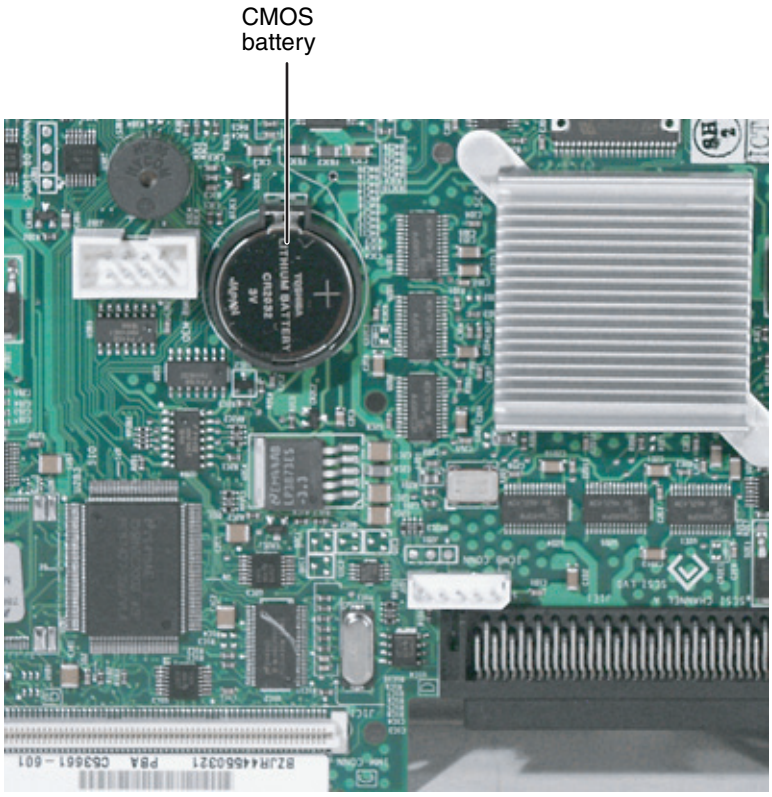
Warning

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of or recycle used batteries by taking them to a hazardous waste facility. Follow all local regulations for correct battery disposal.

To replace the battery:

1. Print the appendix for BIOS Settings in this guide.
2. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
3. Record the BIOS settings on your printout, then close the utility.
4. Turn off your server, then follow the instructions in "Preventing static electricity discharge" on page 41.
5. Follow the instructions in "Opening the server case" on page 42.
6. Remove the PCI riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.

7 Locate the old battery on the system board and note its orientation. You will need to install the new battery the same way.



8 Push the battery retention clip away from the battery until the battery lifts up, then remove the old battery. You can use a screwdriver to help lift the battery.

9 Make sure that the positive (+) side of the new battery is facing up, then press the new battery into the socket until it snaps into place.

10 Replace the PCI riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.

11 Follow the instructions in "Closing the server case" on page 44.

12 Turn on your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.

13 Restore any BIOS settings that you wrote down in Step 3.

14 Save all your settings and close the BIOS Setup utility.

Replacing the control panel module

The steps for replacing the standard control panel module and the optional local control panel (LCP) module, are almost identical and are described in the following steps. Differences in the procedure, where they exist, are noted.

Caution

Your server must be operated with a control panel module in place.

Important

Correct operation of the optional LCP control panel module requires the optional IMM module. For additional information, see "Installing an Intel Management Module (IMM)" on page 86.

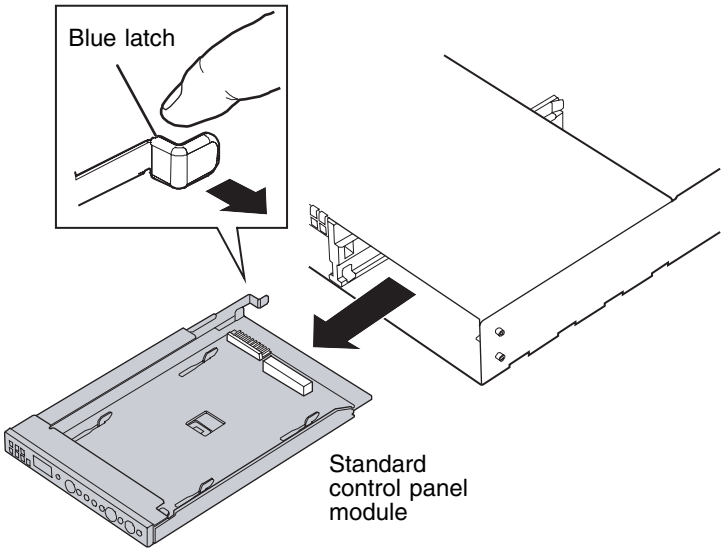
Important

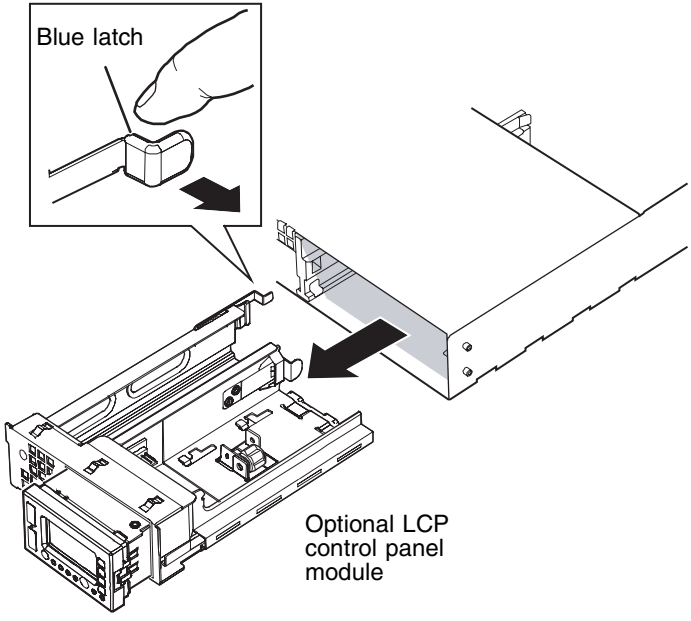
Installation of the optional LCP control panel module requires the removal of the right hot-swap hard drive.

To remove the control panel module:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.
3. Unlock the bezel (if necessary) and remove it by pulling it straight out from the front of the chassis.
4. Disconnect the front panel cable from the backplane.

5 Press the blue latch at the back of the control panel module, then slide the module out of the chassis enough to reach the USB cable.





6 Disconnect the USB connector from the control panel module, then slide the module forward and remove it from the chassis.

Caution

The USB header has a latch to hold the connector on. Be careful to unlatch the USB connector when removing it from the control panel or you could damage the connector or the header.

Important

The position of the USB connector is different in the standard control panel than in the optional local control panel. Note the positions of the cable connectors as you remove them from the module.

7 Disconnect the front panel cable from the control panel module.

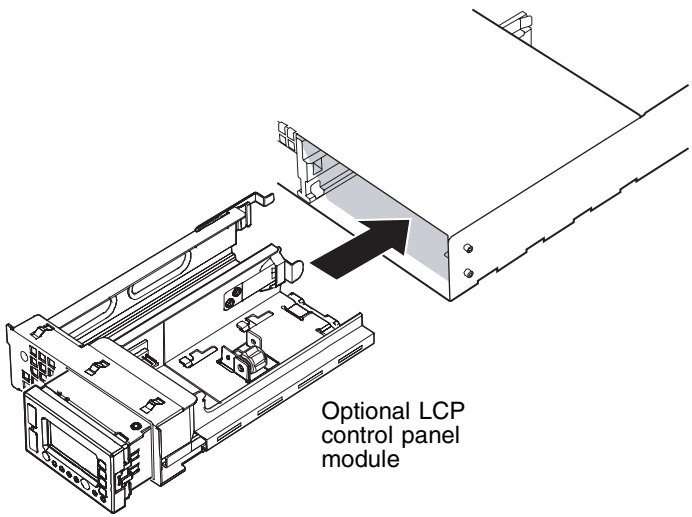
To install the control panel module:

Important

Replacing the standard control panel module with the optional LCP control panel module requires the removal of the right hot-swap hard drive.

1 Connect the front panel cable to the new control panel module.

2 Guide the front panel cable into the control panel opening in the chassis, then slide the new control panel module into the chassis far enough to let you connect the USB cable.



3 Connect the USB cable to the control panel module, then slide the module into the chassis until it clicks into place.

4 Connect the front panel cable to the hot-swap backplane.

5 Replace the bezel by snapping it into place on the front of the server.

Important

If you are replacing the standard control panel module with the optional LCP control panel module and decide to use the optional bezel, you are required to reconfigure the LCP module for use with the bezel. For information on reconfiguring the LCP control panel module tray, see "Reconfiguring the LCP control panel module tray" on page 100.

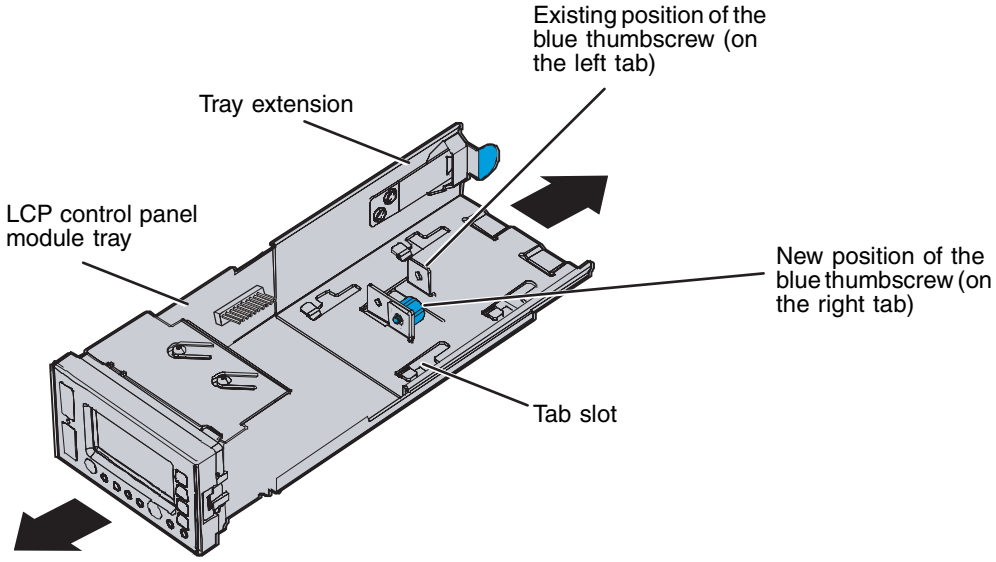
6 Follow the instructions in "Closing the server case" on page 44.

Reconfiguring the LCP control panel module tray

The LCP control panel module tray must be made longer in order for the control panel to be flush with the front of the optional bezel.

To reconfigure the LCP control panel module tray:

1 With the LCP control panel module tray removed from the server, locate the blue thumbscrew that secures the tray extension in position on the module tray.



2 Remove the blue thumbscrew from its existing position on the left tab.

3 Slide the tray sections apart as far as the tab slots allow.

4 Reinstall the blue thumbscrew in the new position on the right tab, securing the tray extension in the back position.

Replacing the sub-bezel

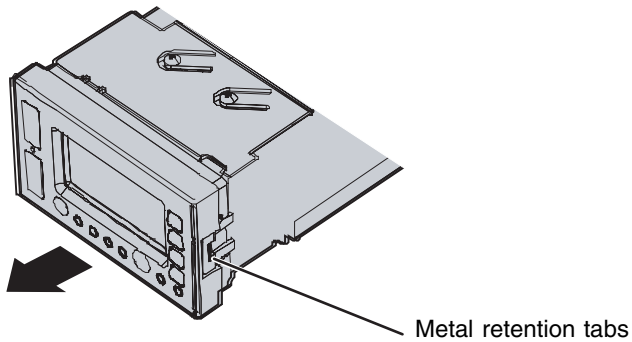
The installed sub-bezel on the LCP control panel module must be replaced with the new sub-bezel included with your server.

To replace the sub-bezel:

1 Use a flat-blade screwdriver to lift the metal retention tabs on both sides of the LCP control panel module, then pull the sub-bezel off of the front of the module.

Warning

Use a flat-blade screwdriver to lift the metal retention tabs. Failure to do so could result in injury to fingers or fingernails.



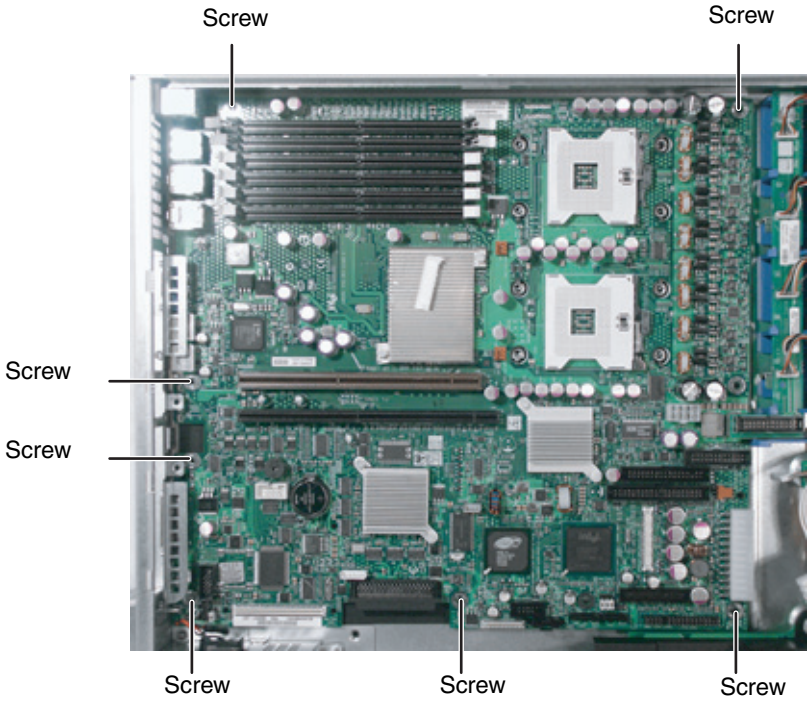
2 Align the new sub-bezel with the LCP control panel, then press it until it clicks into place.

Replacing the system board

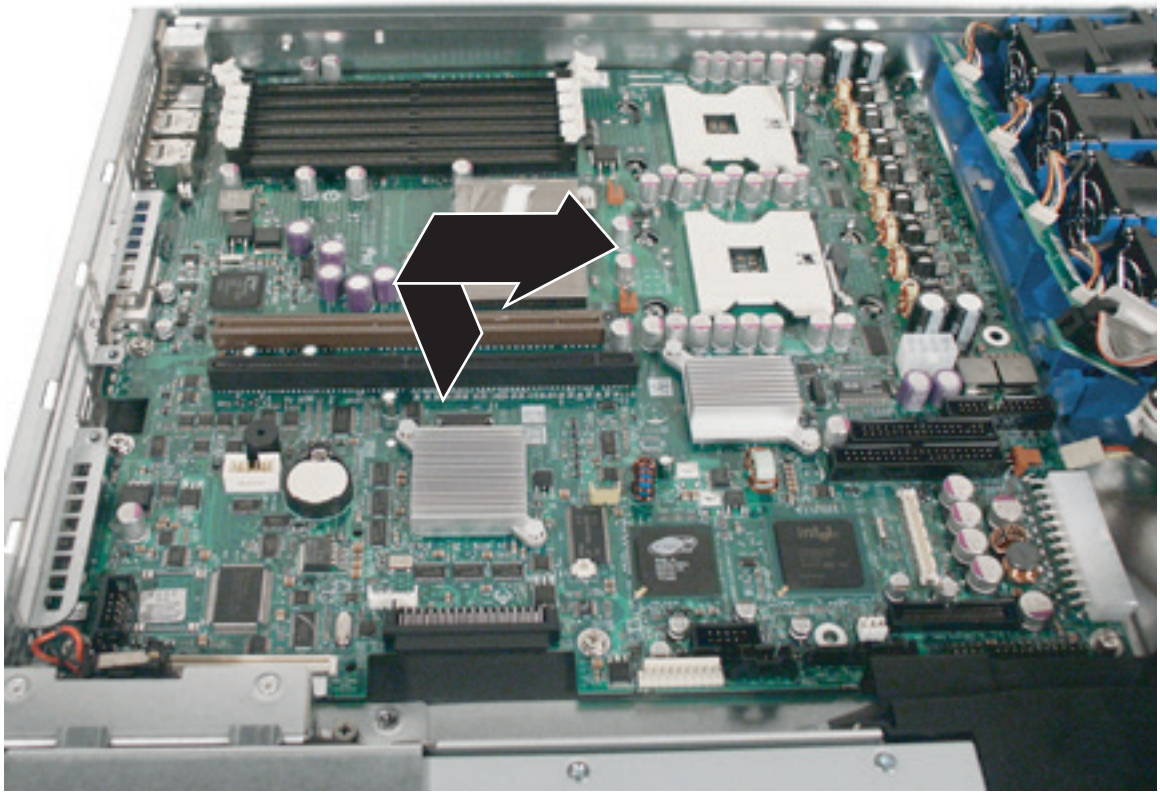
To replace the system board:

1. Follow the instructions in "Preventing static electricity discharge" on page 41. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.
3. Remove the processor air duct by following the instructions in "Removing the processor air duct" on page 45.
4. Remove the PCI riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.
5. Remove the memory modules by following the instructions in "Installing memory" on page 66.
6. Remove the fan module by following the instructions in "Replacing fans and fan modules" on page 76.
7. Remove the heat sinks and processors by following the instructions in "Installing a processor" on page 82.
8. Disconnect all cables from the system board, noting their locations and orientation. (You will reconnect the cables after you install the new board.)

9 Remove the 7 screws that secure the system board to the server.

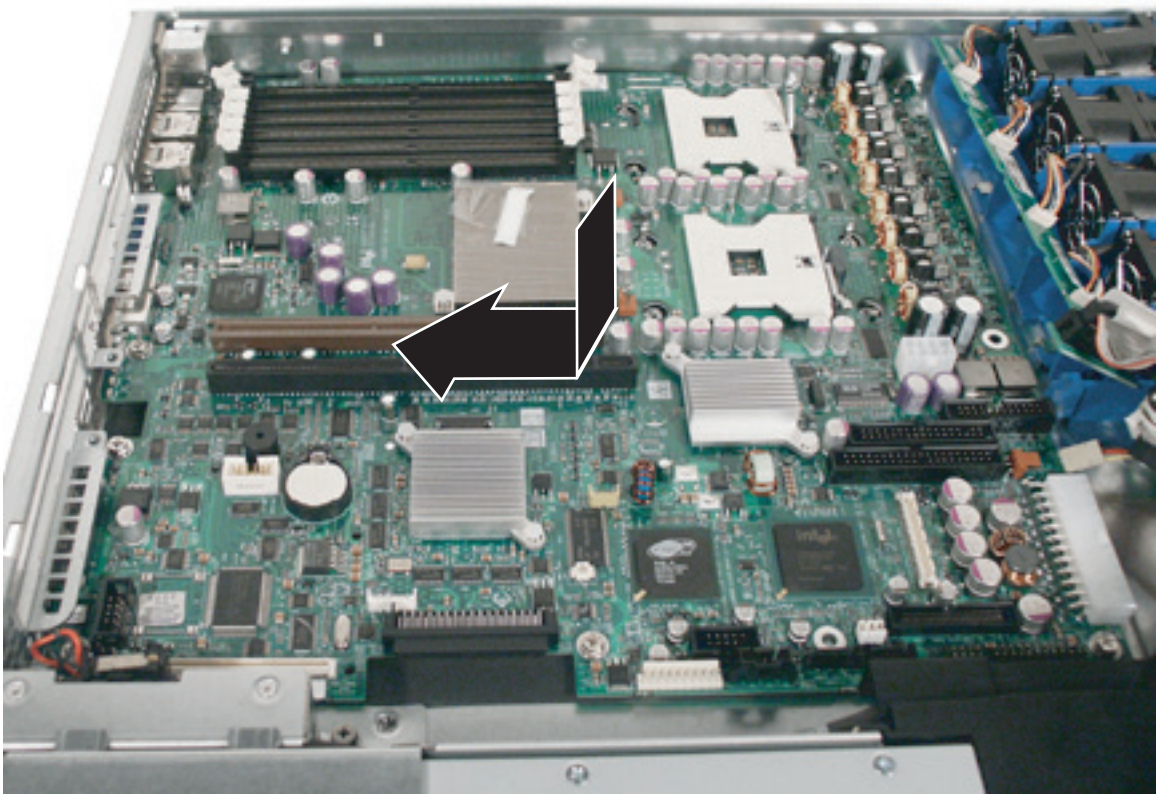


10 Slide the system board toward the front of the server. If the board is difficult to move, push on the back I/O port panel for added leverage.



11 Lift the board away from the case.

12 Insert the new system board into the case, then slide the board toward the back of the case so the board is held under the system board guides.



13 Replace the seven system board screws you removed in Step 9.

14 Follow the instructions in "Installing memory" on page 66.

15 Follow the instructions in "Installing a processor" on page 82.

16 Follow the instructions in "Replacing fans and fan modules" on page 76.

17 Reinstall the PCI riser assembly by following the instructions in "Removing and installing the PCI riser assembly" on page 69.

18 Follow the instructions in "Closing the server case" on page 44.

19 Turn on your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.

20 Check BIOS settings to make sure that they detect the server's new hardware, then save your changes (if any) and close the BIOS Setup utility.

21 If your server does not start after installing the new system board, contact Gateway Customer Care. For more information, see "Getting Help" on page 8.

Chapter 5

Using the BIOS Setup Utility

- Opening the BIOS Setup utility
- Updating the BIOS
- Resetting the BIOS settings to their factory defaults
- Resetting the BIOS passwords

Opening the BIOS Setup utility

The BIOS Setup utility stores basic settings for your server. These settings include basic hardware configuration, resource settings, and password security. These settings are stored and saved even when the power is off.

Caution

The options in the BIOS Setup utility have been set at the factory for optimal performance. Changes to these settings will affect the performance of your server.

Before changing any settings, write them down in case you need to restore them later. You can record the settings on a printout of this guide's appendix for "BIOS Settings" on page 149.

To open the BIOS Setup utility:

1. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.

   When you select menu items, the Item Specific Help box on the right side of the screen displays specific information about the selection. The command bar across the bottom of the screen shows the keys you press to access help, navigate through the menus, and perform other tasks.

2. Select one of these menus:

   - **Main** gives you access to basic information and settings related to your server's hardware and configuration.
   - **Advanced** gives you access to information and settings for PCI, peripheral devices, memory, and the chipset.
   - **Security** gives you access to settings related to system access passwords. For more information, see "Server security" on page 29.
   - **Server** gives you access to settings for system management, console redirection, event log configuration, and fault-resilient boot settings.
   - **Boot** gives you access to information and settings for startup features and startup sequences.
   - **Exit** gives you access to options for closing the BIOS Setup utility.

Updating the BIOS

If you need a new version of the BIOS, you can download the BIOS update from Gateway, then install the new version from a diskette.

To update the BIOS:

1. Print the appendix for "BIOS Settings" on page 149.
2. Restart your server, then press **F2** when the Gateway logo screen appears during startup.
3. Record any custom BIOS settings on your printout.
4. Download the BIOS update from support.gateway.com.
5. Follow the instructions in the self-extracting BIOS update file.
6. Enter any custom BIOS settings you recorded in Step 3, then save your changes and close the BIOS Setup utility.

Rolling BIOS

The BIOS flash memory of this server is divided into two partitions: a primary (active) partition from which the server boots, and a secondary partition to which BIOS updates are diverted. When a BIOS update occurs, the existing BIOS image is preserved on the primary partition and the system is automatically prompted to attempt to boot from the new BIOS (on the secondary partition). If a boot failure occurs with the new BIOS, the system will revert to the old BIOS on the other partition.

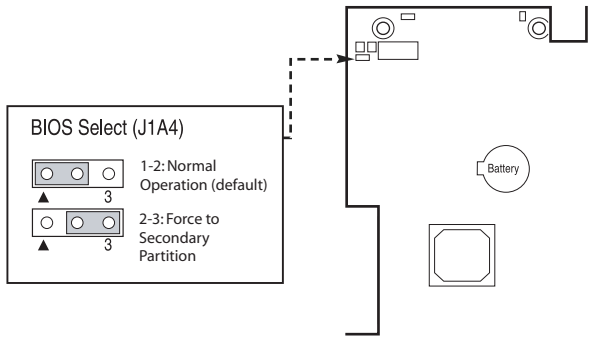
To manually select the BIOS boot partition:

1. Turn off the server, then disconnect the power cords and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.

Caution

Moving the jumper while the power is on can damage your server. Always turn off the server and unplug the power cords and all other cables before changing the jumper.

3 Remove the jumper across pins 1-2 of jumper J1A4 (at the left back of the system board), then place the jumper across pins 2-3.



4 Follow the instructions in "Closing the server case" on page 44.

5 Reconnect the power cords and turn on the server. The BIOS is forced to boot from the secondary partition.

After you repair the primary BIOS partition, return the server to the default condition.

6 Turn off the server, then disconnect the power cords and all other cables connected to the server.

7 Follow the instructions in "Opening the server case" on page 42.

8 Place the jumper back onto pins 1-2.

9 Follow the instructions in "Closing the server case" on page 44.

Recovering the BIOS

If you encounter a problem while you are updating the BIOS, such as a power outage, the BIOS update may not be successful. If the system continues to try to boot from the new, corrupted BIOS, you can manually recover the old BIOS so you can try another update.

To recover the old BIOS:

1. Turn on or restart the server.
2. Press and hold CTRL+HOME. The old BIOS is recovered.

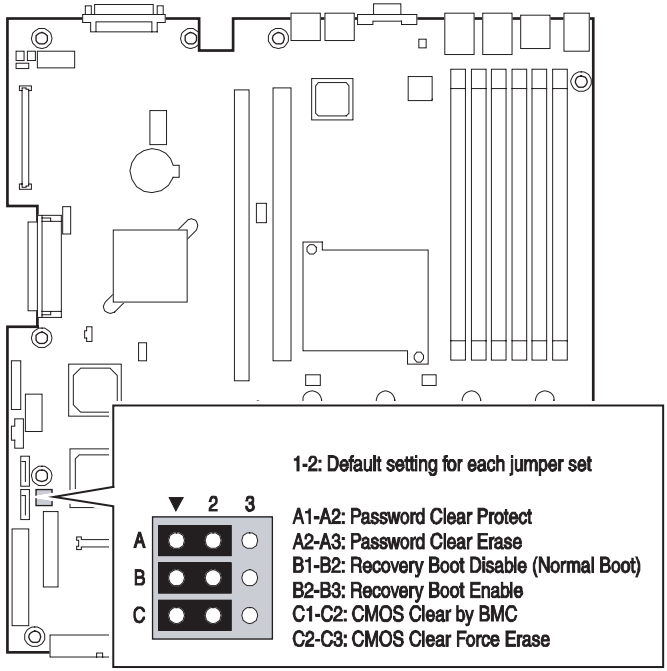
To manually recover the BIOS:

1. Turn off the server, then disconnect the power cords and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.

Caution

Moving the jumper while the power is on can damage your server. Always turn off the server and unplug the power cords and all other cables before changing the jumper.

3. Remove the jumper across pins B1-B2, then place the jumper across pins B2-B3.



4. Follow the instructions in "Closing the server case" on page 44.

5 Insert a bootable USB “disk-on-key” containing a valid BIOS image into a USB port.

6 Reconnect the power cords and turn on the server. The BIOS recovery is initiated.

While the BIOS is being recovered, the monitor displays a blue screen and the server will beep continually. The process is complete when the server stops beeping.

7 Remove the bootable USB “disk-on-key.”

8 Turn off the server, then disconnect the power cords and all other cables connected to the server.

9 Follow the instructions in “Opening the server case” on page 42.

10 Place the jumper back onto pins B1-B2.

11 Follow the instructions in “Closing the server case” on page 44.

12 Plug in the AC power cords and turn on the server, then verify that the recovery was successful.

Resetting the BIOS

You can use two methods to clear all BIOS Setup settings and return them to the factory defaults:

- Press the power and reset buttons on the front of the server.
- Move the Clear BIOS jumper on the system board.

To reset the BIOS using the power and reset buttons:

1. Print the appendix for BIOS Settings in this guide.
2. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
3. Record any custom BIOS settings on your printout.
4. Press the reset button and hold it down for four seconds or more, then press the power button while continuing to hold down the reset button.
5. Release both buttons at the same time. The BIOS is reset.

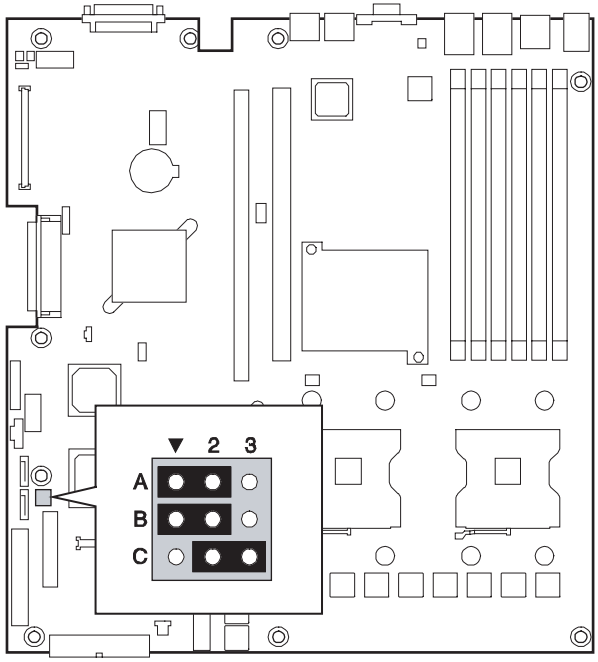
To reset the BIOS using the system board jumper:

1. Turn off the server, then disconnect the power cords and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.

Caution

Moving the jumper while the power is on can damage your server. Always turn off the server and unplug the power cords and all other cables before changing the jumper.

3 Remove the jumper across pins C1-C2, then place the jumper across pins C2-C3.



4 Follow the instructions in “Closing the server case” on page 44.

5 Reconnect the power cords and turn on the server. The BIOS password(s) is cleared.

6 Turn off the server, then disconnect the power cords and all other cables connected to the server.

7 Follow the instructions in “Opening the server case” on page 42.

8 Place the jumper back onto pins C1-C2.

9 Follow the instructions in “Closing the server case” on page 44.

Resetting BIOS passwords

To reset BIOS passwords, you must either reset and clear all BIOS settings, or use the Clear Password jumper. To reset all BIOS settings, follow the instructions in “Resetting the BIOS” on page 113.

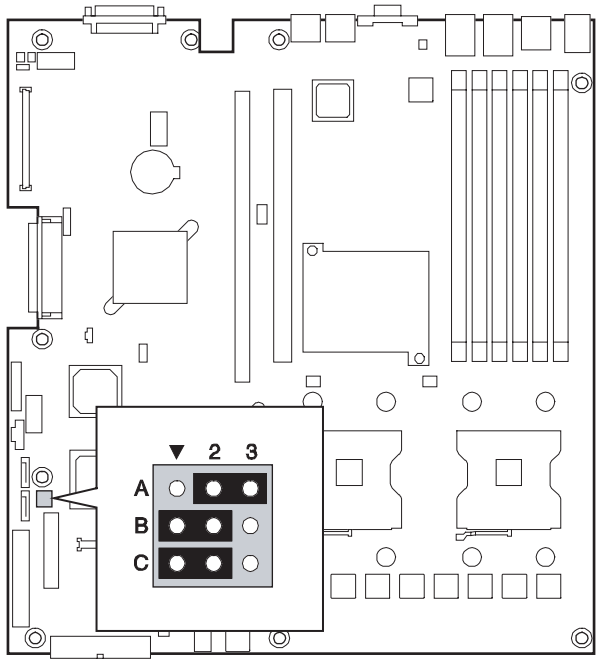
To clear the BIOS password(s):

1. Turn off the server, then disconnect the power cords and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 42.

Caution

Moving the jumper while the power is on can damage your server. Always turn off the server and unplug the power cords and all other cables before changing the jumper.

3. Remove the jumper across pins A1-A2, then place the jumper across pins A2-A3.



4. Follow the instructions in "Closing the server case" on page 44.
5. Reconnect the power cords and turn on the server. The BIOS password(s) is cleared.
6. Turn off the server, then disconnect the power cords and all other cables connected to the server.
7. Follow the instructions in "Opening the server case" on page 42.
8. Place the jumper back onto pins A1-A2.
9. Follow the instructions in "Closing the server case" on page 44.

Chapter 6

Troubleshooting

- Getting telephone support and training
- Interpreting error messages and codes
- Troubleshooting

If the suggestions in this chapter do not correct the problem, see "Telephone support" on page 118 for more information about how to get help.

Telephone support

Before calling Gateway Customer Care

If you have a technical problem with your server, follow these recommendations before contacting Gateway Customer Care:

- Make sure that your server is connected correctly to a grounded AC outlet that is supplying power.
- If a peripheral device, such as a keyboard or mouse, does not appear to work, make sure that all cables are plugged in securely and plugged into the correct port or jack.
- If you have recently installed hardware or software, make sure that you have installed it following the instructions provided with it. If you did not purchase the hardware or software from Gateway, see the manufacturer's documentation and technical support resources.
- If you have "how to" questions about using a program, see:
  - The program's online Help
  - The program's documentation
  - Your operating system's documentation
  - The software or hardware manufacturer's Web site
- See "Troubleshooting" on page 123.
- Have your client ID, serial number (usually located on the back of your server case), and order number available, along with a detailed description of your issue, including the exact text of any error messages, and the steps you have taken.
- Make sure that your server is nearby at the time of your call. The technician may have you follow appropriate troubleshooting steps.
- Consider using Gateway's online technical support. Gateway's Web site has FAQs, tips, and other technical help. You can also use the Web site to e-mail Customer Care. For more information, visit Gateway's Customer Care Web site at support.gateway.com.

Telephone support

Gateway offers a wide range of customer service, technical support, and information services.

Telephone numbers

You can access the following services through your telephone to get answers to your questions:

Resource	Service description	How to reach
Gateway's fee-based software tutorial service	Get tutorial assistance for software issues.	800-229-1103 (charged to your credit card)
Gateway Customer Care	Talk to a Gateway Customer Care representative about a non-tutorial technical support question.	877-485-1464 (US) (option #6) 800-846-3609 (Canada and Puerto Rico) 605-232-2191 (all other countries)
Sales, accounting, and warranty	Get information about available systems, pricing, orders, billing statements, warranty service, or other non-technical issues.	800-846-2000 (US) 888-888-2037 (Canada)

Tutoring and training

Gateway's Customer Care professionals cannot provide hardware and software training. Instead, Gateway recommends the following training resources.

Resource	Service description	For more information
Gateway Learning Libraries	A variety of courses and tutorials are available on CD. Select from several easy-to-use learning libraries.	www.gateway.com/training

Safety guidelines

While troubleshooting your server, follow these safety guidelines:

- Never remove the top panel while your server is turned on and while the modem cable and the power cords are connected.
- Do not attempt to open the monitor. To do so is extremely dangerous. Even if the power is disconnected, energy stored in the monitor components can be dangerous. Also, opening the monitor voids its warranty.
- Make sure that you are grounded correctly before opening the server. For more information about preventing damage from static electricity, see "Preventing static electricity discharge" on page 41.
- After you complete any maintenance task where you have to open the server case, make sure that you close the case and reconnect all cables before you restart your server.

Warning

To avoid bodily injury, do not attempt to troubleshoot your server problem if:

- The power cords or plugs are damaged
- Liquid has been spilled into your server
- Your server was dropped
- The case was damaged

Instead, unplug your server and contact a qualified computer technician. If your server was damaged during shipment from Gateway, contact Gateway Customer Care. For more information, see "Telephone support" on page 118.

Error messages

These messages often indicate procedural errors such as typing an incorrect keystroke or trying to save a file to a write-protected diskette. Some messages, however, may indicate a problem that requires further troubleshooting.

Diskette drive 0 seek to track 0 failed

- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Make sure that the drive settings are correct.

Error loading operating system

- The master boot record may be corrupt. For troubleshooting information, see "The master boot record is corrupted" on page 137.

Hard disk controller failure

- Make sure that the hard drive cable is connected securely.
- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Make sure that the correct drive type is selected.

Hard disk controller failure - press F1 to try reboot

- The drive controller may be defective. Press **F1** to try to restart the server. For more information about running diagnostics on your hard drive, see your operating system's documentation.

Insert bootable media device

- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Make sure that the drive settings are correct.
- See "Your server does not recognize a SCSI drive" on page 136 for a possible solution.

Invalid configuration information

- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Make sure that the settings are correct.
- Reset the BIOS. For instructions, see "Resetting the BIOS" on page 113.

Invalid partition table

- The master boot record may be corrupt. For troubleshooting information, see "The master boot record is corrupted" on page 137.

Invalid password

- Enter your password again. Some passwords are case sensitive.
- If you do not know the password, you may need to reinstall the software you are trying to access.
- System startup passwords are stored in BIOS. If this password has been set and you do not know it, you may be able to reset the password through system board jumper settings. For instructions, see "Resetting BIOS passwords" on page 114.

Memory errors were detected while the system started up

- See "Memory errors were detected during server start up" on page 137 for a possible solution.

Memory size error

- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Save the memory configuration.

Missing operating system

- The master boot record may be corrupt. For troubleshooting information, see "The master boot record is corrupted" on page 137.

System Event Log Full

- Clear the event log. To clear or view the event log, restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Select the **Server** menu, then select the **Event Log Configuration** menu.

Troubleshooting

First steps

Try these steps first before going to the following sections:

- Make sure that the power cords are connected to your server and an AC outlet and that the AC outlet is supplying power.
- If you use a surge protector or a UPS, make sure that it is turned on and is rated to handle the power required by your server.
- If you added or removed server components before the problem started, review the installation procedures you performed and make sure that you followed each instruction. You may need to remove the device, uninstall the device's software, then reinstall the device.
- If an error message appears on the screen, write down the exact message before calling Gateway Customer Care. For instructions, see "Telephone support" on page 118.
- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Check your configuration settings.
- When diagnosing problems, press the non-maskable interrupt (NMI) button with a straightened paper clip to put the server into a halt state. For the location of the button, see "Control panel" on page 2.
- If an error occurs in a program, see its documentation or online help.

Warning

To avoid bodily injury, do not attempt to troubleshoot your server problem if:

- The power cords or plugs are damaged
- Liquid has been spilled into your server
- Your server was dropped
- The case was damaged

Instead, unplug your server and contact a qualified computer technician.

Battery replacement

If you have problems after installing a new CMOS battery, try each of the following items, closing the case and restarting the server after each try:

- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Correct any discrepancies.

- Remove the top panel by following the instructions in "Opening the server case" on page 42, then make sure that all cables inside the case are attached securely. Also, make sure that the colored cable edges are aligned correctly and that the connectors do not miss any pins.

Warning

To avoid bodily injury, do not attempt to troubleshoot your server problem if:

- The power cords or plugs are damaged
- Liquid has been spilled into your server
- Your server was dropped
- The case was damaged

Instead, unplug your server and contact a qualified computer technician.

- If you have the correct test equipment, make sure that the new battery has power. Although unlikely, your new battery may be defective.

Beep codes

Whenever a recoverable error occurs during the power-on self-test (POST), the BIOS displays an error message that describes the problem. The BIOS also sounds a beep code (one long tone followed by two short tones) during POST if the video configuration fails (a faulty video controller) or if an expansion card is not functioning correctly. One short beep indicates the BIOS will boot the operating system. No error found.

A PCI expansion card (for example, a RAID controller) can also issue audible errors by itself, usually consisting of one long tone followed by a series of short tones. For more information on the beep codes issued, check the documentation for that device.

The following table shows POST error beep codes. Prior to system video initialization, BIOS uses these codes to inform you of error conditions.

Beeps	Description	Troubleshooting steps
1	Memory refresh timer error	Reseat the memory modules or replace with modules you know are good.
2	Parity error in the first 64 KB of memory.	Same as for 1 beep.

Beeps	Description	Troubleshooting steps
3	Base memory read/write test error	Same as for 1 beep.
4	System board timer not operational.	Possible system board malfunction. To eliminate the possibility of an add in-card problem, remove all expansion cards. ▪ If the beep code occurs even when all expansion cards have been removed, the system board is at fault. ▪ If the beep code does not occur when the expansion cards have been removed, one of the cards is causing the problem. Install the cards one at a time until the problem happens again. When the beep code returns, the most recent card you installed is at fault.
5	A processor on the system board generated an error.	Remove one of the processors if two are installed, then try a known good processor in the first socket. Same as for 4 beeps.
6	The keyboard controller (8042) may be defective. The BIOS cannot switch to Protected mode.	Remove the keyboard to see if the error goes away. If it does, try a known good keyboard. Same as for 4 beeps.
7	General exception error (processor exception error).	Same as for 5 beeps
8	Display memory error (system video adapter).	If the system video adapter is an add-in card, replace or reseat the video adapter. If the video adapter is integrated into the system board, the board may be faulty. Try using an add-in card.
9	The ROM checksum value does not match the value encoded in the BIOS.	Same as for 4 beeps.
10	The shutdown register for CMOS RAM failed.	Same as for 4 beeps.
11	The cache memory test failed.	Same as for 4 beeps.

Additional beep codes provided by optional Intel Management Modules

In addition to the preceding beep codes, the following additional beep codes are provided if an Intel Management Module is installed:

Beep Codes	Description
1	Control panel CMOS clear has been initiated
1-5-1-1	Processor failure. Reseat or replace the failed processor.
1-5-2-1	No processor is installed or the CPU 1 socket is empty. Reseat or replace the failed processor.
1-5-2-3	Processor configuration error or CPU 1 socket is empty. Reseat or replace the failed processor. In a two-processor system, make sure the processors are identical.
1-5-2-4	Front-side bus select configuration error.
1-5-4-2	DC power unexpectedly lost.
1-5-4-3	Chipset control failure.
1-5-4-4	Power control failure.

LED information

The system board in this server includes LEDs that can assist you in troubleshooting your system. See the following table for a description of these LEDs and the information they provide:

LED Name	Function	Location	Color	Description
ID	Aid in server identification	Front panel and left back of system board	Blue	On = Server identification enabled
System Fault	Visible fault warning	Front panel and left back of system board	Green or Orange	▪ On = No fault ▪ Green blink = Degraded ▪ Orange = Critical error or non-recoverable ▪ Orange blink = Non critical
ATA drive activity	Indicate drive activity	Front panel and left side of system board	Green	Blinking = Drive active

LED Name	Function	Location	Color	Description
DIMM Fault	Identify failing memory module	On the system board, at the back of each DIMM socket	Orange	On = Fault
POST Code diagnostic LEDs 1-4 (LSB, bit1, bit2, MSB)	Display boot 80 POST code	On the left back of the system board	Each LED can be Off, Green, Orange, or Red	See the following Post Code Table
CPU 1 and 2 Fan Fault	Identify fan failure	At the front center of the system board	Orange	On = Fault
CPU 1 and 2 Fault	Identify processor failure	On the system board, 1” behind the processor socket	Orange	On = Fault
5v Standby	Identify 5v standby power on state	At the front left of the system board	Orange	On = 5v standby power on
Power LED	Identify the power state of the system	Front panel	Green	▪ Off = Power is off (or S5) ▪ On = Power is on (or S0) ▪ Slow blink = Low power state (S1-S3)

Diagnostic LEDs

The BIOS sends a 1-byte hex code to port 80 prior to each POST task. These codes are displayed on four tri-colored LEDs, located on the system board and available at the back of the server chassis. They can provide troubleshooting information in the event of a system hang during POST.

POST code checkpoints

The following table shows the checkpoints, LED codes, and task description of events that may occur during the POST portion of the BIOS:

Check point	Diagnostic LED decoder G=Green, R=Red, O=Orange				Description
03	Off	Off	G	G	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable “wCMOSFlags.”
04	Off	G	Off	Off	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initialize data variables that are based on CMOS setup questions. Initialize both the 8259 compatible PICs in the system.
05	Off	G	Off	G	Initialize the interrupt controller in hardware (generally PIC) and interrupt vector table.
06	Off	G	G	Off	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Trap INT1Ch vector to “POSTINT1ChHandlerBlock.”
08	G	Off	Off	Off	Initialize the CPU. The BAT test is being done on KBC. The keyboard controller command byte is being programmed after Auto detection of KB/MS using AMI KB-5.
C0	R	R	Off	Off	Early CPU Init Start — Disable Cache - Init Local APIC
C1	R	R	Off	G	Set up boot strap processor information.
C2	R	R	G	Off	Set up boot strap processor for POST.
C5	R	O	Off	G	Enumerate and set up application processors.
C6	R	O	G	Off	Re-enable cache for boot strap processor.
C7	R	O	G	G	Early CPU Init Exit.
0A	G	Off	G	Off	Initialize the 8042 compatible keyboard controller.
0B	G	Off	G	G	Detect the presence of PS/2 mouse.
0C	G	G	Off	Off	Detect the presence of keyboard in KBC port.

Check point	Diagnostic LED decoder G=Green, R=Red, O=Orange				Description
0E	G	G	G	Off	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Trap the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Off	Off	G	O	Early POST initialization of chipset registers.
24	Off	G	R	Off	Uncompress and initialize any platform specific BIOS modules.
30	Off	Off	R	R	Initialize System Management Interrupt.
2A	G	Off	O	Off	Initialize different devices through DIM. See “DIM code checkpoints” on page 134 for more information.
2C	G	G	R	Off	Initialize different devices. Detects and initializes the video adapter installed in the system that has optional ROMs.
2E	G	G	O	Off	Initialize all the output devices.
31	Off	Off	R	O	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Off	Off	O	O	Initialize the silent boot module. Set the window for displaying text information.
37	Off	G	O	O	Displaying sign-on message, CPU information, setup key message, and any OEM-specific information.
38	G	Off	R	R	Initialize different devices through DIM. See “DIM code checkpoints” on page 134 for more information.
39	G	Off	R	O	Initialize DMAC-1 and DMAC-2.
3A	G	Off	O	R	Initialize RTC date/time.
3B	G	Off	O	O	Test for total memory installed in the system. Also, check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	G	G	R	R	Mid-POST initialization of chipset registers.
40	Off	R	Off	Off	Detect different devices (parallel ports, serial ports, and coprocessor in CPU, and so on) successfully installed in the system and update the BDA, EBDA, and so on.
50	Off	R	Off	R	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size, if needed.

Check point	Diagnostic LED decoder G=Green, R=Red, O=Orange				Description
52	Off	R	G	R	Update CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Off	R	R	Off	Initialize NUM-LOCK status and programs the KBD typematic rate.
75	Off	O	R	O	Initialize Int-13 and prepare for IPL detection.
78	G	R	R	R	Initialize IPL devices controlled by BIOS and option ROMs.
7A	G	R	O	R	Initialize remaining option ROMs.
7C	G	O	R	R	Generate and write contents of ESCD in NVRam.
84	R	G	Off	Off	Log errors encountered during POST.
85	R	G	Off	G	Display error to the user and gets the user response to error.
87	R	G	G	G	Execute BIOS setup if needed/requested.
8C	O	G	Off	Off	Late POST initialization of chipset registers.
8D	O	G	Off	G	Build ACPI tables (if ACPI is supported).
8E	O	G	G	Off	Program the peripheral parameters. Enable/disable NMI as selected.
90	R	Off	Off	R	Late POST initialization of system management interrupt.
A0	R	Off	R	Off	Check boot password if installed.
A1	R	Off	R	G	Clean-up work needed before booting to operating system.
A2	R	Off	O	Off	Take care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft® IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display, if needed.
A4	R	G	R	Off	Initialize runtime language module.
A7	R	G	O	G	Display the system configuration screen, if enabled. Initialize the CPUs before boot, including the programming of the MTRRs.
A8	O	Off	R	Off	Prepare CPU for operating system boot, including final MTRR values.
A9	O	Off	R	G	Wait for user input at config display, if needed.
AA	O	Off	O	Off	Uninstall POST INT1Ch vector and INT09h vector. De-initializes the ADM module.

Check point	Diagnostic LED decoder G=Green, R=Red, O=Orange				Description
AB	O	Off	O	G	Prepare BBS in Int 19 boot.
AC	O	G	R	Off	End of POST initialization of chipset registers.
B1	R	Off	R	O	Save system context for ACPI.
00	Off	Off	Off	Off	Pass control to OS Loader (typically INT19h).
61-70	-	-	-	-	OEM POST Error. This range is reserved for chipset vendors and system manufacturers. The error associated with this value may be different from one platform to the next.

Bootblock initialization code checkpoints

The Bootblock initialization code sets up the chipset, memory and other components before system memory is available. The following table provides the diagnostic LED code for these checkpoints and describes the type of checkpoints that may occur during the bootblock initialization:

Check point	Diagnostic LED decoder G=Green, R=Red, O=Orange				Description
Before D1h	R	R	Off	O	Early chipset initialization is done. Early super I/O initialization is done, including RTC and keyboard controller, NMI is disabled.
D1	R	R	Off	O	Perform keyboard controller BAT test. Check if waking up from power management suspend state. Save power-on CPUID value in scratch CMOS.
D0	R	R	Off	R	Go to flat mode with 4 GB limit and GA20 enabled. Verify the bootblock checksum.
D2	R	R	G	R	Disable CACHE before memory detection. Execute full memory sizing module. Verify that flat mode is enabled.
D3	R	R	G	O	If memory sizing module not executed, start memory refresh and do memory sizing in Bootblock code. Do additional chipset initialization. Re-enable CACHE. Verify that flat mode is enabled.
D4	R	O	Off	R	Test base 512 KB memory. Adjust policies and cache first 8 MB. Set stack.
D5	R	O	Off	O	Bootblock code is copied from ROM to lower system memory and control is given to it. BIOS now executes out of RAM.

Check point	Diagnostic LED decoder G=Green, R=Red, O=Orange				Description
D6	R	O	G	R	Both key sequence and OEM-specific method is checked to determine if BIOS recovery is forced. Main BIOS checksum is tested. If BIOS recovery is necessary, control flows to checkpoint E0. See Bootblock Recovery Code Checkpoints section of document for more information.
D7	R	O	G	O	Restore CPUID value back into register. The Bootblock-Runtime interface module is moved to system memory and control is given to it. Determine whether to execute serial flash.
D8	O	R	Off	R	The Runtime module is uncompressed into memory. CPUID information is stored in memory.
D9	O	R	Off	O	Store the Uncompressed pointer for future use in PMM. Copying Main BIOS into memory. Leaves all RAM below 1 MB Read-Write, including E000 and F000 shadow areas, but closing SMRAM.
DA	O	R	G	R	Restore CPUID value back into register. Give control to BIOS POST (ExecutePOSTKernel). See "POST code checkpoints" on page 128 for more information.
E1-E8 EC-EE	-	-	-	-	OEM memory detection/configuration error. This range is reserved for chipset vendors and system manufacturers. The error associated with this value may be different from one platform to the next.

Bootblock recovery code checkpoints

The bootblock recovery code gets control when the BIOS determines that a BIOS recovery needs to occur because the user has forced the update or the BIOS checksum is corrupt. The following table provides the diagnostic LED codes for these checkpoints and describes the type of checkpoints that may occur during the Bootblock recovery portion of the BIOS:

Check point	Diagnostic LED decoder G=Green, R=Red, O=Orange				Description
E0	R	R	R	Off	Initialize the floppy controller in the super I/O. Some interrupt vectors are initialized. DMA controller is initialized. 8259 interrupt controller is initialized. L1 cache is enabled.
E9	O	R	R	G	Set up floppy controller and data. Attempt to read from floppy.
EA	O	R	O	Off	Enable ATAPI hardware. Attempt to read from ARMD and ATAPI CDROM.
EB	O	R	O	G	Disable ATAPI hardware. Jump back to checkpoint E9.

Check point	Diagnostic LED decoder G=Green, R=Red, O=Orange				Description
EF	O	O	O	G	Read error occurred on media. Jump back to checkpoint EB.
F0	R	R	R	R	Search for pre-defined recovery file name in root directory.
F1	R	R	R	O	Recovery file not found.
F2	R	R	O	R	Start reading FAT table and analyze FAT to find the clusters occupied by the recovery file.
F3	R	R	O	O	Start reading the recovery file cluster by cluster.
F5	R	O	R	O	Disable L1 cache.
FA	O	R	O	R	Check the validity of the recovery file configuration to the current configuration of the flash part.
FB	O	R	O	O	Make flash write-enabled through chipset and OEM-specific method. Detect correct flash part. Verify that the found flash part size equals the recovery file size.
F4	R	O	R	R	The recovery file size does not equal the found flash part size.
FC	O	O	R	R	Erase the flash part.
FD	O	O	R	O	Program the flash part.
FF	O	O	O	O	The flash has been updated successfully. Make flash write-disabled. Disable ATAPI hardware. Restore CPUID value back into register. Give control to F000 ROM at F000:FFF0h.

DIM code checkpoints

The Device Initialization Manager (DIM) gets control at various times during BIOS POST to initialize different system buses. The following table describes the main checkpoints where the DIM module is accessed.

Checkpoint	Description
2A	Initialize different buses and perform the following functions: ▪ Reset, Detect, and Disable (function 0) — Disables all device nodes, PCI devices, and PnP ISA cards. It also assigns PCI bus numbers. ▪ Static Device Initialization (function 1) — Initializes all static devices that include manual configured onboard peripherals, memory and I/O decode windows in PCI-PCI bridges, and noncompliant PCI devices. Static resources are also reserved. ▪ Boot Output Device Initialization (function 2) — Searches for and initializes any PnP, PCI, or AGP video devices.
38	Initialize different buses and perform the following functions: ▪ Boot Input Device INitialization (function 3) — Searches for and configures PCI input devices and detects if system has standard keyboard controller. ▪ IPL Device Initialization (function 4) — Searches for and configures all PnP and PCI boot devices. ▪ General Device Initialization (function 5) — Configures all onboard peripherals that are set to an automatic configuration and configures all remaining PnP and PCI devices.

ACPI runtime checkpoints

ACPI checkpoints are displayed when an ACPI-capable operating system either enters or leaves a sleep state. The following table describes the types of checkpoints that may occur during ACPI sleep or wake events:

Checkpoint	Description
AC	First ASL checkpoint. Indicates that the system is running in ACPI mode.
AA	System is running in APIC mode.
01, 02, 03, 04, 05	Entering sleep state S1, S2, S3, S4, or S5.
10, 20, 30, 40, 50	Waking from sleep state S1, S2, S3, S4, or S5.

BIOS

The settings in the BIOS Setup utility are not retained

- Replace the CMOS battery. For instructions, see "Replacing the CMOS battery" on page 95.

CD drive

Your server does not recognize a CD or the CD drive

- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Make sure that the IDE controllers are enabled. For more information, see "Using the BIOS Setup Utility" on page 107.
- Reinstall the device driver. For instructions, see *Using Your System Companion CD*.
- Make sure that the drive is configured correctly by following the instructions in the drive's documentation.
- Turn off your server, then remove the drive and push it in again to make sure the drive is seated correctly. For instructions, see "Installing a CD or DVD drive" on page 58.

Your CD drive tray does not open

- Press a straightened paper clip wire into the CD drive's manual eject hole. The drive tray opens.
- If this problem happens frequently while the server is turned on, the drive may be defective.

Expansion cards

Your server does not recognize an expansion card

- Restart your server.
- Make sure that you have installed the necessary software or driver. For instructions, see the card's documentation.
- Reseat the expansion card and riser card. For instructions, see "Installing and removing PCI expansion cards" on page 69.
- If another slot of the correct size is available, install the card in a different slot.

Hard drive

The hard drive cannot be accessed, or you receive a "General failure reading drive C" error message

- If a diskette is in the diskette drive, eject it and restart your server by pressing the reset button.
- Restart your server by pressing the reset button.
- Turn off your server, then remove all hard drives and push them in again to make sure the drives are seated correctly. For instructions, see "Installing a hard drive" on page 60.
- Run a verification from the SCSI BIOS.
- If your server has been subjected to static electricity or physical shock, you may need to reinstall the operating system.

You receive a "Non-system disk" or "disk error" error message

- Eject the diskette from the diskette drive, then press ENTER.
- Make sure that your hard drive has an active partition. For more information, see "The master boot record is corrupted" on page 137.

Your server does not recognize a SCSI drive

- Make sure that the SCSI controller is enabled in the BIOS Setup utility.
- Reinstall the device driver. For instructions, see *Using Your System Companion CD*.
- Change the drive's SCSI address to one that is not being used by your server. For more information about SCSI device configurations, see your drive's documentation.
- Run SCSI Verify in the SCSI BIOS. For more information about the SCSI BIOS, see the SCSI controller's documentation.
- Turn off your server, then remove all hard drives and push them in again to make sure that the drives are seated correctly. For instructions, see "Installing a hard drive" on page 60.

You are having problems with a SATA drive

- For normal SATA drives (not SATA RAID), check the BIOS setup utility to see if the BIOS has recognized the drive.
- Make sure that the power cable and SATA cables are attached securely to the drive cage.
- If the drive is not detected, try a different SATA port.
- Try swapping SATA cables between drives to determine if the cable is defective.
- Try listening to the drive to determine if the drive is spinning up. If not, the drive may be defective.

The master boot record is corrupted

- In a Windows network operating system, repair the master boot record using FDISK.

To repair the master boot record:

- At a DOS command prompt, type **fdisk/mbr**, then press **ENTER**.

Internet

See also *Modem*.

You cannot connect to the Internet

- Make sure that your account with your Internet Service Provider (ISP) is set up correctly. Contact your ISP technical support for help.
- Make sure that you do not have a problem with your modem. For more information, see "Monitor" on page 137.

Keyboard

Liquid has been spilled into the keyboard

- If you spilled liquid in the keyboard, turn off your server and unplug the keyboard. Clean the keyboard and turn it upside down to drain it. Let the keyboard dry before using it again. If the keyboard does not work after it dries, you may need to replace it. This type of damage is not covered by your server's warranty.

Memory

Memory errors were detected during server start up

- Open your server and make sure that the memory modules are installed correctly. For instructions, see "Installing memory" on page 66.
- A memory module may be defective. If possible, try another memory module and see if the error repeats.

Monitor

Your server is running but there is no picture

- Adjust the brightness and contrast controls to the center position.

- Make sure that the monitor is plugged in and turned on. If the monitor is turned on, the power LED should be lit.
- Check the port and cable for bent or damaged pins.
- Connect your monitor to another computer, or connect a monitor that you know works to your server.

The color is not uniform

Make sure that the monitor warms up for at least 30 minutes before making a final judgment about color uniformity.

Make sure that:

- The monitor is not positioned too close to another monitor, electric fan, or fluorescent light.
- You demagnetize the screen using the monitor's degauss feature. For more information on degauss, see the monitor's documentation.

A horizontal line or wire is visible across the monitor screen

The monitor may use thin *damper* wires, located approximately 1/3 of the way from the upper and lower screen edges, to stabilize the internal aperture grille. These wires are most obvious when the monitor displays a white background. The aperture grille allows more light to pass through the screen for brighter colors and greater luminescence. The damper wire is a critical part of the overall monitor design and does not negatively affect the monitor's function.

Power

You press the power button, but the server does not turn on

- If the power button LED is green, the server is turned on, but you may not be seeing an image on the monitor. For monitor troubleshooting, see "Monitor" on page 137.
- If your server is plugged into a surge protector or UPS, make sure that the surge protector or UPS is connected securely to an electrical outlet, turned on, and working correctly. One way to check this is to plug the server directly into a wall outlet, bypassing the surge protector or UPS.
- Make sure that the electrical outlet is working by plugging a working device, such as a lamp, into the outlet, then turning it on to test the outlet.
- Open your server and make sure that the power supply module cage cable is connected correctly to the system board.

When you turn on the server, it makes several short beeps

- The short beeps indicate the server has encountered some type of error. See "Beep codes" on page 124.

Processor

Your server does not recognize a new processor

- Make sure that the processor is fully seated in its socket. The processor should be recognized automatically if it is installed correctly.
- Set the Retest Processor option in the BIOS Setup utility to **Yes**.
- If you have upgraded your server from one processor to two, you may need to reconfigure your operating system so it recognizes the additional processor. For instructions, see your operating system's documentation.

Appendix A

Server Specifications

The following specifications are for the standard configuration. Your server may contain optional equipment. All specifications are subject to change.

System specifications

Case size	27.48 × 16.93 × 1.70 inches (69.8 × 43.0 × 4.33 cm) (without handles)
Weight	Varies by configuration. A fully loaded server weighs about 35 lbs. (15.9 kg)
Fans	▪ Four dual-rotor, 40 × 40 × 56 mm, multi-speed processor fans ▪ One single-rotor, 40 × 40 × 28 mm, multi-speed PCI fan ▪ Two dual-rotor, 40 × 40 × 56 mm, multi-speed power supply fans
Ports	▪ PS/2 keyboard or mouse (2) ▪ USB (3 standard, 2 additional with optional LCP front panel) ▪ Serial (RJ-45) ▪ VGA (2 standard, only 1 with optional LCP front panel) ▪ U320 high density SCSI (1) ▪ LAN (2) (RJ-45)
Drives (standard)	One slimline drive bay for a CD drive (standard) or a DVD drive (optional)
Card sizes	Supports one full-length, full-height and one low-profile PCI expansion card
Power supply	▪ One 520 W hot-swap, power supply module (standard) ▪ Additional 520 W hot-swap redundant power supply module (optional)
Operating systems	Supports Windows Server 2003 and Windows Small Business Server 2003
Certifications	▪ FCC Class A ▪ UL ▪ cUL

System board specifications

Processor	Dual socket 604 package 800 MHz Front Side Bus Supports as many as two Intel Xeon CPUs, 2.8 GHz or faster
Chipset	Intel E7520 ▪ 800 MHz FSB ▪ MCH memory controller (Northbridge) ▪ ICH-5R I/O controller (Southbridge)
Memory	▪ Six DIMM slots support from 256 MB to 16 GB total memory ▪ Use only DDR2-400 compliant, ECC, registered, 72-bit, single rank or dual rank,low profile, SDRAM modules. **Caution** - When using Dual Rank (double row) DIMMs, a maximum of four loads per memory channel is supported. This means a maximum of four dual rank DIMMs can be populated on this system board.
PCI device/slot	PCI riser assembly, featuring: ▪ One full-length, full-height 64-bit PCI riser (PCI, PCI-X, or PCI-Express) which supports one card. ▪ One low-profile (LP) 64-bit PCI-X riser (up to 66 MHz) which supports one card.
VGA	On-board ATI Rage XL ▪ 8 MB SDRAM ▪ Up to 1600 × 1200 (2D and 3D)
LAN	▪ Intel 82546GB controller ▪ Dual onboard 10/100/1000 network interface ▪ IEEE 850.3u auto-negotiation support ▪ Full duplex support
SCSI	▪ LSI 53C1030 controller ▪ Dual-channel Ultra320 SCSI channels with integrated RAID 0/1 support ▪ Accessible at back panel
ACPI	ACPI compliance Supports: ▪ S0 ▪ S1 ▪ S4 ▪ S5

Environmental specifications

The following specifications identify maximum environmental conditions. At no time should the server run under conditions which violate these specifications.

Variable	Requirements
Temperature	Nonoperating: -40° to 158°F (-40° to 70°C) Operating: 50° to 95°F (10° to 35°C) with a maximum rate of change not to exceed 10° per hour
Humidity	Nonoperating: 90% relative (noncondensing) at 95° F (35° C)
Acoustic noise	Sound Pressure: 55 dBA (Rackmount) in an idle state at typical office ambient temperature. (73.4 +/- ° F) Sound Power: 7.0 BA in an idle state at typical office ambient temperature. (73.4 +/- 3.6° F)
Shock	Operating - 2.0 g, 11 mSec, 1/2 sine Unpackaged - Trapezoidal, 25 g, velocity change 136 inches/sec (≧ 40 lbs to > 80 lbs). Packaged - Non-palletized free fall in height 24 inches (≧ 40 lbs to > 80 lbs)
Vibration	5 Hz to 500 Hz, 2.20 g RMS random
Electrostatic discharge (ESD)	Tested to +/-15 kV, except I/O port +/- 8kV per Intel Environmental test specification
System cooling requirement in BTU/Hr	2322 BTU/hour (Based on 520W maximum power, 78% power subsystem efficiency, and 98% power factory correction loss)

Electronic specifications

Memory map

Address Range (hex)	Amount	Function
0 to 07FFFFh	640 KB	DOS region, base system memory
0A0000h to 0BFFFFh	128 KB	Video or SMM memory
0C0000h and 0DFFFFh	128 KB	Expansion card BIOS and buffer area
0E0000h to 0FFFFFh	128 KB	System BIOS
0E0000h to 0EFFFFh	2 MB	Extended system BIOS
FC000000h to FFFFFFFFh	64 MB	PCI memory space

Interrupts

The following table reflects a typical configuration, but you can change these interrupts. Use this information to determine how to program each interrupt. The actual interrupt map is defined using configuration registers in the ICH5-R (I/O controller). I/O Redirection Registers in the I/O APIC are provided for each interrupt signal. The signals define hardware interrupt signal characteristics for APIC messages sent to local APIC(s).

Important

If you disable an IDE controller to free the interrupt for that controller, you must physically unplug the IDE cable from the system board. Simply disabling the drive by configuring the BIOS option does not make the interrupt available.

ISA Interrupt	Description
IRQ0	Timer/counter, HPET #0 in legacy replacement Mode. In APIC mode, cascade from 8259 controller 1
IRQ1	Keyboard controller
IRQ2	Slave controller INTR output. In APIC mode Timer/counter, HPET #0
IRQ3	Serial port A
IRQ4	Serial port B
IRQ5	Parallel port (not implemented)

ISA Interrupt	Description
IRQ6	Diskette controller
IRQ8	Real-time clock/HPET#1 in legacy replacement mode
IRQ9	Generic, Option for SCI
IRQ10	Generic, Option for SCI
IRQ11	HPET #2, option for SCSI, TCO
IRQ12	Mouse controller
IRQ13	System interrupt/FERR
IRQ14	Primary ATA, legacy mode
IRQ15	Secondary ATA, legacy mode
PIRQA	USB 2.0 controller 1 and 4
PIRQB	Video
PIRQC	USB 2.0 controller 3, Native IDE, SATA
PIRQD	USB 2.0 controller 2
PIRQE	Option for SCI, TCO, HPET #0,1,2
PIRQF	Option for SCI, TCO, HPET #0,1,2
PIRQG	Option for SCI, TCO, HPET #0,1,2
PIRQH	USB 2.0 EHCI controller 1, Option for SCI, TCO, HPET #0,1,2
Ser IRQ	SIO3

PCI interrupt routing

PCI interrupt routing in PIC mode

Device	Interrupt A	Interrupt B	Interrupt C	Interrupt D
Video	ICH5R_PIRQB			
IDE RAID	ICH5R_PIRQC			
SIO	ICH5R_SIRIRQ			
Legacy IDE	ICH5R_IRQ14			

Device	Interrupt A	Interrupt B	Interrupt C	Interrupt D
Legacy IDE	ICH5R_IRQ15			
Intel 82546GB 1	P64A_IRQ6			
Intel 82546GB 2	P64A_IRQ7			
SCSI Controller 1	P64B_IRQ2			
SCSI Controller 2	P64B_IRQ1			
FH Riser	P64A_IRQ5	P64A_IRQ4	P64A_IRQ2	P64A_IRQ1
LP Riser	P64B_IRQ4	P64B_IRQ3	P64B_IRQ2	P64B_IRQ1

Additional specifications

For more information about your server, such as memory size, hard drive size, and processor type, visit Gateway's *eSupport* page at support.gateway.com. The *eSupport* page also has links to additional Gateway documentation and detailed specifications for your own server.

Appendix B

BIOS Settings

If you ever need to restore your BIOS settings, such as after a system board change, a record of the settings will make the process much easier. You can print this appendix, then record your custom BIOS settings on the printout. Only settings which can be changed are listed. For a complete list of viewable BIOS settings, run the BIOS Setup utility.

To view all BIOS settings:

1. Restart your server
2. Press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
3. Select menus and submenus to display setting information.

Caution

Setting the wrong values in the Advanced Menu may cause the server to malfunction.

BIOS menu	BIOS submenu	Setting	Value
Main			
		System Overview AMIBIOS (Version, Build date), Processor (Type, Speed, Count)	
		System Memory (Size)	
		System Time	HH:MM:SS
		System Date	DAY MM/DD/YYYY
		Language	**English** French German Italian Spanish
Advanced			
	Processor Configuration		
		Manufacturer	
		Brand String	
		Frequency	
		FSB Speed	

BIOS menu	BIOS submenu	Setting	Value
		CPU1 (CPUID, Cache L1, Cache L2, Cache L3)	
		CPU2 (CPUID, Cache L1, Cache L2, Cache L3)	
		Processor Retest	Enabled **Disabled**
		Max CPUID Value Limit	Enabled **Disabled**
		Hyper-Threading Technology	**Enabled** Disabled
		Intel Speed Step™ Tech	Auto **Disabled**
	IDE Configuration		
		Onboard P-ATA Channels	Disabled **Primary** **Secondary** **Both**
		Onboard S-ATA Channels	Disabled **Enabled**
		Configure S-ATA as RAID	**Disabled** Enabled
		S-ATA Ports Definition	**A1-3rd M/A2-4th M** A1--4th M/ A2-3rd M
		Mixed P-ATA/S-ATA	Selects Mixed P-ATA / S-ATA sub-menu.
		Primary IDE Master	N/A (auto-detected) Selects IDE Device Configuration sub-menu.
		Primary IDE Slave	N/A (auto-detected) Selects IDE Device Configuration sub-menu.

BIOS menu	BIOS submenu	Setting	Value
		Secondary IDE Master	N/A (auto-detected) Selects IDE Device Configuration sub-menu.
		Secondary IDE Slave	N/A (auto-detected) Selects IDE Device Configuration sub-menu.
		Third IDE Master	N/A (auto-detected) Selects IDE Device Configuration sub-menu.
		Fourth IDE Master	N/A (auto-detected) Selects IDE Device Configuration sub-menu.
		Hard Disk Write Protect	**Disabled** Enabled
		IDE Detect Time Out (Sec)	0, 5, 10, 15, 20, 25, 30, **35**
		ATA(PI) 80-Pin Cable Detection	**Host & Device** Host Device
	Floppy Configuration		
		Floppy A	Disabled 720 KB 3 1/2” **1.44 MB 3 1/2”** 2.44 MB 3 1.2”
		Onboard Floppy Controller	Disabled **Enabled**
	Super I/O Configuration		

BIOS menu	BIOS submenu	Setting	Value
		Serial Port A Address	Disabled **3F8/IRQ4** 2F8/IRQ3 3E8/IRQ4 2E8/IRQ3
		Serial Port B Address	Disabled 3F8/IRQ4 **2F8/IRQ3** 3E8/IRQ4 2E8/IRQ3
	USB Configuration		
		USB Devices Enabled (List of USB devices detected by BIOS)	
		USB Function	Disabled **Enabled**
		Legacy USB Support	Disabled Keyboard only **Auto** Keyboard and Mouse
		Port 60/64 Emulation	**Disabled** Enabled
		USB 2.0 Controller	**Enabled** Disabled
		USB 2.0 Controller Mode	FullSpeed (12Mbps) **HiSpeed** (480Mbps)
		USB Mass Storage Device Configuration	Selects USB Mass Storage Device Configuration submenu with USB Device enable
	PCI Configuration		
		Onboard Video	Disabled **Enabled**

BIOS menu	BIOS submenu	Setting	Value
		Dual Monitor Video	Enabled **Disabled**
		Onboard NIC 1 (Left)	Disabled **Enabled**
		Onboard NIC 1 ROM	Disabled **Enabled**
		Onboard NIC 2 (Right)	Disabled **Enabled**
		Onboard NIC 2 ROM	Disabled **Enabled**
		Onboard SCSI	Disabled **Enabled**
		Onboard SCSI ROM	Disabled **Enabled**
		Onboard SCSI Mode *	**IM/IME** (Integrated Mirroring/Integrated Mirroring Enhanced) IS (Integrated Striping)
		Slot 1 Option ROM	Disabled **Enabled**
		Slot 2 Option ROM	Disabled **Enabled**
		Slot 3 Option ROM (Only visible when supported by riser)	Disabled **Enabled**
		Slot 4 Option ROM (Only visible when supported by riser)	Disabled **Enabled**
		Slot 5 Option ROM (Only visible when supported by riser)	Disabled **Enabled**

BIOS menu	BIOS submenu	Setting	Value
		Slot 6 Option ROM (Only visible when supported by riser)	Disabled **Enabled**
	Memory Configuration		
		DIMM 1A (Information)	Installed Not Installed Disabled Spare
		DIMM 1B (Information)	Installed Not Installed Disabled Spare
		DIMM 2A (Information)	Installed Not Installed Disabled Spare
		DIMM 2B (Information)	Installed Not Installed Disabled Spare
		DIMM 3A (Information)	Installed Not Installed Disabled Spare
		DIMM 3B (Information)	Installed Not Installed Disabled Spare
		Extended Memory Test	1 MB 1 KB Every Location **Disabled**
		Memory Retest	Enabled **Disabled**

BIOS menu	BIOS submenu	Setting	Value
		Memory Remap Feature	**Enabled** Disabled
		Sparing (Disabled provides the most memory space. Sparing reserves memory to replace failures.	Sparing **Disabled**
Boot			
	Boot Settings Configuration		
		Quick Boot	Disabled **Enabled**
		Quiet Boot	**Disabled** Enabled
		Bootup Num-Lock	**Off** On
		PS/2 Mouse Support	Disabled Enabled **Auto**
		POST Error Pause	Disabled **Enabled**
		Hit <F2> Message Display	Disabled **Enabled**
		Scan User Flash Area	**Disabled** Enabled
	Boot Device Priority		
		1st Boot Device	Varies (Specifies boot sequence from the available devices. A device enclosed in parenthesis has been disabled.)

BIOS menu	BIOS submenu	Setting	Value
		nth Boot Device	Varies (Specifies boot sequence from the available devices. A device enclosed in parenthesis has been disabled.)
	Hard Disk Drive		
		1st Drive	Varies (Specifies boot sequence from the available devices.)
		nth Drive	Varies (Specifies boot sequence from the available devices.)
	Removable Drive		
		1st Drive	Varies (Specifies boot sequence from the available devices.)
		nth Drive	Varies (Specifies boot sequence from the available devices.)
	ATAPI CDROM Drives		
		1st Drive	Varies (Specifies boot sequence from the available devices.)
		nth Drive	Varies (Specifies boot sequence from the available devices.)
Security			
		Administrator Password is	(Installed/Not installed)

BIOS menu	BIOS submenu	Setting	Value
		User Password is (Installed/Not installed)	
		Set Admin Password (Set or clear Admin password)	
		Set User Password (Set or clear User password)	
		User Access Level	No Access View Only **Limited** Full Access
		Clear User Password	
		Fixed disk boot sector protection	**Disabled** Enabled
		Password On Boot	**Disabled** Enabled
		Secure Mode Timer	**1 minute** 2 minutes 5 minutes 10 minutes 20 minutes 60 minutes 120 minutes
		Secure Mode Hot Key (Ctrl-Alt-)	[Z] **[L]**
		Secure Mode Boot	**Disabled** Enabled
		Diskette Write Protect	**Disabled** Enabled
		Video Blanking	**Disabled** Enabled
		Power Switch Inhibit	**Disabled** Enabled
		NMI Control	**Disabled** Enabled

BIOS menu	BIOS submenu	Setting	Value
Server			
	System Management		
		Server Board Part Number	Varies
		Server Board Serial Number	Varies
		NIC 1 MAC Address	Varies
		NIC 2 MAC Address	Varies
		System Part Number	Varies
		System Serial Number	Varies
		Chassis Part Number	Varies
		Chassis Serial Number	Varies
		BIOS Version	BIOS ID string (excluding build time/date)
		BMC Device ID	Varies
		BMC Firmware Revision	Varies
		BMC Device Revision	Varies
		PIA Revision	Varies
		SDR Revision	Varies
		HSC FW Revision (HSBP)	Firmware revision of the Hotswap controller. N/A if not present.
	Serial Console Features		
		BIOS Redirection Port	**Disabled** Serial A Serial B

BIOS menu	BIOS submenu	Setting	Value
		Baud Rate	9600 **19.2K** 38.4K 57.6K 115.2K
		Flow Control	No Flow Control **CTS/RTS** XON/XOFF CTS/RTS + CD
		Terminal Type	PC-ANSI **VT100+** VT-UTF8
		ACPI Redirection Port	**Disabled** Serial A Serial B
		Serial Port Connector	Serial A **Serial B**
	Event Log Configuration		
		Clear All Event Logs	**Disabled** Enabled
		BIOS Event Logging	Disabled **Enabled**
		Critical Event Logging	Disabled **Enabled**
		ECC Event Logging	Disabled **Enabled**
		PCI Error Logging	Disabled **Enabled**
		FSB Error Logging	Disabled **Enabled**
		Hublink Error Logging	Disabled **Enabled**

BIOS menu	BIOS submenu	Setting	Value
Server (Cont'd)			
		Assert NMI or SERR	Disabled **Enabled**
		Assert NMI or PERR	Disabled **Enabled**
		Resume on AC Power Loss	**Stays Off** Power On Last State (Only displayed if Intel Management Module is present. Default if present.
		FRB-2 Policy	**Disable BSP** Do not disable BSP Retry on Next Boot Disable FRB2 Timer
		Late POST Timeout	**Disabled** 5 minutes 10 minutes 15 minutes 20 minutes
		Hard Disk OS Boot Timeout	**Disabled** 5 minutes 10 minutes 15 minutes 20 minutes
		PXE OS Boot Timeout	**Disabled** 5 minutes 10 minutes 15 minutes 20 minutes
		OS Watchdog Timer Policy	**Stay On** Reset Power Off

BIOS menu	BIOS submenu	Setting	Value
		Platform Event Filtering	**Enabled** Disabled
Exit			
		Save Changes and Exit (**F10**)	
		Discard Changes and Exit (**ESC** key)	
		Discard Changes (**F7**)	
		Load Setup Defaults (**F9**)	
		Load Custom Defaults	
		Save Custom Defaults	

* See the following Caution before changing the Onboard SCSI.

Caution

Before changing modes, back up array data and delete existing arrays, if any. Otherwise, loss of data may occur.

After operating system installation with a selected SCSI RAID mode, only change this mode selection if you are prepared to rebuild the RAID array. Changing the mode could damage the current operating system installation on the RAID volume.

The following 2nd level submenus are accessed from the submenu indicated in the first column.

BIOS submenu	BIOS 2nd level submenu	Setting	Value
IDE Configuration			
	Mixed P-ATA / S-ATA		
		First ATA Channel	**P-ATA M-S** S-ATA M-S
		Second ATA Channel	**S-ATA M-S** None

BIOS submenu	BIOS 2nd level submenu	Setting	Value
IDE Configuration (Cont'd)			
	IDE Device Configuration		
		Device	Device information
		Vendor	Device vendor
		Size	Device size
		LBA Mode	Device LBA mode
		Block Mode	Device block mode
		PIO Mode	Device PIO mode
		Async DMA	Device Async DMA mode
		Ultra DMA	Device Ultra DMA mode
		S.M.A.R.T.	Device S.M.A.R.T. support
		Type	Not Installed **Auto** CDROM ARMD
		LBA/Large Mode	Disabled **Auto**
		Block (Multi-Sector Transfer) Mode	Disabled **Auto**
		PIO Mode	**Auto** 0 1 2 3 4

BIOS submenu	BIOS 2nd level submenu	Setting	Value
		DMA Mode	**Auto** SWDMA 0-2 MWDMA 0-2 UWDMA 0-5
		S.M.A.R.T.	**Auto** Disabled Enabled
		32Bit Data Transfer	**Disabled** Enabled

BIOS submenu	BIOS 2nd level submenu	Setting	Value
USB Configuration			
	USB Mass Storage Device Configuration		
		USB Mass Storage Reset Delay	10 Sec **20 Sec** 30 Sec 40 Sec
		Device #1	Only displayed if a device is detected. Includes a DeviceID string returned by the USB device.
		Emulation Type	**Auto** Floppy Forced FDD Hard Disk CDROM
		Device #n	Only displayed if a device is detected. Includes a DeviceID string returned by the USB device.

BIOS submenu	BIOS 2nd level submenu	Setting	Value
USB Configuration (cont'd)		Emulation Type	**Auto** Floppy Forced FDD Hard Disk CDROM

Appendix C

Safety, Regulatory, and Legal Information

- Safety information
- Legal and Regulatory Information

Important safety information

Your Gateway system is designed and tested to meet the latest standards for safety of information technology equipment. However, to ensure safe use of this product, it is important that the safety instructions marked on the product and in the documentation are followed.

Warning

Always follow these instructions to help guard against personal injury and damage to your Gateway system.

Setting up your system

- Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use.
- Do not use this product near water or a heat source such as a radiator.
- Set up the system on a stable work surface.
- The product should be operated only from the type of power source indicated on the rating label.
- If your computer has a voltage selector switch, make sure that the switch is in the proper position for your area. The voltage selector switch is set at the factory to the correct voltage.
- Openings in the computer case are provided for ventilation. Do not block or cover these openings. Make sure you provide adequate space, at least 6 inches (15 cm), around the system for ventilation when you set up your work area. Never insert objects of any kind into the computer ventilation openings.
- Some products are equipped with a three-wire power cord to make sure that the product is properly grounded when in use. The plug on this cord will fit only into a grounding-type outlet. This is a safety feature. If you are unable to insert the plug into an outlet, contact an electrician to install the appropriate outlet.
- If you use an extension cord with this system, make sure that the total ampere rating on the products plugged into the extension cord does not exceed the extension cord ampere rating.
- If your system is fitted with a TV Tuner, cable, or satellite receiver card, make sure that the antenna or cable system is electrically grounded to provide some protection against voltage surges and buildup of static charges.

Care during use

- Do not walk on the power cord or allow anything to rest on it.
- Do not spill anything on the system.
- Some products have a replaceable CMOS battery on the system board. There is a danger of explosion if the CMOS battery is replaced incorrectly. Replace the battery with the same or equivalent type recommended by the manufacturer. Dispose of batteries according to the manufacturer's instructions.
- When the computer is turned off, a small amount of electrical current still flows through the computer. To avoid electrical shock, always unplug all power cables and modem cables from the wall outlets before cleaning the system.

Warning

This unit has two power supplies. To remove power from all internal circuitry you must disconnect both power cords.

- Unplug the system from the wall outlet and refer servicing to qualified personnel if:
  - The power cord or plug is damaged.
  - Liquid has been spilled into the system.
  - The system does not operate properly when the operating instructions are followed.
  - The system was dropped or the cabinet is damaged.
  - The system performance changes.

Replacement parts and accessories

Use only replacement parts and accessories recommended by Gateway.

Warning

To reduce the risk of fire, use only No. 26 AWG or larger telecommunications line cord.

Important

Do not use Gateway products in areas classified as hazardous locations. Such areas include patient care areas of medical and dental facilities, oxygen-laden environments, or industrial facilities.

Regulatory compliance statements

United States of America

Federal Communications Commission (FCC)
Unintentional emitter per FCC Part 15

FCC Part 15 Class A Statement

The server is designated as complying with Class A requirements if it bares the following text on the rating label:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

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

Caution

Changes or modifications not expressly approved by Gateway could void the FCC compliance and negate your authority to operate the product.

Telecommunications per FCC part 68
(applicable to products fitted with USA modems)

Your modem complies with Part 68 of the Federal Communications Commission (FCC) rules. On the computer or modem card is a label that contains the FCC registration number and Ringer Equivalence Number (REN) for this device. If requested, this information must be provided to the telephone company.

An FCC-compliant telephone line cord with a modular plug is required for use with this device. The modem is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68-compliant. See installation instructions for details.

The Ringer Equivalence Number (REN) is used to determine the number of devices which may be connected to the telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

If this device causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. The telephone company may request that you disconnect the equipment until the problem is resolved.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of this equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

This equipment cannot be used on telephone company-provided coin service. Connection to party line service is subject to state tariffs. Contact the state public utility commission or public service commission for information.

When programming or making test calls to emergency numbers:

- Remain on the line and briefly explain to the dispatcher the reason for the call.
- Perform such activities in the off-peak hours such as early morning or late evenings.

The United States Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly contains, in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent, an identification of the business, other entity, or other individual sending the message, and the telephone number of the sending machine or such business, other entity, or individual. Refer to your fax communication software documentation for details on how to comply with the fax-branding requirement.

FCC declaration of conformity

Responsible party:

Gateway Companies, Inc.
610 Gateway Drive, North Sioux City, SD 57049
(605) 232-2000 Fax: (605) 232-2023

Product:

- Gateway 9415 Server

For unique identification of the product configuration, please submit the 10-digit serial number found on the product to the responsible party.

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

Caution

Changes or modifications not expressly approved by Gateway could void the FCC compliance and negate your authority to operate the product.

Canada

Industry Canada (IC)
Unintentional emitter per ICES-003

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par Industrie Canada.

Telecommunications per Industry Canada CS03 (for products fitted with an IC-compliant modem)

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operation, and safety requirements. The Department does not guarantee the equipment will operate to the users' satisfaction.

Before installing this equipment, users should make sure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the inside wiring associated with a single-line individual service may be extended by means of a certified connector assembly. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should make sure, for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Warning

To avoid electrical shock or equipment malfunction do not attempt to make electrical ground connections by yourself. Contact the appropriate inspection authority or an electrician, as appropriate.

The **Ringer Equivalence Number** (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Laser safety statement

All Gateway systems equipped with CD and DVD drives comply with the appropriate safety standards, including IEC 825. The laser devices in these components are classified as "Class 1 Laser Products" under a US Department of Health and Human Services (DHHS) Radiation Performance Standard. Should the unit ever need servicing, contact an authorized service location.

Warning

Use of controls or adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure. To prevent exposure to laser beams, do not try to open the enclosure of a CD or DVD drive.

California Proposition 65 Warning

Warning

This product contains chemicals, including lead, known to the State of California to cause cancer and/or birth defects or reproductive harm.

Notices

7565 Irvine Center Drive
Irvine, CA 92618-2930 USA

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