SGI™ Origin™ 300 User's Guide

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CONTRIBUTORS

Written by Olivier Clarinval

Illustrated by Dan Young

Production by Karen Jacobson

Contributions by James Oliver, Ron Naminski, William Menezes, Charles Skandalis, David Alexander, Vince Duperron, German Rico, Hao Pham, Matt Law, Cherry Nuque, Lyle Stoll, Samuel West, John Kelly, Jim Passint, Keith Schilling, David Diederichs.

Cover Design by Sarah Bolles, Sarah Bolles Design, and Dany Galgani, SGI Technical Publications

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About This Guide

This guide provides an overview, and describes how to set up and operate the SGI Origin 300 server in the following chapters:

- Chapter 1, “Overview of the SGI Origin 300 Server”
- Chapter 2, “Rack Mounting Instructions”
- Chapter 3, “Setting Up and Operating the Server”
- Chapter 4, “Installing Customer-Replaceable Components”
- Appendix A, “Technical Specifications”
- Appendix B, “System Controller Commands and Error Messages”
- Appendix C, “Regulatory Specifications”

An index completes this guide.

Audience

This guide is written for owners, system administrators, and users of the SGI Origin 300 server. It presumes general knowledge of computers and computer operations.

Your SGI system support engineer (SSE) should perform the addition or replacement of parts, cabling, and service of your SGI Origin 300 server, with the exception of the following items that you can perform yourself:

- Installing your system in a rack.
- Connecting a system console to your server.
- Using your system console to enter commands and perform system functions such as powering on and powering off, as described in this guide.
- Installing and replacing disk drives as described in this guide.
- Installing and removing PCI option cards as described in this guide.

- Installing and removing DIMMs as described in this guide.
- Using the On/Off, reset, and non-maskable interrupt (NMI) switches on the front panel of your server.

Information Sources

This section lists SGI documents that are relevant to the setup and use of the SGI Origin 300 server, as follows:

- *SGI Origin 300 User's Guide* (this manual) (hard copy shipped with system)
- *IRIX Admin Software Installation and Licensing Guide* (hard copy shipped with system)
- Other SGI documentation
- Man pages (online)
- *IRIX Release Notes* (on CD)

SGI Origin 300 User's Guide

This guide helps you to get acquainted with your server system, to mount it in a 19-inch rack, and to learn how to operate and monitor it. In addition, this guide contains information on installing and replacing disk drives, PCI option cards, and DIMMs.

Warning: For your safety and the protection of your server system, only the items designated in this guide as to be added or replaced by a customer can be added or replaced by customers. Contact your SGI system service engineer (SSE) to install any hardware items not designated in this guide as items to be added or replaced by customers.

IRIX Admin: Software Installation and Licensing Guide

IRIX Admin: Software Installation and Licensing Guide is the complete reference guide on using the installation program, *inst*, to install software. For information on using the Software Manager to install software, see the online *Personal System Administration Guide*.

Other SGI Documentation

You can access other SGI documentation in either of the following two ways:

- SGI manuals are available in various formats at:

  `http://techpubs.sgi.com`.

If you have an SGI workstation running IRIX software, you can use the online documentation package called *IRIS InSight*. Select **Online Books** from the Help toolchest. You will see bookshelves for end-user, developer, and administration manuals. Double-click the name of a book to open it. For descriptions of hard-copy manuals available for purchase, double-click **Documentation Catalog**.

Online Man Pages

Your system includes a set of IRIX man pages, formatted in the standard UNIX "man page" style. These are found online on the internal system disk (or CD-ROM) and are displayed using the `man` command. For example, to display the man page for the `Add_disk` command, enter the following command at a shell prompt:

```
man Add_disk
```

Important system configuration files and commands are documented on man pages. References in the documentation to these pages include the name of the command and the section number in which the command is found. For example, "Add_disk(1)" refers to the `Add_disk` command and indicates that it is found in section 1 of the IRIX reference.

For additional information about displaying reference pages using the `man` command, see `man(1)`.

In addition, the `apropos` command locates man pages based on keywords. For example, to display a list of man pages that describe disks, enter the following command at a shell prompt:

```
apropos disk
```

For information about setting up and using `apropos`, see `apropos(1)` and `makewhatis(1M)`.

Release Notes

You can view the release notes for various SGI products and software subsystems by using one of two utilities:

`relnotes` Text-based viewer for online release notes.

`grelnotes` Graphics viewer for online release notes.

To see a list of available release notes, type the following at a shell prompt:

```
relnotes
```

For more information, see the `relnotes(1)` and `grelnotes(1)` man pages.

Product Support

SGI provides a comprehensive product support and maintenance program for its products:

- If you are in North America and want support for your SGI-supported products, contact the Technical Assistance Center at 1-800-800-4SGI or your authorized service provider.
- If you are outside North America, contact the SGI subsidiary or authorized distributor in your country.

Reader Comments

If you have comments about the technical accuracy, content, or organization of this document, contact SGI. Be sure to include the title and document number of the manual with your comments. (Online, the document number is located in the front matter of the manual. In printed manuals, the document number is located at the bottom of each page.)

You can contact SGI in any of the following ways:

- Send e-mail to the following address:

  `techpubs@sgi.com`

- Use the Feedback option on the Technical Publications Library Web page:

  `http://techpubs.sgi.com`

- Contact your customer service representative and ask that an incident be filed in the SGI incident tracking system.
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  SGI
  1600 Amphitheatre Pkwy., M/S 535
  Mountain View, California 94043-1351

- Send a fax to the attention of "Technical Publications" at +1 650 932 0801.

SGI values your comments and will respond to them promptly.

Overview of the SGI Origin 300 Server

The SGI Origin 300 server is a 2U-high system consisting of two or four 64-bit 500-MHz MIPS R14000 processors with a secondary cache of 2 MB per processor. Each processor can execute two floating-point instructions per cycle, which supports a peak speed of 1.08 Gflop/sec. A maximum single system image (SSI) of 4, 6, or 8 CPUs is available by interconnecting two SGI Origin 300 chassis via a NUMAlink3 cable. Each SGI Origin 300 system has from 512 MB to 4 GB of local memory available on four memory slots. As much as 8 GB of memory is addressable when two SGI Origin 300 servers are connected via a NUMAlink3 cable.

The server houses up to two sled-mounted Ultra3 SCSI disk drives with peak data transfer speeds of up to 160 MB/sec between the disks and system memory. Two PCI 2.2-compliant option card slots are configured on one bus. The two Universal PCI slots support both 32- and 64-bit modes at 33 or 66 MHz. The server also supports two USB (universal serial bus) master ports, one USB slave port, one 10/100 Base-T Ethernet connector, three serial ports, real-time (RT) interrupt input and output ports, one external Ultra3 SCSI port, and one NUMAlink3 port. Also, a Crosstown2 connector connects the server to an InfiniteReality-series graphics pipeline.

For I/O expandability, the system can be connected to a peer-attached PCI expansion chassis. For storage expandability, the system can be connected to a 2U 8-disk Ultra3/160 SCSI JBOD SGI TP900 system.

This chapter provides an overview of the server features as follows:

Chassis Features

The SGI Origin 300 server is a multiprocessor system that consists of one or two chassis. A two-chassis system uses a NUMAlink3 cable to interconnect the two compute nodes. The server is available in rack-mountable configuration, and can be mounted in an industry-standard 19-inch rack.

Figure 1-1 shows a front and side view of an SGI Origin 300 server.

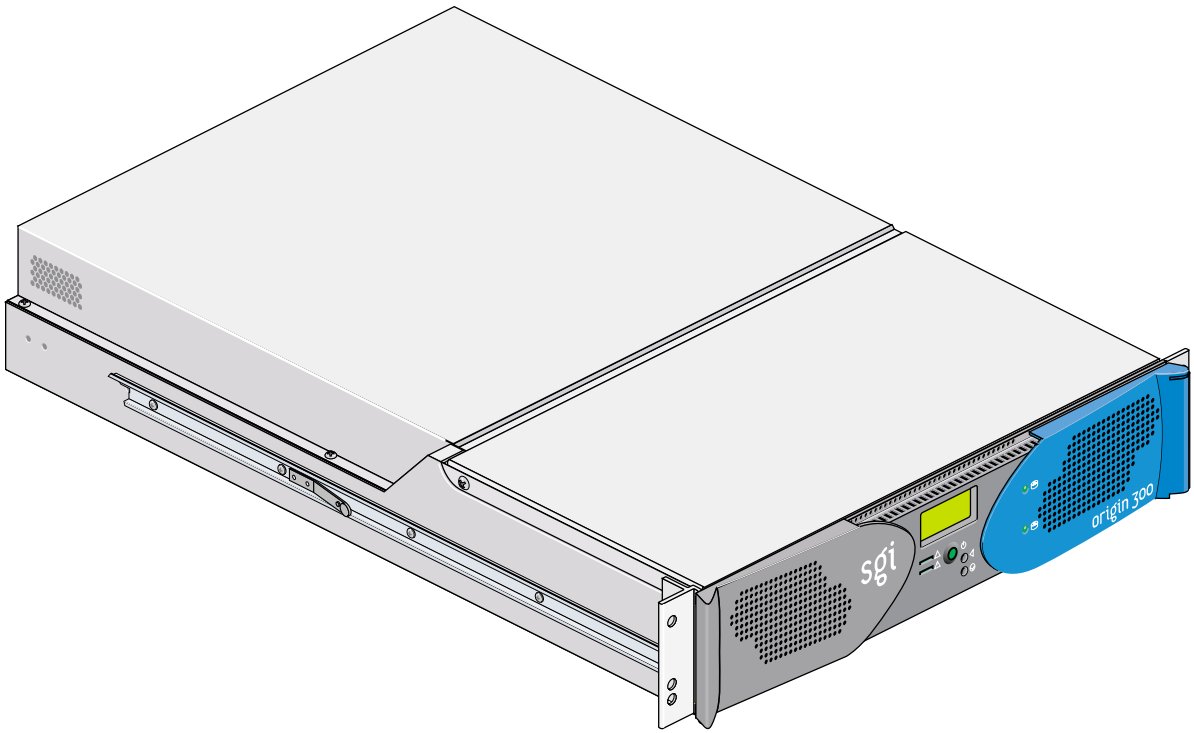

Figure 1-1 Front and Side View of an SGI Origin 300 Server

Figure 1-2 shows the rear and side view of an SGI Origin 300 server.

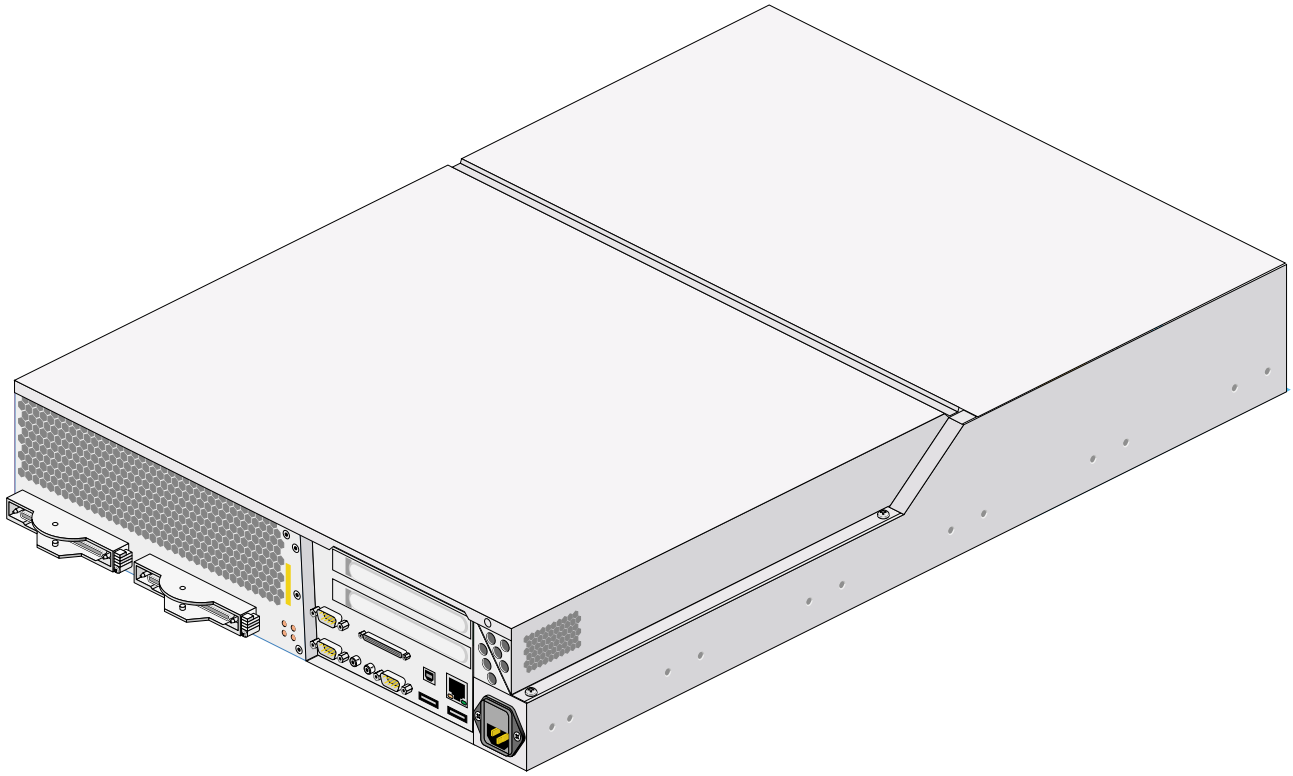

Figure 1-2 Rear and Side View of an SGI Origin 300 Server

Physical and Environmental Specifications

Table 1-1 shows the physical and environmental specifications for the SGI Origin 300 server system. See Appendix A for complete technical specifications.

Table 1-1 Physical and Environmental Specifications

Height	3.46 inches (8.8 cm)
Width	19 inches (48.3 cm) (front panel width) 17.07 inches (43.36 cm) (chassis width)
Depth	26 inches (66 cm) (without bezel) 26.8 inches (68 cm) (with bezel)
Weight	36 lbs (16.4 kg)
Temperature, operating	+5 ˚C (+41 ˚F) to +35 ˚C (+95 ˚F) (up to 1500 m / 5000 ft) +5 ˚C (+41 ˚F) to +30 ˚C (+86 ˚F) (1500 m to 3000 m / 5000 ft to 10000 ft)
Temperature, non-operating	-40 ˚C (-40 ˚F) to +60 ˚C (+140 ˚F)
Humidity	10% to 95% RH, non-condensing
Altitude	Sea level to 40,000 ft (non-operating) Sea level to 10,000 ft (3000 m) (operating)
Noise	50 dB(A) maximum
Heat dissipation	1,194 Btu/hr maximum

Chassis Front Controls and Indicators

This section describes the front controls and indicators of the SGI Origin 300 server, as shown in Figure 1-3.

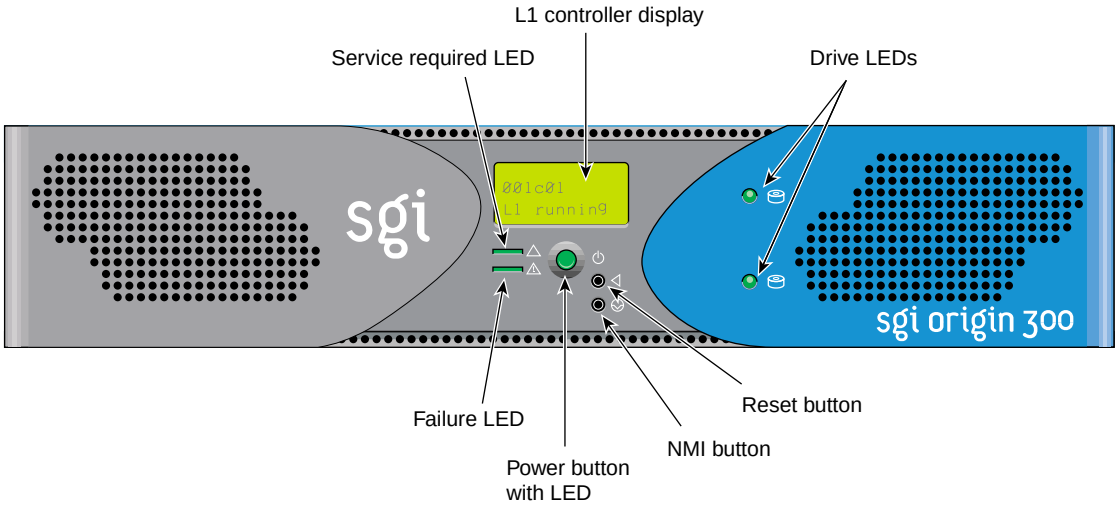

Figure 1-3 Front Controls and Indicators

The front panel of the server has the following items:

- **L1 controller display.** This liquid crystal display (LCD) for the L1 controller generates status and error messages.

  Note: See Appendix B for more information on the L1 controller.

- **Power button with LED**. Press this button to turn on the internal components. Alternatively, you can turn on the internal components at a system console. The LED lights green when the internal components are on and turns off when they are off.
- **Reset button**. Press this button to reset the internal processors and ASICs. The reset will cause a memory loss. (See the non-maskable interrupt [NMI] to perform a reset without losing memory.)

- **Non-maskable interrupt (NMI) button**. Press this button to reset the internal processors and ASICs without losing memory. Register data and memory are stored in a `/var/adm/crash` file.
- **Service required LED**. This LED lights yellow to indicate that an item has failed or is not operating properly, but the system is still operating.
- **Failure LED**. This LED lights red to indicate that a system failure has occurred and the system is down.
- **Drive LEDs**. This LED light green to indicate drive activity.

Rear Panel I/O Ports and Features

This section describes the rear panel I/O ports and features of the SGI Origin 300 server, as shown in Figure 1-4.

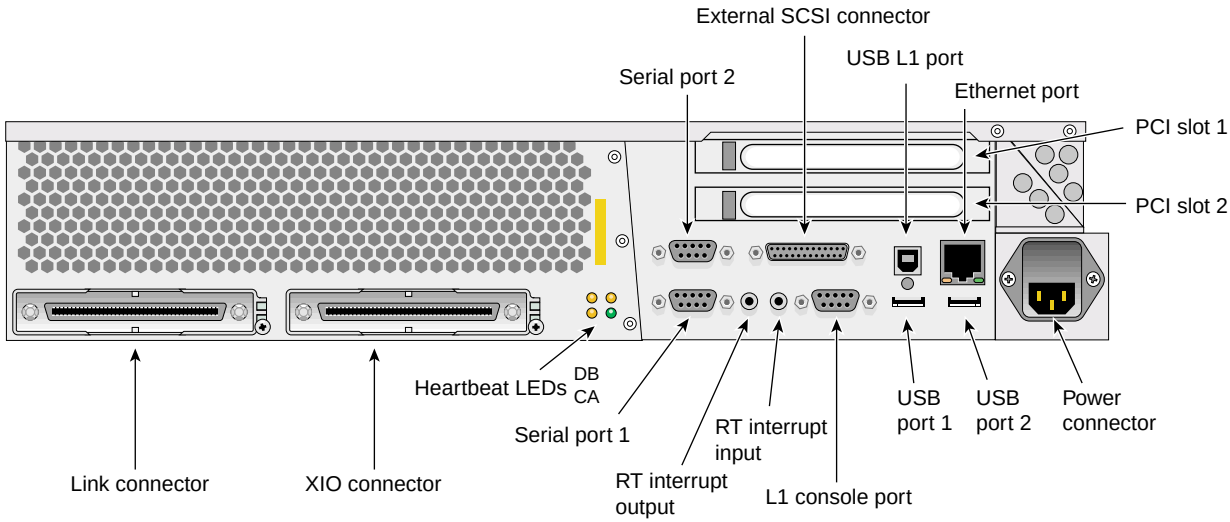

Figure 1-4 Rear I/O Ports and Features

The rear panel of the server has the following items:

- **Power connector.** This connects the connector to an AC power outlet.
- **LINK connector.** This NUMAlink connector connects the server to another SGI Origin 300 server or to a peer-attached PCI expansion chassis. This connection is made with a NUMAlink3 cable at 1.6 GB/sec in each direction.
- **XIO connector**. This Crosstown2 connector connects an SGI Origin 300 server to an InfiniteReality-series graphics pipeline. This connection is made with a NUMAlink3 cable at 1.2 GB/sec in each direction.
- **L1 console port.** This DB-9 RS-232 port (console and diagnostic port) connects the server's L1 controller to a system console, or to a system running the SGIconsole software.

- **USB L1 port.** This universal serial bus (USB) connector connects the server's L1 controller to a system console.
- **PCI slots 1 and 2.** These are used to install and replace PCI cards on your server system. The two PCI 2.2-compliant option card slots are configured on one bus. The PCI bus supports both 32- and 64-bit modes at 33 or 66 MHz. See the SGI Supportfolio online home page at `http://support.sgi.com` for an updated list of supported PCI cards.
- **Serial ports 1 and 2.** These DB-9 RS-232 or RS-422 connectors can be used as COM ports to connect modems or other serial devices.
- **USB ports 1 and 2.** These can be used to connect auxiliary equipment such as a keyboard or a mouse.
- **RT interrupt input and output.** These real-time interrupts are used by the graphics cards to keep the graphics synchronized and in time with each other.
- **Ethernet port.** This autonegotiating 10-Base-T or 100-Base-TX twisted-pair Ethernet port connects the server to an Ethernet network.
- **External SCSI connector.** This 68-pin VHDCI external SCSI port connects to SCSI devices. See the SGI Supportfolio online home page at `http://support.sgi.com` for an updated list of supported SCSI devices.
- **Heartbeat LEDs (4).** These LEDs, one for each processor (A, B, C, and D), are controlled by the hub ASIC.

Internal Components and Features

The SGI Origin 300 server internal components and features are described in the following sections:

IP45 System Board

The IP45 system board houses these components:

- **Two or four MIPS R14000 processors** (2-MB L2 cache per processor), with **one voltage regulator module (VRM)**.
- **Four dual-inline memory module (DIMM) slots** that are organized as one bank of memory per two DIMM slots (two banks total), configurable from 512 MB to 4 GB of main memory. See "Dual-inline Memory Modules (DIMMs)" on page 10 for more information on DIMMs.
- **Bedrock memory controller**. The bedrock (or hub ASIC) allows communication between the processors, memory, and I/O devices.
- **Serial ID EEPROM** that contains component information.
- **L1 controller logic** that monitors and controls the environment of the server (for example, fan speed, operating temperature, and system LEDs). See Appendix B for more information on the L1 controller.
- **Three 2.5 VDC, 30 A VRMs** (VRMs 1 through 3) that convert the incoming voltages to the voltage levels required by the components.
- **Light-emitting diodes (LEDs)** on the rear panel include the following:
  - Two NUMAlink3 LEDs, controlled by the L1 controller

– Four heartbeat LEDs, controlled by the hub ASIC

Note: Ports and LEDs on the rear panel are described in detail in "Rear Panel I/O Ports and Features" on page 7.

Dual-inline Memory Modules (DIMMs)

Each SGI Origin 300 system has from 512 MB to 4 GB of local memory, which includes main memory and directory memory for cache coherence.

Local memory can consist of two to four banks, which are referred to as banks 0, 1, 2, and 3 as shown in Figure 1-5. The four banks are arranged as two DIMM pairs; DIMM pair 0 and DIMM pair 1. Pair 0 consists of banks 0 and 1; Pair 1 consists of banks 2 and 3. Each pair of banks consists of two dual-inline memory modules (DIMMs) that contain double data rate synchronous dynamic random access memory (DDR SDRAM chips). Memory is increased or decreased in two-DIMM increments only. The two DIMMs that make up a pair of banks must be the same memory size; however, each pair of DIMMs can be a different memory size. Figure 1-5 shows the layout of the memory banks.

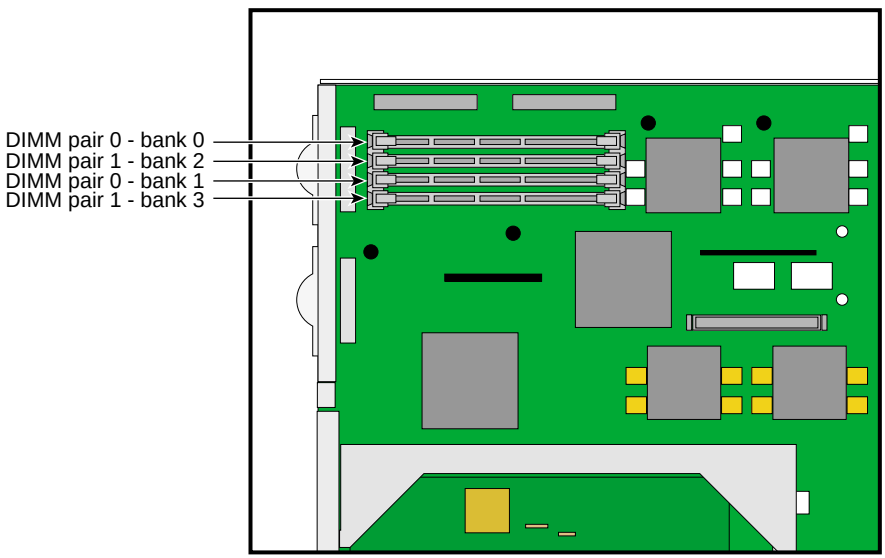

Figure 1-5 Memory Banks Layout

Note: The DIMMs used in the SGI Origin 300 server are not compatible with the DIMMs used in Origin 200, Origin 2000, Onyx2, or Octane systems.

The SGI Origin 300 server supports three types of memory kits:

- 512-MB kit with integrated directory memory.
- 1-GB kit with integrated directory memory.
- 2-GB kit with premium integrated directory memory.

I/O-8 Board Assembly

The I/O-8 board assembly consists of a main I/O-8 board and an I/O-8 daughter card board. The assembly provides I/O interface functions, the I/O connectors to the system back panel, and the L1 system controller functions.

The I/O-8 board assembly has the following connectors at the bulkhead:

- One 68-pin VHDCI external SCSI connector
- One 10-Base-T/100-Base-Tx auto-selecting Ethernet connector
- One DB9 RS-232 L1 console connector
- Two USB 4-pin master ports
- One USB 4-pin slave port
- Two RS-232 or RS-422 115.2 Kbaud-capable DB9 async ports with modem control
- One real-time (RT) interrupt output
- One RT interrupt input

Note: Ports and LEDs on the rear panel are described in detail in “Rear Panel I/O Ports and Features” on page 7.

PCI Riser Board

The PCI Riser card provides a connection between the IP45 system board and the I/O-8 board assembly, while also providing two PCI card slots. The PCI Riser card, which plugs into a connector on the IP45 system board, has two 64-bit universal PCI connectors, a third non-standard PCI connector to connect the I/O-8 board assembly, and one 50-pin AMP connector into which the I/O-8 board is plugged. See the SGI Supportfolio online home page at `http://support.sgi.com` for a list of supported PCI option cards.

SCSI Backplane Board and Drive Options

The SCSI backplane provides a connection between the internal SCSI interface on the I/O-8 board and up to 2 disk drives. The SCSI backplane supports Ultra3 SCSI LVD disks with a peak transfer rate of 160 MB/s. See the SGI Supportfolio online home page at `http://support.sgi.com` for an updated list of supported drives.

The chassis accommodates up to two sled-mounted 3.5-inch by 1.0-inch Ultra3 SCSI LVD drives. The backplane supports 10,000 RPM and 15,000 RPM drives.

Power Supply

The SGI Origin 300 server uses a non-redundant modified ATX power supply with an input of 110/220V AC (autosensing) and a maximum output of 460W DC (3.3/5/12V). The DC power from the power supply is delivered via a cable harness, which has multiple connectors for power delivery.

Cooling

Cooling is provided by four fans in an N+1 redundant configuration plus the fan in the power supply. The direction of the air flow is front to back through the enclosure.

Storage Expandability

For storage expandability, the SGI Origin 300 server can be connected to a 2U 8-disk Ultra3/160 SCSI JBOD TP900 system. See *SGI Total Performance 900 Storage System User's Guide* (007-4428-001) for information on the SGI TP900 storage system.

I/O Expandability

For I/O expandability, the SGI Origin 300 server can be connected to a PCI expansion chassis via the NUMAlink3 port.

SGI Origin 300 Feature Summary

Table 1-2 summarizes the general features of the SGI Origin 300 server.

Table 1-2 General Features of the SGI Origin 300 Server

Feature	One-Chassis System	Two-Chassis System
MIPS RISC R14000 CPUs	2 or 4	4, 6, or 8
Memory	512 MB to 4 GB	1 GB to 8 GB
Expansion slots	Two 32- or 64-bit (33- or 66-MHz) PCI slots	Four 32- or 64-bit (33- or 66-MHz) PCI slots
Serial ports	Two DB-9 RS-232 or RS-422	Four DB-9 RS-232 or RS-422
Ethernet	One 10-Base-T and 100-Base-TX	Two 10-Base-T and 100-Base-TX
SCSI channels (internal)	One Ultra3 SCSI, 160 MB/sec	Two Ultra3 SCSI, 160 MB/sec
SCSI channels (external)	One Ultra3 SCSI (VHDCI)	Two Ultra3 SCSI (VHDCI)
3.5-inch drive bays	Two	Four
USB ports	Two master, one slave	Four master, two slave
RT interrupt input	One	Two
RT interrupt output	One	Two
L1 console port	One	One
NUMAlink3 port	One	N/A
XIO port	One	Two

Rack Mounting Instructions

This chapter provides information on mounting the SGI Origin 300 server in an SGI 19-inch rack. The server rack-mounting kit also allows the server to be mounted in an industry-standard 19-inch rack. The following topics are covered:

Warning: To avoid personal injury when unpacking the server, two people should lift it off the shipping pallet, move the server from one location to another, or install it in a rack.

Warning: Service personnel could be seriously injured and equipment could be damaged if the rack topples over. Make sure that only one rack-mounted SGI Origin 300 server at a time is extended forward on slides. Install all equipment in the rack from the lowest available position. The rack must be anchored to the floor with stabilizing feet to enhance stability.

Unpacking and Inspecting the Server

Remove the server from the packaging container and check that all accessories are included. Inspect the packaging container for evidence of mishandling during transit. If the packaging container is damaged, photograph it for reference. After removing the contents, keep the damaged container and the packing materials.

Inspect the server and accessories for damage. If the contents appear damaged, file a damage claim with the carrier immediately. For installations under U.S. auspices, notify the Customer Support Call Center (CSCC) for any missing, incorrect, or damaged items. Elsewhere, follow local policies.

Determining Space Requirements

Table 2-1 specifies the space requirements for the SGI Origin 300 server when installed in a 19-inch rack.

Table 2-1 SGI Origin 300 Server Space Requirements

Height	3.46 inches (8.8 cm)
Width	19 inches (48.3 cm)
Depth	27 inches (68.6 cm)
Weight	36 lbs (16.4 kg)
Required front clearance	8.25 inches
Required rear clearance	10 inches
Required side clearance	6 inches (right side) No clearance requirement for left side

Mounting-hole Pattern of Rack Vertical Rails

The four vertical rails of the SGI rack contain mounting holes arranged as shown in Figure 2-1.

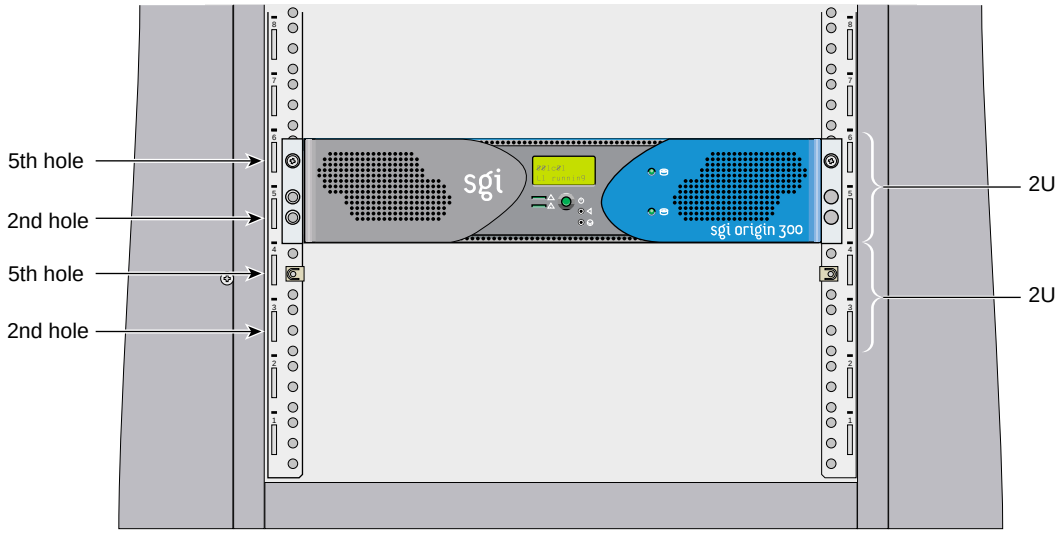

Figure 2-1 Mounting-hole Pattern of Rack Vertical Rails

The system occupies 2U in the rack. Count the U positions and hole numbers from the bottom to the top.

Note: The unit of measurement used in this document is "U" (1U = 1.75 inches or 44.5 mm). The total sum of the heights of all components in the rack measured in "U" cannot exceed the height of the rack. For more information, see the rack's documentation.

The distance from the center of any hole to the center of the sixth hole above it is equivalent to 2U.

When installing components, you must start your measurement from the center of the two holes with closer spacing. Otherwise, the screw holes on the component may not match with those on the rack.

Checking the Slide Rail Kit

The hardware detailed in Table 2-2 is used in the mounting of the SGI Origin 300 server in a 19-inch rack.

Table 2-2 Rack Mounting Hardware Kit

Hardware Type	Qty	Usage
10-32 x 3/8″ screw	16	Secures the slides to the rack rails (8). Secures the slides to their mounting brackets (8).
10-32 nut	8	Secures the slides to their mounting brackets (4).
10-32 shoulder washer	8	Secures the slides to the rack rail.
10-32 barnuts	4	Provides threaded holes for fastening the slides to the rack rails.
10-24 x 1/4″ screw	10	Secures the chassis rails to the system.
10-32 caged U-nut	2	Provides a threaded hole for fastening the server front panel to the rack rails.
10-32 x 1/2″ screw	2	Fastens the server front panel to the U-nut.
Slide (includes chassis rail)	2	Allows the server chassis to slide out of rack for access. (The left and right slides are identical.)
Rear mounting bracket	2	Mounts slide to the rear rack rails. (The left and right brackets are identical.)

Note: The rack-mounting kit also contains short rear mounting brackets. You can disregard them, as only the long rear mounting brackets are used in this installation.

Preparing the Slide Rail Assemblies

Follow these steps to disassemble the slide rail assemblies:

1. Remove the two slide rails and the rear mounting brackets from the shipping container.
2. Extend each slide out until the safety latch snaps into place.
3. Press the safety latch and remove the chassis rail from the slide rail, as shown in Figure 2-2.

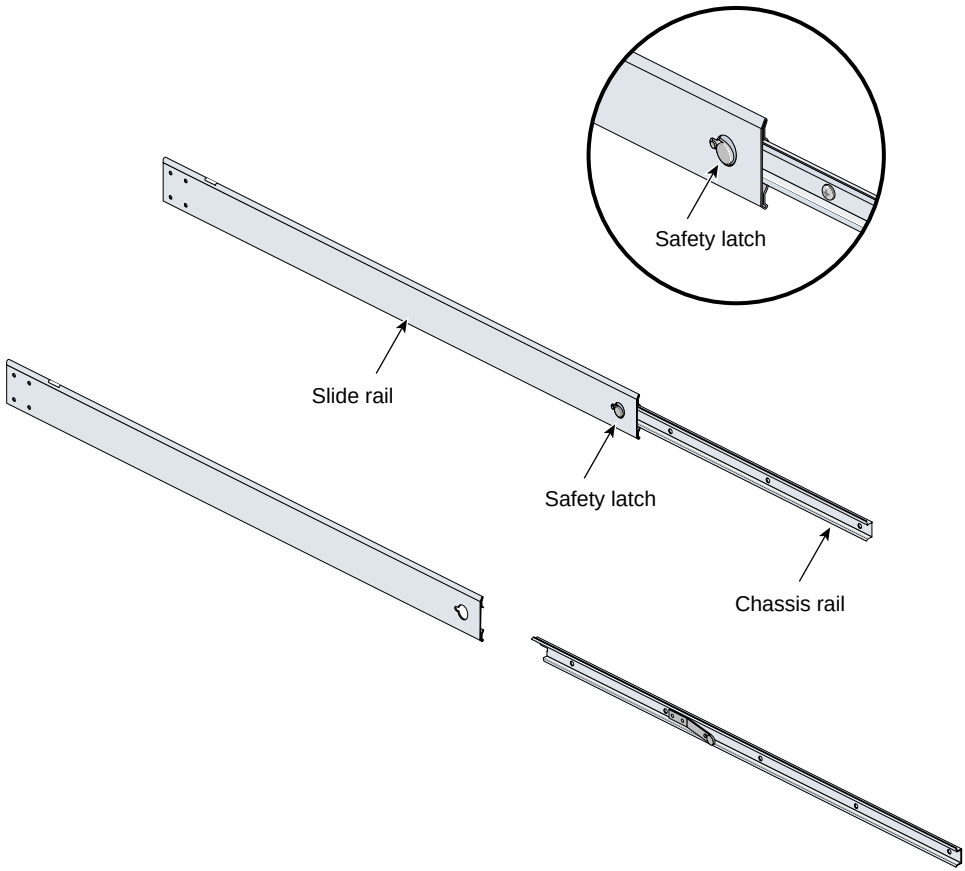

Figure 2-2 Removing the Chassis Rail from the Slide Rail

4. Take one of the slides and identify the back of the slide where the rear mounting bracket is to be attached (see Figure 2-3).
5. Take one of the mounting brackets and place it on the slide as shown in Figure 2-3. Adjust the position of the mounting bracket on the slide according to the depth of the rack.
6. Insert four screws through the assembly as shown in Figure 2-3, and tighten them loosely with nuts.

Note: Depending on the depth of the rack you are using, you may find that there is room for only two screws to attach the bracket to the slide. In that case, it is acceptable to use only two screws and nuts per slide-bracket assembly.

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7. Repeat steps 4 through 6 to attach the mounting bracket on the other slide.

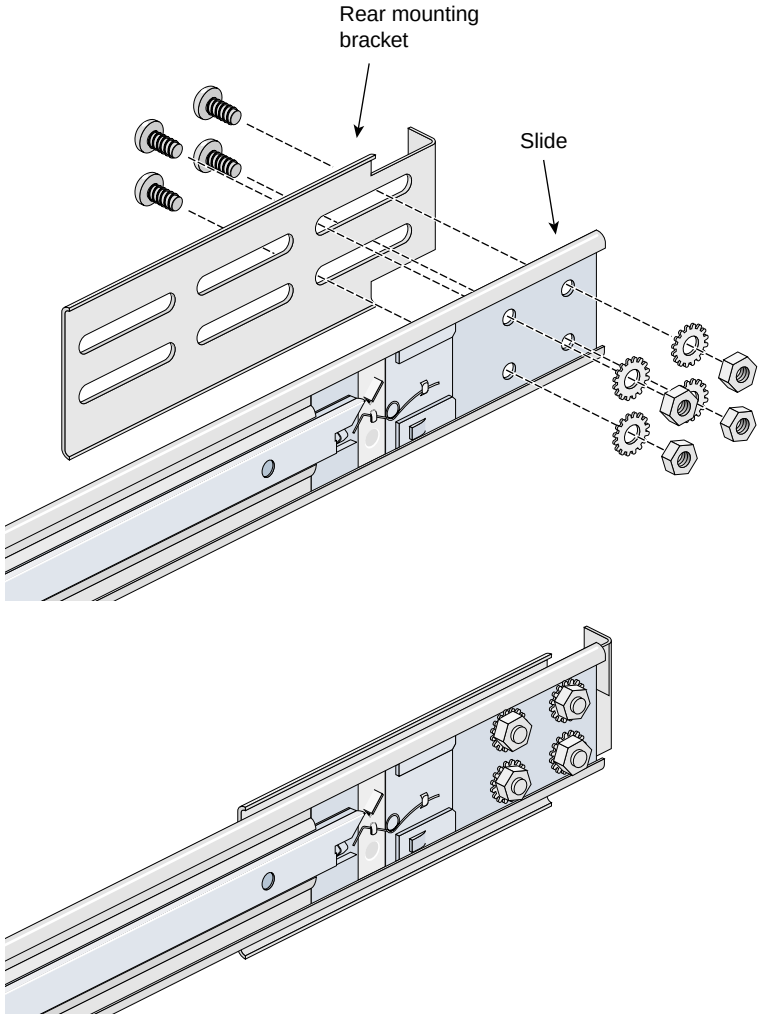

Figure 2-3 Attaching the Rear Mounting Bracket to the Slide

Preparing the Server

Follow these steps to attach the chassis rails to the server:

1. Place the server on a flat stable surface.
2. Using five 10-24 x 1/4″ screws, attach one of the chassis rails to the right side of the server chassis. Ensure that the rail is installed in the correct direction (see Figure 2-4).

   Caution: Use only the included 1/4-inch (0.64 cm) length screws. Using longer screws will damage internal components in the server.

3. Repeat step 2 to mount the second rail to the left side of the server chassis.

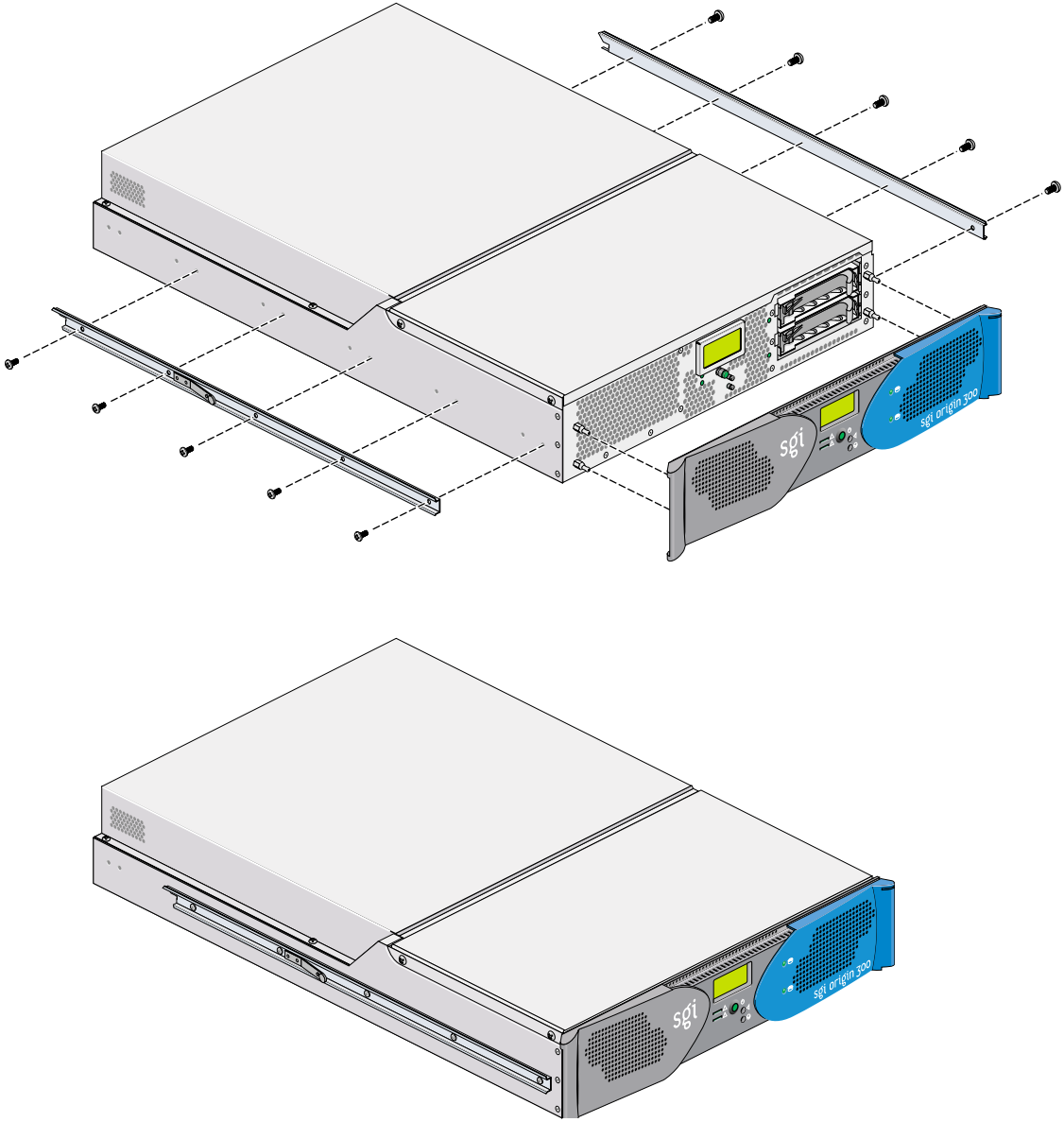

Figure 2-4 Attaching Rails to the Server Chassis

Attaching the Slide Rail Assemblies to the Rack

Follow these steps to attach the slide rail assemblies to the rack:

Tip: To make sure you install the rails level, carefully count the holes on the rack rails from the bottom of the rack on each side.

1. Remove eight 10-32 x 3/8" screws, the eight shoulder washers, and the four barnuts from the kit.

   Note: The shoulder washers are used to center the screws in the vertical rack rail holes. Depending on the size of the rack rail holes, shoulder washers may not be required.

2. Take one of the barnuts and place it inside the rack, on the second and third holes from the bottom of the selected 2U space (see Figure 2-5).

   Note: The holes in the barnuts are not centered. The barnuts need to be placed in such a way that the holes are closest to the inside edge of the rack rails. See Figure 2-5.

3. Insert two screws with shoulder washers through the rack rail to hold the barnut in place. The barnut should not be tightened at this point.
4. Repeat steps 2 and 3 to place the remaining three barnuts on the other three rack rails.

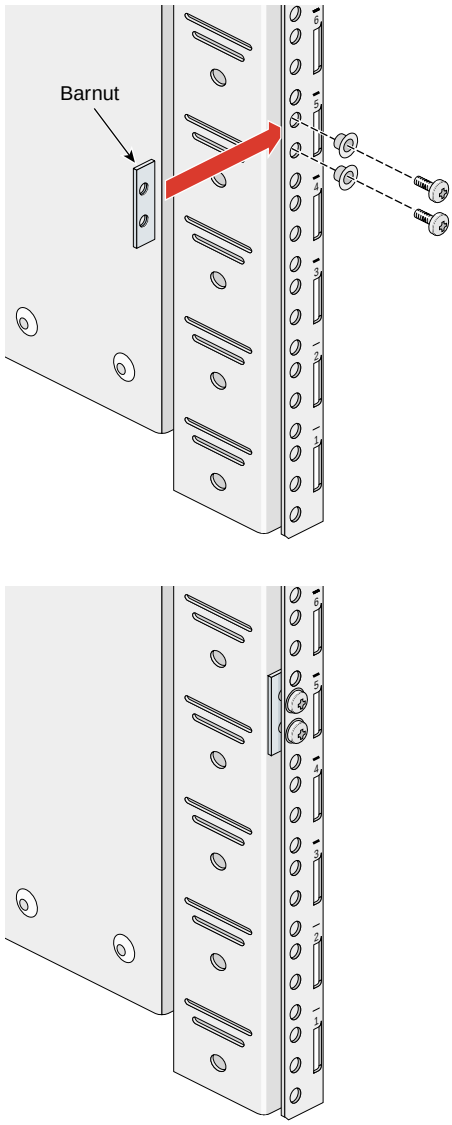

Figure 2-5 Placing the Barnuts on the Rack Rails

5. Take one of the slide rail assemblies and insert the front and rear brackets between the rack rails and the barnuts, as shown in Figure 2-6.
6. Tighten the screws on the front and rear rails. Do not tighten firmly at this point, as all screws will be firmly tightened once the chassis is installed in the rack.
7. Repeat steps 5 and 6 to attach the second slide assembly to the other side of the rack.

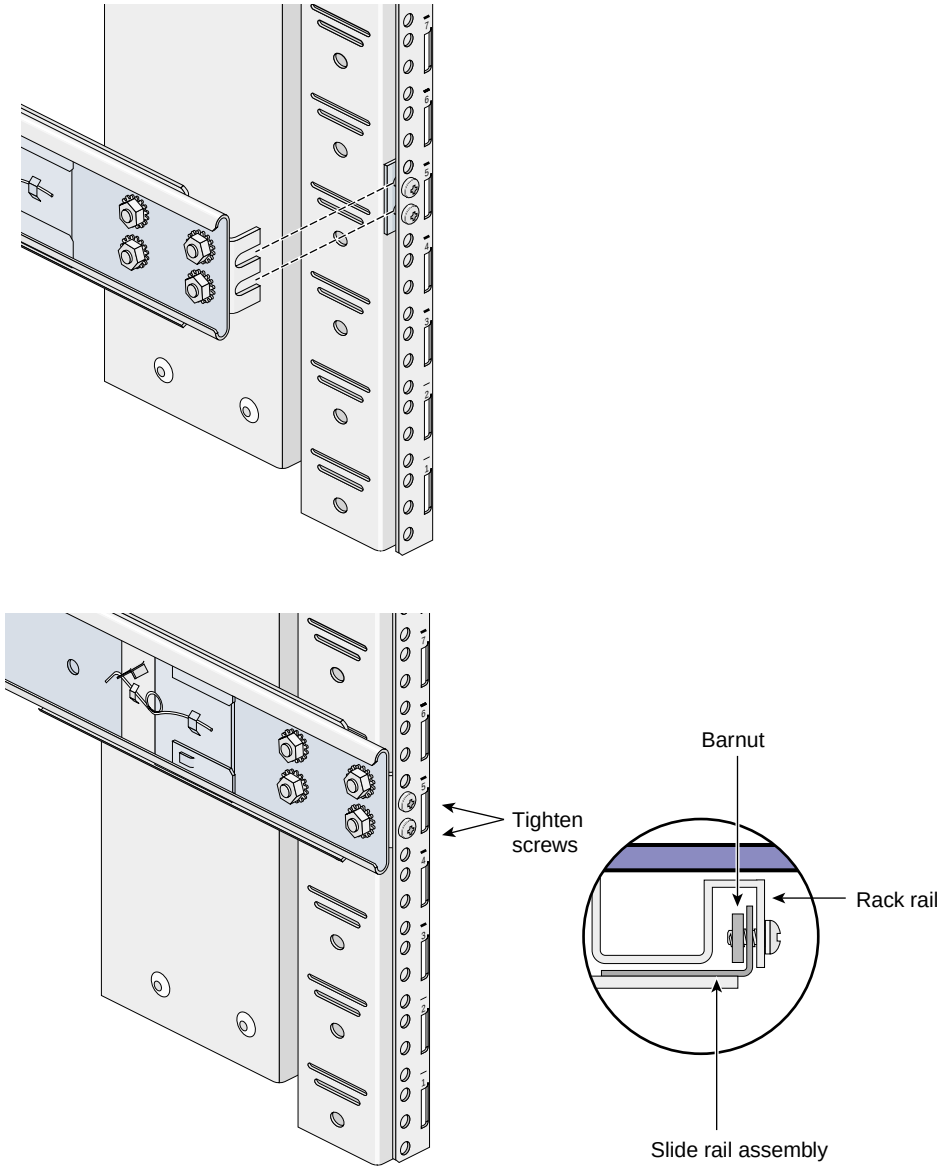

Figure 2-6 Attaching the Slide Rail Assemblies to the Rack

Installing Caged U-nuts in Rack Rails

Caged U-nuts are used to secure systems to the vertical rails in the rack. To snap the two caged U-nuts into place, slide one caged U-nut over the fifth hole from the bottom of the selected 2U space on each of the front rails. (Snap one on the right front rail, and snap the other on the left front rail). See Figure 2-7 for details.

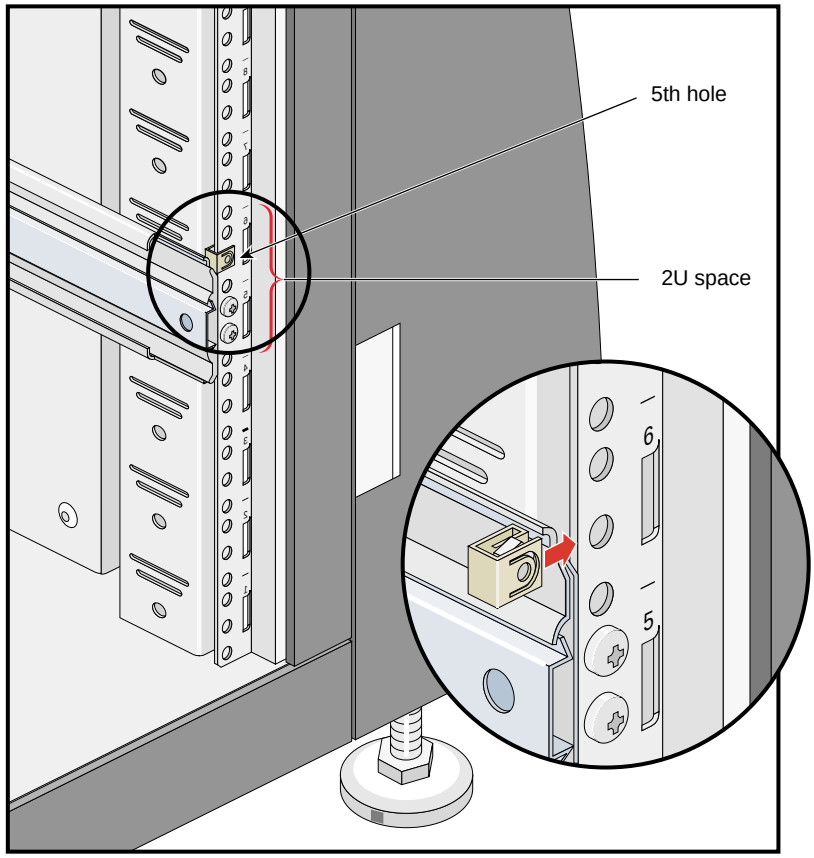

Figure 2-7 Installing Caged U-nuts in Rack Rails

Installing the Server in the Rack

Follow these steps to install the server in the rack:

1. Fully extend both the left and right slides from the rack until they lock into place when fully extended.
2. With one person holding each side, align the chassis rails with the slide rails on each side, and slide the server into the rack until the server is stopped by the safety latches.
3. Press the safety latches on both sides of the chassis to fully seat the chassis rails into the slide rails (see Figure 2-8).
4. Firmly fasten all screws and nuts (the eight screws that secure the slides to the rack rails, and the four nuts that secure the slides to their mounting brackets).

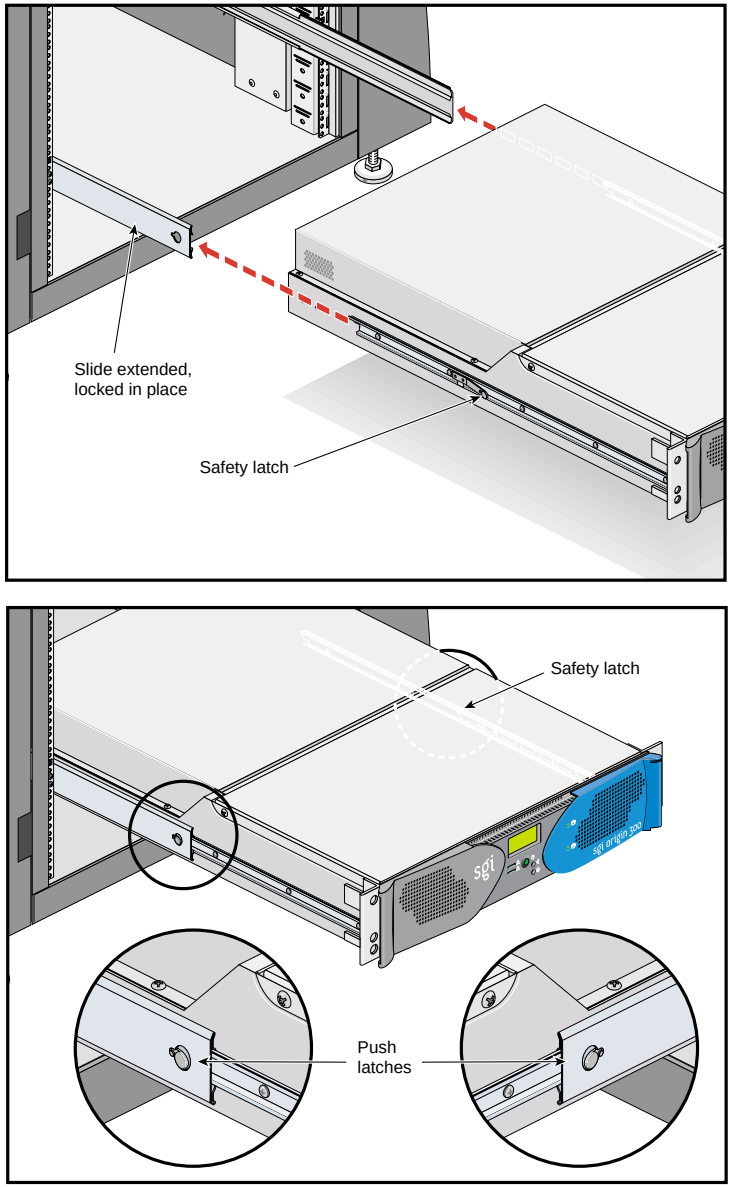

Figure 2-8 Pressing the Safety Latches

5. Place a 10-32 x 1/2″ screw in the top hole of each handle and tighten the screws to secure the server to the rack (see Figure 2-9).

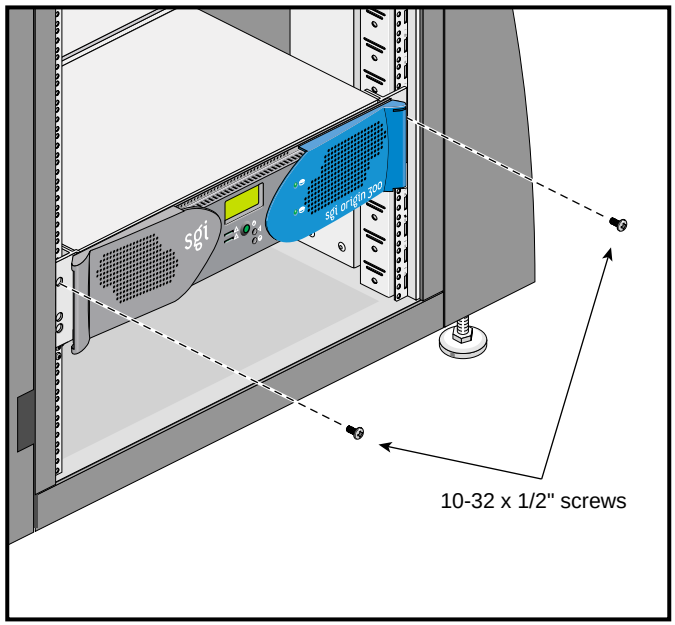

Figure 2-9 Securing the Server to the Rack

Adjusting the Position of the Rack-Mounted Server

Once the server is installed into the rack, the position of the server can be adjusted upward, and toward the left or right side. To adjust the position of the server, loosen the front mounting screws of the slides and hold the system by its ears in the desired position, and then tighten the slide front mounting screws.

Caution: Do not lift the system by its bezel; it is not made to handle the weight of the system.

Removing the Server from the Rack

Follow these steps to remove the server from the rack:

1. Pull the server out until it is stopped by the safety latches.
2. With one person holding each side, release the safety latches on both sides of the server and pull the chassis out of the slide rail assembly (see Figure 2-10).
3. Place the server on a flat stable surface.

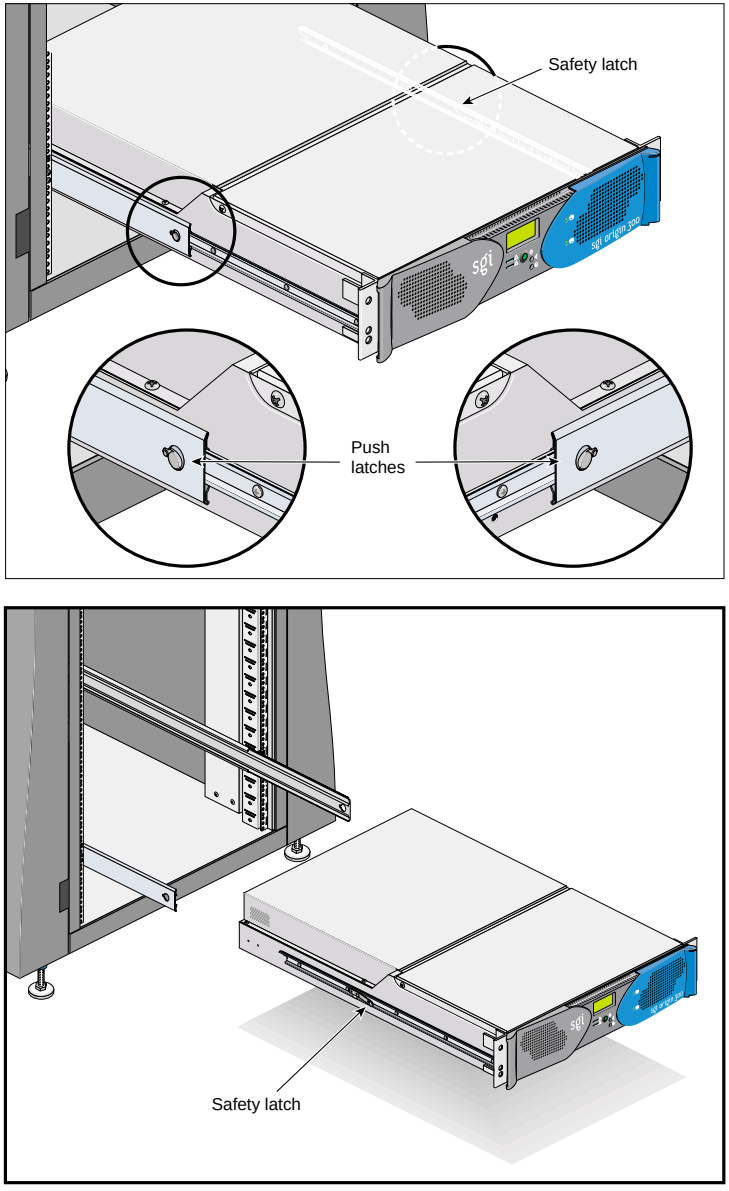

Figure 2-10 Releasing the Safety Latches

4. To push the slides back into the rack, release the slide latches as shown in Figure 2-11.

Note: Before reinstalling an SGI Origin 300 server into the rack, you need to fully extend the slides from the rack until they lock into place.

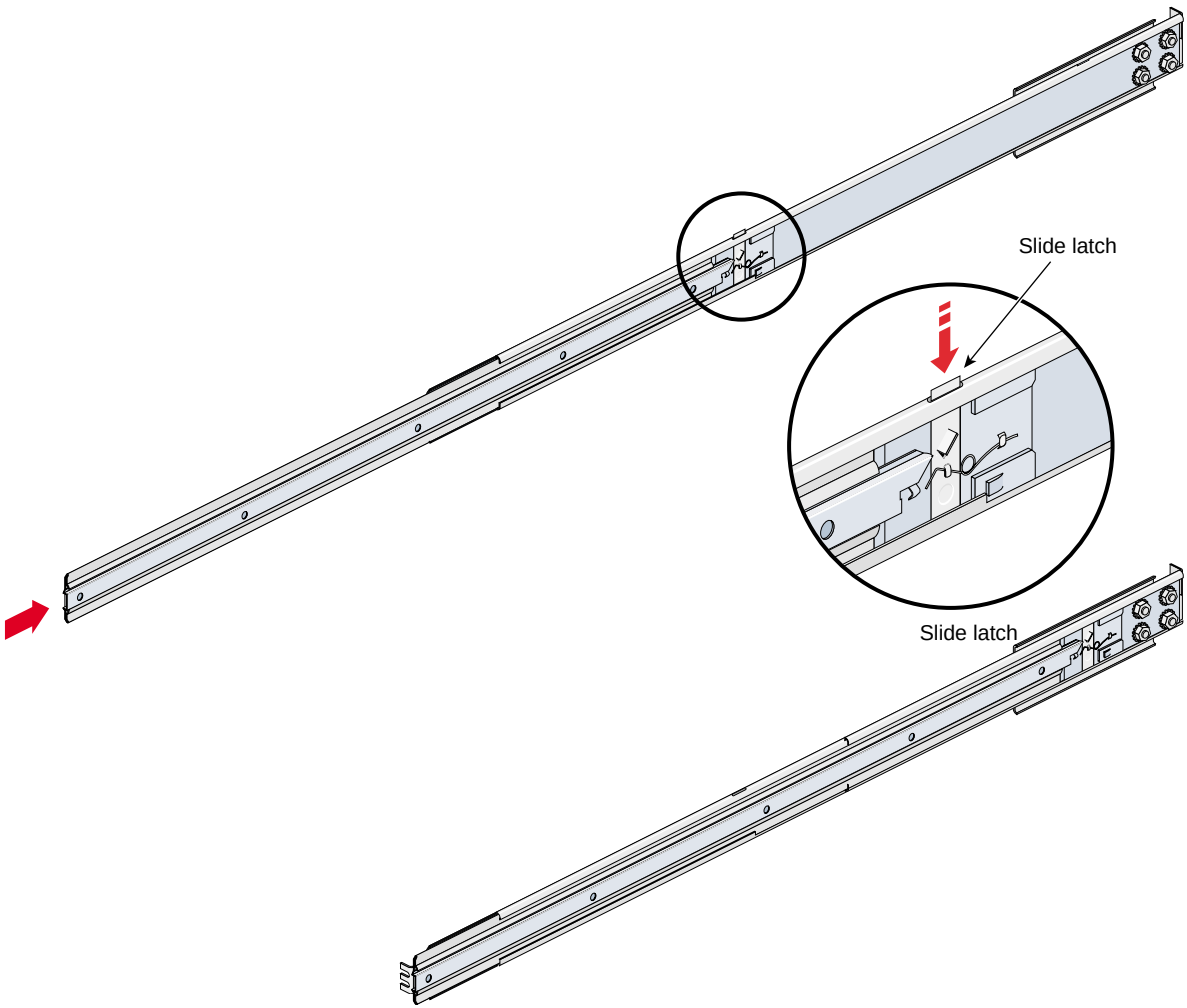

Figure 2-11 Releasing the Slide Latches

Setting Up and Operating the Server

This chapter describes how to set up and operate an SGI Origin 300 system in the following sections:

Before setting up your server, see *SGI Origin 300 site Planning Guide* (007-4431-001) for electrical, thermal, and other pre-installation requirements.

Setting the Server on a Table Top

If you choose to operate your server set on a table top, you need to install five self-adhesive feet supplied with the server. Follow these steps to install the feet:

1. Place the server upside down on a flat stable surface.
2. Peel off the protective film from the feet and place them on the five circular marks shown in Figure 3-1.

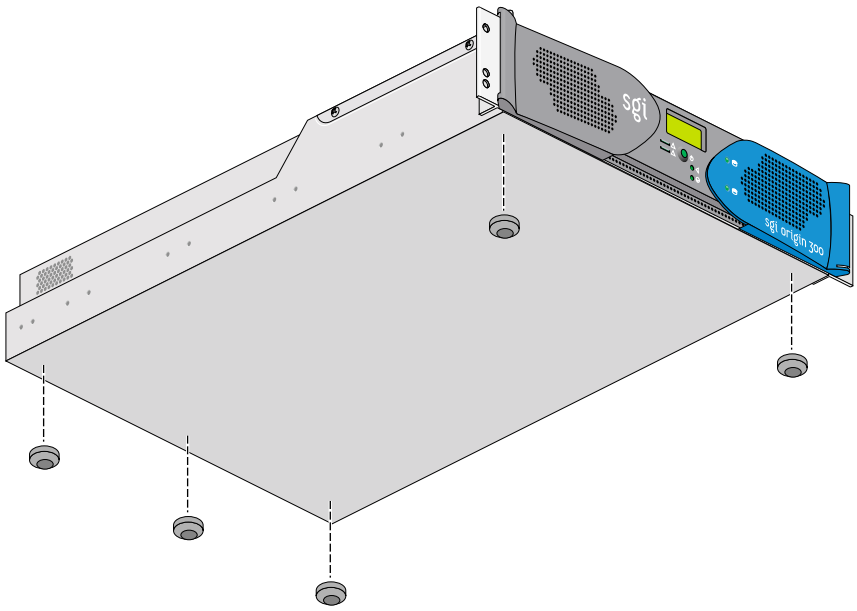

Figure 3-1 Location of Table-mounting Feet

Note: If the server is mounted in a rack at a later date, the feet will have to be removed. See Chapter 2 for rack-mounting instructions.

Connecting the System Console

This section explains how to attach and establish a connection between a system console and an SGI Origin 300 server. This connection enables you to do the following:

- Start an IRIX console session to set up networking and other configuration parameters.
- Monitor your server system by reading status and error message information generated by the L1 controller.
- Enter L1 controller commands to monitor or change particular server system functions. See Appendix B for descriptions of the L1 controller commands you can use.
- Power on or power off your server system.

Attaching the System Console

An SGI Origin 300 server system requires an ASCII terminal and keyboard. This terminal can be a customer-supplied terminal and keyboard or an optional system running the SGIconsole software. If you connect a customer-supplied dumb terminal, ensure that you set the parameters of the terminal as follows:

- 38,400 bps
- No parity
- No hardware flow control (RTS/CTS)
- 8 bits
- 1 stop bit

You have the following two options for connecting an SGI Origin 300 server to a console:

- You can connect a dumb terminal or a system running the SGIconsole software to the L1 console port connector. See Figure 3-2 for the location of the console port connector. The console should be running in dumb-terminal-emulator mode.

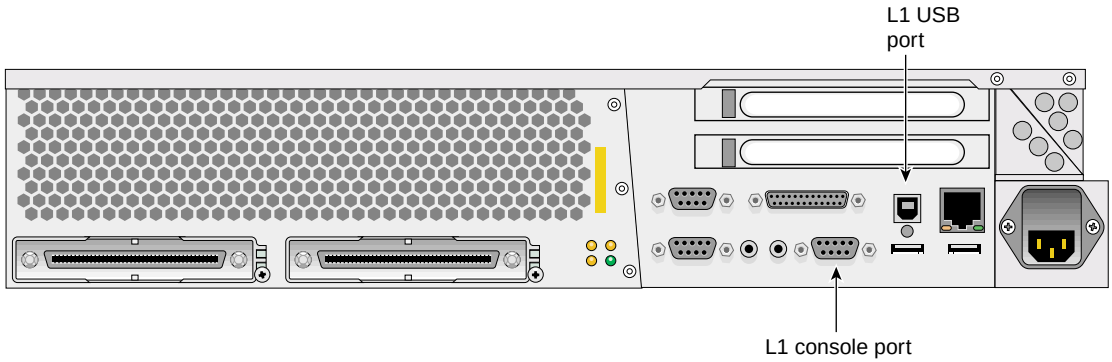

Figure 3-2 Location of the L1 Console Port and L1 Port (USB) Connectors

- You can connect a dumb terminal to the server's L1 USB port connector. See Figure 3-2 for the location of the L1 USB port connector. The console should be running in dumb-terminal-emulator mode.

Note: For server-to-server communication to work correctly, the network mode on the server must be set to either 422 (when connecting to a serial port) or USB (when connecting to the USB port). Use the L1 `network` command to set the network mode. (See "L1 System Controller Commands" on page 69 for more information on L1 commands.)

Establishing a Connection between the Server and the System Console

Follow these steps to establish a connection between your server and the system console:

1. Connect a console to your server, and set the connectivity parameters of the console as explained in "Attaching the System Console" on page 37.

   Note: The L1 controller should display "`L1 running`." If it does not, power cycle the server.

2. Power on the system console.
3. Type **`cu -l ttyd2`** for an IRIX-based console, or **`cu -l ttys0 -S38400`** for a Linux-based console, and then press **Enter** to display the L1 prompt. If the console uses another operating system, start a terminal emulation program as instructed in the console's user documentation.
4. See "Powering On and Off" on page 43 for instructions on powering on the system.

Front Panel Features

The front panel provides the following features, as shown in Figure 3-3:

- Status LEDs
- Power button
- Reset button
- Non-maskable interrupt (NMI) button

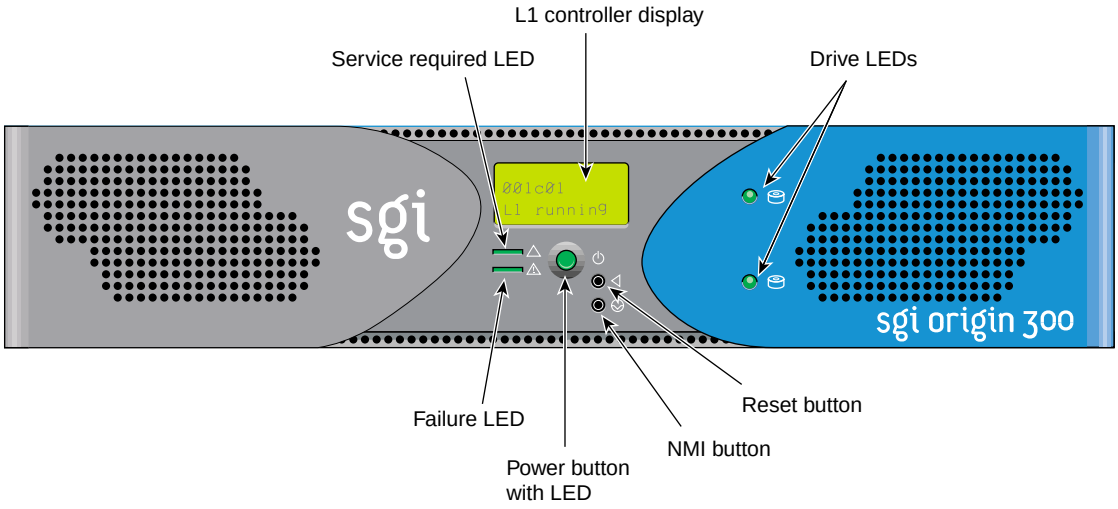

Figure 3-3 Front Panel Functions

Status LEDs

The front panel has the following LEDs:

- **Power button LED**. Lights green when the internal components are on and turns off when they are off.
- **Service required LED**. Lights yellow to indicate that an item is broken or not operating properly (for example, a fan is off), but the system is still operating.

- **Failure LED**. Lights red to indicate that a system failure has occurred and the system is down.

Power Button

Press this button to turn on the internal components. Alternatively, you can turn on the internal components at a system console.

Reset Button

Press this button to reset the internal processors and ASICs. The reset will cause a memory loss. (See the non-maskable interrupt [NMI] to perform a reset without losing memory.)

Non-maskable Interrupt (NMI) Button

Press this button to reset the internal processors and ASICs without losing memory. Register data and memory are stored in a `/var/adm/crash` file.

Operating L1

The L1 operates in one of the two following modes:

- **L1 Mode**. The L1 prompt (`001c01-L1>`) is visible and all input is directed to the L1 command processor.
- **Console Mode from L1**. Output from the system is visible and all input is directed to the system.

When you see a prompt of the following form, the L1 is ready to accept commands:

```
001c01-L1>
```

See Appendix B for a detailed list of L1 commands.

To enter console mode, press `Ctrl+D` at the L1 prompt, as follows:

```
001c01-L1> Ctrl+D
entering console mode 001c01 console, <CTRL-T> to escape to L1
.
<system output appears here>
.
```

To return to L1 mode, press `Ctrl+T`, as follows:

```
Ctrl+T
escaping to L1 system controller
001c01-L1>
```

At this point, you can enter any L1 command. When the command completes execution, the L1 returns to console mode:

```
re-entering console mode 001c01 console, <CTRL-T> to escape to L1
```

To permanently engage the L1 mode, press `Ctrl+T` and then enter the `l1` command, as follows:

```
Ctrl+T
escaping to L1 system controller
001c01-L1> l1
L1 command processor engaged, <CTRL-D> for console mode.
001c01-L1>
```

Powering On and Off

Follow these steps to power on, boot, and power off your system:

1. Connect a console to the server system as explained in "Connecting the System Console" on page 37.
2. To power on the server, enter the following command at the L1 prompt:

   ```
   001c01-L1> power up
   ```

3. To power on a peer-attached server, enter the following command at the L1 prompt:

   ```
   001c01-L1> ctc power up
   ```

4. Type **Ctrl+D** to view the power-on diagnostics (POD) and console output.
5. When POD is complete, the following menu appears:

   ```
   System Maintenance Menu
   1) Start System
   2) Install System Software
   3) Run Diagnostics
   4) Recover System
   5) Enter Command Monitor
   Option?
   ```

6. Enter **1** to boot the system.

Follow these steps to power off your system:

- To power off the server indicated at the L1 prompt (001c01-L1, for example), enter the following command. (If you want to power off the peer-attached server instead, proceed to the next step.)

  ```
  001c01-L1> power down
  ```

- To power off the system connected to the server indicated at the L1 prompt (001c01-L1, for example), enter the following command:

  ```
  001c01-L1> ctc power down
  ```

Connecting Two Servers

Before connecting two SGI Origin 300 servers, you must follow these steps to give them two different system IDs:

1. Designate one of the servers as the master system, and the other as the slave system.
2. Connect a console to the slave system (see "Connecting the System Console" on page 37), and power on the system (see "Powering On and Off" on page 43).
3. If the master system's L1 prompt indicates that its ID number is, for example, `01` (`001c01-L1>`), then the slave system ID number should be higher (for example, `02`, as shown in this L1 prompt: `001c02-L1>`).
4. Use the `brick slot <slotnumber>` L1 command to set the slave system ID number higher than the master system ID number, as shown in this example:

   ```
   001c01-L1>brick slot 02
   brick slot set to 02.
   ```

   See "L1 System Controller Commands" on page 69 for more information on L1 commands

Follow these steps to connect two SGI Origin 300 servers with a NUMAlink3 cable:

1. Power off both servers (see "Powering On and Off" on page 43).
2. Connect the NUMAlink3 cable to the LINK connectors on both servers.
3. Connect a system console to the master system, as shown in "Connecting the System Console" on page 37.
4. Power on both servers as shown in "Powering On and Off" on page 43.

The console output should indicate that the CPUs and memory on both systems have been discovered. If the slave system has not been discovered, use the `reset` L1 command to perform a reset of the system.

Installing Customer-Replaceable Components

This chapter describes how to install customer-replaceable components in the following sections:

Safety Instructions

Read these instructions carefully.

1. Follow all warnings and instructions marked on the product and noted in this and other documentation included with the product.
2. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
3. Do not use this product near water.
4. Do not place this product or components of this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
5. Slots and openings in the bottom of the cabinet and the back or front of the components are provided for ventilation, reliable operation, and protection from overheating. These openings must not be blocked or covered. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.
6. This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.

7. Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.
8. Do not use extension cords with your SGI system.
9. Never push objects of any kind into this product through cabinet slots as the objects may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
10. Do not attempt to service this product yourself except as noted in this guide. Opening or removing covers of internal components may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel.
11. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - When the power cord or plug is damaged or frayed.
    - If liquid has been spilled into the product.
    - If the product has been exposed to rain or water.
    - If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions, because improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal condition.
    - If the product has been dropped or the cabinet has been damaged.
    - If the product exhibits a distinct change in performance, indicating a need for service.
12. Only qualified service personnel should replace the lithium battery on the system I/O board, and only with the same type or an equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. There is a danger of explosion if the battery is incorrectly replaced. See Appendix C.
13. Use only the proper type of power supply cord set (provided with the system) for this unit.

Installing Drives

Follow these steps to install or replace a disk drive:

1. If you are replacing a data drive, ensure that the drive to be replaced has spun down before removing it.
2. If you are replacing the system drive, you must first power off the server, as follows:
   - To power off the server indicated at the L1 prompt (001c01-L1, for example), enter the following command. (If you want to power off the peer-attached server, proceed to the next step.)

     ```
     001c01-L1> power down
     ```

   - To power off the system connected to the server indicated at the L1 prompt (001c01-L1, for example), enter the following command:

     ```
     001c01-L1> ctc power down
     ```

3. Open the bezel door as shown in Figure 4-1.
4. Remove a drive by depressing its handle lock with your thumb and pulling the handle away from the chassis until the handle disengages. (See Figure 4-1.)
5. Grasp the locking handle and pull it toward you to disengage the drive connector from the backplane connector.
6. Carefully slide the drive out of the bay. Place the drive on an antistatic surface.

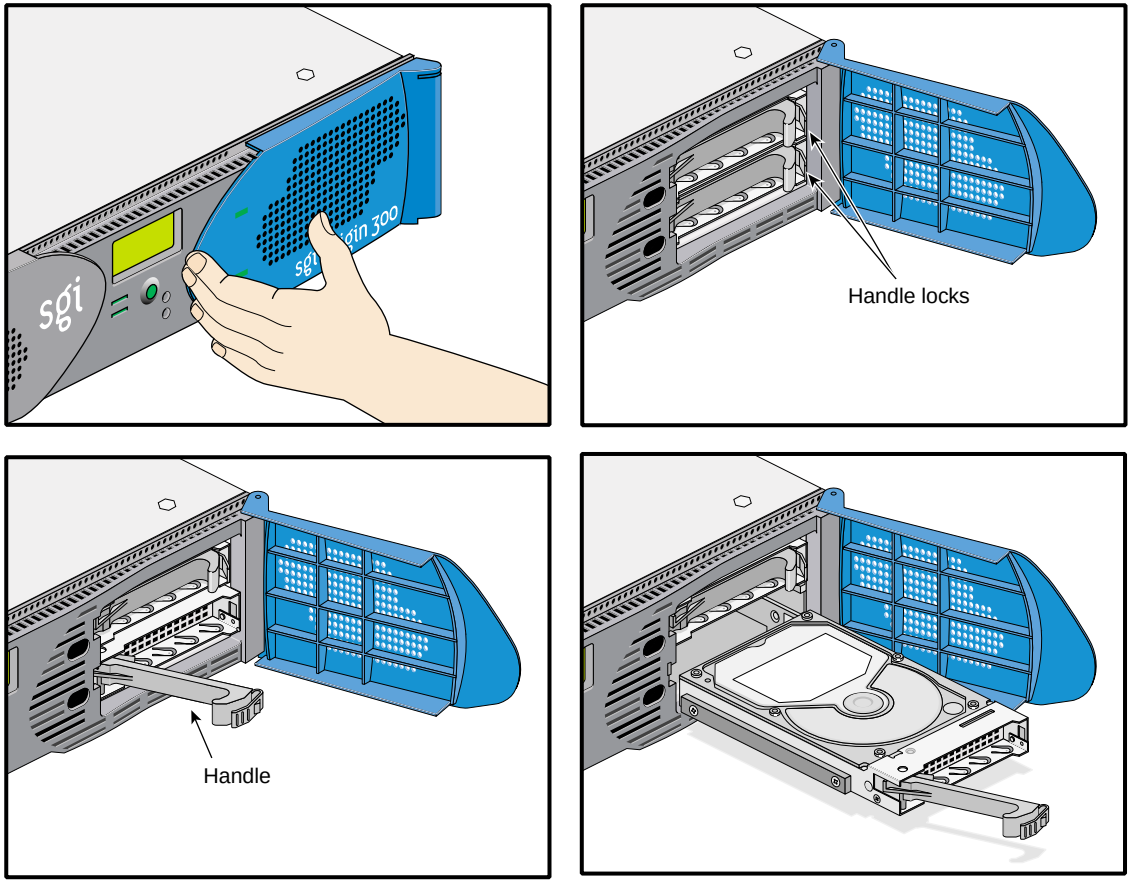

Figure 4-1 Removing a Drive

7. To install a drive, position the drive assembly so that it engages the bay guide rails.
8. Gently push the drive into the bay. Swing the locking handle toward the chassis. The locking handle engages the latch. (See Figure 4-2.)
9. Close the bezel door as shown in Figure 4-2.

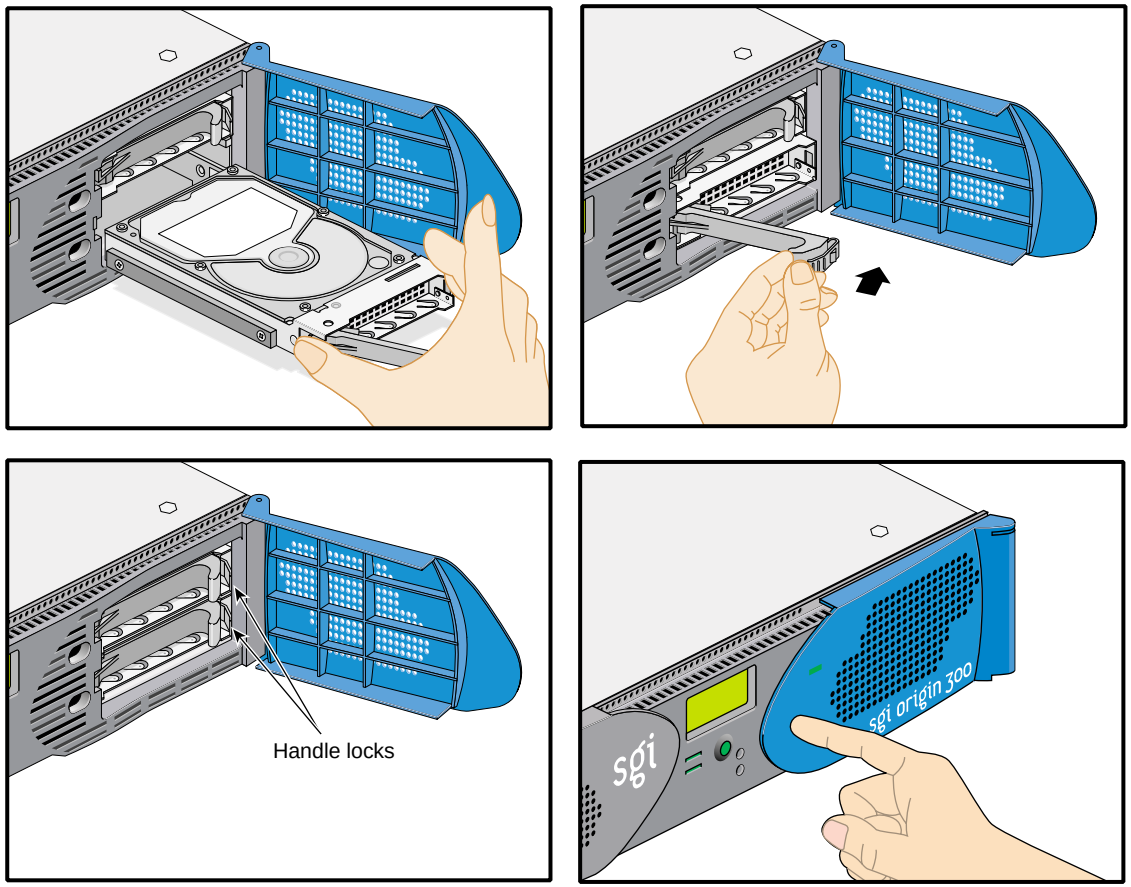

Figure 4-2 Installing a Drive

Removing and Installing PCI Cards

The SGI Origin 300 server has two Universal PCI 2.2-compliant option card slots configured on one bus. The PCI bus supports both 32- and 64-bit modes at 33 or 66 MHz. This section describes how to remove and install PCI cards. Figure 4-3 shows PCI slots 1 and 2.

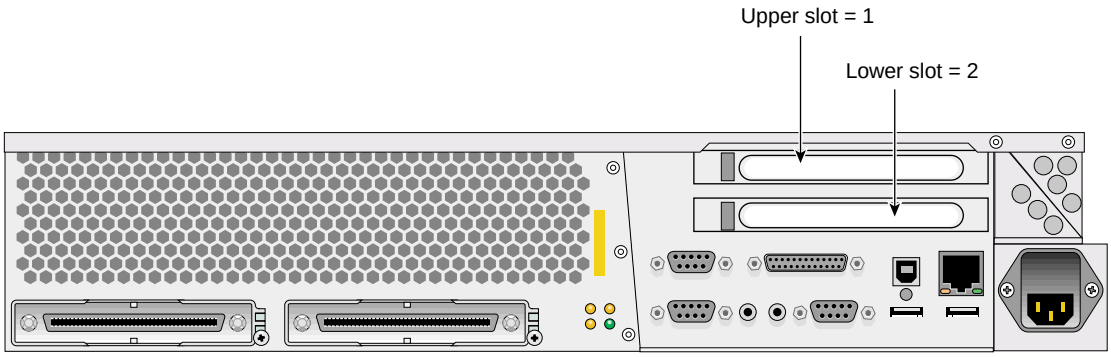

Figure 4-3 PCI Slots 1 and 2

Caution: Follow electrostatic discharge (ESD) precautions. Electronic equipment can be irreparably damaged by ESD. Always follow these preventative measures when handling a system component:

- Remove a component from its antistatic bag only when you are ready to install it.
- If you have to handle a component before installation, do not place it on surfaces that produce ESD (carpeting, for example), or near devices that create static electricity.
- Attach a static wrist strap to a grounded connection on your system when installing or removing a component.

Removing PCI Cards

Follow these steps to remove PCI expansion cards:

Note: If you plan to remove a full-length PCI expansion card from the lower slot (PCI slot 2), you must remove the rack-mounting chassis rail adjacent to the I/O assembly. If you remove a full-length PCI card from the upper slot (PCI slot 1), you do not need to remove the rack-mounting rail. See "Removing the Server from the Rack" on page 32.

---

1. Power off the system (see "Powering On and Off" on page 43).
2. Unplug the AC power cable from the power source.
3. Open the chassis by removing two screws and lifting the cover, as shown in Figure 4-4.

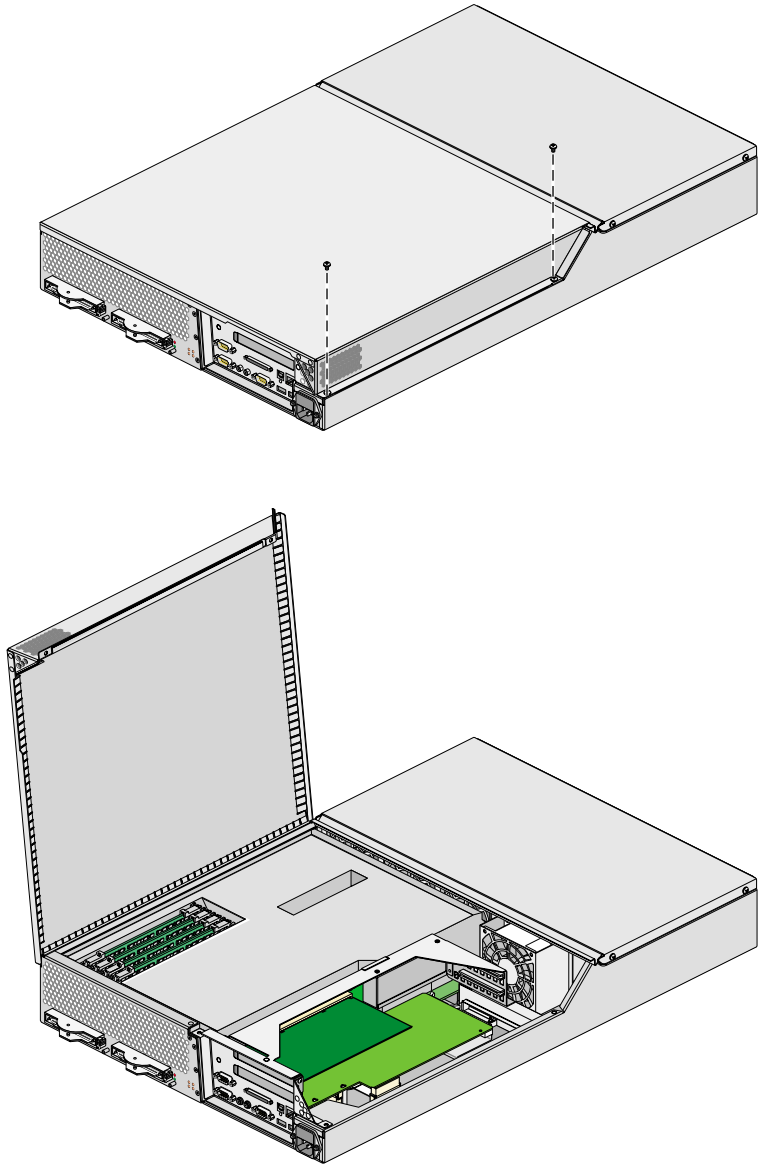

Figure 4-4 Opening the Chassis

4. Release the retaining screw of the card to be removed, as shown in Figure 4-5.
5. Gently pull the card straight out of the slot.

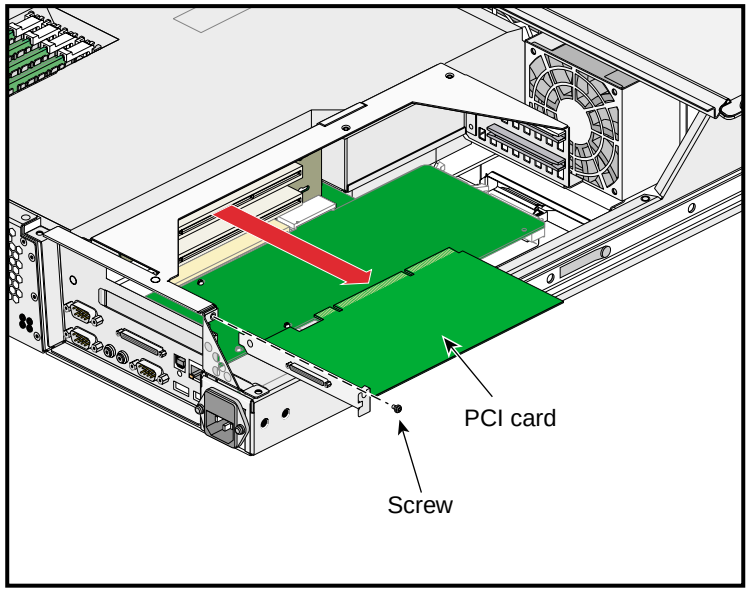

Figure 4-5 Removing a PCI Card

6. If you are not installing another card in the empty slot, place a blanking plate on the slot opening and tighten the retaining screw (see Figure 4-6).

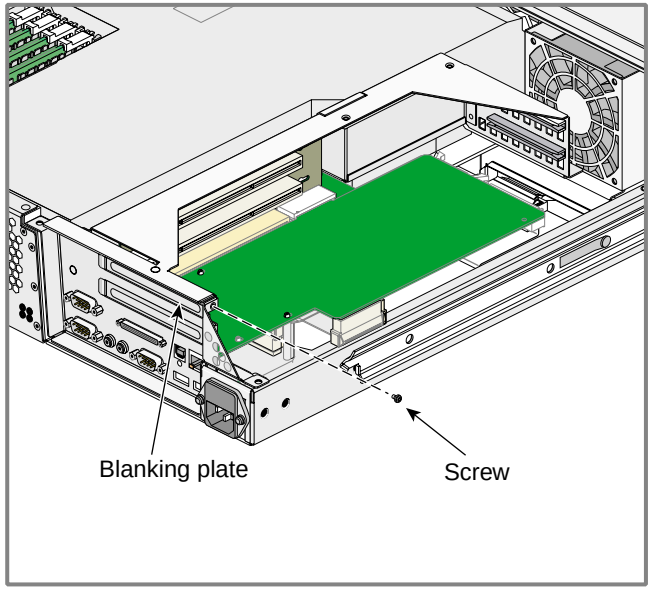

Figure 4-6 Installing a Blanking Plate

7. If you are installing another PCI card, proceed to the next section “Installing PCI Cards”.

Installing PCI Cards

Follow these steps to install PCI expansions cards:

Note: If you plan to install a full-length PCI expansion card into the lower slot (PCI slot 2), you must remove the rack-mounting chassis rail adjacent to the I/O assembly. If you install a full-length PCI card in the upper slot (PCI slot 1), you do not need to remove the rack-mounting rail. See "Removing the Server from the Rack" on page 32.

1. Power off the system (see "Powering On and Off" on page 43).
2. Unplug the AC power cable from the power source.
3. Open the chassis by removing two screws and lifting the cover, as shown in Figure 4-4 on page 52.
4. If a blanking plate covers the slot opening selected for installation, remove the retaining screw and the blanking plate as shown in Figure 4-7.

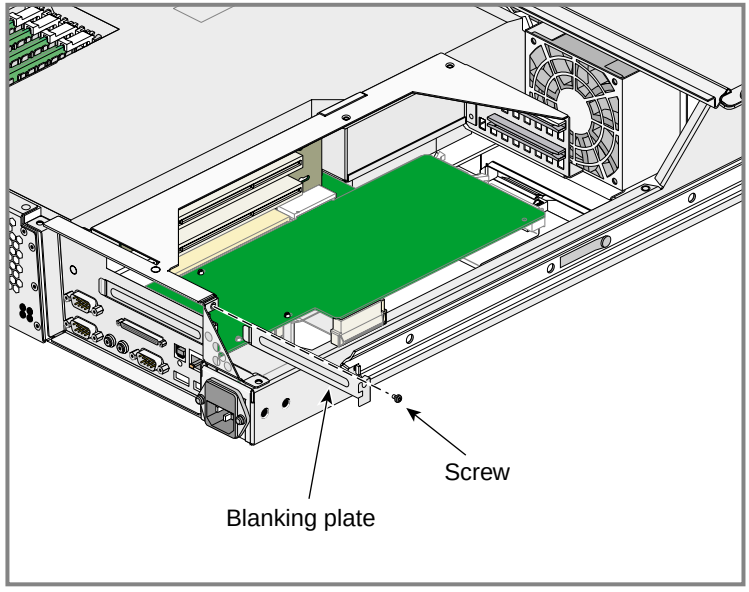

Figure 4-7 Removing a Blanking Plate

5. Insert the PCI expansion card into its slot by pushing the card into the connector until it is properly seated.
6. Tighten the retaining screw as shown in Figure 4-8.

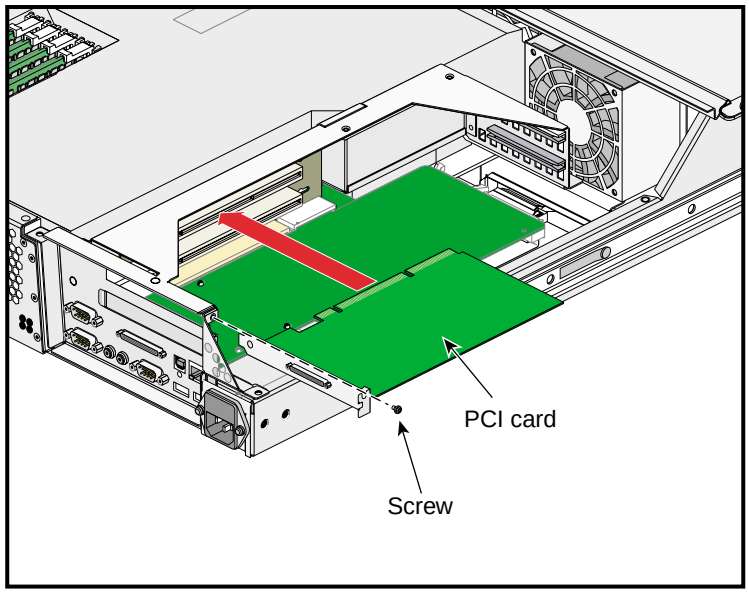

Figure 4-8 Installing a PCI Card

7. Close the chassis cover and tighten the two retaining screws.

Installing and Removing Memory

Local memory can consist of two to four banks, which are referred to as Banks 0, 1, 2, and 3, as shown in Figure 4-9. The four banks are arranged as two DIMM pairs; DIMM pair 0 and DIMM pair 1. Pair 0 consists of banks 0 and 1; pair 1 consists of banks 2 and 3. Memory is increased or decreased in two-DIMM increments only. The two DIMMs that make up a pair of banks must be the same memory size; however, each pair of DIMMs can be a different memory size. Figure 4-9 shows the layout of the memory banks.

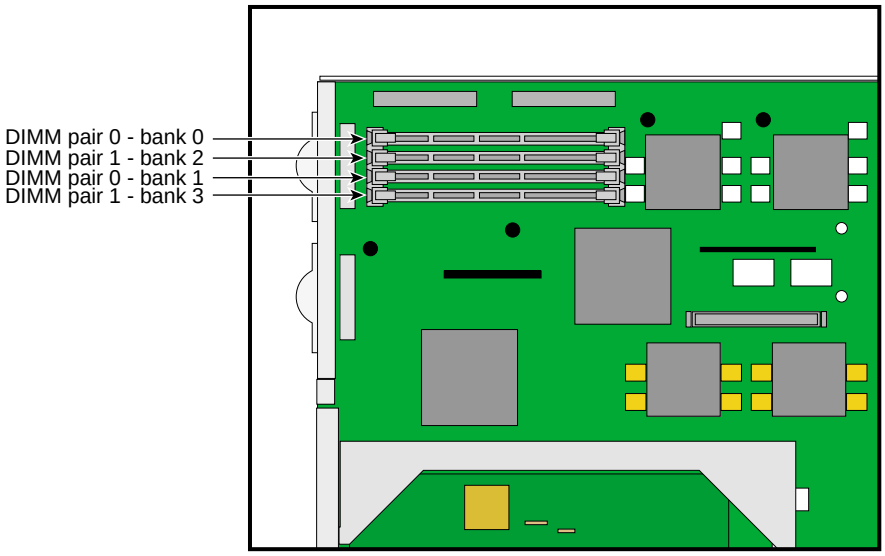

Figure 4-9 Memory Banks Layout

Note: The DIMMs used in the SGI Origin 300 server are not compatible with the DIMMs used in Origin 200, Origin 2000, Onyx2, or Octane systems.

The SGI Origin 300 server supports three types of memory kits:

- 512-MB kit with integrated directory memory.
- 1-GB kit with integrated directory memory.
- 2-GB kit with premium integrated directory memory.

This sections describes how to install and remove DIMMs.

Caution: Follow electrostatic discharge (ESD) precautions. Electronic equipment can be irreparably damaged by ESD. Always follow these preventative measures when handling a system component:

- Remove a component from its antistatic bag only when you are ready to install it.
- If you have to handle a component before installation, do not place it on surfaces that produce ESD (carpeting, for example), or near devices that create static electricity.
- Attach a static wrist strap to a grounded connection on your system when installing or removing a component.

Removing DIMMs

Follow these steps to remove DIMMs:

Caution: Use extreme care when removing a DIMM. Too much pressure can damage the socket slot. Apply only enough pressure on the plastic ejector levers to release the DIMM.

---

1. Power off the system (see "Powering On and Off" on page 43).
2. Unplug the AC power cable from the power source.
3. Open the chassis by removing two screws and lifting the cover, as shown in Figure 4-4 on page 52.

4. Lift the plastic ejector latches to release the DIMM from its socket, as shown in Figure 4-10.

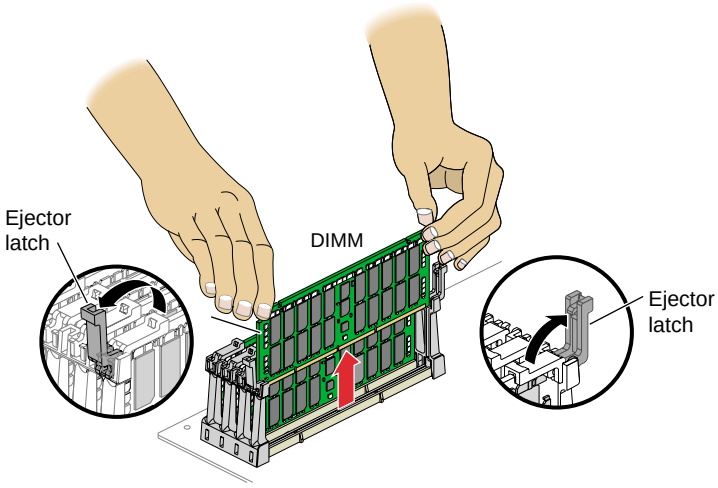

Figure 4-10 Removing a DIMM

5. Hold the DIMM only by its edges, being careful not to touch its components or gold edge connectors. Carefully lift it away from the socket and store it in an antistatic package.
6. Repeat this procedure to remove other DIMMs as necessary.

Installing DIMMS

Follow these steps to install DIMMs:

Caution: Use extreme care when installing a DIMM. Applying too much pressure can damage the socket.

Note: If only one pair of DIMMs is installed, banks 0 and 1 must be populated. (See Figure 4-9 on page 57 for the memory bank layout.) The two DIMMs that make up a pair of banks must be the same memory size; however, each pair of DIMMs can be a different memory size.

1. Power off the system (see "Powering On and Off" on page 43).
2. Unplug the AC power cable from the power source.
3. Open the chassis by removing two screws and lifting the cover, as shown in Figure 4-4 on page 52.
4. Remove DIMMs to be replaced by following the instructions in "Removing DIMMs" on page 58.
5. Remove the new DIMM from its antistatic package, holding the DIMM only by its edges.

6. Orient the DIMM so that the three notches in the bottom edge of the DIMM align with the keyed socket, as shown in Figure 4-11.
7. Insert the bottom edge of the DIMM into the socket, and then press down on the DIMM until it seats correctly.
8. Gently push the plastic ejector latches down to secure the DIMM, as shown in Figure 4-11.

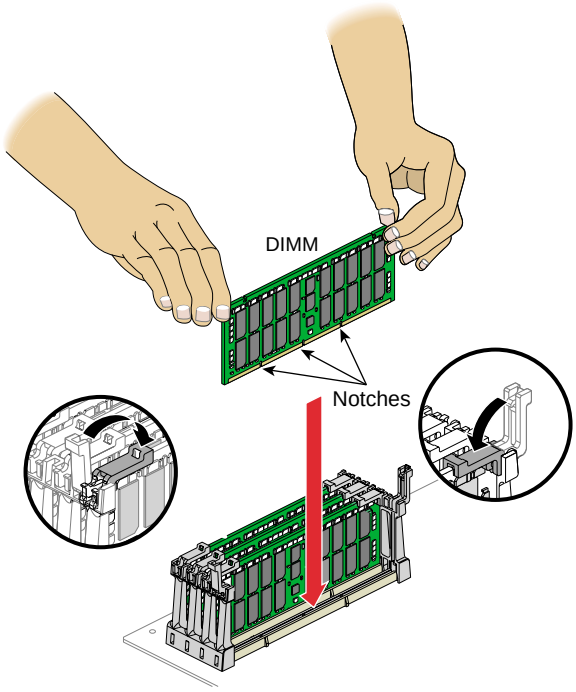

Figure 4-11 Installing a DIMM

9. Repeat this procedure to install the other DIMMs.
10. Close the chassis cover and tighten the two retaining screws.

Technical Specifications

This appendix lists technical specifications of the SGI Origin 300 server in these sections:

Physical and Environmental Requirements

Table A-1 shows the physical and environmental specifications for the SGI Origin 300 server.

Table A-1 Physical and Environmental Specifications

Height	3.46 inches (8.8 cm)
Width	19 inches (48.3 cm) (front panel width) 17.07 inches (43.36 cm) (chassis width)
Depth	26 inches (66 cm) (without bezel) 26.8 inches (68 cm) (with bezel)
Weight	36 lbs (16.4 kg)
Temperature operating	+5 ˚C (+41 ˚F) to +35 ˚C (+95 ˚F) (up to 1500 m / 5000 ft) +5 ˚C (+41 ˚F) to +30 ˚C (+86 ˚F) (1500 m to 3000 m / 5000 ft to 10000 ft)
Temperature non-operating	-40 ˚C (-40 ˚F) to +60 ˚C (+140 ˚F)
Humidity	10% to 95% RH, non-condensing
Altitude	Sea level to 40,000 ft (non-operating) Sea level to 10,000 ft (3000 m) (operating)
Noise	50 dB(A) maximum
Heat dissipation	1,194 Btu/hr maximum

Power Requirements

Table A-2 shows the power requirements.

Table A-2 Power and Cooling Requirements

Power supply voltage‘	110/220 VAC auto-sensing worldwide
Power supply type	Modified WTX 460 W
Frequency	50/60 Hz
Electrical service	100/120 VAC @15A, 200/240 VAC @15A (single-phase cord)
Service type	U.S., Japan, NEMA 5-15P (110V), 6-15P (220V)

System Controller Commands and Error Messages

This appendix describes the SGI Origin 300 system controller functions, commands, and error messages in these sections:

L1 System Controller Functionality

The L1 is the SGI Origin 300 system controller. The L1 system controller and its associated logic perform the following functions:

- Report state of all LEDs in the system to remote or local console under software control.
- Report all failure conditions to local or remote console under software control.
- Monitor fan speed; display failed fan number.
- Control and sequence DC power output of voltage regulators; monitor for failures and report them; drive DC ON, FAILURE LEDs.
- Monitor and report operating temperature and status of DC input power.
- Drive RESET signal to local electronics on command from software.
- Read and write contents of module identification EEPROMs.
- Control JTAG boundary scan.
- Log information in NVRAM.
- Control voltage margining within the server on command from software.
- Provide a high-speed serial channel to communicate between the system controller network and the hub ASIC.
- Provide a high-speed serial channel to communicate with the L1 in a second server. This is implemented as an RS485 ICMB interface in the NUMAflex cable.
- Provide an external high-speed serial console port.
- Monitor and act on the state of the POWER, RESET, and NMI buttons.
- Drive the RESET, SOFT RESET, and NMI signals to the node electronics.
- Read and report the memory and processor configuration within the node. Read DIMM serial ID proms.
- Provide a USB slave port to communicate with upstream system controllers.
- Drive the L1 controller display.
- Provide the ability to FLASH the L1 firmware that can be updated.
- Provide the time of day (TOD).
- Monitor slot power for PCI cards (currently takes no action).

L1 System Controller Commands

Using a console, you may issue L1 system controller commands that read status from the controller or set variables that the controller uses. The following subsections describe the L1 controller command set. The commands are listed alphabetically.

* (asterisk character)

Use the asterisk character (*) to broadcast a command. A command that is broadcasted is sent to the system that is attached to the SGI Origin 300 that issued the command. Example B-1 shows sample output from the `* version` command.

Example B-1 `*version` Command Output

```
001c01-L1>* version
001c01:
L1 1.3.7l (Image A), Built 01/31/2001 14:41:39
001c02:
L1 1.5.12L (Image B), Built 06/07/2001 12:24:28
```

bedrock

The following `bedrock` set of commands provides the status of and sets the L1-controller-to-hub-ASIC protocol setting.

- `bedrock`
- `bedrock ppp`

Note: For the bedrock command set, you can use the mnemonic `bdrck` instead of the word `bedrock`.

Use the `bedrock` command to determine the current settings for the L1-controller-to-hub-ASIC protocol. Example B-2 shows sample output from this command. (Use the `l1dbg` set of commands to turn debugging on or off.)

Example B-2 `bedrock` Command Output

```
001c01-L1>bedrock
bedrock protocol is PPP
```

Use `bedrock ppp` to set the L1-controller-to-hub-ASIC protocol to PPP. Example B-3 shows sample output from this command.

Example B-3 `bedrock ppp` Command Output

```
001c01-L1>bedrock ppp
bedrock protocol is PPP
```

brick

The following `brick` set of commands provides the status of and sets the server location.

- `brick`
- `brick slot <slotnumber>`

Note: For this command set, you can use the mnemonics `upos` and `part` instead of the words `slot` and `partition`.

Use the `brick` command to determine the server location. Example B-4 shows sample output from this command.

Example B-4 `brick` Command Output

```
001c07-L1>brick
rack: 001 slot: 07 partition:0type: C source: EEPROM
```

Use `brick slot <slotnumber>` to set the server position (slot number) in the rack. The variable `<slotnumber>` is a unit number from 01 to 39. Example B-5 shows sample output from the `brick slot 03` command.

Example B-5 `brick slot 03` Command Output

```
001c07-L1>brick slot 03
brick slot set to 03.
```

Use `brick rack <racknumber>` to set the server rack number. The variable `<racknumber>` is the number of a valid rack. Example B-6 shows sample output from the `brick rack 01` command.

Example B-6 `brick rack <racknumber>` Command Output

```
001c07-L1>brick rack 1
brick rack set to 001.
```

ctc <cmd>

Use the `ctc <cmd>` command to send a command to an attached SGI Origin 300 server. Example B-7 shows sample output from the `ctc version` command.

Example B-7 `ctc version` Command Output

```
001c01-L1>ctc version
002c01:
L1 0.7.37 (Image A), Built 02/24/2001 14:59:42    [P1 support]
```

date

Use the following `date` set of commands to view and set the current date and time used by the L1 controller.

- `date`
- `date <value>`
- `date tz`
- `date tz <value>`

Use the `date` command to view the current date and time value used by the L1 controller. Example B-8 shows sample output from this command.

Example B-8 `date` Command Output

```
001c01-L1>date
02/14/2001 22:47:07
```

Use `date <value>` to set the date and time value used by the L1 controller. The variable `<value>` is a time value in the form *mmddHHMMYYYY.SS* (where *mm* is a two-digit month, *dd* is a two-digit day, *HH* is a two-digit hour, *MM* is a two-digit minute, *YYYY* is the four-digit year, and *SS* is a two-digit second).

Use `date tz` to display the time zone offset used by the L1 controller. Use `date tz <value>` to set the time zone offset. The variable `<value>` is a maximum of +12 (for 12 hours ahead of GMT) and a minimum of -12 (for 12 hours behind GMT).

debug

The following `debug` set of commands provides the status of and sets the virtual debug switches.

- `debug`
- `debug <switches>`

Use the `debug` command to determine the current settings for the virtual debug switches. Example B-9 shows sample output from this command.

Example B-9 `debug` Command Output

```
001c01-L1>debug
debug switches set to 0x0000
```

Use `debug <switches>` to set the virtual debug switches. The variable `<switches>` is a hexadecimal value for the switches.

display

The following `display` set of commands displays text on the front panel display and controls the LEDs on the front panel display.

- `display`
- `display <line> <text>`
- `display power <on|off>`
- `display attention <on|off>`
- `display failure <on|off>`

Use the `display` command to view the front panel display status. Example B-10 shows sample output from this command.

Example B-10 `display` Command Output

```
001c01-L1>display
line 1: "001c01     /"
line 2: "L1 running  "
```

Use `display <line> <text>` to display text on a line of the L1 controller display. The length of the variable `<text>` must be 12 characters or less. Example B-11 and Figure B-1 show sample output from the `display 1 Football` command.

Note: For these commands, you can use the mnemonic `dsp` instead of the word `display`.

Example B-11 `display 1 Football` Command Output

```
001c01-L1>display 1 Football
```

Figure B-1 `display 1 <text>` Front Panel Display Output

Use `display power <on|off>` to turn the power LED on or off. Use `display attention <on|off>` to turn the attention LED on or off. Use `display failure <on|off>` to turn the failure LED on or off.

eeprom

Use the `eeprom` command to view the eeprom data. Example B-12 shows sample output from this command.

Example B-12 `eeprom` Command Output

```
001c01-L1>eeprom
NODE (CH)
00 20 01 06 00 00 00 d9
NODE (CIA)
00 02 17 c2 4e 41 c2 4e 41 c1 00 00 00 00 00 84
NODE (BIA)
00 09 00 88 a3 2a c9 43 45 4c 45 53 54 49 43 41
c9 49 50 34 35 5f 34 43 50 55 c6 4d 47 43 32 35
39 cc 30 33 30 5f 31 37 32 38 5f 30 30 31 00 c2
5f 43 01 02 c2 30 30 04 00 00 57 6d 04 00 00 00
02 04 00 00 00 2c c1 01
NODE (IUA)
00 01 85 01 01 01 02 04 00 00 01 08 04 00 0b 02
13 0a 17 02 2b 04 2f 01 3b 01 3b 01 4a 01 4a 01
4a 01 4a 01 4a 01 4a 01 4a 01 4a 01 4a 01 4a 01
55 01 76 00 2c a0 00 2d a0 00 2e a0 00 2f a0 04
44 01 00 00 00 0f 00 01 01 01 70 00 01 70 04 03
01 01 20 07 01 00 44 00 44 0a 45 01 03 00 20 1f
00 01 02 03 4a 00 03 4a 06 50 26 06 3f fc 06 3f
b7 06 08 88 06 02 46 06 00 ec 04 43 01 03 00 20
07 00 01 02 02 73 00 02 73 00 00 00 00 00 00 48
IO8 (CH)
00 20 01 06 00 00 00 d9
IO8 (CIA)
00 02 17 c2 4e 41 c2 4e 41 c1 00 00 00 00 00 84
IO8 (BIA)
00 0a 00 f0 c4 2a c9 43 45 4c 45 53 54 49 43 41
c3 49 4f 38 c6 4b 4a 44 31 32 33 cc 30 33 30 5f
31 36 37 33 5f 30 30 33 00 c2 5f 43 01 02 c2 30
30 04 00 00 00 89 04 00 00 00 02 04 00 00 00 88
cc 30 38 30 30 36 39 31 31 42 44 41 42 c1 00 a2
IO8 (IUA), checksum error (3)
DIMM 0 - no hardware detected
DIMM 2 (JEDEC)
80 08 07 0c 0a 02 48 00 04 a0 80 02 80 08 08 01
0e 04 0c 01 02 26 00 00 00 00 00 50 3c 50 30 20
b0 b0 60 60 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 39
```

```
ce 00 00 00 00 00 00 00 01 4d 33 20 34 36 4c 33
33 31 33 42 54 30 2d 43 41 30 20 30 42 25 00 14
04 05 09 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
DIMM 1 - no hardware detected
DIMM 3 (JEDEC)
80 08 07 0c 0a 02 48 00 04 a0 80 02 80 08 08 01
0e 04 0c 01 02 26 00 00 00 00 00 50 3c 50 30 20
b0 b0 60 60 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 39
ce 00 00 00 00 00 00 00 01 4d 33 20 34 36 4c 33
33 31 33 42 54 31 2d 43 41 30 20 30 42 06 01 26
f5 76 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

env

The following `env` set of commands provides the status of environmental conditions or turn environmental monitoring on and off. The following are the commands in this set:

- `env`
- `env altitude <high|low>`
- `env reset`

Use the `env` command to view the status of the voltage, fan speed, and internal temperature. The output of this command is divided into four areas: environmental monitoring and auto start status, voltage status, fan status, and temperature status (see Example B-13).

Example B-13 `env` Command Output

```
001c01-L1>env
Environmental monitoring is enabled and running.

Description    State       Warning Limits     Fault Limits       Current
-------------- ----------  -----------------  -----------------  -------
        12V IO    Enabled  10%  10.80/ 13.20  20%   9.60/ 14.40   12.31
       12V DIG    Enabled  10%  10.80/ 13.20  20%   9.60/ 14.40   12.12
            5V    Enabled  10%   4.50/  5.50  20%   4.00/  6.00    4.99
          3.3V    Enabled  10%   2.97/  3.63  20%   2.64/  3.96    3.34
        5V aux    Enabled  10%   4.50/  5.50  20%   4.00/  6.00    4.99
      3.3V aux    Enabled  10%   2.97/  3.63  20%   2.64/  3.96    3.41
          2.5V    Enabled  10%   2.25/  2.75  20%   2.00/  3.00    2.50
   Speedo2 CPU    Enabled  10%   1.35/  1.65  20%   1.20/  1.80    1.49
          1.5V    Enabled  10%   1.35/  1.65  20%   1.20/  1.80    1.48

Description    State       Warning RPM  Current RPM
-------------- ----------  -----------  -----------
FAN 0     Left    Enabled         2160         3400
FAN 1   Center    Enabled         2160         3543
FAN 2    Right    Enabled         2160         3543
FAN 3       PS    Enabled         2160         3088
FAN 4      PS'      Fault         2160            0

                           Advisory  Critical  Fault     Current
Description    State       Temp      Temp      Temp      Temp
-------------- ----------  --------  --------  --------  ---------
NODE    TEMP 0    Enabled  30C/ 86F  35C/ 95F  40C/104F  23c/ 73F
```

```
NODE    TEMP 1    Enabled  30C/ 86F  35C/ 95F  40C/104F  22c/ 71F
NODE    TEMP 2    Enabled  30C/ 86F  35C/ 95F  40C/104F  27c/ 80F
```

The environmental monitoring and auto start status area has two statements. The first statement describes the current state of environmental monitoring, which is one of the following:

- `disabled - initialization error`
- `disabled - configuration error`
- `disabled - start error`
- `disabled`
- `disabled - unknown error (0x00)`
- `running`

The second statement describes the current state of the auto start. The auto start state is `enabled` or `disabled`.

The voltage status contains five columns as follows:

- The Description column provides the name of the supply voltage (2.5 V, 3.3 V, 5 V, etc.).
- The State column provides the current state of the supply voltage (Enabled, Fault, Warning, Waiting, or Disabled).
- The Warning Limits column provides the range of voltages that, when exceeded, causes a supply voltage to be in a Warning state.
- The Fault Limits column provides the range of voltages that, when exceeded, causes a supply voltage to be in a Fault state.
- The Current column provides the current value of the supply voltage.

The fan status contains four columns, as follows:

- The Description column provides the name of each fan.
- The State column provides the current state of the fan (Warning, Enabled, Waiting, or Disabled).
- The Warning RPM column provides the lowest revolutions-per-minute allowed before a fan enters a Warning state.

- The Current RPM column provides the current value of the revolutions-per-minute for the fan.

The temperature status contains six columns, as follows:

- The Description column provides the name of a temperature sensor.
- The State column provides the current state of the temperature sensor (Fault, Warning, Enabled, or Disabled).
- The Advisory Temp column provides the temperature that, when exceeded, causes a temperature advisory state.
- The Critical Temp column provides the temperature that, when exceeded, causes a critical temperature state.
- The Fault Temp column provides the temperature that, when exceeded, causes the temperature sensor to be in a Fault state.
- The Current Temp column provides the current temperature reading from the temperature sensor.

Use `env altitude <high|low>` to enable a high- or low-altitude setting for the environmental monitoring. The variable `<high|low>` is high or low.

Use `env reset` to reset all current warnings and faults that are set.

Note: For this command, you can use the mnemonic `rst` instead of the word `reset`.

---

flash

The following `flash` set of commands provides status and updates on the firmware images stored in flash memory.

- `flash status`
- `flash default <a|b>`
- `flash default current`
- `flash default new`
- `flash default old`
- `flash default reset`

Use the `flash status` command to view the status of the two firmware images stored in flash memory. Example B-14 shows sample output from the `flash status` command. Each image has a checksum value that indicates whether an image is valid.

Example B-14 `flash status` Command Output

```
001c01-L1>flash status
Flash image B currently booted

Image      Status        Revision    Built
-----   -------------   ----------   -----
  A     valid           1.5.10L      05/31/2001 16:41:43
  B     user default    1.5.12L      06/07/2001 12:24:28
```

Use `flash default <a|b>` to set firmware image A or firmware image B as the default image that the system controller uses when booting. The variable `<a|b>` is A or B. Use `flash default current` to set the current image as the default flash image. Use `flash default new` to set the new image as the default flash image. Use `flash default old` to set the old image as the default flash image.

Use `flash default reset` to set the firmware image with the latest time-stamp as the default image that the system controller uses when booting. If the selected firmware image is not valid, the flash default commands will return the following message: `cannot set default--image A (or B) is invalid!`

help

The following `help` set of commands provides helpful information on the system controller commands.

- `help`
- `help <command>`

Use the `help` command to generate a list of all of the system controller commands. Use the `help <command>` command to display more information on a single command. The variable `<command>` is the name of a command.

history

Use the `history` command to create a list of commands that have been issued. In the `history` command output, the first number in the history length is the number of commands stored in the history array. The second number is the maximum number of commands that can be stored in the history array. Example B-15 shows sample output from this command.

Example B-15 `history` Command Output

```
001c01-L1>history
History length: 3/20

2: fan speed 4
1: fan
0: env
```

istat

Use the following `istat` set of commands to view the status of the memory, queues, tasks, and memory allocation.

- `istat memory`
- `istat queues`
- `istat tasks`
- `istat pmalloc`.

Use the `istat memory` command to view the status of the memory. Example B-16 shows sample output from this command.

Example B-16 `istat memory` Command Output

```
001c01-L1>istat memory
SYSMEM   [0x30003244]    Size:  45664         Avail:  21512
SMLPOOL  [0x300029f0]    Size:   8704/ 272 Avail:     30
BIGPOOL  [0x300029b4]    Size:  16640/1040 Avail:     15
```

Use `istat queues` to view the status of the queues. Example B-17 shows sample output from this command.

Example B-17 `istat queues` Command Output

```
001c01-L1>istat queues
CMD_REQQ [0x300058bc]    Size: 10   Avail: 10   Msgs:  0
CMD_RSPQ [0x30005904]    Size: 10   Avail: 10   Msgs:  0
SMP_RQUE [0x3000bb2c]    Size: 10   Avail: 10   Msgs:  0
SMP_WQUE [0x3000bb74]    Size: 10   Avail: 10   Msgs:  0
SMP_IQUE [0x3000bbbc]    Size: 10   Avail: 10   Msgs:  0
B2BQ_NIA [0x30009410]    Size: 10   Avail: 10   Msgs:  0
B2BQ_IIA [0x300094a0]    Size: 10   Avail: 10   Msgs:  0
USB_WQUE [0x30008e54]    Size: 10   Avail: 10   Msgs:  0
SCAN_QUE [0x30002294]    Size: 20   Avail: 20   Msgs:  0
FLASH_Q  [0x3000e51c]    Size:  5   Avail:  5   Msgs:  0
BDR_WQUE [0x3000ac14]    Size: 20   Avail: 20   Msgs:  0
```

Use `istat tasks` to view the status of the tasks. Example B-18 shows sample output from this command.

Example B-18 `istat tasks` Command Output

```
001c01-L1>istat tasks
MAIN_TSK [0x30001794] (SLEEP     )  PRI=000  TS=010  STACK: 2048 @ 0x30000f94 ( 708 used,
1340 free)
USB_CNTL [0x30004d70] (DRV_SUSP  )  PRI=010  TS=010  STACK: 1536 @ 0x30004e18 ( 176 used,
1360 free)
CMD_ITSK [0x3000694c] (READY     )  PRI=020  TS=010  STACK: 4096 @ 0x3000594c (2020 used,
2076 free)
SMP_RTSK [0x3000d454] (QUEUE_SUSP)  PRI=020  TS=010  STACK: 2048 @ 0x3000bc54 ( 916 used,
1132 free)
SMP_WTSK [0x3000d4fc] (QUEUE_SUSP)  PRI=020  TS=040  STACK: 2048 @ 0x3000c454 ( 544 used,
1504 free)
SMP_ITSK [0x3000d5a4] (QUEUE_SUSP)  PRI=020  TS=010  STACK: 2048 @ 0x3000cc54 ( 592 used,
1456 free)
ENV_PITK [0x30006d9c] (SEM_SUSP  )  PRI=010  TS=010  STACK: 1024 @ 0x3000718c ( 280 used,
744 free)
ENV_FITK [0x30006e44] (SEM_SUSP  )  PRI=010  TS=010  STACK: 1024 @ 0x3000758c ( 748 used,
276 free)
ENV_TITK [0x30006eec] (SEM_SUSP  )  PRI=010  TS=010  STACK: 1024 @ 0x3000798c ( 264 used,
760 free)
ENV_PMTK [0x30006f94] (SEM_SUSP  )  PRI=010  TS=010  STACK: 1024 @ 0x30007d8c ( 260 used,
764 free)
ENV_FMTK [0x3000703c] (SLEEP     )  PRI=010  TS=010  STACK: 1024 @ 0x3000818c ( 388 used,
636 free)
ENV_TMTK [0x300070e4] (SEM_SUSP  )  PRI=010  TS=010  STACK: 1024 @ 0x3000858c ( 324 used,
700 free)
BDR_RTSK [0x3000aa7c] (DRV_SUSP  )  PRI=025  TS=010  STACK: 2048 @ 0x30015c48 (1492 used,
556 free)
BDR_WTSK [0x3000ab6c] (QUEUE_SUSP)  PRI=025  TS=010  STACK: 2048 @ 0x30016458 ( 604 used,
1444 free)
BDR_TTSK [0x3000ac5c] (SEM_SUSP  )  PRI=025  TS=010  STACK: 2048 @ 0x30016c68 ( 296 used,
1752 free)
B2BR_NIA [0x30009020] (DRV_SUSP  )  PRI=025  TS=010  STACK: 2048 @ 0x300174b0 ( 316 used,
1732 free)
B2BW_NIA [0x300095c0] (DRV_SUSP  )  PRI=025  TS=010  STACK: 2048 @ 0x30017cc0 ( 320 used,
1728 free)
B2BR_IIA [0x30009170] (DRV_SUSP  )  PRI=025  TS=010  STACK: 2048 @ 0x30018508 ( 316 used,
1732 free)
B2BW_IIA [0x30009710] (DRV_SUSP  )  PRI=025  TS=010  STACK: 2048 @ 0x30018d18 ( 320 used,
1728 free)
```

```
USB_RTSK [0x30008dac] (DRV_SUSP  )  PRI=025  TS=010  STACK: 1800 @ 0x30019590 ( 380 used,
1420 free)
USB_WTSK [0x30008ec4] (QUEUE_SUSP)  PRI=025  TS=010  STACK: 1500 @ 0x30019ca8 ( 604 used,
896 free)
SCAN_TSK [0x300021ec] (QUEUE_SUSP)  PRI=025  TS=010  STACK: 2048 @ 0x300019ec ( 724 used,
1324 free)
I2C_HIGH [0x300041f0] (SEM_SUSP  )  PRI=005  TS=010  STACK: 1500 @ 0x30004298 ( 300 used,
1200 free)
I2C_LOW  [0x30003ac8] (SEM_SUSP  )  PRI=010  TS=010  STACK: 1500 @ 0x30003b70 ( 388 used,
1112 free)
FLASH_T  [0x3000e474] (QUEUE_SUSP)  PRI=025  TS=020  STACK: 1024 @ 0x3000e074 ( 440 used,
584 free)
```

Use the `istat pmalloc` command to view the status of the memory allocation. Example B-19 shows sample output from this command.

Example B-19 `istat pmalloc` Command Output

```
001c01-L1>istat pmalloc

small pool size:   272
small pool avail:   30
small pool used:     1
small pool max:     13

big pool size:    1040
big pool avail:     15
big pool used:       0
big pool max:        3

pmalloc calls:       0
prealloc calls:      0

history:
```

l1

Use the `l1` command to engage the L1 controller command processor. Press **`Ctrl+D`** to disengage the command processor.

leds

Use the `leds` command to read the value of the group 0 and group 1 status LEDs. These LEDs connect to I/O expanders that monitor group 0 status LEDs 0 through 15 and group 1 status LEDs 0 through 15. In the output of this command, the CPUs correspond to the status LEDs as follows:

- CPU A corresponds to I/O expander A_0100001x - group 0 status LEDs 0 through 7.
- CPU B corresponds to I/O expander A_0100010x - group 0 status LEDs 8 through 15.
- CPU C corresponds to I/O expander A_0100011x - group 1 status LEDs 0 through 7.
- CPU D corresponds to I/O expander A_0100100x - group 1 status LEDs 8 through 15.

The number next to the CPU letter is a hexadecimal value that represents the value of the status LEDs that connect to the I/O expander (a bit set to 1 indicates the LED is on, and a bit set to 0 indicates the LED is off). Example B-20 shows sample output from the `leds` command.

Example B-20 `leds` Command Output

```
001c01-L1>leds
CPU A: 0x00
CPU B: 0x80
CPU C: 0x0f
CPU D: 0xf8
```

log

The following `log` set of commands displays the contents of the log, resets the log, and writes an entry into the log.

- `log`
- `log reset`
- `log <entry>`

Use the `log` command to view the contents of the log. If the log is empty, the output from the `log` command is `log is empty`.

Use `log reset` to empty the log. Use `log <entry>` to write a line in the log. The variable `<entry>` is text to enter in the log. Example B-21 shows sample output from the `log Start the Test` command.

Example B-21 `log Start the Test` Command Output

```
001c01-L1>log Start the Test
log entry made.
```

network

The following `network` set of commands displays and sets the mode for the network communication interface.

- `network`
- `network usb`
- `network 422`
- `network autodetect|auto on`
- `network autodetect|auto off`

Use the `network` command to view the current mode of the network communication interface. Example B-22 shows sample output from this command.

Example B-22 `network` Command Output

```
001c01-L1>network
network interface communication is 422
network autodetection is disabled
```

Use `network usb` to set the network communication interface mode to Universal Serial Bus (USB). Use `network 422` to set the network communication interface mode to the RS-422 protocol. Example B-23 shows sample output from the `network usb` command.

Example B-23 `network usb` Command Output

```
001c01-L1>network usb
nvram parameter changed, reset required to affect change.
```

Use `autodetect|auto on` to turn on the autodetection. Use `autodetect|auto off` to turn off the autodetection.

nmi

Use the `nmi` command to issue a non-maskable interrupt (NMI). After the system controller receives an `nmi` command, it displays `NMI...` on the front-panel display and asserts the NMI signal in I/O expander B_0100001x. If no errors occur while the system controller issues the NMI, it displays `NMI done` on the front-panel display (see Example B-24 and Figure B-2). If an error occurs, the system controller displays `NMI Fail` on the front panel display.

Example B-24 `nmi` Command Output

```
001c01-L1>nmi
001c01-L1>
```

Figure B-2 Example of `nmi` Front Panel Display Output

port

Use the `port` command to view the value of the status register for each port. As shown in Example B-25, the output of the `port` command contains six columns, as follows:

- The Port column lists the name of each port.
- The Stat column lists the hexadecimal value of the status register for each port.
- The Remote Pwr column lists the value, “okay” or “none,” of the remote power OK bit (bit 0) for each port.
- The Local Pwr column lists the value, “okay” or “none,” of the local power OK bit (bit 1) for each port.
- The Link LED column lists the value, “on” or “off,” of the link LED bit (bit 2) for each port.
- The SW LED column lists the value, “on” or “off,” of the software LED bit (bit 3) for each port.

Note: For this command, you can use the mnemonic `prt` instead of the word `port`.

Example B-25 `port` Command Output

```
001c01-L1>port
Port Stat Remote Pwr Local Pwr  Link LED SW LED
---- ---- ---------- ---------- -------- --------
   A 0x02       none       okay      off      off
   B 0x02       none       okay      off      off
```

power

The following `power` set of commands displays the status of the supplies, and powers on and powers off the supplies.

- `power`
- `power check`
- `power <up|down>`
- `power vrm`

Note: For the power command set, you can use the mnemonics `pwr`, `u`, and `d` instead of the words `power`, `up`, and `down`.

Use the `power` command to view the detailed current state of the power and margin values for the supplies in a system. Example B-26 shows sample output from this command.

Example B-26 `power` Command Output

```
001c01-L1>power
Supply          State Voltage    Margin  Value
--------------  ----- ---------  ------- -----
           12V     on       N/A      N/A
        12V IO     NC   12.312V      N/A
       12V DIG     NC   12.125V      N/A
            5V     NC    4.992V      N/A
          3.3V     NC    3.337V      N/A
         5V aux     NC    4.992V      N/A
       3.3V aux     NC    3.406V      N/A
           2.5V     on    2.496V  default     3
   Speedo2 CPU     on    1.480V   custom    19
           1.5V     on    1.480V  default     5
```

Use `power check` to view the summary of the current state of the power and margin values for the supplies in a system. Example B-27 shows sample output from this command.

Example B-27 `power check` Command Output

```
001c01-L1>power check
power appears on
```

Use `power <up|down>` to power on or power off all of the supplies in a server. The variable `<up|down>` is on or off. Use `power vrm` to check the VRM status.

reboot_l1

The `reboot_l1` set of commands reboots the L1 controller. The following are the commands in this set:

- `reboot_l1`
- `reboot_l1 <a|b>`

Use the `reboot_l1` command to reboot the L1 controller using the newest firmware image (firmware image a or firmware image b). Use `reboot_l1 <a|b>` to reboot the L1 controller using the specified firmware image. The variable `<a|b>` is a (firmware image a) or b (firmware image b).

reset

Use the `reset` command to perform a reset of the system. After the system controller receives a `reset` command, it sets various control and status signals back to their default values, and reboots the operating system. Example B-28 shows sample output for this command.

Example B-28 `reset` Command Output

```
001c01-L1>reset
001c01-L1>
```

select

The following `select` set of commands displays and sets the mode of console I/O.

- `select`
- `select <rack> <slot>`
- `select local`
- `select ctc`
- `select console`
- `select <a|b|c|d>`
- `select <subchannel>`
- `select filter <on|off>`

Use the `select` command to view the current mode of console I/O. Example B-29 shows sample output from this command.

Example B-29 `select` Command Output

```
001c01-L1>select
console input:  001c01 console
console output: not filtered.
```

Use the other `select` commands as follows:

- Use `select <rack> <slot>` to set the rack and slot for console I/O.
- Use `select local` to set the system console to the local server. The L1 will then identify the system to which to send console input. If filtering is enabled, the L1 identifies the system for which to display output.
- Use `select ctc` to set the attached server for console I/O.
- Use `select console` to set the mode of console I/O to console.
- Use `select <a|b|c|d>` to set the mode of console I/O to a CPU name (a, b, c or d).
- Use `select <subchannel>` to set the mode of console I/O to a specified subchannel (0, 1, 2, 3, or 4).
- Use `select filter <on|off>` to enable (on) or disable (off) the console output filter.

serial

Use the following `serial` set of commands to view or set the system serial number that is stored in each server.

- `serial`
- `serial all`
- `serial dimm`

Use the `serial` command to view the system serial number (SSN) settings stored in the NVRAM. Use `serial all` to show the brick serial number (BSN) and the SSN settings in NVRAM. Use `serial dimm` to show the dual-inline memory module (DIMM) serial number.

softreset

Use the `softreset` command to issue a software reset. After receiving a `softreset` command, the system controller displays `Sft rst...` on the front panel display and asserts the soft reset signal in I/O expander B_0100001x. If no errors occur while the system controller issues the soft reset, it displays `Sft rst done` on the front panel display (see Example B-30 and Figure B-3). If an error occurs while the system controller issues the soft reset, it displays `Sft rst fail` on the front panel display.

Note: For this command, you can use the mnemonic `softrst` instead of the word `softreset`.

Example B-30 `softreset` Command Output

```
001c01-L1>softreset
001c01-L1>
```

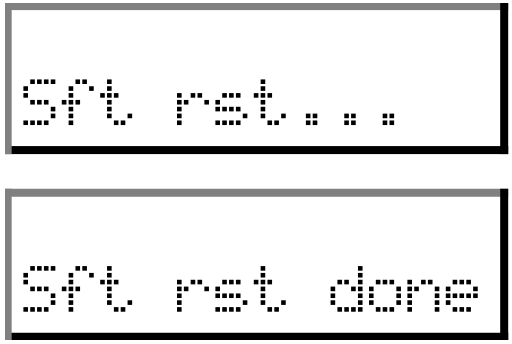

Figure B-3 Example of `softreset` Command Output

version

Use the `version` command to view the version of the firmware that is running in the system controller. Example B-31 shows sample output from this command.

Example B-31 `version` Command Output

```
001c01-L1>version
L1 1.5.12L (Image B), Built 06/07/2001 12:24:28
```

L1 System Controller Status and Error Messages

The L1 controller front panel display consists of a 2-line, 12-character liquid crystal display (LCD) that provides the following:

- System identification
- System status
- Warning of required service or failure
- Identification of failed components

Table B-1 lists the L1 controller messages.

Note: Note that in Table B-1, a voltage warning occurs when a supplied level of voltage is below or above the nominal (normal) voltage by 10 percent. A voltage fault occurs when a supplied level is below or above the nominal by 20 percent.

Table B-1 L1 Controller Messages

L1 System Controller Message	Message Meaning and Action Needed
Internal voltage messages:	
ATTN: x.xV high fault limit reached @ x.xxV	30-second power off sequence for the server (or system, if no backup is available).
ATTN: x.xV low fault limit reached @ x.xxV	30-second power off sequence for the server (or system, if no backup is available).
ATTN: x.xV high warning limit reached @ x.xxV	A higher than nominal voltage condition is detected.
ATTN: x.xV low warning limit reached @ x.xxV	A lower than nominal voltage condition is detected.
ATTN: x.xV level stabilized @ x.xV	A monitored voltage level has returned to within acceptable limits.
Fan messages:	
ATTN: FAN # x fault limit reached @ xx RPM	A fan has reached its maximum RPM level. The ambient temperature may be too high. Check to see if a fan has failed.

Table B-1 (continued) L1 Controller Messages

L1 System Controller Message	Message Meaning and Action Needed
ATTN: FAN # x warning limit reached @ xx RPM	A fan has increased its RPM level. Check the ambient temperature. Check to see if the fan stabilizes.
ATTN: FAN # x stabilized @ xx RPM	An increased fan RPM level has returned to normal.
Temperature messages: low alt.	
ATTN: TEMP # advisory temperature reached @ xxC xxF	The ambient temperature at the server's air inlet has exceeded 30 ˚C.
ATTN: TEMP # critical temperature reached @ xxC xxF	The ambient temperature at the server's air inlet has exceeded 35 ˚C.
ATTN: TEMP # fault temperature reached @ xxC xxF	The ambient temperature at the server's air inlet has exceeded 40 ˚C.
Temperature messages: high alt.	
ATTN: TEMP # advisory temperature reached @ xxC xxF	The ambient temperature at the server's air inlet has exceeded 27 ˚C.
ATTN: TEMP # critical temperature reached @ xxC xxF	The ambient temperature at the server's air inlet has exceeded 31 ˚C.
ATTN: TEMP # fault temperature reached @ xxC xxF	The ambient temperature at the server's air inlet has exceeded 35 ˚C.
Temperature stable message:	
ATTN: TEMP # stabilized @ xxC/xxF	The ambient temperature at the server's air inlet has returned to an acceptable level.
Power off messages:	
Auto power down in xx seconds	The L1 controller has registered a fault and is shutting down. The message displays every five seconds until shutdown.
Server appears to have been powered down	The L1 controller has registered a fault and has shut down.

Regulatory Specifications

This appendix presents regulatory information that may be important to the operation of your SGI Origin 300 server.

Manufacturer's Regulatory Declarations

The SGI Origin 300 sever products conform to several national and international specifications and European Directives listed on the "Manufacturer's Declaration of Conformity." The CE insignia displayed on each device is an indication of conformity to the European requirements.

Caution: Each SGI server system has several governmental and third-party approvals, licenses, and permits. Do not modify this product in any way that is not expressly approved by SGI. If you do, you may lose these approvals and your governmental agency authority to operate this device.

Server Model Number

The CMN (model) number for each server is shown on the system label on the unit.

CE Notice and Manufacturer's Declaration of Conformity

The "CE" symbol indicates compliance of the device to directives of the European Community. A "Declaration of Conformity" in accordance with the standards has been made and is available from SGI upon request.

Electromagnetic Emissions

This section provides the contents of electromagnetic emissions notices from various countries.

FCC Notice (USA Only)

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

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

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

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by using one or more of the following methods:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Caution: Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Industry Canada Notice (Canada Only)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique német pas de perturbations radioélectriques dépassant les normes applicables aux appareils numériques de Classe A préscrites dans le Règlement sur les interferences radioélectriques établi par le Ministère des Communications du Canada.

VCCI Notice (Japan Only)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Chinese Class A Regulatory Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策．

Korean Class A Regulatory Notice

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Shielded Cables

The SGI Origin 300 server product is FCC-compliant under test conditions that include the use of shielded cables between the server and its peripherals. Your server and any peripherals you purchase from SGI have shielded cables. Shielded cables reduce the possibility of interference with radio, television, and other devices. If you use any cables that are not from SGI, ensure that they are shielded. Telephone cables do not need to be shielded.

Optional monitor cables supplied with your server system use additional filtering molded into the cable jacket to reduce radio frequency interference.

Always use the cable supplied with your system. If your monitor cable becomes damaged, obtain a replacement cable from SGI.

Electrostatic Discharge

SGI designs and tests its products to be immune to the effects of electrostatic discharge (ESD). ESD is a source of electromagnetic interference and can cause problems ranging from data errors and lockups to permanent component damage.

It is important that you keep all the covers and doors, including the plastics, in place while you are operating the server system. The shielded cables that came with the server and its peripherals should be installed correctly, with all thumbscrews fastened securely.

An ESD wrist strap may be included with some products, such as memory or PCI upgrades. The wrist strap is used during the installation of these upgrades to prevent the flow of static electricity, and it should protect your system from ESD damage.

Laser Compliance Statements

The CD-ROM drive in this computer is a Class 1 laser product. The CD-ROM drive's classification label is located on the drive.

Warning: Invisible laser radiation when open. Avoid exposure to beam.

Warning: **Attention: Radiation du faisceau laser invisible en cas d'ouverture. Evitter toute exposition aux rayons.**

Warning: **Vorsicht: Unsichtbare Laserstrahlung, Wenn Abdeckung geöffnet, nicht dem Strahl aussetzen.**

Warning: **Advertencia: Radiación láser invisible al ser abierto. Evite exponerse a los rayos.**

Warning: **Advarsel: Laserstråling vedåbning se ikke ind i strålen**

Warning: **Varo! Lavattaessa Olet Alttina Lasersåteilylle**

Warning: **Varning: Laserstrålning når denna del år öppnad ålå tuijota såteeseenstirra ej in i strålen.**

Warning: **Varning: Laserstrålning nar denna del år öppnadstirra ej in i strålen.**

Warning: **Advarsel: Laserstråling nar deksel åpnesstirr ikke inn i strålen.**

Lithium Battery Statement

Warning: **Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.**

Warning: **Advarsel!: Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Léver det brugte batteri tilbage til leverandøren.**

Warning: **Advarsel: Eksplosjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.**

Warning: **Varning: Explosionsfara vid felaktigt batteribyte. Anvãnd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera anvãnt batteri enligt fabrikantens instruktion.**

Warning: **Varoitus: Päristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.**

Warning: **Vorsicht!: Explosionsgefahr bei unsachgemäßen Austausch der Batterie. Ersatz nur durch denselben oder einen vom Hersteller empfohlenem ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.**

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