

SGI® Origin® 300 User's Guide

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Record of Revision

Version	Description
001	August 2001 Initial Revision
002	April 2002 This revision includes the following changes: <ul style="list-style-type: none">- Changed the size of the rear mounting bracket from 6 inches to 2 inches.- Changed the number of required mounting-bracket screws from 4 screws to 2 screws.- Indicated that you no longer have to remove the chassis rail from the server when you install or remove a full-height PCI card in PCI slot 2.- Indicated that you must remove the hinged cover from the server when you install or remove a customer-replaceable unit.- Updated the power-on and power-off procedures.- Updated the instructions that describe how to install a server in an SGI rack.- Added connector pinouts.- Removed the appendix that contained L1 controller information.- Added references to the SGI L1 and L2 Controller Software User's Guide.

Contents

Figures	ix
Tables	xi
About This Guide.	xiii
Audience	xiv
Information Sources	xiv
SGI Origin 300 User's Guide.	xv
IRIX Admin: Software Installation and Licensing Guide.	xv
SGI L1 and L2 Controller Software User's Guide	xv
Other SGI Documentation	xv
Online Man Pages	xvi
Release Notes	xvi
Product Support	xvii
Conventions	xvii
Reader Comments.	xviii
1. Overview of the SGI Origin 300 Server	1
Chassis Features	3
Physical and Environmental Specifications	5
Chassis Front Controls and Indicators	6
Rear Panel I/O Ports and Features	8
Internal Components and Features	10
IP45 Motherboard.	10
Dual-inline Memory Modules (DIMMs)	11
I/O-8 Board Assembly	12
SCSI Backplane Board and Drive Options	13
Power Supply	13
Cooling.	13

Storage Expandability . . . . .	. 13
I/O Expandability . . . . .	. 14
SGI Origin 300 Feature Summary . . . . .	. 14
2. Installation Instructions . . . . .	. 15
Unpacking and Inspecting the Server . . . . .	. 16
Setting the Server on a Table Top. . . . .	. 16
Installing the Server in an SGI Rack . . . . .	. 17
Determining Space Requirements . . . . .	. 17
Checking the Rackmounting Hardware . . . . .	. 18
Preparing the Slide-rail Assemblies . . . . .	. 19
Preparing the Server . . . . .	. 22
Determining Where to Attach the Slide Rail in the Rack . . . . .	. 23
Attaching the Slide Rail to the Rack . . . . .	. 24
Installing Clipnuts in Rack Rails. . . . .	. 27
Installing the Server in the Rack . . . . .	. 28
Adjusting the Position of the Rackmounted Server . . . . .	. 30
Removing the Server from an SGI Rack . . . . .	. 31
3. Setting Up and Operating the Server . . . . .	. 33
Connecting the Server to a Power Source . . . . .	. 33
Connecting the System Console . . . . .	. 34
Powering On and Off the Server . . . . .	. 36
Connecting Two Servers . . . . .	. 38
Operating the Server via Front Panel Controls . . . . .	. 39
Status LEDs. . . . .	. 39
Power Button . . . . .	. 40
Reset Button . . . . .	. 40
Non-maskable Interrupt (NMI) Button . . . . .	. 40
Operating the L1 Controller . . . . .	. 41
4. Installing and Removing Customer-replaceable Units . . . . .	. 43
Safety Instructions . . . . .	. 43
PCI Cards . . . . .	. 45
Installing a PCI Card . . . . .	. 46
Removing a PCI Card . . . . .	. 49

Disk Drives	52
Installing a Disk Drive	52
Removing a Disk Drive	54
Memory	56
Installing a DIMM	57
Removing a DIMM	60
A. Technical Specifications	63
Physical and Environmental Requirements	64
Power Requirements	65
B. Connector Pinouts	67
DB9 Connector	68
RJ-45 Connector	69
External SCSI Port Connector	70
Stereo Jack Connector Conductor	72
USB Type A Connector	73
USB Type B Connector	74
C. Regulatory Specifications	75
Manufacturer's Regulatory Declarations	75
Server Model Number	75
CE Notice and Manufacturer's Declaration of Conformity	75
Electromagnetic Emissions	76
FCC Notice (USA Only)	76
Industry Canada Notice (Canada Only)	77
VCCI Notice (Japan Only)	77
Chinese Class A Regulatory Notice	77
Korean Class A Regulatory Notice	77
Shielded Cables	78
Electrostatic Discharge	78
Laser Compliance Statements	78
Lithium Battery Statement	80
Index	81

Figures

Figure 1-1	Front and Side View of an SGI Origin 300 Server	3
Figure 1-2	Rear and Side View of an SGI Origin 300 Server	4
Figure 1-3	Front Controls and Indicators.	6
Figure 1-4	Rear I/O Ports and Features	8
Figure 1-5	Memory Bank Layout	11
Figure 2-1	Location of Table-mounting Feet	16
Figure 2-2	Removing the Chassis Rail from the Slide Rail	19
Figure 2-3	Attaching the Rear Mounting Bracket to the Slide Rail	21
Figure 2-4	Attaching Chassis Rails to the Server Chassis	22
Figure 2-5	Mounting-hole Pattern of Rack Vertical Rails	23
Figure 2-6	Placing the Barnuts on the Rack Rails	25
Figure 2-7	Attaching the Slide Rail to the Rack	26
Figure 2-8	Installing Clipnuts in Rack Rails	27
Figure 2-9	Pressing the Safety Latches	29
Figure 2-10	Securing the Server to the Rack	30
Figure 2-11	Releasing the Safety Latches	31
Figure 2-12	Releasing the Slide Latches	32
Figure 3-1	Power Connector on the Rear of the Server	33
Figure 3-2	Location of the L1 Console Port	35
Figure 3-3	Location of the Power Button	36
Figure 3-4	Front Panel Functions	39
Figure 4-1	PCI Slots Located in the Rear of the Origin 300 Server.	45
Figure 4-2	Opening Server to Install PCI Card	47
Figure 4-3	Removing Blanking Plate	47
Figure 4-4	Installing a PCI Card	48
Figure 4-5	Opening Server to Remove PCI Card	49
Figure 4-6	Removing a PCI Card	51

Figure 4-7	Disk Drive Location. . . . .	.52
Figure 4-8	Installing a Disk Drive . . . . .	.53
Figure 4-9	Removing a Disk Drive. . . . .	.55
Figure 4-10	DIMM Slots . . . . .	.56
Figure 4-11	Opening Server to Install DIMM . . . . .	.58
Figure 4-12	Inserting a DIMM . . . . .	.59
Figure 4-13	Opening Server to Remove DIMM . . . . .	.60
Figure 4-14	Removing a DIMM . . . . .	.61
Figure B-1	Rear Panel of Origin 300 Server . . . . .	.67
Figure B-2	DB9 Pin Assignments . . . . .	.68
Figure B-3	RJ-45 Connector Pin Assignments. . . . .	.69
Figure B-4	External SCSI Port Pin Number Locations . . . . .	.70
Figure B-5	Stereo Jack Connector Conductors . . . . .	.72
Figure B-6	USB Type A Connector Pin Number Locations . . . . .	.73
Figure B-7	USB Type B Connector Pin Number Locations . . . . .	.74

Tables

Table 1-1	Physical and Environmental Specifications	5
Table 1-2	General Features of the SGI Origin 300 Server	14
Table 2-1	SGI Origin 300 Space Requirements	17
Table 2-2	Rackmounting Hardware	18
Table A-1	Physical and Environmental Specifications	64
Table A-2	Power and Cooling Requirements	65
Table B-1	SGI Origin 300 Server Connectors	67
Table B-2	SCSI VHDCI Pin Assignments	70
Table B-3	Stereo Jack Connector Conductor Assignments	72
Table B-4	USB Type A Connector Pin Assignments	73
Table B-5	USB Type B Connector Pin Assignments	74

About This Guide

This guide provides an overview of the SGI Origin 300 server components. It also describes how to set up and operate the SGI Origin 300 server. Specifically, it provides the following information:

- Chapter 1, “Overview of the SGI Origin 300 Server”
- Chapter 2, “Installation Instructions”
- Chapter 3, “Setting Up and Operating the Server”
- Chapter 4, “Installing and Removing Customer-replaceable Units”
- Appendix A, “Technical Specifications”
- Appendix B, “Connector Pinouts”
- 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 is written with the assumption that the reader has a 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 tasks that you may 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.
- Installing and removing disk drives.
- Installing and removing PCI cards.
- Installing and removing DIMMs.
- 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)
- *SGI L1 and L2 Controller Software User's Guide*
- Other SGI documentation
- Man pages (online)
- IRIX Release Notes (on CD)

SGI Origin 300 User's Guide

Use this guide to become acquainted with your server and to learn how to operate and monitor the server. In addition, this guide contains information on installing the server in a 19-inch rack and installing and replacing disk drives, PCI cards, and DIMMs.



Warning: To ensure your safety and protect your system, do not add or replace any components that this guide does not designate as customer replaceable. Contact your SGI system support engineer (SSE) to install any hardware components that are not designated as customer replaceable in this guide.

IRIX Admin: Software Installation and Licensing Guide

This is the complete reference guide on using the installation program, *inst*, to install software. For information on using the Software Manager to install software, refer to the online *Personal System Administration Guide*.

SGI L1 and L2 Controller Software User's Guide

This guide describes the L1 controller functions, commands, and error messages that you may need to operate and maintain your system.

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 that are available for purchase, double-click **Documentation Catalog**.

Online Man Pages

Your system includes a set of IRIX online manual pages, which are formatted in the standard UNIX “man page” style. These man pages are located 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
```

Man pages document important system configuration files and commands. References in SGI documentation to these pages include the name of the command and the section number in which the command is located. For example, “`Add_disk(1)`” refers to the `Add_disk` command and indicates that it is located 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 the `apropos(1)` and `makewhatis(1M)` man pages.

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 command 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, please contact the SGI subsidiary or authorized distributor in your country.

Conventions

The following conventions are used throughout this document:

Convention	Meaning
<code>command</code>	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
<i>variable</i>	Italic typeface denotes variable entries and words or concepts being defined.
user input	This bold, fixed-space font denotes literal items that the user enters in interactive sessions. Output is shown in nonbold, fixed-space font.
[]	Brackets enclose optional portions of a command or directive line.
...	Ellipses indicate that a preceding element can be repeated.
manpage(<i>x</i>)	Man page section identifiers appear in parentheses after man page names.

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.)

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Overview of the SGI Origin 300 Server

The SGI Origin 300 server is a 2U-high system that consists of two or four 64-bit MIPS RISC (reduced instruction set computer) processors. A single system image (SSI) of 4, 6, or 8 processors is available by interconnecting two SGI Origin 300 servers via a NUMALink 3 cable.

Each SGI Origin 300 server has from 512 MB to 4 GB of local memory available on four memory DIMMs (dual-inline memory modules). As much as 8 GB of memory is addressable when two SGI Origin 300 servers are connected via a NUMALink 3 cable.

The server:

- Houses one or two sled-mounted Ultra3 SCSI disk drives that have a peak data transfer speed of up to 160 MB/s between the disks and system memory. For storage expandability, the server can connect to a 2U 8-disk Ultra3/160 SCSI JBOD SGI Total Performance 900 (TP900) storage system.
- Contains two PCI 2.2-compliant option card slots that are configured on one bus. The two universal PCI slots support both 32- and 64-bit addressing modes at 33 or 66 MHz. For I/O expandability, the server can connect to a peer-attached PCI expansion module.
- Supports two USB (universal serial bus) ports, one 10/100BaseT Ethernet port, two serial ports, real-time (RT) interrupt input and output ports, one external Ultra3 SCSI port, one L1 port, one console port, and one NUMALink 3 port.
- Has a Crosstown2 port that connects the server to an InfiniteReality graphics pipeline.

This chapter provides an overview of the server as follows:

- “Chassis Features” on page 3
- “Internal Components and Features” on page 10
- “Storage Expandability” on page 13
- “I/O Expandability” on page 14
- “SGI Origin 300 Feature Summary” on page 14

Chassis Features

The SGI Origin 300 server is a multiprocessor system that consists of one or two chassis. A two-chassis system uses a NUMALink 3 cable to interconnect the two chassis. The server is available in stand-alone configurations and industry-standard rackmountable configurations.

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

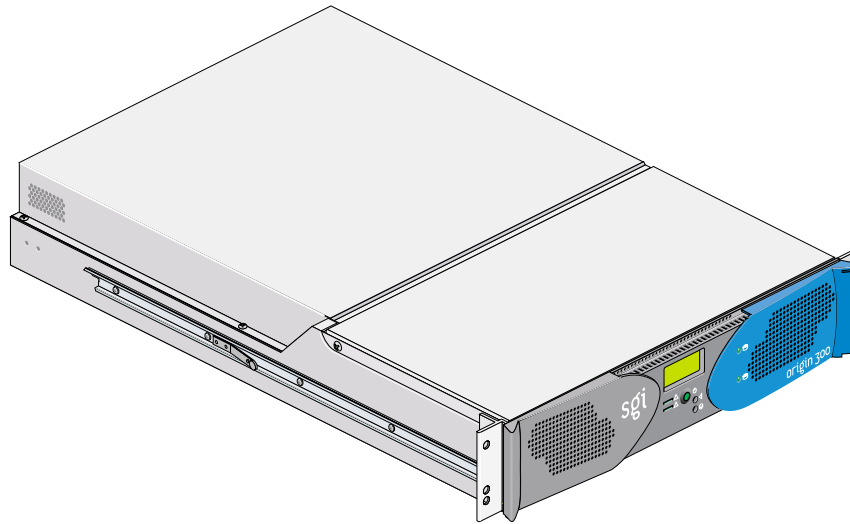


Figure 1-1 Front and Side View of an SGI Origin 300 Server

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

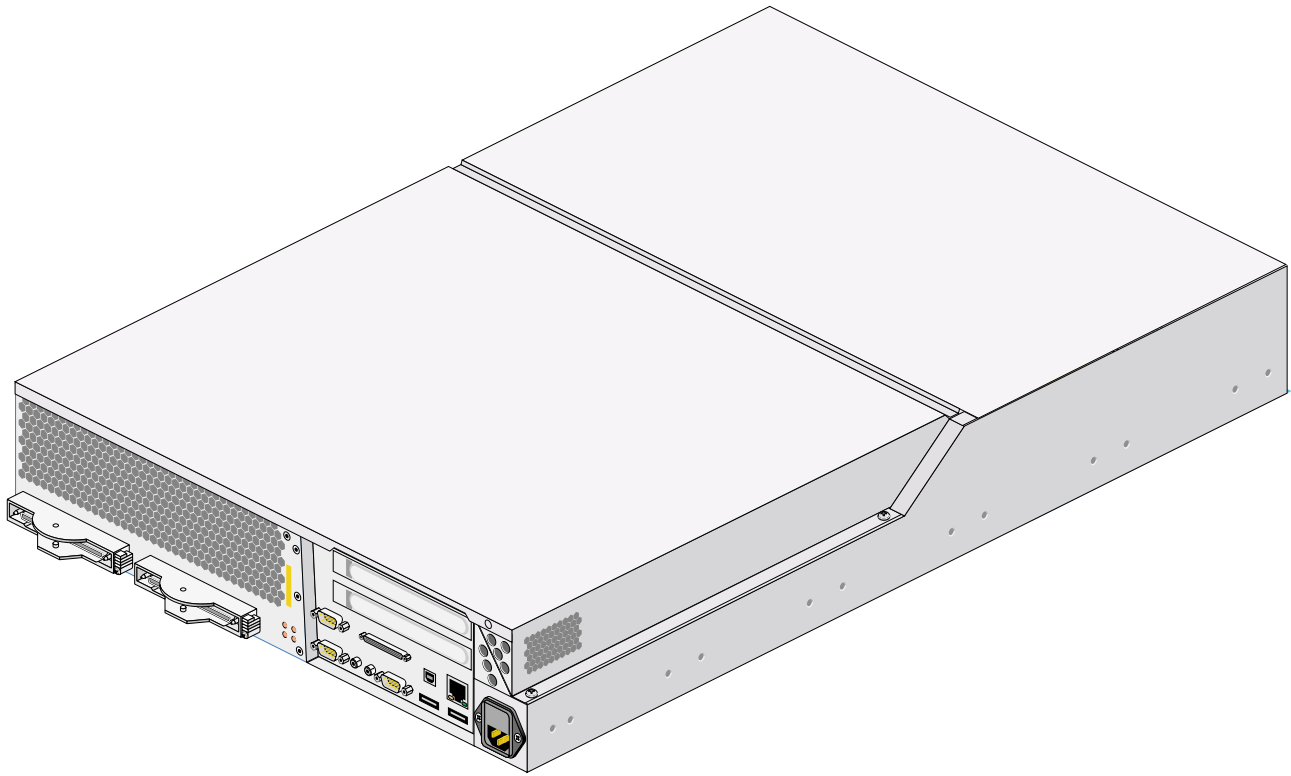


Figure 1-2 Rear and Side View of an SGI Origin 300 Server

Physical and Environmental Specifications

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

Table 1-1 Physical and Environmental Specifications

Height	3.46 inches (8.80 cm)
Width	19.0 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 (68.0 cm) (with bezel)
Weight	36.0 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 / 5,000 ft to 10,000 ft)
Temperature, nonoperating	-40 °C (-40 °F) to +60 °C (+140 °F)
Humidity	10% to 95% RH, noncondensing
Altitude	Sea level to 40,000 ft (nonoperating) Sea level to 10,000 ft (3000 m) (operating)
Noise	50 dB(A) maximum
Heat dissipation	938 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.

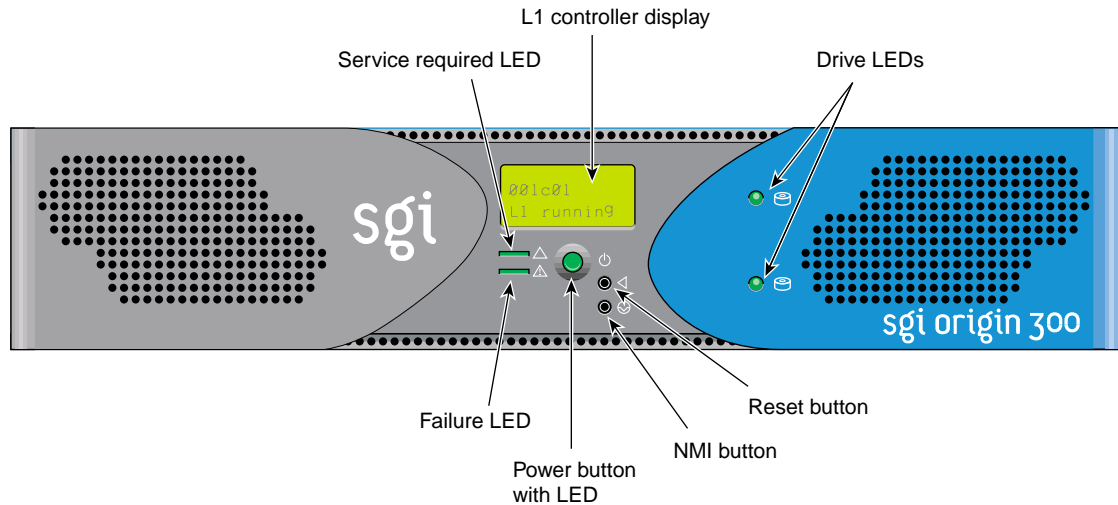


Figure 1-3 Front Controls and Indicators

The front panel of the server has the following items:

- **L1 controller display.** A liquid crystal display (LCD) that displays status and error messages that the L1 controller generates.

Note: Refer to the *SGI L1 and L2 Controller Software User's Guide* (007-3938-00x) for more information on the L1 controller.

- **Power button with LED.** Press this button to power on the internal components. Alternatively, you can power on the internal components at a system console. The LED illuminates green when the internal components are on.
- **Reset button.** Press this button to reset the internal processors and ASICs. The reset will cause a memory loss. (Refer to 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 illuminates yellow to indicate that an item has failed or is not operating properly, but the server is still operating.
- **Failure LED.** This LED illuminates red to indicate that a failure has occurred and the server is down.
- **Drive LEDs.** These LEDs illuminate 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.

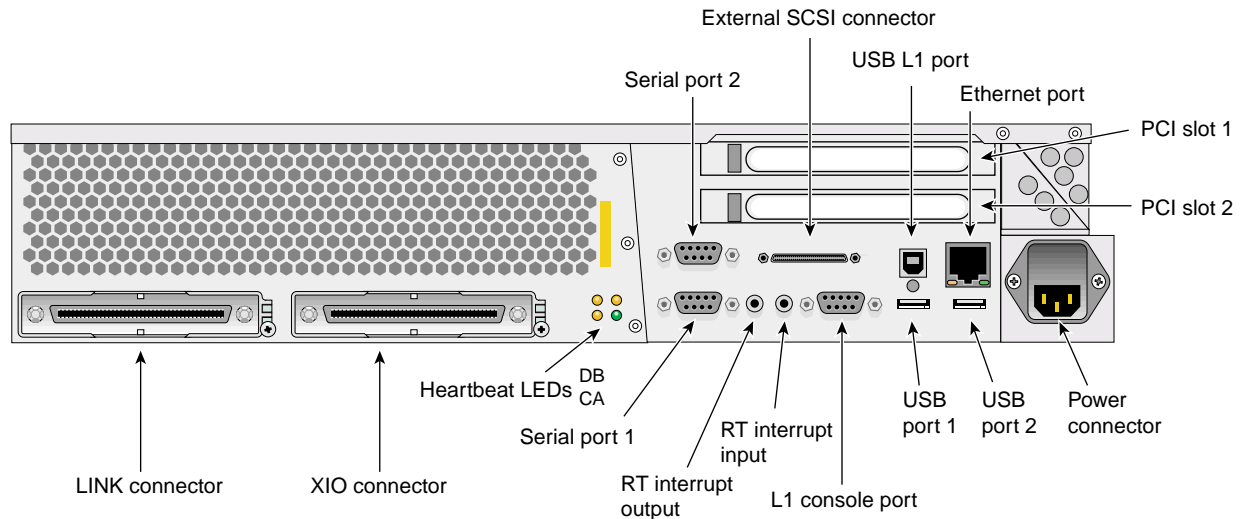


Figure 1-4 Rear I/O Ports and Features

The rear panel of the server has the following items:

- **Power connector.** This connector connects the server 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 module. This connection is made with a NUMAlink 3 cable at 1.6 GB/s in each direction.
- **XIO connector.** This Crosstown2 connector connects an SGI Origin 300 server to an InfiniteReality graphics pipeline. This connection is made with a NUMAlink 3 cable at 800 MB/s in each direction.
- **L1 console port.** This port (console and diagnostic port) connects the server's L1 controller to a system console.
- **USB L1 port.** This universal serial bus (USB) connector connects the server's L1 controller to an L2 controller.

- **PCI slots 1 and 2.** These slots house the PCI cards. The two PCI 2.2-compliant slots are configured on one bus. The PCI bus supports both 32- and 64-bit modes at 33 or 66 MHz. Refer to 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 ports can be used as COM ports to connect modems or other serial devices.
- **USB ports 1 and 2.** These ports can connect to 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.
- **Ethernet port.** This autonegotiating 10BaseT or 100BaseT 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. Refer to 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), indicate processor activity.

Internal Components and Features

The internal components of the Origin 300 server are described in the following sections:

- “IP45 Motherboard” on page 10
- “Dual-inline Memory Modules (DIMMs)” on page 11
- “I/O-8 Board Assembly” on page 12
- “SCSI Backplane Board and Drive Options” on page 13
- “Power Supply” on page 13
- “Cooling” on page 13

IP45 Motherboard

The IP45 motherboard houses the following components:

- **Two or four MIPS RISC processors** (each processor has a secondary (L2) cache).
- **Four dual-inline memory module (DIMM) slots** that are organized as two banks of memory per two DIMM slots (four banks total), and configurable from 512 MB to 4 GB of main memory. Refer to “Dual-inline Memory Modules (DIMMs)” on page 11 for more information on DIMMs.
- **Xbridge ASIC** (application-specific integrated circuit) that is the interface between the Bedrock ASIC and the PCI slots.
- **Bedrock ASIC** (or hub ASIC) that enables 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). Refer to the *SGI L1 and L2 Controller Software User’s Guide* (007-3938-00x) for more information on the L1 controller.
- **Five VRMs** that convert the incoming voltages to the voltage levels required by the components.
- **Light-emitting diodes (LEDs)** that provide information about the NUMalink port and the processor:
 - Two NUMalink 3 LEDs, controlled by the L1 controller
 - Four heartbeat LEDs, controlled by the Bedrock ASIC

Note: Ports and LEDs are described in detail in “Rear Panel I/O Ports and Features” on page 8.

Dual-inline Memory Modules (DIMMs)

Each SGI Origin 300 server 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 or four banks that are referred to as banks 0, 1, 2, and 3. 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 bank pair 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.

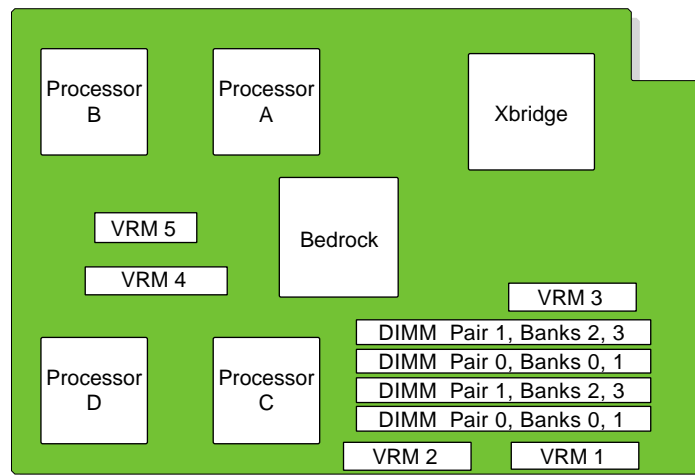


Figure 1-5 Memory Bank Layout

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

The SGI Origin 300 server supports three memory kits:

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

I/O-8 Board Assembly

The I/O-8 board assembly consists of a main I/O-8 board, an I/O-8 daughtercard, and a PCI riser card. The assembly provides I/O interface functions, the I/O connectors to the system backpanel, and the L1 controller functions.

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

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

Note: Ports and LEDs are described in detail in “Rear Panel I/O Ports and Features” on page 8.

The PCI riser card provides a connection between the IP45 motherboard and the I/O-8 board assembly, while also providing two PCI card slots. The PCI riser card has the following connectors:

- One connector that connects the PCI riser card to the IP45 motherboard
- Two 64-bit universal PCI connectors that seat the PCI cards
- One nonstandard PCI connector that connects to the I/O-8 board assembly
- One 50-pin AMP connector that connects to the I/O-8 board assembly

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 two disk drives. The SCSI backplane supports Ultra3 SCSI LVD disks with a peak transfer rate of 160 MB/s. Refer to 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 nonredundant modified WTX power supply with an input of 110/220 Vac (autosensing) and a maximum output of 460 W (3.3/5/12Vdc). 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 three fans in an N+1 redundant configuration. The power supply also uses an N+1 redundant cooling configuration; it is cooled by two fans. The direction of the airflow is front to back through the enclosure.

Storage Expandability

For storage expandability, the SGI Origin 300 server can connect to a 2U 8-disk Ultra3/160 SCSI JBOD TP900 system. Refer to *SGI Total Performance 900 Storage System User's Guide* (007-4428-00x) for information on the SGI TP900 storage system.

I/O Expandability

For I/O expandability, the SGI Origin 300 server can connect to a PCI expansion module via the NUMALink 3 port. For more information about the PCI expansion module, refer to the *PCI Expansion Module User's Guide* (007-4499-00x).

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 processors	2 or 4	4, 6, or 8
Memory	512 MB to 4 GB	1 GB to 8 GB
I/O 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 port	One 10BaseT or 100BaseT	Two 10BaseT or 100BaseT
SCSI channel (internal)	One Ultra3 SCSI, 160 MB/s	Two Ultra3 SCSI, 160 MB/s
SCSI channel (external)	One Ultra3 SCSI (VHDCI)	Two Ultra3 SCSI (VHDCI)
3.5-inch drive bays	Two	Four
USB ports	Three	Six
RT interrupt input port	One	Two
RT interrupt output port	One	Two
L1 console port	One	One
NUMALink port	One	N/A
XIO port	One	Two

Installation Instructions

This chapter provides information on installing the SGI Origin 300 server on a table top or in an SGI 19-inch rack. This chapter also includes instructions on how to remove the server from the rack. Specifically, the following topics are covered:

- “Unpacking and Inspecting the Server” on page 16
- “Setting the Server on a Table Top” on page 16
- “Installing the Server in an SGI Rack” on page 17

Note: The server rackmounting kit also enables the server to be mounted in an industry-standard 19-inch rack.

- “Removing the Server from an SGI Rack” on page 31



Warning: Employ a minimum of two people to lift the server off the shipping pallet, move the server from one location to another, and install the server in a rack or serious injury to personnel could occur.



Warning: Use the following guidelines to prevent the rack from toppling over or serious injury to personnel and/or damage to equipment could occur.

Use the following guidelines to prevent the rack from toppling over:

- Make sure that only one Origin 300 server is extended out of the rack at one time.
- Install all equipment in the lowest available position in the rack.
- Ensure that the tip tray is bolted to the front of the rack.

Unpacking and Inspecting the Server

Inspect the packaging container for evidence of mishandling during transit. If the packaging container is damaged, photograph it for reference. After you remove the contents, keep the damaged container and the packing materials.

Remove the server from the packaging container and ensure that all accessories are included. Inspect the server and accessories for damage. If the contents appear damaged, file a damage claim with the carrier immediately. In addition, notify your local Customer Support Center (CSC) for any missing, incorrect, or damaged items.

CSC contact information is provided at the following URL:
<http://www.sgi.com/support/supportcenters.html>

Setting the Server on a Table Top

If you choose to operate your server on a table top, you need to install five self-adhesive feet that are 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 as shown in Figure 2-1.

Note: If you mount the server in a rack at a later date, you will need to remove the feet.

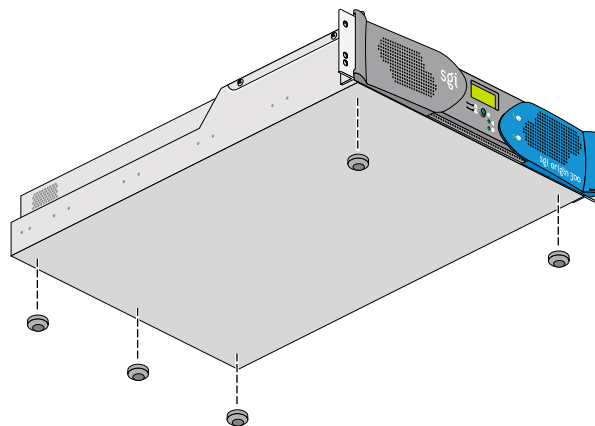


Figure 2-1 Location of Table-mounting Feet

Installing the Server in an SGI Rack

The rackmount instructions include the following topics:

- “Determining Space Requirements” on page 17
- “Checking the Rackmounting Hardware” on page 18
- “Preparing the Slide-rail Assemblies” on page 19
- “Preparing the Server” on page 22
- “Determining Where to Attach the Slide Rail in the Rack” on page 23
- “Installing Clipnuts in Rack Rails” on page 27
- “Installing the Server in the Rack” on page 28
- “Adjusting the Position of the Rackmounted Server” on page 30

Determining Space Requirements

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

Table 2-1 SGI Origin 300 Space Requirements

Height	3.46 inches (8.79 cm)
Width	19.0 inches (48.3 cm)
Depth	27.0 inches (68.6 cm)
Weight	36.0 lbs (16.4 kg)
Required front clearance for server	8.25 inches (20.96 cm)
Required rear clearance for server	10.00 inches (25.40 cm)
Required side clearance for server	6.00 inches (15.24 cm) (right side) No clearance requirement for left side
Required front clearance for rack	36 inches (91 cm)
Required rear clearance for rack	36 inches (91 cm)

Checking the Rackmounting Hardware

Table 2-2 lists the hardware that you will use to mount the SGI Origin 300 server in a 19-inch rack.

Table 2-2 Rackmounting Hardware

Hardware Type	Qty	Usage
Slide-rail assembly (includes chassis rail)	2	Allows the server to slide in and out of rack. (The left and right slides are identical.)
2" rear mounting bracket	2	Mounts the slide rails to the rear rack rails. (The left and right brackets are identical.)
10-24 x 1/4" Phillips screw	10	Secures the chassis rails to the server.
10-32 x 1/2" Phillips screw	8	Secures the slide rails to the rack rails.
Shoulder washer	8	
Barnut	4	
10-32 x 1/2" Phillips screw	4	Secures the slide rails to their mounting brackets.
Barnut	2	
10-32 clipnut	2	Provides a threaded hole for fastening the server front panel to the rack rails.
10-32 x 1/2" Phillips screw	2	Fastens the server front panel to the clipnut.

Preparing the Slide-rail Assemblies

The slide-rail assembly consists of a chassis rail and a slide rail. You need to remove the chassis rail from the slide rail so that you can install a mounting bracket to the slide rail and attach the chassis rail to the server (refer to “Preparing the Server” on page 22). Follow these steps to remove the chassis rail from the slide rail:

1. Remove the two slide-rail assemblies and the rear mounting brackets from the shipping container.
2. Extend each slide-rail assembly 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.

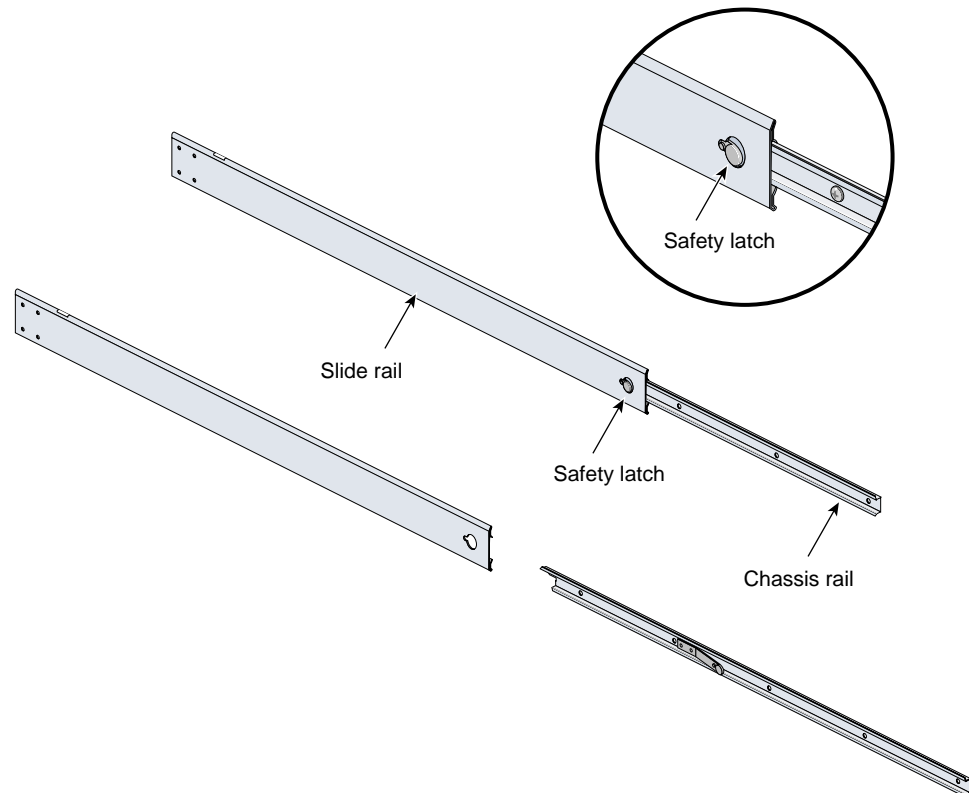


Figure 2-2 Removing the Chassis Rail from the Slide Rail

4. Place one of the mounting brackets on the back of the slide rail as shown in Figure 2-3. Adjust the position of the mounting bracket on the slide rail according to the depth of the rack.
5. Place a barnut next to the mounting bracket. Secure the mounting bracket to the slide rail by inserting two 10-32 x 1/2" screws through the assembly and into the barnut as shown in Figure 2-3.
6. Repeat Steps 4 and 5 to attach a mounting bracket to the other slide rail.

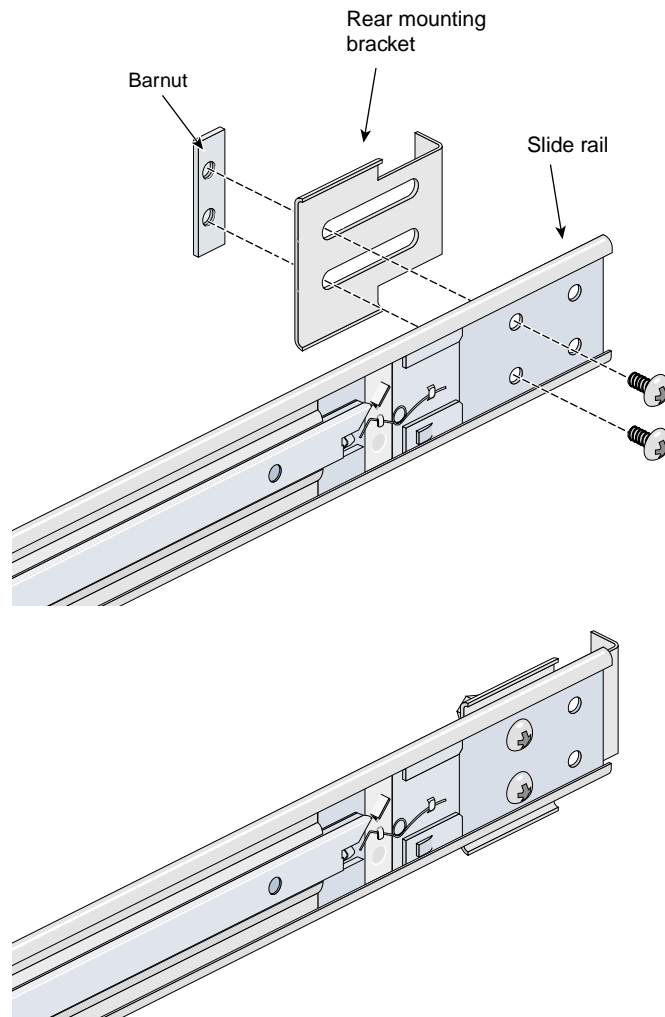


Figure 2-3 Attaching the Rear Mounting Bracket to the Slide Rail

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 (refer to Figure 2-4).



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

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

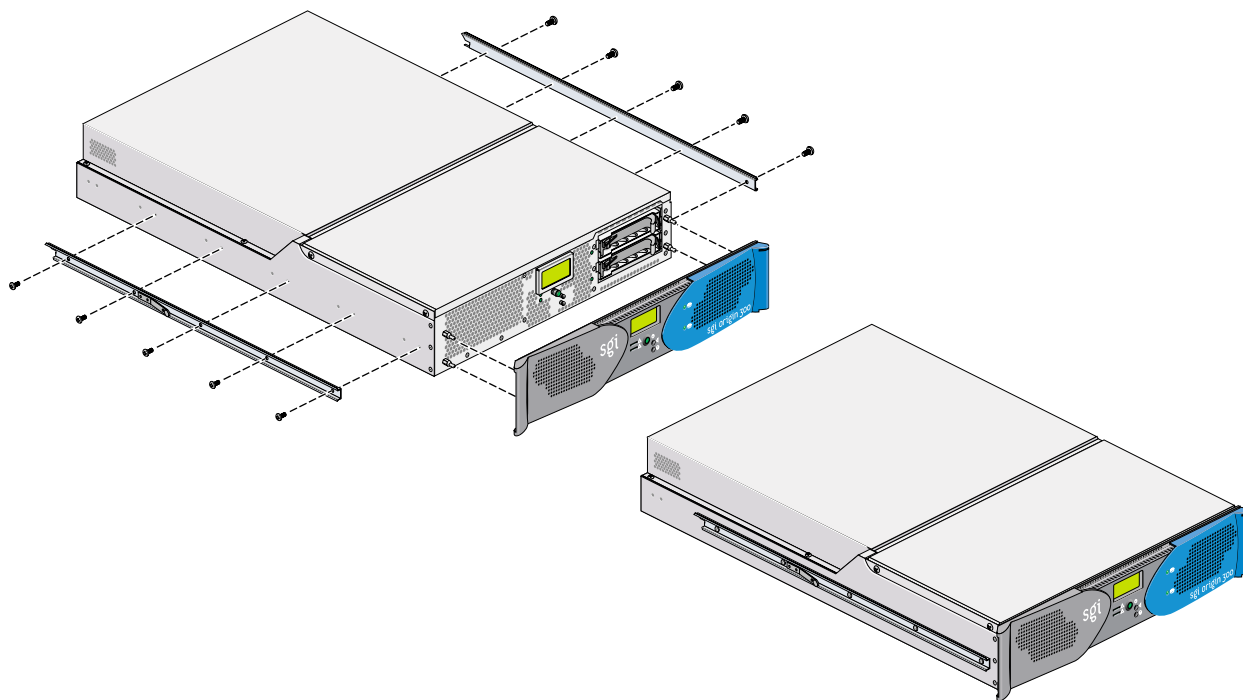


Figure 2-4 Attaching Chassis Rails to the Server Chassis

Determining Where to Attach the Slide Rail in the Rack

The server requires 2 units (U) of space within the rack. (1 unit is equivalent to 1.75 inches [44.5 cm]). To determine where you should install the slide rails in the rack, you must count mounting holes. Each U contains three mounting holes; therefore, in the 2U of space that the server occupies, there are six mounting holes. The bottom hole of the 2U space is hole 1. The top mounting hole in the 2U space is 6. Refer to Figure 2-5.

Note: A server in the rack is identified by the lowest U number that it occupies. For example, in Figure 2-5 the server resides in U5 (the fifth unit within the rack).

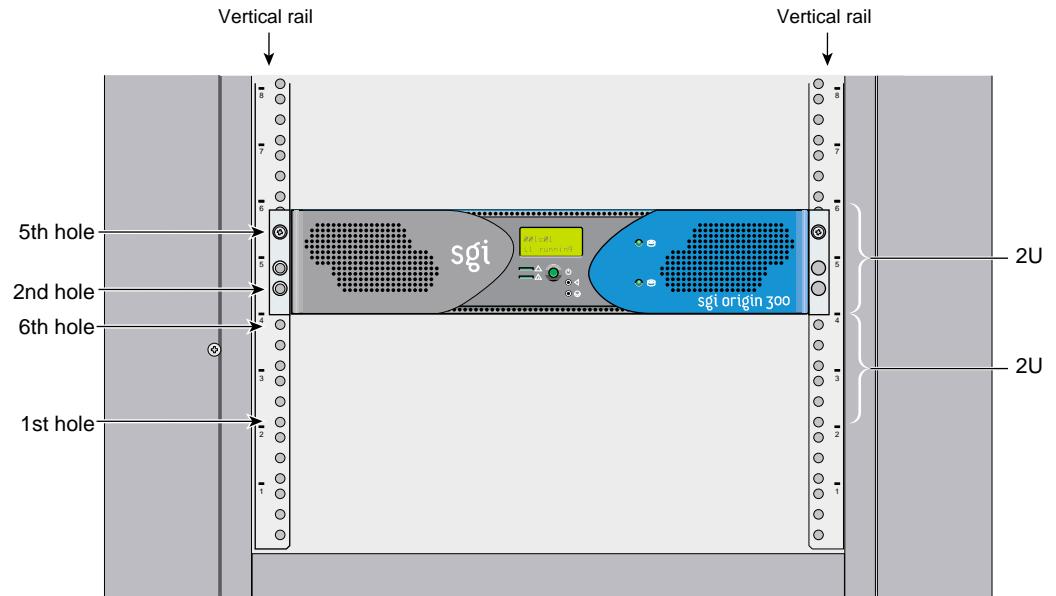


Figure 2-5 Mounting-hole Pattern of Rack Vertical Rails

To determine how many mounting holes you must count, use the following formula:
 $3 \times (\text{the lowest U number that the server will occupy}) - 2$. For example, when you want to install the server in locations U9 and U10, count 25 mounting holes ($3 \times 9 - 2$) starting from the bottom of the rack. The 25th hole is the first mounting hole of U9.

Attaching the Slide Rail to the Rack

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

Tip: The slide rails must be level in the rack. To ensure that you install the slide rails correctly, carefully count the mounting holes on all of the rack rails (two front rails and two rear rails).

1. Locate eight 10-32 x 1/2" Phillips screws, eight shoulder washers, and four barnuts.
2. Place one of the barnuts inside the rack and align it with the second and third holes of the selected 2U of space (refer to Figure 2-6).

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. Refer to Figure 2-6.

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

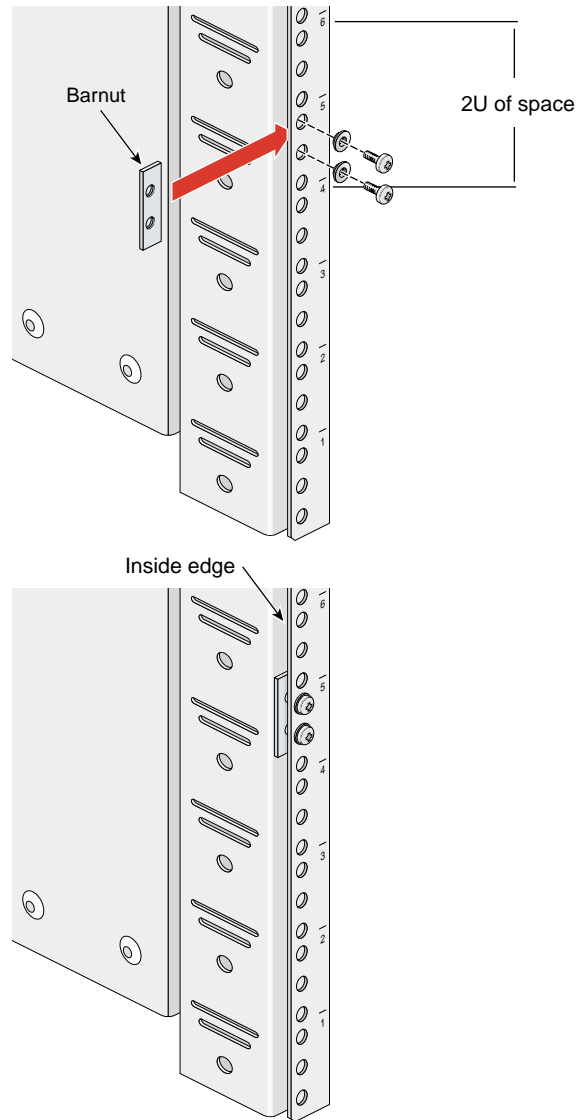


Figure 2-6 Placing the Barnuts on the Rack Rails

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

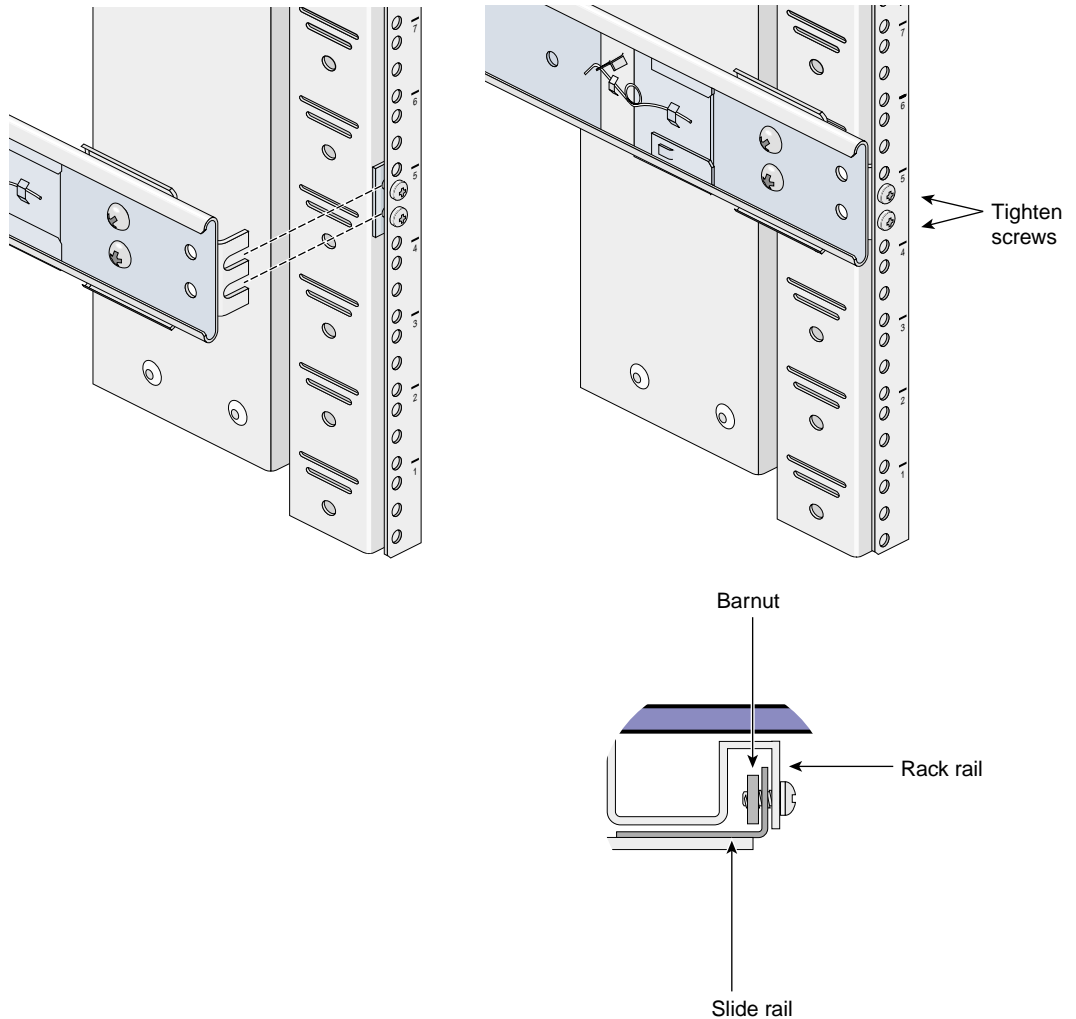


Figure 2-7 Attaching the Slide Rail to the Rack

Installing Clipnuts in Rack Rails

Clipnuts secure the servers to the rack. To install the clipnuts, slide the clipnuts over the fifth hole of the selected 2U of space on each of the front rails. Refer to Figure 2-8 for details.

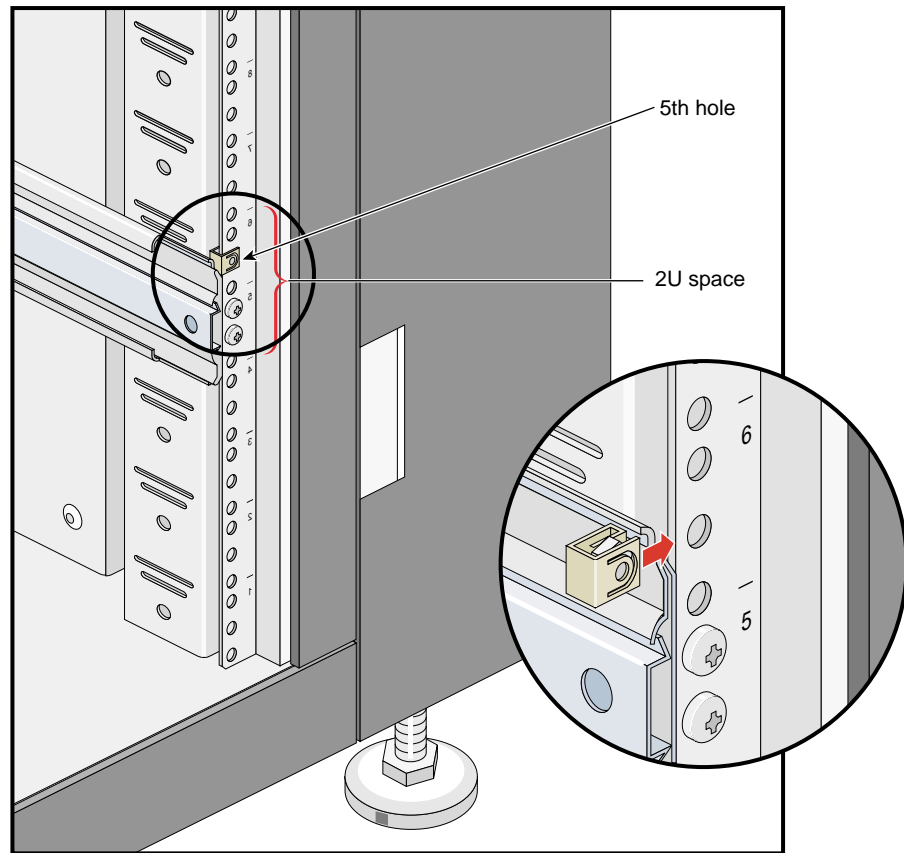


Figure 2-8 Installing Clipnuts in Rack Rails

Installing the Server in the Rack

Follow these steps to install the server in the rack.

Note: Step 2 requires two people.

1. Fully extend the left and right slide rails from the rack until they lock into place.
2. With one person holding each side of the server, align the chassis rails of the server with the slide rails of the rack.
3. Slide the chassis rails into the slide rails until the chassis rails are stopped by the safety latches.
4. Press the safety latches on both sides of the server to fully seat the chassis rails into the slide rails (refer to Figure 2-9).
5. Firmly tighten all screws (the eight screws that secure the slide rails to the rack rails).

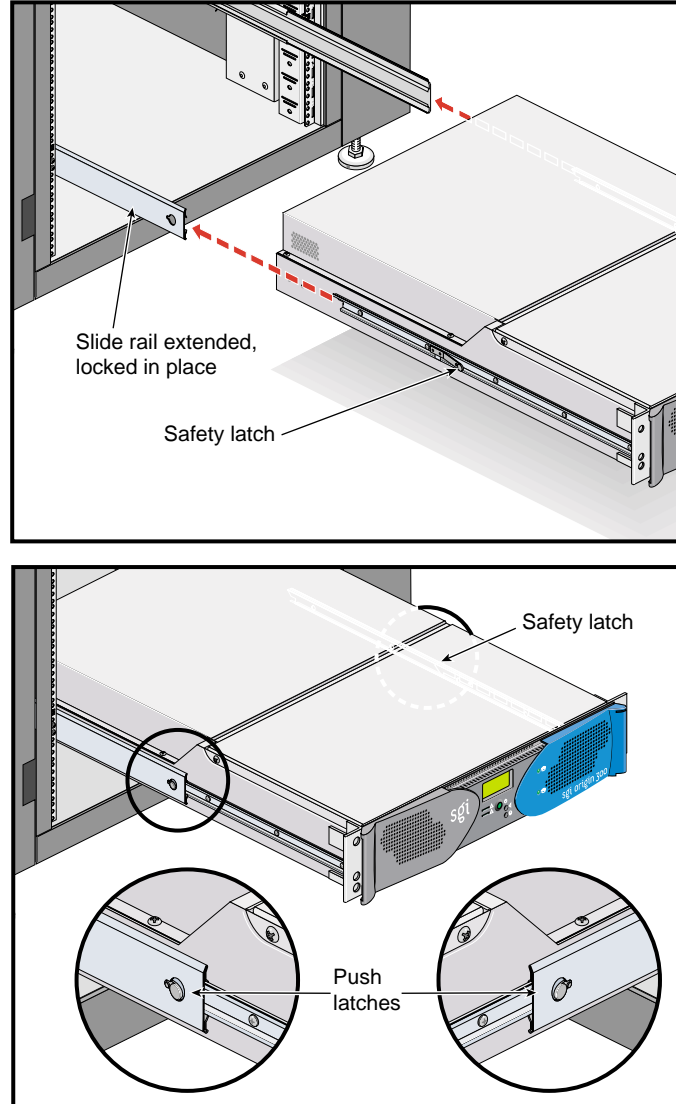


Figure 2-9 Pressing the Safety Latches

- Secure the server to the rack by inserting a 10-32 x 1/2" Phillips screw in the top hole of each chassis ear (refer to Figure 2-10).

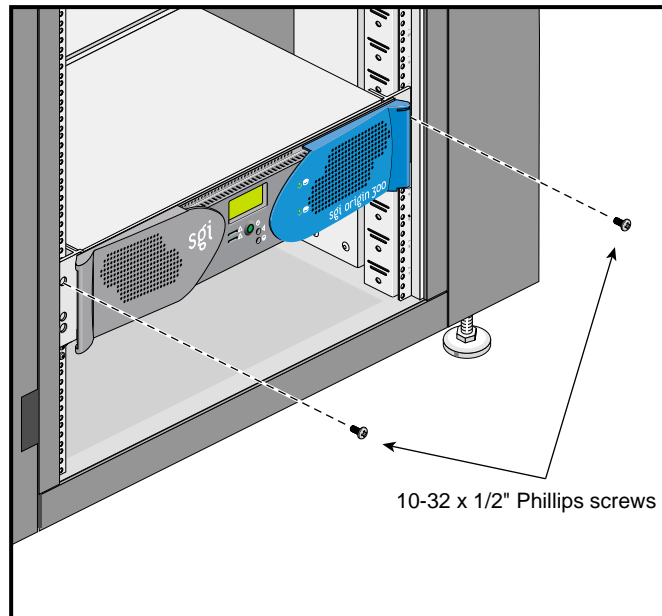


Figure 2-10 Securing the Server to the Rack

Adjusting the Position of the Rackmounted Server

Once the server is installed in the rack, you can adjust the position of the server in the rack (upward and sideways). To adjust the position of the server, loosen the front mounting screws, adjust the server to the desired position, and then tighten the mounting screws.



Caution: Do not lift the server by its bezel; it is not designed to handle the weight of the server. Instead, use the chassis ears to move the server (refer to Figure 2-11).

Removing the Server from an SGI Rack

To remove the server from the rack, follow these steps:

1. Power off the server. For instructions on how to power off the server, refer to “Powering On and Off the Server” on page 36.
2. Disconnect all of the cables at the rear of the server.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately 5 minutes before you proceed with these instructions.

3. Remove the two screws that secure the server to the front rails of the rack.
4. Carefully pull the server from the rack until it is stopped by the safety latches.
5. With one person holding each side, release the safety latches on both sides of the server and pull the server out of the slide rail (refer to Figure 2-11).
6. Place the server on a flat, stable surface.

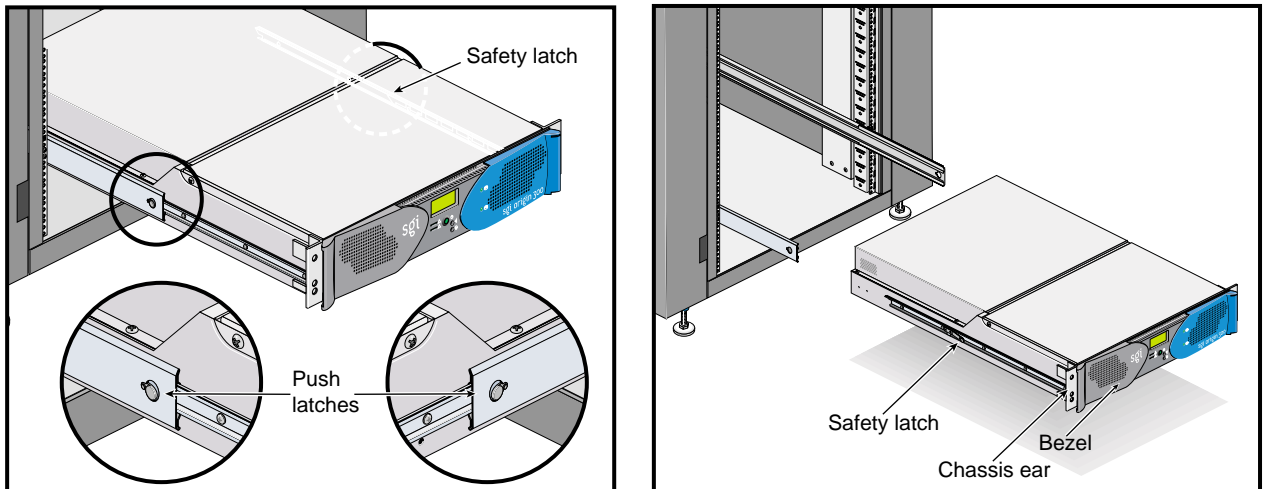


Figure 2-11 Releasing the Safety Latches

7. To slide the slide rails back into the rack, push down on the slide latches as shown in Figure 2-12.

Note: Before you can reinstall an Origin 300 server into the rack, fully extend the slide rails from the rack until they lock into place.

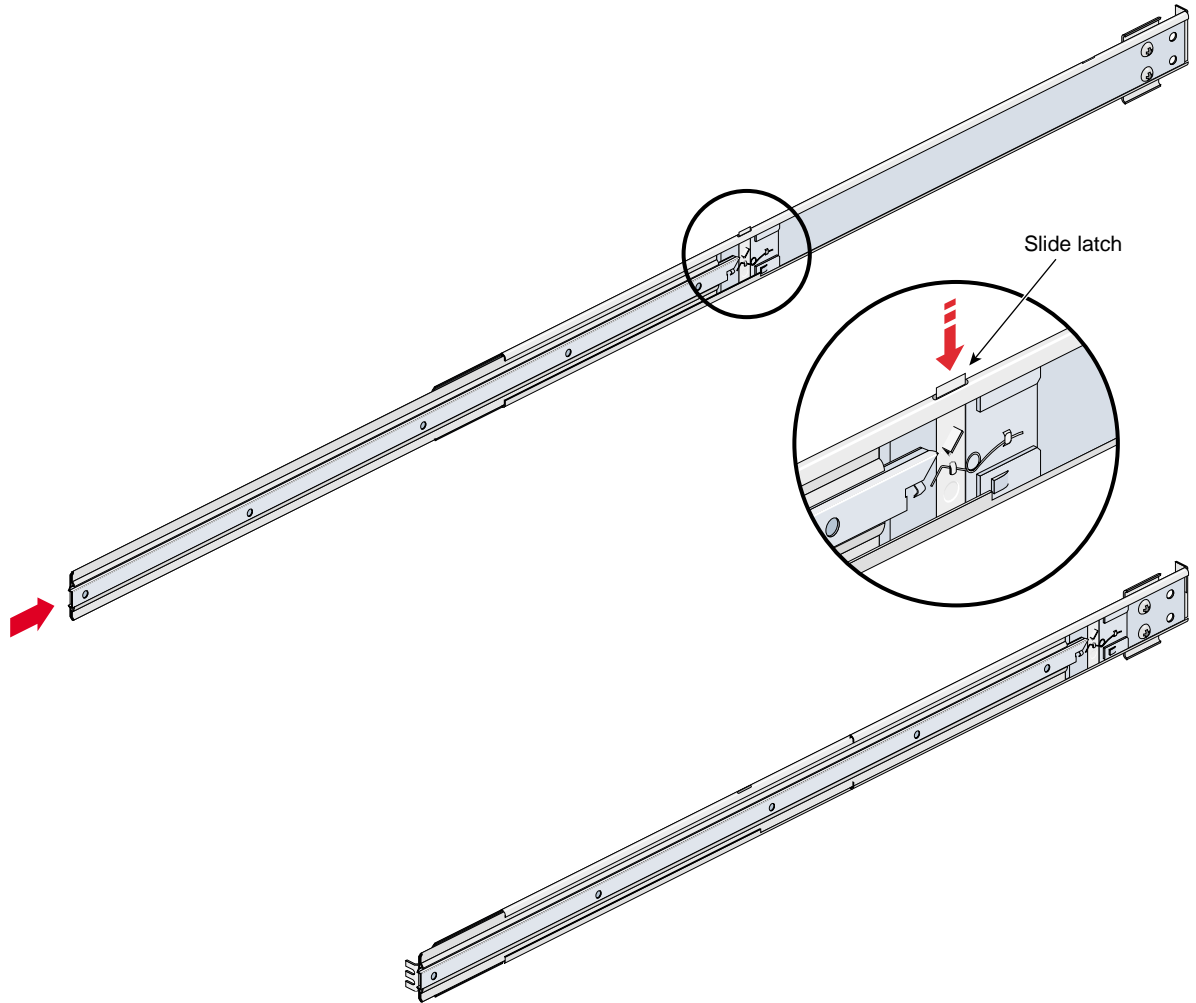


Figure 2-12 Releasing the Slide Latches

Setting Up and Operating the Server

This chapter contains the following sections that describe how to set up and operate an SGI Origin 300 server:

- “Connecting the Server to a Power Source” on page 33
- “Connecting the System Console” on page 34
- “Powering On and Off the Server” on page 36
- “Connecting Two Servers” on page 38
- “Operating the Server via Front Panel Controls” on page 39
- “Operating the L1 Controller” on page 41

Connecting the Server to a Power Source

If you are operating your server on a table top, connect the server to a wall power receptacle. If your server resides in a rack, connect the server to a power distribution unit (PDU) or a power strip. Refer to Figure 3-1 for the location of the server’s power connector.

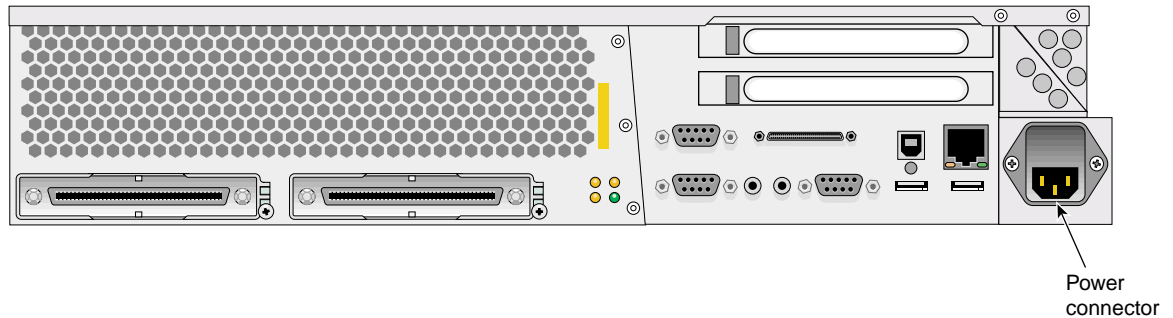


Figure 3-1 Power Connector on the Rear of the Server

Connecting the System Console

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

- Start an IRIX console session to set up networking and other configuration parameters.
- Monitor your system by reading the status and error message information that the L1 controller generates.
- Enter L1 controller commands to monitor or change particular system functions. You can, for example, monitor the speed of fans for a particular server. Refer to the *SGI L1 and L2 Controller Software User's Guide* (007-3938-00x) for descriptions of the L1 controller commands that you can use.
- Power on or power off your server.

The system console can be a server that runs the SGIconsole remote multiserver management system or a personal computer (PC). SGIconsole provides a central server control environment that has the following features:

- Support for SGI clusters, partitioned systems, and large single-system-image servers
- Expandability to support additional servers
- Rackmountable, space-efficient platform
- Software applications and tools for installation and configuration, console functionality, and for monitoring and managing system-level performance
- Web-based user interface

For instructions on how to attach a system console that runs SGIconsole software to your server, refer to the *SGIconsole Hardware Connectivity Guide* (007-4340-00x).

To attach a PC to your server, connect a null modem serial cable between the PC and the server's L1 console port (refer to Figure 3-2). Perform the following steps to establish a connection between your server and the system console (PC):

1. Ensure that the L1 controller of the server is powered on. When the server is connected to a power source, the L1 controller should be powered on.

Note: When powered on, the L1 controller displays "L1 running." If it does not display "L1 running," check the connection between the server and the power source. In addition, ensure that the circuit breaker of the power source is on.

2. Power on the system console.
3. Ensure that the system console has the following network settings:
 - Baud 38400
 - No parity
 - 8 data bits
 - 1 stop bit
 - Hardware flow control on (RTS/CTS)
4. 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.

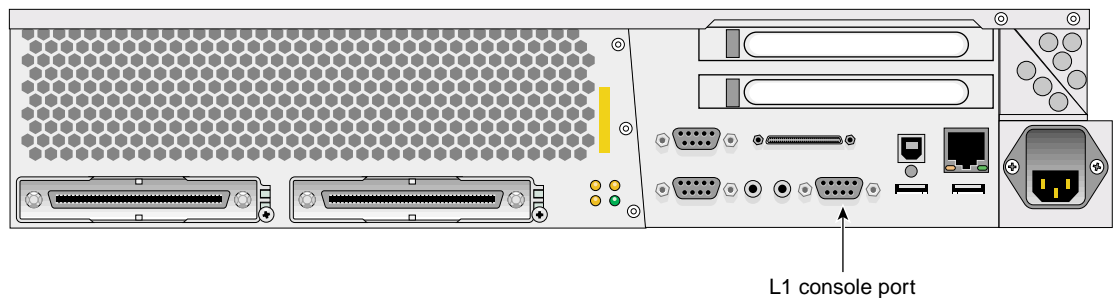


Figure 3-2 Location of the L1 Console Port

Powering On and Off the Server

If your system does not have a system console, you can manually power on and off the server by using the power button that is located on the front of the Origin 300 server (refer to Figure 3-3).

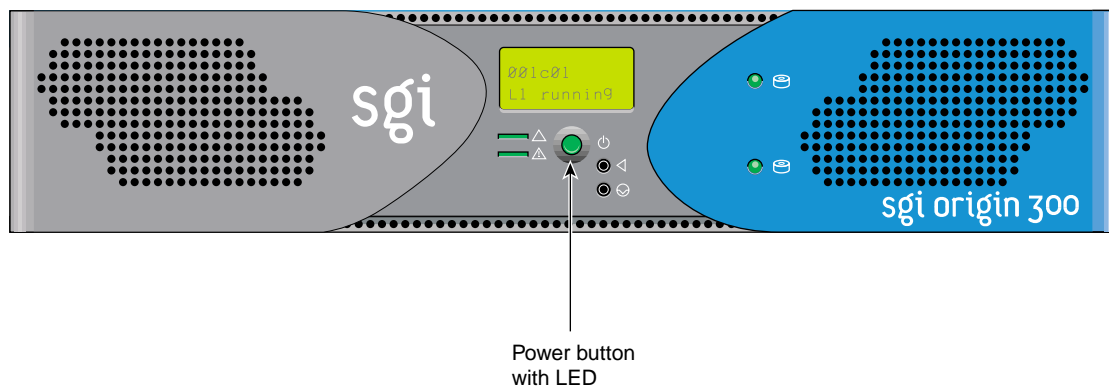


Figure 3-3 Location of the Power Button

Follow these steps to power on and boot your system using the system console:

1. Connect a console to the server system as described in “Connecting the System Console” on page 34.
2. For a system that contains one server, enter the following command at the L1 prompt to power on the server:

```
001c01-L1> power up
```
3. For a system that contains two servers or a server and a PCI expansion module, enter the following command at the L1 prompt to power on the server and the peer-attached server or PCI expansion module:

```
001c01-L1> * 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 using the system console.



Caution: If you power off the system before you halt the operating system, you can lose data.

1. Shut down the IRIX operating system by entering the following command:

```
# init 0
```

2. Type **Ctrl+T** to access the L1 prompt.

3. For a system that contains one server, enter the following command at the L1 prompt to power off the server:

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

4. For a system that contains two servers or a server and a PCI expansion module, enter the following command at the L1 prompt to power off the server and the peer-attached server or PCI expansion module:

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

Connecting Two Servers

Before connecting two SGI Origin 300 servers, you must follow these steps to assign unique system ID numbers to the servers:

1. Designate one of the servers as the master server and the other server as the slave.
2. Connect a console to the slave server (refer to “Connecting the System Console” on page 34), and power on the server (refer to “Powering On and Off the Server” on page 36).
3. Use the `brick slot <slotnumber> L1` command to set the slave system ID number to a higher number than the master system ID number. For example, if the master server’s L1 prompt indicates that its ID number is 01 (001c01-L1>), then the slave system ID number should be 02 or higher (001c02-L1>).

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

Refer to the *SGI L1 and L2 Controller Software User’s Guide* (007-3938-00x) for more information on L1 commands.

Follow these steps to connect two SGI Origin 300 servers with a NUMAlink 3 cable:

1. Power off both servers (refer to “Powering On and Off the Server” on page 36).
2. Connect the NUMAlink 3 cable to the LINK connectors on both servers.
3. Connect a system console to the master server, as described in “Connecting the System Console” on page 34.
4. Power on both servers as described in “Powering On and Off the Server” on page 36.

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

Note: For server-to-server communication to work correctly, the network mode on the server must be set to 422 (when connecting a PC [system console] to a serial port). Use the `network` L1 command to set the network mode. (Refer to the *SGI L1 and L2 Controller Software User’s Guide* (007-3938-00x) for more information on L1 commands.)

Operating the Server via Front Panel Controls

The front panel provides the following control features, as shown in Figure 3-4:

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

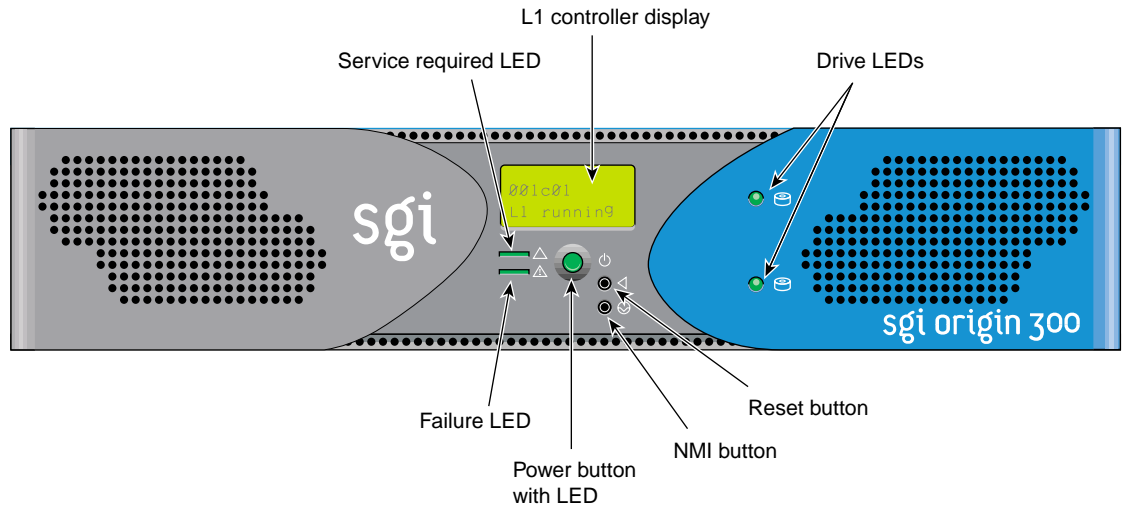


Figure 3-4 Front Panel Functions

Status LEDs

The front panel has the following LEDs:

- **Power button LED.** Illuminates green when the internal components are on.
- **Service required LED.** Illuminates yellow to indicate that an item is not functioning properly (for example, a fan is off), but the server is still operating.
- **Failure LED.** Illuminates red to indicate that a failure has occurred and the server is down.

Power Button

Press this button to power on the server. Alternatively, you can power on the server at a system console.

Reset Button

Press this button to reset the internal processors and ASICs. The reset will cause a memory loss. (Refer to 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 the L1 Controller

The L1 controller 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 controller is ready to accept commands:

```
001c01-L1>
```

Refer to the *SGI L1 and L2 Controller Software User's Guide* (007-3938-00x) 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>
```


Installing and Removing Customer-replaceable Units

This chapter describes how to install and remove the following customer-replaceable units (CRUs):

- “PCI Cards” on page 45
- “Disk Drives” on page 52
- “Memory” on page 56

Safety Instructions

Before you perform any type of maintenance to the server, read the following safety instructions:

- Follow all warnings and instructions marked on the product and noted in this and other documentation included with the product.
- Unplug this product from the wall outlet before you clean it. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- Do not use this product near water.
- 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.
- Slots and openings on the cabinet and components are provided for ventilation, reliable operation, and protection from overheating of the product. These slots and 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.
- 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.

- Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.
- Do not use extension cords with your SGI system.
- Never push objects of any kind into this product through cabinet slots because they 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.
- 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.
- 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 the product has been exposed to rain, water, or other type of liquid.
 - If the product does not operate normally when the operating instructions are followed.

Note: 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, which indicates a need for service.
- 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. The battery can explode if it is replaced incorrectly.
- Use only the proper type of power supply cord set (provided with the system) for this unit.

PCI Cards

Each Origin 300 server has two Universal PCI 2.2-compliant option card slots that are configured on one bus (refer to Figure 4-1). The PCI bus supports both 32- and 64-bit addressing modes at 33 or 66 MHz. Refer to the SGI Supportfolio Online home page for an updated list of supported PCI cards: <http://support.sgi.com>

Note: The PCI slots of the Origin 300 server can seat 3.3-V or Universal PCI cards. The Origin 300 server does not support 5-V only PCI cards.

This section explains how to perform the following procedures:

- Installing a PCI card
- Removing a PCI card

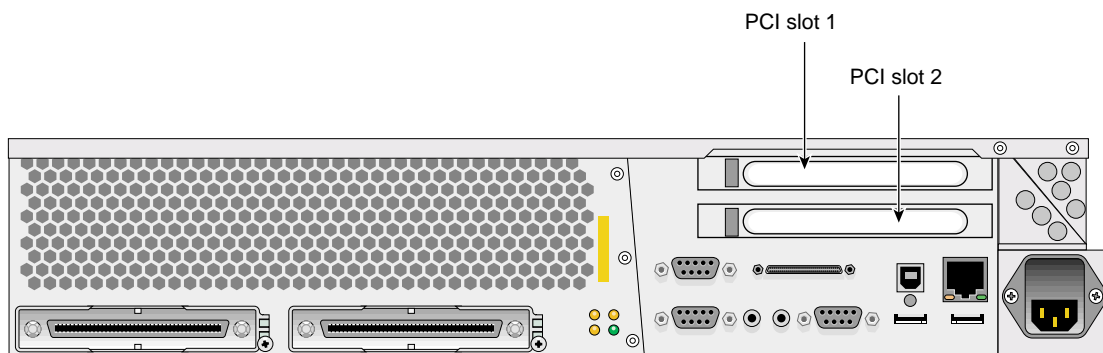


Figure 4-1 PCI Slots Located in the Rear of the Origin 300 Server



Caution: Electronic equipment can be irreparably damaged by electrostatic discharge (ESD). Always follow these preventive measures when you handle a system component:

- Remove a component from its antistatic bag only when you are ready to install it.
 - If you 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 you install or remove a component.
-

Installing a PCI Card

Follow these steps to install a PCI card:

1. Power off the server. For instructions on how to power off the server, refer to “Powering On and Off the Server” on page 36.
2. Disconnect all of the cables at the rear of the server.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately 5 minutes before you proceed with these instructions.

3. Remove the two screws that secure the server to the front rails of the rack.
4. Pull the server from the rack until it is stopped by the safety latches.

Note: If you are installing a full-height PCI card in the lower slot (PCI slot 2), you must remove the server from the rack. For instructions on how to remove a server from the rack, refer to “Removing the Server from an SGI Rack” on page 31.

5. To access the PCI card, remove the two screws shown in Figure 4-2 and lift and remove the hinged cover.

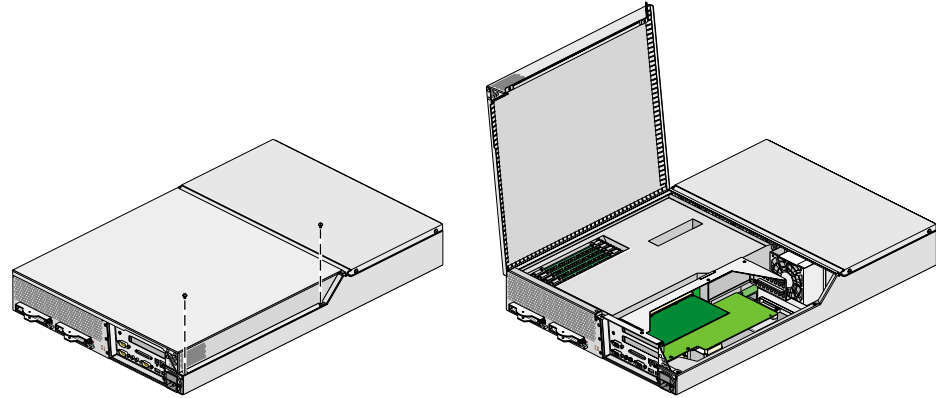


Figure 4-2 Opening Server to Install PCI Card

6. If a blanking plate covers the slot that is needed for the installation, remove the retaining screw as shown in Figure 4-3 and the blanking plate.

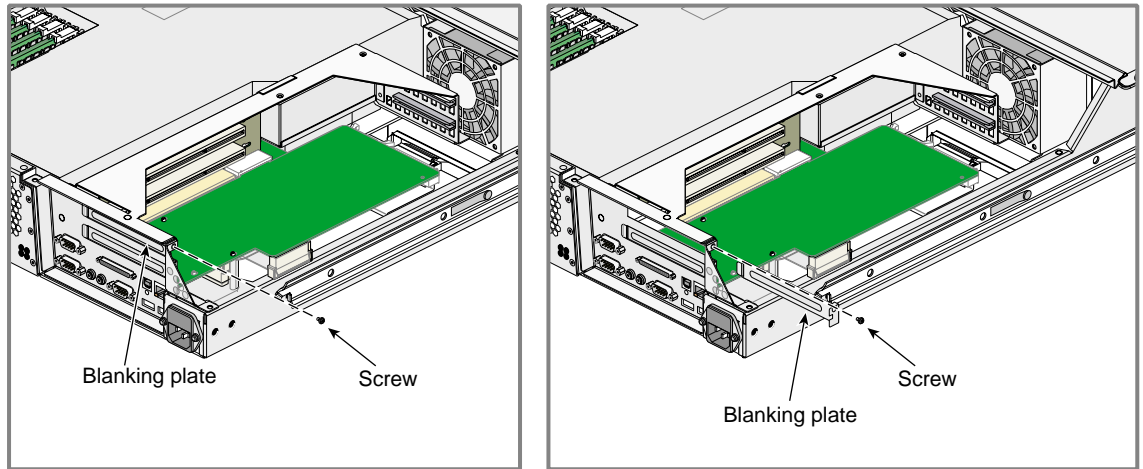


Figure 4-3 Removing Blanking Plate

7. Insert the PCI card into the slot by pushing the card into the connector until it is properly seated.
8. Install the retaining screw as shown in Figure 4-4.
9. Attach the hinged cover and secure it to the server with two screws.

Note: If you removed the server from the rack, refer to “Installing the Server in the Rack” on page 28 for instructions on how to install the server in the rack.

10. Press the safety latches on both sides of the server and slide the server into the rack.
11. Install the two screws that secure the server to the front rails of the rack.
12. Install all of the cables at the rear of the server.
13. Power on the server. For instructions on how to power on the server, refer to “Powering On and Off the Server” on page 36.

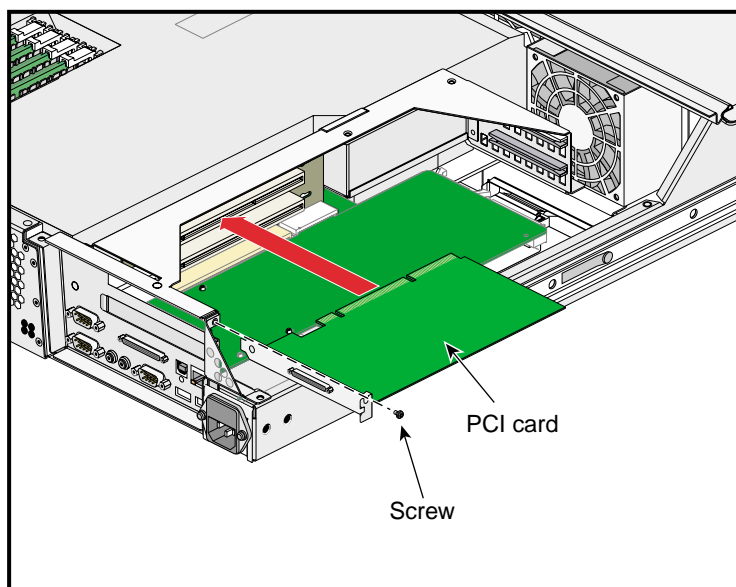


Figure 4-4 Installing a PCI Card

Removing a PCI Card

To remove a PCI card, follow these steps:

1. Power off the server. For instructions on how to power off the server, refer to “Powering On and Off the Server” on page 36.
2. Disconnect all of the cables at the rear of the server.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately 5 minutes before you proceed with these instructions.

3. Remove the two screws that secure the server to the front rails of the rack.
4. Pull the server from the rack until it is stopped by the safety latches.

Note: If you are removing a full-height PCI card from the lower slot (PCI slot 2), you must remove the server from the rack. For instructions on how to remove a server from the rack, refer to “Removing the Server from an SGI Rack” on page 31.

5. To access the PCI card, remove the two screws shown in Figure 4-5 and lift and remove the hinged cover.

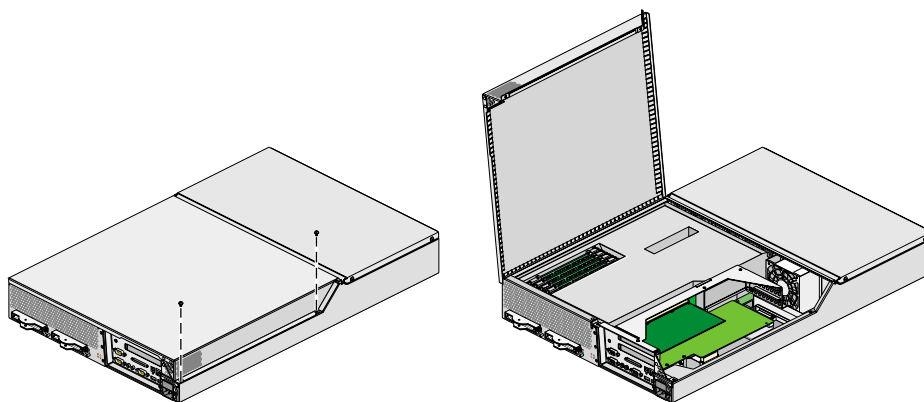


Figure 4-5 Opening Server to Remove PCI Card

6. Release the retaining screw of the card as shown in Figure 4-6.
7. Gently pull the card straight out of the slot.
8. Install a new PCI card or a blanking plate as described in “Installing a PCI Card” on page 46.
9. Attach the hinged cover and secure it to the server with two screws.

Note: If you removed the server from the rack, refer to “Installing the Server in the Rack” on page 28 for instructions on how to install the server in the rack.

10. Press the safety latches on both sides of the server and slide the server into the rack.
11. Install the two screws that secure the server to the front rails of the rack.
12. Install all of the cables at the rear of the server.
13. Power on the server. For instructions on how to power on the server, refer to “Powering On and Off the Server” on page 36.

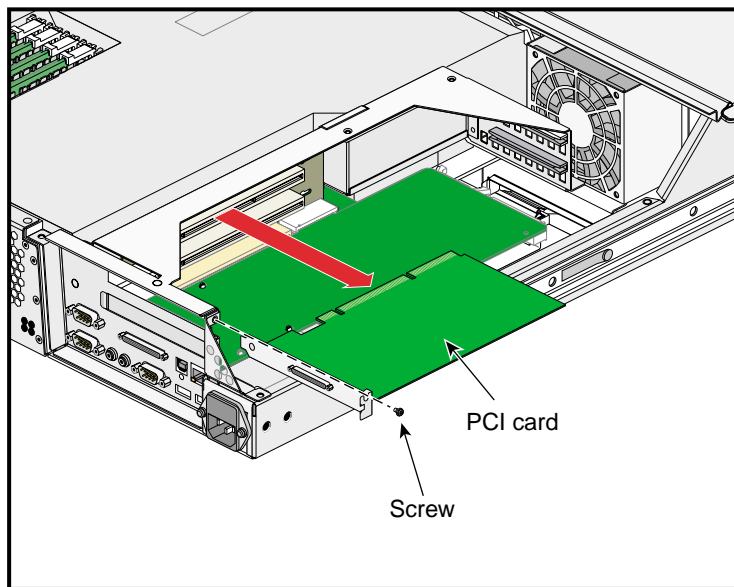


Figure 4-6 Removing a PCI Card

Disk Drives

Each Origin 300 server can contain one or two sled-mounted Ultra3 SCSI disk drives (refer to Figure 4-7).

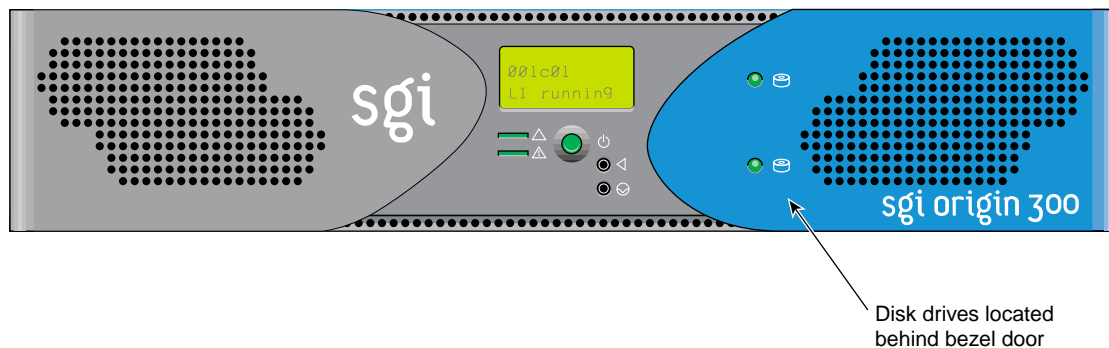


Figure 4-7 Disk Drive Location

Installing a Disk Drive

To install a disk drive, follow these steps:

1. Open the bezel door as shown in Figure 4-8a.
2. Position the drive assembly so that it engages the bay guide rails and gently push the drive into the bay (refer to Figure 4-8b).
3. Swing the locking handle towards the chassis until the locking handle engages the latch (refer to Figure 4-8c).
4. Close the bezel door as shown in Figure 4-8d.

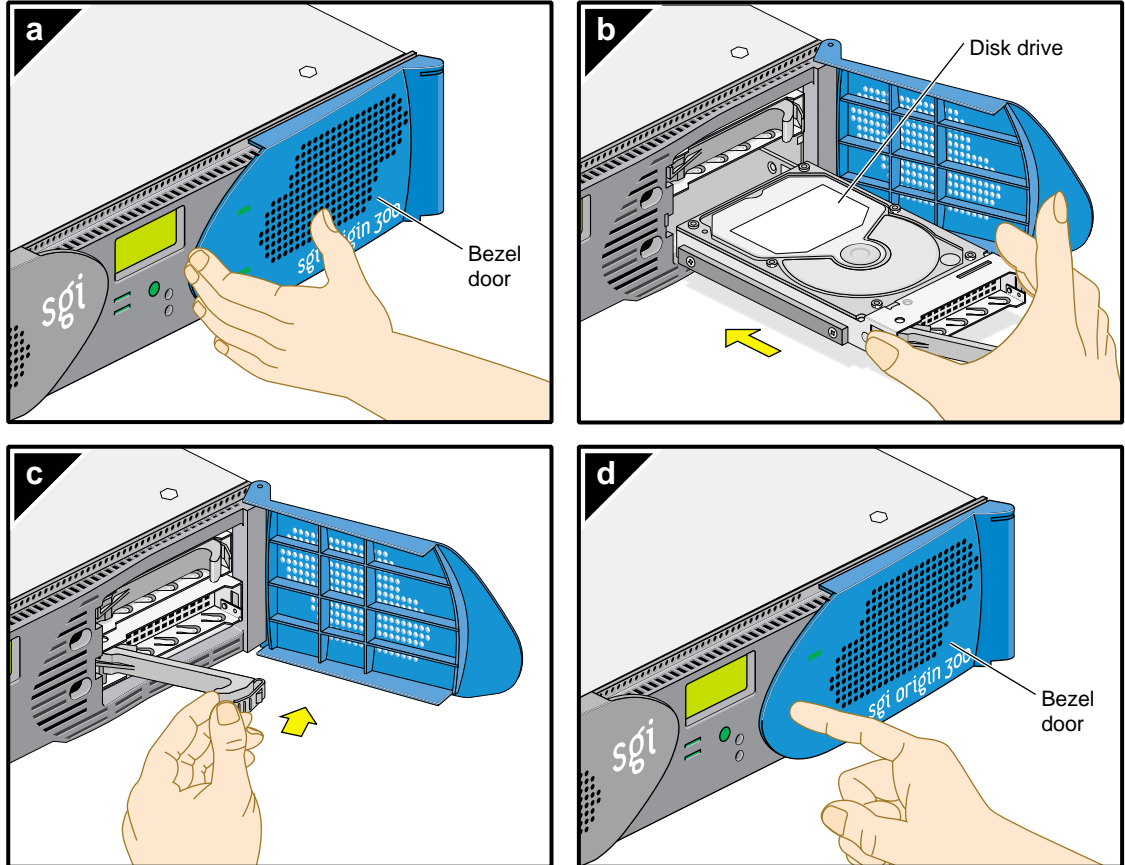


Figure 4-8 Installing a Disk Drive

Removing a Disk Drive

To remove a disk drive, follow these steps:

1. If you are replacing a data drive, ensure that the drive has spun down before you remove 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 server that is 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 4-9a.
4. Remove the drive by depressing its handle lock with your thumb and pulling the handle away from the chassis until the handle disengages the drive connector from the backplane connector (refer to Figure 4-9b).
5. Carefully slide the drive out of the bay (refer to Figure 4-9c) and place it on an ESD-safe surface. Do not use the handle to pull the drive out of the bay.
6. Close the bezel door as shown in Figure 4-9d.

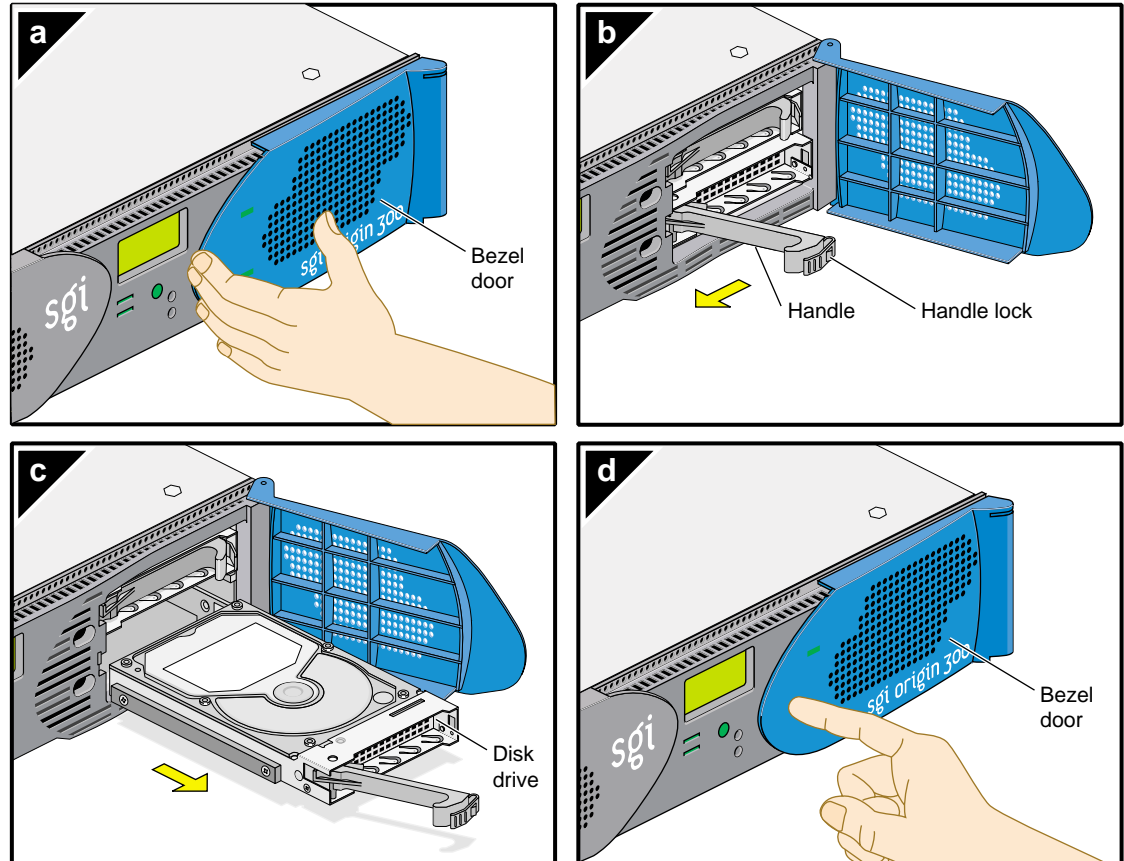


Figure 4-9 Removing a Disk Drive

Memory

Memory is contained on cards that are referred to as DIMMs (dual-inline memory modules). Each Origin 300 server can contain two or four DIMMs. If you are adding memory to your system, populate the DIMM slots in the following order (refer to Figure 4-10):

1. Slots 1 and 3
2. Slots 2 and 4

The DIMMs that reside in slots 1 and 3 or slots 2 and 4 must be the same memory size; however, the DIMMs in slots 1 and 3 may be a different memory size than the DIMMs in slots 2 and 4.

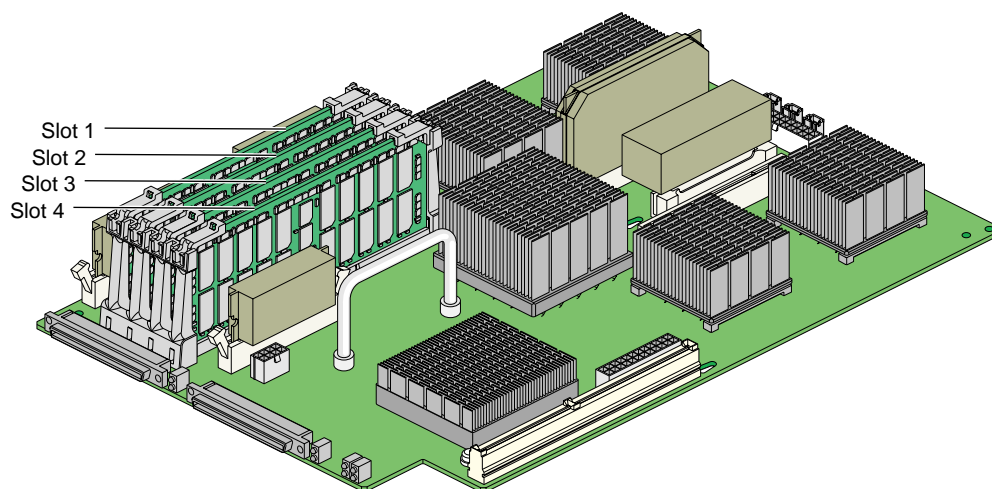


Figure 4-10 DIMM Slots

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



Caution: Electronic equipment can be irreparably damaged by electrostatic discharge (ESD). Always follow these preventive measures when you handle a system component:

- Remove a component from its antistatic bag only when you are ready to install it.
 - If you 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 you install or remove a component.
-

Installing a DIMM

To install a DIMM, follow these steps:

1. Power off the server. For instructions on how to power off the server, refer to “Powering On and Off the Server” on page 36.
2. Disconnect all of the cables at the rear of the server.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately 5 minutes before you proceed with these instructions.

3. Remove the two screws that secure the server to the front rails of the rack.
4. Pull the server from the rack until it is stopped by the safety latches.

5. To access the DIMMs, remove the two screws shown in Figure 4-11 and lift and remove the hinged cover.

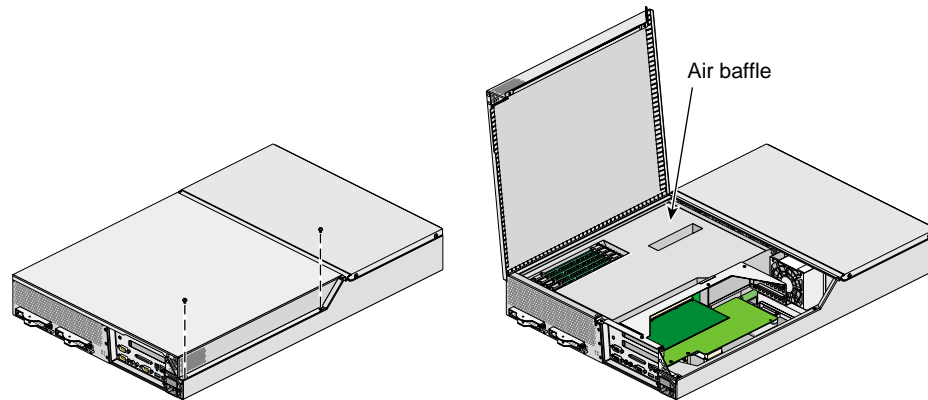


Figure 4-11 Opening Server to Install DIMM

6. Install the DIMM, as follows (refer to Figure 4-12):

Note: You do not have to remove the air baffle to install a DIMM.

- a. Ensure that the ejector latches are open.
 - b. Hold the DIMM only by its edges and remove it from its antistatic package.
 - c. Align the three notches in the bottom edge of the DIMM with the keyed socket, as shown in Figure 4-12.
 - d. Insert the bottom edge of the DIMM into the socket, and then press down on the DIMM until it seats correctly. Use extreme care when you install a DIMM. If you apply too much pressure, you can damage the socket.
 - e. Gently push the plastic ejector latches down to secure the DIMM, as shown in Figure 4-12. When the DIMM is fully seated in the connector, the ejector latches snap into place.
7. Attach the hinged cover and secure it to the server with two screws.
 8. Press the safety latches on both sides of the server and slide the server into the rack.
 9. Install the two screws that secure the server to the front rails of the rack.
 10. Install all of the cables at the rear of the server.

11. Power on the server. For instructions on how to power on the server, refer to “Powering On and Off the Server” on page 36.

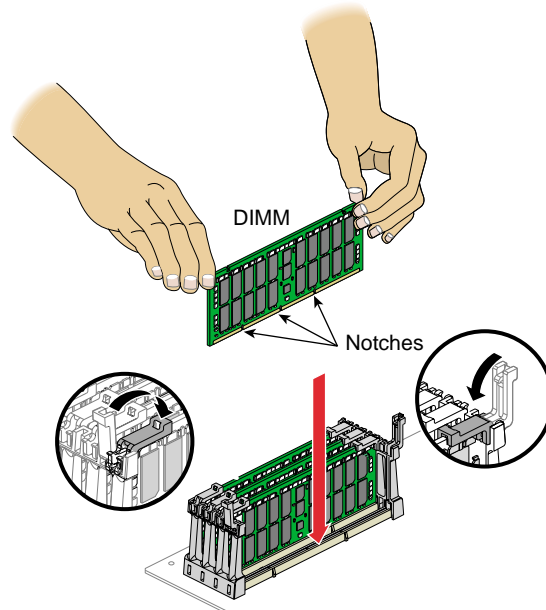


Figure 4-12 Inserting a DIMM

Removing a DIMM

To remove a DIMM, follow these steps:

1. Power off the server. For instructions on how to power off the server, refer to “Powering On and Off the Server” on page 36.
2. Disconnect all of the cables at the rear of the server.



Warning: Components may be hot. To avoid injury, allow the components to cool for approximately 5 minutes before you proceed with these instructions.

3. Remove the two screws that secure the server to the front rails of the rack.
4. Pull the server from the rack until it is stopped by the safety latches.
5. To access the DIMMs, remove the two screws shown in Figure 4-13 and lift and remove the hinged cover.

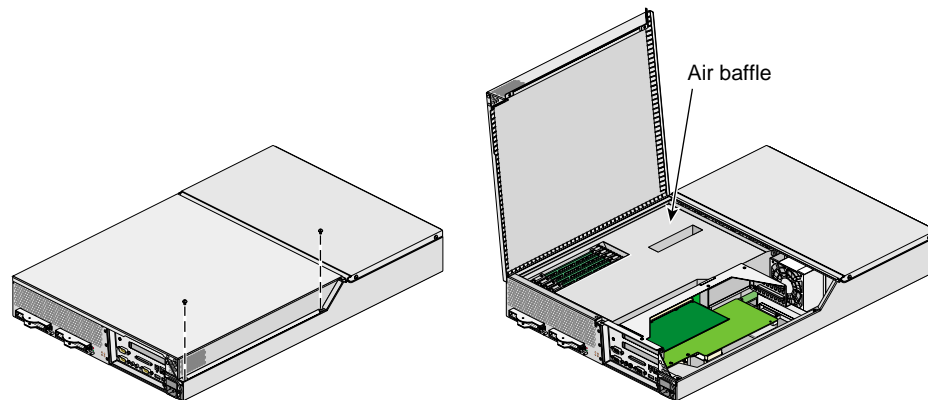


Figure 4-13 Opening Server to Remove DIMM

6. Remove the DIMM, as follows (refer to Figure 4-14):

Note: You do not need to remove the air baffle to remove a DIMM.

- a. Lift the two ejector latches simultaneously to disengage the DIMM from its connector.
- b. Carefully grasp the DIMM and pull it up and out of the guide rails.

Note: Hold the DIMM only by its edges. Be careful not to touch its components or gold edge connectors.

- c. Place the DIMM on an ESD-safe surface.
7. Insert a new DIMM as described in “Installing a DIMM” on page 57.
8. Attach the hinged cover and secure it to the server with two screws.
9. Press the safety latches on both sides of the server and slide the server into the rack.
10. Install the two screws that secure the server to the front rails of the rack.
11. Install all of the cables at the rear of the server.
12. Power on the server. For instructions on how to power on the server, refer to “Powering On and Off the Server” on page 36.

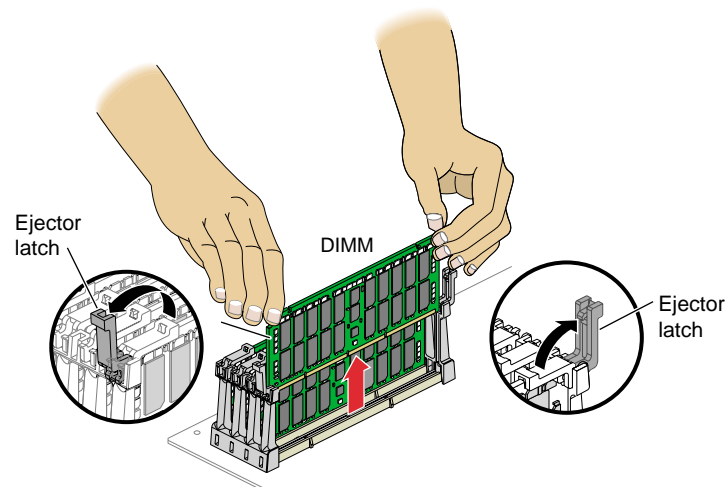


Figure 4-14 Removing a DIMM

Technical Specifications

This appendix lists the following technical specifications for the SGI Origin 300 server:

- “Physical and Environmental Requirements” on page 64
- “Power Requirements” on page 65

Physical and Environmental Requirements

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

Table A-1 Physical and Environmental Specifications

Height	3.46 inches (8.80 cm)
Width	19.0 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 (68.0 cm) (with bezel)
Weight	36.0 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 / 5,000 ft to 10,000 ft)
Temperature nonoperating	-40 °C (-40 °F) to +60 °C (+140 °F)
Humidity	10% to 95% RH, noncondensing
Altitude	Sea level to 40,000 ft (nonoperating) Sea level to 10,000 ft (3000 m) (operating)
Noise	50 dB(A) maximum
Heat dissipation	938 Btu/hr maximum

Power Requirements

Table A-2 lists the power requirements of the SGI Origin 300 server.

Table A-2 Power and Cooling Requirements

Power supply voltage	110/220 Vac auto-sensing worldwide
Power supply type	Modified WTX 460 W
Power requirement (maximum)	275 W
Frequency	50/60 Hz
Electrical service	100/120 Vac @15A, 200/240 Vac @16A (single-phase cord)
Service type	North America / Japan (110V), NEMA 5-15R International (220V), 16 Amp country specific

Connector Pinouts

This appendix provides pin assignment information for non-proprietary connectors on the SGI Origin 300 server (refer to Table B-1 and Figure B-1).

Table B-1 SGI Origin 300 Server Connectors

Port	Connector	Pin Assignments
Serial ports 1 and 2	DB9	Refer to “DB9 Connector” on page 68
L1 console port	DB9	Refer to “DB9 Connector” on page 68
Ethernet port	RJ-45	Refer to “RJ-45 Connector” on page 69
External SCSI port	SCSI 68-pin VHDCI	Refer to “External SCSI Port Connector” on page 70
RT interrupt input and output ports	Stereo jack	Refer to “Stereo Jack Connector Conductor” on page 72
USB ports 1 and 2	USB type A	Refer to “USB Type A Connector” on page 73
USB L1 port	USB type B	Refer to “USB Type B Connector” on page 74

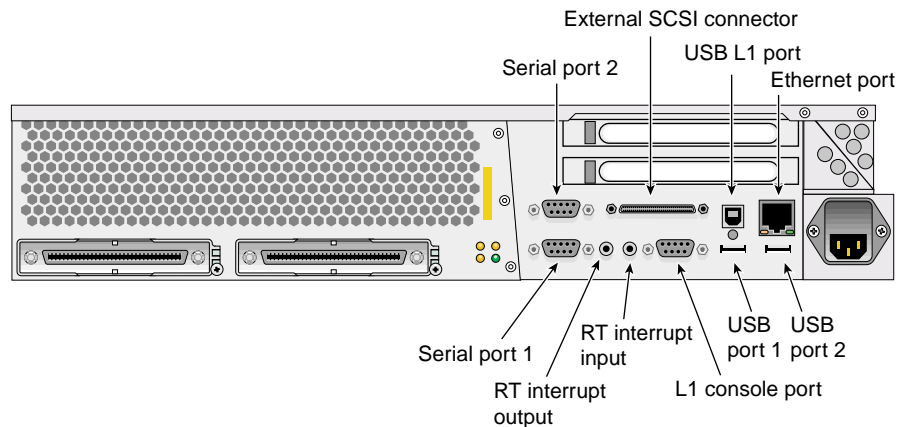


Figure B-1 Rear Panel of Origin 300 Server

DB9 Connector

Figure B-2 shows the DB9 connector pin assignments. This connector is used for the L1 console port and serial ports 1 and 2 of the Origin 300 server.

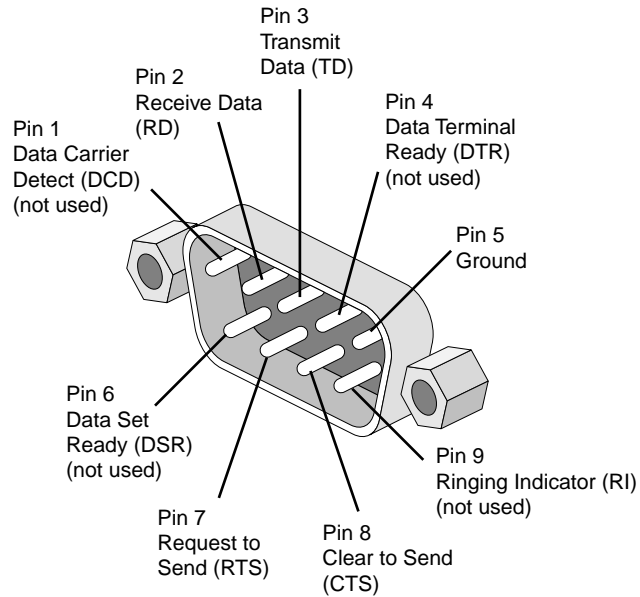


Figure B-2 DB9 Pin Assignments

RJ-45 Connector

Figure B-3 shows the pin assignments for the RJ-45 connector.

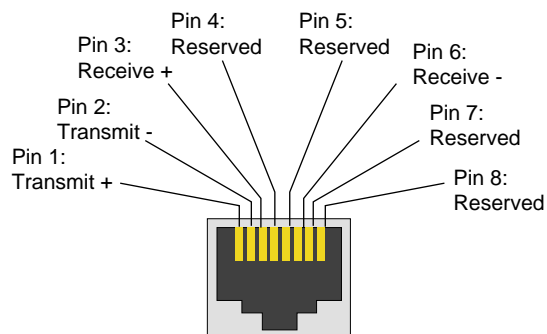


Figure B-3 RJ-45 Connector Pin Assignments

External SCSI Port Connector

Figure B-4 shows the external SCSI VHDCI connector pin locations for the external SCSI connector. Table B-2 lists the pin assignments for this SCSI connector.

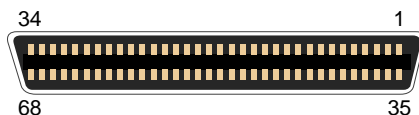


Figure B-4 External SCSI Port Pin Number Locations

Table B-2 SCSI VHDCI Pin Assignments

Pin Number	Signal Name	Pin Number	Signal Name
1	+DB (12)	35	-DB (12)
2	+DB (13)	36	-DB (13)
3	+DB (14)	37	-DB (14)
4	+DB (15)	38	-DB (15)
5	+DB (P1)	39	-DB (P1)
6	+DB (0)	40	-DB (0)
7	+DB (1)	41	-DB (1)
8	+DB (2)	42	-DB (2)
9	+DB (3)	43	-DB (3)
10	+DB (4)	44	-DB (4)
11	+DB (5)	45	-DB (5)
12	+DB (6)	46	-DB (6)
13	+DB (7)	47	-DB (7)
14	+DB (P0)	48	-DB (P0)
15	Ground	49	Ground
16	DIFFSENS	50	Ground

Table B-2 SCSI VHDCI Pin Assignments **(continued)**

Pin Number	Signal Name	Pin Number	Signal Name
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	Reserved	53	Reserved
20	Ground	54	Ground
21	+ATN	55	-ATN
22	Ground	56	Ground
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+CD	62	-CD
29	+REQ	63	-REQ
30	+IO	64	-IO
31	+DB (8)	65	-DB (8)
32	+DB (9)	66	-DB (9)
33	+DB (10)	67	-DB(10)
34	+DB (11)	68	-DB (11)

Stereo Jack Connector Conductor

Figure B-5 shows the stereo jack connector conductors that are used for the RT interrupt input and RT interrupt output ports of the Origin 300 server. Table B-3 lists the conductor assignments for the stereo jack connector.

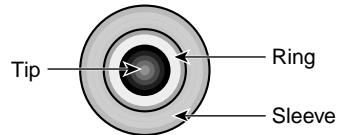


Figure B-5 Stereo Jack Connector Conductors

Table B-3 Stereo Jack Connector Conductor Assignments

Conductor	Function
Tip	Interrupt (active low)
Ring	+5 V
Sleeve	Chassis ground and cable shield

USB Type A Connector

Figure B-6 shows the USB type A connector pin number locations and Table B-4 lists the pin assignments.

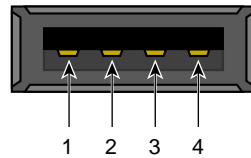


Figure B-6 USB Type A Connector Pin Number Locations

Table B-4 USB Type A Connector Pin Assignments

Signal	Color	Pin Number
VCC	Red	1
-Data	White	2
+Data	Green	3
Ground	Black	4

USB Type B Connector

Figure B-7 shows the USB type B connector pin number locations and Table B-5 lists the pin assignments.

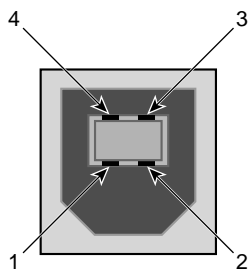


Figure B-7 USB Type B Connector Pin Number Locations

Table B-5 USB Type B Connector Pin Assignments

Signal	Color	Pin Number
VCC	Red	1
-Data	White	2
+Data	Green	3
Ground	Black	4

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 printed 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 for 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 n'émet pas de perturbations radioélectriques dépassant les normes applicables aux appareils numériques de Classe A prescrites dans le Règlement sur les interférences 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 that 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 require shielding.

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 that is 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 resistant 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. Use the wrist strap when you install these upgrades to prevent the flow of static electricity; it is designed to 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-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. Eviter 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 ved åbning se ikke ind i strålen



Warning: Varo! Lavattaessa Olet Alttina Lasersäteilylle



Warning: Varning: Laserstrålning när denna del är öppnad ålä tuijota säteeseenstirra ej in i strålen.



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



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

Lithium Battery Statement



Warning: Replace the battery with the same or equivalent type as recommended by the manufacturer, or the battery could explode. 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. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.



Warning: Varoitus: Pärisko voi räjähtää, jos se on virheellisesti asennettu. Vaihda parisko ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty parisko 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.

Index

A

adding or replacing disk drives, 52
adding or replacing memory, 56
adding or replacing PCI cards, 45
apropos command, xvi

B

battery statements, 80

C

Chinese Class A regulatory notice, 77
commands, man pages
 apropos, xvi
 makewhatis, xvi
 man, xvi
connector
 LINK, 8
 XIO, 8
connector pin assignment
 DB9, 68
 Origin 300 server, 67
 RJ-45, 69
 SCSI VHDCI, 70
 stereo jack, 72
 USB type A, 73
 USB type B, 74
console
 SGIconsole, 34

D

DB9
 connector pin assignments, 68
DIMM installation, 57-59
DIMM removal, 60-61
DIMMs
 adding or replacing, 56
 compatibility, 11
 configuration, 11
 memory bank layout, 11
 memory kits, 12
disk drive installation, 52
disk drive removal, 54
disk drives
 adding or replacing, 52
 list of supported drives, 13
documentation
 release notes, xvi
 World Wide Web, xv
dual-inline memory modules
 memory bank layout, 11

E

electromagnetic emissions, 76
electrostatic discharge
 regulatory notice, 78
environmental requirements, 64
Ethernet connectors, 9
external SCSI connector, 9

F

FCC notice (USA only), 76
feet, installation, 16
front panel LEDs, 39

G

grelnotes utility, xvi

H

heartbeat LEDs, 9

I

Industry Canada Notice (Canada only), 77
install
 disk drive, 52
 memory, 57-59
 PCI card, 45-48
I/O ports, 8
IRIX man pages, xvi

K

Korean Class A regulatory notice, 77

L

L1
 console mode, 41
 operation mode, 41
L1 console port, 8
L1 mode, 41

laser compliance statements, 78-79
LEDs, front panel, 39
LINK connector, 8

M

makewhatis command, xvi
man pages, xvi
manufacturer's declaration of conformity, 75
manufacturer's regulatory declarations, 75
memory
 adding or replacing, 56
 installation, 57-59
 kits, 12
 removal, 60-61

N

NMI button, 40
non-maskable interrupt (NMI) button, 40

O

Origin 300 server
 connector pin assignments, 67

P

PCI card
 installation, 45-48
 removal, 49-51
PCI card slots, 9
physical requirements, 64
ports, rear panel, 8
power requirements, 65

R

- rack mounting
 - hardware kit, 18
- regulatory declarations
 - manufacturer, 75
- regulatory specifications, 75
 - CE notice and Manufacturer's declaration of conformity, 75
 - Chinese Class A regulatory notice, 77
 - electromagnetic emissions, 76
 - electrostatic discharge, 78
 - FCC notice (USA) only, 76
 - Industry Canada notice (Canada only), 77
 - Korean Class A regulatory notice, 77
 - manufacturer's regulatory declarations, 75
 - shielded cables, 78
 - VCCI notice (Japan only), 77
- release notes, viewing, xvi
- relnotes utility, xvi
- remove
 - disk drive, 54
 - memory, 60-61
 - PCI card, 49-51
- reset button, 40
- RJ-45
 - connector pin assignments, 69
- RT0 and RT1, 9

S

- safety, 43-44
 - See also ESD.
- SCSI connector, external, 9
- SCSI VHDCI
 - connector pin assignments, 70
- self-adhesive feet, installation, 16
- serial connectors, 9

- server model number, 75
- SGIconsole, 34
- shielded cables
 - regulatory notice, 78
- space requirements, 17
- stereo jack
 - connector pin assignments, 72
- supported disk drives, 13
- system console
 - SGIconsole, 34

U

- USB connectors, 9
- USB type A
 - connector pin assignments, 73
- USB type B
 - connector pin assignments, 74

V

- VCCI notice (Japan only), 77

W

- World Wide Web
 - documentation, xv

X

- XIO connector, 8

