



SGI® Rackable™ C2108-GP5 System
User Guide

007-6395-002

COPYRIGHT

© 2015 Silicon Graphics International Corp. All rights reserved; provided portions may be copyright in third parties, as indicated elsewhere herein. No permission is granted to copy, distribute, or create derivative works from the contents of this electronic documentation in any manner, in whole or in part, without the prior written permission of SGI.

LIMITED RIGHTS LEGEND

The software described in this document is “commercial computer software” provided with restricted rights (except as to included open/free source) as specified in the FAR 52.227-19 and/or the DFAR 227.7202, or successive sections. Use beyond license provisions is a violation of worldwide intellectual property laws, treaties and conventions. This document is provided with limited rights as defined in 52.227-14.

The electronic (software) version of this document was developed at private expense; if acquired under an agreement with the USA government or any contractor thereto, it is acquired as “commercial computer software” subject to the provisions of its applicable license agreement, as specified in (a) 48 CFR 12.212 of the FAR; or, if acquired for Department of Defense units, (b) 48 CFR 227-7202 of the DoD FAR Supplement; or sections succeeding thereto. Contractor/manufacturer is SGI, 46600 Landing Parkway, Fremont, CA 94538.

TRADEMARKS AND ATTRIBUTIONS

Silicon Graphics, SGI, and the SGI logo, Rackable, and Supportfolio are trademarks or registered trademarks of Silicon Graphics International Corp. in the United States and/or other countries worldwide.

ASPEED is a registered trademark of ASPEED. InfiniBand is a registered trademark of the InfiniBand Trade Association. Intel, Itanium, and Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. ConnectX and Mellonox are registered trademarks of Mellonox Technologies, Ltd. Internet Explorer and MS-DOS are registered trademarks of Microsoft Corporation. Java and Java Virtual Machine are trademarks or registered trademarks of Sun Microsystems, Inc. Linux is a registered trademark of Linus Torvalds, used with permission by SGI. Matrox is a registered trademark of Matrox Electronic Systems Ltd. Novell and Novell Netware are registered trademarks of Novell Inc. PCIe and PCI-X are registered trademarks of PCI SIG. Red Hat and all Red Hat-based trademarks are trademarks or registered trademarks of Red Hat, Inc. in the United States and other countries. SUSE LINUX and the SUSE logo are registered trademarks of Novell, Inc. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company, Ltd.

All other trademarks mentioned herein are the property of their respective owners.

Record of Revision

Version	Description
001	February 2015 Original printing.
002	September 2015 Added GPU configuration requirements for power redundancy.

Contents

	Record of Revision	iii
	About This Guide	xiii
	Audience	xiii
	Chapter Descriptions	xiv
	Related Publications	xv
	Conventions	xv
	Product Support	xvi
	Reader Comments	xvi
1	Introduction	1
	Server Chassis Features	2
	Serverboard Features	6
	Additional Hardware Components	8
2	System Safety	9
	Electrical Safety Precautions	9
	General Safety Precautions	11
	ESD Precautions	12
	Operating Precautions	12
3	Server Installation	13
	Unpack the System	13
	Prepare for Setup	13
	Choose a Setup Location	14
	Warnings and Precautions	14
	Rack Precautions	14
	Server Precautions	15
	Rack Mounting Considerations	15
	Ambient Operating Temperature	15

	Reduced Airflow . . . . .	. 15
	Mechanical Loading . . . . .	. 15
	Circuit Overloading . . . . .	. 16
	Reliable Ground . . . . .	. 16
	Install the System into a Rack . . . . .	. 16
	Separate the Sections of the Rack Rails and Install Outer Rack Rails . . . . .	. 16
	Install the Inner Rail Extensions. . . . .	. 18
	Install the Server in a Rack . . . . .	. 19
	Check the Serverboard Setup. . . . .	. 20
	Removing the Chassis Cover . . . . .	. 20
	Checking the Components and Setup . . . . .	. 22
	Checking the Drive Bay Setup . . . . .	. 22
	Checking the Airflow . . . . .	. 22
	Providing Power . . . . .	. 22
4	System Monitoring . . . . .	. 23
	Control Panel Components . . . . .	. 24
	Rear Control Buttons and LEDs . . . . .	. 26
	Drive Carrier LEDs . . . . .	. 28
	Power Supply LED . . . . .	. 29
5	Chassis Maintenance . . . . .	. 31
	Before You Start . . . . .	. 32
	Tools and Supplies Needed . . . . .	. 32
	Left-Right and User Position . . . . .	. 32
	Removing the Chassis Cover. . . . .	. 32
	Replacing a Power Supply . . . . .	. 34
	Replacing Disk Drives . . . . .	. 36
	Replacing Chassis Fans . . . . .	. 38
	Common Preliminary Steps . . . . .	. 39
	Front and Middle GPU Fans. . . . .	. 40
	System Fans . . . . .	. 42
	Rear GPU Fans . . . . .	. 44
	Fan Cabling . . . . .	. 46

6	Troubleshooting	47
	If the System Does Not Power Up	48
	System Powers Up But Will Not Boot	48
	No Video After System Power Up	49
	Memory Errors	49
	Loss of Power Redundancy with GPUs or Coprocessors	50
A	Technical Specifications	51
B	BIOS POST Beep Codes	55

Figures

Figure 1-1	The SGI Rackable C2108-GP5 Server	1
Figure 1-2	Front Chassis View	3
Figure 1-3	Rear Chassis View	4
Figure 1-4	Serverboard Block Diagram	7
Figure 2-1	Installing the Onboard Battery	10
Figure 2-2	Improper Use of Server Rack and Railing	11
Figure 3-1	Separating and Installing the Rack Rails.	17
Figure 3-2	Installing the Inner Rail Extensions	18
Figure 3-3	Installing the Server in a Rack	19
Figure 3-4	Accessing the Inside of the Chassis	21
Figure 4-1	Front Control Panel	23
Figure 4-2	Control Panel Components	24
Figure 4-3	Rear Control Buttons and LEDs	26
Figure 4-4	Disk Carrier LED.	28
Figure 5-1	Accessing the Inside of the Chassis	33
Figure 5-2	Removing the Power Supply	35
Figure 5-3	Replacing a Hard Disk Drive.	37
Figure 5-4	Chassis Fans	38
Figure 5-5	Removing Front or Middle GPU Fan	40
Figure 5-6	Inserting Front or Middle GPU Fan	41
Figure 5-7	Removing System Fans	42
Figure 5-8	Inserting System Fans	43
Figure 5-9	Removing Rear GPU Fans	44
Figure 5-10	Inserting Rear GPU Fans.	45
Figure 5-11	Fan Cabling View 1	46
Figure 5-12	Fan Cabling View 2	46

Tables

Table 1-1	Server Chassis Features	2
Table 1-2	Rear Chassis Components	5
Table 1-3	Serverboard Features	6
Table 4-1	Front Control Panel Components	24
Table 4-2	Rear Control Buttons and LEDs	26
Table 4-3	Drive Carrier LED Functions	28
Table 4-4	Power Supply LED States	29
Table 6-1	GPU Configuration-Power Requirements for Power Redundancy	50
Table A-1	Temperature, Humidity, and Altitude Specifications	51
Table A-2	Miscellaneous System Specifications	52
Table B-1	PEI Beep Codes	55
Table B-2	DXE Beep Codes.	56

About This Guide

This guide provides an overview of the installation, architecture, general operation, and descriptions of the major components in the SGI® Rackable™ C2108-GP5 server. It also provides basic troubleshooting and maintenance information as well as important safety and regulatory specifications.

Audience

This guide is written for owners, installers, system administrators, and users of SGI Rackable C2108-GP5 computer systems. It is written with the assumption that the reader has a good working knowledge of computers and computer systems.

Chapter Descriptions

The following topics are covered in this guide:

- Chapter 1, “Introduction”
Provides an overview of SGI Rackable C2108-GP5 server components.
- Chapter 2, “System Safety”
Provides system safety information.
- Chapter 3, “Server Installation”
Provides a quick setup checklist to get the server operational.
- Chapter 4, “System Monitoring”
Describes how you monitor the overall status of the system as well as the activity and health of specific components.
- Chapter 5, “Chassis Maintenance”
Describes how you replace fans, disk drives, and power supplies.
- Chapter 6, “Troubleshooting”
Describes some basic steps to troubleshoot your system.
- [Appendix A, “Technical Specifications,”](#)
Describes system component specifications.
- [Appendix B, “BIOS POST Beep Codes,”](#)
Provides BIOS error code information.

Related Publications

The following SGI documents are relevant to the SGI Rackable C2108-GP5 server:

- SGI Foundation Software release notes
- SGI Performance Suite release notes
- SGI InfiniteStorage series documentation
- Man pages

You can obtain SGI documentation, release notes, or man pages in the following ways:

- Refer to the SGI Technical Publications Library at <http://docs.sgi.com>. Various formats are available. This library contains the most recent books and man pages.
- Refer to the SGI Supportfolio™ webpage for release notes and other documents whose access require a support contract. See “[Product Support](#)” on page xvi.

Conventions

The following conventions are used throughout this document:

Convention	Meaning
Command	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
<i>variable</i>	The italic typeface denotes variable entries and words or concepts being defined. Italic typeface is also used for book titles.
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.
man page(x)	Man page section identifiers appear in parentheses after man page names.
GUI element	This font denotes the names of graphical user interface (GUI) elements such as windows, screens, dialog boxes, menus, toolbars, icons, buttons, boxes, fields, and lists.

Product Support

SGI provides a comprehensive product support and maintenance program for its products. SGI also offers services to implement and integrate Linux applications in your environment.

- Refer to <http://www.sgi.com/support/>
- If you are in North America, contact the Technical Assistance Center at +1 800 800 4SGI or contact 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
- Contact your customer service representative and ask that an incident be filed in the SGI incident tracking system.

<http://www.sgi.com/support/supportcenters.html>

SGI values your comments and will respond to them promptly.

Introduction

The SGI Rackable C2108-GP5 server is a 2U rackmount server (see [Figure 1-1](#)). It has two main subsystems: the 2U server chassis and a dual-processor serverboard.

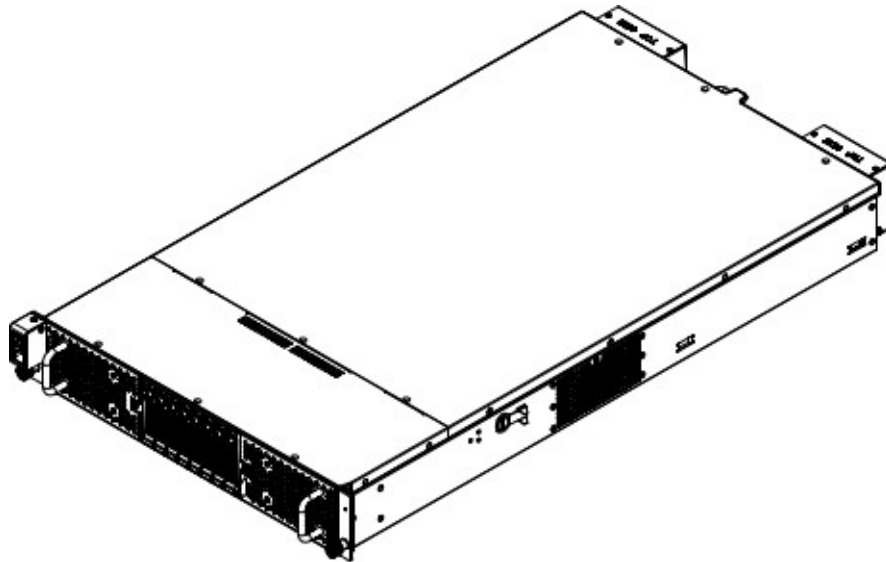


Figure 1-1 The SGI Rackable C2108-GP5 Server

This chapter describes the server using the following topics:

- “[Server Chassis Features](#)” on page 2
- “[Serverboard Features](#)” on page 6
- “[Additional Hardware Components](#)” on page 8

See [Appendix A](#), “[Technical Specifications](#),” for the more details.

Server Chassis Features

Table 1-1 describes the main features of the SGI Rackable C2108-GP5 server chassis.

Table 1-1 Server Chassis Features

Feature	Description
System power	The chassis features a redundant ¹ 2000W power supply consisting of two power modules. The system does not need to be shut down when replacing or removing a single power supply module.
Hard drives	The chassis is designed to support eight 2.5" hot-swappable hard drive carriers.
PCI expansion slots	<ul style="list-style-type: none"> – 8 x PCIe[®] x16 slots, running at x16 (Gen3/PCIE_1/PCIE_2/PCIE_3/PCIE_4) – 1 x PCIe[®] x16 slot, running at x8 (Gen3/MEZZ_1/Proprietary slot) – 1 x PCIe[®] x8 slot, running at x8 (Gen3/MEZZ_2/Proprietary slot)
Front control panel	The front control panel, shown in Figure 1-2 , provides system monitoring and control. LEDs indicate system power, HDD activity, and network activity. A main power button and a reset button are also included.
Rear control buttons and LEDs	For convenience, some of the buttons and LEDs on the front control panel are also on the rear chassis panel. In addition, the rear panel includes LEDs to monitor overheating and power failures. The rear control buttons and LEDs are shown in Figure 1-3
Rear I/O ports	As shown in Figure 1-3 , the rear panel includes the following I/O ports: <ul style="list-style-type: none"> – VGA port – Serial port – Dual 1G SFP+ Ethernet LAN ports – Server management LAN port – Two USB ports
Cooling system	Eight system fans
Notes:	
1. Certain configurations may not offer a redundant power supply option. Check with your SGI support representative for details about your configuration.	

Figure 1-2 shows the noteworthy components on the front of the server chassis.

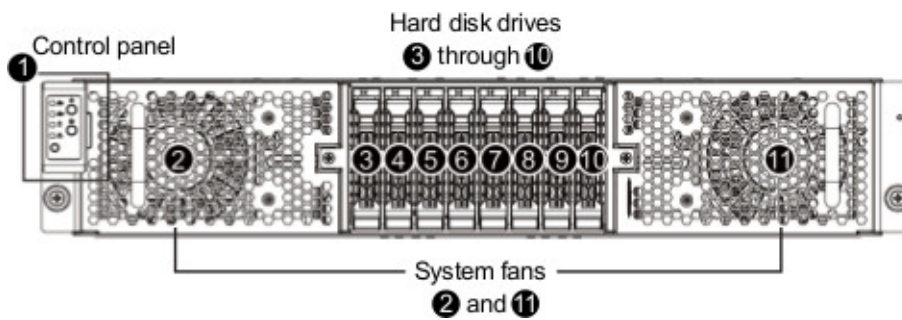


Figure 1-2 Front Chassis View

Figure 1-3 and Table 1-2 identify the components on the rear chassis panel.

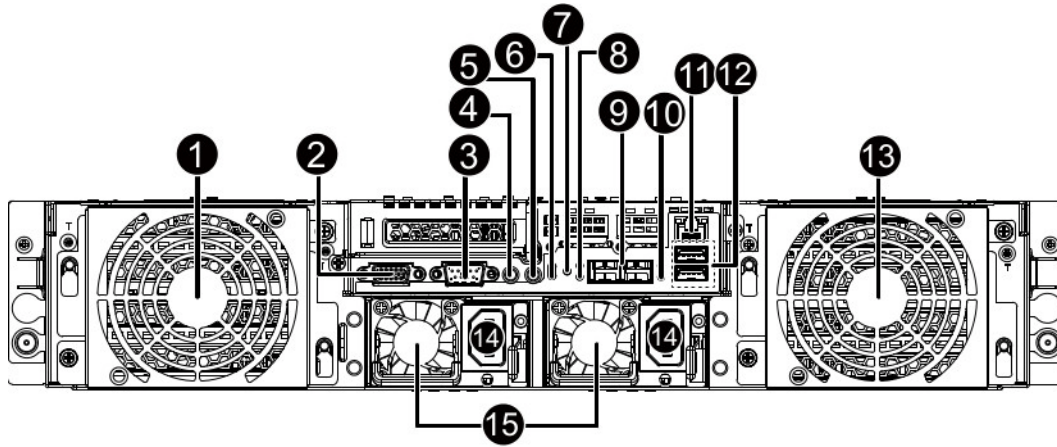


Figure 1-3 Rear Chassis View

Table 1-2 Rear Chassis Components

Item	Description
1	System fan
2	VGA port
3	Serial (COM) port
4	Power button/LED
5	ID switch button
6	Reset button (top)/NMI button (bottom)
7	System status LED
8	LAN1 Active/Link (top)/Speed (bottom) LEDs
9	Dual 1G SFP+ LAN ports
10	LAN2 Active/Link (top)/Speed (bottom) LEDs
11	10/100/1000 Server management LAN port
12	USB 3.0 ports
13	System fan
14	Power supply module cord socket
15	Power supply fan

Serverboard Features

At the heart of the SGI Rackable C2108-GP5 server is a dual-processor serverboard based on the Intel® C612 chipset, designed to provide maximum performance. [Table 1-3](#) describes the major features of the serverboard.

Table 1-3 Serverboard Features

Feature	Description
Processors	The serverboard supports single or dual Intel® Xeon® E5-2600 v3 Series processors.
Memory	<ul style="list-style-type: none"> – 24 x 1.2V DDR4 DIMM sockets supporting up to 768GB RDIMM – 24 x 1.2V DDR4 DIMM sockets supporting up to 1TB LRDIMM – Four-channel memory architecture – DDR4 2133MHz RDIMM memory modules – DDR4 2133MHz LR-DIMM memory modules – Support for ECC RDIMM/LRDIMM memory modules
Onboard serial ATA (SATA)	A SATA controller is integrated into the chipset to provide a ten-port SATA subsystem. Six of the ports are supported by the Intel PCH and four of the ports are supported by the Intel SCU. The SATA 6.0 ports are connected to the backplane by default. RAID 0, 1, 5 and 10 are supported.
Graphics controller	There is an integrated ASPEED® AST2400, supporting 128MB DDR3 VRAM.

[Figure 1-4](#) shows a block diagram of the serverboard.

Note: [Figure 1-4](#) is a general block diagram and may not represent the exact features on your serverboard. See [Table 1-3](#) for the actual specifications of your serverboard. This block diagram is intended for your reference only.

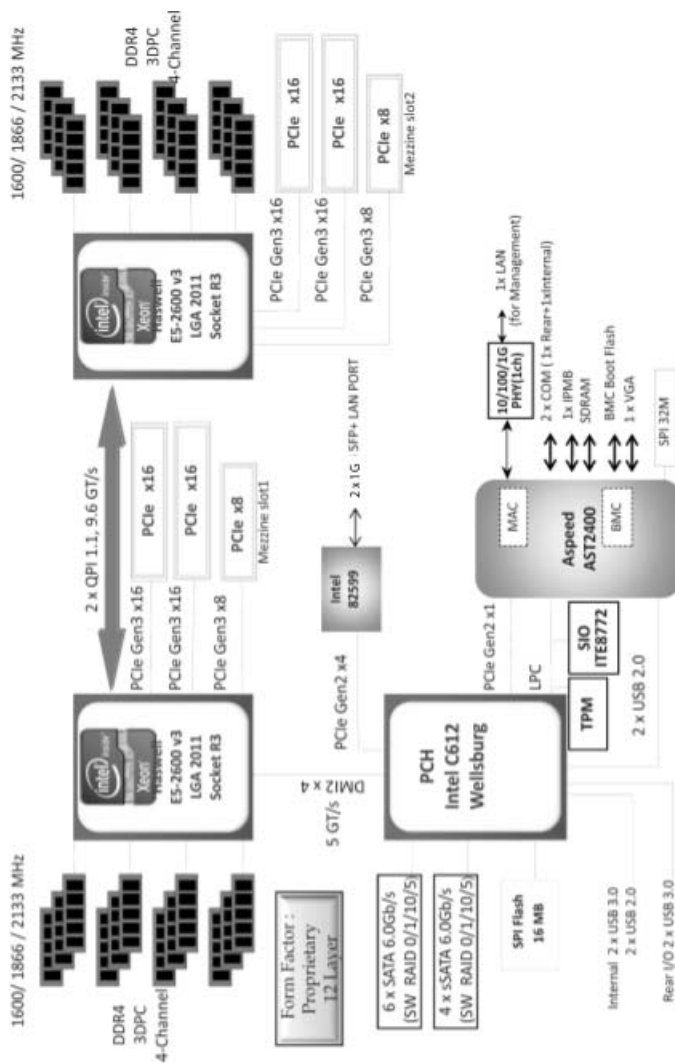


Figure 1-4 Serverboard Block Diagram

Additional Hardware Components

In addition to the serverboard and chassis, the following hardware components have been included with the server:

- Two passive CPU heat sinks
- Two conventional riser cards
- One Ultra riser card
- A plastic air shroud
- Eight 8-cm system cooling fans
- SAS backplane
- Eight hot-swap 2.5" HDD trays
- Four riser cards
- One rail set

Important: SGI Rackable server systems may sometimes require driver versions that are not included in the original operating system release. When required, SGI provides these drivers on an SGI Driver CD, which may ship with the system, or on the system disk (pre-installed in the factory). For more information on this topic check with your sales or service representative.

System Safety

This chapter describes basic safety precautions.

Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SGI Rackable C2108-GP5 system from damage, as follows:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as memory modules and disk drives. When disconnecting power, you should first power down the operating system first and then unplug the power cords. The unit has more than one power supply cord. Disconnect two power supply cords before servicing to avoid electrical shock.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery



Caution: There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see [Figure 2-1](#)). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

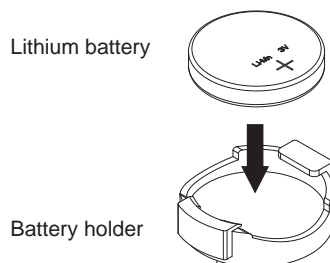


Figure 2-1 Installing the Onboard Battery

General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the SGI Rackable C2108-GP5 system clean and free of clutter.
- The SGI Rackable C2108-GP5 system weighs approximately 75 lbs (34 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.
- Do not make improper use of server rack or rail equipment, as noted [Figure 2-2](#).



Figure 2-2 Improper Use of Server Rack and Railing

ESD Precautions



Caution: Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference. The discharge can damage electronic components and printed circuit boards.

The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Operating Precautions

The following are two noteworthy operating precautions:

- Ensure that the chassis cover is in place when the server is operating to ensure proper cooling. Out-of-warranty damage to the system can occur if this practice is not strictly followed.
- Please handle used batteries carefully. Do not damage the battery in any way. A damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Server Installation

This chapter provides a quick setup checklist to get the SGI Rackable C2108-GP5 server operational.

Unpack the System

Inspect the shipping container used for the server and note if it was damaged in any way. If the server shows damage, file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack that supports the weight, power requirements, and environmental requirements of the server. It should be situated in a clean, dust-free environment that is well ventilated. Avoid areas where heat, electrical noise, and electromagnetic fields are generated. Place the server rack near a grounded power outlet. Refer to [“Warnings and Precautions”](#) on page 14.

Prepare for Setup

The shipping container should include two sets of rail assemblies, two rail mounting brackets and the mounting screws that you will use to install the system into a rack.

Read this section in its entirety before you begin the installation procedure.

Choose a Setup Location

Follow these guidelines:



Caution: The equipment is intended for installation only in a restricted access location.

- This product is not suitable for use with visual display work place devices according to Clause 2 of the *German Ordinance for Work with Visual Display Units* document.
- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

Warnings and Precautions

Rack Precautions



Warning: Failure to follow the following guidelines can result in serious injury or damage to the equipment.

- The SGI Rackable C2108-GP5 server weighs 75 lbs (34 kg). Always use proper lifting techniques when you move the server. Always get the assistance of another qualified person when you install the server in a location above your shoulders.
- Extend the leveling jacks on the bottom of the rack to the floor with the full weight of the rack resting on them.
- Attach stabilizers to the rack in single rack installations.
- Couple racks together in multiple rack installations.
- Be sure the rack is stable before extending a component from the rack.
- Extend only one component at a time. Extending two or more components simultaneously may cause the rack to tip over.

Server Precautions

- Review the electrical and general safety precautions in [Chapter 2, “System Safety.”](#)
- Determine the placement of each component in the rack before you install the rails.
- Install the heaviest server components in the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges and voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot-pluggable SATA drives and power supply modules to cool before touching them.
- Always keep the rack’s front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer’s maximum rated ambient temperature (35° C or 95° F).

Note: Certain processor or coprocessor configurations may require more stringent temperature constraints. If this is true for your system, SGI will so notify you.

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (for example, the use of power strips, and so on).

Install the System into a Rack

This section provides information on installing the server into a rack. If the system has already been mounted into a rack, refer to “[Check the Serverboard Setup](#)” on page 20. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Note: This rail will fit a rack between 26" and 33.5" deep.

Separate the Sections of the Rack Rails and Install Outer Rack Rails

The chassis package includes two rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

Steps 1–4 describe how to separate the inner and outer rails:

1. Locate the rail assembly in the chassis packaging as shown in [Figure 3-1](#).
2. Extend the rail assembly by pulling it outward.
3. Press the quick-release tab
4. Separate the inner rail from the outer rail assembly as shown in [Figure 3-1](#).

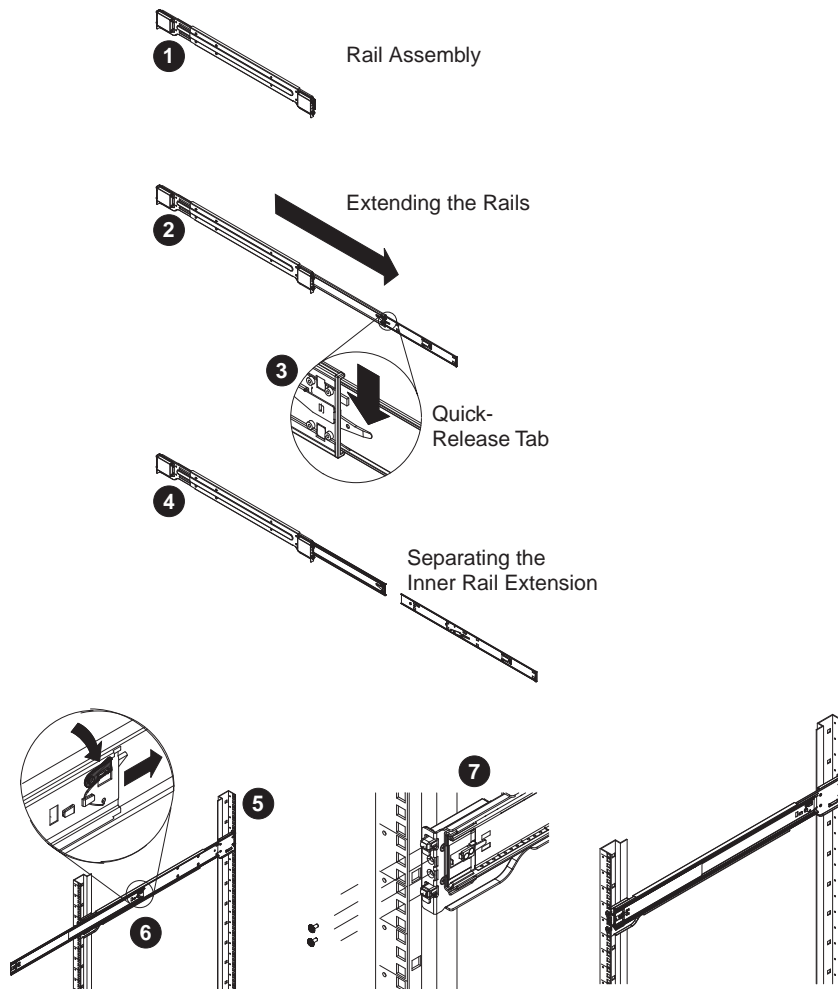


Figure 3-1 Separating and Installing the Rack Rails

Outer rails attach to the rack and hold the chassis in place. The outer rails for the chassis extend between 30 inches and 33 inches.

Steps 5–8 describe how to install the outer rails to the rack (see [Figure 3-1](#)):

5. Secure the back end of the outer rail to the rack, using the screws provided.

6. Press the button where the two outer rails are joined to retract the smaller outer rail.
7. Hang the hooks of the rails onto the rack holes and if desired, use screws to secure the front of the outer rail onto the rack.
8. Repeat steps 5-7 for the remaining outer rail.

Install the Inner Rail Extensions

The server chassis includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rails are pre-attached to the chassis, and do not interfere with normal use of the chassis if you decide not to use a server rack. The inner rail extensions are attached to the inner rails to mount the chassis in the rack.

Perform the following steps to install the inner rail extensions as illustrated in [Figure 3-2](#):

1. Place the inner rail extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces outward just like the pre-attached inner rail.
2. Slide the extension toward the front of the chassis.
3. Secure the chassis with two screws as illustrated.
4. Repeat the prior steps for the other inner rail extension.

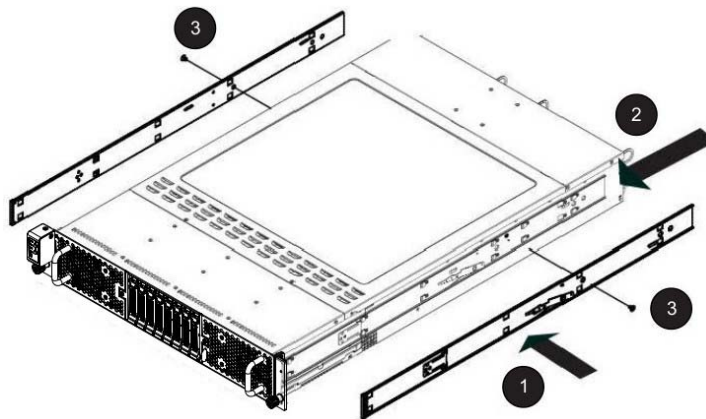


Figure 3-2 Installing the Inner Rail Extensions

Install the Server in a Rack



Warning: The SGI Rackable C2108-GP5 server weighs 75 lbs (34 kg). Always use proper lifting techniques when you move the server. Always get the assistance of another qualified person when you install the sever in a location above your shoulders. Failure to do so may result in serious personal injury or damage to the equipment.

You should now have rails attached to both the server chassis and the rack unit. The next step is to install the server into the rack (refer to [Figure 3-3](#)).

1. Extend the outer rails as shown in [Figure 3-3](#).
2. Align the inner rails of the chassis with the outer rails on the rack.
3. Slide the inner rails into the outer rails, keeping the pressure even on both sides. When the chassis has been pushed completely into the rack, it should click into the locked position.
4. Optional screws may be used to secure the to hold the front of the chassis to the rack.

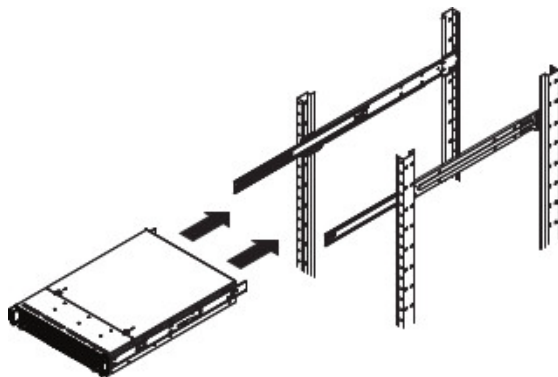


Figure 3-3 Installing the Server in a Rack

Note: The figure above is for illustration purposes. Always install servers to the rack in a bottom-to-top fashion.

Check the Serverboard Setup

After you install the server in the rack, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made. Before operating the server for the first time, it is important to remove any protective film covering the top of the chassis. The removal of this film allows for proper ventilation and cooling.

Removing the Chassis Cover

Use the following procedure for removing the chassis cover as illustrated in [Figure 3-4](#).

1. Ensure that the system is not turned on or connected to AC power.
2. If the server is rack-mounted, grasp the two front handles and pull the server straight out until it locks.

You will hear a click when it locks.

Note: To remove the system from the rack completely, depress the locking tabs on the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

3. Remove the 9 screws securing the cover.
4. Slide the cover toward the rear of the chassis to disengage the cover.

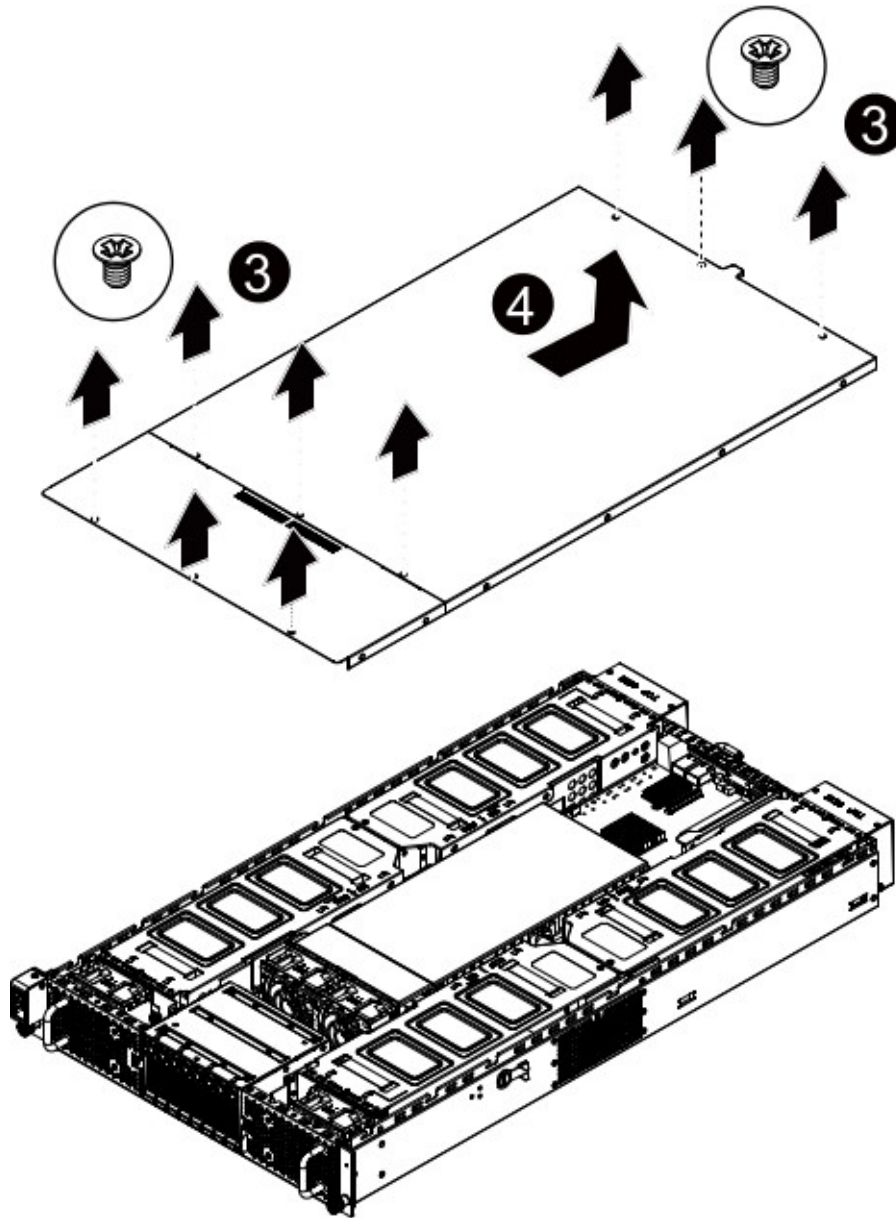


Figure 3-4 Accessing the Inside of the Chassis

Checking the Components and Setup

You may have one or two processors already installed in your serverboard. Ensure that the serverboard is populated per your order.

Your server system comes with system memory already installed. Make sure all DIMMs are fully seated in their slots.

Ensure that all power and data cables are properly connected and not blocking the chassis airflow. Also, make sure that no cables are positioned in front of the fans.

Checking the Drive Bay Setup

Ensure that the peripheral drives and the disk drives have been properly installed and all connections have been made.

Do not operate the server without drives or drive trays in the drive bays. Depending upon your system's configuration, your system may have one or more drives already installed. All drives are accessible from the front of the server. If you need to install hard drives, see [“Replacing Disk Drives” on page 36](#). Use only recommended server parts.

Checking the Airflow

Airflow is provided by eight 8-cm chassis cooling fans. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

Ensure that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

Providing Power

Plug the power cord(s) from the power supply unit(s) into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

Depress the power button on the control panel, located on the front of the chassis. See [“Control Panel Components” on page 24](#).

System Monitoring

There are several buttons and LEDs on the front control panel and on the rear of the chassis to keep you constantly informed of the overall status of the system. As shown in [Figure 4-1](#), the front control panel is on the left side of the chassis front.

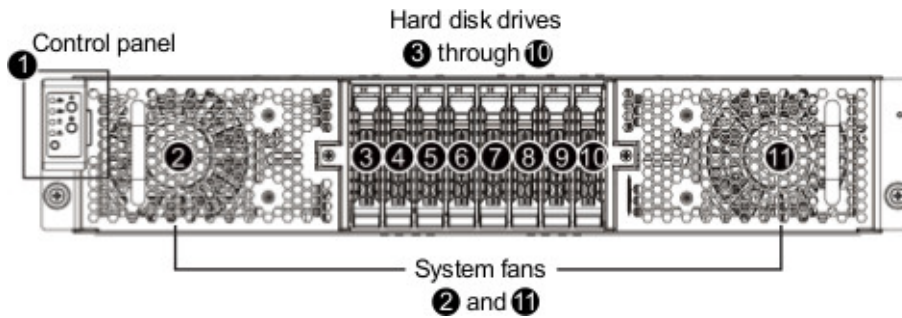


Figure 4-1 Front Control Panel

Additionally, drive carriers and power supplies have LEDs that indicate the disk drive and power supply status, respectively. This chapter describes the functions of the buttons and LEDs and the appropriate responses you may need to take.

Control Panel Components

Figure 4-2 shows the components of the control panel.

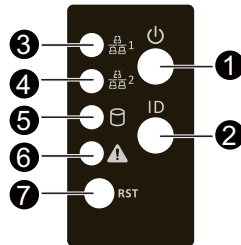


Figure 4-2 Control Panel Components

Table 4-1 describes the functions of the front control panel components.

Table 4-1 Front Control Panel Components

Item	Name	Color	Status	Description
1	Power button and LED	Green	Solid On	System is powered on.
		Green	Blink	System is in ACPI S1 state (sleep mode).
		N/A	Off	– System is not powered on or in ACPI S5 state (power off). – System is in ACPI S4 state (hibernate mode).
2	ID Button and LED	Blue	Solid On	System identification is active.
		N/A	Off	System identification is disabled.
3	LAN1 Activity LED	Green	Solid On	Link between system and network
		Green	Blink	Network access
		N/A	Off	Disconnect/Idle
4	LAN2 Activity LED	Green	Solid On	Link between system and network

Table 4-1 Front Control Panel Components **(continued)**

Item	Name	Color	Status	Description
		Green	Blink	Network access
		N/A	Off	Disconnect/Idle
5	HDD Activity LED	Green	Solid On	HDD access
		Green/ Amber	Blink alternately	HDD rebuilding
6	System Status LED	Green	Solid On	Running or normal operation
		Amber	Solid On	Check for one of the following: – Power module failure – System fan failure – Power supply voltage issue – System temperature/voltage issue
		N/A	Off	System is not ready.
7	Reset Button	N/A	N/A	Press the button to reset the system.

Rear Control Buttons and LEDs

Figure 4-3 shows the location of the rear control buttons and LEDs. Table 4-2 describes the function of the buttons and LEDs.

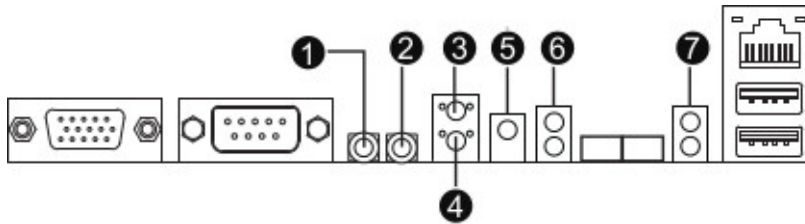


Figure 4-3 Rear Control Buttons and LEDs

Table 4-2 Rear Control Buttons and LEDs

Item	Name	Color	Status	Critical Event	Description
1	Power button and LED	Green	Solid on	N/A	System is powered on.
		Green	Blink	N/A	System is in ACPI S1 state (sleep mode).
		N/A	Off	N/A	System is not powered on or in ACPI S5 state (power off). System is in ACPI S4 state (hibernate mode).
2	ID button and LED	Blue	Solid on	N/A	System identification is active.
		N/A	Off	N/A	System identification is disabled.
3	Reset button	N/A	N/A	N/A	Press the button to reset the system.
4	NMI button	N/A	N/A	N/A	For multi-bit ECC errors, press the button to generate a NMI to the processor (effectively halting the server).

Table 4-2 Rear Control Buttons and LEDs (continued)

Item	Name	Color	Status	Critical Event	Description
5	System status LED	Green	Solid on	N/A	Running or normal operation
		Amber	Solid on	Yes	Check for one of the following: – Power module failure – System fan failure – Power supply voltage issue – System temperature/voltage issue
		N/A	Off	N/A	System is not ready.
6	LAN1 Active/Link LED	Green	Solid on	N/A	Link between system and network or no access
		Green	Blink	N/A	Data transmission or receiving is occurring.
		N/A	Off	N/A	No data transmission or receiving is occurring.
7	LAN2 Active/Link LED	Green	Solid on	N/A	Link between system and network or no access
		Green	Blink	N/A	Data transmission or receiving is occurring.
		N/A	Off	N/A	No data transmission or receiving is occurring.

Drive Carrier LEDs

Figure 4-4 shows the location of the drive carrier LED. Table 4-3 describes the functions of the LED.



Figure 4-4 Disk Carrier LED

Table 4-3 Drive Carrier LED Functions

RAID	LED	Color	Locate	HDD Fault	Rebuilding	HDD Access	HDD Present (No Access)
No RAID (HBA, PCH)	Disk Carrier LED (LED on Back Panel)	Green	On ¹	Off		Blink ²	Off
		Amber	Off	Off		Off	Off
	Removed HDD Slot (LED on Back Panel)	Green	On ¹	Off			
		Amber	Off	Off			
RAID (HW or SW RAID card)	Disk Carrier LED	Green	On	Off	Alternately	Blink ²	Off
		Amber	Off	On	(Low speed at 2Hz)	Off	Off
	Removed HDD Slot	Green	On	Off	See Note 3.		
		Amber	Off	On	See Note 3.		

Notes:

1. Depends on the HBA/utility specification.
2. The blink cycle depends on the HDD activity signal.
3. If an HDD is removed during rebuilding, the disk status is regarded as a fault.
4. The blink frequency is about 2Hz.

Power Supply LED

There is a single bi-color LED (green/amber) to indicate the power supply status. Table 4-4 describes the different states of the LED.

Table 4-4 Power Supply LED States

LED State	Power Supply (PS) State
Off	No AC power to any PS.
Green	Output on and Ok.
Green, 1Hz blink	AC present (only 12VSB on). PS off or PS in cold redundant state. Note: This is the normal state for a redundant PS.
Green, 2Hz blink	PS firmware updating.
Amber	<ul style="list-style-type: none"> – PS critical event causing a shutdown/failure (OCP, OVP, fan failure) – AC cord unplugged or AC power lost. A second power supply in parallel still has AC input power.
Amber, 1Hz blink	PS warning events where the power supply continues to operate (high temperature, high power, high current, slow fan).

Chassis Maintenance

For warranty and safety considerations, SGI designates the following chassis components as customer-replaceable units:

- Power supplies
- Fans
- Disk drives

The disk drives and power supplies are hot-swappable; that is, you can replace them without powering down the server. As a safety precaution, replacing the fans requires a system power-down. A trained service technician should install and replace all other components.

This chapter describes the following chassis maintenance activities:

- “Removing the Chassis Cover” on page 32
- “Replacing a Power Supply” on page 34
- “Replacing Disk Drives” on page 36
- “Replacing Chassis Fans” on page 38

Before You Start



Warning: Review the warnings and precautions listed in this manual before setting up or servicing this chassis. These include the items described in [Chapter 2, “System Safety.”](#)

Tools and Supplies Needed

- Phillips (cross head) screwdriver
- Anti-static wrist strap and conductive foam pad (recommended)

Left-Right and User Position

All references to left, right, front, top, and bottom assume you are facing the front of the chassis as it would be positioned for normal operation.

Removing the Chassis Cover

Caution: Except for short periods of time, do not operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

Use the following procedure for removing the chassis cover as illustrated in [Figure 5-1](#).

1. Ensure that the system is not turned on or connected to AC power.
2. If the server is rack-mounted, grasp the two front handles and pull the server straight out until it locks.
You will hear a click when it locks.
3. Remove the 9 screws securing the cover.
4. Slide the cover toward the rear of the chassis to disengage the cover.

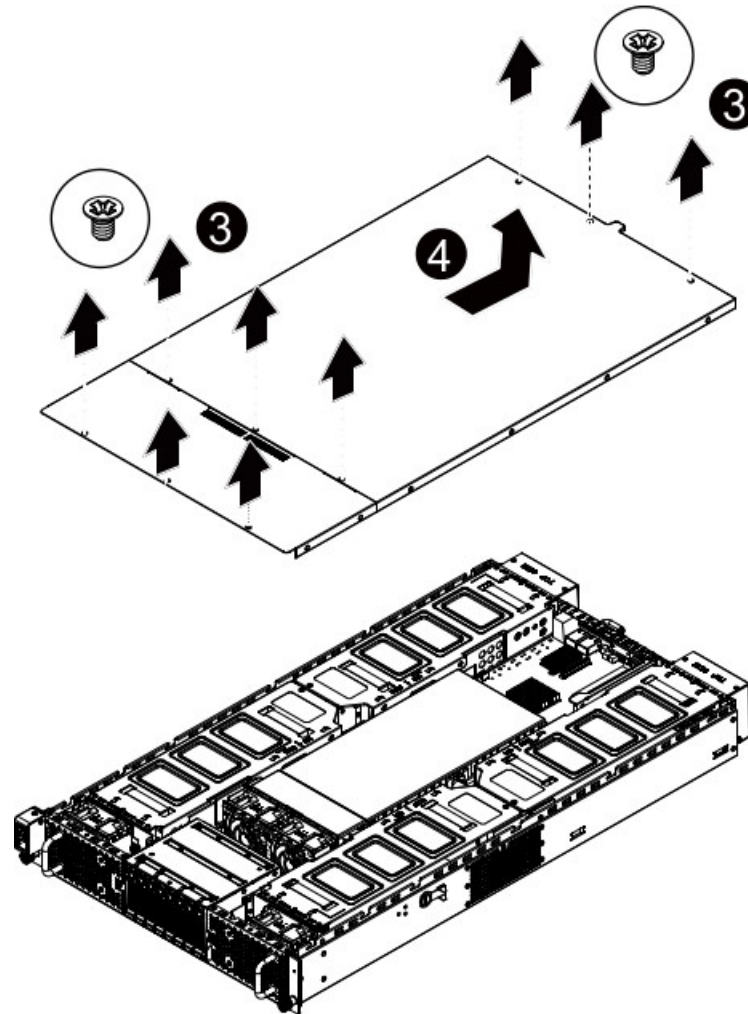


Figure 5-1 Accessing the Inside of the Chassis

Note: To remove the system from the rack completely, depress the locking tabs on the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

Replacing a Power Supply

The server chassis includes two redundant 2000-Watt power supplies. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

In the unlikely event that a power supply unit needs to be replaced, one power supply can be removed without powering down the system. Use the following steps to replace a power supply, as illustrated in [Figure 5-2](#):



Caution: .Unplug the AC power cord from the failed power supply module to reduce the risk of injury from electric shock.

1. Pull out the power supply handle and press the retaining clip on the right side of the power supply along the direction of the arrow.
2. While pressing the retaining clip, pull the power supply out.
3. Push the new power supply module into the power bay until you hear a click.
4. Plug the AC power cord back into the module.

Note: Certain configurations may not offer a redundant power supply option. Check with your SGI support representative for details about your configuration.

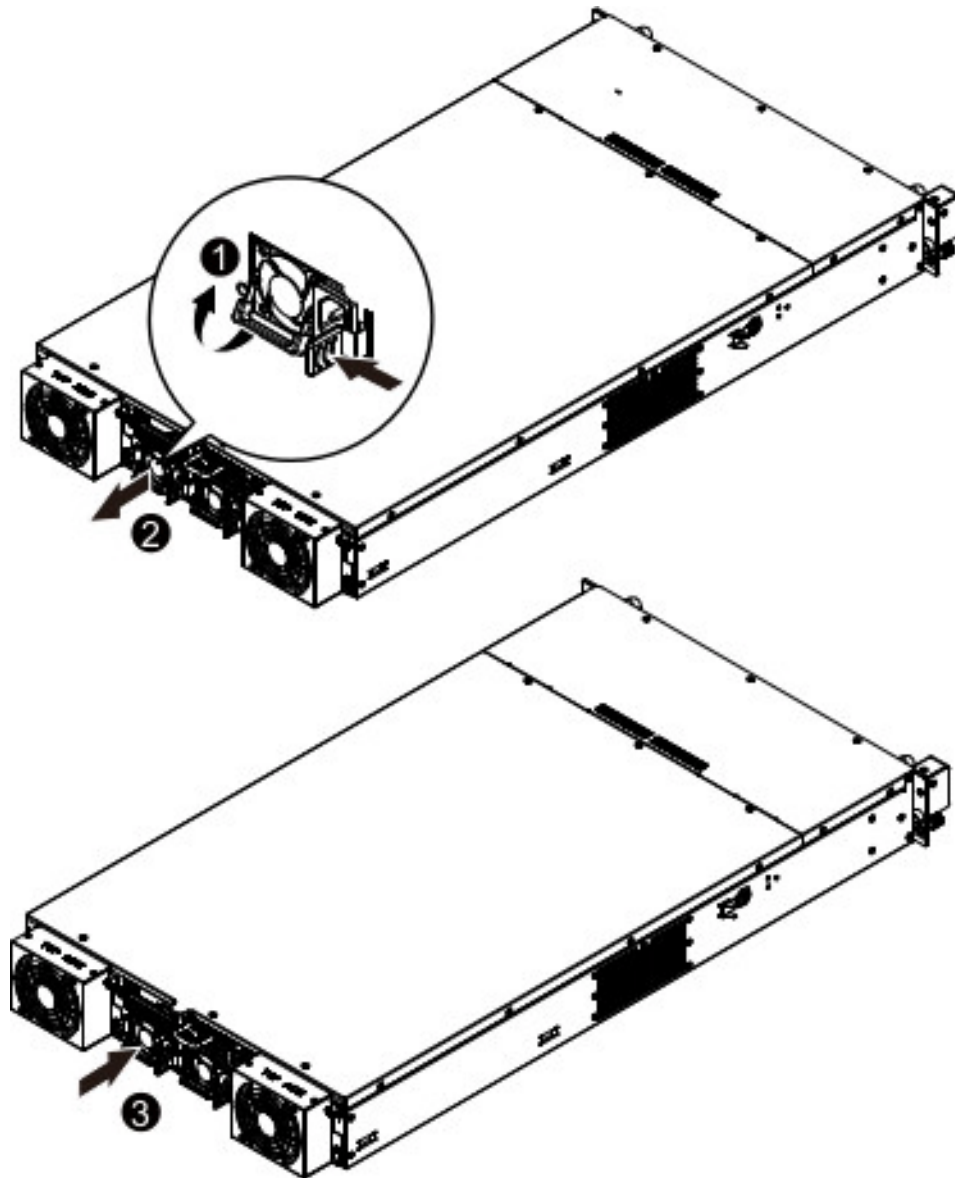


Figure 5-2 Removing the Power Supply

Replacing Disk Drives

Caution: Except for short periods of time while swapping hard drives, do not operate the server with the hard drive carriers empty.

To replace an HDD, perform the following steps, as illustrated in [Figure 5-3](#):

1. Press the release button on the HDD tray.
Note the drive tray orientation so that you can re-insert it properly.
2. Pull the locking lever to remove the HDD tray.
Note the four screws that secure the drive to the tray.
3. Replace the disk drive in the tray.
Note the four screws that secure the drive to the tray.
4. Slide the drive tray back into the bay until it locks to ensure that the HDD is properly connected to the backplane.

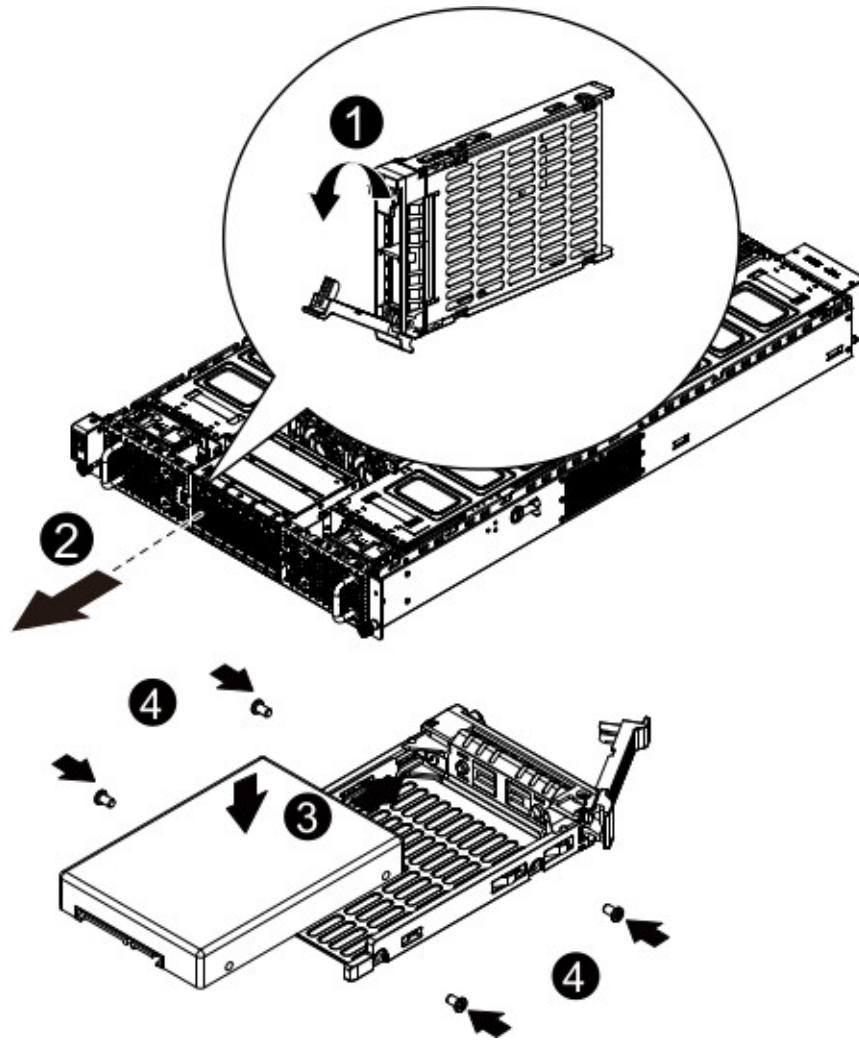


Figure 5-3 Replacing a Hard Disk Drive

Replacing Chassis Fans

As shown in [Figure 5-4](#), the chassis contains eight high-performance fans. If a fan fails, the System Status LED on the control panel will shine amber. Replace any failed fan at your earliest convenience with the same type and model. The system can continue to run with a failed fan.

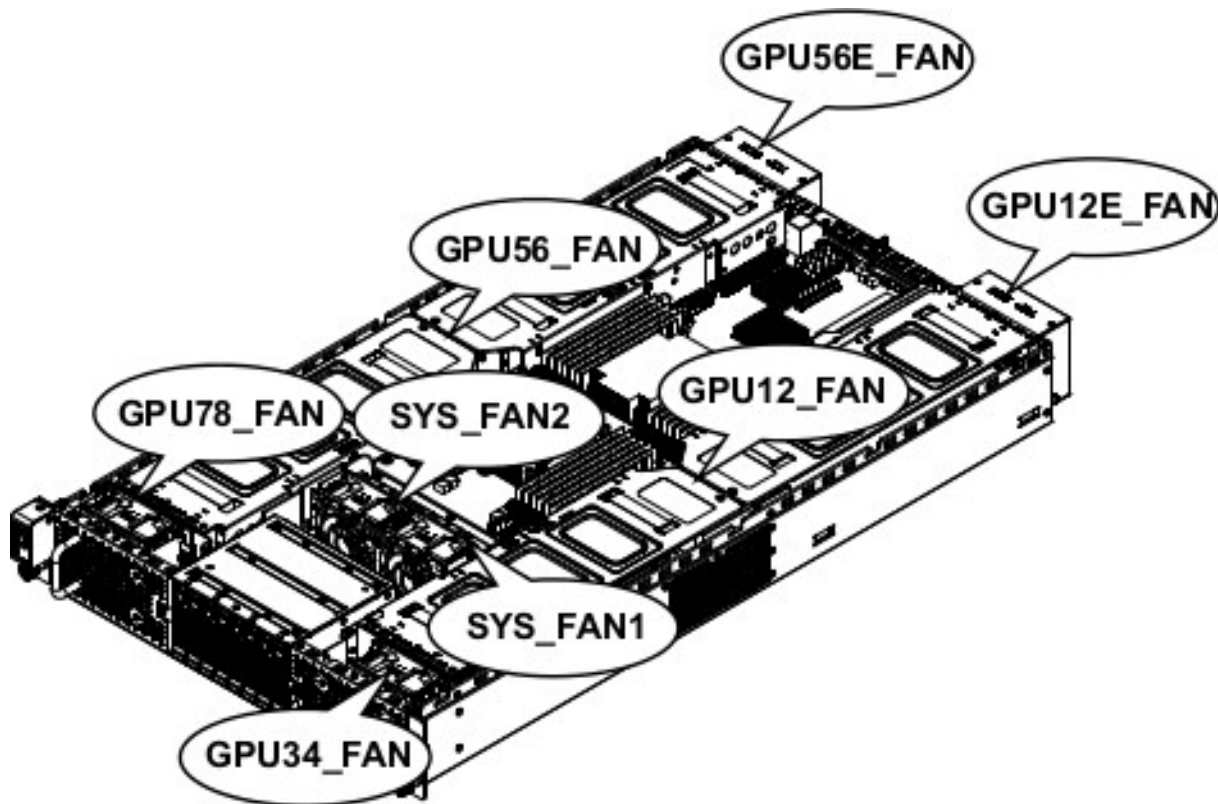


Figure 5-4 Chassis Fans

For the replacement procedures in this section, the fans are categorized as following:

- Front and middle GPU fans (GPU34_FAN, GPU12_FAN, GPU78_FAN, and GPU56_FAN)
- System fans (SYS_FAN1 and SYS_FAN2)
- Rear GPU fans (GPU12E_FAN and GPU56E_FAN)

Common Preliminary Steps

Regardless of fan type, perform the following preliminary steps:

1. Remove the top chassis cover while the system is still running to determine which of the fans has failed.

See “Removing the Chassis Cover” on page 32.

2. Power down the system.
3. Remove the power cord(s).



Caution: Steps 2 and 3 are safety precautions. Failure to observe them could lead to personal injury or damage to the equipment.

Front and Middle GPU Fans

After completing the preliminary steps (See “Common Preliminary Steps” on page 39.), perform the following steps to replace a front or middle GPU fan as illustrated in Figure 5-5 and Figure 5-6:

1. Disconnect the fan cabling and lift the fan assembly from the chassis.
2. Attach the four rubbers on the fan.
3. Reinsert the fan assembly and recable it.

Ensure that the fan cables are seated properly. See “Fan Cabling” on page 46.

4. Power up the system and ensure that the fan is working properly before replacing the chassis cover.

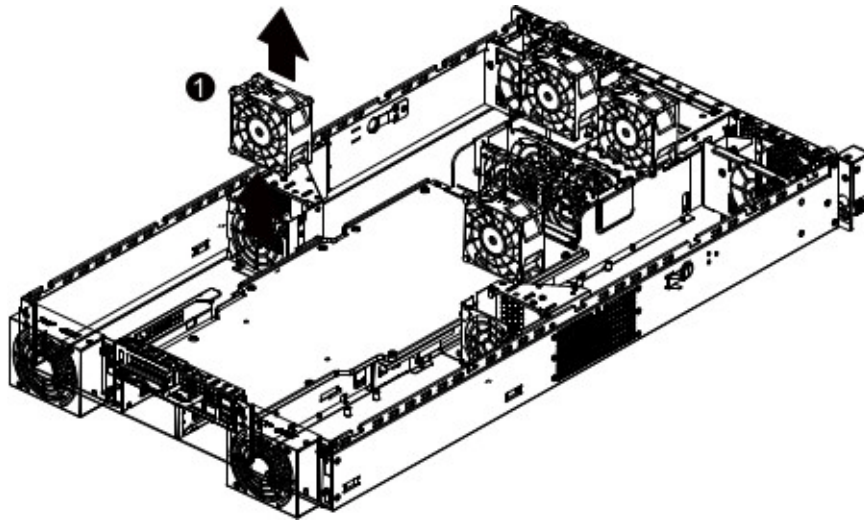


Figure 5-5 Removing Front or Middle GPU Fan

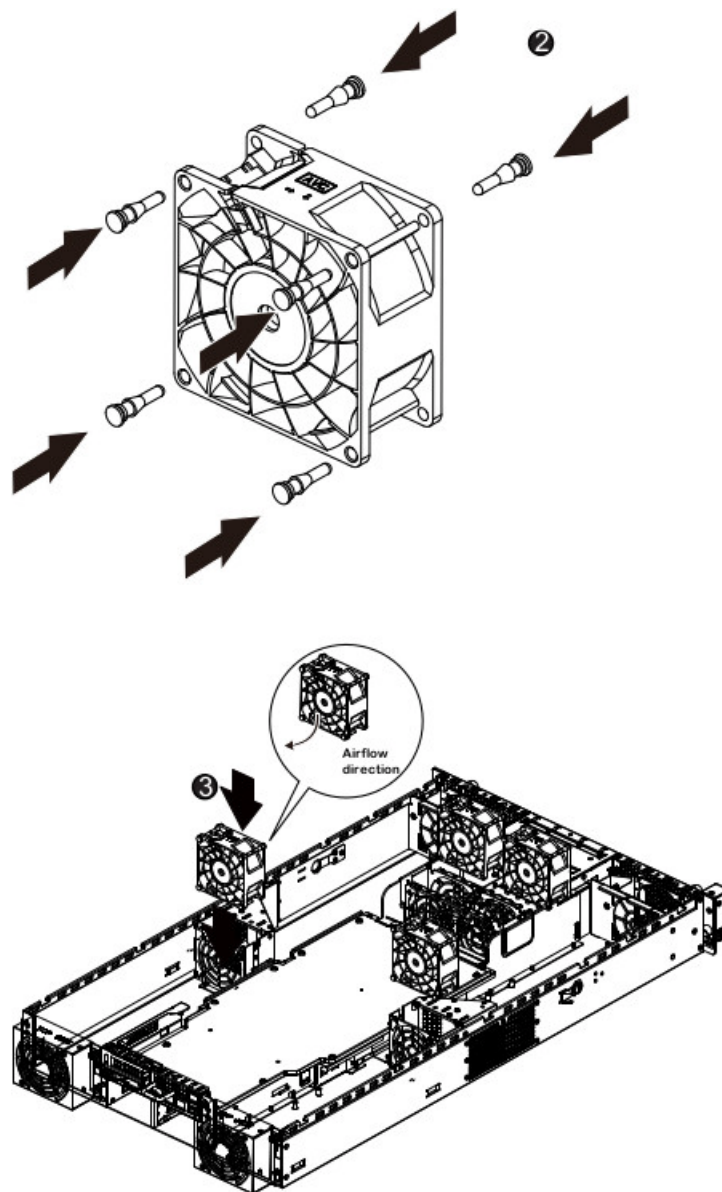


Figure 5-6 Inserting Front or Middle GPU Fan

System Fans

After completing the preliminary steps (See “Common Preliminary Steps” on page 39.), perform the following steps to replace one of the system fans as illustrated in Figure 5-7 and Figure 5-8:

1. Disconnect the fan cabling and lift the fan assembly from the chassis.
2. Attach the four rubbers on the fan.
3. Reinsert the fan assembly and recable it.

Ensure that the fan cables are seated properly. See “Fan Cabling” on page 46.

4. Power up the system and ensure that the fan is working properly before replacing the chassis cover.

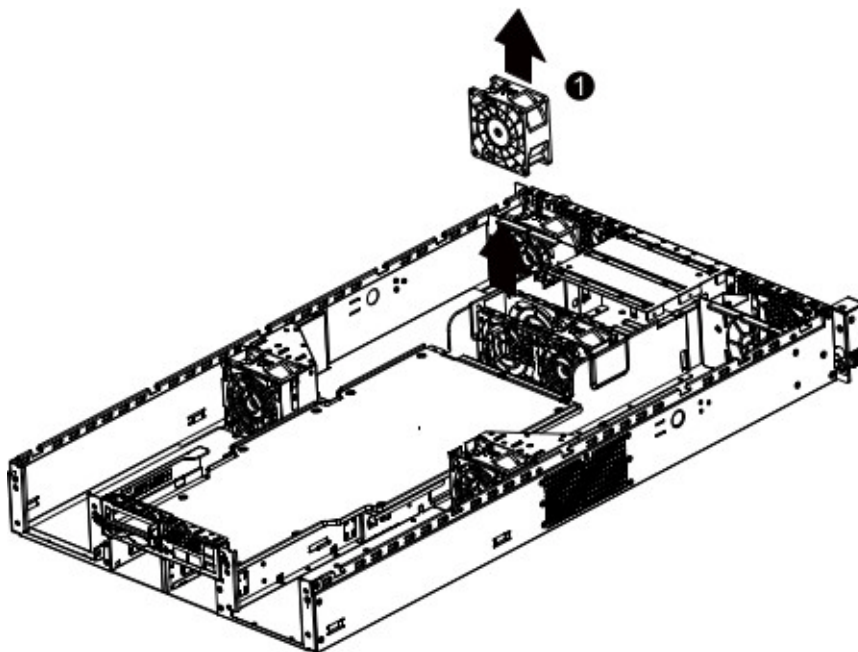


Figure 5-7 Removing System Fans

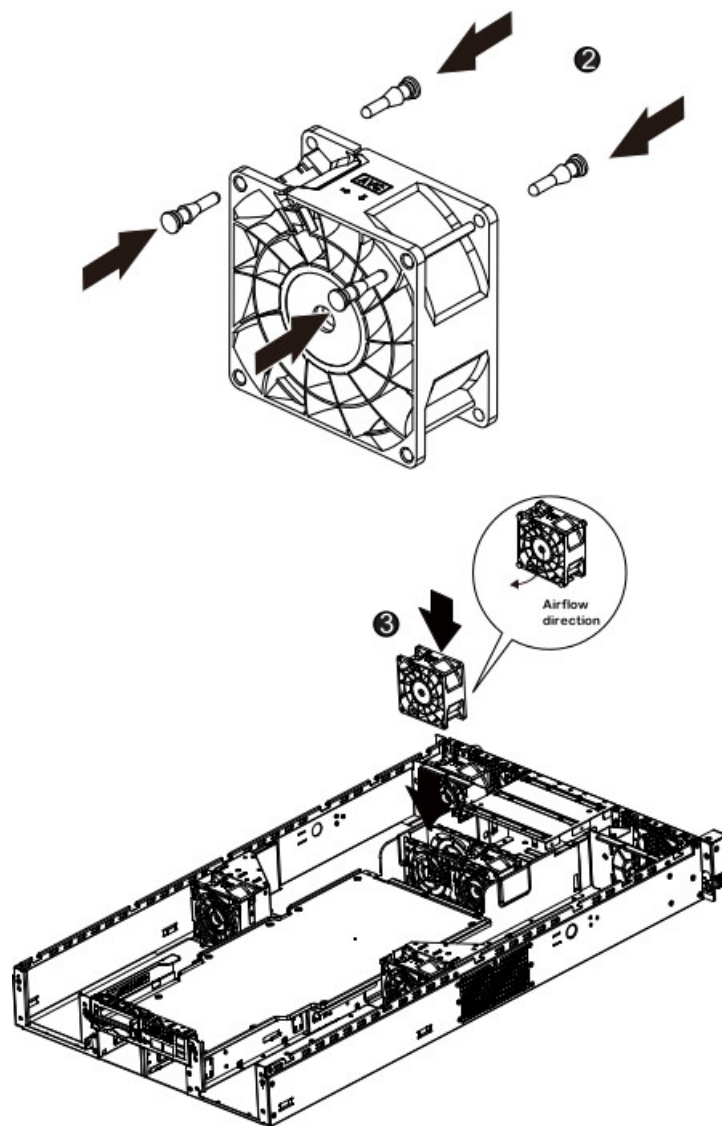


Figure 5-8 Inserting System Fans

Rear GPU Fans

After completing the preliminary steps (See “Common Preliminary Steps” on page 39.), perform the following steps to replace a rear GPU fan as illustrated in Figure 5-9 and Figure 5-10:

1. Remove the screws securing the fan cage.
2. Remove the fan cage from the chassis.
3. Remove the screws securing the cage.
4. Replace the failed fan and re-insert the fan cage into the chassis.
5. With the screws from step 1, secure the fan cage to the chassis.

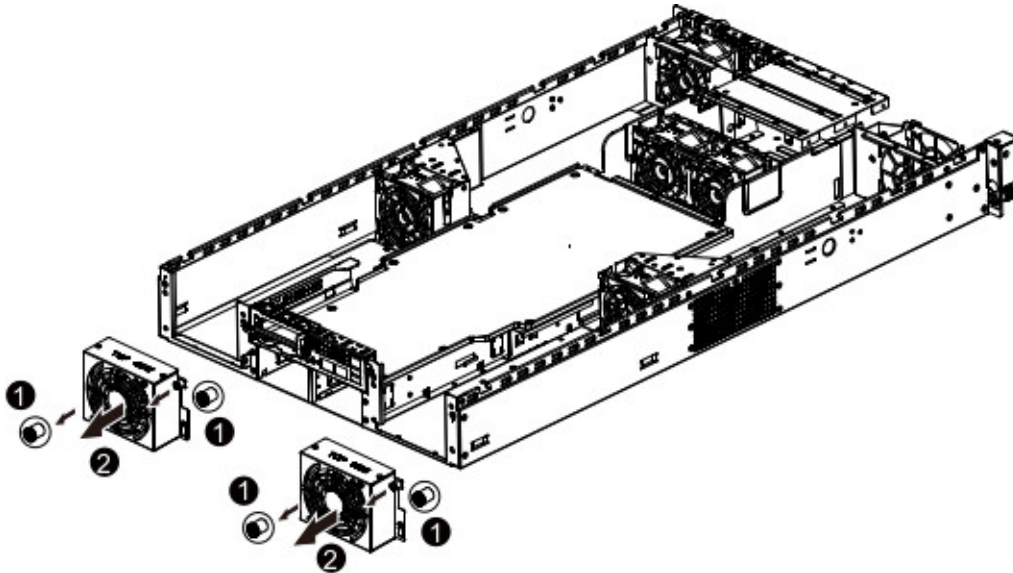


Figure 5-9 Removing Rear GPU Fans

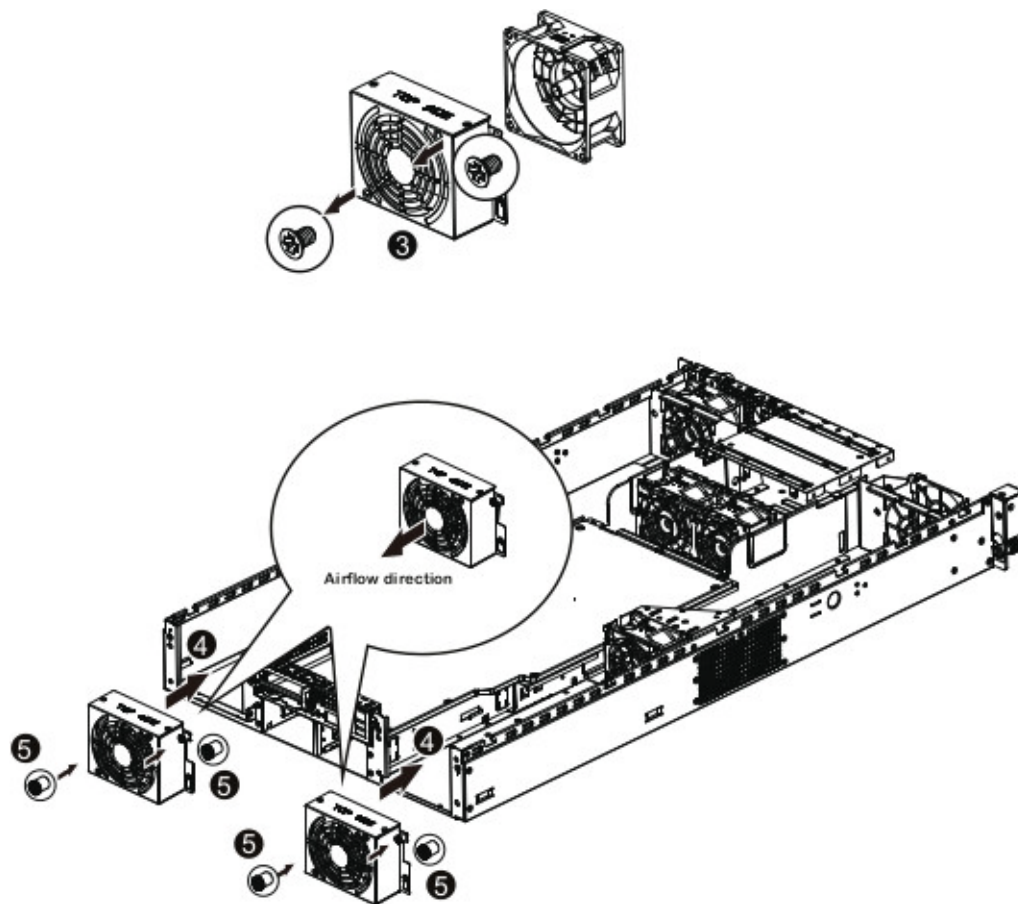


Figure 5-10 Inserting Rear GPU Fans

Fan Cabling



Caution: To avoid fan cable damage, ensure that the fan cables are firmly seated in the grooves. See [Figure 5-11](#) and [Figure 5-12](#).

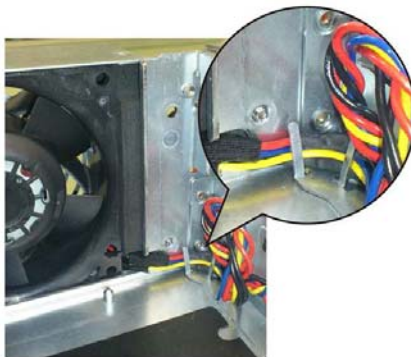


Figure 5-11 Fan Cabling View 1

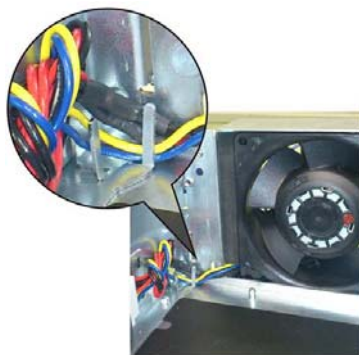


Figure 5-12 Fan Cabling View 2

Troubleshooting

This chapter describes troubleshooting for the problems listed below. Chapter 4 describes use of the control panel to monitor the overall system status and the status of specific components. Chapter 5, “Chassis Maintenance” describes how to replace defective components.

- “If the System Does Not Power Up” on page 48
- “System Powers Up But Will Not Boot” on page 48
- “No Video After System Power Up” on page 49
- “Memory Errors” on page 49
- “Loss of Power Redundancy with GPUs or Coprocessors” on page 50

If you follow all of the prescribed procedures and still need assistance, check with your authorized support organization.

If the System Does Not Power Up

If the system will not power up when the front power button is pushed, use the following checklist to identify common sources for the problem:

- Make sure that both ends of each system power cable are firmly connected to the power supply and the corresponding power source(s) or power distribution unit (PDU).
- Check that the LED on each power supply is properly lit. The power supply has one status LED located on the left side of the front of the power supply. The status LED has three states as follows:
 - Dark or off—Indicates no AC power present.
 - Yellow—AC power is present. The server is not turned on (no DC power).
 - Flashes slowly (about four seconds on/off)—Power supply has failed.
 - Green—AC power is present and the server is turned on (DC power present).
- Open the system cover, remove the air shroud, and check to make sure that no obvious short circuits exist between the serverboard and chassis.

If you must replace the power supply, refer to [“Replacing a Power Supply”](#) on page 34.

System Powers Up But Will Not Boot

If the system powers up but will not boot the operating system, check the following:

- Check the system order document(s) - the server may have been ordered with no operating system. If so, check with your system administrator for OS loading information.
- Check the system disk for drive activity and confirm that it is firmly seated in the disk bay. A red light on the front of the disk indicates a functional error. Check with your service provider or local system administrator.

No Video After System Power Up

If the system powers up and appears to be booting normally but no video is present, try the following basic solutions:

- Confirm your monitor is plugged in and switched on.
- Check all video cables and ensure they are properly connected.
- If using an optional PCIe video card check the back of the card for LED activity or a fault indicator. Try opening the system, reseating the PCI card, and rebooting.

If you cannot get a video signal after trying basic solutions contact your support provider.

Memory Errors

If your system experiences memory related errors, try these basic troubleshooting steps to resolve or better identify the problem:

- Confirm that the power supply LED is not indicating an error.
- Shut the system down, remove the covers over the serverboard and make sure that all the DIMM modules are properly and fully installed.
- You should be using registered ECC DDR4 memory. Also, it is recommended that you use the same memory type and speed for all DIMMs in the system.
- Check for bad DIMM modules or slots by swapping modules between slots and noting the results.

Contact your administrator or support provider if the memory errors continue.

Loss of Power Redundancy with GPUs or Coprocessors

Some GPUs and coprocessors with high-power consumption can cause the system power draw to exceed what a single power supply can provide. In such cases, the server can operate normally because the server has two power supplies. However, the server will not continue to function with one failed power supply.

Power redundancy is retained if you do not exceed the configuration-power maximums described in [Table 6-1](#).

Table 6-1 GPU Configuration-Power Requirements for Power Redundancy

Maximum Power Draw (per card in Watts)	Maximum Number of Cards
225	4
235	4
300	3

Technical Specifications

Table A-1 lists allowable ranges for temperature, humidity, and altitude for the C2108-GP5 server.

Table A-1 Temperature, Humidity, and Altitude Specifications

Attribute	Specification	Rate of Change Constraints
While Product Operating		
Temperature	– Up to 1500m (5000ft) +5°C (41°F) to +35°C ¹ (95°F) – 1525m (5000ft) to 3050m (10,000ft) Reduce max temperature (35°C ¹) by 1°C per 305m (1000ft) of altitude above 1525m (5000ft).	Maximum: 10°C/hour (18°F/hour)
Humidity	20% to 80% Non-condensing	Maximum: 10% relative humidity/hour
Altitude	3050m (10,000ft)	
While Product Power Off		
Temperature	+5°C (41°F) to +45°C (113°F)	Maximum: 20°C/hour (36°F/hour)
Humidity	8% to 80% Non-condensing	
Altitude	3050m (10,000ft)	
While Product Packaged for Shipping		
Temperature	-40°C (-40°F) to +60°C (140°F)	Maximum: 20°C/hour (36°F/hour)
Humidity	8% to 80% Non-condensing	
Altitude	12,200m (40,000ft)	
Notes: 1. Certain processor or coprocessor configurations may require more stringent temperature constraints—for example, a maximum ambient temperature of 25°C or 30°C. If this is true for your system, SGI will so notify you.		

Table A-2 lists other key specifications for the server.

Table A-2 Miscellaneous System Specifications

Attribute	Specification
Processors	<ul style="list-style-type: none"> – Single or dual Intel Xeon E5-2600 v3 Series processors – L3 cache varies with CPU. – Supports Dual QuickPath Interconnect up to 9.6GT/s. – Enhanced Intel SpeedStep Technology (EIST) – Supports Intel Virtualization Technology (VT).
Chipset	One Intel C612 chipset
BIOS	<ul style="list-style-type: none"> – 1 x 128 Mbit flash – AMI® BIOS
Memory	<ul style="list-style-type: none"> – 24 x 1.2V DDR4 DIMM sockets supporting up to 768GB RDIMM – 24 x 1.2V DDR4 DIMM sockets supporting up to 1TB LRDIMM – Four-channel memory architecture – DDR4 2133MHz RDIMM memory modules – DDR4 2133MHz LR-DIMM memory modules – Support for ECC RDIMM/LRDIMM memory modules
SATA Controller	Intel chipset-based controller for 10 SATA 6.0 ports (RAID 0, 1, 5, and 10 supported)
Drive Bays	8 hot-swap drive bays to house 8 standard 2.5” drives
PCI Expansion Slots	<ul style="list-style-type: none"> – 8 x PCIe® x16 slots, running at x16 (Gen3/PCIE_1/PCIE_2/PCIE_3/PCIE_4) – 1 x PCIe® x16 slot, running at x8 (Gen3/MEZZ_1/Proprietary slot) – 1 x PCIe® x8 slot, running at x8 (Gen3/MEZZ_2/Proprietary slot)
Onboard Graphics	ASPEED® AST2400, supporting 128MB DDR3 VRAM
USB	Up to four USB 3.0 ports (two on the back panel and two additional ports via the USB brackets connected to the internal USB headers)

Table A-2 Miscellaneous System Specifications **(continued)**

Attribute	Specification
Internal connectors	<ul style="list-style-type: none"> – 1 x 18-pin main power connector – 1 x 14-pin ATX 12V power connector – 2 x 8-pin power connectors – 2 x 4-pin 12V power connectors – 10 x SATA 6Gb/s connectors – 1 x Front panel header – 1 x HDD back plane board header – 1 x SATA SGPIO header – 1 x sSATA SGPIO header – 1 x Front VGA port header – 1 x Serial port header – 1 x USB 3.0 header – 1 x TPM module connector – 1 x RAID KEY header – 1 x IPMB connector
I/O Controller	ASPEED® AST2400 BMC chip
Chassis	2U standard-depth rackmount Dimensions: (WxHxD) 34.29 x 3.4 x 18.98 in. (871 x 86 x 482mm)
Weight	Gross: 75 lbs (34 kg)
System Cooling	Eight 80 x 80 x 38mm 1500-RPM fans
Power Supply	<ul style="list-style-type: none"> – 2 x Hot-pluggable 1U PSU 2000W at 80 plus Platinum level – AC input 100–127V: DC Output 1000W – AC input 200–240V: DC Output 2000W
Regulatory Compliance	<p>Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A</p> <p>Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)</p> <p>Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)</p> <p>California Best Management Practices Regulations for Perchlorate Materials: “This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. Special handling for perchlorate material may apply. See the webpage www.dtsc.ca.gov/hazardouswaste/perchlorate.”</p>

BIOS POST Beep Codes

During Power-On Self-Test (POST) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your service provider for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. [Table B-1](#) and [Table B-2](#) identify the beep codes and the corresponding errors.

Table B-1 PEI Beep Codes

# of Beeps	Description
1	Memory is not installed.
1	Memory was installed twice. InstallPeiMemory routine in PEI core was called twice.
2	Recovery started.
3	DXE IPL was not found.
3	DXE core firmware volume was not found.
4	Recovery failed.
4	S3 Resume failed.
7	Reset PPI is not available.

Table B-2 DXE Beep Codes

# of Beeps	Description
1	Invalid password
4	Some of the architectural protocols are not available.
5	No console output devices are found.
5	No console input devices are found.
6	Flash update failed.
7	Reset protocol is not available.