



SGI® InfiniteStorage™ Server 3104 (ISS3104)
User Guide

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About This Guide

This guide provides an overview of the installation, architecture, general operation, and descriptions of the major components in the SGI® InfiniteStorage™ Server 3104 (ISS3104). 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 the ISS3104 server. It is written with the assumption that the reader has a good working knowledge of computer systems.

Chapter Descriptions

The following topics are covered in this guide:

- Chapter 1, “Introduction”
Provides an overview of the 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 Interface”
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 Error Codes,”](#)
Provides BIOS error code information.

Related Publications

The following SGI documents are relevant to the server:

- *MegaRAID® SAS Software User's Guide*, publication number 860-0488-xxx
- 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

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- If you are outside North America, contact the SGI subsidiary or authorized distributor in your country.

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SGI values your comments and will respond to them promptly.

Introduction

The ISS3104 server is a rackmount server (see [Figure 1-1](#)). It has two main subsystems: a 1U server chassis and a single-processor serverboard.

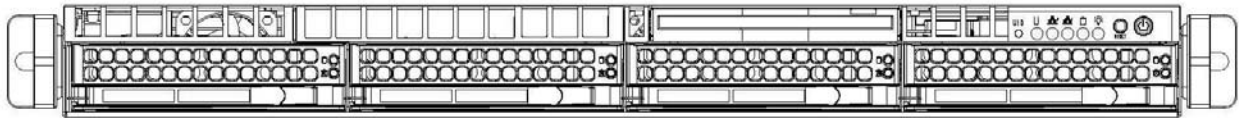


Figure 1-1 The ISS3104 Server

This chapter describes the server using the following topics:

- “[Server Chassis Features](#)” on [page 2](#)
- “[Serverboard Features](#)” on [page 4](#)
- “[Additional Hardware Components](#)” on [page 6](#)

Server Chassis Features

Table 1-1 describes the main features of the ISS3104 server chassis.

Table 1-1 Chassis Features

Feature	Description
System power	The chassis features a redundant 500W 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 drive subsystem	The chassis was designed to support four hot-swap SATA hard drives.
Front control panel	The control panel provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity (two), CPU overheating, fan failure, and power failure. A main power button and system reset button are also included.
Cooling system	The chassis has an innovative cooling design that features five sets of 4-cm counter-rotating fans located in the middle section of the chassis. The chassis fan speed is controlled via the baseboard management controller (BMC). The power supply module also includes a cooling fan.

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

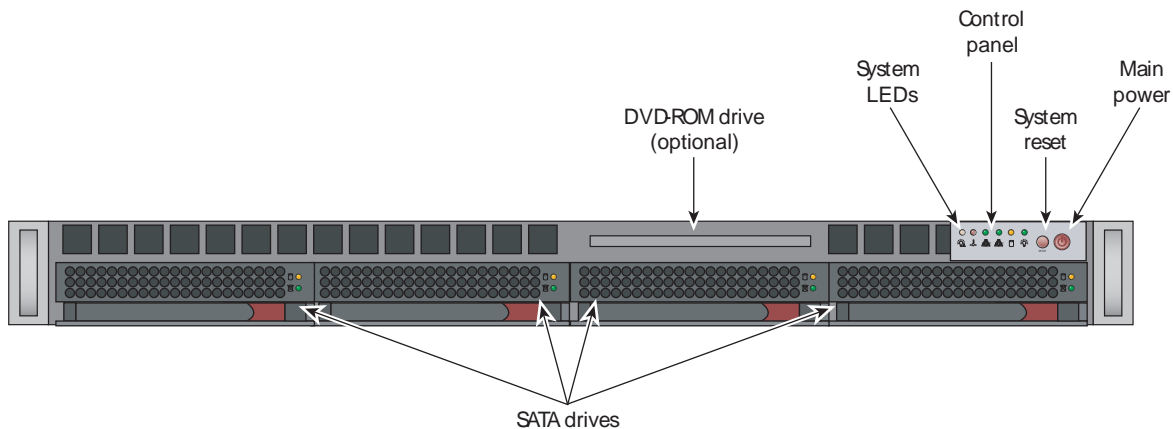


Figure 1-2 Front Chassis View

Figure 1-3 shows the noteworthy components on the rear of the server chassis.

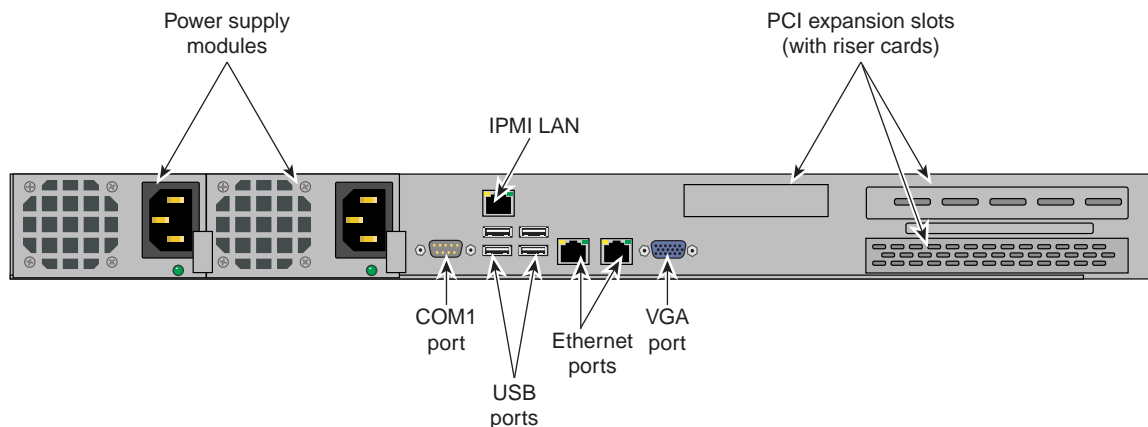


Figure 1-3 Rear Chassis View

Serverboard Features

At the heart of the ISS3104 server is a single-processor serverboard based on the Intel® C600A/D chipset. [Table 1-2](#) describes the major features of the serverboard.

Table 1-2 Serverboard Features

Feature	Description
Processors	The motherboard supports a single Intel Xeon® E5-1600v2 series processor.
Memory	The motherboard has eight DIMM sockets that can support up to 256 GB of DDR3-1600/1333/1066 ECC R/LRDIMMs or up to 64GB of ECC UDIMMs.
SATA	A SATA controller is integrated into the chipset to provide a six-port SATA subsystem, which supports RAID 0, 1, 5, and 10. The SATA drives are hot-swappable units. Two of the ports support SATA 3.0 (6 Gb/s) while the other four are SATA 2.0 (3 Gb/s) ports. Note: You must have RAID configured to enable the hot-swap capability of the SATA drives.
SCU SATA	An additional SCU SATA controller integrated into the chipset provides four SATA 2 ports. RAID 0, 1 and 10 are supported. The SATA drives are hot-swappable units. Note: You must have RAID configured to enable the hot-swap capability of the SATA drives.
Onboard controllers/ports	The color-coded I/O ports include one COM port, a VGA (monitor) port, four USB 2.0 ports, two gigabit Ethernet ports, and an IPMI port. See Figure 1-3 .
Intel Intelligent Power Node Manager (IPNM)	IPNM provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM Specification Version 1.5 is supported by the BMC, your system must also have IPNM-compatible Manageability Engine (ME) firmware installed to use this feature.

[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 1-2](#) for the actual specifications of your serverboard. This block diagram is intended for your reference only.

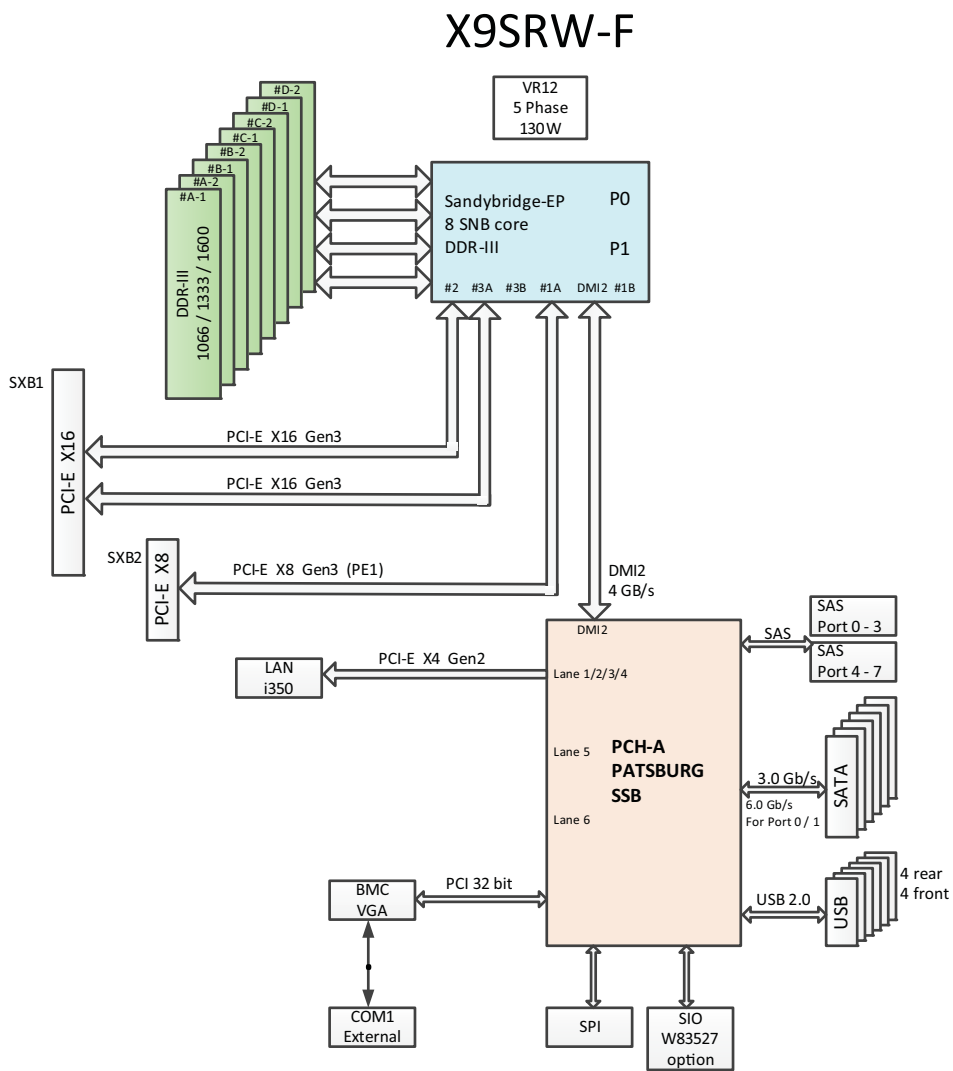


Figure 1-4 Serverboard Block Diagram

Additional Hardware Components

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

- Three 4-cm chassis fans
- One passive CPU heatsink
- Two riser cards
- SATA Accessories
- One hard drive backplane
- Four drive carrier
- One rackmount kit

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 ISS3104 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 the serverboard, 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.
- This product may be connected to an IT power system. In all cases, ensure that the unit is also reliably connected to Earth (grounded).

- 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.

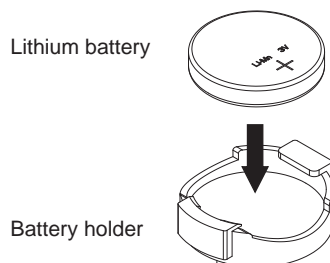


Figure 2-1 Installing the Onboard Battery

General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the ISS3104 system clean and free of clutter.
- Fully loaded, the system weighs approximately 43 lbs (19.5 kg). 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 a person will not step on them accidentally.
- 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.

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 ISS3104 server operational. This chapter assumes your server was shipped with serverboard and most components (like processors and memory) factory-installed.

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 12.

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: Install this product only in a restricted access location (dedicated equipment rooms, service closets, and the like).

- 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.

- Fully loaded, the ISS3104 server weighs about 43lbs (19.5 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).

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).

Installing the System into a Rack

This section provides information on installing the server into a rack. 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.

Identifying the Sections of the Rack Rails

You should have received two rack 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 (see [Figure 3-1](#)). Two pairs of short brackets to be used on the front side of the outer rails are also included.

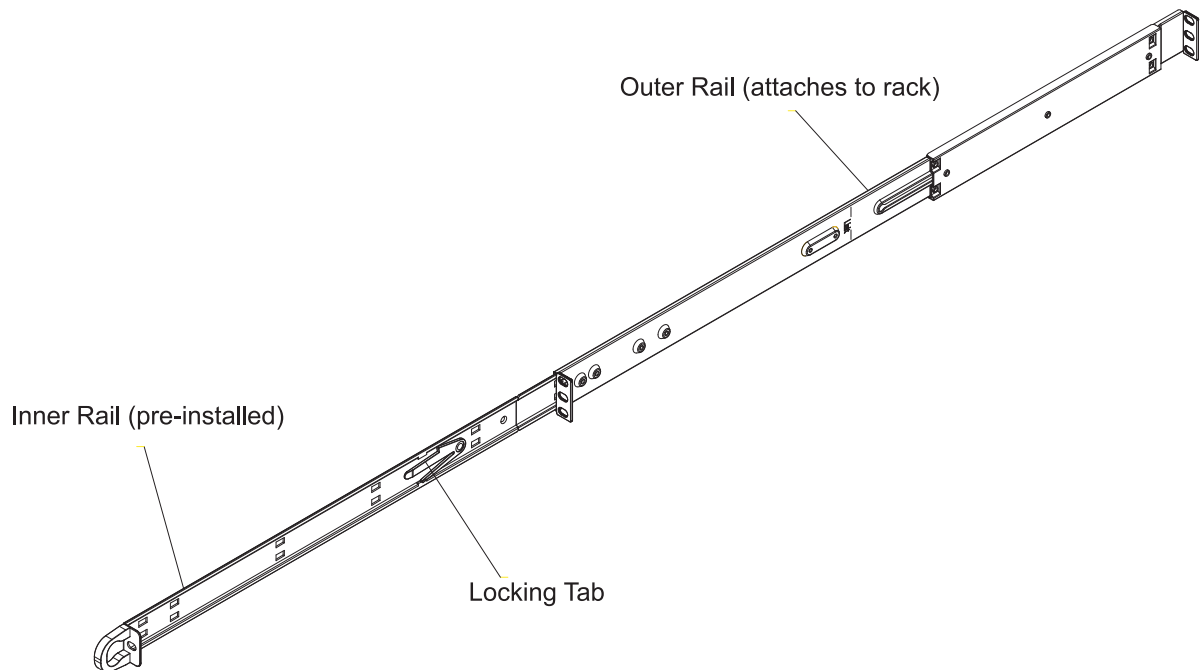


Figure 3-1 Sections of the Rack Rails (right-side rail shown)

Note: Both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Installing the Inner Rails

As shown in [Figure 3-2](#), both the left- and right-side inner rails have been pre-attached to the chassis. Proceed to installing the outer rails.

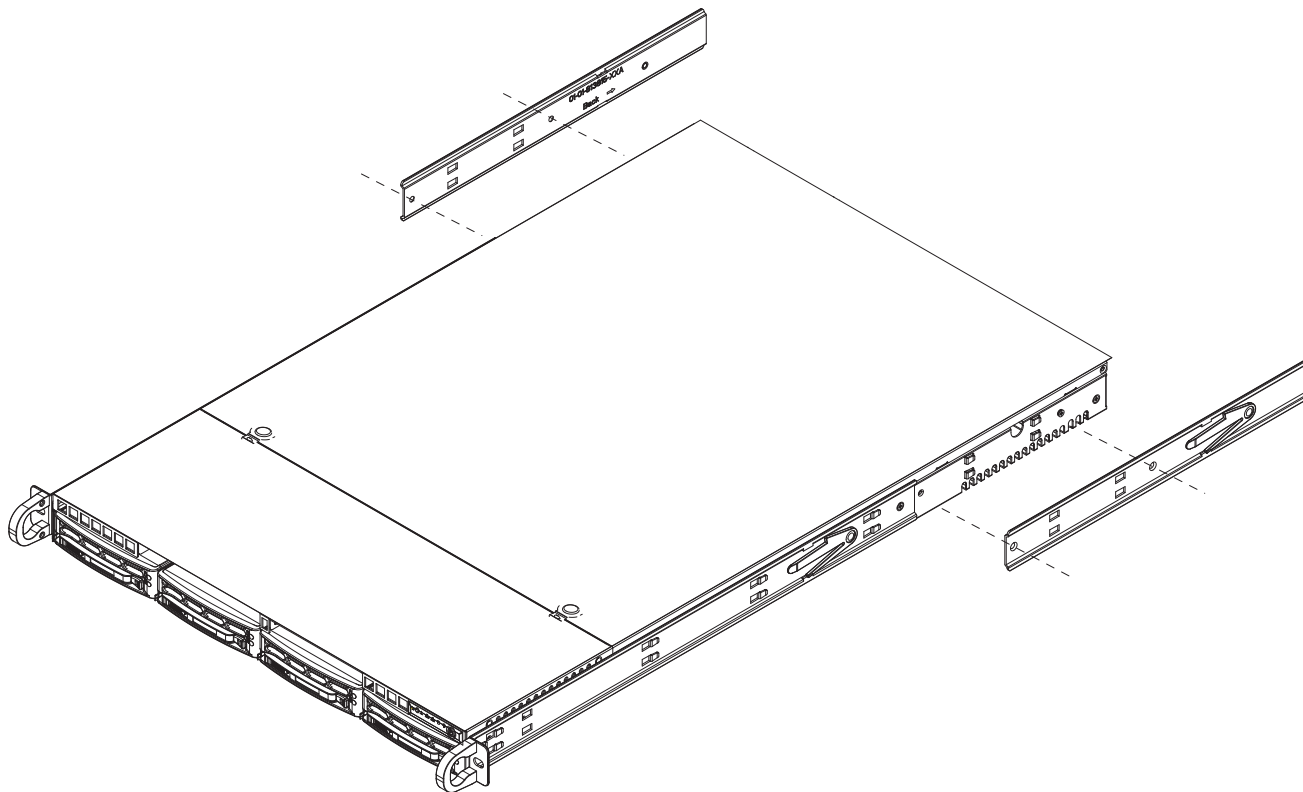


Figure 3-2 Inner Rack Rails

Installing the Outer Rails

Do the following to install the outer rails:

1. Measure the distance from the front rail to the rear rail of the rack.
2. Attach a short bracket to the front side of the right outer rail and a long bracket to the rear side of the right outer rail.
3. Adjust both the short and long brackets to the proper distance so that the rail can fit snugly into the rack.
4. Secure the short bracket to the front side of the outer rail with two screws and the long bracket to the rear side of the outer rail with three screws.
5. Repeat steps 2-4 for the left outer rail.

Installing the Server in a Rack



Warning: Fully loaded, the ISS3104 server weighs about 43 lbs (19.5 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 chassis and the rack unit. The next step is to install the server into the rack. Do the following as shown in [Figure 3-3](#):

1. Align the rear of the chassis rails with the front of the rack rails.
2. Keeping the pressure even on both sides, slide the chassis rails into the rack rails.

You may need to depress the locking tabs when inserting. When the server has been pushed completely into the rack, you should hear the locking tabs click.

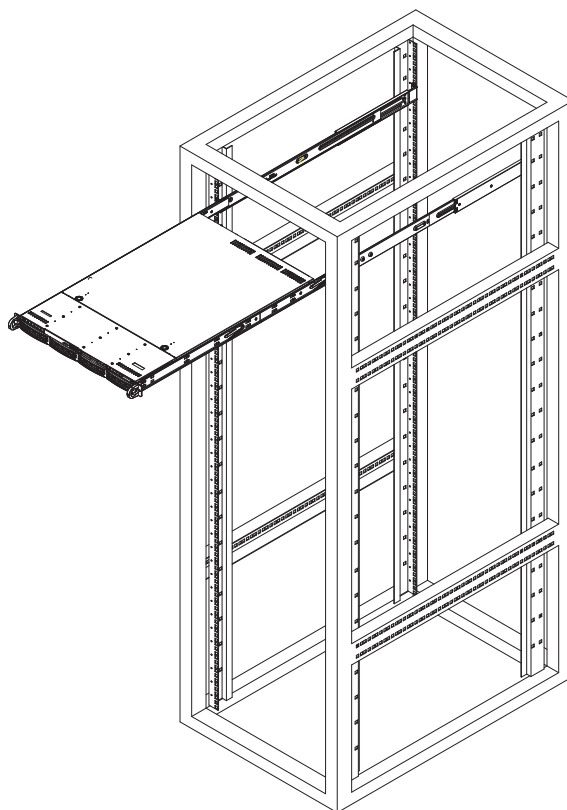


Figure 3-3 Installing the Server in a Rack

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

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.

Installing the Server into a Telco Rack

To install the chassis into a Telco-type rack, use two L-shaped brackets on either side of the chassis (four total). First, determine how far the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

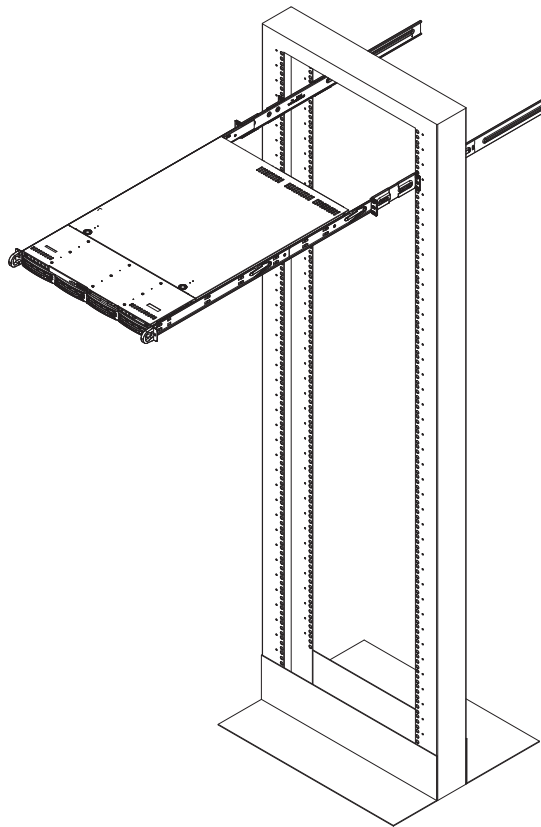


Figure 3-4 Installing the Server into a Telco Rack

System Interface

As shown in [Figure 4-1](#), there are several LEDs on the control panel as well as others on the SATA drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also three buttons on the chassis control panel and an on/off switch on the power supply. This chapter describes the buttons, LED indicators, and any corrective action you may need to take.



Figure 4-1 Control Panel

Control Panel Buttons

There are three push buttons located on the front of the chassis: a reset button, a UID button, and a power on/off button.

UID Button

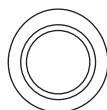


Figure 4-2 UID Button

Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations. The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function.

Reset Button

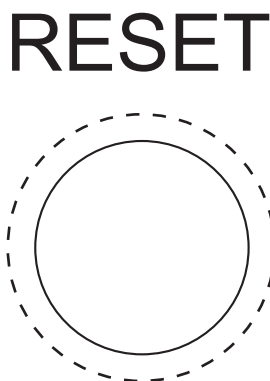


Figure 4-3 Reset Button

Use the reset button to reboot the system.

Power Button

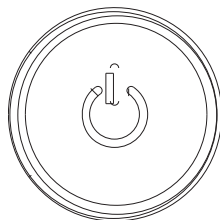


Figure 4-4 Power Button

The main power button is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

Control Panel LEDs

The control panel on the front of the chassis has five LEDs:

- Universal Information LED
- NIC2 LED
- NIC1 LED
- HDD LED
- Power LED

These LEDs provide you with critical information related to different parts of the system. This section describes what each LED indicates when illuminated and any corrective action you may need to take.

Universal Information LED



Figure 4-5 UID LED

You can activate the UID LED by depressing the UID button or via IPMI. You must deactivate the UID LED in the same manner as it was activated. [Table 4-1](#) describes the various states of the LED and corrective actions where appropriate.

Table 4-1 UID LED States

LED State	Description	Corrective Action
Red, fast blinks (1x/sec.)	Fan failure	You might need to replace a fan.
Red, slow blinks (1x/4 sec.)	Power failure	Check your power sources.
Red, solid	CPU overheat	<ul style="list-style-type: none"> – Check for cables obstructing the airflow in the system. – Ensure the ambient room temperature is not too high. – Ensure all fans are present and operating normally. – Ensure that the chassis covers are installed. – Ensure heatsinks are installed properly.
Blue, solid	Unit identification (UID button depressed)	
Blue, blinking	Unit identification (LED IPMI-activated)	

NIC1/2 LED



Figure 4-6 NIC1/2 LED

Indicates network activity on LAN1/2 when flashing.

HDD LED



Figure 4-7 HDD LED

This light indicates SATA and/or DVD-ROM drive activity when flashing.

Power LED



Figure 4-8 Power LED

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

Drive Carrier LEDs

The server chassis uses SATA drives. Each SATA drive carrier has two LEDs. [Table 4-2](#) describes the functions of the two LEDs.

Table 4-2 Drive Carrier LEDs

LED	Description
Green	When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.
Red	An illuminated red LED indicates a SATA drive failure. If one of the SATA drives fails, you should be notified by your system management software.

Refer to [“Installing and Removing Hard Disk Drives”](#) on page 32 for instructions on replacing failed drives.

Chassis Maintenance

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

- Disk drives
- Fans
- Power supplies

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 29
- “Replacing a Power Supply” on page 30
- “Installing and Removing Hard Disk Drives” on page 32
- “Installing/Removing DVD-ROM” on page 35
- “Replacing System Fans” on page 36

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

For some maintenance tasks, you will need to remove the chassis cover. To do so, use the following procedure.

1. Grasp the two handles on the sides of the server and pull the unit straight out until it locks.
When it locks, you will hear a click.
2. Depress the two buttons on the top of the chassis to release the top cover and, at the same time, push the cover away from you until it stops.
3. Lift the top cover from the chassis to gain full access to the inside of the server.

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.

Replacing a Power Supply

The chassis has a 500-Watt redundant power supply configuration consisting of two hot-swap power modules. The power supply modules have an auto-switching capability, which enables them to automatically sense and operate with a 100V–240V input voltage.

Power Supply Failure

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The Universal Information LED on the control panel will blink slowly and remain so until the failed module has been replaced (see “[Universal Information LED](#)” on page 24). The power supply modules have a hot-swap capability—that is, you can replace the failed module without powering down the system. Replace a failed module with the same model.

Replacement Procedure

Use the following steps to replace a power supply module:

1. Unplug the power cord from the failed power supply module.
2. To remove the failed power module, push the release tab (on the back of the power supply) to the side and then pull the module straight out (see [Figure 5-1](#)).

The power supply wiring was designed to detach automatically when the module is pulled from the chassis.

3. Replace the failed power module with an identical module.
4. Push the new power supply module into the power bay until you hear a click.
5. Plug the AC power cord back into the new power module.

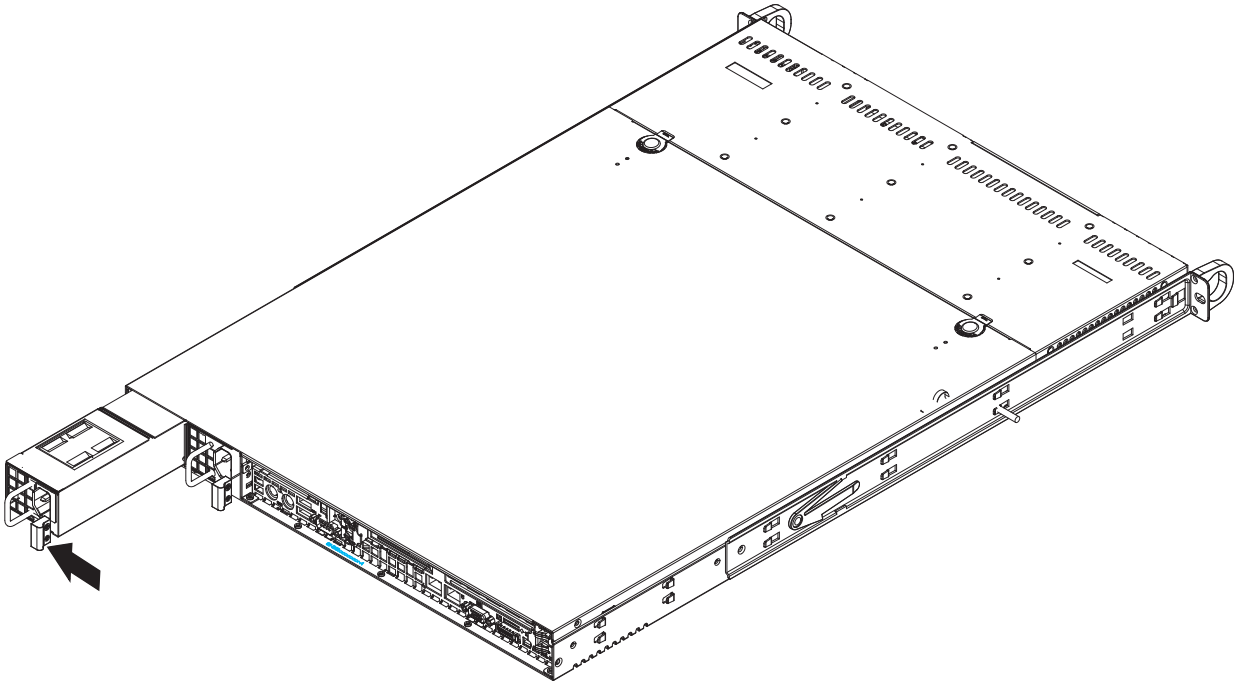


Figure 5-1 Replacing a Power Supply Module

Installing and Removing Hard Disk Drives

Because of the hot-swap capability of the SATA drives, you do not need to access the inside of the chassis or power down the system to install or replace the drives. The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays. For this reason, even empty carriers without drives installed must remain in the chassis.

Mounting a Hard Drive in a Drive Carrier

Use the following procedure to mount a hard drive in a carrier:

1. Place the hard drive carrier on a flat, stable surface such as a desk, table, or workbench.
2. Insert a drive into the carrier with the printed circuit board side facing down, as shown in [Figure 5-2](#).
3. Align the mounting holes of the hard drive with those of the carrier and ensure that the bottom of the hard drive is flush with that of the carrier.
4. Secure the drive to the carrier with four screws, as shown in [Figure 5-2](#).

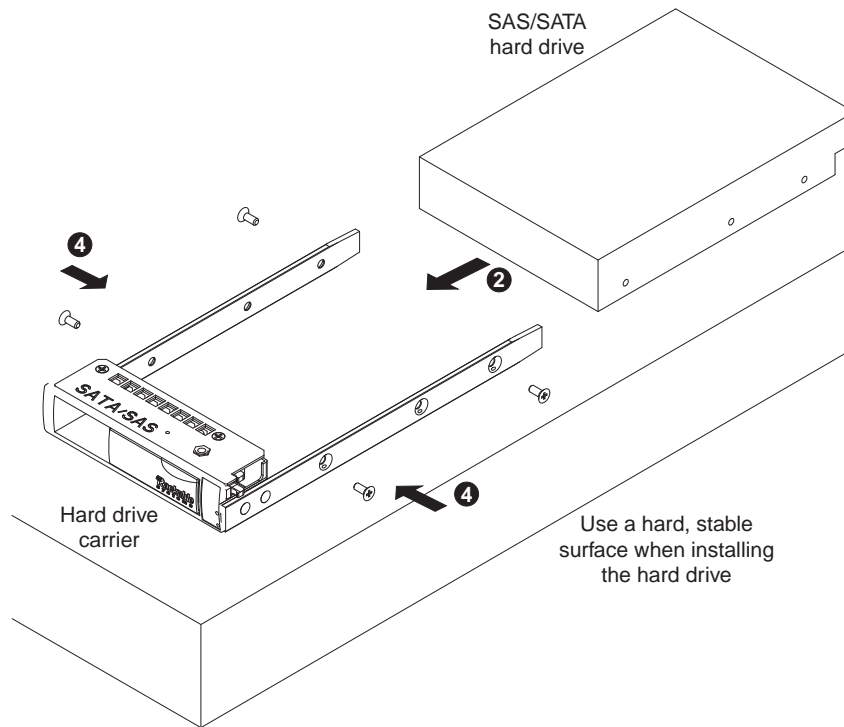


Figure 5-2 Mounting a Hard Drive in a Carrier

Caution: Use caution when working around the SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

Installing/Removing a Hard Drive

1. To remove a carrier, push the release button located beside the drive LEDs.
2. Swing the colored handle fully out and use it to pull the unit straight out.

See [Figure 5-3](#).

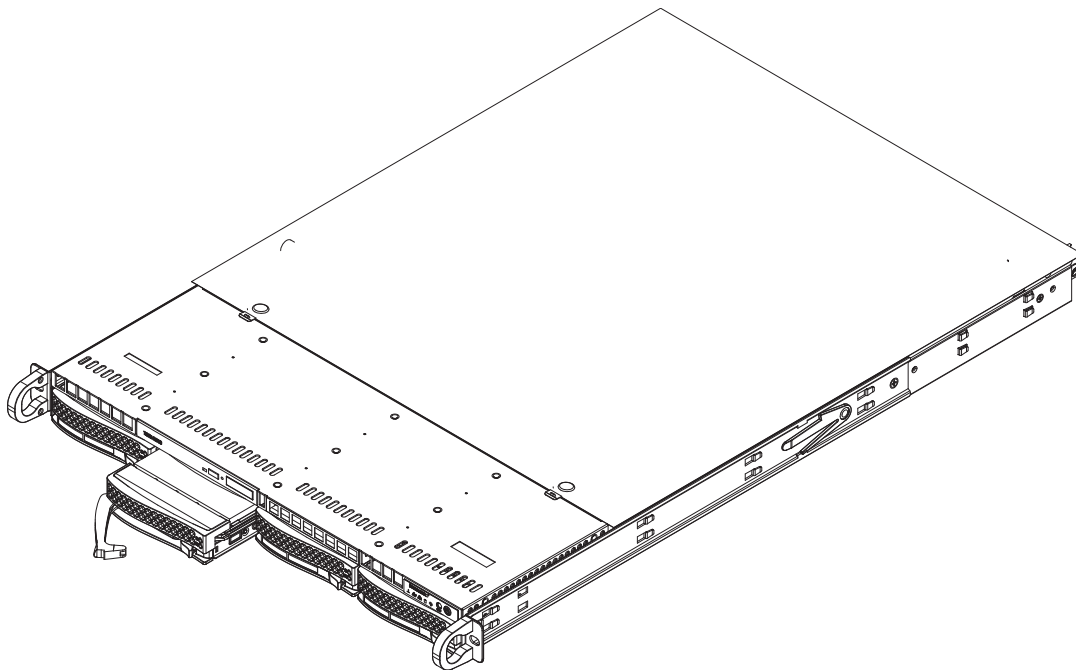


Figure 5-3 Removing a Hard Drive

Notes:

- Your operating system must have RAID support to enable the hot-swap capability of the hard drives.
- Regardless of how many hard drives are installed, all drive carriers must remain in the drive bays to maintain proper airflow.

Installing/Removing DVD-ROM

The top cover of the chassis must be opened to gain full access to the DVD-ROM drive bay. The chassis supports only slim-line DVD-ROM drives and side-mounting brackets are needed to mount a slim-line DVD-ROM drive.

To remove a DVD-ROM, use the following procedure:

1. Power down the system.
2. Remove the chassis cover.
See [“Removing the Chassis Cover” on page 29](#).
3. Unplug the power and data cables from the drive you want to remove.
4. Locate the locking tab at the rear of the drive.

It will be on the left side of the drive when viewed from the front of the chassis.

5. Pull the tab away from the drive and push the drive unit out of the front of the chassis.

To add a new drive, follow this procedure in reverse order. You may hear a faint click of the locking tab when the drive is fully inserted.

Replacing System Fans

As shown in [Figure 5-4](#), 4-cm heavy-duty, counter-rotating fans provide the cooling for the server. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. It is very important that the chassis top cover is properly installed and makes a good seal in order for the cooling air to circulate properly through the chassis and cool the components.

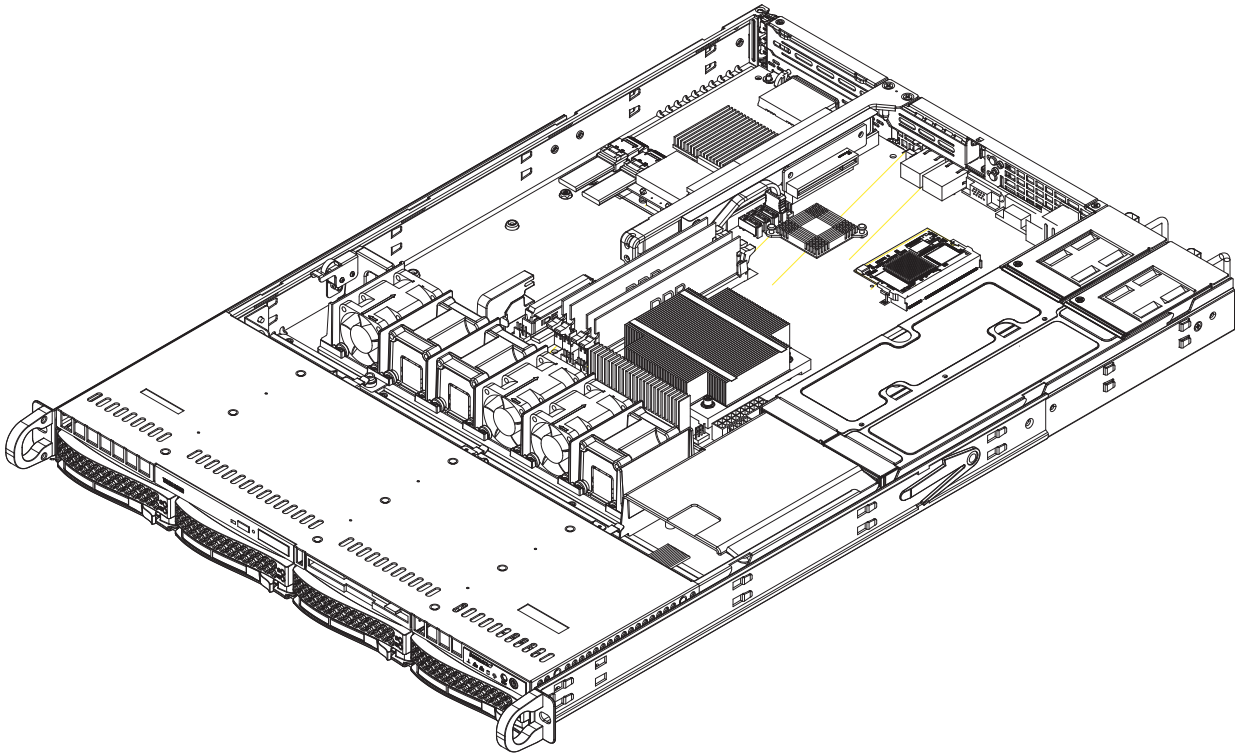


Figure 5-4 System Fans

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fan will ramp up to full speed and the Universal Information LED on the control panel will so indicate (see “[Universal Information LED](#)” on page 24). Replace any failed fan at your earliest convenience with the same type and model. The system can continue to run with a failed fan.

Replacement Procedure

Use the following procedure to replace a fan:

1. Remove the top chassis cover while the system is still running to determine which of the fans has failed.
2. Power down the system.
Removing the power cords is also recommended as a safety precaution.
3. Unplug the fan cable from the motherboard and remove the failed blower fan from the chassis.
4. Replace the failed fan with an identical 4-cm, 12-volt fan.
5. Push the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
6. Reposition the fan housing back over the two mounting posts in the chassis.
7. Reconnect the fan wires to the chassis fan headers from which you removed them.
8. Power up the system and check that the fan is working properly.
The Universal Information LED on the control panel should no longer indicate a fan failure.
9. Replace the chassis cover.

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 40
- “System Powers Up But Will Not Boot” on page 40
- “No Video After System Power Up” on page 41
- “Memory Errors” on page 41

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 30.

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 DDR3 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.

Technical Specifications

Table A-1 lists allowable ranges for temperature, humidity, and altitude for the ISS3104 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 (95°F) – 1525m (5000ft) to 3050m (10,000ft) Reduce max temperature (35°C) 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)	

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

Table A-2 Miscellaneous System Specifications

Attribute	Specification
Processors	Single Intel Xeon E5-1600v2 series processor
Chipset	Intel C600-A/D chipset
BIOS	8 Mb Award® SPI Flash ROM
Memory Capacity	Eight (8) DIMM slots supporting up to 256 GB of DDR3-1600/1333/1066 ECC R/LRDIMMs or up to 64 GB of ECC UDIMMs
SATA	Intel on-chip controllers support 10 SATA ports (two SATA 3.0 ports and 8 SATA 2.0 ports). RAID 0, 1, 5, and 10 are supported.
Drive Bays	Four hot-swap drive bays to house four SATA drives
Serverboard	WIO form factor Dimensions: 8.15 x 13.05 in. (207 x 331 mm)
Chassis	1U standard-depth rackmount Dimensions: (WxHxD) 17 x 1.7 x 25.6 in. (432 x 43 x 650 mm)
Weight	Gross: 43 lbs (19.5 kg)
System Cooling	Five 4-cm heavy-duty counter-rotating fans
System Input Requirements	AC Input Voltage: 100–240V AC auto-range Rated Input Current: 6.1A–2.6A Rated Input Frequency: 50–60 Hz

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

Attribute	Specification
Power Supply	Rated Output Power: 500W Rated Output Voltages: +12V (41.7A), +5Vsb (4A)
Regulatory Compliance	Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A 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) Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe) 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 .”

BIOS Error 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 system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

Table B-1 BIOS Error Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. Ready to power up.
5 short beeps + 1 long beep	Memory error	No memory detected in the system
5 long + 2 short beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep with the front panel OH LED on	System Overheat	System overheat

