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SGI® Rackable™ C1103-G15
System User Guide

Record of Revision

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Contents

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Introduction and Overview

This chapter provides an overview of your server's main features.

Operating precautions are provided in this chapter, followed by a general overview of the product.

Before operating your system, familiarize yourself with the safety information that follows:

ESD and Safety Precautions

Caution: Observe all ESD precautions. Failure to do so can result in damage to the equipment.

Wear an SGI approved wrist strap when you handle an ESD-sensitive device to eliminate possible ESD damage to equipment. Connect the wrist strap cord directly to earth ground.

Warning: Before operating or servicing any part of this product, read the safety precautions.

Danger: Keep fingers and conductive tools away from high-voltage areas. Failure to follow these precautions will result in serious injury or death. The high-voltage areas of the system are indicated with high-voltage warning labels.

Caution: Power off the system only after the system software has been shut down in an orderly manner. If you power off the system before you halt the operating system, data may be corrupted.

Warning: If a lithium battery is installed in your system as a soldered part, only qualified SGI service personnel should replace this lithium battery. For a battery of another type, replace it only with the same type or an equivalent type recommended by the battery manufacturer, or an explosion could occur. Discard used batteries according to the manufacturer's instructions.

System Overview

The SGI Rackable C1103-G15 system is a GPU-optimized server comprised of two main subsystems: the 1U chassis and a serverboard. Check with your sales or service representative before loading any operating system on your server not provided by the SGI factory or service organization.

Various hardware components may be included as part of your SGI Rackable C1103-G15 system configuration as listed below:

- Serverboard with:
    - Two AMD Opteron 6000 series processor sockets
    - Sixteen DDR3 memory DIMM slots
    - Two Gen2 x16 PCIe slots (one full-depth and one half-depth)
    - One low-profile (5.9-inch depth) Gen2 x8 PCIe slot (with x16 physical connector)
- Available riser cards include:
    - One RSC-R1U-E16R-O-P riser card PCIE x8 (with x16 connector), center
    - One RSC-R1UG-E16-O-P riser card 1-PCIE x16 left GPU bay
    - Note that the right-bay GPU attaches directly to the serverboard (motherboard)
- Three drive bays for 3.5" SATA disk drives (SAS RAID card optional)
- Two power cables for GPU cards
- Four 4-cm counter-rotating cooling fans for the serverboard
- Four 4-cm counter-rotating cooling fans for the GPU bays (two fans on each side of chassis)
- One 1400 watt auto-ranging power supply
- Two GPUs (several types of GPUs are supported)

Serverboard Features

The SGI Rackable C1103-G15 system has a dual processor serverboard based on the SR5690/SP5100 I/O chipset. The following subsections describe the main features of the serverboard. See Figure 1-1 on page 5 for a functional block diagram of the serverboard.

Processors

Each serverboard supports two AMD Opteron 6100/6200 series processors. Each processor sits in a 1944-pin "G34" socket and is interconnected via HyperTransport (HT) 3.0 link support, see the next subsection for more information on the HT interconnects. The exact type of processors provided with your system depends on the specific configuration you ordered. Check with your sales or service representative for information on processor upgrades.

Important: 135-Watt (6282) processors are **not** supported in the Rackable C1103-G15 servers.

HyperTransport Interconnect

The HT link is a packet-based link implemented on two unidirectional sets of signals. The link is nominally point-to-point, and connects exactly two devices. Devices can have multiple HT links to allow the construction of larger HT fabrics. The HT link consists of a point-to-point x16 link (16 bits) that supports speeds of 3.2 GT/s to 6.4 GT/s per link in each direction. The HT links are designed to deliver scalable, high-performance interconnects between CPUs and CPU to I/O ASIC devices.

Memory

The SGI Rackable C1103-G15 system has 16 DIMM slots that support registered ECC DDR3-1600/1333/1066/800 SDRAM. Memory DIMMs of the same size and speed are highly recommended for best overall system performance. See "Installing System DIMM Memory" in Chapter 4, for more details on installing memory into the system.

Serial ATA/SAS

A Serial ATA controller (AMD SP5100) is integrated into the system serverboard to provide a SATA subsystem with transfer rates up to 3 Gb/second. The optionally hot-swappable SATA drives are connected to a backplane that provides power, bus termination and configuration

settings. Optional SAS or SATA RAID 0, and 1 are supported, note that RAID functionality is required for hot-swap capability.

Note: Your operating system must support RAID functionality in order to use RAID drives.

Contact your sales or service provider to order a specific RAID upgrade if your system was not ordered with that option.

PCI Expansion Slots

The serverboard has two PCI-Express 2.0 x16 slots and one PCI-Express 2.0 x8 slot (with x16 connector).

On-board Controllers/Ports

The color-coded I/O ports include one COM port (an additional COM header is located on the serverboard), a VGA (monitor) port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two Gigabit Ethernet ports.

IPMI

The IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for the SGI Rackable C1103-G15 system. IPMI allows server administrators to view a server's hardware status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive.

Other Features

Other on-board features that promote system health include voltage monitors, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.
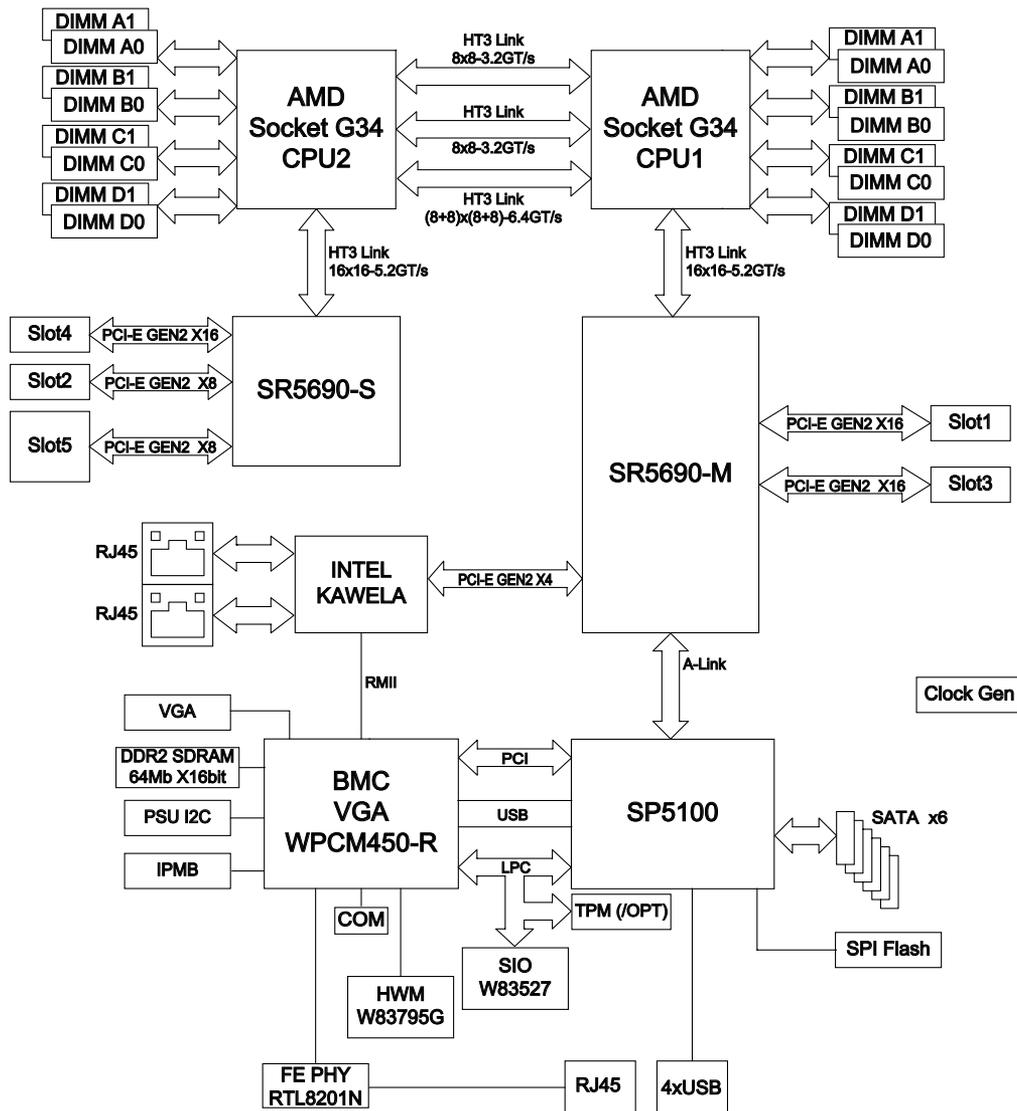
Figure 1-1   Functional Block Diagram of SGI Rackable C1103-G15 System Server Board

BMC Features

The baseboard management controller (BMC) has the following features:

- The platform management subsystem uses the BMC to communicate with buses, sensors, system BIOS, and server management firmware via the Server Management Bus (SMBUS)

- Enables serial-over-LAN (SOL) functionality via serial port B only

- Supports serial-console redirection in BIOS

- The BMC LAN is configured by using the DOS `xgicfg.exe` command or BIOS to assign a static IP address and netmask.

- The ipmitool command is used to communicate with the BMC via an SOL session or by using the web-based BMC interface.

PCI Sub-system

The primary I/O bus for the severboard is PCI Express.

Server Chassis Features

The following sections provide a general outline of the main features of the 1U system chassis.

Figure 1-2 shows the rear panel of the SGI Rackable C1103-G15 system.
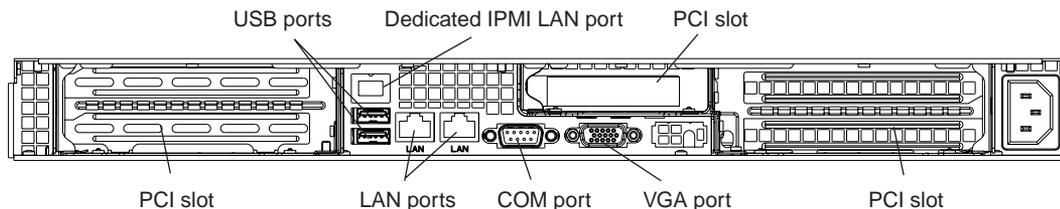
Figure 1-2   SGI Rackable C1103-G15 System Rear Panel and I/O Ports

System Power

Your SGI Rackable C1103-G15 system uses a single high-efficiency 1400W cold-swap power supply. The AC power supply cord should be removed from the system before servicing or replacing the power supply.

Disk Drive Subsystem

The SGI Rackable C1103-G15 system chassis includes three 3.5" drive bays, which may be used optionally to house hot-swappable SATA drives. RAID 0, and 1 are supported. An optional SAS card is also supported.

Control Panel

The SGI Rackable C1103-G15 system control panel provides a system monitoring and control interface. LEDs indicate system power, HDD activity, network activity, system overheat, UID and power supply failure. A main power button and a system reset button are also included.

Cooling System

The server chassis has an innovative cooling design that includes four 4-cm counter-rotating pulse width modulated (PWM) fans located in the middle section of the chassis. Two additional fans are included to cool each GPU in the SGI Rackable C1103-G15 system. The power supply module also includes a cooling fan. All chassis and power supply fans operate continuously. An air shroud channels the airflow from the system fans to efficiently cool the processors and memory.

GPU Subsystem

The SGI Rackable C1103-G15 system is a massively parallel processing dual-GPU server with two NVIDIA Tesla GPUs with multiple x16 non-blocking native Gen2 PCI-Express connectivity.

System Operation

This chapter describes the basic steps needed to get your SGI Rackable C1103-G15 system up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time.

Unpacking the System and Choosing an Operating Location

You should inspect the box the system was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

When you decide on a suitable location for the rack unit that will hold the system, it should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

Preparing for Setup

The box the system was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

Leave enough clearance in front of the rack to enable you to open the front door completely; approximately 25 inches (63.5 cm) should be sufficient.

Leave approximately 30 inches (76.2 cm) of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

This product is for installation 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 the German Ordinance for Work with Visual Display Units.

Rack Precautions

Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.

In single rack installation, stabilizers should be attached to the rack.

In multiple rack installations, the racks should be coupled together.

Always make sure the rack is stable before extending a component from the rack.

You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Server Precautions

Review the electrical and general safety precautions in Chapter 1.

Determine the placement of each component in the rack before you install the rails.

Install the heaviest server components on the bottom of the rack first, and then work up.

For extra protection, use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure. This is an optional device not provided by SGI with your system.

Allow the hot plug disk drives and power supply modules to cool before touching them. Always keep the server closed when not servicing to maintain proper cooling.

Make sure all power and data cables are properly connected and not blocking the chassis airflow.

Rack Mounting Considerations

Use the guidelines in the following subsections to properly install, use and maintain a server in a rack.

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 (Tmra).

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 (i.e. the use of power strips, etc.).

Installing the System into a Rack

This section provides information on installing the SGI Rackable C1103-G15 system into a rack unit with the rack rails provided. If the system has already been mounted into a rack, you can skip ahead to the next section.

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 2-1). Two pairs of short brackets to be used on the front side of the outer rails are also included.

Outer rail (attaches to rack)

Inner rail (pre-installed)

Locking tab
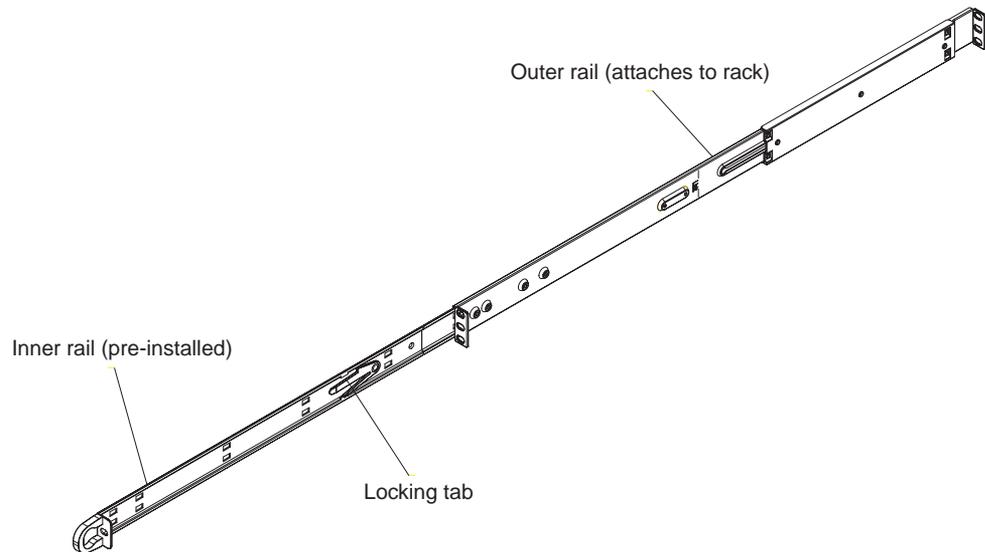
Figure 2-1   SGI Rackable C1103-G15 System Rack Rail Example

Installing the Inner Rails

Both the left and right side inner rails have been pre-attached to the chassis. Proceed to the next step.

Installing the Outer Rails

Begin by measuring the distance from the front rail to the rear rail of the rack. 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. Adjust both the short and long brackets to the proper distance so that the rail can fit snugly into the rack. Secure the short bracket to the front side of the outer rail with two M4 screws and the long bracket to the rear side of the outer rail with three M4 screws. Repeat these steps for the left outer rail.
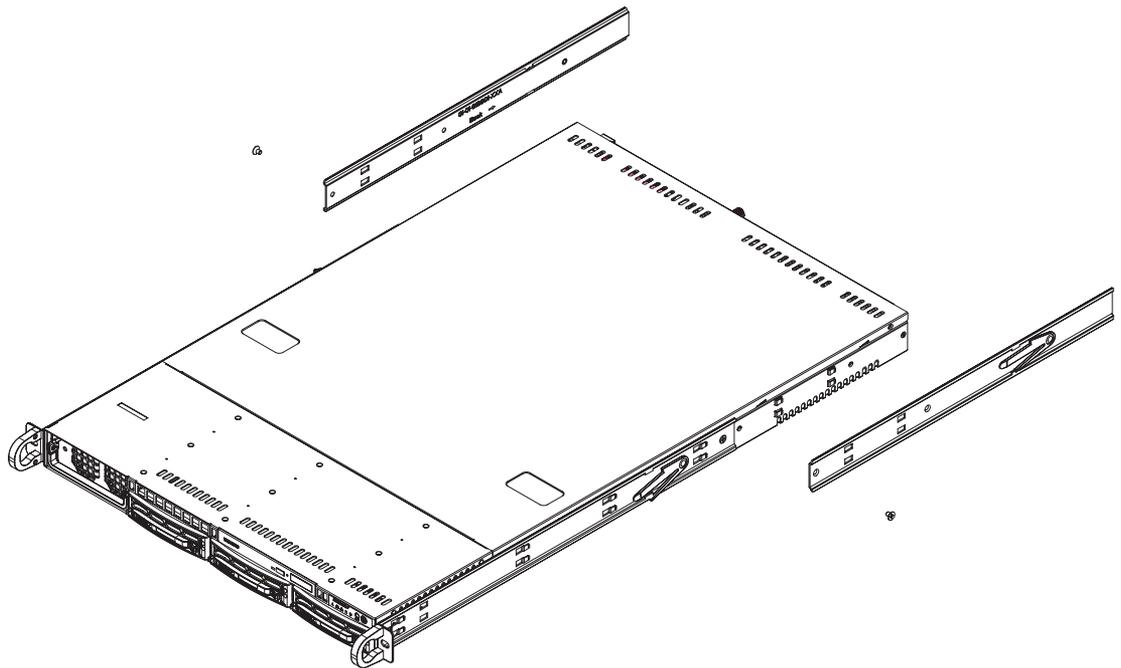
Figure 2-2   Chassis Attachment to Rack Rails

Locking Tabs

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 Server into the Rack

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 this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting the unit). See Figure 2-3 on page 15 for an example. When the server has been pushed completely into the rack, you should hear the locking tabs "click".

Installing the Server into a Telco Rack

To install the server 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 rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.
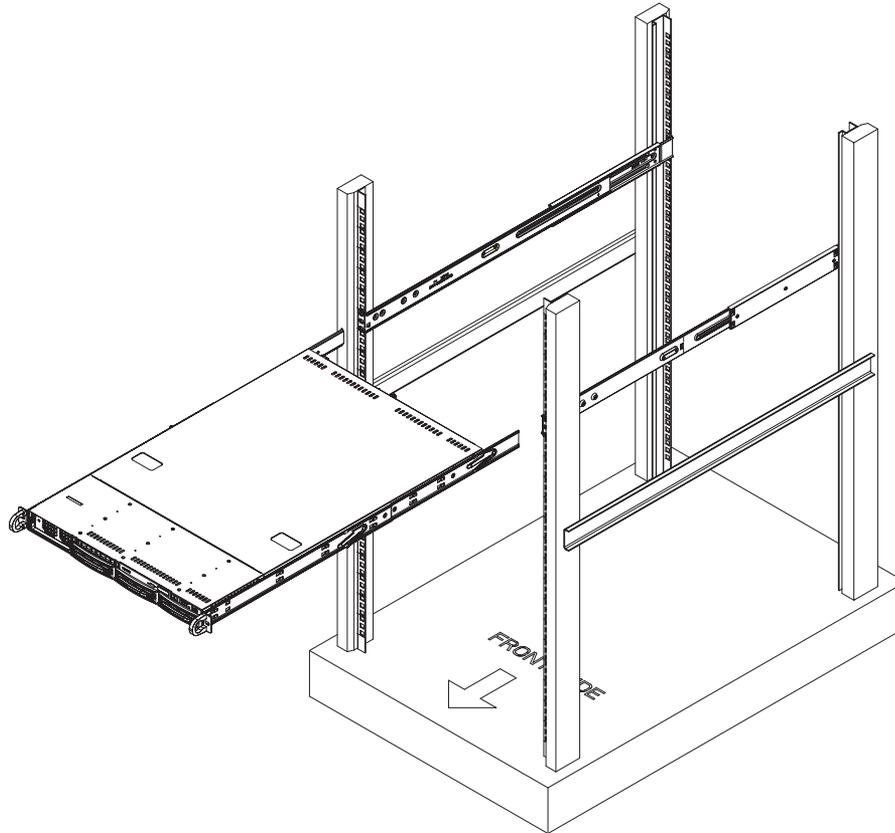
Figure 2-3 Sliding the System into a Rack

Server Access After Rack Installation

After you install the unit in the rack, you may need to open the top cover to make sure the serverboard is properly installed and all the connections have been made.

Grasp the two handles on either side and pull the system straight out until it locks (you should hear a "click").

Remove the four screws (two on the sides and two on the top) that secure the top cover to the chassis. Place your thumbs in the two rectangular recesses and push the cover away from you

(toward the rear of the chassis) until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server (see Figure 2-4).

To remove the system completely from the rack, depress the locking tabs in 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.

Checking the Components and Setup Before Power On

If any internal modifications have been made to the server prior to installation in the rack, you may wish to recheck the server's interior.

You should have one or two processors already installed on the serverboard. Each processor needs its own heatsink.

Your server comes with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, see "Installing System DIMM Memory" on page 23.

Make sure all power and data cables are properly connected and not blocking the chassis airflow.

Checking the Hard Disk Drives

The system disk drives are accessible from the front of the server and can be installed and removed from the front of the chassis without removing the top chassis cover.

Depending upon your system's configuration, your system will have one or more drives already installed.

Checking the Airflow

Airflow through the server is provided by an air shroud and four 4-cm counter-rotating cooling fans for the node board and four 4-cm counter-rotating cooling fans for the GPU bays (two fans on each side of chassis). The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

Note that all power and data cables should be routed in such a way that they do not block the airflow generated by the fans.

Providing Power

Plug the power cord from the server power supply unit into a rack power distibution unit (PDU) or high-quality power strip that offers protection from electrical noise and power surges.

For higher availability it is recommended that you use an optional uninterruptible power supply (UPS) with the server.

Note: The Overheat/Fan fail LED is a bi-color (Red/Blue) that can indicate unit identification (UID) when activated by an IPMI tool command.
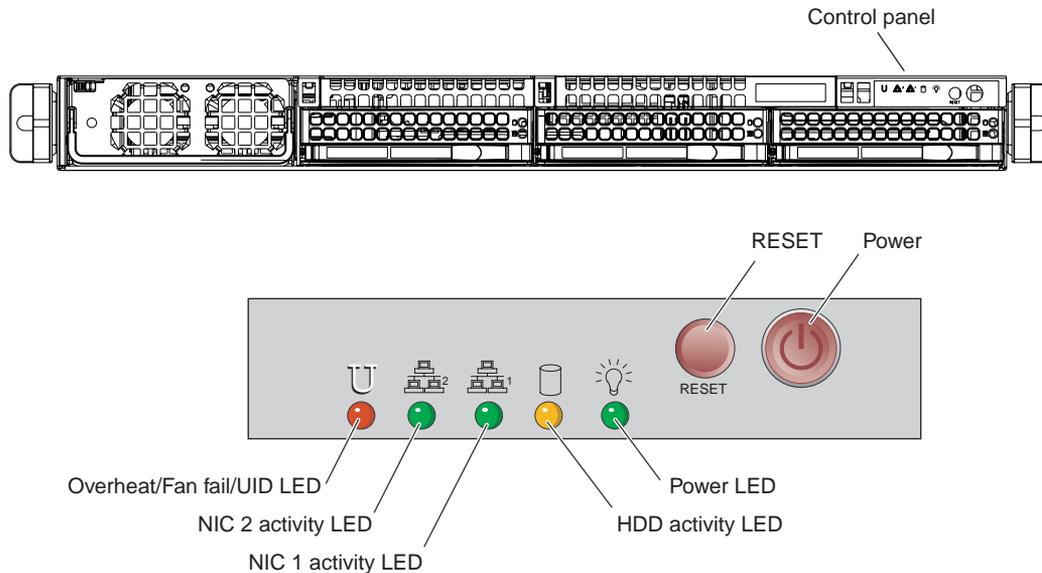
Figure 2-4   Serverboard Front Control Panel Example

System Interfaces Overview

This chapter provides an overview of the standard and optional interfaces available on your SGI Rackable C1103-G15 system. The major components of the system are described and illustrated.

System Interface Overview

There are several LEDs on the two control panels as well as others on the disk 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 two buttons on each control panel. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

Control Panel Buttons

There are two push-buttons located on the control panel: a reset button and a power on/off button.

- **Reset** - Pressing the reset button will reboot the system.

- **Power** - This is the main power button, which is used to apply or turn off the main system power supply. Depressing this button removes the main power but keeps standby power supplied to the serverboard, see Figure 3-1 on page 20.

Control Panel LEDs

The control panel located on the front of the server chassis has five LEDs. Each LED provides you with critical information related to the serverboard. This section explains what each LED indicates when illuminated and any corrective action you may need to take.
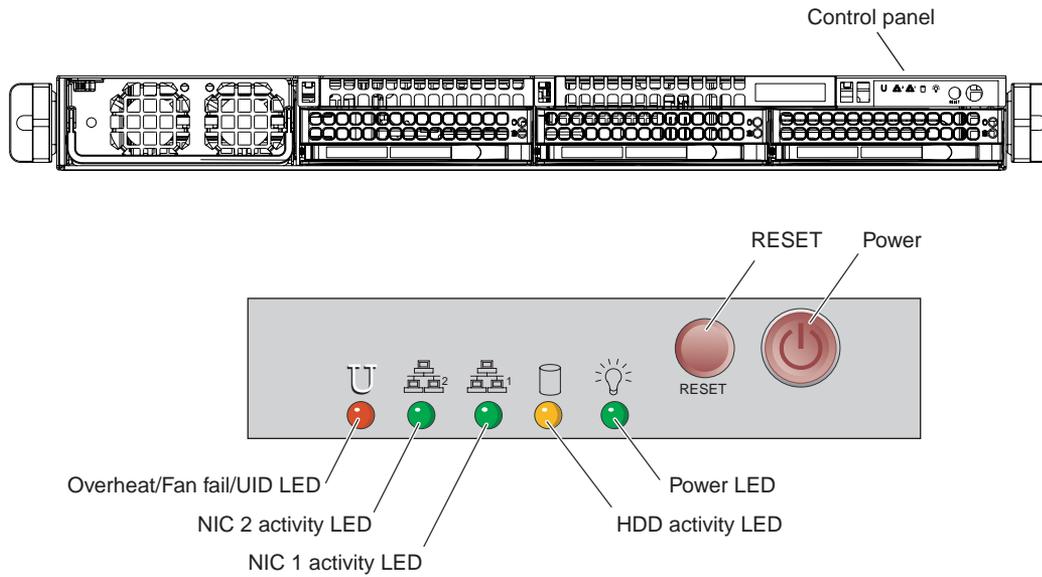
Figure 3-1   Serverboard Control Panel Example

Universal Information LED

When this LED blinks red quickly, it indicates a fan failure. This LED will be blue when used for Unit Identifier (UID). When on continuously it indicates an overheat condition, see Table 3-1.

Table 3-1   Universal Information LED States

State	Indication
Fast blinking red (1x/sec)	Fan fail
Solid red	CPU overheat
Solid blue	Local UID button depressed
Blinking blue	IPMI-activated UID

> **Note:** Deactivating the UID LED must be performed in the same way it was activated. If the UID LED was activated via IPMI, you can only turn the LED off via IPMI and not with the UID button.

A solid red condition may be caused by improperly routed cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed properly. Finally, verify that the heatsinks are installed properly. This LED will remain flashing or on as long as the indicated condition exists.

> **Note:** The Overheat/Fan fail /Unit ID LED is a bi-color (Red/Blue) that can indicate unit identification (UID) when activated by an IPMI tool command, or manually by a switch on the rear of the chassis.

NICs 1 and 2

- **NIC1** - Indicates network activity on LAN1 when flashing.
- **NIC2** - Indicates network activity on LAN2 when flashing.

HDD

Channel activity for the serial ATA hard disk drive. This light indicates disk drive activity on the server when flashing.

Power

The LED indicates power is being supplied to the system's power supply unit. This LED should normally be illuminated when the system is operating.

Disk Drive Carrier LEDs

Each disk drive carrier has two LEDs.

- **Green:** Each drive carrier has a green LED. When illuminated, this green LED (on the front of the drive carrier) indicates drive activity. A connection to the drive backplane enables this LED to blink on and off when that particular drive is being accessed. Please refer to Chapter 4 for instructions on replacing failed hard drives.

- **Red:** The red LED to indicate a disk drive failure. If one of the drives fails, you should be notified by your system management software. Please refer to Chapter 4 for instructions on replacing failed internal disk drives.

Internal Component Replacement and Upgrades

This chapter describes basic component replacement and upgrades for the SGI Rackable C1103-G15 system

General Precautions

Care must be taken to assure that the chassis cover is in place when the server is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Caution: Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD discharge.

• Use a grounded wrist strap designed to prevent static discharge.

• Touch a grounded metal object before removing any board from its antistatic bag.

• Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

• When handling chips or modules, avoid touching their pins.

Installing System DIMM Memory

Exercise extreme care when installing or removing DIMM modules to prevent electrostatic or any other possible damage.

The serverboard has sixteen 240-pin DIMM slots that can support up to 256 GB of registered ECC DDR3-1600/1333/1066/800 SDRAM.

> **Note:** Check with your SGI sales or service representative for approved replacement or upgrade DIMM memory modules.

Installing Memory DIMMs

Insert each memory DIMM vertically into a slot using the information and illustrations in this section. Pay attention to the notch along the bottom of the DIMM to prevent inserting it incorrectly.

To install a DIMM: Insert the DIMM vertically and gently press down until it snaps into place. Pay attention to the alignment notch at the bottom.

Repeat for all DIMMs.

To remove a DIMM: Use your thumbs to gently push the release tabs near both ends of the memory module. This should release it from the slot.
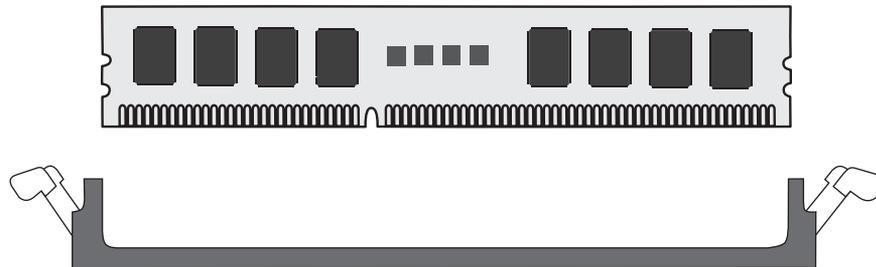
Figure 4-1   DIMM Installation Example

Due to the memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional.

Table 4-1 shows possible system memory allocation and availability.

Table 4-1   Possible System Memory Allocation and Availability

System Device	Size	Physical Memory Available (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99 GB
Local APIC	4 KB	3.99 GB
Area Reserved for the chipset	2 MB	3.99 GB
I/O APIC (4 Kbytes)	4 KB	3.99 GB
PCI Enumeration Area 1	256 MB	3.76 GB
PCI Express (256 MB)	256 MB	3.51 GB
PCI Enumeration Area 2 (if needed) -Aligned on 256-M boundary	512 MB	3.01 GB
VGA Memory	16 MB	2.85 GB
TSEG	1 MB	2.84 GB
Memory available for the OS and other applications		2.84 GB

Adding PCIe Cards

The server includes two pre-installed riser cards designed specifically for use in the 1U rackmount server chassis. One riser card supports a full-height PCI Express (PCIe) x16 card and the other supports a half-height card inside the chassis.

A riser card has already been preinstalled into each serverboard. The PCIe card cannot be "hot installed". Perform the following steps to add a PCIe add-on card:

1.   Grasp the two handles on either side and pull the unit straight out of the rack until it locks (you will hear a "click").

2.   The top cover of the chassis is secured with four screws: two at the top rear of the cover and one on each side lip, also near the back. Remove all four, then place both thumbs in the indentations and push the cover back until it slides off.

3. Lift the top cover from the chassis to gain full access to the inside of the server.

4. Remove the PCIe carrier screws.

5. Remove the carrier.

6. Install the PCIe add-on card in the carrier.

7. Reinstall the PCIe carrier.

System Fans

The main serverboard is cooled by a set of four 4-cm high-performance PWM fans. Fan speed may be controlled by a setting in BIOS (see Chapter 5). Each GPU bay also has two dedicated cooling fans (four total).

System Fan Failure

If a fan fails, the red overheat/fan fail LED on the control panel will blink on and off.

Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the fans has failed. Power down the system before replacing a fan. Removing the power cord is also recommended as a safety precaution.

Drive Bay Installation/Removal

Hard Disk Drives: Because of their hot-swap capability, you do not need to access the inside of the chassis or power down the system to install or replace disk drives. Proceed to the next step for instructions. Note that the operating system you use must have RAID support to enable the optional hot-swap capability of the SATA/SAS drives.

Use caution when working around the disk drive backplane. Do not touch the backplane with any metal objects and make sure no cables touch the backplane. Also, regardless of how many drives are installed, all three drive carriers must remain in the chassis to maintain proper airflow.

Disk Drive Removal and Installation

The system disk drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the system. For this reason, even empty carriers without drives installed must remain in the chassis.

Mounting a Drive in a Carrier

Check with your SGI sales or service representative to obtain new or replacement hard disk drives for the server.

Install the drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.

Secure the drive to the carrier with the side screws, similar to the example in Figure 4-2.
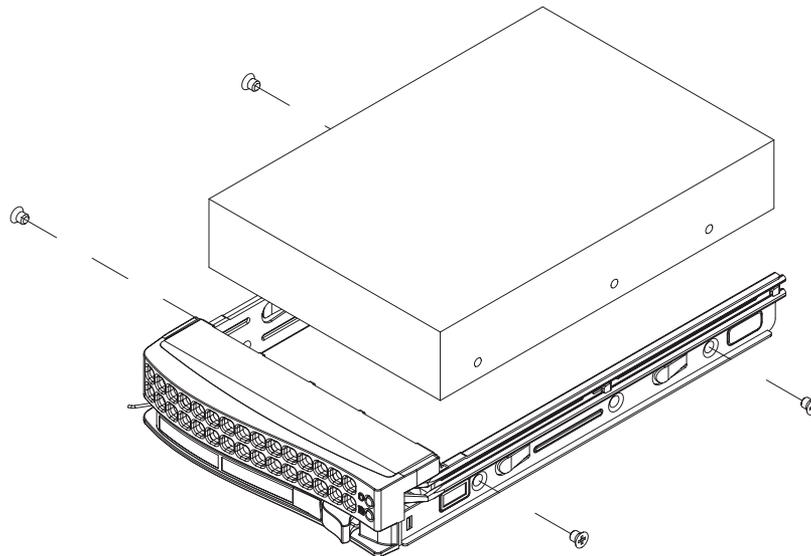
Figure 4-2   Drive Carrier Mounting Example

Installing/Removing Hot-swap Drives

To remove a carrier, push the release button located beside the drive LEDs.

Swing the handle fully out and use it to pull the unit straight out (see Figure 4-3 and Figure 4-4).
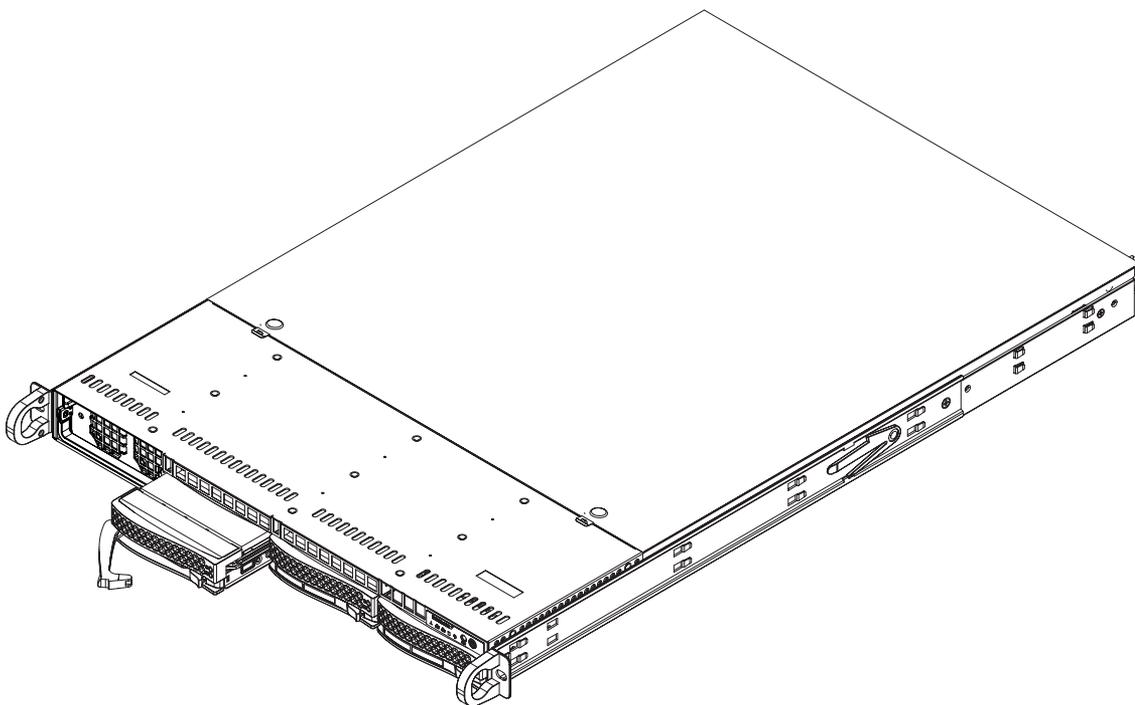
Figure 4-3   Server Disk Drive Remove/Replace Example

Note: When installing the hard drive carrier that is next to the power supply, the power supply handle must be lifted before extending the hard drive carrier handle, or before inserting the hard drive carrier into the drive bay. See Figure 4-4.
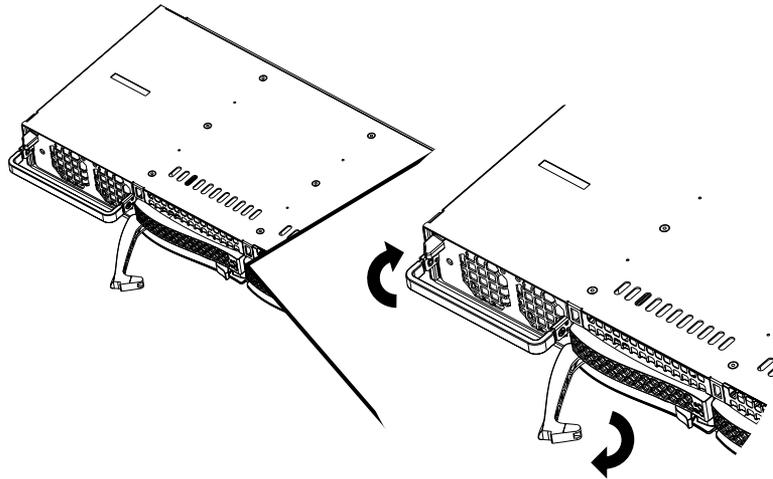
Figure 4-4   Installing or Removing the Carrier Next to the Power Supply

Power Supply

The SGI Rackable C1103-G15 system has a single 1400-Watt, cold-swap power supply. This power supply is auto-ranging (has the capability of operating at 100 - 240 input volts). Depress the main power button on the front of the chassis and then unplug the AC power cord to completely remove power from the system before removing the power supply.

The LED located directly on the front of the power supply has three states:

- Dark - no AC power is available to the supply

- Yellow - AC power available to the supply but the server is not powered on

- Green - AC power is applied and the system is on (front panel power button pushed to on)

Power Supply Failure

If the power supply unit fails, the system will shut down and you will need to replace the power supply unit. Replacement units can be ordered directly from your SGI sales or service representative.

If the power supply has failed, the LED located on the front of the power supply should be off (unlit). Be sure the system power cord is fully plugged in to a power distribution unit that is turned on before replacing the supply.

Removing the Power Supply

Use the following steps to remove a failed power supply from the system:

1. Power off the system and unplug the AC power cord from the system.

   Note: The power supply may be hot if the system has been running - make sure the system has at least 5 minutes to cool down.

2. Push the release tab on the front of the power supply. See Figure 4-5.

3. Pull up the power supply handle.

4. Extract the supply from the chassis by pulling it outward.

5. Follow the instructions in "Installing a New Power Supply" on page 31.
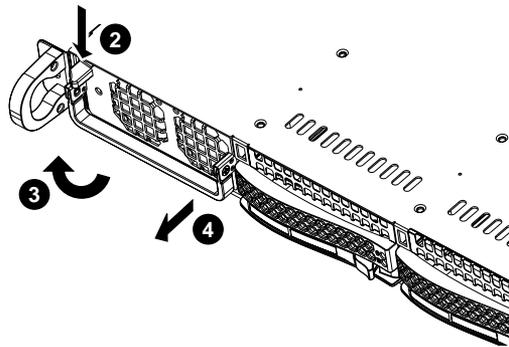
Figure 4-5   Power Supply Removal Example

Installing a New Power Supply

Use the following steps to replace a failed power supply in the server:

1. Replace the failed power supply with the exact same model from SGI or another approved vendor, contact your sales or service representative for more information.

2. Insert the new unit into the chassis and push it in until seated. This may require some moderate force but you should hear an audible "click" as the power supply is seated.

3. Reconnect the AC power cord and then press the power button on the front of the chassis to resupply power to the system.

Server BIOS Information

This chapter describes the functions and features of the AMI BIOS Setup Utility for the SGI Rackable C1103-G15 system. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated; check with your SGI sales or service representative for information on updates. This chapter covers basic navigation of the AMI BIOS Setup Utility screens.

Starting the BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the `<Delete>` key while the system is booting up.

Note: In most cases, the `<Delete>` key is used to launch the AMI BIOS setup screen. There are a few cases when other keys are used, such as `<F1>`, `<F2>`, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Note that "grayed-out" options cannot be configured. Options in black can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. Note that the AMI BIOS has default text messages built in. SGI retains the option to include, omit, or change any of these text messages.

A ">" indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include `<F1>`, `<F9>`, `<F10>`, `<Enter>`, `<ESC>`, arrow keys, etc.

Settings printed in **Bold** are default settings.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing `<Del>` at the appropriate time during system boot.

Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the `<Delete>` key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

Warning: **Do not upgrade the BIOS unless your system has a BIOS-related issue and you have instructions to do the upgrade from your SGI sales or service representative. Flashing the wrong BIOS can cause irreparable damage to the system and may void your warranty. Your warranty may not cover direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.**

Main Menu Setup Screen

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the **Main** tab on the top of the screen using the arrow keys.

The Main Menu screen provides you with a system overview, which includes the version, build date and ID of the AMIBIOS, the type, speed and number of the processors in the system and the amount of memory installed in the system.

The Main BIOS Setup screen has information similar to that listed in the following subsection.

System Time/System Date

Use this option to change the system time and date. Highlight System Time or System Date using the arrow keys. Enter new values through the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (Note that the time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

`BIOS Build Version:`

This item displays the BIOS revision used in your system.

`BIOS Build Date:`

This item displays the date when this BIOS was completed.

`AMI BIOS Core Version:`

This item displays the revision number of the AMI BIOS Core upon which your BIOS was built.

`Processor:`

The AMI BIOS will automatically display the status of the processor used in your system:

`CPU Type:`

This item displays the type of CPU used in the system motherboard.

`Speed:`

This item displays the speed of the CPU detected by the BIOS.

`Physical Count:`

This item displays the number of processors installed in your system as detected by the BIOS.

`Logical Count:`

This item displays the number of CPU **Cores** installed in your system as detected by the BIOS.

`Micro_code Revision:`

This item displays the revision number of the BIOS Micro_code used in your system.

```
System Memory:
```

This displays the size of memory available in the system:

```
Size:
```

This item displays the memory size detected by the BIOS.

Advanced Setup Configurations

Use the arrow keys to select the **Advanced** settings screen at the top of the Main Menu.

Boot Feature Configurations

Use the arrow keys to select Boot Setup and hit `<Enter>` to access the submenu items.

Quick Boot

If enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select **Enabled** to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

Add-On ROM Display Mode

This sets the display mode for Option ROM. The options are **Force BIOS** or Keep Current.

Bootup Num-Lock

This feature selects the power-on state for the Numlock key. The options are Off and **On**.

PS/2 Mouse Support

Use this option to select support for the PS/2 mouse. Options are Disabled, Enabled or **Auto**.

Wait For 'F1' If Error

This setting controls the system response when an error is detected during the boot sequence. When enabled, BIOS will stop the boot sequence when an error is detected, at which point you will need to press the F1 button to re-enter the BIOS setup menu. The options are **Enabled** and Disabled.

Hit 'Del' Message Display

This feature displays "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss.

Select Power-On for the system power to be turned on after a power loss. Select **Last State** to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

Watch Dog Function

If enabled, the Watch Dog Function will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled**.

Processor and Clock Options Configuration

This submenu allows the user to configure the Processor and Clock settings.

CPU Configuration

This displays static information on the Module Version, AGESA Version, Physical Count and Logical Count for the system's processor(s) and clock.

CPU Information

This setting is used to select which physical CPU's information to display. Options include **Processor 0** or Processor 1. The information for the selected processor includes Processor number, Revision, Cache L1/L2/L3, Speed, NB CLK, Able to Change Frequency and uCode Patch Level.

Note: Zero is always the "Boot Strap Processor" or main CPU with all others being "Application Processors".

GART Error Reporting

This option should remain disabled for normal operation. The driver developer may enable this option for testing purposes. Options are Enabled or **Disabled**.

Microcode Update

This setting **Enables** or Disables microcode updating.

Power Now

This setting is used to **Enable** or Disable the AMD Power Now feature.

ACPI SRAT Table

This option **Enables** or Disables the building of the ACPI SRAT Table.

Clock Spread Spectrum

This option Enables or **Disables** the Clock Spread spectrum feature.

Advanced Chipset Control Configuration

The items included in the Advanced Settings submenu are listed below:

Memory Configurations

Channel Interleaving

Selects the channel-interleaving memory scheme when this function is supported by the processor. The options are Disabled or **Auto**.

Enable Clock to All DIMMs

This option allows you to Enable or **Disable** unused clocks to DIMMs even when memory slots are not populated.

Memory Hole Remapping

When "Enabled", this feature enables hardware memory remapping around the memory hole. Options are **Enabled** and Disabled.

CS Sparing Enable

This option will reserve a spare memory rank in each node when enabled. Options are Enable and **Disable**.

Power Down Enable

This option enables or disables DDR power down mode. Options are **Auto**, Enabled and Disabled.

Power Down Mode

This sets the DDR power down mode. Options are **Auto**, Channel and Chip Select.

DRAM Parity Enable

This sets the DRAM Parity Enable to either **Auto**, Enabled or Disabled.

Bank Swizzle Mode

This sets the Bank Swizzle Mode to either **Auto**, Enabled or Disabled.

ECC Configuration

ECC Mode

This submenu sets the level of ECC protection. Options include Disabled, **Basic**, Good, Super, Max and User. Selecting User activates the other options for user setting.

Note: The "Super" ECC mode dynamically sets the DRAM scrub rate so all of memory is scrubbed in 8-hours.

DRAM ECC Enable

This setting allows hardware to report and correct memory errors automatically, maintaining system integrity. Options are **Enabled** or Disabled.

DRAM Scrub Redirect

This setting allows the system to correct DRAM ECC errors immediately when they occur, even if background scrubbing is off. Options are Enabled or **Disabled**.

4-Bit ECC Mode

Allows the user to enabled 4-bit ECC mode (also known as ECC Chipkill). Options are **Enabled** and Disabled.

DRAM BG Scrub

Corrects memory errors so later reads are correct. Options are **Disabled** and various times in nanoseconds and microseconds.

Data Cache BG Scrub

Allows L1 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

L2 Cache BG Scrub

Allows L2 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

L3 Cache BG Scrub

Allows L3 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

DRAM Timing Configuration

DRAM Timing Config

This setting specifies the DRAM timing configuration. Options are **Auto** and Manual.

Memory Timing Parameters

This selects which node's timing parameters to display. Options are **CPU Node 0** or CPU Node 3.

SouthBridge Configuration

OHCI/EHCI HC Device Functions

These settings allow you to either **Enable** or Disable functions for OHCI or EHCI bus devices.

On Chip SATA Channel

This setting allows you to **Enable** or Disable the OnChip SATA channel.

On Chip SATA Type

Use this setting to set the On Chip SATA type. Options include **Native IDE**, RAID, AHCI and Legacy IDE.

IDE/SATA Combined Mode

This setting allows you to **Enable** or Disable the SATA IDE combined mode.

PATA Channel Configuration

This allows you to set PATA channel confi guration. Options include **SATA as Primary** or SATA as secondary.

Power Saving Features

Use this option to Enable or **Disable** power down saving features in the Southbridge chipset. This feature should be enabled for mobile systems and disabled for desktop systems.

PCI Express Configuration

Port 02 ~ Port 13 Features

This submenu allows you to set the features for Ports 02 through 13 in the system. Each port submenu allows you to define the same settings below.

Gen 2 High Speed Mode

This setting allows you to set the Gen 2 high-speed mode. Options include **Auto**, Disabled, Software Initiated and Advertised RC.

Link ASPM

Use this setting to configure the Link ASPM. Options include **Disabled**, L0s, L1, L0s & L1, L0 Downstream and L0 Downstream + L1.

Note: For ATI GFx Card M2x use APSM L1 only, and for ATI GFx Card M5x use APSM L0 only.

Link Width

Use this setting to configure the Link Width. Options include **Auto**, x1, x2, x4, x8 and x16.

Compliance Mode

This setting allows you to Enable or **Disable** the Compliance Mode.

Remap Port Device Number

This setting allows you remap the Port Device number. Options include **Auto** and port numbers between 2 and 13.

L1 Immediate ACK

This setting allows you to Enable or **Disable** L1 ACK. When enabled, the L1 will be ACK'd immediately.

Lane Reversal

Use this setting to Enable or **Disable** Lane Reversal.

Hot Plug Support

Use this setting to set Hot Plug Support. Options include **Disabled** and Native.

NB-SB Port Features

NB-SB Link APSM

Use this to set the NB-SB Link ABSM. Options include **L1** and Disabled.

Link Width

This setting allows you to set the Link Width for the NB-SB port. Options include **Auto**, x1, x2 and x4.

NP NB-SB VC1 Traffic Support

Use this setting to **Disable** or Enable NP NB-SB VC1 traffic support.

Compliance Mode

Use this setting to Enable or **Disable** Compliance Mode for the NB-SB port.

GPP1 ~ GPP3b Core Settings

These submenus allow you to specify GPP core settings. Each submenu allows you to define the same settings listed below.

Core Configuration

This setting allows you to configure the core configuration. Options include **Auto**, 1x16 and 2x8.

Powerdown Unused Lanes

This setting allows you to **Enable** or Disable the powerdown of unused lanes.

Turnoff Off PLL During L1/L23

This setting allows you to **Enable** or Disable turning off PLL during L1/ L23.

TX Drive Strength

Use this setting to configure TX drive strength. Options include Auto, **26mA**, 20mA, 22mA and 24mA.

TXCLK Clock Gating in L1

Use this setting to **Enable** or Disable the TXCLK clock gating in L1.

LCLK Clock Gating in L1

Use this setting to **Enable** or Disable the LCLK clock gating in L1.

SB Core Settings

TX Drive Strength

Use this setting to configure TX drive strength. Options include **Auto**, 26mA, 20mA, 22mA and 24mA.

TXCLK Clock Gating in L1

Use this setting to **Enable** or Disable the TXCLK clock gating in L1.

LCLK Clock Gating in L1

Use this setting to **Enable** or Disable the LCLK clock gating in L1.

GPP1 Deemphasis Setting

This option sets the GPP1 Deemphasis setting. Options include **-3.5 DB** and -6.0 DB.

GPP2 Deemphasis Setting

This option sets the GPP2 Deemphasis setting. Options include **-3.5 DB** and -6.0 DB.

Hyper Transport Configuration

HT Extended Address

This setting allows you to Enable or Disable the HT extended address. Options include Enabled, **Disabled** and Auto.

HT3 Link Power State

This setting allows you to configure the HT3 Link power state. Options include **Auto**, LS0, LS1, LS2 and LS3.

Unit ID Clumping

Use this setting to configure Unit ID clumping. Options include **Disabled**, Auto, UnitID 2/3, UnitID B/C and UnitID 2/3 & B/C.

HT Link Tristate

This setting allwos you to confi gure the HT Link Tristate. Options include **Auto**, Disabled, CAD/CTL and CAD/CTL/CLK.

NB Deemphesis Level

Use this to set the NB deemphesis level. Options include Disabled, 0.4 dB, 1.32 dB, **-2.08dB**, 3.1 dB, 4.22 dB, 5.50 dB and 7.05 dB.

IOMMU

This setting is used to **Disable** or Enable IOMMU.

Primary Video Controller

Use this setting to specify the primary video controller boot order. Options include **PCIE-GPP1-GPP2-GPP3a-PCI**, PCIE-GPP2-GPP1-GPP3a-PCI, PCIE-GPP3a-GPP1-GPP2-PCI or PCI-PCIE-GPP1-GPP2-GPP3a.

USB Configuration

This submenu displays the Module Version and lists the USB devices that are enabled as well as the following options.

Legacy USB Support

Select "Enabled" to enable the support for USB Legacy. Disable Legacy support if there are no USB devices installed in the system. "Auto" disabled Legacy support if no USB devices are connected. The options are Disabled, **Enabled** and Auto.

USB 2.0 Controller Mode

Use this setting to configure the USB 2.0 Controller in either **Hi-Speed** (480 Mps) or Full Speed (12 Mps) mode.

BIOS EHCI Hand Off

This is a workaround for OS's without EHCI hand-off support. The EHCI ownership change should be claimed by the EHCI driver. Options are **Enabled** or Disabled.

Legacy USB 1.1 HC Support

This option **Enables** or Disables support for legacy USB 1.1 HC.

USB Mass Storage Device Configuration

USB Mass Storage Reset Delay

This option set the number of seconds that POST waits for the USB mass storage device after the Start Unit command. Options include 10 Sec, **20 Sec**, 30 Sec and 40 Sec.

Device # Emulation Type

This option sets the device emulation type. If **Auto**, USB devices less than 530MB will be emulated as Floppy and remaining as a hard drive. The Forced FDD option can be used to force a HDD formatted drive to boot as an FDD drive.

Active State Power Management

This option enables/disables the PCI Express L0s and L1 link power states.

Options include Enabled or **Disabled**.

IDE Configuration

Onboard PCI IDE Controller

This setting allows you to enable the Primary or Secondary PCI IDE controller.

Options include Disabled, Primary, Secondary or **Both**.

Primary/Secondary/Third/Fourth IDE Master/Slave

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt. Select "Disabled" to allow the data to be transferred from and to the device one sector at a time. Select "Auto" to allows the data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

PIO (Programmable I/O) mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4.

Select Auto to allow BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

Select 0 to allow BIOS to use PIO mode 0, which has a data transfer rate of 3.3 MBs.

Select 1 to allow BIOS to use PIO mode 1, which has a data transfer rate of 5.2 MBs.

Select 2 to allow BIOS to use PIO mode 2, which has a data transfer rate of 8.3 MBs.

Select 3 to allow BIOS to use PIO mode 3, which has a data transfer rate of 11.1 MBs.

Select 4 to allow BIOS to use PIO mode 4, which has a data transfer rate of 16.6 MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

DMA Mode

Selects the DMA Mode. Options are **Auto**, SWDMA0, SWDMA1, SWDMA2, MWDMA0. MDWDMA1, MWDMA2, UDMA0. UDMA1, UDMA2, UDMA3, UDMA4 and UDMA5. (SWDMA=Single Word DMA, MWDMA=Multi Word DMA, UDMA=UltraDMA.)

S.M.A.R.T.

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select "Auto" to allow BIOS to auto detect hard disk drive support. Select "Disabled" to prevent AMI BIOS from using the S.M.A.R.T. Select "Enabled" to allow AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32-Bit Data Transfer

Select "Enabled" to activate the function of 32-Bit data transfer. Select "Disabled" to deactivate the function. The options are **Enabled** and Disabled.

Hard Disk Write Protect

Use this setting to Enable or **Disable** hard disk write protection for your system. This is effective only if the device is accessed through the BIOS.

IDE Detect Timeout (Sec)

Use the +/- keys to adjust and select the time out for detecting ATA/ATAPI devices. The default value is **35**.

ATA(PI) 80-Pin Cable Detection

This option selects the mechanism used for detecting the installation of an 80-pin ATA(PI) cable. Options include **Host & Device**, Host or Device.

PCI/PnP Configuration Settings

Clear NVRAM

This feature clears the NVRAM during system boot-up. The options are **No** and Yes.

Plug & Play OS

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

PCI Latency Timer

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select a numerical value to set the PCI latency in PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

Allocate IRQ to PCI VGA

Use this option to allocate IRQ to the PCI VGA card. Opitons include **Yes** and No. Selecting **Yes** assigns IRQ to PCI VGA card if the card requests IRQ. Selecting No means the system will not assign IRQ to the PCI VGA card even if the card requests IRQ.

Pallette Snooping

This option Enables or **Disables** Pallette Snooping. If enabled, the system informs the PCI devices that an ISA graphics device is installed in the system so the card will function normally.

PCI IDE BusMaster

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are Disabled and **Enabled**.

Offboard PCI/ISA IDE Card

Some PCI IDE cards may require this option to be set to the PCI slot number that is holding the card. The Auto setting works for most PCI IDE cards. Options include **Auto**, PCI Slot 1, PCI Slot 2, PCI Slot 3, PCI Slot 4, PCI Slot 5 and PCI Slot 6.

Load Onboard LAN Option ROM

Select **Enabled** to enable the onboard LAN Option ROM. This is to boot the computer using a network interface. The options are **Enabled** and Disabled.

IRQ3 ~ IRQ15 Settings

These settings specify if IRQ is available to be used by PCI/PnP devices or is reserved for use by legacy ISA devices. Options are **Available** or Reserved.

DMA Channel 0 ~ DMA Channel 7 Settings

These settings specify if a DMA Channel is available to be used by PCI/PnP devices or is reserved for use by legacy ISA devices. Options are **Available** or Reserved.

Reserved Memory Size

This option specifies the size of the memory block reserved for legacy ISA devices. Options include **Disabled**, 16k, 32k or 64k.

HotPlug Reserve I/O Port Size

This option sets the size that the I/O port block reserves for HotPlug or CardBus devices. Options include **Auto**, 4k, 8k, 12k, 16k, 20k, 24k and 28k.

HotPlug Reserve Memory Size

This option sets the size of the memory block that is reserved for HotPlug or CardBus devices. Options include **Auto**, 8M, 16M, 32M, 64M, 128MB, 256MB and 512MB.

Hotplug Reserve PFMemory Size

This option sets the size of the memory block that is reserved for HotPlug or CardBus devices. Options include **Auto**, 32M, 64M, 128MB, 256MB, 512MB, 1024M and 2048M.

SuperI/O Configuration

Serial 1 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 1. Select "Disabled" to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable. Select "3F8/IRQ4" to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. Options include Disabled, **3F8/IRQ4**, 3E8/IRQ4 and 2E8/IRQ3

Serial 2 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 2. Select "Disabled" to prevent the serial port from accessing any system resources. When this option is set to "Disabled", the serial port physically becomes unavailable. Select "2F8/IRQ3" to allow the serial port to use 2F8 as its I/O port address and IRQ 3 for the interrupt address. Options include Disabled, **2F8/IRQ3**, 3E8/IRQ4 and 2F8/IRQ3.

Remote Access Configuration

Remote Access

This allows the user to enable the Remote Access feature. The options are Disabled and Enabled. If Remote Access is set to Enabled, the following items will display:

• Serial Port Number

This feature allows the user decide which serial port to be used for Console Redirection. The options are COM 1 and **COM 2**. The displayed base address and IRQ for the serial port changes to reflect the selection you make.
Make sure the selected port is enabled.

• Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

- Flow Control

  This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

Redirection After BIOS POST

This option sets redirection after BIOS POST. Options are Disable (no redirection after BIOS POST), Boot Loader (redirection during POST and during boot loader) and **Always** (redirection always active). Select **Always** to keep Console Redirection active all the time after POST.

Note: This setting (**Always**) may not be supported by some operating systems.

Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are **ANSI**, VT100, and VT-UTF8.

VT-UTF8 Combo Key Support

Allows you to **Enable** or Disable VT-UTF8 combination key support for ANSI/ VT100 terminals. A terminal keyboard definition that provides a way to send commands from a remote console. Available options are **Enable** and Disable.

Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay**, Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

Hardware Health Monitor Configurations

This feature allows the user to monitor system health and review the status of each item as displayed.

CPU Overheat Alarm

This setting allows you to specify the type of alarm for CPU overheating. Options include The Early Alarm and **The Default Alarm**.

Warning: **Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed.**

The options are:

• The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

• The Default Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5° C above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action.

Fan Speed Control

This feature allows the user to determine how the system will control the speed of the on-board fans. The options are Full Speed/FS (Max Cooling), Performance/ PF (Better Cooling), **Balanced/BL** (Balance between performance and energy saving), Energy Saving/ES (Lower Power and Noise).

Other items in the submenu are systems monitor displays for the following information:

CPU 1 Temperature, CPU 2 Temperature, System Temperature, Air Temperature, Fan 1-8 Reading, CPU 1 VCore, CPU 2 VCore, CPU 1 DDR3 Memory, CPU 2 DDR3 Memory, CPU 1 Memory Vref 0.75V, CPU 2 Memory Vref 0.75V, SR5690 Core Power P1V1, 1.8V, 5V, 12V, 3.3V, 3.3V STB, Battery 3.0V and CPU 1 1.2V.

ACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

ACPI Version Features

Use this setting to determine which ACPI version to use. The options are ACPI v1.0, **ACPI v2.0** and ACPI v3.0. Please refer to ACPI's website for further explanation: http://www.acpi.info/.

ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT pointer list. The options are **Enabled** and Disabled.

AMI OEMB Table

This setting specifies whether to include the OEMB table pointer to the R(X) SOT pointer lists. Options include **Enabled** or Disabled.

Headless Mode

Use this setting to Enable or **Disable** headless operation mode through ACPI.

IPMI Configuration

This menu shows static information about the IPMI firmware revision and status of the BMC, as well as options for IPMI configuration. Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole.

View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events. Use the "+" and "-" keys to navigate through the system event log. To view an event, select an Entry Number and press <Enter> to display the information.

Clear BMC System Event Log

This feature is used to clear the BMC System Event Log. Selecting this and pressing the Enter key will clear the BMC system event log.

Caution: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

Set LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address.

Use the "+" and "-" keys to choose the desired channel number. This displays Channel Number and Channel Number Status information. This is initially set to [1]. Press "+" or "-" on your keyboard to change the Channel Number.

Channel Number Status -This feature returns the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

IP Address Configuration

This submenu sets the IP address source as either Static or **DHCP**. Selecting Static allows you to manually set the IP Address, Subnet Mask and Gateway Address.

Enter the IP address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255. The IP address and current IP address in the BMC are shown.

MAC Address Configuration

Enter the Mac address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255. The current MAC address in the BMC is shown.

Subnet Mask

Subnet masks tell the network which subnet this machine belongs to. In the field provided here enter the Subnet address in the decimal form of xxx.xxx.xxx.xxx with xxx having a value of less than 256 and in decimal form only. The current subnet address in the BMC is shown.

Gateway Address

In the field provided here enter the Gateway address in the decimal form of xxx.xxx.xxx.xxx with xxx having a value of less than 256 and in decimal form only. The current Gateway address in the BMC is shown.

Event Log Configuration

View Event Log

Pressing the Enter key will open the event log. Use the "up-arrow" and "down-arrow" keys to navigate through the system event log.

Mark all Events as Read

Selecting this and pressing the Enter key marks all events as read in the event log.

Clear Event Log

Selecting this and pressing the Enter key clears the system event log.

Security Menu

AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password **must** be set first.

Change Supervisor Password

Select this option and press <Enter> to access the sub menu, and then type in the password.

Change User Password

> Select this option and press <Enter> to access the sub menu, and then type in the password.

Boot Sector Virus Protection

> This option is near the bottom of the Security Setup screen. Select "Disabled" to deactivate the Boot Sector Virus Protection. Select "Enabled" to enable boot sector protection. When "Enabled", AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

Boot Settings Menu

Boot Device Priority

> This feature allows you to prioritize the boot sequence from the list of available devices. A device that is in parenthesis has been disabled in the corresponding type menu.

Hard Disk Drives

> This feature allows you to specify the boot sequence from the list of available hard disk drives. A device that is in parenthesis has been disabled in the corresponding type menu.

Removable Drives

> This feature allows you to specify the boot sequence from the list of available removable drives. A device that is in parenthesis has been disabled in the corresponding type menu.

CD/DVD Drives

> This feature allows you to specify the boot sequence from the list of available CD/ DVD drives. A device that is in parenthesis has been disabled in the corresponding type menu.

Network Drives

> This feature allows you to specify the boot sequence from the list of available network drives. A device that is in parenthesis has been disabled in the corresponding type menu.

Exit Menu

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.

Save Changes and Exit

When you have completed the system configuration changes, select this option to leave BIOS Setup and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Discard Changes and Exit

Select this option to quit BIOS Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to AMI BIOS Utility Program.

Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then Select "OK" to allow BIOS to automatically load the Optimal Defaults as the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not maximum performance.

BIOS Error Beep Codes

During the POST (Power-On Self-Test) 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.

BIOS Error Beep Code List

The following list of error codes my be helpful in diagnosing certain system problems.

BIOS Error Beep 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
8 beeps 1 continuous beep (with the front panel OH LED on)	Video memory or read/write error	Video adapter missing or with faulty memory

System Specifications

This appendix contains technical specification information about your SGI Rackable C1103-G15 system.

Server Specifications and Features

Processors

Two AMD Opteron 6100/6200 series processors

I/O Chipset

AMD SR5690/SP5100

BIOS

32 Mb AMIBIOS® SPI Flash ROM

Memory Capacity

Sixteen DIMM sockets supporting registered ECC DDR3-1600/1333/1066/800 SDRAM or unbuffered ECC/non-ECC DDR3-1600/1333/1066/800 MHz SDRAM

Graphics Processing Units (GPUs)

The system uses one or two x16 GPU option cards.

Contact your SGI sales or service representative for information on currently available GPU cards.

Disk Drive Controller

On-chip SATA controller for 3 Gb/s SATA (RAID 0, 1 and 10 support)

Drive Bays

Three (3) hot-swap drive bays to house three (3) standard SATA drives

Expansion Slots

The server's expansion slots include the following:

- Two (2) PCI-Express x16 Gen. 2
- One (1) PCI-Express x8 (in x16 slot) Gen. 2

Note: Slot SBX-1A with slot 1 and slot SBX-2A with slot 2 require a riser card or add-on card to work properly. The riser cards need both the SBX and PCIe slots on each side of the serverboard to be connected.

Serverboard

Proprietary board design and size.

Dimensions: 7.74" x 16.64" (197 x 423 mm)

Chassis

SC818GTQ-1400B (1U rackmount)

Dimensions: (WxHxD) 17.2 x 1.7 x 28.2 in. (437 x 43 x 716 mm)

Weight

Gross (approximate): 47 lbs. (21.4 kg.)

System Cooling

Four sets of 4-cm counter-rotating cooling fans (fan speed controlled by BIOS setting) and two sets of 4-cm counter-rotating cooling fans for GPUs (6016GT series only)

System Input Requirements

AC Input Voltage: 180-240 VAC

Rated Input Current: 7.2A (180V) to 9.5 (240V)

Rated Input Frequency: 50-60 Hz

Power Supply

Rated Output Power: 1400W w/PFC (Part# PWS-1K41F-1R)

Rated Output Voltages: +12V (117A), +5Vsb (6A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)

Non-Operating Temperature: -40º to 70º C (-40º to 158º F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-Operating Relative Humidity: 5 to 95% (non-condensing)

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. "Perchlorate Material-special handling may apply.

See www.dtsc.ca.gov/hazardouswaste/perchlorate"