SGI® Altix® XE250 System User's Guide

007-5467-001

COPYRIGHT
© 2008 SGI. All rights reserved; provided portions may be copyright in third parties, as indicated elsewhere herein. No permission is granted to copy, distribute, or create derivative works from the contents of this electronic documentation in any manner, in whole or in part, without the prior written permission of SGI.

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

The electronic (software) version of this document was developed at private expense; if acquired under an agreement with the USA government or any contractor thereto, it is acquired as “commercial computer software” subject to the provisions of its applicable license agreement, as specified in (a) 48 CFR 12.212 of the FAR; or, if acquired for Department of Defense units, (b) 48 CFR 227-7202 of the DoD FAR Supplement; or sections succeeding thereto. Contractor/manufacturer is SGI, 1140 E. Arques Avenue, Sunnyvale, CA 94085.

TRADEMARKS AND ATTRIBUTIONS
Altix, SGI, and the SGI logo are registered trademarks and SGI ProPack is a trademark of SGI in the United States and/or other countries worldwide.

Fusion-MPT, Integrated RAID, MegaRAID and LSI Logic and are trademarks or registered trademarks of LSI Logic Corporation.InfiniBand is a registered trademark of the InfiniBand Trade Association. Intel, Itanium, and Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Internet Explorer is a registered trademark of Microsoft Corporation. Java and Java Virtual Machine are trademarks or registered trademarks of Sun Microsystems, Inc. Linux is a registered trademark of Linus Torvalds, used with permission by SGI. Novell and Novell Netware are registered trademarks of Novell Inc. PCIe and PCI-X are registered trademarks of PCI SIG. Phoenix and PhoenixBIOS are registered trademarks of Phoenix Technologies Ltd. Red Hat and all Red Hat-based trademarks are trademarks or registered trademarks of Red Hat, Inc. in the United States and other countries. SUSE LINUX and the SUSE logo are registered trademarks of Novell, Inc. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company, Ltd.

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

Record of Revision

Version	Description
001	February, 2008 Original printing.

Contents

Node Board Features . . . 3
Processors . . . 5
Memory . . . 5
Serial ATA (SATA) Controller . . . 5
PCI Expansion Slots . . . 5
UIO . . . 5
Onboard Controllers/Ports . . . 6
ATI Graphics Controller . . . 6
Other Features . . . 6
System Disks . . . 6
RAID Support . . . 6
L8i UIO Card . . . 7
MegaRAID 8708 HBA . . . 8
Chipset Overview . . . 9
MCH (North Bridge) . . . 9
I/O Controller Hub-ESB2 (South Bridge) . . . 9
Server Chassis Features . . . 10
System Power . . . 10
SATA/SAS Backplane/Drives . . . 10
Cooling . . . 10
IO Back Panel . . . 11
Controls . . . 12
Indicators . . . 13
Drive Carrier Indicators . . . 14

Unpack the System 15
Prepare for Setup 15
Choose a Setup Location 15
Warnings and Precautions 16
Rack Precautions 16
Server Precautions 17
Rack Mounting Considerations 17
Ambient Operating Temperature 17
Reduced Airflow 17
Mechanical Loading 17
Circuit Overloading 18
Reliable Ground 18
Install the System into a Rack 18
Identify the Sections of the Rack Rails 18
Install the Rack Rails 19
Install the Chassis Rails 20
Install the Server in a Rack 21
Check the Node Board Setup. 23
Access the Inside of the Chassis. 23
Check the CPUs (processors) 23
Check the System Memory 23
Install Expansion PCI Cards. 23
Check all Cable Connections and Airflow 24
Check the Drive Bay Setup 24
Check the System Disk Drives 24
Check the Airflow 24
Supply Power to the System 24
Handling the Node Board 25
ESD Precautions. 26
Unpacking 26

Node Board Installation 26
Install the Node Board in the Chassis 28
Connect the Data Cables 28
Connect the Power Cables 31
Connecting the Control Panel 31
I/O Ports 32
Processor and Heatsink Installation and Removal 32
Install a Processor 33
Remove the Processor 38
Install a Heatsink 40
Remove the Heatsink 41
Replace the Thermal Interface Material 41
Removing TIM from a Processor 42
Removing TIM from a Heatsink 45
Install Memory 47
Memory DIMM Layout 48
Memory DIMM Rules 49
Install DIMMs 51
Node Board Component Locations 53
Add PCI Expansion Cards 54
Install a PCI Expansion Card 55
Node Board Jumpers and Connectors 56
Node Board Connector Pin Definitions 58
ATX Power Connector Pin Definitions (JPW1) 59
Secondary Power Connector Pin Definitions (JPW2) 60
Secondary Power Connector Pin Definitions (JPW3) 60
PW_ON Switch Pin Definitions (JF1) 61
Reset Switch Pin Definitions (JF1) 61
Power Fail LED Pin Definitions (JF1) 62
Overheat/Fan Fail Pin Definitions (JF1) 62
NIC2 LED Pin Definitions (JF1) 63
NIC1 LED Pin Definitions (JF1) 63
HDD LED Pin Definitions (JF1) 63

Power On LED Pin Definitions (JF1) 64
NMI Switch Pin Definitions (JF1) 64
Fan Connector Pin Definitions (Fan1/2 - Fan7/8) 64
PS/2 Keyboard and Mouse Pin Definitions 66
Wake on LAN Connector Pin Definitions (JWOL) 66
Wake on Ring Connector Pin Definitions (JWOR) 67
Chassis Intrusion Connector Pin Definitions (JL1) 67
Power Supply Fail LED Connector Pin Definitions (JP3) 68
Ethernet Port (LAN1/LAN2) 68
Serial Port Pin Definitions (COM1/COM2). 69
Power LED/Speaker (JD1) 69
Serial General Purpose I/O Connector Pin Definitions (SGPIO) 70
USB Connector Pin Definitions 71
System Management Bus I2C Connector (SMBUS) 72
System Management Bus Connector Pin Definitions (SMB) 73
Overheat/Fan Fail LED Connector Pin Definitions (JOH1) 74
Keylock Connector Pin Definitions (JK1) 75
Node Board Jumper Settings 76
Explanation of Jumper Settings 76
CMOS Memory Clear (JBT1) 77
VGA Jumper Settings (JPG1) 78
LAN1/LAN2 Jumper Settings (JPL1) 78
3rd Power Fail Detect Jumper Settings (JP3) 79
Watch Dog Timer Jumper Settings (JWD) 80
Compact Flash Master/Slave Select (JCF1). 81
Compact Flash Power (JWF1) 81
I2C to PCIe Slot Jumper Settings (JPI2C1/JPI2C2). 82
Reboot Option (JP1). 83
Memory Voltage Select (JP2) 84
Node Board LED Descriptions 85
LAN1 and LAN2 (Ethernet Ports) 85
Onboard Power LED (LE1) 85

Floppy, IDE, and SATA Ports 86
Floppy Drive Connector 86
IDE Drive Connector 86
SATA Ports 87
ESD Precautions 89
Chassis Components 90
Part Numbers and Marketing Codes 91
Control Panel 93
Fans 94
Fan Failure 94
Fan Replacement 94
System Drives 96
DVD-CD Drive 96
Hard Disk Drives 97
Disk Drive Replacement 97
Disk Drive Installation 98
Mounting a Drive in a Drive Carrier 98
Drive Replacement 99
SATA/SAS Backplane 100
SATA Backplane Replacement 101
Power Supply 103
Power Supply Failure 103
Power Supply Replacement 103
Default Settings 106
System BIOS 114
How To Change the Configuration Data 114
Starting the Setup Utility 114
Running Setup 115
Main BIOS Setup 116
Main Setup Features 117
System Time 117
System Date 117
BIOS Date 117

Legacy Diskette A 117
IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, SATA Port 3 and SATA Port 4. 117
Type. 117
Parallel ATA 119
Serial ATA 119
Native Mode Operation. 119
SATA Controller Mode. 120
Serial ATA (SATA) RAID Enable 120
ICH RAID Code Base (Available when SATA RAID is Enabled) 120
SATA AHCI (Available when SATA RAID is Disabled) 120
System Memory 120
Extended Memory 120
Advanced Setup 121
Boot Features 121
QuickBoot Mode 121
QuietBoot Mode 121
POST Errors 122
ACPI Mode 122
Power Button Behavior. 122
Resume On Modem Ring 122
EFI OS Boot 122
Keyboard on Now Function 122
Power Loss Control. 122
Watch Dog 123
Summary Screen 123
Memory Cache 123
Cache System BIOS Area 123
Cache Video BIOS Area 123
Cache Base 0-512K. 123
Cache Base 512K-640K 124
Cache Extended Memory 124
Discrete MTRR Allocation 124
PCIe Configuration 124

Onboard GLAN1/Onboard GLAN2 (Gigabit- LAN) OPROM Configure 125
Default Primary Video Adapter 125
Emulated IRQ Solutions 125
PCIe I/O Performance 125
PCI Fast Delayed Transition 125
Reset Configuration Data 125
Frequency for PCI-X 1 and 2 125
PCI Slot Options 126
Large Disk Access Mode 126
Advanced Chipset Control 127
SERR Signal Condition 127
Clock Spectrum Feature 127
Intel VT for Directed I/O(VT-d) 127
4GB PCIe Hole Granularity 128
Memory Voltage 128
Memory Branch Mode 128
Branch 0/1 Rank Interleaving 128
Branch 0/1 Rank Sparing 128
Enhanced x8 Detection 128
Demand Scrub 128
High Bandwidth FSB 129
High Temperature DRAM Operation 129
AMB Thermal Sensor 129
Thermal Throttle 129
Global Activation Throttle 129
Force ITK Config Clocking 129
Snoop Filter 130
Crystal Beach Features. 130
Route Port 80h Cycles to 130
Clock Spectrum Feature 130
High Precision Event Timer 130
USB Function 130
Legacy USB Support 131

Advanced Processor Options 131
CPU Speed 131
Frequency Ratio 131
Core-Multi-Processing 131
Machine Checking 131
Fast Strings Operations 131
Thermal Management 2 131
C1 Enhanced Mode 132
Execute Disable Bit 132
Adjacent Cache Line Prefetch 132
Hardware Prefetcher 132
Set Max Est CPUID = 3 132
IP Prefetcher 132
Direct Cache Access 132
DCA Delay Clocks 133
Intel Virtualization Technology 133
Intel EIST Support 133
I/O Device Configuration 134
KBC Clock Input 134
Serial Port A 134
Serial Port B 134
Parallel Port 135
Floppy Disk Controller 135
Base I/O Address 135
DMI Event Logging 135
Event Log Validity 135
Event Log Capacity 135
View DMI Event Log 135
Event Logging 135
ECC Event Logging 135
Mark DMI Events as Read 136
Clear All DMI Event Logs 136

Console Redirection 136
COM Port Address 136
BAUD Rate 136
Console Type 136
Flow Control 136
Console Connection 136
Continue CR after POST 137
Hardware Monitor 137
Fan Speed Control Modes 138
Voltage Monitoring 138
IPMI 139
IPMI Specification Version 139
Firmware Version 139
System Event Logging 139
Clear System Event Logging 139
Existing Event Log Number 139
Event Log Control 140
BIOS POST Watch Dog 140
OS Boot Watch Dog 140
Timer for Loading OS (Minutes) 140
Time Out Option 140
System Event Log/System Event Log (List Mode) 141
Realtime Sensor Data 142
Security 143
Supervisor Password Is 143
User Password Is 143
Set Supervisor Password 144
Set User Password 144
Password on Boot 144
Boot 145
Boot Priority Order/Excluded from Boot Orders 145

Exit 146
Exit Saving Changes. 146
Exit Discarding Changes 146
Load Setup Defaults 147
Discard Changes. 147
Save Changes 147
BIOS POST Codes 149
Recoverable POST Errors 149
Terminal POST Errors 149
Network Connection 162
Functions Listed on the Home Page 163
Remote Control 165
KVM Console 165
Remote Power 166
Virtual Media. 166
CD-ROM Image 167
Drive Redirection 169
Virtual Media Options 171
System Health 173
Chassis Control 173
Monitor Sensors 175
System Event Log 177
Alert Settings 178
User Management 179
Change Password 179
Users and Groups 180
Permissions 181
KVM Settings 182
User Console 182
Keyboard/Mouse 185
Device Settings 187
Network 187
Dynamic DNS 189

Security 190
Certificate 193
Date and Time 195
Event Log 197
SNMP Settings 199
Maintenance 200
Device Information 200
Event Log 202
Update Firmware 203
Unit Reset 203
Remote Console Main Page 205
Remote Console Options 206
Log Out 207
Manufacturer’s Regulatory Declarations 209
Server Model Number 209
CE Notice and Manufacturer's Declaration of Conformity. 209
Electromagnetic Emissions 210
FCC Notice (USA Only) 210
Industry Canada Notice (Canada Only) 211
VCCI Class A Notice (Japan Only) 211
Shielded Cables 211
Electrostatic Discharge 211
Safety Compliance 212
Electrical Safety Precautions 217
Node Board Battery. 218
General Safety Precautions 219
ESD Safety Precautions 220
Requirements 221
Setting up the Virtual Media Boot Feature 222
Booting the Virtual Media DOS Image 223

Figures

Figure 1-1 SGI Altix XE250 Server 1
Figure 1-2 Chassis Components 2
Figure 1-3 Node Board Features 3
Figure 1-4 Node Board Block Diagram 4
Figure 1-5 L8i UIO RAID Controller 7
Figure 1-6 LSI MegaRAID 8708ELP RAID Controller 8
Figure 1-7 Rear Panel 11
Figure 1-8 Front Panel Controls and Indicators 12
Figure 2-1 Rack Rail Installation 19
Figure 2-2 Chassis Rail Installation 20
Figure 2-3 Install the Server in a Rack 22
Figure 3-1 Remove the Top Cover 27
Figure 3-2 Node Board Replacement 29
Figure 3-3 Node Board Components. 30
Figure 3-4 Control Panel Connector JF1 Pins 31
Figure 3-5 I/O Port Locations 32
Figure 3-6 CPU Heatsink Components 33
Figure 3-7 Install a CPU Heatsink 40
Figure 3-8 Memory DIMM Locations 47
Figure 3-9 Memory Block Diagram 48
Figure 3-10 Install DIMMs 51
Figure 3-11 Replace DIMMs 52
Figure 3-12 Node Board Component Locations 53
Figure 3-13 Install a PCI Card 55
Figure 3-14 JPW1, JPW2, and JPW3 Location 59
Figure 3-15 JF1 Connector Location Pin Definitions 61

Figure 3-16	Fan Connector Locations	65
Figure 3-17	Chassis Intrusion Connector Location	67
Figure 3-18	Power Supply Fail LED Connector Location	68
Figure 3-19	SGPIO Connector Location	70
Figure 3-20	USB Connector Locations	71
Figure 3-21	SMBUS Connector Location	72
Figure 3-22	SMB Connector Location	73
Figure 3-23	JOH1 Connector Location	74
Figure 3-24	JK1 Connector Location	75
Figure 3-25	Explanation of Jumper Pins	77
Figure 3-26	CMOS Memory Jumper Location (JBT1)	77
Figure 3-27	LAN 1 and LAN 2 Jumper Locations (JPL1)	78
Figure 3-28	3rd Power Failure Detect Jumper Locations (JP3)	79
Figure 3-29	Watch Dog Timer Jumper Location (JWD)	80
Figure 3-30	Compact Flash Jumper Settings (JWF1)	81
Figure 3-31	JI2C1 and JI2C2 Jumper Settings (JI2C1/JI2C2)	82
Figure 3-32	Reboot Option Jumper Settings (JP1)	83
Figure 3-33	Memory Voltage Select Jumper Settings (JP2)	84
Figure 3-34	Onboard Power LED (LE1)	86
Figure 3-35	SATA Port Locations	87
Figure 4-1	Chassis Front View	90
Figure 4-2	Chassis Rear View	90
Figure 4-3	JF1 Connector Locations	93
Figure 4-4	Fan Replacement	95
Figure 4-5	Disk Drive Locations	97
Figure 4-6	Disk Drive Carrier	98
Figure 4-7	Drive Removal	99
Figure 4-8	SATA/SAS Backplane Disk Drive Connectors	100
Figure 4-9	SATA/SAS Backplane Power and SAS Connectors	100
Figure 4-10	SATA/SAS Backplane Screws	102
Figure 4-11	SATA/SAS Backplane Data Cables	102
Figure 4-12	Power Supply Replacement	104
Figure 5-1	Main BIOS Setup Menu	116

Figure 5-2	Main BIOS Menu Setup Menu (2)	.119
Figure B-1	Baseboard Management Controller (BMC)	.160
Figure B-2	BMC Remote Console	.163
Figure B-3	Remote Console Screen	.165
Figure B-4	CD-ROM Image	.167
Figure B-5	Drive Redirection	.169
Figure B-6	Virtual Media Options	.171
Figure B-7	Chassis Control	.173
Figure B-8	Monitor Sensors	.175
Figure B-9	System Event Log	.177
Figure B-10	Alert Settings	.178
Figure B-11	User Console Settings	.183
Figure B-12	Keyboard/Mouse Settings	.185
Figure B-13	Network Settings	.187
Figure B-14	Dynamic DNS Settings	.189
Figure B-15	Security Settings	.191
Figure B-16	Certificate Settings	.193
Figure B-17	Date and Time Settings	.195
Figure B-18	Event Log	.197
Figure B-19	SNMP Settings	.199
Figure B-20	Device Information	.201
Figure B-21	Event Log	.202
Figure B-22	Update Firmware	.203
Figure B-23	Unit Reset	.204
Figure B-24	Remote Console Screen	.205
Figure B-25	Remote Console Options	.206
Figure E-1	Install the Battery	.218

Tables

Table 3-1	Memory DIMM Configurations	50
Table 3-2	Node Board Default Jumper Settings	56
Table 3-3	Node Board Connector Descriptions	56
Table 3-4	Node Board Connector Pin Definitions	58
Table 3-5	ATX Power Connector Pin Definitions (JPW1)	59
Table 3-6	Secondary Power Connector Pin Definitions (JPW2)	60
Table 3-7	Secondary Power Connector Pin Definitions (JPW3)	60
Table 3-8	PW_ON Switch Pin Definitions (JF1)	61
Table 3-9	Reset Switch Pin Definitions (JF1)	61
Table 3-10	Power Fail LED Pin Definitions (JF1)	62
Table 3-11	Overheat/Fan Fail LED Pin Definitions (JF1)	62
Table 3-12	NIC2 LED Pin Definitions (JF1)	63
Table 3-13	NIC1 LED Pin Definitions (JF1)	63
Table 3-14	HDD LED Pin Definitions (JF1)	63
Table 3-15	Power On LED Pin Definitions (JF1)	64
Table 3-16	NMI Button Pin Definitions (JF1)	64
Table 3-17	Fan Connector Pin Definitions (Fan1/2 - Fan7/8)	65
Table 3-18	Keyboard Connector Pin Definitions (PS/2)	66
Table 3-19	Wake on LAN Connector Pin Definitions (JWOL)	66
Table 3-20	Wake on Ring Connector Pin Definitions	67
Table 3-21	Chassis Intrusion Pin Definitions (JL1)	67
Table 3-22	Power Supply Fail LED Pin Definitions (JP3)	68
Table 3-23	Ethernet Ports (LAN1/LAN2)	68
Table 3-24	Serial Port Pin Definitions (COM2)	69
Table 3-25	Power LED/Speaker (JD1)	69

Table 3-26	Serial General Purpose I/O Connector Pin Definitions (SGPIO)	70
Table 3-27	Universal Serial Bus (USB) Pin Definitions	71
Table 3-28	SMB Power Connector Pin Definitions (SMBUS)	72
Table 3-29	SMB Connector Pin Definitions (SMB)	73
Table 3-30	Overheat/Fan Fail LED Connector Pin Definitions (JOH1)	74
Table 3-31	Keylock Connector Pin Definitions (JK1)	75
Table 3-32	Node Board Jumper Descriptions	76
Table 3-33	VGA Jumper Settings (JPG1)	78
Table 3-34	LAN1/LAN2 Jumper Settings (JPL1)	78
Table 3-35	3rd Power Failure Detect Jumper Settings (JP3)	79
Table 3-36	Watch Dog Timer Jumper Settings (JWD)	80
Table 3-37	Compact Flash Master/Slave Jumper Settings (JCF1)	81
Table 3-38	Compact Flash Jumper Settings (JWF1)	81
Table 3-39	I2C to PCIe Slot Jumper Settings	82
Table 3-40	Reboot Option Jumper Settings (JP1)	83
Table 3-41	Memory Voltage Select (JP2)	84
Table 3-42	LAN1 and LAN 2 LED Descriptions	85
Table 3-43	Onboard Power LED Description (LE1)	85
Table 3-44	SATA Port Pin Definitions	87
Table 4-1	Part Numbers and Marketing Codes	91
Table 5-1	BIOS Default Settings	106
Table A-1	BIOS Post Codes	150
Table B-1	Health Monitoring Sensors	176
Table D-1	System Specifications	213

About This Guide

This guide provides an overview of the installation, architecture, general operation, and descriptions of the major components in the SGI® Altix® XE250 server. It also provides basic troubleshooting and maintenance information, BIOS information, and important safety and regulatory specifications.

Audience

This guide is written for owners, installers, system administrators, and users of SGI Altix XE250 computer systems. It is written with the assumption that the reader has a good working knowledge of computers and computer systems.

Important Information

Warning: To avoid problems that could void your warranty, your SGI or other approved system support engineer (SSE) should perform any replacement of parts or service of your SGI Altix XE250 system not covered in the following list of items that you can perform yourself:

- Install the server into system rack(s).
- Replace the power supply, power distribution board, or fans in the server chassis.
- Replace disk drives or disk drive backplane in the server chassis.
- Replace processors, memory, or processor heatsinks on the node board.
- Add or replace PCIe cards or the baseboard management controller (BMC)
- Replace cables

Chapter Descriptions

The following topics are covered in this guide:

- Chapter 1, “Introduction,” provides a checklist of the main components included with the system and describes the main features of the SGI Altix XE250 and its node boards.
- Chapter 2, “Server Installation,” describes the steps necessary to install the system into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.
- Chapter 3, “Advanced Node Board Setup,” provides detailed information on the 1U rackmount server chassis. Follow the procedures in this chapter when you install, remove, or reconfigure SAS/SATA or peripheral drives and when you replace system power supply units and cooling fans.
- Chapter 4, “Advanced Chassis Setup,” provides detailed information about the components inside the server chassis, such as the node board connectors and jumper settings, disk drive information, and power supply replacement.
- Chapter 5, “BIOS Settings,” includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.
- Appendix A, “BIOS Power-on Self Test,” provides information about BIOS POST self-test messages and codes.
- Appendix C, “Regulatory Specifications and Safety Information,” lists regulatory information that may be important to the operation of your system.
- Appendix D, “System Specifications,” provides physical, environmental, and power specifications for your system.
- Appendix E, “System Safety,” provides a general overview of safety precautions that should be followed when installing and servicing the SGI Altix XE250.
- Appendix F, “Upgrading BIOS,” gives an overview of the various methods for upgrading BIOS and the details for upgrading clusters via the BMC web interface.

Related Publications

The following SGI and LSI documents are relevant to the SGI Altix XE250 server:

- *MegaRAID SAS Software User's Guide*, publication number, publication number 860-0488-00*x*
- *MegaRAID 1078-based SAS RAID Controllers User's Guide*, publication number 860-0489-00*x*
- *SGI ProPack 5 for Linux Start Here*, publication number 007-4837-00*x*
- *SGI InfiniteStorage* series documentation
- Man pages (online)

You can obtain SGI documentation (as well as the pertinent LSI books), 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 and most comprehensive set of online books, release notes, man pages, and other information.
- You can also view man pages by typing **man** <*title*> on a command line.

SGI systems include a set of Linux® man pages, formatted in the standard UNIX® "man page" style. Important system configuration files and commands are documented on man pages. These are found online on the internal system disk (or DVD-CD) and are displayed using the `man` command. For example, to display the man page for the `xscsidisktest` command, type the following on a command line:

```
man xscsidisktest
```

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

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

```
apropos disk
```

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

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.
variable	The italic typeface denotes variable entries and words or concepts being defined. Italic typeface is also used for book titles.
`user input`	This bold fixed-space font denotes literal items that the user enters in interactive sessions. Output is shown in nonbold, fixed-space font.
[ ]	Brackets enclose optional portions of a command or directive line.
...	Ellipses indicate that a preceding element can be repeated.
`man page`(*x*)	Man page section identifiers appear in parentheses after man page names.
GUI element	This font denotes the names of graphical user interface (GUI) elements such as windows, screens, dialog boxes, menus, toolbars, icons, buttons, boxes, fields, and lists.

Product Support

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

- Refer to http://www.sgi.com/support/
- If you are in North America, contact the Technical Assistance Center at +1 800 800 4SGI or contact your authorized service provider.
- If you are outside North America, contact the SGI subsidiary or authorized distributor in your country.

Reader Comments

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

You can contact SGI in any of the following ways:

- Send e-mail to the following address: techpubs@sgi.com
- Contact your customer service representative and ask that an incident be filed in the SGI incident tracking system.
- Send mail to the following address:

  SGI
  Technical Publications
  1140 East Arques Avenue
  Sunnyvale, CA 94085–4602

SGI values your comments and will respond to them promptly.

Introduction

The SGI Altix XE250 server is a 2U rackmount server (refer to Figure 1-1 and Figure 1-2) that contains 1 node board, power supplies, cooling fans, and disk drives.

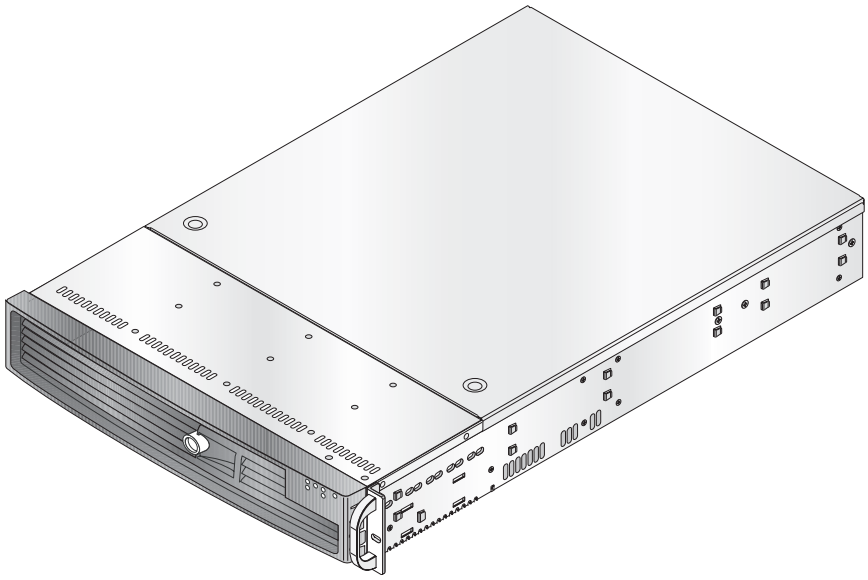


Figure 1-1 SGI Altix XE250 Server

The following hardware are components are included (refer to Figure 1-2):

- Three 8-cm hot-swap chassis fans
- Node board including CPUs and heatsinks, and memory DIMMs
- One DVD-CD drive
- One rail set
- SATA/SAS disk drives
- SATA/SAS Accessories
  - SATA/SAS backplane
  - Eight hot-swap drive carriers
  - Disk drive cables
  - 3.5-in dummy drive trays as needed

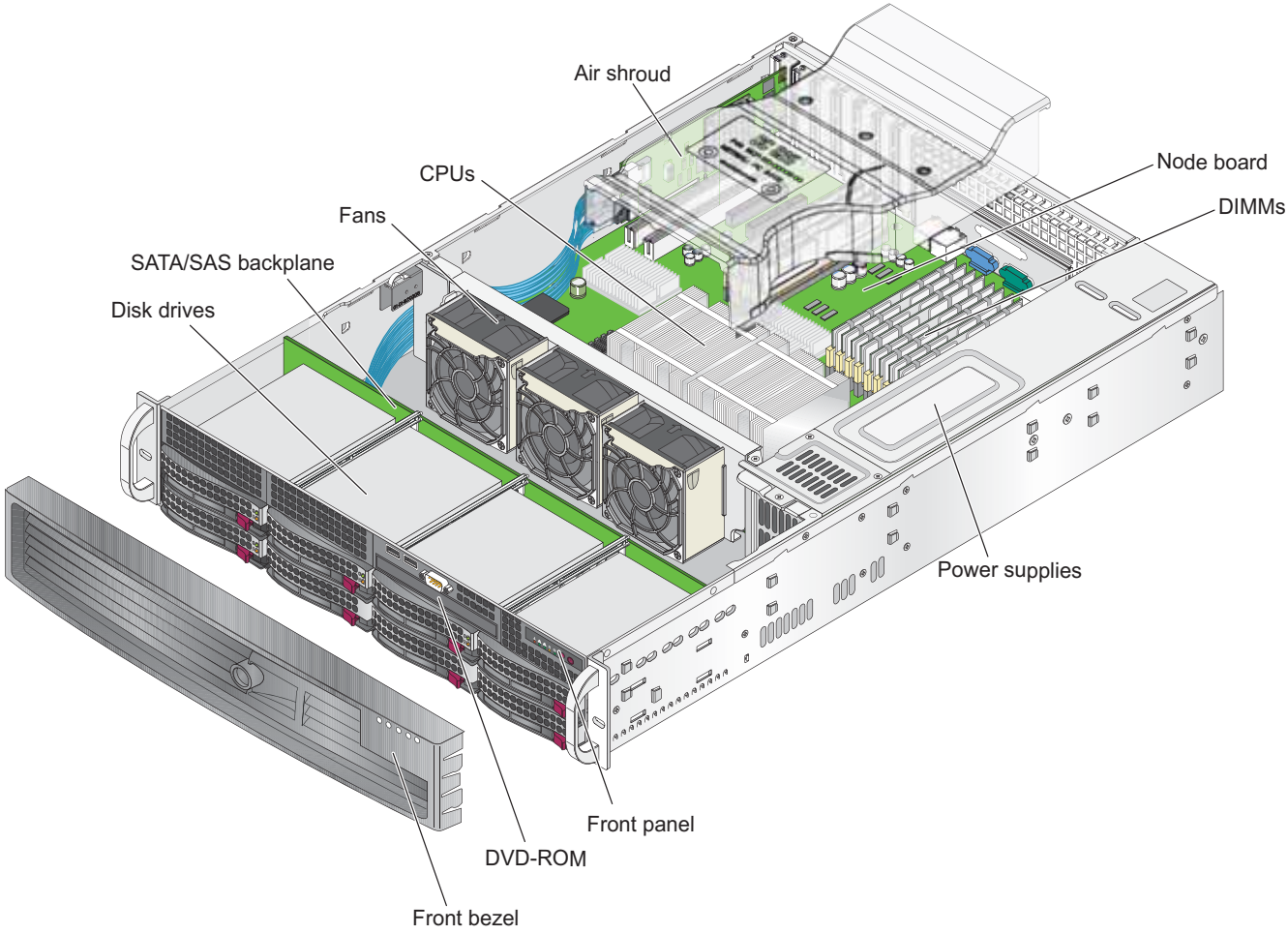


Figure 1-2 Chassis Components

Node Board Features

At the heart of the SGI Altix XE250 a dual-processor node board which is based on the Intel 5400 chipset (refer to Figure 1-3 and Figure 1-4).

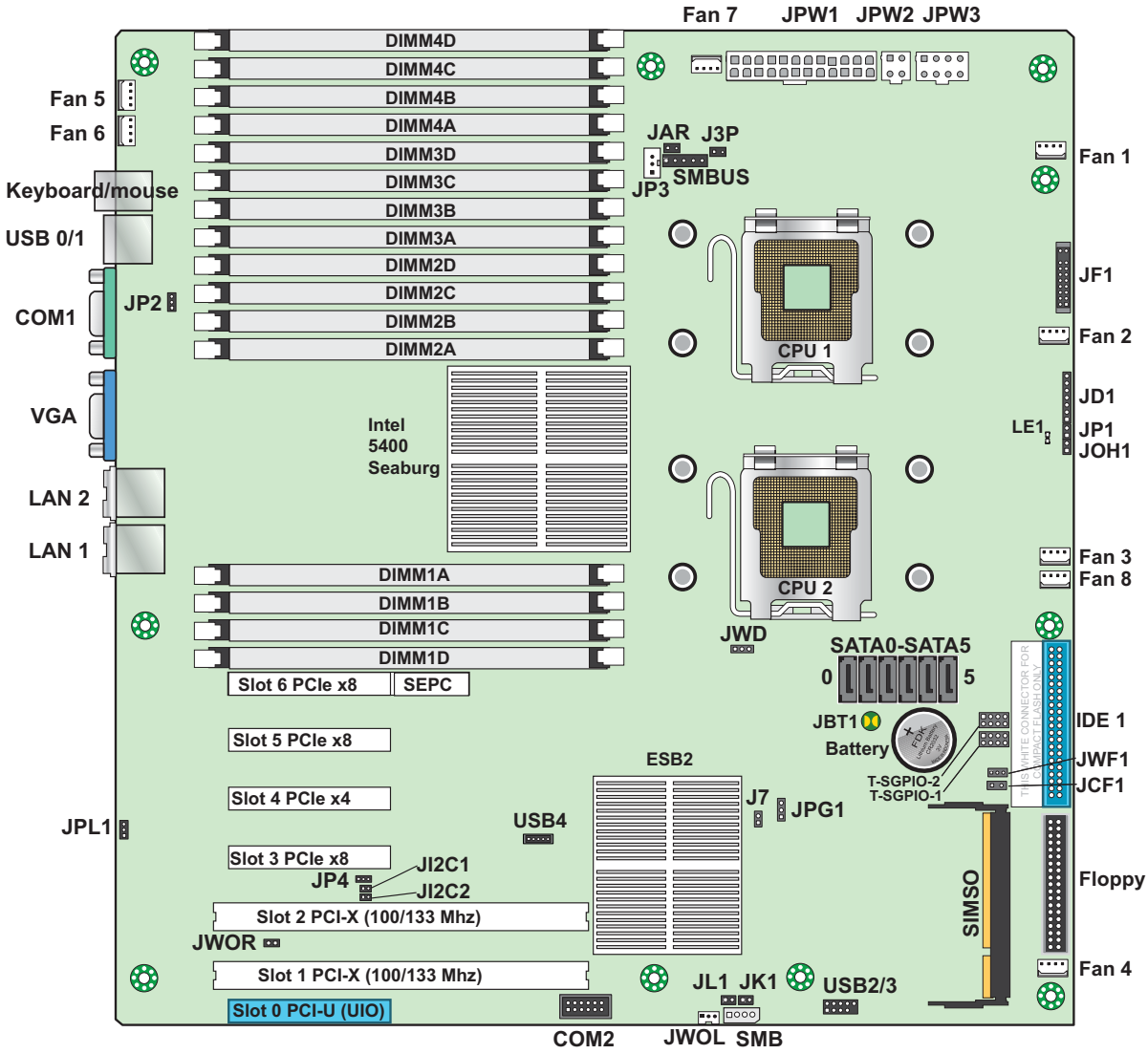


Figure 1-3 Node Board Features

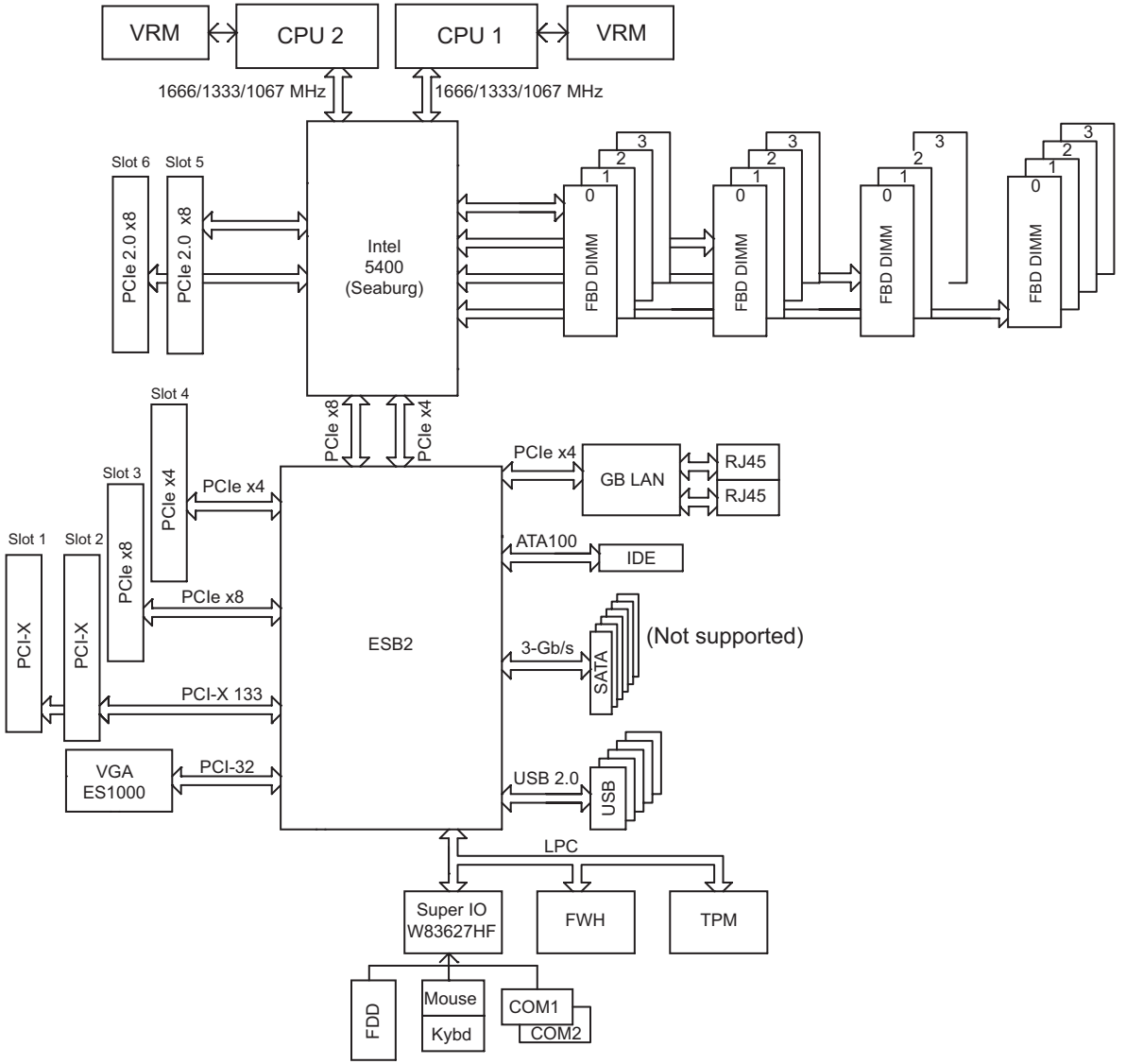


Figure 1-4 Node Board Block Diagram

Processors

The node board supports single or dual Intel® Xeon® processors (CPU 1 and CPU 2 in Figure 1-2 and Figure 1-3) 600/1333 MHz. Quad-core Intel Xeon processor sequence 5400 or dual-core Intel Xeon processor sequence 5200 are supported as long as both CPUs are of the same type.

Memory

The node board has sixteen 240-pin DIMM slots that can support up to 128 GB of FBD (fully buffered DIMM) ECC DDR2-800/667 SDRAM. The memory operates in a 4-way interleaved configurations and requires modules of the same size and speed to be installed two at a time (refer to Figure 1-3 and Figure 1-4).

Serial ATA (SATA) Controller

A SATA controller is integrated into the ESB2 (South Bridge) chip and provides a six-port 3-Gb/s Serial ATA subsystem. This feature is not supported for the initial release of the SGI Altix XE250 server (refer to Figure 1-4).

PCI Expansion Slots

The node board has three PCIe x8 slots (two are generation 2), one PCIe x4 slot, two 64-bit 133/100 MHz PCI-X slots and one UIO slot (refer to Figure 1-3 and Figure 1-7 on page 11).

Note: If you populate the UIO slot you cannot use the 133 MHz PCI-X bus in slot 1 due to the physical space requirements of the UIO card. Conversely, if you populate the 133 MHz PCI-X bus in slot 1 you cannot use the UIO slot.

UIO

The node board features Universal I/O technology (PCI-U) connector that supports a Supermicro AOC-USASLP-L8i UIO card to control internal SATA/SAS drives in a RAID 0, 1, or 10 configuration.

Onboard Controllers/Ports

One floppy drive connector and two onboard ATA/100 connectors (one reserved for the use of a compact flash card) are provided to support IDE hard drives or ATAPI devices (not used). The color-coded I/O ports include one COM port (an additional COM header is located on the node board), a VGA (monitor) port, two USB 2.0 ports (three additional USB headers are included on the node board), PS/2 mouse and keyboard ports and two gigabit Ethernet ports.

ATI Graphics Controller

The SGI Altix XE250 features an integrated ATI video controller based on the ES1000 graphics chip.

Other Features

Other onboard features include voltage monitors, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection, and BIOS rescue.

System Disks

The SGI Altix XE250 server supports 8 serial ATA (SATA) or serial attached SCSI (SAS) system disk drives.

RAID Support

The SGI Altix XE250 server supports a Supermicro AOC-USASLP-L8i UIO or an or an LSI MegaRAID® 8708ELP system drive controller to provide RAID support for the internal system drives.

L8i UIO Card

The AOC-USASLP-L8i UIO card (refer to Figure 1-5) supports RAID 0, 1, (and JBOD volumes) and uses the LSI® LSISAS1068E SAS controller. The SAS controller is an eight-port, 3.0-Gb/s SATA/SAS controller that is compliant with the Fusion-MPT™ (Message Passing Technology) architecture, provides an eight-lane PCI Express interface, and supports Integrated RAID™ technology.

RAID volumes can be created using the LSI SAS BIOS configuration utility. When BIOS loads during boot and you see the message about the LSI configuration utility, press Ctrl-C to start the configuration utility.

The LSI Logic MPT configuration utility included in SGI ProPack™ 5 for Linux (or higher) can be used to manage your RAID when booted into the OS. To start the configuration utility and select the SAS controller, enter `lsiutil`. For additional help, enter `lsiutil -h`.

Note: Refer to the *LSI Integrated SAS for RAID User's Guide*, SGI publication number 860-0476-001for more information about configuring RAID on the SGI Altix XE250 server.

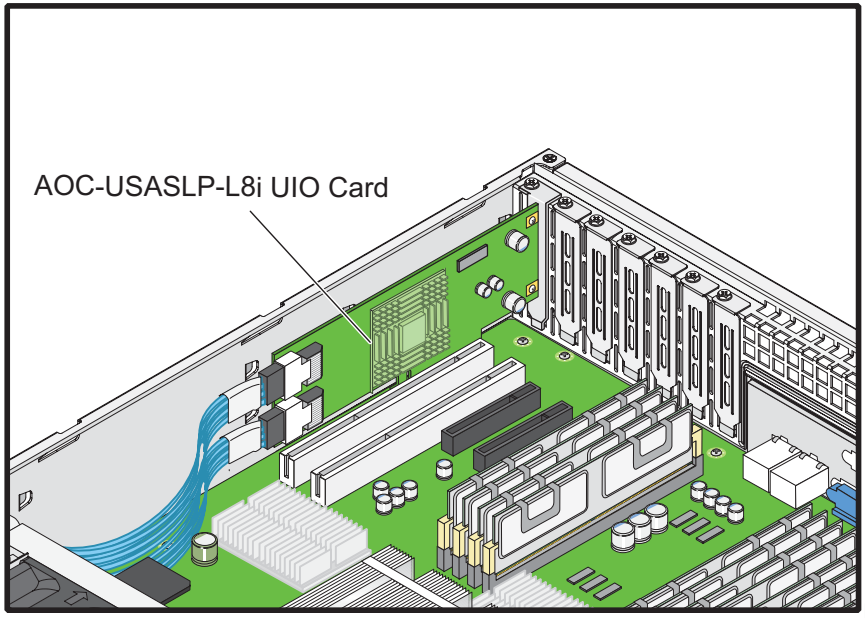


Figure 1-5 L8i UIO RAID Controller

MegaRAID 8708 HBA

The LSI MegaRAID SAS 8708ELP is a low-profile adapter that offers eight internal 3 Gb/s serial attached SCSI (SAS) ports on two SFF8087 mini-SAS multi-lane connectors, 667 Mhz DDRII write cache, and a PCIe host interface. The 8708ELP offers support for both SAS expanders as well as SATA native command queuing (NCQ). This adapter is installed in the slot 4 (PCIe x4) of the SGI Altix XE250 PCI expansion bus and provides support for SATA/SAS drives in a RAID 0, 1, 10, 5, 6, and JBOD volumes.

Your SGI Altix XE250 server includes RAID documentation and tools that are included on a CD-ROM from LSI Logic Corporation. For more information please refer to the following SGI documents that are available from http://techpubs.sgi.com:

- *MegaRAID SAS Software User's Guide*, SGI publication number 860-0488-00*x*.
- *MegaRAID 1078-based SAS RAID Controllers User's Guide*, SGI publication number 860-0489-00*x*.

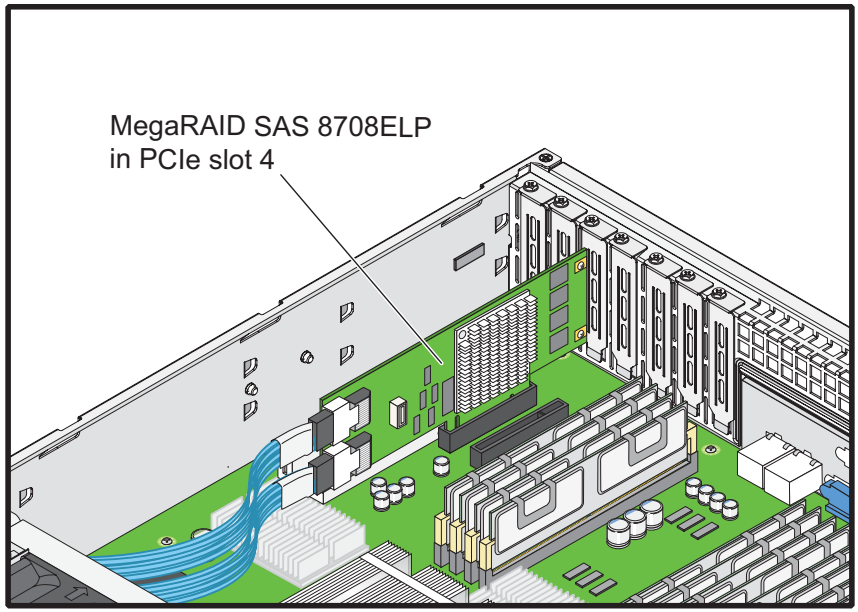


Figure 1-6 LSI MegaRAID 8708ELP RAID Controller

Chipset Overview

Built upon the functionality and the capability of the 5400 chipset, the SGI Altix XE250 node board provides the performance and feature set required for quad-processor or dual-processor-based high-end systems with configuration options optimized for complex storage platforms. The 5400 chipset supports single or dual Intel Quad-Core/Dual-Core Xeon 5200 or 5400 series processors with front side bus speeds of up to 1.6 GHz. The chipset consists of the 5400 Memory Controller Hub (MCH) for the host bridge and the 631xESB/632xESB I/O Controller Hub (Enterprise South Bridge 2-ESB2) for the I/O subsystem.

MCH (North Bridge)

The 5400 MCH (North Bridge) provides two FSB processing interfaces, four fully buffered (FBD) DIMM memory channels, PCI-Express bus interfaces configurable to form x8 or x16 ports, an EB2 South Bridge Interface (ESI) and SMBus Interfaces for system management, and DIMM Serial Presence Detect (SPD). The peak bandwidth for each FBD channel is 8 GB/s for DDR2 800/667 FBD memory, giving a total memory size of 128 MB for 4 FBD channels. The PCI-Express interfaces can be configured to form x8 or x16 ports that can operate up to generation 2 speeds in x16 configuration for enhanced graphics applications.

I/O Controller Hub-ESB2 (South Bridge)

The 631xESB/632xESB I/O Controller Hub (Enterprise South Bridge 2) integrates an Ultra ATA 100 Controller, six Serial ATA host controller ports, one EHCI host controller, six external USB 2.0 ports, an LPC interface controller, and a flash BIOS interface controller. Additionally, the ESB 2 chip also contains a PCI interface controller, Azalia 97 codec digital controller, integrated LAN controller, an ASF controller and an ESI for communication with the MCH. The Intel ESB2 offers the data buffering and interface arbitration capabilities.

Compliant with the ACPI platform, the ESB2 supports the Full-On, Stop-Grant, Suspend-to-RAM, Suspend-to-Disk, and Soft-Off power management states. Combined with the functionality offered by the onboard LAN controller, the ESB2 also supports alert systems for remote management.

Server Chassis Features

This section describes the main features of the SGI Altix XE250 2U chassis. Refer to Chapter 4, “Advanced Chassis Setup.” for more detailed information.

Note: For more detail on the chassis, refer to Chapter 4, “Advanced Chassis Setup.”

System Power

The server chassis features a single 900W power module or dual-redundant 900W power modules. This power redundancy feature allows you to replace a failed power supply without shutting down the system (refer to Figure 1-2).

SATA/SAS Backplane/Drives

As a system, the SGI Altix XE250 supports eight SATA/SAS system disk drives (refer to Figure 1-2). The disk drives are hot-swappable units and are connected to a backplane that provides power and control.

Cooling

The SGI Altix XE250 chassis includes three 8-cm hot-plug system cooling fans located in the middle of the chassis (refer to Figure 1-2). An air shroud channels the airflow from the system fans to efficiently cool the processor area of the system. The power supply module also includes a cooling fan.

An air shroud (refer to Figure 1-2) directs cool air from the fans over the CPU heatsinks and memory DIMMS, and prevents the heat from these components from escaping into the chassis.

IO Back Panel

The I/O backplane provides seven low-profile PCI expansion slots, one COM port, a parallel port, a VGA port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports. The PWR Fail LED on each power supply illuminates when a power supply failure occurs. The LED remains on until the failed unit has been replaced.

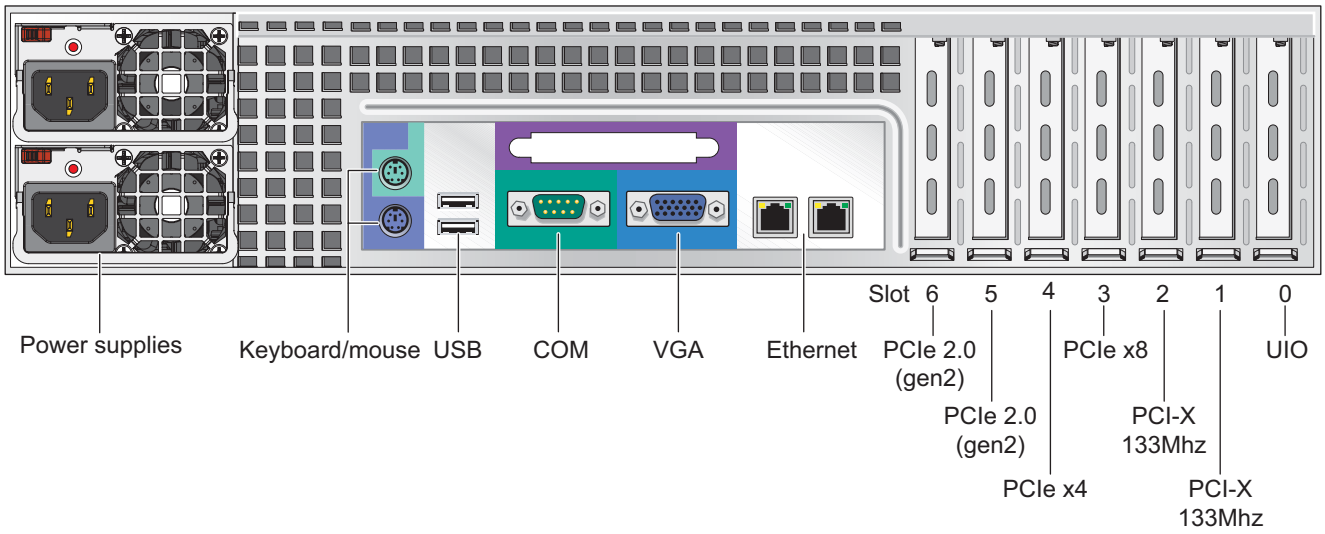


Figure 1-7 Rear Panel

Controls

The front panel controls and indicators (refer to Figure 1-8) are described below:

- **Power/Reset** - The two push-buttons located on the front of the chassis are (in order from left to right) a reset button and a power on/off button.

  Use the reset button to reboot the system. The the main power button is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

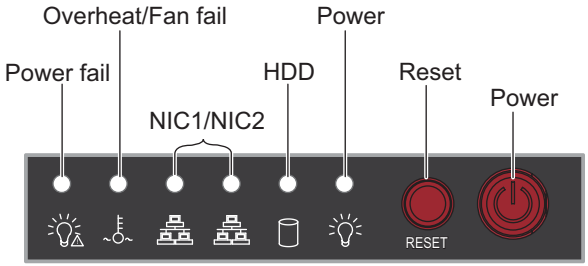


Figure 1-8 Front Panel Controls and Indicators

Indicators

The control panel on the front of the SGI Altix XE250 system and has six LED indicators (refer to Figure 1-8). Each LED provides you with critical information related to its own specific node board.

The following items explain the node board LED indicators and the corrective action that you should take when the LED illuminates:

- **HDD**: Channel activity for the hard disk drive (HDD). This light indicates drive activity on the node board when flashing.
- **NIC1**: Indicates network activity on LAN1 when flashing.
- **NIC2**: Indicates network activity on LAN2 when flashing.
- **Overheat/Fan fail**: When the Overheat/Fan Fail LED flashes, it indicates that a fan has failed. When the Overheat/Fan Fail LED is on continuously, it indicates that an overheat condition has occurred, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm.

  Note: Check the routing of the cables and make sure all fans are present and operating normally. Check that the chassis covers are installed properly.

  Verify that the processor heatsinks are installed properly (refer to Chapter 3). Verify that the overhead/fan fail LED remains flashing. It will remain flashing as long as the overheated or fan fail condition exists.

- **Power Fail**: Indicates power is being supplied to the system's power supply unit. This LED should normally be illuminated when the system is operating.

Drive Carrier Indicators

Each drive carrier has two LED indicators.

- **Green**
  - When illuminated, the green LED on the front of the drive carrier indicates drive activity. A connection to the SATA/SAS backplane enables this LED to blink on and off when that particular drive is being accessed.
- **Red**
  - The red LED indicates two states. When blinking, it indicates the drive is rebuilding. When solid, it indicates a drive failure.
  - If a drive fails, you should be notified by your system management software. Refer to Chapter 4 for instructions about how to replace a failed disk drive.

Server Installation

This chapter provides a quick setup checklist to get the SGI Altix XE250 operational.

Unpack the System

Inspect the shipping container that the SGI Altix XE250 was shipped in 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 SGI Altix XE250 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 16.

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

Leave 48 in. (122 cm) of clearance in front and rear of the rack to enable you to open the front door completely. The clearance is also required for sufficient airflow and service access.

Warnings and Precautions

Rack Precautions

Warning: **The SGI Altix XE250 server weighs 57 lbs (26 kg). Always use proper lifting techniques when your 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.**

Warning: **Extend the leveling jacks on the bottom of the rack to the floor with the full weight of the rack resting on them. Failure to do so can result in serious injury or death.**

Warning: **Attach stabilizers to the rack in single rack installations. Failure to do so can result in serious injury or death.**

Warning: **Couple racks together in multiple rack installations. Failure to do so can result in serious injury or death.**

Warning: **Be sure the rack is stable before extending a component from the rack. Failure to do so can result in serious injury or death.**

Warning: **Extend only one component at a time. Extending two or more components simultaneously may cause the rack to tip over and result in serious injury or death.**

Server Precautions

- Review the electrical and general safety precautions in Appendix E, “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 plug 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 (35º C or 95º F). Refer to Appendix D, “System Specifications” for information.

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.).

Install the System into a Rack

This section provides information on installing the SGI Altix XE250 into a rack. If the system has already been mounted into a rack, refer to "Check the Node Board Setup" on page 23. 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.

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

Install the Rack Rails

Determine where you want to place the Altix XE250 server in the rack. Position the fixed rack rail/sliding rail guide assemblies (made up of two inter-locking sections) at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack and the rollers toward the front of the rack. Attach the other assembly to the other side of the rack, making sure both are at the exact same height and with the rail guides facing inward. Use the following procedure to attach the rack rails:

1. Attach the short bracket to the outside of the long bracket. You must align the pins with the slides. Also, both bracket ends must face the same direction.
2. Adjust both the short and long brackets to the proper distance so that the rail fits snugly into the rack.
3. Secure the long bracket to the front side of the outer rail with two M5 screws and the short bracket to the rear side of the outer rail with three M5 screws.
4. Repeat steps 1-4 for the left outer rail.

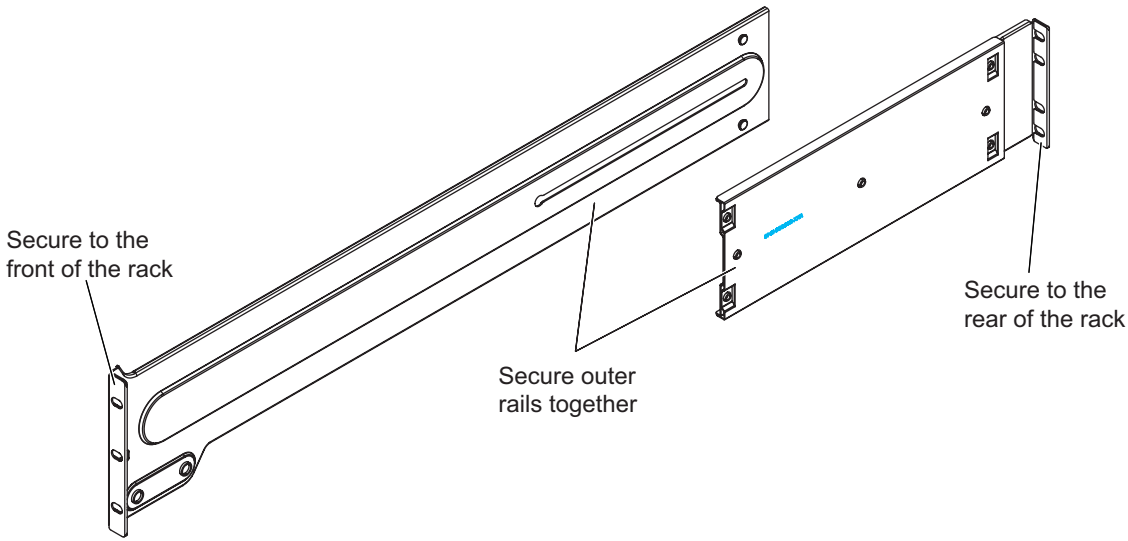


Figure 2-1 Rack Rail Installation

Install the Chassis Rails

Note: The chassis rail may be factory installed on the system. Perform the following procedure to install the chassis rails only if necessary (refer to Figure 2-2).

5. Position the rack rails on the chassis as shown in Figure 2-2 and slide the rail under the tabs on the chassis.
6. Install two screws to secure the rail to the chassis. (Refer to Figure 2-2.)

Both chassis rails have a locking tab (refer to Figure 2-2), which serves two functions: the first is to lock the server into place when it is installed in the rack; the second is to lock the server in place when it is fully extended from the rack. The locking tab prevents the server from being removed from the rack accidentally when you pull it out for service.

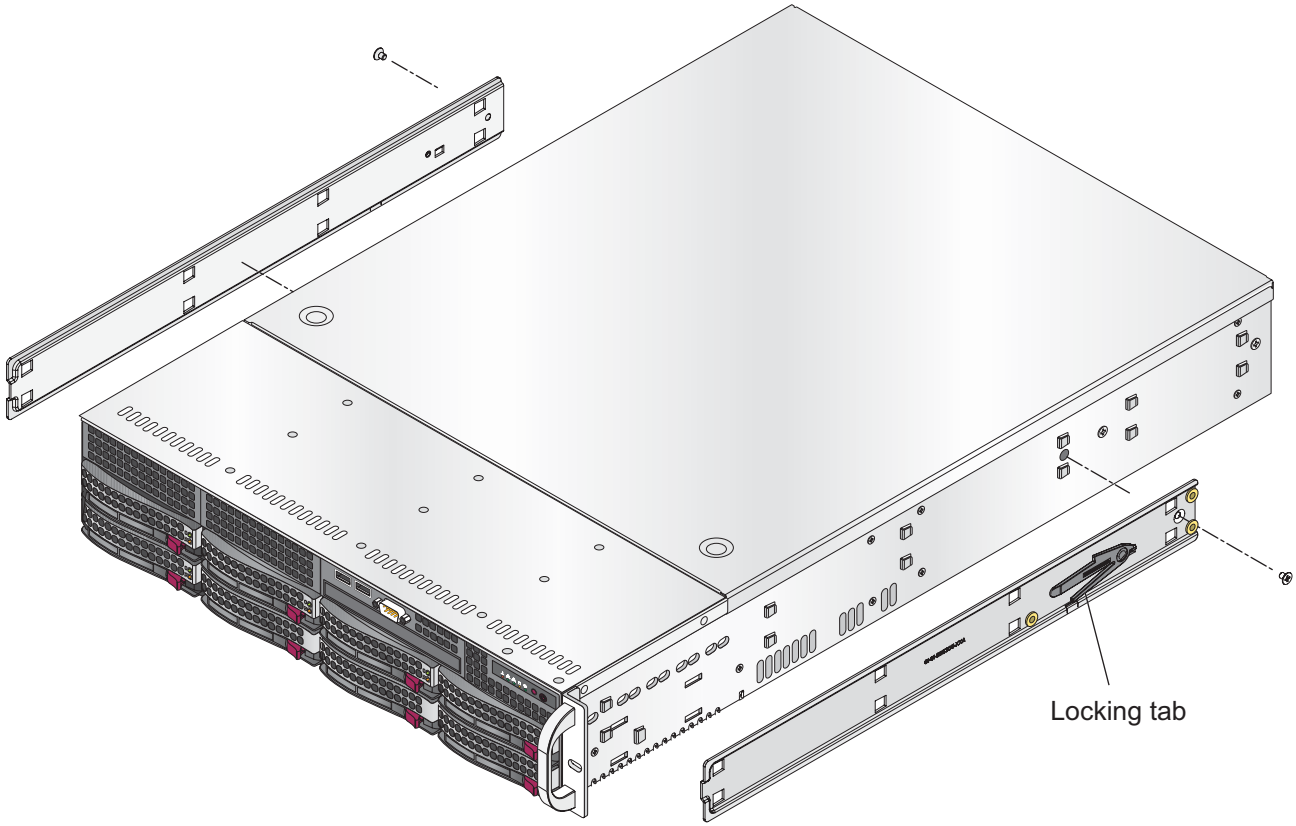


Figure 2-2 Chassis Rail Installation

Install the Server in a Rack

Warning: The SGI Altix XE250 server weighs 57 lbs (26 kg) Always use proper lifting techniques when your move the server. Always get the assistance of another qualified person when you install the sever in a location above your shoulders. Failure to do so may result in serious personal injury or damage to the equipment.

You should now have rails attached to both the server chassis and the rack unit. The next step is to install the server into the rack (refer to Figure 2-3).

1. Line up the rear of the chassis rails with the front of the rack rails.
2. Slide the server chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting).
3. When the server has been pushed completely into the rack, you should hear the locking tabs "click."
4. Install and tighten two screws to secure the server to the rack.

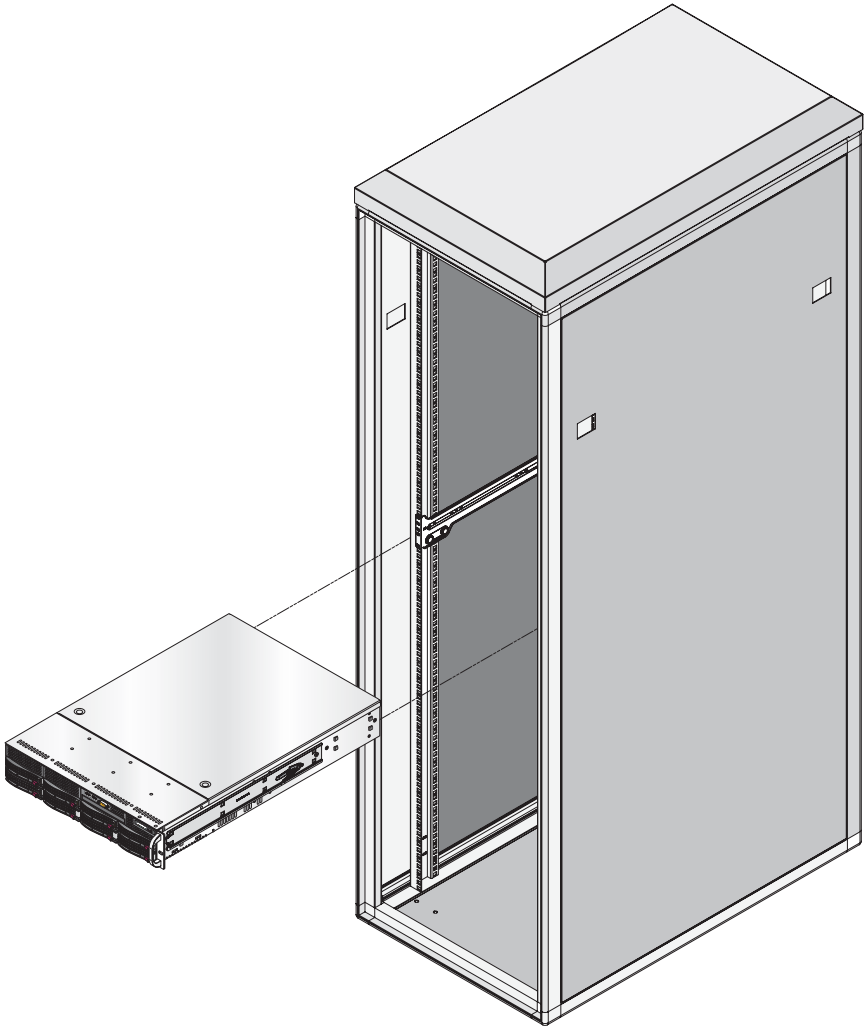


Figure 2-3 Install the Server in a Rack

Check the Node Board Setup

Use the following sections to open the top cover and check that each node board is properly installed and all the connections have been made.

Access the Inside of the Chassis

1. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a “click”).
2. Depress the two buttons on the top of the chassis to release the top cover.
3. Lift the top cover from the chassis.

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

Check the CPUs (processors)

You may have one or two processors installed on each node board. Each processor needs its own heatsink. Refer to Chapter 3, “Advanced Node Board Setup,” for instructions on how to install processors and heatsinks.

Check the System Memory

Your server system is shipped with system memory installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 3.

Install Expansion PCI Cards

You can install six expansion PCI cards in the system. Refer to Chapter 3 for details on installing PCI expansion cards.

Check all Cable Connections and Airflow

Make sure all power and data cables are properly connected and not blocking the chassis airflow. Refer to Chapter 3 for details on cable connections.

Check the Drive Bay Setup

Next, you should check to make sure the system disk drives and disk drive backplane have been properly installed and all connections have been made.

Check the System Disk Drives

Depending upon your system configuration, your system may have one or more drives installed. For detailed information about how to install disk drives, refer to Chapter 4, "Advanced Chassis Setup."

Check the Airflow

Airflow is provided by three 8-cm fans. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans. An air shroud is also installed to focus the airflow to areas where the most heat is generated.

Supply Power to the System

If necessary, install the system in a rack (refer to "Install the System into a Rack" on page 18), and connect the power cord from the power supply module into a power strip or power distribution unit (PDU). The PDU offers protection from electrical noise and power surges. SGI also recommends that you use an uninterruptible power supply (UPS) source.

Advanced Node Board Setup

This chapter includes procedures to install a node board into the SGI Altix XE250 chassis, connect the data and power cables, and install expansion cards. All node board jumpers and connections are also discussed.

A layout and quick reference chart is included in this chapter for your reference.

Note: Some software products are protected with software license keys derived from the Media Access Control (MAC) Ethernet address. When you replace a node board, the MAC Ethernet address changes. If you are using such a product, you must request a new license key after replacing the node board. Contact your local customer support office:

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

Caution: Install the chassis cover after you have completed accessing the components inside the server to maintain proper airflow and cooling for the system.

Handling the Node Board

Caution: Electrostatic discharge (ESD) can damage electrostatic-sensitive devices inside the SGI Altix XE250 server. Use the ESD precautions described below when you handle printed circuit boards or other components in the system. The following measures are generally sufficient to protect your equipment from electric static discharge.

ESD Precautions

- Use a grounded wrist strap designed to prevent electrostatic discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle each printed circuit board (PCB) by the edges; do not touch the components, peripheral chips, memory modules, or gold contacts on the PCB.
- When handling chips or modules, avoid touching the pins.
- Place the node board, expansion PCI cards, or other boards and components into antistatic bags when not in use.
- Make sure your computer chassis provides a conductive path between the power supply, the case, the mounting fasteners, and the node board to chassis ground.

Unpacking

Caution: The node board is shipped in antistatic packaging to avoid electrostatic discharge damage. Be sure to use ESD precautions when you unpack replacement components for the SGI Altix XE250 server. Failure to do so can result in damage to the equipment.

Node Board Installation

This section explains how to mount the node board into the SGI Altix XE250 chassis. To remove the node board, follow this procedure in reverse order.

Note: If the server is already installed in a rack, you must first release the retention screws that secure the unit to the rack. Then grasp the two handles on either side and pull the unit straight out until the rails lock into place.

1. Press the two buttons on the top of the chassis to release the top cover (refer to Figure 3-1).
2. Lift the top cover from the chassis.

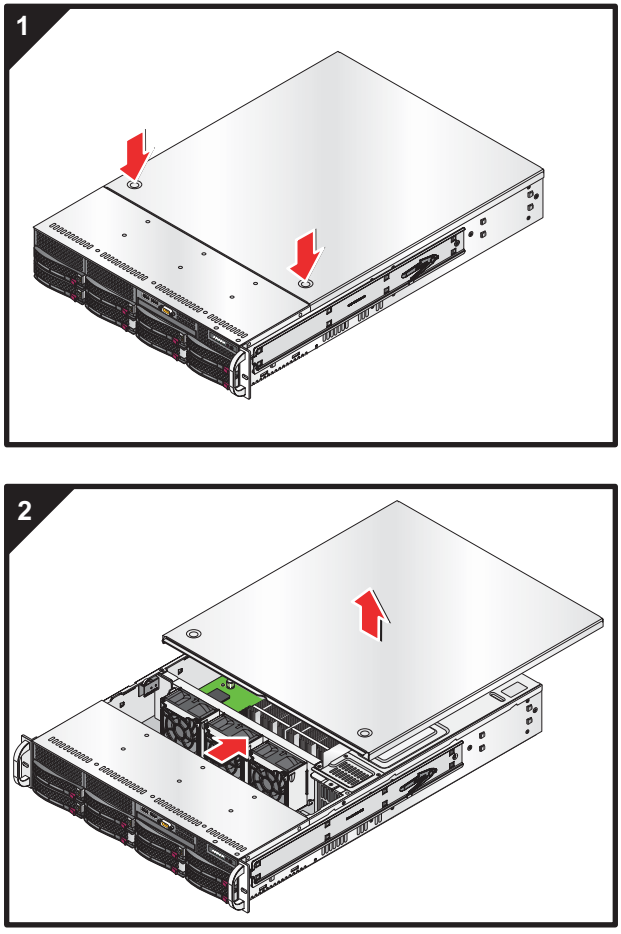


Figure 3-1 Remove the Top Cover

Install the Node Board in the Chassis

This section explains the first step of physically mounting the node board into the chassis. To remove the serverboard, follow the procedure in reverse order.

Note: Ensure that the CPU heatsink backplates and standoffs are installed in the chassis (refer to "Install a Processor" on page 33.)

1. Carefully mount the serverboard to the chassis by aligning the board holes with the raised metal standoffs in the chassis.
2. Insert eight screws into all the mounting holes on the node board that line up with the standoffs (refer to Figure 3-2).

Caution: Do not overtighten the screws in step 3. Overtightening the screws will damage the equipment.

3. Tighten each screw until snug. The metal screws also provide an electrical contact to from the node board to chassis ground.
4. Install the PCI cards in accordance with "Add PCI Expansion Cards" on page 54.
5. Install the top cover.

Connect the Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected (refer to Figure 3-3).

- System disk drive data cables (UIO or PCI adapter card)
- Control Panel cable (JF1)
- DVD-CD drive cable (IDE 1)
- USB cable (USB2/3)
- COM Port cable (COM2)

Important: Make sure the cables do not come into contact with the fans.

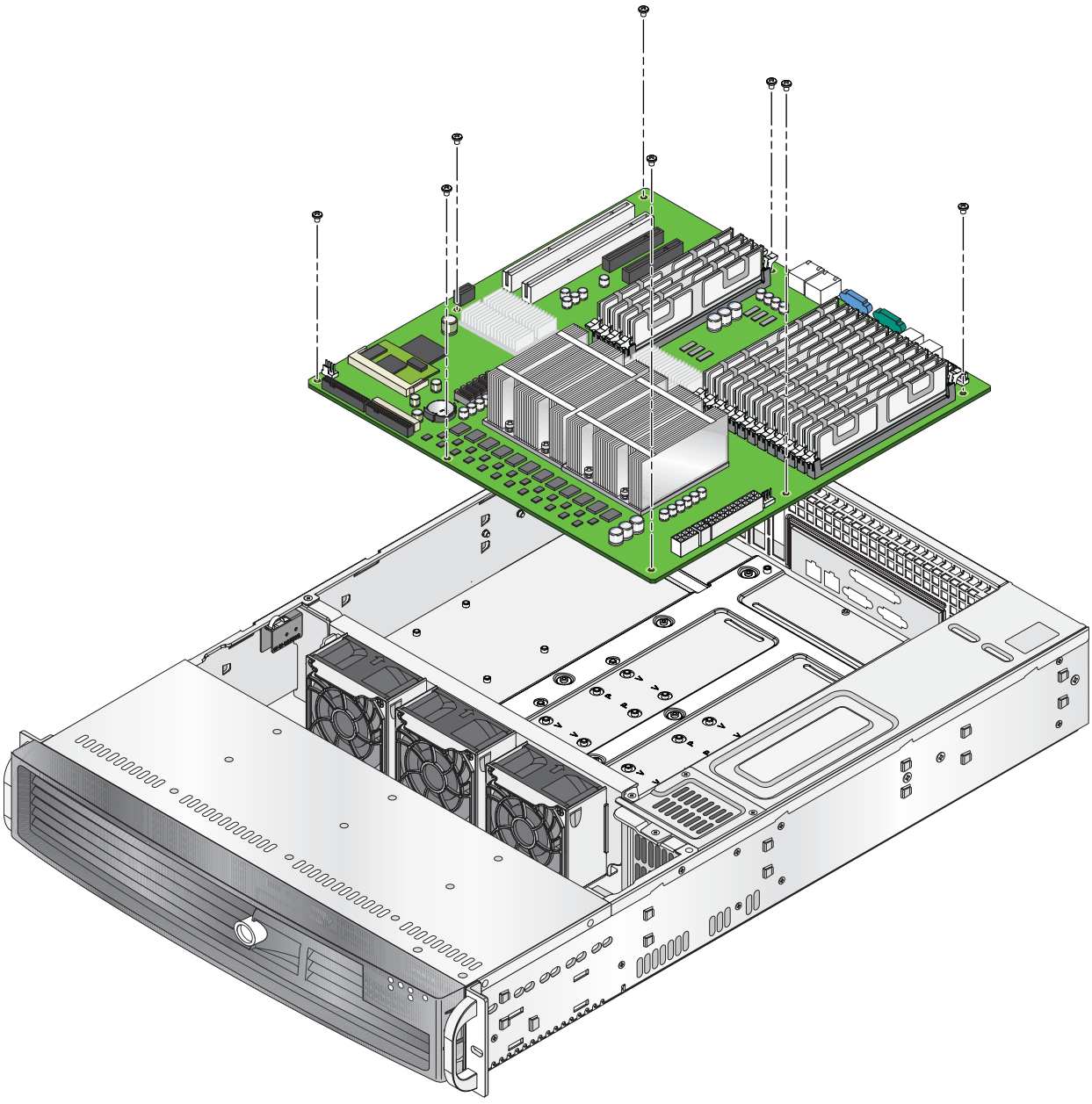


Figure 3-2 Node Board Replacement

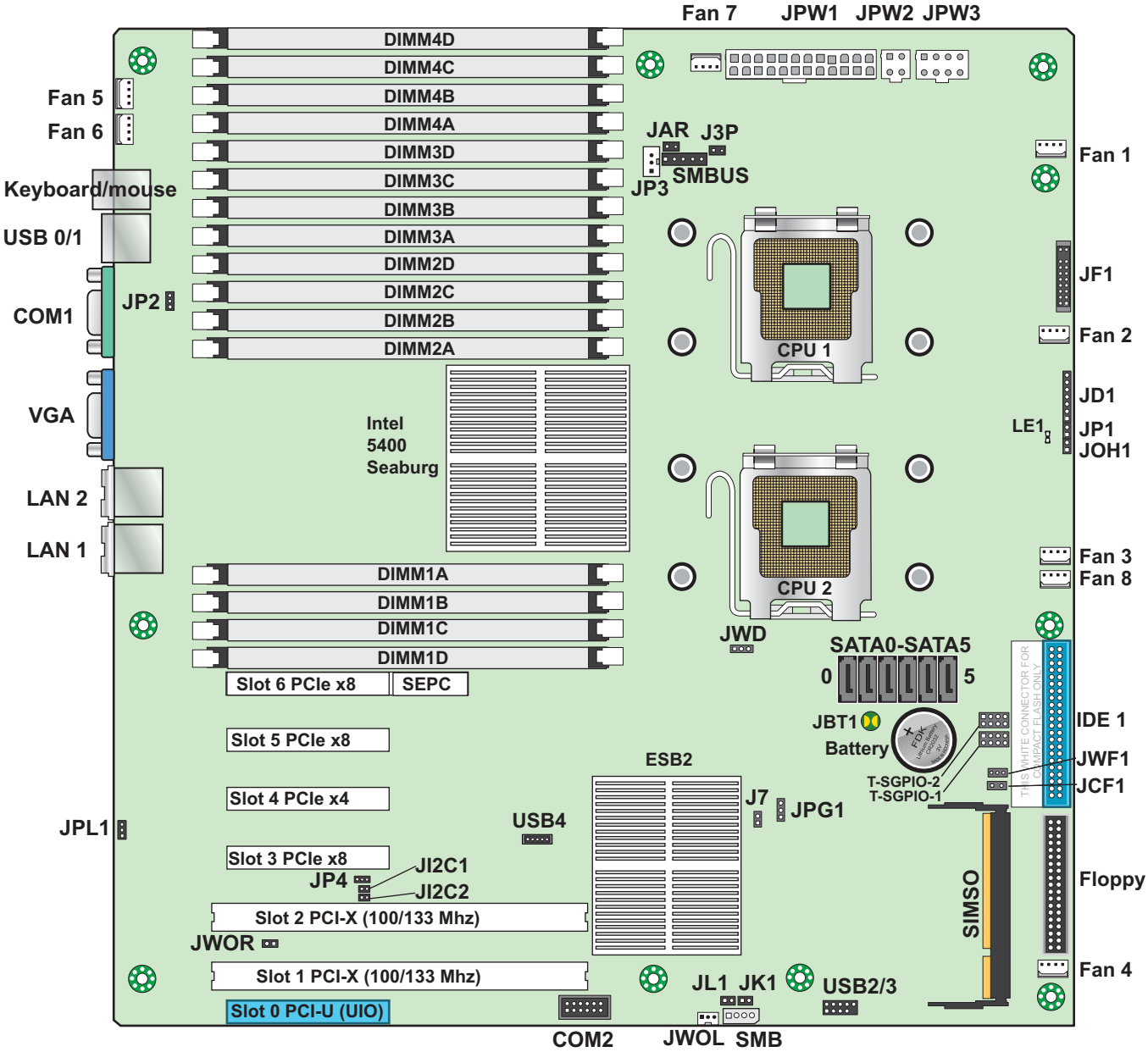


Figure 3-3 Node Board Components

Connect the Power Cables

The node board has a 24-pin primary power supply connector (JPW1) for connection to the ATX power supply. In addition, there is a 4-pin secondary power connector (JPW2) as well as an 8-pin processor power connector (JPW3) that must be connected to your power supply (refer to Figure 3-3).

Connecting the Control Panel

JF1 contains connector pins for various front control panel connectors (refer to Figure 3-4) for the pin locations of the various front control panel buttons and LED indicators. All JF1 wires have been bundled into a single cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. Refer to "Node Board Connector Pin Definitions" on page 58 for more information.

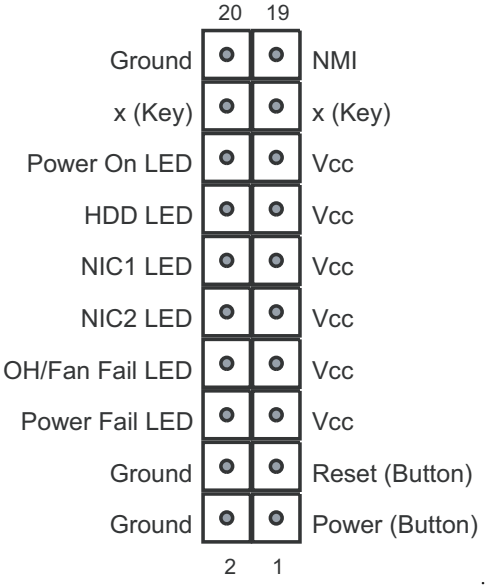


Figure 3-4 Control Panel Connector JF1 Pins

I/O Ports

The I/O ports are color coded. Figure 3-5 shows the color and location of the various I/O ports on the I/O panel.

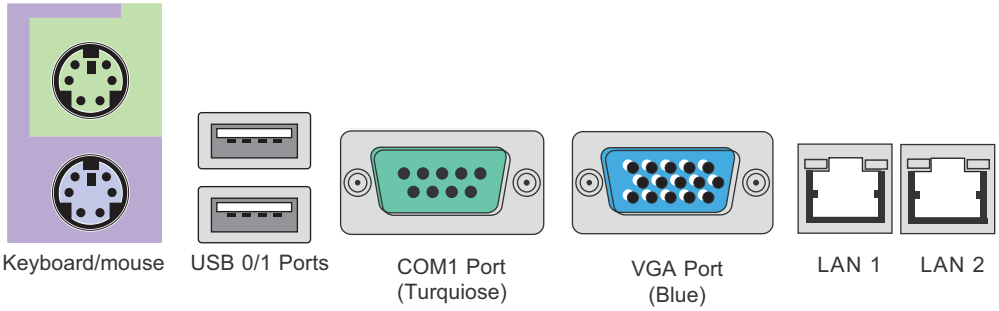


Figure 3-5 I/O Port Locations

Processor and Heatsink Installation and Removal

Caution: Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

Caution: Do not place the node board on a conductive surface. A conductive surface can damage the BIOS battery and prevent the system from booting. Always place the node board on an ESD-safe worksurface.

Caution: Make sure that you install the processor into the CPU socket before you install the heatsink. The node board can support either one or two processors. If installing one processor only, install it into CPU socket 1.

Note: SGI's replacement Xeon CPU package contains a heatsink assembly. Make sure that the black "pick-and-place" (PnP) cap is installed; otherwise, contact the SGI immediately.

Install a Processor

The heat sink backplates and serverboard must be installed in the chassis before you install the CPU heat sink (refer to Figure 3-6).

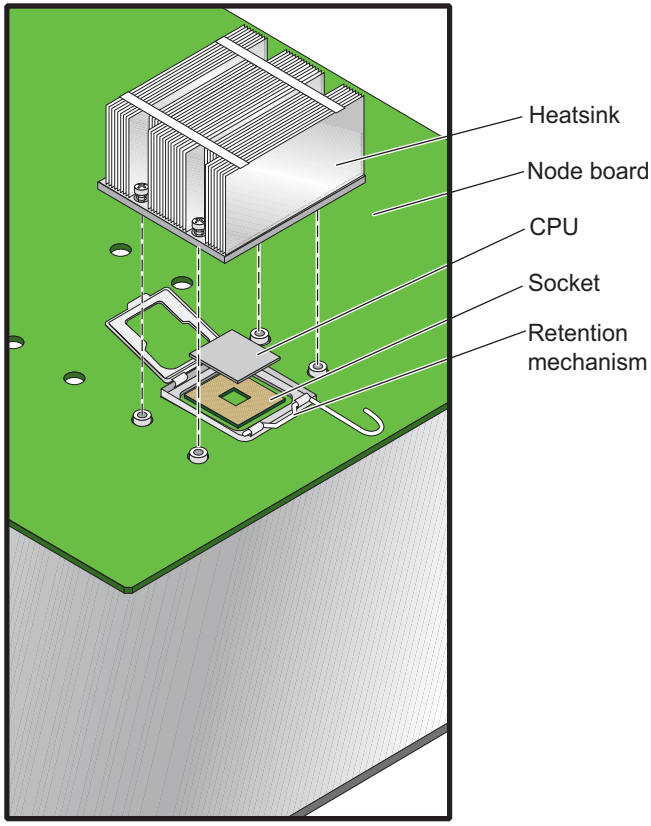
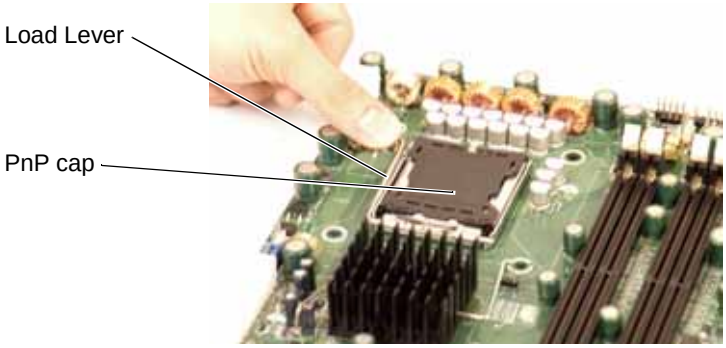


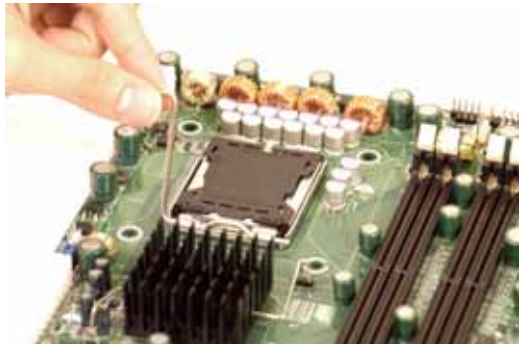
Figure 3-6 CPU Heatsink Components

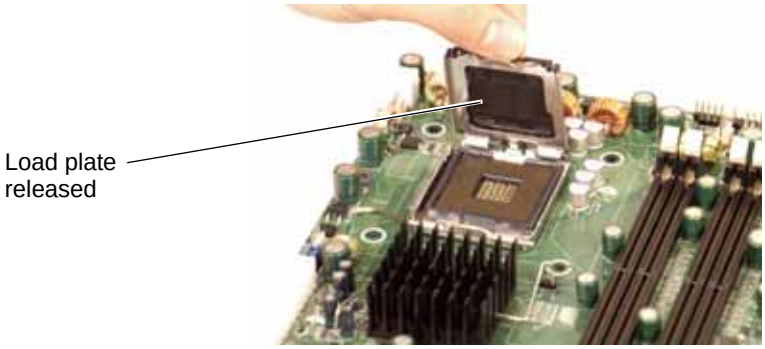
Note: A black “pick-and-place” (PnP) cap is attached to the load plate to protect the CPU socket.

1. Press the load lever down and away from the retention clasp to release the load plate from its locked position.



2. Gently lift the load lever to open the load plate.



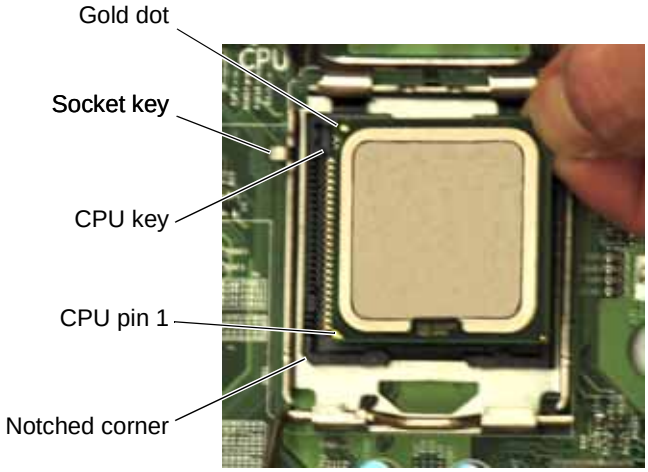


3. Use your thumb and your index finger to hold the CPU at opposite sides.

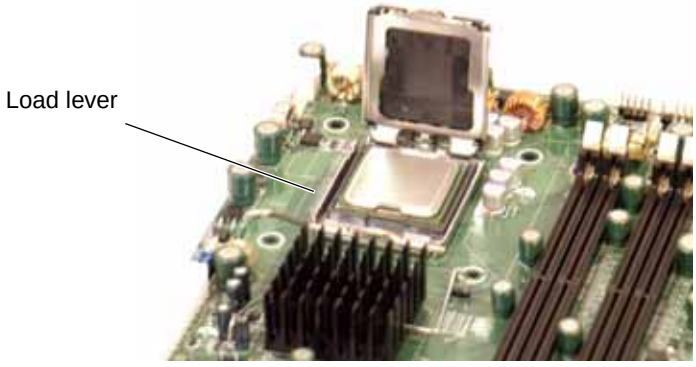
4. Align pin 1 of the CPU (the corner marked with a triangle) with the notched corner of the CPU socket.

Caution: In step 5, do not drop the CPU on the socket. Do not move the CPU horizontally or vertically, and do not rub the CPU against any surface or any of the contacts which may damage the CPU and/or contacts.

5. Once aligned, carefully lower the CPU straight down into the socket.
6. Find the corner of the CPU that has a semi-circle cutout below a gold dot (CPU key). This corner should be aligned with the cutout on the socket (socket key).

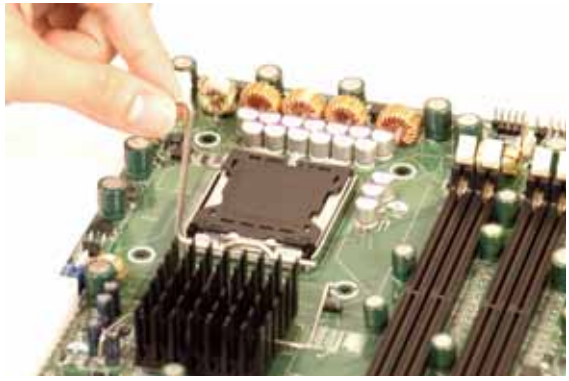


7. With the CPU in the socket, inspect the four corners of the CPU to make sure that it is properly installed.
8. Use your thumb to gently push the load lever down until it snaps into the retention clasp.

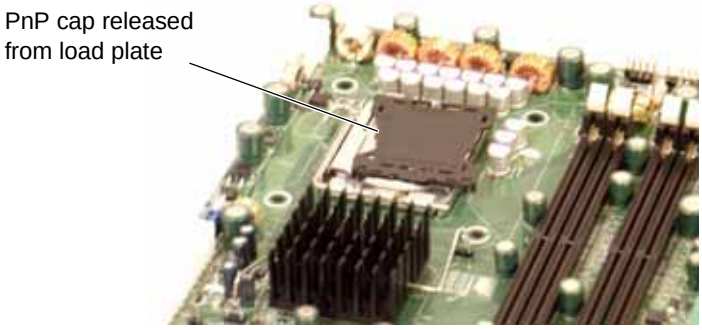


9. If the CPU is properly installed into the socket, the PnP cap is automatically released from the load plate when the lever locks.

Caution: Retain the plastic PnP cap for shipping. The node board must be shipped with the PnP cap properly installed to protect the CPU socket. Shipment without the PnP cap properly installed may void the warranty.



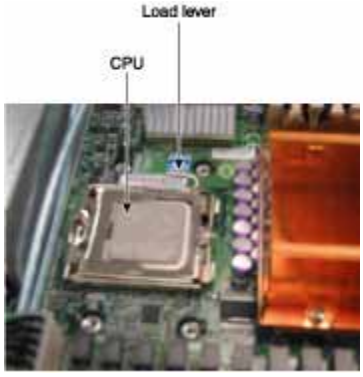
10. Remove the PnP cap.



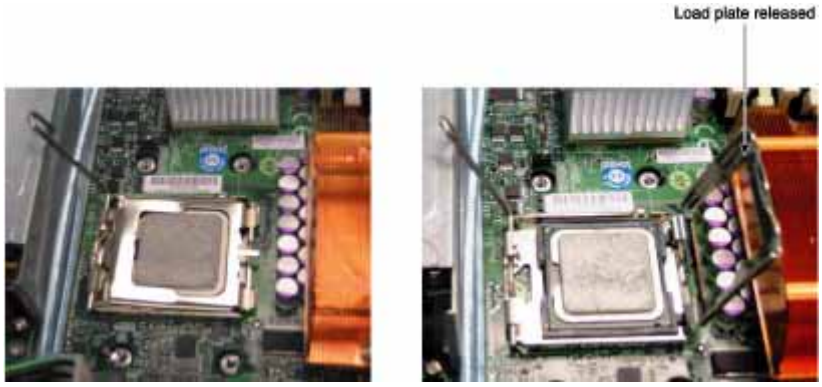
11. Repeat these steps to install a second CPU if desired.

Remove the Processor

1. Press the load lever down and away from the retention clasp to release the load plate from its locked position.



2. Gently lift the load lever to open the load plate.



3. Use your thumb and your index finger to hold the CPU at opposite sides.
4. Carefully lift the CPU straight out of the socket.

Note: If you are removing the processor so that you can return the node board to SGI, install a PnP cap in the socket.

Install a Heatsink

1. Ensure that you have replaced the thermal interface material (TIM) between the heatsink and the CPU die.

   Refer to section "Replace the Thermal Interface Material" on page 41.

Caution: Use caution when you unpack the heat sink so you do not damage the TIM.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the (preinstalled) heatsink retention mechanism.

Caution: Do not tighten the screws in step 3 or you may damage the CPU.

3. Install two screws (screw #1 and screw #2, shown in Figure 3-7) and tighten until just snug.

Caution: Do not overtighten tighten the screws in step 4 or you may damage the CPU.

4. Install the two remaining screws (screw #3 and screw #4, shown in Figure 3-7); then, gently tighten all four screws.

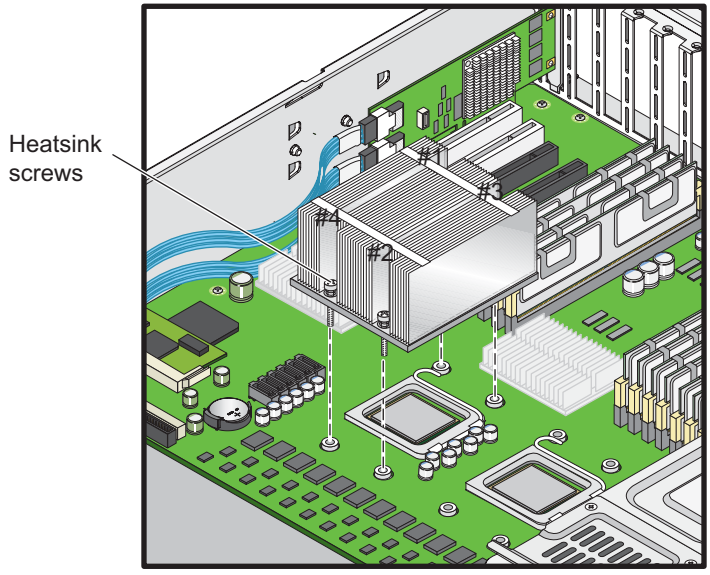


Figure 3-7 Install a CPU Heatsink

Remove the Heatsink

SGI does not recommend that the CPU or the heatsink be removed from the node board. However, if you do need to remove the heatsink, use the instructions below to prevent damage to the CPU or the CPU socket.

1. Unscrew and remove the heatsink screws from the node board in the sequence as shown in Figure 3-7.

Caution: Do not use excessive force when loosening the heatsink. Using excessive force can damage the heatsink, CPU, or node board.

2. Grasp the heatsink and gently loosen it from the CPU.
3. When the heatsink is loose, remove it from the CPU.
4. Clean the surface of the CPU and the heatsink to remove the old thermal grease.

   Refer to section "Replace the Thermal Interface Material" on page 41.
5. Apply a small amount of thermal interface material (TIM) on the surface of the CPU before you install the heatsink.

Replace the Thermal Interface Material

The Intel Xeon processors used in your server require a thermal interface material (TIM) between the processors and heatsinks to properly dissipate the heat that is generated by the processors. If you replace a processor and/or heatsink, you will need to remove the existing TIM from the processor and heatsink. Then, you will need to apply new TIM to the processor before you install the heatsink.

The TIM application instructions accompany the new TIM. The following subsections describe how to remove the existing TIM:

- "Removing TIM from a Processor" on page 42
- "Removing TIM from a Heatsink" on page 45

Removing TIM from a Processor

You should always remove the TIM from a processor before you remove it from the node board. Perform the following steps to remove the TIM from a processor:

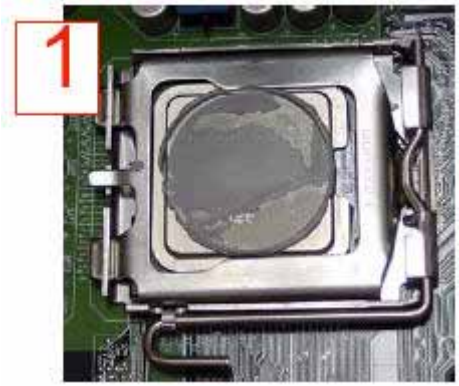
Warning: Always wear gloves when performing this procedure to avoid direct skin contact with the TIM, which is a potentially toxic material.

Tools/Parts Required:

- Dry, lint-free cloth
- Lint-free cloth moistened with isopropyl alcohol
- Gloves

Caution: To prevent the processor from moving in its socket, ensure that the processor load lever remains engaged while you perform the following procedure. If the processor moves while you remove the TIM, the pins on the processor might be damaged.

1. Remove the heatsink from the socket.



Note: If you plan to re-use the heatsink with a replacement processor, you must clean the TIM off of the heatsink. (Refer to "Removing TIM from a Heatsink" on page 45.)

2. Gently push any loose TIM pieces to the center of the processor.

3. Use a dry lint-free cloth to lift the loose TIM pieces off of the processor.

4. Use a dry, lint-free cloth to wipe any remaining TIM pieces off of the processor.

5. Use a different lint-free cloth moistened with isopropyl alcohol (IPA) to remove any remaining TIM from the processor.

Note: Be sure to remove TIM from the gaps between the processor and the load plate.

Removing TIM from a Heatsink

If you plan re-use the heatsink with a replacement processor, you need to remove the TIM from the heatsink.

Warning: Always wear gloves when performing this procedure to avoid direct skin contact with the TIM, which is a potentially toxic material.

Tools/Parts Required:

- Dry, lint-free cloth
- Lint-free cloth moistened with isopropyl alcohol
- Gloves

Perform the following steps to remove the TIM from a heatsink:

1. Remove the heatsink from the socket and place the heatsink on a secure surface with the bottom facing upward.
2. Use a dry, lint-free cloth to wipe any loose TIM pieces off of the heatsink.

3. Use a different lint-free cloth moistened with isopropyl alcohol (IPA) to remove any remaining TIM from the heatsink.

Install Memory

Caution: Exercise extreme care when installing or removing DIMM modules to prevent damage to the node board or DIMM module.

The SGI Altix XE250 node board supports up to 128 GB fully buffered (FBD) ECC DDR2 800/667 in 16 DIMM slots (four channels, two branches). Single channel memory, two-way interleaved memory and four-way interleaved memory schemes are all supported. Using four-way interleaved memory results in the best performance. There are a maximum of sixteen memory DIMMs in each node board. Memory DIMMs must be populated in groups of two on the node board. A minimum of two DIMMs must be installed on each node board. Refer to Figure 3-8 for memory DIMM locations.

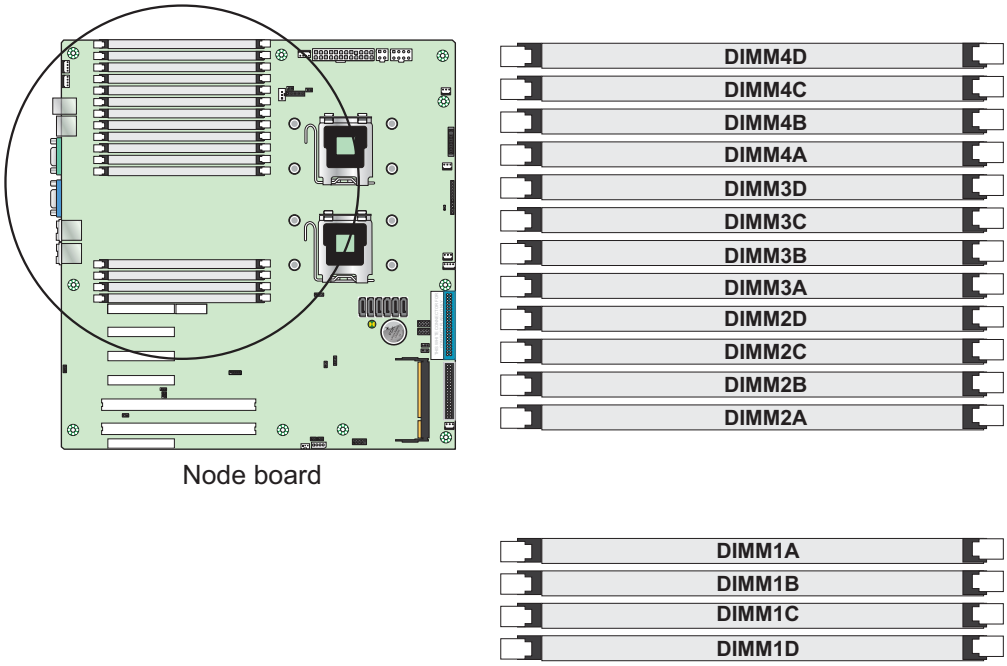


Figure 3-8 Memory DIMM Locations

Memory DIMM Layout

Figure 3-9 shows the DIMM slot designations and bank locations on the node board. There are eight DIMM pairs as follows:

- DIMM pair 1 = 1A and 2A
- DIMM pair 2 = 3A and 4A
- DIMM pair 3 = 1B and 2B
- DIMM pair 4 = 3B and 4B
- DIMM pair 5 = 1C and 2C
- DIMM pair 6 = 3C and 4C
- DIMM pair 7 = 1D and 2D
- DIMM pair 8 = 3D and 4D

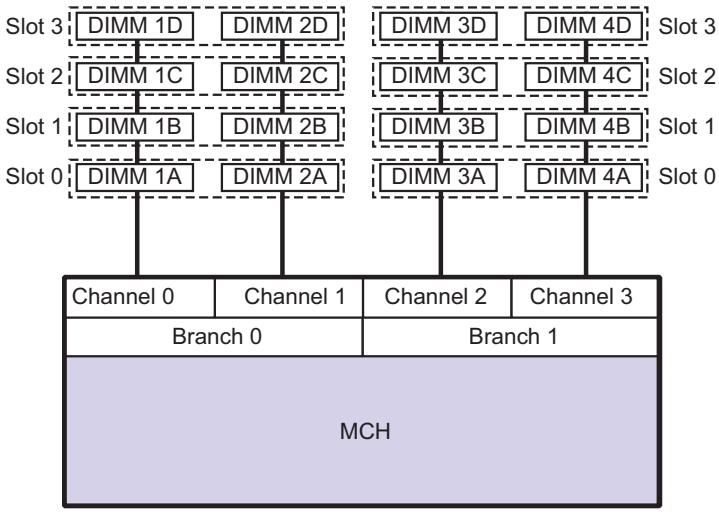


Figure 3-9 Memory Block Diagram

Memory DIMM Rules

Use the following rules when installing memory DIMMs:

- A minimum of two DIMMs must always be present.
- DIMMs within pairs must be identical in:
  - Size (1, 2, or 4 GB)
  - Speed (667 or 800 Mtransfer/sec)
  - Organization (x4 or x8 bit)
- DIMMs do not need to be identical between DIMM pairs. DIMM pair 1A/2A can be different from DIMM pair 3A/4A in size, speed and organization.

Note: The memory controller hub automatically adjusts to the lowest speed DIMM of the DIMM pair.

- When configuring the memory for maximum performance, it is critical that the memory DIMM capacity is balanced across both memory branches (refer to Figure 3-9).

The MCH memory controller has two memory branches: Branch 0 and Branch 1. DIMMs 1A, 2A, 1B, and 2B are on branch 0 and DIMMs 3A, 4A, 3B, and 4B are on branch 1. If the total capacity of the memory DIMMs on each branch are not balanced, memory performance is degraded.

- Install DIMMs with the same capacity in the following order:
  - 2 DIMMs - Install DIMM pair 1
  - 4 DIMMs - Install DIMM pair 1 and 2
  - 8 DIMMs - Install DIMM pair 1, 2, 3, and 4
  - 12 DIMMs - Install DIMM pairs 1, 2, 3, 4, 5, and 6
  - 16 DIMMs - All DIMM slots filled

Refer to Table 3-1 for the recommended DIMM configurations that achieve the maximum memory performance. Memory DIMM configurations that are not described in Table 3-1 run with degraded performance. DIMM configurations with degraded performance are: a single DIMM pair; or three, five, or seven DIMM pairs with all DIMMs the same capacity. Divide the DIMM pair capacity listed in Table 3-1 by 2 to find the size of the DIMMs for each DIMM pair.

Table 3-1 Memory DIMM Configurations

Total Node Memory Size	DIMM Pair 1 Capacity	DIMM Pair 2 Capacity	DIMM Pair 3 Capacity	DIMM Pair 4 Capacity	DIMM Pair 5 Capacity	DIMM Pair 6 Capacity	DIMM Pair 7 Capacity	DIMM Pair 8 Capacity
4GB	2GB	2GB						
8GB	2GB	2GB	2GB	2GB				
8GB	4GB	4GB						
8GB (mixed)	4GB	2GB		2GB				
12GB	2GB	2GB	2GB	2GB	2GB	2GB		
12GB (mixed)	4GB	4GB	2GB	2GB				
16GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB
16GB	4GB	4GB	4GB	4GB				
16GB	8GB	8GB						
16GB (mixed)	8GB	4GB		4GB				
20GB (mixed)	8GB	8GB	2GB	2GB				
24GB	4GB	4GB	4GB	4GB	4GB	4GB		
24GB (mixed)	8GB	8GB	4GB	4GB				
32GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB
32GB	8GB	8GB	8GB	8GB				
48GB	8GB	8GB	8GB	8GB	8GB	8GB		
64GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB

Install DIMMs

Align the DIMM so that the notch along the bottom of the DIMM module (refer to Figure 3-10 and Figure 3-11) aligns with the notch in the DIMM slot. Insert DIMMs vertically and gently press down on the DIMM until it snaps into place.

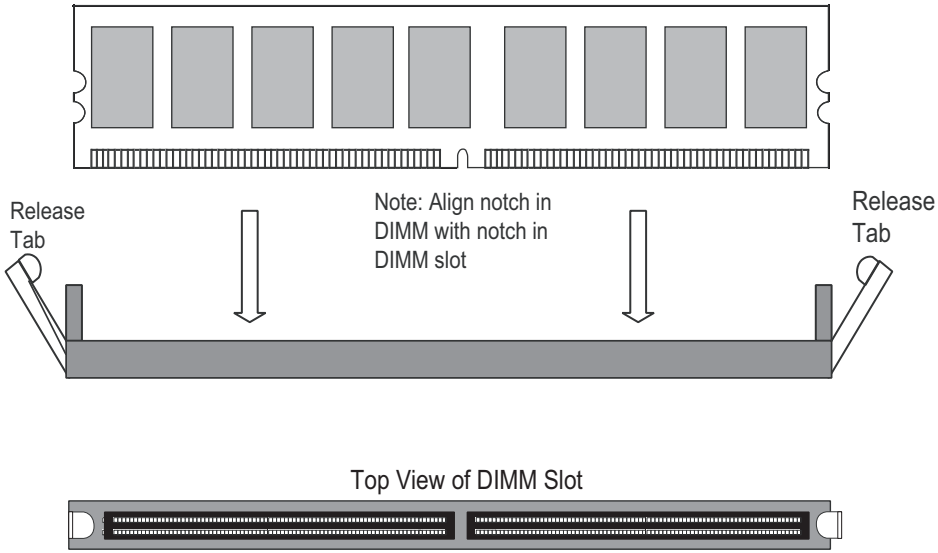


Figure 3-10 Install DIMMs

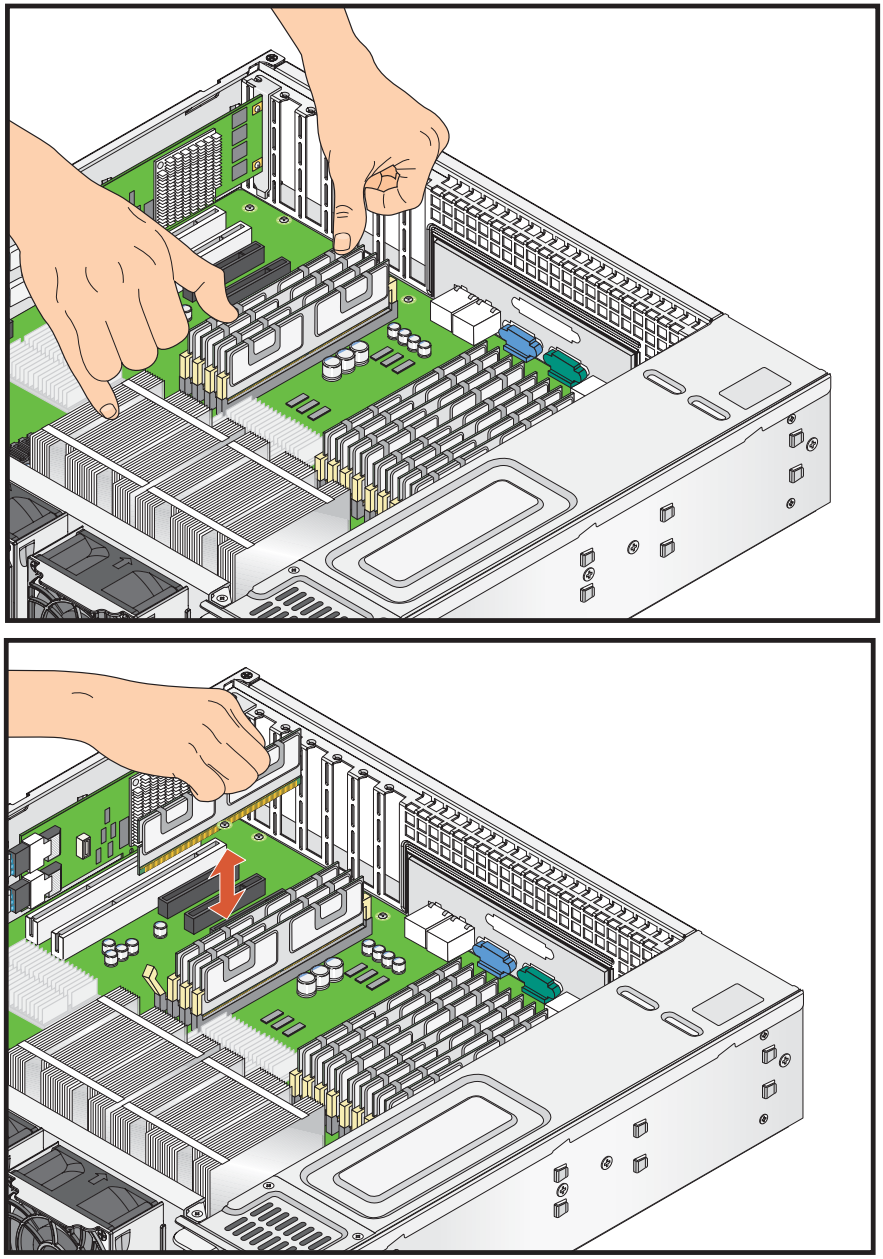


Figure 3-11 Replace DIMMs

Node Board Component Locations

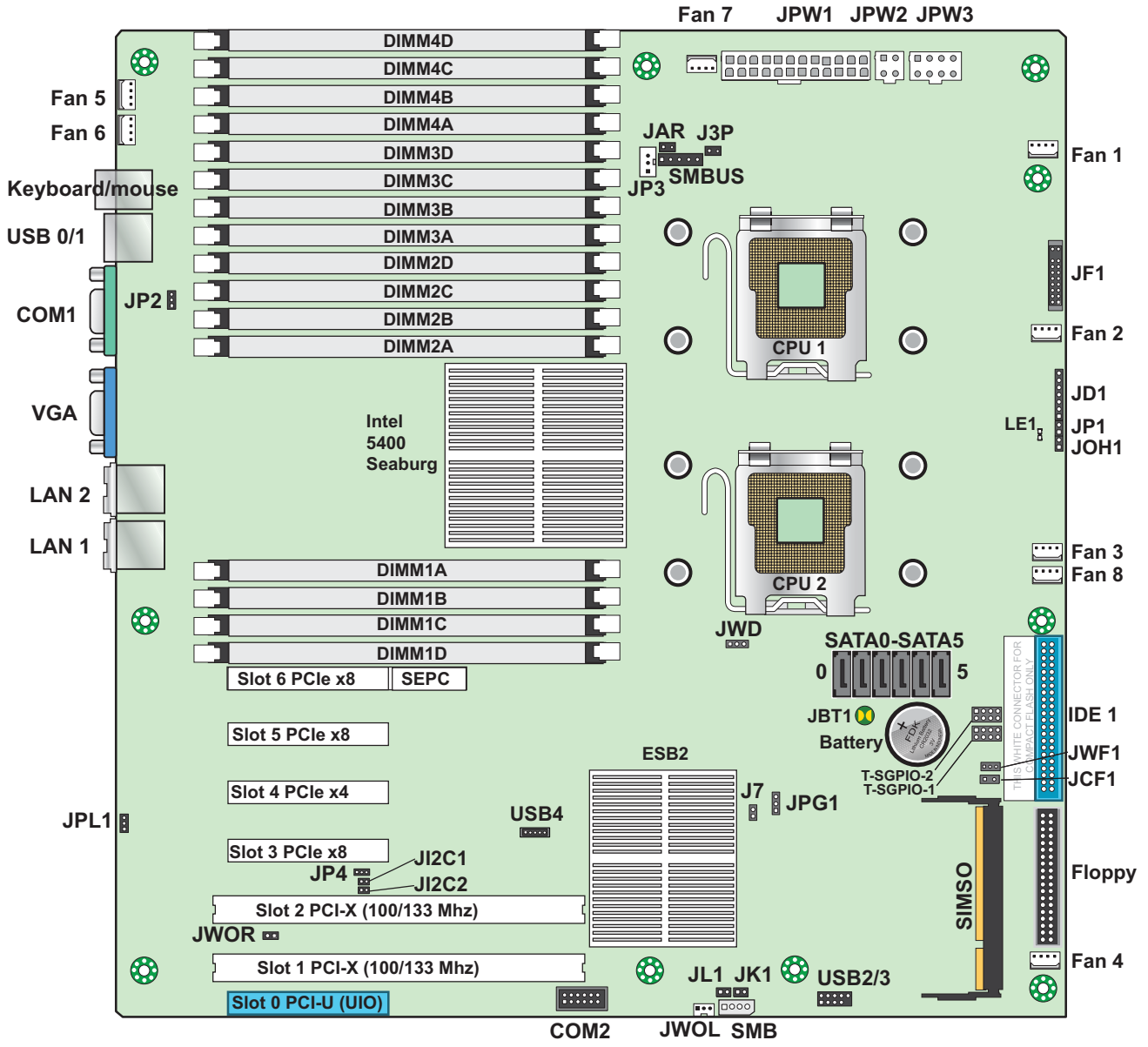


Figure 3-12 Node Board Component Locations

Add PCI Expansion Cards

The SGI Altix XE250 can accommodate three PCI Express (PCIe) x8 cards, one PCIe x4 card (in an x8 slot), two PCI-X 133/100 MHz cards and one UIO card.

All cards must be low-profile.

Note: Use only SGI approved PCI cards in the SGI Altix XE250 server.

Model LSX-BASE-250 includes an AOC-USASLP-L8i UIO adapter card to support internal SAS and SATA drives and RAID 0, 1, and 10. The following PCI slot are available for this configuration:

- 2 low-profile PCIe Gen2 x8 slots
- 1 low-profile PCIe Gen1 x8 slot
- 1low-profile PCIe Gen1 x4 slot with a x8 connector
- 1 low-profile PCI-X 133 MHz slot

Model LSX-BASE-250-RAID5 includes a MegaRAID 3708ELP card in the 1 PCIe x4 slot.The following PCI slot are available for this configuration:

- 2 low-profile PCIe 2.0 (gen2) x8 slots
- 1 low-profile PCIe (gen1) x8 slot
- 2 low-profile PCI-X 133 MHz slots

Install a PCI Expansion Card

Perform the following steps to install a PCI expansion card (refer to Figure 3-13):

1. Remove the top cover in accordance with “Access the Inside of the Chassis” on page 23.
2. Remove the EMI shield from the PCI slot you wish to populate.
3. Fully seat the card into the slot, pushing down with your thumbs evenly on both sides of the card.
4. Finish by using a screw to secure the top of the card shield to the chassis. The PCI slot shields protect the node board and its components from EMI and aid in proper ventilation, so make sure there is always an EMI shield covering each unused slot.
5. Install the top cover in accordance with “Access the Inside of the Chassis” on page 23.

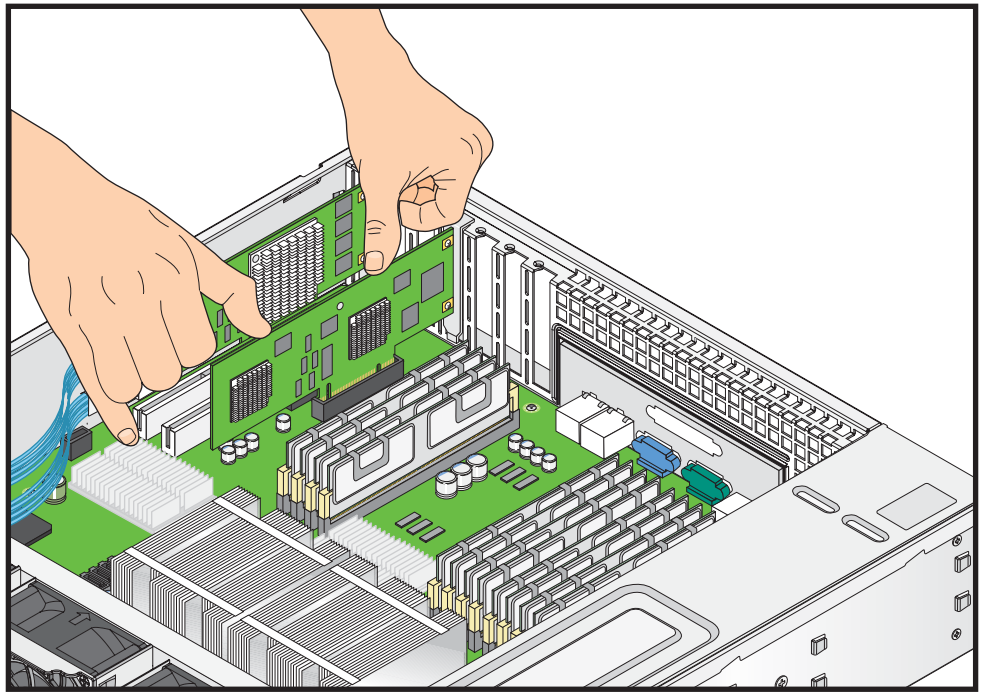


Figure 3-13 Install a PCI Card

Node Board Jumpers and Connectors

Refer to Figure 3-12 when using Table 3-2, Table 3-3 and Table 3-4.

Table 3-2 Node Board Default Jumper Settings

Jumper	Description	Default Setting
JB3	3rd Power Fail Detect	Open (Disabled)
JBT1	CMOS Clear	Refer to "CMOS Memory Clear (JBT1)" on page 77.
JCF1	Compact Flash Card Master/Slave	Closed (Master)
JI²C1/JI²C2	I²C to PCIe Slot	Open (Disabled)
JP1	Reboot option	Open (Reboot)
JP2	Memory Voltage Select	Pins 1-2 (Auto)
JPL1	LAN1/LAN2 Enable/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Table 3-3 Node Board Connector Descriptions

Connector	Description
COM1/COM2	COM1/COM2 Serial Port Connector
FAN 1-8	Chassis/CPU Fan Connectors
Floppy	Floppy Disk Drive Connector
IDE1/IDE2	IDE Drive/Compact Flash Card Connector
I-SATA0 ~ I-SATA5	SATA Ports
J3P	PWR Supply Fail LED
JAR	Alarm Rest Connector
JD1	Onboard Speaker/Power LED

Table 3-3 Node Board Connector Descriptions **(continued)**

Connector	Description
JF1	Front Panel Connector
JK1	Keylock Connector
JL1	Chassis Intrusion Connector
JOH1	Overheat Warning Connector
JPW1	24-pin ATX Power Connector
JPW2/JPW3	+12V 4-Pin / +12V 8-pin Power Connectors
JWOL/JWOR	Wake-On-LAN Connector/Wake-On-Ring Connector
JWF1	Compact Flash Card Power Connector
LAN1/2	Gigabit Ethernet (RJ45) Ports
SIMSO	SIMSO (Remote Management) Slot
SMB	System Management Bus Connector
SMBUS	SMBus I^2C Connector
T-SGPIO-1/T-SGPIO-2	Serial General Purpose Input/Output Connectors
USB0/1, USB2/3/4	Universal Serial Bus (USB) Ports, Connectors

Node Board Connector Pin Definitions

Use Table 3-4 to locate the page number for the node board connector description. Refer to Table 3-32 on page 76 for node board jumper settings.

Table 3-4 Node Board Connector Pin Definitions

Connector Description	Page
ATX Power Connector Pin Definitions (JPW1)	page 59
Secondary Power Connector Pin Definitions (JPW2)	page 60
Secondary Power Connector Pin Definitions (JPW3)	page 60
PW_ON Switch Pin Definitions (JF1)	page 61
Reset Switch Pin Definitions (JF1)	page 61
Power Fail LED Pin Definitions (JF1)	page 62
Overheat/Fan Fail LED Pin Definitions (JF1)	page 62
NIC2 LED Pin Definitions (JF1)	page 63
NIC1 LED Pin Definitions (JF1)	page 63
HDD LED Pin Definitions (JF1)	page 63
Power On LED Pin Definitions (JF1)	page 64
NMI Button Pin Definitions (JF1)	page 64
Fan Connector Pin Definitions (Fan1/2 - Fan7/8)	page 65
Keyboard Connector Pin Definitions (PS/2)	page 66
Wake on LAN Connector Pin Definitions (JWOL)	page 66
Wake on Ring Connector Pin Definitions	page 67
Chassis Intrusion Pin Definitions (JL1)	page 67
Power Supply Fail LED Pin Definitions (JP3)	page 68
Ethernet Ports (LAN1/LAN2)	page 68
Serial Port Pin Definitions (COM2)	page 69
Power LED/Speaker (JD1)	page 69
Serial General Purpose I/O Connector Pin Definitions (SGPIO)	page 70
Universal Serial Bus (USB) Pin Definitions	page 71
SMB Power Connector Pin Definitions (SMBUS)	page 72
SMB Connector Pin Definitions (SMB)	page 73
Overheat/Fan Fail LED Connector Pin Definitions (JOH1)	page 74
Keylock Connector Pin Definitions (JK1)	page 75

Connector Name	Page
COM1/COM2	page 69
Fans 1-8	page 65
JD1	page 69
JF1	page 61 – page 64
JK1	page 75
JL1	page 67
JOH1	page 74
JP3	page 68
JPW1	page 59
JPW2	page 60
JPW3	page 60
JWOL	page 66
JWOR	page 67
LAN1/LAN2	page 70
SGPIO	page 68
SMBUS	page 72
SMB	page 73

ATX Power Connector Pin Definitions (JPW1)

Table 3-5, Table 3-6, and Table 3-7 list the Altix XE250 power connector pin definitions. Figure 3-14 shows the connector location on the node board.

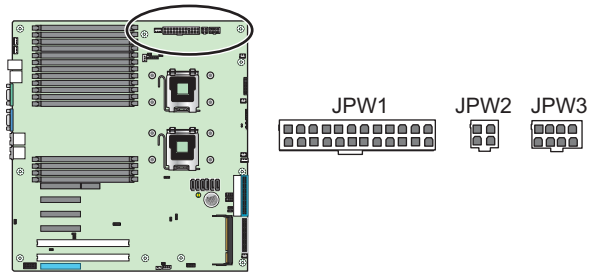


Figure 3-14 JPW1, JPW2, and JPW3 Location

Table 3-5 ATX Power Connector Pin Definitions (JPW1)

Notes	ATX Power 20-pin Connector Pin Definitions JPW1			
	Pin#	Definition	Pin#	Definition
The main ATX power supply connectors on the node board meet the SSI (Superset ATX) 24-pin specification. **Note**: You must also connect the 8-pin (JPW2/JPW3) processor power connectors to the power supply.	13	+3.3V	1	+3.3V
	14	-12V	2	+3.3V
	15	COM	3	COM
	16	PS_ON	4	+5V
	17	COM	5	COM
	18	COM	6	+5V
	19	COM	7	COM
	20	Reserved (NC)	8	PWR_OK
	21	+5V	9	5V standby
	22	+5V	10	+12V
	23	+5V	11	+12V
	24	COM	12	+3.3V

Secondary Power Connector Pin Definitions (JPW2)

Table 3-6 Secondary Power Connector Pin Definitions (JPW2)

Notes	Secondary Power Pin Definitions JPW2	
	Pin#	Definition
A 4-pin 12V auxiliary power connector is included to provide power to hard drive disks.	1	+12V
	2	Ground
	3	Ground
	4	+5V

Secondary Power Connector Pin Definitions (JPW3)

Table 3-7 Secondary Power Connector Pin Definitions (JPW3)

Notes	Secondary Power Pin Definitions JPW3	
	Pin#	Definition
A 4-pin 12V auxiliary power connector is included to provide power to hard drive disks.	1	+12V
	2	Ground
	3	Ground
	4	+5V

PW_ON Switch Pin Definitions (JF1)

Table 3-8 through Table 3-16 list the SGI Altix XE250 JF1 connector pin definitions. Figure 3-15 shows the location of connector JF1 on the node board.

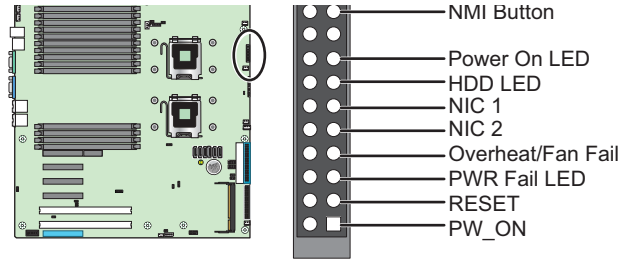


Figure 3-15 JF1 Connector Location Pin Definitions

Table 3-8 PW_ON Switch Pin Definitions (JF1)

Notes	PW_ON Button Pin Definitions JF1	
	Pin#	Definition
The PW_ON connector is on pins 1 and 2 of JF1 (refer to Figure 3-15 on page 61). This connector should be connected to the chassis power button.	1	PW_ON
	2	Ground

Reset Switch Pin Definitions (JF1)

Table 3-9 Reset Switch Pin Definitions (JF1)

Notes	Reset Button Pin Definitions JF1	
	Pin#	Definition
The reset connector is located on pins 3 and 4 of JF1 (refer to Figure 3-15 on page 61) and attaches to the reset switch on the computer chassis.	3	Reset
	4	Ground

Power Fail LED Pin Definitions (JF1)

Table 3-10 Power Fail LED Pin Definitions (JF1)

Notes	Power Fail LED Pin Definitions JF1	
	Pin#	Definition
The power fail LED connection is on pins 5 and 6 of JF1(refer to Figure 3-15 on page 61), which provides warning of a power supply failure.	5	Vcc
	6	Ground

Overheat/Fan Fail Pin Definitions (JF1)

Table 3-11 Overheat/Fan Fail LED Pin Definitions (JF1)

Notes	OH/Fan Fail LED Pin Definitions JF1	
	Pin#	Definition
The overheat (OH) fan fail LED connection is on pins 7 and 8 of JF1(refer to Figure 3-15 on page 61), which provides advanced warning of chassis overheating.	7	Vcc
	8	Ground
	State	Definition
	Off	Normal
	On	Overheat
	Flashing	Fan Fail

NIC2 LED Pin Definitions (JF1)

Table 3-12 NIC2 LED Pin Definitions (JF1)

Notes	NIC2 LED Pin Definitions JF1	
	Pin#	Definition
The NIC2 LED connection (LAN2) is on pins 9 and 10 of JF1 (refer to Figure 3-15 on page 61) and displays network activity on LAN 2.	9	Vcc
	10	Ground

NIC1 LED Pin Definitions (JF1)

Table 3-13 NIC1 LED Pin Definitions (JF1)

Notes	NIC1 LED Pin Definitions JF1	
	Pin#	Definition
The NIC1 LED connection is on pins 11 and 12 of JF1 (refer to Figure 3-15 on page 61) and displays network activity on LAN 1.	11	Vcc
	12	Ground

HDD LED Pin Definitions (JF1)

Table 3-14 HDD LED Pin Definitions (JF1)

Notes	HDD LED Pin Definitions JF1	
	Pin#	Definition
The HDD LED connection is located on pins 13 and 14 of JF1 (refer to Figure 3-15 on page 61). Attach the hard drive LED cable here to display disk activity (for any disk drives in the system, including SAS, serial ATA and IDE disk drives).	13	Vcc
	14	HD Active

Power On LED Pin Definitions (JF1)

Table 3-15 Power On LED Pin Definitions (JF1)

Notes	Power On LED Pin Definitions JF1	
	Pin#	Definition
The Power On LED connector is located on pins 15 and 16 of JF1 (refer to Figure 3-15 on page 61). Use this connection is used to indicate that power is supplied to the system.	15	5V Standby
	16	Control

NMI Switch Pin Definitions (JF1)

Table 3-16 NMI Button Pin Definitions (JF1)

Notes	Power On LED Pin Definitions JF1	
	Pin#	Definition
The non-maskable interrupt button connector is located on pins 19 and 20 of JF1 (refer to Figure 3-15 on page 61).	19	Vcc
	20	Ground

Fan Connector Pin Definitions (Fan1/2 - Fan7/8)

Table 3-17 lists the Altix XE250 fan connector pin definitions. Figure 3-16 shows the fan connector locations on the node board.

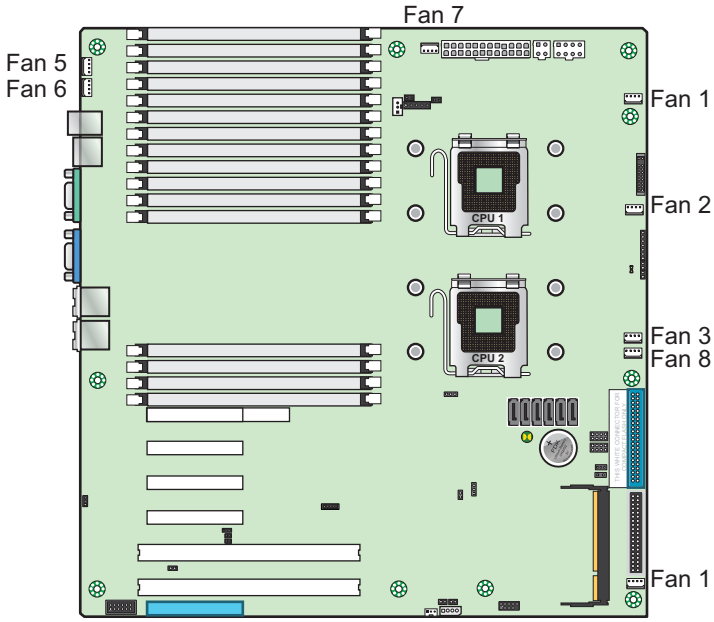


Figure 3-16 Fan Connector Locations

Table 3-17 Fan Connector Pin Definitions (Fan1/2 - Fan7/8)

Notes	Fan Connector Pin Definitions Fans 1-8	
	Pin#	Definition
There are eight fan connectors on the serverboard, all of which are 4-pin fans. However, pins 1-3 of the fan connectors are backward compatible with the traditional 3-pin fans. The onboard fan speeds are controlled by Thermal Management (via Hardware Monitoring) under the Advanced Section in the BIOS. The default is disabled.	1	Ground (Black)
	2	+12V (Red)
	3	Tachometer
	4	PWM Control

PS/2 Keyboard and Mouse Pin Definitions

Table 3-18 lists the PS/2 keyboard and mouse pin definitions.

Table 3-18 Keyboard Connector Pin Definitions (PS/2)

Notes	Keyboard/Mouse Pin Definitions Keyboard/Mouse	
	Pin#	Definition
The ATX PS/2 keyboard and the PS/2 mouse are located beside the USB0/1 ports. The mouse port is above the keyboard port. See the table on the right for pin definitions.	1	Data
	2	NC
	3	Ground
	4	Vcc
	5	Clock
	6	NCC

Wake on LAN Connector Pin Definitions (JWOL)

Table 3-19 Wake on LAN Connector Pin Definitions (JWOL)

Notes	Wake-On-LAN Pin Definitions JWOL	
	Pin#	Definition
The Wake-On-LAN (JWOL) connector (refer to Figure 3-17) enables the wake-on-LAN feature. You must enable the LAN Wake-Up setting in BIOS and also have a LAN card with a wake-on-LAN connector and cable installed to use this feature.	1	+5V Standby
	2	Ground
	3	Wake-up

Wake on Ring Connector Pin Definitions (JWOR)

Table 3-20 Wake on Ring Connector Pin Definitions

Notes	Wake-On-Ring Pin Definitions JWOR	
	Pin#	Definition
The Wake-On-Ring connector (JWOR) connector (refer to Figure 3-26) enables the system to receive and be "awakened" by an incoming call when in the suspend state. You must also have the WOR card and cable installed to use this feature.	1	Ground (Black)
	2	Wake-up

Chassis Intrusion Connector Pin Definitions (JL1)

Table 3-21 lists the chassis intrusion connector pin definitions (JL1). Figure 3-17shows the location of the connector JL1on the node board.

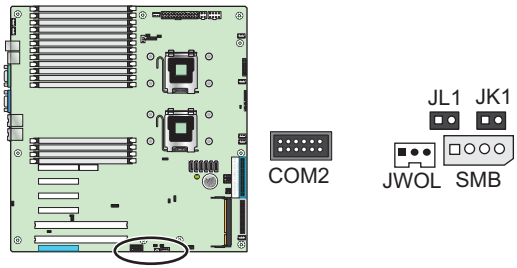


Figure 3-17 Chassis Intrusion Connector Location

Table 3-21 Chassis Intrusion Pin Definitions (JL1)

Notes	Chassis Intrusion Pin Definitions JL1	
	Pin#	Definition
The chassis intrusion connector is designated JL1 (refer to Figure 3-17). A cable connected to a chassis switch alerts you of a chassis intrusion when the chassis is opened.	1	Intrusion Input
	2	Ground

Power Supply Fail LED Connector Pin Definitions (JP3)

Table 3-22 lists the power supply fail LED connector pin definitions (JP3). Figure 3-18 shows the location of the connector JP3 on the node board.

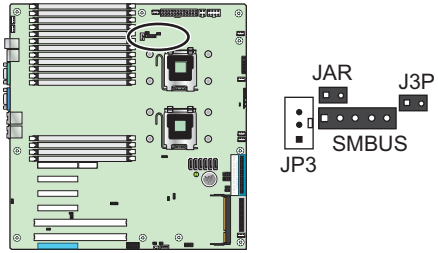


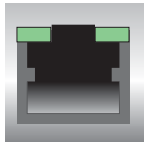
Figure 3-18 Power Supply Fail LED Connector Location

Table 3-22 Power Supply Fail LED Pin Definitions (JP3)

Notes	JP3	
	Pin#	Definition
A cable is connected from the power supply to JP3 to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin to indicate of a power failure on the chassis (refer to Figure 3-18).	1	PWR 1: Fail
	2	PWR 2: Fail
	3	PWR 3: Fail
	4	Signal: Alarm Reset

Ethernet Port (LAN1/LAN2)

Table 3-23 Ethernet Ports (LAN1/LAN2)

Notes	Ethernet Ports LAN1/LAN2
Two gigabit Ethernet ports (designated LAN1 and LAN2) are located on the I/O panel. These ports accept RJ45 type cables.	

Serial Port Pin Definitions (COM1/COM2)

Table 3-24 Serial Port Pin Definitions (COM2)

Notes	Serial Port Pin Definitions COM1/COM2			
	Pin#	Definition	Pin#	Definition
Two serial ports are included on the node board. COM1 is a backpanel port and the COM2 connector is located near the UIO slot on the edge of the motherboard.	1	DCD	6	DSR
	2	RXD	7	RTS
	3	TXD	8	CTS
	4	DTR	9	RI
	5	Ground	10	NC

Power LED/Speaker (JD1)

Table 3-25 Power LED/Speaker (JD1)

Notes	Power LED/Speaker Pin Definitions JD1	
	Pin#	Definition
On JD1 header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. Close pins 4-7 with a jumper to use an external speaker. If you wish to use the onboard speaker, close pins 6-7.	6-7	Internal Speaker
	4-7	External Speaker

Serial General Purpose I/O Connector Pin Definitions (SGPIO)

Table 3-26 Serial General Purpose I/O Connector Pin Definitions (SGPIO)

Notes	SGPIO Connectors Pin Definitions SGPIO			
	Pin#	Definition	Pin#	Definition
The Serial General Purpose Input/Output (SGPIO) connector (refer to Figure 3-26) is used to communicate with the system monitoring chip on the motherboard.	1	NC	2	NC
	3	Ground	4	DATA Out
	5	Load	6	Ground
	7	Clock	8	NC

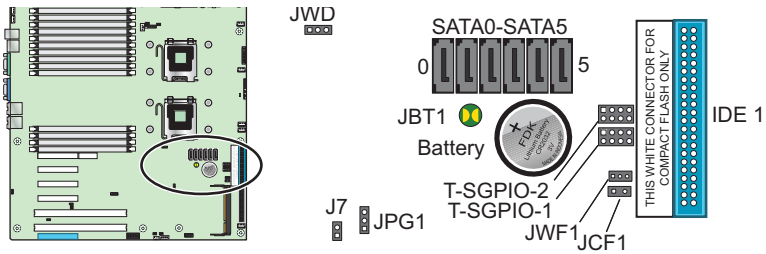


Figure 3-19 SGPIO Connector Location

USB Connector Pin Definitions

Table 3-27 lists the USB port pin definitions. Figure 3-20 shows the location of the USB0/USB1, USB2/USB3, and USB4 connectors on the node board.

Table 3-27 Universal Serial Bus (USB) Pin Definitions

Notes	USB0/1 Ports	
	Pin#	**Definition**
There are two Universal Serial Bus ports located on the I/O panel and three additional USB connectors located on the node board. The connectors, labeled are used to provide front side USB access.	1	+5V
	2	PO-
	3	PO+
	4	Ground
	5	N/A
	USB2/3/4 Ports	
	Pin#	**Definition**
	1	+5V
	2	PO-
	3	PO+
	4	Ground
	5	Key

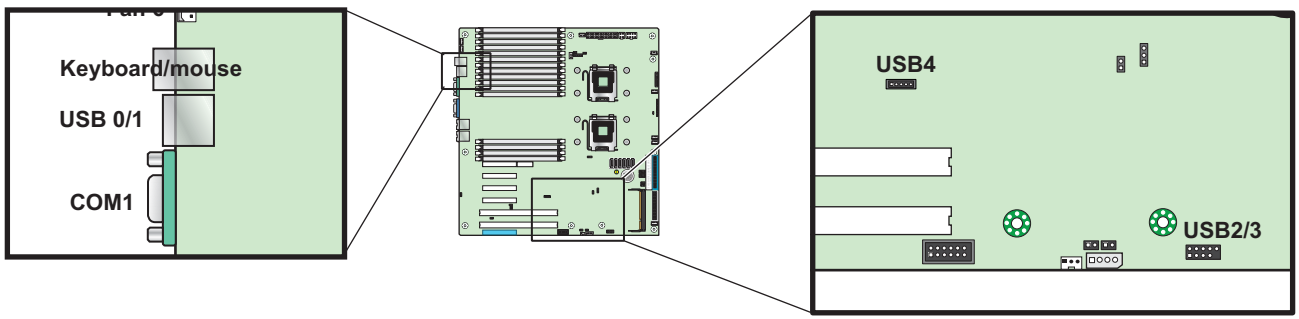


Figure 3-20 USB Connector Locations

System Management Bus I2C Connector (SMBUS)

Table 3-28 SMB Power Connector Pin Definitions (SMBUS)

Notes	SMB Power (I^2C) Pin Definitions SMBUS	
	Pin#	Definition
The system management bus (SMBUS) power connector is used to support the I^2C bus (refer to Figure 3-21).	1	Clock
	2	Data
	3	PWR Fail from power supply
	4	Ground
	5	+3.3V

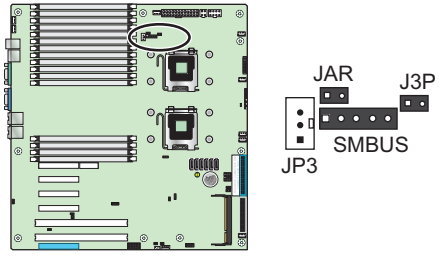


Figure 3-21 SMBUS Connector Location

System Management Bus Connector Pin Definitions (SMB)

Table 3-29 SMB Connector Pin Definitions (SMB)

Notes	SMB Connector Pin Definitions SMB	
	Pin#	Definition
A SMB bus connector (SMB) monitors the status of the system's power supply, fan speed, and temperature (refer to Figure 3-22).	1	Data
	2	Ground
	3	Clock
	4	NC

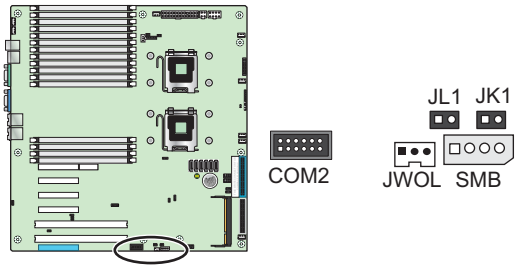


Figure 3-22 SMB Connector Location

Overheat/Fan Fail LED Connector Pin Definitions (JOH1)

Table 3-30 Overheat/Fan Fail LED Connector Pin Definitions (JOH1)

Notes	JOH1 Connector Pin Definitions JOH1	
	Pin#	Definition
The JOH1 connector is used to connect an LED to provide warning of chassis overheating. This LED will blink to indicate a fan failure (refer to Figure 3-23). A solid LED indicates an overheat condition. A blinking LED indicates a fan fail condition.	1	5Vdc
	2	OH Active

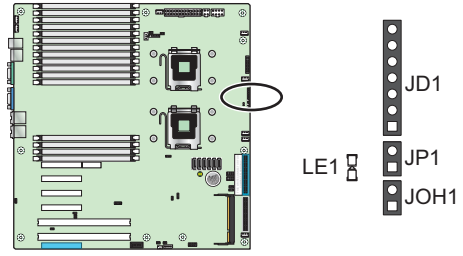


Figure 3-23 JOH1 Connector Location

Keylock Connector Pin Definitions (JK1)

Table 3-31 Keylock Connector Pin Definitions (JK1)

Notes	JK1 Connector Pin Definitions JK1	
	Pin#	Definition
The keyboard lock connection is designated JK1. Utilizing this connector enables you to inhibit any actions made on the keyboard, effectively “locking” it. The (refer to Figure 3-24).	1	Ground
	2	Keylock R-N

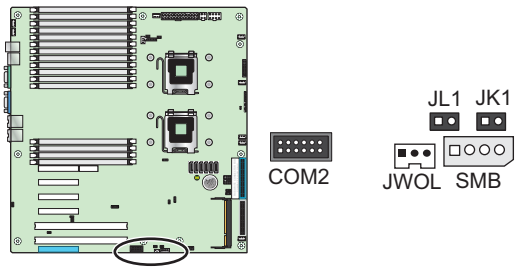


Figure 3-24 JK1 Connector Location

Node Board Jumper Settings

Table 3-32 Node Board Jumper Descriptions

Connector Description	Page
CMOS Memory Clear (JBT1)	page 77
VGA Jumper Settings (JPG1)	page 78
LAN1/LAN2 Jumper Settings (JPL1)	page 78
3rd Power Fail Detect Jumper Settings (JP3)	page 79
Watch Dog Timer Jumper Settings (JWD)	page 80
Compact Flash Master/Slave Select (JCF1)	page 81
Compact Flash Power (JWF1)	page 81
I2C to PCIe Slot Jumper Settings (JPI2C1/JPI2C2)	page 82
Reboot Option (JP1)	page 83
Memory Voltage Select (JP2)	page 84

Explanation of Jumper Settings

To modify the operation of the node board, jumpers (refer to Figure 3-25) can be used to choose between optional settings. Jumpers create shorts between two pins to change specific functions or features on the node board. Pin 1 is identified with a square solder pad on the printed circuit board.

Note: On a two-pin jumper, “Closed” means the jumper is on both pins and “Open” means the jumper is either on only one pin or completely removed.

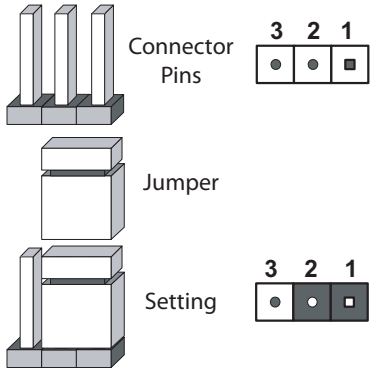


Figure 3-25 Explanation of Jumper Pins

CMOS Memory Clear (JBT1)

Jumper pad JBT1 (refer to Figure 3-26) is used to clear CMOS memory (which also clears passwords). Instead of pins, this jumper consists of contact pads to prevent you from accidentally clearing the contents of CMOS memory. To clear CMOS memory:

1. Power down the system and unplug the power cords.

Caution: Do not use the PW_ON connector to clear CMOS memory. Using the PW_ON connector to clear CMOS memory may damage the equipment.

2. Short the JBT1 pads with a metal object such as a small screwdriver.
3. Remove the screwdriver or shorting device.
4. Reconnect the power cords and power on the system.

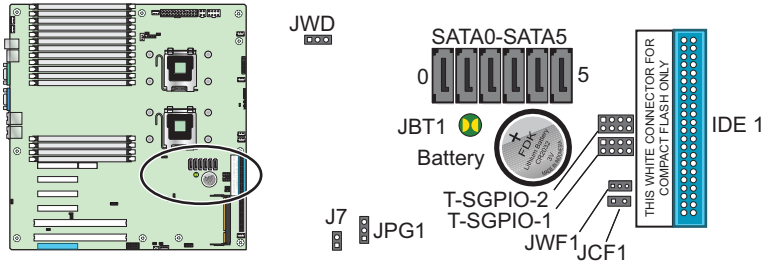


Figure 3-26 CMOS Memory Jumper Location (JBT1)

VGA Jumper Settings (JPG1)

Table 3-33 VGA Jumper Settings (JPG1)

Notes	VGA Enable/Disable Jumper Settings JPG1	
	Jumper	Definition
Jumper JPG1 (refer to Figure 3-26) enables or disables the VGA port. The default position is pins 1 and 2 jumpered, which enables VGA port.	1-2	Enabled
	2-3	Disabled

LAN1/LAN2 Jumper Settings (JPL1)

Table 3-34 LAN1/LAN2 Jumper Settings (JPL1)

Notes	LAN1/LAN2 Jumper Settings JPL1	
	Jumper	Definition
Jumper JPL1 (refer to Figure 3-27) enables or disables the LAN1 and LAN2 ports on the node board. The default setting is enabled.	1-2	Enabled
	2-3	Disabled

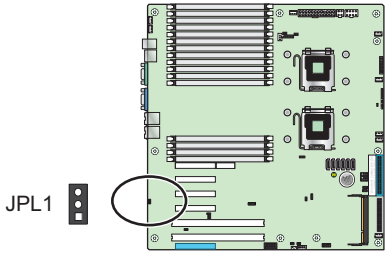


Figure 3-27 LAN 1 and LAN 2 Jumper Locations (JPL1)

3rd Power Fail Detect Jumper Settings (JP3)

Table 3-35 3rd Power Failure Detect Jumper Settings (JP3)

Notes	3rd Power Fail Detect Jumper Setting JP3	
	Jumper	Definition
The system can notify you in the event of a power supply failure. This feature is available when three power supply units are installed in the chassis with one acting as a backup. If you only have one or two power supply units installed, you should disable this feature (the default setting) using J3P to prevent false alarms (refer to Figure 3-28).	1-2	Enabled
	2-3	Disabled

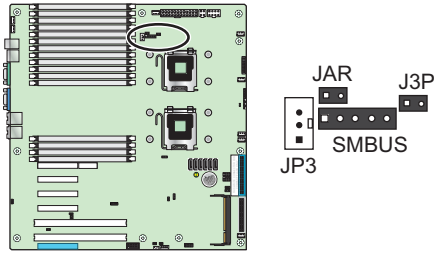


Figure 3-28 3rd Power Failure Detect Jumper Locations (JP3)

Watch Dog Timer Jumper Settings (JWD)

Users must write their own application software to disable the watch dog timer when it is enabled.

Table 3-36 Watch Dog Timer Jumper Settings (JWD)

Notes	Watch Dog Jumper Settings JWD	
	Jumper	Definition
JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 causes WD to reset the system if an application hangs. Jumping pins 2-3 generates a non-maskable interrupt signal for the application that hangs. Watch Dog must also be enabled in BIOS. **Note**: When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer (refer to Figure 3-29).	Pins 1-2	Reset
	Pins 2-3	NMI
	Open	Disabled

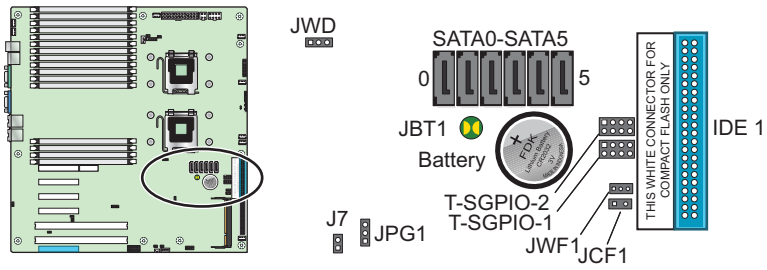


Figure 3-29 Watch Dog Timer Jumper Location (JWD)

Compact Flash Master/Slave Select (JCF1)

Table 3-37 Compact Flash Master/Slave Jumper Settings (JCF1)

Notes	JCF1 Jumper Settings JCF1	
	Jumper	Definition
A Compact Flash Master (Primary)/Slave (Secondary) Select Jumper is located at JCF1. Close this jumper to enable Compact Flash Card. Connect the Compact Flash Card power cable to JWF1 so the Compact Flash Card works properly (refer to Figure 3-30).	Open	Slave (Secondary)
	Closed	Master (Primary)

Compact Flash Power (JWF1)

Table 3-38 Compact Flash Jumper Settings (JWF1)

Notes	JWF1 Jumper Settings JWF1	
	Jumper	Definition
A Compact Flash Card Power Connector is located at JWF1. Connect a Compact Flash Card power cable to JWF1 so that the Compact Flash Card to works properly, and enable it with JCF1 (refer to Figure 3-30).	On	Compact Flash Power On
	Off	Compact Flash Power Off

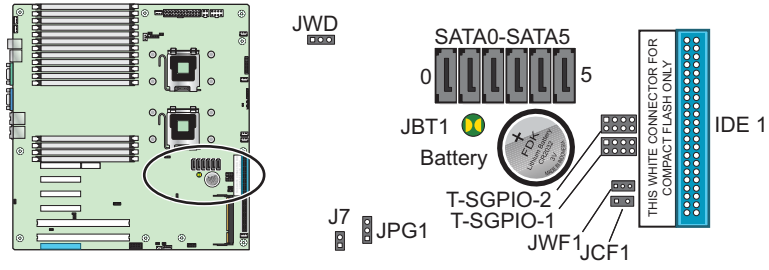


Figure 3-30 Compact Flash Jumper Settings (JWF1)

I²C to PCIe Slot Jumper Settings (JPI2C1/JPI2C2)

Table 3-39 I²C to PCIe Slot Jumper Settings

Notes	I²C to PCIe Slot Jumper Settings JPI2C1/JPI2C2		
	Jumper	Jumper	Definition
Jumpers JI2C1 and JI2C2 enable you to connect the System Management Bus (I2C) to the PCI-X/PCI-E slots. The default setting is Open (Disabled.) Both jumpers must be set to the same setting (refer to Figure 3-31).	JI2C1: Closed	JI2C2: Closed	Enabled
	JI2C1: Open	JI2C2: Open	Disabled

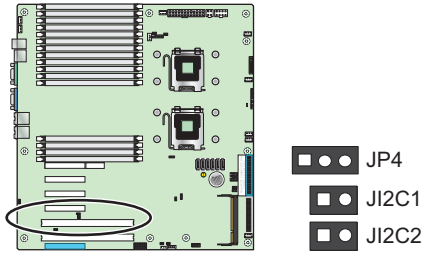


Figure 3-31 JI2C1 and JI2C2 Jumper Settings (JI2C1/JI2C2)

Reboot Option (JP1)

Table 3-40 Reboot Option Jumper Settings (JP1)

Notes	Reboot Option Jumper Settings JP1	
	Jumper	**Definition**
Setting jumper JP1 to Open (the default setting) enables the system to automatically reboot after power-off (refer to Figure 3-32).	Off	Reboot
	On	No reboot

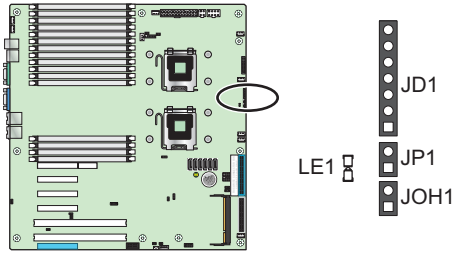


Figure 3-32 Reboot Option Jumper Settings (JP1)

Memory Voltage Select (JP2)

Table 3-41 Memory Voltage Select (JP2)

Notes	Reboot Option Jumper Settings JP2	
	Jumper	Definition
Jumper JP2 allows the user to select the memory voltage for the motherboard. The default setting is Auto.(refer to Figure 3-33).	Pins 1-2	Auto
	Pins 2-3	1.5V
	Open	1.8V

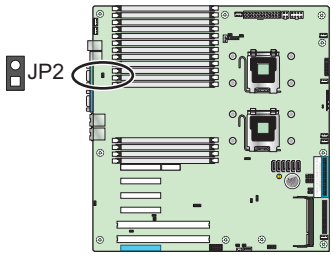


Figure 3-33 Memory Voltage Select Jumper Settings (JP2)

Node Board LED Descriptions

LAN1 and LAN2 (Ethernet Ports)

Table 3-42 LAN1 and LAN 2 LED Descriptions

Notes	LAN LED Speed Indicators LAN1/LAN2	
	LED Color	Description
The Ethernet ports (located beside the serial COM2 port) have two LEDs. On each Gigabit LAN port, one LED indicates activity when blinking while the other LED may be green, amber, or off to indicate the speed of the connection.	Off	10 MHz
	Green	100 MHz
	Amber	1 GHz

Onboard Power LED (LE1)

Table 3-43 Onboard Power LED Description (LE1)

Notes	Power LED LE1	
	LED Color	Description
The Onboard Power LED (LE1) illuminates when the system is on. Be sure to unplug the power cable before removing or adding any components.	Green (solid)	Power is on and system is on
	Green, flashing quickly	ACPI S1 State
	Green, flashing slowly	ACPI S3 (STR) State
	Off	Power off or power cable not connected

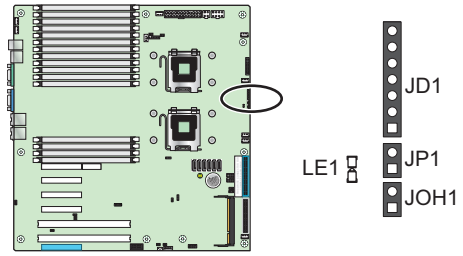


Figure 3-34 Onboard Power LED (LE1)

Floppy, IDE, and SATA Ports

Floppy Drive Connector

SGI Altix XE250 systems do not use the IDE drive connector.

IDE Drive Connector

SGI Altix XE250 systems do not use the IDE drive connector.

SATA Ports

Table 3-44 SATA Port Pin Definitions

Notes	SATA Ports SATA0 - SATA5	
	Pin#	Definition
There are no jumpers to configure the onboard SATA connectors.	1	Ground
	2	TXP
	3	TXN
	4	Ground
	5	RXN
	6	RXP
	7	Ground

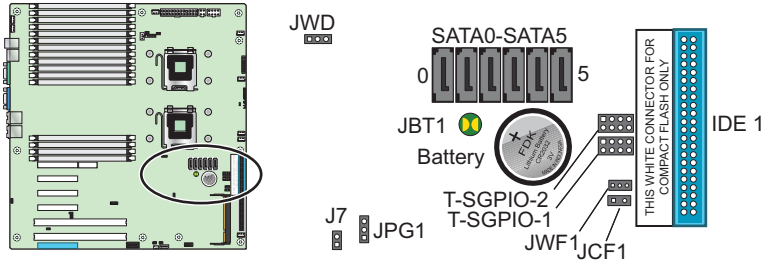


Figure 3-35 SATA Port Locations

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SGI Altix XE250 chassis (refer to Figure 4-1 and Figure 4-2).

ESD Precautions

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.
- Put the node board, add-on cards, 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 node board.
- The node board is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Chassis Components

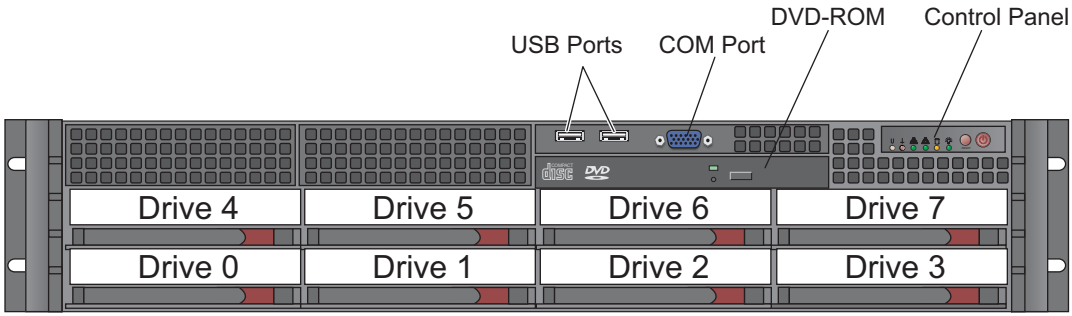


Figure 4-1 Chassis Front View

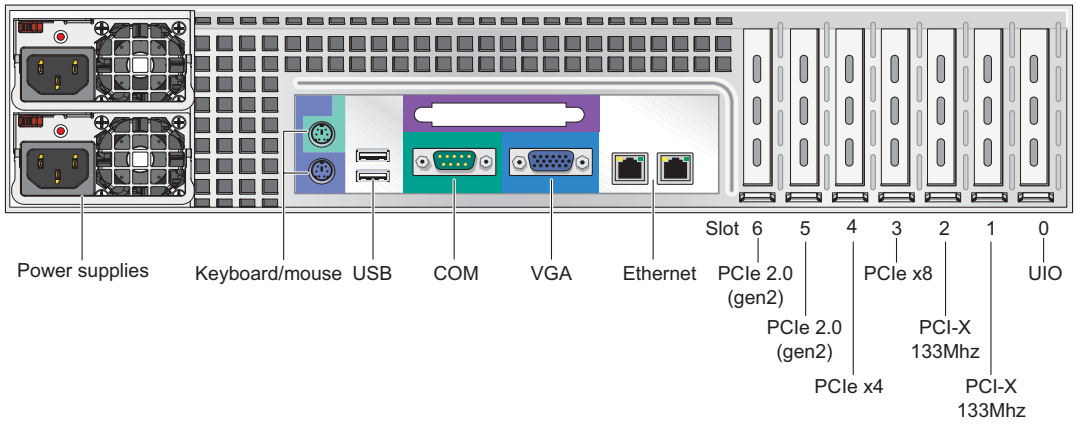


Figure 4-2 Chassis Rear View

Part Numbers and Marketing Codes

Table 4-1 lists the marketing codes and part numbers for the SGI Altix XE250 server.

Table 4-1 Part Numbers and Marketing Codes

Marketing Codes and Part Numbers	Description
LSX-BASE-250	SGI Altix 250 2U base node
LSX-BASE-250-H	SGU Altix XE250 2U head node
LSX-BASE-250-C-MS	SGI Altix 250 2U base node with Microsoft Windows CCS 2003
LSX-BASE-250-S-MS	SGI Altix XE250 base node with Microsoft Windows Server 2003, Standard Edition
LSX-BASE-250-E-MS	GI Altix 250 2U base node with Microsoft Windows Server 2003, Enterprise Edition
LSX-BASE-250-H-C-MS	SGU Altix XE250 2U head node with Microsoft Windows CCS 2003
LSX-BASE-250-R5-C-MS	SGI Altix XE250 base node with RAID5 or RAID6 and Microsoft Windows CCS 2003
LSX-BASE-250-R5-E-MS	SGI Altix XE250 base node with RAID5 or RAID6 and Microsoft Windows Server 2003, Enterprise Edition
LSX-BASE-250-R5-S-MS	SGI Altix XE250 base node with RAID5 or RAID6 and Microsoft Windows Server 2003, Standard Edition
LSX-BASE-250-RAID5	SGI Altix XE250 base node with RAID5 or RAID6
LSX-BASE-250-RAID5-H	SGI Altix XE250 head node with RAID5 or RAID6
LSX-DVD-RW-INT-Z	DVD-CD
LSX-CPU-5272	3.4 GHz/6M/1600MHz 80 Watt dual-core Intel Xeon processor
LSX-CPU-5472	3.0 GHz/12M/1600MHz 120 Watt quad-core Intel Xeon processor
LSX-CPU-5462	2.8 GHz/12M/1600MHz 80 Watt quad-core Intel Xeon processor
LSX-CPU-5440	2.83 GHz/12M/1333MHz 80 Watt quad-core Intel Xeon processor
LSX-CPU-5420	2.5 GHz/12M/1333MHz 80 Watt quad-core Intel Xeon processor
LSX-MEM-FB-2G-800	2GB Fully Buffered DIMM set (2 x 1GB, 800MHz)
LSX-MEM-FB-4G-800	4GB Fully Buffered DIMM set (2 x 2GB, 800MHz)
LSX-MEM-FB-8G-800	8GB Fully Buffered DIMM set (2 x 4GB, 800MHz)
LSX-SASDRV-300G-Z	300GB 15K RPM SAS HDD

Table 4-1 Part Numbers and Marketing Codes **(continued)**

Marketing Codes and Part Numbers	Description
LSX-SASDRV-146G-Z	146GB 15K RPM SAS HDD
LSX-SASDRV-73G-Z	73GB 15K RPM SAS HDD
LSX-SATADRV-750G-Z	750GB 7200 RPM SATA HDD
LSX-SATADRV-500G-Z	500GB 7200 RPM SATA HDD
LSX-SATADRV-250G-	250GB 7200 RPM SATA HDD
PCIX-GENET-OR-2P-Z	Dual port optical GigE card (PCI-X) Low Profile (ETH-5)
PCIX-GENET-C-2P-Z	Dual port copper GigE card (PCI-X, low profile) (ETH-6)
PCIX-10GIGENET-OR-Z	1 port 10Gb Ethernet, Optical (PCI-X, full height) (ETH-11)
PCIE-10GENET-OR-Z	1 port Optical, 10 GB Ethernet card (PCIE, low profile or full height) (ETH-11)
PCIX-IB-HCA400-Z	InfiniBand HCA (PCI-X, low profile, 128MB RAM) w/ dual 4X SDR IB ports
PCIE-IB-HCA410D	InfiniBand HCA (X8 PCIe, low profile, memory free) w/ single 4X DDR IB port
PCIE-IB-HCA410-Z	InfiniBand HCA (X8 PCIe, low profile, memory free) w/ single 4X SDR IB port
PCIE-IB-HCA400D	InfiniBand HCA (X8 PCIe, low profile) w/ dual 4X DDR IB port
030-2295-001	Node board assembly
030-2296-001	SATA/SAS backplane
9310227	Fan Assembly
060-0276-001	Power Supply Assembly, 900W
030-2273-001	BMC board IPMI 3.0 Compliance with 2.2 KIRA
030-2308-001	UIO LSISAS LP L8I system disk drive controller
030-2307-001	PCIe MegaRAID SAS8708ELP system disk drive controller
018-1384-001	Cable Assembly, Mini-SAS 4-to-1

Control Panel

The control panel on the front of the chassis must be connected to the JF1 connector on the node board to provide you with system control buttons and status indicators.

These wires have been bundled together in a ribbon cable to simplify the connection. Refer to Table 3-4 on page 58. Connect the cable from JF1 (refer to Figure 4-3) on the node board to the control panel printed circuit board (JP4). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path. The LEDs inform you of the node board status.

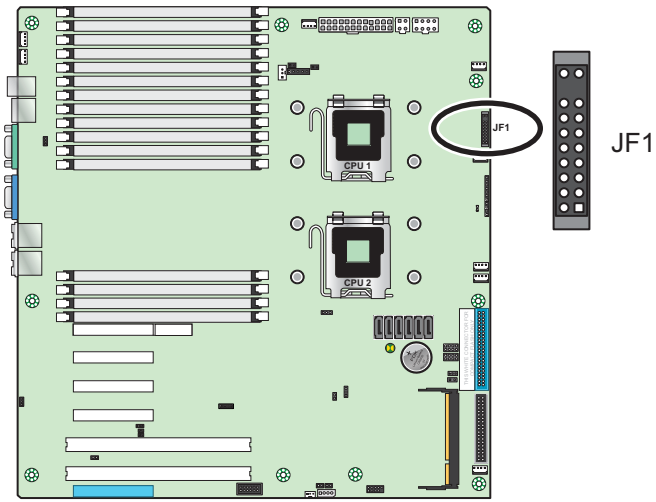


Figure 4-3 JF1 Connector Locations

Fans

Three 8-cm hot-swap fans provide the cooling for the SGI Altix XE250 server. It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components.

Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fans increase their RPM up to full speed and the overheat/fan fail LED on the control panel illuminates. Replace the failed fan as soon as possible. Remove the top chassis cover while the system is operating to determine which of the fans has failed.

Fan Replacement

Removal

1. Remove the chassis cover.
2. Press the tabs on the sides of the fan to unlock and remove the fan and its housing. The fan's power connections disconnect automatically.
3. System power does not need to be shut down since the fans are hot-pluggable.

Installation

1. Position the new fan into the space vacated by the failed fan.
2. You will hear an audible "click" when the fan is installed and the power connectors engage.
3. If the system power is on, the hot-plug feature causes the fan to start immediately when it is connected to the fan connector on the node board.

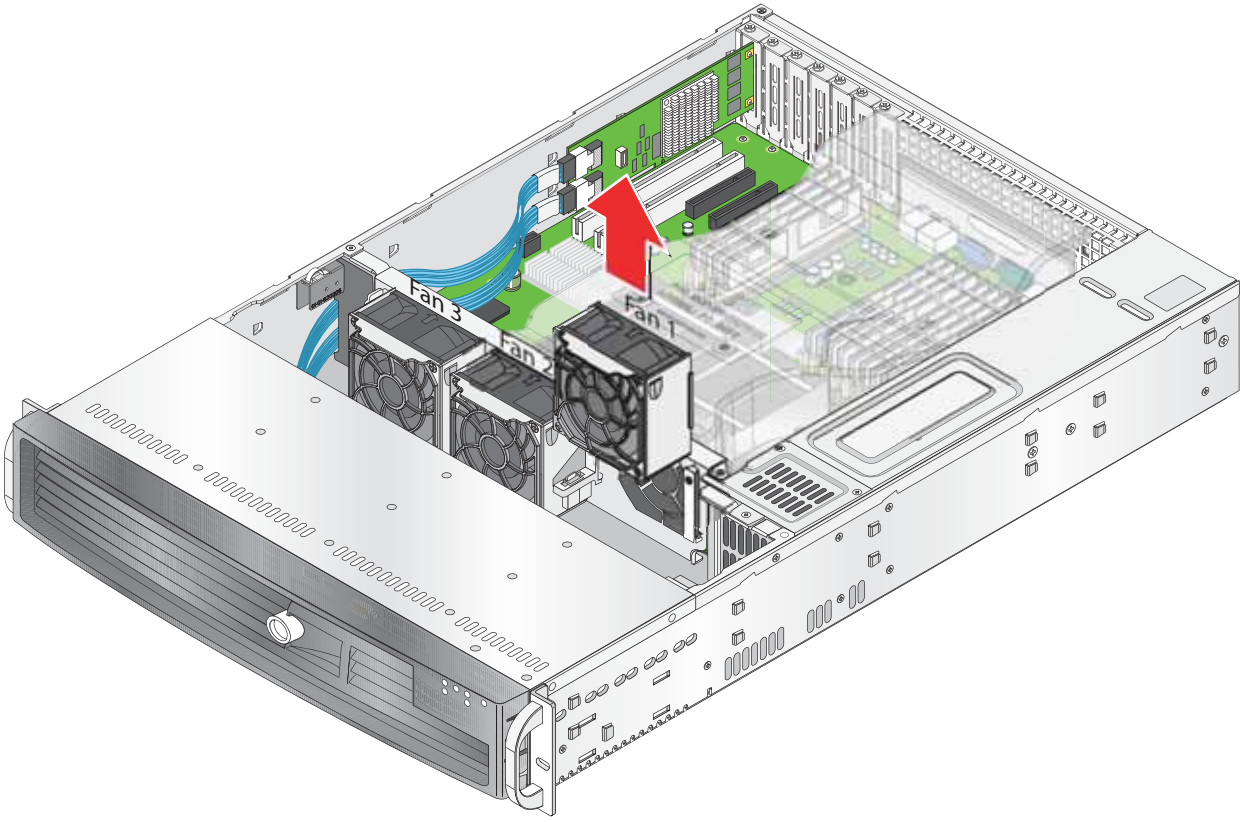


Figure 4-4 Fan Replacement

System Drives

DVD-CD Drive

Note: You must power down the system before installing or removing the DVD-CD.

The top cover of the chassis must be opened to gain full access to the DVD-CD drive bays. The SGI Altix XE250 accommodates only a slim DVD-CD drive. Side mounting brackets are needed to mount the slim DVD-CD drive in the server.

Removal and Installation

1. Release the retention screws that secure the server unit to the rack.
2. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a “click”).
3. Press 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. You can then lift the top cover from the chassis to gain full access to the inside of the server.
4. Disconnect the power and data cables from the drive to other chassis components including the node board and SATA backplane.
5. Remove the DVD-CD drive by pressing the release tab located at the rear of the drive.
6. Pull the drive out of the chassis.
7. Insert the new drive unit in the slot until the tab locks into place.
8. Connect the data and power cables to the backplane and node board.

Hard Disk Drives

The 2U chassis supports a maximum of eight disk drives. Install the drives from left to right.

Note: All disk drive bays must be populated to maintain proper system cooling. Drive bays must either have a disk drive or a drive blank installed.

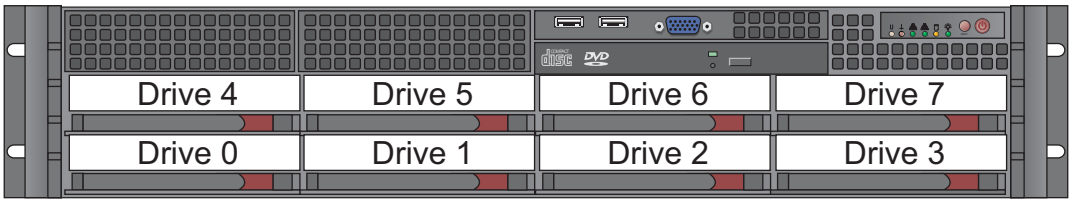


Figure 4-5 Disk Drive Locations

Disk Drive Replacement

Note: Drives can be removed during operation (hot swapped) only if you are running an operating system that supports RAID.

Caution: Use caution when working with the SATA/SAS backplane. Do not touch the backplane with any metal objects, and make sure that ribbon cables do not touch the backplane. Also, regardless of how many drives are installed, all eight drive carriers must remain in the chassis to maintain proper airflow. Failure to follow these precautions can damage the equipment.

Disk Drive Installation

Mounting a Drive in a Drive Carrier

The drives are mounted in drive carriers (refer to Figure 4-6) 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. To add a new drive, install it 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 four screws, as shown in Figure 4-6.

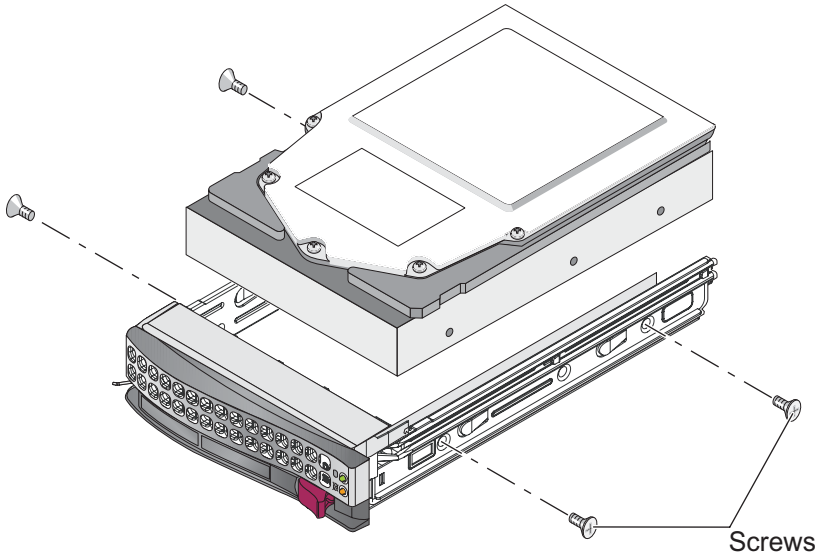


Figure 4-6 Disk Drive Carrier

Drive Replacement

The drive carriers are all easily accessible at the front of the chassis. These are (with RAID enabled) hot-swap drives. To remove a carrier, push the release button located beside the drive LEDs. Then, swing the handle fully out and use it to pull the unit straight out (refer to Figure 4-7).

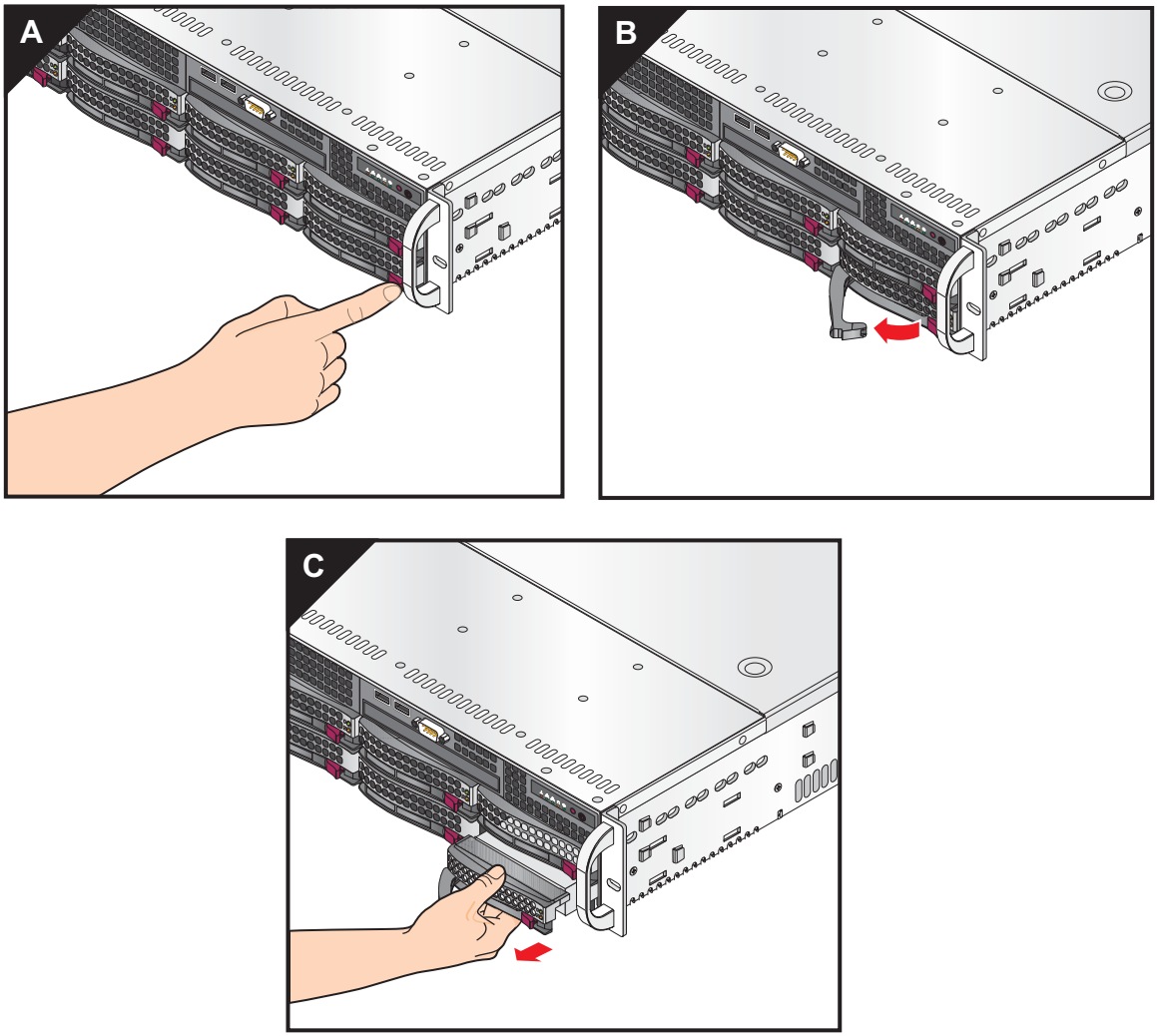


Figure 4-7 Drive Removal

SATA/SAS Backplane

The SATA/SAS backplane provide the power and control connections for the system disk drives (refer to Figure 4-8 and Figure 4-9).

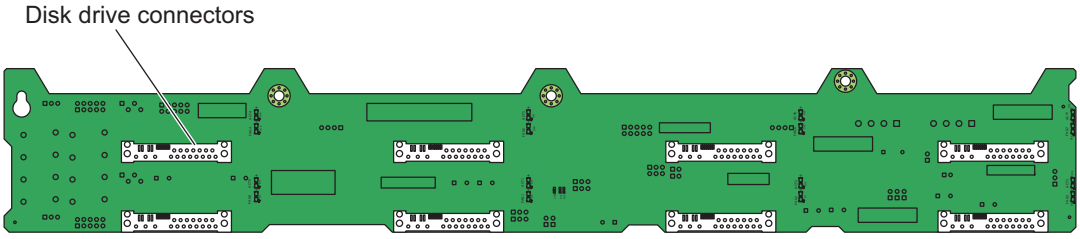
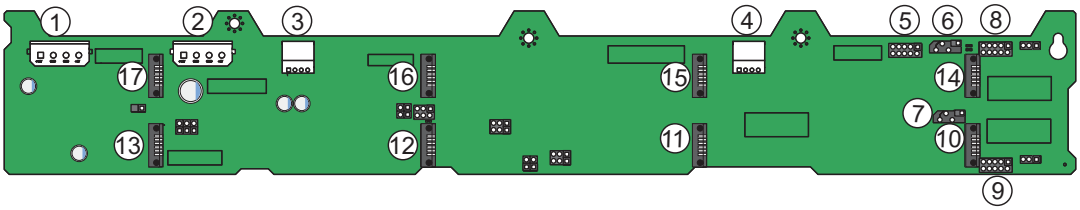


Figure 4-8 SATA/SAS Backplane Disk Drive Connectors



1. JP13: 4-Pin PWR Connector
2. JP10: 4-Pin PWR Connector
3. J18: CD-ROM/Floppy PWR Connector
4. J17: CD-ROM/Floppy PWR Connector
5. JP26: Activity In LED Header
6. JP45: I2C Connector#2
7. JP44: I2C Connector#1
8. JP52: SideBand #2
9. JP51: SideBand #1
10. SAS Port #0
11. SAS Port #1
12. SAS Port #2
13. SAS Port #3
14. SAS Port #4
15. SAS Port #5
16. SAS Port #6
17. SAS Port #7

Figure 4-9 SATA/SAS Backplane Power and SAS Connectors

SATA Backplane Replacement

Before you begin the SATA backplane removal procedure, read the following statements:

Caution: Use caution when working with the SATA/SAS backplane. Do not touch the backplane with any metal objects, and make sure that ribbon cables do not touch the backplane. Also, regardless of how many drives are installed, all eight drive carriers must remain in the chassis to maintain proper airflow. Failure to follow these precautions can damage the equipment.

- Use a grounded wrist strap to prevent static discharge.
- Touch a grounded metal object before removing a component from the antistatic bag.
- Handle the RAID card 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.
- Put the card and peripherals back into their antistatic bags when not in use.

Use the following procedure to replace the SATA backplane:

1. Power down the system and remove the power cord from each power supply.
2. Access the inside of the server chassis (refer to “Access the Inside of the Chassis” on page 23).
3. Remove all of the system disk drives (refer to “Disk Drive Replacement” on page 97).
4. Disconnect the SATA/SAS data cables from the backplane.
5. Disconnect the power supply cables and DVD-CD power cable from the backplane.
6. Remove three screws that secure the backplane to the chassis (refer to Figure 4-10).
7. Remove the backplane from the chassis and place it on an ESD-safe surface.
8. Install the replacement backplane in the chassis and secure it with 3 screws (refer to Figure 4-10).
9. Connect the SATA/SAS data cables to the backplane as shown in refer to Figure 4-11.
10. Connect the power supply cables and DVD-CD power cable to the backplane.
11. Install the disk drives and replace the top cover.

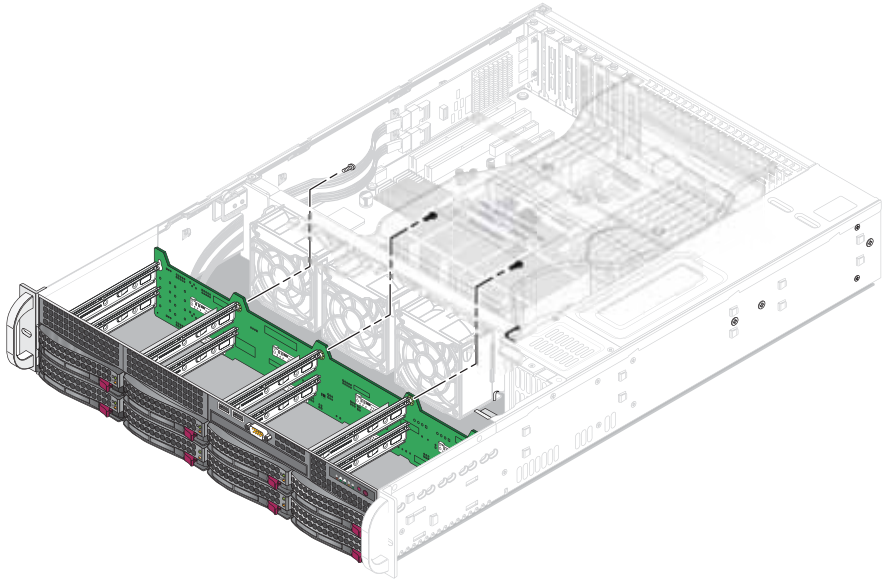


Figure 4-10 SATA/SAS Backplane Screws

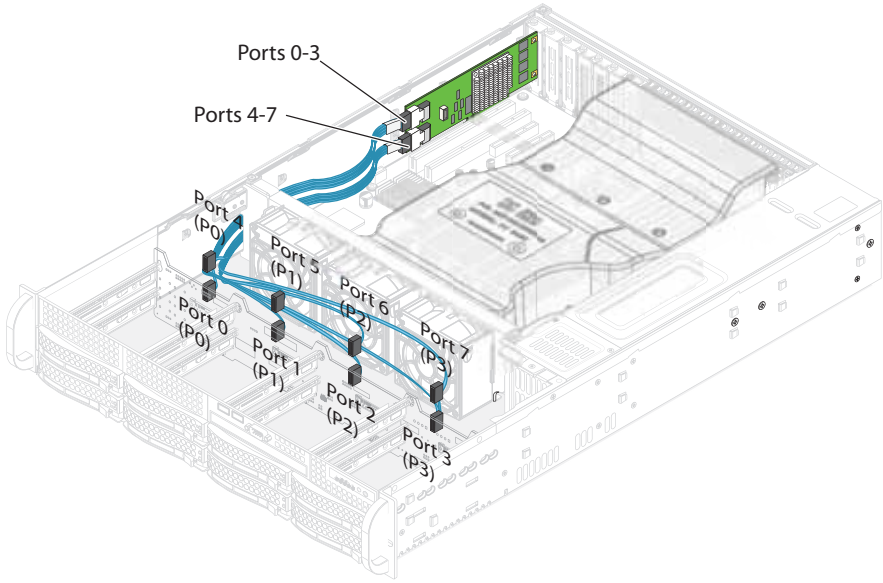


Figure 4-11 SATA/SAS Backplane Data Cables

Power Supply

The SGI Altix XE250 has one or two 900W power supplies. The power supplies have the capability of operating at 100 - 240 input volts. A single failed power supply can be replaced while the system is operating if you have two redundant power supplies.

Power Supply Failure

If the power supply unit fails, the system shuts down and you must replace the power supply. Replacement power supplies can be ordered directly from SGI customer service.

Power Supply Replacement

To replace a power supply (refer to Figure 4-12):

1. Unplug the power cord from the failed power supply.
2. Use the handle to grasp the power supply.
3. Move the lever to the right to unseat the power supply connector from the chassis.
4. Slide the power supply straight out of the chassis.
5. Install the replacement power supply and connect the power cord.

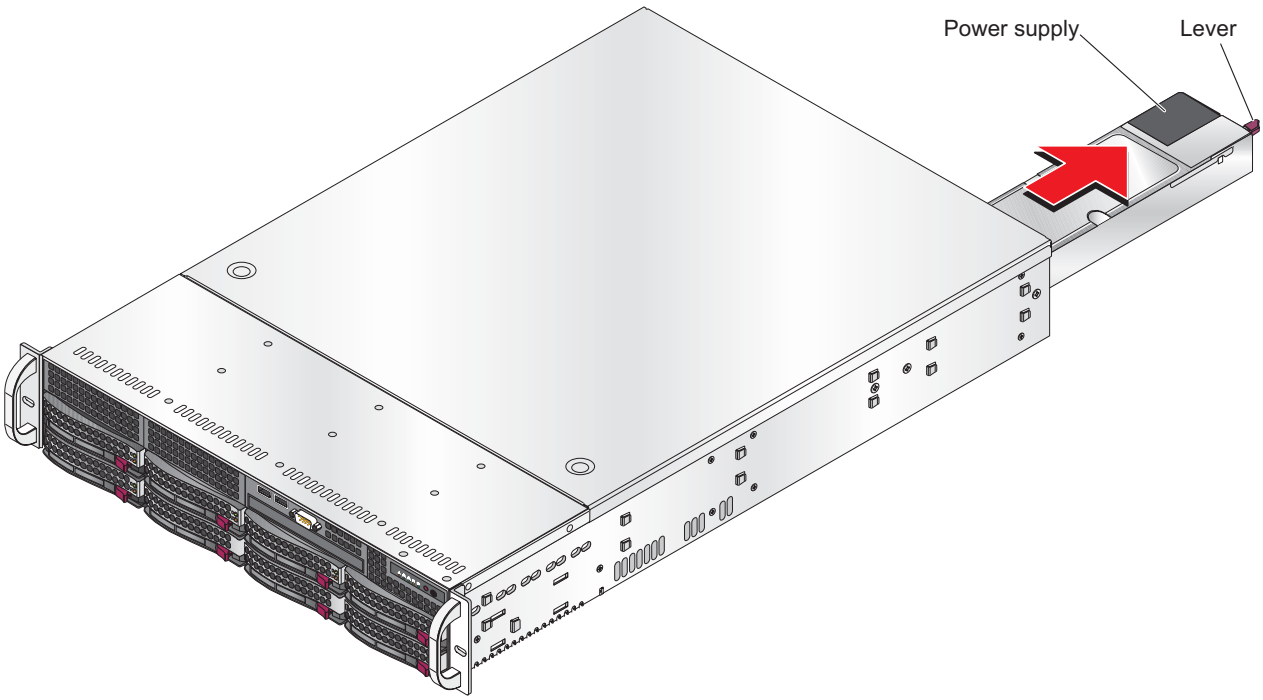


Figure 4-12 Power Supply Replacement

BIOS Settings

This chapter lists the BIOS default settings and describes the setup utility for the node board. The BIOS is stored in a flash chip and can be easily upgraded. For the upgrade procedure, see Appendix F, “Upgrading BIOS”.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual.

Default Settings

Table 5-1 lists the SGI Altix XE250 default BIOS settings.

Note: Some of the settings in Table 5-1 are reported by the system and stored in flash memory as a BIOS setting and cannot be changed. Examples are Extended Memory, CPU Speed, Fan RPM, etc.

Table 5-1 BIOS Default Settings

Menu Item	Setting	Page
Main		
System Time	[08:36:58]	117
System Date	[01/29/08]	117
BIOS Date	01/16/08	117
> SATA Port 0	[None]	
> SATA Port 1	[None]	
> SATA Port 2	[None]	
> SATA Port 3	[None]	
> SATA Port 4	[None]	
> SATA Port 5	[None]	
MAIN / SATA Port		
Type	Auto	
Multi-Sector Transfers	[16 Sectors]	
LBA Mode Control	[Enabled]	
32 Bit I/O	[Disabled]	
Transfer Mode	[FPIO 4 / DMA 2]	
Ultra DMA Mode	[Mode 5]	

Table 5-1 BIOS Default Settings **(continued)**

Menu Item	Setting	Page
Advanced / Boot Features		
QuickBoot Mode	[Enabled]	121
QuietBoot Mode	[Enabled]	121
POST Errors	[Disabled]	122
ACPI Mode	[Yes]	122
Power Button Behavior	[Instant-Off]	122
Resume On Modem Ring	[Off]	122
EFI OS Boot	[Disabled]	122
Keyboard ON now function	[Disabled]	122
Power Loss Control	[Last State]	122
Watch Dog	[Disabled]	123
Summary screen	[Enabled]	123
Advanced / Memory Cache		
Cache System BIOS area	[Write Protect]	123
Cache Video BIOS area	[Write Protect]	123
Cache Base 0-512k	[Write Back]	123
Cache Base 512k-640k	[Write Back]	124
Cache Extended Memory Area	[Write Back]	124
Discrete MTRR Allocation	(Disabled] *Note: Subject to Change*	124
Advanced / PCI Configuration		
Onboard G-LAN1 OPROM Configure	[Enabled]	125
Onboard G-LAN2 OPROM Configure	[Enabled]	125
Default Primary Video Adapter	[Onboard]	125
Emulated IRQ Solution	[Disabled]	125

Table 5-1 BIOS Default Settings **(continued)**

Menu Item	Setting	Page
PCIe I/O Performance	[Payload 256B]	125
PCI Fast Delayed Transition	[Disabled]	125
Reset Configuration Data	[No]	125
Frequency for PCI-X 1 and 2	[Auto]	125
PCI Options for each Slot		126
Large Disk Access Mode	[Other]	126
Advanced /Advanced Chipset Control		
SERR signal condition	[Both]	127
Clock Spectrum Feature	[Enabled]	127
Intel VT for Directed I/O(VT-d)	[Disabled]	127
4GB PCI Hole Granularity	[256 MB]	128
Memory Voltage	[Auto]	128
Memory Branch Mode	[Interleave]	128
Branch 0 Rank Interleave	[4:1]	128
Branch 0 Rank Sparing	[Disabled]	128
Branch 1 Rank Interleave	[4:1]	128
Branch 1 Rank Sparing	[Disabled]	128
Enhanced x8 Detection	[Enabled]	128
Demand Scrub	[Enabled]	128
High Bandwidth FSB	[Enabled]	129
High Temp DRAM OP	[Disabled]	129
AMB Thermal Sensor	[Disabled]	129
Thermal Throttle	[Disabled]	129
Global Activation Throttle	[Disabled]	129

Table 5-1 BIOS Default Settings **(continued)**

Menu Item	Setting	Page
Force ITK Config Clocking	[Disabled]	129
Snoop Filter	[Enabled]	130
Crystal Beach Feature	[Enabled]	130
Route Port 80h cycles to	[LPC]	130
Clock Spectrum Feature	[Enabled]	130
High Precision Event Timer	[Yes]	130
USB Function	[Enabled]	130
Legacy USB Support	[Enabled]	131
Advanced / Advanced Processor Options		
CPU Speed	2.33 GHz (*varies*)	131
Frequency Ratio	[Default]	131
Core Multi-Processing	[Enabled]	131
Machine Checking	[Enabled]	131
Fast Strings operations	[Enabled]	131
Thermal Management 2	[Enabled]	131
C1 Enhanced Mode	[Disabled]	132
Execute Disable Bit	[Enabled]	132
Adjacent Cache Line Prefetch	[Disabled]	132
Hardware Prefetcher	[Enabled]	132
Set Max Est CPUID = 3	[Disabled]	132
IP Prefetcher	[Enabled]	132
Direct Cache Access	[Disabled]	132
Intel(R) Virtualization Technology	[Disabled]	133
Intel EIST support	[Disabled]	133

Table 5-1 BIOS Default Settings **(continued)**

Menu Item	Setting	Page
Advanced / I/O Device Configuration		
KBC Clock Input	[12 MHz]	134
Serial port A	[Enabled]	134
Base I/O address	[3F8]	134
Interrupt	[IRQ 4]	134
Serial port B	[Enabled]	134
Mode	[Normal]	134
Base I/O address	[2F8]	134
Interrupt	[IRQ 3]	134
Parallel Port		135
Floppy Disk Controller		135
Base I/O Address		135
Advanced / DMI Event Logging		
Event log validity	Valid	135
Event log capacity	Space Available	135
View DMI event log	[Enter]	135
Event Logging	[Enabled]	135
ECC Event Logging	[Enabled]	135
Mark DMI events as read	[Enter]	136
Clear all DMI event logs	[No]	136
Advanced / Console Redirection		
Com Port Address	[On-board COM B]	136
Baud Rate	[115.2K]	136
Console Type	[VT100+]	136

Table 5-1 BIOS Default Settings **(continued)**

Menu Item	Setting	Page
Flow Control	[CTS/RTS]	136
Console connection	[Direct]	136
Continue C.R. after POST	[On]	137
Advanced / Hardware Monitor		
CPU 1:	38 C	
CPU 2:	38 C	
System Temperature	26 C	
FAN1 =	6300 RPM	
FAN2 =	6298 RPM	
FAN3 =	6301 RPM	
FAN4 =	N/A	
FAN5 =	N/A	
FAN6 =	N/A	
FAN7 =	N/A	
FAN8 =	N/A	
Fan Speed Control Modes	[1) disable (full speed)]	138
VcoreA	1.198 V	138
VcoreB	1.218 V	138
P1V5	1.504 V	138
+3.3V	3.296 V	138
+12V	11.904 V	138
5Vsb	4.872 V	138
5VDD	4.968 V	138
P_VTT	1.200 V	138

Table 5-1 BIOS Default Settings **(continued)**

Menu Item	Setting	Page
Vbat	3.296 V	138
Advanced / IPMI		
IPMI Specification Version	2.0	139
Firmware Version	1.49.04	139
System Event Logging	[Enabled]	139
Clear System Event Log	[Disabled]	139
Existing Event Log number	40	139
SYS Firmware Progress	[Disabled]	139
BIOS POST Errors	[Enabled]	139
BIOS POST Watchdog	[Disabled]	139
OS boot Watchdog	[Disabled]	139
Timer for loading OS (min)	[10]	140
Time out action	[No Action]	140
System Event Log	Data	141
System Event Log (list mode)	Data	141
Realtime Sensor Data	Data	143
Security		
Supervisor Password Is	Clear	144
User Password Is	Clear	144
Set Supervisor Password	[Enter]	144
Set User Password	[Enter]	144
Password on boot	[Disabled]	144

Table 5-1 BIOS Default Settings **(continued)**

Menu Item	Setting	Page
Boot		145
1: USB FDC		145
2: IDE CD		145
3: USB CDROM		145
4: USB KEY		145
5: BEV 0		145
6: ALL PCI Bev 1		145
7:		145
8:		145
: IDE 0:		145
: IDE 1:		145
: IDE 4:		145
: IDE 5:		145
: USB HDD:		145
: PCI SCSI:	HDT722525DLA380-(S0)	145
: PCI SCSI:	HDS725050KLA360-(S1) (If installed)	145
: USB ZIP:		145
: USB LS120:		145
: PCI BEV: IBA GE Slot 0401 v1236		145
: PCI BEV: IBA GE Slot 0400 v1236		145
: Other USB:		145

System BIOS

The BIOS is the Basic Input Output System used in nearly all computers. The BIOS stores the system parameters, types of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a backup battery provides power to the CMOS logic, enabling it to retain system parameters. Each time the computer is powered on, the computer is configured with the values stored in the CMOS by the system BIOS, which gains control at boot up.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key 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 BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Detailed descriptions are provide in the section for each parameter setting in the Setup utility.

Caution: To prevent possible boot failure, do not shut down or reset the system while updating BIOS.

Running Setup

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options.

When you first power on the computer, the BIOS is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Delete> immediately after turning the system on.
2. When the message shown below is displayed briefly at the bottom of the screen during the power-on self-test (POST), press the <Delete> key to activate the main Setup menu:

```
Press the <Delete> key to enter Setup
```

Main BIOS Setup

The main BIOS Setup screen is displayed in Figure 5-1. All main setup options are described in this section.

- Use the Up/Down arrow keys to move among the different settings in each menu.
- Use the Left/Right arrow keys to change the options for each setting.
- Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.
- Items that use submenus are indicated triangle icon. With the item highlighted, press the <Enter> key to access the submenu.

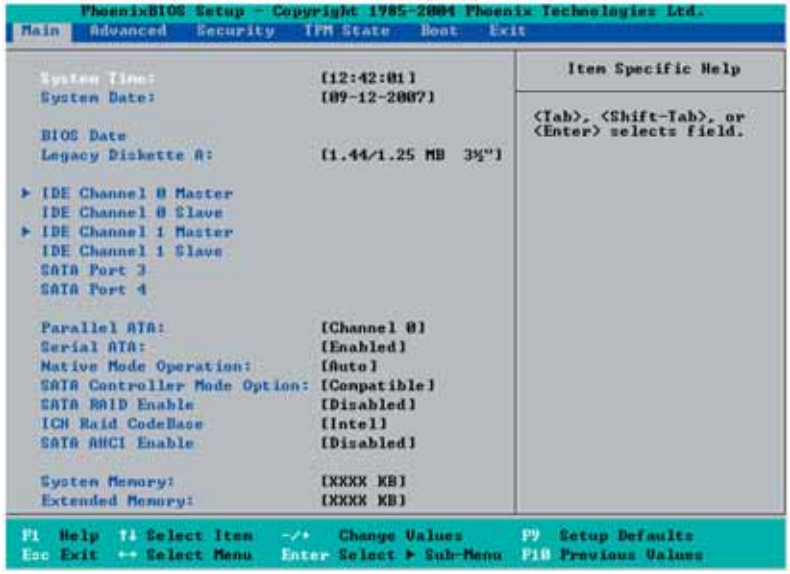


Figure 5-1 Main BIOS Setup Menu

Main Setup Features

System Time

To set the system date and time, type the correct information into the appropriate fields. Then, press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day, and year fields, and enter the correct data. Press the <Enter> key to save the data.

BIOS Date

This field displays the date when this version of BIOS was built.

Legacy Diskette A

Note: This feature is not implemented on SGI Altix XE250 servers.

IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, SATA Port 3 and SATA Port 4

Note: This feature is not implemented on SGI Altix XE250 servers.

These settings allow the user to set the parameters of IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, SATA Port 3, SATA Port 4 slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are described in the following paragraphs.

Type

This option allows the user to select the type of IDE hard drive (refer to Figure 5-2). Select Auto to allow the BIOS to automatically configure the parameters of the HDD installed at the connection. Enter a number between 1 to 39 to select a predetermined HDD type. Select User to allow the user to enter the parameters of the HDD installed. Select CDROM if a CDROM drive is

installed. Select ATAPI if a removable disk drive is installed. The following items will be displayed by the BIOS:

CHS Format

- **Type**: This item displays the type of IDE or SATA Device.
- **Cylinders**: This item indicates the status of Cylinders.
- **Headers**: This item indicates the number of headers.
- **Sectors**: This item displays the number of sectors.
- **Maximum Capacity**: This item displays the maximum storage capacity of the system.
- **Multi-Sector Transfers**: This item enables you to specify the number of sectors per block to be used in multi-sector transfer. The options are Disabled, 4 Sectors, 8 Sectors, and 16 Sectors.
- **LBA Mode Control**: This item determines whether the BIOS accesses the IDE Channel 0 Master Device via the LBA mode. The options are Enabled and Disabled.
- **32 Bit I/O**: This option enables you to enable or disable the function of 32-bit data transfer. The options are Enabled and Disabled.
- **Transfer Mode**: This option allows the user to set the transfer mode. The options are Standard, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.
- **Ultra DMA Mode**: This option allows the user to select Ultra DMA Mode. The options are Disabled, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, and Mode 5.

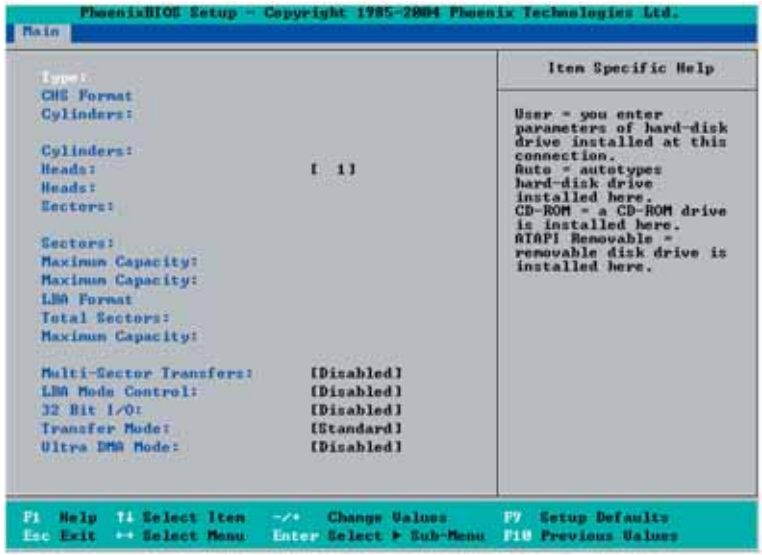


Figure 5-2 Main BIOS Menu Setup Menu (2)

Procedure 5-1 Native Mode Operation

Parallel ATA

Note: This feature is not implemented on SGI Altix XE250 servers.

This setting allows the user to enable or disable the function of Parallel ATA. The options are Disabled, Channel 0, Channel 1, and Both.

Serial ATA

This setting allows the user to enable or disable the function of Serial ATA. The options are Disabled and Enabled.

Native Mode Operation

Select the native mode for ATA. The options are: Parallel ATA, Serial ATA, Both, and Auto.

SATA Controller Mode

Select Compatible to enable the SATA and PATA drives to be automatically-detected and be placed in the Legacy Mode by the BIOS. Select Enhanced to allow the SATA and PATA drives to be to be automatically-detected and be placed in the Native IDE Mode.

When the SATA Controller Mode is set to Enhanced, the following items are displayed.

Serial ATA (SATA) RAID Enable

Select Enable to allow Serial ATA RAID functions. (For the Windows OS environment, use the RAID driver if this feature is set to Enabled. When this item is set to Enabled, the item: “ICH RAID Code Base” is available for you to select Intel or Adaptec Host RAID firmware to be activated. If this item is set to Disabled, the item-SATA AHCI Enable is available.) The options are Enabled and Disabled.

ICH RAID Code Base (Available when SATA RAID is Enabled)

Select Intel to enable the Intel SATA RAID firmware. Select Adaptec to use the Adaptec HostRAID firmware. The options are Intel and Adaptec.

SATA AHCI (Available when SATA RAID is Disabled)

Select Enable to enable the function of Serial ATA Advanced Host Interface. (**Use caution when using this function. This feature is for advanced programmers only**.) The options are Enabled and Disabled.

System Memory

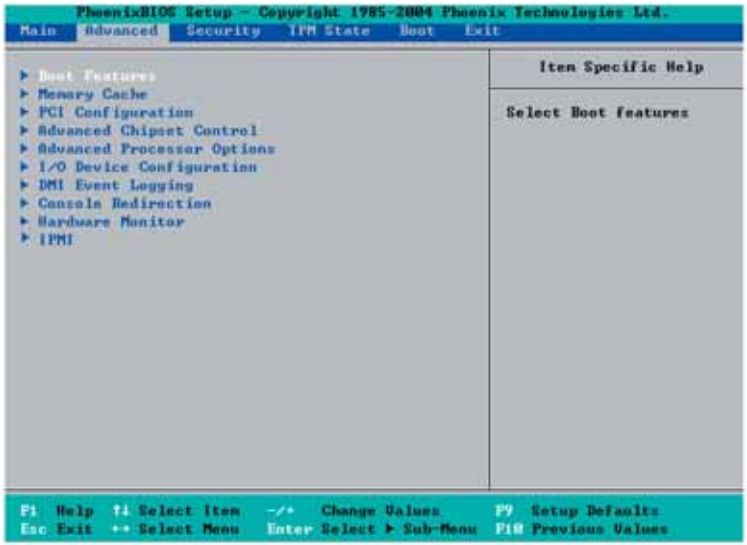
This display informs you how much system memory is recognized as being present in the system.

Extended Memory

This display informs you how much extended memory is recognized as being present in the system.

Advanced Setup

Choose Advanced from the BIOS Setup Utility main menu with the arrow keys. The items with a triangle beside them have submenus that can be accessed by highlighting the item and pressing <Enter>.



Boot Features

Access the submenu to make changes to the following settings.

QuickBoot Mode

If enabled, this feature speeds up the POST routine by skipping certain tests after the computer is turned on. The settings are Enabled and Disabled. If Disabled, the POST routine will run at normal speed.

QuietBoot Mode

This setting enables you to Enable or Disable the graphic logo screen during boot-up.

POST Errors

Set to Enabled to display POST Error Messages if an error occurs during bootup. If set to Disabled, the system will continue to boot without displaying any error message even when a boot error occurs.

ACPI Mode

Use this setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system. The options are Yes and No.

Power Button Behavior

If set to Instant-Off, the system will power off immediately as soon as the user hits the power button. If set to 4-sec., the system will power off when the user presses the power button for 4 seconds or longer. The options are instant-off and 4-second override.

Resume On Modem Ring

Select On to “wake your system up” when an incoming call is received by your modem. The options are On and Off.

EFI OS Boot

If enabled, this feature provides support for EFI OS booting. The options are Enabled and Disabled.

Keyboard on Now Function

This feature allows the user to determine how to use the keyboard to power on the system from S3~S5 States. Select Space to allow the user to power on the system by pressing the space bar. Select Password to allow the user to enter the password to power on the system. Select Disabled to disable this function.

Power Loss Control

The feature allows the user to set the power state after a power outage. You can select Stay 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 the power loss.

Watch Dog

If enabled, this option automatically resets the system if the system is not active for more than 5 minutes. The options are Enabled and Disabled.

Summary Screen

This setting enables you to Enable or Disable the summary screen, which displays the system configuration during bootup.

Memory Cache

Cache System BIOS Area

This setting enables you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow BIOS to write (cache) its data into it. Select Write Protect to enable the function and reserve this area for system BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS to write (cache) its data into this reserved memory area. Select Write Protect to enable the function and reserve this area for the Video BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM), or to be written into L1 or L2 cache inside the CPU to speed up CPU's operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 0-512K. Select Write Back to allow the CPU to write data back

directly from the buffer without writing data to the system memory in order to speed up CPU's operation. The options are Uncached, Write Through, Write Protect, and Write Back.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the SDRAM or written into L1, L2, or L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 512-640K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the system memory to speed up CPU's operation. The options are Uncached, Write Through, Write Protect, and Write Back.

Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DROM (SDROM), or written into L1, L2, or L3 cache inside the CPU to speed up CPU's operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 0-512K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the system memory to speed up CPU's operation. The options are Uncached, Write Through, Write Protect and Write Back.

Discrete MTRR Allocation

If enabled, MTRRs (Memory Type Range Registers) are configured as distinct, separate units and cannot be overlapped. If enabled, the user can achieve better graphic effects when using a Linux graphic driver that requires the write combining configuration with 4GB or more memory. The options are Enabled and Disabled.

PCIe Configuration

Access the submenu to make changes to the following settings for PCIe devices.

Onboard GLAN1/Onboard GLAN2 (Gigabit- LAN) OPROM Configure

Enabling this option provides the capability to boot from GLAN Port 1 or GLAN Port 2. The options are Disabled and Enabled.

Default Primary Video Adapter

This feature allows the user to specify which video adapter is to be used as the default primary video adapter: the onboard video adapter or others. The options are Other and Onboard Video.

Emulated IRQ Solutions

The options are Disabled and Enabled.

PCIe I/O Performance

Some add-on cards perform faster with the coalesce feature, which limits the payload size to 128 bytes, while others perform faster with a payload size of 256 bytes, which inhibits coalesce features. Please refer to your add-on card user guide for the desired setting. The options are Payload (256 bytes) and Coalesce Enabled (128 bytes).

PCI Fast Delayed Transition

Enable this function to improve the DMA data transfer rate for a PCI 32-bit multimedia card. The options are Enable and Disabled.

Reset Configuration Data

If set to Yes, this setting clears the Extended System Configuration Data- (ESCD) area. The options are Yes and No.

Frequency for PCI-X 1 and 2

This option allows the user to change the bus frequency for the devices installed in the slot indicated. The options are Auto, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

PCI Slot Options

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are Enabled and Disabled.

Enable Master

This setting enables you to enable the selected device as the PCI bus master. The options are Enabled and Disabled.

Latency Timer

This setting enables you to set the clock rate for Bus Master. A high-priority, high throughout device may benefit from a greater clock rate. The options are Default, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novell and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate.

Large Disk Access Mode

This setting determines how large a hard drive is to be accessed. The options are DOS or Other (for Unix, Novell NetWare, and other operating systems).

Advanced Chipset Control

Access the submenu to make changes to the following settings.

Caution: Use caution when changing the Advanced settings. Incorrect values entered may cause a system to malfunction. Also, a very high DRAM frequency or incorrect DRAM timing may cause system to become unstable. When this occurs, revert the item to the default setting.

SERR Signal Condition

This setting specifies the ECC Error conditions. The options are None, Single Bit, Multiple Bit, and Both.

Clock Spectrum Feature

If Enabled, the BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and Disabled.

Intel VT for Directed I/O(VT-d)

Select Enable to enable the functionality of the Intel Virtualization Technology for Direct I/O VT-d support by reporting the I/O device assignment to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and Disabled.

Press the <Enter> key to enter the submenu. The following items are displayed:

- VT-d for Port 0 (ESI)
- VT-d for Port 1
- VT-d for Port 3
- VT-d for Port 5
- VT-d for Port 7
- VT-d for Port 9

Select Enable to enable Intel VT-d support for Port 0(ESI), Port 3, Port 5, Port 7, Port 9 through using DRHD structures located in the ACPI Tables.

4GB PCIe Hole Granularity

This feature enables you to specify the size of PCIe hole. The options are: 256 MB, 512 MB, 1GB and 2GB.

Memory Voltage

These feature enables you to set you memory voltage preference. The default setting is Auto.

Memory Branch Mode

This option determines how the two memory branches operate. System address space can either be interleaved between the two branches or Sequential from one branch to another. Mirror mode allows data correction by maintaining two copies of data in two branches. Single Channel 0 allows a single DIMM population during system manufacturing. The options are Interleave, Sequential, Mirroring, and Single Channel 0.

Branch 0/1 Rank Interleaving

Select Enabled to enable the feature of memory Interleaving for Branch 0 Rank/ Branch1 Rank. The options are 1:1, 1:2 and 1:4.

Branch 0/1 Rank Sparing

Select Enabled to enable the sparing feature for Branch 0 Rank/Branch 1 Rank. The options are Enabled and Disabled.

Enhanced x8 Detection

Select Enabled to enable Enhanced x8 DRAM UC Error Detection. The options are Disabled and Enabled.

Demand Scrub

Scrubbing is a process that allows the North Bridge to correct correctable memory errors found on an FBD memory module. When the CPU or I/O issues a Demand Read command, and the read data from memory turns out to be a correctable ECC, it is corrected and sent to the original source. Memory is updated as well. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are Enabled and Disabled.

High Bandwidth FSB

The front side bus (FSB) is the physical bi-directional data bus that carries signals between the central processing unit (CPU) and other devices within the system, such as random access memory (RAM), AGP video cards, PCI expansion cards, hard disks, the memory containing the system BIOS, etc. A higher bandwidth FSB improves performance of the system. The options are Enabled and Disabled.

High Temperature DRAM Operation

When set to Enabled, the BIOS will refer to the SPD table to set the maximum DRAM temperature. When set to Disabled, the BIOS sets the maximum DRAM temperature based on a predefined value. The options are Enabled and Disabled.

AMB Thermal Sensor

Select Enabled to enable the thermal sensor embedded in the Advanced Memory Buffer on a fully buffered memory module for thermal monitoring. The options are Disabled and Enabled.

Thermal Throttle

Select Enabled to enable the function of closed-loop thermal throttling on a fully buffered (FBD) memory module. In the closed-loop thermal environment, thermal throttling will be activated when the temperature of the FBD DIMM device exceeds a predefined threshold. The options are Enabled and Disabled.

Global Activation Throttle

Select Enabled to enable open-loop global thermal throttling on a fully buffered (FBD) memory module to make it active whenever the number of activate control exceeds a predefined number. The options are Enabled and Disabled.

Force ITK Config Clocking

Select Enabled to configure FBD clock settings to support ITK testing. The options are Disabled and Enabled.

Snoop Filter

Select Enabled to eliminate snoop traffic to the graphics port to improve system performance when running graphics intensive applications. The options are Enabled and Disabled.

Crystal Beach Features

This feature was designed to implement Intel's I/O AT (Acceleration Technology) to accelerate the performance of TCP offload engine (TOE) devices.

Note: A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some or all packet processing of the add-on card. For this motherboard, the TOE device is built inside the ESB2 southbridge chip. The options are Enabled and Disabled.

Route Port 80h Cycles to

This feature allows the user to decide on which bus to send debug information. The options are Disabled, PCI, and LPC.

Clock Spectrum Feature

If Enabled, the BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and Disabled.

High Precision Event Timer

This is a replacement timer for the 8254 Programmable Interval Timer and the Real-time clock's (RTC) periodic interrupt function. The high-precision event timer (HPET) can produce periodic interrupts at much higher resolutions than the RTC interrupt function. The HPET is used to synchronize multimedia streams and provide smooth playback which reduces the need to use other timestamp calculations such as the Intel x86 RDTSC instruction.

USB Function

Select Enabled to enable the function of USB devices specified. The settings are Enabled and Disabled.

Legacy USB Support

This setting enables you to enable Legacy USB device support. The settings are Enabled and Disabled.

Advanced Processor Options

CPU Speed

This is a display that indicates the speed of the installed processor.

Frequency Ratio

This feature enables you to set the internal frequency multiplier for the CPU. The options are: Default, x12, x13, x14, x15, x16, x17 and x18.

Core-Multi-Processing

Set to Enabled to use a processor's second core and beyond. (Please refer to Intel's web site for more information.) The options are Disabled and Enabled.

Machine Checking

Set to Enabled to activate the function of Machine Checking and allow the CPU to detect and report hardware (machine) errors via a set of model-specific registers (MSRs). The options are Disabled and Enabled.

Fast Strings Operations

To to Enabled to optimize code for string operations and a decrease in the time required to carry out the string instruction.

Thermal Management 2

Set to Enabled to use Thermal Management 2 (TM2), which will lower CPU voltage and frequency when the CPU temperature reaches a predefined overheat threshold. Set to Disabled to use Thermal Manager 1 (TM1), allowing CPU clocking to be regulated via CPU Internal Clock modulation when the CPU temperature reaches the overheat threshold.

C1 Enhanced Mode

Select Disable to disable the Standard C1 Halt State, which will partially turns off the CPU internal clocks to conserve energy and prevent system overheating when the OS is idle. Select Enable to use the Enhanced C1 Halt State to lower the CPU clock frequency and the supply voltage before turning off the clocks.

Execute Disable Bit

Set to Enabled to enable Execute Disable Bit and allow the processor to classify areas in memory where an application code can be executed and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes to overwhelm the processor or damage the system during an attack. The options are Disabled and Enabled.

Adjacent Cache Line Prefetch

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are Disabled and Enabled.

Hardware Prefetcher

Set this option to Enabled to enable the hardware components that are used in conjunction with software programs to prefetch data in order to shorten execution cycles and maximize data processing efficiency. The options are Disabled and Enabled.

Set Max Est CPUID = 3

When set to Enabled, the Maximum Extended CPUID will be set to 3. The options are Disabled and Enabled.

IP Prefetcher

Set this option to Enabled to use the feature of IP Prefetch to speed up data processing. The options are Disabled and Enabled.

Direct Cache Access

Set to Enable to route inbound network IO traffic directly into processor caches to reduce memory latency and improve network performance. The options are Disabled and Enabled.

DCA Delay Clocks

This feature allows the user to set the clock delay setting from snoop to prefetch for Direct Cache Access. Select a setting from 8 (bus cycles) to 120 (bus cycles) (in 8-cycle increment). The default setting is 32 (bus cycles).

Intel Virtualization Technology

Select Enabled to use the Intel Virtualization Technology and enable one platform to run multiple operating systems and applications in independent partitions, creating multiple “virtual” systems in one physical computer. The options are Enabled and Disabled.

Note: If there is any change to this setting, you must power off and restart the system for the change to take effect.

Intel EIST Support

Select Enabled to use the Enhanced Intel SpeedStep Technology and enable the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. The options are Enabled and Disabled.

I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock Input

This setting allows you to select clock frequency for KBC. The options are 6MHz, 8MHz, 12MHz, and 16MHz.

Serial Port A

This setting enables you to assign control of serial port A. The options are Enabled (user defined), Disabled, Auto (BIOS controlled), and OS Controlled.

Base I/O Address
This setting enables you to select the base I/O address for serial port A. The options are 3F8, 2F8, 3E8, and 2E8.

Interrupt
This setting enables you to select the IRQ (interrupt request) for serial port B. The options are IRQ3 and IRQ4.

Serial Port B

This setting enables you to assign control of serial port B. The options are Enabled (user defined), Disabled, Auto (BIOS controlled), and OS Controlled.

Mode
This setting enables you to set the type of device that will be connected to serial port B. The options are Normal, IR (for an infrared device), and ASK_IR.

Base I/O Address
This setting enables you to select the base I/O address for serial port B. The options are 3F8, 2F8, 3E8, and 2E8.

Interrupt
This setting enables you to select the IRQ (interrupt request) for serial port B. The options are IRQ3 and IRQ4.

Parallel Port

This setting allows you to assign control of the parallel port. The options are Enabled (user defined), Disabled and Auto (BIOS-or OS- controlled).

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are Enabled (user defined), Disabled, and Auto (BIOS and OS controlled).

Base I/O Address

This setting enables you to select the base I/O address for the Floppy port. The options are Primary and Secondary.

DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display to inform you of the event log validity. It is not a setting.

Event Log Capacity

This is a display to inform you of the event log capacity. It is not a setting.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting enables you to Enable or Disable event logging.

ECC Event Logging

This setting enables you to Enable or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and No.

Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

This item enables you to specify which COM port to direct the remote console to: Onboard COM A or Onboard COM B. This setting can also be Disabled.

BAUD Rate

This item enables you to set the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, 19.2K, 38.4K, 57.6K, and 115.2K.

Console Type

This item enables you to set console redirection type. The options are VT100, VT100,8bit, PC-ANSI, 7bit, PC ANSI, VT100+, VT-UTF8, and ASCII.

Flow Control

This item enables you to select the flow control option for console redirection. The options are None, XON/XOFF, and CTS/RTS.

Console Connection

This item enables you to decide how console redirection is to be connected: either Direct or Via Modem.

Continue CR after POST

Choose whether to continue with console redirection after the POST routine. The options are On and Off.

Hardware Monitor

Note: The BIOS automatically detects the type of CPU(s) and hardware monitoring chips that are used on the motherboard and displays the Hardware Monitoring Screen accordingly. The Hardware Monitoring Screen may look different than one shown on the following pages.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select 3-pin if your chassis uses 3-pin fans. Select 4-pin if your chassis uses 4-pin fans. Select “Disable” to disable the fan speed control function and allow the onboard fans to constantly run at the full speed (12V). The Options are:

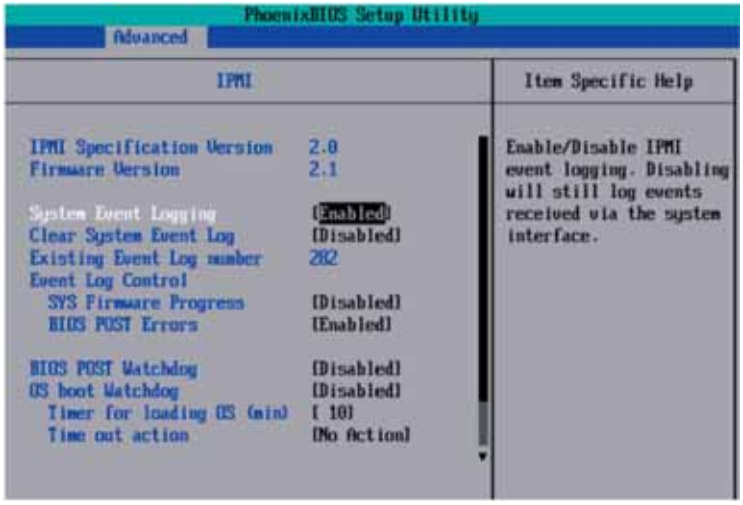
- 1. Disable
- 2. Optimized Server w/3-pin
- 3. Optimized Workstation w/3-pin
- 4. Optimized Server w/4-pin
- 5. Optimized Workstation w/4-pin.

Voltage Monitoring

The following items are monitored and displayed:

- Vcore A
- Vcore B
- P1V5
- +3.3V
- +12V
- 5Vsb
- 5VDD
- P_VTT
- Vbat

IPMI



IPMI Specification Version

This item displays the current IPMI Version.

Firmware Version

This item displays the current Firmware Version.

System Event Logging

Select Enabled to enable IPMI Event Logging. When this function is set to Disabled, the system will continue to log events received via system interface. The options are Enabled and Disabled.

Clear System Event Logging

Enable this function to force the BIOS to clear the system event logs during the next cold boot. The options are Enabled and Disabled.

Existing Event Log Number

This item displays the number of the existing event log.

Event Log Control

System Firmware Progress
Enable this function to log POST progress. Options are Enabled and Disabled.

BIOS POST Errors
Enable this function to log POST errors. Options are Enabled and Disabled.

BIOS POST Watch Dog

Set to Enabled to enable POST Watch Dog. Options are Enabled and Disabled.

OS Boot Watch Dog

Set to Enabled to enable OS Boot Watch Dog. The options are Enabled and Disabled.

Timer for Loading OS (Minutes)

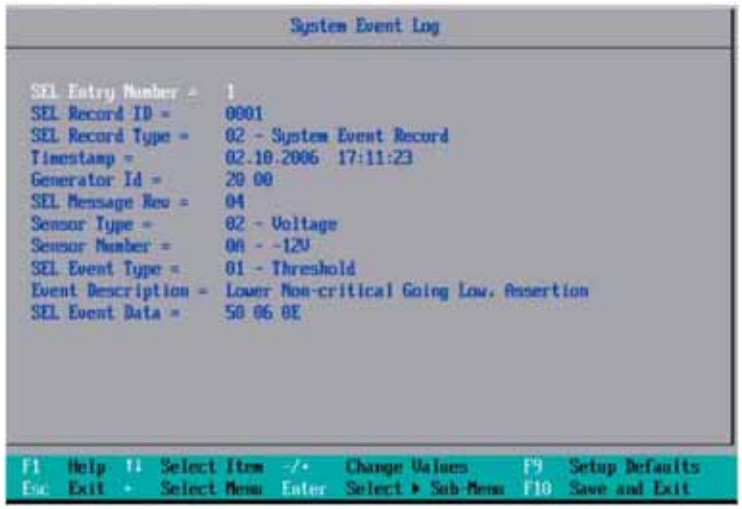
This feature allows the user to set the time value (in minutes) for the previous item: OS Boot Watch Dog by keying-in a desired number in the blank. The default setting is 10 minutes. **Ignore this option when OS Boot Watch Dog is set to Disabled.**

Time Out Option

This feature allows the user to determine what action to take in an event of a system boot failure. The options are No Action, Reset, Power Off, and Power Cycles.

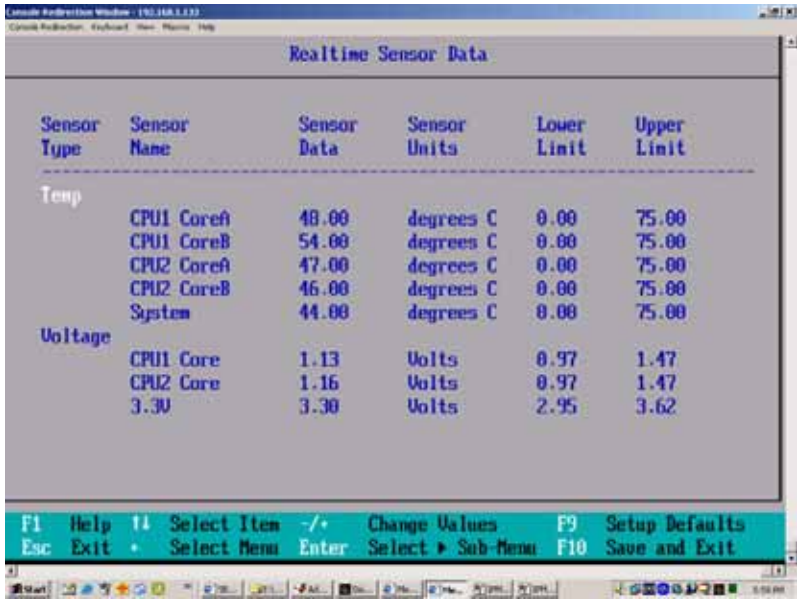
System Event Log/System Event Log (List Mode)

These options display the System Event (SEL) Log and System Event (SEL) Log in List Mode. Items include: SEL (System Event Log) Entry Number, SEL Record ID, SEL Record Type, Time Stamp, Generator ID, SEL Message Revision, Sensor Type, Sensor Number, SEL Event Type, Event Description, and SEL Event Data.



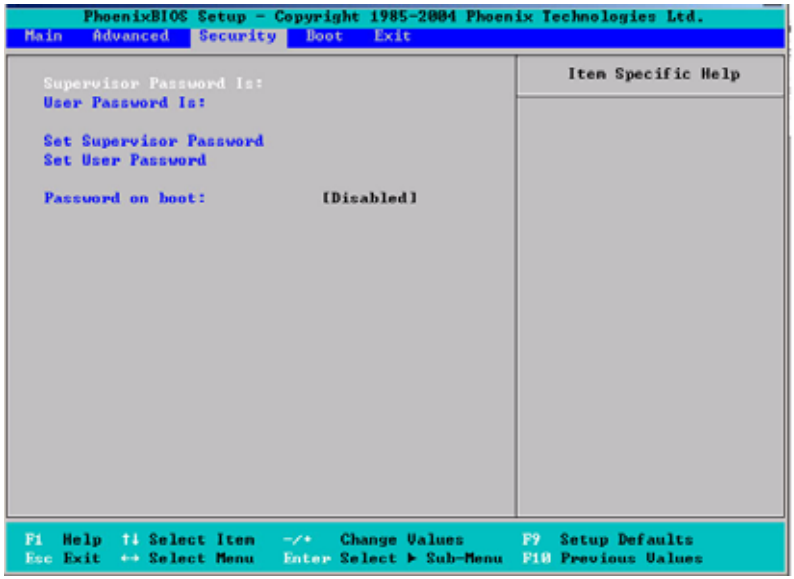
Realtime Sensor Data

This feature display information from motherboard sensors, such as temperatures, fan speeds, and voltages of various components.



Security

Choose Security from the BIOS Setup Utility main menu with the arrow keys. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.



Supervisor Password Is

This displays whether a supervisor password has been entered for the system. Clear means such a password has not been used, and Set means a supervisor password has been entered for the system.

User Password Is

This displays whether a user password has been entered for the system. Clear means such a password has not been used, and Set means a user password has been entered for the system.

Set Supervisor Password

When the item “Set Supervisor Password” is highlighted, press the <Enter> key. When prompted, type the Supervisor’s password in the dialogue box to set or to change the supervisor’s password, which allows access to the BIOS.

Set User Password

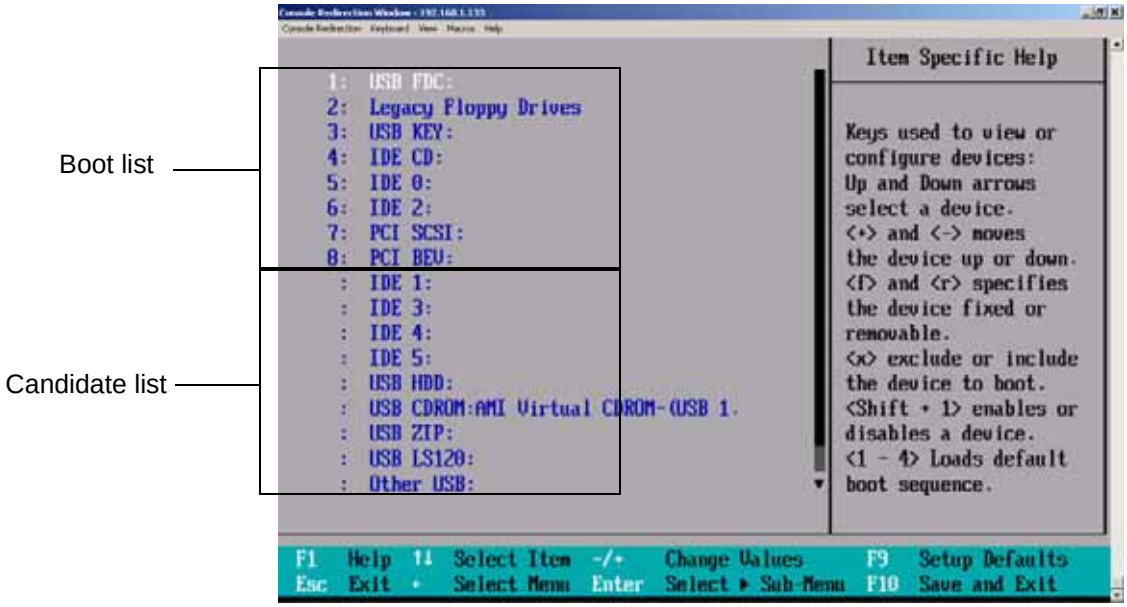
When the item “Set User Password” is highlighted, press the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Password on Boot

This setting enables you to require a password to be entered when the system boots up. The options are Enabled (password required) and Disabled (password not required).

Boot

Choose Boot from the BIOS Setup Utility main menu with the arrow keys. For details on how to change the order and specs of boot devices, refer to the Item Specific Help window. All Boot BIOS settings are described in this section.

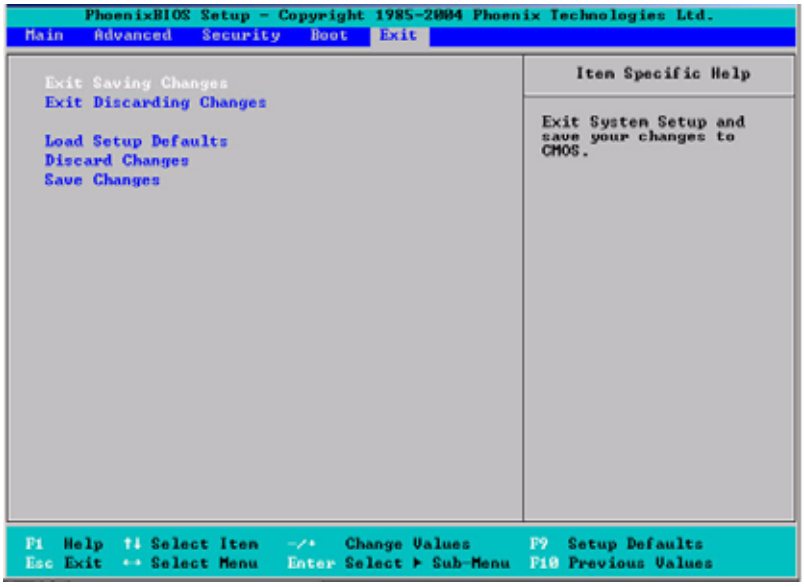


Boot Priority Order/Excluded from Boot Orders

The devices included in the boot list section (above) are bootable devices listed in the sequence of boot order as specified. The boot functions for the devices included in the candidate list (above) are currently disabled. Use a <+> key or a <-> key to move the device up or down. Use the <f> key or the <r> key to specify the type of an USB device, either fixed or removable. You can select one item from the boot list and press the <x> key to remove it from the list of bootable devices (to make its resource available for other bootable devices). Subsequently, you can select an item from the candidate list and press the <x> key to remove it from the candidate list and put it in the boot list. This item will then become a bootable device. For details on changing the boot priority order of a device, refer to the “Item Specific Help” window.

Exit

Choose Exit from the BIOS Setup Utility main menu with the arrow keys. All Exit BIOS settings are described in this section.



Exit Saving Changes

Highlight this item and press <Enter> to save any changes you have made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and press <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and press <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and press <Enter> to discard (cancel) any changes you've made. You will remain in the Setup utility.

Save Changes

Highlight this item and press <Enter> to save any changes you've made. You will remain in the Setup utility.

BIOS Power-on Self Test

This appendix lists and describes the BIOS power-on self-test (POST) messages and codes.

BIOS POST Codes

The POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display a POST code that describes the problem. BIOS may also issue one of the following beep codes:

- 1 long and two short beeps - video configuration error
- 1 repetitive long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS shuts down the system. Before doing so, BIOS writes the error to port 80h, attempts to initialize video, and writes the error in the top left corner of the screen.

Table A-1 lists the codes that may be written to port 80h.

Table A-1 BIOS Post Codes

POST Code (hex)	Description
01	IPMI Initialization
02	Verify Real Mode
03	Disable Non-Maskable Interrupt (NMI)
04	Get CPU type
06	Initialize system hardware
07	Disable shadow and execute code from the ROM
08	Initialize chipset with initial POST values
09	Set IN POST flag
0A	Initialize CPU registers
0B	Enable CPU cache
0C	Initialize caches to initial POST values
0E	Initialize I/O component
0F	Initialize the local bus IDE
10	Initialize Power Management
11	Load alternate registers with initial POST values
12	Restore CPU control word during warm boot
13	Reset PCI Bus Mastering devices
14	Initialize keyboard controller
16	1-2-2-3 BIOS ROM checksum
17	Initialize cache before memory Auto size
18	8254 timer initialization
1A	8237 DMA controller initialization
1C	Reset Programmable Interrupt Controller

Table A-1 BIOS Post Codes **(continued)**

POST Code (hex)	Description
20	1-3-1-1 Test DRAM refresh
22	1-3-1-3 Test 8742 Keyboard Controller
24	Set ES segment register to 4 GB
28	Auto size DRAM
29	Initialize POST Memory Manager
2A	Clear 512 KB base RAM
2C	1-3-4-1 RAM failure on address line ***xxxx****
2E	1-3-4-3 RAM failure on data bits ***xxxx**** of low byte of memory bus
2F	Enable cache before system BIOS shadow
32	Test CPU bus-clock frequency
33	Initialize Phoenix® Dispatch Manager
36	Warm start shut down
38	Shadow system BIOS ROM
3A	Auto size cache
3C	Advanced configuration of chipset registers
3D	Load alternate registers with CMOS values
41	Initialize extended memory for RomPilot (optional)
42	Initialize interrupt vectors
45	POST device initialization
46	2-1-2-3 Check ROM copyright notice
48	Check video configuration against CMOS
49	Initialize PCI bus and devices
4A	Initialize all video adapters in system
4B	QuietBoot start (optional)

Table A-1 BIOS Post Codes **(continued)**

POST Code (hex)	Description
4C	Shadow video BIOS ROM
4E	Display BIOS copyright notice
4F	Initialize MultiBoot
50	Display CPU type and speed
51	Initialize EISA board (optional)
52	Test keyboard
54	Set key click if enabled
55	Enable USB devices
58	2-2-3-1 Test for unexpected interrupts
59	Initialize POST display service
5A	Display prompt “Press <ESC> to enter SETUP”
5B	Disable CPU cache
5C	Test RAM between 512 and 640kB
60	Test extended memory
62	Test extended memory address lines
64	Jump to UserPatch1
66	Configure advanced cache registers
67	Initialize Multi Processor APIC
68	Enable external and CPU caches
69	Setup System Management Mode (SMM) area
6A	Display external L2 cache size
6B	Load custom defaults (optional)
6C	Display shadow-area message
70	Display error messages

Table A-1 BIOS Post Codes **(continued)**

POST Code (hex)	Description
72	Check for configuration errors
76	Check for keyboard errors
7C	Set up hardware interrupt vectors
7D	Initialize Intelligent System Monitoring (optional)
7E	Initialize coprocessor if present
80	Disable onboard Super I/O ports and IRQs (optional)
81	Late POST device initialization
82	Detect and install external RS232 ports
83	Configure non-MCD IDE controllers
84	Detect and install external parallel ports
85	Initialize PC-compatible PnP ISA devices
86	Re-initialize onboard I/O ports.
87	Configure Motherboard Configurable Devices (optional)
88	Initialize BIOS Data Area
89	Enable Non-Maskable Interrupts (NMIs)
8A	Initialize Extended BIOS Data Area
8B	Test and initialize PS/2 mouse
8C	Initialize floppy controller
8F	Determine number of ATA drives (optional)
90	Initialize hard-disk controllers
91	Initialize local-bus hard-disk controllers
92	Jump to UserPatch2
93	Build MPTABLE for multi-processor boards
95	Install CD ROM for boot

Table A-1 BIOS Post Codes **(continued)**

POST Code (hex)	Description
96	Clear huge ES segment register
97	Fix up Multi-processor table
98	1-2 Search for option ROMs and shadow if successful. (One long, two short beeps on checksum failure)
99	Check for SMART Drive (optional)
9C	Set up Power Management
9D	Initialize security engine (optional)
9E	Enable hardware interrupts
9F	Determine number of ATA and SCSI drives
A0	Set time of day
A2	Check key lock
A4	Initialize typematic rate
A8	Erase <ESC> prompt
AA	Scan for <ESC> key stroke
AC	Enter SETUP
AE	Clear Boot flag
B0	Check for errors
B1	Inform RomPilot about the end of POST (optional)
B2	POST done - prepare to boot operating system
B4	One short beep before boot
B5	Terminate QuietBoot (optional)
B6	Check password (optional)
B7	Initialize ACPI BIOS and PPM Structures
B9	Prepare Boot

Table A-1 BIOS Post Codes **(continued)**

POST Code (hex)	Description
BA	Initialize SMBIOS
BC	Clear parity checkers
BD	Display MultiBoot menu
BE	Clear screen (optional)
BF	Check virus and backup reminders
C0	Try to boot with INT 19
C1	Initialize POST Error Manager (PEM)
C2	Initialize error logging
C3	Initialize error display function
C4	Initialize system error flags
C6	Console redirection init.
C7	Unhook INT 10h if console redirection enabled
C8	Force check (optional)
C9	Extended ROM checksum (optional)
CD	Reclaim console redirection vector
D2	Unknown interrupt
D4	Check Intel Branding string
D8	Alert Standard Format initialization
D9	Late init for IPMI
DE	Log error if micro-code not updated properly
The following POST codes pertain to the boot block in Flash ROM	
E0	Initialize the chipset
E1	Initialize the bridge
E2	Initialize the CPU

Table A-1 BIOS Post Codes **(continued)**

POST Code (hex)	Description
E3	Initialize system timer
E4	Initialize system I/O
E5	Check force recovery boot
E6	Checksum BIOS ROM
E7	Go to BIOS
E8	Set Huge Segment
E9	Initialize Multi Processor
EA	Initialize OEM special code
EB	Initialize PIC and DMA
EC	Initialize Memory type
ED	Initialize Memory size
EE	Shadow Boot Block
EF	System memory test
F0	Initialize interrupt vectors
F1	Initialize Run Time Clock
F2	Initialize video
F3	Initialize System Management Manager
F4	Output one beep
F5	Clear Huge Segment
F6	Boot to Mini DOS
F7	Boot to Full DOS

If BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (xxxx) indicating the address line or bits that failed. For example, “2C 0002” means address line 1 (bit one set) has failed. “2E 1020” means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the low-order byte of the error. It repeats this sequence continuously.

IPMI 2.0 Management Utility

This section describes the baseboard management controller (BMC) intelligent platform management interface (IPMI) 2.0 management utility. It provides basic overview information for the application that supports remote access (KVM-over-LAN).

IPMI defines the protocols used for interfacing with the BMC on the node board. The BMC links to a main processor and other onboard elements using a serial bus.

The BMC monitors onboard instrumentation such as temperature sensors, power status, voltages and fan speed, and provides remote power control capabilities to reboot and/or reset the server. It also includes remote access to the BIOS configuration and operating system console information via serial-over-LAN (SOL) or embedded KVM capabilities. Because the controller is a separate processor, the monitoring and control functions work regardless of CPU operation or system power-on status.

An administrator accesses the BMC by using an IPMI-compliant management application loaded on a PC or via a web interface on a management appliance that includes IPMI management and KVM. The IPMI protocol leverages an out-of-band network (typically dedicated for server monitoring and management), which provides a a secure path for mission-critical applications when regular in-band connectivity is lost or is unresponsive. IPMI messages follow the same format whether they are received through an operating system or are sent and received out-of-band.

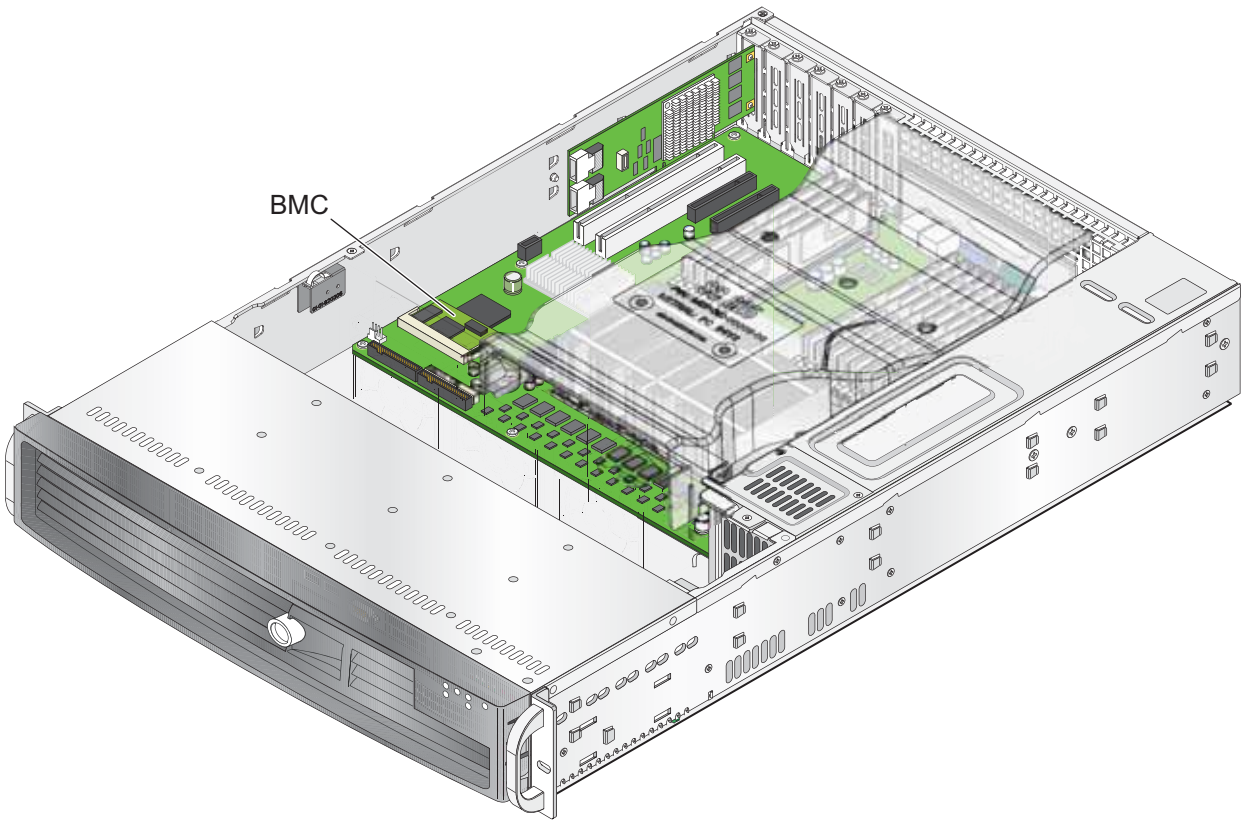


Figure B-1 Baseboard Management Controller (BMC)

The BMC card supports the functionality of IPMI Version 2.0. The key features include the following:

- Supports IPMI 2.0
- Supports Serial over LAN
- Supports KVM over LAN
- Supports LAN Alerting-SNMP trap
- Supports Event Log
- Offers operating system (OS) independency
- Provides remote hardware health monitors.
  Key features include the following:
  - Temperature monitor
  - Fan speed monitor
  - Voltage monitor
  - Power status monitor
  - Chassis intrusion monitor
  - Remote power control to power-on, power-off or reboot a system
  - Remote access to text-based, graphic-based system information, including BIOS configurations and OS operation information (KVM)
  - Remote management of utility/software applications
- Provides Network Management Security via remote access/console redirection.
  Key features include:
  - User authentication enhancement
  - Encryption support enhancement, allowing for password configuration security to protect sensitive data transferring via Serial over LAN
- Supports the following management tools:
  - IPMIView
  - CLI (Command Line Interface)
- Supports RMCP & RMCP protocols

The following system administration functions are available through the BMC interface:

- “Remote Control” on page 165
  Click on this icon for remote access and management of video console redirection.
- “Virtual Media” on page 166
  Click on this icon to use virtual remote media devices.
- “System Health” on page 173
  Click on this icon to view and manage health monitoring for remote systems.
- “User Management” on page 179
  Click on this icon for User Management.
- “KVM Settings” on page 182
  Click on this icon to configure keyboard, Video and mouse settings.
- “Device Settings” on page 187
  Click on this icon to configure device settings.
- “Maintenance” on page 200
  Click on this icon to access, diagnose and manage hardware devices.

Network Connection

1. Enter the IP address of the server in the address bar of your browser.
2. Once the connection is made, the Log In screen displays.
3. Enter the user name **`admin`** in the Username field.
4. Enter the password **`admin`** in the Password field and click on Login. The following menu is displayed:

Note: Click on the refresh button to refresh the remote console preview.

Functions Listed on the Home Page

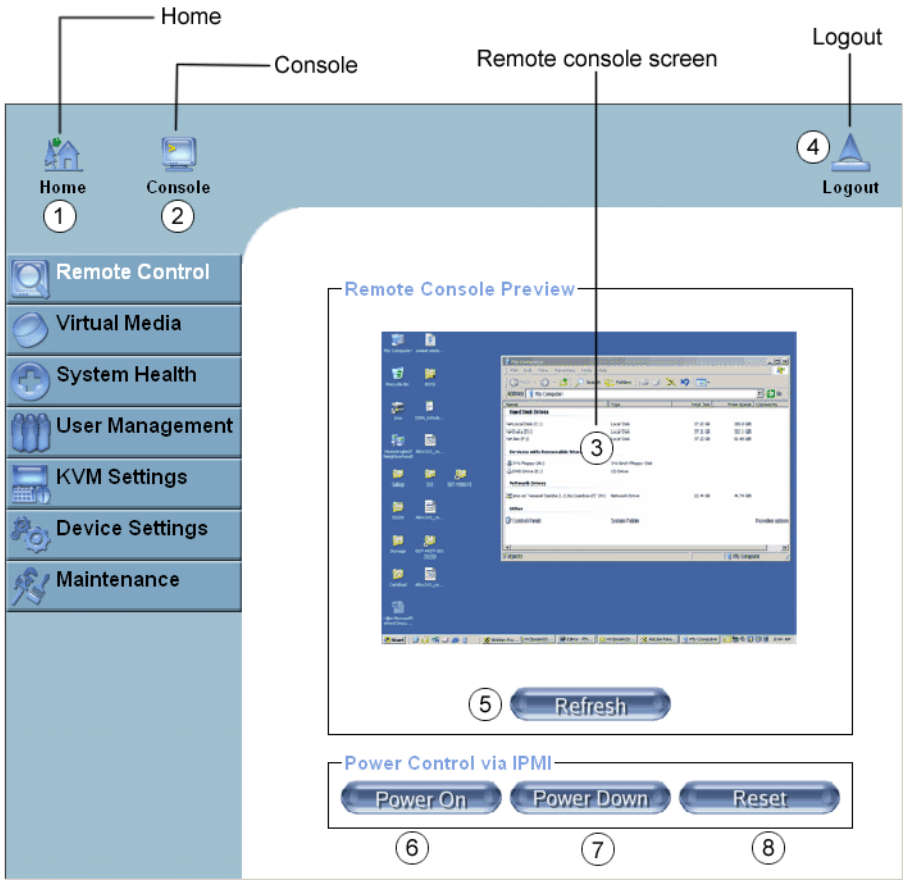


Figure B-2 BMC Remote Console

The functions of the icons for this home page are listed below:

- **Home**: Click this icon to return to the Home Page.
- **Console**: Click this icon to open the remote console screen.
- **Click to Open**: Click this link to open the remote console screen.
- **Logout**: Click this icon to log out.
- **Refresh**: Click this icon to refresh the remote console preview screen.
- **Power On**: Click this icon to power on the remote server.
- **Power down**: Click this icon to power down the remote server.
- **Reset**: Click this icon to reset the remote server.

Remote Control

Click on the Remote Control icon (refer to Figure B-2) to activate its submenus, such as the KVM console and remote power functions.

KVM Console

Click on this function to configure keyboard, mouse or video settings for the remote host.

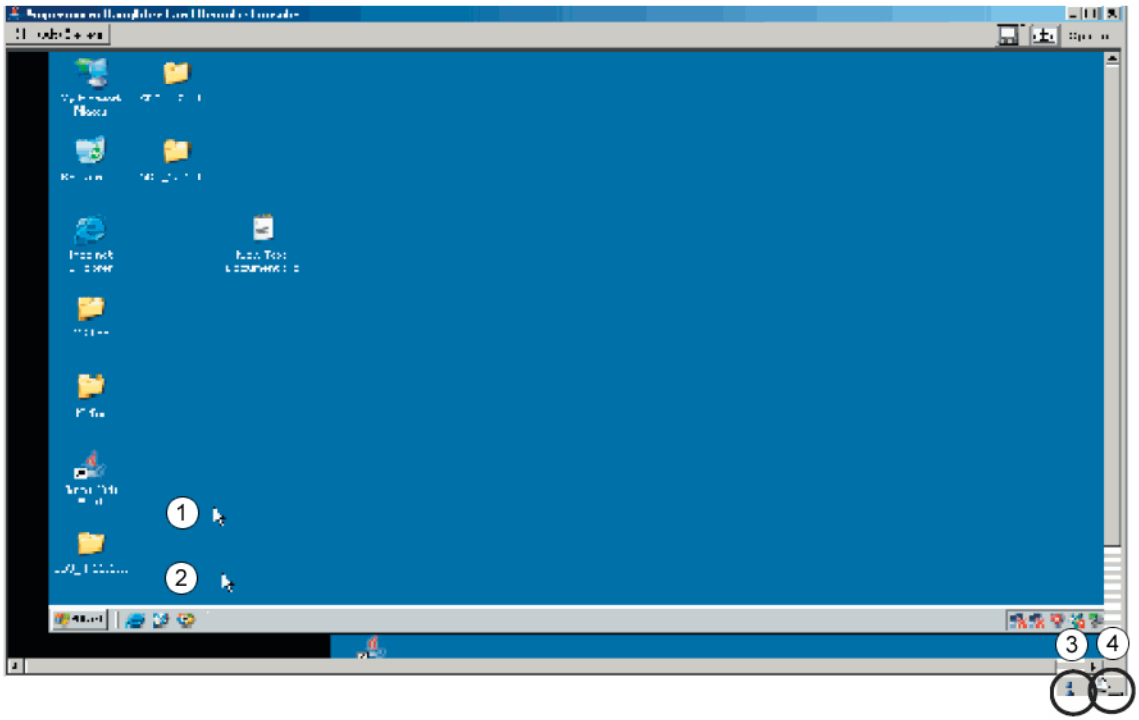


Figure B-3 Remote Console Screen

Refer to Figure B-3.

1. In the Single/Synchronized Mouse Mode, this cursor indicates the system that is currently active. For the Double Mouse mode, this is the cursor for the remote host.
2. This second mouse cursor only appears in the Double Mouse Mode. This cursor represents the local mouse.
3. This icon indicates the availability of Keyboard and Mouse.
4. This icon indicates the number of networks (users) that are connected via Console Redirection. (The number of figure icons indicates the number of users connected.)

Remote Power

Click on this item to configure the power settings for Remote Console.

- **Power On**: Click on this icon to power on the remote host.
- **Power Down**: Click on this icon to power down the remote host.
- **Reset**: Click on this icon to reset the remote host.

Virtual Media

Click on the Virtual Media icon on the Home Page to activate its submenus-Floppy Disk, CD-ROM, Drive Redirection and Options.

Note: The floppy disk menu is not used in the SGI Altix XE250 system. The BIOS file size exceeds that of a floppy disk image.

CD-ROM Image

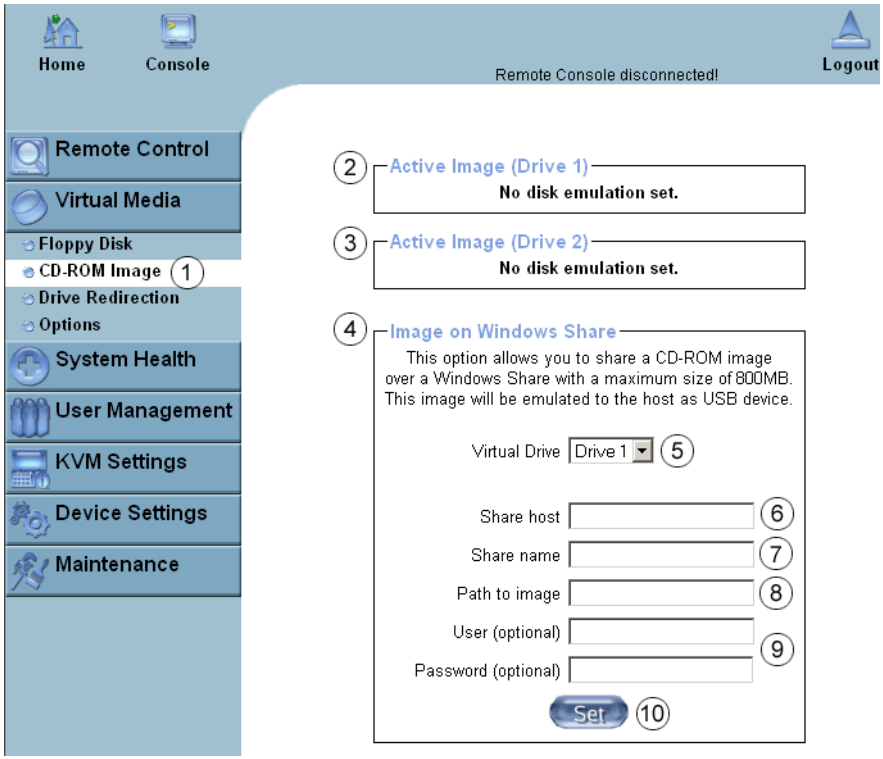


Figure B-4 CD-ROM Image

Refer to Figure B-4.

1. **CD-ROM image**: Click on this function key to share data stored in your local CD-ROM drive with other users in the remote host through the Windows Share application via USB.
2. **Active Image (Drive1)**: This window displays the filename of the data currently active in host Drive 1.
3. **Active Image (Drive2)**: This window displays the filename of the data currently active in host Drive 2.
4. **Image on Windows Share**: This option enables you to configure Windows Share settings. It enables you to decide how you want to share the data stored in your local CD-ROM with users in the remote host.
5. **Virtual Drive**: Specify the drive that you want to share your data with in the remote host.
6. **Share Host**: Enter the IP Address or the name of the system you wish to share data with via Windows Share.
7. **Share Name**: Enter the name of the system you wish to share data with in the remote host.
8. **Path to Image**: Enter the location of source files that you wish to share via Windows Share.
9. **User/Password** (Optional): Enter the Username and password for the person to access the data that you want to share and
10. Click “Set” to enter your selections.

Drive Redirection

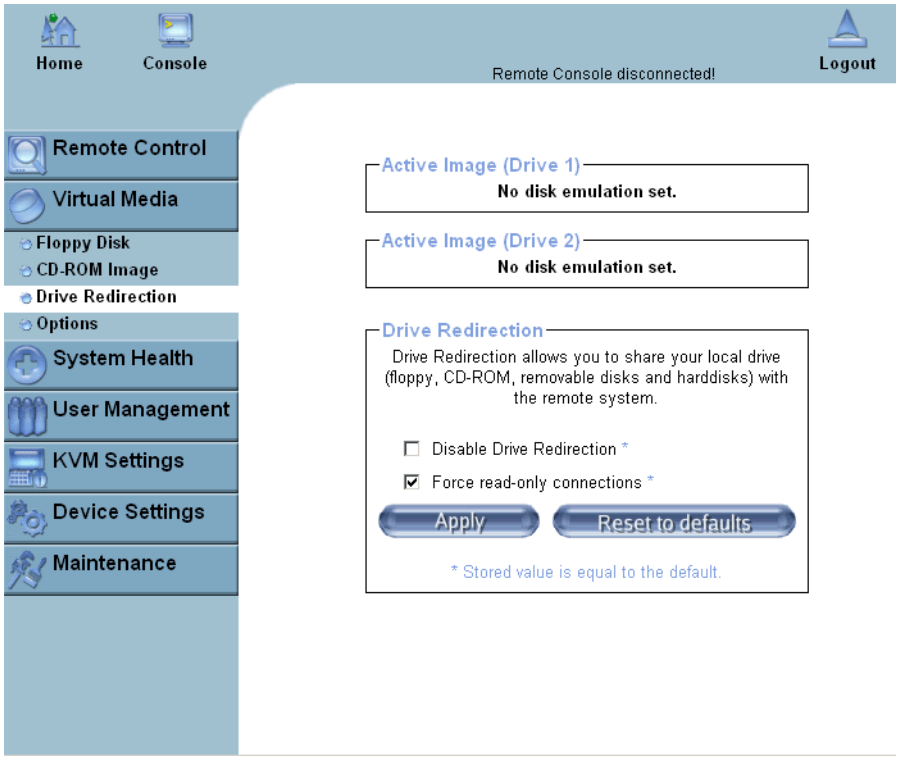


Figure B-5 Drive Redirection

Refer to Figure B-5.

- **Drive Redirection**: Click on this function key to make local drives accessible for other users via console redirection. This function enables you to share your local drives (CD-ROM and HDDs) with users in the remote systems.
- **Active Image (Drive1)**: This window displays the filename of the data currently active in host Drive 1.
- **Active Image (Drive2)**: This window displays the filename of the data currently active in host Drive 2.
- **Disable Drive Redirection**: Check the box to disable Drive Redirection. Once this function is disabled, local drives are not be accessible for other users in remote host.
- **Force Read Only**: Check this box to allow the data stored in local drives to be read in a remote system, but it cannot be overwritten to ensure data integrity and system security.
- **Apply**: Once you've configured your settings, click “Apply” to enter your settings.
- **Reset Default**: You can also enter your own setting values and re-set these values as “default” by clicking on this icon to reset the defaults.

Virtual Media Options

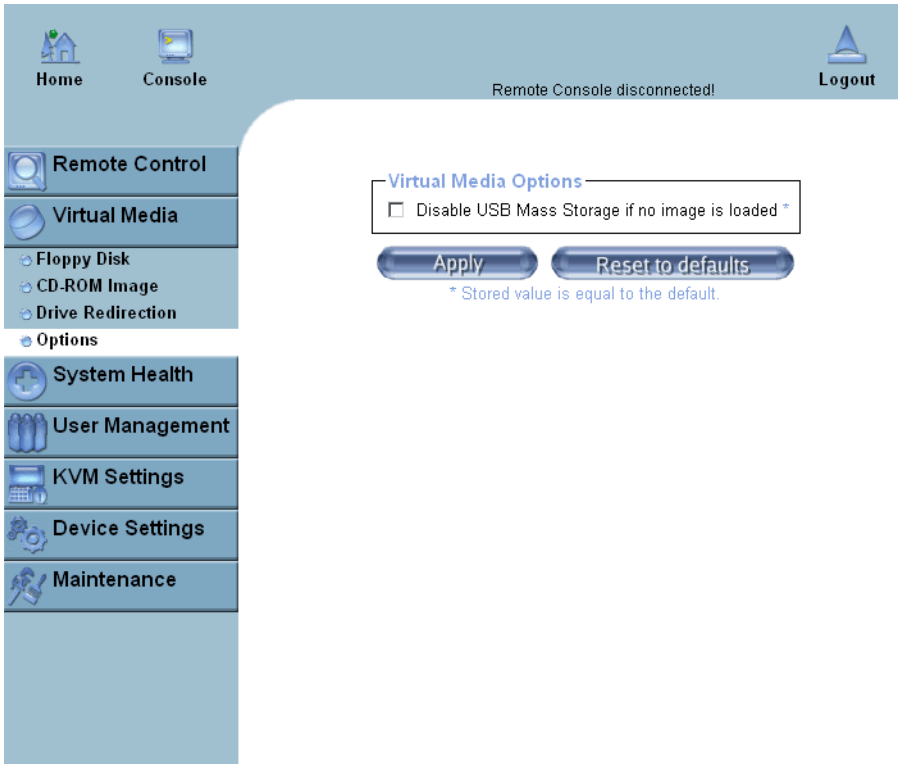


Figure B-6 Virtual Media Options

Refer to Figure B-6.

- **Options**: Click on this item to activate the Virtual Media sub-menu.
- **Virtual Media Options**: Use this option to disable or enable USB mass storage in the remote host. Check this box to disable the function of Virtual Media Options to prevent data stored in a local drive from being accessed, or uploaded by the user in the remote host. The default setting is “Enabled.”
- **Apply**: Once you have checked the box, click “Apply” to enter this value.
- **Reset to Defaults**: Click on this icon if you want to set “Disabled” as the default setting for the Virtual Media Options.

System Health

Click on the System Health icon on the Home Page to activate its submenus: Chassis Control, Monitor Sensor, System Event Log and Alert settings.

Chassis Control

Click on this item to access Health Monitoring information on the remote system.

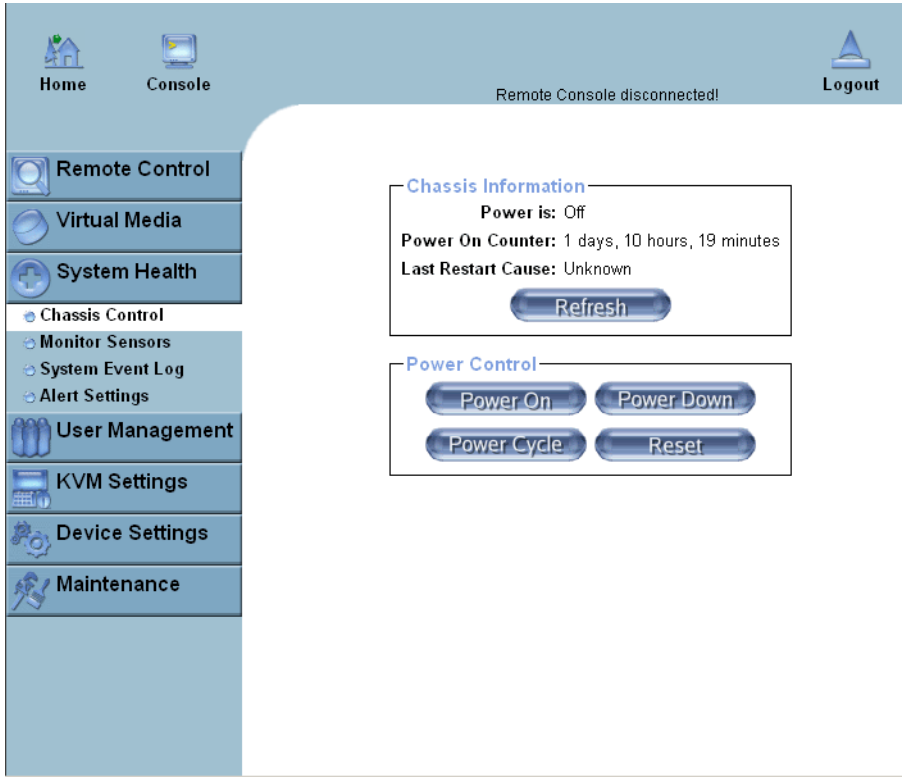


Figure B-7 Chassis Control

Refer to Figure B-7.

- **Power Is**: This indicates if the system is on or off for the remote host.
- **Power On Counter**: If power is on, then the counter indicates the length of time the power has been turned on.
- **Last Restart Cause**: This item states the reason why the host system is restarted if the system has been turned off.
- **Refresh**: Click the Refresh button to update “Chassis Information” as shown in Window 2.
- **Refresh**: Click on this icon to refresh the screen of the remote host.
- **Power On**: Click on this icon to power on the system for the remote host.
- **Power Down**: Click on this icon to power down the system for the remote host.
- **Reset**: Click on this icon to reset the remote console.
- **Power Cycle**: Click on this icon to power down the system for the remote host and turn it back on later.

Monitor Sensors

Click on this item to display the Health Monitoring Information shown in Figure B-8 and Table B-1.

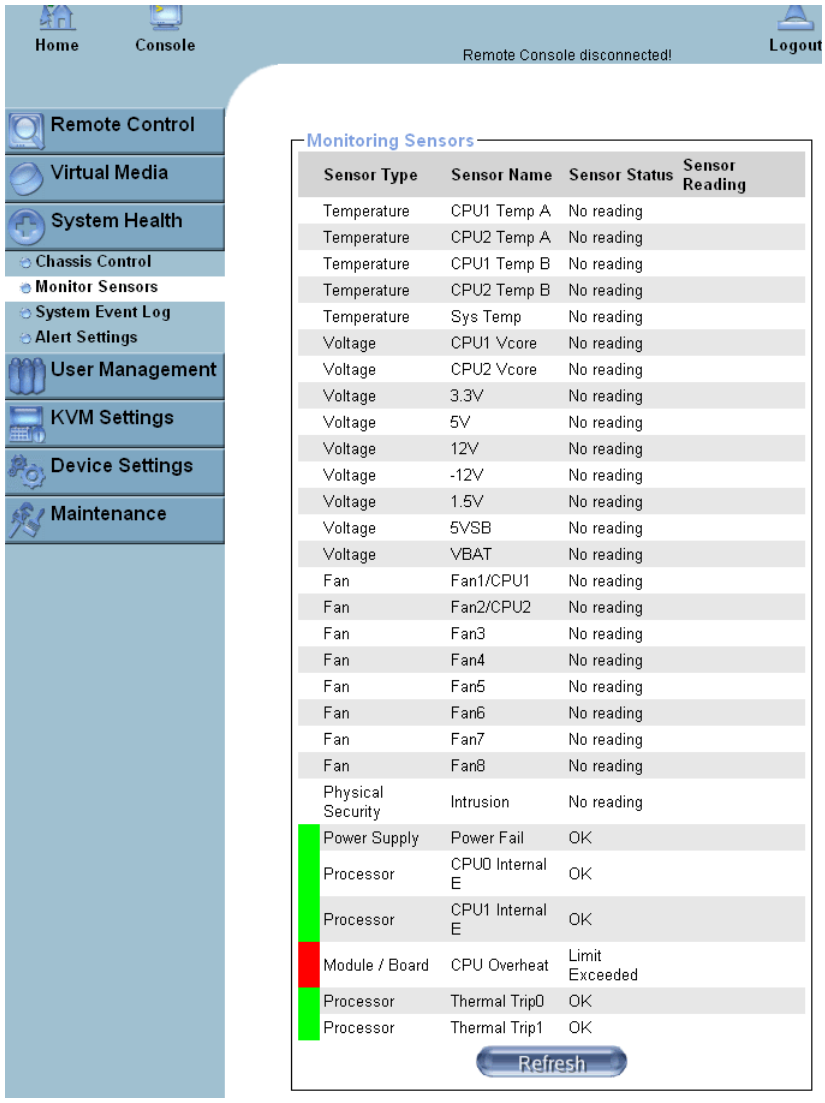


Figure B-8 Monitor Sensors

Table B-1 Health Monitoring Sensors

Temperature Monitoring	CPU1 Temperature (Temp A, Temp B)	Temp A: CPU1 Core1 Temperature Temp B: CPU1 Core2 Temperature
	CPU2 Temperature (Temp A, Temp B)	Temp A: CPU2 Core1 Temperature Temp B: CPU2 Core2 Temperature
	System Temperature	
Voltage Monitoring	CPU1 VCore	CPU1 Vcore: CPU1 Core Voltage
	CPU2 VCore	CPU2 Vcore: CPU2 Core Voltage
	3.3V	
	5V, 5VSB	5VSB: 5V Standby
	+12V, -12V	
	1.5V	
	VBAT	VBAT: Battery voltage
Fan Control	Fan1/CPU Fan	
	Fan2/CPU Fan	
	Fan 3 – Fan 6	
Physical Security	Chassis Intrusion	
Node Board CPU0 Internal Err		
Node Board CPU1 Internal Err		
Node Board CPU Overheat		When the CPU temperature exceeds this preset temperature, the overheat LED or alert is triggered, the CPUs slow down, the CPU fans are in the full speed mode.
Node Board Thermal Trip		When the system temperature exceeds this preset temperature, the overheat LED or alert is triggered, and the cooling fans are in the full speed mode to prevent system overheat.

System Event Log

Click on this item to display the System Health Event Log for the remote system.

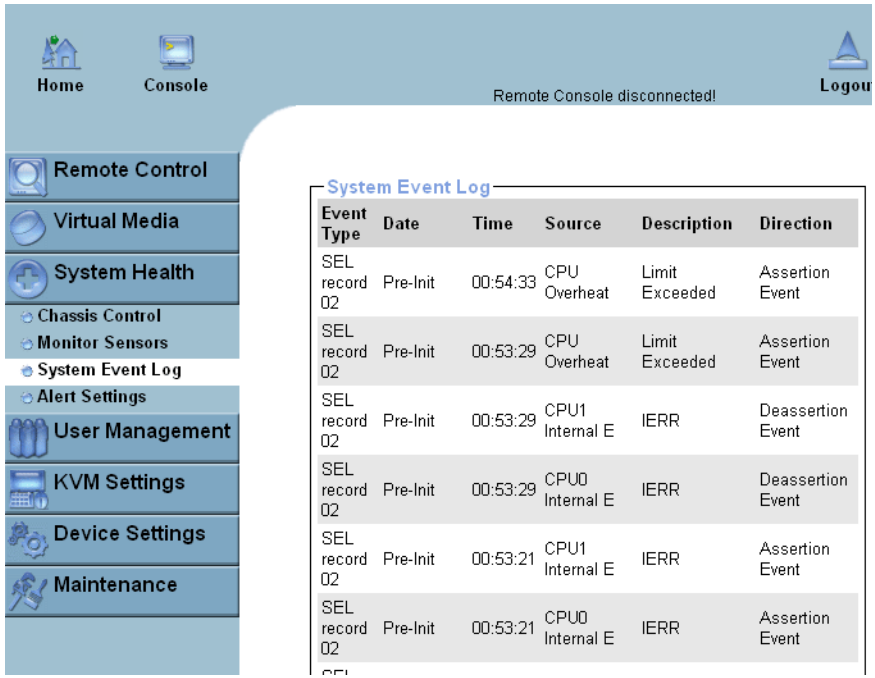
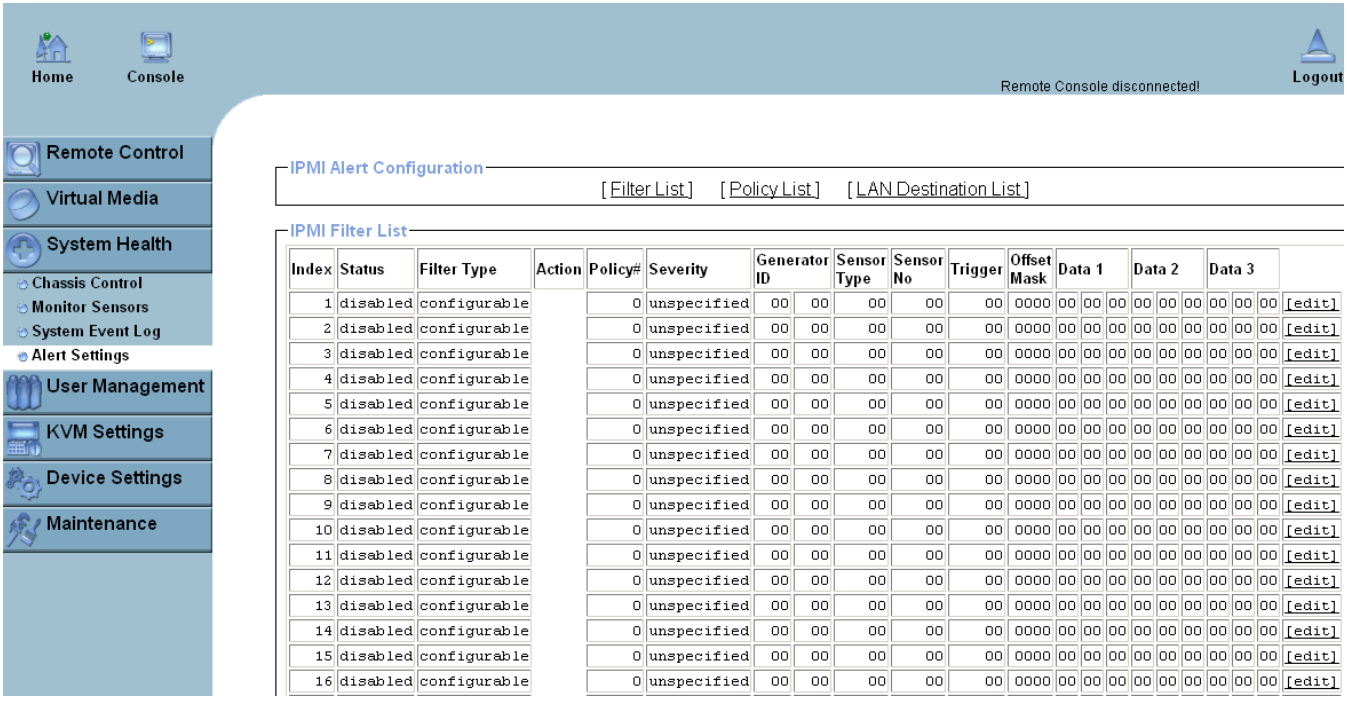


Figure B-9 System Event Log

Alert Settings

Click on this item to activate the alert settings submenu for the remote system.



Index	Status	Filter Type	Action	Policy#	Severity	Generator ID		Sensor Type	Sensor No	Trigger	Offset Mask	Data 1			Data 2			Data 3			
1	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
2	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
3	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
4	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
5	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
6	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
7	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
8	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
9	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
10	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
11	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
12	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
13	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
14	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
15	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]
16	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00	00	00	00	00	00	00	00	00	[edit]

Figure B-10 Alert Settings

User Management

Click on the User Management icon on the Home Page to activate its submenus:

Change Password

Change Password, Users & Group and Permissions as needed. Click on this icon to activate the Passwords submenu.

1. **Change Password**. Click on this icon to access the New Password and Confirm New Password fields.
2. **New Password**: Enter your new password in the blank.
3. **Confirm New Password**: Enter your new password in the blank again and click “Apply” to confirm it.

Users and Groups

Click on this icon to activate the Users & Groups submenu.

- **User Management**: This window displays the user's information.
- **Existing users**: Select an existing user for information updates. Once a user is selected, click on the "Lookup" icon on right to view user information.
- **New user name**: Enter new user name in this field.
- **Full user name**: Enter full user name in this field.
- **Password and Confirm Password**: Type the user's password in the field and then type the password again in the next field to confirm it. The password must be 4 characters or longer.
- **Email Address**: Enter the user's email address in the field. (Optional)
- **Mobile Phone**: Enter the user's mobile phone number in the field. (Optional)
- **Group Membership**: This field indicates the group that the user belongs to. To select a group, click on the group name on the "Not Member Of" window to select it, then click on the backwards arrow to enter the group name in the Group Membership field. Reverse the procedure to remove the user from a group.
- **IPMI Privilege Level**: Click on the arrow key on the right to activate the Privilege Selection menu. The IPMI Privilege Level contains five categories: No Access, User, Operator, Administrator and OEM.
- **Create**: Click on this button to enter a new user's or group information in the User/Group Management fields.
- **Modify**: Click on this button to modify a user's or group information in the User/ Group Management fields.

Permissions

Click on this icon to activate the User/Group Permissions submenu.

- **Show Permissions for User/Group**: Click on the arrow on the right to activate the user/group permissions selection menu.
- **Update**: Click this icon to update permissions information.
- **Effective Permissions**: This field indicates the actual permissions assigned to a user/group.
- **User Permissions**: This field indicates the actual permissions assigned to a user.
- **Inherited Group Permission**: This field indicates the permissions a user has due to the fact that he or she belongs to a certain group.
- **Copy**: Click on this button to copy a user's or group information in the User/Group Management fields.
    - **Copy User**: Choose an Existing User from the selection box. Enter a new user name in the field "New User Name." Click on the "Copy" button and a new user with the name you have entered is created. The properties of the selected user are copied to the new user.
    - **Copy Group**: Choose an Existing group from the selection box. Enter a new group name in the field "New Group Name." Click on the "Copy" button and a new group with the name you have entered is created. The properties of the selected group are copied to the new group.
- **Delete**: Click on this button to delete a user's or group information in the User/Group Management fields.
- **Group Management**: This window enables you to enter group information for better user management.

KVM Settings

Click on the KVM Settings icon on the Home Page to activate its submenus:

User Console

Refer to Figure B-11.

- **User Console**: Click on this icon to activate the User Console submenu.
- **User Selection**: This field enables you to decide which group the user belongs to. Click on the arrow on the right to activate the selection menu and highlight the name of the group to select it.
- **Update**: Once you have selected the group name, click on Update to save the selections.
- **Transmission Encoding**: This field enables you to decide how (the video) data is transmitted between the local system and the remote host.
- **Automatic Detection**: Select this option to allow the OS to automatically detect the networking configuration settings such as the bandwidth of the connection line, and transmit data accordingly.
- **Pre-configured**: This item enables you to select the data transmission setting from a predefined options list. The pre-configured settings provide the best result because the compression and color depth settings are adjusted for optimization based on the network speed indicated.
- **Network speed**: Once you have selected the pre-configured option above, you then can select a desired network speed setting from the selection menu by clicking on the arrow on the right.
- **Manually**: You can select a desired network speed setting from the selection menu by clicking on the arrow on the right. This item enables you to adjust both compression and color depth settings individually.
- **Compression**: Data signal transmission is compressed to save bandwidth. High compression rates slow down network interfacing and should not be used when several users are connected to the network.

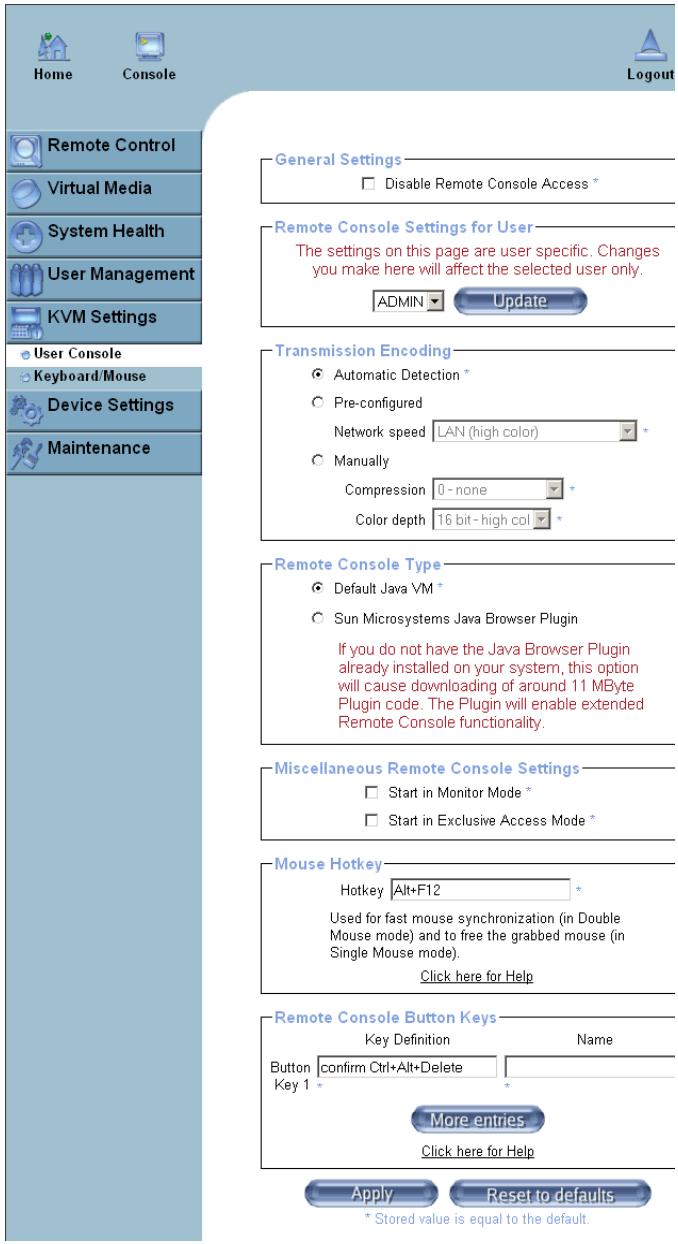


Figure B-11 User Console Settings

- **Color Depth**: Click on the arrow on the right to select either 16 bit-high colors or 8 bit-256 colors. The standard color depth is 16 bit-high color. This setting is recommended for compression level 0. For typical desktop interfaces, the setting of 8 bit-256 colors is recommended for faster data transmission.
- **Remote Console Type**: This field enables you to decide which Remote Console Viewer to use.
- **Default Java VM (JVM)**: Select this option to use the default Java Virtual Machine (JVM) of your web browser. This can be the Microsoft JVM for Internet Explorer or the Sun JVM depending on the configuration of your browser.
- **Sun Microsystems Java Browser Plugin**: Select this option when the JVM used to run the code for the Remote Console is a Java applet. If you use this function for the first time and the appropriate Java plugin is not yet installed in your system, you may download and install it automatically. To download and install it, you need to check “yes” in the dialogs.

Note: If your internet connection is slow, please pre-install the JVM on your administration machine.

- **Miscellaneous Remote Console Settings**: This window enables you to specify the following Remote Console Settings.
- **Start in Monitor Mode**: Check this box to enable the Start in Monitor Mode which enable data to be displayed in the remote monitor as soon as Remote Console is activated. (The data displayed in the remote monitor is read-only.)
- **Start in Exclusive Access Mode**: Check this box to enable the exclusive access mode immediately at Remote Console startup which forces all other users connected to the network to close their connection. No other users can open the Remote Console until you disable this function or log off.
- **Mouse Hotkey**: This option enables you to use a hotkey combination to specify the mouse synchronization mode or the single mouse mode.
- **Hotkey**: Enter a hotkey combination in the box to specify the mouse synchronization mode or the single mouse mode.
- **Remote Console Button Keys**: This window enables you to define button keys for the remote host. The button keys allow simulating keystrokes on a remote host or issuing commands to a remote system. The button keys are needed when you have a missing key or when you want to prevent interference caused to the local system. After a remote console button key is set, it displays on the right upper corner of the remote monitor screen.
- **Button Keys:** Enter the syntax of a button enter the box.

- **Name**: Enter the name of a button enter the box.
- **More Entries**: Click on this icon to create more Button Keys.

Keyboard/Mouse

Select Keyboard/Mouse to configure the keyboard and mouse settings:

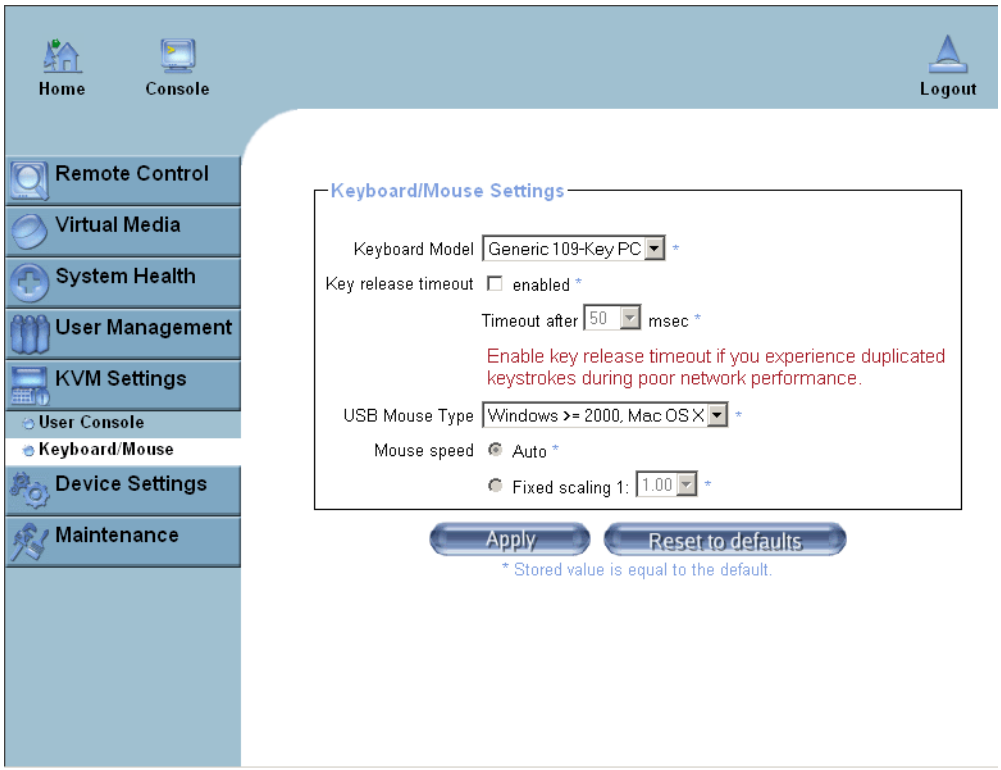


Figure B-12 Keyboard/Mouse Settings

Refer to Figure B-12.

- **Keyboard Model**: Select your keyboard model from the pull-down menu.
- **Key Release Timeout**: Check this box to enable the function of “Key Release Timeout,” which sets the time limit for a key to be pressed by the user.
- **Timeout after_____msec**: If the “Key Release Timeout” indicated above has been enabled, click on the arrow on the right to activate a selection menu to select the timeout setting for the item above.
- **USB Mouse Type**: For the USB Mouse to function properly, please select the correct OS for your system from the selection menu by clicking on the arrow on the right.
- **Mouse Speed-Auto**: Check the selection to allow your system to automatically set your mouse speed.
- **Fixed Scaling**: You can also check the “Fixed Scaling” box and manually enter your selection.
- **Apply**: Click on this icon to enter your selections.
- **Reset to defaults**: Cancels your selections and uses the default values set by the manufacturer.

Device Settings

Click on the Device Settings icon on the Home Page to activate its the device settings menu.

Network

Click on this function key to activate the Network submenu to configure the network settings.

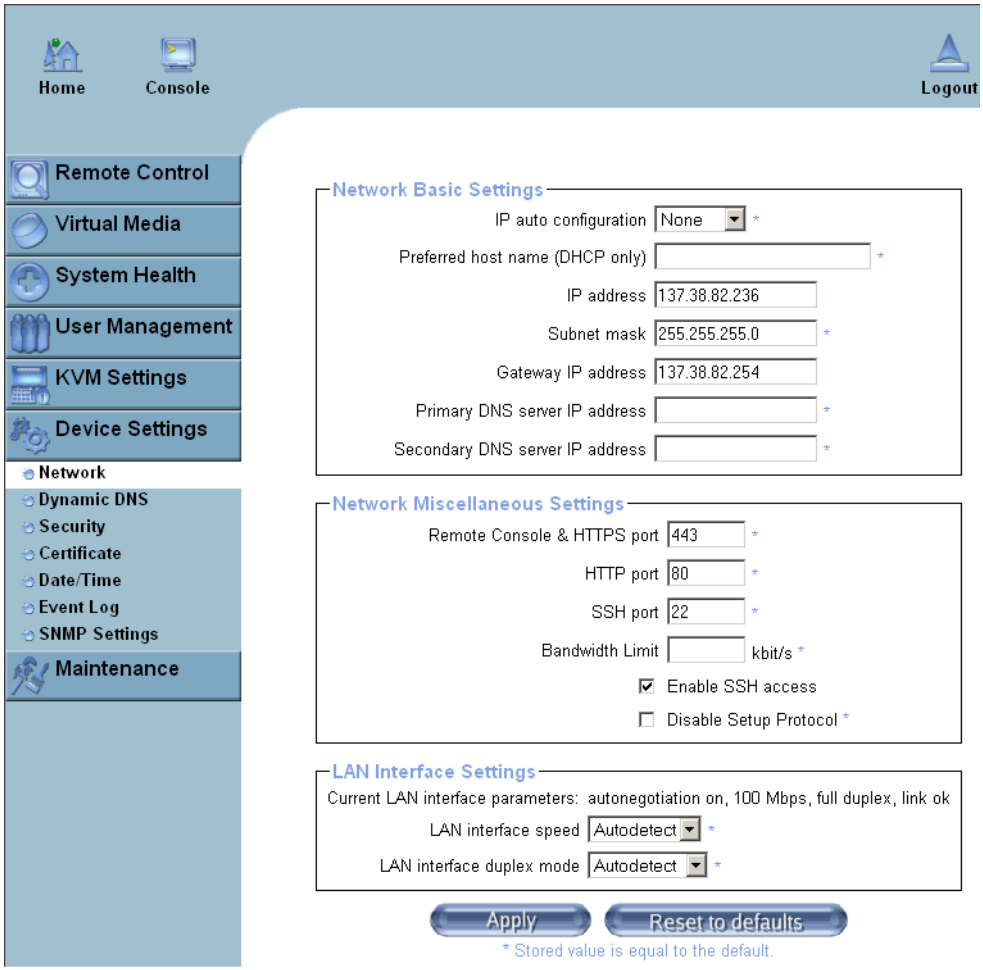


Figure B-13 Network Settings

Refer to Figure B-13.

- **IP Auto Configuration**: Click on the box to activate the selection menu and select a desired item from the list. The options are None, DHCP, and BOODP.
- **Preferred Host Name (DHCP only)**: Enter a Preferred Host Name in the box.
- **IP Address**: Enter the IP Address for the remote host in the box.
- **Subnet Mask**: Enter the net mask of the local network in the box.
- **Gateway IP Address**: Enter the local network router's IP address in this box for the accessibility of the users that are not connected to the local network.
- **Primary DNS Server IP Address**: Enter the IP Address of the Primary Domain Name Server in the box.
- **Secondary DNS Server IP Address**: Enter the IP Address of the Secondary Domain Name Server in the box. It is used when the Primary DNS Server cannot be contacted.
- **Network Miscellaneous Setting**: This field enables you to configure the following Network Miscellaneous settings as listed below:
- **Remote Console & HTTPS Port**: Enter the port numbers the remote host and the HTTP server are listening. If a number is not entered in the box, the default value is used.
- **HTTP Port**: Enter the port number the HTTP server is listening. If a number is not entered in the box, the default value is used.
- **SSH Port**: Enter the port number the SSH server is listening. If a number is not entered in the box, the default value is used.
- **Bandwidth Limit**: Enter the maximum bandwidth value for network interfacing. The value should be in Kbits per second.
- **Enable SSH Access**: Click this box to enable SSH Access.
- **Disable Setup Protocol**: Check this box to disable the function of Setup Protocol for the BMC card.
- **LAN Interface Setting**: This field enables you to configure the following LAN Interface settings as listed below:
- **LAN Interface Speed**: Click on the arrow on the right to activate the selection menu and select a desired speed. The options are: Auto-detect, 10 Mega bits per second or 100 Mega bits per second. If Auto-detect is selected, LAN Interface Speed is set at the optimized speed based on the system configurations detected by the OS.

- **LAN Interface Duplex Mode**: Click on the arrow on the right to activate the selection menu to select a desired LAN Interface Duplex Mode. The options are: Auto-detect, Half Duplex and Full Duplex. If Auto-detect is selected, the LAN Interface Duplex Mode is set to the optimized setting based on the system configurations detected by the OS.

Dynamic DNS

Click on this function key to activate its submenu and configure the Dynamic Domain Name Server (DNS).

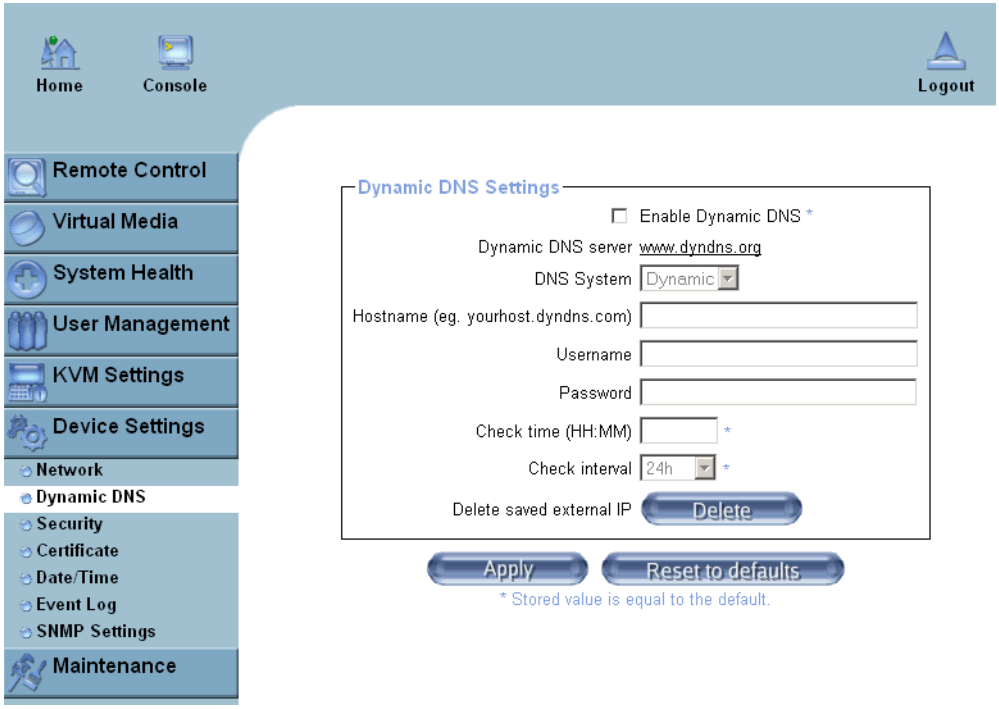


Figure B-14 Dynamic DNS Settings

Refer to Figure B-14.

- **Enable Dynamic DNS**: Check this box to enable the Dynamic DNS service.
- **Dynamic DNS Server www.dyndns.org**: Click this link to access the DynDNS web site. This is the server name where the DDNS Service is registered.
- **DNS System**: When Dynamic DNS is enabled, you can select from the options: Custom or Dynamic from the selection menu. Select “Custom” to use your own system as the DNS server. Select Dynamic to use the pre-configured Dynamic DNS as your server.
- **Hostname**: Enter the name you want to use for the remote host server.
- **Username/Password**: Enter the username and the password for the remote host user.
- **Check time (HH:MM)**: Enter the time the BMC card first registers with the DNS server in the HH:MM Format. (e.g. 07:25, 19:30).
- **Check Interval**: Enter the interval for the IPMI to report to the Dynamic DNS again.
- **Delete Saved External IP Address**: Click on the Delete Icon to delete the IP Address for an external system that has been previous entered and saved.

Security

Click on this function key to activate the Security settings.

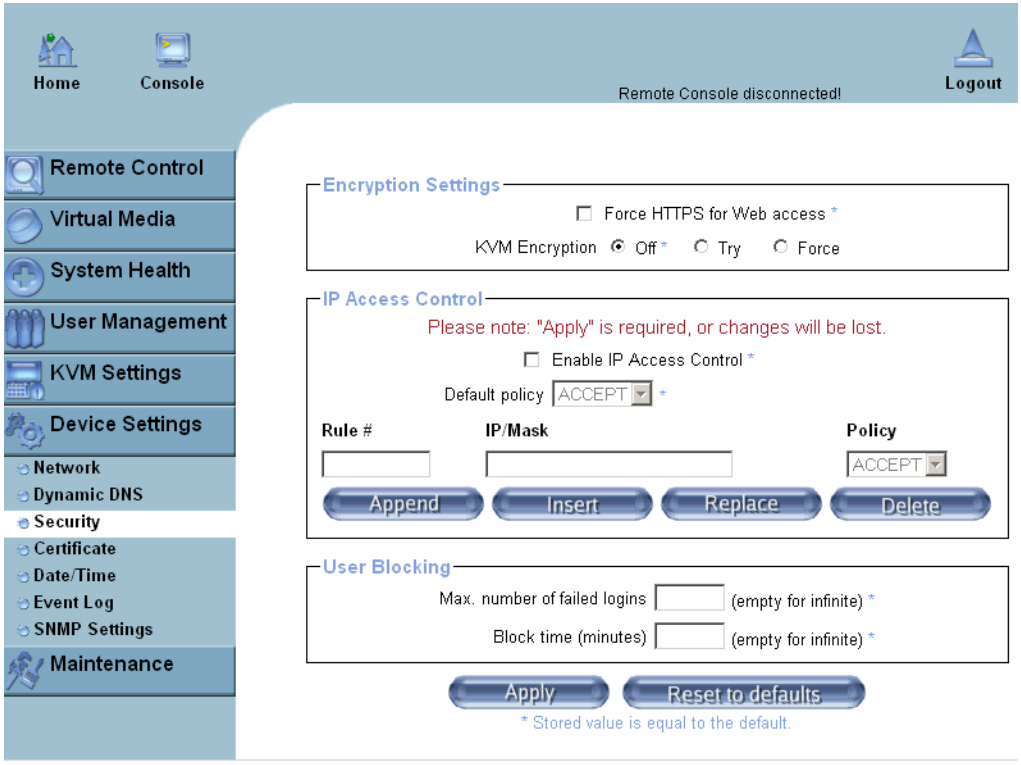


Figure B-15 Security Settings

Refer to Figure B-15:

- **Encryption Settings**: This window enables you to configure encryption settings.
- **Force HTTPS for Web Access**: Check this box to enable the function-Force HTTPS for Web Access. If enabled, you must to use an HTTPS connection to access to the web.
- **KVM Encryption**: This option enables you to configure the encryption of the RFB protocol. RFB is used by the remote host to transmit video data displayed in the host monitor to the local administrator machine, and transmit keyboard and mouse data from the local administrator machine back to the remote host. If set to “Off,” no encryption is used. If set to “Try,” the applet (JVM of the remote host) attempts to make an encrypted connection. In this case, when a connection cannot be established, an unencrypted connection is used. If set to “Force,” the applet makes an encrypted connection. In this case, an error is reported if no connection is made.

- **IP Access Control**: This section enables you to configure the IP Access Control settings listed below.
- **Enable IP Access Control**: Check this box to enable the function of IP Access Control. This function is used to limit user access to the network by identifying them by their IP addresses. (This function is available to the LAN interface only.)
- **Default Policy**: When **IP Access Control** set to “enabled,” you can select either “accept” or “drop”, allowing access or denying access according to pre-defined rules.
- If this option is set to “drop,” and you do not have a set of rules to accept the internet connection, then the internet connection over LAN is impossible. In this case, you need to change your security settings via modem or by disabling the **IP Access Control**.
- **Rule#**: Enter a rule number in the box for a command (or commands) that is used by the IP Access Control.
- **IP/Mask**: Enter the IP Address or an IP Address Range for which the command(s) are applied.
- **Policy**: This item instructs the IPMI what to do with the matching packages.

Note: The sequence or the order of the rules is important. The rules are checked in the ascending order until a rule matches. All rules below the matching rule are ignored. The default policy applies if no matching rules are found.

- **Append**: Select this option to add IP Address/Mask, rules or commands to the existing ones.
- **Insert**: Select this option to insert IP Address/Mask, rules or commands to the existing ones.
- **Replace**: Select this option to replace an old IP Address/Mask, rule or command with a new one.
- **Delete**: Select this option to delete (a part of) an existing IP Address/Mask, rule or command.
- **User Blocking**: This window enables you to set the conditions how a user is blocked.
- **Max. Number of Failed Logins**: Enter the maximum number of failed attempts or failed logins allowed for a user. If the number of failed logins or attempts exceeds this maximum number allowed, the user is blocked from system.

Note: If this box is left empty, the user is allowed to try to login to the server indefinitely. For network security, this is not recommended.

- **Block Time (Minutes)**: Enter the number of minutes allowed for a user to attempt to login. If the user fails to login within this time allowed, the user is blocked from system.

Note: If this box is left empty, the user is allowed to try to login to the server infinitely. For network security, this is not recommended.

Certificate

Click on this function key to activate its submenu and configure the Certificate settings.

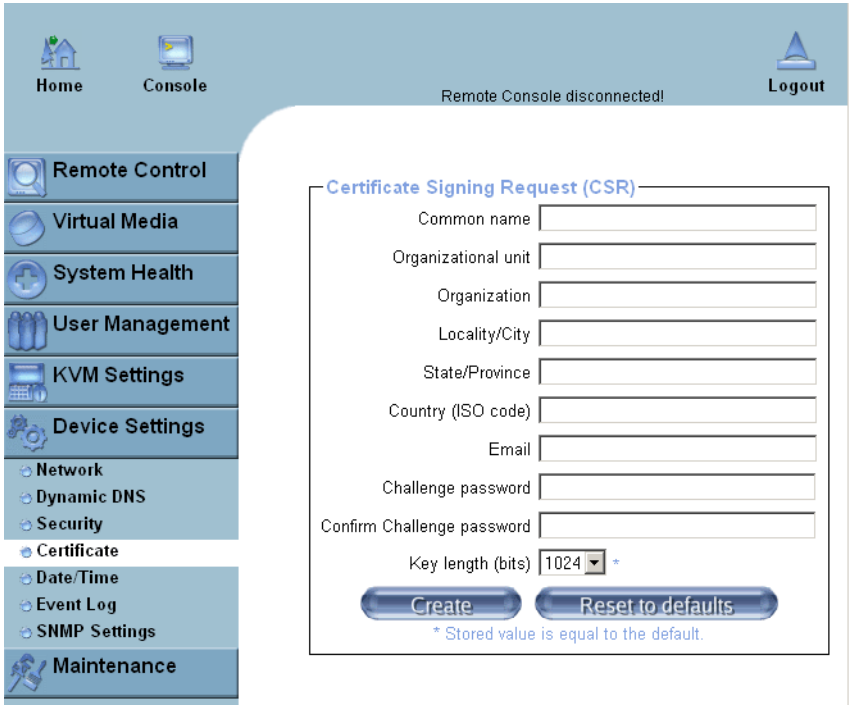


Figure B-16 Certificate Settings

Refer to Figure B-16

- **Certificate Signing Request (CSR)**: This window enables you to define the Certificate Signing Request (CSR) form. The IPMI uses the Secure Socket Layer (SSL) protocol for encrypted network traffic between itself and the remote host servers. When a connection is made, the IPMI has to expose its identity to a remote host by using a cryptographic certificate.

  To create a certificate that is unique to a particular IPMI card or BMC card, a certification authority (CA) must fill out the CSR form indicated in the CSR window above and click "Create" to generate it.
- **Common Name**: Enter the (fully qualified domain) network name of the IPMI.
- **Organization Unit**: Enter the name of the department within an organization that the IPMI belongs to.
- **Organization**: Enter the name of the organization that the IPMI belongs to.
- **Locality/City**: Enter the name of the city or the location where the organization is located.
- **State/Province**: Enter the name of the state/province where the organization is located.
- **Country (ISO)**: Enter the name of the country or the ISO code where the organization is located.
- **Email**: Enter the email address of a contact person that is responsible for the IPMI.
- **Challenge Password**: Enter a challenge Password for the Certification Authority to authorize necessary changes to the certificate at a later time. The password shall be four characters or longer.
- **Confirm Challenge Password**: Enter a challenge Password one more time to confirm it.
- **Key Length (bits)**: This is the length of key generated in bits.

Date and Time

Click on this function key to activate the internal realtime clock for your BMC card.

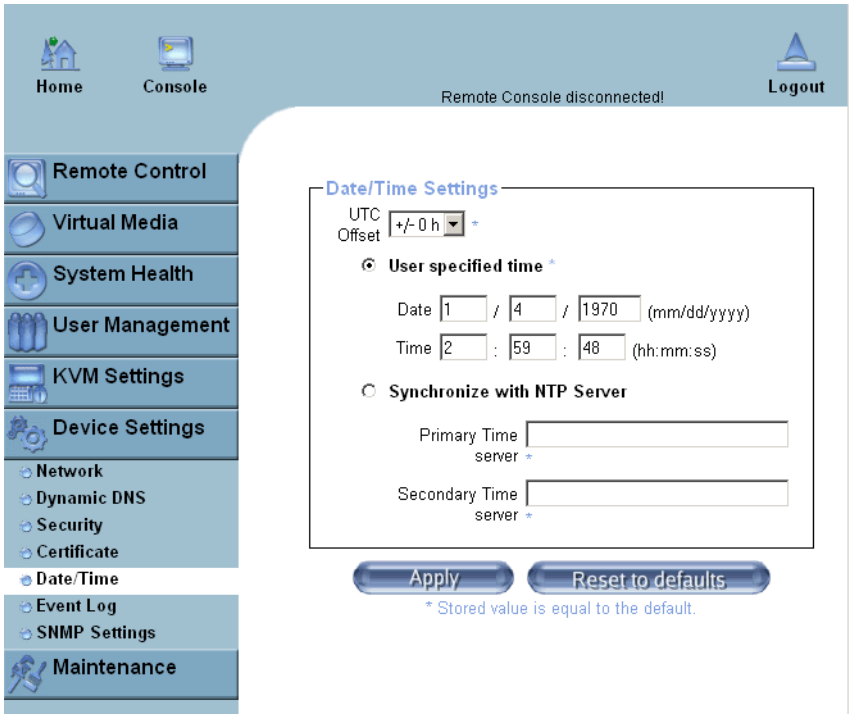


Figure B-17 Date and Time Settings

Refer to Figure B-17.

- **UTC Offset**: This window enables you to offset the UTC Timer.
- **User Specified Time**: This option enables you to enter the time values for the BMC internal realtime clock.
- **Synchronize with NTP Server**: Enter the IP Address for the NTP (Network Time Protocol) Server that you want your BMC internal realtime clock to synchronize with.
- **Primary Time Server/Secondary Time Server**: Enter the IP Address for the primary NTP Server and the secondary NTP Server that you want to synchronize with your BMC internal realtime clock.

Note: The daylight saving time cannot be automatically adjusted. Please manually set up the UTC offset twice a year for your timer to work properly.

Event Log

Click on this function key to activate its submenu. This feature enables you to set Event Log Targets and Event Log Assignment.

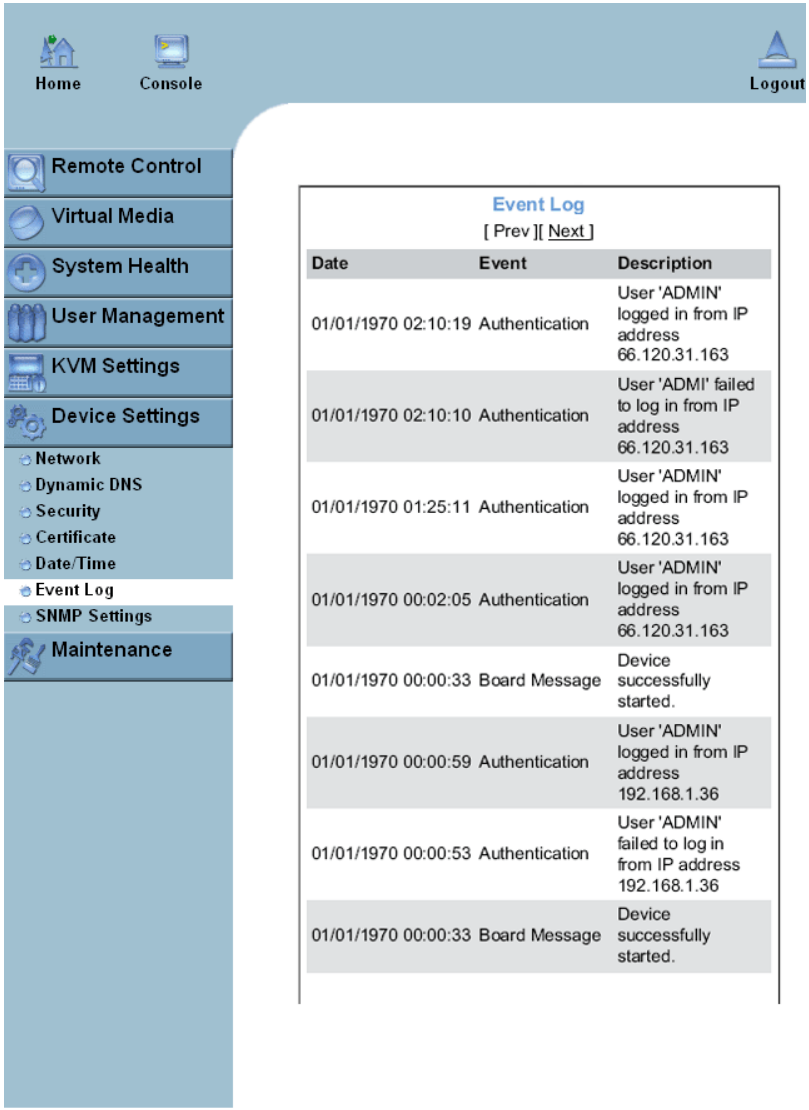


Figure B-18 Event Log

Refer to Figure B-18.

- **Event Log Targets**: This section enables you to manually set the event log targets and settings.
- **List Logging Enabled**: Check this box to activate the event-logging list. To show the event log list, click on “Event Log” on the “Maintenance” page.

Note: The maximum number of log list entries is 1,000 events. Every entry that exceeds this limit automatically overrides the oldest one in the list. If the reset button is pressed, all logging information is saved; however, all logging data is lost if hard reset is performed or the system loses power.

- **Entries Shown Per Page**: Enter the number of entries you want to display on a page.
- **Clear Internal Log**: Click this icon to clear internal event log from the memory.
- **NFS Logging Enable**: Click this box to enable NFS Logging that creates a Network File System (NFS) for writing the event logging data.
- **NFS Server**: Enter the IP Address of the NFS Server.
- **NFS Share**: Enter the path of the Network File System in which the event logging data is stored.
- **NFS Log File**: Enter the filename of the Network File System in which the event logging data is stored.
- **SMTP Logging Enable**: Check this box to enable the function of SMTP (Simple Mail Transfer Protocol) logging.
- **SMTP Server**: Enter the IP Address for the SMTP Server.
- **Receiver Email Address**: Enter the email address that the SMTP event logging data is sent to.
- **Sender Email Address**: Enter the email address from which the SMTP event logging data is sent.
- **SNMP Logging Enable**: Check this box to enable the function of SNMP (Simple Network Management Protocol) logging.
- **Destination IP**: Enter the IP address to where the SNMP trap is sent.
- **Community**: Enter the name of the community if the receiver requires a community string.
- **Click here to view the Supermicro Daughter Card SNMP MIB**: Click this link to see the SMLP card SNMP MIB.

- **Event Log Assignments**: This window enables you to specify the types and the destination for the event logging.

SNMP Settings

Click on this function key to configure Simple Network Management Protocol (SNMP) settings.

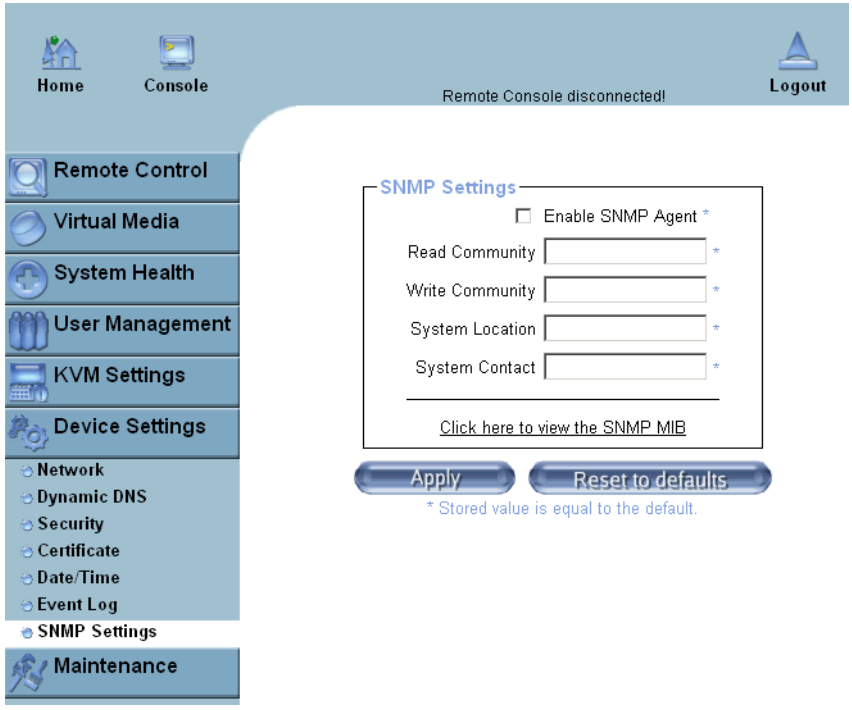


Figure B-19 SNMP Settings

Refer to Figure B-19.

- **Enable SNMP Agent**: Check the box to enable the SNMP Agent and allow it to interface with your BMC card.
- **Read Community**: Enter the name of the SNMP Community from which you retrieve information via SNMP.
- **Write Community**: Enter the name of the SNMP Community to which you can write information and issue commands via SNMP.

- **System Location**: Enter the physical location of the SNMP host server. This location is used in response to the SNMP request as "`sysLocation0`."
- **System Contact**: Enter the name of the contact person for the SNMP host server. This value is referred to as "`sysContact0`."
- Click here to view the SNMP MIB: Click this link to view the SMLP card SNMP MIB file. This file may be necessary for an SNMP client to interface with the BMC card.

Maintenance

Click on the Maintenance icon on the Home Page to activate its submenus, Device Information, Event Log, Update Firmware and Unit Reset Settings.

Device Information

Click on this function key to activate its submenu. This feature displays the information of the BMC card and its firmware information.

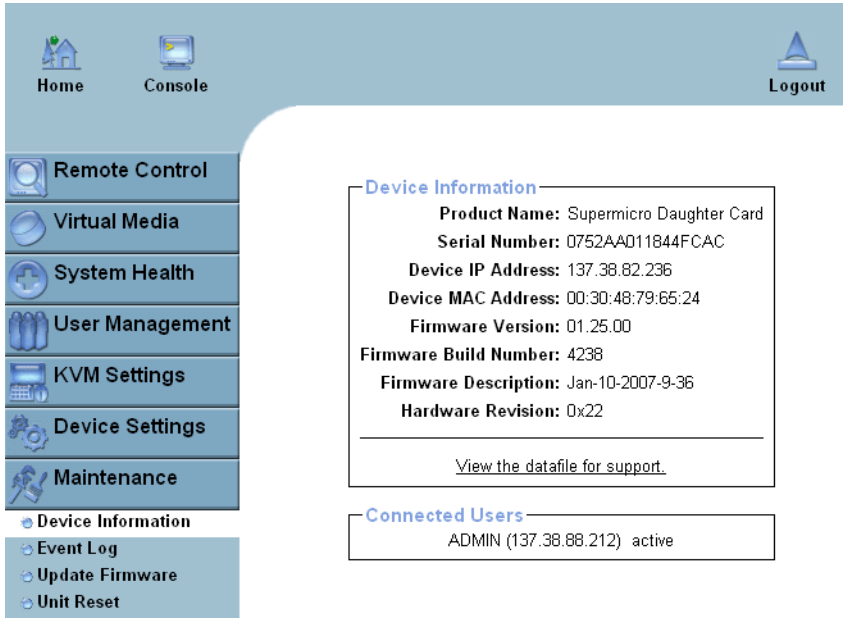


Figure B-20 Device Information

Refer to Figure B-20.

- **View the Data File for Support**: Click on this link to view the XML file that contains your product information used for technical support.
- **Connected Users**: List the name(s), the IP Address(es) and the status of connected users.

Event Log

Click on the Event Log function key to display a list of events that are recorded by the BMC in the order of Date/Time, Type, Descriptions IP address(es), person(s) and their activities (refer to Figure B-21).

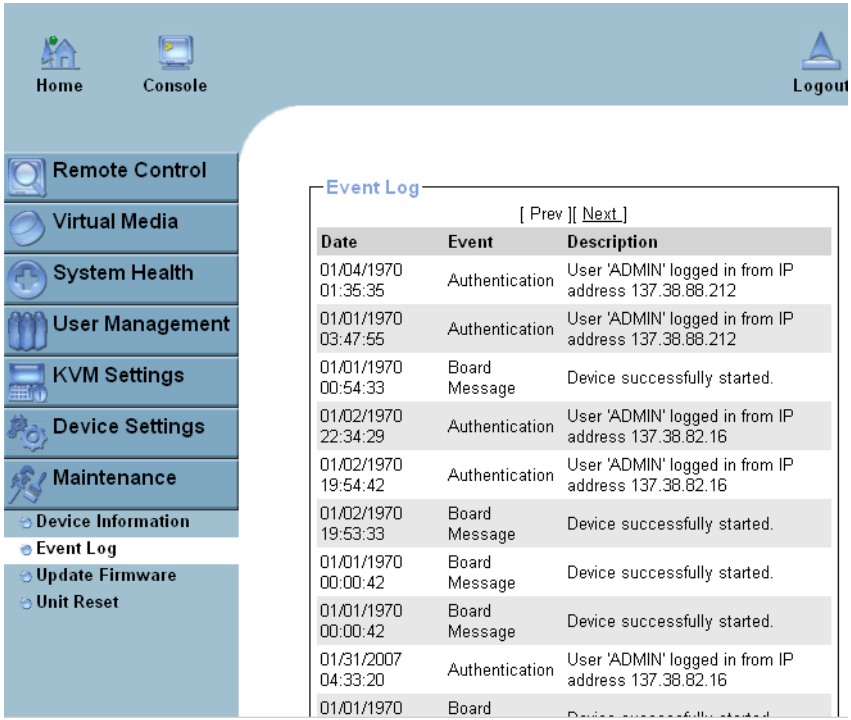


Figure B-21 Event Log

Update Firmware

Click on this function key to update the BMC firmware.

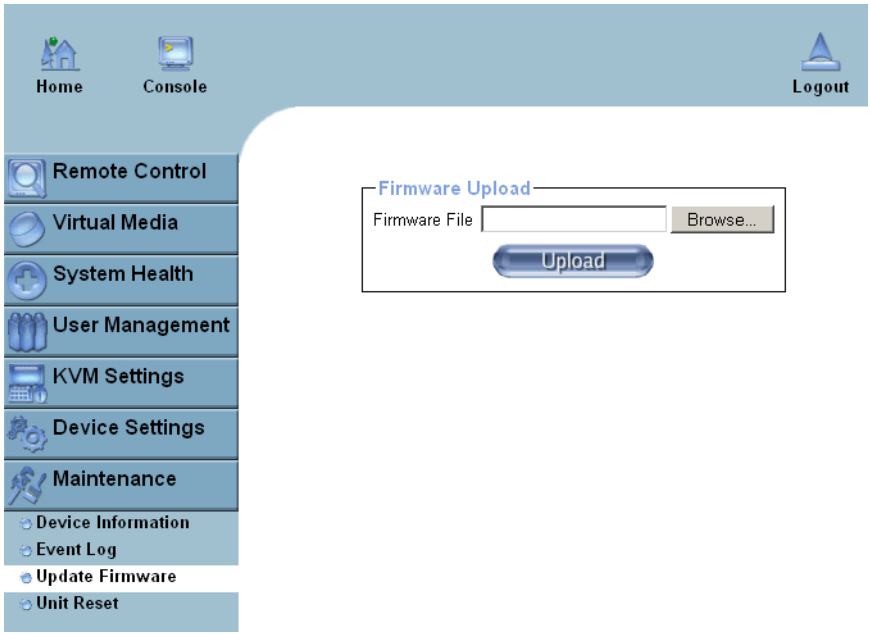


Figure B-22 Update Firmware

Refer to Figure B-22.

- **Firmware Upload**: Enter the name of the firmware you want to update or click on the "Browser" icon to select the firmware file.
- **Update**: Click on the "Upload" icon to upload the firmware file to the server for the update.

Note: This process is not reversible once the BMC firmware is updated, so proceed with caution. It might take a few minutes to complete the procedure.

Unit Reset

This feature enables you to reset the USB or BMC.

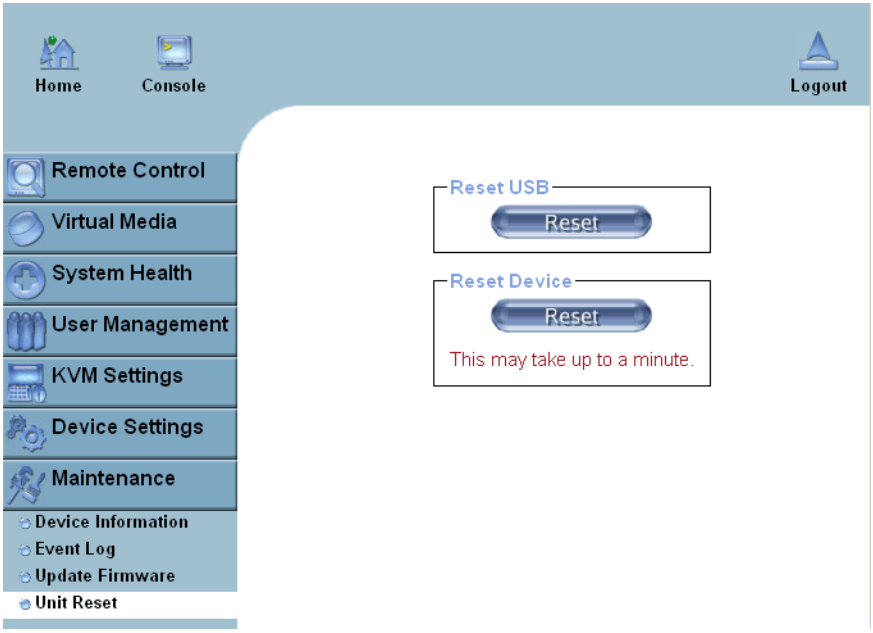


Figure B-23 Unit Reset

Refer to Figure B-23.

- **Reset USB**: Click the “Reset” icon to reset the USB module.
- **Reset Device**: Click the “Reset” icon to cold reset the IPMI firmware.

Remote Console Main Page

After you have entered the correct IP address for your remote console and typed in correct user name and password, you should be connected to the remote console. When the remote console is connected, the Remote Console window displays as shown in Figure B-24.

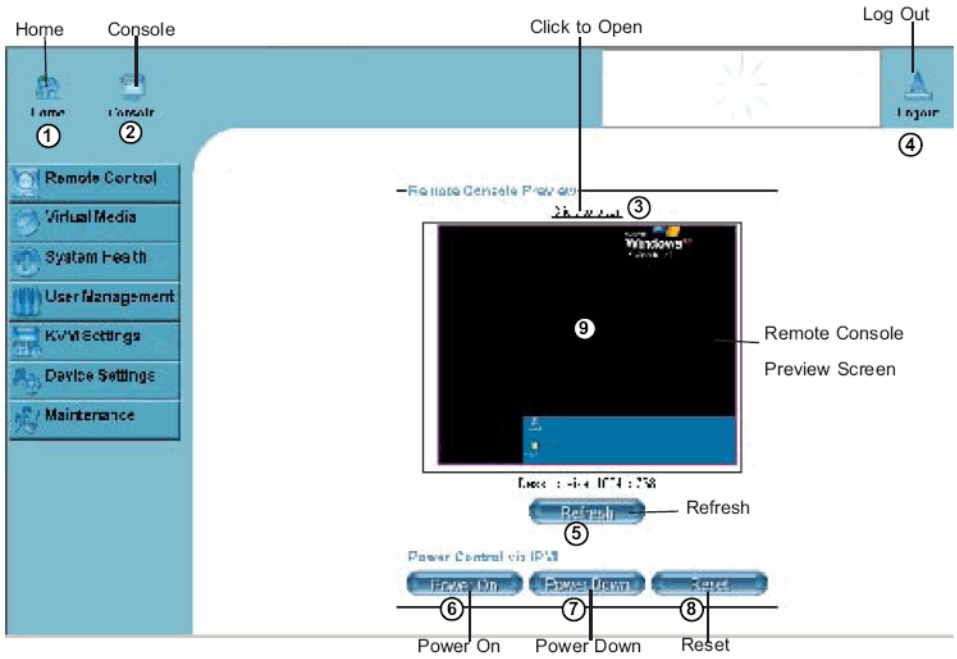


Figure B-24 Remote Console Screen

- Click on the console icon (marked “2”) on the upper left corner, or
- Click on the link “Click to Open” to open the remote console screen (refer to item 3 in Figure B-24.

1. **Home**: Click this icon to return to the Home Page.
2. **Console**: Click this icon to open the remote console screen.
3. **Click to Open**: Click this link to open the remote console screen.
4. **Log-Out**: Click this icon to log out.
5. **Refresh**: Click this icon to refresh the remote console preview screen.

6. **Power On**: Click this icon to power on the remote server.
7. **Power down**: Click this icon to power down the remote server.
8. **Reset**: Click this icon to reset the remote server.
9. **Remote Console Preview Screen**: This window displays the preview of the remote console screen. Click on this window to go to the remote console screen.

Remote Console Options

After the remote console screen is displayed, click on the **Options** button in the upper right corner to display the Options Menu (refer to Figure B-25).

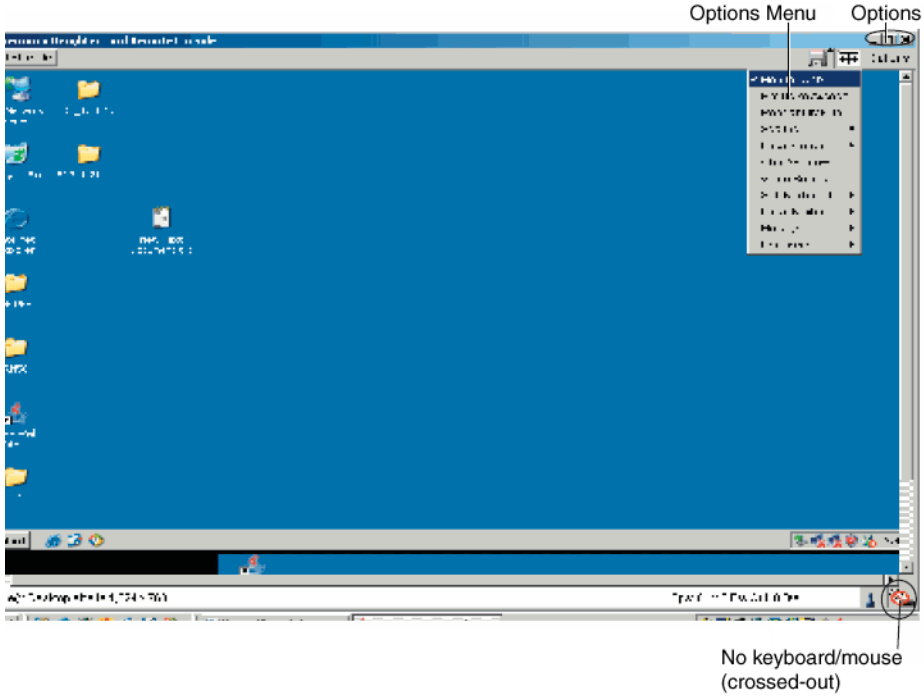


Figure B-25 Remote Console Options

Options Menu items (refer to Figure B-25).

- **Monitor Only**: Click on the Monitor Only button to turn the function of “Monitor Only” on or off. If the function of “Monitor Only” is selected, the KB/Mouse icon on the lower right corner is crossed out as shown above, and the user can only view or monitor remote console activities. Any remote console interaction is no longer available.
- **Exclusive Access**: With an appropriate permission, a user can force other users to quit the remote console and claim the console for his or her own exclusive use by clicking on the Exclusive Access icon to select it. When this function is selected, the second user icon on the lower left corner of the screen is crossed out.
- **Readability Filter**: Click on this button to turn the “Readability Filter” on or off. Turn on this function to preserve most of the screen details even when the screen image is substantially scaled down.

Note: This item is available for a system with a JVM 1.4 or higher.

- **Scaling**: This item enables you to scale the remote console screen to a desired size. Click on this button to access its submenu and select a desired setting from the options listed in the submenu: 25%, 50%, 100% and Scale to Fit.
- **Local Cursor**: This item enables you to choose the desired shape for the local cursor pointer. Click on this button to access its submenu and select a desired shape from the options listed in the submenu: Transparent, Default, Big, Pixel, and Cross-hair. The availability of the shapes depends on the Java Virtual Machine used.
- **Chat Window**: This item enables you to communicate with other users logged in the same remote host by clicking on the Chat Window button. The screen below shows a Chat Window displayed in a scaled down remote console screen.

Log Out

Return to the Home Page and click on the “Log Out” button to log out from Remote Console Interface.

Regulatory Specifications and Safety Information

This appendix presents regulatory information that may be important to the operation of your SGI Altix XE250 server.

Manufacturer's Regulatory Declarations

The SGI Altix XE250 products conform to several national and international specifications and European Directives listed on the "Manufacturer's Declaration of Conformity." The CE insignia displayed on each device is an indication of conformity to the European requirements.

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

Server Model Number

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

CE Notice and Manufacturer's Declaration of Conformity

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

Electromagnetic Emissions

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

FCC Notice (USA Only)

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

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

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

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

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

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

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

Industry Canada Notice (Canada Only)

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

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

VCCI Class A Notice (Japan Only)

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

Shielded Cables

The SGI Altix XE250 product is FCC compliant under test conditions that include the use of shielded cables between the server and its peripherals. Your server and any peripherals that you purchase from SGI have shielded cables. Shielded cables reduce the possibility of interference with radio, television, and other devices. If you use any cables that are not from SGI, ensure that they are shielded. Telephone cables do not require shielding. Optional monitor cables supplied with your server system use additional filtering molded into the cable jacket to reduce radio frequency interference. Always use the cable that is supplied with your system. If your monitor cable becomes damaged, obtain a replacement cable from SGI.

Electrostatic Discharge

SGI designs and tests its products to be resistant to the effects of electrostatic discharge (ESD). ESD is a source of electromagnetic interference and can cause problems ranging from data errors and lockups to permanent component damage. It is important that you keep all the covers and doors, including the plastics, in place while you are operating the server system. The shielded cables that came with the server and its peripherals should be installed correctly, with all thumbscrews fastened securely. An ESD wrist strap may be included with some products, such as memory or PCI upgrades. Use the wrist strap when you install these upgrades to prevent the flow of static electricity; it is designed to protect your system from ESD damage.

Safety Compliance

The current state-of-the-art standard for product safety is the International Electro technical Commission standard IEC 950, Safety of Information Technology Equipment including Electrical Business Equipment. Various national and international committees are adopting this standard with certain deviations due to their specific electrical codes. SGI products are international in scope and must meet all versions of the standard. Supermicro will ensure that the SGI Altix XE250 server including optional devices meets the listed standards and as a minimum has the following approvals:

- North America - UL/CUL, or cCSAus, or UL and CSA
- European – CE
- China – CCC required for all monitors and power supplies
- Taiwan – BSMI (Safety approval)
- Japan – VCCI
- Other - CB Scheme Report, Group and National differences for United States, Canada, Australia, China, Switzerland, Denmark, Finland, Japan, and Norway required.
- Germany TUV, Safety Requirements and approval.
- Other - Certification marks for Argentina and Singapore are under consideration.

System Specifications

Table D-1 System Specifications

Specification	Description
Node type	Head or compute node
Processors	1 or 2 Dual or Quad-Core Intel® Xeon® Processors, 5200 or 5400 series Front Side Bus: 1600 or 1333 MHz L2 Cache: 6.0 MB for 5200 series, 12.0 MB for 5400 series
Chipset	Intel 5400 Memory Control Hub (MCH) and the Enterprise South Bridge 2 (ESB2)
BIOS	Phoenix BIOS® in 8 MB Flash EEPROM (per node)
Memory	16 240-pin DIMM slots support a maximum up to 128 GB of ECC fully buffered DIMM (FBDIMM) 800/667 **Note**: Interleaved memory requires DIMMs to be installed in pairs. Refer to "Install Memory" on page 47 for more information.
System disk controller	There are RAID 3 options for the SGI Altix XE250 server: 1. Intel ESB2 on-chip controller to support 6 internal 3-Gb/s SATA RAID 0 and 1(not support at initial release of the SGI Altix XE250 server). 2. Supermicro AOC-USASLP-L8i UIO card, internal SAS and SATA drives RAID 0, 1, or 10 3. LSI MegaRAID 8708ELP HBA in the PCIe x4 slot, internal SAS and SATA drives RAID 0, 1, 10, 5, or 6
Drive bays	8 hot-swap drive bays house up to 6 SATA/SAS drives, RAID 0, 1, 5, or 10 3.5" SATA drive - 250GB, 500GB, 750GB 3.5" SAS drive - 73GB, 146GB, 300GB, 400GB 1 x DVD-RW drive
Peripherals	1 slim DVD-CD drive

Table D-1 System Specifications **(continued)**

Specification	Description
PCI expansion	Two PCIe 2.0 x8 (Slot 5, Slot 6 Gen 2) One PCI-E x8 (Slot 3) One PCI-E x4 (Slot 4 with x8 connector) Two 64-bit PCI-X 133/100 MHz (Slot 1, Slot2) One PCI-U universal slot (Slot0, Gen 2)
Integrated I/O	2 COM ports 1 VGA port 2 Gigabit Ethernet ports 4 USB 2.0 ports
Cluster interconnects	InfiniBand or Gigabit Ethernet
Node board dimensions	13.05 in. (L) x 13.68 in. (W) (331.5 mm x 347.47 mm)
Chassis	2U rackmount Dimensions: Width: 16.8 in. (427 mm) Height: 3.5 in. (89 mm) Depth: 25.5 in. (648 mm)
Weight	57 lb (25.9 kg)
System cooling	3 high performance 8-cm fans
System input requirements	AC Input Voltage: 200 - 240 VAC (North America/Japan/International) Rated Input Current: 4.5A - 9.5A max Rated Input Frequency: 50 to 60 Hz
Power supply	Rated Output Power: 700 Watts Rated Output Voltages: +12V @ 58A, +5V Standby@ 4A
BTU rating	3431 BTUs/hr (for rated output power of 700 Watts)

Table D-1 System Specifications **(continued)**

Specification	Description
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 compliances	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: EN 60950/IEC 60950-Compliant UL Listed (USA) CUL Listed (Canada) TUV Certified (Germany) CE Marking (Europe)

System Safety

Electrical Safety Precautions

Caution: Follow these basic electrical safety precautions to protect yourself from harm and the SGI Altix XE250 from damage.

- 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 node boards, memory modules and processors (not disk drives). When disconnecting power, you should first power down the system with the operating system first and then unplug the power cord from the power supply unit.
- 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 cord must include a grounding plug and must be plugged into a grounded electrical outlet.

Node Board Battery

Caution: There is a danger of explosion if the onboard battery is installed upside down, which reverses its polarity (refer to Figure E-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.

Figure E-1 Install the Battery

General Safety Precautions

Caution: Follow these general safety precautions to protect yourself from harm and the SGI Altix XE250 from damage.

- Keep the area around the SGI Altix XE250 clean and free of clutter. Failure to do so may cause the system to become overheated and damage the equipment.
- The SGI Altix XE250 weighs approximately 57 lbs (26 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs. Failure to use proper lifting techniques may result in personal injury or equipment damage.
- Place the chassis top cover and any system components that you remove on a sturdy ESD-safe table. Failure to do so may result in equipment damage from electrostatic discharge.
- Do not wear loose clothing such as neckties or unbuttoned shirt sleeves which can come into contact with electrical circuits or be pulled into a cooling fan. Failure to do so may result in personal injury or equipment damage.
- Remove any jewelry or metal objects from your body, which are excellent conductors of electricity and can create short circuits. Failure to do so may result in personal injury or equipment damage.
- 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 Safety Precautions

Caution: Follow these general ESD precautions to protect the electrostatic-sensitive devices (ESD) inside SGI Altix XE250 from damage.

Electrostatic discharge is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which 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:

- 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 node board and peripherals back into their antistatic bags when not in use.
- Make sure your computer chassis provides an excellent conductivity path between each of the system components and chassis ground.

Upgrading BIOS

There are several ways to flash BIOS firmware in the SGI XE250 platform:

- Bootable DOS CDROM
- Bootable DOS USB flash drive
- Bootable DOS image via the Virtual Media boot feature from the BMC web interface

To obtain and perform BIOS upgrades using the first two methods cited, visit the SGI Supportfolio website:

https://support.sgi.com/login

If you are upgrading BIOS in a cluster, use the BMC web interface. This appendix describes the procedure.

Requirements

The Virtual Media boot method from the BMC web interface allows you to flash the BIOS without connecting any external media readers or USB flash devices. You will need the following:

- Bootable DOS image file
- Samba or Windows shared mount
- Web browser

Setting up the Virtual Media Boot Feature

To set up the Virtual Media boot feature, you must create a Samba (SMB) shared mount on the cluster headnode. Perform the following steps:

1. Ensure that `smb` (Samba package) is installed on the server.
2. Enable `smb` by entering the following:

   `chkconfig smb on`

3. Create a directory for the BIOS bootable DOS images by entering the following:

   `mkdir /BIOS`

4. Add the following lines to file `/etc/samba/smb.conf`:

   ```
   [bios]
   comment = Bios Upgrade
   path = /BIOS
   public=no
   valid users = root
   writeable = Yes
   force create mode = 0770
   force directory mode = 0775
   ```

5. Create an `smb` password for `root` by entering the following and supplying a password when prompted:

   `smbpasswd -a root`

   The SGI factory setting for the password is `sgisgi`.

6. Start the `smb` service by entering the following:

   `/etc/init.d/smb start`

Booting the Virtual Media DOS Image

To boot the Virtual Media DOS image, perform the following steps:

1. Open a web browser.
2. In the URL address, enter the BMC IP address or BMC hostname of the system you want to boot the DOS image.
3. Log in to the BMC web interface.

   The SGI factory default value for both `login` and `password` is `admin`.
4. Click the **Virtual Media** tab on the left side of screen.
5. Select **CD-ROM image**.
6. In the **Image on Windows Share** box, enter the following information:

   Virtual Drive = `1`

   Share Host = *IP-address-of-headnode-admin-network* (`10.0.10.1` is the SGI factory default.)

   Share Name = `bios`

   Path to image = *image-filename-to-boot* (located in `/BIOS` dir)

   User = `root` (SGI factory default)

   Password = `sgisgi` (SGI factory default)
7. Click the **Set** button.

   This ensures that the boot image is successfully set to boot.

The boot order in the BIOS has been automatically set to boot this image before any other boot device. The image will boot at the next reboot/power cycle.

Note: You must unset this image when you are done booting on it. Otherwise, all subsequent reboots will boot from this virtual image. Repeat steps 1, 2, and 3; then click the unset button.

Index

A

ACPI mode, 122
Airflow, 24
Alert settings, 178
AOC-USASLP-L8i UIO card, 7
ATI graphics controller, 6

B

BIOS
  battery backup, 114
  default settings, 106
  main menu, 116
  POST
    codes, 149
  upgrading, 221
BMC, 159
  device information, 200
  locations, 2
  reset, 203
Boot
  devices, 145
  setup, 121

C

Cabling
  data cables, 28
Cautions, 16
CD-ROM image, 168
Certificate settings, 193
Chassis
  front view, 90
  overview, 1
  rear view, 90
CMOS memory, 77
configuring, 97
Connector
  locations, 53
  pin definitions, 58
Console
  remote, 205
  user, 182
Control panel
  cabling, 93
  connectors, 31
  LEDs, 12
  switches, 12
Cooling, 24
Customer service, xxvi

D

Data cables, 28
Date and time, 117, 195
Device settings, 187, 187
DIMM
  installing, 47
  slot locations, 53

sockets, 5
Disk drive
carrier, 98
installation, 98
locations, 2
part number, 91
replacement, 97
disk drive, 97
DNS, dynamic, 189
Documentation
available via the World Wide Web, xxv
conventions, xxvi
Drive redirection, 170
DVD-CD
replacement, 96
Dynamic, DNS, 189

E

Earth ground, 18
Electrical safety, 217
Electromagnetic emissions, 210
Electrostatic discharge
regulatory notice, 211
ESB2
SATA controller, 5
ESD precautions, 26, 89
Event log, 197, 202

F

Fans, 24
part number, 91
replacement, 94
FCC notice (USA only), 210
Firmware
update, 203
Front panel, 12

G

Graphics, 6
Ground, earth, 18

H

Heatsink
installation procedure, 40
removal procedure, 41

I

I2C bus
overview, 10
IDE
controllers, 6
Indicators, 12
Input power, 24
I/O
panel, 6
performance, 125
port locations, 32
IPMI
configuration in BIOS, 139
overview, 159

J

JBT1
clear CMOS memory procedure, 77
description, 56
JF1

connector cable routing, 31
JI2C1/JI2C2 description, JPG1 description, 56
JP4, control panel connector, 31
JPL1/JPL2 description, 56
Jumper
default settings, 56
locations, 53
JWD description, 56

K

Keyboard
settings, 185
KVM
console, 165
over LAN, 159
settings, 182

L

LEDs
control panel, 12
NIC1, 13
NIC2, 13
overheat/fan fail, 13
SATA drive carrier, 14

M

MAC address, 25
Manufacturer’s declaration of conformity, 209
Manufacturer’s regulatory declarations, 209
Marketing codes, 91
Media Access Control (MAC) ethernet address, 25
Memory
branch mode, 128
cache, 123
configuration, 128
configurations, 50
DIMM layout, 48
installing, 47
POST, 114
rules, 49
Monitor sensors, 175
Mouse
settings, 185
Mouse mode, 166

N

Network settings, 187, 187
NIC1 LED, 13
NIC2 LED, 13
Node board
block diagram, 4
component locations, 53
configuring a single processor, 32
connector pin definitions, 58
connectors, 56
default jumper settings, 56
installation, 26, 28
locations, 2, 12
part number, 91
power connectors, 31
precautions, 25, 32
removal, 26
software licensing and MAC address, 25
unpacking, 26

O

Overheat/fan fail LED, 13

P

Part numbers, 91
Password
  changing, 179
PCIe
  configuration, 124
  installing expansion cards, 54
  I/O performance, 125
  slots, 5
Permissions, 181
PnP cap, 33
POST
  errors, 122
  memory test, 114
  quickboot mode, 121
Power supply, 24
  connectors, 31
  overview, 10
  part number, 91
  replacement, 103, 103
Power switch, 12
Processor
  configuring a single-processor board, 32
  heatsink precautions, 32
  installation procedure, 33
  locations, 53
  removing, 38
Product support, xxvi

R

Rack
  precautions, 16
RAID
  AOC-USASLP-L8i UIO card, 7
  configurations, 10
  support, 6
Regulatory compliances, 215
Regulatory declarations
  manufacturer, 209
Regulatory specifications
  CE notice and Manufacturer's declaration of conformity, 209
  electromagnetic emissions, 210
  electrostatic discharge, 211
  FCC notice (USA) only, 210
  manufacturer's regulatory declarations, 209
  shielded cables, 211
Remote console
  options, 206
  power functions, 165
Replacement procedures
  disk drive, 97
  fans, 94
  memory, 47
  node board, 26
  power supply, 103
Reset
  BMC, 203
  switch, 12

S

Safety precautions, 217
SATA
  backplane, 10
  controller mode, 120
  disk drives, 10
  drive carrier LEDs, 14
  drive locations, 2
  overview, 5
Security
  BMC settings, 190
  options in BIOS, 143
Sensors, 175

Server model number, 209
Setting the date and time, 117
Setup menu, accessing, 115
Shielded cables
  regulatory notice, 211
Shipping container, 15
SNMP settings, 199
Southbridge, 5
Standby power, 12
System event log, 177
System health, 173
System time, 117

T

Technical support, xxvi
Thermal interface material (TIM), 41
TIM, 41
Top cover
  removal, 23, 26, 103

U

UIO
  AOC-USASLP-L8i, 7
  slot location, 7, 8
Unpacking, 15
  node board, 26
UPS, 17, 24
User console, 182
User management, 179
Users and groups, 180

V

Virtual media, 166
Virtual media options, 172

W

Warnings and Cautions, 16
Watch dog timer, 123