Sun Microsystems

Sun Netra™ CP3220 Blade Server User's Guide

Sun Microsystems, Inc.
www.sun.com

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Preface

The *Sun Netra CP3220 Blade Server User's Guide* describes the hardware specifications, function, and physical properties of the Sun Netra™ CP3220 blade server. It also provides detailed information on the system firmware.

The *Sun Netra CP3220 Blade Server User's Guide* is written for system integration engineers, field applications and service engineers, and others involved in the integration of this blade server into systems. This guide is written for personnel who are familiar with the Solaris™ Operating System, the Linux operating systems and Advanced Telecommunications Computing Architecture (ATCA) computing environment.

How This Document Is Organized

Chapter 1 provides an overview of the Sun Netra CP3220 blade server.

Chapter 2 provides instructions on hardware installation.

Chapter 3 provides information on the supported operating systems and on the Sun Validation Test Suite (SunVTS™) software.

Chapter 4 provides information on the Sun Netra CP3220 blade server firmware.

Chapter 5 provides information on hardware architecture.

Appendix A provides information on the Sun Netra CP3220 blade server physical characteristics.

Appendix B provides first-level and second-level BIOS menu illustrations.

Using UNIX Commands

This document might not contain information about basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at:

  http://docs.sun.com/app/docs/prod/solaris

Shell Prompts

Shell	Prompt
C shell	machine-name%
C shell superuser	machine-name#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Typographic Conventions

Typeface[*]	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your .login file. Use ls -a to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% **su** Password:
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type rm *filename*.

* The settings on your browser might differ from these settings.

Related Documentation

The following table lists the documentation for this product. Except for the *Important Safety Information for Sun Hardware Systems*, all the documents listed are available online at:

http://docs.sun.com/app/docs/prod/cp3220.brd#hic

Application	Title	Part Number	Format	Location
Getting Started	*Sun Netra CP3220 Blade Server Getting Started Guide*	820-1981	Printed, PDF, HTML	Shipkit and Online
Latest Information	*Sun Netra CP3220 Blade Server Product Notes*	820-1980	PDF, HTML	Online
Installation and Usage	*Sun Netra CP3220 Blade Server User's Guide* (this manual)	820-1982	PDF, HTML	Online
Safety and Compliance	*Sun Netra CP3220 Blade Server Safety and Compliance Guide*	820-1983	PDF, HTML	Online
Safety	*Important Safety Information for Sun Hardware Systems*	816-7190	Printed	Shipkit

Documentation, Support, and Training

Sun Function	URL
Documentation	http://docs.sun.com/documentation
Support	http://www.sun.com/support/
Training	http://www.sun.com/training/

Third-Party Web Sites

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Please include the title and part number of your document with your feedback:

Sun Netra CP3220 Blade Server User's Guide, part number 820-1982-12.

Introduction

This chapter provides an overview of the features, configurations, and system requirements of the Sun Netra CP3220 blade server.

This chapter contains the following topics:

1.1 Overview

The Sun Netra CP3220 blade server is a high-performance, single-board computer based on an AMD Opteron X64 processor. The blade server is designed for high availability in a switched network computing environment. This blade server is compliant with Advanced Telecommunications Computing Architecture (ATCA) specifications (PICMG 3.0 and PICMG 3.1). It can achieve greater performance levels than previously supported CompactPCI® (cPCI) standards-based products targeted for Telco markets.

The ATCA standard comprises the PICMG 3.0, 3.1, 3.2, and 3.3 versions of the standard. The Sun Netra CP3220 blade server complies with the following specifications:

- PICMG 3.0, the base specification that defines the mechanical, power distribution, system management, data transport, and regulatory guidelines
- PICMG 3.1, which builds on the PICMG 3.0 base specification and on IEEE 802.3-2003

1.2 Features

The Sun Netra CP3220 blade server features include:

- ATCA card 322.25 mm x 280 mm, 1.2 inch slot card height
- One 1207-pin socket, AMD Opteron dual or quad core versions at up to 68w
- Double Data Rate (DDR-2) DIMMs, at up to 667 MHz DIMMs (8 modules per card), up to 4-Gbyte/DIMM, in Very Low Profile design (0.72' height)
- nVidia MCP-55 PCIe and Southbridge media controller
- Two AMC.1 Type 4S2E2 expansion slots (PCIe x4) supporting I/O expansion with signaling to the Rear Transition Module (RTM)
- Two 1000 BASE-T Ethernet base fabric (PICMG 3.0) interface ports (using BCM5715C) from PCIe 4x
- Two 10 Gigabit XUAI Ethernet Extended Fabric (PICMG 3.1) interface ports (using Sun 10 GbE Multithreaded Networking ASIC) from PCIe x8
- One Asychronous Serial port to RJ 45 on front panel, from SuperIO
- One 10/100/1000BASE-T management port on front panel, with second management LAN sent to the advanced rear transition module (ARTM)

- E-IDE master to support one Compact Flash socket supporting up to 16-Gbyte user flash (accessible when blade is removed from chassis)
- Management support using on-board IPM controller (Renesas H8) that provides a dual IPMB bus and IPMI redundant channels
- Rear I/O expansion provided to an optional RTM, compatible with AdvancedRTM shared architecture RTMs
- SAS/SATA connectivity from RTM to each AMC slot (local MCP-55 SATA ports are not used)
- Supports AdvancedRTM Shared Architecture Zone 3 connector plans
- Contains location for Trusted Platform Module chip (Infineon SLB 9635 TT 1.2), which conforms to TCG v1.2 specifications
- Designed to fit in a NEBS-compliant ATCA chassis

1.3   Physical Description

1.3.1   Front Panel Components

The following figures show the front panels of the Dual-Core and Quad-Core Sun Netra CP3220 blade server.

FIGURE 1-1   Sun Netra CP3220 Dual-Core Blade Server (Front View)
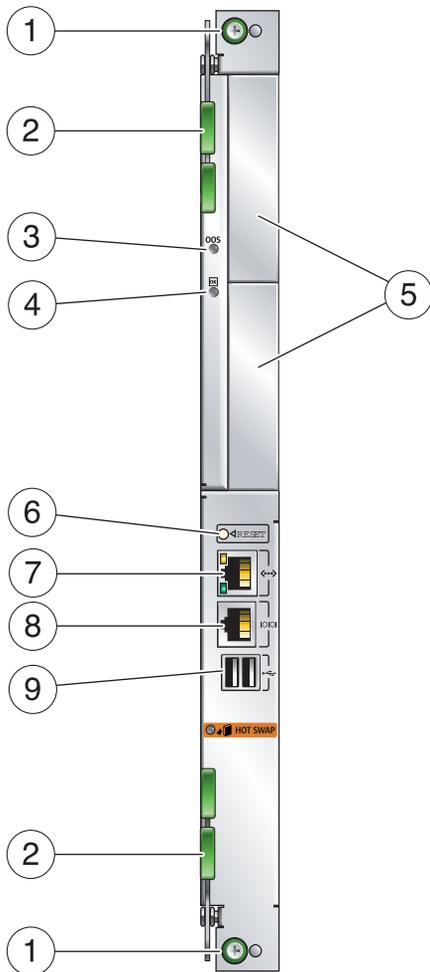
Figure Legend

1	Locking screws	6	Reset button
2	Latches	7	10/100/1000 Ethernet management port
3	Out-of-service (OOS) LED	8	Serial port
4	OK LED	9	USB ports
5	AMC card slots		

FIGURE 1-2 Sun Netra CP3220 Quad-Core Blade Server (Front View)
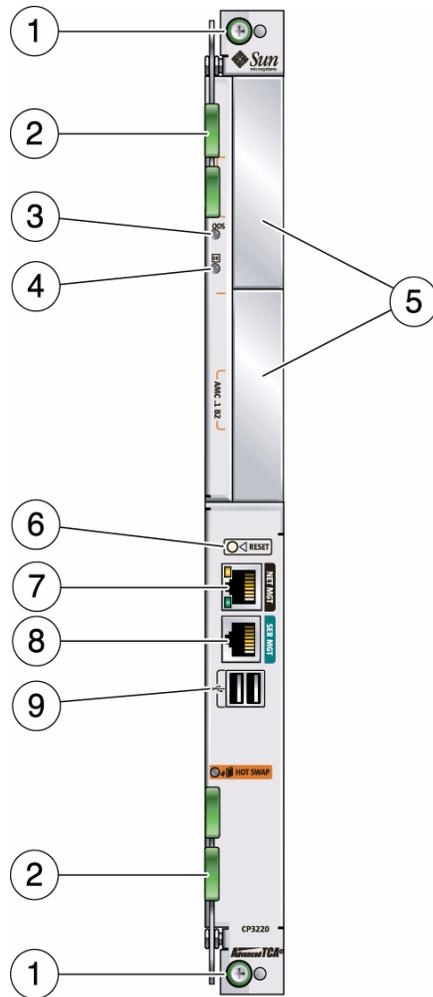
Figure Legend

1	Locking screws	6	Reset button	
2	Latches	7	10/100/1000 Ethernet management port	
3	Out-of-service (OOS) LED	8	Serial port	
4	OK LED	9	USB ports	
5	AMC card slots			

1.3.2 Blade Server Diagram
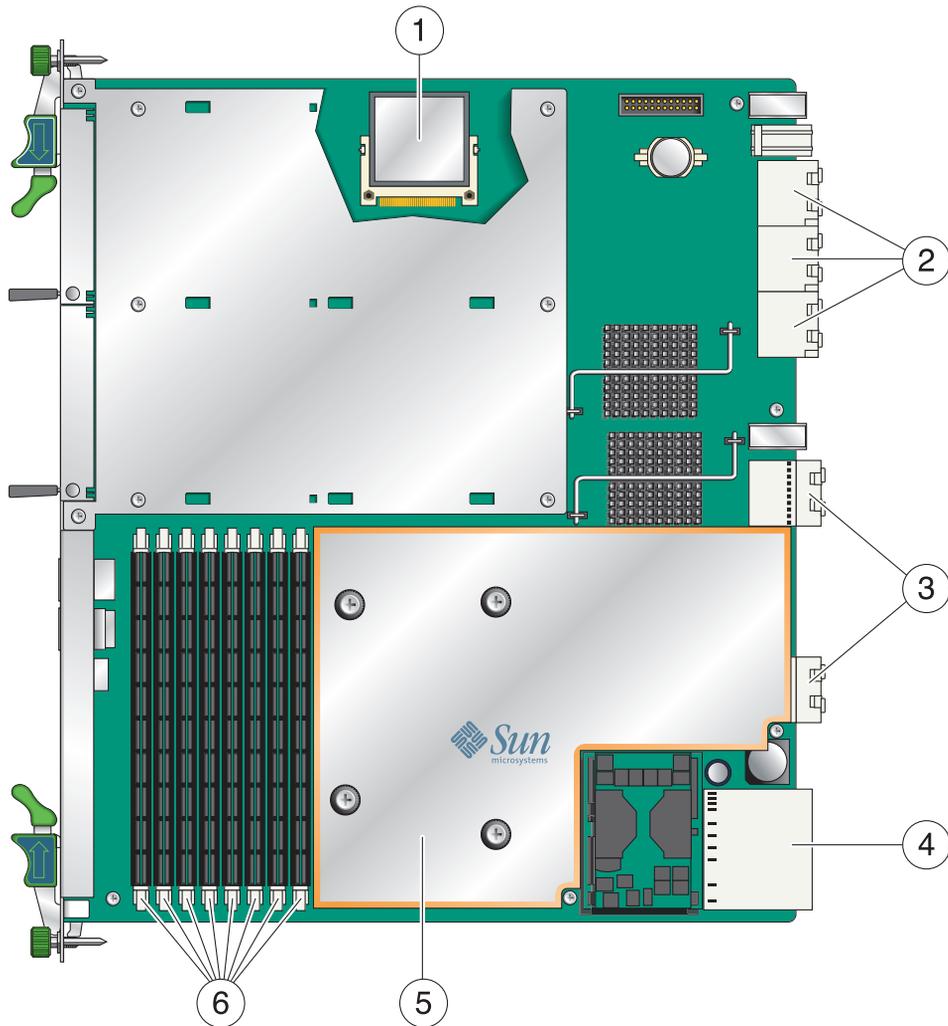
Figure Legend

1	Compact Flash card	4	Zone 1 power connector
2	Zone 3 connectors	5	CPU Heatsink
3	Zone 2 connectors	6	DIMMs

1.4 System Configurations

Sun Netra CP3220 blade servers can be installed into an ATCA shelf (chassis), as shown in FIGURE 1-4. The blade servers can be deployed in various electrical configurations to suit user requirements. For example, the blade server can be configured to boot from a network as a diskless client with either a front panel or advanced rear transition module (ARTM) network connection. The Sun Netra CP3220 blade server has a slot for a Compact Flash card (optional) and 8 DIMM sockets for memory.

FIGURE 1-4   Sun Netra CP3220 Blade Server in Shelf Enclosure
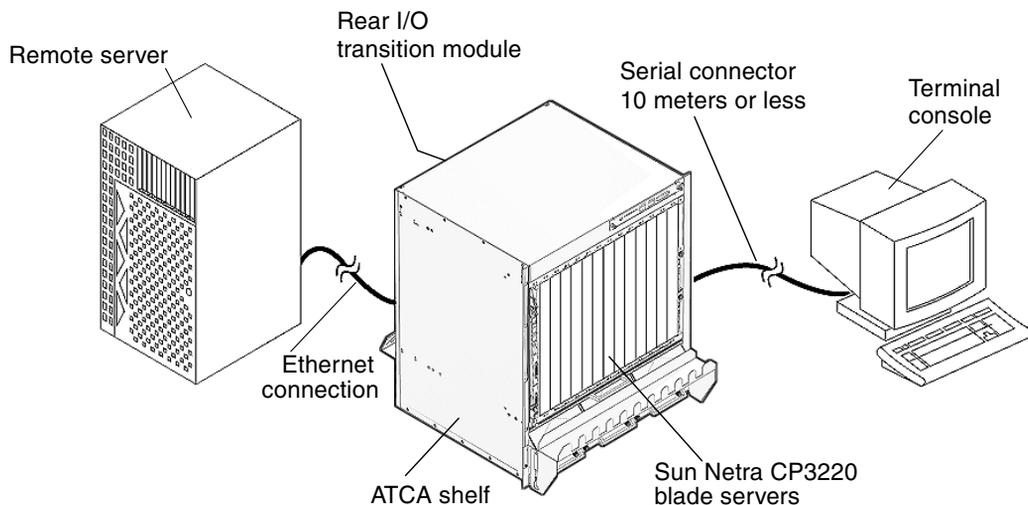
1.4.1 AMC Modules

The Sun Netra CP3220 blade server has two AMC slots, with four lanes each of PCIe, to provide additional I/O to the front panels or to the rear of the enclosure when used with an advanced rear transition module.

The Sun Netra CP3220 blade server supports AMC.1 Type 4E2 cards, as defined by the AMC specification.

1.4.2   Advanced Rear Transition Module

You can install an optional Sun Netra CP32x0 Advanced Rear Transition Module
(ARTM) (FIGURE 1-5) into the rear of the ATCA shelf, opposite the Sun Netra CP3220
blade server (FIGURE 1-6).

The Sun Netra CP32x0 SAS Storage Advanced Rear Transition Module, Dual HD
provides the following components:

- Up to two hot-pluggable SAS drives
- One serial port
- One 10/100/1000BASE-T Ethernet port with an RJ-45 connector
- Two Infiniband style connectors for external SAS

FIGURE 1-5   Sun Netra CP32x0 SAS Storage Advanced Rear Transition Module, Dual HD
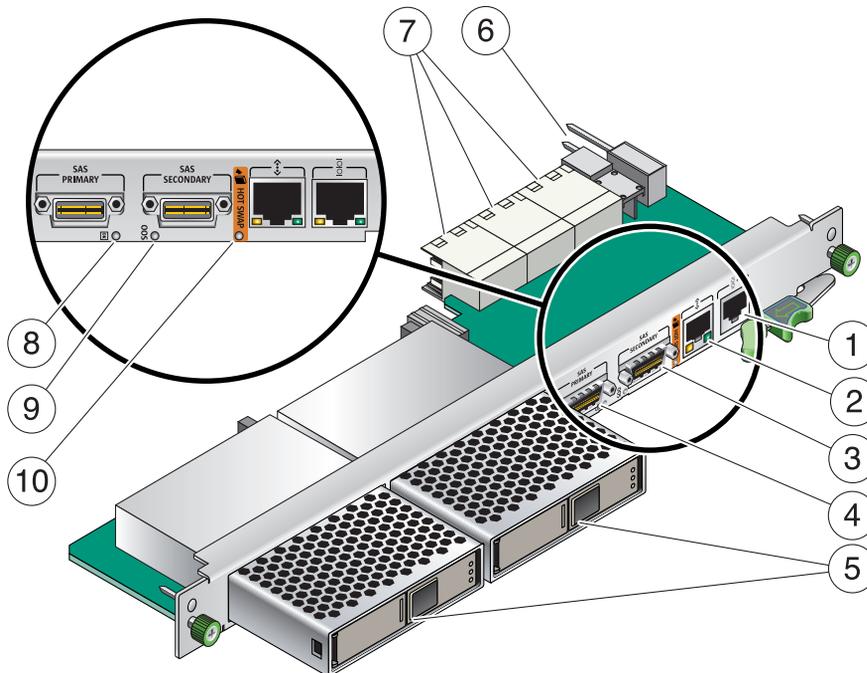
Figure Legend

1	Serial port
2	10/100/1000 MBASE-T management port
3	External SAS port (secondary)
4	External SAS port (primary)
5	Hard disk drives
6	RTM Alignment pin
7	Zone 3 connectors
8	OK LED
9	Out-of-service (OOS) LED
10	Blue Hot Swap LED

Note – Use only serial cables that are less than 10 meters in length.

FIGURE 1-6 shows the physical relationship between the Sun Netra CP3220 blade server, the ARTM, and the backplane in a typical ATCA system.

FIGURE 1-6   Sun Netra CP3220 Blade Server, Backplane, and Relationship to ARTM

Sun Netra CP32x0 ARTM
(installed from the rear)

Sun Netra CP3220 blade server
(installed from the front)

ATCA backplane
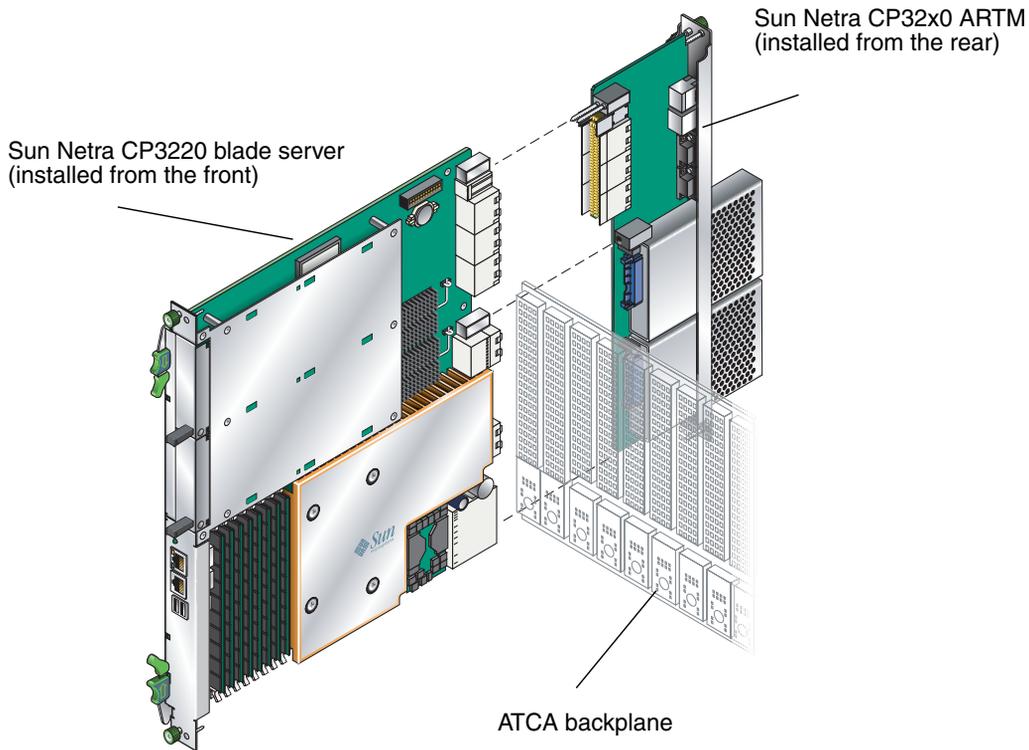
Note – When using the Sun Netra CP32x0 ARTM with the Sun Netra CP3220 blade server, use shielded cables of less than 10 meters in length for serial I/O ports.

Caution – You must use shielded cables for all ports to satisfy EMI compliance standards.

You can order the CP32x0 ARTM, build a custom module, or buy one from an IHV. You must set up a minimal set of I/O for a boot path for the host board and for a path for console I/O to deliver commands and read board and system status.

Possible boot and console configurations are described in TABLE 1-1. Sun Microsystems provides the Sun Netra CP3220 blade server and optionally, a compatible Sun Netra CP32x0 ARTM. This module provides one

10/100/1000BASE-T per second Ethernet RJ-45 port from the host to the rear of the system. This port can be used to accomplish, optionally, a network boot as a diskless client. The other configurations require IHV hardware.

TABLE 1-1   I/O Configurations

I/O	Hardware Required	Description
Ethernet	Sun Netra CP32x0 ARTM, supplied as an option for rear access	The default boot path uses an Ethernet port; the blade server runs in a diskless client configuration
SAS	Sun Netra 146-GB hard disk and the Sun Netra CP32x0 ARTM	Available only with the optional Sun Netra CP32x0 SAS Storage Advanced Rear Transition Module, Dual HD or through an AMC card with SAS capabilities. When the optional rear transition module is installed, connect to the drive(s) via SAS ports on the rear transition module.
Serial data	Sun Netra CP3220 blade server	Serial port A on the front panel provides the path of the default console I/O.
Serial data	Sun Netra CP32x0 ARTM rear transition module	When the optional transition module is installed, the module's serial port A will become the path of the default console I/O (FIGURE 1-5).
Compact Flash	IDE Compact Flash card	Sun Netra CP3220 blade server supports one, optional IDE Compact Flash drive, either 8-Gbyte (Type I) or 16-Gbyte (Type II), installed in a Type II CF socket on the blade.

1.5 Hot-Swap Support

In general, the hot-swap process includes the orderly connection of the hardware and software. The process uses hardware connection control to connect the hardware in an orderly sequence. The process includes the use of pins of different lengths to accomplish signal sequencing to protect the hardware and avoid corrupting the system interface. For further details on hot-swap standards, see the ATCA hot-swap specification.

The ATCA specification describes three hot-swap models: basic hot-swap, full hot-swap, and HA hot-swap. When a Sun Netra CP3220 blade server functions as a node board it supports all three hot-swap models.

1.6 System Components

This section contains the system-level hardware and software components, required and optional, for the Sun Netra CP3220 blade server.

1.6.1 Required Hardware Components

The Sun Netra CP3220 blade server cannot be used as a stand-alone system. It is designed to be used in an ATCA chassis for 8U boards. The minimum hardware requirements needed to use the Sun Netra CP3220 blade server are as follows:

- ATCA system enclosure for 8U boards (includes shelf, backplane, hub/switch board, shelf manager, and power supply)
- Console output device or serial terminal
- Boot device (such as hard drive, network, or Compact Flash card)
- Peripheral device for network access
- IPMC (built in)
- Cables for terminal and network connections
- High-speed fans. If you are installing the Sun Netra CP3220 blade server in a Sun Netra CT 900 server, the Sun Netra CT 900 server must have high-speed fan trays to support the additional cooling needs of the Sun Netra CP3220 blade server. For more information, see the *Sun Netra CT 900 Server Upgrade Guide* (820-3255).

> **Caution –** You can damage the Sun Netra CP3220 blade server components if you install the blade server in a chassis that does not provide sufficient cooling. For more information, see Section 2.2.1.1, "Check Power, Thermal, Environmental, and Space Requirements" on page 2-4.

> **Note –** Use only shielded serial cables that are less than 10 meters in length.

1.6.2 Optional Hardware Components

You can order the following optional items:

- Compact Flash card
- AMC modules
- Sun Netra CP32x0 ARTM

  The Sun Netra CP32x0 ARTM enables rear system I/O access to the following:

  - Network
  - Boot device
  - With the ARTM-HD, two hot-swappable SAS hard disk drives
  - Console terminal (FIGURE 1-4).
- Sun Netra CP3240 switch

The Sun Netra CP3240 switch is capable of operating at 10 GB, but is set by default to operate at 1GB. To use the switch at 10 GB, perform a one-time configuration procedure, available in the *CP3x40 Switch Product Notes* (820-3260).

1.6.3 Software Components

The Sun Netra CP3220 blade server has been tested for compatibility with the Solaris™ 10 Operating System (Solaris OS) and WindRiver Linux.

Refer to the *Sun Netra CP3220 Blade Server Product Notes* (820-1980) for more Solaris OS information, including a list of any required Sun Netra software patches and support for subsequent versions of Solaris. You can view and download the latest version of the product notes at the following web site:

http://docs.sun.com/app/docs/prod/cp3220.brd#hic

Refer to the appropriate vendor documentation for more information on your operating system.

1.7 Technical Support and Warranty

Should you have any technical questions or support issues that are not addressed in the Sun Netra CP3220 blade server documentation set or on the technical support web site, contact your local Sun Services representative. This hardware carries a one-year return-to-depot warranty.

For customers in the U.S. or Canada, please call 1-800-USA-4SUN (1-800-872-4786).

For customers in the rest of the world, you can find the World Wide Solution Center nearest you at the following web site:

http://www.sun.com/contact/services_solutions.jsp

When you call Sun Services, be sure to indicate if the Sun Netra CP3220 blade server was purchased separately and is not associated with a system. Please have the blade server identification information ready. For proper identification of the blade server, be prepared to give the representative the blade server part number, serial number, and date code (FIGURE 1-7).

1.7.1 Locating the Blade Server Identification Information

The Sun Netra CP3220 blade server part number, serial number, revision number, and media access control (MAC) address are printed on stickers located on the Sun Netra CP3220 blade server (FIGURE 1-7).

The Sun barcode label provides the following information:

- Blade server serial number (for example, 1005LCB-07296R0912), which is on the barcode label

The part number/dash/revision/date code label provides the following information:

- Blade server part number (for example, 3753529), which is the first seven digits on the part number label
- Product dash number (for example, -01)
- Revision number (for example, REV: 01)

The MAC address label contains the base MAC address for the blade server in printed and barcode form. Is it an orange label located below the AMC slots.

FIGURE 1-7 Sun Netra CP3220 Blade Server Barcode Labeling

Part number label

Serial number label
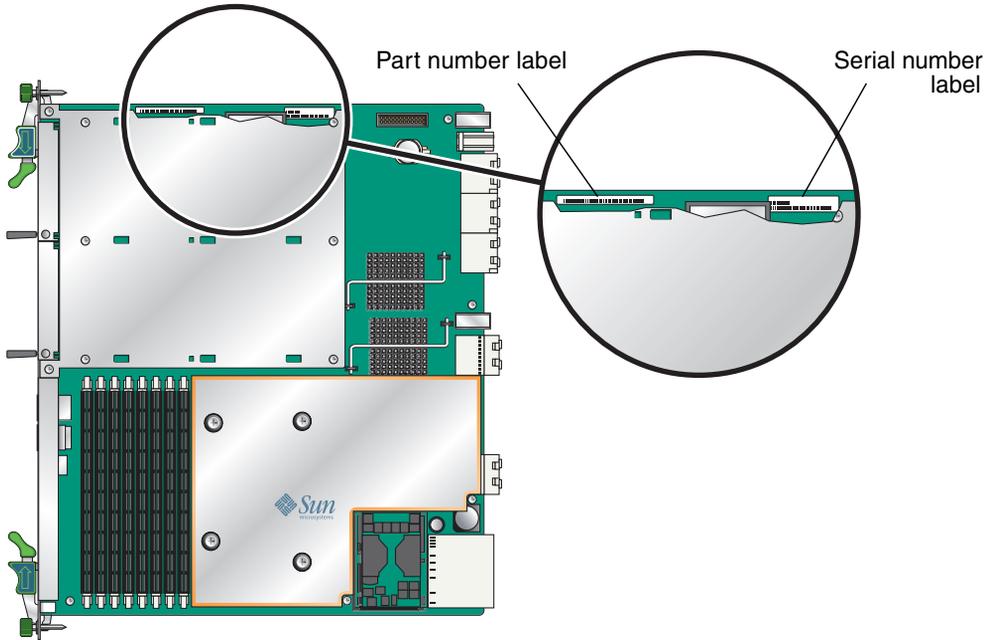
Hardware Installation and Service

This chapter describes the Sun Netra CP3220 blade server hardware installation and service procedures.

This chapter contains the following topics:

- Section 2.1, "Safety and Tool Requirements" on page 2-2
- Section 2.2, "Installing the Blade Server" on page 2-3
- Section 2.3, "Service Procedures" on page 2-17

2.1 Safety and Tool Requirements

2.1.1 Equipment and Operator Safety

Refer to the *Important Safety Information for Sun Hardware Systems* (816-7190) for general safety information.

Read the following safety statements that are specific to the Sun Netra CP3220 blade server carefully before you install or remove any part of the system.

Caution – Depending on the particular chassis design, operations with open equipment enclosures can expose the installer to hazardous voltages with a consequent danger of electric shock. Ensure that line power to the equipment is disconnected during operations that make high voltage conductors accessible.

The installer must be familiar with commonly accepted procedures for integrating electronic systems and the general practice of Sun systems integration and administration. Although parts of these systems are designed for hot-swap operation, other components must not be subjected to such stresses. Work with power connected to a shelf only when necessary, and follow these installation procedures to avoid equipment damage.

This equipment is sensitive to damage from electrostatic discharge (ESD) from clothing and other materials. Use the following antistatic measures during an installation:

- If possible, disconnect line power from the shelf when servicing a system or installing a hardware upgrade. If the shelf cannot be placed on a grounded antistatic mat, connect a grounding strap between the facility electrical input ground (usually connected to the shelf) and facility electrical service ground.
- Use an antistatic wrist strap when performing the following tasks:
  - Removing a blade server from its antistatic bag
  - Connecting or disconnecting blade servers, boards, or peripherals

  The other end of the antistatic wrist strap lead should be connected to one of the following:
  - A ground mat
  - The chassis metal as a ground

The grounded mat or the chassis must be connected to a facility ground to prevent a floating ground.

- Keep blade servers in the antistatic bags until they are needed.
- Remove a blade server from its antistatic bag only when wearing a properly connected ground strap.
- Place blade servers that are out of their antistatic bags on an antistatic mat if one is available and the mat is grounded to a facility electrical service ground. Do not place blade servers on top of an antistatic bag unless the outside of the bag also has antistatic protective properties.

2.1.2 Materials and Tools Required

The tools required for installation and service are:

- Phillips screwdrivers: No. 1 (required), No. 2 (optional)
- Antistatic wrist strap
- Terminal console
- Serial cable of less than 10 meters in length to connect the Sun Netra CP3220 blade server with a system console

Refer to Section 1.6, "System Components" on page 1-12 for information on hardware requirements.

2.2 Installing the Blade Server

2.2.1 Preparing for the Installation

Prepare for installation by reading and performing the following steps.

1. Become familiar with the contents of the documentation referenced in the steps.

2. Verify that all listed hardware and software are available (see Section 1.6, "System Components" on page 1-12).

3. Check power, thermal, environmental, and space requirements (see Section 2.2.1.1, "Check Power, Thermal, Environmental, and Space Requirements" on page 2-4).

4. Verify that local area network (LAN) preparations are completed (see Section 2.2.1.2, "Local Network IP Addresses and Host Names Worksheet" on page 2-5).

5. Ensure that the host names and their network IP addresses are allocated and registered at the site. Record this information in TABLE 2-1.

2.2.1.1 Check Power, Thermal, Environmental, and Space Requirements

Observe that your environment meets the following requirements:

- Your enclosure specifications can support the sum of the specified maximum blade server power loads. (See Section A.2, "Power and Thermal Metrics" on page A-2).

- Facility power loading specifications can support the rack or enclosure requirements.

- Your enclosure specifications can support the cooling airflow requirements.

The Sun Netra CP3220 blade server fits into a standard ATCA shelf. If your installation requirements are different, contact your field applications engineer.

2.2.1.2 Local Network IP Addresses and Host Names Worksheet

Collect the information listed in TABLE 2-1 to connect hosts to the LAN. Ask your network administrator for help, if necessary. This information is not needed for a stand-alone installation.

TABLE 2-1   Local Area Network Information

Information Needed	Your Information
IP address* and host name for each Sun Netra CP3220 client	
Domain name	
Type of name service and corresponding name server names and IP addresses—for example DNS and NIS (or NIS+)	
Subnet mask	
Gateway router IP address	
Network File System (NFS) server names and IP addresses	
Web server URL	

* Local IP addresses are not needed if they are assigned by a network Dynamic Host Configuration Protocol (DHCP) server.

You may need the MAC (Ethernet) addresses of the local hosts to make name server database entries. You can see the MAC address in the console output while booting the blade server. You can also find it on the barcode label on the blade server (see Section 1.7.1, "Locating the Blade Server Identification Information" on page 1-14).

2.2.1.3 Installation Procedure Summary

This section summarizes the high-level procedures that are required to install the Sun Netra CP3220 blade server. Ensure that you are familiar with the information in Section 2.2.2, "Configuring the Hardware" on page 2-6 through the end of Chapter 2 before installing the blade server.

The process to set up and configure a Sun Netra CP3220 blade server in a system includes the following procedures:

1. Configure the blade server's physical hardware.

   For example, install memory and AMC cards, and set switches, as necessary (Section 2.2.2, "Configuring the Hardware" on page 2-6).

2. Physically install the ARTM as necessary (Section 2.2.3.1, "Installing an Advanced Rear Transition Module" on page 2-8).

3. Physically install the Sun Netra CP3220 blade server, and any peripheral boards into the ATCA shelf Section 2.2.3, "Installing the Sun Netra CP3220 Blade Server in an ATCA Shelf" on page 2-8).

4. Connect the nodes to a local network. (Section 2.2.4, "Connecting External I/O Cables" on page 2-13).

5. If you are running the Solaris Operating System on the Sun Netra CP3220 blade server, and want to verify system integrity, download and install SunVTS (Section 3.1, "Operating Systems" on page 3-2).

2.2.2 Configuring the Hardware

This section lists hardware installation and settings that might apply to your blade server configuration. Read and perform the procedures, as necessary, before installing the Sun Netra CP3220 blade server into the ATCA shelf.

2.2.2.1 Verify Chassis Fan Tray Upgrade

Caution – The Sun Netra CT 900 server fan tray upgrade kit (594-4953) must be installed in the chassis before the Sun Netra CP3220 blade server is installed. This fan tray upgrade is required to provide adequate cooling and prevent the system from overheating or shutting down due to an over temperature condition that can occur with the older fan trays.

● **To verify if the fan tray upgrade is installed on a Sun Netra CT 900 server, log into the Shelf Manager and issue the following command for fan trays 1,2, and 3:**

```
# clia fruinfo fan_tray 1 | grep "Product Part"
```

If "Product Part / Model Number = 371-3033-xx", an upgraded fan tray is installed. If "Product Part / Model Number" is not 371-3033, an old fan tray is installed and the upgrade is required. Refer to the *Sun Netra CT 900 Server Upgrade Guide* (820-3255) for more information.

2.2.2.2 Installing Optional Components

Use the following table to locate your options and installation instructions.

DIMMs	Section 2.3.6.1, "DIMM Requirements" on page 2-19
	Section 2.3.6.2, "Installing a DDR2 DIMM" on page 2-21
Compact Flash card	Section 2.3.7, "Installing the Optional Compact Flash Card" on page 2-24
AMC card	Section 2.3.8, "Installing Optional AMC Cards" on page 2-26

2.2.2.3 Configuring the Advanced Rear Transition Module Hardware

If you are using a Sun Netra CP32x0 Advanced Rear Transition Module (ARTM), refer to the appropriate documentation. See Section , "Related Documentation" on page -xvii.

You can also see Section A.3, "Connectors and Pinouts" on page A-4 for detailed connector pin assignments for the Sun Netra CP3220 blade server.

2.2.3 Installing the Sun Netra CP3220 Blade Server in an ATCA Shelf

If you are installing the Sun Netra CP3220 blade server with the Sun Netra CP32x0 ARTM, install the Sun Netra CP32x0 ARTM at the rear of the server and then install the Sun Netra CP3220 blade server in the front of the server. Even though you will be installing the Sun Netra CP32x0 ARTM first, look at the front of the server and locate the slot number where you will be installing the Sun Netra CP3220 blade server. Then go to the back of the server and install the Sun Netra CP32x0 ARTM in that particular slot. If you do not install the Sun Netra CP3220 blade server and the Sun Netra CP32x0 ARTM in corresponding slots, the system will recognize the Sun Netra CP3220 blade server but not the Sun Netra CP32x0 ARTM.

Note – Slots 1 through 6 and 9 through 14 are available for Sun Netra CP3220 blade servers. Slots 7 and 8 are reserved for the switch card.

2.2.3.1 Installing an Advanced Rear Transition Module

A compatible advanced rear transition module (ARTM) can be used with the Sun Netra CP3220 blade server for rear I/O access. The ARTM enables access to the network, a boot device, and a console terminal. You can use the Sun Netra CP32x0 ARTM or you can design your own compatible ARTM. For more information, see Section 1.4.2, "Advanced Rear Transition Module" on page 1-8

FIGURE 2-1 Installing the Sun Netra CP32x0 ARTM
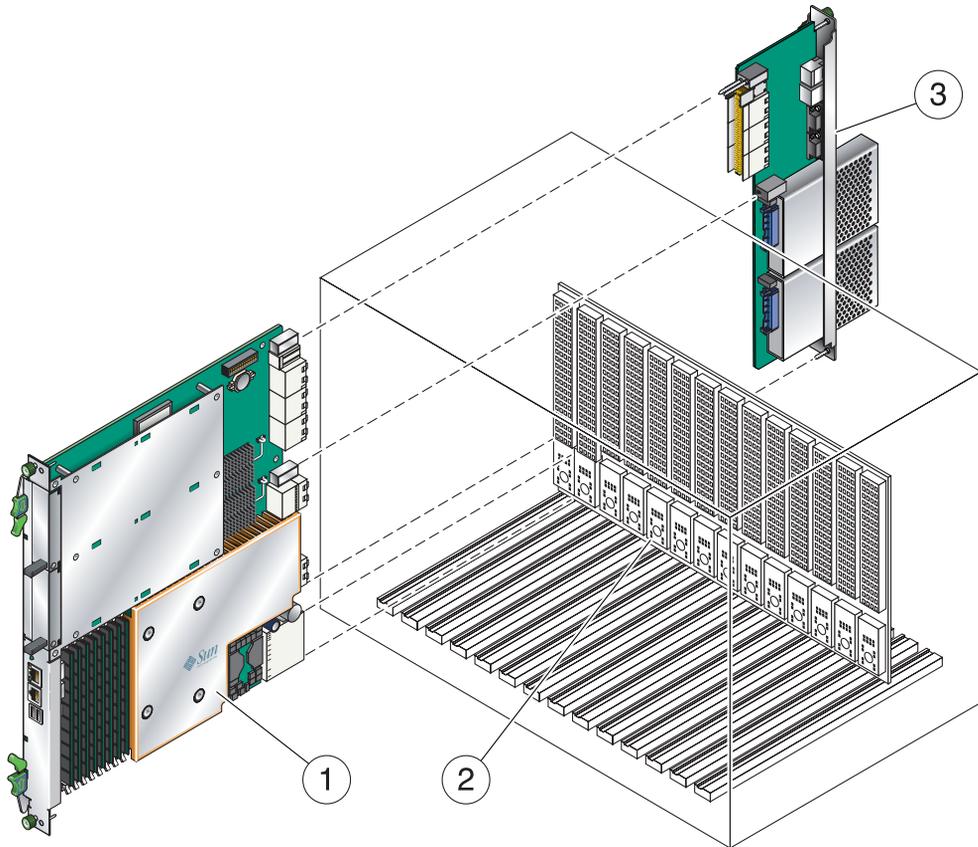
▼ To Install an ARTM

1. **Verify that you have taken the necessary antistatic precautions.**

   See Section 2.1.1, "Equipment and Operator Safety" on page 2-2.

2. **From the rear of the system, choose an appropriate slot for the ARTM.**

   The ARTM must be installed, inline, behind a compatible Sun Netra blade server (Sun Netra CP3220 blade server or Sun Netra CP3260 blade server).

   For example, if the Sun Netra CP3220 blade server will be installed in slot 3, the corresponding ARTM must be installed at the back of the system in slot 3 (FIGURE 2-1). If you do not install the ARTM and the Sun Netra CP3220 blade server in corresponding slots, the system will recognize the Sun Netra CP3220 blade server, but not the ARTM.

Note – Slots 1 through 6 and 9 through 14 are available for Sun Netra CP3220 blade servers. Slots 7 and 8 are reserved for the switch card.

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3. **Remove the slot filler panel from the selected slot, if necessary.**

4. **Retrieve the ARTM from the ship kit.**

5. **Prepare the ARTM by opening the injector/ejector latch at the top of the module (**FIGURE 2-2**).**

FIGURE 2-2 Injector/Ejector Latch and Locking Screw on the ARTM
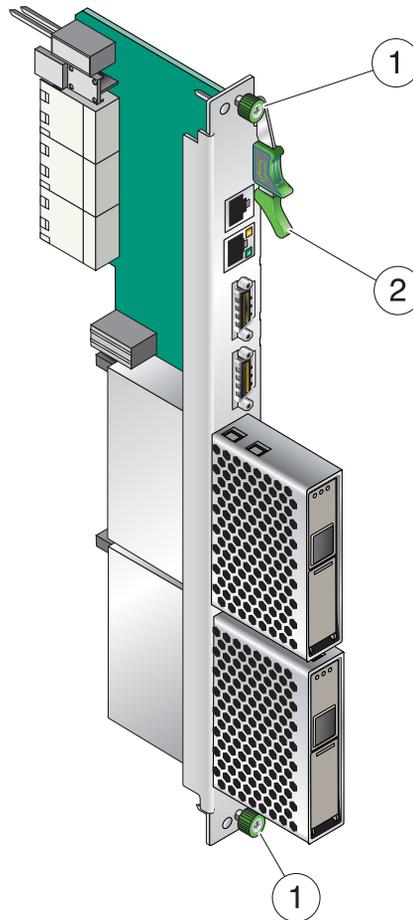
6. **Carefully align the edges of the ARTM with the card guides in the appropriate slot.**

   Look into the enclosure to verify correct alignment of the rails in the guides.

7. **Keep the ARTM aligned in the guides, and slide the ARTM in until the injector/ejector latches engage the card cage.**

8. **Push the ARTM into the backplane connectors, and close the latch.**

9. **Tighten the locking screws to ensure that the module is secured into the ATCA shelf.**

10. **Install the Sun Netra CP3220 blade server into the front of the ATCA shelf in the corresponding slot.**

See Section 2.2.3.2, "Installing the Blade Server Into the Shelf" on page 2-12 for instructions.

2.2.3.2 Installing the Blade Server Into the Shelf

Note – You can install the Sun Netra CP3220 blade server in any available slot in the ATCA shelf except for slots 7 and 8.

1. **If you have installed an ARTM, go to the front of the system and locate the same slot number where you installed the ARTM.**

2. **Remove the filler panel from the blade server slot, if necessary.**

The filler panel is secured to the card cage using two screws, one at the top of the filler panel, the other at the bottom. Store the filler panel in a safe place; you might need to use it again if you remove a blade server for an extended time.

3. **Prepare the Sun Netra CP3220 blade server by opening the injector/ejector latches (**FIGURE 2-2**).**

4. **Carefully align the edges of the blade server with the guides in the appropriate slot.**

Look into the enclosure to verify correct alignment of the rails in the guides.

5. **Keep the blade server aligned in the guides and slide the blade server in until the injector/ejector latches engage the card cage.**

6. **Push the blade server slightly into the backplane connectors and close the latches to seat the blade server in the connectors.**

When the lower latch is closed, the blue Hot-Swap LED blinks while the blade server is initializing. The blue LED turns off and the green OK LED lights when the blade server is ready for use.

7. **Tighten the locking screws and the top and the bottom of the Sun Netra CP3220 blade server to ensure that it is secured to the ATCA shelf (**FIGURE 2-2**).**

The blade server is now completely installed and will power on automatically.

2.2.4   Connecting External I/O Cables

Front panel ports are typically used for maintenance and troubleshooting purposes in installed and running systems. External I/O cables are connected to the Sun Netra CP3220 blade server or to the Sun Netra CP32x0 ARTM.

To connect each of these following cables:

- For Ethernet connections, Category 5e or better network cable is required. Connect one end of the Ethernet cable to a suitable 10/100/1000 MBASE-T Ethernet switch and the other end to one of the Ethernet ports on the Sun Netra CP3220 blade server or Sun Netra CP32x0 ARTM. By default, when a Sun Netra CP32x0 ARTM is installed, the Ethernet cable is connected only to the Ethernet port on the ARTM. Refer to the *Sun Netra CP32x0 ARTM SAS Storage Advanced Rear Transition Module, Dual HD User's Guide* (820-0460) for more information.

Note – Although the front panel Ethernet port does not support gigabit Ethernet, it can be connected to a gigabit switch capable of 10/100/1000 MBASE-T Ethernet.

- Attach asynchronous serial I/O cables from serial communication devices to the RJ-45 serial ports on the CP3220 blade server or Sun Netra CP32x0 ARTM.

Note – The front and rear serial ports use the same physical wire, so only one serial port, either the front or the rear, can be used at a time.

2.2.4.1   Connecting Cables to a System Console Running the Solaris OS

1. **Connect a shielded serial cable to the serial console port on the front panel of the Sun Netra CP3220 blade server (**FIGURE 2-3**) or the Sun Netra CP32x0 ARTM.**

2. **Connect the other end of the serial cable to the serial port of the system serving as the serial console.**

FIGURE 2-3 Serial Port on the Sun Netra CP3220 Blade Server

Serial port
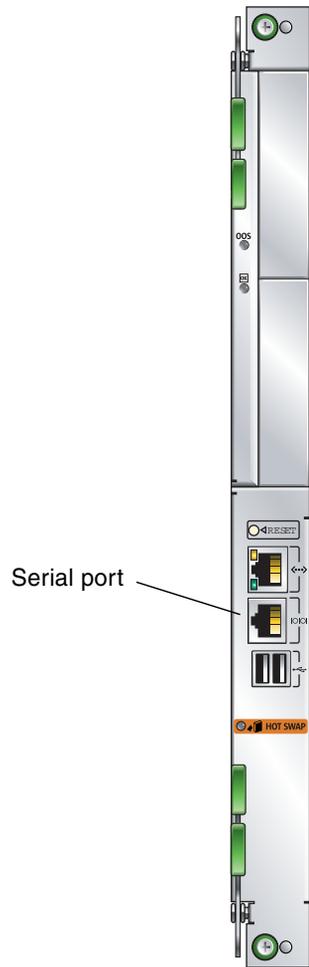
3. Use one of the following to establish a full-duplex serial terminal connection with the Sun Netra CP3220 blade server:

■ The `tip` utility

■ The `minicom` utility

- A `telnet` utility (Connect to the proper port on a Network Terminal Server to which the Sun Netra CP3220 is connected.)
- Another suitable serial communications program on the system console

  For example, if you are using a UNIX system as the system console, at the UNIX prompt in a command tool or shell tool, or serial port A, type:

```
# tip -9600 /dev/ttya
```

2.2.4.2 Connecting Cables to the System Console Not Running the Solaris OS

1. **Connect a shielded serial cable to the serial console port on the front panel of the Sun Netra CP3220 blade server (**FIGURE 2-3**) or the Sun Netra CP32x0 ARTM.**

2. **Connect the other end of the serial cable to the serial port of the system serving as the system console.**

3. **Set the serial communications settings to 9600 baud, 8 bit, 1 stop bit, no parity, and no handshake.**

2.2.4.3 Netinstall Boot Device Map

TABLE 2-2 provides a map of netinstall boot devices. You may need this information to understand which MAC address is associated with the system IP address on the install server.

For example, the Base Fabric interface is connected to the switch model-number in slot 8 of the ATCA shelf. To install to this device, select the xxx Ethernet interface from the BIOS setup menus.

TABLE 2-2 Netinstall Boot Device Table

MAC Address	Solaris Device	Hardware Device	Connects to...	Switch Slot Connection
0:3:ba.xx.xx.xn+0	bge0	(BMC5715C)	Base Fabric 0	Slot 7
0:3:ba.xx.xx.xn+1	bge1	(BMC5715C)	Base Fabric 1	Slot 8
0:3:ba.xx.xx.xn+2	nge0	(MCP55)	mgtA (front panel)	
0:3:ba.xx.xx.xn+3	nge1	(MCP55)	mgtB (rear panel)	
0:3:ba.xx.xx.xn+4	nxge0	(Sun 10 GbE Multithreaded Networking ASIC 10 GB)	Extended Fabric 0	Slot 7

TABLE 2-2   Netinstall Boot Device Table *(Continued)*

MAC Address	Solaris Device	Hardware Device	Connects to...	Switch Slot Connection
`0:3:ba.xx.xx.xn+5`	`nxge1`	(Sun 10 GbE Multithreaded Networking ASIC 10 GB)	Extended Fabric 1	Slot 8
`0:3:ba.xx.xx.xn+6`	`nxge2`	(Sun 10 GbE Multithreaded Networking ASIC 1 GB)	AMC and RTM	
`0:3:ba.xx.xx.xn+7`	`nxge3`	(Sun 10 GbE Multithreaded Networking ASIC 1 GB)	AMC and RTM	

The Sun Netra CP3220 blade server supports virtual LAN configuration for the Sun 10 GbE Multithreaded Networking ASIC ports (MAC addresses 4, 5, 6, and 7). When configured, the virtual LAN feature enables the assignment of multiple MAC address to one port. TABLE 2-3 lists the extra MAC addresses available for the Sun 10 GbE Multithreaded Networking ASIC ports.

TABLE 2-3   Extra MAC Addresses for Virtual LAN Configuration

Primary MAC Address	Additional MAC Addresses
`0:3:ba.xx.xx.xn+4`	`0:3:ba.xx.xx.xn+8` through `0:3:ba.xx.xx.xn+14`
`0:3:ba.xx.xx.xn+5`	`0:3:ba.xx.xx.xn+15` through `0:3:ba.xx.xx.xn+21`
`0:3:ba.xx.xx.xn+6`	`0:3:ba.xx.xx.xn+22` through `0:3:ba.xx.xx.xn+28`
`0:3:ba.xx.xx.xn+7`	`0:3:ba.xx.xx.xn+29` through `0:3:ba.xx.xx.xn+35`

2.3 Service Procedures

2.3.1 Hot-Swapping the Sun Netra CP3220 Blade Server

You can remove the Sun Netra CP3220 blade server without powering off the entire chassis by performing these steps.

1. **Power off the blade server.**

   See Section 2.3.2, "Powering Off the Sun Netra CP3220 Blade Server" on page 2-17.

2. **Remove the blade server.**

   See Section 2.3.3, "Removing the Sun Netra CP3220 Blade Server" on page 2-18.

2.3.2 Powering Off the Sun Netra CP3220 Blade Server

1. **Shut down the operating system.**

   Log in and shut down any OS operating on the blade server or its companion ARTM.

2. **Deactivate the blade server.**

   Log in to the shelf manager and deactivate the blade server in the target slot.

   For example, to shut down the blade server in slot 3, log in to the shelf manager and type:

   ```
   # clia deactivate board 3
   ```

   Wait for the blue Hot-Swap LED to light steadily before removing the blade server.

2.3.3 Removing the Sun Netra CP3220 Blade Server

1. **Power off the Sun Netra CP3220 blade server.**

   Use the instructions in Section 2.3.2, "Powering Off the Sun Netra CP3220 Blade Server" on page 2-17.

2. **If installed, remove all cables from the front of the Sun Netra CP3220 blade server.**

3. **Loosen the locking screws to release the blade server from the ATCA shelf.**

4. **When the blue Hot-Swap LED lights steadily, release the upper latch and the lower latch at the same time to unseat the blade server from the connectors.**

5. **Remove the blade server from the ATCA shelf and place the blade server on an antistatic mat.**

2.3.4 Powering On the System

Sun Netra CP3220 blade servers are powered on automatically via the H8 BMC when you install the blade server into a slot in the ATCA shelf. Once installed, the blade server sequences through power-on states until it is fully powered on.

2.3.5 Automatic Power-Off Events

A power-off sequence is initiated either by a request from the shelf manager or a fault condition. The Sun Netra CP3220 blade server shuts down to standby power mode when the following upper critical threshold conditions are met:

- Detection of DC input (both -48V A and -48V B) drop for more than 5ms
- Processor thermal trip drops to standby mode

Thermal trip of DC brick turns off all local power (standby included)

2.3.6   Servicing DIMMs

2.3.6.1   DIMM Requirements

The Sun Netra CP3220 blade server supports a total of eight DIMMs and the maximum memory capacity of 32 Gbytes (using four 4-Gbyte DIMMs). The Sun Netra CP3220 blade server accommodates the following DIMMs and configurations:

- Up to eight standard DDR2-667 (PC2-5300) SDRAM registered/ECC DIMMs
- DIMMs must be installed in matching pairs, in the lowest-number slots available
- DIMM pair 0 must always be installed first
- 2-Gbyte and 4-Gbyte, DDR2 modules are supported
- Maximum of 32 Gbytes in eight slots

The Sun Netra CP3220 blade server supports DIMMs that have the following characteristics:

- A 144-bit wide data bus DDR2 interface (2x64-bit data + 2x8-bit ECC)
- DDR2 DIMM: 4.4 - 7.0 watts (1.8 V)
- Very low profile (VLP) with a maximum height of 0.72 inch (18.3 mm)
- Data Bus: 64 bits, Clock Rate: 333 MHz, Data Rate: 667, MegaTransfers, Throughput 5.3 Gbytes/second

FIGURE 2-4 Locating DIMM Slots


```
| B  A || B  A || B  A || B  A |
```

Pair 0   Pair 2
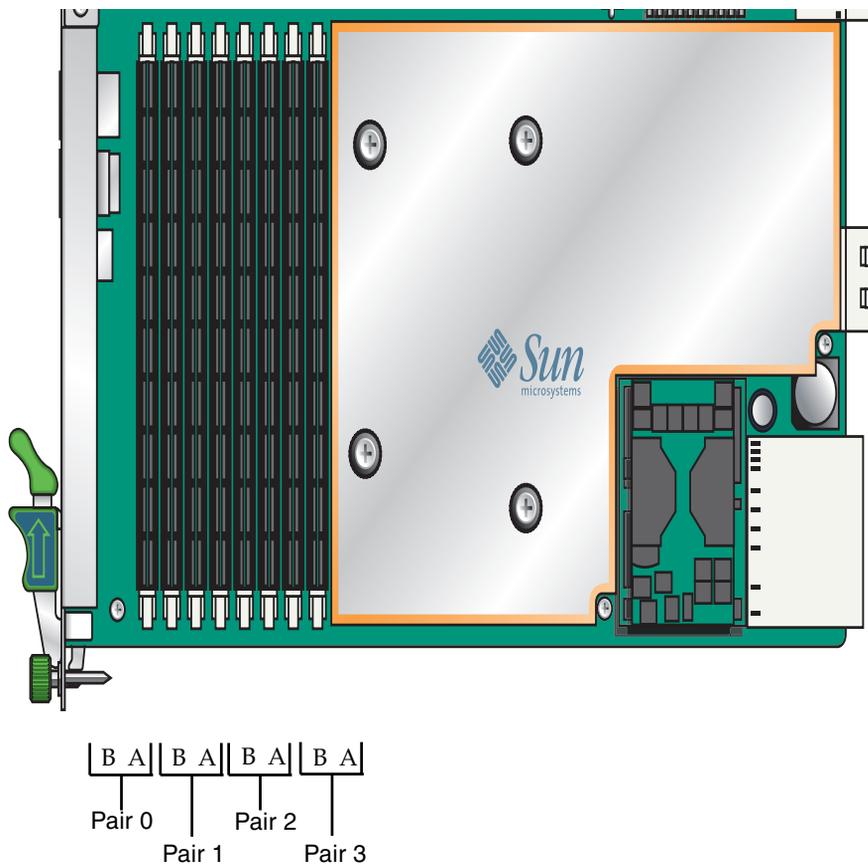
     Pair 1   Pair 3

Populate DIMMs in matching pairs, starting with Pair 0, then adding Pair 1, Pair 2, and Pair 3 as needed.

2.3.6.2 Installing a DDR2 DIMM

The following procedure provides a general guide for installing additional memory. However, for specific directions on installing DIMMs on the Sun Netra CP3220 blade server, refer to the documentation that shipped with the DIMMs.

1. **Access the blade server by performing one of the following procedures:**

   ■ If the Sun Netra CP3220 blade server is installed in an ATCA shelf, remove the blade server from the shelf as explained in Section 2.3.3, "Removing the Sun Netra CP3220 Blade Server" on page 2-18.

   ■ Remove the Sun Netra CP3220 blade server from its antistatic envelope and place it on an ESD mat near the ATCA shelf.

2. **Take antistatic precautions: Attach and electrically ground the wrist strap.**

Caution – Always wear a grounded antistatic wrist strap when handling DIMMs.

3. **Locate the DIMM connectors on the Sun Netra CP3220 blade server.**

   Select the connectors where you will install the DIMM. See FIGURE 2-4 for DIMM slot locations.

Caution – Do not remove the DIMM from its antistatic container until you are ready to install the DIMM on the Sun Netra CP3220 blade server. Handle the DIMM only by its edges. Do not touch DIMM components or metal parts. Always wear a grounded antistatic wrist strap when handling DIMM.

4. **Remove the DIMM from its protective packaging, holding the module only by the edges.**

5. **Holding the DIMM upright to the blade server, insert the bottom edge of the DIMM into the bottom of the slot's hinge-style connector (**FIGURE 2-5**).**

Caution – Evenly engage the DIMM in its hinge-style slot; uneven contact can cause shorts that will damage the Sun Netra CP3220 blade server. Do not rock the DIMM into place. Ensure that all contacts engage at the same time. You will feel or hear a click when the DIMM properly seats in the connector.

The socket and module are both keyed, which means that the DIMM can be installed only one way. With even pressure, push simultaneously on both upper corners of the DIMM until its bottom edge (the edge with the gold fingers) is firmly seated in the connector.

FIGURE 2-5 Installing a DIMM
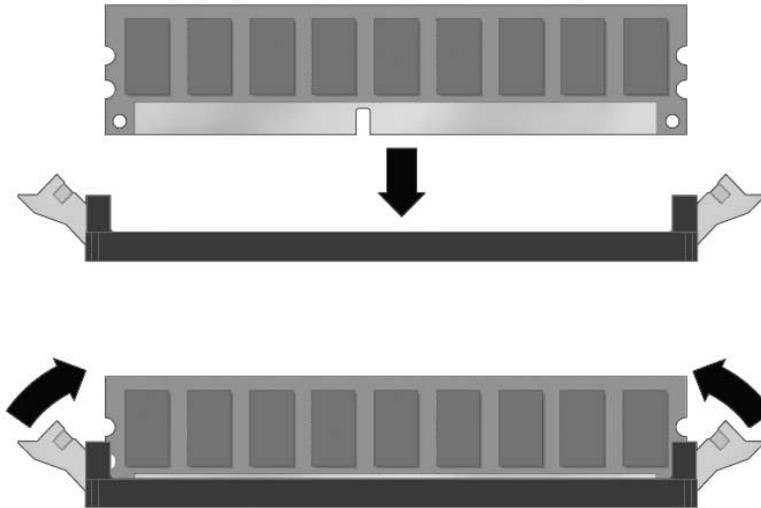
6. **Press the top edge of the DIMM toward the blade server until the retainer clips click into place in the notches on the DIMM sides (**FIGURE 2-5**).**

   The small metal retainer clips on each side of the DIMM slot are spring-loaded, and they should click into place in the notches on the sides of the DIMM.

2.3.6.3 Removing a DDR2 DIMM

If you are returning the DIMM or the blade server for service, or if you are replacing a DIMM with another DIMM, remove the DIMM from the Sun Netra CP3220 blade server.

Note – Safely store the original factory-shipped DIMM and related DIMM packaging. Store any removed DIMM in the new DIMM packaging.

To remove a DIMM from the Sun Netra CP3220 blade server, perform the following steps:

1. **Access the blade server by performing one of the following procedures:**

   ■ If the Sun Netra CP3220 blade server is installed in an ATCA shelf, remove the blade server from the shelf as explained in Section 2.3.3, "Removing the Sun Netra CP3220 Blade Server" on page 2-18.

   ■ Remove the Sun Netra CP3220 blade server from its antistatic envelope and place it on an ESD mat near the ATCA shelf.

If an ESD mat is not available, you can place the blade server on the antistatic envelope in which it was packaged.

Caution – Do not place blade servers on top of an antistatic bag unless the outside of the bag also has antistatic protective properties.

2. Take antistatic precautions: Attach and electrically ground the wrist strap.

Caution – Always wear a grounded antistatic wrist strap when handling DIMMs.

3. Simultaneously pull both spring retainer clips outward from the slot for the DIMM you want to remove.

4. Grasp the DIMM by the edges, and carefully pull it out of its connector.

Place it in an antistatic bag.

FIGURE 2-6 Removing a DIMM
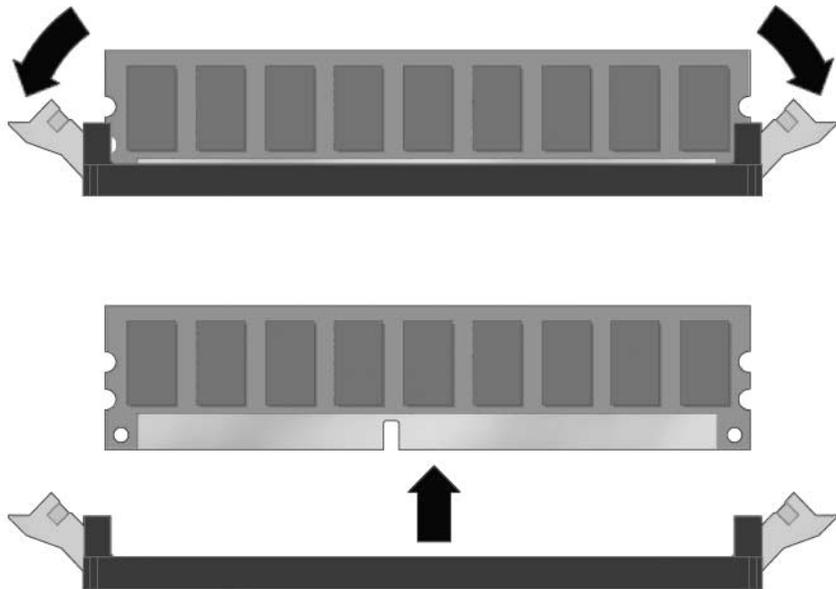
5. If you are replacing the DIMM you removed with a new DIMM, install it as described in Section 2.3.6.2, "Installing a DDR2 DIMM" on page 2-21**.**

Note – Before installing a replacement DIMM, verify that the new DIMM is the same size as its paired DIMM.

2.3.7   Installing the Optional Compact Flash Card

An IDE Compact Flash card can be installed on the Sun Netra CP3220 blade server.
The Compact Flash card is not hot-swappable, and there is no access to the Compact
Flash card once the Sun Netra CP3220 is installed in an ATCA shelf.

1. Access the blade server by performing one of the following procedures:

- If the Sun Netra CP3220 blade server is installed in an ATCA shelf, remove the
  blade server from the shelf as explained in Section 2.3.3, "Removing the Sun
  Netra CP3220 Blade Server" on page 2-18.

- Remove the Sun Netra CP3220 blade server from its antistatic envelope and place
  it on an ESD mat near the ATCA shelf.

  If an ESD mat is not available, you can place the blade server on the antistatic
  envelope in which it was packaged.

Caution – Do not place blade servers on top of an antistatic bag unless the outside
of the bag also has antistatic protective properties.

2. Locate the Compact Flash connector.

The connector is located on the blade server, under the sheet metal protecting
AMC slot B1(FIGURE 2-7).

**3. To install the Compact Flash card, use the arrow on the card as a guide to insert
the card into the Compact Flash connector.**

FIGURE 2-7   Compact Flash Location
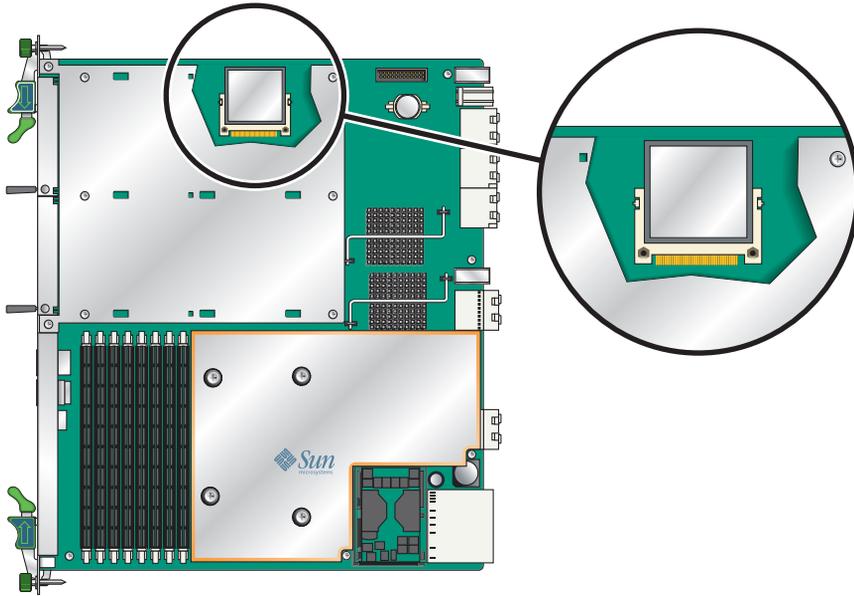
Note – Sun Compact Flash cards have a life time of 2,000,000 write/erase cycles. Users are responsible for ensuring that the operating system and applications do not exceed this limitation.

2.3.8 Installing Optional AMC Cards

An Advanced Mezzanine card (AMC) is a card or module that provides additional functionality to the Sun Netra CP3220 blade server. The blade server contains two AMC slots in which you can install an optional AMC device. An AMC device can be installed and removed via a cutout in the front panel while the Sun Netra CP3220 blade server is installed in the chassis.

Note – The following procedure provides a general set of instructions for installing AMC modules on the Sun Netra CP3220 blade server. Refer to the AMC module manufacturer's documentation for specific instructions on installing these devices.

---

1. **Retrieve the wrist strap from the modules's shipping kit.**

2. **Attach the adhesive copper strip of the antistatic wrist strap to the metal chassis.**

   Wrap the other end twice around your wrist, with the adhesive side against your skin.

3. **Remove the AMC slot filler panel from the blade server's front panel** FIGURE 2-8**.**

FIGURE 2-8   Removing an AMC Filler Panel
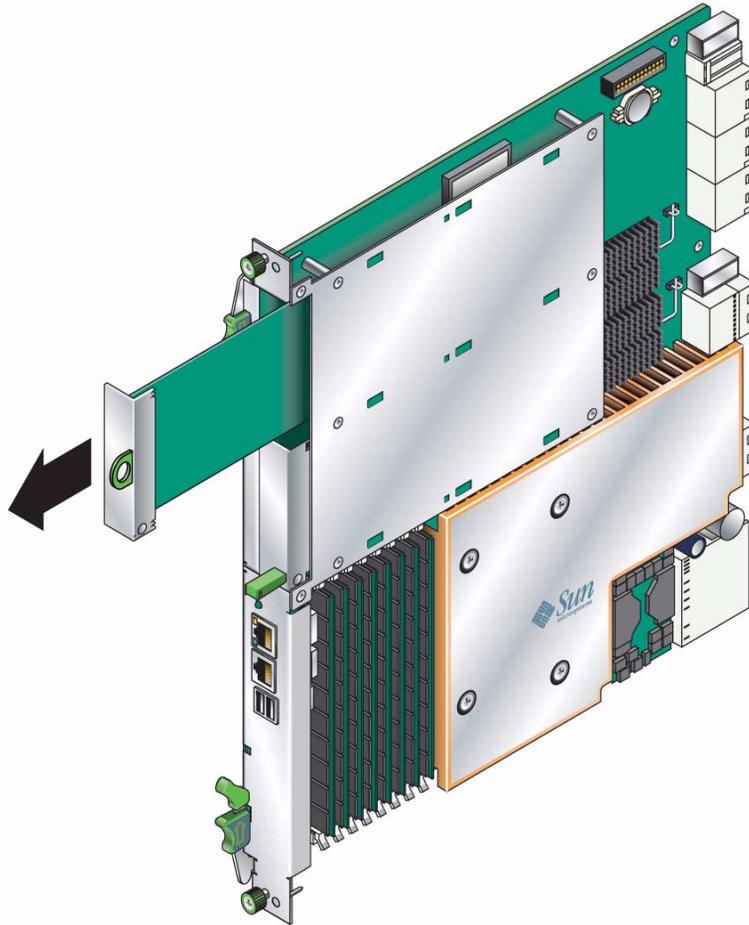
4. **Retrieve the AMC module from its shipping kit and place it on an antistatic surface.**

5. **Insert the AMC module through the cutout and into the AMC slot** FIGURE 2-9**.**

FIGURE 2-9 Installing an AMC Card
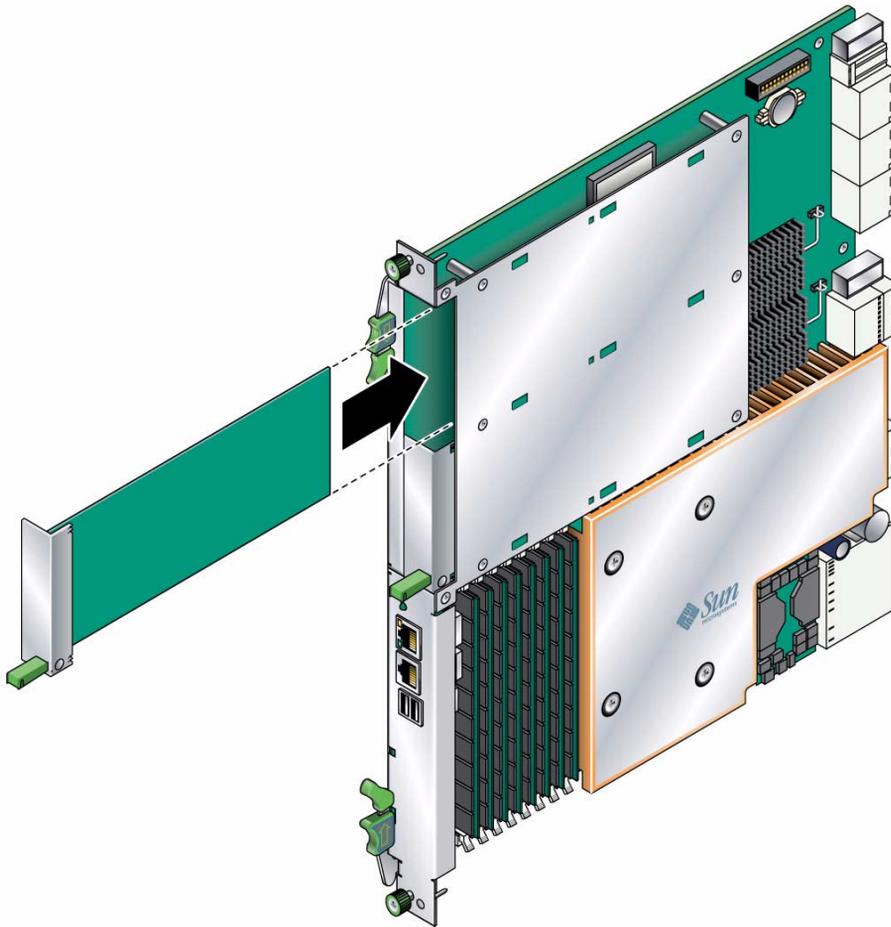
⚠️ **Caution –** Do not use excessive force when installing the AMC module into the slot. You might damage the AMC connector on the Sun Netra CP3220 blade server, causing permanent damage to the AMC module or the blade server. If the AMC module does not seat properly when you apply even pressure, remove the AMC module and carefully reinstall it.

6. Carefully insert the AMC card into the AMC slot, ensuring that the edge of the card is installed into the card guides on both edges.

7. **Press on the front face of the AMC card until the card is fully seated into the AMC connector.**

8. **Press the black ejector in, toward the AMC card, to activate the card.**

9. **Refer to the AMC module documentation for software and cabling installation instructions.**

2.3.9 Adding or Replacing a TOD Clock Battery

The optional TOD battery must be type CR1632, with a minimum of 4ma abnormal charging current rating (for example; a Renata CR1632).

Caution – Risk of explosion if the battery is replaced by an incorrect type. Dispose of batteries properly in accordance with manufacturer's instructions and local regulations.

To install battery, perform the following steps:

1. **Remove the old battery, if necessary.**

2. **Slide the new battery into the holder with the side labeled "+" facing up.**

2.3.10 Changing Jumper Settings

2.3.10.1 Clearing the CMOS Setting Using Jumper 1

Reset jumper 1 to clear the CMOS settings, which restores the default BIOS settings.

Jumper 1 is shown in FIGURE 2-10. The jumper housing should be stored in the P1/P2 position, which is the run position.

FIGURE 2-10 Jumper 1 in the Run Position
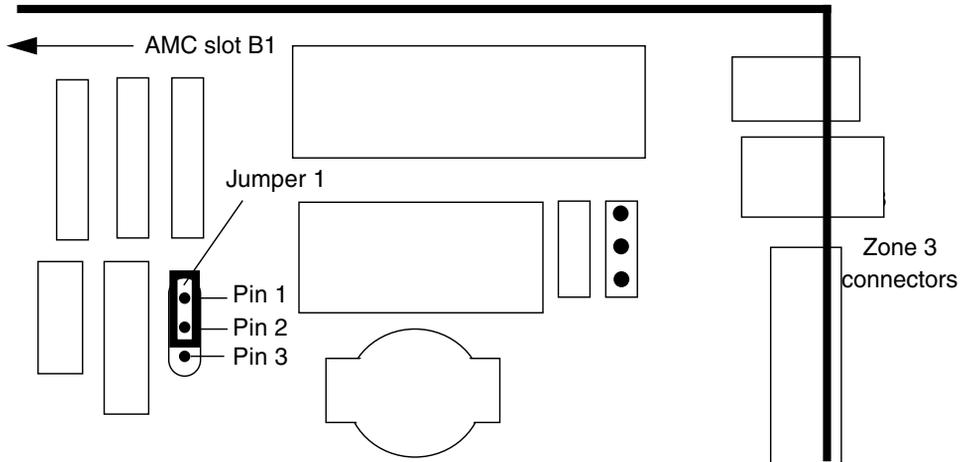
TABLE 2-4 provides information on the pin functions on jumper 1.

TABLE 2-4   Pin Functions on Jumper 1

Pin Number	Purpose
Pin 1	Battery Feed
Pin 2	VCC_RTC (destination for battery power)
Pin 3	BATT_CLR (resistor to GND, used to drain capacitive charge and clear the CMOS memory)

To reset the jumper and return the CMOS settings to the default settings, perform the following steps:

1. **Remove the jumper housing from the run position (P1/P2) and move it to the reset position (P2/P3).**

FIGURE 2-11 Jumper 1 in the Reset Position
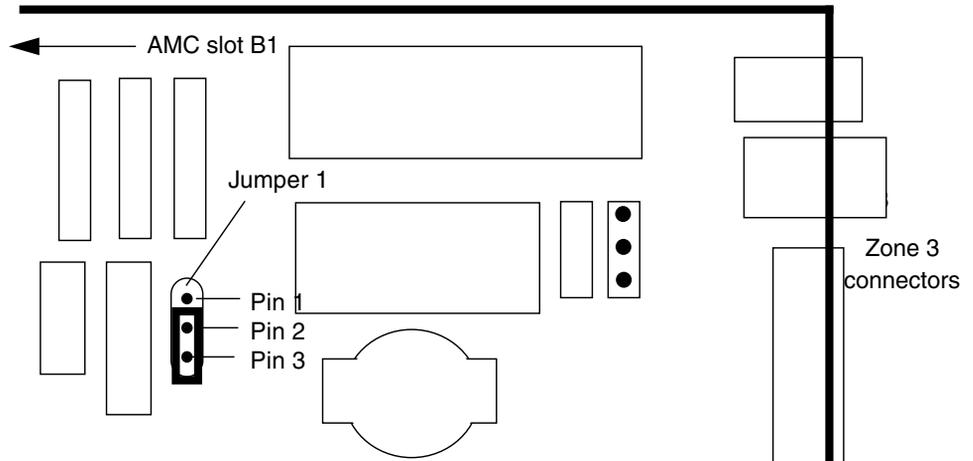
2. **Wait at least one second for the CMOS settings to reset and then move the jumper housing back to the run position.**

3. **Reinstall the blade server.**

   Use the procedure in Section 2.2.3.2, "Installing the Blade Server Into the Shelf" on page 2-12.

Note – The blade server will operate normally only when the jumper housing is in the run position.

2.3.10.2 Changing the OOS LED Color

The color of the Out-of-service (OOS) LED can be set to red or amber by moving jumper 2 to the appropriate position. Amber is the default color for the OOS LED.

To change the Jumper 2 position to red:

1. Remove the jumper housing from the default (amber) position (P2/P3) and move it to the red position (P1/P2).

FIGURE 2-12 Jumper 2 in the Red Position
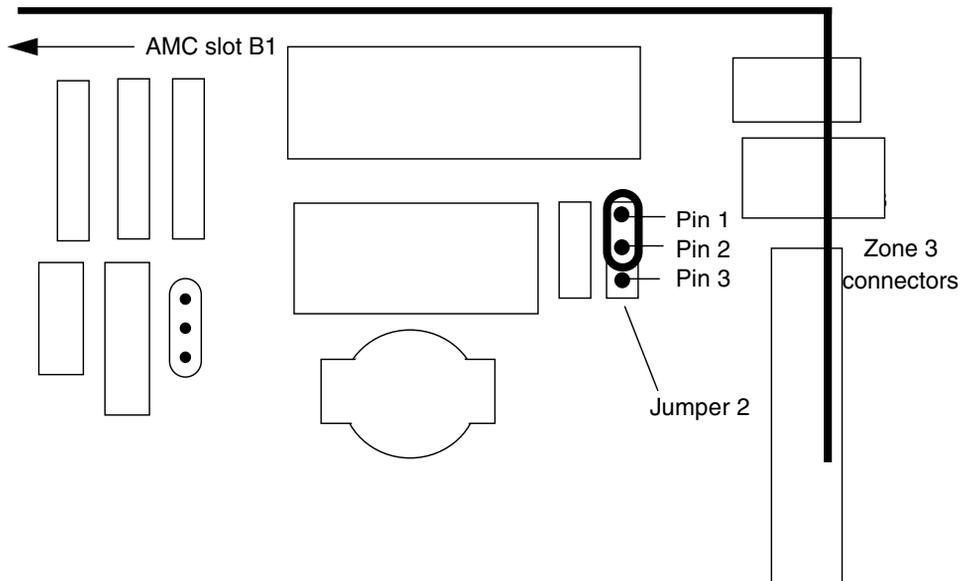
2. Reinstall the blade server.

Use the procedure in Section 2.2.3.2, "Installing the Blade Server Into the Shelf" on page 2-12.

2.3.11 Changing OOS LED Behavior

When blade servers are shipped from manufacturing, they are set to the default LED behavior. The default OOS LED behavior is as follows:

- IPMC lights up OOS LED if it detects POST failure.
- IPMC lights up OOS LED if it fails to power up the blade server.
- Most of the time, OOS LED remains OFF.

Users can change the default behavior of the out-of-service (OOS) LED through the IPMC by using an LED1 control bit. This bit is available only on the Sun Netra CP3220 blade server.

You can use the set and get IPMC control byte IPMI commands, which are the same commands used to control the Green OK LED, to change the default OOS LED behavior to the following:

- IPMC will not light up OOS LED on POST or any other failure.
- Upon blade insertion, OOS LED will turn on promptly after the Blue LED turns off, then remain on.
- The IPMC will only change the state of OOS LED when commanded via ATCA/IPMI commands to change LED state.

The alternate behavior remains enabled after firmware upgrades and IPMC cold, warm, and hard resets. Also, it remains enabled after firmware downgrades, as long as the version being downgraded to supports this feature.

▼ Viewing OOS LED Settings

● **At the** clia **CLI, enter the** Get IPMI Control Bits **command.**

Command	NetFn	Opcode
Get IPMI Control Bits	0x2E	0xE9

Data Bytes

Type	Byte	Data Field
Request Data	1	00
	2	00
	3	2A
Response Data	1	Completion Code: • [00] OK • [C1] Command not supported • [CC] Invalid data in request (Refer to IPMI specification for more completion codes)
	2	00
	3	00
	4	2A
	5	IPMC control bit: • Bit 0 = Green LED control bit • Bit 1 = LED1 (OOS) control bit • Bits 2 to 7 reserved for future use

▼ Setting OOS LED Behavior

Note – You must always perform a read, modify, and write to change any of the bits in the control byte.

- **At the** `clia` **CLI, enter the** `Set IPMI Control Bits` **command.**

Command	NetFn	Opcode
Set IPMI Control Bits	0x2E	0xE9

Data Bytes

Type	Byte	Data Field
Request Data	1	00
	2	00
	3	2A
	4	Control byte: Bit 0 = LED 2 (Green LED) control bit. • 1 = IPMC controls green LED. • 0 = IPMC does not control green LED. Bit 1 = OOS LED1 (Amber/Red LED) control bit. • 1 = IPMC controls LED1 for default behavior. • 0 = IPMC does not control LED1. Bits 2 to 7= reserved for future use
Response Data	1	Completion Code: • [00] OK • [C1] Command not supported • [CC] Invalid data in request (Refer to IPMI specification for more completion codes)
	2	00
	3	00
	4	2A

2.3.12   Resetting the Sun Netra CP3220 Blade Server

⚠ **Caution –** Do not operate the ATCA shelf without all fans, component heatsinks, air baffles, and covers installed. Severe damage to components can occur if the ATCA shelf is operated without adequate cooling mechanisms.

1. **Use a spudger tool or other stylus to press and release the recessed Reset button on the front of the Sun Netra CP3220 blade server (**FIGURE 2-13**).**

2. **Confirm the progress of the reset by monitoring the BIOS POST messages.**

FIGURE 2-13 Sun Netra CP3220 Blade Server Front Panel
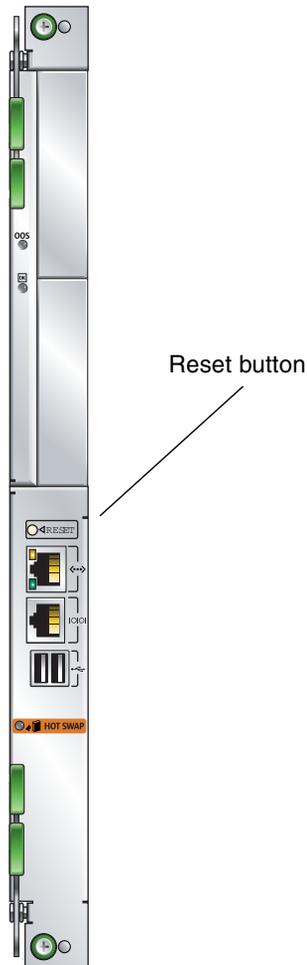
Software Configuration

This chapter provides procedures and information about configuring the software.

This chapter contains the following topics:

3.1 Operating Systems

The Sun Netra CP3220 blade server has been tested for compatibility with the following operating systems:

- WindRiver Linux version 3.1
- Solaris 10 OS, Release S10U4 and subsequent versions that may be tested for compatibility with the Sun Netra CP3220 blade server. See the *Sun Netra CP3220 Blade Server Product Notes* (820-1980) for information on Sun Netra patches.

For information on the WindRiver Linux operating system, see the documentation that came with the WindRiver operating system.

For information on versions of the Solaris OS, including installation, see the appropriate Solaris Documentation Collection at the Sun Documentation web site at:

http://docs.sun.com

3.2 Software Updates

Software updates and support information for the Sun Netra CP3220 blade server, Sun Netra CP32x0 ARTM, and the Sun Netra CT 900 system can be found at the Sun Download Center:

http://www.sun.com/download

For information on your specific configuration, contact your local Sun Services representative.

http://www.sun.com/service/contacting/solution.html

3.3 SunVTS Software

Note – The Sun Validation Test Suite (SunVTS software) runs on the Solaris OS only. There are similar test suites available for the Linux operating systems.

The SunVTS software is a comprehensive software suite that tests and validates the Sun Netra CP3220 blade server by verifying the configuration and function of most hardware controllers and devices on the blade server.

SunVTS software is used to validate a system during development, production, inspection, troubleshooting, periodic maintenance, and system or subsystem stressing. SunVTS software can be tailored to run on various types of machines, ranging from desktops to servers with modifiable test instances and processor affinity features.

You can perform high-level system testing by using the appropriate version of SunVTS software. For detailed information on SunVTS software support and downloads, refer to the following web site:

http://www.sun.com/oem/products/vts/

You will be prompted for your Sun Online Account name and password.

Ensure that the SunVTS software version is compatible with the Solaris OS being used. You can find information about the SunVTS software version installed on your system by viewing the content of the .version file:

```
# cat /opt/SUNWvts/bin/.version
```

To obtain SunVTS documentation, contact your local Customer Service representative, field applications engineer, or system support engineer.

Note – For security reasons, only a superuser is permitted to run SunVTS software. Installation and starting instructions are included with the software when it is downloaded.

3.4 Configuring Sun Netra CP3220 For 1GbE or 10GbE Switches

The extended fabric on the Sun Netra CP3220 blade server is capable of operating at either 1 Gbps or 10 Gbps. The Sun Netra CP3220 can be used in the Sun Netra CT 900 server with either the Sun Netra CP3240 10-GbE switch or the Sun Netra CP3140 1-GbE switch. Therefore it is important that the driver configuration file be modified accordingly.

The network interface driver configuration file, nxge.conf, for the extended fabric ports of the Sun 10GbE ASIC might need to be modified to employ the proper switch and ARTM configurations. The nxge.conf file is located in the /platform/i86pc/kernel/drv directory. The following examples show the proper entries for each switch configuration.

Example 1: If both network interface ports are routed to Sun Netra CP3240 switches in Slot 7 and Slot 8, the nxge.conf file should have the following entries:

```
name = "pciex108e,abcd" parent = "/pci@0,0/pci10de,377@f" unit-address ="0" phy-type = "xgsd";
name = "pciex108e,abcd" parent = "/pci@0,0/pci10de,377@f" unit-address ="0,1" phy-type = "xgsd";
```

Example 2: If both network interface ports are routed to Sun Netra CP3140 switches in Slot 7 and Slot 8, the nxge.conf file should have the following entries:

```
name = "pciex108e,abcd" parent = "/pci@0,0/pci10de,377@f" unit-address ="0" phy-type = "gsd";
name = "pciex108e,abcd" parent = "/pci@0,0/pci10de,377@f" unit-address ="0,1" phy-type = "gsd";
```

3.5 Configuring Alternate OOS LED Behavior

Administrators and service technicians can change the default behavior of the out-of-service (OOS) LED through the IPMC by using an LED1 control bit. This bit is available only on the Sun Netra CP3220 blade server.

Use the set and get IPMC control byte IPMI commands, which are the same commands used to control the Green OK LED, to change the default OOS LED behavior to the following:

■ IPMC will not light up OOS LED on POST or any other failure.

■ Upon blade insertion, OOS LED will turn on promptly after the Blue LED turns off, then remain on.

■ The IPMC will only change the state of OOS LED when commanded via ATCA/IPMI commands to change LED state.

The alternate behavior remains enabled after firmware upgrades and IPMC cold, warm, and hard resets. Also, it remains enabled after firmware downgrades, as long as the version being downgraded to supports this feature.

When blade servers are shipped from manufacturing, they are set to the default LED behavior. The default OOS LED behavior is as follows:

■ IPMC lights up OOS LED if it detects POST failure.

■ IPMC lights up OOS LED if it fails to power up the blade server.

■ Most of the time, OOS LED remains OFF.

▼ Displaying Configuration of OOS LED Behavior

Use the following command to display the current configuration of OOS LED behavior.

Command	NetFn	Opcode
Get IPMC Control Bits	0x2E	0xE8

Data Bytes

Type	Byte	Data Field
Request Data	1	00
	2	00
	3	2A

Response Data	1	Completion Code:
		  [00] OK
		  [C1] Command not supported
		  [CC] Invalid data in request
		(Refer to IPMI specification for more completion codes)

	2	00
	3	00
	4	2A
	5	IPMC control bit: • Bit 0 : Green LED control bit. • Bit 1 : LED1 control bit. • Bits 2 to 7: Reserved for future use.

▼ Setting Configuration of OOS LED Behavior

Use the following command to set the configuration of OOS LED behavior.

Command	NetFn	Opcode
Set IPMI Control Bits	0xE9	0xE9

Data Bytes

Type	Byte	Data Field
Request Data	1	00
	2	00
	3	2A
	4	Control byte.
		Bit 0 = LED 2 (Green LED) control bit:
		• 1 = IPMC controls green LED.
		• 0 = IPMC does not control green LED.
		Bit 1 = LED1 (Amber/Red LED) control bit.
		• 1 = IPMC controls LED1 for default behavior.
		• 0 = IPMC does not control LED1.
		Bits 2 to 7 = Reserved for future use. Write as 1s. (See Note.)
Response Data	1	Completion Code:
		[00] OK
		[C1] Command not supported
		[CC] Invalid data in request
		(Refer to IPMI specification for more completion codes)
	2	00
	3	00
	4	2A

Note – If an attempt is made to write 0 to any reserved bit (2 to 7), IPMC will reject the command with completion code 0xCC.

Configuring and Using BIOS Firmware

This chapter describes how to use the BIOS (Basic Input Output System) to configure the blade server.

This chapter contains the following topics:

4.1 About BIOS Settings

This section describes how to view and modify the BIOS settings.

The BIOS has a Setup utility stored in the BIOS flash memory. The Setup utility reports system information and can be used to configure the BIOS settings. The configured data is provided with context-sensitive help and is stored in the system's battery-backed CMOS RAM. If the configuration stored in the CMOS RAM is invalid, the *BIOS settings will default to the original state specified at the factory.*

4.1.1 Navigating BIOS Screens

The BIOS Setup utility contains seven menu screens, which are displayed in this order: Main, Advanced, PCI/PnP, Boot, Security, Chipset, and Exit. See Appendix B for a BIOS menu tree and illustrations of the screens.

Use the left and right arrow keys to move sequentially through the seven BIOS screens. Fields that can be reconfigured are displayed in color. All other fields are non-configurable. Use the up and down arrow keys to scroll through a screen's menu. Use the Tab key to move across columns.

4.1.2 BIOS Considerations

This section contains special considerations regarding the system BIOS.

4.1.2.1 BIOS Option ROMs on the Sun Netra CP3220 Blade Server

The Sun Netra CP3220 blade server has an option ROM for each of the following components:

- Broadcom BCM 5715C base interfaces
- MPC55 Ethernet administration interfaces
- Sun 10 GbE Multithreaded Networking ASIC Extended fabric interfaces

4.1.2.2 AMD PowerNow! Feature Enabled by Default

The AMD PowerNow! feature, which is accessed from the BIOS Setup utility Advanced menu, is enabled by default on the Sun Netra CP3220 blade server. Some problems have been observed when using this feature on certain operating systems. If you want to disable this feature, first refer to the *Sun Netra CP3220 Blade Server Product Notes* (820-1980) for any outstanding known issues for your operating system.

4.1.3 Description of the BIOS Screens

TABLE 4-1 contains summary descriptions of the first-level BIOS Setup screens. For more information about the BIOS screens and screen illustrations, see Appendix B.

TABLE 4-1 BIOS Setup Screens Summary

Screen	Description
Main	General system information.
Advanced	Configuration information for the CPUs, IDE, Super I/O, ACPI, Event Log, PCI Express, Smbios, MPS, Remote Access, and USB.
PCI/PnP	Configure Plug-and-Play (PnP) devices. Note: For some operating systems you can also configure PnP devices using the operating system.
Boot	Configure the boot device priority (hard disk drives and the ATAPI DVD-ROM drive).
Security	Install or change the user and supervisor passwords.
Chipset	Configuration options for the NorthBridge, SouthBridge, and HyperTransport devices. Note that the Memory Chipkill option is enabled by default. Enabling Chipkill improves system reliability but degrades system performance under specific applications.
Exit	Save or discard changes, or load optimal default BIOS settings.

4.2　Changing the Configuration of a BIOS Menu Item

You can change the BIOS configuration by using a terminal (or terminal emulator connected to a computer) through the serial console port on the front of the Sun Netra CP3220 blade server.

Note – Using the ANSI terminal emulation mode provides the best viewing of the BIOS screens.

---

1. **To change the system's parameters, enter the BIOS Setup utility by pressing the F2 key while the system is performing the power-on self-test (POST).**

   Refer to TABLE 4-1 for summary descriptions of the BIOS screens.

   The first BIOS Setup menu screen is displayed.

2. **Highlight the field to be modified using the arrow and Tab keys.**

3. **Press Enter to select the field.**

   A dialog box is displayed. The box displays the options that are available for the setup field that you have chosen.

4. **Modify the setup field and close the screen.**

5. **To modify other setup parameters, use the arrow and Tab keys to navigate to the appropriate screen and menu item, and repeat Step 2 through Step 4.**

   Otherwise, go to Step 6.

6. **Press and release the right arrow key until the Exit menu screen is displayed.**

7. **Follow the instructions on the Exit menu screen to save your changes and exit the Setup utility.**

4.3 Setting the Boot Device Using BIOS Setup Screens

Before beginning this procedure, ensure that you have installed the serial cable as described in Section 2.2.4, "Connecting External I/O Cables" on page 2-13.

Note – See Section 4.1.3, "Description of the BIOS Screens" on page 4-3 for descriptions of the first-level BIOS menu screens. See Appendix B for a BIOS menu tree and illustrations of the first-level and second-level BIOS screens.

---

1. **Use terminal emulation software to configure the serial COM1 settings.**

   Use the ANSI terminal type setting.

2. **Set the serial communication settings to 9600 baud, 8 bit, 1 stop bit, no parity, and no handshake.**

3. **Power on or reset the ATCA shelf.**

   The BIOS starts running POST.

4. **Press the F2 key to interrupt the boot and access the BIOS Main menu (FIGURE 4-1).**

FIGURE 4-1 BIOS Main Menu

```
_ Main    Advanced   PCIPnP    Boot    Security   Chipset    Exit
*******************************************************************************
* System Overview                                  * Use [ENTER], [TAB]      *
* ************************************************* * or [SHIFT-TAB] to       *
* AMIBIOS                                           * select a field.         *
* Version    :08.00.14                              *                         *
* Build Date:07/20/07                               * Use [+] or [-] to       *
* ID         :0ABMWD03                              * configure system Time.  *
*                                                   *                         *
* Processor                                         *                         *
* Dual-Core AMD Opteron(tm) Processor 1214 HE       *                         *
* Speed      :2200MHz                               *                         *
* Count      :2                                     *                         *
*                                                   *                         *
* System Memory                                     * *     Select Screen     *
* Size       :2048MB                                * **    Select Item       *
*                                                   * +-    Change Field      *
* System Time             [08:33:45]                * Tab   Select Field      *
* System Date             [Thu 08/23/2007]          * F1    General Help      *
*                                                   * F10   Save and Exit     *
*                                                   * ESC   Exit              *
*                                                   *                         *
*******************************************************************************
        v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

   5. Using the arrow keys, move across the top of the screen to the Boot menu and press the Enter key.

   The Boot Settings menu is displayed (FIGURE 4-2).

FIGURE 4-2 Boot Settings Menu


```
_ Main     Advanced    PCIPnP     Boot     Security     Chipset     Exit
****************************************************************************
* Boot Settings                                      * Configure Settings     *
* ***********************************************     * during System Boot.    *
* * Boot Settings Configuration                      *                         *
*                                                    *                         *
* * Boot Device Priority                             *                         *
*                                                    *                         *
* Initiate Pre-boot Services     [Hot Key]           *                         *
*                                                    *                         *
*                                                    *                         *
*                                                    *                         *
*                                                    *                         *
*                                                    * *     Select Screen      *
*                                                    * **    Select Item        *
*                                                    * Enter Go to Sub Screen  *
*                                                    * F1    General Help      *
*                                                    * F10   Save and Exit     *
*                                                    * ESC   Exit              *
*                                                    *                         *
*                                                    *                         *
****************************************************************************
          v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

6. Move down the list, select the Boot Device Priority option, and press Enter.

The Boot Device Priority menu is displayed (FIGURE 4-3).

FIGURE 4-3   Boot Device Priority Menu

```
                        Boot
_
*******************************************************************************
* Boot Device Priority                         * Specifies the boot        *
* *******************************************   * sequence from the         *
* 1st Boot Device          [NVIDIA Boot Agent ] * available devices.        *
* 2nd Boot Device          [Disabled]          *                           *
*                                               * A device enclosed in      *
*                                               * parenthesis has been      *
*                                               * disabled in the           *
*                                               * corresponding type        *
*                                               * menu.                     *
*                                               *                           *
*                                               *                           *
*                                               *                           *
*                                               * *    Select Screen        *
*                                               * **   Select Item          *
*                                               * +-   Change Option        *
*                                               * F1   General Help         *
*                                               * F10  Save and Exit        *
*                                               * ESC  Exit                 *
*                                               *                           *
*                                               *                           *
*******************************************************************************
          v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

7. **Select the** `NVIDIA Boot Agent` **device as the 1st Boot Device.**

8. **Disable all unneeded boot devices in the menu.**

9. **Use the arrow keys to move to the Exit menu, and press Enter.**

   The confirmation dialog box is displayed.

10. **Press Enter to select Ok.**

    The BIOS boots the selected device. The operating system on the selected boot device loads.

11. **Configure the operating system by providing a locale, system name, IP address, and other information.**

    Refer to the documentation for your operating system for information on configuring the operating system.

4.4 Changing the BIOS Continuous Boot Setting

Traditionally, the BIOS of a PC would go through the list of bootable devices and try to boot up the OS. If all devices failed to boot, BIOS would print a message to inform the user and wait for user intervention. In the ATCA environment, there is typically no one watching the console screen when a blade is booting. Therefore. it is preferred for the BIOS to retry and walk through the boot list continuously. The continuous boot feature is implemented in the AMI BIOS for ATCA blades.

The Continuous Boot feature is activated by default. At the end of the boot list, if all devices fail to boot, BIOS will pause for a few seconds to make sure the user has a chance to see the message, and continue the boot process by going through the boot list again.

Users can specify how long the pause is in seconds by changing the `Continuous Boot` CMOS setting in the Advanced Setup or the Boot menu.

If the value is set to disabled, the feature is disabled and the BIOS will not retry the boot list automatically.

● **To change the setting, press F2 when prompted at the beginning of the boot process, move the cursor to highlight** `Continuous Boot`**, then press Enter to select a new value.**

4.5 Setting Supervisor and User Passwords

You must set the Supervisor password before you can set the User password. The Supervisor password sets the desired access level for the User password.

To reset any BIOS passwords, clear the CMOS settings by resetting Jumper 1. See Section 2.3.10.1, "Clearing the CMOS Setting Using Jumper 1" on page 2-29 for further details.

1. **Enter the BIOS Setup utility by pressing the F2 key on the keyboard while the system is performing the power-on self-test (POST).**

2. **Using the arrow keys, move across the top of the screen to the Security menu and press the Enter key.**

   The Security Settings Menu is displayed (FIGURE 4-4).

FIGURE 4-4   Security Settings Menu

```
_ Main    Advanced   PCIPnP   Boot    Security   Chipset   Exit
****************************************************************************
* Security Settings                                 * Install or Change the  *
* ************************************************** * password.              *
* Supervisor Password :Not Installed                *                        *
* User Password        :Not Installed               *                        *
*                                                   *                        *
* Change Supervisor Password                        *                        *
* Change User Password                              *                        *
*                        ********************************                    *
* Boot Sector Virus Prote*                           *                        *
*                        * Enter New Password        *                        *
*                        *                           *                        *
*                        ********************************                    *
*                                                   * *     Select Screen    *
*                                                   * **    Select Item      *
*                                                   * Enter  Change          *
*                                                   * F1     General Help    *
*                                                   * F10    Save and Exit   *
*                                                   * ESC    Exit            *
*                                                   *                        *
*                                                   *                        *
****************************************************************************
          v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

FIGURE 4-5   Change Password Menu

```
_ Main    Advanced   PCIPnP   Boot    Security   Chipset   Exit
****************************************************************************
* Security Settings                                 * Install or Change the  *
* ************************************************** * password.              *
* Supervisor Password :Not Installed                *                        *
* User Password        :Not Installed               *                        *
*                                                   *                        *
* Change Supervisor Password                        *                        *
* Change User Password                              *                        *
*                                                   *                        *
* Boot Sector Virus Protection    [Disabled]        *                        *
*                                                   *                        *
*                                                   *                        *
*                                                   *                        *
*                                                   * *     Select Screen    *
*                                                   * **    Select Item      *
*                                                   * Enter  Change          *
*                                                   * F1     General Help    *
*                                                   * F10    Save and Exit   *
*                                                   * ESC    Exit            *
*                                                   *                        *
*                                                   *                        *
****************************************************************************
          v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

3. **Move down the list, select the Change Supervisor Password or Change User Password option, and press Enter.**

   The Change Password menu is displayed (FIGURE 4-5).

4. **Type a password, then press Enter.**

5. **Use the arrow keys to move to the Exit Menu.**

6. **Select OK to confirm the changes you made.**

4.6   Resetting the System Time and System Date

1. **Enter the BIOS Setup utility by pressing the F2 key while the system is performing the power-on self-test (POST).**

2. **Press and release the right arrow key until the Exit menu is selected. Press the Enter key.**

3. **Select the Load Optimal Defaults option and press the Enter key.**

4. **Use the arrow keys to return to the BIOS Main Menu.**

5. **Use the arrow keys to move down the main menu and reset the System Time and System Date fields.**

6. **Use the arrow keys to move to the Exit Menu.**

7. **Choose Save Changes and Exit.**

8. **Select OK to confirm the changes you made.**

4.7 Updating the BIOS

When they become necessary, updated BIOS images will be available as patches on the following web site:

http://sunsolve.sun.com/

Use the Solaris BIOS Update Utility or the Linux BIOS Update Utility to implement the updates. For more information, see the *Sun Netra CT 900 Server Product Notes (819-1180).*

4.8 Secondary BIOS Image

The Sun Netra CP3220 blade server provides dual 1-Mbyte BIOS chips that support redundant BIOS images for increased reliability. The default chip (page 0) acts as the primary BIOS chip and is automatically selected for update during a firmware upgrade. The secondary BIOS chip (page 1) retains the original BIOS image, and can be used through manual configuration in the unlikely case where the primary BIOS becomes corrupt.

4.9 Use the Secondary BIOS Image

If the primary BIOS becomes unbootable, use the secondary BIOS to boot the blade server:

1. **Log into the Shelf Manager.**

2. **To select the secondary BIOS image, type:**

```
# clia sendcmd 96 2e 81 00 00 2a 01
```

For example:

```
# clia sendcmd 96 2e 81 00 00 2a 01 <----- Setting the boot page to 1

 Pigeon Point Shelf Manager Command Line Interpreter

Completion code: 0x0 (0)    <----- successful completion code
Response data: 00 00 2A     <----- no data returned
```

3. **To boot the blade server from the Shelf Manager, type:**

```
# clia activate board n
```

Note – Once the blade server is booted, reset the blade server to use the primary BIOS image (page 0).

4.10 Perform a Live Firmware Upgrade

To upgrade the BIOS firmware while retaining the current BIOS image, follow these steps:

1. **Switch the BIOS image from page 0 to page 1.**

   See Section 4.9, "Use the Secondary BIOS Image" on page 4-12.

2. **Use the Solaris BIOS Update Utility to upgrade the page 1 BIOS image.**

   See Section 4.7, "Updating the BIOS" on page 4-12.

3. **Reboot the system into the updated page 1 BIOS.**

   See Section 2.3.12, "Resetting the Sun Netra CP3220 Blade Server" on page 2-36.

4.11 Power-On Self-Test

The system provides a rudimentary power-on self-test (POST) that runs each time the blade server boots to check the basic devices required for the system to operate.

The progress of the self-test is indicated by a series of POST codes. These codes appear at the bottom right corner of the system's VGA screen (once the self-test has progressed far enough to initialize the video monitor).

You can configure the level of POST testing and some POST display features through the BIOS menus. For more information, see Section 4.12, "Changing POST Options" on page 4-14.

4.12 Changing POST Options

These instructions are optional, but you can use them to change the operations that the server performs during POST testing.

1. **Initialize the BIOS Setup utility by pressing the F2 key while the system is performing the power-on self-test (POST).**

   The BIOS Main Menu screen is displayed.

2. **From the BIOS Main Menu screen, select the Boot menu.**

3. **From the Boot Settings screen, select Boot Settings Configuration.**

4. On the Boot Settings Configuration screen (FIGURE B-17**), you can enable or disable the options shown in** TABLE 4-2

TABLE 4-2 POST Options

Option	Description
Quick Boot	This option is disabled by default. If you enable Quick Boot, the BIOS skips certain tests while booting, such as the extensive memory test. This decreases the time it takes for the system to boot.
Quiet Boot	This option is disabled by default. If you enable this, the Sun Microsystems logo is displayed instead of POST codes.
AddOn ROM Display Mode	This option is set to Force BIOS by default. This option has effect only if you have also enabled the Quiet Boot option, but it controls whether output from the Option ROM is displayed. The two settings for this option are as follows: • Force BIOS – Remove the Sun logo and display Option ROM output. • Keep Current – Do not remove the Sun logo. The Option ROM output is not displayed.
Bootup Num-Lock	This option is On by default (keyboard Num-Lock is turned on during boot). If you set this to Off, the keyboard Num-Lock is not turned on during boot.
PS2 Mouse Support	This option is set to On by default. Select this option for PS/2 mouse support.
Wait for 'F1' If Error	This option is disabled by default. If you enable this option, the system will pause if an error is found during POST and will resume only when you press the F1 key.
Hit 'F2" Message	This option is enabled by default. If you disable this option, the system will not display the "Press DEL to run Setup" messages in POST.
Interrupt 19 Capture	This option is reserved for future use. Do not change.
Show Extended System Information	This option is disabled by default. If you enable this option, the systems shows the extended system information at the end of POST and before the operating system takes control.

Hardware Architecture

This chapter provides information about the hardware architecture.

This chapter contains the following topics:

5.1 Block Diagram

FIGURE 5-1 Block Diagram
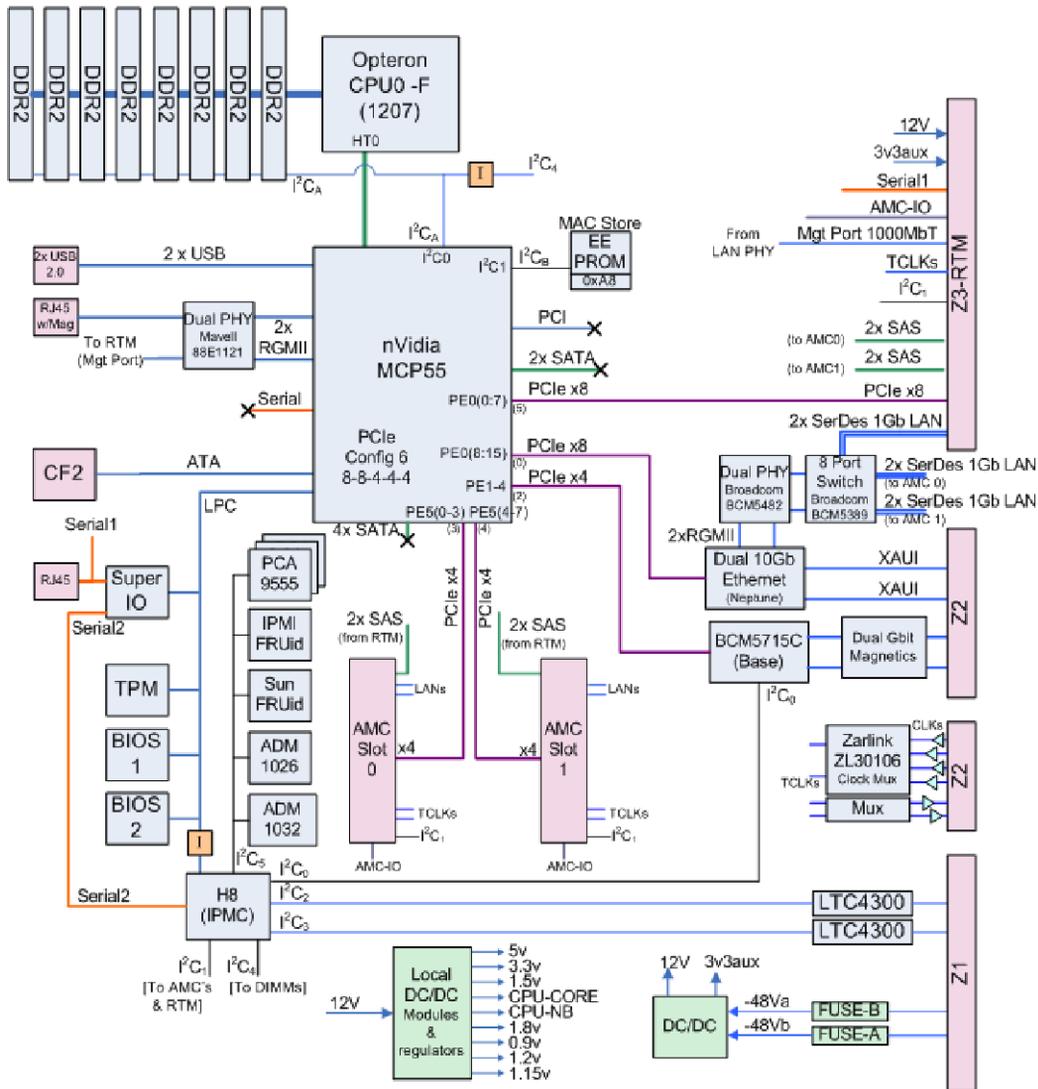
5.2 The AMD Opteron Processor

AMD Opteron processors with Direct Connect Architecture include several new features, including seamless quad-core upgradability and DDR2 memory. AMD Opteron processors with DDR2 memory feature a common core architecture that is consistent across 1-way, 2-way, and 8-way systems. Features of the second generation 2.2-GHz AMD Opteron include:

- x64 Architecture (64-bit extensions) with AMD Direct Connect Architecture using HyperTransport technology supports simultaneous 32-bit and 64-bit computing
- Three HyperTransport links supporting up to 24 Gbyte/sec peak bandwidth per processor
- Integrated 128-bit wide DDR memory controller that reduces latency and increases performance
- Individual 1-MB L2 cache per core
- Low power usage and cooling requirements - AMD Opteron processors running at 68W offer efficient heat dissipation without reducing performance
- AMD PowerNow! technology can deliver performance on demand while minimizing power consumption
- DDR2-based systems can upgrade to Quad-Core AMD Opteron processors when they are available, within existing power and thermal envelopes
- NEBS certified
- Socket F 1207-pin

The following processors are supported on the Sun Netra CP3220 blade server:

- CPU, Opteron, Dual-Core, 2.2GH 68 W, NFP
- CPU, Opteron, Quad-Core, 1.8 GHZ 79W, NFP

FIGURE 5-2   AMD Opteron Processors Block Diagram
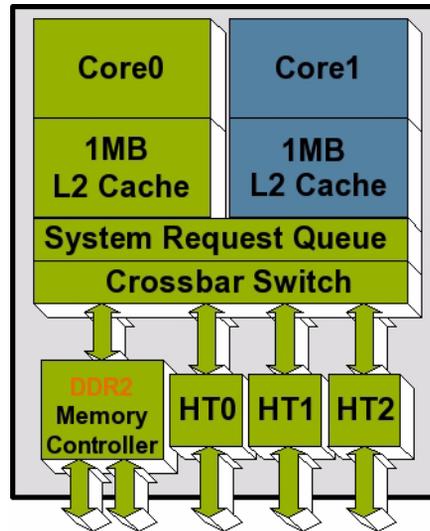
5.3   Memory

The Sun Netra CP3220 blade server supports 1-Gbyte, 2-Gbyte, and 4-Gbyte registered DDR2-667 memory, for up to 32 Gbytes memory total. When four DIMM slots or less are populated, the DIMM clock rate will be set to the max clock rate of up to 333 Mhz. When six or eight DIMMs slots are populated, the DIMM clock rate will be set to a max clock rate of up to 267 Mhz.

The AMD Opteron's processor's memory controller works in 144-bit mode ECC operation. For optimal performance, memory DIMMs must be installed in like pairs. The controller supports 1 bit per byte ECC and supports DDR2 667 registered DRR SDRAM modules. For more information on supported DIMM configurations, see Section 2.3.6.1, "DIMM Requirements" on page 2-19.

Additional features of the Sun Netra CP3220 blade server's memory architecture include:

- Dedicated onboard 128-bit wide DDR memory controller

- Very low profile (0.72 inch) DIMM support

- Memory bandwidth up to 5.3 Gbyte/sec

- DDR2 power requirements 4.4W to 7.0W (1.8V)

5.4 Networking and I/O

Networking and I/O are provided by the following chips and interconnects:

- nVidia MCP55 (southbridge)
- PCI Express Bus
- Dual BIOS
- Trusted Platform Module
- Broadcom 5715C Gbit Ethernet chip
- Sun Sun 10 GbE Multithreaded Networking ASIC Dual 10-Gbit + Dual 1-Gbit Ethernet chip

5.4.1 nVidia MCP55

The nVidia MCP55 media and communication processors (MCP) are based on a high-performance, scalable architecture with a low power design and low footprint optimized for power-constrained rack and blade servers. nVidia's HyperTransport design integrated tightly with the AMD Opteron Direct Connect architecture to deliver 32-bit and 64-bit performance.

The Sun Netra CP3220 blade server uses one nVidia MCP55 for:

- 8 lanes of PCIe to the Zone 3 Connectors
- 8 lanes of PCIe to Sun 10 GbE Multithreaded Networking ASIC
- 4 lanes of PCIe to the base fabric
- 4 lanes of PCIe to each AMC slot
- ATA controller to the compact flash slot
- 2 USB ports
- Low Pin Count (LPC) bus to the BIOS chips, H8 and TPM
- 2 RGMII ports to the front panel and RTM for serial management

5.4.2 PCI Express Bus

PCI Express 1.0 (PCIe) is a high-speed, point-to-point dual simplex chip interconnect. It is the latest extension of the PCI bus. PCI e operates at 2.5 GHz and supports land widths of x1, x2, x4, x8, x16, and x32. Additional features include:

- Serial point-to-point interconnect between two devices
- Each lane supports two differential signal pairs, one pair for each data direction
- 2.5-Gbyte/sec transfer rate
- Scalable performance based on the number of lanes implemented per interconnect

5.4.3 Dual BIOS

The Sun Netra CP3220 blade server provides dual 1-Mbyte BIOS chips that support redundant BIOS images for increased reliability. The default chip acts as the primary BIOS chip and automatically selected for update during a firmware upgrade. The secondary BIOS chip retains the original BIOS image, and can be used through manual configuration if the primary BIOS is corrupt.

5.4.4 Trusted Platform Module (TPM)

The Sun Netra CP3220 blade server provides a Trusted Platform Module (TPM) chip, which enables various security features, including hardware and software authentication. This chip is reserved for future use on the Sun Netra CP3220 blade server.

5.4.5 Broadcom 5715C Gigabit Ethernet

The Broadcom 5715C Gigabit Ethernet chip used on the Sun Netra CP3220 blade server provides two 10/100/1000 MBASE-T interfaces to the Zone 2 connectors. It incorporates the media access control (MAC) and physical (PHY) layer functions for the two LANs used as the ATCA base fabric.

5.4.6 Sun Dual 10-Gbit Ethernet/Quad 1-Gbit RGMII Network Interface Chip (Sun 10 GbE Multithreaded Networking ASIC)

The Sun Netra CP3220 blade server is equipped with one Sun Dual 10-Gbit Ethernet/Quad 1-Gbit RGMII Network Interface chip that is specifically designed to support multicore and multithreaded processor with minimum CPU load while maximizing network I/O thoughput.

Sun 10 GbE Multithreaded Networking ASIC provides two 10-Gbit XAUI Ethernet connections to the ATCA back plane extended fabric, where four lanes are driven at 3.125 Gbyte/sec (if the ATCA switch supports 10-Gbit Ethernet) or a single lane at 1.25 Gbyte/sec if the switch is a 1-Gbit Ethernet device.

Sun 10 GbE Multithreaded Networking ASIC also provides two 1 Gbit RGMII ethernet connections to the Broadcom BCM5482H chip, which converts to SERDES and routes the SERDES signals through and 8 port switch and providing two 1Gb LANS to Zone 3-RTM and to each AMC slot.

5.5 I/O Components

5.5.1 AMC Slots

The Sun Netra CP3220 blade server contains two AMC slots, B1 and B2, which are available from the front panel. Both slots are single-width, mid-height slots. If needed, AMC I/O connectivity can be accessed from the front panel (depending on the AMC card installed) and through the optional ARTM.

Each slot has one hot-plug connector for the AMC cards. The Sun Netra CP3220 blade server conforms to the *PICMG Advanced Mezzanine Card AMC.0 specification R1.0 ECR_002 D0.9, June 29, 2006*, and supports AMC.1 Type 4E2 cards, as defined by the same specification.

5.5.2 EIDE/ATA for Compact Flash

EIDE is an enhanced IDE controller, implemented through the nVidia MCP55 chip. The Sun Netra CP3220 blade server contains one on-board 50-pin Type II Compact Flash connector, for use with an optional compact flash card. The location of the compact flash connector allows access to this component only when the blade server is removed from the ATCA chassis.

5.5.3 SAS/SATA

The Sun Netra CP3220 blade server supports AMC cards with SAS/SATA drives under the following conditions:

- AMC cards with drives must use Port 2 or 3 SAS/SATA connections
- Sun Netra Dual SAS RTM is installed with the Sun Netra CP3220 blade server

There is no native support for SAS or SATA drives on the Sun Netra CP3220 blade server.

Physical Characteristics

Specifications for the Sun Netra CP3220 blade server are provided in the following sections:

- Section A.1, "Form Factor" on page A-2
- Section A.2, "Power and Thermal Metrics" on page A-2
- Section A.3, "Connectors and Pinouts" on page A-4

A.1 Form Factor

The Sun Netra CP3220 blade server is a standard 8-rack unit (8U) factor, single-slot wide. It complies with the board mechanical dimensions that are required by the PICMG 3.0 R1.0 specification:

- 322.25 mm x 280 mm (12.7 inches x 11.0 inches)
- 30.48 mm (1.2 inch) front panel

A.2 Power and Thermal Metrics

The heatsink was designed specifically for the Sun Netra CP3220 blade server and is mechanically mounted to the blade server. The heatsink and DIMMs are positioned on the blade server to provide adequate airflow (bottom to top).

A.2.1 Processor Metrics

Typical heat dissipation and power consumption metrics for a Sun Netra CP3220 blade server equipped with an AMD Opteron processor are as follows.

- Dual-Core CPU:
    - 115 W typical, 140 W maximum for CPU only
    - 205 W maximum power (includes 25 W to ARTM and 20 W per AMC slot)
    - -5C - 55C for NEBS compliance
    - Power input: -36 VDC to -72 VDC (-48 VDC nominal)
- Quad-Core CPU:
    - 125 W typical, 150 W maximum for CPU only
    - 215 W maximum power (includes 25 W to ARTM and 20 W per AMC slot)
    - -5C - 55C for NEBS compliance
    - Power input: -36 VDC to -72 VDC (-48 VDC nominal)

A.2.2 PICMG Board Cooling Requirements

TABLE A-1 provides the blade server board cooling requirements. No alarms are triggered at any of the listed temperatures for the given airflow.

TABLE A-1 Airflow Requirements

Watts	m³/min				CFM			
Power Level	25°C	28°C	40°C	55°C	25°C	28°C	40°C	55°C
140	0.045	0.045	0.91	0.91	16	16	32	32
205	0.045	0.045	0.91	0.91	16	16	32	32
210	0.045	0.045	0.91	0.91	16	16	32	32

A.2.3 PICMG ARTM Cooling Requirements

TABLE A-2 provides the Pressure Drop vs. Flow Rate for the ARTM.

TABLE A-2 ARTM Pressure Drop

Volumetric Flow Rate (CFM)	Volumetric Flow Rate (m³/min)	Pressure Drop 2 DIMMs (Pa)	Pressure Drop 2 DIMMs (inches of H_2O)	Pressure Drop 8 DIMMs (Pa)	Pressure Drop 8 DIMMs (inches of H_2O)
0	0	0	0	0	0
17	0.48	11.16	0.05	11.16	0.05
24	0.68	18.61	0.08	18.61	0.08
30	0.85	28.53	0.12	31.01	0.13
34	0.96	34.73	0.14	38.45	0.16
42	1.19	48.38	0.2	54.58	0.22
45	1.27	59.05	0.24	64.5	0.26
48	1.36	64.5	0.26	71.95	0.29
51	1.44	71.95	0.29	79.39	0.32
54	1.53	79.39	0.32	86.83	0.35

A.3 Connectors and Pinouts

A.3.1 Front Panel Connectors

The front panel has the following connectors, see FIGURE 1-1:

- One 10/100/1000BASE-T Ethernet port (RJ-45)
- One serial port (RJ-45)
- Two USB ports

A.3.1.1 Ethernet Port

The Ethernet connector is an RJ-45 connector. The controller autonegotiates to either 10 BASE-T, 100 BASE-T, or 1000 BASE-T.

FIGURE A-1 shows the Ethernet port connector.

FIGURE A-1 Ethernet RJ-45 Connector
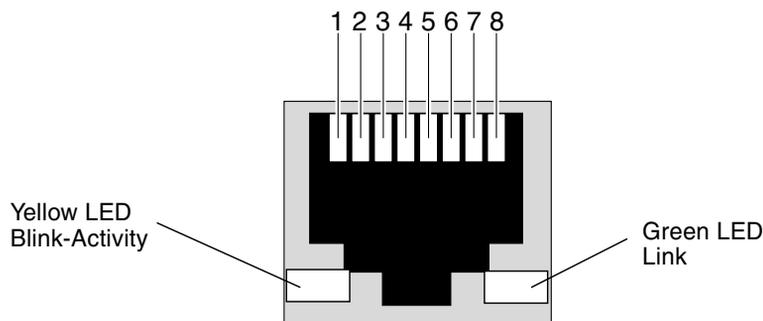
TABLE A-3 provides the eight pin assignments for the Ethernet port connector.

TABLE A-3 Ethernet Port Connector Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	DA+	5	DC-

Pin	Signal Name	Pin	Signal Name
2	DA-	6	DB-
3	DB+	7	DD+
4	DC+	8	DD-

A.3.1.2   USB Ports

FIGURE A-2 shows the connector pin assignments for both of the front panel USB ports.

FIGURE A-2   Front Panel USB Connector
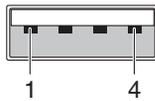
TABLE A-5 lists the USB port connector pin assignments.

TABLE A-4   USB Port Pin Assignments

Pin	Signal Name	Description
1	VCC	+5 VDA (500ma)
2	D-	Data-
3	D+	Data+
4	GND	Ground

A.3.1.3 Serial Port

FIGURE A-3 shows the connector pin assignments for the front panel serial port. TABLE A-5 lists the serial port connector pin assignments.

FIGURE A-3 Front Panel Serial RJ-45 Connector
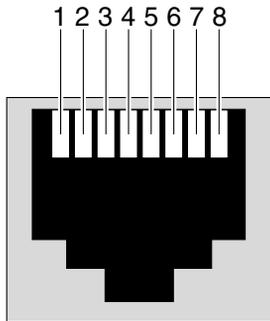
TABLE A-5 Serial Port Mini DIN 8-pin Connector Pinouts

Pin	Signal Name	Pin	Signal Name
1	RTS	5	GND
2	DTR	6	RXD
3	TXD	7	DSR
4	GND	8	CTS

A.3.2 AMC Connectors

Two 170-pin connectors make up the AMC card connections. These connectors and pinouts are defined by the following industry-standard specification: *PICMG Advanced Mezzanine Cards AMC.0 Specification R1.0 ECR-002 D0.9,* June 29, 2006

The AMC slots are available at the front panel. The AMC cards can be accessed from the front panel, depending on the features of the AMC card, or through an optional ARTM.

A.3.3 Power Connector (Zone 1)

The Sun Netra CP3220 blade server uses a 34-pin Positronic connector as the Zone 1 power distribution connector. It provides the support for the following signals:

- Two -48 VDC power feeds (four signals each; eight signals total)
- Two IPMB ports (two signals each; four signals total)
- Geographic address (eight signals)

The analog test and ring voltage pins are left unconnected. FIGURE A-4 shows the pin assignments.

FIGURE A-4   Power Distribution Connector (Zone 1) P10
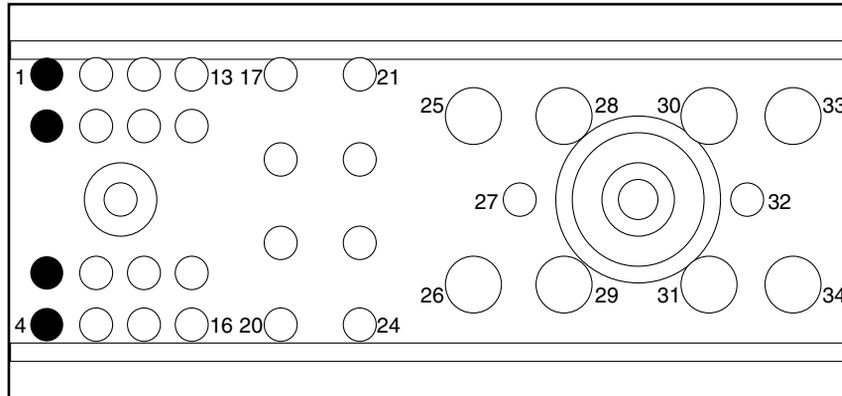
TABLE A-6 lists the power distribution connector pin assignments.

TABLE A-6   Power Distribution Connector Pin Assignments

Pin Number	Name	Description
1	Reserved	Reserved
2	Reserved	Reserved
3	Reserved	Reserved
4	Reserved	Reserved
5	HA0	HA0 Hardware Address Bit 0
6	HA1	HA1 Hardware Address Bit 1
7	HA2	HA2 Hardware Address Bit 2
8	HA3	HA3 Hardware Address Bit 3
9	HA4	HA4 Hardware Address Bit 4
10	HA5	HA5 Hardware Address Bit 5
11	HA6	HA6 Hardware Address Bit 6
12	HA7/P	HA7/P Hardware Address Bit 7 (Odd Parity Bit)

TABLE A-6   Power Distribution Connector Pin Assignments *(Continued)*

Pin Number	Name	Description
13	SCL_A	IPMB Clock, Port A
14	SDA_A	IPMB Data, Port A
15	SCL_B	IPMB Clock, Port B
16	SDA_B	IPMB Data, Port B
17	MT1_TIP	Metallic Test #1 Tip
18	MT1_TIP	Metallic Test #2 Tip
19	-RING_A	Ringing Generator A Negative Ringing
20	-RING_B	Ringing Generator B Negative Ringing
21	MT1_RING	Metallic Test #1 Ringing
22	MT2_RING	Metallic Test #2 Ringing
23	-RING_A	Ringing Generator AReturn
24	-RING_B	Ringing Generator B Return
25	SHELF_GND	Shelf Ground
26	LOGIC_GND	Logic Ground
27	ENABLE_B	Enable B
28	VRTN_A	Voltage Return A
29	VRTN_B	Voltage Return B
30	EARLY_A	-48V Early A
31	EARLY_B	-48V Early B
32	ENABLE_A	Enable A
33	-48V_A	-48V A
34	-48V_B	-48V B

A.3.4 Data Transport Connector (Zone 2)

The data transport connector consists of two 120-pin HM-Zd connectors, labeled P20 and P23, with 40 differential pairs each. These are called the Zone 2 connectors.

The Zone 2 connectors provides the following signals:

- Two 10/100/1000BASE-T/TX Ethernet base fabric channels (four differential signal pairs each; 16 signals total)
- Two 10-Gbit SERDES ports on the extended fabric (eight differential signal pairs each; 32 signals total)

The connector vendor part number is Tyco: 1469001-1.

FIGURE A-5   Zone 2 Connector
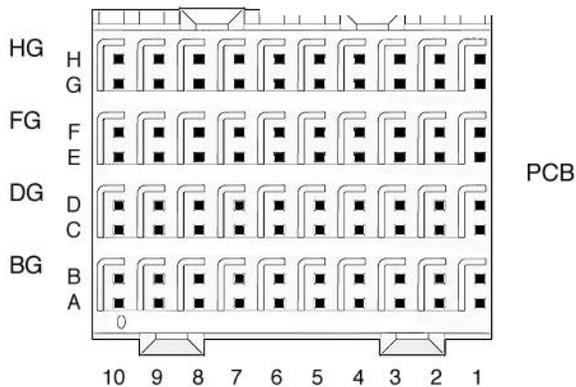
TABLE A-7 Zone 2 Connector Pin Assignments

Row No.	Interface Designation	J23/P23 Connector Pairs							
		ab		cd		ef		gh	
1	Fabric Channel 2	Tx2[2]+	Tx2[2]-	Rx2[2]+	Rx2[2]-	Tx3[2]+	Tx3[2]-	Rx3[2]+	Rx3[2]-
2		Tx0[2]+	Tx0[2]-	Rx0[2]+	Rx0[2]-	Tx1[2]+	Tx1[2]-	Rx1[2]+	Rx1[2]-
3	Fabric Channel 1	Tx2[1]+	Tx2[1]-	Rx2[1]+	Rx2[1]-	Tx3[1]+	Tx3[1]-	Rx3[1]+	Rx3[1]-
4		Tx0[1]+	Tx0[1]-	Rx0[1]+	Rx0[1]-	Tx1[1]+	Tx1[1]-	Rx1[1]+	Rx1[1]-
5	Base Channel 1	BI_DA1+ (Tx1+)	BI_DA1- (Tx1-)	BI_DB1+(Rx1+)	BI_DB1- (Rx1-)	BI_DC1+	BI_DC1-	BI_DD1+	BI_DD1-
6	Base Channel 2	BI_DA2+(Tx2+)	BI_DA2- (Tx2-)	BI_DB2+(Rx2+)	BI_DB2- (Rx2-)	BI_DC2+	BI_DC2-	BI_DD2+	BI_DD2-
7	n/a	unused	unused	unused	unused	unused	unused	unused	unused
8	n/a	unused	unused	unused	unused	unused	unused	unused	unused
9	n/a	unused	unused	unused	unused	unused	unused	unused	unused
10	n/a	unused	unused	unused	unused	unused	unused	unused	unused

A.3.5 Advanced Rear Transition Module Connector (Zone 3)

The Sun Netra CP3220 blade server provides all the I/O connections for rear access through the Zone 3 ARTM connector. The connector view and the pinout for the Zone 3 connector are shown in FIGURE A-6.

FIGURE A-6 Zone 3 Connector
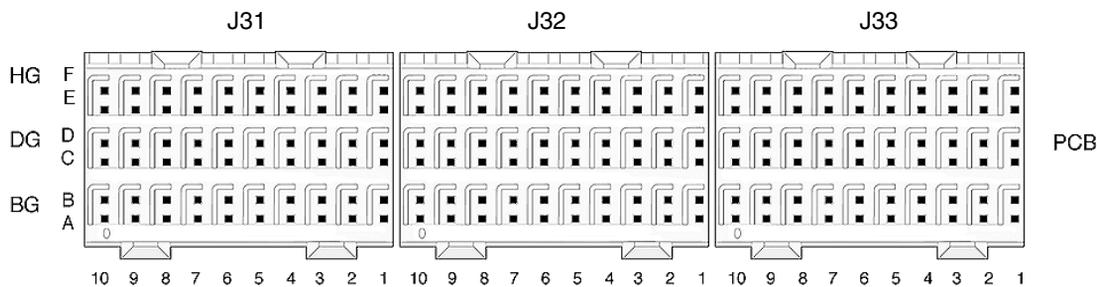
TABLE A-8 shows the J31 connector pin assignments, used for AMC I/O signals.

TABLE A-8   J31 Connector Pin Assignments

Row	Interface	A	B	C	D	E	F
1	AMC1 EO Ports	TX1_13+	TX1_13-	RX1_12+	RX1_12-	TX1_12+	TX1_12-
2		RX1_14+	RX1_14-	TX1_14+	TX1_14-	RX1_13+	RX1_13-
3		TX1_17+	TX1_17-	RX1_15+	RX1_15-	TX1_15+	TX1_15-
4		RX1_18+	RX1_18-	TX1_18+	TX1_18-	RX1_17+	RX1_17-
5		TX1_20+	TX1_20-	RX1_19+	RX1_19-	TX1_19+	TX1_19-
6		RX2_12+	RX2_12-	TX2_12+	TX2_12-	RX1_20+	RX1_20-
7	AMC2 EO Ports	TX2_14+	TX2_14-	RX2_13+	RX2_13-	TX2_13+	TX2_13-
8		RX2_15+	RX2_15-	TX2_15+	TX2_15-	RX2_14+	RX2_14-
9		TX2_18+	TX2_18-	RX2_17+	RX2_17-	TX2_17+	TX2_17-
10		RX2_19+	RX2_19-	TX2_19+	TX2_19-	RX2_18+	RX2_18-

TABLE A-9 shows the J32 connector pin assignments, which are used for infrastructure signals.

TABLE A-9 J32 Connector Pin Assignments

Row	Interface	A	B	C	D	E	F
1	AMC2 EO Ports	NC	NC	RX2_20+	RX2_20-	TX2_20+	TX2_20+
2	SAS/SATA0 - SER0	SA_TX0+	SA_TX0-	SA_RX0+	SA_RX0-	SR0_RTS	SR0_DTR
3	SAS/SATA1 - SER0	SA_TX1+	SA_TX1-	SA_RX1+	SA_RX1-	SR0_TXD	SR0_RXD
4	SAS/SATA2 - SER0	SA_TX2+	SA_TX2-	SA_RX2+	SA_RX2-	SR0_DSR	SR0_CTS
5	SAS/SATA3 - SER0	SA_TX3+	SA_TX3-	SA_RX3+	SA_RX3-	NC	NC
6	LAN0 (MNGT)	LAN0_A+	LAN0_A-	LAN0_CTV	LAN0_CTV	LAN0_B+	LAN0_B-
7		LAN0_C+	LAN0_C-	ACT_LED#	LINK_LED#	LAN0_D+	LAN0_D-
8	LAN1 (SerDes)	SLAN_TX1+	SLAN_TX1-	SLAN_RX1+	SLAN_RX1-	NC	NC
9	LAN2 & LAN4 (SerDes)	SLAN_TX2+	SLAN_TX2-	SLAN_RX2+	SLAN_RX2-	SLAN_TX4+	SLAN_TX4-
10	LAN3 & LAN4 (SerDes)	SLAN_TX3+	SLAN_TX3-	SLAN_RX3+	SLAN_RX3-	SLAN_RX4+	SLAN_RX4-

TABLE A-10 shows the J33 connector pin assignments, which are used for PCIe signals.

TABLE A-10 J33 Connector Pin Assignments

Row	Interface	A	B	C	D	E	F
1	PCIe x8 Lane	PETx0+	PETx0-	PERx0+	PERx0-	FCLKA+	FCLKA-
2		PETx1+	PETx1-	PERx1+	PERx1-	TCLKA+	TCLKA-
3		PETx2+	PETx2-	PERx2+	PERx2-	TCLKB+	TCLKB-
4		PETx3+	PETx3-	PERx3+	PERx3-	TCLKC+	TCLKC-
5		PETx4+	PETx4-	PERx4+	PERx4-	TCLKD+	TCLKD-
6		PETx5+	PETx5-	PERx5+	PERx5-	TCK	TMS
7		PETx6+	PETx6-	PERx6+	PERx6-	TRST#	TDO
8		PETx7+	PETx7-	PERx7+	PERx7-	TDI	PCI_RST#
9		NC	NC	NC	NC	RTM#	PCI_CFG
10		NC	NC	NC	NC	PS0#	Enable#

BIOS Screens

This appendix provides examples of the first-level and second-level screens from the BIOS menu. To enter the BIOS menu, press the F2 key during the POST portion of the boot process.

FIGURE B-1 shows the BIOS menu tree. FIGURE B-2 through FIGURE B-29 show the screens within the BIOS menu tree.

FIGURE B-1 BIOS Menu Tree

Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit

Advanced
- CPU Configuration
- IDE Configuration
- Super IO Configuration
- ACPI Configuration
- Event Log Configuration
- MPS Configuration
- PCI Express Configuration
- Smbios Configuration
- Remote Access
- USB Configuration

PCI/PnP
- Clear NVRAM
- Plug & Play OS
- PCI Latency Timer
- Allocate IRQ to PCI VGA
- Palette Snooping
- PCI IDE BusMaster
- Offboard PCI/ SA IDE Card
- IRQs
- DMA Channels
- Reserved Memory Size
- RTM Option ROM
- nVidia Onboard NIC ROMs
- Sun ASIC Onboard NIC
- Broadcom Onboard NIC
- AMC Slot B1 Option ROM
- AMC Slot B2 Option ROM

Boot
- Boot Settings
- Boot Settings Configuration
- Boot Device Priority

Security
- Change Supervisor Password
- Change User Password
- Boot Sector Virus Protection

Chipset
- NorthBridge Chipset
- SouthBridge Chipset
- HyperTransport Configuration

FIGURE B-2 BIOS Main Menu

```
_ Main    Advanced   PCIPnP   Boot    Security   Chipset   Exit
*************************************************************************
* System Overview                                 * Use [ENTER], [TAB]   *
* ************************************************ * or [SHIFT-TAB] to     *
* AMIBIOS                                          * select a field.       *
* Version    :08.00.14                             *                       *
* Build Date:07/20/07                              * Use [+] or [-] to     *
* ID         :0ABMWD03                             * configure system Time.*
*                                                  *                       *
* Processor                                        *                       *
* Dual-Core AMD Opteron(tm) Processor 1214 HE      *                       *
* Speed      :2200MHz                              *                       *
* Count      :2                                    *                       *
*                                                  *                       *
* System Memory                                    * *     Select Screen   *
* Size       :2048MB                               * **    Select Item     *
*                                                  * +-    Change Field    *
* System Time                  [08:33:45]          * Tab   Select Field    *
* System Date                  [Thu 08/23/2007]    * F1    General Help    *
*                                                  * F10   Save and Exit   *
*                                                  * ESC   Exit            *
*                                                  *                       *
*************************************************************************
          v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

FIGURE B-3 Advanced Configuration Menu

```
_ Main    Advanced   PCIPnP   Boot    Security   Chipset   Exit
*************************************************************************
* Advanced Settings                               * Configure CPU.        *
* ************************************************ *                       *
* WARNING: Setting wrong values in below sections *                       *
*          may cause system to malfunction.       *                       *
*                                                 *                       *
* * CPU Configuration                             *                       *
* * IDE Configuration                             *                       *
* * SuperIO Configuration                         *                       *
* * ACPI Configuration                            *                       *
* * Event Log Configuration                       *                       *
* * MPS Configuration                             *                       *
* * PCI Express Configuration                     *                       *
* * Smbios Configuration                          * *     Select Screen   *
* * Remote Access Configuration                   * **    Select Item     *
* * USB Configuration                             * Enter Go to Sub Screen *
*                                                 * F1    General Help    *
*                                                 * F10   Save and Exit   *
*                                                 * ESC   Exit            *
*                                                 *                       *
*                                                 *                       *
*************************************************************************
          v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

FIGURE B-4   CPU Configuration Menu

```
          Advanced
*****************************************************************************
* Module Version: 13.12                        * Enable or Disable the  *
* AGESA Version: 03.00.09                       * building of ACPI       *
* Physical Count: 1                             * SRAT Table             *
* Logical Count : 2                             *                        *
* ************************************************ *                      *
* Dual-Core AMD Opteron(tm) Processor 1214 HE   *                        *
* Revision: F3                                  *                        *
* Cache L1: 256KB                               *                        *
* Cache L2: 2048KB                              *                        *
* Cache L3: N/A                                 *                        *
* Speed    : 2200MHz,   NB Clk: N/A             *                        *
* Current FSB Multiplier: 11x                   *                        *
* Maximum FSB Multiplier: 11x                   * *     Select Screen    *
* Able to Change Freq.  : Yes                   * **    Select Item      *
* uCode Patch Level     : None Required         * +-    Change Option    *
* GART Error Reporting          [Disabled]      * F1    General Help     *
* Microcode Update              [Enabled]       * F10   Save and Exit    *
* Secure Virtual Machine Mode   [Enabled]       * ESC   Exit             *
* PowerNow                      [Enabled]       *                        *
* ACPI SRAT Table               [Enabled]       *                        *
*****************************************************************************
        v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

FIGURE B-5   IDE Configuration Menu

```
_         Advanced
*****************************************************************************
* IDE Configuration                             * DISABLED: disables the *
* ************************************************ * integrated IDE         *
* OnBoard IDE Controller         [Enabled]      * Controller.            *
*                                               * PRIMARY: enables only  *
* * Primary IDE Master           : [Hard Disk]  * the Primary IDE        *
* * Primary IDE Slave            : [Not Detected] * Controller.          *
*                                               * SECONDARY: enables     *
* Hard Disk Write Protect        [Disabled]     * only the Secondary IDE *
* IDE Detect Time Out (Sec)      [35]           * Controller.            *
*                                               * BOTH: enables both IDE *
*                                               * Controllers.           *
*                                               *                        *
*                                               * *     Select Screen    *
*                                               * **    Select Item      *
*                                               * +-    Change Option    *
*                                               * F1    General Help     *
*                                               * F10   Save and Exit    *
*                                               * ESC   Exit             *
*                                               *                        *
*                                               *                        *
*****************************************************************************
        v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

FIGURE B-6   Super IO Configuration Menu

```
           Advanced
**************************************************************************
* Configure Win627EHF Super IO Chipset          * Allows BIOS to Select *
* ********************************************** * Serial Port1 Base      *
* Serial Port1 Address              [3F8/IRQ4]  * Addresses.             *
*                                               *                        *
*                                               *                        *
*                                               *                        *
*                                               *                        *
*                                               *                        *
*                                               *                        *
*                                               *                        *
*                                               *                        *
*                                               *    *    Select Screen  *
*                                               *    **   Select Item    *
*                                               *    +-   Change Option   *
*                                               *    F1   General Help    *
*                                               *    F10  Save and Exit   *
*                                               *    ESC  Exit            *
*                                               *                        *
*                                               *                        *
**************************************************************************
        v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

FIGURE B-7   ACPI Settings Menu

```
           Advanced
**************************************************************************
* ACPI Settings                                 * Advanced ACPI          *
* ********************************************** * Configuration settings *
* * Advanced ACPI Configuration                 *                        *
* * Chipset ACPI Configuration                  * Use this section to    *
*                                               * configure additional   *
*                                               * ACPI options.          *
*                                               *                        *
*                                               *                        *
*                                               *                        *
*                                               *                        *
*                                               *                        *
*                                               *    *    Select Screen  *
*                                               *    **   Select Item    *
*                                               * Enter Go to Sub Screen *
*                                               *    F1   General Help    *
*                                               *    F10  Save and Exit   *
*                                               *    ESC  Exit            *
*                                               *                        *
*                                               *                        *
**************************************************************************
        v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

FIGURE B-8   Event Logging Details Menu

```
              Advanced
*************************************************************************
* Event Logging details                        * View all unread events *
* *************************************************** * on the Event Log.  *
* View Event Log                                *                         *
* Mark all events as read                       *                         *
* Clear Event Log                               *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               * *      Select Screen    *
*                                               * **      Select Item     *
*                                               * Enter Go to Sub Screen  *
*                                               * F1     General Help      *
*                                               * F10    Save and Exit     *
*                                               * ESC    Exit              *
*                                               *                         *
*                                               *                         *
*************************************************************************
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```

FIGURE B-9   MPS Configuration Menu

```
              Advanced
*************************************************************************
* MPS Configuration                             * Select MPS             *
* *************************************************** * Revision.          *
* MPS Revision                    [1.4]         *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               *                         *
*                                               * *      Select Screen    *
*                                               * **      Select Item     *
*                                               * +-      Change Option    *
*                                               * F1     General Help      *
*                                               * F10    Save and Exit     *
*                                               * ESC    Exit              *
*                                               *                         *
*                                               *                         *
*************************************************************************
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```

FIGURE B-10 PCI Express Configuration Menu

```
 _         Advanced
********************************************************************************
* PCI Express Configuration                       * Enable/Disable            *
* *********************************************** * PCI Express L0s and        *
* Active State Power-Management  [Disabled]       * L1 link power              *
*                                                 * states.                    *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 * *    Select Screen         *
*                                                 * **   Select Item           *
*                                                 * +-   Change Option         *
*                                                 * F1   General Help          *
*                                                 * F10  Save and Exit         *
*                                                 * ESC  Exit                  *
*                                                 *                            *
*                                                 *                            *
********************************************************************************
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```

FIGURE B-11 SMBIOS Configuration Menu

```
          Advanced
********************************************************************************
* Smbios Configuration                            * SMBIOS SMI Wrapper         *
*                                                 * support for PnP Func       *
* Smbios Smi Support              [Enabled]       * 50h-54h                    *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 *                            *
*                                                 * *    Select Screen         *
*                                                 * **   Select Item           *
*                                                 * +-   Change Option         *
*                                                 * F1   General Help          *
*                                                 * F10  Save and Exit         *
*                                                 * ESC  Exit                  *
*                                                 *                            *
*                                                 *                            *
********************************************************************************
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```

FIGURE B-12 Remote Access Configuration Menu

```
              Advanced
*********************************************************************************
* Configure Remote Access type and parameters       * Select Remote Access    *
* ********************************************        * type.                   *
* Remote Access                  [Enabled]           *                         *
*                                                    *                         *
* Serial port number             [COM1]              *                         *
*      Base Address, IRQ         [3F8h, 4]           *                         *
* Serial Port Mode               [09600 8,n,1]       *                         *
* Flow Control                   [None]              *                         *
* Redirection After BIOS POST    [Always]            *                         *
* Terminal Type                  [ANSI]              *                         *
* VT-UTF8 Combo Key Support       [Enabled]          *                         *
* Sredir Memory Display Delay    [No Delay]          *                         *
*                                                    * *     Select Screen     *
*                                                    * **    Select Item       *
*                                                    * +-    Change Option      *
*                                                    * F1    General Help       *
*                                                    * F10   Save and Exit      *
*                                                    * ESC   Exit               *
*                                                    *                         *
*                                                    *                         *
*********************************************************************************
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```

FIGURE B-13 USB Configuration Menu

```
              Advanced
*********************************************************************************
* USB Configuration                                  * Enables support for     *
* ********************************************        * legacy USB. AUTO        *
* Module Version - 2.24.1-13.4                       * option disables         *
*                                                    * legacy support if       *
* USB Devices Enabled :                              * no USB devices are      *
*          None                                      * connected.              *
*                                                    *                         *
* Legacy USB Support             [Enabled]           *                         *
* USB 2.0 Controller Mode        [HiSpeed]           *                         *
* BIOS EHCI Hand-Off             [Enabled]           *                         *
*                                                    *                         *
*                                                    *                         *
*                                                    * *     Select Screen     *
*                                                    * **    Select Item       *
*                                                    * +-    Change Option      *
*                                                    * F1    General Help       *
*                                                    * F10   Save and Exit      *
*                                                    * ESC   Exit               *
*                                                    *                         *
*                                                    *                         *
*********************************************************************************
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```

FIGURE B-14 Advanced PCI/PnP Settings Menu

```
_ Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
*************************************************************************
* Advanced PCI/PnP Settings                        ** Clear NVRAM during  *
* ***************************************************** System Boot.       *
* WARNING: Setting wrong values in below sections   **                    *
*          may cause system to malfunction.         **                    *
*                                                   **                    *
* Clear NVRAM                    [No]               **                    *
* Plug & Play O/S                [No]               **                    *
* PCI Latency Timer              [64]               **                    *
* Allocate IRQ to PCI VGA        [Yes]              **                    *
* Palette Snooping               [Disabled]         **                    *
* PCI IDE BusMaster              [Disabled]         **                    *
* OffBoard PCI/ISA IDE Card      [Auto]             **                    *
*                                                   ** *    Select Screen *
* IRQ3                           [Available]        ** **   Select Item   *
* IRQ4                           [Available]        ** +-   Change Option *
* IRQ5                           [Available]        ** F1   General Help  *
* IRQ7                           [Available]        ** F10  Save and Exit *
* IRQ9                           [Available]        ** ESC  Exit          *
* IRQ10                          [Available]        **                    *
* IRQ11                          [Available]        **                    *
*************************************************************************
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```

FIGURE B-15 Advanced PCI/PnP Settings Menu Continued

```
_ Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
*************************************************************************
* OffBoard PCI/ISA IDE Card      [Auto]             ** Size of memory block *
*                                                   ** to reserve for legacy *
* IRQ3                           [Available]        ** ISA devices.          *
* IRQ4                           [Available]        **                       *
* IRQ5                           [Available]        **                       *
* IRQ7                           [Available]        **                       *
* IRQ9                           [Available]        **                       *
* IRQ10                          [Available]        **                       *
* IRQ11                          [Available]        **                       *
* IRQ14                          [Available]        **                       *
* IRQ15                          [Available]        **                       *
*                                                   **                       *
* DMA Channel 0                  [Available]        ** *    Select Screen    *
* DMA Channel 1                  [Available]        ** **   Select Item      *
* DMA Channel 3                  [Available]        ** +-   Change Option    *
* DMA Channel 5                  [Available]        ** F1   General Help     *
* DMA Channel 6                  [Available]        ** F10  Save and Exit    *
* DMA Channel 7                  [Available]        ** ESC  Exit             *
*                                                   **                       *
* Reserved Memory Size           [Disabled]         **                       *
*************************************************************************
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```

FIGURE B-16   Boot Settings Menu

```
_ Main     Advanced    PCIPnP     Boot     Security    Chipset     Exit
****************************************************************************
* Boot Settings                                      * Configure Settings   *
* **************************************************** * during System Boot.  *
* * Boot Settings Configuration                      *                       *
*                                                    *                       *
* * Boot Device Priority                             *                       *
*                                                    *                       *
* Initiate Pre-boot Services      [Hot Key]          *                       *
*                                                    *                       *
*                                                    *                       *
*                                                    *                       *
*                                                    *                       *
*                                                    * *    Select Screen    *
*                                                    * **   Select Item      *
*                                                    * Enter Go to Sub Screen *
*                                                    * F1   General Help      *
*                                                    * F10  Save and Exit     *
*                                                    * ESC  Exit              *
*                                                    *                       *
*                                                    *                       *
****************************************************************************
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```

FIGURE B-17   Boot Settings Configuration Menu

```
_                        Boot
****************************************************************************
* Boot Settings Configuration                        * Allows BIOS to skip  *
* **************************************************** * certain tests while  *
* Quick Boot                 [Disabled]              * booting. This will    *
* Quiet Boot                 [Disabled]              * decrease the time     *
* AddOn ROM Display Mode      [Force BIOS]           * needed to boot the    *
* Bootup Num-Lock             [On]                   * system.               *
* PS/2 Mouse Support          [Auto]                 *                       *
* Wait For 'F1' If Error      [Disabled]             *                       *
* Hit 'F2' Message Display    [Enabled]              *                       *
* Interrupt 19 Capture        [Disabled]             *                       *
* Show Extended System Info   [Disabled]             *                       *
*                                                    *                       *
*                                                    * *    Select Screen    *
*                                                    * **   Select Item      *
*                                                    * +-   Change Option     *
*                                                    * F1   General Help      *
*                                                    * F10  Save and Exit     *
*                                                    * ESC  Exit              *
*                                                    *                       *
*                                                    *                       *
****************************************************************************
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```

FIGURE B-18 Boot Device Priority Menu

```
 _                              Boot
************************************************************************************
* Boot Device Priority                              * Specifies the boot          *
* ************************************************** * sequence from the           *
* 1st Boot Device           [NVIDIA Boot Agent ]    * available devices.          *
* 2nd Boot Device           [HDD:PM-HMS360604D5]    *                             *
* 3rd Boot Device           [Disabled]              * A device enclosed in        *
*                                                   * parenthesis has been        *
*                                                   * disabled in the             *
*                                                   * corresponding type          *
*                                                   * menu.                       *
*                                                   *                             *
*                                                   *                             *
*                                                   * *    Select Screen          *
*                                                   * **   Select Item            *
*                                                   * +-   Change Option          *
*                                                   * F1   General Help           *
*                                                   * F10  Save and Exit          *
*                                                   * ESC  Exit                   *
*                                                   *                             *
*                                                   *                             *
************************************************************************************
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```

FIGURE B-19 Boot Hard Disk Drive Priority Menu

```
 _                              Boot
************************************************************************************
* Hard Disk Drives                                  * Specifies the boot          *
* ************************************************** * sequence from the           *
* 1st Drive                 [HDD:PM-HMS360604D5]    * available devices.          *
*                                                   *                             *
*                                                   *                             *
*                                                   *                             *
*                                                   *                             *
*                                                   *                             *
*                                                   *                             *
*                                                   *                             *
*                                                   *                             *
*                                                   *                             *
*                                                   * *    Select Screen          *
*                                                   * **   Select Item            *
*                                                   * +-   Change Option          *
*                                                   * F1   General Help           *
*                                                   * F10  Save and Exit          *
*                                                   * ESC  Exit                   *
*                                                   *                             *
*                                                   *                             *
************************************************************************************
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```

FIGURE B-20 Security Settings Menu

```
_ Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
********************************************************************************
* Security Settings                              * Install or Change the  *
* ***********************************************  * password.              *
* Supervisor Password :Not Installed             *                        *
* User Password       :Not Installed             *                        *
*                                                 *                        *
* Change Supervisor Password                     *                        *
* Change User Password                           *                        *
*                                                 *                        *
* Boot Sector Virus Protection   [Disabled]      *                        *
*                                                 *                        *
*                                                 *                        *
*                                                 *  *      Select Screen  *
*                                                 *  **     Select Item    *
*                                                 * Enter  Change          *
*                                                 * F1     General Help    *
*                                                 * F10    Save and Exit   *
*                                                 * ESC    Exit            *
*                                                 *                        *
*                                                 *                        *
********************************************************************************
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```

FIGURE B-21 Change Password Settings Menu

```
_ Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
********************************************************************************
* Security Settings                              * Install or Change the  *
* ***********************************************  * password.              *
* Supervisor Password :Not Installed             *                        *
* User Password       :Not Installed             *                        *
*                                                 *                        *
* Change Supervisor Password                     *                        *
* Change User Password          ***********************                    *
*                              *                                          *
* Boot Sector Virus Prote*                        *                        *
*                         * Enter New Password    *                        *
*                         *                        *                       *
*                          ***********************                         *
*                                                 *  *      Select Screen  *
*                                                 *  **     Select Item    *
*                                                 * Enter  Change          *
*                                                 * F1     General Help    *
*                                                 * F10    Save and Exit   *
*                                                 * ESC    Exit            *
*                                                 *                        *
*                                                 *                        *
********************************************************************************
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```

FIGURE B-22 Chipset Main Menu

```
_ Main    Advanced    PCIPnP    Boot    Security   Chipset   Exit
*****************************************************************************
* Advanced Chipset Settings                          * Options for NB      *
* *****************************************************  *                     *
* WARNING: Setting wrong values in below sections    *                     *
*          may cause system to malfunction.          *                     *
*                                                    *                     *
* * NorthBridge Configuration                        *                     *
* * SouthBridge/MCP55 Configuration                  *                     *
* * Hyper Transport Configuration                    *                     *
*                                                    *                     *
*                                                    *                     *
*                                                    *                     *
*                                                    *                     *
*                                                    * *     Select Screen   *
*                                                    * **    Select Item     *
*                                                    * Enter Go to Sub Screen *
*                                                    * F1    General Help    *
*                                                    * F10   Save and Exit   *
*                                                    * ESC   Exit            *
*                                                    *                     *
*                                                    *                     *
*****************************************************************************
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```

FIGURE B-23 NorthBridge Chipset Configuration Menu

```
_                                          Chipset
*****************************************************************************
* NorthBridge Chipset Configuration                  *                     *
* *****************************************************  *                     *
* * Memory Configuration                              *                     *
* * ECC Configuration                                 *                     *
* * DRAM Timing Configuration                         *                     *
* Power Down Control              [Auto]              *                     *
* *****************************************************  *                     *
* Alternate VID                   [Auto]              *                     *
* *****************************************************  *                     *
*   Memory CLK              :333 MHz                  *                     *
*   CAS Latency(Tcl)        :5.0                      *                     *
*   RAS/CAS Delay(Trcd)     :5 CLK                    *                     *
*   Row Precharge Time(Trp):5 CLK                     * *     Select Screen   *
*   Min Active RAS(Tras)    :15 CLK                   * **    Select Item     *
*   RAS/RAS Delay(Trrd)     :3 CLK                    * Enter Go to Sub Screen *
*   Row Cycle (Trc)         :21 CLK                   * F1    General Help    *
*                                                    * F10   Save and Exit   *
*                                                    * ESC   Exit            *
*                                                    *                     *
*                                                    *                     *
*****************************************************************************
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```

FIGURE B-24 NorthBridge Chipset Memory Configuration Menu

```
                                           Chipset
*****************************************************************************
* Memory Configuration                       * Enable Bank Memory        *
* ***************************************** * Interleaving                *
* Bank Interleaving          [Auto]          *                           *
* Channel Interleaving       [Auto]          *                           *
* Enable Clock to All DIMMs  [Disabled]      *                           *
* MemClk Tristate C3/ATLVID  [Disabled]      *                           *
* Memory Hole Remapping      [Enabled]       *                           *
* CS Sparing Enable          [Disabled]      *                           *
* Unganged Mode support      [Enabled]       *                           *
*                                            *                           *
*                                            *                           *
*                                            *  *      Select Screen      *
*                                            *  **     Select Item        *
*                                            *  +-     Change Option       *
*                                            *  F1     General Help        *
*                                            *  F10    Save and Exit       *
*                                            *  ESC    Exit                *
*                                            *                           *
*                                            *                           *
*****************************************************************************
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```

FIGURE B-25 NorthBridge Chipset ECC Configuration Menu

```
                                           Chipset
*****************************************************************************
* ECC Configuration                          * Set the level of ECC      *
* ***************************************** * protection. Note: The      *
* ECC Mode                   [Enabled]        * 'Super' ECC mode          *
*   DRAM ECC Enable          [Enabled]        * dynamically sets the      *
*   ECC Error Log            [Disabled]       * DRAM scrub rate so        *
*   DRAM SCRUB REDIRECT      [Disabled]       * all of memory is          *
*   4-Bit ECC Mode           [Enabled]        * scrubbed in 8 hours.      *
*   DRAM BG Scrub            [Disabled]       *                           *
*   Data Cache BG Scrub      [Disabled]       *                           *
*   L2 Cache BG Scrub        [Disabled]       *                           *
*   L3 Cache BG Scrub        [Disabled]       *                           *
*                                            *  *      Select Screen      *
*                                            *  **     Select Item        *
*                                            *  +-     Change Option       *
*                                            *  F1     General Help        *
*                                            *  F10    Save and Exit       *
*                                            *  ESC    Exit                *
*                                            *                           *
*                                            *                           *
*****************************************************************************
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```

FIGURE B-26 NorthBridge Chipset DRAM Configuration Menu

```
_                                              Chipset
******************************************************************************
* DRAM Timing Configuration                          *          Options      *
*  ************************************************** *                       *
* Memory Clock Mode             [Auto]           * Auto                      *
* DRAM Timing Mode              [Auto]           * Limit                     *
*                                                * Manual                    *
*                                                *                           *
*                                                *                           *
*                                                *                           *
*                                                *                           *
*                                                *                           *
*                                                *                           *
*                                                *                           *
*                                                *  *     Select Screen      *
*                                                *  **    Select Item        *
*                                                *  +-    Change Option       *
*                                                *  F1    General Help        *
*                                                *  F10   Save and Exit       *
*                                                *  ESC   Exit                *
*                                                *                           *
*                                                *                           *
******************************************************************************
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```

FIGURE B-27 SouthBridge Chipset Configuration Menu

```
_                                              Chipset
******************************************************************************
* SouthBridge/MCP55 Chipset Configuration          **          Options      *
*  *************************************************** **                    *
* LPC P2P* P2P*                 [+   +/-  +/-]    ** -    +    +             *
*                                                ** -    +    +             *
* CPU/LDT Spread Spectrum       [Center Spread]  ** +    -    +             *
* PCIE Spread Spectrum          [Enabled]        ** +  +/-  +/-            *
*                                                **                         *
* CPU Frequency, MHz            [200.9]          **                         *
*                                                **                         *
* MCP PCI-Express Frequency, MHz [100]           **                         *
*                                                **                         *
*                                                **                         *
* MCP55 SLI Optimizations       [Enabled]        ** *     Select Screen      *
*                                                ** **    Select Item        *
* PMU                           [Disabled]       ** +-    Change Option       *
* USB 1.1 Controller            [Enabled]        ** F1    General Help        *
* USB 2.0 Controller            [Enabled]        ** F10   Save and Exit       *
* MAC0 LAN0                     [Auto]           ** ESC   Exit                *
* MAC1 LAN1                     [Auto]           **                          *
*                                                **                          *
******************************************************************************
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```

FIGURE B-28 Hyper Transport Configuration Menu


```
                                              Chipset
*****************************************************************************
* Hyper Transport MCP55 Configuration            * MCP55(SB) to K8(CPU)   *
* ********************************************** * frequency selection      *
* MCP55(SB) to K8(CPU) Freq Auto [Enabled]        * by CPU capability       *
* MCP55(SB) to K8(CPU) LinkWidth [16 * 16 *]      *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 * *    Select Screen       *
*                                                 * **   Select Item         *
*                                                 * +-   Change Option       *
*                                                 * F1   General Help        *
*                                                 * F10  Save and Exit       *
*                                                 * ESC  Exit                *
*                                                 *                         *
*                                                 *                         *
*****************************************************************************
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```

FIGURE B-29 Exit Options Menu


```
 _ Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit
*****************************************************************************
* Exit Options                                    * Exit system setup       *
* ********************************************** * after saving the        *
* Save Changes and Exit                           * changes.                *
* Discard Changes and Exit                        *                         *
* Discard Changes                                 * F10 key can be used     *
*                                                 * for this operation.     *
* Load Optimal Defaults                           *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 *                         *
*                                                 * *    Select Screen       *
*                                                 * **   Select Item         *
*                                                 * Enter Go to Sub Screen  *
*                                                 * F1   General Help        *
*                                                 * F10  Save and Exit       *
*                                                 * ESC  Exit                *
*                                                 *                         *
*                                                 *                         *
*****************************************************************************
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