Sun Netra™ CP32x0 Quad GbE, Dual-Fibre Channel, Advanced Rear Transition Module User's Guide

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Preface

The *Sun Netra CP32x0 Quad GbE, Dual-Fibre Channel, Advanced Rear Transition Module User's Guide* provides installation instructions and hardware specifications for the Netra™ CP32x0 Quad GbE, Dual-Fibre Channel, Advanced Rear Transition Module (ARTM-FC).

This manual is written for technicians, system administrators, field applications and service engineers, authorized service providers (ASPs), and users involved in the integration of this module into Netra Advanced Telecommunications Computing Architecture (ATCA) systems.

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

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*.

Note – Characters display differently depending on browser settings. If characters do not display correctly, change the character encoding in your browser to Unicode UTF-8.

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/cp32x0.4gbefc?l=en#hic

Application	Title	Part Number	Format	Location
Getting Started	*Sun Netra CP32x0 Quad GbE, Dual-Fibre Channel, Advanced Rear Transition Module Getting Started Guide*	820-3149	Printed PDF HTML	Shipping kit Online Online
Latest information, Upgrades	*Netra CP32x0 Advanced Rear Transition Module Product Notes*	820-3261	PDF HTML	Online Online
Usage (this document)	*Sun Netra CP32x0 Quad GbE, Dual-Fibre Channel, Advanced Rear Transition Module User's Guide*	820-3148	PDF HTML	Online Online
Safety and Compliance	*Netra CP32x0 Advanced Rear Transition Module Safety and Compliance Manual*	820-3506	PDF HTML	Online Online
Safety	*Important Safety Information for Sun Hardware Systems*	816-7190	Printed	Shipping kit

The following table lists the documentation that is related to this product.

Application	Title	Part Number	Format	Location
Latest information	*Sun Netra CP3220 Blade Server Product Notes*	820-0455	PDF	Online at:
	http://docs.sun.com/app/docs/prod/cp3220.brd#hic			
Latest information	*Netra CP3250 Blade Server Product Notes*	820-5194	PDF	Online
	http://docs.sun.com/app/docs/prod/cp3250.brd#hic			
Latest information	*Sun Netra CP3260 Blade Server Product Notes*	820-0455	PDF	Online at:
	http://docs.sun.com/app/docs/prod/cp3260.brd#hic			

Documentation, Support, and Training

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

Third-Party Web Sites

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Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

http://www.sun.com/hwdocs/feedback

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

Sun Netra CP32x0 Quad GbE, Dual-Fibre Channel, Advanced Rear Transition Module User's Guide, part number 820-3148-10.

Overview

This chapter provides an overview of the Sun Netra CP32x0 Quad GbE, Dual-Fibre Channel, Advanced Rear Transition Module (ARTM-FC).

This chapter contains the following topics:

- Section 1.1, "Features" on page 1-2
- Section 1.2, "Standards Compliance" on page 1-5
- Section 1.3, "I/O Interfaces" on page 1-5
- Section 1.4, "LEDs" on page 1-6
- Section 1.5, "Part Number, Serial Number, and MAC Address Labels" on page 1-9
- Section 1.6, "Software Support" on page 1-10

1.1 Features

The Netra CP32x0 ARTM-FC is a fully compatible, carrier-grade Advanced Telecom Computing Architecture® (ATCA) RTM for ATCA node boards designed to be compatible with the AdvancedRTM specification and is not compatible with ATCA cards that do not comply with this specification.

The Netra CP32x0 ARTM-FC transitions an ATCA node board's I/O signals from the Zone 3 (user zone) connectors to standard I/O interfaces. The node board drives the LAN and Serial Management ports, as well as the Gigabit Ethernet (GbE) SFPs, using the Zone 3 I/O. There is a x8 PCI-Express (PCI-E) link connected to a switch which drives downstream x4 ports to the Fibre Channel and GbE controllers as well as the PCI-E cable connector.

The Netra CP32x0 ARTM-FC maximizes communications I/O for GbE networks by providing four fixed 10/100/1000BASE-T copper ports and two user-configurable SFP ports on a single module.

The rear I/O access enables replacement of the Netra ATCA node board without disconnecting cables. Industry-standard connectors and pin assignments ensure ease of use and flexible design. The Netra CP32x0 ARTM-FC permits the creation of high-density systems by enabling easy access to I/O.

See FIGURE 1-1 for an illustration of the Netra CP32x0 ARTM-FC.

Features of the Netra CP32x0 ARTM-FC include:

- ATCA RTM form factor per ATCA specifications, see Chapter 2
- Intelligent Platform Management Interface (IPMI) controller with a Module Management Controller (MMC), Silicon Labs C8051F127, to provide full module management support
- Hot-swap ability allows module replacement during live operation per the ATCA Specification
- PCI-E switch compliance with PCI-Express 2.0 Base Specification Revision 0.9
- PCI-E x8 bus interface to node card
- LAN management port (RJ-45 connector)
- RS232 serial management port (RJ-45 connector)
- Auto-negotiations and automatic MDI/MDIX switchover to each fixed GbE port

- Transmission Control Protocol (TCP) segmented checksum off loading
- Compliance with IEEE 802.3a for 10/100/1000BASE-T
- Four fixed GbE ports (copper RJ-45 connectors)
- Two user-configurable GbE ports (SFP modules)
- Two Fibre Channel ports (SFP modules)
- IEEE 802.1Q-VLAN support (up to 4094 VLAN tags)
- 25 W Max power
- Designed for NEBS level 3 compliance

FIGURE 1-1 Netra CP32x0 ARTM-FC
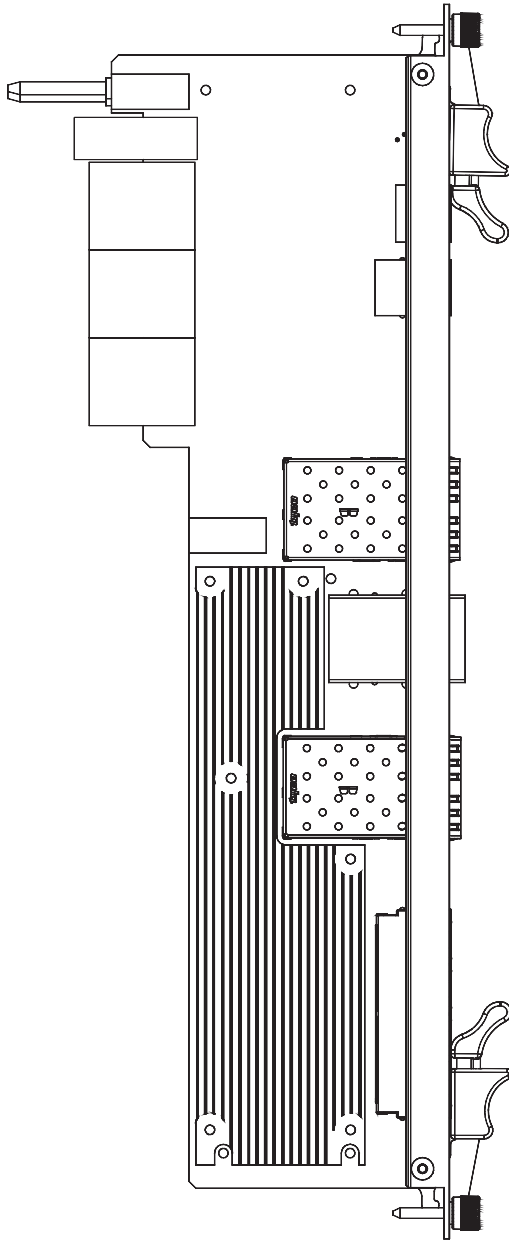
1.2 Standards Compliance

The Netra CP32x0 ARTM-FC is compliant with the following specifications:

- PICMG® 3.1 from the ATCA Specification
- PCI Express® 2.0 Base Specification Revision 0.9
- *PCI-E External Cabling Specification* Rev. 1.0

1.3 I/O Interfaces

The Netra CP32x0 ARTM-FC installs into the rear of the ATCA enclosure, opposite an ATCA node board designed for compatibility with the AdvancedRTM specification. The ARTM-FC connects to the node board's Zone 3 rear connectors directly. The ARTM-FC supports four fixed GbE ports (copper RJ-45), two Fibre Channel ports (SFP), one x4 PCI-E port, two modular GbE ports (SFP), one LAN management port (RJ-45), and one serial management port (RJ-45) on the front panel.

TABLE 1-1   I/O Ports on ARTM-FC Faceplate

RTM Zone-3 Function	RTM Faceplate
PCI-E, x8 (2.5 GHz)	<···> Port 1 - 1GbE RJ-45
	<···> Port 2 - 1GbE RJ-45
	<···> Port 3 - 1GbE RJ-45
	<···> Port 4 - 1GbE RJ-45
	⇌ Port 1 - FC SFP
	⇌ Port 2 - FC SFP
1GbE SERDES	Port 5 - 1GbE SFP
	Port 6 - 1GbE SFP
Management port 1	Port 7 - 1GbE RJ-45
Management port 2	Port 8 - RS232 RJ-45
IPMI to MMC device on ARTM	NA
Power	NA

1.4 LEDs

LEDs are located on the front panel of the Netra CP32x0 ARTM-FC. See .

FIGURE 1-2   Netra CP32x0 ARTM-FC Front Panel
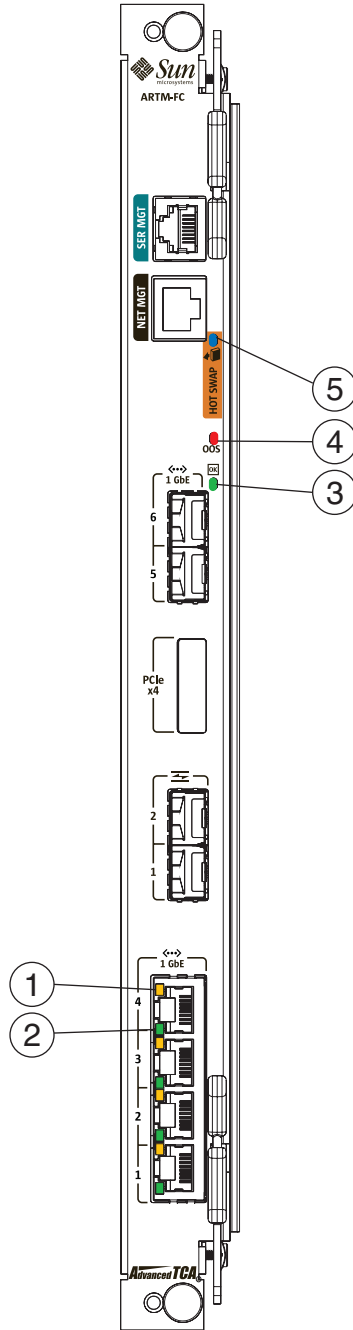
TABLE 1-2 LEDs and Their Meanings

Figure Callout	LED	Color	Usage Summary	State	Status
1	ACT	Amber	Ethernet Activity LED blinks to show data network activity.	Off	No network activity
				Blinking	Network activity
2	LNK	Green	Ethernet Link	On	Link Active at 1 Gbps
		Amber		On	Link Active at 100 Mbps
		NA		Off	Link Active at 10 Mbps
3	OK	Green	Module is powered	On	Module is powered on
				Off	Module is powered off
4	OOS	Red	Fault or "Out of Service"	On	Module fault
				Off	No module fault
5	HOT SWAP	Blue	Hot Swap indicator	On	Management power available to the module, and the module can safely be extracted
				Off	The module is operational and is unsafe to extract
				Slow Blinking	Delay before module is deactivated
				Fast Blinking	Delay before module is activated

1.5 Part Number, Serial Number, and MAC Address Labels

The Netra CP32x0 ARTM-FC serial number, part number, and media access control (MAC) address are printed on stickers located on the module. For proper identification of the ARTM-FC, find the Sun Microsystems barcode labels on the module.

FIGURE 1-3 Netra CP32x0 ARTM-FC Identification Labels
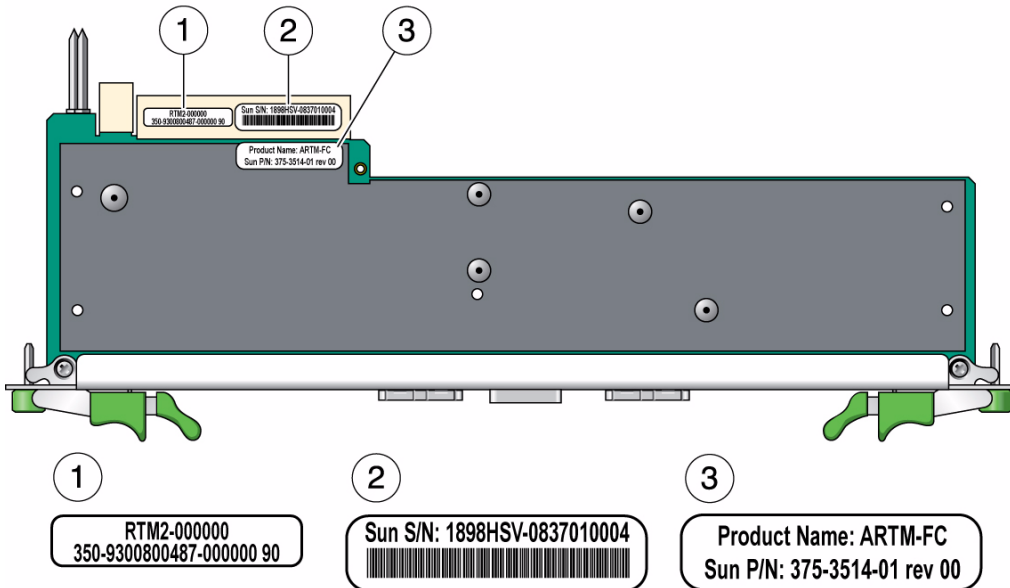
The barcode labels provide the following information.

TABLE 1-3 Netra CP32x0 ARTM-FC Identification Labels

Label	Description
1	Top Level Assembly Label: Contract manufacturer part format Contract manufacturer serial number
2	Sun Serial Number Label: Sample 1898HSV-0547XL1234, *where*: • 1898 = vendor code • HSV = factory code • 05 = year code • 47 = week code • XL = multiuse code • 1234 = sequence number
3	Prototype Label (appears only on preproduction ARTMs)
4	Sun Product Name and Part Number Label: Product Name: ARTM-FC Sun P/N: 375-3514-xx rev xx

1.6 Software Support

The Netra CP32x0 ARTM-FC supports ATCA node boards designed to be compatible with the AdvancedTCA specification, and the software supported by those boards.

Refer to the following documentation for software support information about Sun blade servers that are compatible with this ARTM:

- *Sun Netra CP3220 Blade Server Product Notes* (820-1980)
- *Sun Netra CP3250 Blade Server Product Notes* (820-5194)
- *Sun Netra CP3260 Blade Server Product Notes* (820-0455)

Installing and Removing the ARTM-FC

This chapter contains procedures for unpacking, installing, and removing the Sun Netra CP32x0 Quad GbE, Dual-Fibre Channel, Advanced Rear Transition Module (ARTM-FC).

This chapter contains the following sections:

2.1 Important Information

Before installing the Sun Netra CP32x0 ARTM-FC, verify the ARTM's part number to ensure that the correct ARTM is being installed into the system. For information on identifying the ARTM, see Section 1.5, "Part Number, Serial Number, and MAC Address Labels" on page 1-9.

The following paragraphs provide important information to ensure compatibility and safety of the ARTMs, other components, and the system.

2.1.1 Take Antistatic Precautions

Caution – When a system is plugged in, energy hazards are present on the midplane. Do not reach into the enclosure.

Caution – Electrostatic discharge (ESD) can damage electronic components. Use an antistatic wrist strap and a conductive foam pad when installing or upgrading any components.

After removing the component from its protective wrapper or from the system, place the component flat on a grounded, static-free surface (and, in the case of a board, component side up). Do not slide the component over any surface.

If an ESD station is not available, you can avoid damage resulting from ESD by wearing an antistatic wrist strap (available at electronics stores) that is attached to an active electrical ground. Note that a system chassis might not be grounded if it is unplugged.

Caution – Dangerous voltages, capable of causing death, are present in this equipment. Use extreme caution when handling, testing, and adjusting equipment.

2.1.2 Unpack the Equipment Carefully

If the shipping carton is damaged upon receipt, request that the carrier's agent be present during the unpacking and inspection of the equipment.

Caution – Sun Microsystems has designed special packing material to protect the component during shipping. It is critical that you save the packing material. Shipping the component without the original packing material might void the warranty. Replacement packing material can be purchased from Sun Microsystems.

1. **Unpack the equipment from the shipping carton.**

2. **Refer to the packing list and verify that all items are present.**

3. **Save the packing material for storing and reshipping of equipment.**

4. **Avoid touching areas of integrated circuitry.**

   Static discharge can damage circuits.

5. **After removing the product from the packaging, check for any obvious physical damage.**

6. **Disconnect the chassis from the main power supply before you install the ARTM.**

2.1.3 Use a Compatible Chassis and Slot

The Sun Netra CP32x0 ARTM-FC can be installed into an ATCA shelf (chassis) with a midplane made for front- and rear-board installations. The ARTM must be installed in the slot directly behind the host ATCA node board. These back-to-back slots have common PINs to enable passing of signals via the Zone 3 connector complex.

Caution – Connectors on earlier generation node boards do not mate with connectors on the Sun Netra CP32x0 ARTM-FC. Use the Sun Netra CP32x0 ARTM-FC only with compatible node boards. Attempts to install the ARTM with an incompatible node board might damage the node board and/or the ARTM.

2.1.3.1 Safety Statement

The Sun Netra CP32x0 ARTM-FC is designed to comply with UL60950-1, and is intended to be used with similarly tested AdvancedTCA products that have user documentation detailing installation of AMC module accessories.

2.1.3.2 Maximum Power Requirements

Be sure to validate that the chassis and the ARTM slot is cable of providing the ARTM the maximum power requirements of 25W current draw.

2.1.4 Use a Compatible Host Board

The Sun Netra CP32x0 ARTM-FC was tested and qualified to operate with the following Sun Netra ATCA host boards:

TABLE 2-1   Compatible Sun Host Boards

ATCA Board	Description	FW revision
Sun Netra CP3220 Blade Server	10 GbE Opteron™ blade	Rev. 0.16 or greater
Sun Netra CP3250 Blade Server	Dual-socket quad-core Intel-based ATCA blade	BIOS rev. 1.1 or greater
Sun Netra CP3260 Blade Server	UltraSPARC© T2 ATCA blade	OpenBoot™ 4.27.8 or greater

The Sun Netra CP32x0 ARTM-FC is designed to operate with similarly tested AdvancedTCA products.

2.2 Before Installing or Removing the ARTM

ARTMs can be damaged when improperly handled. Read and follow the guidelines in this section to protect your equipment.

2.2.1 Observe ESD Precautions

Installation persons are urged to use an antistatic wrist strap and a conductive foam pad when installing or upgrading a system. See Section 2.1.1, "Take Antistatic Precautions" on page 2-2.

2.2.2 Inspect for Bent PINs or Other Damage

Bent PINs or loose components can cause damage to the ARTM, host board, the backplane, or other system components. Carefully inspect your ARTM and the backplane for both PIN and component integrity before installation. Our manufacturers take significant steps to ensure there are no bent PINs on the backplane or connector damage to the products prior to leaving our factory. Bent PINs caused by improper installation or by products with damaged connectors could void the warranty for the backplane, boards, and modules.

If a system contains one or more crushed PINs, power off the system and contact your local sales representative to schedule delivery of a replacement chassis assembly.

Caution – When first installing boards in an empty chassis or onto a carrier card, start at the left of the card cage and work to the right. When inserting or removing a board in a slot adjacent to other boards, use extra caution to avoid damage to the PINs and components located on the primary or secondary sides of the boards.

2.2.3 Preserve EMI Compliance

To preserve compliance with applicable standards and regulations for electromagnetic interference (EMI), during operation all front and rear openings on the chassis or board faceplates must be filled with an appropriate card or covered with a filler panel. If the EMI barrier is open, devices might cause or be susceptible to excessive interference.

2.2.4 Understand Hot Swap

Your ARTM-FC is electrically designed for hot-swap insertion within a fully powered chassis. However, hot-swap removal is not supported.

⚠ **Caution –** Powering down or removing a board before the operating system or other software running on the board has been properly shut down can cause corruption of data or file systems.

Prior to board removal, terminate applications or operating systems running on the board. When this task is complete, use the shelf manager to manually shut down (activate/deactivate) the ATCA board, which in turn shuts down the ARTM-FC.

There is a blue LED on the rear faceplate. This LED is under software control and indicates the following:

TABLE 2-2 Blue LED Indications

Status	Description
Off	Module has been properly recognized
Lit, Steady	Module can be safely removed.
Blinking	Module state is indeterminate, and the module should not be removed.

Hot-swap compliant components may be installed while the system is powered on. If a module is not hot-swap compliant, remove power to the slot or system before installing the component.

2.2.5 Verify Slot Usage

Prevent possible damage to components by verifying the proper slot usage for your configuration. See Section 2.1.3, "Use a Compatible Chassis and Slot" on page 2-3.

In most cases, electronic keying (e-Keying) will prevent a module to power on in an incompatible slot. However, as an extra precaution, you should be familiar with the slot purpose.

2.3 Installing the ARTM-FC

This section describes the procedure for installing the ARTM-FC in a chassis. See FIGURE 2-1 for an example of installing a node board and ARTM-FC into a chassis.

Before you install your ARTM-FC, read all cautions, warnings, and instructions presented in the following sections:

- Section 2.1.1, "Take Antistatic Precautions" on page 2-2
- Section 2.1.2, "Unpack the Equipment Carefully" on page 2-3
- Section 2.1.3, "Use a Compatible Chassis and Slot" on page 2-3
- Section 2.1.4, "Use a Compatible Host Board" on page 2-4
- Section 2.2.2, "Inspect for Bent PINs or Other Damage" on page 2-5
- Section 2.2.3, "Preserve EMI Compliance" on page 2-5
- Section 2.2.4, "Understand Hot Swap" on page 2-6

FIGURE 2-1   Installing a Node Board and ARTM-FC Into the ATCA Chassis
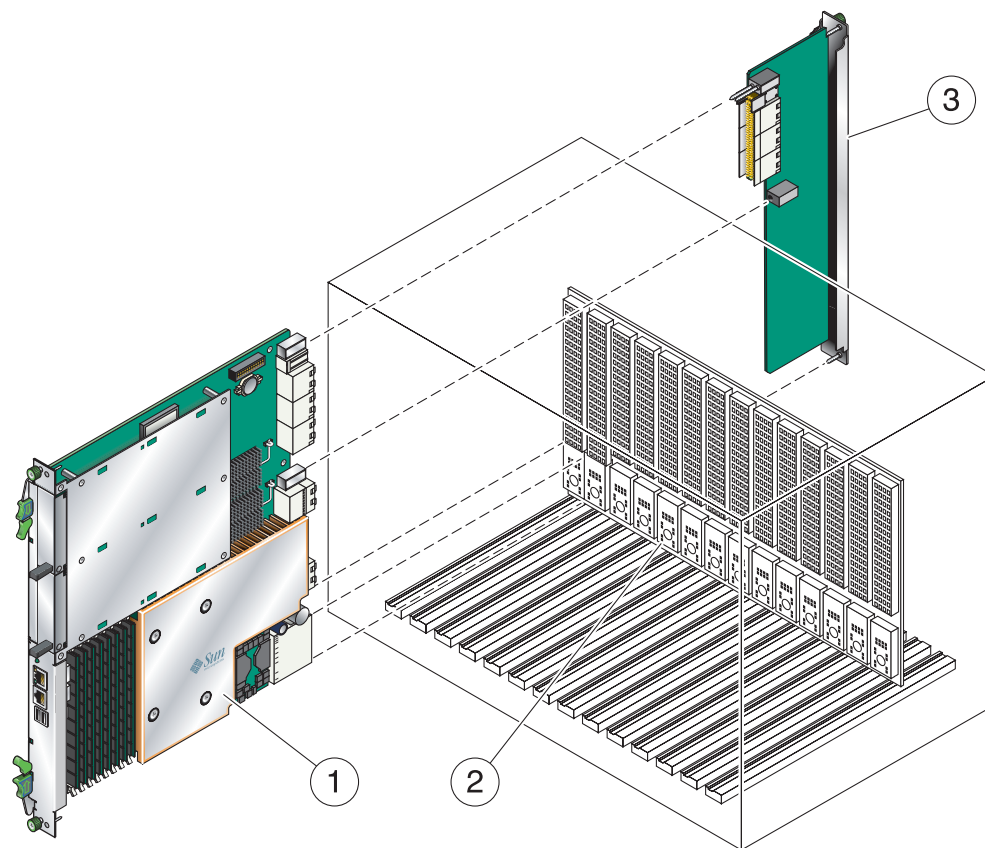
Figure Legend

1	Netra ATCA node board (blade server) installed from front
2	ATCA midplane (front)
3	Netra ARTM-FC (installed from rear)

The Sun Netra CP32x0 ARTM-FC must be used with a Netra ATCA node board for rear I/O access. The ARTM-FC enables access to Fibre Channel networks and additional GbE connections.

Caution – The Sun Netra CP32x0 ARTM-FC and the corresponding Sun Netra blade server can be installed while the shelf is powered. However, start with a power shelf only if you must do so. The ARTM-FC must be installed **before** the node board.

Caution – Ensure that no node board is installed in front of the rear midplane slot. This precaution is very important if you are installing into a powered midplane.

▼ To Install an ARTM-FC

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

2. **Facing the back of the system, identify an appropriate slot for the ARTM-FC.**

   ARTM-FCs must be installed inline behind the accompanying node board. If the accompanying node board is to be installed in slot 3, its ARTM-FC must be installed at the back of the system in slot 3.

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

4. **Prepare the module by loosening the locking screws and opening the injector/ejector latch at the top of the module.**

FIGURE 2-2   Injector/Ejector Latch and Locking Screw

Locking Screw

Injector/Ejector Latch
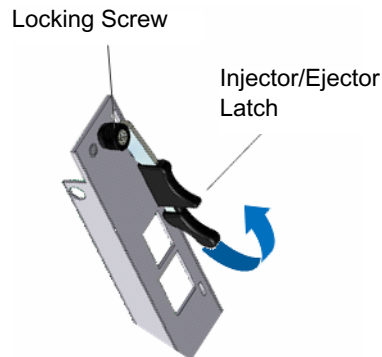
5. **Carefully align the edges of the module with the guides in the appropriate slot.**

   It might be helpful to look into the enclosure to verify correct alignment of the rails in the guides.

6. **Taking care to keep the module aligned in the guides, slide the module in until the injector/ejector mechanism engages the retention bars.**

7. **Simultaneously push in the module and rotate the injector/ejector mechanism inward to its closed position to seat the midplane connectors.**

8. **Tighten the module retention screws to ensure that the module is secured into the shelf.**

9. **Install the node board into the front of the shelf (**FIGURE 2-1**) and push the board toward the midplane. Ensure that it is seated properly and that the connectors make good contact with the ARTM-FC.**

   For further details on installation of the board, refer to the appropriate user documentation for the board.

10. **Install the supported peripheral at the ARTM-FC's connector ports, as required.**

    Use shielded cables for the ports on the ARTM-FC. The shield should be grounded at both ends. For further details on installation of the board, refer to the appropriate user documentation for the board.

11. **Power on the system, if necessary.**

    Refer to your system manual for instructions on correctly powering on the system.

Note – If you are installing a Sun Netra CP32x0 ARTM-FC, paired with a Sun Netra blade server, into a system with a 10 GbE switch, you must perform a one-time configuration on the Sun Netra blade server to assure the blade server and ARTM-FC operate at the correct speed for your switch. For information on configuring your board, see the applicable Sun Netra blade server documentation, which is listed in the Preface.

2.4 Removing the ARTM-FC

Caution – Payload Power to the Sun Netra CP32x0 ARTM-FC must be off before the module can be safely removed.

▼ To Remove the ARTM-FC

1. **Deactivate the ARTM-FC from the shelf manager, or manually deactivate the ARTM-FC by unlatching the top latch and waiting for the blue LED to light steady.**

   For example, to deactivate just the ARTM-FC in slot 1, log into the shelf manager and type:

   ```
   clia deactivate 9a 3
   ```

   where "9a" is the hex address for slot 1, and '3' is the ARTM-FC in slot 1.

   Alternatively, to deactivate both the ARTM-FC and its companion node board, type:

   ```
   clia deactivate board 1
   ```

2. **Loosen the locking screws on the ARTM-FC.**

3. **Pull the ARTM-FC out of the card slot.**

4. **If the card slot is to remain empty, install a filler panel in the slot.**

5. **Reactivate the node board, if necessary.**

2.5 Changing the OOS LED Color

The color of the Out-of-service (OOS) LED can be set to red or amber by moving jumper E21 to the appropriate position. Setting the jumper to the 1-2 position makes the OOS LED appear red (default setting). Setting the jumper to the 2-3 position makes the OOS LED appear amber.

MMC and IPMI

This chapter describes the Module Management Controller and Intelligent Platform Management Interface.

This chapter contains the following sections:

3.1 MMC and IPMI Functions

The Netra CP32x0 ARTM-FC module includes a Modular Management Controller (MMC) that communicates with the ATCA blade using the Intelligent Platform Management Interface (IPMI).

The MMC software complies with PICMG AMC 0.RC1.1.

The MMC provides a variety of functions including the following:

- Supports hot-swap operation as defined in the AMC.0 specification
- Supports e-Keying, as described in the AMC.0 specification
- Monitors inlet air temperature
- Monitors onboard voltage monitoring
- Stores FRU information, sensor records, and e-Keying data using an external EEPROM
- Complies with the Hardware Platform Management (HPM) IPMI Controller Firmware Upgrade specification
- Supports firmware rollback using an external flash
- Controls onboard HOT SWAP, OOS, and OK LEDs
- Controls onboard power sequencing and device resets
- Optional I^2C control of GbE SFPs

The MMC implementation conforms to the ARTM port commands specified in the AdvancedTCA specification. An ATCA board communicates to the ARTM using site ID 15, and thus an IPMB-L address of 0x8E. The IPMB-L is monitored by an I^2C buffer that prevents bus lockups and conflicts at ARTM insertion.

3.2 IPMI Commands

The MMC communicates with the blade management controller (BMC) via the local IPMB. The Netra CP32x0 ARTM-FC supports the following IPMI 2.0 commands per the AMC.0 specification:

TABLE 3-1   IPMI Commands

Request	CMD
IPM Device Global Commands (App NetFn = 0x06)	
Get Device ID	(0x01)
Get Self Test Results	(0x04)
Event Commands (Sensor/Event NetFn = 0x04)	
Set Event Receiver	(0x00)
Get Event Receiver	(0x01)
Platform Event	(0x02)
Sensor Device Commands (Sensor/Event NetFn = 0x04)	
Set Event Receiver	(0x00)
Get Event Receiver	(0x01)
Event Message	(0x02)
Get Device SDR Info	(0x20)
Get Device SDR	(0x21)
Reserve Device SDR Repository	(0x22)
Get Sensor Reading	(0x2D)
Set Sensor Hysteresis	(0x24)
Get Sensor Hysteresis	(0x25)
Set Sensor Thresholds	(0x26)
Get Sensor Thresholds	(0x27)
FRU Device Commands (Storage NetFn = 0x0A)	
Get FRU Inventory Area	(0x10)
Read FRU Data	(0x11)
Write FRU Data	(0x12)

TABLE 3-1   IPMI Commands *(Continued)*

Request	CMD
Application Extension Commands (Extension NetFn = 0x2C)	
Get PICMG Properties	(0x00)
FRU Control	(0x04)
Get FRU LED Properties	(0x05)
Get LED Color Capabilities	(0x06)
Set FRU LED State	(0x07)
Get FRU LED State	(0x08)
Get Device Record Locator ID	(0x0D)
Set AMC Port State	(0x19)
Get AMC Port State	(0x1A)
OEM Extension Commands (OEM NetFn = 0x32)	
SDR Initialization	(0x20)
FRU Initialization	(0x21)
HPM.1 Extension Commands (Extension NetFn = 0x2C)	
Get target upgrade capabilities	(0x2E)
Get component properties	(0x2F)
Abort firmware upgrade	(0x30)
Initiate upgrade action	(0x31)
Upload firmware block	(0x32)
Finish firmware upload	(0x33)
Get upgrade status	(0x34)
Activate firmware	(0x35)
Query self-test results	(0x36)
Query rollback status	(0x37)
Initiate manual rollback	(0x38)

3.3 FRU Information

The Netra CP32x0 ARTM-FC contains FRU information in non-volatile memory as definedin AMC.0. This includes general information about the product (model number, manufacturer's name, etc.) and information necessary for proper e-Keying with the carrier. The parsed FRU information is as follows:

```
Common Header:    Format Version = 1

Board Info Area:
    Version    = 1
    Language Code            = 0
   Mfg Date/Time            = Oct 29 15:30:00 2007 (6220290 minutes since 1996)
    Board Manufacturer       = GE FANUC
    Board Product Name       = RTM2-000000
    Board Serial Number      = 1234567890
    Board Part Number        = 350-9300800487-000000
    FRU Programmer File ID   = 04-14-08

Product Info Area:
    Version    = 1
    Language Code            = 0
    Manufacturer Name        = GE FANUC
    Product Name             = ARTM-FC
    Product Part / Model#    = 375-3514-01
    Product Version          = 50
    Product Serial Number    = 1898HSV-YYWW01SSSS
    Asset Tag                = 04
    FRU Programmer File ID   = 04-14-08

Multi Record Area:
    Module Current Requirements Record (ID=0x16)
        Version = 0

    AMC Point-to-Point Connectivity Record (ID=0x19)
        Version = 0

    Record Format Version    = 0x00
```

Note – The FRU information shown above serves as an example and could change without notice.

3.4 ARTM e-Keying

The Netra CP32x0 ARTM-FC contains custom Common Option and Extended port connections are as follows:

TABLE 3-2 Port and Link Information

Channel	Port	Link Type	Link Type Extension	ARTM PIN Groups
0	0	AMC.2 Ethernet	1000BASE-BX Ethernet Link	P32 A8, B8, C8, D8
1	1	AMC.2 Ethernet	1000BASE-BX Ethernet Link	P32 A9, B9, C9, D9
2	30	AMC.2 Ethernet	1000BASE-BX Ethernet Link	P32 A10, B10, C10, D10
4	2	AMC.1 PCI Express	Gen1 capable	P33 A1, B1, C1, D1
4	3	AMC.1 PCI Express	Gen1 capable	P33 A2, B2, C2, D2
4	4	AMC.1 PCI Express	Gen1 capable	P33 A3, B3, C3, D3
4	5	AMC.1 PCI Express	Gen1 capable	P33 A4, B4, C4, D4
3	6	AMC.1 PCI Express	Gen1 capable	P33 A5, B5, C5, D5
3	7	AMC.1 PCI Express	Gen1 capable	P33 A6, B6, C6, D6
3	8	AMC.1 PCI Express	Gen1 capable	P33 A7, B7, C7, D7
3	9	AMC.1 PCI Express	Gen1 capable	P33 A8, B8, C8, D8

3.5 Sensor Data Records

The following sensors are supported by the Netra CP32x0 ARTM-FC. Their states can be read using the "Get Sensor Reading" request.

TABLE 3-3 Netra CP32x0 ARTM-FC Sensors

Sensor Number	Signal Type	Sensor Type	Signal Monitored
1	Reserved		
2	Event	Discrete	Hot swap switch
3	Voltage	Threshold	+12 VDC
4	Voltage	Threshold	+3.3 VDC

TABLE 3-3   Netra CP32x0 ARTM-FC Sensors *(Continued)*

Sensor Number	Signal Type	Sensor Type	Signal Monitored
5	Voltage	Threshold	+1.8 VDC
6	Voltage	Threshold	+1.5 VDC
7	Voltage	Threshold	+1.2 VDC
8	Voltage	Threshold	+1.0 VDC #1
9	Voltage	Threshold	+1.0 VDC #2
10	Reserved		
11	Temperature	Threshold	8051 Internal Temp.
12	Temperature	Threshold	LM74 #1 (U36)
13	Temperature	Threshold	LM74 #2 (U34)

TABLE 3-4   Threshold Values for Voltage Sensors

Sensor Threshold	Description (% of nominal)
Upper Non-Critical	1.05%
Lower Non-Critical	0.95%
Upper Critical	1.10%
Lower Critical	0.90%
Upper Non-Recoverable	1.15%
Lower Non-Recoverable	0.85%
Normal Max	1.03%
Normal Min	0.97%

TABLE 3-5   Threshold Values for Temperature Sensors

Sensor Threshold	Temperature (in Celcius)
Nominal Temperature	30°
Normal Max	40°
Normal Min	20°
High	45°

TABLE 3-5 Threshold Values for Temperature Sensors *(Continued)*

Sensor Threshold	Temperature (in Celcius)
Low	10˚
Upper Critical	55˚
Lower Critical	0˚
Upper Non-Recoverable	65˚
Lower Non-Recoverable	-10˚

These sensor data records (SDRs) are available in the Netra CP32x0 ARTM-FC and can be accessed by using the "Get Device SDR" request. For sensors #2-13, the SDR record type is 0x01 (Full Sensor Record). Sensor #1 has an SDR record type of 0x12 (Management Controller Device Locator Record). Sensors #2-13 generate events.

Specifications, Components, and Connectors

This chapter contains information on the specifications, components, and connectors for the Sun Netra CP32x0 ARTM-FC.

This chapter contains the following sections:

4.1 Specifications

This section provides mechanical, electrical, environmental, and other relevant specifications for the Sun Netra CP32x0 ARTM-FC.

4.1.1 Physical Dimensions

The Sun Netra CP32x0 ARTM-FC is a 6U (322.25 mm) height board with 81 mm in depth for standard applications. It complies with IEEE 1101.11 mechanical standards, as required by the PICMG 2.0 Revision 3.0 specification. The Sun Netra CP32x0 ARTM-FC is keyed to conform to the PICMG 2.10, Keying of ATCA Boards and Backplane specification.

4.1.2 Power Requirements

The power consumption of the ARTM-FC card is limited to 25 W maximum. The 3.3 V management power is limited to 150 mA and the current limit set point for the 12 V payload power is 2.5 A.

4.1.3 Electrical Requirements

The Sun Netra CP32x0 ARTM-FC is powered through the Netra ATCA node board. The node board provides the following voltages: 3.3 V and 12 V.

4.1.4 Thermal Requirements

TABLE 4-1 shows the Sun Netra CP32x0 ARTM-FC airflow requirements. TABLE 4-2 and FIGURE 4-1 show the worst-case pressure drop as a function of air flow rate.

**TABLE 4-1** Airflow Requirements

Watts	m³/min				CFM			
Power Level	25°C	28°C	40°C	55°C	25°C	28°C	40°C	55°C
25	0.062	0.071	0.102	0.142	2.2	2.5	3.6	5

TABLE 4-2　RTM Pressure Drop

Volumetric Flow Rate (CFM)	Volumetric Flow Rate (m³/min)	Pressure Drop (Pa)	Pressure Drop (inches of H$_2$O)
0	0.0000	0.0000	0.0000
1	0.0283	0.0284	0.0001
2	0.0566	0.0974	0.0004
3	0.0850	0.2169	0.0009
4	0.1133	0.3785	0.0015
5	0.1416	0.5817	0.0023
6	0.1699	0.8182	0.0033
7	0.1982	1.0834	0.0044
8	0.2265	1.3872	0.0056
9	0.2549	1.8202	0.0073
10	0.2832	2.0729	0.0083

FIGURE 4-1　RTM Pressure Drop
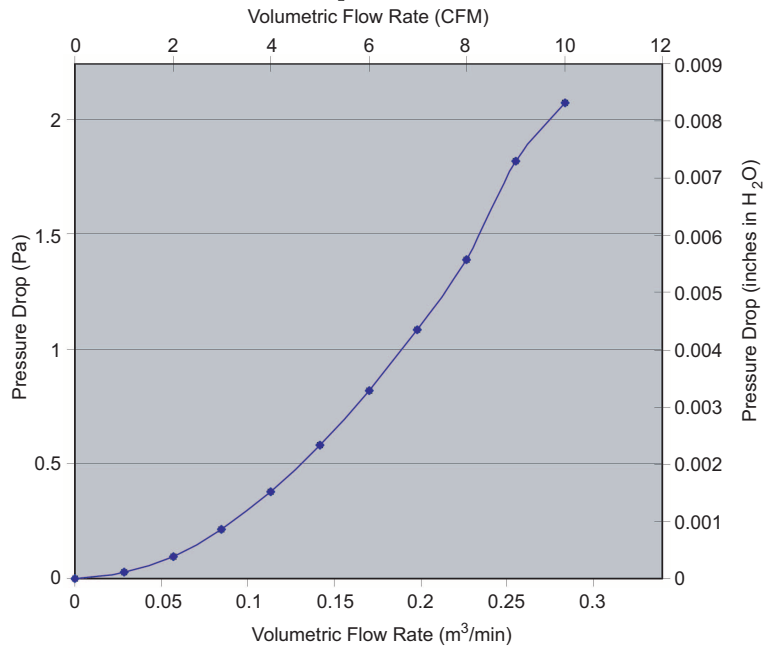
4.1.5 Environmental Specifications and Compliance

The environmental specifications for the Sun Netra CP32x0 ARTM-FC assembly are as follows.

TABLE 4-3 Environmental Specifications

Specification	Value
Operating Temperature (airflow 5.0 CFM)	0°C ~ 55°
Operating Temperature (airflow 2.0 CFM)	0°C ~ 23°
Storage Temperature	-40° ~ 85°
Operating Shock	See PICMG 3.0 specification, Regulatory guidelines
Operating Vibration	See PICMG 3.0 specification, Regulatory guidelines
RoHS	6 of 6 compliant

4.2 Hardware Components

The Sun Netra CP32x0 ARTM-FC maximizes communications input/output (I/O) for GbE networks by providing four fixed 10BASE-T, 100BASE-TX, or 1000BASE-T ports and two modular SFP ports, controlled by a device on the ATCA blade, on a single module.

The Sun Netra CP32x0 ARTM-FC contains the following components and connectors. See FIGURE 4-2 for a block diagram and Section 4.3, "Connectors and Pin Assignments" on page 4-8.

- Two Dual GbE controllers
- 24-lane PCI-Express switch
- IPMI Controller for module management
- Four fixed GbE ports (copper RJ-45 connectors)
- Two modular GbE ports (SFP modules)
- Two Fibre Channel ports (SFP modules)
- One x4 PCI-E cable connector
- One RS-232 Serial Management port (RJ-45 connector)
- One LAN Management port (RJ-45 connector)
- Three User I/O and One Power/Management Zone 3 connectors

The Sun Netra CP32x0 ARTM-FC contains a x8 PCI-E connection that complies with the AMC.1 specification. This PCI-E is switched into four x4 ports: one to each of the two Ethernet controllers, one to a x4 PCI-E cable connector, and one to the Fibre Channel controller. The onboard Emulex IOC3532 controller supports two Fibre Channel ports with fabric switching for high speed and high capacity storage access. The two onboard Intel 82571EB controllers support four fixed GbE copper ports. The other two GbE ports are supported by the Ethernet controller on the host board using a SERDES protocol.

The RS-232 serial port and the LAN Management port are used for managing the host ATCA blade.

4.2.1 Ethernet Management Port

The Sun Netra CP32x0 ARTM-FC provides one 10/100/1000BASE-T Ethernet management port as an RJ-45 connector equipped with LEDs.

4.2.2 Serial Port

The Sun Netra CP32x0 ARTM-FC provides one asynchronous RJ-45 serial port as an RJ-45 connector. The serial port may be redirected to and from the front node board when using an ARTM-FC-compatible node board. For more information on using both the front and rear serial ports, refer to the appropriate node board documentation.

4.2.3 Module Management Controller

The onboard MMC provides IPMI management communication between the ARTM-FC and the node board, and local monitoring of temperature and voltage. The MMC also controls the Hot-swap function.

4.2.4 Hot-swap Handle Latch

The Hot-swap latch allows for easy module replacement during live operation.

4.2.5 FRU PROM

The Sun Netra CP32x0 ARTM-FC contains an IPMI FRU PROM compatible with the ATCA specification.

4.2.6 PCI-Express Switch

The PCI-Express Switch is used to aggregate the two Ethernet Controllers, Fibre Channel Controller, and external PCI-E cable connector into a x8 PCI-E port connected to the rear I/O of the ARTM-FC via the Zone 3 connectors. Each of these devices is connected by a x4 port to the PCI-Express Switch.

4.2.7 Fibre Channel

The Sun Netra CP32x0 ARTM-FC supports two Fibre Channel ports provided by the onboard Emulex IOC3532 controller. These ports connect to SFP modules. The controller supports Fibre Channel link speeds of 1, 2, and 4 Gbps. These rates are software-selectable, but may be limited by the capability of the module installed.

Firmware for the Fibre Channel controller, including x86 and SPARC$^{©}$ boot BIOS, is included and can be configured using Emulex utilities. The boot BIOS settings can be accessed during the boot sequence.

4.2.8 Ethernet

4.2.8.1 10BASE-T

A network based on the 10BASE-T standard uses unshielded twisted-pair cables, providing an economical solution to the networking by allowing the use of existing telephone wiring and connectors. The RJ-45 connector is used with the 10BASE-T standard. 10BASE-T has a maximum length of 100 meters.

4.2.8.2 100BASE-TX

The Sun Netra CP32x0 ARTM-FC also supports the 100BASE-TX Ethernet. A network based on a 100BASE-TX standard uses unshielded twisted-pair cables and an RJ-45 connector. 100BASE-TX has a maximum length of 100 meters.

4.2.8.3 1000BASE-T

The Sun Netra CP32x0 ARTM-FC supports GbE offering speeds of 1000 Mbps. It is fully compatible with existing Ethernet, as it uses the same CSMA/CD and MAC protocols. 1000BASE-T has a maximum length of 3000 meters using Single-mode fiber-optic cables.

4.2.9 Two Dual GbE Controllers

Each dual GbE controller supports two fixed GbE ports via copper RJ-45 connectors. The controllers support 10BASE-T, 100BASE-TX, and 1000BASE-T operational modes, which comply with IEEE 802.3 (802.3u, 802.3ab) specifications, and TCP segmentation and checksum offloading, reducing the host CPU utilization. Each port features auto-negotiations and automatic MDI/MDIX switchover on RJ-45 ports to enable greater compatibility with existing devices and infrastructures. Both full duplex and half-duplex modes are supported in 10BASE-T and 100BASE-TX modes. The 1000BASE-T mode supports only full-duplex operations.

Each dual GbE controller supports boot over LAN using a PXE boot ROM, which can be configured during the boot sequence. This firmware appears to the protocol stack as ordinary MAC layer interfaces and is ready to use without modifications. The protocol stack simply interfaces to a MAC-layer driver, which communicates to the onboard GbE MACs through the PCI-Express bus.

4.2.10 GbE SFP Ports

The Sun Netra CP32x0 ARTM-FC supports two GbE ports connected directly to the Ethernet controller on the host board using a SERDES protocol. These ports connect to SFP modules. The module type (fiber or copper) is user-configurable.

4.3 Connectors and Pin Assignments

FIGURE 4-2 is an illustration of the Sun Netra CP32x0 ARTM-FC connectors, switches, and headers.

FIGURE 4-2   Sun Netra CP32x0 ARTM-FC Connectors
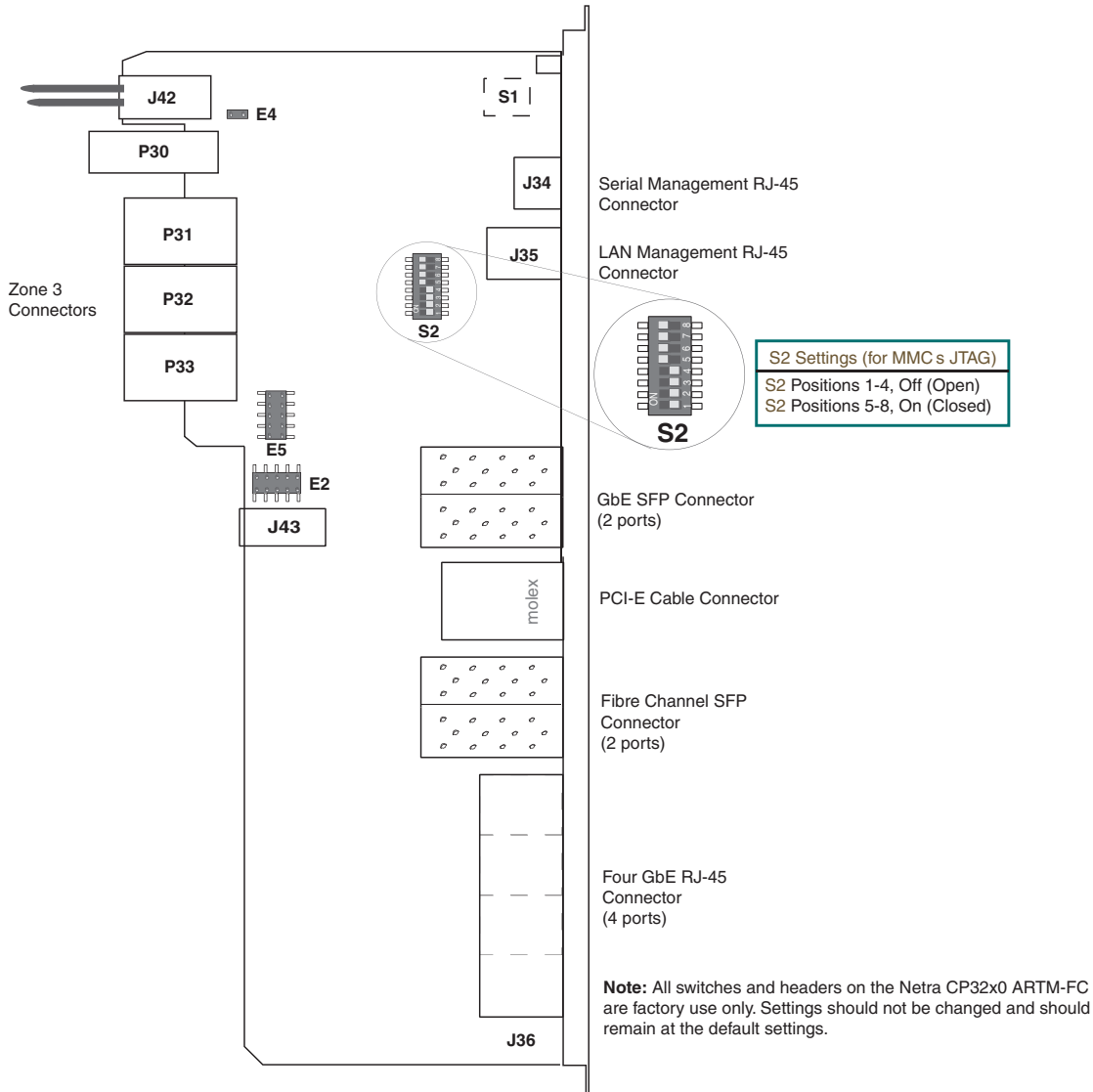
Note – All switches and headers on the Sun Netra CP32x0 ARTM-FC are **factory-use only**.

TABLE 4-4   Description of Connectors

Connector	Description
J36	Local MDI GbE RJ-45 Connector (contains four ports)
J40	External PCI-E Cable Connector
J34	RS232 Serial Management Port RJ-45 Connector
J35	LAN Management Port Connector
J38	GbE SFP Connector (contains 2 ports)
J37	Fibre Channel SFP Connector (contains 2 ports)
P31, P32, P33	Backplane Connectors for Zone 3
P30	Power Management Connector
J42, J43	Guide Modules - for proper keying and alignment to the appropriate node board

4.3.1   I/O Connectors

The Sun Netra CP32x0 ARTM-FC provides the following I/O connectors.

- One RJ-45 connector for LAN Management
- One RJ-45 connector for Serial Management
- One GbE SFP connector (contains two ports)
- One GbE RJ-45 connector (contains four individual GbE ports)
- One external PCI-E connector
- One Fibre Channel SFP connector (contains two ports)

4.3.1.1 LAN and Serial Management Connectors (J35 and J34)

FIGURE 4-3 illustrates the connectors for the LAN and Serial Management. TABLE 4-5 shows the pin assignments for the LAN connector and TABLE 4-6 shows the pin assignments for the serial connector.

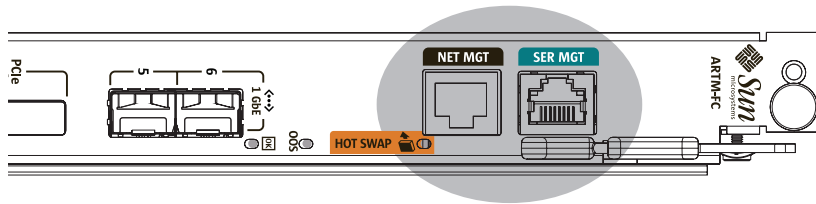**FIGURE 4-3** LAN and Serial Management Connectors (J35 and J34)

TABLE 4-5 LAN Management Connector Pin Assignments (J35)

Pin	Name	Description
1	BI_DA+	Bi-directional pair A +
2	BI_DA-	Bi-directional pair A -
3	BI_DB+	Bi-directional pair B +
4	BI_DC+	Bi-directional pair C +
5	BI_DC-	Bi-directional pair C -
6	BI_DB-	Bi-directional pair B -
7	BI_DD+	Bi-directional pair D +
8	BI_DD-	Bi-directional pair D -

Note – All four ports have the same pinouts.

TABLE 4-6 Serial Management Connector Pin Assignment (J34)

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

4.3.1.2 GbE SFP Connector (J38)

This connector provides two ports supporting modules for either copper cable or optical fiber. The ports can be either both copper or both optical, or one can be copper and the other optical. (The ports are independent of each other.)

FIGURE 4-4 GbE SPF Connector (J38)
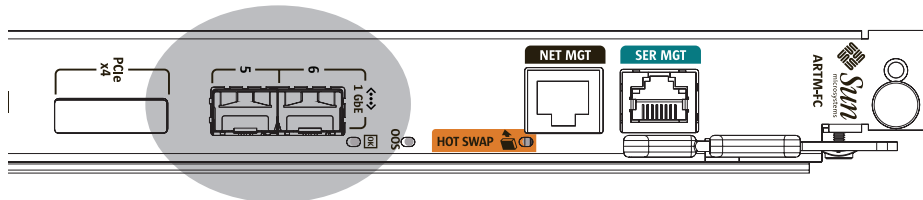
TABLE 4-7 GbE SFP Connector Pin Assignments (J38)

Port 5		Port 6	
Pin	Signal Name	Pin	Signal Name
1	GND	1	GND
2	SERDES_GIGE1_TXFAULT_SFP	2	SERDES_GIGE2_TXFAULT_SFP
3	SERDES_GIGE1_TX_DIS	3	SERDES_GIGE2_TX_DIS
4	SERDES_GIGE1_SDA	4	SERDES_GIGE2_SDA
5	SERDES_GIGE1_SCL	5	SERDES_GIGE2_SCL

TABLE 4-7   GbE SFP Connector Pin Assignments (J38) *(Continued)*

Port 5		Port 6	
Pin	**Signal Name**	**Pin**	**Signal Name**
6	SERDES_GIGE1_PRESENCE#	6	SERDES_GIGE2_PRESENCE#
7	SERDES_GIGE1_RATESEL	7	SERDES_GIGE2_RATESEL
8	SERDES_GIGE1_LOS	8	SERDES_GIGE2_LOS
9	GND	9	GND
10	GND	10	GND
11	GND	11	GND
12	SERDES_GIGE1_RX-	12	SERDES_GIGE2_RX-
13	SERDES_GIGE1_RX+	13	SERDES_GIGE2_RX+
14	GND	14	GND
15	SERDES_GIGE1_VCC_RX	15	SERDES_GIGE2_VCC_RX
16	SERDES_GIGE1_VCC_TX	16	SERDES_GIGE2_VCC_TX
17	GND	17	GND
18	SERDES_GIGE1_TX+	18	SERDES_GIGE2_TX+
19	SERDES_GIGE1_TX-	19	SERDES_GIGE2_TX-
20	GND	20	GND

4.3.1.3   PCI-Express Cable Connector (J40)

This connector provides support for one external x4 PCI-E cable connection.

FIGURE 4-5   PCI-E Cable Connector (J40)
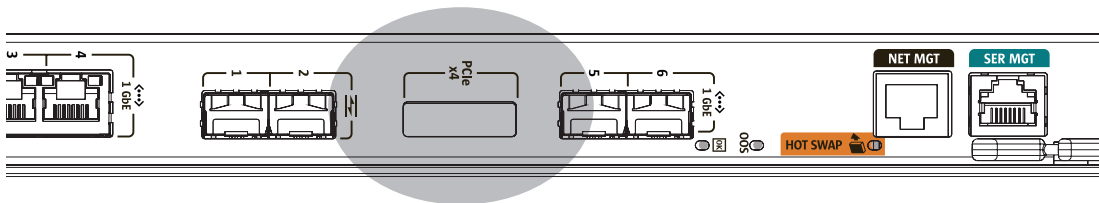
TABLE 4-8 PCI-E Cable Connector Pin Assignment (J40)

Pin (Row A)	Signal Name	Pin (Row B)	Signal Name
1	GND	1	GND
2	TX[0]+	2	RX[0]+
3	TX[0]-	3	RX[0]-
4	GND	4	GND
5	TX[1]+	5	RX[1]+
6	TX[1]-	6	RX[1]-
7	GND	7	GND
8	TX[2]+	8	RX[2]+
9	TX[2]-	9	RX[2]-
10	GND	10	GND
11	TX[3]+	11	RX[3]+
12	TX[3]-	12	RX[3]-
13	GND	13	GND
14	CLK+	14	3.3V
15	CLK-	15	3.3V
16	GND	16	GND
17	SB_RTN	17	GND
18	CPRSNT#	18	No Connection
19	CPWRON	19	CPERST#

4.3.1.4 Fibre Channel SFP Connector (J37)

This connector provides two ports for Fibre Channel, using optical fiber only.

FIGURE 4-6 Fibre Channel SFP Connector (J37)
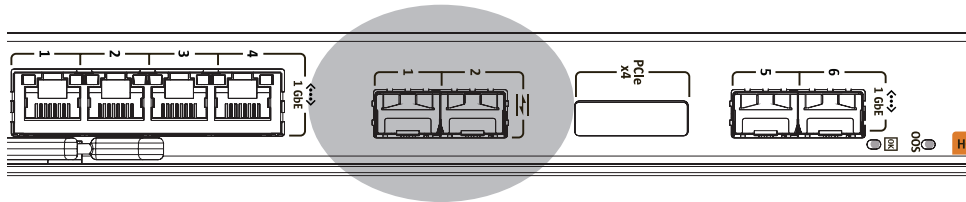
TABLE 4-9 Fibre Channel SFP Connector Pin Assignments (J37)

	Port 1		Port 2
Pin	Signal Name	Pin	Signal Name
1	GND	1	GND
2	FC1_TXFAULT	2	FC2_TXFAULT
3	FC1_TX_DIS	3	FC2_TX_DIS
4	FC1_SDA	4	FC2_SDA
5	FC1_SCL	5	FC2_SCL
6	FC1_PRESENCE#	6	FC2_PRESENCE#
7	FC1_RATESEL	7	FC2_RATESEL
8	FC1_LOS	8	FC2_LOS
9	GND	9	GND
10	GND	10	GND
11	GND	11	GND
12	FC1_RX-	12	FC2_RX-
13	FC1_RX+	13	FC2_RX+
14	GND	14	GND
15	FC1_VCC_RX	15	FC2_VCC_RX
16	FC1_VCC_TX	16	FC2_VCC_TX

TABLE 4-9   Fibre Channel SFP Connector Pin Assignments (J37) *(Continued)*

	Port 1		Port 2
Pin	**Signal Name**	**Pin**	**Signal Name**
17	GND	17	GND
18	FC1_TX+	18	FC2_TX+
19	FC1_TX-	19	FC2_TX-
20	GND	20	GND

4.3.1.5   GbE RJ-45 Copper Connector (J36 A-D)

All four GbE RJ-45 copper ports are encompassed in this one connector (see FIGURE 4-7). They are arranged from bottom to top, labeled 1 through 4. (These ports are independent of each other.) TABLE 4-10 lists the basic signal names.

FIGURE 4-7   GbE RJ-45 Copper Connector (J36)
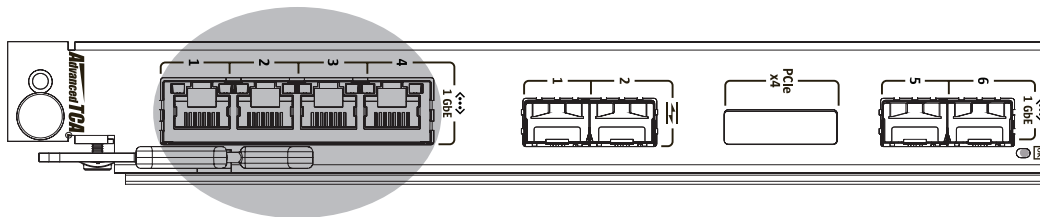
TABLE 4-10   GbE RJ-45 Connector Pin Assignments (J36)

Pin	Name	Description
1	BI_DA+	Bi-directional pair A +
2	BI_DA-	Bi-directional pair A -
3	BI_DB+	Bi-directional pair B +
4	BI_DC+	Bi-directional pair C +
5	BI_DC-	Bi-directional pair C -
6	BI_DB-	Bi-directional pair B -
7	BI_DD+	Bi-directional pair D +
8	BI_DD-	Bi-directional pair D -

4.3.2 Zone 3 Connectors

The I/O connections for rear access are provided by the Netra node board through the Zone 3 connectors. The Zone 3 I/O connectors are P31, P32, and P33. The Zone 3 connectors are shown in FIGURE 4-8. The pin assignments for P32 and P33 are in TABLE 4-11 and TABLE 4-12. P31 is not used on the Sun Netra CP32x0 ARTM-FC.

P30 (Power/Management connector) is also part of Zone 3. See FIGURE 4-9 and TABLE 4-13 for the illustration and pin assignments.

FIGURE 4-8   Backplane Connectors for Zone 3
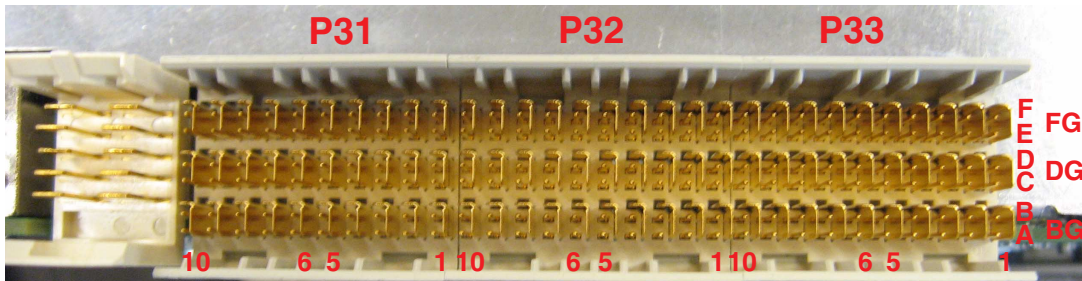
TABLE 4-11   Zone 3, P32 Pin Assignments

Pin	Row A Signal	Row B Signal	Row C Signal	Row D Signal	Row E Signal	Row F Signal
1	N/C	N/C	N/C	N/C	N/C	N/C
2	N/C	N/C	N/C	N/C	RS232_RTS#	RS232_DTR#
3	N/C	N/C	N/C	N/C	RS232_TXD	RS232_RXD
4	N/C	N/C	N/C	N/C	RS232_DSR#	RS232_CTS#
5	N/C	N/C	N/C	N/C	N/C	N/C
6	MGMT_LAN_A+	MGMT_LAN_A-	MGMT_LAN_CTV	MGMT_LAN_ACTV	MGMT_LAN_B+	MGMT_LAN_B-
7	MGMT_LAN_C+	MGMT_LAN_C-	MGMT_LAN_ACT#	MGMT_LAN_LINK#	MGMT_LAN_D+	MGMT_LAN_D-
8	GIGE1_RX+	GIGE1_RX-	GIGE1_TX+	GIGE1_TX-	N/C	N/C
9	GIGE2_RX+	GIGE2_RX-	GIGE2_TX+	GIGE2_TX-	GIGE4_RX+	GIGE4_RX-
10	GIGE3_RX+	GIGE3_RX-	GIGE3_TX+	GIGE3_TX-	GIGE4_TX+	GIGE4_TX-

Note – N/C indicates No Connection

TABLE 4-12   Zone 3, P33 Pin Assignment

Pin	Row A Signal	Row B Signal	Row C Signal	Row D Signal	Row E Signal	Row F Signal
1	PCIE_RX[0]+	PCIE_RX[0]-	PCIE_TX[0]+	PCIE_TX[0]-	PCIE_CLK+	PCIE_CLK-
2	PCIE_RX[1]+	PCIE_RX[1]-	PCIE_TX[1]+	PCIE_TX[1]-	N/C	N/C
3	PCIE_RX[2]+	PCIE_RX[2]-	PCIE_TX[2]+	PCIE_TX[2]-	N/C	N/C
4	PCIE_RX[3]+	PCIE_RX[3]-	PCIE_TX[3]+	PCIE_TX[3]-	N/C	N/C
5	PCIE_RX[4]+	PCIE_RX[4]-	PCIE_TX[4]+	PCIE_TX[4]-	N/C	N/C
6	PCIE_RX[5]+	PCIE_RX[5]-	PCIE_TX[5]+	PCIE_TX[5]-	TCK	TMS
7	PCIE_RX[6]+	PCIE_RX[6]-	PCIE_TX[6]+	PCIE_TX[6]-	TRST#	TDI
8	PCIE_RX[7]+	PCIE_RX[7]-	PCIE_TX[7]+	PCIE_TX[7]-	TDO	PCIE_RST#
9	N/C	N/C	N/C	N/C	GND	PCI_CFG
10	N/C	N/C	N/C	N/C	PS1#	MMC_EN#

FIGURE 4-9   Power/Management Connector (P30) for Zone 3
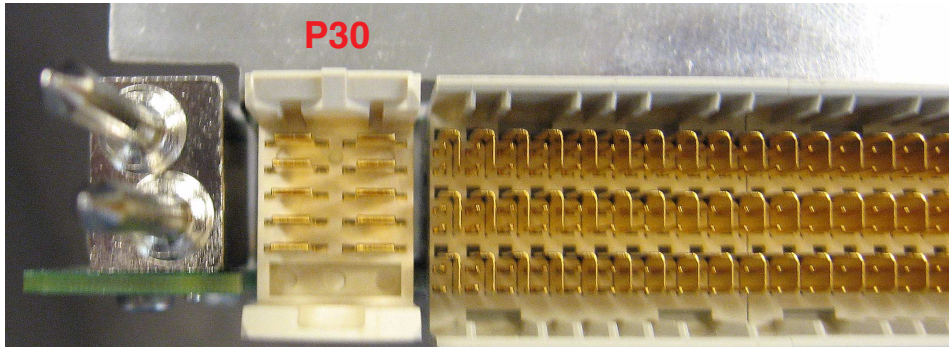
TABLE 4-13   Zone 3, P30 (Power/Management Connector) Pin Assignment

Pin	Signal	Pin	Signal
A1, A2, A3	GND	A4, A5, A6	Shelf_GND
B1, B2, B3	GND	B4, B5, B6	VCC_3.3V MP_SRC
C1, C2, C3	IPMI_SCL	C4, C5, C6	IPMI_SDA
D1, D2, D3	VCC_12V	D4, D5, D6	VCC_12V
E1, E2, E3	PS1#	E4, E5, E6	No Connection

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