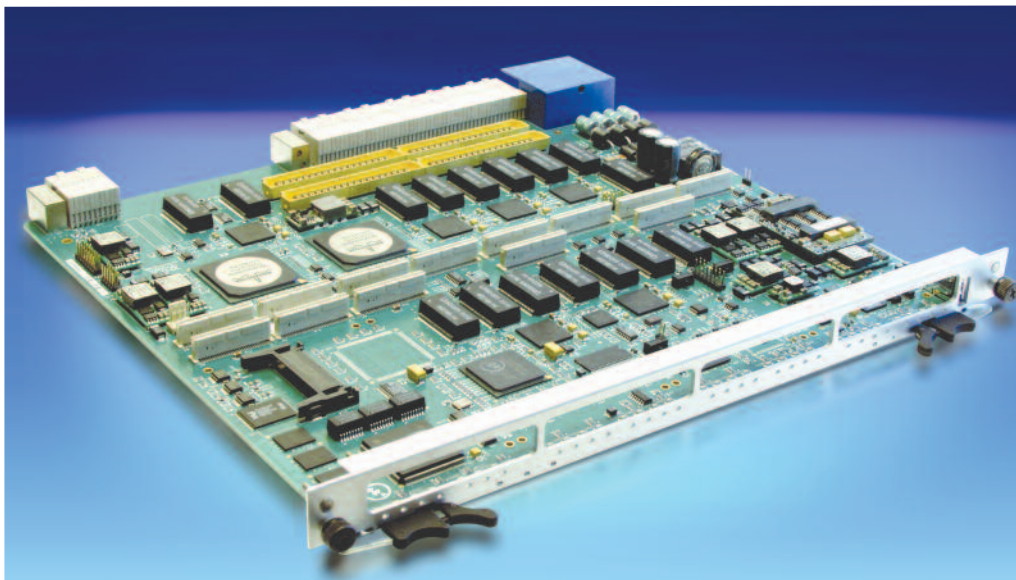


# ZX6000 with OpenArchitect®

## ATCA Modular Switching Platform

### ***Gigabit Ethernet Modular Switching Platform for AdvancedTCA® Chassis***



#### **PRODUCT DESCRIPTION**

The ZX6000 is a 24-port AdvancedTCA® Hub board / PTMC Carrier, providing switched Gigabit Ethernet service for up to 14 node boards via the PICMG 3.0 Base Interface. The ZX6000 provides a tightly integrated modular switching platform that enables high-density solutions with the addition of onboard PMC/PTMC sites.

Linux-based OpenArchitect® 3 runs on the embedded Freescale MPC8270VR, providing a comprehensive package for the management of Layer 2 and Layer 3 packet switching. VLAN management and Layer 2-7 packet classification are also included with a user-friendly interface. OpenArchitect may be used with a variety of IP routing protocols.

Up to 8 switch egress ports are provided, depending on chassis/switch configuration, and one port is dedicated to the switch-to-switch connection in redundant configurations. For additional management connections, a USB, RS-232 serial, and three out-of-band 10/100 Ethernet ports are available for local configuration.

#### **PTMC CARRIER**

Four standards-based PMC/PTMC slots allow for significant expansion of possible applications. Each slot may host additional memory, I/O, processing or packet-processing capability. Accessories for the ZX6000 include two and four-port breakout cards for Gigabit Ethernet, out-of-band Ethernet, and RS-232 connections.

#### **FAULT TOLERANT BACKPLANE**

Two ZX6000 AdvancedTCA® switches can be used in a standard ATCA chassis to implement a fully redundant dual star network architecture over the base and fabric interface. Each payload slot has two Base Interface connections, one to each switch. With the OpenArchitect High Availability (HA) software suite, the chassis can respond and automatically correct any single point of failure.

#### **Features**

- 24-port GigE Non-Blocking Switch Fabric
  - Supports 14 or 16 slot ATCA chassis
  - 12 or 14 PICMG 3.0 Base Interface Ports
  - Up to 8 Gigabit Ethernet Egress RJ-45 Ports
  - Switch-Switch Link
  - One or two Shelf Manager (ShMC) Links
- Four PMC/PTMC, Option 5 GigE sites (2.0Gb/s)
- Optional RTM
  - Two RS-232 Management Ports
  - Two 10/100 Ethernet Management Ports
  - up to Six Switched GigE RJ-45 Ports
- OpenArchitect 3 w/ Linux Kernel
- Wire-speed L2/L3 Switching
- Wire-speed L2 - L7 Packet Classification
- IEEE 802.1Q 4096 VLANs
- Linux shell management
- SNMP v1, v2, v3 management
- HTTP Browser-based management
- SSH Secure Shell
- IEEE 802.1p Class-of-Service
- DHCP Server/Client/Relay
- Network Time Protocol (NTP)
- VRRP
- Link Aggregation
- Link Aggregation Control Protocol (LACP)
- Port Mirroring
- Load Balancing
- COPS
- DiffServ
- OSPF v1, v2
- RIP v1, v2
- BGP/EGP
- IEEE 802.1D Spanning Tree (STP)
- Rapid Spanning Tree (RSTP)
- Per-VLAN Spanning Tree (MSTP)
- GARP-based Multicast Protocol (GMRP)
- GARP-based VLAN Protocol (GVRP)
- PowerPC® Processor
- 256MB SDRAM
- 48MB FlashROM
- CompactFlash socket for additional storage
- USB
- Real Time Clock with capacitor backup
- IPMI Controller

# ZNYX ZX6000 AdvancedTCA Modular Switching Platform

Fabric Switch / PTMC Carrier for high performance AdvancedTCA platforms.

## BACKPLANE

The ZX6000 supports all the features required of an ATCA hub subsystem with a total of 24 Gigabit Ethernet ports in both non-redundant and dual-star architectures. Re-configuration options allow both 14 and 16 slot ATCA chassis to be supported. In a 14-slot chassis, the surplus ports may be used for alternate purposes such as chassis egress.

Payload boards requiring PICMG 3.0 Base Interface may be used. With a fully non-blocking fabric and the VLAN control of OpenArchitect, the system designer can guarantee available bandwidth and separation between control and data planes.

## PICMG 3.0 BASE INTERFACE

The base interface supports IEEE 802.3-compliant auto-negotiated 10/100/1000BaseT Ethernet. The ZX6000 supports 12 or 14 payload slots via the base interface. ATCA applications may dedicate this interface for control-plane or data-plane traffic. Switch ports are also allocated for egress to the chassis, the Shelf-Manager (ShMC), and an inter-switch link for dual-switch installations.

## UNIQUE MODULAR PLATFORM

The ZX6000 may be upgraded to PICMG 3.1 or other ATCA data-plane standards such as PICMG 3.2 (Infiniband) or PICMG 3.4 (ASI Switching). The ZNYX roadmap includes several options, protecting the investment of the customer-base by accommodating new payload boards as they are introduced into the market.

## CONFIGURABLE

The ZX6000 can be configured to a variety of port/egress configurations. See the Configuration Guide for details.

## PMC/PTMC

A key feature that enables the true application flexibility of the ZX6000 are the four PMC/PTMC sites. These allow industry-standard third-party function boards to be hosted on the ZX6000. In some cases this eliminates the need to use an ATCA payload slot for the same purpose, improving the density of the system chassis while

- System Logging
- Chassis Firewall
- NAT
- System Boot Servers and File Servers
- T1/E1 or T3 Egress gateway
- ATM interface
- IPv6 migration
- Supplemental Out-of-Band ports
- Packet Processing

gaining a cost advantage. Functions can include a variety of I/O boards, supplemental processors, memory devices, and packet processors. The flexibility and power of the Linux-based OpenArchitect software allows fast implementation of features such as:

## ATCA 3.0 IPMI MANAGEMENT

The ZX6000 includes an IPMI management controller, compliant with the PICMG 3.0 version 1.5 protocol, which interfaces the shelf management system via I<sup>2</sup>C for remote management of the shelf. All required functions are supported, including the electronic keying feature of ATCA that prevents the accidental mis-match of boards inserted into the system. In addition, the switch fabric provides a link to the Shelf Management controller to allow it full access to the network.

## Configuration Options

Interface	Min.	Max.
PICMG 3.0 Base Interface Connections	12	14
Front Egress	0	8
Rear Panel Egress	0	6
Switch-to-Switch Interlink	1	1
Shelf Manager (ShMC) Connections	1	2
PMC/PTMC sites	0	8

\* - Total port count is 24. Check user manual for configuration options.

# OpenArchitect Switch Management

The Industry-Leading fabric board management suite for AdvancedTCA chassis

## OPENARCHITECT®

The core software technology of the ZX6000 goes far beyond simple Ethernet switch management. As a full-featured embedded Linux distribution, OpenArchitect supports user applications running in the industry-standard Linux environment. From the point of view of the technician, an OpenArchitect switch appears as a stand-alone Linux system with all the familiar tools and utilities. Users that know how to configure Linux networking systems can become proficient with an OpenArchitect switch within minutes.

While the OpenArchitect philosophy is to enable the use of open-source software as much as possible, the key to this technology is the proprietary core virtualization structure developed exclusively by ZNYX Networks. More than 7 years of continuous development and deployment have made OpenArchitect 3 the most robust and full-featured embedded Ethernet control software.

## PowerPC® EMBEDDED SUBSYSTEM

The ZX6000's embedded processor is the Freescale MPC8270VR, which combines a high degree of density with low power consumption and significant processing capability.

- 266MHz Core PowerPC processor
- 256MB SDRAM
- 48MB Flash ROM
- Two RS-232 Ports
- Three 10/100 Ethernet Mgmt. Ports
- USB Port
- PCI Bus control
- Real Time Clock

## LINUX ROUTING PLATFORM

A significant advantage of OpenArchitect is its ability to use any routing protocol stack that runs in the Linux environment. The standard release of OpenArchitect includes the gated daemon, which drives OSPF, RIP, EGP and BGP. Other protocol stacks, open-source or proprietary, may

be easily re-compiled with no source code changes to run on OpenArchitect. Other embedded switch architecture solutions require customization of routing code to a proprietary API. Only OpenArchitect uses Linux open APIs, enabling true transparency and flexibility for network architecture integration.

## LAYER 2-7 PACKET CLASSIFICATION

One of the ways in which the ZX6000 with OpenArchitect expands the envelope is its ability to do line-rate packet classification from layer 2 through layer 7. This feature can often eliminate the need for an expensive external security device by providing IP filtering capability, or it can manage traffic by assigning specific packets to different VLANs, Classes of Service, or separated for special processing. As with other features of OpenArchitect, the interface to program the packet classification uses familiar Linux commands.

## LOAD BALANCING

The advanced OpenArchitect 3 packet classification feature may be used to implement load balancing, where packets are distributed among ATCA blades based on their content. This feature enables true scalability for ATCA applications, and can be adapted according to any user-set policy. The switch silicon handles the distribution of packets at full line rate, giving the ZX6000 a significant advantage over processor-based load-balancing schemes.

## COMPACT FLASH

To support larger applications, the ZX6000 includes a CompactFlash socket that can support a FlashROM device or a micro disk drive, in addition to the embedded processor's Flash ROM. This feature can be used to manage software upgrades, or provide bulk storage for system logs and other purposes. For security, the CompactFlash cannot be removed without removing the ZX6000 from the ATCA chassis.

## USB

The front panel of the ZX6000 includes a USB socket that enables inexpensive, industry-standard expandability. Any Linux compatible peripheral device may be used for a variety of application enhancements, such as one-step upgrades and inline diagnostics.

## REAR TRANSITION MODULE

For applications that use rear-panel I/O, the ZX6000 may be used with an RTM. Up to six in-band Ethernet channels are provided, as well as two out-of-band RS-232 ports and two out-of-band 10/100 Ethernet ports.

## TELCO CLOCK

The ATCA Zone-3 connector of the ZX6000 provides full connectivity for the ATCA backplane clock, which permits the implementation of a chassis backplane clock feature. A custom RTM may host a hardware-based clock generator to meet any ATCA-compatible specification that requires telco-grade clock synchronization.

## OPENARCHITECT® HA SUITE

OpenArchitect HA Suite features transparent port-to-port, VLAN-to-VLAN and switch-to-switch rapid failover. With the OpenArchitect High Availability (HA) software suite, the chassis can respond and automatically correct any single point of failure.

# Gigabit Ethernet Modular Switching Platform for ATCA Chassis

## ZNYX Networks

ZNYX specializes in the development of blade-based Modular Switching Platforms for proprietary and open-standards based systems including PICMG 2.16 and AdvancedTCA®.

ZNYX's OpenArchitect® Switch Management Software and HA Suite provide a highly integrated solution based on a hardened Linux environment. Developers and Integrators can leverage the Linux environment to customize and re-use application code across multiple switching/routing platforms.

ZNYX products service the following markets:

- Mobile
- Communications
- Telephony
- Military
- Homeland Security
- Aerospace
- Medical
- Automation
- Storage
- Enterprise

**AdvancedTCA™**



**Intel®**  
**Communications**  
**Alliance**  
Affiliate Member  
BRONZE



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Fax: (510) 656-2460  
Web: www.znyx.com

## PRODUCT SPECIFICATIONS

### PICMG 3.0 Interfaces

- 12 or 14 10/100/1000Base-T to payload slots
- 1 10/100/1000Base-T to inter-switch fabric link
- 1 or 2 10/100/1000Base-T to Shelf Manager (ShMC)

### Front Panel Management Interfaces

- 10/100Base-T Out of band Management
- RS-232 Serial management ports
- USB

### PTMC Interfaces

- 4 PTMC Option 5 (2.0Gb/s), or 8 ports front egress

### Rear Transition Module Interfaces

- up to 6 10/100/1000Base-T for Fabric Egress
- 2 RS-232 Serial ports
- 2 10/100Mbps Out-of-Band Ethernet ports

### Hardware

- Broadcom BCM5695 Switch Fabric (2)
- Motorola MPC8270VR PowerPC Processor
- 256MB SDRAM
- 48MB Flash ROM
- CompactFlash socket
- Real-time clock

### Layer 2 Switching Features

- Line-rate 48 Gbps non-blocking switching fabric
- 4,096 IEEE 802.1Q VLANs
- Double 802.1Q VLAN Tagging
- IEEE 802.1D Spanning Tree Protocol (STP)
- IEEE 802.1s Multiple Spanning Tree\*
- IEEE 802.1w Rapid Spanning Tree
- IEEE 802.1x port-based access control
- Fast Forward Port
- IEEE 802.3AD Link Aggregation Control Protocol
- IEEE 802.3x Full Duplex Flow Control
- Jumbo Frames support (up to 9KB)
- Large On-chip Layer 2 MAC table (16k addresses)
- Port Mirroring
- IGMP, GARP, GMRP, GVRP support
- Auto MDI-X crossover
- per port traffic shaping, policies, and broadcast storm control

### Layer 3 Routing Features

- Line-Rate Layer 3 IP Forwarding (8K IP Addresses)
- IP Multicast
- DVMRPv2
- RIPv1 & RIPv2
- OSPFv2
- VRRP
- Network Address Translation (NAT)

### AdvancedTCA® Features

- PICMG 3.0 FRUID Support
- PICMG 3.0 compliant IPMI Controller
- Temperature Sensor

### AdvancedTCA® Features (cont.)

- PICMG 3.0 compliant HotSwap Power Management Controller
- PICMG 3.0 / 3.1 Extended Mode Support
- PICMG 3.0 Status Indicators

### QoS and Priority Queues

- IEEE 802.1p Class of Service / Quality of Service
- up to 8 priority queues
- Type of Service (TOS)
- Architecture for Differentiated Services

### Network Services

- FTP Server
- HTTP Server
- TFTP
- DHCP Server/Client/Relay
- NFS Client
- Network Time Protocol (NTP)
- Telnet
- Secure Shell (SSH)

### Management

- Command Line Interface
- Web-based management interface
- IPMI v1.5 client
- SNMP v1, v2, v3
- Common Open Policy Service (COPS)
- Extensive MIB Support
- Password enabled
- RMON Counters
- Field Upgradeable

### High Availability Features (OA/HA)

- Power-On Diagnostics
- Switch-to-Switch Failover
- Automatic Reconfiguration after a hotswap
- Redundant run-time OpenArchitect® image in flash
- Full PICMG 2.1 HotSwap Support
- OA/Node for transparent failovers on client

### Specifications

- PICMG 3.0 Base Fabric Interface
- PICMG 3.1 Fabric Interface
- PICMG 2.15 PTMC
- IEEE 802.3u Fast Ethernet Specification
- IEEE 802.3z Gigabit Ethernet Specification

### Status Indicators

- Base Fabric, per channel (24 channels)  
Link, Speed, Activity
- PICMG 3.0 Status Indicators  
Out of Service, Health, System, Hot Swap
- OpenArchitect Status Indicators  
External Fault, Internal Fault, Clock, OK

Manufactured in the U.S.A.

**Mechanical:** Dimensions: 322.25mm x 280mm

**Environmental:** Operating Temperature: -5° C to +50° C  
Humidity: 90% Non Condensing  
MTBF: Pending

**Power Requirements:** Maximum Power Draw: up to 200 Watts

**Telcordia NEBS:** GR-1089-CORE, GR-63-CORE

### Emissions Certifications (EMI):

Class A emissions levels for FCC, DOC, EN55022,  
EN300-386:1997, VCCI, EN61000-3-2, -3

**Environmental:** UL/CUL-UL 60950, CSA C22.2 No.950  
CB Scheme-IEC950, EN60950(CE)

**Immunity:** EN55024, EN61000-4-2, -4, -6, EN300-386:1997

### Specifications Subject to Change

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