



*Carrier Class*

*Hot Swap*

The ZX4500 Ethernet switch is the first in a series of OpenArchitect™ switches from ZNYX Networks. As a CarrierClass™ High Availability switch, the ZX4500 is designed specifically to meet demanding Telco equipment applications.

### Comprehensive

The ZX4500 has been designed for flexibility and uncompromising performance. With twenty-four rear-panel 10/100Mbps Ethernet ports, and two ports of Gigabit fiber on the front panel, the ZX4500 offers state-of-the-art features. Its switch silicon supports Layer 2 and Layer 3 switching at 6.6 million packets per second, plus layer 2 through 7 filtering. Onboard the ZX4500 is a Motorola™ MPC8240 PowerPC® processor with direct access to the switch fabric and Processor PMC site. The 32 MB of Flash ROM holds virtually any applica-

tion and 64 MB of SDRAM ensures optimal performance.

### Higher Performance and Density

The ZX4500 combines the functionality of a soft switch with the performance of a silicon switch. Its OpenArchitect design runs the latest RFC's of open-source or customized Linux networking application and protocols that directly update the switch silicon's routing tables. The ZX4500 replaces a separate CPU card, a router, multi-port adapters, and a rack mount switch with a single card. Even more rack space is saved by the on-board PMC/PPMC slot that can be used a separate application processor or media conversion board.

### Nothing Less Than CarrierClass

The ZX4500 continues ZNYX Networks commitment to CarrierClass Telco prod-

ucts by featuring full PICMG 2.1 Hot Swap compliance, Bellcore 2914 Ok-to-Pull LED, Rear Panel I/O for easy cable management, as well as link failover and load balancing. The ZX4500 can be quickly tailored to accommodate special requirements such as:

- ▶ Auto Configuration on HotSwap
- ▶ Switch-to-Switch Failover
- ▶ Link-to-Link Failover

### Upgrades Without Downtime

The network architect can remotely upgrade the ZX4500 OpenArchitect firmware, or install and configure customized Linux applications, from anywhere in the world. Even during a Flash ROM update, the ZX4500 continues its operation, and the network stays up. If any errors occur during this process, a fail-save system provides complete recovery.

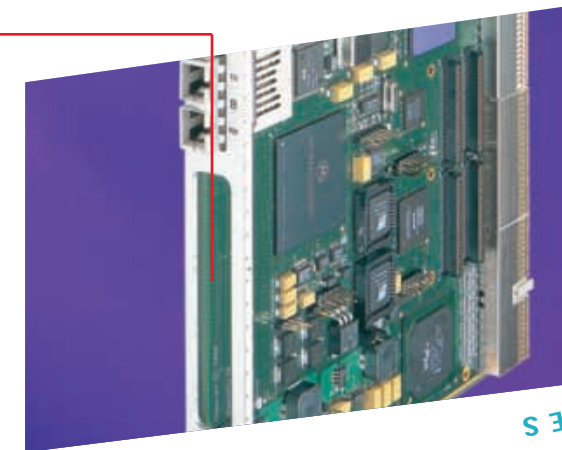


- ▶ OpenArchitect™ Series
- ▶ 2 Front Panel Gigabit
- ▶ 24 Rear Panel 10/100
- ▶ Onboard Motorola™ MPC8240 processor
- ▶ 64 MB SDRAM  
32 MB Flash ROM
- ▶ CarrierClass™ + Hot Swap
- ▶ ZX4500P supports CPSB



Open PPMC site for expansion or media conversion

*Adaptable*



OPENARCHITECT™ SWITCH SERIES  
10/100 + 1000 ETHERNET

Model Numbers	ZX4500 6U CompactPCI 10/100+1000 Ethernet Switch w/OpenArchitect
	ZX4012 12 ports Egress with 12 RJ-45 receptacles, single wide RTM ZX4024 24 ports Egress with 24 RJ-45 receptacles, double wide RTM ZX4024R 24 ports Egress with 2 RJ-21 receptacles, single wide RTM
Connectors	Gigabit - Two1000BaseFX fiber SC connectors 10/100 - 12 or 24 RJ-45 connectors on RTM except for ZX4526R which uses two RJ-21 Telco Connectors.
Media	Gigabit - multi-mode fiber; 10/100 Mbps - Category 5 UTP
Bus Interface	PCI 2.2 Compliant PICMG 2.1 Full Hot Swap compliant
Data Transfer*	Capable of: 32 or 64 bit PCI bus master with burst mode DMA
Host Channel Speed*	Capable of: 64 bit address/data at 66 MHz or 33 MHz 32 bit address/data at 66 MHz or 33 MHz
Maximum Channels	Stackable to 30 ZX4500s and 720 ports
Packet Switch Rate	6.6 million packets per second
Memory	Main: 64 MB SDRAM Buffer: 64 MB SDRAM Application: 32 MB Flash ROM Boot: 512 KB Flash ROM
Power	11.3A @ 5V 40mA @ +12V 10mA @ -12V (max. theoretical)
Humidity	Maximum of 90%, non-condensing
Certifications	UL, cUL, CE
Safety	UL1950, 3 <sup>rd</sup> edition CAN/CSA C22.2 No. 950-95 IEC 950 2 <sup>nd</sup> Edition with Amdts. No. 1 • 2 • 3 • 4 EN60950 with Amdts 1 • 2 • 3 • 4 • 11 EN45001
EMC/EMI	FCC Part 15, EN55022 & EN50082-1 (EN61000-3-2, EN61000-3-3, EN6100-4-2, EN61000-4-3, ENV50204, EN61000-4-4, EN61000-4-6, EN61000-4-11), CISPR 22, VCCI, AS/NZS 3548, CNS 13438 - Class A
Dimensions	160mm x 233.5mm (6U formfactor)
LEDs	Channel status LEDs, OK to Pull, Power, Clock, OK, Internal/External Fault
Manufacture	Designed and manufactured in the USA

### High Availability LAN Solutions

ZNYX Networks is the leading supplier of CompactPCI Ethernet switches and PCI, PMC, PIM, and CompactPCI network adapters for commercial, industrial, and telephony applications:

- ▶ OpenArchitect Switches
- ▶ Single and multi-channel LAN adapters
- ▶ RAINlink high availability software
- ▶ Over 18 Ethernet drivers
- ▶ Portable driver kit for custom environments

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Preliminary Data - Specifications subject to change

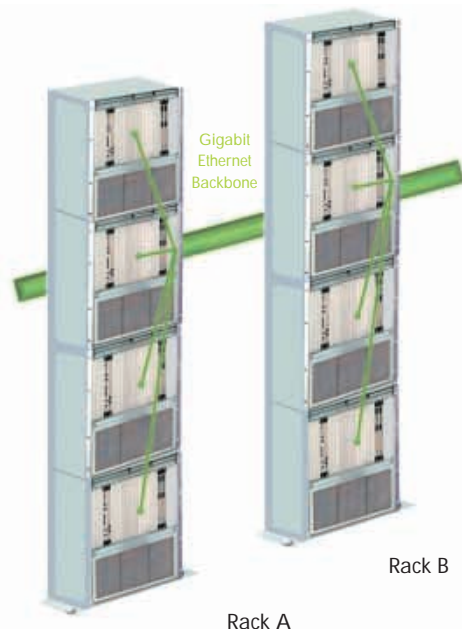
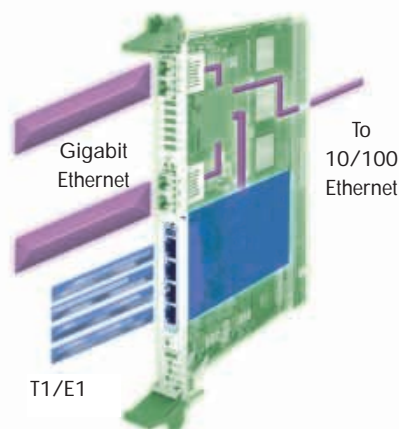


# Applications

## High Availability Connections

Choose Internal or External 10/100 Mbps and 1000 Mbps

CompactPCI Packet Switching Backplane (CPSB) outperforms the PCI bus



### CompactPCI Packet Switching Backplane

The ZX4500P offers the ideal solution to moving large amounts of data to and from multiple call processing and data conversion cards. Fast Ethernet has rapidly replaced the slow and contentious PCI bus as the preferred means to quickly move data within a CompactPCI chassis. Fast Ethernet provides dedicated channels, far greater total bandwidth, and failover features that are not possible using the PCI bus.

### Media Conversions

Need higher chassis density? The ZX4500's 64-bit processor PMC slot allows installation of third-party media converters such as multi-port T1/E1 or OC-3 cards. The PPMC slot ties directly to the ZX4500's internal PCI bus and a 27th port on the switch silicon, allowing additional routing options. Alternatively, a processor card in this slot can perform DSP or CPU functions, and not require any additional slot space.

### Rack Area Networks (RAN)

Ethernet has increasingly become the serial bus of choice for CompactPCI peripheral cards to communicate across the network infrastructure. The ZX4500's rear Fast Ethernet ports can be used to concentrate all other Ethernet connections in the rack, while the front gigabit fiber ports link entire racks of equipment to a central high-availability switch.

### Supports internal backplane or external connections.

The ZX4500P, a special version of the ZX4500, supports the new CompactPCI Packet Switching Backplane standard of 19 internal node cards. With a second ZX4500P in the chassis, every node gains dual-switch support for high availability, redundancy (N+1), and fail-over.

The ZX4500 may also be used with several different rear transition modules (RTM) in a standard CompactPCI chassis to provide up to 24 ports of 10/100 Mbps connectivity between every device using standard external CAT 5 cabling. In all configurations, two gigabit fiber Ethernet connections on the ZX4500's front panel offer backbone connectivity, switch stacking, or a super high-speed uplink/downlink for moving enormous amounts of data with minimal latency.

### The ZX4500's internal PCI bus provides direct switch fabric access to the open PMC expansion site.

The ZX4500 features an internal 64 bit PCI bus that provides a high speed connection between the onboard PMC site, PowerPC processor, switch fabric and the chassis PCI bus. Media conversions can be accomplished by simply adding a Linux driver to any PMC-compliant peripheral board and the ZX4500 with OpenArchitect firmware takes care of the media-to-media routing, drastically reducing development time projects requiring media conversions.

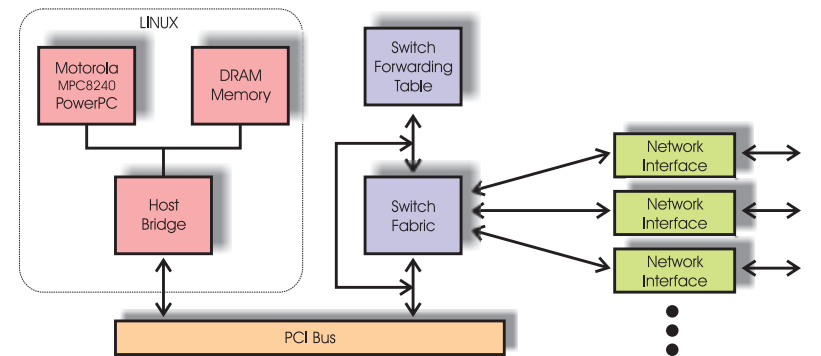
The ZX4500's PMC site can also accept peripheral boards that are Processor PCI Mezzanine Cards (PPMC)-compliant. The PMC site allows for an after-market processor to have direct access to the switch fabric and can work in parallel with the onboard Motorola MPC8240 PowerPC processor.

### Run any off-the-shelf Linux networking software to create custom switching, filtering, management or routing applications!

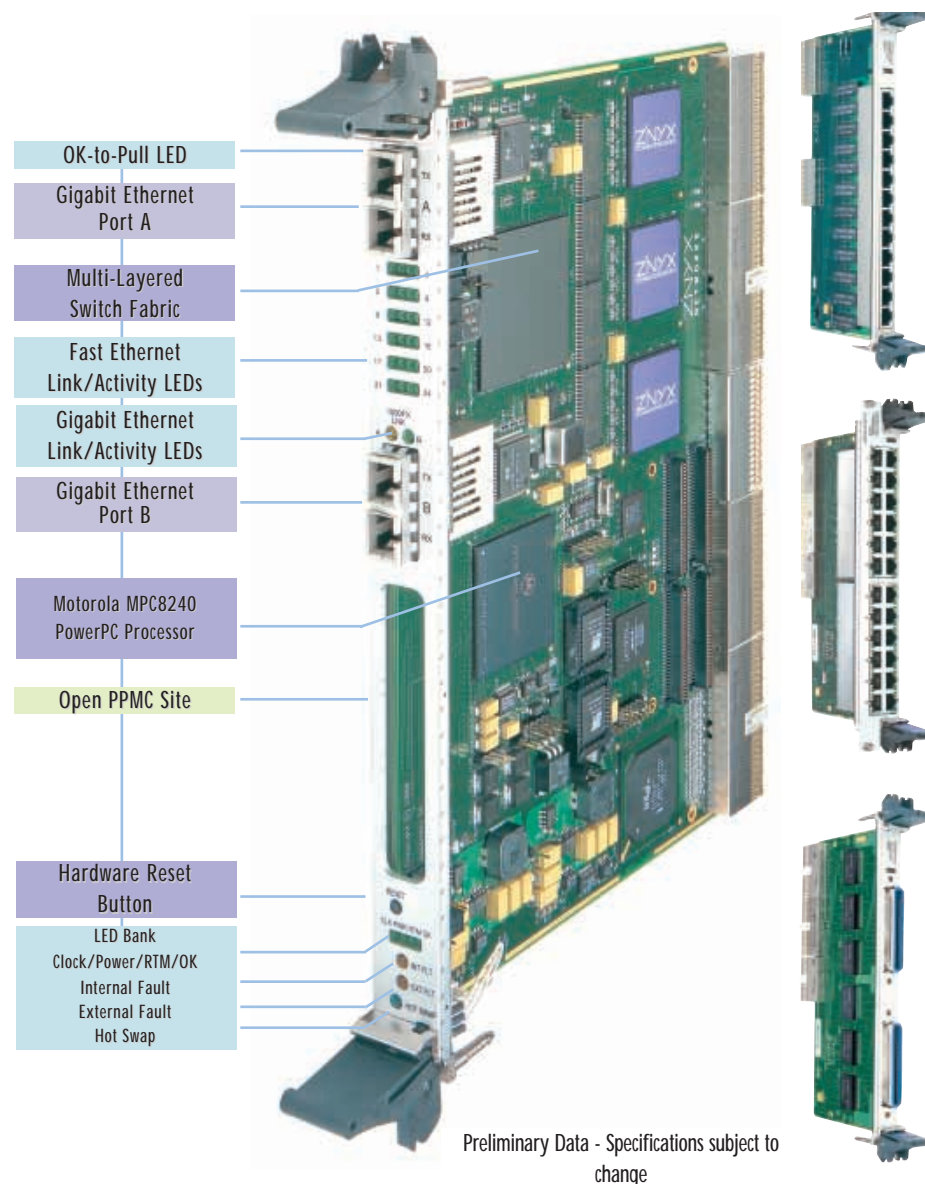
By using ZNYX Networks' OpenArchitect™ technology, the ZX4500 can run value-added Commercial Off the Shelf Linux software that used to require extensive R&D development time and money. Development in OpenArchitect's Linux environment means no more costly development seat licenses, royalties, specialized training, or proprietary switch operating systems.

Telco, ISP, and large enterprise networks have substantial investments in their management systems. The ZX4500 protects that investment by working with virtually any management system. Even custom protocols can be brought up with minimal effort.

# Features



The ZX4500 uses an internal PCI bus to connect the switch fabric to the onboard Motorola PowerPC processor, allowing direct access to the switch fabric and routing tables.



Preliminary Data - Specifications subject to change

### Highlights:

- ▶ 2 - 1000 Mbps Gigabit Ethernet ports on the Front panel
- ▶ 12 or 24 - 10/100 Mbps Fast Ethernet ports on the RTM
- ▶ Layer 2 Switching
- ▶ Layer 3 IP Routing
- ▶ Layer 2 through 7 Filtering and Packet Classification
- ▶ 6.6 Million Packets/sec Line-Rate Switching
- ▶ Stackable to 30 Gigabit and 720 10/100 ports
- ▶ PowerPC® MPC8240 CPU with 64MB SDRAM
- ▶ 32 MB Flash ROM
- ▶ 64 MB Buffer SDRAM
- ▶ Open PMC/PPMC site
- ▶ HotSwap™
- ▶ Link Aggregation, Load Balancing
- ▶ Bellcore 2914 OK-to-pull LED
- ▶ Support for DHCP Client and Server
- ▶ 802.1D Spanning Tree
- ▶ 802.1p Traffic Class/Multicast
- ▶ 802.1Q VLAN
- ▶ 802.3x Flow Control
- ▶ RMON/Ethernet MIB (RFC 1757,2358)
- ▶ SNMP MIB-II
- ▶ Bridge MIB (RFC 1493)
- ▶ Downloadable Upgrades w/ Fail-safe Recovery
- ▶ Designed for Telcordia NEBS Level 3 Compliance
- ▶ ZX4500P model supports CPSB

### OpenArchitect

The first in a series of OpenArchitect products is the ZX4500, implementing a Linux-on-Silicon platform on one CompactPCI card. The OpenArchitect platform enables multi-gigabit switching applications on silicon with commercial off-the-shelf Linux applications. OpenArchitect speeds the OEM development cycle. Developers can create high-value applications by combining unmodified, open-source routing and management protocols with custom management software. (For more details about OpenArchitect™, contact ZNYX Networks)

### Rear Transition Modules

The ZX4000 family of rear transition modules (RTMs) provides a passive CarrierClass Ethernet Rear Panel I/O solution when connected to a ZX4500 switch. Diagnostic LEDs are located on all ZX4000 series RTMs to help minimize the Mean Time to Repair (MTTR) in time-critical field replacements.

The ZX4000 provides complete cabling flexibility with options for front or rear panel I/O.

### Models

- ZX4012 - Single slot RTM, 12 10/100TX ports
- ZX4024 - Dual slot RTM, 24 10/100TX ports
- ZX4024R - Single slot RTM, 2 RJ-21 (use with front or rear patch panel)