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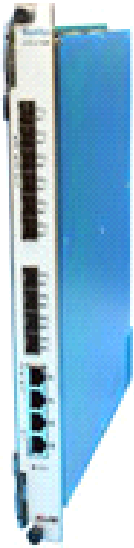
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Promentum ATCA-7220

Dual Oxeon™ CN58xx Packet Processing Module

Industry's first blade to enable highest density of Gigabit Ethernet interfaces in a single slot. Incorporates a Smart FrontEnd with a 10 Gigabit Ethernet Switch that enables a complete solution for packet processing applications such as RNC, SBC, edge routers, security and media gateways.

Dual OXTEON™ CN58xx Packet Processing Module

With the increased Internet traffic and multitude of enhanced services, communication infrastructure is challenged with increased capacity of packet throughput and processing. Increase in security threats forces equipment makers to offer deeper packet inspection and processing capability in their all-IP network infrastructure. More and more, network elements are now incorporating packet interfaces with increased need for packet processing and I/O capacity, scaling to multiple 10s of 1GE and 10GE interfaces.

AdvancedTCA has become the industry standard form factor for carrier grade infrastructure. As the designers architect the next generation network elements such as Media Gateways and Radio Network Controllers, they seek latest and greatest technologies to address the processing density and scalability needed for the future requirements.

PRODUCT DESCRIPTION

The RadiSys Promentum™ ATCA-7220 is an AdvancedTCA packet processing blade that provides highest available Gigabit Ethernet density and throughput. It incorporates two industry leading Cavium Networks OXTEON™ Plus multi-core processors with a powerful architecture to be used for intense packet processing application with or without I/O.

On-board 10 Gigabit and 1 Gigabit Ethernet switching, acting as a "Smart Front-End", allows powerful and flexible data flow for sophisticated security processing and traffic handling. AdvancedTCA form factor makes it appropriate for use in Carrier Grade network elements such as Security, Media Gateways and high bandwidth RNC and other network elements in wireless and broadband infrastructure. The AdvancedTCA module is available fully integrated into the award winning RadiSys Promentum™ SYS-6010 10 Gigabit Application Ready Platform to enable faster time to market for TEMs/NEPs to develop their next generation network elements.

The ATCA-7220 is a single slot AdvancedTCA packet processing module/blade compliant with PICMG 3.1 Option 9 interface specification. The OXTEON CN58xx processors are independent Data Processing Blocks with independent memory associated with them. Each processor includes up to 16 GB of SDRAM through two VLP MiniRDIMMs. For faster table look up applications, 128MB RLDRAM is optionally supported. The processors can also be configured in a pipelined mode by setting up the

FEATURE SUMMARY

- Single slot PICMG 3.0/3.1 (Option 1 and 9) compliant
- Dual OXTEON™ CN58xx multi-core processors, each with:
 - Up to 800 MHz clock rate
 - Up to 16 GB SDRAM
 - Up to 128 MB RLDRAM (optional)
 - 128 MB program and local flash file system
- High bandwidth I/O – 10GE and 1GE front and rear
- 4*10GE or 1GE (SFP+) front I/O
- 6*1GE (SFP) front I/O
- 16*1GE or 4*10GE rear I/O (optional)
- Onboard 10GE/1GE switch provides "Smart Front-End" to

enable flexible data flow for the I/O. – Front and rear I/O goes through switch to either OCTEON processor or backplane (Fabric)

- Powerful Local Management Processor - MPC8548 PowerQUICC[®] III processor supporting
 - Up to 1.5GHz clock rate
 - 1GB DDR2 SDRAM
 - 256 MB program and local flash file system
- Network Timing Subsystem provides backplane synchronous clocking signals to LMP and OCTEON processors with hitless switchover support
- Optimized IP Data path software including:
 - IPv4/V6 forwarding, filtering, tunneling
 - IPSec/SRTP
- Load Balancing, Traffic Management
- Virtual Routing Domains
- Board support software includes CG OS (Windriver PNE LE V1.4), switch management, blade management and diagnostics
- Intelligent Platform Management Controller (IPMC)

data flow to pass through the 10GE switch with HiGig™ capability in a “cut-through” fashion.

Powerful architecture with “Smart Front-end” for data flow flexibility, reliability and performance

The ATCA-7220 includes a 10GE switch on board that acts as a “smart front-end” for the OCTEON processors. This allows independent resetting of the OCTEON processing complexes for fault isolation, off-loading and augmenting the OCTEON data path processing software, and provides flexible data flow options. A Broadcom BCM56800 family switch serves as the central “hub” for I/O ports, OCTEON processors, the Local management Processor (LMP), and a secondary Broadcom switch. The switches also connect to the backplane Fabric and Base interfaces. The LMP is a stand-alone PowerQUICC III (MPC8548) CPU with 1GB of memory and a local flash file system, running a Linux OS. Its primary task is to provide blade management and switch management software for the Gigabit Ethernet switches. It also can host data control path software, diagnostics, and application provisioning software.

The switches are capable of supporting L2 and L3 processing functions in silicon and can be configured through CLI, SNMP, or APIs hosted on the LMP. Since all I/O interfaces (front and rear) pass through the switches, and the switches have significant “ContentAware™” processing capabilities, it is possible to take advantage of such processing and off-load the OCTEON CN58xx processors. For example, link aggregation (LAG) can be done in the switch instead of the OCTEONs. Some applications require all packets to be sent directly to the OCTEON CN58xx processors for processing, completely untouched by the switch. This is possible to do using the HiGig™ interface and ContentAware™ capabilities of the Broadcom switch. There are two fundamental dataflow configuration modes available on the ATCA-7220: uncoupled I/O and directly coupled I/O. The uncoupled mode uses the switch as a normal layer 2 hub switch, while the directly coupled mode configures the switch as a “cross-bar” switch to allow data transfer to and from the OCTEONs with no modifications, giving the OCTEON full visibility of each I/O port. For more details on these modes, please refer to the user manual.

Future proofing your design

The ATCA-7220 is designed to be “ready” to take on the next generation OCTEON processor already. By keeping the design of the board independent of the OCTEON CN58xx processors and isolating the OCTEON CN58xx processor portion of the board, the ATCA-7220 is “ready” to migrate to the next generation when it comes available. Customers utilizing the ATCA-7220 can take advantage of the new board without having to redo their design. Application may require a mere recompile to take advantage of the increased processing power.

Board Support Software

The ATCA-7220 comes complete with all the board support software inclusive of the carrier grade OS on the LMP, diagnostics, application provisioning, switch management and blade management software. The LMP is validated for the Windriver PNE LE v1.4 carrier grade operating system. The diagnostics software includes tests that verify system health at power up and are accessible through the shelf manager and IPMI. The software also includes comprehensive switch management for L2 (and optionally L3) functions including setting up VLANs and various port specific functions. The switch management API is accessible through CLI, SNMP, or C language APIs.

Powerful Internet Protocol (IP) Data path software

The power of the OCTEON CN58xx processor is its ability to do IP packet processing. To enable even faster time to market, RadiSys offers, optimized and pre-validated comprehensive suite of IP data path software. This software includes:

- IPv4 forwarding
- IP Filtering, Tunneling
- Traffic Management (DiffServ)

- IPsec
- NAT
- Load Balancing
- And more

These capabilities are available through RadiSys supported APIs and are available both in binary and source code formats. Source code access requires customer to sign up for source code access program offered by RadiSys.

Promentum ATCA-7220 Specifications

FEATURE	FUNCTION	DESCRIPTION
ATCA-7220		
PHYSICAL	Dimensions	8Ux6HPx280mm ATCA, single slot
	Compliance	PICMG 3.0, PICMG 3.1 Option 9 Revision 2.0
PACKET PROCESSORS	Component	2 Cavium OCTEON™ CN58xx processors each up to 800 MHz
	Memory	Per Cavium Processor: 2 VLP MiniRDIMM (72 bit ECC) sockets capable of hosting memory up to 16 GB per socket at 800 MT/sec
		128 MB Flash per processor for Linux OS boot image and file system
	RLDRAM	128 MB Per Cavium Processor (optional)
ETHERNET SWITCHING	Component	18 port 10GE/HiGig™ BCM56801 and 24 port 1GE + 2 port 10GE/HiGig™ port BCM56317 Broadcom Ethernet switches
	Base Interface	2 10/100/1000BASE-T ports connecting to Zone 2 Base Interface on the backplane
	Fabric Interface	ATCA 3.1 option 9 with 2 x 10GE XAUI
Switch Management	CLI SNMP Agent SNMP MIBs	Full-featured CLI for controlling all switch features SNMPv2c Support for all switch features via standard and enterprise MIBs. Standard MIBs include: RFC1213, RFC1907, RFC2863, RFC2011, RFC2012, RFC2013, RFC1493, RFC2674, RFC2665, RFC2819, IEEE8023-LAG-MIB
PLATFORM MGMT	IPMI	Version 1.5 per PICMG 3.0
LOCAL MANAGEMENT PROCESSOR (LMP)	Processor	Freescale MPC8548 clocked up to 1.5GHz
	Memory	1 GB of DDR2 SDRAM – One 244 pin MiniRDIMM 72 bit ECC VLP socket at 667 MT/sec.

		Redundant pair of 128MB NOR Flash for PQIII configuration, Linux OS boot image and file system
NETWORK TIMING SUBSYSTEM		CLK1 / CLK2 - 8KHz / 19.44MHz redundant backplane input 1.544MHz, 2.048MHz, 19.44MHz, or 8KHz output to LMP and OCTEON processors
16*1GE RTM MODULE CONNECTORS	Gigabit Ethernet	16 SFP connectors for data plane connectivity through rear
	LMP	10/100BASE-T Interface Direct to LMP
FRONT PANEL	I/O	4 SFP+ connectors, 6 SFP connectors 2 RJ-45 Serial port connection to OCTEON processors – 2 ports per connector 1 RJ-45 Ethernet port connectivity to LMP 1 RJ-45 Serial port connection to LMP
	LEDs	Hot Swap (Blue)
		Red or Amber Out of Service (ATCA “LED 1”)
		Green/Amber Power Good (ATCA “LED 2”)
		Green/Amber Activity indicator Activity and status indicators for Maintenance Ethernet (RJ-45), SFPs and SFP+s
	Mechanical	Hot Swap extraction ejector
		Reset Button
4*10GE RTM MODULE CONNECTOR (FUTURE)	10 Gigabit Ethernet	4 SFP+ connectors for data plane connectivity through rear
	LMP	10/100BASE-T Interface Direct to LMP
BACKPLANE CONNECTORS	Ethernet Base, Fabric, Power, and Clock	ATCA Zone 1, P10 connector
		ATCA Zone 2, J20 & J23 connector only
		ATCA Zone 3, RTM connectors
SOFTWARE	Operating System (standard)	LMP : Windriver PNE LE 1.4 Cavium Cores : Busy Box Linux

	Blade Management (standard)	Blade health management, module management, IP Services management, Time of Day management, Software (image) management, flash/file management
POWER	ATCA-7220	200W Max. and TBD Typical
ENVIRONMENTAL	Temperature (operating)	Continuous : +5° C to +45° C
	Temperature (storage)	-40 o C to +70 o C
	Vibration (operating)	0.1g, 5 to 100 Hz and back, 0.1 octave/min sine sweep 3
		5% to 85% RH non-condensing
	Relative Humidity (non-condensing)	5 – 90% (operating), 5 – 90% (non-operating)
REGULATORY	Safety	UL/EN/IEC 60950-1, CSA 22.2
	EMC	FCC Part 15, Class A, EN 55022: 1998, Class A 60950
WARRANTY	-	Two years, parts only

Ordering Information

- A7220-NSP-CFG01 – Dual OCTEON NSP Processor 750 MHz with 4 GB memory each, RLD RAM (128 MB), 1.3 GHz LMP, 1 GB LMP Memory, Front I/O only with BSP, switch and blade management software, Wind River PNE LE 2.0 validated on the LMP, Busy Box Linux on the Cavium with CDK 1.7.x support
- A7220-SCP-CFG01 – Dual OCTEON SCP Processor 750 MHz with 4 GB memory each, NO RLD RAM, 1.3 GHz LMP, 1GB LMP Memory, Front I/O only w/ BSP, Switch and blade management software, Wind River PNE LE 2.0 validated on LMP, Busy Box Linux on the Cavium with CDK 1.7.x support
- A7220-NSP-CFG03 - Dual OCTEON NSP Processor 750 MHz with 8 GB memory each, RLD RAM (128 MB), 1.3 GHz LMP, 1 GB LMP Memory, Front I/O only with BSP, switch and blade management software, Wind River PNE LE 2.0 validated on the LMP, Busy Box Linux on the Cavium with CDK 1.7.x support
- A7220-NSP-CFG04 - Dual OCTEON SCP Processor 800 MHz with 8 GB memory each, RLD RAM (128MB), 1.3 GHz LMP, 1GB LMP Memory, Front I/O only w/ BSP, Switch and blade management software, Wind River PNE LE 2.0 validated on LMP, Busy Box Linux on the Cavium with CDK 1.7.x support



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