

Multi-Core MIPS64® Processors

OCTEON™ Plus CN58XX 4 to 16-Core MIPS64-Based SoCs

Product Brief



OVERVIEW

The OCTEON™ Plus CN58XX family of Multi-core MIPS64 processors targets intelligent networking, control plane, storage, and wireless applications in next-generation equipment from 2 Gbps to full-duplex 10 Gbps (20 Gbps) performance. The family includes 12 different software-compatible parts, with four to sixteen cnMIPS64 cores on a single chip that integrate next-generation networking I/Os along with the most advanced security and application hardware acceleration to deliver a 2x – 3x performance, power and real-estate value proposition over alternatives.

FEATURES

Fully pin and software compatible with the leading OCTEON CN38XX/CN36XX family

- 4-16 cnMIPS™ CPU cores (MIPS64/32 compatible) with MMU
- Available in 600 MHz to 1 GHz versions
- Enhanced MIPS64 integer (Release2) instruction set
- Dual-issue, five-stage pipeline, optimized latencies
- Auto instruction pre-fetching and advanced data pre-fetching features to minimize memory stalls

High-performance coherent memory subsystem

- 1MB or 2MB ECC protected 8-way set associative L2 cache with locking, partitioning features for optimal performance
- Integrated mainstream 128/144b DDR2 memory controller with ECC, up to DDR2-800
- Optional, additional, low-latency 2x18b or 4x9b RDRAM2 for content based processing, meta-data and TCAM connectivity

Integrated Coprocessors for Application Acceleration

- Packet I/O processing, QoS, TCP Acceleration
- Support for IPsec, SSL, SRTP, WLAN and UMTS/LTE security (includes DES, 3DES, AES-GCM, AES up to 256, SHA1, SHA-2 up to SHA-512, RSA up to 8192, DH, KASUMI)
- Regular Expression, Compression/Decompression

Integrated high-performance networking interfaces

- Up to 2 sets of I/Os - each configurable as 4x 10/100/1000 Ethernet MACs (RGMII) or SPI-4.2
- Integrated 64-bit, 133 MHz PCI-X host or slave

Comprehensive development environment with Linux, VxWorks and C/C++ support

Optimized Power Consumption: 18W – 40W

Package: 1521 FCBGA

BENEFITS

Market-Leading Performance

- Up to 32 Billion instructions per second
- Leading-edge application performance
 - Up to 30 Mpps 64B IP forwarding
 - Full Duplex up to 10 Gbps for TCP, IPsec, SSL, KASUMI
 - Up to 5 Gbps for Regular Expression Compression/Decompression

Double L1/L2 caches and up to 3x Interconnect bandwidth along with 1 GHz Core delivers up to 2x performance over OCTEON CN38XX

Sophisticated Hardware Based QoS Support

- Queuing, scheduling
- Very low latency for real-time traffic

Reduced BOM Cost with Essential Interfaces for Standalone Routers/Appliances, Line-card and Services-card Applications

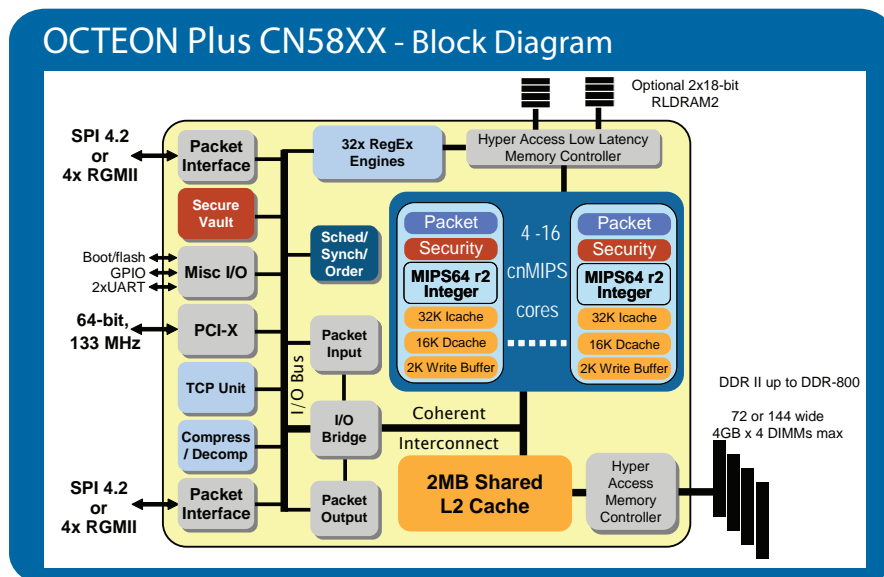
Flexible Architecture allows Host and Coprocessor Implementations

Industry-Standard Programming Model without any need for Proprietary Tools or Micro-coding

Fully Software Compatible with OCTEON CN31XX and CN30XX to deliver 1- 16 CPU scalability

2x – 3x Advantage over Alternative System Architectures in Performance and Power for L4-L7 Data and Security Services

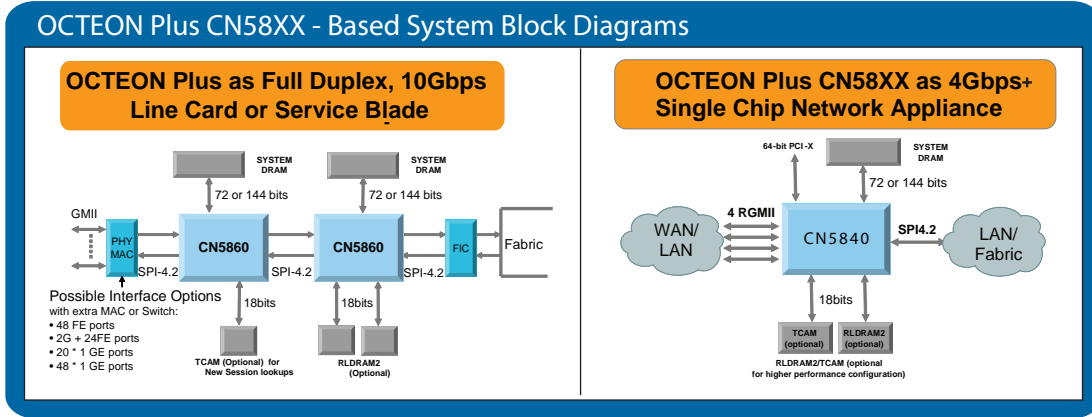
2x performance/watt over OCTEON CN38XX



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OCTEON Plus Applications

- Next generation integrated, standalone routers and appliances
- Unified Threat Management (UTM) appliances with Firewall, VPN (IPsec, SSL), IDS, IPS and Anti-virus scanning
- Application aware/L4+ content processing and switching
- Network acceleration cards for security, TCP, content processing, compression
- Integrated management and route processor cards
- Switch/router line card and services card control and datapath processing
- TCP, iSCSI, RDMA, compression processing for storage applications
- Wireless LAN switch/appliance security and packet processing
- Wireless WAN security, control and packet processing including 3G/4G/LTE and WiMAX

OCTEON Plus Software Support

- Cavium Networks SDK includes:
 - Up to 16-way SMP LINUX support
 - Cavium Simple Executive for data plane applications
 - Complete GNU tool-chain, GDB, DDD and viewzilla for tuning
 - Optimized C libraries for security, regular expression, de/compression processing offload
 - Support for run-to-completion or pipelined software models
- Complete production quality development toolkits for IP, IPsec, SSL, TCP, SSL-VPN available
- Comprehensive Ecosystem support
 - Popular third-party Operating systems and toolchains, including MontaVista Linux, Wind River VxWorks, ENEA OSE
 - Broad range of third-party application software vendors, including 6Wind, Intoto, D2 Technologies and Apogee
 - Appliances, AMC, ATCA cards from Asustek, Portwell, Flextronics, Radisys, Lanbird and others
- MIPS64/32 support enables thousands of MIPS and other C/C++ applications to be easily ported to OCTEON

OCTEON Plus CN58XX - Product Family

Device	Part Number*	cnMIPS cores	Performance	Option			L2 Cache	Interfaces	PCI/PCI-X	Memory IO w/ECC	DFA Memory IO w/ECC	Package
			Max. Available Instructions Per Second	N S P	E X P	S C P						
CN5830	CN5830-XXXBG1521- Option Code	4	8.0G	Y	Y	Y	1MB	2x [4x RGMII or 1x SPI-4.2]	64-bit/133 MHz PCI-X	DDR II - 72-bit or DDR II - 144-bit	2x 18-bit RDRAM2 (optional)	1521 pins
CN5840	CN5840-XXXBG1521- Option Code	8	16.0G	Y	Y	Y	1MB					
CN5850	CN5850-XXXBG1521- Option Code	12	24.0G	Y	Y	Y	2MB					
CN5860	CN5860-XXXBG1521- Option Code	16	32.0G	Y	Y	Y	2MB					



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* (Part Number Options):

XXX = Device Speed Grade (600 = 600 MHz, 800 = 800 MHz, 900 = 900 MHz, 1000 = 1000 MHz)

Option Code = Device Family Listed Below:

NSP = Network Services Processor: Includes, encryption, reg-ex acceleration, decompression, networking, TCP acceleration and QoS

EXP = Extreme Processor: Includes reg-ex acceleration, decompression, networking, TCP acceleration and QoS

SCP = Secure Communications Processor: Includes, encryption, networking, TCP acceleration and QoS