

# Multi-Core MIPS64<sup>®</sup> Processors

## OCTEON<sup>®</sup> Plus CN58XX 4 to 16-Core MIPS64-Based SoCs

Product Brief



### OVERVIEW

The OCTEON<sup>®</sup> 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 10 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

Pin and software compatible with the leading OCTEON CN38XX/CN36XX family

- 4-16 cnMIPS™ CPU cores (MIPS64/32 compatible) with MMU
- Available in 500 MHz to 800 MHz 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

- Up to 2MB ECC protected 8-way set associative L2 cache with locking, partitioning features for optimal performance
- Integrated mainstream 128/144-bit DDR2 memory controller with ECC, up to DDR2-800
- Optional, additional, low-latency 2x18-bit or 4x9-bit 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, OSE and C/C++ support

Optimized power consumption: 15W – 40W

Package: 1521 FCBGA

### BENEFITS

Market-leading performance

- Up to 28.8 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

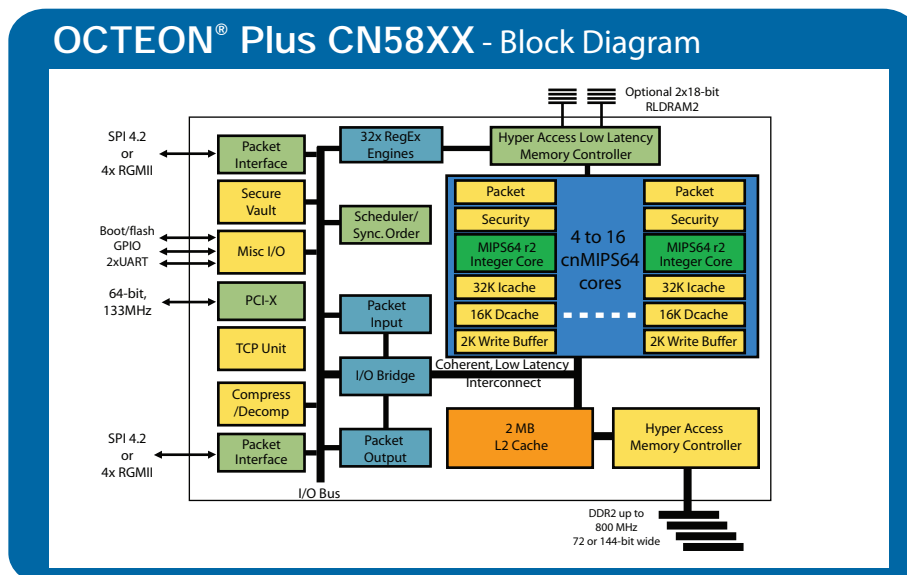
Flexible architecture allows host and coprocessor Implementations

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

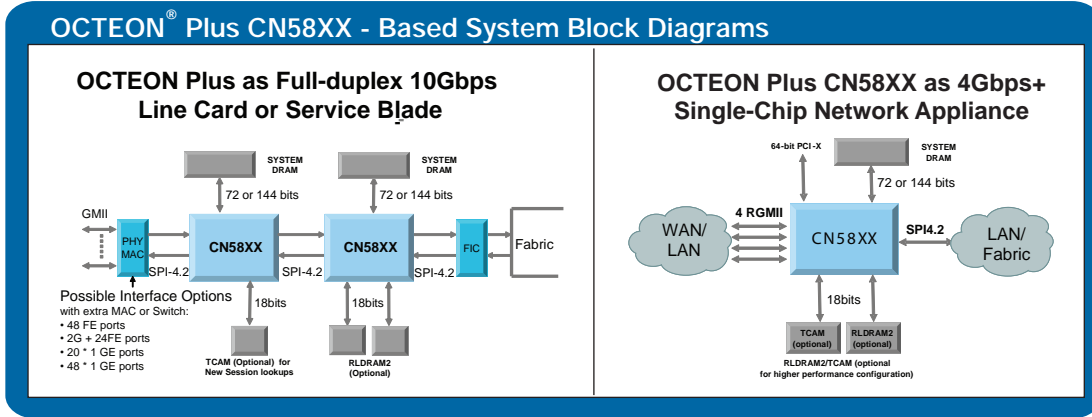
2x – 3x advantage over alternative system architectures in performance and power for L4-L7 data and security services

2x performance/watt over OCTEON CN38XX



# OCTEON<sup>®</sup> Plus CN58XX 4 to 16-Core MIPS64-Based SoCs

Product Brief



## 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 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, Emerson Network Power, Flextronics, GE Fanuc, Lanbird, Portwell, RadiSys and others
- MIPS64/32 support enables thousands of MIPS and other C/C++ applications to be easily ported to OCTEON

## OCTEON<sup>®</sup> 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	7.2G	Y	Y	Y	2MB	2x [4x RGMII or 1x SPI-4.2]	64-bit/133 MHz PCI-X	DDR2 up to 800 MHz 72-bit or 144-bit wide	2x 18-bit RDRAM2 (optional)	1521 FCBGA
CN5840	CN5840-XXXBG1521- Option Code	8	14.4G	Y		Y	2MB					
CN5850	CN5850-XXXBG1521- Option Code	12	21.6G	Y		Y	2MB					
CN5860	CN5860-XXXBG1521- Option Code	16	28.8G	Y	Y	Y	2MB					

\* (Part Number Options):

XXX = Device Speed Grade (500LP = 500 MHz Low Power, 600LP = 600 MHz Low Power, 600 = 600 MHz, 750 = 750 MHz, 800 = 800 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

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