



### OVERVIEW

The OCTEON<sup>®</sup> Plus CN54XX family of Multi-core MIPS64 processors targets intelligent networking, control plane, security, and wireless applications in next-generation equipment from 500Mbps to full-duplex 4Gbps performance. The family includes nine different software-compatible parts, with four to six cnMIPS64 cores on a single chip that integrate next-generation SERDES based networking I/Os along with the most advanced security and application hardware acceleration to deliver a robust performance, power and real-estate value proposition over alternative solutions. Industry's first Network Services Processor with less than 3 Watt/GHz power consumption across the 3 GHz to 6 GHz range.

### FEATURES

Software compatible with the leading OCTEON family

- 4 - 6 cnMIPS CPU cores (MIPS64/32 compatible)
- Available in 500 MHz to 700 MHz versions
- Enhanced MIPS64 integer (Release 2) 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 ECC protected L2 cache with locking, partitioning features for optimal performance
- Integrated mainstream Dual DDR2 memory controller with ECC, up to DDR2-800, up to 72-bit wide

Integrated coprocessors for application acceleration

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

High-density, high-bandwidth serial I/O for networking

- 16 high-speed SERDES allowing flexible combination of PCI Express, XAUI (10GE), SGMII (GbE/2GbE)

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

Optimized power consumption: 8W – 20W

- Package: 35 x35 mm 1217 FCBGA

### BENEFITS

Market-leading performance

- Up to 8.4 Billion instructions per second
- Over 4+ Gbps application performance
  - Up to 8 Mpps 64B IP forwarding
  - Up to 10+ Gbps for TCP, IPsec, SSL, KASUMI
  - Up to 8Gbps for Compression/Decompression

Double L1/L2 caches and up to 3x Interconnect bandwidth along with over OCTEON CN3XXX family

Sophisticated hardware based QoS support

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

Scalable per-core security coprocessor architecture for lower latency, reduced interconnect overhead, and higher small packet performance

Reduced BOM cost with essential interfaces

Standalone Routers/Appliances, Offload Module, ATCA, AMC, MicroTCA and NIC Applications

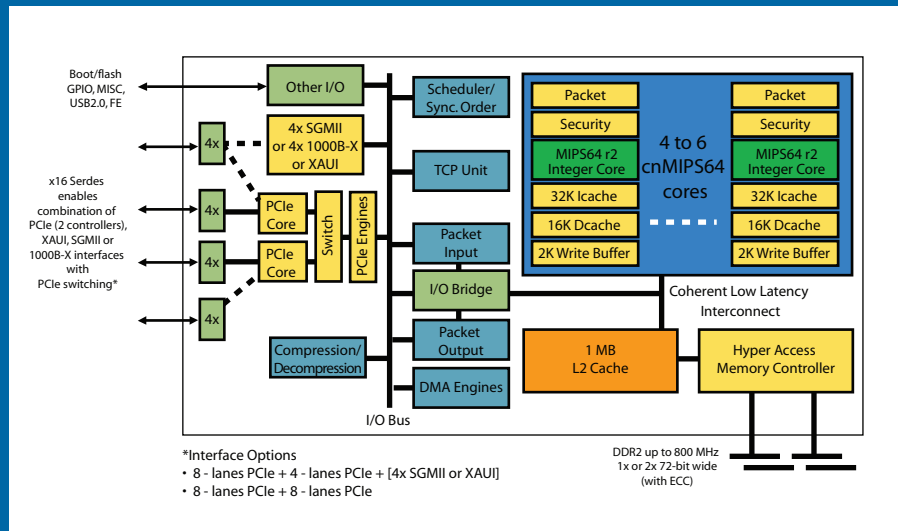
Flexible architecture allows host and coprocessor implementations in a single chip

Industry-standard programming model without any need for proprietary tools or micro-coding

Fully software compatible with entire OCTEON family to deliver 1- 16 CPU scalability

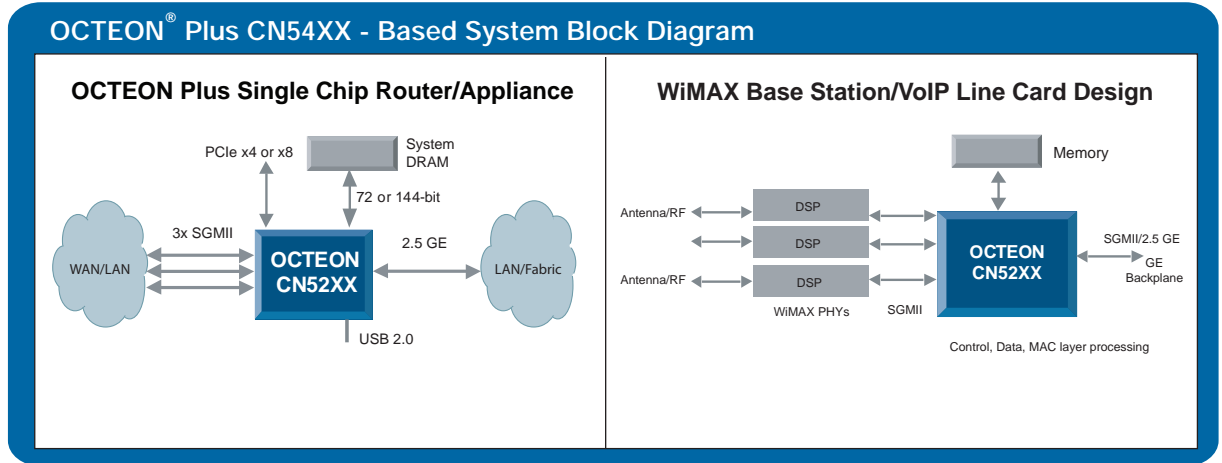
Highest performance, optimized power and integration for Networking and Wireless control plane, L4-L7 data and security services

## OCTEON<sup>®</sup> Plus CN54XX - Block Diagram



# OCTEON® Plus CN54XX 4 to 6-Core MIPS64-Based SoCs

Product Brief



## APPLICATIONS

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

## SOFTWARE SUPPORT

- Cavium SDK includes:
  - Up to 6-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, SRTP available
- Comprehensive ecosystem support
  - Popular third-party operating systems and toolchains, including MontaVista Linux, Wind River VxWorks, and Linux, ENEA OSE, and NetBSD
  - Broad range of third-party application software vendors
  - Broad choices of ODM appliances, AMC, and ATCA cards
- MIPS64/32 support enables thousands of MIPS and other C/C++ applications to be easily ported to OCTEON

## OCTEON® Plus CN54XX - Product Family

Device	cnMIPS cores	Performance	Option		L2 Cache	Packet Interfaces	PCI-Express Controllers	Main Memory IO w/ECC	Package
		Max. Available Instructions Per Second	NSP	CP					
CN5430	4	5.6B	Y	Y	1MB	4x SGMII or 1x XAUI	2x [x4 or x 8 Lanes]	DDR2 up to 800 MHz 1x or 2x 72-bits wide	1217 FCBGA
CN5434	6	8.4B	Y	Y					

### Device Options:

Device Speed Grade (500LP = 500 Low Power, 600LP = 600 MHz Low Power, 600 = 600 MHz, 700 = 700 MHz)

Option code for device family listed below:

NSP = Network Services Processor: Includes, encryption, de/compression, networking, TCP acceleration and QoS  
CP = Communications Processor: Includes networking, TCP acceleration and QoS