

Multi-Core MIPS64® Processors

OCTEON™ Plus CN52XX 2 to 4-Core MIPS64-Based SoCs

Product Brief



OVERVIEW

The OCTEON™ Plus CN52XX family of Multi-core MIPS64 processors targets intelligent networking, control plane, security, and wireless applications in next-generation equipment from 500Mbps to 4Gbps performance. The family includes four different software-compatible parts, with two to four 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.

FEATURES

Software compatible with the leading OCTEON family

- 2 - 4 cnMIPS CPU cores (MIPS64/32 compatible)
- Available in 500 MHz to 900 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

- 512KB ECC protected L2 cache with locking, partitioning features for optimal performance
- Integrated mainstream DDR2 memory controller with ECC, up to DDR2-800, 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)
- RAID, De-duplication

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

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

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

Max power consumption: 7W – 13W

- Package: 35 x35 mm 729 HSBGA

BENEFITS

Market-leading performance

- Up to 7.2 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

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

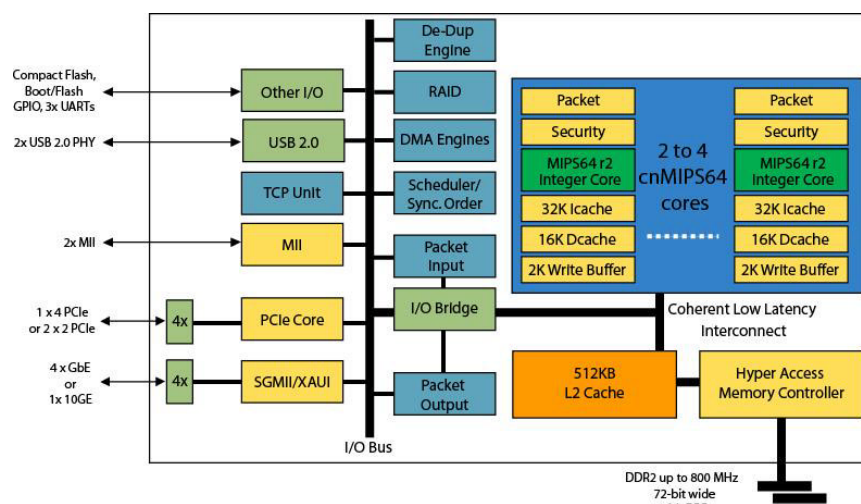
Flexible architecture allows host and coprocessor implementations in a single chip

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

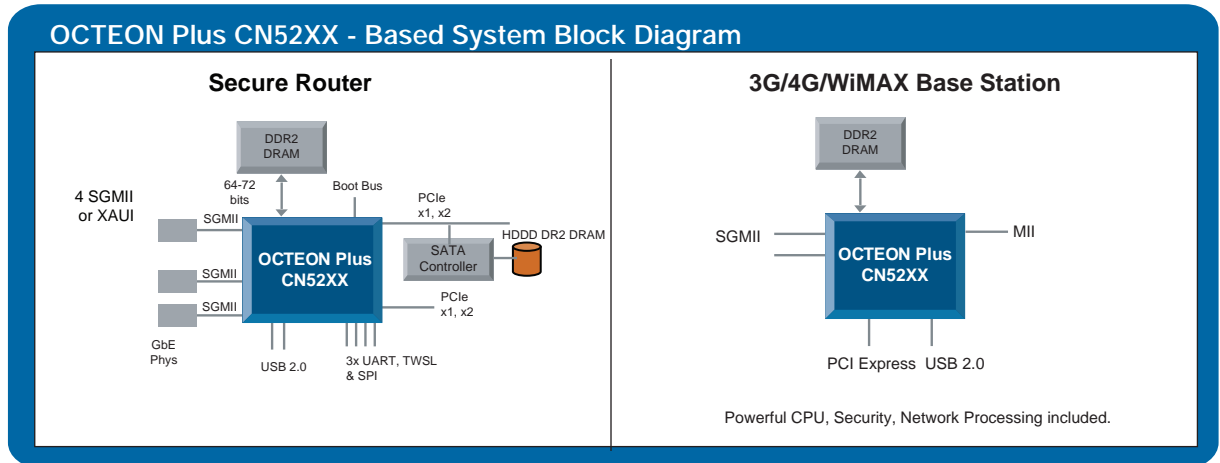
OCTEON Plus CN52XX - Block Diagram



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APPLICATIONS

- Wireless WAN security, control and packet processing including 3G/UMB, LTE, and WiMAX
- Next-generation integrated, standalone routers and appliances
- Unified Threat Management (UTM) appliances with Firewall, VPN (IPsec, SSL), IDS, IPS and Anti-virus scanning
- 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 Networks SDK includes:
 - Up to 4-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, 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 CN52XX - Product Family

Device	cnMIPS cores	Performance	Option		L2 Cache	Networking Interfaces	PCIe v1	Main Memory IO w/ECC	Package
		Max. Available Instructions Per Second	SCP	CP					
CN5220	2	3.6B	Y	Y	512KB	2 MII, 4x SGMII or 1x XAUI	1x 4 Lanes or 2x 2 Lanes	DDR2 up to 800 MHz 1x 72-bits wide	729 HSBGA
CN5230	4	7.2B							



Device Options:

Device Speed Grade (500 = 500 MHz, 600 = 600 MHz, 700 = 700 MHz, 800 = 800 MHz, 900 = 900 MHz)

Option code for device family listed below:

- SCP = Secure Communications Processor: Includes encryption, networking, TCP acceleration, QoS, RAID, De-dup acceleration
- CP = Communications Processor: Includes networking, TCP acceleration and QoS

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