

## Embedded MIPS64® Processors

# OCTEON™ CN30XX Single Core MIPS64 Embedded Processors



### Product Brief

#### OVERVIEW

The OCTEON CN30XX family of MIPS64 processors targets intelligent broadband networking, control plane, storage, and wireless applications in next-generation equipment from 100 Mbps to 1Gbps. This family consists of 4 different software-compatible processors, with a cnMIPS64 core and integrated next-generation I/Os including Fast Ethernet, Gigabit Ethernet, TDM/PCM, and USB 2.0, along with the most advanced security, packet processing and QoS features. CN30XX processors are the industry's first products to deliver the performance of 64-bit computing and integrated L2 cache starting at market-leading price points. Supported by industry-standard software toolchains and operating systems, the CN30XX is ideal for 802.11a/b/g/n, VDSL2, PON, Triple-Play, UTM, SOHO/SMB NAS, and VoIP applications.

#### FEATURES

- Custom CPU core optimized for networking
- cnMIPS™ CPU core (MIPS64/32 compatible) with MMU
- Available in 300 MHz to 500 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
- 64KB -128KB ECC protected L2 cache with locking, partitioning features for optimal performance
- Integrated mainstream 16 - 32-bit DDR2 memory controller with ECC, up to DDR2-533

- Integrated coprocessors for application acceleration
- Packet I/O processing, QoS and TCP acceleration
- Support for IPsec, SSL, SRTP, WLAN security (includes DES, 3DES, AES (up to 256-bit), SHA1, SHA-2 up to SHA-512, RSA, DH)

- Integrated high-performance networking interfaces
- Up to three configurable Ethernet I/Os - 3x FE/GE MACs
- Integrated 32-bit, 66 MHz PCI host or slave
- TDM/PCM interface for glueless VoIP support
- USB 2.0, high-speed (480Mbps), host with integrated PHY

- Low-power consumption:
- 2W - 4W

- Small footprint package:
- 564 HSBGA

#### BENEFITS

- Market-leading performance
- Up to 1 Billion instructions per second
- 100Mbps to 1Gbps application performance
  - Up to 1Gbps 64B IP forwarding
  - Up to 1Gbps for TCP, IPsec, SSL

- Support for Voice, Video and Data with integrated hardware
- Queuing, scheduling
- Very low latency for real-time traffic

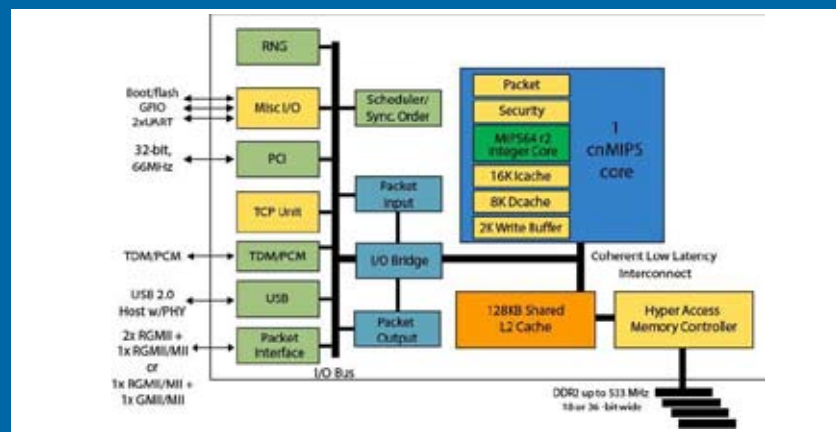
- Reduced BOM cost with essential interfaces for next-generation networking equipment
- Glueless support for switching, WLAN, voice and video
- High-speed USB2.0 enables printer, storage connectivity

- 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 CN38XX, CN36XX, CN31XX to deliver 1- 16 CPU scalability

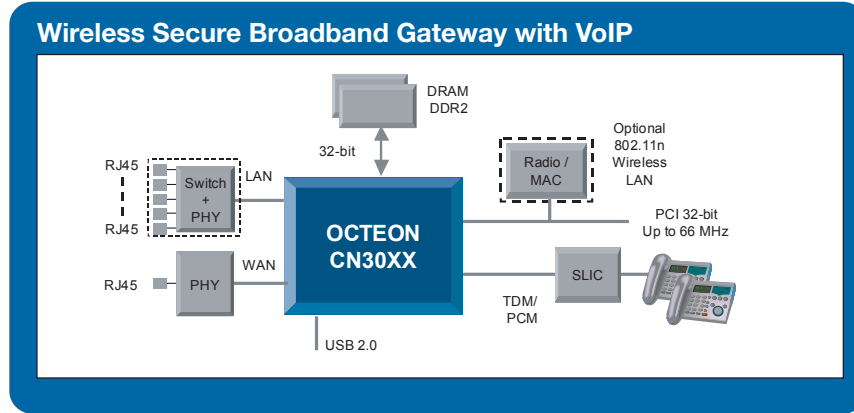
#### OCTEON CN30XX - Block Diagram



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Product Brief



### OCTEON CN30XX APPLICATIONS

- Wired and Wireless Broadband Gateway with security and packet processing
- Unified Threat Management (UTM) security appliances with Firewall, VPN (IPsec, SSL), IDS, IPS and Anti-virus scanning
- Triple-play voice, video and data wired and wireless gateways
- Integrated management and router processor cards
- Network acceleration cards for security, TCP, content processing and compression
- Switch/router line card, services card control and datapath processing
- Intelligent PCI NIC cards and motherboards

### OCTEON SOFTWARE SUPPORT

- Cavium Networks SDK includes:
  - 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
- 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, WindRiver VxWorks, ENEA OSE
  - Broad range of third-party application software vendors, including D2 Technologies Intoto, Jungo, and Team F1
- MIPS64/32 support enables thousands of MIPS and other C/C++ applications to be easily ported to OCTEON

### OCTEON CN30XX - Product Family

Device	Part Number	cnMIPS cores	Performance	Option		L2 Cache	Interfaces			PCI	Memory I/O	Package
			Max. Available Instructions Per Second	SCP	CP		USB 2.0	TDM	Ethernet			
CN3005	CN3005-XXXBG564-Option Code	1	800M	x	x	64KB	x	x	2x RGMII/MII or 1x GMII	32-bit/66 MHz	DDR2 up to 533 MHz 18 or 36-bit wide	564 HSBGA
CN3010	CN3010-XXXBG564-Option Code	1	1.0G	x	x	128KB	x	x				

Part Number Options:

XXX = Device Speed Grade (300 = 300 MHz, 400 = 400 MHz, 500 = 500 MHz), CN3005 only up to 400 MHz

Option Code = Device Family (listed below):

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

CP = Communication Processor Includes: high performance packet processing, TCP acceleration and QoS