

Embedded MIPS64® Processors

OCTEON™ Plus CN50XX Single and Dual Core MIPS64 Embedded Processors

Product Brief



OVERVIEW

The OCTEON CN50XX single and dual core MIPS64 processor family targets intelligent broadband access, storage, SMB and wireless applications in next-generation equipment from 100 Mbps to 2 Gbps performance. This cost-effective family consists of four different software-compatible processors, each with one or two cnMIPS64 cores on a single chip. These processors integrate next-generation I/Os including Gigabit Ethernet and USB 2.0, along with the most advanced security, QoS and application hardware acceleration to deliver greater than three times the performance, power and real estate over alternative solutions. The CN50XX processors are fully hardware and software compatible with the OCTEON CN30XX family of products.

FEATURES

- Custom CPU core optimized for networking
- 1-2 cnMIPS™ CPU cores (MIPS64/32 compatible) with MMU
- Available in 300 MHz to 700 MHz versions
- OCTEON Plus 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
- 128KB ECC protected L2 cache with locking, partitioning features for optimal performance
- Integrated mainstream 16 - 32-bit DDR2 memory controller with ECC, up to DDR2-667

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

- Integrated high-performance networking interfaces
- Up to 3 configurable Ethernet I/Os - 3x 10/100/1000 Ethernet MACs (RGMII; GMII or MII)
- Integrated 32-bit, 66 MHz PCI host or slave
- TDM/PCM interface for glueless VoIP support
- USB 2.0, high-speed (480 Mbps), host with integrated PHY

- Small footprint package:
- 564 HSBGA package - compatible with OCTEON CN30XX single core processors

BENEFITS

- Market-leading performance
- Up to 2.8 Billion instructions per second
- 500 Mbps to 2+ Gbps application performance
 - Up to 1+ Gbps 64B IP forwarding

- Support for voice, video and data with integrated hardware
- Queuing, scheduling
- Very low latency for real-time traffic

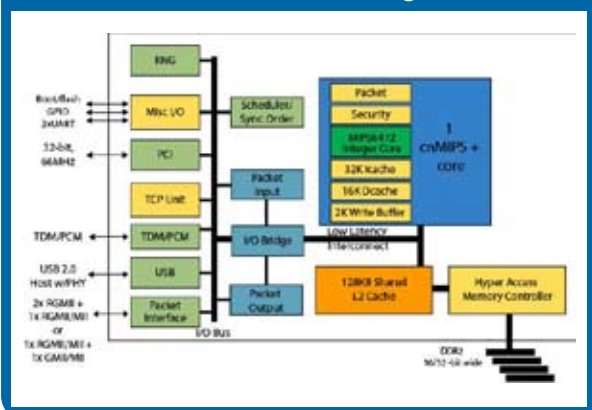
- Reduced BOM cost with essential interfaces for next-generation networking equipment
- Glueless support for switching, WLAN, voice and video
- High-speed USB 2.0 enables printer, storage connectivity

Flexible architecture allows host and coprocessor implementations

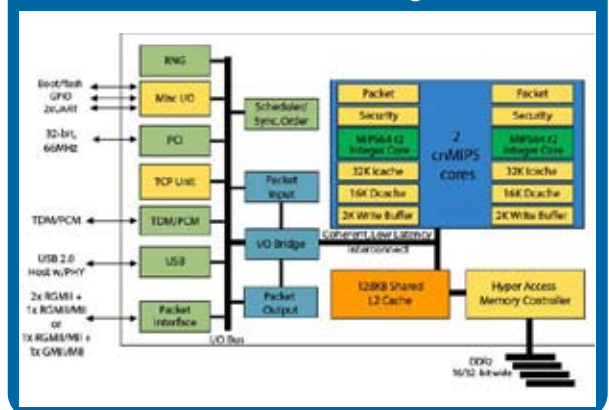
Industry-standard programming model without any need for proprietary tools or micro-coding

Fully software compatible with OCTEON CN50XX, CN30XX to deliver 1-16 CPU scalability

OCTEON CN5010 - Block Diagram



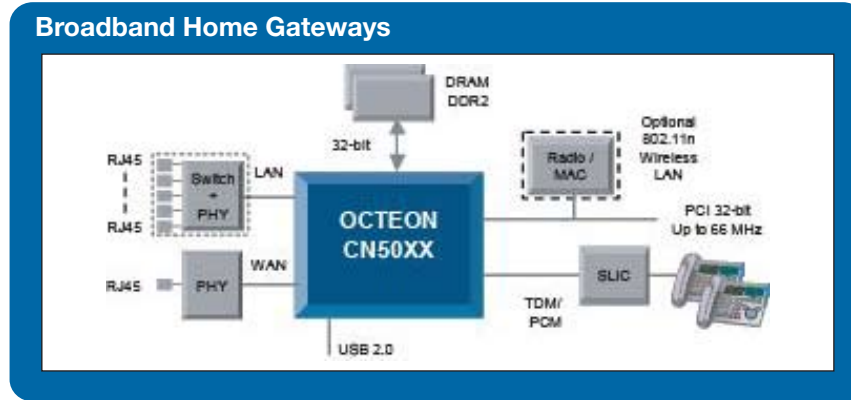
OCTEON CN5020 - Block Diagram



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OCTEON Plus CN50XX Single and Dual Core MIPS64 Embedded Processors

Product Brief



OCTEON CN50XX APPLICATIONS

Next generation integrated, standalone routers and appliances

- Highest performance for service provider networks
- Triple-play wired and wireless Broadband gateways
- Best-in-class performance and low-power for 802.11n Enterprise APs
- Maximum throughput SME & SOHO NAS with processing headroom for advanced RAID and management functions
- Unified Threat Management (UTM) security appliances with Firewall, VPN (IPsec, SSL), Software based IDS, IPS and Anti-virus scanning
- Control processor for integrated management and route processor cards
- Switch/router line card and services card control and data-path processing

SOFTWARE SUPPORT

- Cavium Networks SDK includes:
 - SMP LINUX support
 - Complete GNU tool-chain, GDB, DDD and viewzilla for tuning
 - Optimized C libraries for security and processing offload
- 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: Arada Systems, D2 Technologies, Intoto, Jungo, TeamF1 and 6Wind
- MIPS64/32 support enables thousands of MIPS and other C/C++ applications to be easily ported to OCTEON
- Application Development Kits (ADK) for rapid application bring up and profiling for WLAN, VoIP, NAS, Networking and Security
- Wide variety of third-party drivers for applications such as MoCA, 802.11n, UWB, and MPEG4

OCTEON CN50XX - Product Family

Device	Part Number	cnMIPS cores	Performance Max. Available Instructions Per Second	Option		L2 Cache	Interfaces			PCI	Memory I/O	Package
				SCP	CP		USB 2.0	TDM	Ethernet			
CN5010	CN5010-XXXBG564-Option Code	1	1.4G	x	x	128KB	x	x	2x RGMII+ 1x RGMII/MII or 1x GMII/MII+ 1x RGMII/MII	32-bit/ 66 MHz	32/36 bit DDR2-400, 533 or 667	564 HSBGA
CN5020	CN5020-XXXBG564-Option Code	2	2.8G	x	x	128KB	x	x				

Part Number Options:

XXX = Device Speed Grade (300 = 300MHz, 400 = 400MHz, 500 = 500MHz, 600 = 600MHz, 700 = 700MHz))

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