CAVIUM NETWORKS

Processor Innovation for Intelligent Networks

Multi-Core MIPS64® Processors

OCTEON™ CN31XX Single and Dual Core MIPS64 Based SoCs

Product Brief

OVERVIEW

The OCTEON CN31XX family of Single and Dual Core MIPS64 processors targets intelligent networking, control plane, storage, and wireless applications in next-generation equipment from hundreds of Mbps to 2 Gbps performance. This cost-effective family consists of 8 different software-compatible parts, with one or two cnMIPS64 cores on a single chip that integrate next-generation I/Os, including gigabit Ethernet and USB 2.0, along with the most advanced security and application hardware acceleration to deliver a 3x+ performance, power and real-estate value proposition over alternatives.

FEATURES

Custom CPU cores optimized for networking

- 1-2 cnMIPS™ CPU cores (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

- 256KB ECC protected 4-way set associative L2 cache with locking, partitioning features for optimal performance
- Integrated mainstream 64/72b DDR2 memory controller with ECC, up to DDR2-667
- Optional, additional low-latency 16-bit DDR2-667 for content based processing and meta-data

Integrated coprocessors for application acceleration

- Packet I/O processing, QoS, TCP, Acceleration
- Support for IPsec, SSL, SRTP, WLAN security (includes DES, 3DES, AES (up to 256-bit), SH-A1, SHA-2 up to SHA-512, RSA, DH)
- Regular expression, compression/de-compression

Integrated high-performance networking interfaces

- Up to 3 Configurable Ethernet I/Os - 3x 10/100/1000 Ethernet MACs (RGMII) or 1x RGMII + 1x GMII
- Integrated 32-bit, 100 MHz PCI/PCI-X host or slave
- TDM/PCM interface for glueless VoIP support
- USB 2.0, high-speed (480 Mbps), host with integrated PHY

BENEFITS

Market-leading performance

- Up to 2 Billion instructions per second
- 500 Mbps to 2 Gbps application performance
  - Up to 2 Gbps 64B IP forwarding
  - Up to 2 Gbps for TCP, IPsec, SSL, compression/ decompression
  - Up to 1 Gbps for Regular Expression

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

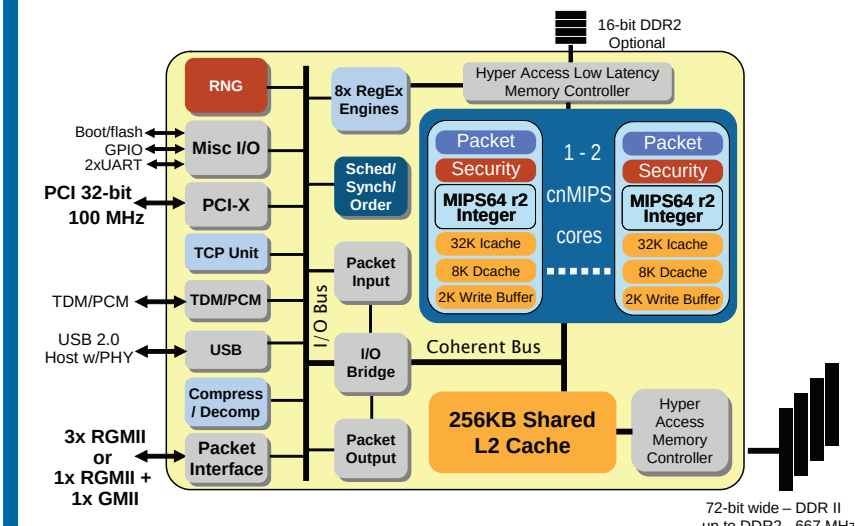
- Glueless support for switching, WLAN, voice and video
- High-speed USB 2.0 enables printer, storage connectivity

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 CN38XX, CN36XX, CN30XX to deliver 1-16 CPU scalability

OCTEON CN31XX - Block Diagram



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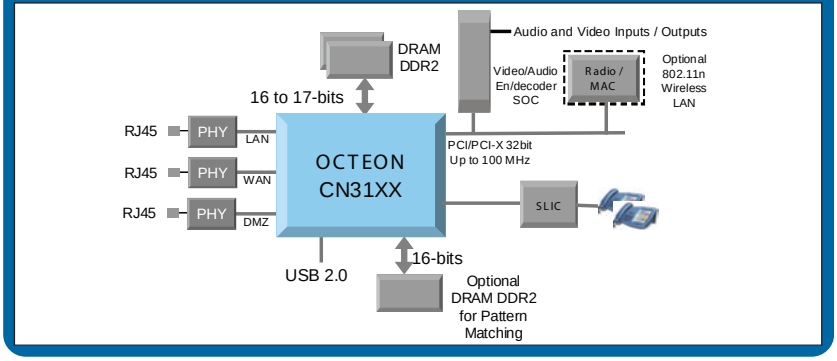
Single Chip UTM/Triple Play Solution



OCTEON CN31XX Applications

- Next generation integrated, standalone routers and appliances
- Unified Threat Management (UTM) security appliances with Firewall, VPN (IPsec, SSL), IDS, IPS and Anti-virus scanning
- Application aware / L4+ content processing and switching
- Triple-play voice, video and data wired and wireless gateways
- Network acceleration cards for security, TCP, content processing, compression
- Integrated management and route processor cards
- Switch/router line card and services card control and data-path processing
- TCP, iSCSI, RDMA, compression processing for storage applications

OCTEON Software Support

- Cavium Networks SDK includes:
  - 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, WindRiver VxWorks, ENEA OSE
  - Broad range of third-party application software vendors, including 6Wind, Intoto, D2 Technologies
- MIPS64/32 support enables thousands of MIPS and other C/C++ applications to be easily ported to OCTEON

OCTEON CN31XX - Product Family

Device	Part Number*	cnMIPS cores	Performance	Option				L2 Cache	Interfaces			PCI / PCI-X	Memory I/O wECC	DFA Memory I/O wECC	Package
			Max. Available Instructions Per Second	NCP	EXP	SCP	CP		USB 2.0	TDM	Ethernet				
CN3110	CN3110-XXXBG868-Option Code	1	1G	x	x	x	x	256KB	x	x	3xRGMII or 1xRGMII+ 1xGMII	32-bit/ 100 MHz	64/72-bit DDR2-667	1x16-bit DDR2-667	868 BGA
CN3120	CN3120-XXXBG868-Option Code	2	2G	x	x	x	x		x	x					868 BGA

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* (Part Number Options):

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

Option Code = Device Family (listed below):

NSP = Network Services Processor Includes: encryption, reg-ex acceleration, de/compression, networking, TCP acceleration and QoS

EXP = Extreme Processor Includes: reg-ex acceleration, de/compression, networking, TCP acceleration and QoS

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

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

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