

OCTEON[®] CN38XX/CN36XX 4 to 16-Core MIPS64 Based SoCs

Product Brief



OVERVIEW

The OCTEON[®] CN38XX and CN36XX family of Multi-core MIPS64 processors targets intelligent networking, control plane, storage, and wireless applications in next-generation equipment from 1Gbps to 10Gbps performance. The family includes 15 different software-compatible parts, with four to sixteen cnMIPS64 cores on a single chip that integrate next-generation networking I/Os along with the most advanced security and application hardware acceleration to deliver a 3x – 5x performance, power and real-estate value proposition over alternatives.

FEATURES

Custom CPU Cores Optimized for Networking

- 4-16 cnMIPS[™] CPU cores (MIPS64/32 compatible) with MMU
- Available in 400 MHz to 600 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 8-way set associative L2 cache with locking, partitioning features for optimal performance
- Integrated mainstream 128/144-bit DDR2 memory controller with ECC, up to DDR2-800
- Optional, additional, low-latency 2x18-bit or 4x9-bit RDRAM2 for content based processing, meta-data and TCAM connectivity

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, SHA1, SHA-2 up to SHA-512, RSA, DH)
- Regular expression, compression/decompression

Integrated High-Performance Networking Interfaces

- Up to 2 sets of I/Os - each configurable as 4x10/100/1000 Ethernet MACs (RGMII) or SPI-4.2
- Integrated 64-bit, 133 MHz PCI-X host or slave

Comprehensive Development Environment with Linux, VxWorks and C/C++ support

Optimized power consumption: 14W – 30W

Package: 1521 FCBGA

BENEFITS

Market Leading Performance

- Up to 19.2 billion instructions per second
- Up to 10Gbps application performance
 - Up to 20Mpps 64B IP forwarding
 - Up to 10+Gbps for TCP, IPsec, SSL
 - Up to 4Gbps for Regular Expression, Compression/Decompression

Sophisticated Hardware Based QoS Support

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

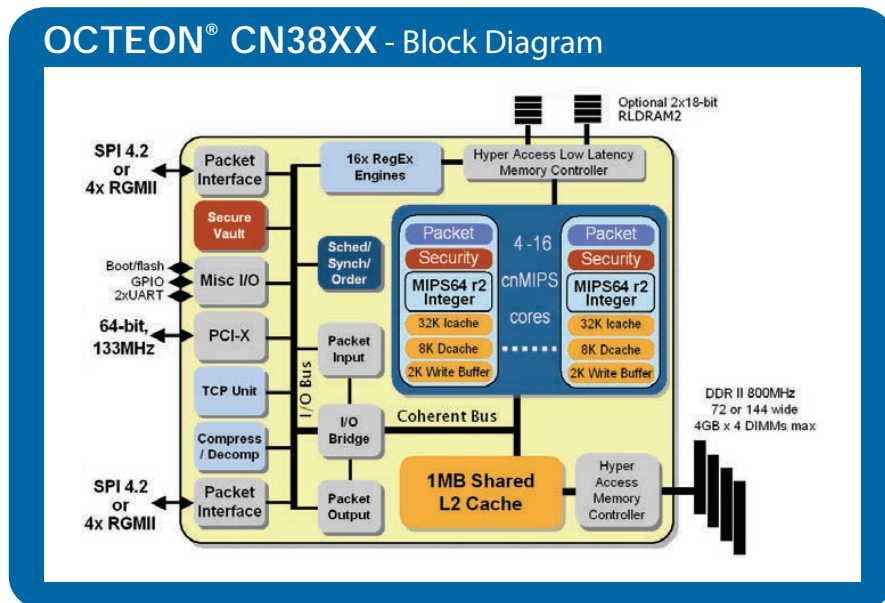
Reduced BOM cost with essential interfaces for standalone routers/appliances, line-card and Services-card Applications

Flexible Architecture allows Host and Co-processor Implementations

Industry-Standard Programming Model without any need for Proprietary Tools or Micro-coding

Fully Software Compatible with OCTEON CN31XX and CN30XX to deliver 1- 16 CPU scalability

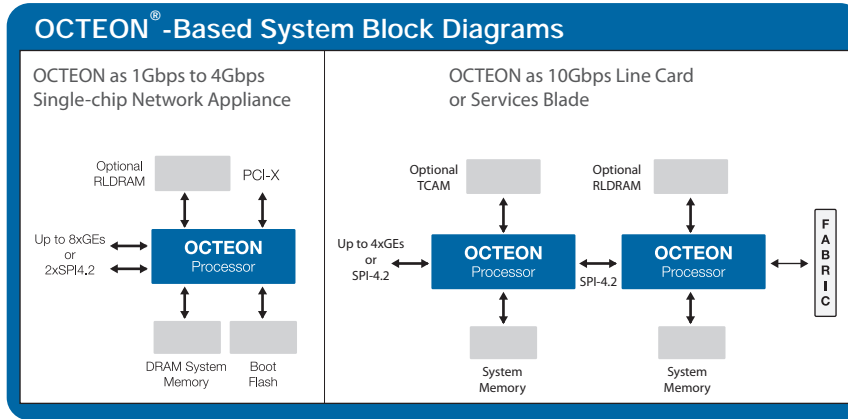
3x – 5x Advantage over Alternative System Architectures in Performance and Power for L4-L7 Data and Security Services



Multi-Core MIPS64[®] Processors

OCTEON[®] CN38XX/CN36XX 4 to 16-Core MIPS64 Based SoCs

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OCTEON CN38XX/CN36XX APPLICATIONS

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

OCTEON SOFTWARE SUPPORT

- Cavium SDK includes:
 - Up to 16-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 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 and D2 Technologies
- MIPS64/32 support enables thousands of MIPS and other C/C++ applications to be easily ported to OCTEON

OCTEON[®] CN38XX and CN36XX - Product Family

Device	Part Number *	cnMIPS cores	Performance			L2 Cache	Interfaces	PCI/PCI-X	Memory IO w/ECC	DFA Memory IO w/ECC	Package
			Max. Available Instructions Per Second	Option N	Option E						
CN3630	CN3630-XXXBG1521- Option Code	4	4.8G	Y	Y	Y	512KB	4x RGMII or SPI-4.2	64-bit/133 MHz	DDR II - 72-bit	2x 18-bit RLD RAM2 (optional) 1521 pins
CN3830	CN3830-XXXBG1521- Option Code	4	4.8G	Y	Y	Y	1MB	2x [4x RGMII or 1x SPI-4.2]	64-bit/133 MHz	DDR II - 72-bit or DDR II - 144-bit	
CN3840	CN3840-XXXBG1521- Option Code	8	9.6G	Y	Y	Y					
CN3850	CN3850-XXXBG1521- Option Code	12	14.4G	Y	Y	Y					
CN3860	CN3860-XXXBG1521- Option Code	16	19.2G	Y	Y	Y					

* (Part Number Options):
 XXX = Device Speed Grade (400 = 400 MHz, 500 = 500 MHz, 550 = 550 MHz, 600 = 600 MHz)
 Option Code = Device Family Listed Below:

NPS = Network Services Processor: Includes, encryption, reg-ex acceleration, decompression, networking, TCP acceleration and QoS
 EXP = Extreme Processor: Includes reg-ex acceleration, decompression, networking, TCP acceleration and QoS
 SCP = Secure Communications Processor: Includes, encryption, networking, TCP acceleration and QoS