

Multi-Core MIPS64® Processors

# 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 400MHz to 600MHz versions
- 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**

- 1MB ECC protected 8-way set associative L2 cache with locking, partitioning features for optimal performance
- Integrated mainstream 128/144b DDR2 memory controller with ECC, up to DDR2-800
- Optional, additional, low-latency 2x18bit or 4x9bit RLDRAM2 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/De-compression

**Integrated High-Performance Networking Interfaces**

- Up to 2 sets of I/Os - each configurable as 4x 10/100/1000 Ethernet MACs (RGMII) or SPI-4.2
- Integrated 64bit, 133MHz 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**

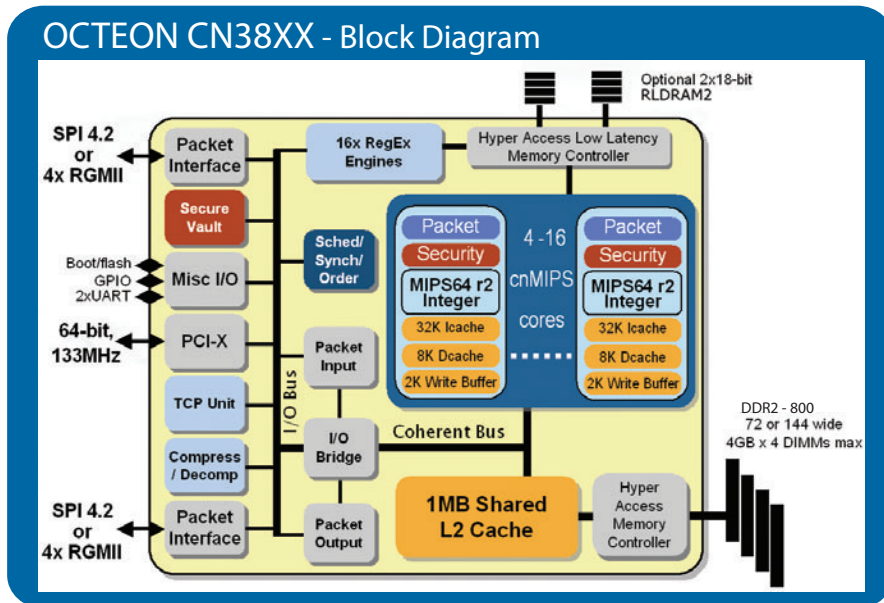
**Industry-Standard Programming Model without any Need for Proprietary Tools or Micro-coding**

**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**



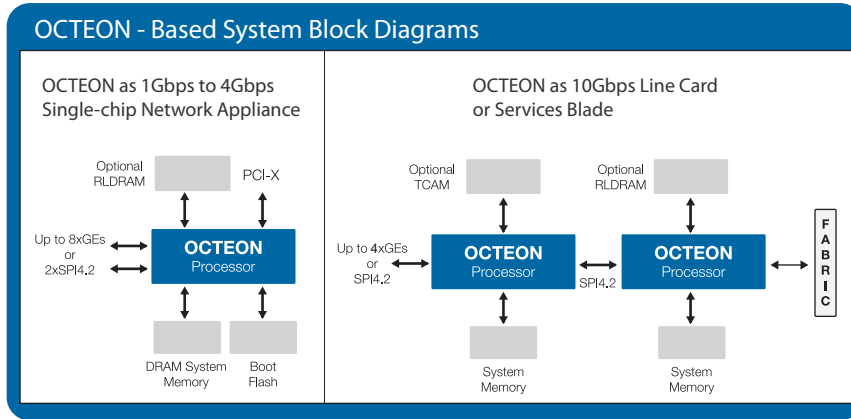
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Product Brief



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

\* (Part Number Options):

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

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