# CAVIUM

**Multi-Core MIPS64® Processors**

## OCTEON III® CN70XX and CN71XX Single to Quad-Core Embedded Processors with Hardware Virtualization

Product Brief

### OVERVIEW

The OCTEON® III CN70XX/CN71XX families of Multi-Core MIPS64 Processors target SMB and entry-level Enterprise platforms for networking and storage including Service Provider Gateways, Switches, Routers, Security Appliances, Network Attached Storage (NAS), Mainstream Control Plane, Network Attached Printers, Enterprise WLAN Access Points, Industrial and Military/Aero. The families includes six software and pin-compatible processors, with one to four cnMIPS64 v3 cores on a highly- integrated SoC that includes a rich set of I/O's including PCIe Gen2, 9 GbE controllers, 10GbE, USB 3.0, and SATA 3.0 along with Cavium's most advanced fourth-generation application hardware acceleration.

### FEATURES

- Up to 4 cores at 1.6GHz per core with large 78K/32K L1 cache and shared 512KB L2 cache
- Rich I/O interfaces including DDR3/4, Q/SGMII, RXAUI, SATA3.0, USB 3.0, and PCIe Gen2
- Integrated fourth-generation Deep Packet Inspection (DPI) and security acceleration engines without additional memory requirements
- Very low power down to <3W
- Integrated acceleration for networking, QoS, RAID, and multicore scaling
- Per Core Floating Point Unit and Hardware Virtualization
- 36b DDR3/DDR4 up to 1333MHz

### BENEFITS

- Low power - suitable for fanless and POE designs
- Virtualization support enables legacy OS and applications to be firewalled
- >14M Packets Per Second of Networking Performance
- 23K Coremarks with gcc compiler (no special or custom compilers)
- >200MB/s of multi-flow NAS performance
- Quad-core scalability for performance and feature headroom. Single platform for variety of applications and OEM SKU
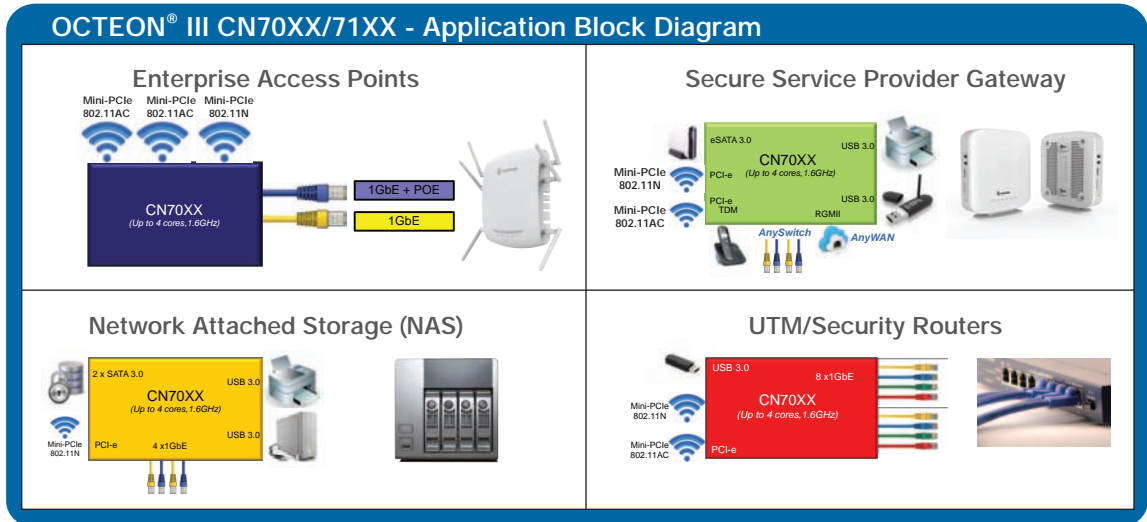- Rich set of I/O minimizes BOM cost and enables most flexible system configuration options

## OCTEON® III CN70XX/CN71XX - Block Diagram
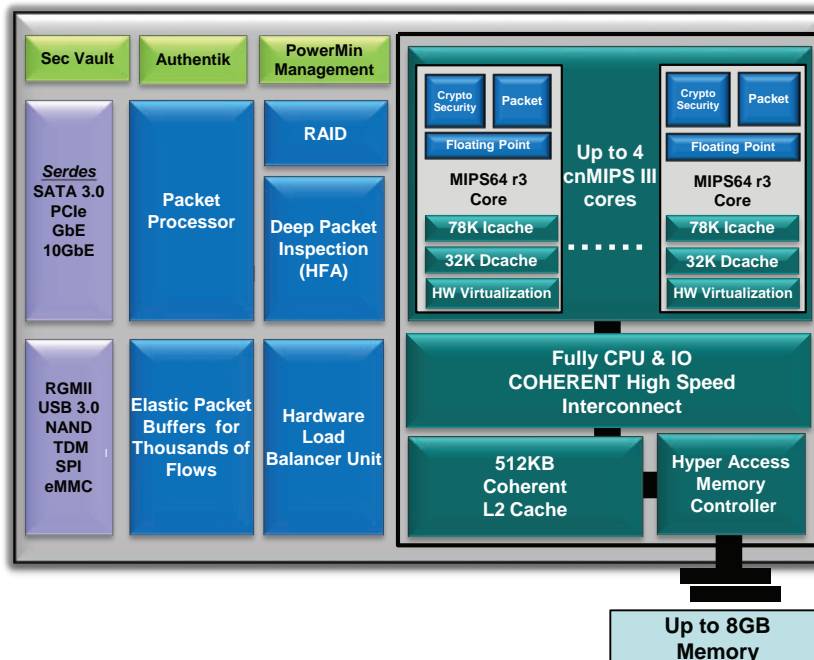
# Multi-Core MIPS64® Processors

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## OCTEON® III CN70XX/71XX - Application Block Diagram

### Enterprise Access Points

Mini-PCIe 802.11AC
Mini-PCIe 802.11AC
Mini-PCIe 802.11N

CN70XX
(Up to 4 cores, 1.6GHz)

1GbE + POE
1GbE

### Secure Service Provider Gateway

Mini-PCIe 802.11N
Mini-PCIe 802.11AC

eSATA 3.0
CN70XX
(Up to 4 cores, 1.6GHz)
USB 3.0
PCI-e
PCI-e
TDM
USB 3.0
RGMII
AnySwitch    AnyWAN

### Network Attached Storage (NAS)

2 x SATA 3.0
CN70XX
(Up to 4 cores, 1.6GHz)
USB 3.0
Mini-PCIe 802.11N
PCI-e
4 x1GbE
USB 3.0

### UTM/Security Routers

USB 3.0
8 x1GbE
CN70XX
(Up to 4 cores, 1.6GHz)
Mini-PCIe 802.11N
Mini-PCIe 802.11AC
PCI-e

## OCTEON III CN70XX/71XX Applications

- Enterprise 802.11ac/n/g access points
- Next-generation service provider gateways
- UTM and security appliances
- Network attached storage
- Control plane processors for blades/appliances
- SME Routers and switches
- Network Attached Printers
- Industrial Control
- Military/Aero Applications

## Software Support

- Industry's most comprehensive software development kit for embedded applications including
  - Commercial-grade Linux
  - Complete GNU tool-chain, GDB
  - Performance analysis and profiling tools
  - Optimized C libraries for security and DPI
- Integrated Application Development Kits (ADK's) for AP, Gateway, and Router applications
- Production-grade software toolkits for TCP/IP, IPSec, SSL
- OpenWRT for Gateway and Router applications

## OCTEON® III CN70XX/71XX - Product Family

| Device | cnMIPS cores | Max Frequency (MHz) | Networking I/F | Other System I/F | Memory I/O w/ ECC |
|--------|--------------|---------------------|----------------|------------------|-------------------|
| CN7010 | 1 | 800, 1000, 1200 | Up to 2 x (QSGMII/SGMII) + 1x RGMII | Up to 3x PCIev2 + 2x USB 3.0 + 2x SATA 3.0 | 1x 36-bit DDR3/4 with ECC |
| CN7020 | 2 | 800, 1000, 1200 | | | |
| CN7120 | 2 | 1000, 1200, 1500, 1600 | Up to 2 x (QSGMII/SGMII) or 1 x RXAUI + 1x RGMII | | |
| CN7125 | 3 | 800, 1000, 1200, 1500, 1600 | | | |
| CN7130 | 4 | 800, 1000, 1200, 1500, 1600 | | | |