



Cavium Corporate and Product Overview

**Embedded Multi-core MIPS64[®], ARM[®] Processors,
and Accelerators for the Enterprise, Data Center,
Service Provider and Connected Home**

Fall 2011



COMPANY OVERVIEW

COMPANY

Cavium, Inc. (NASDAQ: CAVM) is a provider of highly integrated semiconductor products that enable intelligent processing for networking, communication and the digital home. Cavium offers a broad portfolio of integrated, software compatible processors ranging in performance from 10 Mbps to over 40 Gbps that enable secure, intelligent functionality in Enterprise, Data-Center, Broadband/Consumer, Mobile and Service Provider Equipment. Cavium processors are supported by ecosystem partners that provide operating systems, tools and application support, hardware reference designs and other services. Cavium is headquartered in San Jose, CA with design centers in California, Massachusetts, India, China, Taiwan and Canada.

PRODUCTS

OCTEON® Multi-core MIPS64 Processors: Provide a scalable range from one to forty-eight cnMIPS® cores on a single system on a chip (SoC) along with the most advanced networking, security and application hardware acceleration. The cnMIPS® core is Cavium's custom implementation of MIPS64 release 2, optimized for networking, and services with very low power consumption. Application hardware acceleration engines for QoS, packet processing, TCP, compression, encryption, SNOW 3G, KASUMI, RAID, de-duplication and pattern matching enable OCTEON to deliver unmatched scalability, performance and integration from 100 Mbps to over 100 Gbps of network performance in a single chip. OCTEON supports flexible standards-based I/O's including gigabit Ethernet, 10 gigabit Ethernet, PCI Express Gen 1 & 2, USB2.0, serial Rapid I/O (sRIO™) and Interlaken.

OCTEON Fusion: OCTEON Fusion™ Family, the industry's most powerful, small cell "Base Station-on-a-chip" family are specifically designed for LTE & 3G multi-mode small cell base stations, including picocell and micro base stations. OCTEON Fusion processors combine OCTEON's widely successful multi-core architecture along with purpose-built Baseband DSP cores, extensive LTE/3G hardware accelerators and digital front end (DFE) features into a single chip, slashing the BOM cost and power envelope of small cell base stations.

NITROX® Processors: The NITROX and NITROX DPI families support cryptography, compression and deep packet inspection (DPI) at up to 40 Gbps and up to 200K RSA Ops/sec. They are ideally suited for enterprise routers and switches, data center networking appliances, integrated security appliances and service provider infrastructure.

NEURON Search™ Processors: Provide high performance and ultra low power L2-L4 network search for enterprise and service provider infrastructure equipment. Includes support for both IPv4 & IPv6 rules and delivers 100 million to over 1.6 billion searches/second based on patent pending Search Technology. This family delivers up to four times the capacity per chip enabling the replacement of four existing state-of-the-art 40 Mbit TCAMs.

ECONA™ ARM Processors: Provide an integrated ARM CPU, comprehensive I/Os and hardware offload blocks for low BOM cost broadband/consumer and network attached storage applications. They offer a rich set of integrated hardware accelerators and a range of I/Os for glueless voice, video and data connectivity. ECONA's sophisticated power management techniques enable super low-power operation starting at less than 1 Watt.

PureVu® Video Processors: The family offer 2D and 3D video processors and WiVu™ Wireless Display integrates dual ARM11 processors with the industry's lowest latency H.264, multi-stream codecs supporting up to 1200P video processing at 60 Hz frame rates, as well as security and graphics accelerators. Applications include networked home video distribution, connected TV, gaming, and video conferencing.

Celestial™ Set-Top Box Processors: Highly integrated set-top box processors targeting worldwide digital Terrestrial, satellite, Cable and IP based operator and retail products. The ARM based SoC's include multi-standard video codecs, image and display processing, advanced conditional access, 2D graphics acceleration and combined with a rich peripheral set addresses major set-top box requirements.

Intelligent Network & Security Adapters: Includes three major product families: OCTEON Intelligent Network, NITROX XL and NITROX XL FIPS HSM Adapters. The OCTEON Intelligent Network Adapters support several offloads including compression, crypto, DPI, TCP, De-duplication and RAID. NITROX XL Adapters deliver 40 Gbps of crypto processing and over 20 Gbps of compression processing along with over 500K RSA Ops/sec. The FIPS HSM Adapters deliver 5 Gbps of crypto performance, 45K Ops/sec and are certified to the stringent FIPS 140-2 Level 3 standard.

CAVIUM SERVICES AND SOLUTIONS

Cavium Services and Solutions (CSS) provides a group of highly experienced architects and developers who are dedicated to help customers accelerate development. Furthermore, CSS offers TurboDPI software, a production ready solution integrating protocol analysis, application recognition, URL filtering, IDS/IPS and anti-malware.

TARGET MARKETS

Cavium products are used in a wide variety of networking, video and wireless applications including:

- **Enterprise Networks:** Routers, Security Appliances, WAN Optimization and Enterprise Switches.
- **Data Centers:** Application Delivery Switches, XML Gateways and Server Offload.
- **Broadband and Consumer:** Broadband Routers, Triple Play Gateways, Retail and Small Office Wired and WLAN Routers, VoIP Phones, Network Attached Storage Devices and Broadband Multi-media Gateways.
- **Access and Service Provider:** Mobile 3G/4G, Base station to Core Network Equipment, Infrastructure Equipment, Security Gateways, Session Border Controllers and Routers.
- **Storage:** FC to IP Routers, Disk Arrays, Switches, TCP, Compression, De-duplication and Security Offload.
- **WiVu:** Wireless display applications for consumer electronic devices.
- **Video Conferencing:** Full 1080p with Sub-frame Latency.
- **Embedded Video Processors:** Medical imaging, digital signage and low latency broadcast.
- **Digital Media Gateway:** Set-top boxes, DVR media player.

Leader in Embedded Multi-core Design Wins for Networking, Wireless, Communications and Storage

#1 in Security Processor Market Share
Broadest & most flexible set of security algorithms deployed



Leader in new products for emerging HD Wireless Video, Home Broadband Gateways and Storage (NAS)

Fast growth, Public, Embedded Processor Company (NASDAQ: CAVM)



CAVIUM MULTI-CORE, SECURITY, SEARCH & VIDEO PROCESSORS

OCTEON Multi-core MIPS64 Processors Family

Device	Cores	CPU Speed	L2 Cache	Interfaces	Options	Package
CN7XXX	1 - 48	Up to 2500 MHz	Large	Multiple 40G, 20G, 10GE, GE Interlaken, Interlaken/LA	AAP, CP	TBD
CN68XX	16 - 32	800 - 1500 MHz	4MB	XAUI or SGMII/Interlaken/PCIe/USB	AAP, CP	1936 FCBGA
CN67XX	8 - 16	800 - 1500 MHz	4MB	XAUI or SGMII/Interlaken/PCIe/USB	AAP, CP	1936 FCBGA
CN66XX	6 - 10	800 - 1500 MHz	2MB	XAUI or SGMII/PCIe/sRIO/USB	AAP, CP	900 FCBGA
CN63XX	2 - 6	800 - 1800 MHz	2MB	XAUI or SGMII/PCIe/sRIO/USB	AAP, CP	900 FCBGA
CN62XX	2 - 4	800 - 1000 MHz	1MB	XAUI or SGMII/PCIe/sRIO/USB	AAP, CP	900 FCBGA
CN61XX	2 - 4	700 - 1000 MHz	1MB	SGMII/PCIe/USB	AAP, SCP, CP	868 HSBGA
CN60XX	1 - 2	500 - 1000 MHz	1MB	SGMII/PCIe/USB/TDM	SCP, CP	564 TEBGA
CN58XX	4 - 16	600 - 800 MHz	2MB	RGMII/SPI-4.2/PCI-X/USB	EXP, NSP, SCP	1521 FCBGA
CN57XX	8 - 12	600 - 800 MHz	2MB	SGMII/XAUI/PCIe/USB	SP, SSP	1217 FCBGA
CN56XX	8 - 12	600 - 800 MHz	2MB	SGMII/XAUI/PCIe/USB	NSP, SCP	1217 FCBGA
CN55XX	4 - 6	500 - 700 MHz	1MB	SGMII/XAUI/PCIe/USB	SP, SSP	1217 FCBGA
CN54XX	4 - 6	500 - 700 MHz	1MB	SGMII/XAUI/PCIe/USB	NSP, CP	1217 FCBGA
CN52XX	2 - 4	500 - 750 MHz	512KB	SGMII/XAUI/PCIe/USB	SCP, CP	729 HSBGA
CN50XX	1 - 2	300 - 700 MHz	128KB	RGMII/GMII/TDM/PCI-X/USB	SCP, CP	564 HSBGA

NITROX DPI Processors Family

Device	Performance	Board Interfaces	Pattern Memory	Package
CN18XX	1-40 Gbps	PCIe, x4, x8	DDR3	900 FCBGA

NITROX Security Processors Family

Device	Performance	RSA 1024-bit EXP	RSA 2048-bit EXP	Interfaces	Local DDR Required	Package
CNN35XX	5 - 40 Gbps	35 - 200K	6 - 35K	PCIe Gen 2.0 x4, x8, x16	No	676 FCBGA
CN16XX	0.5 - 2.5 Gbps	4 - 17K	0.7 - 3K	PCIe Gen 1.0 x4	No	233 BGA
CN15XX	0.5 - 2.5 Gbps	4 - 17K	0.7 - 3K	PCI-X 64-bit/133 MHz	No	256 BGA

NEURON Search and NEURONMAX Search Processor Family

Device	Performance	Interfaces	External Memory	Package
CNSP1XXX	100 Million to over 1.6 Billion Searches/Sec	Interlaken/LA	None	900 FCBGA
CNSP2XXX	100 Million to over 1.6 Billion Searches/Sec	Interlaken/LA	DDR3	900 FCBGA

ECONA Single and Dual-core ARM Processors Family

Device	Cores	CPU Speed	Memory I/O	Interfaces	Options	Package
CNS33XXX	1-2	500 - 700 MHz	16/32-bit	3xGE, 12S, SATA, USB, PCM, 2x PCIe, LCD, SDIO	HW NAT, 2D GPU, RAID 5/6, DPI, PPE	404 LFBGA/484 HSBGA
CNS22XXX	1	250 MHz	16-bit	USB, 2.0, 12S, FE PHY, IDE, PCM, PCI	N/A	269 LFBGA/128 PQFP
CNS11XXX	1	200 MHz	16/32-bit	USB, 2x GE, PCI 32-bit	HW NAT, IDE	267 LFBGA/208 PQFP/304 BGA

PureVu 2D/3D Video Processors Family

Device	Cores	CPU Speed	Streams Processed	Interfaces	Options	Package
CNW6611	1	378 MHz	1080p30	USB, Ge	DLNA, Graphics	425 PBGA
CNW6611L	1	600 MHz	1080p30	SDIO, USB	DLNA, DTCP, HDCP 2.0, Graphics	429 PBGA
CNW5602	2	466 MHz	1 x 1200p60 encode or decode	PCIe, Ge, USB	HDCP 2.0	644 PBGA
CNW5621	0	0	1 x 1200p60 encode	PCIe, USB	HDCP 2.0	400 PBGA
CNW5611	2	466 MHz	1 x 1200p60 decode	PCIe, USB	HDCP 2.0	644 PBGA
CNW5102	2	466 MHz	1 x 1200p60 encode or decode	PCIe, Ge, USB	Graphics	644 PBGA
CNW5302	2	466 MHz	2D: 1 x 1200p60 or 3D: 1 x 1080p30	PCIe, Ge, USB	HDCP 2.0, 3D	676 PBGA

Celestial Processor Family

Device	Cores	CPU Speed	Memory I/O	Interfaces	Options	Package
CNC1800H	1	378 MHz	16/32 bit DDR2	USB, SATA, MII, HDMI, CVBS, S-Video, I2S, SPDIF	CA, H.264 Encoder	425 PBGA
CNC1800L	1	600 MHz	16 bit DDR3	USB, MII, HDMI, CVBS, S-Video, I2S, SPDIF	CA	429 PBGA

CAVIUM NETWORKING, SECURITY & STORAGE ADAPTERS

OCTEON Intelligent Network Adapters

Device	Ethernet I/O	PCIe	DPI	Dimension	Compression/Decompression	TCP	Security Services
CN68XX-NIC	4x10 Gbe	PCIe Gen 2.0	20 - 40 Gbps	4.2" x 10.8"	20 - 40 Gbps	20 - 40 Gbps	20 - 40 Gbps
CN66XX-NIC	2x10Gbe	PCIe Gen 2.0	5 - 10 Gbps	4.2" x 6.6"	5 - 15 Gbps	5 - 15 Gbps	5 - 15 Gbps
CN63XX-CHB	N/A	PCIe Gen 2.0	5 Gbps	2.1" x 6.6"	5 - 10 Gbps	5 - 10 Gbps	5 - 10 Gbps
CN63XX-NIC	2x GE/4x GE/1x10Gbe	PCIe Gen 2.0	5 Gbps	4.2" x 6.6"	2 - 10 Gbps	2 - 10 Gbps	2 - 10 Gbps
CN57XX-NIC	2x10Gbe	PCIe Gen 2.0	5 Gbps	4.2" x 6.6"	5 - 10 Gbps	5 - 20 Gbps	5 - 20 Gbps

Intelligent Network Adapter NIC 2E



Intelligent Network Adapter NIC 4E



Intelligent Network Adapter NIC 10E



NITROX XL Security Adapters

Device	Interface	Dimensions	Performance			
			RSA 1024-bit EXP	RSA 2048-bit EXP	IPSec Mbps	SSL Mbps
CNN35XX-NHB2/3	PCIe Gen 3.0 x8	2.1" x 6.6"	300 - 600K	70 - 105K	64,000	64,000
CNN35XX-NHB	PCIe Gen 2.0 x8	2.1" x 6.6"	35 - 200K	6 - 35K	32,000	32,000
CN16XX-NFBE	PCIe Gen 2.0 x4	2.1" x 6.6"	45K	N/A	5,000	5,000
CN15XX-NFBE	PCIe Gen 1.0 x4	2.1" x 6.6"	10K	N/A	1,000	1,000
CN16XX-NHB4	PCIe x8	2.1" x 6.6"	65K	90K	6,000	6,000
CN1620-NHB	PCIe x4	2.1" x 6.6"	4 - 17K	7 - 3K	500 - 2,500	500 - 2,500
CN1520-NHB	PCI-X 64-bit 133 MHz	2.1" x 6.6"	4 - 17K	7 - 3K	500 - 2,500	500 - 2,500

NITROX XL NFBE
FIPS 140-2 Card



NITROX XL NFBE
FIPS 140-2 Card



NITROX XL NHB4
PCIe NITROX PX



NITROX XL NHB
PCIe NITROX PX



Cavium PACE: Partnership to Accelerate Customer End-solutions

Cavium provides a rich ecosystem for its OCTEON, NITROX, ECONA, PureVu and Celestial family of processors. Below is a selected list of PACE Partners.



For more information on Cavium's 100+ PACE Partners, please visit: http://www.cavium.com/Ecosystem_Partners.php

CAVIUM NETWORKING, BROADBAND, VIDEO & LTE EVALUATION/REFERENCE BOARDS

OCTEON Evaluation/Reference Boards

Device	OCTEON II Processor Family	SERDES I/O Module Options	Miscellaneous I/O	DDR3 DIMM Slots
CN68XX-EVB-Base Kit	CN68XX/CN67XX	PCIe Endpoint PCIe Root Complex 4xSGMII (RJ-45) XAUI (SFP+) SMA Cable	UART USB 2.0 RJ-45 (MGMT) CF	2
CN66XX-EVB Base Kit	CN66XX			2
CN63XX-EVB-Base Kit	CN63XX/CN62XX			2
CN61XX-EVB-Base Kit	CN61XX			2
CN60XX-EVB-Base Kit	CN60XX			1

Evaluation systems are also available for all OCTEON Plus processor families: CN58/57/56/55/54/52/50XX

ECONA Evaluation/Reference Boards

Device	Interface	Memory Sub-System	Extension	Performance IP Forwarding	Dimensions
CNS3420-EVB-HS3-600	2x UART, 1x USB 1.1/2.0 1x PCIe, 1x Mini-PCIe 1x SATA, 6x 10/100/1000 RJ-45	16MB Serial Flash 128MB Parallel Flash 256MB DDR2 SDRAM	I2S/PCM/SPI/GPIO/TWI USBOTG/USB EHCI/OHCI /SDIO/D-Sub	2Gbps	27cm x 27cm
CNS3411-EVB-HS3-600	2x UART, 1x USB 1.1/2.0 1x PCIe, 1x Mini-PCIe 1x SATA, 6x 10/100/1000 RJ-45	16MB Serial Flash 128MB Parallel Flash 128MB DDR2 SDRAM	I2S/PCM/SPDIF/SPI/GPIO/ TWI/USB EHCI&OHCI /SDIO/D-Sub	2Gbps	29.7cm x 22.3cm
CNS2133-EVB-01	2x UART, 2x USB 1.1/2.0 2x Mini-PCI, 1x RJ-45 1x IDE/SATA Bridge	8MB Flash 32MB DDR SDRAM	16-bit SRAM I/F 12S/SPI/GPIO/TWI SMC header for H.264 Codec	95Mbps	15.4cm x 18.2cm
CNS1102-EVB-02	1 x UART, 2 x USB 1 x Mini-PCIe 5x 10/100/1000 RJ-45	8MB Flash 64MB DDR SDRAM	N/A	917Mbps	19.4cm x 20.4cm

PureVu Evaluation/Reference Boards

Device	Audio Inputs	Audio Outputs	Board I/F	Video Compression	Video Resolutions	Dimensions
CNW6611-EVB-TIG	N/A	1x HDMI 1x CVBS	USB 2.0	H.264	Up to 1080p30	50mm x 90mm
CNW5602-EVB-MAU	1x HDMI	1x HDMI	RJ45 Ethernet, USB 2.0, PCI. IR	H.264 sub-frame encode-decode latency	Up to 1200p60	5cm x 9cm
CNW5602-EVB-WIL	1x HDMI	1x HDMI	RJ45 Ethernet, USB 2.0, PCI. IR	H.264 sub-frame encode-decode latency	Up to 1200p60	5cm x 9cm
CNW5621-EVB-BER	1x Display Port	N/A	USB 2.0, PCIe, Mini Display Port	H.264 sub-frame encode latency	Up to 1200p60	44.4mm x 26.8mm
CNW5302-EVB-MOK	1x HDMI	1x HDMI	USB 2.0	H.264 sub-frame encode latency	Up to 1200p60 1080p24 3D	110mm x 80mm

Celestial Evaluation/Reference Board

Device	Interface	Memory Sub-System	Video Resolution	Dimensions
CNC1800H-EVB	Analog Video, HDMI, SPDIF, MII, 2x USB 2.0, SATA II, Front Panel, Tuner Card	DDR2, Nand Flash	Up to 1080p30	180mmx 100mm



Cavium products have been designed-in by the world's leading networking, wireless, storage, video and security vendors. Below is a list of selected customers.



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