

# Marvell ARMADA 8040 Quad-Core CA72 Processor with Marvell MoChi

High-Performance Multi-Core CPU System on Chip

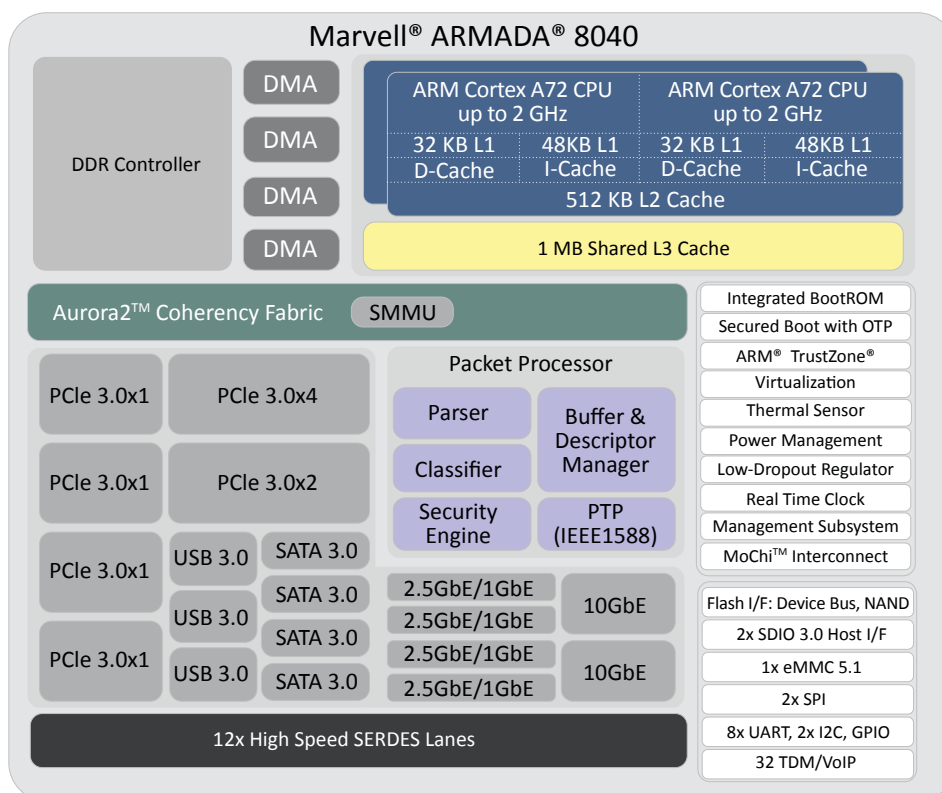
## PRODUCT OVERVIEW

The Marvell® ARMADA® 8040 (88F8040) is a complete system-on-chip (SoC) solution based on the latest ARMv8 high-performance CPU technology, ideally suited for a wide range of SoHo, SMB and Enterprise class applications. The first two products of the ARMADA® 8K Family, the Armada® 8040 and the Armada® 8020 include, respectively, a quad-core and a dual-core ARM Cortex-A72, bringing a high level of performance, integration, and efficiency, and delivers an optimal Performance-per-Watt in the embedded markets.

88F8040 built as part of Marvell's MoChi family of products. As the MCI interface is essentially transparent to the driver, all the connected MCI will appear to the driver as though it is an integrated function in the 88F8040 itself, enabling a Virtual System-on-Chip (vSoC).

The 88F8040 also supports standard high speed DDR4 interface in 32b bus widths, with optional ECC function.

## BLOCK DIAGRAM



**KEY FEATURES AND BENEFITS**

FEATURES	BENEFITS
CPU	<ul style="list-style-type: none"> <li>• Quad core ARMv8 Cortex-A72 CPU</li> <li>• Multiple speed grade versions, with up to 2GHz CPU clock speed</li> <li>• Symmetrical/Asymmetric Multiprocessing (SMP/AMP) operational modes</li> <li>• 48 KB 3-way, set associative Instruction L1 cache per core</li> <li>• 32 KB 2-way, set-associative Data L1 cache per core</li> <li>• 512 KB 16-way, set associative L2 cache per dual-core cluster</li> <li>• 1 MB 8-way, set associative shared L3 cache</li> <li>• Cryptography and CRC extensions</li> <li>• High-bandwidth, low-latency Coherency Fabric</li> <li>• ARM® TrustZone® support</li> </ul>
Memory	<ul style="list-style-type: none"> <li>• High-speed, low-latency, tightly coupled DDR4 DRAM memory controller with advanced scheduling algorithms</li> </ul>
Virtualization	<ul style="list-style-type: none"> <li>• CPU virtualization</li> <li>• Natively shared virtualized network interface</li> <li>• PCIe with SR-IOV support</li> <li>• IO virtualization, using IO MMU with stage 1 and stage 2 translations</li> <li>• Virtualized DMA engines</li> </ul>
Connectivity	<ul style="list-style-type: none"> <li>• 12 shared high-speed SERDES interfaces</li> <li>• Advanced I/O peripherals</li> <li>• 2 x 10 GbE port (XAUI/RXAUI/KR/XFI) + 4x 1/2.5 GbE Ports (SGMII/HSGMII/RGMII)</li> <li>• 3 x USB 3.0 (Host/Device)</li> <li>• 4 x SATA 3.0</li> <li>• PCIe 1 Port x 4 + 1 Ports x 2 + 4 Ports x 1, total of 6 controllers and up to 10 lanes</li> <li>• HDLC/TDM, SDIO 3.0, eMMC 5.1, serial and flash interfaces</li> <li>• Marvell® MoChi™ interfaces enable scalability and extension ports</li> </ul>
Network and Security Subsystem	<ul style="list-style-type: none"> <li>• Configurable packet processor</li> <li>• ODP (Open Data Plane) compliant</li> <li>• I/O Virtualization</li> <li>• 24 Gbps full duplex networking throughput</li> <li>• Flexible parsing and classification</li> <li>• IPv4 and IPv6 N-Tuple classification</li> <li>• QoS, Buffer management</li> <li>• Energy Efficient Ethernet</li> <li>• PTP (IEEE1588)</li> <li>• High throughput, Suite-B compatible security engine</li> <li>• Public Key Processor (RSA/DH/ECC)</li> <li>• TRNG (true random number generator)—FIPS140 compliant</li> </ul>
Other Features	<ul style="list-style-type: none"> <li>• Acceleration engines for storage, networking and security</li> <li>• High bandwidth DMA engines</li> <li>• Secure boot</li> <li>• Advanced power management, RTC and Thermal sensors</li> <li>• High Reliability, ECC protection for L1D, L2, L3. Parity protection on all RAMs</li> <li>• HFCBGA 24x24 mm, 0.8 mm ball pitch, green-compliant ballout compatible package for the ARMADA® 8K</li> <li>• 28nm process</li> </ul>

**TARGET APPLICATIONS**

- **Control Plane Card** - Paired with Marvell's industry-leading wired networking solutions, the RMADA® 8K Family is perfectly suited for next generation control plane cards, delivering the right CPU performance and memory throughput, along with key features such as 64b processing and virtualization.
- **Gateway** - Paired with Marvell's industry-leading wireless and wired networking solutions, the ARMADA® 8K Family is perfectly suited for Enterprise and Home Gateway applications delivering the right balance between performance, power and price, along with key features such as security acceleration and virtualization.

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