Marvell® ARMADA® 7040 Quad-Core CA72 Processor with Marvell MoChi
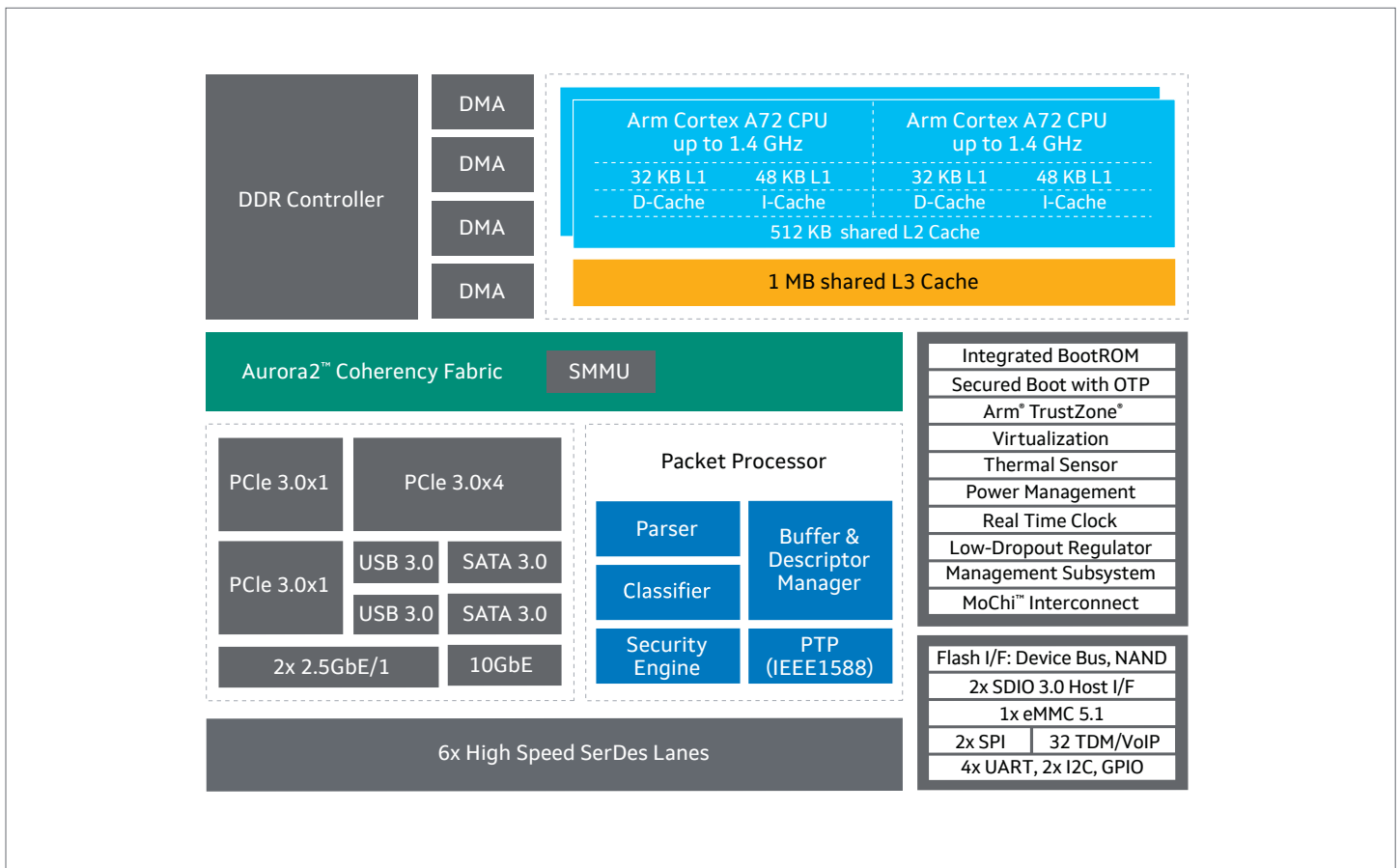
High-Performance Multi-Core CPU System on Chip

Overview

The Marvell® ARMADA® 7040 (88F7040) 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 ARMADA® 7040, includes a quad-core Arm Cortex-A72, bringing a high level of performance, integration, and efficiency, and delivers an optimal Performance-per-Watt in the embedded markets.

88F7040 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 88F7040 itself, enabling a Virtual System-on-Chip (vSoC).

The 88F7040 also supports standard high speed DDR4 interface in 32b bus widths, with optional ECC function.

Block Diagram

Marvell 88F7040 Quad-Core + MoChi Computing Platform

Key Features

Features	Benefits
CPU	• Quad core Armv8 Cortex-A72 CPU • Multiple speed grade versions, with up to 1.4GHz CPU clock speed • Symmetrical/Asymmetric Multiprocessing (SMP/AMP) operational modes • 48 KB 3-way, set associative Instruction L1 cache per core • 32 KB 2-way, set-associative Data L1 cache per core • 512 KB 16-way, set associative L2 cache per quad-core cluster • 1 MB 8-way, set associative shared L3 cache • Cryptography and CRC extensions • High-bandwidth, low-latency Coherency Fabric • Arm® TrustZone® support
Memory	• High-speed, low-latency, tightly coupled DDR4 DRAM memory controller with advanced scheduling algorithms
Virtualization	• CPU virtualization • Natively shared virtualized network interface • PCIe with SR-IOV support • IO virtualization, using IO MMU with stage 1 and stage 2 translations • Virtualized DMA engines
Connectivity	• 6 shared high-speed SERDES interfaces • Advanced I/O peripherals • 1 x 10 GbE port (XAUI/RXAUI/KR/XFI) + 2x 1/2.5 GbE Ports (SGMII/HSGMII/RGMII) • 2 x USB 3.0 (Host/Device) • 2 x SATA 3.0 • 1 Port x 4 +2 Ports x 1 - Total of 3 controllers and up to 6 lanes • HDLC/TDM, SDIO 3.0, eMMC 5.1, serial and flash interfaces • Marvell® MoChi™ interfaces enable scalability and extension ports
Network and Security Subsystem	• Configurable packet processor • ODP (Open Data Plane) compliant • I/O Virtualization • 12 Gbps full duplex networking throughput • 1x 10 GbE + 2x 1 GbE / 2.5 GbE ports • Flexible parsing and classification • IPv4 and IPv6 N-Tuple classification • QoS, Buffer management • Energy Efficient Ethernet • PTP (IEEE1588) • High throughput, Suite-B compatible security engine • Public Key Processor (RSA/DH/ECC) • TRNG (true random number generator)—FIPS140 compliant
Other Features	• Acceleration engines for storage, networking and security • High bandwidth DMA engines • Secure boot • Advanced power management, RTC and Thermal sensors • High Reliability, ECC protection for L1D, L2, L3. Parity protection on all RAMs • HFCBGA 17x17 mm, 0.65 mm ball pitch, green-compliant • 28nm process

Target Applications

- **Enterprise and Home Gateway Applications** - Paired with Marvell's industry-leading wireless and wired networking solutions, 88F7040 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.

- **Network Attached Storage (NAS)** - Paired with Marvell's industry-leading wired networking solutions, the 88F7040 is perfectly suited for Enterprise and Small to Medium Business (SMB) Network Attached Storage (NAS), delivering the right balance between performance, power and price, along with key features such as RAID5/6 acceleration.

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Marvell_ARMADA_7040_PB Revised: 11/20