MARVELL

Solutions Brief

Marvell® LiquidIO™ III

An inline DPU based SmartNIC for cloud network and security acceleration

Overview

Marvell's LiquidIO III is an OCTEON-based DPU for inline network and security acceleration card in a SmartNIC PCI form factor. It includes support for a full networking software stack based on Linux and DPDK. The LiquidIO III architecture can scale on the hardware as well as software capabilities using the latest generation of OCTEON infrastructure processors. Marvell's third generation 100GbE adapter family enables data centers to rapidly deploy high-performance SDN applications for both installed and new infrastructure optimizing server utilization, response times and network agility. This product in a PCI Express form factor, provides a proven, high-performance programmable adapter platform that enables cloud service providers to offload and accelerate infrastructure workloads in the data center.

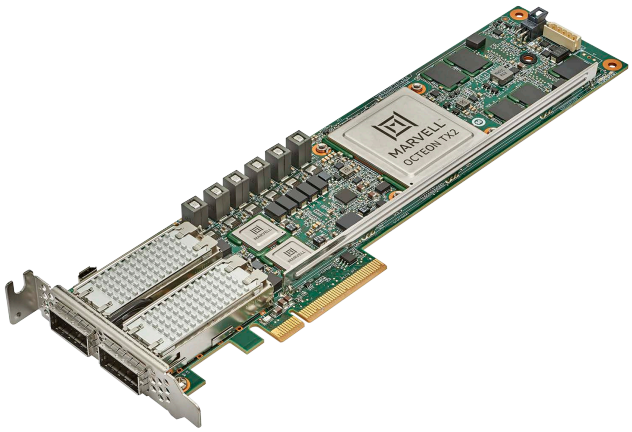
Marvell's DPDK-enabled hardware accelerators include the following:

- **QUALITY OF SERVICE (QOS):** Data center efficiency and scalability depends on the network adapter's ability to manage, schedule, steer, and prioritize traffic based on queue management, packet marking, congestion notification, and priority based scheduling. OCTEON TX2 supports various mechanisms to manage and shape traffic with dedicated independent queues in hardware. LiquidIO III Smart NICs support hierarchical levels with single- or dual-rate, tri-color marking and per-queue shaping and scheduling.
- **OVERLAY NETWORK OFFLOAD:** In a multi-tenant cloud data center, VM isolation in a shared network infrastructure is critical. As more VMs get hosted on powerful compute nodes, efficiently managing traffic from each VM is done using overlay networks. Overlay networks carry traffic from each VM encapsulated in formats such as VXLAN, NVGRE, and GENEVE. With LiquidIO III hardware capabilities, overlay network traffic encapsulation/de-encapsulation is offloaded to the NIC, while maintaining all the traditional offloads.
- **Crypto OFFLOADS:** LiquidIO uses Marvells's industry-leading security architecture to deliver security acceleration with IPsec/SSL offload and inline processing with no CPU overhead, both as a standalone solution and as part of OVS offload (tunnel and transport mode). LiquidIO III Smart NICs support advanced features, such as packet classification and flow aggregation with encapsulation, while maintaining support for traditional offloads (inner and outer transport and checksum offload) in a virtual data center with end-to-end packet encryption. The ability to customize and handle multiple offloads with high performance separates LiquidIO from the competition.

In addition to these offloads the OCTEON TX2 based DPU family does support other offloads enabled by DPDK APIs such as Deep Packet Inspection, DMA controller, Work Scheduler and packet parser. In addition to the user plane support the OCTEON SDK supports kernel level extensions as well.

Features

Compute	• OCTEON TX2 DPU • Up to 36 cores ARM V8 at 2.2GHz
SW	• DPDK networking suite
Memory	• 16GB DDR4 +ECC on-board memory • Up to 6 channels of DDR4 3200
IO	• Up to 5 x 100G network • Up to 2x PCIe Gen4x16 connectivity



Key Features

Features	Benefits
2x50G network ports	• Enables high speed network offloads QoS, TM and security.
Open software platforms based SDK support	• Enables easy transition from existing x86 based software stacks based on DPDK, also supports kernel level hooks.
DPDK Networking suite for data plane and control/management plane acceleration	• Network and security APIs for ethernet, TCP/UDP, tunneling, security, QoS/TM , Netconf/Yang, PPPoE and other extensions.

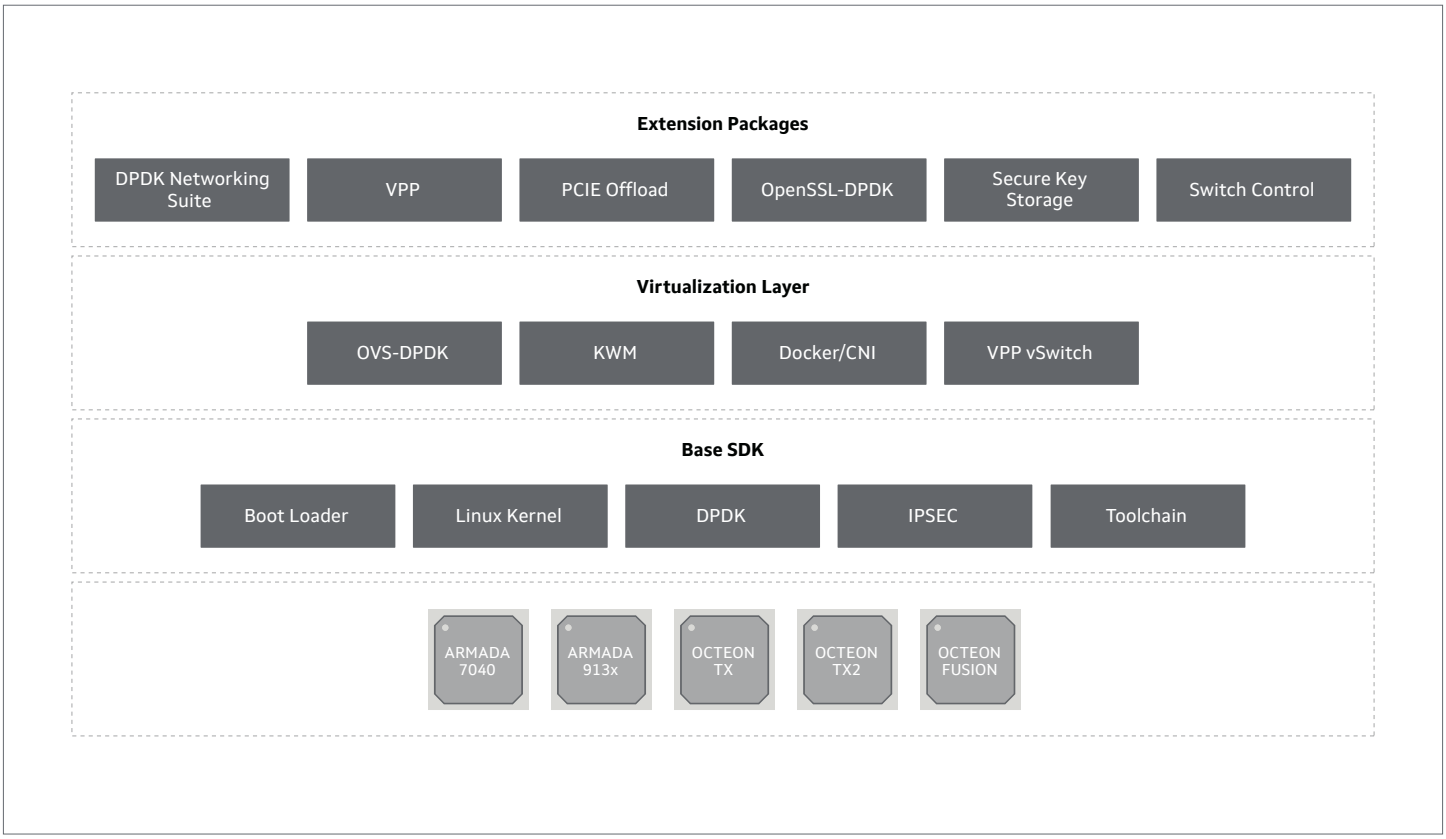
Target Applications

Cloud and Enterprise:
DPU for network traffic management, switching and security.

LiquidIO III Card

Processor and Peripherals	
Processor	Marvell – OCTEON TX2 Processor, Up to 2200MHz
Memory Devices	
Main Memory	16GB DDR4 +ECC on-board memory
Non-Volatile Memory Devices	SPI 2Gb eMMC 128GB
PCIe Device Capability	
SerDes	PCI Gen4 capable
AIC	Add-In Card (AIC) acting as an End Point (EP)
I/O Interfaces	
Front Panel IO	2 x 50GbE QSFP28 Ports Link and Status LEDs

Block Diagram



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