

Marvell® OCTEON SDK

An optimized software platform based on open source platforms that enables accelerated performance over an end to end architecture

Overview

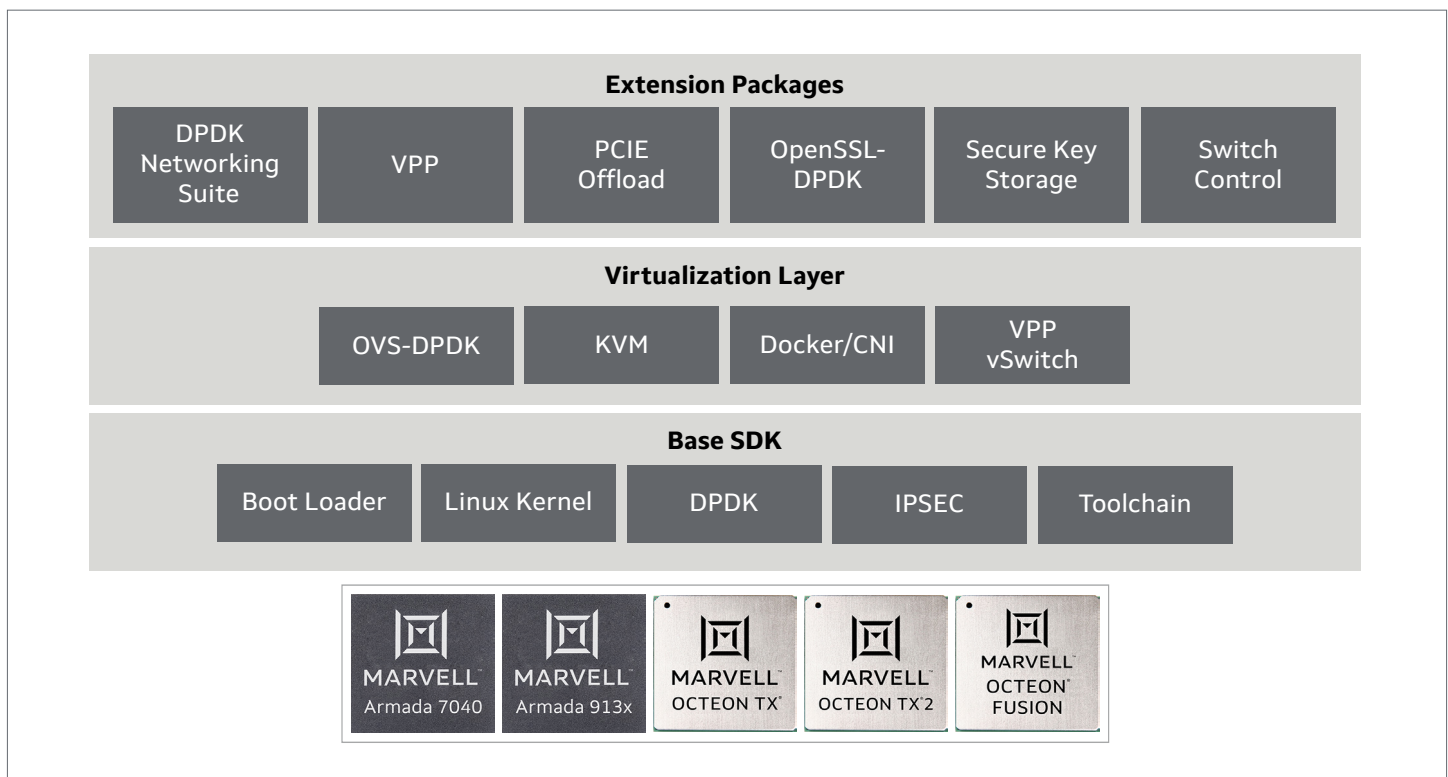
Marvell's OCTEON processors are supported by a common SDK with user plane extensions and hooks for kernel level enhancements.

The software platform enables a uniform user experience across the entire portfolio of the latest generation of OCTEON devices and enables tight integration with other Marvell silicon products to create an end to end solution. Marvell's OCTEON product line has a leadership position across multiple market verticals and workloads and ensures that the customers investment stays relevant across multiple generations of the silicon product lines. It also ensures that there is no vendor lock in or dependence on the refresh cadence of hardware and custom software.

OCTEON processors provide highly efficient execution or workloads for networking, security, 5G baseband, and edge infrastructure applications. Through the use of open standards and APIs, the OCTEON SDK helps customers re-use software seamlessly on both OCTEON and non-OCTEON platforms including x86. by providing highly efficient network, security, 5G, and Edge infrastructure hardware acceleration offloads.

The software platform comes with specific vertical workload extensions for control, management and user plane APIs which can support a complete portfolio of integrated control and data plane to independent CPU architecture which is compatible to a bare metal as well as a virtualized cloud native implementation.

Block Diagram



OCTEON SDK Block Diagram

OCTEON SDK

The OCTEON SDK is a complete suite of optimized software modules and development environment for building applications on top of the OCTEON family processors. It consists of the base

Key Features

Core Open Platform: Open source linux-based platform fully leveraging the multi-core processing, hardware acceleration and high-performance networking of OCTEON processors

High-Performance DPDK: Marvell provides a highly optimized and hardware accelerated implementation of DPDK

Target Applications

Carrier and Edge: 5G baseband, MEC edge , vEPC, vBNG, vRouter.

Base SDK

The OCTEON Base SDK is the common software platform that can be used for any application. The core platform is based on standard Linux environment and user-space DPDK. Any DPDK, Linux or Control Plane application can be compiled seamlessly on top of the base SDK with little to no modifications.

The SDK supports open source standard modules and Marvell's team is dedicated to continuous upstreaming of new capabilities to the open source community.

The Base SDK includes a development environment to assist in cross-compiling and debugging applications from Linux machines and are designed to ensure easy integration into continuous integration (CI) systems.

SDK, the virtualization layer and a set of SDK extension packages for targeted application functions.

Optimized Network and Application Stacks: Ready-map stacks for TCP/UDP, IPSEC, Routing/Forwarding, SSL/TLS, Tunneling, QoS, NAT, etc.

Virtualization: Run control plane and data plane applications blazingly fast whether on bare metal, containers or virtual machines

Cloud and Enterprise: DPU for network, switching, storage , ML and security

Linux

- LTS Kernel
- Arm Trusted Firmware
- UBoot and UEFI
- Board Support Packages

Dataplane

- Continuous upgrade to the latest DPDK Releases
- Optimized DPDK tied to HW Acceleration including cryptodev, eventdev, regex
- IPSEC and SSL/TLS Acceleration

Toolchain

- GCC, GDB, BinUtils
- Buildroot Environment

SDK Extensions

Today's software applications can be complex and involved multiple services and functions. The OCTEON SDK is designed to help enable customers to rapidly create complex applications by providing application-specific modules that are pre-optimized for OCTEON processors.

These optimized modules are bundled into 'extension packages' that run on the Base SDK. These extensions provide additional stack and other functionality on top of the core platform. They are specifically optimized for the best performance on OCTEON processors.

Extensions go through rigorous design and testing and are usable in production software by OCTEON customers.

Infrastructure Processor Fastpath

- Highly optimized network stack running on top of DPDK
- Ethernet, TCP/UDP, QoS, Tunneling, Security
- Netconf/Yang Configuration and Management
- Control Plane components
- Synchronization with Linux Networking

OVS-DPDK

- High performance open source virtual switch

PCIE Offload

- X86 Drivers to transparently offload DPDK and NetDev operations onto attached PCIE Octeon
- Expose OCTEON and Marvell Switch ports as native ports on x86

VPP

- Complete open source stack
- Batch Packet Processing
- Graph-Based Node Execution

Secure Key Storage

- On-chip key management for data-in-flight

OP-TEE

- Portable, small footprint trusted execution environment

Switch Integration

- Integration of switch configuration and management for Marvell external switches



To deliver the data infrastructure technology that connects the world, we're building solutions on the most powerful foundation: our partnerships with our customers. Trusted by the world's leading technology companies for 25 years, we move, store, process and secure the world's data with semiconductor solutions designed for our customers' current needs and future ambitions. Through a process of deep collaboration and transparency, we're ultimately changing the way tomorrow's enterprise, cloud, automotive, and carrier architectures transform—for the better.

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