

SwitchX[®] Software Development Kit

The SwitchX Software Development Kit (SDK), compatible with Mellanox's SwitchX-2, Switch-IB[™], Switch-IB 2, and Spectrum switch ICs, allows switch OEMs and Network Operating System (NOS) vendors to bring to market flexible, innovative and cost-effective switching solutions, to build InfiniBand, Ethernet or Virtual Protocol Interconnect (VPI) fabrics.

With the growing demand for customization and feature richness in the HPC, cloud, Web2.0, storage and Enterprise Data Center, SwitchX SDK provides the flexibility to implement any switching and routing functionality via a well-defined and well-documented set of Application Programming Interface (API), at low cost and short time-to-market.

The SwitchX SDK implements Virtual Protocol Interconnect[®] (VPI), and provides the flexibility to implement InfiniBand or Ethernet connectivity, while offering gateway and routing capabilities between protocols. Utilizing SwitchX InfiniBand Link Level Flow control or Data Center Bridging (DCB) functionality, OEMs can deliver robust data center connectivity.

Easy Portability with Fast Time-to-Market

Mellanox SwitchX SDK includes a robust and portable device driver with two levels of APIs, so users can choose their level of integration. A minimal set of code is implemented in the kernel to allow for easy porting to various CPU architectures and operating systems. The SDK runs on top of x86 and PowerPC architectures, utilizing commercial Linux operating system distributions. Within the SDK, the device driver and API libraries are written in standard ANSI "C" language for easy porting to additional processor architectures and operating systems.



HIGHLIGHTS

BENEFITS

- Easily portable code base for fast time-to-market
- Linux development environment
- API Library written in ANSI "C"
- Flexible development environment
- Seamless integration with SwitchX Development Kit enabling development on CPU and OS of choice
- Reduced development cycles with Python scripts through development acceleration tool

KEY FEATURES

- Low-latency Ethernet and InfiniBand gateways and routers between protocols
- Multiple API levels for flexibility
- Support for VPI, virtualized and multichip implementations
- Support for Adaptive Routing/ Congestion Control/QoS

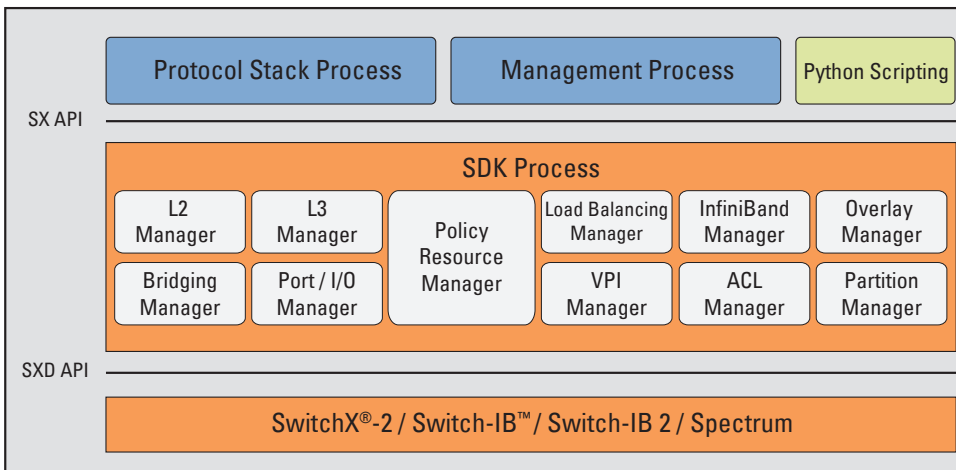


Figure 1. Mellanox Software Development Kit (SDK) Stack

Advanced Features

The SwitchX SDK provides an interface to support multi-generation solutions. Policies such as QoS and ACLs can be implemented across the fabric. The SwitchX SDK also provides access to hardware resources locally and fabric wide to implement multiple switch partitions, bridging, switching, routing and virtual forwarding modes. When multiple switch partitions are implemented, a single switch device can have independent management planes; another feature exposed by the SwitchX APIs. The SwitchX SDK is topology aware for multipath implementations such as ECMP, LAG and Adaptive Routing.

Applications

The SwitchX SDK is designed for managing SwitchX-2, Switch-IB™, Switch-IB 2, and Spectrum in blade switches, top-of-rack (TOR) switches or large port count modular chassis aggregation switches providing Web 2.0, Cloud scale-out, HPC and storage infrastructure.

Multi-Protocol Gateways

The SwitchX SDK provides APIs to make use of stateless gateways to provide an efficient

but simple packet relay function, resulting in high performance, low power and ultra low-latency.

Port Configuration

The SwitchX SDK provisions the Switch IC for SDR/DDR/QDR/FDR10/FDR/EDR InfiniBand and 1/10/25/40/50/56/100Gb/s Ethernet. This ease of provisioning provides flexibility in repurposing the forwarding protocol of any switch port making on-the-fly repurposing for multi-tenant cloud environments a reality.

To support efficient, lossless or lossy traffic, the SwitchX SDK includes facilities to set priorities per port, per virtual port and even per traffic flow. In doing so, management and protocol stack software running on top of the SwitchX SDK can moderate traffic efficiently for latency and bandwidth, instantiate gateways and routers and manage Link Aggregation Groups (LAG), ECMP and QoS resources.

Development Acceleration Tool

The SwitchX SDK is complemented by a Python-based scripting tool, for development acceleration, which is designed to reduce development and porting time. The tool provides a Command Line Interface (CLI) to

test SwitchX application interface (API) and functionality without writing a single line of code.

This acceleration tool can be used as a debug tool or as an easy way to test the software and hardware capabilities before development starts. The syntax is straight forward, similar to the SDK API and help information is available with every command. It is provided as source code in the SDK package.

Development System-OS (DVS-OS)

Mellanox development systems come with pre-loaded DVS-OS. This lean operating system allows developers to experience and exercise the SDK API. The DVS-OS is a Linux-based OS. It boots over ONIE, and includes the SDK library, a SAI library and other components to operate the switch system. More information about ONIE and SAI can be found on the Open Compute Project (OCP) website.

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 - Selection of components
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- SwitchX SDK API On-Line Documentation
- Technical Support
- Python scripting development acceleration tool
 - Configuration and management references and examples

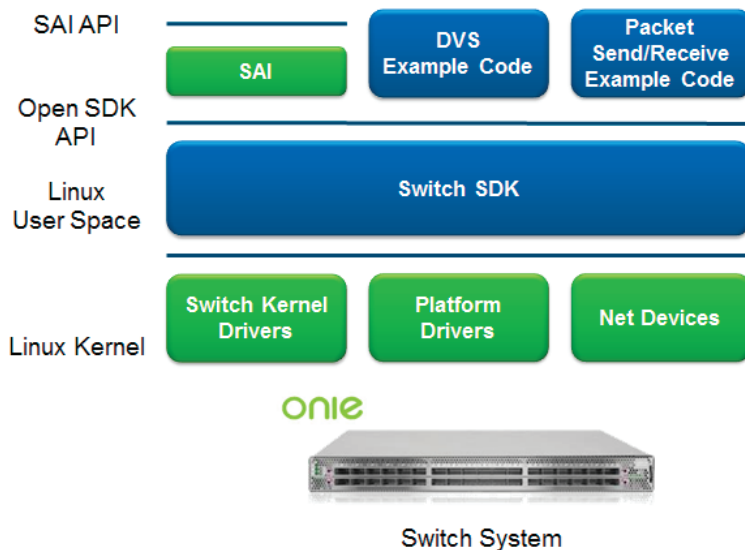


Figure 2. DVS-OS Architecture



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