

Mellanox Spectrum™ Ethernet Switch IC

10/25/40/50 and 100Gb/s Ethernet Switch Solution
SDN-Optimized Enabling Efficient Data Center Fabrics

Providing the most efficient performing server and storage system Ethernet interconnect solution for Enterprise Data Centers, Cloud Computing, Web 2.0, Data Analytics, Deep Learning, High-Performance, and embedded environments.

Spectrum, the eighth generation of switching IC family from Mellanox, delivers leading Ethernet performance, efficiency and throughput, low-latency and scalability for data center Ethernet networks by integrating advanced networking functionality for Ethernet fabrics.

FROM 10 TO 100 GIGABIT ETHERNET

Hyperscale, cloud, data-intensive, virtualized datacenters or storage environments drive the need for increased interconnect performance and throughput beyond 10 and 40GbE. The increase in the amount of data and the need to analyze it faster and in real time require interconnect speeds of 100Gb/s and even beyond. Spectrum Ethernet Switch enables users to upgrade their datacenter Ethernet network from 1G or 10G to 25G, from 40G to 50G, and to leverage 100G for highest datacenter return on investment. Spectrum's flexibility enables solutions companies to build any Ethernet switch system at the speeds of 10, 25, 40, 50 and 100G, with leading port density, low latency, zero packet loss, and non-blocking traffic.

The industry-leading integration of 128 PHYs which are flexible enough to operate at data rates of 1Gb/s to 28Gb/s per lane, makes Spectrum an obvious choice for OEMs that must address end-user requirements for faster and more robust applications. Spectrum supports network speeds of 1/10/25/40/50 and 100Gb/s per port with extremely low latency, low jitter and high message rate. Reduced power, footprint and a fully integrated PHY capable of connectivity across PCBs, backplanes as well as passive and active copper/fiber cables allow interconnect fabrics based on Spectrum to be utilized by network architects for deploying leading, fabric-flexible computing and storage systems with the lowest TCO.

LARGE-SCALE LAYER 2 OR LAYER 3

Fabrics drive requirements for increased bandwidth and virtualization, while maintaining non-blocking performance at low latency. Spectrum addresses these requirements by integrating advanced networking functionality, such as virtualization and tunneling cores, with flexible Software Defined Network (SDN) control and monitoring engines on top of industry leading cut-through latencies and 6.4Tb/s, non-blocking switching capacity.

HIGHLIGHTS

- Zero packet loss ([learn more](#))
- Industry leading, true cut-through latency
- Forwarding database sized for hyperscale
- Optimized for Software Defined Networking
 - Support for OpenFlow Switch Specification Version 1.0 to 1.4 and beyond
 - Remote configurable routing tables
- 3.2Tb/s switching capacity delivering wire speed performance at all packet sizes and traffic patterns
- Dynamically shared, flexible packet buffering
- Comprehensive overlay and tunneling support including VXLAN, NVGRE, Geneve and MPLS
- Data Center Bridging (DCB)
 - PFC, DCBX, ETS
- Advanced load balancing
- Advanced congestion management, ECN
- Low cost solution
 - Fully integrated PHY
 - Backplane and cable support
 - 1, 2 and 4 lane
- Flexible port configurations
 - Up to 32 40/56/100GbE ports
 - Up to 64 10/20/25/50GbE ports

MOST EFFICIENT SWITCH NETWORK INFRASTRUCTURE

The demand for data center performance continues to grow as multi-tenant private and public cloud workloads require the network to deliver a high level of reliability and guaranteed service levels. Unlike other companies' switch products, Mellanox switch solutions deliver zero loss, wire speed throughput for all message sizes and the lowest jitter for predictable latency.

PORT CONFIGURATION

Spectrum has flexible port configuration that can support a variety of port speeds in 4-lane, 2-lane or 1-lane operation. Spectrum can provide up to 32 40/56/100GbE ports or up to 64 10/25/40/50GbE ports, or any mix of these port speeds.

Figure 1. Mellanox Spectrum™ Architecture

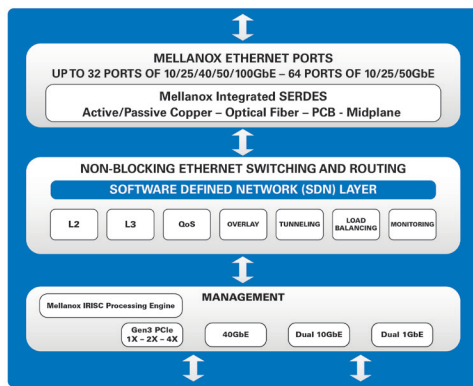
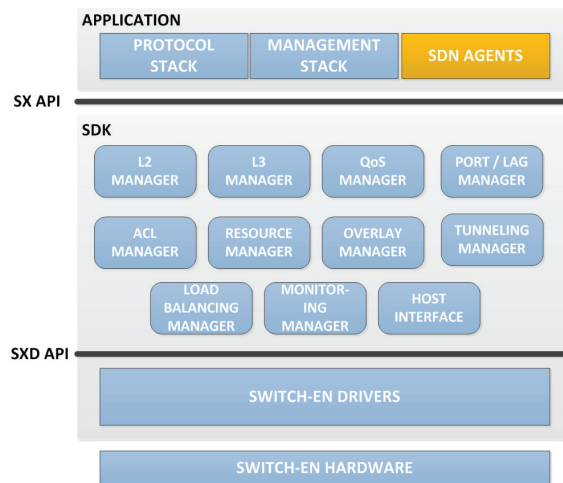


Figure 2. SDN-Optimized Software



FEATURE SUMMARY

Optimized SDN Support

Spectrum includes advanced capabilities for remote management, configuration and monitoring of data center fabrics, exceeding the requirements of OpenFlow Switch Specification Version 1.4. Such capabilities combine functions like L2 and L3 forwarding tables, overlay network units and tunneling protocols with advanced statistics and monitoring tables, through an efficient, SDN-optimized control plane and software interfaces. The Spectrum packet processing pipeline provides unmatched flexibility in managing, monitoring and distributing data flows at all layers, including tunneling and virtualized flows. Spectrum enables IT managers to program and centralize their server and storage interconnect management and dramatically reduce their operation expenses by completely virtualizing their data center network.

Switch Product Development Platforms

The Spectrum Development Kit (DVK) and Software Development Kit (SDK) are available to accelerate OEMs' evaluation, development and time to market. These rack mountable systems are available with full hardware functionality and a mix of QSFP and SFP+ interfaces. OEMs can develop fully functional switching software by integrating a switching management stack on top of the Spectrum SDK.

Mellanox Advantage

Mellanox is the leading supplier of industry standard InfiniBand and Ethernet adapter and switch silicon. Our products have been deployed in clusters scaling to thousands of nodes and are being deployed end-to-end in data center systems around the world.

COMPATIBILITY

Ethernet

- 1, 10, 25, 40, 50 and 100Gb/s
- DCB (PFC, ETS, DCBX)

CPU Interoperability

- PowerPC, Intel x86, AMD x86 and MIPS

PCI Express Interface

- PCIe 3.0 compliant, 1.1 compatible
- 2.5GT/s or 5GT/s link rate x4

Interoperability

- Full interoperability with standard Ethernet NICs and switches

Connectivity

- Drives active/passive copper cables, fiber optics, PCB or backplanes

I/O Specifications

- 32 40/56/100GbE ports, 64 10/20/25/40/50GbE ports
- SPI flash interface, I²C
- IEEE 1149.1 boundary-scan JTAG
- Link status LED indicators
- General purpose I/O
- 52.5mm x 52.5mm FCBGA

Table 1 - Part Numbers and Descriptions

OPN	Description	Typical Power
MT52132A0-FDCR-C	Spectrum, 32 Port Ethernet 100GbE Switch IC (RoHS R6)	95W