SN2410 Ethernet Switch

Spectrum-based 48-port 25GbE + 8-port 100GbE Open Ethernet Platform

Mellanox SN2410 provides the most predictable, highest performance 100GbE ToR switching platform for the growing demands of today's data centers.

The SN2410 switch is an ONIE (Open Network Install Environment) based platform for allowing a multitude of operating systems to be mounted on it and utilizing the advantages of Open Networking and the capabilities of the Mellanox Spectrum™ ASIC.

The SN2410 has three modes of operation. It can be provided preinstalled with Mellanox Onyx™ (successor to MLNX-OS Ethernet), a home-grown operating system utilizing common networking user experiences and industry standard CLI. It can come preinstalled with Cumulus® Linux, a revolutionary operating system taking the Linux user experience from servers to switches and providing a rich routing functionality for large scale applications. Finally, it can be provided with a bare ONIE image ready to be installed with the aforementioned or other ONIE-based operating systems.

The SN2410 switch is an ideal top-of-rack (ToR) solution, allowing maximum flexibility, with port speeds spanning from 10Gb/s to 100Gb/s per port. Its optimized port configuration enables high-speed rack connectivity to any server at 10GbE or 25GbE speeds. The 100GbE uplink ports allow a variety of blocking ratios that suit any application requirement.

Powered by the Spectrum ASIC and packed with 8 ports running at 100GbE (can be split to 16 ports running 50GbE) and 48 ports running at 25GbE, the SN2410 carries a whopping throughput of 4Tb/s with a landmark 5.95Bpps processing capacity in a compact 1RU form factor.

Keeping with the Mellanox tradition of setting performance record switch systems, the SN2410 introduces the world's lowest latency for a 100GbE switching and routing element, and does so while having the lowest power consumption in the market. The low latency is maintained while switching or routing between ports at different speeds, leveraging a smart cut-through architecture that performs on-the-fly optimized buffering, eliminating any dependency between ports. With the SN2410, the use of 25, 40, 50 and 100GbE in large scale is enabled without changing power infrastructure facilities.

The SN2410 is part of Mellanox's complete end-to-end solution which provides 10GbE through 100GbE interconnectivity within the data center. Other devices in this solution include ConnectX®-4 based network interface cards, and LinkX™ copper or fiber cabling. This end-to-end solution is topped with Mellanox NEO™, a management application that relieves some of the major obstacles when deploying a network. NEO enables a fully certified and interoperable design, speeds up time to service and eventually speeds up RoI.

HIGHLIGHTS

BENEFITS
– A predictable data center through predictable, affordable network
– Choice, no vendor lock-in
– Zero Packet Loss (learn more)
– Future proof solution: enhanced scalability
– Arranged and organized data center
  • Supports speeds of 10/25/40/50/56/100GbE
  • Easy deployment
  • Easy maintenance
– Unprecedented performance
  • Line rate performance on all ports at all packet sizes
  • Storage and server applications run faster
– Software Defined Networking (SDN) support
– Running Mellanox Onyx, Cumulus Linux, and alternative operating systems over ONIE

KEY FEATURES
– Throughput
  • 4Tb/s
  • 5.95B packets-per-second
– High density
  • 8 40/56/100GbE ports in 1RU
  • Up to 48 10/25GbE ports
  • Up to 16 50GbE ports
– Lowest latency
  • 300nsec port-to-port
  • Flat latency across L2 and L3 forwarding
  • Cut-through latency between ports in different speeds
– Lowest power

†For illustration only. Actual products may vary.

The SN2410 introduces superior hardware capabilities including dynamic flexible shared buffers and predictable wire speed performance with no packet loss for any packet size.

While Spectrum provides the thrust and acceleration that powers the SN2410, the system gets yet another angle of capabilities while running with a powerful x86-based processor, which allows this system to not only be the highest performing switch fabric element, but also gives the ability to incorporate a Linux running server into the same device. This opens up multiple application aspects of utilizing the high CPU processing power and the best switching fabric, to create a powerful machine with unique appliance capabilities that can improve numerous network implementation paradigms.

While the SN2410 Ethernet switch series is aimed for data centers which deploy 25GbE servers, Mellanox offers the SN2410B series for data centers with 10GbE servers. SN2410B switches are priced comfortably for the 10GbE servers market, providing 100GbE uplinks which further save on cost and cabling along with the superior feature set of Spectrum.

FEATURES

Layer 2 Feature Set
– Multi chassis LAG (MLAG)
– IGMPv2/v3, Snooping, Querier
– VLAN 802.1Q (4K)
– Q-In-Q
– 802.1W Rapid Spanning Tree
  • BPDU Filter, Root Guard
  • Loop Guard, BPDU Guard
– 802.1Q Multiple STP
– PVRST+ (Rapid Per VLAN STP+)
– 802.3ad Link Aggregation (LAG) & LACP
  • 32 Ports/Channel – 64 Groups Per System
– LLDP
– Store & forward / cut-through mode of work
– HLL
– 10/25/40/50/56/100GbE
– Jumbo Frames (9216 Bytes)

Layer 3 Feature Set
– User and management VRFs
– IPv4 & IPv6 routing including route maps: BGP4, OSPFv2
– PIM-SSM

– BFD (BGP, OSPF, static routes)
– VRRP
– DHCPv4/v6 Relay
– Router Port, int VLAN, NULL Interface for Routing
– ECMP, 64-way
– IGMPv2/v3 Snooping Querier

Synchronization
– PTP IEEE-1588 (SMPTE profile)
– NTP

Quality of Service
– 802.3X Flow Control
– WRED, Fast ECN & PFC
– 802.1Qbb Priority Flow Control
– 802.1Qaz ETS
– DCBX – App TLV support
– Advanced QoS – Qualification, Rewrite, Policers – 802.1AB
– Shared buffer management

Management and Automation
– ZTP
– Ansible, Puppet
– FTP / TFTP / SCP
– AAA , RADIUS / TACACS+ / LDAP
– JSON & CLI, Web UI

– SNMP v1,2,3
– In-band management
– DHCP, SSHv2, Telnet
– SYSLOG
– 10/100/1000Mb/s Ethernet RJ45 mng ports
– USB Console port for Management
– Dual SW image
– Events history
– ONIE

Network Virtualization
– VXLAN Hardware VTEP – L2 GW
– Integration with VMware NSX & OpenStack, etc.

Software Defined Network (SDN)
– OpenFlow 1.3:
  • Hybrid
  • Supported controllers: ODL, ONOS, FloodLight, RYU, etc.

Docker Container
– Full SDK access through the container
– Persistent container & shared storage

Monitoring & Telemetry
– sFlow
– Real time queue depth histograms & thresholds
– Port mirroring (SPAN & ERSPAN)
– Enhanced Link & Phy Monitoring
– BER degradation monitor
– Enhanced health mechanism
– 3rd party integration (Splunk, etc.)

Security
– USA Department of Defense certification – UC APL
– System secure mode – FIPS 140-2 compliance
– Storm Control
– Access Control Lists (ACLs L2-L4 & user defined)
– 802.1X - Port Based Network Access Control
– SSH server strict mode – NIST 800-181A
– CoPP (IP filter)
– Port isolation

* This section describes hardware features and capabilities. Please refer to the driver and firmware release notes for feature availability.

SPECIFICATIONS

Power Specifications
– Typical power with passive cables (ATIS): 165 Watts
– Input range: 100-127 VAC, 200-240VAC
– Frequency: 50-60Hz, single phase AC, 4.5A, 2.9A

Physical Characteristics
– Dimensions:
  1.72'' (43.8mm) H x
  17.24'' (438mm) W x
  17'' (436mm) D
– Weight: 8.52kg (18.8lb)

Supported Modules and Cables*
– QSFP28, SFP28 short and long range optics
– QSFP28, SFP28 DAC cable
– QSFP breakout cables 100GbE to 4x25GbE and 40GbE to 4x10GbE DAC, optical

– QSFP breakout cables 100GbE to 2x50GbE DAC, optical
– QSFP AOC
– 1000BASE-T module

* Systems limited to 10/40GbE will support modules and cables accordingly.

Table 1 - SN2410 Series Part Numbers and Descriptions

OPN	Description
MSN2410-CB2F	Spectrum™ based 25GbE/100GbE 1U Open Ethernet switch with Mellanox Onyx, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, P2C airflow, Rail Kit, RoHS6
MSN2410-CB2FC	Spectrum™ based 25GbE/100GbE 1U Open Ethernet switch with Cumulus Linux, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, P2C airflow, Rail Kit, RoHS6
MSN2410-CB2FE	Spectrum™ based 25GbE/100GbE 1U Development System with SDK, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, P2C airflow, Rail Kit, RoHS6
MSN2410-CB2FO	Spectrum™ based 25GbE/100GbE 1U Open Ethernet switch with ONIE, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, P2C airflow, Rail Kit, RoHS6
MSN2410-CB2R	Spectrum™ based 25GbE/100GbE 1U Open Ethernet switch with Mellanox Onyx, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, C2P airflow, Rail Kit, RoHS6
MSN2410-CB2RC	Spectrum™ 25GbE/100GbE switch w/Cumulus Linux, 48 SFP28 ports + 8 QSFP28 ports, 2 AC PSUs, x86 2core, short depth, C2P air flow, Rail Kit, (Cumulus License Key is required)
MSN2410-CB2RO	Spectrum™ based 25GbE/100GbE 1U Open Ethernet switch with ONIE, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, C2P airflow, Rail Kit, RoHS6

Table 2 - SN2410B Series Part Numbers and Descriptions

OPN	Description
MSN2410-BB2F	Spectrum™ based 10GbE/100GbE 1U Open Ethernet switch with Mellanox Onyx, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, P2C airflow, Rail Kit, RoHS6
MSN2410-BB2R	Spectrum™ based 10GbE/100GbE 1U Open Ethernet switch with Mellanox Onyx, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, C2P airflow, Rail Kit, RoHS6
MSN2410-BB2FC	Spectrum™ based 10GbE/100GbE 1U Open Ethernet switch with Cumulus Linux, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, P2C airflow, Rail Kit, RoHS6
MSN2410-BB2FO	Spectrum™ based 10GbE/100GbE 1U Open Ethernet switch with ONIE, 48 SFP28 ports, 8 QSFP28 ports, 2 power supplies (AC), x86 dual core, Short depth, P2C airflow, Rail Kit, RoHS6

*C2P – Connector-to-Power supply airflow, P2C – Power supply-to-Connector airflow.

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