SWITCH SYSTEM
PRODUCT BRIEF

SN2100 Open Ethernet Switch

Spectrum™ †

Half-width 16-port Non-blocking 100GbE Open Ethernet Switch System

The SN2100 switch provides a high density, side-by-side 100GbE switching solution which scales up to 128 ports in 1RU for the growing demands of today's database, storage, data centers environments.

The SN2100 switch is an ideal spine and top of rack (ToR) solution, allowing maximum flexibility, with port speeds spanning from 10Gb/s to 100Gb/s per port and port density that enables full rack connectivity to any server at any speed. The uplink ports allow a variety of blocking ratios that suit any application requirement.

Powered by the Mellanox Spectrum™ ASIC and packed with 16 ports running at 100GbE, the SN2100 carries a whopping throughput of 3.2Tb/s with a landmark 4.76Bpps processing capacity in a compact 1RU form factor.

Following the footsteps of the SwitchX®-2 based-systems, the SN2100 enjoys the legacy of the field-proven Mellanox Onyx™ operating system (successor to MLNX-OS Ethernet) with a wide installed base and a robust implementation of data, control and management planes that drives the world's most powerful data centers.

Keeping with the Mellanox tradition of setting performance record switch systems, the SN2100 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. With the SN2100, the use of 25, 40, 50 and 100GbE in large scale is enabled without changing power infrastructure facilities.

The SN2100 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.

The SN2100 carries a unique design to accommodate the highest rack performance. Its design allows side-by-side placement of two switches in a single, 1RU slot of a 19" rack, delivering high availability to the hosts.

Database solutions require high availability and the ability to scale out in active-active configuration. For example, DB2 pureScale or Oracle RAC require high bandwidth and low latency to the caching facility, the disk storage system, etc., with connectivity to the application servers. The SN2100 is the best fit, providing the highest network throughput, resilience and a mix of 25GbE and 100GbE ports.

HIGHLIGHTS

BENEFITS

- Zero Packet Loss (learn more)
- True cut-through latency
- Easy scale from one to thousands of nodes and switches
- 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, alternative operating systems over ONIE

KEY FEATURES

- Throughput
  - 3.2Tb/s
  - 4.76B packets-per-second
- High density
  - 16 40/56/100GbE ports in 1RU
  - Up to 64 10/25-ports; up to 32 50GbE ports
- Lowest latency
  - 300nsec for 100GbE port-to-port
  - Flat latency across L2 and L3 forwarding
- Lowest power
  - Under 6 watts per port

† For illustration only. Actual products may vary.

The SN2100 introduces hardware capabilities for multiple tunneling protocols that enable increased reachability and scalability for today's data centers. Implementing MPLS, NVGRE and VXLAN tunneling encapsulations in the network layer of the data center allows more flexibility for terminating a tunnel by the network, in addition to termination on the server endpoint.

While Spectrum provides the thrust and acceleration that powers the SN2100, an integrated powerful x86-based processor 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.

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): 94.3W
- Input voltage range: 100-240VAC

Physical Characteristics
- Dimensions: 1.72"(43.8mm) H x 7.87"(200mm) W x 20"(508mm) D
- Weight: 4.540kg(10lb)

Supported Modules and Cables
- QSFP28, SFP28 short and long range optics
- QSFP28 to QSFP28 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 and 1000BASE-SX/LX/ZX modules

Table 1 - SN2100 Series Part Numbers and Descriptions

OPN	Description
MSN2100-CB2F	Spectrum™ based 100GbE, 1U Open Ethernet Switch with Mellanox Onyx, 16 QSFP28 ports, 2 Power Supplies (AC), short depth, Rangeley CPU, P2C airflow, Rail Kit must be purchased separately, RoHS6
MSN2100-CB2R	Spectrum™ based 100GbE, 1U Open Ethernet Switch with Mellanox Onyx, 16 QSFP28 ports, 2 Power Supplies (AC), short depth, Rangeley CPU, C2P airflow, Rail Kit must be purchased separately, RoHS6
MSN2100-CB2FC	Spectrum™ based 100GbE, 1U Open Ethernet Switch with Cumulus, 16 QSFP28 ports, 2 Power Supplies (AC), short depth, Rangeley CPU, P2C airflow, Rail Kit must be purchased separately, RoHS6
MSN2100-CB2RC	Spectrum™ based 100GbE, 1U Open Ethernet Switch with Cumulus, 16 QSFP28 ports, 2 Power Supplies (AC), short depth, Rangeley CPU, C2P airflow, Rail Kit must be purchased separately, RoHS6
MSN2100-CB2FE	Spectrum™ based 100GbE 1U Development System with SDK, 16 QSFP28 ports, 2 Power Supplies (AC), Short depth, Rangeley CPU, P2C airflow, Rail Kit must be purchased separately, RoHS6
MSN2100-CB2FO	Spectrum™ based 100GbE 1U Open Switch with ONIE, 16 QSFP28 ports, 2 AC PSUs, x86 2-core, short depth, P2C airflow, Rail Kit must be purchased separately, RoHS6

Table 2 - SN2100B Series Part Numbers and Descriptions

OPN	Description
MSN2100-BB2F	Spectrum™ based 40GbE, 1U Open Ethernet Switch with Mellanox Onyx, 16 QSFP28 ports, 2 Power Supplies (AC), short depth, Rangeley CPU, P2C airflow, Rail Kit must be purchased separately, RoHS6S6
MSN2100-BB2R	Spectrum™ based 40GbE, 1U Open Ethernet Switch with Mellanox Onyx, 16 QSFP28 ports, 2 Power Supplies (AC), short depth, Rangeley CPU, C2P airflow, Rail Kit must be purchased separately, RoHS6
MSN2100-BB2FC	Spectrum™ based 40GbE, 1U Open Ethernet Switch with Cumulus, 16 QSFP28 ports, 2 Power Supplies (AC), short depth, Rangeley CPU, P2C airflow, Rail Kit must be purchased separately, RoHS6
MSN2100-BB2RC	Spectrum™ based 40GbE, 1U Open Ethernet Switch with Cumulus, 16 QSFP28 ports, 2 Power Supplies (AC), short depth, Rangeley CPU, C2P airflow, Rail Kit must be purchased separately, RoHS6
MSN2100-BB2FO	Spectrum™ based 40GbE 1U Open Switch with ONIE, 16 SFP28 ports, 2 AC PSUs, x86 2-core, short depth, P2C airflow, Rail Kit must be purchased separately, RoHS6

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

Table 3 - Rail Kit Part Number and Description

OPN	Description
MTEF-KIT-D	Rack installation kit for SN2100 series short depth 1U switches, allows installation of one or two switches side-by-side into standard depth racks

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