



# CS7520 InfiniBand Switch



216-Port EDR 100Gb/s InfiniBand Smart Director Switch

Switch IB™ 2 †

Mellanox provides the world's first smart switch, enabling in-network computing through the Co-Design Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)™ technology. The CS7520 system provides the highest performing fabric solution in a 12U form factor by delivering 43Tb/s of full bi-directional bandwidth with 400ns port latency.

## SCALING-OUT DATA CENTERS WITH EXTENDED DATA RATE (EDR) INFINIBAND

Faster servers based on PCIe 3.0, combined with high-performance storage and applications that use increasingly complex computations, are causing data bandwidth requirements to spiral upward. As servers are deployed with next generation processors, High-Performance Computing (HPC) environments and Enterprise Data Centers (EDC) will need every last bit of bandwidth delivered with Mellanox's next generation of EDR InfiniBand high-speed smart switches.

## SUSTAINED NETWORK PERFORMANCE

Built with Mellanox's latest Switch-IB™ InfiniBand switch devices, the CS7520 provides up to 216 100Gb/s full bi-directional bandwidth per port. The CS7520 modular chassis switch provides an excellent price-performance ratio for medium to extremely large size clusters, along with the reliability and manageability expected from a director-class switch.

CS7520 is the world's first smart network switch designed to enable in-network computing through the Co-Design Scalable Hierarchical Aggregation and Reduction Protocol (SHARP) technology. The Co-Design architecture enables the usage of all active data center devices to accelerate the communications frameworks, resulting in order-of-magnitude applications performance improvements.

## WORLD-CLASS DESIGN

CS7520 is an elegant director switch designed for performance, serviceability, energy savings and high-availability. The CS7520 comes with highly efficient, 80 gold+ and energy star certified AC power supplies. The leaf, spine blades and management modules, as well as the power supplies and fan units, are all hot-swappable to help eliminate down time.

## COLLECTIVE COMMUNICATION ACCELERATION

Collective is a term used to describe communication patterns in which all members of a group of communication endpoints participate.

## HIGHLIGHTS

### BENEFITS

- Industry-leading switch platform in performance, power, and density
- Collective communication acceleration
- Designed for energy and cost savings
- Maximizes performance by removing fabric congestions
- Backward compatible to FDR and QDR technologies

### KEY FEATURES

- Performance
  - 216 EDR 100Gb/s ports in a 12U switch
  - 43Tb/s aggregate switch throughput
  - Ultra low switch latency
- Optimized design
  - N+N redundant & hot-swappable power
  - 80 gold+ and energy star certified power supplies
  - Dual-core x86 CPU
  - SGCC platings

Collectives have implications on overall application performance and scale. CS7520 introduces the Co-Design SHARP technology, which enables the switch to manage collective communications using embedded hardware. Switch-IB 2 improves the performance of selected collective operations by processing the data as it traverses the network, eliminating the need to send data multiple times between endpoints. This decreases the amount of data traversing the network and frees up CPU resources for computation rather than using them to process communication.

## MANAGEMENT

The CS7520, dual-core x86 CPU, comes with an onboard subnet manager enabling simple out-of-the-box fabric bring-up for up to 2048 nodes. The CS7520 switch runs the same MLNX-OS® software package as Mellanox FDR products to deliver complete chassis management to manage the firmware, power supplies, fans and ports.

## FEATURES

### Mellanox CS7520

- 12U modular chassis
- 36 QSFP28 EDR 100Gb/s InfiniBand ports per dual IC leaf blade

### Switch Specifications

- Compliant with IBTA 1.21 and 1.3
- 9 virtual lanes: 8 data + 1 management
- 256 to 4Kbyte MTU
- 4x48K entry linear forwarding database

### Management Ports

- DHCP
- Familiar Industry Standard CLI

- Management over IPv6
- Management IP
- SNMP v1,v2,v3
- Web UI

### Fabric Management

- On-board Subnet Manager supporting fabrics of up to 2048 nodes
- Unified Fabric Manager™ (UFM™) Agent

### Connectors and Cabling

- QSFP28 connectors
- Passive copper or active fiber cables
- Optical modules

### Indicators

- Per port status LED Link, Activity
- System status LEDs: System, fans, power supplies
- Port Error LED
- Unit ID LED

### Physical Characteristics

- Dimensions: 20.96"H x 17.64"W x 30.3"D
- Weight: Fully populated 200kg (441lb)

### Power Supply

- Hot swappable with N+N redundancy

- Input range: 180-265VAC
- Frequency: 47-63Hz, single phase AC

### Cooling

- Hot-swappable fan trays
- Front-to-rear air flow
- Auto-heat sensing fans

### Power Consumption

- Typical power consumption (fully populated):
  - Passive cable: 3833W
  - Active cable: 4798W

## COMPLIANCE

### Safety

- CB
- cTUVus
- CE
- CU

### EMC (Emissions)

- CE
- FCC
- VCCI
- ICES
- RCM

### Operating Conditions

- Operating 0°C to 40°C
- Non-Operating -40°C to 70°C
- Humidity: Operating 10% to 85%, non-condensing
- Altitude: Operating -60 to 3200m

### Acoustic

- ISO 7779
- ETS 300 753

### Others

- RoHS compliant
- 1-year warranty

Table 1 - CS7520 Series Part Numbers and Descriptions

OPN	Description
MCS7520	43Tb/s, 216-port EDR chassis switch, includes 8 fans and 4 power supplies, (N+N configuration)
MSB7510-E2	Switch-IB™ 2, 36-port EDR 100Gb/s InfiniBand leaf blade, no support for Mellanox SHARP technology
MSB7520-E2	Switch-IB™ 2, 36-port EDR 100Gb/s InfiniBand spine blade, no support for Mellanox SHARP technology
MSB7560-E	Switch-IB™ 2, 36-port EDR 100Gb/s InfiniBand leaf blade
MSB7570-E	Switch-IB™ 2, 36-port EDR 100Gb/s InfiniBand spine blade
MMB7500	x86 dual-core management module
MTDF-FAN-A	Director system fan unit located on the leaf side
MTDF-FAN-B	Director system fan unit located on the spine fan unit
MTDF-PS-A	2.5 KW AC power supply w/ P2C air flow



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