SWITCH SYSTEM

PRODUCT BRIEF

Grid Director™ 4200

Fourth Generation InfiniBand Switch Brings QDR (40 Gb/s) Performance to Mid-Size Clusters

Mellanox's 4th generation Grid Director™ 4000 series of switches addresses the growing size and complexity of clusters by providing high interconnect bandwidth, advanced management and unique scalable architectures.

Grid Director 4200

Scaling-Out Data Centers with QDR

Faster servers combined with high performance storage and applications are causing data center bandwidth requirements to spiral upward.

The Grid Director 4200 is a high performance, ultra-low latency InfiniBand switch for high performance clusters. With configurations of up to 162 ports of 40 Gb/s per port InfiniBand connectivity, the Grid Director 4200 delivers 11.52 Tb/s of bandwidth and between 100 and 300 nanoseconds of port-to-port latency.

As a result, I/O bottlenecks are removed, allowing applications to operate at maximum efficiency. As a mid-size 40 Gb/s switching solution, the Grid Director 4200 is designed to provide an excellent price-performance ratio for mid-size clusters, along with the reliability and manageability expected from a director-class switch.

Advanced Port and Signal Optimization

Mellanox's smart switch design leverages advances in cabling technology to determine the optimal settings for the connected QSFP cable. This makes the selection of cables more flexible and provides for simpler and faster cluster deployments without errors caused by degraded signal integrity.

On-board Device and Fabric Management

The Grid Director 4200 on-board device and fabric management provides a simple interface for deploying, troubleshooting, maintaining and upgrading the switch. The embedded SM (subnet manager) provides an easy out-of-the-box experience for a quick, smooth deployment.

Enhanced Software Stack

The Grid Director 4200 works with Mellanox's Unified Fabric Manager™ (UFM™) software, which automatically discovers, virtualizes, monitors and optimizes the fabric infrastructure and accelerates the active applications. UFM™ provides fast fabric bring-up by implementing leading-edge routing algorithms to maximize the use of available bandwidth and enable the creation of scale-out clusters from tens to thousands of nodes.

Fabric Optimization

Mellanox fabric optimization includes application-based QoS and isolation, congestion management capabilities, and traffic aware routing to prevent degraded application performance.

Building Efficient Clusters & Grids

The Grid Director 4200 is the industry's most cost-effective building block for deploying high performance clusters and data centers. Whether looking at price-to-performance or energy-to-performance, the Grid Director 4200 reaches new levels of achievement.

Mellanox's InfiniBand solutions have been at the top of both the Top500 (top500.org) list of fastest supercomputers in the world and the Green500 (green500.org) list of "greenest" supercomputers for years, indicating recognized leadership in both performance and efficiency.

HIGHLIGHTS

- Removes I/O bottlenecks for extreme application performance
- Unlimited scalability across application, database and storage servers
- Ideal for scientific, commercial HPC and enterprise applications
- Ultra-low latency: between 100 and 300 nanoseconds port-to-port
- 162 x 40 Gb/s InfiniBand ports (QDR)
- Available bandwidth: up to 11.52 Tb/s
- Simple and fast device management
- Fully managed by Unified Fabric Manager™ (UFM™) software
- Fast fabric bring-up and advanced routing algorithms
- Advanced congestion management
- Zero downtime guaranteed with no single point of failure and real-time fault notifications

TOP500® SUPERCOMPUTER SITES

Green500

SPECIFICATIONS

GRID DIRECTOR 4200

– 9-slot, 19" rack mountable chassis, 11U height
– Per chassis: up to 9 Line Boards, each may accommodate one 4X QDR Line Board
– Up to 4 QDR fabric boards supported per chassis , each includes 36 QDR ports
– Per chassis: 162 QDR (40Gb/s) ports; 144 ports fully non-blocking
– Aggregate data throughput: 11.52 Tb/s
– Port-to-port latency: 100-300 ns
– 9 Virtual lanes: 8 data + 1 management
– MTU: 4096 Bytes (max.)

INFINIBAND PORTS (LINE BOARDS)

– Per line: 18 x 40 Gb/s QDR ports
– IBTA 1.2 compliant
– Interconnect options: QSFP passive and/or active copper/fiber optic cables
– All ports are located on the rear panel

MANAGEMENT

– Two redundant management boards (sMB-CM)
– Physical Ports:
  • *DB-9 for serial management (RS232)*
  • *RJ45 jack connector for 10/100/1000 Ethernet port*
  • *Chassis Reset Button on the front and rear panels*
  • *USB port for file transfer*
– Device Management:
  • *CLI (Local/Telnet/SSH)*
  • *Management over IPv4 or IPv6*
  • *SNMP v1/v2C/v3*
  • *RADIUS, TACACS+ Authentication*
– Fabric Management
  • *On-board SM for fabrics up to 648 nodes*
  • *Unified Fabric Manager™ (UFM™) software*

INDICATORS

– Line and Fabric Boards: Physical connectivity and logical connectivity LEDs per link port, PWR, RDY & Info LEDs
– Management board: PWR, Info, Fan, PSU, Temp LEDs
– Fan unit: Reset Button, Temp, sFU and PSU LEDs
– PSU LED indicator on the power suppl

POWER REQUIREMENTS

– Up to 4 redundant hot-swappable load sharing power supplies (sPSU-40) with built in power inlet (for N:1 or N:N Redundancy)
– Power entry: 100 to 240 VAC, 50/60 Hz, auto-sensing
– Power consumption:
  • *Maximum: 2243W*
  • *Typical: 1683W*
  • *Numbers relate to copper cables. For optic cables add 1.5W per port*

COOLING

– Two fan units: a Horizontal Fan Unit (sFU- 42H) and a Vertical Fan Unit (sFU-42V) with internal redundancy
– Air flow: Front-to-rear
– Auto-heat sensing for silent fan operation

PHYSICAL CHARACTERISTICS

– Dimensions (H x W x D): 18.98" (482 mm) x 19.25" (489 mm) x 26.69" (678 mm)
– Weight:
  • *Basic configuration: 132 Lbs (60 Kgs)*
  • *Full configuration: 220 Lbs (100 Kgs)*
– Cabling guide brackets kit designed for cable management

ENVIRONMENTAL

– Operating
  • *Ambient temperature: 32º to 113º F (0º to 45º C)*
  • *Humidity: 15 to 80%, non-condensing*
  • *Altitude: 0 to 9843 ft (3000m)*
– Storage
  • *Temperature: -13º to 158º F (-25º to 70º C)*
  • *Humidity: 5 to 90 non-condensing*
  • *Altitude: 0 to 15,000 ft (4570m)*

CERTIFICATIONS

– Safety
  • *UL60950-1*
  • *CB IEC60950*
  • *CSA-C22.2 No.60950- 00*
– EMC
  • *47CFR FCC part 15*
  • *EN55022:98/EN55024:98/EN61000-3- 2:00/ EN61000-3-3:95*
– VCCI

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