

Grid Director™ 4700

Fourth Generation Smart Switch Brings QDR (40Gb/s) Performance to InfiniBand Fabrics

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

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 4700 is a high performance, ultra low latency and fully non-blocking InfiniBand switch for high performance clusters. With configurations of up to 324 ports or double-sided 648 ports of 40 Gb/s per port InfiniBand connectivity, the 4700 delivers an impressive 51.8 Tb/s of non-blocking bandwidth with between 100 and 300 nanoseconds of port-to-port latency.

The switch's HyperScale™ architecture provides a unique inter-switch link capability for stacking multiples of 324 ports to form highly scalable, cost effective, and low latency fabrics.

As a result, I/O bottlenecks are removed, allowing applications to operate at maximum efficiency. As the industry's largest QDR switching solution, the Grid Director 4700's smart design provides unprecedented levels of price performance 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 Mellanox Grid Director 4700 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 4700 works with Mellanox's Unified Fabric Manager™ (UFM™), 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 that maximize the use of available fabric bandwidth and enable the creation of scale-out clusters from tens to thousands of nodes.

Fabric Optimization

Mellanox fabric optimization includes congestion management capabilities for detecting congestion with advanced multi-path and adaptive routing capabilities to prevent degraded application performance.

Building Efficient Clusters & Grids

The Grid Director 4700 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 4700 reaches new levels of achievement.



Grid Director 4700

HIGHLIGHTS

- Extreme application performance by removing I/O bottlenecks
- 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
- 324 QDR (40Gb/s) ports in a 19U switch
- 648 port option can be divided between two racks for weight distribution
- Unique HyperScale™ architecture allows scaling to thousands of nodes
- Available bandwidth: up to 51.8 Tb/s
- Simple and fast device management
- Fully managed by Unified Fabric Manager™ (UFM™)
- Fast fabric bring-up and advanced routing algorithms
- Advanced congestion management
- Zero down time guaranteed with no single point of failure and real-time fault notifications

SPECIFICATIONS

GRID DIRECTOR 4700

- 19" rack mountable chassis, 19U height
- Each slot may accommodate one 4X QDR Line Board (sLB-4018).
- Per chassis: 324 QDR (40Gb/s) ports
- Aggregate data throughput: 51.8 Tbps (HyperScale Configuration)
- Port-to-port latency: 100 -300 ns
- 9 Virtual lanes: 8 data + 1 management
- MTU: 4096 Bytes (max.)
- Up to 9 QDR Fabric Boards supported per chassis, each with 36 QDR ports

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
- Physical Ports:
 - DB-9 for serial management (RS232)
 - RJ45 jack connector for 10/100/1000 Ethernet port
 - Chassis Reset Button on the front/rear panels
 - USB port for file transfer
- Device Management:
 - CLI (Local/Telnet/SSH)
 - Management over IPv4 or IPv6
 - 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 supply

POWER REQUIREMENTS

- Up to 6 redundant hot-swappable load sharing power supplies (N:1 or N:N Redundancy)
- Power entry: 100 to 240 VAC, 50/60 Hz, auto-sensing
- Standard power consumption:
 - Maximum: 4221W
 - Standard: 3166W
 - Fully populated configuration. (copper cables) For optic cables add 1.5W per port.
- Hyperscale
 - Maximum: 5256W
 - Standard: 3942W
 - Fully populated (copper cables). For optic cables add 1.5W per port.

COOLING

- Two fan units: a Horizontal Fan Unit (sFU-40H) and a Vertical Fan Unit (sFU-40V) with internal redundancy
- Air flow: Front-to-rear
- Auto-heat sensing for silent fan operation

PHYSICAL CHARACTERISTICS

- Dimensions (H x W x D) 33.25" (844 mm) x 17" (432 mm) x 26" (660 mm)
- Weight:
 - Basic configuration: 145 Lbs (66 Kgs)
 - Full configuration: 340 Lbs (154.5 Kgs)
- Optional cabling guide brackets kit designed for cable management

ENVIRONMENTAL

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

CERTIFICATIONS

- Safety
 - UL60950
 - 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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