SWITCH SYSTEM

PRODUCT BRIEF

Grid Director™ 4036E

Hardware-based Bridging Between Infiniband and Ethernet

The Grid Director™ 4036E is a high-performance, low-latency InfiniBand switch, which includes a built-in low latency Ethernet gateway for bridging traffic to and from Ethernet-based networks or storage.

Grid Director 4036E

Scaling-Out Data Centers with InfiniBand

Faster servers combined with high performance storage and applications that use increasingly complex models are causing data bandwidth requirements to spiral upward.

Grid Director 4036E has thirty-four 40 Gb/s InfiniBand ports (delivering 2.72 Tb/s), less than 100 nanoseconds of port-to-port latency, and two 1/10Gb Ethernet ports bridging traffic in less than one microsecond. The 4036E switch was designed as a self-contained full solution including an InfiniBand switch, an embedded subnet manager, and a built-in, hardware-based low latency Ethernet gateway in a compact 1U device.

Accelerating Applications Across Networks

With its high bandwidth, low latency and reduced overhead, InfiniBand is the ideal choice for speeding application performance while simultaneously consolidating network and I/O infrastructure. Combining InfiniBand and Ethernet into a single solution provides ideal rack backbone for next generation data centers. By utilizing InfiniBand to connect application servers and Mellanox's multi-service switch solutions to seamlessly connect Ethernet and InfiniBand IT organizations reduce complexity and cost and can concentrate on providing reliable, scalable, high performance solutions rather than on the specifics of the technology.

Much More than Just Bridging

- Transparent mapping between Ethernet VLANs and InfiniBand partitions to ensure continuity of security and service levels
- Accelerating IP multicast over InfiniBand using hardware-based multicast
- Flow control support over InfiniBand and Ethernet for efficient handling of congestion
- Layer 2/3/4-based packet filtering and classification
- Link aggregation (LAG) between Ethernet ports
- Aggregation of Ethernet ports from multiple gateways for scalability or redundancy purposes

InfiniBand-to-Ethernet Gateway Use Cases

Financial service organizations

The market data streams incoming from the stock exchange are typically received over 1 or 10 Gb Ethernet, and these need to enter the InfiniBand cluster with minimal additional cost or latency penalty. Market data feeds typically run mostly multicast traffic, which the 4036E significantly accelerates by seamlessly mapping it to hardware-based InfiniBand multicast.

Database applications

These environments typically require seamless bridging to Ethernet in order to accelerate access to 10GbE NAS or for long distance connectivity to backup sites for disaster recovery.

Server and Storage Solutions

Using built-in gateways to bridge the InfiniBand cluster to the file system reduces the overall solution cost and guarantees maximum bandwidth for each node accessing the file system.

HIGHLIGHTS

- Low latency, hardware-based bridging between InfiniBand and Ethernet
- High-performance connectivity to Ethernet-based services and resources
- Reduce switching and adapter costs by consolidating network and I/O infrastructure
- 34 QDR (40 Gb/s) ports and two 1/10 GbE ports in a 1U switch
- Ultra-low latency:
  - *less than 100 nanoseconds between InfiniBand ports*
  - *less than one microsecond between InfiniBand and Ethernet*
- Plug & play, standards-based protocol bridging with zero configuration
- Embedded subnet manager

SPECIFICATIONS

GRID DIRECTOR 4036E
- 19" rack mountable chassis, 1U height
- Aggregate data throughput: 2.72 Tb/s
- Port-to-port Latency
  - *less than 100 ns InfiniBand to InfiniBand*
  - *less than 1 µs InfiniBand to Ethernet*
- 9 Virtual lanes: 8 data + 1 management
- MTU: 4096 Bytes (max.)

INFINIBAND PORTS
- 34 4X Quad Data Rate ports
- IBTA 1.2.1 compliant
- Interconnect options:
  QSFP passive/active cooper or fiber cables
- All ports are located on the rear panel

ETHERNET PORTS
- Two 1/10 GbE interconnect ports, SFP+ interfaces
- IEEE 802.3ab
- IEEE 802ad (link aggregation)
- IEEE P802.3ak and IEEE P802.3ae 10GBASE-SR, 10GBASE-LR
- Support for Jumbo frames

IETF PROTOCOLS
- TCP/IP: IETF RFC-793, IETF RFC-791, IETF RFC-768, RFC-926, RFC-1812, RFC-1027
- IPoIB: IETF RFC 4391, 4392
- VLAN support according IEEE 802.1q (up to 64 VLANS)
- IP multicast (IETF RFC 3171) and IGMPv2 (up to 3000 multicast groups)
- SNMP v2c: IETF — RFC190x

MANAGEMENT
- Physical Ports:
  - *DB-9 connector on the rear panel*
  - *RJ45 jack connector for 10/100/1000 Ethernet port on the rear panel*
  - *Chassis Reset Button on the front/rear panels*
  - *USB port on the rear panel*
- Device Management:
  - *CLI*
  - *SNMP*
- Fabric Management
  - *On-board SM for fabrics up to 648 nodes*
  - *Unified Fabric Manager™ (UFM™)*

INDICATORS
- Fan unit LED on the fan unit
- PSU LED on the power supply
- Power supply/fan LED on the front/rear panels
- Info LED on the front and rear panels
- SM LED on the front and rear panels
- System Power LED on the front/rear panels
- System Temp LED on the rear panel
- I/O LED on the rear panel

POWER REQUIREMENTS
- Dual redundant power supply slots and two hot-swappable power supplies
- Power entries: 100 to 240 VAC, 50/60 Hz, auto-sensing
- Power consumption
  - *Maximum: 240W*
  - *Typical: 180W*
  - *Numbers relate to copper cables. For optic cables add 1.5W per port.*

COOLING
- Front-to-rear cooling
- Hot-swappable fan unit containing three fans for high availability
- Auto-heat sensing for silent fan operation

PHYSICAL CHARACTERISTICS
- Dimensions (H x W x D):
  1.69" (43 mm) x 16.93" (430 mm) x 20.9" (530 mm)
- Fixed rack-mount bracket kit included
- Optional cabling guide brackets kit designed for cable management
- Weight: 20 Lbs (9 Kgs)

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 (Voltaire Typical)
  - *UL60950*
  - *CB IEC60950*
  - *CSA-C22.2 No.60950-00*
- EMC (Voltaire Typical)
  - *47CFR FCC part 15*
  - *EN55022:98/EN55024:98/EN61000-3-2:00/ EN61000-3-3:95*
- VCCI

Mellanox TECHNOLOGIES

350 Oakmead Parkway, Suite 100, Sunnyvale, CA 94085
Tel: 408-970-3400 • Fax: 408-970-3403
www.mellanox.com