

Voltaire® Grid Director™ 4036

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



Scaling-Out Data Centers with QDR

Faster servers combined with high performance storage and applications that use increasingly complex models are causing data bandwidth requirements to spiral upward. As servers are deployed with next generation processors and server busses, high-performance computing environments - in industries such as energy, bioscience, financial services, government and academic research - will need every last bit of bandwidth delivered with Voltaire's new fourth generation Grid Director 4036 smart switches. As clusters grow in size and complexity, efficient routing and advanced management tools become mandatory for quick fabric bring-up and minimal fabric downtime.

The Voltaire Grid Director 4036 is a high performance, low latency and fully non-blocking InfiniBand switch for high performance clusters. Delivering 2.88 Tb/s of non-blocking bandwidth with less than 100 nanoseconds of port-to-port latency, I/O bottlenecks are removed making applications operate at maximum efficiency. The Voltaire Grid Director 4036 was designed to fit into today's densely configured racks. It has thirty-six 40Gb/s ports that use the new smaller and intelligent QSFP connector in a 1U chassis that is only 15" deep. The efficient Grid Director 4036's smart design makes it easy to build clusters that can scale-out to thousands of nodes.

Use Smart Switches to Create Smart Clusters

Voltaire's fourth generation InfiniBand switches add many new smart capabilities to meet the needs of next generation data centers. Smart switches are designed to fit easily into the modern data center's

infrastructure with an optimized form factor. The Voltaire Grid Director 4036 also comes with new smart capabilities:

- The Grid Director 4036 includes smart device management that provides a simple interface for deploying, troubleshooting, maintaining and upgrading the switch. With a simple to use CLI interface, routine tasks such as monitoring the switch's operation or upgrading software and firmware are made simple.
- With the increased 40Gb/s speeds come faster signaling rates. Voltaire's smart switch design leverages advances in cabling technology in concert with the Grid Director 4036's advanced port and signal optimization capabilities 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.
- The Voltaire Grid Director 4036 comes with an onboard subnet manager, enabling simple, out-of-the-box fabric bring-up for small to medium clusters. Furthermore, the Grid Director 4036 can be coupled with Voltaire'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 that maximize the use of available fabric bandwidth and enable the creation of scale-out clusters from tens to thousands of nodes.
- Applications require fabrics to provide reliable bandwidth and latency that can scale to support thousands of nodes. Voltaire fabric optimization includes advanced congestion management capabilities for detecting congestion with advanced multi-path and adaptive routing capabilities to prevent degraded application performance



- Extreme application performance by removing I/O bottlenecks
- Unlimited scalability across application, database and storage servers
- Ideal for scientific, commercial HPC and enterprise applications
- 36 QDR (40Gb/s) ports in a 1U switch
- Available bandwidth: up to 2.88 Tb/s
- Ultra-low latency: less than 100 nanoseconds
- Simple and fast device management
- Support for longer and more varied cable options
- Fully managed by Voltaire Unified Fabric Manager (UFM)
- Fast fabric bring-up and advanced routing algorithms
- Advanced congestion management

Building Efficient Clusters & Grids

The Grid Director 4036 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 4036 reaches new levels of achievement.

Voltaire'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. The design of the Grid Director 4036 ensures that this leadership will be maintained in the QDR era.



Voltaire Grid Director 4036

- 19" rack mountable chassis, 1U height, configurable with redundant Power Supplies, and Fan Units
- Aggregate data throughput: 2.88 Tb/s (QDR), 1440 Gb/s (DDR) or 720Gb/s (SDR)
- Port-to-port Latency: less than 100 nanoseconds latency
- 9 Virtual lanes: 8 data + 1 management
- MTU: 4096 Bytes (max.)

InfiniBand Ports

- 36 4X Quad Data Rate ports (QDR – 40 or 20 or 10 Gb/s auto-negotiate)
- IBTA 1.2 compliant
- Interconnect options: QSFP passive and/or active copper/fiber optic cables
- All ports are located on the rear panel
- Indicators: physical and logical status

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 and rear panels
 - USB port on the rear panel
- Device Management:
 - CLI
 - SNMP (future)
- Fabric Management:
 - On-board SM for fabrics up to 648 nodes
 - Voltaire Unified Fabric Manager (UFM)

Indicators

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

Power Requirements

- Dual redundant power supply slots
- Two hot-swappable power supplies
- Power entries: 100 to 240 VAC, 50/60 Hz, auto-sensing
- Power consumption
 - ▶ Maximum: 216W
 - ▶ Typical: 106W
 - ▶ (Numbers relate to copper cables. For optic cables add 2.1W per port.)
- Power supply with built-in power inlet

Cooling

- Front-to-rear or rear-to-front cooling (fan unit ordering option)
- Hot-swappable fan unit containing three fans for high availability
- Auto-heat sensing for silent fan operation

Physical Characteristics

- 19-inch front or rear rack-mountable chassis
- Dimensions (H x W x D): 1.69 in. (43 mm) x 16.93 in. (430 mm) x 15.7 in. (400 mm) [including handles]
- Fixed rack-mount bracket kit (RM-24) or sliding rail kit (RK-24 - optional)
- Optional cabling guide brackets kit designed for cable management
- Weight: 17 Lbs (7.7 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



Contact Voltaire to Learn More

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