

# Voltaire® Grid Director™ Switches

## The Industry's Most Scalable Family of Unified Fabric Switches for Deploying High Performance Data Centers

### Overview

Voltaire is a leading provider of server and storage switching and software solutions that enable unified fabrics for high performance data centers. Unified fabrics provide application acceleration and seamless SAN, LAN and inter-server communications over a single virtualized server connection.

By combining industry standard InfiniBand technology with integrated Ethernet and Fibre Channel gateways, Voltaire Grid Director switches provide a scalable unified fabric for powering the world's largest and fastest high performance computing systems and enterprise data centers. Multiple Grid Director switches can be interconnected to form server fabrics that can grow into the thousands of nodes with "pay as you grow" scalability.

### Voltaire Grid Director 2012/2004 - 20 Gb/s InfiniBand Switches

The Voltaire Grid Director 2012 and 2004 switches are designed from the ground up to provide the next generation data center with a no compromise solution for building 20 Gb/s unified fabrics. The Grid Director 2012 is the most scalable switch in the industry with up to 288 20 Gb/s links and 11.52 Tb/s of full bisectional bandwidth in a fat-tree (Clos) topology. The Grid Director 2004 provides up to 96 20 Gb/s links and 3.84 Tb/s of full bisectional bandwidth in a fat-tree (Clos) topology. The Grid Director 2012 and 2004 have the best signal integrity in the industry allowing the use of the longest cable lengths with the lowest error rates. With a state-of-the-art design, the Grid Director 2012 and 2004 switches decrease energy consumption helping to green the data center.

### Voltaire Grid Director 9288/9096 - 10 Gb/s InfiniBand Switches

Voltaire Grid Director 9288 and 9096 switches provide 5.76 Tb/s or 1.92 Tb/s of full bisectional bandwidth with ultra low latencies in a fat-tree (Clos) topology. The Grid Director 9288 supports up to 288 10 Gb/s InfiniBand ports and the Grid Director 9096 supports up to 96 10 Gb/s InfiniBand ports.

The Grid Director 9288 and 9096 switches include seamless integration of Ethernet and Fibre Channel networks. Wire-speed non-blocking switch capacity combined with latencies of less than 450 nanoseconds make the Grid Director 9288 and 9096 switches the perfect building blocks for clusters and grids scaling into the thousands of nodes.

### Voltaire Grid Director 9024 - 10/20 Gb/s InfiniBand Switch

The Voltaire Grid Director 9024 is a high performance, low latency and fully non-blocking switch for high performance computing clusters. Perfect for use as an edge or leaf switch, it offers full bisectional bandwidth of 960 Gb/s. With built-in high availability and a design that is easy to maintain, the Grid Director 9024 is a cost-effective alternative to proprietary interconnect technologies. With 24, 10 or 20 Gb/s ports in a 1U chassis, the Grid Director 9024 delivers high bandwidth and low latency at an affordable price.

### Voltaire Unified Fabric Solutions

Voltaire's integrated family of switching hardware and network virtualization software delivers a high-performance, intelligent solution for deploying clusters and grids. Leveraging InfiniBand technology, Voltaire solutions offer improved application performance, resource utilization and data center scalability for its customers' high-performance computing needs.

The Voltaire Grid Director families of switches provide cost-effective building blocks for fully non-blocking topologies of thousands of nodes for HPC, manufacturing, energy, financial, media, life sciences and other next generation data center environments. Combined with the integrated Ethernet and Fiber Channel routing capabilities, Voltaire's director-class switches enable truly efficient virtualization of all computing resources.

### FEATURES/BENEFITS:

- ▶ **Accelerate application performance by reducing communication bottlenecks**
- ▶ **Decrease power/cooling requirements with a unified fabric**
- ▶ **Best price/performance solution with error-free 10/20 Gb/s fabrics**
- ▶ **Scale server fabrics into the thousands of nodes**
- ▶ **Integrated fabric management that is field proven to speed deployments**



Grid Director 10 Gb/s and 20 Gb/s Family of Switches

## Voltaire Grid Director switches help to solve many important challenges for today's data centers

### Eliminate Bottlenecks

With the trend toward multi-socket, multi-core environments, server I/O has become a major bottleneck. Voltaire Grid Director switches eliminate the imbalance by providing servers with up to a 20 Gb/s InfiniBand fabric with application latencies as low as 2.5 µsecs. Voltaire's integrated Ethernet and Fibre Channel connectivity lets you share the power of InfiniBand with your data center LAN and SAN networks to improve the performance of existing network infrastructure.

### Reduce Complexity

Managing separate networks for storage, IPC and LAN based traffic is expensive and complicated. Voltaire Grid Director switches reduce complexity by creating a Unified Fabric for the data center with seamless connectivity between InfiniBand, Ethernet and Fibre Channel based networks. You no longer need three separate network technologies with multiple network adapters to operate your data center fabric which greatly simplifies the requirements on server hardware.

### Improve Efficiency

Voltaire Grid Director switches accelerate application performance and enable scalability into the thousands of nodes. Moreover, with high bandwidths, low latencies and reliable packet delivery, application performance won't be harmed by packet retransmissions of lost information.

### Reduce Environmental Costs

Improved application efficiency along with the need for fewer network adapters allows you to accomplish the same amount of work using fewer more cost-effective servers. With improved cooling mechanisms comes reduced power consumption and heat generation allowing data centers to reduce the costs associated with physical space, power and cooling.



Voltaire solutions work with a broad array of applications in various vertical markets.

## How do I know which Voltaire Grid Director switch to choose?

The Voltaire Grid Director family of switches can be used as building blocks to deploy systems ranging from small high performance database applications to multi-teraflop HPC systems. The Grid Director 9024 is the right solution for smaller clusters and can be used in combination with the larger Grid Directors to build clusters ranging into the thousands of nodes. The choice of switch is based upon the required fabric bandwidth, the number of total InfiniBand-based servers and the need for external connectivity to Ethernet and Fibre Channel networks.

	Grid Director 9024	Grid Director 9096	Grid Director 9288	Grid Director 2004	Grid Director 2012
<b>Rack Height</b>	1U	6U	14U	6U	15U
<b>Rack Width</b>	19"	19"	19"	19"	19"
<b>Switch Type</b>	Edge	Core	Core	Core	Core
<b>Backplane Bandwidth</b>	480/960 Gb/s	1.92 Tb/s	5.76 Tb/s	3.84 Tb/s	11.52 Tb/s
<b>Line Board</b>	0	4	12	4	12
<b>Fabric Boards</b>	0	4	4	4	4
<b>Max # of InfiniBand Ports</b>	24 10/20 Gb/s InfiniBand Ports	96 10 Gb/s InfiniBand Ports	288 10 Gb/s InfiniBand Ports	96 20 Gb/s InfiniBand Ports	288 20 Gb/s InfiniBand Ports
<b>Integrated IO</b>	No	Yes	Yes	Yes	Yes
<b>Interface Type</b>	4X 10/20Gb/s (SDR/DDR) CX4 ports with support for optical adapters and cables	4X 10 Gb/s (SDR/DDR) CX4 ports with support for optical adapters and cables	4X 10 Gb/s (SDR/DDR) CX4 ports with support for optical adapters and cables	4X 20 Gb/s (DDR) CX4 ports with support for optical adapters and cables	4X 20 Gb/s (DDR) CX4 ports with support for optical adapters and cables
<b>Redundant Components</b>	Power Supplies	Power Supplies (sPSUs), Fan Units (sFUs), Management Boards (sMB)	Power Supplies (sPSUs), Fan Units (sFUs), Management Boards (sMB)	Power Supplies (sPSUs), Fan Units (sFUs), Management Boards (sMB)	Power Supplies (sPSUs), Fan Units (sFUs), Management Boards (sMB)
<b>Embedded Fabric Management</b>	Optional	Yes	Yes	Yes	Yes



Contact Voltaire to Learn More

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