

Product Bulletin:

Voltaire® Grid Director™ ISR 2012 Multi-Service Switch



Product Overview

The Voltaire® Grid Director™ ISR 2012 multi-service switch enables high performance applications to run on distributed server, storage and network resources. Multiple Grid Director ISR 2012s can be interconnected to form very large high performance clusters and grids that can grow into the thousands of nodes with “pay as you grow” scalability.

High performance environments require no-compromise solutions. The Voltaire Grid Director ISR 2012 delivers just that — with up to 288 ports of error-free 20 gigabits per second InfiniBand connectivity. Ultra low latencies and an impressive 11.52 terabits per second non-blocking backplane eliminate communication bottlenecks, allowing applications to perform at maximum efficiency. As the industry’s largest multi-service switching solution, the Grid Director ISR 2012 provides unprecedented levels of performance and scalability for large, high performance computing environments and grids.

Purpose-Built for the Next Generation Data Center

The Grid Director ISR 2012 is Voltaire’s second generation enterprise-class 20 Gb/s InfiniBand switch. Voltaire’s considerable experience deploying high performance interconnects in the world’s fastest supercomputers and high performance data centers was used to create the perfect building block for clusters and grids that scale into the thousands of nodes.

The industry-leading design of the Grid Director ISR 2012 provides reliable packet delivery with the best signal quality available. The reliable delivery of packets increases application efficiency by avoiding costly packet drops and retransmissions associated with alternative solutions.

With its excellent signal integrity, the Grid Director ISR 2012 supports copper InfiniBand cables up to 14m and optical InfiniBand cables up to 100m extending the reach of high performance computing systems and increasing data center scalability. This becomes increasingly important as grids and clusters scale and require

more space in the data center requiring longer cable reaches.

To further reduce complexity, the Grid Director ISR 2012 supports the sRB-20210G InfiniBand-10GbE Gateway Module creating a unified fabric for InfiniBand, storage and IP networks. This switch also incorporates enhanced cooling and power margins to provide investment protection. As clusters and grids continue to grow, higher port densities enabled with new optical, copper (RJ45) or pluggable (QSFP) interfaces will be supported as well as future application line boards with advanced storage and data center virtualization capabilities that provide integrated solutions for automating and virtualizing data centers.



Figure 1: Voltaire Grid Director ISR 2012 Multi-Service Switch

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Building Unified Fabrics with Voltaire Solutions

Unified Fabrics provide applications with access to high performance storage solutions and to multiple networks that span across InfiniBand, Fibre Channel and Ethernet. InfiniBand's high bandwidth and low latency combined with advanced QoS, congestion management and routing capabilities provide the ideal transport for speeding up storage, interconnect and networking traffic. By using a single virtual backplane that eliminates application bottlenecks, Unified Fabrics improve data center efficiency while reducing the cost and complexity associated with connecting servers to multiple IP and storage networks.

GridVision™ Fabric Manager provides a single point of management accessed through an intuitive Java-based GUI or flexible CLI that makes finding and replacing failing nodes, viewing the overall health of network resources or tuning fabric parameters for optimal performance easy and intuitive. With accelerated fabric initialization, advanced fabric routing algorithms, and enterprise class fabric visualization capabilities, GridVision Fabric Manager is much more than a simple InfiniBand Subnet Manager (SM). It is a set of advanced tools and utilities that simplifies common tasks related to the configuration, management and monitoring of InfiniBand resources. GridVision is available as an embedded solution on the Grid Director 2012.

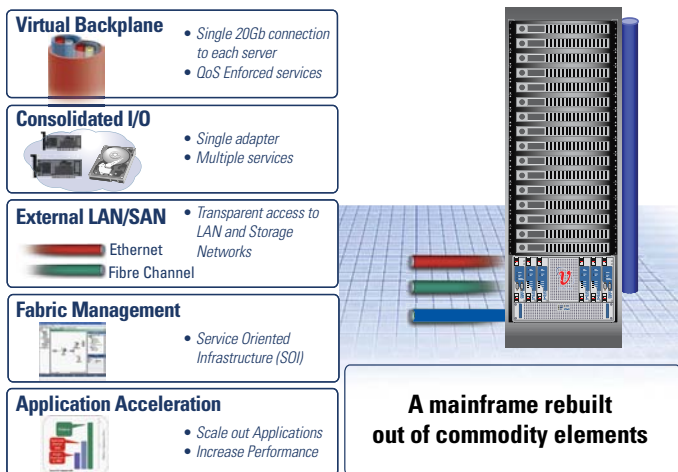


Figure 2: The Voltaire Unified Fabric for the Data Center

Reducing Data Center Energy Consumption

The number and density of servers in data centers continues to expand and grow stretching the capabilities of enterprises to find enough physical space with adequate power and cooling. As a vital component of a Unified Fabric, Voltaire Grid Director switches provide an energy efficient solution for improving data center efficiency by increasing application performance.

Data centers can deliver the same or better results with fewer servers connected with Grid Director switches. Voltaire Grid Director switches' energy-efficient designs use up to 10X less energy when compared with alternative 10 GbE-based solutions. By utilizing less power per packet and generating less heat per gigabit, you can deliver more computing power to your users at a lower cost.

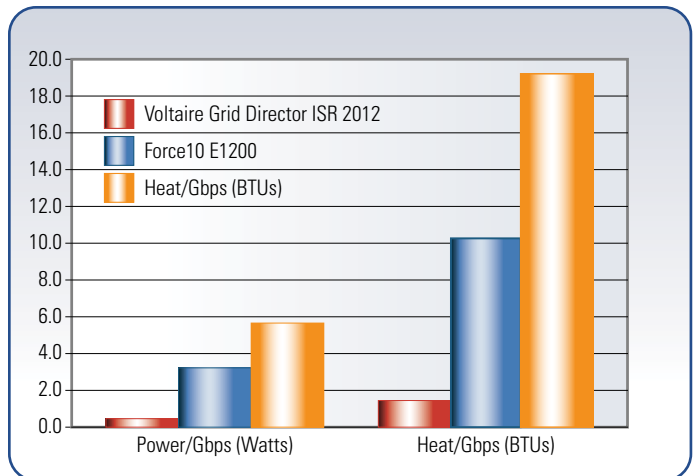


Figure 3: Voltaire Grid Backbone Solutions Decrease Data Center Energy Costs

Built-in Reliability, Availability and Supportability (RAS)

The Grid Director ISR 2012 was designed for data center administrators who want to spend time delivering business results and less time worrying about problems. All critical components including power supplies, fans and management controllers have built-in redundancy ensuring maximum system up time and supportability. Redundant management boards maintain synchronization so that a failure can be recovered without the loss of management information or any disruption in communication.

The Grid Director ISR 2012 provides comprehensive and powerful management capabilities through GridVision InfiniBand Fabric Management Software. The advanced management capabilities of GridVision can be accessed via CLI, GUI or SNMP managers. GridVision delivers real-time proactive management by providing: aggregated fabric and resource views, access to a suite of fabric and switch diagnostics, the ability to manage fail-over on all levels, and provisioning of InfiniBand fabrics and the attached server, networking and storage resources.

Also available is Voltaire OFED, a production-ready version of the open source OFED stack available through the OpenFabrics Alliance. Voltaire OFED is optimized for both application performance and supportability with advanced tools for deploying and troubleshooting large clusters and grids.

Voltaire Server & Storage Switching Solutions

Voltaire is a leading provider of server and storage switching and software solutions that enable high-performance grid computing within the data center. Voltaire's integrated family of switching hardware and network virtualization software delivers the a unified fabric for high performance data centers. Leveraging the InfiniBand interconnect architecture, Voltaire solutions offer improved performance, utilization and scalability for its customers' high-performance computing needs.

The Voltaire Grid Director Family of switches provides cost-effective building blocks for fully non-blocking topologies of thousands of nodes for HPC, manufacturing, energy, financial, media, life sciences and other compute-intensive applications. Combined with the integrated Ethernet and Fiber Channel routing capabilities, Voltaire's director-class switches enable the full benefits of grid computing by providing access to virtualization of all computing resources on the network.

Voltaire server and storage switching solutions help to solve many important challenges for today's data centers.

Eliminate Bottlenecks

With the trend towards multi-socket, multi-core environments, server I/O has become a major bottleneck. Voltaire Grid Director switches eliminate this imbalance by providing servers with 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 server and storage switching solutions 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 server and storage switching solutions accelerate application performance and enable scalability into the thousands of nodes. Moreover, with high bandwidths, low latencies and error-free data delivery, application performance won't be hurt 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.

Ordering Information

| Module Name | Description | Part Number |
|-------------|--|-------------|
| ISR 2012 | ISR 2012 20Gb/s basic configuration chassis | 501S39288 |
| sFB-2012 | sFB-2012, 12-20Gb/s-connections Fabric Board | 501S12001 |
| sLB-2024 | sLB-2024, 24 4X 20Gb/s InfiniBand ports Line Board | 501S24001 |
| sMB | sMB Management Board | 501S40070 |
| sPSU | sPSU, Power supply unit | 501S40100 |

TECHNICAL SPECIFICATIONS

Voltaire Grid Director ISR 2012

- 12-slot, 19" rack mountable chassis, 15U height, configurable with redundant Power Supplies (sPSUs) and Fan Units (sFUs)
- Each slot may accommodate one Line Board InfiniBand 4X Line Board (sLB-2024)
- Up to 12 InfiniBand 4x Line Boards supported per chassis
- 24 external 20 Gb/s Double Data Rate (DDR) InfiniBand ports
 - ▶ Connectors: 8-pair Micro GigaCN / LANELINK F CONN (CX4)
 - ▶ Supports hot-pluggable Optical Media Converters and Optical InfiniBand Cables
 - ▶ Indicators: Physical connectivity and logical connectivity LEDs per port, power and info LEDs

Fabric Board (sFB-2012)

- Up to 4 Fabric Boards supported per chassis
- Indicators: Physical connectivity and logical connectivity LEDs per line board link port, power, info and hot-swap LEDs

Switch Specifications

- Bisectional Bandwidth: 11.52 Tbps
- Port-to-port Latency: less than 420 nanoseconds latency
- Data Virtual Lanes: 8
- Management Virtual Lanes: 1
- MTU: 4096 Bytes (max.)

Management Board (sMB)

- GridVision™ Integrated fabric management including: Fabric Management, Chassis and Device Management
- InfiniBand 1.1 compliant managers and agents
- Supported Management protocols: SNMPv2c, Telnet, SSH, HTTP, FTP, IBTA SMI/GSI
- Connectors: RS232 DB9-M, I2C DB9-F
- Indicators: Power, subnet manager active, chassis manager active, info and hot-swap LEDs

Control (rear)

- Connectors: EIA/TIA-232 Console DB-9, 10/100 Ethernet RJ45
- Indicators: Subnet manager activity (2 LEDs), chassis management activity (2 LEDs), Fabric Boards (4 LEDs) and temperature LED
- Management/device reset button

Power Requirements

- 1 to 5 power supplies (for N:1 or N:N Redundancy)
- Power entry: 85-265 VAC, 50/60 Hz auto-sensing
- Total power consumption (configuration dependent): 2,500W, max for full configuration
- Indicators - Operational AC and DC Status LED

Cooling

- Air flow: Front-to-back
- Heat dissipation (configuration dependent): 8000 BTU/Hour max. for full configuration

Physical Characteristics

- 19-inch rack-mountable
- Dimensions (H x W x D): 25.6 in. (660 mm) x 17.5 in. (444 mm) x 22.75 in. (578 mm)
- Optional front or rear rack mounting
- Weight: 128 to 163 lb (58 to 74 Kg), depending on configuration and packaging

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



Contact Voltaire to Learn More

1.800.865.8247
info@voltaire.com
www.voltaire.com

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