

Voltaire® Grid Director™ ISR 9288

**Ideal for HPC Clusters and Grids Ranging in Size From Tens to Thousands of Nodes
With Powerful Multiprotocol Capabilities for SAN/LAN Connectivity**

Introducing the Voltaire Grid Director ISR 9288

As the industry's largest InfiniBand switching solution, the Grid Director ISR 9288 provides unprecedented levels of performance and scalability for large high performance computing (HPC) clusters and grids. The Grid Director ISR 9288 enables high performance applications to run on distributed server, storage and network resources. Elegantly designed with 10 Gbps of full bisectional bandwidth for 288 ports in a single chassis, multiple Grid Director ISR 9288s can also be interconnected to form very large clusters. Possible configurations range from dozens to thousands of nodes with "pay as you grow" scalability.

Unmatched Performance

The Grid Director ISR 9288 leads the InfiniBand industry with the highest switching capacity. It features a FAT Tree (Clos) topology that provides full bisectional bandwidth for each port. The Grid Director ISR 9288 supports up to 288 InfiniBand 4X (20 Gbps) ports (or 10 Gbps with SDR) or 96 InfiniBand 12X (30 Gbps) ports. Wire-speed non-blocking switch capacity combined with latency of less than 420 nanoseconds make the Grid Director ISR 9288 the highest performing switch available.

Multiprotocol Connectivity

In addition to scalable InfiniBand switching, the Grid Director ISR 9288 offers powerful multi-protocol connectivity in a single, flexible system. The chassis hosts the Voltaire router blades, providing seamless connectivity between server clusters, FC SANs, NAS appliances, IP SANs and TCP/IP networks (LANs). InfiniBand-to-TCP/IP and InfiniBand-to-Fibre Channel Router Blades can be mixed and matched in any combination and up to 132 router ports are supported in a single chassis.

Cost-Effective Solution for Large Clusters and Grids

Large clusters and grids are the most cost-effective when built using the largest available switches. Due to its high switching capacity, the Grid Director ISR 9288 can be used

to build large clusters using one or fewer switches, which dramatically reduces the overall cost of the cluster. Its integrated networking and storage connectivity provides high performance and requires fewer devices, thereby making the cluster simple to build and more reliable.

Comprehensive Management

The Grid Director ISR 9288 provides comprehensive and powerful management capabilities through GridVision™ InfiniBand Fabric Management Software. The management capabilities are enabled in the switch independent of any external management platform and 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.

High-Availability

All of the Grid Director ISR 9288 product components are hot-swappable to allow for the highest availability. Power supplies, as well as fans provide system high availability and serviceability. Redundant management blades maintain synchronization so that a failure can be recovered without the loss of management information or any disruption in port-to-port communication.

Voltaire Grid Backbone™ Family

Voltaire is the worldwide leader in grid backbone solutions for networked computing in the next generation data center. Voltaire's integrated Grid Backbone Family of multi-service switching solutions and network virtualization software delivers the highest performance, intelligent backbone for grid computing architectures. Leveraging the InfiniBand standard, Voltaire solutions offer improved performance, utilization and scalability across compute clusters, storage and IP networks.

- ▶ **Unbeatable 10-30 Gbps performance for clusters and grids**
- ▶ **Up to 288 InfiniBand 4X (20 Gbps with DDR, 10 Gbps with SDR) ports in a 14U enclosure. Alternative 96 InfiniBand 12X (30 Gbps) ports**
- ▶ **11.52 Tbps (with SDR) of full bisectional switch bandwidth in a FAT Tree (Clos) architecture**
- ▶ **Ultra-low latency: under 4 microseconds at the user level**
- ▶ **Optional multiprotocol connectivity to Fibre Channel storage and LANs**
- ▶ **Built-in high availability**



TECHNICAL SPECIFICATIONS

Voltaire Grid Director ISR 9288

- 12-slot, 19" rack mountable chassis, 14U height, configurable with redundant Power Supplies (sPSUs), Router Blades (sRBDs), and Fan Units (sFUs).
- Each slot may accommodate one Line Board (of various types) or one Router Blade Drawer (hosting two router blade types).

InfiniBand 4X / 12X Line Board

- 24, auto-sensing 1X/4X InfiniBand ports (2.5/10 Gbps)
 - Connectors: 8-pair MicroGigaCN / LANELINK F CONN
 - Supports hot-pluggable MediaConverters for a single optical cable.
 - Indicators: Physical connectivity and logical connectivity LEDs per port, power and info LEDs
- Alternative 1: 24 4X DDR InfiniBand Ports (20 Gbps)
- Alternative 2: 8 12X InfiniBand ports (30 Gbps)

Router Blade Drawer

- Up to 3 InfiniBand Form Factor Router Modules may be installed in each Router Blade Drawer (sRBD)

IP Router: Voltaire IPR

- InfiniBand form factor for integration with ISR 9288 and OEM systems
- 4 interfaces, IEEE 802.3ab, and 802ad (link aggregation) compliant
- Connectors: 4 ports, 1000BASE-SX mini-GBIC RJ-45 or optic (SMF); RJ-45 for Management
- Indicators: 2 InfiniBand link/activity LEDs, 4 GbE link/activity LEDs, system LED and management link LEDs.
- Blade reset button

FC Router: Voltaire FCR

- InfiniBand form factor for integration with Grid Director ISR 9288 and OEM systems
- 4 interfaces, Up to 400Mbps per channel full duplex, 1 or 2-Gb auto-sensing FC
- Connectors: 4 Fibre Channel ports, external small form factor LC pluggable; RJ-45 for management
- Indicators: 2 InfiniBand link/activity LEDs, 4 Fibre Channel link/activity LEDs, system LED and management link LEDs
- Blade reset button

Fabric Board

- One to four per system
- Indicators: Physical connectivity and logical connectivity LEDs per line board link port, power, info and hot-swap LEDs

Switch Specifications

- Data Throughput: 11.52 Tbps
- Port-to-port Latency: 420 nanoseconds (max.)
- Data Virtual Lanes: 8
- Management Virtual Lanes: 1
- MTU: 4096 Bytes (max.).

Management Board

- Embedded GridVision™ Management Suite including: Fabric Management, Chassis and Device Management, Network Traffic Management, and Storage Resource 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: 2,500W, max for full configuration
- Indicators - Operational AC and DC Status LED

Cooling

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

Physical Characteristics

- 19-inch rack-mountable
- Dimensions (H x W x D): 24.5 in. (622 mm) x 17.5 in. (444 mm) x 22.75 in. (578 mm)
- Optional front or rear rack mounting
- Weight: 110 to 187 lb (50 to 85 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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