

Voltaire® HCA 4X0 Product Family with Voltaire GridStack™ InfiniBand 4X Host Channel Adapters

Voltaire HCAs with InfiniBand Protocol Stacks Bring Superior Performance to HPC Clusters and Enterprise Grids

Overview

The Voltaire HCA 4X0 product family is a complete set of low profile 4X InfiniBand Host Channel Adapter cards (HCAs) that enable industry standard servers to access the full performance of a high speed (10-20 Gbps) InfiniBand fabric and latency as low as 1.3 microseconds. Voltaire HCAs support the industry's widest variety of host interfaces, InfiniBand rates and upper layer protocols to meet the needs of a broad range of applications and computing environments.

Powerful Applications

Voltaire HCAs support network, cluster and storage connectivity over an InfiniBand fabric and feature device drivers for Linux and Microsoft Windows. They also include include GridStack™, a comprehensive suite of upper layer protocols that is ideal for high performance computing clusters, utility computing, grids and enterprise data center applications including IBM DB2 and Oracle 10g.

Voltaire GridStack

Voltaire GridStack is a comprehensive set of drivers and protocols that enable any application to utilize the exceptional performance of RDMA which is featured in the hardware. GridStack allows both HPC and enterprise applications to run significantly faster leveraging bandwidth of more than 2500 MB/sec with minimal latency and reduced CPU utilization. The TCP/IP emulation software incorporated into GridStack makes InfiniBand appear to the user as a standard IP network with IP addressing, TCP/IP protocols, RDMA protocols, network booting and IP management for easy deployment and maintenance. Supported protocols include MPI, SDP, IPoB and iSER.

Broad Support

Voltaire HCAs support industry-leading host interfaces including PCI Express, PCI-X, and AMD Hyper Transport HTX. In addition, Voltaire HCAs include complete software support for a range of demanding enterprise and high performance computing applications.

Voltaire HCAs come with a choice of one or two 4X InfiniBand ports.

HCA 400Ex for PCI Express

InfiniBand is the only technology that fully exploits the performance benefits of PCI Express. The Voltaire HCA 400Ex InfiniBand PCI Express adapters enable PCI-Express-based servers to access the full performance of InfiniBand with measured performance of over 2500 MB/sec and latency as low

as 3.5 microseconds. The HCA 400 Ex features dual 4X InfiniBand ports for high availability or bandwidth aggregation, making it an ideal solution for enterprise data center environments.

HCA 410Ex – MemFree

Leveraging MemFree technologies, the Voltaire HCA 410Ex provides the industry's best price/performance for an HCA solution. The HCA 410Ex offers full PCI-Express performance and supports one 4X InfiniBand port, making it a compelling solution for large clusters and grids

DDR Support

The Voltaire HCA 400Ex-D and HCA 410Ex-D DDR InfiniBand PCI Express adapters support Double Data Rate (DDR) InfiniBand technology that delivers up to 20 Gbps bandwidth without compromising the low latency or CPU utilization benefits InfiniBand provides. DDR brings improved performance to both switch-to-switch applications as well as connectivity to computing resources.

HCA 460HT

The Voltaire HCA 460HT offers the industry's highest performance cluster interconnect for MPI and TCP/IP applications. By connecting directly to the AMD Opteron™ processor via a standard HyperTransport HTX slot, the Voltaire HCA 460HT provides the industry's lowest MPI latency of 1.3 microseconds with bandwidth of 950 MB/s.

HCA 400 for PCI-X

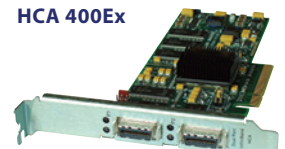
For clusters of PCI/PCI-X servers, the Voltaire HCA 400 integrates seamlessly with PCI/PCI-X-based dense servers to create a high performance InfiniBand fabric with over 800MB/sec of sustained bandwidth.

Voltaire Grid Backbone Solutions

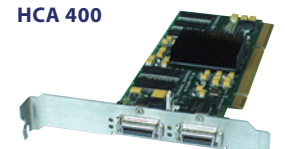
Voltaire is the worldwide leader in grid backbone solutions for networked computing in the next generation data center. Voltaire's integrated family of switching hardware and network virtualization software delivers the high performance, intelligent backbone for grid computing architectures. Leveraging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

- ▶ **Dual or single-port InfiniBand host channel adapter**
- ▶ **Unbeatable performance for clusters and grids**
- ▶ **PCI-Express bus interface provides over 2500 MB/sec throughput over 20Gb DDR 4X InfiniBand connectivity, and 2500 MB/sec throughput over 10Gb SDR 4X InfiniBand**
- ▶ **PCI/PCI-X bus interface provides over 800 MB/sec throughput**
- ▶ **Software drivers for Linux and Microsoft Windows**
- ▶ **Multiprotocol support for MPI, SDP, IPoB, DAPL and iSER (iSCSI RDMA) enables a variety of high performance applications**
- ▶ **Remote booting capabilities**
- ▶ **Optional MediaConverter support for fiber optic InfiniBand connectivity**



HCA 400Ex



HCA 400



TECHNICAL SPECIFICATIONS

	Single-Port HCA	Dual-Port HCA
Board	<p>HCA 410Ex</p> <ul style="list-style-type: none"> • Single port 4X (10Gbps) InfiniBand PCI-Express low profile host channel adapter <p>HCA 410Ex-D</p> <ul style="list-style-type: none"> • Single port 4X DDR (20 Gbps) InfiniBand PCI-Express low profile host channel adapter <p>HCA 460HT</p> <ul style="list-style-type: none"> • Single port 4X (10 Gbps) InfiniBand low profile host channel adapter with HTX interface 	<p>HCA 400Ex/Ex-F</p> <ul style="list-style-type: none"> • Dual port 4X (10 Gbps) InfiniBand PCI-Express low profile host channel adapter <p>HCA 400Ex-D</p> <ul style="list-style-type: none"> • Dual port 4X DDR (20 Gbps) InfiniBand PCI-Express low profile host channel adapter <p>HCA 400</p> <ul style="list-style-type: none"> • Dual port 4X (10 Gbps) InfiniBand PCI/PCI-X low profile host channel adapter
Bus Interface	<p>HCA 400Ex/Ex-F/Ex-D, 410Ex/Ex-D PCI-Express 1.0 (4X or 8X)</p> <p>HCA 460HT AMD HyperTransport (HTX)</p> <p>HCA 400 PCI-X 1.0 (3.3V, 64-bit 133 MHz); PCI 2.2 (32/64-bit, 33/66 MHz)</p>	
InfiniBand Copper Interface	1, auto-sensing 1X/4X InfiniBand ports, 8-pair MicroGigaCN copper	2, auto-sensing 1X/4X InfiniBand ports, 8-pair MicroGigaCN copper
Optional Fiber Interface	HCA 410Ex/Ex-D support hot-pluggable MediaConverter for single optical cable	HCA 400Ex-F/Ex-D support hot-pluggable MediaConverter for single optical cable
Memory	MemFree	128 MB, optional 256 MB
Device Drivers	Support for a variety of Linux distributions and for Microsoft Windows	
Protocol Software	<ul style="list-style-type: none"> • MPI Support: MPI-CH (open source), and MPI-Pro, Scali-MPI, HP-MPI (available separately), uDAPL, kDAPL • IP and TCP: IETF IPoIB, IBTA Socket Direct (SDP) • Storage: IETF iSCSI/iSER (iSCSI RDMA), Lustre, PVFS2, NFS/RDMA (through kDAPL) (available separately) • Optional Network Booting (PXE) 	
Diagnostic Software	Loop-back tests, host stack diagnostics and automated deployment utilities	
Management Interfaces	SNMP MIB: draft-IETF-IPoIB-IBIF-MIB, Telnet/SSH for configuration and automation	
Reliability	MTBF: 400,000 hours	
Physical Dimensions	<p>HCA 460HT (HxD): 4.376 in (111.15 mm) x 6.604 in (167.75 mm)</p> <p>HCA 410 (HxD): 2.15 in (54.5 mm) x 3.94 in (100 mm)</p>	<p>Low-profile MD2 (H x D): 2.5 in. (64 mm) x 6.7 in. (170 mm)</p>
Environmental	<p>Operating:</p> <ul style="list-style-type: none"> • Temperature: 32° to 122°F (0° to 50°C) • Humidity: 15 to 80%, non-condensing • Altitude: 0 to 9843 ft (3000m) <p>Storage:</p> <ul style="list-style-type: none"> Temperature: -13° to 158°F (-25° to 70°C) Humidity: 5 to 90% non-condensing Altitude: 0 to 15,000 ft (4570m) 	
	 <p>HCA 460HT</p>	 <p>HCA 410Ex</p>



Contact Voltaire to Learn More

1.800.865.8247

www.voltaire.com

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