

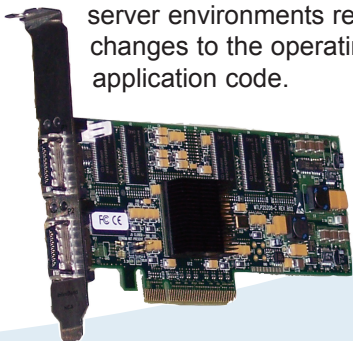
# SilverStorm Host Channel Adapter 9000

## Host Channel Adapter

An integral member of the SilverStorm family of virtual I/O and clustering offerings, the SilverStorm Host Channel Adapter (HCA) 9000 PCIe is a dual port 4X InfiniBand HCA utilizing an 8X PCI Express interface to enable higher server bandwidth than is possible with PCI-X. It offers an aggregate of 20 Gb/sec of full duplex bandwidth. PCI Express offers up to four times peak bandwidth improvement over PCI-X slots coupled with lower latencies.

The increased bandwidth and lower latency are critical attributes for High Performance Business Computing (HPBC) and storage applications. RDMA protocol support provides InfiniBand with added advantages.

The SilverStorm HCA 9000 PCIe creates an expressway of balanced bandwidth between the server and the InfiniBand fabric, allowing information transfer at 20Gb/s, up to 16 times the bandwidth of GbE and 8 times Myrinet—with up to 90% reduction in internal latency. A comprehensive host environment of high-performance Upper Level Protocols (ULPs) contained within the QuickSilver software family, including QuickSilver VirtualNIC, QuickSilver VirtualHBA, MPI, IBolP, SDP, and uDAPL, enables the SilverStorm HCA 9000 to supercharge High Performance Business Computing (HPBC) applications such as modeling and simulation, clustered databases, and embedded clustering applications. Like all offerings from SilverStorm Technologies, the SilverStorm ULPs seamlessly integrate with existing server environments requiring no changes to the operating system or application code.



### SILVERSTORM HCA IN THE ENTERPRISE

Combined with its ULPs, SilverStorm HCA is the channel by which today's complex and costly enterprise environments can quickly evolve to feed ever-growing processing requirements. A SilverStorm HCA combined with a rich suite of standards-based ULPs can replace physical Ethernet NICs and HBAs with virtual Ethernet and Fibre Channel I/O gateways. This savings enables physical Ethernet and Fibre Channel ports to be shared by many virtual connections, thus reducing network complexity. A SilverStorm key is that unlike other approaches, the virtual Ethernet connection supports all Ethernet protocols, not just IP. This includes IPX, SNA, and custom protocols designed to use Ethernet as transport, leaving no application behind.

The net effect is a significantly reduced level of infrastructure complexity and improved business responsiveness, with a lower total cost of ownership.

The HCA 9000, combined with SilverStorm ULPs and SilverStorm's entire family of InfiniBand switching and virtual I/O products, is part of a complete end-to-end InfiniBand solution package ready to enable the new more powerful servers of today with the ability to handle tomorrow's processing requirements.

## DATA SHEET

### SilverStorm HCA 9000 Strategic Benefits

- Seamless InfiniBand enabling of PCI Express servers
  - no operating system or application changes required
- Improved server CPU utilization with RDMA protocols
- Economical 10Gb/s technology today for High Performance Business Computing (HPBC)
  - modeling and simulation
  - clustered databases
  - embedded clustering applications
- Server connectivity to InfiniBand based intelligent virtual I/O and clustering fabrics

### Key Design Features

- Dual 4X (10Gb) InfiniBand ports
- 8X PCI Express support
- Fully PCI Express compliant
- Low profile design
  - supports greatest variety of servers
- Comprehensive suite of high performance Upper Level Protocols (ULPs)
  - QuickSilver VirtualNIC
  - QuickSilver VirtualHBA
  - IPoIB
  - uDAPL
  - MPI
  - SDP
- Higher performance than PCI-X
  - 20% better latency
  - three times the data throughput

# SilverStorm Host Channel Adapter 9000

## SilverStorm HCA 9000 Specifications

### PCI Express Interface

PCI Express compliant

- Low profile design
- 8X PCI Express support
- Supports 20G + 20Gb/s full duplex InfiniBand bandwidth
- Supports 20G + 20Gb/s full duplex PCI Express bus bandwidth

### Management Support

- BMA, PMA, SMA, CM
- Fabric and device discovery
- Generates SMA traps

### Operating Environments

- Linux
- Mac OS X
- Solaris
- Windows 200x

### Connectivity

- Dual 4X (10Gb) or 1X (2.5Gb) port - copper HSSD

### SilverStorm Host Driver/Upper Level Protocol (ULP) Support

- **QuickSilver VirtualNIC** - Ethernet ULP and advanced functionality (port sharing, load balancing, Ethernet IB switching)
- **QuickSilver VirtualHBA** - Fibre Channel ULP and advanced functionality (port sharing, LUN management, SCSI Remote DMA Protocol (SRP))
- **IPoIB** - ULP to allow Internet Protocol (IP) using InfiniBand (IB) as a link layer
- **uDAPL** - ULP RDMA server-to-server access utilizing User Direct Access Program Library (uDAPL) APIs
- **MPI** - ULP for HPC clusters utilizing Message Passing Interface (MPI) function calls
- **SDP** - Sockets Direct Protocol (SDP) support for high-performance sockets-based data transfers

### InfiniBand Interfaces & Specifications

#### Transport Types

- Unreliable Datagram (UD)
- Reliable Connection (RC)

#### Transport Services

- RDMA read request
- RDMA write request and atomic operations

#### Kernel Bypass

### InfiniBand Specifications

- 8 virtual lanes plus management lane
- Configurable up to 130K queue pairs<sup>§</sup> and 130K completion queues<sup>§</sup>
- Configurable up to 256K memory regions<sup>§</sup>/520K Windows regions<sup>§</sup>
- Auto-configurable MTU 256 to 2048 bytes (2048 default)
- Support for 64 configurable P\_Keys per port
- Up to 8 RDMA read requests as target per queue pair
- Maximum message size 2GB
- 1 constant and 31 configurable Global IDs (GUIDs)
- Supports acknowledge (ACK) coalescing
- Memory, work queue, and completion queue, access protection
- InfiniBand v1.1 compliant

<sup>§</sup> Memory options are 128 MB or 256 MB for the PCIe HCA. The architecture supports up to 16 GB. Larger memory sizes will be released as application requirements grow.

### Physical Specifications

Low profile form factor 6.60 in x 2.536 in (167.64 mm x 64.41 mm)

### Environmental

Maximum power consumption	14 Watts
Typical power consumption	10 Watts
Operating temperature	10° to 45° C at sea level 0–3 km (10,000 feet) -30° to 60° C (non-operating)
Humidity (non-condensing)	20% to 80% (operating) 5% to 90% (non-operating)

### Regulatory Compliance

#### Safety

- United States  
UL 60950  
Listed accessory
- European Community  
EN 60950  
Listed accessory

#### EMC

- United States  
FCC Part 15 Class A
- European Community  
EN55022 level A  
EN55024  
EN61000-3-2,-3



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