ConnectX®-4 VPI

Single/Dual-Port Adapter supporting 10/25/40/50/56/100 Gb/s with Virtual Protocol Interconnect® and Multi-Host™ Technology

ConnectX®-4 adapter with Virtual Protocol Interconnect (VPI), supporting 10/25/40/50/56/100 Gb/s InfiniBand and Ethernet connectivity, provides the highest performance and most flexible solution for high-performance, Web 2.0, Cloud, data analytics, database, and storage platforms.

With the exponential increase and usage of data, the advantages in scientific algorithms, and the creation of new applications, the demand for the highest interconnect throughput, lowest latency and sophisticated data acceleration engines continues to increase. ConnectX-4 enables data centers to leverage the world's leading interconnect adapter for increasing their applications while reducing operational and capital expenses.

ConnectX-4 provides an unmatched combination of 100Gb/s bandwidth, sub 700ns latency and 150 million messages per second. It includes native hardware support for RDMA over InfiniBand and Ethernet, Ethernet stateless offload engines, GPU Direct®, and the Multi-Host Technology.

The Multi-Host Technology enables the next generation scalable data center design to achieve maximum CAPEX and OPEX savings without compromising on network performance.

HPC Environments

ConnectX-4 delivers high bandwidth, low latency, and high computation efficiency for the High Performance Computing clusters. Collective operation is a communication pattern in HPC in which all members of a group of processes participate and share data.

CORE-Direct® (Collective Offload Resource Engine) provides advanced capabilities for implementing MPI and SHMEM collective operations. It enhances collective communication scalability and minimizes the CPU overhead for such operations, while providing asynchronous and high-performance collective communication capabilities. It also enhances application scalability by reducing the exposure of the collective communication to the effects of system noise (the bad effect of system activity on running jobs). ConnectX-4 enhances the CORE-Direct capabilities by removing the restriction on the data length for which data reductions are supported.

Mellanox Multi-Host™ Technology

Mellanox’s ConnectX-4 Multi-Host technology enables connecting multiple hosts into a single interconnect adapter by separating the ConnectX-4 PCIe interface into multiple and independent interfaces. Each interface can be connected to a separate host with no performance degradation. ConnectX-4 offers four fully-independent PCIe buses, lowering total cost of ownership in the data center by reducing CAPEX requirements from four cables, NICs, and switch ports to only one of each, and by reducing OPEX by cutting down on switch port management and overall power usage.

Each host can be active or inactive at any time, independent of the other hosts, and receives bandwidth of its own. Bandwidth is split between the hosts, either evenly (default) or based on

HIGHLIGHTS

BENEFITS
- 10/25/40/50/56/100 Gb/s connectivity for servers and storage
- Industry-leading throughput and low latency performance for HPC, Web access and storage
- Maximizing data centers’ return on investment (ROI) with Multi-Host technology
- Smart interconnect for x86, Power, ARM, and GPU-based compute and storage platforms
- Cutting-edge performance in virtualized overlay networks (VXLAN and NVGRE)
- Efficient I/O consolidation, lowering data center costs and complexity
- Virtualization acceleration
- Power efficiency

KEY FEATURES
- EDR 100Gb/s InfiniBand or 100Gb/s Ethernet per port
- Single and dual-port options available
- 10/25/40/50/56/100Gb/s speeds
- 150M messages/second
- Multi-Host technology
- Connectivity to up-to 4 independent hosts
- Hardware offloads for NVGRE and VXLAN encapsulated traffic
- CPU offloading of transport operations
- Application offloading
- Mellanox PeerDirect™ communication acceleration
- End-to-end QoS and congestion control
- Hardware-based I/O virtualization
- Erasure Coding offload
- T10-DIF Signature Handover
- Ethernet encapsulation (EoIB)
- RoHS-R6