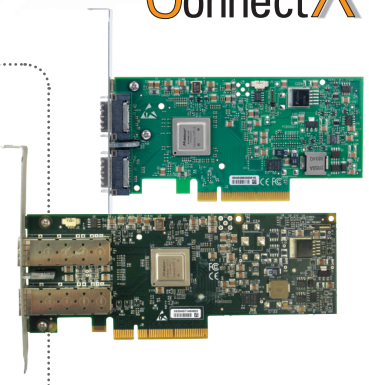
ETHERNET ADAPTER CARDS

PRODUCT BRIEF

ConnectX®-2 EN

10 Gigabit Ethernet Adapters with PCI Express 2.0



ConnectX-2 EN Ethernet Network Interface Cards (NIC) deliver high-bandwidth and industry-leading 10GigE connectivity with stateless offloads for converged fabrics in High-Performance Computing, Enterprise Data Centers, and Embedded environments.

Clustered databases, web infrastructure, and IP video servers are just a few example applications that will achieve significant throughput and latency improvements resulting in faster access, real time response and increased number of users per server. ConnectX-2 EN improves network performance by increasing available bandwidth to the CPU and providing enhanced performance, especially in virtualized server environments.

ConnectX-2 EN protects investments by providing in hardware support for Data Center Bridging (DCB) and Fibre Channel over Ethernet (FCoE) as well as technologies such as SR-IOV that provide enhanced virtual machine performance for virtualized servers.

Optimal Price/Performance

ConnectX-2 EN removes I/O bottlenecks in mainstream servers that are limiting application performance. Servers supporting PCI Express 2.0 with 5GT/s will be able to fully utilize both 10Gb/s ports, balancing the I/O requirement of these high-end servers. Hardware-based stateless offload engines handle the TCP/UDP/IP segmentation, reassembly, and checksum calculations that would otherwise burden the host. Stateless offload connections are also easy to scale using multiple adapters to reach the desired level of performance and fault tolerance. Total cost of ownership is optimized by maintaining an end-to-end Ethernet network on existing operating systems and applications.

Mellanox provides 10GigE adapters suitable for all network environments. The dual port SFP+ adapter supports 10GBASE-SR, -LR, and direct attached copper cable providing the flexibility to connect over short, medium, and long distances. The dual port 10GBASE-CX4 adapter with its powered connectors can utilize active copper and fiber cables as well as passive copper.

Converged Ethernet

ConnectX-2 EN delivers the features needed for a converged network with support for Data Center Bridging (DCB). T11 compliant FCoE support with full hardware offloads simplifies the storage network while keeping existing Fibre Channel targets. IBTA RDMA over Converged Ethernet (RoCE) technology provides efficient, low latency, RDMA transport over Layer 2 Ethernet. The RoCE software stack maintains existing and future compatibility with bandwidth and latency sensitive applications. By maintaining link-level interoperability with existing Ethernet networks, IT managers can leverage existing data center fabric management solutions.

I/O Virtualization

ConnectX-2 EN supports hardware-based I/O virtualization, providing dedicated adapter resources and guaranteed isolation and protection for virtual machines (VM) within the server. ConnectX-2 EN gives data center managers better server utilization and LAN and SAN unification while reducing costs, power, and complexity.

HIGHLIGHTS

BENEFITS

- 10Gb/s full duplex bandwidth for servers and storage
- Industry-leading throughput and latency performance
- I/O consolidation
- Virtualization acceleration
- High-performance networking and storage access
- Software compatible with standard TCP/UDP/IP and iSCSI stacks

KEY FEATURES

- Dual 10 Gigabit Ethernet ports
- Copper and fiber connection options
  - *SFP+ for -SR, -LR, direct attached copper*
  - *10GBASE-CX4*
- PCI Express (up to 5GT/s)
- Low Latency Ethernet, RoCE
- Data Center Bridging support
- T11.3 FC-BB-5 FCoE
- TCP/IP stateless offload in hardware
- Traffic steering across multiple cores
- Hardware-based I/O virtualization
- Advanced Quality of Service
- RoHS-R6

Quality of Service

Resource allocation per application or per VM is provided by the advanced QoS supported by ConnectX-2 EN. Service levels for multiple traffic types can be based on IETF DiffServ or IEEE 802.1p/Q, along with the Data Center Bridging enhancements, allowing system administrators to prioritize traffic by application, virtual machine, or protocol. This powerful combination of QoS and prioritization provides the ultimate fine-grain control of traffic – ensuring that applications run smoothly in today's complex environment.

Software Support

ConnectX-2 EN is supported by a full suite of software drivers for Microsoft Windows, Linux distributions, VMware and Citrix XENServer. ConnectX-2 EN supports stateless offload and is fully interoperable with standard TCP/UDP/IP stacks. ConnectX-2 EN supports various management interfaces and has a rich set of configuring and management tools across operating systems.

vmware READY

FEATURES SUMMARY*

ETHERNET

- IEEE Std 802.3ae 10 Gigabit Ethernet
- IEEE Std 802.3ak 10GBASE-CX4
- IEEE Std 802.3ad Link Aggregation and Failover
- IEEE Std 802.3x Pause
- IEEE Std 802.1Q VLAN tags, .1p Priorities
- IEEE P802.1au D2.0 Congestion Notification
- IEEE P802.1az D0.2 Enhanced Transmission Selection
- IEEE P802.1bb D1.0 Priority-based Flow Control
- Multicast
- Jumbo frame support (10KB)
- 128 MAC/VLAN addresses per port

TCP/UDP/IP STATELESS OFFLOAD

- TCP/UDP/IP checksum offload
- TCP Large Send (< 64KB) or Giant Send (64KB-16MB) Offload for segmentation
- Receive Side Scaling (RSS) up to 32 queues
- Line rate packet filtering

ADDITIONAL CPU OFFLOADS

- RDMA over CEE support
- FC checksum offload
- VMDirect Path support
- Traffic steering across multiple cores
- Intelligent interrupt coalescence
- Compliant to Microsoft RSS and NetDMA

HARDWARE-BASED I/O VIRTUALIZATION

- Single Root IOV
- Address translation and protection
- Dedicated adapter resources and guaranteed isolation
- Multiple queues per virtual machine
- Hardware switching between guest OSs
- Enhanced QoS for vNICs
- VMware NetQueue support

STORAGE SUPPORTS

- T11.3 FC-BB-5 FCoE

COMPATIBILITY

PCI EXPRESS INTERFACE

- PCIe Base 2.0 compliant, 1.1 compatible
- 2.5GT/s or 5.0GT/s link rate x8 (20+20Gb/s or 40+40Gb/s bidirectional bandwidth)
- Fits x8 or x16 slots
- Support for MSI/MSI-X mechanisms

CONNECTIVITY

- Interoperable with 10GigE switches & routers
- 20m+ of copper CX4 cable, with powered connectors supporting active copper or fiber cables
- 100m (OM-2) or 300m (OM-3) of multimode fiber cable, duplex LC connector from SFP+ optics module
- 10km single mode fiber cable, duplex LC connector from SFP+ optics module
- 10m+ direct attached copper cable through SFP+ connector

OPERATING SYSTEMS/DISTRIBUTIONS

- Novell SuSE Linux Enterprise Server (SLES), Red Hat Enterprise Linux (RHEL), and other Linux distributions
- Microsoft Windows, Server 2003/2008, CCS 2003
- VMware ESX 2.5/vSphere 4.0
- Citrix XenServer 4.1, 5.0, 5.5

MANAGEMENT

- MIB, MIB-II, MIB-II Extensions, RMON, RMON 2
- Configuration and diagnostic tools

Ordering Part Number	Ethernet Ports	Host Bus	Power (Typ)	Dimensions w/o Brackets
MNEH29B-XTR	Dual CX4 with powered connector	PCIe 2.0 5.0GT/s	7.4W	13.6cm x 6.4cm
MNPH29D-XTR	Dual SFP+	PCIe 2.0 5.0GT/s	6.4W	16.8cm x 6.4cm
MFM1T02A-SR	SR Module	n/a	1W	n/a
MFM1T02A-LR	LR Module	n/a	1W	n/a

*This product brief describes all of the hardware features and capabilities. Please refer to the driver release notes on www.mellanox.com for feature availability.
** Product images may not include heat sync assembly; actual product may differ.

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