Mellanox
TECHNOLOGIES

ConnectX™

Mellanox ConnectX™ EN

10 Gigabit Ethernet Adapters with PCI Express 2.0

Mellanox ConnectX EN Ethernet Network Interface Cards (NIC) deliver high-bandwidth and industry leading 10GigE connectivity with stateless offloads for performance-driven server and storage applications 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 EN improves network performance by increasing available bandwidth to the CPU and providing enhanced performance, especially in virtualized server environments.

Optimal Price/Performance

ConnectX EN 10Gig Ethernet removes I/O bottle-necks 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 require-ment 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 process. These offload technologies are fully compatible with Intel I/OAT QuickData technology. Total cost of ownership is optimized by maintaining an end-to-end Ethernet network on existing operating systems and applications.

The dual port 10GBASE-CX4 adapter enables connectivity over 20+ meters of copper cables satisfying in-rack and rack-to-rack connec-tions. The powered connectors also support active copper and active fiber cable solutions for reaches up to 100m. Single and dual port 10GBASE-T adapters provide easy connectivity up to 100m over familiar UTP wiring. For longer distances, single and dual port 10GBASE-SR adapters support up to 300 meters over multi-mode fiber.

I/O Virtualization

ConnectX EN support for hardware-based I/O
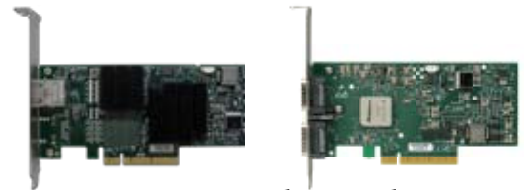
ConnectX EN Adapter Cards
Copper UTP and CX4 Shown

virtualization is complementary to Intel and AMD virtualization technologies. Virtual machines (VM) within the server are provisioned with dedicated I/O adapter resources and guaranteed isolation and protection. Hypervisor offload features remove software-based virtualization overheads and free up CPU cycles enabling native OS performance for VMs and higher server utilization by supporting more VMs per physical server.

Quality of Service

Resource allocation per application or per VM is provided by the advanced QoS supported by ConnectX EN. Service levels for multiple traffic types can be based on IETF DiffServ or IEEE 802.1p/Q 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 EN adapters are supported by a full suite of Microsoft Windows and Linux drivers and are fully interoperable with standard TCP/UDP/IP stacks. Unlike complex TCP Offload Engine imple-mentations, stateless offloads are compatible with host-resident TCP stacks, eliminating the need to change operating systems, drivers, or applica-tions, and thereby easing the transition to 10Gb/s. With host-resident TCP under Linux, the entire open source community stands behind the TCP implementation, and code can be quickly updated in the event that any security holes are discovered. Stateless offload connections are also easy to scale using multiple adapters to reach the desired level of performance and fault tolerance.

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FEATURE SUMMARY

ETHERNET
– IEEE Std 802.3ae 10 Gigabit Ethernet
– IEEE Std 802.3ak 10GBASE-CX4
– IEEE Std 802.3an 10GBASE-T
– IEEE Std 802.3aq 10GBASE-LRM
– IEEE Std 802.3ad Link Aggregation and Failover
– IEEE Std 802.3x Pause
– IEEE Std 802.1Q VLAN tags
– IEEE Std 802.1p Priorities
– 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
– Traffic steering across multiple cores
– Intelligent interrupt coalescence
– Full support for Intel I/OAT
– Compliant to Microsoft RSS and NetDMA

HARDWARE-BASED I/O VIRTUALIZATION
– Address translation and protection
– Multiple queues per virtual machine
– Native OS performance
– Complimentary to Intel and AMD I/OMMU

COMPATIBILITY

CPU
– AMD X86, X86_64
– Intel X86, EM64T, IA-32, IA-64
– SPARC
– PowerPC, MIPS, and Cell

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 and routers
– 20m+ of copper CX4 cable, with powered connectors supporting active copper or fiber cables (MNEH28/9)
– 100m of Cat6a and Cat7 UTP, Cat5e and Cat6 at shorter distances (MNTHxy)
– 100m (OM-2) or 300m (OM-3) of multimode fiber cable, duplex LC connector from XFP optics module (MNKHxy)
– Consult the factory for 10GBASE-LR and -LRM availability

OPERATING SYSTEMS/DISTRIBUTIONS
– Novell SuSE Linux Enterprise Server (SLES), Red Hat Enterprise Linux (RHEL), and other Linux distributions
– Microsoft Windows Server 2003/2008, Windows Compute Cluster Server 2003

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

COMPLIANCE

SAFETY
– USA/Canada: cTUVus UL
– EU: IEC60950
– Germany: TUV/GS
– International: CB Scheme

EMC (EMISSIONS)
– USA: FCC, Class A
– Canada: ICES, Class A
– EU: EN55022, Class A
– EU: EN55024, Class A
– EU: EN61000-3-2, Class A
– EU: EN61000-3-3, Class A
– Japan: VCCI, Class A
– Taiwan: BSMI, Class A

ENVIRONMENTAL
– EU: IEC 60068-2-64: Random Vibration
– EU: IEC 60068-2-29: Shocks, Type I / II
– EU: IEC 60068-2-32: Fall Test

OPERATING CONDITIONS
– Operating temperature: 0 to 55° C
– Air flow: 200LFM @ 55° C
– Requires 3.3V, 12V supplies

Adapter Cards

Ordering Part Number	Ethernet Ports	Host Bus	Power (Max)	Dimensions w/o Bracket
MNEH28-XTC	Dual CX4 with powered connector	PCIe 2.0 2.5GT/s	11.5W (preliminary)	13.6cm x 6.4cm
MNEH29-XTC	Dual CX4 with powered connector	PCIe 2.0 5.0GT/s	12.1W (preliminary)	13.6cm x 6.4cm
MNKH18-XTC	Single SR (300m MMF)	PCIe 2.0 2.5GT/s	14W (preliminary)	16.8cm x 6.4cm
MNKH28-XTC	Dual SR (300m MMF)	PCIe 2.0 2.5GT/s	16W (preliminary)	16.8cm x 6.4cm
MNKH29-XTC	Dual SR (300m MMF)	PCIe 2.0 5.0GT/s	16.6W (preliminary)	16.8cm x 6.4cm
MNTH18-XTC	Single RJ-45	PCIe 2.0 2.5GT/s	Consult factory	16.8cm x 6.4cm
MNTH28-XTC	Dual RJ-45	PCIe 2.0 2.5GT/s	Consult factory	16.8cm x 6.4cm
MNTH29-XTC	Dual RJ-45	PCIe 2.0 5.0GT/s	Consult factory	16.8cm x 6.4cm

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Ordering Part Numbers are for cards with tall bracket installed and come with an additional short bracket and conversion kit.
Substitute "SC" for "TC" for cards with short "Low Profile" bracket installed.
Fiber optic cards come with Mellanox optical modules.
Consult factory for Ordering Part Number for 10GBASE-LR and -LRM adapter cards.

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