Mellanox® TECHNOLOGIES

ConnectX®-3 Pro

Single/Dual-Port Adapters

ConnectX-3 Pro adapter cards with 10/40/56 Gigabit Ethernet connectivity with hardware offload engines to Overlay Networks ("Tunneling"), provide the highest performing and most flexible interconnect solution for PCI Express Gen3 servers used in public and private clouds, enterprise data centers, and high performance computing.

Public and private cloud clustered databases, parallel processing, transactional services, and high-performance embedded I/O applications will achieve significant performance improvements resulting in reduced completion time and lower cost per operation.

World-Class Performance

Virtualized Overlay Networks — Infrastructure as a Service (IaaS) cloud demands that data centers host and serve multiple tenants, each with their own isolated network domain over a shared network infrastructure. To achieve maximum efficiency, data center operators are creating overlay networks that carry traffic from individual Virtual Machines (VMs) in encapsulated formats such as NVGRE and VXLAN over a logical "tunnel," thereby decoupling the workload's location from its network address. Overlay Network architecture introduces an additional layer of packet processing at the hypervisor level, adding and removing protocol headers for the encapsulated traffic. The new encapsulation prevents many of the traditional "offloading" capabilities (e.g. checksum, TSO) from being performed at the NIC.

ConnectX-3 Pro effectively addresses the increasing demand for an overlay network, enabling superior performance by introducing advanced NVGRE and VXLAN hardware offload

engines that enable the traditional offloads to be performed on the encapsulated traffic. With ConnectX-3 Pro, data center operators can decouple the overlay network layer from the physical NIC performance, thus achieving native performance in the new network architecture.

I/O Virtualization — ConnectX-3 Pro SR-IOV technology provides dedicated adapter resources and guaranteed isolation and protection for virtual machines (VMs) within the server. I/O virtualization with ConnectX-3 Pro gives data center managers better server utilization while reducing cost, power, and cable complexity.

RDMA over Converged Ethernet — ConnectX-3 Pro utilizing IBTA RoCE technology delivers similar low-latency and high-performance over Ethernet networks. Leveraging Data Center Bridging capabilities, RoCE provides efficient low latency RDMA services over Layer 2 Ethernet. With link-level interoperability in existing Ethernet infrastructure, Network Administrators can leverage existing data center fabric management solutions.

Sockets Acceleration — Applications utilizing TCP/UDP/IP transport can achieve industry-leading throughput over 10/40/56GbE. The hardware-based stateless offload engines in ConnectX-3 Pro reduce the CPU overhead of IP packet transport. Socket acceleration software

HIGHLIGHTS

BENEFITS
– 10/40/56Gb/s connectivity for servers and storage
– World-class cluster, network, and storage performance
– Cutting edge performance in virtualized overlay networks (VXLAN and NVGRE)
– Guaranteed bandwidth and low-latency services
– I/O consolidation
– Virtualization acceleration
– Power efficient
– Scales to tens-of-thousands of nodes

KEY FEATURES
– 1us MPI ping latency
– Up to 40/56 Gigabit Ethernet per port
– Single- and Dual-Port options available
– PCI Express 3.0 (up to 8GT/s)
– CPU offload of transport operations
– Application offload
– Precision Clock Synchronization
– HW Offloads for NVGRE and VXLAN encapsulated traffic
– End-to-end QoS and congestion control
– Hardware-based I/O virtualization
– 17mm x 17mm RoHS-R6

further increases performance for latency sensitive applications.

Storage Acceleration — A consolidated compute and storage network achieves significant cost-performance advantages over multi-fabric networks. Standard block and file access protocols can leverage Ethernet or RDMA for high-performance storage access.

Software Support

All Mellanox adapter cards are supported by Windows, Linux distributions, VMware, FreeBSD, Ubuntu, and Citrix XenServer. ConnectX-3 Pro adapters support OpenFabrics-based RDMA protocols and software and are compatible with configuration and management tools from OEMs and operating system vendors.
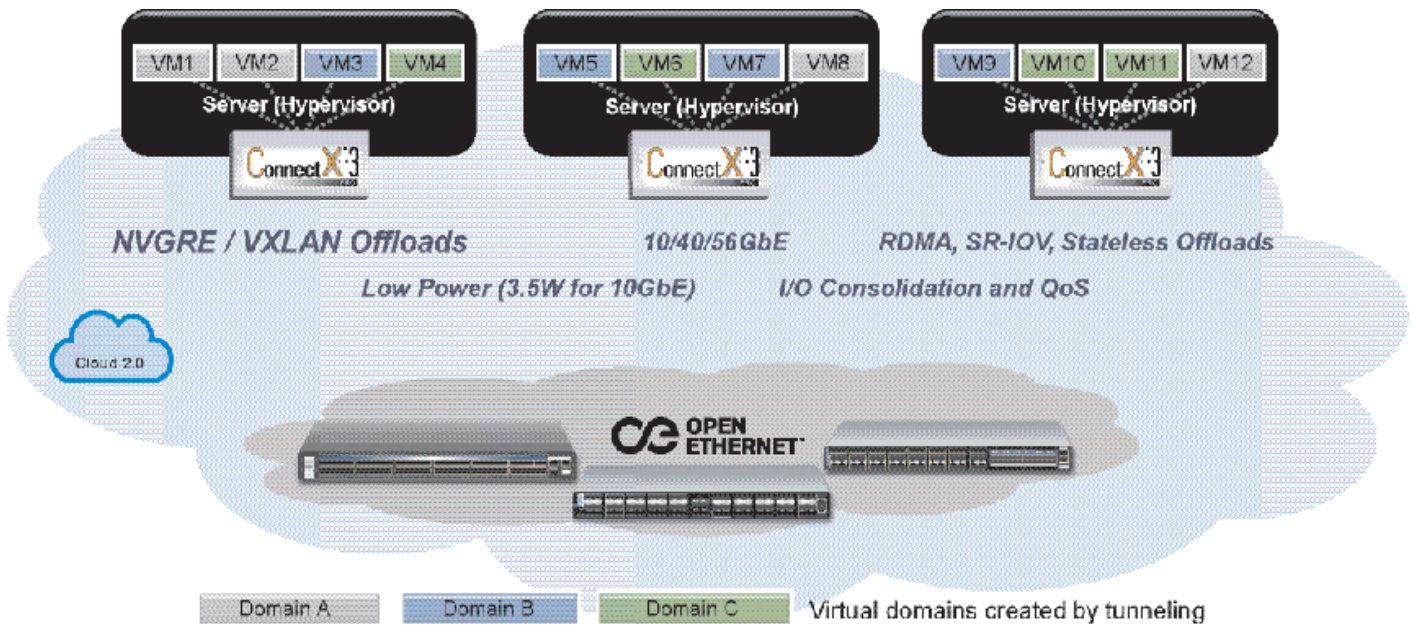
ConnectX-3 Pro Intelligent NIC — The Foundation of Cloud 2.0

FEATURES SUMMARY*

ETHERNET
– IEEE Std 802.3ae 10 Gigabit Ethernet
– IEEE Std 802.3ba 40 Gigabit Ethernet
– IEEE Std 802.3ad Link Aggregation
– IEEE Std 802.3az Energy Efficient Ethernet
– IEEE Std 802.1Q, .1P VLAN tags and priority
– IEEE Std 802.1Qau Congestion Notification
– IEEE Std 802.1Qbg
– IEEE P802.1Qaz D0.2 ETS
– IEEE P802.1Qbb D1.0 Priority-based Flow Control
– IEEE 1588v2
– Jumbo frame support (9600B)

OVERLAY NETWORKS
– VXLAN and NVGRE - A Framework for Overlaying Virtualized Layer 2 Networks over Layer 3 Networks. Network Virtualization hardware offload engines

HARDWARE-BASED I/O VIRTUALIZATION
– Single Root IOV
– Address translation and protection
– Dedicated adapter resources
– Multiple queues per virtual machine
– Enhanced QoS for vNICs
– VMware NetQueue support

ADDITIONAL CPU OFFLOADS
– RDMA over Converged Ethernet
– TCP/UDP/IP stateless offload
– Intelligent interrupt coalescence

FLEXBOOT™ TECHNOLOGY
– Remote boot over Ethernet
– Remote boot over iSCSI

PROTOCOL SUPPORT
– Open MPI, OSU MVAPICH, Intel MPI, MS
– MPI, Platform MPI
– TCP/UDP
– iSER, NFS RDMA
– uDAPL

COMPATIBILITY

PCI EXPRESS INTERFACE
– PCIe Base 3.0 compliant, 1.1 and 2.0 compatible
– 2.5, 5.0, or 8.0GT/s link rate x8
– Auto-negotiates to x8, x4, x2, or x1
– Support for MSI/MSI-X mechanisms

CONNECTIVITY
– Interoperable with 10/40GbE Ethernet switches. Interoperable with 56GbE Mellanox Switches.
– Passive copper cable with ESD protection
– Powered connectors for optical and active cable support
– QSFP to SFP+ connectivity through QSA module

OPERATING SYSTEMS/DISTRIBUTIONS
– Citrix XenServer 6.1
– RHEL/CentOS 5.X and 6.X, Novell SLES10 SP4; SLES11 SP1 , SLES 11 SP2, OEL, Fedora 14,15,17, Ubuntu 12.04
– Windows Server 2008/2012/2012 R2
– FreeBSD
– OpenFabrics Enterprise Distribution (OFED)
– OpenFabrics Windows Distribution (WinOF)
– VMware ESXi 4.x and 5.x

*This brief describes hardware features and capabilities. Please refer to the driver release notes on mellanox.com for feature availability.

**Image depicts sample product only; actual product may differ.

Ordering Part Number	Network Ports	Dimensions w/o Brackets
MCX311A-XCCT	Single 10GbE	14.2cm x 5.3cm
MCX312B-XCCT	Dual 10GbE	14.2cm x 5.3cm
MCX312C-XCCT	Dual 10GbE (High Message Rate)	14.2cm x 6.9cm
MCX313A-BCCT	Single 40/56GbE	14.2cm x 5.3cm
MCX314A-BCCT	Dual 40/56GbE	14.2cm x 6.9cm

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