

ConnectX[®]-3 EN



Dual-Port 10 and 40 Gigabit Ethernet Controllers with PCI Express 3.0

Mellanox ConnectX-3 EN 10 and 40 Gigabit Ethernet Media Access Controllers (MAC) with PCI Express 3.0 deliver high-bandwidth and industry-leading Ethernet connectivity for performance-driven server and storage applications in Enterprise Data Centers, High-Performance Computing, and Embedded environments.

Clustered databases, web infrastructure, and high frequency trading are just a few applications that will achieve significant throughput and latency improvements resulting in faster access, real-time response and more users per server. ConnectX-3 EN improves network performance by increasing available bandwidth while decreasing the associated transport load on the CPU especially in virtualized server environments.

ConnectX-3 is well suited for Blade Server and LAN on Motherboard (LOM) designs. Its 17x17mm package, integrated PHYs, and minimal additional external component requirements were designed for a small PCB footprint. It also has an array of power saving features with real-time monitors that lower total system power usage.

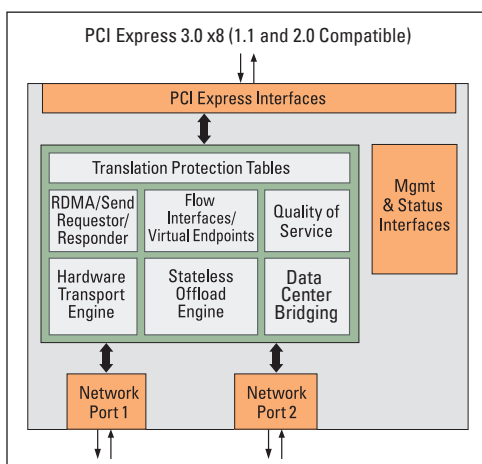


Figure 1. ConnectX-3 EN Block Diagram

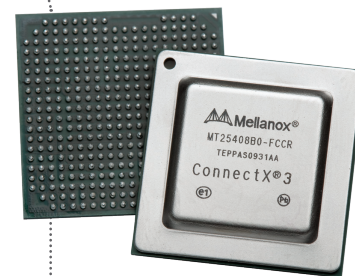
World-Class Ethernet Performance RDMA over Converged Ethernet—

ConnectX-3 utilizing IBTA RoCE technology provides efficient RDMA services, delivering low-latency and high-performance to bandwidth and latency sensitive applications. 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 or 40GbE. The hardware-based stateless offload and flow steering engines in ConnectX-3 reduce the CPU overhead of IP packet transport, freeing more processor cycles to work on the application. Sockets acceleration software further increases performance for latency sensitive applications.

I/O Virtualization — ConnectX-3 EN with SR-IOV provides dedicated adapter resources and guaranteed isolation and protection for virtual machines (VM) within the server. ConnectX-3 EN gives data center managers better server utilization and LAN and SAN unification while reducing costs, power, and complexity.

Precision Data Centers — ConnectX-3 EN IEEE 1588 precision time protocol circuitry synchronizes the host clock to the data center master clock for accurate data delivery time stamping and data center SLA measurements.



HIGHLIGHTS

BENEFITS

- 10 or 40Gb/s connectivity for servers and storage
- Industry-leading throughput and latency performance
- I/O consolidation
- Virtualization acceleration
- Software compatible with standard TCP/UDP/IP and iSCSI stacks
- Small PCB footprint

KEY FEATURES

- Single chip architecture, low power
- Dual 10 or 40 Gigabit Ethernet ports
- PCI Express 3.0 (up to 8GT/s)
- Low Latency RDMA over Ethernet
- 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
- Intelligent interrupt coalescence
- Advanced Quality of Service
- 17mm x 17mm RoHS-R6

The hardware-based mechanisms ensure high accuracy and low jitter.

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 RDMA for high-performance storage access. T11 compliant encapsulation (FCoE) with full hardware offloads simplifies the storage network while keeping existing Fibre Channel targets.

Quality of Service —Resource allocation per application or per VM is provided and protected by the advanced QoS supported by ConnectX-3 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-grained control of traffic – ensuring that applications run smoothly in today's complex environments.

Software Support

ConnectX-3 EN is supported by a full suite of software drivers for Microsoft Windows, Linux distributions, VMware and Citrix XENServer. ConnectX-3 EN supports stateless offload and is fully interoperable with standard TCP/UDP/IP stacks. ConnectX-3 EN supports various management interfaces and has a rich set of configuring and management tools across operating systems.

FEATURE SUMMARY

ETHERNET

- IEEE Std 802.3ae 10 Gigabit Ethernet
- IEEE Std 802.3ap Backplanes, including FEC
- IEEE Std 802.3ba 40 Gigabit Ethernet
- IEEE Std 802.3ad Link Aggregation and Failover
- IEEE Std 802.3az Energy Efficient Ethernet
- IEEE Std 802.1Q VLAN tags, .1p Priorities
- IEEE Std 802.3Qau Congestion Notification
- IEEE P802.1Qaz D0.2 ETS
- IEEE P802.1Qbb D1.0 Priority-based Flow Control
- IEEE 1588 Precision Clock Synchronization
- 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 Converged Ethernet 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
- Multiple queues per virtual machine
- Enhanced QoS for vNICs
- VMware NetQueue Support

STORAGE SUPPORT

- T11.3 FC-BB-5 FCoE

FLEXBOOT™ TECHNOLOGY

- Remote boot over Ethernet
- Remote boot over iSCSI

COMPATIBILITY

PCI EXPRESS INTERFACE

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

CONNECTIVITY

- Interoperable with 10 and 40GbE switches and routers
- 40GbE ports backward compatible with 10GbE
- Integrated 10GbE PHYs
 - XAUI, CX4, KR, KX4, XFI/SFI
- Integrated 40GbE PHYs
 - XLAUI, KR4

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
- OpenFabrics Enterprise Distribution (OFED)
- VMware ESX Server 3.5, vSphere 4.0/4.1
- Citrix XenServer 4.1, 5.0, 5.5

MANAGEMENT

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

*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.



350 Oakmead Parkway, Suite 100, Sunnyvale, CA 94085
Tel: 408-970-3400 • Fax: 408-970-3403
www.mellanox.com