

# Mellanox ConnectX-2 Dual Port 10 GbE Adapter for IBM System x

## Product Guide (withdrawn product)

The Mellanox ConnectX-2 Dual Port 10 GbE Adapter for IBM System x delivers high-bandwidth and industry leading low latency 10 GbE connectivity. With industry-leading performance, power-efficiency, integration and feature set, ConnectX-2 EN with RDMAoE (RDMA over Ethernet) adapters provide an optimized, low-latency solution for high-transaction databases, financial services, cloud computing, and virtualized server and storage data center environments. The ConnectX-2 Dual-Port 10 GbE Adapter improves network performance by increasing available bandwidth to the CPU and providing enhanced performance especially in virtualized server environments.

The adapter is shown in Figure 1.

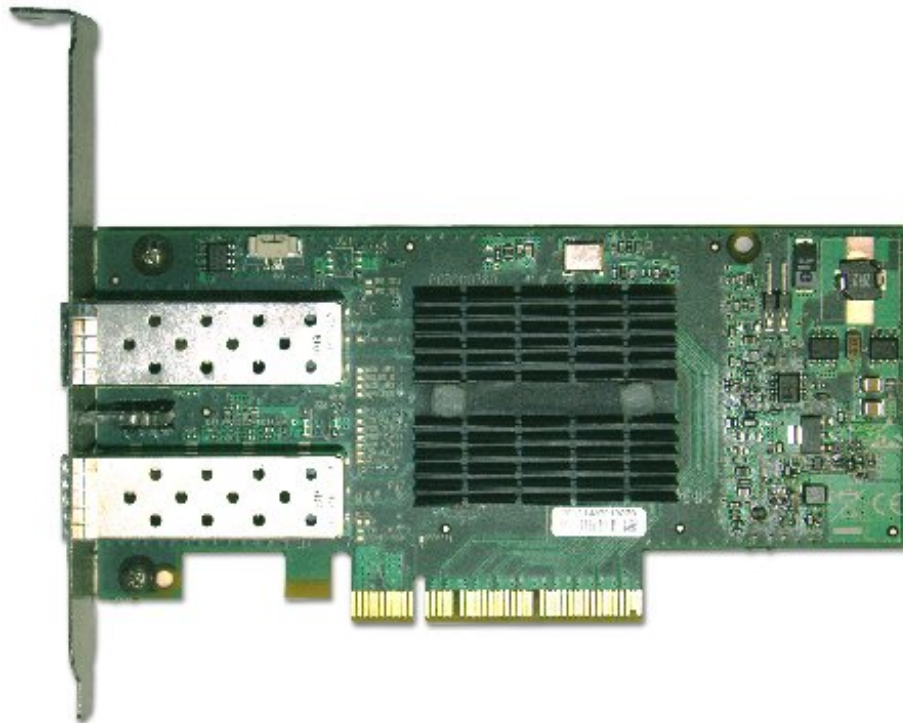


Figure 1. Mellanox ConnectX-2 Dual Port 10 GbE Adapter for IBM System x

## **Did you know?**

The Mellanox ConnectX-2 Dual Port 10GbE Adapter for IBM System x is a high-performance, dual-port network adapter for 10Gb/s Ethernet (10GbE) networks with performance requirements for low latency. It provides an ideal solution for all servers needing high-performance, low-latency data transfer in LAN connectivity for mission-critical applications. This network adapter provides support for 10GbE networking with optical or copper connectivity.

## Part number information

The part number to order this card is shown in Table 1.

Table 1. Ordering part number and feature code

Description	Part number	Feature code
Mellanox ConnectX-2 Dual Port 10 GbE Adapter for IBM System x	81Y9990	A1M4

The adapter has two empty SFP+ cages that support either SFP+ SR transceivers or twin-ax direct-attached copper (DAC) cables as listed in Table 2.

Table 2. Supported transceivers and direct-attach copper (DAC) cables

Description	Part number	Feature code
Optical Transceivers		
QLogic 10Gb SFP+ SR Optical Transceiver	49Y4218	0064
Brocade 10Gb SFP+ SR Optical Transceiver	49Y4216	0069
IBM SFP+ SR Transceiver	46C3447	5053
Active Direct-attach copper (DAC) cables		
1m IBM Active DAC SFP+ Cable	95Y0323	A25A
3m IBM Active DAC SFP+ Cable	95Y0326	A25B
5m IBM Active DAC SFP+ Cable	95Y0329	A25C
Passive Direct-attach copper (DAC) cables		
0.5m IBM Passive DAC SFP+ Cable	00D6288	A3RG
1m IBM Passive DAC SFP+ Cable	90Y9427	A1PH
3m IBM Passive DAC SFP+ Cable	90Y9430	A1PJ
5m IBM Passive DAC SFP+ Cable	90Y9433	A1PK
7m IBM Passive DAC SFP+ Cable	00D6151	A3RH

## Features and benefits

The Mellanox ConnectX-2 Dual Port 10 GbE Adapter for IBM System x has the following features:

### Performance:

Based on ConnectX-2 EN technology, the PCI Express 2.0 x8 adapter provides a high level of throughput performance for all network environments by removing I/O bottlenecks in mainstream servers that are limiting application performance. Servers supporting PCI Express 2.0 with 5 GTps can fully utilize both 10 Gbps ports and achieve up to 40 Gbps duplex bandwidth. Hardware-based stateless offload engines handle the TCP/UDP/IP segmentation, reassembly, and checksum calculations that would otherwise burden the host processor. These offload technologies are fully compatible with Microsoft RSS and NetDMA.

RDMA over Ethernet (RDMAoE) further accelerates application run time. The RDMAoE specification provides efficient data transfer with very low latencies on lossless Ethernet networks. RDMAoE enables lowest latency memory transaction, with less than 2µs at full bandwidth with small message size. This allows very high volume, transaction intensive applications typical of financial market firms and other industries where speed of data delivery is paramount to take advantage. With Mellanox ConnectX-2 Dual Port 10 GbE Adapter, high frequency transaction applications are able to access trading information with shorter times, making sure the trading servers are able to respond first to any new market data and market inefficiencies, while the higher throughput enables higher volume trading, maximizing liquidity and profitability.

In data mining or web crawl applications, RDMAoE provides the needed boost in performance to search faster by solving the network latency bottleneck associated with I/O cards and the corresponding transport technology in the cloud. Various other applications that benefit from RDMAoE with ConnectX-2 EN include Web 2.0 (Content Delivery Network), Business intelligence, data base transactions and various Cloud computing applications.

Mellanox ConnectX-2 EN low power consumption, less than 3.5W per port, provides customers high bandwidth and low latency at the lowest cost of ownership.

### I/O virtualization

ConnectX-2 EN with Virtual Intelligent Queuing (Virtual-IQ) technology provides dedicated adapter resources and guaranteed isolation and protection for virtual machines within the server. The adapter gives data center managers better server utilization and LAN and SAN unification while reducing cost, power, and cable complexity.

### Quality of Service

Resource allocation per application or per virtual machine 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, allowing system administrators to prioritize traffic by application, virtual machine, or protocol.

## Specifications

The adapter has the following specifications:

- Low-profile adapter form factor
- Ports: Two 10 Gigabit Ethernet ports with SFP+ connectors
- ASIC: Mellanox ConnectX-2 EN
- Cabling types: Direct Attached Copper, SR and LR Fiber Optic

- Host interface: PCI Express 2.0 x8 (5.0 GT/s)
- Features: Stateless Offload, Priority Flow Control
- Power consumption: 6.4 W (typical)

Note: The adapter does not support FCoE.

Ethernet support and standards:

- IEEE Std 802.3ae 10 Gigabit Ethernet
- IEEE Std 802.3ad Link Aggregation and Failover
- IEEE Std 802.3x Pause
- IEEE 802.1Q, .1p VLAN tags and priority
- 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 Offload (< 64KB) or Giant Send Offload (64KB-16MB) for segmentation
- Receive Side Scaling (RSS) up to 32 queues
- Line rate packet filtering

Additional CPU offloads:

- RDMA over Ethernet support
- Traffic steering across multiple cores
- Intelligent interrupt coalescence
- Compliant to Microsoft RSS and NetDMA

Hardware-based I/O virtualization:

- 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

## **Physical specifications**

The adapter has the following physical specifications (without the bracket):

- Length: 142 mm
- Height: 69 mm
- Depth: 18 mm
- Maximum weight: 0.25 kg (0.5 lb)

## **Operating environment**

The adapter is supported in the following environment:

- Operating temperature: 0 to 55° C
- Air flow: 200 LFM at 55° C

## **Warranty**

One year limited warranty. When installed in a System x server, these cards assume your system's base warranty and any IBM ServicePac® upgrade.

## Supported servers

The adapter is supported in the IBM System x servers listed in Table 3.

Table 3. Supported System x servers (Part 1)

	x3100 M3	x3200 M2	x3200 M3	x3250 M2	x3250 M3	x3350	x3400	x3400 M2	x3400 M3	x3455	x3500	x3500 M2	x3500 M3	x3550	x3550 M2
Mellanox ConnectX-2 Dual Port 10 GbE Adapter	N	N	N	N	N	N	N	N	Y	N	N	N	Y	N	N

Table 3. Supported System x servers (Part 2)

	x3550 M3	x3620 M3	x3630 M3	x3650	x3650 T	x3650 M2	x3650 M3	x3655	x3690 X5	x3755	x3755 M3	x3850 M2	x3950 M2	x3850 X5	dx360 M3
Mellanox ConnectX-2 Dual Port 10 GbE Adapter	Y	Y	Y	N	N	N	Y	N	Y	N	Y	N	N	Y	Y

## Supported operating systems

The adapter as part of the System x portfolio supports the following operating systems:

- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Datacenter x86 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Enterprise x86 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Standard x86 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2008, Web x86 Edition
- Red Hat Enterprise Linux 5 Server Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- Red Hat Enterprise Linux 6 Server Edition
- Red Hat Enterprise Linux 6 Server x64 Edition
- SUSE LINUX Enterprise Server 10 for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 for x86
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for x86
- VMware ESX 4.0
- VMware ESX 4.1
- VMware ESXi 4.0
- VMware ESXi 4.1

See IBM ServerProven for the latest information about the specific versions and service packs supported: <http://ibm.com/servers/eserver/serverproven/compat/us/>. Click System x servers, and then click LAN to see the support matrix. Click the check mark that is associated with the System x server in question to see the details of operating system support.



## Related publications

For more information refer to these documents:

- *Mellanox ConnectX-2 Dual Port 10 GbE Adapter Installation Guide*  
<http://ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5087563>
- Linux device drivers (select the **Download** tab, then choose the link for the supported operating system):  
[http://www.mellanox.com/content/pages.php?pg=products\\_dyn&product\\_family=26](http://www.mellanox.com/content/pages.php?pg=products_dyn&product_family=26)
- Publications for the IBM Intelligent Cluster portfolio:  
<http://ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5080504>
- Mellanox ConnectX-2 EN Dual-port SFP+ 10GbE PCI-E 2.0 Adapter product page:  
[http://mellanox.com/content/pages.php?pg=ethernet\\_cards\\_overview](http://mellanox.com/content/pages.php?pg=ethernet_cards_overview)
- IBM System x Configuration and Options Guide  
<http://ibm.com/systems/xbc/cog/>

## Related product families

Product families related to this document are the following:

- [Ethernet Adapters](#)

## Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.  
8001 Development Drive  
Morrisville, NC 27560  
U.S.A.  
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

© Copyright Lenovo 2025. All rights reserved.

This document, TIPS0777, was created or updated on July 16, 2013.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:  
<https://lenovopress.lenovo.com/TIPS0777>
- Send your comments in an e-mail to:  
[comments@lenovopress.com](mailto:comments@lenovopress.com)

This document is available online at <https://lenovopress.lenovo.com/TIPS0777>.

## Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at <https://www.lenovo.com/us/en/legal/copytrade/>.

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®

ServerProven®

System x®

The following terms are trademarks of other companies:

Linux® is the trademark of Linus Torvalds in the U.S. and other countries.

Microsoft®, Windows Server®, and Windows® are trademarks of Microsoft Corporation in the United States, other countries, or both.

IBM®, ServicePac®, and ibm.com® are trademarks of IBM in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.