Broadcom NX-E 10GBASE-T Adapters
Product Guide

The Broadcom NX-E 10Gb Base-T Ethernet Adapters are dual-port 10GBASE-T adapters that are fully compliant with the IEEE 802.3an standard and provide a low-cost solution for 10 Gb Ethernet using copper wiring. The adapters are available in either ML2 form factor or PCIe low-profile form factor for use in Lenovo ThinkSystem servers.

The following figure shows the ThinkSystem Broadcom NX-E ML2 10Gb 2-Port Base-T Ethernet Adapter.

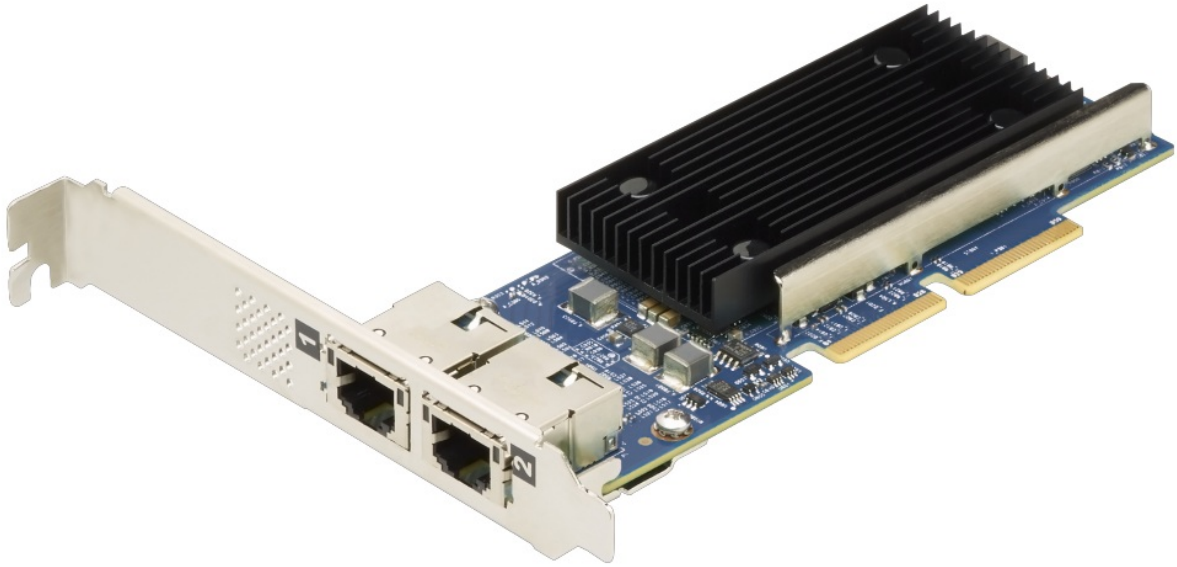

Figure 1. ThinkSystem Broadcom NX-E ML2 10Gb 2-Port Base-T Ethernet Adapter

Did you know?

10GBASE-T is a low-cost way to enter the 10 Gb Ethernet space. By using standard UTP twisted pair cabling, you eliminate the need for transceivers or fiber optic cabling.

The Broadcom NX-E ML2 10Gb 2-Port Base-T Ethernet Adapter is a special mezzanine LAN-on-motherboard (mezzanine LOM) form factor adapter that also supports the Network Controller Sideband Interface (NC-SI) for communication with the server's onboard XClarity Controller (XCC) management processor. This support enables the sharing the network interface with the XCC and the operating system, thereby eliminating the need for a separate management network.

Part number information

The following table provides the ordering information.

Table 1. Ordering information

Part number	Feature code	Description
7ZT7A00497	AUKQ	ThinkSystem Broadcom NX-E ML2 10Gb 2-Port Base-T Ethernet Adapter
7ZT7A00496	AUKP	ThinkSystem Broadcom NX-E PCIe 10Gb 2-Port Base-T Ethernet Adapter

The adapter option part numbers include the following items:

- One Ethernet adapter with RJ45 connectors
- Full-height (3U) bracket (PCIe adapter only) and low-profile (2U) bracket
- Installation and warranty documentation

The following figure shows the ThinkSystem Broadcom NX-E PCIe 10Gb 2-Port Base-T Ethernet Adapter.

Figure 2. ThinkSystem Broadcom NX-E PCIe 10Gb 2-Port Base-T Ethernet Adapter

Network cabling requirements

The network cables that can be used with the adapters are as follows:

- 10GBASE-T
  - UTP Category 7 (100 m maximum)
  - UTP Category 6a (100 m maximum)
  - UTP Category 6 (55 m maximum)

The following table lists the supported Category 6 (CAT 6) cables.

Table 2. CAT6 cables

Part number	Feature code	Description
CAT6 Green Cables		
00WE123	AVFW	0.75m CAT6 Green Cable
00WE127	AVFX	1.0m CAT6 Green Cable
00WE131	AVFY	1.25m CAT6 Green Cable
00WE135	AVFZ	1.5m CAT6 Green Cable
00WE139	AVG0	3m CAT6 Green Cable
90Y3718	A1MT	10m CAT6 Green Cable
90Y3727	A1MW	25m CAT6 Green Cable
CAT6 Blue Cables		
90Y3721	A1MU	10m CAT6 Blue Cable
90Y3730	A1MX	25m CAT6 Blue Cable
CAT6 Yellow Cables		
90Y3724	A1MV	25m CAT6 Yellow Cable

Specifications

The adapters have the following specifications:

- Dual-channel 10 Gbps Ethernet controller
  - 10GBASE-T IEEE 802.3an support
  - 1000BASE-T IEEE 802.3ab support
- Based on the Broadcom BCM957416A4160C adapter and BCM57416 controller
- Supports IPv4 and IPv6
- Broadcom TruFlow flow processing engine
- PCI Express 3.0 x8 host interface
- Form factor:
  - ML2 form factor (7ZT7A00497)
  - PCIe low-profile form factor (7ZT7A00496)

Virtualization features

- SR-IOV support with up to 128 VFs
- VXLAN, NVGRE, Geneve, GRE encapsulation and decapsulation
- vSwitch acceleration
- Multiqueue, NetQueue, and VMQ
- Tunnel-aware stateless offloads
- Message Signal Interrupts (MSI-X) support

Ethernet and NIC features:

- IPv4 and IPv6 offloads
- TCP, UDP, and IP checksum offloads
- Large Send Offload (LSO)
- Large Receive Offload (LRO)
- TCP Segmentation Offload (TSO)
- Receive-side Scaling (RSS)
- Transmit-side Scaling (TSS)
- VLAN insertion/removal
- Interrupt coalescing
- Jumbo frames up to 9 KB
- Network boot-PXE, UEFI
- iSCSI boot

Remote Direct Memory Access (RDMA):

- Supports RDMA over converged Ethernet (RoCE) specifications

Data Center Bridging / Converged Enhanced Ethernet (DCB/CEE):

- Hardware Offloads of Ethernet TCP/IP
- 802.1Qbb Priority Flow Control (PFC)
- 802.1 Qaz Enhanced Transmission Selection (ETS)
- 802.1 Qaz Data Center Bridging Exchange (DCBX)

Management:

- SMBus 2.0
- MCTP over SMBus
- NC-SI support (ML2 adapter only)

Server support

The following table lists the ThinkSystem servers that are compatible.

Table 3. ThinkSystem server support

		2S Rack & Tower							4S Rack			Dense/ Blade		
Part number	**Description**	**ST550 (7X09/7X10)**	**SR530 (7X07/7X08)**	**SR550 (7X03/7X04)**	**SR570 (7Y03/7Y04)**	**SR590 (7X98/7X99)**	**SR630 (7X01/7X02)**	**SR650 (7X05/7X06)**	**SR850 (7X18/7X19)**	**SR860 (7X69/7X70)**	**SR950 (7X11/12/13)**	**SD530 (7X21)**	**SN550 (7X16)**	**SN850 (7X15)**
7ZT7A00497	ThinkSystem Broadcom NX-E ML2 10Gb 2-Port Base-T Ethernet Adapter	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N
7ZT7A00496	ThinkSystem Broadcom NX-E PCIe 10Gb 2-Port Base-T Ethernet Adapter	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N

Operating system support

The adapters support the following operating systems:

- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Red Hat Enterprise Linux 6 Server x64 Edition
- SUSE Linux Enterprise Server 11 for AMD64/EM64T
- SUSE Linux Enterprise Server 12
- SUSE Linux Enterprise Server 12 with XEN
- VMware ESXi 6.0
- VMware ESXi 6.5

Physical specifications

The adapters have the following physical specifications:

The PCIe low profile adapters dimensions has the following specifications (approximate, without bracket):

- Length: 168 mm (6.6 in.)
- Width: 69 mm (2.7 in.)
- Height: 15 mm (0.6 in.)

The ML2 adapter has the following physical specifications:

- Height: 69 mm (2.7 in.)
- Length: 168 mm (6.6 in.)
- Width: 17 mm (0.7 in.)

Operating environment

These adapters are supported in the following environment:

- Storage temperature: -40°C to 65°C
- Storage humidity: 5% to 95% non-condensing

Warranty

One-year limited warranty. When installed in a supported Lenovo server, these cards assume the servers's base warranty and any warranty upgrade.

Agency approvals

The adapters conform to the following standards:

- CE/European Union EN60950-1
- UL/USA UL60950-1
- CTUVus UL
- Canada: CSA 22.2 No. 950
- Taiwan: CNS14336 Class A
- EN55022:2010 + *AC:2011 Class A
- EN55024 Class A
- FCC CFR47, Part 15 Class A
- Canada: ICES-003 Class A
- Australia, New Zealand: EN 5022:2010 + *AC:2011
- Taiwan: BSMI CNS13438 Class A
- South Korea: MIC RRL KN22 Class A
- South Korea: KN24 (ESD)
- Japan: VCCI V-3 04/2014
- EN55024:2010 Air/Direct discharge

Top-of-rack Ethernet switches

The following 10GBASE-T 10Gb Ethernet top-of-rack switches are supported.

Table 4. 10Gb Ethernet top-of-rack switches with 10GBASE-T support

Part number	Description
7159B1X	Lenovo ThinkSystem NE1032T RackSwitch (Rear to Front)
7159C1X	Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front)

For more information, see the Lenovo Press Product Guides in the 10Gb top-of-rack switch category:
https://lenovopress.com/networking/tor/10gb

Related publications

For more information, see the following documents:

- Lenovo product page for ThinkSystem and System x network adapters:
  http://shop.lenovo.com/us/en/systems/servers/options/systemx/networking/
- Lenovo ServerProven compatibility information for network adapters:
  http://www.lenovo.com/us/en/serverproven
- 10Gb Top-of-rack switch publications - Lenovo Press
  https://lenovopress.com/networking/tor/10gb

Related product families

Product families related to this document are the following:

- Ethernet Adapters

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