

# Lenovo Broadcom NetXtreme 2x10GbE BaseT Adapter for System x User Guide

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Lenovo Broadcom NetXtreme 2x10GbE BaseT Adapter for System x



### **Product Guide**

The Broadcom NetXtreme 10 GbE 10GBase-T Network Adapter Family for System x® features robust, standards-based 10GBase-T adapters in either a low-profile PCI Express or mezzanine LOM generation 2 (ML2) form factor. These adapters enable affordable 10-Gigabit Ethernet (10 GbE) network performance with cost-effective RJ-45 connections for distances up to 100 meters. They are compatible with the installed base of GbE switching and cabling infrastructure commonly deployed today.

## Did you know?

The Broadcom NetXtreme 10 GbE 10GBase-T Network Adapter family provides an ideal solution for System x servers requiring high-speed data transfer in LAN connectivity for mission-critical applications levering the existing, affordable cabling and switching IT infrastructure. These network adapters provides support for 10 Gb networking with CAT 6/7 copper cable connectivity with two built-in RJ-45 ports.

### Part number information

Withdrawn from marketing: All adapters listed in this product guide are now withdrawn from marketing.

Table 1. Ordering part numbers and feature codes

Description	Part number	Feature code
Broadcom NetXtreme 2x10GbE BaseT Adapter for System x	44T1370	A5GZ
Broadcom NetXtreme II ML2 Dual Port 10GbaseT for System x	00D2026	A40S
Broadcom NetXtreme II Dual Port 10GBaseT Adapter for System x	49Y7910	A18Y

The part number for these adapters includes the following items:

- One Ethernet adapter with standard (4.75 in) bracket
- Publication CD

- Low profile (3.13 in) bracket
- · Important notices flyer
- Warranty information

Figure 2 shows the Broadcom NetXtreme II ML2 Dual Port 10GbaseT adapter.



Figure 2. Broadcom NetXtreme II ML2 Dual Port 10GbaseT for System x

### Overview

The Broadcom NetXtreme II 10GBase-T adapter family provide:

- A turnkey dual-port 10 GbE adapter solution operating at 100 m over CAT6a or CAT7 unshielded twisted pair (UTP) cable
- Interoperable with IEEE standard devices operating at 10 Mbps, 100 Mbps, and 1 Gbps over existing CAT5 LITP
- A dependable, performance-focused solution that can be optimized for high throughput and high I/O per second, with low CPU utilization

Broadcom offload architecture minimizes the CPU overhead, eliminating competition with the host application for host resources and freeing valuable CPU cycles for processing user applications:

- TCP offload engine (TOE) accelerates network data transfers, with high I/O-per-second and high bandwidth.
- Receive side scaling (RSS) is used to avoid bottlenecks by distributing network processing across multiple CPUs.
- Adaptive interrupt coalescing streamlines interrupt processing.
- Message Signal Interrupt (MSI/MSI-X) allows interrupt distribution in multi-CPU systems.

Broadcom's 10GBASE-T PHY is based on highly advanced digital signal processing to allow robust operation over unshielded twisted pair (UTP) wiring. It is a highly integrated solution that combines enhanced analog front ends with digital adaptive equalizers, ADCs, phase-locked loops, line drivers, LDPC encoders and decoders,

echo cancellers, crosstalk cancellers, and all required support circuitry.

The Broadcom NetXtreme II ML2 Dual Port 10GbaseT 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 IMM2 management processor. This support enables sharing the network interface with the IMM2 and the operating system, thereby eliminating the need for a separate management network. The following figure shows the Broadcom NetXtreme II Dual Port 10GBaseT Adapter.



Figure 3. Broadcom NetXtreme II Dual Port 10GBaseT Adapter for System x

### **Features and specifications**

The adapters have the following features:

- Offer an end-to-end solution up to 10 Gb on Category 6A or 7 UTP cabling up to 100 m, and up to 1 Gb on Category 5E UTP cabling up to 55 m
- Two integrated RJ-45 Ethernet ports operating at 10/100/1000 Mbps or 10 Gbps speeds
- pNIC mode support
- · Supports failover and NIC teaming
  - Smart Load Balancing
  - IEEE 802.3ad link aggregation
- Supports PXE 2.1
- Jumbo frame support (up to 9 KB)
- IEEE 802.1Q VLAN tagging support
- IEEE 802.1x flow control support
- IEEE 802.1p quality of service (QoS) support
- Supports IPv4 and IPv6
- Supports Broadcom Advanced Control Suite (BACS)
- Suppors Network Controller Sideband Interface (NC-SI) (ML2 adapter only)

#### Performance features:

- TCP offload engine (TOE)
- · TCP, IP, UDP checksum offload
- · Receive side scaling (RSS)
- TCP segmentation offload (TCO)
- Giant send offload (GSO)
- Message Signal Interrupt (MSI/MSI-X)
- Supports Switch-independent NIC partitioning (NPAR) with up to four partition assignments per 10GbE link (44T1370 and 00D2026)
- Supports Unfied Fabric Port (UFP)
- VXLAN and NVGRE offload technology (not supported with UFP)
- Supports SR-IOV with up to 64 virtual functions per 10GbE link (44T1370 and 00D2026)

The NetXtreme 2x10GbE BaseT Adapter (44T1370) and NetXtreme II ML2 Dual Port 10GbaseT Adapter (00D2026) support PCI-SIG single root input/output virtualization (SR-IOV) and NIC partitioning (NPAR). SR-IOV delivers higher performance and lower CPU utilization with increased virtual machine (VM) scalability. QLogic NPAR enables up to four physical, switch-agnostic, switch-independent NIC partitions per adapter port. Dynamic and fine-grained bandwidth provisioning enables control of network traffic from VMs and hypervisor services. The adapters have the following specifications:

- · Form factor:
  - 44T1370: Low-profile half-length PCle
  - 00D2026: ML2 form factor
  - 49Y7910: Low-profile half-length PCIe
- Standard (3U) bracket attached with low-profile (2U) bracket included in the box (option part number orders only)
- Host interface: PCle x8 Gen 2
- ASIC:
  - 44T1370: Broadcom BCM57810
  - 00D2026: Broadcom BCM57810
  - 49Y7910: Broadcom BCM57712
- Power dissipation:
  - 44T1370: 21 W typical
  - 00D2026: 28.4 W typical
  - 49Y7910: 21 W typical
- · Cable support:
  - CAT 7: 10 GbE and 1 GbE up to 100 meters
  - CAT 6a: 10 GbE and 1 GbE up to 100 meters
  - CAT 6: 10 GbE up to 55 meters, 1 GbE up to 100 meters
  - CAT5e: 1 GbE up to 100 meters (10 GbE not recommended)

# Server support

The adapters are supported in the System x servers identified in the following table. Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors

Table 2. Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors

Part nu mber	Description	x3 25 0 M 6 ( 39 43	x3 25 0 M 6 ( 36 33 )	x3 55 0 M5 (8 86 9)	x3 65 0 M5 (8 87 1)	x3 85 0 X 6/ x3 95 0 X 6( 62 41 , E 7 v4	nx 36 0 M5 (5 46 5, E5 -2 60 0 v 4)	sd 35 0 ( 54 93 )
44T137 0	Broadcom NetXtreme 2x10GbE BaseT Adapter	N	N	Υ	Υ	Y	Υ	N
00D202 6	Broadcom NetXtreme II ML2 Dual Port 10GbaseT	N	N	Υ	Υ	Υ	Υ	N
49Y791 0	Broadcom NetXtreme II Dual Port 10GBaseT Adapter	N	N	N	N	Υ	N	N

Support for servers with Intel Xeon E5 v3 and E3 v4 processors Table 3. Support for servers with Intel Xeon v3 processors

Part num ber	Description	x3 10 0 M 5 ( 54 57	x3 25 0 M 5 ( 54 58 )	x3 50 0 M 5 ( 54 64 )	x3 55 0 M5 (5 46 3)	x3 65 0 M5 (5 46 2)	x3 85 0 X 6/ x3 95 0 X 6( 62 41 , E 7 v3	nx 36 0 M5 (54 65)
44T1370	Broadcom NetXtreme 2x10GbE BaseT Adapter	N	Υ	Υ	Υ	Υ	Υ	Y
00D2026	Broadcom NetXtreme II ML2 Dual Port 10GbaseT	N	N	N	Υ	Υ	Υ	Υ
49Y7910	Broadcom NetXtreme II Dual Port 10GBaseT Adapter	Υ	Υ	N	N	N	Υ	N

Part n umber	Description	x3 50 0 M 4 ( 73 83 , E 5- 26 00 v2 )	x3 53 0 M 4 ( 71 60 , E 5- 24 00 v2 )	x3 55 0 M 4 ( 79 14 , E 5- 26 00 v2 )	x3 63 0 M 4 ( 71 58 , E 5- 24 00 v2 )	x3 65 0 M 4 ( 79 15 , E 5- 26 00 v2 )	x3 65 0 M 4 B D (5 46 6)	x3 65 0 M 4 H D (5 46 0)	x3 75 0 M 4 ( 87 52	x3 75 0 M 4 ( 87 53 )	x 3 8 5 0 X 6/ x 3 9 5 0 X 6 (3 8 3 7)	x 3 8 5 0 X 6/ x 3 9 5 0 X 6 (6 2 4 1, E 7 v 2)	dx 36 0 M 4 ( E5 -2 60 0 v2	nx 36 0 M 4 ( 54 55 )
44T137 0	Broadcom NetXtreme 2x10GbE Bas eT Adapter	Υ	Y	Υ	Υ	Υ	Υ	Y	Υ	Υ	Y	Υ	Υ	Y
00D20 26	Broadcom NetXtreme II ML2 Dual P ort 10GbaseT	N	N	N	N	N	N	N	Υ	Υ	Υ	Υ	N	N
49Y79 10	Broadcom NetXtreme II Dual Port 10 GBaseT Adapter	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ

See ServerProven for the latest information about the adapters supported by each System x server type: <a href="http://www.lenovo.com/us/en/serverproven/xseries/lan/matrix.shtml">http://www.lenovo.com/us/en/serverproven/xseries/lan/matrix.shtml</a>

# **Operating system support**

The following tables list the supported operating systems for each part number:

- Broadcom NetXtreme 2x10GbE BaseT Adapter, 44T1370
- Broadcom NetXtreme II ML2 Dual Port 10GbaseT, 00D2026
- Broadcom NetXtreme II Dual Port 10GBaseT Adapter for System x, 49Y7910

**Tip:** These tables are automatically generated based on data from Lenovo ServerProven.

Table 5. Operating system support for Broadcom NetXtreme 2x10GbE BaseT Adapter, 44T1370

Operating systems	x 3 8 5 0/ 3 9 5 0 X 6 (3 8 3 7)	x 3 8 5 0/ 3 9 5 0 X 6 (6 2 4 1, E 7 v 2)	x 3 8 5 0/ 3 9 5 0 X 6 (6 2 4 1, E 7 v 3)	x 3 8 5 0/ 3 9 5 0 X 6 (6 2 4 1, E 7 v 4)	n x3 60 M 5 (5 46 5)	x3 50 0 M 5 ( 54 64 )	x3 55 0 M 5 ( 54 63 )	x3 55 0 M 5 ( 88 69 )	x3 65 0 M 5 ( 54 62 )	x3 65 0 M 5 ( 88 71	x3 25 0 M 5 ( 54 58 )
Microsoft Windows Server 2008 R2	Υ	Υ	Υ	N	N	Υ	Υ	Υ	Υ	N	Υ
Microsoft Windows Server 2012	Y	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Microsoft Windows Server 2012 R2	Y	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Microsoft Windows Server 2016	N	Y 1	Y 1	Y 1	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Microsoft Windows Server 2019	N	N	N	Υ	N	N	N	Υ	N	Υ	N
Microsoft Windows Server version 1709	N	N	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	N
Microsoft Windows Server version 1803	N	N	N	N	N	N	N	Υ	N	Υ	N
Red Hat Enterprise Linux 5 Server Edition	N	N	N	N	N	N	N	N	N	N	Υ
Red Hat Enterprise Linux 5 Server x64 Edition	N	N	N	N	N	N	N	N	N	N	Υ
Red Hat Enterprise Linux 6 Server Edition	N	N	N	N	N	N	N	N	N	N	Υ
Red Hat Enterprise Linux 6 Server x64 Edition	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Red Hat Enterprise Linux 8.0	N	N	N	Υ	N	N	N	N	N	N	N
SUSE Linux Enterprise Server 11 for AMD64/EM64T	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
SUSE Linux Enterprise Server 11 for x86	N	N	N	N	N	N	N	N	N	N	Υ
VMware vSphere 5.1 (ESXi)	Y	Υ	N	N	Υ	Υ	Υ	N	Υ	N	Υ
VMware vSphere Hypervisor (ESXi) 5.5	Υ	Υ	Υ	N	Υ	Υ	Υ	Υ	Υ	Υ	Υ
VMware vSphere Hypervisor (ESXi) 6.0	Y	Υ	Υ	N	Υ	Υ	Υ	Υ	Υ	Υ	Υ
VMware vSphere Hypervisor (ESXi) 6.5	Y	N	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
VMware vSphere Hypervisor (ESXi) 6.7	N	N	N	Υ	Υ	Υ	N	Υ	N	Υ	N

[in box driver support only]

Operating systems	x 3 8 5 0/ 3 9 5 0 X 6 (3 8 3 7)	x 3 8 5 0/3 9 5 0 X 6 (6 2 4 1, E 7 v 2)	x 3 8 5 0/3 9 5 0 X 6 (6 2 4 1, E 7 v 3)	x 3 8 5 0/3 9 5 0 X 6 (6 2 4 1, E 7 v 4)	nx 36 0 M 5 ( 54 65	x3 55 0 M 5 ( 54 63 )	x3 55 0 M 5 ( 88 69 )	x3 65 0 M 5 ( 54 62	x3 65 0 M 5 ( 88 71
Microsoft Windows Server 2008 R2	Y	Υ	Υ	N	N	Υ	Υ	Υ	N
Microsoft Windows Server 2012	Y	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Microsoft Windows Server 2012 R2	N	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Microsoft Windows Server 2016	N	Y 1	Y 1	Y 1	Υ	Υ	Υ	Υ	Υ
Microsoft Windows Server 2019	N	N	N	Υ	N	N	Υ	N	Υ
Microsoft Windows Server version 1709	N	N	Υ	Υ	N	Υ	Υ	Υ	Υ
Microsoft Windows Server version 1803	N	N	N	N	N	N	Υ	N	Υ
Red Hat Enterprise Linux 6 Server x64 Edition	Y	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Red Hat Enterprise Linux 7	Y	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Red Hat Enterprise Linux 8.0	N	N	N	Υ	N	N	N	N	N
SUSE Linux Enterprise Server 11 for AMD64/EM64T	Y	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
SUSE Linux Enterprise Server 11 with Xen for AMD64/EM64T	Y	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
SUSE Linux Enterprise Server 12	N	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
SUSE Linux Enterprise Server 12 with Xen	N	N	N	N	N	Υ	Υ	Υ	Υ
SUSE Linux Enterprise Server 15	N	N	Υ	Υ	N	N	Υ	N	Υ
SUSE Linux Enterprise Server 15 with Xen	N	N	Υ	Υ	N	N	Υ	N	Υ
VMware vSphere 5.1 (ESXi)	Y	Υ	N	N	Υ	Υ	N	Υ	N
VMware vSphere Hypervisor (ESXi) 5.5	Y	Υ	Υ	N	Υ	Υ	Υ	Υ	Υ
VMware vSphere Hypervisor (ESXi) 6.0	N	Υ	Υ	N	Υ	Υ	Υ	Υ	Υ
VMware vSphere Hypervisor (ESXi) 6.5	Y	N	Υ	Υ	Υ	Υ	Υ	Υ	Υ

VMware vSphere Hypervisor (ESXi) 6.7	N	N	N	Υ	N	N	Υ	N	Υ	
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Table 7. Operating system support for Broadcom NetXtreme II Dual Port 10GBaseT Adapter for System x, 49Y7910

Operating systems	x3 85 0/ 39 50 X 6 ( 38 37	x3 85 0/ 39 50 X 6( 62 41 , E 7 v2	x3 10 0 M 5 ( 54 57	x3 25 0 M5 (5 45 8)
Microsoft Windows Server 2008 R2	Υ	Υ	Υ	Υ
Microsoft Windows Server 2012	Υ	Υ	Υ	Υ
Microsoft Windows Server 2012 R2	Υ	Υ	Υ	Υ
Red Hat Enterprise Linux 5 Server with Xen x64 Edition	N	N	Υ	Υ
Red Hat Enterprise Linux 5 Server x64 Edition	N	N	Υ	Υ
Red Hat Enterprise Linux 6 Server Edition	N	N	Υ	Υ
Red Hat Enterprise Linux 6 Server x64 Edition	Υ	Υ	N	Υ
Red Hat Enterprise Linux 7	Υ	Υ	Υ	Υ
SUSE Linux Enterprise Server 11 for AMD64/EM64T	Υ	Υ	N	Υ
SUSE Linux Enterprise Server 11 with Xen for AMD64/EM64T	Υ	Υ	N	Υ
SUSE Linux Enterprise Server 12	N	Υ	Υ	Υ
SUSE Linux Enterprise Server 12 with Xen	N	N	Υ	Υ
VMware vSphere 5.1 (ESXi)	Υ	Υ	Υ	Υ
VMware vSphere Hypervisor (ESXi) 5.5	Υ	Υ	Υ	Υ
VMware vSphere Hypervisor (ESXi) 6.0	Υ	Υ	N	Υ

# **Physical specifications**

The Broadcom NetXtreme 2x10GbE BaseT Adapter has the following physical specifications:

Height: 69 mm (2.7 in)Length: 168 mm (6.6 in)Width: 16 mm (0.6 in)

• Weight: 127 g (0.28 lb)

The Broadcom NetXtreme II ML2 Dual Port 10GbaseT adapter has the following physical specifications:

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

The Broadcom NetXtreme II Dual Port 10GBaseT adapter has the following physical specifications:

Height: 70 mm (2.7 in)
Length: 150 mm (5.9 in)
Width: 17.3 mm (0.7 in)

Shipping dimensions (all adapters):

Length: 290 mm (11.5 in)
Width: 251 mm (8.2 in)
Height: 51 mm (2.3 in)
Weight: 0.4 kg (0.89 lb)

# **Operating environment**

The Broadcom NetXtreme 2x10GbE BaseT Adapter is supported in the following environment

- Operating temperature: 0 °C to 55 °C (32 °F to 131 °F)

Storage temperature: -40 °C to 65 °C (-40 °F to 149 °F)

• Relative humidity: 5% to 95% non-condensing

The Broadcom NetXtreme II ML2 Dual Port 10GbaseT adapter and Broadcom NetXtreme II Dual Port 10GBaseT adapter are supported in the following environment:

• Temperature:

```
\circ~0-914~m~(0-3,000~ft):10-35~^{\circ}C~(50-95~^{\circ}F)
```

- ∘ 914 2,133 m (3,000 7,000 ft): 10 32 °C (50 90 °F)
- Relative humidity: 20 80% (non-condensing)
- Maximum altitude: 2,133 m (7,000 ft)

### Warranty

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

### Agency approvals

The adapters have the following agency approvals:

- EN55022
- EN55024
- EN60950 / CE
- EN 61000-3-2
- EN 61000-3-3
- ICES-003, Issue-004
- IEC 950 CB Scheme
- FCC 47 CFR Part 15 Class A
- UL 1950
- CSA C22.2 950-95
- VCCI
- AS/NZSCISPR 22 / C-tick
- · RRL for KC
- BSMI
- UL 94-/V

# **Related publications**

For more information, refer to the following resources:

- NetXtreme II Quick Installation Guide and User's Guide
   http://ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5081963
- (Download the ISO file, burn it to disc or unpack it using 7zip or another tool, and then open Manuals/English/index.htm.)
- Lenovo System x networking options product page
   https://www3.lenovo.com/us/en/data-center/servers/server-options/system-x-options/networking-adapters/system-x-adapters/c/system-x-adapters
- Lenovo ServerProven compatibility information for network adapters:
   <a href="http://www.lenovo.com/us/en/serverproven/xseries/lan/matrix.shtml">http://www.lenovo.com/us/en/serverproven/xseries/lan/matrix.shtml</a>
- Announcement letter Broadcom NetXtreme 2x10GbE BaseT Adapter
   http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS114-065
- Announcement letter Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+
   http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS114-031
- US Announcement Letter for Broadcom NetXtreme II Dual Port 10GBase-T Adapter
   http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS111-197

### Related product families

Product families related to this document are the following:

- 10 Gb Ethernet Connectivity
- · Ethernet Adapters

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### **Documents / Resources**



<u>Lenovo Broadcom NetXtreme 2x10GbE BaseT Adapter for System x</u> [pdf] User Guide Broadcom NetXtreme 2x10GbE, BaseT Adapter for System x, Broadcom NetXtreme 2x10GbE BaseT Adapter for System x

### References

- L Welcome | ServerProven
- Land 10 Gb Ethernet Connectivity > Lenovo Press
- **Ethernet Adapters** > **Lenovo Press**
- Broadcom NetXtreme 10GBase-T Network Adapter Family for System x Product Guide (withdrawn product) > Lenovo Press
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