



IBM Flex System EN2024 4-port 1Gb Ethernet Adapter for Power Systems

IBM Redbooks Product Guide

The IBM Flex System™ EN2024 4-port 1Gb Ethernet Adapter is a quad-port Gigabit Ethernet network adapter that is supported on all IBM Power Systems compute nodes. When it is combined with the IBM Flex System EN2092 1Gb Ethernet Scalable Switch, clients can use an end-to-end 1 Gb solution on the IBM Flex System Enterprise Chassis. The EN2024 adapter is based on the Broadcom 5718 controller and offers a PCIe 2.0 x1 host interface with MSI/MSI-X.

Figure 1 shows the adapter.



Figure 1. IBM Flex System EN2024 4-port 1Gb Ethernet Adapter

Did you know?

This EN2024 is based on the industry-standard PCIe architecture and is ideal for customers that are using Gigabit Ethernet in their network infrastructure. The IBM Flex System compute nodes support up to two of these adapters for a total of eight NICs per system.

Part number information

The following table lists the ordering part number and feature code for the adapter.

Table 1. Ordering part number and feature code

Description	Feature code (e-config)
IBM Flex System EN2024 4-port 1Gb Ethernet Adapter	1763

The EN2024 4-port 1Gb Ethernet Adapter part number includes the following items:

- One adapter
- Documentation CD
- Important Notices flyer

Features

The IBM Flex System EN2024 4-port 1Gb Ethernet Adapter has the following features:

- Dual Broadcom BCM5718 ASICs
- Quad-port Gigabit 1000BASE-X interface
- Two PCI Express 2.0 x1 host interfaces, one per ASIC
- Full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the Ethernet network
- MSI and MSI-X capabilities, up to 17 MSI-X vectors
- A total of 17 receive queues and 16 transmit queues
- A total of 17 MSI-X vectors that support per-queue interrupt to host
- Function Level Reset (FLR)
- ECC error detection and correction on internal SRAM
- TCP, IP, and UDP checksum offload
- Large Send offload, TCP segmentation offload
- Receive-side scaling
- Virtual LANs (VLANs): IEEE 802.1q VLAN tagging
- Jumbo frames (9 KB)
- IEEE 802.3x flow control
- Statistic gathering (SNMP MIB II, Ethernet-like MIB [IEEE 802.3x, Clause 30])
- Comprehensive diagnostic and configuration software suite
- ACPI 1.1a-compliant: multiple power modes
- Wake-on-LAN (WOL) support
- Preboot Execution Environment (PXE) support
- RoHS-compliant

Supported servers

The following table lists the IBM Flex System compute nodes that support the adapters.

Table 2. Supported servers

Description	Part number	p24L (1457)	p260 (7895)	p270 (7954)	p460 (7895)
IBM Flex System EN2024 4-port 1Gb Ethernet Adapter	49Y7900	Y	Y	Y	Y

For more information about the expansion cards that are supported by each blade server type, see this IBM® ServerProven website:

<http://ibm.com/servers/eserver/serverproven/compat/us/>

I/O adapter cards are installed in the slot in supported servers (such as the x240) as shown in the following figure.

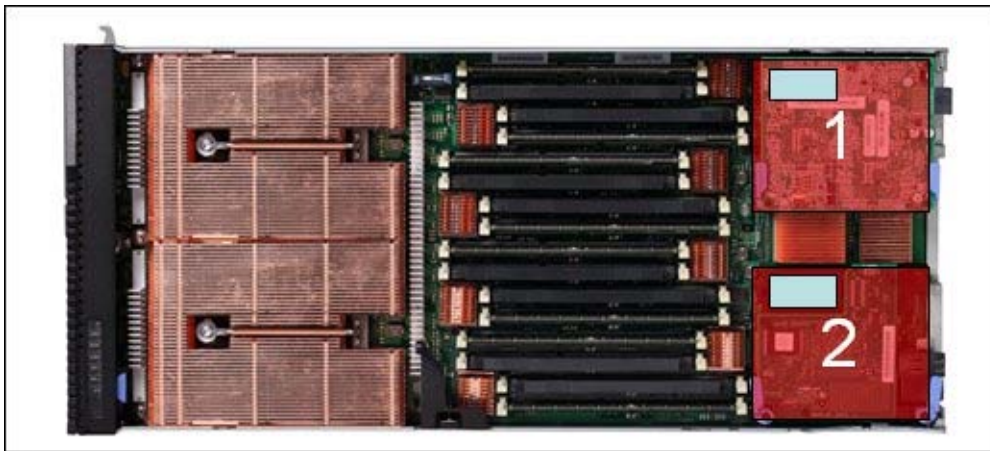


Figure 2. Location of the I/O adapter slots in the IBM Flex System p270 Compute Node

Supported I/O modules

These adapters can be installed in any I/O adapter slot of a supported IBM Flex System compute node. One or two compatible 1 Gb or 10 Gb I/O modules must be installed in the corresponding I/O bays in the chassis. The following table lists the switches that are supported. When connected to the 10 Gb switch or pass-thru module, the internal switch ports operate at 1 Gb speeds.

To maximize the number of usable adapter ports, you might also need to order switch upgrades to enable more ports as listed in the table. Alternatively, for CN4093, EN4093R, and SI4093 switches, you can use Flexible Port Mapping, which is a new feature of Networking OS 7.8 that allows you to minimize the number of upgrades needed. For more information, see the Product Guides for the switches that are available at this website:

<http://www.redbooks.ibm.com/portals/puresystems?Open&page=pg&cat=switches>

The table also specifies how many ports of the adapter are supported after the indicated upgrades are applied. Switches should be installed in pairs to maximize the number of ports enabled and to provide redundant network connections.

Table 3. I/O modules and upgrades for use with the EN2024 4-port 1Gb Ethernet Adapter

Description	Feature code (e-config)	Port count (per pair of switches)*
1 Gb switches		
IBM Flex System EN2092 1Gb Ethernet Scalable Switch + EN2092 1Gb Ethernet Scalable Switch (Upgrade 1)	3598 3594	4
10 Gb switches		
IBM Flex System Fabric CN4093 10Gb Converged Scalable Switch + CN4093 10Gb Converged Scalable Switch (Upgrade 1)	ESW2 ESU1	4
IBM Flex System Fabric EN4093R 10Gb Scalable Switch + EN4093 10Gb Scalable Switch (Upgrade 1)	ESW7 3596	4
IBM Flex System Fabric EN4093 10Gb Scalable Switch + EN4093 10Gb Scalable Switch (Upgrade 1)	3593 3596	4
IBM Flex System EN4091 10Gb Ethernet Pass-thru	3700	2
IBM Flex System Fabric SI4093 System Interconnect Module + SI4093 System Interconnect Module (Upgrade 1)	ESWA ESW8	4
IBM Flex System EN4023 10Gb Scalable Switch + IBM Flex System EN4023 10Gb Scalable Switch (Upgrade 1) or Flex System EN4023 10Gb Scalable Switch (Upgrade 2)	ESWD ESWE ESWF	4
Cisco Nexus B22 Fabric Extender for IBM IBM Flex System	ESWB	2

* This column indicates the number of adapter ports that are active if indicated upgrades are installed.

The adapter does not support the IBM Flex System EN6131 40Gb Ethernet Switch I/O module.

The following table shows the connections between adapters that are installed in the compute nodes to the switch bays in the chassis.

Table 4. Adapter to I/O bay correspondence

I/O adapter slot in the server	Port on the adapter	Corresponding I/O module bay in the chassis
Slot 1	Port 1	Module bay 1
	Port 2	Module bay 2
	Port 3*	Module bay 1
	Port 4*	Module bay 2
Slot 2	Port 1	Module bay 3
	Port 2	Module bay 4
	Port 3*	Module bay 3
	Port 4*	Module bay 4
Slot 3 (full-wide compute nodes only)	Port 1	Module bay 1
	Port 2	Module bay 2
	Port 3*	Module bay 1
	Port 4*	Module bay 2
Slot 4 (full-wide compute nodes only)	Port 1	Module bay 3
	Port 2	Module bay 4
	Port 3*	Module bay 3
	Port 4*	Module bay 4

* Ports 3 and 4 require Upgrade 1 of the EN2092 1Gb or EN4093 10Gb switch. The EN4091 Pass-thru only supports ports 1 and 2 (and only when two I/O modules are installed).

The connections between the adapters that are installed in the compute nodes to the switch bays in the chassis are shown in the following figure. The figure shows half-wide servers, such as the p270 with two adapters.

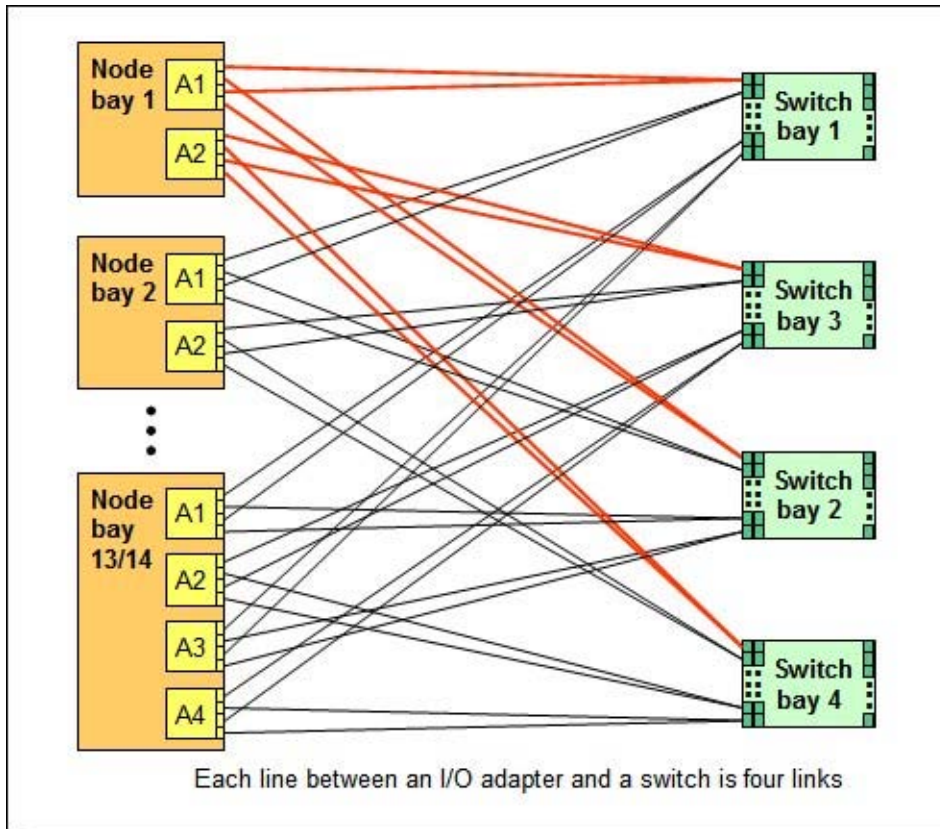


Figure 3. Logical layout of the interconnects between I/O adapters and I/O modules

Operating system support

The IBM Flex System EN2024 4-port 1Gb Ethernet Adapter supports the following operating systems:

- AIX Version 6.1
- AIX Version 7.1
- IBM i 6.1
- IBM Virtual I/O Server
- Red Hat Enterprise Linux 6 for IBM POWER
- SUSE LINUX Enterprise Server 11 for IBM POWER

Support for operating systems is based on the combination of the expansion card and the blade server on which it is installed. See the IBM ServerProven website for the latest information about the specific versions and service packs supported. Select the blade server, and then select the expansion card to see the supported operating systems: <http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/>

Warranty

There is a 1-year, customer-replaceable unit (CRU) limited warranty. When installed in a server, these adapters assume your system's base warranty and any IBM ServicePac® upgrade.

Physical specifications

The adapter features the following dimensions and weight:

- Width: 100 mm (3.9 inches)
- Depth: 80 mm (3.1 inches)
- Weight: 13 g (0.3 lb)

The adapter features the following shipping dimensions and weight (approximate):

- Height: 58 mm (2.3 in)
- Width: 229 mm (9.0 in)
- Depth: 208 mm (8.2 in)
- Weight: 0.4 kg (0.89 lb)

Regulatory compliance

The adapter conforms to the following standards:

- United States FCC 47 CFR Part 15, Subpart B, ANSI C63.4 (2003), Class A
- United States UL 60950-1, Second Edition
- IEC/EN 60950-1, Second Edition
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1-03
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22:2006, Class A
- IEC 60950-1 (CB Certificate and CB Test Report)
- Taiwan BSMI CNS13438, Class A
- Korea KN22, Class A; KN24
- Russia/GOST ME01, IEC-60950-1, GOST R 51318.22-99, GOST R 51318.24-99, GOST R 51317.3.2-2006, GOST R 51317.3.3-99
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A

Popular configurations

The adapters can be used in various configurations. The following figure shows EN2024 4-port 1Gb Ethernet Adapters that are installed in both slots of the p270 (a model without the Embedded 10Gb Virtual Fabric Adapter), which in turn is installed in the chassis. The chassis also has four IBM Flex System EN2092 1Gb Ethernet Scalable Switches, each with Upgrade 1 installed to enable 28 internal ports.

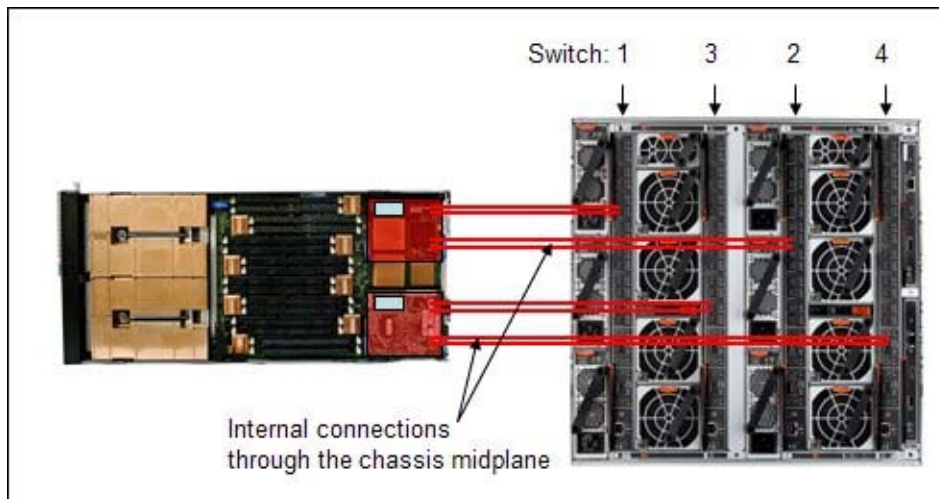


Figure 4. Example configuration

The following table lists the parts that are used in the configuration.

Table 5. Components used when connecting the adapter to the 10 GbE switches

Machine type / Feature Code	Description	Quantity
7954-24X	IBM Flex System p270 or other supported server	1 to 14
1763	IBM Flex System EN2024 4-port 1Gb Ethernet Adapter	2 per server
7893-92X	IBM Flex System Enterprise Chassis	1
3598	IBM Flex System EN2092 1Gb Ethernet Scalable Switch	4
3594	IBM Flex System EN2092 1Gb Ethernet Scalable Switch (Upgrade 1)	4

Related publications

For more information, see the following resources:

- Product Guides for all Flex System switches:
<http://www.redbooks.ibm.com/portals/flexsystem?Open&page=pg&cat=switches>
- Product Guides for Flex System compute nodes:
<http://www.redbooks.ibm.com/portals/flexsystem?Open&page=pg&cat=nodes>
- IBM Redbooks® publication *IBM Flex System Products and Technology for Power Systems*:
<http://www.redbooks.ibm.com/abstracts/sg248256.html>
- IBM Redbooks Product Guides for Flex System servers and options:
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- IBM Configurator for e-business (e-config):
<http://ibm.com/services/econfig/>
- ServerProven for Flex System:
<http://ibm.com/systems/info/x86servers/serverproven/compat/us/flexsystems.html>

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