

QLogic 16Gb FC Single-port and Dual-port HBA for IBM System x

IBM Redbooks Product Guide

The QLogic 16Gb FC Single-port and Dual-port Host Bus Adapters (HBAs) for IBM® System x® are sixth generation Fibre Channel Adapters. They offer 16 Gbps line-rate performance at extremely low CPU utilization with full hardware offloads. Support for powerful virtualization features make this adapter ideal for virtualized environments that need excellent I/O performance to service growing numbers of virtual machines (VMs).

Figure 2 shows the dual-port adapter.

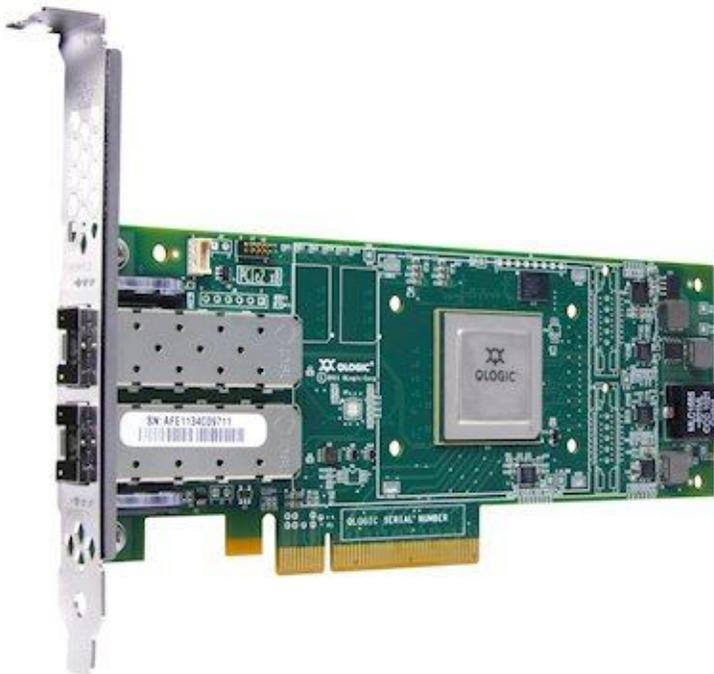


Figure 2. QLogic 16 Gb FC Dual-port HBA (included SFP+ transceivers are not present)

Did you know

Did you know that these QLogic adapters support nearly twice the throughput and 2.5 times the I/O operations per second (IOPS) per port compared to 8 Gb adapters? In addition, the adapters support both PCI Express 3.0 x4 or 2.0 x8 data transfer on the host side. The QLogic 16 Gb HBAs are ideal for high bandwidth and I/O-intensive applications, such as media streaming, backup/recovery, data warehousing, OLTP, Microsoft® Exchange Server, and server virtualization. Through rigorous testing by IBM through the IBM ServerProven® program, you can maintain a high degree of confidence that your System x server storage subsystem is compatible and functions reliably when using these 16 Gb HBA adapters.

Part number information

Table 1 shows the part number and feature codes for ordering the QLogic 16Gb FC HBAs.

Table 1. Ordering part numbers and feature codes

Description	Part number	Feature code
QLogic 16 Gb FC Single-port HBA for IBM System x	00Y3337	A3KW
QLogic 16 Gb FC Dual-port HBA for IBM System x	00Y3341	A3KX

The part numbers for the QLogic 16Gb FC Single-port and Dual-port HBAs include the following:

- One adapter with one or two short-wave (SWL) 16/8/4 Gb SFP+ transceivers installed and 3U bracket attached
- Quick installation guide
- Documentation CD
- Warranty Flyer
- IBM Important Notices Flyer

Note: The 2U bracket is only available via CTO using feature codes A3KY (single-port) or A3KZ (dual-port)

Figure 2 shows the single-port adapter.



Figure 2. QLogic 16 Gb FC Single-port HBA

Features

The QLogic 16Gb FC Single-port and Dual-port HBAs have the following features:

- Port architecture that offers independent functionality on each port -- independent CPU, isolated memory and independent firmware image -- provides higher reliability and predictable performance.
- Support for Message Signaled Interrupts eXtended (MSI-X) improves host utilization and enhances application performance.
- Support for 16 Gb, 8 Gb, and 4 Gb FC devices.
- Full hardware offload for Fibre Channel protocol.
- Support for PCIe 2.0 and PCIe 3.0 host interfaces.
- Comprehensive virtualization capabilities with support for N_Port ID Virtualization (NPIV) with 255 N_Port IDs per port.
- Host-to-fabric Fibre Channel Security Protocol (FC-SP) authentication.
- A common driver model allows a single driver to support all QLogic HBAs on a given operating system.
- Universal boot capability allows the appropriate boot environment to be automatically selected for any given hardware.
- Boot from SAN capability reduces the system management costs and increases uptime.

Technical specifications

The QLogic 16Gb FC Single-port and Dual-port HBAs have the following specifications:

- Host interface: PCI Express 2.0 x8 or PCI Express 3.0 x4 (physical connector is PCIe x8)
- Single-port or dual-port SFP+ based adapters
- Support for 16 Gb, 8 Gb and 4 Gb FC link speeds, which are automatically negotiated
- Data rate: 14.025 Gbps (1600 MBps), 8.5 Gbps (800 MBps), and 4.25 Gbps (400 MBps) autosensing (per port), with full duplex
- Performance: Over 500,000 IOPS per port (over 1,200,000 IOPS per dual-port adapter)
- Throughput: 3,200 MB per port, full-duplex
- 2048 concurrent logins
- 255 N_Port IDs (NPIV) per port
- Industry standards:
 - Current ANSI/IETF standards: FC-PI-4, FC-PI-5, FC-FS-2 with amendment 1, FC-AL-2 with amendments 1 and 2, FC-LS-2, FC-GS-6, FC-DA, FC-SP-2, FCP-4, FC-MJS, FC-SB-4, FC-SP, SPC-4, SBC-3, SSC-3, and RFC4338
 - Legacy ANSI/IETF standards: FC-PH, FC-PH-2, FC-PH-3, FC-PI, FC-PI-2, FC-FS, FC-AL, FC-GS-2/3/4/5, FCP, FCP-2, FC-SB-2, FC-FLA, FC-HBA, FC-PLDA, FC-TAPE, FC-MI, SPC-3, SBC-2, SSC-2, and RFC2625
- Topology: Point-to-point and switched fabric
- Supported media: 16 Gbps Fibre Channel LC SFP+ short wave optical transceivers (850 nm), hot-pluggable

- Management software:
 - The QLogic QConvergeConsole (QCC) management software delivers a unified web based single-pane-of-glass management console across the QLogic family of storage and networking adapters. A graphical user interface (GUI) or command line interface (CLI) are available. A VMware vCenter plug-in is also available.
 - Common IT tasks, such as VLAN configuration and teaming, can be easily accomplished either through QConvergeConsole or through native OS tools, thereby minimizing IT training and deployment costs.
 - Role-based authentication allows for separate logins and access for SAN and LAN administrators. This eliminates the need to change your organizational structure as you converge your network.

Supported servers

The QLogic 16Gb FC Single-port and Dual-port HBAs are supported on the IBM System x servers that are listed in Table 2.

Table 2. Supported System x servers (Part 1)

Product description	Part number	x3100 M4 (2582)	x3250 M4 (2583)	x3300 M4 (7382)	x3500 M4 (7383)	x3530 M4 (7160)	x3550 M4 (7914)	x3630 M4 (7158)	x3650 M4 (7915)	x3690 X5 (7147)	x3750 M4 (8722)	x3850 X5 (7143)	dx360 M4 (7912)
QLogic 16 Gb FC Single-port HBA	00Y3337	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
QLogic 16 Gb FC Dual-port HBA	00Y3341	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 2. Supported System x servers (Part 2)

Product description	Part number	x3200 M3 (7327, 7328)	x3250 M3 (4251, 4252)	x3400 M3 (7378, 7379)	x3500 M3 (7380)	x3550 M3 (7944)	x3620 M3 (7376)	x3630 M3 (7377)	x3650 M3 (7945)	x3755 M3 (7164)	dx360 M3 (6391)
QLogic 16 Gb FC Single-port HBA	00Y3337	Y	Y	Y	N	Y	N	Y	Y	Y	Y
QLogic 16 Gb FC Dual-port HBA	00Y3341	Y	Y	Y	N	Y	N	Y	Y	Y	Y

For the latest information about the System x servers that support each adapter, see the IBM ServerProven® website at:

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

Supported operating systems

The QLogic 16 Gb FC Single-port and Dual-port HBAs for IBM System x support the following operating systems:

- Microsoft Windows® Server 2008 HPC Edition
- 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
- Microsoft Windows Server 2012
- Microsoft Windows Small Business Server 2008 Premium Edition
- Microsoft Windows Small Business Server 2008 Standard Edition
- Red Hat Enterprise Linux® 5 Server Edition
- Red Hat Enterprise Linux 5 Server with Xen x64 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 10 with Xen for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for x86
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- VMware ESX 4.1
- VMware ESXi 4.1
- VMware vSphere 5
- VMware vSphere 5.1

For the latest information about the specific versions and service packs supported, see the IBM ServerProven website at:

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

Click **System x servers** and then click **Shared storage adapters** to see the support matrix. Select the check mark associated with the System x server in question to see the operating system support details.

Physical specifications

The QLogic 16Gb FC Single-port and Dual-port HBAs have the following physical specifications.

Dimensions and weight (approximate):

- Height: 69 mm (2.7 in.)
- Width: 168 mm (6.6 in.)
- Depth: 25 mm (1.0 in.)
- Weight: 113 g (0.25 lb)

Shipping dimensions and weight (approximate):

- Height: 48 mm (1.9 in.)
- Width: 217 mm (8.5 in.)
- Depth: 140 mm (5.5 in.)
- Weight: 450 g (1.0 lb)

Operating environment

The adapters are supported in the following environment:

- Temperature:
 - Operating: 0 - 55 °C (32 - 131 °F)
 - Storage: -40 - 70 °C (-40 - 158 °F)
- Relative humidity:
 - 5 - 95% (relative, non-condensing)

Warranty

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

Agency approvals

The adapter conforms to the following standards:

- EN55022
- EN55024
- EN60950 / CE
- EN 61000-3-2
- EN 61000-3-3
- IEC 950 CB Scheme
- FCC Part 15 Class A
- UL 1950
- CSA C22.2 950-95
- VCCI
- NZ AS3548 / C-tick
- RRL for MIC (KCC)
- BSMI
- UL 94-/V

Popular configurations

This section illustrates how the QLogic 16Gb FC Single-port and Dual-port HBAs can be used in configurations. For a list of IBM-supported configurations that include QLogic 16Gb HBAs, fabric switches, and storage targets, see the IBM System Storage® Interoperation Center at the following web address:

<http://ibm.com/systems/support/storage/ssic>

Figure 3 shows the QLogic 16Gb FC Single-port HBAs installed in a supported server. The servers are connected to the IBM System Storage DS3500 through IBM System Storage SAN48B-5 switches.

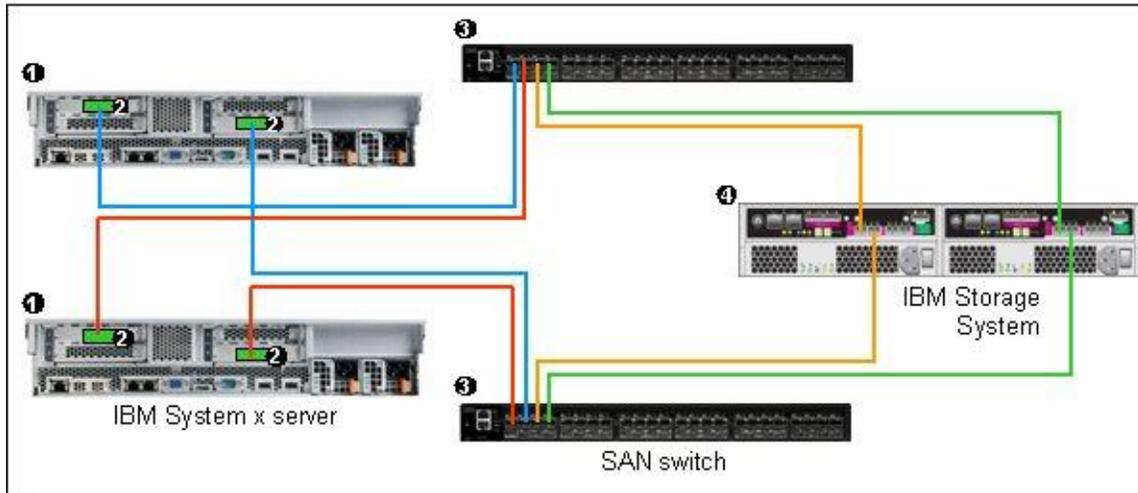


Figure 3. System x server with QLogic 16 Gb FC adapters connected to an external IBM System Storage DS3500 through SAN switches

The parts used are listed in Table 3.

Table 3. Components used when connecting QLogic 16 Gb FC Single-port HBAs to the external disk storage (as shown in Figure 3)

Diagram reference	Part number/machine type	Description	Quantity
1	Varies	x3650 M4 or other supported server	1
2	00Y3337	QLogic 16 Gb FC Single-port HBA	2 per server
3	2498F48	IBM System Storage SAN48B-5	2
4	1746A4D	IBM System Storage DS3524 Express Dual Controller Storage System	1

This configuration also requires cabling between the servers and the SAN switches and between the SAN switches and the storage system. (The cable part numbers are not listed in Table 3.)

Related publications

For more information, refer to these documents:

- IBM US Announcement Letter for the QLogic 16Gb FC Single-port and Dual-port HBAs:
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS113-004>
- *QLogic 16Gb FC Single-port and Dual-port HBAs Installation and User Guide*:
<http://www.ibm.com/systems/support>
- *IBM System x Configuration and Options Guide*:
<http://ibm.com/support/entry/portal/docdisplay?Indocid=SCOD-3ZVQ5W>

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