

# Brocade 16Gb FC Single-port and Dual-port HBAs for System x

## IBM Redbooks Product Guide

The Brocade 16 Gb Fibre Channel (FC) host bus adapters (HBAs) for IBM® System x® are part of a family of high-performance FC HBA solutions. These HBAs deliver exceptional performance, enabling small and medium businesses to experience unsurpassed robustness and reliability for a wide spectrum of servers, storage, and SANs.

Figure 1 shows the single-port adapter (SFP+ is not present).



Figure 1. Brocade 16Gb FC Single-port for IBM System x (with 3U bracket attached, SFP+ is not present)

### Did You Know?

Brocade 16Gb FC HBAs enhance availability via a unified driver with integrated firmware and simplified broadcast of driver updates across the fabric, including a proactive driver/firmware check of version levels to ensure synchronization. Fabric boot LUN discovery allows a server to boot-from-SAN, simplifying startup and reducing image management complexity. Fabric Assigned World Wide Name (FA-WWN) auto-assigns the switch port WWN upon install, simplifying server deployment and ongoing management.

Diagnostic Ports (D\_Ports) are a new port type supported by the Brocade 16Gb HBAs that enables administrators to quickly identify and isolate 16 Gbps optics, port and cable problems, reducing fabric deployment and diagnostic times. If the optical media is found to be the source of the problem, it can be transparently replaced, as 16 Gbps optics are hot-pluggable.

## Part number information

Table 1. Ordering part numbers and feature codes

Description	Part number	Feature code
Brocade 16Gb FC Single-port HBA for IBM System x	81Y1668	A2XU
Brocade 16Gb FC Dual-port HBA for IBM System x	81Y1675	A2XV

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

- FC HBA adapter with one or two short-wave (SWL) 16 Gb (16/8/4 Gb support) SFP+ installed and 3U bracket attached
- Quick install guide
- Documentation CD
- Low profile (2U) bracket
- Warranty Flyer
- Important Notices Flyer

Figure 2 shows the dual-port adapter (SFP+ is not present).

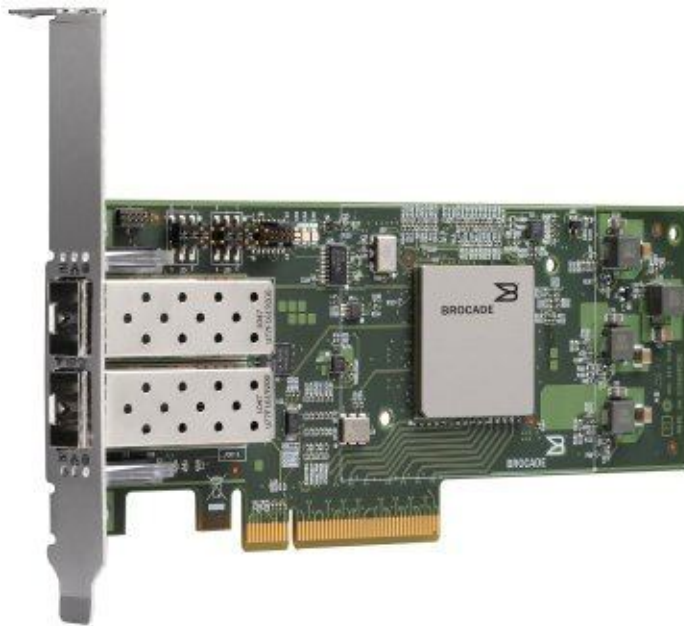


Figure 2. Brocade 16Gb FC Dual-port for IBM System x (with 3U bracket attached, SFP+ is not present)

## Features

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

- 16 Gbps Fibre Channel  
16 Gb FC enables I/O consolidation of multiple 2/4/8 Gbps Fibre Channel HBAs into a single adapter to dramatically reduce CapEx/OpEx costs. It can also provide 50% server rack space savings by reducing from a 2U to 1U rack-mount server with fewer PCIe adapter slots.
- Over 500,000 IOPS per port  
The industry's most powerful FC adapter that achieves the highest transaction performance to

maximize density of VMs per server, performance of 315,000 IOPS for E-mail Exchange, and 205,000 IOPS for SQL Database.

- 16 Gbps and 8 Gbps optical media support  
Investment protection for existing previous-generation 8 Gbps optics.
- Fabric Assigned World Wide Name (FA-WWN)  
FA-WWN virtualizes host WWNs to simplify server deployment by enabling pre-provisioning prior to initial install and to eliminate time-consuming fabric reconfigurations when replacing adapters and servers.
- Boot-From-SAN  
Automate SAN Boot LUN discovery to simplify boot from SAN and reduce image management complexity and support for Direct Attached Storage (DAS point-to-point topology).
- Brocade Server Application Optimization (SAO)  
Quality of Service (QoS) levels assignable to VM applications and support for N\_Port Trunking of 2×16 Gbps links into a single logical 32 Gbps link to improve application performance and availability.
- Direct I/O  
This enables native (direct) I/O performance by allowing VMs to bypass the hypervisor and communicate directly with the adapter.
- Brocade Network Advisor  
This simplifies and unifies the management of Brocade adapter, SAN, and LAN resources through a single pane-of-glass.
- Brocade Diagnostics (D-Port)  
This improves detection and isolation of 16 Gbps optics problems between adapters and switches.
- LUN Masking  
Initiator-based LUN masking for storage traffic isolation.
- Target Rate Limiting (TRL)  
This throttles data traffic when accessing slower speed storage targets to avoid back pressure problems.

## Technical specifications

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

- Host interface: PCI Express Gen 2 x8
- Data rate: 14.025 Gbps (1600 MBps); 8.5 Gbps (800 MBps); 4.25 Gbps (400 MBps); 2.125 Gbps (200 MBps) autosensing (per port); full duplex
- Performance: over 500,000 IOPS per port (1,000,000 IOPS per dual-port adapter)
- Boot support: Boot from SAN, Fabric-based Boot LUN Discovery
- Protocols: SCSI-FCP, FCP-2, FCP-3, FC-SP
- Topology: Point-to-point (N\_Port), switched fabric (N\_Port)
- N\_Port Trunking of 2×16 Gbps links into a single logical 32 Gbps link
- Supported media: Brocade 16 Gbps and 8 Gbps Fibre Channel LC-style pluggable (SFP+), SWL (850 nm), hot-pluggable

- Distance support:
  - 15 m at 16 Gbps on 62.5/125 μm (OM1) Multi-Mode Fiber (MMF)
  - 35 m at 16 Gbps on 50/125 μm OM2 MMF
  - 100 m at 16 Gbps on 50/125 μm OM3 MMF
  - 125 m at 16 Gbps on 50/125 μm OM4 MMF
- Management software:
  - Brocade Host Connectivity Manager (HCM)
  - Brocade Configuration Utility (BCU) Command Line Interface (CLI)
  - Brocade Network Advisor

## Supported servers

The Brocade 16Gb FC Single-port and Dual-port HBAs are supported on the IBM System x servers that are listed in the following table.

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)
Brocade 16Gb FC Single-port HBA	81Y1668	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Brocade 16Gb FC Dual-port HBA	81Y1675	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)
Brocade 16Gb FC Single-port HBA	81Y1668	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Brocade 16Gb FC Dual-port HBA	81Y1675	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

See the IBM ServerProven® website for the latest information about the System x servers that support each adapter: <http://ibm.com/servers/eserver/serverproven/compat/us/>

## Supported operating systems

The Brocade 16Gb 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

See the IBM ServerProven website 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 **Shared storage adapters** to see the support matrix. Click the check mark associated with the System x server in question to see the operating system support details.

## Physical specifications

The Brocade 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: 18 mm (0.7 in)
- Weight: 127 g (0.28 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: -43 - 73 °C (-40 - 163 °F)
- Relative humidity:
  - Operating: 5 - 93% (relative, non-condensing)
  - Non-operating: 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:

- United States Bi-Nat UL/CSA 60950-1 2nd Ed; ANSI C63.4; cCSAus; FCC Class B
- Canada Bi-Nat UL/CSA 60950-1 2nd Ed; ICES-003 Class B; cCSAus
- Japan CISPR22 Class B and JEIDA (Harmonics); VCCI-B
- European Union EN60950-1; EN55022 Class B and EN55024; TUVBauart, CE Mark
- Australia, New Zealand EN55022 and CISPR22 Class B or AS/NZS CISPR22; C-Tick
- Russia IEC60950-1; 51318.22-99 and .24-99; GOST Mark
- Korea KN22 and KN24; KC Mark Class B
- Taiwan CNS 13438(95) Class A; BSMI Mark

## Popular configurations

This section illustrates how the Brocade 16Gb FC Single-port and Dual-port HBAs can be used in configurations. For a list of IBM-supported configurations that include Brocade 16Gb HBAs, fabric switches, and storage targets, see IBM System Storage® Interoperation Center located at: <http://ibm.com/systems/support/storage/ssic>

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

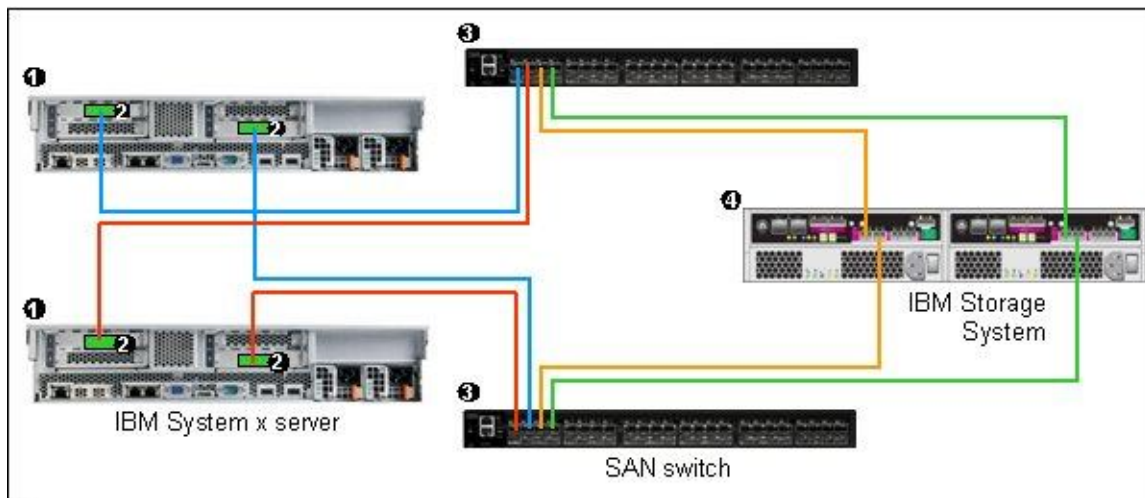


Figure 3. IBM System x server connected to an external IBM System Storage DS3500 via SAN switches

The parts used are listed in Table 3.

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

Diagram reference	Part number/machine type	Description	Quantity
①	Varies	Supported server	1
②	81Y1668	Brocade 16Gb 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 Brocade 16Gb FC Single-port and Dual-port HBAs  
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS112-047>
- Brocade 16Gb FC Single-port and Dual-port HBAs Installation and User Guide  
[www.ibm.com/systems/support](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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