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# QLogic 8200 Virtual Fabric Adapter Family for IBM System x
**IBM Redbooks Product Guide**

The QLogic 8200 Virtual Fabric Adapter Family for IBM System x consists of 10 Gigabit Ethernet adapters available in either a standard PCIe adapter form factor or a mezzanine form factor. Both adapters are high-performance Converged Network Adapters (CNAs) based on the new QLogic 8200 design. The adapters offer upgrades to full hardware offload for Fibre Channel over Ethernet (FCoE) and iSCSI processing. The adapters connect to SFP+ Multimode Fiber SR optical modules and direct-attach copper (DAC) cables.

The QLogic 8200 Dual Port 10GbE SFP+ VFA is shown in the following figure.



Figure 1. QLogic 8200 Dual Port 10GbE SFP+ VFA for IBM System x

## Did you know

With the IBM Features on Demand (FoD) entitlement upgrade, the QLogic 8200 adapters support full hardware offload for FCoE and iSCSI protocol processing. This feature frees up the server's CPU to perform other tasks. Consequently, the server's applications can run faster and virtualized servers can support more virtual machines.

The QLogic Dual Port 10GbE SFP+ Embedded Virtual Fabric Adapter (VFA) is designed specifically to fit in to a dedicated slot in servers such as the IBM® System x3650 M4 and x3550 M4. This card design allows you to use the server's standard PCIe slots for other technologies.

## Part number information

The following table shows the ordering part numbers and feature codes for these adapters.

Table 1. Ordering part numbers and feature codes

| Description | Part number | Feature code |
|---|---|---|
| Standard PCIe adapter | | |
| QLogic 8200 Dual Port 10GbE SFP+ VFA for IBM System x | 90Y4600 | A3MR |
| QLogic 8200 VFA FCoE/iSCSI License for IBM System x (Features on Demand) | 00Y5624 | A3MT |
| Embedded PCIe adapter | | |
| QLogic Dual Port 10GbE SFP+ Embedded VFA for IBM System x | 90Y6454 | A22H |
| QLogic Embedded VFA FCoE/iSCSI License for IBM System x (Features on Demand) | 90Y5179 | A2TF |

The part numbers for the adapters (90Y4600 and 90Y6454) includes the following items:

- One QLogic adapter
- 3U bracket attached with 2U bracket included in the box (90Y4600 only)
- Support CD
- Safety flyer

The QLogic Dual Port 10GbE SFP+ Embedded VFA is shown in the following figure.



Figure 2. QLogic Dual Port 10GbE SFP+ Embedded Virtual Fabric Adapter

Transceivers are not included with the adapter. The adapters support the SFP+ SR transceivers and direct-attach copper (DAC) cables listed in the following table.

Table 2. Supported transceivers and DAC cables

| Description | Option part number | Feature code |
|---|---|---|
| Optical Transceivers | | |
| QLogic 10Gb SFP+ SR Optical Transceiver | 49Y4218 | 0064 |
| Brocade 10Gb SFP+ SR Optical Transceiver | 49Y4216 | 0069 |
| IBM SFP+ SR Transceiver | 46C3447 | 5053 |
| Active Direct-attach copper (DAC) cables | | |
| 1m IBM Active DAC SFP+ Cable | 95Y0323 | A25A |
| 3m IBM Active DAC SFP+ Cable | 95Y0326 | A25B |
| 5m IBM Active DAC SFP+ Cable | 95Y0329 | A25C |
| Passive Direct-attach copper (DAC) cables | | |
| .5m IBM Passive DAC SFP+ Cable | 00D6288 | A3RG |
| 0.5m IBM Passive DAC SFP+ Cable | 00D6288 | A3RG |
| 1m IBM Passive DAC SFP+ Cable | 90Y9427 | A1PH |
| 3m IBM Passive DAC SFP+ Cable | 90Y9430 | A1PJ |
| 5m IBM Passive DAC SFP+ Cable | 90Y9433 | A1PK |
| 7m IBM Passive DAC SFP+ Cable | 00D6151 | A3RH |

The following figure shows the component side of the QLogic Dual Port 10GbE SFP+ Embedded VFA.
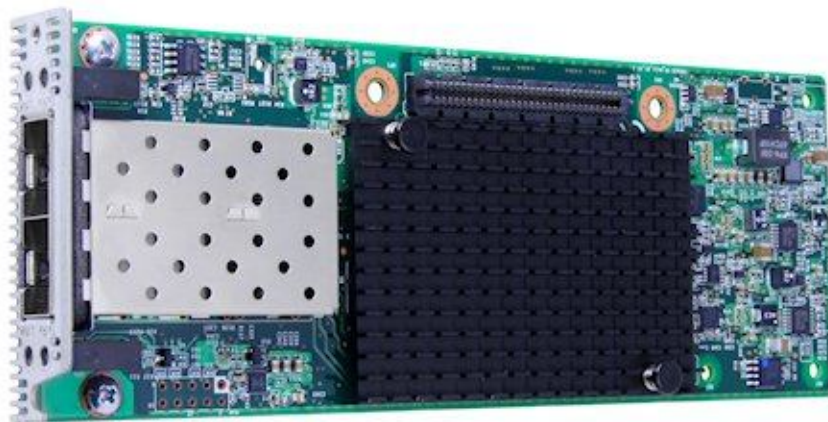


Figure 3. QLogic Dual Port 10GbE SFP+ Embedded VFA

## Features

The QLogic 8200 VFA family is based on the QLogic second generation of Converged Network Controllers, supporting simultaneous LAN (TCP/IP) and SAN (FCoE and iSCSI) traffic at line-rate, 10 Gbps Ethernet speed. This convergence of networking traffic lowers data center costs by eliminating the need for separate LAN and SAN infrastructure. Data centers now need fewer adapters, cables, and switches, which also means reduced power and cooling costs. In addition, these controllers are fully compatible with existing Fibre Channel and iSCSI storage, providing investment protection for existing infrastructure.

The QLogic 8200 VFA family adapters have the following features:

- 10 Gbps per-port maximum throughput for high bandwidth storage (SAN) and networking (LAN) traffic.
- Based on the QLogic 8200 ASIC.
- PCI Express 2.0 x8 host interface.
- Operate at full 10 Gbps line rate on both ports.
- Support for SFP+ transceivers and DAC cables.
- Two form factors:
    - Standard PCIe low-profile form factor adapter fits most M4 systems.
    - Mezzanine form-factor card installed in a dedicated slot on the system board of supported servers.
- Support for Switch Independent vNIC mode, also known as NIC Partitioning or NPAR, where each physical port appears to the server as four virtual NICs. Bandwidth for each vNIC can be configured from 100 Mbps to 10 Gbps. This vNIC mode extends the existing VLANs to the virtual NIC interfaces. It uses IEEE 802.1Q VLAN tags to separate data traffic; the VLAN tags are added to the packet by the applications or drivers rather than by the switch.
- Support for full FCoE and iSCSI hardware offload through the Features on Demand (FoD) license upgrade. This support enables flexibility and investment protection by letting you buy the FCoE or iSCSI license when you need it. FCoE and iSCSI can also be enabled with 4 of the vNIC ports (2 FCoE, 2 iSCSI) if vNIC is also enabled.
- Full support for TCP/IP and Ethernet performance enhancements, such as Priority-Based Flow Control (802.1Qbb), jumbo frames, checksum offloads, and segmentation offloads.
- Support for IPv4 and IPv6.
- Support for Wake on LAN.
- Port 1 can be configured to be a shared management port to remotely connect to the IMM2 management controller.

**Note**: The adapter only supports connectivity to a 10 Gb Ethernet switch. 1 Gb Ethernet connectivity is not supported.

Check the IBM System Storage Interoperation Center (SSIC) for full listing of IBM supported FCoE & iSCSI configurations:
http://ibm.com/systems/support/storage/ssic/interoperability.wss

## Specifications

The QLogic 8200 VFA family adapters have the following specifications:

### Ethernet specifications

- Throughput: 10 Gbps full-duplex line rate per-port

- Ethernet frame: 1500 byte or 9600 byte (jumbo frame)

- Stateless offload:

    - IP, TCP, and UDP checksum offloads
    - Large and giant send offload (LSO and GSO)
    - Large receive offload (LRO)
    - Receive side scaling (RSS)
    - Header-data split
    - Interrupt coalescing
    - VMware NetQueue and Microsoft VMQ

- Wake on LAN

- Enhanced Ethernet

    - Priority-Based Flow Control (802.1Qbb)
    - Enhanced Transmission Selection (802.1Qaz)
    - DCBX Protocol (802.1Qaz)

- Compliance

    - IEEE: 802.3ae (10 Gb Ethernet)
    - 802.3ap (10GBASE-KR)
    - 802.1q (VLAN)
    - 802.3ad (Link Aggregation)
    - 802.1p (Priority Encoding)
    - 802.3x (Flow Control)
    - IPv4 (RFQ 791)
    - IPv6 (RFC 2460)

### FCoE specifications

- Logins: Support for 2,048 concurrent logins and 2,048 active exchanges
- Port virtualization: N_Port ID virtualization (NPIV)
- Compliance:

    - SCSI-3 Fibre Channel Protocol (SCSI-FCP)
    - Fibre Channel Tape (FC-TAPE) Profile
    - SCSI Fibre Channel Protocol-2 (FCP-2)
    - Second Generation FC Generic Services (FC-GS-2)
    - Third Generation FC Generic Services (FC-GS-3)
    - FCoE and FIP (FC-BB-5)

### iSCSI Specifications

- Compliance

    - RFC 3347 (iSCSI Requirements and Design Considerations)
    - CHAP
    - iSNS
    - SLP

## Supported servers

The adapter is supported in the System x servers listed in the following table.

Table 3. 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 8200 Dual Port 10GbE SFP+ VFA | 90Y4600 | N | Y | Y | N | Y | Y | Y | Y | N | Y | N | Y |
| QLogic 8200 VFA FCoE/iSCSI License (FoD) | 00Y5624 | N | N | Y | N | Y | Y | Y | Y | N | Y | N | Y |
| QLogic Dual Port 10GbE SFP+ Embedded VFA | 90Y6454 | N | N | N | N | N | Y† | N | Y† | N | N | N | Y |
| QLogic Embedded VFA FCoE/iSCSI License (FoD) | 90Y5179 | N | N | N | N | N | Y | N | Y | N | N | N | Y |

† The Embedded VFA, 90Y6454, requires both processors be installed in the server to ensure sufficient air flow. The second processor includes additional system fans.

Table 3. 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 8200 Dual Port 10GbE SFP+ VFA | 90Y4600 | N | N | N | N | N | N | N | N | N | N |
| QLogic 8200 VFA FCoE/iSCSI License (FoD) | 00Y5624 | N | N | N | N | N | N | N | N | N | N |
| QLogic Dual Port 10GbE SFP+ Embedded VFA | 90Y6454 | N | N | N | N | N | N | N | N | N | N |
| QLogic Embedded VFA FCoE/iSCSI License (FoD) | 90Y5179 | N | N | N | N | N | N | N | N | N | N |

For the latest information about the System x servers that support this adapter, see the IBM ServerProven® website at http://ibm.com/servers/eserver/serverproven/compat/us/

The following figure shows where the QLogic Dual Port 10GbE SFP+ Embedded VFA is installed in the x3650 M4 server. Its location and connection does not consume any of the available standard PCIe slots.
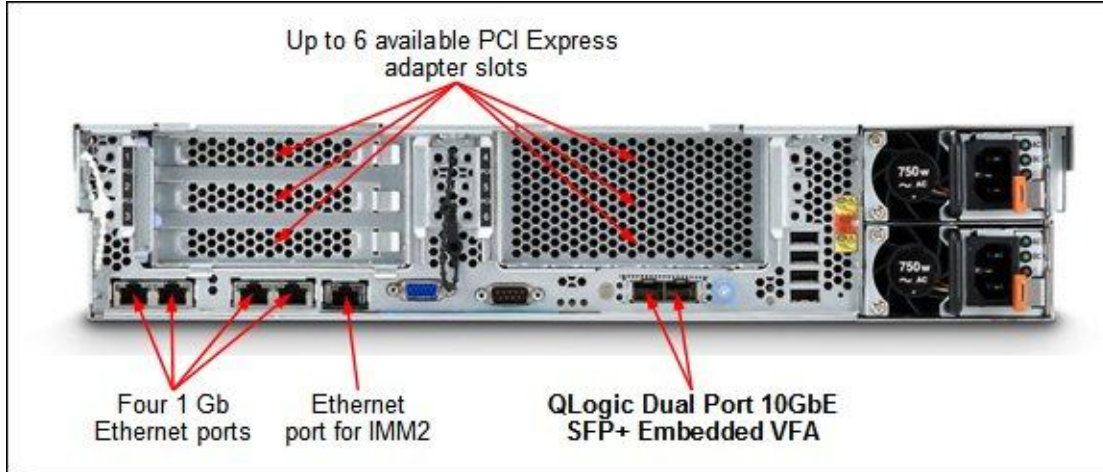


Figure 3. Rear of the IBM System x3650 M4

## Popular configurations

This section illustrates how the QLogic Dual Port 10GbE SFP+ Embedded VFA can be used in 10 Gb Ethernet configurations.

The following figure shows the adapter installed in the x3650 M4 and connected to a pair of IBM RackSwitch G8124E top-of-rack switches.
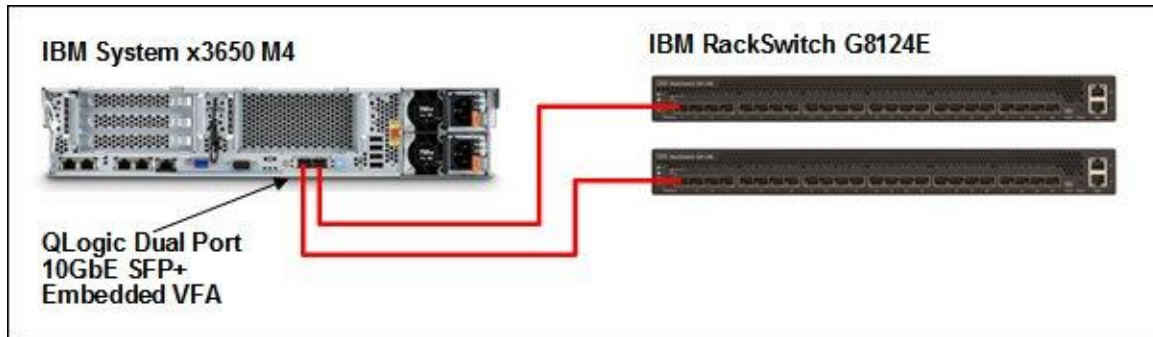


Figure 4. 10 Gb Ethernet solution

The parts used are listed in the following table. We provide two cabling options: a direct-attach copper (DAC) cable option and a fiber optic cable option.

Table 4. Components used when connecting the QLogic adapter to Ethernet switches

| Part number/<br>machine type | Description | Quantity |
|---|---|---|
| 7915 | IBM System x3650 M4 or other supported server | 1 |
| 90Y6454 | QLogic Dual Port 10GbE SFP+ Embedded VFA | 1 |
| 7309BF7 | IBM RackSwitch G8124E | 2 |
| **Direct-attach copper (DAC) cable connectivity** | | |
| 95Y0323 | 1 m IBM Active DAC SFP+ Cable | 2 |
| **Fibre optic cable connectivity** | | |
| 49Y4218 | QLogic 10Gb SFP+ SR Optical Transceiver | 2 |
| 46C3447 | IBM SFP+ SR Transceiver (for the G8124E) | 2 |
| 88Y6851 | 1 m LC-LC Fiber Cable (networking) - Optical | 2 |

## Supported operating systems

The adapters supports the following operating systems:

- Microsoft Windows HPC Server 2008
- 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
- Windows Small Business Server 2008 Premium Edition
- Windows Small Business Server 2008 Standard 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 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/

## Warranty

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

## Physical specifications

The QLogic 8200 Dual Port 10GbE SFP+ VFA for IBM System x has the following physical specifications:

Dimensions and weight (approximate):

- Height: 167 mm (6.60 in)
- Width: 69 mm (2.71 in)
- Depth: 17 mm (0.69 in)
- Weight: 95 g (0.21 lb)

Shipping dimensions and weight (approximate):

- Height: 189 mm (7.51 in)
- Width: 90 mm (3.54 in
- Depth: 38 mm (1.50 in)
- Weight: 450 g (0.99 lb)

The QLogic Dual Port 10GbE SFP+ Embedded VFA has the following physical specifications:

Dimensions (approximate):

- Height: 60 mm (2.4 in)
- Width: 160 mm (6.3 in)
- Depth: 17 mm (0.7 in)

## Operating environment

The adapter is supported in this environment:

- Temperature:

  - Operating: 0° - 55°C (32° - 113°F) at 0 - 914 m (0 - 3000 ft)
  - Storage: -43° - 73°C (-40° - 163°F) at 0 - 914 m (0 - 3000 ft)

- Relative humidity: 5% - 93% (non-condensing)

## Agency approvals

The adapters have the following agency approvals:

- Safety: US, Canada, Europe
- EMI
- EMC
- 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

## Related publications

For more information, refer to these documents:

- Product web page
  http://ibm.com/systems/x/options/networking/adapters.html

- Announcement letter for the QLogic 8200 Dual Port 10GbE SFP+ VFA
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS112-219

- Announcement letter for the QLogic Dual Port 10GbE SFP+ Embedded VFA
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS112-144

- *IBM System x Configuration and Options Guide*
  http://www.ibm.com/support/docview.wss?uid=psg1SCOD-3ZVQ5W

- IBM System Storage Interoperation Center (SSIC)
  http://ibm.com/systems/support/storage/ssic/interoperability.wss

- *IBM System x Networking Interoperability Guide*
  http://ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=XSO03137USEN

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