QLogic 20-Port 8 Gb and 4/8 Gb SAN Switch Modules for BladeCenter

Product Guide (withdrawn product)

The QLogic 20-port 8 Gb and 4/8 Gb SAN Switch Modules for BladeCenter are a high-speed addition to the BladeCenter switch portfolio. Each module helps enable scalability in storage area network (SAN) size and complexity while maintaining ease of management. These modules are full-fabric Fibre Channel (FC) switches which enables high performance SAN connectivity of up to 8 Gbps.

Figure 1 shows the QLogic 20-port 4/8 Gb SAN Switch Module.

Figure 1. QLogic 20-port 4/8 Gb SAN Switch Module for BladeCenter

Did you know?

The switch connects to the midplane directly, without having to use cables or small form-factor pluggable (SFP) modules. By eliminating these components for up to 14 servers, the resulting savings alone cover the BladeCenter chassis investment.

These switch modules are licensed to operate in either full-fabric mode or intelligent pass-thru mode. These modules allow BladeCenter integration with any open-standards-based SAN, whether it is an enterprise open-system fabric functionality using the full-fabric mode or the module with transparent switching functionality using the intelligent pass-thru mode.

Part number information

Table 1 shows the part number to order these modules.

Table 1. Part number and feature code for ordering

Description	Part number	Feature code
QLogic 20-port 8 Gb SAN Switch Module for BladeCenter	44X1905	5478
QLogic 20-port 4/8 Gb SAN Switch Module for BladeCenter	88Y6406	A24C

Each part number includes the following items:

- One QLogic 20-port 8 Gb SAN Switch Module, or QLogic 20-port 4/8 Gb SAN Switch Module
- The Documentation CD
- The *IBM Important Notices* document

Each switch comes without small form-factor pluggable plus (SFP+) modules, and they must be ordered additionally. Table 2 lists the part numbers that are supported.

Table 2. Supported SFPs and SFPs+ for QLogic 20-port 8 Gb and 4/8 Gb SAN Switch Modules

Description	Part number	Feature code
IBM 8 Gb SFP+ SW Optical Transceiver	44X1964	5075
4 Gbps SW SFP Transceiver	39R6475	4804
4 Gbps shortwave SFP transceiver pair	26K7941	2410
4 Gbps SW SFP Transceiver 4 Pack	22R4897	2414
4 Gbps SW SFP Transceiver	22R4902	2410

Features

The QLogic 20-port 8 Gb and 4/8 Gb SAN Switch Module have the following features:

- Six external autosensing Fibre Channel ports (2 Gbps, 4 Gbps, or 8 Gbps for 8 Gb SFP+ transceivers, and 1 Gbps, 2 Gbps, or 4 Gbps for 4 Gb SFP transceivers) that operate at a maximum speed of 8 Gbps
- The QLogic 20-port 8 Gb SAN Switch Module has 14 internal Fibre Channel ports that operate as F_ports (fabric ports) at 2, 4, or 8 Gbps, depending on FC expansion cards installed into blades
- The QLogic 20-port 4/8 Gb SAN Switch Module has 14 internal Fibre Channel ports that operate as F_ports (fabric ports) at 2 Gbps, 4 Gbps, or 8 Gbps, depending on FC expansion cards installed into blades and the I/O module bays the switch is installed in:
    - When installed in an MSIM (BladeCenter H only) or MSIM-HT (BladeCenter HT only), the internal ports operate at up to 8 Gbps
    - When installed in standard I/O module bays 3 or 4, the internal ports operate at up to 4 Gbps
    - When installed in a BladeCenter T chassis, the internal ports operate at 2 Gbps
- Two internal full-duplex 100 Mbps Ethernet interfaces
- External ports that can operate as F_ports (fabric ports), FL_ports (fabric loop ports), or E_ports (expansion ports)
- Power-on self-test diagnostics and status reporting
- Support for Non-Disruptive Code Load Activation (NDCLA)
- Registered State Change Notification (RSCN)
- Support for standards-based FC-SW2 interoperability
- Error detection
    - Cyclic redundancy check (CRC)
    - 8-byte and 10-byte conversion
    - Parity

    - Long frame and short frame
    - D_ID mismatch
    - S_ID mismatch
- Frame bundling
    - No frame bundling (frames are intermixed from different source ports)
    - Soft lockdown (The I/O module waits for the sequence to be completed or a gap in the frame traffic to occur before it services requests from a different port.)
- Configurable Fabric Address Notification (FAN)
- Support for up to 239 switches depending on the configuration
- 8 Gb switch fabric aggregate bandwidth: 320 Gbps at full duplex
- Maximum frame size: 2148 bytes (2112 byte payload)
- Nonblocking architecture to prevent latency
- Support for the Call Home function
- Support for Domain Name Service (DNS)
- Support for Internet Protocol (IP) Version 6
- Support for Internet Protocol security (IPsec)
- Support for separate trap community strings for each trap address
- Support for Simple Network Management Protocol (SNMP) Version 3
- Support for vital product data (VPD)
- Optional SFP+ modules

The following software feature comes with the switch module:

- QuickTools Web interface

The switch supports the following fabric management (all management connections go through the management module):

- Web interface through QuickTools
- Command-line interface (CLI) through the Telnet program
- Enterprise Fabric Suite 2007 application
- Switch SNMP agent, which enables a network management workstation to receive configuration values, traffic information, and FC failure data through SNMP and the Ethernet interface

Supported BladeCenter chassis and expansion cards

The QLogic 20-port 8 Gb and 4/8 Gb SAN Switch Modules are supported in the BladeCenter chassis as listed in Table 3. The switch module fits in a standard I/O bay (bays 3 & 4) and, with the addition of the Multi-Switch Interconnect Module (MSIM) in the BladeCenter H and HT, can also fit in a high-speed I/O bay (bays 7-10). Installing both QLogic 20-port 8 Gb and 4/8 Gb SAN Switch Modules in the one chassis is not supported.

Table 3. BladeCenter chassis that support the QLogic 20-port 8 Gb and 4/8 Gb SAN Switch Modules

I/O module	Part number	BladeCenter S	BladeCenter E	BladeCenter H	BladeCenter T	BladeCenter HT	MSIM	MSIM-HT
QLogic 20-port 8 Gb SAN Switch Module	44X1905	Y	Y	Y	Y	Y	Y	Y
QLogic 20-port 4/8 Gb SAN Switch Module	88Y6406	Y	Y	Y	Y	Y	Y	Y

Speed maximums with the QLogic 20-port 8 Gb SAN Switch Module:

- When the I/O module is installed in an MSIM (BladeCenter H) or MSIM-HT (BladeCenter HT) or switch bays 3 or 4 of a BladeCenter E, S, H or HT chassis, both the internal ports and external ports operate at speeds up to 8 Gbps.
- When the I/O module is installed in switch bays 3 or 4 of a BladeCenter T chassis, the internal ports operate at 2 Gbps, and the external ports operate at speeds up to 8 Gbps.

Speed maximums with the QLogic 20-port 4/8 Gb SAN Switch Module:

- When the I/O module is installed in an MSIM (BladeCenter H) or MSIM-HT (BladeCenter HT), both the internal ports and external ports operate at speeds up to 8 Gbps.
- When the I/O module is installed in switch bays 3 or 4 of a BladeCenter E, S, H or HT chassis, the internal ports operate at speeds up to 4 Gbps, and the external ports operate up to 8 Gbps.
- When the I/O module is installed in switch bays 3 or 4 of a BladeCenter T chassis, the internal ports operate at 2 Gbps, and the external ports operate at speeds up to 8 Gbps.

The QLogic 20-port 8 Gb and 4/8 Gb SAN Switch Modules support the expansion cards listed in Table 4. Table 4 also lists the chassis bays in which the switch modules must be installed when used with each expansion card.

Table 4. Expansion card support and Chassis I/O bay support

Supported expansion cards	Part number	Bay 1 (Standard)	Bay 2 (Standard)	Bay 3 (Standard)	Bay 4 (Standard)	Bay 5 (Bridge)	Bay 6 (Bridge)	Bay 7 (High-speed)	Bay 8 (High-speed)	Bay 9 (High-speed)	Bay 10 (High-speed)
QLogic 4 Gb FC Expansion Card (CFFv)	41Y8527	N	N	Y	Y	N	N	N	N	N	N
QLogic 4 Gb FC Expansion Card (CIOv)	46M6065	N	N	Y	Y	N	N	N	N	N	N
QLogic Ethernet and 8 Gb FC Card (CFFh)	44X1940	N	N	N	N	N	N	N	Y	N	Y
Emulex 8Gb Fibre Channel Exp. Card (CIOv)	46M6140	N	N	Y*	Y*	N	N	N	N	N	N
QLogic 8Gb Fibre Channel Exp. Card (CIOv)	44X1945	N	N	Y*	Y*	N	N	N	N	N	N

* The internal ports of the QLogic 20-port 4/8 Gb SAN Switch Module operate at speeds up to 4 Gbps (with BladeCenter T, the maximum is 2 Gbps)

Popular configurations

The QLogic 20-port 8 Gb and 4/8 Gb SAN Switch Module can be used in various configurations.

Installation in standard switch bays

Figure 2 shows the QLogic 20-port 8 Gb SAN Switch Module that is installed in standard I/O bays in the BladeCenter chassis. The chassis is connected to the IBM System Storage DS3400. The servers in the chassis each have compatible CFFv or CIOv Fibre Channel expansion cards. The Redundant Array of Independent Disks (RAID) functionality is provided by the external storage system.

Tip: Had the QLogic 20-port 4/8 Gb SAN Switch Module been used in this configuration, the internal ports of the switch would operate at 4 Gbps.

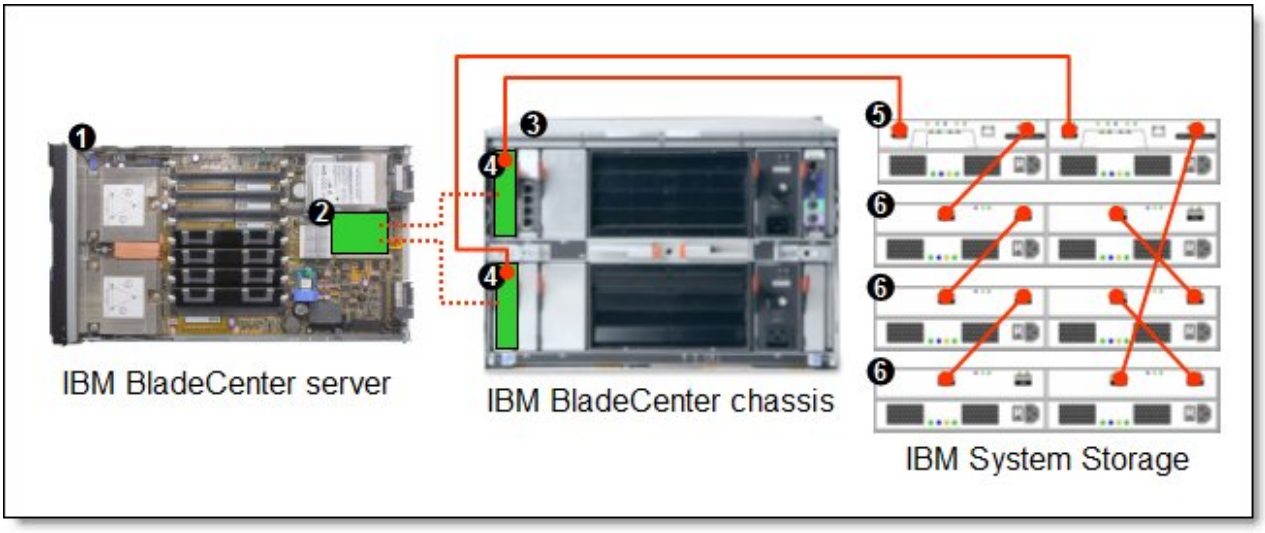

Figure 2. BladeCenter connected to an external IBM System Storage DS3400 storage solution using a CFFv card and standard I/O bays

Table 5 lists the parts that are used in this configuration.

Table 5. Components used as shown in Figure 2

Diagram reference	Part number / Machine type	Description	Quantity
1	Varies	BladeCenter HS22, HS21, or other supported server	1 to 14
2	Varies	Supported CIOv or CFFv expansion card (see Table 4)	1 per server
3	Varies	Supported BladeCenter chassis*	1
4	44X1905	QLogic 20-port 8 Gb SAN Switch Module	1 or 2
5	1726-41X or 1726-42X	IBM System Storage DS3400 (Single or Dual Controller)	1
6	1727	**Optional** IBM System Storage EXP3000 (Single or Dual ESM)	1 to 3
Not shown	39R6536	DS3000 Partition Expansion License	1

* The expansion card can be installed in servers in the BladeCenter S (8886). However, by doing so, you lose the ability to connect to the BladeCenter S Disk Storage Modules (DSMs). The Fibre Channel expansion card goes in place of the SAS expansion card that is needed to connect to the DSMs.

This configuration also requires cabling between the chassis and the storage server and between the storage server and expansion units. (The cable part numbers are not listed in the table.)

Installation in BladeCenter H high-speed switch bays

Figure 3 shows the QLogic 20-port 4/8 Gb SAN Switch Module installed in MSIMs in the BladeCenter H chassis. The chassis is connected to the IBM System Storage DS3400. The servers in the chassis each have compatible CFFh Fibre Channel expansion cards. The RAID functionality is provided by the external storage system. In this configuration the internal ports of the Switch Module operate at 8 Gbps.

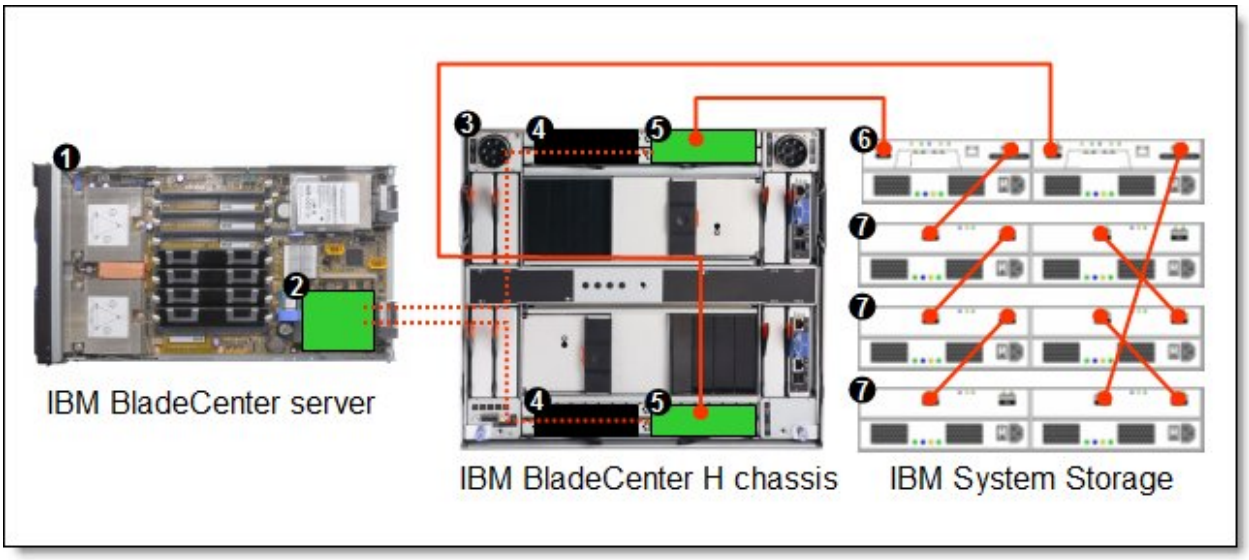

Figure 3. BladeCenter H connected to an external IBM System Storage DS3400 storage solution

Table 6 lists the parts that are used in this configuration.

Table 6. Components used as shown in Figure 3

Diagram reference	Part number / machine type	Description	Quantity
1	Varies	BladeCenter HS22, HS21, or other supported server	1 to 14
2	Varies	Supported CFFh expansion card (see Table 4)	1 per server
3	8852	BladeCenter H chassis	1
4	39Y9314	Multi-switch Interconnect Module	1 or 2
5	88Y6406	QLogic 20-port 4/8 Gb SAN Switch Module	1 or 2
6	1726-41X or 1726-42X	IBM System Storage DS3400 (Single or Dual Controller)	1
7	1727	Optional: IBM System Storage EXP3000 (Single or Dual ESM)	1 to 3
Not shown	39R6536	DS3000 Partition Expansion License	1

This configuration also requires cabling between the chassis and the storage server and between the storage server and expansion units. (The cable part numbers are not listed in the table.)

Connectors and LEDs

The front panel of the QLogic 20-port 8 Gb and 4/8 Gb SAN Switch Module contain the following components, as shown in Figure 4:

- Information LEDs that display the status of the I/O module and its network connections.
- Six external Fibre Channel ports to connect Fibre Channel devices and switches. These ports are labeled 0, 15, 16, 17, 18, and 19 (from top to bottom) on the I/O module.

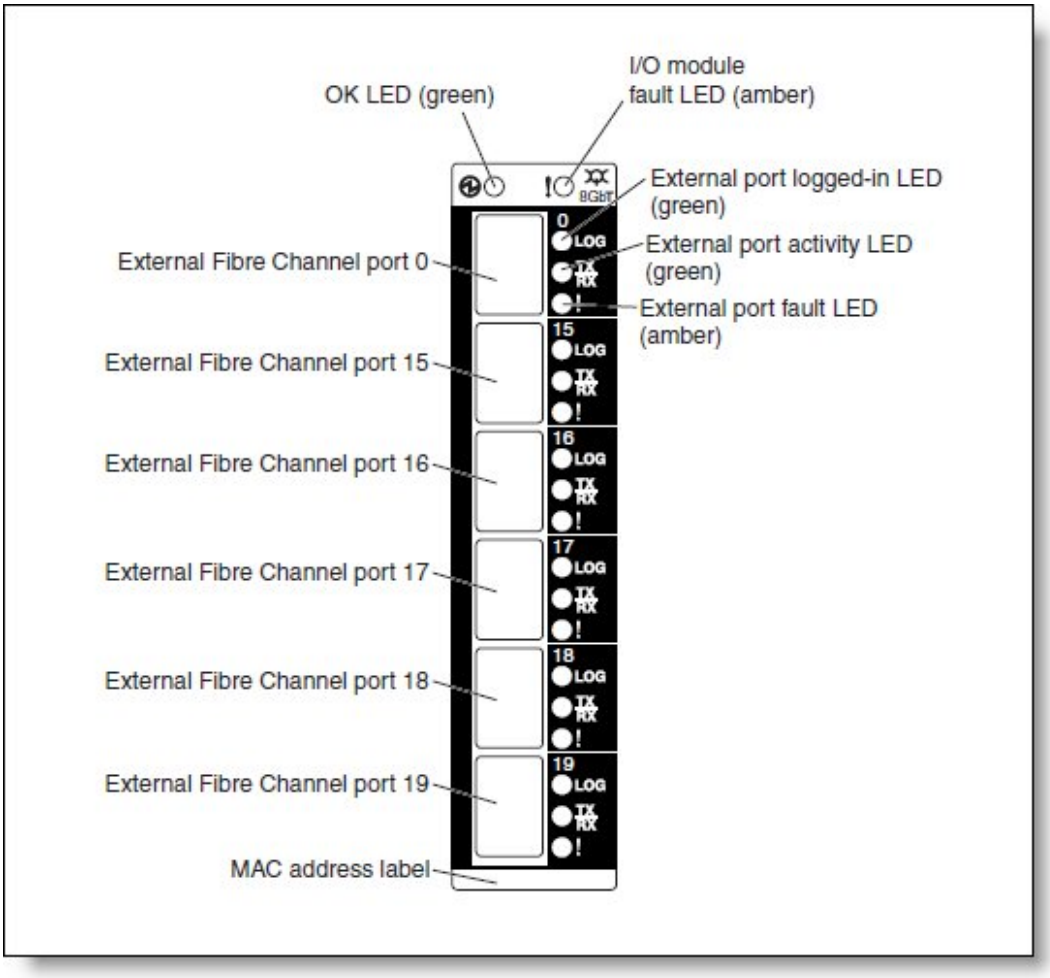

Figure 4. Front panel of the I/O module

Table 7 lists the LEDs on the front panel and their meanings.

Table 7. LEDs on the front panel

LED name	**LED description**
OK	This green LED is at the top left of the I/O module on the front panel and indicates that the module is working properly.
! (I/O module fault)	This amber LED is at the top right of the I/O module on the front panel. This LED indicates that the I/O module has a fault. If the I/O module fails the POST, this fault LED is lit.
External port logged-in (LOG)	There are six green external port logged-in (LOG) LEDs. When one of these LEDs is lit, it indicates that there is a connection (or link) to a device on that port.
External port activity (TX/RX)	There are six green external port activity (TX/RX) LEDs. When one of these LEDs flashes, it indicates that data is being received or transmitted (that is, activity is occurring) on that port. The flash frequency is proportional to the amount of traffic on that port.
External port fault (!)	There are six amber external port fault (!) LEDs. When an external port fault LED is lit, it indicates that the external port has failed the internal, external, or online port diagnostics tests.

Operating environment

The environment has the following temperature and altitude:

- Operating:
  - 10 - 52 °C (50 - 125 °F) at an altitude of 0 to 914 m (0 to 3,000 ft)
  - 10 - 49 °C (50 - 20 °F) at an altitude of 0 to 3,000 m (0 to 10,000 ft)
- Non-operating:
  - 40 - 65 °C (-40 - 149 °F) at an altitude of 0 to 12,000 m (0 to 39,370 ft)

The environment has the following humidity levels:

- Operating: 8% to 80%, noncondensing
- Non-operating: 5% to 80%, noncondensing

Related publications

For more information, see the following documents:

- *QLogic 8 Gb Intelligent Pass-thru Module and 20-port 8 Gb SAN Switch Module Installation and User's Guide*
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5079302
- IBM US Announcement Letter *BladeCenter support options expand with new selection of higher capacity QLogic products*
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS108-862
- *BladeCenter Interoperability Guide*
  http://lenovopress.com/bcig
- *BladeCenter Products and Technology*, SG24-7523
  http://lenovopress.com/sg247523

Related product families

Product families related to this document are the following:

- Blade Storage Modules
- Embedded SAN Switches

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This document, TIPS0693, was created or updated on June 15, 2011.

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