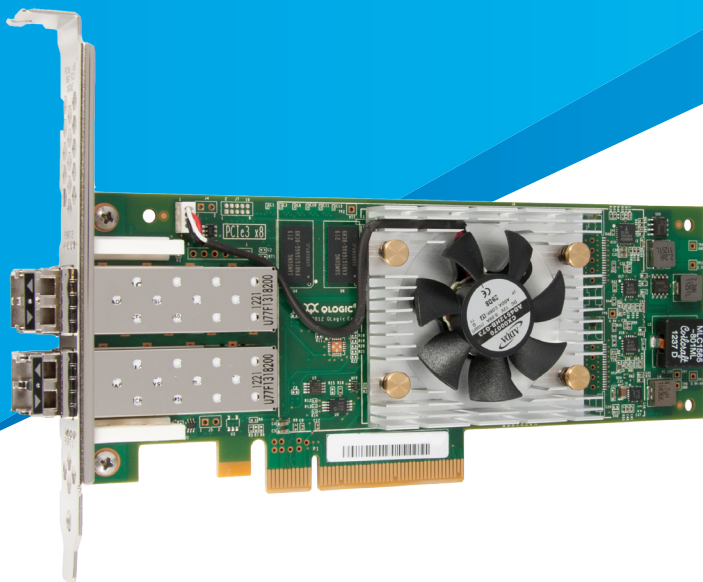


# QLE2670/2672

## Gen 5 (16Gb) Fibre Channel Adapters



- 3,000MBps per port maximum throughput for high bandwidth storage (SAN) traffic
- Up to 1.2 million IOPS reduce latency in high transaction intensive applications and virtualized environments
- Improved reliability and diagnostics with support for Brocade ClearLink
- Enhanced QoS prioritizes SAN traffic for high performance
- Simplified deployment with fabric pre-provisioning
- Future-proof design enables conversion to a 10GbE CNA

### OVERVIEW

The QLogic® QLE2670/2672 Gen 5 (16Gb) Fibre Channel (FC) Adapters boast excellent native Fibre Channel performance—achieving dual-port, line-rate 16Gbps FC throughput—at extremely low CPU usage with full hardware offloads. Gen 5 FC resolves data center complexities by enabling a storage network infrastructure that supports powerful virtualization features, application-aware services, and simplified management. This achievement provides a next-generation storage networking infrastructure capable of supporting the most demanding virtualized and cloud-enabled environments, while fully leveraging the capabilities of high-performance Gen 5 FC and solid-state disk (SSD) storage. These features help reduce cost and complexity while the unmatched 16Gb performance eliminates potential I/O bottlenecks in today's powerful multiprocessor, multicore servers.

#### VIRTUALIZATION OPTIMIZED

The QLE2670/2672, powered by QLogic VMflex® technology, supports standards-based virtualization features. Support for N\_Port ID virtualization (NPIV) enables a single FC adapter port to provide multiple virtual ports, increasing network scalability. Virtual fabric technology allows a single FC adapter port to participate in multiple virtual fabric domains for improved availability. In addition, line-rate 16Gbps throughput per physical port delivers unmatched storage performance to maximize the number of virtual machines per physical server.

#### SUPERIOR PERFORMANCE

Up to 1.2 million I/O transactions per second provides industry-leading application throughput for physical, virtual, and cloud environments. Integrated QLogic StarPower™ technology delivers dynamic power management, which ensures that the PCIe® host bus link uses the minimum number of PCIe lanes to meet the required bandwidth. Overlapping protection domains (OPDs) ensure the highest level of reliability as data moves to and from the PCI bus and FC network. As a result, QLE2670/2672 Adapters consume less power and fewer CPU cycles while maintaining peak performance.

#### INTEGRATED BROCADE FABRIC FEATURES

QLogic Gen 5 FC Adapters include advanced capabilities that are enabled when deployed with supported Brocade® switches. By implementing these industry-leading solutions together, SAN administrators can take advantage of enhanced features that improve availability, streamline deployment, and increase network performance.

Support for Brocade ClearLink® diagnostics, a key Brocade Fabric Vision™ technology, improves availability and support for high-performance fabrics. Using the ClearLink diagnostic port (D\_Port), administrators can quickly run a battery of automated diagnostic tests to assess the health of links and fabric components. As a result, fabric deployment time is reduced and

tedious, manual troubleshooting methods are eliminated, saving thousands of man-hours in enterprise environments.

Fabric pre-provisioning enables servers to be quickly deployed, replaced, and moved across the SAN. By leveraging Brocade's fabric-assigned port world wide name (FA-WWN) and fabric-based boot LUN discovery (F-BLD) capabilities, the creation of zones, LUNs, and other services can be completed before the servers arrive on site—eliminating time consuming, manual tasks that typically delay server deployment.

Network performance can be dramatically improved by implementing the industry-standard class-specific control (CS\_CTL) based frame prioritization quality of service (QoS), which helps to alleviate network congestion. When connected to Brocade Gen 5 FC SAN fabrics and supported target arrays, traffic is classified as it arrives at the switch, and then processed on the basis of configured priorities. Traffic can be dropped, prioritized for delivery, or subjected to limited delivery options. As a result, mission-critical workloads can be assigned a higher priority than less time-sensitive network traffic for optimized performance.

#### **SIMPLIFIED MANAGEMENT**

The QLogic unified management application, QLogic QConvergeConsole® (QCC), provides single-pane-of-glass management for QLogic storage and networking adapters (FC, Ethernet, FCoE, iSCSI, and RDMA-based protocols). In addition, QLogic supports all major APIs for deployment flexibility and integration with third-party management tools, including VMware® vCenter™.

#### **HIGH-AVAILABILITY ARCHITECTURE FROM QLOGIC**

QLogic QLE2670/2672 Gen 5 FC architecture continues to provide complete port-level isolation across its dual-port ASIC. This architecture, unlike other vendor solutions, provides independent function, transmit/receive buffers, an on-chip CPU, DMA channels, and a firmware image for each port. These features enable complete port-level isolation, prevent errors and firmware crashes from propagating across both ports, and provide predictable and scalable performance across both ports. These benefits are essential for enterprise data centers—assuring “five nines” availability for mission-critical applications.

#### **INVESTMENT PROTECTION**

The QLE2670/2672 Adapters are compatible with the same FC software driver stack that has been tested and validated across all major hardware platforms, all major hypervisors and OSes, and has been battle-hardened across millions of enterprise installations. The adapters are backward compatible with existing 4Gb and 8Gb FC (4GFC and 8GFC) infrastructure to leverage existing SAN investments.

In addition, the QLE2670/2672 Adapters support QLogic I/OFlex™ technology, which enables the administrator to modify the adapter's “personality” from FC to Ethernet. This unique ability allows a QLE2670/2672 Adapter to transform from a Gen 5 FC Host Bus Adapter (HBA) to an 8300 Series 10Gb Ethernet (10GbE) Converged Network

Adapter (CNA) that supports Ethernet, FC over Ethernet (FCoE), and iSCSI traffic. This integrated, powerful flexibility simplifies deployment and reduces costs for organizations seeking to deploy a FC SAN today and migrate to an Ethernet SAN in the future.

#### **LEADERSHIP, CONFIDENCE, AND TRUST**

QLogic is the undisputed leader in FC adapters, with over 20 years of experience and multiple generations of FC products that have been qualified by all major server OEMs in multiple form factors. QLogic owns the most established, proven FC stack in the industry with more FC ports shipped than any other vendor.

**Host Bus Interface Specifications**

**Bus Interface**

- PCI Express® 3.0 x4 and 2.0 x8 (x8 physical connector)

**Host Interrupts**

- INTx and MSI-X

**Compliance**

- PCI Express Base Specification, Rev. 3.0
- PCI Express Card Electromechanical Specification, Rev. 3.0
- PCI Bus Power Management Interface Specification, Rev. 1.2

**Fibre Channel Specifications**

**Throughput**

- 16Gbps line rate per port (maximum)

**Logins**

- Support for 2,048 concurrent logins and 2,048 active exchanges
- Expandable to 16K concurrent logins and 32K active exchanges

**Port 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 Fibre Channel Generic Services (FC-GS-2)
- Third Generation Fibre Channel Generic Services (FC-GS-3)

**Tools and Utilities**

**Management Tools and Device Utilities**

- QConvergeConsole: a unified management tool (GUI and CLI) for FC, FCoE, iSCSI, and networking

**Boot Support**

- BIOS, Unified Extensible Firmware Interface (UEFI), Forth code (FCode)

**APIs**

- SNIA HBA API V2
- SMI-S

**Operating Systems**

- For the latest applicable OS information, see <http://driverdownloads.qlogic.com>

**End-to-End Provisioning and Management Features**

*The following features require a supported Brocade switch running Fabric OS version 7.3.0a or later.*

**Performance**

- QoS CS\_CTL

**Diagnostics**

- ClearLink D\_Port

**Deployment and Management**

- FA-WWN
- F-BLD
- FC Ping
- FC Traceroute
- Fabric device management interface (FDMI) enhancements

**Physical Specifications**

**Ports**

- QLE2670: single-port Gen 5 FC
- QLE2672: dual-port Gen 5 FC

**Form Factor**

- Low profile adapter: (6.6 inches × 2.54 inches)
- Custom form factors also available

**Environment and Equipment Specifications**

**Temperature**

- Operating: 0°C to 55°C (32°F to 131°F)
- Storage: -20°C to 70°C (-4°F to 158°F)

**Humidity**

- Relative (noncondensing): 10% to 90%
- Storage: 5% to 95%

**Maximum Cable Distances**

Rate	Multi-Mode Optic			
	Cable and Distance (m)			
	OM1	OM2	OM3	OM4
4Gbps	70	150	380	400
8Gbps	21	50	150	190
16Gbps	*	35	100	125

\* Not supported

**Agency Approvals—Safety**

**US/Canada**

- UL 60950-1; CSA C22.2

**Europe**

- TUV EN60950-1; TUV IEC 60950-1; CB Certified

**Agency Approvals—EMI and EMC (Class A)**

**US/Canada**

- FCC Rules, CFR Title 47, Part 15, Subpart Class A; Industry Canada, ICES-003: Class A

**Europe**

- EN55022; EN55024; EN61000-3-2; EN61000-3-3

**Japan**

- VCCI: Class A

**New Zealand/Australia**

- AS/NZS: Class A

**Korea**

- KC-RRA Class A

**Taiwan**

- BSMI CNS 13438

**Ordering Information**

**QLE2670 (single-port)**

- Ships with SR optical transceivers and standard height bracket installed
- Ships with spare low profile bracket (-CK and -SP models only)

**QLE2672 (dual-port)**

- Ships with SR optical transceivers and standard height bracket installed
- Ships with spare low profile bracket (-CK and -SP models only)



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