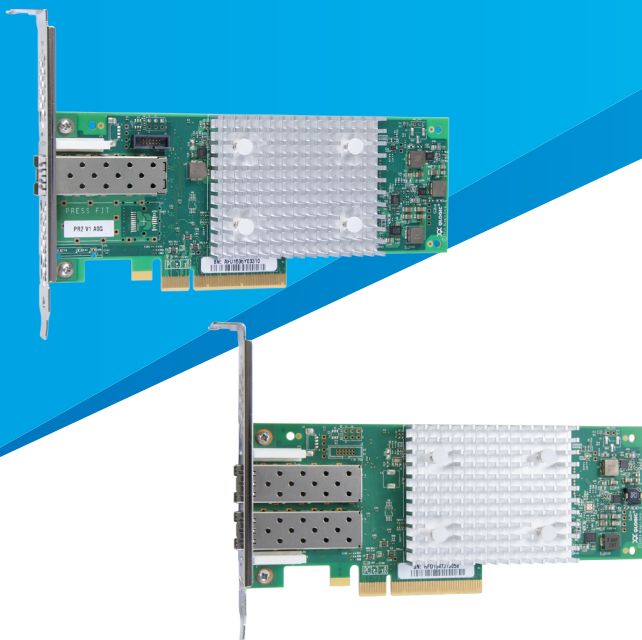


# QLE2740/2740L-DEL and QLE2742/2742L-DEL

## Single and Dual-port 32Gb Fibre Channel Adapters



- Industry leading 32Gb Fibre Channel HBA, available in single and dual-port versions
- Up to 1.3 million IOPS fuel high performance in AFAs and high-density virtualized environments
- Enhanced reliability, diagnostics and accelerated deployment powered by QLogic StorFusion technology
- Port isolation design offers deterministic and scalable performance on each port

### OVERVIEW

The QLogic® QLE274x/274xL-DEL Single and Dual-port 32Gb Fibre Channel (FC) Host Bus Adapters (HBAs) boast industry leading native FC performance with extremely low CPU usage with full hardware offloads.

#### 32Gb FC TECHNOLOGY

The FC solution from QLogic provides the industry's leading 32Gbps adapter. The QLogic FC solution offers higher per-port performance (up to 650K IOPS) with low power consumption. In addition, QLogic StorFusion™ technology delivers streamlined provisioning, guaranteed quality of service (QoS), and improved resiliency with built-in forward error correction (FEC) while addressing the needs of IT organizations that require reliability, integrated management, and guaranteed network performance.

The 32Gb FC technology resolves data center complexities by enabling a storage network infrastructure that supports powerful virtualization features, application-aware services, and simplified management. The QLE274x/274xL-DEL Adapters provide advanced storage networking features capable of supporting the most demanding virtualized and private cloud environments, while fully leveraging the capabilities of high-performance 32Gb FC, all-flash arrays (AFAs), and demanding enterprise applications. Powerful management tools automate and simplify SAN provisioning to help reduce cost and complexity, while the unmatched

32Gbps performance eliminates potential I/O bottlenecks in today's powerful multiprocessor, multicore servers.

#### SUPERIOR PERFORMANCE

The QLE274x/274xL-DEL Adapters can accelerate mission-critical enterprise applications by delivering up to 1.3 million IOPS for physical, virtual, and private cloud environments. QLogic adapters deliver the application performance in virtualized and non-virtualized environments with up to 24,000Mbps of aggregate throughput.

#### VIRTUALIZATION OPTIMIZED

The QLE274x/274xL-DEL Adapters support standards-based virtualization features. Support for N\_Port ID virtualization (NPIV) enables a single FC adapter port to provide multiple virtual ports for increased network scalability. Standard class-specific control (CS\_CTL)-based QoS technology per NPIV port allows bandwidth controls and guarantee per virtual machine (VM). In addition, the 32Gbps line rate per physical port delivers unmatched storage performance to maximize the number of VMs per physical server.

### QLOGIC STORFUSION TECHNOLOGY

QLogic FC Adapters, powered by StorFusion technology, include advanced capabilities when deployed with supported Brocade® switches. By implementing these industry-leading solutions together, SAN administrators can take advantage of enhanced features that improve availability, accelerate deployment, and increase network performance. StorFusion solves the top issues for SAN administrators worldwide.

#### Improved Total Cost of Ownership and Reliability

StorFusion technology delivers advanced link diagnostics, which improve 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.

The QLE274x/274xL-DEL Adapters support link cable beacon (LCB) technology, which enables administrators to visually identify both ends of a physical link. In a large data center with hundreds of ports and cables to manage, a simple command turns on port LED beacons on both ends of a link cable connection. Administrators can use LCB to quickly identify connection peer ports without tracing the cable.

QLogic technology includes the read diagnostic parameters (RDP) feature, which provides detailed port, media, and optics diagnostics. From any point in the fabric, an administrator can use RDP to easily discover and diagnose link-related errors and degrading conditions on any N\_Port-to-F\_Port link.

With ClearLink diagnostics, LCB, and RDP, fabric deployment time is reduced. Tedious manual troubleshooting methods are eliminated, thus saving thousands of man-hours in enterprise environments.

#### Rapid Server Deployment and Orchestration

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

#### Performance SLA Enforcement with VM-level QoS

Network performance can be dramatically improved by implementing the industry-standard CS\_CTL-based frame prioritization QoS, which helps alleviate network congestion. QLogic adapters with StorFusion technology, when connected to supported SAN fabrics, enable the classification of traffic as it arrives at the switch. The classified traffic is then processed on the basis of configured priorities. Traffic can be 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.

#### Higher Resiliency and Performance with Automatic Error Recovery

FEC is automatically used at 32Gbps as required by the Fibre Channel Specification to improve performance and link integrity. FEC improves performance and link integrity to support higher end-to-end data rates by automatically recovering from transmission errors without re-sending the frames. FEC automatically detects and automatically recovers from bit errors, which results in higher availability and performance. Use of FEC is optional at 16Gbps speeds.

#### SIMPLIFIED MANAGEMENT

The QLogic unified management application, QLogic QConvergeConsole® (QCC), provides single-pane-of-glass management across generations of QLogic FC Adapters. In addition, QLogic supports all major APIs for deployment flexibility and integration with third-party management tools, including VMware® vCenter™ and Brocade Network Advisor.

#### HIGH AVAILABILITY AND RELIABILITY

QLogic FC Adapters continue the tradition of providing complete port-level isolation across their FC controller architecture. This architecture, unlike other vendor solutions, provides independent function, transmit and 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 all ports, and provide predictable and scalable performance across all ports. The QLogic architecture delivers ultimate reliability to meet the needs of mission-critical enterprise applications, with lower power and fewer CPU cycles, all while maintaining peak performance.

In addition, overlapping protection domains (OPDs) ensure the highest level of reliability as data moves to and from the PCI® bus and FC network.

The QLE274x/274xL-DEL Adapters also provide end-to-end data integrity with support for T10 Protection Information (T10 PI), which prevents the risk of silent data corruption in environments running Oracle® Linux® with the Unbreakable Enterprise Kernel.

#### LEADERSHIP, CONFIDENCE, AND TRUST

The QLE274x/274xL-DEL 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. Operating at 32Gbps, this adapter is backward compatible with existing 16Gb FC and 8Gb FC infrastructure, leveraging existing SAN investments.

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. 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**

- QLE2740/2740L-DEL: PCIe® 3.0 x8 (single-port)
- QLE2742/2742L-DEL: PCIe 3.0 x8 (dual-port)

**Host Interrupts**

- INTx and MSI-X

**Compliance**

- PCI Express Base Specification, rev. 3.1
- PCI Express Card Electromechanical Specification, rev. 3.0
- PCI Bus Power Management Interface Specification, rev. 1.2

**Fibre Channel Specifications**

**Throughput**

- 32Gbps line rate per port (maximum)

**Logins**

- Support for 2,048 concurrent logins and 2,048 active exchanges per port

**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 FC Generic Services (FC-GS-2)
- Third Generation FC Generic Services (FC-GS-3)
- PCI Hot Plug Specification, rev. 1.1
- Fibre Channel-Physical Interface-5 (FC-PI-5)
- Fibre Channel-Physical Interface-6 (FC-PI-6)

**Tools and Utilities**

**Management Tools and Device Utilities**

- QConvergeConsole: a unified management tool (GUI and CLI) for networking that spans generations of QLogic FC Adapters

**Boot Support**

- BIOS, Unified Extensible Firmware Interface (UEFI)

**APIs**

- SNIA HBA API V2, SMI-S

**Operating Systems**

- For the latest applicable operating system information, see <http://support.dell.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
- FEC

**Diagnostics**

- ClearLink D\_Port
- LCB
- RDP

**Deployment and Management**

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

**Physical Specifications**

**Ports**

- QLE2740/2740L-DEL: single-port FC
- QLE2742/2742L-DEL: dual-port FC

**Form Factor**

- Low-profile PCIe card (6.6 inches x 2.731 inches)

**Environment and Equipment Specifications**

**Temperature**

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

**Humidity**

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

**Maximum Cable Distances**

Rate	Multi-Mode Optic Cable and Distance (m)		
	OM2	OM3	OM4
8Gbps	50	150	190
16Gbps	35	100	125
32Gbps	20	70	100

**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****QLE2740-DEL-BK (403-BBMI)**

- Single-port 32Gb FC HBA
  - Ships in a bulk packed box with a standard-height bracket installed
  - Ships with SR optical transceivers installed
- 

**QLE2740L-DEL-BK (403-BBMN)**

- Single-port 32Gb FC HBA, low profile
  - Ships in a bulk packed box with a low-profile bracket installed
  - Ships with SR optical transceivers installed
- 

**QLE2742-DEL-BK (403-BBML)**

- Dual-port 32Gb FC HBA
  - Ships in a bulk packed box with a standard-height bracket installed
  - Ships with SR optical transceivers installed
- 

**QLE2742L-DEL-BK (403-BBMM)**

- Dual-port 32Gb FC HBA, low profile
- Ships in a bulk packed box with a low-profile bracket installed
- Ships with SR optical transceivers installed



Follow us:       

**Corporate Headquarters** QLogic Corporation 26650 Aliso Viejo Parkway Aliso Viejo, CA 92656 949-389-6000

**International Offices** UK | Ireland | Germany | France | India | Japan | China | Hong Kong | Singapore | Taiwan | Israel

© 2016 QLogic Corporation. All rights reserved worldwide. QLogic, the QLogic logo, StorFusion, and QConvergeConsole, are trademarks or registered trademarks of QLogic Corporation. Brocade and ClearLink are registered trademarks of Brocade Communications Systems, Inc. Linux is a registered trademark of Linus Torvalds. Oracle is a registered trademark of Oracle Corporation. PCI, PCIe, and PCI Express are trademarks or registered trademarks of PCI-SIG. VMware and vCenter are trademarks or registered trademarks of VMware, Inc. All other brand and product names are trademarks or registered trademarks of their respective owners.

This document is provided for informational purposes only and may contain errors. QLogic reserves the right, without notice, to make changes to this document or in product design or specifications. QLogic disclaims any warranty of any kind, expressed or implied, and does not guarantee that any results or performance described in the document will be achieved by you. All statements regarding QLogic's future direction and intent are subject to change or withdrawal without notice and represent goals and objectives only.