Lenovo ThinkSystem Marvell® QLogic QLE2740/2742

Single and Dual Port Gen 6 (32Gb) Fibre Channel Adapters

- Industry leading Gen 6 Fibre Channel HBA from Marvell QLogic® available in single and dual-port versions
- Up to 1.3 million IOPS fuel high performance in AFA and-high-density virtualized environments
- Enhanced reliability, diagnostics, and accelerated deployment powered by Marvell QLogic StorFusion™ technology
- Port isolation design offers deterministic and scalable performance on each port

Overview

The Lenovo ThinkSystem® Marvell QLogic QLE2740 and QLE2742 Adapters are Lenovo's first Gen 6, 32Gb Fibre Channel (32GFC) HBAs available in single and dual ports. The QLE2740 and QLE2742 Adapters boast leading native FC performance with extremely low CPU usage and full hardware offloads.

32GB Gen 6 FC Technology

The Lenovo Gen 6 FC HBAs fare the industry's leading 32GFC adapters, offering higher per-port performance (up to 650K IOPS) with low power consumption compared to Gen 5 FC. In addition, Marvell QLogic StorFusion technology delivers streamlined provisioning, guaranteed quality of service (QoS), and improved resiliency with built-in FEC. StorFusion addresses the needs of IT organizations that require reliability, integrated management, and guaranteed network performance.

Gen 6, 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 Lenovo ThinkSystem Marvell QLogic QLE2740 and QLE2742 Adapters provide advanced storage networking features that support the most demanding virtualized and private cloud environments. These adapters fully leverage 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 32GFC performance eliminates potential I/O bottlenecks in today's powerful multiprocessor, multicore servers.

Superior Performance

The QLE2740 and QLE2742 Adapters can accelerate mission-critical enterprise applications by delivering up to 1.3 million IOPS for physical, virtual, and private cloud environments. These two adapters deliver the application performance in virtualized and non-virtualized environments with up to 12,000MBps of aggregate throughput.

Virtualization Optimized

The QLE2740 and QLE2742 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. In addition, the 32GFC line rate per physical port delivers unmatched storage performance to maximize the quantity of VMs per physical server.

Marvell Qlogic Storfusion Technology

The Lenovo ThinkSystem Gen 6 FC Adapters, powered by StorFusion technology, include advanced capabilities when deployed with supported Brocade® switches. By implementing these industry-leading solutions, 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 TCO and Reliability

StorFusion technology delivers advanced link diagnostics, which improve availability and provide support for high-performance fabrics. Using the adapter's Diagnostics Port feature with a Brocade switch that supports ClearLink®, administrators can quickly run a battery of automated diagnostic tests to assess the health of links and fabric components.

The Lenovo ThinkSystem Marvell QLogic QLE2740 and QLE2742 Adapters support link cable beacon (LCB), 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.

Marvell QLogic StorFusion technology on these adapters 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.

ClearLink diagnostics, LCB, and RDP reduce fabric deployment time and eliminate tedious, manual troubleshooting methods, 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. When Lenovo adapters with Marvell QLogic StorFusion technology are connected to supported SAN fabrics, traffic is classified as it arrives at the switch, and 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

As required by the Fibre Channel Specification, FEC is automatically used at 32GFC 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.

Automatic buffer-to-buffer credit recovery (BB-CR) helps overcome performance degradation, congestion, and link resets caused by buffer credit loss, especially on longer distance and high-loss fiber connections.

Simplified Management

The unified management application, QConvergeConsole® (QCC), provides single-pane-of-glass management across generations of Marvell QLogic FC Adapters. In addition, QCC 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

Lenovo ThinkSystem 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 Marvell 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 QLE2740 and QLE2742 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.cycles, all while maintaining peak performance.

Leadership, Confidence, and Trust

The QLE2740 and QLE2742 Adapters are compatible with the same FC software driver stack that has been tested and validated across all major hardware platforms, as well as all major hypervisors and operating systems. Operating at 32GFC, these adapters are backward compatible with existing 16GFC and 8GFC infrastructure to leverage existing SAN investments.

Marvell QLogic technology makes it the undisputed leader in FC adapters, with over 20 years of experience, 17.5 million ports shipped, and multiple generations of FC products that have been the leading choice of Lenovo customers. Marvell 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: PCIe® 3.0 ×8 (single-port)
- QLE2742: PCIe 3.0 ×8 (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

- 32GFC 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 Fibre Channel Generic Services (FC-GS-2)*
- *Third Generation Fibre Channel 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 Marvell 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 https://www.marvell.com/support/downloads.html

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

- Diagnostics port[1]
- LCB
- RDP

Deployment and Management

- FA-WWN[1]
- F-BLD[1]
- FC Ping
- FC Traceroute
- Fabric device management interface (FDMI) enhancements

Physical Specifications

Ports

- QLE2740: single-port Gen 6 FC
- QLE2742: dual-port Gen 6 FC

Form Factor

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

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

- Multimode optic:

Rate	Cable and Distance (m)		
	OM2	OM3	OM4
8GFC	50	150	190
16GFC	35	100	125
32GFC	20	70	100

US/Canada

- UL 60950-1
- CSA C22.2

Europe

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

Agency Approvals[1]—EMI and EMC (Class A)

US and 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 and Australia

- AS/NZS: Class A

Korea

- KC-RRA Class A

Taiwan

- BSMI CNS 13438

Ordering Information

QLE2740 (Single Port)
[Lenovo part number 7ZT7A00516]

- Ships in a bulk packed box with a standard-height bracket installed
- Ships with a spare low profile bracket
- Ships with SR optical transceiver installed

QLE2742 (Dual Port)
[Lenovo part number 7ZT7A00518]

- Ships in a bulk packed box with a standard-height bracket installed
- Ships with a spare low profile bracket
- Ships with SR optical transceivers installed

Disabled (default); can be enabled by user.

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To deliver the data infrastructure technology that connects the world, we're building solutions on the most powerful foundation: our partnerships with our customers. Trusted by the world's leading technology companies for 25 years, we move, store, process and secure the world's data with semiconductor solutions designed for our customers' current needs and future ambitions. Through a process of deep collaboration and transparency, we're ultimately changing the way tomorrow's enterprise, cloud, automotive, and carrier architectures transform—for the better.