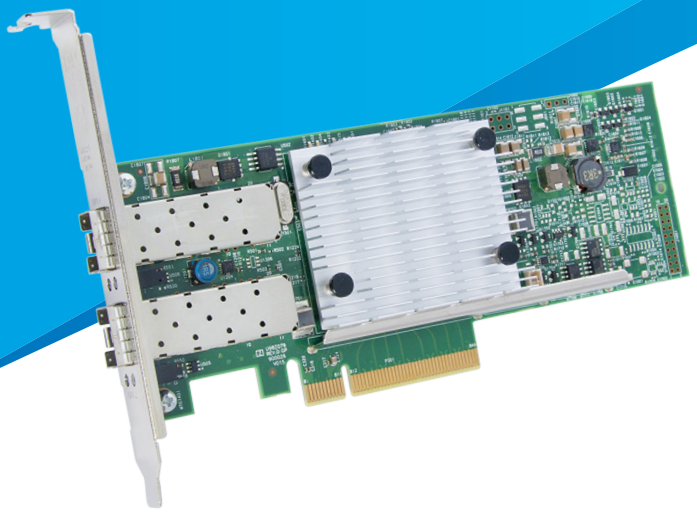
QLOGIC The Ultimate in Performance

Data Sheet

# QLogic 8400 Series

## 10Gbps Ethernet-to-PCIe Converged Network Adapters



- Delivers full line-rate 10GbE performance across both ports
- Consolidates network traffic (TCP/IP, FCoE, and iSCSI) over converged 10GbE connections
- Enables provisioning of 10GbE ports for greater deployment flexibility through switch-independent NIC partitioning
- Boosts host CPU efficiency with hardware offloads for network (TCP/IP) and storage (FCoE and iSCSI) data traffic
- Industry-leading storage (FCoE and iSCSI) transactional performance

## OVERVIEW

The QLogic® 8400 Series Converged Network Adapters support simultaneous LAN (TCP/IP) and SAN (Fibre Channel over Ethernet [FCoE] and iSCSI) traffic at 10Gbps Ethernet (GbE) line rate speeds. The 8400 Series provides extremely low host CPU usage by enabling full hardware offloads.

The 8400 Series leverages QLogic's long-standing industry leadership in Ethernet by providing the highest levels of performance, efficiency, and scalability for the enterprise data center.

For more effective utilization of the 10GbE bandwidth, the QLogic 8400 Series Converged Network Adapters offer switch-independent NIC partitioning (network partitioning [NPAR]), which enables segmentation of a single 10GbE port into multiple network partitions and dynamic allocation of bandwidth to each port. The segmentation allows IT organizations to optimize resource utilization while lowering infrastructure and operational costs.

The acceleration of data center convergence—triggered by virtualization, software-defined networking (SDN), and multitenant cloud computing platforms—demands high-performance, converged network solutions. The QLogic 8400 Series Converged Network Adapters are the solution of choice for workload-intensive computing environments, providing a reliable, high-performance 10GbE connectivity solution.

### FEATURES

- PCI Express® (PCIe®) Gen3 x8 (8GT/s) support
- Full line-rate performance across both ports
- Broad OS and hypervisor support
- Network boot support:
  - iSCSI remote boot
  - FCoE boot from SAN
  - Pre-execution environment (PXE) 2.0
- Switch-independent NIC partitioning with up to four partition assignments per 10GbE link
- MSI and MSI-X support
- IPv4 and IPv6 offloads
- PCI-SIG® single root input/output virtualization (SR-IOV)
- Comprehensive stateless offloads

## FEATURES (*continued*)

- RX/TX multiqueue:
  - VMware® NetQueue™
  - Microsoft® virtual machine queue (VMQ)
  - Linux® Multiqueue
- Tunneling offloads for Network Virtualization using Generic Routing Encapsulation (NVGRE) and Virtual Extensible LAN (VXLAN)
- Receive side scaling (RSS)
- Transmit side scaling (TSS)
- Support for virtual LAN (VLAN) tagging
- Support for jumbo frames larger than 1,500 bytes
- Network teaming, failover, and load balancing:
  - Smart Load Balancing™ (SLB)
  - Link aggregation control protocol (LACP) and generic trunking
- Data center bridging (DCB)

## BENEFITS

### Designed for Next-Gen Server Virtualization

The 8400 Series Converged Network Adapters support today's most compelling set of powerful networking virtualization features: SR-IOV, switch-independent NIC partitioning (NPAR), tunneling offloads (VXLAN and NVGRE), and industry-leading performance, thus enhancing the underlying server virtualization features.

- SR-IOV delivers higher performance and lower CPU utilization with increased virtual machine (VM) scalability.
- QLogic NPAR enables up to four physical, switch-agnostic NIC partitions per adapter port that are switch independent. Dynamic and fine-grained bandwidth provisioning enables seamless migration to 10GbE infrastructure.
- Concurrent support for SR-IOV and NPAR enables virtual environments with the choice and flexibility to create an agile virtual server platform.
- Designed to meet the demands of large public cloud deployments, the 8400 Series Converged Network Adapters feature tunneling offloads for multitenancy with VXLAN and NVGRE support.
- The 8400 Series is designed for maximum flexibility, which enables simultaneous, fully-offloaded, high-performance, multiprotocol (FCoE, iSCSI, and NIC) support from each independent port of the adapter.

### Extreme Application Performance

The QLogic 8400 Series Adapter features a high-speed, flexible architecture driven by independent ultra-high performance engines. It delivers the industry's highest performance to meet and exceed the peak demands of the most demanding enterprise application or virtual platform.

- Availability of both RSS and TSS allows for more efficient load balancing across multiple CPU cores.
- Increases server performance with full hardware offload for storage traffic.
- Industry-leading FCoE performance of up to 2.6 million IOPS, suitable for high-density server virtualization and large databases.
- Industry-leading iSCSI performance of up to 1.5 million IOPS, suitable for a diverse set of applications leveraging the flexibility of iSCSI.

### Operating Expense Savings with Low-Power PCI Express Gen3

The 8400 Series Converged Network Adapters are PCIe Gen3-based adapters that have one of the lowest power consumption profiles in the industry.

- Supporting the latest generation of host bus connectivity, PCIe Gen3 enables the 8400 Series Adapters to deliver line rate dual-port performance without compromise.
- The 8400 Series Adapters are designed to provide maximum power efficiency, consuming a mere 7.1 watts (single-port) of power and yet delivering a fully-offloaded, high-performance I/O connectivity platform.

### Leadership, Confidence, and Trust

QLogic adapters offer users peace of mind and confidence, as proven through the company's market share leadership: #1 in Converged Network Adapters. The 8400 Series Converged Network Adapters offer the highest reliability, availability, and serviceability options that customers rely on to meet and exceed stringent service-level agreements for enterprise data centers.

## Host Bus Interface Specifications

Bus Interface
- PCI Express Gen3 x8 (x8 physical connector)

Host Interrupts
- MSI-X supports independent queues

I/O Virtualization and Multitenancy
- SR-IOV
- Switch-independent NIC partitioning
- Generic routing encapsulation (NVGRE) packet task offloads
- Virtual Extensible LAN (VXLAN) packet task offloads

Compliance
- *PCI Base Specification*, rev. 3.0
- *PCI Bus Power Management Interface Specification*, rev. 1.2
- Advanced configuration and power interface (ACPI) v2.0

## Ethernet Specifications

Throughput
- 10Gbps line rate per port

Ethernet Frame
- 1,500 bytes and larger (jumbo frame)

Stateless Offload
- TCP segmentation offload (TSO)
- Large send offload (LSO)
- Large receive offload (LRO)
- Giant send offload (GSO)
- TCP and user datagram protocol (UDP) checksum offloads
- Receive segment coalescing (RSC)
- Interrupt coalescing
- RSS and TSS
- VMware NetQueue, Microsoft VMQ, and Linux Multiqueue

Compliance
- IEEE 802.3ae (10Gb Ethernet)
- IEEE 802.1q (VLAN)
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.3x (Flow Control)
- IPv4 (RFC 791)
- IPv6 (RFC 2460)
- IEEE 802.1Qbb (Priority-Based Flow Control)
- IEEE 802.1Qaz (data center bridging exchange (DCBX) and enhanced transmission selection [ETS])

## FCoE Specifications

Performance
- 2.6 million FCoE IOPS (QLE8442)

## iSCSI Specifications

Performance
- 1.5 million iSCSI IOPS (QLE8442)

## Tools and Utilities

Management Tools and Device Utilities
- Advanced Control Suite™ (ACS)
- Native OS management tools for networking

Boot Support
- iSCSI remote boot
- FCoE boot from SAN
- PXE 2.0

Operating System Support
- For the latest applicable operating system information, see http://driverdownloads.qlogic.com

## Physical Specifications

Ports
- QLE8440: single 10Gbps Ethernet
- QLE8442: dual 10Gbps Ethernet

Form Factor
- PCI Express short, low-profile card: 167.64mm × 68.91mm (6.60in. × 2.71in.)

## Agency Approvals—EMI and EMC[1]

US and Canada
- FCC Rules,CFR Title 47, Part 15, Subpart B:2013 Class A
- Industry Canada, ICES-003:2012 Class A

Europe
- EN55022:2010/CISPR 22:2009+A1:2010 Class A
- EN55024:2010
- EN61000-3-2:2006 A1+A2:2009
- EN61000-3-3:2008

Japan
- VCCI:2012-04; Class A

Australia and New Zealand
- AS/NZS; CISPR 22:2009+A1:2010 Class A

Korea
- KC-RRA KN22 KN24(2013) Class A

## Agency Approvals—Safety[1]

US and Canada
- UL 60950-1 (2nd Edition) 2007
- CSA C22.2 No.60950-1-07 (2nd Edition) 2007

Europe
- TUV EN60950-1:2006+A11+A1+A12 2nd Edition
- TUV IEC 60950-1:2005 2nd Edition Am 1:2009 CB

## Environmental and Equipment Specifications

Temperature
- Operating: 32°F to 131°F (0°C to 55°C)
- Storage: –40°F to 149°F (–40°C to 65°C)

Airflow
- QLE8440 and QLE8442: 200LFM

Humidity (Relative, Non-condensing)
- Operating and non-operating: 10% to 90%

Power
- QLE8440-CU/-SR: 7.1 watts (nominal)
- QLE8442-CU/-SR: 7.65 watts (nominal)

## Ordering Information

QLE8440-CU (Single Port)
- Ships with empty SFP+ cages (optics and cables are not included)[2]

QLE8442-CU (Dual Port)
- Ships with empty SFP+ cages (optics and cables are not included)[2]

QLE8440-SR (Single Port)
- Ships with SR optical transceiver[2]

QLE8442-SR (Dual Port)
- Ships with SR optical transceivers[2]

1 Agency certifications are pending.

2 Ships with a standard-size bracket installed. A spare low-profile bracket (-CK and -SP only) is also included.

## DISCLAIMER

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