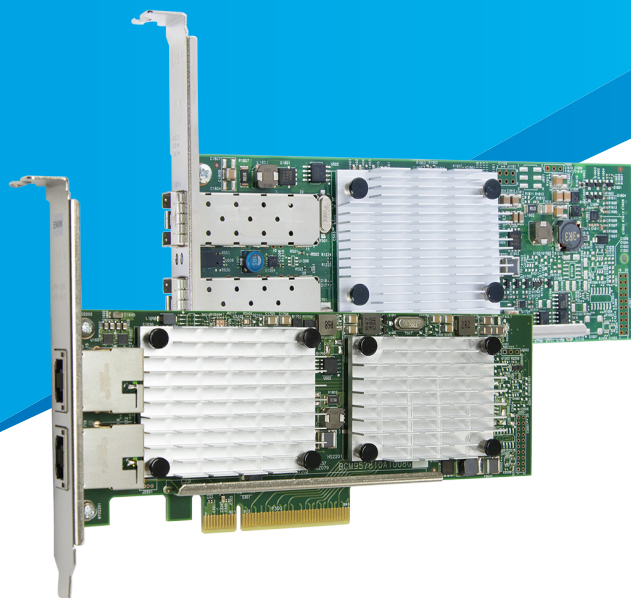


# QLogic® FastLinQ™ 3400 Series

10Gbps Ethernet-to-PCIe® Intelligent Ethernet Adapters



- Delivers full line-rate 10GbE performance across both ports
- Enables provisioning of 10GbE ports for greater deployment flexibility through switch-independent NIC partitioning
- Boosts host CPU efficiency with hardware offloads for NVGRE and VXLAN tunnels
- Improves reliability and interoperability—leverages QLogic’s market-proven Ethernet architecture and software
- 10GBASE-T version provides a low-cost and easy-to-install RJ45 network connectivity solution that is backward compatible with existing 1GbE

## OVERVIEW

The QLogic® FastLinQ™ 3400 Series Intelligent Ethernet Adapters—available in 10GBASE-T (RJ45), SR optic, and direct attach copper (DAC)—support LAN (TCP/IP) traffic at 10Gbps Ethernet (GbE) line-rate speeds. The 3400 Series provides extremely low host CPU usage by enabling full hardware offloads.

The 3400 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 FastLinQ 3400 Series Intelligent Ethernet 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 evolution of data centers—triggered by high-density server virtualization, software-defined networking (SDN), and multitenant cloud computing platforms—demands a high-performance 10GbE solution that boosts CPU efficiency, and reduces capital expenditures (CAPEX) and

operating expense (OPEX) of the migration to 10GbE. The QLogic FastLinQ 3400 Series Intelligent Ethernet 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 for pre-execution environment (PXE) 2.0
- Switch-independent NIC partitioning with up to four partition assignments per 10GbE link
- Energy efficient Ethernet (EEE) support reduces idle power consumption in RJ45-based networks
- 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)
- Storage over Ethernet:
  - iSCSI using OS-based software initiators

**BENEFITS****Simplified Migration to 10GbE**

QLogic FastLinQ 3400 Series Adapters feature a high-speed flexible architecture and switch-independent NIC partitioning (NPAR) technology. Designed for both physical and virtual environments, this switch-agnostic approach enables administrators to split up the 10GbE network pipe to divide and reallocate bandwidth and resources, as needed, at the adapter level.

- Customers deploying rack and tower servers with multiple GbE adapters can greatly benefit from consolidating multiple network adapters and freeing up PCI slots for other add-in card upgrades.
- With NPAR, 3400 Series Adapters can further partition their network bandwidth into multiple virtual connections, making one dual-port adapter appear as eight adapters to the OS for use by the applications.
- NPAR greatly simplifies the physical connectivity to the server, reduces implementation time, and lowers the acquisition cost of the 10GbE migration.
- Available in 10GBASE-T, SR optic, and DAC, 3400 Series Adapters are the ideal choice for migrating multiple 1GbE network connections to consolidated 10GbE.
- Ability to converge storage and networking I/O by deploying OS-based software iSCSI initiators over the 3400 Series Adapters' 10GBASE-T and optical or DAC connections. (Note: The QLogic 8400 Series Adapters deliver a fully offloaded iSCSI solution that conserves CPU resources and delivers maximum performance.)

**Designed for Next-Gen Server Virtualization**

3400 Series Intelligent Ethernet Adapters support today's most compelling set of powerful networking virtualization features, including SR-IOV, enhanced network 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, switch-independent NIC partitions per adapter port. Dynamic and fine-grained bandwidth provisioning enables control of network traffic from VMs and hypervisor services.
- Concurrent support for SR-IOV and NPAR enables virtual environments with the choice and flexibility to create an agile virtual server platform.
- Availability of both RSS and TSS allows for more efficient load balancing across multiple CPU cores.

**High-Performance Multitenancy Delivered**

As large-scale private and public cloud deployment requirements for isolation and security stretch the boundaries of traditional VLANs, the 3400 Series Intelligent Ethernet Adapters deliver network virtualization features for high-performance overlay networks with tunneling offloads for VXLAN and NVGRE technologies.

- Designed to meet the demands of large, public cloud deployments, the 3400 Series Adapters feature tunneling offloads for multitenancy with VXLAN and NVGRE support.
- Line-rate 10GbE performance across individual ports, in multitenant deployments, maximizes server-processing performance by delivering an offloaded NIC for cloud deployments on Microsoft Windows Server 2012 and VMware vSphere™.

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

The 3400 Series 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 3400 Series Intelligent Ethernet Adapters to deliver line-rate, dual-port performance without compromise.
- 3400 Series Adapters are designed to provide maximum power efficiency, consuming a mere 7.1 watts (nominal, single-port -CU with DAC) of power and yet delivering a high-performance, I/O connectivity platform.

**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)
- IEEE 802.3an 10GBASE-T
- IEEE 802.3ab 1000BASE-T
- IEEE 802.3u 100BASE-TX
- 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])

**Tools and Utilities****Management Tools and Device Utilities**

- QLogic Control Suite (QCS)
- Native OS management tools for networking

**Boot Support**

- PXE 2.0

**Operating System Support**

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

**Physical Specifications****Ports**

- QLE3440: single 10Gbps Ethernet
- QLE3442: dual 10Gbps Ethernet

**Form Factor**

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

**Agency Approvals—EMI and EMC <sup>1</sup>****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

<sup>1</sup> Agency certifications are pending.

**Agency Approvals—Safety <sup>1</sup>****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**

- 100LFM at 55°C

**Humidity (Relative, Non-condensing)**

- Operating and non-operating: 10% to 90%

**Power**

- QLE3440-CU: 7.1 watts (nominal)
- QLE3442-CU: 7.65 watts (nominal)
- QLE3440-SR: 8.1 watts (nominal)
- QLE3442-SR: 9.65 watts (nominal)
- QLE3442-RJ: 15.5 watts (nominal)

**Cabling Distance (Maximum)**

- QLE3442-RJ: CAT6a/7 up to 100 meters

**Ordering Information****QLE3440-CU (Single Port)**

- Ships with empty SFP+ cages (optics and cables are not included)<sup>2</sup>

**QLE3442-CU (Dual Port)**

- Ships with empty SFP+ cages (optics and cables are not included)<sup>2</sup>

**QLE3442-RJ (Dual Port)**

- Ships with RJ45 connectors (10GBASE-T). Intended for use with twisted pair copper cabling (not included)<sup>2</sup>

**QLE3440-SR (Single Port)**

- Ships with SR optical transceiver<sup>2</sup>

**QLE3442-SR (Dual Port)**

- Ships with SR optical transceivers<sup>2</sup>

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

**DISCLAIMER**

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