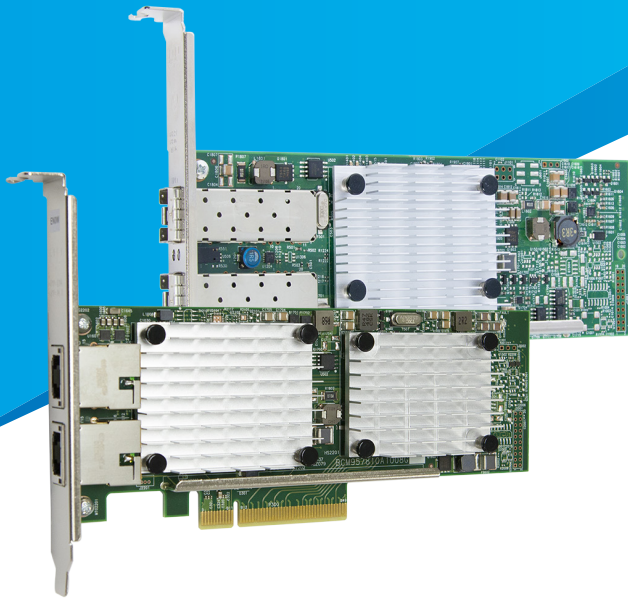# QLogic FastLinQ 3400 Series

10Gb Ethernet 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 GRE, 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
- Simplifies deployment, troubleshooting, and lifecycle management using the QLogic QConvergeConsole® GUI, QLogic Control Suite™ CLI, vCenter Plug-in, and OpenStack integration

OVERVIEW

The QLogic® FastLinQ™ 3400 Series 10Gb Ethernet (10GbE) Intelligent Ethernet Adapters—available in 10GBASE-T (RJ45), SR optic, and direct attach copper (DAC)—support LAN (TCP/IP) traffic at 10Gb Ethernet (10GbE) line-rate speeds. The 3400 Series provides extremely low host CPU usage by enabling full stateless 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 (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 operational expenditures (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®) 3.0 x8 (8GT/s) support
- Full line-rate performance across both ports
- Broad OS and hypervisor support
- Network boot support:
  - iSCSI remote boot
  - Preboot Execution Environment (PXE) 2.0
- Switch-independent NPAR with up to four partition assignments per 10GbE link
- Energy Efficient Ethernet (EEE) support for reduced idle power consumption in RJ45-based networks
- MSI and MSI-X support
- IPv4 and IPv6 offloads
- PCI-SIG® Single Root I/O Virtualization (SR-IOV)
- Comprehensive stateless offloads

FEATURES (*continued*)

- RX/TX multiqueue:
  - VMware® NetQueue
  - Windows® Hyper-V® Virtual Machine Queue
  - Linux® Multiqueue

- Tunneling offloads:
  - Windows Network Virtualization using Generic Routing Encapsulation (NVGRE)
  - Linux Generic Routing Encapsulation (GRE)
  - VMware and Linux 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 (up to 9,600 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 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 and Fibre Channel over Ethernet (FCoE) 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, NPAR, tunneling offloads, including VXLAN, Generic Routing Encapsulation (GRE), and Network Virtualization using Generic Routing Encapsulation (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.

- Designed to meet the demands of large, public cloud deployments, the 3400 Series Adapters feature tunneling offloads for multitenancy with VXLAN, GRE, 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®.

Simplified Management
The QLogic QConvergeConsole® (QCC) delivers a broad set of powerful Ethernet and Fibre Channel (FC) adapter management features for administrators to maximize application performance and availability. Available in both GUI and CLI options, QCC offers application-based wizards to enable the environment to be quickly and easily provisioned based on published best practices.

OPEX Savings with Low-power PCIe 3.0
The 3400 Series are PCIe 3.0 based adapters that have one of the lowest power-consumption profiles in the industry.

- Supporting the latest generation of host bus connectivity, PCIe 3.0 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 7.85 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 (PCIe) 3.0 x8 (x8 physical connector)

Host Interrupts
- MSI-X supports independent queues

I/O Virtualization and Multitenancy
- SR-IOV
- Switch-independent NPAR
- GRE and NVGRE packet task offloads
- 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 UDP checksum offloads
- Receive segment coalescing (RSC)
- Interrupt coalescing
- RSS and TSS
- VMware NetQueue, Microsoft Hyper-V VMQ, Linux Multiqueue

Compliance
- IEEE 802.3-2012 Clause 52 (10Gb Ethernet optical)
- IEEE 802.1q (VLAN)
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.3x (Flow Control)
- IEEE 802.3an-12 Clause 55 10GBASE-T
- IEEE 802.3ab-2012 Clause 39 1000BASE-T
- IEEE 802.3-2012 Clause 25 100BASE-TX
- SFF8431 Annex E (10Gb Direct Attach Copper)
- IPv4 (RFC 791)
- IPv6 (RFC 2460)
- IEEE 802.1Qbb (Priority-based Flow Control)
- IEEE 802.1Qaz (DCBX and ETS)

Tools and Utilities

Management Tools and Device Utilities
- QLogic Control Suite (Windows, Linux, and CLI)
- QConvergeConsole GUI
- QConvergeConsole plug-ins for vSphere (VMware)
- 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: 167.65mm × 68.90mm (6.60in. × 2.71in.)

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

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

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: 7.85 watts (nominal)
- QLE3442-CU: 8.40 watts (nominal)
- QLE3440-SR: 8.45 watts (nominal)
- QLE3442-SR: 9.60 watts (nominal)
- QLE3442-RJ: 17.01 watts (nominal)

Cabling Distance (Maximum)
- QLE3442-RJ: CAT6a/7 up to 100 meters

Ordering Information

QLE3440-CU (Single port)
- Ships with empty SFP+ cage (optics and cables are not included)[1]

QLE3442-CU (Dual port)
- Ships with empty SFP+ cages (optics and cables are not included)[1]

QLE3442-RJ (Dual port)
- Ships with RJ45 connectors (10GBASE-T). Intended for use with twisted pair copper cabling (not included)[1]

QLE3440-SR (Single port)
- Ships with SR optical transceiver[1]

QLE3442-SR (Dual port)
- Ships with SR optical transceivers[1]

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

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