QLogic's 8100 Series Converged Network Adapters
A next-generation approach to data center convergence

By Deni Connor
Principal analyst, Storage Strategies NOW

Rarely does a product or technology make as much simple sense. But that is exactly what QLogic's announcement of the QLogic 8100 Series Converged Network Adapters (CNAs) does -- it makes simple sense – whether products such as the QLogic 8100 Series of CNAs are used to consolidate the data center infrastructure, reduce cabling and switch ports, simplify management or save on power consumption – all while protecting existing data center investments and reducing total cost of ownership.

The QLogic 8100 family of Converged Network Adapters is a study in simplicity. The family includes an array of single- and dual-ported PCI-Express-based adapters that converge storage and IP networks into a combined fabric that supports Fibre Channel, 10Gbit Ethernet and iSCSI transport protocols, as well as Fibre Channel over Ethernet (FCoE) offload processing, and run at 10Gbps line speeds. QLogic's converged network adapters are available in several configurations, including mezzanine-card implementations specifically targeted at the blade server and OEM markets, where they have been in qualification since the fourth quarter of 2008.

What is important about this announcement though is that the QLogic 8100 Series of Converged Network Adapters are the introduction of the industry's first adapters that use a single-chip application specific integrated circuit (ASIC) rather than discrete components. QLogic's first-generation CNAs used four discrete chips from Nuova Systems, Intel, QLogic and PLX. All these capabilities – Fibre Channel, 10Gbit Ethernet and PCIe -- are now combined in QLogic's Network Plus Architecture on a single chip. QLogic's design is far enough ahead of its competitors that they were able to demonstrate the working single chip silicon rather than only talk about it.

Single-chip ASIC advantages
The advantages of ASIC design in the QLogic 8100 Series of CNAs are borne out primarily in the increased performance, lower power dissipation and the smaller footprint it offers. Other vendors' first-generation implementations of FCoE presently rely on discrete components and perform at only as much as 150,000 IOPs per second. The new QLogic CNAs, for instance, performs at as much as 250,000 IOPs per port, an increase of 65% over first generation CNAs.

The ASIC design also contributes to power savings. The new QLE8152 has a power dissipation of seven watts, 60% more efficient than that of competing products which operate at 22 watts.

Another advantage of the ASIC design is its small footprint – replacing spread out discrete components and circuitry -- which leaves space on the adapter for future purposes or applications used in crowded, blade server or high-density storage environments.

QLogic has looked at ASIC design and called on its deep expertise, market dominance and several years of experience with iSCSI and Fibre Channel to design an ASIC that supports FCoE and Enhanced Ethernet, as well as FCoE offload – and does it reliably in a lossless manner.

The market wants simple

Today's data centers rely on different infrastructures for storage and network traffic. Data center managers installed Fibre Channel storage area networks (SANs), for their speed and reliability in handling storage traffic, despite their expense. At the same time, IT managers relied on Ethernet networks and now Gigabit Ethernet networks to deliver low-cost IP connectivity. Each approach requires different cabling, switches and transport protocols to handle each individual networking stream.

QLogic's new Network Plus Architecture for its converged network adapters is an enabling technology to bring these separate networking infrastructures together into a single converged Ethernet network.

For CIOs, this translates to greatly simplified network management, lower cost connectivity and highly flexible provisioning of data center resources over a single line -- all at full 10GbE speed.

We've seen server and storage virtualization play a big part in data center consolidation. Now with FCoE and Enhanced Ethernet, we are going to see intelligent converged fabrics take this paradigm one step further.

With FCoE, IT can maintain existing investments in Fibre Channel and Ethernet infrastructure and evolve it to a single, converged network over time. New servers with converged network adapters can be installed from Day One to connect to existing SAN and IP infrastructures. FCoE maintains CIO investment in Ethernet and overtime as the protocol evolves and is standardized, users can migrate infrastructure without doing a rip and replace.

What convergence offers

Consider this scenario. Each server in a data center environment contains as many as four adapters – two redundant Fibre Channel host bus adapters (HBAs) for connection to the SAN and two redundant Gigabit Ethernet adapters for connection to the IP network. Add to this the cabling infrastructure – two fiber-optic cables for each dual-port Fibre Channel HBA and two Cat 5 cables for each Gigabit Ethernet adapter. Then add the Fibre Channel and Gigabit Ethernet switch ports necessary to support this infrastructure.

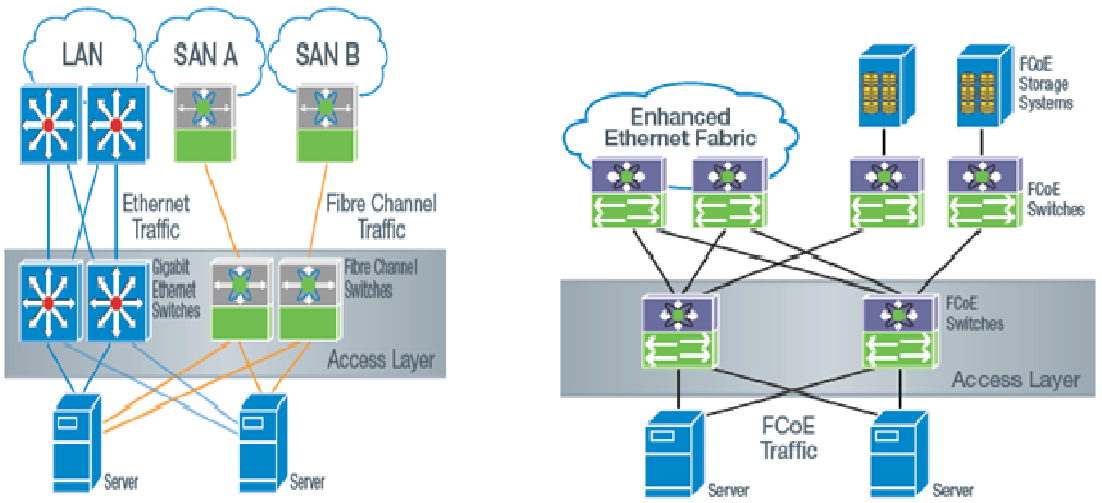

Figure 1. Before and after adopting FCOE

By replacing the HBAs and Gigabit Ethernet adapters with Converged Network Adapters and top-of-rack FCoE switches, the number of adapters (and their attendant power consumption) can be reduced by half. Cabling also will be reduced by 50%. And, with a converged environment, management is easier – a single management interface can be used to manage and monitor both networks and provisioning of data center resources can be accomplished via a single line at 10GbE speed.

This is not to say that customers are going to migrate wholesale to FCoE for Fibre Channel or Gigabit Ethernet. They are not going to rip and replace equipment, but rather migrate to FCoE slowly to maintain their investment in Fibre Channel and Ethernet gear. In an evolving infrastructure, it may mean initially replacing HBAs and network interface adapters (NICs) with CNAs as new servers are added to the network, then adding a top-of-the rack switch or as networking gear ages and replacing older Fibre Channel and Gigabit Ethernet infrastructure with second-generation FCoE equipment.

SSG-NOW Assessment

Separate networks for servers, network and storage just don't make sense. QLogic's uptake of the FCoE/Enhanced Ethernet infrastructure with a second-generation product such as the 8100 family of Converged Network Adapters leads the rest of the industry into a technology convergence that is meant to take place for its simple, uncomplicated sense.

Especially in this challenging economic climate, repurposing and redeploying infrastructure makes sense. End users are looking for savings across management, space and power. QLogic is enabling customers to leverage the ubiquity and economics of Ethernet while preserving the investment and strengths of Fibre Channel.