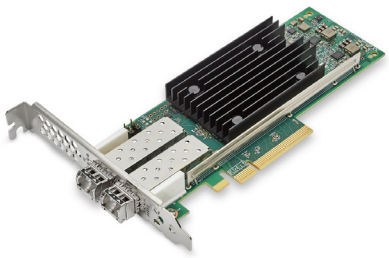
Marvell® QLogic® Fibre Channel Port Isolation Architecture

Port-level isolation architecture provides reliability and predictability across all ports on all Marvell QLogic FC HBAs



Overview

With today's data consumption and retention increasing daily, it's hard to keep up with not only storing the data but delivering it when requested and all the while protecting it … keeping it safe from hackers, malware, spyware, viruses and technology glitches. That's right, technology glitches! It does happen and IT professionals are constantly looking to improve their environment to keep that data – your data – protected. Hence the very reason for Fibre Channel (FC) and FC Storage Area Networks (Figure 1). These networks are designed with data protection in mind using redundancy throughout starting from the Fibre Channel HBA (Host Bus Adapter) to the switches and down to the storage. As you can see from Figure 1, professionals depend on the reliability built into these dual-ported HBAs. Based on Marvell shipment data, 8 out of 10 HBAs sold are dual port.

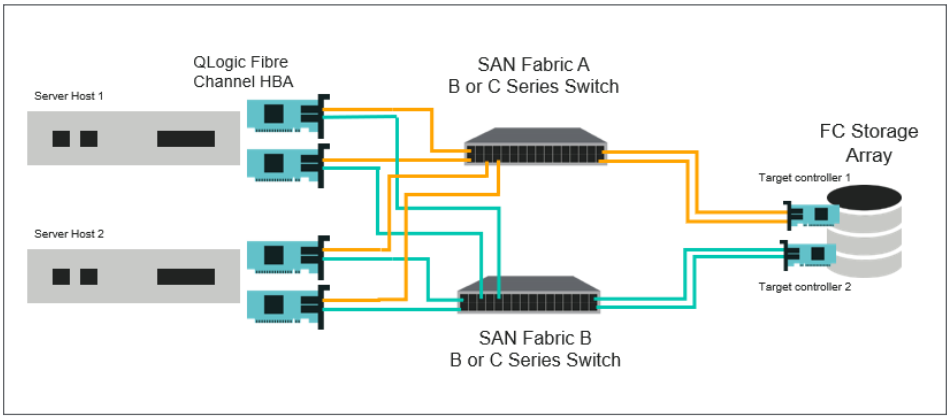


Figure 1. Typical Storage Area Network (SAN) Design

When tasked with keeping the data flowing and protected, IT professionals are looking for reliability and predictability built into all components of the SAN. These features as well as cost, performance, and reputation are mission-critical when investing in the best FC HBA for their environment.

With over 20 years of service, the QLogic FC HBA from Marvell is one of the top-rated adapters in the industry with a reputation for reliability… "It just works!" One of the reasons for this is our port-level isolation architecture which was implemented on our first controller designs and has carried through to today's 32GFC and 64GFC devices. This architecture, unlike other vendor solutions, provides independent function, transmit and receive buffers, an on-chip CPU, DMA (Direct Memory Access) channels, and a firmware image for each port. In other words, each port on the QLogic FC HBA, whether dual or quad port, is independent of every other port. These features enable

complete port-level isolation, prevent errors and firmware crashes from propagating across all ports, and deliver predictable and scalable performance across all ports. This provides the end user with peace of mind knowing that one port's fault cannot affect another.

The QLogic FC controller's unique design is the only one of its kind in the Fibre Channel HBA industry. Other FC controller designs use a shared architecture where all resources are dynamically available to any port that requires them. With this type of architecture, the risk of one or any of the controller components having an issue can impact the entire adapter. Also, with this type of architecture, any port on the adapter can, in theory, affect any other port on the same adapter (Figures 2 and 3).

The Marvell 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.

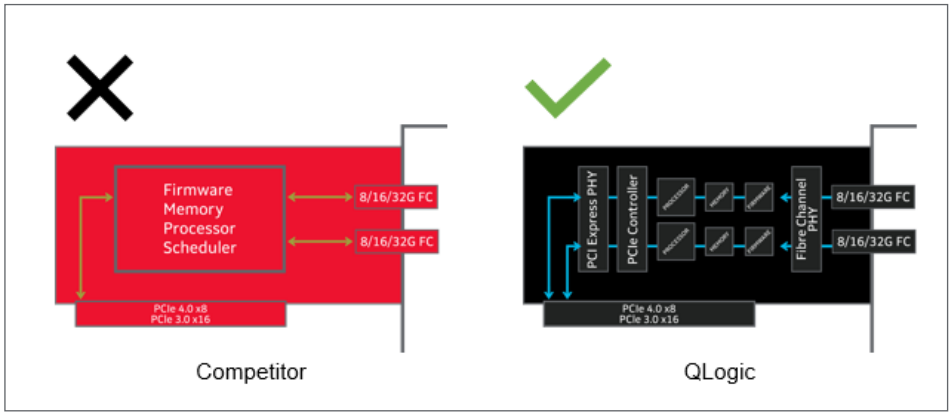


Figure 2. FC PCIe Adapter Comparison

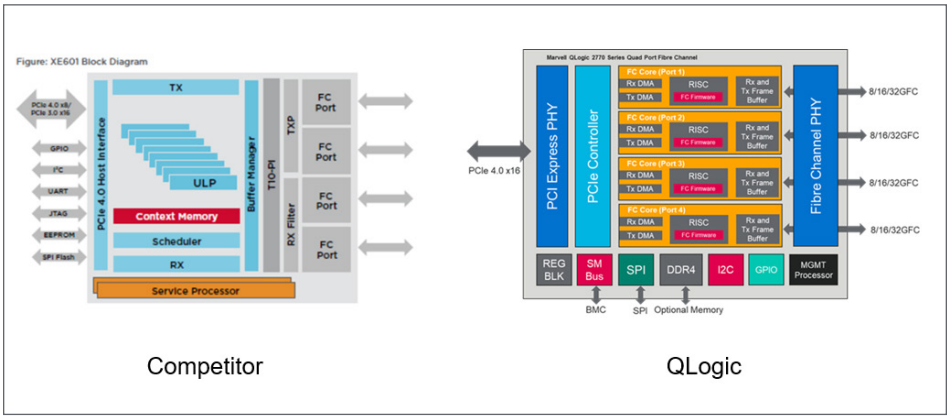


Figure 3. FC Controller Comparison

Advantages of the Marvell QLogic Architecture

IT professionals have much to decide when building out the future of their SAN infrastructure down to the ports on their HBA. Looking at QLogic Fibre Channel HBAs from Marvell they can understand that:

- Each port has its independent functions
- Each port has a RISC processor independent from other ports
  - The performance is predictable and scalable
  - No host CPU resources required – lowers latency and improves performance
- Each port has its own firmware image
  - If there is a firmware issue on a particular port it does not propagate to other ports
- Each port has its own DMA channels
- Each port has its own transmit and receive buffers

With these architectural advantages, IT professionals can rely on Marvell QLogic 2700 and 2690 Series of Enhanced 32G and 16GFC HBAs to deliver predictable per port performance. These are available on PCIe and mezzanine form factors today.

For more information please visit https://www.marvell.com/QLogic

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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.

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