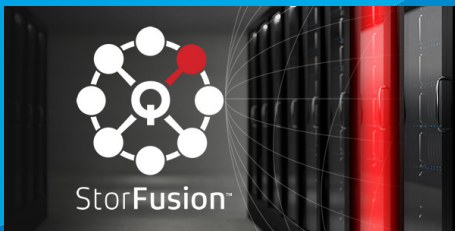


# Enhanced Reliability and Diagnostics for QLogic Enhanced Gen 5 (16Gb) and Gen 6 (32Gb) Fibre Channel Adapters

Advanced Link Diagnostics Leveraging Brocade  
ClearLink with QLogic StorFusion

## End-to-end Gen 5 and Gen 6 Fibre Channel Infrastructure Validation and Diagnostics Ensures SAN Robustness and Performance

- Quickly and easily diagnose links and fabric components.
- Leverages Brocade® ClearLink™ Diagnostic Port (D\_Port) diagnostic features.
- Ideal for new deployments and existing SANs.
- Eliminate ad-hoc, time-consuming diagnostic methods.
- Optimize performance, while freeing IT resources for other projects.
- Simple, single pane-of-glass management and integration with Brocade Network Advisor.

### CHALLENGES

Leading enterprise organizations depend on their Fibre Channel (FC) Storage Area Network (SAN) for fast, reliable access to mission-critical storage. Administrators understand the importance of maintaining network performance, since slow and unreliable links can lead to lost productivity and revenue. Unfortunately, identifying faulty links and components can be a very time consuming, manual process. In a large environment with thousands of servers, switches, and network links, IT staff can easily spend hundreds of man-hours per year testing and troubleshooting, especially if the problem is intermittent. Multiple testing methods and management interfaces can cause further delays.

Ensuring optimal network performance is an ongoing process. By leveraging the latest diagnostic tools, SAN administrators can quickly identify and resolve performance issues at pre-production or even during short maintenance windows.

### JOINT QLOGIC AND BROCADE SOLUTION

QLogic® StorFusion™ from Cavium™ is a new suite of Enhanced Gen 5 FC and Gen 6 FC features leveraging Brocade's Gen 5 FC and Gen 6 FC Fabric Vision™ to address the needs of IT organizations that require reliability, security, and guaranteed network performance. This advanced link diagnostics suite enables administrators to verify the integrity of new connections when adding components to the fabric before placing the systems into a production environment.

### BROCADE CLEARLINK DIAGNOSTICS IS FABRIC-INTEGRATED

QLogic Enhanced Gen 5 FC and Gen 6 FC adapters from Cavium enable Brocade ClearLink diagnostics (D\_Port) by seamlessly integrating with Brocade's Fabric Vision technology. This enables administrators to quickly diagnose and manage the SAN links when connected to Brocade Gen 5 FC and Gen 6 FC SAN fabrics with QLogic Enhanced Gen 5 FC and Gen 6 FC Adapters. Integration with Brocade Network Advisor enables administrators to use a single management console to quickly run D\_Port diagnostics across multiple QLogic Enhanced Gen 5 FC and Gen 6 FC Adapters and fabric components. As a result, large enterprise organizations can save thousands of man-hours per year, freeing IT staff, budget, and resources to work on other projects.

When diagnosing potential disruptive links or prior to deploying new components in the FC SAN, administrators can take the relevant ports offline and put them into ClearLink D\_Port mode.

As illustrated in Figure 1, the administrator can then quickly perform diagnostic tests, including:

- Electrical loopback—validates the electrical components of the local transceiver
- Optical loopback—validates the optical and electrical components of the remote transceiver
- Link latency and distance measurement—the link distance (in meters) and latency (in nanoseconds) between ports

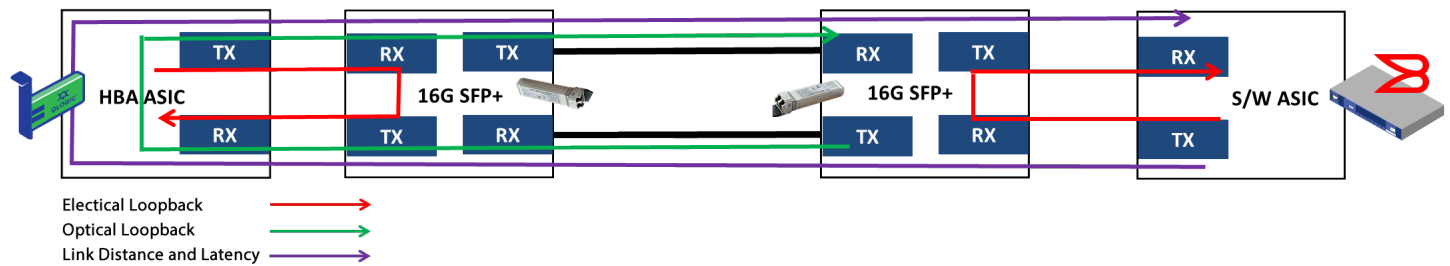
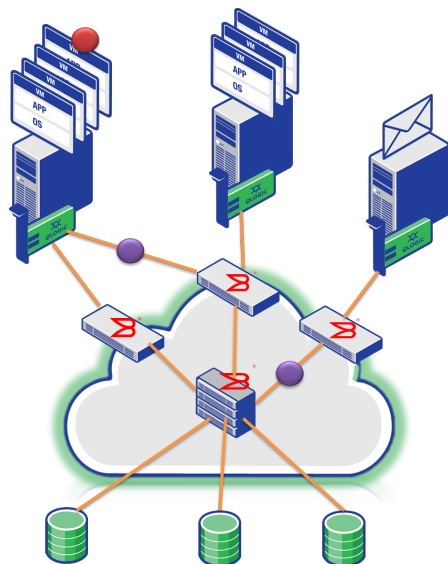


Figure 1: ClearLink D\_Port Diagnostics

The D\_Port tests can also be utilized in the following situations:

- Testing new ISL before adding it to the fabric
- Testing a trunk member before joining it with the trunk
- Testing long distance cables and SFPs
- Testing loopback ports

As a result, administrators can quickly and easily pinpoint the faulty component (such as a port, cable, or transceiver) and take corrective action—saving valuable time and maintaining network performance (Figure 2).



**Problem:**

- Application Issues point to the SAN
- Difficult to pin-point to a specific SAN component
- Significant time spent replacing cables/optics

**Solution: QLogic D\_Port – Brocade ClearLink**

- Complete optical/electrical testing to ensure reliable connections
- Validate configurations prior to deployment or troubleshooting
- Avoids downstream problems
- Ensure Application uptime

Figure 2: Quickly Diagnose SAN Fabric Components for Optimized Performance and Availability

## ONE-CLICK IDENTIFICATION OF NETWORK ISSUES

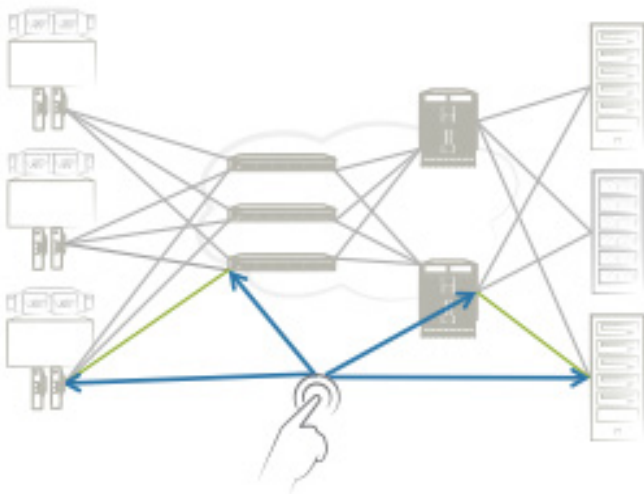
The Enhanced Gen 5 FC and Gen 6 FC features in StorFusion (available only in the QLogic Enhanced Gen 5 FC and Gen 6 FC Adapters) also support link cable beaconing (LCB), which enables administrators to visually identify both ends of a physical link. In a large data center with hundreds of ports and cables to manage, a simple command turns on port LED beacons on both ends of a link cable connection. Administrators can use LCB to quickly identify connection peer ports without tracing the cable.



**Figure 3: LCB Assists Operations When Attempting to Identify an End Point Link in a Large Storage Environment**

## TROUBLESHOOT FAILING COMPONENTS FASTER

Another StorFusion technology available in the QLogic Enhanced Gen 5 FC and Gen 6 FC Adapters is the read diagnostic parameters (RDP) feature, which provides optics and media diagnostics. From any point in the fabric, an administrator can use RDP to easily discover and diagnose link related errors and degrading conditions on any N\_Port-to-F\_Port link.



**Figure 4: RDP Allows Administrators to Easily Identify the Source of Network and Media Errors, such as CRC and LOS, by Remotely Accessing Diagnostic Information from Anywhere in the Fabric**

QLogic Enhanced Gen 5 FC and Gen 6 FC Adapters are further enhanced by capabilities that provide powerful visual connectivity and path analysis. FC Ping will help to validate configurations by enabling users to ping a Fibre Channel N\_port or end device. FC Traceroute is used to ensure correct switch and multi-path configurations.

## TECHNOLOGY REQUIREMENTS

Enabling the D\_Port advanced diagnostics capabilities with QLogic StorFusion requires:

- Servers with one or more QLogic 2600 Series Gen 5 FC or 2700 Series Gen 6 FC Adapters
- Brocade Gen 5 FC or Gen 6 FC switch with FOS 7.3.0a or higher and Brocade Fabric Vision License
- Qualified 16Gb FC or 32Gb FC transceivers on both ends (server and switch)

Enabling RDP and LCB capabilities with QLogic StorFusion requires:

- Servers with one or more QLogic 2690 Series Enhanced Gen 5 FC or 2700 Series Gen 6 FC Adapters
- Brocade Gen 5 FC or Gen 6 FC switch with FOS 7.4x or higher and Brocade Fabric Vision License
- Qualified 16Gb FC or 32Gb FC transceivers on both ends (server and switch)

## ABOUT CAVIUM

Cavium, Inc. (NASDAQ: CAVM), offers a broad portfolio of infrastructure solutions for compute, security, storage, switching, connectivity and baseband processing. Cavium's highly integrated multi-core SoC products deliver software compatible solutions across low to high performance points enabling secure and intelligent functionality in Enterprise, Data Center and Service Provider Equipment. Cavium processors and solutions are supported by an extensive ecosystem of operating systems, tools, application stacks, hardware reference designs and other products. Cavium is headquartered in San Jose, CA with design centers in California, Massachusetts, India, Israel, China and Taiwan.



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