BROCADE

PARTNER BRIEF

# Brocade and Emulex: Advanced Gen 5 Features

## HIGHLIGHTS

- Provide enhanced management functionality with the ability to identify and quickly recover from faults
- Minimize the chance of transmission errors that affect storage performance
- Streamline provisioning and accelerated server and storage troubleshooting
- Ensure the health of optical and signal transmissions prior to and after deployment
- Reduce time locating termination points of the network on physical switches and Host Bus Adapters (HBAs)

## Increase Operational Simplicity with New Gen 5 Fibre Channel Advanced Features

Fibre Channel (FC) remains the best solution for IT professionals who need reliable, cost-effective information storage and delivery at high speeds. With development starting in 1988, ANSI standard approval in 1994, and widespread deployment beginning in 1998, Fibre Channel is still growing strong. Fibre Channel is the mature, safe solution for high-speed communications and is the foundation for over 90 percent of all Storage Area Network (SAN) installations throughout the world.[1]

Customers depend on the reliability of Fibre Channel and the strength of tools available to manage their network and enable them to quickly recover from rare outages. Recently, Brocade and Emulex, an Avago Technologies Company, announced the availability of a suite of features that will enable these customers to maintain a high-performing environment, with enhanced management and the ability to identify faults and recover from them quickly.

### Optimize Performance Through Reduced Transmission Errors

IT organizations are looking for ways to optimize the efficiency of their infrastructures to extract as much value as possible from the technology they deploy. Brocade and Emulex have partnered to develop a set of advanced features aimed to streamline provisioning and to provide efficient diagnostics that accelerate server and storage troubleshooting and deployment. These integration efforts are now available to provide centralized management of Gen 5 FC adapters and switches from Brocade and Emulex and enable IT administrators to manage a hyperscale storage network with greater simplicity. This is accomplished by eliminating many of the manual steps in server deployment, routine maintenance, server replacement, and SAN trouble-shooting. This paper provides an overview of the co-developed enhanced features and discusses the benefits that can be achieved by implementing a joint end-to-end solution.

[1] http://fibrechannel.org/fibre-channel-features.html

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## Prevent Errors

No transmission protocol is completely immune to transmission errors. In order to minimize the chance of transmission errors that affect storage network performance, Forward Error Correction (FEC) controls errors in data transmission over noisy or congested links by adding measured redundancy in the transmitted message. The receiver can detect as well as correct errors in the received message thereby improving message reliability.

This both ensures the integrity of the data and provides optimal performance. Emulex LightPulse Gen 5 FC HBAs and Brocade® Gen 5 FC switch platforms enable FEC between ports by default (see Figure 1). Using the combined Emulex and Brocade solution, customers can optimize the performance of their storage network and maintain high Quality of Service (QoS) through the use of forward error correction throughout their FC fabric.

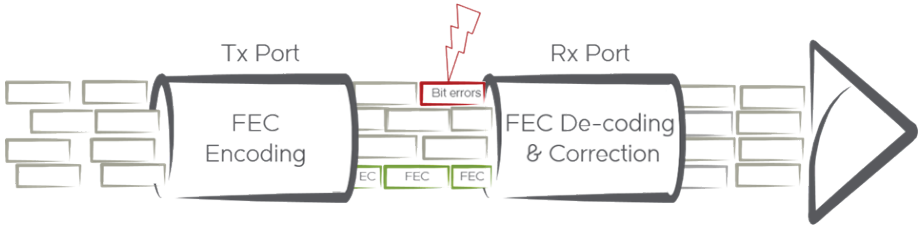


**Figure 1.** Obtaining error control with forward error correction.

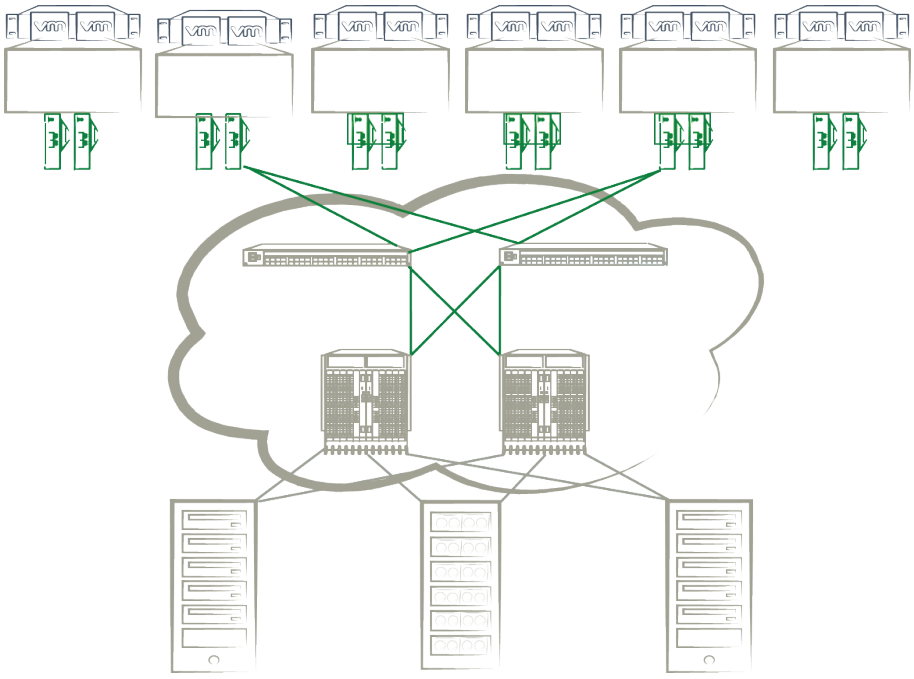

**Figure 2.** Identify faults with ClearLink diagnostic capabilities.

## Reduce Outage Impact with ClearLink Diagnostics

IT organizations need tools that can help them ensure nonstop operations, quickly identify potential problems, and maximize application performance, while simplifying administration. Emulex LightPulse HBAs have integrated the Brocade Gen 5 ClearLink diagnostic capabilities for high-performing SANs that demand nonstop availability for mission-critical applications. This feature, when combined with Emulex LightPulse Gen 5 HBAs, ensures the reliability and management of SAN configurations when connected to Brocade Gen 5 fabrics (see Figure 2).

ClearLink helps ensure optical and signal integrity for Gen 5 cables and optics by validating the health, reliability, and performance of the network prior to and after deployment. By proactively verifying the integrity of components connecting critical ports, IT administrators can quickly address any physical layer issues without the need for special optical testers. ClearLink diagnostics allow users to automate a battery of tests to measure and validate latency and distance across the switch links. These tests allow the IT administrator to detect physical cable issues, find faulty ports, estimate cable length, and perform data integrity checks quickly and efficiently.

## Easily Identify Ports, Cables, and Connections

When a fault is detected, the next challenge is to physically locate the termination point of the cable in the data center. In large data centers, this can be a time-consuming task. Link Cable Beacon enables the administrator to light up the LED (see Figure 3) on the physical switch

or HBA port where the cable terminates, in order to facilitate that process. This can dramatically reduce the time involved in locating the physical cable in order to swap it out. Avago Emulex and Brocade jointly support Link Cable Beacon between HBA ports and switch ports to facilitate rapid port isolation.


**Figure 3.** Link Cable Beaconing at the adapter port.

### Improve Automated Management and Diagnostics

Traditionally, administrators tracked FC ports by capturing Worldwide Port Names (WWPNs) from vendor management tools and associate them with servers in a manual tracking tool such as a spreadsheet. In order to reduce the need to manually associate WWPNs with servers, Emulex and Brocade provide support for Host Name Registration to automate the capture of this information from HBA ports and switch ports. Brocade Fabric Vision™ technology becomes the tracking tool that automatically discovers ports and logs them, as opposed to manual spreadsheet based systems. Through Fabric Vision, aliases can be easily assigned to ports for easy identification. This can dramatically reduce the overhead of managing port inventory and allows an administrator to have an accurate real-time view of their port inventory.

Read Diagnostics Parameters (RDP) is an enhanced capability that allows Brocade switches and Emulex HBA ports to self-report diagnostic information. RDP requests an FC port to return the identified diagnostic parameters associated with the N_Port_ID specified in the payload. This provides the port transmitting the request with information that may be used for diagnosis of link- or port-related errors or degraded conditions associated with the designated FC port. Typical information includes port speed, link error status, port name (including Worldwide Node Name [WWNN] and WWPN) and Small Form-Factor Pluggable (SFP) or Quad SFP (QSFP) information (including temperature, voltage, Tx bias, and Tx/Rx power). RDP is also used to track the status of FEC blocks in order to track the number of corrupted blocks that are corrected by FEC transmission and the number of corrupted blocks that are uncorrectable by retransmission. Emulex and Brocade have implemented RDP capabilities in the HBA ports and switch ports in order to enable more automated end-to-end Fabric Vision monitoring of the FC fabric and improve automated diagnostics in FC fabrics.

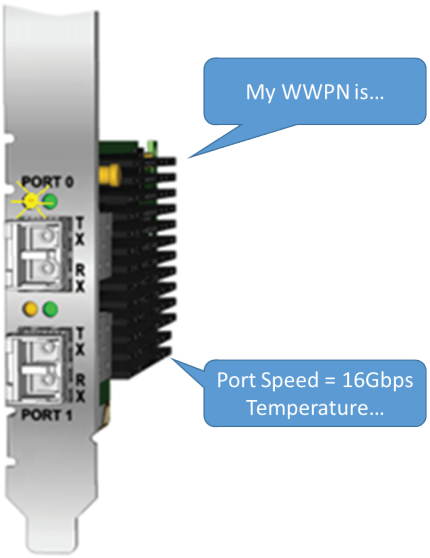


**Figure 4.** RDP improves fault isolation.

As data centers continue to scale shared storage to meet the needs of dense virtual and cloud environments, the need for completely dependable storage fabrics with automated and quick recovery capabilities become paramount, in order to maintain Service-Level Agreements (SLAs). Emulex and Brocade provide these data centers with the feature-rich FC fabric needed to meet these requirements.

## Learn More

Brocade partners with companies of all sizes to deliver innovative solutions that help organizations maximize the value of their most critical information. To learn more, visit www.brocade.com.

## About Brocade

Brocade networking solutions help organizations transition smoothly to a world where applications and information reside anywhere. Innovative Ethernet and storage networking solutions for data center, campus, and service provider networks help reduce complexity and cost while enabling virtualization and cloud computing to increase business agility. Learn more at www.brocade.com.

## About Emulex, an Avago Technology Company

Emulex provides connectivity, monitoring and management solutions for high-performance networks, delivering provisioning, end-to-end application visibility, optimization and acceleration for the next generation of software-defined, telco and Web-scale data centers.

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