Fibre Channel Testing

For T-BERD/MTS and OneAdvisor Platforms

T-BERD®/MTS and OneAdvisor Fibre Channel Functionality—The Tool You Need to Maximize Storage Area Network Revenue

In today's business environment, Fibre Channel (FC) is the technology that enterprises rely on to transport data to remote sites and store it for protection against potentially damaging natural and human events. The practice of building these storage area networks (SANs) supports business continuity and enables data protection, backup, mirroring, and restoration. For enterprises, reliable SANs can minimize and alleviate the risk associated with loss of access to data and applications. For providers who can test and ensure reliable FC functionality, SANs are bringing a lucrative service opportunity.

VIAVI T-BERD/MTS and OneAdvisor 800/1000, enabled with Fibre Channel functionality, are the tools providers need to maximize SAN business potential. A breakthrough in economy and efficiency, the VIAVI Fibre Channel solutions leverage the user's existing investments in equipment and technician training. Using the already familiar T-BERD/MTS interface, technicians can install and maintain SAN-related links and test to ensure that service level agreements (SLAs) are met.



Key Features

- 1/2/4/8/10/16/32/64 G Fibre Channel testing at 100% wire speed
- Dual-port capability to install and troubleshoot multiple circuits simultaneously
- Enhanced BER Testing at Layer 1 and Layer 2 for FC circuits per INCITS and ANSI standards
- Support for Implicit and Explicit flow control login
- 'RFC 2544-like' automated testing for FC circuit installation with buffer-to-buffer credit estimation that verifies minimum required buffer size to meet FC SLAs
- At 64GFC especially, LSN (Link Speed Negotiation) and TTS (Transmitter Training Sequence) are important functions in orderto bring up Fibre Channel links

RS-FEC

- For 32GFC and 64GFC, there is a mandatory RS-FEC layer
- Test features include statistics to report all correctable and uncorrectable errors in addition to error injection capabilities

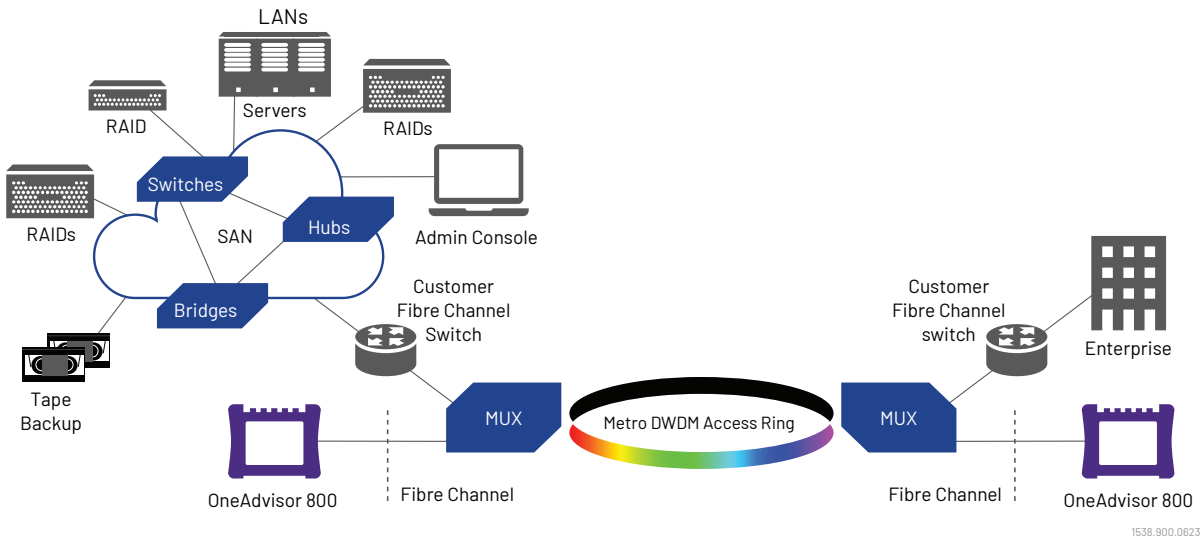


Figure 1. Storage area network

Applications

The T-BERD/MTS-5800 and OneAdvisor 800/1000 with Fibre Channel functionality analyzes transport networks used in SAN deployments. It supports test applications from verifying network connectivity to performing frame loss and throughput measurements and proving that FC SLAs are met. Additionally, it allows technicians to understand the critical impact of flow control (buffer-to-buffer credit) on SLAs. For storage applications, the ability to determine the optimal network buffer credit size makes meeting SLAs possible without increasing deployment costs.

Throughput and RTD Verification

The VIAVI Fibre Channel solutions ensure physical layer integrity and verify end-to-end connectivity of the circuit. By generating FC traffic up to full line rate, VIAVI instruments can verify error-free throughput of the link. With the functionality to loop back frames at the far end, it enables the qualification of the link in both directions, and it performs the round trip delay (RTD) measurement, which is a critical parameter for delay sensitive applications such as SANs.

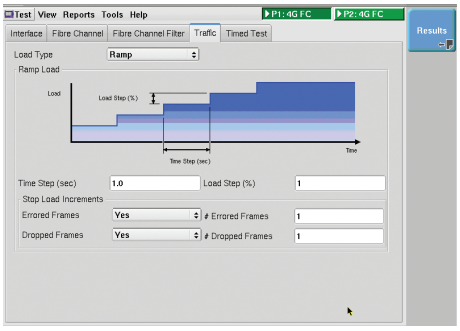


Figure 2. Throughput setup

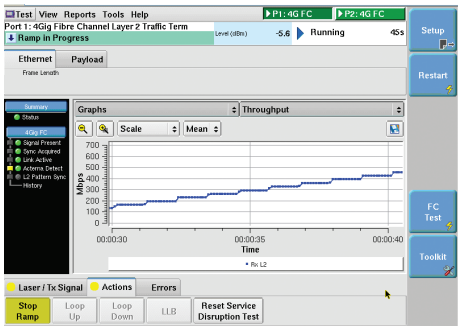


Figure 3. Throughput results

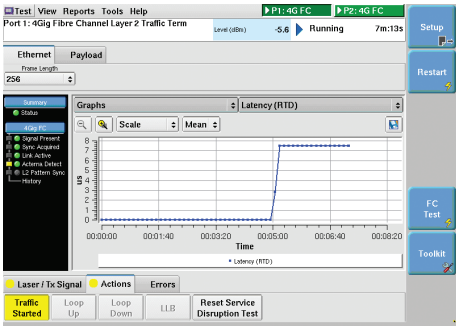


Figure 4. RTD verification

Bit Error Testing

T-BERD/MTS instruments feature BER testing at both Layer 1 (physical layer) and Layer 2 of FC circuits using a variety of stress test patterns per INCITS and ANSI standards. The ability to stress test both network layers enables accurate benchmarking at the time of service installation.

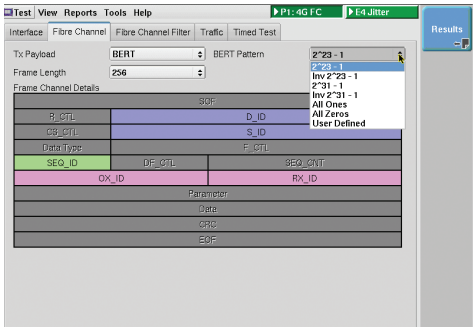


Figure 5. BER test setup

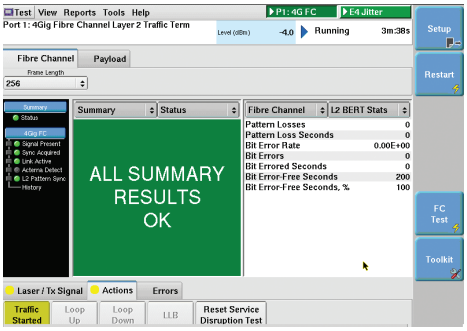


Figure 6. BER test results

Flow Control Verification

In order to support FC service installation with flow control, T-BERD/MTS tailors RFC 2544-like methodology to FC circuits. This FC test provides an automated test routine and result analysis for consistent and repeatable installation of services, and it can be configured to automatically verify the optimal buffer credit size to meet the desired SLAs of the link by:

- Finding the optimal buffer size: large enough not to lose data, small enough not to slow down the link
- Calculating the minimum buffer credit size for the specified throughput at each frame length
- Measuring the throughput at various buffer credit sizes to assess the overall health of the link

64GFC

64G Fibre Channel is a complex rate in part because it uses a PAM4 electrical bus and RS(544,514) FEC on SFP56. As such LSN and TTS are required in order to negotiate the usage of 64GFC on a link. Complete testing including flow control, port login, fabric login, throughput, frame loss and latency are available in order to test networks and fabrics supporting 64GFC.

Full Line Rate Bidirectional Testing

The 1/2/4/8/10/16/32/64G FC test configuration enables providers to simultaneously stress circuits up to full line-rate traffic. In addition, performing bidirectional unobtrusive monitoring of FC circuits verifies that the network can support reliable communications without impact to live traffic.

Ordering Information

Description	Part Number
T-BERD/MTS-5800	
1, 2, and 4G Fibre Channel	C51G2G4GFC
8G Fibre Channel	C58GFC
10G Fibre Channel	C510GFC
16G Fibre Channel	C516GFC
32G Fibre Channel	C532GFC
OneAdvisor 800 400G/800G	
4G Fibre Channel	CALSFC
8G Fibre Channel	CA8GFC
16G Fibre Channel	CA16GFC
32G Fibre Channel	CA32GFC
64G Fibre Channel	CA64GFC

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