FCIP SAN EXTENSION WITH Riverbed WAN OPTIMIZATION PRODUCTS

The Brocade 7800 Extension Switch and FX8-24 Extension Blade are advanced SAN extension platforms which provide best-in-class Fibre Channel (FC) and Fibre Channel over IP (FCIP) port density, bandwidth and throughput to enable remote data replication, backup and migration solutions. The Brocade 7800 and FX8-24 FCIP extension products support IP WAN connections with up to 350ms of round-trip latency and up to 1% packet loss with most types of networking infrastructure. Some customers are interested in using external WAN Optimization devices in conjunction with SAN extension to take advantage of the additional compression and TCP acceleration benefits such solutions can offer. However, most WAN Optimization products break the TCP stream apart in order to do additional compression, presenting a different TCP data stream than what was received at the other end of the connection. For that reason, Brocade has not supported WAN Optimization products with our FCIP SAN extension solutions, except in pass-through or by-pass mode where no optimization is done.

Brocade and Riverbed have engaged to address this issue. In Riverbed's RiOS 6.1.4, Riverbed has enhanced the FCIP Optimization mode to fully preserve the TCP data stream. The enhanced FCIP Optimization mode has been fully tested by Riverbed with Brocade FOS 6.4.x. Brocade has reviewed these test results, and is offering qualified support for Riverbed devices running RiOS 6.1.4 only with Brocade 7800 and FX8-24 running FOS 6.4.x only. Joint solutions with Riverbed will be supported by the OEM in the same manner as all other support for FCIP SAN extension solutions.

In testing performed by Brocade, the Riverbed solution can provide a significant compression benefit, particularly for slower connections where maximum de-duplication and compression by Riverbed platforms can be performed. However, we also observed application throughput limitation of less than 2Gbps. Since the level of compression and throughput is data dependent, Brocade recommends that testing is performed in the target environment, paying particular attention to throughput and the compression ratio observed with the actual data that will be transmitted over the WAN connection.

When deployed with Riverbed in the middle, IPsec and compression should be disabled on the Brocade 7800 or FX8-24 (otherwise the compression by Riverbed will not be effective). If encryption is required for a specific deployment, IPsec encryption can also be enabled on the Riverbed appliances.

For application throughput higher than the supported 2Gbps, customers should use the integrated compression capabilities of the Brocade 7800 or FX8-24, and not use external WAN optimization devices. Brocade 7800 and Brocade FX8-24 support more than 12 Gbps and 40 Gbps application throughput, respectively.

The Brocade 7800 and FX8-24 products offer three flexible modes of high performance compression to meet customers' throughput performance and bandwidth savings needs when extending Fibre Channel SAN over IP WAN connections. The three flexible compression modes are:

1. (Mode 1) Provides average 2:1 compression ratio with no limit on the FC traffic it supports.

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2. (Mode 2) Provides average 3:1 compression ratio and supports up to 8 Gbps of FC traffic on the Brocade 7800 and 16 Gbps of FC traffic on the Brocade FX8-24.
3. (Mode 3) Provides average 4:1 compression ratio and supports up to 2.5 Gbps of FC traffic on the Brocade 7800 and 5 Gbps of FC traffic on the Brocade FX8-24.

The compression ratio varies for each of these compression modes and is data dependent. Brocade recommends testing in the target environment with the data that will actually be transmitted over the WAN.

The Brocade 7800 and FX8-24 were designed to be deployed smoothly in environments with shared WAN connections, and provide controls over bandwidth consumption by FCIP traffic on shared connections. The products allow you to configure a committed rate so that traffic won't exceed a certain configured threshold. Additionally, with Adaptive Rate Limiting, the Brocade 7800 and FX8-24 provide graceful dynamic bandwidth sharing between FCIP traffic and non-FCIP traffic in scenarios where the amount of WAN traffic from other workloads varies.

Brocade 7800 and FX8-24 also include the following advanced capabilities, all preserved in the Riverbed solution:
- FCIP Trunking combines multiple IP source and destination address pairs into a logical high-bandwidth FCIP trunk spanning multiple physical ports to provide frame based load balancing and failure resiliency.
- FCIP Quality of Service (QoS) provides high-, medium-, and low-priority handling of initiator-target flows within the same FCIP tunnels.
- FCIP Fast Write and Open Systems Tape Pipelining accelerate SCSI write processing remote disk and tape operations, maximizing performance across high-latency WAN connections.

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