

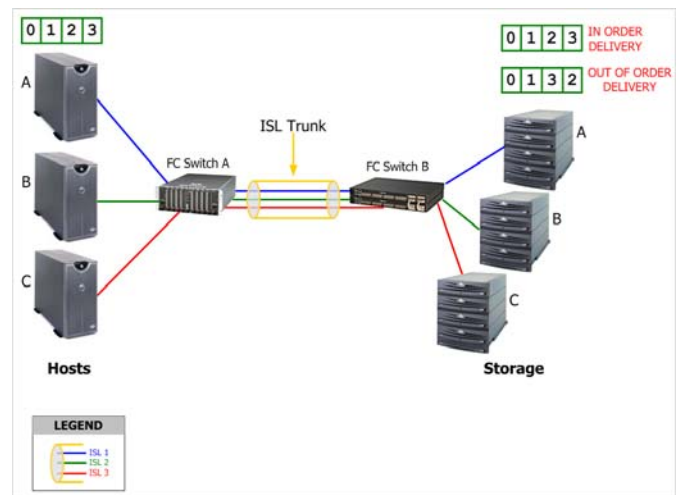


# OoOFR

## Out-of-Order Frame Reassembly

### Industry Challenge

Enterprise IT managers deploy multiple Fibre Channel (FC) switches and Inter Switch Links (ISLs) in an attempt to increase SAN reliability, availability, and performance. Although meshed switch topologies increase SAN reliability and availability, there may be instances where a FC frame traverses through different ISLs during its route to a target device and arrive out-of-order. According to the FC specification, if frames arrive out of order, the entire exchange of multiple frames must be retransmitted, reducing the overall SAN performance. To solve this SAN performance problem, FC HBAs must be able to correct the out-of-ordered frames in real time and eliminate the need to retransmit entire frames.



### QLogic's OoOFR Solution

Out-of-Order Frame Reassembly (OoOFR) is a QLogic (patent pending) feature that reassembles the out-of-ordered frames as they are received. All QLogic 4Gb FC HBAs support OoOFR and can minimize network congestion by eliminating the retransmission of frames and exchanges. Competitive HBA solutions that do not support OoOFR must retransmit a given exchange (I/O block) when out-of-order frames are received.

### How QLogic's OoOFR Works

All 4Gb FC HBAs with OoOFR support has the ability to inspect incoming FC frames at line speed and determine if any of the frames within a given exchange is out-of-order. If out-of-ordered frames are detected, the frames within an exchange are reordered. This frame inspection process is handled at line speed in the ASIC hardware.

### User Benefits

- **Increased Network Performance** – Frames do not have to be retransmitted when received out-of-order
- **Robust Network** – ISLs are still deployed without concern for out-of-order frames