



Network Storage Group Host Products Technology Brief

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FULL-DUPLEX AND FIBRE CHANNEL

WHAT IS FULL-DUPLEX?

With full-duplex data transmission, data is received and transmitted at the same time. A Fibre Channel adapter that has full-duplex capability can send data to a Fibre Channel node and receive data from that node simultaneously.

WHY FIBRE CHANNEL?

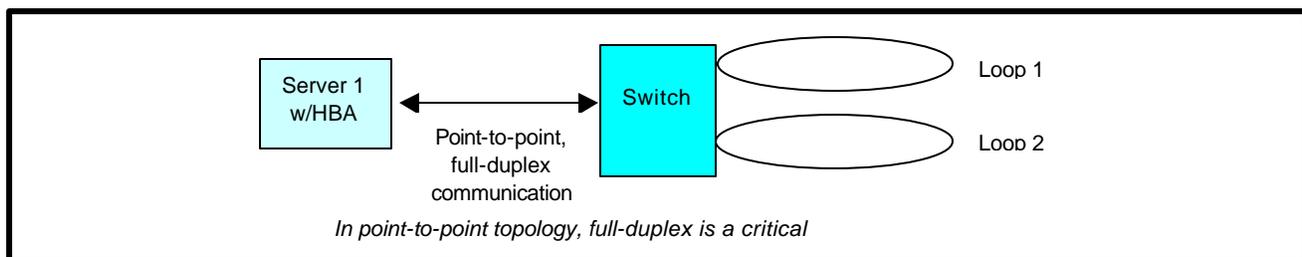
Traditional I/O channels are buses. Buses are like one-way tunnels. Parallel SCSI and ATA, for example, can only process a single point-to-point transfer at a time. Fibre Channel is different. On a single Fibre Channel cable, there are two connections between any two devices:

- The outbound half of the cable goes from the transmitting device to the receiving device.
- The inbound half of the cable goes from the receiver back to the sender and completes the connection.

These connections are physically separate; Fibre Channel supports separate communications being in process on each half of the cable at the same time. This capability, called full-duplex communication, makes Fibre Channel more efficient than traditional buses.

WHEN IS FULL-DUPLEX MOST CRITICAL?

Full-duplex is most important in point-to-point communications on a switched fabric. A host system communicating with a switch can take advantage of the simultaneous send and receive capabilities. A switch is most likely to have data ready to transmit to the host when a connection is opened between them.



In the above diagram, the host adapter in the Server 1 is communicating simultaneously with a drive on Loop 1 and a drive on Loop 2. (The drives can be spread across more than two loops; however, only two loops are needed to illustrate the feature.) In this configuration, the system can realize the performance potential of Fibre Channel full duplex capability.

SUMMARY

Full-duplex is one of many features that highlight the advantages of Fibre Channel. When a host adapter accesses drives on multiple loops on a switch and has a workload that keeps the attached drives busy, using full-duplex results in a considerable improvement in performance.