

BROCADE ISL TRUNKING



STORAGE AREA NETWORK

Higher Performance for Demanding Applications

HIGHLIGHTS

- Combines up to eight Inter-Switch Links (ISLs) into a single logical trunk that provides up to 128 Gbps data transfers (with 16 Gbps solutions)
- Optimizes link usage by evenly distributing traffic across all ISLs at the frame level
- Maintains in-order delivery to ensure data reliability
- Helps ensure reliability and availability even if a link in the trunk fails
- Optimizes fabric-wide performance and load balancing with Dynamic Path Selection (DPS)
- Simplifies management by reducing the number of ISLs required
- Provides a high-performance solution for network- and data-intensive applications

Brocade® ISL Trunking is an optional software product available for all Brocade Fabric OS®-based Fibre Channel switches, directors, and the Brocade DCX® Backbone family. This technology is ideal for optimizing performance and simplifying the management of multiswitch Storage Area Network (SAN) fabrics containing Brocade 4 and 8 Gbps switches and directors and the latest 16 Gbps solutions. When two or more adjacent Inter-Switch Links (ISLs) in a port group are used to connect two switches with trunking enabled, the switches automatically group the ISLs into a single logical ISL, or “trunk.” The throughput of the resulting trunk can be anywhere from 8 Gbps to as much as 128 Gbps.

INCREASED PERFORMANCE WITH ISL TRUNKING

ISL Trunking is designed to significantly reduce traffic congestion in storage networks. As shown in Figure 1, up to eight ISLs can be combined into a single logical ISL with a total bandwidth of 128 Gbps that can support any number of devices.

To balance workload across all of the ISLs in the trunk, each incoming frame is sent across the first available physical ISL in the trunk. As a result, transient workload peaks are much less likely to impact the performance of other parts of the SAN fabric, and bandwidth is not wasted by inefficient traffic routing. ISL Trunking can also help simplify fabric design, lower provisioning time, and limit the need for additional ISLs or switches.

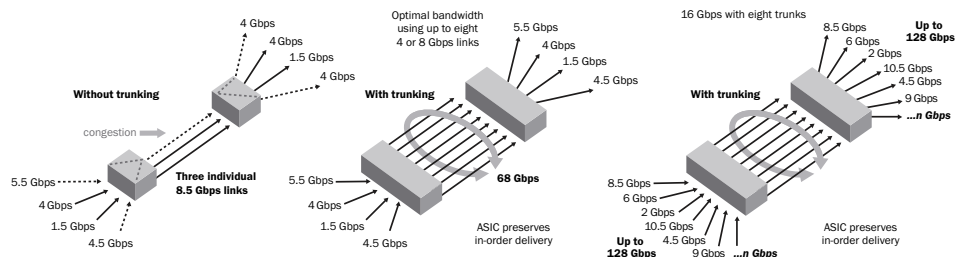


Figure 1. Optimal bandwidth using up to eight 4, 8, or 16 Gbps links.

The Brocade One™ strategy helps simplify networking infrastructures through innovative technologies and solutions. Brocade ISL Trunking supports this strategy by optimizing application performance and availability across the network, and simplifying network design and management.

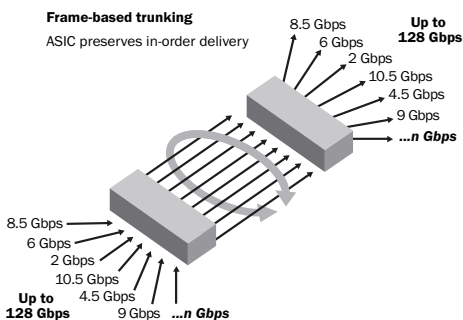
DYNAMIC PATH SELECTION FOR OPTIMIZED PERFORMANCE

To further optimize network performance, Brocade 4, 8, and 16 Gbps switches and directors support optional Dynamic Path Selection (DPS). Available as a standard feature in Brocade Fabric OS, exchange-based DPS optimizes fabric-wide performance by automatically routing data to the most efficient available path in the fabric (see Figure 2).

DPS augments ISL Trunking to provide more effective load balancing. With DPS, traffic loads are distributed at the exchange level across independent ISLs or trunks, and in-order delivery is guaranteed within the exchange. The combination of trunking and DPS provides immediate benefits to network performance—even in the absence of 16 Gbps devices—and DPS in particular can provide performance advantages when connecting to lower-speed 4 Gbps switches. As a result, this combination of technologies provides the greatest design flexibility and the highest degree of load balancing.

TRUNKING OVER DISTANCE

To provide maximum flexibility, trunking is also supported over long distance Fibre Channel links. The actual distance supported depends on the specific configuration,



including number of links and link speeds employed. But as long as the ports belong to the same trunk group, they can be trunked at any supported distance and speed. Refer to the *Brocade Fabric OS Administrator's Guide* for additional information.

SIMPLIFIED MANAGEMENT AND DESIGN

In almost any network, management costs increase with complexity—rising with the number of elements being managed. With ISL Trunking, Brocade Fabric OS views the group of physical ISLs as a single logical ISL, a design that:

- Lowers the number of entities to manage
- Reduces the number of lines on a logical topology map
- Improves traffic and capacity provisioning to keep systems and applications running at full speed
- Simplifies network design, capacity planning, and fabric administration

ISL Trunking can be managed through a small number of commands with the Brocade Command Line Interface (CLI) or through the graphical Brocade Web Tools utility.

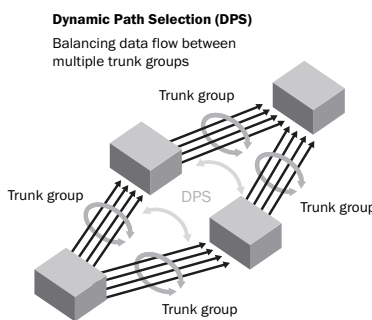


Figure 2.

Dynamic Path Selection augments ISL Trunking to route data efficiently between multiple trunk groups.

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HIGHER AVAILABILITY

The failure of a link in a route causes the network to reroute any traffic that was using that particular link—as long as an alternate path is available. Brocade Fabric Shortest Path First (FSPF) is a highly efficient routing algorithm that reroutes around failed links in less than a second.

ISL Trunking improves on this concept by helping to prevent the loss of the route. A link failure merely reduces the available bandwidth of the logical ISL trunk. In other words, a failure does not completely “break the pipe,” but simply makes the pipe thinner. As a result, data traffic is much less likely to be affected by link failures, and the bandwidth automatically increases when the link is repaired.

AUTOMATIC CONFIGURATION

As with all Brocade optional software products, the license for ISL Trunking can be factory-installed or added later. No software installation is required. ISL Trunking is automatically invoked when ISLs are added between any two Brocade 4, 8, or 16 Gbps solutions.

BROCADE GLOBAL SERVICES

Brocade Global Services delivers world-class professional services and technical support to enable the transition to virtualized data centers and cloud-optimized architectures. Brocade Professional Services offers assessment, design, and implementation services to help organizations optimize their SAN architectures in cloud-optimized data centers. Brocade Premier Support and onsite residencies help organizations maximize availability of mission-critical data in SAN environments through personalized, preferential, and proactive technical support.

MAXIMIZING INVESTMENTS

To help optimize technology investments, Brocade and its partners offer complete solutions that include professional services, technical support, and education. For more information, contact a Brocade sales partner or visit www.brocade.com.

