

BROCADE INTER-SWITCH LINK TRUNKING



STORAGE AREA NETWORK

Higher Performance for Demanding Applications

HIGHLIGHTS

- Combines up to eight ISLs into a single logical trunk that provides up to 32 Gbit/sec data transfers (with 4 Gbit/sec switches)
- Optimizes link usage by distributing heavy SAN frame traffic across all ISLs
- 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 2 and 4 Gbit/sec Fibre Channel switches and directors. This technology is ideal for optimizing performance and simplifying the management of multi-switch SAN fabrics containing Brocade 1, 2, and 4 Gbit/sec switches and directors. When two or more adjacent ISLs are used to connect two switches, the switches automatically group the ISLs into a single logical ISL, or “trunk.” The throughput of the resulting trunk can be anywhere from 4 Gbit/sec to as much as 32 Gbit/sec.

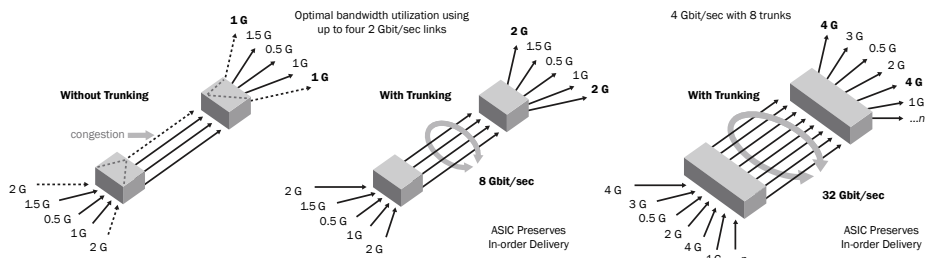
INCREASED PERFORMANCE WITH ISL TRUNKING

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 32 Gbit/sec 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

Figure 1.

ISL Trunking is available for 2 and 4 Gbit/sec links.



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.

DYNAMIC PATH SELECTION FOR OPTIMIZED PERFORMANCE

To further optimize network performance, Brocade 4 Gbit/sec switches and directors support optional Dynamic Path Selection (DPS). Available in Brocade Fabric OS® 4.4 and higher, 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 in certain configurations, such as routing data between multiple trunk groups. As a result, a combination of DPS and ISL Trunking provides the greatest design flexibility and the highest degree of load balancing.

TRUNKING OVER DISTANCE

Depending on the number of links and link speeds employed, trunks can operate at distances ranging from 100 kilometers for a 10 Gbit/sec five-port trunk up to 250 kilometers for a 4 Gbit/sec two-port trunk.

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

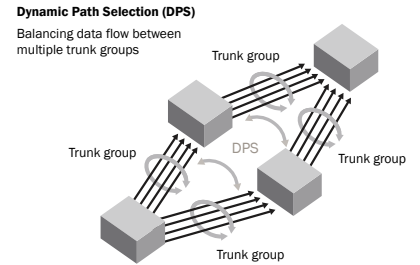
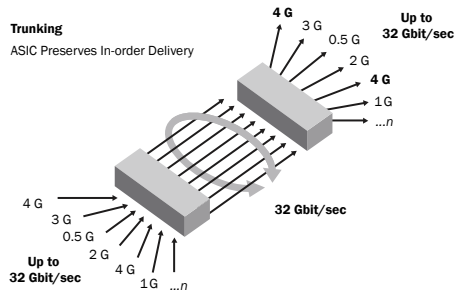


Figure 2.

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

- 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 or through the graphical Brocade Web Tools utility.

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 2 or 4 Gbit/sec switches or directors. Brocade 4 Gbit/sec switches and directors can also form trunks to previous-generation products with the individual links operating at 2 Gbit/sec for full backwards compatibility.

MAXIMIZING SAN INVESTMENTS

Brocade and its partners offer complete SAN solutions to meet a wide range of technology and business requirements. These solutions include education and training, support, service, and professional services to help optimize SAN investments. For more information, contact an authorized Brocade sales partner or visit www.brocade.com.

Corporate Headquarters

San Jose, CA USA
T: (408) 333-8000
info@brocade.com

European Headquarters

Geneva, Switzerland
T: +41 22 799 56 40
emea-info@brocade.com

Asia Pacific Headquarters

Singapore
T: +65-6538-4700
apac-info@brocade.com