2.1.2 ISL considerations

ISLs are responsible for interconnecting the SAN switches, creating SAN flexibility and scalability. For this reason, they can be considered as the core of a SAN topology. Consequently, they are sometimes the main cause of issues that can affect a SAN. For this reason it is important to take extra caution when planning and sizing the ISL in your SAN.

Regardless of your SAN size, topology, or the size of your FlashSystem installation, consider the following practices to your SAN Inter-switch link design:

- Beware of the ISL oversubscription ratio
  - The standard recommendation is up to 7:1 (seven hosts using a single ISL). However, it can vary according to your SAN behavior. Most successful SAN designs are planned with an oversubscription ratio of 7:1 and some extra ports are reserved to support a 3:1 ratio. However, high-performance SANs start at a 3:1 ratio.
  - Exceeding the standard 7:1 oversubscription ratio requires you to implement fabric bandwidth threshold alerts. If your ISLs exceed 70%, schedule fabric changes to distribute the load further.
- Avoid unnecessary ISL traffic
  - If you plan to use external virtualized storages, connect all FlashSystem canister ports in a clustered system to the same SAN switches/Directors as all of the storage devices with which the clustered system of FlashSystem is expected to communicate. Conversely, storage traffic and internode traffic must never cross an ISL, except during migration scenarios.
  - Keep high-bandwidth utilization servers and I/O Intensive application on the same SAN switches as the FlashSystem host ports. Placing these servers on a separate switch can cause unexpected ISL congestion problems. Also, placing a high-bandwidth server on an edge switch wastes ISL capacity.
- Properly size the ISLs on your SAN. They must have adequate bandwidth and buffer credits to avoid traffic or frames congestion. A congested inter-switch link can affect the overall fabric performance.
- Always deploy redundant ISLs on your SAN. Using an extra ISL avoids congestion if an ISL fails because of certain issues, such as a SAN switch line card or port blade failure.
- Use the link aggregation features, such as Brocade Trunking or Cisco Port Channel, to obtain better performance and resiliency.
- Avoid exceeding two hops between the FlashSystem and the hosts. More than two hops are supported. However, when ISLs are not sized properly, more than two hops can lead to ISL performance issues and buffer credit starvation (SAN congestion).