

Article Overview

FCIP (Fibre Channel over IP) enables transparent tunneling of Fibre Channel frames over IP networks, allowing geographically distributed SANs to interconnect while maintaining fabric services.

Overview of FCIP

Fibre Channel over IP (FCIP) is a protocol that encapsulates Fibre Channel (FC) frames into TCP/IP packets, allowing SANs to extend over long distances using existing IP networks without altering the native FC fabric . From the FC perspective, FCIP operates at the FC-2 layer, providing framing and flow control, while from the IP perspective, it functions at the application layer . This tunneling preserves the original SAN fabric services, such as zoning, domain IDs, and name services, making the IP network transparent to the SAN devices .

FCIP in Fiber Optic Switches

FCIP is typically implemented in FCIP-enabled switches or gateways, which can be standalone devices or integrated into multi-function SAN switches. Examples include:

- o Cisco MDS series and IBM SAN42B-R switches, which support multiple FCIP tunnels, QoS classes, and high-bandwidth IP connections for long-distance SAN extension .
- o Dell EMC Connectrix MP series, which can form a Meta-SAN by connecting multiple SAN fabrics over IP while maintaining separate fabric services and enabling redundancy and bandwidth scaling . These switches allow multiple logical FCIP tunnels over 1/10/40 GbE interfaces, supporting high throughput and failover resiliency. Features like FCIP trunking, hardware-based compression, IPsec encryption, and jumbo frame support optimize performance over WAN links .

Benefits of FCIP

- o Long-distance SAN connectivity: Extends Fibre Channel SANs across metropolitan or wide-area networks.
- o Preserves SAN fabric services: Devices remain unaware of the IP network, avoiding domain or zoning conflicts.
- o Scalable bandwidth: Multiple tunnels and trunking allow aggregation of IP links for higher throughput.
- o Cost efficiency: Uses existing IP infrastructure instead of dedicated FC links.
- o Enhanced reliability: QoS, failover, and compression features improve performance over variable WAN conditions .

Use Cases

- o Disaster recovery and replication: Connects primary and secondary data centers for synchronous or

asynchronous replication.

- o Meta-SAN creation: Combines multiple SAN fabrics into a logically connected network while keeping them physically separate.

- o Heterogeneous SAN environments: Enables interoperability between different FC switch vendors over IP networks. In summary, FCIP-enabled fiber optic switches provide a robust solution for extending SANs over IP networks, maintaining native FC services, and optimizing performance for long-distance storage connectivity .

Configuring FCIP Cisco MDS 9000 Family IP storage (IPS) services extend the reach of Fibre Channel SANs by using open

Although the Fibre Channel protocol is configured to match the transmission and technological characteristics of single

Fibre Channel over IP (FCIP) is supported on Gen 6 directors from Fabric OS 8.1.0 or above and on Gen 7 directors from Fabric OS

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Most importantly, FCIP allows fiber channels to route over existing Ethernet switches and routers. This allows network designers to

FCIP - Fibre Channel over IP Fibre Channel over IP (FCIP) is supported on Gen 6 directors from Fabric OS 8.1.0 or above and on

4 FCIP over IP/MPLS Core This chapter discusses the transport of Fibre Channel over IP (FCIP) over IP/Multiprotocol Label

TCP connections are bound to an FCIP Link, which is used to realize Inter-Switch Links between pairs of Fibre Channel

Fiber-optic Switches Author: the photonics expert Dr. Rüdiger Paschotta (RP) Expert Buyer's Guide for

Fibre Channel over IP (FCIP) is the standard. It allows transparent tunneling of FC switch-to-switch links across IP networks. In

Introduction This document provides a sample configuration for basic Fibre Channel Over TCP/IP (FCIP) Multilayer Director Switch

Fiber Optic Switch fcip

Fibre Channel over IP (FCIP) is an important technology for linking Fibre Channel storage area networks (SAN). FCIP and iSCSI are

The IBM® System Storage SAN42B-R switch is intended as a platform for Fibre Channel over IP (FCIP). This enables transmission

Information About FCIP The Fibre Channel over IP Protocol (FCIP) is a tunneling protocol that connects geographically distributed

Figure 1 describes the internal model of FCIP with respect to Fibre Channel Inter-Switch Links (ISLs) and Cisco's extended ISLs

IBM Redbooks Product Guide This IBM® Redbooks® Product Guide introduces IBM Storage Networking SAN384C-6. It is a director

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