

Terminology

FCIP is a tunneling protocol that connects geographically distributed Fibre Channel storage area networks (SAN Islands) transparently over IP networks (LAN), (WAN) and (MAN). FCIP removes distance limitation of FC suitable for big enterprise. It creates point to point connection between FC SAN's tunnels and sends FC frames into TCP/IP packet through tunnel. Provides data encryption with the help of IPsec over IP routers

FCIP frame Maximum Fibre Channel frame is 2148 bytes plus optional extras. FCIP will segment and reassemble FC frames if MTU too small (TCP payload on second or subsequent packets). Jumbo frames may increase performance

FCIP Profile Contains information about the local IP address and TCP parameters. The profile defines the local connection points (IP address and TCP port number), The behavior of the underlying TCP connections for all FCIP links that use this profile. The FCIP profile's local IP address determines the Gigabit Ethernet port where the FCIP links terminate

FCIP Interface is the local endpoint of the FCIP link and a VE port interface. All the FCIP and E port parameters are configured in context to the the FCIP interface. The FCIP parameters consist of Peer information, Number of TCP connection for the FCIP link, E port parameters (Trunking mode and trunk allowed VSAN list)

FCIP VE Port virtual E (VE) ports behave exactly like standard Fibre Channel E ports, except that the transport is FCIP instead of Fibre Channel. A virtual ISL is established over an FCIP link and transport Fibre Channel traffic

FCIP Links Consist of one or more TCP connections between two FCIP link endpoints. Each link carries encapsulated Fibre Channel frames. When the FCIP link comes up, the VE ports at the both ends of the FCIP link create a virtual Fibre Channel (E) ISL and initiate the E port protocol to bring up the (E)ISL

FCIP Configuration

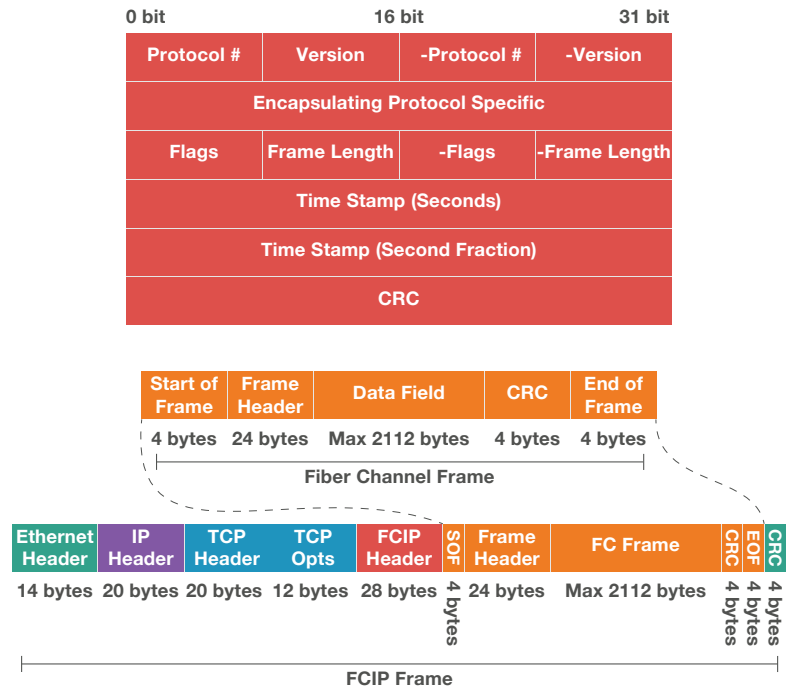
```
# Enable feature
feature fcip

# Ethernet Interface
inter g1/1
ip add 10.10.10.1
switchport mtu 2300 (optional)

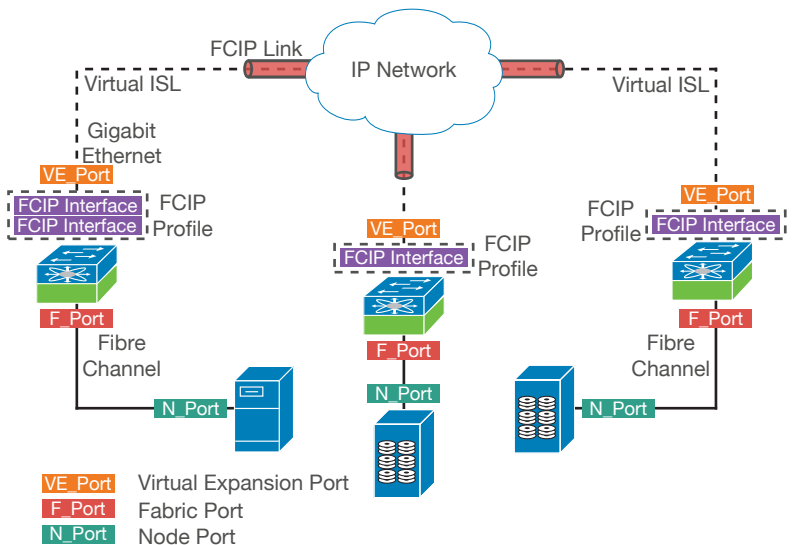
# FCIP Profile
fcip profile 1
ip add 10.10.10.1
port 3225 (optional)

# FCIP Interface
interface fcip 1
use-profile 1
peer-info addr 10.10.10.2 [port 3225]
passive-mode (optional)
switchport mode e
switchport trunk mode on
switchport trunk allowed vsan all
```

FCIP Frame Format



FCIP Design



Troubleshooting & Debugging

```
# Show command
Show fcip [profile | summary | host-map | target-map]
Show fcns [database | internal route]
Show interface fcip 1
Show port internal [port-channel | link-events]
Show ips stats [dma inter gi0/1 | tcp interfa gi0/1]
Show ips internal even epp interface fcip 1
Show tech fcip

# Debug command
Debug ips flow fcip
Debug ip igmp group
Debug ips fcip error port 1
```