

Configuración básica de MDS a MDS con FCIP

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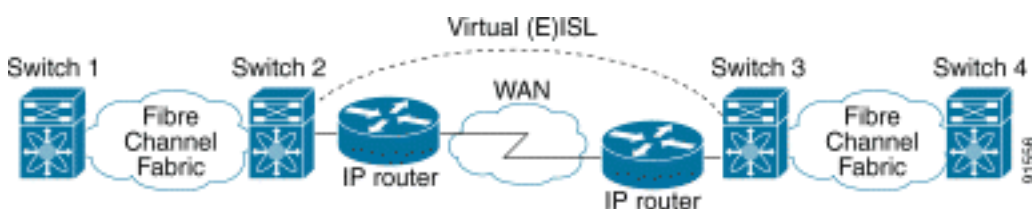
Introducción

Este documento suministra un ejemplo de configuración para Canal de Fibra por TCP/IP (FCIP) básico con Switch de Director de Capas Múltiples (MDS) a MDS.

Esta configuración de ejemplo es relevante para las versiones 1.2 y 1.3 de SAN-OS. Algunos parámetros cambian en la versión 2.0 de SAN-OS. Consulte la guía de configuración de SAN-OS 2.0 y las notas de la versión.

FCIP describe mecanismos que permiten la interconexión de islas de redes de área de almacenamiento (SAN) Fibre Channel (FC) a través de redes basadas en IP para formar una SAN unificada en un único fabric FC. FCIP se basa en servicios de red basados en IP para proporcionar la conectividad entre las islas SAN a través de redes de área local, redes de área metropolitana o redes de área extensa.

SAN de Fibre Channel conectadas por FCIP



FCIP utiliza el protocolo de control de transmisión (TCP) en el puerto 3225 como transporte de capa de red.

Prerequisites

Requirements

La red troncal IP debe estar operativa y ofrecer el ancho de banda necesario para admitir las aplicaciones que se ejecutan en los enlaces FCIP; puede ser una topología de capa 2 (L2) o capa 3 (L3). Si L3, los routers intermedios o los switches multicapa deben configurarse y configurarse para reenviar el tráfico IP entre las direcciones IP de origen y de destino de los túneles FCIP adecuadamente. Si se aplica la calidad de servicio (QoS) o el modelado del tráfico en cualquier dispositivo de red en la ruta entre los pares FCIP, se debe consultar al administrador de red que administra la infraestructura IP para obtener los detalles necesarios antes de configurar cualquier parámetro y función relacionados con TCP en los perfiles FCIP MDS .

Componentes Utilizados

La información que contiene este documento se basa en las siguientes versiones de software y hardware.

- MDS 9509 con módulo de servicio de almacenamiento IP (IPS) (DS-X9308-SMIP) que ejecuta la versión 1.2.(2a)
- MDS 9216 con módulo de servicio IPS (DS-X9308-SMIP) que ejecuta la versión 1.2.(2a)
- Win2003 Server (HPQ Pro-Liant-P4) con Emulex LP9K HBA
- Matriz de almacenamiento IBM (ESS-2105-F20)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Convenciones

For more information on document conventions, refer to the [Cisco Technical Tips Conventions](#).

Antecedentes

FCIP consta de las siguientes especificaciones:

ANSI T11

1. FC-SW-2 describe el funcionamiento y la interacción de los switches FC, incluidos E_Port y el funcionamiento del fabric.
2. FC-BB-2 es un mapping que se relaciona con la extensión de redes conmutadas FC a través de una red troncal TCP, y define modelos de referencia que soportan E_Port y B_Port.

Grupo de trabajo IETF IPS

1. FC sobre TCP cubre los requisitos TCP/IP para el transporte de tramas FC a través de una red IP.
2. La encapsulación de trama FC define el formato común de encapsulación de fibra.

Una interconexión entre dos switches o fabrics SAN a través de FCIP se denomina link FCIP y puede contener una o más conexiones TCP. Cada extremo de un enlace FCIP se asocia a un puerto E virtual (VE_port) o a un puerto B, según la implementación. FC-BB y FC-BB-2 están

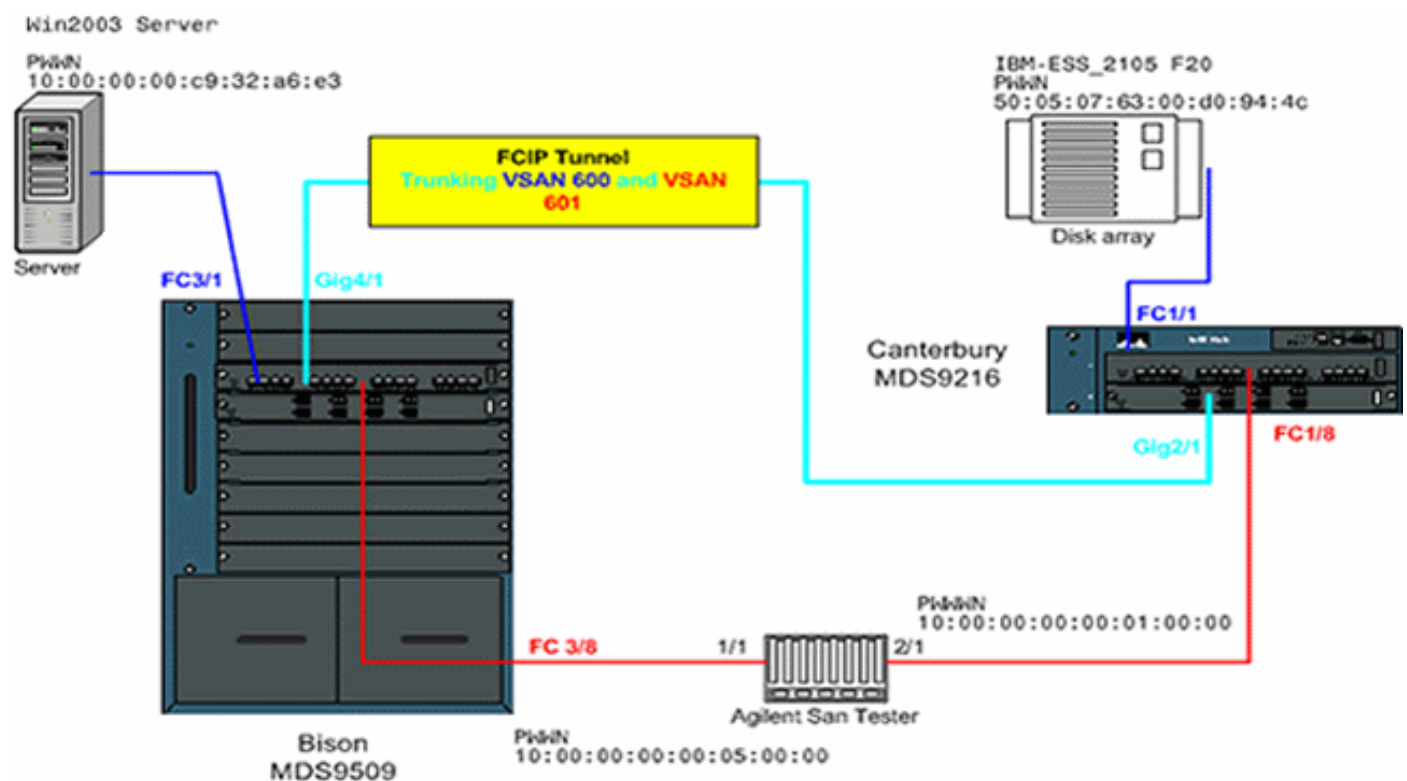
describiendo las diferencias entre ambos enfoques. El módulo de servicios IP (DS-X9308-SMIP) admite ambos modos, pero de forma predeterminada es VE_Port, que también es el modo recomendado para ejecutarse si todos los peers relevantes son módulos DS-X9308-SMIP. La funcionalidad VE_Port en las plataformas MDS también admite la funcionalidad de puerto TE, lo que la hace capaz de truncar el tráfico de varios VSAN a través de una instancia FCIP.

Configurar

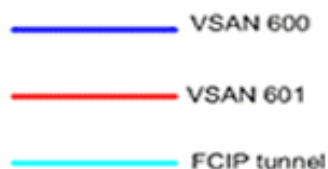
En MDS, debe familiarizarse con las guías de configuración IPS para ambas plataformas. La versión más actual del manual es [Configuración del Almacenamiento IP](#).

Diagrama de la red

Este documento utiliza la instalación de red que se muestra en el siguiente diagrama.



Topology 1 - FCIP tunnel 1Gbps Back-to-back



Este diagrama muestra una configuración de laboratorio típica en la que no hay ningún equipo de red adicional conectado entre ambas interfaces Gigabit Ethernet (GE) de ambos switches MDS. Esta es la forma más sencilla de una instalación de MDS FCIP y se suele utilizar en laboratorios de clientes para verificar la funcionalidad básica. En VSAN 600, el HBA Emulex LightPulse 9000 conecta el servidor de Windows 2003 al MDS9509 llamado Bison, y un arreglo de almacenamiento IBM conectado al MDS9216 llamado Canterbury, donde se configuran LUNs para el servidor Windows 2003.

El dispositivo de prueba SAN de Agilent se utiliza como emulador para rellenar VSAN 601 con dos dispositivos, así como para generar un tráfico en segundo plano FC-2 no FCP sustancial. Este equipo periférico se agrega para hacer la configuración más realista y para tener entradas sustanciales en el servidor de nombres distribuido de ambos switches participantes. El objetivo de este documento no es la conectividad de extremo a extremo, y no se incluyen capturas de pantalla del servidor o de la matriz de almacenamiento. El equipo periférico no conoce el FCIP y se comporta como si el link EISL entre ambos MDS se estuviera ejecutando a través de un link FC normal.

Configuraciones

Este documento usa las configuraciones detalladas a continuación.

- [MDS 9509 \(Bison\) con módulo IPS-8](#)
- [MDS 9216 \(Canterbury\) con módulo IPS-8](#)

MDS 9509 (Bison) con módulo IPS-8

```
bison# sh ver
Cisco Storage Area Networking Operating System (SAN-OS)
Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2003 by Cisco Systems, Inc. All
rights reserved.
The copyright for certain works contained herein are
owned by
Andiamo Systems, Inc. and/or other third parties and
are used and
distributed under license.

Software
BIOS: version 1.0.8
loader: version 1.2(2)
kickstart: version 1.2(2a)
system: version 1.2(2a)

BIOS compile time: 08/07/03
kickstart image file is: bootflash:/k122a
kickstart compile time: 9/23/2003 11:00:00
system image file is: bootflash:/s122a
system compile time: 10/8/2003 18:00:00

Hardware
RAM 1024584 kB

bootflash: 500736 blocks (block size 512b)
slot0: 0 blocks (block size 512b)

bison uptime is 1 days 15 hours 45 minute(s) 44
second(s)

Last reset
Reason: Unknown
System version: 1.2(2a)
Service:

bison# sh run
```

```
Building Configuration ...
fcip profile 1
ip address 100.100.100.1
!--- FCIP profile 1 is bound to the local relevant IPS
interface. In this !--- example, it is the IP address of
interface Gig4/1. vsan database vsan 600 vsan 601
fcdomain priority 1 vsan 1 fcdomain domain 1 preferred
vsan 1 fcdomain domain 1 preferred vsan 600 fcdomain
domain 1 preferred vsan 601 interface fcip1 no shutdown
switchport trunk allowed vsan 600-601 use-profile 1
peer-info ipaddr 100.100.100.2 !--- Interface FCIP 1 is
configured to act as an EISL port carrying traffic !---
for both VSAN 600 and VSAN 601 across the tunnel. The
FCIP interface, !--- in most respects, is configured
identical then any normal FC interface !--- acting as
ISL or EISL. Bind this interface to FCIP profile 1, and
define !--- the peer-ip address 100.100.100.2, which is
the address of the MDS9216's !--- Gig 2/1 interface in
the example. vsan database vsan 600 interface fc3/1 vsan
601 interface fc3/2 vsan 601 interface fc3/8 vsan 600
interface fc3/16 zone name z-fcip2 vsan 600 member pwwn
50:05:07:63:00:d0:94:4c member pwwn
10:00:00:00:c9:32:a6:e3 zone name Zone_a1 vsan 601
member pwwn 10:00:00:00:00:01:00:00 member pwwn
10:00:00:00:00:05:00:00 zoneset distribute full vsan 600
zoneset name zs-fcip2 vsan 600 member z-fcip2 zoneset
name Agilent_1 vsan 601 member Zone_a1 zoneset activate
name zs-fcip2 vsan 600 zoneset activate name Agilent_1
vsan 601 interface GigabitEthernet4/1 ip address
100.100.100.1 255.255.255.252 no shutdown !--- Note that
Gig4/1 in the default state is configured with an MTU
size of !--- 1500 bytes, if the network topology allows
for larger end-to-end frame !--- sizes known as jumbo
frames. !--- The default value may be changed to a
higher value. A good value is !--- 3000 bytes, because
this would avoid the fragmentation of full 2048 FC !---
frames into multiple TCP segments. Not all networking
equipment can handle !--- jumbo frames, so the default
value of 1500 bytes is a conservative !--- approach to
avoid connectivity issues while bringing up the FCIP
tunnel.
```

MDS 9216 (Canterbury) con módulo IPS-8

```
canterbury# sh ver
Cisco Storage Area Networking Operating System (SAN-OS)
Software
TAC support: http://www.cisco.com/tac
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rights reserved.
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Andiamo Systems, Inc. and/or other third parties and
are used and
distributed under license.

Software
BIOS: version 1.0.8
loader: version 1.2(2)
kickstart: version 1.2(2a)
system: version 1.2(2a)
```

```
BIOS compile time: 08/07/03
kickstart image file is: bootflash:/k122a
kickstart compile time: 9/23/2003 11:00:00
system image file is: bootflash:/s122a
system compile time: 10/8/2003 18:00:00

Hardware
RAM 960072 kB

bootflash: 500736 blocks (block size 512b)
slot0: 0 blocks (block size 512b)

canterbury uptime is 6 days 22 hours 35 minute(s) 37
second(s)

Last reset at 995484 usecs after Wed Nov 5 15:05:04 2003
Reason: Reset by installer
System version: 1.2(1a)
Service:

canterbury# sh run

Building Configuration ...
fcip profile 1
ip address 100.100.100.2
!--- At this side of the tunnel, choose the same profile
number that you !--- used on the peer to make management
easier. This is not mandatory, !--- and you can choose
another value between 1 and 255. vsan database vsan 600
vsan 601 fcdomain domain 2 preferred vsan 600 fcdomain
domain 2 preferred vsan 601 interface fcip1 no shutdown
switchport trunk allowed vsan 600-601 use-profile 1
peer-info ipaddr 100.100.100.1 !--- FCIP interface 1 is
chosen for arbitrary reasons. You can choose another !--
- FCIP number and still tunnel to the peer FCIP 1
instance. !--- It is important that you bind the correct
profile-id to your FCIP interface !--- of choice. Allow
the same VSANS that you allowed on the peer FCIP
interface, !--- which is good practice in general for
normal EISL trunks. The peer ip-address !--- is the IP
address of the MDS9505s interface Gig4/1 !--- in the
Network Diagram above. vsan database vsan 600 interface
fc1/1 vsan 601 interface fc1/8 vsan 600 interface fc1/16
zone name z-fcip2 vsan 600 member pwwn
50:05:07:63:00:d0:94:4c member pwwn
10:00:00:00:c9:32:a6:e3 zone default-zone permit vsan
777 zoneset distribute full vsan 600 zoneset name zs-
fcip2 vsan 600 member z-fcip2 zoneset activate name zs-
fcip2 vsan 600 zoneset activate name Agilent_1 vsan 601
interface GigabitEthernet2/1 ip address 100.100.100.2
255.255.255.252 no shutdown
```

Verificación

En esta sección encontrará información que puede utilizar para confirmar que su configuración esté funcionando correctamente.

- **show interface gig x/y** —Muestra el estado de la interfaz Gigabit relevante enlazada al perfil FCIP.

- **show ips stats tcp int gig x/y**—Muestra las estadísticas TCP y las conexiones activas para la interfaz Gigabit relevante.
- **show ips arp int gig x/y**—Muestra todas las entradas del protocolo de resolución de direcciones (ARP) para la interfaz Gigabit correspondiente; el siguiente salto o par debe estar presente en esta lista.
- **show ips ip route int gig x/y**—Muestra las rutas específicas que atraviesan la interfaz Gigabit relevante.
- **show interface fcip x**—Muestra el estado de la interfaz FCIP y todos los detalles relacionados con este túnel FCIP.
- **show profile fcip x**—Muestra la dirección IP a la que está enlazado el perfil y todos los parámetros TCP configurados.
- **show int fcip x counters**: se utiliza para verificar si hay tramas que atraviesan el túnel FCIP.
- **show fcdomain vsan x**—Enumera todos los detalles relacionados con el dominio; se utiliza para verificar que el fabric se forma a través de los túneles FCIP.
- **show fcns da vsan x**—Muestra todos los tipos pwwn, FC4 y FCID de la VSAN relevante; se utiliza para verificar que todas las entradas esperadas se distribuyen a través de los túneles FCIP.

Troubleshoot

Asegúrese de ejecutar los comandos **show** más arriba varias veces para generar un historial de contadores. Los contadores que no están relacionados con un momento concreto y que se recopilan una sola vez son en su mayoría inútiles.

Utilice las configuraciones que se ilustran a continuación para la resolución de otros problemas.

- [MDS 9509 \(Bison\)](#)
- [MDS 9216 \(Canterbury\)](#)

```

MDS 9509 (Bison)

GigabitEthernet4/1 is up
  Hardware is GigabitEthernet, address is
0005.3000.a85a
  Internet address is 100.100.100.1/30
  MTU 1500 bytes  !...default value
  Port mode is IPS
  Speed is 1 Gbps
  Beacon is turned off
  Auto-Negotiation is turned on
  5 minutes input rate 320 bits/sec, 40 bytes/sec, 0
frames/sec
  5 minutes output rate 312 bits/sec, 39 bytes/sec, 0
frames/sec
  933169199 packets input, 998306879592 bytes
    12 multicast frames, 0 compressed
    0 input errors, 0 frame, 0 overrun 0 fifo
  337209366 packets output, 214303313560 bytes, 0
underruns
    0 output errors, 0 collisions, 0 fifo
    0 carrier errors

bison# sh ips stats tcp int gig 4/1

```

```

TCP Statistics for port GigabitEthernet4/1
  Connection Stats
    272 active openings, 107 accepts
    206 failed attempts, 0 reset received, 163
established
  Segment stats
    932985717 received, 337201993 sent, 7
retransmitted
    0 bad segments received, 103 reset sent

TCP Active Connections
Local Address Remote Address State Send-Q Recv-Q
100.100.100.1:3225 100.100.100.2:65128 ESTABLISH 0 0
100.100.100.1:3225 100.100.100.2:65130 ESTABLISH 0 0
100.100.100.1:3225 0.0.0.0:0 LISTEN 0 0
!--- By default, MDS establishes two TCP connections per
FCIP tunnel instance. bison# sh ips stats tcp int gig
4/1 de
TCP Statistics for port GigabitEthernet4/1
  TCP send stats
    337202017 segments, 222637392068 bytes
    130562402 data, 205533417 ack only packets
    503 control (SYN/FIN/RST), 0 probes, 1105737
window updates
    7 segments retransmitted, 2208 bytes
    4 retransmitted while on ethernet send queue,
40061909 packets split
    250922624 delayed acks sent
  TCP receive stats
    932985742 segments, 921498012 data packets in
sequence,
                                936715052100 bytes in
sequence
    770241 predicted ack, 856752348 predicted data
    0 bad checksum, 0 multi/broadcast, 0 bad offset
    0 no memory drops, 0 short segments
    0 duplicate bytes, 16 duplicate packets
    0 partial duplicate bytes, 0 partial duplicate
packets
    53128 out-of-order bytes, 165 out-of-order
packets
    0 packet after window, 0 bytes after window
    5 packets after close
    76225562 acks, 192030009160 ack bytes, 0 ack
toomuch, 5851 duplicate acks
    0 ack packets left of snd_una, 0 non-4 byte
aligned packets
    9124012 window updates, 0 window probe
    1381 pcb hash miss, 984 no port, 103 bad SYN, 0
paws drops
  TCP Connection Stats
    272 attempts, 107 accepts, 163 established
    511 closed, 3 drops, 206 conn drops
    3 drop in retransmit timeout, 20 drop in
keepalive timeout
    0 drop in persist drops, 0 connections drained
  TCP Miscellaneous Stats
    61792500 segments timed, 76225541 rtt updated
    124 retransmit timeout, 0 persist timeout
    5760 keepalive timeout, 5740 keepalive probes
  TCP SACK Stats
    0 recovery episodes, 0 data packets, 0 data bytes
    0 data packets retransmitted, 0 data bytes
retransmitted

```



```

    0 connections closed, 0 retransmit timeouts
TCP SYN Cache Stats
    107 entries, 107 connections completed, 0 entries
timed out
    0 dropped due to overflow, 0 dropped due to RST
    0 dropped due to ICMP unreachable, 0 dropped due to
bucket overflow
    0 abort due to no memory, 0 duplicate SYN, 0 no-
route SYN drop
    0 hash collisions, 0 retransmitted

TCP Active Connections
Local Address Remote Address State Send-Q Recv-Q
100.100.100.1:3225 100.100.100.2:65128 ESTABLISH 0 0
100.100.100.1:3225 100.100.100.2:65130 ESTABLISH 0 0
100.100.100.1:3225 0.0.0.0:0 LISTEN 0 0
bison#

bison# sh ips stats tcp int gig 4/1 de
TCP Statistics for port GigabitEthernet4/1
TCP send stats
    337202017 segments, 222637392068 bytes
    130562402 data, 205533417 ack only packets
    503 control (SYN/FIN/RST), 0 probes, 1105737
window updates
    7 segments retransmitted, 2208 bytes
    4 retransmitted while on ethernet send queue,
40061909 packets split
    250922624 delayed acks sent
TCP receive stats
    932985742 segments, 921498012 data packets in
sequence,
                                936715052100 bytes in
sequence
    770241 predicted ack, 856752348 predicted data
    0 bad checksum, 0 multi/broadcast, 0 bad offset
    0 no memory drops, 0 short segments
    0 duplicate bytes, 16 duplicate packets
    0 partial duplicate bytes, 0 partial duplicate
packets
    53128 out-of-order bytes, 165 out-of-order
packets
    0 packet after window, 0 bytes after window
    5 packets after close
    76225562 acks, 192030009160 ack bytes, 0 ack
toomuch, 5851 duplicate acks
    0 ack packets left of snd_una, 0 non-4 byte
aligned packets
    9124012 window updates, 0 window probe
    1381 pcb hash miss, 984 no port, 103 bad SYN, 0
paws drops
TCP Connection Stats
    272 attempts, 107 accepts, 163 established
    511 closed, 3 drops, 206 conn drops
    3 drop in retransmit timeout, 20 drop in
keepalive timeout
    0 drop in persist drops, 0 connections drained
TCP Miscellaneous Stats
    61792500 segments timed, 76225541 rtt updated
    124 retransmit timeout, 0 persist timeout
    5760 keepalive timeout, 5740 keepalive probes
TCP SACK Stats
    0 recovery episodes, 0 data packets, 0 data bytes
    0 data packets retransmitted, 0 data bytes

```

```

retransmitted
    0 connections closed, 0 retransmit timeouts
TCP SYN Cache Stats
    107 entries, 107 connections completed, 0 entries
timed out
    0 dropped due to overflow, 0 dropped due to RST
    0 dropped due to ICMP unreachable, 0 dropped due to
bucket overflow
    0 abort due to no memory, 0 duplicate SYN, 0 no-
route SYN drop
    0 hash collisions, 0 retransmitted

TCP Active Connections
Local Address Remote Address State Send-Q Recv-Q
100.100.100.1:3225 100.100.100.2:65128 ESTABLISH 0 0
100.100.100.1:3225 100.100.100.2:65130 ESTABLISH 0 0
100.100.100.1:3225 0.0.0.0:0 LISTEN 0 0
bison#
!--- Most of the TCP details displayed above can be used
to determine the !--- health of your FCIP tunnel,
provided that there is a one-to-one relationship !---
between the FCIP tunnel and the physical interface. Note
that for this !--- particular FCIP instance, both TCP
connections were initiated from this peer, !--- which
you can derive from the local address x.x.x.x:3225
statement.
bison# sh ips arp interface gig 4/1
Protocol Address Age (min) Hardware Addr Type Interface
Internet 100.100.100.2 9 0005.3000.ade6 ARPA
GigabitEthernet4/1
bison#

bison# sh ips ip route int gig 4/1
Codes: C - connected, S - static

No default gateway

C 100.100.100.0/30 is directly connected,
GigabitEthernet4/1
bison#
!--- The FCIP tunnel is connected in a back-to-back
fashion. Issue the !--- sh ips ip route command to get
the directly connected IP subnet. !--- In a more
realistic situation, where you would need to configure a
!--- next-hop to reach the FCIP peer ip-address, this
command would show !--- the configured routes through
the relevant interfaces.

bison# sh fcip profile 1
FCIP Profile 1
Internet Address is 100.100.100.1 (interface
GigabitEthernet4/1)
Listen Port is 3225
TCP parameters
SACK is enabled
PMTU discovery is enabled, reset timeout is 3600 sec
Keep alive is 60 sec
Minimum retransmission timeout is 200 ms
Maximum number of re-transmissions is 4
Send buffer size is 0 KB
Maximum allowed bandwidth is 1000000 kbps
Minimum available bandwidth is 15000 kbps
Estimated round trip time is 1000 usec
Congestion window monitoring is enabled, burst size is

```

```
10 KB
!--- The profile parameters are an easy way to directly
verify your !--- configured TCP parameters per FCIP
instance. bison# sh int fcip 1
fcip1 is trunking
Hardware is GigabitEthernet
Port WWN is 20:c2:00:05:30:00:7a:de
Peer port WWN is 20:42:00:0c:30:6c:24:40
Admin port mode is auto, trunk mode is on
Port mode is TE
vsan is 1
Trunk vsans (allowed active) (600-601)
Trunk vsans (operational) (600-601)
Trunk vsans (up) (600-601)
Trunk vsans (isolated) ()
Trunk vsans (initializing) ()
Using Profile id 1 (interface GigabitEthernet4/1)
Peer Information
Peer Internet address is 100.100.100.2 and port is 3225
Special Frame is disabled
Maximum number of TCP connections is 2
Time Stamp is disabled
QOS control code point is 0
QOS data code point is 0
B-port mode disabled
TCP Connection Information
2 Active TCP connections
Control connection: Local 100.100.100.1:3225, Remote
100.100.100.2:65128
Data connection: Local 100.100.100.1:3225, Remote
100.100.100.2:65130
272 Attempts for active connections, 58 close of
connections
TCP Parameters
Path MTU 1500 bytes
Current retransmission timeout is 200 ms
Round trip time: Smoothed 2 ms, Variance: 1
Advertised window: Current: 118 KB, Maximum: 118 KB,
Scale: 1
Peer receive window: Current: 118 KB, Maximum: 118 KB,
Scale: 1
Congestion window: Current: 10 KB, Slow start
threshold: 112 KB
5 minutes input rate 120 bits/sec, 15 bytes/sec, 0
frames/sec
5 minutes output rate 120 bits/sec, 15 bytes/sec, 0
frames/sec
72182460 frames input, 135382910244 bytes
34626 Class F frames input, 3190588 bytes
72147834 Class 2/3 frames input, 135379719656 bytes
0 Error frames timestamp error 0
47823751 frames output, 97610768920 bytes
34632 Class F frames output, 3194464 bytes
47789119 Class 2/3 frames output, 97607574456 bytes
0 Error frames 373 reass frames

!--- You can see the specific details per FCIP
interface, as they are taken !--- into account by a
running FCIP instance. You can also derive the TCP !---
parameters of the peer with this output. bison# sh
fcdomain vsan 600
The local switch is the Principal Switch.

Local switch run time information:
```

```
State: Stable
Local switch WWN: 22:58:00:05:30:00:7a:df
Running fabric name: 22:58:00:05:30:00:7a:df
Running priority: 2
Current domain ID: 0x01(1)

Local switch configuration information:
State: Enabled
FCID persistence: Disabled
Auto-reconfiguration: Disabled
Contiguous-allocation: Disabled
Configured fabric name: 20:01:00:05:30:00:28:df
Configured priority: 128
Configured domain ID: 0x01(1) (preferred)

Principal switch run time information:
Running priority: 2

Interface Role RCF-reject
```

```
-----
fcip1 Downstream Disabled
-----
```

```
bison# sh fcdomain vsan 601
The local switch is the Principal Switch.
```

```
Local switch run time information:
State: Stable
Local switch WWN: 22:59:00:05:30:00:7a:df
Running fabric name: 22:59:00:05:30:00:7a:df
Running priority: 2
Current domain ID: 0x01(1)

Local switch configuration information:
State: Enabled
FCID persistence: Disabled
Auto-reconfiguration: Disabled
Contiguous-allocation: Disabled
Configured fabric name: 20:01:00:05:30:00:28:df
Configured priority: 128
Configured domain ID: 0x01(1) (preferred)

Principal switch run time information:
-----
fcip1 Downstream Disabled
-----
```

```
bison# sh fcdomain vsan 601
The local switch is the Principal Switch.
```

```
Local switch run time information:
State: Stable
Local switch WWN: 22:59:00:05:30:00:7a:df
Running fabric name: 22:59:00:05:30:00:7a:df
Running priority: 2
Current domain ID: 0x01(1)

Local switch configuration information:
State: Enabled
FCID persistence: Disabled
Auto-reconfiguration: Disabled
Contiguous-allocation: Disabled
Configured fabric name: 20:01:00:05:30:00:28:df
Configured priority: 128
```

Configured domain ID: 0x01(1) (preferred)

Principal switch run time information:

Running priority: 2

Interface Role RCF-reject

fcip1 Downstream Disabled

bison#

!--- Similar to normal (E)ISL troubleshooting, verify that !--- your fabric is formed as expected. bison# **sh fcns da vsan 600-601**

VSAN 600:

FCID TYPE PWWN (VENDOR) FC4-TYPE:FEATURE

0x010001 N 10:00:00:00:c9:32:a6:e3 (Emulex) scsi-fcp:init

0x020001 N 50:05:07:63:00:d0:94:4c (IBM) scsi-fcp:target fc..

Total number of entries = 2

VSAN 601:

FCID TYPE PWWN (VENDOR) FC4-TYPE:FEATURE

0x010001 N 10:00:00:00:c9:32:a6:e2 (Emulex) scsi-fcp:init

0x010100 N 10:00:00:00:00:05:00:00

0x020100 N 10:00:00:00:00:01:00:00

Total number of entries = 3

MDS 9216 (Canterbury)

canterbury# **sh int gig 2/1**

GigabitEthernet2/1 is up

Hardware is GigabitEthernet, address is 0005.3000.ade6

Internet address is 100.100.100.2/30

MTU 1500 bytes

Port mode is IPS

Speed is 1 Gbps

Beacon is turned off

Auto-Negotiation is turned on

5 minutes input rate 312 bits/sec, 39 bytes/sec, 0 frames/sec

5 minutes output rate 312 bits/sec, 39 bytes/sec, 0 frames/sec

337277325 packets input, 214308964948 bytes

12 multicast frames, 0 compressed

0 input errors, 0 frame, 0 overrun 0 fifo

932989688 packets output, 998294817662 bytes, 0

underruns

0 output errors, 0 collisions, 0 fifo

0 carrier errors

```

canterbury# sh ips arp int gig 2/1
Protocol          Address   Age (min)   Hardware Addr
Type   Interface
Internet  100.100.100.1       7       0005.3000.a85a
ARPA GigabitEthernet2/1
canterbury#

canterbury# sh ips ip route int gig 2/1
Codes: C - connected, S - static

No default gateway

C 100.100.100.0/30 is directly connected,
GigabitEthernet2/1
canterbury#

canterbury# sh ips stats tcp int gig 2/1 de
TCP Statistics for port GigabitEthernet2/1
TCP send stats
932982227 segments, 1022389174048 bytes
921498559 data, 11061499 ack only packets
401 control (SYN/FIN/RST), 0 probes, 421342 window
updates
454 segments retransmitted, 972180 bytes
291 retransmitted while on ethernet send queue,
223642028 packets split
76162595 delayed acks sent
TCP receive stats
337204879 segments, 130561386 data packets in sequence,
192030387428 bytes in sequence
156457374 predicted ack, 65996627 predicted data
0 bad checksum, 0 multi/broadcast, 0 bad offset
0 no memory drops, 0 short segments
48 duplicate bytes, 3542 duplicate packets
48 partial duplicate bytes, 1 partial duplicate packets
4336 out-of-order bytes, 131 out-of-order packets
0 packet after window, 0 bytes after window
0 packets after close
268794983 acks, 936715866930 ack bytes, 0 ack toomuch,
4152 duplicate acks
0 ack packets left of snd_una, 0 non-4 byte aligned
packets
50179371 window updates, 0 window probe
1251 pcb hash miss, 1061 no port, 0 bad SYN, 0 paws
drops
TCP Connection Stats
204 attempts, 73 accepts, 155 established
357 closed, 64 drops, 70 conn drops
4 drop in retransmit timeout, 10 drop in keepalive
timeout
0 drop in persist drops, 0 connections drained
TCP Miscellaneous Stats
233047332 segments timed, 268794618 rtt updated
105 retransmit timeout, 0 persist timeout
105 keepalive timeout, 94 keepalive probes
TCP SACK Stats
3 recovery episodes, 25938540 data packets, 71110030772
data bytes
180 data packets retransmitted, 272884 data bytes
retransmitted
1 connections closed, 388 retransmit timeouts
TCP SYN Cache Stats

```

```
93 entries, 73 connections completed, 0 entries timed
out
0 dropped due to overflow, 18 dropped due to RST
0 dropped due to ICMP unreachable, 0 dropped due to bucket
overflow
0 abort due to no memory, 6 duplicate SYN, 0 no-route
SYN drop
0 hash collisions, 8 retransmitted

TCP Active Connections
Local Address Remote Address State Send-Q Recv-Q
100.100.100.2:65128 100.100.100.1:3225 ESTABLISH 0 0
100.100.100.2:65130 100.100.100.1:3225 ESTABLISH 0 0
100.100.100.2:3225 0.0.0.0:0 LISTEN 0 0
0.0.0.0:3260 0.0.0.0:0 LISTEN 0 0
canterbury#
!--- This MDS initiated both TCP connections for FCIP 1.
Although no passive !--- statement was configured on the
peer MDS, MDS9216 Canterbury has the !--- highest IP
address configured on the tunnel. This makes the other
side !--- disconnect its TCP connection. canterbury# sh
fcip profile 1
FCIP Profile 1
Internet Address is 100.100.100.2 (interface
GigabitEthernet2/1)
Listen Port is 3225
TCP parameters
SACK is enabled
PMTU discovery is enabled, reset timeout is 3600 sec
Keep alive is 60 sec
Minimum retransmission timeout is 200 ms
Maximum number of re-transmissions is 4
Send buffer size is 0 KB
Maximum allowed bandwidth is 1000000 kbps
Minimum available bandwidth is 15000 kbps
Estimated round trip time is 1000 usec
Congestion window monitoring is enabled, burst size is
10 KB

canterbury# sh interface fcip 1
fcip1 is trunking
Hardware is GigabitEthernet
Port WWN is 20:42:00:0c:30:6c:24:40
Peer port WWN is 20:c2:00:05:30:00:7a:de
Admin port mode is auto, trunk mode is auto
Port mode is TE
vsan is 1
Trunk vsans (allowed active) (600-601)
Trunk vsans (operational) (600-601)
Trunk vsans (up) (600-601)
Trunk vsans (isolated) ()
Trunk vsans (initializing) ()
Using Profile id 1 (interface GigabitEthernet2/1)
Peer Information
Peer Internet address is 100.100.100.1 and port is 3225
Special Frame is disabled
Maximum number of TCP connections is 2
Time Stamp is disabled
QOS control code point is 0
QOS data code point is 0
B-port mode disabled
TCP Connection Information
2 Active TCP connections
Control connection: Local 100.100.100.2:65128, Remote
```

```
100.100.100.1:3225
  Data connection: Local 100.100.100.2:65130, Remote
100.100.100.1:3225
  204 Attempts for active connections, 72 close of
connections
  TCP Parameters
  Path MTU 1500 bytes
  Current retransmission timeout is 200 ms
  Round trip time: Smoothed 2 ms, Variance: 1
  Advertized window: Current: 118 KB, Maximum: 118 KB,
Scale: 1
  Peer receive window: Current: 118 KB, Maximum: 118 KB,
Scale: 1
  Congestion window: Current: 10 KB, Slow start
threshold: 112 KB
  5 minutes input rate 120 bits/sec, 15 bytes/sec, 0
frames/sec
  5 minutes output rate 120 bits/sec, 15 bytes/sec, 0
frames/sec
  91063905 frames input, 192030052404 bytes
  41991 Class F frames input, 3931568 bytes
  91021914 Class 2/3 frames input, 192026120836 bytes
  0 Error frames timestamp error 0
  753551524 frames output, 936716093696 bytes
  42028 Class F frames output, 3909128 bytes
  753509496 Class 2/3 frames output, 936712184568 bytes
  0 Error frames 40061908 reass frames

canterbury#
```

[Información Relacionada](#)

- [RFC 3821 – Canal de fibra por TCP/IP \(FCIP\)](#)
- [Página de inicio de T11](#)
- [Soporte Técnico - Cisco Systems](#)