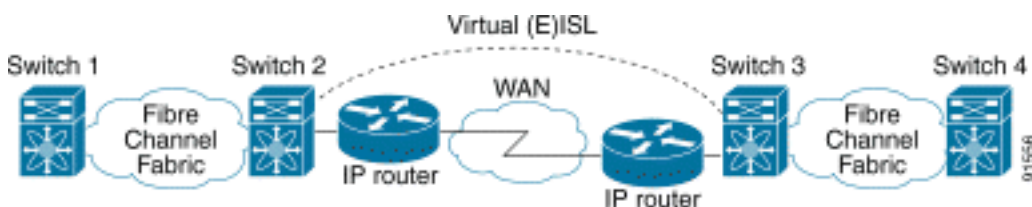# 对MD基本配置的MD与FCIP

目录

简介

本文提供一个示例配置，关于MDS基本的TCP/IP光纤信道 (FCIP)多层导向交换机(MDS)。

此配置示例与 SAN-OS 的 1.2 和 1.3 版本有关。SAN-OS 2.0 版本中的一些参数发生了变化。请参考 2.0 SAN-OS 配置指南和版本说明。

FCIP描述了在基于IP的光纤信道(FC)存储区域网络（SAN）岛实现互连的机制，以便在单个FC光组织中组成统一的SAN。FCIP依靠基于IP的网络服务，在通过局域网、城域网或广域网的SAN岛之间提供连连通性。

由 FCIP 连接的光纤通道 SAN

FCIP 在端口 3225 上使用传输控制协议 (TCP) 作为一种网络层传输技术。

先决条件

要求

IP骨干网必须是可运行的，并提供所需的带宽，以支持在FCIP链路上 - 可能是第二层(L2)拓扑或第三层(L3)拓扑 - 运行的应用。如果必须配置L3、中间路由器或多层交换机来正确转发FCIP隧道的

IP数据流源IP地址和目的地IP地址。如果在FCIP对等体路径上的任何网络设备中强制执行服务质量（QoS）或流量整形，那么在MDS FCIP配置文件上配置任何TCP的相关参数和功能之前，应参考管理IP结构的网络管理器，以了解必要的详细资料。

使用的组件

本文档中的信息基于下列软件和硬件版本：

- 具备 IP Storage (IPS) 服务模块 (DS-X9308-SMIP) 1.2.(2a) 运行版本的 MDS 9509
- 具备 IPS 服务模块 (DS-X9308-SMIP) 1.2.(2a) 运行版本的 MDS 9509
- 带有Emulex LP9K HBA的Win2003服务器(HPQ Pro-Liant-P4)
- IBM 存储阵列 (ESS-2105-F20)

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

规则

有关文件规则的更多信息请参见"Cisco技术提示规则"。

背景信息

FCIP 包括以下规格：

ANSI T11

1. FC-SW-2描述FC交换机的操作和交互作用包括E_Port和结构操作。
2. FC-BB-2是适合通过TCP网络主干的FC交换网络扩展的映射，它同时还定义了支持E_端口 和 B_端口的参考模型。

IETF IPS 工作组

1. TCP的FC包括在一个IP网络上传输FC帧的TCP/IP要求。
2. FC 帧封装可定义普通的光纤封装格式。

在2个SAN交换机或整个FCIP上的结构互连被称为FCIP链路，它能包含一条或多条TCP连接。FCIP链路的每个结尾与虚拟E端口(VE_端口)或B_端口连接，这取决于实施情况。FC-BB 和 FC-BB-2 可描述两种方法之间的区别。IP业务模块(DS-X9308-SMIP)支持两种模式，但默认为VE_Port，如果所有相关对等体都是DS-X9308-SMIP模块，VE_Port也是推荐运行的模式。MDS平台上的VE_Port功能还支持TE 端口功能，此功能使它能够在一个FCIP实例上支持来自多个VSAN的中继数据流。
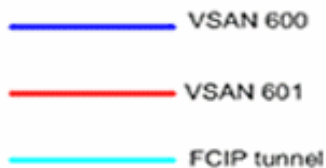
配置

在MDS上，您需要用适于两个平台的IPS配置指南进行自我熟悉。手册的最新版本为<u>配置 IP 存储</u>。

网络图

本文档使用下图所示的网络设置。
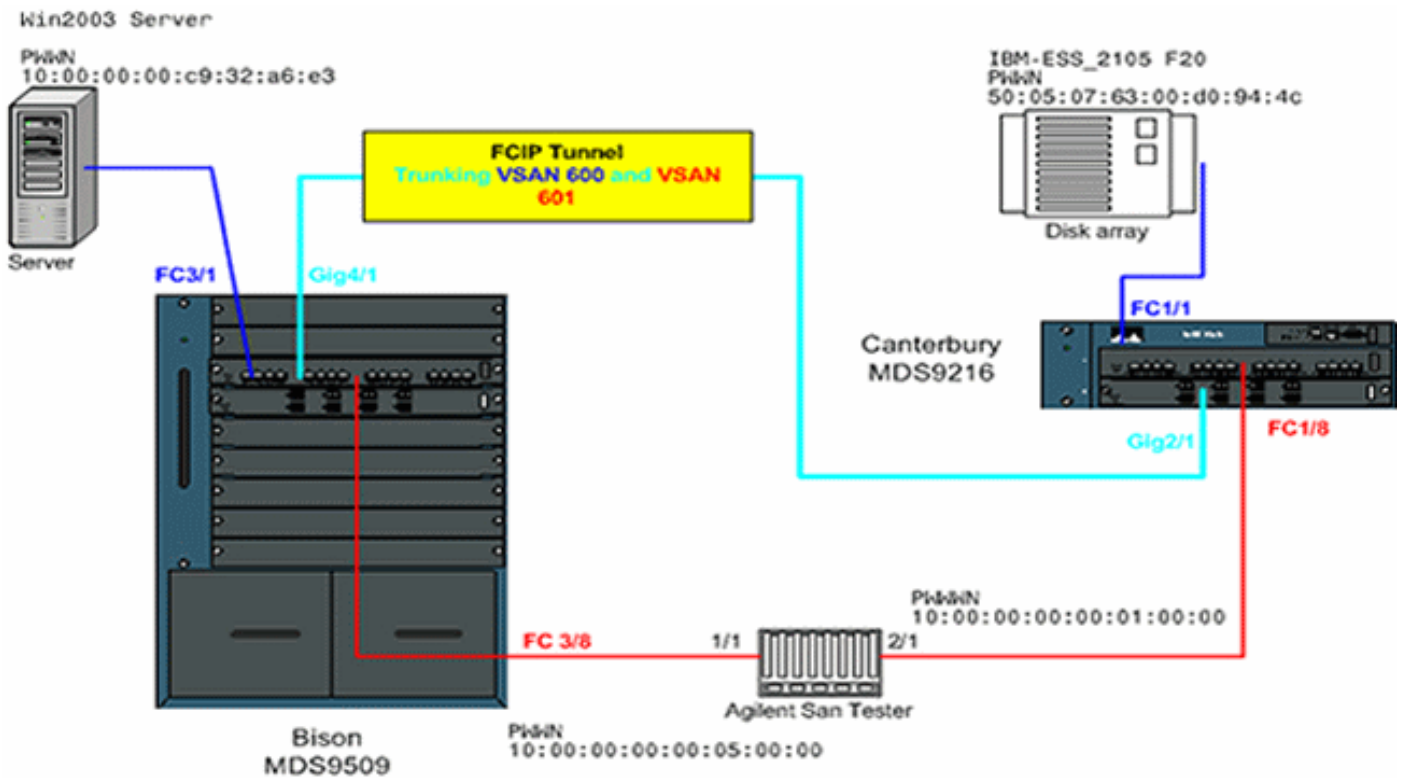
Topology 1 - FCIP tunnel 1Gbps Back-to-back

VSAN 600

VSAN 601

FCIP tunnel

此图表显示了一个典型的实验室设置，其中没有其它的网络设备在两台MDS交换机的两个千兆以太网(GE)接口之间连接。这是 FCIP安装的MDS的最简单形式，一般用于用户实验室，以验证基本功能。在 VSAN 600 中，Emulex LightPulse 9000 HBA 将 Windows 2003 服务器连接至 MDS 9509 (Bison)，将 IBM 存储阵列连接至 MDS9216 (Canterbury)，在其中可配置 Windows 2003 服务器的 LUN。

Agilent SAN测试设备用作仿真器，用两个装置安装VSAN 601，并且生成大量的FC-2非-FCP后台流量。增加外围设备使配置更可实现，并可在两台参与交换机的被分配名称服务器中拥有大量条目。本文不关注端到端连通性，不包括服务器或存储阵列的截屏画面。外围设备不了解FCIP，并且它的运行就好象两个MDS之间的EISL链路在一条正常FC链路上运行一样。

配置

本文档使用如下所示的配置。

- 具备 IPS-8 模块的 MDS9509 (Bison)
- 具备 IPS-8 模块的 MDS9216 (Canterbury)

具备 IPS-8 模块的 MDS9509 (Bison)

```
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.
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owned by
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 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.
```

具备 IPS-8 模块的 MDS9216 (Canterbury)

```
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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 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
```

验证

本部分所提供的信息可用于确认您的配置是否正常工作。

- show interface gig x/y - 显示绑定到 FCIP 配置文件的相关千兆接口的状态。
- show ips stats tcp int gig x/y---显示相关千兆接口的TCP统计数据和活动连接。
- show ips arp int gig x/y - 显示相关千兆接口的所有地址解析协议 (ARP) 条目；对端的下一跳应该是存在于此列表中。
- show ips ip route int gig x/y - 显示通过相关千兆接口的特定路由。
- show interface fcip x——显示FCIP接口状态和与此FCIP隧道相关的全部详情。
- show profile fcip x ——显示文件夹所捆绑的IP地址，以及所有配置的TCP参数。
- show int fcip x counters——用于检查是否有任何帧通过FCIP隧道。
- show fcdomain vsan x - 列出所有与域相关的详细信息；过去常常验证结构在FCIP隧道间被形成。
- show fcns da vsan x ---显示与VSAN相关的所有pwwn、FC4-类型和FCID;用于验证所有期望的条目通过FCIP隧道被分配。

故障排除

务必多次发出上述 show 命令以建立计数器历史记录。与时点无有关并且只收集一次的计数器通常没有用。

请使用下方所示的配置进行更多故障排除。

- MDS9509 (Bison)
- MDS9216 (Canterbury)

MDS9509 (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 unreach, 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 unreach, 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
```

MDS9216 (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 unreach, 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#
```

相关信息

- [RFC 3821 - 基于 TCP/IP 的光纤通道 (FCIP)](#)
- [T11 主页](#)
- [技术支持 - Cisco Systems](#)