

適用於MDS交換器的FC Analyzer和SPAN設定範例

目錄

[簡介](#)

[必要條件](#)

[需求](#)

[採用元件](#)

[慣例](#)

[背景理論](#)

[設定](#)

[配置本地FC Analyzer](#)

[為遠端FC Analyzer配置](#)

[設定本地SPAN](#)

[設定遠端SPAN](#)

[連線埠分析器配接器裝置說明](#)

[驗證](#)

[疑難排解](#)

[相關資訊](#)

簡介

與Cisco路由器產品線的調試功能類似，Cisco MDS儲存交換機具有光纖通道(FC)分析器來檢查資料包。FC分析器檢查進出交換機提供的實體的資料包。FC分析器能夠對交換機負責接收或傳送到儲存裝置的幀進行調試。FC分析器無法檢查終端站之間的幀。

要檢查會話流，應使用MDS交換機的交換埠分析器(SPAN)功能。與Cisco乙太網路交換器上的SPAN功能類似，MDS產品線上的SPAN會將資料複製到SPAN目的地連線埠，以便第三方裝置可以收集資料。

必要條件

需求

本文件沒有特定需求。

採用元件

本文中的資訊係根據以下軟體和硬體版本：

- Cisco MDS 9216交換器
- Cisco MDS 9509交換器
- 兩者均運行儲存區域網路作業系統(SAN-OS)1.2.1a。

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路正在作用，請確保您已瞭解任何指令可能造成的影響。

慣例

如需文件慣例的詳細資訊，請參閱[思科技術提示慣例](#)。

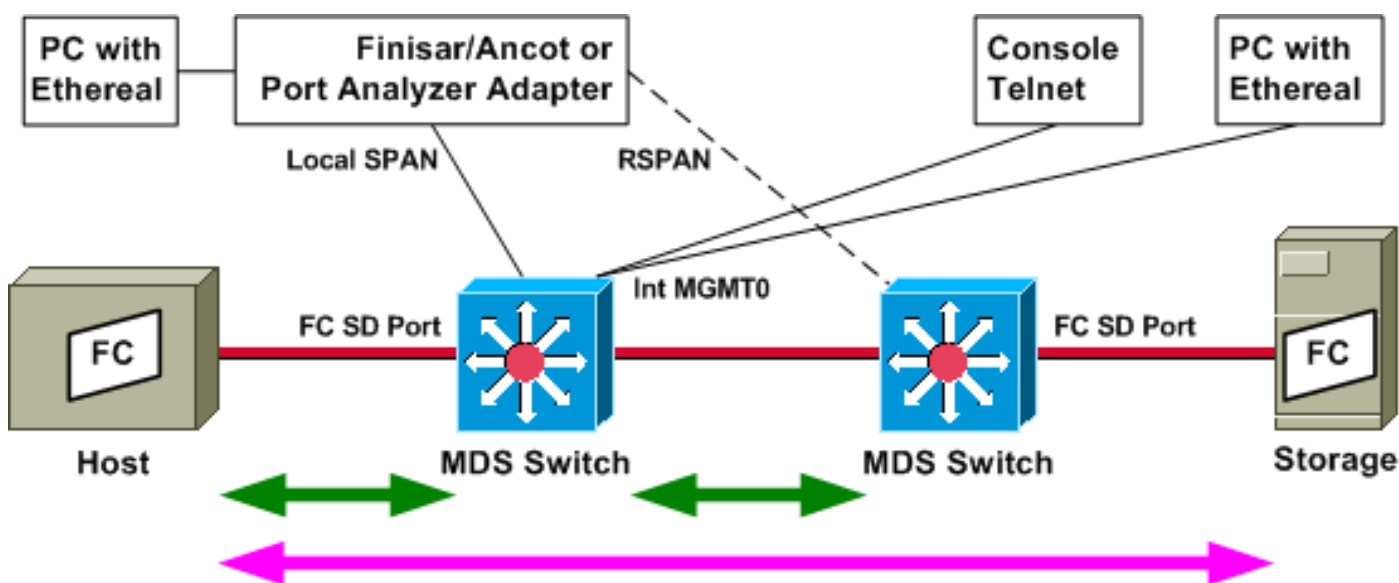
背景理論

您必須知道何時使用FC Analyzer工具以及何時使用SPAN功能。

FC分析器是一種工具，用於收集發往MDS Supervisor或來自MDS Supervisor的幀。使用此工具可以看到節點到交換機或交換機到交換機的流量。

SPAN是一種功能，允許將暫時連線到交換器的訊框複製到第二個連線埠進行分析。使用此方法可以看到節點到節點的流量。

如需圖示，請參閱下圖：



綠色箭頭表示可使用FC分析器工具進行跟蹤的流量，而粉紅色箭頭表示可使用SPAN方法捕獲的流量。FC分析器無法觀察從主機到儲存的流量。在左側交換機上運行FC analyzer時，只能看到從主機到交換機或從右側的交換機發出的流量。

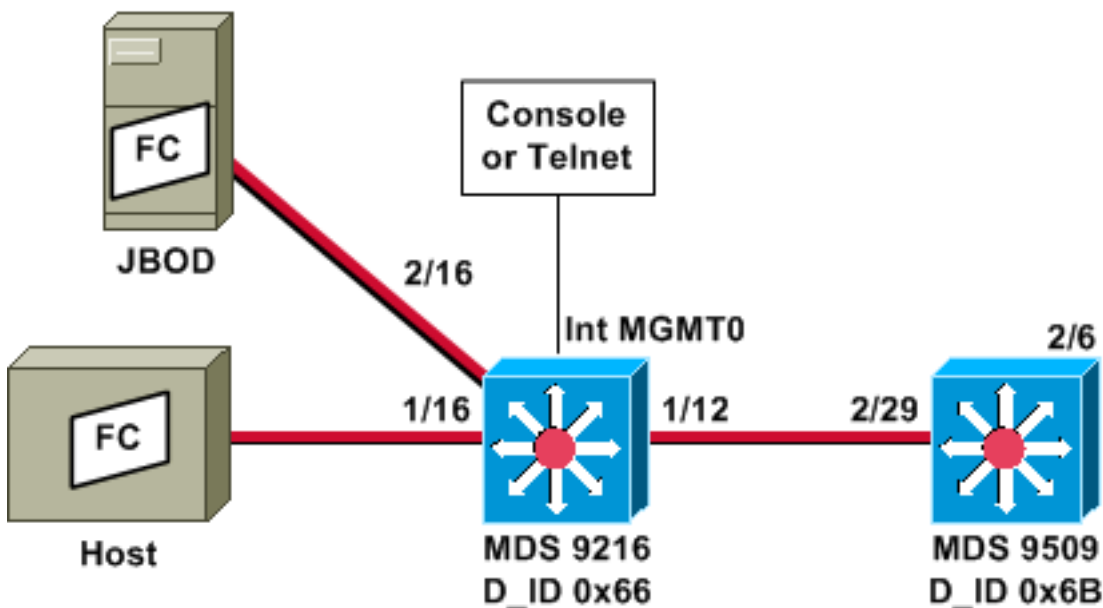
SPAN可用於追蹤交換器上任何連線埠的進（輸入）和出（輸出）流量。如前面的圖所示，遠端SPAN(RSPAN)可用於收集從左側交換器（分析儀連線到右側交換器）上的主機連線埠進出的訊框。

設定

本節提供用於設定本文件中所述功能的資訊。

注意：要查詢有關本文檔中使用的命令的其他資訊，請使用[命令查詢工具](#)([僅限註冊客戶](#))。

配置本地FC Analyzer



注意：其目的是收集源自9612 Supervisor或發往9612 Supervisor的FC幀。從主機到JBOD的幀不會使用FC分析器工具收集。

FC analyzer local通過控制檯附件或Telnet從命令列介面(CLI)運行。您可以運行一個簡短的顯示以只顯示每個幀的一小部分，或者運行一個詳細的跟蹤以顯示整個幀。

在配置模式下會啟動跟蹤，在按Ctrl-C時跟蹤會停止。預設情況下，僅捕獲100幀。要捕獲100多個幀，請將limit-captured-frames命令選項新增到用於啟動跟蹤的命令中。

也可以使用顯示過濾器將跟蹤的輸出限制為僅特定幀。

```
!--- VSAN 13 (0xd) is used here as example. MDS9216# show fcdomain domain-list vsan 13
```

```
Number of domains: 2
Domain ID          WWN
-----
0x66(102)         20:0d:00:05:30:00:47:9f [Local] [Principal]
0x6b(107)         20:0d:00:05:30:00:51:1f
```

```
MDS9216# show fcns data vsan 13
```

```
VSAN 13:
-----
FCID      TYPE  PWWN                                (VENDOR)      FC4-TYPE:FEATURE
-----
0x6600dc  NL    21:00:00:20:37:15:a2:49 (Seagate)     scsi-fcp:target
0x6600e0  NL    21:00:00:04:cf:6e:4a:8c (Seagate)     scsi-fcp:target
0x6600e1  NL    21:00:00:04:cf:6e:37:8b (Seagate)     scsi-fcp:target
0x660101  NL    10:00:00:01:73:00:81:82 (JNI)          scsi-fcp:target
0x660201  N     10:00:00:05:30:00:47:9f (Cisco)         ipfc
0x6b0001  N     10:00:00:05:30:00:51:23 (Cisco)         ipfc
```

```
Total number of entries = 6
```

```
!--- Configure FC analyzer for brief output. MDS9216# config t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
MDS9216(config)# fcanalyzer local brief display-filter mdshdr.vsan==0xd
```

Capturing on eth2

```
0.000000 ff.ff.fd -> ff.ff.fd SW_ILS HLO
0.000095 ff.ff.fd -> ff.ff.fd FC Link Ctl, ACK1
18.721559 ff.ff.fd -> ff.ff.fd SW_ILS HLO
18.721879 ff.ff.fd -> ff.ff.fd FC Link Ctl, ACK1
19.970287 ff.ff.fd -> ff.ff.fd SW_ILS HLO
19.970368 ff.ff.fd -> ff.ff.fd FC Link Ctl, ACK1
38.941558 ff.ff.fd -> ff.ff.fd SW_ILS HLO
38.941849 ff.ff.fd -> ff.ff.fd FC Link Ctl, ACK1
39.940546 ff.ff.fd -> ff.ff.fd SW_ILS HLO
39.940628 ff.ff.fd -> ff.ff.fd FC Link Ctl, ACK1
```

在下一個示例中，您有相同的資料。但這一次，命令中省略**brief**選項，以提供每個資料包的詳細檢視。

```
MDS9216(config)# fcanalyzer local display-filter mdshdr.vsan==0xd
```

Capturing on eth2

Frame 1 (100 bytes on wire, 100 bytes captured)

```
Arrival Time: Jul 4, 2003 12:31:18.310251000
Time delta from previous packet: 0.000000000 seconds
Time relative to first packet: 0.000000000 seconds
Frame Number: 1
Packet Length: 100 bytes
Capture Length: 100 bytes
```

Ethernet II, Src: 00:00:00:00:00:0a, Dst: 00:00:00:00:ee:00

```
Destination: 00:00:00:00:ee:00 (00:00:00:00:ee:00)
Source: 00:00:00:00:00:0a (00:00:00:00:00:0a)
Type: Unknown (0xfcfc)
```

Vegas (FC, SOFf/EOFn)

Vegas Header

```
.000 .... = Version: 0
.... 0000 = Andiamo Type: Normal FC frame (0)
#MPLS Labels: 0
Packet Len: 70
TTL: 255
0111 .... = User Priority: 7
.... 0000 0010 11.. = Dst Index: 0x000b
.... ..00 1111 1111 = Src Index: 0x00ff
Ctrl Bits: Index Directed frame (0x01)
Timestamp: 42678
.... .000 = Status: 0 (0)
0000 0... = Reason Code: 0 (0x00)
.... 0000 0000 1101 = VSAN: 13
Checksum: 0
```

Vegas Trailer

```
EOF: EOFn (3)
CRC: 4022250974
```

Fibre Channel

```
R_CTL: 0x02
Dest Addr: ff.ff.fd
CS_CTL: 0x00
Src Addr: ff.ff.fd
Type: SW_ILS (0x22)
F_CTL: 0x380000 (Exchange Originator, Seq Initiator, Exchg First,
Exchg Last, Seq Last, CS_CTL, Last Data Frame - No Info,
ABTS - Abort/MS, )
SEQ_ID: 0xe7
```

DF_CTL: 0x00
SEQ_CNT: 0
OX_ID: 0x1eb4
RX_ID: 0xffff
Parameter: 0x00000000

SW_ILS

Cmd Code: HLO (0x14)
FSPF Header
Version: 0x02
AR Number: 0x00
Authentication Type: 0x00
Originating Domain ID: 102
Authentication: 0000000000000000
Options: 00000000
Hello Interval (secs): 20
Dead Interval (secs): 80
Recipient Domain ID: 107
Originating Port Idx: 0x01000b

Frame 2 (60 bytes on wire, 60 bytes captured)

Arrival Time: Jul 4, 2003 12:31:18.310563000
Time delta from previous packet: 0.000312000 seconds
Time relative to first packet: 0.000312000 seconds
Frame Number: 2
Packet Length: 60 bytes
Capture Length: 60 bytes

Ethernet II, Src: 00:00:00:00:00:00, Dst: 00:00:00:00:00:00

Destination: 00:00:00:00:00:00 (00:00:00:00:00:00)
Source: 00:00:00:00:00:00 (00:00:00:00:00:00)
Type: Unknown (0x0000)

Vegas (FC, SOFf/EOft)

Vegas Header
.000 = Version: 0
.... 0000 = Andiamo Type: Normal FC frame (0)
#MPLS Labels: 0
Packet Len: 30
TTL: 255
0111 = User Priority: 7
.... 0011 1111 11.. = Dst Index: 0x00ff
.... ..00 0000 1011 = Src Index: 0x000b
Ctrl Bits: 0 (0x00)
Timestamp: 42679
.... .000 = Status: 0 (0)
0000 0... = Reason Code: 0 (0x00)
.... 0000 0000 1101 = VSAN: 13
Checksum: 241

Vegas Trailer

EOF: EOft (1)
CRC: 1019832848

Fibre Channel

R_CTL: 0xc0 (ACK1)
Dest Addr: ff.ff.fd
CS_CTL: 0x00
Src Addr: ff.ff.fd
Type: Unknown (0x00)
F_CTL: 0xf80000 (Exchange Responder, Seq Recipient, Exchg First,
Exchg Last, Seq Last, CS_CTL, Last Data Frame - No Info,
ABTS - Cont,)

SEQ_ID: 0xe7
DF_CTL: 0x00
SEQ_CNT: 0
OX_ID: 0x1eb4
RX_ID: 0x1e66
Parameter: 0x00000001

Frame 3 (100 bytes on wire, 100 bytes captured)

Arrival Time: Jul 4, 2003 12:31:19.309559000
Time delta from previous packet: 0.998996000 seconds
Time relative to first packet: 0.999308000 seconds
Frame Number: 3
Packet Length: 100 bytes
Capture Length: 100 bytes

Ethernet II, Src: 00:00:00:00:00:00, Dst: 00:00:00:00:00:00

Destination: 00:00:00:00:00:00 (00:00:00:00:00:00)
Source: 00:00:00:00:00:00 (00:00:00:00:00:00)
Type: Unknown (0x0000)

Vegas (FC, SOFf/EOFn)

Vegas Header

.000 = Version: 0
.... 0000 = Andiamo Type: Normal FC frame (0)
#MPLS Labels: 0
Packet Len: 70
TTL: 255
0111 = User Priority: 7
.... 0011 1111 11.. = Dst Index: 0x00ff
.... ..00 0000 1011 = Src Index: 0x000b
Ctrl Bits: 0 (0x00)
Timestamp: 42779
.... .000 = Status: 0 (0)
0000 0... = Reason Code: 0 (0x00)
.... 0000 0000 1101 = VSAN: 13
Checksum: 101

Vegas Trailer

EOF: EOFn (3)
CRC: 4200187557

Fibre Channel

R_CTL: 0x02
Dest Addr: ff.ff.fd
CS_CTL: 0x00
Src Addr: ff.ff.fd
Type: SW_ILS (0x22)
F_CTL: 0x380000 (Exchange Originator, Seq Initiator, Exchg First,
Exchg Last, Seq Last, CS_CTL, Last Data Frame - No Info,
ABTS - Abort/MS,)
SEQ_ID: 0xe7
DF_CTL: 0x00
SEQ_CNT: 0
OX_ID: 0x1e67
RX_ID: 0xffff
Parameter: 0x00000000

SW_ILS

Cmd Code: HLO (0x14)
FSPF Header
Version: 0x02
AR Number: 0x00
Authentication Type: 0x00
Originating Domain ID: 107
Authentication: 0000000000000000
Options: 00000000
Hello Interval (secs): 20
Dead Interval (secs): 80
Recipient Domain ID: 102
Originating Port Idx: 0x01011c

Frame 4 (60 bytes on wire, 60 bytes captured)

Arrival Time: Jul 4, 2003 12:31:19.309646000
Time delta from previous packet: 0.000087000 seconds
Time relative to first packet: 0.999395000 seconds

```

Frame Number: 4
Packet Length: 60 bytes
Capture Length: 60 bytes
Ethernet II, Src: 00:00:00:00:00:0a, Dst: 00:00:00:00:ee:00
Destination: 00:00:00:00:ee:00 (00:00:00:00:ee:00)
Source: 00:00:00:00:00:0a (00:00:00:00:00:0a)
Type: Unknown (0xfcfc)
Vegas (FC, SOFf/EOft)
Vegas Header
    .000 .... = Version: 0
    .... 0000 = Andiamo Type: Normal FC frame (0)
    #MPLS Labels: 0
    Packet Len: 30
    TTL: 255
    0111 .... = User Priority: 7
    .... 0000 0010 11.. = Dst Index: 0x000b
    .... ..00 1111 1111 = Src Index: 0x00ff
    Ctrl Bits: Index Directed frame (0x01)
    Timestamp: 42778
    .... .000 = Status: 0 (0)
    0000 0... = Reason Code: 0 (0x00)
    .... 0000 0000 1101 = VSAN: 13
    Checksum: 0
Vegas Trailer
    EOF: EOft (1)
    CRC: 4022250974
Fibre Channel
    R_CTL: 0xc0 (ACK1)
    Dest Addr: ff.ff.fd
    CS_CTL: 0x00
    Src Addr: ff.ff.fd
    Type: Unknown (0x00)
    F_CTL: 0xf80000 (Exchange Responder, Seq Recipient, Exchg First,
                Exchg Last, Seq Last, CS_CTL, Last Data Frame - No Info,
                ABTS - Cont, )
    SEQ_ID: 0xe7
    DF_CTL: 0x00
    SEQ_CNT: 0
    OX_ID: 0x1e67
    RX_ID: 0x1eb5
    Parameter: 0x00000001

```

再次顯示簡短的追蹤軌跡。但是這一次，連線埠1/16上的PC拔出並重新插入以強制登入。您可以看到與其他FC交換機之間的幀，以及與所連線的本地節點(PC)之間的幀。

```
MDS9216(config)# fcanalyzer local brief display-filter mdshdr.vsan==0xd
```

```

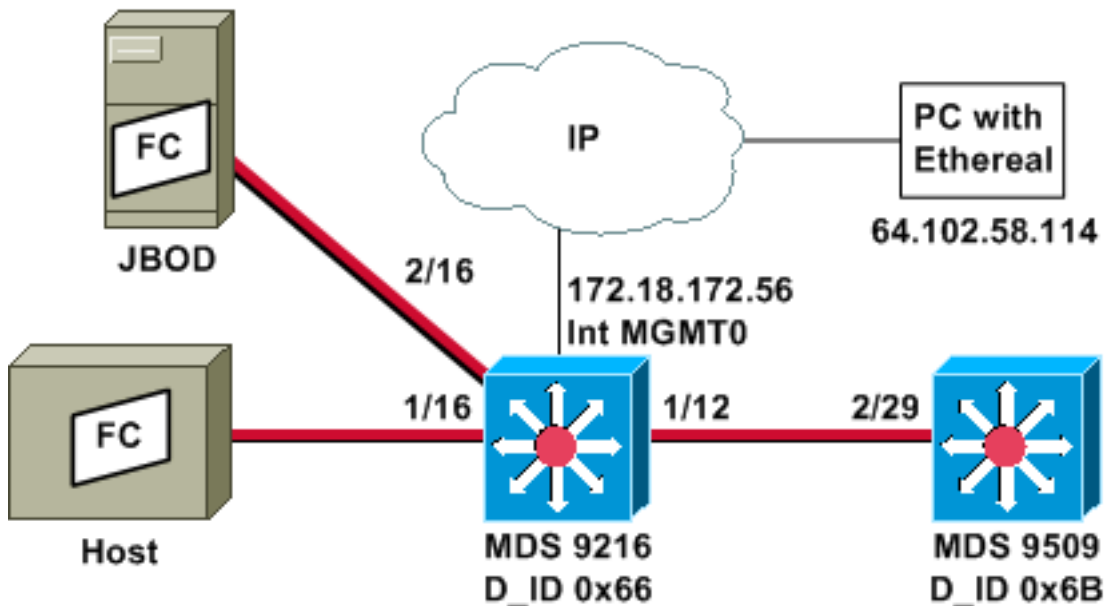
Capturing on eth2
0.000000    ff.ff.fd -> ff.ff.fd    SW_ILS HLO
0.000310    ff.ff.fd -> ff.ff.fd    FC Link Ctl, ACK1
0.999598    ff.ff.fd -> ff.ff.fd    SW_ILS HLO
0.999684    ff.ff.fd -> ff.ff.fd    FC Link Ctl, ACK1
19.990040   ff.ff.fd -> ff.ff.fd    SW_ILS HLO
19.990295   ff.ff.fd -> ff.ff.fd    FC Link Ctl, ACK1
20.990602   ff.ff.fd -> ff.ff.fd    SW_ILS HLO
20.990682   ff.ff.fd -> ff.ff.fd    FC Link Ctl, ACK1
26.028780   ff.fc.66 -> ff.fc.6b    SW_ILS SW_RSCN
26.029087   ff.fc.6b -> ff.fc.66    FC Link Ctl, ACK1
26.029541   ff.fc.6b -> ff.fc.66    SW_ILS SW_ACC (SW_RSCN)
26.029596   ff.fc.66 -> ff.fc.6b    FC Link Ctl, ACK1
31.151197   00.00.01 -> ff.ff.fe    FC ELS FLOGI
31.162809   ff.ff.fe -> 66.01.01    FC ELS ACC (FLOGI)
31.162841   ff.ff.fe -> 66.01.01    FC ELS ACC (FLOGI)

```

31.163139	66.01.01 -> ff.ff.fd	FC ELS SCR
31.163583	ff.ff.fd -> 66.01.01	FC ELS ACC (SCR)
31.163603	ff.ff.fd -> 66.01.01	FC ELS ACC (SCR)
31.163835	66.01.01 -> ff.ff.fc	FC ELS PLOGI
31.163965	ff.ff.fc -> 66.01.01	FC ELS ACC (PLOGI)
31.163985	ff.ff.fc -> 66.01.01	FC ELS ACC (PLOGI)
31.164186	66.01.01 -> ff.ff.fc	dns GA_NXT
31.164305	ff.fc.66 -> ff.fc.6b	SW_ILS SW_RSCN
31.164479	ff.fc.6b -> ff.fc.66	FC Link Ctl, ACK1
31.164628	ff.fc.6b -> ff.fc.66	SW_ILS SW_ACC (SW_RSCN)
31.164670	ff.fc.66 -> ff.fc.6b	FC Link Ctl, ACK1
31.165030	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.165050	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.165125	ff.fc.6b -> ff.fc.66	dns GE_ID
31.165193	ff.fc.66 -> ff.fc.6b	FC Link Ctl, ACK1
31.165419	66.01.01 -> ff.ff.fc	dns GA_NXT
31.165577	ff.fc.66 -> ff.fc.6b	dns ACC (GE_ID)
31.165781	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.165804	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.165943	ff.fc.6b -> ff.fc.66	FC Link Ctl, ACK1
31.166063	66.01.01 -> ff.ff.fc	dns GA_NXT
31.166870	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.166892	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.167268	66.01.01 -> ff.ff.fc	dns GA_NXT
31.167529	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.167549	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.168704	66.01.01 -> ff.ff.fc	dns GA_NXT
31.169272	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.169294	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.169568	66.01.01 -> ff.ff.fc	dns GA_NXT
31.170453	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.170473	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.170756	66.01.01 -> ff.ff.fc	dns GA_NXT
31.170975	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.170994	ff.ff.fc -> 66.01.01	dns ACC (GA_NXT)
31.171400	66.01.01 -> 66.02.01	FC ELS PLOGI
31.171562	66.02.01 -> 66.01.01	FC ELS ACC (PLOGI)
31.171581	66.02.01 -> 66.01.01	FC ELS ACC (PLOGI)
31.171752	66.01.01 -> 66.02.01	FC ELS PRLI
31.171812	66.02.01 -> 66.01.01	FC ELS LS_RJT (PRLI)
31.171832	66.02.01 -> 66.01.01	FC ELS LS_RJT (PRLI)
31.173863	66.01.01 -> ff.ff.fc	FC ELS LOGO
31.175020	ff.ff.fc -> 66.01.01	FC ELS ACC (LOGO)
31.175047	ff.ff.fc -> 66.01.01	FC ELS ACC (LOGO)
31.175182	66.01.01 -> ff.ff.fc	FC ELS PLOGI
31.175290	ff.ff.fc -> 66.01.01	FC ELS ACC (PLOGI)
31.175310	ff.ff.fc -> 66.01.01	FC ELS ACC (PLOGI)
31.175632	66.01.01 -> ff.ff.fa	FC ELS PLOGI
31.175753	ff.ff.fa -> 66.01.01	FC ELS ACC (PLOGI)
31.175777	ff.ff.fa -> 66.01.01	FC ELS ACC (PLOGI)
32.460020	ff.fc.66 -> 66.01.01	FC ELS PLOGI
32.460050	ff.fc.66 -> 66.01.01	FC ELS PLOGI
32.460207	66.01.01 -> ff.fc.66	FC ELS ACC (PLOGI)
32.460246	66.01.01 -> ff.fc.66	FC ELS ACC (PLOGI)
32.460340	ff.fc.66 -> 66.01.01	FC ELS PRLI
32.460362	ff.fc.66 -> 66.01.01	FC ELS PRLI
32.460492	66.01.01 -> ff.fc.66	FC ELS LS_RJT (PRLI)
32.460525	66.01.01 -> ff.fc.66	FC ELS LS_RJT (PRLI)
32.461839	ff.fc.66 -> 66.01.01	FC ELS LOGO
32.461866	ff.fc.66 -> 66.01.01	FC ELS LOGO
32.462046	66.01.01 -> ff.fc.66	FC ELS ACC (LOGO)
32.462080	66.01.01 -> ff.fc.66	FC ELS ACC (LOGO)

MDS9216(config)# **exit**

為遠端FC Analyzer配置



注意：其目的是收集源自9612 Supervisor或發往9612 Supervisor的FC幀。從主機到JBOD的幀不會使用FC分析器工具收集。

FC分析器遠端運行於使用Ethereal 0.9(9)或更高版本和WinPcap 的PC上。PC的IP地址是在為啟動MDS CLI上的FC分析器跟蹤而發出的命令中指定的。在PC上，還必須從命令列啟動Ethereal，並且必須在命令中指定MDS管理介面的IP地址。

1. 要停止MDS FC分析器跟蹤，您必須從CLI按Ctrl-C。

```
MDS9216# config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
MDS9216(config)# fcanalyzer remote 64.102.58.114
```

```
MDS9216(config)# ^C
```

請勿在上一個命令上指定**active**選項，否則啟動Ethereal時，您需要在PC上的命令列中新增其他選項。新增**active**關鍵字通常意味著您還必須配置TCP埠號。建議您使用預設值。

2. 在PC上，驗證IP地址並啟動Ethereal遠端捕獲程式。

```
d:\> ipconfig
```

```
Windows 2000 IP Configuration
```

```
Ethernet adapter wireless:
```

```
Connection-specific DNS Suffix . : cisco.com
IP Address. . . . . : 64.102.58.114
Subnet Mask . . . . . : 255.255.255.128
Default Gateway . . . . . : 64.102.58.1
```

```
Ethernet adapter builtinE:
```

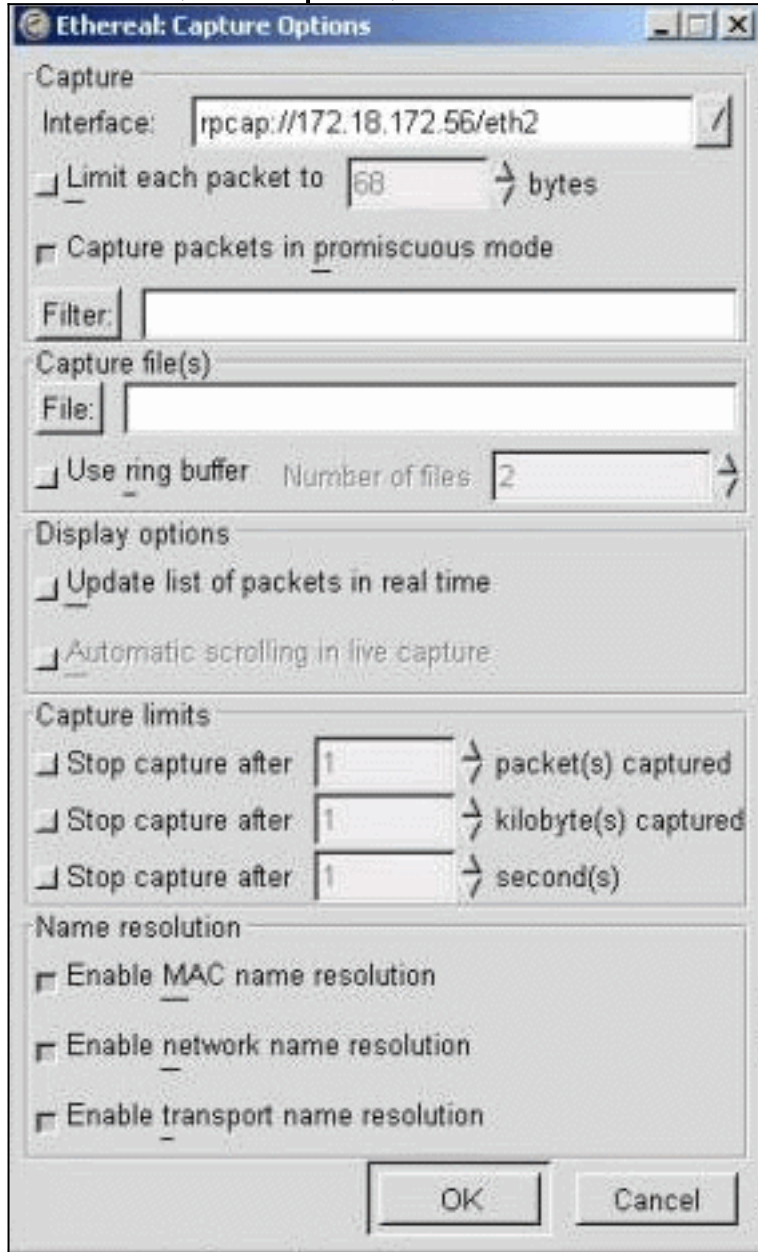
```
Connection-specific DNS Suffix . : cisco.com
Autoconfiguration IP Address. . . : 169.254.219.141
```

Subnet Mask : 255.255.0.0
Default Gateway :

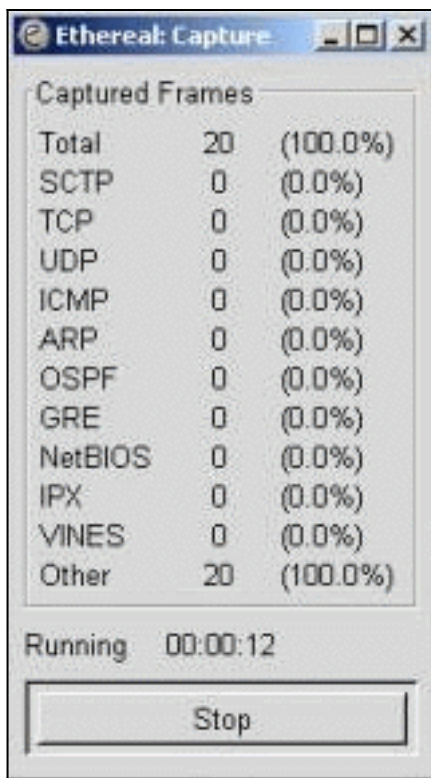
d:\> cd ethereal099

D:\Ethereal099> ethereal099 -i rpcap://172.18.172.56/eth2

3. 程式啟動後，選擇Capture，然後按一下OK以啟動資料包收集。

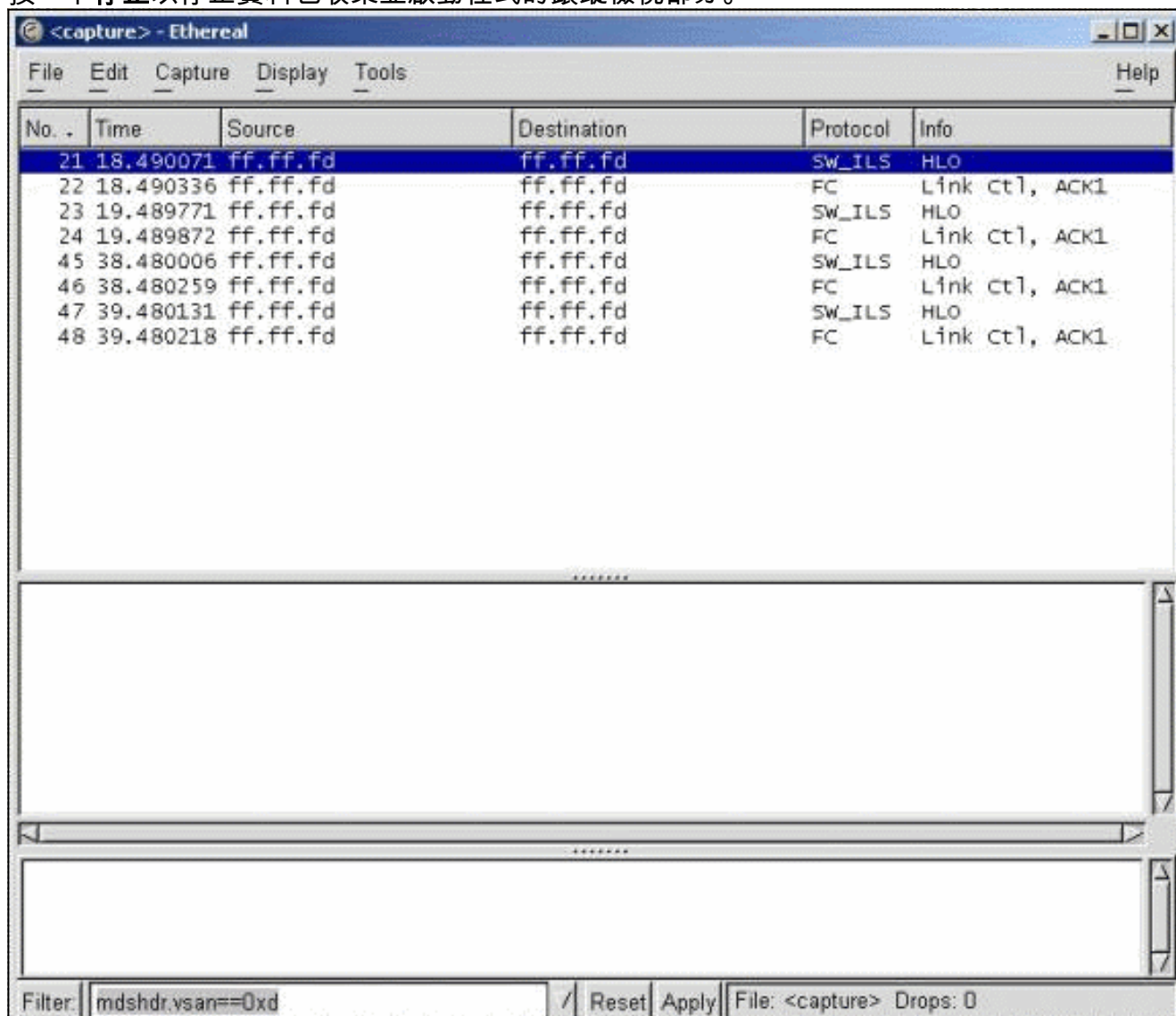


在摘要顯示中，收集的FC資料包顯示為



Other。

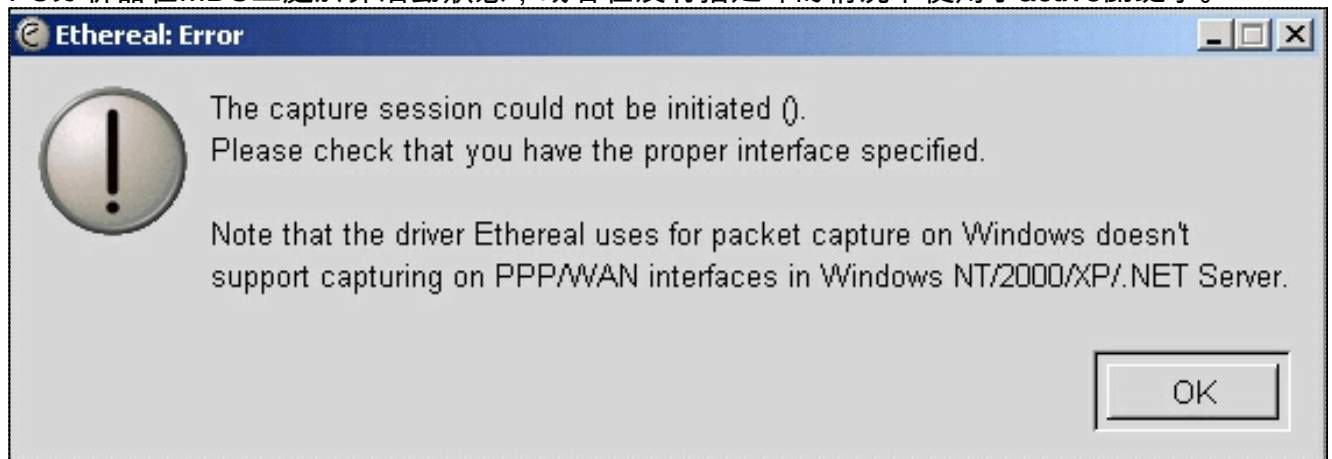
4. 按一下**停止**以停止資料包收集並啟動程式的跟蹤檢視部分。



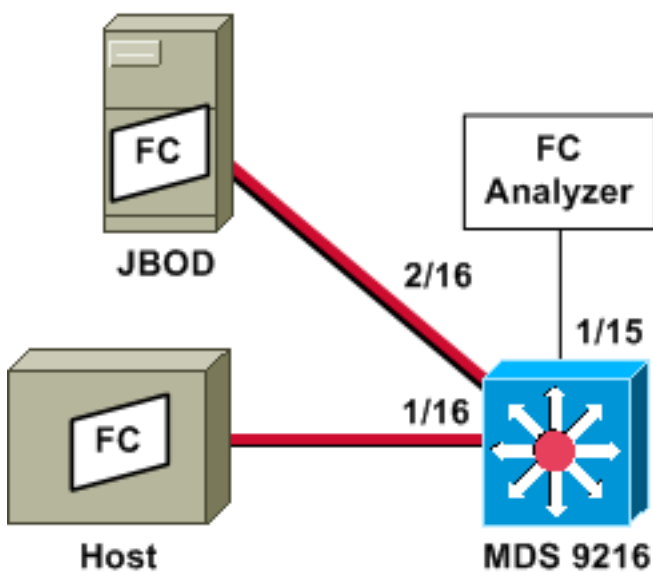
可以使用過濾器將顯示限制為特定流量流。

5. 如果遠端捕獲啟動出現問題，您可能會看到與下一個影像中的錯誤螢幕相似的錯誤螢幕。

FC分析器在MDS上處於非活動狀態，或者在沒有指定埠的情況下使用了**active**關鍵字。



設定本地SPAN



注意：目的是使用埠1/15上的FC分析器收集9216埠1/16上主機與主機之間的FC幀。

埠1/15上的FC分析器顯示有序集，但不顯示正在SPAN連線的鏈路上發生的有序集。FC分析器裝置可以是埠分析器介面卡(PAA)和運行Ethereal的PC，類似於Finisar裝置。

MDS 9216配置

```
MDS9216# show run

vsan 13

vsan 13 interface fc1/16
vsan 13 interface fc2/16

boot system bootflash:/m9200-ek9-mzg.1.2.0.77.bin
boot kickstart bootflash:/m9200-ek9-kickstart-mzg.1.2.0.77.bin

interface fc1/15
switchport mode SD
switchport speed 2000
no shutdown
```

```
interface fc1/16
no shutdown

interface mgmt0
ip address 172.18.172.56 255.255.255.0
```

```
span session 1
destination interface fc1/15
source interface fc1/16 rx
```

```
source interface fc1/16 tx
```

[MDS 9216顯示器](#)

```
MDS9216# show interface fc 1/15
```

```
fc1/15 is up
Hardware is Fibre Channel
Port WWN is 20:0f:00:05:30:00:47:9e
Admin port mode is SD
Port mode is SD
Port vsan is 1
Speed is 2 Gbps
Beacon is turned off
5 minutes input rate 73704 bits/sec, 9213 bytes/sec, 13 frames/sec
5 minutes output rate 2275584 bits/sec, 284448 bytes/sec, 430 frames/sec
2839098 frames input, 1883173240 bytes
 0 discards, 0 errors
 0 CRC, 0 unknown class
 0 too long, 0 too short
3049460 frames output, 2038253240 bytes
 0 discards, 0 errors
 0 input OLS, 0 LRR, 0 NOS, 0 loop inits
 0 output OLS, 0 LRR, 0 NOS, 0 loop inits
```

```
MDS9216# show interface fc 1/16
```

```
fc1/16 is up
Hardware is Fibre Channel
Port WWN is 20:10:00:05:30:00:47:9e
Admin port mode is auto, trunk mode is on
Port mode is FL, FCID is 0x660100
Port vsan is 13
Speed is 2 Gbps
Transmit B2B Credit is 0
Receive B2B Credit is 16
Receive data field Size is 2112
Beacon is turned off
5 minutes input rate 771568 bits/sec, 96446 bytes/sec, 171 frames/sec
5 minutes output rate 1503144 bits/sec, 187893 bytes/sec, 258 frames/sec
1238843 frames input, 691853044 bytes
 0 discards, 0 errors
 0 CRC, 0 unknown class
 0 too long, 0 too short
1864744 frames output, 1357707740 bytes
 0 discards, 0 errors
 0 input OLS, 0 LRR, 0 NOS, 49 loop inits
 10 output OLS, 0 LRR, 10 NOS, 14 loop inits
```

```
MDS9216# show interface fc 2/16
```

```
fc2/16 is up
Hardware is Fibre Channel
```

```

Port WWN is 20:50:00:05:30:00:47:9e
Admin port mode is FX
Port mode is FL, FCID is 0x660000
Port vsan is 13
Speed is 1 Gbps
Transmit B2B Credit is 0
Receive B2B Credit is 12
Receive data field Size is 2112
Beacon is turned off
5 minutes input rate 1647552 bits/sec, 205944 bytes/sec, 283 frames/sec
5 minutes output rate 845624 bits/sec, 105703 bytes/sec, 188 frames/sec
1867680 frames input, 1361393600 bytes
    0 discards, 0 errors
    0 CRC, 0 unknown class
    0 too long, 0 too short
1241179 frames output, 694505284 bytes
    0 discards, 0 errors
    0 input OLS, 0 LRR, 0 NOS, 2 loop inits
    0 output OLS, 0 LRR, 0 NOS, 2 loop inits

```

MDS9216# **show fcns data vsan 13**

VSAN 13:

```

-----
FCID          TYPE  PWWN                               (VENDOR)          FC4-TYPE:FEATURE
-----
0x6600dc      NL    21:00:00:20:37:15:a2:49 (Seagate)         scsi-fcp:target
0x6600e0      NL    21:00:00:04:cf:6e:4a:8c (Seagate)         scsi-fcp:target
0x6600e1      NL    21:00:00:04:cf:6e:37:8b (Seagate)         scsi-fcp:target
0x660101      NL    10:00:00:01:73:00:81:82 (JNI)

```

Total number of entries = 4

MDS9216# **show span session brief**

```

-----
Session  Admin          Oper          Destination
         State           State         Interface
-----
1         no suspend      active        fc1/15

```

MDS9216# **show span session 1**

```

Session 1 (active)
Destination is fc1/15
No session filters configured
Ingress (rx) sources are
    fc1/16,
Egress (tx) sources are
    fc1/16,

```

MDS9216# **show span internal info session 1**

```

=====
Admin Configuration for session [1]
=====
Name:
Destination port: [100e000] [fc1/15] Flags [1]
State: [0] not suspended
Session Flags: [0] <>
Session Filter rx: none
Session Filter tx: none
Source interface - rx: fc1/16
Source interface - tx: fc1/16

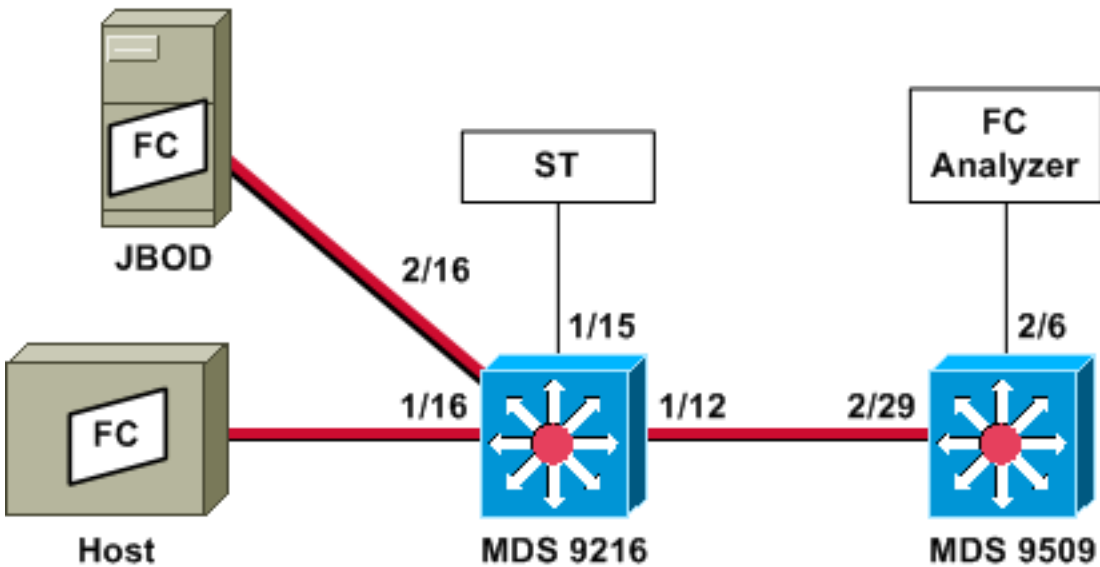
```

```

Source vsan (rx): none
Session [1] is UNLOCKED txn[0] cfg[0] rid[80000000]
=====
Runtime Data for session [1]
=====
Status <active: 0 inactive 1> : [0] active
State reason:[0] Flags [6]rx_span_bit [0] tx_span_bit[1] ( 4s invalid)
oper configured PHYSICAL ports
fc1/16
PHYSICAL ports undergoing configuration
none
PHYSICAL ports in error state
none
PHYSICAL ports (incl. dest) link status
fc1/15, fc1/16

```

設定遠端SPAN



註：目的是收集9216主機的FC幀 (FC分析器連線到9509)。ST介面必須安裝Gigabit介面轉換器 (GBIC)，且速度必須與9509上的Span目的地(SD)連線埠相符。

嘗試設定RSPAN之前，請確保解決了以下問題：

- 所有交換機都必須運行MDS代碼1.2或更高版本。
- 在Span終端(ST)埠中，不應將任何電纜連線到小型可插拔(SFP)。
- 在開始收集幀之前，請確保FC隧道已啟動。
- FC分析器可以是運行Ethereal的PAA和PC，類似於Finisar裝置。

如果SPAN來源和SPAN目的地交換器之間有任何中間交換器，請依照以下程式操作：

1. 在與隧道源和目標相同的子網中建立活動VSAN介面。
2. 啟用IP路由。
3. 啟用FC隧道。
4. 使用SAN-OS 1.2或更高版本。

MDS 9216配置

```
MDS9216# show version
```

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

Software

BIOS: version 1.0.7
loader: version 1.0(3a)
kickstart: version 1.2(1) [build 1.2(0.77)] [gdb]
system: version 1.2(1) [build 1.2(0.77)] [gdb]

BIOS compile time: 03/20/03
kickstart image file is: bootflash:/m9200-ek9-kickstart-mzg.1.2.0.77.bin
kickstart compile time: 6/29/2003 0:00:00
system image file is: bootflash:/m9200-ek9-mzg.1.2.0.77.bin
system compile time: 6/29/2003 0:00:00

Hardware

RAM 963108 kB

bootflash: 503808 blocks (block size 512b)
slot0: 0 blocks (block size 512b)

MDS9216 uptime is 0 days 21 hours 28 minute(s) 20 second(s)

Last reset at 50030 usecs after Thu Jul 3 13:09:31 2003
Reason: Reset Requested by CLI command reload
System version: 1.2(0.45c)

MDS9216# **show run**

Building Configuration ...

```
interface fc-tunnel 13
destination 10.0.0.2
source 10.0.0.1
no shutdown

vsan database
vsan 13

interface vsan13
ip address 10.0.0.1 255.255.255.0
no shutdown

vsan 13 interface fc1/16
vsan 13 interface fc2/16

boot system bootflash:/m9200-ek9-mzg.1.2.0.77.bin
boot kickstart bootflash:/m9200-ek9-kickstart-mzg.1.2.0.77.bin
fc-tunnel enable

ip routing
zone default-zone permit vsan 13

interface fc1/12
no shutdown

interface fc1/15
switchport mode ST
switchport speed 1000
rspan-tunnel interface fc-tunnel 13
```


no shutdown

```
interface fc1/16
no shutdown
```

```
interface fc2/16
no shutdown
```

```
interface mgmt0
ip address 172.18.172.56 255.255.255.0
```

```
span session 1
destination interface fc-tunnel 13
source interface fc1/16 rx
```

```
source interface fc1/16 tx
```

!--- Output suppressed.

MDS 9216顯示器

MDS9216# **show interface fc 1/16**

fc1/16 is up

```
Hardware is Fibre Channel
Port WWN is 20:10:00:05:30:00:47:9e
Admin port mode is auto, trunk mode is on
Port mode is FL, FCID is 0x660100
Port vsan is 13
Speed is 2 Gbps
Transmit B2B Credit is 0
Receive B2B Credit is 16
Receive data field Size is 2112
Beacon is turned off
5 minutes input rate 1480080 bits/sec, 185010 bytes/sec, 331 frames/sec
5 minutes output rate 2907712 bits/sec, 363464 bytes/sec, 498 frames/sec
574444 frames input, 320246452 bytes
    0 discards, 0 errors
    0 CRC, 0 unknown class
    0 too long, 0 too short
865170 frames output, 629303788 bytes
    0 discards, 0 errors
0 input OLS, 0 LRR, 0 NOS, 10 loop inits
5 output OLS, 0 LRR, 5 NOS, 9 loop inits
```

MDS9216# **show interface fc 2/16**

fc2/16 is up

```
Hardware is Fibre Channel
Port WWN is 20:50:00:05:30:00:47:9e
Admin port mode is FX
Port mode is FL, FCID is 0x660000
Port vsan is 13
Speed is 1 Gbps
Transmit B2B Credit is 0
Receive B2B Credit is 12
Receive data field Size is 2112
Beacon is turned off
5 minutes input rate 2905056 bits/sec, 363132 bytes/sec, 498 frames/sec
5 minutes output rate 1480184 bits/sec, 185023 bytes/sec, 330 frames/sec
867932 frames input, 632889576 bytes
    0 discards, 0 errors
    0 CRC, 0 unknown class
    0 too long, 0 too short
```

```
576681 frames output, 322771132 bytes
 0 discards, 0 errors
0 input OLS, 0 LRR, 0 NOS, 2 loop inits
0 output OLS, 0 LRR, 0 NOS, 2 loop inits
```

MDS9216# **show interface fc 1/15**

```
fc1/15 is up
Hardware is Fibre Channel
Port WWN is 20:0f:00:05:30:00:47:9e
Admin port mode is ST
Port mode is ST
Port vsan is 1
Speed is 1 Gbps
Rspan tunnel is fc-tunnel 13
Beacon is turned off
5 minutes input rate 4391896 bits/sec, 548987 bytes/sec, 827 frames/sec
5 minutes output rate 4391896 bits/sec, 548987 bytes/sec, 820 frames/sec
1431232 frames input, 941079708 bytes
 0 discards, 0 errors
 0 CRC, 0 unknown class
 0 too long, 0 too short
1406853 frames output, 941079708 bytes
 0 discards, 0 errors
 0 input OLS, 0 LRR, 0 NOS, 0 loop inits
 0 output OLS, 0 LRR, 0 NOS, 0 loop inits
```

MDS9216# **show interface fc 1/12**

```
fc1/12 is trunking
Hardware is Fibre Channel
Port WWN is 20:0c:00:05:30:00:47:9e
Peer port WWN is 20:5d:00:05:30:00:51:1e
Admin port mode is auto, trunk mode is on
Port mode is TE
Port vsan is 1
Speed is 2 Gbps
Transmit B2B Credit is 12
Receive B2B Credit is 255
Receive data field Size is 2112
Beacon is turned off
Trunk vsans (admin allowed and active) (1-5,13,20,777)
Trunk vsans (up) (1,13)
Trunk vsans (isolated) (2-5,20,777)
Trunk vsans (initializing) ()
5 minutes input rate 384 bits/sec, 48 bytes/sec, 0 frames/sec
5 minutes output rate 4458296 bits/sec, 557287 bytes/sec, 827 frames/sec
19865 frames input, 2220112 bytes
 0 discards, 0 errors
 0 CRC, 0 unknown class
 0 too long, 0 too short
1468709 frames output, 971064244 bytes
 0 discards, 0 errors
 0 input OLS, 2 LRR, 0 NOS, 0 loop inits
 2 output OLS, 2 LRR, 0 NOS, 2 loop inits
```

MDS9216# **show interface fc-tunnel 13**

```
fc-tunnel 13 is up
Dest IP Addr: 10.0.0.2 Tunnel ID: 13
Source IP Addr: 10.0.0.1 LSP ID: 1
Explicit Path Name:
Outgoing interface: fc1/12
Outgoing Label(s) to Insert: 10005:0:1:ff'h
```

Record Routes:
10.0.0.2

MDS9216# **show interface vsan 13**

vsan13 is up, line protocol is up
WWPN is 10:00:00:05:30:00:47:9f, FCID is 0x660201
Internet address is 10.0.0.1/24
MTU 1500 bytes, BW 1000000 Kbit
2207 packets input, 170332 bytes, 0 errors, 0 multicast
14952 packets output, 2225444 bytes, 0 errors, 0 dropped

MDS9216# **show span session 1**

Session 1 (active)
Destination is fc-tunnel 13
No session filters configured
Ingress (rx) sources are
fc1/16,
Egress (tx) sources are
fc1/16,

MDS9216# **show fc-tunnel internal states**

number of sessions : 1
Sess: 10.0.0.2 Tunnel-ID 13 Ext-Tunnel-ID 10.0.0.1

MDS9216# **show fc-tunnel internal data**

vsan interfaces:
vsan 13: 10.0.0.1/255.255.255.0 [2]
vsan 2: 15.0.0.4/255.255.255.0 [2]
next hop switch information:
10.0.0.2 {vsan (13), 0x6b0001/8}: [4] fc1/12
layer 2 interfaces:
fc1/12: Trunking, Up

[MDS 9509配置](#)

RTP-9509-1# **show run**

Building Configuration ...
vsan database
vsan 13

interface vsan13
ip address 10.0.0.2 255.255.255.0
no shutdown

vsan 13 interface fc2/16

boot system bootflash:/m9500-sf1ek9-mzg.1.2.0.77.bin sup-1
boot kickstart bootflash:/m9500-sf1ek9-kickstart-mzg.1.2.0.77.bin sup-1
boot system bootflash:/m9500-sf1ek9-mzg.1.2.0.77.bin sup-2
boot kickstart bootflash:/m9500-sf1ek9-kickstart-mzg.1.2.0.77.bin sup-2

fc-tunnel enable
fc-tunnel tunnel-id-map 13 interface fc2/6

ip routing

switchname RTP-9509-1

```
interface fc2/6
switchport mode SD
switchport speed 1000
no shutdown
```

```
interface fc2/29
switchport mode E
no shutdown
```

```
interface mgmt0
ip address 172.18.172.57 255.255.255.0
```

[MDS 9509顯示器](#)

RTP-9509-1# **show interface fc 2/29**

```
fc2/29 is trunking
Hardware is Fibre Channel
Port WWN is 20:5d:00:05:30:00:51:1e
Peer port WWN is 20:0c:00:05:30:00:47:9e
Admin port mode is E, trunk mode is on
Port mode is TE
Port vsan is 501
Speed is 2 Gbps
Transmit B2B Credit is 255
Receive B2B Credit is 12
Receive data field Size is 2112
Beacon is turned off
Trunk vsans (admin allowed and active) (1,13,86,100,501)
Trunk vsans (up) (1,13)
Trunk vsans (isolated) (86,100,501)
Trunk vsans (initializing) ()
5 minutes input rate 4497752 bits/sec, 562219 bytes/sec, 835 frames/sec
5 minutes output rate 344 bits/sec, 43 bytes/sec, 0 frames/sec
1934604 frames input, 1285716656 bytes
  0 discards, 0 errors
  0 CRC, 0 unknown class
  0 too long, 0 too short
16903 frames output, 932076 bytes
  0 discards, 0 errors
1 input OLS, 1 LRR, 2 NOS, 0 loop inits
3 output OLS, 1 LRR, 2 NOS, 0 loop inits
```

RTP-9509-1# **show interface fc 2/6**

```
fc2/6 is up
Hardware is Fibre Channel
Port WWN is 20:46:00:05:30:00:51:1e
Admin port mode is SD
Port mode is SD
Port vsan is 1
Speed is 1 Gbps
Beacon is turned off
5 minutes input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
5 minutes output rate 4421448 bits/sec, 552681 bytes/sec, 835 frames/sec
0 frames input, 0 bytes
  0 discards, 0 errors
  0 CRC, 0 unknown class
  0 too long, 0 too short
1912319 frames output, 1263982444 bytes
  0 discards, 0 errors
0 input OLS, 0 LRR, 0 NOS, 0 loop inits
0 output OLS, 0 LRR, 0 NOS, 0 loop inits
```

```
RTP-9509-1# show interface fc-tunnel 13
^
% invalid interface range detected at '^' marker.
!--- This is because the tunnel is not defined on the 9509. RTP-9509-1# show interface vsan 13

vsan13 is up, line protocol is up
  WWPN is 10:00:00:05:30:00:51:23, FCID is 0x6b0001
  Internet address is 10.0.0.2/24
  MTU 1500 bytes, BW 1000000 Kbit
  15071 packets input, 2243728 bytes, 0 errors, 1 multicast
  2342 packets output, 185864 bytes, 0 errors, 0 dropped
```

```
RTP-9509-1# show fc-tunnel tunnel-id-map
```

```
tunnel id egress interface
  13          fc2/6
  14
```

```
RTP-9509-1# show fc-tunnel internal states
```

```
number of sessions : 1
Sess: 10.0.0.2 Tunnel-ID 13 Ext-Tunnel-ID 10.0.0.1
```

```
RTP-9509-1# show fc-tunnel internal data
```

```
vsan interfaces:
  vsan 13: 10.0.0.2/255.255.255.0 [2]
next hop switch information:
layer 2 interfaces:
  fc2/6: Non-Trunking, Up
```

[連線埠分析器配接器裝置說明](#)

乙太網埠是銅纜埠，其自動檢測速度為1 Gbps或100 Mbps。必須在PC上安裝Ethereal 0.9(9)或更高版本，以及WinPcap。

FC埠需要SFP和LC到LC電纜才能連線到MDS。

以下是PAA上的交換機設定：

- 交換機位置從左到右編號為1、2、3和4。
- 在下一個清單中，1表示dip開關為ON或UP。0表示dip開關已關閉或關閉。

```
0001 1G  NTM
1001 1G  ETM
0101 1G  STM
0011 1G  DTM
```

```
0000 2G  NTM
1000 2G  ETM
0100 2G  STM
0010 2G  DTM
```

```
1111 1G  MNM
```

!--- Used for diagnostics only.

- 開關4指定速度 (開= 1G , 關= 2G)。交換機1、2和3指定截斷模式。任何更改都需要重新通電。

以下是模式：

- No Truncate Mode(NTM) — 無需修改即可傳遞FC幀。

- Ethernet Truncate Mode(ETM) — 將負載大小從528行減少到368行，以將FC幀中繼到最多1496位元組。
- Shallow Truncate Mode(STM) — 將負載大小從528行減少到58行，以將FC幀中繼到最多256位元組。
- 深度截斷模式(DTM) — 將負載大小從528行減少到10行，將FC幀中繼到最多64位元組。

驗證

目前沒有適用於此組態的驗證程序。

疑難排解

目前尚無適用於此組態的具體疑難排解資訊。

相關資訊

- [MDS 9000多層次交換器硬體支援](#)
- [儲存網路產品支援](#)
- [技術支援 - Cisco Systems](#)