

Dot1Q/L2P通道上的封包遺失

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簡介

本檔案將討論疑難排解Cisco IOS[®]中由於Dot1Q/L2P通道上的網路設計不良而導致的封包遺失，並提供個例研究。

必要條件

需求

思科建議您瞭解以下主題：

- 有關Dot1Q隧道的基本知識
- OSPF基礎知識

採用元件

本檔案所述內容不限於特定軟體或硬體版本。

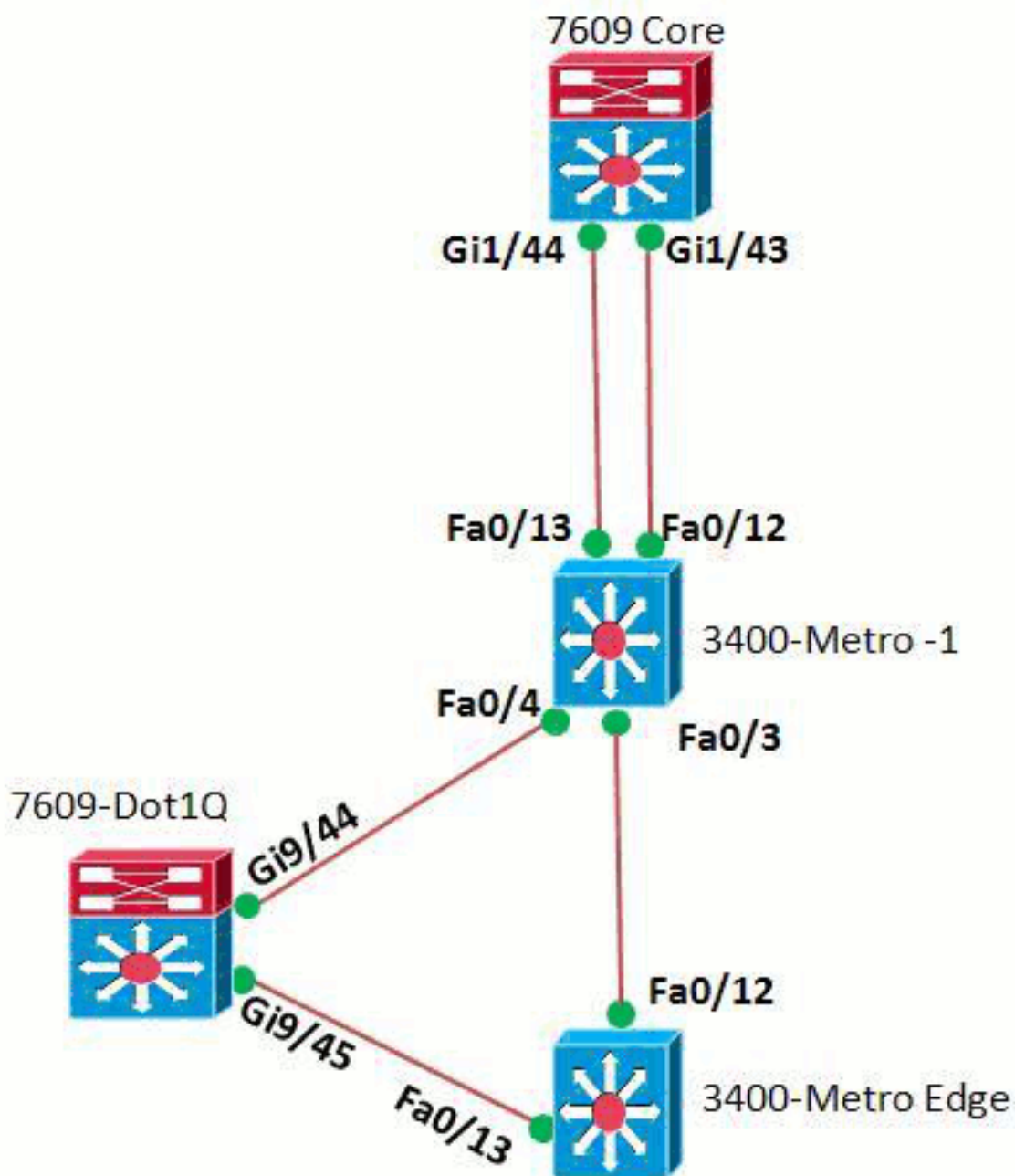
本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路正在作用，請確保您已瞭解任何指令可能造成的影響。

慣例

如需文件慣例的詳細資訊，請參閱[思科技術提示慣例](#)。

網路圖表

在此網路設定中，路由器7600-Core的介面Gi1/44和Gi1/43的路由器分別與3400-Metro-1的Fa0/13和Fa0/12位於單臂設定中。在7600-Dot1Q交換器中，介面Gi9/44和Gi 9/45使用Dot1q通道模式啟用。在3400-Metro Edge上建立了SVI VLAN介面，並將Fa0/13和Fa0/12配置為中繼埠。路由器使用OSPF相互通訊。



組態

- [7609核心](#)
- [7609-Dot1Q](#)
- [3400-Metro-1](#)
- [3400-Metro Edge](#)

7609核心

```
version 15.0
hostname 7609-CORE
interface GigabitEthernet1/43
  mtu 9216
  no ip address
  no ip redirects
  no ip proxy-arp
  load-interval 60
  carrier-delay 2
  flowcontrol send off
  storm-control broadcast level 1.00
!
interface GigabitEthernet1/43.3503
  encapsulation dot1Q 3503
  ip address 172.16.41.17 255.255.255.252
  no ip redirects
  no ip proxy-arp
  ip mtu 1500
  ip ospf authentication-key 7 072C0E6B6B272D
  ip ospf network point-to-point
  ip ospf hello-interval 3
  ip ospf dead-interval 10
!
!
interface GigabitEthernet1/44
  mtu 9216
  no ip address
  no ip redirects
  no ip proxy-arp
  load-interval 60
  carrier-delay 2
  flowcontrol send off
  storm-control broadcast level 1.00
!
interface GigabitEthernet1/44.3803
  encapsulation dot1Q 3803
  ip address 172.16.73.137 255.255.255.248 secondary
  ip address 172.16.41.21 255.255.255.252
  no ip redirects
  no ip proxy-arp
  ip mtu 1500
  ip ospf authentication-key 7 072C0E6B6B272D
  ip ospf network point-to-point
  ip ospf cost 5
  ip ospf hello-interval 3
  ip ospf dead-interval 10
!
!
!--- Output omitted. ! end
```

7609 DOT1Q

```
!
version 12.2
!
interface GigabitEthernet9/44
  switchport
  switchport access vlan 24
  switchport mode dot1q-tunnel
  mtu 9216
  load-interval 60
  carrier-delay 2
  flowcontrol send off
  storm-control broadcast level 1.00
```

```
l2protocol-tunnel cdp
l2protocol-tunnel stp
l2protocol-tunnel vtp
no cdp enable
spanning-tree portfast disable
spanning-tree bpdudfilter enable
!
!
interface GigabitEthernet9/45
  switchport
  switchport access vlan 24
  switchport mode dot1q-tunnel
  mtu 9216
  load-interval 60
  carrier-delay 2
  flowcontrol send off
  storm-control broadcast level 1.00
  l2protocol-tunnel cdp
  l2protocol-tunnel stp
  l2protocol-tunnel vtp
  no cdp enable
  spanning-tree portfast disable
  spanning-tree bpdudfilter enable
!
!
!--- Output omitted. ! end
```

3400-Metro-1

```
!
version 12.2
!
interface FastEthernet0/3
  port-type nni
  switchport trunk allowed vlan 1052,3503
  switchport mode trunk
  load-interval 60
!
interface FastEthernet0/4
  port-type nni
  switchport trunk allowed vlan 1052,3803
  switchport mode trunk
  load-interval 60
!
!
interface FastEthernet0/12
  port-type nni
  switchport trunk allowed vlan 2-4094
  switchport mode trunk
!
!
interface FastEthernet0/13
  port-type nni
  switchport trunk allowed vlan 2-4094
  switchport mode trunk
!
end
```

3400-Metro Edge

```
!
version 12.2
```

```

!
interface FastEthernet0/12
  port-type nni
  switchport mode trunk
  load-interval 60
  storm-control broadcast level 1.00
  spanning-tree portfast disable
  spanning-tree bpdudfilter disable
!
interface FastEthernet0/13
  port-type nni
  switchport mode trunk
  load-interval 60
  storm-control broadcast level 1.00
  spanning-tree portfast disable
  spanning-tree bpdudfilter disable
!
!
interface Vlan3503
  ip address 172.16.41.18 255.255.255.252
  no ip redirects
  no ip proxy-arp
  ip ospf authentication-key 7 072C0E6B6B272D
  ip ospf network point-to-point
  ip ospf hello-interval 3
  ip ospf dead-interval 10
!
interface Vlan3803
  ip address 172.16.73.139 255.255.255.248 secondary
  ip address 172.16.41.22 255.255.255.252
  no ip redirects
  no ip proxy-arp
  ip ospf authentication-key 7 072C0E6B6B272D
  ip ospf network point-to-point
  ip ospf cost 5
  ip ospf hello-interval 3
  ip ospf dead-interval 10
!
!--- Output omitted. ! end

```

觀察

當封包通過Dot1Q通道時，會發生隨機Ping捨棄。但是，介面上沒有輸入/輸出丟棄，也沒有物理層問題的症狀。發出[show interface <interface>](#) 命令，以檢查介面上的輸入/輸出捨棄專案：

```

7609-Dot1Q#show interface gi9/44
!--- Output omitted. Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  0 input errors, 0 CRC, 1 frame, 0 overrun, 0 ignored
  0 output errors, 0 collisions, 1 interface resets
  0 lost carrier, 0 no carrier, 0 PAUSE output
!--- Output omitted.

```

從Metro-Edge發出大約100個Ping的ICMP流量時，核心區只收到95個回應，這表明路徑中丟棄了ICMP資料包。

```
Metro-Edge#ping 172.16.41.21 re 100
```

```
Type escape sequence to abort.
```

```
Sending 100, 100-byte ICMP Echos to 172.16.41.21, timeout is 2 seconds:
```

.....!!
!!

Success rate is 95 percent (95/100), round-trip min/avg/max = 2/9 ms

注意：7609中的[show ip traffic](#)命令顯示僅接收到95個回波，而在Metro-edge中，該命令顯示傳送了100個回波。

```

show ip traffic
在Metro-Edge
ICMP statistics:
  Rcvd: 0 format errors, 0 checksum errors, 0 redirects,
0 unreachable
      0 echo, 95 echo reply, 0 mask requests, 0 mask
replies, 0 quench
      0 parameter, 0 timestamp, 0 info request, 0
other
      0 irdp solicitations, 0 irdp advertisements
  Sent: 0 redirects, 0 unreachable, 100 echo, 0 echo
reply
      0 mask requests, 0 mask replies, 0 quench, 0
timestamp
      0 info reply, 0 time exceeded, 0 parameter
problem
      0 irdp solicitations, 0 irdp advertisements
!--- The above output shows that 100 echos are sent !---
but received 95 replies from 7609-Core.
在7609-Core
ICMP statistics:
  Rcvd: 0 format errors, 0 checksum errors, 0 redirects,
0 unreachable
      95 echo, 0 echo reply, 0 mask requests, 0 mask
replies, 0 quench
      0 parameter, 0 timestamp, 0 info request, 0
other
      0 irdp solicitations, 0 irdp advertisements
  Sent: 0 redirects, 0 unreachable, 0 echo, 95 echo
reply
      0 mask requests, 0 mask replies, 0 quench, 0
timestamp
      0 info reply, 0 time exceeded, 0 parameter
problem
      0 irdp solicitations, 0 irdp advertisements

```

疑難排解

驗證是否正確得知MAC位址，以排解封包捨棄的疑難問題。

使用show mac address table命令驗證MAC地址條目。

成功Ping

```

7609-DOT1q#sh mac-address-table address E05F.B972.1F00 all
Legend: * - primary entry
age - seconds since last seen
n/a - not available
vlan mac address type learn age ports
-----+-----+-----+-----+-----+-----+-----
Active Supervisor:
* 24 e05f.b972.1f00 dynamic Yes 0 Gi9/44

```

!--- This output displays the MAC address learnt !--- and its associated port, in this case the associated !--- port for successful ping is Gi9/44.

對於故障Ping

```
7609-DOT1q#sh mac-address-table address E05F.B972.1F00 all
```

Legend: * - primary entry

age - seconds since last seen

n/a - not available

vlan mac address type learn age ports

-----+-----+-----+-----+-----+-----+-----
Active Supervisor:

* 24 e05f.b972.1f00 dynamic Yes 5 Gi9/45

*!--- This output displays the MAC address learnt !--- and its associated port, in this case, !---
- the port number is Gi9/45.*

要檢視詳細的MAC索引程式設計，請使用**show mac-address-table**命令。

```
7609-DOT1q#sh mac-address-table address E05F.B972.1F00 det
```

MAC Table shown in details

=====

```
PI_E RM RMA Type Alw-Lrn Trap Modified Notify Capture Flood Mac Address Age Pvlan SWbits Index  
XTag
```

-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

+-----

Active Supervisor:

```
Yes No No DY No No Yes No No No e05f.b972.1f00 0xE0 24 0 0x22C 0
```

發出**Remote login switch**和**test mcast ltl-info index <Index number>**命令，以瞭解前一個HEX值指示的埠號。

```
7609-DOT1q-sp#test mcast ltl-info index 22B
```

index 0x22B contain ports 9/44

```
7609-DOT1q-sp#test mcast ltl-info index 22C
```

index 0x22C contain ports 9/45

!--- The output shows that hex number 22B !--- points to 9/44 port and hex 22C points to 9/45.

對於失敗的ping，源和目標索引是相同的埠，因此丟棄了。在7600上使用**mac-address-table notification mac-move**命令啟用Mac-move時，它顯示兩個不同連線埠之間的MAC擺動，並且出現以下錯誤消息：

註：由於6500/7600使用交換機的一個公用MAC地址，因此在不同埠之間分配相同的MAC地址。**show catalyst 6000 chassis-mac-address**命令會顯示保留的交換機MAC地址。

```
* Jul 2 10:29:44.011: %MAC_MOVE-SP-4-NOTIF: Host e05f.b972.1f00 in
```

vlan 24 is flapping between port Gi9/45 and port Gi9/44

*!--- The previous error message indicates !--- that the same MAC address is assigned between !---
- two different ports: Gi9/45 and port Gi9/44.*

解決方案

上一個網路是全網狀網路設定，在同一交換機上具有DOT1Q隧道終端。在這種網路設定中需要MAC擺動。為了避免MAC擺動，可以實施這些解決方案之一。

- 將通道端點移動到不同的交換器，例如，封裝和解除封裝應在不同的交換器中進行。
- 可以執行VLAN修剪來調節任何中繼埠中的VLAN。

相關資訊

- [配置IEEE 802.1Q隧道](#)
- [技術支援與文件 - Cisco Systems](#)