執行Cisco IOS系統軟體的Catalyst 3550/3560/3750系列交換器和Catalyst交換器之間的EtherChannel組態範例

目錄

簡介

本文提供如何在Catalyst 3550和執行Cisco IOS®系統軟體的Catalyst 6500/6000之間設定EtherChannel的范例組態。EtherChannel可以稱為快速EtherChannel或Gigabit EtherChannel，這取決於用來形成EtherChannel的介面或連線埠的速度。

註：本檔案中應用到Catalyst 3550交換器的EtherChannel命令也可應用到Catalyst 3750系列交換器。

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：

- 執行Cisco IOS軟體版本12.1(14)EA的Catalyst 3550交換器
- 執行Cisco IOS軟體版本12.1(13)E1的Catalyst 6500/6000交換器

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

在本文中，Catalyst 3550交換器上的兩個千兆位乙太網路介面（3500上的GigabitEthernet介面是10/100/1000交涉乙太網路介面）已捆綁到一個包含兩個快速乙太網路介面的快速EtherChannel，這些介面來自執行Cisco IOS系統軟體的Catalyst 6500/6000交換器，以形成第2層(L2)EtherChannel。

注意：在本檔案中，Fast EtherChannel、Gigabit EtherChannel、連線埠通道和通道群組都引用EtherChannel。

本檔案中的Catalyst交換器組態適用於執行Cisco IOS系統軟體的任何Catalyst 6500/6000或Catalyst 4500/4000系列交換器。

本檔案只會顯示交換器的組態檔，以及相關範例**show**命令的輸出。有關如何配置EtherChannel的詳細資訊，請參閱以下文檔：

- *設定EtherChannel(*Catalyst 3550交換器)的第2層EtherChannel一節
- *設定EtherChannel(*Catalyst 3560交換器)的第3層EtherChannel一節
- *設定EtherChannel(*Catalyst 3750交換器)的第2層EtherChannel一節
- 設定第3層和第2層EtherChannel（執行Cisco IOS系統軟體的Catalyst 6500/6000）
- *瞭解和設定*EtherChannel中的設定*第*2層EtherChannel（執行Cisco IOS系統軟體的Catalyst 4500/4000）

重要附註

您可以使用適當的命令手動配置EtherChannel。您也可以使用連線埠彙總通訊協定(PAgP)自動設定EtherChannel，讓交換器與另一端交涉通道。有關PAgP的詳細資訊，請參閱以下文檔：

- *瞭解配置EtherChannel(*Catalyst *3550*交換機)的埠聚合協定部分
- *瞭解配置EtherChannel(*Catalyst *3560*交換機)的埠聚合協定部分
- *配置EtherChannel(*Catalyst 3750交換器)的埠聚合協定部分
- *瞭解設定EtherChannel(執行*Cisco IOS系統軟體的Catalyst 6500/6000)的連線埠彙總通訊協定一節
- *瞭解和設定EtherChannel*(執行Cisco IOS系統軟體的Catalyst 4500/4000)中的「瞭解連線埠彙總通訊協定」一節

本文檔中的配置是使用desirable模式實現的。如果計畫手動配置EtherChannel，請使用提供的步驟

建立埠通道。這可避免在設定過程中發生跨距樹狀目錄通訊協定(STP)問題。如果一端設定為通道，另一端設定為通道，則STP可以關閉某些連線埠，且連線埠狀態為錯誤停用[errdisable]。

執行以下步驟以建立埠通道：

1. 將埠通道中要使用的介面保留為管理性關閉。
2. 在Catalyst 6500/6000交換器上建立連線埠通道（通道組）。請確保將通道模式設定為`on`，例如`channel-group 1 mode on`。
3. 在Catalyst 3550、3560或3750交換器上建立連線埠通道。請確保將通道模式設定為`on`。
4. 使用**no shut** 指令重新啟用先前在Catalyst 6500/6000交換器上停用的介面。

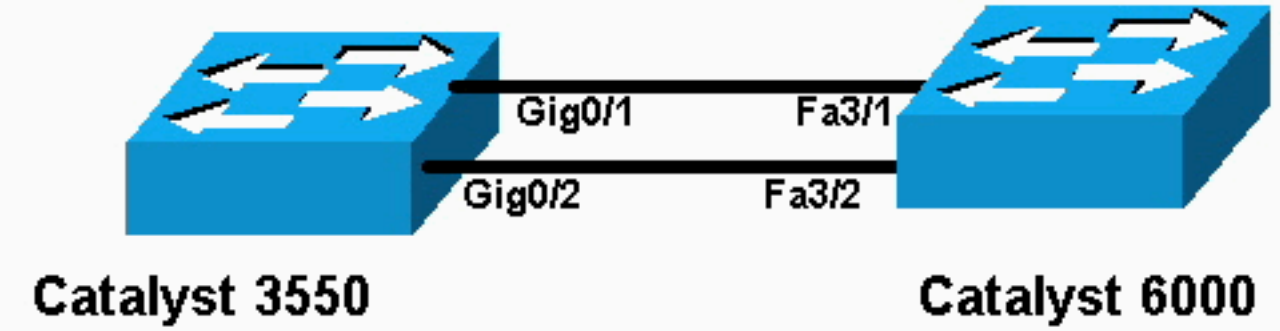
設定

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)。

網路圖表

本檔案會使用下圖所示的網路設定：



注意：Catalyst 3550上的千兆乙太網介面是10/100/1000 Mbps協商乙太網介面。Catalyst 3550上的Gigabit連線埠也可以連線到Catalyst 6500/6000上的FastEthernet(100 Mbps)連線埠。

注意：Catalyst 3750系列交換器支援跨堆疊EtherChannel，這允許來自不同堆疊交換器的介面成為同一EtherChannel群組的成員。如需堆疊交換器環境中乙太通道的詳細資訊，請參閱設定EtherChannel檔案中有關Catalyst 3750系列交換器的*乙太通道和交換器堆疊*一節。

組態

本檔案會使用以下設定：

- Catalyst 3550
- Catalyst 6500/6000

Catalyst 3550

```
Building configuration...
Current configuration : 1610 bytes
!
version 12.1
```

```
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Cat3550
!
enable password ww
!
ip subnet-zero
no ip finger
!
!
!
!!--- A logical port-channel interface is automatically
created !--- when ports are grouped into a channel
group. interface Port-channel 1 !--- In this example,
the L2 EtherChannel is configured. !--- A Layer 3 (L3)
EtherChannel can also be configured on the Catalyst 3550
switches. !--- For more information, refer to the
document Configuring EtherChannel. switchport mode
access no ip address snmp trap link-status! !--- Note:
The Gigabit Ethernet interface on the Catalyst 3550 is a
!--- 10/100/1000 Mbps negotiated Ethernet interface. The
Gigabit port on the Catalyst 3550 is !--- connected to a
FastEthernet (100 Mbps) port on the Catalyst 6500/6000.
!--- The port is a member of channel group 1.

interface GigabitEthernet0/1
 switchport mode access
 no ip address
 snmp trap link-status
 channel-group 1 mode desirable
!

!--- The port is a member of channel group 1. interface
GigabitEthernet0/2 switchport mode access
 no ip address
 snmp trap link-status
 channel-group 1 mode desirable
!
interface GigabitEthernet0/3
 switchport mode access
 no ip address
 snmp trap link-status
!

!--- Output suppressed. interface GigabitEthernet0/12
switchport mode access no ip address snmp trap link-
status !--- Interface VLAN1 is required for management
purposes. interface Vlan1 ip address 10.1.1.1
255.255.255.0 ! ip classless ip http server ! ! line con
0 transport input none line vty 5 15 ! end
```

Catalyst 6500/6000

```
Building configuration...

 Current configuration : 5869 bytes
 !
 version 12.1
 service timestamps debug uptime
 service timestamps log uptime
```

```
 no service password-encryption
 !
 hostname cat6500
 !
 boot buffersize 126968
 boot bootldr bootflash:c6msfc-boot-mz.121-4.E1
 enable password ww
 !
 redundancy
  main-cpu
   auto-sync standard
 ip subnet-zero
 !
 !
 no ip finger
 !
 !
 !
 !

!--- A logical port-channel interface is automatically
created !--- when ports are grouped into a channel
group. interface Port-channel 1 no ip address switchport
switchport mode access ! interface GigabitEthernet1/1 no
ip address shutdown ! interface GigabitEthernet1/2 no ip
address shutdown ! !--- Note: The Gigabit Ethernet
interface on the Catalyst 3550 is a !--- 10/100/1000
Mbps negotiated Ethernet interface. The Gigabit port on
the Catalyst 3550 is !--- connected to a FastEthernet
(100 Mbps) port on the Catalyst 6500/6000.

 interface FastEthernet3/1
  no ip address

!--- In this example, the L2 EtherChannel is configured.
!--- An L3 EtherChannel can also be configured on the
Catalyst 6500/6000 running !--- Cisco IOS System
Software. For more details, refer to the document !---
Configuring EtherChannel. !--- On a Catalyst 6500/6000,
you must issue the switchport !--- command once, without
any keywords, in order to configure the interface as an
L2 port. !--- By default, all the ports are router ports
(L3 ports). !--- On a Catalyst 4500/4000 switch, all
ports are L2 ports by default; !--- no additional
command is required.

 switchport
!--- This command puts the interface in VLAN1, by
default. switchport mode access
!--- The port is a member of channel group 1. channel-
group 1 mode desirable
 !
 interface FastEthernet3/2
  no ip address
!--- On a Catalyst 6500/6000, you must issue the
switchport !--- command once, without any keywords, in
order to configure the interface as an L2 port. !--- By
default, all the ports are router ports (L3 ports). !---
On a Catalyst 4500/4000 switch, all ports are L2 ports
by default; !--- no additional command is required.

  switchport
!--- This command puts the interface in VLAN1, by
default. switchport mode access
```

```
!--- The port is a member of channel group 1. channel-
group 1 mode desirable
 !
 interface FastEthernet3/3
  no ip address
 switchport
  switchport mode access
 !

!--- Output suppressed. ! interface FastEthernet3/48 no
ip address switchport switchport mode access ! !---
Interface VLAN1 is required for management purposes.
interface Vlan1 ip address 10.1.1.2 255.255.255.0 ! ip
classless no ip http server ! ! ! line con 0 transport
input none line vty 0 4 ! end
```

注意：此組態范例顯示具有存取連結的EtherChannel組態。同樣的配置適用於EtherChannel中繼鏈路。發出**switchport mode trunk** 命令，或允許交換器使用**dynamic desirable**模式協商模式。有關如何配置中繼的詳細資訊，請參閱配置VLAN文檔的*配置VLAN中繼*部分。

埠通道子介面配置

執行Cisco IOS軟體版本12.2(25)的Catalyst 3560交換器中使用子介面設定連線埠通道的另一個範例。

Catalyst 3560

```
Building configuration...

Current configuration : 2480 bytes
!
version 12.2
!
interface Port-channel5
no switchport
no ip address
!
interface Port-channel5.690
!
interface Port-channel10
no switchport
no ip address
!
interface Port-channel10.1
!
interface Port-channel10.690
!
interface Port-channel11
no switchport
no ip address
```

驗證

Output Interpreter Tool (僅供註冊客戶使用)支援某些**show**命令，這允許您檢視show命令輸出的分析。

若要驗證執行Cisco IOS系統軟體的Catalyst 6500/6000和Catalyst 3500交換器中的連線埠通道，請

發出以下命令：

- show interfaces port-channel *channel-group-number*
- show etherchannel *channel-group-number* summary

若要檢查執行Cisco IOS系統軟體的Catalyst 6500/6000和Catalyst 3500交換器中的STP狀態，請發出以下命令：

- show spanning-tree vlan *vlan-number* detail

Catalyst 3550

```
Cat3550#show interface port-channel 1
Port-channel1 is up, line protocol is up
Hardware is EtherChannel, address is 0002.4b28.db02 (bia 0002.4b28.db02)
MTU 1500 bytes, BW 200000 Kbit, DLY 1000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
 Full-duplex, 100Mb/s
input flow-control is off, output flow-control is off
 Members in this channel: Gi0/1 Gi0/2
ARP type: ARPA, ARP Timeout 04:00:00
Last input 00:03:27, output 00:00:00, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
26 packets input, 5344 bytes, 0 no buffer
Received 17 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 input packets with dribble condition detected
59 packets output, 5050 bytes, 0 underruns
0 output errors, 0 collisions, 2 interface resets
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier
0 output buffer failures, 0 output buffers swapped out

Cat3550#show spanning-tree vlan 1 detail

 VLAN1 is executing the ieee compatible Spanning Tree protocol
  Bridge Identifier has priority 32768, address 0002.4b28.db01
  Configured hello time 2, max age 20, forward delay 15
  We are the root of the spanning tree
  Topology change flag not set, detected flag not set
  Number of topology changes 1 last change occurred 00:00:38 ago
          from Port-channel1
  Times:  hold 1, topology change 35, notification 2
          hello 2, max age 20, forward delay 15
  Timers: hello 0, topology change 0, notification 0, aging 0

 Port 65 (Port-channel1) of VLAN1 is forwarding
   Port path cost 12, Port priority 128, Port Identifier 128.65.
   Designated root has priority 32768, address 0002.4b28.db01
   Designated bridge has priority 32768, address 0002.4b28.db01
   Designated port id is 128.65, designated path cost 0
   Timers: message age 0, forward delay 0, hold 0
   Number of transitions to forwarding state: 1
   BPDU: sent 34, received 0
```

```
Cat3550# show etherchannel 1 summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        R - Layer3      S - Layer2
        U - port-channel in use
Group Port-channel  Ports
------+------------+-----------------------------------------------------------
1     Po1(SU)     Gi0/1(P)   Gi0/2(P)

Cat3550# ping 10.1.1.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
```

Catalyst 6500/6000

```
Cat6500# show interface port-channel 1
Port-channel1 is up, line protocol is up
  Hardware is EtherChannel, address is 0002.7ef1.36e1 (bia 0002.7ef1.36e1)
  MTU 1500 bytes, BW 200000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Full-duplex, 100Mb/s
  Members in this channel: Fa3/1 Fa3/2
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/2000, 0 drops
  5 minute input rate 1000 bits/sec, 1 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     407 packets input, 34994 bytes, 0 no buffer
     Received 311 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     93 packets output, 16598 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out

Cat6500# show spanning-tree vlan 1 detail

 VLAN1 is executing the ieee compatible Spanning Tree protocol
  Bridge Identifier has priority 32768, address 00d0.024f.6001
  Configured hello time 2, max age 20, forward delay 15
  Current root has priority 32768, address 0002.4b28.db01
  Root port is 833 (Port-channel1), cost of root path is 12
  Topology change flag not set, detected flag not set
  Number of topology changes 0 last change occurred 00:02:13 ago
  Times:  hold 1, topology change 35, notification 2
          hello 2, max age 20, forward delay 15
  Timers: hello 0, topology change 0, notification 0, aging 300

 Port 833 (Port-channel1) of VLAN1 is forwarding
    Port path cost 12, Port priority 128, Port Identifier 131.65.
    Designated root has priority 32768, address 0002.4b28.db01
    Designated bridge has priority 32768, address 0002.4b28.db01
    Designated port id is 128.65, designated path cost 0
    Timers: message age 1, forward delay 0, hold 0
```

```
   Number of transitions to forwarding state: 1
   BPDU: sent 0, received 66

Cat6500# show etherchannel 1 summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        R - Layer3      S - Layer2
Group Port-channel  Ports
------+------------+-----------------------------------------------------------
1     Po1(SU)     Fa3/1(P)   Fa3/2(P)

Cat6500# ping 10.1.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
```

疑難排解

錯誤停用狀態

EtherChannel設定期間的一個常見問題是介面會進入模式。當一台交換器中的EtherChannel切換到開啟模式，而另一台交換器沒有立即設定時，可以看到這種情況。如果保持此狀態約一分鐘，則啟用EtherChannel之交換器上的STP會認為有回圈。這會導致通道化的連線埠進入`err-disable`狀態。有關如何確定EtherChannel介面是否處於錯誤停用狀態的詳細資訊，請範例：

```
%SPANTREE-2-CHNL_MISCFG: Detected loop due to etherchannel misconfiguration of Gi0/9
%PM-4-ERR_DISABLE: channel-misconfig error detected on Po10, putting Gi0/9 in err-disable state
%PM-4-ERR_DISABLE: channel-misconfig error detected on Po10, putting Gi0/10 in err-disable state

Switch1#show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        u - unsuitable for bundling
        U - in use      f - failed to allocate aggregator
        d - default port

Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------
10     Po10(SD)         -        Gi0/9(D)    Gi0/10(D)

Switch1#show interfaces GigabitEthernet 0/9 status

Port      Name               Status       Vlan       Duplex  Speed Type
Gi0/9                        err-disabled 1            auto   auto 10/100/1000BaseTX

Switch1#show interfaces GigabitEthernet 0/10 status

Port      Name               Status       Vlan       Duplex  Speed Type
Gi0/10                       err-disabled 1            auto   auto 10/100/1000BaseTX
```

錯誤訊息指出EtherChannel遇到了跨距樹狀目錄回圈。為了解決問題，請在連線的兩端將通道模式設定為`desirable`，然後重新啟用這些介面：

```
Switch1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch1(config)#interface gi0/9
Switch1(config-if)#channel-group 10 mode desirable
```

這會導致兩端都同意進行通道時，才會形成通道。如果它們不同意進行通道化，則它們會繼續以一般連線埠運作。

在連線兩端的通道模式設定為desirable後，在相關聯的介面上發出**shutdown**和**no shutdown**命令，透過手動重新啟用連線埠：

```
Switch1(config-if)#shutdown
Switch1(config-if)#no shutdown
```

「speed nonegotiate」命令不會顯示在運行配置中

在連線埠通道上設定的speed nonegotiate命令不會一律顯示在執行組態中。發生這種情況是因為連線埠通道介面上的非交涉取決於捆綁連線埠上的非交涉。當連線埠通道處於使用中狀態時，系統根據個別通道連線埠組態插入此連線埠。

相關資訊

- 在Catalyst交換機上實施EtherChannel的系統要求
- 示例配置：執行CatOS和Cisco IOS系統軟體的Catalyst交換器之間的EtherChannel
- 交換器產品支援
- LAN 交換技術支援
- 技術支援與文件 - Cisco Systems