使用執行CatOS系統軟體的Catalyst 5500/5000和6500/6000交換器上的內部路由器（第3層卡）設定InterVLAN路由

目錄

簡介

本文提供如何使用內部路由器（第3層[L3]卡/模組）在Catalyst交換器（執行Catalyst OS [CatOS]系統軟體）上設定InterVLAN路由的基本資訊。 術語內部路由器是指Catalyst 5500/5000和6500/6000交換器上的以下L3卡/模組：

- Catalyst 6500/6000系列交換器上的多層交換器功能卡(MSFC)
- Catalyst 6500/6000系列交換器上的MSFC2
- Catalyst 5500/5000系列交換器上的路由交換器功能卡(RSFC)
- Catalyst 5500/5000系列交換器上的路由交換器模組(RSM)

任何執行CatOS的Catalyst 5500/5000或Catalyst 6500/6000系列交換器（搭配支援的L3卡）都可以在本檔案中使用以取得相同的結果。

必要條件

需求

本文檔的讀者應瞭解以下主題：

注意：本文不會討論如何使用第3層服務模組(WS-X4232-L3)在Catalyst 4500/4000交換器上設定

InterVLAN路由。 有關詳細資訊，請參閱以下檔案：

- Catalyst 4000*第3層服務模組的安裝和配置說明*中*的「為InterVLAN路由配置模組」部分*
- Catalyst 4000系列路由器模組的配置和概述(WS-X4232-L3)

採用元件

本文中的資訊係根據以下軟體和硬體版本：

- 採用RSM的Catalyst 5500交換器
- 執行CatOS 6.1(1)軟體的Supervisor Engine模組(WS-X5530)
- 執行Cisco IOS®軟體版本12.0(5)W5(12)的RSM(WS-X5302)

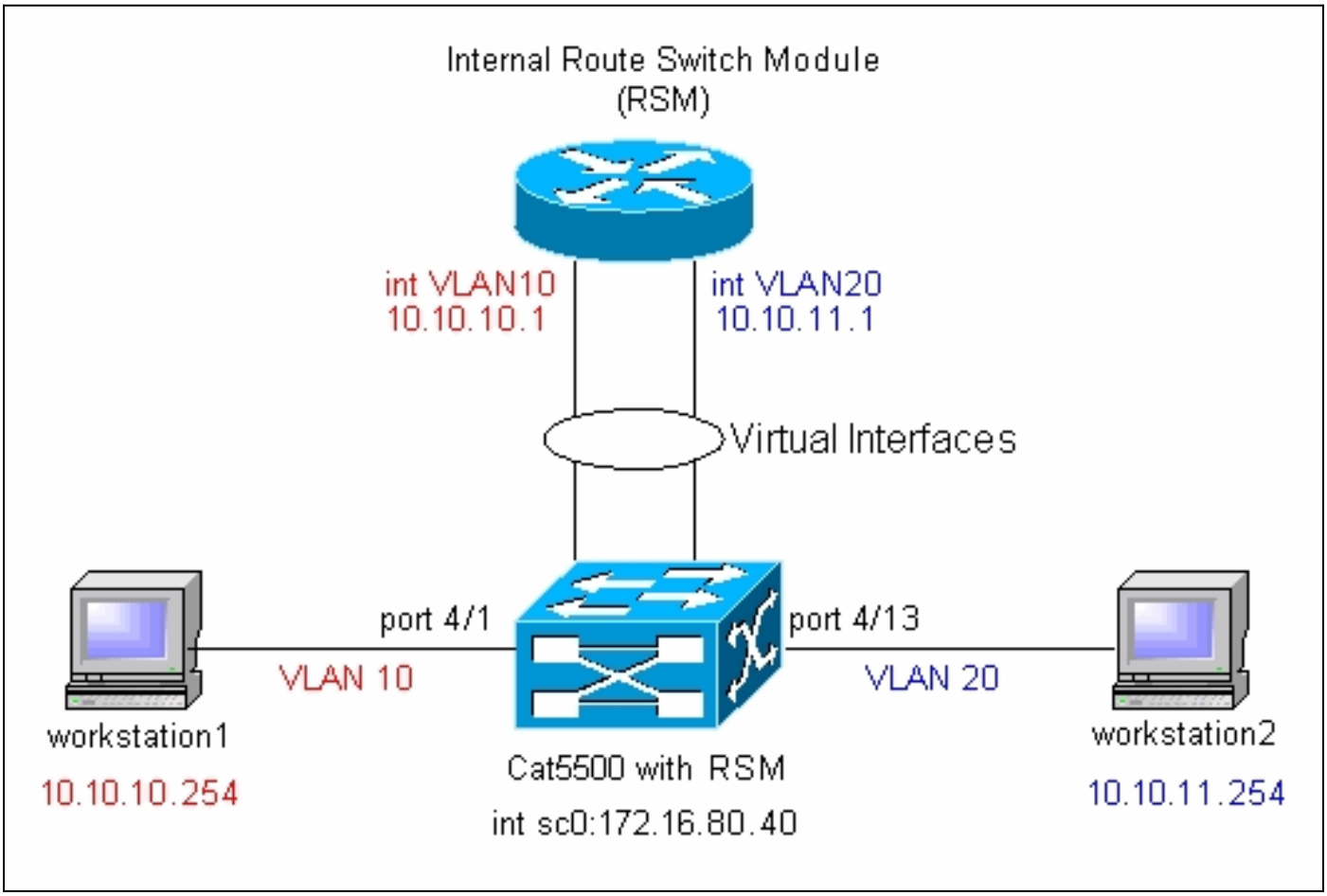
已使用**clear config all**和**write erase**命令清除所有裝置上的配置，以確保它們具有預設配置。

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



註：除非本文檔要求您連線workstation1和workstation2，否則不要連線workstation1。本檔案指出了客戶在路由器模組上設定InterVLAN路由或多個VLAN介面時報告的常見問題。請參閱常見問題

：VLAN介面顯示關閉/關閉部分以瞭解詳細資訊。

常規配置任務

本節總結了本文所執行的主要配置任務：

- 配置交換機以進行管理
- 在交換機上建立VLAN
- 將埠新增到已配置的VLAN
- 配置內部路由器以進行管理
- 設定 InterVLAN 路由
- 驗證設定

設定 InterVLAN 路由

完成以下步驟，在Catalyst交換器上設定InterVLAN路由：

1. 存取Supervisor Engine上的主控台連線埠。如果您難以存取主控台，請參閱以下檔案：適用於Catalyst 5500/5000系列交換器 — 將終端機連線到Catalyst交換器上的主控台連線埠。適用於Catalyst 6500/6000系列交換器 — 將終端機連線到Catalyst交換器上的主控台連線埠和將資料機連線到Catalyst交換器上的主控台連線埠的*連線終端*一節
2. 配置交換機以進行基本管理。使用這組命令配置Catalyst交換機以進行管理：
   ```
   Console> enable) set system name Cat5500
   !--- Configure the system name. System name set. Cat5500> (enable) set interface sc0
   172.16.80.40 255.255.255.0
   !--- Configure the IP address. Interface sc0 IP address and netmask set. Cat5500> (enable)
   set ip route 0.0.0.0 172.16.80.1
   !--- Configure the default gateway.
   ```
   注意：如果您要管理位於路由器另一端的交換機，則需要在交換機上配置預設網關，因為該交換機不參與IP路由，因此不知道網路的第3層拓撲。您還可以使用**set ip route default 172.16.80.1**命令來配置預設網關，而不是使用**set ip route 0.0.0.0 172.16.80.1**命令。
3. 在交換機上配置所需的VLAN數量。根據網路圖表，您需要在交換器上設定兩個新的VLAN（VLAN 10和VLAN 20）。在可以建立新的VLAN之前，交換機必須處於VLAN中繼線協定(VTP)伺服器模式或VTP透明模式。如果交換機是VTP伺服器，您必須先定義VTP域名，然後才能新增任何VLAN。無論網路中交換機的數量（一台或多台），也不管您是否使用VTP將VLAN傳播到網路中的其他交換機，都必須定義該值。有關VTP的詳細資訊，請參閱以下文檔：瞭解和設定VLAN中繼線通訊協定(VTP)交換機上的預設VTP配置為：
   ```
   Cat5500> (enable) show vtp domain
   Domain Name                    Domain Index VTP Version Local Mode  Password
   ------------------------------ ------------ ----------- ----------- ----------
                                  1            2           server      -

   Vlan-count Max-vlan-storage Config Revision Notifications
   ---------- ---------------- --------------- -------------
   5          1023             0               disabled

   Last Updater    V2 Mode  Pruning  PruneEligible on Vlans
   --------------- -------- -------- --------------------------
   0.0.0.0         disabled disabled 2-1000
   ```
   使用**set vtp**命令設定域名和模式：
   ```
   Cat5500> (enable) set vtp domain mode transparent
   VTP domain  modified
   ```

```
!--- Set the VTP mode. Cat5500> (enable) set vtp domain cisco
VTP domain cisco modified
!--- Set the VTP domain name.
```

附註： 在示例中，VTP模式設定為透明。根據您的網路，相應地設定VTP模式。之所以選擇透明模式，是為了避免受到其它交換機的影響，也避免影響實驗中的其它交換機。

4. 發出**show vtp domain**命令以驗證VTP配置：

```
Cat5500> (enable) show vtp domain
Domain Name                    Domain Index VTP Version Local Mode  Password
------------------------------ ------------ ----------- ----------- ----------
cisco                          1            2           Transparent -

Vlan-count Max-vlan-storage Config Revision Notifications
---------- --------------- -------------- -------------
5          1023            0              disabled

Last Updater    V2 Mode  Pruning  PruneEligible on Vlans
--------------- -------- -------- -------------------------
0.0.0.0         disabled disabled 2-1000
```

5. 在交換機上建立VLAN。預設情況下，交換器上只有一個名為VLAN 1的VLAN。VLAN 1也稱為預設VLAN。預設情況下，所有連線埠都屬於此VLAN。不能重新命名或刪除此VLAN。要建立VLAN，請使用**set vlan**命令：

```
Cat5500> (enable) set vlan
Usage: set vlan  <mod/port>
       (An example of mod/port is 1/1,2/1-12,3/1-2,4/1-12)
       set vlan  [name ] [type ] [state ]
                         [said ] [mtu ] [ring ]
                         [decring ]
                         [bridge ] [parent ]
                         [mode ] [stp ]
                         [translation ] [backupcrf <off/on>
                         [aremaxhop ] [stemaxhop ]
       (name = 1..32 characters, state = (active, suspend)
        type = (ethernet, fddi, fddinet, trcrf, trbrf)
        said = 1..4294967294, mtu = 576..18190
        hex_ring_number = 0x1..0xfff, decimal_ring_number = 1..4095
        bridge_number = 0x1..0xf, parent = 2..1005, mode = (srt, srb)
        stp = (ieee, ibm, auto), translation = 1..1005
        hopcount = 1..13)
Set vlan commands:
--------------------------------------------------------------------------------
set vlan                    Set vlan information
set vlan mapping            Map an 802.1Q vlan to an Ethernet vlan
set vlan                    Vlan number(s)
```

```
Cat5500> (enable) set vlan 10
!--- Create VLAN 10. VTP advertisements transmitting temporarily stopped and will resume
after the command finishes. Vlan 10 configuration successful Cat5500> (enable) set vlan 20
!--- Create VLAN 20. VTP advertisements transmitting temporarily stopped and will resume
after the command finishes. Vlan 20 configuration successful Cat5500> (enable) set vlan 10
4/1-12
!--- Add ports to VLAN 10. VLAN 10 modified. VLAN 1 modified. VLAN Mod/Ports ---- ---------
-------------- 10 4/1-12 Cat5500> (enable) set vlan 20 4/13-20
!--- Add ports to VLAN 20. VLAN 20 modified. VLAN 1 modified. VLAN Mod/Ports ---- ---------
-------------- 20 4/13-20 Cat5500> (enable) show vlan
VLAN Name                             Status    IfIndex Mod/Ports, Vlans
---- -------------------------------- --------- ------- -----------------------
1    default                          active    443     1/1-2
                                                        3/1-3
                                                        4/21-24
                                                        11/1-48
```

```
                                                          12/1-2
10   VLAN0010                         active    448      4/1-12
20   VLAN0020                         active    449      4/13-20
1002 fddi-default                     active    444
1003 token-ring-default               active    447
1004 fddinet-default                  active    445
1005 trnet-default                    active    446


VLAN Type  SAID       MTU   Parent RingNo BrdgNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ ------ ---- -------- ------ ------
1    enet  100001     1500  -      -      -      -    -        0      0
10   enet  100010     1500  -      -      -      -    -        0      0
20   enet  100020     1500  -      -      -      -    -        0      0
1002 fddi  101002     1500  -      -      -      -    -        0      0
1003 trcrf 101003     1500  -      -      -      -    -        0      0
1004 fdnet 101004     1500  -      -      -      -    -        0      0
1005 trbrf 101005     1500  -      -      -      ibm  -        0      0
!--- Output suppressed.
```

6. 在連線到工作站或伺服器的埠上配置生成樹協定(STP)PortFast。發出以下命令以啟用STP PortFast功能：

```
Cat5500> (enable) set spantree portfast 4/1-20 enable

Warning: Spantree port fast start should only be enabled on ports connected to a
 single host. Connecting
hubs, concentrators, switches, bridges, etc. to a fast start port can cause
 temporary spanning tree loops.
Use with caution.

Spantree ports 4/1-20 fast start enabled.
```

注意：此步驟是可選的，但最好在連線到常規工作站或伺服器的埠上啟用STP PortFast。有關啟用PortFast的詳細資訊，請參閱以下檔案：使用 PortFast 和其他命令修復工作站啟動連線延遲

7. 在路由器模組上為要在其中路由流量的每個VLAN配置VLAN介面。發出**session *module#*** 命令以存取路由器模組，其中*module#* 是路由器模組所在的插槽。在示例中，RSM位於插槽7中，如下所示：

```
Cat5500> (enable) show module 7
Mod Slot Ports Module-Type               Model               Sub Status
--- ---- ----- ------------------------ ------------------- --- --------
7   7    1     Route Switch             WS-X5302            no  ok

Mod Module-Name         Serial-Num
--- ------------------- --------------------
7                       00006591991

Mod MAC-Address(es)                         Hw     Fw          Sw
--- --------------------------------------- ------ ----------- -----------------
7   00-e0-1e-91-b5-08 to 00-e0-1e-91-b5-09 4.5    20.20       12.0(5)W5(12)
Cat5500> (enable) session 7
Trying Router-7...
Connected to Router-7.
Escape character is '^]'.

Router>
```

8. 在路由器模組上配置啟用口令和Telnet口令。同樣地，此步驟是可選的，但如果您嘗試直接使用Telnet而不是通過Supervisor Engine訪問路由器模組，則需要使用Telnet密碼。使用這組命

令配置路由器模組上的口令：

```
Router> enable
Router# configure terminal
!--- Enter the global configuration mode. Enter configuration commands, one per line. End
with CNTL/Z. Router(config)# enable password cisco
!--- Set enable password. Router(config)# line vty 0 4
Router(config-line)# login
Router(config-line)# password cisco
!--- Set Telnet password. Router(config-line)# end
Router#
05:22:40: %SYS-5-CONFIG_I: Configured from console by vty0 (127.0.0.2)
Router#
```

9. 建立兩個VLAN介面，為這些VLAN介面分配IP地址，並在模組上啟用路由。**注意：**此步驟是配置InterVLAN路由的關鍵。**注意：**在路由器模組上，VLAN介面是虛擬介面，但它們配置為物理介面。在特權執行模式下發出以下命令集：

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
!--- Configure interface VLAN 1 and assign it an IP address. !--- An interface VLAN 1 is
configured for management purposes only !--- so that you can establish a Telnet session or
ping the switch !--- from the workstation. Router(config)# interface vlan 1
Router(config-if)# no shutdown
Router(config-if)# ip address 172.16.80.79 255.255.255.0
Router(config-if)# exit
!--- Configure interface VLAN 10 and assign it an IP address. Router(config)# interface
vlan 10
Router(config-if)# no shutdown
Router(config-if)# ip address 10.10.10.1 255.255.255.0
Router(config-if)# exit
!--- Configure interface VLAN 20 and assign it an IP address. Router(config)# interface
vlan 20
Router(config-if)# ip address 10.10.11.1 255.255.255.0
Router(config-if)# no shutdown
Router(config)# ip routing
!--- Enable routing protocol on the module. !--- The following two commands are optional;
!--- they are only used if you have multiple routers in your network. !--- Depending on
your network, you may want to use a different routing protocol. Router(config)# router rip
Router(config-router)# network 10.0.0.0
Router(config-router)# network 172.16.0.0

Router(config-router)# Ctrl-Z
Router#
07:05:17: %SYS-5-CONFIG_I: Configured from console by vty0 (127.0.0.2)
Router# write memory
!--- Save the configuration. Building configuration... Router#
```

此時，根據網路圖表,InterVLAN設定已完成。

10. 在Router#提示時發出**exit**命令以返回Supervisor Engine模組：

```
Router# exit
Cat5500> (enable
```

常見問題：VLAN介面顯示down/down

本節介紹客戶嘗試在Catalyst 5500/5000或Catalyst 6500/6000系列路由器模組(RSM、MSFC、RSFC)上設定VLAN介面時遇到的常見問題。

客戶報告他們無法ping通路由器模組上配置的部分或所有VLAN介面。此外，當他們發出**show interface vlan *vlan#***指令時，其狀態不會顯示為up/up。它們確保在這些介面**上配置**了**no shutdown**。唯一顯示為up/up的VLAN介面是VLAN 1。

在這種情況下，如果您的部分或所有VLAN介面沒有顯示/顯示，首先應檢查交換機上是否存在有關

VLAN的任何活動埠。

重要附註：只有在交換機（路由器介面除外）上至少有一個埠分配給該VLAN，並且該埠已連線時，路由器模組上的VLAN介面才會開啟/開啟。配置為中繼的連線埠也滿足此VLAN開啟/關閉要求。如果不滿足此條件，路由器介面將不會啟動。

在網路圖表一節中，系統會警告您不要將工作站連線到Catalyst 5500交換器。此時，如果您發出這組命令，您會發現只有介面VLAN 1顯示/開啟，而另外兩個介面關閉：

```
Router# show ip interface brief

Interface                  IP-Address      OK? Method Status                Protocol

Vlan1                      172.16.80.79    YES manual up                    up
Vlan10                     10.10.10.1      YES manual down                  down
Vlan20                     10.10.11.1      YES manual down                  down

Router# show interface vlan 1
Vlan1 is up, line protocol is up
  Hardware is Cat5k Virtual Ethernet, address is 0010.f6a9.9800 (bia 0010.f6a9.9800)
  Internet address is 172.16.80.79/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:02, 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, 1 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec  !--- Output suppressed. Router# show interface
vlan 10
Vlan10 is down, line protocol is down
  Hardware is Cat5k Virtual Ethernet, address is 0010.f6a9.9800 (bia 0010.f6a9.9800)
  Internet address is 10.10.10.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:01, output 00:25:48, 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 !--- Output suppressed. Router# show interface
vlan 20
Vlan20 is down, line protocol is down
  Hardware is Cat5k Virtual Ethernet, address is 0010.f6a9.9800 (bia 0010.f6a9.9800)
  Internet address is 10.10.11.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:01, output 00:01:04, 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 2000 bits/sec, 2 packets/sec
  5 minute output rate 1000 bits/sec, 2 packets/sec !--- Output suppressed. Router#
```

介面VLAN 1處於up/up狀態，儘管在交換機上，VLAN 1中沒有任何已連線埠和活動埠。在VLAN 1中有一個活動埠/介面，即Supervisor模組上的sc0介面。預設情況下，sc0介面是VLAN 1的成員。在交換機(Supervisor Engine)上發出以下命令檢查sc0介面配置：

```
Cat5500> (enable) show interface
sl0: flags=51 <UP ,POINTOPOINT ,RUNNING>
        slip 0.0.0.0 dest 0.0.0.0
sc0: flags=63 <UP ,BROADCAST ,RUNNING>
        vlan 1 inet 172.16.80.40 netmask 255.255.255.0 broadcast 172.16.80.255
Cat5500> (enable)
```

此時，在埠4/1上連線工作站1，在埠4/13上連線工作站2。在交換機上發出**show port 4/1**和**show port 4/13**命令，以確保這些埠的狀態顯示為「已連線」：

```
Cat5500> (enable) show port 4/1
Port  Name               Status     Vlan       Level  Duplex Speed Type
----- ------------------ ---------- ---------- ------ ------ ----- ------------
 4/1                     connected  10         normal a-half  a-10 10/100BaseTX
!--- Output suppressed. Cat5500> (enable) show port 4/13
Port  Name               Status     Vlan       Level  Duplex Speed Type
----- ------------------ ---------- ---------- ------ ------ ----- ------------
 4/13                    connected  20         normal a-full a-100 10/100BaseTX
!--- Output suppressed. Cat5500> (enable)
```

現在，登入到路由器模組並檢查介面VLAN 10和VLAN 20的狀態。您應該將它們視為up/up。發出此組命令以檢查路由器模組上VLAN介面的狀態：

```
Cat5500> (enable) session 7
Trying Router-7...
Connected to Router-7.
Escape character is '^]'.


User Access Verification

Password:
!--- Enter the password; in this case, it is cisco. Router> enable
Password:
!--- Enter the password; in this case, it is cisco. Router# show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
Vlan1                      172.16.80.79    YES manual up                    up

Vlan10                     10.10.10.1      YES manual up                    up

Vlan20                     10.10.11.1      YES manual up                    up

Router# show interface vlan 10
Vlan10 is up, line protocol is up
  Hardware is Cat5k Virtual Ethernet, address is 0010.f6a9.9800 (bia 0010.f6a9.9800)
  Internet address is 10.10.10.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:01, output 00:46:14, 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 !--- Output suppressed. Router# show interface
vlan 20
Vlan20 is up, line protocol is up
  Hardware is Cat5k Virtual Ethernet, address is 0010.f6a9.9800 (bia 0010.f6a9.9800)
  Internet address is 10.10.11.1/24
```

```
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:56, 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 2000 bits/sec, 5 packets/sec
  5 minute output rate 2000 bits/sec, 2 packets/sec !--- Output suppressed. Router# exit
Cat5500> (enable)
```

驗證設定

可以執行幾個ping測試來驗證本文檔中說明的配置。在本節中，您將使用workstation2對workstation1、交換機的sc0介面和路由器模組的VLAN介面執行ping操作。

注意：請確保已將工作站上的預設網關設定為路由器模組上的VLAN介面。根據網路圖表,workstation1上的預設閘道設定為10.10.10.1，而workstation2設定為10.10.11.1。

測試1:從Workstation2 ping Workstation1

```
C:\> ipconfig
!--- This command is used to check the IP configuration on the !--- Windows 2000 workstation.
Use the appropriate commands on the workstations !--- that you use. Windows 2000 IP
Configuration Ethernet adapter Local Area Connection: Connection-specific DNS Suffix . : IP
Address. . . . . . . . . . . . : 10.10.11.254
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 10.10.11.1

C:\> ping 10.10.10.254

Pinging 10.10.10.254 with 32 bytes of data:

Reply from 10.10.10.254: bytes=32 time=10ms TTL=31
Reply from 10.10.10.254: bytes=32 time<10ms TTL=31
Reply from 10.10.10.254: bytes=32 time<10ms TTL=31
Reply from 10.10.10.254: bytes=32 time<10ms TTL=31

Ping statistics for 10.10.10.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  10ms, Average =  2ms
```

測試2:從Workstation2 ping Supervisor Engine上的sc0介面

```
C:\> ping 172.16.80.40

Pinging 172.16.80.40 with 32 bytes of data:

Reply from 172.16.80.40: bytes=32 time<10ms TTL=59
Reply from 172.16.80.40: bytes=32 time<10ms TTL=59
Reply from 172.16.80.40: bytes=32 time<10ms TTL=59
Reply from 172.16.80.40: bytes=32 time<10ms TTL=59

Ping statistics for 172.16.80.40:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
```

```
    Minimum = 0ms, Maximum =  0ms, Average =  0ms
```

測試3:從工作站2 ping路由器模組上的介面VLAN 1

```
C:\> ping 172.16.80.79

Pinging 172.16.80.79 with 32 bytes of data:

Reply from 172.16.80.79: bytes=32 time<10ms TTL=255
Reply from 172.16.80.79: bytes=32 time<10ms TTL=255
Reply from 172.16.80.79: bytes=32 time<10ms TTL=255
Reply from 172.16.80.79: bytes=32 time<10ms TTL=255

Ping statistics for 172.16.80.79:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  0ms, Average =  0ms
```

測試4:從Workstation2 ping路由器模組上的介面VLAN 10

```
C:\> ping 10.10.10.1

Pinging 10.10.10.1 with 32 bytes of data:

Reply from 10.10.10.1: bytes=32 time<10ms TTL=255
Reply from 10.10.10.1: bytes=32 time<10ms TTL=255
Reply from 10.10.10.1: bytes=32 time<10ms TTL=255
Reply from 10.10.10.1: bytes=32 time<10ms TTL=255

Ping statistics for 10.10.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  0ms, Average =  0ms
```

測試5:從Workstation2 ping路由器模組上的介面VLAN 20

```
C:\> ping 10.10.11.1

Pinging 10.10.11.1 with 32 bytes of data:

Reply from 10.10.11.1: bytes=32 time<10ms TTL=255
Reply from 10.10.11.1: bytes=32 time<10ms TTL=255
Reply from 10.10.11.1: bytes=32 time<10ms TTL=255
Reply from 10.10.11.1: bytes=32 time<10ms TTL=255

Ping statistics for 10.10.11.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  0ms, Average =  0ms
```

附錄

Supervisor Engine模組組態

```
Cat5500> (enable) show config
This command shows non-default configurations only.
Use show config all to show both default and non-default configurations.
...
```

```
begin
!
# ***** NON-DEFAULT CONFIGURATION *****
!
!
#time: Tue Apr 10 2001, 09:09:54
!
#version 6.1(1)
!
set option fddi-user-pri enabled
set password $2$lx7B$WipkVnLnbYIfrBSqD2SN9.
set enablepass $2$6/eK$I3lDb2nnP7Fc9JKF3XwRW/
set prompt Cat5500>
!
#errordetection
set errordetection portcounter enable
!
#system
set system name  Cat5500
!
#frame distribution method
set port channel all distribution mac both
!
#vtp
set vtp domain cisco
set vtp mode transparent
set vlan 1 name default type ethernet mtu 1500 said 100001 state active
set vlan 1002 name fddi-default type fddi mtu 1500 said 101002 state active
set vlan 1004 name fddinet-default type fddinet mtu 1500 said 101004 state active stp ieee
set vlan 1005 name trnet-default type trbrf mtu 1500 said 101005 state active stp ibm
set vlan 10,20
set vlan 1003 name token-ring-default type trcrf mtu 1500 said 101003 state active
mode srb aremaxhop 7 stemaxhop 7 backupcrf off
!
#ip
set interface sc0 1 172.16.80.40/255.255.255.0 172.16.80.255

set ip route 0.0.0.0/0.0.0.0         172.16.80.79
!
#set boot command
set boot config-register 0x2102
clear boot system all
!
# default port status is enable
!
!
#module 1 : 2-port 1000BaseSX Supervisor
!
#module 2 : 4-port 10/100BaseTX Supervisor
!
#module 3 : 3-port 1000BaseX Ethernet
!
#module 4 : 24-port 10/100BaseTX Ethernet
set vlan 10   4/1-12
set vlan 20   4/13-20
set spantree portfast    4/1-20 enable
!
#module 5 : 2-port MM OC-3 Dual-Phy ATM
!
#module 6 empty
!
#module 7 : 1-port Route Switch
!
```

```
#module 8 empty
!
#module 9 empty
!
#module 10 empty
!
#module 11 : 48-port 10BaseT Ethernet
!
#module 12 : 2-port MM MIC FDDI
!
#module 13 empty
end
Cat5500> (enable)
```

RSM配置

```
Router# show running-config
Building configuration...

Current configuration:
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router
!
enable password cisco
!
ip subnet-zero
ip cef
!
!
process-max-time 200
!
interface Vlan1
 ip address 172.16.80.79 255.255.255.0
 no ip directed-broadcast
!
interface Vlan10
 ip address 10.10.10.1 255.255.255.0
 no ip directed-broadcast
!
interface Vlan20
 ip address 10.10.11.1 255.255.255.0
 no ip directed-broadcast
!
ip classless
!
!
line con 0
 transport input none
line aux 0
line vty 0 4
 password cisco
 login
!
end

Router#
```

相關資訊

- Catalyst 4000系列路由器模組的配置和概述(WS-X4232-L3)
- 使用 PortFast 和其他命令修復工作站啟動連線延遲
- LAN 產品支援頁面
- LAN 交換支援頁面
- 技術支援 - Cisco Systems