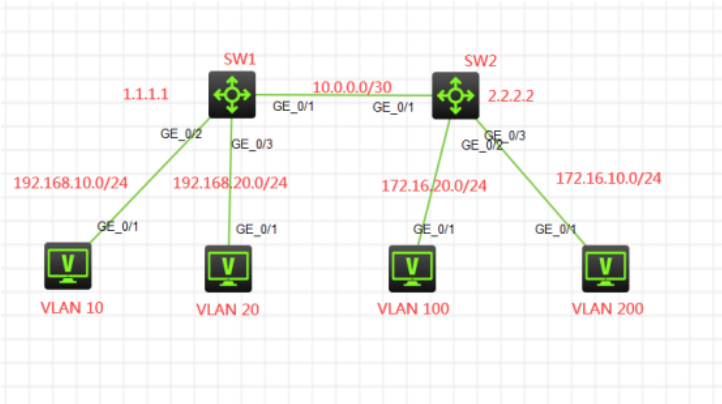
# S5820 多vpn-instance实例之IS-IS典型组网配置案例

IS-IS MCE H3C模拟器 **韦家宁** 2020-04-01 发表

## 组网及说明

网络拓扑图如下：




组网说明：

本案例采用H3C HCL模拟器来模拟多vpn-instance实例ISIS典型组网配置，为了实现不同VLAN之间通过不同的vpn实例进行隔离，因此采用多vpn实例捆绑到相应的VLAN。

VLAN 400与用于在SW1 、SW2的vpn-rt互联使用，VLAN 500用于SW1、SW2的vpn-nrt互联使用。由于VLAN 400与VLAN 500绑定到了不同的VPN实例，因此可以共同使用10.0.0.0/30作为互联地址。

业务地址、互联地址、Loopback地址如拓扑图所示。其中VLAN 10、VLAN 100属于vpn-rt中，VLAN 20、VLAN 200属于vpn-nrt实例中，另外SW1与SW2之间的互联采用trunk，互联的VLAN使用VLAN 400（绑定到vpn-rt）和VLAN 500（绑定到vpn-nrt），全网采用多VPN实例IS-IS互联互通，不通VPN实例的业务地址不能互通。

vpn-rt规划如下：

RD:100:1

RT:100:1

vpn-nrt规划如下：

RD:200:1

RT:200:1

## 配置步骤

1、分别在SW1和SW2创建VPN实例

2、根据组网说明将各业务地址、互联地址、loopback绑定到vpn实例

3、创建多实例IS-IS，并发布业务地址实现互通

4、SW1与SW2之间的互联采用trunk，仅允许互联的VLAN互通。

## 配置关键点

SW1：

```
sys
[H3C]sysname SW1
#创建vpn-rt实例，并配置RD值和RT值
[SW1]ip vpn-instance vpn-rt
[SW1-vpn-instance-vpn-rt]route-distinguisher 100:1
[SW1-vpn-instance-vpn-rt]vpn-target 100:1
[SW1-vpn-instance-vpn-rt]quit
#创建vpn-nrt实例，并配置RD值和RT值
[SW1]ip vpn-instance vpn-nrt
[SW1-vpn-instance-vpn-nrt]route-distinguisher 200:1
[SW1-vpn-instance-vpn-nrt]vpn-target 200:1
[SW1-vpn-instance-vpn-nrt]quit
[SW1]int LoopBack 0
[SW1-LoopBack0]ip binding vpn-instance vpn-rt  //将Loopback0绑定到vpn-rt
Some configurations on the interface are removed.
[SW1-LoopBack0]ip address 1.1.1.1 32
[SW1-LoopBack0]quit
[SW1]int LoopBack 1
```

```
[SW1-LoopBack1]ip binding vpn-instance vpn-nrt //将Loopback1绑定到vpn-nrt
Some configurations on the interface are removed.
[SW1-LoopBack1]ip address 1.1.1.1 32
[SW1-LoopBack1]quit
[SW1]vlan 10
[SW1-vlan10]quit
[SW1]vlan 20
[SW1-vlan20]quit
[SW1]vlan 400
[SW1-vlan400]quit
[SW1]vlan 500
[SW1-vlan500]quit

[SW1]int vlan 10
[SW1-Vlan-interface10]ip binding vpn-instance vpn-rt  //将VLAN 10绑定到vpn-rt
Some configurations on the interface are removed.
[SW1-Vlan-interface10]ip address 192.168.10.1 24
[SW1-Vlan-interface10]quit
[SW1]int vlan 20
[SW1-Vlan-interface20]ip binding vpn-instance vpn-nrt //将VLAN 20绑定到vpn-nrt
Some configurations on the interface are removed.
[SW1-Vlan-interface20]ip address 192.168.20.1 24
[SW1-Vlan-interface20]quit
[SW1]int vlan 400
[SW1-Vlan-interface400]ip binding vpn-instance vpn-rt //将VLAN400绑定到vpn-rt
Some configurations on the interface are removed.
[SW1-Vlan-interface400]description
[SW1-Vlan-interface400]ip address 10.0.0.1 30
[SW1-Vlan-interface400]quit
[SW1]int vlan 500
[SW1-Vlan-interface500]ip binding vpn-instance vpn-nrt //将VLAN 500绑定到vpn-nrt
Some configurations on the interface are removed.
[SW1-Vlan-interface500]description
[SW1-Vlan-interface500]ip address 10.0.0.1 30
[SW1-Vlan-interface500]quit
[SW1]

[SW1]int gi 1/0/2
[SW1-GigabitEthernet1/0/2]port link-type access
[SW1-GigabitEthernet1/0/2]port access vlan 10
[SW1-GigabitEthernet1/0/2]quit
[SW1]int gi 1/0/3
[SW1-GigabitEthernet1/0/3]port link-type access
[SW1-GigabitEthernet1/0/3]port access vlan 20
[SW1-GigabitEthernet1/0/3]quit
[SW1]

[SW1]int gi 1/0/1
[SW1-GigabitEthernet1/0/1]description
[SW1-GigabitEthernet1/0/1]port link-type trunk
[SW1-GigabitEthernet1/0/1]undo port trunk permit vlan 1
[SW1-GigabitEthernet1/0/1]port trunk permit vlan 400 500
[SW1-GigabitEthernet1/0/1]quit

创建IS-IS进程，并绑定到VPN实例中
[SW1]isis 10 vpn-instance vpn-rt
[SW1-isis-10]network-entity 10.0000.0000.0001.00
[SW1-isis-10]is-level level-1
[SW1-isis-10]quit

[SW1]isis 20 vpn-instance vpn-nrt
[SW1-isis-20]network-entity 10.0000.0000.0001.00
[SW1-isis-20]is-level level-1
[SW1-isis-20]quit
```

将各业务地址、接口地址使能IS-IS（注意不同的VPN实例使能不同的IS-IS进程）

```
[SW1]interface LoopBack 0
[SW1-LoopBack0]isis enable 10
[SW1-LoopBack0]quit
[SW1]int vlan 400
[SW1-Vlan-interface400]isis enable 10
[SW1-Vlan-interface400]quit
[SW1]int vlan 10
[SW1-Vlan-interface10]isis enable 10
[SW1-Vlan-interface10]quit
[SW1]int LoopBack 1
[SW1-LoopBack1]isis enable 20
[SW1-LoopBack1]quit
[SW1]int vlan 20
[SW1-Vlan-interface20]isis enable 20
[SW1-Vlan-interface20]quit
[SW1]int vlan 500
[SW1-Vlan-interface500]isis enable 20
[SW1-Vlan-interface500]quit
[SW1]
```

SW2：

```
sys
[H3C]sysname SW2
[SW2]ip vpn-instance vpn-rt
[SW2-vpn-instance-vpn-rt]route-distinguisher 100:1
[SW2-vpn-instance-vpn-rt]vpn-target 100:1
[SW2-vpn-instance-vpn-rt]quit
[SW2]ip vpn-instance vpn-nrt
[SW2-vpn-instance-vpn-nrt]route-distinguisher 200:1
[SW2-vpn-instance-vpn-nrt]vpn-target 200:1
[SW2-vpn-instance-vpn-nrt]quit
[SW2]int LoopBack 0
[SW2-LoopBack0]ip binding vpn-instance vpn-rt
Some configurations on the interface are removed.
[SW2-LoopBack0]ip address 2.2.2.2 32
[SW2-LoopBack0]quit
[SW2]int LoopBack 1
[SW2-LoopBack1]ip binding vpn-instance vpn-nrt
Some configurations on the interface are removed.
[SW2-LoopBack1]ip address 2.2.2.2 32
[SW2-LoopBack1]quit
[SW2]vlan 100
[SW2-vlan100]quit
[SW2]vlan 200
[SW2-vlan200]quit
[SW2]vlan 400
[SW2-vlan400]quit
[SW2]vlan 500
[SW2-vlan500]quit
[SW2]int vlan 100
[SW2-Vlan-interface100]ip binding vpn-instance vpn-rt
Some configurations on the interface are removed.
[SW2-Vlan-interface100]ip address 172.16.20.1 24
[SW2-Vlan-interface100]quit
[SW2]int vlan 200
[SW2-Vlan-interface200]ip binding vpn-instance vpn-nrt
Some configurations on the interface are removed.
[SW2-Vlan-interface200]ip address 172.16.10.1 24
[SW2-Vlan-interface200]quit
[SW2]int vlan 400
[SW2-Vlan-interface400]ip binding vpn-instance vpn-rt
```

Some configurations on the interface are removed.
[SW2-Vlan-interface400]description
[SW2-Vlan-interface400]ip address 10.0.0.2 30
[SW2-Vlan-interface400]quit
[SW2]int vlan 500
[SW2-Vlan-interface500]ip binding vpn-instance vpn-nrt
Some configurations on the interface are removed.
[SW2-Vlan-interface500]description
[SW2-Vlan-interface500]ip address 10.0.0.2 30
[SW2-Vlan-interface500]quit
[SW2]int gi 1/0/2
[SW2-GigabitEthernet1/0/2]port link-type access
[SW2-GigabitEthernet1/0/2]port access vlan 100
[SW2-GigabitEthernet1/0/2]quit
[SW2]int gi 1/0/3
[SW2-GigabitEthernet1/0/3]port link-type access
[SW2-GigabitEthernet1/0/3]port access vlan 200
[SW2-GigabitEthernet1/0/3]quit
[SW2]int gi 1/0/1
[SW2-GigabitEthernet1/0/1]description
[SW2-GigabitEthernet1/0/1]port link-type trunk
[SW2-GigabitEthernet1/0/1]undo port trunk permit vlan 1
[SW2-GigabitEthernet1/0/1]port trunk permit vlan 400 500
[SW2-GigabitEthernet1/0/1]quit

创建IS-IS进程，并绑定到VPN实例中
[SW2]isis 20 vpn-instance vpn-nrt
[SW2-isis-20]network-entity 10.0000.0000.0002.00
[SW2-isis-20]is-level level-1
[SW2-isis-20]quit

将各业务地址、接口地址使能IS-IS（注意不同的VPN实例使能不同的IS-IS进程）
[SW2]int LoopBack 0
[SW2-LoopBack0]isis enable 10
[SW2-LoopBack0]quit
[SW2]int vlan 100
[SW2-Vlan-interface100]isis enable 10
[SW2-Vlan-interface100]quit
[SW2]int vlan 400
[SW2-Vlan-interface400]isis enable 10
[SW2-Vlan-interface400]quit
[SW2]int LoopBack 1
[SW2-LoopBack1]isis enable 20
[SW2-LoopBack1]quit
[SW2]int vlan 200
[SW2-Vlan-interface200]isis enable 20
[SW2-Vlan-interface200]quit
[SW2]int vlan 500
[SW2-Vlan-interface500]isis enable 20
[SW2-Vlan-interface500]quit

查看各VPN路由表确认已学习到对端VPN发布的路由
[SW1]dis ip routing-table vpn-instance vpn-rt

Destinations : 19 Routes : 19

| Destination/Mask | Proto | Pre | Cost | NextHop | Interface |
|---|---|---|---|---|---|
| 0.0.0.0/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 1.1.1.1/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 2.2.2.2/32 | IS_L1 | 15 | 10 | 10.0.0.2 | Vlan400 |
| 10.0.0.0/30 | Direct | 0 | 0 | 10.0.0.1 | Vlan400 |
| 10.0.0.0/32 | Direct | 0 | 0 | 10.0.0.1 | Vlan400 |
| 10.0.0.1/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 10.0.0.3/32 | Direct | 0 | 0 | 10.0.0.1 | Vlan400 |

```
127.0.0.0/8        Direct  0   0           127.0.0.1       InLoop0
127.0.0.0/32       Direct  0   0           127.0.0.1       InLoop0
127.0.0.1/32       Direct  0   0           127.0.0.1       InLoop0
127.255.255.255/32 Direct  0   0           127.0.0.1       InLoop0
172.16.20.0/24     IS_L1   15  20          10.0.0.2        Vlan400
192.168.10.0/24    Direct  0   0           192.168.10.1    Vlan10
192.168.10.0/32    Direct  0   0           192.168.10.1    Vlan10
192.168.10.1/32    Direct  0   0           127.0.0.1       InLoop0
192.168.10.255/32  Direct  0   0           192.168.10.1    Vlan10
224.0.0.0/4        Direct  0   0           0.0.0.0         NULL0
224.0.0.0/24       Direct  0   0           0.0.0.0         NULL0
255.255.255.255/32 Direct  0   0           127.0.0.1       InLoop0
[SW1]

[SW1]dis ip routing-table vpn-instance vpn-nrt

Destinations : 19       Routes : 19

Destination/Mask    Proto   Pre Cost        NextHop         Interface
0.0.0.0/32          Direct  0   0           127.0.0.1       InLoop0
1.1.1.1/32          Direct  0   0           127.0.0.1       InLoop0
2.2.2.2/32          IS_L1   15  10          10.0.0.2        Vlan500
10.0.0.0/30         Direct  0   0           10.0.0.1        Vlan500
10.0.0.0/32         Direct  0   0           10.0.0.1        Vlan500
10.0.0.1/32         Direct  0   0           127.0.0.1       InLoop0
10.0.0.3/32         Direct  0   0           10.0.0.1        Vlan500
127.0.0.0/8         Direct  0   0           127.0.0.1       InLoop0
127.0.0.0/32        Direct  0   0           127.0.0.1       InLoop0
127.0.0.1/32        Direct  0   0           127.0.0.1       InLoop0
127.255.255.255/32  Direct  0   0           127.0.0.1       InLoop0
172.16.10.0/24      IS_L1   15  20          10.0.0.2        Vlan500
192.168.20.0/24     Direct  0   0           192.168.20.1    Vlan20
192.168.20.0/32     Direct  0   0           192.168.20.1    Vlan20
192.168.20.1/32     Direct  0   0           127.0.0.1       InLoop0
192.168.20.255/32   Direct  0   0           192.168.20.1    Vlan20
224.0.0.0/4         Direct  0   0           0.0.0.0         NULL0
224.0.0.0/24        Direct  0   0           0.0.0.0         NULL0
255.255.255.255/32  Direct  0   0           127.0.0.1       InLoop0
[SW1]

[SW2]dis ip routing-table vpn-instance vpn-rt

Destinations : 19       Routes : 19

Destination/Mask    Proto   Pre Cost        NextHop         Interface
0.0.0.0/32          Direct  0   0           127.0.0.1       InLoop0
1.1.1.1/32          IS_L1   15  10          10.0.0.1        Vlan400
2.2.2.2/32          Direct  0   0           127.0.0.1       InLoop0
10.0.0.0/30         Direct  0   0           10.0.0.2        Vlan400
10.0.0.0/32         Direct  0   0           10.0.0.2        Vlan400
10.0.0.2/32         Direct  0   0           127.0.0.1       InLoop0
10.0.0.3/32         Direct  0   0           10.0.0.2        Vlan400
127.0.0.0/8         Direct  0   0           127.0.0.1       InLoop0
127.0.0.0/32        Direct  0   0           127.0.0.1       InLoop0
127.0.0.1/32        Direct  0   0           127.0.0.1       InLoop0
127.255.255.255/32  Direct  0   0           127.0.0.1       InLoop0
172.16.20.0/24      Direct  0   0           172.16.20.1     Vlan100
172.16.20.0/32      Direct  0   0           172.16.20.1     Vlan100
172.16.20.1/32      Direct  0   0           127.0.0.1       InLoop0
172.16.20.255/32    Direct  0   0           172.16.20.1     Vlan100
192.168.10.0/24     IS_L1   15  20          10.0.0.1        Vlan400
224.0.0.0/4         Direct  0   0           0.0.0.0         NULL0
224.0.0.0/24        Direct  0   0           0.0.0.0         NULL0
255.255.255.255/32  Direct  0   0           127.0.0.1       InLoop0
```

[SW2]

[SW2]dis ip routing-table vpn-instance vpn-nrt

Destinations : 19 Routes : 19

| Destination/Mask | Proto | Pre | Cost | NextHop | Interface |
|---|---|---|---|---|---|
| 0.0.0.0/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 1.1.1.1/32 | IS_L1 | 15 | 10 | 10.0.0.1 | Vlan500 |
| 2.2.2.2/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 10.0.0.0/30 | Direct | 0 | 0 | 10.0.0.2 | Vlan500 |
| 10.0.0.0/32 | Direct | 0 | 0 | 10.0.0.2 | Vlan500 |
| 10.0.0.2/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 10.0.0.3/32 | Direct | 0 | 0 | 10.0.0.2 | Vlan500 |
| 127.0.0.0/8 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 127.0.0.0/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 127.0.0.1/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 127.255.255.255/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 172.16.10.0/24 | Direct | 0 | 0 | 172.16.10.1 | Vlan200 |
| 172.16.10.0/32 | Direct | 0 | 0 | 172.16.10.1 | Vlan200 |
| 172.16.10.1/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |
| 172.16.10.255/32 | Direct | 0 | 0 | 172.16.10.1 | Vlan200 |
| 192.168.20.0/24 | IS_L1 | 15 | 20 | 10.0.0.1 | Vlan500 |
| 224.0.0.0/4 | Direct | 0 | 0 | 0.0.0.0 | NULL0 |
| 224.0.0.0/24 | Direct | 0 | 0 | 0.0.0.0 | NULL0 |
| 255.255.255.255/32 | Direct | 0 | 0 | 127.0.0.1 | InLoop0 |

[SW2]

查看IS-IS邻居的状态：

[SW1]dis isis peer

Peer information for IS-IS(vpn-rt-10)

---

System ID: 0000.0000.0002
Interface: Vlan400 Circuit Id: 0000.0000.0002.02
State: Up HoldTime: 8s Type: L1 PRI: 64

Peer information for IS-IS(vpn-nrt-20)

---

System ID: 0000.0000.0002
Interface: Vlan500 Circuit Id: 0000.0000.0002.02
State: Up HoldTime: 7s Type: L1 PRI: 64

[SW1]

[SW2]dis isis peer

Peer information for IS-IS(vpn-rt-10)

---

System ID: 0000.0000.0001
Interface: Vlan400 Circuit Id: 0000.0000.0002.02
State: Up HoldTime: 29s Type: L1 PRI: 64

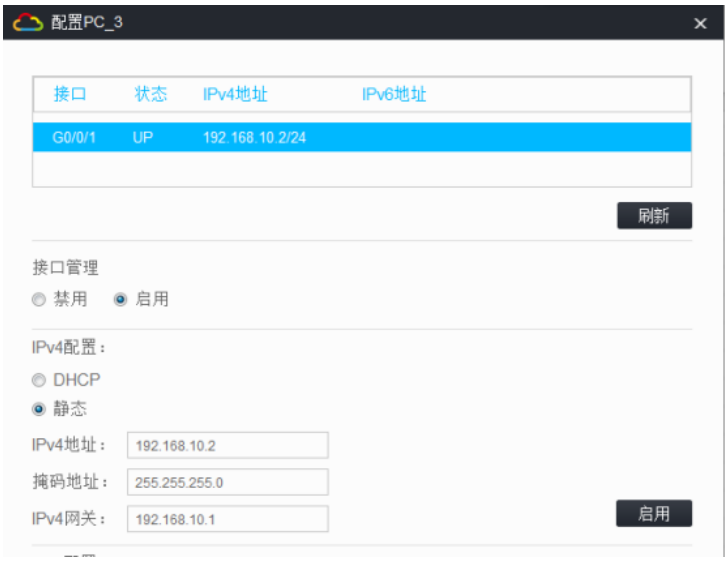
Peer information for IS-IS(vpn-nrt-20)

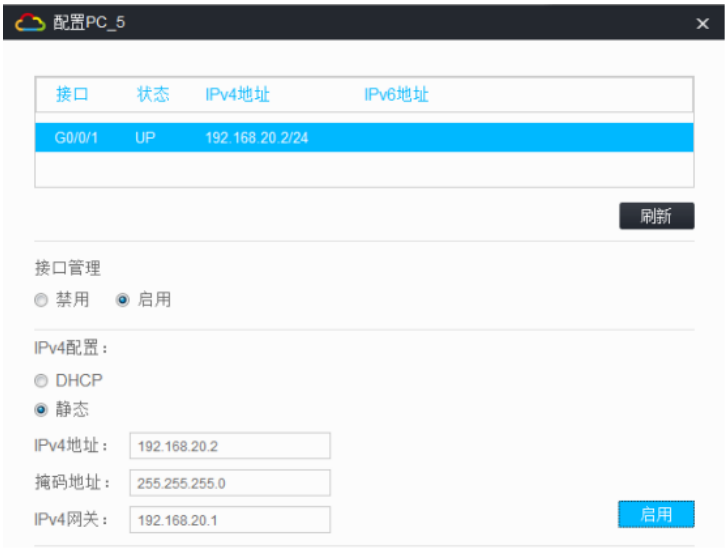
---

System ID: 0000.0000.0001
Interface: Vlan500 Circuit Id: 0000.0000.0002.02
State: Up HoldTime: 21s Type: L1 PRI: 64

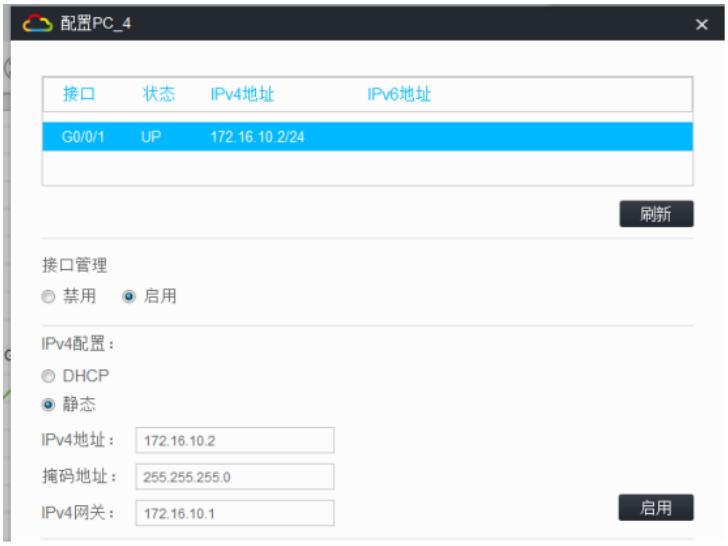
[SW2]

PC填写相应的IP地址，同VPN实例的可以PING通，不同VPN实例的不可以PING通

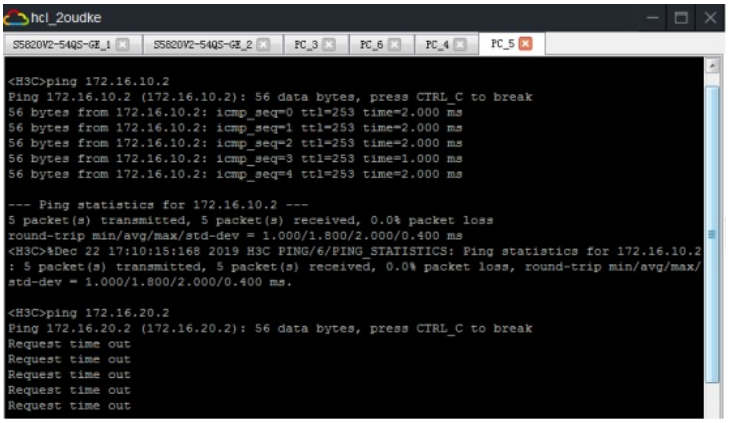

配置PC_3
接口 状态 IPv4地址 IPv6地址
G0/0/1 UP 192.168.10.2/24
刷新
接口管理
禁用 启用
IPv4配置：
DHCP
静态
IPv4地址： 192.168.10.2
掩码地址： 255.255.255.0
IPv4网关： 192.168.10.1
启用


配置PC_5
接口 状态 IPv4地址 IPv6地址
G0/0/1 UP 192.168.20.2/24
刷新
接口管理
禁用 启用
IPv4配置：
DHCP
静态
IPv4地址： 192.168.20.2
掩码地址： 255.255.255.0
IPv4网关： 192.168.20.1
启用


配置PC_6
接口 状态 IPv4地址 IPv6地址
G0/0/1 UP 172.16.20.2/24
刷新
接口管理
禁用 启用
IPv4配置：
DHCP
静态
IPv4地址： 172.16.20.2
掩码地址： 255.255.255.0
IPv4网关： 172.16.20.1
启用




同VPN实例能互通，不同VPN实例不能PING通




至此，多VPN实例IS-IS典型组网配置案例已配置完成!