HCIA 实验 7 VLAN 和 VLAN 间通信

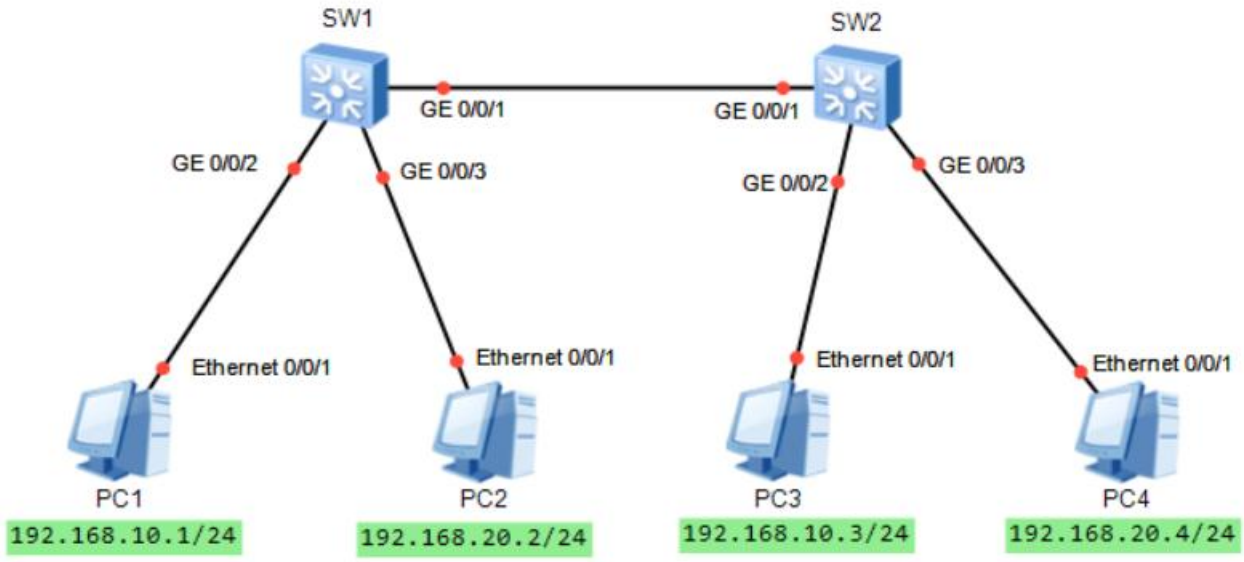
版本 **V1.0**

密级 ☑开放 ☐内部 ☐机密

类型 ☐讨论版 ☐测试版 ☑正式版

修订记录				
修订日期	**修订人**	**版本号**	**审核人**	**修订说明**
2019-11-14	**Ryan**	1.0		

1 实验拓扑



2 实验需求

1. 如图所示，配置设备名称和IP地址

2. sw1与sw2之间使用trunk链路，连接pc使用access链路，且trunk上仅允许必要的vlan通过。

3. PC1和PC3属于vlan10，PC2和PC4属于vlan20

4. vlan10的网络号为192.168.10.0/24，vlan20的网络号为192.168.20.0/24

5. vlan10的网关在sw1上，地址为192.168.10.254/24；vlan20的网关在sw2上，地址为192.168.20.254/24

6. sw1与sw2上另有vlan12，并分别建立vlanif12，用于互联通信。地址如下：

   sw1：192.168.12.1/24

   sw2：192.168.12.2/24

7. 在sw1与sw2上运行OSPF，满足以下需求：

   a) ospf进程号为1，sw1的rid为1.1.1.1，sw2的rid为2.2.2.2

   b) 所有接口都属于区域0，并使用实际配置掩码的反掩码宣告。

   c) PC1/2/3/4全部可以互相通信

3 配置思路及验证结果

3.1 创建 VLAN 并划分对应接口

SW1

```
[Huawei] sysname SW1
[SW1] vlan batch 10 20 12
[SW1] interface g0/0/2
[SW1-GigabitEthernet0/0/2] port link-type access
[SW1-GigabitEthernet0/0/2] port default vlan 10
[SW1-GigabitEthernet0/0/2] interface g0/0/3
[SW1-GigabitEthernet0/0/3] port link-type access
[SW1-GigabitEthernet0/0/3] port default vlan 20
[SW1-GigabitEthernet0/0/3] interface g0/0/1
[SW1-GigabitEthernet0/0/1] port link-type trunk
[SW1-GigabitEthernet0/0/1] port trunk allow-pass vlan 10 20 12
```

SW2

```
[Huawei] sysname SW2
[SW2] vlan batch 10 20 12
[SW2] interface g0/0/2
[SW2-GigabitEthernet0/0/2] port link-type access
[SW2-GigabitEthernet0/0/2] port default vlan 10
[SW2-GigabitEthernet0/0/2] interface g0/0/3
[SW2-GigabitEthernet0/0/3] port link-type access
[SW2-GigabitEthernet0/0/3] port default vlan 20
[SW2-GigabitEthernet0/0/3] interface g0/0/1
[SW2-GigabitEthernet0/0/1] port link-type trunk
[SW2-GigabitEthernet0/0/1] port trunk allow-pass vlan 10 20 12
```

3.2 配置 VLANIF 接口

SW1

```
[SW1] interface vlanif 10
[SW1-Vlanif10] ip address 192.168.10.254 24
[SW1-Vlanif10] interface vlanif12
[SW1-Vlanif12] ip add 192.168.12.1 24
```

SW2

```
[SW2] interface vlanif20
[SW2-Vlanif20] ip address 192.168.20.254 24
[SW2-Vlanif20] interface vlanif12
[SW2-Vlanif12] ip add 192.168.12.2 24
```

3.3 配置 OSPF

SW1

```
[SW1] ospf 1 router-id 1.1.1.1
[SW1-ospf-1] area 0
[SW1-ospf-1-area-0.0.0.0] network 192.168.12.0 0.0.0.255
[SW1-ospf-1-area-0.0.0.0] network 192.168.10.0 0.0.0.255
```

SW2

```
[SW2] ospf 1 router-id 2.2.2.2
```

```
[SW2-ospf-1] area 0
[SW2-ospf-1-area-0.0.0.0] network 192.168.12.0 0.0.0.255
[SW2-ospf-1-area-0.0.0.0] network 192.168.20.0 0.0.0.255
```

3.4 验证实验结果

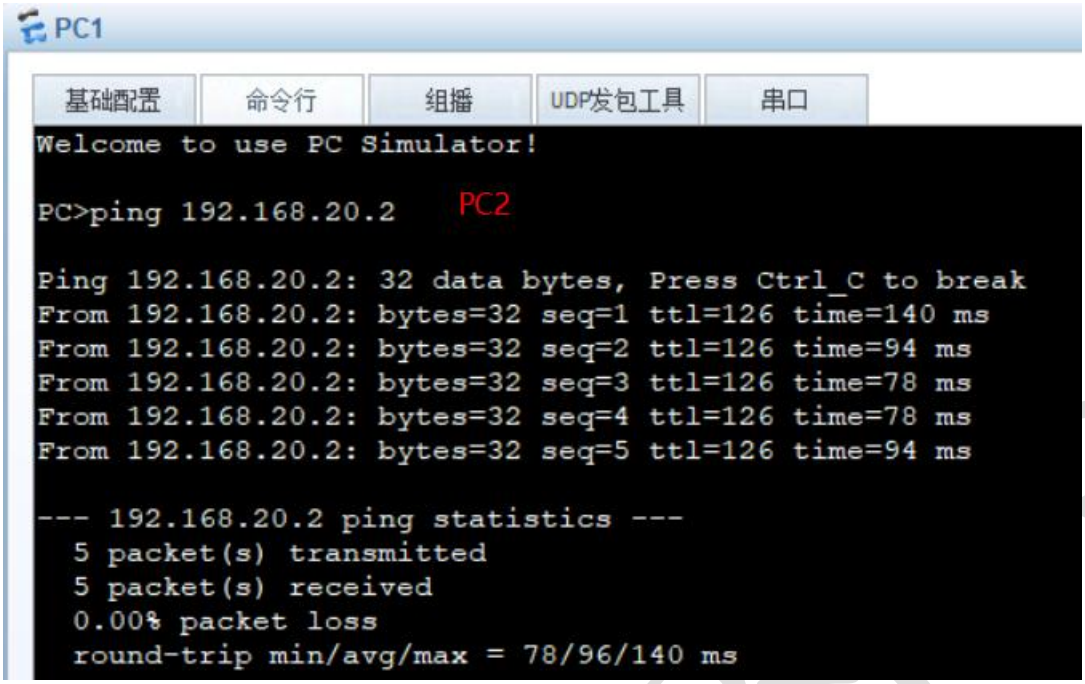
a) SW1 与 SW2 能够建立 OSPF 邻居

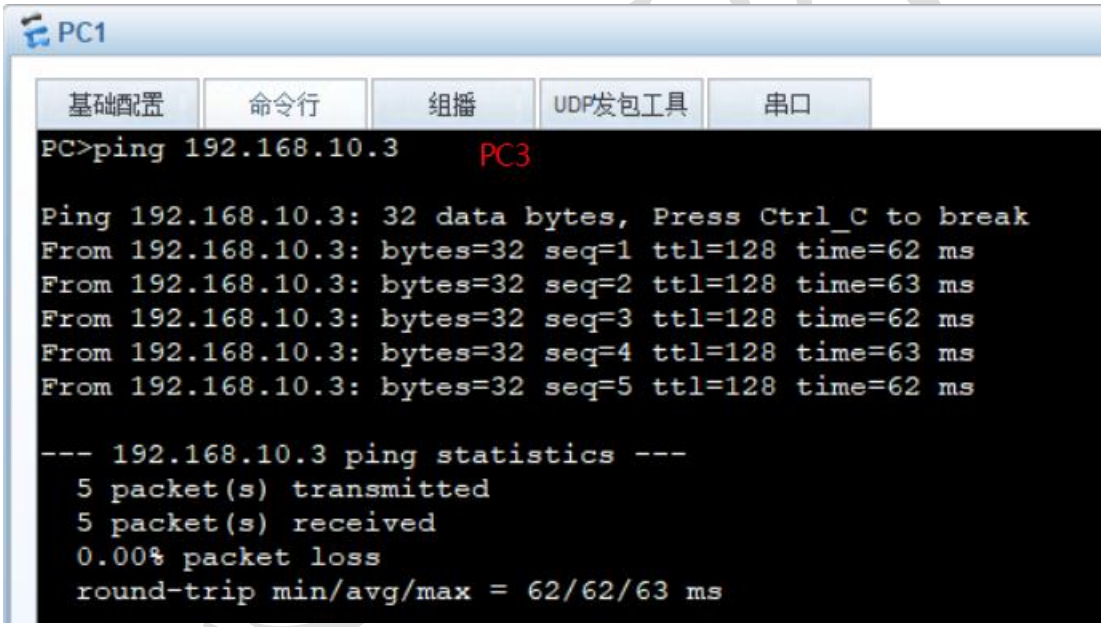
```
[SW1]dis ospf peer b

        OSPF Process 1 with Router ID 1.1.1.1
                Peer Statistic Information
 ----------------------------------------------------------------------------
 Area Id          Interface                       Neighbor id      State
 0.0.0.0          Vlanif12                        2.2.2.2          Full
 ----------------------------------------------------------------------------
```

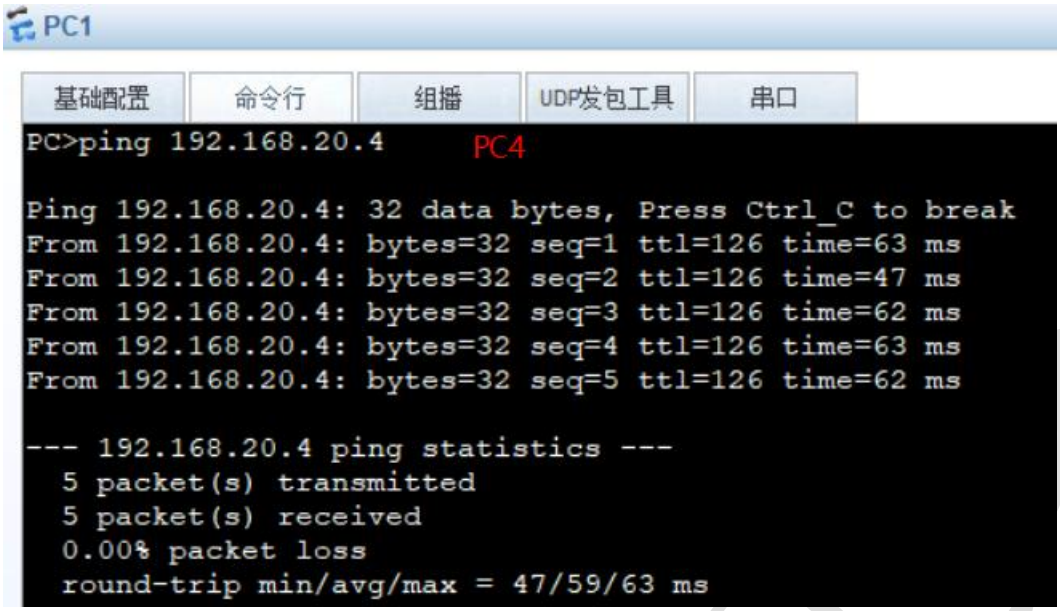
b) 路由可以正常学习

```
[SW1]display ip routing-table protocol ospf
Route Flags: R - relay, D - download to fib
------------------------------------------------------------------------------
Public routing table : OSPF
         Destinations : 1        Routes : 1

OSPF routing table status : <Active>
         Destinations : 1        Routes : 1

Destination/Mask    Proto   Pre  Cost      Flags NextHop         Interface

   192.168.20.0/24  OSPF    10   2           D   192.168.12.2    Vlanif12

OSPF routing table status : <Inactive>
         Destinations : 0        Routes : 0
```

c) 联通性测试


PC1
基础配置
命令行
组播
UDP发包工具
串口
Welcome to use PC Simulator!
PC>ping 192.168.20.2
PC2
Ping 192.168.20.2: 32 data bytes, Press Ctrl_C to break
From 192.168.20.2: bytes=32 seq=1 ttl=126 time=140 ms
From 192.168.20.2: bytes=32 seq=2 ttl=126 time=94 ms
From 192.168.20.2: bytes=32 seq=3 ttl=126 time=78 ms
From 192.168.20.2: bytes=32 seq=4 ttl=126 time=78 ms
From 192.168.20.2: bytes=32 seq=5 ttl=126 time=94 ms
--- 192.168.20.2 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 78/96/140 ms


PC1
基础配置
命令行
组播
UDP发包工具
串口
PC>ping 192.168.10.3
PC3
Ping 192.168.10.3: 32 data bytes, Press Ctrl_C to break
From 192.168.10.3: bytes=32 seq=1 ttl=128 time=62 ms
From 192.168.10.3: bytes=32 seq=2 ttl=128 time=63 ms
From 192.168.10.3: bytes=32 seq=3 ttl=128 time=62 ms
From 192.168.10.3: bytes=32 seq=4 ttl=128 time=63 ms
From 192.168.10.3: bytes=32 seq=5 ttl=128 time=62 ms
--- 192.168.10.3 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 62/62/63 ms


PC1
基础配置
命令行
组播
UDP发包工具
串口
PC>ping 192.168.20.4
PC4
Ping 192.168.20.4: 32 data bytes, Press Ctrl_C to break
From 192.168.20.4: bytes=32 seq=1 ttl=126 time=63 ms
From 192.168.20.4: bytes=32 seq=2 ttl=126 time=47 ms
From 192.168.20.4: bytes=32 seq=3 ttl=126 time=62 ms
From 192.168.20.4: bytes=32 seq=4 ttl=126 time=63 ms
From 192.168.20.4: bytes=32 seq=5 ttl=126 time=62 ms
--- 192.168.20.4 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 47/59/63 ms