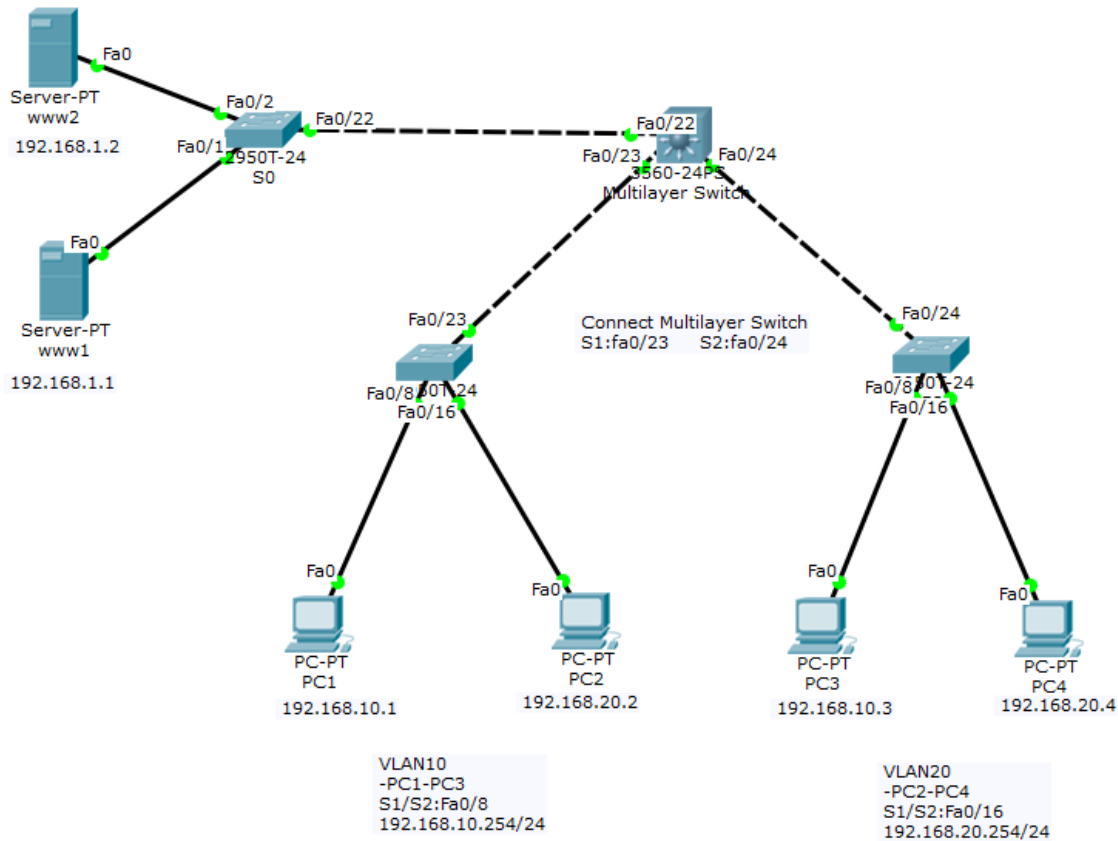


实验一：利用三层交换机进行两个VLAN的相互访问，而且PC机还能访问我们的服务器网站

实验环境：

三台二层交换机（2950-T），一台三层交换机（3-layerSwitch），四台主机，二台服务器，两个Vlan，划分的ip地址（已输入到静态ip中）以及接口如下



实验步骤：

1) 划分VLAN10,20分别给S1，S2交换机，并设置Fa0/23、fa0/24Trunk工作模式 S1：

```
1 Switch(config)#hostname S1
2 S1(config)#vlan 10
3 S1(config-vlan)#name vlan10
4 S1(config-vlan)#int fa0/8
5 S1(config-if)#switchport access vlan 10
6
7 S1(config-if)#vlan 20
8 S1(config-vlan)#name vlan20
9 S1(config-vlan)#int fa0/16
10 S1(config-if)#switchport access vlan 20
```

```
11
12 S1(config-if)#int fa0/23
13 S1(config-if)#switchport mode trunk
```

S2:

```
1 Switch(config)#no ip domain look //不让cisco进行domain搜寻
2 Switch(config)#hostname S2
3 S2(config)#vlan 10
4 S2(config-vlan)#name S2-vlan10
5 S2(config-vlan)#int fa0/8
6 S2(config-if)#switchport access vlan 10
7
8 S2(config-if)#vlan 20
9 S2(config-vlan)#name S2-vlan20
10 S2(config-vlan)#int fa0/16
11 S2(config-if)#switchport access vlan 20
12
13 S2(config-if)#int fa0/24
14 S2(config-if)#switchport mode trunk
```

2) 在交换机S0中设置fa0/22的Trunk工作模式：

```
1 Switch(config)#int fa0/1
2 Switch(config-if)#switchport mode access
3
4 Switch(config-if)#int fa0/2
5 Switch(config-if)#switchport mode access
6
7 Switch(config-if)#int fa0/22
8 Switch(config-if)#switchport mode trunk
```

3) 设置三层交换机(3LayerSwitch)端口的Trunk工作模式

注意：使用Trunk模式的时候必须要先要封装协议(Encapsulation dot1q)

```
1 3-layerSwitch(config)#interface fastEthernet 0/22
```

```

2 3-layerSwitch(config-if)#switchport trunk encapsulation dot1q
3  #switchport mode trunk
4
5 3-layerSwitch(config)#interface fastEthernet 0/23
6 3-layerSwitch(config-if)#switchport trunk encapsulation dot1q
7  #switchport mode trunk
8
9 3-layerSwitch(config)#interface fastEthernet 0/23
10 3-layerSwitch(config-if)#switchport trunk encapsulation dot1q
11  #switchport mode trunk

```

4) 在三层交换机中创建虚拟的VLAN接口，配置其网关地址(Gateway),使不同VLAN间的计算机能够通信.

```

1 3-layerSwitch(config)#interface vlan 1
2 3-layerSwitch(config-if)#ip address 192.168.1.254 255.255.255.0 //注意这里是
   网关地址
3 3-layerSwitch(config-if)#int
4 3-layerSwitch(config-if)#exit
5
6 3-layerSwitch(config)#int
7 3-layerSwitch(config)#interface vlan 10
8 3-layerSwitch(config-if)#ip address
9 3-layerSwitch(config-if)#ip address 192.168.10.254 255.255.255.0
10 3-layerSwitch(config-if)#exit
11
12 3-layerSwitch(config)#interface vlan20 //貌似可以写合并
13 3-layerSwitch(config-if)#ip address
14 3-layerSwitch(config-if)#ip address 192.168.20.254 255.255.255.0
15 3-layerSwitch(config-if)#exit

```

5) 将fa接口加入到虚拟的Vlan接口 (!! Important)

```

1 3-layerSwitch(config)#interface FastEthernet 0/22
2 3-layerSwitch(config-if)#switchport access vlan 1
3
4 3-layerSwitch(config)#interface FastEthernet 0/23
5 3-layerSwitch(config-if)#switchport access vlan 10

```

```
6
7 3-layerSwitch(config)#interface FastEthernet 0/24
8 3-layerSwitch(config-if)#switchport access vlan 20
```

6) 激活路由的选择协议 (默认是没激活的)

只有这样, 当目的地不在本地的Vlan上时候, 三层交换机才会使用路由协议来转发分组

```
1 3-layerSwitch#configure terminal
2 Enter configuration commands, one per line. End with CNTL/Z.
3 3-layerSwitch(config)#ip routi
4 3-layerSwitch(config)#ip routing
5 3-layerSwitch(config)#end
```

7) 查看配置文件看是不是激活成功

路由表:

```
1 3-layerSwitch#show ip route
2 Gateway of last resort is not set
3
4 C    192.168.1.0/24 is directly connected, Vlan1
5 C    192.168.10.0/24 is directly connected, Vlan10
6 C    192.168.20.0/24 is directly connected, Vlan20
```

当前运行的配置文件:

```

interface FastEthernet0/22
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface FastEthernet0/23
switchport access vlan 10
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface FastEthernet0/24
switchport access vlan 20
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
ip address 192.168.1.254 255.255.255.0
!
interface Vlan10
mac-address 00e0.f799.3e01
ip address 192.168.10.254 255.255.255.0
!
interface Vlan20
mac-address 00e0.f799.3e02
ip address 192.168.20.254 255.255.255.0
!
router rip
!
ip classless
!

```

9) 验证结果：

The screenshot shows the Cisco Packet Tracer interface with a network topology and a command prompt window.

Network Topology:

- Root Switch:** A central switch connected to two other switches.
- Left Switch:** Connected to two servers (Server-PT www2, 192.168.1.2 and Server-PT www1, 192.168.1.1) and two PCs (PC1, 192.168.10.1 and PC2, 192.168.10.2).
- Right Switch:** Connected to two PCs (PC3, 192.168.20.3 and PC4, 192.168.20.4).
- VLANs:**
 - VLAN10:** PC1, PC2, and the left switch's Fa0/23.
 - VLAN20:** PC3, PC4, and the right switch's Fa0/24.

Command Prompt Window:

```

PC>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time=1ms TTL=128
Reply from 192.168.10.3: bytes=32 time=0ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

Control-C
^C
PC>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time=1ms TTL=127
Reply from 192.168.20.2: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.20.2:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

Control-C
^C
PC>

```

Cisco Packet Tracer Instructor - E:\网络工程\HomeWork.pkt

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster

Server-PT www2 192.168.1.2
Server-PT www1 192.168.1.1

PC-PT PC1 192.168.10.1
PC-PT PC2 192.168.20.2
PC-PT PC3 192.168.10.3
PC-PT PC4 192.168.20.4

VLAN10 -PC1-PC3 S1/S2 Fa0/8 192.168.10.254/24
VLAN20 -PC2-PC4 S1/S2 Fa0/16 192.168.20.254/24

Connect Multilayer Switch S1:fa0/23 S2:fa0/24

Web Browser

URL http://192.168.1.2 Go Stop

Successful

this is login web server 'n IP?192.168.1.2

username: username

password: password

Time: 01:25:21 Power Cycle Devices Fast Forward Time

Cisco Packet Tracer Instructor - E:\网络工程\HomeWork.pkt

File Edit Options View Tools Extensions Help

Logical [Root] New Cluster

Server-PT www2 192.168.1.2
Server-PT www1 192.168.1.1

PC-PT PC1 192.168.10.1
PC-PT PC2 192.168.20.2
PC-PT PC3 192.168.10.3
PC-PT PC4 192.168.20.4

VLAN10 -PC1-PC3 S1/S2 Fa0/8 192.168.10.254/24
VLAN20 -PC2-PC4 S1/S2 Fa0/16 192.168.20.254/24

Connect Multilayer Switch S1:fa0/23 S2:fa0/24

Web Browser

URL http://192.168.1.1 Go Stop

This successful load Web

This is WWW1 WEB----this is login web server 'n IP?192.168.1.1

??? nameuser

?? password

Login

Time: 01:25:48 Power Cycle Devices Fast Forward Time

