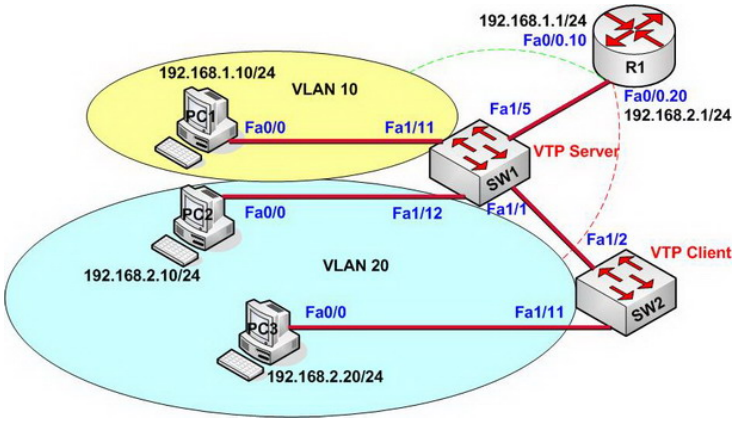
BCMSN Lab1 - Routing Between VLANs and VTP Protocol

?Lab Objectives?

1. Master the VTP configuration methods.
2. Master the routing configuration methods between VLANs and the sub-interface configurations.

?Lab Topology?



?Lab Steps?

1. Configure PC1?PC2 and PC3 to be used as simulation hosts, the configuration is as follows

```
PC1(config)#no ip routing
PC1(config)#
PC1(config)#ip default-network   192.168.1.1
PC1(config)#
PC1(config)#interface   fastEthernet 0/0
PC1(config-if)#ip   address 192.168.1.10 255.255.255.0
PC1(config-if)#no   shutdown
PC1(config-if)#exit
PC1(config)#
```

```
PC2(config)#no ip   routing
PC2(config)#
PC2(config)#ip   default-network 192.168.2.1
PC2(config)#
PC2(config)#interface   fastEthernet 0/0
```

```
PC2(config-if)#ip   address 192.168.2.10 255.255.255.0
PC2(config-if)#no   shutdown
PC2(config-if)#exit
PC2(config)#
```

```
PC3(config)#no ip   routing
PC3(config)#
PC3(config)#ip   default-network 192.168.2.1
PC3(config)#
PC3(config)#interface   fastEthernet 0/0
PC3(config-if)#ip   address 192.168.2.20 255.255.255.0
PC3(config-if)#no   shutdown
PC3(config-if)#exit
PC3(config-if)#
```

2. Configure trunk between SW1 and SW2, the configuration is as follows:

```
SW1(config)#interface   fastEthernet 1/1
SW1(config-if)#switchport trunk encapsulation   dot1q
SW1(config-if)#switchport mode trunk
SW1(config-if)#exit
```

```
SW2(config)#interface   fastEthernet 1/2
SW2(config-if)#switchport trunk encapsulation   dot1q
SW2(config-if)#switchport   mode trunk
SW2(config-if)#exit
```

3. Check the trunk information:

SW2#show interfaces trunk

Port Mode Encapsulation Status Native vlan
Fa1/2 on 802.1q trunking 1

Port Vlans allowed on trunk
Fa1/2 1-1005

Port Vlans allowed and active in management domain
Fa1/2 1

Port Vlans in spanning tree forwarding state and not pruned
Fa1/2 1
SW2#

4. Check the VTP status of SW1 and SW2 before configuring VTP

SW2#show vtp status
VTP Version : 2
Configuration Revision : 0
Maximum VLANs supported locally : 256
Number of existing VLANs : 5
VTP Operating Mode : Server
VTP Domain Name :
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0xBF 0x86 0x94 0x45 0xFC 0xDF 0xB5 0x70
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
Local updater ID is 0.0.0.0 (no valid interface found)

5. Configure VTP on SW1 and SW2

SW1#vlan database
SW1(vlan)#vtp domain ccnp
Changing VTP domain name from NULL to ccnp
SW1(vlan)#
SW1(vlan)#vtp server
Device mode already VTP SERVER.
SW1(vlan)#
SW1(vlan)#vtp password cisco
Setting device VLAN database password to cisco.
SW1(vlan)#
SW1(vlan)#vtp pruning
SW1(vlan)#

6. Configure VTP in the global configuration mode.

SW2(config)#vtp password cisco
Setting device VLAN database password to cisco
SW2(config)#
SW2(config)#vtp domain ccnp
Changing VTP domain name from fuckcisco to ccnp
SW2(config)#
SW2(config)#vtp pruning
Pruning switched on
SW2(config)#
SW2(config)#vtp mode client
Setting device to VTP CLIENT mode.
SW2(config)#

7. Check the information about VTP status on SW1 and SW2

SW2#show vtp status
VTP Version : 2
Configuration Revision : 1
Maximum VLANs supported locally : 1005
Number of existing VLANs : 10
VTP Operating Mode : Client

VTP Domain Name : ccnp
VTP Pruning Mode : Enabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0x71 0x62 0x0B 0xD1 0xED 0xFD 0x7D 0xAC
Configuration last modified by 199.1.1.3 at 3-2-93 02:11:08
SW2#

8. Create VLAN on SW1 and SW2

SW1#vlan database
SW1(vlan)#vlan 10 name cisco
VLAN 10 added:
Name: cisco
SW1(vlan)#exit
APPLY completed.
Exiting....
SW1#
SW1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SW1(config)#
SW1(config)#vlan 20
SW1(config-vlan)#name microsoft
SW1(config-vlan)#exit

9. Check the VLAN configuration on SW1

SW1#show vlan

VLAN Name Status Ports
---------- ---
1 default active Fa1/0, Fa1/2, Fa1/3, Fa1/4
Fa1/5, Fa1/6, Fa1/7, Fa1/8
Fa1/9, Fa1/10, Fa1/11, Fa1/12
Fa1/13, Fa1/14, Fa1/15
10 cisco active
20 microsoft active
1002 fddi-default active

1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1 enet 100001 1500 - - - - - 1002 1003
10 enet 100010 1500 - - - - - 0 0
20 enet 100020 1500 - - - - - 0 0
1002 fddi 101002 1500 - - - - - 1 1003
1003 tr 101003 1500 1005 0 - - srb 1 1002
1004 fdnet 101004 1500 - - 1 ibm - 0 0
1005 trnet 101005 1500 - - 1 ibm - 0 0
SW1#

10. Check the VTP status information.

SW1#show vtp status
VTP Version : 2
Configuration Revision : 2
Maximum VLANs supported locally : 256
Number of existing VLANs : 7
VTP Operating Mode : Server
VTP Domain Name : ccnp
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0xF3 0x1C 0x33 0x46 0xEA 0x14 0xBB 0x9F
Configuration last modified by 0.0.0.0 at 3-1-02 00:52:53
Local updater ID is 0.0.0.0 (no valid interface found)
SW1#

11. Check the VTP status information on SW2.

SW2#show vtp status
VTP Version : 2
Configuration Revision : 2
Maximum VLANs supported locally : 256

Number of existing VLANs : 7
VTP Operating Mode : Client
VTP Domain Name : ccnp
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0xF3 0x1C 0x33 0x46 0xEA 0x14 0xBB 0x9F
Configuration last modified by 0.0.0.0 at 3-1-02 00:52:53
SW2#

12. Check the VLAN information on SW2.

SW1#show vlan

VLAN Name Status Ports
---------- ---------- ----------
1 default active Fa0/3, Fa0/4, Fa0/5, Fa0/6
Fa0/7, Fa0/8, Fa0/9, Fa0/10
Fa0/11, Fa0/12, Fa0/13, Fa0/14
Fa0/15, Fa0/16, Fa0/17, Fa0/18
Fa0/19, Fa0/20, Fa0/21, Fa0/22
Fa0/23, Fa0/24, Gi0/1, Gi0/2
10 cisco active
20 microsoft active
1002 fddi-default act/unsup
1003 token-ring-default act/unsup
1004 fddinet-default act/unsup
1005 trnet-default act/unsup
????

13. Add the appropriate host ports into the VLAN on SW1 and SW2.

SW1(config)#interface fastEthernet 1/11
SW1(config-if)#switchport access vlan 10
SW1(config-if)#exit
SW1(config)#
SW1(config)#interface fastEthernet 1/12
SW1(config-if)#switchport access vlan 20

SW1(config-if)#exit

14. Configure VLAN on SW2

SW2(config)#interface fastEthernet 1/11
SW2(config-if)#switchport access vlan 20
SW2(config-if)#exit

15. Use the ping command on PC1, PC2 and PC3 to test communications between VLANs.

PC1#ping 192.168.1.20

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.20, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
PC1#

PC2#ping 192.168.2.20

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.20, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 24/24/24 ms
PC2#
PC2#ping 192.168.1.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.10, timeout is 2 seconds:
.....

Success rate is 0 percent (0/5)
PC2#

PC3#ping 192.168.2.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/18/32 ms
PC3#
PC3#ping 192.168.1.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.10, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

16. Configure single-arm routing on R1 to guarantee the communication between two VLANs.
17. Configure the TRUNK link between R1 and SW1, the configuration is as follows:

SW1(config)#interface fastEthernet 1/5
SW1(config-if)#switchport trunk encapsulation dot1q
SW1(config-if)#
SW1(config-if)#switchport mode trunk
SW1(config-if)#exit

R1(config)#
R1(config)#interface fastEthernet 0/0

```
R1(config-if)#no ip   address
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
R1(config)#interface fastEthernet 0/0.10
R1(config-subif)#encapsulation dot1Q 10
R1(config-subif)#ip address 192.168.1.1   255.255.255.0
R1(config-subif)#exit
R1(config)#
R1(config)#interface   fastEthernet 0/0.20
R1(config-subif)#encapsulation   dot1Q 20
R1(config-subif)#ip   address 192.168.2.1 255.255.255.0
R1(config-subif)#exit
R1(config)#
```

18. Check the R1 routing table.

```
R1#show ip route

Gateway of last resort   is not set

C 192.168.1.0/24 is directly connected, FastEthernet0/0.10
C 192.168.2.0/24 is directly connected, FastEthernet0/0.20
```

19. Use the ping command on PC1, PC2 and PC3 to test routes between VLANs.

```
PC1#ping 192.168.1.1

Type escape sequence   to abort.
Sending 5, 100-byte   ICMP Echos to 192.168.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100   percent (5/5), round-trip min/avg/max = 16/232/1040 ms
PC1#
PC1#ping 192.168.2.1

Type escape sequence   to abort.
Sending 5, 100-byte   ICMP Echos to 192.168.2.1, timeout is 2 seconds:
!!!!!
```

Success rate is 100 percent (5/5), round-trip min/avg/max = 4/223/1012 ms
PC1#
PC1#ping 192.168.2.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.10, timeout is 2 seconds:
..!!!
Success rate is 60 percent (3/5), round-trip min/avg/max = 12/48/92 ms
PC1#
PC1#ping 192.168.2.20

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.20, timeout is 2 seconds:
..!!!
Success rate is 60 percent (3/5), round-trip min/avg/max = 20/52/96 ms

PC2#ping 192.168.1.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 20/48/88 ms

PC3#ping 192.168.1.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 12/50/88 ms

20. End.
Hope to helpful for you!