CCNA – 200 – 301

(Lab # 2c)

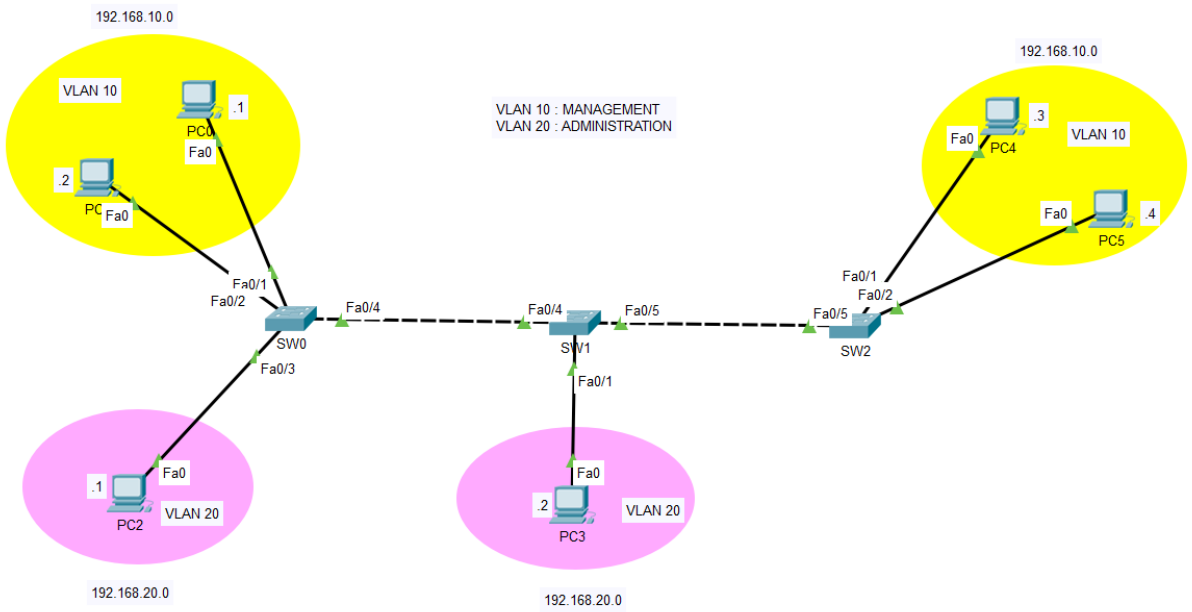
VTP Configuration for VLAN

(By Engr. Gul Raeez Gulshan)

Objective:

- Creating two virtual LANs named **VLAN 10 and VLAN 20**.
- VLAN 10 refers to MANAGEMENT while VLAN 20 refers to ADMINSTRATION.
- Network IP is 192.168.10.0 for all PCs configured in VLAN 10 while Network IP is 192.168.20.0 for all PCs configured in VLAN 20.
- Configuring switchports of switches in access and trunking mode for VLAN 10 & VLAN 20.
- For switch (SW0), the ports **f0/1** and **f0/2** are configured to be accessed in **VLAN 10**, the port **f0/3** is configured to be accessed in **VLAN 20** and port **f0/4** is configured as **Trunk**.
- For switch (SW1), the ports **f0/1** is configured to be accessed in **VLAN 20**, the ports **f0/4 and f0/5** are configured as trunk.
- For switch (SW2), the ports **f0/1** and **f0/2** are configured to be accessed in **VLAN 10**, and port **f0/5** is configured as trunk.
- Configuring VTP for all switches.
- SW0 will be configured as **VTP Server** while SW1 and SW2 will be configured as **VTP Client**.
- VTP domain name will be **axiom.edu.pk** and password will be **12345**.
- Showing the results by pinging between the devices in both VLANs.

Logical Topology in Packet Tracer



Configuring Switch (SW0) for VLAN 10 & 20 & Trunking

```
SW0>enable
SW0#configure terminal
SW0(config)#vlan 10
SW0(config-vlan)#name MANAGEMENT
SW0(config-vlan)#exit
SW0(config)#vlan 20
SW0(config-vlan)#name ADMISTRATION
SW0(config-vlan)#exit
SW0(config)#interface range fastEthernet 0/1-2
SW0(config-if-range)#switchport mode access
SW0(config-if-range)#switchport access vlan 10
SW0(config-if-range)#exit
SW0(config)#interface fastEthernet 0/3
SW0(config-if)#switchport mode access
SW0(config-if)#switchport access vlan 20
SW0(config-if)#exit
SW0(config)#interface fastEthernet 0/4
SW0(config-if)#switchport mode trunk
SW0(config-if)#exit
SW0(config)#do show vlan
```

```
SW0(config)#do show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    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
                                                 Gig0/1, Gig0/2
10   MANAGEMENT                        active    Fa0/1, Fa0/2
20   ADMINISTRATION                    active    Fa0/3
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
```

Configuring Switch (SW1) for VLAN 20 & Trunking

```
SW1>enable
SW1#configure terminal
SW1(config)#vlan 20
SW1(config-vlan)#name ADMISTRATION
SW1(config-vlan)#exit
SW1(config)#interface fastEthernet 0/1
SW1(config-if)#switchport mode access
SW1(config-if)#switchport access vlan 20
SW1(config-if)#exit
SW1(config)#interface range fastEthernet 0/4-5
SW1(config-if-range)#switchport mode trunk
SW1(config-if-range)#exit
SW1(config)#do show vlan
```

```
SW1(config)#do show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/2, Fa0/3, 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, Gig0/1, Gig0/2
20   ADMINISTRATION                   active    Fa0/1
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

Configuring Switch (SW2) for VLAN 10 & Trunking

```
SW2>enable
SW2#configure terminal
SW2(config)#vlan 10
SW2(config-vlan)#name MANAGEMENT
SW2(config-vlan)#exit
SW2(config)#interface range fastEthernet 0/1-2
SW2(config-if-range)#switchport mode access
SW2(config-if-range)#switchport access vlan 10
SW2(config-if-range)#exit
SW2(config)#interface fastEthernet 0/5
SW2(config-if)#switchport mode trunk
SW2(config-if)#exit
SW2(config)#do sh vlan
```

```
SW2(config)#do sh vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/3, Fa0/4, 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, Gig0/1, Gig0/2
10   MANAGEMENT                       active    Fa0/1, Fa0/2
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

Pinging from PC2 (VLAN20) to PC0 (VLAN20): Successful

```
C:\>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=128
Reply from 192.168.20.2: bytes=32 time=3ms TTL=128
Reply from 192.168.20.2: bytes=32 time<1ms TTL=128
Reply from 192.168.20.2: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

Pinging from PC0 (VLAN10) to PC4 (VLAN10): Unsuccessful

```
C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

As you can see the ping from same network and in same VLAN has not been successful, but why? The reason is that all switches do not have same entries in VLAN database. For example, SW0 includes VLAN 10 & 20, SW1 includes VLAN 20 only and SW2 includes VLAN 10 only. As the matter of fact, all switches in intra-VLAN communication must have same number of VLAN entries in database. So, in this case, if we create VLAN 10 in SW1 and VLAN 20 in SW2, then the network will work fine as all switches are going to have same number of VLAN. But this is not the permeant solution as we will implement the VTP in this case later as workable solution.

Creating VLAN 10 in Switch (SW1)

```
SW1>enable
SW1#configure terminal
SW1(config)#vlan 10
SW1(config-vlan)#name MANAGEMENT
SW1(config-vlan)#exit
SW1(config)#do sh vlan
```

```
SW1(config)#do sh vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/2, Fa0/3, 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, Gig0/1, Gig0/2
10   MANAGEMENT                        active
20   ADMINISTRATION                    active    Fa0/1
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
```

Creating VLAN 20 in Switch (SW2)

```
SW2>enable
SW2#configure terminal
SW2(config)#vlan 20
SW2(config-vlan)#name ADMINISTRATION
SW2(config-vlan)#exit
SW2(config)#do sh vlan
```

```
SW2(config)#do sh vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/3, Fa0/4, 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, Gig0/1, Gig0/2
10   MANAGEMENT                        active    Fa0/1, Fa0/2
20   ADMINISTRATION                    active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
```

Pinging from PC0 (VLAN10) to PC4 (VLAN10): Successful

```
C:\>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<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Checking VTP status of all switches before configuring VTP

To check VTP status of switch you can simply issue **"show vtp status"** command in privileged EXEC mode

VTP Status of switch (SW0)

```
SW0#show vtp status
VTP Version                     : 2
Configuration Revision          : 4
Maximum VLANs supported locally : 255
Number of existing VLANs        : 7
VTP Operating Mode              : Server
VTP Domain Name                 :
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x9B 0x5C 0xF9 0x3D 0x30 0x19 0xDB 0x5F
Configuration last modified by 0.0.0.0 at 3-1-93 00:08:28
Local updater ID is 0.0.0.0 (no valid interface found)
```

VTP Status of switch (SW1)

```
SW1#show vtp status
VTP Version                     : 2
Configuration Revision          : 4
Maximum VLANs supported locally : 255
Number of existing VLANs        : 7
VTP Operating Mode              : Server
VTP Domain Name                 :
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x43 0xFB 0x9D 0x3B 0x43 0xAD 0x1A 0xED
Configuration last modified by 0.0.0.0 at 3-1-93 00:55:22
Local updater ID is 0.0.0.0 (no valid interface found)
```

VTP Status of switch (SW2)

```
SW2#sho vtp status
VTP Version                     : 2
Configuration Revision          : 4
Maximum VLANs supported locally : 255
Number of existing VLANs        : 7
VTP Operating Mode              : Server
VTP Domain Name                 :
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x17 0x30 0x5A 0x93 0x6E 0xD1 0x26 0x22
Configuration last modified by 0.0.0.0 at 3-1-93 00:57:28
Local updater ID is 0.0.0.0 (no valid interface found)
```

Now we need to configure the following for VTP to work

- VTP domain name
- VTP password
- VTP operating mode
- VTP version

Configuring VTP for switch SW0

```
SW0>enable
SW0#configure terminal
SW0(config)#vtp domain axiom.edu.pk
SW0(config)#vtp password 12345
SW0(config)#vtp mode server
SW0(config)#vtp version 2
SW0(config)#do show vtp status
```

```
SW0(config)#do show vtp status
VTP Version                     : 2
Configuration Revision          : 0
Maximum VLANs supported locally : 255
Number of existing VLANs        : 7
VTP Operating Mode              : Server
VTP Domain Name                 : axiom.edu.pk
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Enabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xDA 0x29 0x13 0x63 0x0A 0x00 0xF0 0xCC
Configuration last modified by 0.0.0.0 at 3-1-93 01:04:42
Local updater ID is 0.0.0.0 (no valid interface found)
```

Configuring VTP for switch SW1

```
SW1>enable
SW1#configure terminal
SW1(config)#vtp password 12345
SW1(config)#vtp mode client
SW1(config)#vtp version 2
SW1(config)#do show vtp status
```

```
SW1(config)#do show vtp stat
VTP Version                     : 2
Configuration Revision          : 1
Maximum VLANs supported locally : 255
Number of existing VLANs        : 7
VTP Operating Mode              : Client
VTP Domain Name                 : axiom.edu.pk
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Enabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xA3 0x62 0x9E 0xDE 0xA3 0x4E 0x47 0xB1
Configuration last modified by 0.0.0.0 at 3-1-93 01:25:18
```

Configuring VTP for switch SW2

```
SW2>enable
SW2#configure terminal
SW2(config)#vtp password 12345
SW2(config)#vtp mode client
SW2(config)#vtp version 2
SW2(config)#do show vtp status
```

```
SW2(config)#do show vtp status
VTP Version                     : 2
Configuration Revision          : 1
Maximum VLANs supported locally : 255
Number of existing VLANs        : 7
VTP Operating Mode              : Client
VTP Domain Name                 : axiom.edu.pk
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Enabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xA3 0x62 0x9E 0xDE 0xA3 0x4E 0x47 0xB1
Configuration last modified by 0.0.0.0 at 3-1-93 01:25:18
```

Adding new VLAN to switch SW0 (VTP Server)

```
SW0>enable
SW0#configure terminal
SW0(config)#vlan 30
SW0(config-vlan)#name MARKETING
SW0(config-vlan)#do show vlan
```

```
SW0(config-vlan)#do show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    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
                                                Gig0/1, Gig0/2
10   MANAGEMENT                       active    Fa0/1, Fa0/2
20   ADMINISTRATION                   active    Fa0/3
30   MARKETING                        active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

Now we check the VLAN status of SW1 and SW2, we will see that newly added VLAN 30 (Marketing) in SW0 will also be present there; this is due to the VTP we have configured.

```
SW1#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/2, Fa0/3, 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, Gig0/1, Gig0/2
10   MANAGEMENT                       active
20   ADMINISTRATION                   active    Fa0/1
30   MARKETING                        active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

```
SW2#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/3, Fa0/4, 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, Gig0/1, Gig0/2
10   MANAGEMENT                       active    Fa0/1, Fa0/2
20   ADMINISTRATION                   active
30   MARKETING                        active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```