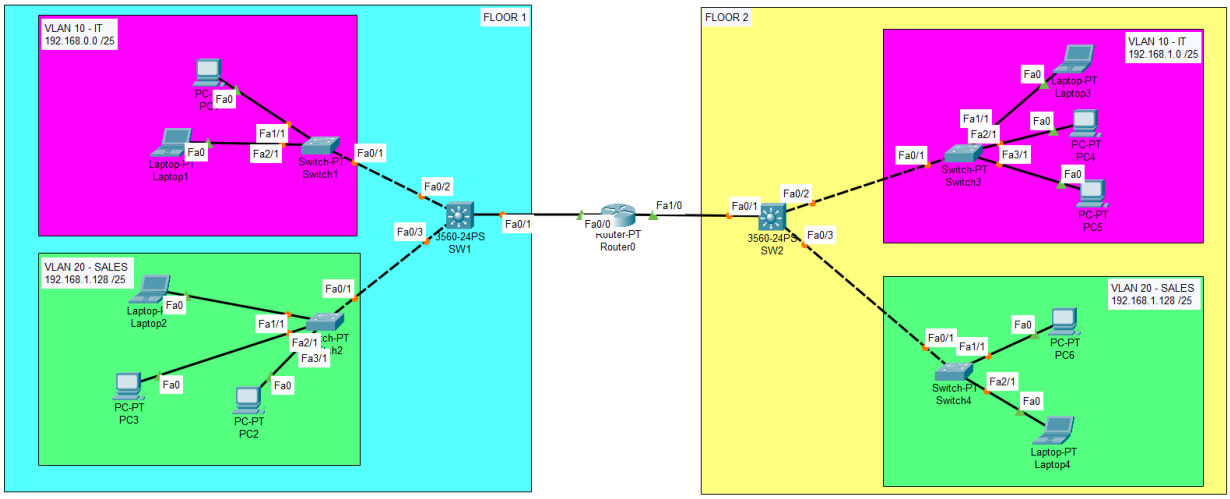
LAB2: VLAN



Details:

A network topology for a company branch with two departments and two floors

1-Create VLAN 10,20.

2-Trunking and access protocols.

3- Create VTP, ROS, DHCP.

4-Testing and pings between devices.

1-Multilayer switch configuration (sw1/sw2):

Basic configuration:

```
switch#conf t
switch(config)#hostname sw1
sw1(config)#line con 0
sw1(config-line)#logging synchronous
sw1(config-line)#no exec-timeout
sw1(config)#line vty 0 15
sw1(config-line)#logging synchronous
sw1(config-line)#no exec-timeout
sw1(config-line)#transport input all
sw1(config-line)#exit
```

Change interface to trunk and dot1Q protocol:

```
sw1(config)#int range f0/1-3
sw1(config-if-range)#switchport trunk encapsulation dot1q
sw1(config-if-range)#switchport mode trunk
sw1(config-if-range)#do show interfaces trunk

Port        Mode         Encapsulation  Status        Native vlan
Fa0/1       on           802.1q         trunking      1
Fa0/2       on           802.1q         trunking      1
Fa0/3       on           802.1q         trunking      1
```

Enable VTP adding domain/ and made mode as server:

```
sw1(config)#vtp domain admin
sw1(config)#vtp mode server
sw1(config)#do sh vtp status
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 : admin
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0010.1105.B000
Configuration last modified by 0.0.0.0 at 3-1-93 00:58:47
Local updater ID is 0.0.0.0 (no valid interface found)

Feature VLAN :
--------------
VTP Operating Mode              : Server
Maximum VLANs supported locally : 1005
Number of existing VLANs        : 7
Configuration Revision          : 0
MD5 digest                      : 0x9F 0x43 0xE9 0x0B 0xFB 0xA3 0xE3 0x11
                                  0x2F 0x46 0xBD 0xAA 0x67 0x16 0x0F 0x14
```

Adding vlan and its name:

```
sw1(config)#vlan 10
sw1(config-vlan)#name IT
sw1(config-vlan)#vlan 20
sw1(config-vlan)#name sales
sw1(config)#do sh vlan brie

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Gi0/3, Gi1/0, Gi1/1, Gi1/2
                                                Gi1/3, Gi2/0, Gi2/1, Gi2/2
                                                Gi2/3, Gi3/0, Gi3/1, Gi3/2
                                                Gi3/3
10   IT                               active
20   sales                            active
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
1005 trnet-default                    act/unsup
```

2-Switch configuration (switch1-4):

Basic configuration in all switches:

```
switch-1#conf t
switch(config)#line con 0
switch(config-line)#logging synchronous
switch(config-line)#no exec-timeout
switch(config)#line vty 0 15
switch(config-line)#logging synchronous
switch(config-line)#no exec-timeout
switch(config-line)#transport input all
switch(config-line)#exit
```

Change VTP mode to client in all switches:

```
switch(config)#vtp mode client
switch(config)#do sh vtp status
VTP Version                     : 1
Configuration Revision          : 0
Maximum VLANs supported locally : 255
Number of existing VLANs        : 7
VTP Operating Mode              : Client
VTP Domain Name                 : admin
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x9F 0x43 0xE9 0x0B 0xFB 0xA3 0xE3 0x11
Configuration last modified by 0.0.0.0 at 3-1-93 00:58:47
```

Change interfaces that connect to multilayer switch to trunk in all switches:

```
Switch(config)#int f0/1
Switch(config-if)#no shutdown
Switch(config-if)#switchport mode trunk
```

Assign VLAN to interfaces and change mode to access in switch1 and switch4:

```
switch(config)#int range f1/1 ,f2/1
switch(config-if)#switchport mode access
switch(config-if)#switchport access vlan 10
switch(config-if)exit
switch(config)#do sh vlan brie
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa3/1, Fa4/1, Fa5/1
10   IT                               active    Fa1/1, Fa2/1
20   SALES                            active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

Assign VLAN to interfaces and change mode to access in switc2 and switch3:

```
switch(config)#int range f1/1 ,f2/1 ,f3/1
switch(config-if)#switchport mode access
switch(config-if)#switchport access vlan 10
switch(config-if)exit
switch(config)#do sh vlan brie
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa4/1, Fa5/1
10   IT                               active
20   SALES                            active    Fa1/1, Fa2/1, Fa3/1
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

1-Router configuration:

Basic configuration in all switches:

```
Router#conf t
Router(config)#hostname R1
R1(config)#line con 0
R1(config-line)#logging synchronous
R1(config-line)#no exec-timeout
R1(config)#line vty 0 15
R1(config-line)#logging synchronous
R1(config-line)#no exec-timeout
R1(config-line)#transport input all
```

Adding sub-interfaces for VLANS in left:

```
R1(config-line)#int f0/0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#int f0/0.10
R1(config-subif)#encapsulation dot1Q 10
R1(config-subif)#ip address 192.168.0.1 255.255.255.128
R1(config-subif)#int f0/0.20
R1(config-subif)#encapsulation dot1Q 20
R1(config-subif)#ip address 192.168.0.129 255.255.255.128
R1(config-subif)#exit
```

Adding sub-interfaces for VLANS in right:

```
R1(config)#int f1/0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#int f1/0.10
R1(config-subif)#encapsulation dot1Q 10
R1(config-subif)#ip address 192.168.1.1 255.255.255.128
R1(config-subif)#int f1/0.20
R1(config-subif)#encapsulation dot1Q 20
R1(config-subif)#ip address 192.168.1.129 255.255.255.128
R1(config-subif)#exit

R1(config)#do sh ip int brie
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        unassigned      YES unset  up                    up
FastEthernet0/0.10     192.168.0.1     YES manual up                    up
FastEthernet0/0.20     192.168.0.129   YES manual up                    up
FastEthernet1/0        unassigned      YES unset  up                    up
FastEthernet1/0.10     192.168.1.1     YES manual up                    up
FastEthernet1/0.20     192.168.1.129   YES manual up                    up
Serial2/0              unassigned      YES unset  administratively down down
Serial3/0              unassigned      YES unset  administratively down down
FastEthernet4/0        unassigned      YES unset  administratively down down
FastEthernet5/0        unassigned      YES unset  administratively down down
```

Making DHCP for left devices:

```
R1(config)#ip dhcp pool LEFT-IT
R1(dhcp-config)#network 192.168.0.0 /25
R1(dhcp-config)#default-router 192.168.0.1
R1(dhcp-config)#dns-server 8.8.8.8
R1(dhcp-config)#ip dhcp pool LEFT-sales
R1(dhcp-config)#network 192.168.0.128 /25
R1(dhcp-config)#default-router 192.168.0.129
R1(dhcp-config)##dns-server 8.8.8.8
```

Making DHCP for right devices:

```
R1(dhcp-config)#ip dhcp pool RIGHT-IT
R1(dhcp-config)#network 192.168.1.0 /25
R1(dhcp-config)#default-router 192.168.1.1
R1(dhcp-config)#dns-server 8.8.8.8
R1(dhcp-config)#ip dhcp pool RIGHT-sales
R1(dhcp-config)#network 192.168.1.128 /25
R1(dhcp-config)#default-router 192.168.1.129
R1(dhcp-config)##dns-server 8.8.8.8
```

Exclude some IPs from the pool:

```
R1(config)#ip dhcp excluded-address 192.168.0.0 192.168.0.10
R1(config)#ip dhcp excluded-address 192.168.0.128 192.168.0.138
R1(config)#ip dhcp excluded-address 192.168.1.0 192.168.1.10
R1(config)#ip dhcp excluded-address 192.168.1.128 192.168.1.138
```

Ping from pc1 to laptop1 (the same VLAN on the same network):

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.11

Pinging 192.168.0.11 with 32 bytes of data:

Reply from 192.168.0.11: bytes=32 time<1ms TTL=128
Reply from 192.168.0.11: bytes=32 time<1ms TTL=128
Reply from 192.168.0.11: bytes=32 time<1ms TTL=128
Reply from 192.168.0.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping from pc1 to pc3 (different VLAN):

```
C:\>ping 192.168.0.141

Pinging 192.168.0.141 with 32 bytes of data:

Request timed out.
Reply from 192.168.0.141: bytes=32 time<1ms TTL=127
Reply from 192.168.0.141: bytes=32 time<1ms TTL=127
Reply from 192.168.0.141: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.0.141:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping from laptop2 to pc6 (the same VLAN on different network):

```
C:\>ping 192.168.1.139

Pinging 192.168.1.139 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.139: bytes=32 time<1ms TTL=127
Reply from 192.168.1.139: bytes=32 time<1ms TTL=127
Reply from 192.168.1.139: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.1.139:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping from laptop2 to laptop3 (different VLAN):

```
C:\>ping 192.168.1.13

Pinging 192.168.1.13 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.13: bytes=32 time<1ms TTL=127
Reply from 192.168.1.13: bytes=32 time<1ms TTL=127
Reply from 192.168.1.13: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.1.13:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```