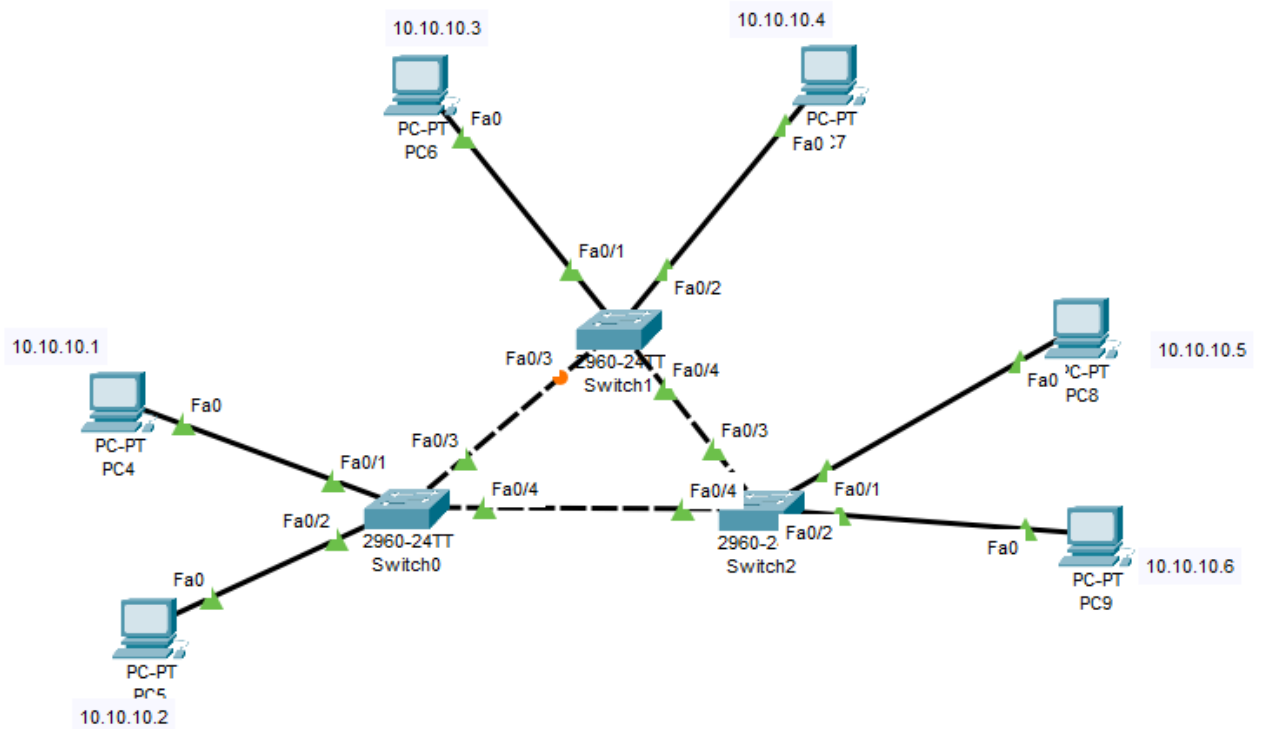


1a)Implement spanning tree protocol:

Step 1:



Step 2:

Switch 0:

```
Switch#sh spanning-tree
VLAN0001
Spanning tree enabled protocol ieee
Root ID Priority 32769
Address 0002.1670.8C10
Cost 19
Port 4(FastEthernet0/4)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
Address 0010.1125.6107
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
```

Interface Role Sts Cost Prio.Nbr Type

```
-----
Fa0/2 Desg FWD 19 128.2 P2p
Fa0/3 Desg FWD 19 128.3 P2p
Fa0/4 Root FWD 19 128.4 P2p
Fa0/1 Desg FWD 19 128.1 P2p
```

Switch 1:

```
witch>sh spanning-tree
VLAN0001
Spanning tree enabled protocol ieee
Root ID Priority 32769
Address 0002.1670.8C10
Cost 19
Port 4(FastEthernet0/4)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
Address 00D0.BA4E.6583
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
```

Interface Role Sts Cost Prio.Nbr Type

```
-----
Fa0/3 Altn BLK 19 128.3 P2p
Fa0/1 Desg FWD 19 128.1 P2p
Fa0/2 Desg FWD 19 128.2 P2p
Fa0/4 Root FWD 19 128.4 P2p
```

Switch 2:

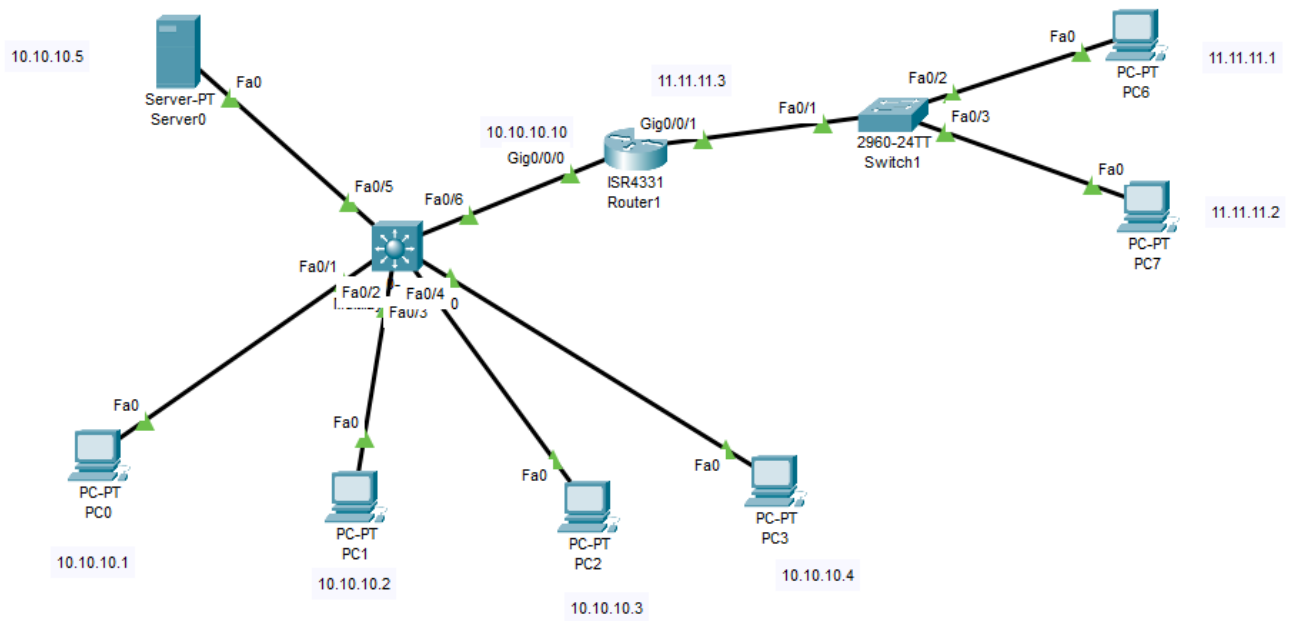
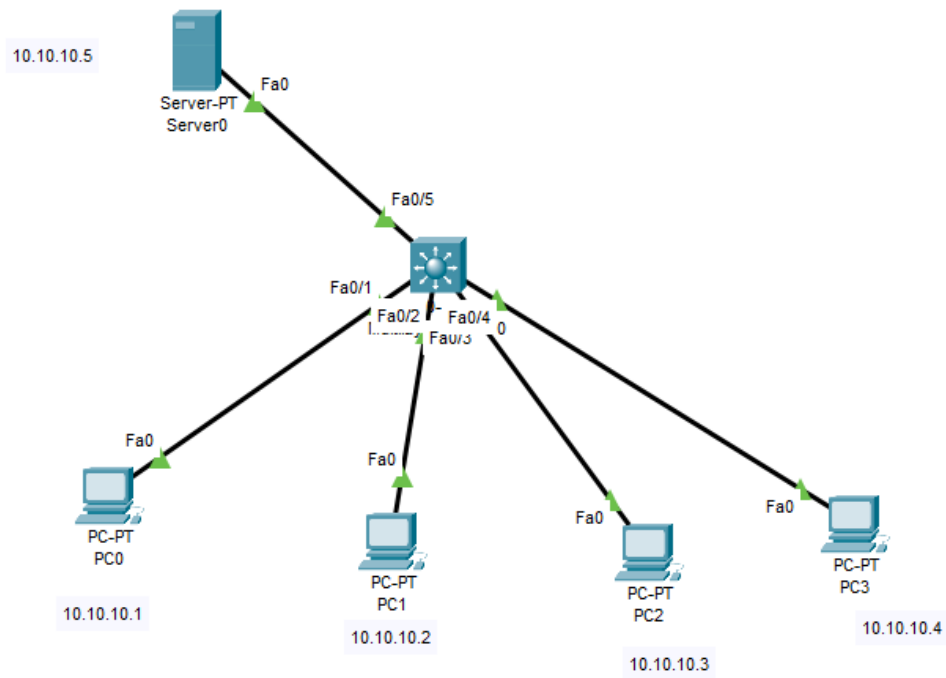
```
Switch>sh spanning-tree
VLAN0001
Spanning tree enabled protocol ieee
Root ID Priority 32769
Address 0002.1670.8C10
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
Address 0002.1670.8C10
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
```

Interface Role Sts Cost Prio.Nbr Type

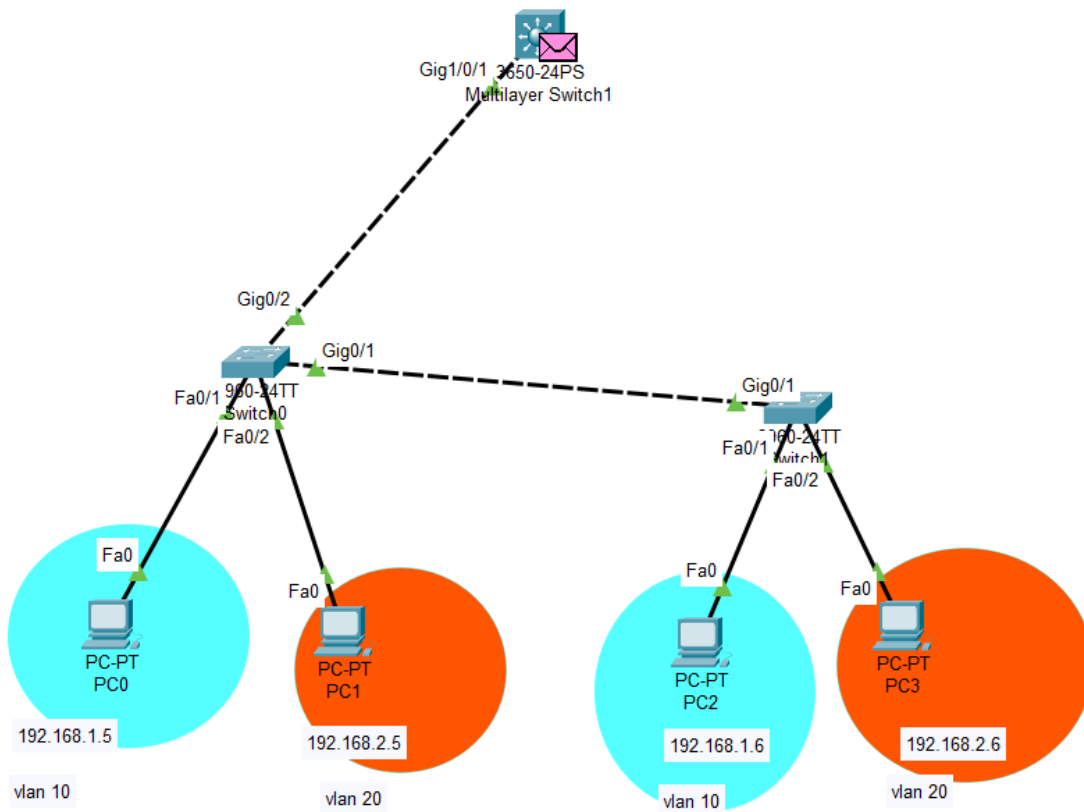
```
-----
Fa0/2 Desg FWD 19 128.2 P2p
Fa0/1 Desg FWD 19 128.1 P2p
Fa0/3 Desg FWD 19 128.3 P2p
Fa0/4 Desg FWD 19 128.4 P2p
```

1b) Set up a network with Multi layer switch



1c) Inter vlan communication using multi layer switch

Step 1 design the topology



Step 2:

Do the vlan configuration

Switch 0:

```
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name p1
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name p2
Switch(config-vlan)#exit
Switch(config)#int fa 0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa 0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#
```

Switch 1:

```
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name p1
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name p2
Switch(config-vlan)#exit
Switch(config)#int fa 0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa 0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#
```

Step 3:

Trunking two switch :

Switch 0:

```
Switch(config)#int gig 0/1
Switch(config-if)#switchport mode trunk
```

```
Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state
to down
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state
to up
```

```
Switch(config-if)#exit
```

Switch 1:

```
Switch(config)#int gig 0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
```

Step :4

Connect the multi layer switch

```
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name p1
Switch(config-vlan)#exit
```

```
Switch(config)#vlan 20
Switch(config-vlan)#name p2
Switch(config-vlan)#exit
Switch(config)#int vlan 10
Switch(config-if)#ip address 192.168.1.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#int vlan 20
Switch(config-if)#ip address 192.168.2.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#int gig 1/0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#end
Switch#sh ip route
Default gateway is not set
```

Host Gateway Last Use Total Uses Interface
ICMP redirect cache is empty

```
Switch(config)#ip routing
Switch#wri mem
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
Switch#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

Gateway of last resort is not set

```
C 192.168.1.0/24 is directly connected, Vlan10
C 192.168.2.0/24 is directly connected, Vlan20
```

Gateway is not set so set gateway al last