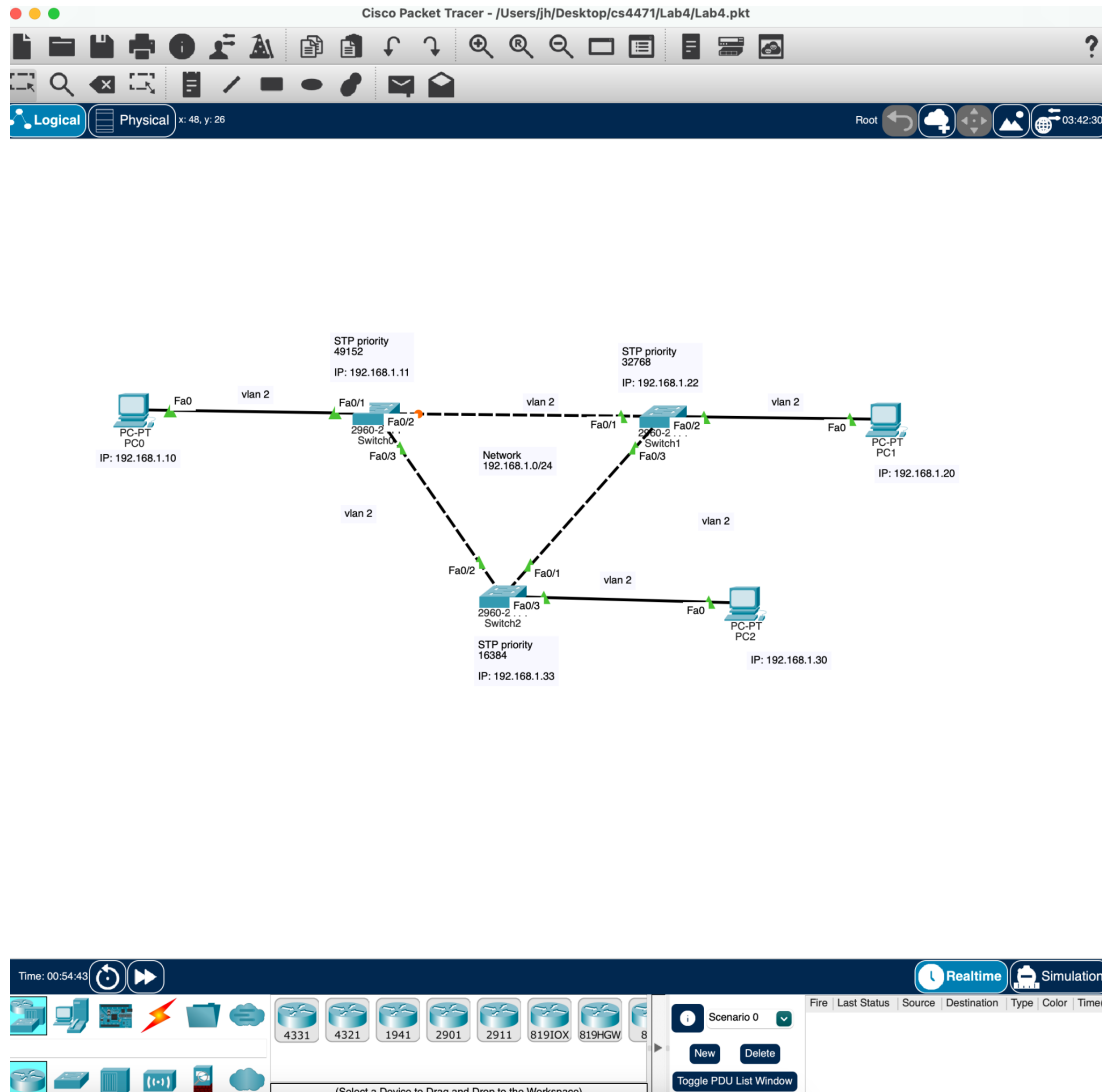


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CS 4771-01
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Lab 4 - Spanning Tree Protocol

1. (1 pt) Submit screenshot of Cisco Packet Tracer network diagram created. Make sure that the port labels are shown (Options->Preferences->Show Port Labels)



2. Submit output of “show running-config” of each switch.

a. (1 pt) Highlight the Cisco command(s) used to configure each connected switch port to be in vlan 2.

b. (1 pt) Highlight the Cisco command(s) used to configure the ip address of the switches to be in vlan 2.

c. (1 pt) Highlight the Cisco command(s) used to configure the spanning-tree priority for vlan 2 of each switch

Switch0

Switch#show running-config

Building configuration...

Current configuration : 1215 bytes

!

version 15.0

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Switch

!

!

!

!

!

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

switchport access vlan 2

!

interface FastEthernet0/2

switchport access vlan 2

!

interface FastEthernet0/3

switchport access vlan 2

!

interface FastEthernet0/4

!

interface FastEthernet0/5

!

interface FastEthernet0/6

!

interface FastEthernet0/7

```
!  
interface FastEthernet0/8  
!  
interface FastEthernet0/9  
!  
interface FastEthernet0/10  
!  
interface FastEthernet0/11  
!  
interface FastEthernet0/12  
!  
interface FastEthernet0/13  
!  
interface FastEthernet0/14  
!  
interface FastEthernet0/15  
!  
interface FastEthernet0/16  
!  
interface FastEthernet0/17  
!  
interface FastEthernet0/18  
!  
interface FastEthernet0/19  
!  
interface FastEthernet0/20  
!  
interface FastEthernet0/21  
!  
interface FastEthernet0/22  
!  
interface FastEthernet0/23  
!  
interface FastEthernet0/24  
!  
interface GigabitEthernet0/1  
!  
interface GigabitEthernet0/2  
!  
interface Vlan1
```

```
no ip address
shutdown
!
interface Vlan2
ip address 192.168.1.11 255.255.255.0
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
!
end
```

Switch1

```
Switch>en
Switch#show running-config
Building configuration...

Current configuration : 1215 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
!
!
```

```
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport access vlan 2
!
interface FastEthernet0/2
switchport access vlan 2
!
interface FastEthernet0/3
switchport access vlan 2
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
```

```
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
interface Vlan2
ip address 192.168.1.22 255.255.255.0
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
!
end
```

Switch2

Switch>en

Switch#

Switch#show running-config

Building configuration...

Current configuration : 1215 bytes

!

version 15.0

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Switch

!

!

!

!

!

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

switchport access vlan 2

!

interface FastEthernet0/2

switchport access vlan 2

!

interface FastEthernet0/3

switchport access vlan 2

!

interface FastEthernet0/4

!

interface FastEthernet0/5

!

interface FastEthernet0/6

!

interface FastEthernet0/7

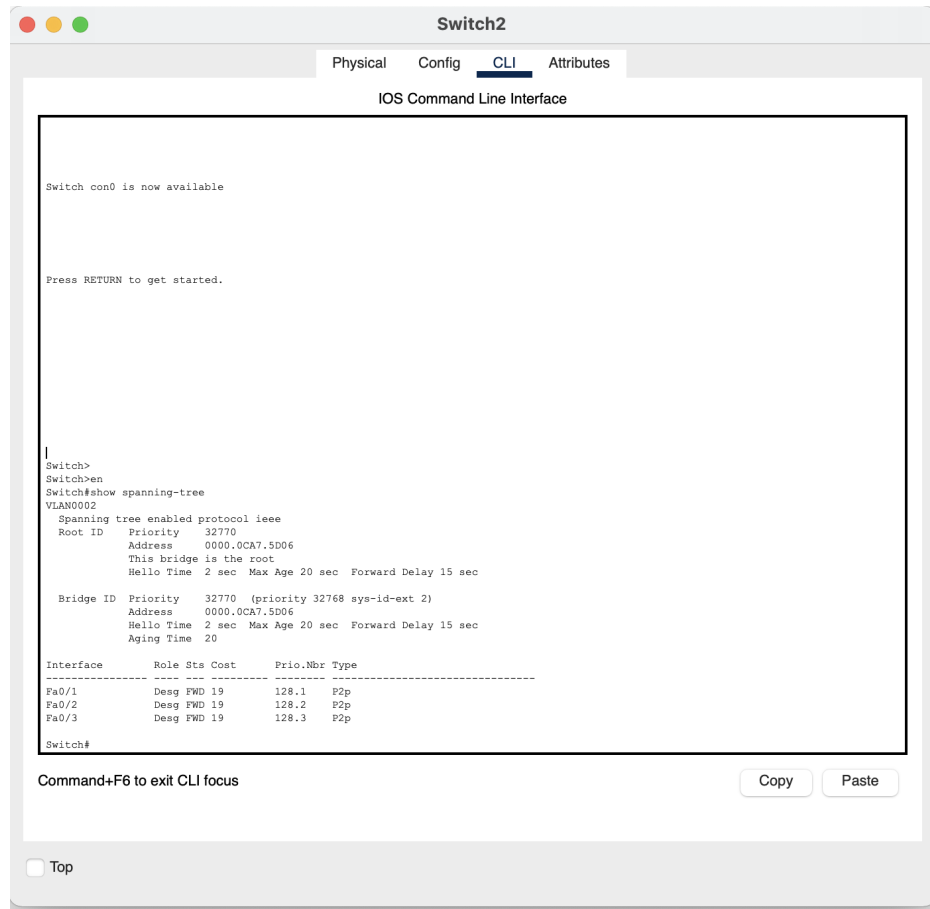
!

```
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
```



```
shutdown
!  
interface Vlan2  
ip address 192.168.1.33 255.255.255.0  
!  
!  
!  
!  
line con 0  
!  
line vty 0 4  
login  
line vty 5 15  
login  
!  
!  
!  
!  
end
```

3. (1pt) Which switch is the root bridge? Support your answer with an appropriate screenshot of “show spanning-tree” executed on the root bridge.



The screenshot shows the CLI of Switch2. The output of the 'show spanning-tree' command is as follows:

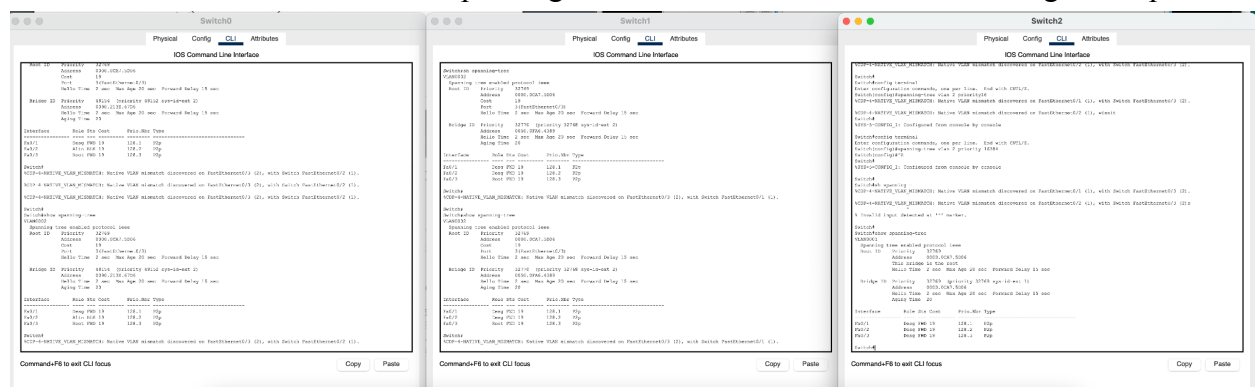
```
Switch2>
Switch2#show spanning-tree
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID    Priority    32770
             Address     0000.0CA7.5D06
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32770  (priority 32768 sys-id-ext 2)
             Address     0000.0CA7.5D06
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface    Role Sts Cost      Prio.Nbr Type
-----
Fa0/1        Desg FWD 19      128.1   P2p
Fa0/2        Desg FWD 19      128.2   P2p
Fa0/3        Desg FWD 19      128.3   P2p
```

Switch2 is the root bridge after running the command show spanning-tree.

4. (1pt) Which switch ports will become a Spanning-Tree Protocol root port? Support your answer with screenshots of “show spanning-tree” executed on switches containing a root port



The three screenshots show the 'show spanning-tree' output for Switch0, Switch1, and Switch2. In all three, the root bridge is 0000.0CA7.5D06 (Switch2). The root ports are Fa0/3 on Switch0 and Switch1.

Switch0:

```
Switch0>show spanning-tree
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID    Priority    32770
             Address     0000.0CA7.5D06
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32770  (priority 32768 sys-id-ext 2)
             Address     0000.0CA7.5D06
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface    Role Sts Cost      Prio.Nbr Type
-----
Fa0/1        Desg FWD 19      128.1   P2p
Fa0/2        Desg FWD 19      128.2   P2p
Fa0/3        Root P2P 19      128.3   P2p
```

Switch1:

```
Switch1>show spanning-tree
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID    Priority    32770
             Address     0000.0CA7.5D06
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32770  (priority 32768 sys-id-ext 2)
             Address     0000.0CA7.5D06
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface    Role Sts Cost      Prio.Nbr Type
-----
Fa0/1        Desg FWD 19      128.1   P2p
Fa0/2        Desg FWD 19      128.2   P2p
Fa0/3        Root P2P 19      128.3   P2p
```

Switch2:

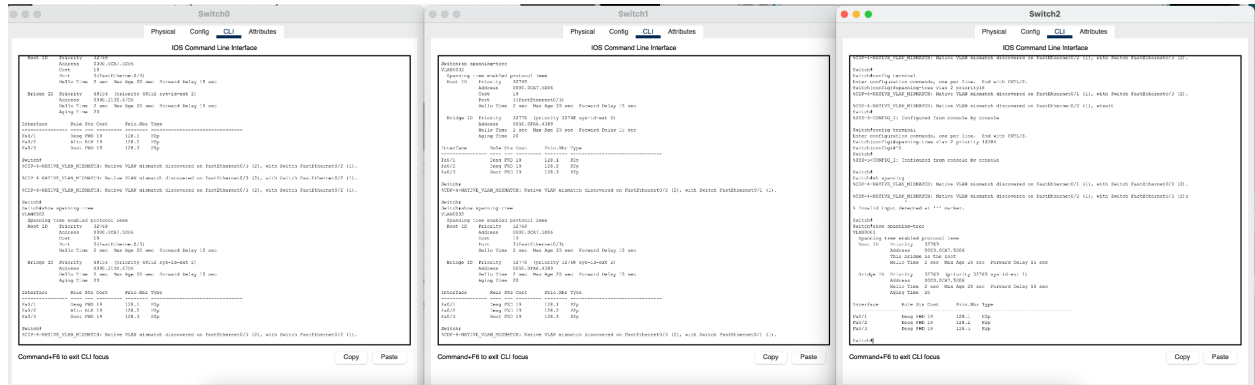
```
Switch2>show spanning-tree
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID    Priority    32770
             Address     0000.0CA7.5D06
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32770  (priority 32768 sys-id-ext 2)
             Address     0000.0CA7.5D06
             Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface    Role Sts Cost      Prio.Nbr Type
-----
Fa0/1        Desg FWD 19      128.1   P2p
Fa0/2        Desg FWD 19      128.2   P2p
Fa0/3        Desg FWD 19      128.3   P2p
```

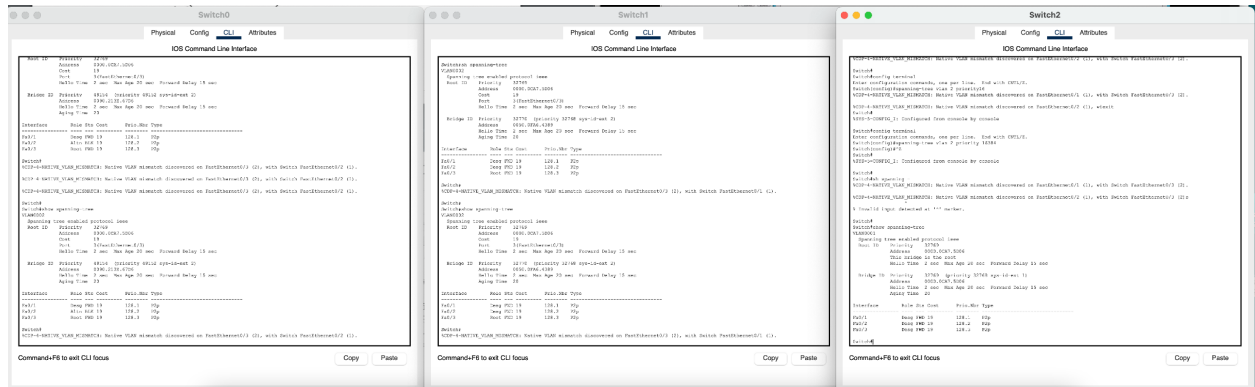
The switches ports that become a Spanning-Tree Protocol root port is Fa0/3 on both **switch0** and **switch1**. Where as **switch2** does not have any because of the switch being the root bridge.

5. (1pt) Which switch port(s) on each switch will Spanning-Tree Protocol place into forwarding state? Support your answer with screenshots.



The switch ports on each switch Spanning-Tree Protocol that is placed forward is on
Switch0 ports - Fa0/1 and Fa0/3
Switch1 ports - Fa0/1, Fa0/2, and Fa0/3
Switch2 ports - Fa0/1, Fa0/2, and Fa0/3

6. (1pt) Which switch port(s) on which switch will Spanning-Tree Protocol place into blocking state? Support your answer with a screenshot of “show spanning-tree” executed on switch with blocked port.



There is only one switch port that is in the blocked state and that is Switch0 port number Fa0/2

7. (1pt) If PC1 were to send ICMP ping packets to PC2, which network links will the packets traverse?
The shortest route for the ICMP ping packets to be sent from PC1 to PC2 it will go directly from PC1 to Switch1 then pingping Switch2 and from there the packet will reach its destination to PC2. If it were to be PC0 to ping PC1, the ping can't take the shortest route because the port Fa0/2 on Switch0 has a blocked status. The ping will have to go all the way around from PC0 to Switch0 to Switch2 and then to Switch1 and then pingping its final destination PC1

8. (1pt) On the switch that has a STP blocked port, what will spanning tree protocol do to this port if you were to administratively “shutdown” the interface of this switch’s original STP root port?

Switch0 and Switch1 are no longer connected due to a mismatch Vlans. Switch1 then changes Fa0/1 port state to down. Even though these two switches are not connected anymore PC0 can still ping all 5 devices.