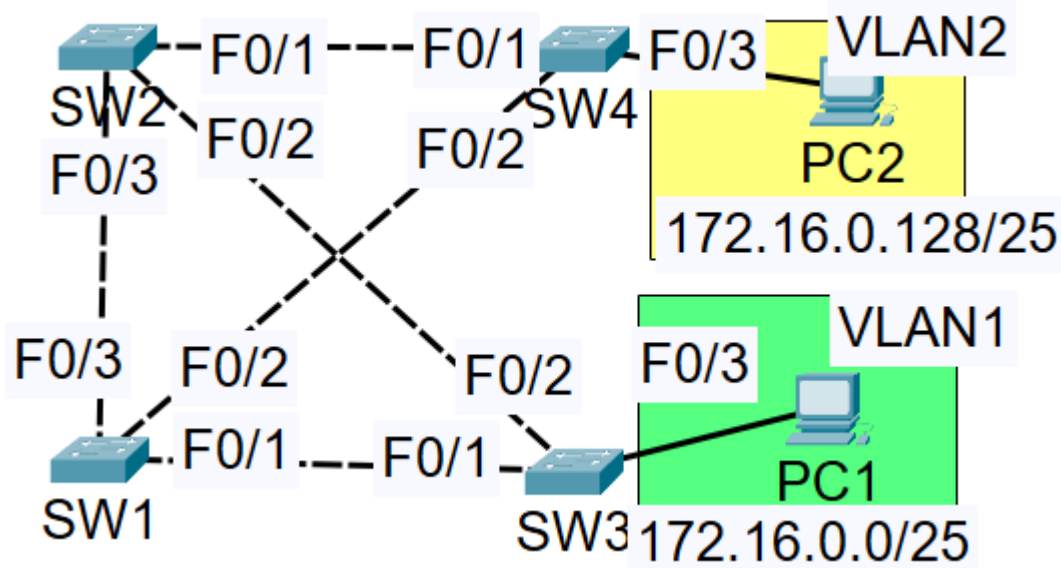Network Topology:

>Finding the root bridge:

#show spanning-tree

When the root and bridge IDs (First check for the priority and then the MAC address) are different, the current switch is not the root bridge

SW2 is the root bridge, since Bridge ID = Root ID and all the ports are Designated

>Configuring specified ports as primary and secondary roots for VLANs:

SW1: Global config mode

(config)#spanning-tree vlan 1 root primary

(config)#spanning-tree vlan 2 root secondary

>Checking now

#do sh spanning-tree

For VLAN0001 – SW1 is the root bridge (same root and bridge IDs), SW2 is not the root bridge (different root and bridge IDs)

For VLAN0002 – SW2 is the root bridge (same root and bridge IDs), SW1 is not the root bridge (different root and bridge IDs)

>Upon changing the root cost of the F0/2 interface of SW4 for VLAN1 to 200 – Now, its F0/1 interface becomes the root port for VLAN1 (since, lower cost = 19+19 = 38<200)

CLI:

(config-if)#spanning-tree vlan 1 cost 200

>Changing the port priority of SW1 F0/1 for VLAN 1 to 240

(config-if)#spanning-tree vlan 1 port-priority 240

But on SW3, its F0/1 is still the root port

Since the port priority is supposed to be the last tie breaker, and its root cost is obviously lesser than F0/2 for SW3

>On SW3's F0/3 interface, enable portfast and bpduguard – since the interface is connected with the end host and not any switch.

Therefore, no chance of layer 2 loops

(config-if)#spanning-tree portfast

(config-if)#spanning-tree bpduguard enable

>Replace the PC connected with SW3 F0/3 with a switch

CLI shows –

%SPANTREE-2-BLOCK_BPDUGUARD: Received BPDU on port FastEthernet0/3 with BPDU Guard enabled. Disabling port.

%PM-4-ERR_DISABLE: bpduguard error detected on 0/3, putting 0/3 in err-disable state

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to administratively down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down

The BPDU guard disables the port on receiving a BPDU from a new switch and goes into err-disable mode.

>I disconnected the new switch from SW3 and connected the PC again, but the int F0/3 of SW3 is still in err-disable mode, checked using:

(config-if)#do sh int status

Solution – On the F0/3 interface of SW3, after reconnecting PC, do:

(config-if)#shutdown

(config-if)#no shutdown

Recheck:

#do sh int status

Now, the F0/3 status is "connected"