Lab Report

Course: Computer Networks (CN)
Lab: 3
Student: 23BCP182

Aim

To investigate and configure the Spanning Tree Protocol (STP) in a switched network environment with multiple VLANs.

Theory

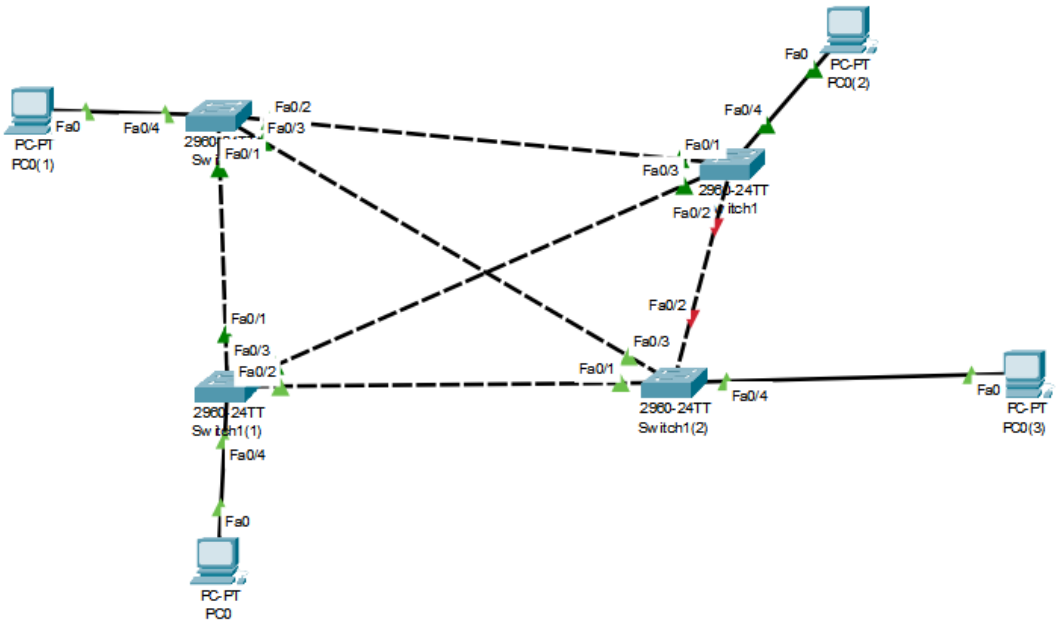
The Spanning Tree Protocol (STP) prevents loops in switched networks by electing a root bridge and disabling redundant paths. Cisco's PVST+ (Per-VLAN Spanning Tree Plus) allows a separate STP instance per VLAN, enabling load balancing and traffic optimization.

Procedure

1. Study the concept and configuration steps.
2. Implement the setup using Cisco Packet Tracer or commands.
3. Observe the behavior of the network.
4. Record results and verify communication.

Result

Experiment 3 was successfully performed and verified.



IOS Command Line Interface

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

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up

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


Switch>
Switch>
Switch>en
Switch#show sp
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID     Priority    32769
              Address     0007.EC8E.CD34
              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     0007.EC8E.CD34
              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
Fa0/4            Desg FWD 19        128.4    P2p
Fa0/5            Desg FWD 19        128.5    P2p
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/3            Desg FWD 19        128.3    P2p

Switch#
```

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Conclusion

This experiment demonstrated how STP prevents loops and how administratively configuring the root bridge ensures efficient use of high-speed links, improving performance while maintaining redundancy.