CMPE – 206 LAB REPORT

LAB 1.1 BASICS

Topology:

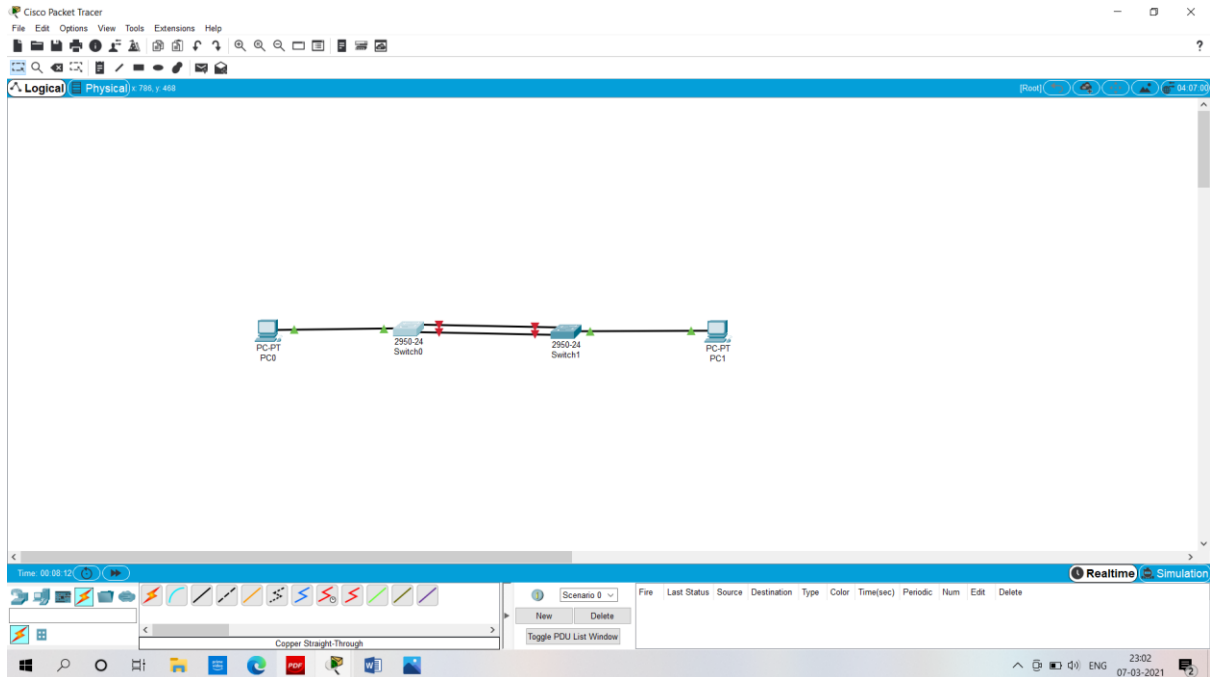
TASK 1 – Connect to a switch

```
debug      Debugging functions (see also 'undebug')
delete     Delete a file
dir        List files on a filesystem
disable    Turn off privileged commands
disconnect Disconnect an existing network connection
enable     Turn on privileged commands
erase      Erase a filesystem
exit       Exit from the EXEC
logout     Exit from the EXEC
more       Display the contents of a file
no         Disable debugging informations
ping       Send echo messages
reload     Halt and perform a cold restart
resume     Resume an active network connection
setup      Run the SETUP command facility
show       Show running system information

Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
Switch(config)#?
Configure commands:
  access-list        Add an access list entry
  banner             Define a login banner
  boot               Boot Commands
  cdp                Global CDP configuration subcommands
  clock              Configure time-of-day clock
  crypto             Encryption module
  default            Set a command to its defaults
  do                 To run exec commands in config mode
  enable             Modify enable password parameters
  end                Exit from configure mode
  exit               Exit from configure mode
  hostname           Set system's network name
  interface          Select an interface to configure
  ip                 Global IP configuration subcommands
  line               Configure a terminal line
  lldp               Global LLDP configuration subcommands
  logging            Modify message logging facilities
  mac                MAC configuration
  mac-address-table  Configure the MAC address table
  monitor            SPAN information and configuration
  no                 Negate a command or set its defaults

Switch1(config)#hostname Switch1
Switch1(config)#
Switch1(config)#end
Switch1#
%SYS-5-CONFIG_I: Configured from console by console

Switch1#disable
Switch1>
```

TASK 2 - Configure basic security


```
Cisco Internetwork Operating System Software
IOS (tm) C2950 Software (C2950-I6Q4L2-M), Version 12.1(22)EA4, RELEASE SOFTWARE(fc1)
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 18-May-05 22:31 by jharirba

Cisco WS-C2950-24 (RC32300) processor (revision C0) with 21039K bytes of memory.
Processor board ID FHK0610Z0WC
Running Standard Image
24 FastEthernet/IEEE 802.3 interface(s)

63488K bytes of flash-simulated non-volatile configuration memory.
Base ethernet MAC Address: 0002.4AC4.38D1
Motherboard assembly number: 73-5781-09
Power supply part number: 34-0965-01
Motherboard serial number: FOC06100452
Power supply serial number: DAB0609127D
Model revision number: C0
Motherboard revision number: A0
Model number: WS-C2950-24
System serial number: FHK0610Z0WC

Cisco Internetwork Operating System Software
IOS (tm) C2950 Software (C2950-I6Q4L2-M), Version 12.1(22)EA4, RELEASE SOFTWARE(fc1)
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 18-May-05 22:31 by jharirba

Press RETURN to get started!


%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up


Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#enable password CMPE-206X
Switch(config)#enable secret cisco
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
disable
Switch>enable
Password:
Password:
Password:
% Bad secrets

Switch>enable
Password:
Switch#
```

LAB 1.2 VLAN

Topology:

CLI Commands:

LAB 1.3 STP

Introduction:

Spanning Tree Protocol is a communication protocol that operates in data link layer to prevent bridge loops. It creates a free topology for Ethernet networks. When a message is sent in a given network it will have multiple path which may flood the network that leads to bridge looping forever. STP creates a network disabling all links that form a loop and a single path for the message to travel. To construct a spanning tree, they execute an algorithm for finding out the minimal tree in the network. If the link fails algorithm is executed again without the failed link.

Advantages:

- Simplification of bridging logic – avoids bridging problem when many computers use LAN at the same time.
- Prevention of loops – When there are multiple network it uses single active path to avoid loops.
- Preventing connection problems – Has various backups that become active when the main connection experiences technical hiccups.
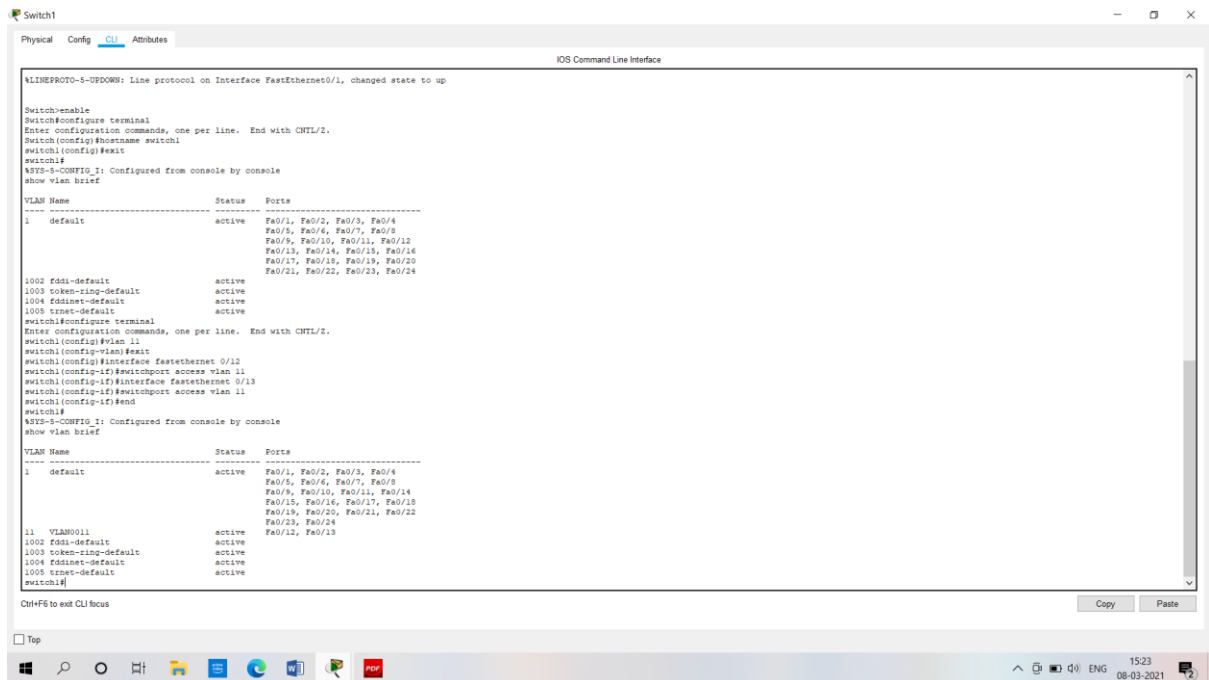
Disadvantages:

- All the traffic will flow along a single path that has been defined bt STP.It means blocking alternative, and sometimes more direct path.
- The full network capacity can never be realized.
- Time consuming.

Topology:
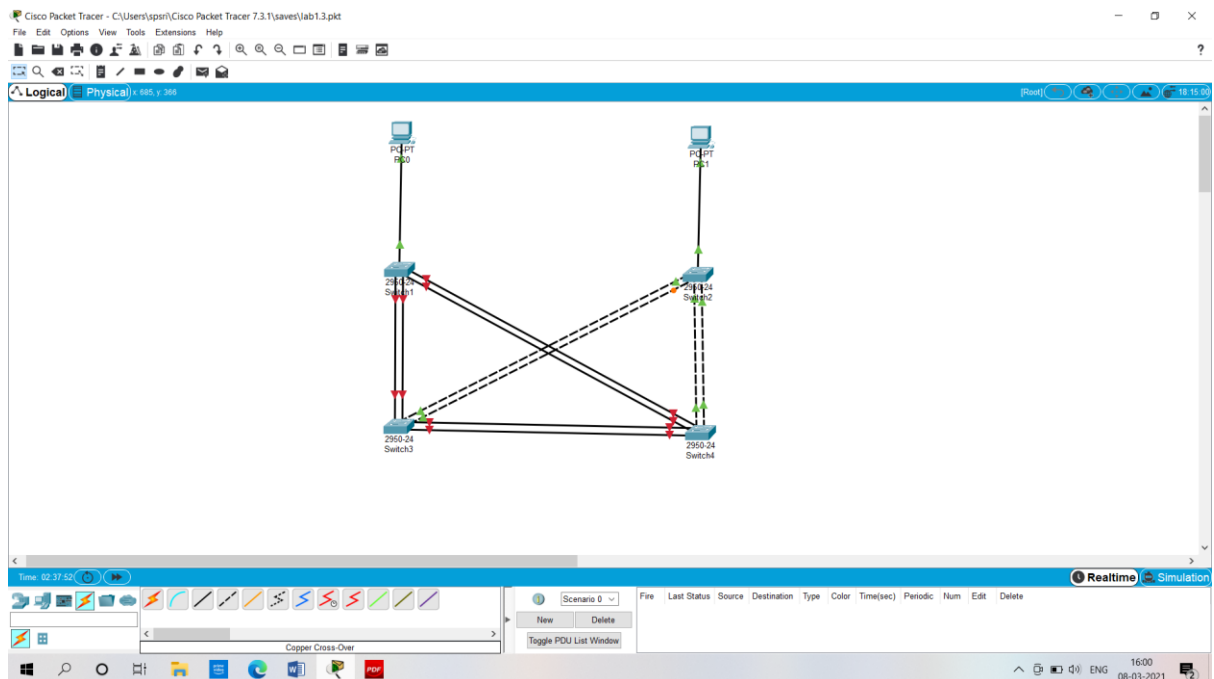
Switch1:


```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up


Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname switch1
switch1(config)#exit
switch1#
%SYS-5-CONFIG_I: Configured from console by console
show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
switch1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch1(config)#vlan 11
switch1(config-vlan)#exit
switch1(config)#interface fastethernet 0/12
switch1(config-if)#switchport access vlan 11
switch1(config-if)#interface fastethernet 0/13
switch1(config-if)#switchport access vlan 11
switch1(config-if)#end
switch1#
%SYS-5-CONFIG_I: Configured from console by console
show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                Fa0/9, Fa0/10, Fa0/11, Fa0/14
                                                Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                                Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                Fa0/23, Fa0/24
11   VLAN0011                         active    Fa0/12, Fa0/13
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
switch1#
```
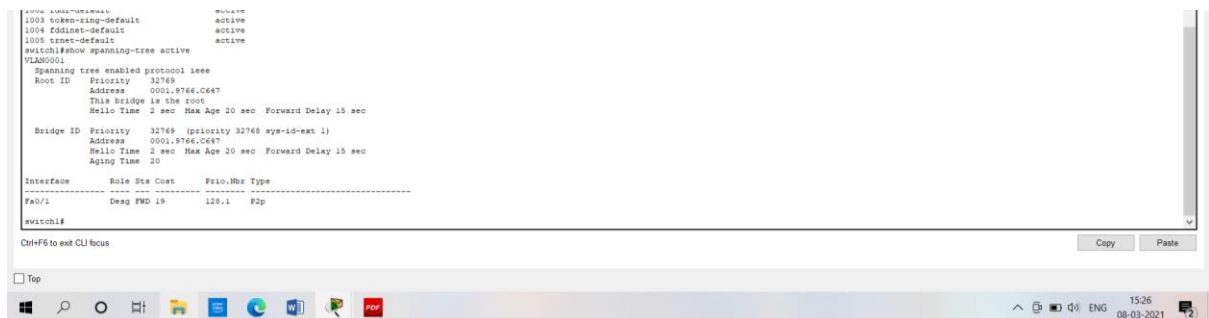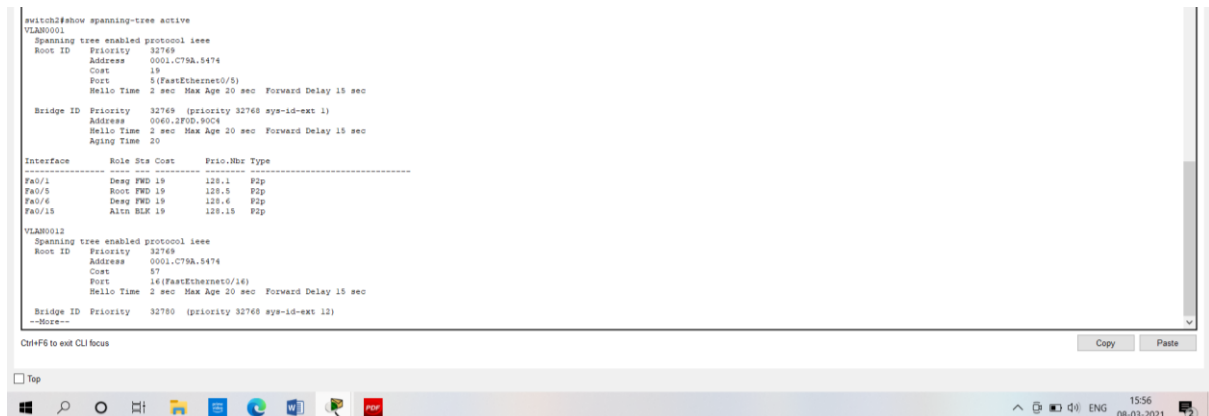
STP active:


```
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
switch1#show spanning-tree active
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     0001.9766.C647
             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     0001.9766.C647
             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
switch1#
```
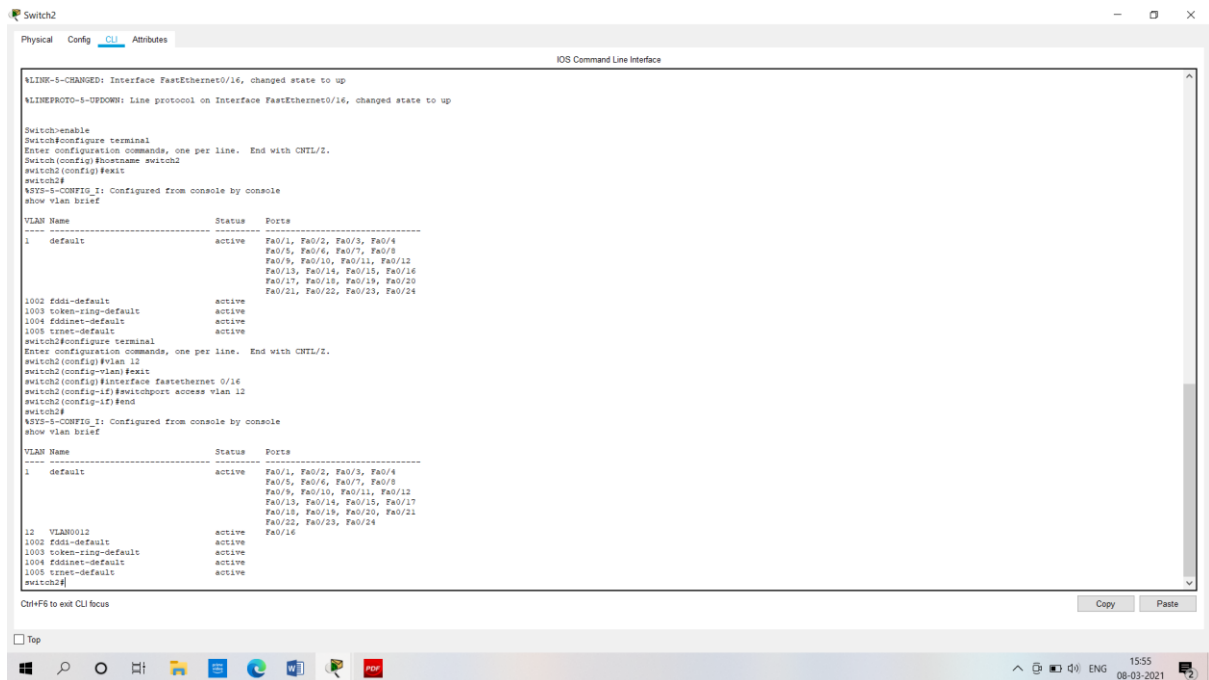
Switch 2:


```
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/16, changed state to up

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname switch2
switch2(config)#exit
switch2#
%SYS-5-CONFIG_I: Configured from console by console
show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
switch2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch2(config)#vlan 12
switch2(config-vlan)#exit
switch2(config)#interface fastethernet 0/16
switch2(config-if)#switchport access vlan 12
switch2(config-if)#end
switch2#
%SYS-5-CONFIG_I: Configured from console by console
show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                Fa0/13, Fa0/14, Fa0/15, Fa0/17
                                                Fa0/18, Fa0/19, Fa0/20, Fa0/21
                                                Fa0/22, Fa0/23, Fa0/24
12   VLAN0012                         active    Fa0/16
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
switch2#
```
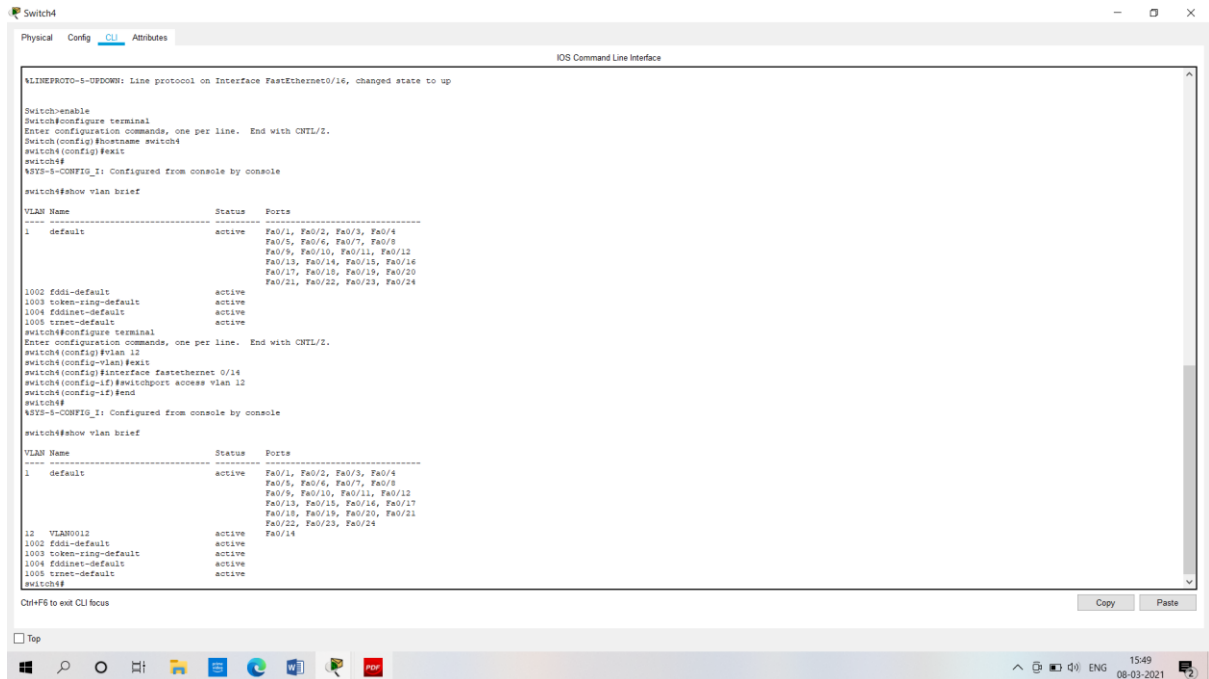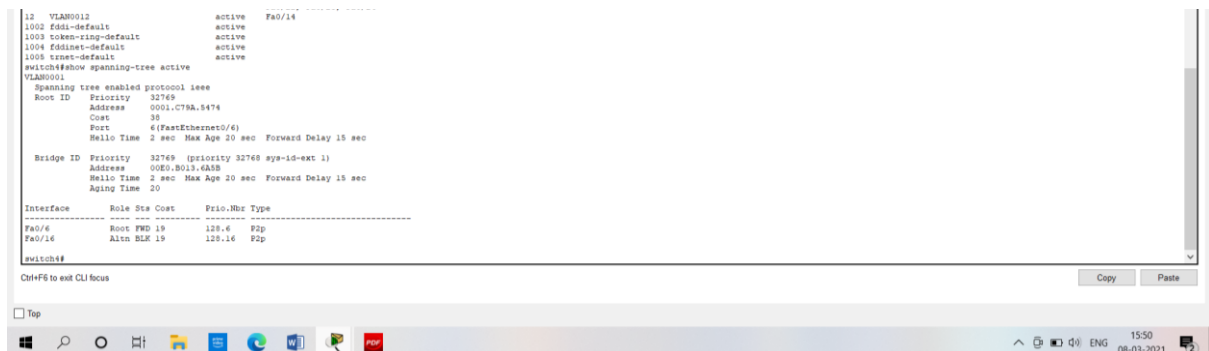
STP active:


```
switch2#show spanning-tree active
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     0001.C79A.5474
             Cost        19
             Port        5(FastEthernet0/5)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
             Address     0060.2F0D.90C4
             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
Fa0/5            Root FWD 19        128.5    P2p
Fa0/6            Desg FWD 19        128.6    P2p
Fa0/15           Altn BLK 19        128.15   P2p

VLAN0012
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     0001.C79A.5474
             Cost        57
             Port        16(FastEthernet0/16)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32780  (priority 32768 sys-id-ext 12)
--More--
```
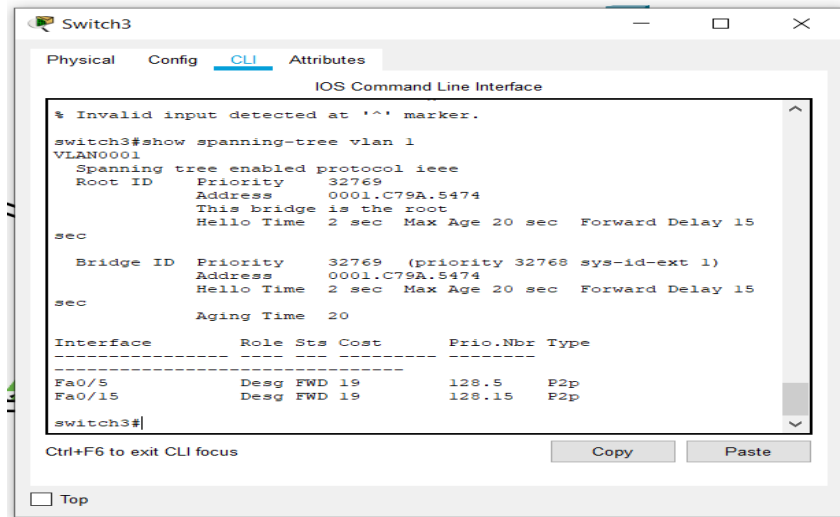
SWITCH 3:

STP active:

Switch 4:

STP active:

TASK 1: Examine the default Spanning tree

> P1DSW1 is switch 3 in the above topology

a. It is executing VLAN0001 spanning tree.
b. Priority – 32769, Sysid – ext 1, MAC address - 0001.C79A.5474
c. The switch here is still in first round sending so it believes it is the root.
d. VLAN 1 is the default port where it has its own protocols and all switch ports are members of vlan1.
e. BPDU timer value – 2 sec
f. Max age for BPDU – 20 sec
g. Forward delay timer – 15 sec

> P2ASW2 is switch 2
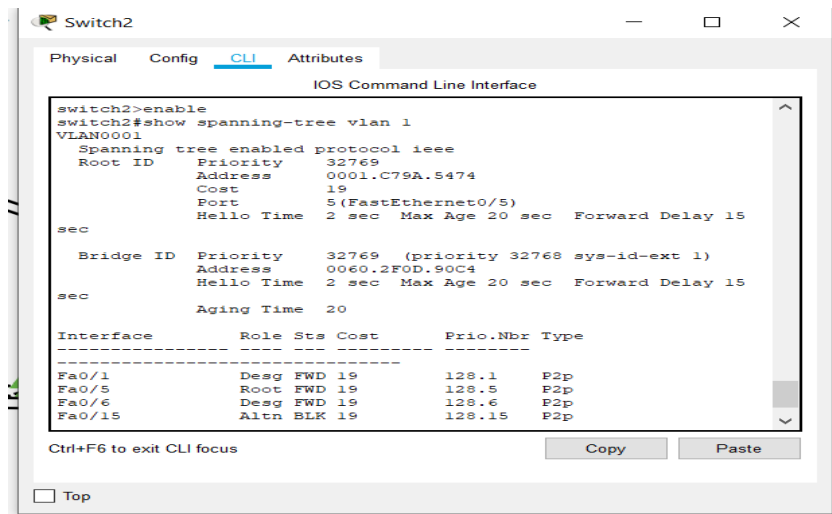
a. Priority – 32769, Sysid – ext 1, MAC address - 0001.2F0D.90C4
b. Priority – 32769, MAC address - 0001.C79A.5474
c. The root port is switch3.
d. Cost of using is 19
e. Values of hello time, maximum age, and forward delay are 2, 20 and 15 sec respectively.
f. Yes, because it the default timer.
g. All are network protocols in spanning tree. All are standards of STP network protocol.
h. STP is a network protocol building a loop free logical topology for Ethernet networks. It prevents bridge loops and broadcast radiation. Per-VLAN spanning tree(PVST) is a kind of proprietary network protocol by CISCO which is basically a default STP.PVST+ uses 802.IQ VLAN encapsulation which differs from STP.
i. The convergence time for STP IEEE 802.1D Standard is 30 to 50 seconds.
j.