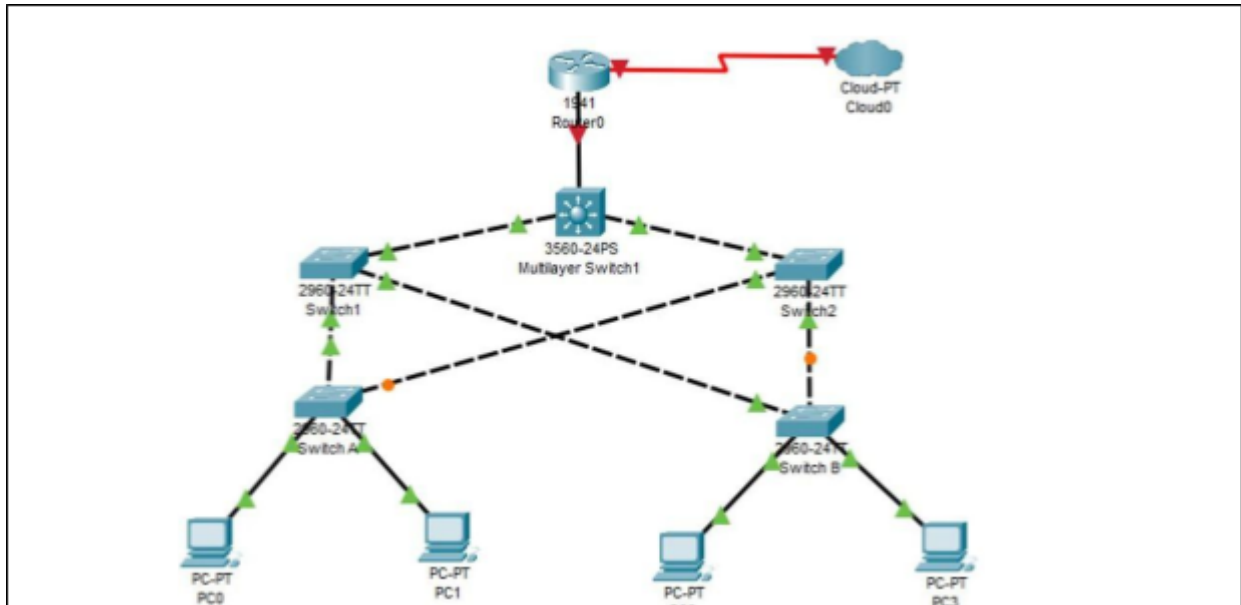
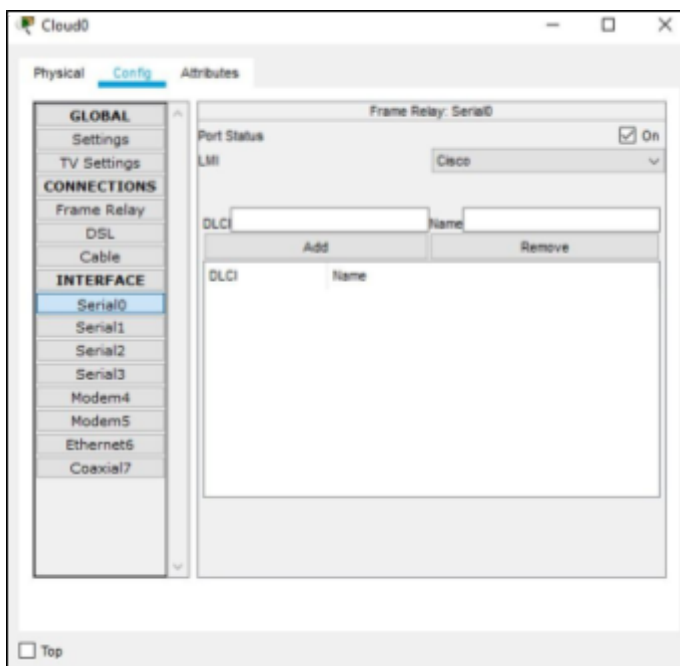
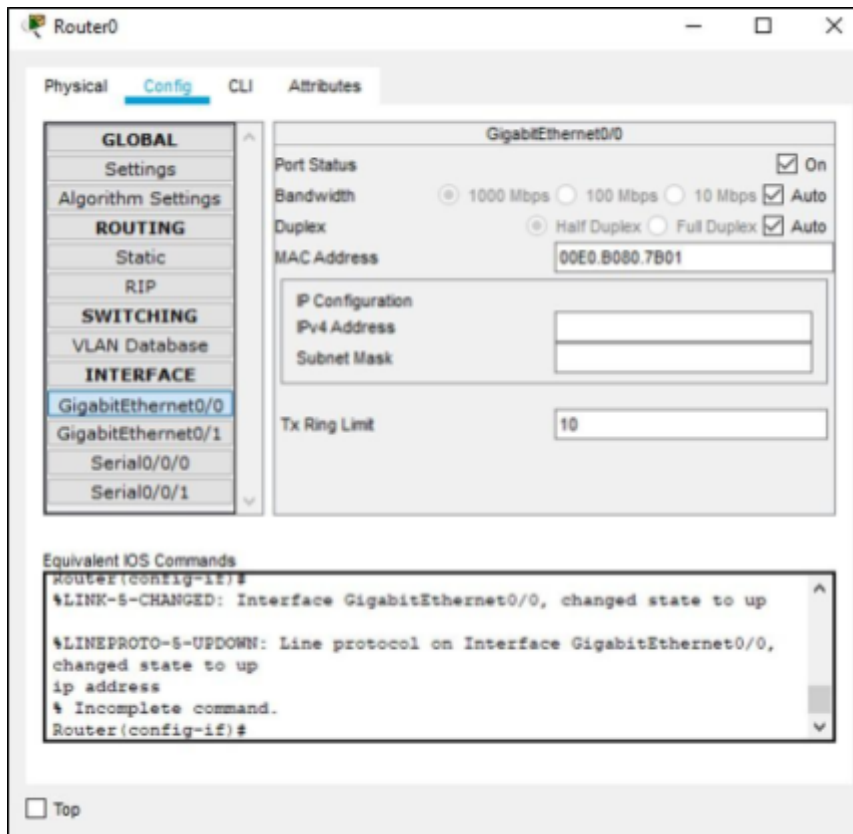


Practical 7**Packet Tracer – Layer 2 Security****Topology:****Procedure:****Step 1: To make connection establishment:**

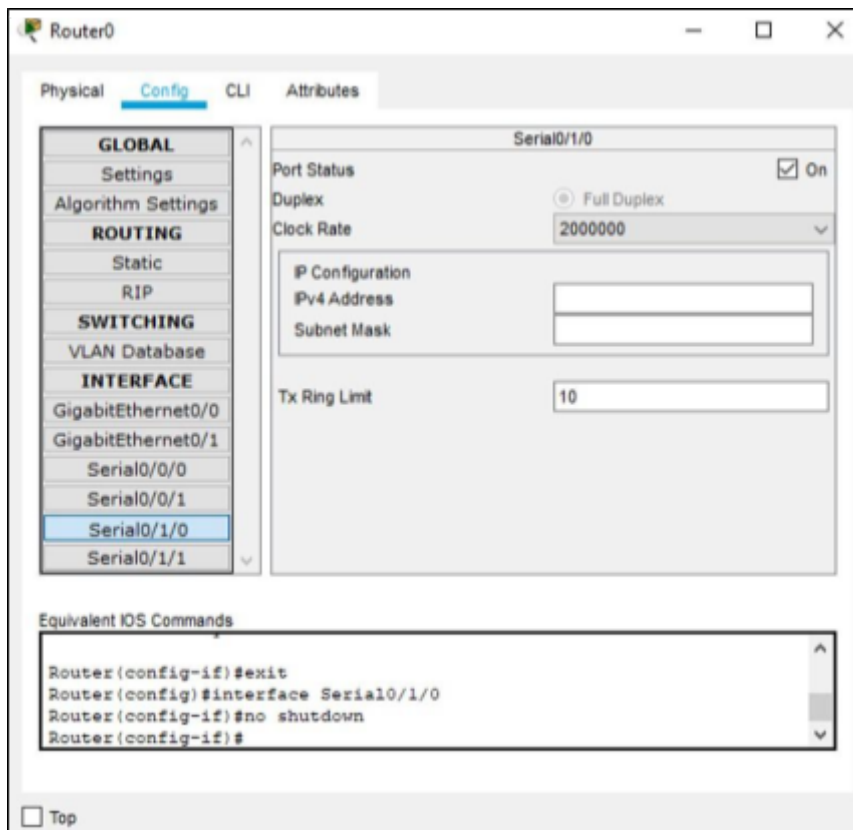
i) Click on Cloud0 → Config Tab → Serial0 → Make Port Status ON.



ii) Click on Router0 → Config Tab → GigabitEthernet0/0 → Make Port Status ON.

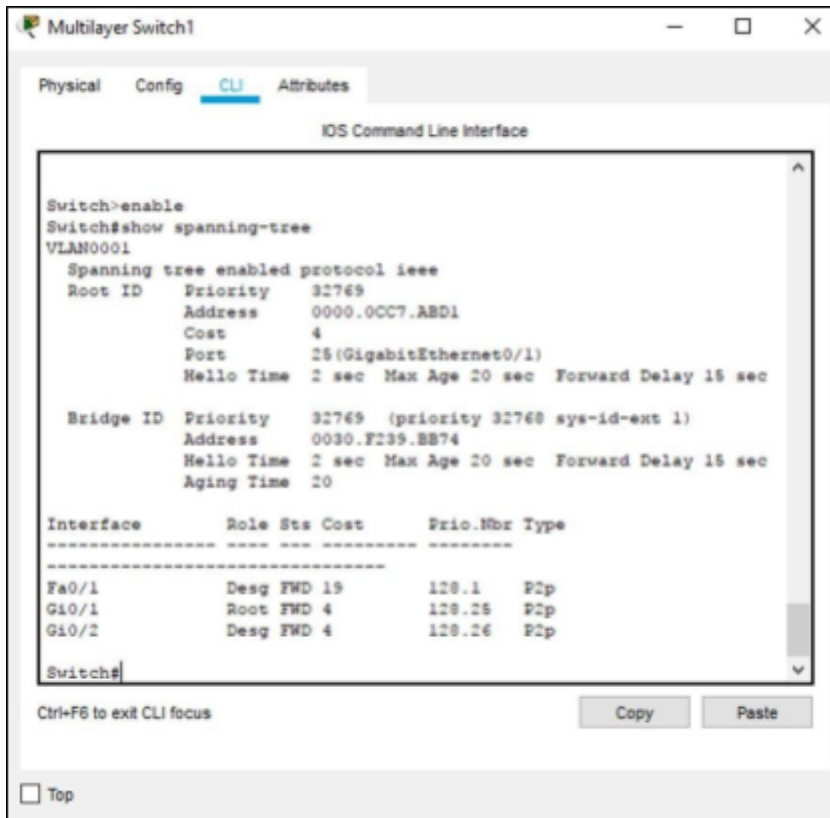


iii) Click on Router0 → Config Tab → Serial0/1/0 → Make Port Status ON.



Step 2: To configure route bridge:

i) Click on Multilayer Switch1 → Config Tab → Type following command:



Multilayer Switch1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Switch>enable
Switch#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
            Address    0000.0CC7.ABD1
            Cost        4
            Port        25 (GigabitEthernet0/1)
            Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
            Address    0030.F239.BB74
            Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
            Aging Time  20
```

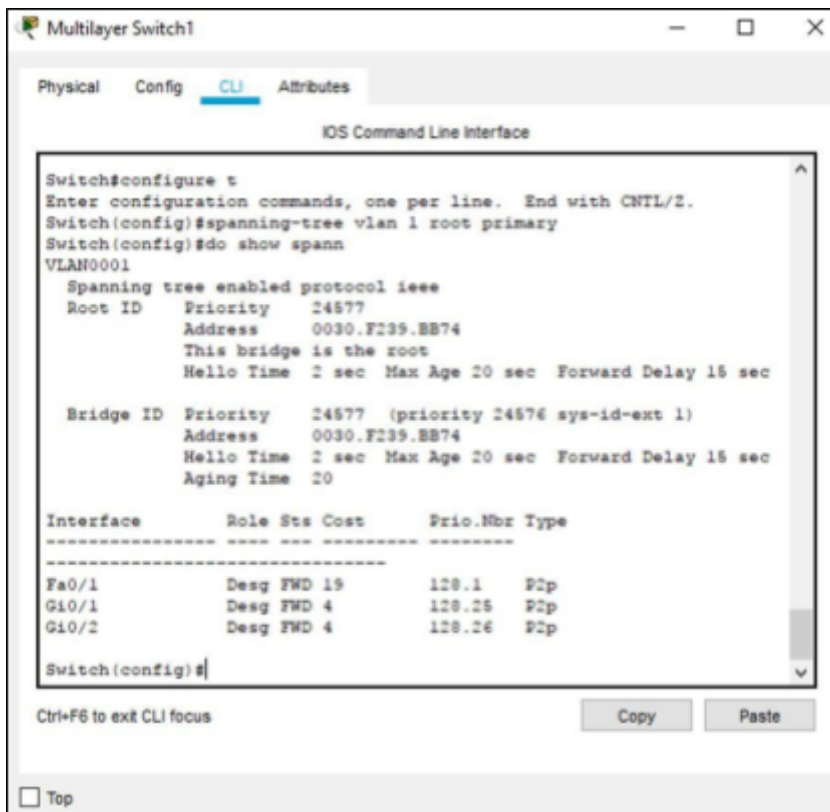
Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa0/1	Desg	FWD	19	128.1	P2p
Gi0/1	Root	FWD	4	128.25	P2p
Gi0/2	Desg	FWD	4	128.26	P2p

Switch#

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top



Multilayer Switch1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Switch#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#spanning-tree vlan 1 root primary
Switch(config)#do show spann
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    24577
            Address    0030.F239.BB74
            This bridge is the root
            Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    24577 (priority 24576 sys-id-ext 1)
            Address    0030.F239.BB74
            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
Gi0/1	Desg	FWD	4	128.25	P2p
Gi0/2	Desg	FWD	4	128.26	P2p

Switch(config)#

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

ii) Click on Switch1 → CLI Tab → Type following command:

```
Switch>
Switch>enable
Switch#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    24577
             Address     0001.97E9.595E
             Cost        4
             Port        25(GigabitEthernet0/1)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
             Address     0000.0CE8.BB11
             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
Gi0/1                    Root FWD 4       128.25  P2p

Switch#
```

```
Switch#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#spanning-tree vlan 1 root secondary
Switch(config)#do show spann
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    24577
             Address     0001.97E9.595E
             Cost        4
             Port        25(GigabitEthernet0/1)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

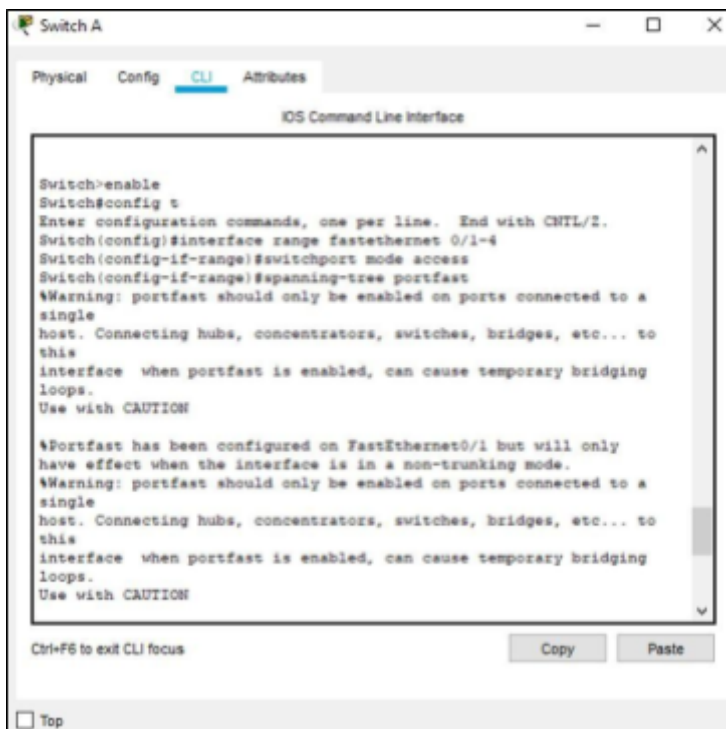
  Bridge ID  Priority    28673 (priority 28672 sys-id-ext 1)
             Address     0000.0CE8.BB11
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface                Role Sts Cost      Prio.Nbr Type
-----
Fa0/2                    Desg FWD 19      128.2   P2p
Fa0/1                    Desg FWD 19      128.1   P2p
Gi0/1                    Root FWD 4       128.25  P2p

Switch(config)#
```

Step 3: Protect against STP Attack:

i) Click on Switch A → CLI Tab → Type following command:

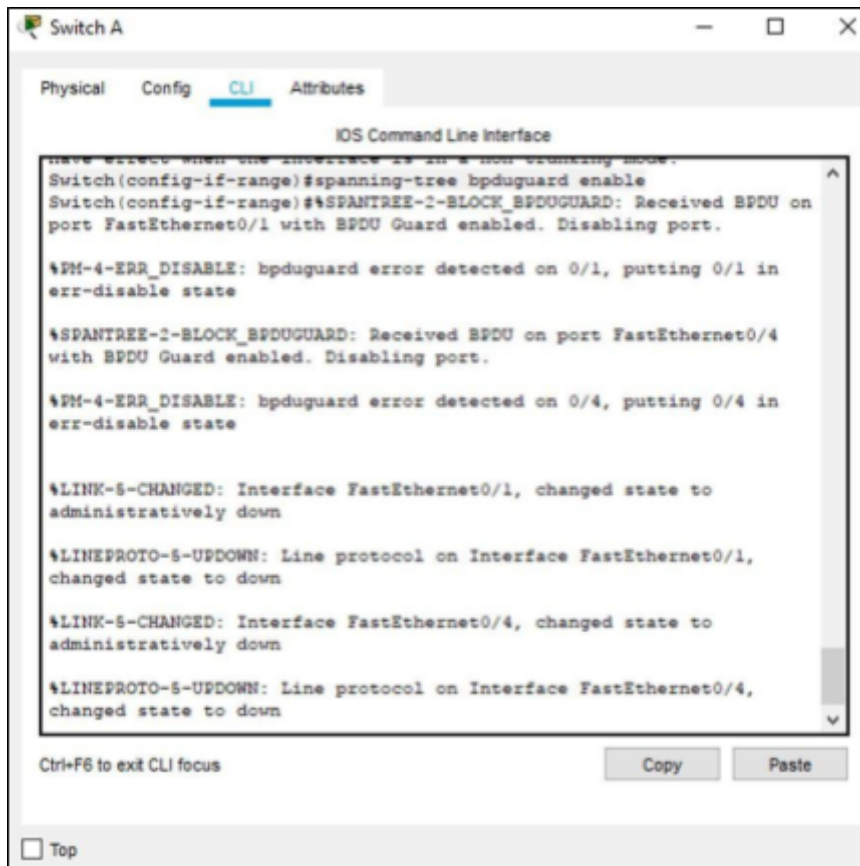


```
Switch A
Physical Config CLI Attributes
IOS Command Line Interface

Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fastethernet 0/1-4
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a
single
host. Connecting hubs, concentrators, switches, bridges, etc... to
this
interface when portfast is enabled, can cause temporary bridging
loops.
Use with CAUTION

%Portfast has been configured on FastEthernet0/1 but will only
have effect when the interface is in a non-trunking mode.
%Warning: portfast should only be enabled on ports connected to a
single
host. Connecting hubs, concentrators, switches, bridges, etc... to
this
interface when portfast is enabled, can cause temporary bridging
loops.
Use with CAUTION

Ctrl+F6 to exit CLI focus
Copy Paste
Top
```



Switch A

Physical Config **CLI** Attributes

IOS Command Line Interface

```

Switch>enable
Switch#config t
Switch(config)#spanning-tree bpduguard enable
Switch(config-if-range)#%SPANTREE-2-BLOCK_BPDUGUARD: Received BPDU on
port FastEthernet0/1 with BPDU Guard enabled. Disabling port.

%PM-4-ERR_DISABLE: bpduguard error detected on 0/1, putting 0/1 in
err-disable state

%SPANTREE-2-BLOCK_BPDUGUARD: Received BPDU on port FastEthernet0/4
with BPDU Guard enabled. Disabling port.

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

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

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

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

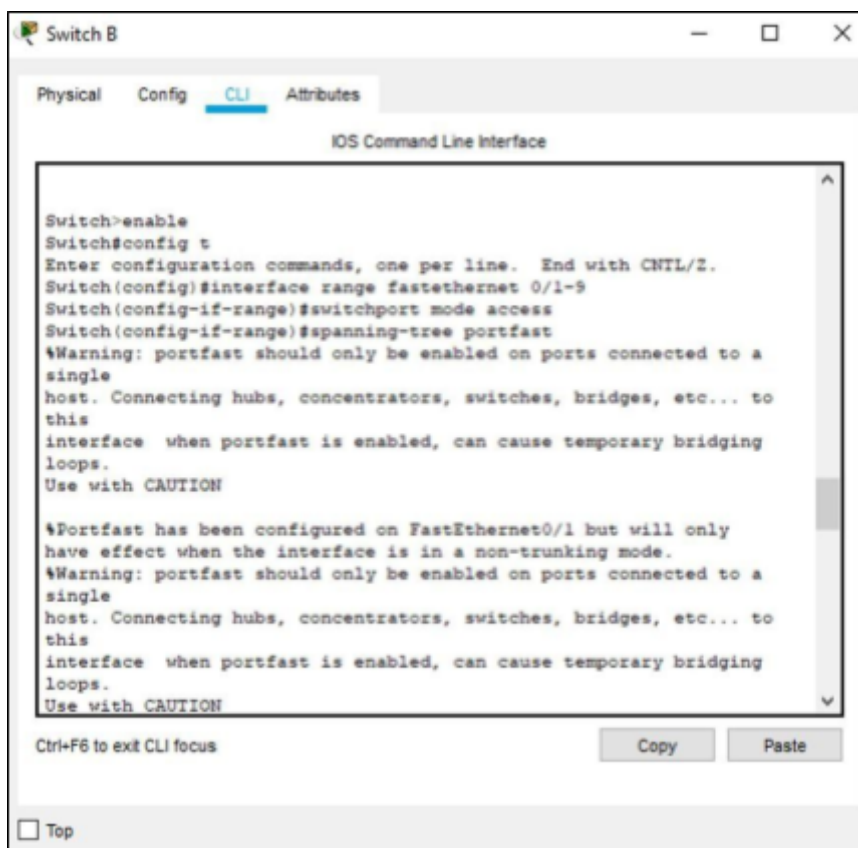
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4,
changed state to down
  
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

ii) Click on Switch B → CLI Tab → Type following command:



Switch B

Physical Config **CLI** Attributes

IOS Command Line Interface

```

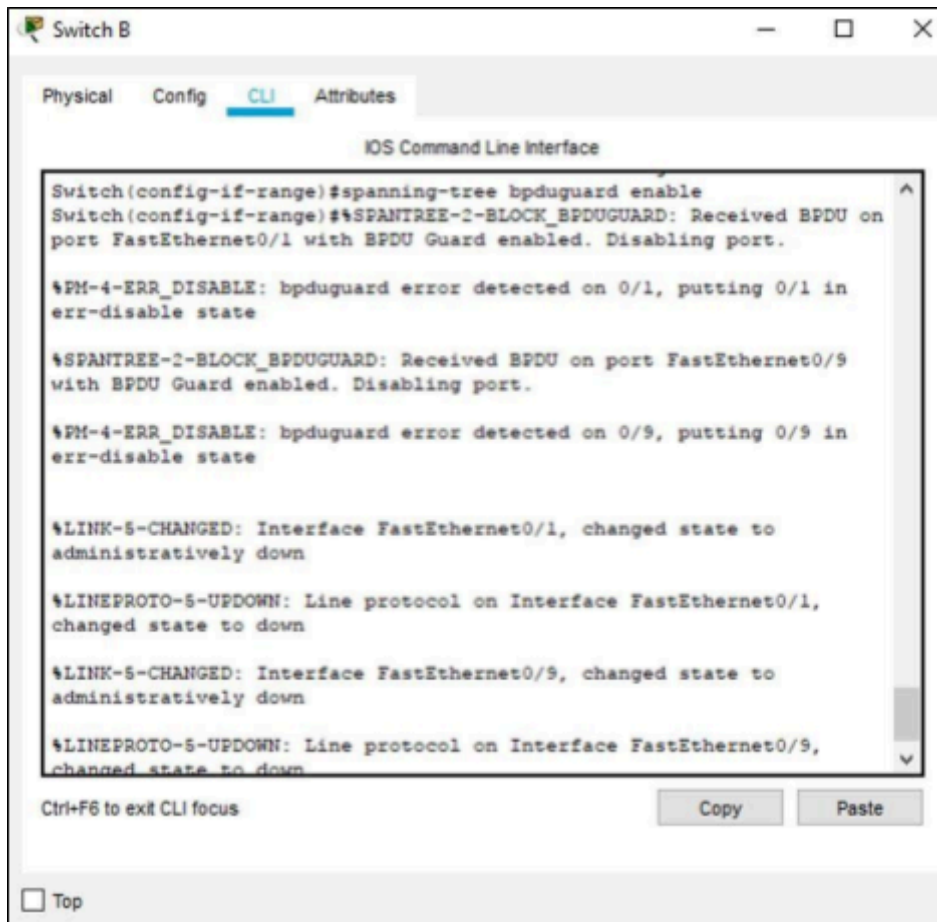
Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fastethernet 0/1-9
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a
single
host. Connecting hubs, concentrators, switches, bridges, etc... to
this
interface when portfast is enabled, can cause temporary bridging
loops.
Use with CAUTION

%Portfast has been configured on FastEthernet0/1 but will only
have effect when the interface is in a non-trunking mode.
%Warning: portfast should only be enabled on ports connected to a
single
host. Connecting hubs, concentrators, switches, bridges, etc... to
this
interface when portfast is enabled, can cause temporary bridging
loops.
Use with CAUTION
  
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top



iii) Click on Switch1 → CLI Tab → Type following command:

```
Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fastethernet 0/1-4
Switch(config-if-range)#spanning-tree guard root
Switch(config-if-range)#exit
Switch(config)#
```

iv) Click on Switch1 → CLI Tab → Type following command:

```
Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fastethernet 0/1-4
Switch(config-if-range)#spanning-tree guard root
Switch(config-if-range)#exit
Switch(config)#
```


Step 4: Configure Port Security:

i) Click on Switch A → CLI Tab → Type following command:



```

Switch A
Physical Config CLI Attributes
IOS Command Line Interface

Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fastethernet 0/1-4
Switch(config-if-range)#switchport port-security maximum 2
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#exit
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show port-security interface f0/1
Port Security      : Disabled
Port Status        : Secure-shutdown
Violation Mode     : Shutdown
Aging Time         : 0 mins
Aging Type         : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses : 2
Total MAC Addresses : 0
Configured MAC Addresses : 0
Sticky MAC Addresses : 0
Last Source Address:Vlan : 0000.0000.0000:0
Security Violation Count : 0

Switch#

```

ii) Click on Switch B → CLI Tab → Type following command:



```

Switch B
Physical Config CLI Attributes
IOS Command Line Interface

Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fastethernet 0/1-9
Switch(config-if-range)#switchport port-security
Switch(config-if-range)#switchport port-security maximum 2
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#exit
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console

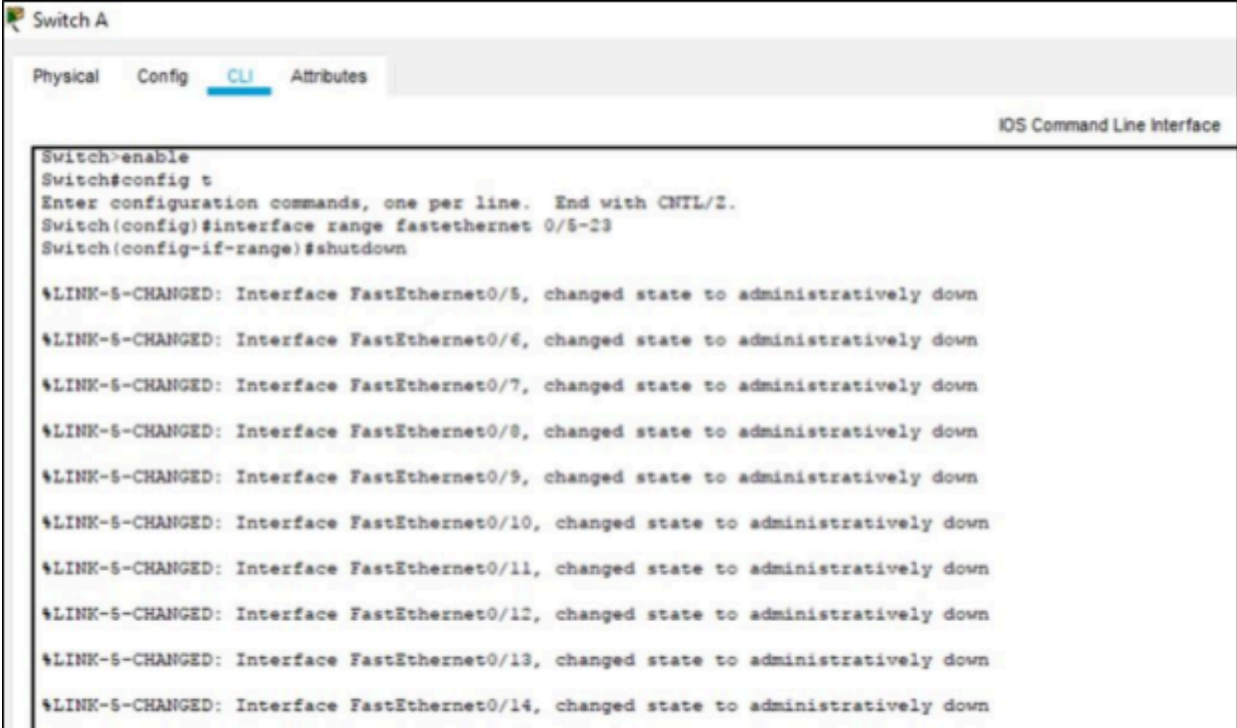
Switch#show port-security interface f0/1
Port Security      : Enabled
Port Status        : Secure-shutdown
Violation Mode     : Shutdown
Aging Time         : 0 mins
Aging Type         : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses : 2
Total MAC Addresses : 0
Configured MAC Addresses : 0
Sticky MAC Addresses : 0
Last Source Address:Vlan : 0000.0000.0000:0
Security Violation Count : 0

Switch#

```

Step 5: Disable the Unused Ports:

i) Click on Switch A → CLI Tab → Type following command:



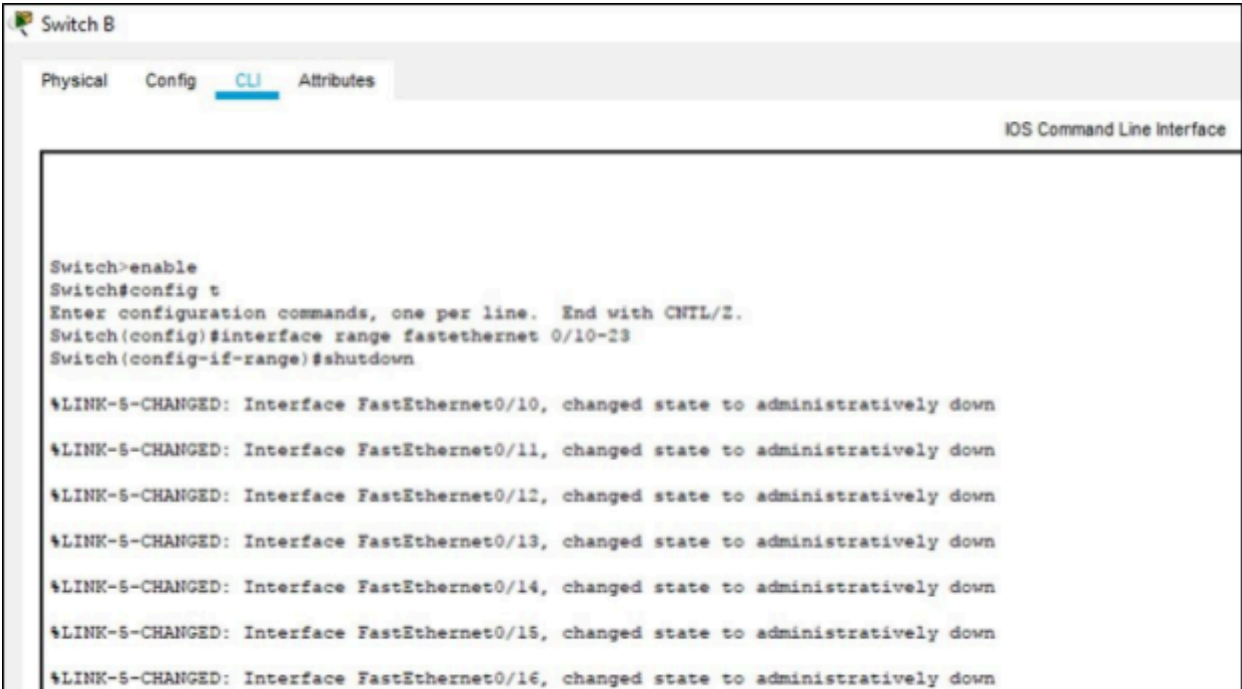
The screenshot shows the CLI interface for Switch A. The 'CLI' tab is selected. The commands entered are: `Switch>enable`, `Switch#config t`, `Switch(config)#interface range fastethernet 0/5-23`, and `Switch(config-if-range)#shutdown`. The output shows 19 messages indicating that interfaces FastEthernet0/5 through FastEthernet0/23 have been changed to administratively down.

```
Switch A
Physical Config CLI Attributes
IOS Command Line Interface

Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fastethernet 0/5-23
Switch(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down
```

ii) Click on Switch B → CLI Tab → Type following command:



The screenshot shows the CLI interface for Switch B. The 'CLI' tab is selected. The commands entered are: `Switch>enable`, `Switch#config t`, `Switch(config)#interface range fastethernet 0/10-23`, and `Switch(config-if-range)#shutdown`. The output shows 7 messages indicating that interfaces FastEthernet0/10 through FastEthernet0/16 have been changed to administratively down.

```
Switch B
Physical Config CLI Attributes
IOS Command Line Interface

Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface range fastethernet 0/10-23
Switch(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down
```