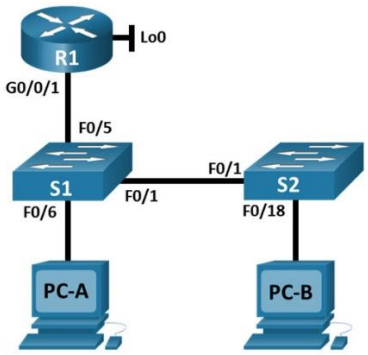
Week4: **Assignment 1:- VLANs and Secure Switch Configuration**

Report by: **Aisha Khalifan, cs-cns04-23014**

Introduction



Addressing Table

Device	Interface / VLAN	IP Address	Subnet Mask
R1	G0/0/1	192.168.10.1	255.255.255.0
	Loopback 0	10.10.1.1	255.255.255.0
S1	VLAN 10	192.168.10.201	255.255.255.0
S2	VLAN 10	192.168.10.202	255.255.255.0
PC - A	NIC	DHCP	255.255.255.0
PC - B	NIC	DHCP	255.255.255.0

Objectives

Part 1: Configure the Network Devices.
- Cable the network.
- Configure R1.
- Configure and verify basic switch settings.

Part 2: Configure VLANs on Switches.
- Configure VLAN 10.
- Configure the SVI for VLAN 10.
- Configure VLAN 333 with the name Native on S1 and S2.
- Configure VLAN 999 with the name ParkingLot on S1 and S2.

Part 3: Configure Switch Security.
- Implement 802.1Q trunking.
- Configure access ports.
- Secure and disable unused switchports.
- Document and implement port security features.
- Implement DHCP snooping security.
- Implement PortFast and BPDU guard.
- Verify end-to-end-connectivity.

Background

This is a comprehensive lab to review previously covered Layer 2 security features.

Note: The routers used with CCNA hands-on labs are Cisco 4221 with Cisco IOS XE Release 16.9.3 (universalk9 image). The switches used in the labs are Cisco Catalyst 2960s with Cisco IOS Release 15.0(2) (lanbasek9 image). Other routers, switches, and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and the output produced might vary from what is shown in the labs. Refer to the Router Interface Summary Table at the end of the lab for the correct interface identifiers.

Note: Make sure that the switches have been erased and have no startup configurations.

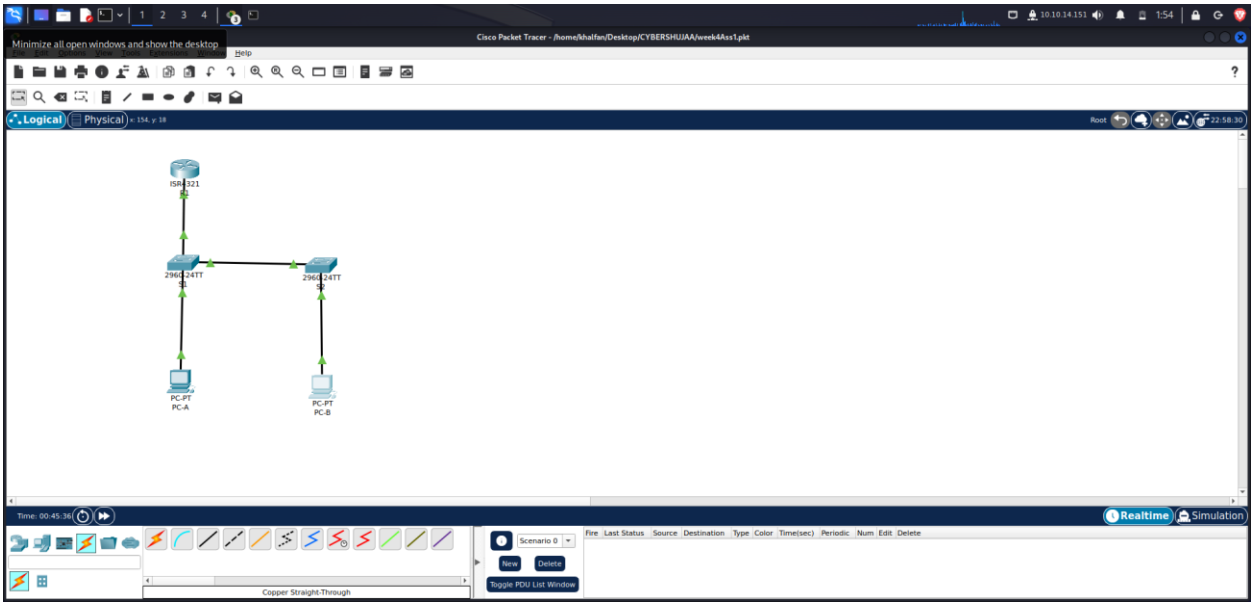
Required Resources

- 1 Router (Cisco 4221 with Cisco IOS XE Release 16.9.3 universal image or comparable)
- 2 Switches (Cisco 2960 with Cisco IOS Release 15.0(2) lanbasek9 image or comparable)
- 2 PCs (Windows with a terminal emulation program, such as Tera Term)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

Part 1: Configure the Network Devices.

Step 1: Cable the network.

1. Cable the network as shown in the topology.
2. Initialize the devices**.**



Step 2: Configure R1.

1. Load the following configuration script on R1.

   enable

   configure terminal

hostname R1

no ip domain lookup

ip dhcp excluded-address 192.168.10.1 192.168.10.9

ip dhcp excluded-address 192.168.10.201 192.168.10.202

!

ip dhcp pool Students

network 192.168.10.0 255.255.255.0

default-router 192.168.10.1

domain-name secure.com

!

interface Loopback0

ip address 10.10.1.1 255.255.255.0

!

interface GigabitEthernet0/0/1

description Link to S1 Port 5

ip dhcp relay information trusted

ip address 192.168.10.1 255.255.255.0

no shutdown

!

line con 0

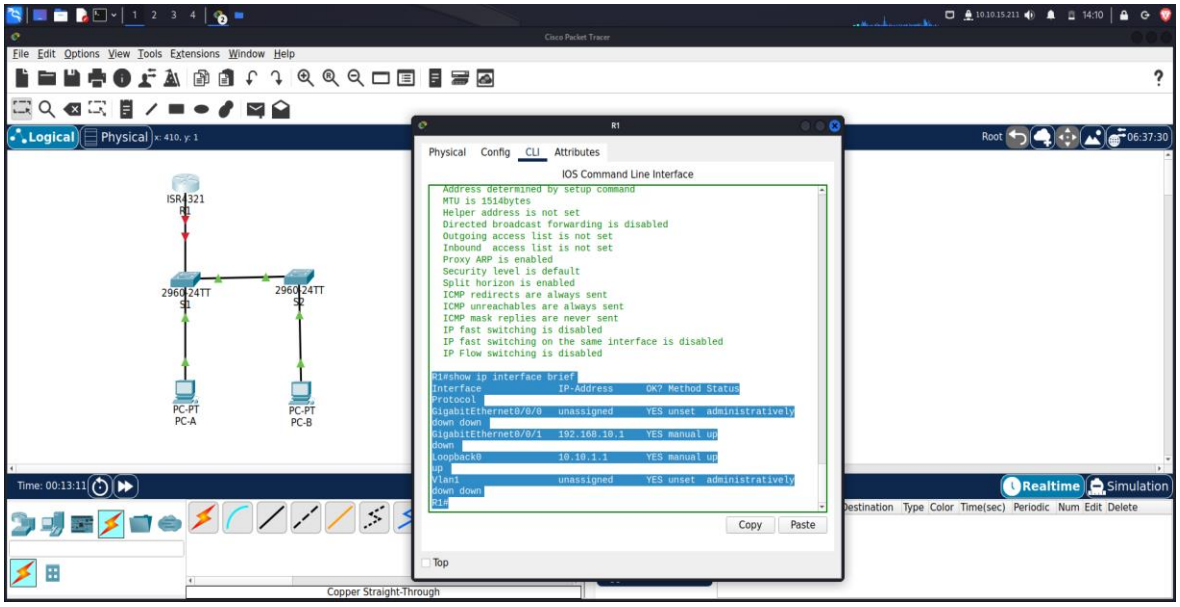
logging synchronous

exec-timeout 0 0

2. Verify the running-configuration on R1 using the following command:

R1# **show ip interface brief**

Interface	IP-Address	OK? Method Status	Protocol
GigabitEthernet0/0/0	unassigned	YES unset down	down
GigabitEthernet0/0/1	192.168.10.1	YES manual up	up
Loopback0	10.10.1.1	YES manual up	up

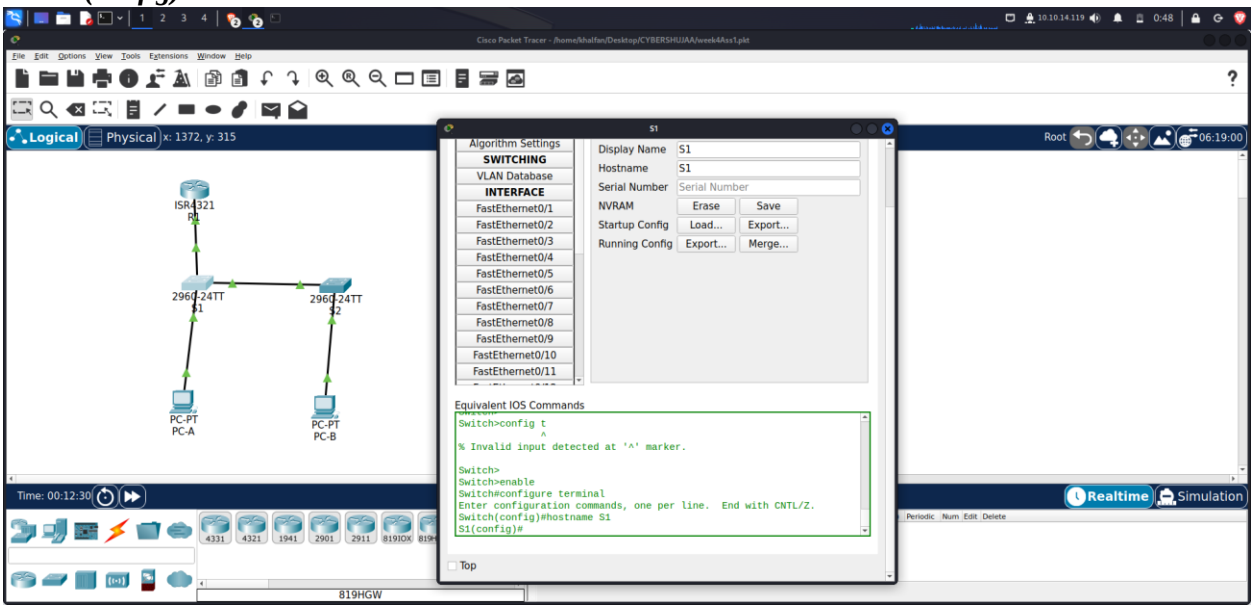


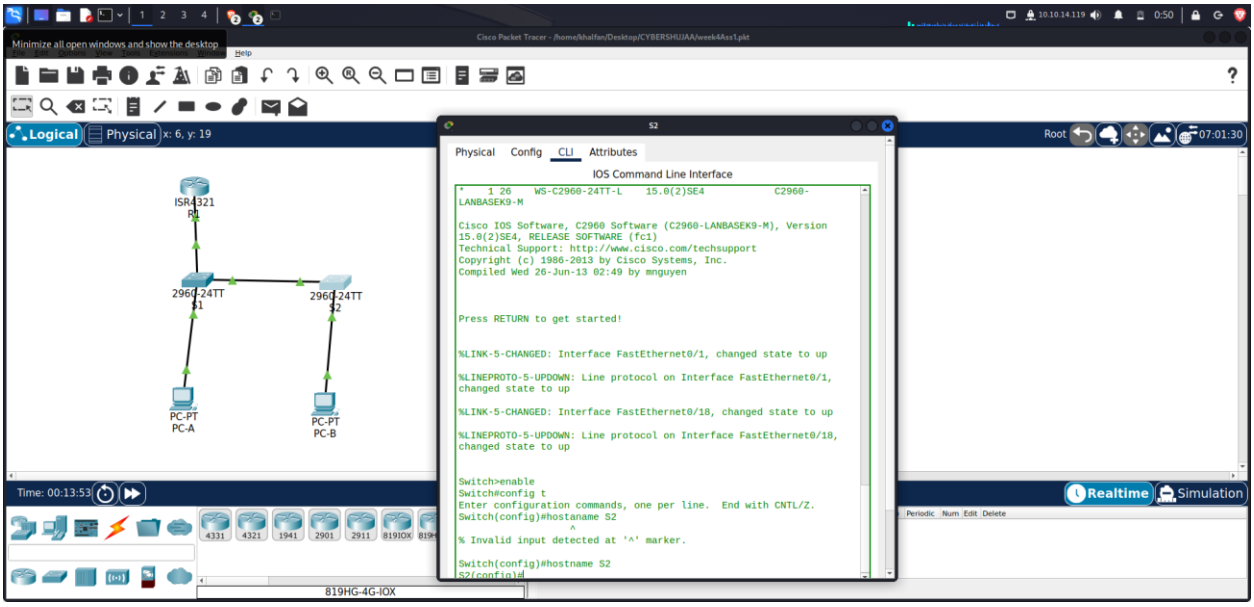
3. Verify IP addressing and interfaces are in an up / up state (troubleshoot as necessary).

Step 3: Configure and verify basic switch settings.

1. Configure the hostname for switches S1 and S2**.**
Open configuration window

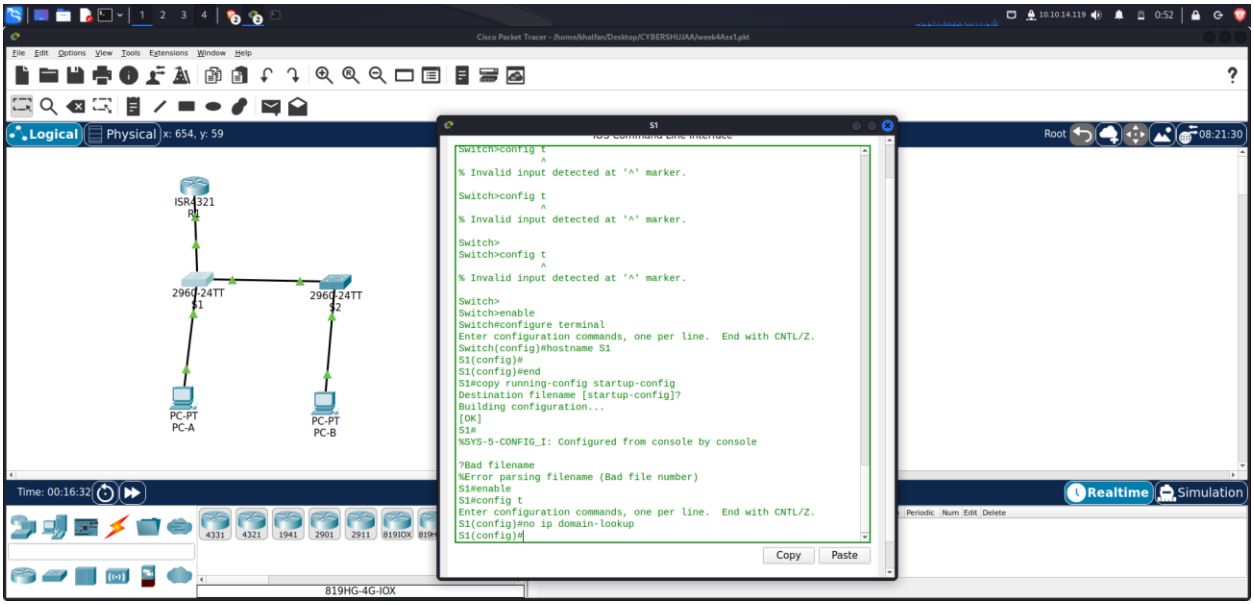
Switch# config t
Switch(config)# hostname S1
Open configuration window
Switch# config t
Switch(config)# hostname S2



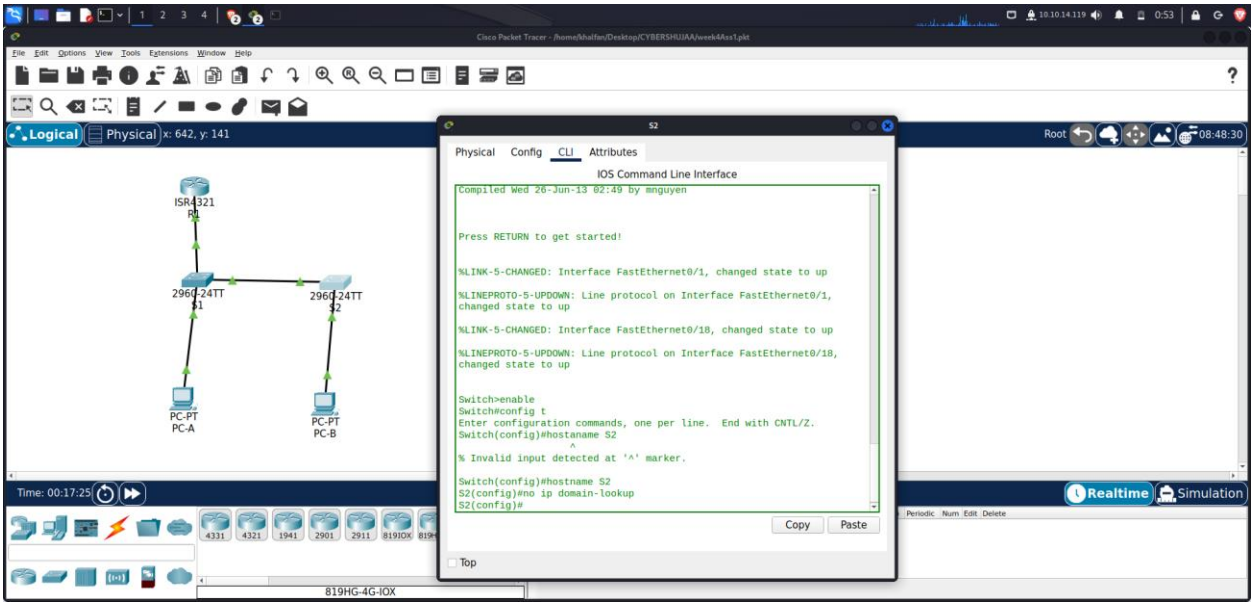


2. Prevent unwanted DNS lookups on both switches.

S1(config)# no ip domain-lookup

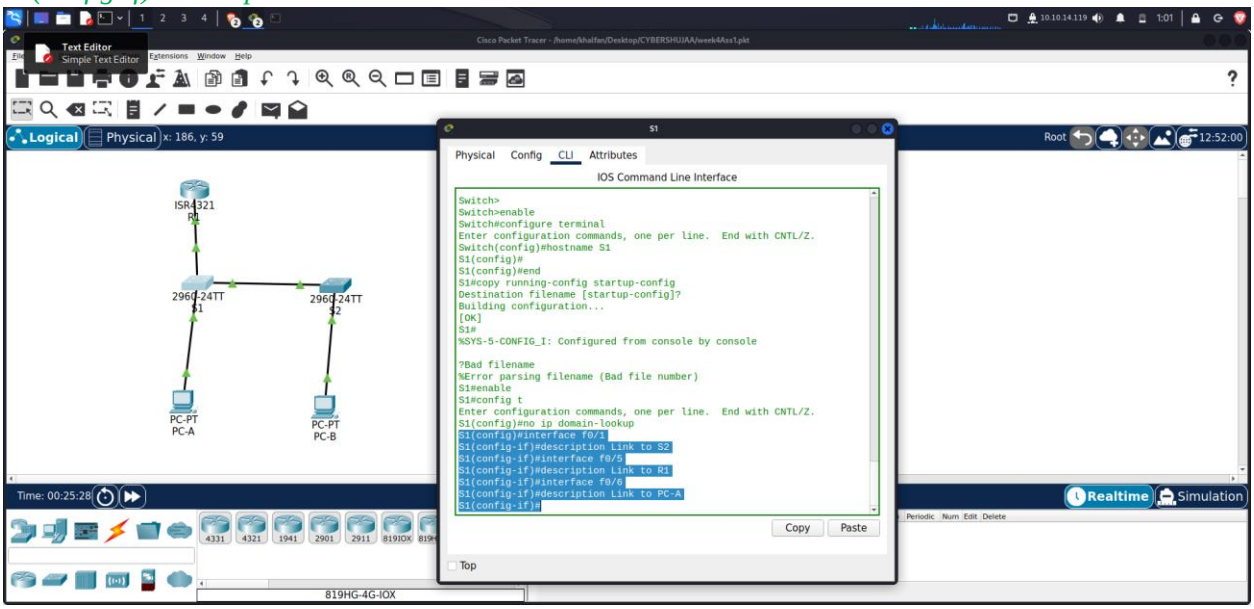


S2(config)# no ip domain-lookup

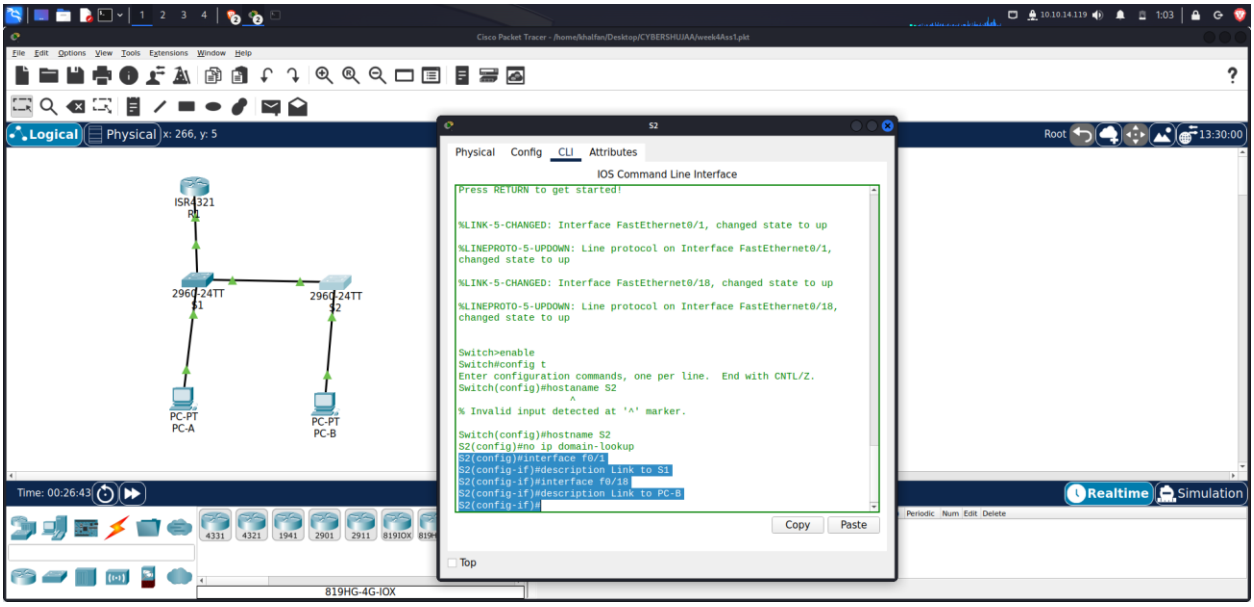


3. Configure interface descriptions for the ports that are in use in S1 and S2.

S1(config)# interface f0/1
S1(config-if)# description Link to S2
S1(config–if)# interface f0/5
S1(config-if)# description Link to R1
S1(config–if)# interface f0/6
S1(config-if)# description Link to PC-A

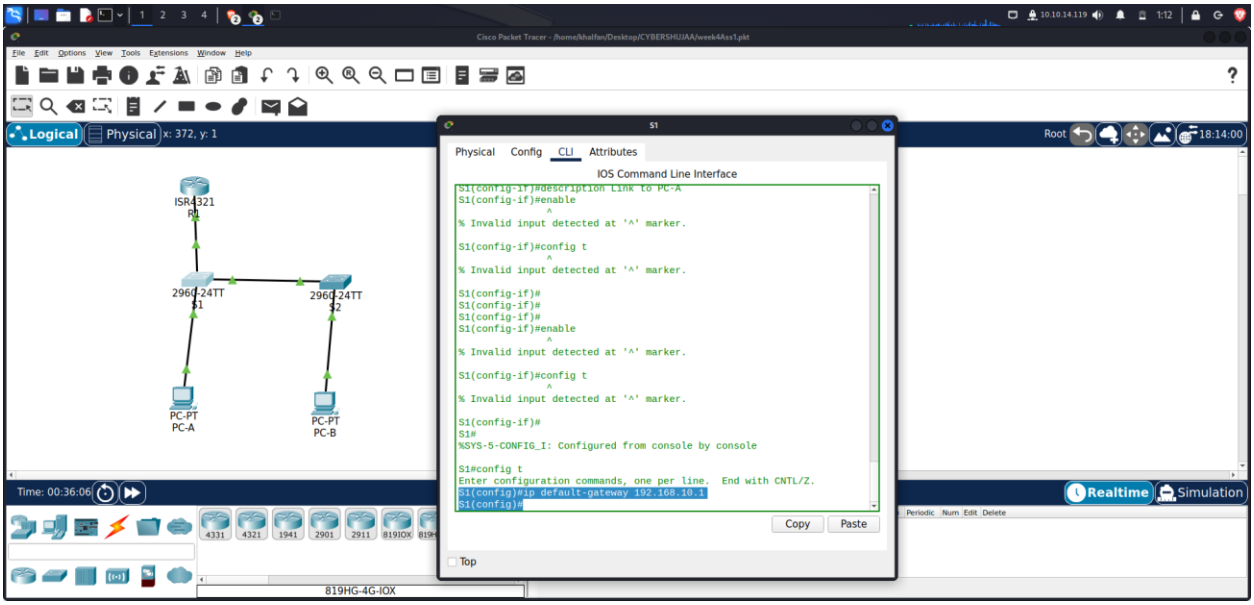


S2(config)# interface f0/1
S2(config-if)# description Link to S1
S2(config–if)# interface f0/18
S2(config-if)# description Link to PC-B

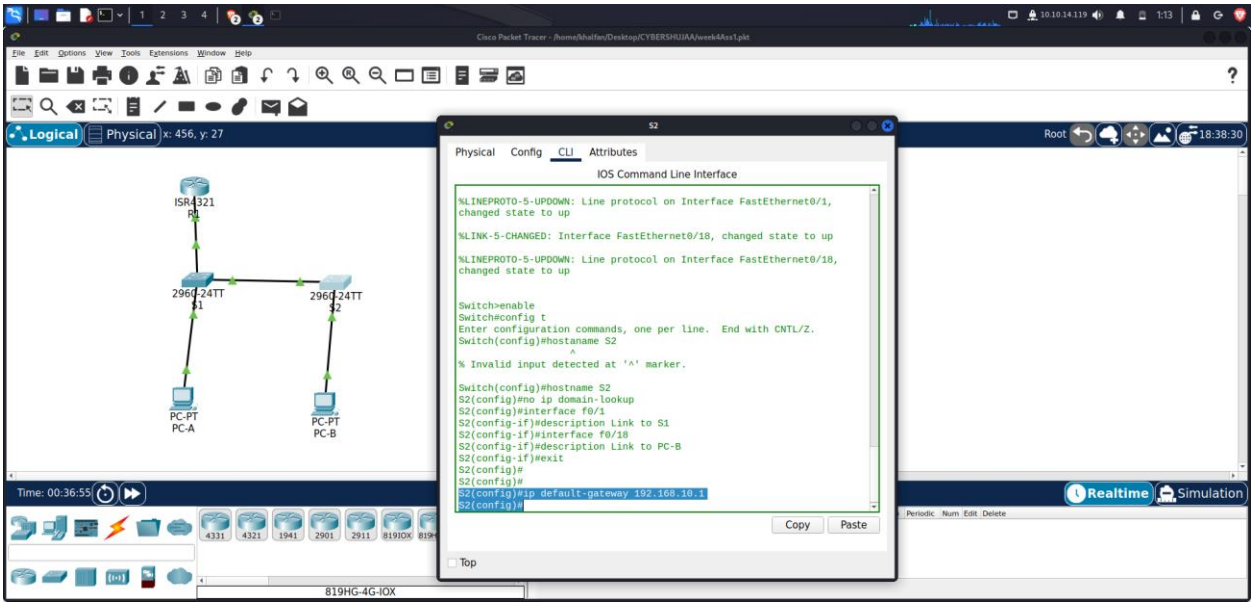


4. Set the default-gateway for the Management VLAN to 192.168.10.1 on both switches.

S1(config)# ip default-gateway 192.168.10.1



S2(config)# ip default-gateway 192.168.10.1

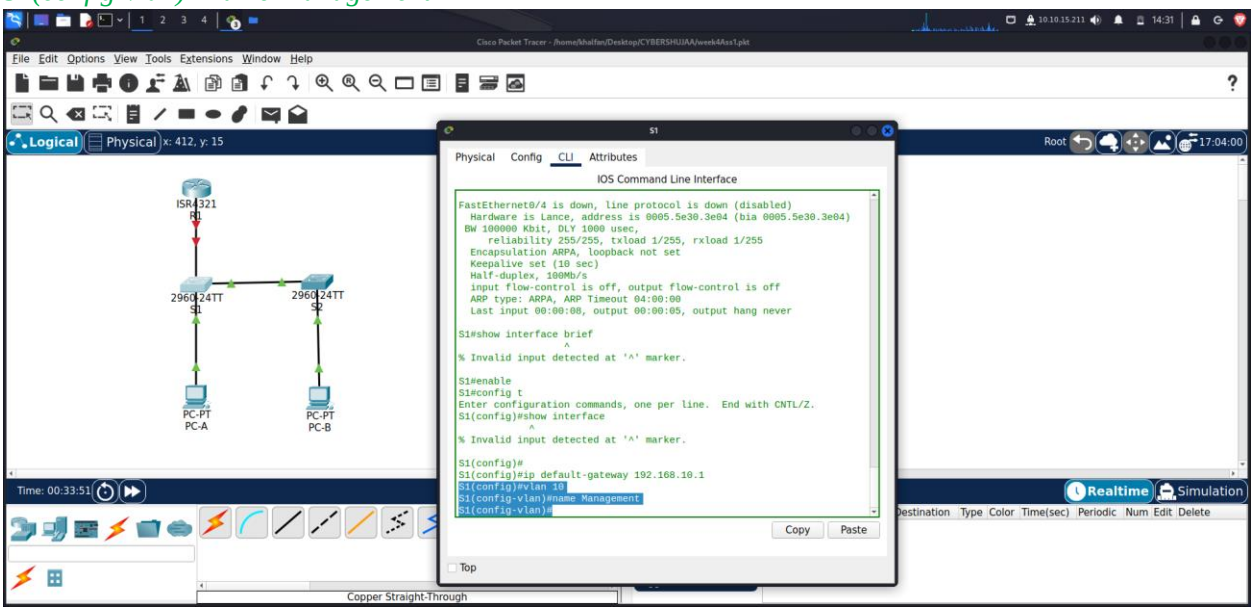


Part 2: Configure VLANs on Switches.

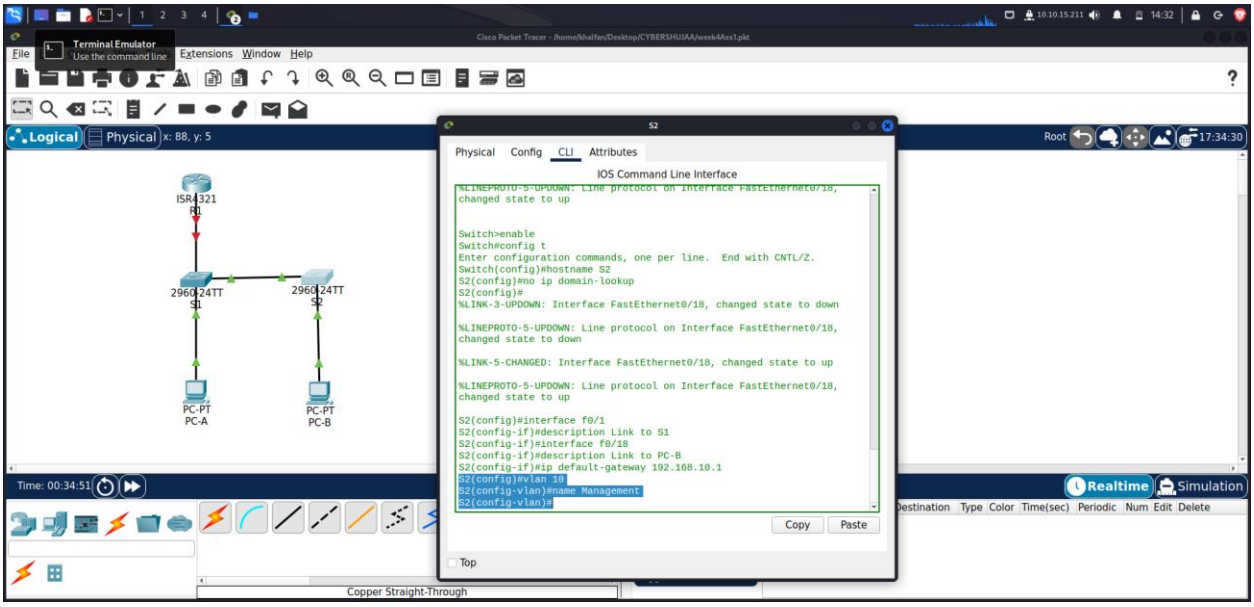
Step 1: Configure VLAN 10.

1. **Add VLAN 10 to S1 and S2 and name the VLAN Management.**

S1(config)# vlan 10
S1(config-vlan)# name Management



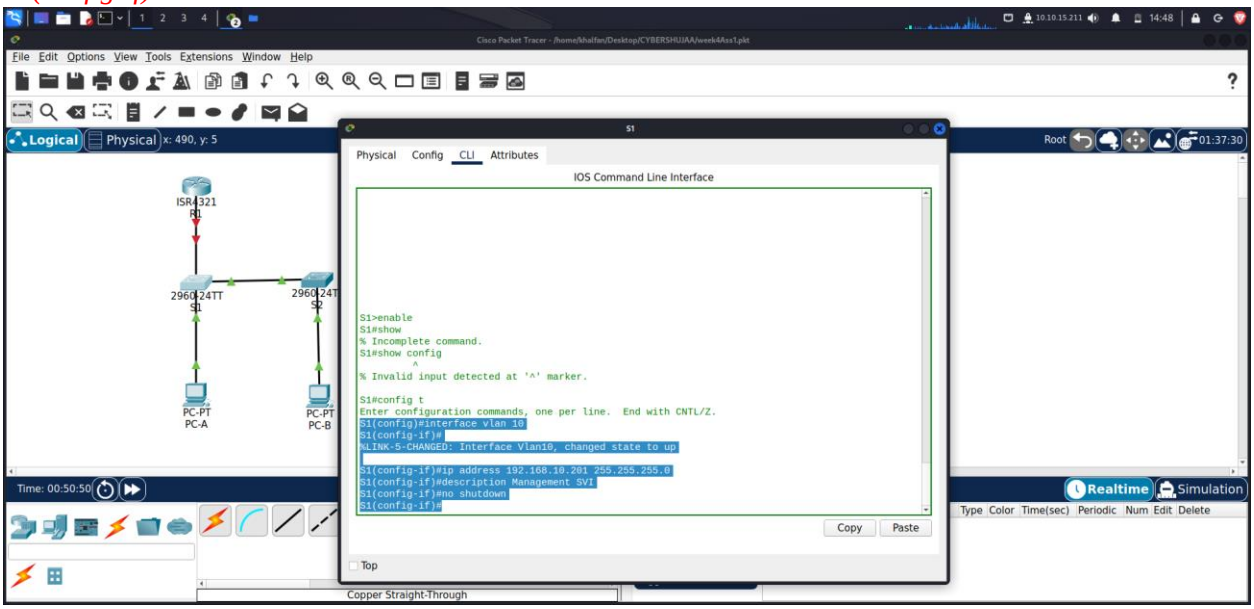
S2(config)# vlan 10
S2(config-vlan)# name Management



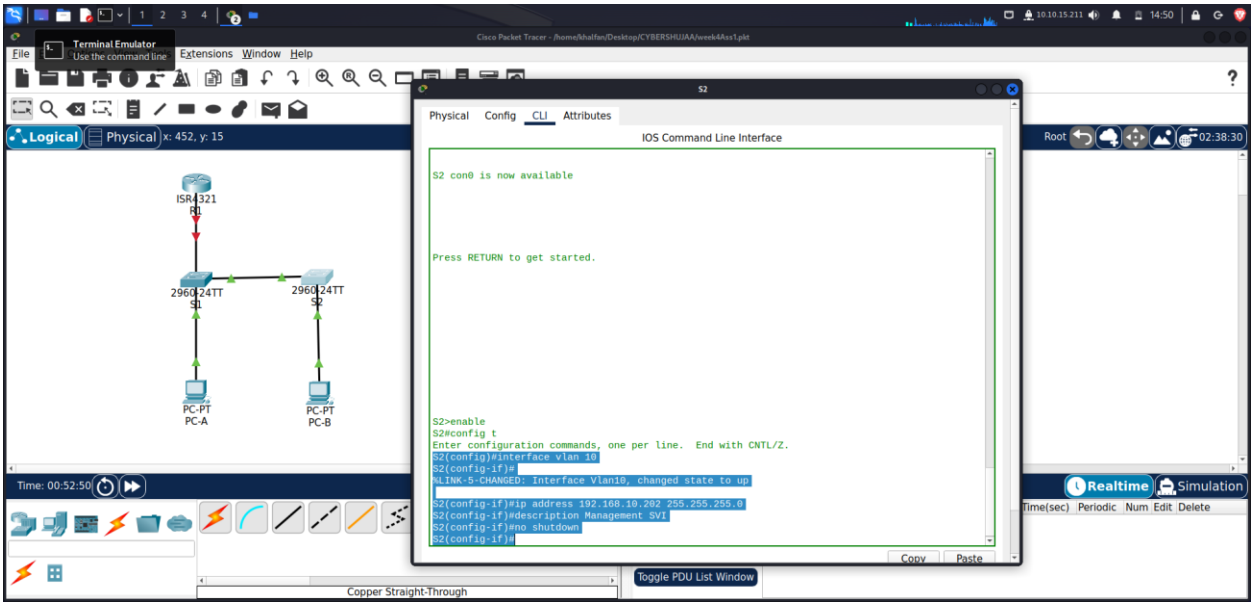
Step 2: Configure the SVI for VLAN 10.

2. **Configure the IP address according to the Addressing Table for SVI for VLAN 10 on S1 and S2. Enable the SVI interfaces and provide a description for the interface.**

S1(config)# interface vlan 10
S1(config-if)# ip address 192.168.10.201 255.255.255.0
S1(config-if)# description Management SVI
S1(config-if)# no shutdown

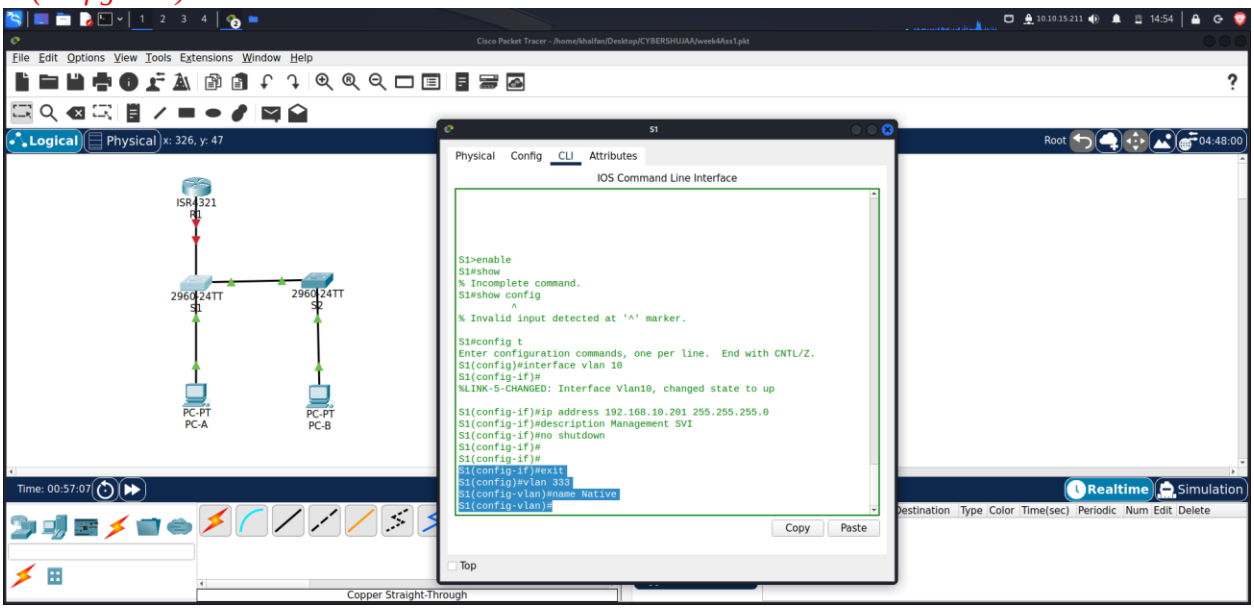


S2(config)# interface vlan 10
S2(config-if)# ip address 192.168.10.202 255.255.255.0
2S1(config-if)# description Management SVI
S2(config-if)# no shutdown

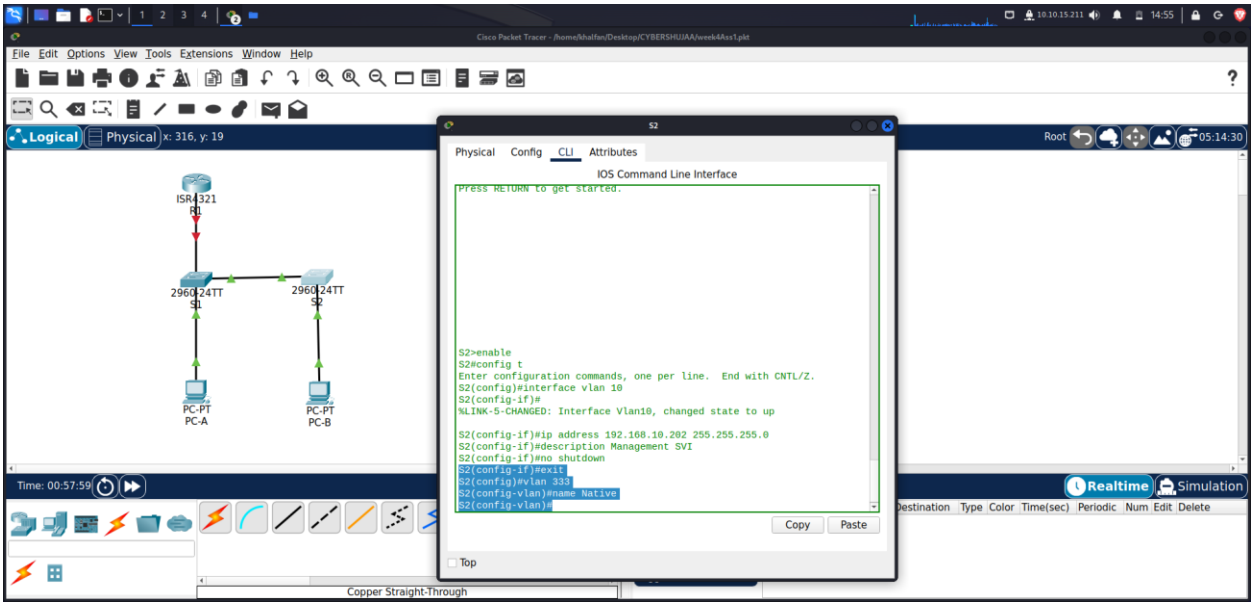


Step 3: Configure VLAN 333 with the name Native on S1 and S2.

S1(config)# vlan 333
S1(config-vlan)# name Native

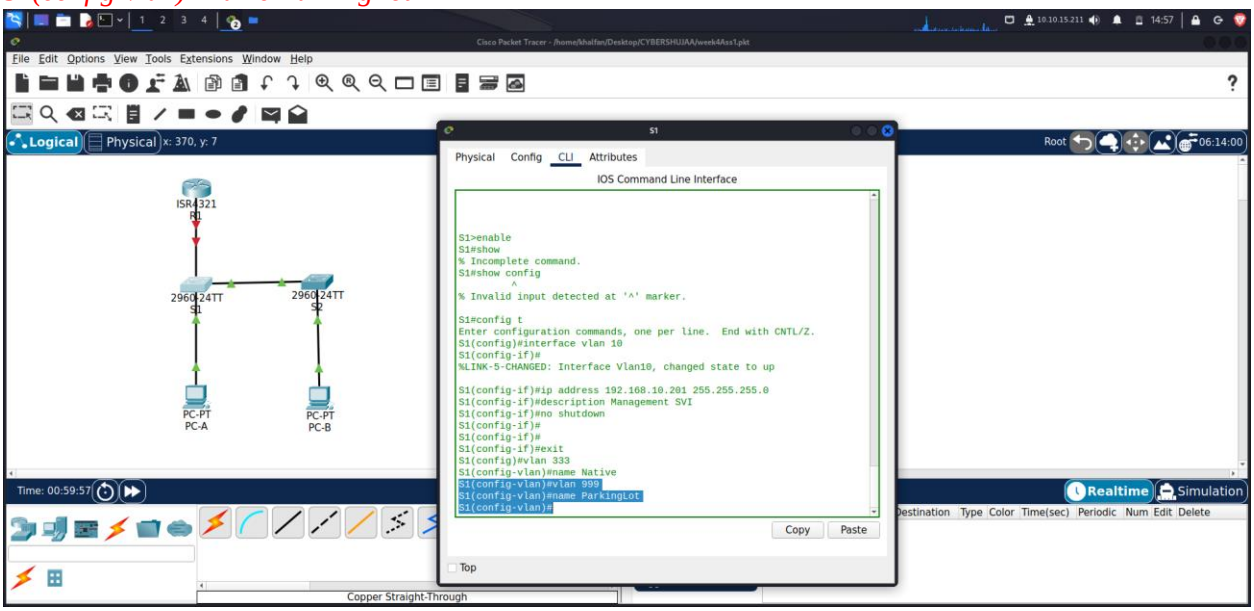


S2(config)# vlan 333
S2(config-vlan)# name Native

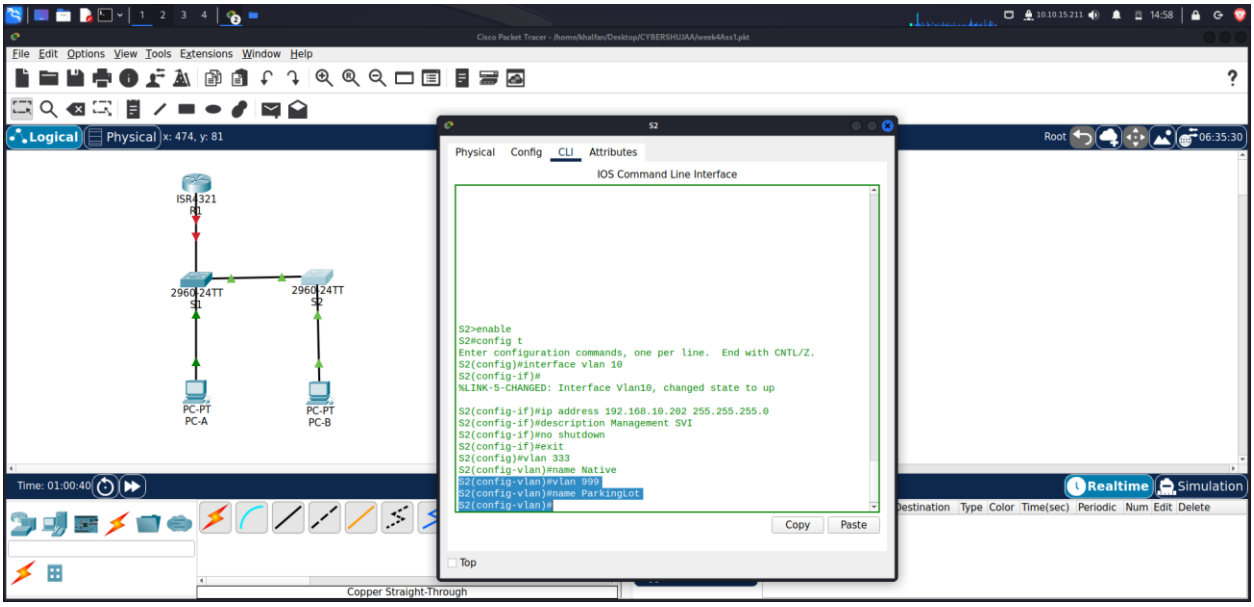


Step 4: **Configure VLAN 999 with the name ParkingLot on S1 and S2.**

S1(config-vlan)# vlan 999
S1(config-vlan)# name ParkingLot



S2(config-vlan)# vlan 999
S2(config-vlan)# name ParkingLot

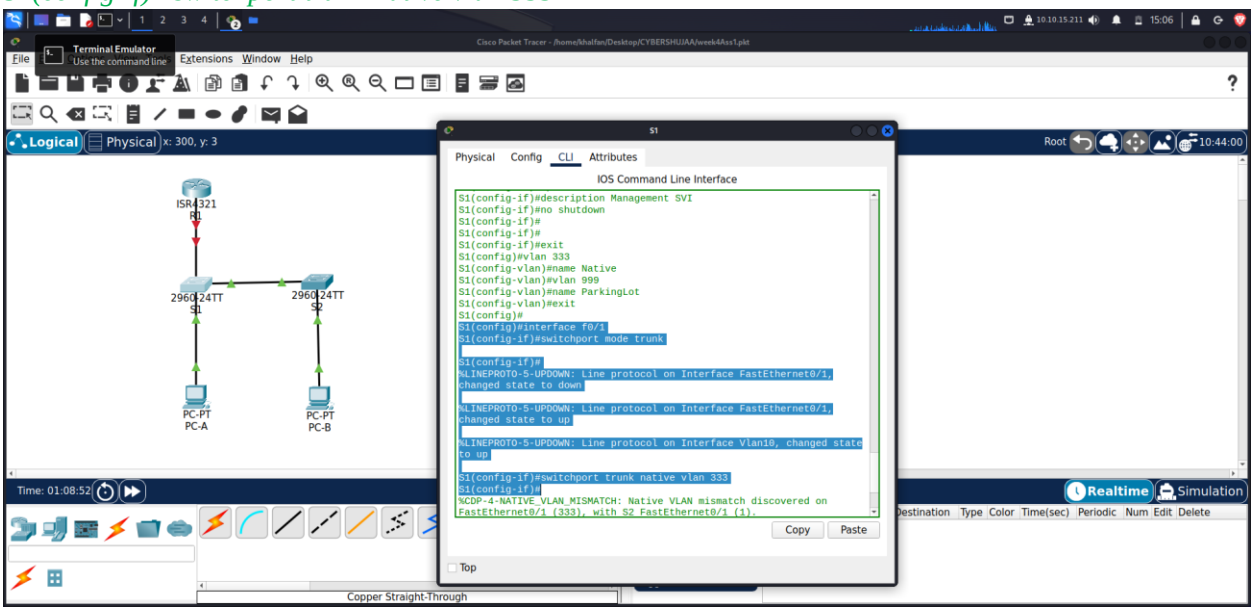


Part 3: Configure Switch Security.

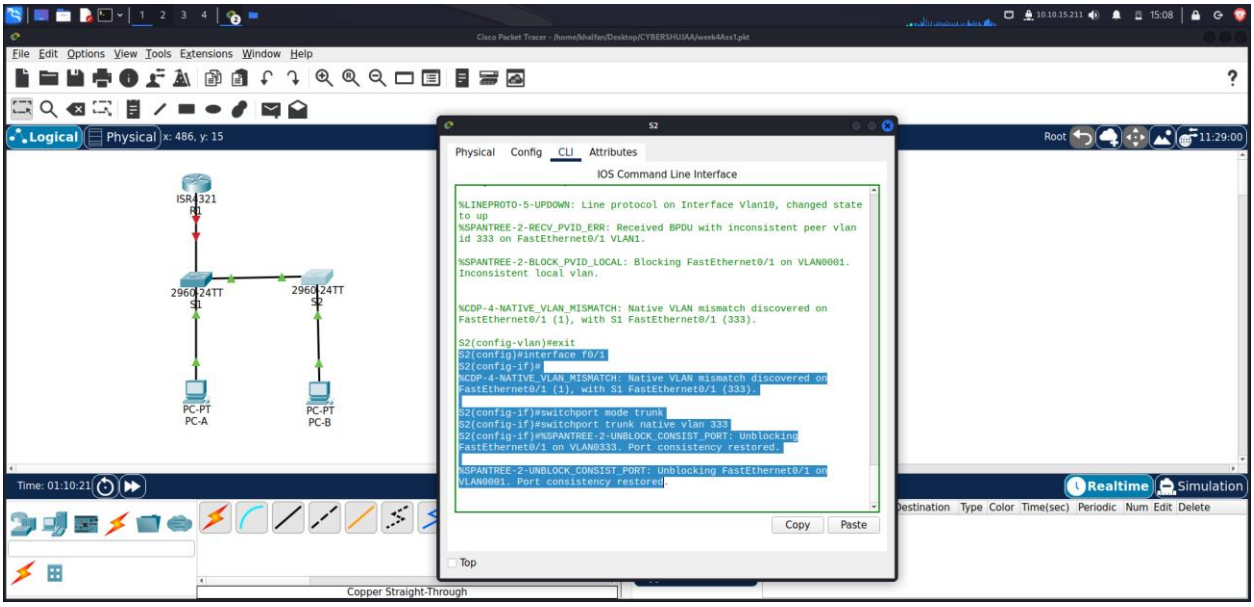
Step 1: Implement 802.1Q trunking.

1. **On both switches, configure trunking on F0/1 to use VLAN 333 as the native VLAN.**

S1(config)# interface f0/1
S1(config-if)# switchport mode trunk
S1(config-if)# switchport trunk native vlan 333



S2(config)# interface f0/1
S2(config-if)# switchport mode trunk
S2(config-if)# switchport trunk native vlan 333



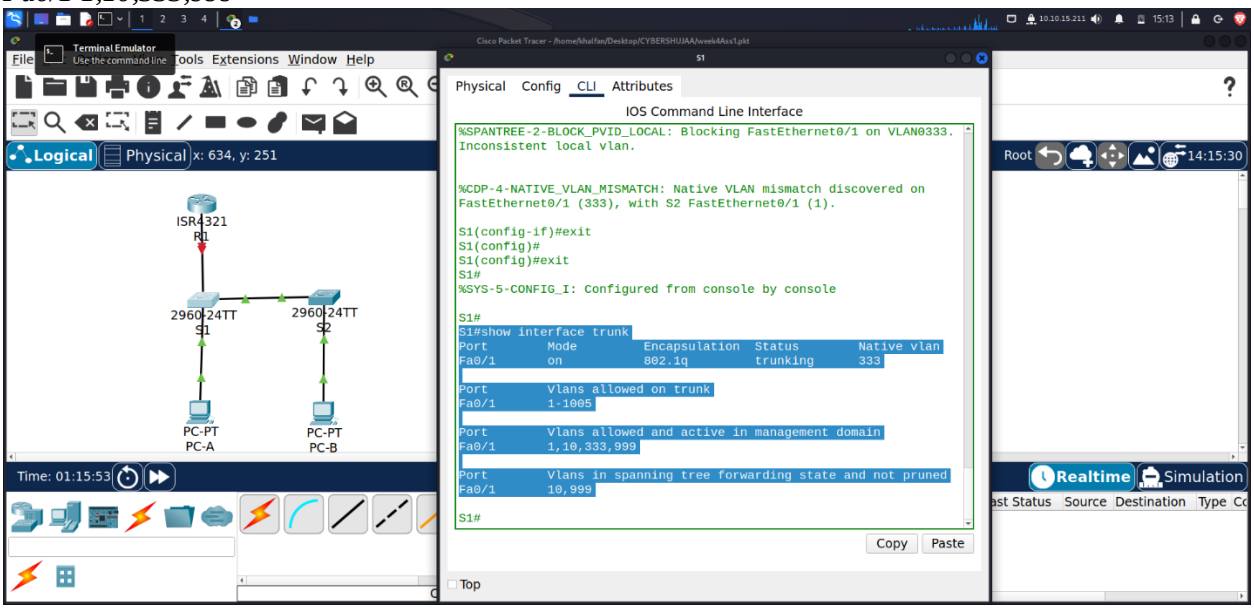
2. Verify that trunking is configured on both switches.

S1# show interface trunk

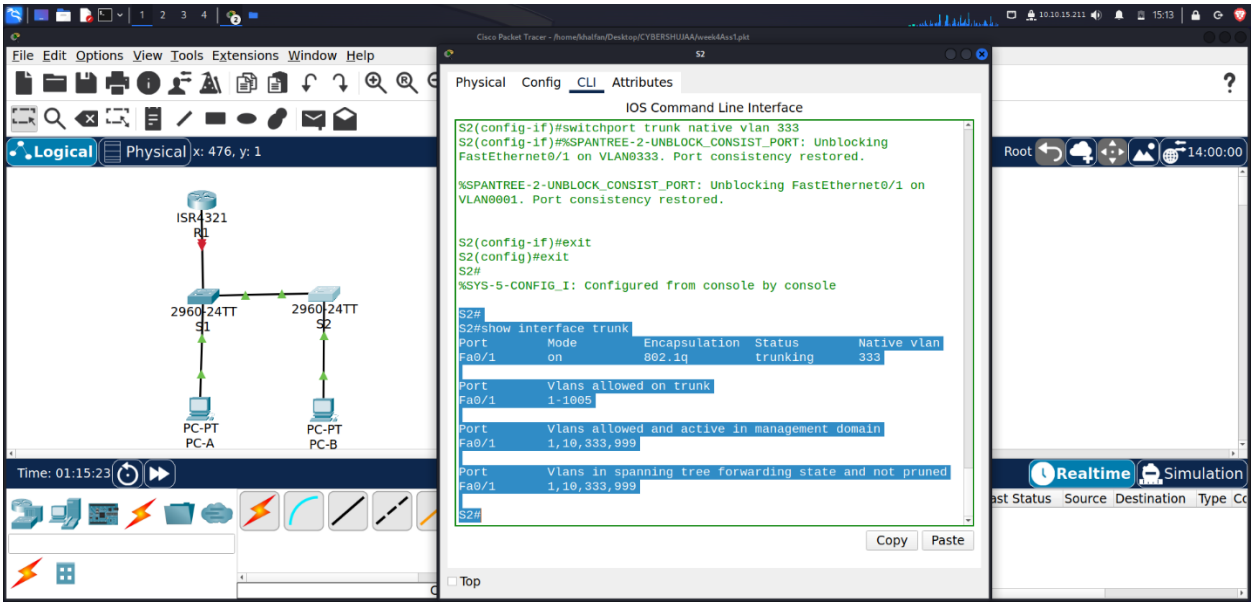
Port	*Mode*	*Encapsulation*	*Status*	*Native vlan*
Fa0/1	*on*	*802.1q*	*trunking*	*333*

Port Vlans allowed on trunk
Fa0/1 1-4094
Port Vlans allowed and active in management domain
Fa0/1 1,10,333,999

Port Vlans in spanning tree forwarding state and not pruned
Fa0/1 1,10,333,999

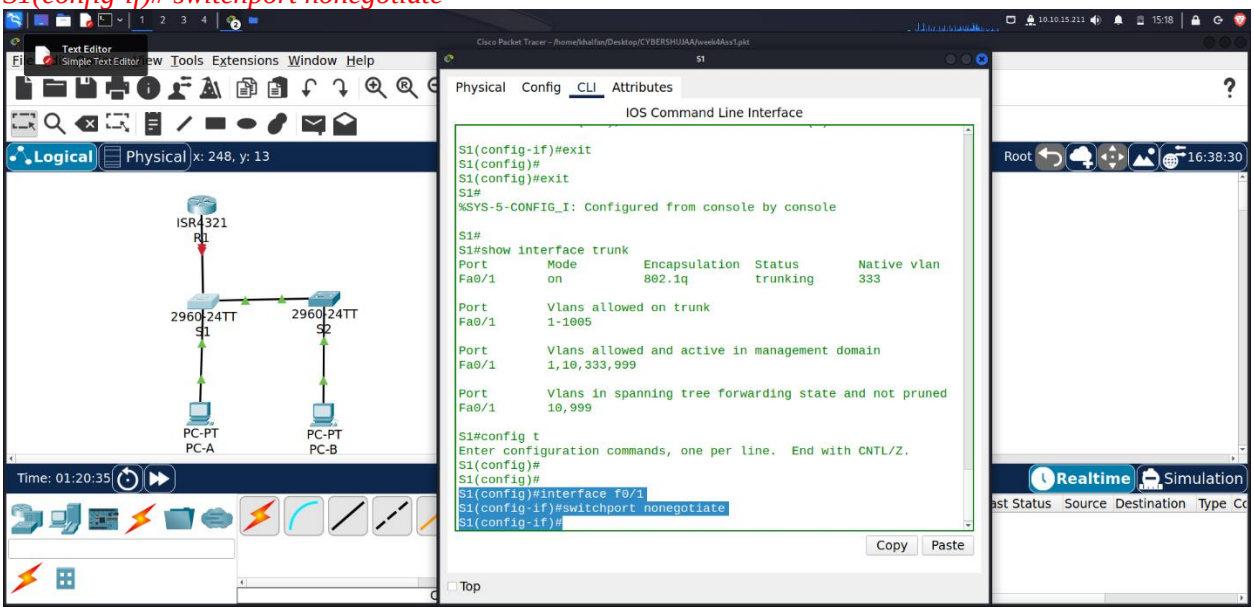


*S2# **show interface trunk***

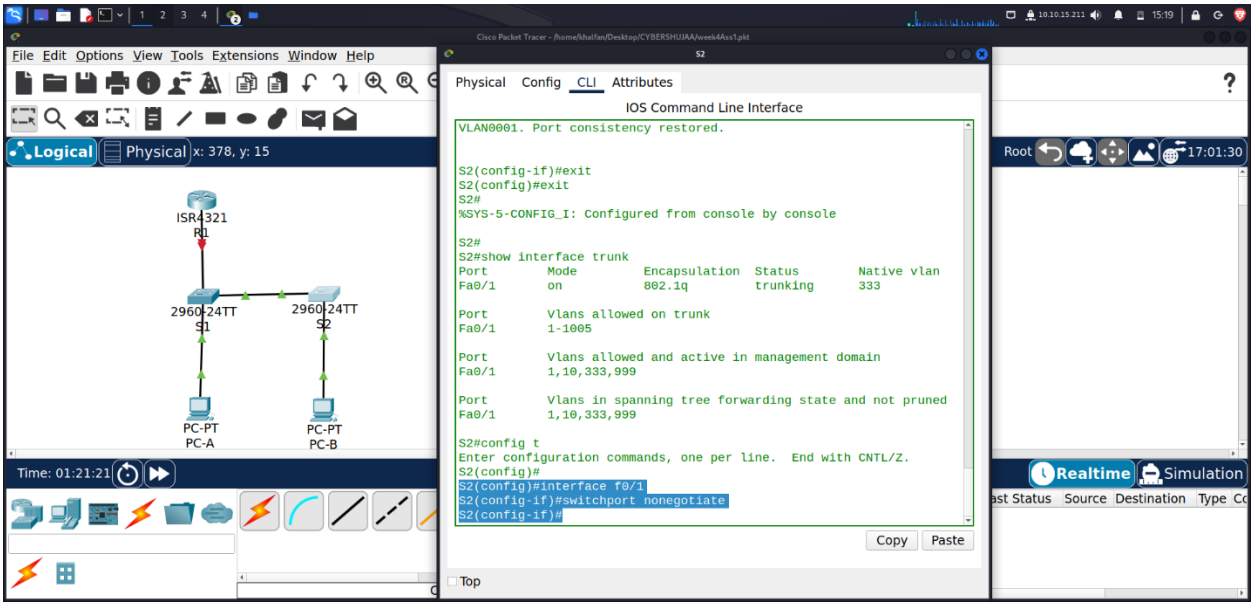


3. Disable DTP negotiation on F0/1 on S1 and S2.

S1(config)# interface f0/1
S1(config-if)# switchport nonegotiate



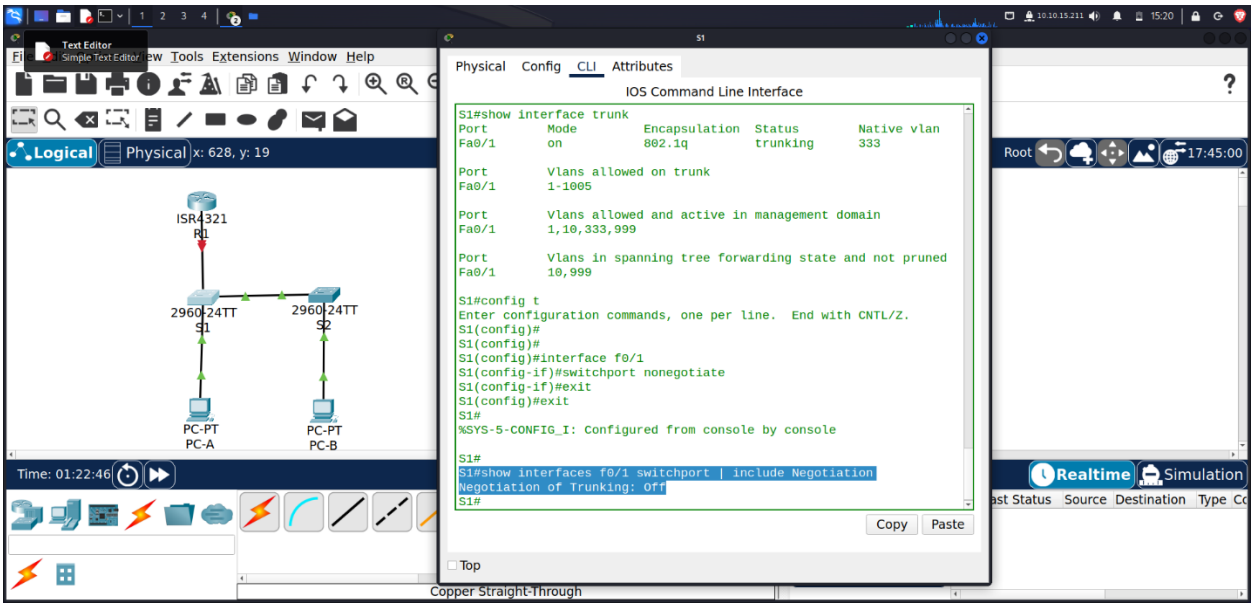
S2(config)# interface f0/1
S2(config-if)# switchport nonegotiate



4. **Verify with the show interfaces command.**

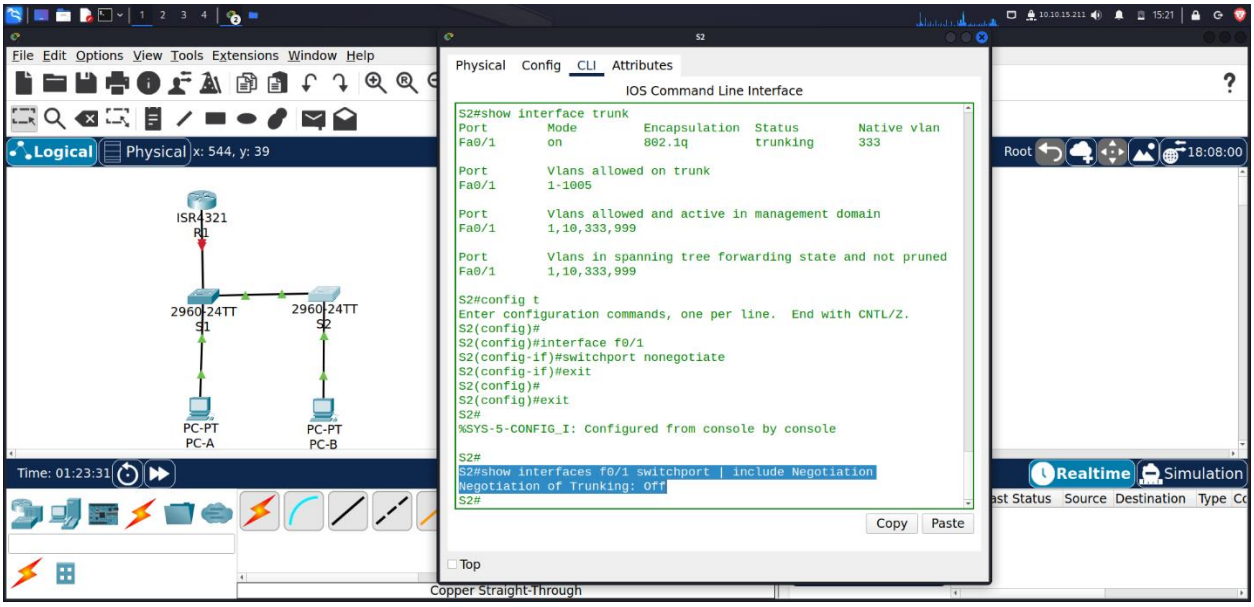
*S1# **show interfaces f0/1 switchport | include Negotiation***

Negotiation of Trunking: Off



*S2# **show interfaces f0/1 switchport | include Negotiation***

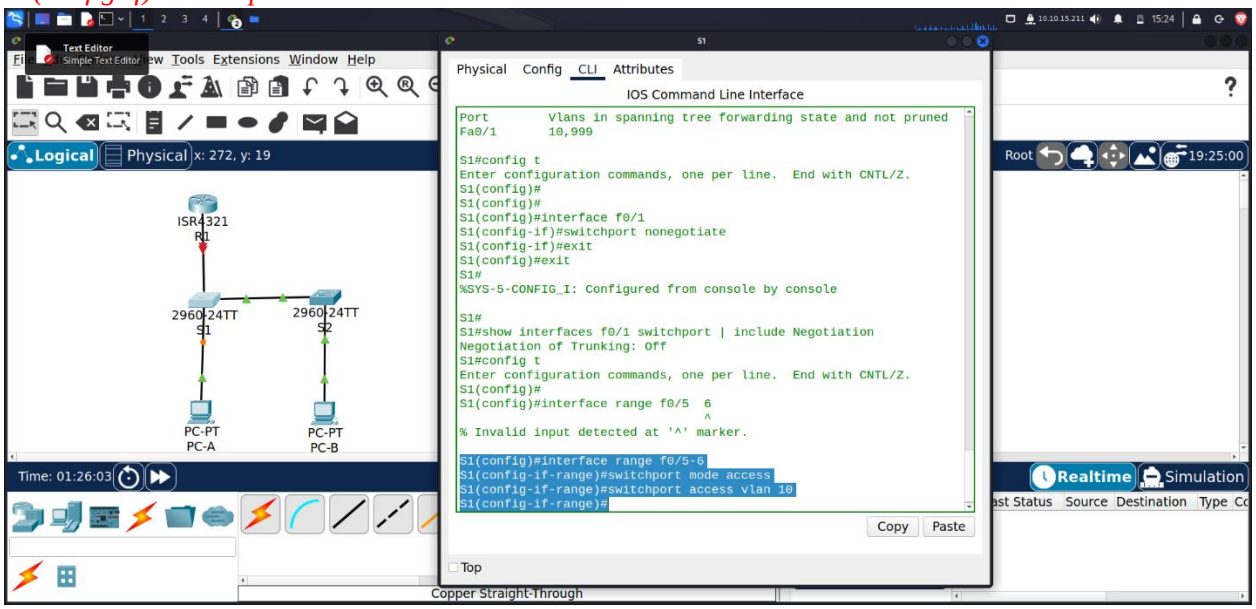
Negotiation of Trunking: Off



Step 2: Configure access ports.

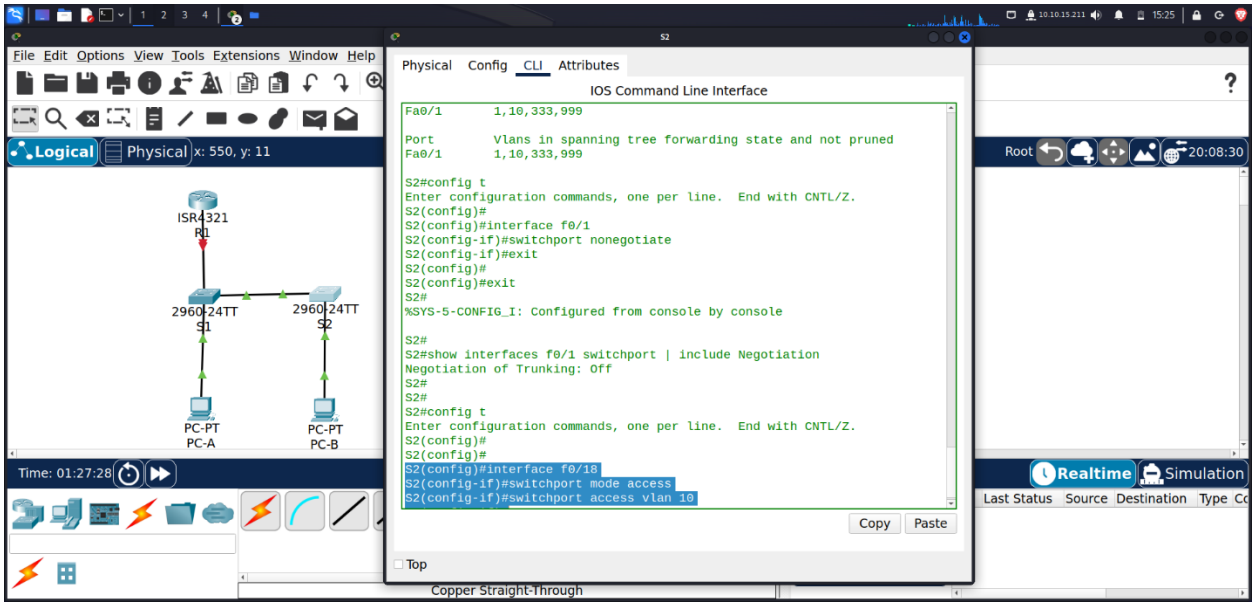
1. **On S1, configure F0/5 and F0/6 as access ports that are associated with VLAN 10.**

   S1(config)# interface range f0/5 – 6
   S1(config-if)# switchport mode access
   S1(config-if)# switchport access vlan 10



2. **On S2, configure F0/18 as an access port that is associated with VLAN 10.**

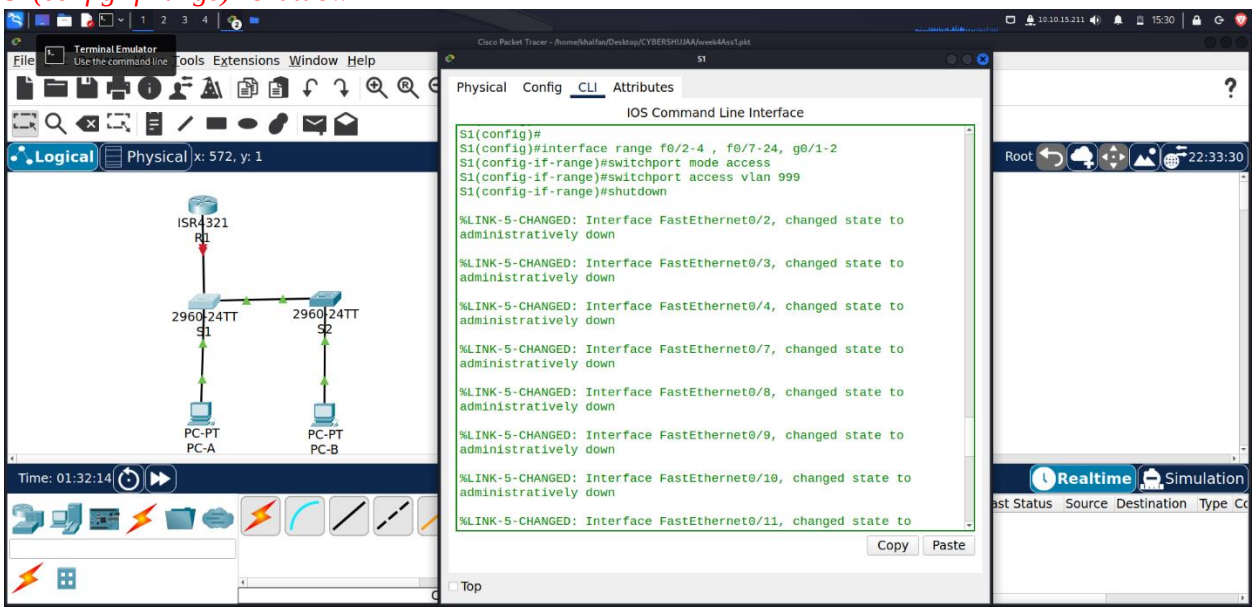
   S2(config)# interface f0/18
   S2(config-if)# switchport mode access
   S2(config-if)# switchport access vlan 10



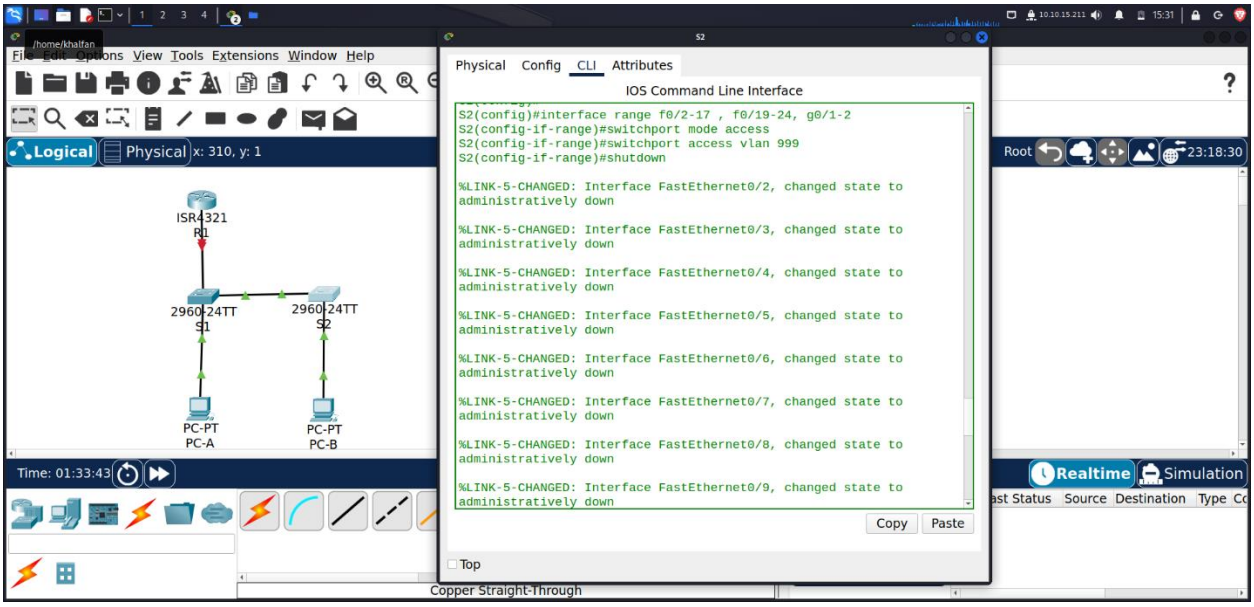
Step 3: Secure and disable unused switchports.

1. **On S1 and S2, move the unused ports from VLAN 1 to VLAN 999 and disable the unused ports.**

S1(config)# interface range f0/2-4 , f0/7-24, g0/1-2
S1(config-if-range)# switchport mode access
S1(config-if-range)# switchport access vlan 999
S1(config-if-range)# shutdown

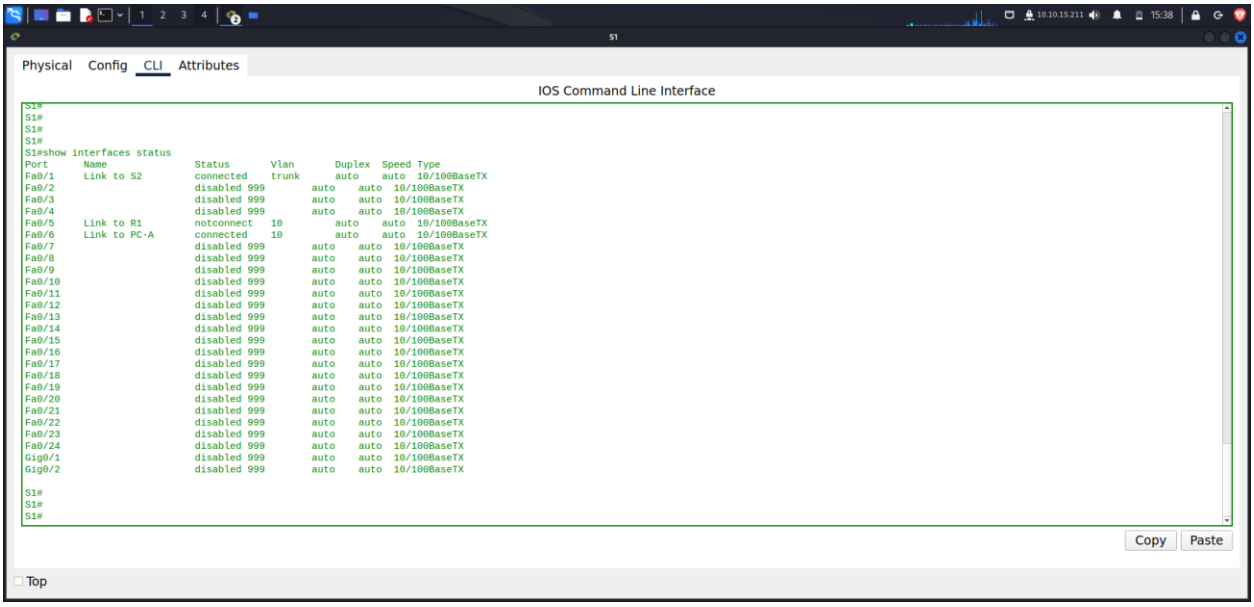


S2(config)# interface range f0/2-17 , f0/19-24, g0/1-2
S2(config-if-range)# switchport mode access
S2(config-if-range)# switchport access vlan 999
S2(config-if-range)# shutdown



2. **Verify that unused ports are disabled and associated with VLAN 999 by issuing the show command.**

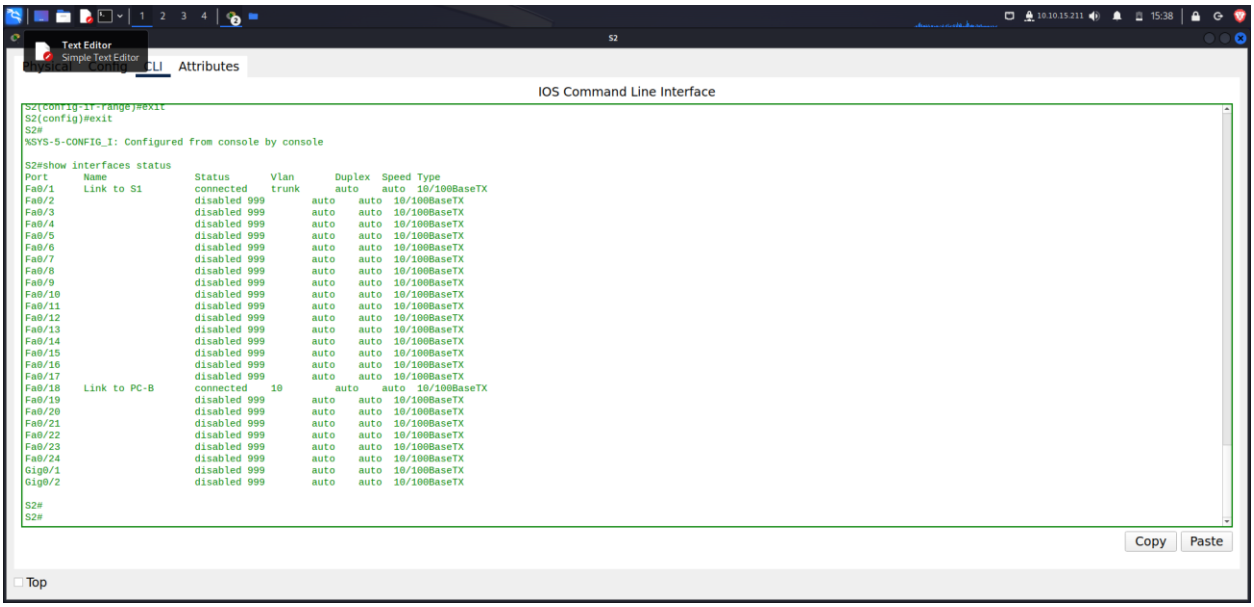
*S1# **show interfaces status***



S1#show interfaces status
Port Name Status Vlan Duplex Speed Type
Fa0/1 Link to S2 connected trunk auto auto 10/100BaseTX
Fa0/2 disabled 999 auto auto 10/100BaseTX
Fa0/3 disabled 999 auto auto 10/100BaseTX
Fa0/4 disabled 999 auto auto 10/100BaseTX
Fa0/5 Link to R1 notconnect 10 auto auto 10/100BaseTX
Fa0/6 Link to PC-A connected 10 auto auto 10/100BaseTX
Fa0/7 disabled 999 auto auto 10/100BaseTX

Fa0/8 disabled 999 auto auto 10/100BaseTX
Fa0/9 disabled 999 auto auto 10/100BaseTX
Fa0/10 disabled 999 auto auto 10/100BaseTX
Fa0/11 disabled 999 auto auto 10/100BaseTX
Fa0/12 disabled 999 auto auto 10/100BaseTX
Fa0/13 disabled 999 auto auto 10/100BaseTX
Fa0/14 disabled 999 auto auto 10/100BaseTX
Fa0/15 disabled 999 auto auto 10/100BaseTX
Fa0/16 disabled 999 auto auto 10/100BaseTX
Fa0/17 disabled 999 auto auto 10/100BaseTX
Fa0/18 disabled 999 auto auto 10/100BaseTX
Fa0/19 disabled 999 auto auto 10/100BaseTX
Fa0/20 disabled 999 auto auto 10/100BaseTX
Fa0/21 disabled 999 auto auto 10/100BaseTX
Fa0/22 disabled 999 auto auto 10/100BaseTX
Fa0/23 disabled 999 auto auto 10/100BaseTX
Fa0/24 disabled 999 auto auto 10/100BaseTX
Gig0/1 disabled 999 auto auto 10/100BaseTX
Gig0/2 disabled 999 auto auto 10/100BaseTX

S2# show interfaces status



S2#show interfaces status
Port Name Status Vlan Duplex Speed Type
Fa0/1 Link to S1 connected trunk auto auto 10/100BaseTX
Fa0/2 disabled 999 auto auto 10/100BaseTX
Fa0/3 disabled 999 auto auto 10/100BaseTX
Fa0/4 disabled 999 auto auto 10/100BaseTX
Fa0/5 disabled 999 auto auto 10/100BaseTX

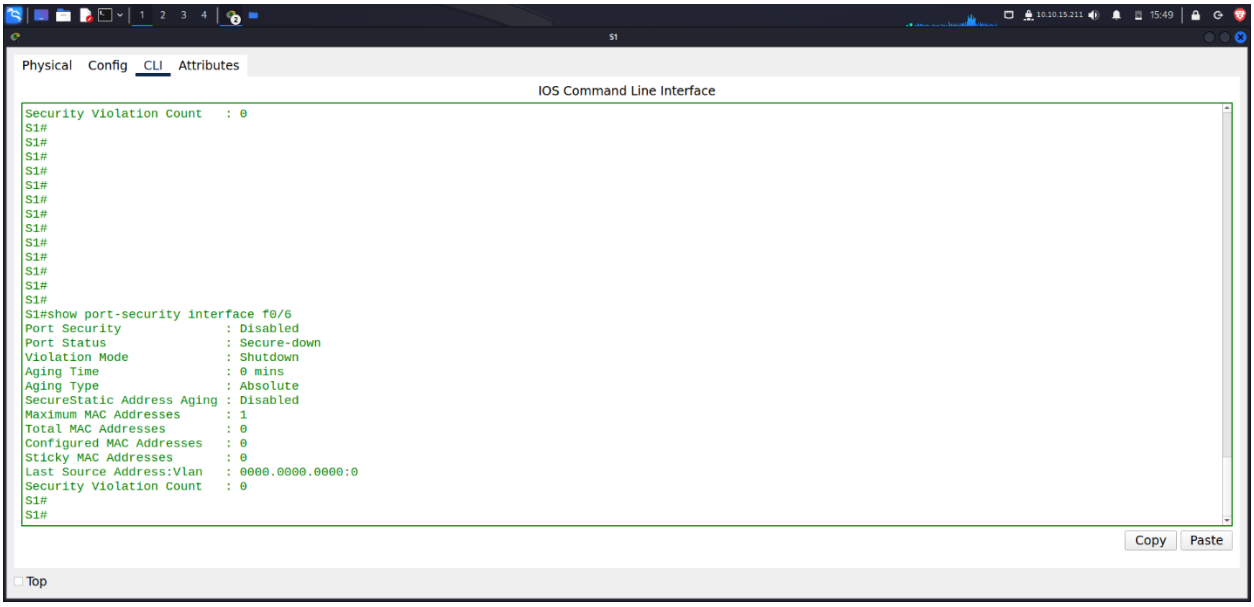
Fa0/6 disabled 999 auto auto 10/100BaseTX
Fa0/7 disabled 999 auto auto 10/100BaseTX
Fa0/8 disabled 999 auto auto 10/100BaseTX
Fa0/9 disabled 999 auto auto 10/100BaseTX
Fa0/10 disabled 999 auto auto 10/100BaseTX
Fa0/11 disabled 999 auto auto 10/100BaseTX
Fa0/12 disabled 999 auto auto 10/100BaseTX
Fa0/13 disabled 999 auto auto 10/100BaseTX
Fa0/14 disabled 999 auto auto 10/100BaseTX
Fa0/15 disabled 999 auto auto 10/100BaseTX
Fa0/16 disabled 999 auto auto 10/100BaseTX
Fa0/17 disabled 999 auto auto 10/100BaseTX
Fa0/18 Link to PC-B connected 10 auto auto 10/100BaseTX
Fa0/19 disabled 999 auto auto 10/100BaseTX
Fa0/20 disabled 999 auto auto 10/100BaseTX
Fa0/21 disabled 999 auto auto 10/100BaseTX
Fa0/22 disabled 999 auto auto 10/100BaseTX
Fa0/23 disabled 999 auto auto 10/100BaseTX
Fa0/24 disabled 999 auto auto 10/100BaseTX
Gig0/1 disabled 999 auto auto 10/100BaseTX
Gig0/2 disabled 999 auto auto 10/100BaseTX

Step 4: Document and implement port security features.

The interfaces F0/6 on S1 and F0/18 on S2 are configured as access ports. In this step, you will also configure port security on these two access ports.

1. On S1, issue the show port-security interface f0/6 command to display the default port security settings for interface F0/6. Record your answers in the table below.

*S1# **show port-security interface f0/6***



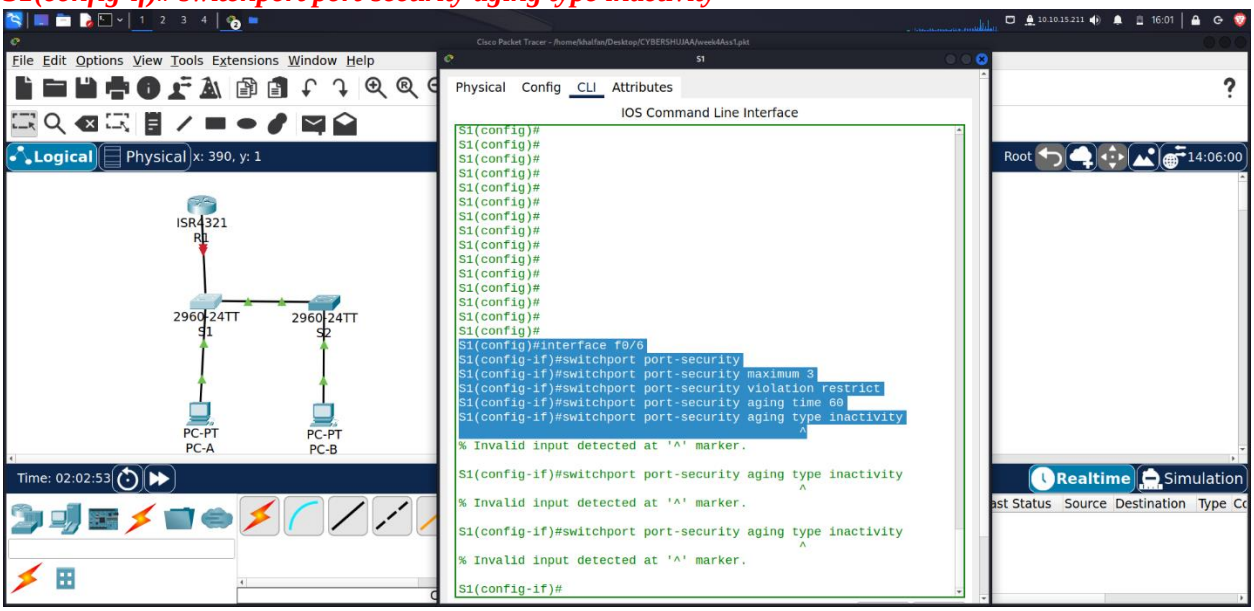
S1#show port-security interface f0/6
Port Security : Disabled
Port Status : Secure-down
Violation Mode : Shutdown
Aging Time : 0 mins
Aging Type : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses : 1
Total MAC Addresses : 0
Configured MAC Addresses : 0
Sticky MAC Addresses : 0
Last Source Address:Vlan : 0000.0000.0000:0
Security Violation Count : 0

Default Port Security Configuration	
Feature	Default Setting
Port Security	Disabled
Maximum number of MAC addresses	1
Violation Mode	Shutdown
Aging Time	0 mins
Aging Type	Absolute
Secure Static Address Aging	Disabled
Sticky MAC Address	0

2. On S1, enable port security on F0/6 with the following settings:

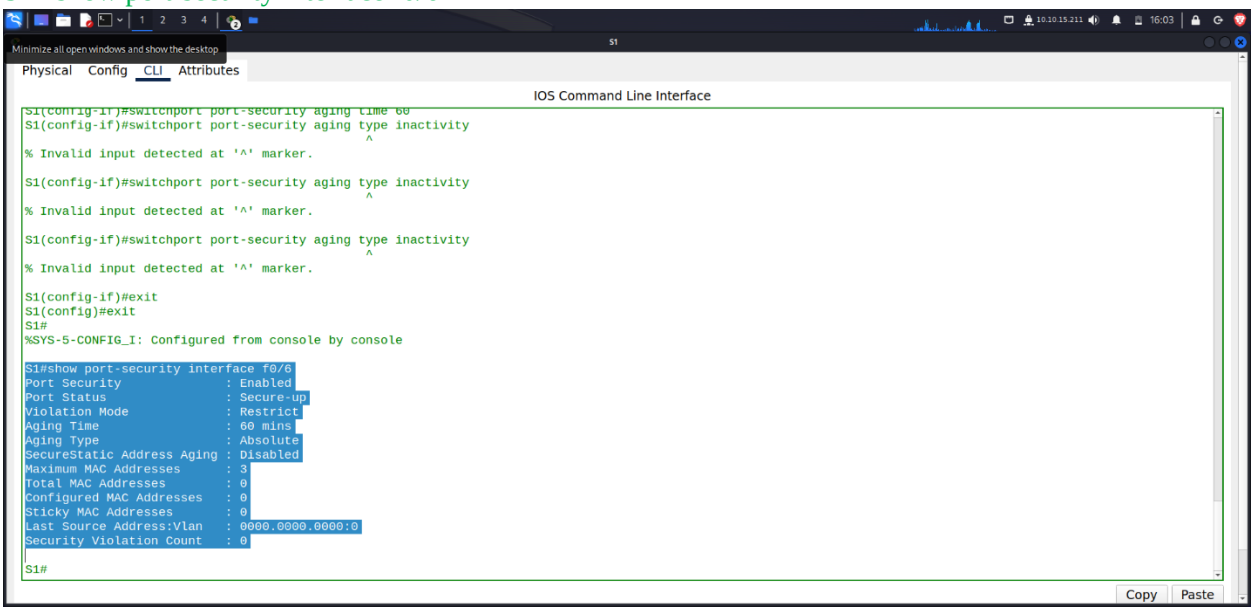
- Maximum number of MAC addresses: 3
- Violation type: restrict
- Aging time: 60 min
- Aging type: inactivity

S1(config)# interface f0/6
S1(config-if)# switchport port-security
S1(config-if)# switchport port-security maximum 3
S1(config-if)# switchport port-security violation restrict
S1(config-if)# switchport port-security aging time 60
S1(config-if)# switchport port-security aging type inactivity

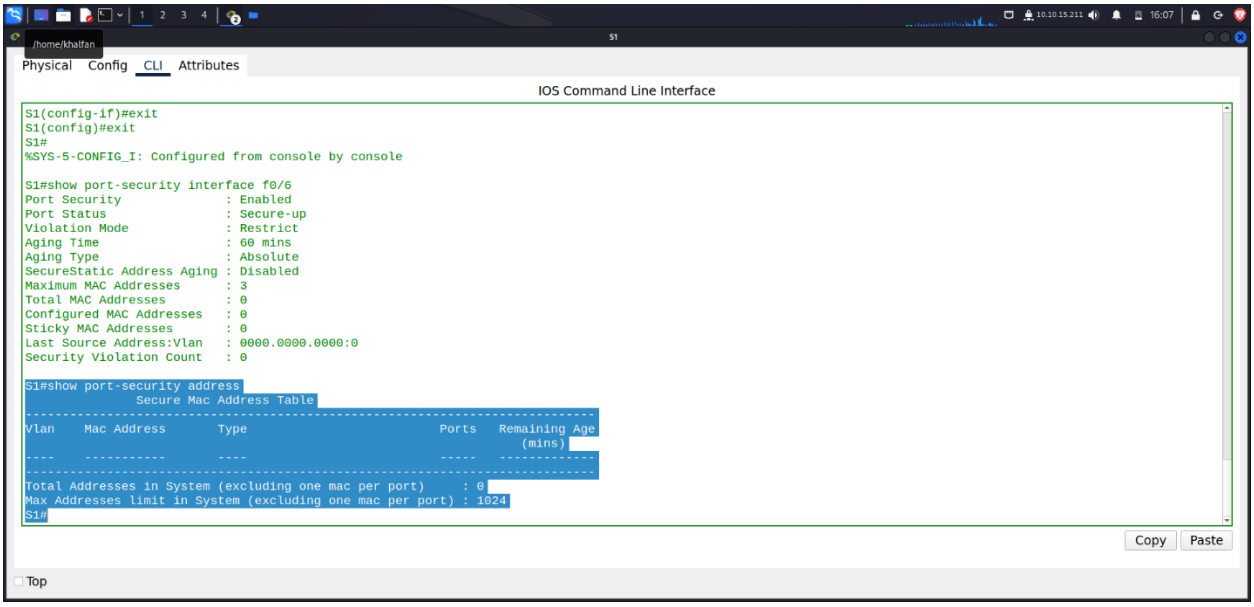


3. Verify port security on S1 F0/6.

S1# show port-security interface f0/6



S1# show port-security address

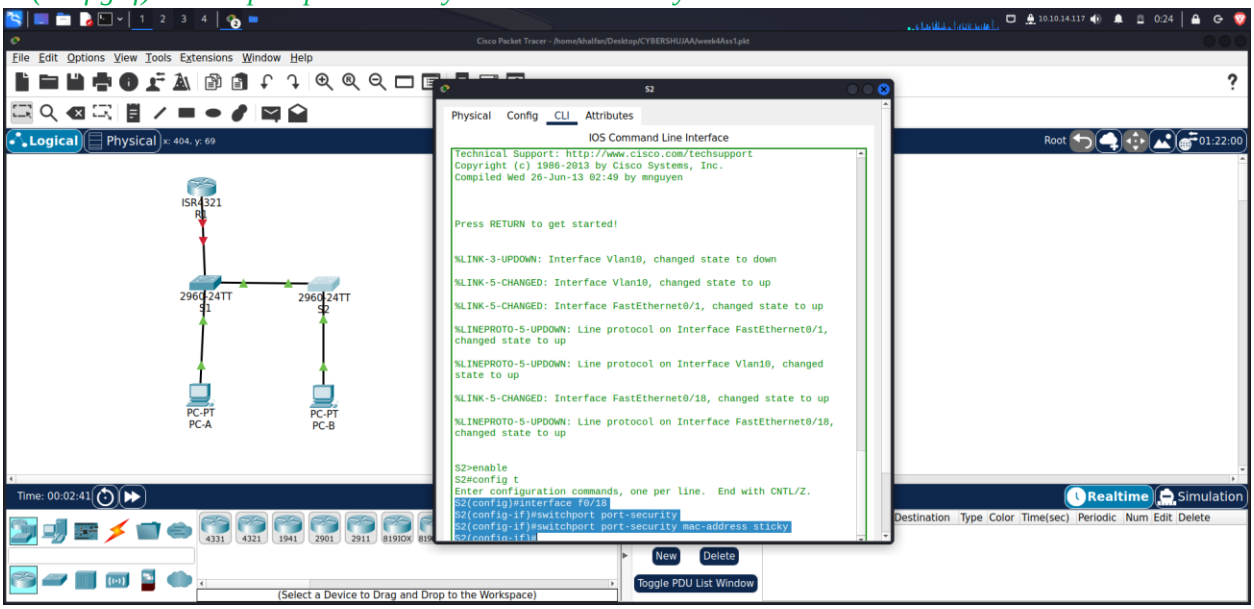


4. Enable port security for F0/18 on S2. Configure the port to add MAC addresses learned on the port automatically to the running configuration.

S2(config)# interface f0/18

S2(config-if)# switchport port-security

S2(config-if)# switchport port-security mac-address sticky



5. Configure the following port security settings on S2 F/18:

• Maximum number of MAC addresses: 2

• Violation type: Protect

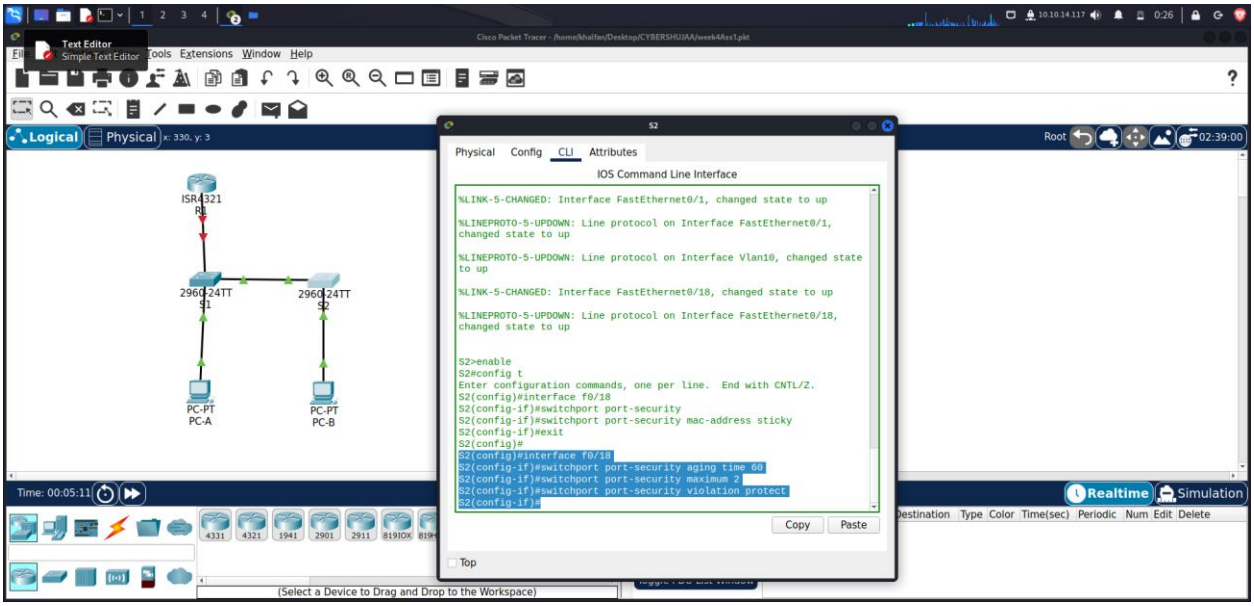
• Aging time: 60 min

S2(config)# interface f0/18

S2(config-if)# switchport port-security aging time 60

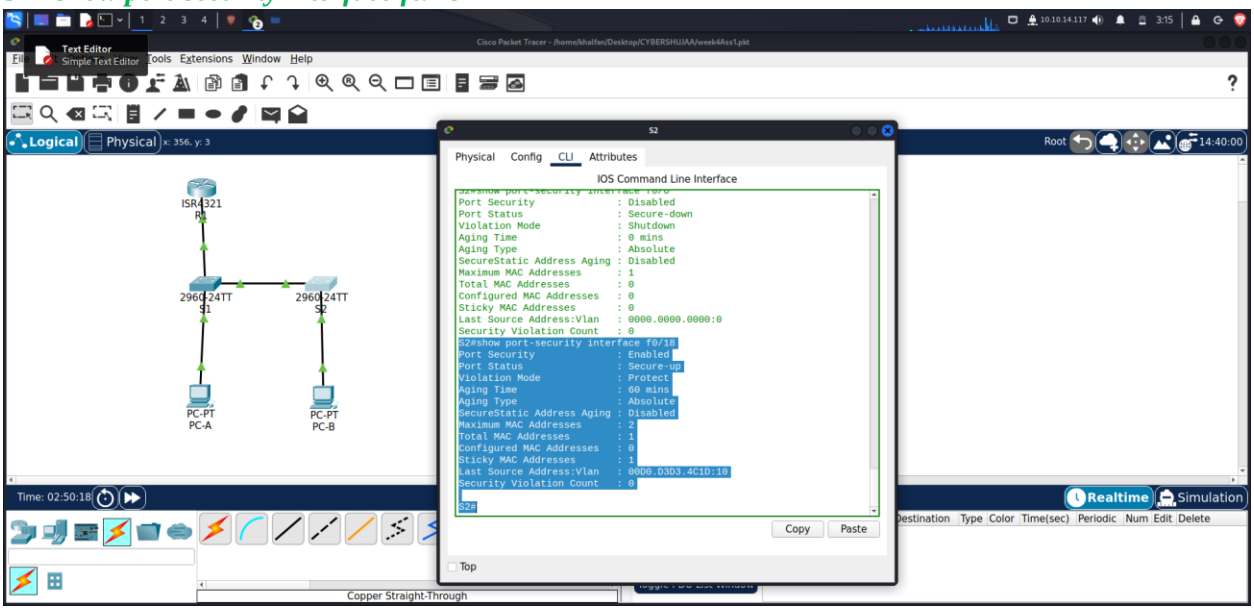
S2(config-if)# switchport port-security maximum 2

S2(config-if)# switchport port-security violation protect



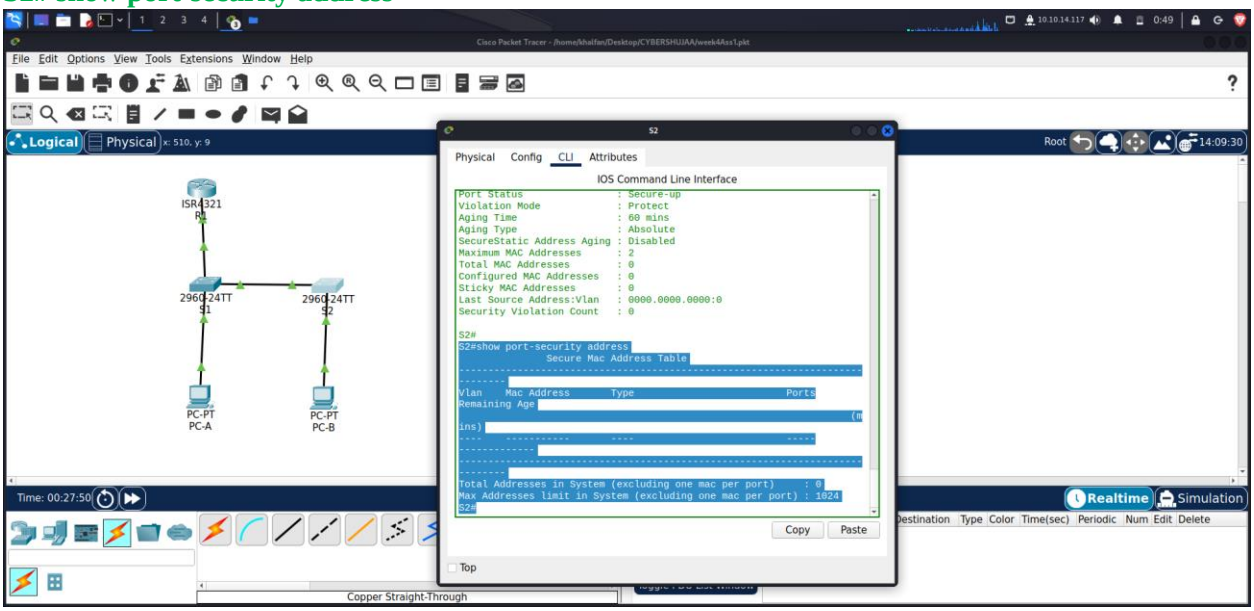
6. Verify port security on S2 F0/18.

S2# show port-security interface f0/18

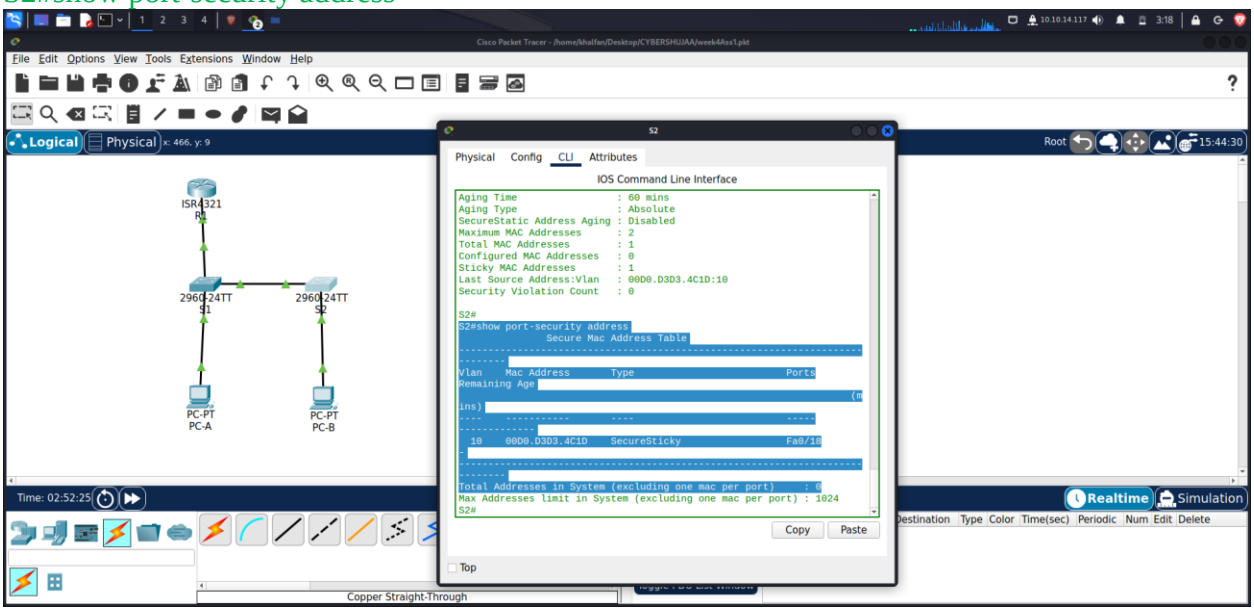


Port Security : Enabled
Port Status : Secure-up
Violation Mode : Protect
Aging Time : 60 mins
Aging Type : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses : 2
Total MAC Addresses : 1
Configured MAC Addresses : 0
Sticky MAC Addresses : 0
Last Source Address:Vlan : 0022.5646.3413:10
Security Violation Count : 0

S2# show port-security address



S2#show port-security address



Secure Mac Address Table

Vlan Mac Address Type Ports Remaining Age
(mins)

---- ----------- ---- ----- -------------

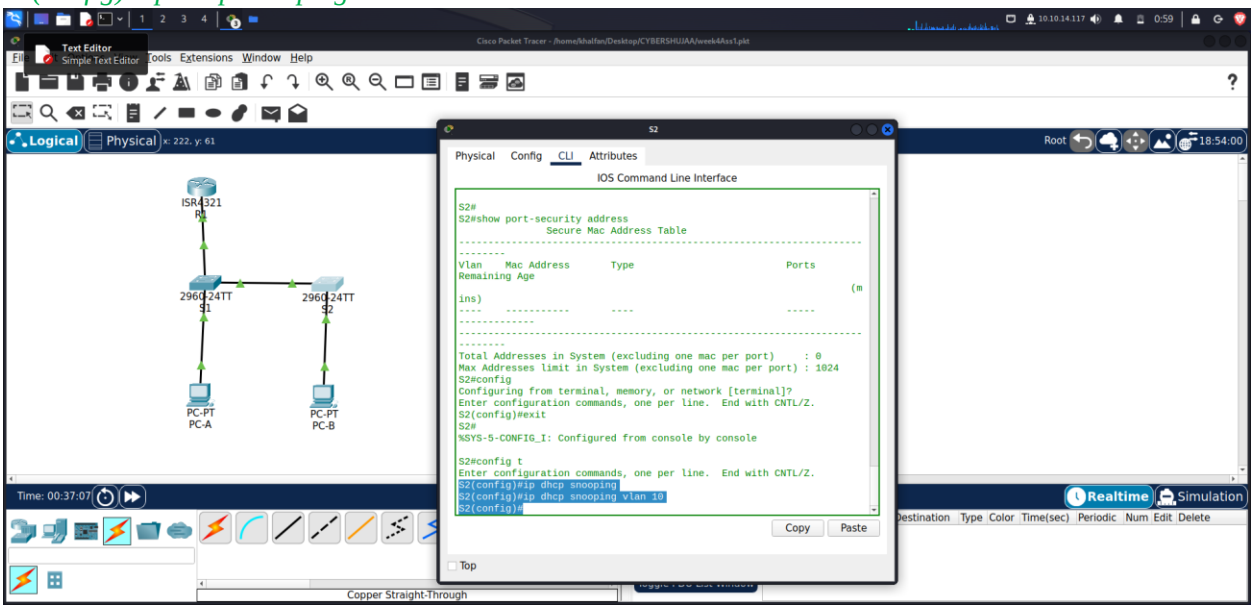
Total Addresses in System (excluding one mac per port) : 0
Max Addresses limit in System (excluding one mac per port) : 1024
S2#

Step 5: Implement DHCP snooping security.

1. **On S2, enable DHCP snooping and configure DHCP snooping on VLAN 10**.

S2(config)# ip dhcp snooping

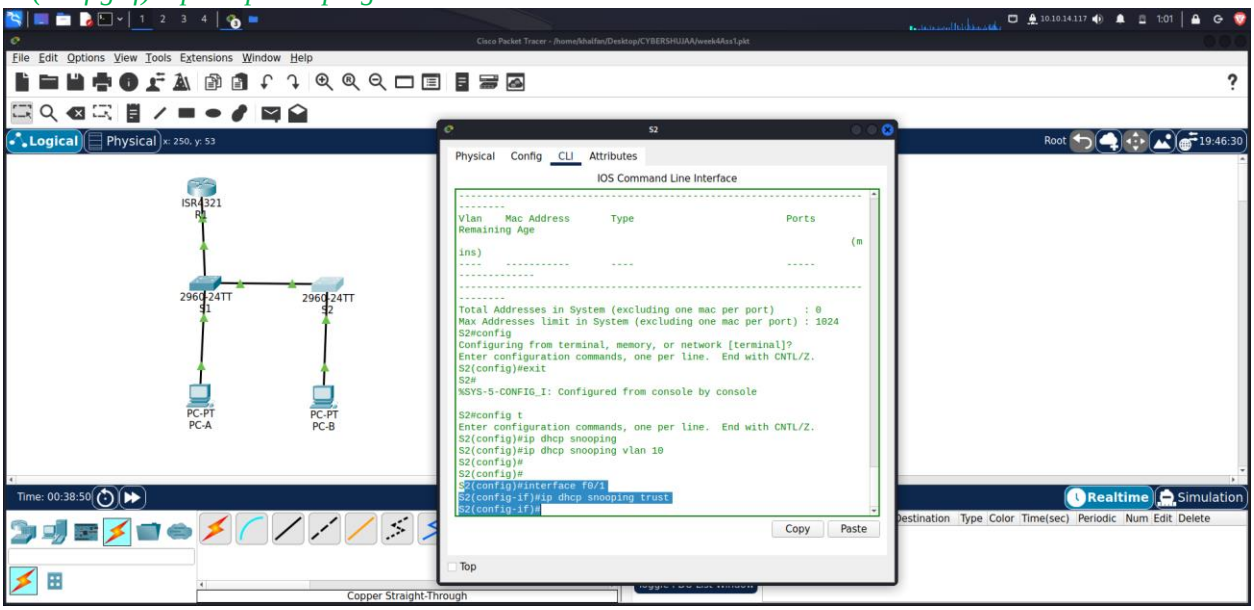
S2(config)# ip dhcp snooping vlan 10



2. **Configure the trunk port on S2 as a trusted port.**

S2(config)# interface f0/1

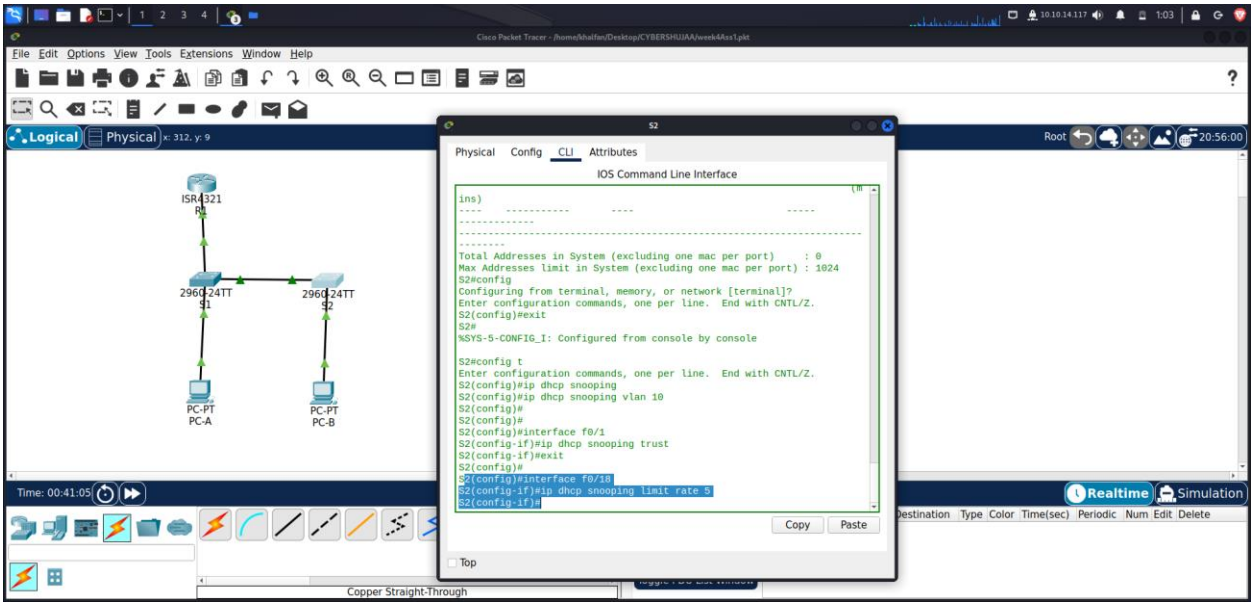
S2(config-if)# ip dhcp snooping trust



3. **Limit the untrusted port, F18 on S2, to five DHCP packets per second.**

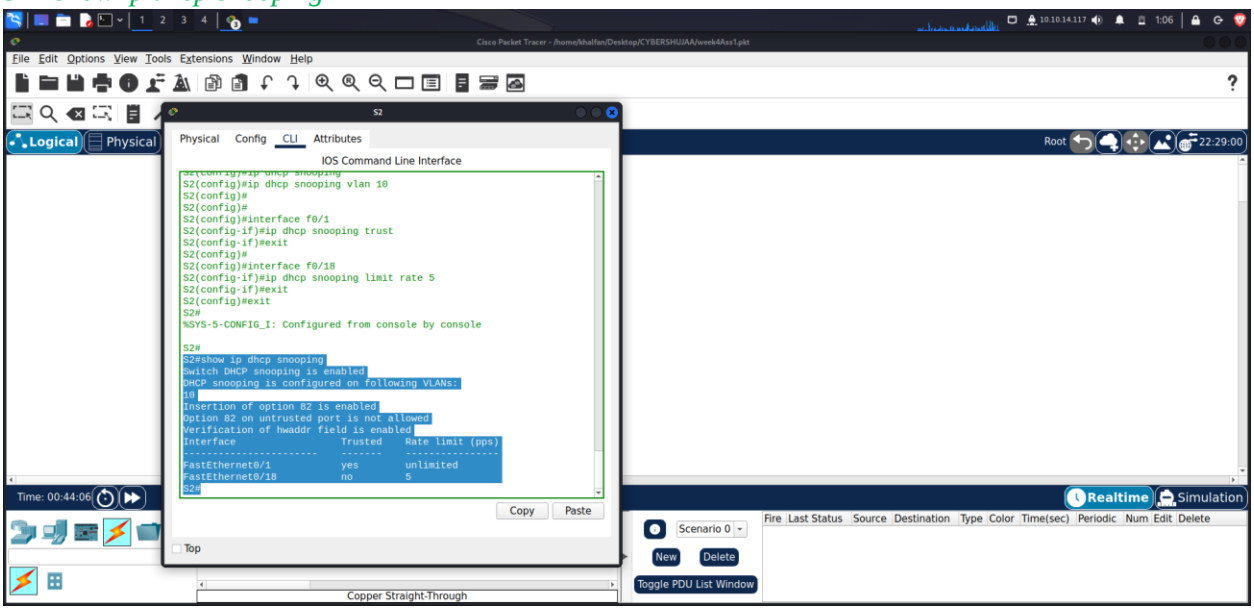
S2(config)# interface f0/18

S2(config-if)# ip dhcp snooping limit rate 5



4. Verify DHCP Snooping on S2.

S2# show ip dhcp snooping

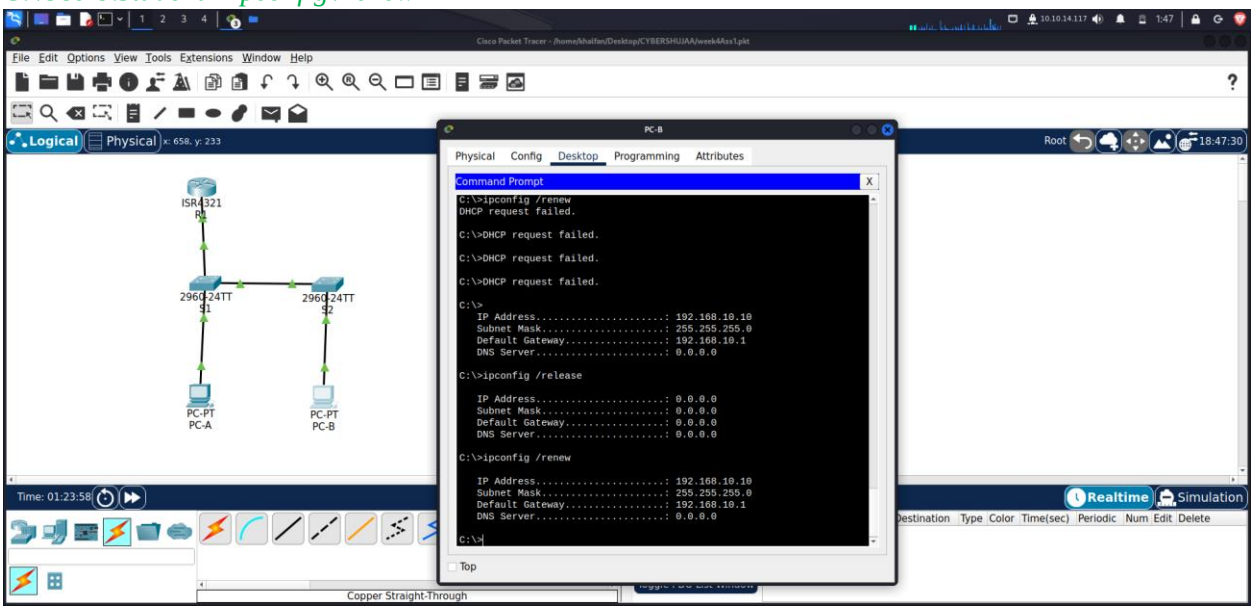


Switch DHCP snooping is enabled
DHCP snooping is configured on following VLANs:
10
DHCP snooping is operational on following VLANs:
10
DHCP snooping is configured on the following L3 Interfaces:
Insertion of option 82 is enabled
circuit-id default format: vlan-mod-port
remote-id: 0cd9.96d2.3f80 (MAC)
Option 82 on untrusted port is not allowed
Verification of hwaddr field is enabled
Verification of giaddr field is enabled

DHCP snooping trust/rate is configured on the following Interfaces:
Interface Trusted Allow option Rate limit (pps)
_____ _____ _____ _____
FastEthernet0/1 yes yes unlimited
Custom circuit-ids:
FastEthernet0/18 no no 5
Custom circuit-ids:

5. From the command prompt on PC-B, release and then renew the IP address.

C:\Users\Student> ipconfig /release
C:\Users\Student> ipconfig /renew



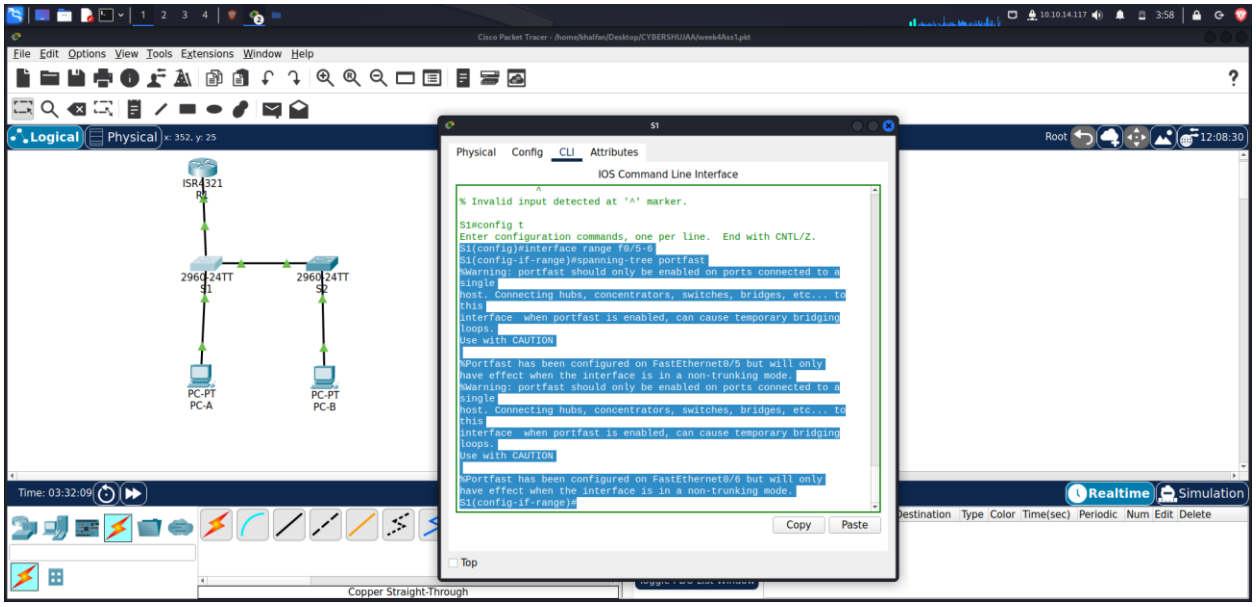
6. Verify the DHCP snooping binding using the show ip dhcp snooping binding command.

S2# show ip dhcp snooping binding
MacAddress IpAddress Lease(sec) Type VLAN Interface
_____ _____ _____ _____ ____ _____

00:50:56:90:D0:8E 192.168.10.11 86213 dhcp-
snooping 10 FastEthernet0/18
USER
Total number of bindings: 1

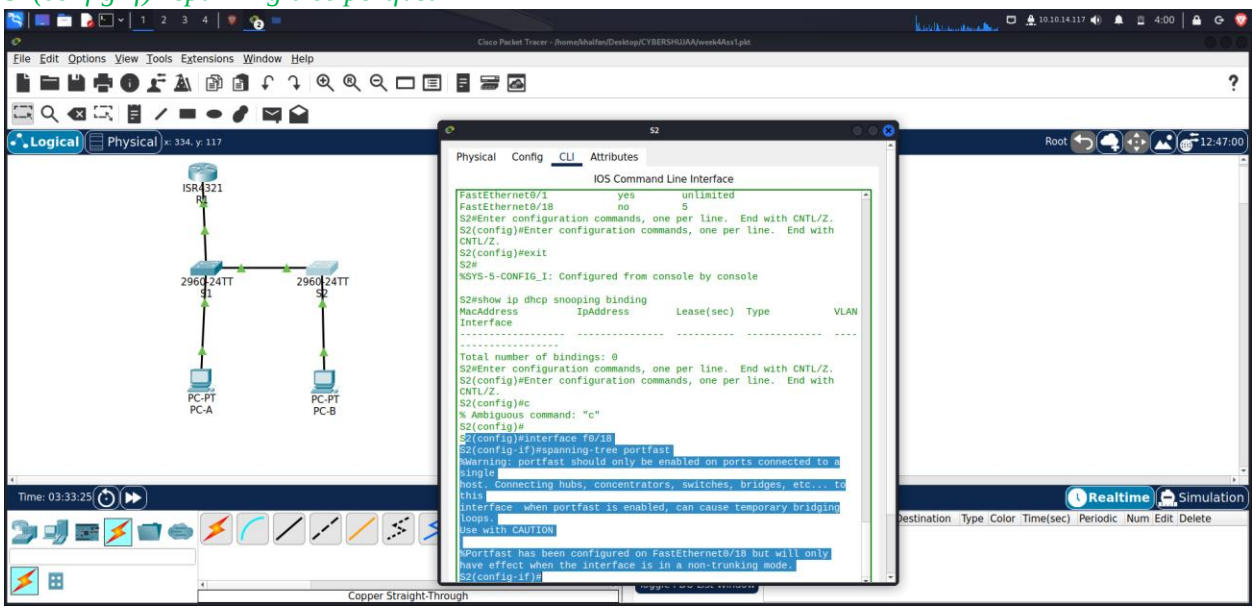
Step 6: Implement PortFast and BPDU guard.

1. **Configure PortFast on all the access ports that are in use on both switches.**
   S1(config)# interface range f0/5 – 6
   S1(config-if)# spanning-tree portfast



S2(config)# interface f0/18

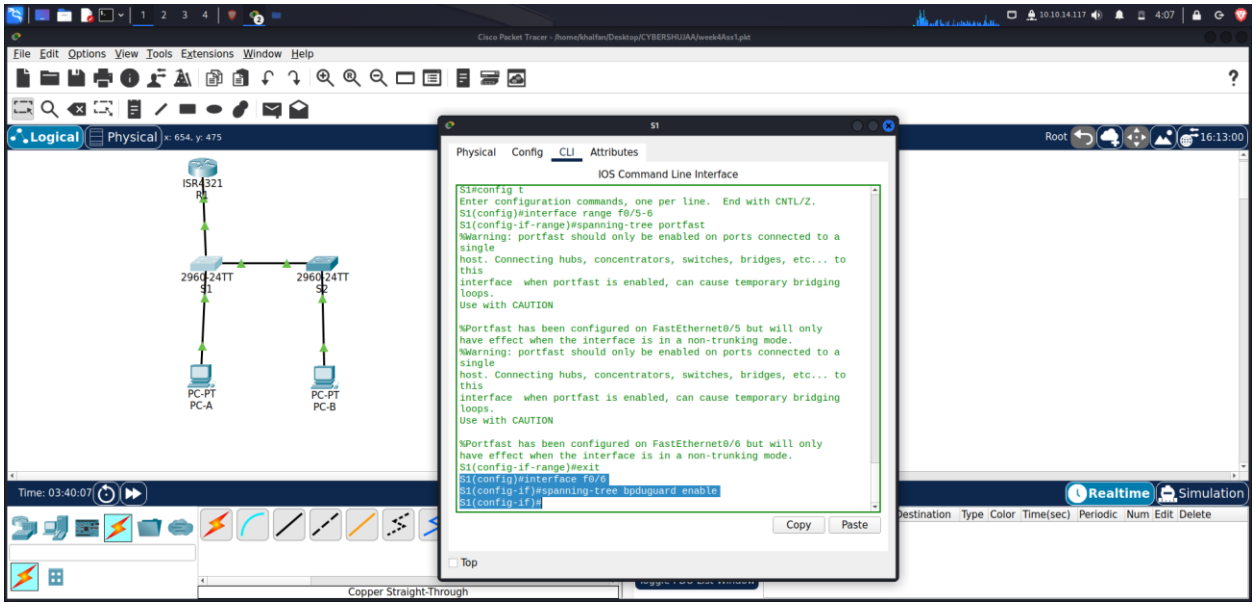
S2(config-if)# spanning-tree portfast



2. **Enable BPDU guard on S1 and S2 VLAN 10 access ports connected to PC-A and PC-B.**

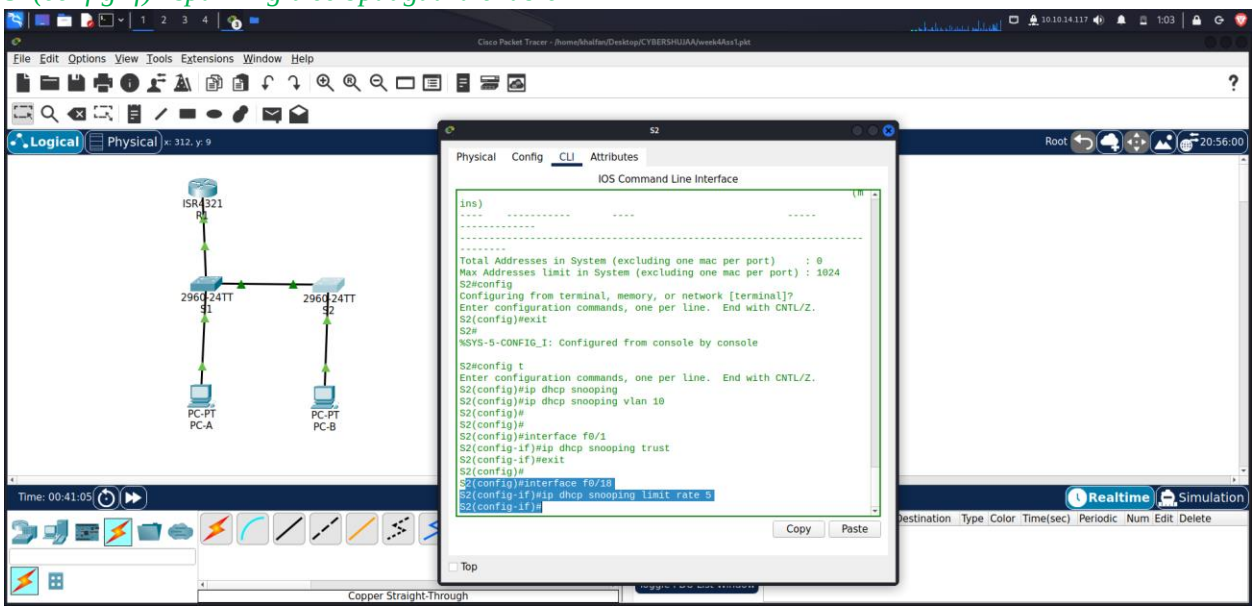
   S1(config)# interface f0/6

   S1(config-if)# spanning-tree bpduguard enable



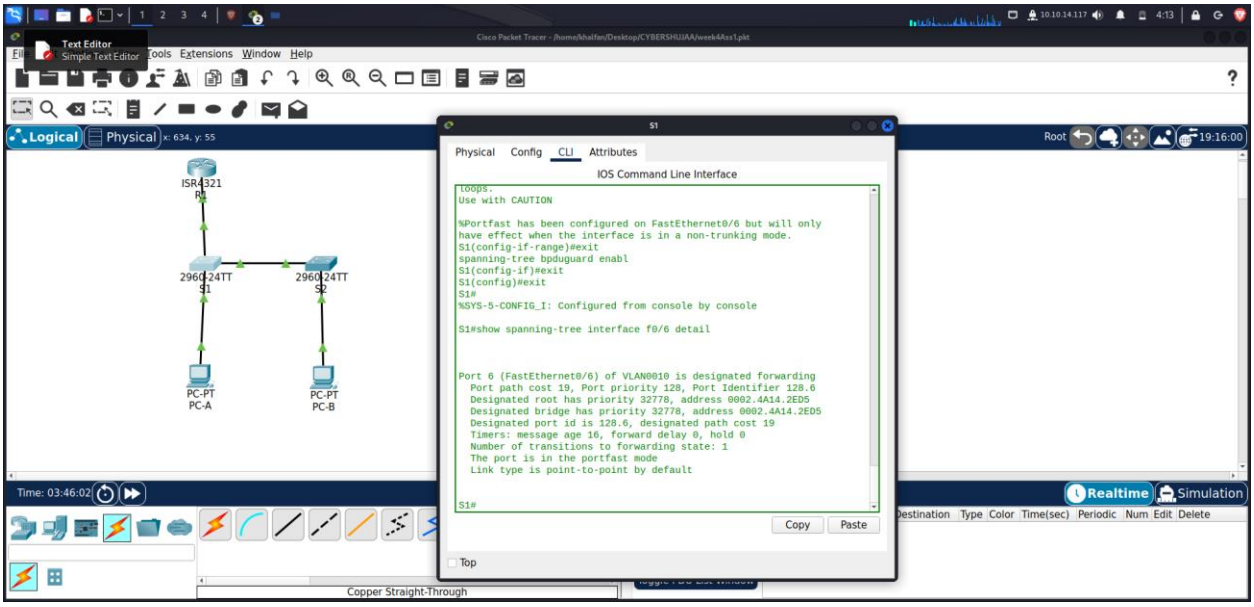
S2(config)# interface f0/18

S2(config-if)# spanning-tree bpduguard enable



3. Verify that BPDU guard and PortFast are enabled on the appropriate ports.

S1# show spanning-tree interface f0/6 detail



Port 6 (FastEthernet0/6) of VLAN0010 is designated forwarding
Port path cost 19, Port priority 128, Port Identifier 128.6
Designated root has priority 32778, address 0002.4A14.2ED5
Designated bridge has priority 32778, address 0002.4A14.2ED5
Designated port id is 128.6, designated path cost 19
Timers: message age 16, forward delay 0, hold 0
Number of transitions to forwarding state: 1
The port is in the portfast mode
Link type is point-to-point by default

Step 7: Verify end-to-end connectivity.

Verify PING connectivity between all devices in the IP Addressing Table. If the pings fail, you may need to disable the firewall on the PC hosts.

Close configuration window

Questions to answer

1. **In reference to Port Security on S2, why is there no timer value for the remaining age in minutes when sticky learning was configured?**

This switch does not support the port security aging of sticky secure addresses.

2. **In reference to Port Security on S2, if you load the running-config script on S2, why will PC-B on port 18 never get an IP address via DHCP?**

We set Port security for only two MAC addresses and port 18 has two "sticky" MAC address bound to the port. Additionally, the violation is protect, which will never send a console/syslog message or increment the violation counter.

3. **In reference to Port Security, what is the difference between the absolute aging type and inactivity aging type?**

If the inactivity type is set, then the secure addresses on the port will be removed only if there

is no data traffic from the secure source addresses for the specified time period.
If the absolute type is set, then all secure addresses on this port age out exactly after the time specified ends.

Device Configurations

Switch S1

```
S1# show running-config
Building configuration...
Current configuration : 5203 bytes
!
version 15.0
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname S1
!
no ip domain-lookup
!

spanning-tree mode pvst
!
vlan 10
name Management
!
vlan 333
name Native
!
vlan 999
name ParkingLot
!
interface FastEthernet0/1
description Link to S2
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport mode trunk
switchport nonegotiate
!
interface FastEthernet0/2
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/3
switchport access vlan 999
switchport mode access
```

```
shutdown
!
interface FastEthernet0/4
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/5
description Link to R1
switchport access vlan 10
switchport mode access
spanning-tree portfast
!
interface FastEthernet0/6
description Link to PC-A
switchport access vlan 10
switchport mode access
switchport port-security maximum 3
switchport port-security violation restrict
switchport port-security aging time 60
switchport port-security aging type inactivity
switchport port-security
spanning-tree portfast
spanning-tree bpduguard enable
!
interface FastEthernet0/7
switchport access vlan 999
switchport mode access
shutdown

!
interface FastEthernet0/8
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/9
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/10
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/11
```

switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/12
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/13
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/14
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/15
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/16
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/17
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/18
switchport access vlan 999
switchport mode access
shutdown

!
interface FastEthernet0/19
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/20
switchport access vlan 999

```
switchport mode access
shutdown
!
interface FastEthernet0/21
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/22
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/23
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/24
switchport access vlan 999
switchport mode access
shutdown
!
interface GigabitEthernet0/1
switchport access vlan 999
switchport mode access
shutdown
!
interface GigabitEthernet0/2
switchport access vlan 999
switchport mode access
shutdown
!
interface Vlan1
no ip address
!
interface Vlan10
description Management SVI
ip address 192.168.10.201 255.255.255.0
!
ip default-gateway 192.168.10.1
line con 0
exec-timeout 0 0
logging synchronous
line vty 0 4
login
```

```
line vty 5 15
login
!
end
Switch S2
S2# show running-config
Building configuration...
Current configuration : 5303 bytes
!
version 15.0
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname S2
!
ip dhcp snooping vlan 10
ip dhcp snooping
no ip domain-lookup
!
spanning-tree mode pvst
!
vlan 10
name Students
!
vlan 333
name Native
!
vlan 999
name ParkingLot
!
interface FastEthernet0/1
description Link to S1
switchport trunk native vlan 333
switchport mode trunk
switchport nonegotiate
ip dhcp snooping trust
!
interface FastEthernet0/2
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/3
switchport access vlan 999
switchport mode access
```

```
shutdown
!
interface FastEthernet0/4
switchport access vlan 999
switchport mode access
shutdown

!
interface FastEthernet0/5
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/6
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/7
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/8
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/9
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/10
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/11
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/12
switchport access vlan 999
switchport mode access
shutdown
```

```
!
interface FastEthernet0/13
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/14
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/15
switchport access vlan 999
switchport mode access
shutdown

!
interface FastEthernet0/16
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/17
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/18
description Link to PC-B
switchport access vlan 10
switchport mode access
switchport port-security maximum 2
switchport port-security violation protect
switchport port-security mac-address sticky
switchport port-security aging time 60
switchport port-security
spanning-tree portfast
spanning-tree bpduguard enable
ip dhcp snooping limit rate 5
!
interface FastEthernet0/19
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/20
switchport access vlan 999
```

```
switchport mode access
shutdown
!
interface FastEthernet0/21
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/22
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/23
switchport access vlan 999
switchport mode access
shutdown
!
interface FastEthernet0/24
switchport access vlan 999
switchport mode access
shutdown
!
interface GigabitEthernet0/1

switchport access vlan 999
switchport mode access
shutdown
!
interface GigabitEthernet0/2
switchport access vlan 999
switchport mode access
shutdown
!
interface Vlan1
no ip address
!
interface Vlan10
description Management SVI
ip address 192.168.10.202 255.255.255.0
!
ip default-gateway 192.168.10.1
!
line con 0
exec-timeout 0 0
logging synchronous
line vty 0 4
```

login
line vty 5 15
login
!
End

Conclusion

The completion of this Packet Tracer assignment allowed us to achieve a comprehensive understanding of network configuration and security. We successfully accomplished the following objectives:

In Part 1 We effectively cabled the network, ensuring proper physical connectivity. Configuration of R1 was completed, enabling communication within the network. Basic switch settings were configured and verified, ensuring smooth switch operation.

In Part 2 VLANs were created, including VLAN 10 with an associated SVI for enhanced network segmentation. Special VLANs, such as VLAN 333 (Native) and VLAN 999 (ParkingLot), were configured on S1 and S2, catering to specific network requirements.

In Part 3 Security measures were implemented, including 802.1Q trunking for efficient VLAN traffic segregation. Access ports were configured to provide secure connections to end devices. Unused switch ports were secured and disabled to mitigate potential security risks. Port security features were documented and implemented, adding an extra layer of protection. DHCP snooping security was implemented to safeguard against unauthorized DHCP servers. PortFast and BPDU guard were employed to enhance network stability and mitigate potential issues. We successfully verified end-to-end connectivity, ensuring that our network operates as intended.

This assignment has not only provided valuable hands-on experience but also emphasized the importance of network security and reliability in a real-world context. It is a significant step toward becoming proficient in network configuration and ensuring that networks are both robust and secure.