

# MAC Filtering & Port Security

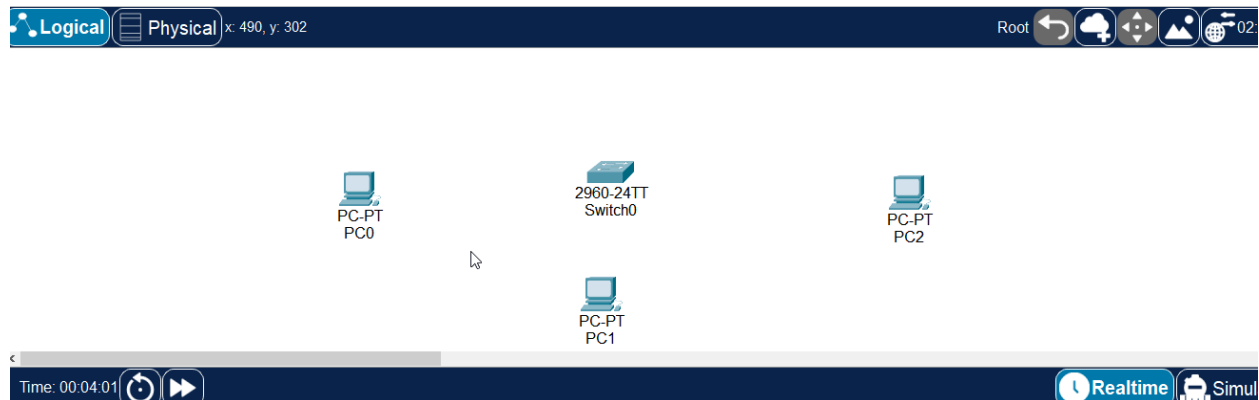
- **MAC Filtering and Port Security:** MAC filtering restricts specific MAC addresses from accessing wireless LANs (WLANs) on access points, while port security applies physical security to Ethernet ports on switches, preventing unauthorized devices from connecting to the network through physical connections.
- **Effectiveness and Limitations:** Both MAC filtering and port security function by filtering based on MAC addresses but are susceptible to bypassing through MAC address spoofing. While these methods can deter unauthorized access from non-technical users, they provide limited security against more technically skilled individuals who can easily spoof MAC addresses.

## Equipment and Setup

- Cisco Packet Tracer
- One Cisco 2960 switch
- Three PCs

## Step 1: Set Up the Network

1. Add Devices:
  - Place one Cisco 2960 switch and three PCs in the workspace.

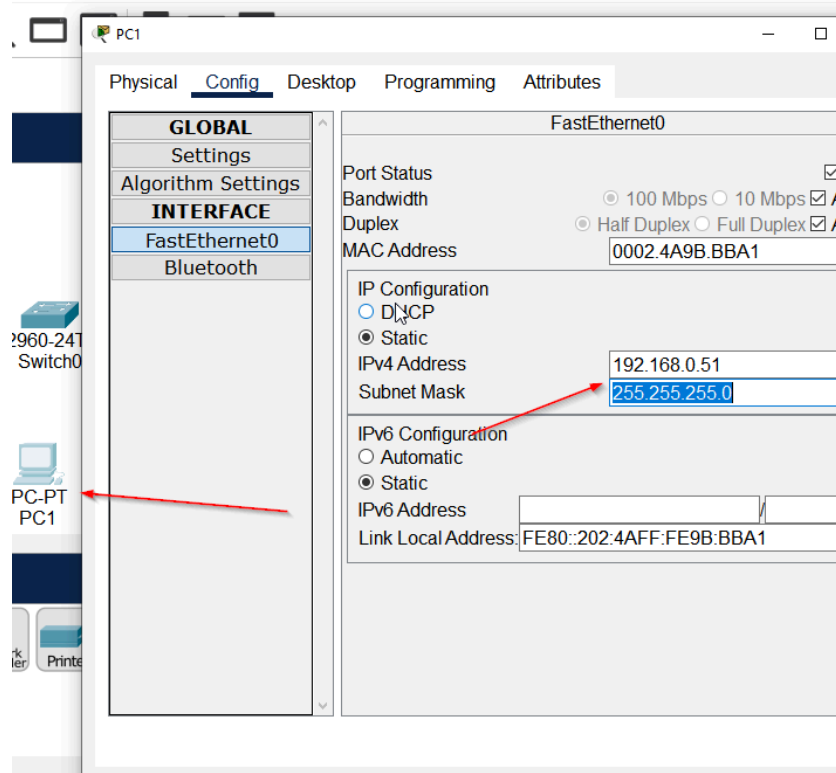
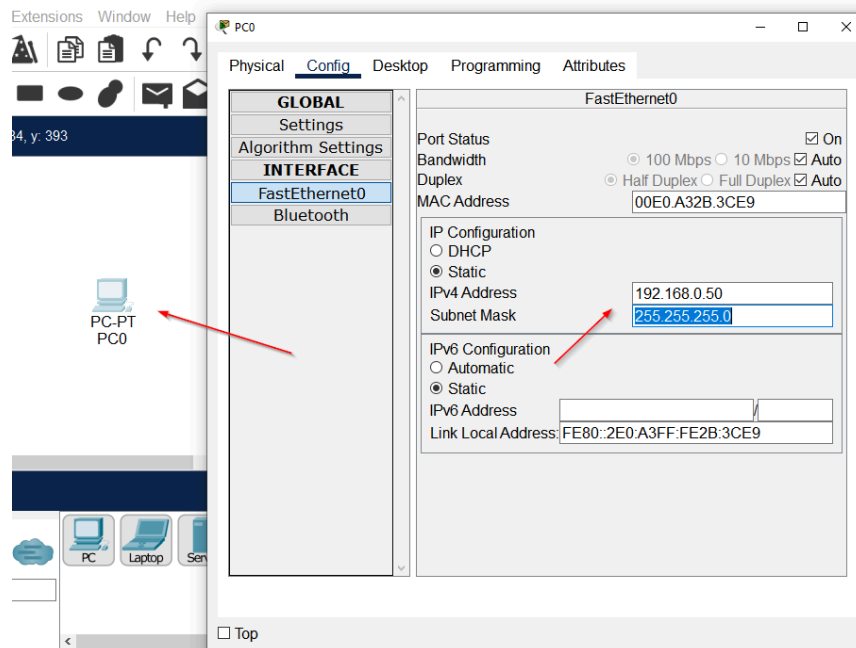


## 2. Configure Static IPs on PCs:

PC0: IP 192.168.0.50, Subnet Mask 255.255.255.0

PC1: IP 192.168.0.51, Subnet Mask 255.255.255.0

PC2: IP 192.168.0.52, Subnet Mask 255.255.255.0





## 2. Set Up Port Security for PC1:

- Select the interface connected to PC1 (e.g., FastEthernet0/1)

```
interface FastEthernet0/1
  switchport mode access
  switchport port-security
  switchport port-security mac-address sticky
  exit
exit
```

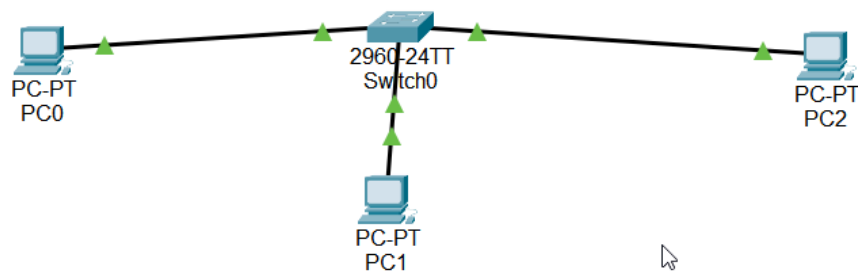
```
Switch(config)#int f0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport port-security mac-address sticky
Switch(config-if)#exit
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console
Switch#
```

*This configuration sets the port to access mode, enables port security, and makes the MAC address of the first connected device "sticky" (i.e., the switch remembers and secures this MAC address).*

## Step 3: Connect Devices and Test Connectivity

### 1. Connect the PCs to the Switch:

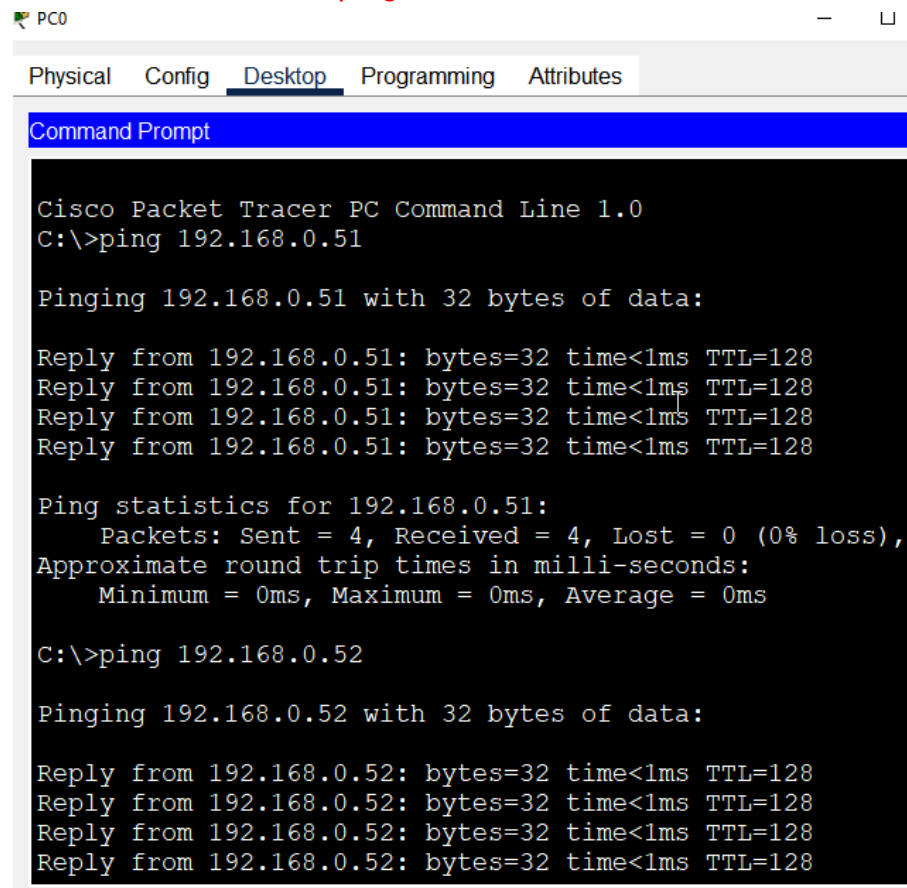
- Connect PC1 to FastEthernet0/1, PC2 to FastEthernet0/2, and PC3 to FastEthernet0/3.



### 2. Test Initial Connectivity:

- From PC0, ping PC1 and PC2 to confirm connectivity

ping 192.168.0.51  
ping 192.168.0.52



```
PC0
Physical Config Desktop Programming Attributes
Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.51

Pinging 192.168.0.51 with 32 bytes of data:

Reply from 192.168.0.51: bytes=32 time<1ms TTL=128
Reply from 192.168.0.51: bytes=32 time<1ms TTL=128
Reply from 192.168.0.51: bytes=32 time<1ms TTL=128
Reply from 192.168.0.51: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.51:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

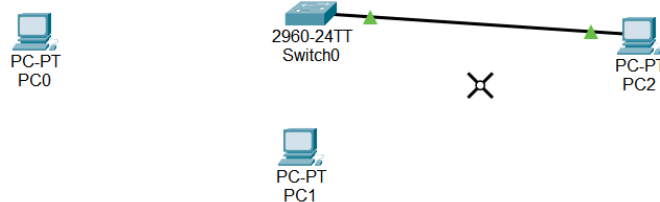
C:\>ping 192.168.0.52

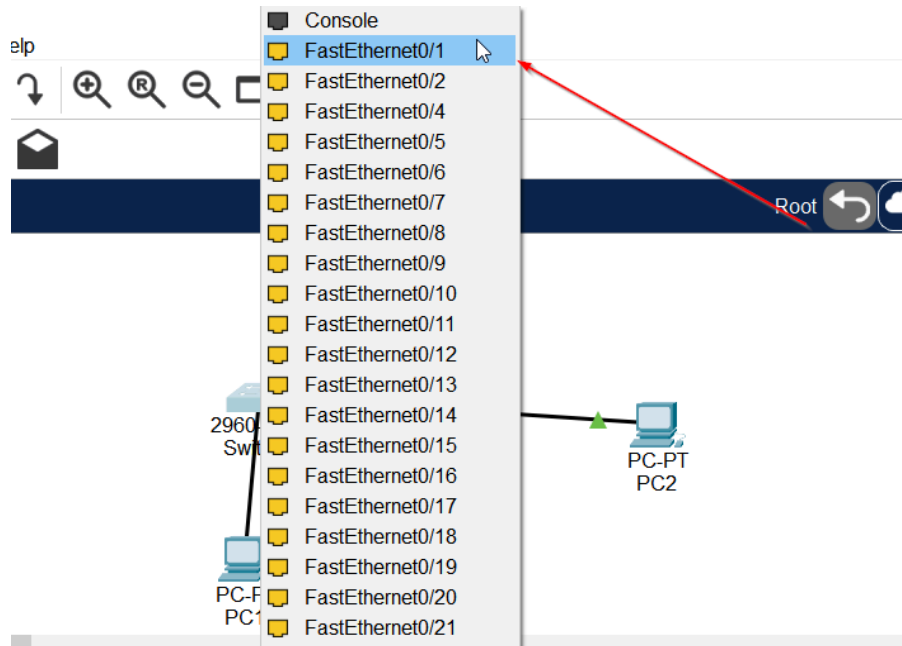
Pinging 192.168.0.52 with 32 bytes of data:

Reply from 192.168.0.52: bytes=32 time<1ms TTL=128
Reply from 192.168.0.52: bytes=32 time<1ms TTL=128
Reply from 192.168.0.52: bytes=32 time<1ms TTL=128
Reply from 192.168.0.52: bytes=32 time<1ms TTL=128
```

## Step 4: Test Port Security by Swapping Devices

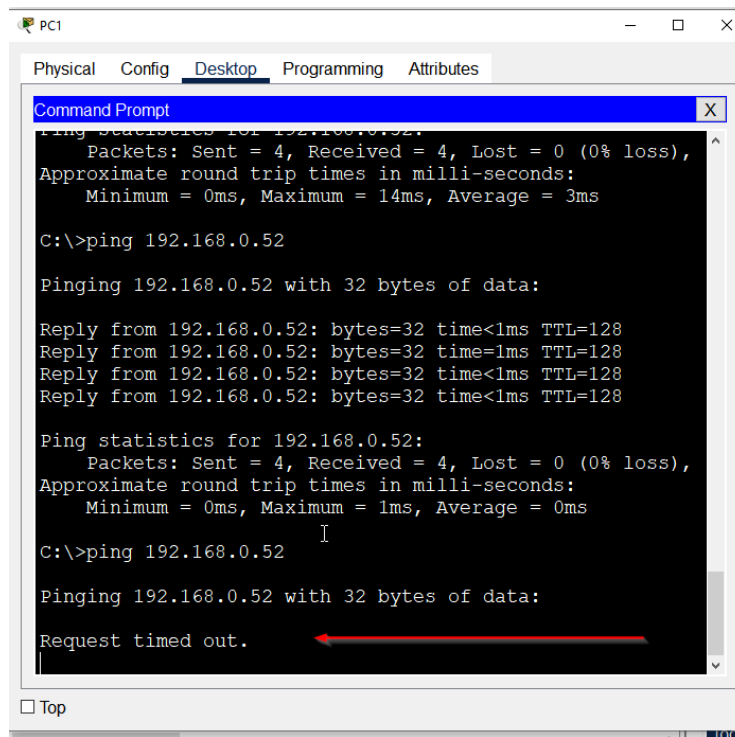
1. Disconnect PC1 and Connect PC2 to FastEthernet0/1:
  - Physically disconnect PC1 from FastEthernet0/1 and connect PC2 to the same port.





## 2. Attempt to Ping from PC1:

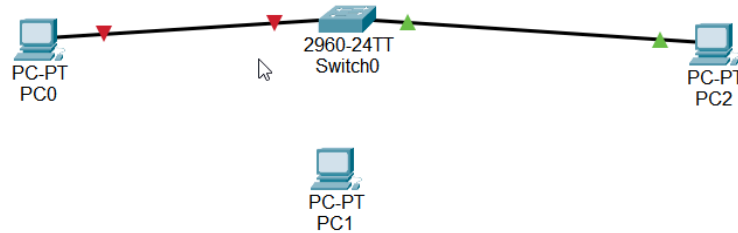
- Try to ping PC2 from PC1 connected to the port with security. The ping should fail because the MAC address of PC1 does not match the "sticky" MAC address configured on the port.



## Step 5: Restore Connectivity and Verify

1. Reconnect PC0 to FastEthernet0/1:

- Disconnect PC1 and reconnect PC2 to FastEthernet0/1.



2. Reactivate the Port:

- On the switch CLI

```
interface FastEthernet0/1
shutdown
no shutdown
exit
```

The screenshot shows the CLI interface of Switch0. The 'CLI' tab is selected. The command history shows the following sequence of commands and outputs:

```
Switch0
Physical Config CLI Attributes
IOS Command Line Interface
FastEthernet0/1, changed state to down
Switch#enable
Switch#config t
Enter configuration commands, one per line. End with
CNTL/Z.
Switch(config)#int
Switch(config)#interface f0/1
Switch(config-if)#shut

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state
to administratively down
Switch(config-if)#no shut

Switch(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state
to up

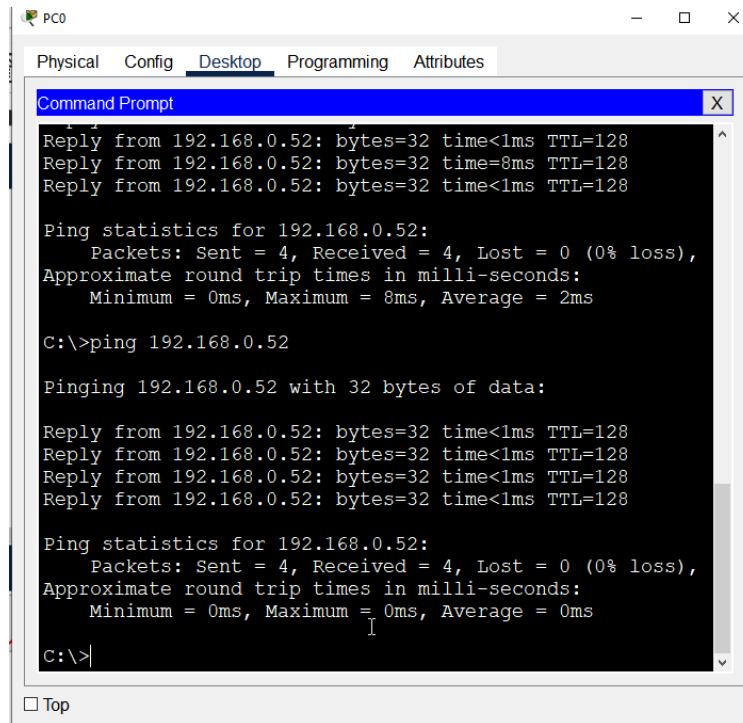
%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/1, changed state to up
Switch(config-if)#
```

At the bottom of the window, there are 'Copy' and 'Paste' buttons, and a 'Top' button.

*This sequence shuts down the interface and brings it back up, re-enabling it after the port security violation.*

### 3. Test Connectivity Again:

- From PC0, ping PC2 to confirm that connectivity is restored.



The screenshot shows the desktop of PC0 in Cisco Packet Tracer. A 'Command Prompt' window is open, displaying the results of a ping command to 192.168.0.52. The window has tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes', with 'Desktop' selected. The command prompt shows three successful replies from 192.168.0.52, followed by ping statistics: 4 packets sent, 4 received, 0% loss, with round trip times of 0ms, 8ms, and 2ms. The user then enters the command 'C:\>ping 192.168.0.52', which results in another three successful replies and updated statistics showing 0ms round trip times. The cursor is at the 'C:\>' prompt.

```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Reply from 192.168.0.52: bytes=32 time<1ms TTL=128
Reply from 192.168.0.52: bytes=32 time=8ms TTL=128
Reply from 192.168.0.52: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.52:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>ping 192.168.0.52

Pinging 192.168.0.52 with 32 bytes of data:

Reply from 192.168.0.52: bytes=32 time<1ms TTL=128
Reply from 192.168.0.52: bytes=32 time<1ms TTL=128
Reply from 192.168.0.52: bytes=32 time<1ms TTL=128
Reply from 192.168.0.52: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.52:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

## Conclusion

This guide demonstrates configuring and testing port security on a Cisco 2960 switch in Cisco Packet Tracer, showing how port security can prevent unauthorized devices from accessing the network even when physically connected to a secured port.



