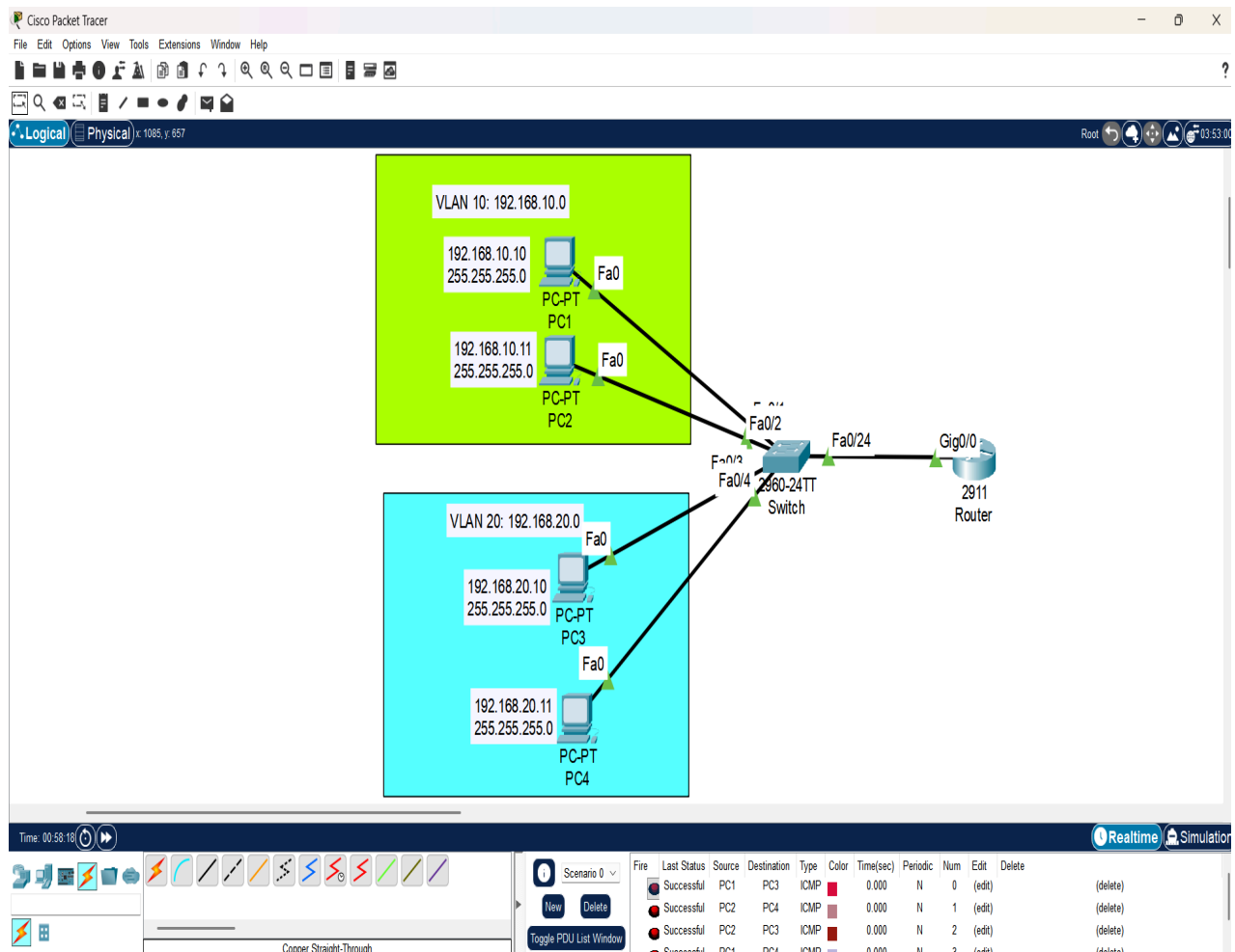


Objective:

Enable communication between VLANs using router-on-a-stick.

Topology:

One router connected to a switch using a trunk port. Two VLANs on the switch.



VLAN Design:

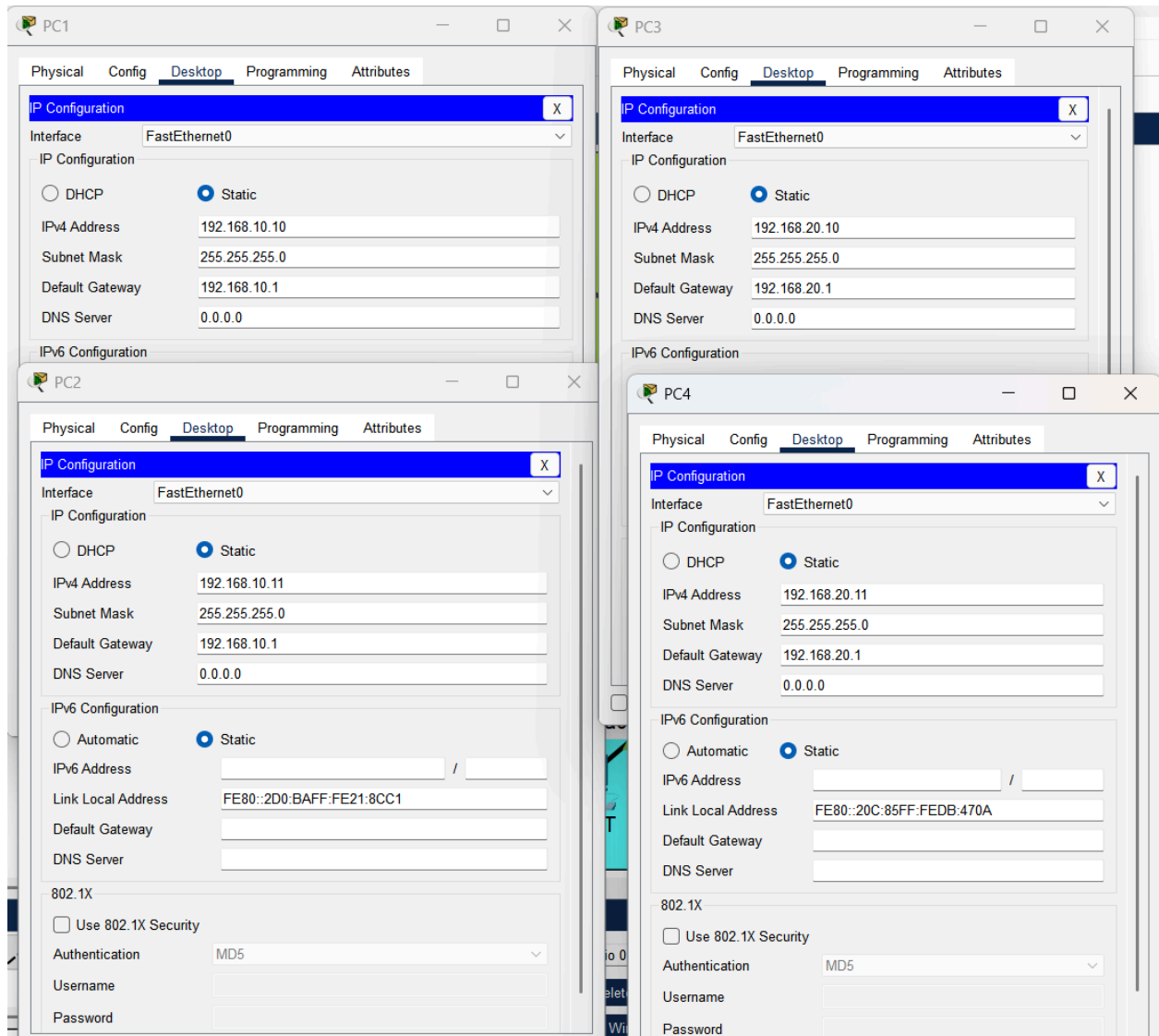
VLAN 10 (SALES)

VLAN 20 (IT)

IP Addressing:

VLAN 10 Gateway: 192.168.10.1

VLAN 20 Gateway: 192.168.20.1



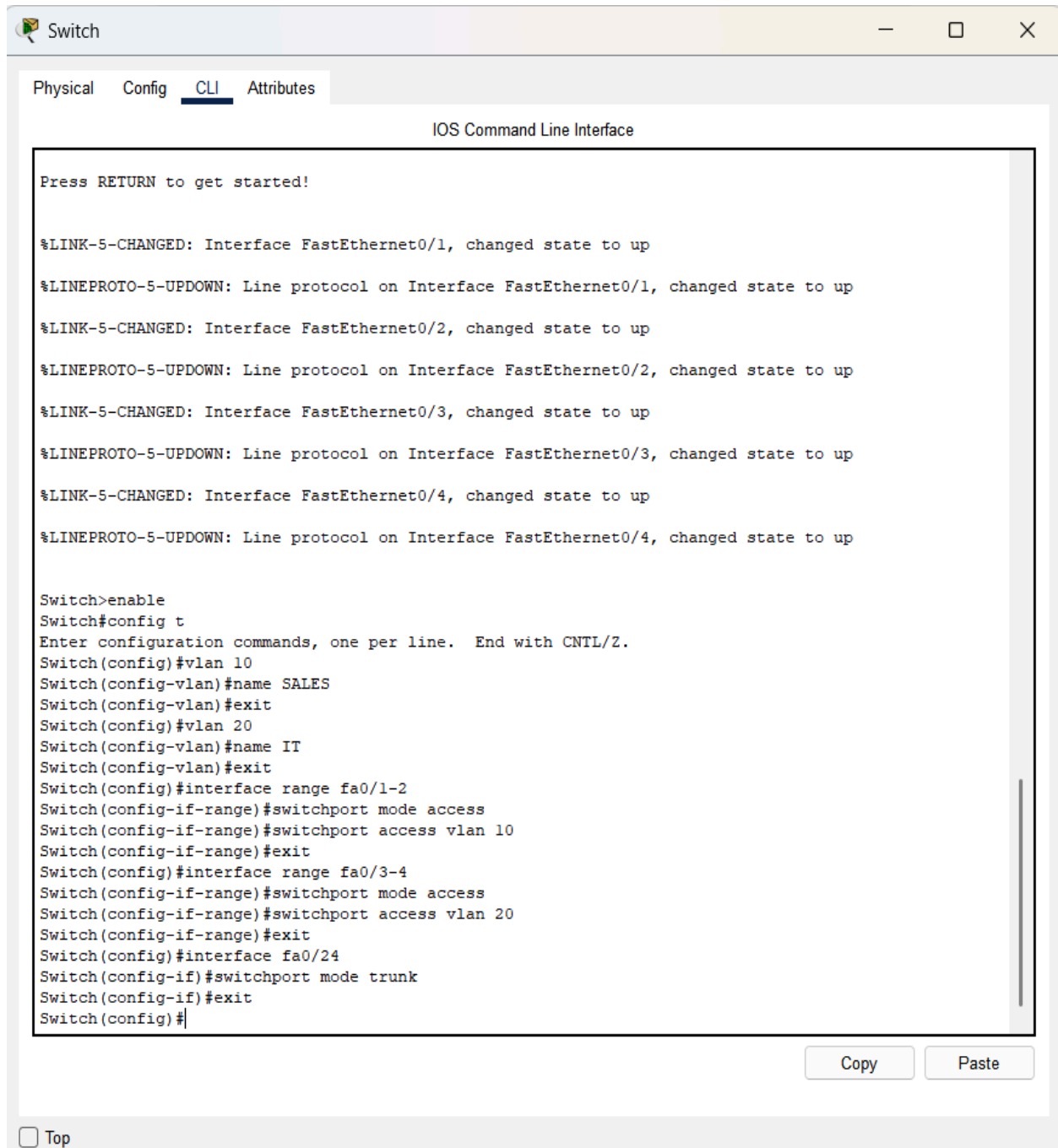
PC Addresses:

VLAN 10: 192.168.10.10, 192.168.10.11

VLAN 20: 192.168.20.10, 192.168.20.11

Switch Config:

- VLAN 10 and VLAN 20 created
- Access ports assigned
- Trunk port configured to router



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

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
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%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

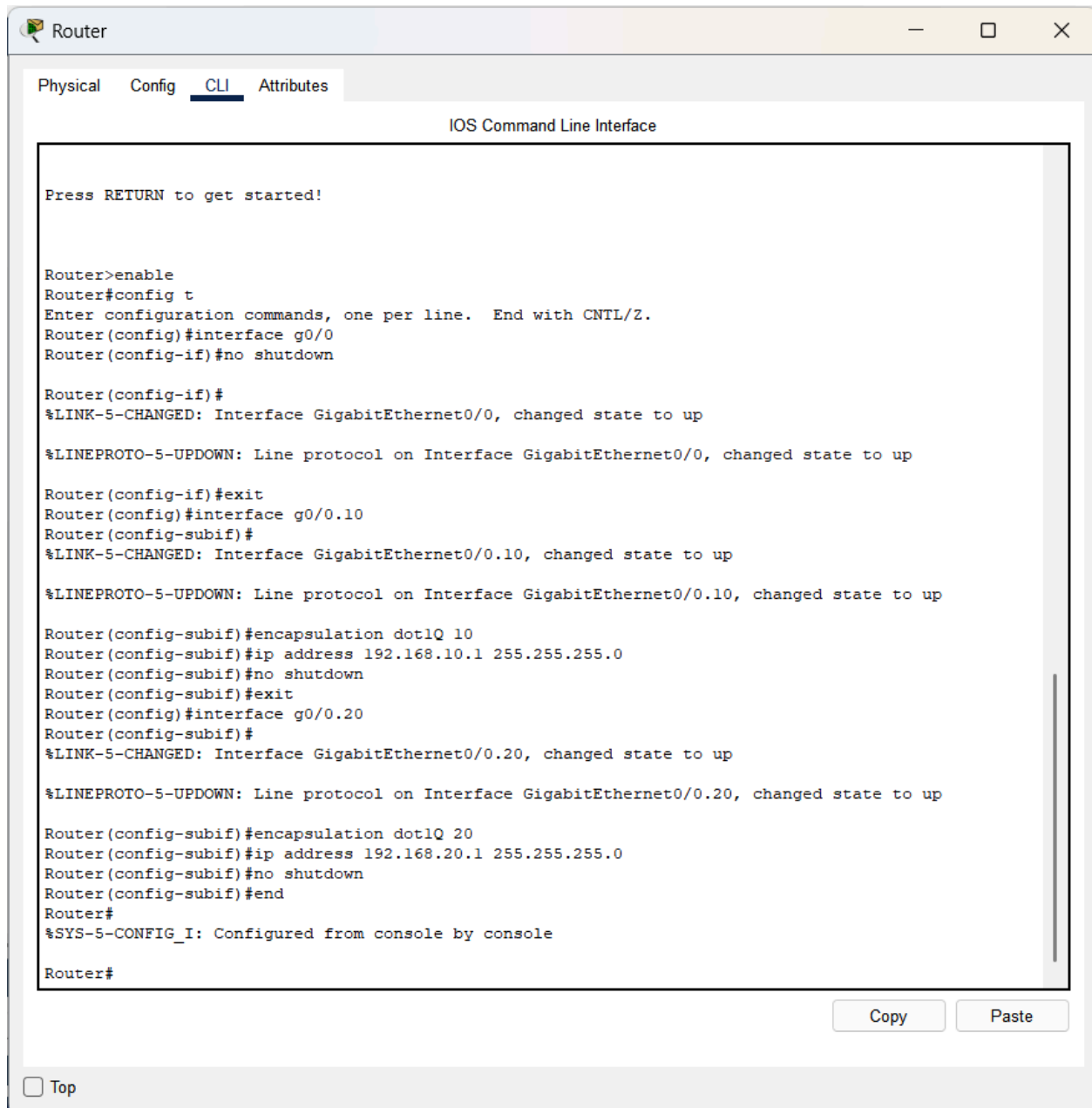
Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name SALES
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name IT
Switch(config-vlan)#exit
Switch(config)#interface range fa0/1-2
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#exit
Switch(config)#interface range fa0/3-4
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 20
Switch(config-if-range)#exit
Switch(config)#interface fa0/24
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#
```

☐ Top

Copy Paste

Router Config:

- Subinterfaces g0/0.10 and g0/0.20 created
- Dot1Q encapsulation enabled
- IP addresses assigned



The screenshot shows a Packet Tracer window titled "Router" with tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following sequence of commands and responses:

```
Press RETURN to get started!

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface g0/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#interface g0/0.10
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.10, changed state to up

Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip address 192.168.10.1 255.255.255.0
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#interface g0/0.20
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.20, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.20, changed state to up

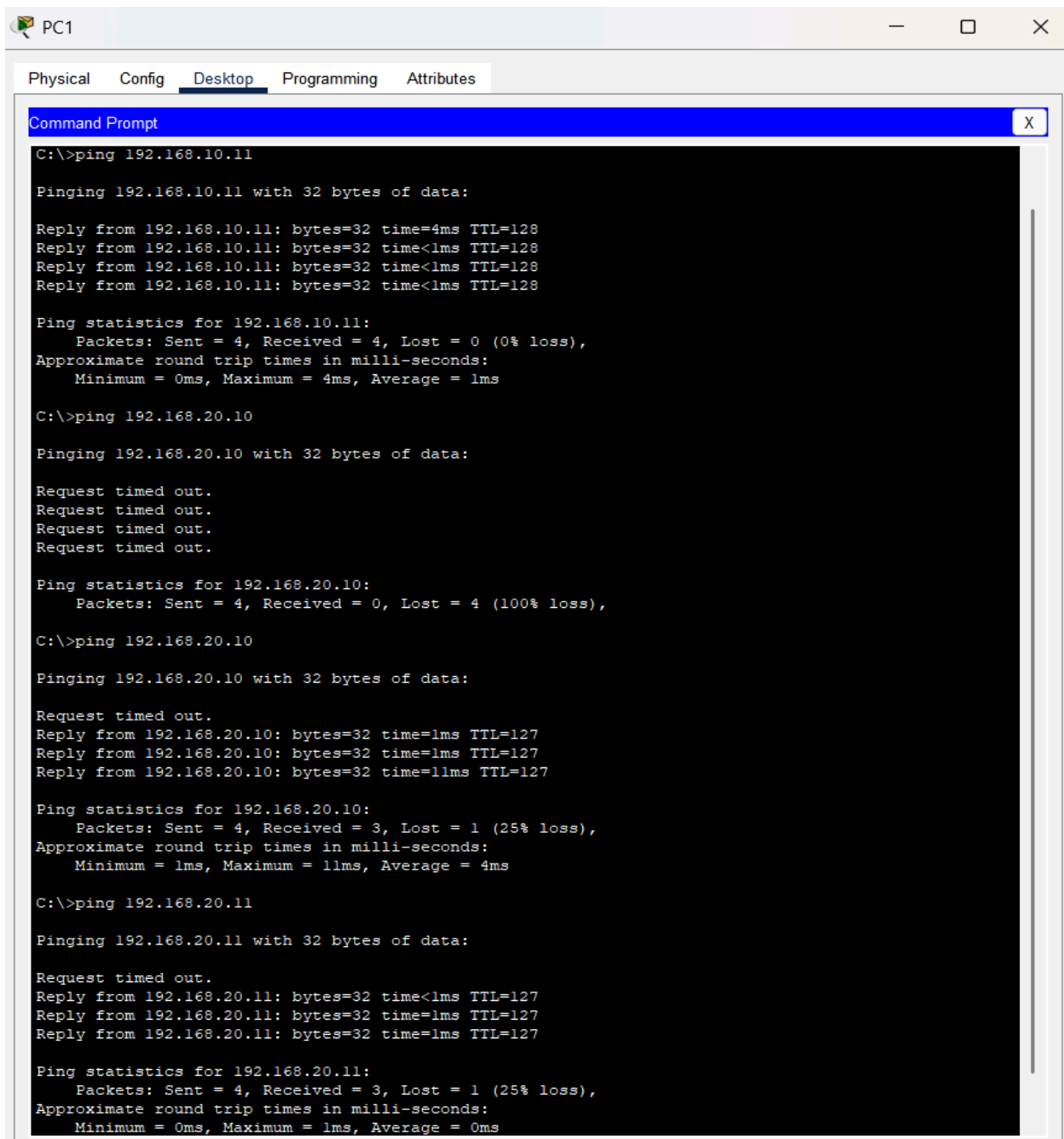
Router(config-subif)#encapsulation dot1Q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#no shutdown
Router(config-subif)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

At the bottom of the CLI window, there are "Copy" and "Paste" buttons. Below the window, there is a "Top" button with a checkbox next to it.

Verification:

- Successful ping between VLAN 10 and VLAN 20 devices



The screenshot shows a Windows Command Prompt window titled "PC1" with tabs for Physical, Config, Desktop, Programming, and Attributes. The Command Prompt displays the following output:

```
C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.10.11: bytes=32 time=4ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 4ms, Average = 1ms

C:\>ping 192.168.20.10

Pinging 192.168.20.10 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.20.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.20.10

Pinging 192.168.20.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.10: bytes=32 time=1ms TTL=127
Reply from 192.168.20.10: bytes=32 time=1ms TTL=127
Reply from 192.168.20.10: bytes=32 time=11ms TTL=127

Ping statistics for 192.168.20.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 11ms, Average = 4ms

C:\>ping 192.168.20.11

Pinging 192.168.20.11 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.11: bytes=32 time<1ms TTL=127
Reply from 192.168.20.11: bytes=32 time=1ms TTL=127
Reply from 192.168.20.11: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.20.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Lessons Learned:

- Routers perform inter-VLAN routing
- Trunk links carry multiple VLANs
- Subinterfaces represent VLAN gateways