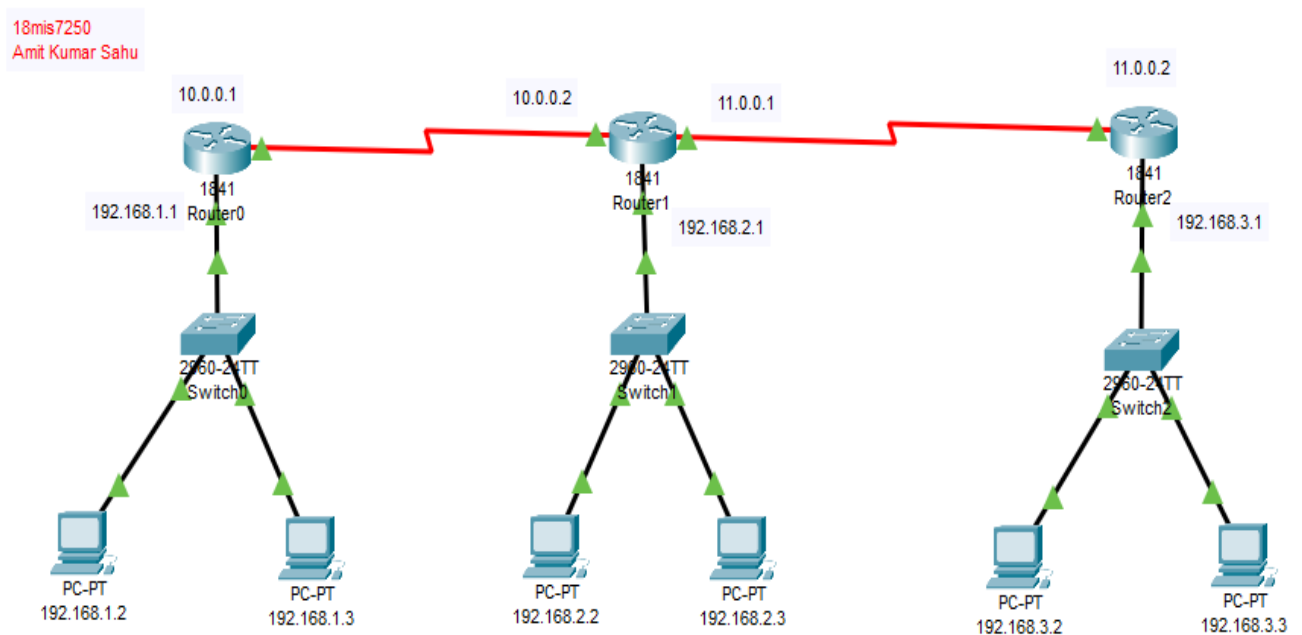


LAB – 9

18MIS7250

AMIT KUMAR SAHU

WAN Using RIP Routing protocol



Configuring router serial ports

Note: this is for 2nd router

```
Router(config)#interface Serial0/0/0
```

```
Router(config-if)#ip address 10.0.0.2 255.0.0.0
```

```
Router(config-if)#ip address 10.0.0.2 255.0.0.0
```

```
Router(config-if)#no shutdown
```

```
Router(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

```
Router(config-if)#exit
```

```
Router(config)#interface Serial0/0/1
```

```
Router(config-if)#
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
ip address 11.0.0.1 255.0.0.0
Router(config-if)#ip address 11.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
```

Configuring rip

Note: this below config is for 1st router

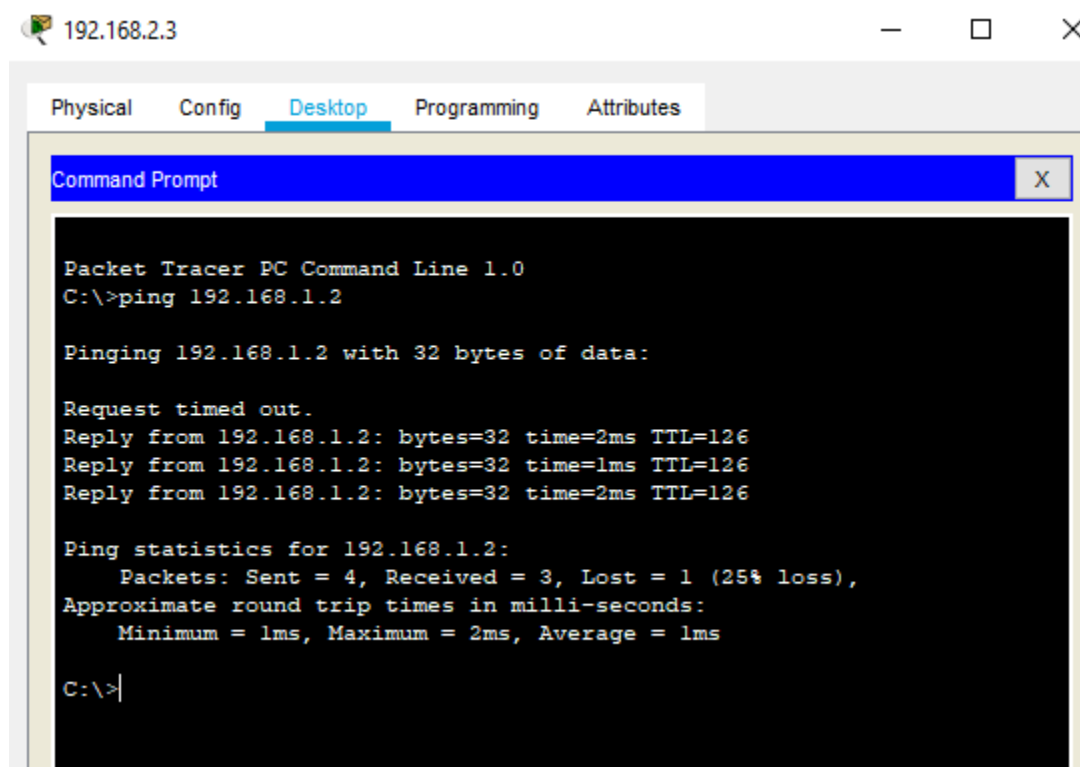
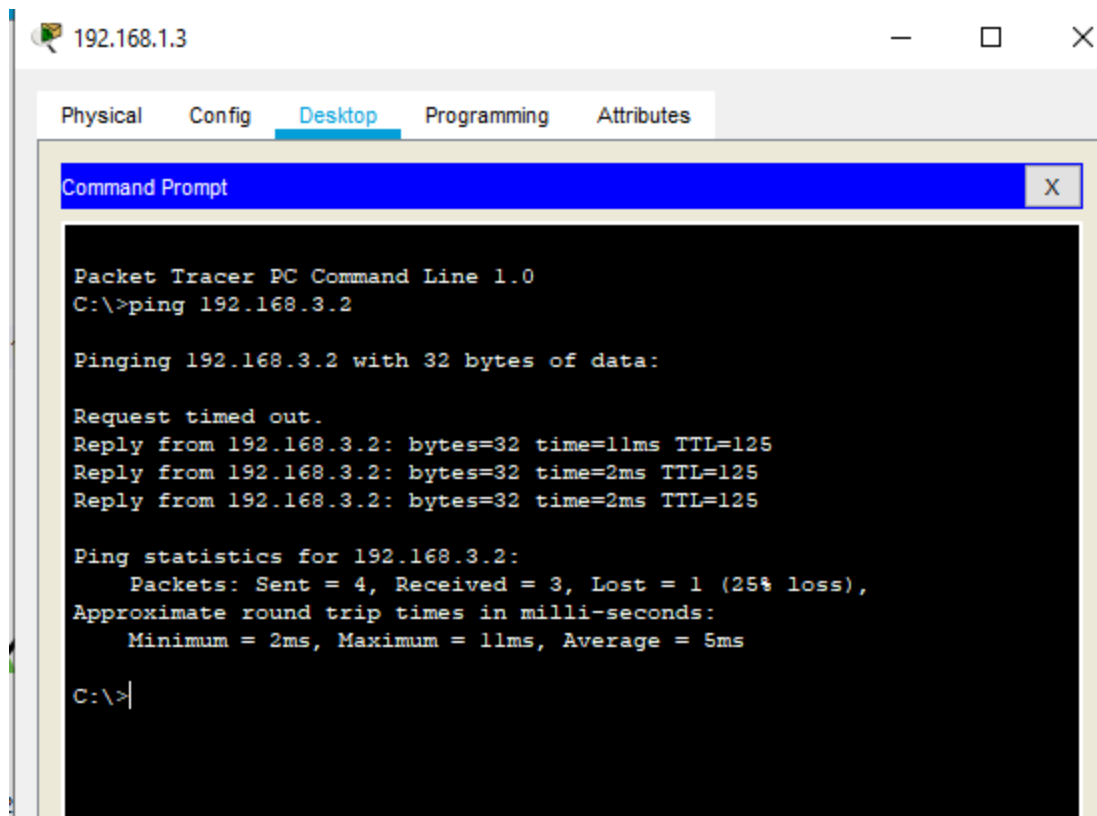
```
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 11.0.0.0
Router(config-router)#network 192.168.2.0
Router(config-router)#network 192.168.3.0
Router(config-router)#network 192.168.1.0
Router(config-router)#
```

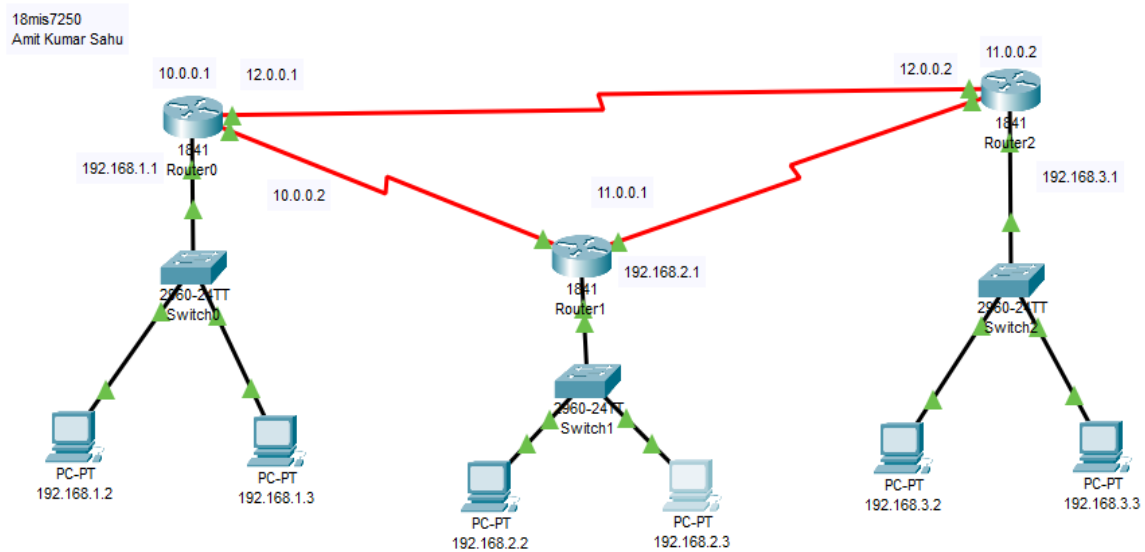
Note: this below config is for 2nd router

```
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 11.0.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#network 192.168.2.0
Router(config-router)#network 192.168.3.0
Router(config-router)#
```

Note: this below config is for 3rd router

```
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 11.0.0.0
Router(config-router)#network 192.168.2.0
Router(config-router)#network 192.168.1.0
Router(config-router)#network 192.168.3.0
Router(config-router)
```





1st Router

```
Router(config)#interface Serial0/0/1
Router(config-if)#no ip address
Router(config-if)#ip address
% Incomplete command.
Router(config-if)#ip address 12.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
```

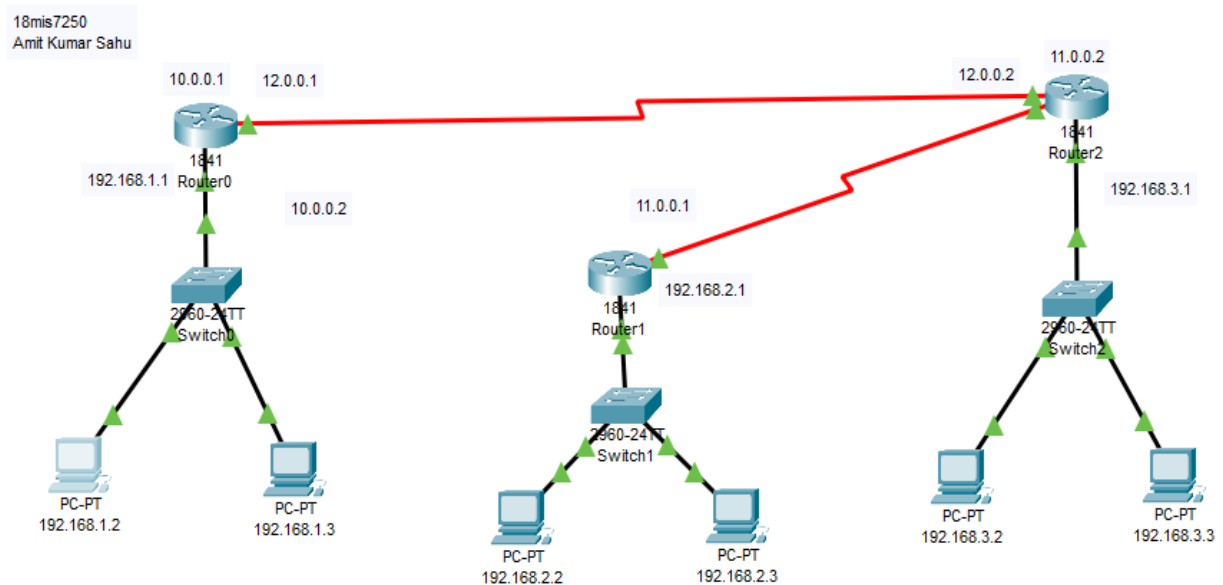
3rd Router

```
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial0/0/1
Router(config-if)#ip address 12.0.0.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
```

For all 3 routers

```
Router(config)#router rip
Router(config-router)#network 12.0.0.0
```

After disconnecting also we are able to access with new serial port



```
192.168.1.2
```

```
Physical Config Desktop Programming Attributes
```

```
Command Prompt
```

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.3.3

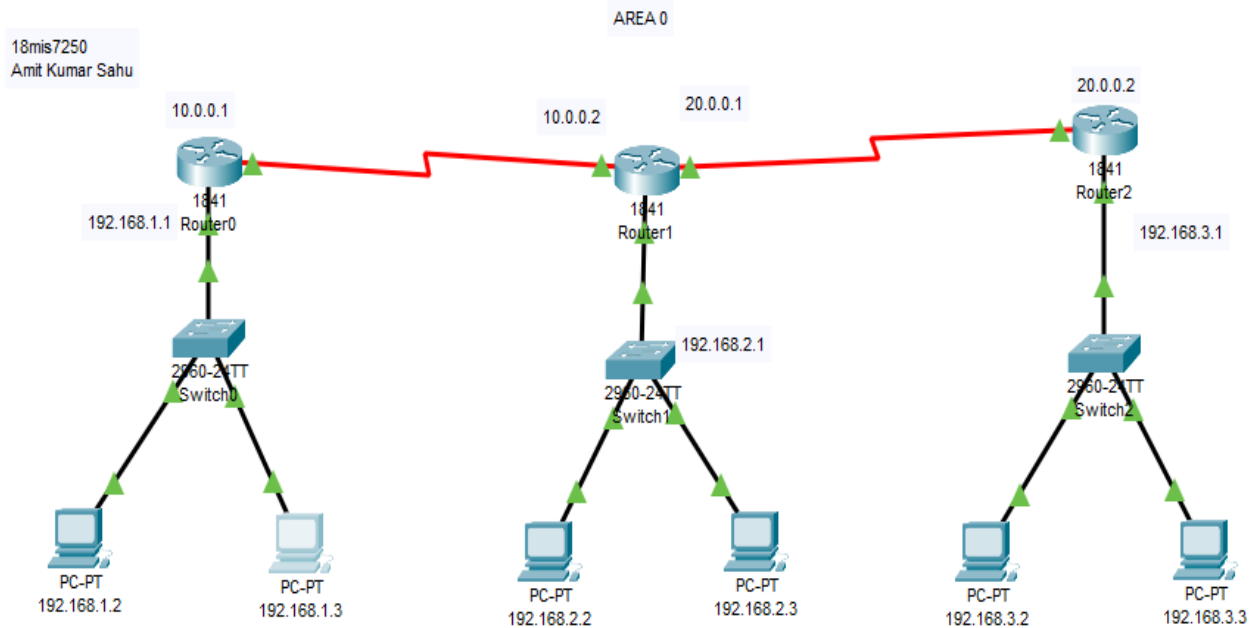
Pinging 192.168.3.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.3.3: bytes=32 time=5ms TTL=126
Reply from 192.168.3.3: bytes=32 time=1ms TTL=126
Reply from 192.168.3.3: bytes=32 time=7ms TTL=126

Ping statistics for 192.168.3.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 7ms, Average = 4ms

C:\>
```

OSPF



Router Serial port configuration

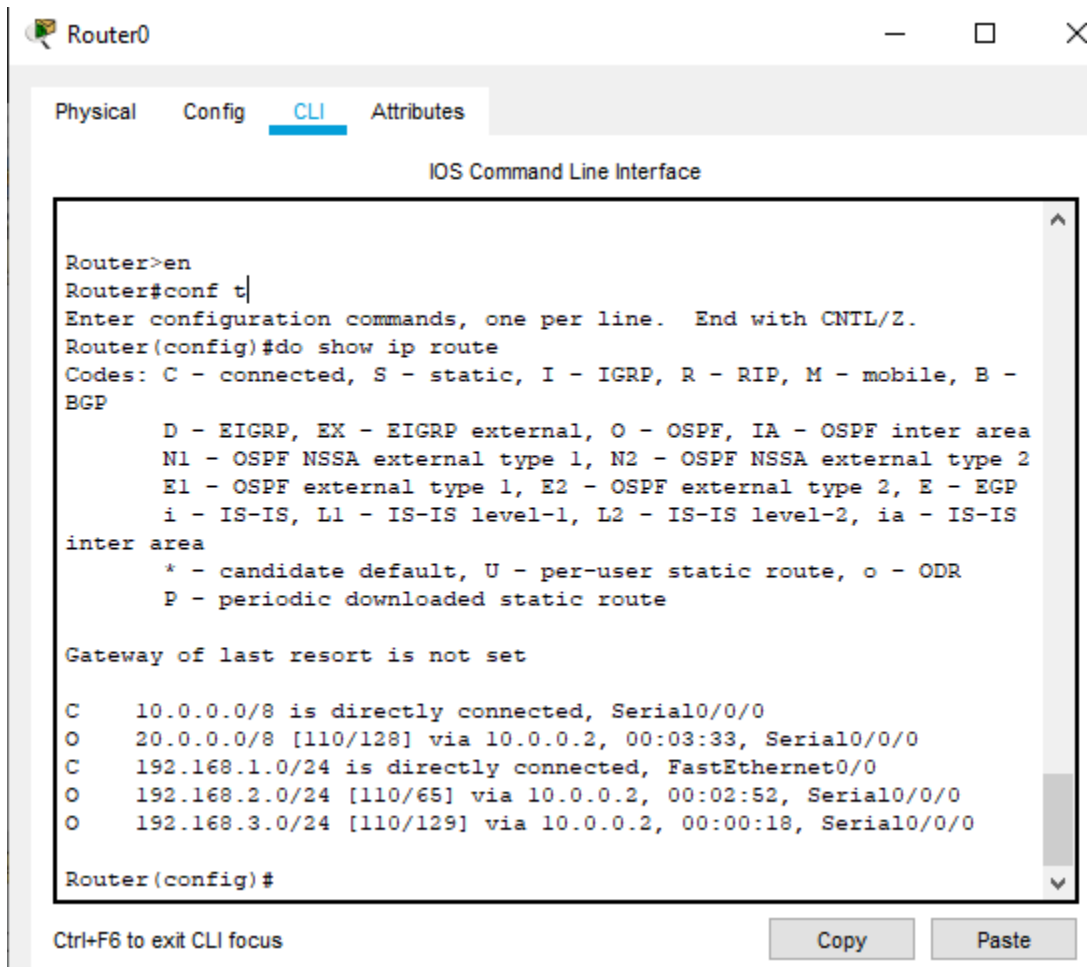
```
Router(config)#interface Serial0/0/1
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
ip address 20.0.0.1 255.0.0.0
Router(config-if)#
```

OSPF configuration

```
Router(config)#router ospf 1
Router(config-router)#network 192.168.1.0 0.255.255.255 area 0
Router(config-router)#network 10.0.0.0 0.0.0.255 area 0
Router(config-router)#

Router(config)#router ospf 1
Router(config-router)#network 10.0.0.0 0.0.0.255 area 0
Router(config-router)#network 10.0.0.0 0.0.0.255 area 0
00:47:29: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on Serial0/0/0 fr
Router(config-router)#network 20.0.0.0 0.0.0.255 area 0
Router(config-router)#network 192.168.2.0 0.255.255.255 area 0
```

Router(config-router)#



The screenshot shows a window titled "Router0" with a tabbed interface. The "CLI" tab is selected, displaying the "IOS Command Line Interface". The terminal shows the following sequence of commands and output:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#do show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

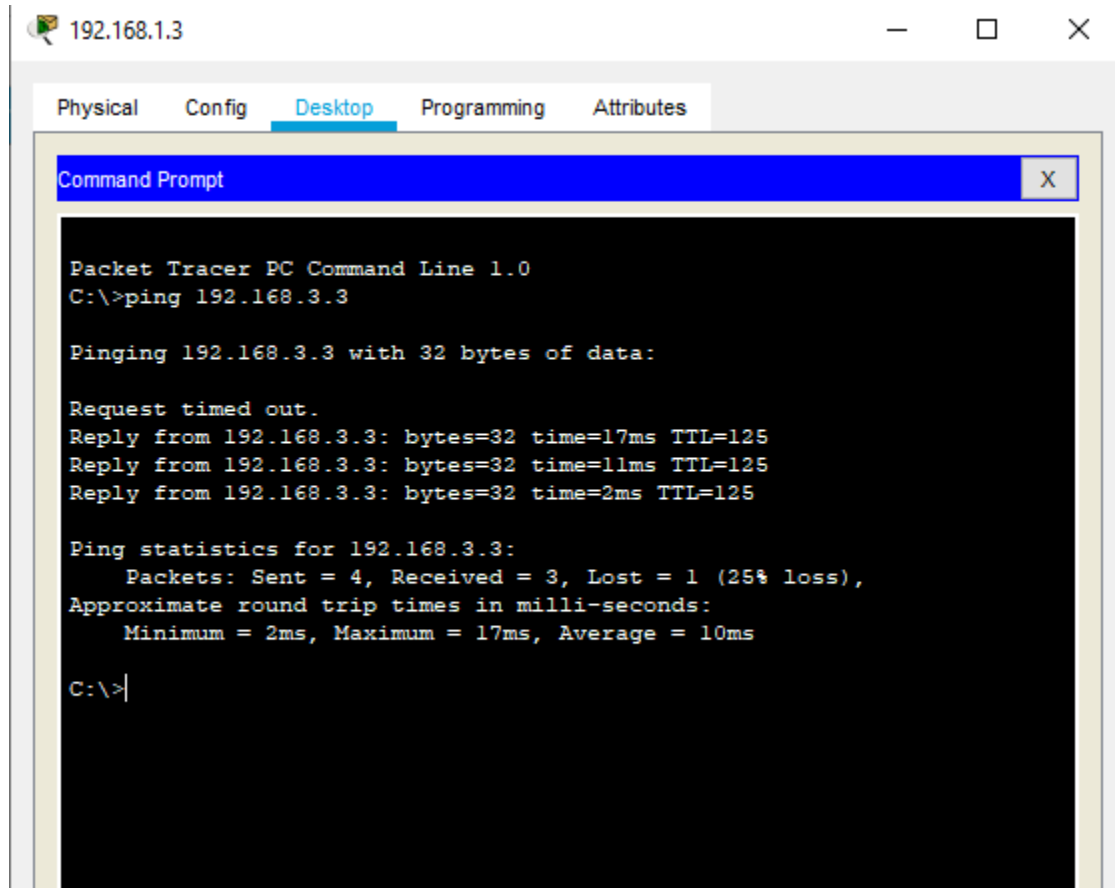
Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, Serial0/0/0
O    20.0.0.0/8 [110/128] via 10.0.0.2, 00:03:33, Serial0/0/0
C    192.168.1.0/24 is directly connected, FastEthernet0/0
O    192.168.2.0/24 [110/65] via 10.0.0.2, 00:02:52, Serial0/0/0
O    192.168.3.0/24 [110/129] via 10.0.0.2, 00:00:18, Serial0/0/0

Router(config)#
```

At the bottom of the window, there is a status bar that says "Ctrl+F6 to exit CLI focus" and two buttons labeled "Copy" and "Paste".

Successful Pinging



The screenshot shows a Packet Tracer PC Command Line window for a device named 192.168.1.3. The window has tabs for Physical, Config, Desktop, Programming, and Attributes, with Desktop selected. The Command Prompt shows the following output:

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.3.3

Pinging 192.168.3.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.3.3: bytes=32 time=17ms TTL=125
Reply from 192.168.3.3: bytes=32 time=11ms TTL=125
Reply from 192.168.3.3: bytes=32 time=2ms TTL=125

Ping statistics for 192.168.3.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 17ms, Average = 10ms

C:\>|
```

Summary

Routing Information Protocol (RIP) is a dynamic routing protocol which uses hop count as a routing metric to find the best path between the source and the destination network. It is a distance vector routing protocol which has AD value 120 and works on the application layer of OSI model. RIP uses port number 520.

Hop Count :

Hop count is the number of routers occurring in between the source and destination network. The path with the lowest hop count is considered as the best route to reach a network and therefore placed in the routing table. RIP prevents routing loops by limiting the number of hops allowed

in a path from source and destination. The maximum hop count allowed for RIP is 15 and hop count of 16 is considered as network unreachable.

Features of RIP :

1. Updates of the network are exchanged periodically.
2. Updates (routing information) are always broadcast.
3. Full routing tables are sent in updates.
4. Routers always trust on routing information received from neighbor routers. This is also known as *Routing on rumours*.

OSPF : Open Shortest Path First is a robust link-state interior gateway protocol (IGP). People use OSPF when they discover that RIP just isn't going to work for their larger network, or when they need very fast convergence. This installment of Networking 101 will provide a conceptual overview of OSPF, and the second part of our OSPF coverage will delve a bit deeper into the protocol itself, as well as OSPF area configurations.

To understand the design needs for areas in OSPF, let's start by discussing how OSPF works. There's some terminology you may not have encountered before, including:

- **Router ID:** In OSPF this is a unique 32-bit number assigned to each router. This is chosen as the highest IP address on a router, and can be set large by configuring an address on a loopback interface of the chosen router.
- **Neighbor Routers:** two routers with a common link that can talk to each other.
- **Adjacency:** a two-way relationship between two neighbor routers. Neighbors don't always form adjacencies.
- **LSA:** Link State Advertisements are flooded; they describe routes within a given link.
- **Hello Protocol:** this is how routers on a network determine their neighbors and form LSAs.
- **Area:** a hierarchy. A set of routers that exchange LSAs, with others in the same area. Areas limit LSAs and encourage aggregate routes.