



BITS Pilani
Dubai Campus

Dynamic Routing

CS F303

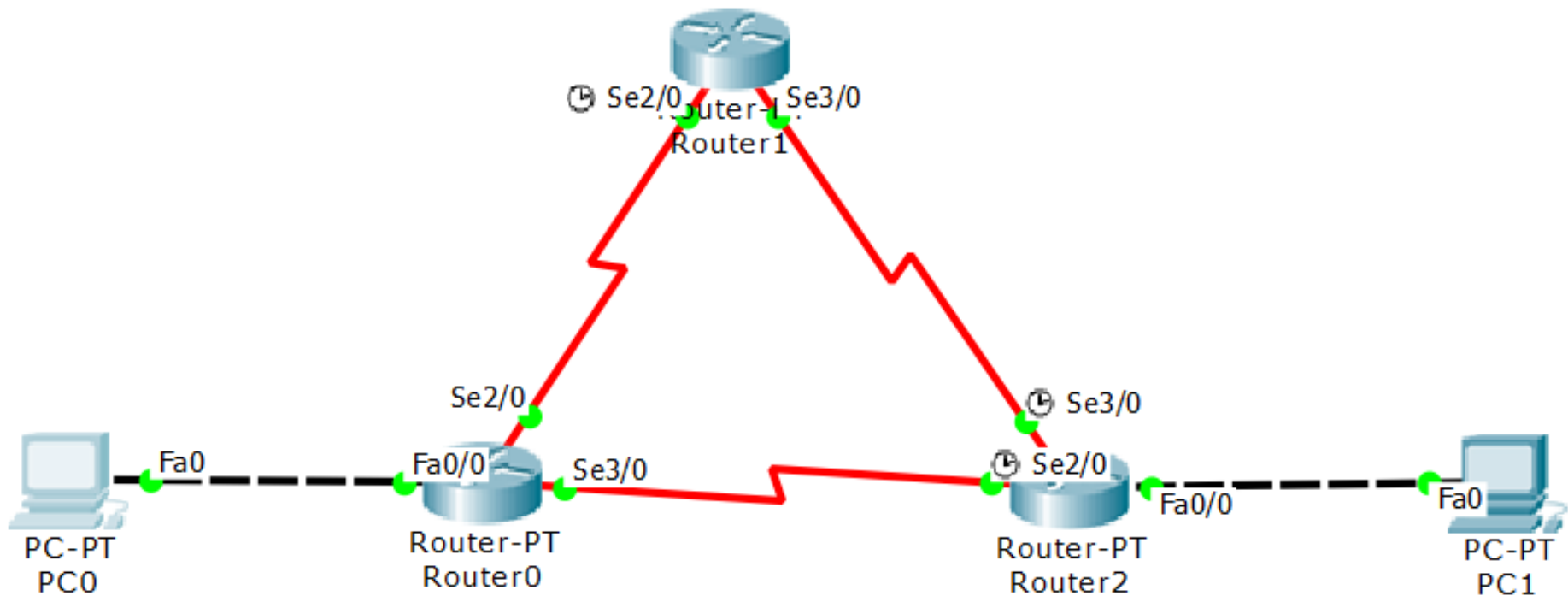
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Network Topology

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Assign IP Address PC

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- Assign IP address to PC0 and PC1

PC0	
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Default Gateway	10.0.0.1

PC1	
IP Address	20.0.0.2
Subnet Mask	255.0.0.0
Default Gateway	20.0.0.1

Configuring Router 0

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- Configure Fa 0/0, Se 2/0, and Se 3/0 interfaces

```
Router>enable
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#interface FastEthernet0/0
```

```
Router(config-if)#ip address 10.0.0.1 255.0.0.0
```

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

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

```
Router(config)#interface Serial2/0
```

```
Router(config-if)#ip address 192.168.0.252 255.255.255.0
```

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

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

```
Router(config)#interface Serial3/0
```

```
Router(config-if)#ip address 193.167.0.219 255.255.255.0
```

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

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

```
Router(config)#
```

Configuring Router 1

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- Configure Se 2/0 and Se 3/0

```
Router>enable
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with
CNTL/Z.

```
Router(config)#interface Serial2/0
```

```
Router(config-if)#ip address 192.168.0.253 255.255.255.0
```

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

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

```
Router(config)#interface Serial3/0
```

```
Router(config-if)#ip address 194.16.0.20 255.255.255.0
```

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

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

```
Router(config)#
```

Configuring Router 2

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- **Configure Fa 0/0, Se 2/0, and Se 3/0 interfaces**

```
Router>enable
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#interface FastEthernet0/0
```

```
Router(config-if)#ip address 20.0.0.1 255.0.0.0
```

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

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

```
Router(config)#interface Serial2/0
```

```
Router(config-if)#ip address 193.167.0.218 255.255.255.0
```

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

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

```
Router(config)#interface Serial3/0
```

```
Router(config-if)#ip address 194.16.0.21 255.255.255.0
```

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

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

```
Router(config)#
```

Configure dynamic routing

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- For Router 0

```
Router>enable
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with
CNTL/Z.

```
Router(config)#router rip
```

```
Router(config-router)#network 10.0.0.0
```

```
Router(config-router)#network 192.168.0.0
```

```
Router(config-router)#network 193.167.0.0
```

Configure dynamic routing

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- For Router 1

```
Router>enable
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with
CNTL/Z.

```
Router(config)#router rip
```

```
Router(config-router)#network 192.168.0.0
```

```
Router(config-router)#network 194.16.0.0
```


Configure dynamic routing

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- For Router 2

```
Router>enable
```

```
Router#configure terminal
```

Enter configuration commands, one per line. End with
CNTL/Z.

```
Router(config)#router rip
```

```
Router(config-router)#network 20.0.0.0
```

```
Router(config-router)#network 193.167.0.0
```

```
Router(config-router)#network 194.16.0.0
```

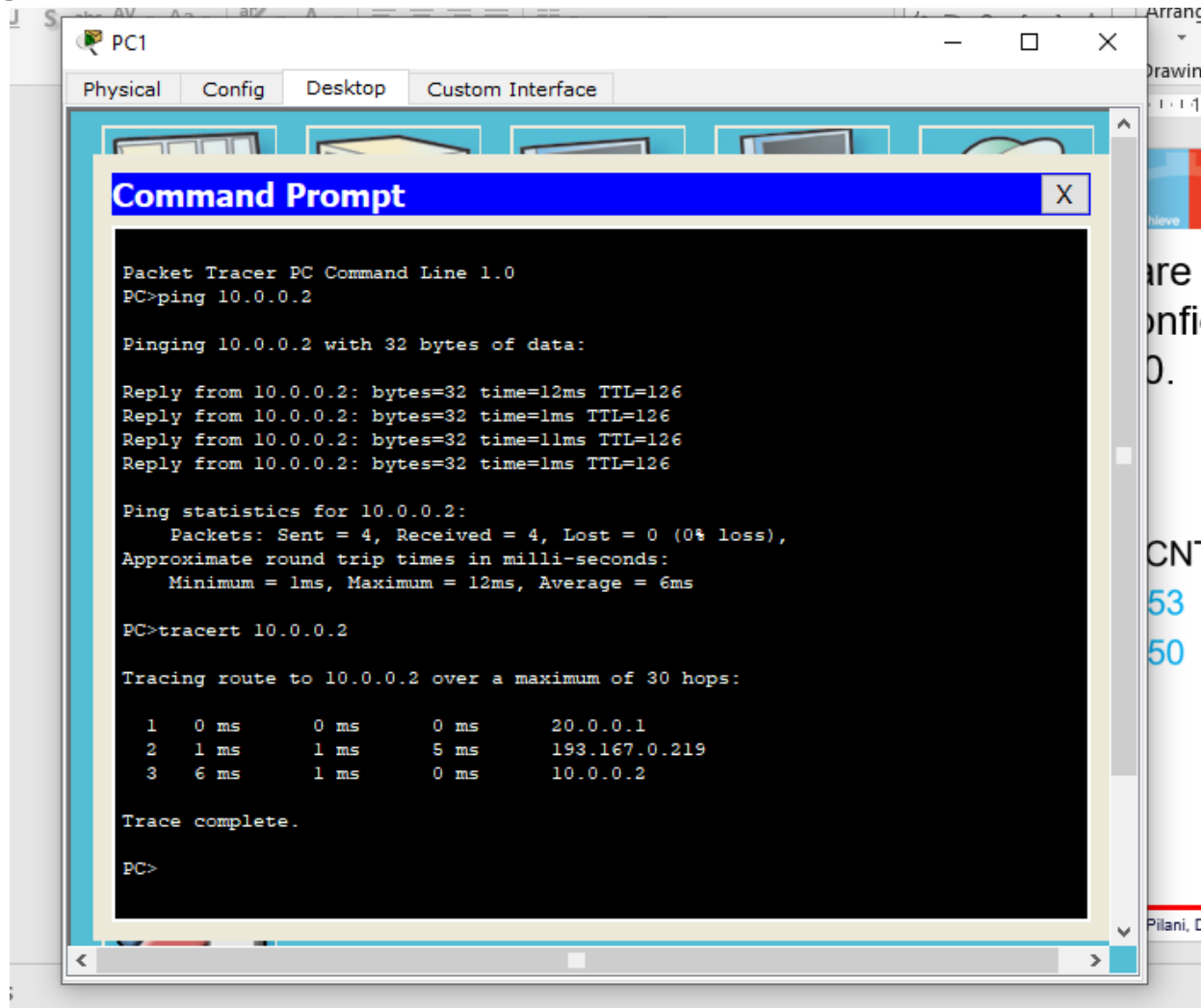
Testing of Scenario

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- Ping and tracert from PC1 to PC0 and vice versa



```
PC1
Physical Config Desktop Custom Interface

Command Prompt

Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=12ms TTL=126
Reply from 10.0.0.2: bytes=32 time=1ms TTL=126
Reply from 10.0.0.2: bytes=32 time=11ms TTL=126
Reply from 10.0.0.2: bytes=32 time=1ms TTL=126

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 12ms, Average = 6ms

PC>tracert 10.0.0.2

Tracing route to 10.0.0.2 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    20.0.0.1
  2  1 ms    1 ms    5 ms    193.167.0.219
  3  6 ms    1 ms    0 ms    10.0.0.2

Trace complete.

PC>
```

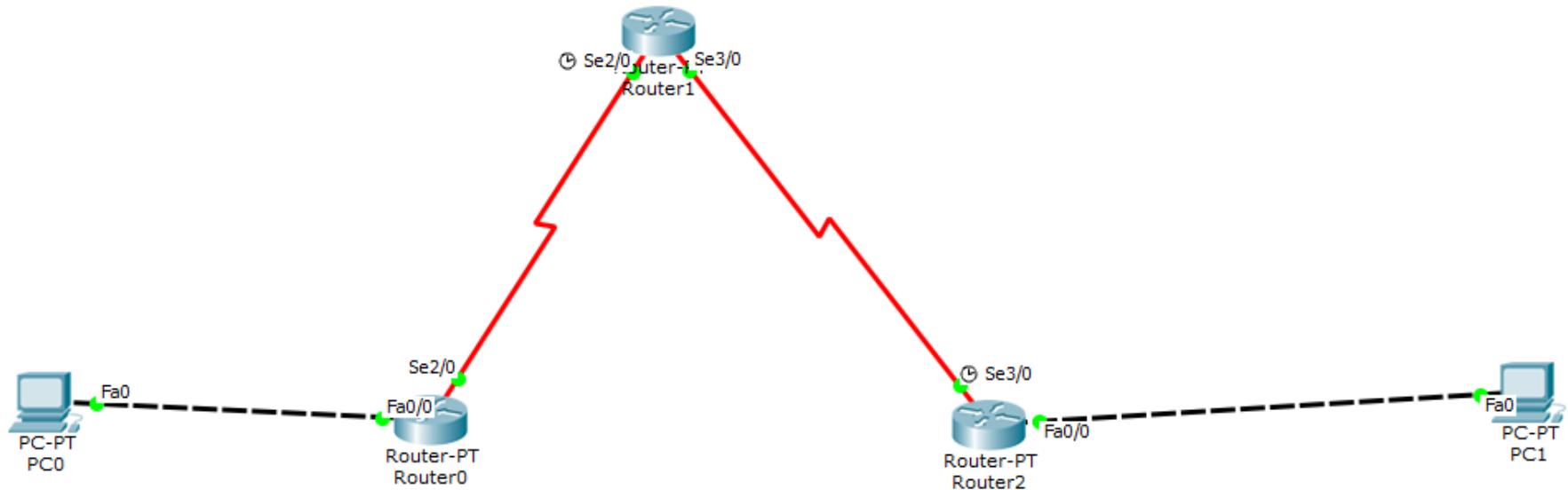
Remove Link Router 0-2

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- Remove link between Router 0 and Router 2.



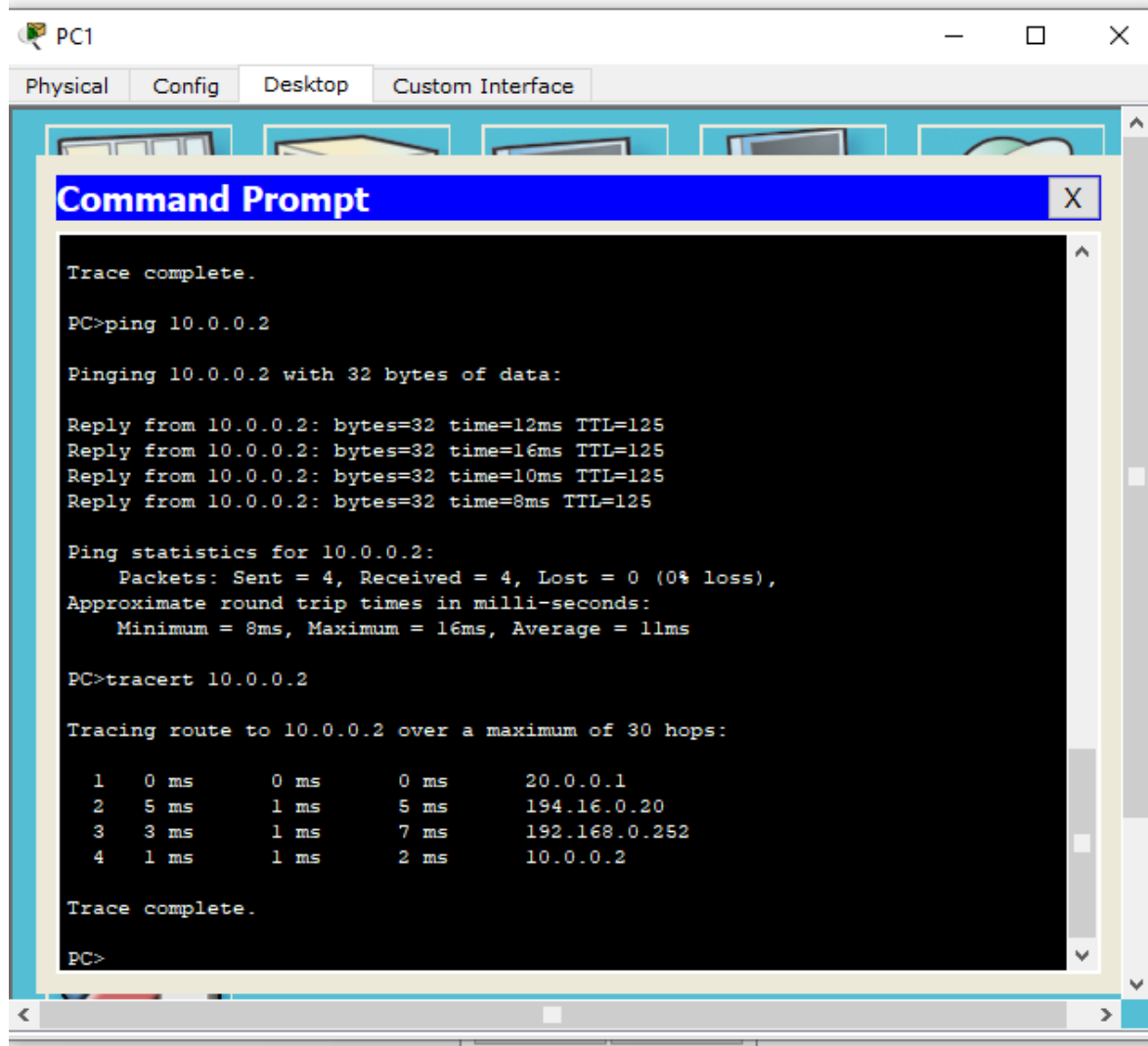
Testing of Scenario

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- Ping and tracert from PC1 to PC0 and vice versa.



The screenshot shows a PC1 desktop environment with a taskbar at the top. A Command Prompt window is open, displaying the results of a ping and tracert command. The window title is "Command Prompt". The output shows a successful ping to 10.0.0.2 and a successful tracert to 10.0.0.2.

```
PC1
Physical Config Desktop Custom Interface
Command Prompt
Trace complete.
PC>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=12ms TTL=125
Reply from 10.0.0.2: bytes=32 time=16ms TTL=125
Reply from 10.0.0.2: bytes=32 time=10ms TTL=125
Reply from 10.0.0.2: bytes=32 time=8ms TTL=125

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 8ms, Maximum = 16ms, Average = 11ms

PC>tracert 10.0.0.2

Tracing route to 10.0.0.2 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    20.0.0.1
  2  5 ms    1 ms    5 ms    194.16.0.20
  3  3 ms    1 ms    7 ms    192.168.0.252
  4  1 ms    1 ms    2 ms    10.0.0.2

Trace complete.
PC>
```

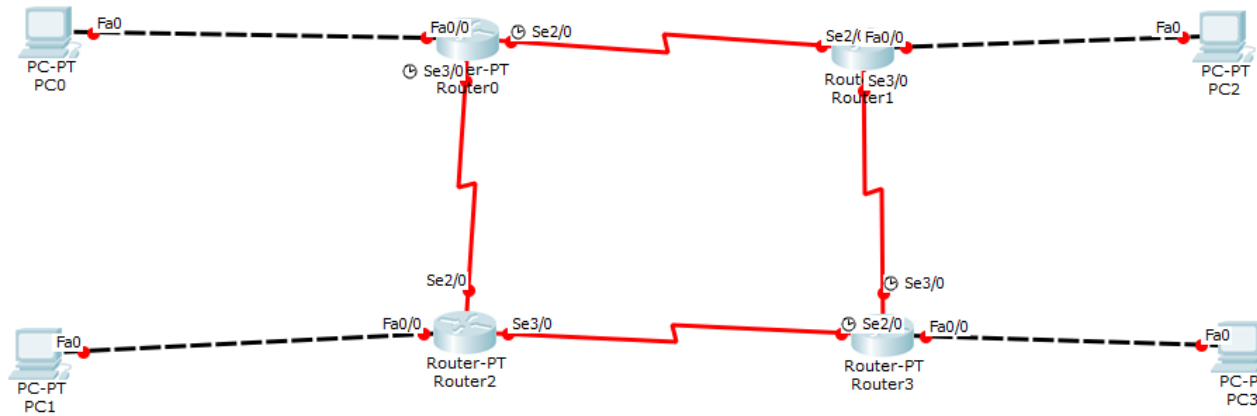
Practice Scenario

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- Simulate the dynamic routing by considering following network scenario.



- Ping and tracert from PC0 to PC1, PC2, PC3 and vice versa.
- Down the link between Router 0 to Router 2, and observe the difference between tracert outcome from PC0 to PC1.

Check routing table entries on each Router



```
Router>enable
```

```
Router#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, FastEthernet0/0
```

```
R 20.0.0.0/8 [120/1] via 193.167.0.218, 00:00:21, Serial3/0
```

```
C 192.168.0.0/24 is directly connected, Serial2/0
```

```
C 193.167.0.0/24 is directly connected, Serial3/0
```

```
R 194.16.0.0/24 [120/1] via 192.168.0.253, 00:00:02, Serial2/0
```

```
[120/1] via 193.167.0.218, 00:00:21, Serial3/0
```



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Thank You!