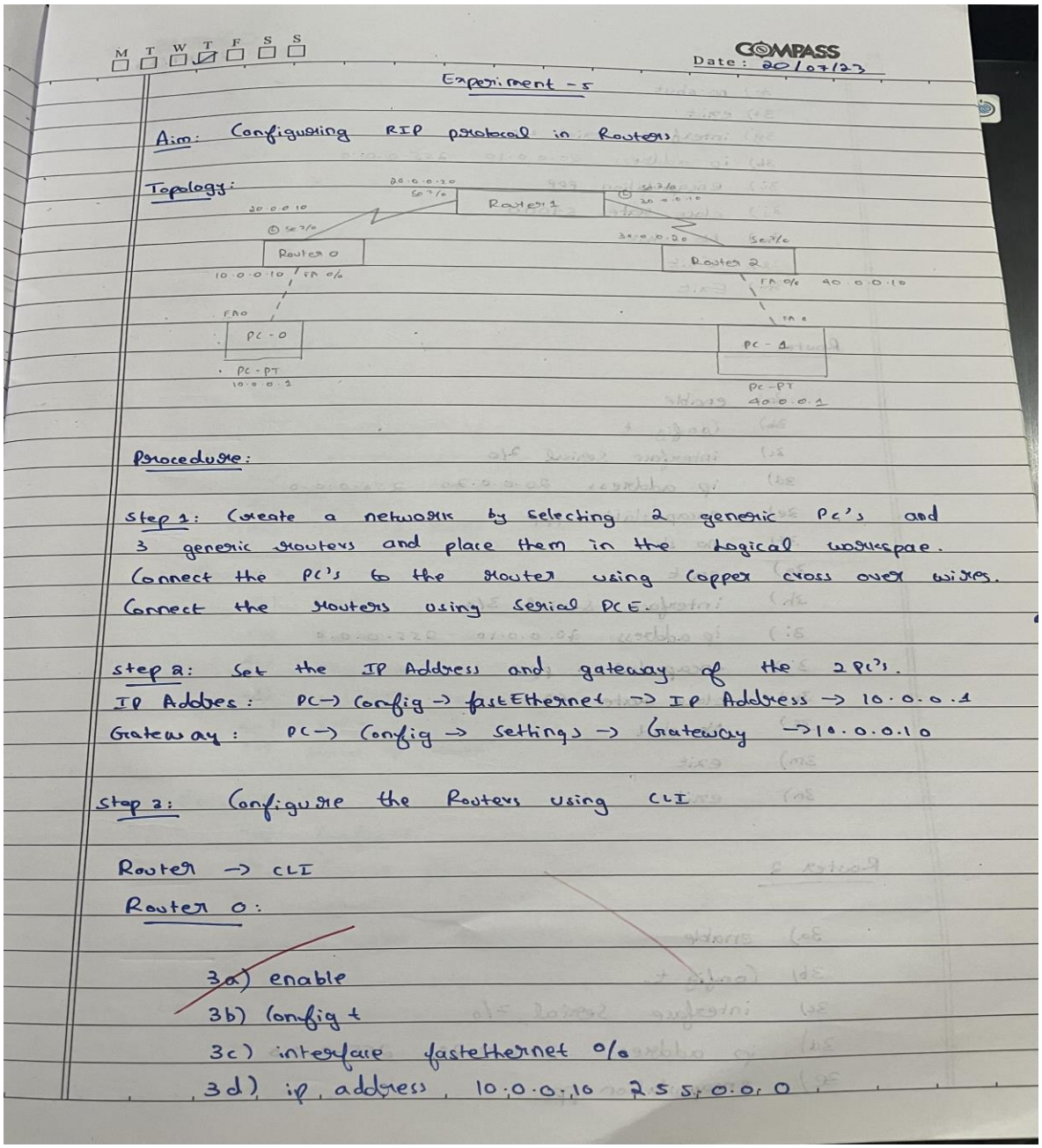
LAB PROGRAM -5

Q) Configure RIP routing Protocol In Routers.

Procedure :



Experiment - 5

Aim: Configuring RIP protocol in Routers

Topology:

Procedure:

Step 1: Create a network by selecting 2 generic Pc's and 3 generic routers and place them in the logical workspace. Connect the Pc's to the router using copper cross over wires. Connect the routers using serial DCE.

Step 2: Set the IP Address and gateway of the 2 Pc's.

IP Addres: PC→ Config → fastEthernet → IP Address → 10.0.0.1

Gateway: PC→ Config → Settings → Gateway →10.0.0.10

Step 3: Configure the Routers using CLI

Router → CLI

Router 0:

3a) enable

3b) config t

3c) interface fastethernet 0/0

3d) ip address 10.0.0.10 255.0.0.0

COMPASS
Date: 20/07/23

M T W T F S S

3e) no shut
3f) exit
3g) interface serial 2/0
3h) ip address 20.0.0.10 255.0.0.0
3i) encapsulation ppp
3j) clock rate 64000
3k) No shut
3l) Exit
3m) Exit

Router 1

3a) enable
3b) Config t
3c) interface serial 2/0
3d) ip address 20.0.0.20 255.0.0.0
3e) encapsulation ppp
3f) no shut
3g) exit
3h) interface serial 3/0
3i) ip address 30.0.0.10 255.0.0.0
3j) encapsulation ppp
3k) clock rate 64000
3l) No shut
3m) exit
3n) exit

Router 2

3a) enable
3b) Config t
3c) interface serial 2/0
3d) ip address 30.0.0.20 255.0.0.0
3e) Encapsulation ppp

M T W T F S S

COMPASS

Date: 20/07/23

3f) no shut

3g) exit

3h) interface fastethernet 0/0

3i) ip address 40.0.0.10 255.0.0.0

3j) no shut

3k) exit

3l) Exit

Step 4: Router -> CLI

Router 0:

4a) Config t

4b) Router RIP

4c) network 10.0.0.0

4d) network 20.0.0.0

4e) exit

4f) show ip route

Router 1:

4a) Config t

4b) Router RIP

4c) network 20.0.0.0

4d) network 30.0.0.0

4e) exit

4f) show ip route

Router 2:

4a) Config t

4b) Router RIP

4c) network 30.0.0.0

4d) network 40.0.0.0

4e) exit

4f) show ip route

COMPASS
Date: 00/07/23

M T W T F S S

The show ip route command will show ip Address Associated with the path as 'c' and other IP Addresses are labelled 'R'.

Result:

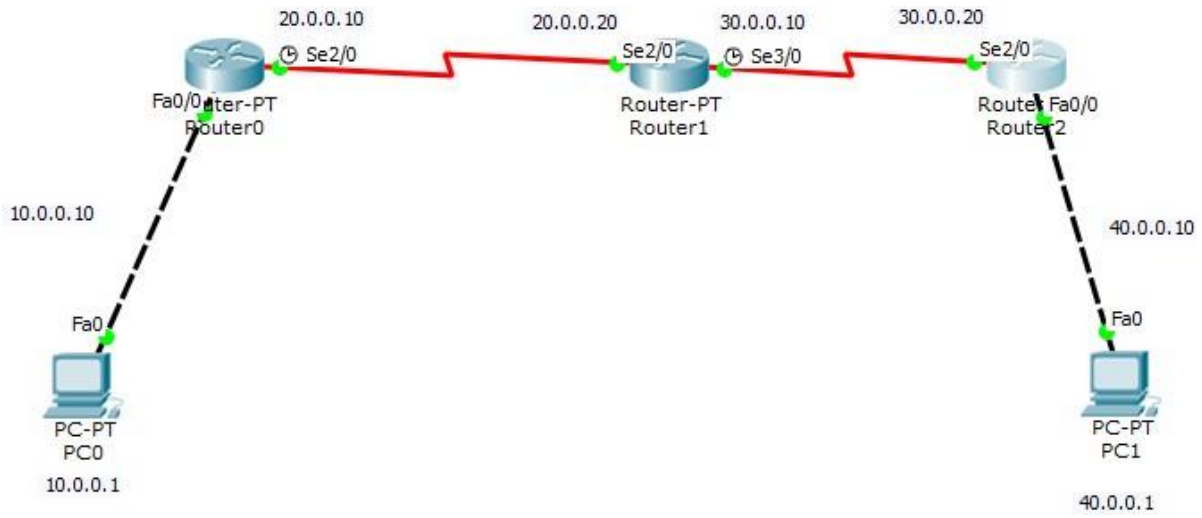
```
Pc > ping 40.0.0.1
pinging 40.0.0.1 with 32 bytes of data:
Request timed out
Reply from 40.0.0.1 : bytes = 32 time = 11ms TTL = 125
Reply from 40.0.0.1 : bytes = 32 time = 10ms TTL = 125
Reply from 40.0.0.1 : bytes = 32 time = 2ms TTL = 125
ping statistics for 40.0.0.1:
    packets : Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 11ms, Average = 7ms
```

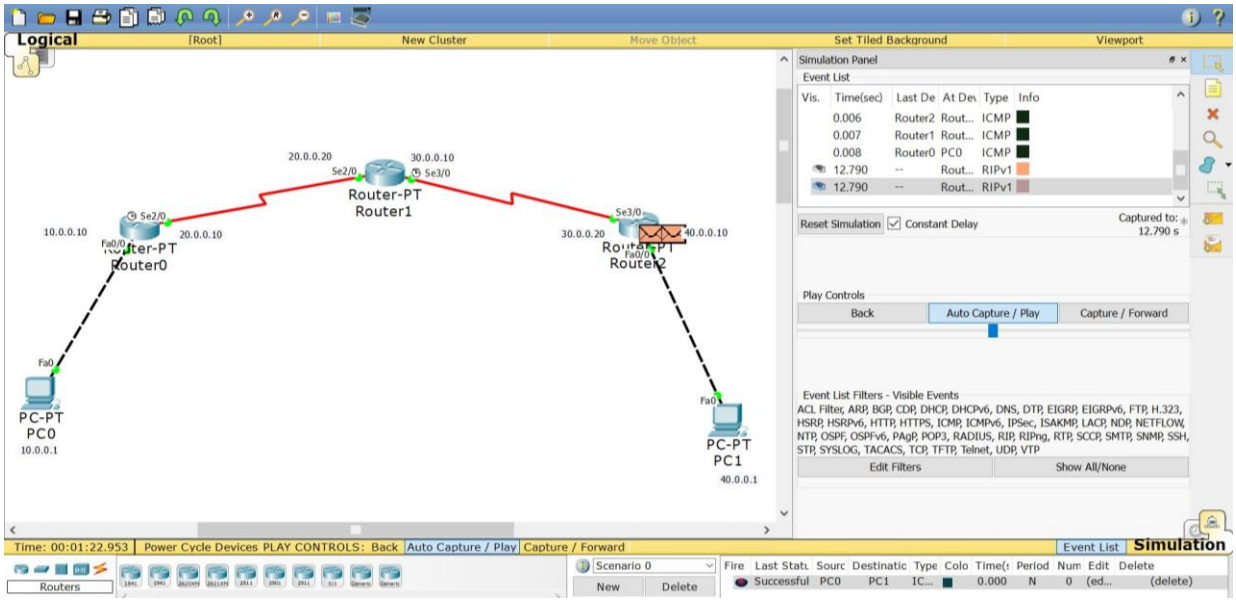
observation:

Routing information protocol (RIP) is a distance vector protocol that uses hop count as its primary metric. RIP defines how routers should share information when moving traffic among an interconnected group of local area networks.

RIP uses a distance vector Algo to decide which path to put a packet on to get to its destination. Each RIP router maintains a routing table which is a list of all the destinations the router knows how to reach. Each router broadcasts its entire routing table to it's closest neighbors every 30 seconds. The neighbors (routers) pass the information to nearest neighbors until all the RIP hosts within the network have the same knowledge of Routing paths. (∴ RIP uses the shortest no of hops to determine the best path to a remote network.)

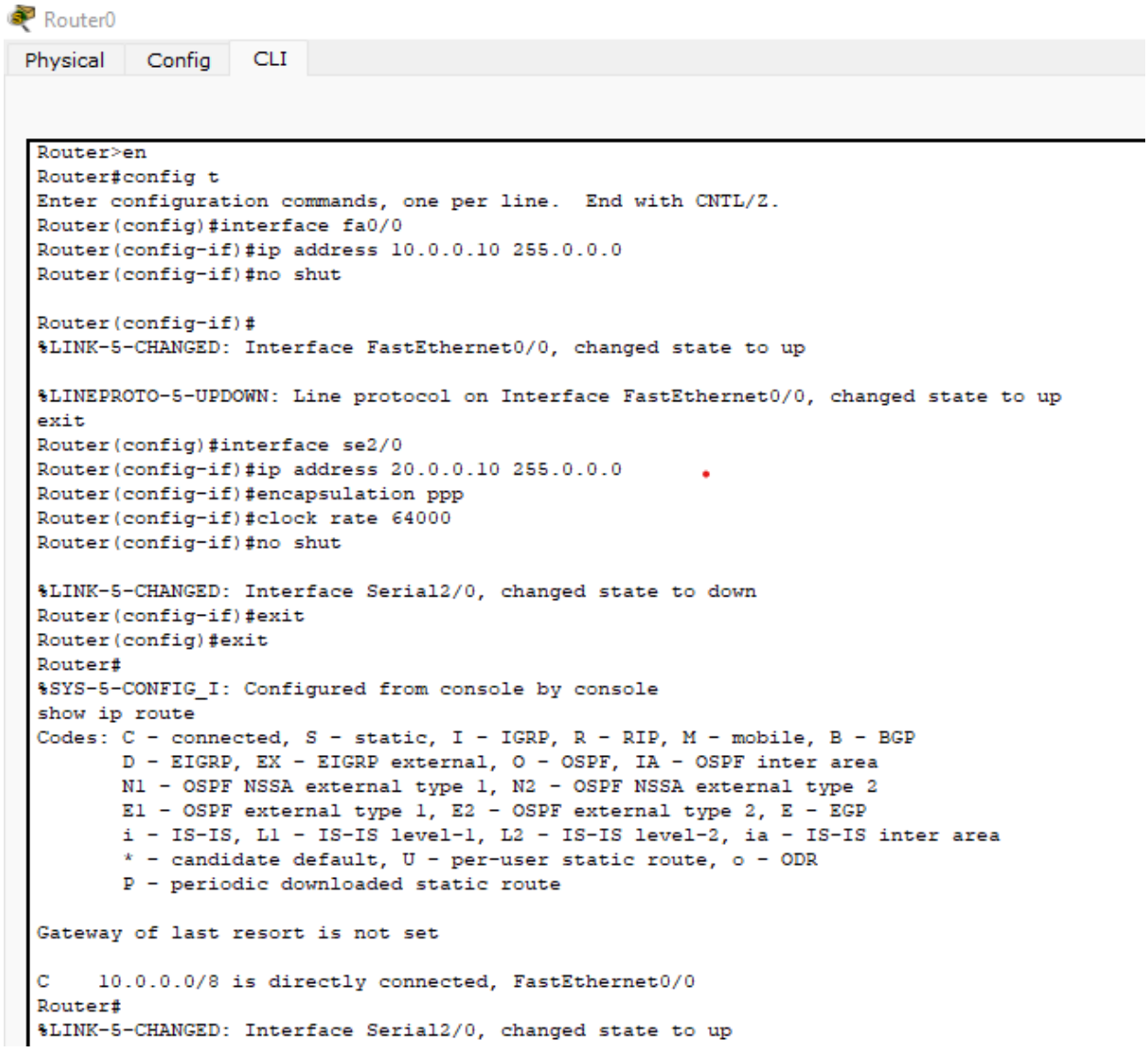
Topology :


20.0.0.10
Se2/0
20.0.0.20
Se2/0
30.0.0.10
Se3/0
30.0.0.20
Se2/0
Fa0/0
Router-PT
Router0
Router-PT
Router1
Router-PT
Router2
Fa0/0
10.0.0.10
40.0.0.10
Fa0
Fa0
PC-PT
PC0
10.0.0.1
PC-PT
PC1
40.0.0.1

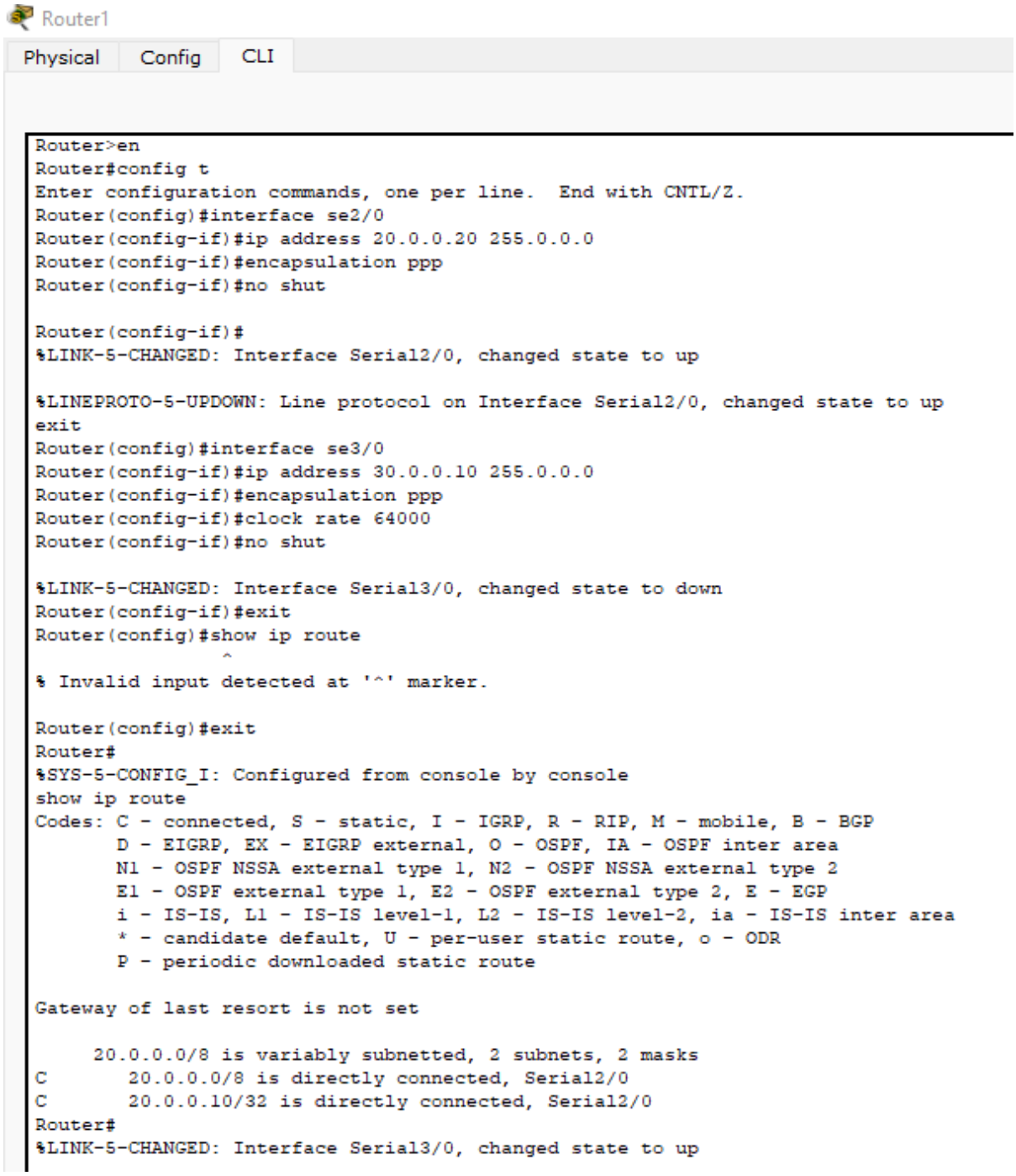

Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Simulation Panel
Event List
Vis.
Time(sec)
Last De
At De
Type
Info
0.006
Router2
Rout...
ICMP
0.007
Router1
Rout...
ICMP
0.008
Router0
PC0
ICMP
12.790
Rout...
RIPv1
12.790
Rout...
RIPv1
Reset Simulation
Constant Delay
Captured to:
12.790 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323,
HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW,
NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH,
STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
Time: 00:01:22.953
Power Cycle Devices PLAY CONTROLS: Back
Auto Capture / Play
Capture / Forward
Event List
Simulation
Routers
Scenario 0
New
Delete
Fire
Last Stat
Sourc
Destinatic
Type
Colo
Time(
Period
Num
Edit
Delete
Successful
PC0
PC1
IC...
0.000
N
0
(ed...
(delete)

Configuration:

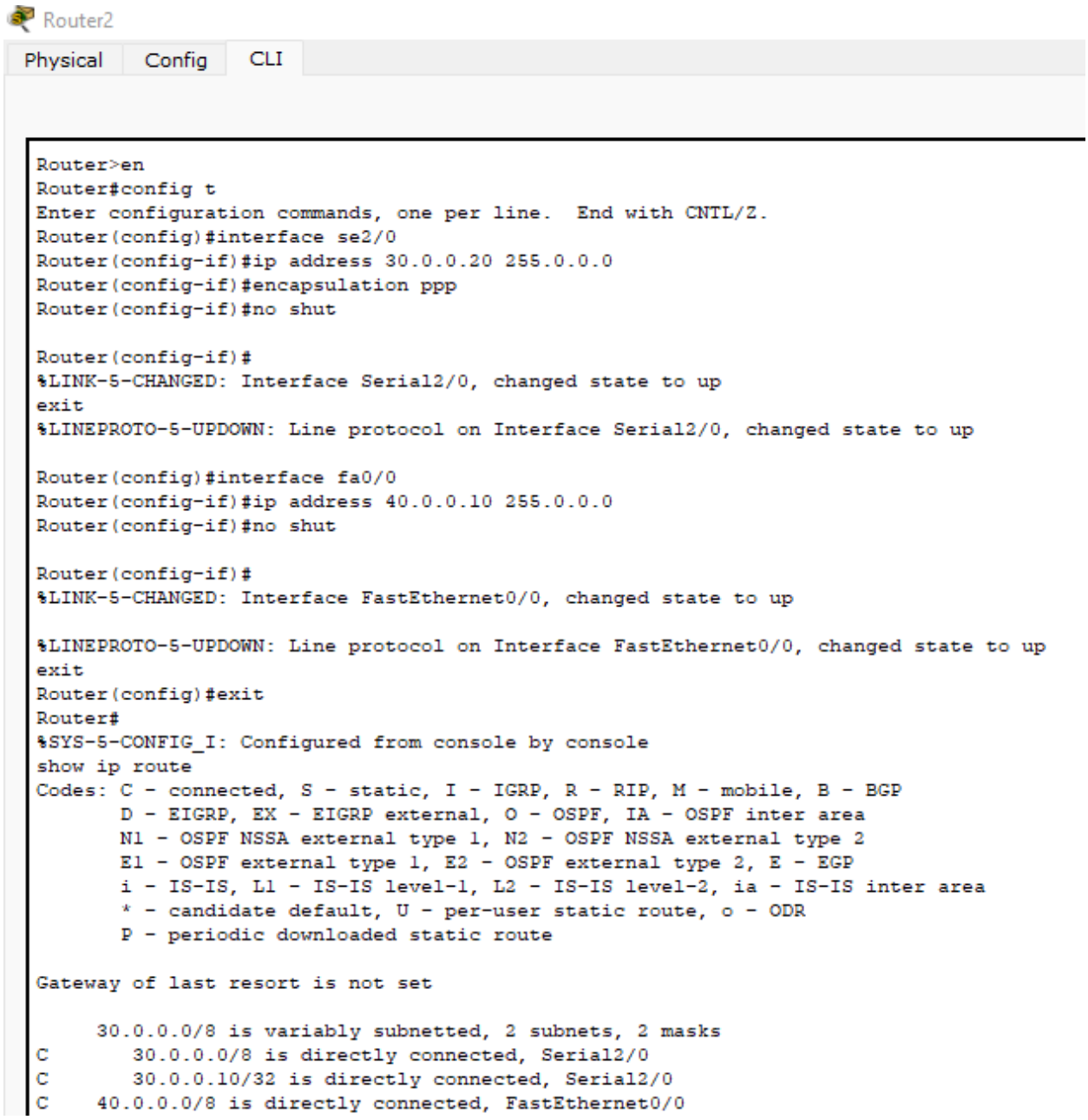
Router 0 :



Router 1 :


Router1
Physical
Config
CLI
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface se2/0
Router(config-if)#ip address 20.0.0.20 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
exit
Router(config)#interface se3/0
Router(config-if)#ip address 30.0.0.10 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#clock rate 64000
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#show ip route
^
% Invalid input detected at '^' marker.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial2/0
C 20.0.0.10/32 is directly connected, Serial2/0
Router#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

Router 2 :


Router2
Physical
Config
CLI
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface se2/0
Router(config-if)#ip address 30.0.0.20 255.0.0.0
Router(config-if)#encapsulation ppp
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
exit
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config)#interface fa0/0
Router(config-if)#ip address 40.0.0.10 255.0.0.0
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/8 is directly connected, Serial2/0
C 30.0.0.10/32 is directly connected, Serial2/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0

RIP routing:

Router 0:

```
Router#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
config t
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 20.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.20/32 is directly connected, Serial2/0
R    30.0.0.0/8 [120/1] via 20.0.0.20, 00:00:18, Serial2/0
R    40.0.0.0/8 [120/2] via 20.0.0.20, 00:00:18, Serial2/0
Router#
```

Router 1:

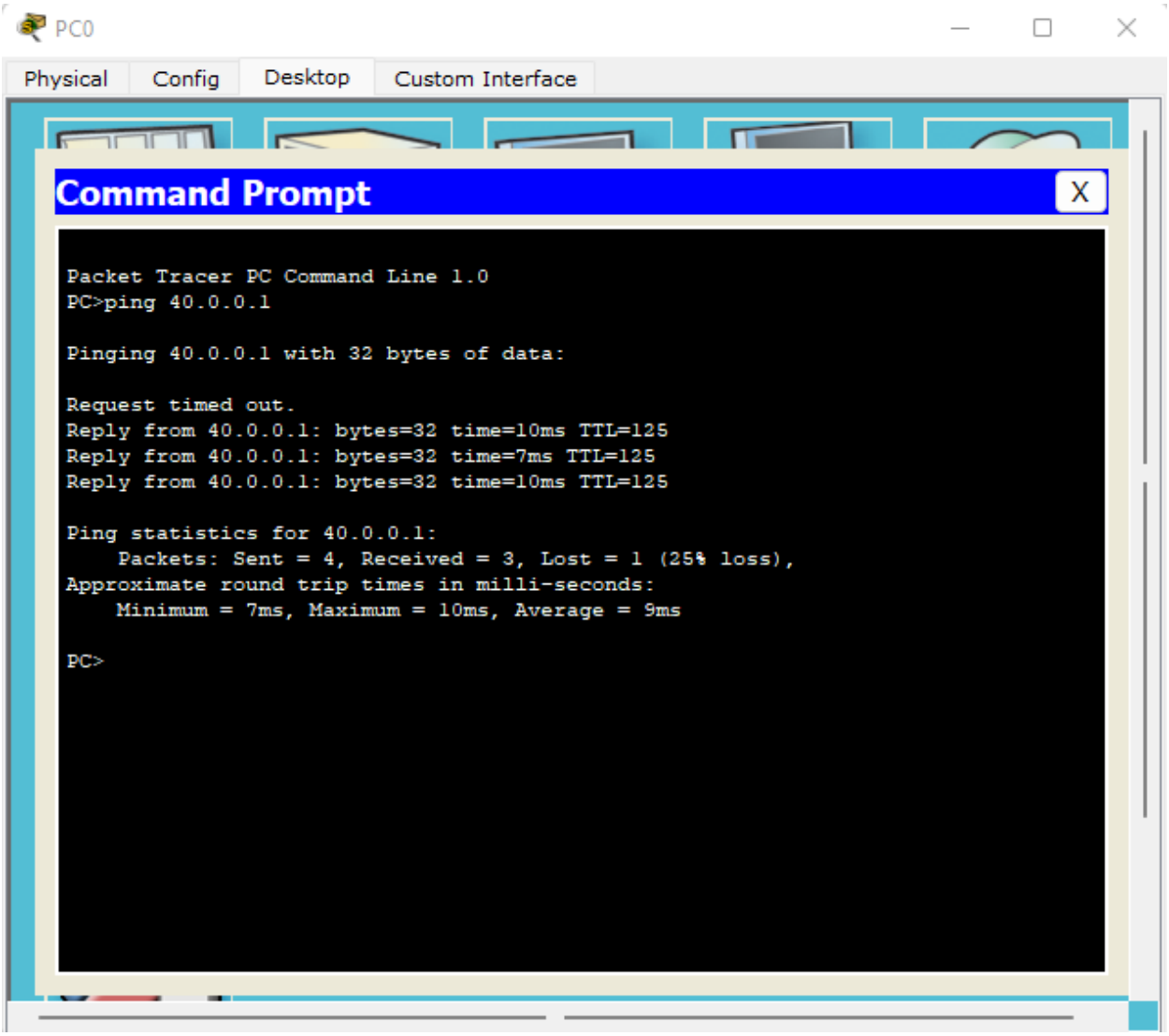
```
Router#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
config t
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 30.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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

R    10.0.0.0/8 [120/1] via 20.0.0.10, 00:00:20, Serial2/0
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.10/32 is directly connected, Serial2/0
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial3/0
C       30.0.0.20/32 is directly connected, Serial3/0
R    40.0.0.0/8 [120/1] via 30.0.0.20, 00:00:19, Serial3/0
Router#
```

Router 2:

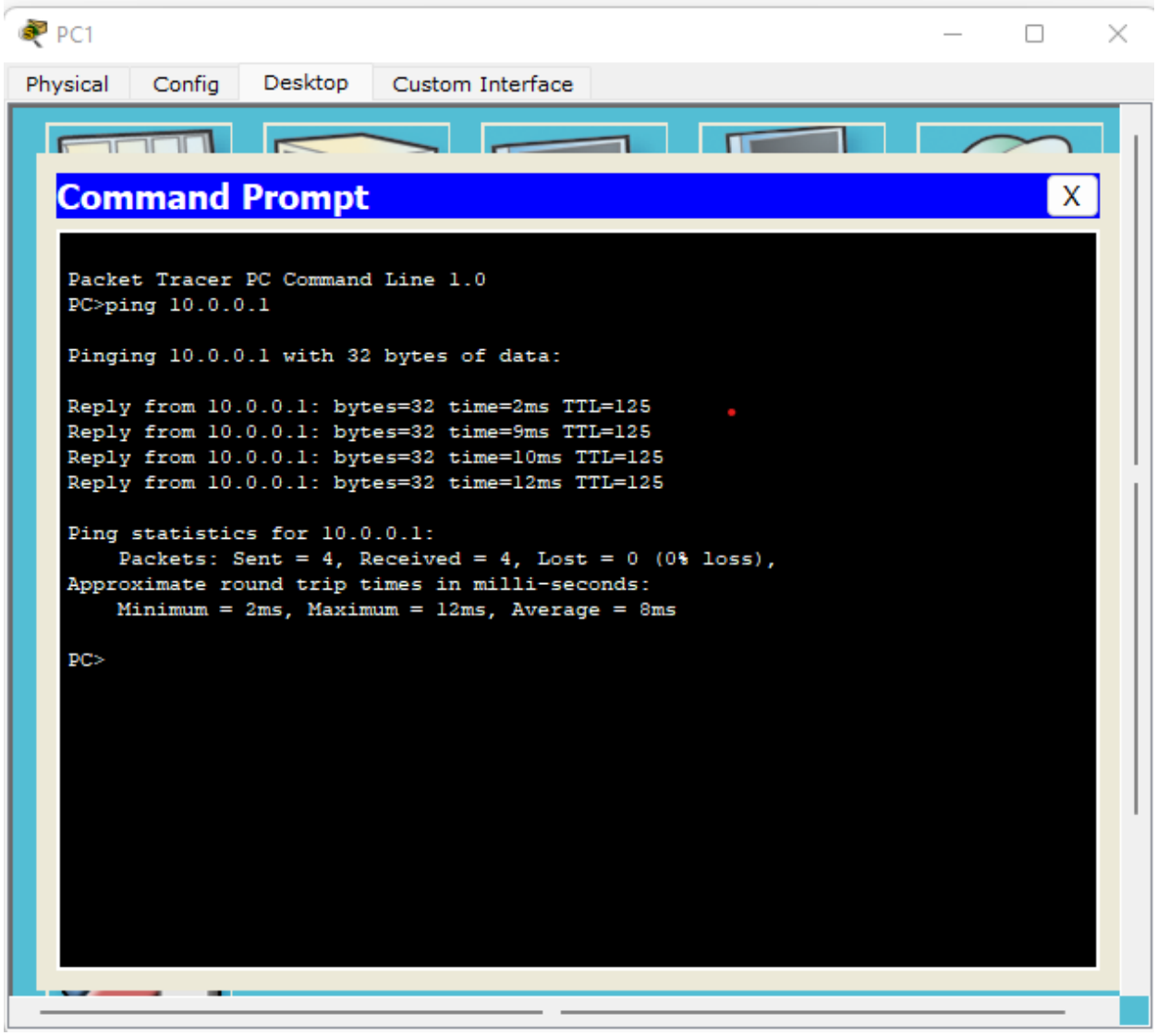
```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#network 30.0.0.0
                ^
% Invalid input detected at '^' marker.

Router(config)#router rip
Router(config-router)#network 30.0.0.0
Router(config-router)#network 40.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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

R    10.0.0.0/8 [120/2] via 30.0.0.10, 00:00:14, Serial2/0
R    20.0.0.0/8 [120/1] via 30.0.0.10, 00:00:14, Serial2/0
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial2/0
C       30.0.0.10/32 is directly connected, Serial2/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
Router#
```

Command Prompt:

P0:



P1:


PC1
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time=2ms TTL=125
Reply from 10.0.0.1: bytes=32 time=9ms TTL=125
Reply from 10.0.0.1: bytes=32 time=10ms TTL=125
Reply from 10.0.0.1: bytes=32 time=12ms TTL=125
Ping statistics for 10.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 12ms, Average = 8ms
PC>