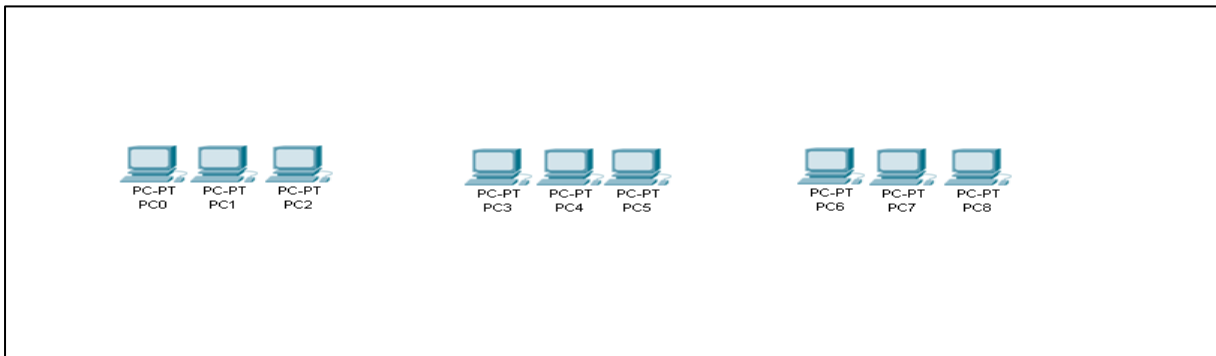


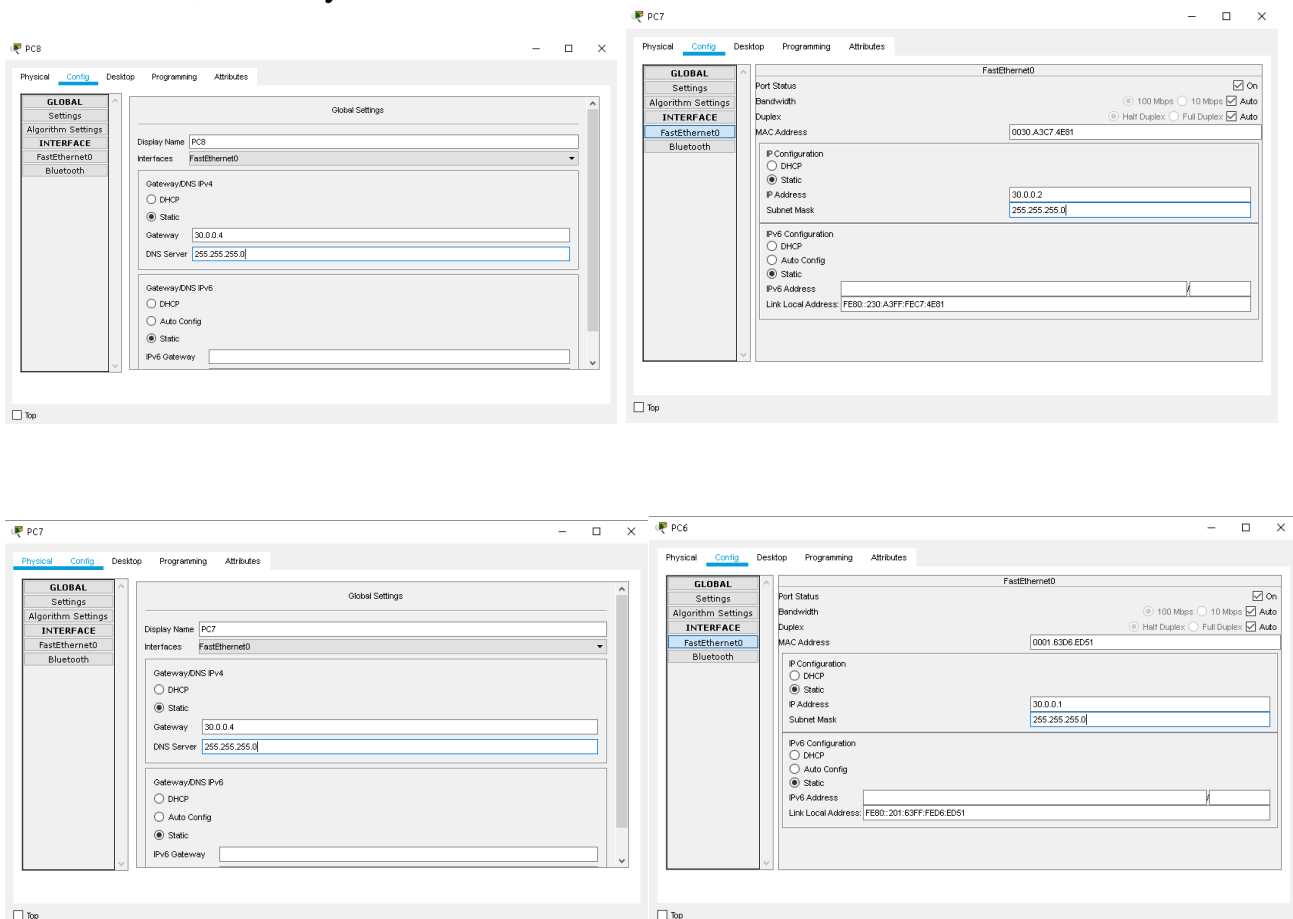
PRACTICAL NO: 1

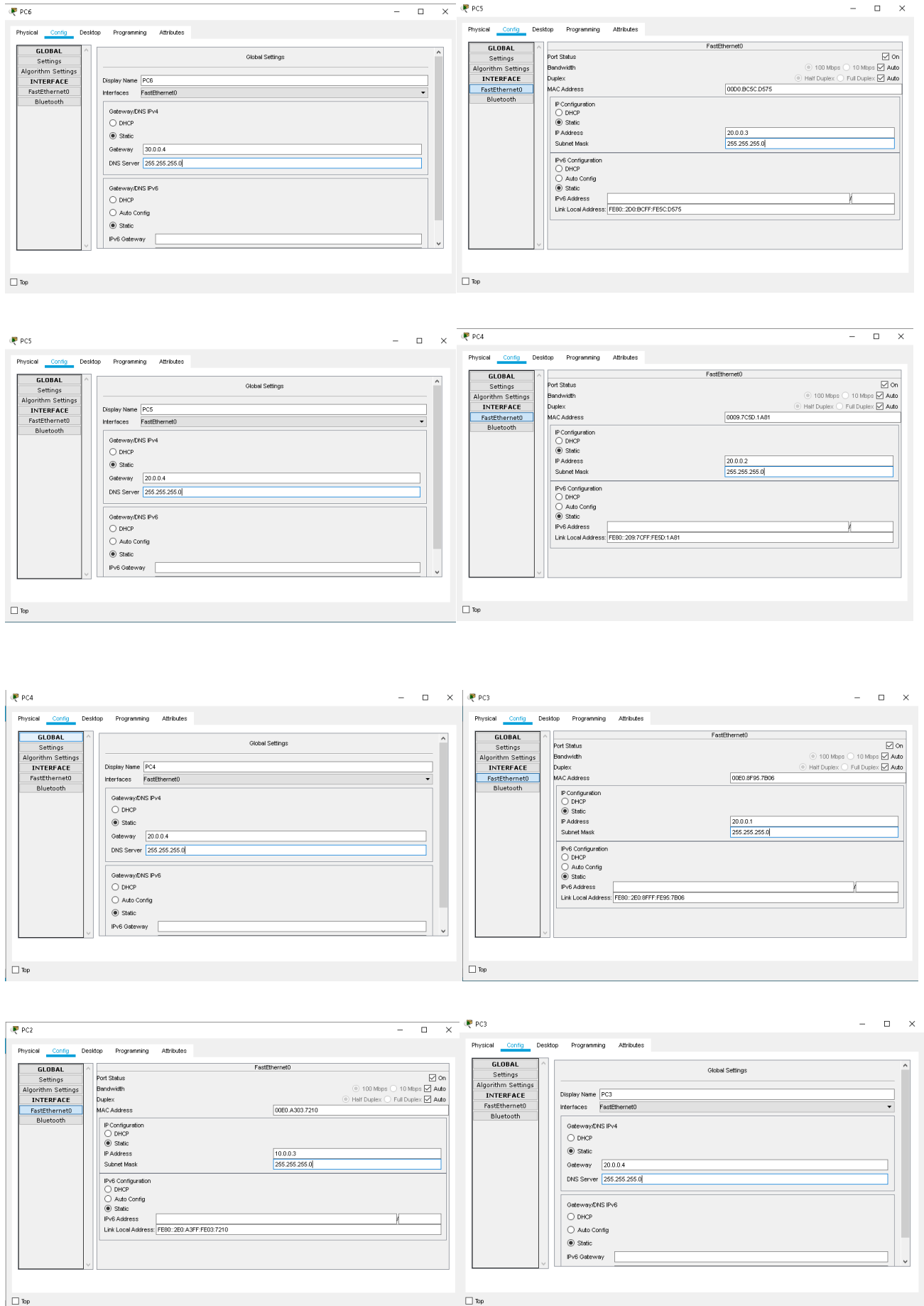
Aim - Create a network with three routers with RIPv2 and each router associated network will have minimum three PC. Show connectivity.

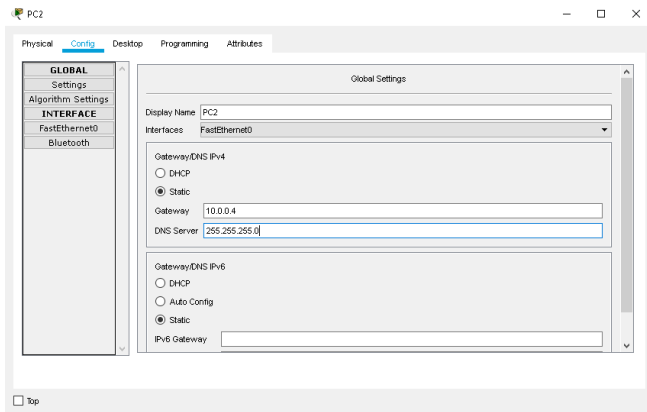
1. Align 9 end-devices as follows:



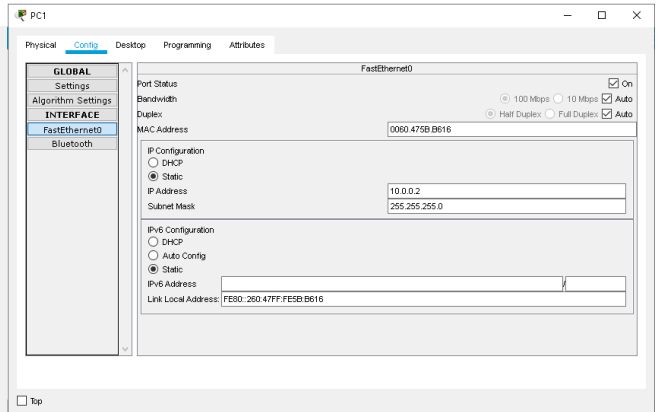
2. Set the DNS, Gateway and Fast Ethernet connections for all the PCs as follows:



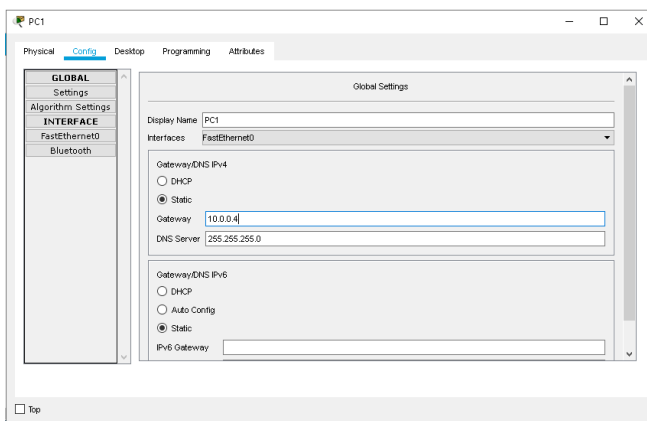




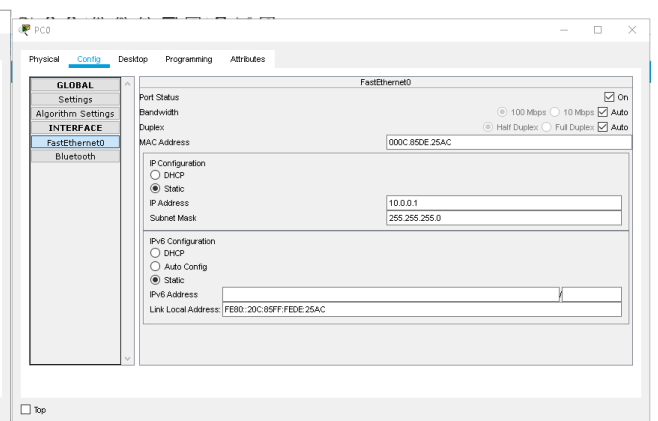
PC2 configuration window showing Global Settings. The Display Name is PC2. The selected interface is FastEthernet0. The Gateway/DNS IPv4 configuration is set to Static with a Gateway of 10.0.0.4 and a DNS Server of 255.255.255.0. The Gateway/DNS IPv6 configuration is also set to Static with an IPv6 Gateway field.



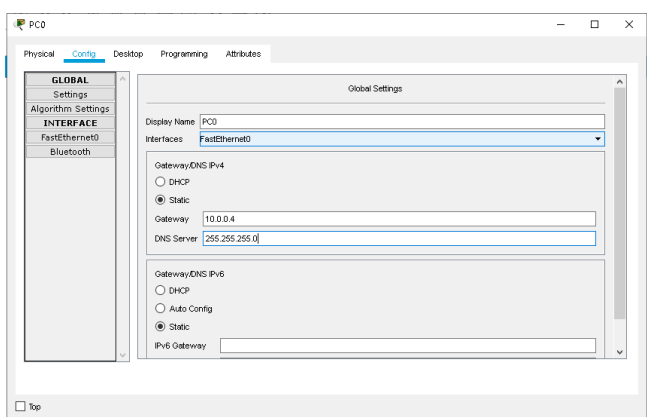
PC1 configuration window showing FastEthernet0 interface settings. The Port Status is On. The Bandwidth is 100 Mbps. The Duplex is set to Auto. The MAC Address is 0000.475B.B616. The IP Configuration is set to Static with an IP Address of 10.0.0.2 and a Subnet Mask of 255.255.255.0. The IPv6 Configuration is set to Static with an IPv6 Address field and a Link Local Address of FE80::260:47FF:FE5B:B616.



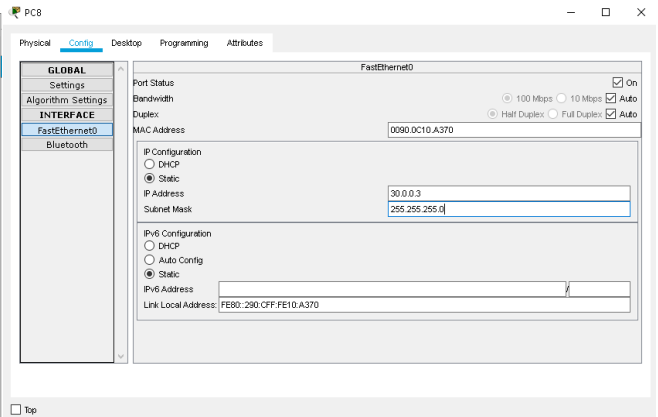
PC1 configuration window showing Global Settings. The Display Name is PC1. The selected interface is FastEthernet0. The Gateway/DNS IPv4 configuration is set to Static with a Gateway of 10.0.0.4 and a DNS Server of 255.255.255.0. The Gateway/DNS IPv6 configuration is also set to Static with an IPv6 Gateway field.



PC0 configuration window showing FastEthernet0 interface settings. The Port Status is On. The Bandwidth is 100 Mbps. The Duplex is set to Auto. The MAC Address is 000C.850E.25AC. The IP Configuration is set to Static with an IP Address of 10.0.0.1 and a Subnet Mask of 255.255.255.0. The IPv6 Configuration is set to Static with an IPv6 Address field and a Link Local Address of FE80::20C:85FF:FEDE:25AC.

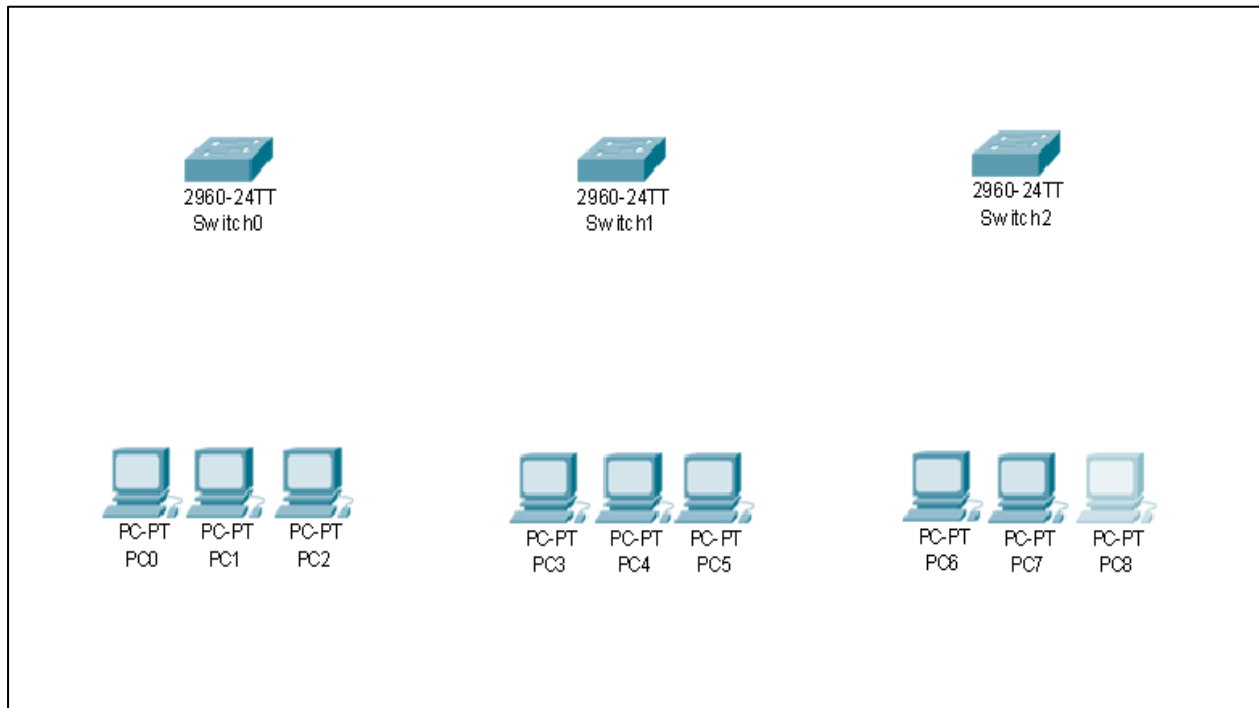


PC0 configuration window showing Global Settings. The Display Name is PC0. The selected interface is FastEthernet0. The Gateway/DNS IPv4 configuration is set to Static with a Gateway of 10.0.0.4 and a DNS Server of 255.255.255.0. The Gateway/DNS IPv6 configuration is also set to Static with an IPv6 Gateway field.

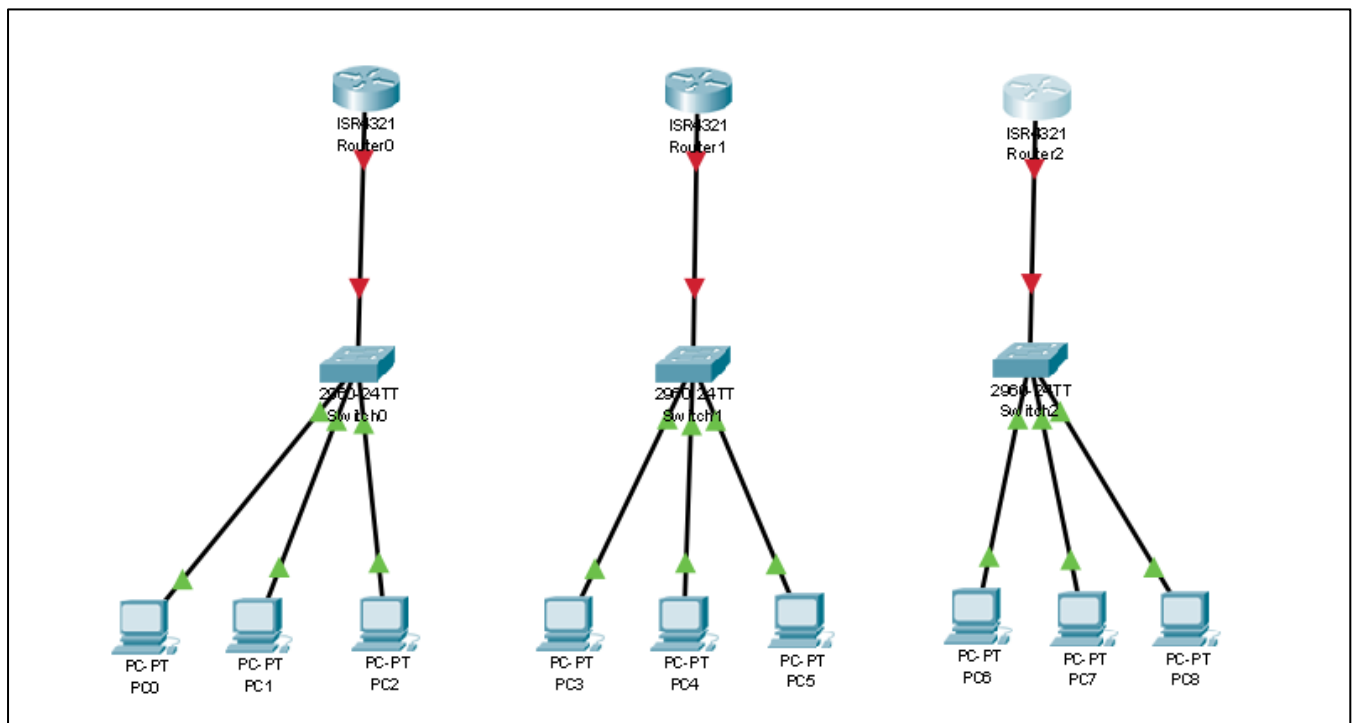


PC8 configuration window showing FastEthernet0 interface settings. The Port Status is On. The Bandwidth is 100 Mbps. The Duplex is set to Auto. The MAC Address is 0090.DC10.A370. The IP Configuration is set to Static with an IP Address of 30.0.0.3 and a Subnet Mask of 255.255.255.0. The IPv6 Configuration is set to Static with an IPv6 Address field and a Link Local Address of FE80::290:CFF:FE10:A370.

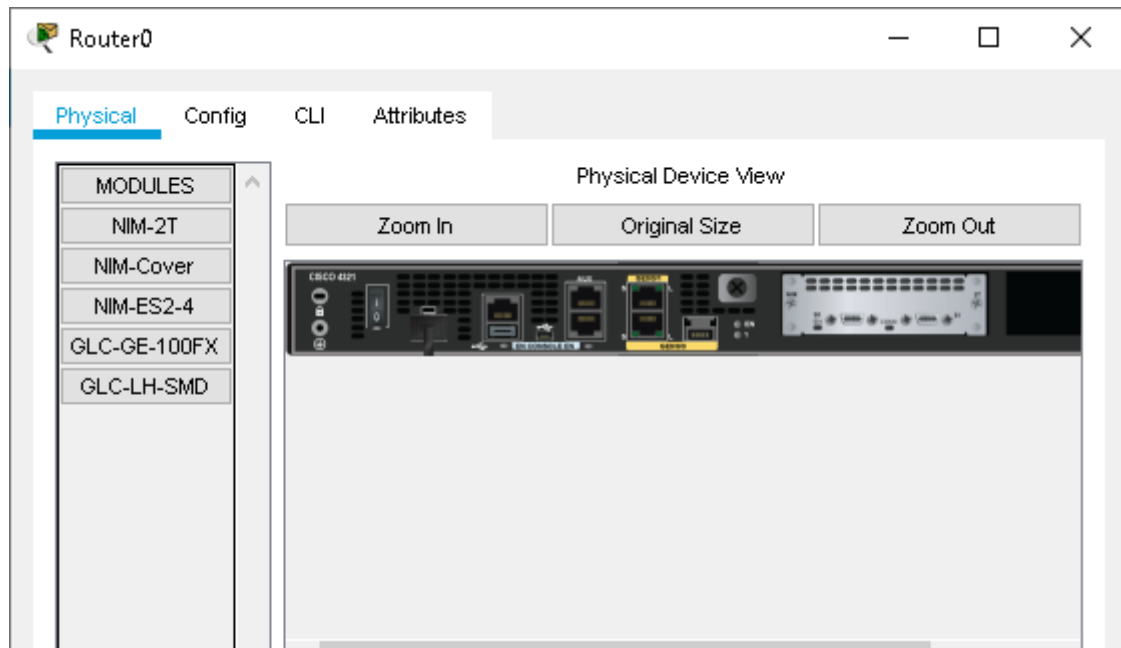
3. Add 3 Switches as follows:



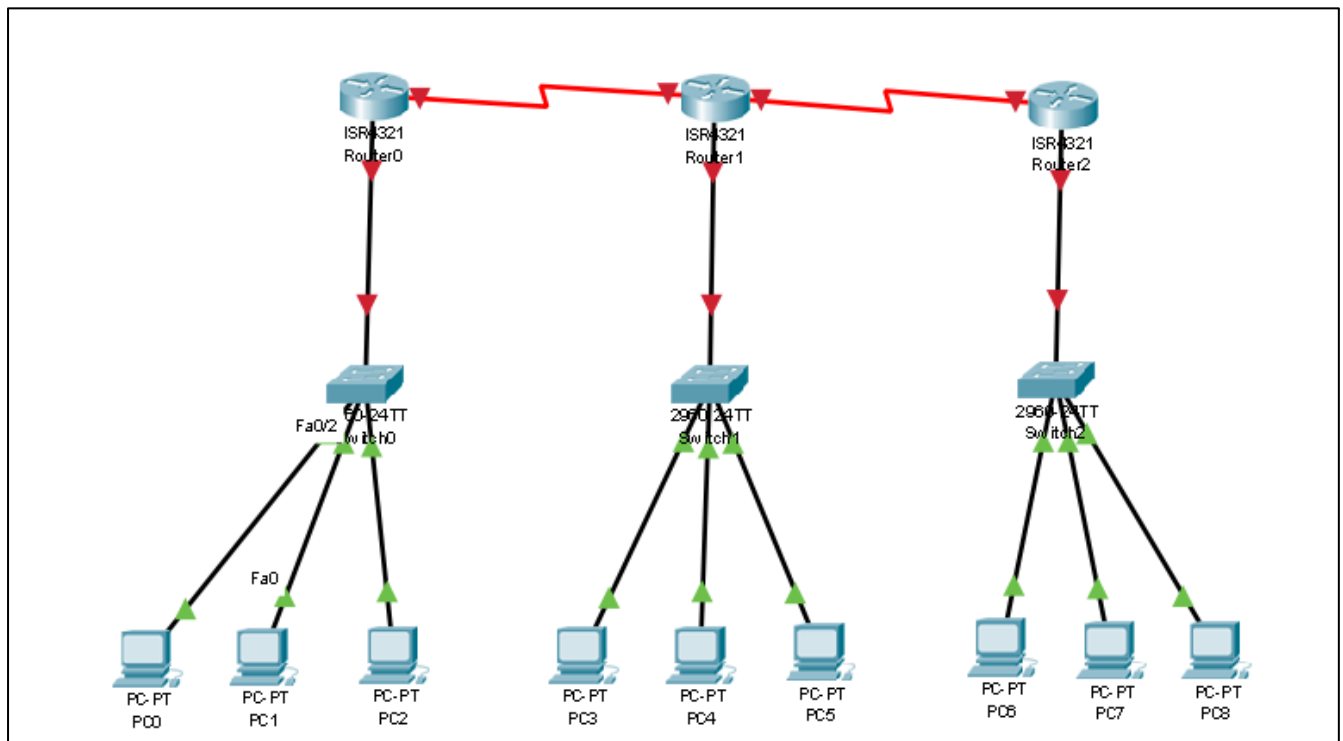
4. Add 3 Routers and connect all the components using Fast Ethernet connection as follows:



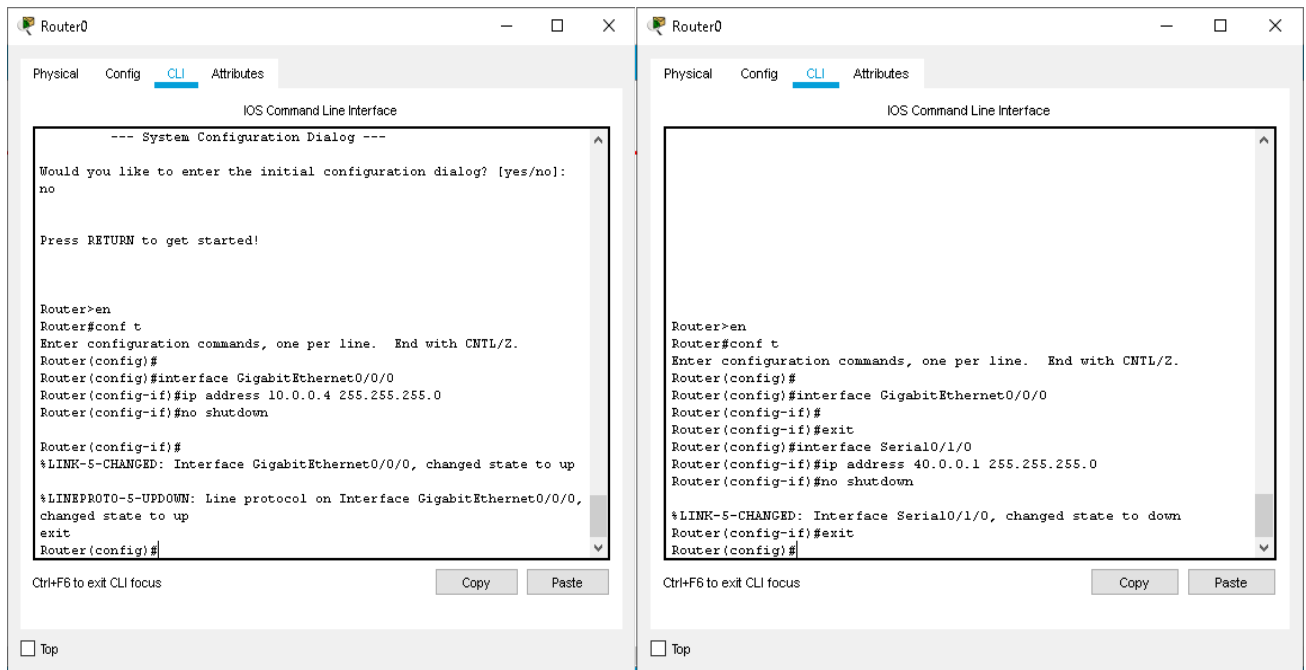
5. Power off each of the Routers and add the NIM-2T Module to all the Routers as follows:



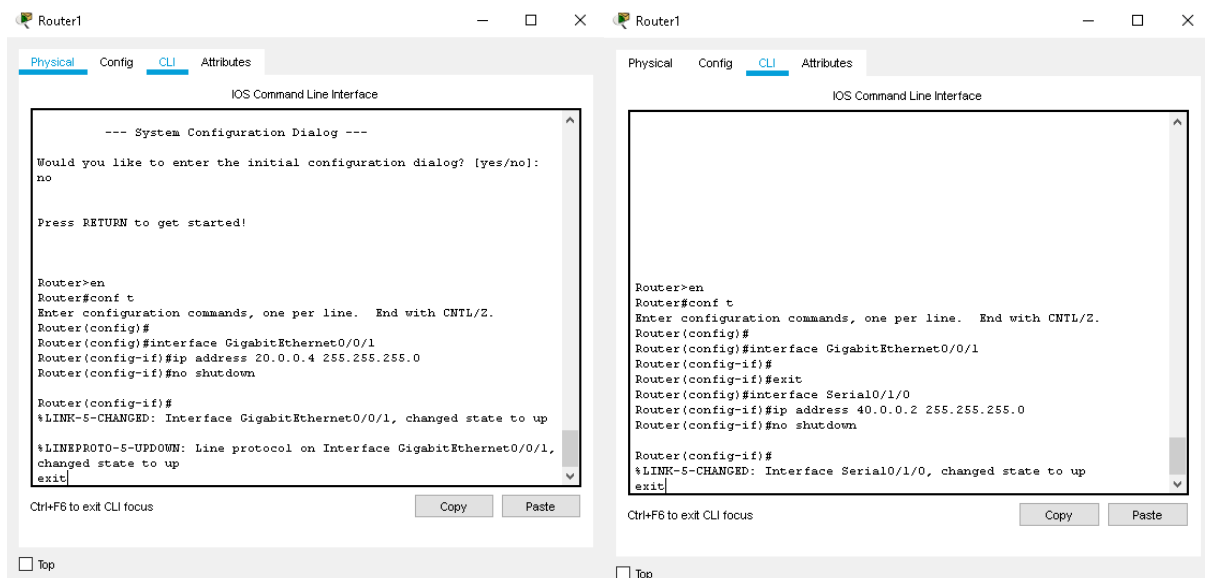
6. Connect the Routers using Serial DTE wires as shown:

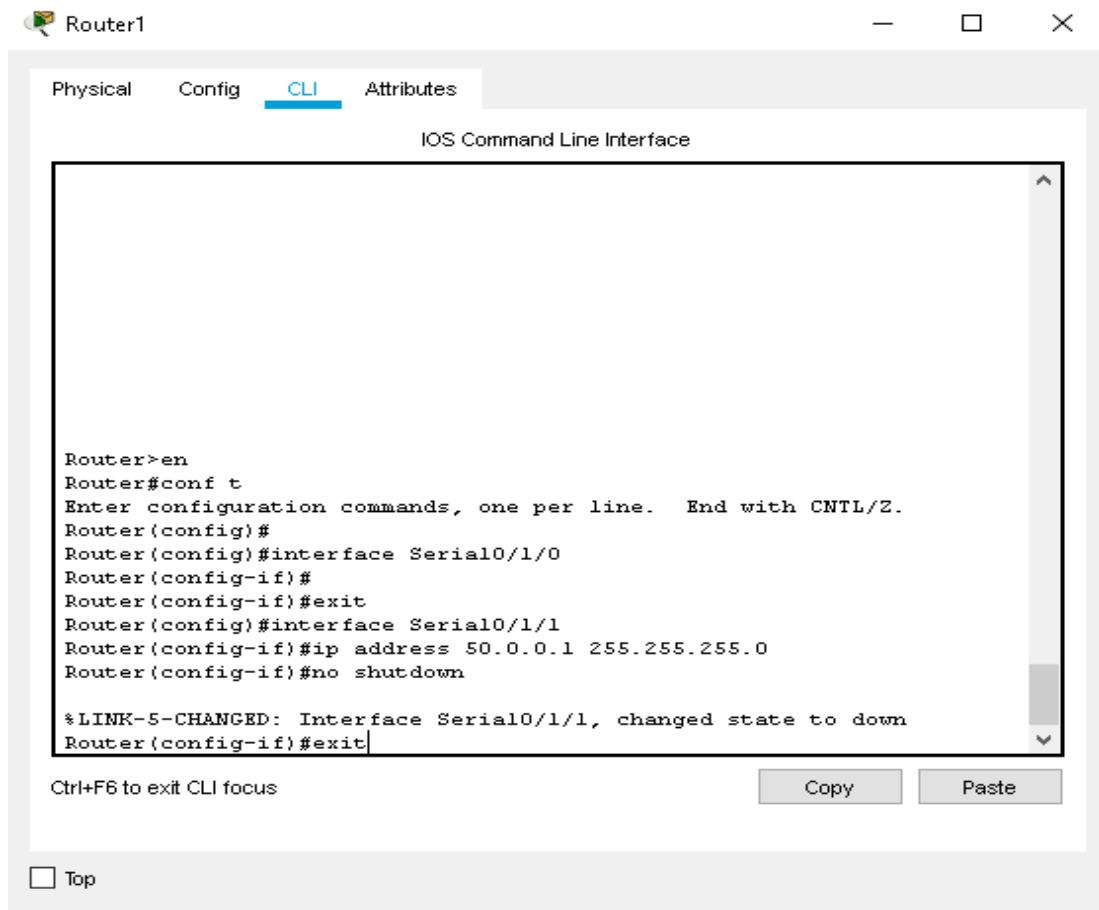


7. Configure Router 0 using the Command Line Interface as follows:

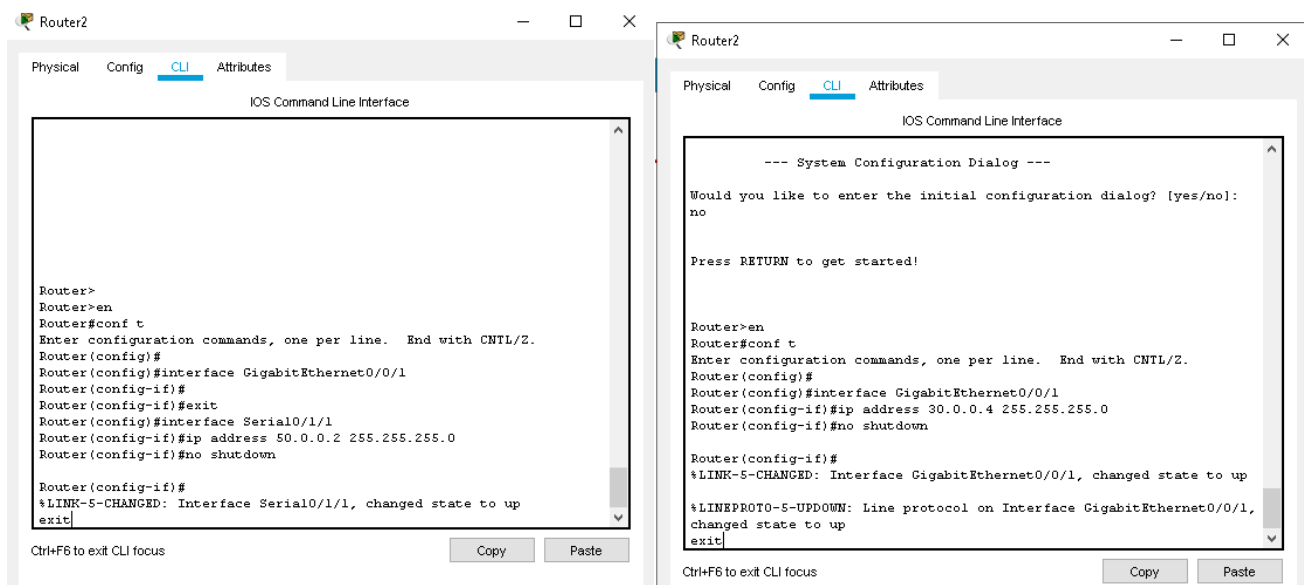


8. Configure Router 1 using the Command Line Interface as follows:

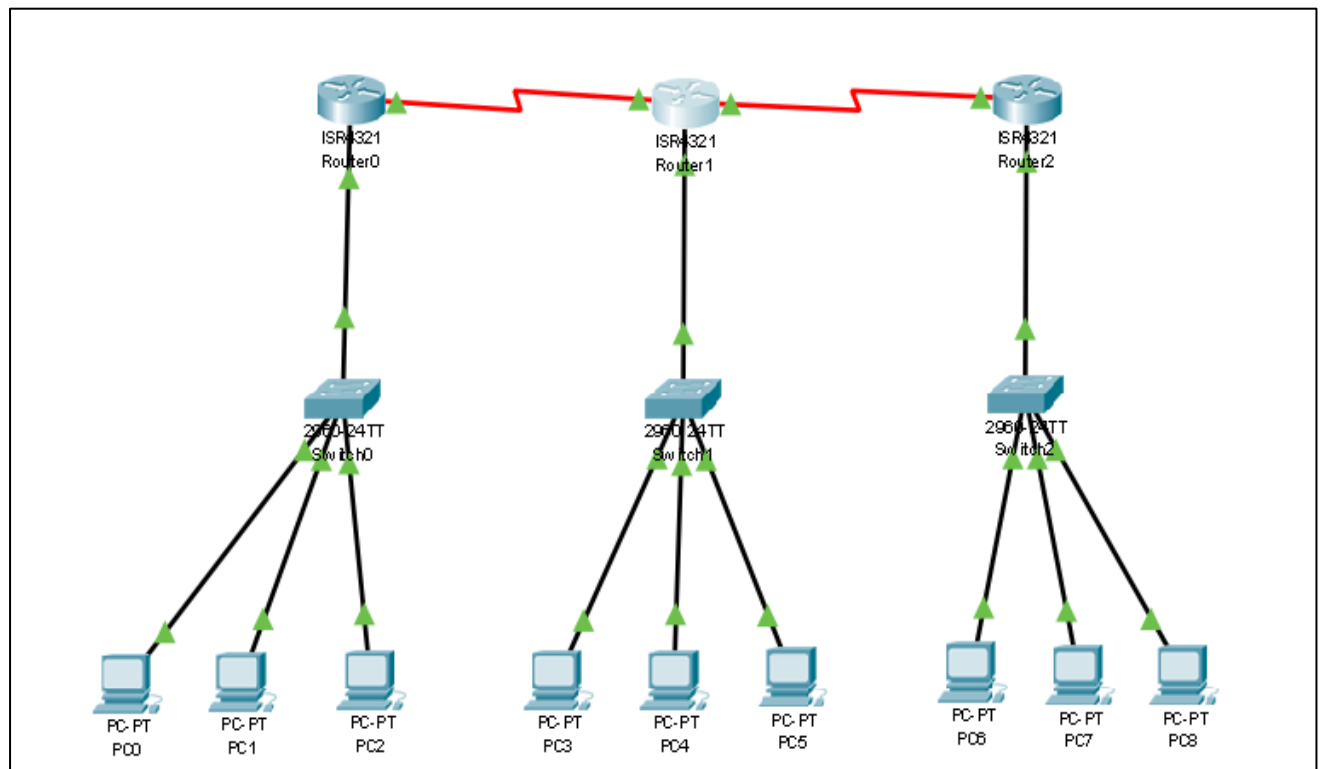




9. Configure Router 2 using the Command Line Interface as follows:



10. The Final connection will look as shown:



11. Note how intra-connection packet sending succeeds and inter-connection fails:

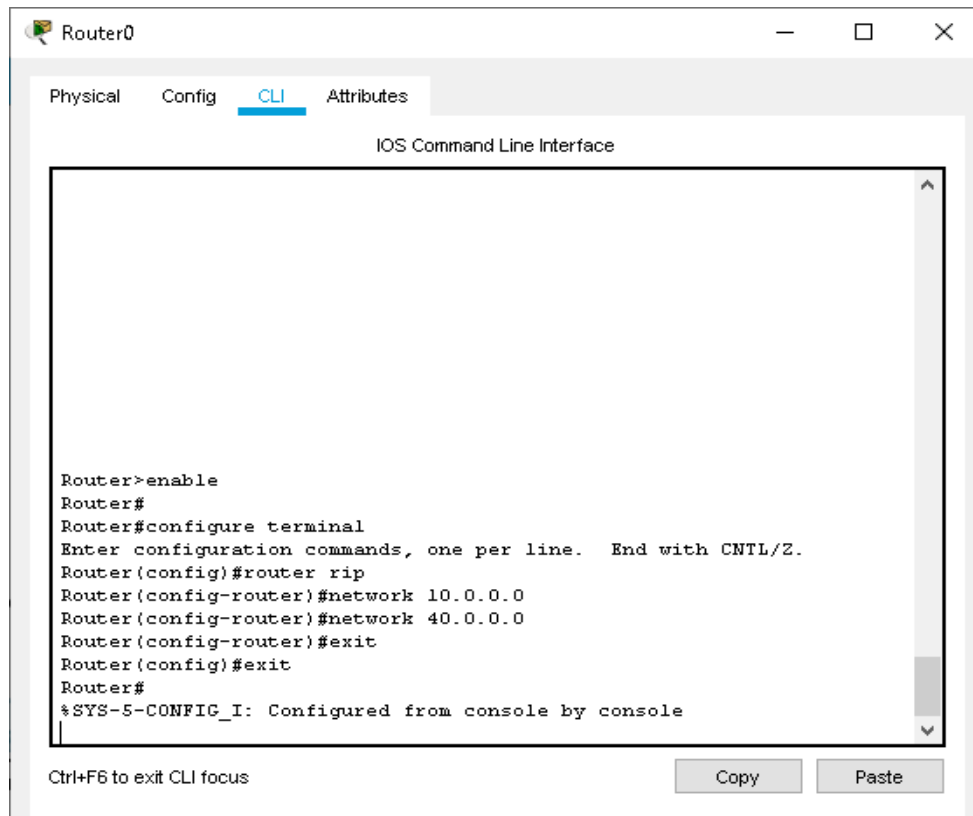
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC0	PC1	ICMP	Dark Blue	0.000	N	0	(edit)
	Successful	PC3	PC4	ICMP	Blue	0.000	N	1	(edit)
	Successful	PC6	PC7	ICMP	Orange	0.000	N	2	(edit)

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	Router0	Router1	ICMP	Cyan	0.000	N	0	(edit)
	Successful	Router1	Router2	ICMP	Magenta	0.000	N	1	(edit)

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Failed	PC0	PC3	ICMP	Blue	0.000	N	0	(edit)
	Failed	PC3	PC6	ICMP	Blue	0.000	N	1	(edit)
	Failed	PC8	PC2	ICMP	Magenta	0.000	N	2	(edit)

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Failed	Router0	Router2	ICMP	Green	0.000	N	0	(edit)

12. Configure RIP Routing in Router 0 as follows:

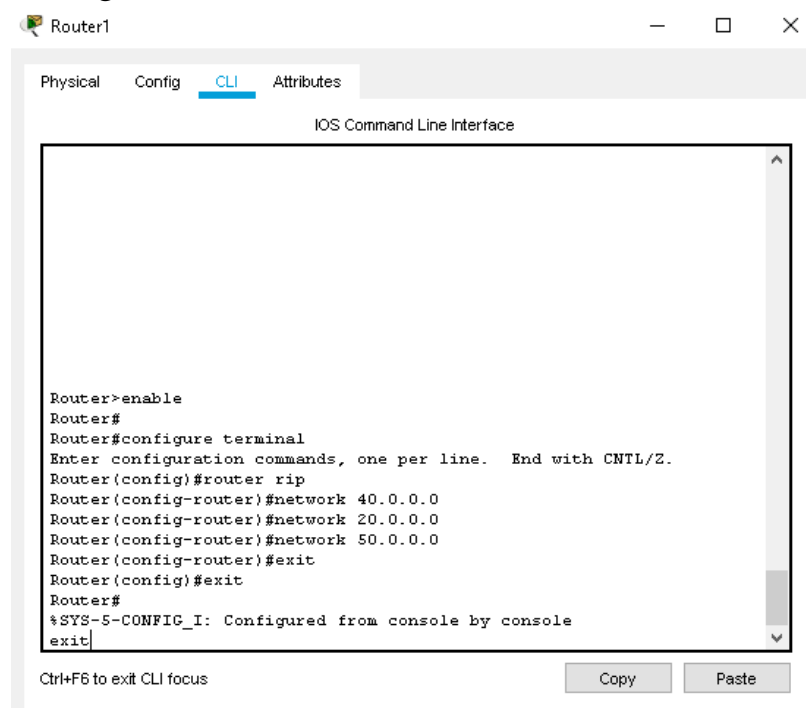


The screenshot shows a window titled 'Router0' with tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the following commands and responses:

```
Router>enable
Router#
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 40.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

Below the terminal window, there is a text prompt 'Ctrl+F6 to exit CLI focus' and two buttons labeled 'Copy' and 'Paste'.

13. Configure RIP Routing in Router 1 as follows:

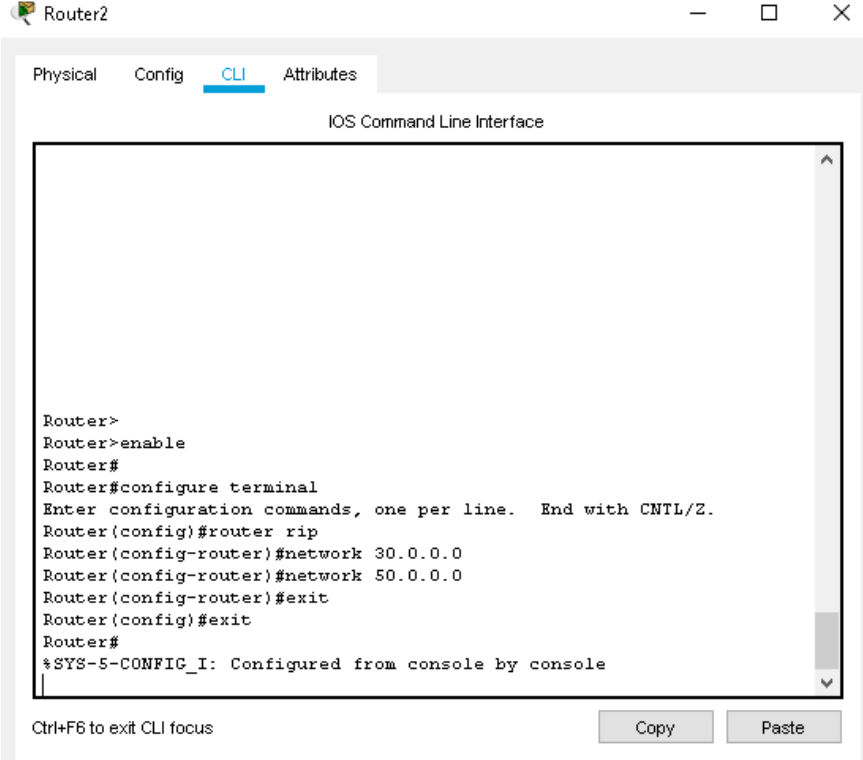


The screenshot shows a window titled 'Router1' with tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the following commands and responses:

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 40.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#network 50.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

Below the terminal window, there is a text prompt 'Ctrl+F6 to exit CLI focus' and two buttons labeled 'Copy' and 'Paste'.

14. Configure RIP Routing in Router 2 as follows:



The screenshot shows the CLI interface of Router2. The tabs at the top are Physical, Config, CLI (selected), and Attributes. The main window displays the following commands and output:

```

Router>
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 30.0.0.0
Router(config-router)#network 50.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
  
```

At the bottom, there are buttons for 'Copy' and 'Paste', and a note 'Ctrl+F6 to exit CLI focus'.

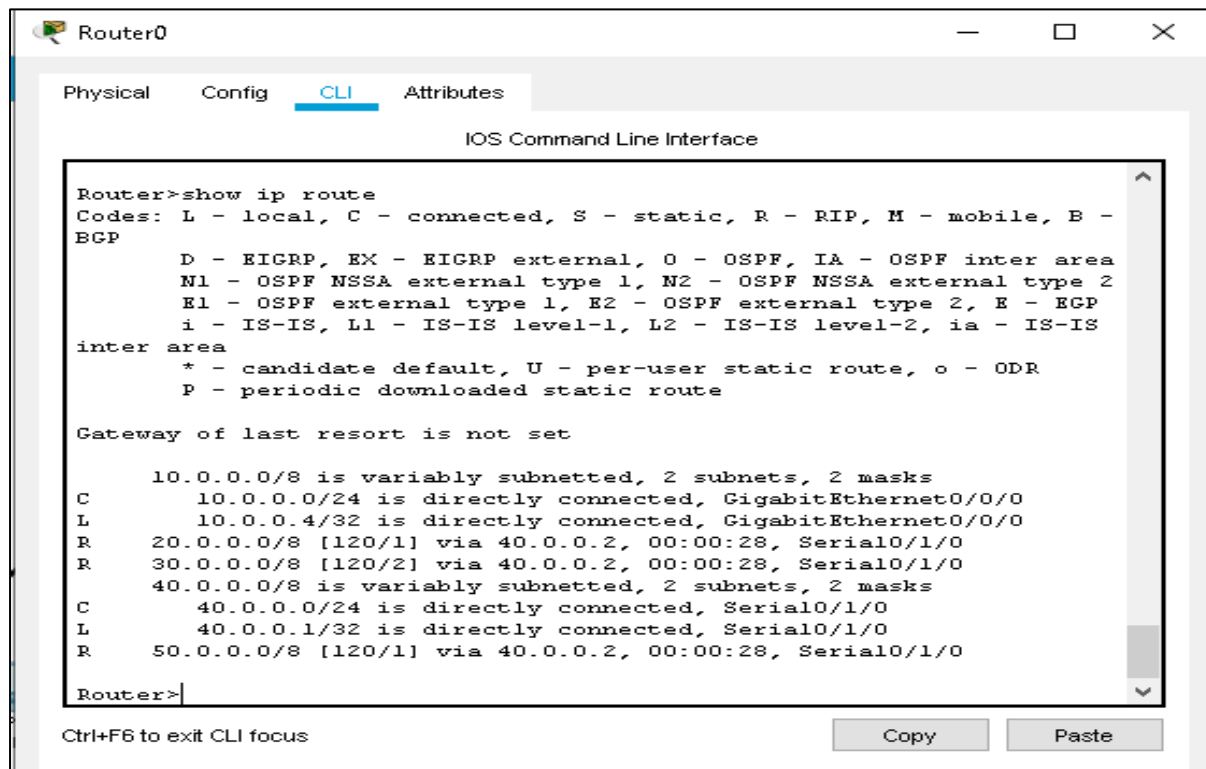
15. Sending packets after RIP routing gives the following result:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC0	PC3	ICMP		0.000	N	0	(edit)
	Failed	PC0	PC6	ICMP		0.000	N	1	(edit)
	Successful	PC0	PC6	ICMP		0.000	N	2	(edit)

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	Router0	Router2	ICMP		0.000	N	0	(edit)
	Successful	Router1	Router0	ICMP		0.000	N	1	(edit)
	Successful	Router2	Router0	ICMP		0.000	N	2	(edit)

16. Finally, type 'show ip route' in the Router's CLI to obtain the IP route results:

ROUTER 0



The screenshot shows the Router0 CLI interface with the 'show ip route' command executed. The output displays the routing table for Router0, including codes for route types, a legend for route codes, and a list of routes with their respective metrics and interfaces.

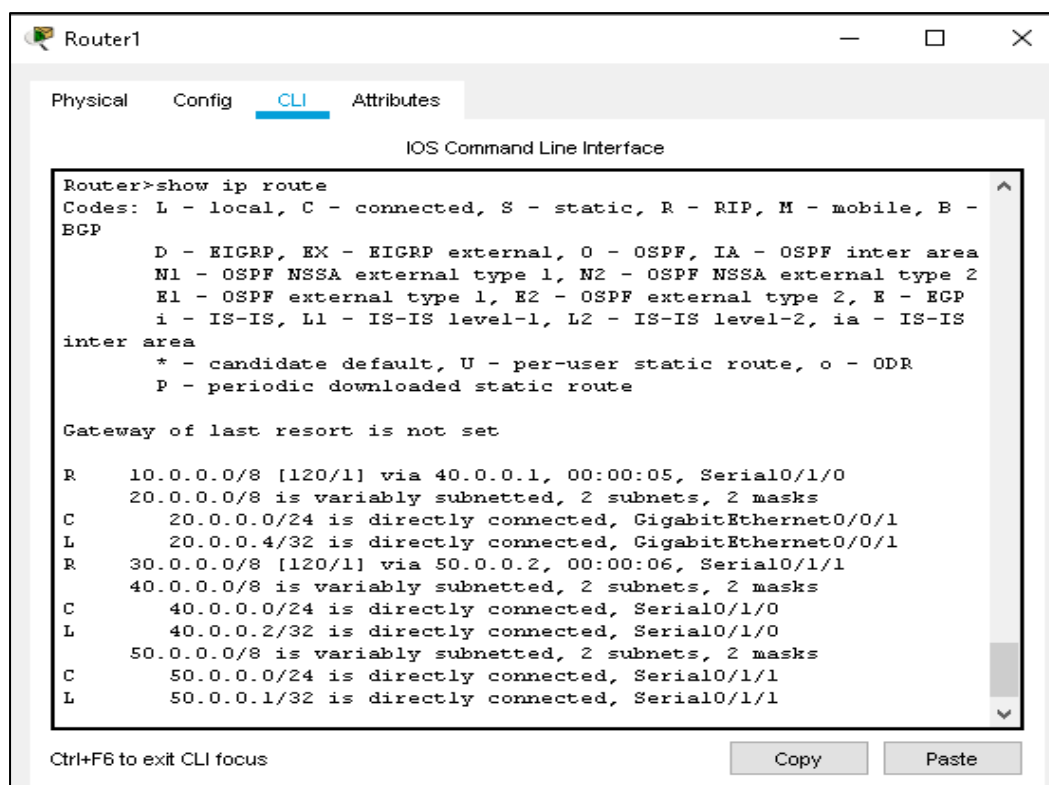
```
Router0>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B -
BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, 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

    10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.0.0.0/24 is directly connected, GigabitEthernet0/0/0
L       10.0.0.4/32 is directly connected, GigabitEthernet0/0/0
R       20.0.0.0/8 [120/1] via 40.0.0.2, 00:00:28, Serial0/1/0
R       30.0.0.0/8 [120/2] via 40.0.0.2, 00:00:28, Serial0/1/0
       40.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       40.0.0.0/24 is directly connected, Serial0/1/0
L       40.0.0.1/32 is directly connected, Serial0/1/0
R       50.0.0.0/8 [120/1] via 40.0.0.2, 00:00:28, Serial0/1/0

Router0>
```

ROUTER 1



The screenshot shows the Router1 CLI interface with the 'show ip route' command executed. The output displays the routing table for Router1, including codes for route types, a legend for route codes, and a list of routes with their respective metrics and interfaces.

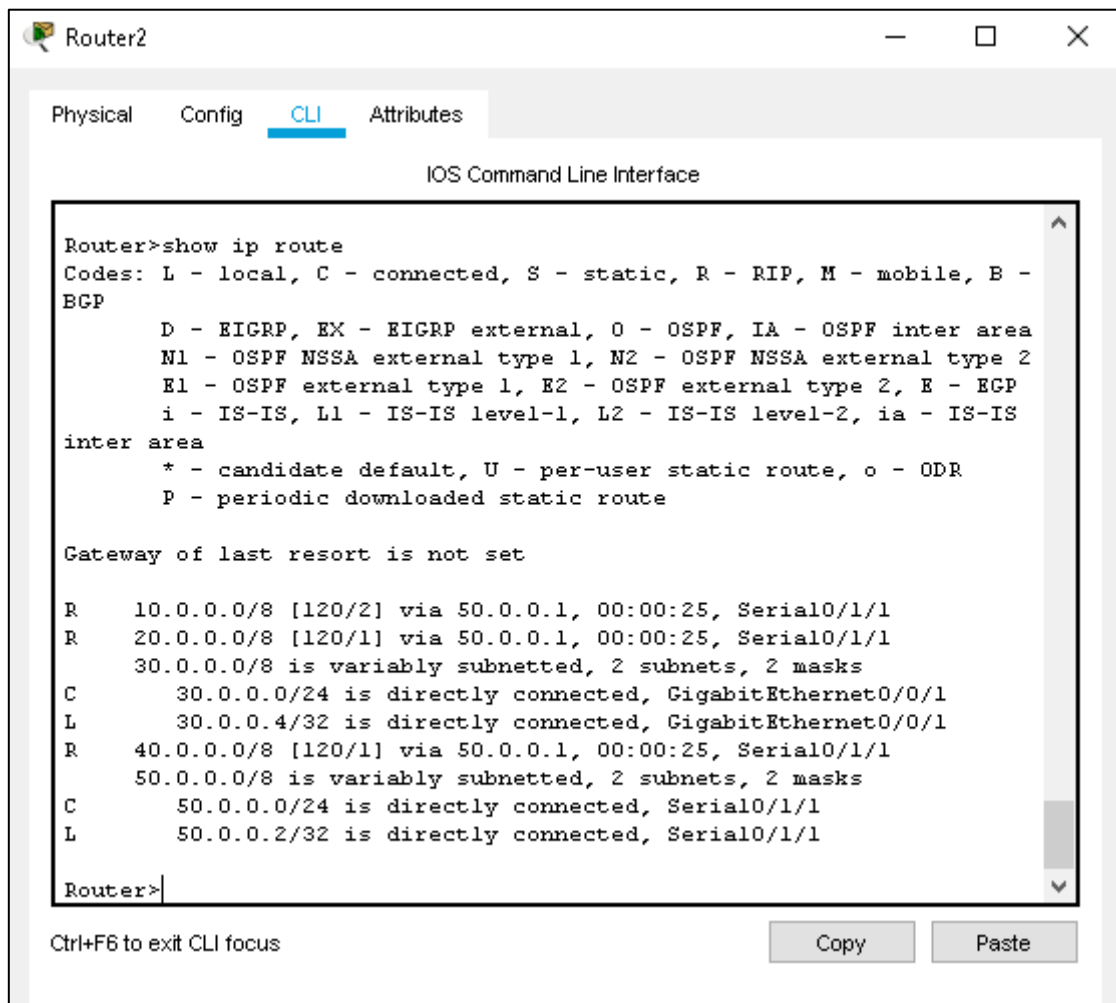
```
Router1>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B -
BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, 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 40.0.0.1, 00:00:05, Serial0/1/0
       20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/24 is directly connected, GigabitEthernet0/0/1
L       20.0.0.4/32 is directly connected, GigabitEthernet0/0/1
R       30.0.0.0/8 [120/1] via 50.0.0.2, 00:00:06, Serial0/1/1
       40.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       40.0.0.0/24 is directly connected, Serial0/1/0
L       40.0.0.2/32 is directly connected, Serial0/1/0
       50.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       50.0.0.0/24 is directly connected, Serial0/1/1
L       50.0.0.1/32 is directly connected, Serial0/1/1

Router1>
```

ROUTER 2



The screenshot shows a window titled "Router2" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The command "Router>show ip route" has been entered, and the output is displayed. The output includes a legend for route codes (L, C, S, R, M, B, D, N1, N2, E1, E2, E, i, L1, L2, ia, *, U, o, P) and a list of routes. The routes are: 10.0.0.0/8 [120/2] via 50.0.0.1, 00:00:25, Serial0/1/1; 20.0.0.0/8 [120/1] via 50.0.0.1, 00:00:25, Serial0/1/1; 30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks; 30.0.0.0/24 is directly connected, GigabitEthernet0/0/1; 30.0.0.4/32 is directly connected, GigabitEthernet0/0/1; 40.0.0.0/8 [120/1] via 50.0.0.1, 00:00:25, Serial0/1/1; 50.0.0.0/8 is variably subnetted, 2 subnets, 2 masks; 50.0.0.0/24 is directly connected, Serial0/1/1; 50.0.0.2/32 is directly connected, Serial0/1/1. The prompt "Router>" is visible at the bottom of the CLI window. Below the CLI window, there is a text "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste".

```
Router>show ip route
Codes: L - local, C - connected, S - static, 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 50.0.0.1, 00:00:25, Serial0/1/1
R    20.0.0.0/8 [120/1] via 50.0.0.1, 00:00:25, Serial0/1/1
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    30.0.0.0/24 is directly connected, GigabitEthernet0/0/1
L    30.0.0.4/32 is directly connected, GigabitEthernet0/0/1
R    40.0.0.0/8 [120/1] via 50.0.0.1, 00:00:25, Serial0/1/1
     50.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    50.0.0.0/24 is directly connected, Serial0/1/1
L    50.0.0.2/32 is directly connected, Serial0/1/1

Router>
```