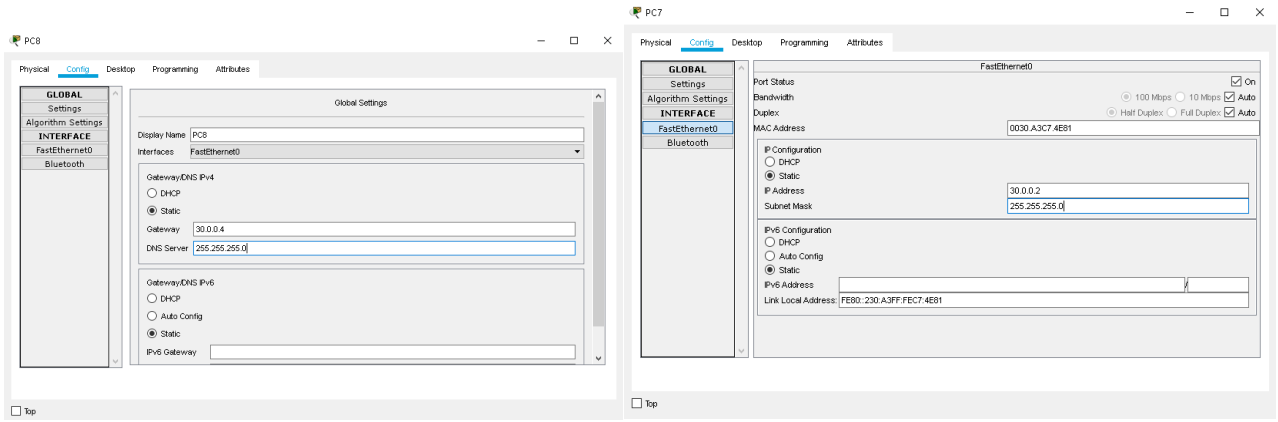
Abhishek Iyengar
07 - MSc. CS. Part – 1
Advanced Networking Concepts

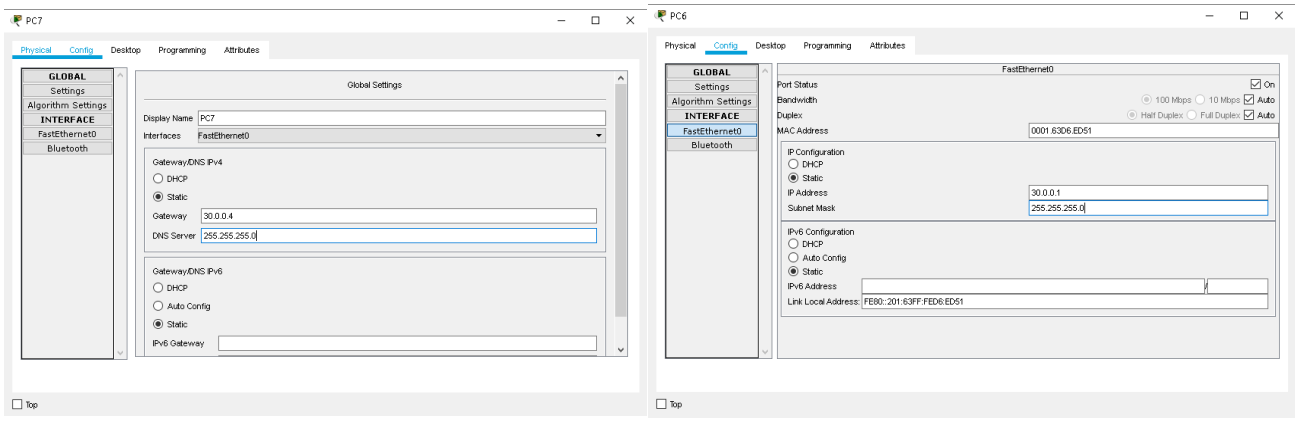
PRACTICAL - 2

Aim - Create a network with three routers with OSPF 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:





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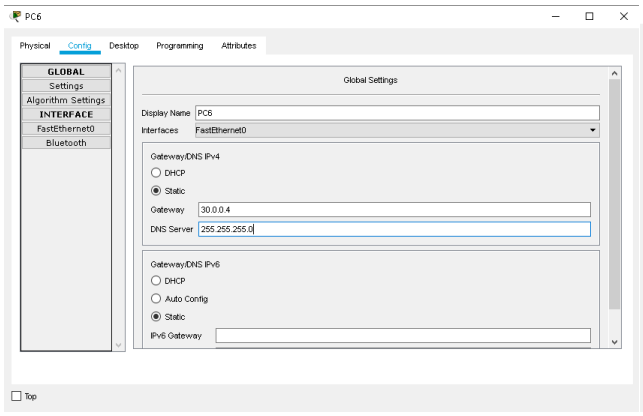
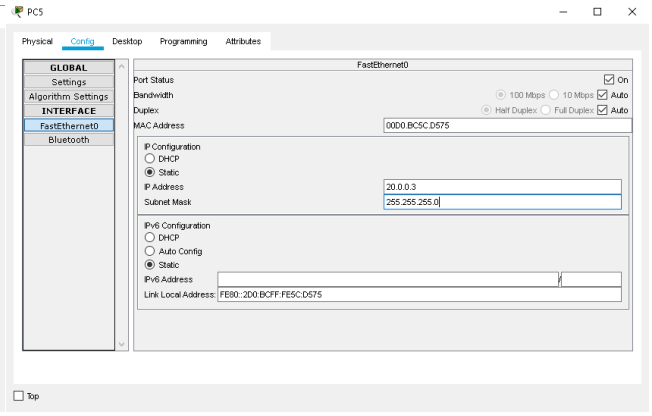
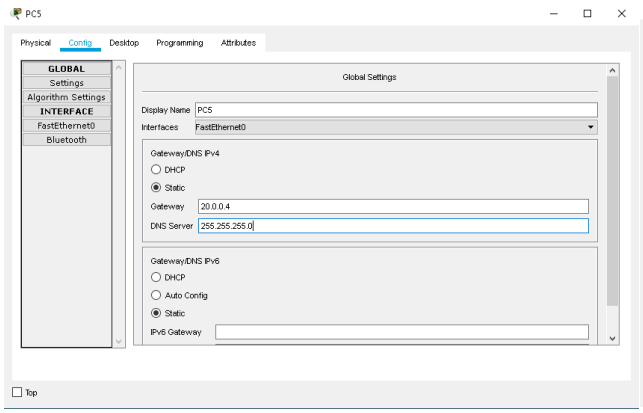
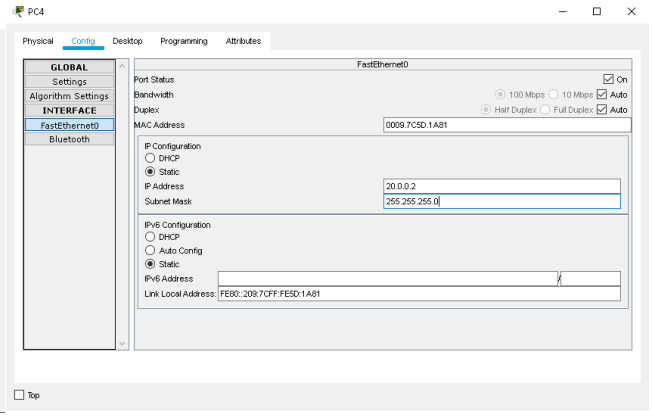
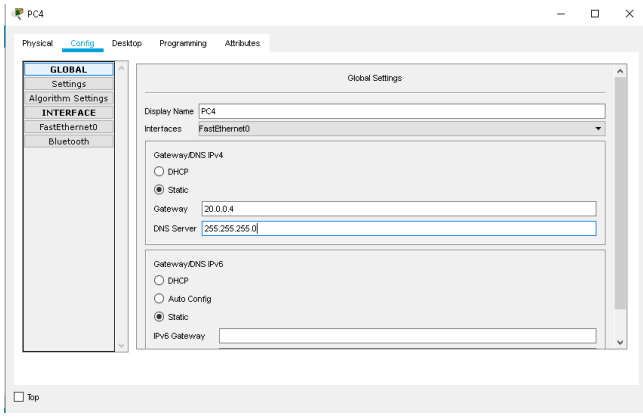
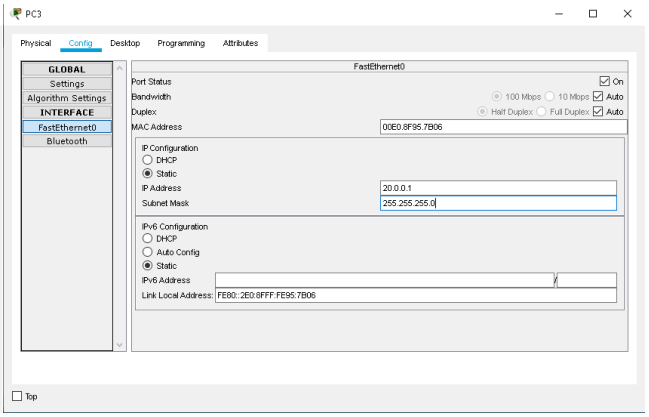


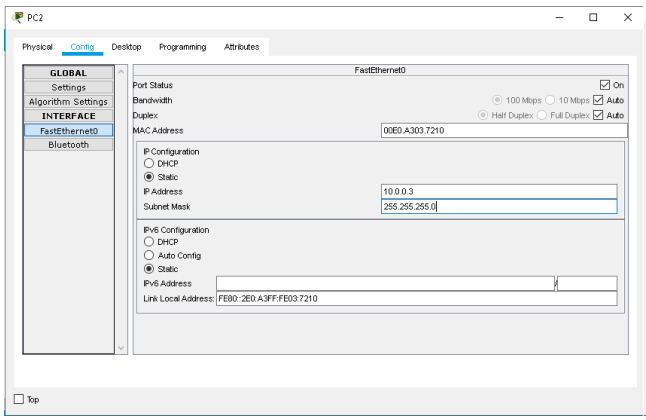


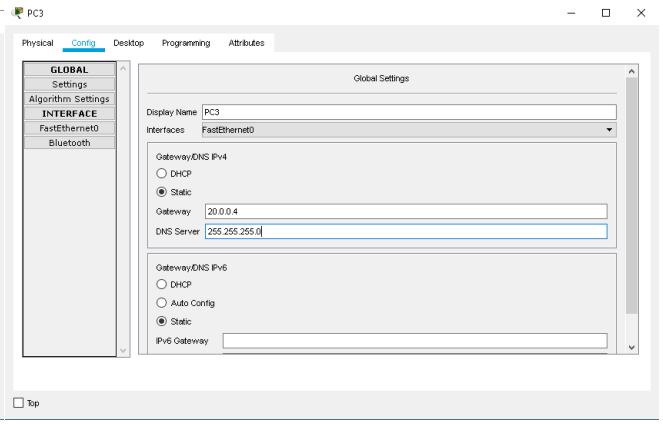


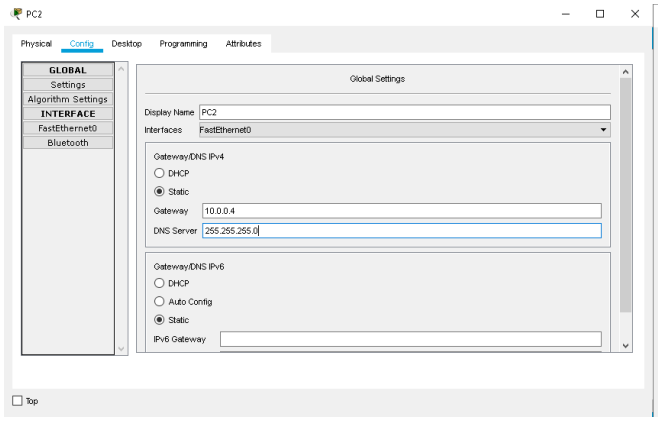


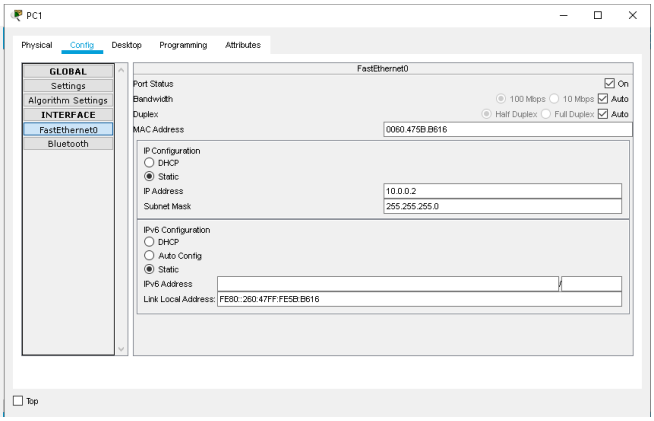


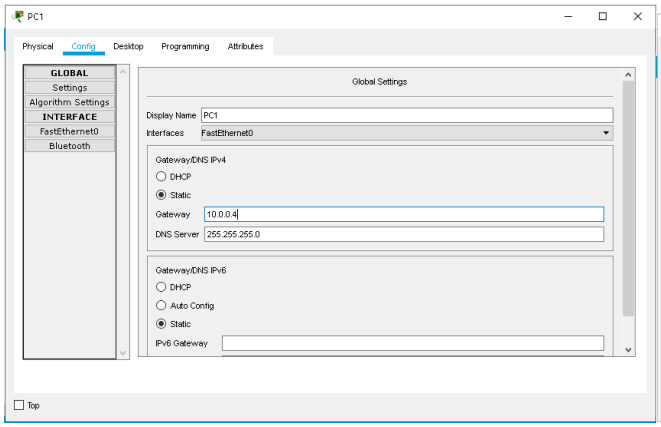


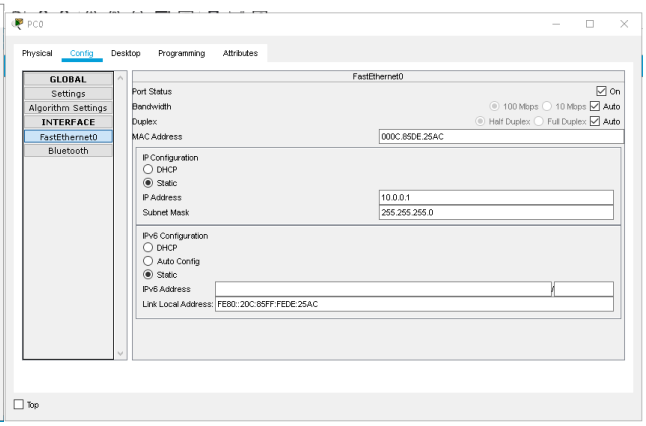


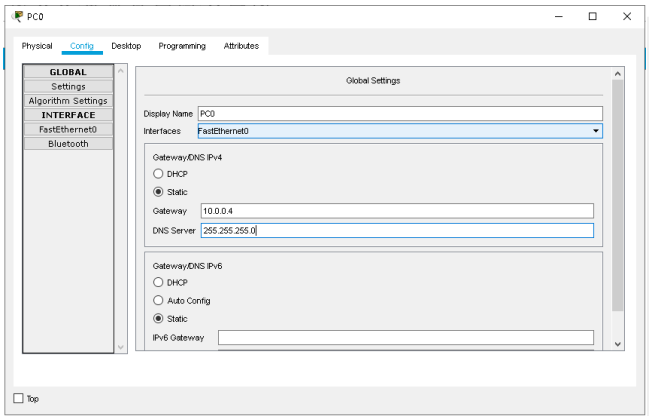


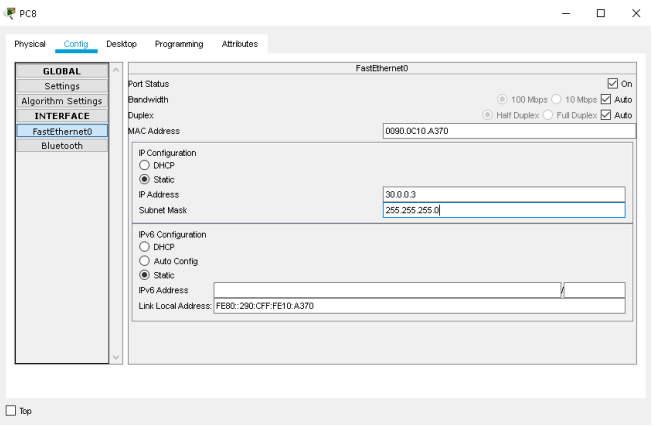

PC2
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
Global Settings
Display Name PC2
Interfaces FastEthernet0
Gateway/DNS IPv4
DHCP
Static
Gateway 10.0.0.4
DNS Server 255.255.255.0
Gateway/DNS IPv6
DHCP
Auto Config
Static
IPv6 Gateway
Top


PC1
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
FastEthernet0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address 0060.475B.B616
IP Configuration
DHCP
Static
IP Address 10.0.0.2
Subnet Mask 255.255.255.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address FE80::260:47FF:FE5B:B616
Top

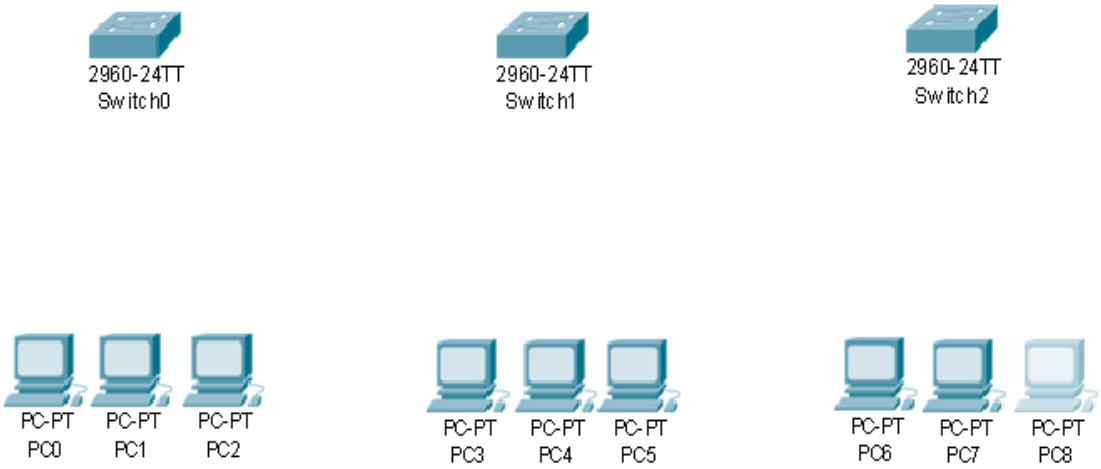

PC1
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
Global Settings
Display Name PC1
Interfaces FastEthernet0
Gateway/DNS IPv4
DHCP
Static
Gateway 10.0.0.4
DNS Server 255.255.255.0
Gateway/DNS IPv6
DHCP
Auto Config
Static
IPv6 Gateway
Top


PC0
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
FastEthernet0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address 000C.85DE.25AC
IP Configuration
DHCP
Static
IP Address 10.0.0.1
Subnet Mask 255.255.255.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address FE80::20C:85FF:FEDE:25AC
Top

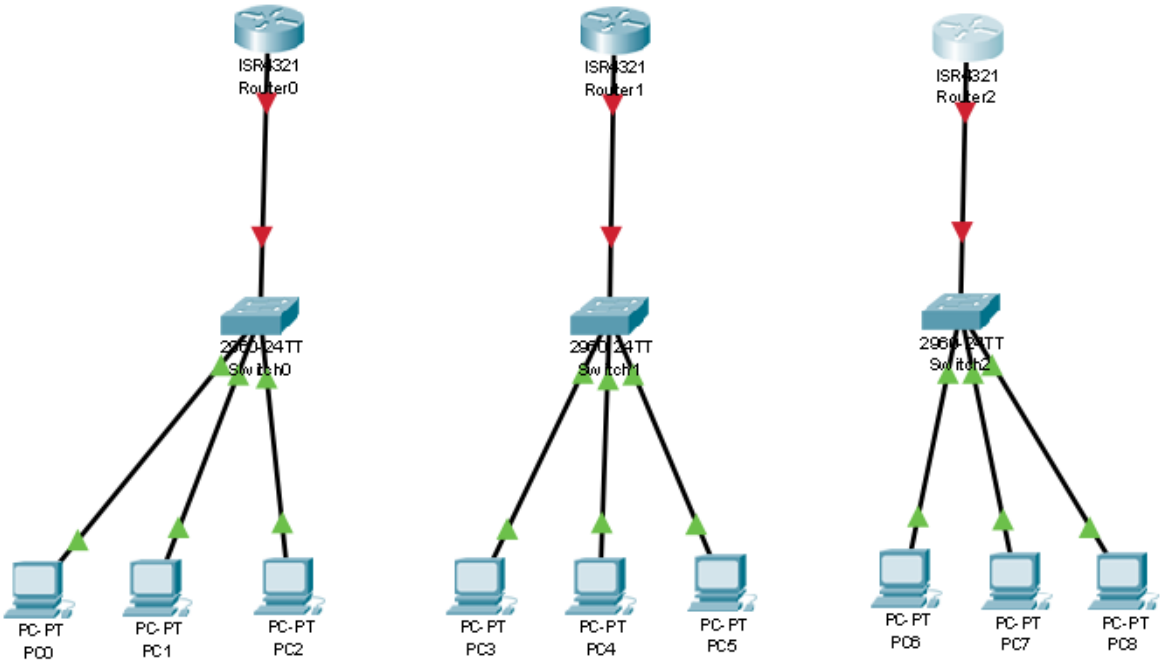

PC0
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
Global Settings
Display Name PC0
Interfaces FastEthernet0
Gateway/DNS IPv4
DHCP
Static
Gateway 10.0.0.4
DNS Server 255.255.255.0
Gateway/DNS IPv6
DHCP
Auto Config
Static
IPv6 Gateway
Top


PC8
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
FastEthernet0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address 0090.0C10.A370
IP Configuration
DHCP
Static
IP Address 30.0.0.3
Subnet Mask 255.255.255.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address FE80::290:CFF:FE10:A370
Top

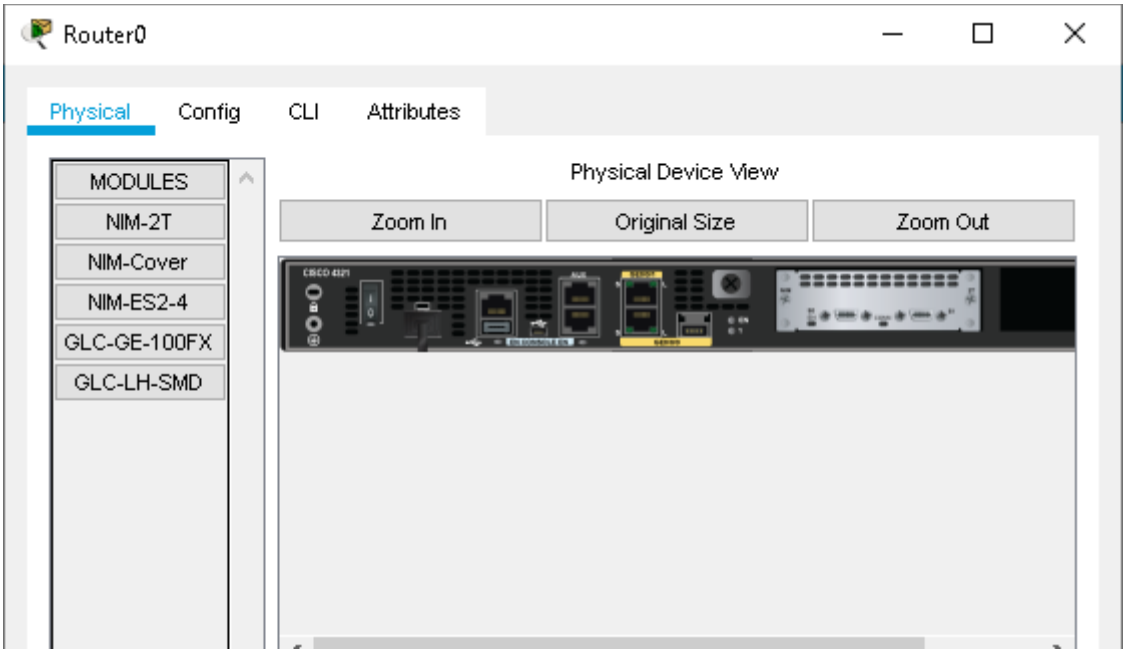
3. Add 3 Switches as follows:



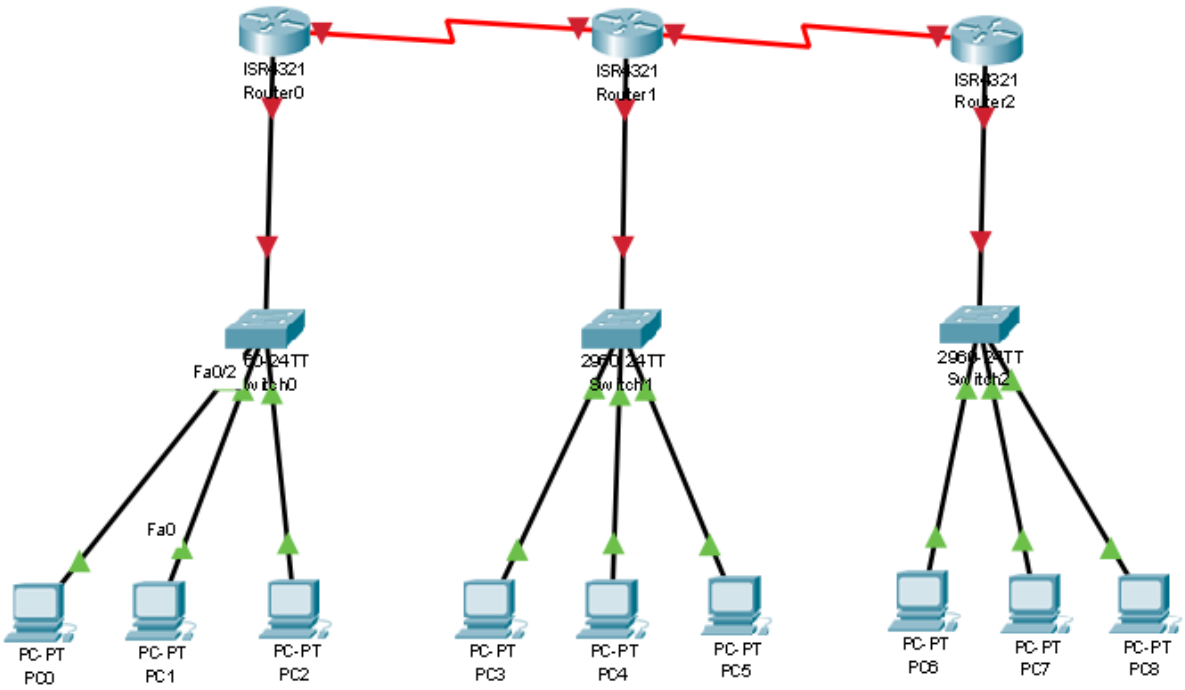
4. Add 3 Routers and connect all the components using Fast Ethernet connection as follows:



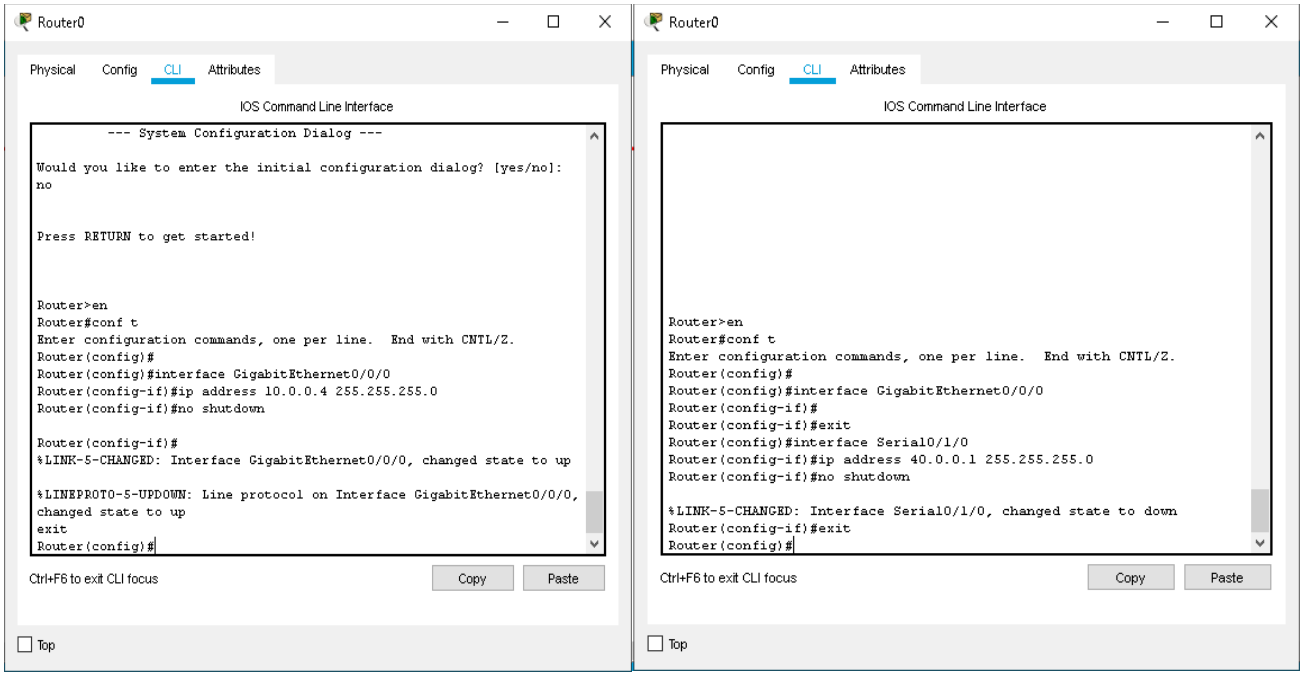
5. Power off each of the Routers and add the NIM-2T Module to all the Routers as follows:



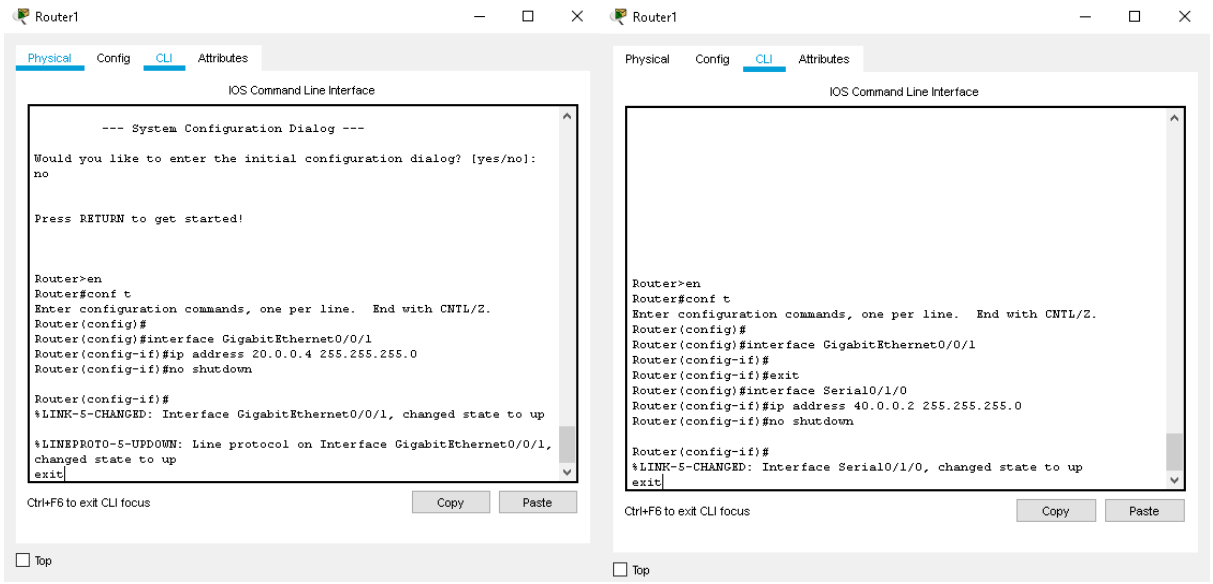
6. Connect the Routers using Serial DTE wires as shown:

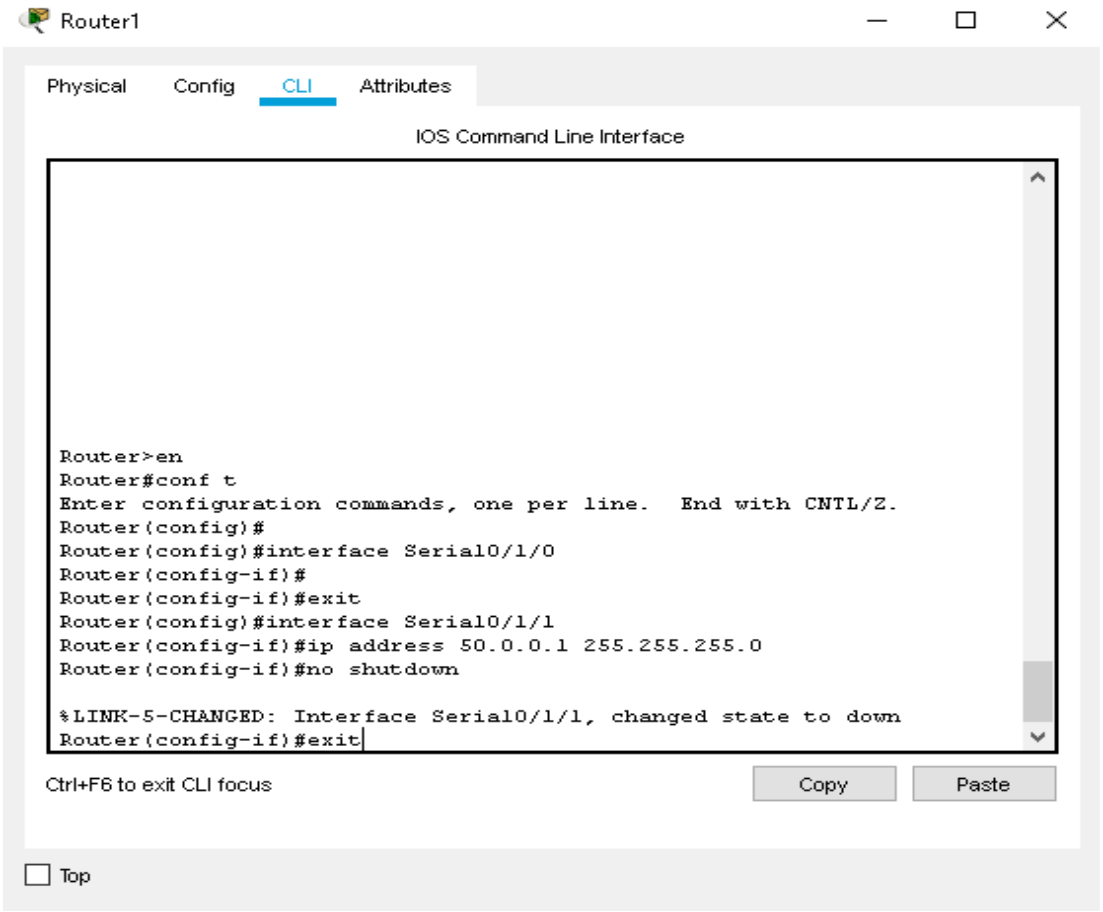


7. Configure Router 0 using the Command Line Interface as follows:

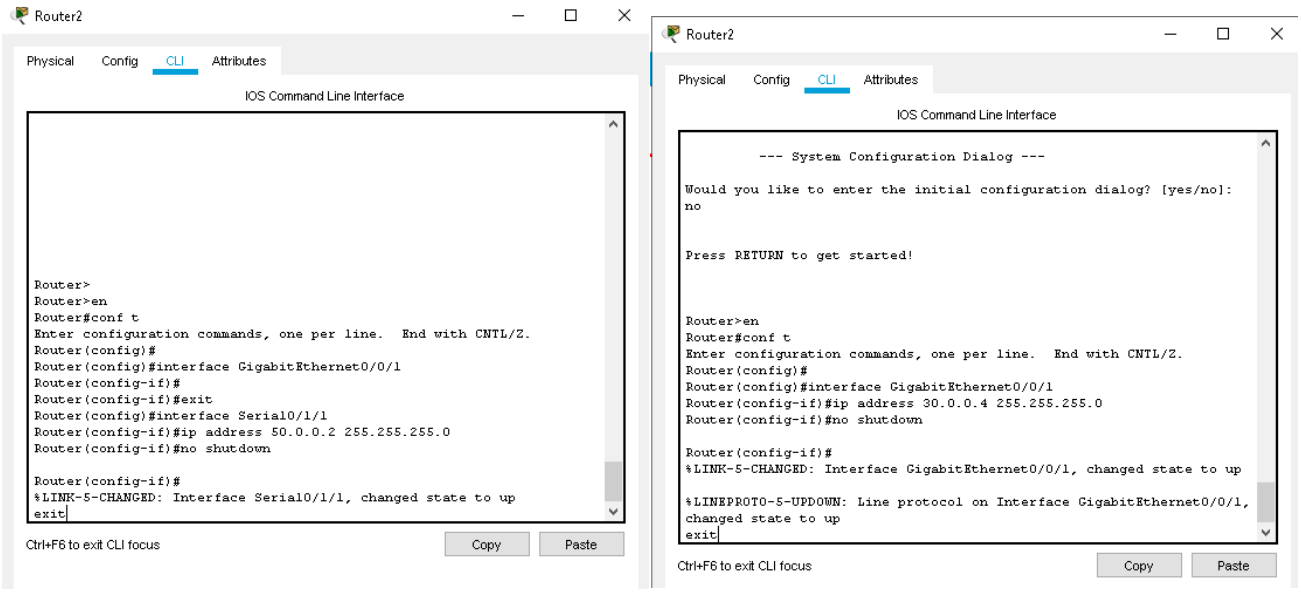


8. Configure Router 0 using the Command Line Interface as follows:

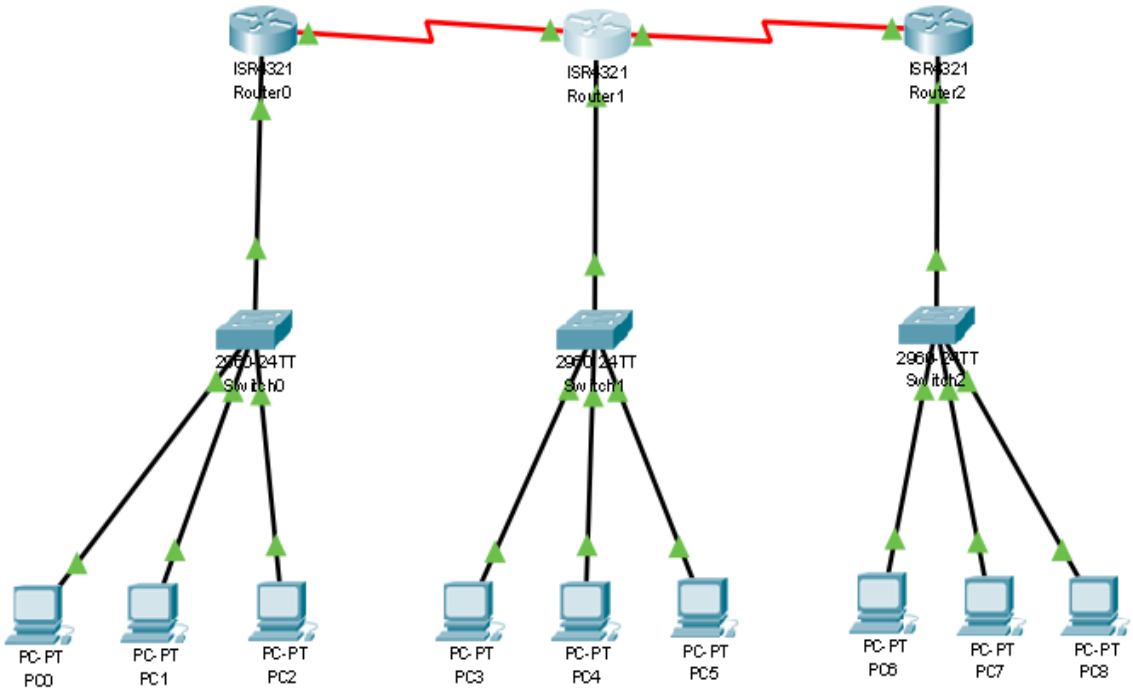




9. Configure Router 0 using the Command Line Interface as follows:



10. The Final connection will look as shown:



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

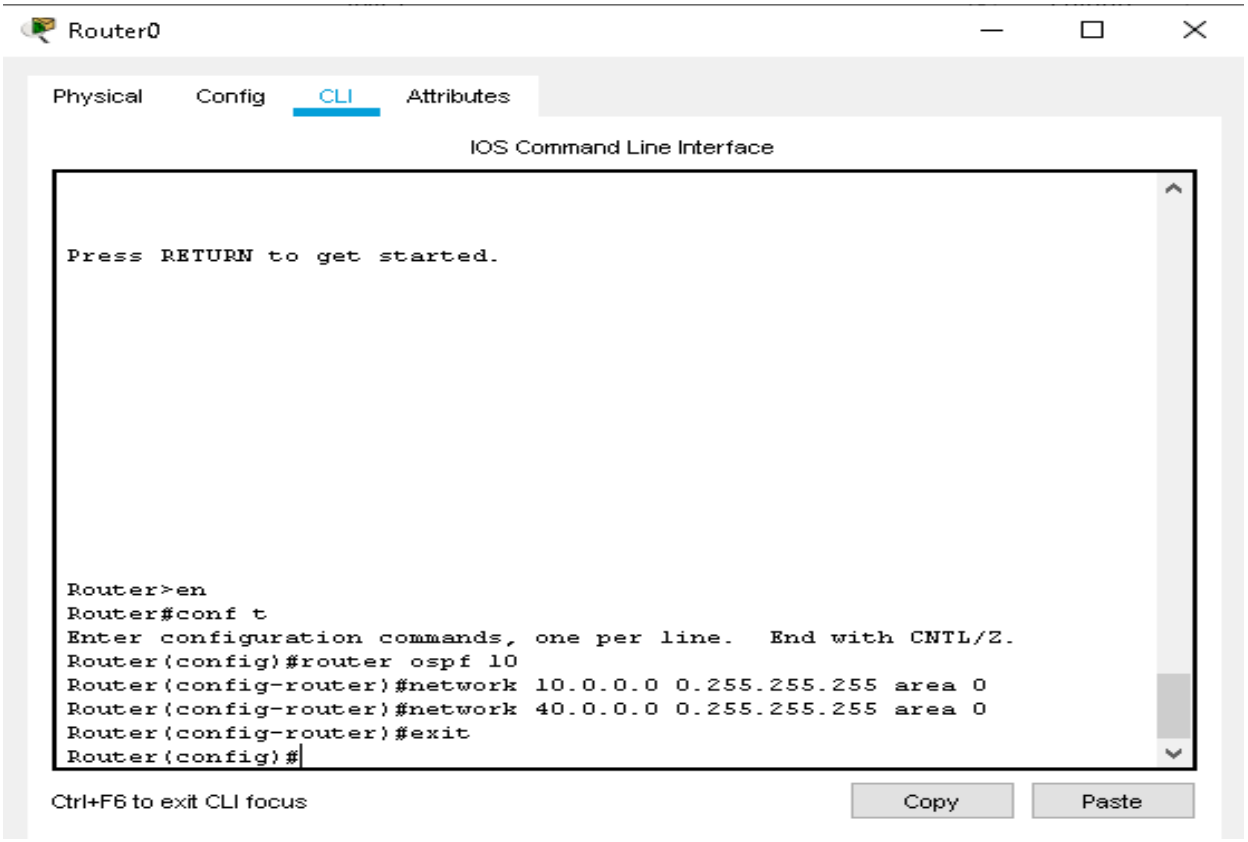
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)
	Successful	PC3	PC4	ICMP		0.000	N	1	(edit)
	Successful	PC6	PC7	ICMP		0.000	N	2	(edit)

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

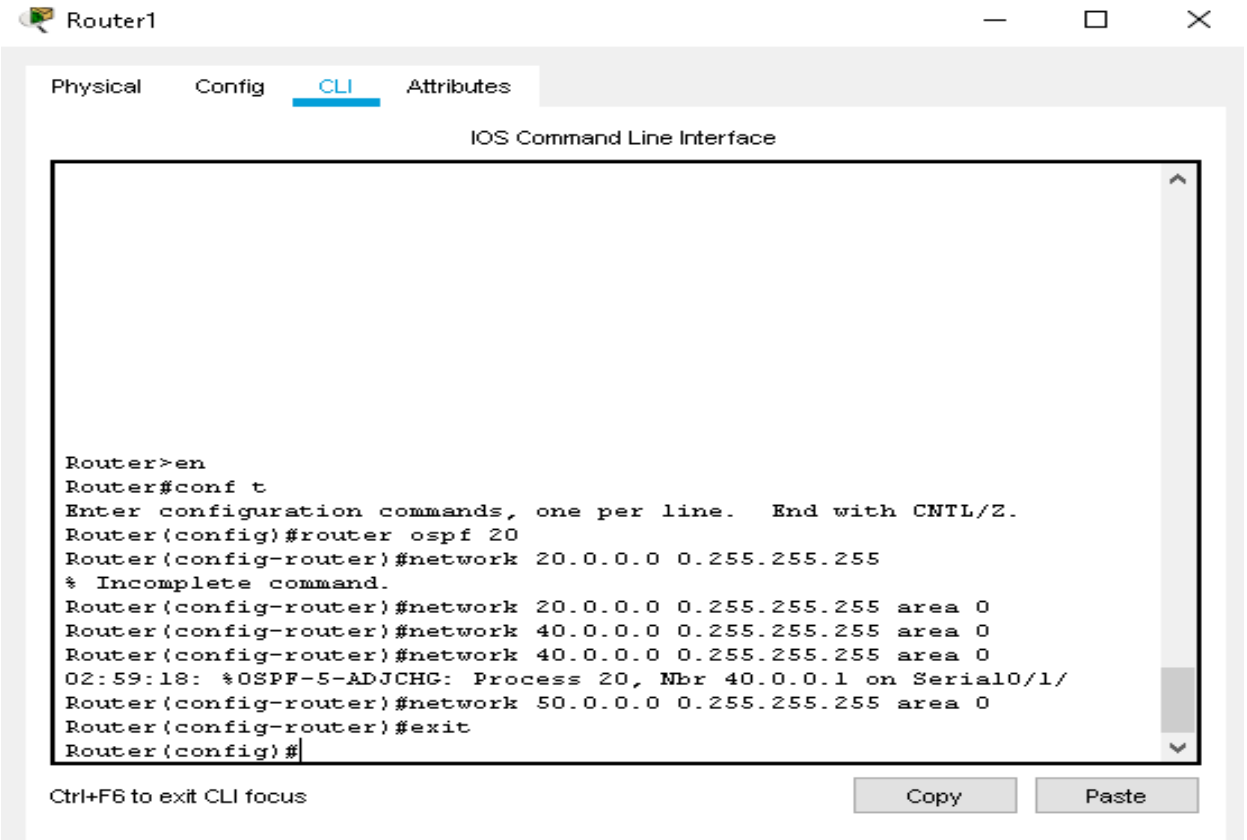
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Failed	PC0	PC3	ICMP		0.000	N	0	(edit)
	Failed	PC3	PC6	ICMP		0.000	N	1	(edit)
	Failed	PC8	PC2	ICMP		0.000	N	2	(edit)

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

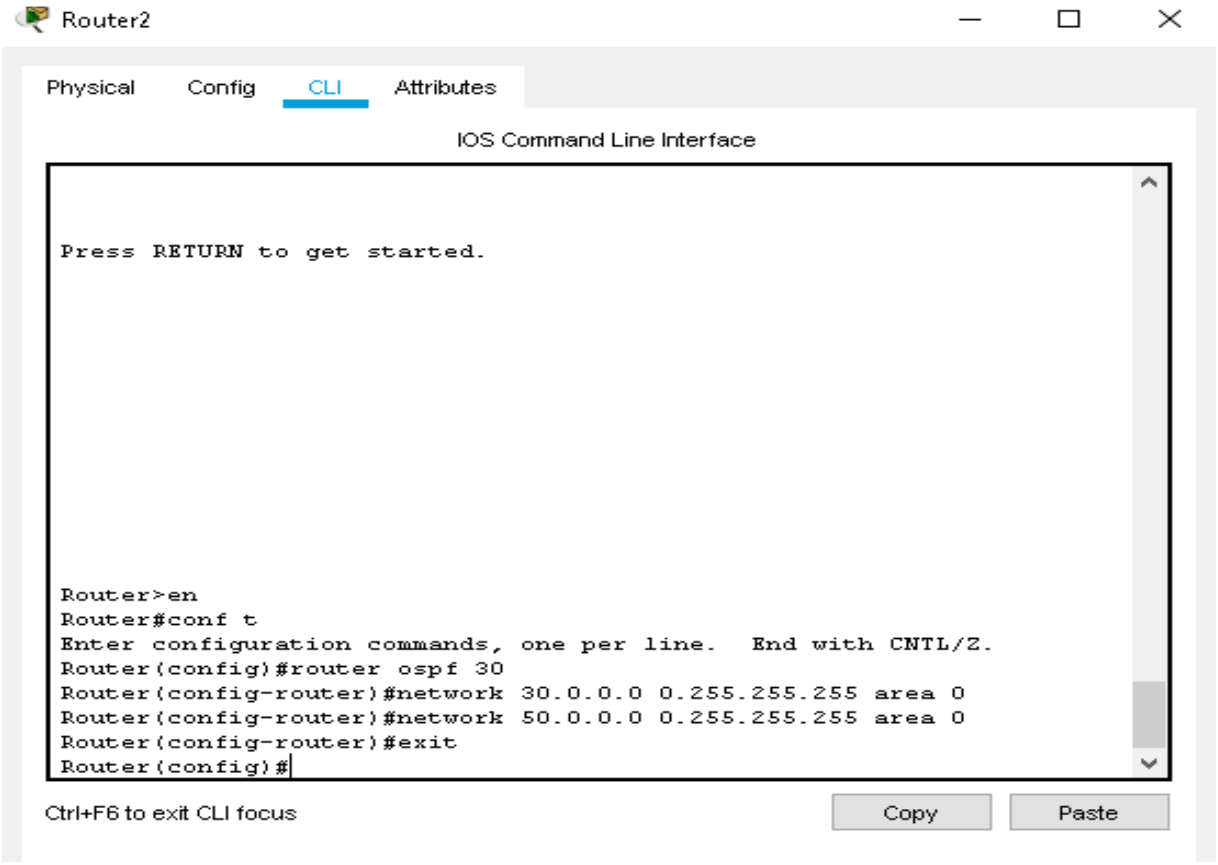
12. Configure OSPF Routing in Router 0 as follows:



13. Configure OSPF Routing in Router 1 as follows:



14. Configure OSPF Routing in Router 2 as follows;



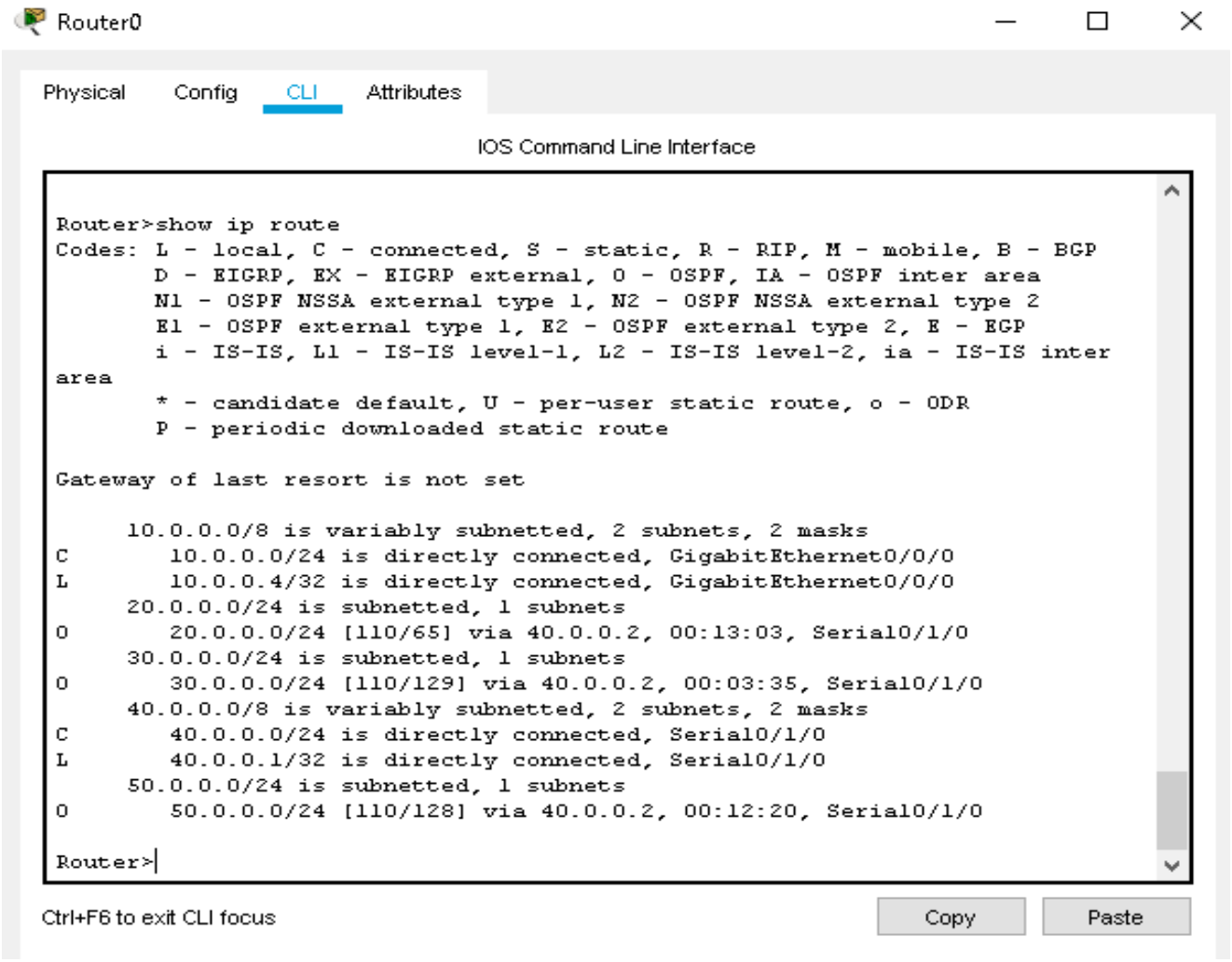
15. After successful OSPF configuration, send packets over the inter-connected network :

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, in every Router's CLI, type 'show ip route' to get the connection details:

ROUTER 0



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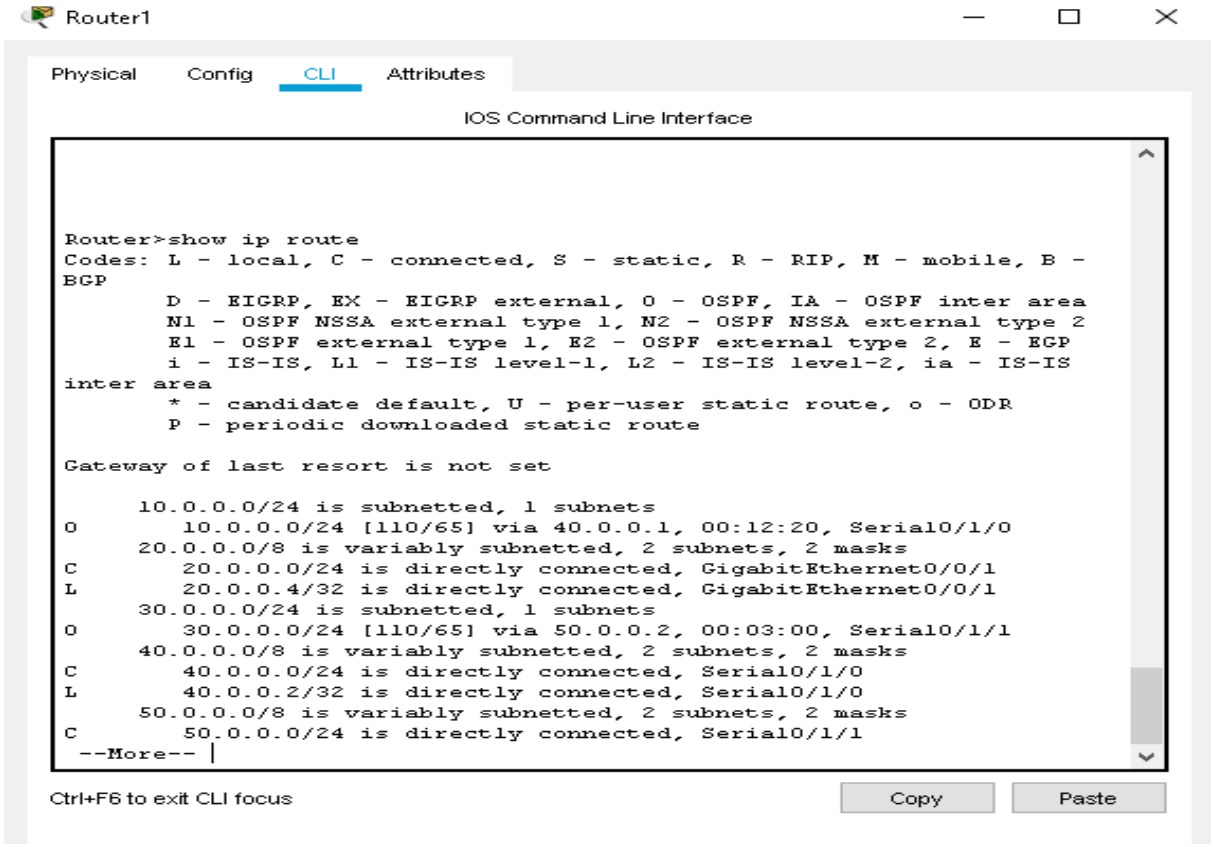
ROUTER 1



ROUTER 2