INSTITUTE OF COMPUTER TECHNOLOGY

B-TECH COMPUTER SCIENCE ENGINEERING 2025-26

SUBJECT:COMPUTER NETWORKS

NAME: Rahul Prajapati

ENRLL. NO: 23162171020

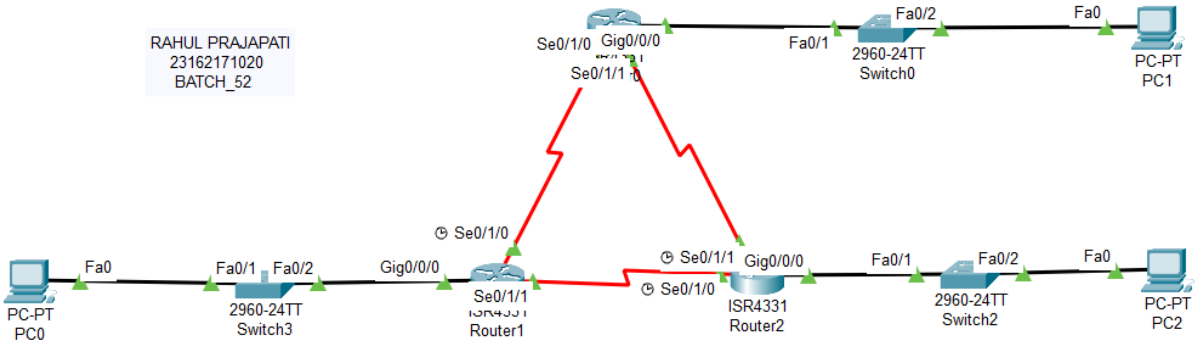
BRANCH: CYBER SECURITY

BATCH: 52

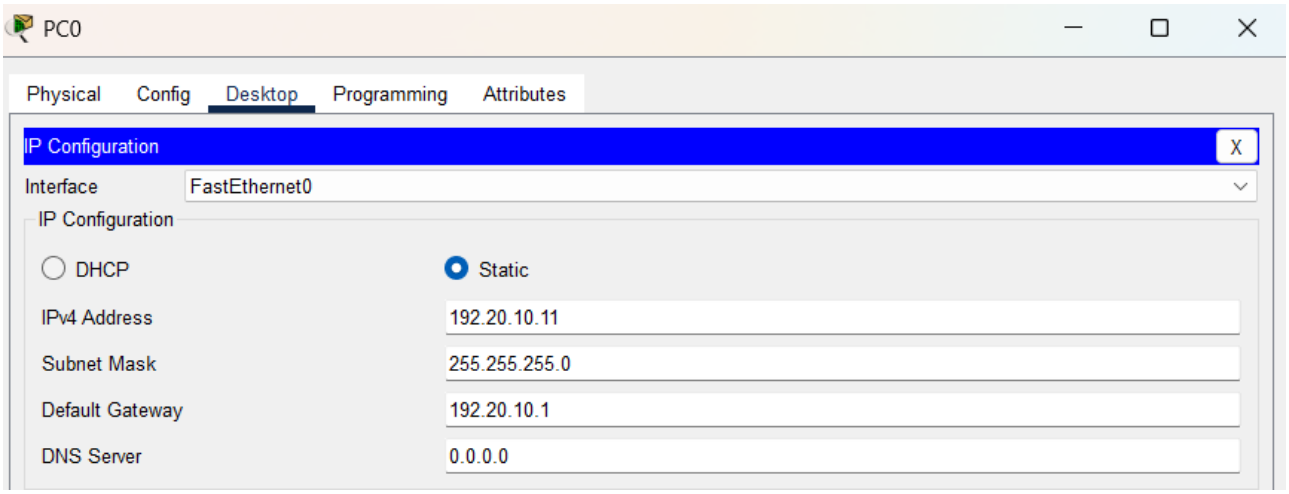
PRACTICAL_08

Aim: To design a network using Open Shortest Path First (OSPF) Protocol.

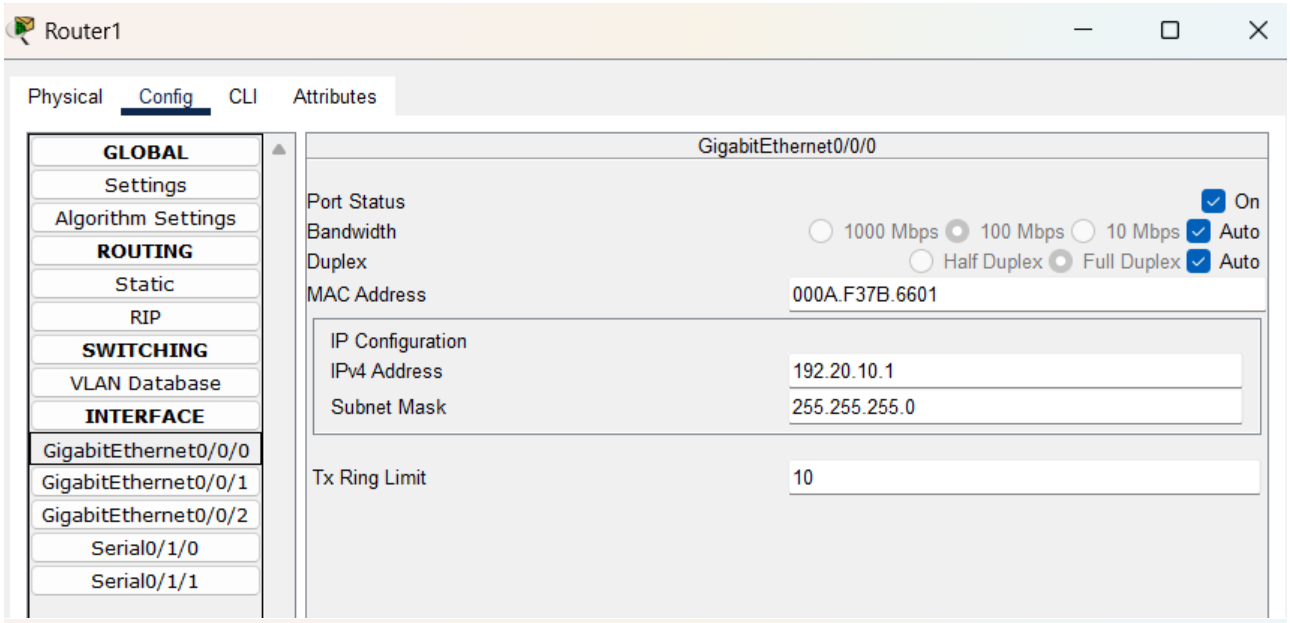
1. NETWORK DESIGN:

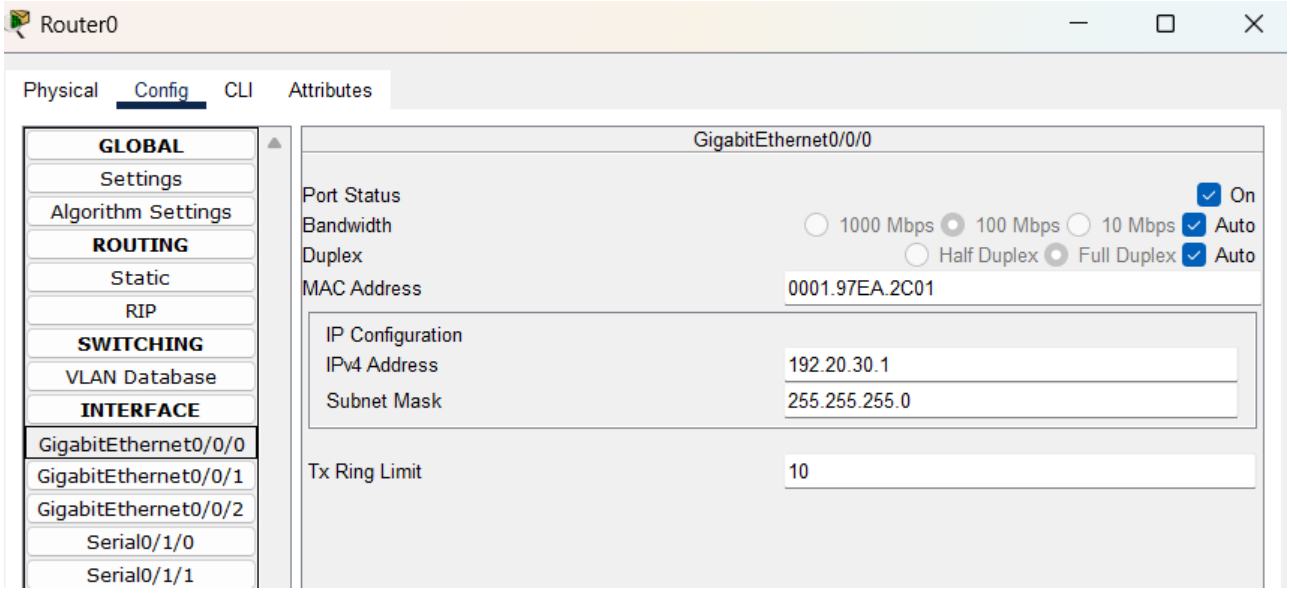


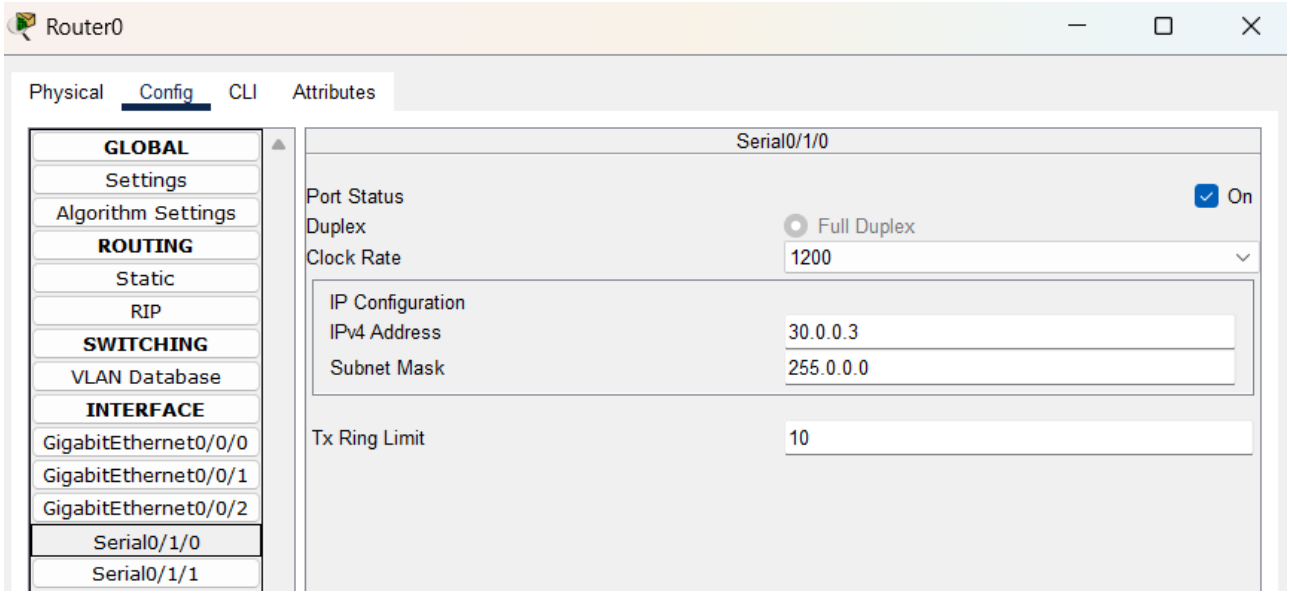
2. PC0_IP:

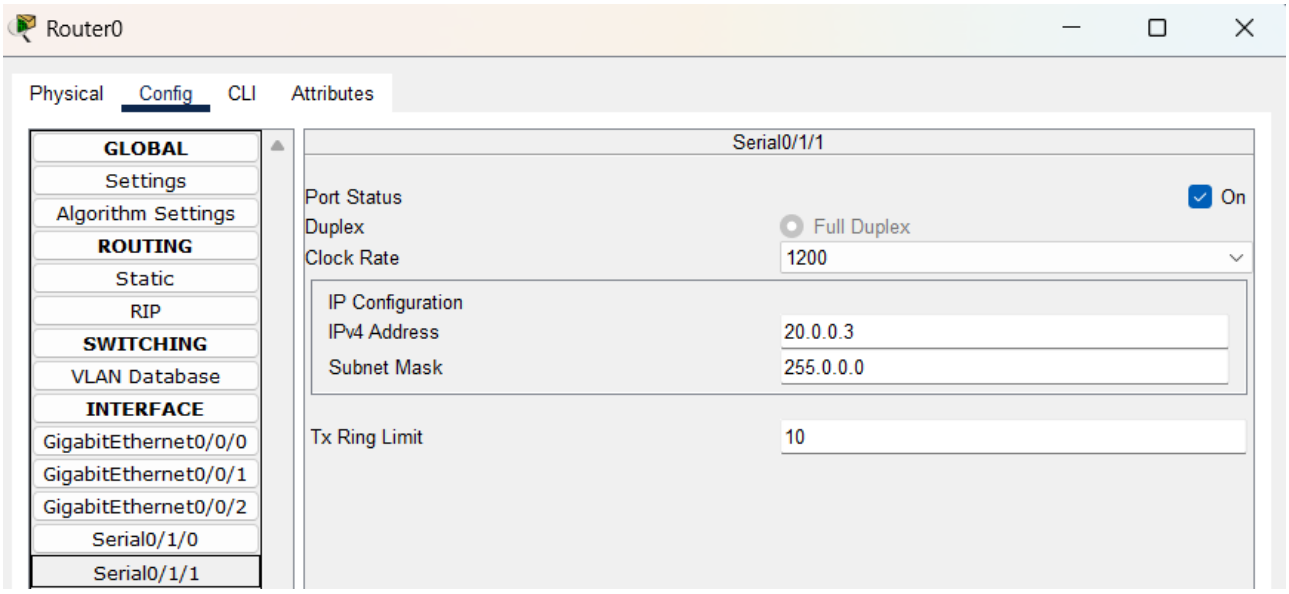


3. ROUTER_1_IP_CONFIGURATION:



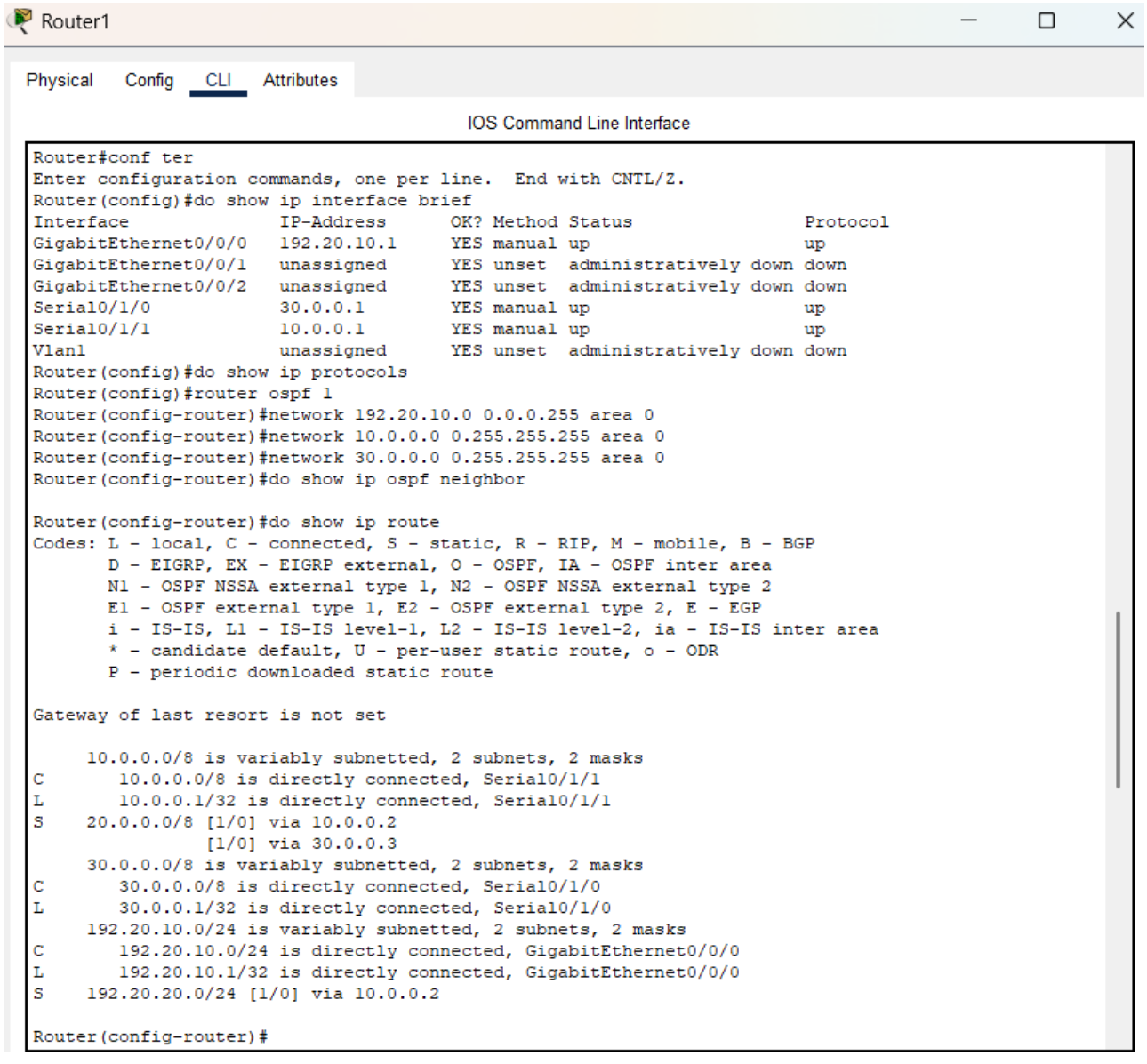






4. IP_ROUTE&CONFIGURATION :

A. ROUTER_1:



```
Router(config-router)#do show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 192.20.10.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.20.10.0 0.0.0.255 area 0
    10.0.0.0 0.255.255.255 area 0
    30.0.0.0 0.255.255.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    192.20.10.1           110      00:01:38
  Distance: (default is 110)
```

A. ROUTER_0:

Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
Router(config)#do show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0/0   192.20.30.1     YES manual up                    up
GigabitEthernet0/0/1   unassigned      YES unset  administratively down down
GigabitEthernet0/0/2   unassigned      YES unset  administratively down down
Serial0/1/0            30.0.0.3        YES manual up                    up
Serial0/1/1            20.0.0.3        YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
Router(config)#do show ip protocols
Router(config)#router ospf 1
Router(config-router)#network 192.20.30.0 0.0.0.255 area 0
Router(config-router)#network 20.0.0.0 0.255.255.255 area 0
Router(config-router)#network 30.0.0.0 0.255.255.255 area 0
Router(config-router)#
00:44:34: %OSPF-5-ADJCHG: Process 1, Nbr 192.20.10.1 on Serial0/1/0 from LOADING to FULL, Loading Done

Router(config-router)#do show ip ospf neighbor


Neighbor ID     Pri   State           Dead Time   Address         Interface
192.20.10.1       0   FULL/  -        00:00:36    30.0.0.1        Serial0/1/0
Router(config-router)#do show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 192.20.30.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.20.30.0 0.0.0.255 area 0
    20.0.0.0 0.255.255.255 area 0
    30.0.0.0 0.255.255.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    192.20.10.1           110      00:01:00
    192.20.30.1           110      00:01:00
  Distance: (default is 110)

Router(config-router)#do 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

S    10.0.0.0/8 [1/0] via 30.0.0.1
                [1/0] via 20.0.0.2
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial0/1/1
L       20.0.0.3/32 is directly connected, Serial0/1/1
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial0/1/0
L       30.0.0.3/32 is directly connected, Serial0/1/0
O    192.20.10.0/24 [110/65] via 30.0.0.1, 00:01:10, Serial0/1/0
S    192.20.20.0/24 [1/0] via 10.0.0.1
     192.20.30.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.20.30.0/24 is directly connected, GigabitEthernet0/0/0
L       192.20.30.1/32 is directly connected, GigabitEthernet0/0/0

Router(config-router)#
```

A. ROUTER_2:

Router2

Physical Config CLI Attributes

IOS Command Line Interface

```
Router(config-if)#do show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0/0   192.20.20.1     YES manual up                    up
GigabitEthernet0/0/1   unassigned      YES unset  administratively down down
GigabitEthernet0/0/2   unassigned      YES unset  administratively down down
Serial0/1/0            10.0.0.2        YES manual up                    up
Serial0/1/1            20.0.0.2        YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
Router(config-if)#do show ip protocols
Router(config-if)#router ospf 1
Router(config-router)#network 192.20.20.0 0.0.0.255 area 0
Router(config-router)#network 10.0.0.0 0.255.255.255 area 0
Router(config-router)#network 10.0.0.0 0.255.255.255 area 0
00:50:35: %OSPF-5-ADJCHG: Process 1, Nbr 192.20.10.1 on Serial0/1/router ospf 1
Router(config-router)#network 20.0.0.0 0.255.255.255 area 0
Router(config-router)#
00:51:02: %OSPF-5-ADJCHG: Process 1, Nbr 192.20.30.1 on Serial0/1/1 from LOADING to FULL, Loading Done

Router(config-router)#do show ip ospf neighbor brief
show ip ospf neighbor brief
                  ^
% Invalid input detected at '^' marker.

Router(config-router)#do show ip ospf neighbor


Neighbor ID     Pri   State           Dead Time   Address         Interface
192.20.30.1       0   FULL/  -        00:00:34    20.0.0.3        Serial0/1/1
192.20.10.1       0   FULL/  -        00:00:38    10.0.0.1        Serial0/1/0
Router(config-router)#do 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       10.0.0.0/8 is directly connected, Serial0/1/0
L       10.0.0.2/32 is directly connected, Serial0/1/0
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial0/1/1
L       20.0.0.2/32 is directly connected, Serial0/1/1
S    30.0.0.0/8 [1/0] via 20.0.0.3
                [1/0] via 10.0.0.3
S    192.20.10.0/24 [1/0] via 10.0.0.1
     192.20.20.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.20.20.0/24 is directly connected, GigabitEthernet0/0/0
L       192.20.20.1/32 is directly connected, GigabitEthernet0/0/0
S    192.20.30.0/24 [1/0] via 20.0.0.3

Router(config-router)#
```

5. DO SHOW RUN:

Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
interface Serial0/1/0
 ip address 30.0.0.3 255.0.0.0
!
interface Serial0/1/1
 ip address 20.0.0.3 255.0.0.0
!
interface Vlan1
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.20.30.0 0.0.0.255 area 0
 network 20.0.0.0 0.255.255.255 area 0
 network 30.0.0.0 0.255.255.255 area 0
!
ip classless
ip route 192.20.30.0 255.255.255.0 30.0.0.1
ip route 192.20.20.0 255.255.255.0 10.0.0.1
ip route 10.0.0.0 255.0.0.0 30.0.0.1
ip route 10.0.0.0 255.0.0.0 20.0.0.2
!
ip flow-export version 9
!
```

Router1

Physical Config CLI Attributes

IOS Command Line Interface

```
interface Serial0/1/0
 ip address 30.0.0.1 255.0.0.0
 clock rate 2000000
!
interface Serial0/1/1
 ip address 10.0.0.1 255.0.0.0
!
interface Vlan1
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.20.10.0 0.0.0.255 area 0
 network 10.0.0.0 0.255.255.255 area 0
 network 30.0.0.0 0.255.255.255 area 0
!
ip classless
ip route 20.0.0.0 255.0.0.0 10.0.0.2
ip route 20.0.0.0 255.0.0.0 30.0.0.3
ip route 192.20.30.0 255.255.255.0 30.0.0.3
ip route 192.20.20.0 255.255.255.0 10.0.0.2
!
ip flow-export version 9
```

Router2

Physical Config CLI Attributes

IOS Command Line Interface

```
interface Vlan1
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.20.20.0 0.0.0.255 area 0
 network 10.0.0.0 0.255.255.255 area 0
 network 20.0.0.0 0.255.255.255 area 0
!
ip classless
ip route 192.20.10.0 255.255.255.0 10.0.0.1
ip route 192.20.30.0 255.255.255.0 20.0.0.3
ip route 30.0.0.0 255.0.0.0 20.0.0.3
ip route 30.0.0.0 255.0.0.0 10.0.0.3
!
ip flow-export version 9
```

6. Packet_Transfer:

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)

Simulation Panel

Event List

Vis.	Time(sec)	Last Device
	0.000	--
	0.001	PC0
	0.002	Switch3
	0.003	Router1
	0.004	Router0
	0.005	Switch0
	0.006	PC1
	0.007	Switch0
	0.008	Router0
	0.009	Router1
	0.010	Switch3

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC2	PC1	ICMP		0.000	N	0	(edit)

Simulation Panel

Event List

Vis.	Time(sec)	Last Device
	0.000	--
	0.001	PC2
	0.002	Switch2
	0.003	Router2
	0.004	Router0
	0.005	Switch0
	0.006	PC1
	0.007	Switch0
	0.008	Router0
	0.009	Router2
	0.010	Switch2