Lab2 Static and Default routes for routers

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Lab Objectives

1. To gain skills for achieving basic configuration of a router.
2. To practice calculating IP addresses using VLSM and major network address
3. To configure the IP addresses of different networks connected through routers.
4. To check the status of the interfaces of a router.
5. To achieve connectivity through two different ways; static and default.
6. To understand the meaning of the routing table

Network Topology

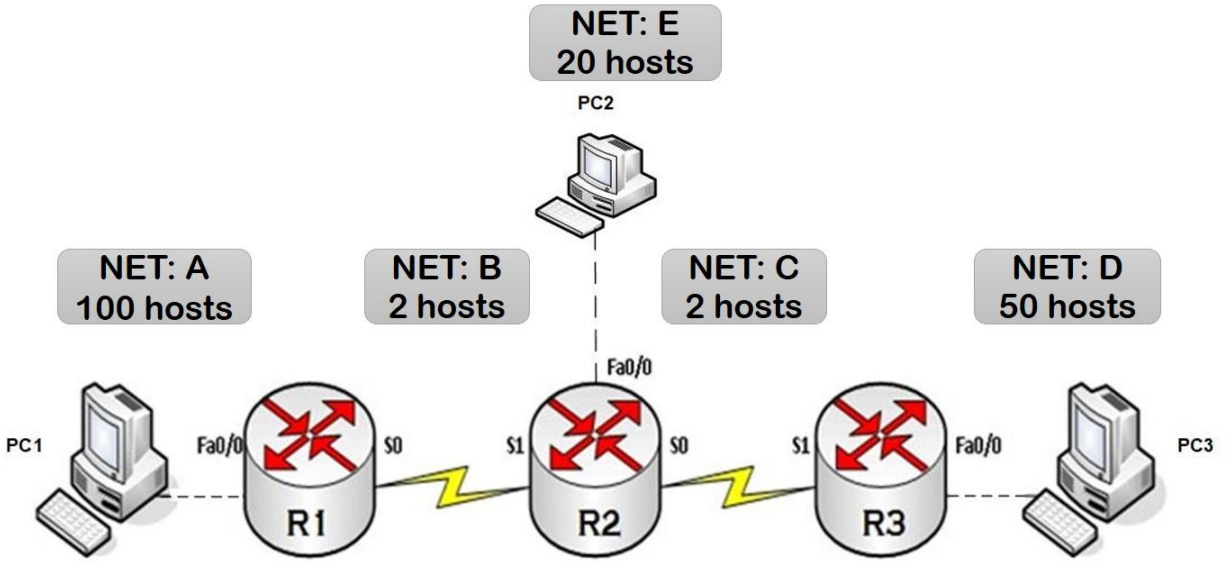

Fig.1: Topology of Static and Default Routes

In this scenario, networks A and D represent SOHO LANs, andR2 represents the ISP and Net E represents the Internet.

Procedure:

1. Connect the diagram shown above using the proper ports on routers
2. Add your personalized major IP address as a note to your diagram. For Group 1, this Subnet ID would be **192.168.0.0/(15+1)**.
3. Use VLSM to calculate all the subnet IDs, IP addresses and ranges. You must use the smallest subnets possible and not leave gaps in your subnetting scheme.
4. For the serial cables, connect the DCE end to the lowest serial interface
5. For the serial cable, connect the first valid address to the lowest serial interface
6. For networks A, D & E: assign lowest IP of the range (first valid address) to the router's interface and the highest IP (last valid address) to the PC .
7. Use proper labels to indicate the Net ID of each network and the addresses of all the devices connected to it.
8. Add enough notes when appropriate to make the diagram well understood.
9. Take a screenshot of your diagram and insert it as image 1 ***[2 mark]***

Insert image 1 here

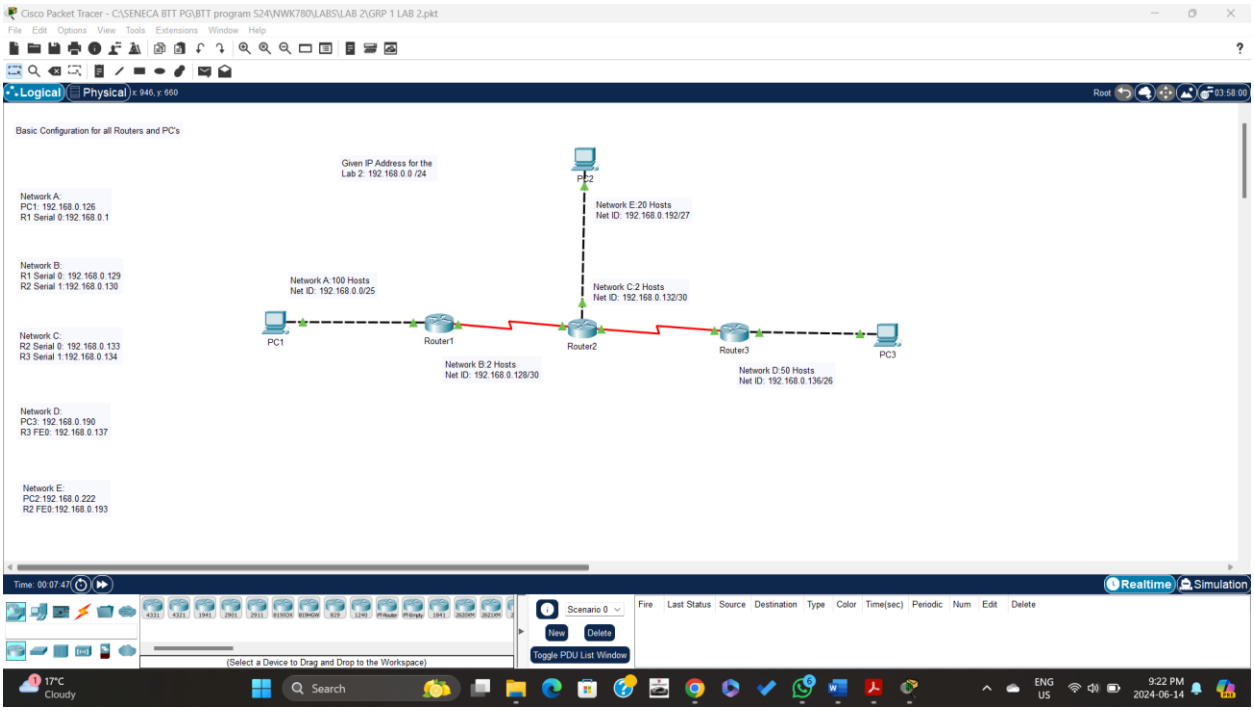

Fig.2: My personalized network diagram

10. Fill in the table below with the proper IP addresses ***[1 mark]***

R1	FastEthernet0/0	192.168.0.1	255.255.255.128	N.A
	Serial0	192.168.0.129	255.255.255.252	N.A.
R2	Serial1	192.168.0.130	255.255.255.252	N.A.
	Serial0	192.168.0.133	255.255.255.252	N.A.
	FastEthernet0/0	192.168.0.193	255.255.255.224	N.A.
R3	FastEthernet0/0	192.168.0.137	255.255.255.192	N.A.
	Serial1	192.168.0.134	255.255.255.252	N.A.
PC1	NIC	192.168.0.126	255.255.255.128	192.168.0.1
PC2	NIC	192.168.0.222	255.255.255.224	192.168.0.193
PC3	NIC	192.168.0.190	255.255.255.192	192.168.0.137

Table 1: IP addresses for all devices

11. Check connectivity between each PC and its gateway by pinging the gateway from the PC's CLI.

12. Check the routing table of each router and make sure that it includes the connected networks
13. Take a screen capture of the routing table of R2; insert the picture below ***[0.3 marks]***

Insert image 3 here

```
R2#sh ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     192.168.0.0/27 is subnetted, 1 subnets
C       192.168.0.192 is directly connected, FastEthernet0/0
R2#
R2#group 1
```

Fig.4: Routing table of R2

Connected LANs using Static Routes

14. Configure static routes on all three routers.
15. Check the routing table of each router and take a screen capture of it. ***[0.6 marks]***

Insert the routing table of R1 here

```
C       192.168.0.0 is directly connected, FastEthernet0/0
R1#sh ip int br
Interface                  IP-Address      OK? Method Status                Protocol
FastEthernet0/0            192.168.0.1     YES manual up                    up
FastEthernet0/1            unassigned      YES unset  administratively down down
Serial0/0/0                unassigned      YES unset  administratively down down
Serial0/0/1                192.168.0.129   YES manual down                  down
R1#Group 1
```

Fig.5: Routing table of R1

Insert the routing table of R2 here

```
R2#sh ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     192.168.0.0/27 is subnetted, 1 subnets
C       192.168.0.192 is directly connected, FastEthernet0/0
R2#
R2#group 1
```

Fig.6: Routing table of R2

Insert the routing table of R3 here

```
R2#
R2#sh ip int br
Interface                  IP-Address      OK? Method Status                Protocol
FastEthernet0/0            192.168.0.193   YES manual up                    up
FastEthernet0/1            unassigned      YES unset  administratively down down
Serial0/0/0                unassigned      YES unset  administratively down down
Serial0/0/1                192.168.0.130   YES manual down                  down
R2#
R2#GROUP 1
```

Fig.7: Routing table of R3

16. Check connectivity between all PCs, you should have all PCs able to ping all others ***[0.6 marks]***