LINUX NETWORKING MODULE 5 ASSESSMENT SOLUTION

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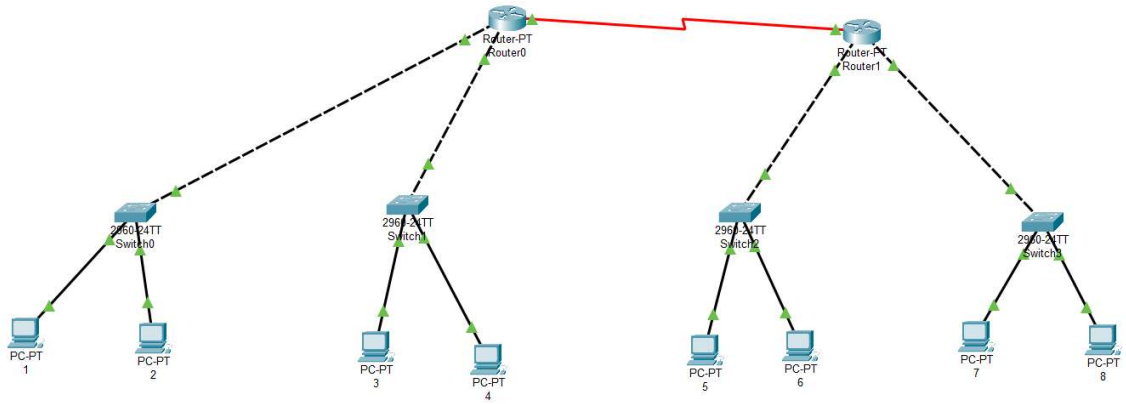
5) Given an IP address range of 192.168.1.0/24, divide the network into 4 subnets.

- Task: Manually calculate the new subnet mask and the range of valid IP addresses for each subnet.
- Assign IP addresses from these subnets to devices in Cisco Packet Tracer and verify connectivity using ping between them.

Dividing the **192.168.1.0/24** network into **4 equal subnets**. The subnet mask will be **255.255.255.192 (/26)**.

Subnet	Subnet Address	Usable IP Range	Broadcast Address
Subnet 1	192.168.1.0/26	192.168.1.1 - 192.168.1.62	192.168.1.63
Subnet 2	192.168.1.64/26	192.168.1.65- 192.168.1.126	192.168.1.127
Subnet 3	192.168.1.128/26	192.168.1.129 - 192.168.1.190	192.168.1.191
Subnet 4	192.168.1.192/26	192.168.1.193 - 192.168.1.254	192.168.1.255

Topology:



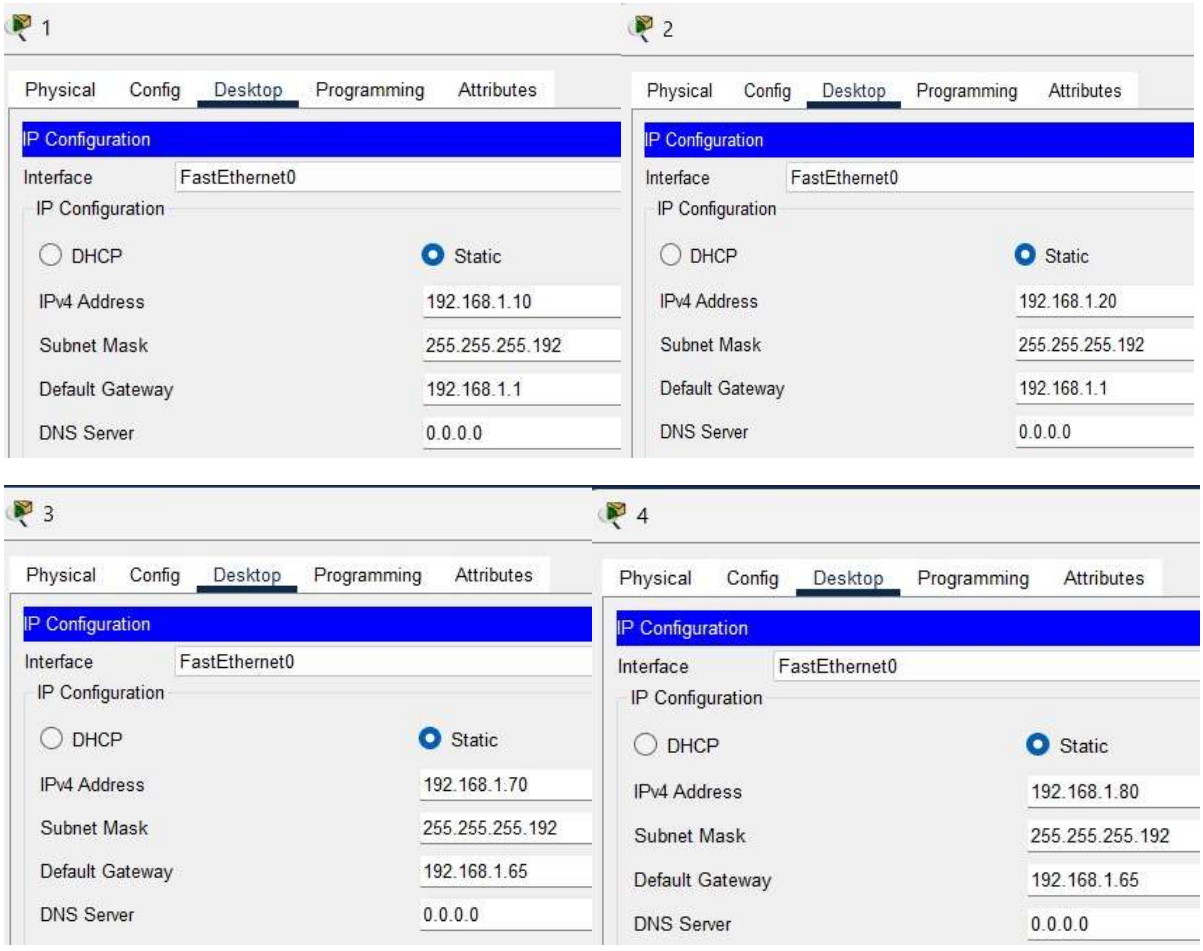
Assume 4 departments, each using a separate subnet:

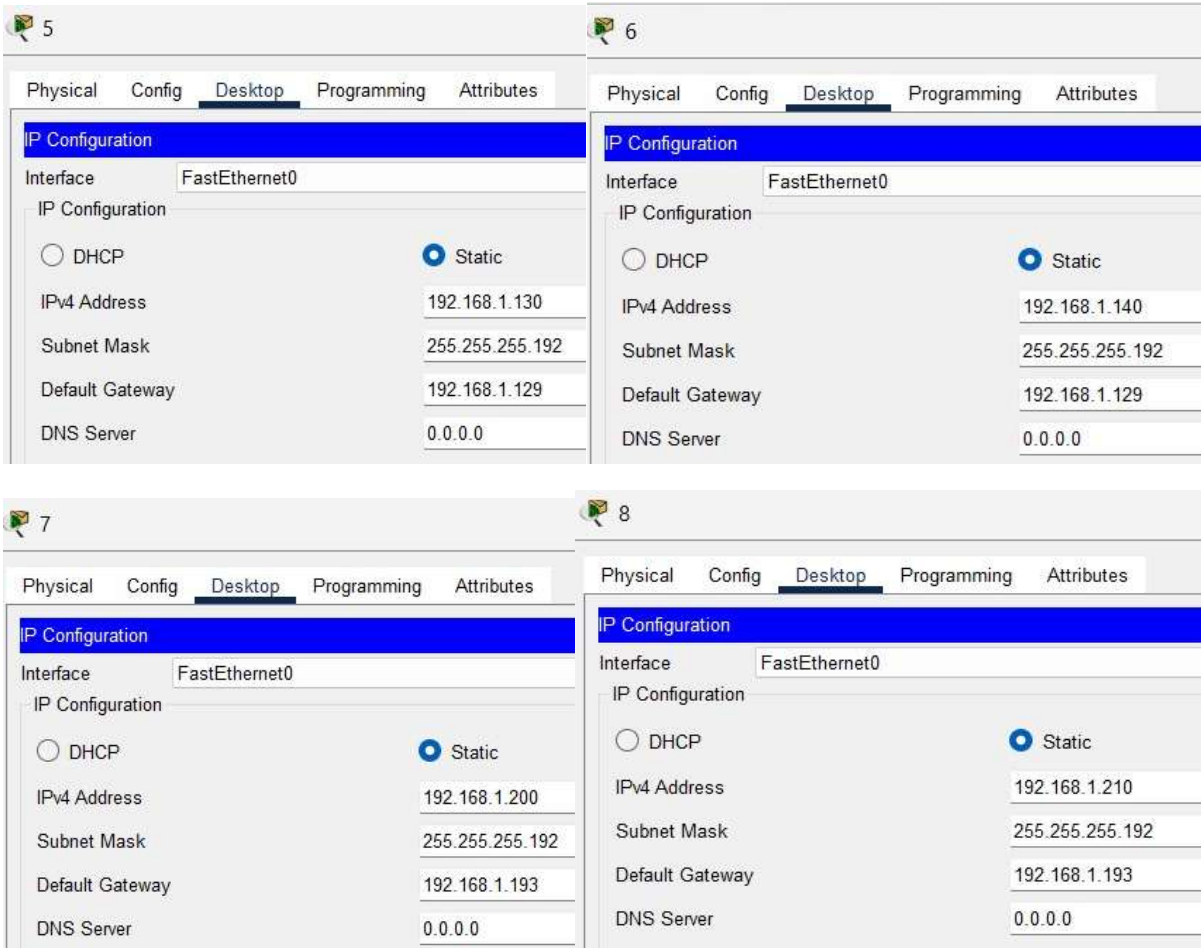
- **Subnet 1:** Admin Department
- **Subnet 2:** HR Department
- **Subnet 3:** IT Department
- **Subnet 4:** Sales Department

DEVICE	ASSIGNED IP	SUBNET MASK
Admin PC1	192.168.1.10	255.255.255.192
Admin PC2	192.168.1.20	255.255.255.192
HR PC1	192.168.1.70	255.255.255.192
HR PC2	192.168.1.80	255.255.255.192
IT PC1	192.168.1.130	255.255.255.192
IT PC2	192.168.1.140	255.255.255.192
SALES PC1	192.168.1.200	255.255.255.192
SALES PC2	192.168.1.210	255.255.255.192

- Subnet 1 Gateway: 192.168.1.1
- Subnet 2 Gateway: 192.168.1.65
- Subnet 3 Gateway: 192.168.1.129
- Subnet 4 Gateway: 192.168.1.193

IP CONFIGURATIONS:





ROUTER CONFIGURATIONS:

ROUTER 0

```
Router>enable
Router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        192.168.1.1     YES manual up                    up
FastEthernet1/0        192.168.1.65    YES manual up                    up
Serial2/0              192.168.2.1     YES manual up                    up
Serial3/0              unassigned      YES unset  down                  down
FastEthernet4/0        unassigned      YES unset  down                  down
FastEthernet5/0        unassigned      YES unset  down                  down
Router#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

     192.168.1.0/26 is subnetted, 4 subnets
C       192.168.1.0 is directly connected, FastEthernet0/0
C       192.168.1.64 is directly connected, FastEthernet1/0
S       192.168.1.128 [1/0] via 192.168.2.2
S       192.168.1.192 [1/0] via 192.168.2.2
     192.168.2.0/30 is subnetted, 1 subnets
C       192.168.2.0 is directly connected, Serial2/0
```

ROUTER 1

```
Router>enable
Router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        192.168.1.129   YES manual up                    up
FastEthernet1/0        192.168.1.193   YES manual up                    up
Serial2/0              192.168.2.2     YES manual up                    up
Serial3/0              unassigned      YES unset  administratively down down
FastEthernet4/0        unassigned      YES unset  administratively down down
FastEthernet5/0        unassigned      YES unset  administratively down down
Router#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

     192.168.1.0/26 is subnetted, 4 subnets
S       192.168.1.0 [1/0] via 192.168.2.1
S       192.168.1.64 [1/0] via 192.168.2.1
C       192.168.1.128 is directly connected, FastEthernet0/0
C       192.168.1.192 is directly connected, FastEthernet1/0
     192.168.2.0/30 is subnetted, 1 subnets
C       192.168.2.0 is directly connected, Serial2/0
```

Routing Table:

Routing Table for Router0

Type	Network	Port	Next Hop IP	Metric
C	192.168.1.0/26	FastEthernet0/0	---	0/0
C	192.168.1.64/26	FastEthernet1/0	---	0/0
S	192.168.1.128/26	---	192.168.2.2	1/0
S	192.168.1.192/26	---	192.168.2.2	1/0
C	192.168.2.0/30	Serial2/0	---	0/0

Routing Table for Router1

Type	Network	Port	Next Hop IP	Metric
S	192.168.1.0/26	---	192.168.2.1	1/0
S	192.168.1.64/26	---	192.168.2.1	1/0
C	192.168.1.128/26	FastEthernet0/0	---	0/0
C	192.168.1.192/26	FastEthernet1/0	---	0/0
C	192.168.2.0/30	Serial2/0	---	0/0

PING TESTS:

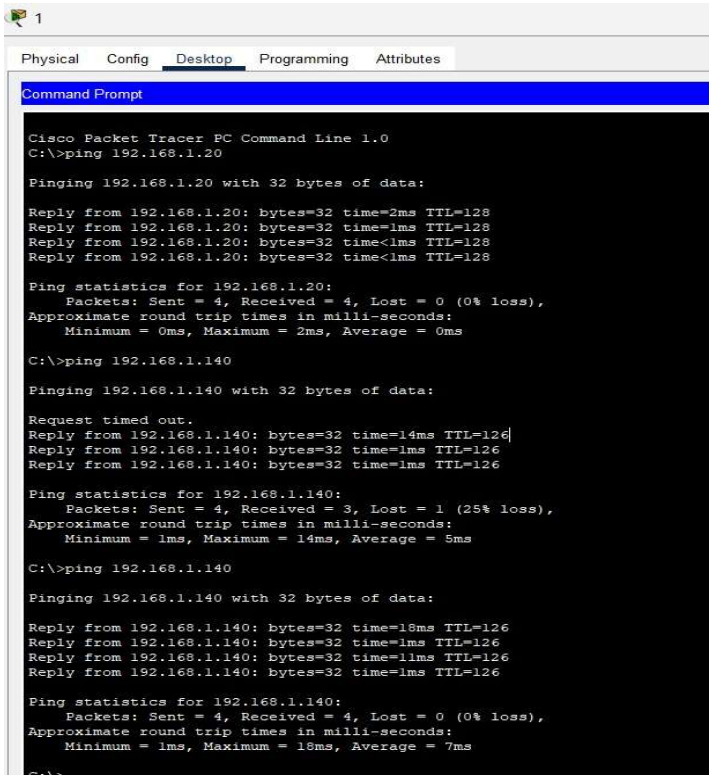
1)Router-to-Router Connectivity (on Router1)

```
Router>ping 192.168.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 14/27/58 ms
```

2)Same Subnet Ping on Admin PC1 (192.168.1.10): ping 192.168.1.20

3)Inter-Subnet Ping on Admin PC1 (192.168.1.10): ping 192.168.1.140



4)From HR PC1 (192.168.1.70) to IT PC1 (192.168.1.130): ping 192.168.1.130

5)From Sales PC2 (192.168.1.210) to Admin PC2 (192.168.1.20): ping 192.168.1.20