

## LINUX NETWORKING MODULE 5 ASSESSMENT SOLUTION

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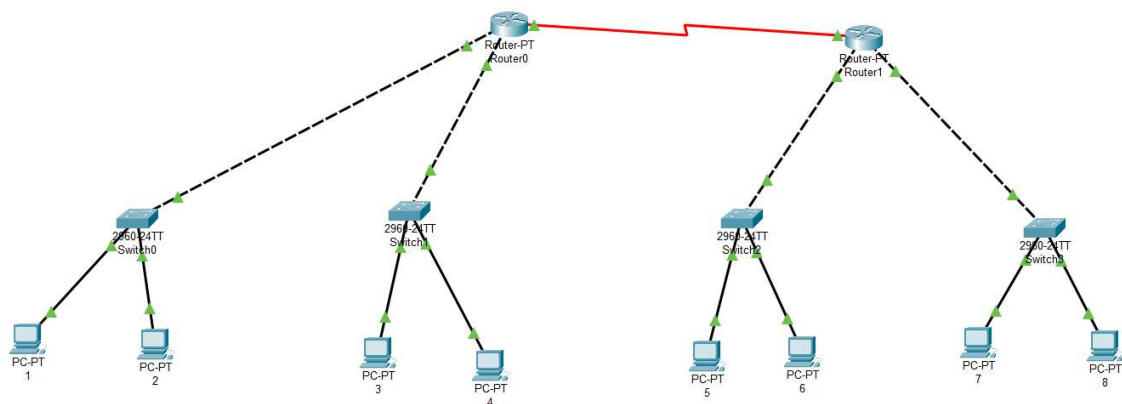
5) Given an IP address range of 192.168.1.0/24, divide the network into 4 subnets.

- 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:

1

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.10

Subnet Mask 255.255.255.192

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

2

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.20

Subnet Mask 255.255.255.192

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

3

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.70

Subnet Mask 255.255.255.192

Default Gateway 192.168.1.65

DNS Server 0.0.0.0

4

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

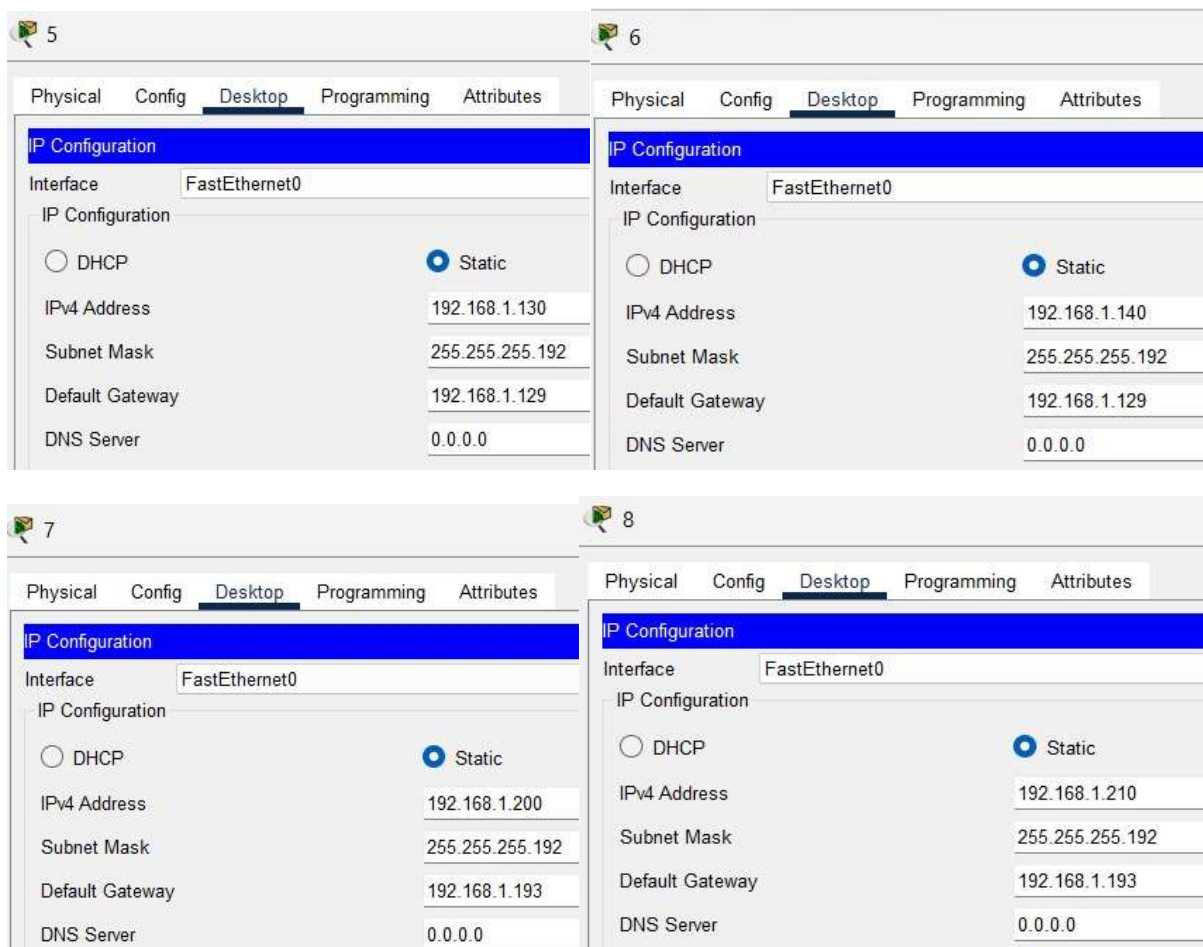
☐ DHCP ☒ Static

IPv4 Address 192.168.1.80

Subnet Mask 255.255.255.192

Default Gateway 192.168.1.65

DNS Server 0.0.0.0



## 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					Routing Table for Router1				
Type	Network	Port	Next Hop IP	Metric	Type	Network	Port	Next Hop IP	Metric
C	192.168.1.0/26	FastEthernet0/0	---	0/0	S	192.168.1.0/26	---	192.168.2.1	1/0
C	192.168.1.64/26	FastEthernet1/0	---	0/0	S	192.168.1.64/26	---	192.168.2.1	1/0
S	192.168.1.128/26	---	192.168.2.2	1/0	C	192.168.1.128/26	FastEthernet0/0	---	0/0
S	192.168.1.192/26	---	192.168.2.2	1/0	C	192.168.1.192/26	FastEthernet1/0	---	0/0
C	192.168.2.0/30	Serial2/0	---	0/0	C	192.168.2.0/30	Serial2/0	---	0/0

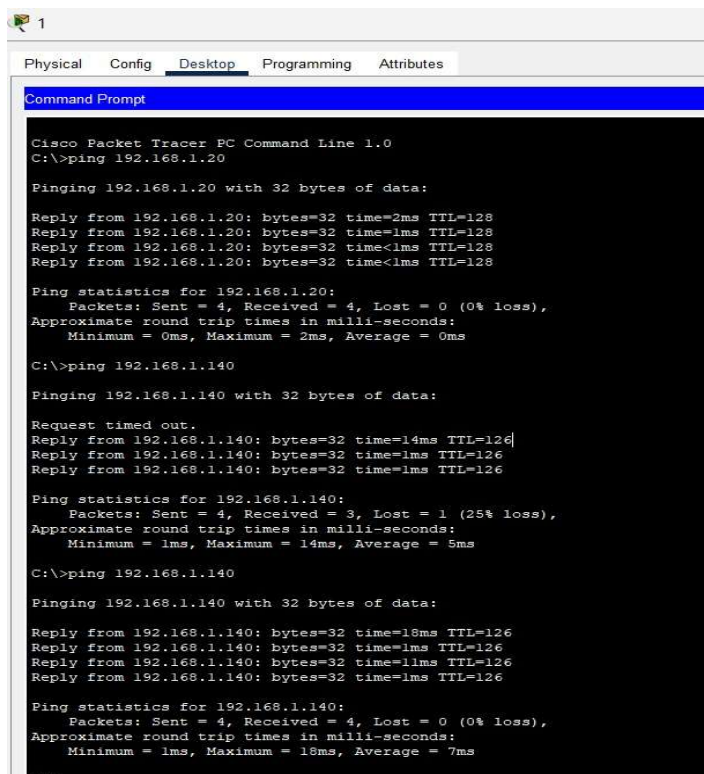
## PING TESTS:

### 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



```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.20

Pinging 192.168.1.20 with 32 bytes of data:

Reply from 192.168.1.20: bytes=32 time=2ms TTL=128
Reply from 192.168.1.20: bytes=32 time=1ms TTL=128
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>ping 192.168.1.140

Pinging 192.168.1.140 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.140: bytes=32 time=14ms TTL=126
Reply from 192.168.1.140: bytes=32 time=1ms TTL=126
Reply from 192.168.1.140: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.1.140:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 14ms, Average = 5ms

C:\>ping 192.168.1.140

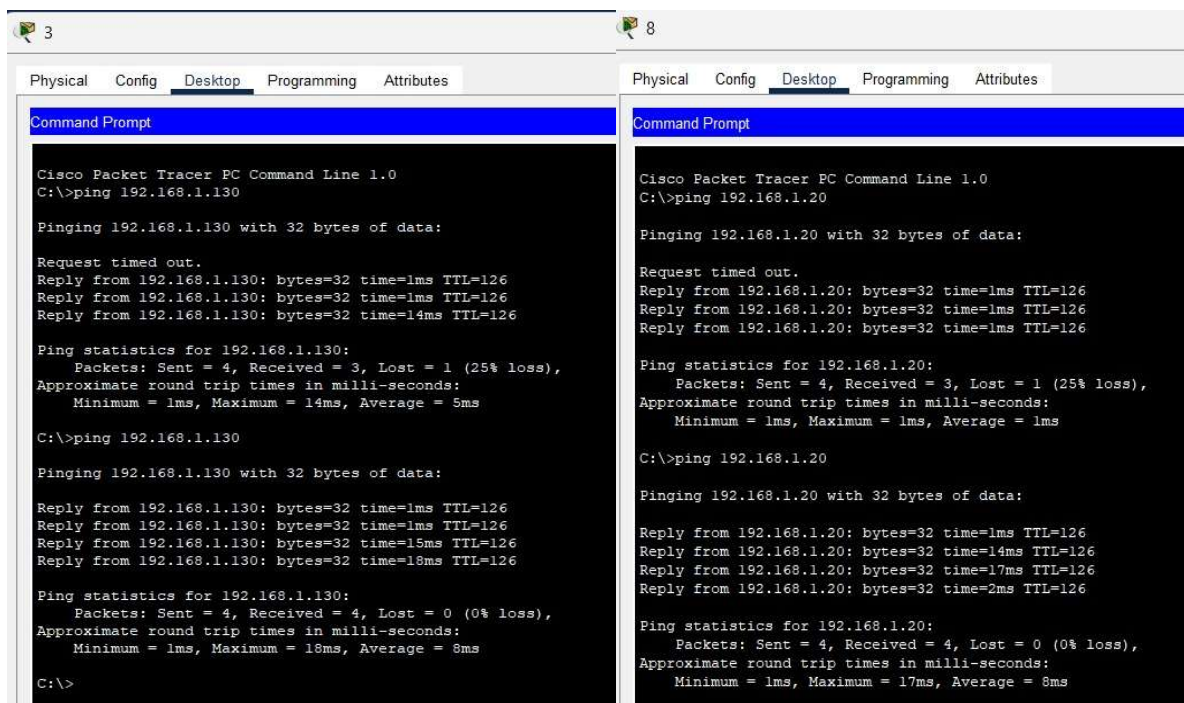
Pinging 192.168.1.140 with 32 bytes of data:

Reply from 192.168.1.140: bytes=32 time=18ms TTL=126
Reply from 192.168.1.140: bytes=32 time=1ms TTL=126
Reply from 192.168.1.140: bytes=32 time=11ms TTL=126
Reply from 192.168.1.140: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.1.140:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 18ms, Average = 7ms
```

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



```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.130

Pinging 192.168.1.130 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.130: bytes=32 time=1ms TTL=126
Reply from 192.168.1.130: bytes=32 time=1ms TTL=126
Reply from 192.168.1.130: bytes=32 time=14ms TTL=126

Ping statistics for 192.168.1.130:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 14ms, Average = 5ms

C:\>ping 192.168.1.130

Pinging 192.168.1.130 with 32 bytes of data:

Reply from 192.168.1.130: bytes=32 time=1ms TTL=126
Reply from 192.168.1.130: bytes=32 time=1ms TTL=126
Reply from 192.168.1.130: bytes=32 time=15ms TTL=126
Reply from 192.168.1.130: bytes=32 time=18ms TTL=126

Ping statistics for 192.168.1.130:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 18ms, Average = 8ms

C:\>

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.20

Pinging 192.168.1.20 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.20: bytes=32 time=1ms TTL=126
Reply from 192.168.1.20: bytes=32 time=1ms TTL=126
Reply from 192.168.1.20: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.1.20:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 192.168.1.20

Pinging 192.168.1.20 with 32 bytes of data:

Reply from 192.168.1.20: bytes=32 time=1ms TTL=126
Reply from 192.168.1.20: bytes=32 time=14ms TTL=126
Reply from 192.168.1.20: bytes=32 time=17ms TTL=126
Reply from 192.168.1.20: bytes=32 time=2ms TTL=126

Ping statistics for 192.168.1.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 17ms, Average = 8ms
```