



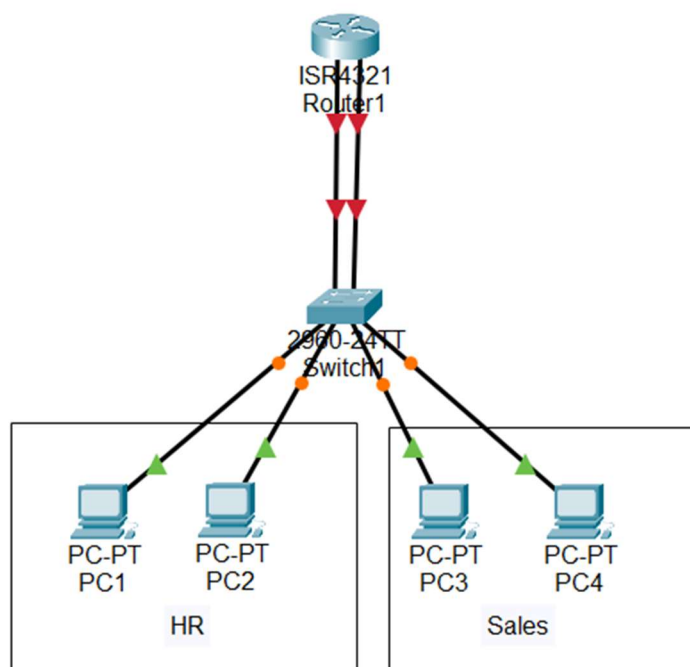
1.6. Configure and Verifying IPv4 Addressing and Subnetting

Objective:

Practice subnetting a given network, assigning IPv4 addresses, and verifying connectivity across hosts and routers.

Topology

- **Router1** connected to **Switch1**
- **Switch1** connected to **PC1**, **PC2**, **PC3**, and **PC4**



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Lab Tasks

Step 1 – Subnet your network

- You are given the network 192.168.10.0/24 to subnet for the HR and Sales department network devices.
- You need 2 subnets, one for HR and one for Sales. Both subnets should only have 14 useable IP's. 14 useable IP's for HR, 14 useable IP's for Sales.
- Determine the subnet mask, network ID's, and useable host ranges

Step 2 – Determine IP Addresses

- Assign the first usable IP of Subnet 1 to Router1's G0/0/0 interface.
- Assign the first usable IP of Subnet 2 to Router1's G0/0/1 interface.
- Assign PC1 and PC2 addresses from Subnet 1.
- Assign PC3 and PC4 addresses from Subnet 2.
- Use the appropriate router interface IPs as the default gateways for the PCs.

Step 3 – Configure Devices

- On Router1, configure the two (Gig0/0/0 & Gig0/0/1) interfaces with the assigned default gateway IPs. It is best practice to use the first available IP address as the default gateway of your subnets.
- On each PC, configure the static IP address, subnet mask, and default gateway.

Step 4 – Verification

- Verify that each PC can ping their default gateway
- Verify PC1 and PC2 can ping PC3 and PC4

ANSWERS BEYOND THIS POINT.
LET'S SEE HOW YOU DID!.....

Solution Key

Step 1 – Subnetting

- Original Network: 192.168.10.0/24
- Need 2 subnets that support 14 devices. Using a /28 would give us 16 IP addresses in total.
- First Subnet:
 - ID: 192.168.10.0/28
 - Subnet Mask: 255.255.255.240
 - Useable IP's: 192.168.10.1 – 192.168.10.14
(14 total useable IP addresses)
 - Broadcast Address: 192.168.10.15
- Second Subnet:
 - ID: 192.168.10.16/28
 - Subnet Mask: 255.255.255.240
 - Useable IP's: 192.168.10.17 – 192.168.10.30
(14 total useable IP addresses)
 - Broadcast Address: 192.168.10.31

Step 2 – Address Assignment

- Router1 Gig0/0/0: 192.168.10.1/28 (gateway for PC1 & PC2)
- Router1 G0/0/1: 192.168.10.17/28 (gateway for PC3 & PC4)
- PC1: 192.168.10.2 /28, GW 192.168.10.1
- PC2: 192.168.10.3 /28, GW 192.168.10.1
- PC3: 192.168.10.18 /28, GW 192.168.10.17
- PC4: 192.168.10.19 /28, GW 192.168.10.17

Step 3 – Router/Switch Configuration

- Router1 Configuration:

```
Router1> enable
```

```
Router1# configure terminal
```

```
Router1(config)# interface g0/0/0
```

```
Router1(config-if)# ip address 192.168.10.1 255.255.255.240
```

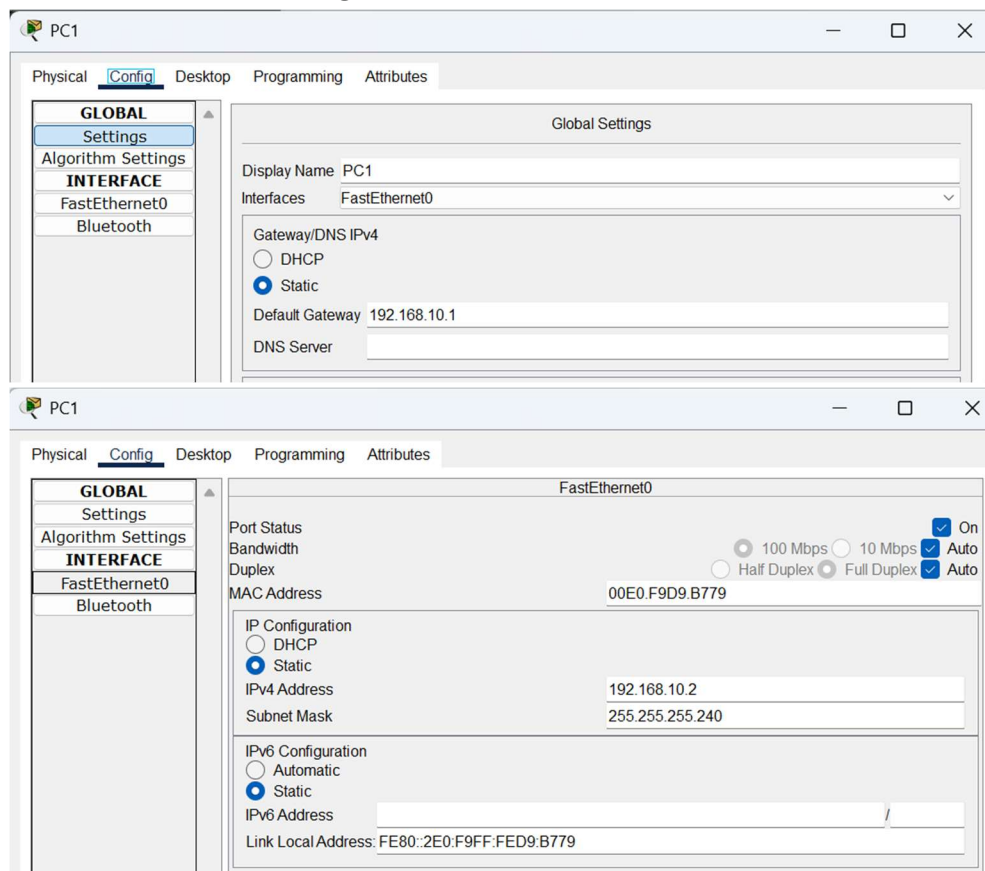
```
Router1(config-if)# no shutdown
```

```
Router1(config)# interface g0/0/1
```

```
Router1(config-if)# ip address 192.168.10.17 255.255.255.240
```

```
Router1(config-if)# no shutdown
```

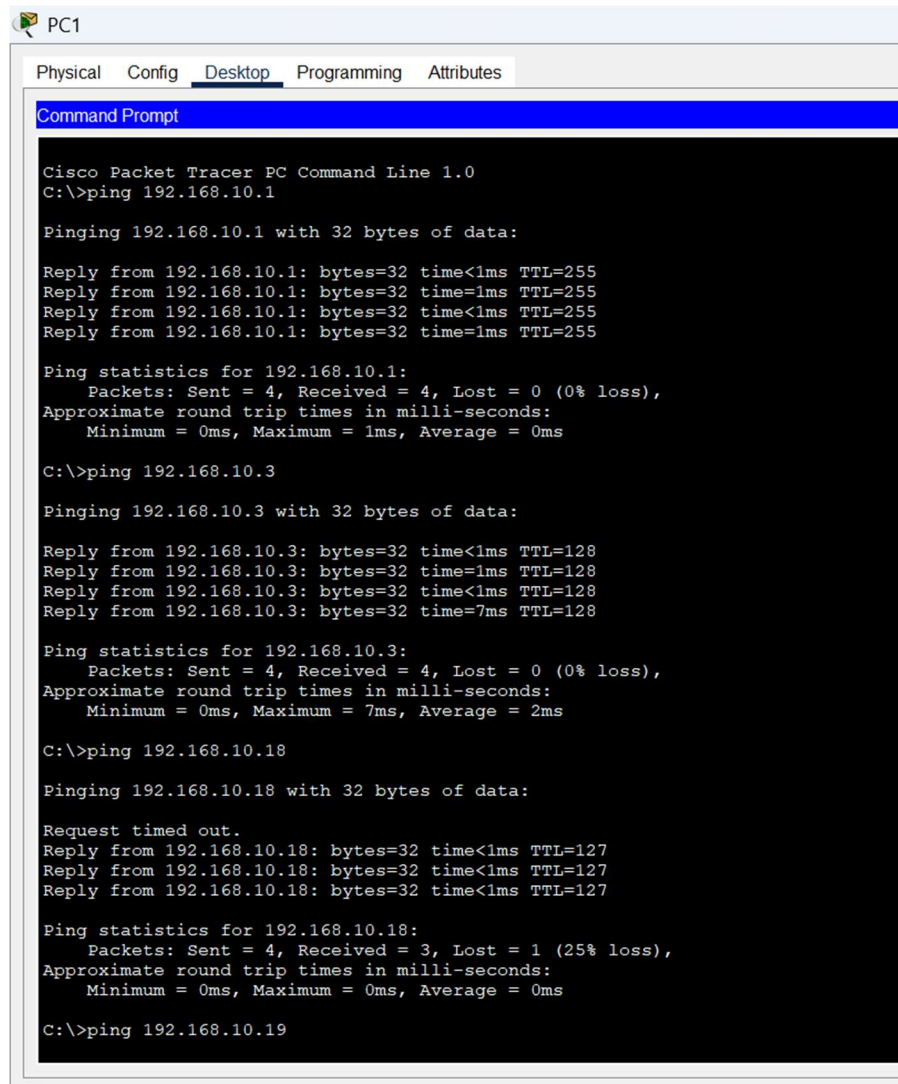
- Switch1 needs no configuration for this lab.
- Add IP addresses, subnet mask, and default gateway from *Step 2* manually into each PC under the *config* tab.



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Step 4 – Verification Output

- Open the *Command Prompt* program under the *Desktop* tab of PC1
- Ensure you can *ping* its default gateway, PC2, PC3, and PC4



```
PC1
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time=1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time=1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time=7ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 7ms, Average = 2ms

C:\>ping 192.168.10.18

Pinging 192.168.10.18 with 32 bytes of data:

Request timed out.
Reply from 192.168.10.18: bytes=32 time<1ms TTL=127
Reply from 192.168.10.18: bytes=32 time<1ms TTL=127
Reply from 192.168.10.18: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.18:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.19
```

- Then do the same from PC2, PC3, and PC4
- If successful, you've configured this lab correctly! Congrats!