

Task 2:

Calculate total number of subnets, total number of hosts per subnet, total number of valid hosts per subnet, subnet mask for each subnet, first valid host for each subnet, last valid host for each subnet, broadcast ip address of each subnet, subnetwork IP address for each subnet, block size for each family of IPs in each subnet. Generate a table as shown in the classroom exercise for enlisting range of IP address in each of subnet families. & finally design the same on packet tracer.

Given Network Address is 192.168.10.0 which is Class C IPv4 and subnet mask is 255.255.255.128 (binary=11111111.11111111.11111111.10000000) Now with this we will find following information.

TASK 2

Total Subnets = $2^1 = 2$

Total Hosts Per Subnet = $2^7 = 128$

Total Valid Hosts per Subnet = $2^7 - 2 = 126$

Block Size = $256 - 128 = 128$

First Subnet Mask = 192.168.10.00000000 - 192.168.10.11111111

IP address = 192.168.10.0 - 192.168.10.127

1st Valid Host = 192.168.10.00000001
OR 192.168.10.1

Last Valid Host = 192.168.10.01111110
OR 192.168.10.126

Broadcast IP = 192.168.10.01111111
OR 192.168.10.127

Second Subnet Mask = 192.168.10.10000000 - 192.168.10.11111111

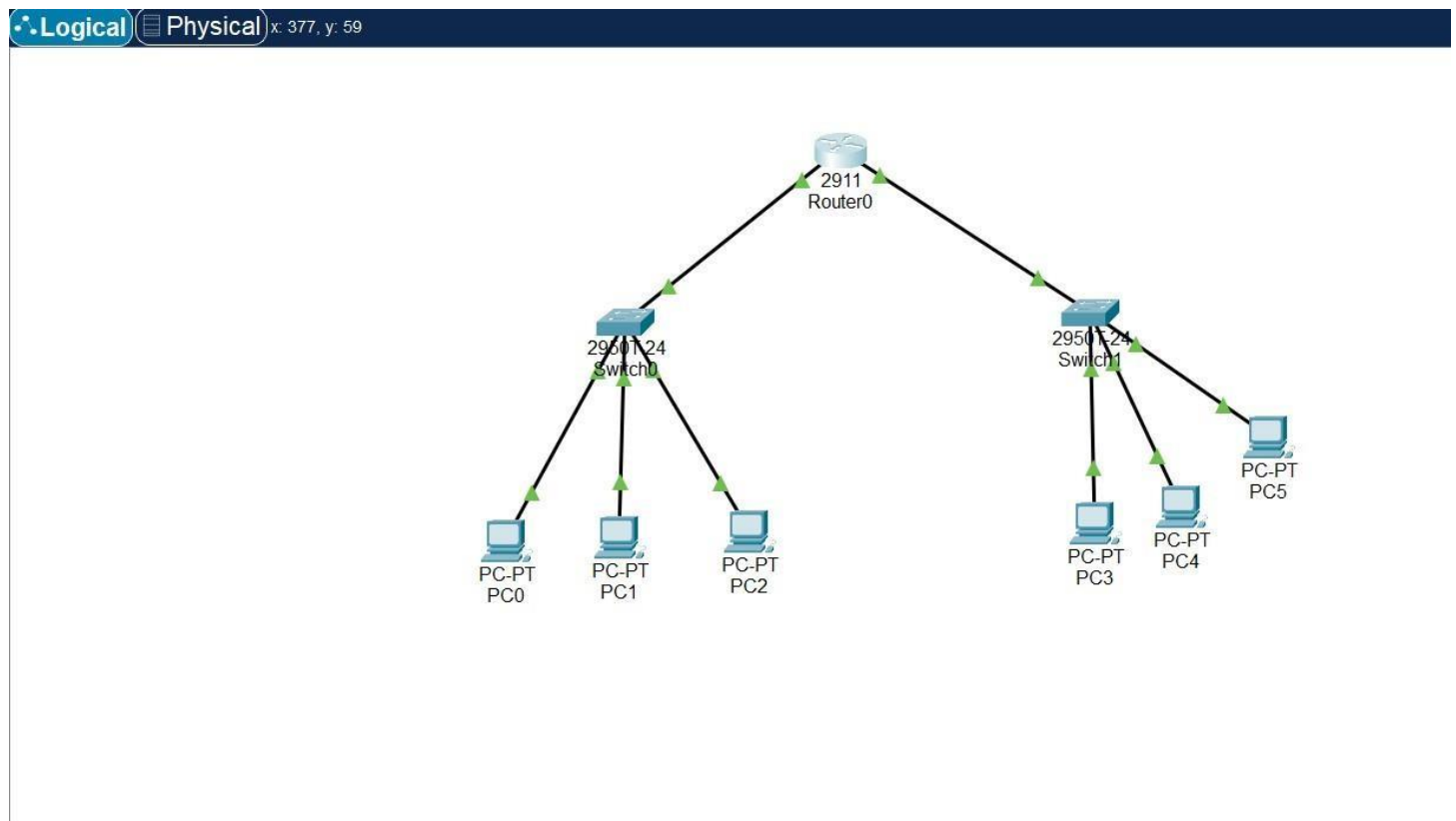
IP address = 192.168.10.128 - 192.168.10.255

1st Valid Host = 192.168.10.10000001
OR 192.168.10.129

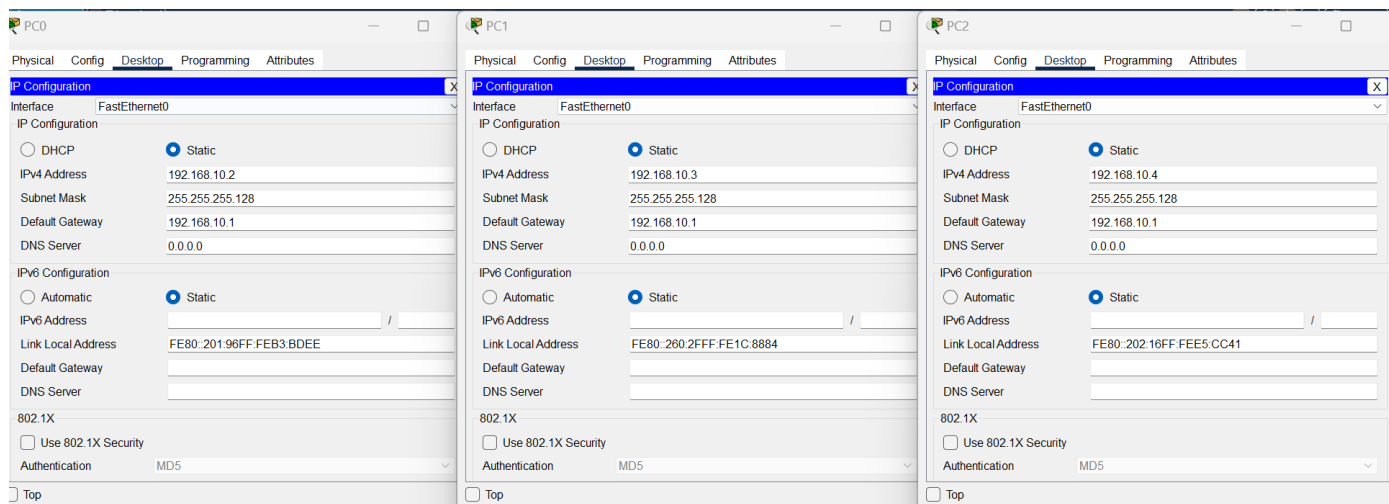
Last Valid Host = 192.168.10.11111110
OR 192.168.10.254

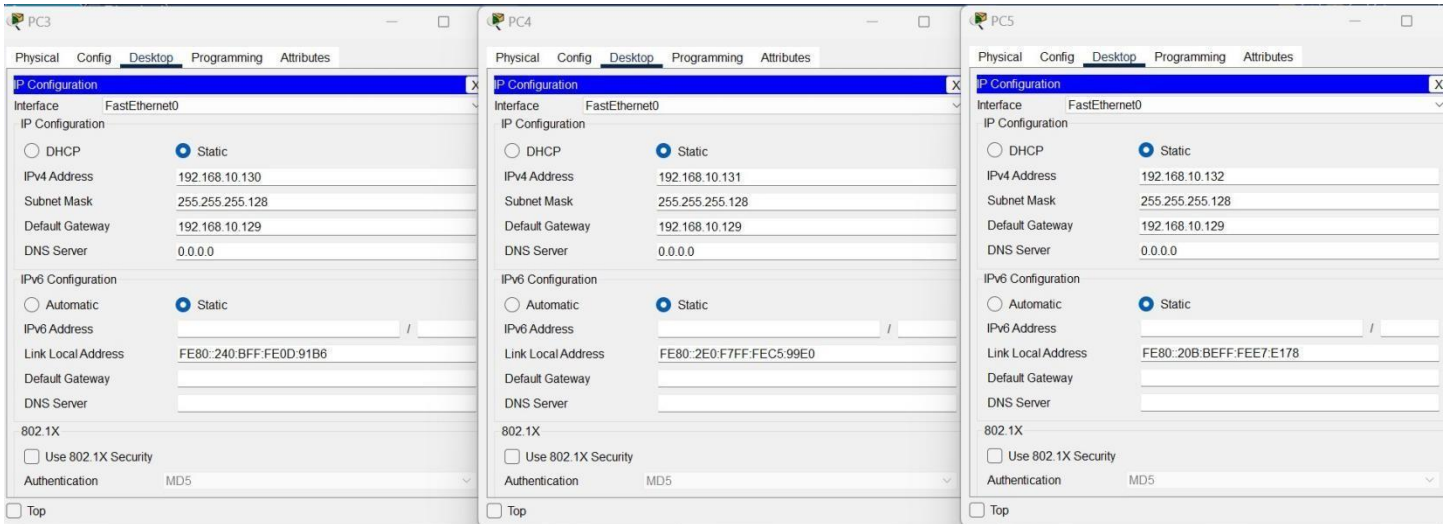
Broadcast IP = 192.168.10.11111111
OR 192.168.10.255

Designing the Topology: As there are 2 possible Subnets we attached 2 switches to the router to differentiate the broadcast domains and assigned 3 PCs to each domain.

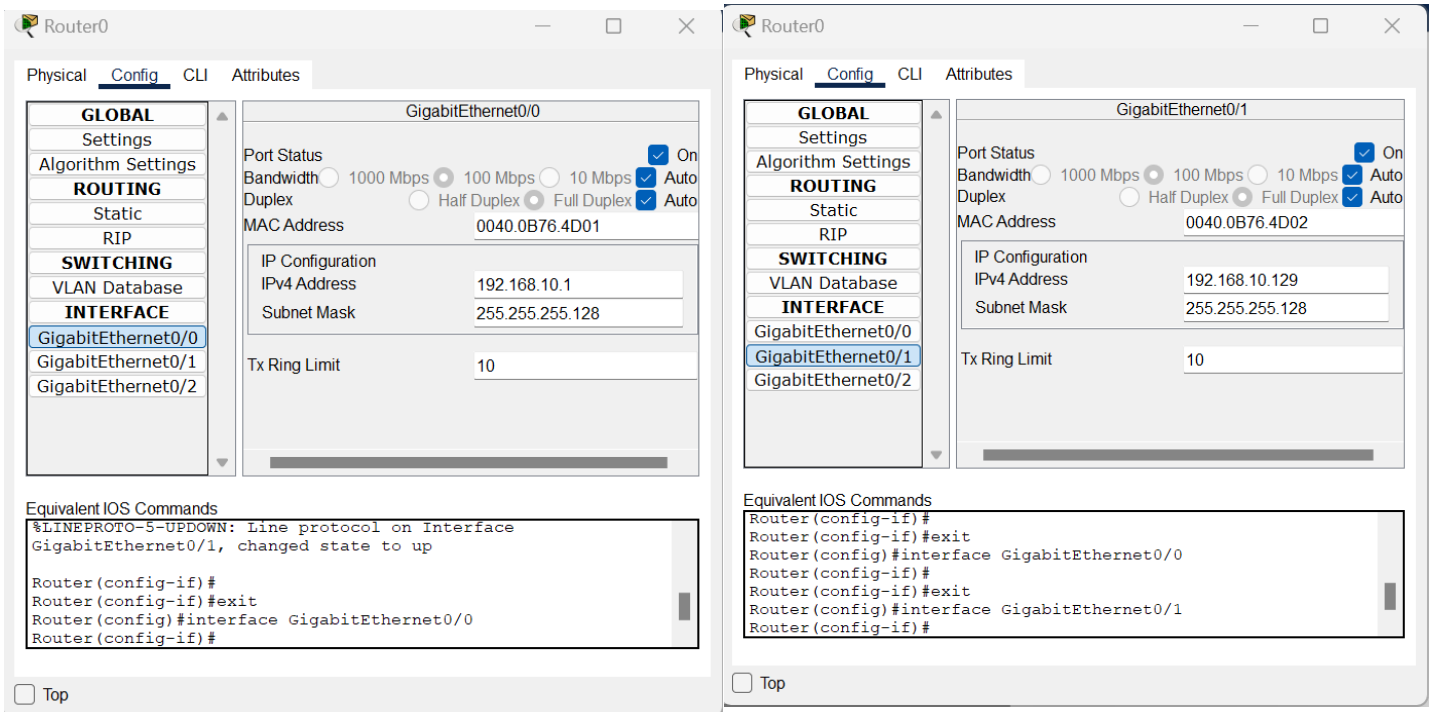


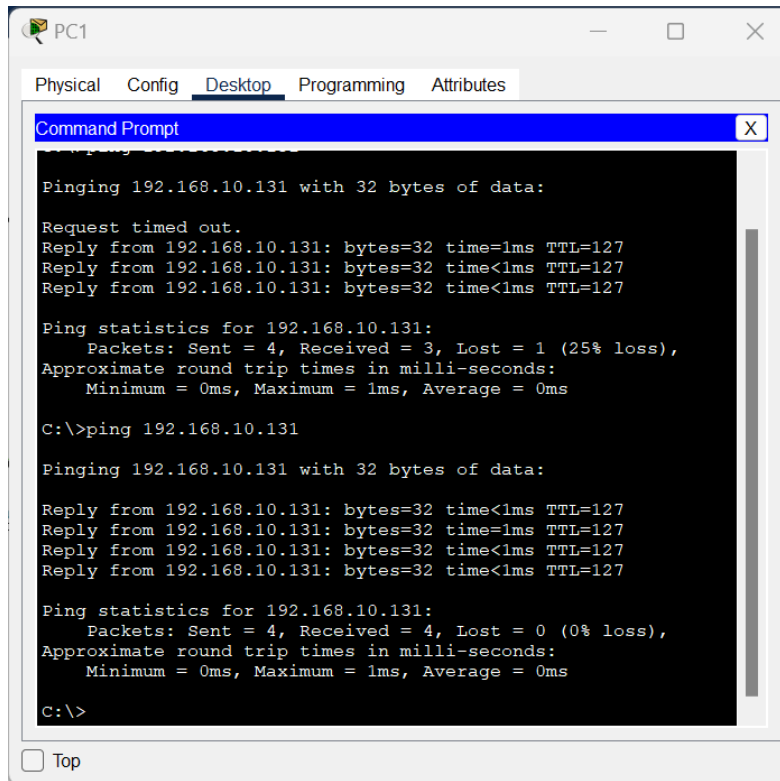
Setting up PCs: Assigning IP addresses to first 3 PCs between 192.168.10.2 - 192.168.10.4 with default gateway being 192.168.10.1 which is 1st valid host in this subnet family. Default subnet mask is 255.255.255.128





Setting up Router: Connecting the switches to router and adding the default IPv4 of each subnet. As there are 2 domains so this is done twice 1st IP is 192.168.10.1 and 2nd is 192.168.10.129.





The screenshot shows a window titled "PC1" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the results of a ping command to 192.168.10.131. The first attempt shows a "Request timed out." followed by three successful replies. The second attempt shows four successful replies. The ping statistics for 192.168.10.131 are displayed at the end of each attempt.

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Pinging 192.168.10.131 with 32 bytes of data:

Request timed out.
Reply from 192.168.10.131: bytes=32 time=1ms TTL=127
Reply from 192.168.10.131: bytes=32 time<1ms TTL=127
Reply from 192.168.10.131: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.131:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.10.131

Pinging 192.168.10.131 with 32 bytes of data:

Reply from 192.168.10.131: bytes=32 time<1ms TTL=127
Reply from 192.168.10.131: bytes=32 time=1ms TTL=127
Reply from 192.168.10.131: bytes=32 time<1ms TTL=127
Reply from 192.168.10.131: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.131:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

Pinging: Verifying connections by pinging PC1 (IPv4=192.168.10.3) to PC4 (IPv4=192.168.10.131) which is successful.

