

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.

IP Address: 192.168.1.0

Subnet Mask: 255.255.255.0

Total IPs in /24: 256 IPs

Usable IPs: $256 - 2 = 254$ we exclude network and broadcast addresses

2 bits $\rightarrow 2^2 = 4$. so to create 4 subnets, we borrow 2 more bits from the host. Hence new subnet mask: /26

Subnet size: $2^{(32-26)} = 64$ IPs

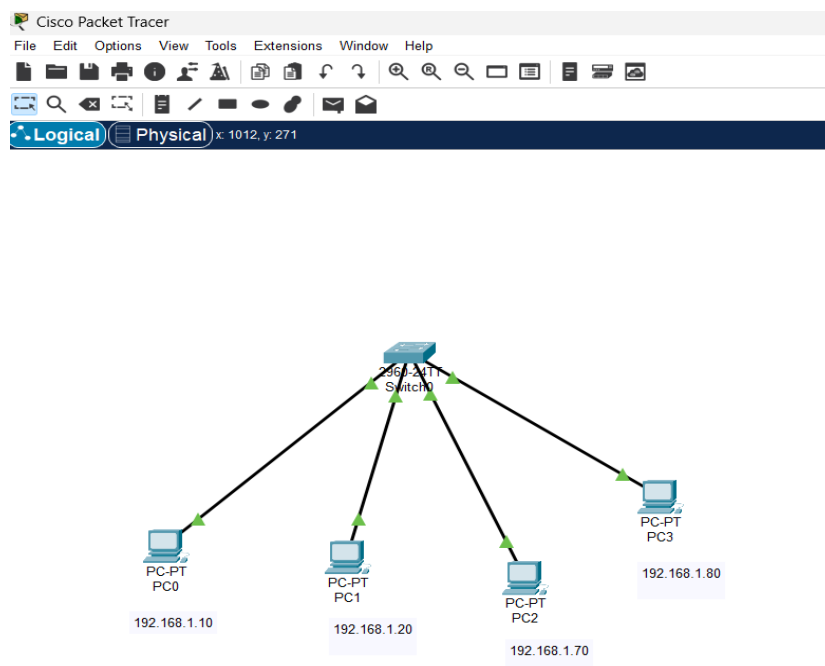
Usable IPs: 62 (excluding network & broadcast)

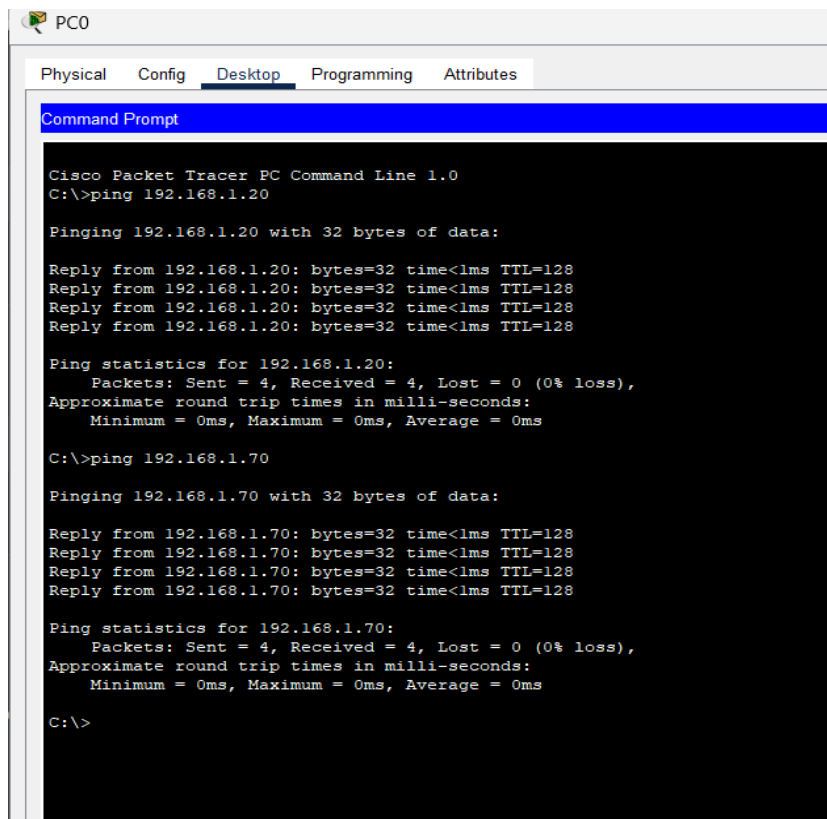
Subnet 1 : Usable Ip Range - 192.168.1.1 to 192.168.1.62 here Network Add - 192.168.1.0 and broadcast Add- 192.168.1.63

Subnet 2 : Ip Range - 192.168.1.65 to 192.168.1.126 here Network Add - 192.168.1.64 and broadcast Add- 192.168.1.127

Subnet 3 : Ip Range - 192.168.1.129 to 192.168.1.190 here Network Add - 192.168.1.128 and broadcast Add- 192.168.1.191

Subnet 4 : Ip Range - 192.168.1.193 to 192.168.1.254 here Network Add - 192.168.1.192 and broadcast Add- 192.168.1.255





The screenshot shows a Cisco Packet Tracer PC Command Prompt window for PC0. The window has tabs for Physical, Config, Desktop, Programming, and Attributes, with Desktop selected. The Command Prompt displays the output of two ping commands. The first command is 'ping 192.168.1.20', which shows four successful replies with 32 bytes of data, a time of less than 1ms, and a TTL of 128. The statistics for 192.168.1.20 show 4 packets sent, 4 received, 0 lost (0% loss), and approximate round trip times of 0ms. The second command is 'ping 192.168.1.70', which also shows four successful replies with 32 bytes of data, a time of less than 1ms, and a TTL of 128. The statistics for 192.168.1.70 show 4 packets sent, 4 received, 0 lost (0% loss), and approximate round trip times of 0ms. The prompt ends with 'C:\>'.

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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<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
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 = 0ms, Average = 0ms

C:\>ping 192.168.1.70

Pinging 192.168.1.70 with 32 bytes of data:

Reply from 192.168.1.70: bytes=32 time<1ms TTL=128
Reply from 192.168.1.70: bytes=32 time<1ms TTL=128
Reply from 192.168.1.70: bytes=32 time<1ms TTL=128
Reply from 192.168.1.70: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.70:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Ping is Successful.