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----------PRACTICAL 06----------

- **AIM :** Design a Network of an organization using fundamentals of subnetting.
- **Scenario :**

An organization named Zenith enterprise has setup a branch office at Noida and hired you as a Network Engineer. The branch office will be having 5 different Departments and each department has its own network. Each department has actually 14 devices. The IP address range given to you is 201.1.1.0/24. Design the network such that wastage of IP address is less. So, for designing purpose you can take 4 devices in each department. Also assign IP address dynamically to the device for ease of the implementation.

- ✓ **Procedure :**

1. Calculate subnet mask for the departments :

Number of departments: 5

Each department needs 14 devices Starting IP: 201.1.1.0/24

$14 <= 2^4 - 2$

n = 4

New Subnet mask: 32- 4 = 28 11111111.11111111.11111111.11110000

DEPARTMENT A :

Network IP : 201.1.1.10
First Valid Host IP : 201.1.1.1
Last Valid Host IP : 201.1.1.14
Broadcast IP : 201.1.1.15

DEPARTMENT B :

Network IP : 201.1.1.16
First Valid Host IP : 201.1.1.17
Last Valid Host IP : 201.1.1.30
Broadcast IP : 201.1.1.31

DEPARTMENT C :

Network IP : 201.1.1.32
First Valid Host IP : 201.1.1.33
Last Valid Host IP : 201.1.1.46
Broadcast IP : 201.1.1.47

DEPARTMENT D :

Network IP : 201.1.1.48
First Valid Host IP : 201.1.1.49
Last Valid Host IP : 201.1.1.62
Broadcast IP : 201.1.1.63

DEPARTMENT E :

Network IP : 201.1.1.64
First Valid Host IP : 201.1.1.45
Last Valid Host IP : 201.1.1.88
Broadcast IP : 201.1.1.89

2. Create a network with 5 departments through above IPs :

The network IP of each department is as follows:

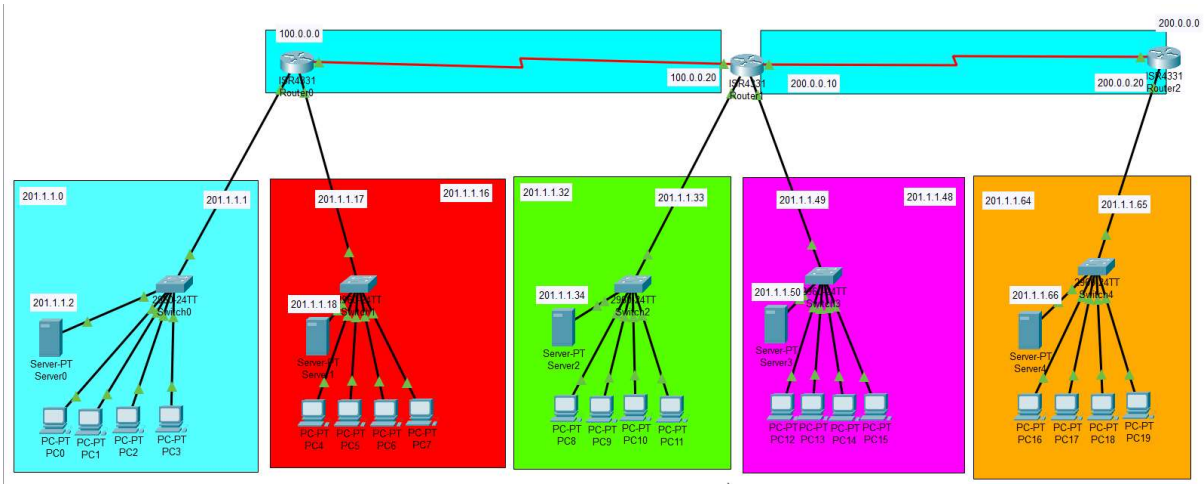
Department A: 201.1.1.0

Department B: 201.1.1.16

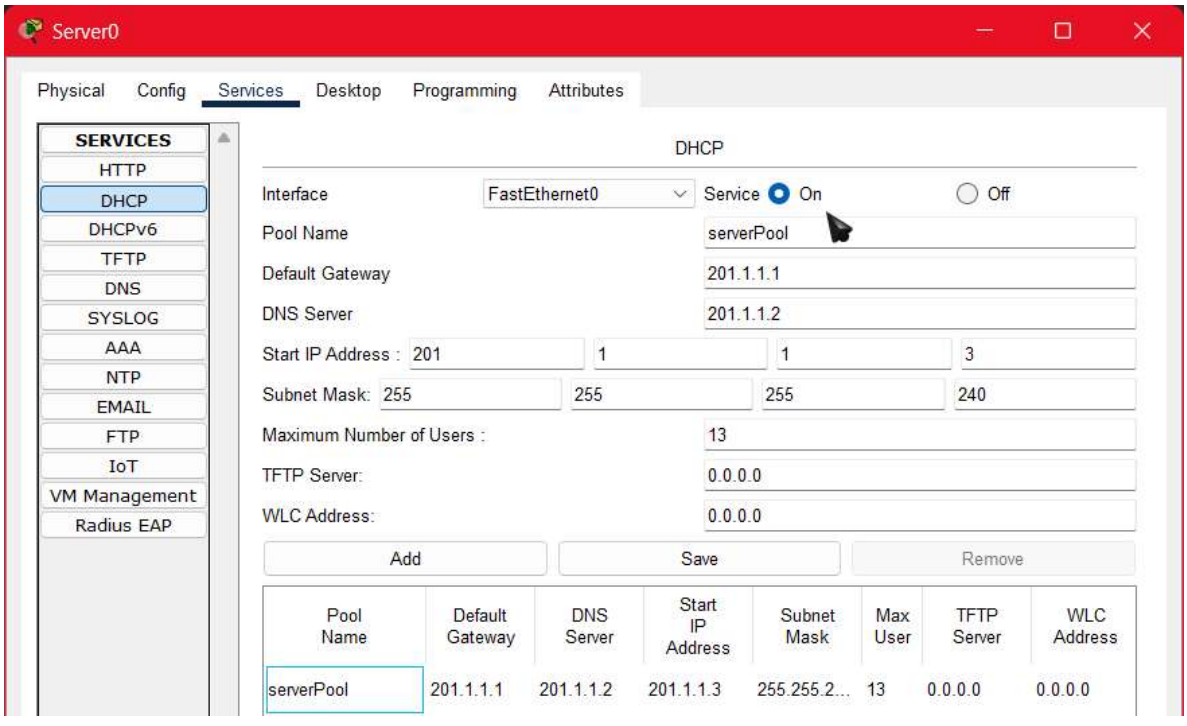
Department C: 201.1.1.32

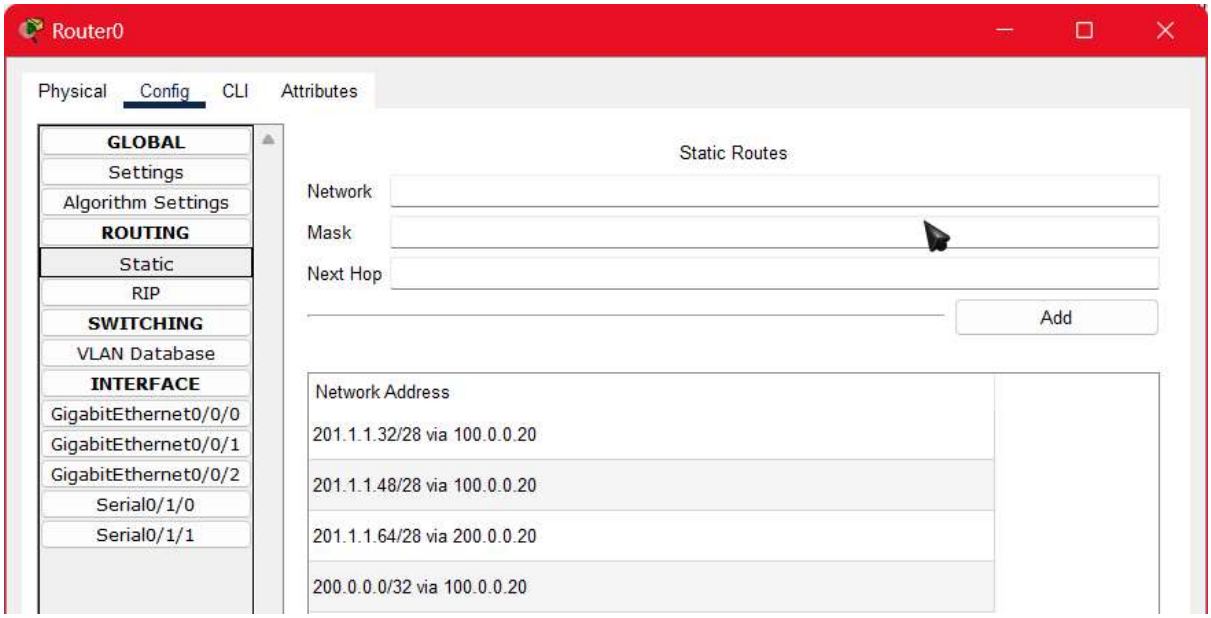
Department D: 201.1.1.48

Department E: 201.1.1.64

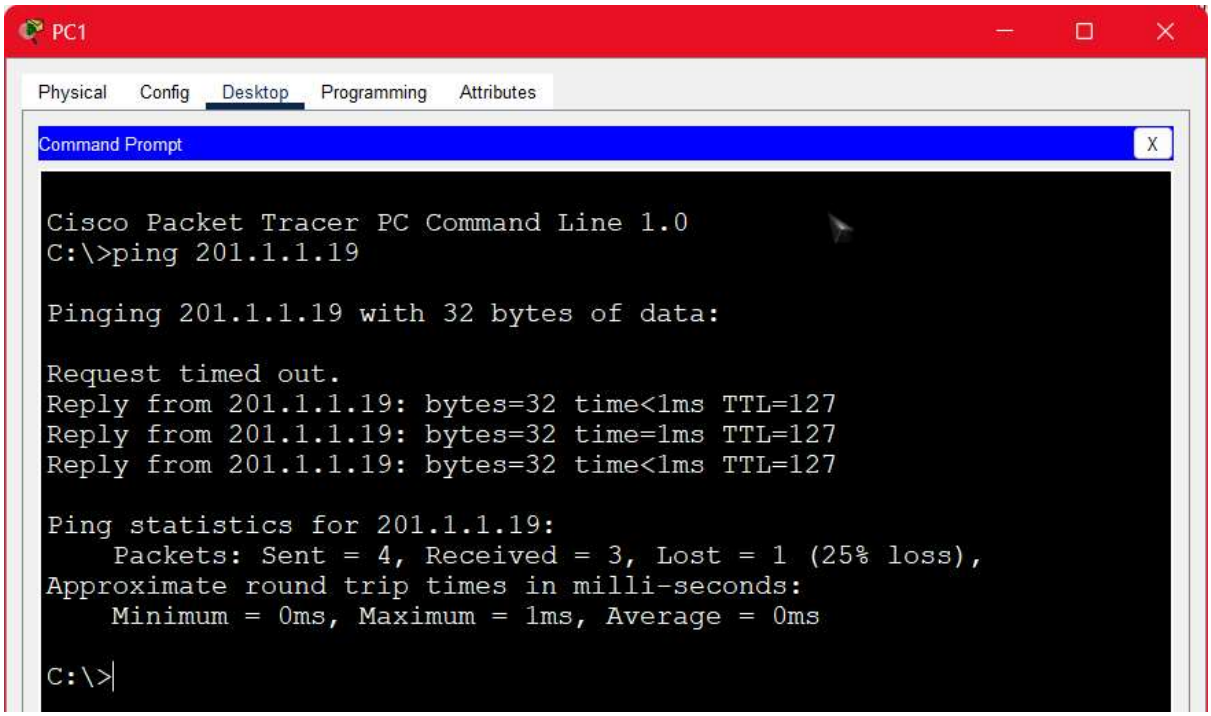


3. Using DHCP to assign IP addresses & then adding static routes to Routers. [NOTE: We're using subnet and IP's calculated]:





4. Pinging from PC1 to PC7 :



Conclusion :

Thus, hereby performing this practical we understand how to calculate subnet and minimize the wastage of IP addresses.