



**Ganpat
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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

$$14 \leq 2^n - 2$$

$$n = 4$$

New Subnet mask: 32 - 4 = 28 11111111.11111111.11111111.11110000

DEPARTMENT A :

Network IP : 201.1.10

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:

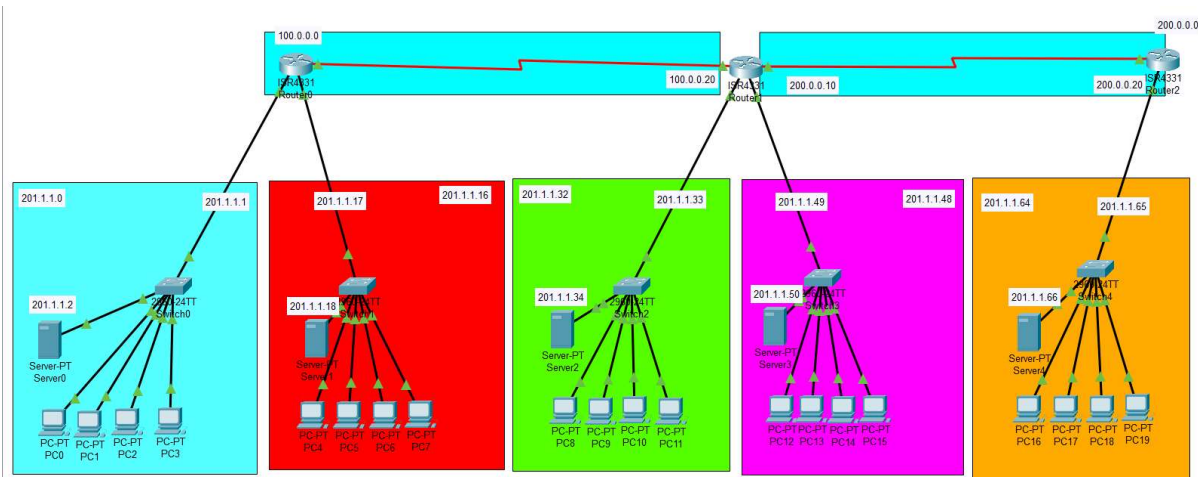
Department A: 201.1.1.0

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]:

Server0

Physical Config **Services** Desktop Programming Attributes

SERVICES

- HTTP
- DHCP**
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DHCP

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 201.1.1.1

DNS Server: 201.1.1.2

Start IP Address: 201.1.1.1 1 1 3

Subnet Mask: 255.255.255.240

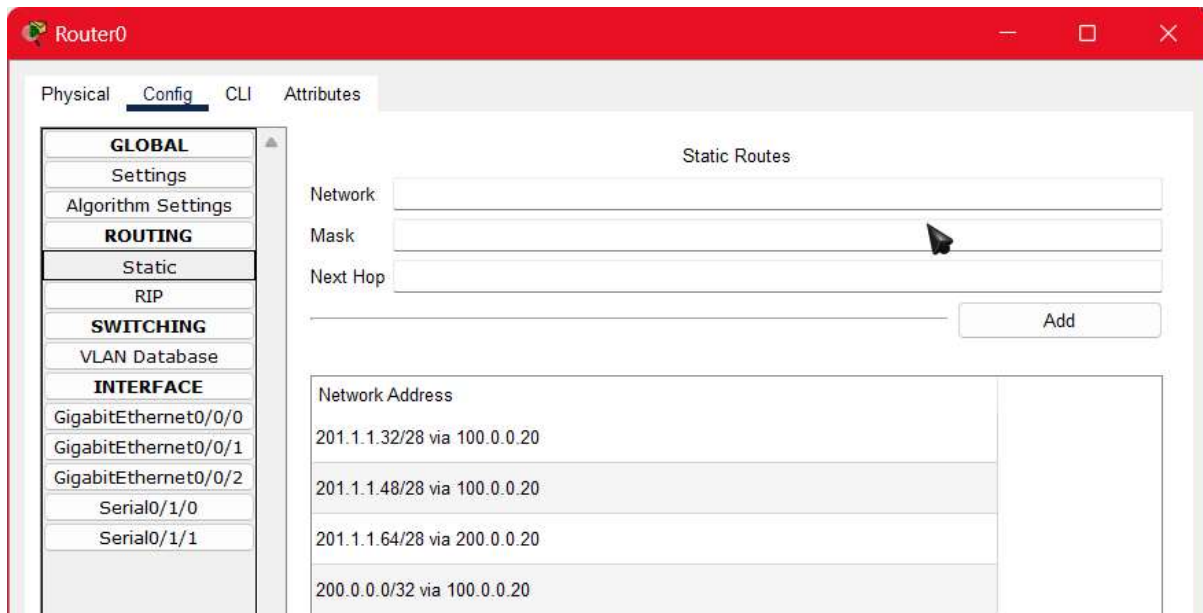
Maximum Number of Users: 13

TFTP Server: 0.0.0.0

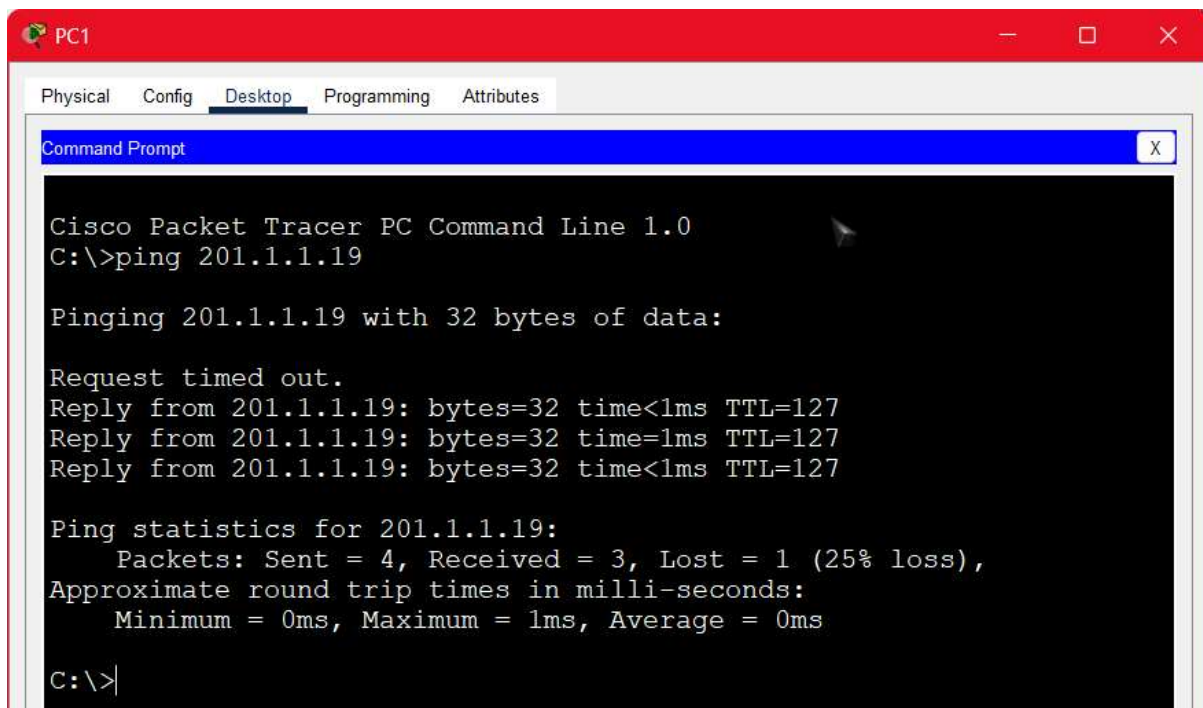
WLC Address: 0.0.0.0

Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool	201.1.1.1	201.1.1.2	201.1.1.3	255.255.255.240	13	0.0.0.0	0.0.0.0



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.