# Summative Assessment

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## Scenario 1:

The ip address 172.16.0.0 is a class B address with a subnet mask of 255.255.0.0.

1. To create a network address of a network that will have 1000 hosts
   > we will need 10 host bits(1024 hosts) for the hosts so that the network can accommodate 1000 hosts
   > 11111111.11111111.00000000.00000000
   >11111111.11111111.11111100.00000000
   10 hostbits
   Therefore the subnet address will be 172.16.0.0/22
   The subnet mask will be 255.255.252.0
   The valid usable host address range is 172.16.0.1 - 172.16.3.254

2. To create one network for 190 staff members we will need.
   > 8 hostbits(256 addresses)
   >11111111.11111111.00000000.00000000
   Therefore the subnet address for this network will be 172.16.4.0/24
   The subnet mask will be 255.255.255.0
   The valid usable host address range 172.16.4.1 - 172.16.4.254

3. To create one network for 60 guests we will need.
   >6 host bits(64 addresses)
   >11111111.11111111.00000000.00000000
   Therefore the subnet address for this network will be 172.16.5.0/26
   The subnet mask will be 255.255.255.192
   The valid usable host address range 172.16.5.1 -172.16.5.62
   Broadcast address will be 172.16.5.63

4. To create one network fo 30 institutional admins we will need
   >5 hotbits( 32 addresses)
   >11111111.11111111.00000000.00000000
   Therefore the subnet address for this network will be 172.16.5.64/27

The subnet mask will be 255.255.255.224
The valid usable host address range is 172.16.5.65 - 172.16.5.94
The broadcast address will be 172.16.5.95

5. To create 2 networks each for 3 network Administrators
   >3 hostbits( 8 addresses)
   >1111111.1111111.1111111.11111000
   >11111111.11111111.00000000.00000000

   Therefore the subnet address for the first network will be 172.16.5.96/29

   The subnet mask will be 255.255.255.248
   The valid usable address range is 172.16.5.97 -172.16.5.102
   The broadcast address will be 172.16.5.103

   For the second network
   >11111111.11111111.00000000.00000000
   >Therefore the network address of the second network will be 172.16.5.104/29
   >The subnet mask will be 255.255.255.248
   >The valid usable address range is 172.16.5.105 - 172.16.5.110
   >The broadcast address will be  172.16.5.111

## Scenario 2:

The servers ip addresses are static because they need to be readily available to the end hosts. If they are dynamic, the end hosts will have a hard time trying to reach the server.

## Scenario 3:

NAT - Network Address Translation, Is used to translate private ip addresses into public ip addresses. This helps in preserving the ip addresses used and also helps protect internal LAN from attackers.