Subnetting:

Private Addressing:

10.0.0.0/14 /8 255.0.0.0 /14 = 11111111.11111100.00000000.00000000

Class A

Subnet Mask = 255.252.0.0

No. of Subnet Bits = 6

No. of Subnets = 2^6 = 64

No. of Host Bits = 18

No. of Hosts per Subnet = 2^{18} = 262144 – 2 = 262142

Total No. of Hosts = No. of Subnets * No. of Hosts per Subnet

64 * 262142 = 16777216

Subnetwork Address [Host Addresses] Broadcast Address

10.0.0.0 [10.0.0.1 – 10.3.255.254] 10.3.255.255

10.4.0.0 [10.4.0.1 – 10.7.255.254] 10.7.255.255

10.8.0.0 [10.8.0.1 – 10.11.255.254] 10.11.255.255

10.12.0.0

10.16.0.0

10.20.0.0

10.24.0.0

.

.

.

10.252.0.0[10.252.0.1 – 10.255.255.254] 10.255.255.255

Subnetwork Address [Host Addresses] Broadcast Address

172.21.186.51/20 /16 /20 = 11111111.11111111.11110000.00000000
Class B
Subnet Mask = 255.255.240.0
No. of Subnet Bits = 4
No. of Subnets = 2^4 = 16
No. of Host Bits = 12
No. of Hosts per Subnet = 2^{12} = 4096 – 2 = 4094
Total No. of Hosts = No. of Subnets * No. of Hosts per Subnet
16 * 4094 = 65504

172.21.0.0 [172.21.0.1 – 172.21.15.254] 172.21.15.255
172.21.16.0 [172.21.16.1 – 172.21.31.254] 172.21.31.255
172.21.32.0 [172.21.32.1 – 172.21.47.254] 172.21.47.255
172.21.48.0
172.21.64.0
172.21.80.0
172.21.96.0
.
.
.
.
172.21.240.0[172.21.240.1 – 172.21.255.254] 172.21.255.255
Subnetwork Address [Host Addresses] Broadcast Address

192.168.0.0/27 /27 = 11111111.11111111.11111111.11100000
Class C
Subnet Mask = 255.255.255.224
No. of Subnet Bits = 3
No. of Subnets = 2^3 = 8
No. of Host Bits = 5
No. of Hosts per Subnet = 2^5 = 32 – 2 = 30
Total No. of Hosts = No. of Subnets * No. of Hosts per Subnet
8 * 30 = 240

192.168.0.0 [192.168.0.1 – 192.168.0.30] 192.168.0.31
192.168.0.32 [192.168.0.33 – 192.168.0.62] 192.168.0.63
192.168.0.64 [192.168.0.65 – 192.168.0.94] 192.168.0.95
192.168.0.96
192.168.0.128
192.168.0.160
192.168.0.192
192.168.0.224 [192.168.0.225 – 192.168.0.254] 192.168.0.255
Subnetwork Address [Host Addresses] Broadcast Address

192.168.0.0 [192.168.0.1 – 192.168.0.30] 192.168.0.31 Subnet Mask = 255.255.255.224
192.168.0.32 [192.168.0.33 – 192.168.0.62] 192.168.0.63 Subnet Mask = 255.255.255.224
192.168.0.64 [192.168.0.65 – 192.168.0.94] 192.168.0.95 Subnet Mask = 255.255.255.224
192.168.0.96 [192.168.0.97 – 192.168.0.110] 192.168.0.111 Subnet Mask = 255.255.255.240
192.168.0.112 [192.168.0.113 – 192.168.0.118] 192.168.0.119 Subnet Mask = 255.255.255.248
192.168.0.120 [192.168.0.121 – 192.168.0.122] 192.168.0.123 Subnet Mask = 255.255.255.252
192.168.0.124 Subnet Mask = 255.255.255.252
192.168.0.128 Subnet Mask = 255.255.255.252
192.168.0.132 Subnet Mask = 255.255.255.252
192.168.0.136 Subnet Mask = 255.255.255.252
.
.
.
192.168.0.252 [192.168.0.253 – 192.168.0.254] 192.168.0.255 Subnet Mask = 255.255.255.252
Subnetwork Address [Host Addresses] Broadcast Address

- A firm or a company has 4 floors, ISP has granted block of address starting from 222.178.13.0/25
- The company or firm has following no of computers on each floor as below:
- 115, 58, 30, 15
- Design the sub blocks for each floor and give slash notation for each sub block.

222.178.13.0/25
192 to 223 – C
Class C
Default Subnet Mask of Class C - /24 (slash notation)
How many bits are subnetted = 25 – 24 = 1
Number of Subnets = $2^1 = 2$
Number of Host Bits = 32 – 25 = 7
Number of hosts per subnet = $2^7 = 128 – 2 = 126$
Total number of hosts in both subnets = 2 * 126 = 252
222.178.13.0 [222.178.13.1 – 222.178.13.126] 222.178.13.127 =for first floor (subnet mask is 255.255.255.128)
11111111.11111111.11111111.10000000

Subnet Mask = /26
Number of subnet bits = 2
Number of subnets = $2^2 = 4$
Number of host bits = 6
Number of hosts per subnet = $2^6 = 64 – 2 = 62$
222.178.13.128 [222.178.13.129 – 222.178.13.190] 222.178.13.191 =for second floor (SM is 255.255.255.192)

Subnet Mask = /27
Number of subnet bits = 3
Number of subnets = $2^3 = 8$
Number of host bits = 5
Number of hosts per subnet = $2^5 = 32 – 2 = 30$
222.178.13.192 [222.178.13.193 – 222.178.13.222] 222.178.13.223 =for third floor (SM is 255.255.255.224)

Subnet Mask = /27

Number of subnet bits = 3
Number of subnets = $2^3 = 8$
Number of host bits = 5
Number of hosts per subnet = $2^5 = 32 - 2 = 30$
222.178.13.224 [222.178.13.225 – 222.178.13.254] 222.178.13.255 =for fourth floor (SM is 255.255.255.224)