

### **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

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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

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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
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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)