**For Company CMP-X**

5 Rooms 🡪 5 Subnets\\

1 PC Each Room\\

Assigned IP: 144.186.96.0/19\\

Binary Form Of IP: 10010000.10111010.01100000.00000000\\

Network Mask:11111111.11111111.11100000.00000000\\

As we need to have 5 subnets, we will use 3 additional bits for subnetting that will be 20,21,22\\

Subnet Mask = 19+3 = /22\\

**For Subnet No #01\\**

Subnet IP: 10010000.10111010.011**000**00.00000000\\

144.186.96.0\\

First IP:\\

10010000.10111010.01100000.00000000\\

11111111.11111111.11111100.00000000\\

AND\\

144.186.96.0/22\\

Last IP:\\

10010000.10111010.01100000.00000000\\

00000000.00000000.00000011.11111111\\

OR\\

144.186.99.255/22\\

Difference: 0.0.3.255\\

Total Address: \\

* 2^32-22 = 1024\\
* By IP Difference: 4\*256 = 1024\\

**For Subnet No #02**

Subnet IP: 10010000.10111010.011**001**00.00000000

First IP:

10010000.10111010.01100100.00000000

11111111.11111111.11111100.00000000

AND

144.186.100.0/22

Last IP:

10010000.10111010.01100100.00000000

00000000.00000000.00000011.11111111

OR

144.186.103.255/22

Difference: 0.0.3.255

Total Address:

* 2^32-22 = 1024
* By IP Difference: 4\*256 = 1024

**For Subnet No #03**

Subnet IP: 10010000.10111010.011**010**00.00000000

First IP:

10010000.10111010.01101000.00000000

11111111.11111111.11111100.00000000

AND

144.186.104.0/22

Last IP:

10010000.10111010.01101000.00000000

00000000.00000000.00000011.11111111

OR

144.186.107.255/22

Difference: 0.0.3.255

Total Address:

* 2^32-22 = 1024
* By IP Difference: 4\*256 = 1024

**For Subnet No #04**

Subnet IP: 10010000.10111010.011**011**00.00000000

First IP:

10010000.10111010.01101100.00000000

11111111.11111111.11111100.00000000

AND

144.186.108.0/22

Last IP:

10010000.10111010.01101100.00000000

00000000.00000000.00000011.11111111

OR

144.186.111.255/22

Difference: 0.0.3.255

Total Address:

* 2^32-22 = 1024
* By IP Difference: 4\*256 = 1024

**For Subnet No #05**

Subnet IP: 10010000.10111010.011**100**00.00000000

First IP:

10010000.10111010.01110000.00000000

11111111.11111111.11111100.00000000

AND

144.186.112.0/22

Last IP:

10010000.10111010.01110000.00000000

00000000.00000000.00000011.11111111

OR

144.186.115.255/22

Difference: 0.0.3.255

Total Address:

* 2^32-22 = 1024
* By IP Difference: 4\*256 = 1024

**For Company CMP-Y:**

3 Rooms -- 3 Subnets\\

3 PC Each Room\\

Assigned IP: 50.152.0.0/15\\

Binary Form Of IP: 00110010.10011000.00000000.00000000\\

Network Mask:11111111.11111111.10000000.00000000\\

As we need to have 5 subnets, we will use 2 additional bits for subnetting that will be 16,17\\

Subnet Mask = 15+2 = /17\\

**For Subnet No #01\\**

Subnet IP: 00110010.1001100**0.0**0000000.00000000\\

50.152.0.0\\

First IP:\\

00110010.10011000.00000000.00000000\\

11111111.11111111.10000000.00000000\\

AND\\

50.152.0.0/17\\

Last IP:\\

00110010.10011000.00000000.00000000\\

00000000.00000000.01111111.11111111\\

OR\\

50.152.127.255/17\\

Difference: 0.0.127.255\\

Total Address:\\

* 2^32-17 = 32768\\

By IP Difference: 128\*256 = 32768\\

**For Subnet No #02\\**

Subnet IP: 00110010.1001100**0.1**0000000.00000000\\

50.152.128.0\\

First IP:\\

00110010.10011000.10000000.00000000\\

11111111.11111111.10000000.00000000\\

AND\\

50.152.128.0/17\\

Last IP:\\

00110010.10011000.10000000.00000000\\

00000000.00000000.01111111.11111111\\

OR\\

50.152.255.255/17\\

Difference: 0.0.127.255\\

Total Address:\\

* 2^32-17 = 32768\\

By IP Difference: 128\*256 = 32768\\

**For Subnet No #03\\**

Subnet IP: 00110010.1001100**1.0**0000000.00000000\\

50.153.0.0\\

First IP:\\

00110010.10011001.00000000.00000000\\

11111111.11111111.10000000.00000000\\

AND\\

50.153.0.0/17\\

Last IP:\\

00110010.10011001.00000000.00000000\\

00000000.00000000.01111111.11111111\\

OR\\

50.153.127.255/17\\

Difference: 0.0.127.255\\

Total Address:\\

* 2^32-17 = 32768\\

By IP Difference: 128\*256 = 32768\\

**For Company CMP-Z:**

2 Rooms -- 2 Subnets\\

4 PC Each Room\\

Assigned IP: 210.98.169.64/26\\

Binary Form Of IP: 11010010.01100010.10101001.01000000\\

Network Mask:11111111.11111111.11111111.11000000\\

As we need to have 2 subnets, we will use 1 additional bit for subnetting that will be 27\\

Subnet Mask = 26+1 = /27\\

**For Subnet No #01\\**

Subnet IP: 11010010.01100010.10101001.01**0**00000\\

210.98.169.64\\

First IP:\\

11010010.01100010.10101001.01000000\\

11111111.11111111.11111111.11100000\\

AND\\

210.98.169.64/27\\

Last IP:\\

11010010.01100010.10101001.01000000\\

00000000.00000000.00000000.00011111\\

OR\\

210.98.169.95/27\\

Difference: 0.0.0.31\\

Total Address: \\

2^32-27 = 32\\

By IP Difference: 1\*32 = 32\\

**For Subnet No #02\\**

Subnet IP: 11010010.01100010.10101001.01**1**00000\\

210.98.169.95\\

First IP:\\

11010010.01100010.10101001.01100000\\

11111111.11111111.11111111.11100000\\

AND\\

210.98.169.95/27\\

Last IP:\\

11010010.01100010.10101001.01100000\\

00000000.00000000.00000000.00011111\\

OR\\

210.98.169.127/27\\

Difference: 0.0.0.31\\

Total Address: \\

2^32-27 = 32\\

By IP Difference: 1\*32 = 32\\