

1. Find the First host ID, Broadcast address and network address for the first three networks , the given address is 10.0.0.0/20

10.0.0.0/20 (20 bits are network bits)

Step 1

11111111. 11111111.11110000.00000000

Network bits

host bits

Class A default network bits =8 bits , so (20-8) =12 bits

Host bits = (32-20 (network bits)) =12

Maximum network = $2^n = 2^{12} = 4096$

Maximum host ID= $2^n - 2 = 2^{12} - 2 = 4096 - 2 = 4094$

Step 2

Subnet mask

128 64 32 16 8 4 2 1

11111111. 11111111. 1 1 1 1 0000.00000000

Network bits

host bits

Add : 128 +64+32+16 =240

8+8+4=20 network bits

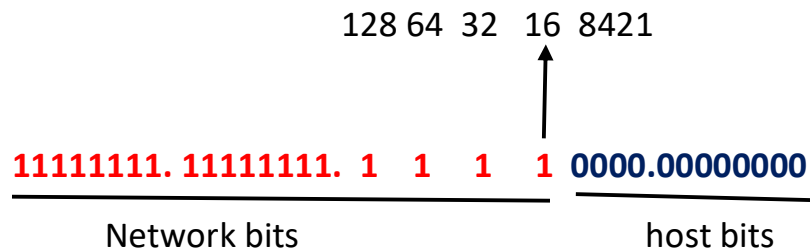
So

8. 8. 4. 0

255.255.240. 0---→ new subnet mask

Step 3:

Block size (network range)



Last network bits value is 16 , so block size is **16**

Step 4

Address

Address	Network 1	Network 2	Network3
Network address	10.0.0.0	10.0.16.0	10.0.32.0
First host address	10.0.0.1	10.0.16.1	10.0.32.1
Broadcast address	10.0.15.255	10.0.31.255	10.0.47.255

2. Find the First host ID, Broadcast address and network address for the first three networks , the given address is 172.168.0.0/19

172.168.0.0/19 (19 bits are network bits)

Step 1

11111111. 11111111.11100000.00000000

Network bits

host bits

Class B default network bits =16 bits , so (19-16) =3 bits

Host bits = (32-19(network bits)) =13

Maximum network = $2^n = 2^3 = 8$

Maximum host ID= $2^n - 2 = 2^{13} - 2 = 8192 - 2 = 8190$

Step 2

Subnet mask

128 64 32 16 8 4 2 1

11111111. 11111111. 1 1 1 0000.00000000

Network bits

host bits

Add : 128 +64+32=224

8+8+4=20 network bits

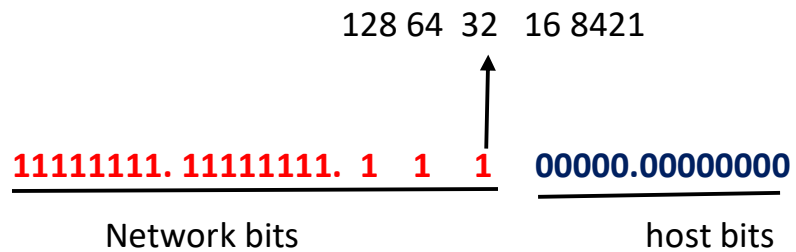
So

8. 8. 3. 0

255.255.224. 0---→ new subnet mask

Step 3:

Block size (network range)



Last network bits value is 32 , so block size is **32**

Step 4

Address

Address	Network 1	Network 2	Network3
Network address	172.168.0.0	172.168.32.0	172.168.64.0
First host address	172.168.0.1	172.168.32.1	172.168.64.1
Broadcast address	172.168.31.255	172.168.63.255	172.168.95.255

3. Find the First host ID, Broadcast address and network address for the first three networks , the given address is 200.10.10.0/28

200.10.10.0/20 (28 bits are network bits)

Step 1

11111111.11111111.11111111.11100000

Network bits host bits

Class c default network bits =24 bits , so (28-24) =4 bits

Host bits = (32-28 (network bits)) =4

Maximum network = $2^n = 2^4 = 16$

Maximum host ID= $2^n - 2$ $2^4 - 2 = 16 - 2 = 16$

Step2

128 64 32 16 8421

11111111. 11111111.11111111. 1 1 1 1 0000

Add : $128 + 64 + 32 + 16 = 240$

8+8+8+4=28 network bits

So

8. 8. 8. 4

255.255.255. 240---→ new subnet mask

Step 3:

Block size (network range)

128 64 32 16 8 4 2 1
 ↑
11111111. 11111111.11111111. 1 1 1 1 0000

Last network bits value is 16 , so block size is **16**

Step 4

Address

Address	Network 1	Network 2	Network3
Network address	200.10.10.0	200.10.10.16	200.10.10.32
First host address	200.10.10.1	200.10.10.17	200.10.10.33
Broadcast address	200.10.10.15	200.10.10.31	200.10.10.47

4. Assume that you're the network administrator for the RMK university , the university needs 50 networks. Find the First host ID, Broadcast address and network address for the first three networks , the given address is 160.0.0.0

Step1 : find how many bits for the 50 networks

50 decimal to binary	128	64	32	16	8	4	2	1
					1	1	0	0

So 6 bits needed for the 50

Step 2

Subnet mask

	128	64	32	16	8	4	2	1
160.0.	1	1	1	1	1	1	0	0

New subnet mask= $128+64+32+16+8+4= 252$
=255.255.252.0.0

Step 3:

Block size (network range)

	128	64	32	16	8	4	2	1
						↑		
160.0.	1	1	1	1	1	1	0	0

Last network bits value is 4 , so block size is **4**

Step 4

Address

Address	Network 1	Network 2	Network3
Network address	160.0.0.0	160.0.4.0	160.0.8.0
First host address	160.0.0.1	160.0.4.1	160.0.8.1
Broadcast address	160.0.3.255	160.0.7.255	160.0.11.255

5. Assume that you're the network administrator for the ABC company , the company needs 10 networks. Find the First host ID, Broadcast address and network address for the first three networks , the given address is 200.0.0.0

Step1 : find how many bits for the 50 networks

```
10 decimal to binary      128 64 32 16 8 4 2 1
                           1 0 10
```

So 4 bits needed for the 10

Step 2

Subnet mask

128 64 32 16 8 4 2 1

```
200.0.0  1    1    1    1
```

New subnet mask= 128+64+32+16
=255.255.255.240

Step 3:

Block size (network range)

128 64 32 16 8 4 2 1

↑

200. 0.0. 1 1 1 1 0000

Last network bits value is 16 , so block size is **16**

Step 4

Address

Address	Network 1	Network 2	Network3
Network address	200.0.0.0	200.0.0.16	200.0.0.32
First host address	200.0.0.1	200.0.0.17	200.0.0.33
Broadcast address	200.0.0.15	200.0.0.31	200.0.0.47