IP Subnetting

Maimoona Khilji

Institute of Management Science

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Muhammad Saad Rashad

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Task 1: Create subnet of Class C IP 192.168.11.0/27

IP: 192.168.11.0

Subnet: 255.255.255.0

192	168	11	0	IP (Decimal)
255	255	255	0	Subnet Mask
8	8	8	0	Bits = 24
11111111	11111111	11111111	00000000	IP (Binary)

As 27 bits are specified in IP Address, so we will on 3 bits in host part of IP.

Here n=3,

$2^n = 2^3 = 8$

It means 8 subnets will be created.

8	8	8	3	Bits = 27
11111111	11111111	11111111	11100000	IP (Binary)

Here decimal for 11100000 will be 128+64+32=224

8	8	8	3	Bits = 27
11111111	11111111	11111111	11100000	IP (Binary)
255	255	255	224	Subnet Mask

Now we will find the range of IP for single network

Range= Total number of hosts in class C – number of hosts in updated subnet

Range= 256 – 224

Range= 32

So each network will consist of 32 IPs.

Subnet 1	192.168.11.0 192.168.11.31	verify: 0+31 =32 (consider 0 as a 1)
Subnet 2	192.168.11.32 192.168.11.63	
Subnet 3	192.168.11.64 192.168.11.95	
Subnet 4	192.168.11.96 192.168.11.127	
Subnet 5	192.168.11.128 192.168.11.159	
Subnet 6	192.168.11.160 192.168.11.191	
Subnet 7	192.168.11.192 192.168.11.223	
Subnet 8	192.168.11.224 192.168.11.255	

Task 2: Create 50 Subnets of Class B IP 131.10.0.0

IP: 131.10.0.0

Subnet: 255.255.0.0

131	10	0	0	IP (Decimal)
255	255	0	0	Subnet Mask
8	8	0	0	Bits = 16
11111111	11111111	00000000	00000000	IP (Binary)

As we have to create 50 subnets

So we will choose n = 6

Then,

$2^n = 2^6 = 64$

As n=6, so we will on 6 bits in host part of IP.

8	8	6	0	Bits = 22
11111111	11111111	11111100	00000000	IP (Binary)

Here decimal for 11100000 will be 128+64+32=224

8	8	6	0	Bits = 22
11111111	11111111	11111100	00000000	IP (Binary)
255	255	252	0	Subnet Mask

Now we will find the range of IP for single network

Range= Total number of hosts in class B – number of hosts in updated subnet

Range= (256 x 256) – (252 x 256)

Range= 65,536 - 64,512

Range= 1,024

So each network will consist of 1024 IPs.

Subnet 1	131.10.0.0	
	131.10.3.255	
Subnet 2	131.10.4.0	
	131.10.7.255	
Subnet 3	131.10.8.0	
	131.10.11.255	
Subnet 4	131.10.12.0	
	131.10.15.255	
Subnet 5	131.10.16.0	
	131.10.19.255	
Subnet 6	131.10.20.0	
	131.10.23.255	
Subnet 7	131.10.24.0	
	131.10.27.255	
Subnet 8	131.10.28.0	
	131.10.31.255	

Subnet 9	131.10.32.0	
	131.10.35.255	
Subnet 10	131.10.36.0	
	131.10.39.255	
Subnet 11	131.10.40.0	
	131.10.43.255	
Subnet 12	131.10.44.0	
	131.10.47.255	
Subnet 13	131.10.48.0	
	131.10.51.255	
Subnet 14	131.10.52.0	
	131.10.55.255	
Subnet 15	131.10.56.0	
	131.10.59.255	
Subnet 16	131.10.60.0	
	131.10.63.255	

Subnet 17	131.10.64.0	
	131.10.67.255	
Subnet 18	131.10.68.0	
	131.10.71.255	
Subnet 19	131.10.72.0	
	131.10.75.255	
Subnet 20	131.10.76.0	
	131.10.79.255	
Subnet 21	131.10.80.0	
	131.10.83.255	
Subnet 22	131.10.84.0	
	131.10.87.255	
Subnet 23	131.10.88.0	
	131.10.91.255	
Subnet 24	131.10.92.0	
	131.10.95.255	

Subnet 25	131.10.96.0	
	131.10.99.255	
Subnet 26	131.10.100.0	
	131.10.103.255	
Subnet 27	131.10.104.0	
	131.10.107.255	
Subnet 28	131.10.108.0	
	131.10.111.255	
Subnet 29	131.10.112.0	
	131.10.115.255	
Subnet 30	131.10.116.0	
	131.10.119.255	
Subnet 31	131.10.120.0	
	131.10.123.255	
Subnet 32	131.10.124.0	
	131.10.127.255	

Subnet 33	131.10.128.0	
	131.10.131.255	
Subnet 34	131.10.132.0	
	131.10.135.255	
Subnet 35	131.10.136.0	
	131.10.139.255	
Subnet 36	131.10.140.0	
	131.10.143.255	
Subnet 37	131.10.144.0	
	131.10.147.255	
Subnet 38	131.10.148.0	
	131.10.151.255	
Subnet 39	131.10.152.0	
	131.10.155.255	
Subnet 40	131.10.156.0	
	131.10.159.255	

Subnet 41	131.10.160.0	
	131.10.163.255	
Subnet 42	131.10.164.0	
	131.10.167.255	
Subnet 43	131.10.168.0	
	131.10.171.255	
Subnet 44	131.10.172.0	
	131.10.175.255	
Subnet 45	131.10.176.0	
	131.10.179.255	
Subnet 46	131.10.180.0	
	131.10.183.255	
Subnet 47	131.10.184.0	
	131.10.187.255	
Subnet 48	131.10.188.0	
	131.10.191.255	

Subnet 49	131.10.192.0	131.10.195.255
Subnet 50	131.10.196.0	131.10.199.255
Subnet 51	131.10.200.0	131.10.203.255
Subnet 52	131.10.204.0	131.10.207.255
Subnet 53	131.10.208.0	131.10.211.255
Subnet 54	131.10.212.0	131.10.215.255
Subnet 55	131.10.216.0	131.10.219.255
Subnet 56	131.10.220.0	131.10.223.255
Subnet 57	131.10.224.0	131.10.227.255

Subnet 58 — 131.10.228.0 — 131.10.231.255

Subnet 59 — 131.10.232.0 — 131.10.235.255

Subnet 60 — 131.10.236.0 — 131.10.239.255

Subnet 61 — 131.10.240.0 — 131.10.243.255

Subnet 62 — 131.10.244.0 — 131.10.247.255

Subnet 63 — 131.10.248.0 — 131.10.251.255

Subnet 64 — 131.10.252.0 — 131.10.255.255

Subnet	IP Range Start	IP Range End
Subnet 1	131.10.0.0	131.10.3.255
Subnet 2	131.10.4.0	131.10.7.255
Subnet 3	131.10.8.0	131.10.11.255
Subnet 4	131.10.12.0	131.10.15.255
Subnet 5	131.10.16.0	131.10.19.255
Subnet 6	131.10.20.0	131.10.23.255
Subnet 7	131.10.24.0	131.10.27.255

Subnet 8	131.10.28.0	131.10.31.255
Subnet 9	131.10.32.0	131.10.35.255
Subnet 10	131.10.36.0	131.10.39.255
Subnet 11	131.10.40.0	131.10.43.255
Subnet 12	131.10.44.0	131.10.47.255
Subnet 13	131.10.48.0	131.10.51.255
Subnet 14	131.10.52.0	131.10.55.255
Subnet 15	131.10.56.0	131.10.59.255
Subnet 16	131.10.60.0	131.10.63.255
Subnet 17	131.10.64.0	131.10.67.255
Subnet 18	131.10.68.0	131.10.71.255
Subnet 19	131.10.72.0	131.10.75.255
Subnet 20	131.10.76.0	131.10.79.255
Subnet 21	131.10.80.0	131.10.83.255
Subnet 22	131.10.84.0	131.10.87.255
Subnet 23	131.10.88.0	131.10.91.255
Subnet 24	131.10.92.0	131.10.95.255
Subnet 25	131.10.96.0	131.10.99.255
Subnet 26	131.10.100.0	131.10.103.255
Subnet 27	131.10.104.0	131.10.107.255
Subnet 28	131.10.108.0	131.10.111.255
Subnet 29	131.10.112.0	131.10.115.255
Subnet 30	131.10.116.0	131.10.119.255
Subnet 31	131.10.120.0	131.10.123.255
Subnet 32	131.10.124.0	131.10.127.255
Subnet 33	131.10.128.0	131.10.131.255
Subnet 34	131.10.132.0	131.10.135.255
Subnet 35	131.10.136.0	131.10.139.255
Subnet 36	131.10.140.0	131.10.143.255
Subnet 37	131.10.144.0	131.10.147.255
Subnet 38	131.10.148.0	131.10.151.255
Subnet 39	131.10.152.0	131.10.155.255
Subnet 40	131.10.156.0	131.10.159.255
Subnet 41	131.10.160.0	131.10.163.255
Subnet 42	131.10.164.0	131.10.167.255
Subnet 43	131.10.168.0	131.10.171.255
Subnet 44	131.10.172.0	131.10.175.255
Subnet 45	131.10.176.0	131.10.179.255
Subnet 46	131.10.180.0	131.10.183.255
Subnet 47	131.10.184.0	131.10.187.255
Subnet 48	131.10.188.0	131.10.191.255
Subnet 49	131.10.192.0	131.10.195.255
Subnet 50	131.10.196.0	131.10.199.255
Subnet 51	131.10.200.0	131.10.203.255
Subnet 52	131.10.204.0	131.10.207.255

Subnet 53	131.10.208.0	131.10.211.255
Subnet 54	131.10.212.0	131.10.215.255
Subnet 55	131.10.216.0	131.10.219.255
Subnet 56	131.10.220.0	131.10.223.255
Subnet 57	131.10.224.0	131.10.227.255
Subnet 58	131.10.228.0	131.10.231.255
Subnet 59	131.10.232.0	131.10.235.255
Subnet 60	131.10.236.0	131.10.239.255
Subnet 61	131.10.240.0	131.10.243.255
Subnet 62	131.10.244.0	131.10.247.255
Subnet 63	131.10.248.0	131.10.251.255
Subnet 64	131.10.252.0	131.10.255.255

Note:

We created 64 networks because if we turned on 5 bits instead of 6, then it will create only 32 networks that cannot fulfil the requirement of 50 hosts. In such cases, we prefer to create larger number of subnets.