1,1/ 194.144.45.15/27

11000010.10010000.00101101.00001111 ip to binary

11111111.11111111.11111111.11100000 mask to binary 27 ones and 5 zeros

11000010.10010000.00101101.00000000 to network is the ip AND mask

11000010.10010000.00101101.00011111 to broadcast is the ip OR mask

transform to decimal:

mask → 255.255.255.224

network → 194.144.45.0

broadcast → 192.144.45.31

in the mask in binary have 5 zeros

2^5 = 32 direcctions – 2 (network and broadcast) = 30 hosts

1.2/ 133.3.54.32/23

11000010.00000011.00110110.00100000 ip to binary

11111111.11111111.11111110.00000000 mask to binary 23 ones and 9 zeros

11000010.00000011.00110110.00000000 to network is the ip AND mask

11000010.00000011.00110111.11111111 to broadcast is the ip OR mask

transform to decimal

mask → 255.255.254.0

network → 133.3.54.0

broadcast → 133.3.55.255

in the mask in binary have 9 zeros

2^9 = 512 direcctions – 2 (network and broadcast) = 510 hosts

1.3/ 158.123.15.42/18

10011110.01111011.00001111.00101010 ip to binary

11111111.11111111.11000000.00000000 mask to binary 18 ones and 14 zeros

10011110.01111011.00000000.00000000 to network is the ip AND mask

10011110.01111011.00111111.11111111 to broadcast is the ip OR mask

transform to decimal

mask → 255.255.192.0

network → 158.123.0.0

broadcast → 158.123.63.255

in the mask in binary have 14 zeros

2^14 = 16384 direcctions – 2 (network and broadcast) = 16382 hosts

1.4/ 127.152.165.73/12

01111111.10011000.10100101.01001001 ip to binary

11111111.11110000.00000000.00000000 mask to binary 12 ones and 20 zeros

01111111.10010000.00000000.00000000 to network is the ip AND mask

01111111.10011111.11111111.11111111 to broadcast is the ip OR mask

transform to decimal

mask → 255.240.0.0

network → 127.144.0.0

broadcast → 127.159.255.255

in the mask in binary have 20 zeros

2^20 = 1048576 direcctions – 2 (network and broadcast) = 1048574 hosts

2/ Network 157.21.0.0/16

to divide in 4 subnets use the last 8 bytes from mask start left

2^2 = 4 subnets use 2 ones the last block

10011101.00010101.0.0 network in binary

11111111.11111111.11111111.11000000 mask in binary

10011101.00010101.00000000.00000000 first subnetwork

10011101.00010101.00000000.00111111 first broadcast

in decimal:

157.21.0.0 first subnetwork

157.21.0.63 first broadcast

255.255.255.192 mask

6 zeros in the mask

2^6 = 64 – 2 for network and broadcast = 62 host

subnet 1:

157.21.0.0/26 network

157.21.0.63/26 broadcast

subnet 2:

157.21.0.64/26 network

157.21.0.127/26 broadcast

subnet 3:

157.21.0.128/26 network

157.21.0.191/26 broadcast

subnet 4:

157.21.0.192/26 network

157.21.0.192/26 broadcast

3.1/

2001:0DB8:0000:0000:A2FD:0000:0000:1234 → 2001:DB8::A2FD:0:0:1234

3.2/

fe80:0000:0000:34ca:01c0:81d2:0000:311c → fe80::34ca:1c0:81d2:0:311c

3.3/

2607:08b0:4009:0815:00e0:0000:0000:0f00 → 2607:8b0:4009:815:e0::f00

3.4

2001:0b8f:0000:0000:0e01:a001:0001:0e01 → 2001:b8f::e01:a001:1:e01