

Subnetting Tip Sheet

Courtesy of
EasySubnetting.com

Class of IP Addresses				
Class	Range	High Order Bits	Number of Networks	Number of Hosts
A	1-127	0	126	1,666,214
B	127-191	10	16,384	65,534
C	192-223	110	2,097,152	254
D	224-239	1110	Used for Multicasting	
E	240-255	11110	Experimental, reserved for future use	

Default Subnet Mask, Networks, and Hosts Per Class				
Class A	/8	11111111.00000000.00000000.00000000	255. 0. 0. 0	N . H . H . H
Class B	/16	11111111.11111111.00000000.00000000	255.255. 0. 0	N . N . H . H
Class C	/24	11111111.11111111.11111111.00000000	255.255.255. 0	N . N . N . H

Quick Binary Chart								
Bits, Right to Left	8	7	6	5	4	3	2	1
Octet borrow from	128	64	32	16	8	4	2	1
Custom subnet to be used	128	192	224	240	248	252	254	255
Bits Borrowed	1	2	3	4	5	6	7	8
Subnets Created (2 ^N -2)	0	2	6	14	30	62	126	254
Class C Remaining Hosts (2 ^N -2)		62	30	14	6	2	0	0

Steps To Subnetting

1. Determine Class
2. Determine Default Subnet Mask
3. Determine # of Subnets
OR
4. Determine # of Hosts
5. Determine Borrowed Bits
6. Determine Custom Subnet Mask

To Create Custom Subnet Mask

Subnets: Start from LEFT to RIGHT turning bits on (borrow) from the host portion of the default subnet mask. Add up borrowed bits and calculate number of subnets using 2^N-2 where N is the number of borrowed bits.

Hosts: From RIGHT to LEFT, add the number of remaining bits turned OFF and calculate the number of hosts on each subnet using 2^N-2 where N is the number of remaining bits.

Bits	2 ^N - 2 = x
1	2 x 1 = 2 - 2 = 0
2	2 x 2 = 4 - 2 = 2
3	2 x 4 = 8 - 2 = 6
4	2 x 8 = 16 - 2 = 14
5	2 x 16 = 32 - 2 = 30
6	2 x 32 = 64 - 2 = 62
7	2 x 64 = 128 - 2 = 126
8	2 x 128 = 256 - 2 = 254
9	2 x 256 = 512 - 2 = 510
10	2 x 512 = 1,024 - 2 = 1,022
11	2 x 1,024 = 2,048 - 2 = 2,046
12	2 x 2,048 = 4,096 - 2 = 4,094
13	2 x 4,096 = 8,192 - 2 = 8,190
14	2 x 8,192 = 16,384 - 2 = 16,382
15	2 x 16,384 = 32,768 - 2 = 32,766
16	2 x 32,768 = 65,536 - 2 = 65,534
17	2 x 65,536 = 131,072 - 2 = 131,070
18	2 x 131,072 = 262,144 - 2 = 262,142
19	2 x 262,144 = 524,288 - 2 = 524,286
20	2 x 524,288 = 1,048,576 - 2 = 1,048,574
21	2 x 1,048,576 = 2,097,152 - 2 = 2,097,150
22	2 x 2,097,152 = 4,194,304 - 2 = 4,194,302
23	2 x 4,194,304 = 8,388,608 - 2 = 8,388,606
24	2 x 8,388,608 = 16,777,216 - 2 = 16,777,214