

EIGHT STEPS TO SUBNETTING SUCCESS

by Bob Cunningham

Given an IP address and a subnet mask these steps will enable you to identify the total number of subnets available, the number of hosts per subnet, the network address of the subnet, the first usable address on that subnet and the broadcast address of that subnet.

Before beginning subnetting problems create a powers of “2” table, a bits over mask table, a multiples of “2”, “4”, “8”, “16”, “32” and “64” tables (in practice, I only create the “8” and “32” tables and extrapolate the others). My “cheat sheet” is attached to this paper.

- 1) Identify the interesting octet of the subnet mask (the octet which is neither 0 nor 255) and write it out in binary. (If the mask is presented with CIDR notation, convert the mask to dotted decimal using the mask table before beginning step 1.)
- 2) Count the number of 1’s from the network boundary through the end of the interesting octet to calculate the number of usable network addresses using the formula 2^n (use the powers of “2” table to do this quickly!)
- 3) Count the number of 0’s from the interesting octet to the end of the address and calculate the number of usable host addresses using the formula $2^n - 2$ (use the powers of “2” table to do this quickly!)
- 4) In decimal, subtract the interesting octet from 256 – the result is the size of the boundary of subnets for this mask.
- 5) Using the multiples tables equal to the size of your subnet boundary, and the interesting octet from the IP address, identify the first multiple number that is larger than the address of your interesting octet of the IP address – the number just below than (less than) on your chart (followed by all zeros) is the network address of your subnet.
- 6) Add one to your network address and you have your first usable address.
- 7) Find the next larger number on your multiples table, subtract one and you have your broadcast address.
- 8) Subtract one from the broadcast address and you have the last usable address on your subnet.



Bob's shortcut sheet

The horizontal row represents the decimal value of each column of an 8 bit binary work

128	64	32	16	8	4	2	1
1	1	2	2	2	2	2	2
2	9	2	4	4	5	5	5
8	2	4	0	8	2	4	5

The vertical columns are used to convert an uninterrupted series of 1's into a binary coded decimal number (i.e. from the left, three 1's places us in the 3rd position which is 224)

Powers of 2

2
4
8
16
32
64
128
256
512
1024
2048
4096
8192
16384
32768
65536

16
32
48
64
80
96
112
128
144
160
176
192
208
224
240
256

8
16
24
32
40
48
56
64
72
80
88
96
104
112
120
128
136
144
152
160
168
176
184
192
200
208
216
224
232
240
248
256

