

Demystifying Networking
Prof. Sridhar Iyer
Department of Computer Science and Engineering
Indian Institute of Technology, Bombay

Lecture – 27
Nomenclature of a sub-net mask

(Refer Slide Time: 00:00)

Subnet Mask

192	168	0	1
255	255	255	0
0, 128, 192 ... 252, 254, 255	0, 128, 192 ... 252, 254, 255	0, 128, 192 ... 252, 254, 255	0, 128, 192 ... 252, 254, 255

Demystifying Networking | CS75

What are these special values? Let us look at them.

(Refer Slide Time: 00:02)

Subnet Mask

$2^7 = 128$	$2^6 = 64$	$2^5 = 32$	$2^4 = 16$	$2^3 = 8$	$2^2 = 4$	$2^1 = 2$	$2^0 = 1$	Σ (SUM)
1	1	1	1	1	1	1	1	255
1	1	1	1	1	1	1	0	254
1	1	1	1	1	1	0	0	252
1	1	1	1	1	0	0	0	248
1	..	...	...	...	...	...	...	...
1	1	0	0	0	0	0	0	192
1	0	0	0	0	0	0	0	128

Demystifying Networking | CS75

So, how subnet mask work is, they use the binary form of a subnet mask, do a logical operation with the IP address and then try to determine the network address. But to do that, what is very essential for a subnet mask is, to have the trailing set of 1s. So, a subnet mask can only take values which are trailing 1s and in continuation.

(Refer Slide Time: 00:29)

IP Addresses Packet tracer

Subnet Mask
 255.255.255.0 (8+8+8+0 = 24)
 255.0.0.0 (8+0+0+0 = 8)
 255.255.255.252 (8+8+8+6 = 30)

$2^7 = 128$	$2^6 = 64$	$2^5 = 32$	$2^4 = 16$	$2^3 = 8$	$2^2 = 4$	$2^1 = 2$	$2^0 = 1$	Σ (SUM)
1	1	1	1	1	1	1	1	255
1	1	1	1	1	1	1	0	254
1	1	1	1	1	1	0	0	252
1	..	...	...	...	...	...	...	...

Demystifying Networking | C575

Let us look at some of the other type of subnet masks. So, another subnet mask here is 255 255 255 0 which we just saw. So, it has a 8+8+8 that is 24 trailing 1s. Similarly, a subnet mask for 255.0.0.0 has a 8 trailing 1s. Similarly, a subnet mask for 255 255 255 252 would a have a total of 30 trailing 1s.

(Refer Slide Time: 00:57)

IP Addresses Packet tracer



Subnet Mask

192	168	0	1
255	255	0	0
192	168	0-255	0-255

First Address: 192.168.0.0 (Network Address)

Last Address: 192.168.255.255 (Broadcast Address)

So, using these different type of subnet mask, how can you calculate the number of IP addresses that are available?