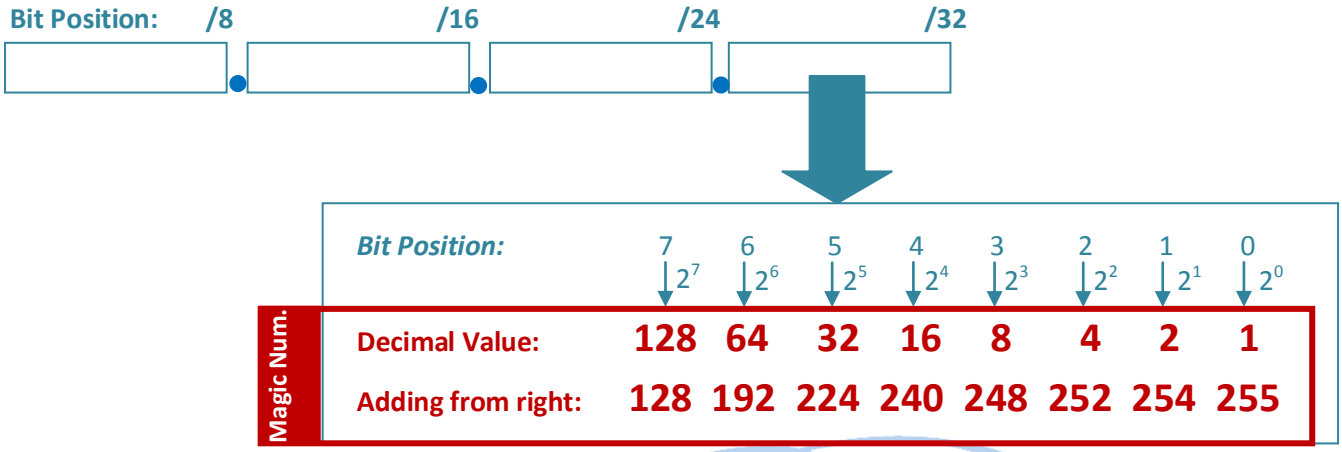
Easy Way to Cal IPv4

Use "Magic Number" according to Cisco, profess like professional

Both IPv4 and Subnet Mask, 32 bits (4 Bytes), are usually written in "Dot-Decimal", or in decimal number. Remember the value of each bit position per byte will help a lot to calculation all about IPv4, no need to find anything from binary. We called these number as "Magic Number" for IPv4 addressing calculation like Network Engineer always uses. Please look at this:



1 Change "Prefix Length" to "Subnet Mask":

Example: /27 = /24 + 3 Then Subnet Mask is 255.255.255.224

128 192 **224** 240 248 252 254 255

/20 = /16 + 4 Then Subnet Mask is 255.255.240.0

128 192 224 **240** 248 252 254 255

2 Find number of all Host IDs per subnet (including Network ID and Broadcast IP) from Prefix Length:

Example: /26 = /24 + 2 Then this subnet has = 64 Host ID (IP)

128 **64** 32 16 8 4 2 1

/30 = /24 + 6 Then this subnet has = 4 Host ID (IP)

128 64 32 16 8 **4** 2 1

3 **หา Network ID, Broadcast IP และ Host ID ที่นำไปตั้งค่าได้ (Assignable, Valid):**

Example: 178.9.32.145/25 **128** 64 32 16 8 4 2 1

3.1) Number of all Host IDs per subnet /25 is 128 IP

3.2) Network ID is IP address in last byte of Network ID portion that is the multiply (x0, x1, x2, …) of number of Host ID that is nearest the given IP address.

Then Network ID of 178.9.32.145/25 is 178.9.32.128/25 *(=128x1)*

3.3) Broadcast IP is the last IP of subnet. Then the first byte of Host ID portion will be "the value of last byte in Network ID portion + number of Host IDs - 1"

or we can say as "Network ID of next subnet minus one."

Then Broadcast IP of 178.9.32.145/25 is 178.9.32.255/25 *(=128+128-1)*

3.4) Number of Host ID that is "**Assignable/Valid**" will be "no. of all Host IDs – 2"

Then no. of Assignable Host ID of 178.9.32.128/25 is 128 – 2 = 126 IP

Range: 178.9.32.129 – 178.9.32.254

4 **Find no. of "same length" subnet from the given "Prefix Length" range:**

Instead of using "2^n", n is no. of bits borrowed to divided subnet, such as:

From /20 to /25, borrowing the bits of Network ID for 25 – 20 = 5 bits or 2^5 = 32 Subnet

From /26 to /29, borrowing the bits of Network ID for 29 – 26 = 3 bits or 2^3 = 8 Subnet

We can use "Magic Number" to calculate more easy like:

128 64 **32** 16 8 4 2 1

Example: Subnets divided from /20 → /25 = 32 Subnets

128 64 32 16 **8** 4 2 1

Subnets divided from /26→/29 = 8 Subnets

For using with Online Practice: http://www.ranet.co.th/IPsubnet01-eng.php