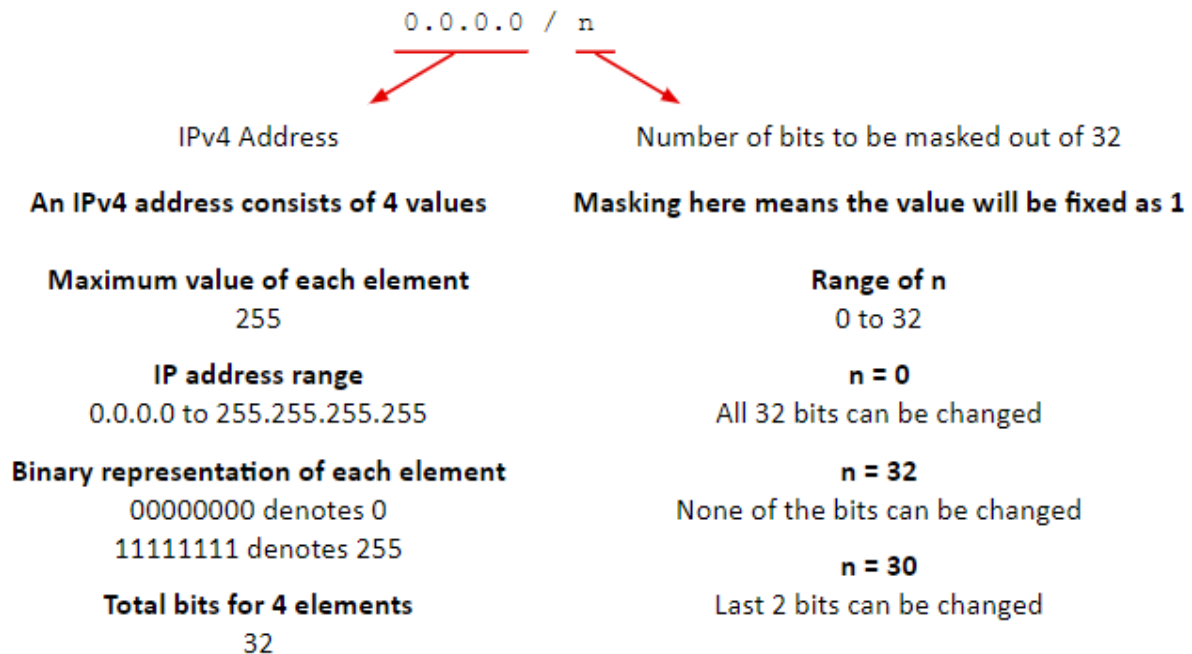# CIDR Blocks

CIDR stands for **Classless Inter-Domain Routing** and is a method for allocating IP addresses for the VPC and the subnets in AWS.

0.0.0.0 / n

IPv4 Address   Number of bits to be masked out of 32

An IPv4 address consists of 4 values   **Masking here means the value will be fixed as 1**

Maximum value of each element   **Range of n**
255   0 to 32

IP address range   **n = 0**
0.0.0.0 to 255.255.255.255   All 32 bits can be changed

Binary representation of each element   **n = 32**
00000000 denotes 0   None of the bits can be changed
11111111 denotes 255

Total bits for 4 elements   **n = 30**
32   Last 2 bits can be changed

By changing the value of 'n', you can define the range of the IP addresses within the CIDR Block. If you see the binary representation of the IP address 0.0.0.0, it looks like:

00000000. 00000000.00000000.00000000

If I keep the value of n as 0 in the CIDR, this means that I have the facility to change all the values to 1 in the above address.

00000000.00000000.00000000.00000000

However, if I change the value to 30, this means only last two values can be altered:
XXXXXXXX.XXXXXXXX.XXXXXXXX.XXXXXX00

Therefore, the total number of IP addresses that I have within this CIDR block is 2^2, that is, 4.

Similarly, in case I change the value to 24, I can change the last 8 values:
XXXXXXXX.XXXXXXXX.XXXXXXXX.00000000

This gives a total range of 2^8, that is, 256 IP addresses.