SUBNET CALCULATION

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IP address $\rightarrow$ 198.170.12.0/27

Let the no. of required Subnets be 2

Since the number of required Subnets are 2 we need 1 bit to identify each Subnet.

So, the Subnet mask becomes

$$\Rightarrow 27+1$$

$$\Rightarrow 28$$

$$= 198.170.12.0/28$$

As 28 bits are reserved for the network part of the ip address only 4 bits will be reserved for the host.

$$\therefore 2^{32-28} \Rightarrow 2^4 \Rightarrow 16 \text{ ip address}$$

can be used in each subnet

Subnet-1 — 0

Subnet-2 — 1

Subnet-1

Here first 28 bits are fixed

Next 1 bit is (0) - which is used to identify the

   Subnet-1

Since there are 16 addresses. To point to the

1st address all the 3^4 non fixed bits should be 0.

So, the 1st address of Subnet 1 is

$$198.170.12.\underline{0000}\underline{0 00} 00/28$$

Fixed   To identify Subnet

$\therefore$ 198.170.12.0/28 — Starting IP addr for Sub-1

Since 16 addresses are possible (16-1) gives
                                    (15)

the last address.

$\therefore$ 198.170.12.(0+15)

$\Rightarrow$ 198.170.12.15/28 — Last IP addre for Sub1

Subnet - 2

First 27 bits are fixed
Next 1 bit is (1) — which is used to identify
   Subnet -2

The First IP address for Subnet 2 is

$\Rightarrow$ 198.170.12.000 1 0000 /28

Fixed   used to identify Subnet-2

$\therefore$ 198.170.12. 16 /28 $\rightarrow$ First IP address
  for 2nd subnet

Since 16 addresses are possible then we
can add 15 to the first ip address.

$\Rightarrow$ 198.170.12. (16 + 15)

$\therefore$ 198.170.12. 31 /28 $\rightarrow$ Last IP
  address for
  2nd Subnet.

***

IP address — 154.105.0.0/27

Let the no. of required Subnets be 2

Since the no. of required Subnets are 2 we need

1 bit to identify each bit. Subnet.

So the Subnet mask will become

$$\Rightarrow 27 + 1$$

$$\Rightarrow 28$$

$$= 154.105.0.0/28$$

As 28 bits are reserved for the network part of the IP address only 4 bits will be reserved for the host.

$$\therefore 2^{32-28} \Rightarrow 2^4 \Rightarrow 16 - \text{IP addresses}$$

can be used in an each Subnet.

Subnet 1 — 0

Subnet 2 — 1

Subnet - 1

1st 27 bits are fixed

next 1 bit is (0) → which is used to identify the Subnet - 1

→ Since there are 16 addresses. To point to the 1st ip address all the 4 non fixed bits should be 0.

So the first address of subnet-1 is

$$\therefore \underbrace{154.105.0.000}_{\text{Fixed}} \underset{\substack{\downarrow \\ \text{used to identify the subnet 1}}}{0000} /28$$

$$\therefore 154.105.0.0 /28 \quad \text{— Subnet-1 starting}$$
$$\text{IP address}$$

→ Since 16 addresses are possible adding 15 will gives us an last Ip address.

$$154.105.0.(0+15)$$

$$\therefore 154.105.0.15/28 \quad \text{— Subnet-1 Last}$$
$$\text{Ip address.}$$

Subnet-2

First 27 bits are fixed

Next 1 bit is (1) – which is used to identify

Subnet 2

The First ip address for Subnet-2 is

$$154 \cdot 105 \cdot 0 \cdot \underbrace{0001}_{} 0000$$

Fixed ↓ used to identify Subnet 2

$\therefore$ 154·105·0·16/28 – Subnet 2 First

Ip address

Last IP address can be found by adding 15
to an last ip address.

154·105·0·(16+15)

$\Rightarrow$ 154·105·0·31

$\therefore$ 154·105·0·31/28 — Subnet 2 Last

Ip address.

IP address — 198.170.12.0/27

Subnet	Starting Address	Last Address
1	198.170.12.0	198.170.12.15
2	198.170.12.16	198.170.12.31

IP address — 154.105.0.0/27

Subnet	Starting address	Last address
1	154.105.0.0	154.105.0.15
2	154.105.0.16	154.105.0.31