**XYZ Company**

Total Number of Hosts: 600

Departments HB (2n-2) NB (32-HB) CIDR Subnet Mask

Sales 400 9 23 /23 255.255.254.0

Marketing 180 8 24 /24 255.255.255.0

Admin 12 4 28 /28 255.255.255.240

IT 8 4 28 /28 255.255.255.240

Find the following for each subnet:

1. Subnet Address
2. Broadcast Address
3. Host IP Address Range
4. Subnet Mask

Find the Host IP address of the following subnets:

1. IP Address of Host # 250, 255, 256, 306, 400 of Sales Department
2. IP Address of Host # 128, 180 of Marketing Department

Solution

Range

Class A 0.0.0.0 127.255.255.255

Class B 128.0.0.0 191.255.255.255

Class C 192.0.0.0 223.255.255.255

***Private IP Address Block***

Class A 10.0.0.0 10.255.255.255

Class B 172.16.0.0 172.31.255.255

Class C 192.168.0.0 192.168.255.255

NB HB CIDR

Class A 8 24 /8 Total 28 Network where every network having 224 hosts

Class B 16 16 /16 Total 216 Network where every network having 216 hosts

Class C 24 8 /24 Total 224 Network where every network having 28 hosts

Network Baskets

|  |  |  |
| --- | --- | --- |
| Class A  28 | Class B  216 | Class C  224 |

Which Network Class to Choose? – The decision is based on **Total Number of Hosts**

Network 🡪 172.16.0.0/16

Rule: Any unused subnet can be further subnetted.

Sales need a /23 subnet

/16 🡪 /23

172.16. 0000000 0.00000000

0000001

0000010

0000011

……………

1111111

We get a total Number of /23 subnet = 27 = 128

Assigning the 1st subnet to Sales Department

172.16. 0000000 0.00000000/23

Marketing needs a /24 subnet

Subnetting further the 2nd /23 subnet

/23 🡪 /24

172.16. 0000001 0. 00000000

1

We get a total Number of /24 subnet = 21 = 2

Assigning the 1st subnet to Marketing Department

172.16. 0000001 0. 00000000/24

Admin needs a /28 subnet

IT needs a /28 subnet

/23 🡪 /28

172.16. 0000010 0.0000 0000

0.0001

0.0010

…………

1.1111

We get a total Number of /28 subnet = 25 = 32

Assigning the 1st /28 subnet to Admin Department

172.16. 0000010 0.0000 0000/28

Assigning the 2nd /28 subnet to IT Department

172.16. 0000010 0.0001 0000/28

Sales

172.16. 0000000 0.00000000/23 Network Address 172.16.0.0/23

0.00000001 # 1 Host IP 172.16.0.1

0.11111010 # 250 Host IP 172.16.0.250

0.11111111 # 255 Host IP 172.16.0.255

1.00000000 # 256 Host IP 172.16.1.0

1.00110010 # 306 Host IP 172.16.1.50

1.10010000 # 400 Host IP 172.16.1.144

1.11111111 Broadcast Address 172.16.1.255

Host IP Address Range: 172.16.0.1 – 172.16.1.254

Marketing

172.16. 0000001 0. 00000000/24 Network Address 172.16.2.0/24

# 128 Host IP 172.16.2.128

# 180 Host IP 172.16.2.180

11111111 Broadcast Address 172.16.2.255

Host IP Address Range: 172.16.2.1 – 172.16.2.254

Admin

172.16. 0000010 0.0000 0000/28 Network Address 172.16.4.0/28

1111 Broadcast Address 172.16.4.15

Host IP Address Range: 172.16.4.1 – 172.16.4.14

IT

172.16. 0000010 0.0001 0000/28 Network Address 172.16.4.16/28

172.16. 0000010 0.0001 1111 Broadcast Address 172.16.4.31

Host IP Address Range: 172.16.4.17 – 172.16.4.30