Question:

ABC Mobile Software Development company Which provide Application for users on different part of the world is getting known. This company has bought an IP Address 140.10.0.0 from an ISP. The company 14 Department on different basic sell s branch where it has about 2000 computers on each sells .this company also has 14 departments on medium income country with about 250 computer on each beside that company opened new sells getting on 7 low income country where each the accommodate about 25 computer.

1. Do think the IP Address can afford all the 35 Department and the computer on each Department?

solution :let borrow 6 bit for the 35 department 210-2=1024-2=1022 computer .

the frist department computer above the 35 department computer.

all the 35 department and computer are not afford.

The total computer of 35 departemnt is 31,675 .

for the first 14 department 2000 computer for each that means

14\*2000=28000copmuter

For the 2nd 14department 250 computer for each total=14\*250=3500

For the 3rd 7 department 25 computer for each total=7\*25=175

Total computer of 35 departement is 2800+3500+175=31,675.

But in uniform subneting 210-2=1022 computer so the first departemnt is not afford.

2.If not what you will be the solution for this you provide for this company?

The solution for this campany is use vlsm instead of uniform subnetmask slove the problem

The vlsm of each departement are :

IP Address 140.10.0.0 /16 =10001100.0001010.00000000.00000000/16

because the host number is greater than the number of computer that used for each department

* Let us see step by step for all department
* For the first 14 department we brow 5 bits 10001100.00001010.00000000/21 Network ID/number of department =25=32 but the department number is 14 .18 department are reserved for future .2n-2 host/computer are needed for these department

2n-2=211-2=2048-2=2046hosts for each department

Magic number =2048/256=8

* Each department can possible assign up to 2048 computer for each department and the given computer is 2000 it can afford all computer
* The list of 14 department are listed below

140.10.0.0

140.10.8.0/21

140.10.16.0/21

140.10.24.0/21

140.10.32.0/21

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140.10.148.0/21

The next 14 department brow 8 bits 10001100.0001010.00000000.00000000 /24 the number of department for 5 bits 28 =256 but only 14 department are required the remaining 242 department are use for the future .2n-2 hosts are needed for these department .

2n-2 =28-2=254 magic number =256/256=1

The list of 14 department are

140.10.0.0

140.10.1.0/24

140.10.2.0/24

140.10.3.0/24

140.10.4.0/24

140.10.5.0/24

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140.10.256.0/24

The last of 7 department borrow 11 bits =211=2048 department .10001100.0001010.00000000.00000000 /27

25-2=32-2=30 host for each department from this 25 are used .

The Magic number =32

The list of 7 department are

140.10.0.0

140.10.32.0/27

140.10.64.0/27

21140.96.12.0/27

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140.10.224.0/27

Generally the ip address 140.10.0.0 not afford for all computer and department .

When the number of department increase the number of host decrease .so the branch in which have low income/economy should use low host or computer and more dept.