**Small Office Home Office Network (SOHO) – Project**

XYZ company is a fast-growing company in Eastern Australia with more than 2 million customers globally. The company deals with selling and buying of food items, which are basically operated from the headquarters. The company is intending to open a branch near the local village Bonalbo. Thus, the company requires young IT graduates to design the network for the branch. The network is intended to operate separately from the HQ network. Being a small network, the company has the following requirements during implementation:

* One router and one switch to be used (all CISCO products)
* 3 departments (Admin/IT, Finance/HR, and Customer service/Reception).
* Each department is required to be in different VLANS.
* Each department is required to have a wireless network for the users.
* Host devices in the network are required to obtain IPv4 address automatically.
* Devices in all the departments are required to communicate with each other.

Assume the ISP give out a base network of 192.168.1.0, you as the young network engineer who has been hired, design and implement a network considering the above requirements.

>>> Subnetting

Network = 192.168.1.0

Default Subnet Mask = 255.255.255.0 as it is class C address

11111111.11111111.11111111.00000000

We need 3 subnets for 3 departments.

2^n gives no of subnets where n is borrowed bit from host portion

If n = 1, 2^1 = 2 >> doesn’t meet our requirements so,

If n = 2, 2^2 = 4 >> we can three of them for our 3 departments >> which mean we need two bits from host portion

11111111.11111111.11111111.11000000 >> 255.255.255.192 which is subnet mask >> \26

Block size = 64

1st Subnet

Network Address: 192.168.1.0

Usable Host Range: 192.168.1.1 – 192.168.1.62

Broadcast Address: 192.168.1.64

2nd Subnet

Network Address: 192.168.1.64

Usable Host Range: 192.168.1.65 - 192.168.1.126

Broadcast Address: 192.168.1.127

3rd Subnet

Network Address: 192.168.1.128

Usable Host Range: 192.168.1.129 – 192.168.1.190

Broadcast Address: 192.168.1.191

4th Subnet

Network Address: 192.168.1.192

Usable Host Range: 192.168.1.193 – 192.168.1.254

Broadcast Address: 192.168.1.255