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;

a) One router and one switch to be used (all CISCO products).

b) 3 departments (Admin/IT, Finance/HR and Customer service/Reception)

c) Each department is required to be in different VLANS.

d) Each department is required to have wireless network for the users.

e) Host devices in the network are required to obtain IPv4 address automatically.

f) Devices in all the departments are required to communicate with each other.

Assume the ISP gave 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.

I recommend you understand the requirements and implement it on your own wish you the best 😊

THIS IS The Required Topology:
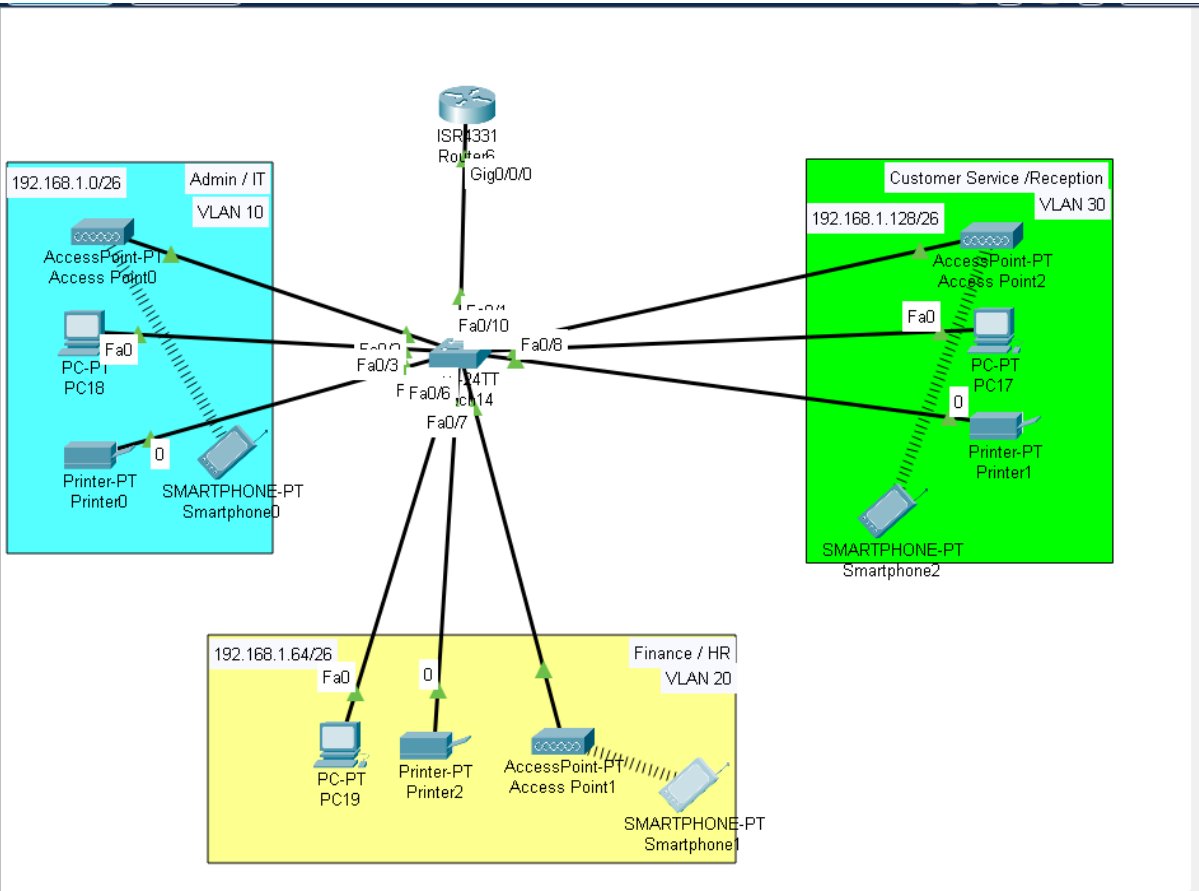
We got from the ISP a Base network of 192.168.1.0 so we first need to do Subnet and assign each VLAN with it's IP address

---

Base Network: 192.168.1.0

Number of Required Subnets = 3

Step 1 — Choose number of bits to borrow

- $2^N >=$ Number of Subnets
- $2^N >= 3$

- $2^2 >= 3$ N=2

Step 2 — New mask

- And as we know the base network is in Class C : 255.255.255.0
- When we convert it to Bits 11111111. 11111111. 11111111. 0
- After we Borrow 2 bits for Netowrk segment
- 11111111. 11111111. 11111111. 11000000
- And this the Network ID : 255.255.255.192
- CIDR:/26

Step 3 — Hosts per subnet

- Host bits remaining = 8 − 2 = 6
- Addresses per subnet = 2^6 = 64
- Usable hosts per subnet = 64 − 2 = 62 (network + broadcast reserved)

Then the Block Size of Hosts is : 64

The define the IP network for each VLAN

1st Subnet →

- Network ID:192.168.1.0
- Broadcast ID : 192.168.1.63
- Host Range:192.168.1.1-62

2nd Subnet →

- Network ID:192.168.1.64
- Broadcast ID : 192.168.1.127
- Host Range:192.168.1.65-126

3rd Subnet →

- Network ID:192.168.1.128
- Broadcast ID : 192.168.1.191
- Host Range:192.168.1.129-190

Configuration:

1-Switch Config to define the VLANs

#enable

#config t

#interface range fa0/2-4   (Configuring VLAN 10)

#switchport mode access

#switchport access vlan 10

#interface range fa0/5-7   (Configuring VLAN 20)

#switchport mode access

#switchport access vlan 20

#interface range fa0/8-10   (Configuring VLAN 30)

#switchport mode access

#switchport access vlan 30

#do write   (Saving to start-up Configuration)

#exit

#do show start   (To Verify)

Access Point to configure the wireless
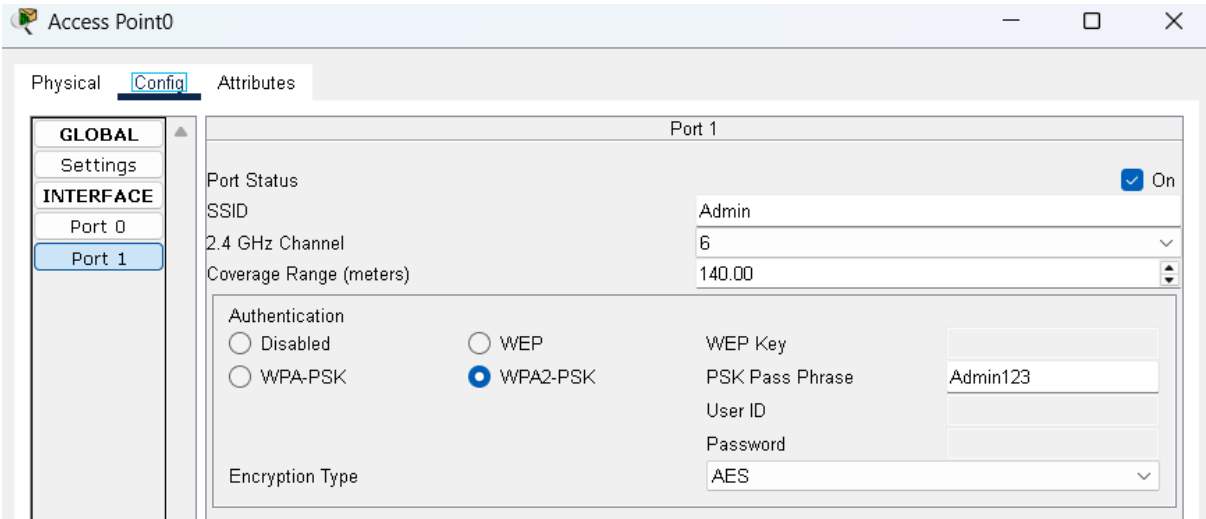
2-Configure the trunking port with the router to do the Inter-Vlan Routing On Switch:

#enable

#configure ter

#interface f0/1

#switchport mode trunk

#do write

3-Configuring the router:

#enable

#configure ter

#interface Gig0/0/0

#no shutdown

#do write

#Interface Gig0/0/0.10

#encapsulation dot1q 10

#ip address 192.168.1.1 255.255.255.192

#Interface Gig0/0.20

#encapsulation dot1q 20

#ip address 192.168.1.65 255.255.255.192

#Interface Gig0/0.30

#encapsulation dot1q 30

#ip address 192.168.1.129 255.255.255.192

#do show start

We gonna configure the DHCP with three pools each one for each VLAN on router:

#enable

#Configure T

#service dhcp

#ip dhcp pool Admin-Pool

#network 192.168.1.0 255.255.255.192

#default-router 192.168.1.1

#dns-server 192.168.1.1

#domain-name Admin.com

#exit

#ip dhcp pool Finance-Pool

#network 192.168.1.64 255.255.255.192

#default-router 192.168.1.65

#dns-server 192.168.1.65

#domain-name finance.com

#exit

#ip dhcp pool Reception-Pool

#network 192.168.1.128 255.255.255.192

#default-router 192.168.1.129

#dns-server 192.168.1.129

#domain-name Reception.com

#do write

You just need to activate the DHCP on the devices to make each one receives it's IP .

By that way we have finished all the requirements and you can watch the explanation from this video , but I recommend you understand the requirements and implement it on your own wish you the best 😊

https://www.youtube.com/watch?v=S4YPDEAJCac&list=PLyEymK89ZUabd7h9FK4dGVdONbxFEJoyk&index=2