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# SMALL OFFICE HOME OFFICE NETWORK -SOHO

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CISCO Project 1



SUBASH SUBEDI

# Project #2 Case Study and Requirements

Design a network in Cisco Packet Tracer of a Small Office Small Office Home Office Network -SOHO

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 VANS.

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 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.

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## Technologies Implemented

### 1. Creating a Simple Network using a Router and Access Layer Switch.

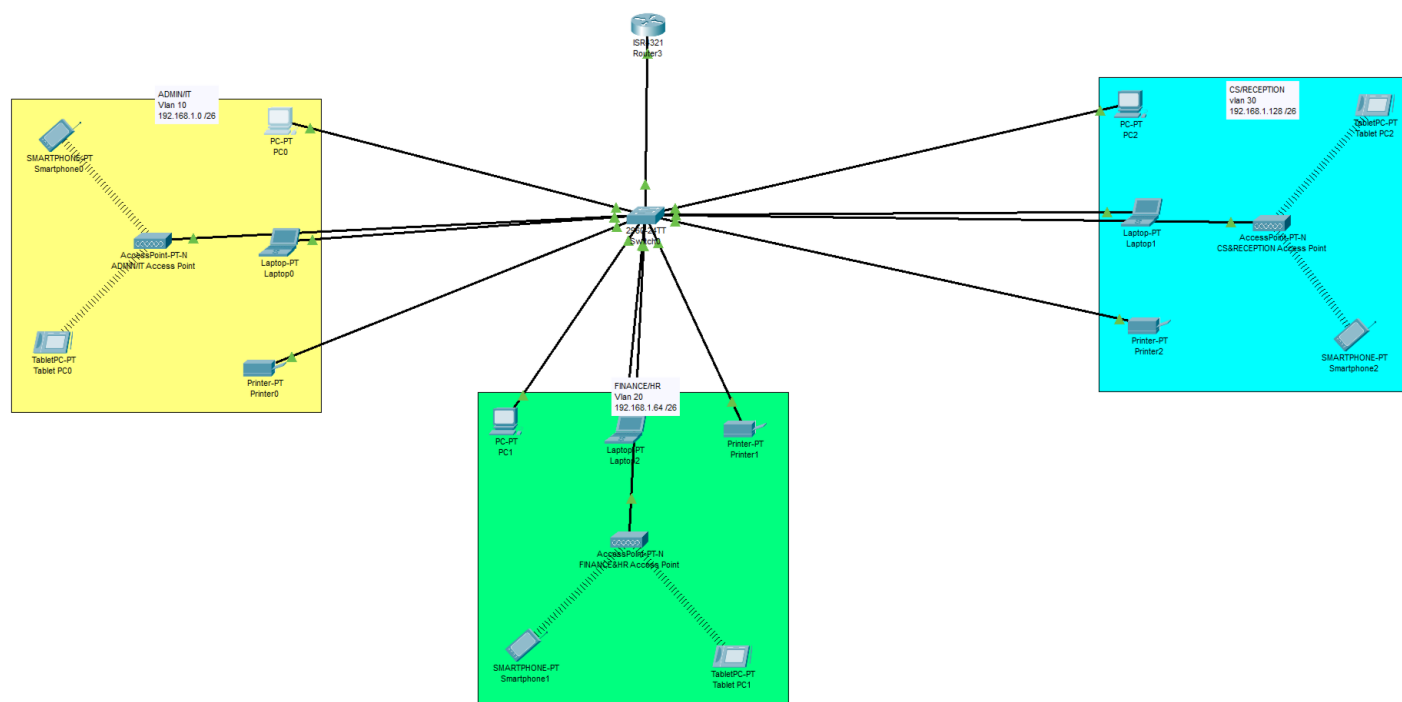


Figure 1

### 2. Connecting Networking devices with Correct cabling.

Copper straight cable

### 3. Creating VLANs and assigning ports VLAN numbers.

#### Creating VLAN on Switch

```
S1(config)#vlan 10
S1(config-vlan)#name ADMIN/IT
S1(config-vlan)#exit
```

```
S1(config)#vlan 20
S1(config-vlan)#name FINANCE/HR
S1(config-vlan)#exit
```

```
S1(config)#vlan 30
S1(config-vlan)#name CR/RECEPTION
S1(config-vlan)#exit
```

**assigning VLAN on interface on switch**

S1(config)#interface range fastEthernet 0/1-4 S1(config-if-range)#switchport mode access S1(config-if-range)#switchport access vla10 S1(config-if-range)#exit
S1(config)#interface range fastEthernet 0/5-8 S1(config-if-range)#switchport mode access S1(config-if-range)#switchport access vlan 20 S1(config-if-range)#exit
S1(config)#interface range fastEthernet 0/9-12 S1(config-if-range)#switchport mode access S1(config-if-range)#switchport access vlan 30 S1(config-if-range)#exit
S1(config)#interface gigabitEthernet 0/1 S1(config-if)#switchport mode trunk S1(config-if)#no shutdown S1(config-if)#exit

**4. Subnetting and IP Addressing.**

subnet: 255.255.255.192 (/26)

Block Size = 64

DEPARTMENT	NETWORK ID	GATEWAYS / STARTING IP	LAST IP	BROADCAST ID	SUBNET MASK
1 <sup>ST</sup>	192.168.1.0/26	192.168.1.1	192.168.1.62	192.168.1.63	255.255.255.192
2 <sup>ND</sup>	192.168.1.64/26	192.168.1.65	192.168.1.126	192.168.1.127	255.255.255.192
3 <sup>RD</sup>	192.168.1.128/26	192.168.1.129	192.168.1.190	192.168.1.191	255.255.255.192

## 5. Configuring Inter-VLAN Routing (Router on a stick).

Core_Router(config)#interface gigabitEthernet 0/0/0.10
Core_Router(config-subif)#encapsulation dot1Q 10
Core_Router(config-subif)#ip address 192.168.1.1 255.255.255.192 //on ip address set gateways
Core_Router(config-subif)#exit
Core_Router(config)#interface gigabitEthernet 0/0/0.20
Core_Router(config-subif)#encapsulation dot1Q 20
Core_Router(config-subif)#ip address 192.168.1.65 255.255.255.192 //on ip address set gateways
Core_Router(config-subif)#exit
Core_Router(config)#int gigabitEthernet 0/0/0.30
Core_Router(config-subif)#encapsulation dot1Q 30
Core_Router(config-subif)#ip address 192.168.1.129 255.255.255.192 //on ip address set gateways
Core_Router(config-subif)#exit

## 6. Configuring DHCP Server (Router as the DHCP Server).

Core_Router(config)#service dhcp
Core_Router(config)#ip dhcp pool Admin-pool
Core_Router(dhcp-config)#network 192.168.1.0 255.255.255.192
Core_Router(dhcp-config)#default-router 192.168.1.1
Core_Router(dhcp-config)#dns-server 192.168.1.1
Core_Router(dhcp-config)#domain-name Admin.com
Core_Router(dhcp-config)#exit
explain each cmd in deep details
Core_Router(config)#ip dhcp pool Finance-Pool
Core_Router(dhcp-config)#network 192.168.1.64 255.255.255.192
Core_Router(dhcp-config)#default-router 192.168.1.65
Core_Router(dhcp-config)#dns-server 192.168.1.65
Core_Router(dhcp-config)#domain-name finance.com
Core_Router(dhcp-config)#exit

```
Core_Router(config)#ip dhcp pool CS-Pool
Core_Router(dhcp-config)#network 192.168.1.128 255.255.255.192
Core_Router(dhcp-config)#default-router 192.168.1.129
Core_Router(dhcp-config)#dns-server 192.168.1.129
Core_Router(dhcp-config)#domain-name cs.com
Core_Router(dhcp-config)#exit
```

*If you are configuring a **Cisco router or switch**, you should use:*

*Router#**show ip dhcp binding***

*This command will display the **list of devices** that have received an IP from the DHCP server.*

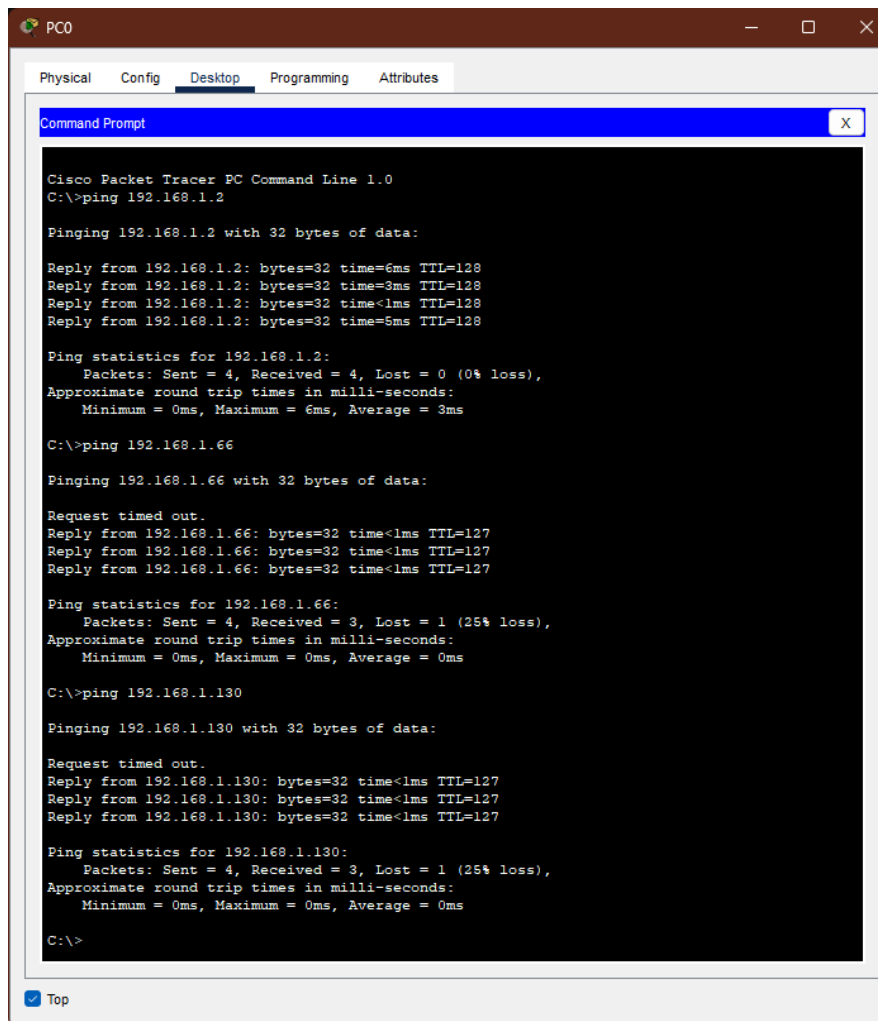
## 7. Configuring WLAN or wireless network (Cisco Access Point).

All the Wireless AP will automatically learn the IP address From Core Router.

## 8. Host Device Configurations.

Select the device and on that you find the **Desktop** on that you will find the **Command Prompt** types cmd  
**ipconfig /renew**

## 9. Test and Verifying Network Communication.



The screenshot shows a PC0 window with a Command Prompt open. The Command Prompt displays the results of three ping commands. The first command is for 192.168.1.2, which shows successful replies with 0% loss. The second command is for 192.168.1.66, which shows a request timed out and 25% loss. The third command is for 192.168.1.130, which also shows a request timed out and 25% loss.

```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=6ms TTL=128
Reply from 192.168.1.2: bytes=32 time=3ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time=5ms TTL=128

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 6ms, Average = 3ms

C:\>ping 192.168.1.66

Pinging 192.168.1.66 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.66: bytes=32 time<1ms TTL=127
Reply from 192.168.1.66: bytes=32 time<1ms TTL=127
Reply from 192.168.1.66: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.1.66:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.130

Pinging 192.168.1.130 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.130: bytes=32 time<1ms TTL=127
Reply from 192.168.1.130: bytes=32 time<1ms TTL=127
Reply from 192.168.1.130: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.1.130:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```