

SMALL OFFICE FOR NETWORK DIAGRAM AND DESIGN ARCHITECTURE

NETWORK SCENARIO

- XYZ company is a fast-growing company in Eastern Sri Lanka 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 Ampara. 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, Finance, Customer).
 - 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 192.168.54.0, you as the young network engineer who has been hired, design and implement a network considering the above requirements.

IP ADDRESSING TABLE

Department / VLAN ID	Subnet	Default Gateway	DHCP IP Range	Broadcast Address
Admin - 10	192.168.54.0/26	192.168.54.1	192.168.54.2–62	192.168.54.63
Finance - 20	192.168.54.64/26	192.168.54.65	192.168.54.66– 126	192.168.54.127
Customer - 30	192.168.54.128/2 6	192.168.54.129	192.168.54.130– 190	192.168.54.191

SWITCH CONFIGURATION

```
en
```

```
conf t
```

```
# Admin VLAN - Ports fao/1 to fao/8
```

```
int range fao/1-8
```

```
switchport mode access
```

```
switchport access vlan 10
```

```
exit
```

```
# Finance VLAN - Ports fao/9 to fao/16
```

```
int range fao/9-16
```

```
switchport mode access
```

```
switchport access vlan 20
```

```
exit
```

```
# Customer VLAN - Ports fao/17 to fao/24
```

```
int range fao/17-24
```

```
switchport mode access
```

```
switchport access vlan 30
```

```
exit
```

```
# Trunk link to router
```

```
int gigo/1
```

```
switchport mode trunk
```

```
Exit
```

```
do wr
```

ROUTER CONFIGURATION

```
en
```

```
conf t
```

```
int gigo/o
```

```
no shut
```

Sub-interfaces for VLANs

```
int gigo/o.10
```

```
encapsulation dot1Q 10
```

```
ip address 192.168.54.1 255.255.255.192
```

```
exit
```

```
int gigo/o.20
```

```
encapsulation dot1Q 20
```

```
ip address 192.168.54.65 255.255.255.192
```

```
exit
```

```
int gigo/o.30
```

```
encapsulation dot1Q 30
```

```
ip address 192.168.54.129 255.255.255.192
```

```
exit
```

DHCP Configuration

```
service dhcp
```

```
ip dhcp pool Admin-Pool
```

```
network 192.168.54.0 255.255.255.192
```

```
default-router 192.168.54.1
```

```
domain-name Admin.com
```

```
exit
```

```
ip dhcp pool Finance-Pool
```

```
network 192.168.54.64 255.255.255.192
```

```
default-router 192.168.54.65
```

```
domain-name Finance.com
```

```
exit
```

```
ip dhcp pool Customer-Pool
```

```
network 192.168.54.128 255.255.255.192
```

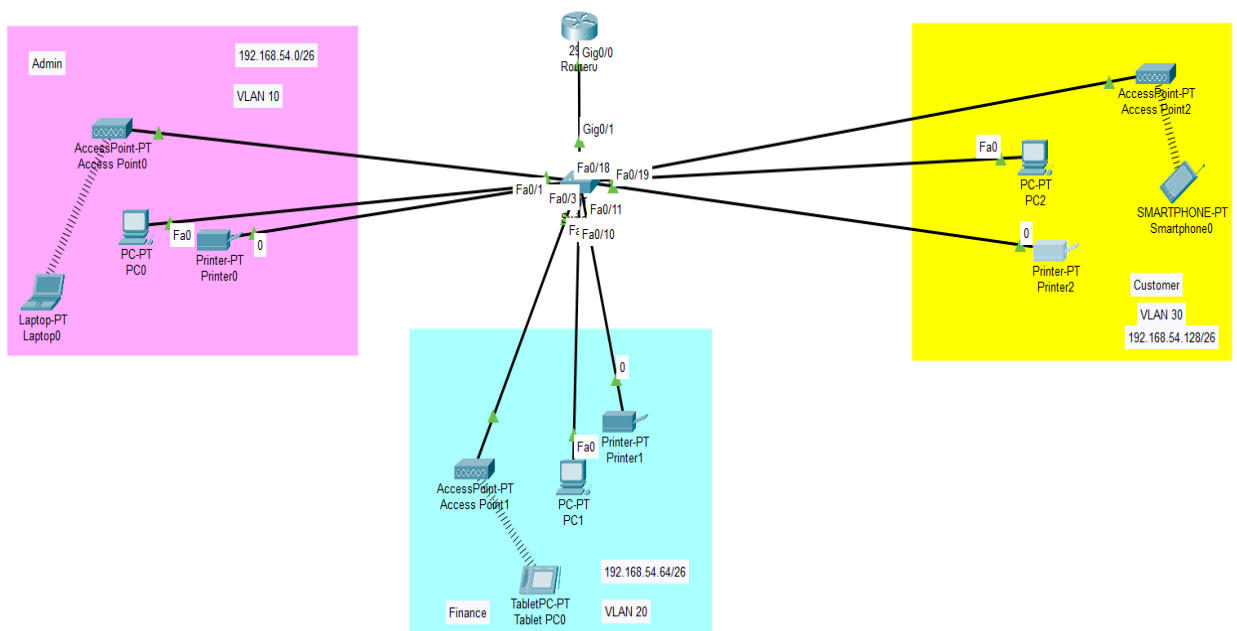
```
default-router 192.168.54.129
```

```
domain-name Customer.com
```

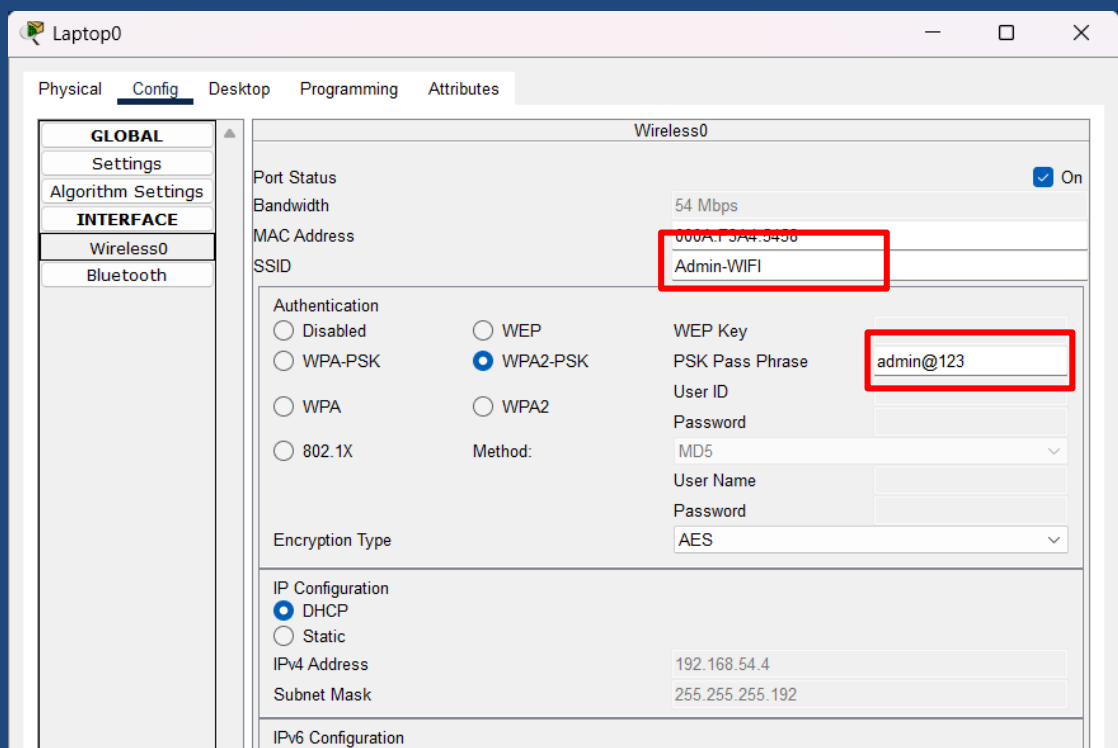
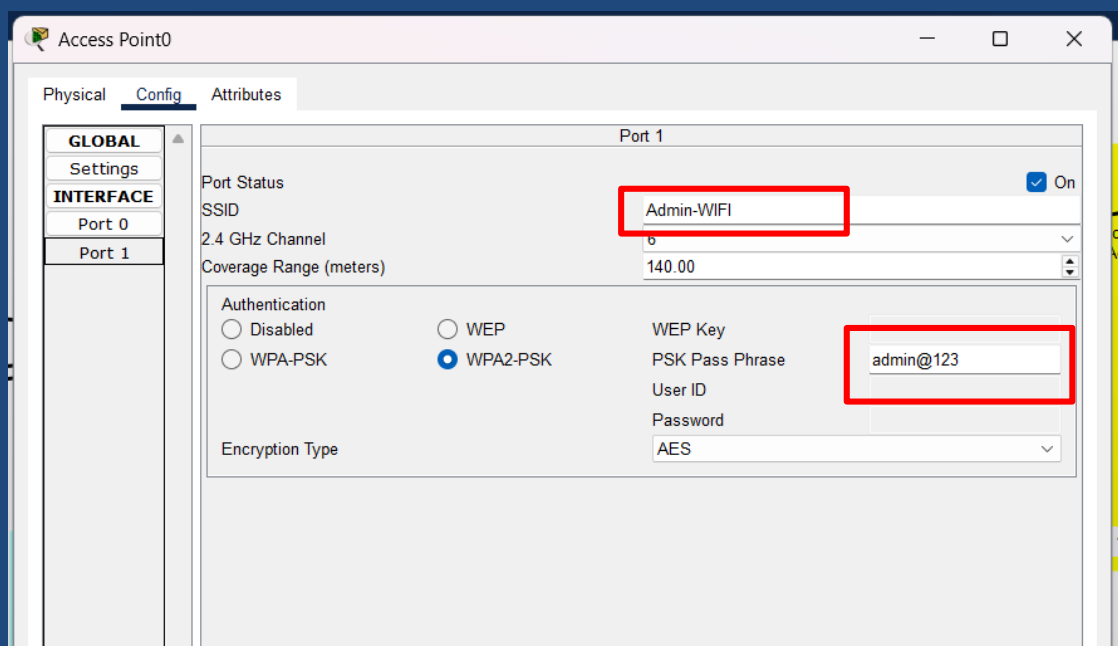
```
exit
```

```
do wr
```

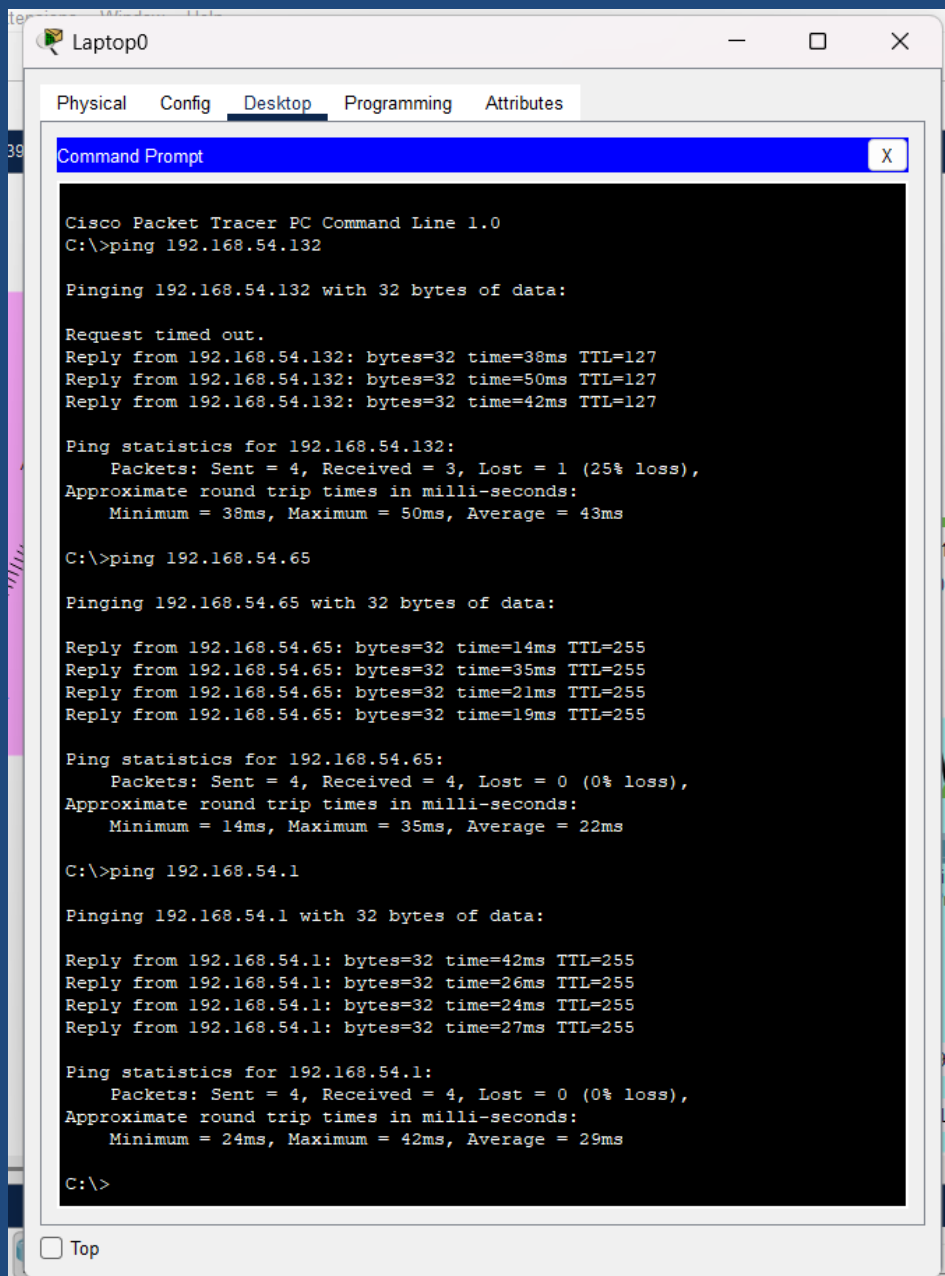
DIAGRAM OF NETWORK



WIRELESS CONNECTION



VERIFICATION



The screenshot shows a Cisco Packet Tracer interface for a device named 'Laptop0'. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The window contains the output of three ping commands executed from the PC's command line.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.54.132

Pinging 192.168.54.132 with 32 bytes of data:

Request timed out.
Reply from 192.168.54.132: bytes=32 time=38ms TTL=127
Reply from 192.168.54.132: bytes=32 time=50ms TTL=127
Reply from 192.168.54.132: bytes=32 time=42ms TTL=127

Ping statistics for 192.168.54.132:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 38ms, Maximum = 50ms, Average = 43ms

C:\>ping 192.168.54.65

Pinging 192.168.54.65 with 32 bytes of data:

Reply from 192.168.54.65: bytes=32 time=14ms TTL=255
Reply from 192.168.54.65: bytes=32 time=35ms TTL=255
Reply from 192.168.54.65: bytes=32 time=21ms TTL=255
Reply from 192.168.54.65: bytes=32 time=19ms TTL=255

Ping statistics for 192.168.54.65:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 14ms, Maximum = 35ms, Average = 22ms

C:\>ping 192.168.54.1

Pinging 192.168.54.1 with 32 bytes of data:

Reply from 192.168.54.1: bytes=32 time=42ms TTL=255
Reply from 192.168.54.1: bytes=32 time=26ms TTL=255
Reply from 192.168.54.1: bytes=32 time=24ms TTL=255
Reply from 192.168.54.1: bytes=32 time=27ms TTL=255

Ping statistics for 192.168.54.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 24ms, Maximum = 42ms, Average = 29ms

C:\>
```

At the bottom left of the Command Prompt window, there is a checkbox labeled 'Top' which is currently unchecked.