



# **BANK NETWORK SYSTEM**

Course Name: Computer Network Lab  
Course Code: CSE-320

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# Introduction

In today's digital age, a secure, efficient, and scalable network infrastructure is essential for banking operations. This project focuses on designing a comprehensive network system for a modern bank, ensuring reliable communication between branches, data security, fast transaction processing, and smooth customer service delivery.



# Technologies



- Creating VLANs and assigning ports VLAN numbers.
- Subnetting and IP Addressing.
- Configuring Dedicated DHCP Server device to provide dynamic IP allocation.
- Configuring SSH for secure Remote access.
- Configuring OSPF as the routing protocol.
- Configuring WLAN or wireless network (Cisco Access Point).

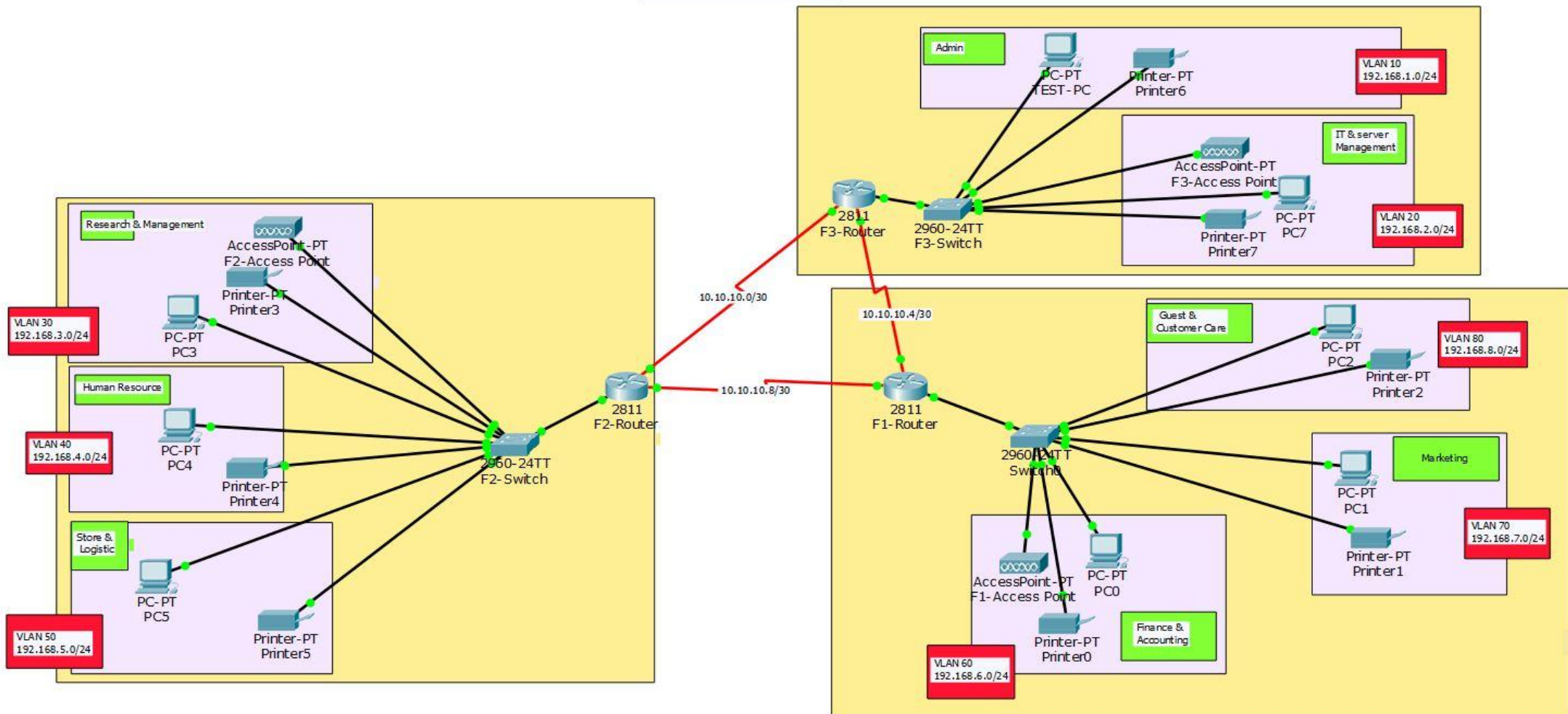
# Wireless Access

- WI-FI FOR BOTH GUESTS AND STAFF
- Access via SSID and password
- DHCP assigns IPs automatically



# Bank System

Bank Management System



# Topology Overview

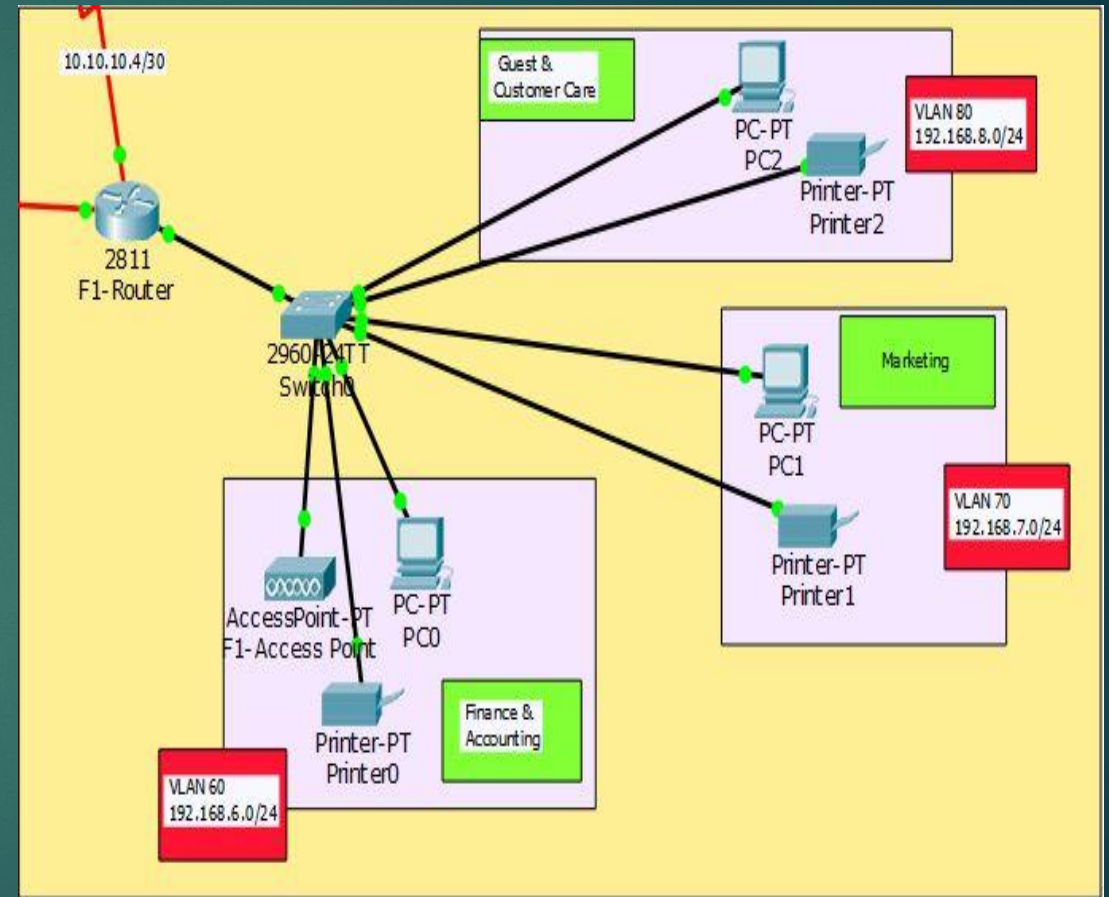
- 3 ROUTERS (1 PER FLOOR) IN A RING TOPOLOGY
- 3 Switches, each with VLANs for departments
- Serial links (10.10.10.0/30) between routers
- Separate VLANs for each department
- Wi-Fi APs, printers, and DHCP in each floor
- **OSPF** for inter-router communication



# Floor-Wise VLAN Setup

## 1st Floor:

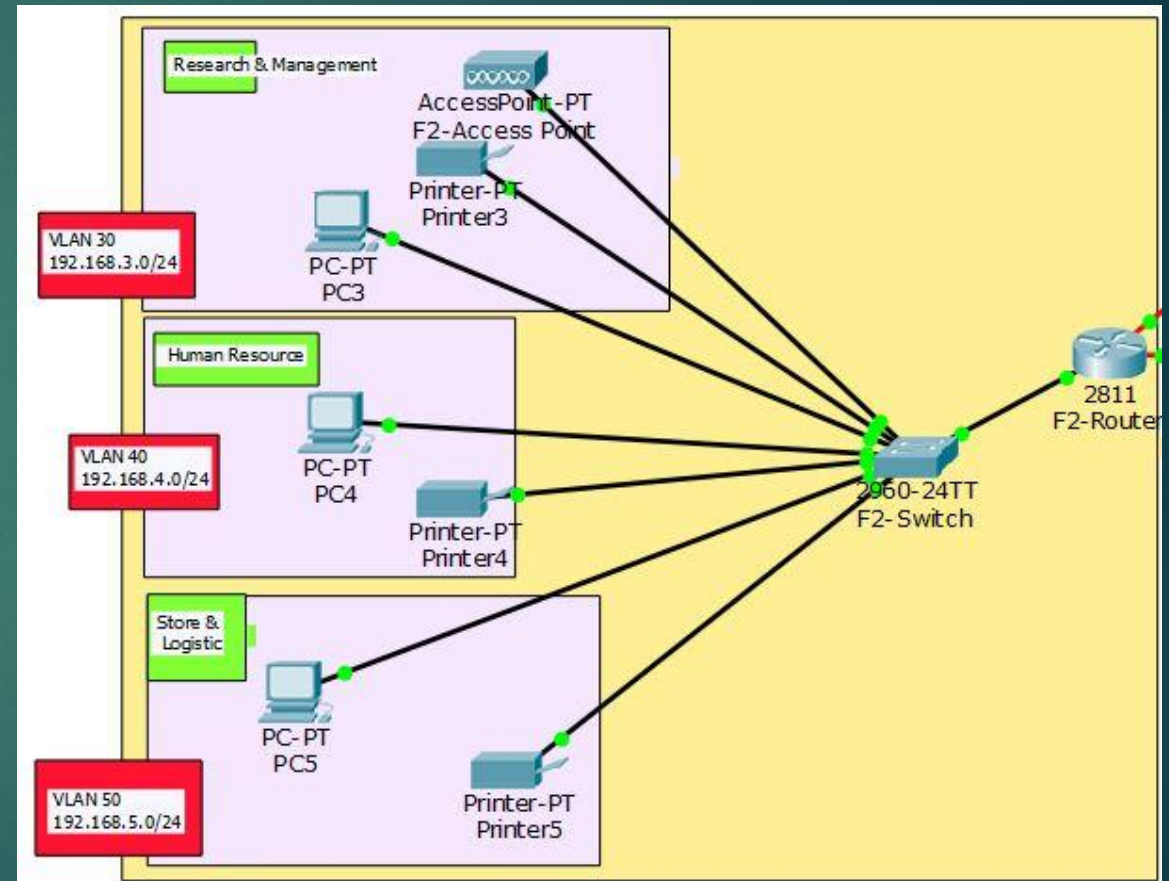
- VLAN 80 – Customer Care
- VLAN 70 – Marketing
- VLAN 60 – Finance & Accounting



# Floor-Wise VLAN Setup

## 2nd Floor:

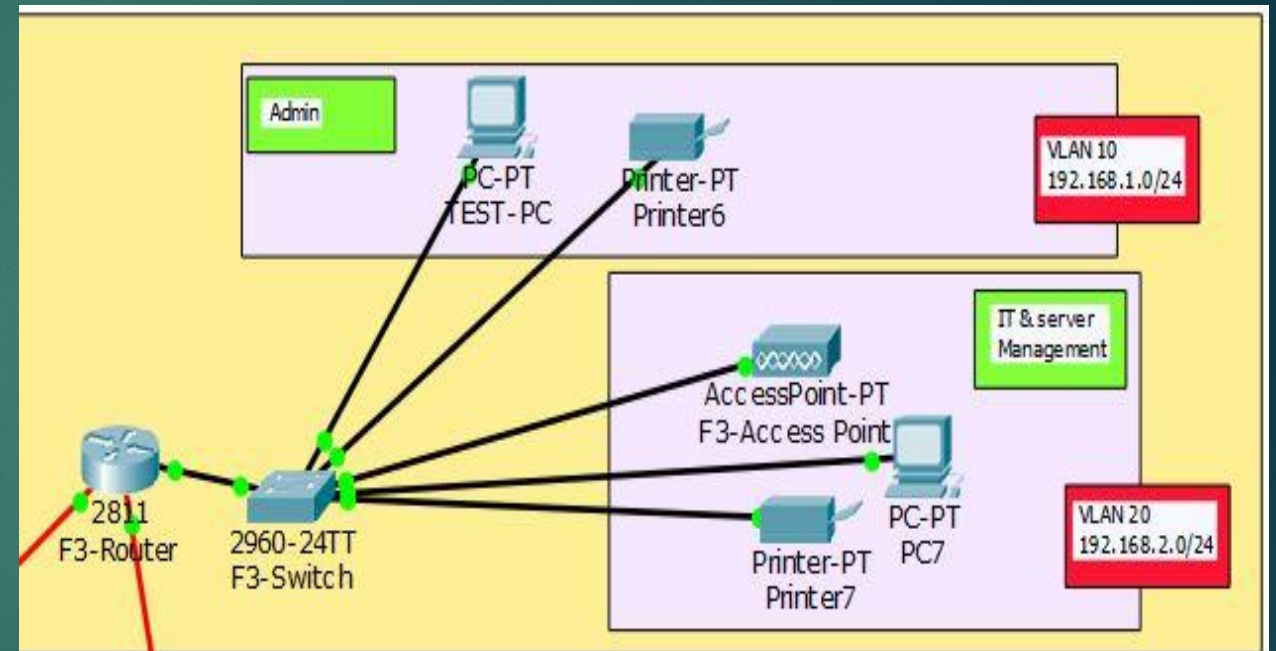
- VLAN 30 – Research & Management
- VLAN 40 – Human Resource
- VLAN 50 – Store & Logistic



# Floor-Wise VLAN Setup

## 3rd Floor:

- VLAN 10 – Admin
- VLAN 20 – IT & Server Management





# Configurations



# Configurations

```
Router(config-subif)#encapsulation dot1Q 80
Router(config-subif)#ip address 192.168.8.1 255.255.255.0
Router(config-subif)#ex
Router(config)#int fa0/0.70
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.70, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.70, changed state
to up

Router(config-subif)#encapsulation dot1Q 70
Router(config-subif)#ip address 192.168.7.1 255.255.255.0
Router(config-subif)#ex
Router(config)#
Router(config)#
Router(config)#int fa0/0.60
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.60, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.60, changed state
to up

Router(config-subif)#encapsulation dot1Q 60
Router(config-subif)#ip address 192.168.6.1 255.255.255.0
Router(config-subif)#do wr
Building configuration...
[OK]
```

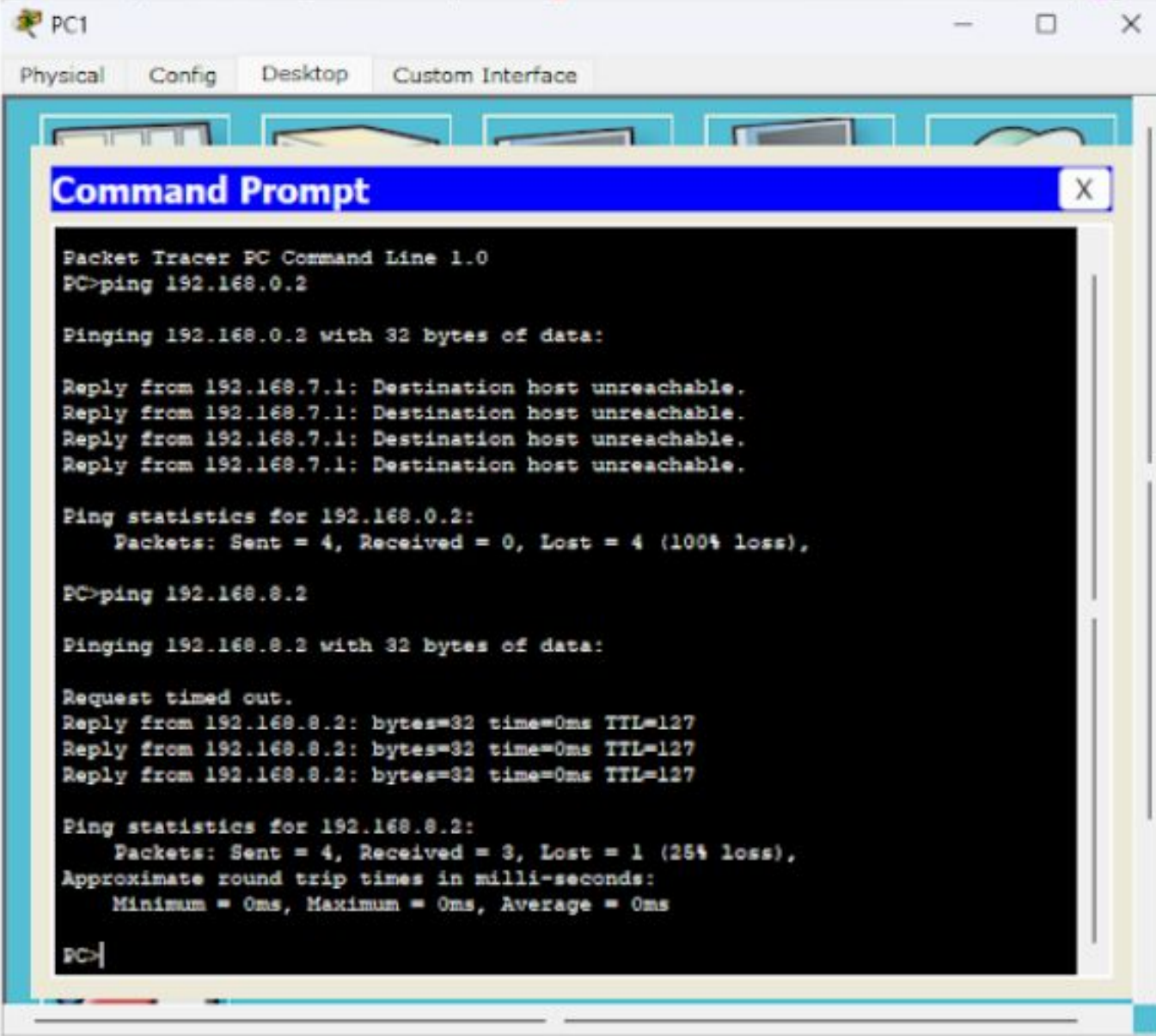
# VLAN

**Inter-Floor communication  
have become secure**

**but**

**Inter-Floor communication  
were not secured**

# Configurations



The screenshot shows a Packet Tracer PC window titled 'PC1' with tabs for 'Physical', 'Config', 'Desktop', and 'Custom Interface'. The 'Desktop' tab is active, displaying a 'Command Prompt' window. The command prompt shows the results of two ping commands. The first command, 'ping 192.168.0.2', results in four 'Destination host unreachable' replies and a 100% loss rate. The second command, 'ping 192.168.8.2', results in three successful replies (0ms time, TTL=127) and one 'Request timed out', leading to a 25% loss rate.

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.0.2

Pinging 192.168.0.2 with 32 bytes of data:

Reply from 192.168.7.1: Destination host unreachable.
Reply from 192.168.7.1: Destination host unreachable.
Reply from 192.168.7.1: Destination host unreachable.
Reply from 192.168.7.1: Destination host unreachable.

Ping statistics for 192.168.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>ping 192.168.8.2

Pinging 192.168.8.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.8.2: bytes=32 time=0ms TTL=127
Reply from 192.168.8.2: bytes=32 time=0ms TTL=127
Reply from 192.168.8.2: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.8.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>
```



Then **WHAT** is  
the **SOLUTION**  
of this?





## OSPF Routing!



## OSPF Configuration

```
Router(config)#router ospf 10
Router(config-router)#network 10.10.10.4 255.255.255.252 area 0
Router(config-router)#network 10.10.10.8 255.255.255.252 area 0
Router(config-router)#network 192.168.8.0 255.255.255.0 area 0
Router(config-router)#network 192.168.7.0 255.255.255.0 area 0
Router(config-router)#network 192.168.6.0 255.255.255.0 area 0
```

# Configurations

## Command Prompt

```
PC>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=9ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 9ms, Average = 3ms

PC>ping 192.168.6.2

Pinging 192.168.6.2 with 32 bytes of data:

Reply from 192.168.6.2: bytes=32 time=5ms TTL=126
Reply from 192.168.6.2: bytes=32 time=8ms TTL=126
Reply from 192.168.6.2: bytes=32 time=1ms TTL=126
Reply from 192.168.6.2: bytes=32 time=2ms TTL=126

Ping statistics for 192.168.6.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 8ms, Average = 4ms

PC>|
```

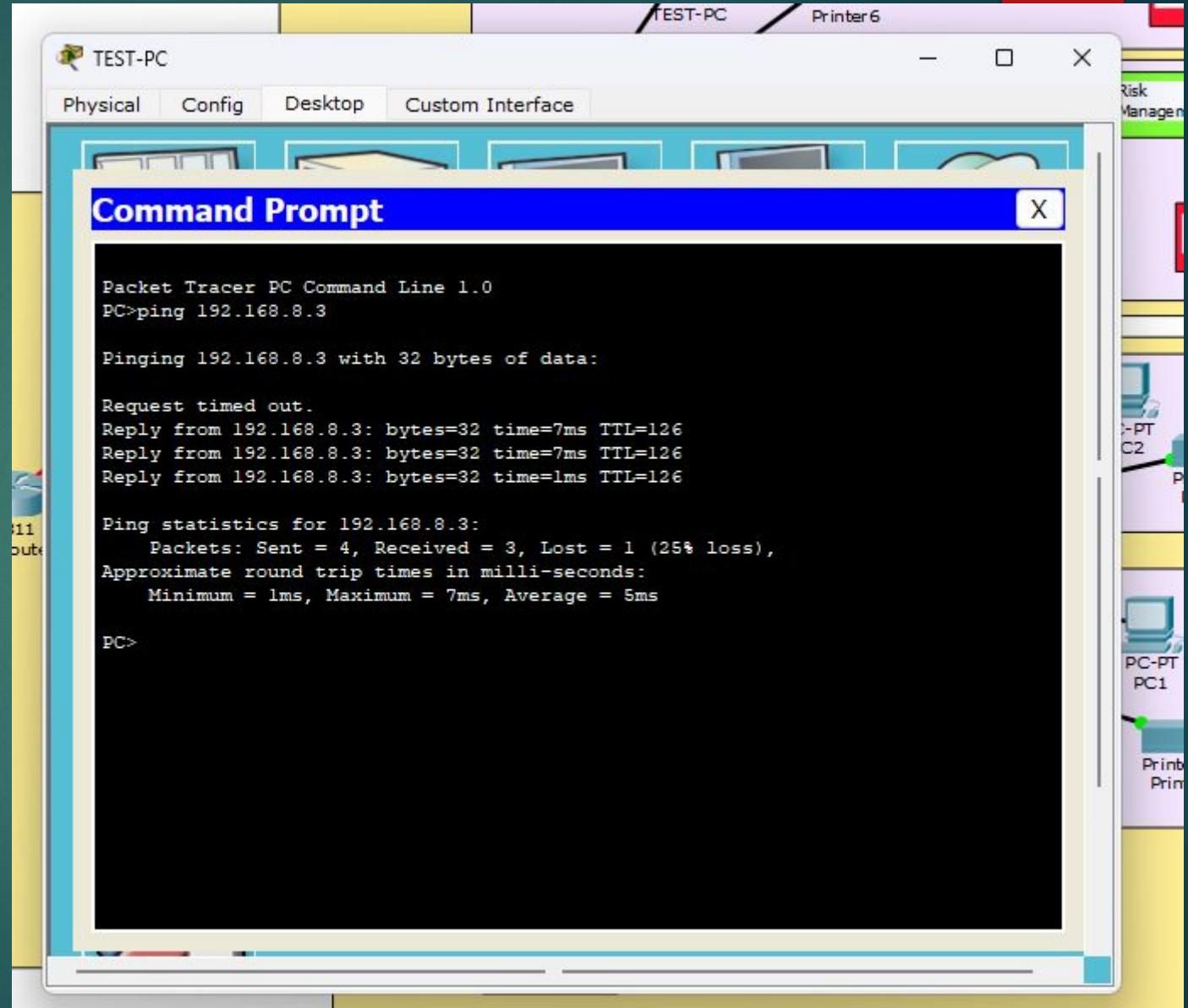
Entire  
Building  
Connection  
Is secured!

# Testing



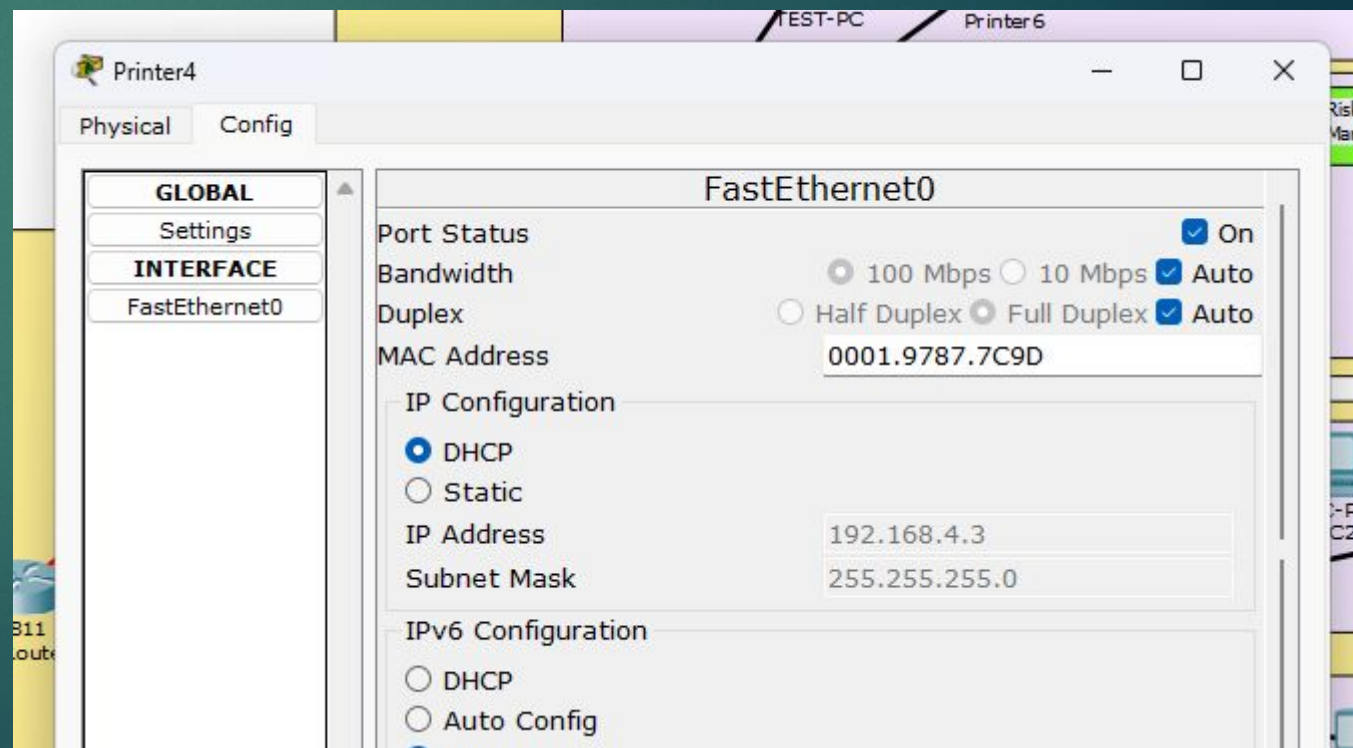
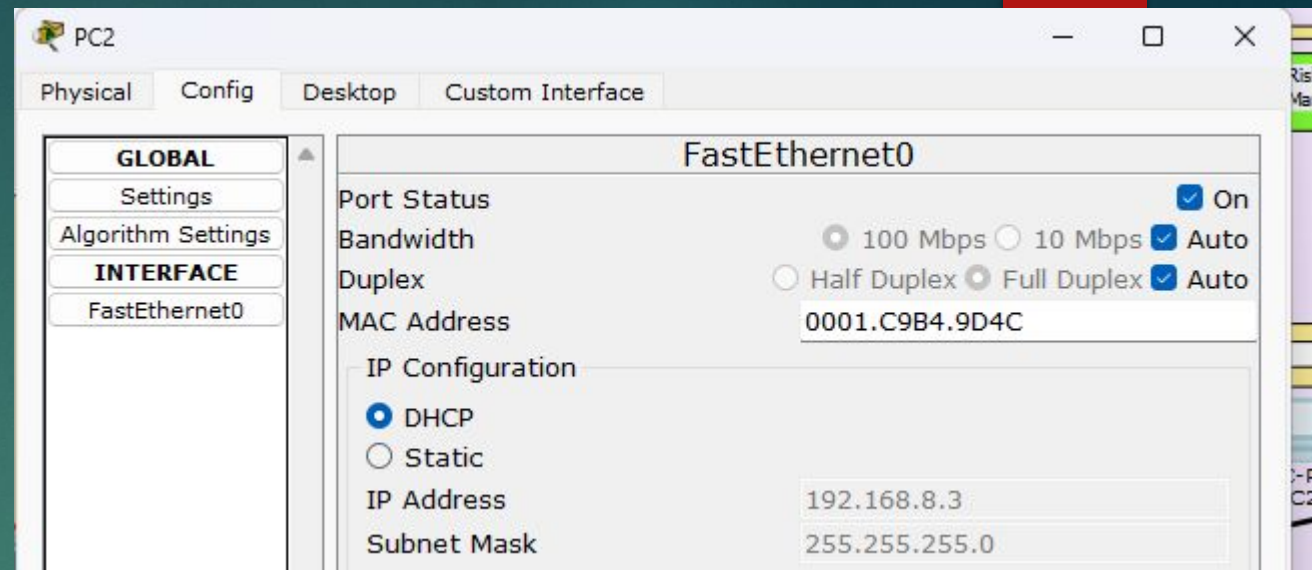
## Results

Entire  
Connection  
is  
Done &  
Dusted!



## Results

All PCs &  
Printers  
Receiving  
Proper  
IPs





# Result





## Realtime





# Conclusion

- Successfully simulated a secure Bank Network
- Achieved efficient communication using VLANs and OSPF
- Implemented enterprise features: DHCP, SSH, port security and so on!
- Scalable for the future!



**Thank You!**