A Mini Project Report

on

HOTEL MANAGEMENT NETWORKING PROJECT

In Subject: **Fundamentals of Computer Networks**

by

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Contents

1.1 Introduction

In this PBL we have built an networking project using **cisco packet tracer**.

We have created a ‘Hotel Management Networking’ project which has three floors : First , Second and Third.

First floor comprising of departments (Reception, store and Logistics).

Second floor comprising of departments (Finance, HR and Sales/Marketing).

Third floor comprising of departments (IT and Admin).

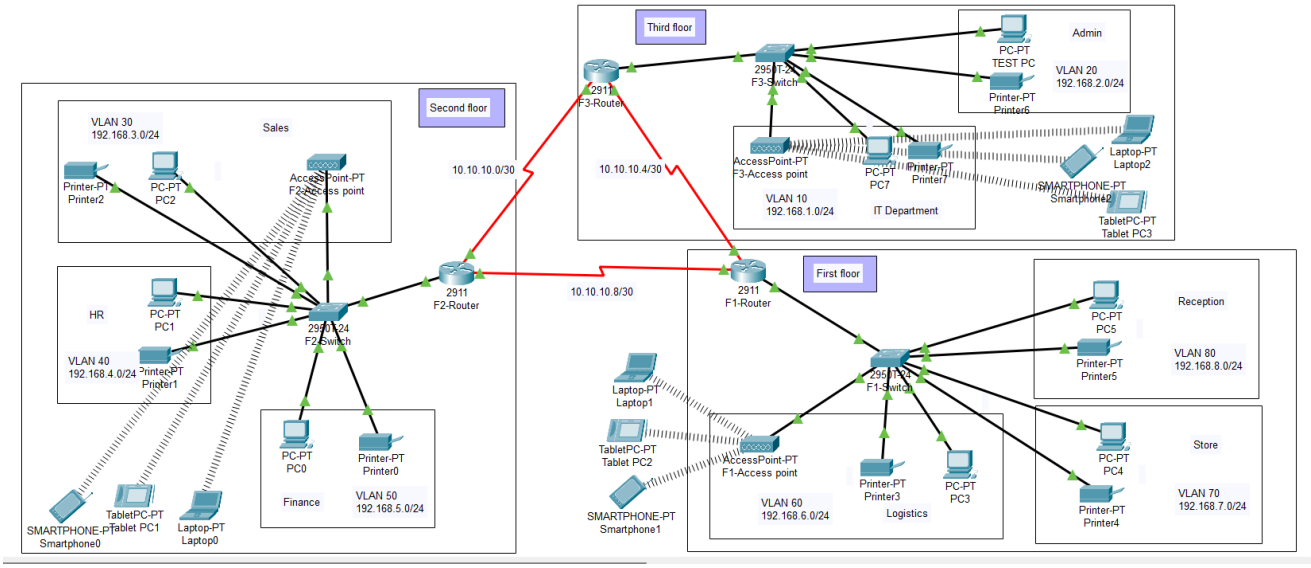
This is very primitive idea which will help us to understand the theoretical concepts and implement them practically.

This management system can be altered as per requirements and domain.

1.2 Requirements

- Basic knowledge of cisco packet tracer.
- Understanding of types of connections and cables used and how to configure different components .
- Software like Cisco packet tracer.

1.3 Design & Problem Statement

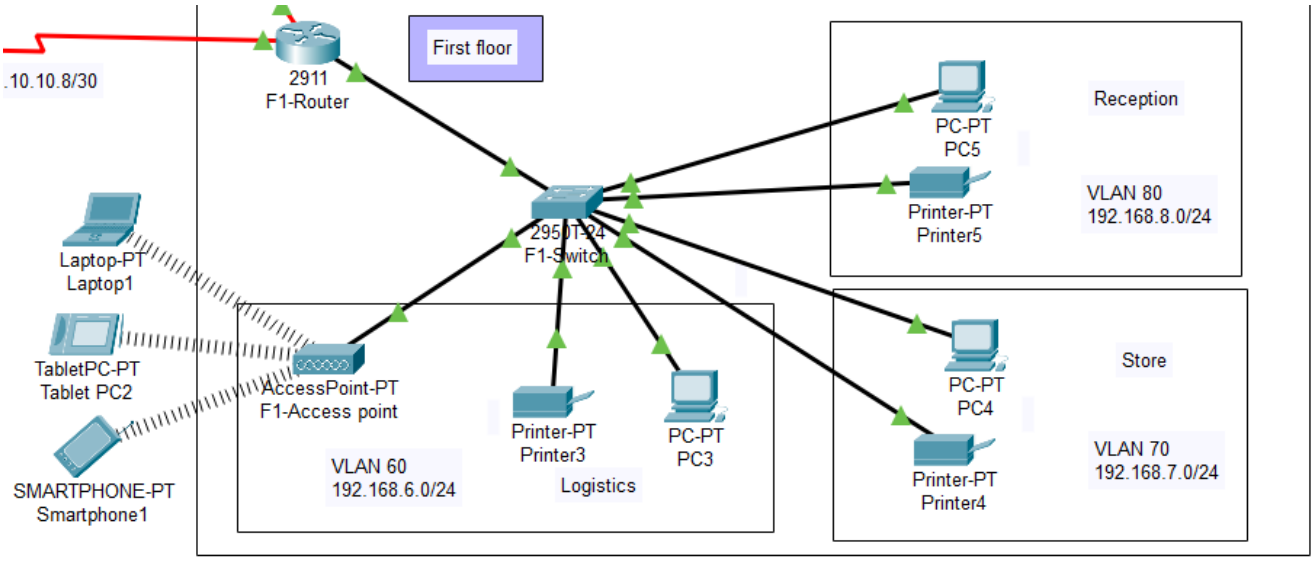


We have created a basic design as per the requirement, according to problem statement we needed to build an networking project for three floors

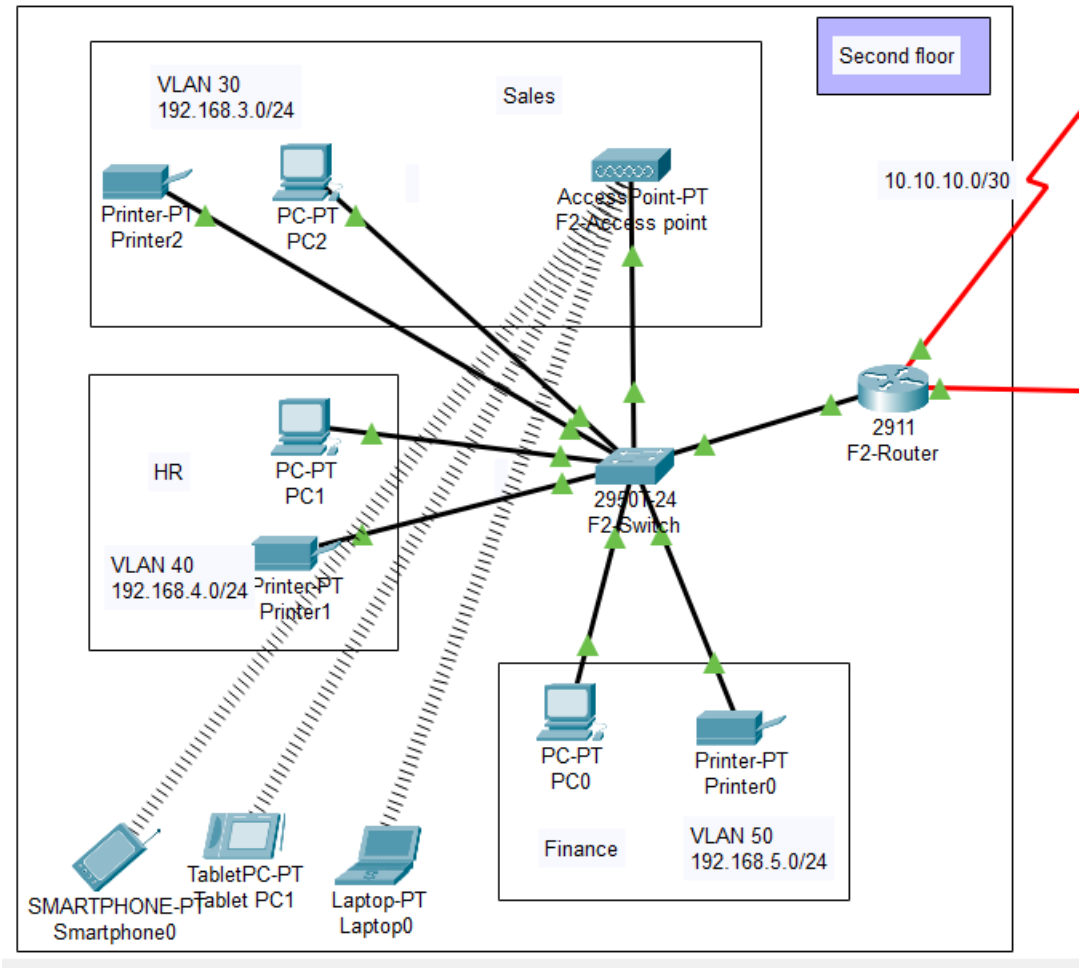
Problem Statement : To build an hotel management networking project using cisco packet tracer

1.4 Proposed Work

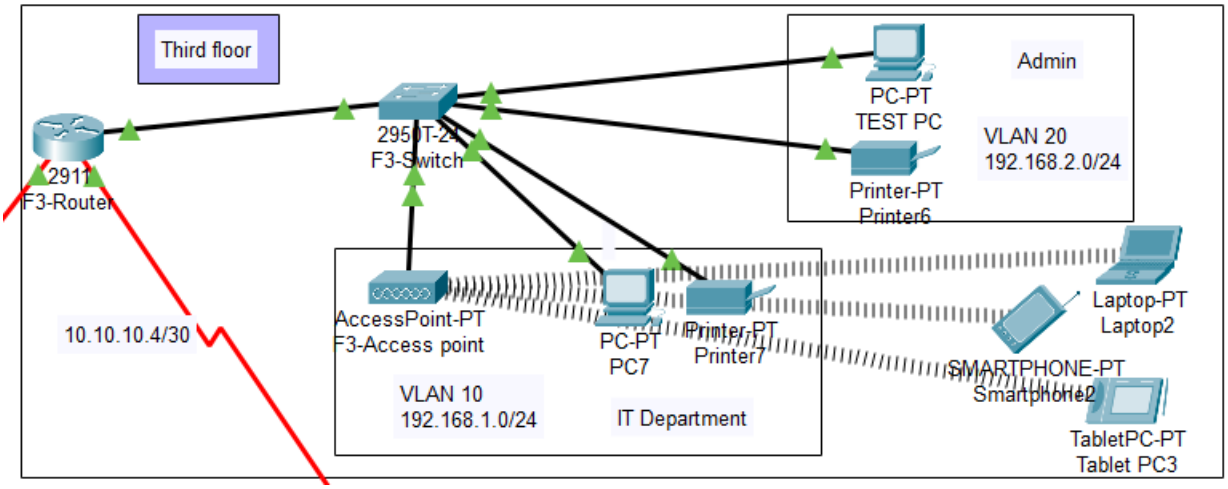
First Floor design:



Second Floor design:



Third Floor design:



Concepts used:

DCE Cable/Serial DCE:

A DCE provides a physical connection to a network and forwards traffic. A DTE connects

to a network through a DCE device. Typically, a DTE device is connected to a DCE device

(or vice versa) rather than another DTE device.

VLAN:

A virtual local area network is any broadcast domain that is partitioned and isolated in a

computer network at the data link layer. LAN is the abbreviation for local area network and

in this context virtual refers to a physical object recreated and altered by additional logic.

OSPF routing protocol:

Open Shortest Path First (OSPF) is a link-state routing protocol that is used to find the best

path between the source and the destination router using its own Shortest Path First). It is a

network layer protocol which works on protocol number 89 and uses AD value 110. OSPF

uses multicast address 224.0.0.5 for normal communication and 224.0.0.6 for update to

designated router(DR)/Backup Designated Router (BDR).

SSH:

The Secure Shell Protocol is a cryptographic network protocol for operating network

services securely over an unsecured network. Its most notable applications are remote login

and command-line execution.

Access Point:

A Wireless Access Point (WAP) is a networking device that allows wireless-capable

devices to connect to a wired network. Instead of using wires and cables to connect every

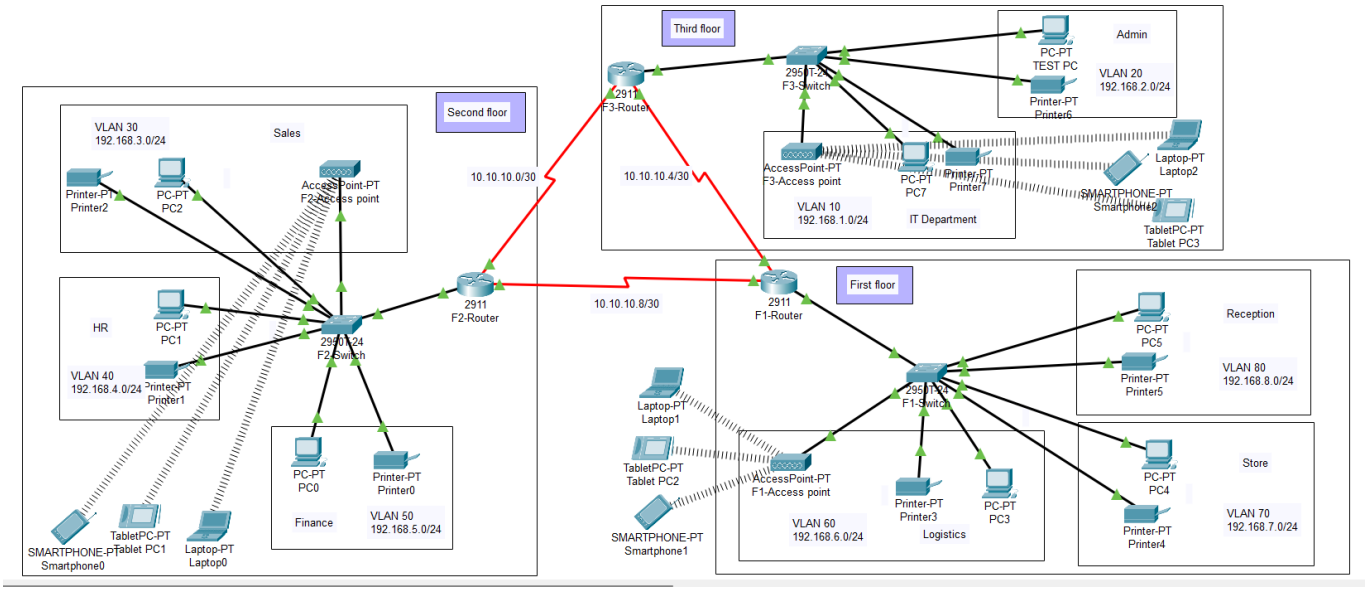
computer or device in the network, installing WAPs is a more convenient, more secure, and

cost-efficient alternative.

Crypto keys:

A cryptographic key is a string of data that is used to lock or unlock cryptographic functions, including authentication, authorization and encryption. Cryptographic keys are grouped into cryptographic key types according to the functions they perform.

Final design:



2.1 Approach

The approach was simple where we have to design every floor and define what kind of cables and connections we are going to use and finally configure all the routers, switches and devices to function accordingly.

1. First we have placed three routers connecting each floor (all placed in the server room in IT department).
2. All routers were connected to each other using serial DCE cables.
3. The network between the routers should be 10.10.10.0/30,10.10.10.4/30,10.10.10.8/30
4. Each floor is expected to have one switch (placed in the respective floor).
5. Each floor have WIFI networks connected to laptops , Tablets and phones.
6. Every department on each floor has a printer.
7. Each department have different VLAN with the following details:

1st Floor,

Reception- VLAN 80, Network of 192.168.8.0/24

Store- VLAN 70, Network of 192.168.7.0/24

Logistics- VLAN 60, Network of 192.168.6.0/24

2nd Floor,

Finance- VLAN 50, Network of 192.168.5.0/24

HR- VLAN 40, Network of 192.168.4.0/24

Sales- VLAN 30, Network of 192.168.3.0/24

3rd Floor,

Admin- VLAN 20, Network of 192.168.2.0/24

IT- VLAN 10, Network of 192.168.1.0/24

8. Used OSPF as the routing protocol to advertise routes.
9. All devices in the network obtain their IP address dynamically with their respective router configured as the DHCP server.
10. All the devices in the network are expected to communicate with each other.
11. We hace configured SSH in all the routers for remote login.
12. In IT department, we have added a PC called Test-PC to port fa0/2 and use it to test remote login.
13. Finally we have configured port security to IT-dept switch to allow only Test-PC to access port fa0/2
14.

2.2 Platform & Technology

Platform used is Cisco Packet Tracer.

2.3 Outcomes

1st floor router configuration:

```
%LINK-5-CHANGED: Interface Serial0/2/0, changed state to up

%LINK-5-CHANGED: Interface Serial0/2/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.60, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.70, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.80, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2/1, changed state to up

00:00:10: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.2.1 on Serial0/2/0 from LOADING to FULL, Loading
Done

00:00:10: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.5.1 on Serial0/2/1 from LOADING to FULL, Loading
Done
%DHCPD-4-PING_CONFLICT: DHCP address conflict:  server pinged 192.168.8.1.
%DHCPD-4-PING_CONFLICT: DHCP address conflict:  server pinged 192.168.7.1.
```

Floor 1 switch :

```
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up

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

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
```

2nd floor router configuration:

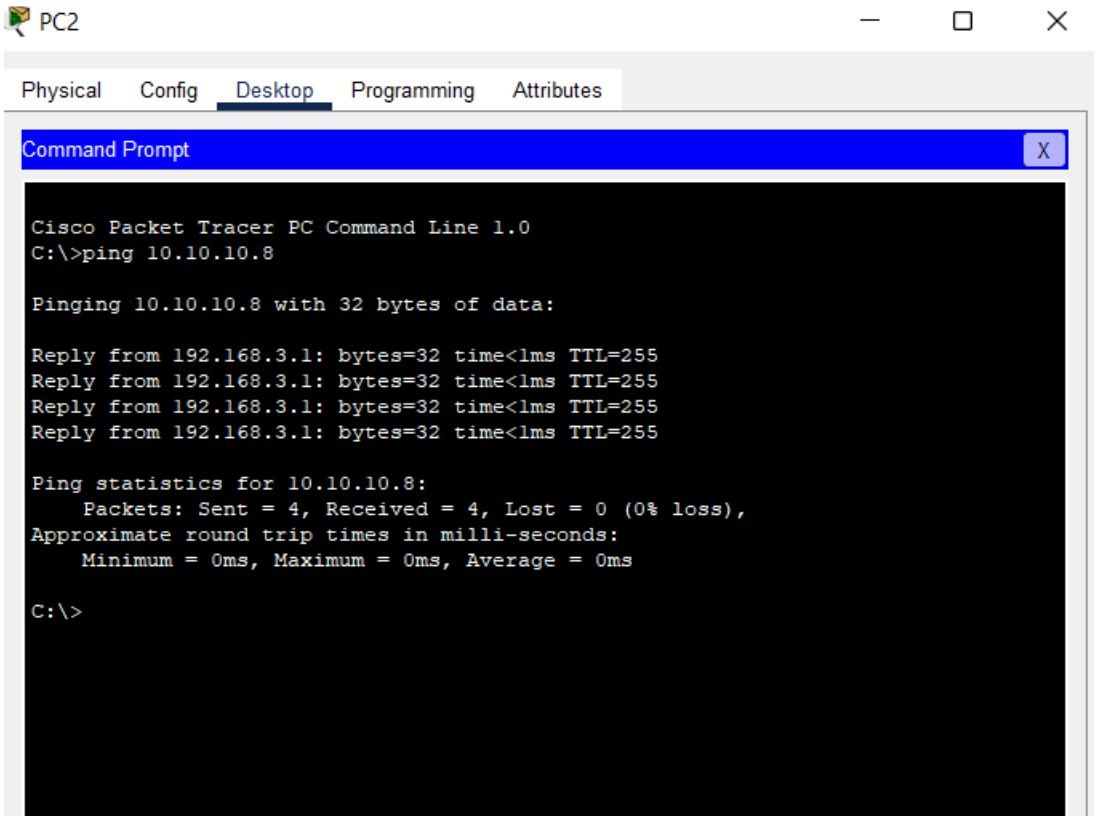
```
%LINK-5-CHANGED: Interface Serial0/2/0, changed state to up

%LINK-5-CHANGED: Interface Serial0/2/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.40, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.50, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2/0, changed state to up

00:00:10: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.2.1 on Serial0/2/0 from LOADING to FULL, Loading
Done

00:00:10: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.8.1 on Serial0/2/1 from LOADING to FULL, Loading
Done
%DHCPD-4-PING_CONFLICT: DHCP address conflict:  server pinged 192.168.5.1.
```

Floor 2 switch :

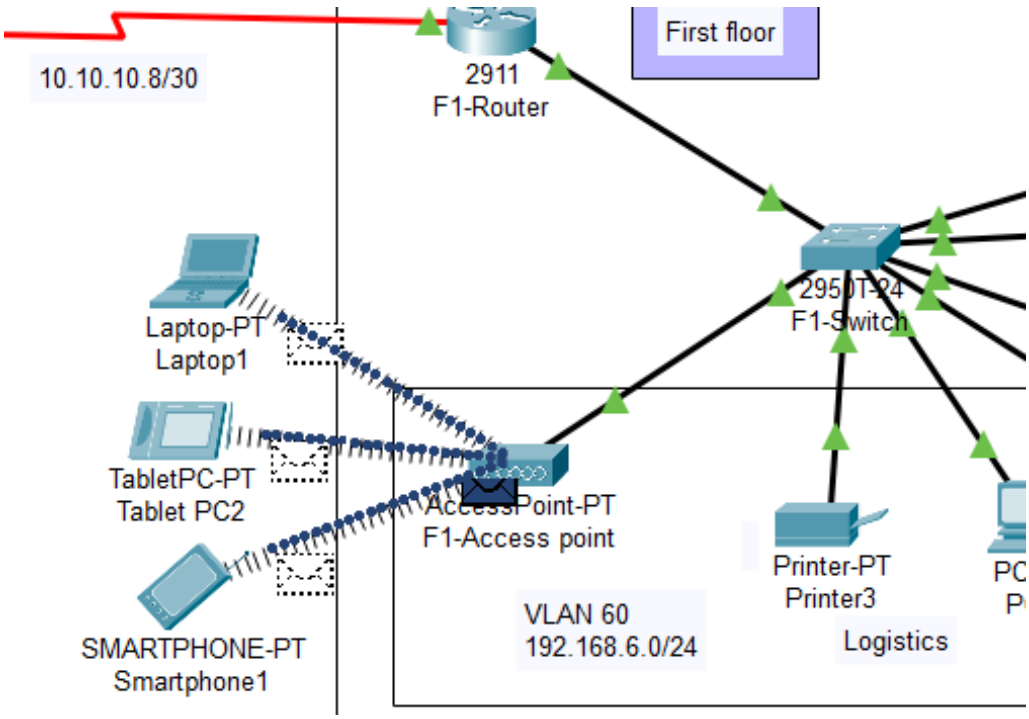
```
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up

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

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
```

Packet sent from PC-2 on second floor to Laptop 1 on first floor and Tablet on Third floor

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC2	PC0	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC2	Laptop1	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC2	Tablet PC3	ICMP		0.000	N	2	(edit)	(delete)



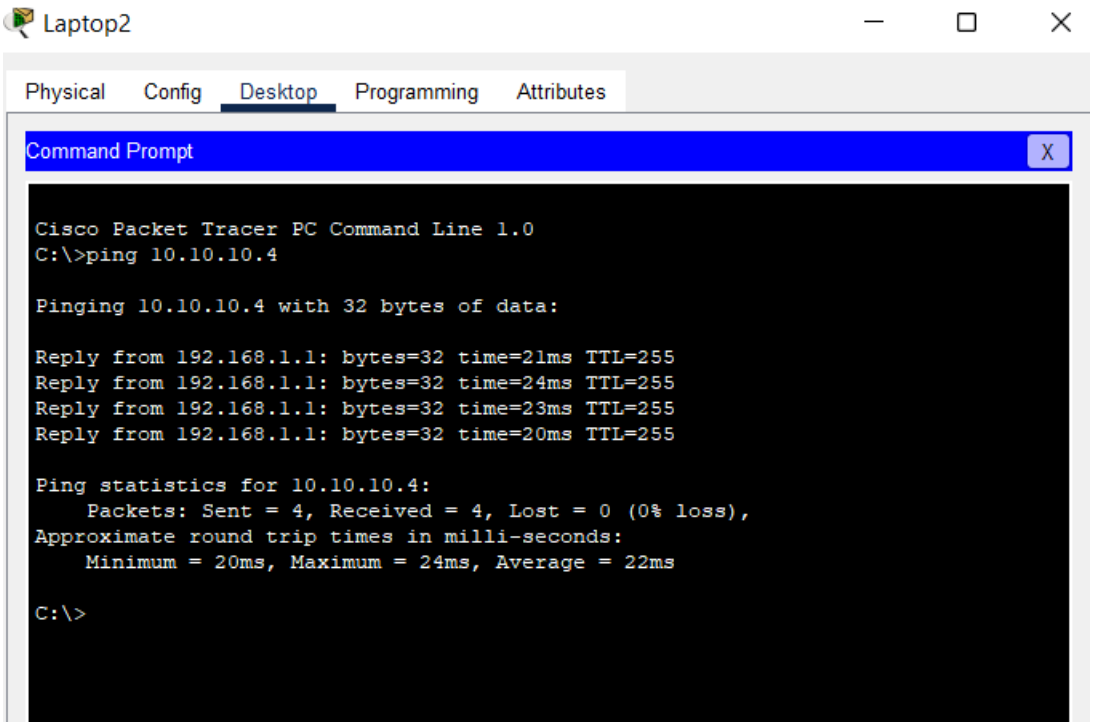
Receiving Packets



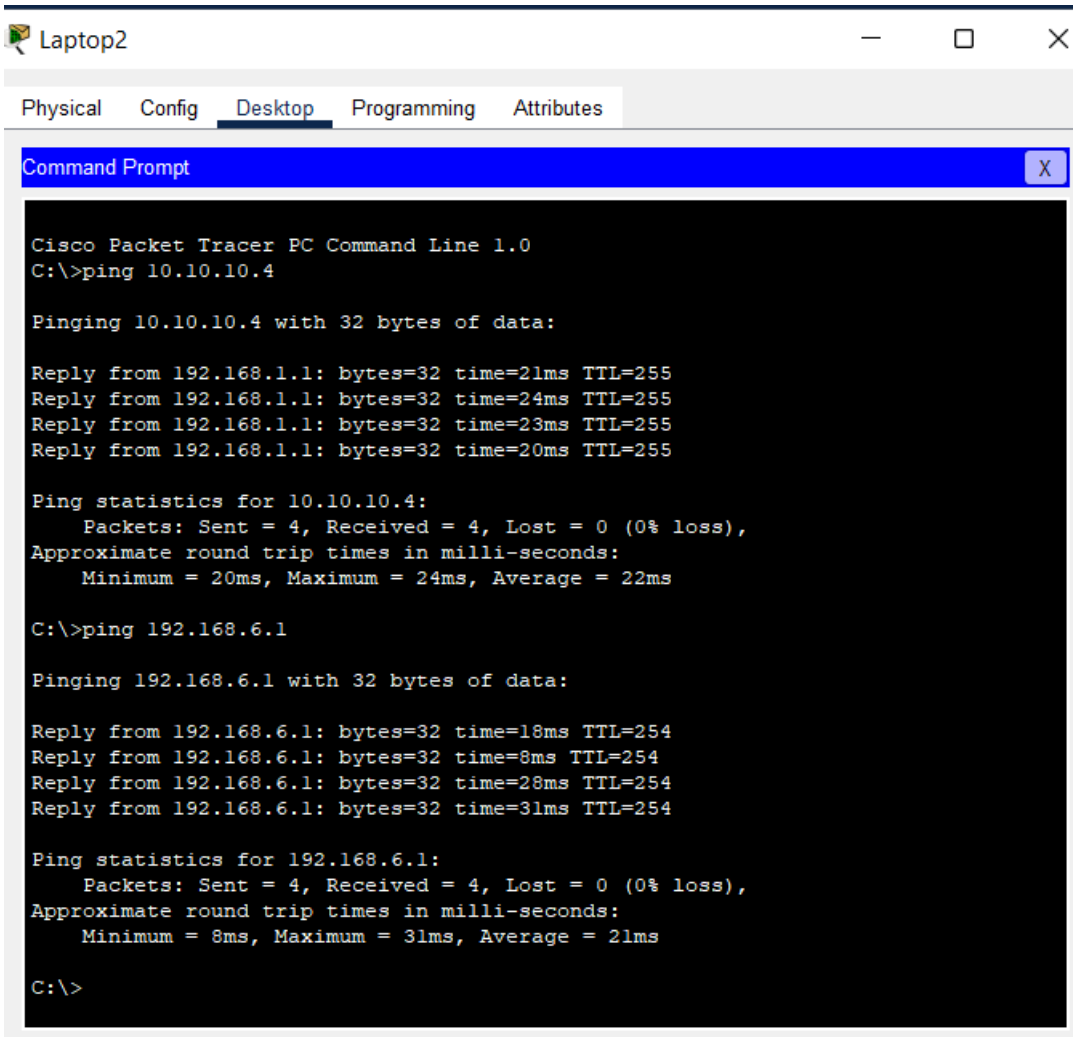
Packets sent from TEST PC (third floor) to Printer 1 (Second floor)

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	TEST...	Printer1	ICMP		0.000	N	0	(edit)	(delete)
	Successful	Laptop2	Printer1	ICMP		0.000	N	1	(edit)	(delete)
	Successful	Laptop2	Laptop1	ICMP		0.000	N	2	(edit)	(delete)

Packets sent from Laptop 2 (third floor) to Printer 1 (Second floor)



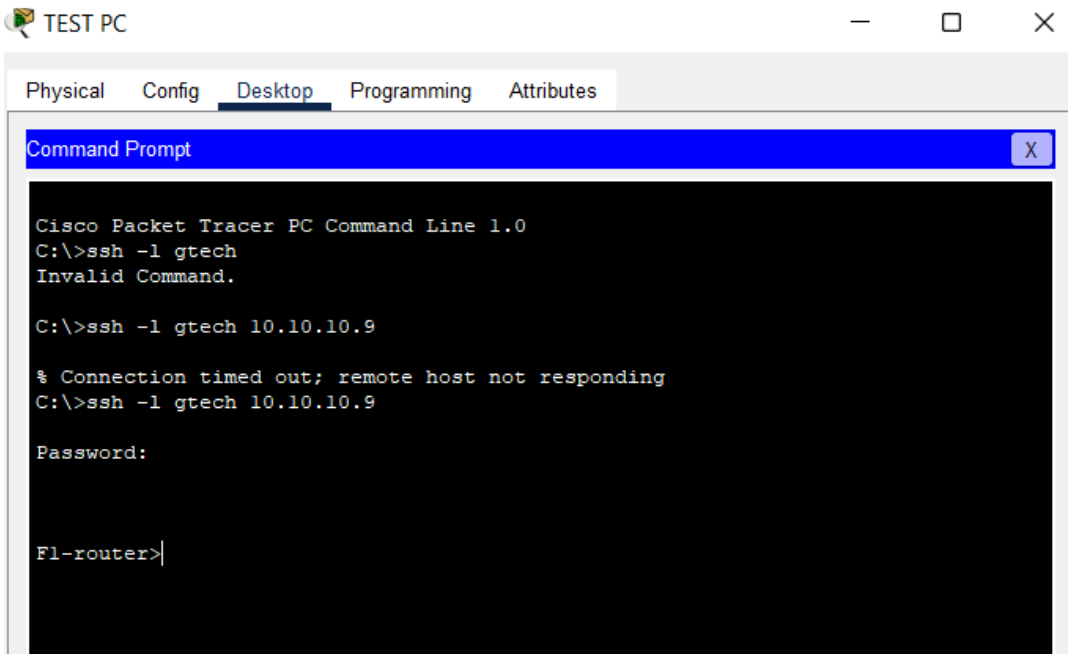
Packets sent from Laptop 2 (Third floor) to Laptop 1 (Second floor)



SSH login for test PC:

```
% Please answer 'yes' or 'no'.
% Do you really want to replace them? [yes/no]: 1024
% Please answer 'yes' or 'no'.
% Do you really want to replace them? [yes/no]: line vty 0 15
% Please answer 'yes' or 'no'.
% Do you really want to replace them? [yes/no]: login local
% Please answer 'yes' or 'no'.
% Do you really want to replace them? [yes/no]: y
The name for the keys will be: F2-Router.gtech
Choose the size of the key modulus in the range of 360 to 2048 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]

F2-Router(config)#login local
*Mar 1 0:7:52.63: %SSH-5-ENABLED: SSH 1.99 has been enabled
                  ^
% Invalid input detected at '^' marker.

F2-Router(config)# line vty 0 15
F2-Router(config-line)#login local
F2-Router(config-line)#transport input ssh
F2-Router(config-line)#do wr
Building configuration...
[OK]
F2-Router(config-line)#
```

Remote login through Test PC:



2.4 Future Work

This networking project can be improved by adding a separate server room and adding more PC's and Laptops as and when required accordingly .Also to manage the load we can add a separate test PC on each floor.

Conclusion:

- Thus we have successfully built an hotel management networking project using cisco packet tracer.
- We have made use of serial DCE cable to interconnect all the routers which are located at different floors.
- Also we have used OSPF as the routing protocol to advertise routers which is basically a link-state routing protocols for IP networks.
- To test remote login we have placed an PC named test PC in the IT department.

References:

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THANK YOU!!