OPEN ENDED LAB
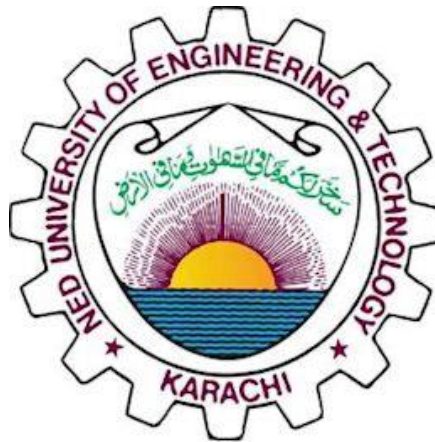
COMPUTER COMMUNICATION NETWORK CS-327

PROJECT

HOTEL MANAGEMENT NETWORK

GROUP: G3

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NOVEMBER 28, 2024

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Abstract

This project entails the design and configuration of a comprehensive network infrastructure tailored for a hotel environment, utilizing Cisco Packet Tracer. The network setup encompasses various elements including serial router configurations, VLAN, subnetting and DHCP implementation to streamline IP address management.

The primary aim of this project is to develop a robust and efficient network infrastructure customized to meet the specific demands of a hotel setting. This involves the creation of segmented VLANs to manage traffic effectively, configuring routers to enable inter-VLAN communication, and integrating DHCP services for simplified IP address allocation.

HOTEL MANAGEMENT NETWORK

In our design the building is divided into three floors and each floor consists of departments. The network is structured in a way that it is organized into VLANs to ensure efficient communication, security and scalability.

FIRST FLOOR:

There are three departments on this floor
Reception:
Logistics
Store

SECOND FLOOR

There are three departments on this floor
Sales & Marketing
Finance
Human Resources

THIRD FLOOR

There are two departments on this floor
IT
Admin

NETWORK OVERVIEW:

The network consists of three routers and three switches for each floor to handle traffic between different departments and provide connectivity to the internet. The routers are configured to provide inter-VLAN routing, allowing devices on different VLANs to communicate with each other and access resources outside the local network.

- **FF Router**: Routes traffic on the first floor (Reception, Store, and Logistics departments).
- **SF Router**: Handles traffic for the second floor (Sales & Marketing, HR, Finance departments).
- **FF Router:** It provides inter-VLAN routing for the devices in the IT and Admin departments.

NETWORK TOPOLOGY:

The network topology comprises the following components:

1. Routers: Facilitate interconnection between VLANs and provide gateway access to the internet.
2. Switches: Serve to connect devices within each VLAN segment.
3. PCs: Representing guest devices including laptops, smartphones.
4. Web Server: Hosts essential services such as guest portal, room service requests, etc.
5. DHCP Server: Facilitates automatic IP address assignment to network devices.

ROUTING PROTOCOL:

We have implemented the OSPF routing protocol in our network design due to its ability to efficiently handle large and complex networks. OSPF offers faster convergence, scalability, and load balancing, making it ideal for the hotel's multi-floor infrastructure.
Metric - Cost

VLANS (Virtual Local Area Network):

First floor:
Reception Dept: VLAN 80
Store Dept: VLAN 70
Logistics Dept: VLAN 60

Second floor:
Sales & Marketing Dept: VLAN 50
Human Resources Dept: VLAN 40
Finance Dept: VLAN 30

Third floor:
IT Dept: VLAN 20
Admin Dept: VLAN 10

SUBNETS AND SUBNETTING

First floor: (Network 192.168.1.0/26)
Reception Dept: 192.168.1.0/26   (Subnet 0)
Store Dept: 192.168.1.64/26   (Subnet 1)

Logistics Dept: 192.168.1.128/26   (Subnet 2)
192.168.1.192/26 (Subnet 3) is for the future implementation.

Second floor: (Network 192.168.2.0/26)
Sales & Marketing Dept: 192.168.2.0/26   (Subnet 0)
Human Resources Dept: 192.168.2.64/26   (Subnet 1)
Finance Dept: 192.168.1.128/26   (Subnet 2)
192.168.2.192/26 (Subnet 3) is for the future implementation.

Third floor: : (Network 192.168.1.0/25)
IT Dept: 192.168.3.0/25   (Subnet 0)
Admin Dept: 192.168.3.128/25   (Subnet 1)

NETWORKS FOR ROUTER

Private Ips:
Btw FFRouter & SFrouter: 10.10.10.8/30
Btw SFRouter & TFrouter: 10.10.10.0/30
Btw FFRouter & TFrouter: 10.10.10.4/30

FFrouter: 10.10.10.5/30, 10.10.10.9/30
SFrouter: 10.10.10.1/30, 10.10.10.10/30
TFrouter: 10.10.10.6/30, 10.10.10.2/30

Public Ips:
200.100.50.0/30

Web Server:
8.8.8.0/24
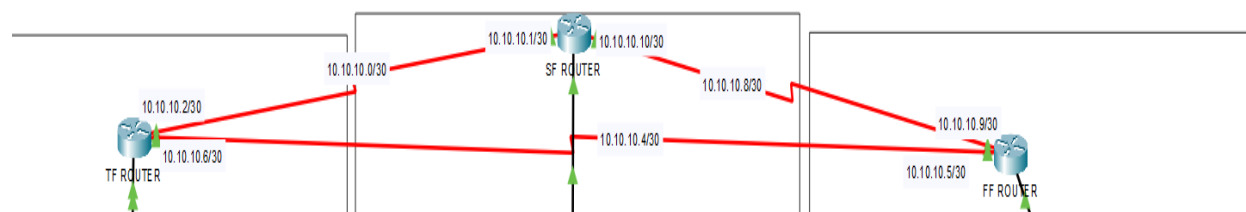
HOTEL MANAGEMENT NETWORK ARCHITECTURE:
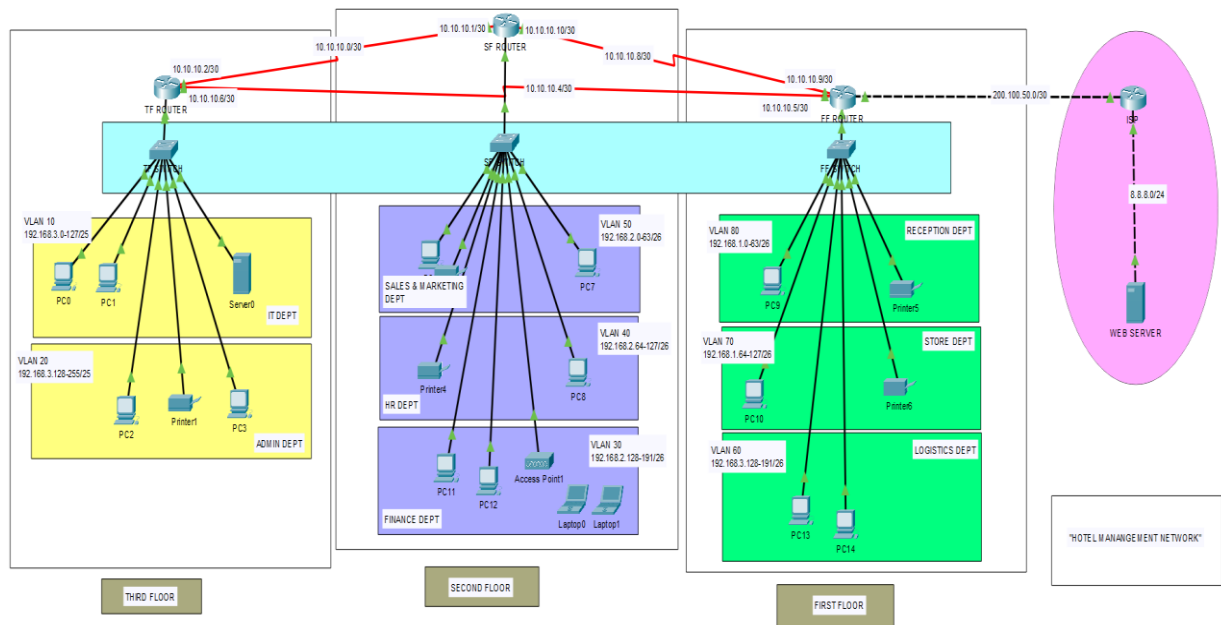
TEST OUTPUTS:
DHCP:

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
●	Successful	FF SW...	FIRST FLOOR ...	ICMP		0.000	N	0	(edit)	(delete)
●	Successful	SF SW...	SECOND FLO...	ICMP		0.000	N	1	(edit)	(delete)
●	Successful	TF SW...	THIRD FLOOR...	ICMP		0.000	N	2	(edit)	(delete)

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
●	Successful	PC6	PC8	ICMP		0.000	N	0	(edit)	(delete)
●	Successful	PC1	PC2	ICMP		0.000	N	1	(edit)	(delete)
●	Successful	PC11	PC13	ICMP		0.000	N	2	(edit)	(delete)
●	Successful	PC3	PC6	ICMP		0.000	N	3	(edit)	(delete)

FROM LOGISTICS DEPT TO RECEPTION:

PC13 — 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:

Request timed out.
Reply from 192.168.1.2: bytes=32 time<1ms TTL=127
Reply from 192.168.1.2: bytes=32 time=16ms TTL=127
Reply from 192.168.1.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 16ms, Average = 5ms

C:\>ping 192.168.1.65

Pinging 192.168.1.65 with 32 bytes of data:

Reply from 192.168.1.65: bytes=32 time<1ms TTL=255
Reply from 192.168.1.65: bytes=32 time=16ms TTL=255
Reply from 192.168.1.65: bytes=32 time<1ms TTL=255
Reply from 192.168.1.65: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.65:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 16ms, Average = 4ms

C:\>
```
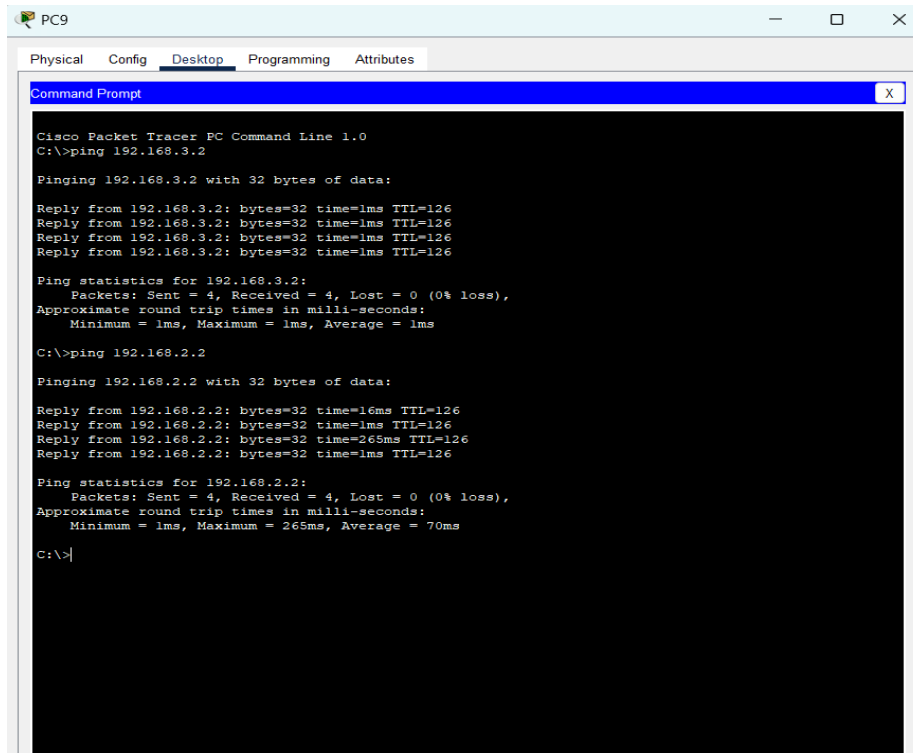
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FROM RECEPTION TO SALES AND MARKETING

CONCLUSION:

By implementing this network infrastructure, the hotel ensures efficient communication, robust security, and seamless access to essential services for guests and staff. The segmented STICK VLAN, DHCP and routing configuration, facilitate smooth operations across different departments while maintaining network integrity.