

**Title:Project report on Hotel system
network design**

**Under the course: Basic Computer
Networking**

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Abstract:

The Vic Modern Hotel network project aims to design and implement a computer network for a three-story hotel with different departments on each floor. The network will have three routers connecting each floor, and each floor will have a switch and wireless access points. Each department will have a printer and be in a different VLAN with its own subnet and IP address. OSPF will be used as the routing protocol, and DHCP will be used to assign IP addresses dynamically. SSH will be configured for secure remote access, and port security will be implemented on the IT-dept switch.

The project will be implemented using Cisco Packet Tracer and will involve hierarchical network design, inter-VLAN routing, and WLAN configuration. The end goal is to ensure that all devices in the network

can communicate with each other seamlessly. The hotel has three floors; in the first floor there three departments (Reception, store and Logistics), in the second floor there are three departments (Finance, HR and Sales).

Introduction about Project

The motivation behind the Vic Modern Hotel network project is to provide a robust and reliable computer network infrastructure for a hotel with different departments on each floor. A well-designed and implemented network can enhance the hotel's operations by improving communication, making it easier to seamless guest experience. This project aims to create a network that is secure, scalable, and easy to manage, ensuring that all devices in the network can communicate with each other efficiently. By using advanced technologies and best practices in network design and implementation, this project can provide a foundation for the hotel's technological needs and help it stay competitive in the hospitality industry.

Objectives

1. Design and implement a hierarchical network topology that meets the hotel's requirements.
2. Configure three routers to provide inter-floor connectivity using serial DCE cables and implement OSPF as the routing protocol.
3. Create VLANs for each department with their respective subnet and IP address.
4. Configure DHCP to assign IP addresses dynamically to devices on the network.
5. Implement inter-VLAN routing on the routers to allow communication between departments.
6. Configure SSH for secure remote access to the network devices.
7. Implement port security on the IT-dept switch to allow only authorized devices to access the network.
8. Create wireless networks for each floor and connect laptops and phones to them.
9. Test and verify network communication between devices in the network.
10. Document the network design and implementation process for future reference and troubleshooting.

These objectives aim to provide a stable and secure network infrastructure that meets the hotel's needs and is easily manageable. The project also aims to enhance the overall experience of the hotel guests and staff by providing a reliable and efficient network that supports their needs.

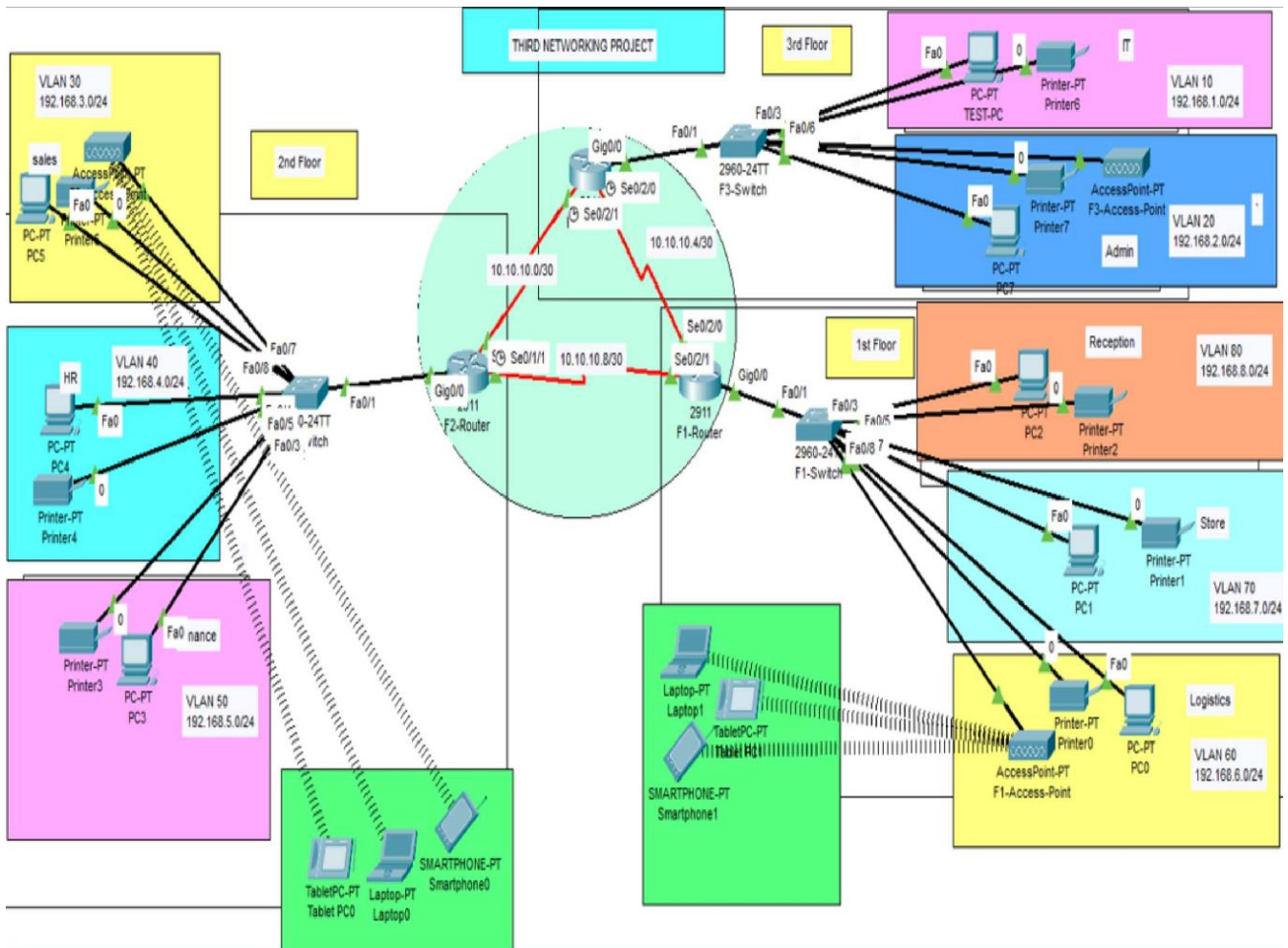
Tools and technologies used:

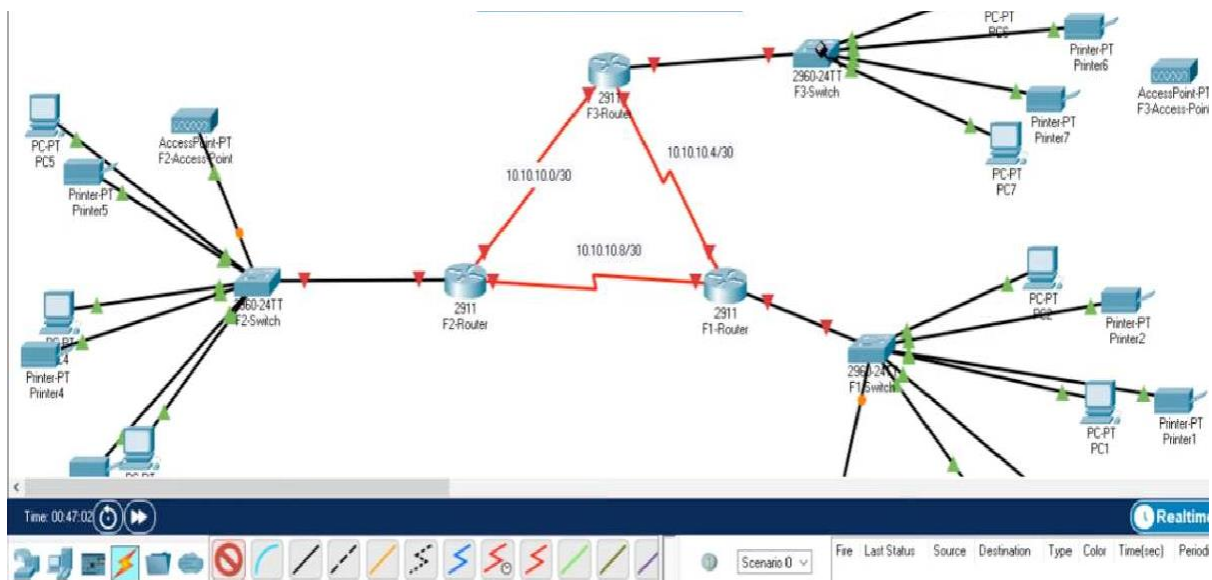
1. Cisco Packet Tracer - a network simulation tool that will be used to design, configure, and test the network topology.
2. Cisco routers - three routers will be used to connect the different floors of the hotel.
3. Cisco switches - one switch will be placed on each floor to connect the devices on that floor.
4. Cisco Access Point - to create wireless networks for each floor and connect laptops and phones.
5. OSPF - a routing protocol that will be used to advertise routes between the routers.
6. VLAN - to create different virtual networks for each department.
7. DHCP - to assign IP addresses dynamically to devices on the network.
8. SSH - to enable secure remote access to the network devices.
9. Port security - to limit access to the network by allowing only authorized devices.
10. Subnetting - to divide the IP address range into smaller subnetworks for each VLAN.

Methodology:

1. Requirements gathering: Gather requirements from the hotel management to understand their needs and expectations from the network infrastructure.
2. Design: Based on the requirements, design a hierarchical network topology that includes routers, switches, VLANs, wireless networks, and DHCP configuration.
3. Implementation: Implement the network topology using Cisco Packet Tracer. Configure routers, switches, VLANs, wireless networks, DHCP, and port security. Configure SSH for secure remote access to network devices.
4. Testing: Test the network to ensure that devices are able to communicate with each other across different departments and floors. Verify DHCP is working properly, and devices are receiving IP addresses dynamically. Ensure port security is working as expected and only authorized devices are able to access the network.
5. Documentation: Document the network design, configuration, and testing process for future reference and troubleshooting.

Project Snapshots:





IOS Command Line Interface

```

Router(config-subif)#ip address 192.168.8.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#
Router(config-subif)#
Router(config-subif)#ex
Router(config)#
Router(config)#
Router(config)#int gig0/0.70
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.70, changed state to up

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

Router(config-subif)#enc
Router(config-subif)#encapsulation d
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)#
Router(config)#
Router(config)#int gig0/0.60
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.60, changed state to up

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

Router(config-subif)#enc
Router(config-subif)#encapsulation d
Router(config-subif)#encapsulation dot1Q 60
Router(config-subif)#ip address 192.168.6.1 255.255.255.0
Router(config-subif)#

```

```
Request timed out.
Reply from 192.168.2.2: bytes=32 time<1ms TTL=127
Reply from 192.168.2.2: bytes=32 time=21ms TTL=127
Reply from 192.168.2.2: bytes=32 time<1ms 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 = 21ms, Average = 7ms

C:\>ping 192.168.6.2

Pinging 192.168.6.2 with 32 bytes of data:

Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.
Reply from 192.168.1.1: Destination host unreachable.

Ping statistics for 192.168.6.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss)

C:\>ping 192.168.6.2

Pinging 192.168.6.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.6.2: bytes=32 time=10ms TTL=126
Reply from 192.168.6.2: bytes=32 time=1ms TTL=126
Reply from 192.168.6.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.6.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss)
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 10ms, Average = 4ms
```

Project Outcomes:

1. A hierarchical network topology that connects different departments across different floors of the hotel.
2. Implementation of OSPF as the routing protocol to advertise routes between the routers.
3. Creation of different VLANs for each department with their own unique IP address range.
4. Configuration of DHCP servers on the routers to assign IP addresses dynamically to devices.
5. Configuration of SSH for secure remote access to network devices.
6. Implementation of port security on the switches to limit access to the network by allowing only authorized devices.
7. Creation of wireless networks for each floor to connect laptops and phones.
8. All devices in the network can communicate with each other.
9. Documentation of the network design, configuration, and testing process for future reference and troubleshooting.
10. Training for hotel staff on how to use and troubleshoot the network infrastructure.
11. Regular maintenance activities to ensure the network infrastructure is up-to-date and functioning correctly.

References: