**COMPUTER NETWORKS**

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**BSSEM-F22-246-5B**

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**Hotel Network System Documentation**

**1. Project Overview**

The **Hotel Network System** project demonstrates a network infrastructure for a hotel. The network connects various areas of the hotel, including offices, reception, security, server rooms, and provides internet access. The design ensures seamless communication, security, and accessibility for employees and guests.

**2. Objectives**

1. Provide a reliable and efficient network for the hotel's operations.
2. Enable communication between different departments (Reception, Security, Offices, and Server Room).
3. Ensure secure access to the internet for guests and employees.
4. Deploy essential servers for hotel management and operations.

**3. Network Design Overview**

**Logical Topology**

The network is segmented into different areas:

1. **Reception Area**
   * Hosts several PCs and phones connected via Switch3.
   * IP range: 192.168.5.0/24.
2. **Office Areas**
   * Divided into Office1 and Office2.
   * Connected through Switch1 and Switch4.
   * IP ranges: 192.168.1.0/24 (Office1) and 192.168.7.0/24 (Office2).
3. **Security Area**
   * Contains devices like PCs and phones for surveillance and security.
   * IP range: 192.168.18.0/24.
4. **Server Room**
   * Hosts DHCP, HTTP, and File Servers.
   * IP range: 192.168.9.0/24.
5. **Internet Access**
   * Internet is provided via Router3 and a cloud connection.

**4. Components**

**Devices**

1. **Routers:**
   * Router1: Connects Office1 and Server Room.
   * Router2: Interlinks Reception and Office2.
   * Router3: Gateway to the internet.
2. **Switches:**
   * Switch1, Switch2, Switch3, Switch4: Used to connect PCs, phones, and other devices in respective areas.
3. **Servers:**
   * DHCP Server: Automatically assigns IP addresses.
   * HTTP Server: Provides web services.
   * File Server: Stores and manages hotel data.
4. **End Devices:**
   * PCs: For staff use in all areas.
   * Phones: For internal and external communication.

**5. IP Addressing Scheme**

| **Area** | **IP Range** | **Subnet Mask** |
| --- | --- | --- |
| Reception | 192.168.5.0/24 | 255.255.255.0 |
| Office1 | 192.168.1.0/24 | 255.255.255.0 |
| Office2 | 192.168.7.0/24 | 255.255.255.0 |
| Security | 192.168.18.0/24 | 255.255.255.0 |
| Server Room | 192.168.9.0/24 | 255.255.255.0 |

**6. Configurations**

**Router Configurations**

Each router is configured with the following:

* **Interfaces**: Set up with IP addresses matching the assigned subnets.
* **Routing**: Use static or dynamic routing protocols like RIP or OSPF to connect the subnets.

**Switch Configurations**

* VLANs may be configured for security and traffic segregation.
* All ports are assigned to respective VLANs.

**Server Configurations**

* **DHCP Server**: Configured to assign IP addresses automatically in each subnet.
* **HTTP Server**: Configured with a hotel management web application.
* **File Server**: Stores guest data, employee records, and operational files.

**7. Security Measures**

1. Use **Access Control Lists (ACLs)** to restrict unauthorized access between subnets.
2. Configure **firewalls** to protect against external threats.
3. Enable **secure passwords** and encryption for all devices.
4. Use VLANs to isolate sensitive areas like the Server Room.

**8. Testing and Troubleshooting**

1. Verify connectivity between all devices using **ping** and **traceroute**.
2. Ensure proper IP allocation via DHCP.
3. Test internet access from all departments.
4. Simulate various failure scenarios to validate fault tolerance.

**9. Conclusion**

The hotel network design provides a robust and scalable solution for the hotel's operations. It supports efficient communication, secure operations, and reliable internet connectivity for both staff and guests.

