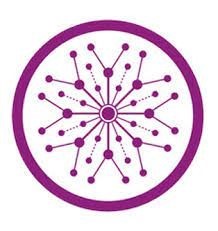
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**Superior University Gold Campus**

**CN LAB Project Documentation**

Hotel Management System

**Program:**

BS DATA SCIENCE

**Course Name:**

(Computer Network LAB)

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**Hotel Management System Network Documentation**

**Project Overview**

The Hotel Management System network is designed to provide robust and efficient communication for various departments within the hotel. The network is segmented into VLANs to ensure security and better traffic management for different floors and departments. This document provides an overview of the network design, topology, and VLAN configurations.

**Network Design**

**Topology**

The network is structured across three floors with departmental segregation. The core components include:

1. **Floor Routers:**
   * F1-Router (1st Floor)
   * F2-Router (2nd Floor)
   * F3-Router (3rd Floor)
2. **Switches:**
   * Each floor has switches connecting PCs, printers, and other devices.
3. **End Devices:**
   * PCs
   * Printers
4. **Network Interconnections:**
   * Routers are interconnected with IP address assignments for inter-floor communication.

**IP Addressing and VLANs**

**Network between the Routers**

|  |  |
| --- | --- |
| **Network** | **Subnet** |
| 10.10.10.0/30 | 10.10.10.0 - 10.10.10.3 |
| 10.10.10.4/30 | 10.10.10.4 - 10.10.10.7 |
| 10.10.10.8/30 | 10.10.10.8 - 10.10.10.11 |

**VLAN Assignments**

**1st Floor**

|  |  |  |
| --- | --- | --- |
| Department | VLAN | Network |
| Reception | 80 | 192.168.80.0/24 |
| Store | 70 | 192.168.70.0/24 |
| Logistics | 60 | 192.168.60.0/24 |

**2nd Floor**

|  |  |  |
| --- | --- | --- |
| Department | VLAN | Network |
| Finance | 50 | 192.168.50.0/24 |
| HR | 40 | 192.168.40.0/24 |
| Sales | 30 | 192.168.30.0/24 |

**3rd Floor**

|  |  |  |
| --- | --- | --- |
| Department | VLAN | Network |
| Admin | 20 | 192.168.20.0/24 |
| IT | 10 | 192.168.10.0/24 |

**Detailed Floor Configurations**

**1st Floor**

* **Departments:** Reception, Store, Logistics
* **Devices:**
  + Reception: PC7, Printer3
  + Store: PC6, Printer2
  + Logistics: PC8, Printer5
* **Router:** F1-Router

**2nd Floor**

* **Departments:** Finance, HR, Sales
* **Devices:**
  + Finance: PC5, Printer1
  + HR: PC2, Printer4
  + Sales: PC1, Printer11
* **Router:** F2-Router

**3rd Floor**

* **Departments:** Admin, IT
* **Devices:**
  + Admin: PC3, PC10, Printer6
  + IT: PC9, PC4, Printer7
* **Router:** F3-Router

**Communication and Security**

1. **VLAN Segmentation:**
   * Each department is assigned a unique VLAN to isolate traffic.
2. **Routing:**
   * Inter-VLAN routing is enabled through routers to facilitate communication between VLANs.
3. **IP Address Allocation:**
   * Each VLAN is assigned a unique subnet for addressing.
4. **Printer Sharing:**
   * Each department has dedicated printers accessible to its VLAN.

**Benefits of the Design**

1. **Improved Security:**
   * VLANs ensure isolation of departmental traffic.
2. **Scalability:**
   * Additional devices or VLANs can be added with minimal changes.
3. **Efficient Management:**
   * Segmented network simplifies troubleshooting and monitoring.
4. **Optimized Performance:**
   * VLANs reduce broadcast traffic, enhancing overall performance.

**Recommendations for Future Enhancements**

1. **Implement Network Redundancy:**
   * Add backup links between routers and switches.
2. **Introduce a Firewall:**
   * For enhanced network security.
3. **Deploy Monitoring Tools:**
   * Tools like SNMP for real-time network monitoring.
4. **Wireless Integration:**
   * Add access points for wireless connectivity in common areas.

**Conclusion**

The Hotel Management System network is designed to meet the operational needs of the hotel while ensuring security, scalability, and performance. The VLAN segmentation and structured IP addressing provide a robust foundation for current and future expansions.

**Commands Using in Project:**

**Network between the Routers**

10.10.10.0/30

10.168.10.4/30

10.10.10.8/30

**1st Floor;**

-Reception: VLAN 80, Network of 192.168.8.0/24

-Store: VLAN 70, Network of 192.168.7.0/24

-Logistic: 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

**F1 switch**

**VLAN:**

Int range fa0/4-5

Switchport mode mode access

Switchport mode access VLAN 80

Int range fa0/6-7

Switchport mode access

Switchport mode access VLAN 70

Int range fa0/8-10

Switchport mode access

Switchport mode access Vlan 60

**F2 switch VLAN**

Int range fa0/1-2

Switchport mode access

Switchport mode access Vlan 50

Int range fa0/3-5

Switchport mode access

Switchport mode access Vlan 40

Int range fa0/6-7

Switchport mode access

Switchport mode access Vlan 30

**F3 switch VLAN**

Int range fa0/8-9

Switchport mode access

Switchport mode access Vlan 20

Int range fa0/10-11

Switchport mode access

Switchport mode access Vlan 10

**F1-Router**

**Inter VLAN;**

Int gig0/0.80

encapsulation dot1q 80

ip address 192.168.8.1 255.255.255.0

ex

Int gig0/0.70

encapsulation dot1q 70

ip address 192.168.7.1 255.255.255.0

ex

Int gig0/0.60

encapsulation dot1q 60

ip address 192.168.6.1 255.255.255.0

ex

**DHCP:**

Service dhcp

Ip dhcp pool Reception

Network 192.168.8.0 255.255.255.0

Default-router 192.168.8.1

Dns-server 192.168.8.1

ex

Service dhcp

Ip dhcp pool Store

Network 192.168.7.0 255.255.255.0

Default-router 192.168.7.1

Dns-server 192.168.7.1

Ex

Service dhcp

Ip dhcp pool Logistics

Network 192.168.6.0 255.255.255.0

Default-router 192.168.6.1

Dns-server 192.168.6.1

ex

**F2-Router**

**Inter VLAN;**

Int gig0/0.50

encapsulation dot1q 50

ip address 192.168.5.1 255.255.255.0

ex

Int gig0/0.40

encapsulation dot1q 40

ip address 192.168.4.1 255.255.255.0

ex

Int gig0/0.30

encapsulation dot1q 30

ip address 192.168.3.1 255.255.255.0

ex

**DHCP :**

Service dhcp

Ip dhcp pool Reception

Network 192.168.5.0 255.255.255.0

Default-router 192.168.5.1

Dns-server 192.168.5.1

ex

Service dhcp

Ip dhcp pool Store

Network 192.168.4.0 255.255.255.0

Default-router 192.168.4.1

Dns-server 192.168.4.1

Ex

Service dhcp

Ip dhcp pool Logistics

Network 192.168.3.0 255.255.255.0

Default-router 192.168.3.1

Dns-server 192.168.3.1

Ex

**F3-Router**

**Inter VLAN;**

Int gig0/0.20

encapsulation dot1q 20

ip address 192.168.2.1 255.255.255.0

ex

Int gig0/0.10

encapsulation dot1q 10

ip address 192.168.1.1 255.255.255.0

ex

**Routing Using OSPF**

**F1-Router**

Router ospf 10

Network 10.10.10.8 255.255.255.252 area 0

Network 10.10.10.10.4 255.255.255.252 area 0

Do wr

Network 192.168.8.0 255.255.255.0 area 0

Network 192.168.7.0 255.255.255.0 area 0

Network 192.168.6.0 255.255.255.0 area 0

**Routing Using OSPF**

**F2-Router**

Router ospf 10

Network 10.10.10.8 255.255.255.252 area 0

Network 10.10.10.10.0 255.255.255.252 area 0

Do wr

Network 192.168.5.0 255.255.255.0 area 0

Network 192.168.4.0 255.255.255.0 area 0

Network 192.168.3.0 255.255.255.0 area 0

**Routing Using OSPF**

**F2-Router**

Router ospf 10

Network 10.10.10.0 255.255.255.252 area 0

Network 10.10.10.10.4 255.255.255.252 area 0

Do wr

Network 192.168.2.0 255.255.255.0 area 0

Network 192.168.1.0 255.255.255.0 area 0

Do wr