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**Superior University Gold Campus**

**Project**

**Concentrix Ltd Network**

**Program:**

BS DATA SCIENCE

**Course Name:**

(Computer Network Lab)

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**Concentrix Ltd Network**

**Overview**

This document outlines the components and architecture of a multi-floor network infrastructure designed to provide connectivity for various departments and devices. The network includes multiple VLANs, routers, switches, PCs, servers, and printers to ensure efficient communication and segmentation.

**Network Components**

**1. Devices**

* **PCs (Personal Computers):**
  + PCs labeled PC0, PC1, PC2, PC3, etc., are distributed across different VLANs and physical locations such as floors or rooms.
* **Laptops:**
  + Devices labeled Laptop0, Laptop1, etc., connect to the network, primarily on VLAN 40.
* **Printers:**
  + Printers, such as Printer0, Printer1, and Printer2, are located in different segments for printing services.
* **Servers:**
  + Server0 and Server1 serve as central resources for network services like DHCP, DNS, or application hosting.

**2. Switches**

* Managed switches, such as 2960-24TT Switch0, Switch1, Switch2, etc., are deployed to aggregate and forward traffic within VLANs and to other network segments.

**3. Routers**

* **2911 Routers:**
  + Devices such as Router1, Router2, and Router3 connect different subnets and VLANs and provide routing between them.

**VLAN Configuration**

The network uses VLANs to segment traffic and improve performance and security. Key VLAN details:

* **VLAN 10:**
  + Devices: PCs and laptops on specific switches.
  + IP Range: 192.168.1.x/24.
  + Configuration: Associated with specific ports on switches for traffic isolation.
* **VLAN 30:**
  + Devices: PCs PC4, PC5, and PC8.
  + IP Range: 192.168.3.x/24.
* **VLAN 40:**
  + Devices: PC15, PC16, Printer1, Laptop1.
  + IP Range: 192.168.4.x/24.

**IP Addressing and Subnetting**

The network employs a structured IP addressing scheme:

* **Server Room (Ground Floor):**
  + Subnet: 192.168.1.1/24.
* **2nd Floor:**
  + Subnet: 192.168.2.1/24.
* **3rd Floor:**
  + Subnet: 192.168.3.1/24.
* **4th Floor (Employee Room):**
  + Subnet: 192.168.4.1/24.

**DHCP and DNS Configuration**

* **DHCP Server (Server0):**
  + Provides dynamic IP addresses for devices on the ground floor and ensures non-conflicting address assignments.
  + Excluded IP range: 192.168.1.2 - 192.168.1.10.
* **DNS Server:**
  + External DNS configured as 8.8.8.8.

**Trunking and Routing**

* **Trunk Ports:**
  + Specific ports configured in trunk mode to allow inter-VLAN communication.
* **Routing:**
  + Routers interconnect VLANs, with routing tables facilitating communication between subnets.

**Floor-wise Distribution**

* **Ground Floor:**
  + Server Room hosting central resources (e.g., Server0, Switch0).
* **2nd Floor:**
  + Workstations (PC2, PC3) and Printer0.
* **3rd Floor:**
  + PCs PC4, PC5, and PC8.
* **4th Floor:**
  + Employee Room devices, including PC15, PC16, Laptop1, and Printer1.

**Key Configuration Commands**

**VLAN Setup Example:**

plaintext

Copy code

interface fa0/1

switchport mode access

switchport access vlan 10

**Trunk Configuration Example:**

plaintext

Copy code

interface fa0/7

switchport trunk mode

**Notes**

* The diagram also provides visual labeling for room names such as "Server Room Ground Floor," "Admin Room," and "Employee Room."
* Ensure all switch and router configurations align with the defined VLAN and IP schema.