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**Section: 5-A**

### Lab 10 - Task

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**Task Task 1;**

**Research about Topics for Project and submit a deliverables document having:**

**• Organization Name**

**•Number of Floors of the Organization**

**• Number of PC / Server in the system**

**Network Description**

1. **Topology Overview**:
   * The topology uses a combination of **hierarchical and VLAN-based segmentation**.
   * Multiple switches (Layer 2) connect different VLANs, and a router (Layer 3) facilitates inter-VLAN communication.
   * Each VLAN appears to be associated with a distinct department, location, or purpose.
2. **Key Components**:
   * **Router (Router0)**:
     + Acts as the main Layer 3 device for inter-VLAN communication.
     + Likely uses **Router-on-a-Stick** configuration with sub interfaces for each VLAN.
   * **Switches**:
     + Three main Layer 2 switches are visible, each connected to a unique VLAN.
     + Additional switches and a hierarchical setup are used for extended network connectivity.
   * **End Devices**:
     + PCs and other devices (e.g., a printer) are connected to VLAN-specific switches.

**Detailed Breakdown of the Network**

1. **VLAN Segmentation**:
   * **VLAN 10**:
     + Devices: PC0, PC1, PC2
     + Likely represents **Department 1** or **Floor 1**.
   * **VLAN 20**:
     + Devices: PC3, PC4, PC5
     + Likely represents **Department 2** or **Floor 2**.
   * **VLAN 30**:
     + Devices: PC6, PC7, PC8
     + Likely represents **Department 3** or **Floor 3**.
2. **Network Connectivity**:
   * **Trunk Links**:
     + Switches are connected to the router via trunk links, allowing multiple VLAN traffic to pass over a single physical connection.
   * **Uplink to Router**:
     + All VLANs route traffic through Router0, which performs inter-VLAN routing.
   * **Additional Connections**:
     + Several other PCs (PC9-PC24) and devices are connected to a separate section of the network.
3. **Hierarchical Design**:
   * A multi-tiered approach is used:
     + **Access Layer**: PCs connect to access-layer switches.
     + **Distribution Layer**: Switch-to-switch connections aggregate traffic.
     + **Core Layer**: Router manages the traffic for all VLANs and connects to other external networks.

**Possible Network Applications**

1. **Inter-VLAN Communication**:
   * Traffic between VLANs (e.g., PC0 in VLAN 10 communicating with PC3 in VLAN 20) is routed by the router.
2. **Printer Sharing**:
   * A shared printer is visible, indicating that all VLANs may use it, depending on routing rules.
3. **Additional External Connections**:
   * The network connects to other external routers (Router1 and Router2), suggesting:
     + Connection to an external WAN or another branch.
     + Potential for internet access or cross-site communication.

**Suggestions for Improvement**

1. **Scalability**:
   * If the network grows, additional Layer 3 switches can be used for distribution to reduce the load on the central router.
2. **Security**:
   * Access Control Lists (ACLs) can be implemented to control inter-VLAN traffic.
3. **Redundancy**:
   * Spanning Tree Protocol (STP) can be configured to prevent loops and improve fault tolerance.
   * Link aggregation can be used for redundancy on trunk links.

**Summary**

The network depicted in the image is a well-structured and VLAN-segmented topology designed for a multi-floor or multi-department organization. It supports inter-VLAN communication, shared resources (e.g., printer), and external connectivity. With 3 VLANs mapped to different departments or floors, the topology balances segmentation and centralized routing efficiently.