**DOCUMANTATION**

**CN LAB**

**Punjab College Management System Network Design**

**1. Introduction**

The Punjab College Management System (PCMS) is a robust network infrastructure designed to interconnect various departments and branches within Punjab College. The objective is to provide secure, high-speed communication, centralized resource management, and streamlined operations across the institution. This documentation outlines the architecture, components, and functionality of the network.

**2. Network Design Overview**

**2.1 Purpose**

The network aims to:

* Facilitate inter-departmental communication.
* Provide centralized data management and resource sharing.
* Support scalability for future expansion.

**2.2 Network Topology**

The design employs a hybrid topology incorporating both star and hierarchical structures. Key nodes include:

* **Core Layer:** Centralized routers connecting branches.
* **Distribution Layer:** Switches connecting departmental servers and devices.
* **Access Layer:** End-user devices like PCs and printers.

**2.3 Tools Used**

The design is created using advanced simulation tools such as Cisco Packet Tracer and is scalable for real-world implementation.

**3. Key Components**

**3.1 Core Devices**

* **Routers:** High-performance routers interconnect branches and manage inter-campus communication.
* **Servers:** Centralized database and application servers support college operations like attendance tracking, examination systems, and record management.

**3.2 Distribution Devices**

* **Switches:** Layer-2/3 switches connect local devices within departments.
* **Firewalls:** Security devices safeguard the network from unauthorized access.

**3.3 Access Layer Devices**

* **PCs and Printers:** Provide user-level access for staff and students.
* **Wi-Fi Access Points:** Enable wireless connectivity within the campus.

**4. Functional Description**

1. **Branch Communication:** The core layer ensures seamless connectivity between campuses using dedicated links.
2. **Departmental Networks:** Each department has isolated subnets for better traffic management.
3. **Security:** Firewalls and VLANs protect sensitive data from breaches.
4. **Scalability:** Additional devices and campuses can easily integrate into the existing framework.

**5. Network Features**

* **High Availability:** Redundant links ensure uninterrupted operations.
* **Centralized Control:** Central servers provide unified management of data and applications.
* **Enhanced Security:** Firewalls and authentication protocols safeguard information.
* **Efficient Resource Sharing:** Printers, servers, and applications are accessible to all authorized users.

**6. Conclusion**

The Punjab College Management System network is a scalable, secure, and efficient design tailored to the needs of the institution. Its robust architecture supports current operations and allows for future growth, making it an ideal solution for modern educational environments.

**THE END**