

SAYLANI SMIT NETWORK DESIGN
BSCS 4th | B
CS-406
DATA COMMUNICATION AND NETWORKS
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PROJECT DESCRIPTION

The Sayani Mass IT University Network Design project aims to establish a reliable, secure, and efficient network infrastructure to support the university's operations and connectivity requirements across its campuses. The project encompasses the design and implementation of a comprehensive network solution, considering the diverse needs of the university's departments, faculties, staff, and students.

Scope

The scope of the Sayani Mass IT University Network Design project includes connecting the Main Campus and the Smaller Campus, implementing a hierarchical network design with VLAN segmentation, configuring inter-VLAN routing, setting up a DHCP server, implementing security measures, deploying RIPv2 as the routing protocol, and configuring servers. The goal is to establish efficient and secure communication, optimize resource utilization, and provide documentation for future maintenance.

Deliverables

The project will deliver a fully functional network infrastructure that includes interconnected campuses, VLAN segmentation, inter-VLAN routing, DHCP server configuration, security measures, routing protocol implementation, and server setup. Network documentation, including network diagrams, IP addressing scheme, and configuration details, will also be provided for future reference and maintenance.

Conclusion

The Sayani Mass IT University Network Design project aims to establish a robust network infrastructure that supports the university's connectivity requirements. The implementation of VLANs, inter-VLAN routing, DHCP services, security measures, and a hierarchical design will ensure efficient communication, secure data transmission, and optimal resource utilization. The successful completion of this project will contribute to enhancing the university's operational efficiency, collaboration, and overall network performance.

OBJECTIVE

The primary objective of the project is to design a comprehensive network infrastructure for Sayani Mass IT University that supports the following goals:

- **Connectivity:** Establish a reliable and high-performance network infrastructure that enables seamless connectivity among the university's campuses, departments, faculties, and staff.
- **Department/Faculty Segregation:** Implement VLANs to ensure network segregation and secure communication between different departments and faculties. Each department/faculty will have its own separate IP network to maintain privacy and security.
- **Inter-VLAN Routing:** Enable inter-VLAN routing using L3 switches to facilitate communication between different departments and faculties while maintaining appropriate access controls and security measures.
- **DHCP Functionality:** Configure a router-based DHCP server to dynamically assign IP addresses to devices within the Building A VLANs, ensuring efficient network management and IP resource allocation.
- **Routing and External Connectivity:** Implement RIPv2 as the internal routing protocol to enable efficient routing of network traffic between the main campus routers. Configure static routing on the external router to establish connectivity with the external cloud-based email server.
- **Web Server Hosting:** Set up the university's web server within the IT department on the smaller campus, allowing students and staff to access online services and information conveniently.

The overall objective of the project is to create a robust and scalable network infrastructure that supports the university's operations, facilitates effective communication, enhances security, and provides reliable connectivity for students, staff, and faculty across different departments and campuses.

NETWORK DESIGN

The Sayani Mass IT University network design project aims to establish a robust and secure network infrastructure to support the university's operations and connectivity requirements across its two campuses: the Main Campus and the Smaller Campus. The network design encompasses the following key aspects:

Main Campus:

The Main Campus comprises three buildings: Building A, Building B, and Building C.

- **Building A** houses the administrative staff departments, including management, HR, and finance, as well as the Faculty of Artificial Intelligence. VLANs are implemented to ensure network segregation and secure communication. PCs are distributed in building offices to facilitate efficient collaboration.
- **Building B** is dedicated to the Faculty of Blockchain Studies and the Faculty of IoT Studies, fostering interdisciplinary collaboration and knowledge sharing.
- **Building C** hosts students' labs and the Cloud Native Faculty. It also accommodates an external cloud-based email server for seamless email communication.

Smaller Campus:

The Smaller Campus is home to the IT department and staff labs. It serves as the central hub for network management and houses the university's web server and other essential internal servers, ensuring smooth internal IT operations.

- **IT Department:** The IT department acts as the central hub for network management and houses the university's web server and other essential internal servers.

The Sayani Mass IT University network design project creates a scalable, secure, and efficient network infrastructure that meets the university's connectivity needs. It fosters collaboration, enables seamless communication, and enhances network management capabilities. By implementing VLANs, inter-VLAN routing, DHCP, secure access, and robust routing protocols, the network design ensures reliable and secure connectivity for students, staff, and faculty across different departments and campuses.

OUTCOME

