🏦 Bank Network Design and Implementation Project Report

# 📌 Project Objective

The purpose of this project is to design and implement a secure, segmented, and functional network infrastructure for a bank using Cisco Packet Tracer. The implementation follows best practices for enterprise network design, emphasizing modularity, scalability, and security.

# 🧱 Network Design Overview

- Hierarchical Design: The network follows a three-layer model—core, distribution, and access layers—to enhance performance and manageability.  
- VLAN Segmentation: Each department is assigned a unique VLAN to isolate broadcast domains and enhance security.  
- Inter-VLAN Routing: Configured using router-on-a-stick, allowing communication between VLANs.  
- DHCP and DNS Servers: Centrally configured for automatic IP assignment and internal name resolution.  
- Wireless Networks: Each department includes a wireless access point with WPA2 security for mobile connectivity.  
- Security Features:  
 - Port Security with sticky MAC to limit unauthorized access.  
 - SSH Access for secure device management.

# ⚙️ Key Configurations

- VLANs: Implemented for departments such as Finance, HR, IT, and Customer Service.  
- DHCP: Configured on a centralized server, with relay support (ip helper-address) on the router interfaces.  
- Wireless Setup: Separate SSIDs per department; WPA2-PSK encryption.  
- Device Configuration: Hostnames, banners, password encryption, domain lookup disabled, and secure remote login.

# 📡 Network Screenshot

\*(Replace with an actual screenshot from your simulation)\*

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# ✅ Testing and Validation

- DHCP Test: All PCs obtain IP addresses dynamically.  
- Ping Tests: Devices in different VLANs can communicate.  
- Wireless: Laptops connect to the appropriate SSIDs and access internal resources.  
- Security Test: Unauthorized MAC addresses trigger port-security violations.

# 📘 Conclusion

This project demonstrates the complete design and simulation of a bank network that incorporates VLANs, inter-VLAN routing, wireless access, DHCP/DNS services, and security protocols. The result is a robust and secure network suitable for a modern banking environment.