Project Documentation - Small Office Network

1.1 Introduction

This project aims to design and implement a network infrastructure suitable for a small business operating across two physical sites: a headquarters and a branch office. The network will provide reliable connectivity for employees, enable automatic IP address assignment through DHCP, allow remote device management via Telnet, and ensure communication between the two sites using static routing. This documentation outlines the project's objectives, scope, equipment requirements, network design, configuration details, and testing procedures to deliver a fully functional and scalable networking solution.

1.2 Project Objective

The objective of this project is to develop a network that efficiently connects all users within and across both locations, simplifies network management, and provides remote administrative access. The project focuses on providing dynamic IP addressing to end-user devices, ensuring secure and organized device management through Telnet, and enabling inter-site communication via a statically routed WAN connection.

1.3 Project Scope

The network infrastructure will connect approximately fifty employee workstations distributed between the headquarters and the branch office. At each site, a router will connect to a switch, and the switch will connect to all PCs. DHCP services will be configured on the routers to automatically assign IP addresses to client devices, reducing the administrative burden. Static routing will be configured to allow seamless communication between the two sites over a point-to-point serial connection. Telnet access will be enabled on all routers and switches to facilitate centralized management from any administrative computer.

1.4 Network Design Overview

At the headquarters, the router will connect directly to a switch, which in turn will connect to all PCs. Similarly, at the branch office, a router will connect to a switch, which will provide access to all branch PCs. DHCP services will be provided locally at each site through their respective routers. The headquarters router and the branch router will be interconnected using a serial WAN link, with static routes manually configured to enable communication between the two networks. Telnet services will be configured on all network devices to allow remote administrative access.

1.5 Bonus VLAN Implementation at Branches

As an additional challenge, you have the opportunity to earn a bonus by implementing **VLANs** at the branch office. This will require you to segment the network based on teams or departments within the branch, just like the headquarters. The VLAN configuration will enhance network organization and security.

Instructions:

1. **VLAN Setup at the Branch**: Configure VLANs at the branch, just like for the headquarters. You can create one VLAN per department or team, such as:
    - VLAN 10: HR Team
    - VLAN 20: IT Team
    - VLAN 30: Sales Team
    - Each VLAN should have its own subnet for IP addressing

1.6 Groups and Discussion

- Each group will consist of **5 members** minimum 2 from your group

- **Roles** should be divided within each team to cover different aspects of the network configuration (DHCP, Static Routing, Telnet, VLAN setup, etc.). each team member should present his work clearly

- Each group will work together to ensure the correct configuration of the entire network and will have **20 minutes** to present their work.

1.7 Avoid Cheating and Copying

It is crucial that each group **designs and configures their own unique network** based on the project requirements. **Plagiarism or copying** from other teams will not be tolerated and will result in a **zero** grade for the project. Every team is expected to come up with their own configuration, solutions, and designs.

- **Original Work**: Each group's network configuration must be based on their own creativity and the requirements of the project. While you can discuss concepts and general approaches, the actual design and implementation should be done individually within your group.

- **No Shared Configurations**: Sharing or copying network setups between groups will result in disciplinary actions, including a **zero grade** for all involved parties. Each network must reflect the understanding and effort of the group members.

- **Collaboration within Groups**: You are encouraged to work together within your group to solve problems and come up with the best configuration, but **each group must have a unique solution**.

- **Check Your Work**: Before submission, make sure that your configuration is original and that it aligns with your own team's understanding and design approach. Repeating the same network design as another group will lead to the project being disqualified.

1.8 Discussion Schedule:

- **Discussion Starting Date**: **May 4, 2025**
- **Project Grade : 10 Marks**
- **Discussion Duration**: Discussions will take place **throughout the week** in your designated sections.

1.9 Important Dates & Information:

- **Project Discussion Date**: **May 4, 2025**
- **Discussion and Presentations**: **All week** from May 4–May 8, 2025.
- **Final Submission Deadline**: Next week
