University of Dhaka

Department of Computer Science and Engineering

CSE-3111 : Computer Networking Lab

Project Report : **TalkSync** A Real-Time Messaging Application

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1 Introduction

To maintain connections with friends, share important documents, collaborate on projects, and exchange ideas effectively, reliable messaging platforms are essential. In this regard, **TalkSync** emerges as an excellent tool for online interaction and communication.

1.1 Objectives and Motivation

The main goal of **TalkSync** is to create a real-time messaging application, which will provide functionalities such as group and private chat options, alongside robust file-sharing capabilities. This project is driven by the ambition to elevate the demand for a secure and efficient communication platform.

2 Technology to be used

- **SvelteKit:** The user interface or frontend will be developed using SvelteKit web framework
- **Python:** Python will be used in the implementation of the server and backend logic
- **PocketBase:** To store and manage data, and user authentication, we will use PocketBase

3 Features to be built

- **Group Chat:** Users will be able to create and join public chat rooms for group discussions.
- **Private Chat:** Users can engage in private conversations with friend ensuring privacy and security.
- **File Sharing:** The application will support the seamless sharing of various file types, allowing users to exchange documents, images, videos, and more within chats.
- **User Authentication:** Secure user authentication and authorization mechanisms will be implemented.

- **Message Encryption:** Messages exchanged within the application will be encrypted to enhance security and protect user privacy.
- User Profiles: Users will have customizable profiles where they can manage their personal information, preferences, and privacy settings.
- **Real-Time Updates:** The application will provide real-time updates for message notifications, user status changes, and new file uploads.
- **Responsive Web Interface:** The web interface will be designed to be responsive, ensuring optimal usability across various devices and screen sizes.

4 Networking concepts to be used

- **Socket Programming:** Socket programming will be used to establish and maintain connections between the server and clients, enabling real-time communication.
- **TCP/IP Protocol:** Transmission Control Protocol/Internet Protocol (TCP/IP) will be used for reliable data transmission over the network.
- **Client-Server Architecture:** The application will follow a client-server architecture, where the server acts as a central hub for managing communication and data exchange between multiple clients.
- **HTTP protocol:** HTTP requests will be sent to the pocketbase database to store all data. And importantly, the connection between the server and the client side processes will be established using this protocol.

5 Prospective Applications

- **Educational Platform:** Students can use **TalkSync** for group discussions like study discussions, group project discussions, sharing important file notes, and other necessary resources.
- **Enterprise Communication: TalkSync** can be used in organizations to facilitate internal communication among employees, teams, and departments.

- **Remote Collaboration: TalkSync** can be used by remote teams and freelancers to communicate, coordinate tasks, and share files effectively.
- **Online Communities: TalkSync** can serve as a platform for online communities and interest groups to engage in discussions, and share knowledge.