

Team project proposal: Multiprocess-Based Chat System with Socket Communication

Team member: 2020320126 LEE WonJun, 2021270131 Lee Seo Jun, 20222200056 An Chae Won, 2022320119 Aisyah Humaira Binti Anuar

Project overview

This project aims to implement a **CLI-based** chat server and client under the Linux environment using multithreading or multiprocessing. Multiple users can connect simultaneously, exchange messages, and maintain a stable chat experience by leveraging network communication and concurrency techniques (threads or processes).

Objectives

- **Enhance the ability to implement real-time communication technology:** Use socket programming to build a reliable and reliable real-time chat system.
- **Design and implement multi-process architecture:** Design and apply a multiprocess-based structure for efficient data processing for servers and clients.
- **Reliable Network Communication:** Implement stable communication channels between server and clients using TCP/UDP socket programming. Handle errors and special cases (e.g., connection failures, disconnections) through well-defined exception handling.
- **Inter-process Communication (IPC):** Employ shared memory, pipes, or message queues for efficient data sharing between processes.

Key features

- **Real-Time Messaging**
- **Multithreading/Multiprocessing Support**
- **Optional User Authentication**

Benefits and practicality

- **Hands-On Network Programming Experience:** Strengthen knowledge in socket programming, concurrency, and synchronization techniques through direct implementation.
- **Enhanced Concurrency Control Skills:** Gain deeper insights into resource management (mutexes, semaphores) and thread management required for stable real-time messaging under heavy loads.
- **Scalability:** Build a strong foundation for adding features like file transfer, AI chatbots, or additional security layers, ensuring the project can evolve further.
- **Educational and Real-World Application:** Acquire skills relevant to designing enterprise chat systems or internal messenger solutions, which makes this project highly valuable for both learning and practical use.