TWMailer Pro

January 14, 2023

1 Authors

- Raza Ghulam
- Skyler Mayfield

2 Architecture

TWMailer Pro is a client / server application written in C++.

2.1 Client

The client is the interface between the user and the server. When started, the client attempts to connect to the server at the address given by the user at the command line. Assuming that the connection can be made successfully, the client then presents a login interface to the user. If login is successful, the client reads and parses input from the user, sending it to the server according to the protocol specification. Finally, if the user wishes to quit the application, the client gracefully closes the connection and exits.

2.2 Server

The server is the control center, responsible for filesystem operations and network concerns (specifically the usage of LDAP). The server first attempts to create and bind a socket. Next, it waits for clients to connect. Each new connection is handled in a thread of its own. After establishing a connection to a client, the server communicates back and forth with the client, listening to the commands and acting on them. The response generated while acting on commands is then sent to the client and the loop repeats.
The logic for handling the commands themselves is delegated to a `CommandHandler` class. The entry point of the class is the `parseInput` method. This method takes the input from the client and parses it line-by-line, passing the relevant parts to the correct methods. All commands are executed in a per-user context.

3 Technologies

- GNU/Linux
- GNU Compiler Collection
- GNU Make
- C/C++ standard libraries

- openldap2

4 Strategy

Adapting the basic version of the TWMailer required several concrete improvements, in no particular order:

- Inclusion of the LDAP libraries in the build chain
- login logic on the client side
- login logic on the server side
- preparation and use of an LDAP connection on the server side
- additional data structures for use in a multi-threaded context
- implementation of multithreading on the server side
- implementation of blacklisting logic on the server side
- small improvements to the code quality across the project
- bug fixes