

**Project Title:** P2P Chat Application

**Course:** CMP 2204 (2)

**Group Name:** Dot Slash

**1st Student Name and Number:** Oğuz Yavuz 2202562

**2nd Student Name and Number:** Mehmet Efe Çakır 2201123

**Workload:** Service\_Announcer and Peer\_Discovery - Oğuz Yavuz / Chat\_Initiator and Chat\_Responder - Mehmet Efe Çakır

**Operating System:** macOS (Oğuz Yavuz), Windows (Mehmet Efe Çakır)

**Challenges:**

1. In the project, encryption was handled using the pyDes library, which returns encrypted data as a sequence of bytes. However, when sending data over a socket using JSON, all transmitted data must be in string format, since JSON does not support raw bytes. This mismatch caused a problem: directly inserting the encrypted bytes into a JSON message would either fail or result in unreadable data. To solve this, the encrypted bytes were first encoded using Base64, which converts binary data into a plain text string that is safe to include in a JSON object. On the receiving side, the Base64 string is decoded back into the original bytes before decryption. This approach ensures that encrypted messages remain compatible with JSON transmission while preserving the full integrity of the data.
2. In the project, sending and receiving messages could happen very quickly and sometimes at the same time, which created a risk when writing logs. If the program tried to use `json.dump()` directly on the entire log file every time, it could accidentally overwrite existing logs, especially if multiple events happened nearly simultaneously. This would cause log loss or even corrupt the whole logs.son file. To solve this problem, the project used `f.write(json.dumps(log) + "\n")` instead. This method appends each new log entry as a separate line without touching the previous ones. It ensures that even if multiple messages are processed quickly, all logs are safely added to the end of the file without collisions or overwrites. This approach keeps the logging fast, safe, and consistent even under active communication.