CMP2204 – Peer‑to‑Peer Chat: Development Report

Platform & Toolchain

• **Operating System:** Windows 11 Pro
• **Language & Runtime:** Python 3.11 (64-bit)
• **Libraries:** tkinter (GUI), socket (network), pyDes (crypto), python-docx (report)
• **Network Analysis:** Wireshark 4.2

Group Members & Workload Division

Member	ID	Main Responsibilities
Mehmet Taha Dogan	2200299	Core networking logic, UDP announcer & TCP responder
Sasan Shafieimatanagh	2250390	Encryption layer (Diffie-Hellman + 3-DES) & secure chat
İbrahim Umut Üstündağ	2367093	Tkinter GUI, presence tracking & event logging
Şerif Botan Kapçuk	2261083	Testing, Wireshark capture, documentation & packaging

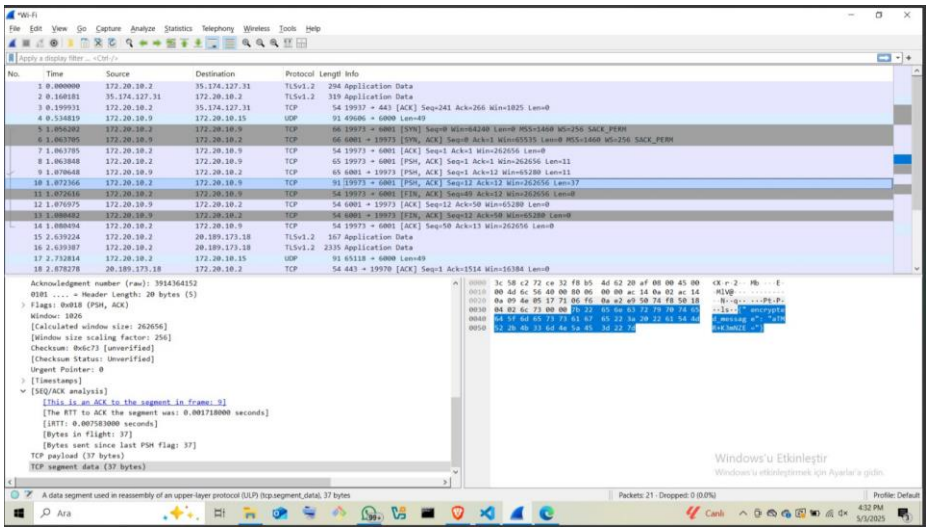
Key Challenges Encountered

1. **UDP Broadcast on Windows 11:** Default firewall rules blocked outgoing broadcasts; resolved by adding an app rule.
2. **Thread Coordination:** Ensuring GUI thread remained responsive while three worker threads (announce, listen, respond) were alive.
3. **Handshake Race-Condition:** Occasional dead-lock when both peers started DH key-exchange simultaneously; fixed by ordering the initiator/acceptor roles.
4. **Packet Size vs. MTU:** Early tests exceeded the Wi-Fi MTU after Base-64 wrapping; trimmed JSON payload.

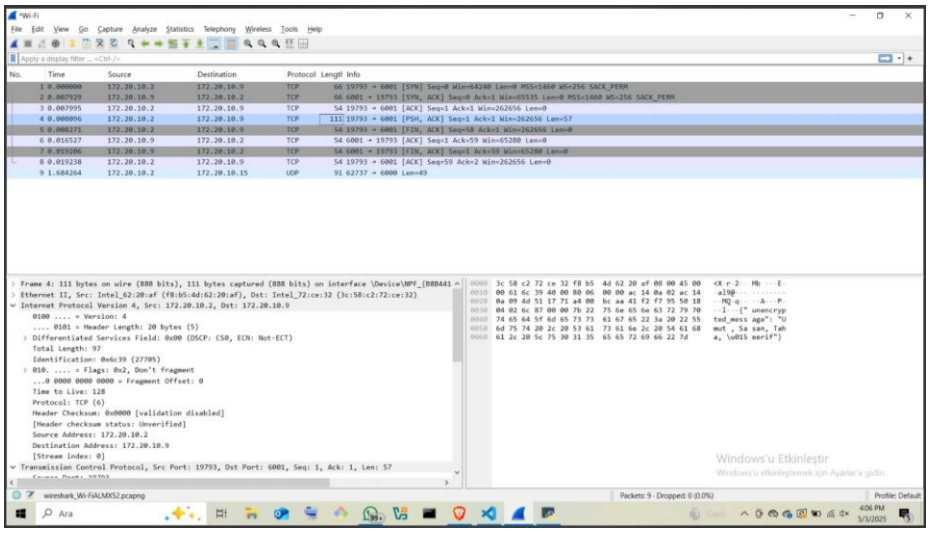
Wireshark Evidence

Below are raw captures showing one **encrypted** and one **unencrypted** message exchange within the LAN.

Encrypted Message (secure chat):



Unencrypted Message (plain chat):



Report generated on 03 May 2025.