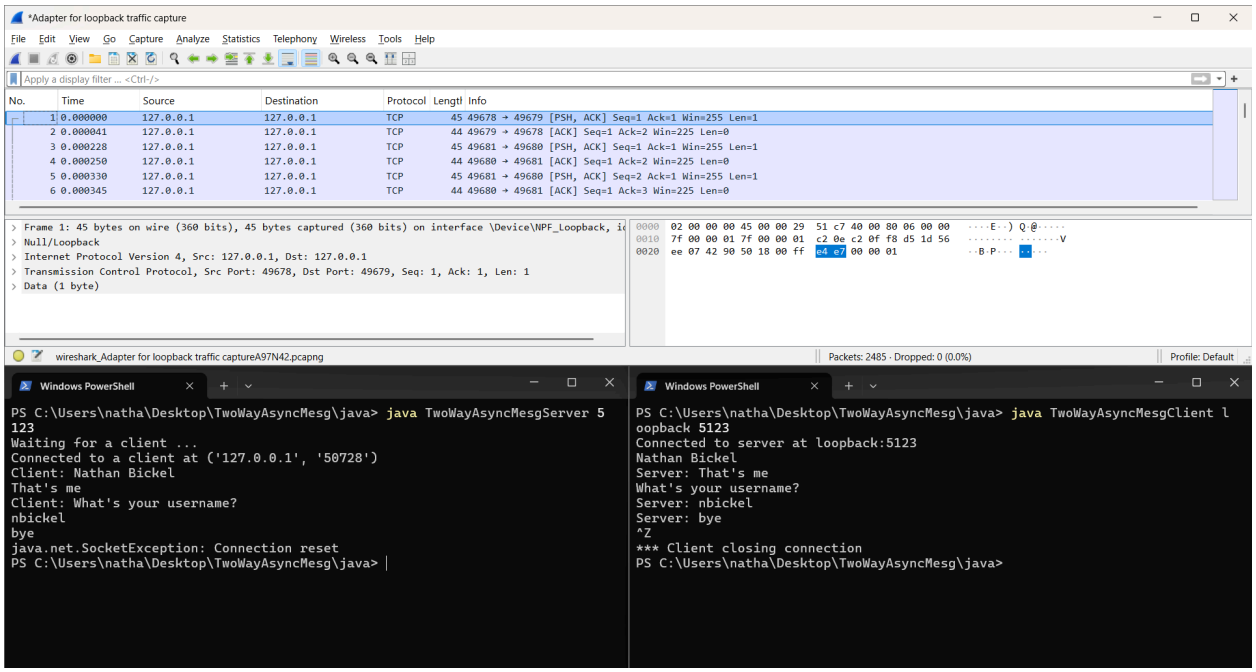
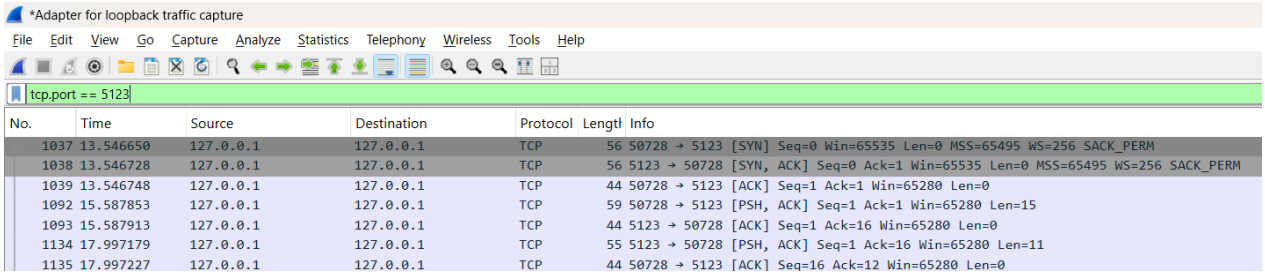
Q1. Server was started on port 5123.

Screenshot1

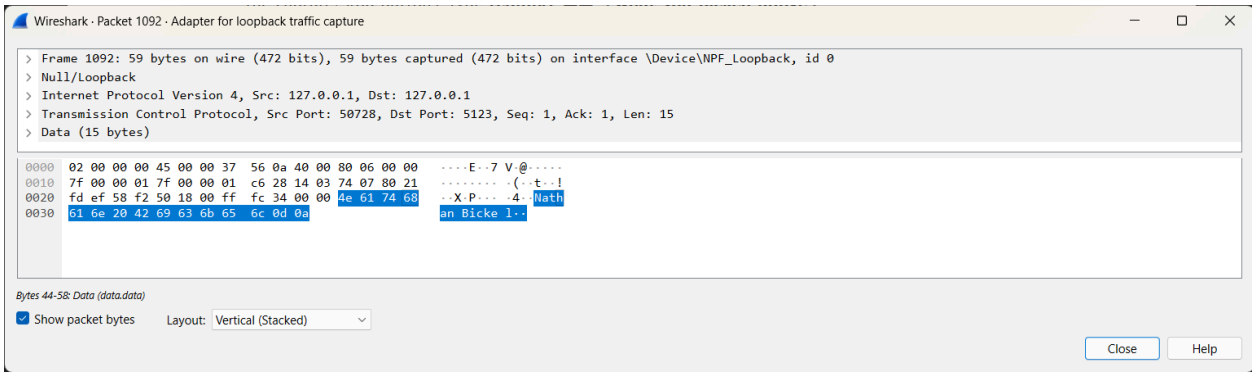



Screenshot 2



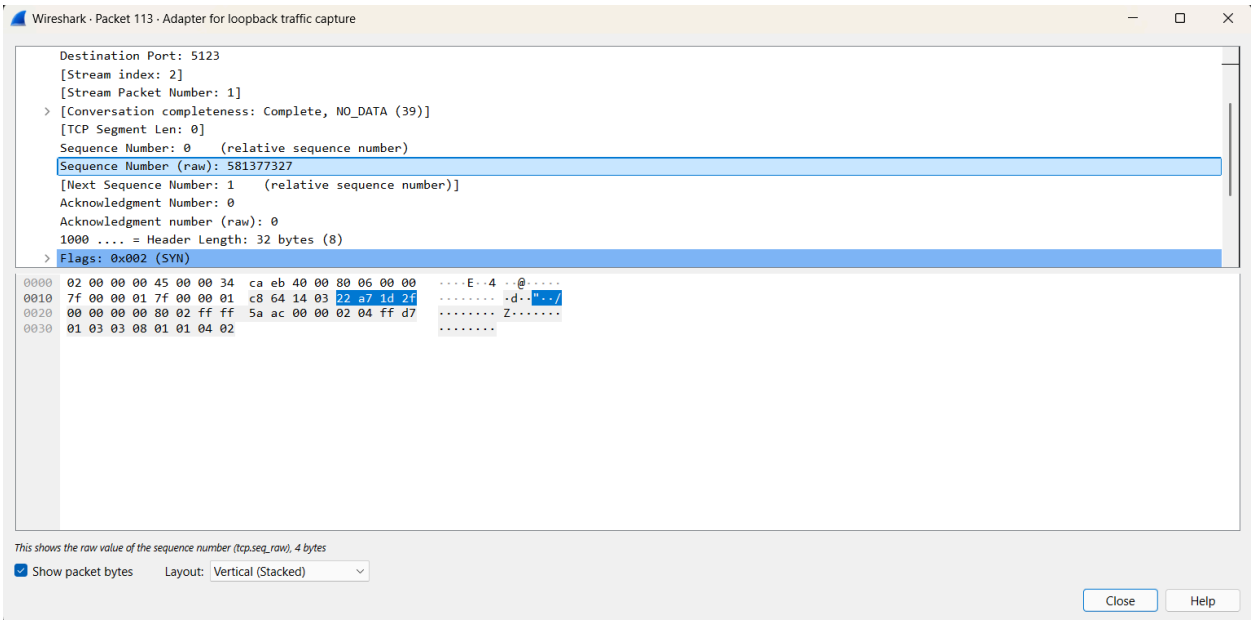

Q2. Client's TCP Source port is 50728.

Screenshot 3



Q3. TCP Sequence numbers don't always start at 0 to resolve issues with duplicate connections and security. Consider if sequence numbers did always start at 0. Then, if a connection were opened and closed twice in quick succession, sequence numbers from the first connection may linger and cause the second connection to believe sequence numbers are being duplicated, causing the second connection to start resending packets when doing so is not necessary. By starting the sequence at a different random number each time the connection is reopened, this overlap will (almost certainly) not be an issue. Having randomized starting sequence numbers also makes it harder for malicious actors to predict future sequence numbers and thus doing so acts as a safeguard against attacks.

Screenshot 4




Q4. The Window Scale Factor is used to allow TCP to support larger receive windows, which is important for high-speed or long-distance networks. Without it, the maximum window size is limited to 65,535 bytes, which can become a bottleneck when trying to transfer a lot of data quickly. For example, on a fast connection with high latency, a small window would often require the sender to wait for acknowledgments before continuing, slowing things down. The Window Scale Factor solves this by letting the receiver tell the sender to interpret the window size as multiplied by the specified factor. This allows the sender to send more data without waiting and improves performance on networks where large amounts of data are expected.

# Screenshot 5