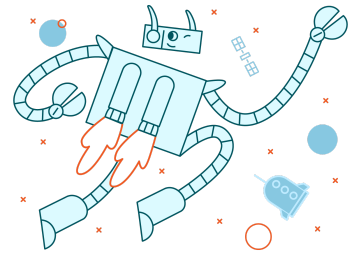# Waterloo 🌐

Did you know?

In 1974, the first version of TCP was born. In the same year, ABBA won the Eurovision song contest with their classic "Waterloo".

Little did they know that 50 years later the lyrics of the song will be transmitted over TCP!

Background

TCP uses sequence numbers to keep track of the bytes in the data stream sent from TCP sender to receiver, to ensure data integrity and order. In this exercise, you will simulate a TCP session's flow of sequence and acknowledgment numbers.

Instructions

Fill in the table shown below.

- This is a conversation in which the client and the server send to each other the lyrics of "Waterloo".

- The session includes a three-way handshake, followed by exchanges of messages.

- Use the provided template to fill in sequence and acknowledgment numbers. The port numbers and flags are included. 3 of the packets are pre-filled to guide you.

Template for TCP Session

Packet #	Source Port	Destination Port	Sequence Number	Acknowledgment Number	Flags	Data
1 (Client)	12345	80	5000	0	SYN	

Packet #	Source Port	Destination Port	Sequence Number	Acknowledgment Number	Flags	Data
2 (Server)	80	12345	3000	5001	SYN+ACK	
3 (Client)	12345	80	5001	3001	ACK	
4 (Client)	12345	80	5001	3001	ACK	Waterloo
5 (Server)	80	12345	3001	5009	ACK	I was defeated, you won the war
6 (Client)	12345	80	5009	3032	ACK	Waterloo
7 (Server)	80	12345	3032	5017	ACK	Promise to love you forevermore
8 (Client)	12345	80	5017	3063	ACK	

Hints:

- Remember, each side of a TCP connection maintains its own sequence number, and also tracks the sequence number of the other side (as the acknowledgment number).

- A message with "SYN" increments the sequence counter by one.

- A message containing a payload increases the sequence counter by the payload's length.

  - Every character in the payload is one byte, including spaces and commas (,).

- Acknowledgment numbers are the next expected sequence number from the other side.

- The first sequence number of each side (here 5000 and 3000) are random.

To submit

- A word document with the filled in table.

Sentinel