Group Project

Presentation

Our Team

UDP Telemetry System with Reliable Batch Delivery

22P0285	Nader Mohamed Elfeel
22P0124	Mohamed Ibrahim Ghoneem
22P0128	Zakria Alaa Eisa
22P0127	Mohamed Magdy
22P0126	Mahmoud Nashaat
22P0089	Mohmed Ahmed Mahdi

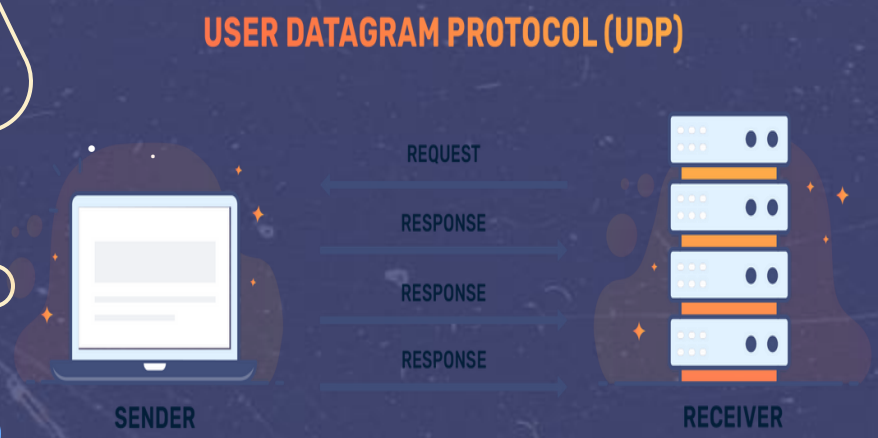
Motivation

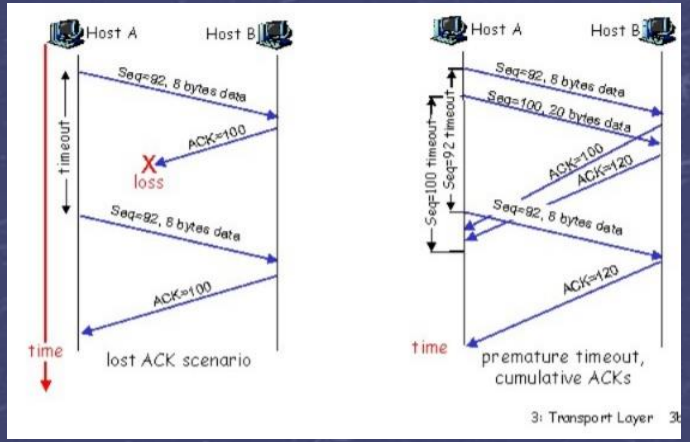
UDP
vs
TCP
vs
our Custom UDP

Objectives

- Collect sensor readings from multiple devices
- Handle packet loss, duplicates, and sequence gaps
- Maintain chronological order
- Compute performance metrics (bytes per report, duplicate rate, CPU per report)

System Architecture





Packet Structure

```
header = struct.pack("!B H H I B 2x",
                     msg_type,
                     device_id,
                     seq,
                     timestamp,
                     batch_count)
```

```
Message Types:
0 → INIT
1 → DATA
2 → HEARTBEAT
3 → ACK
4 → END
```

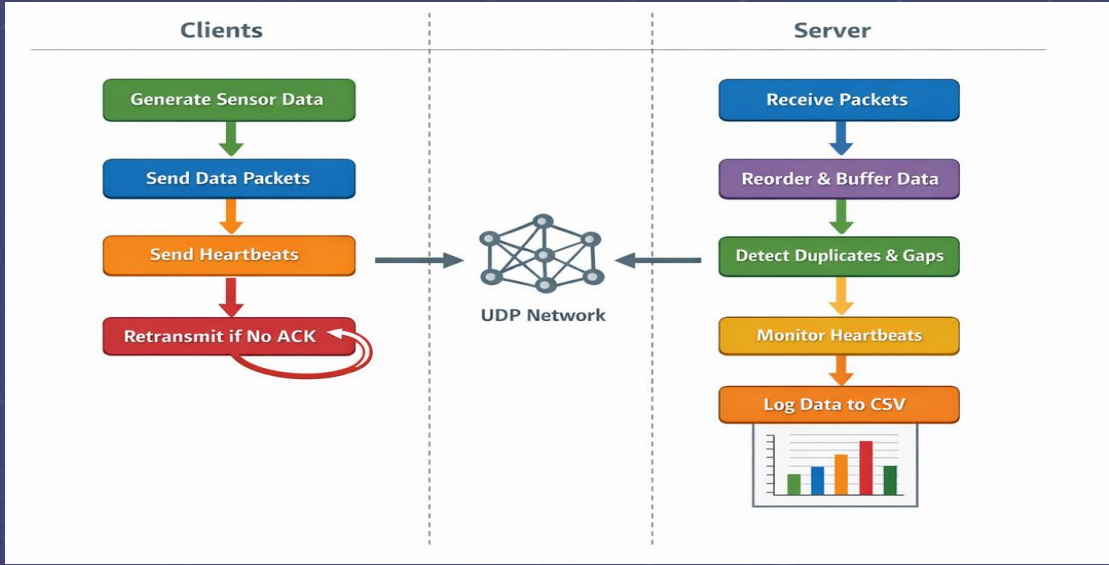
```
for (t, h, ts) in batch:
    payload += struct.pack("!f f I", t, h, ts)

packet = header + payload
```

Handling Data Reliability

- Acknowledgment (ACK) system: Client retransmits unacknowledged packets after timeout

Heartbeat messages: Detect offline devices
Reordering buffer: Sort readings by timestamp before logging
Detect duplicates and sequence gaps

Client Workflow



Welcome to

Question Time

Thank You