[Segmentation, fragmentation and frames]

AL
↓
TL ⟹ Segmentation
↓
NL ⟶ Fragmentation
↓
DLL ⟶ Framing
↓
PL ⟶ Signal conversion of data

① If Application is sending 1 MB data ⟶ OS (TCP) ⇒ divides it into (Segments)

⇓

Segment size is determined by

MTU of medium.

(2) When Sower Machine receives Segments → Its OS (TCP) will reassemble 1 MB data store and in Socket and give pointer to this location in RAM to Node power or any other program

↳ Our Node server power copies Socket data to its Power memory space (RAM) and perform operation on this data.

How TCP Segmentation Works

1. **Application Data Division**:
   - An application sends a large data stream to TCP at the transport layer.
   - TCP breaks this data into segments that fit within the Maximum Segment Size (MSS).
2. **Segment Creation**:
   - Each segment contains:
     - A portion of the data.
     - A TCP header with control information (e.g., sequence numbers, acknowledgment numbers).
3. **MTU and MSS**:
   - **MTU (Maximum Transmission Unit)**: The largest data packet size that can be sent on the network layer (e.g., Ethernet MTU is 1500 bytes).
   - **MSS (Maximum Segment Size)**: The maximum amount of data TCP can send in a single segment, typically `MTU - TCP/IP headers`.
4. **Transmission and Reassembly**:
   - TCP sends each segment to the destination.
   - At the receiving end, TCP reassembles the segments into the original application data.