Assalam-u-alaikum

BILAL KHAN

This is my 9th video of DevOps
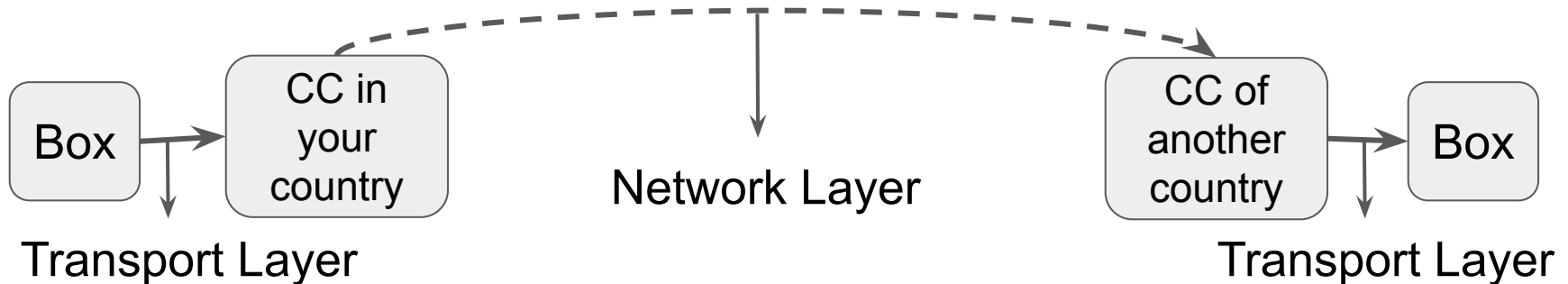
Transfort Layer

Info is transferred using Network Layer

You

Friend
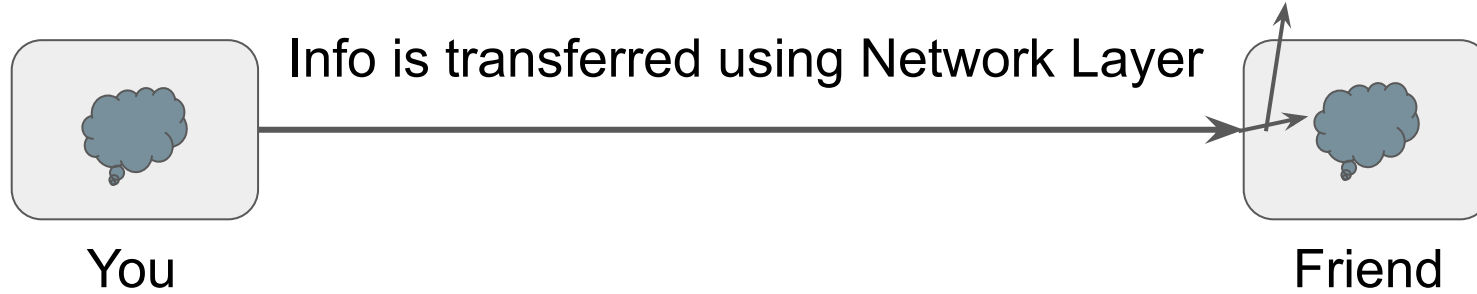
The transportation/communication of data b/w two devices is done by network layer.

Transport layer lies inside the devices. The role of the transport layer is to take the information from the network and transfer it to the application.

Box

CC in your country

Network Layer

CC of another country

Box

Transport Layer

Transport Layer

The Transport layer is located in devices.

Multiplexing and demultiplexing

Multiplexing is method or technique in which more than one signals are combined into one signal that travels on a medium. Demultiplexing is the reverse of multiplexing, in which a multiplexed signal is decomposed in individual signals.

Message		Socket →	Transport Layer Multiplexer	→	Transport Layer Demultiplexer	Socket →	Message
File							File
VC							VC
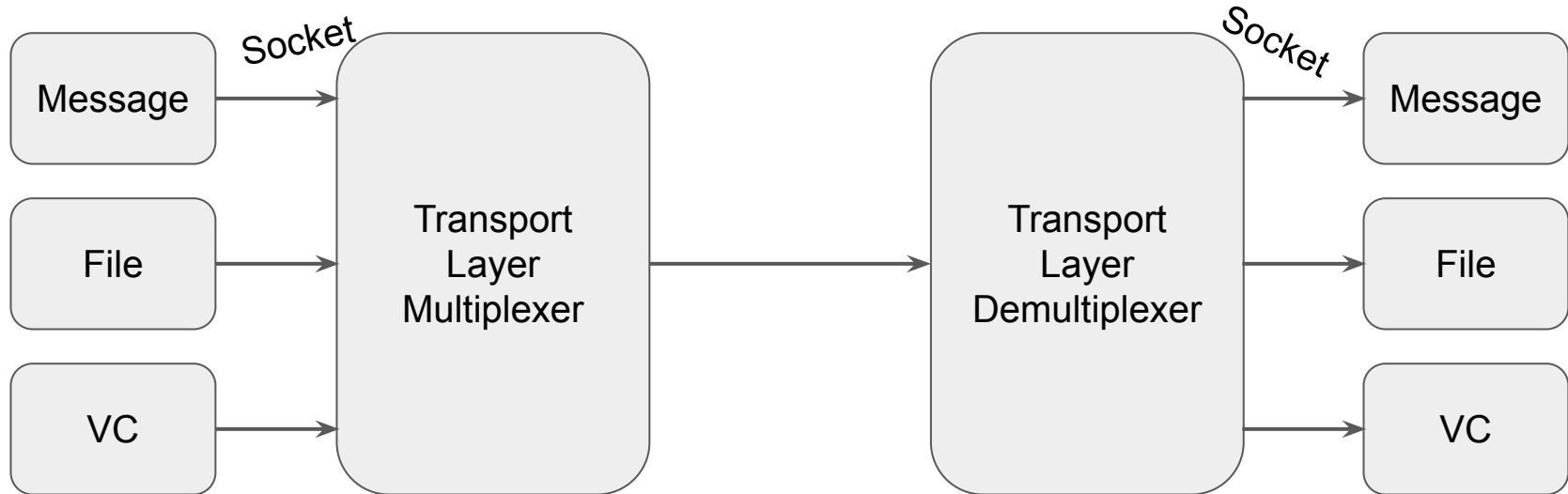
- The transport layer will attach port numbers to the sockets to identify applications.
- The transport layer takes care of the congestion control. It means to align the packets traffic one by one.
- Congestion control algorithms are built in TCP.

What if the packets get corrupted or it is transferred in imperfect order?
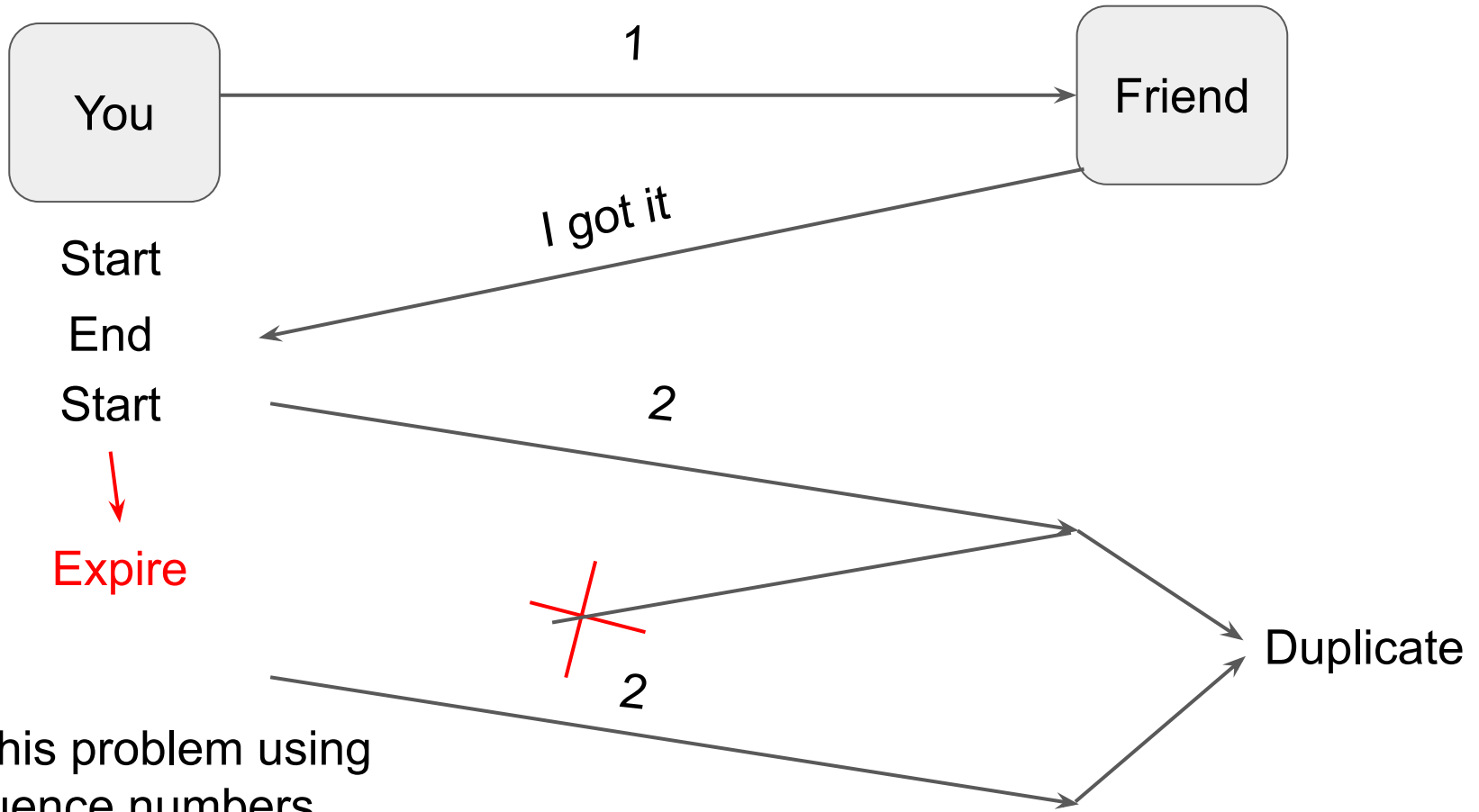
The solution for this is **Checksums**. It is like a number.

You → Data → Friend

Checksums   Checksums
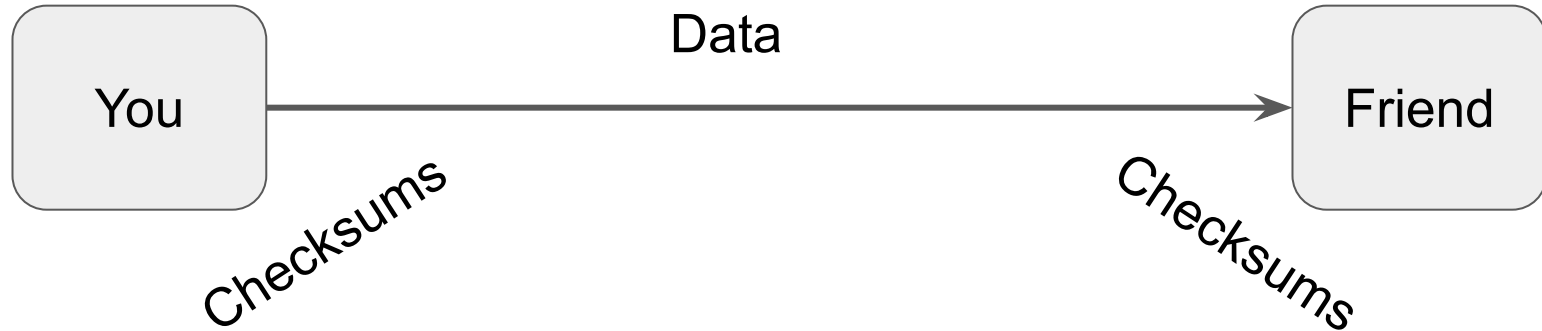
How the sender will know that whether the packets are received or not?

The solution for this is the **Timers.**

You

Friend

1

I got it

Start

End

Start

Expire

2

2

Duplicate
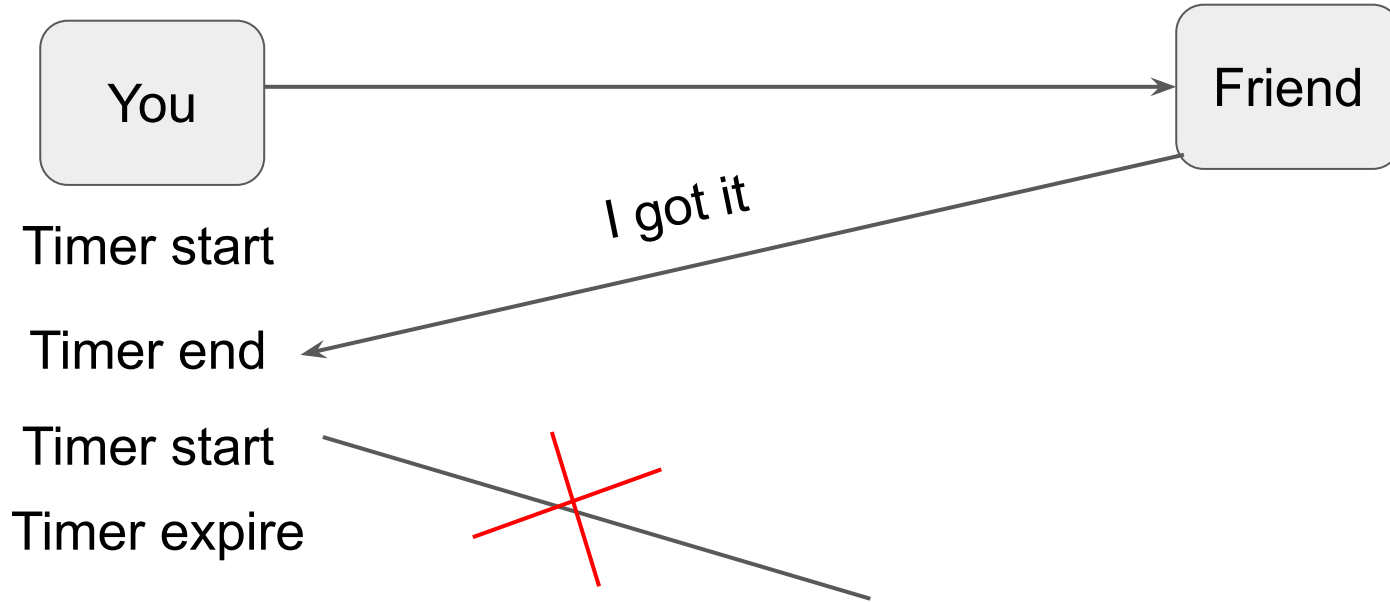
Solve this problem using sequence numbers

UDP(User Datagram Protocol)

- Data may or may not be delivered.
- Data may change.
- Data may not be in order.
- It is a connectionless protocol. It means that the data will be transferred even if the connection is not established.
- UDP uses checksum but it does not care about whether the data is transferred fully or not.

UDP Packet

- Source port number. $\longrightarrow$ 2
- Destination port number. $\longrightarrow$ 2
- Length of datagram. $\longrightarrow$ 2
- Checksum. $\longrightarrow$ 2
- Data. $\longrightarrow$ 65, 536 bytes in one packet

Header 8 bytes $\longrightarrow$ $2^{16} - 8$ = 65, 536 bytes

UDP use cases

- It is very fast.
- DNS also uses UDP.
- It is used in video conferencing apps and gaming.

TCP(Transmission Control Protocol)

- It is used in Transport layer protocol.
- Application layer sends lots of raw data. TCP segments this data and divide it into chunks, add headers. As the transport layer divide the data into segments, network layer also divide the data, so that they can be put together at once.
- It provides congestion control.
- It takes care of
    - When data does not arrive.
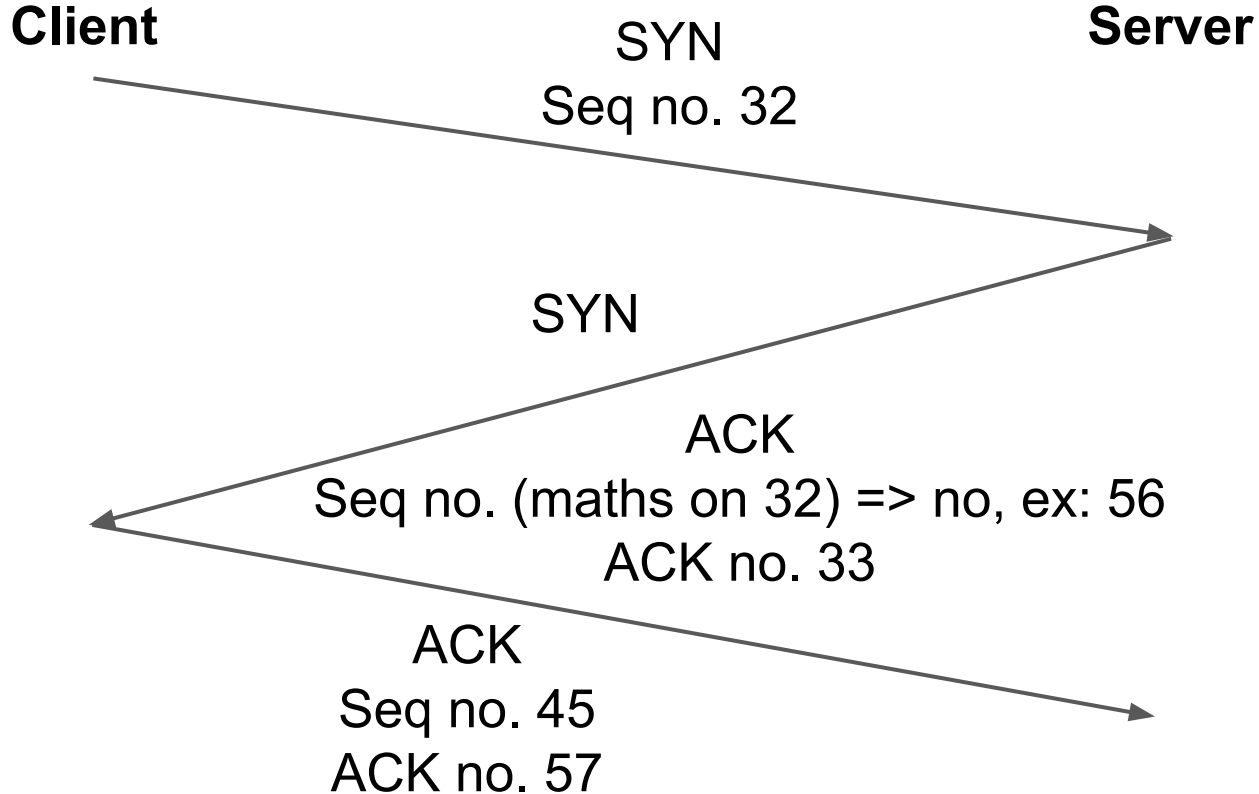   - Maintains the order of data using sequence number.

TCP features

- Connection oriented. It means that first the connection will be established and then it will send the data.
- It provides error control.
- It provides congestion control.
- TCP will make connection b/w two computers, sender and the receiver. One connection will not be established with many computers.
- It uses full-duplex to send and receive the data simultaneously.

How the connection gets established?

The connection is established by using 3 ways handshake?

Client
Server

SYN
Seq no. 32

SYN

ACK
Seq no. (maths on 32) => no, ex: 56
ACK no. 33

ACK
Seq no. 45
ACK no. 57

What we have learned?

Transport layer, Multiplexer and Demultiplexer

Checksums, Timers

UDP, UDP Packets, UDP use cases

TCP, TCP features, how connections are build?

That's It

I hope you will like this video.

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Ask questions in the comment section