



TCP Connection establishment and termination

This presentation will explore the process of establishing and terminating TCP connections, highlighting the role of three-way and four-way handshakes.



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Connection establishment process

1

Three-way handshake

The process of establishing a connection between a client and server through SYN, SYN-ACK, and ACK packets.

2

Source and destination ports

The role of port numbers in identifying sending and receiving processes during connection establishment.

3

Sequence and acknowledgment numbers

How TCP uses sequence and acknowledgment numbers to ensure reliable data transfer.

Connection termination process

1

Four-way handshake

The process of gracefully terminating a TCP connection using FIN, FIN-ACK, and ACK packets.

2

TIME_WAIT state

Exploring the purpose of the TIME_WAIT state in preventing connection conflicts and ensuring data integrity.

Establishing a Connection



SYN - Sending the Request

The client sends a SYN packet to the server to initiate connection establishment.



SYN-ACK - Server Response

The server responds with a SYN-ACK packet, indicating willingness to establish a connection.



ACK - Finalizing the Connection

The client acknowledges the server's response with an ACK packet, establishing a connection.



FIN - Initiating the Termination

Either the client or server sends a FIN packet to initiate the disconnection process.



FIN-ACK - Acknowledgement

The receiving party responds with a FIN-ACK packet, acknowledging the termination request.



ACK - Finalizing the Termination

The initiating party acknowledges the termination by sending an ACK packet.

Sequence Numbers

Sender's Sequence Number

The sender assigns a sequence number to each segment for reliable data transfer.

Acknowledgment Number

The acknowledgment number indicates the sequence number the receiver expects to receive next.

Sliding Window

The sliding window mechanism allows a sender to transmit multiple segments without waiting for individual acknowledgments.



TIME_WAIT State

The TIME_WAIT state ensures that all packets related to a terminated connection are completely processed before releasing the resources.



TCP Connection Conclusion

Understanding the TCP connection establishment and termination processes is essential for network professionals to ensure reliable and efficient data transfer.

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