

UDP and TCP

Q) What is the value of prefix in link local address for ipv6?

→ The length of the prefix of an IPv6 link-local address ranges from 10 to 127 bits.

Q) What is the size of UDP and what are its different fields? Describe each field.

→ A UDP header is 8 bytes (64 bits) long.

(Note:- Udp is simpler and faster than tcp because it doesn't require a connection to be established and does not guarantee delivery, ordering, or error-checking of packets.)

→ there are four fields in Udp:-

1. Source Port (16 bits): This field identifies the port number of the sending application. It's used by the receiver to send a reply back to the sender.

2. Destination Port (16 bits): This field specifies the port number of the receiving application. It tells the Udp layer in the receiving host which application should process the incoming data.

3. Length (16 bits): This field indicates the length of the entire Udp packet, including the header and the data. This field helps the receiving system understand how much data it should expect to receive.

4. Checksum (16 bits): The checksum is used for error-checking of the header and data. It's optional in IPv4 (meaning it can be zero), but mandatory in IPv6. If value is same in checksum as the sent data then there is no loss of data and in contrary, if it's not found then some data has been lost.

Q) What is the size of tcp header? What are the different fields and describe each field.

→ The size of a tcp header ranges from a minimum of 20 bytes (160 bits) to a maximum of 60 bytes (480 bits) ..the total extra size after 20 bytes depends on optional fields.

The different fields in tcp are:

Source Port (16 bits): Identifies the sending application. It's used by the receiving system to know which application to send responses to.

Destination Port (16 bits): Identifies the receiving application on the host that will process the data.

Sequence Number (32 bits): Indicates the position of the first byte of data in this segment relative to the start of the data stream from the sender. It helps ensure

data is delivered in order.

Acknowledgment Number (32 bits): Indicates the next byte the sender expects to receive from the other party. It's used for acknowledging received data.

Data Offset (4 bits): Also known as the header length, it specifies the length of the TCP header in 32-bit words. This field tells where the data begins.

Reserved (3 bits): Reserved for future use and should be set to zero.

Flags (9 bits): Control flags, also known as control bits, provide various control functions:

URG (1 bit): Urgent pointer field significant

ACK (1 bit): Acknowledgment field significant

PSH (1 bit): Push function

RST (1 bit): Reset the connection

SYN (1 bit): Synchronize sequence numbers (used to initiate connections)

FIN (1 bit): No more data from sender (used to terminate connections)

Three additional bits are reserved for future use.

Window Size (16 bits): Specifies the size of the sender's receive window. It's used for flow control to prevent the sender from overwhelming the receiver.

Checksum (16 bits): Used for error-checking of the header and data. Ensures the integrity of the segment during transmission.

Urgent Pointer (16 bits): If the URG flag is set, this field indicates the position of the last byte of urgent data. It's used to prioritize certain data.

Options (variable length): Can vary in length but must be a multiple of 32 bits.

Options can be used for various purposes, like setting maximum segment size, timestamps, etc.

Padding (variable length): Extra bits added to ensure the header length is a multiple of 32 bits.