

Transport Layer

Number of Layer	4th Layer of OSI Model
Role	Transport Data
Protocols	UDP - TCP
PDU (Protocol Data Unit)	Segment
Address	Port Number

UDP Features

Type of Connection	Connectionless (Does Not Need Connection Setup)
Application	Time-Sensitive Connections
Number of Fields in Header	Four Field Header

TCP Features

Type of Connection	Connection-Oriented (Needs Connection Setup)
Application	Reliable Connections
Number of Fields in Header	Eleven Field Header

Commands

Active UDP Connections	<code>netstat -anp udp</code>
Active TCP Connections	<code>netstat -anp tcp</code>

UDP Header Fields

Source Port 16-bit	Port on The Receiver's Side
Destination Port 16-bit	Port on The Sender's Side
Length 16-bit	The Number of Bytes in The UDP Header And Any Data Follows
Checksum 16-bit	Calculated Value for Ensuring Data Integrity

TCP Ports

Source Port 16-bit	The Port on The Sender Side
Destination Port 16-bit	The Port on The Receiver Side
Stream	A Communication Between Two Endpoints
TCP Segment Length	The Value of The TCP Payload (The Data That Follows The TCP Header)

Sequencing and Acknowledging in TCP

Sequence Number 32-bit	The Byte Number of The First Byte of Data
Next Sequence Number	Current Sequence Number Plus The TCP Segment Length
Acknowledgment Number 32-bit	The Sequence Number of The Next Byte The Receiver Expects to Receive
Offset	Indicates The Length of The TCP Header

Flags in TCP

Reserved	3-bit	For Future Use
Nonce	1-bit	Experimental Use
CWR	1-bit	Respond to Indications of Network Congestion with Congestion Avoidance
ECE	1-bit	Notify The Endpoints of Any Network Congestion to Avoid Dropping Packets
URG	1-bit	Indicates a Packet That Should Have Priority
ACK	1-bit	Acknowledging The Data Was Received
PSH	1-bit	Informing Data Should Be Sent Immediately
RST	1-bit	Aborting The TCP Connection
SYN	1-bit	Synchronizing The Sequence Numbers
FIN	1-bit	closing The Connection



Dissecting Window Size

Window Size 16-bit	Controls The Flow of Data
Scaling Factor	A Value For Expanding Window Size
Window Size Scaling Factor	$2^{\text{Scaling Factor}}$ if Scaling Factor ≥ 0
Calculated Window Size	Window Size * Window Size Scaling Factor

Additional Header Values in TCP

Checksum	A Calculated Value For Error Detection
Urgent Pointer	Points to The Sequence Number of Urgent Data
Options	Extra Options Like Timestamps And No-operation



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Published 20th November, 2020.

Last updated 20th November, 2020.

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