Side by Side

Full name	Transmission Control Protocol (TCP) · User Datagram Protocol (UDP)
Connection	TCP: Connection-oriented (handshake first) · UDP: Connectionless (fire and forget)
Reliability	TCP: Guaranteed delivery, ordered, error-checked · UDP: Best effort — no guarantees
Speed	TCP: Slower (overhead) · UDP: Faster (minimal overhead)
Header size	TCP: 20 bytes · UDP: 8 bytes
Use when	TCP: Accuracy matters · UDP: Speed matters

The head-to-head every Network+, Security+, and CCNA exam asks about.

The Three-Way Handshake

Step 1: SYN	Client → Server
Step 2: SYN/ACK	Server → Client
Step 3: ACK	Client → Server
Teardown	FIN → FIN-ACK → ACK

SYN flood attacks abuse this by leaving connections half-open.

Use TCP When…

Web browsing	HTTP/HTTPS
Email	SMTP, IMAP, POP3
File transfer	FTP, SFTP
Remote admin	SSH, RDP

Use TCP when accuracy matters.

Use UDP When…

DNS lookups	Port 53
DHCP	Ports 67/68
Streaming / VoIP / gaming	Speed matters more than perfection
NTP / SNMP / TFTP	Ports 123 / 161 / 69

Use UDP when speed matters.

Exam Traps

"Which is connectionless?"	UDP
SYN flood attack	Abuses the TCP handshake (half-open connections)
Sequencing + ACKs	TCP uses them; UDP has neither
DNS transport	UDP for queries, TCP for zone transfers

Read the question twice — these are designed to trick you.

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