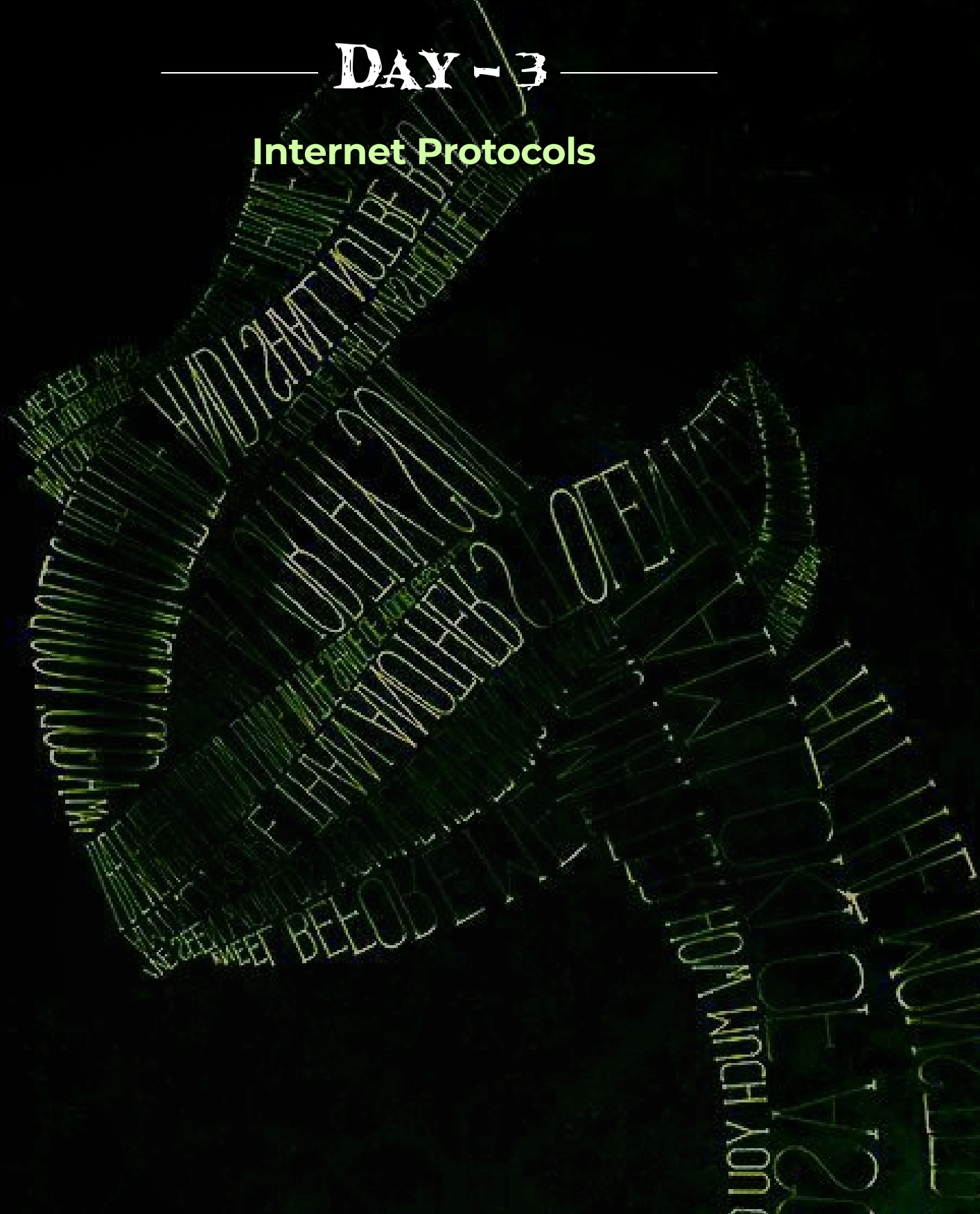
Sheryians
Coding School

Live Cohort

Day - 3

Internet Protocols



Internet Protocols

1. What is TCP Protocol and Why It Is Widely Used

TCP (Transmission Control Protocol) is one of the core communication standards of the internet.

- It ensures **reliable**, **ordered**, and **error-checked** delivery of data.
- Large data is broken into smaller **packets**, and TCP makes sure they are reassembled in the **correct order** at the destination.
- If any packet is lost or corrupted, TCP automatically **resends** it.
- This is why TCP is known for **accuracy**, **reliability**, and **proper sequencing**.

🔷 Example Use Cases:

Web browsing, sending emails, downloading files (FTP).

2. How Connection is Established Using TCP (3-Way Handshake)

Before sending data, TCP ensures that both client and server are ready by performing a **3-way handshake:**

1. **SYN (synchronize)** → Client sends a request to the server: "*Can we connect?*"
2. **SYN-ACK (synchronize-acknowledge)** → Server replies: "*Yes, I'm ready.*"
3. **ACK (acknowledge)** → Client confirms: "*Okay, let's start.*"

👉 After these 3 steps, the connection is **established**.
This ensures **synchronization** and **reliability** between client and server.

3. What is UDP and Why It Is Used for Fast Communication

UDP (User Datagram Protocol) is another major protocol, but unlike TCP, it focuses on speed over **reliability**.

- It sends packets directly **without checking** if they are received.
- There is no **error correction** and **no sequencing**.
- Packets may get lost or arrive in the wrong order, but communication remains **very fast.**

🔷 Example Use Cases:

Video streaming, online gaming, voice and video calls — where speed matters more than 100% accuracy.

4. How UDP Works

UDP skips connection setup and directly sends packets:

- **No handshake** is required.
- Client → directly sends packets → Server.
- Some packets may be lost, but because of its **low latency**, it's ideal for **real-time communication**.

Internet Protocols

5. Difference Between TCP and UDP

Feature	**TCP** (Transmission Control Protocol)	**UDP** (User Datagram Protocol)
Connection	Connection-oriented (3-way handshake)	Connectionless (no handshake)
Reliability	Reliable (error checking, retransmission)	Unreliable (no guarantee of delivery)
Speed	Slower (due to checks & confirmations)	Faster (no checks, direct send)
Use Cases	Web browsing, file transfer, email	Gaming, video streaming, voice calls
Packet Order	Maintains correct packet order	Packets may arrive out of order