Message Transfer Between Applications

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▼ Questions

▼ What is a port?

- A communication endpoint where data be sent and received
- Port numbers are attached to network service and applications

▼ What is a socket?

- A socket is a communication endpoint that allows two processes on a networked computer to communicate with each other

▼ What is the difference between a socket and a port?

- A socket represents an endpoint for communication between two processes
- Port is a numeric identifier used to direct network traffic to specific processes or services
- Sockets are created and managed by the operating system or network programming libraries
- Port numbers are specified in network configurations and protocols

▼ TCP/IP vs UDP

TCP/IP and **UDP** are both ways computers use to talk to each other over the internet, but they work in slightly different ways:

1. **TCP/IP (Transmission Control Protocol/Internet Protocol)**:
    - **Reliable**: Imagine you're sending a letter by post. With TCP/IP, it's like you're sending a letter with a delivery confirmation. You make

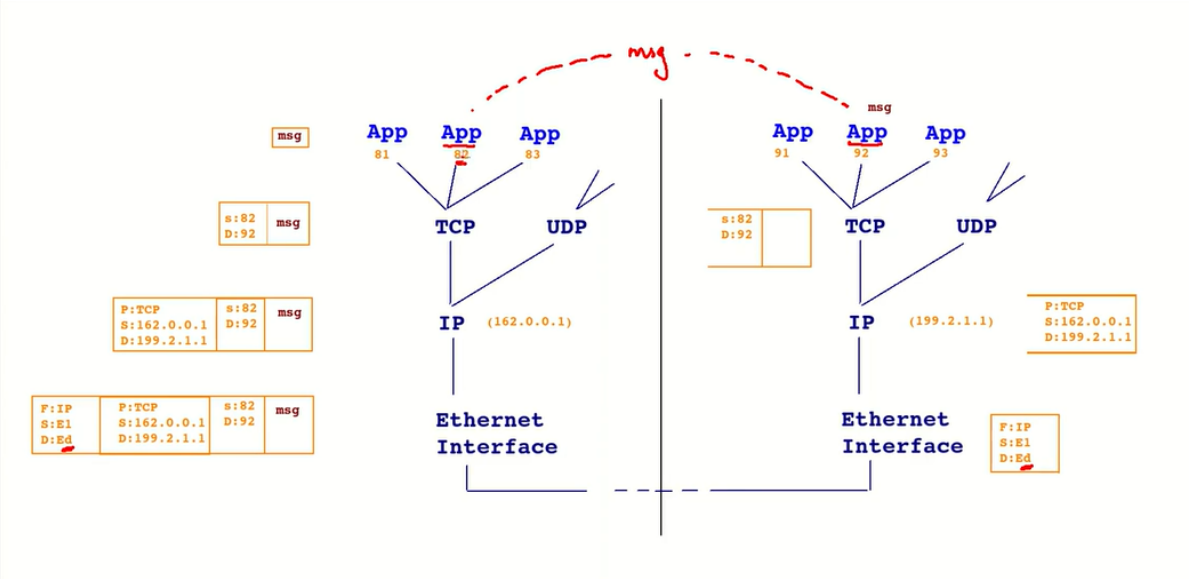
sure that the letter reaches its destination, and if it doesn't, you send it again until it does. This ensures that the information you send arrives intact and in the right order.

- **Ordered**: TCP/IP also makes sure that the information you send arrives in the same order it was sent. It's like sending a series of numbered letters. The person receiving them knows they need to be read in order.
- **Slower**: Because TCP/IP checks and double-checks to make sure your data arrives safely and in order, it can sometimes take a bit longer to send information. It's like sending a package through a slow but reliable postal service.

2. **UDP (User Datagram Protocol)**:
    - **Faster**: UDP, on the other hand, is like sending a postcard. You write your message, drop it in the mailbox, and hope for the best. It doesn't have all the extra checking that TCP/IP does, so it's faster.
    - **Unreliable**: But just like sending a postcard, there's no guarantee it'll arrive, or that it'll arrive in the right order. Sometimes letters can get lost, or they might arrive out of order. Similarly, with UDP, your data might not arrive at all, or it might arrive in a different order than you sent it.
    - **Used for Real-Time Communication**: UDP is often used for things like video calls or online gaming, where it's more important to have information arrive quickly than to make sure every single piece of data gets there perfectly.

    TCP/IP is like sending a letter with delivery confirmation, making sure it arrives safely and in order, while UDP is like sending a postcard, faster but less reliable, and used for things where speed is more important than reliability.

▼ Understanding Transfer between applications



- An application is identified by using a 16 bit port number
  - Port number may be assigned by the application or requested
- To send a message from one application to another, the message needs to be translated using a communication protocol(TCP/IP or UDP/IP).

▼ TCP & UDP

▼ Basic Client Server

ServerSocket → Accepts client connections

▼ Single Threaded Client Server

- Problem with single threaded
  - If the client is block, the server is also blocked