Internet - Multimedia - AI

Protocols, AI applications/models

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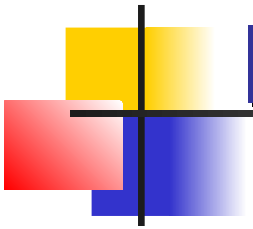
github.com/smartcomputerlab



Internet - Multimedia - AI

Part 1 – Internet and Multimedia

Lab 1: `socket` programming – protocols: **UDP,TCP**

Lab 2: `GStreamer` – protocols: **UDP, RTP, RTCP**

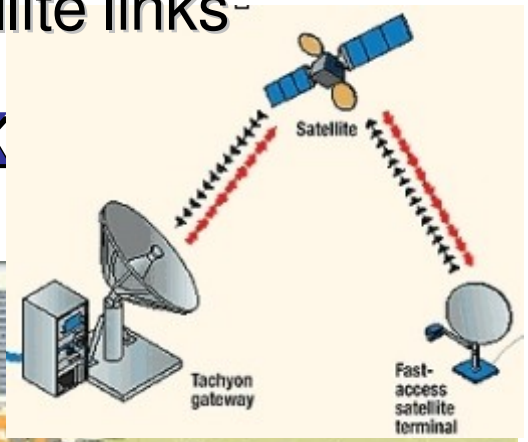
Part 2 – Internet and applications AI

Lab 3: `whisper.cpp`, `piper` – protocols: **UDP**

Lab 4: `llama.cpp`,`whisper.cpp`, `piper` – protocols: **TCP**

What is the Internet - link

satellite links

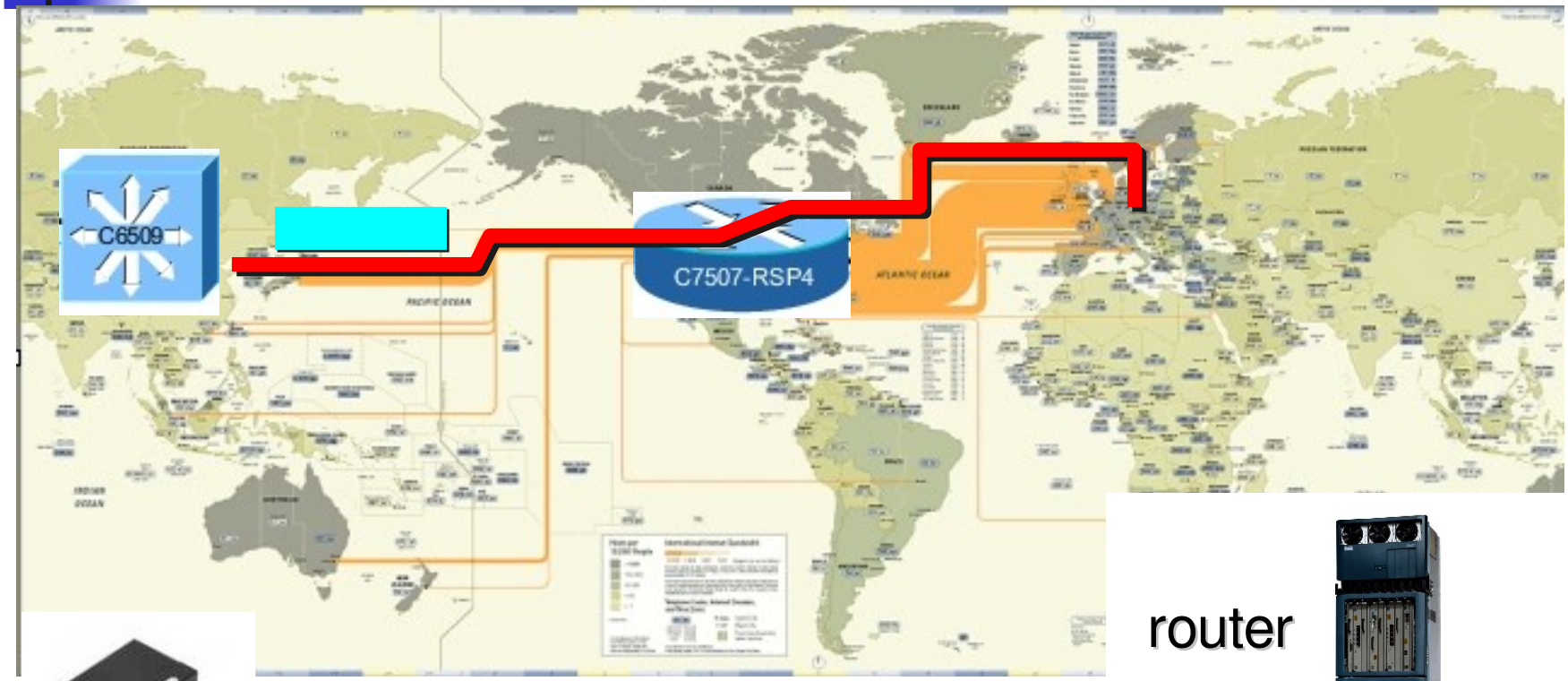


fibre

cable

bandwidth – data rate – bits/s, delays

What is the Internet - routers



switch

routes and packets

queues : delays, packet loss

router

Internet service : e-mail

electronic mail – ASCII text

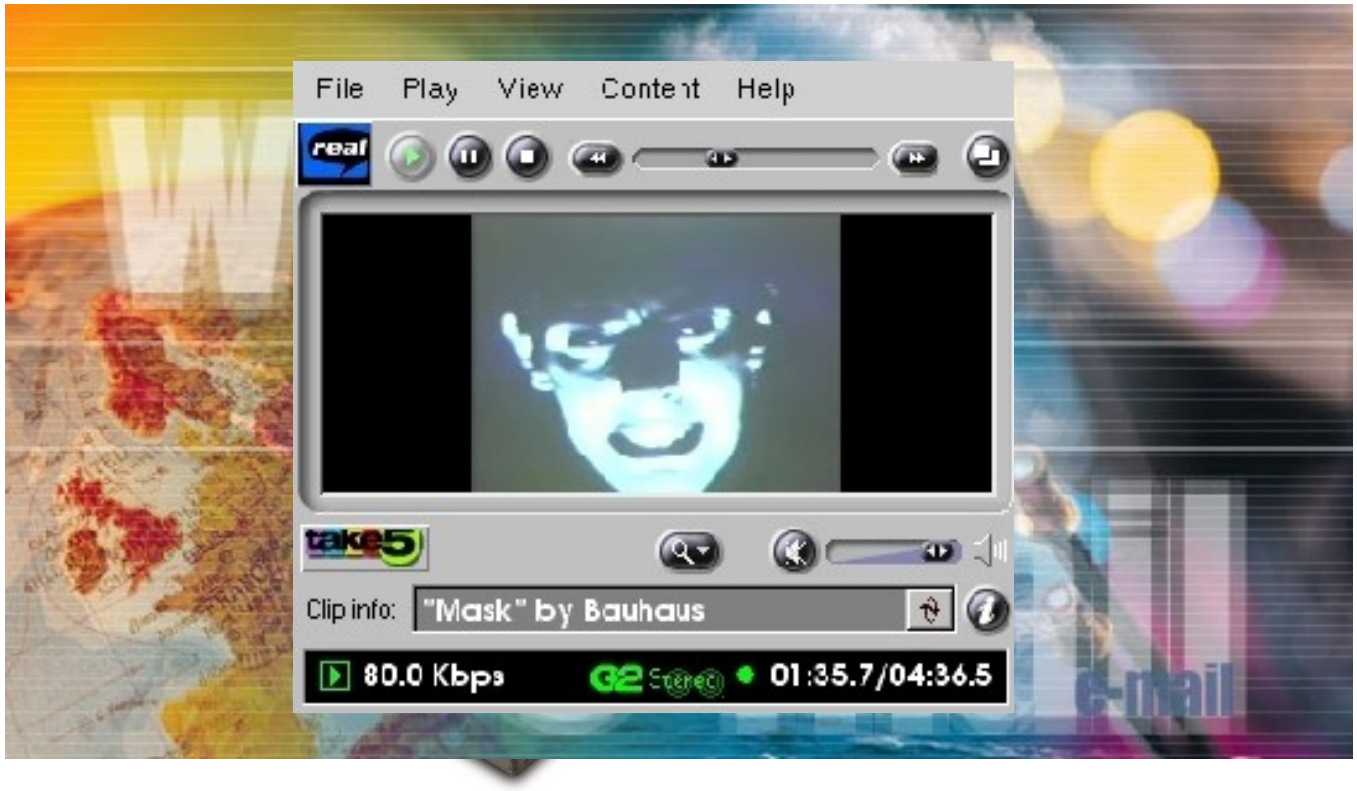
reliable, error free, lower data rate

Internet service : VoIP

internet telephony – VoIP

low delay, constant delay, moderate data rate

Internet service : Video on IP



video streaming – Video on IP

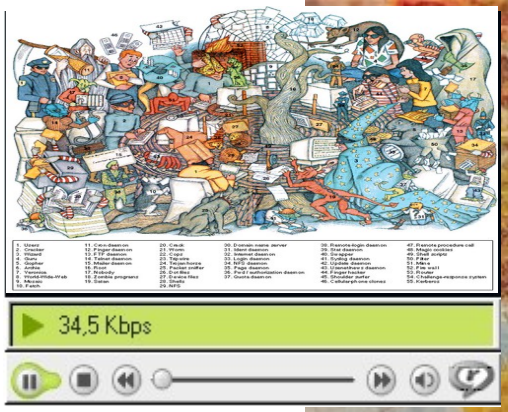
low delay, high data rate

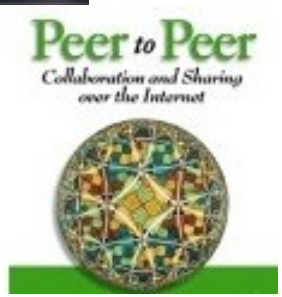
Internet service : interactive video

games – conferences – interactive multimedia

very low delay, high data rate

Internet transport protocol: TCP

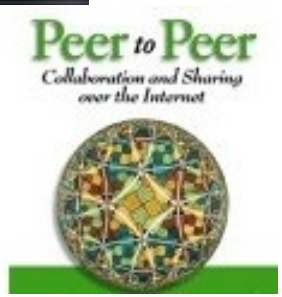




connection oriented - TCP

reliable service, high delay

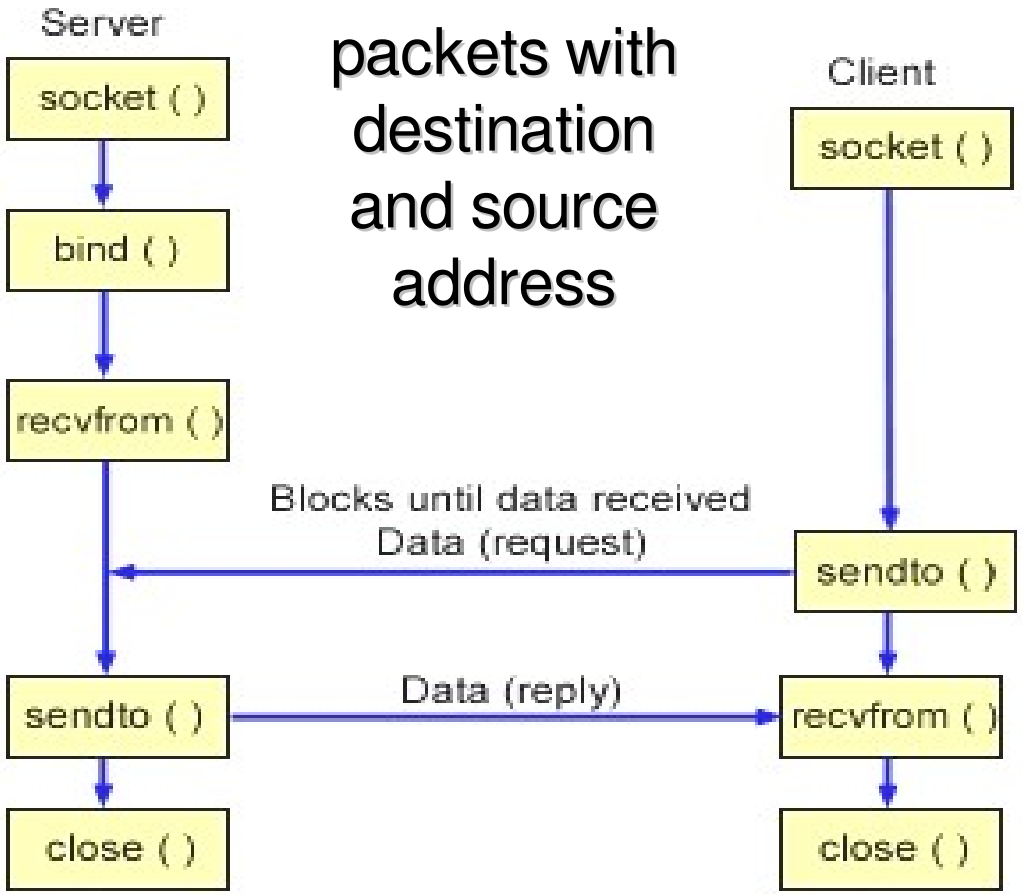
Internet transport protocol : UDP



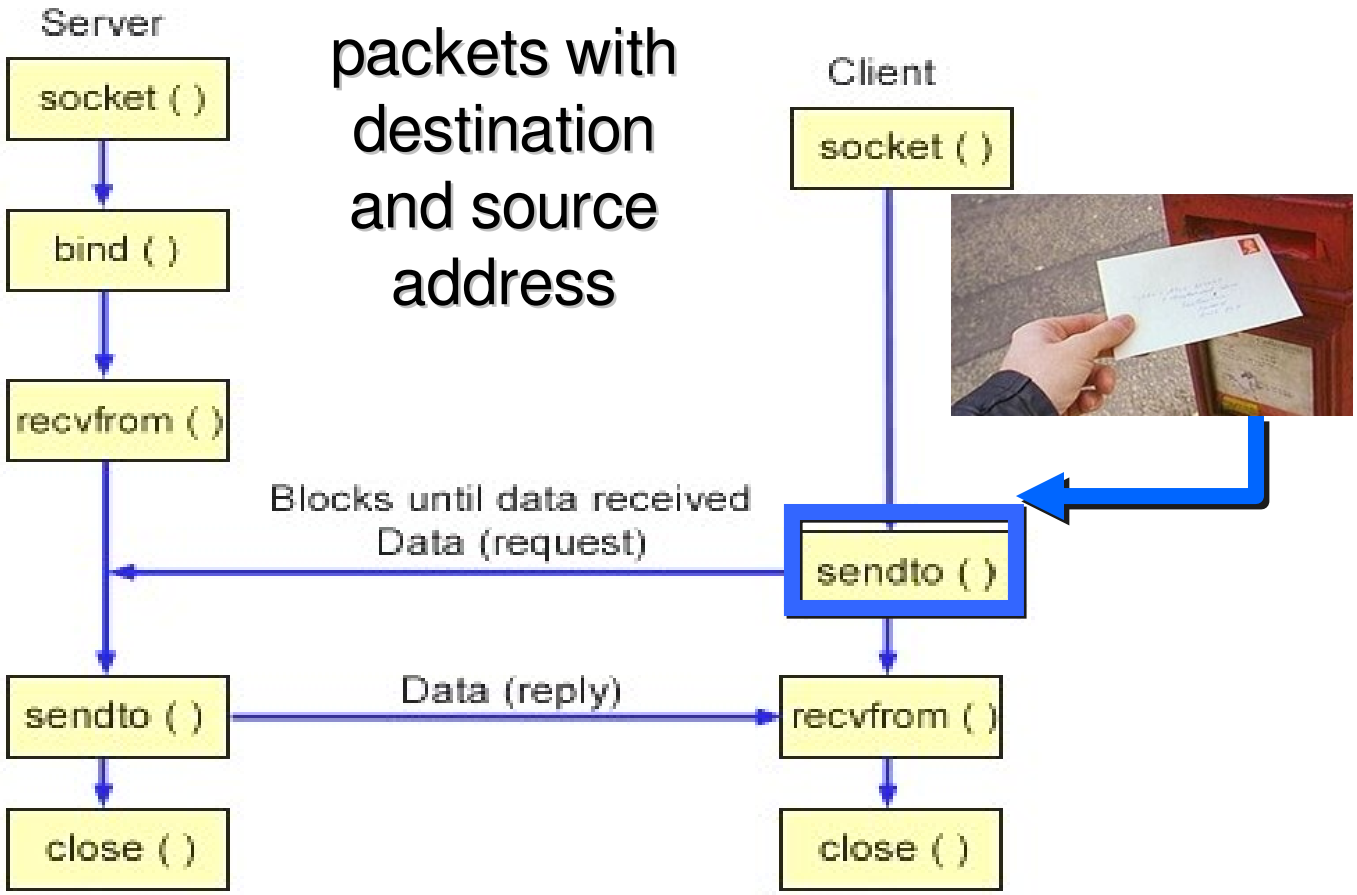
Connectionless - UDP

low reliability, low delay

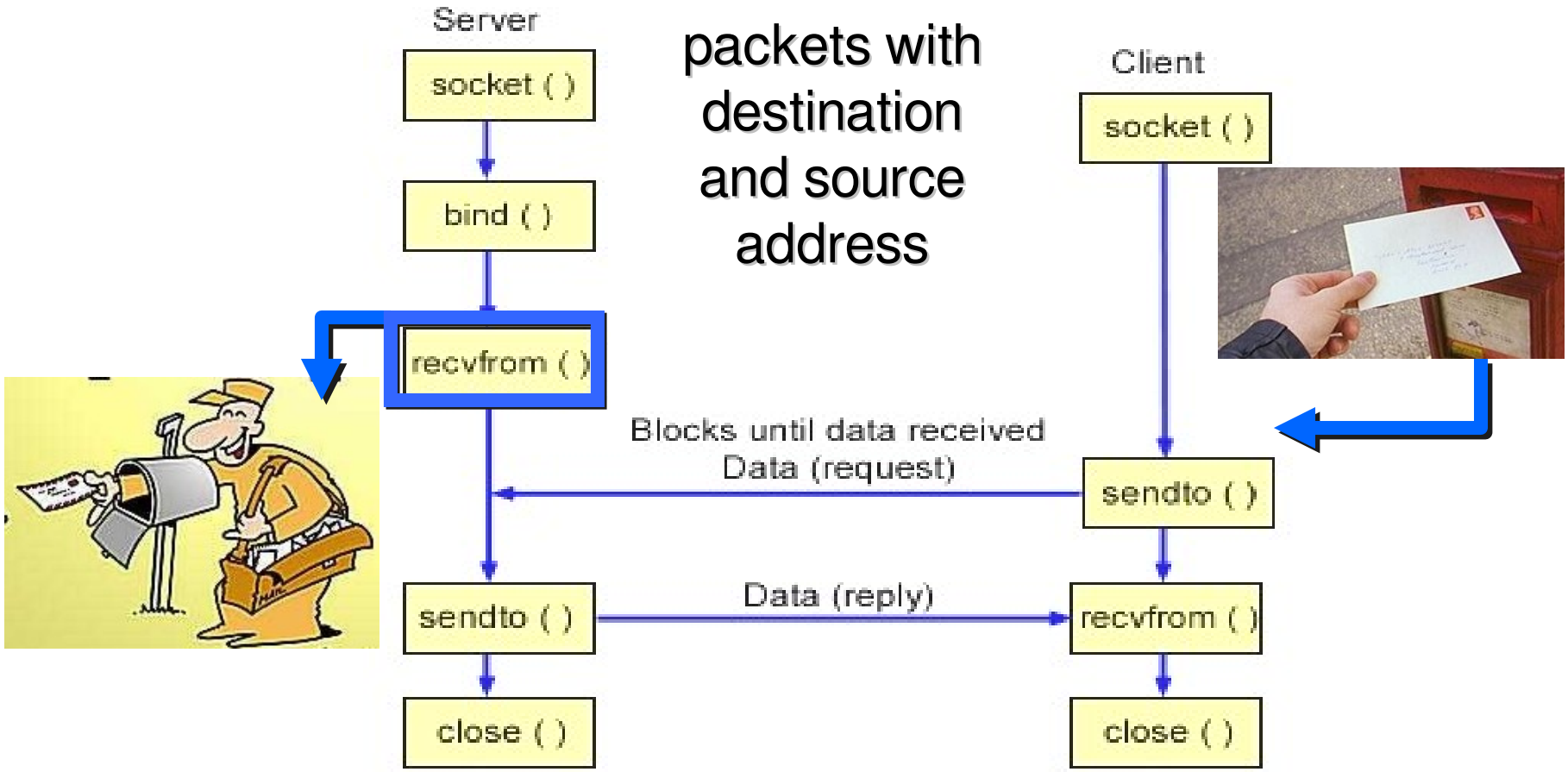
Connectionless Service - UDP



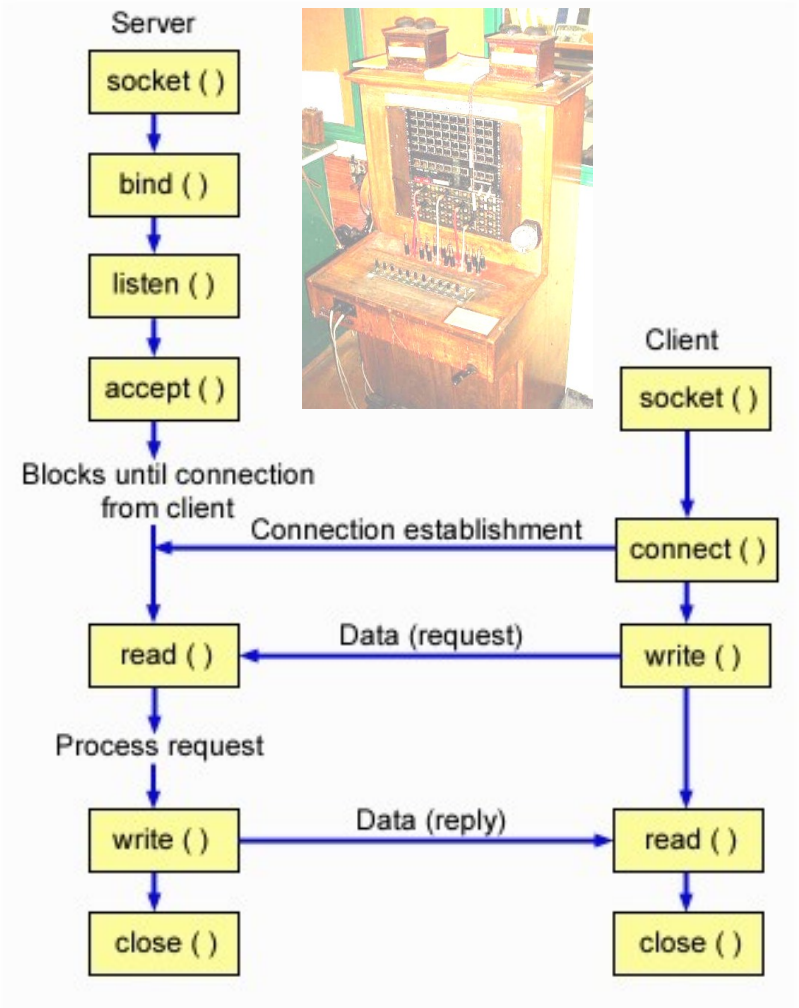
Connectionless Service - UDP



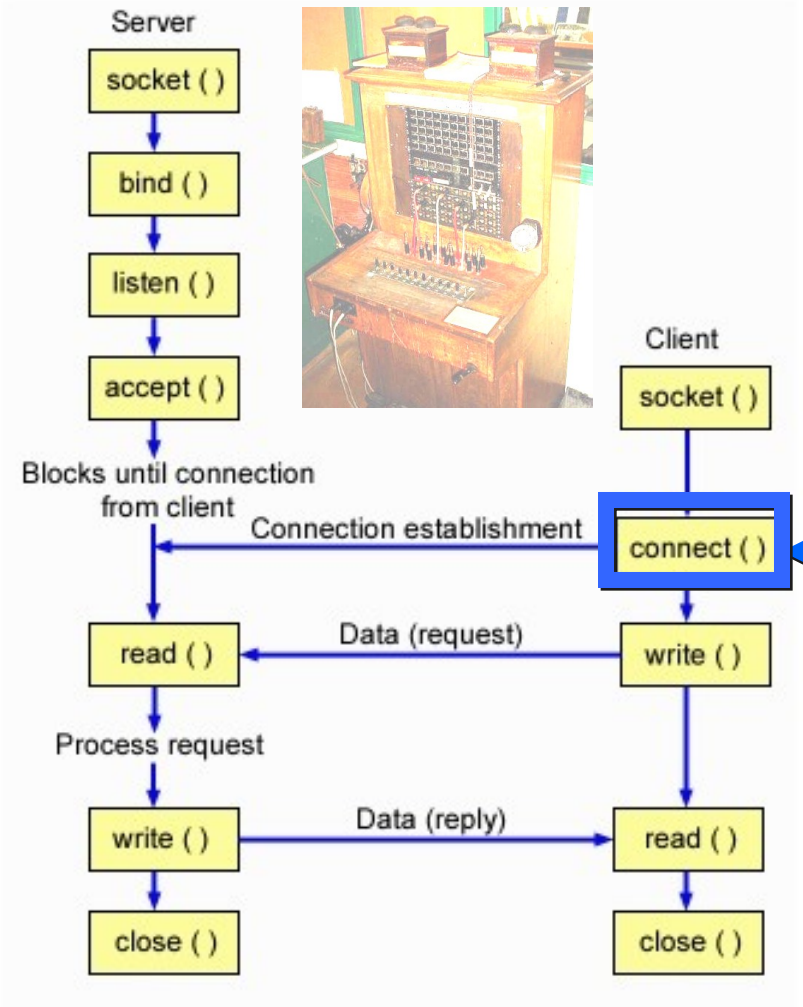
Connectionless Service - UDP



Connection-Oriented Service - TCP

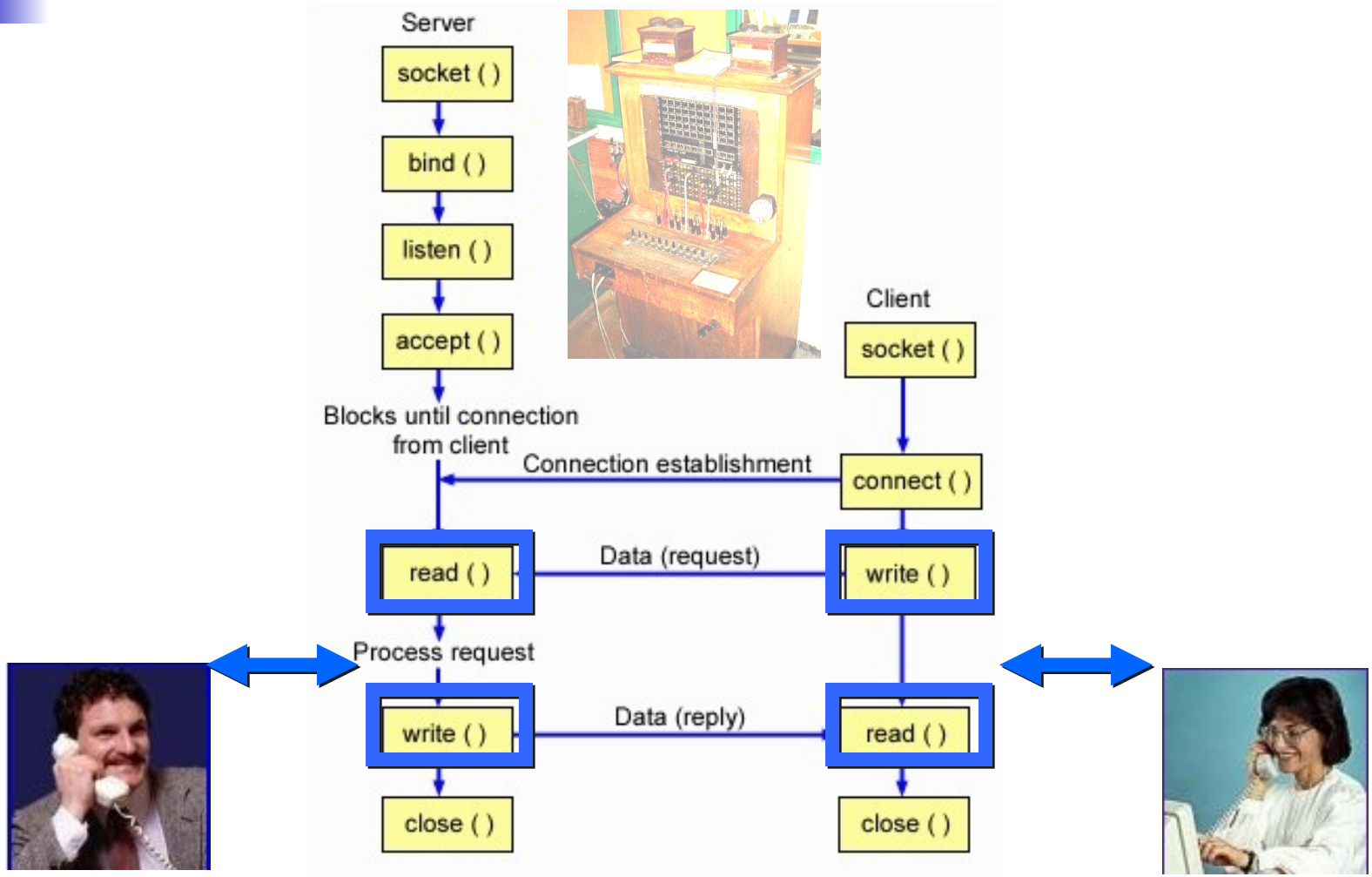


Connection-Oriented Service - TCP

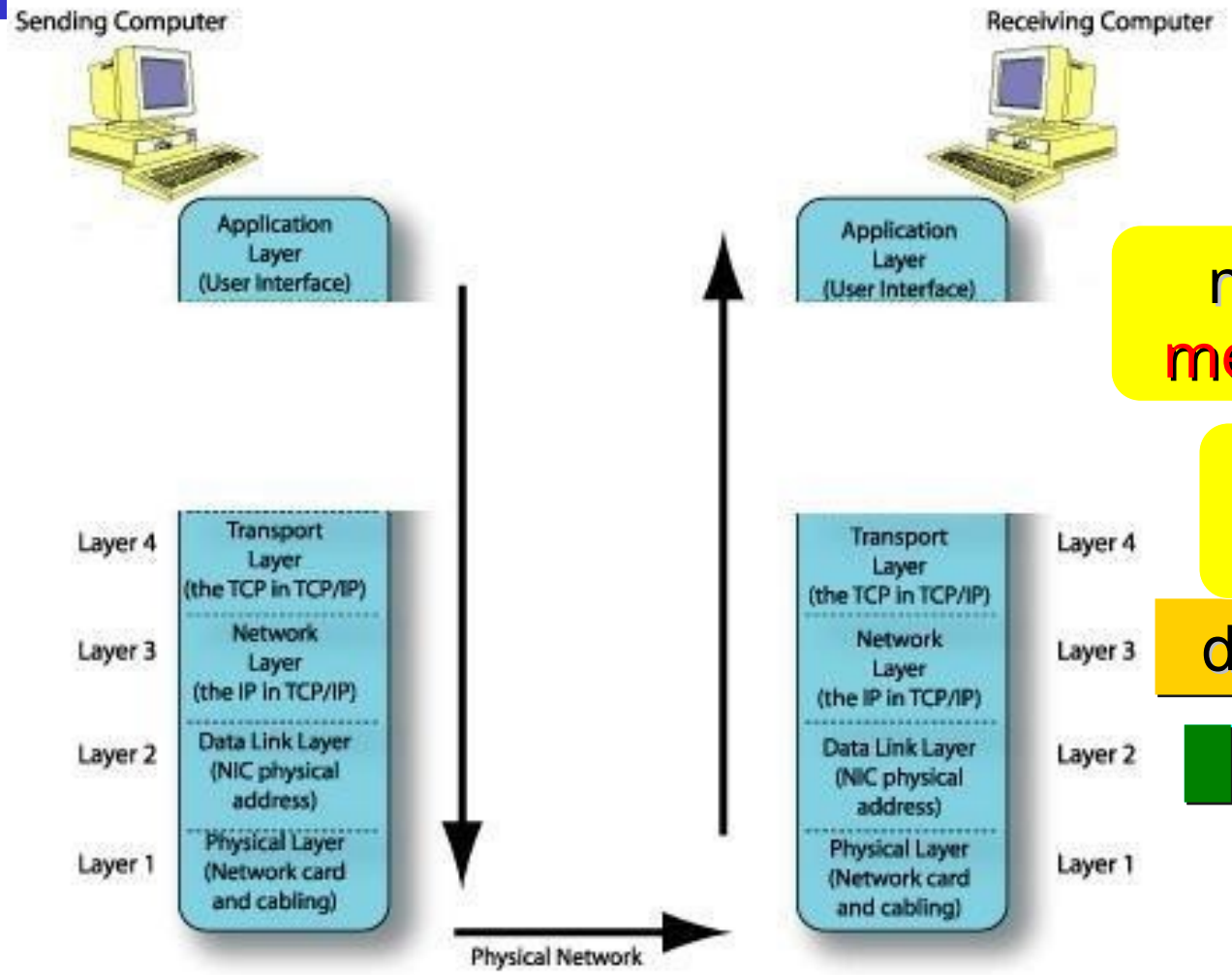


Connection-Oriented Service - TCP

Connection-Oriented Service - TCP



Internet protocol stack



PDUs

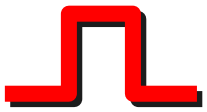
message/
media frame

segment/
packet

datagram - @

frame

bit



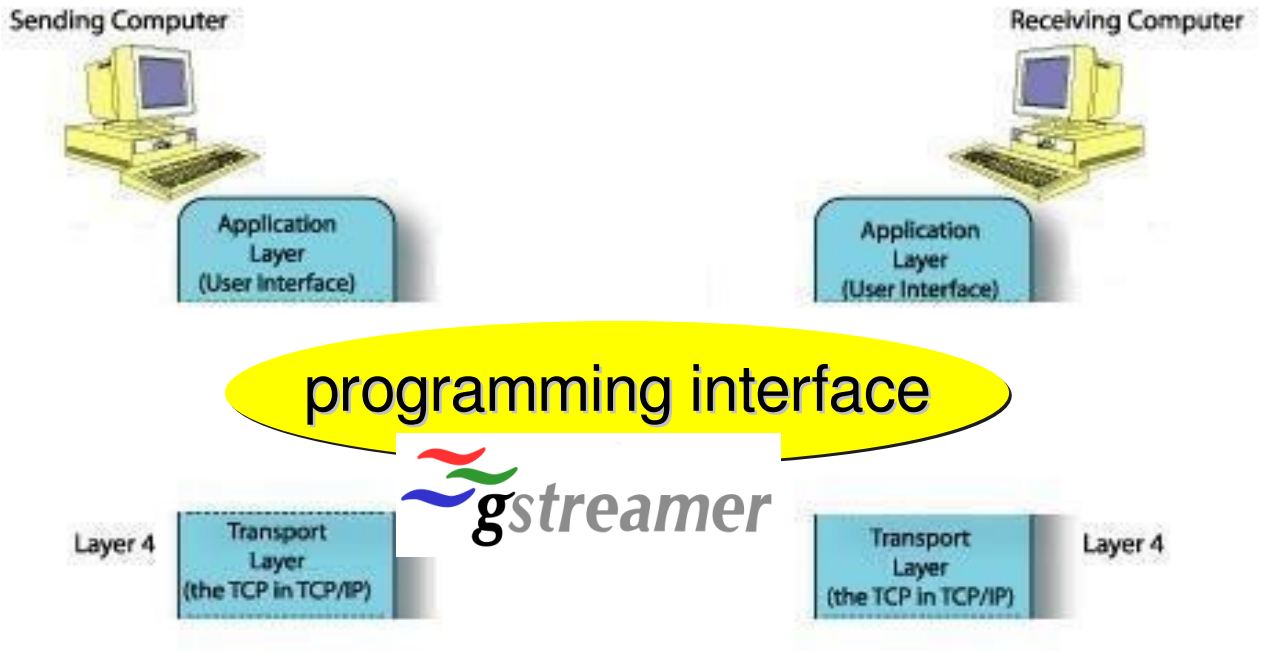
Application layer

HTTP
SMTP
FTP

VoIP

VoD

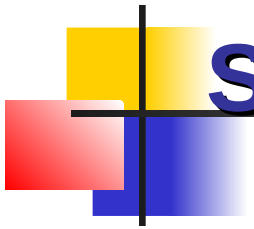
Media Transport layer : UDP+RTP



RTP/RTCP

connectionless service

UDP



Summary

- Various pieces of hardware & software
- Systems & applications
- Communication modes
- Functional layers

Let us start Lab1 – UDP, TCP and socket programming for Client-Server models