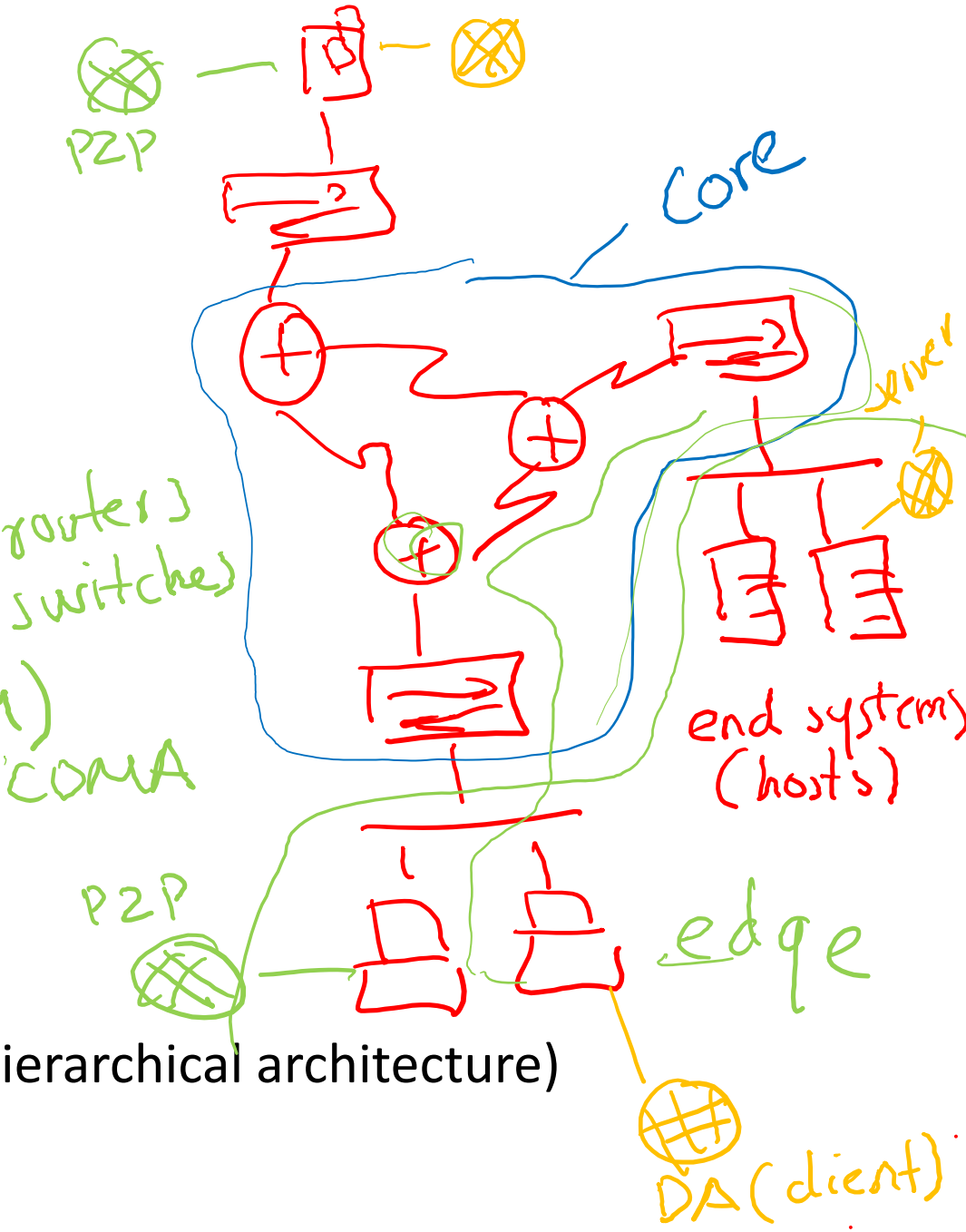
Midterm review

COMP 445

Winter 2022

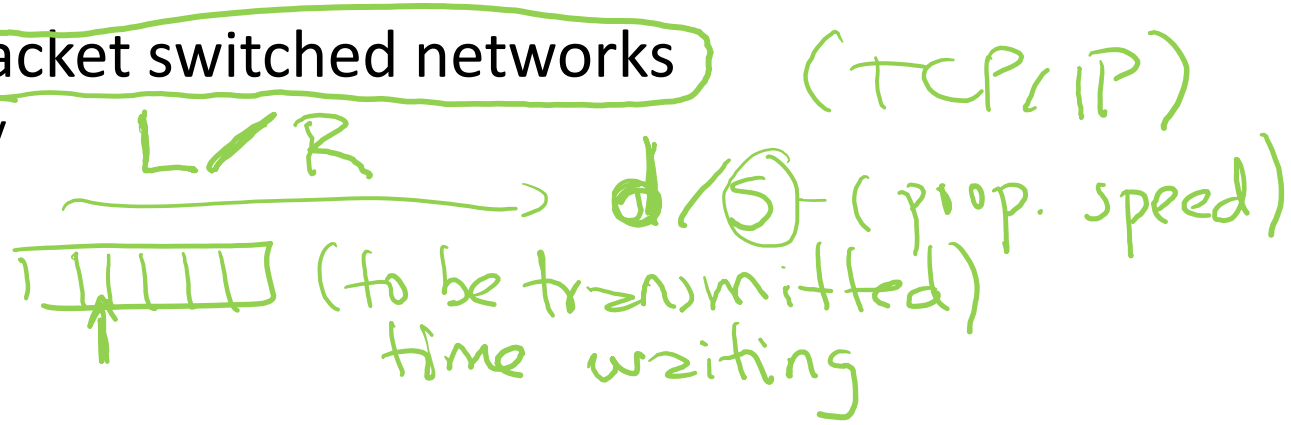
Introduction

- What are computer networks
- Distributed applications
- Protocols (semantics, actions, format)
- Types of communication networks
  - Circuit switching (FDM, TDM, CDM)
  - Message switching
  - Packet switching
- Internet architecture (Edge and Core)
  - Access networks and physical media
  - Network of networks (interconnected ISPs, hierarchical architecture)

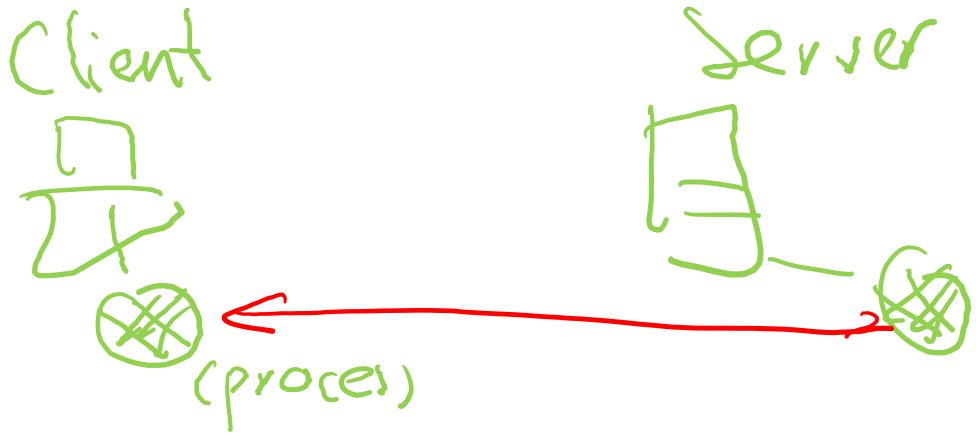


Introduction

- Internet architecture (Edge and Core)
  - Access networks and physical media
  - Network of networks (interconnected ISPs, hierarchical architecture)
- Types of delay in packet switched networks
  - Transmission delay
  - Propagation delay
  - Queuing delay
  - Processing delay
- Protocol layers
  - TCP/IP stack
  - OSI reference model
  - Encapsulation



Application layer



- Application layer protocols
- Architectures
  - Client/server
  - Peer-to-peer
- Services available to an Internet application
  - Reliable, congestion controlled data transfer (TCP)
  - Unreliable data transfer (UDP)
- Web and HTTP
  - Non-persistent
  - Persistent
- Caching

Application layer

- Electronic mail
  - SMTP
  - Mail Access protocols (IMAP, POP3, HTTP)
- DNS (types of records, hierarchy)
- P2P applications
- Socket programming
- Video streaming and Content distribution networks

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DASH

Transport layer

- Logical communication between processes
- Multiplexing and demultiplexing
  - Connectionless and connection-oriented (Socket programming)
- UDP
- Reliable data transfer
  - Automated Repeat reQuest (ARQ) protocols (retransmitting packets)
  - Stop-and-wait
  - Pipelined RDT (GBN, selective repeat)

Transport layer

- TCP
  - Connection management (3-way handshake)
  - RDT (hybrid)
  - Flow control
  - Congestion control