

The Client-Server Architecture

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WEEK 3-1



Today

What is client-server architecture

The underlying principle and technology stack that makes the architecture possible

A lab on home-brewed Broadcast server

Problem

Wish to achieve high availability by centralizing the control of these resources

Achieve high quality of service

Promote modifiability and reuse

Solution – Client-Server

Client interacts by requesting services of server

May be one central server or multiple distributed ones

Uses request/reply protocol

What's the Internet: "nuts and bolts" view

Internet: "network of networks"

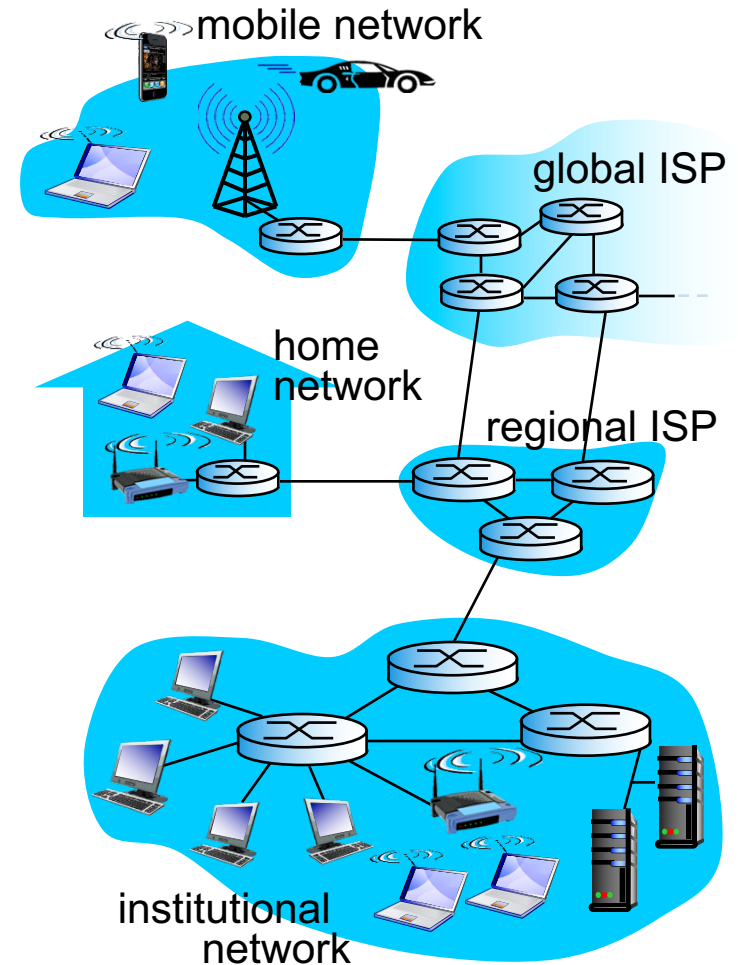
- Interconnected ISPs

Protocols control sending, receiving of msgs

- e.g., TCP, IP, HTTP, Skype, 802.11

Internet standards

- RFC: Request For Comments
- IETF: Internet Engineering Task Force



Internet protocol stack

Application: supporting network applications

- FTP, SMTP, HTTP

Transport: process-process data transfer

- TCP, UDP

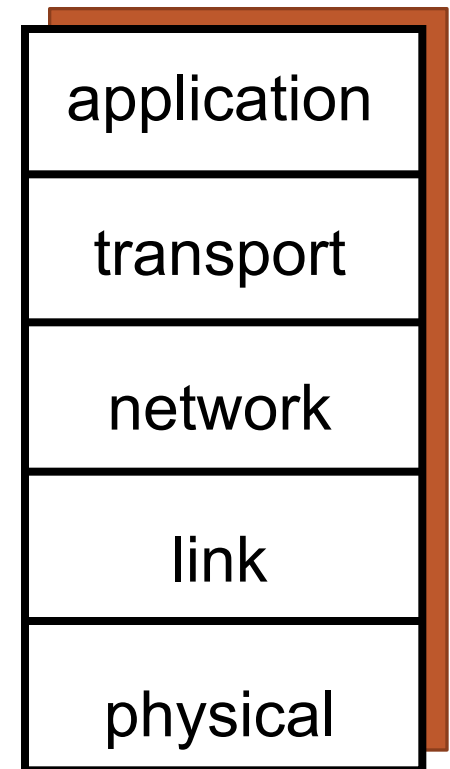
Network: routing of datagrams from source to destination

- IP, routing protocols

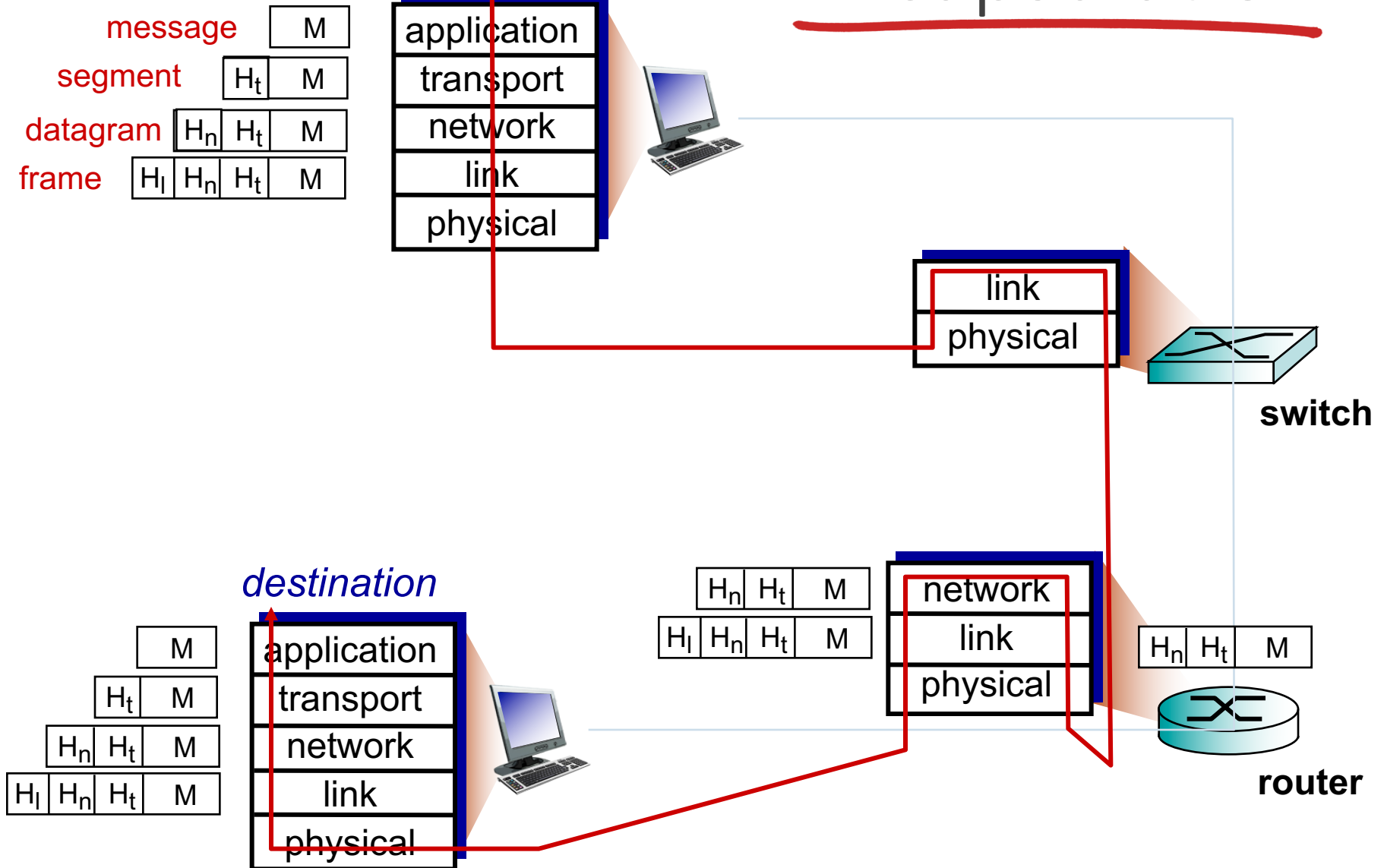
Link: data transfer between neighboring network elements

- Ethernet, 802.11 (WiFi), PPP

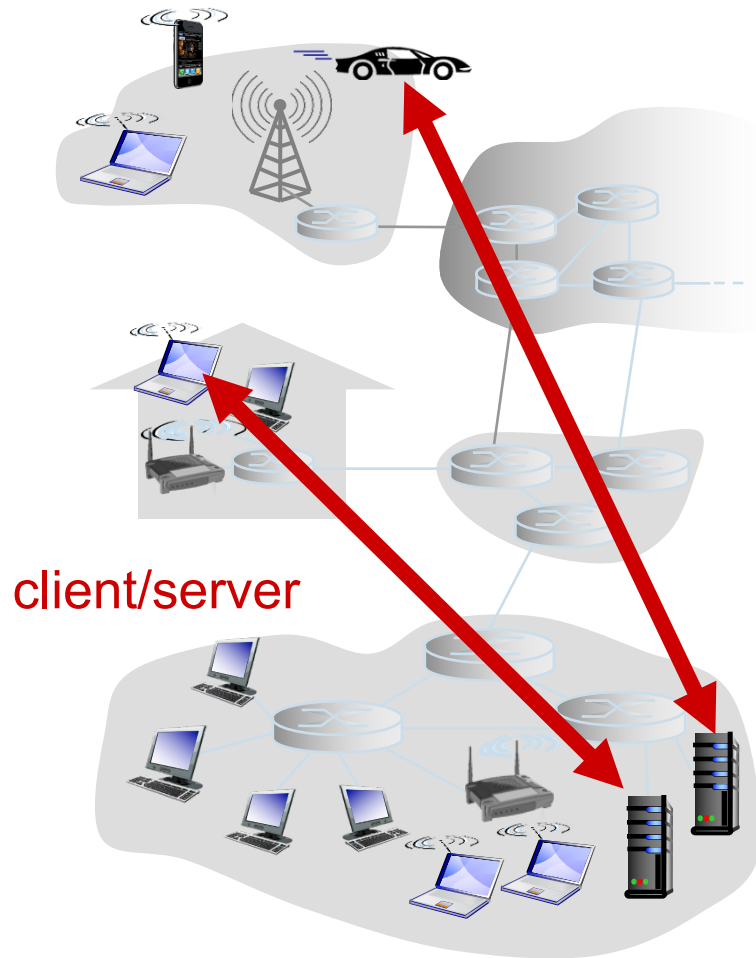
Physical: bits “on the wire”



Encapsulation



Client-server architecture



Server:

- Host that is always on
- Permanent IP address
- Data centers for scaling

Clients:

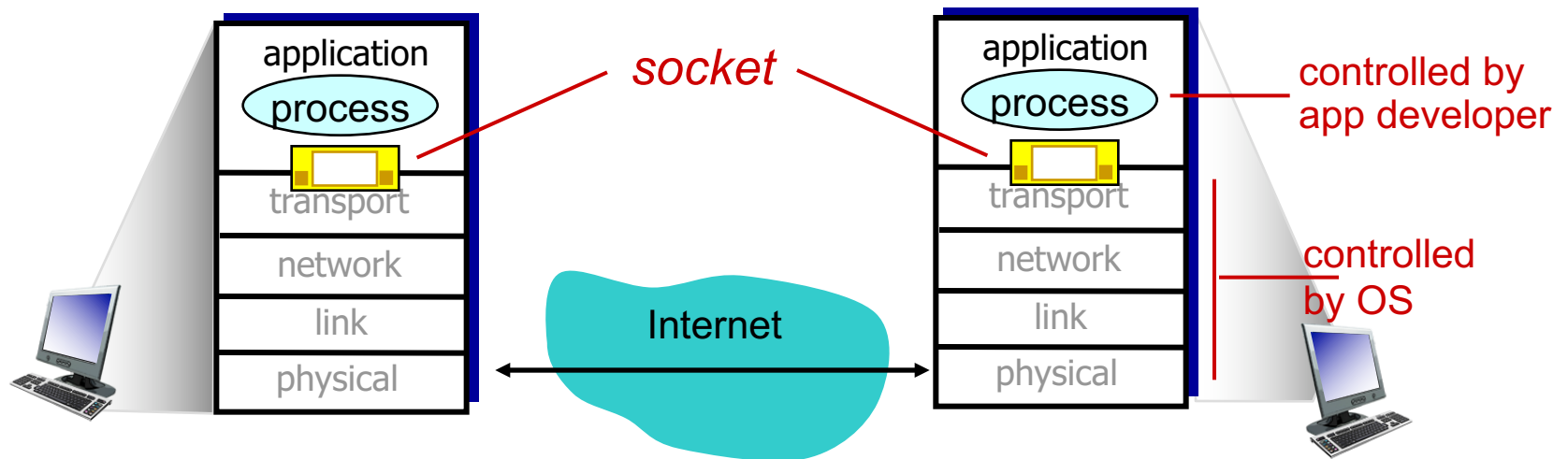
- Communicate with server
- May be intermittently connected
- May have dynamic IP addresses
- Do not communicate directly with each other

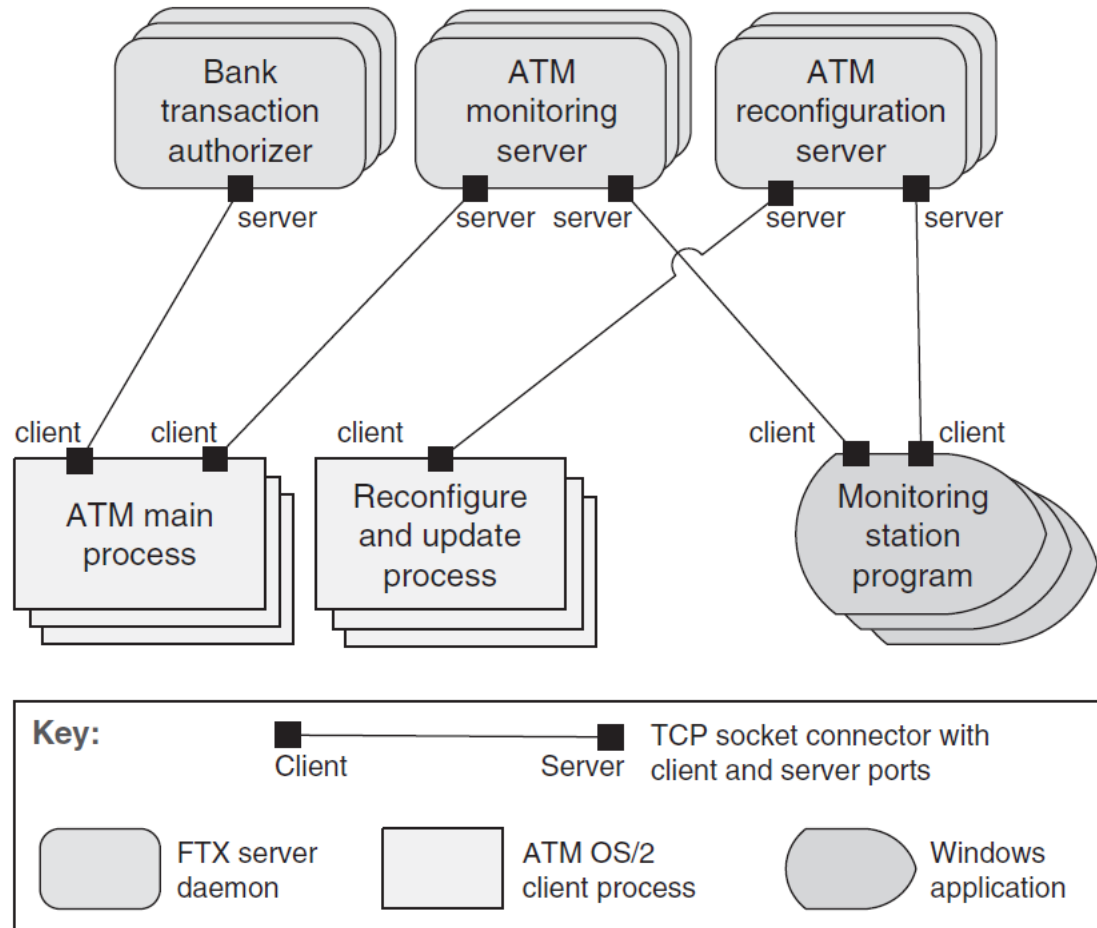
Sockets

Process sends/receives messages to/from its **socket**

Socket analogous to door

- Sending process shoves message out door
- Sending process relies on transport infrastructure on other side of door to deliver message to socket at receiving process





The client-server architecture of an ATM banking system

Limitations of Client-Server

Constraints

- Number of attachments to a given port

Weaknesses

- Server can be a performance bottleneck
- Single point of failure
- Decisions about where to locate functionality, i.e. in the client or in the server, and difficult to change afterwards

Next ...

Lab on broadcast server

Things Due:

- Assignment 3 (Broadcast Server Lab) - Wednesday, 11:55 PM