Socket Programming

مدرس: اسماعیل صادقی

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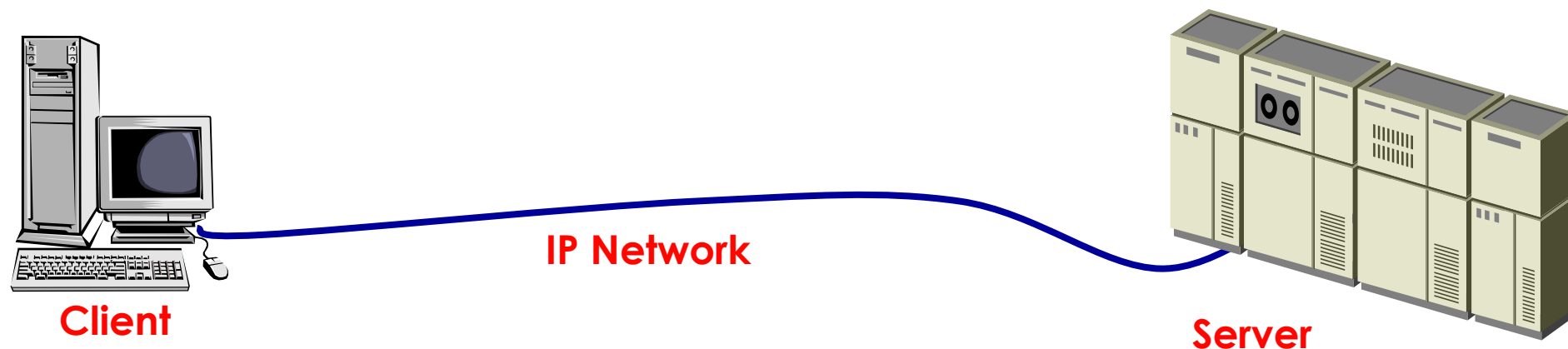
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EsmaelSadeghijob@gmail.com

Questions that will be Addressed

- What mechanisms are available for a programmer who writes network applications?

- How to write a network application that sends packets between hosts (client and server) across an IP network?

IP Network

Client

Server

What is Socket?

- An interface between application and network

The application creates a socket

The **socket type** dictates the **style** of communication

- Once configured the application can

pass data to the socket for network transmission

receive data from the socket (transmitted through the network by some other host)

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Two essential types of sockets

SOCK_STREAM

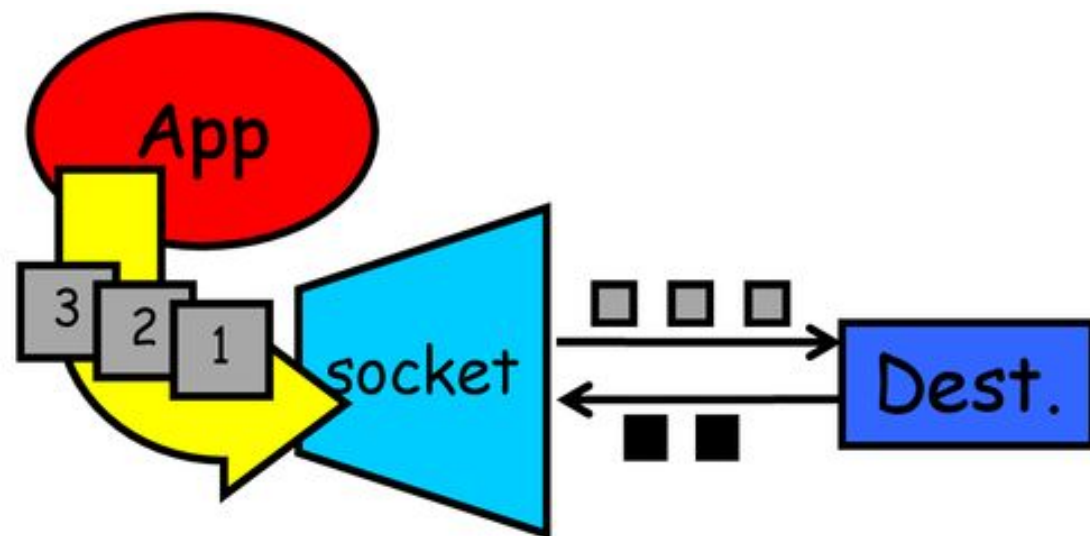   **TCP**

    reliable delivery

    in-order guaranteed

    connection-oriented

    bidirectional

SOCK_DGRAM

   UDP
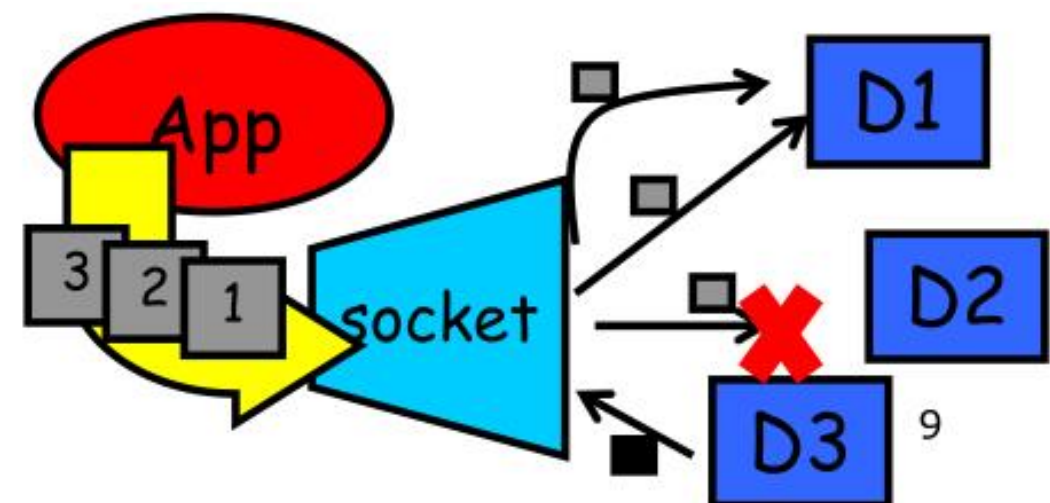
    unreliable delivery

    no order guarantees

    "no notion of "connection

    can send or receive

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CLIENT SERVER ARCHITECTURE

response

Client

Server

request

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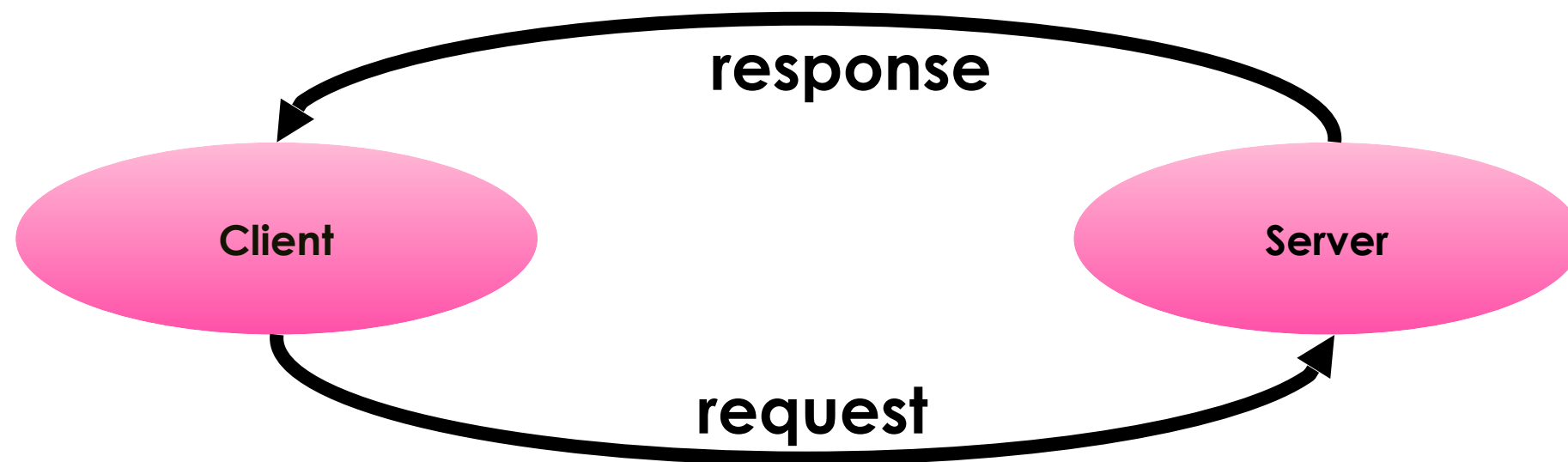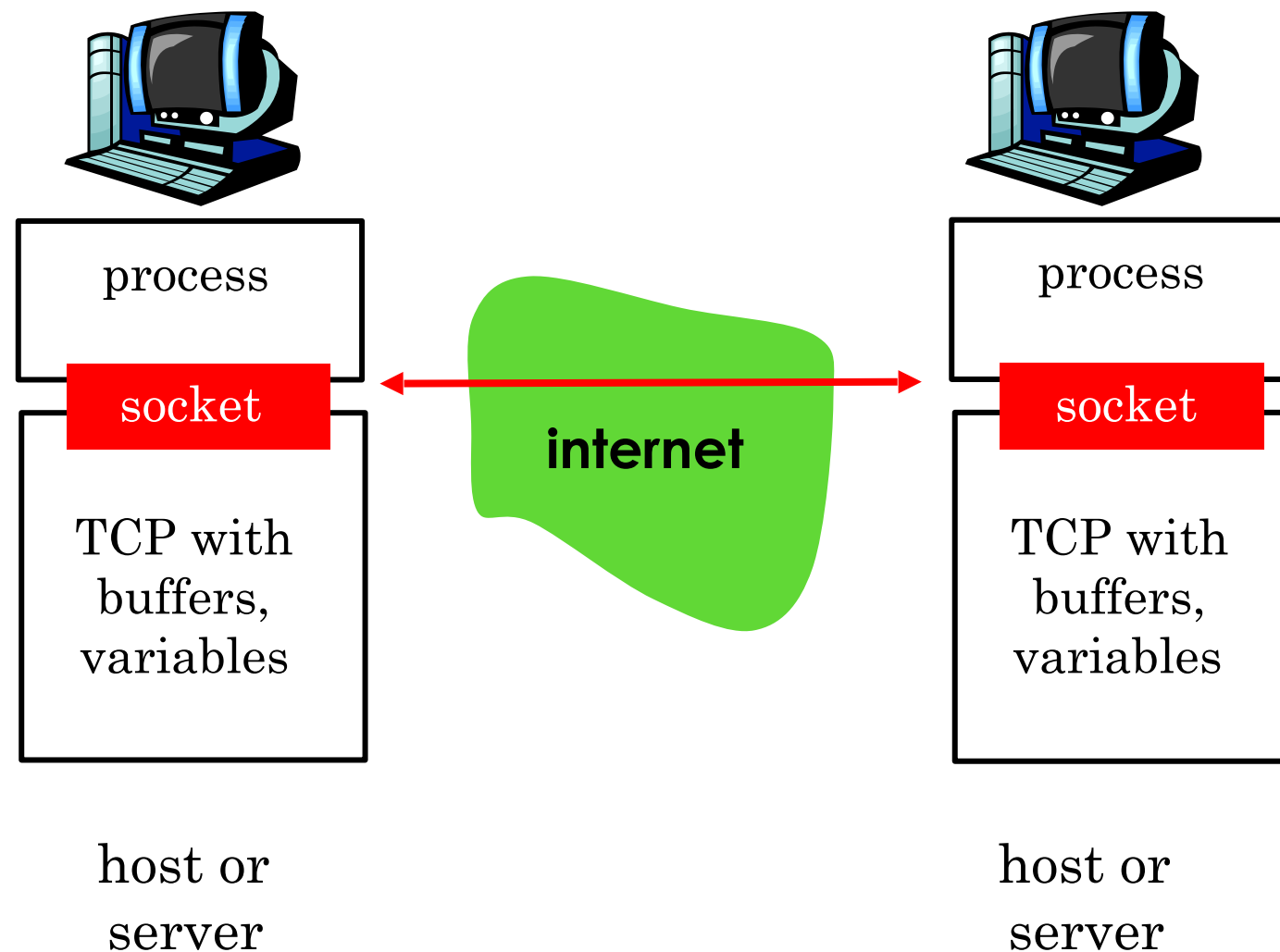
SERVER AND CLIENTS
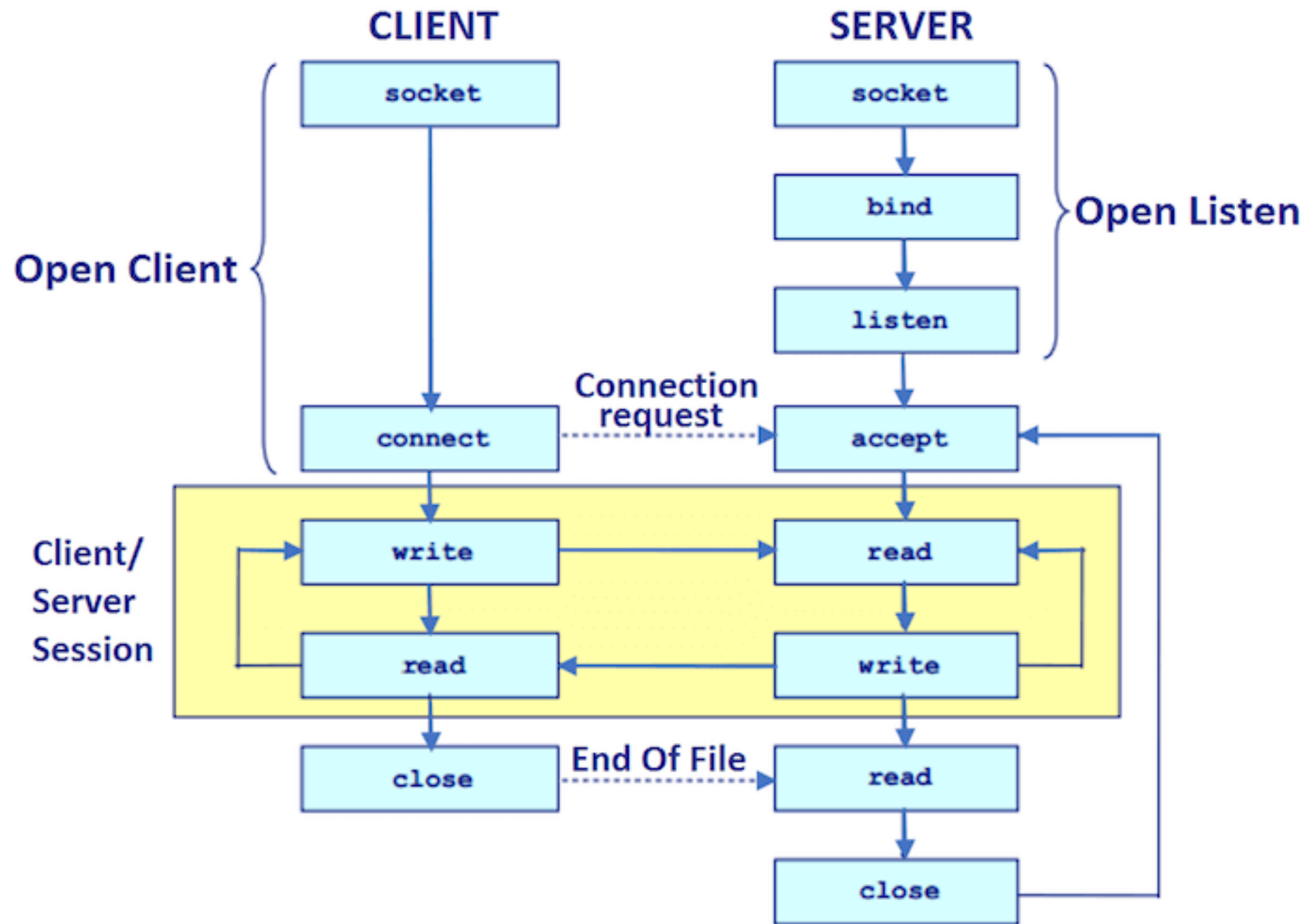
SOCKET-PROGRAMMING USING TCP

- **TCP service:**
  reliable transfer of *bytes* from one process to another

process | internet | process
socket | | socket
TCP with buffers, variables | | TCP with buffers, variables
host or server | | host or server

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CLASS SERVERSOCKET - SOCKET

- ServerSocket(int port)

- Methods

- ○ Socket accept()
- ○ void close()

- Socket(String host, int port)
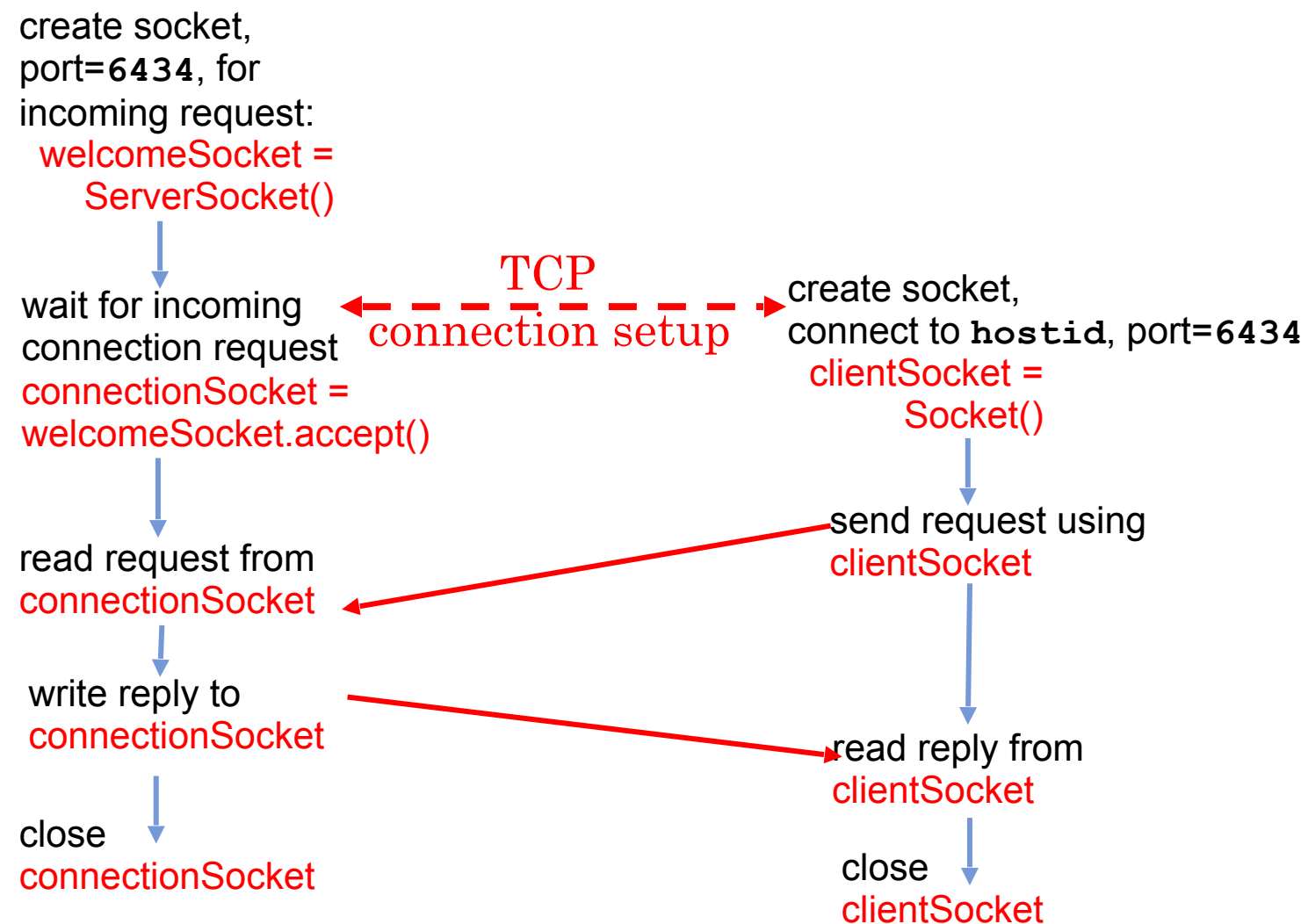
- Methods

- ○ InputStream getInputStream()
- ○ OutputStream getOutputStream()
- ○ InetAddress getInetAddress()
- ○ int getPort()
- ○ int getLocalPort()
- ○ void close()

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CLIENT/SERVER SOCKET INTERACTION: TCP

- Server (running on `hostid`)   - Client

create socket,
port=**6434**, for
incoming request:
  welcomeSocket =
    ServerSocket()

wait for incoming   *TCP*   create socket,
connection request   ◀ ─ ─ ─ ─ ─ ─ ▶   connect to **hostid**, port=**6434**
connectionSocket =   *connection setup*   clientSocket =
welcomeSocket.accept()   Socket()

                                          send request using
read request from   clientSocket
connectionSocket

write reply to
connectionSocket   read reply from
                                             clientSocket

close   close
connectionSocket   clientSocket

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Reference

Natarajan Meghanathan

A Tutorial on Java Socket Programming and Source Code Analysis

Complete Java Source Code Examples and Practice Exercises: Supplement for Computer Networks & Software Security Courses

LAMBERT Academic Publishing

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