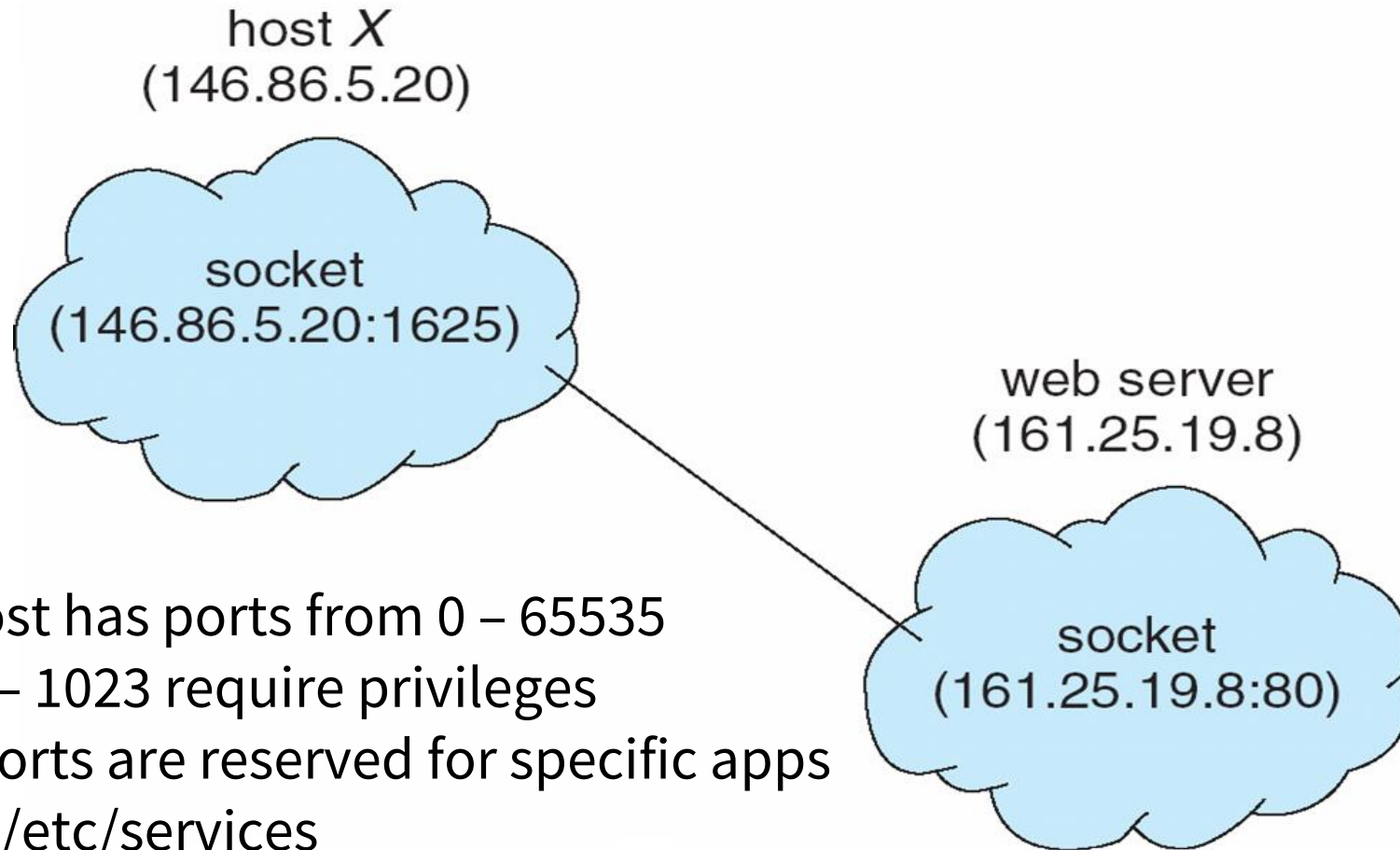


Week 7 Tutorial
NWEN 241
Systems Programming

Alvin Valera

`Alvin.valera@ecs.vuw.ac.nz`

Recap: Socket communication



- Each host has ports from 0 – 65535
- Ports 0 – 1023 require privileges
- Some ports are reserved for specific apps
 - See /etc/services

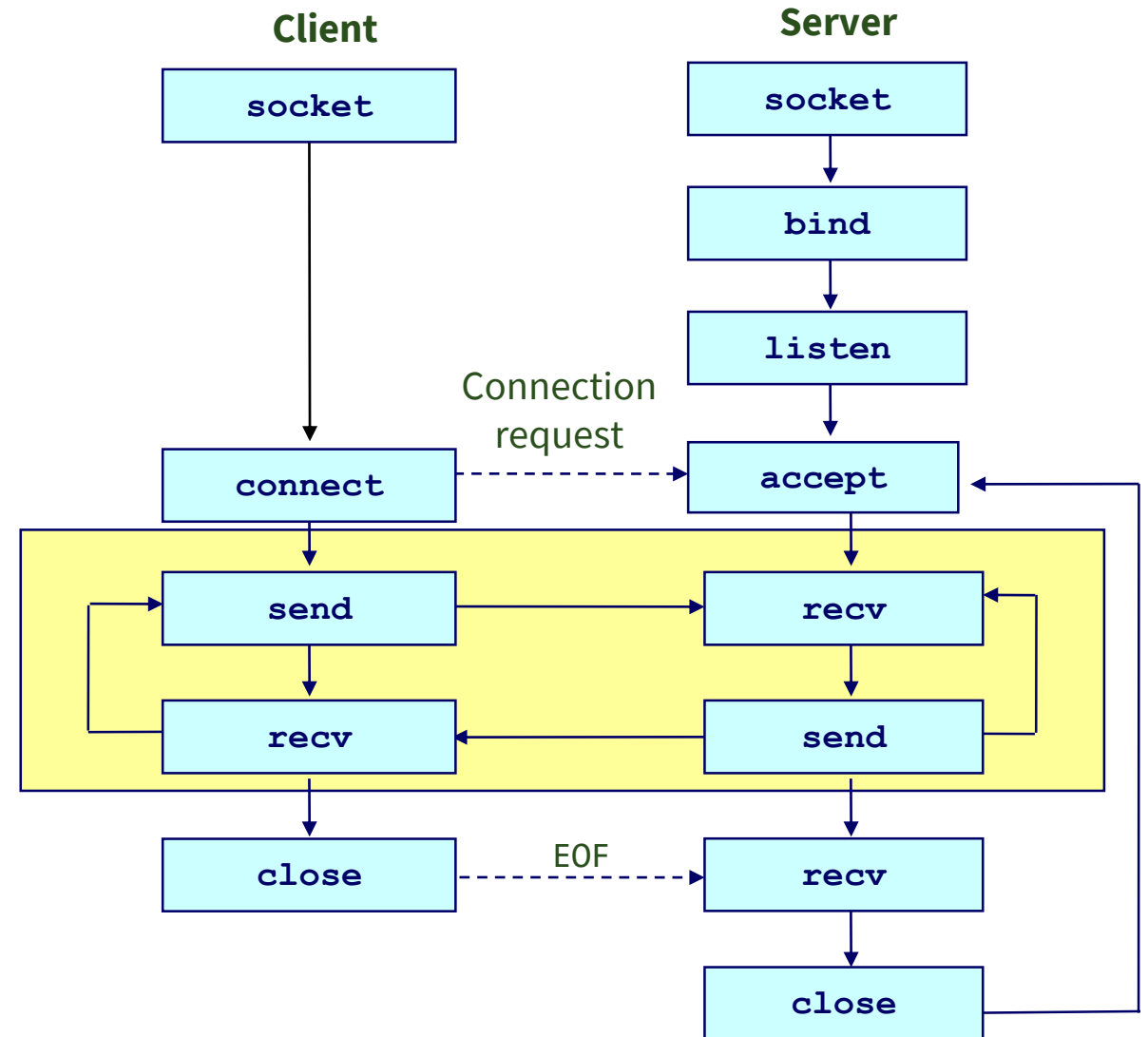
Recap: Socket types

- SOCK_STREAM
 - a.k.a. **TCP**
 - reliable delivery
 - in-order guaranteed
 - connection-oriented
 - bidirectional
- SOCK_DGRAM
 - a.k.a. **UDP**
 - unreliable delivery
 - no order guarantees
 - no notion of “connection” – app indicates destination for each packet
 - can send or receive

We will focus on SOCK_STREAM or TCP socket type

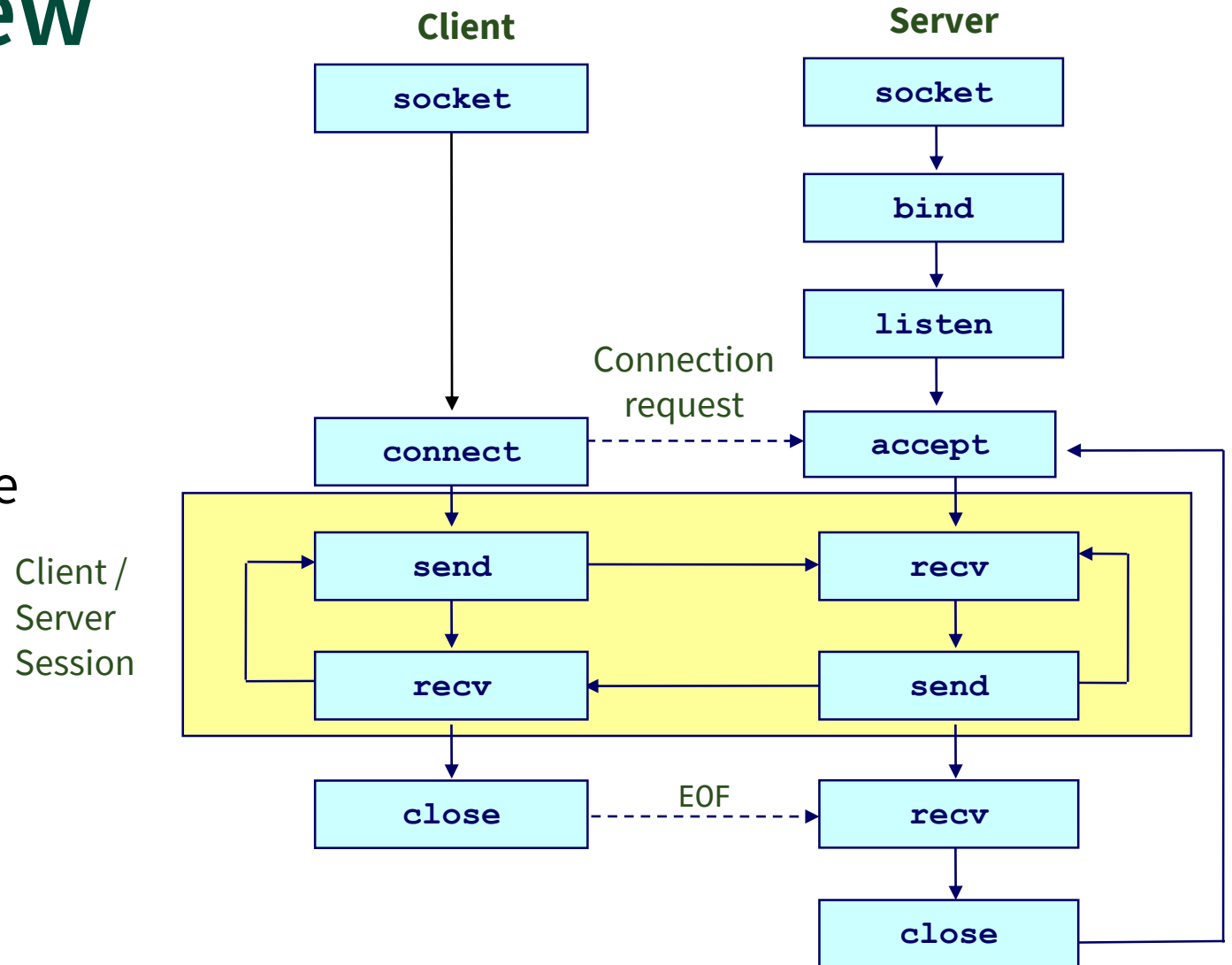
TCP Server overview

- 1) Create a socket with the `socket()` system call
- 2) Bind the socket to an address using the `bind()` system call
- 3) Listen for connections with the `listen()` system call
- 4) Accept a connection with the `accept()` system call
- 5) Send and receive data

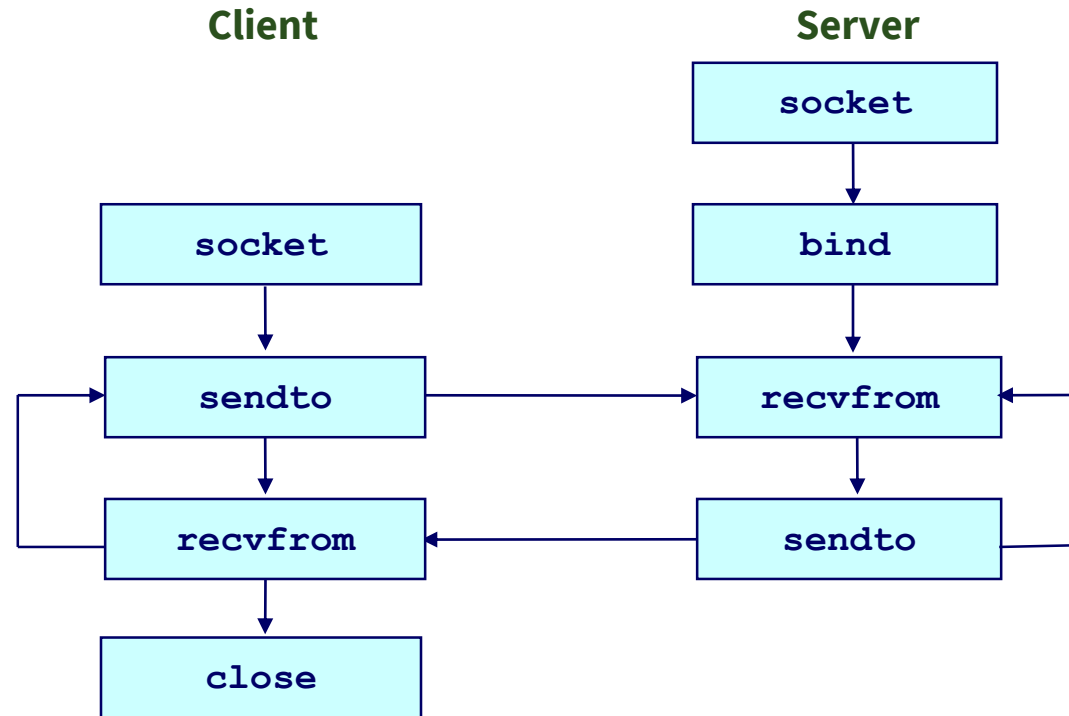


TCP Client overview

- 1) Create a socket with the `socket()` system call
- 2) Connect the socket to the address of the server using the `connect()` system call
- 3) Send and receive data



Client-server communication overview - UDP



Let's write some code

- Write a TCP server program that will (upon connection establishment):
 - Wait for a message from client
 - Capitalise the message and send back to client
- Write a TCP client program that will connect to a known server, then
 - Ask for user input
 - Send user input to server
 - Wait for response from server