EECS 489 - FA 21

Discussion 1

A1 is out

- Please register your github username ASAP
- Due Wed, 22 Sep. 11:59:59 p.m.
  - 1 late day for A1 only
- Get yourself familiar with the basic socket programming
- START EARLY!
- Have fun : -)

Plan

- Introduction to socket programming
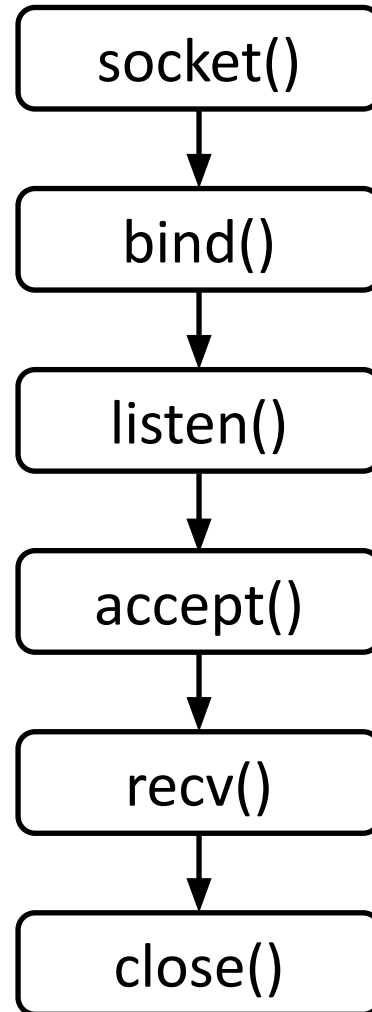- A Demo

Socket Programming: Intro

What is a socket?
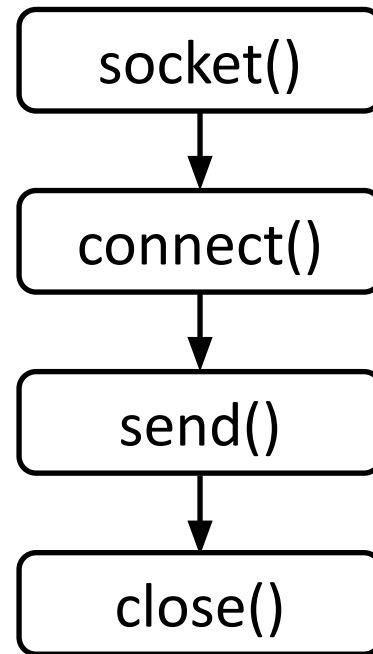- Communication endpoint at the end hosts.

Why do we use a socket?
- It provides an application programming interface to exchange data between processes on the same or different machines.
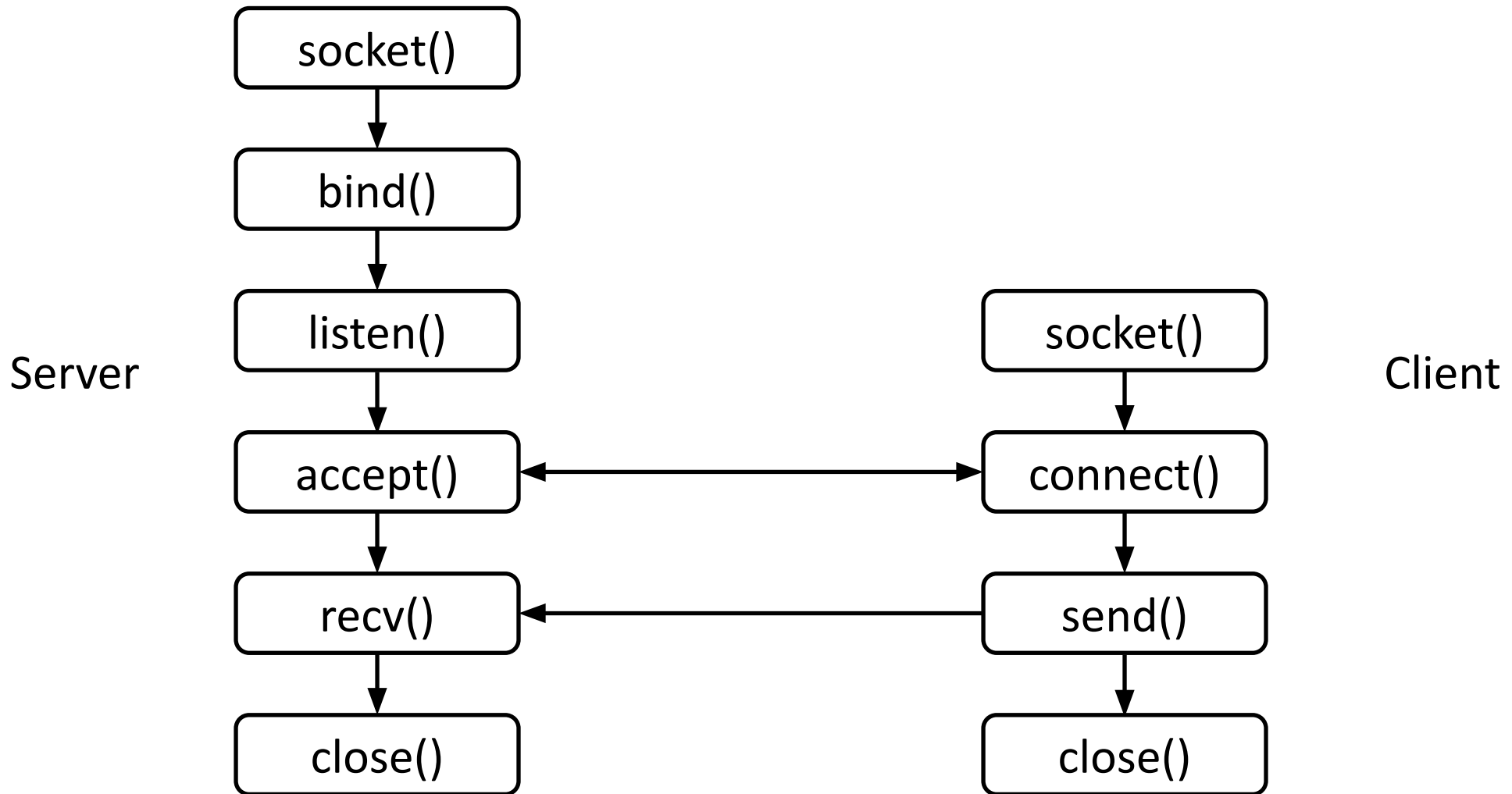
Socket Programming: Server Side

Socket Programming: Client Side

```
socket()
   ↓
connect()
   ↓
send()
   ↓
close()
```

Socket Programming: Complete Flow

Socket Programming: socket()

Create a socket

```
int socket(int domain, int type, int protocol);
```

sockfd = socket(AF_INET, SOCK_STREAM, IPPROTO_TCP);

Socket Programming: bind()

Bind an address to a socket

```c
int bind(int sockfd, const struct sockaddr *addr,
         socklen_t addrlen);
```

```c
struct sockaddr_in addr;
memset(&addr, 0, sizeof(addr));
addr.sin_family = AF_INET;
addr.sin_addr.s_addr = INADDR_ANY;
addr.sin_port = htons(port);
bind(sockfd, (struct sockaddr *) &addr, sizeof(addr));
```

Socket Programming: listen()

Listen for connections on a socket

```
int listen(int sockfd, int backlog);
```

listen(sockfd, 10);

Socket Programming: connect()

Initiate a connection on a socket

```
int connect(int sockfd, const struct sockaddr *addr,
            socklen_t addrlen);
```

struct hostent *server = gethostbyname(hostname);
struct sockaddr_in addr;
memset(&addr, 0, sizeof(addr));
addr.sin_family = AF_INET;
addr.sin_addr.s_addr = * (unsigned long *) server->h_addr_list[0];
addr.sin_port = htons(server_port);

Socket Programming: accept()

Accept a connection on a socket

```
int accept(int sockfd, struct sockaddr *addr, socklen_t *addrlen);
```

socklen_t addr_len = sizeof(addr);
int conn = accept(sockfd, (struct sockaddr *) &addr, &addr_len);

Socket Programming: send()

Send a message on a socket

```
ssize_t send(int sockfd, const void *buf, size_t len, int flags);
```

send(conn, buffer, MSG_SIZE, MSG_NOSIGNAL);

Socket Programming: recv()

Send a message on a socket

```
ssize_t recv(int sockfd, void *buf, size_t len, int flags);
```

byte_recved = recv(conn, buffer, len, MSG_NOSIGNAL);

Socket Programming: A Demo

Done in class.

[eecs482/bgreeves-socket-example: Sockets example from discussion](#)

Socket Programming: Resources

- [Beej's Guide to Network Programming](#)

- [eecs482/bgreeves-socket-example: Sockets example from discussion](#)

- `man` is always your good friend

    - `man socket`

Thanks

Have a good one!