

EECS 489 Discussion 1

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Plans

- Introduction to socket programming
- Mininet Quickstart
- A Demo

Socket Programming: Intro

What is a socket?

Communication endpoint at the end hosts.

Why use a socket?

It provides an application programming interface to exchange data between nodes/processes.

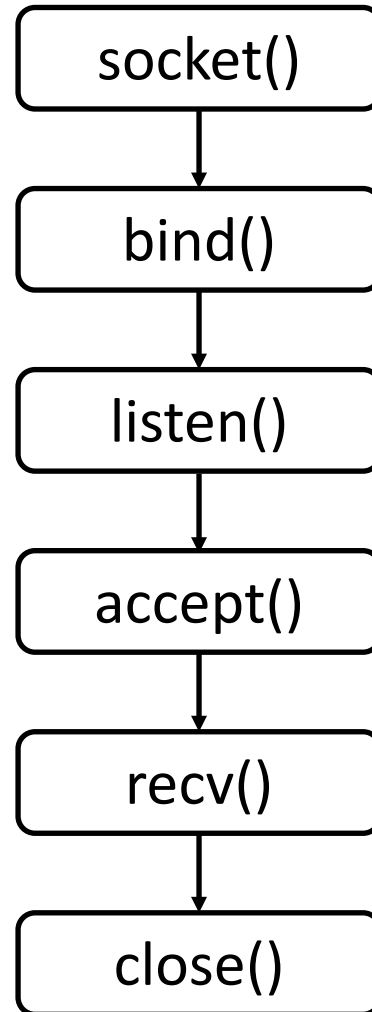
Socket Programming: socket()

Create a socket

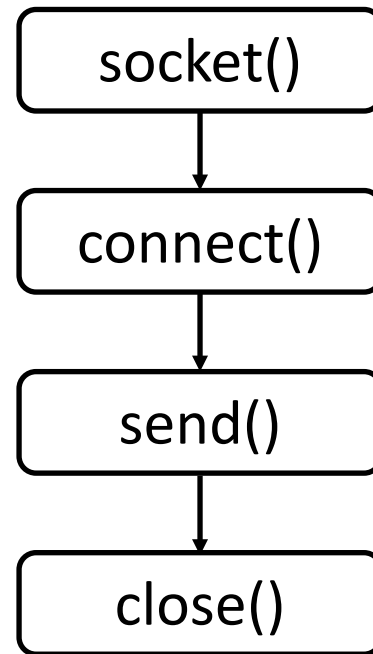
```
int socket(int domain, int type, int protocol);
```

```
sockfd = socket(AF_INET, SOCK_STREAM, IPPROTO_TCP);
```

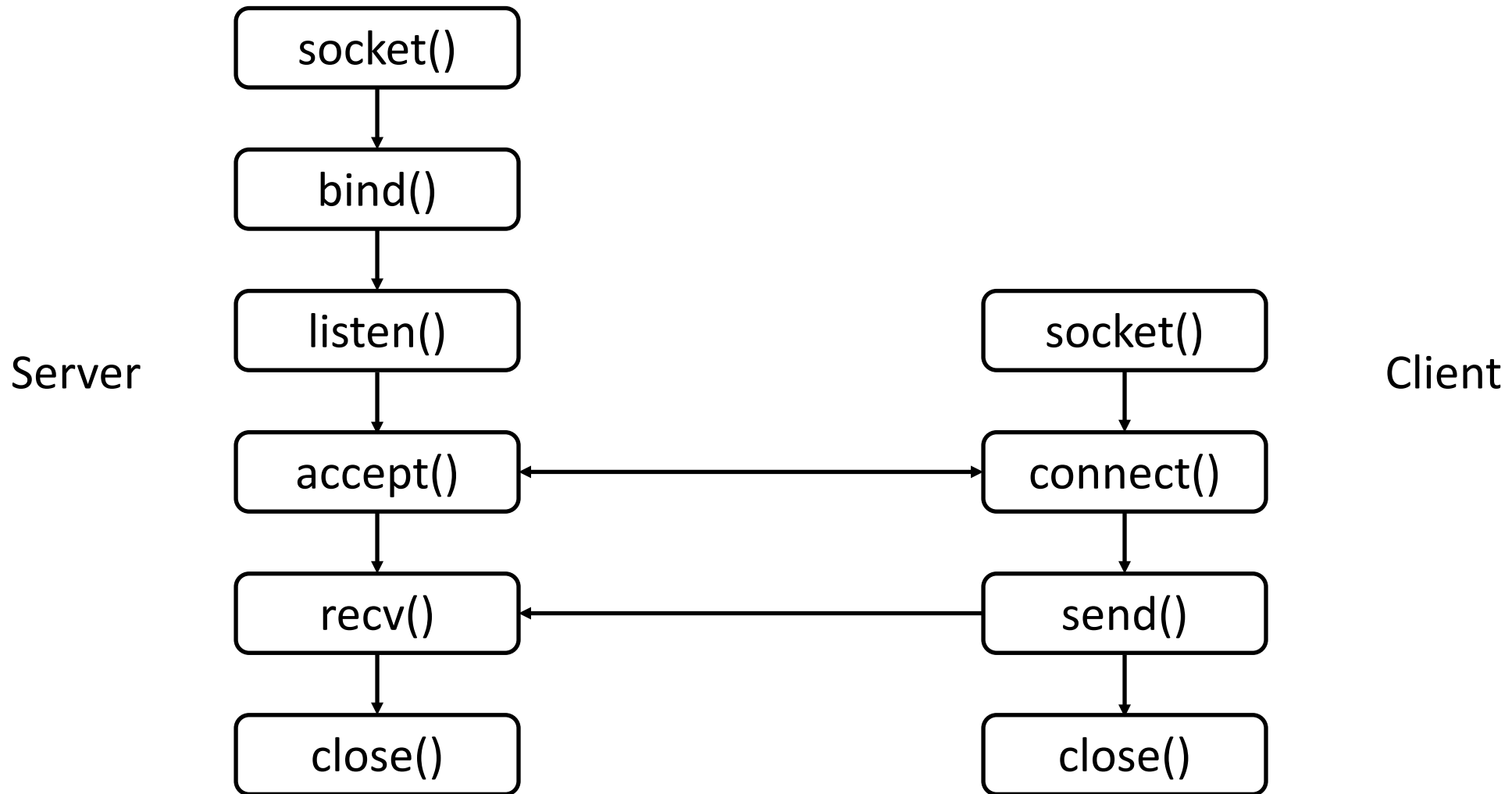
Socket Programming: Server Side



Socket Programming: Client Side



Socket Programming: Complete Flow



Socket Programming: bind()

Bind an address to a socket

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

```
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);
```

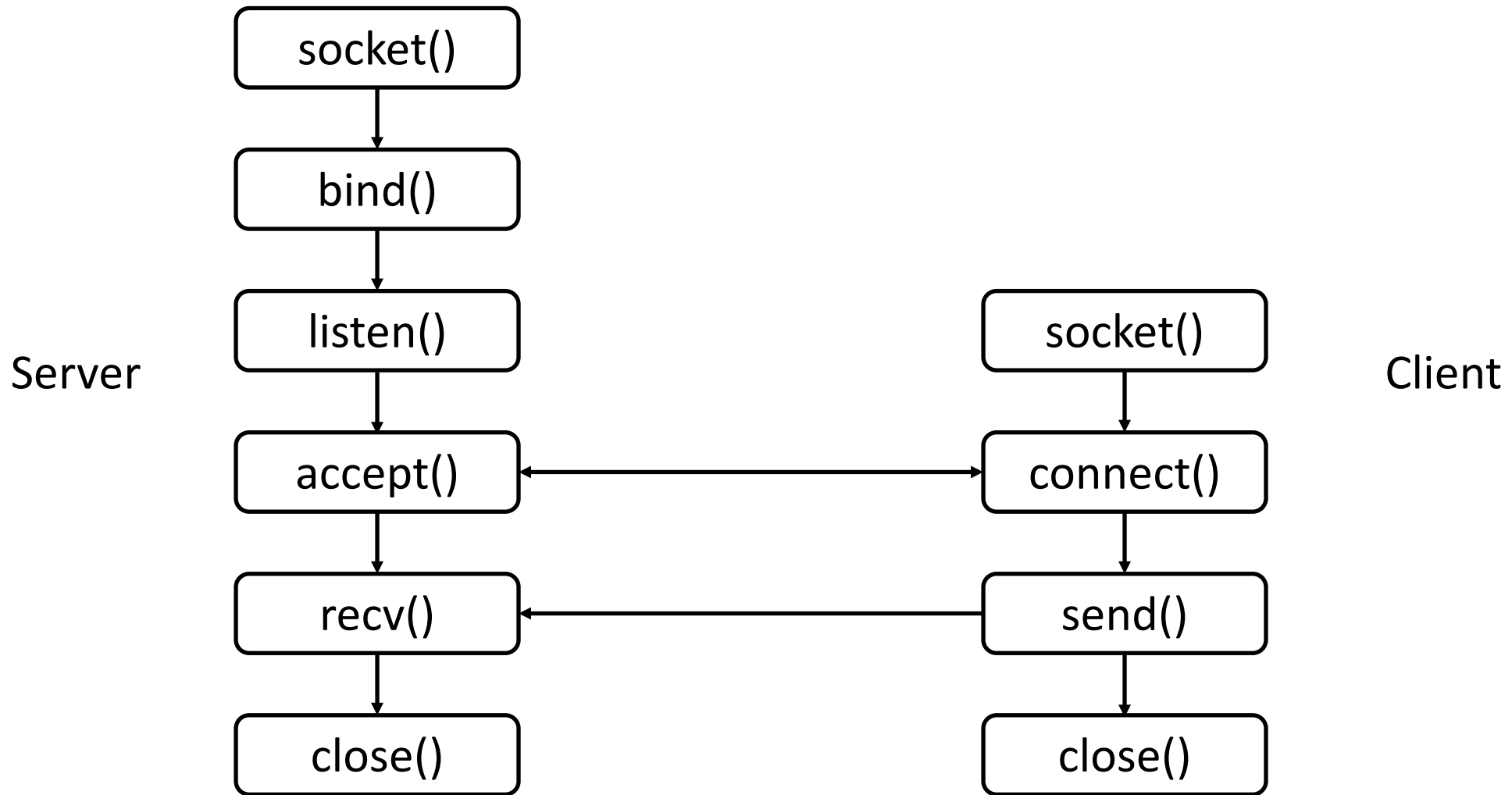
Socket Programming: recv()

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: Complete Flow



Mininet Quickstart

Done in class.

- * Besides launching mininet with “-x” option, do “xterm h1” inside mininet will open an xterm window for host 1.

A Demo

Done in class.