

ECE 4220

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2017-03-22

Prelab 5

Prelab Questions

Explain the functions and parameters needed to:

Create a socket

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

- domain -> AF_INET for IPv4.
- type -> SOCKET_DGRAM for UDP.
- protocol -> Select protocol within protocol family. Set to 0 for default (or single option) protocol.

Write to a socket

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

- sockfd - file descriptor.
- buf - void pointer to buffer (data to be written).
- len - length of message in buf (bytes).
- flags - Bitwise OR of potential flags (man 2 sendto).
- Returns: ssize_t number of bytes sent on success, or -1 and set errno on fail. Doesn't detect failure to deliver.

– Note: Can use write() syscall on any file descriptor including socket, but doesn't handle flags.

Read from a socket

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

- sockfd - file descriptor.
- buf - pointer to buffer (incoming data destination).
- len - length of message to be received.
- flags - Bitwise OR of potential flags (man 2 recvfrom).
- Returns: ssize_t length of message on success, or -1 and set errno.

– Note: Can use read() syscall on any file descriptor including socket, but doesn't handle flags.

Bind a socket

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

- sockfd - file descriptor.
- addr - struct sockaddr to be populated with address to bind.
- addrlen - socklen_t size of the sockaddr addr. I.e. sizeof(addr).
- Returns: 0 on success. On error returns -1 and sets errno.

Change socket permissions

int setsockopt(int sockfd, int level, int optname, const void *optval, socklen_t optlen)

- sockfd - file descriptor.
- level - protocol level of the option to be changed. See 'man 3 getprotoent'.
- optname - Passed to appropriate protocol module. See 'man 7 socket.' and protocol man pages.
- optval - pointer to buffer to be filled with the value for the requested options.
- optlen - size of buffer pointed to by optval. Will be updated with the actual size of the value returned.
- Returns: 0 on success; -1 and set errno on failure.

Flowcharts / Psuedocode

