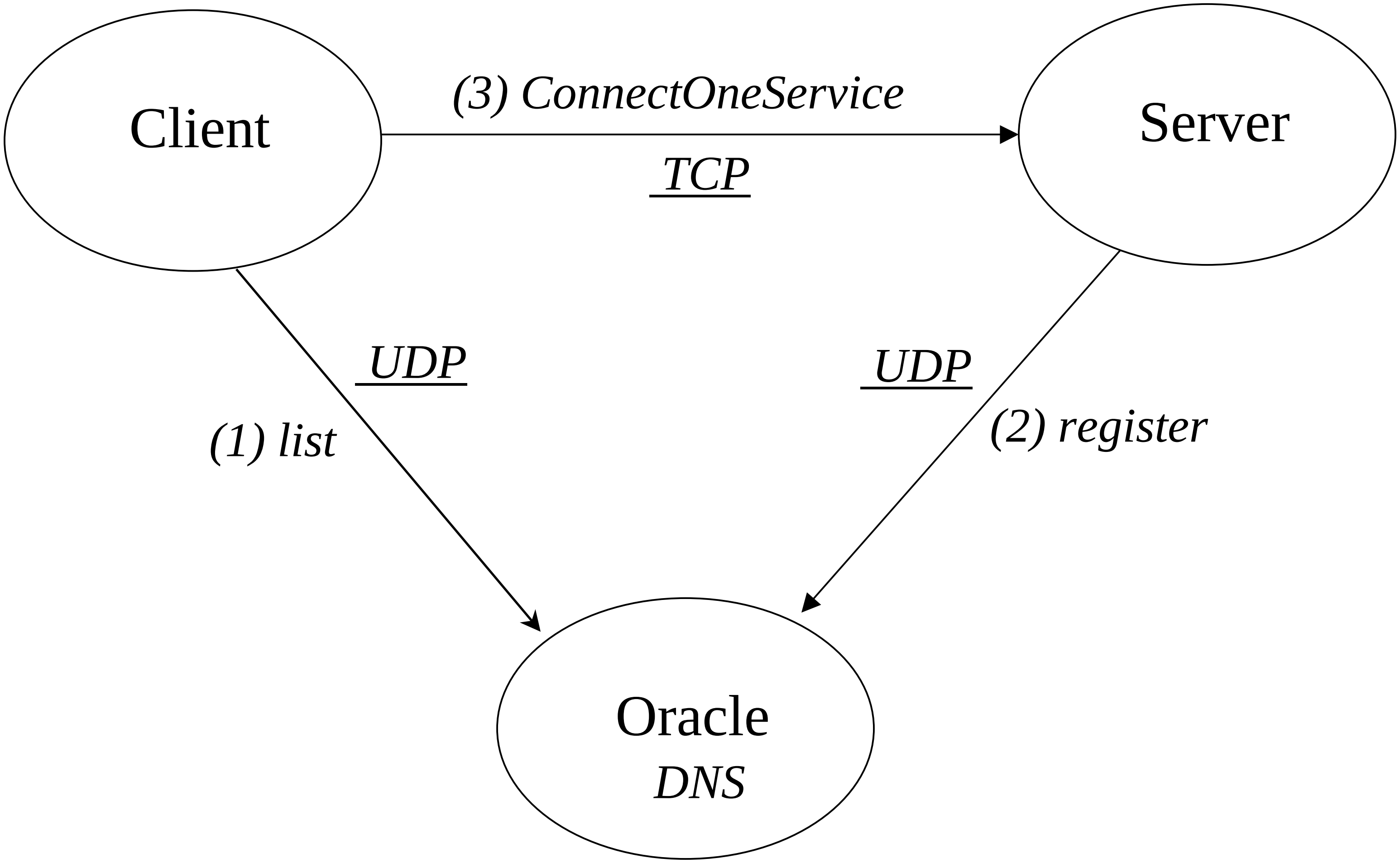
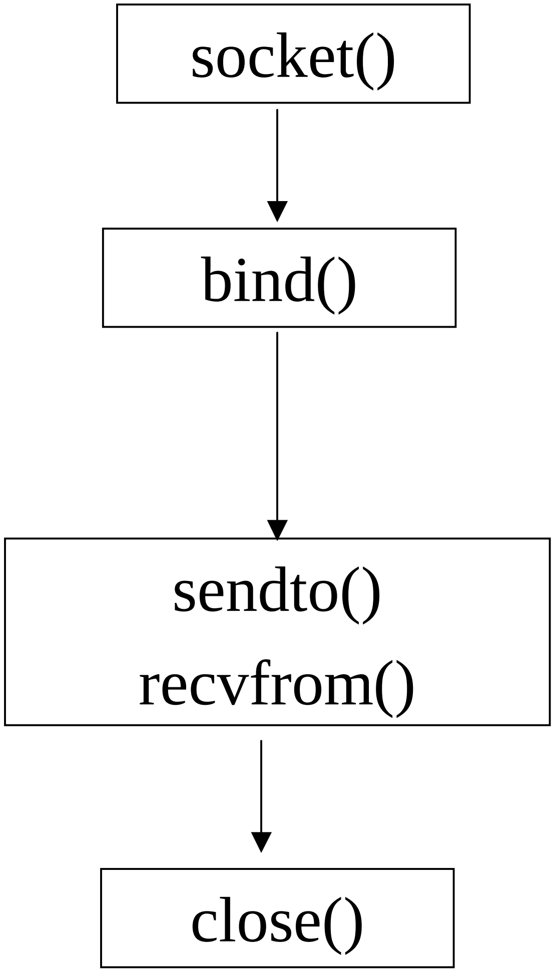
Ken French
HELP Session 1
CS4514


Client
(3) ConnectOneService
TCP
Server
UDP
(1) list
UDP
(2) register
Oracle
DNS

UDP Connection (Client)



socket()

bind()

sendto()

recvfrom()

close()

Example -- UDP Connection (Client)

```
 if ( (sd = socket( AF_INET, SOCK_DGRAM, 0 )) < 0 ) {
            perror( strerror(errno) );
            exit(-1);
 }
bzero(   (char*)&client, sizeof(client)  );
client.sin-family = AF-INET;
client.sin-port = htons(0);
client.sin-addr.s-addr = htonl( INADDR-ANY );
if ( bind(sd, (struct sockaddr*) &client, sizeof(client)) < 0 ) {
           perror( strerror(errno) );
           exit(-1);
}
```

NOTE:

•*struct sockaddr_in client, server;*

•*struct hostent *hp;*

• *For more, see P78-79 of textbook.*

Example -- UDP Connection (Client) *Cont.*

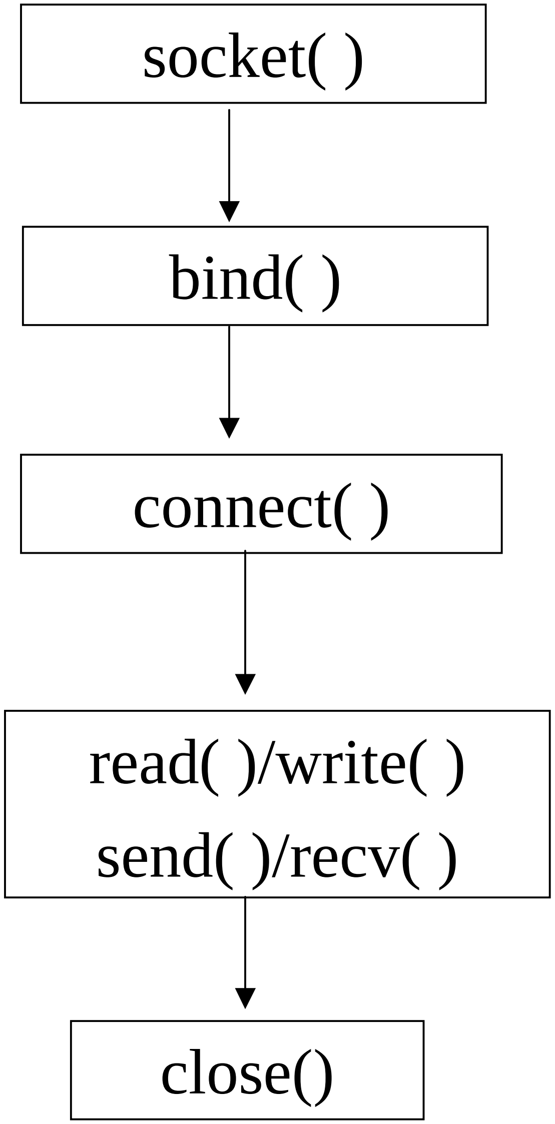
```
  bzero( (char*)&server, sizeof(server) );
  server.sin-family = AF_INET;
  server.sin-port = htons( SERVER-PORT );
  If ( (hp = gethostbyname(SERVER-NAME)) == NULL) {
          perror( strerror(errno) );
          exit(-1);
  }
  bcopy( hp->addr, (char*)&server.sin-addr, hp->length);

    …

sendto( sd, sBuf, data-size, 0, (struct sockaddr*)&server, sizeof(server) );
…
recvfrom( sd, rBuf, MAXLEN, 0, (struct sockaddr*)&server, sizeof(server) );

…
close( sd );
```

TCP Connection (Client)



socket( )

bind( )

connect( )

read( )/write( )
send( )/recv( )

close()

Example: TCP Connection (Client)

```
 if ( (sd = socket( AF_INET, SOCK_STREAM, 0 )) < 0 ) {
            perror( strerror(errno) );
            exit(-1);
 }
bzero(   (char*)&client, sizeof(client)  );
client.sin-family = AF-INET;
client.sin-port = htons(0);
client.sin-addr.s-addr = htonl( INADDR-ANY );
if ( bind(sd, (struct sockaddr*) &client, sizeof(client)) < 0 ) {
           perror( strerror(errno) );
           exit(-1);
}
```

NOTE:

•*struct sockaddr_in client, server;*

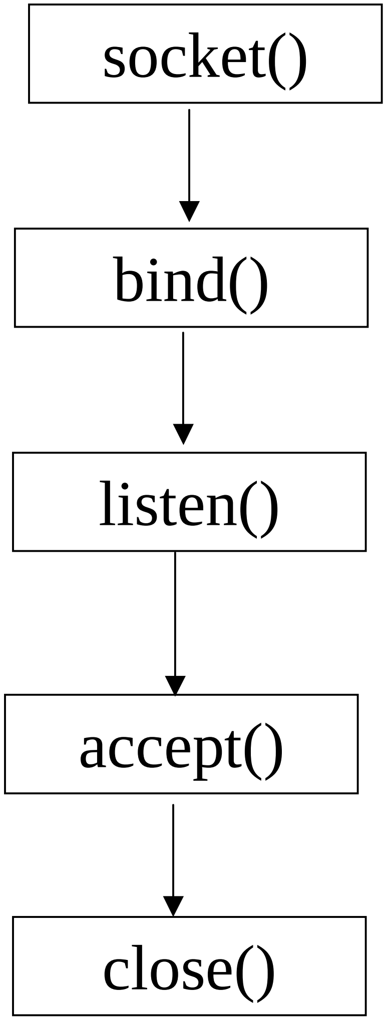
•*struct hostent *hp;*

• *For more, see P74-75 of textbook.*

Example: TCP Connection (Client) *Cont.*

```
bzero( (char*)&server, sizeof(server) );
server.sin-family = AF_INET;
server.sin-port = htons( SERVER-PORT );
if ( (hp = gethostbyname( SERVER-NAME )) == NULL) {
        perror( strerror(errno) );
        exit(-1);
}
bcopy( hp->addr, (char*)&server.sin-addr, hp->length);
if ( connect( sd, (struct sockaddr*)&server, sizeof(server) ) < 0 ) {
        perror( strerror(errno) );
        exit(-1);
}
while (1) {
        …
        read/write()
}
close( sd );
```

TCP Connection (Server)



socket()

bind()

listen()

accept()

close()

```
sd = socket( AF_INET, SOCK_STREAM, 0 );

bzero(   (char*)&server, sizeof(server)  );
server.sin-family = AF-INET;
server.sin-port = YOUR-SERVER-PORT;
server.sin-addr.s-addr = htonl(INADDR-ANY);
bind(  sd, (struct sockaddr*) &server, sizeof(server)  );

 listen( sd, backlog );

 while (1) {
      new-sd = accept( sd, (struct sockaddr *) &client, sizeof(client) );
      read()/write();
      …
 }

 close( sd );
```

NOTE:

•*struct sockaddr_in server;*

•*For more, see P73 of textbook.*

Send/recv the om struct

- ssize_t recv(int sockfd, void *buff, size_t nbytes, int flags);
- ssize_t send(int sockfd, const void *buff, size_t nbytes, int flags);
- Usage:

  struct om sendMsg, recvMsg;

  … set the field’s values in sendMsg first

  send(s, (void *)&sendMsg, lom, 0);

  recv(s, (void *)&recvMsg, lom, 0);

om struct

(struct om serv, newServ;)

- ***To Find a service info. in oracle:***

```
        serv.ver = verCur;
        serv.cmd = cmdGet;
        serv.uid = ?;
        serv.sbServ = ?;
```

- ***Register a service:***

```
        newServ.cmd = cmdPut;
        newServ.uid = ?;
        newServ.sbServ = ?;
        newServ.sbDesc = ?;
        newServ.sa = ?
```

- ***Clear a service:***

```
        oldServ.ver = verCur;
        oldServ.cmd = cmdClr;
        odlServ.uid = ?;
        oldServ.sbServ = ?;
```

Some system calls – gethostbyname & getservbyname

- gethostbyname: mapping from host name to IP address

struct hostent *gethostbyname(const char *hostname)

- Getservbyname: looks up a service given its name

struct servent *getservbyname(const char *servname, const char *protoname)

hostname = “garden.wpi.edu”

servname = “netoracle”

Turnin your files

- Use

```
/cs/bin/turnin submit cs4514 proj1 [all files]
```

- Files should include

  - source code which can be compiled without errors

  - a documentation file (include your compile command)

  - a result script showing the running result