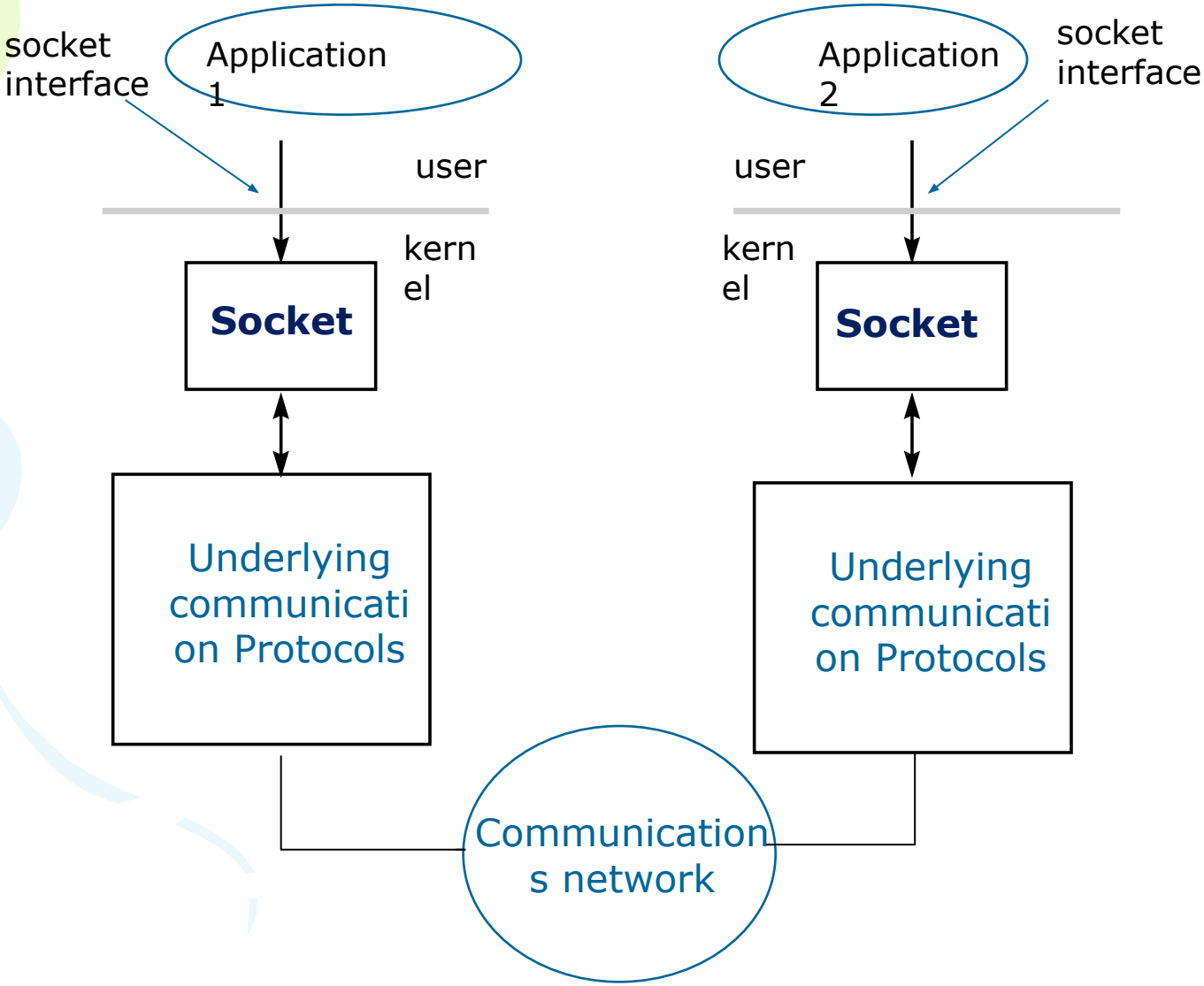
Socket Programming

A Socket is a :-

- It is an API
- It is an end-end connection point between two machines
- Socket address is a combination of IP address and the port number

The Socket Interface



Port numbers

Well known ports:-

- 0-1024

Registered ports

- 1024-49151

Dynamic ports

- 49152-65535

System calls for connection oriented protocol [TCP/IP]

Server side system calls :-

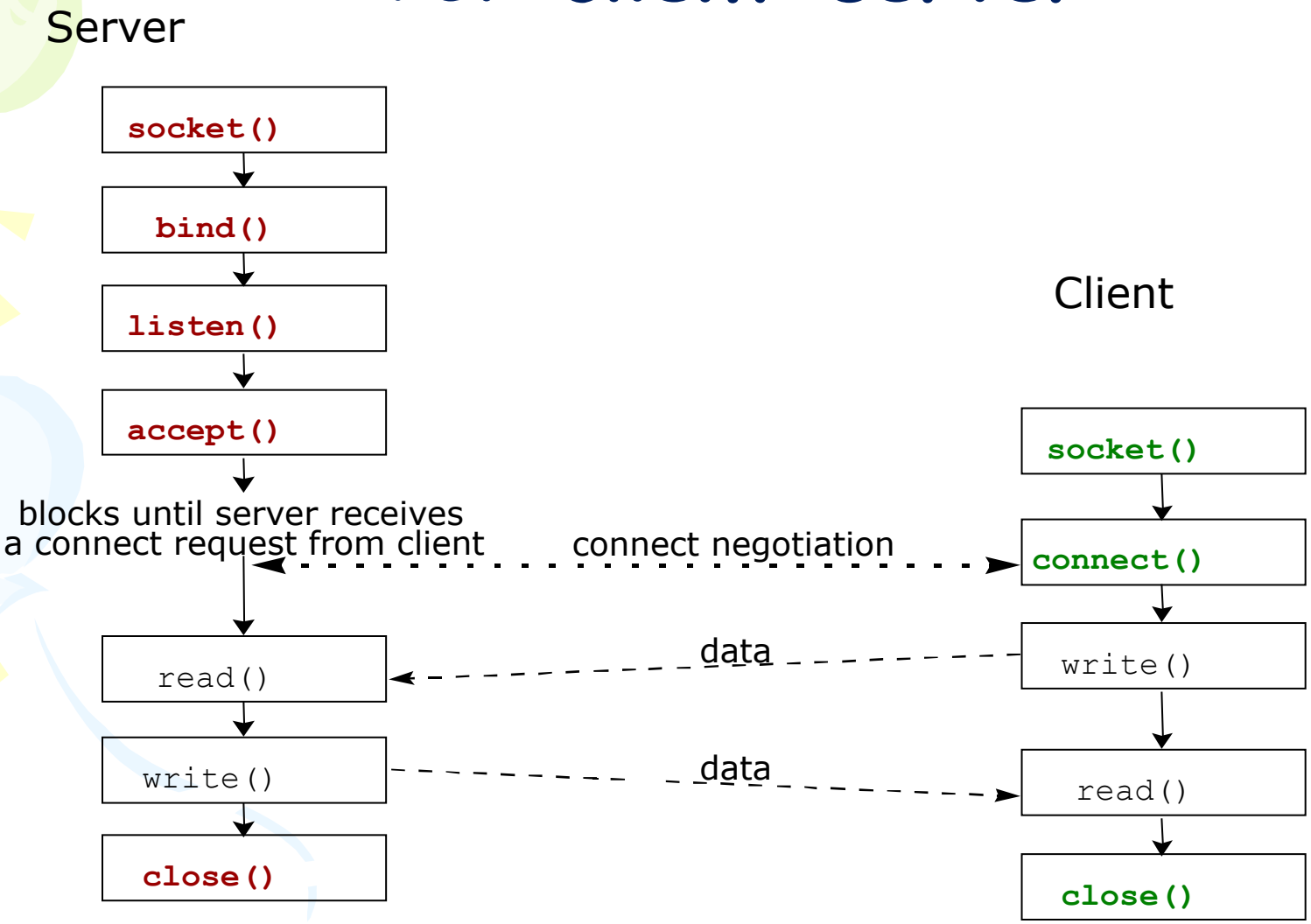
- Socket
- Bind
- Listen
- Accept
- Read
- Write

System calls for connection oriented protocol [TCP/IP]

Client side system calls :-

- Socket
- Connect
- Write
- Read

TCP client-server



System calls for connection less protocol [UDP/IP]

Server side system calls :-

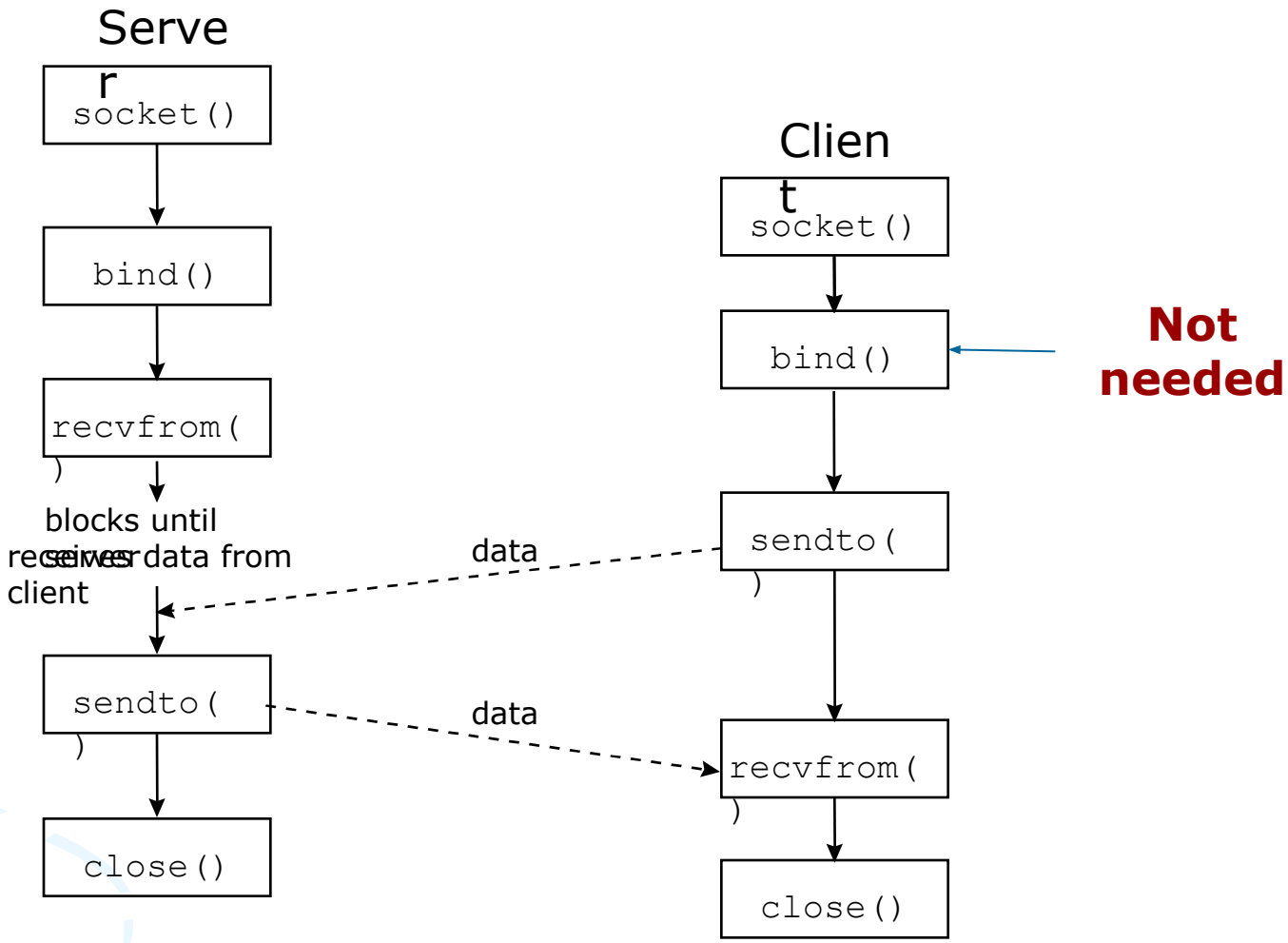
- Socket
- Bind
- Recvfrom
- Sendto

System calls for connection less protocol [UDP/IP]

Client side system calls :-

- Socket
- Bind
- Sendto
- recvfrom

UDP Socket Calls



Socket programming

```
# include <sys/socket.h>

struct in_addr {
 in_addr_t s_addr ;
 };
```

4 bytes in size/32 bit IP address

Socket programming

```
 struct sockaddr_in
{
 uin8_t sin_len; /* structure length ,16 */

 sa_family_t sin_family; /* AF/PF */

 in_port_t sin_port; /* TCP,UDP port,16 bit TCP/UDP
  port     number  */

 struct in_addr sin_addr; /* 32 bit IPv4 addr */

 char sin_zero[8]; /* unused */
};
```

Socket programming

```
#include <sys/types.h>
#include  <sys/socket.h>

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

Descriptor if OK,-1 on error.

Family : AF/PF

Type : SOCK_STREAM,SOCK_DGRAM,SOCK_RAW

Protocol :TCP/IP or UDP/IP

Socket programming

```
#include <sys/types.h>
#include  <sys/socket.h>

int bind (int sockfd,struct sockaddr
   *myaddr,int addrlen);
```

0:OK and -1:error

Assigns local protocol address to a socket,(IP address + port number).

Socket programming

```
#include <sys/types.h>
#include  <sys/socket.h>
int connect (int sockfd,struct sockaddr
   *servaddr,socklen_t addrlen);
```

- For connecting to the server.

Socket programming

```
#include <sys/types.h>
#include  <sys/socket.h>

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

0:OK,-1:error

Listen converts an unconnected socket to a passive socket…

Socket programming

```
#include <sys/types.h>
#include  <sys/socket.h>
```

int accept (int sockfd,struct sockaddr *peer,int *addrlen);

It creates a new socket,to which the properties of old socket are passed.

Socket programming

```
#include <sys/types.h>
#include  <sys/socket.h>


int close (int fd);
```

Socket programming

Threads