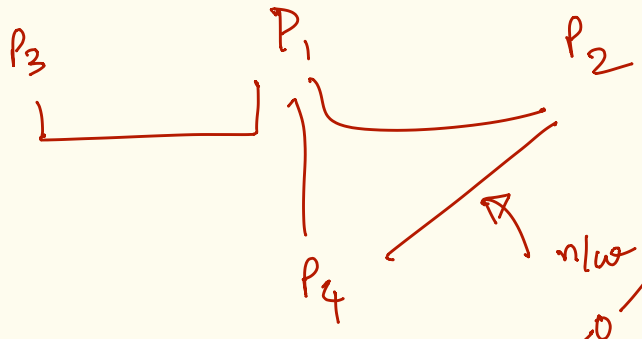
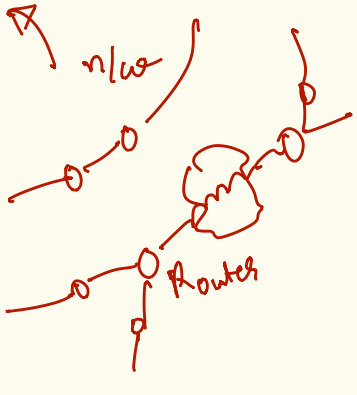
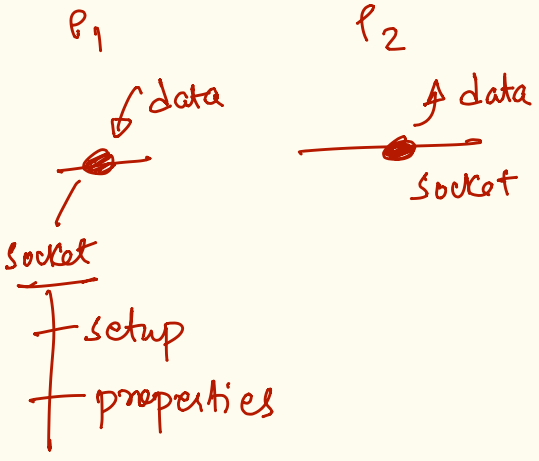
CS 744 Lecture 21

IO
- storage
- network / communication IO
- devices
  - KBd
  - printer
  - USB

all network IO
- via socket abstraction
  - IPC — inter-process communication across n/w attached hosts.
    - similar to the pipe abstraction but over the network
    - n/w endpoint (unique to a process; a process may have many endpoints)







sockfd = socket (domain, type, protocol);

int.
index in
the fd table

domain: AF_UNIX, AF_INET, AF_INET6

type: SOCK_STREAM, SOCK_DGRAM, SOCK_RAW

protocol: TCP, UDP, ...

socket types:

* local vs network

- UDS – UNIX domain sockets.
  - AF_UNIX
  - file pathname
- AF_INET
- AF_INET6

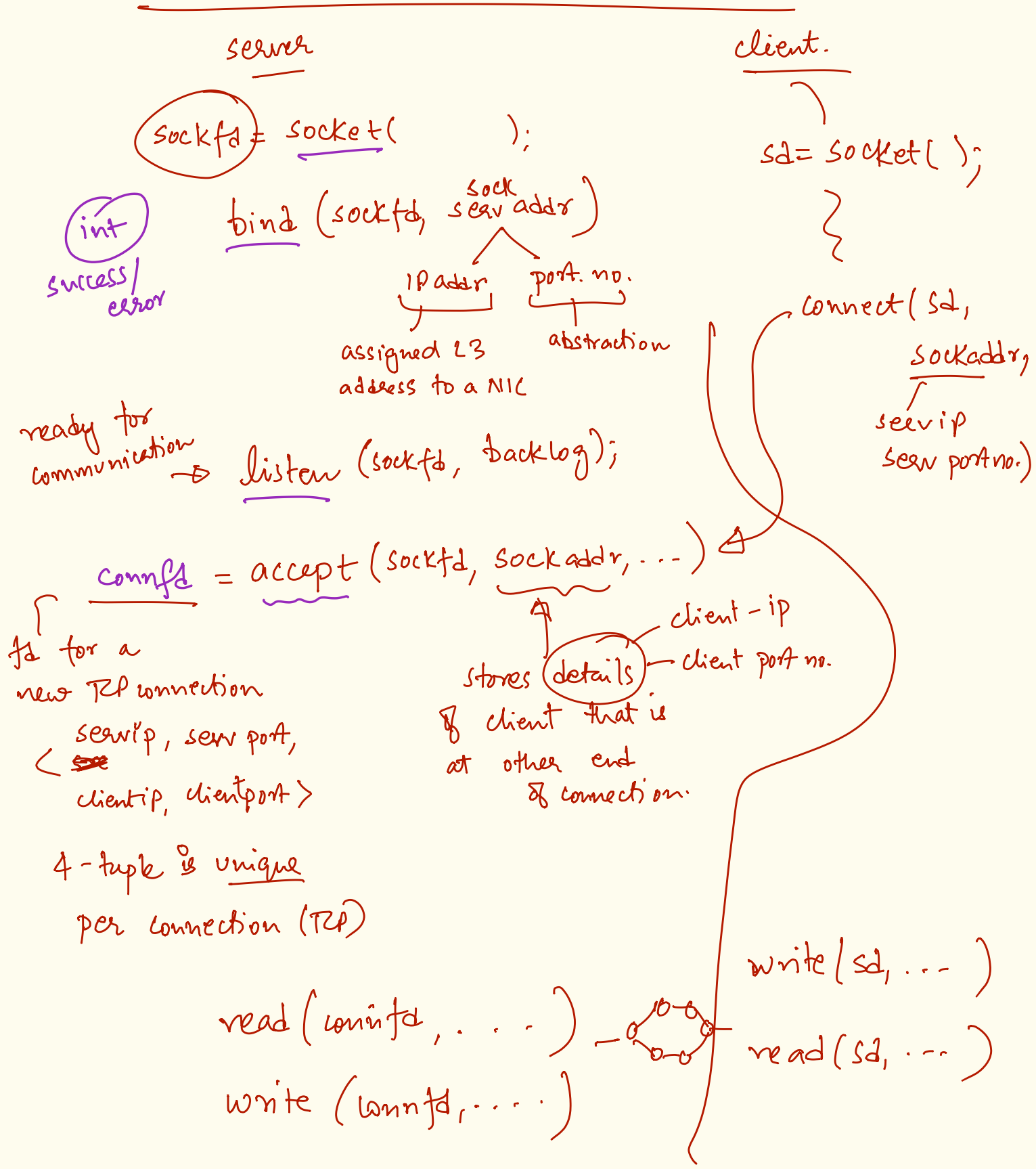
* ~~SOE~~ connection oriented vs connection-less vs raw sockets

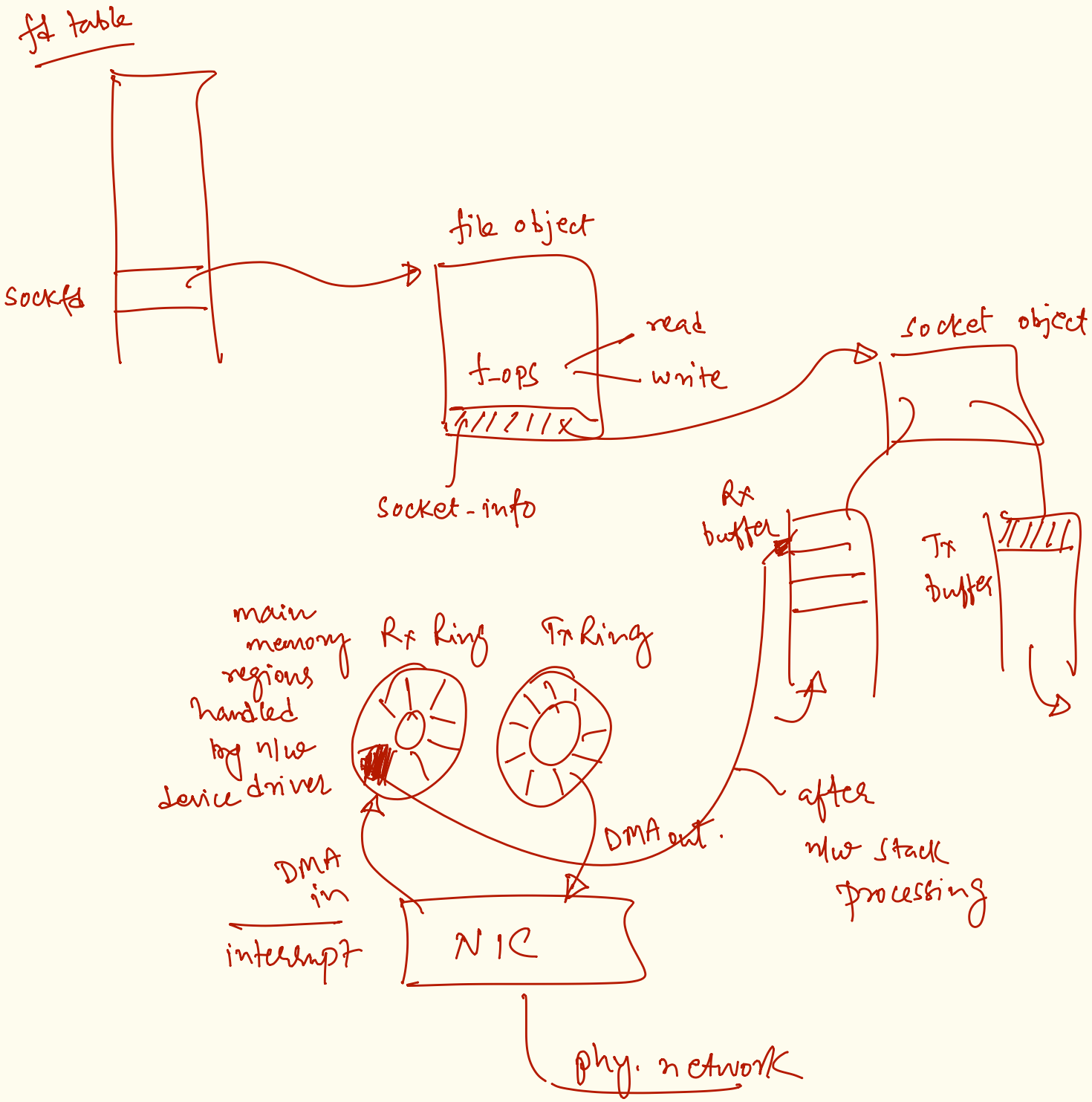
- SOCK_STREAM
  - TCP
- SOCK_DGRAM
  - UDP
- SOCK_RAW

socket related calls

* socket
* read
* write
* connect
* bind
* accept
* listen
* send
* recv
* sendto
* recvfrom
* setsockopt *
* close

⊛ typical socket usage sequence for a TCP-based client-server.




fd table
sockfd
file object
f_ops
read
write
socket object
socket_info
Rx buffer
Tx buffer
main memory regions handled by n/w device driver
Rx Ring
Tx Ring
DMA out.
after n/w stack processing
DMA in
interrupt
NIC
phy. network