MPI

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Point-to-Point Communication: Buffer Structure

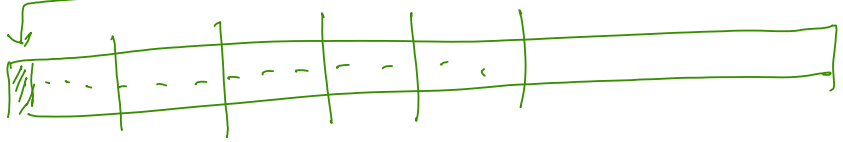
MPI_Send (send_buf, count, datatype, ...)

pre-allocated

4 bytes (e.g. int)

e.g. count => 5

MPI_Recv (recv_buf, count, datatype ...)



// pre-allocated

recv_buf = malloc (...)

MPI_Recv (recv_buf, ...)

MPI: Hockney model

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Hockney Model:

Network communication.

τ: latency (time)

cost of "setting up" a connection

μ: inverse of the n/w bandwidth

cost of transferring each byte

secs/byte

= #bytes/sec

$T(n, p)$: Computation complexity + communication complexity

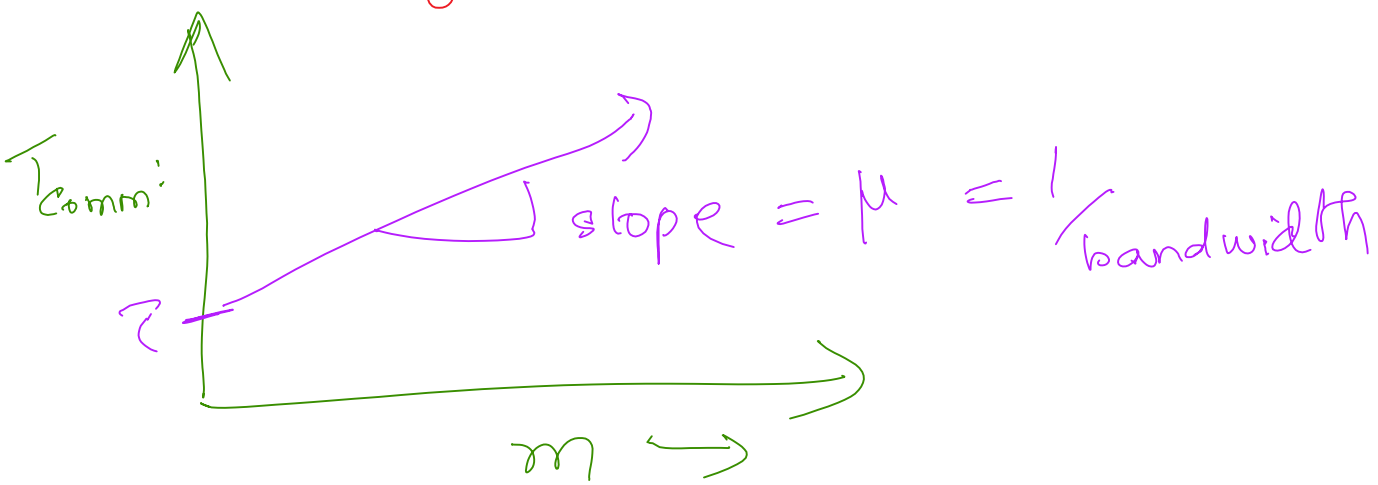
Communication Complexity: m bytes (payload)

$$T_{comm.} = \tau + \mu m$$

τ: latency

μm: transfer time

$$y = c + (\text{slope})\, x$$



MPI: Blocking vs. nonblocking

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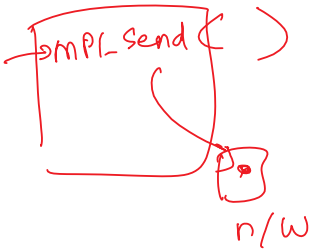
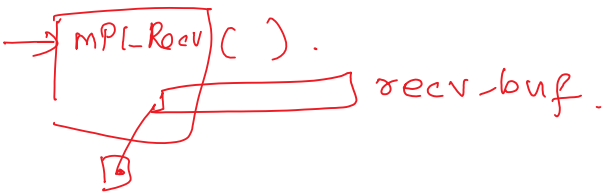
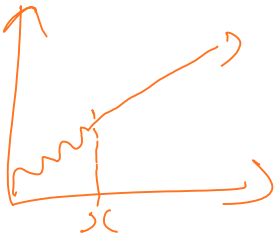
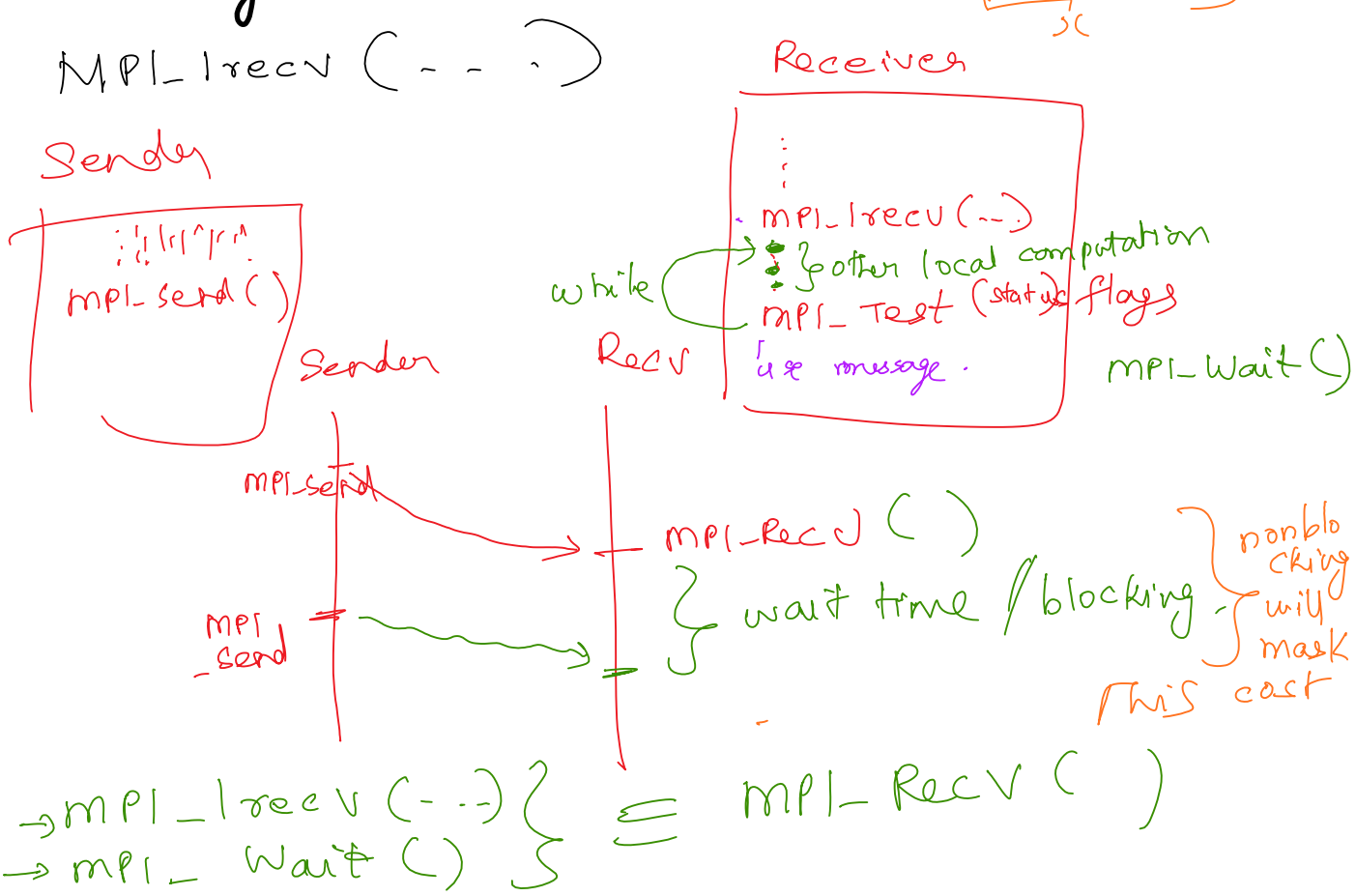
Blocking Calls:

MPI_Send, MPI_Recv are "blocking".







Nonblocking Calls:

MPI_Irecv(...)