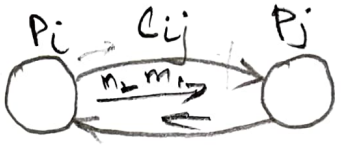
Interconnection Topologies:

03 MAR 2022
2-3 PM

Assumptions:

→ No node failure
→ channels are reliable
→ Commn delay is finite but unpredictable



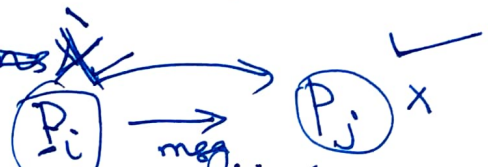
↳ Channel Modelling

↳ FIFO, Non-FIFO,
↓ ↓
Network stack.

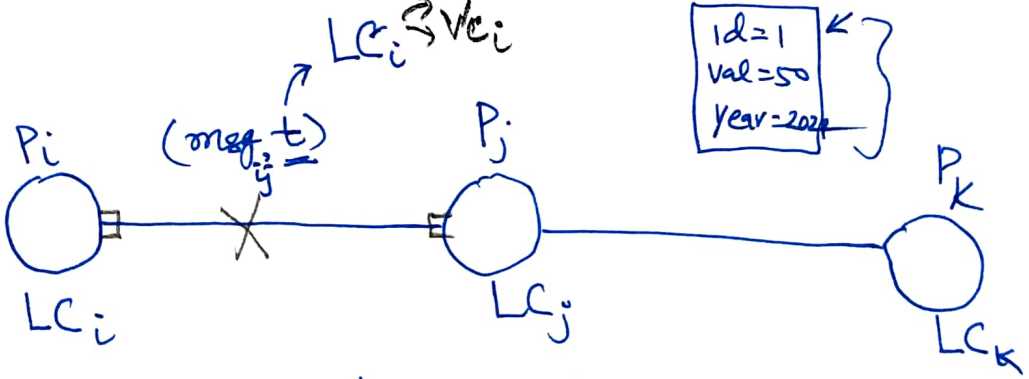
Fault-free Setting of { - nodes - channels.

Process Failures:

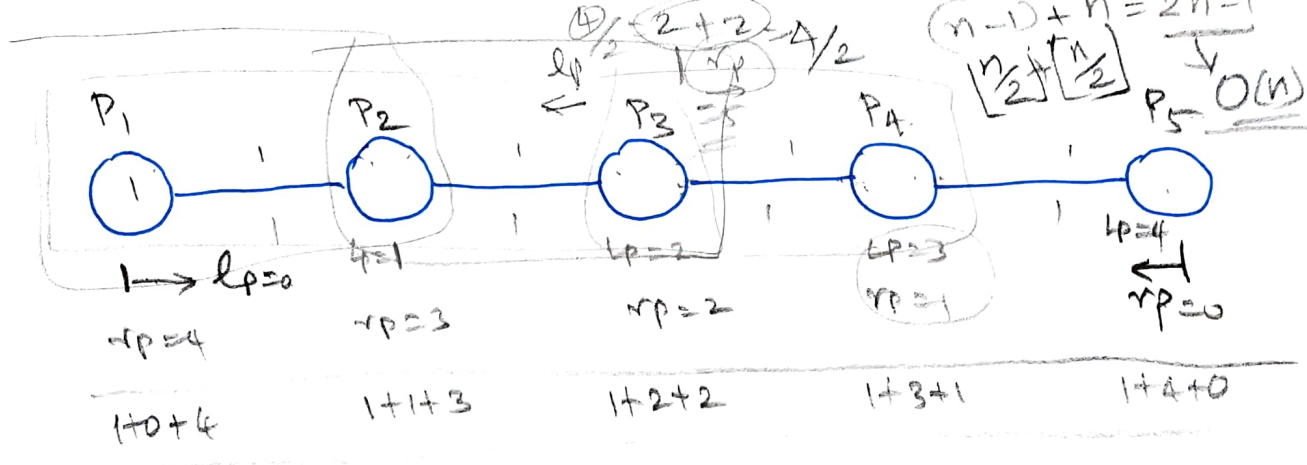
→ Fail-stop:
→ Crash:
→ Receive omission: receive
→ Send — : Send
→ General omission: Send + receive
→ Byzantine failures: ~~Forms~~



- Verifiability



LC_i → logical clock.



$n = ?$ ✓

$n = 5$

$[2(n-1)$ messages $+ 2(n-1)$ messages$] = 4(n-1)$

$= O(n)$

big $Oh(n)$

Metrics:

Space
- Space complexity / node
- → system-wide SC for all events that occur simultaneously.

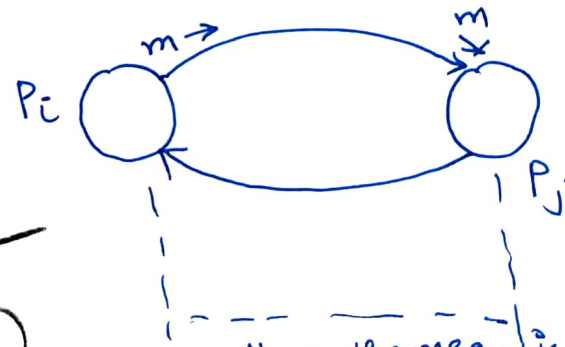
Time
- → TC / node
- → SW TC

Message Complexity:

⇒ # msgs ✓

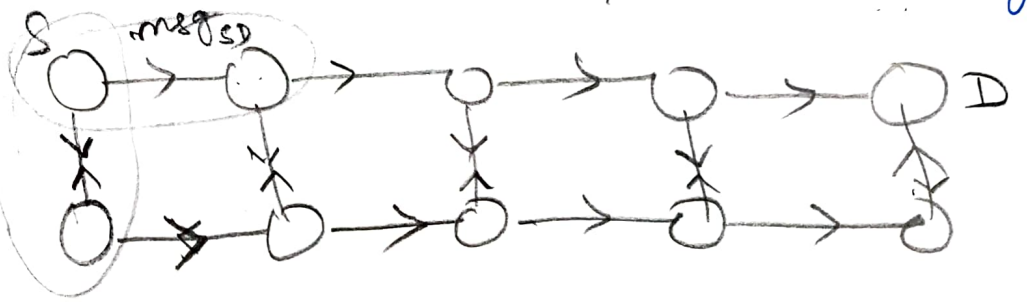
~~size of the msgs~~ ✓

Latency (msg TC)



send, # receive, etc.

Latency.



Message Ordering and Group Communication

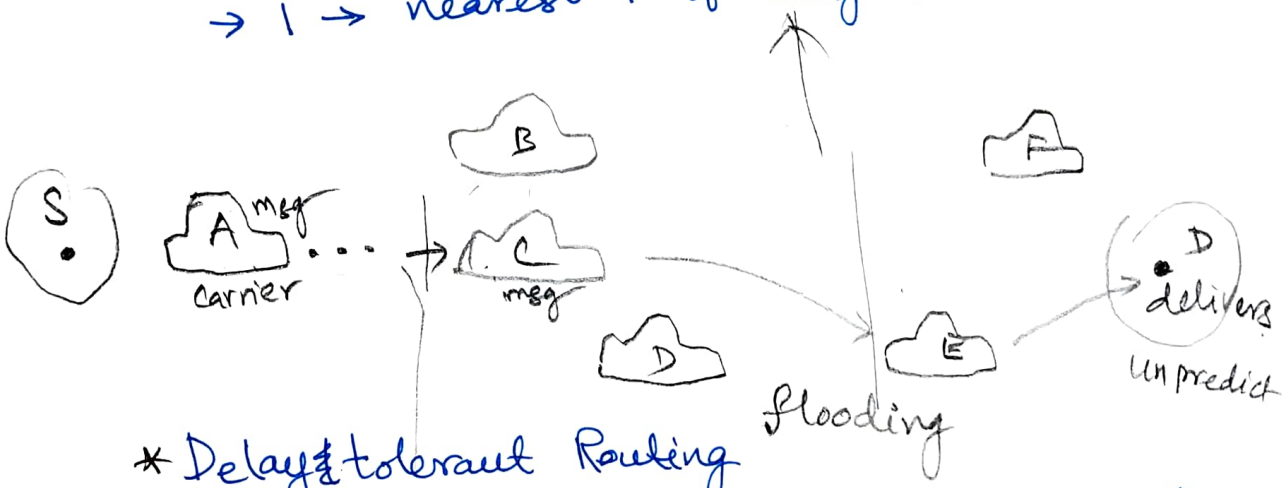
① Models of Communication

* 1 — 1

→ unicast
→ point-to-point

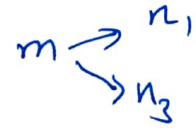
Anycast

→ 1 → nearest 1 of many identical nodes



* Delay & tolerant Routing
  → no fixed infra between P_i and P_j
  → msg sent will eventually be delivered in finite

* 1 - many
  → multicast message
    → radio broadcast
      1 — m
      Group Comm: (m, n)
      ↓ is known



→ Broadcast
  1 — All Recipients are not known