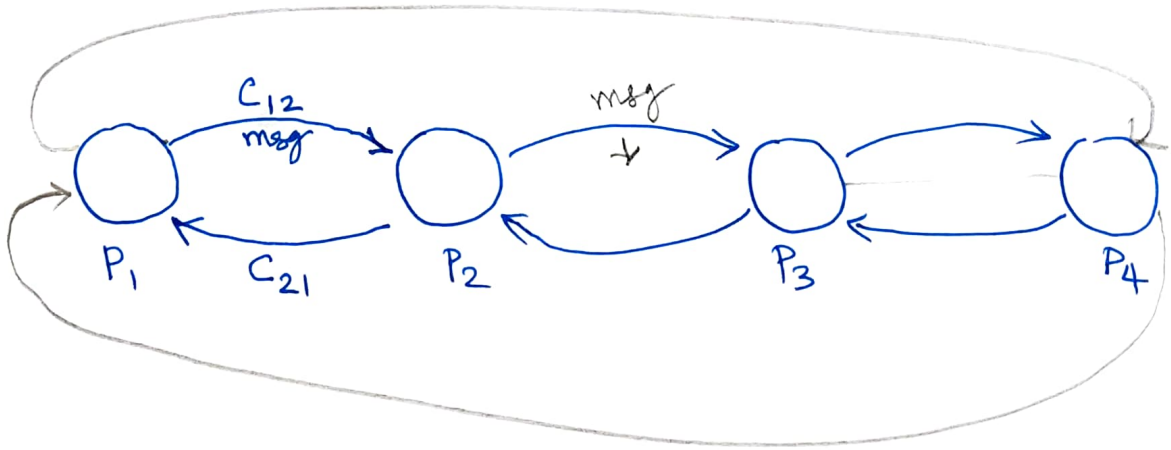
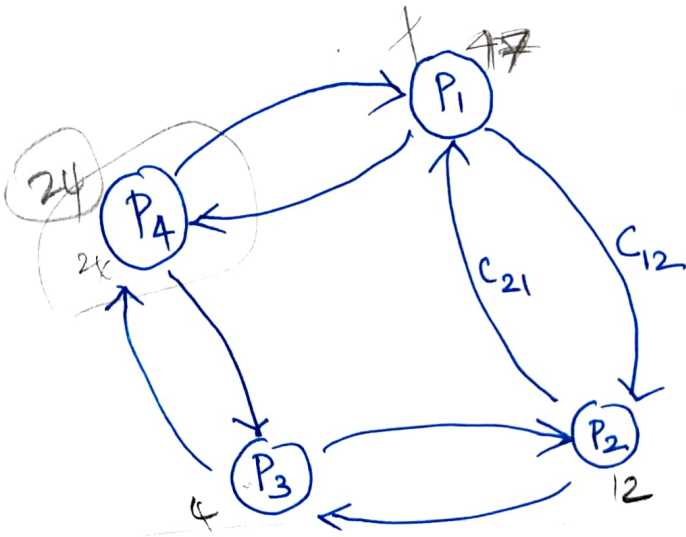
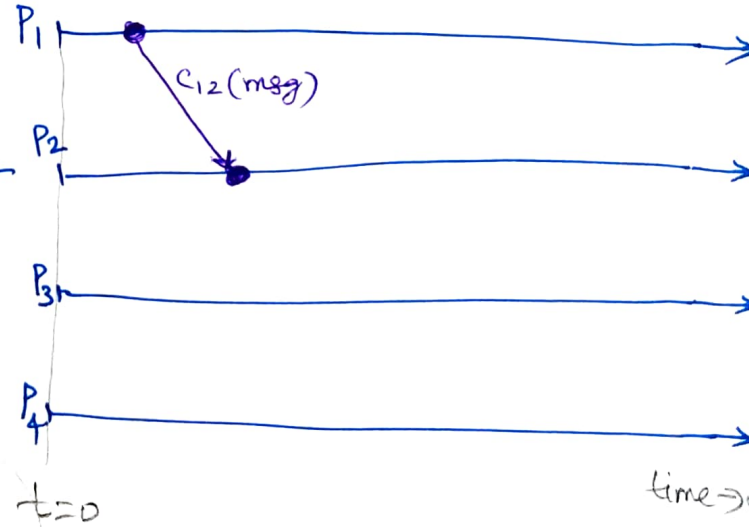
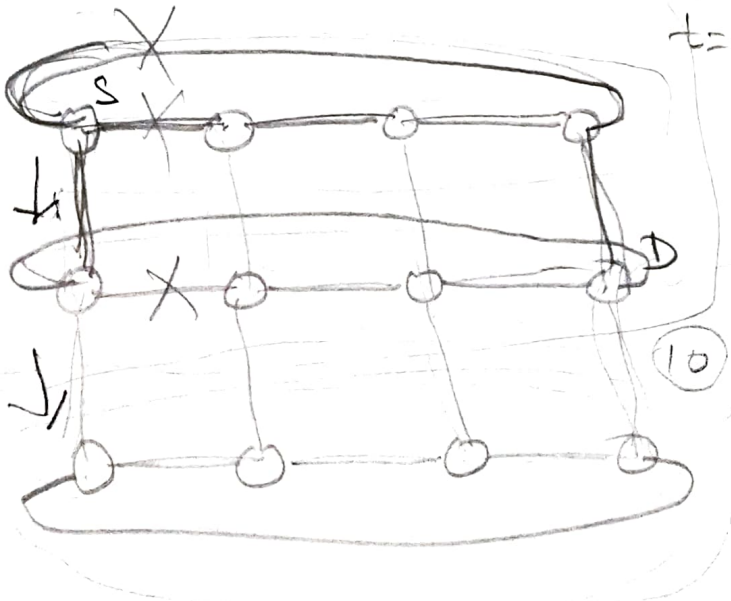
Topology Abstraction and Overlays

24 Feb 2022
2-3pm









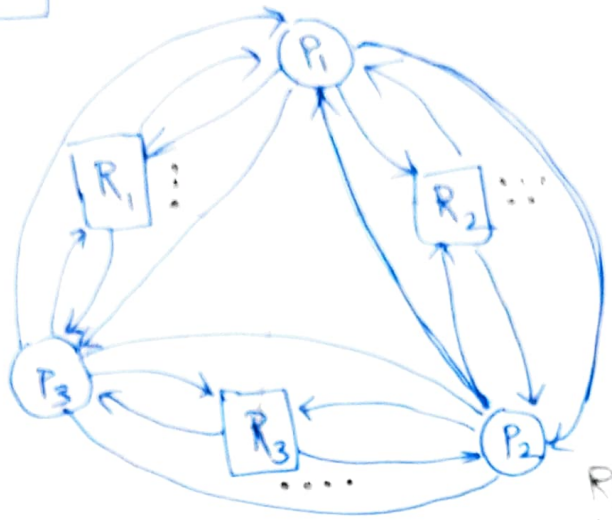
Send(1, 2, msg, -, -, -)

Receive(-, -, -, -, -, -)

10 hops (10 Send / 10 receive)

→ m×n mesh

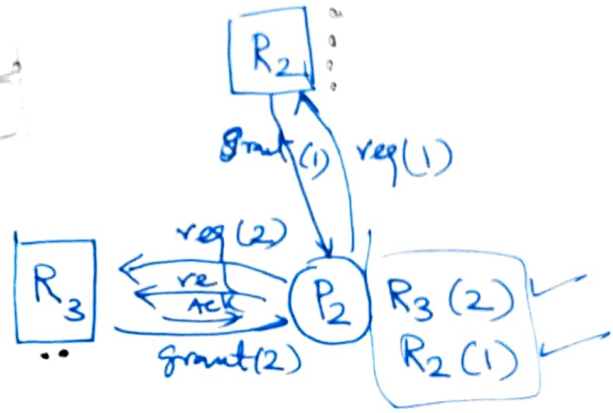
Overlays



→ Reduce message complexity

→ On-demand Virtual networks (one overlay)

→ SDN and NFV



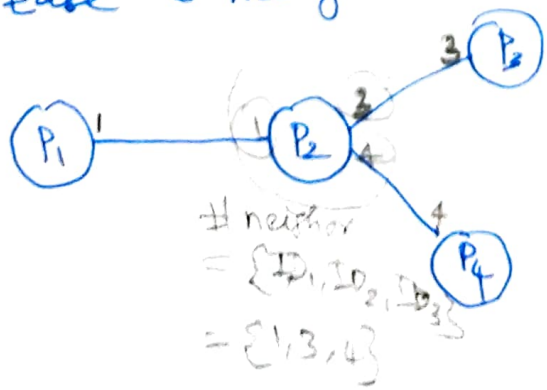
→ Defn: System Model

$G = (V, E)$ → communication channels.
nodes

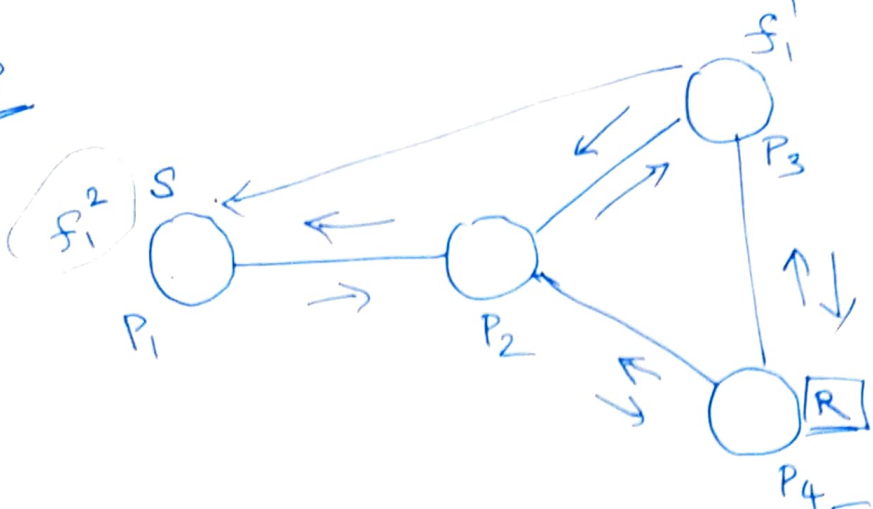
where $|V| = n$ PEs.

→ How to identify the pattern of message passing

→ Ease to manage



P2P



$S_1 = \{f_1^1, f_1^2\}$

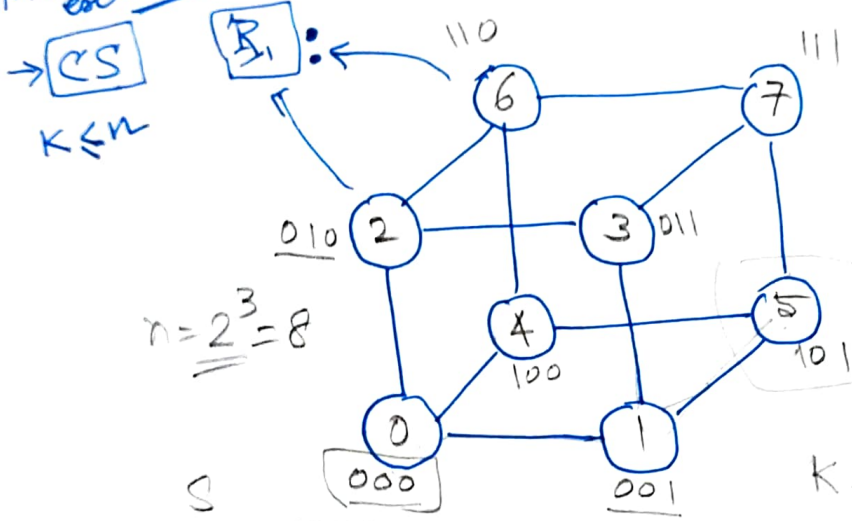
$G_1 = (V, E)$ – directed ⇒ $|V| = 4$, $|E| = 6$, $c_{ij} \neq c_{ji}$

[(undirected) $|V| = 4$, $|E| = 3$, $c_{ij} = c_{ji}$]

Mutual exclusion

CS

$K \leq n$



$n = 2^3 = 8$

3 = k

(n-1) PE

$P_0 \rightarrow P_5$

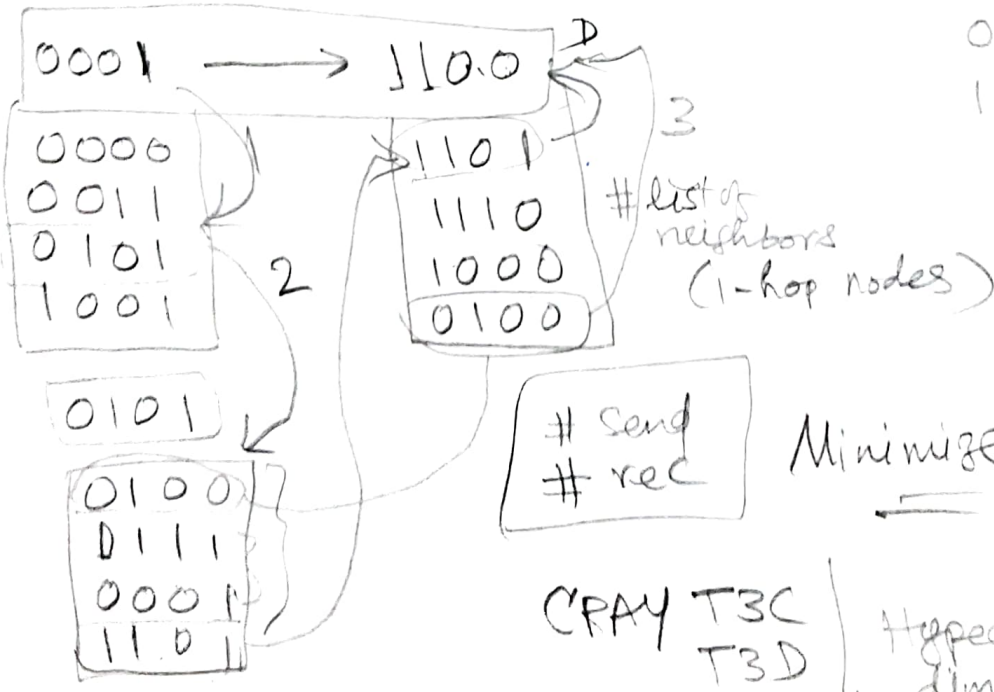
0 – 000

001 = 1

010 = 2

100 = 4

$K = 3 < n$



Send
rec

Minimize.

CRAY T3C
T3D

Hypercube & 2m d.

* Appln execution
* Control Algorithms

} own events.

Types of Algo: