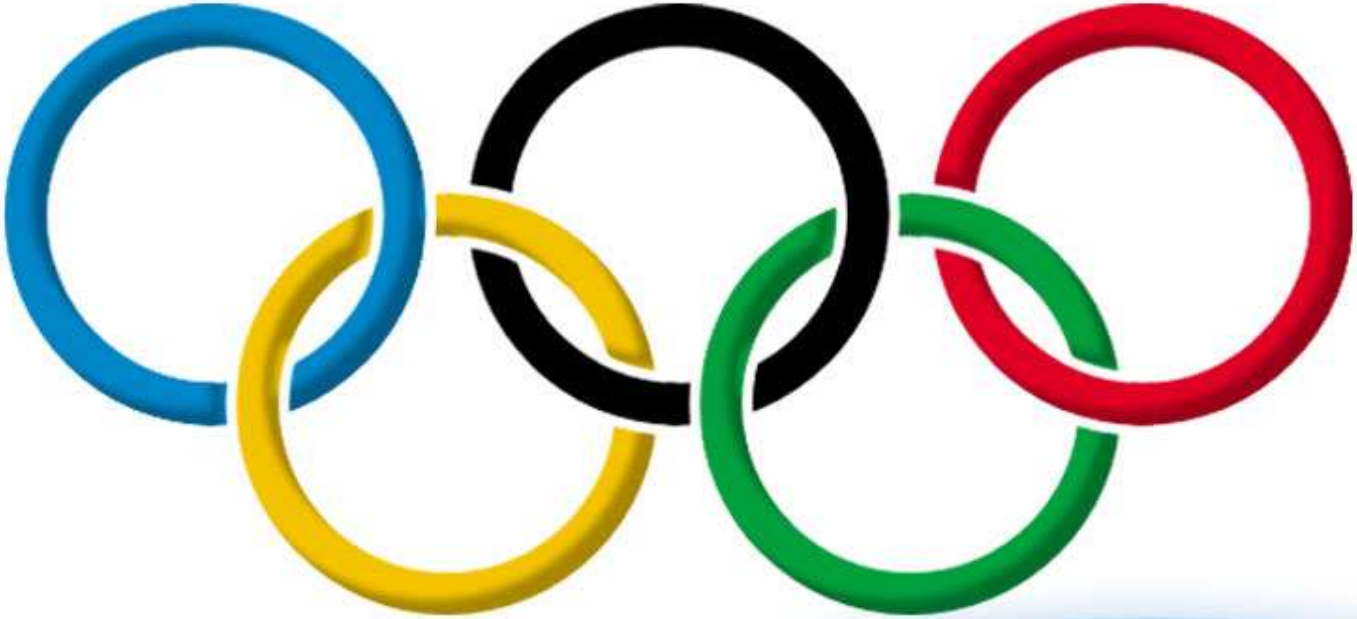
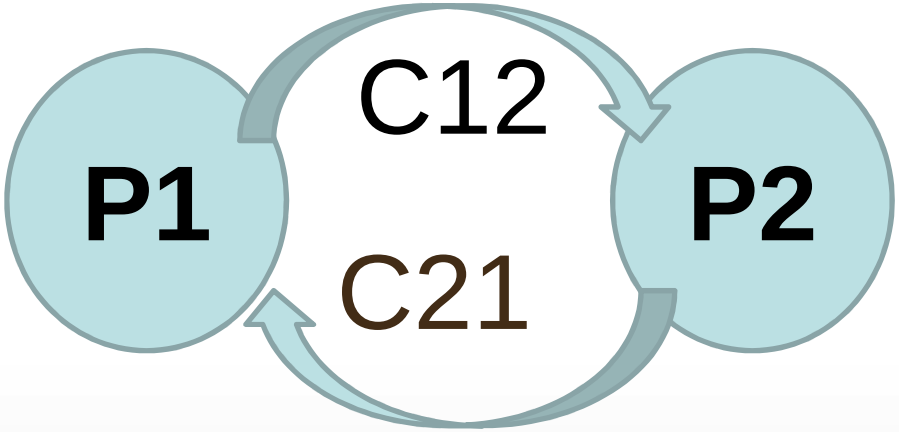


Chandy-Lamport Snapshot Algorithm - Global State

Y. V. Lokeswari , AP/ CSE

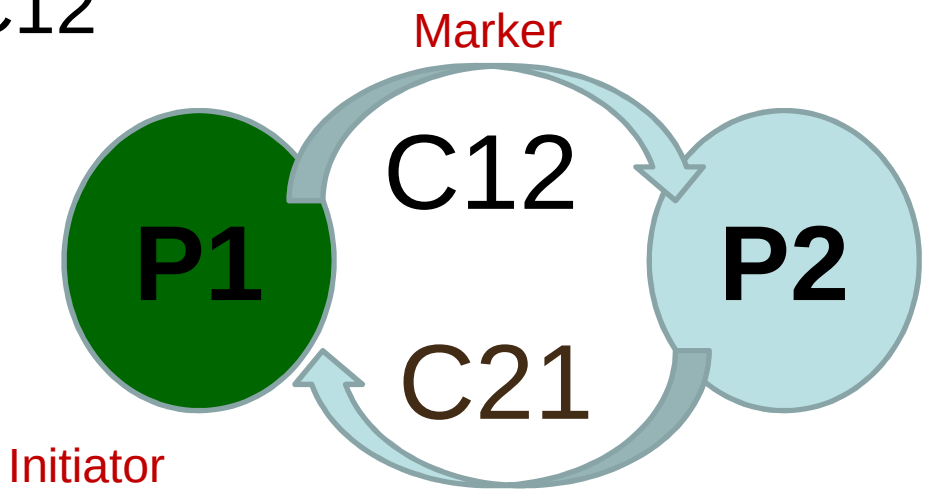
Chandy-Lamport Algorithm - Example

- Consider 2 processes P1 and P2
- Local state of P1 is recorded as LS1
- Local State of P2 is recorded as LS2
- Channel C12 sends message from P1 to P2. Local state is SC12
- Channel C21 sends message from P2 to P1. Local state is SC21



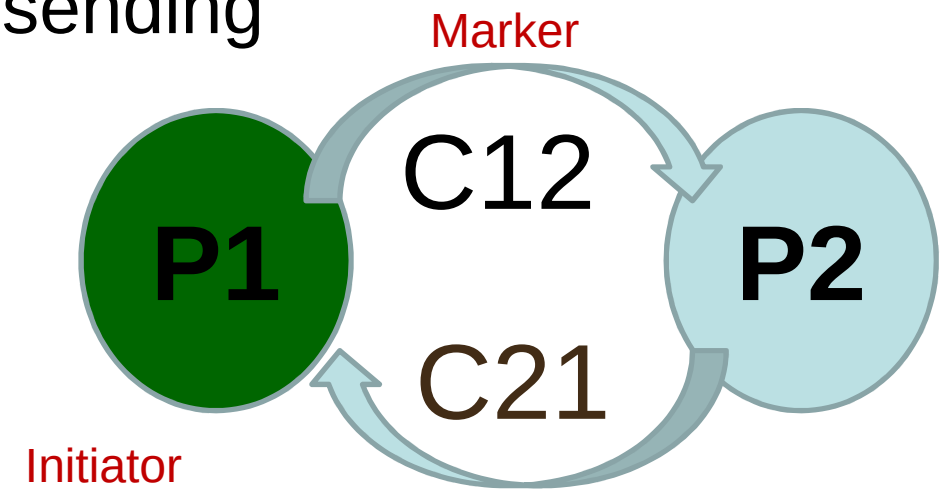
Chandy-Lamport Algorithm - Example

- P1 initiates Marker Sending
  - P1 records its own local state LS1 and
  - Sends marker to all outgoing channels
  - Here it is Channel C12



Chandy-Lamport Algorithm - Example

- P2 receives Marker
  - P2's local state is not recorded
  - P2 records channel C12 as empty
  - P2 initiates marker sending



Chandy-Lamport Algorithm - Example

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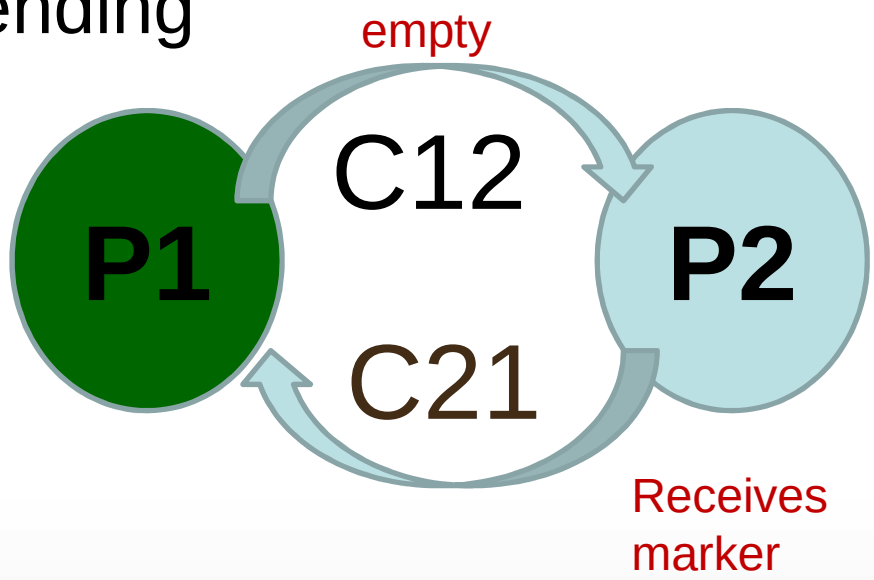
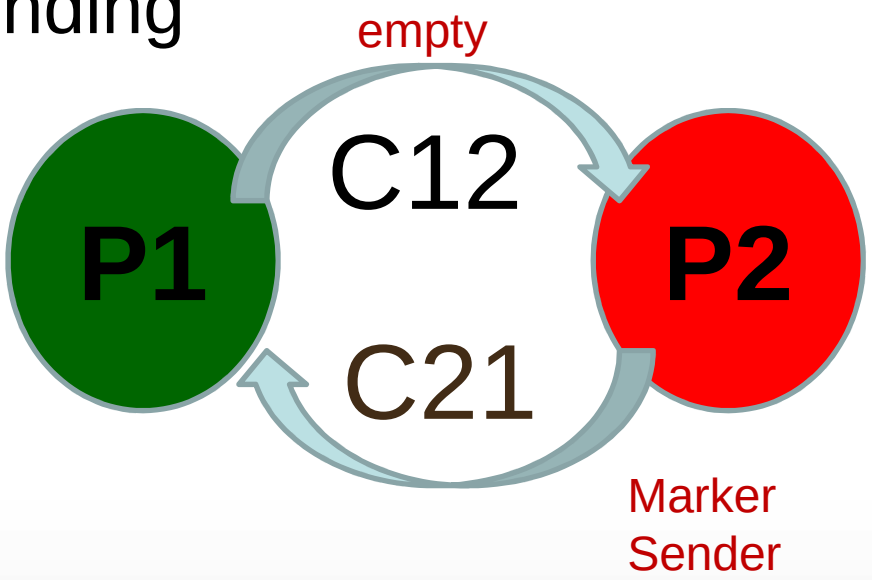
  - P2's local state is not recorded
  - P2 records channel C12 as empty
  - P2 initiates marker sending



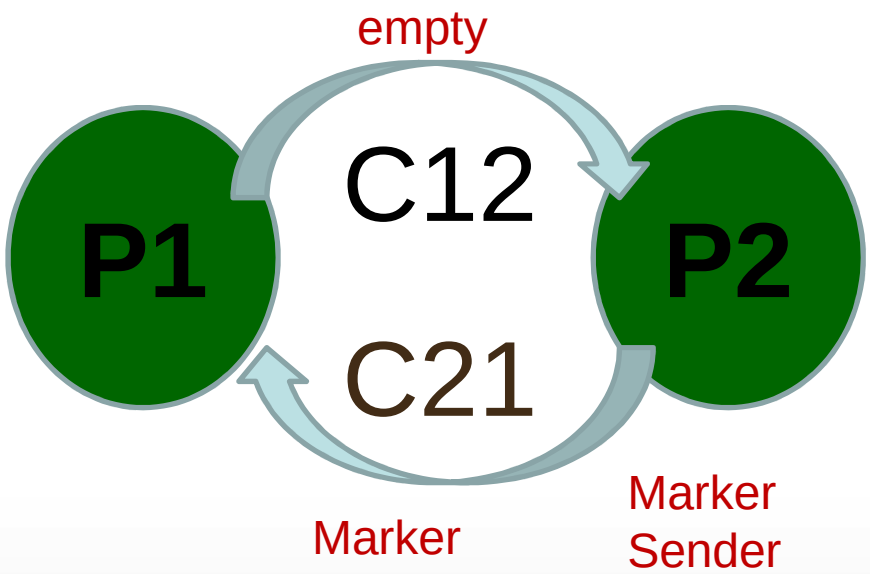
Chandy-Lamport Algorithm - Example

- P2 receives Marker
  - P2's local state is not recorded
  - P2 records channel C12 as empty
  - P2 initiates marker sending



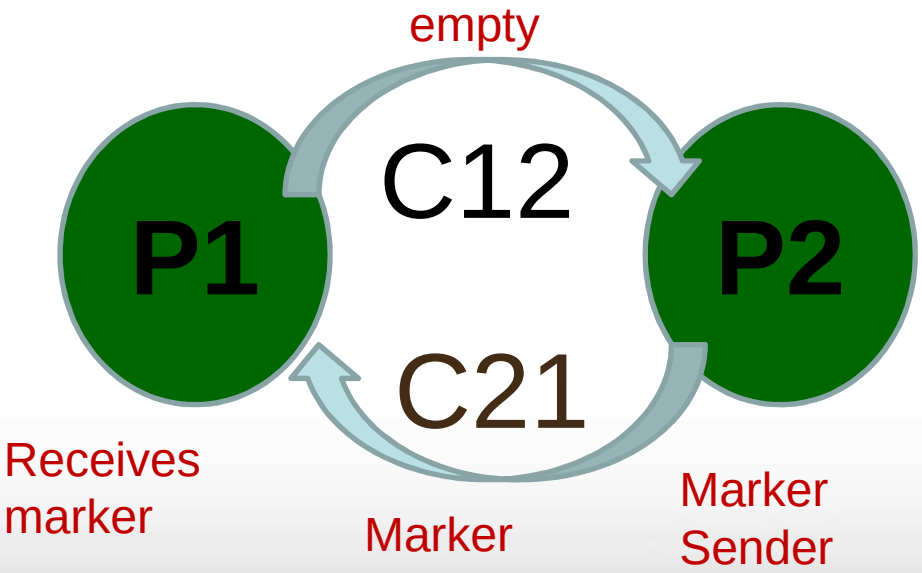
Chandy-Lamport Algorithm - Example

- P2 follows Marker sending rule
  - P2's local state LS2 is now recorded
  - P2 sends marker to all of its outgoing channels
  - Here channel C21



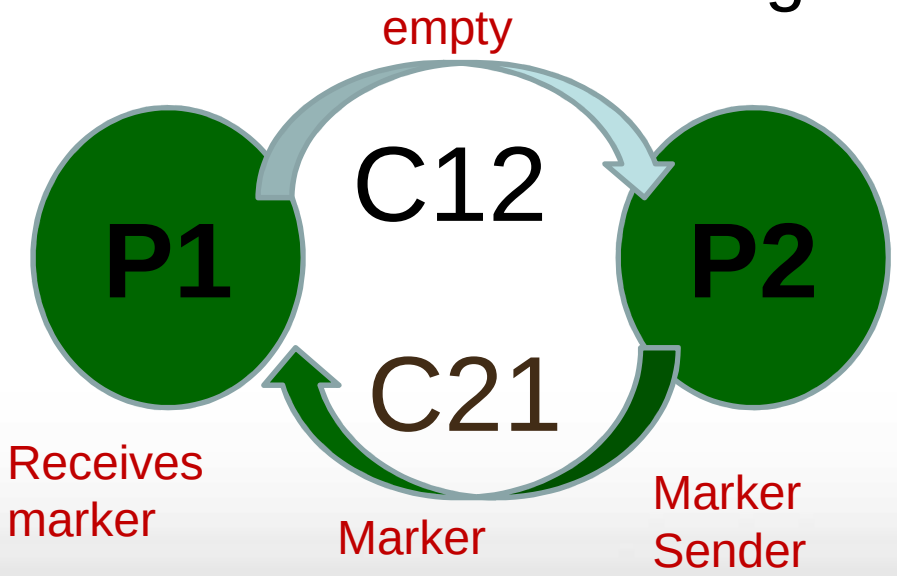
Chandy-Lamport Algorithm - Example

- P1 receives marker
  - P1's local state LS1 is already recorded
  - Records all the messages in channel C21 right from the point P1 recorded its local state



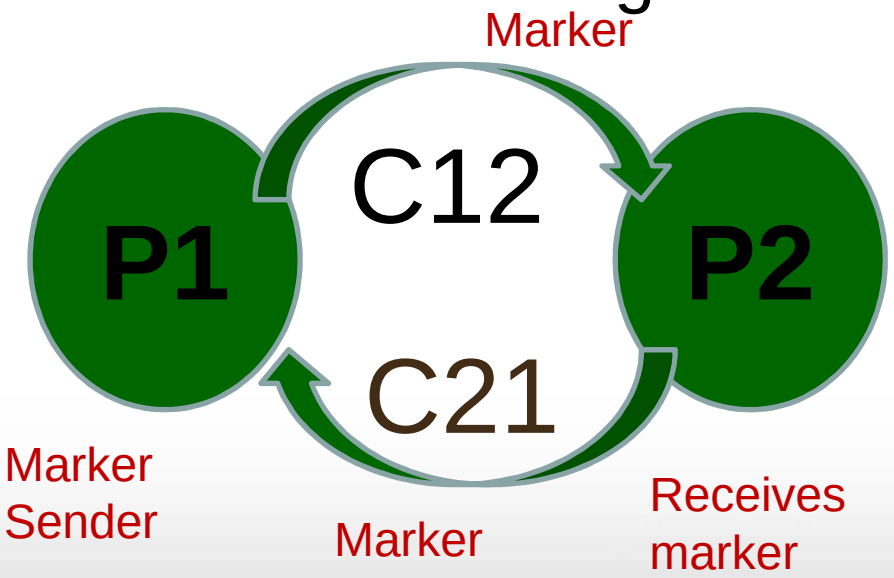
Chandy-Lamport Algorithm - Example

- P1 receives marker
  - P1's local state LS1 is already recorded
  - Records all the messages in channel C21 right from the point P1 recorded its local state till P1 receives second marker in all incoming channels

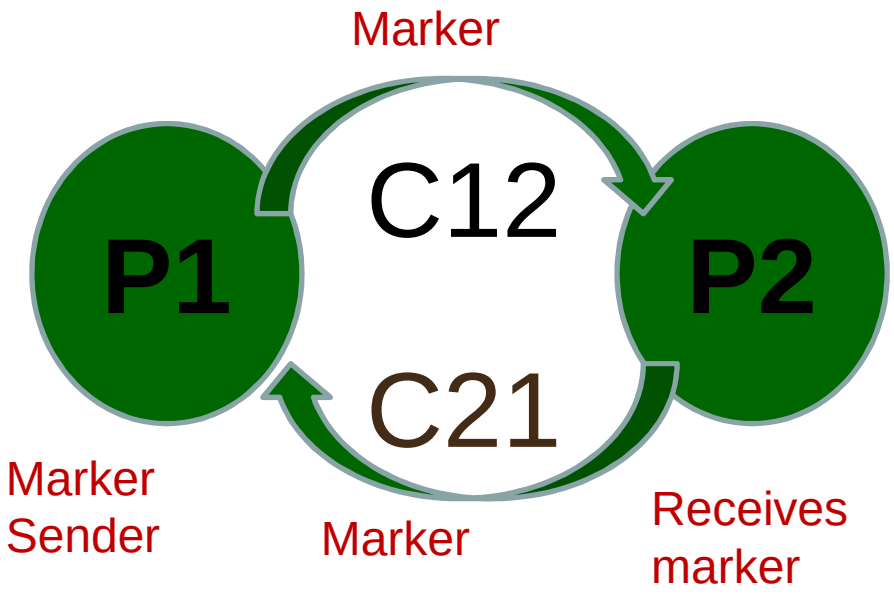


Chandy-Lamport Algorithm - Example

- P1 follows marker sending and P2 receives it
  - P2's local state LS2 is already recorded
  - Records all the messages in channel C12 right from the point P2 recorded its local state till P2receives second marker in all incoming channels

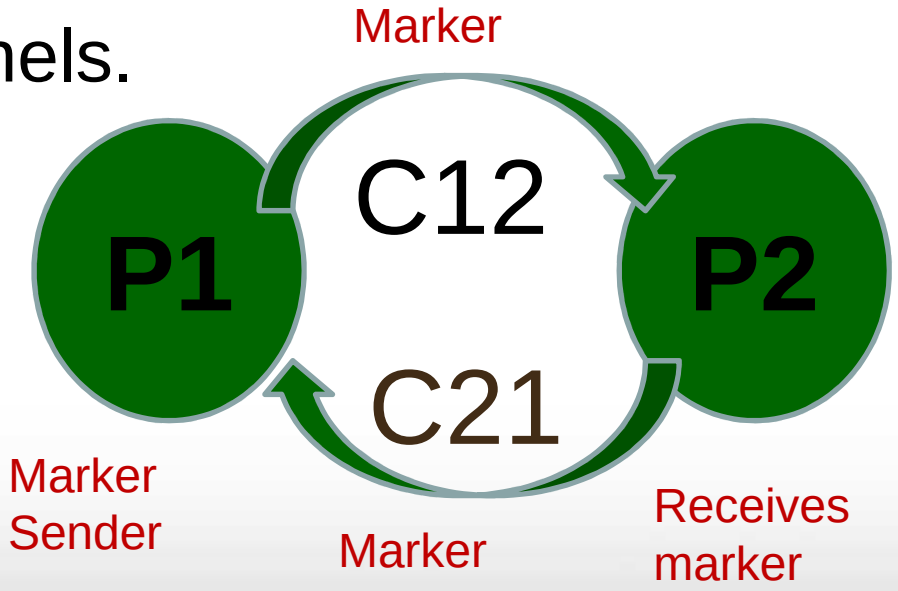


Chandy-Lamport Algorithm - Example

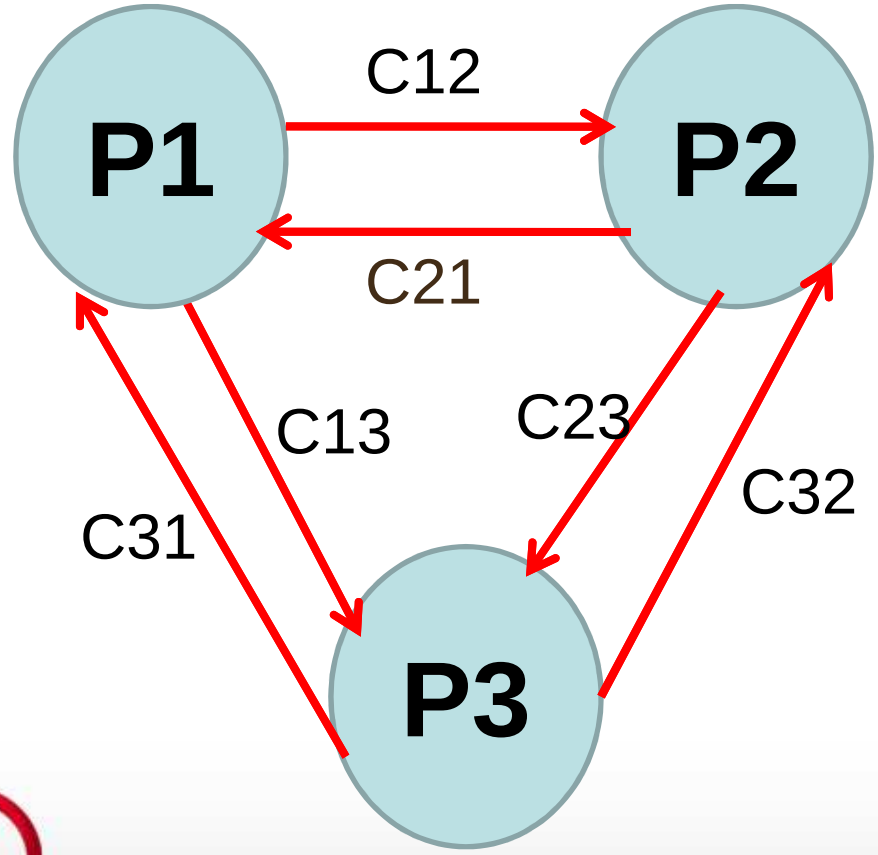


Chandy-Lamport Algorithm - Example

- When does algorithm terminates:
  - The local state is disseminated to all other nodes in the form of second marker message. When all of the processes in the Distributed systems have received second marker in all of its incoming channels.



Chandy-Lamport Algorithm - Example



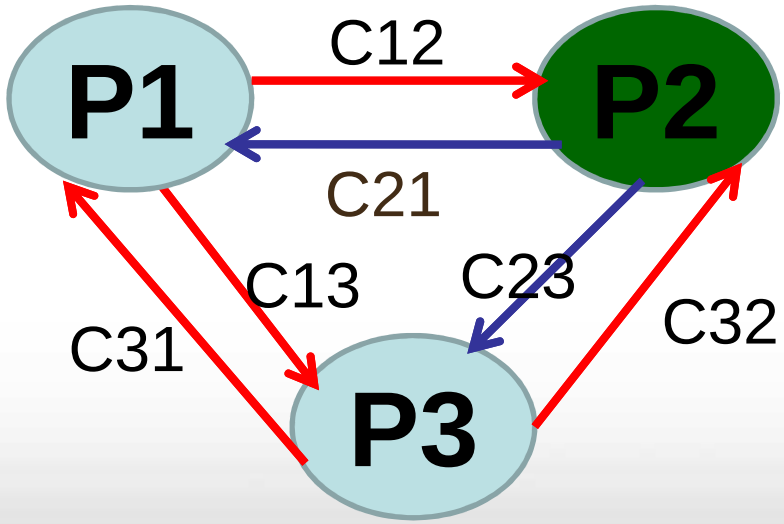
Chandy-Lamport Algorithm - Example

- P2 is initiator.
  - P2 records its local state LS2 and P2 sends marker as follows

P2 -------C21-------- > P1

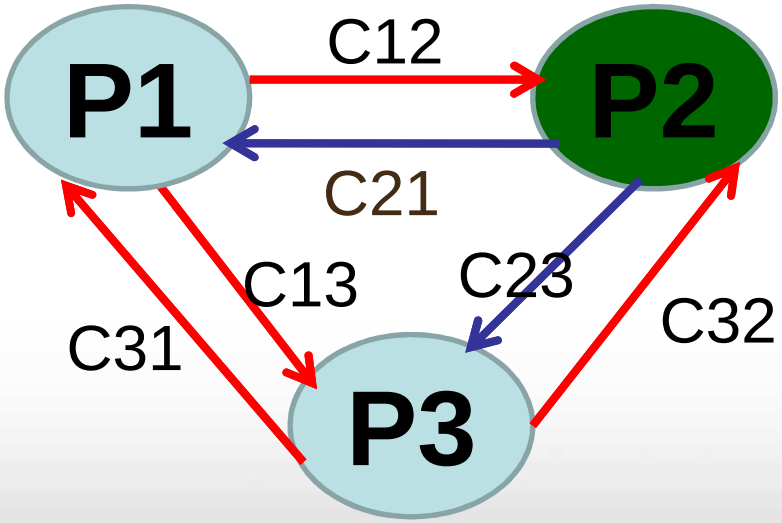
P2 --------C23 ------- > P3

- P1 and P3 receives marker and their states are not recorded.



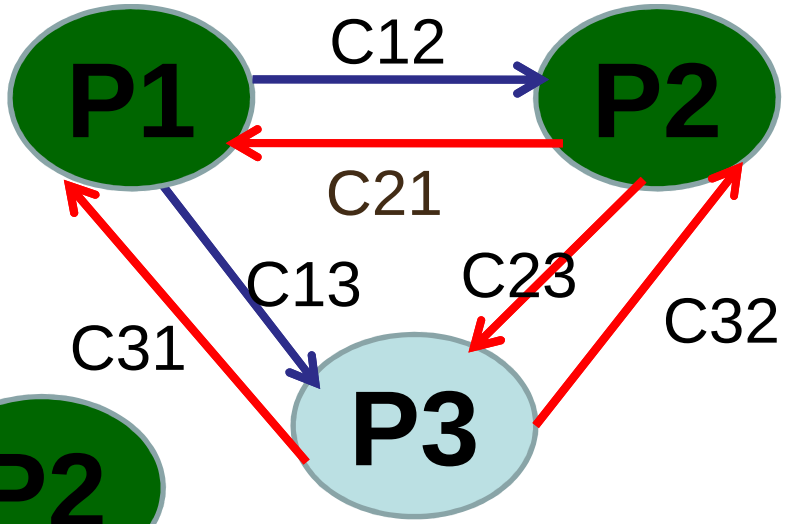
Chandy-Lamport Algorithm - Example

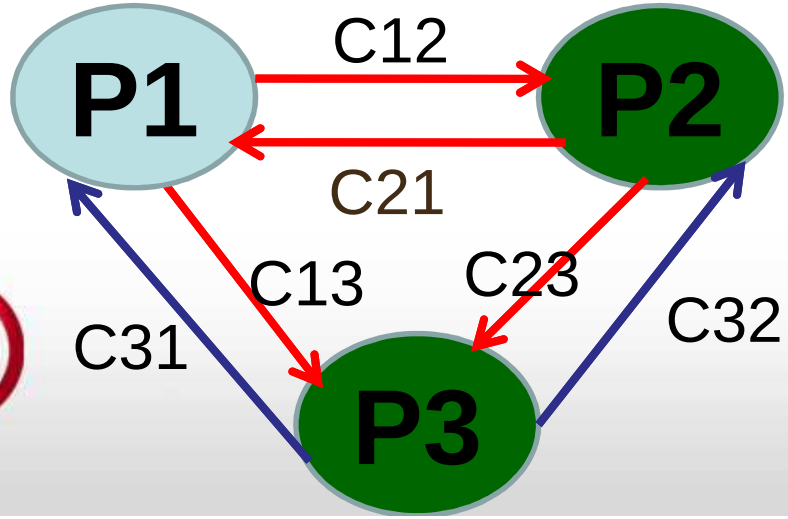
- P1 and P3 receives.
  - P1 records C21 as empty.
  - P3 records C23 as empty
  - P1 and P3 follows Marker sending rule.



Chandy-Lamport Algorithm - Example

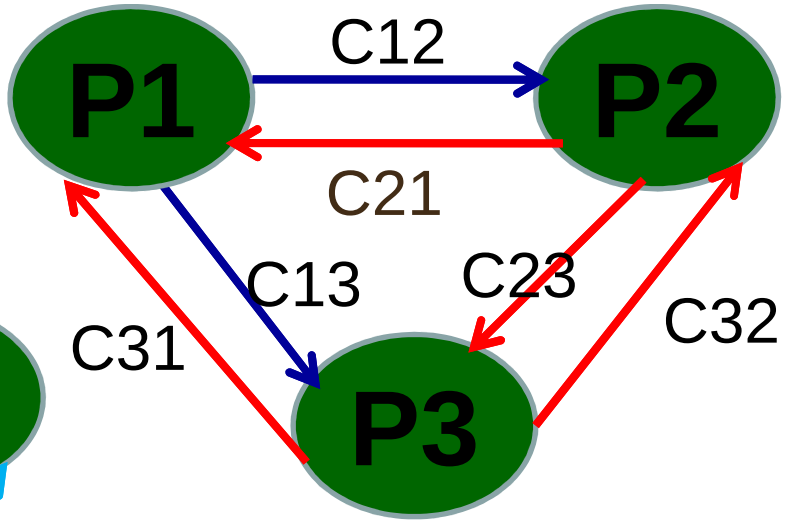
- P1 and P3 follows Marker sending rule
  - P1 records its local state as LS1.
  - P1 sends marker via C12 and C13.
  - P3 records its local state as LS3.
  - P3 sends marker via C31 and C32.

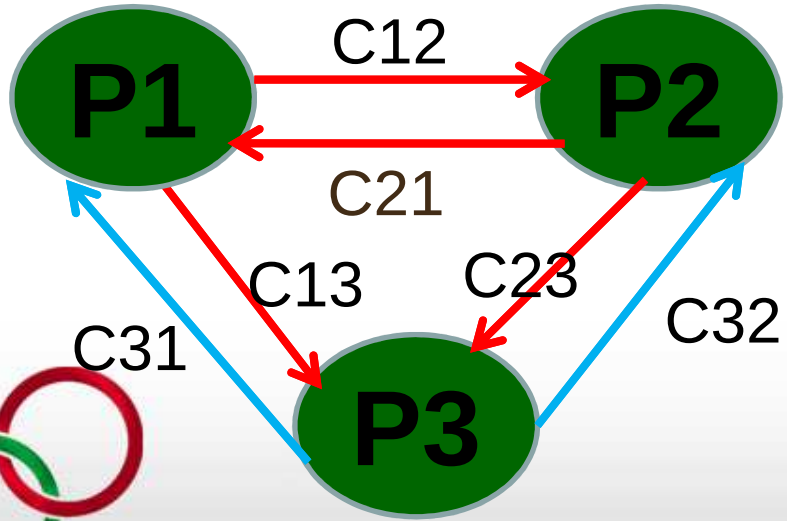




Chandy-Lamport Algorithm - Example

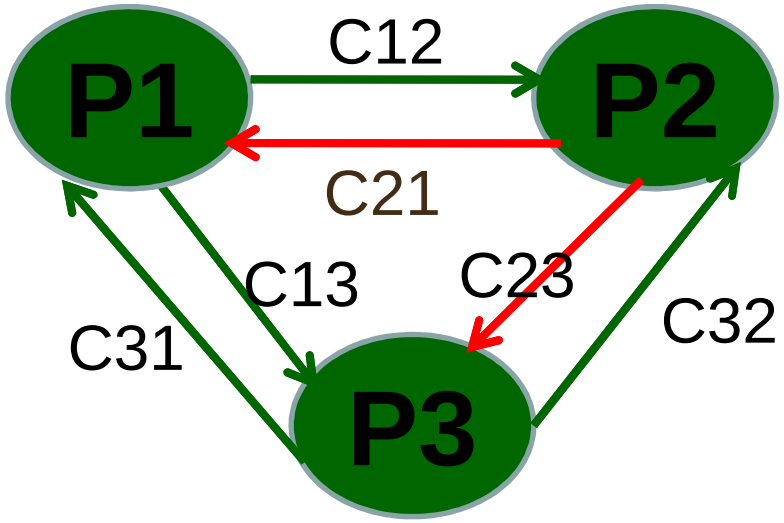
- P1,P2 & P3 follows Marker Receiving rule
  - P2 records C12
  - P3 records C13
  - P1 records C31
  - P2 records C32





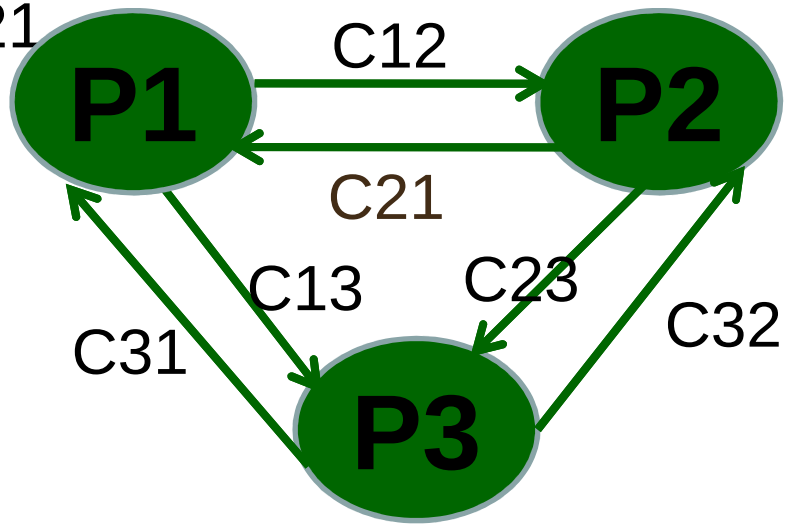
Chandy-Lamport Algorithm - Example

– P1, P2, P3 receives marker and P1, P2, P3 follow marker sending rule as its states are already recorded, they just record the state of channel right from the point P1 , P2 and P3 recorded their states.



Chandy-Lamport Algorithm - Example

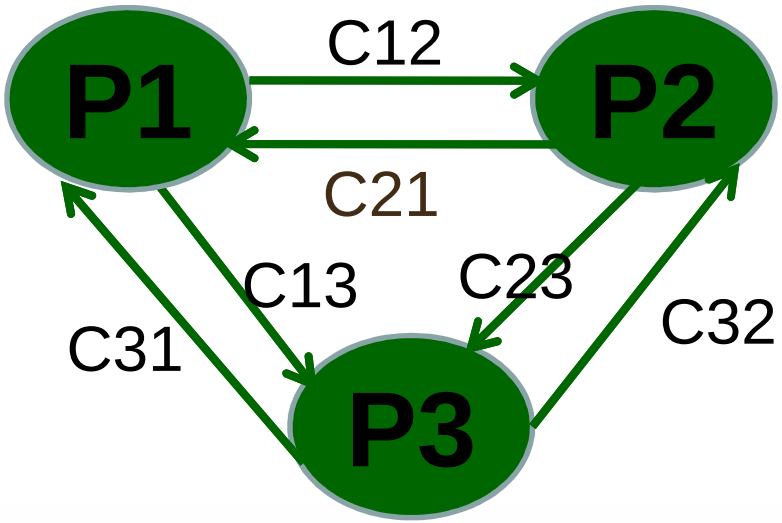
- P3 sends marker to P1 via C31 and P2 via C32 (Already recorded)
- P2 sends marker to P1 via C21 and P3 via C23 (C21 and C23 are recorded)
- P1 sends marker to P2 via C12 and P3 via C13 (Already recorded)



Chandy-Lamport Algorithm - Example

- All the processes received marker in its all incoming channels.

Chandy-Lamport Snapshot algorithm terminates



Chandy-Lamport Algorithm - Example

- Every process will exchange its recorded local state and channel state to all the other processes.
- All the local states are combined to form a Global State.
- To find whether a global state is consistent or not, introduce cuts and check for Consistency or Inconsistency