

# CSCI 251: Concepts of Parallel and Distributed Systems

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## Global States

A cut is nothing more than a snapshot of a distributed system. For a cut to be consistent, the events and messages must be in a state such that there is no state that depends on a state not inside the cut.

## Monitor Process

Assumptions:

- During the snapshot operation, there are no faults.
- There is a finite time for messages to flow from one process to another.
- Any process can start the monitoring process.

## Chandy & Lamport Algorithm for Monitoring

Marker Process (initiating process):

1. Marker message is sent by the initiating process.
2. The marker process records its state and sends a marker message  $m$  on every outgoing channel before it sends to any other process.

Receiving Process  $p_j$ :

1. If  $p_j$  has not recorded its state,  $p_j$  records its state now and starts recording messages arriving on all the other incoming channels.
2. If  $p_j$  has already recorded its state, it records the state of each channel (recording of messages received since it saved its state).

## Coordination and Agreement

- Mutual Exclusion
- Multicasting
- Consensus
- Performance: Latency, bandwidth consumption, energy consumption

With a mutual exclusion, only one process has access to a resource at any given time.

## Reminders

Check MyCourses for details on Project 2.

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