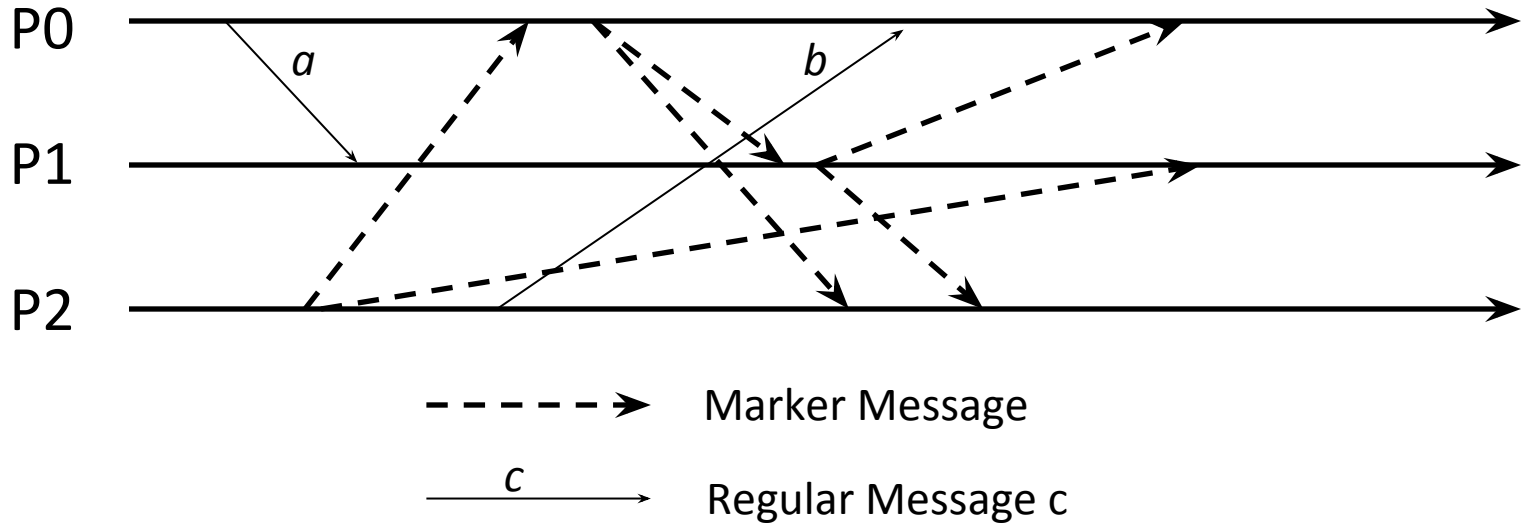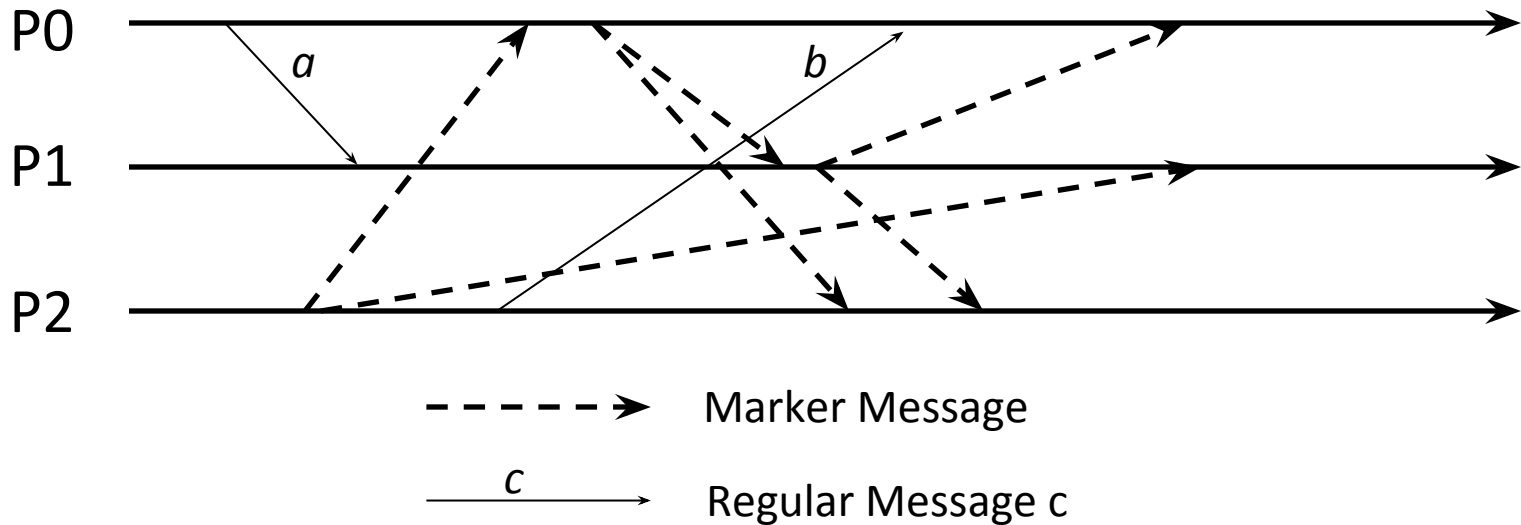# I. Chandy-Lamport Global Snapshots Algorithm

- Mark the entire global snapshot collected.

I. Chandy-Lamport Global Snapshots Algorithm

- Mark the entire global snapshot collected.

- - - ➤	Marker Message
——*c*——➤	Regular Message c

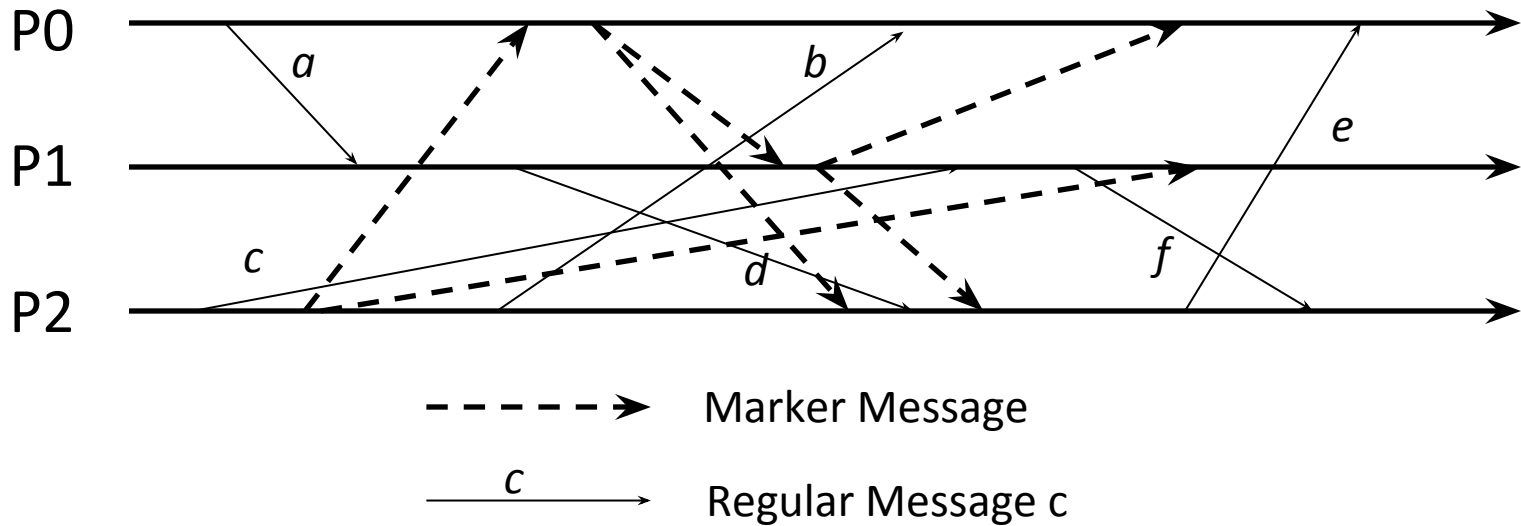P0: S(a)
P1: R(a)
P2: {}
C01: {}
C02: {}
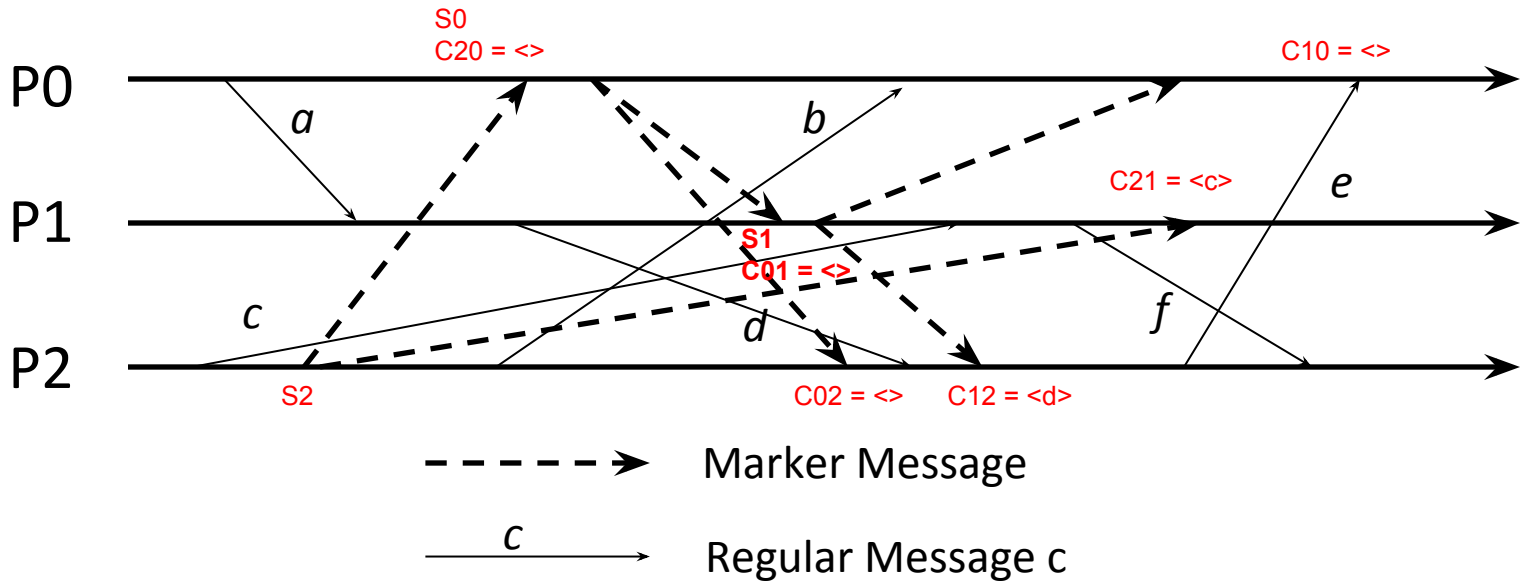C10: {}
C12: {}
C20: {}
C21: {}

II. Chandy-Lamport Global Snapshots Algorithm

- Mark the entire global snapshot collected.

II. Chandy-Lamport Global Snapshots Algorithm

- Mark the entire global snapshot collected.

- - - - → Marker Message

——— c ———→ Regular Message c

P0: S(a)
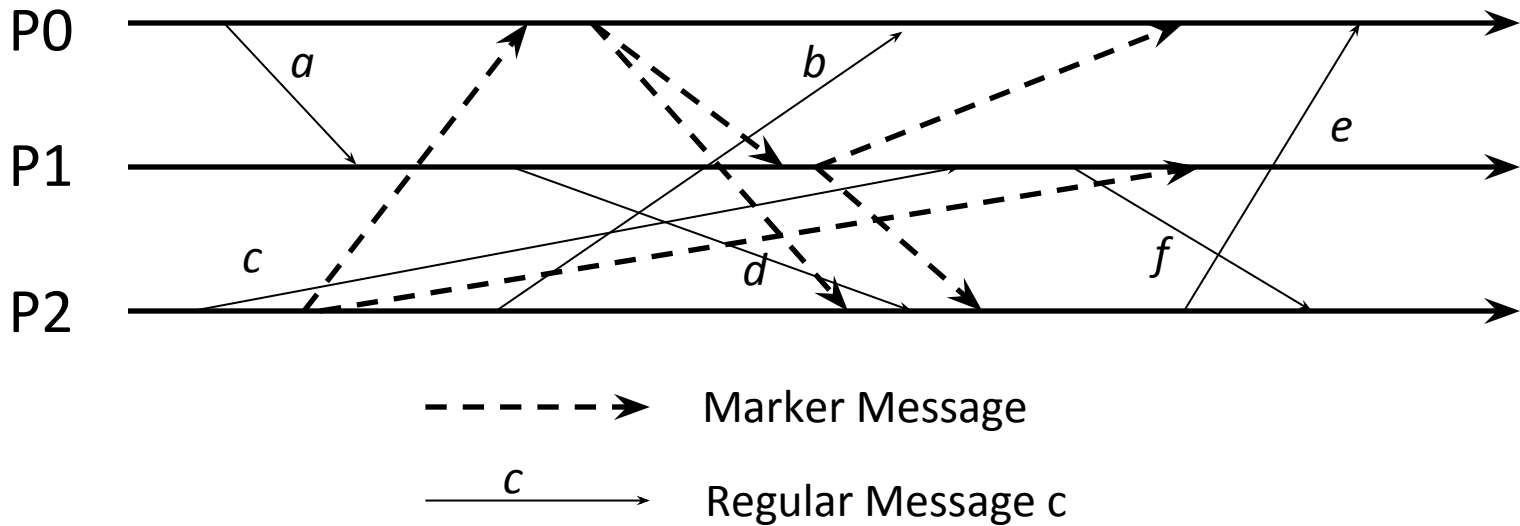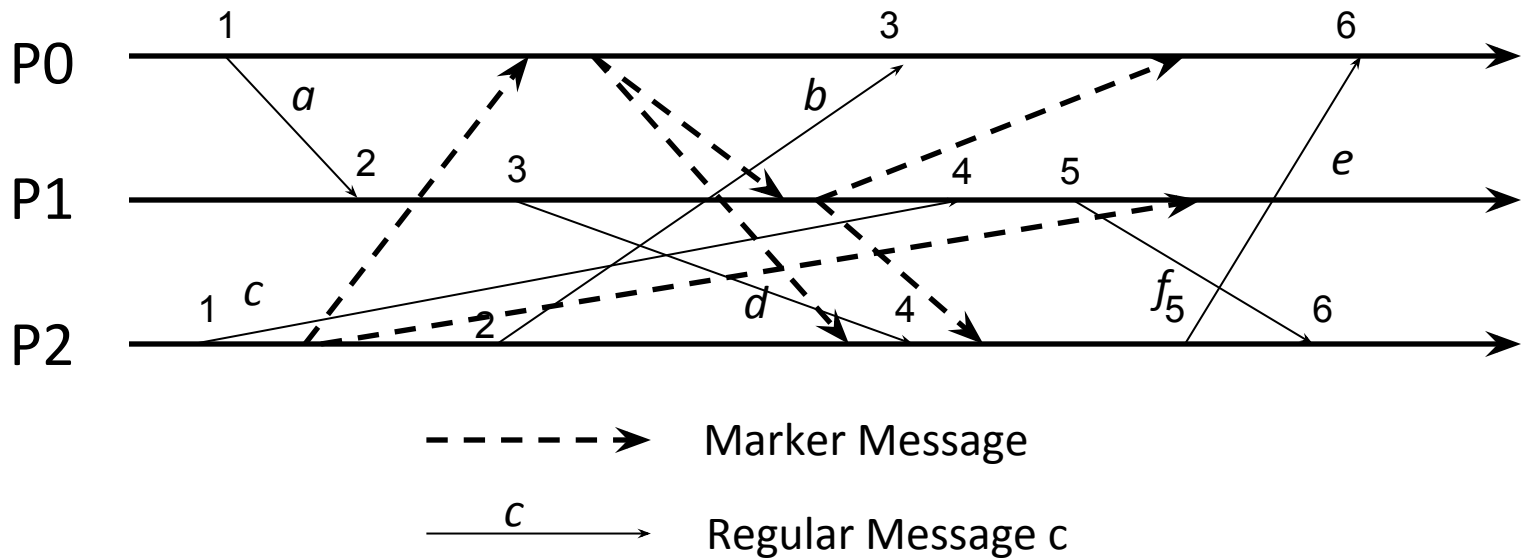P1: S(d)
P2: S(c)
C01: {}
C02: {}
C10: {}
C12: {d}
C20: {}
C21: {c}

III. Mark all Lamport timestamps for application messages on this figure for all events.
All Lamport timestamps start from zero.

Marker Message

Regular Message c

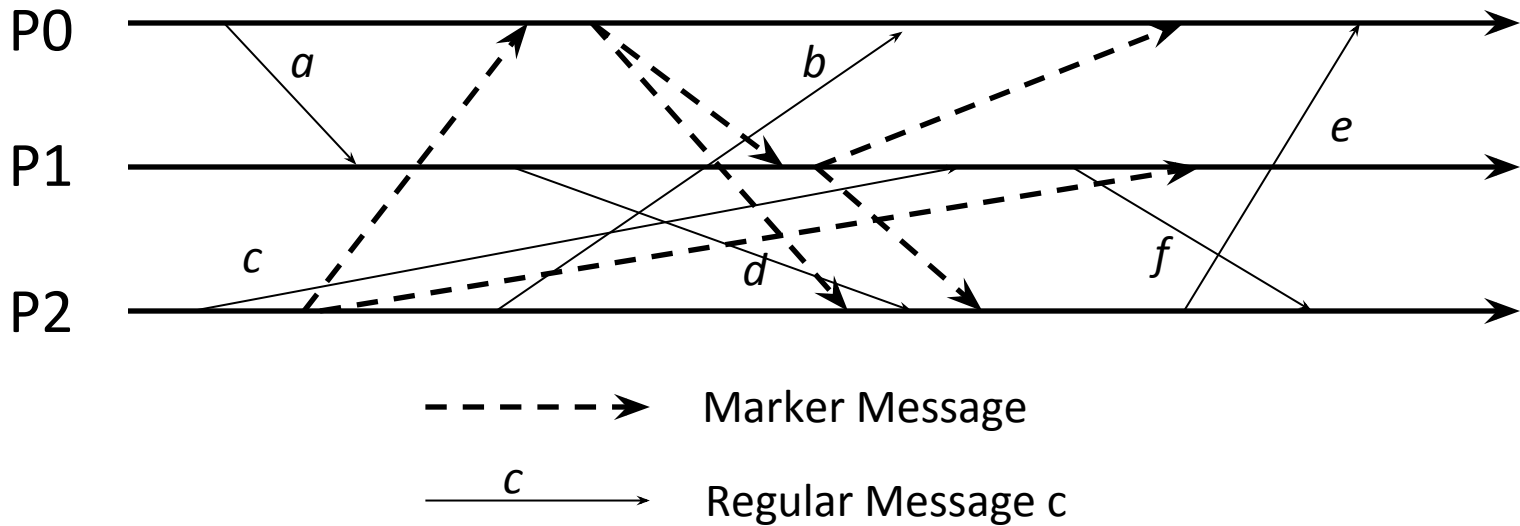**III. Mark all Lamport timestamps for application messages on this figure for all events.**
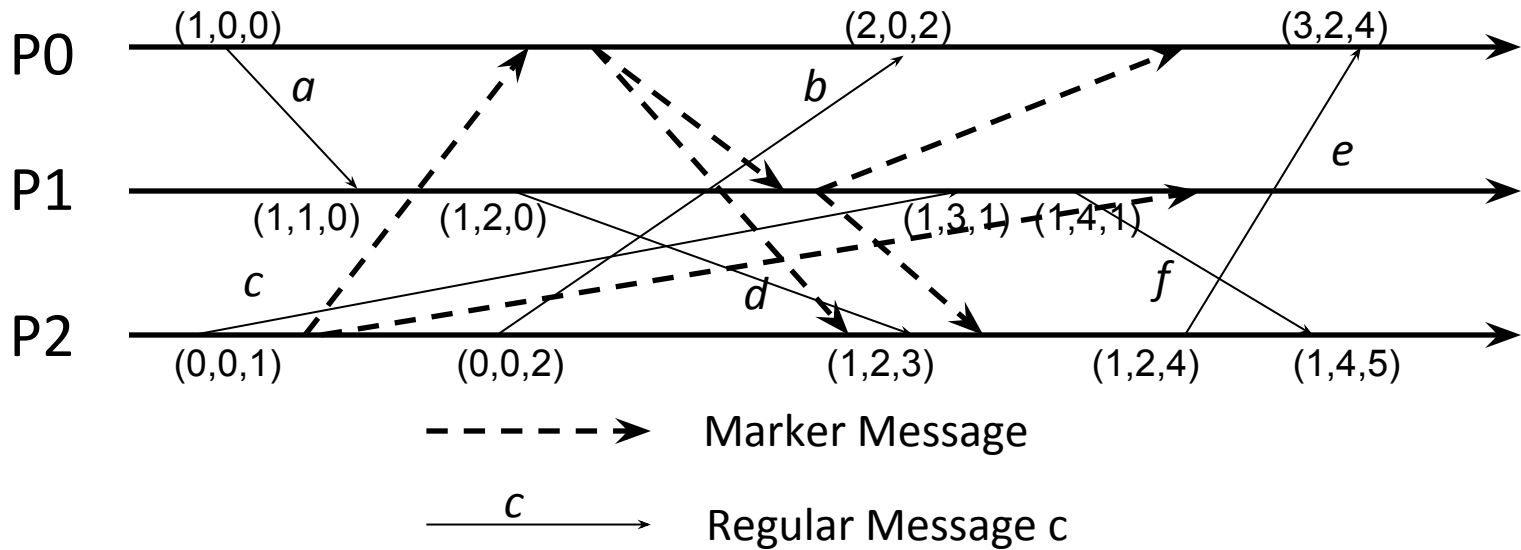**All Lamport timestamps start from zero.**

Marker Message

Regular Message c

P0: S(a)
P1: S(d)
P2: S(c)
C01: {}
C02: {}
C10: {}
C12: {d}
C20: {}
C21: {c}

IV. Mark all vector timestamps for application messages on this figure for all events.
**All vector timestamps start from zeroes.**

- - - ➤ Marker Message

c ⟶ Regular Message c

IV. Mark all vector timestamps for application messages on this figure for all events.
All vector timestamps start from zeroes.

P0 (1,0,0)   (2,0,2)   (3,2,4)

a   b   e

P1 (1,1,0) (1,2,0)   (1,3,1) (1,4,1)

c   d   f

P2 (0,0,1)   (0,0,2)   (1,2,3)   (1,2,4)   (1,4,5)

- - - - → Marker Message
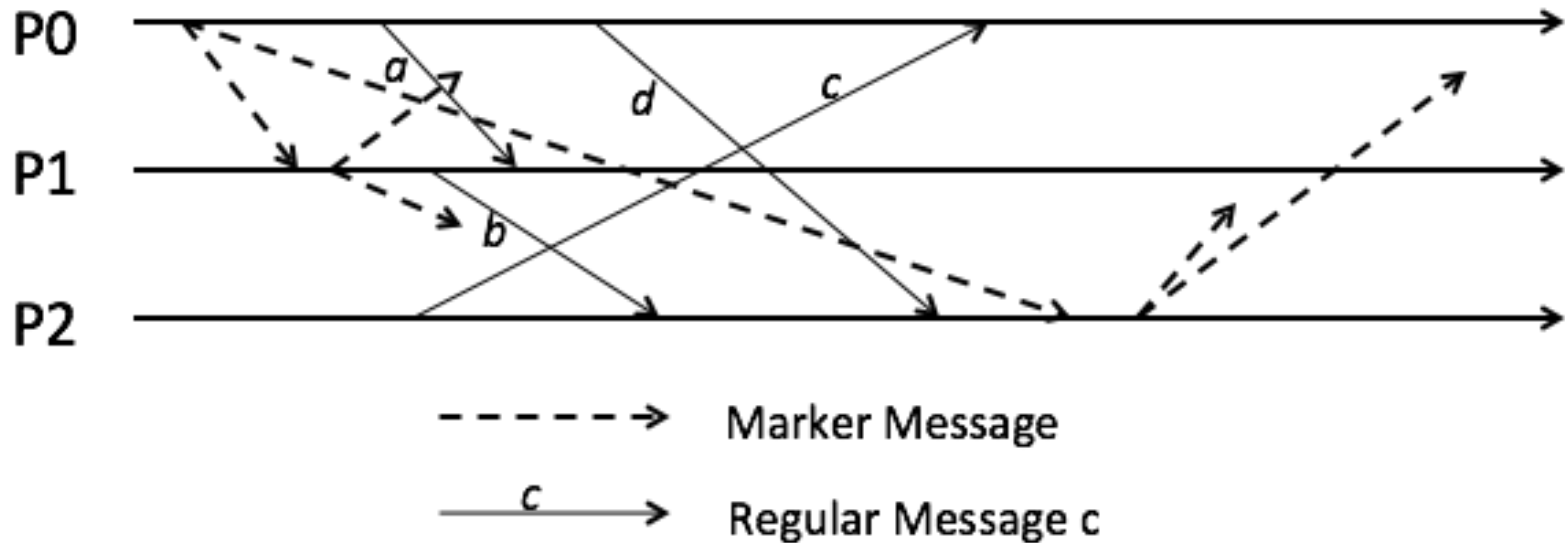
——— c ———→ Regular Message c

V. Chandy-Lamport Global Snapshots Algorithm

- PO initiates a snapshots run. Something is wrong with the figure. What?

V. Chandy-Lamport Global Snapshots Algorithm

•P0 initiates a snapshots run. Something is wrong with the figure. What?

- - - - → Marker Message

——c——→ Regular Message c
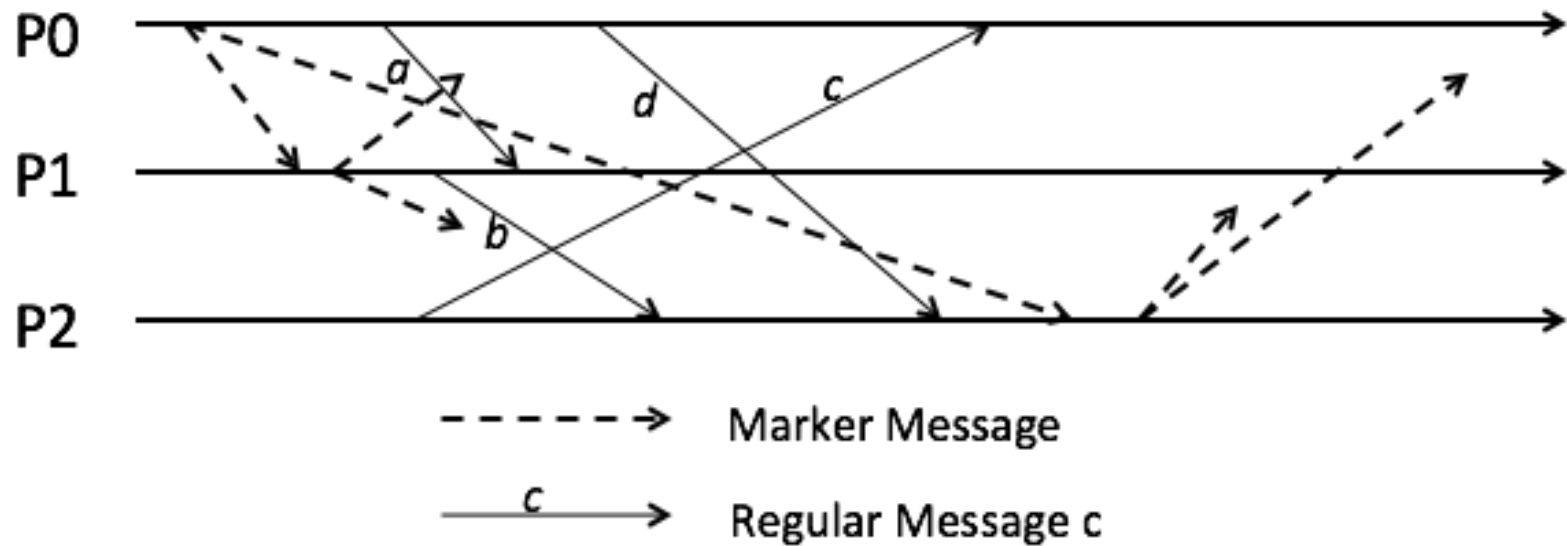
Answer: Message d and the marker from P0 to P2 violate FIFO. As a result, the cut created by this snapshot is inconsistent (contains d's receipt event, but not d's send event).

VI. Chandy-Lamport Global Snapshots Algorithm

•P0 initiates a snapshots run. Something is wrong with the figure. What?
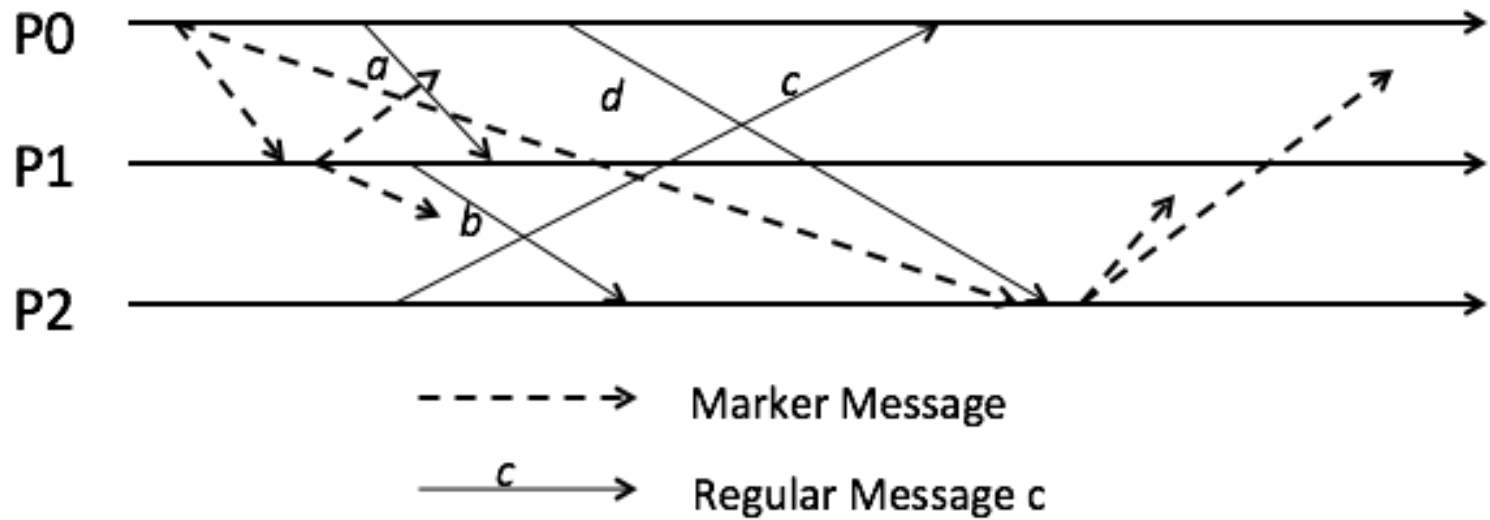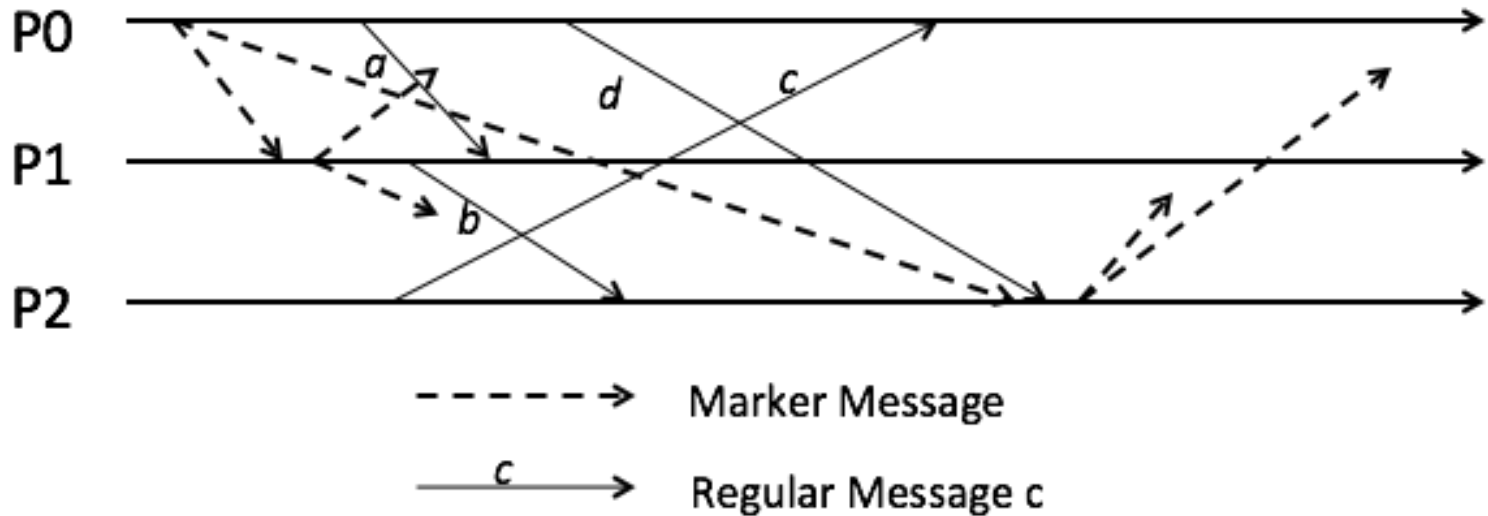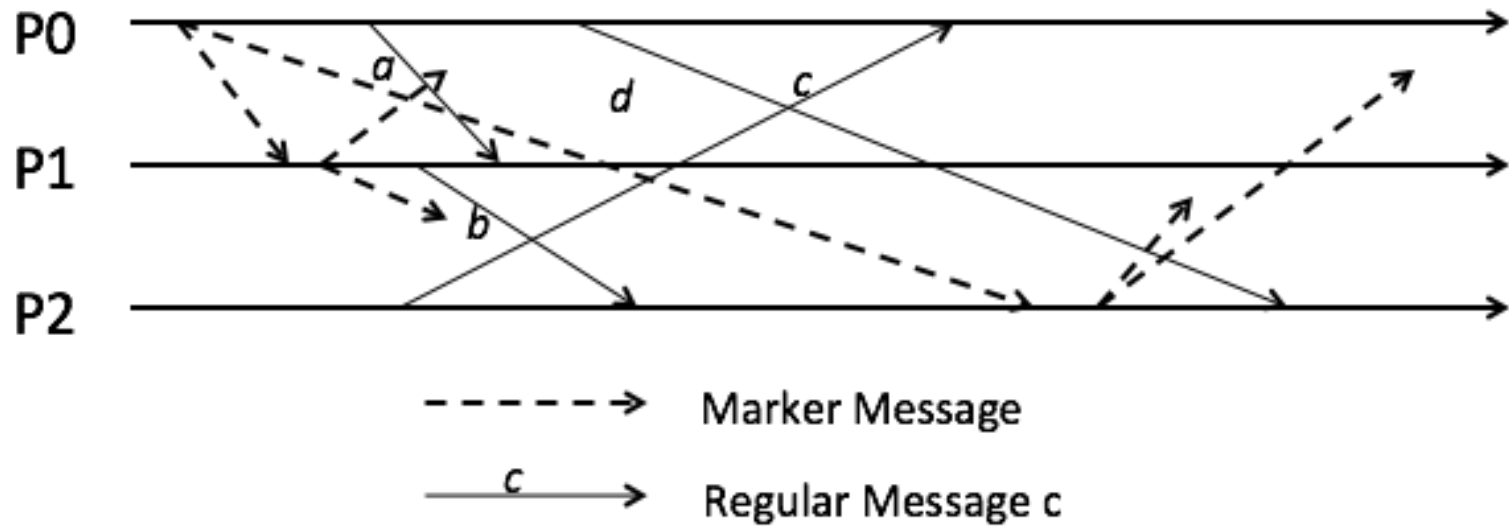
VI. Chandy-Lamport Global Snapshots Algorithm

•P0 initiates a snapshots run. Something is wrong with the figure. What?

Marker Message

Regular Message c

Answer: When P2 receives a marker (from P0), it must send out its markers immediately. In this timeline, it processes message d first then sends out its markers. As a result, it is unclear if d's receipt event belongs to the cut or not.

VII. Chandy-Lamport Global Snapshots Algorithm

•P0 initiates a snapshots run. Some of the markers in transit are shown. List ALL the possible snapshots that might be collected. You must assume FIFO channels.

- - - - → Marker Message
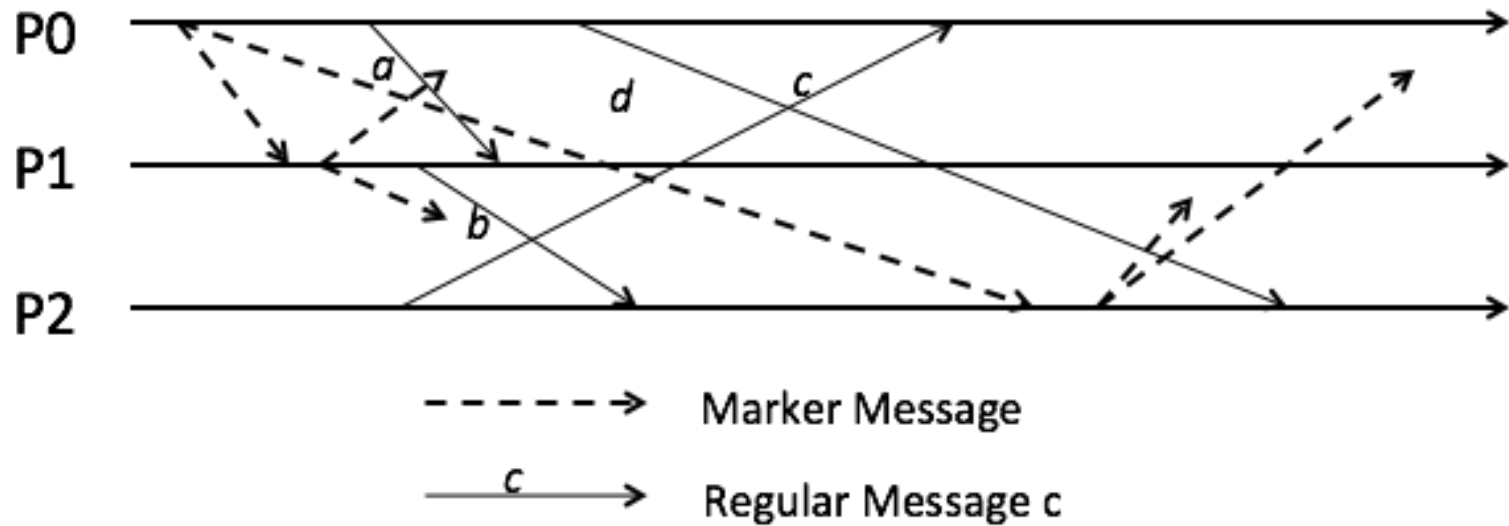
─── c ──→ Regular Message c

VII. Chandy-Lamport Global Snapshots Algorithm

•P0 initiates a snapshots run. Some of the markers in transit are shown. List ALL the possible snapshots that might be collected. You must assume FIFO channels.

Answer: Messages a, b, and d are all sent after the cut at their respective sender process, so by causality their receipt events cannot be in the cut. Message c is sent before the cut at P2, so it's send event is a part of the cut. However, c is received at P0 after the cut, thus c is the only message that is captured in the snapshot. There is only one possible snapshot.