Session 1: Exercises

M2 MOSIG: Large-Scale Data Management and Distributed Systems

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1 Consistent Cuts

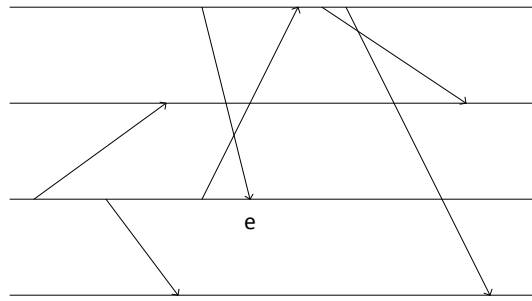Consider Figure 1. Construct the largest consistent cut that does not include event e.

Figure 1: Execution for Exercise 1

2 Chandy-Lamport

a) In the Chandy-Lamport snapshot algorithm, no application event can take place on a process between the reception of the first SNAPSHOT and the broadcast of SNAPSHOT. Show by an example that, if this property does not hold, then the cut may not be consistent.

b) Consider Figure 2. The Chandy-Lamport snapshot algorithm is initiated by p_1; SNAPSHOT messages are shown using dotted lines. Complete the figure showing all messages generated by the snapshot algorithm, such that

1. Message m_1 is in transit on the consistent cut.

2. Message m_2 is not in transit but sent after the cut.

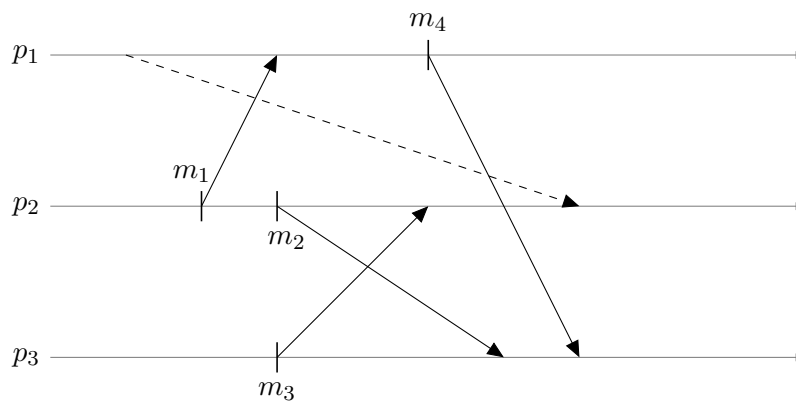What about the two remaining messages (m_3 and m_4)? Are they sent after the cut, received before the cut, or in transit on the cut?

Figure 2: Execution for Exercise 2b