

Exercise Session 4 Broadcast

Exercise 1

In distributed systems, total order broadcast is a broadcast messaging protocol that ensures that messages are received reliably and in the same order by all processes. Consider the broadcast execution below. Which of the following statements are true about this execution?

1. The execution is a correct causal broadcast execution.
2. The execution is a correct total order broadcast execution
3. The execution is a correct uniform reliable broadcast execution
4. None of the above

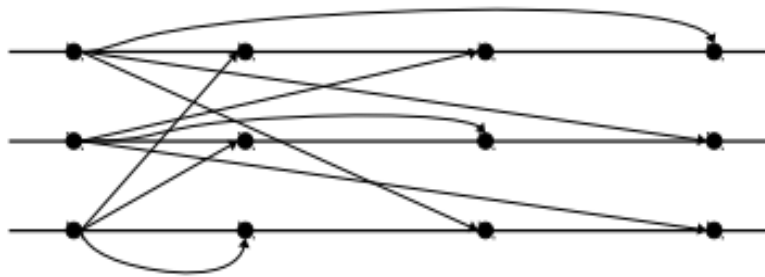


Figure 1: Execution.

Answer. 1,3

Exercise 2

Sketch an execution history with two processes p_1 and p_2 , that satisfies the properties of Reliable Causal Broadcast but does not satisfy Uniform Causal Broadcast.

Answer. Such an execution may happen when the uniformity of agreement is broken. This means that some process should deliver a message and then crash, before relaying it to the rest of the processes.

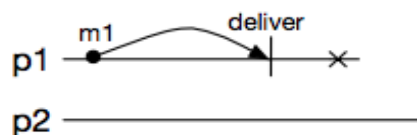


Figure 2: An execution that satisfies Reliable Causal Broadcast but does not satisfy Uniform Causal Broadcast..

Note: This execution represents a more general case (not specific to Causal-ordering), illustrating the difference between Uniform Broadcast and Non-Uniform Broadcast.