

Exercise Session 3

Causal Broadcast

Exercise 1

Can we devise a broadcast algorithm that does not ensure the causal *delivery* property but only its nonuniform variant: no correct process p_i delivers a message m_2 unless p_i has already delivered every message m_1 such that $m_1 \rightarrow m_2$?

Exercise 2

Suggest an optimization of the garbage collection scheme of *Algorithm 1'* (slide 24).

Exercise 3

Why is the condition on slide 30 $VC[pk] \geq VC_x[pk]$ and not just $VC[pk] = VC_x[pk]$? Can you construct an execution where the local vector clock is greater than the received local clock for one place?

Exercise 4

Can we devise a best-effort broadcast algorithm that satisfies the *causal delivery* property without being a causal broadcast algorithm, i.e., without satisfying the *agreement* property of a reliable broadcast?