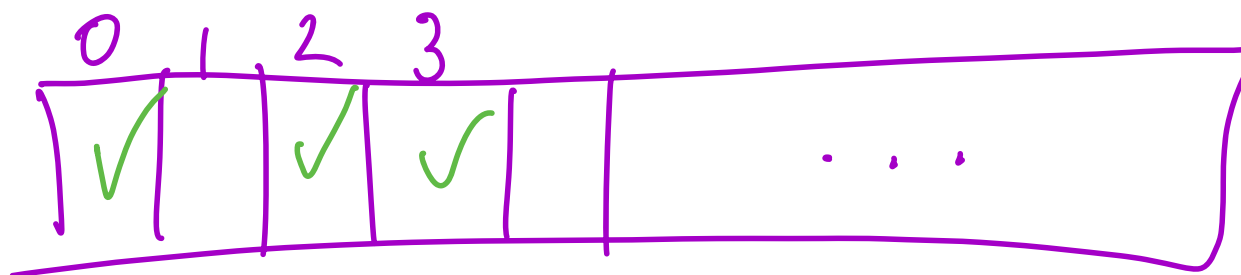
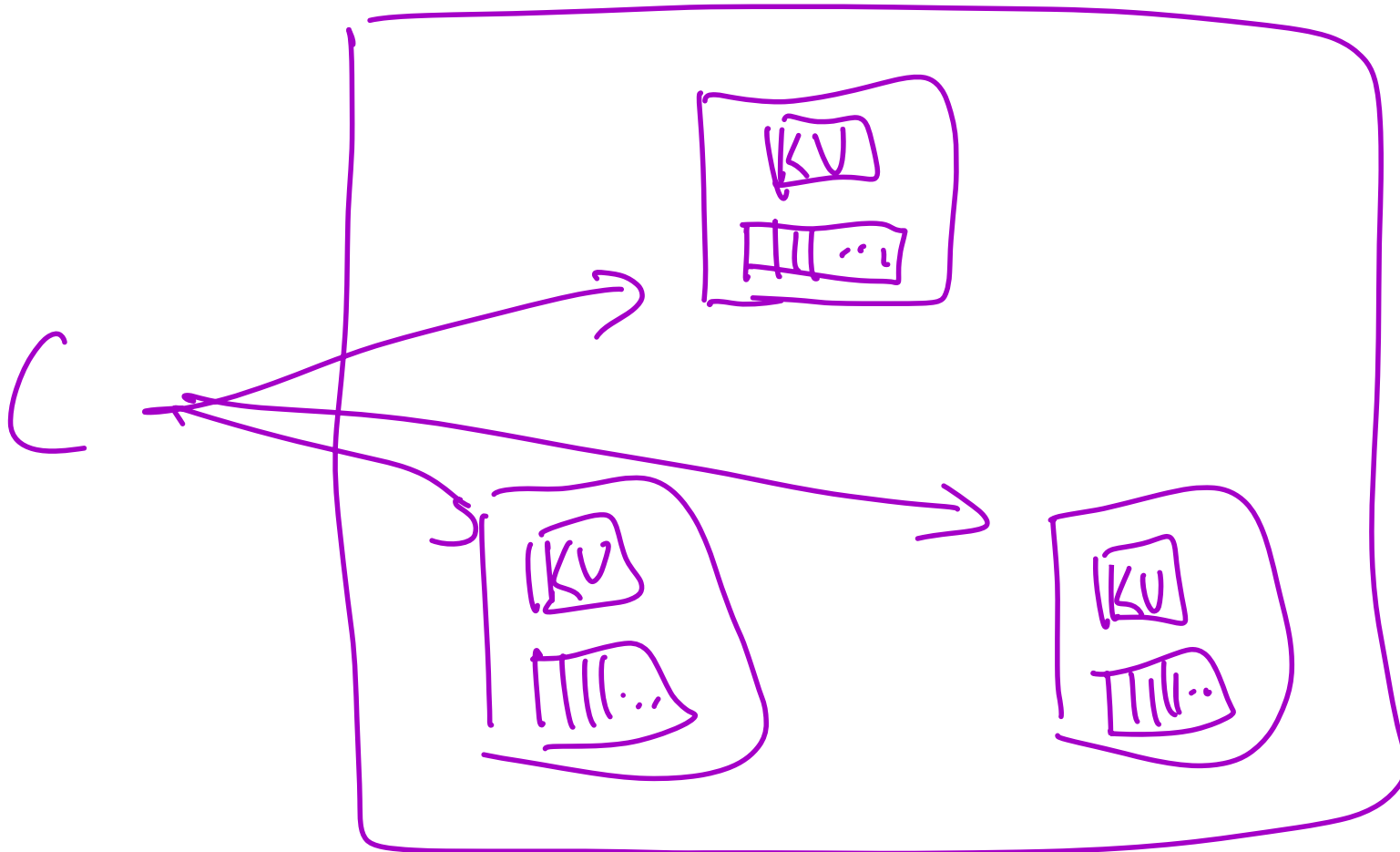


CSE 452

Distributed Systems

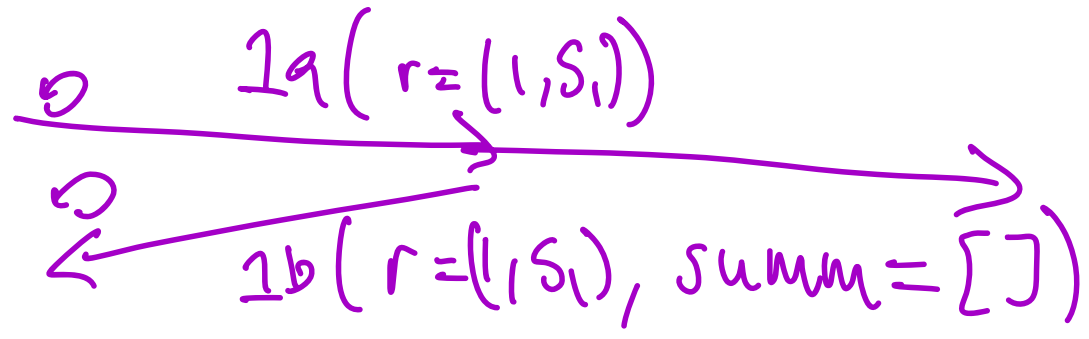
More

MultiPaxos

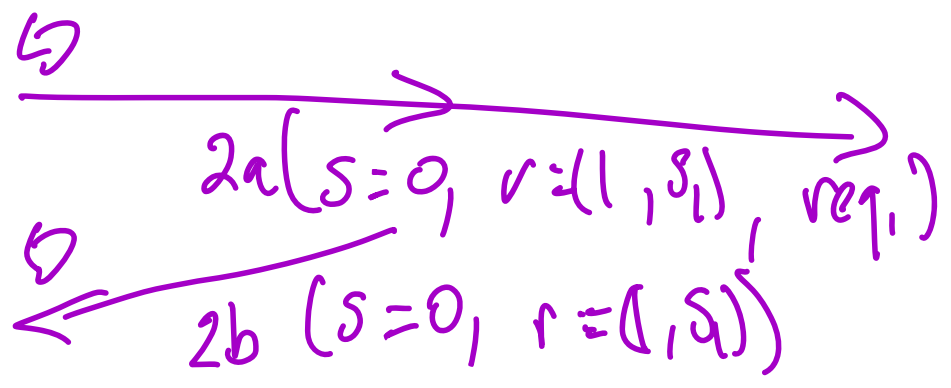


slot = index into log

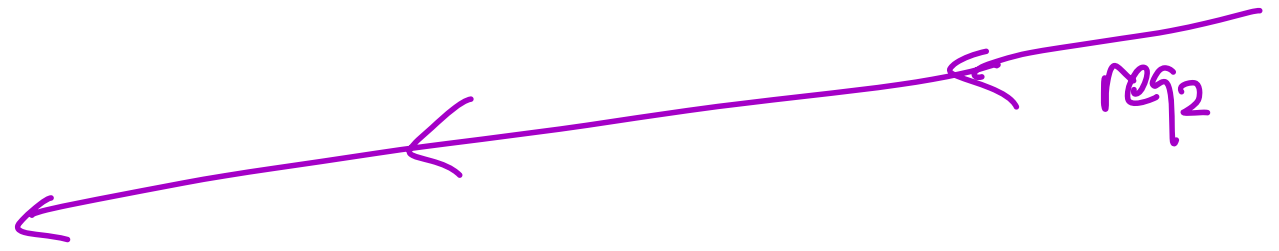
C_1 S_1 S_2 S_3 C_2



req_1 →



← $resp_1$

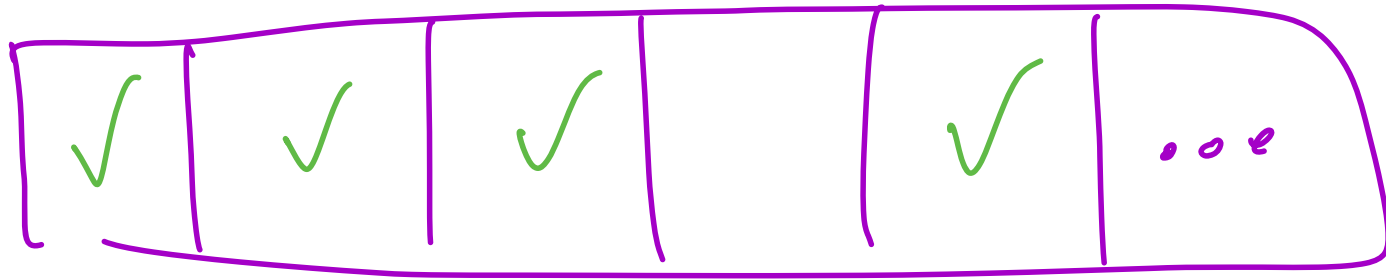


→ $resp_2$

Heartbeats: Failure Detection

- leader tell followers that they are still up
- followers set a timer to check if they've heard from the leader recently
 - if not, try to become leader

Holes in the log



- leader can propose no-op (or get)
- run phase 2, treat like any request

Avoiding Duplicate log entries

- for performance, not correctness
- check if incoming requests already exist
 - req already executed: retransmit the response
 - req is not yet chosen: ignore

Catching Up

- node hasn't heard about a chosen cmd
- leader should inform them of missing info

Log as data structure

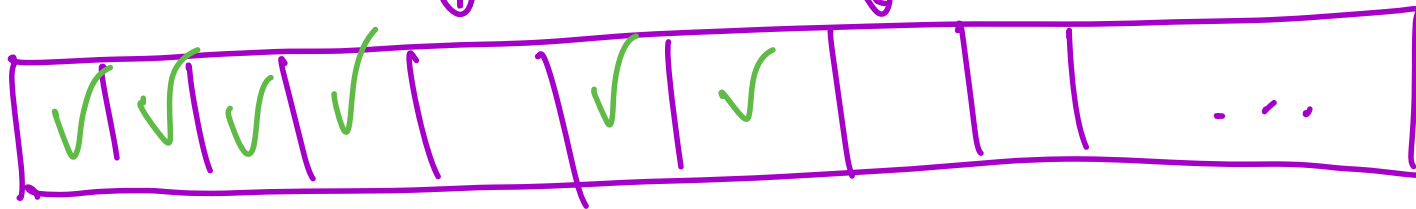
- Map < Integer, LogEntry >

↑
Slot index

↑
all the data
about that slot

- how to find next empty slot

- slot-out = first unexecuted
slot-in = first available slot



Garbage Collection

- when is it safe to delete a log entry?
- must execute before deleting
- need to know every server has that entry

