Plan

* Recitation Qs
  * Recap: Big picture
  * Raft: common case
  * Raft: failures
  * Scenarios

Logistics

* DB hands-on due tomorrow May 5
* Design project due May 11
* Rest of 6.033 is about security

Recitations Qs

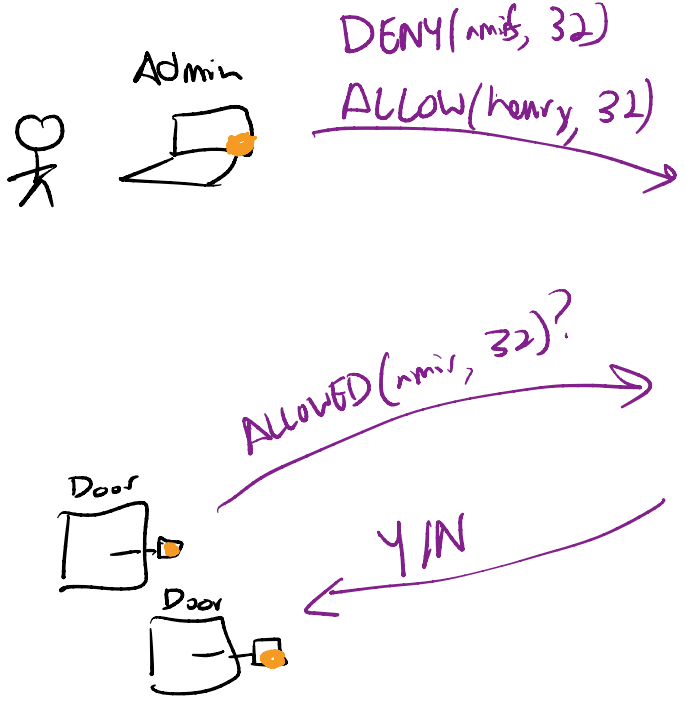
1. What does "understandibility" mean in Raft context?

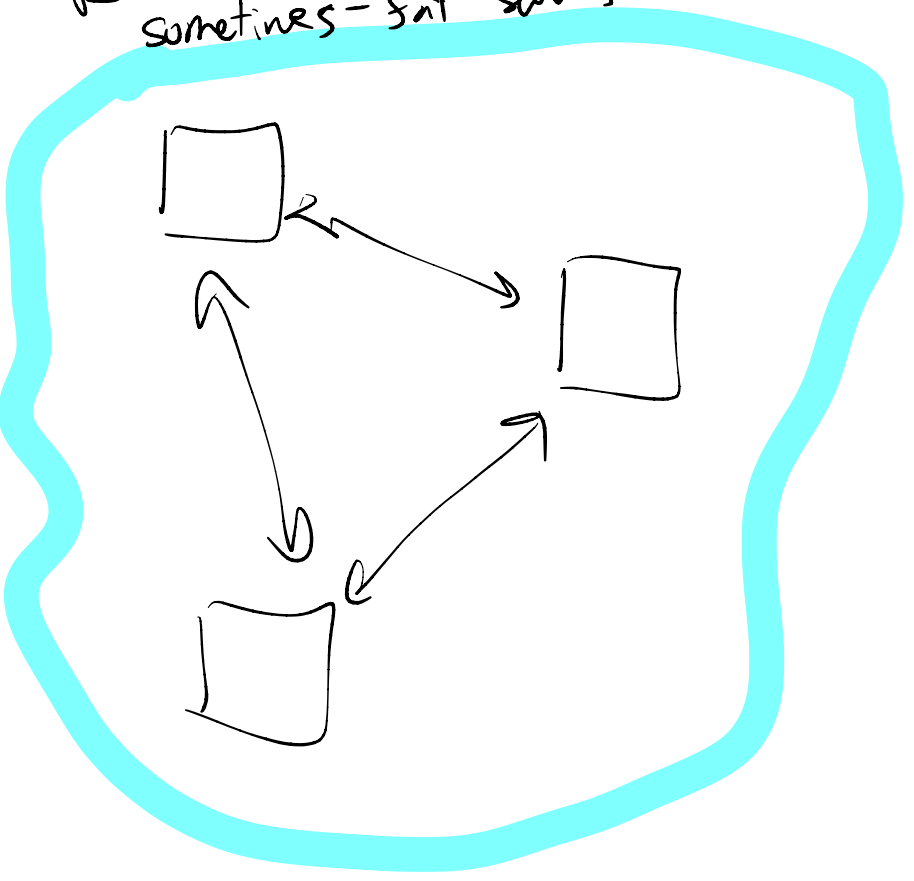
2. Did they succeed?

3. Why is understability important?
   - ↳ Fewer bugs
   - ↳ No surprises

understability → simplicity

The Big Picture

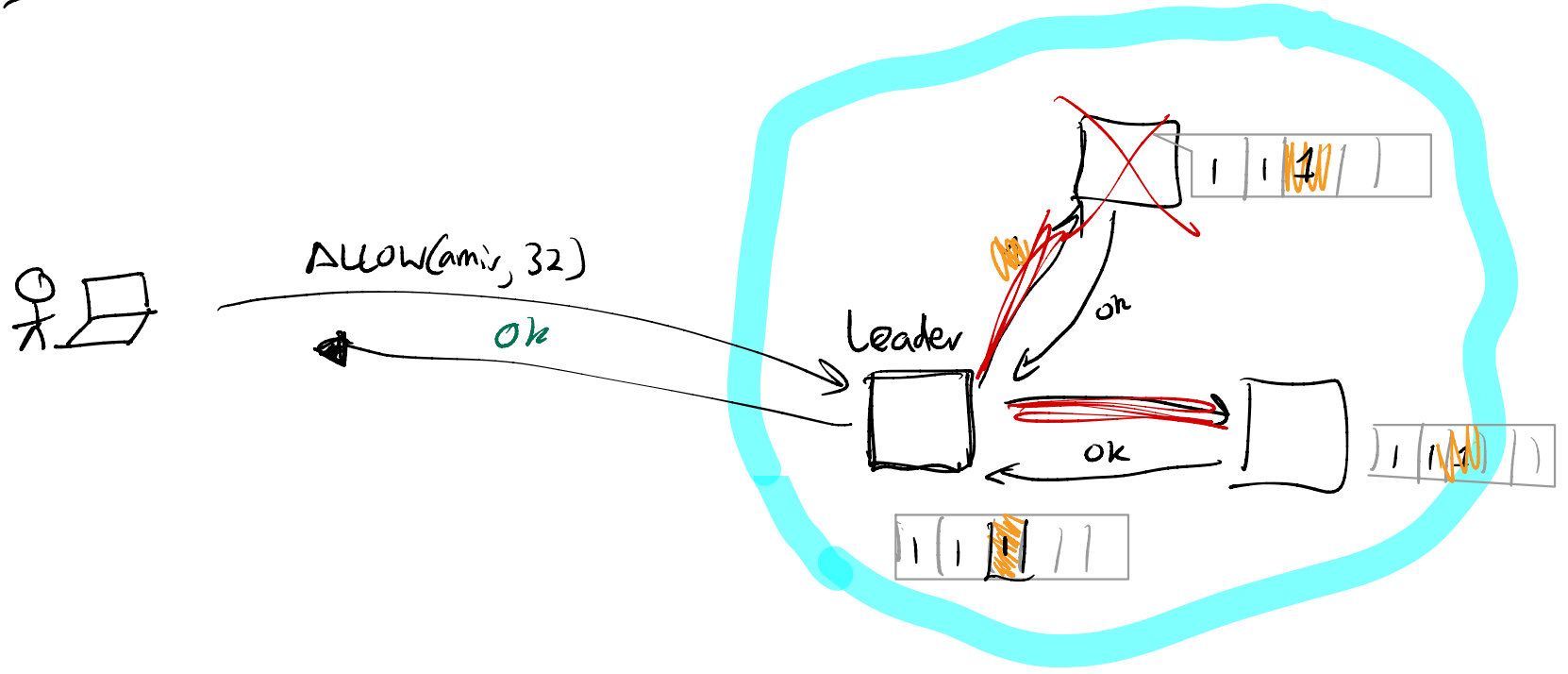




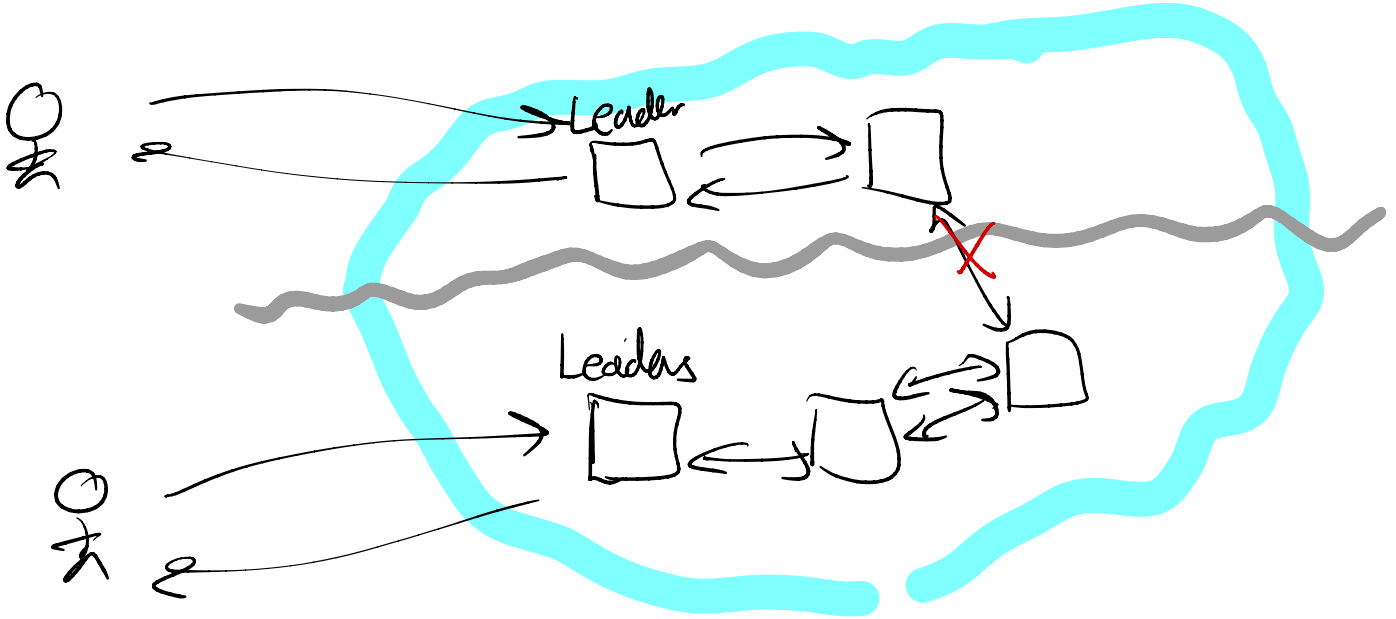
Goal: Implement/Simulate a never-fail server w/ many sometimes-fail servers.

Normal operations in Raft

Fail-stop failure



Why a majority of servers?



"Split brain"

How does Raft recover from Leader failure?

* When a follower doesn't hear from leader for a while
  - run election

* Node w/ most "up to date" log wins

* Leader never deletes its log entries.

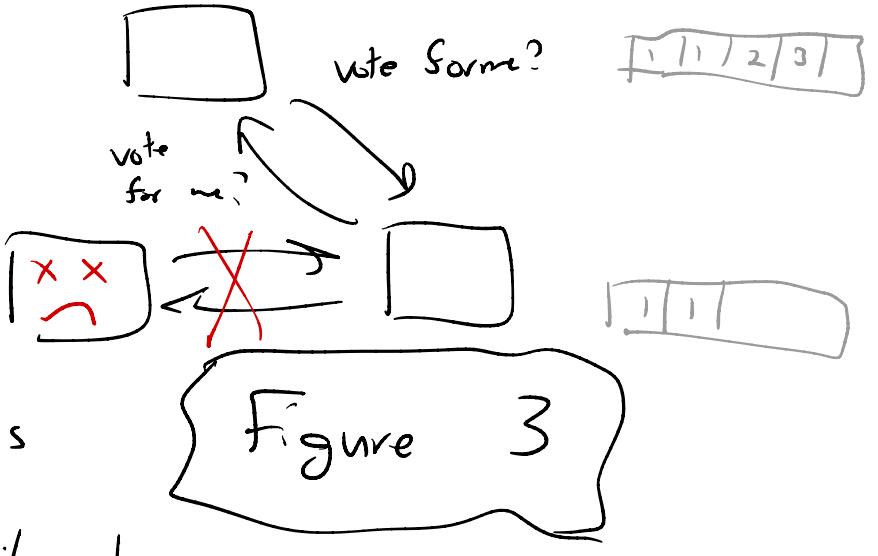
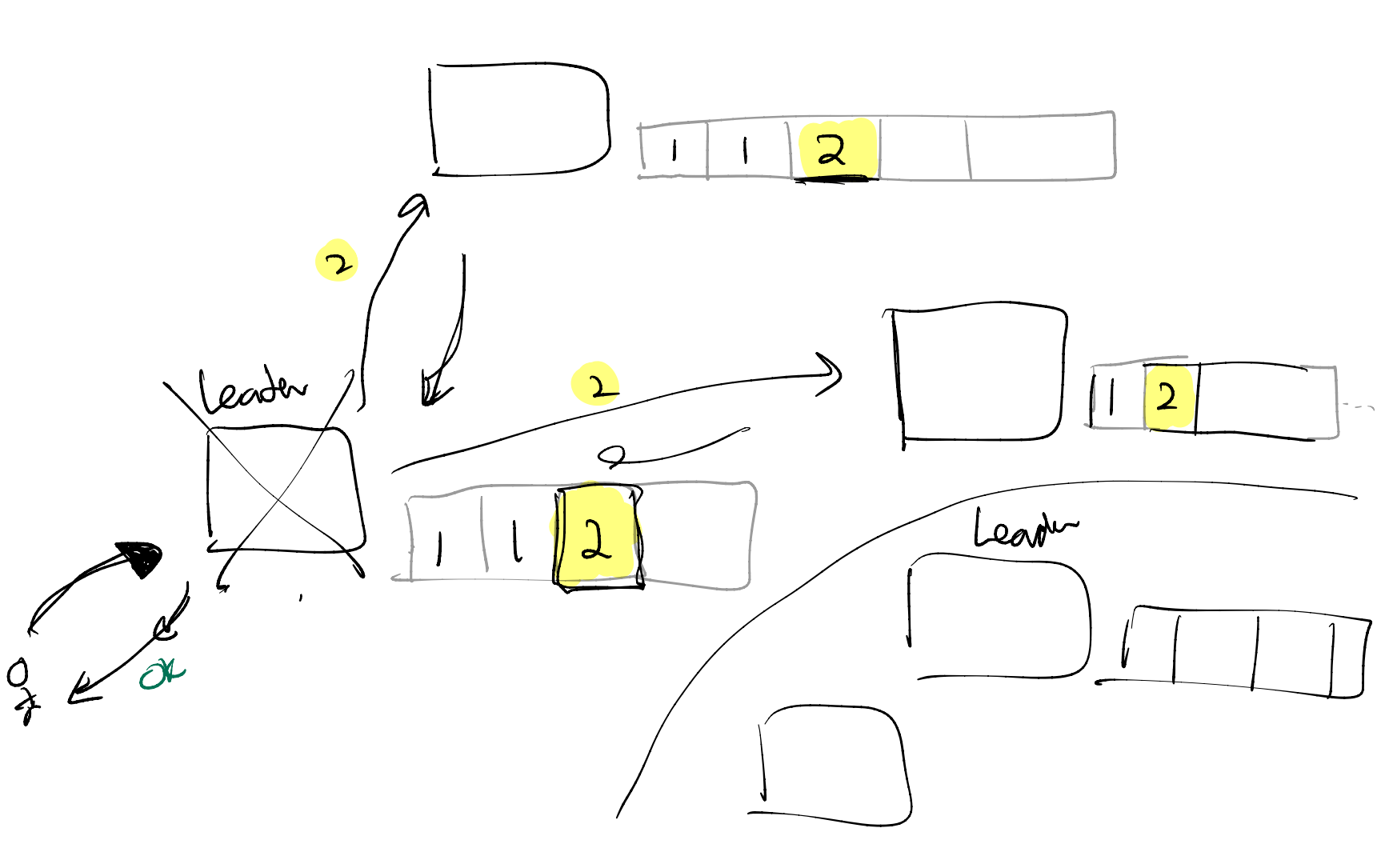


Figure 3


1
1
2
2
Leader
2
1
2
1
1
2
Leader

Rules to Remember (2019 Final)

* Server w/ most up-to-date log wins
* Term increases w/ each election
* Majority to wins.

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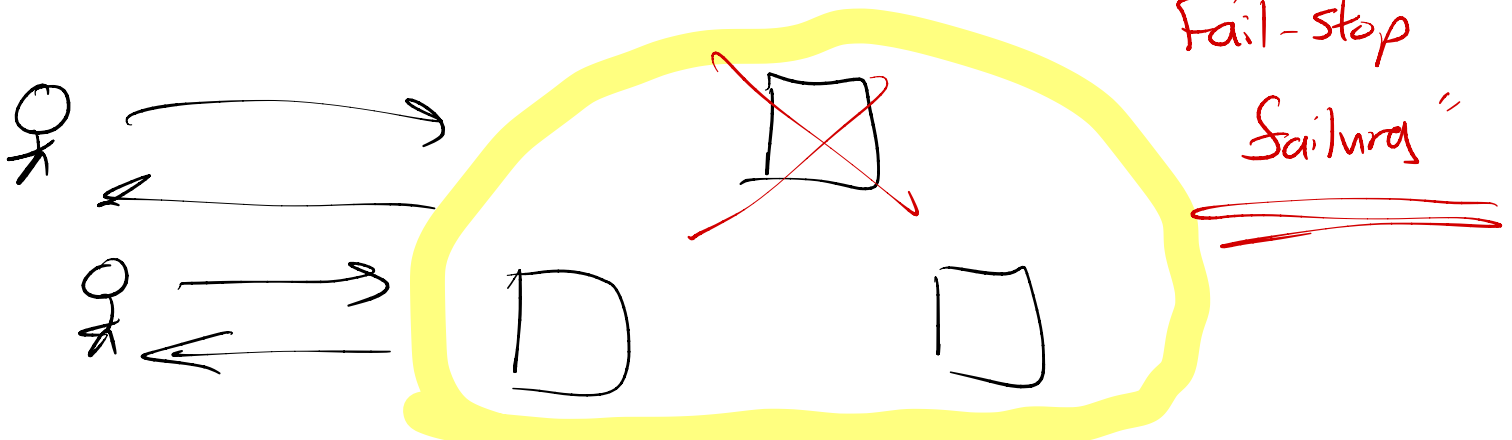
Understandability

- know what you're doing
- Apply concepts elsewhere
- Easier to understand + ... more usefully
- Avoids bugs

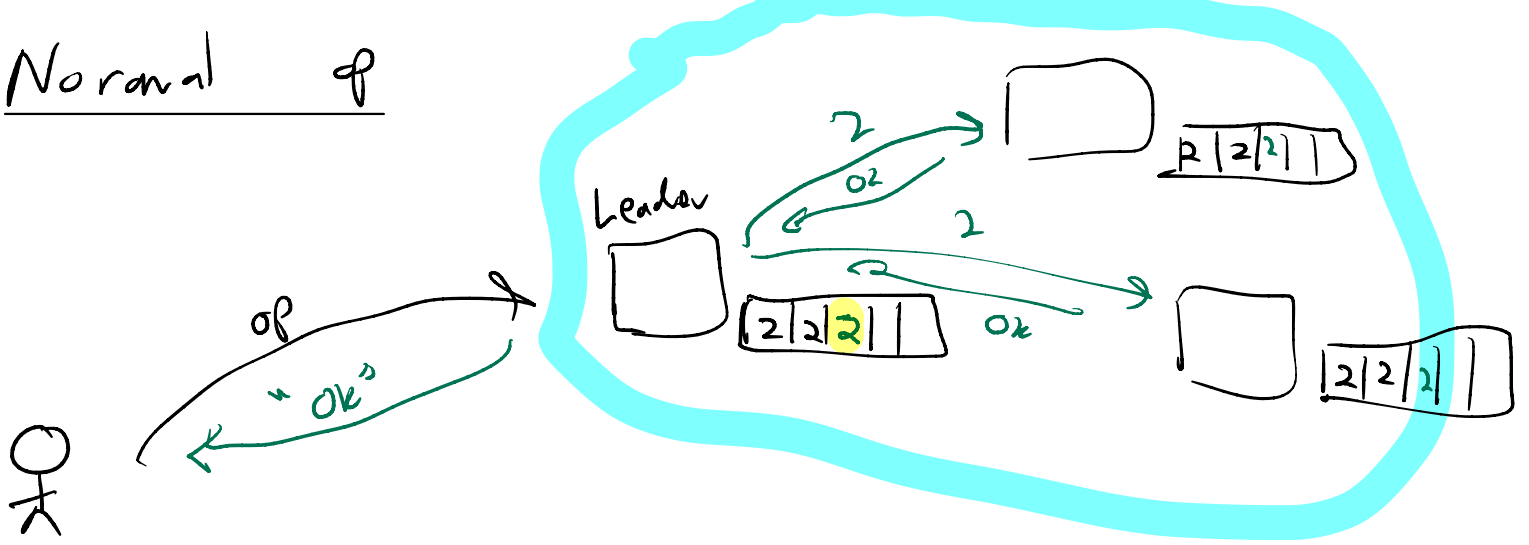
Goal:

* Achieving Consensus on log from client
* Strong leader w/ election
* Majority of nodes w/ correct info
* Sustain node failures.

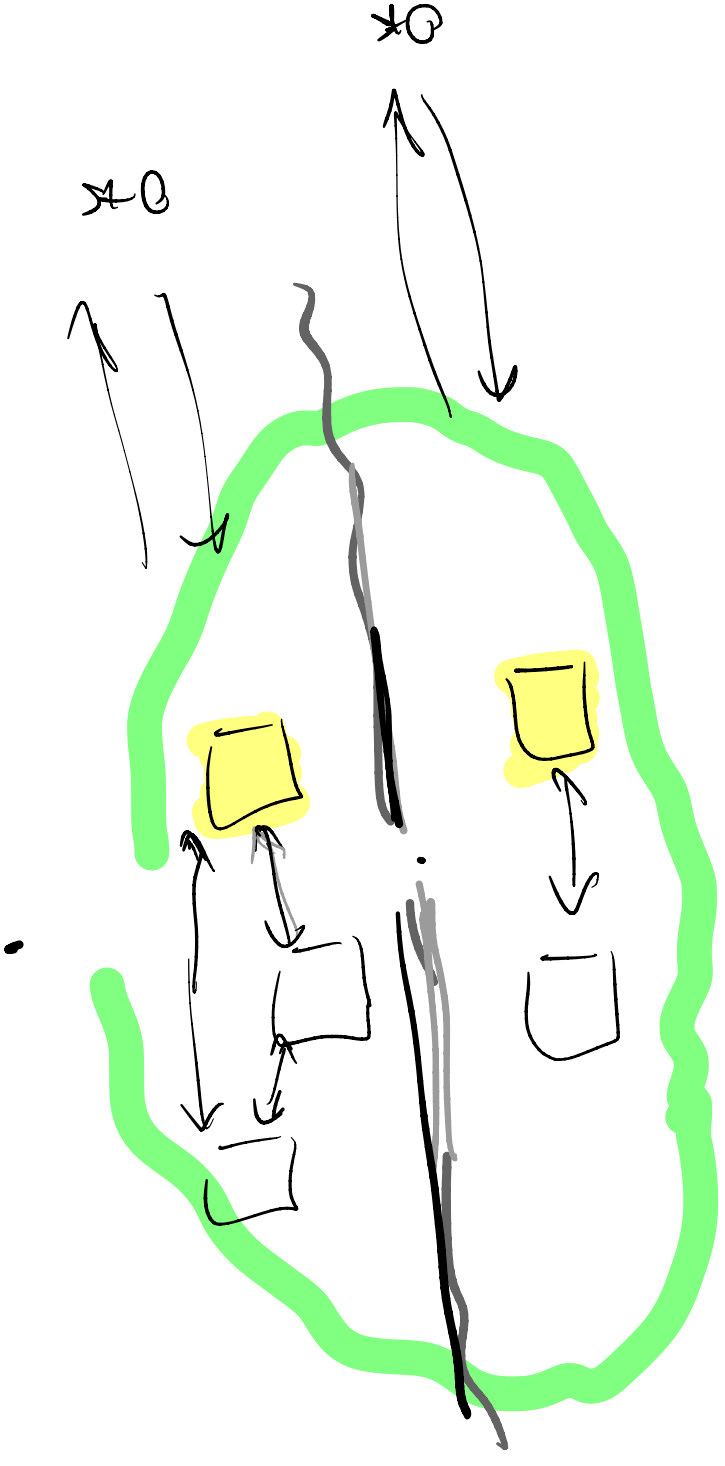
Goal: Implement a never-fail server on a cluster of sometimes-fail servers.



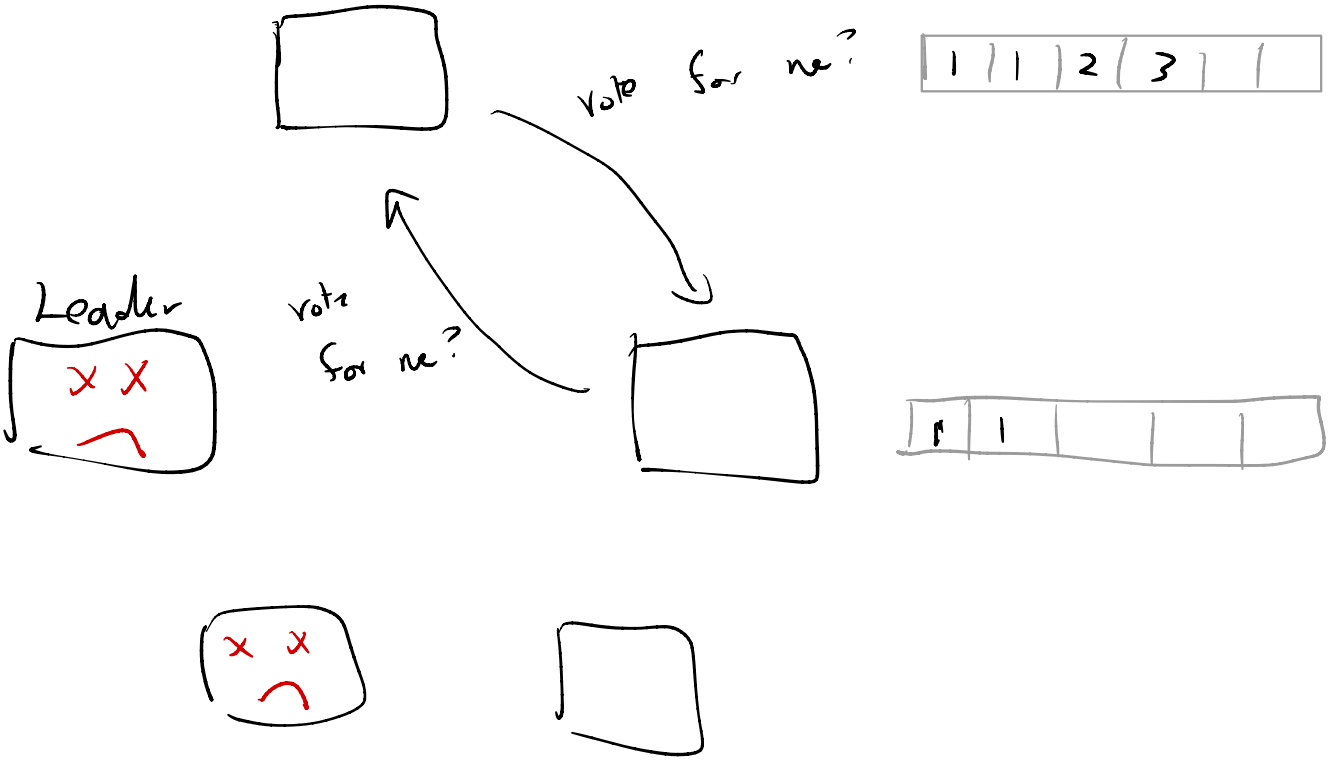
Normal op



1. Client talks to leader
2. Leader sends append req to followers ≥ 1/3
3. When leader hears from majority (≥ 2):
   * applies change to its "state machine"
   * replies to client



What happens when leader fails?

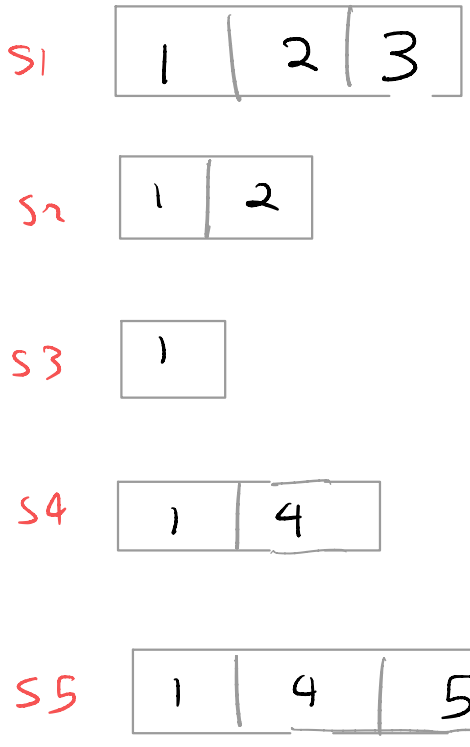
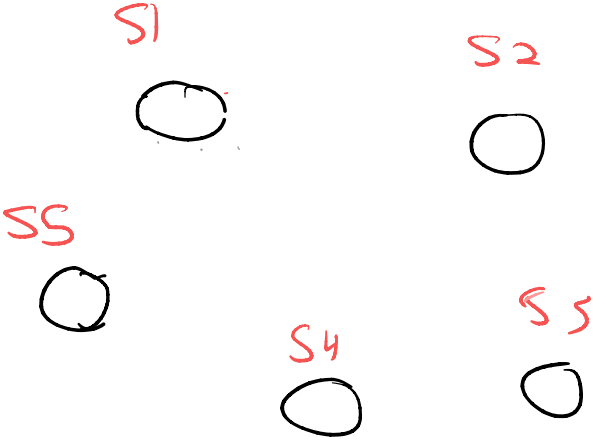


When a new leader gets elected...

↳ Its log is authoritative

↳ Committed entries stay committed (safety)

↳ Followers logs may be inconsistent w/ leader's log — leader takes precedence.

* In elections, most up-to-date log wins
* Term # increases w/ each election
* Majority to win.

Example Scenarios (2019 final)