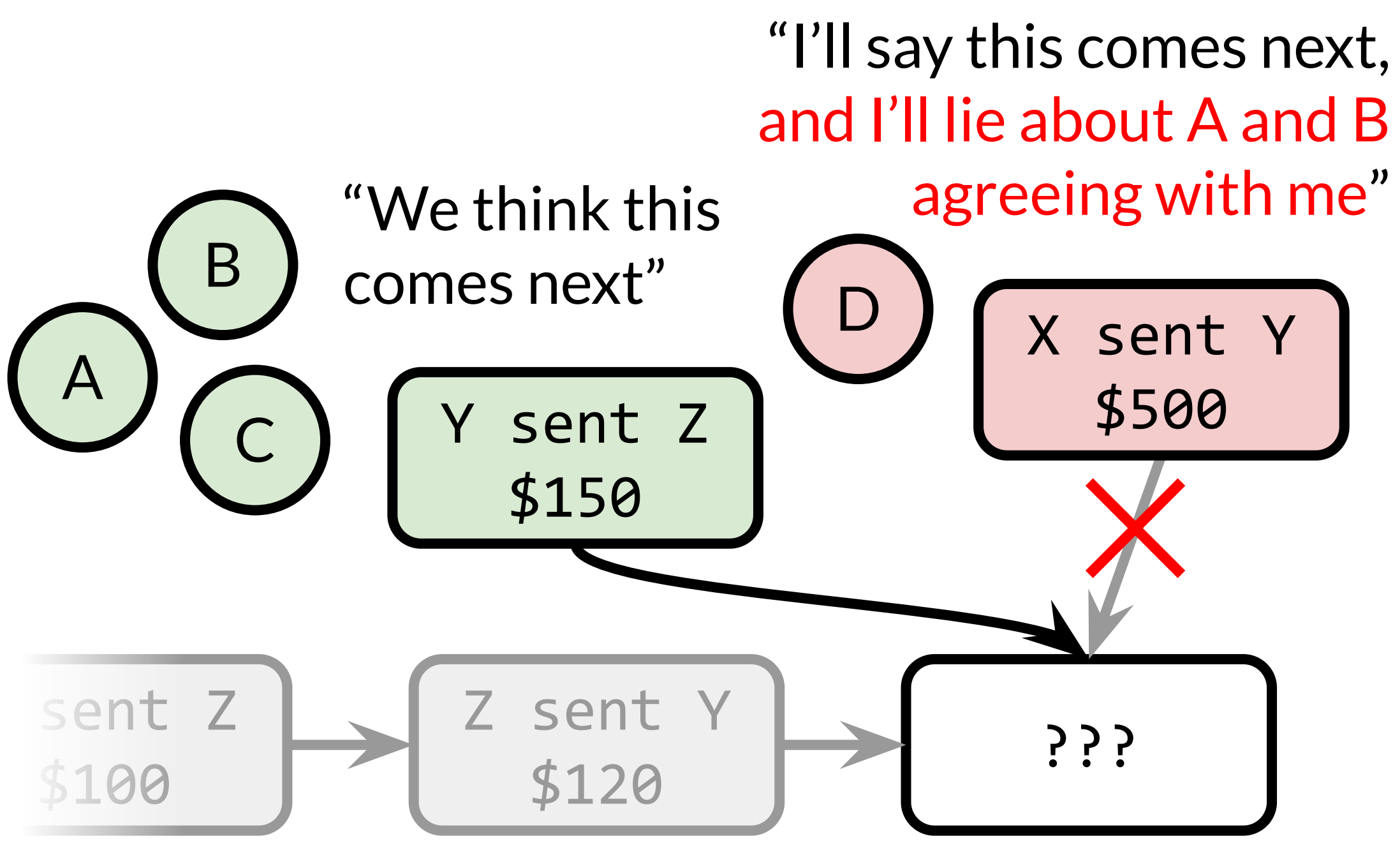
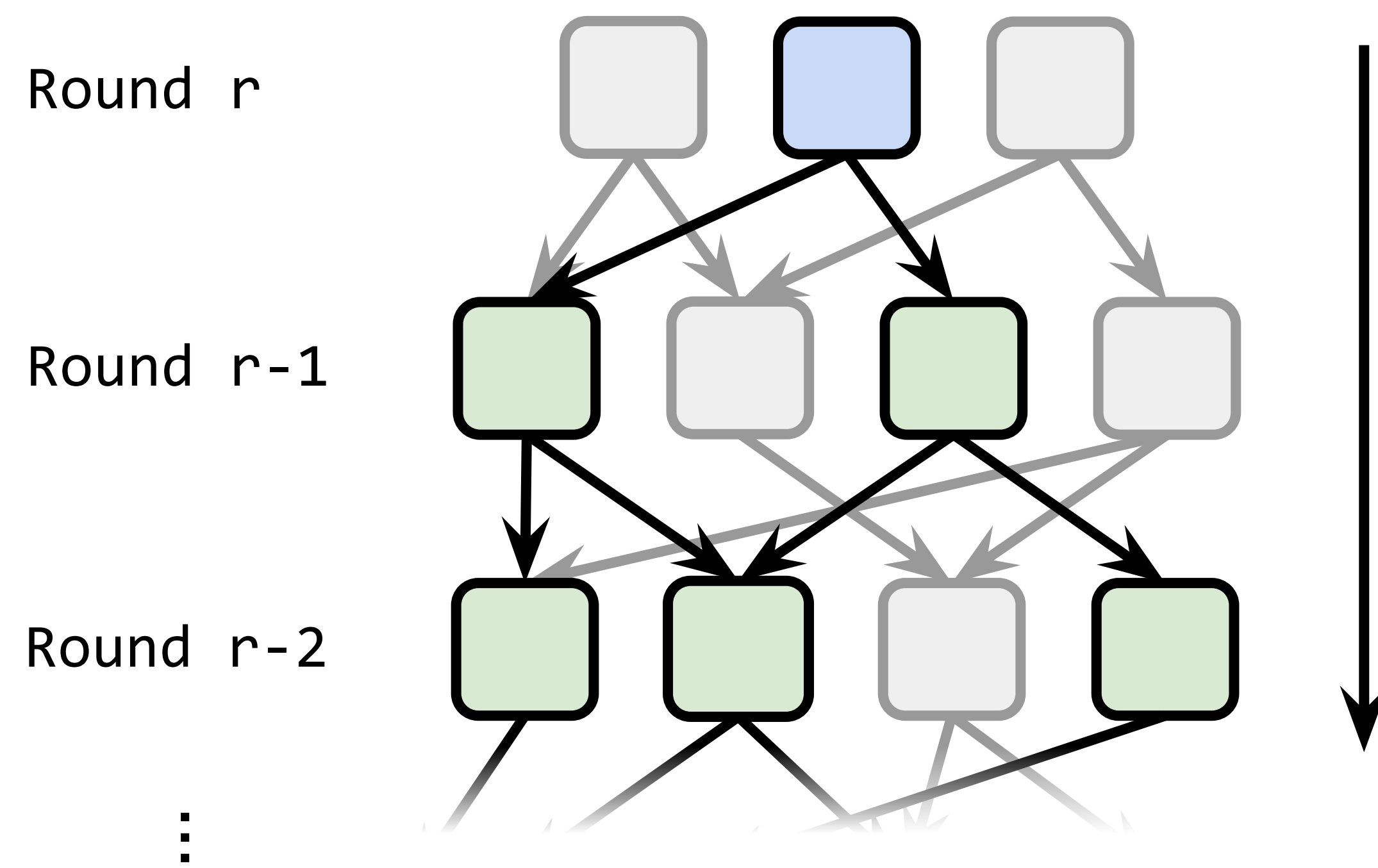


BFT: Fault Tolerance with Bad Actors



Narwhal: Propose First, Commit Later



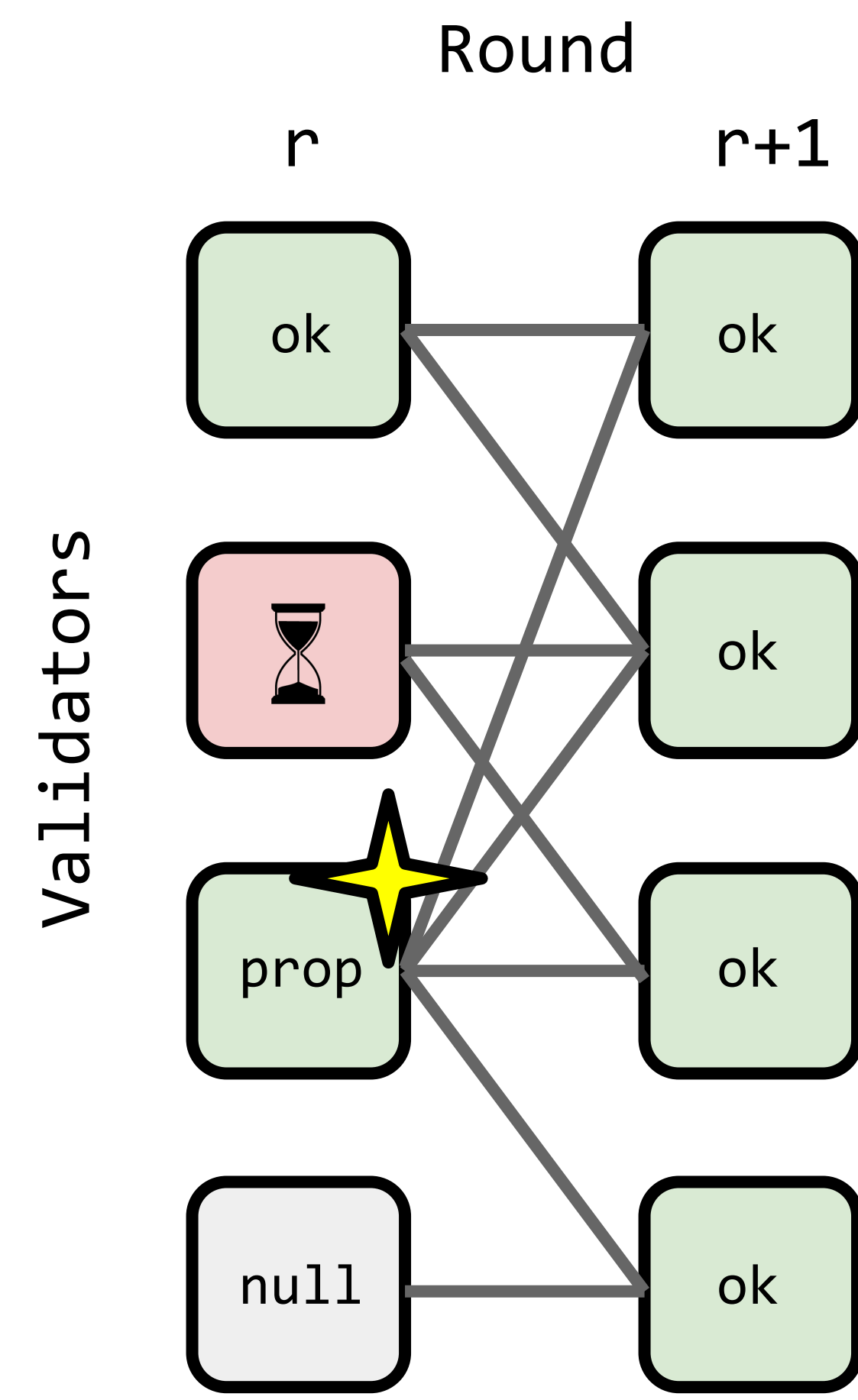
Previous work: a DAG structure to enable all nodes to gossip blocks w/ guarantee of commit later

When a **block is committed**, traverse blocks in its causal history & **commit them as well**

Avoids wasteful messaging on blocks that may not ever be committed

Challenge: Implementing a novel DAG-BFT protocol and understanding performance

Fino: A Logical Layer on Narwhal



Fino by Malkhi and Szalachowski uses **timeouts** integrated natively into the DAG: allows for complaints as part of *logical* messages

Attach **decision** logical metadata onto Narwhal physical gossip → minimal extra data sent

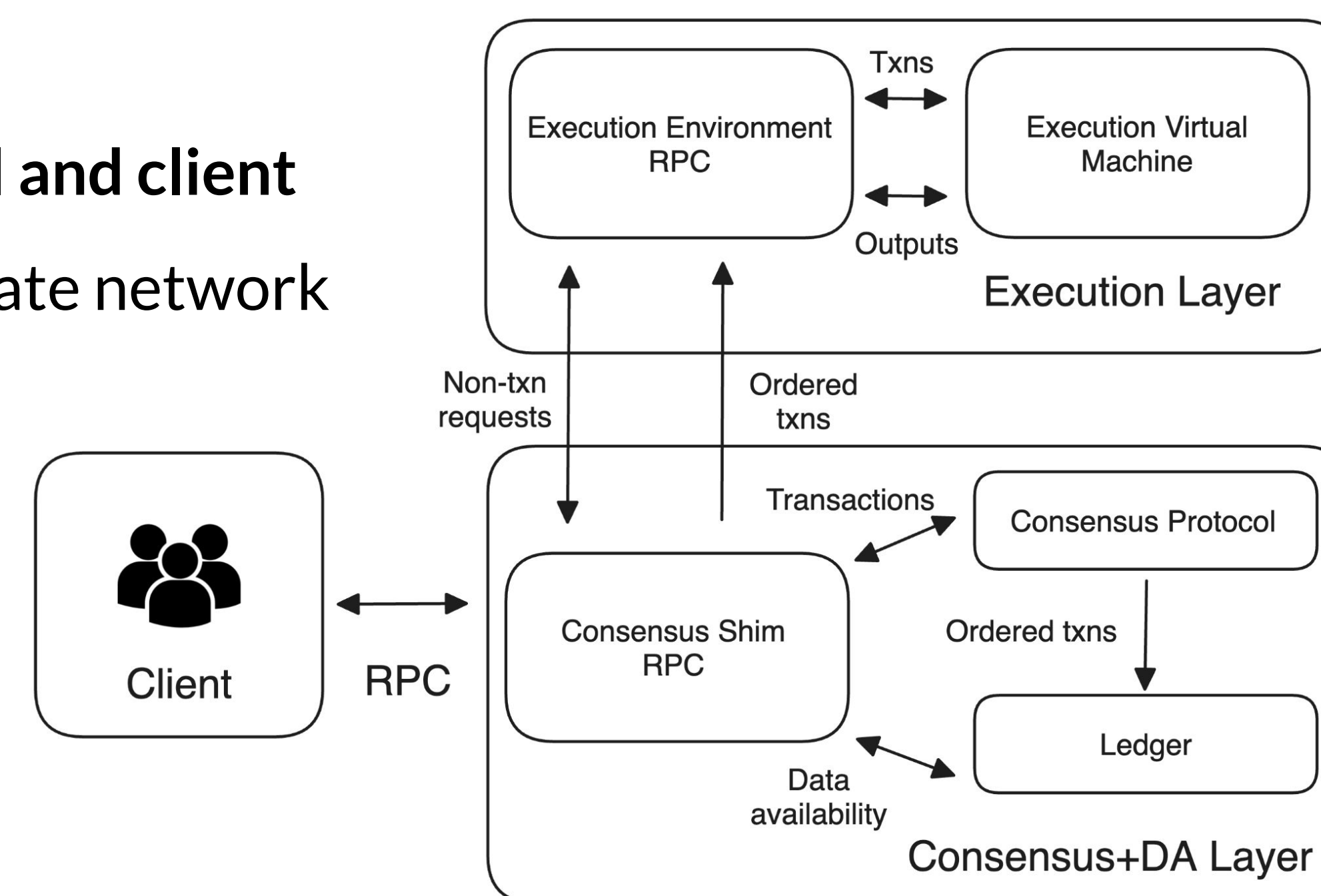
Zero message overhead: same complexity class as Bullshark

Macro Benchmarking Blockchains

Add an **RPC execution environment** for end-to-end system testing

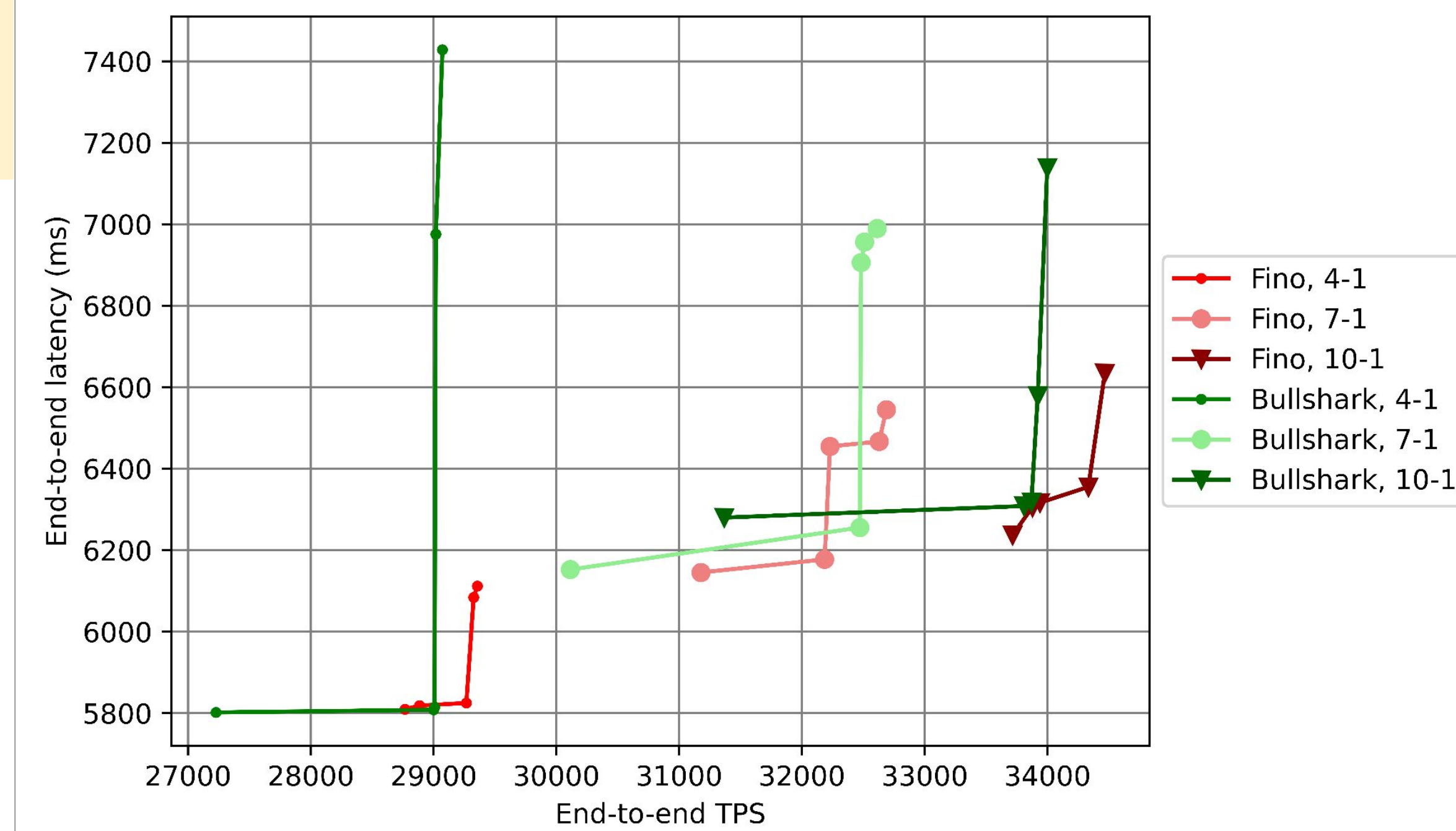
Replay mempool and client txn traces: recreate network state with different consensus and system configurations

Modular execution, consensus, and mempool protocols via RPC

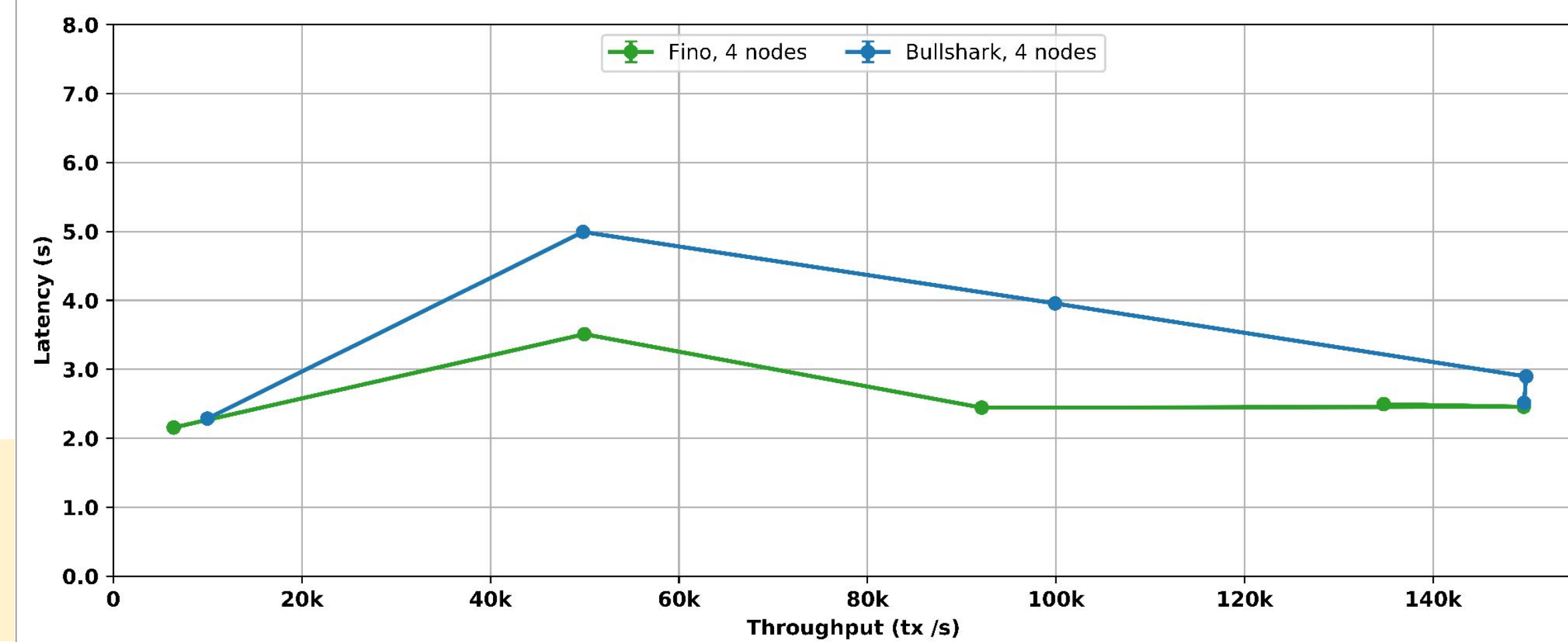


Evaluation

Simulated Latency: Fino vs. Bullshark



Cloud Benchmarks



Macro Benchmarks

