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Paxos Algo, Paxos Made Live

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# Paxos Made Live

- Actual engineering challenges in deploying Paxos
- From Chubby developers at Google
- Chubby provides locking and small-file storage for Google File System, BigTable, etc
- Chubby used as a metadata server in most cases

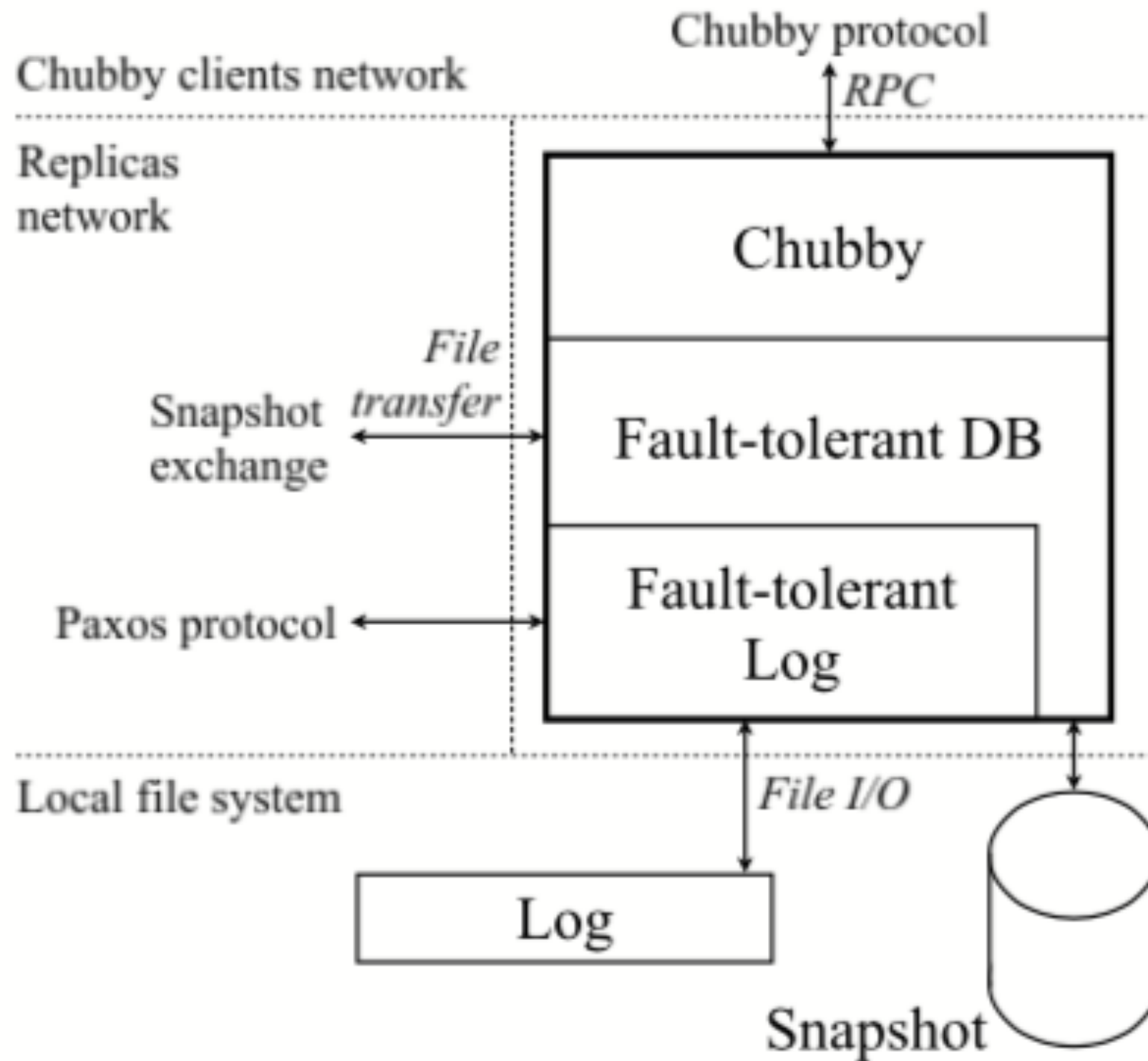


Figure 1: A single Chubby replica.



# Deployment Issues

- Handling disk corruption
- Master leases
- Epoch numbers
- Snapshots

# Database Transactions

- Interesting way to do transactions
- MultiOp:
  - List of conditions
  - An action to be performed if the condition is true
  - An action to be performed if the condition is false
  - Each db action applies to a single row or data item



# Expressing the algorithm

- Designed a simple specification language
- This language is compiled down into C++
- In the spec language, Paxos can be expressed much more briefly

# Testing

- Testing safety and liveness
  - Testing safety first
  - Allow system to recover
  - Then test liveness