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CS 647
HW3 Writeup

How does what you've implemented compare to how you might implement similar functionality on top of Bayou? What parts of this would become easier on Bayou (e.g., with custom conflict resolvers), and what might become harder?

What we have implemented only supports quick or inconsistent reads. If the user needs to actually buy tickets, and the client commits the tickets then it waits for consistency. Bayou is more like everything is asynchronous and the client never waits for anything. With Bayou it would be easier to sell off the last few tickets because there would not be a need to ask other clients for tickets, however, the system would need to be able to support refunds. Bayou would very easily oversell tickets, so it would need to be possible to recall some of those tickets.

What additional guarantees does this approach have compared to implementing the functionality on top of CRDTs like the bounded counter CRDT? What advantages does having a single log bring over using CRDTs? (Note: you don't have to read that paper to answer this question.)

This approach makes sure that tickets are never oversold. The single log and requiring all writes to be to the master allows the state of the system to always agree and never need to backtrack. A CRDT has some conflict resolution strategy that could end up taking tickets back from a client, but with Raft a client only ever thinks it has a ticket when the system has agreed that it has a ticket. This means there is no need to roll back since that sale has been 'committed'.

What are the disadvantages of using the approach taken here, compared to using CRDTs? What sort of reliability advantages might CRDTs bring to this system, that we've given up by using a single log?

The main advantage a CRDT would give us is that it is much faster. Since there is no need to agree on consensus right away, a CRDT can sell tickets as fast as it wants without contacting other CRDTs and with the caveat that it may need to pull some of them back once all of the CRDTs have agreed on the order of execution.