Flight Reservation System on Paxos

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Flight Reservation Functionality

Client

- **Check available flights**, in a specified date range
- **Reserve flight ticket**, given flight id and date
- **List one user’s reserved flights**, given username

Airline Admin

- **Add flight**, given flight id, date and number of tickets
- **Edit flight**, given flight id, date and number of tickets
- **Cancel flight**, given flight id and date

Paxos Features

- Failure tolerance
- Fail recover
- Handles network partition
- Support adding/removing Paxos node, checking condition of all Paxos nodes manually by PaxosAdmin (set the cluster to quiesce mode during operation)

Test Structure

Use shell scripts for testing, including black-box and white-box testing:

- **Basic test**: test basic functionality of flight reservation on fixed-size Paxos
- **Fail tolerance test**: test if system continues working after up to f nodes fail
- **Fail recover test**: test if node continues working after fail-then-recover
- **Race condition test**: test if system works when multiple clients try to make reservation on the same flight which has only 1 ticket remaining.
- **Add node test**: test whether system is in the right status after adding a node manually (use both black-box and white-box test)
- **Remove node test**: same as above.
- **Quiesce mode test**: test if the system can be interrupted when it is adding/removing node

Stress Test Structure

Use shell scripts for testing, including black-box and white-box testing:

- **Stress test 1**: This is to test that we run the paxos for many operations and it is still works
- **Stress test 2(node fail)**: This is to test that we kill some server and the remaining server is still working fine