TESTING AND EVALUATION DOCUMENT

for

Trading Application

COMPSCI 677 Lab 3

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1 Evaluation methodology

1.1 What do we evaluate?

We perform evaluation by measuring latency in seconds for lookup, order and order lookup requests using with and without cache. We use 5 parallel clients to send the requests. The server is hosted on AWS EC2 `t2.micro`. We also perform unit testing. The output of unit tests are provided in `docs/tests_output.txt`.

1.2 How do we evaluate?

The client was on a local machine and server on AWS EC2.

We run the following load testing experiments:

- **With cache** Varying the order probability from 0% to 80% with 20% intervals.
  1. Send 300 random lookup requests with the given probability of sending a subsequent order request after lookup and average the response times.
  2. Send order lookup requests for the valid orders.
- **Without cache** Varying the order probability from 0% to 80% with 20% intervals.
  1. Send 300 random lookup requests with the given probability of sending a subsequent order request after lookup and average the response times.
  2. Send order lookup requests for the valid orders.

2 Evaluation Results

Fig. 2.1 shows the variation in latency (lookup, order and order lookup requests) for varying probability of performing an order request after a lookup request. We can observe that as the order probability increases, the latency for order requests also increases. Moreover, we observe higher latency in case the cache is turned off, especially for lookup requests. Caching reduces the lookup time by 21.3% on average.

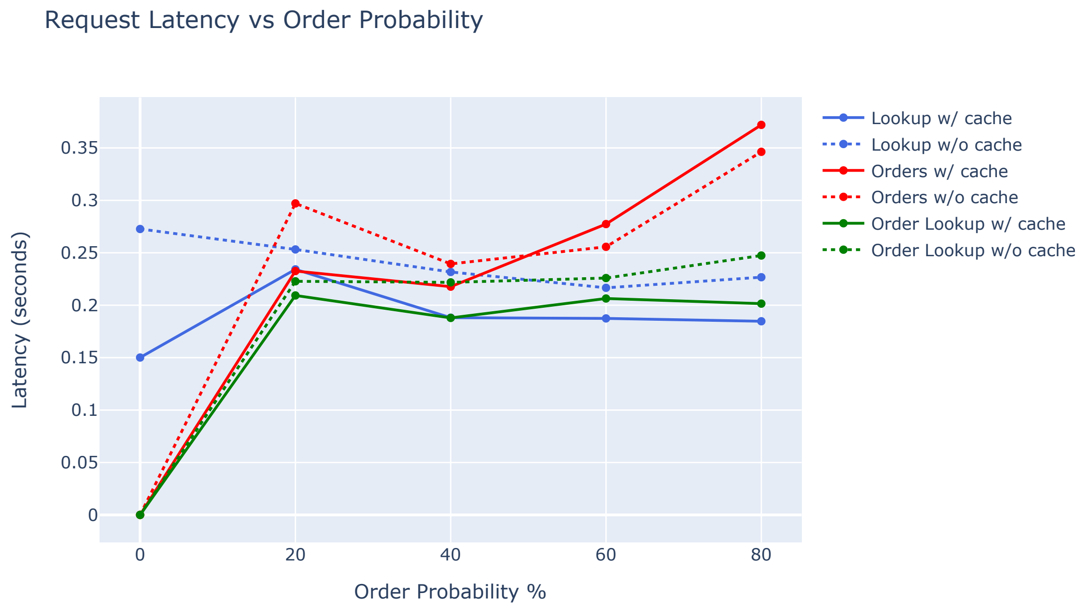

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Figure 2.1: Request Latency vs Order Probability

3 Lab Questions

1. Can the clients notice the failures? (either during order requests or the final order checking phase) or are they transparent to the clients?
   Ans: No, the clients do not notice any failures. Although there is a minimal increase in latency due to leader election being performed whenever the leader replica crashes. In case a non-leader replica crashes, there is no observed change in latency.

2. Do all the order service replicas end up with the same database file?
   Ans: Yes, all replicas end up with the same database file due to the synchronization protocol.