Performance Report

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No Failures

Client Function	Average Response Time
search items	42.36 ms
add items to cart	21.18 ms
remove item from cart	0.0071 ms
clear cart	
display cart	0.0057 ms
make purchase	15.89 ms
get seller rating	11.56 ms
get purchase history	9.08 ms

One seller server and one buyer server fail

Client Function	Average Response Time
search items	
add items to cart	
remove item from cart	
clear cart	
display cart	
make purchase	
get seller rating	
get purchase history	

One non-leader database replica fails

Client Function	Average Response Time
search items	
add items to cart	
remove item from cart	
clear cart	
display cart	
make purchase	
get seller rating	
get purchase history	

when the product database replica acting as leader fails

Client Function	Average Response Time
search items	
add items to cart	
remove item from cart	
clear cart	
display cart	
make purchase	
get seller rating	
get purchase history	

System Description

The raft consensus algorithm is implemented by replicating queries to a SQLite database. That is, SQL requests are sent to one of the product databases using gRPC. The database replicas then communicate over TCP. The logs that are replicated are create, update, and delete queries, which get appended to a text file. The implementation is adapted from the following Medium article: https://mecha-

mind.medium.com/understanding-and-implementing-raft-consensus-protocol-in-python-dd4e9f23b784

The rotating sequencer atomic broadcast algorithm uses a UDP socket to send request messages and sequence messages to all group members when a client request is received. The requests are replicated across 5 servers each having their own sql database. There are some improvements to be made such as improving on how messages are retransmitted when a message is lost or a failure occurs.