

# Design Document

I decided to implement Gigapaxos RSM since that was the most comfortable implementation to me. For the implemented functions I simply made a session with Cluster Build and saved the session as a variable for later access. Execute was straightforward as the libraries provided an easy way to parse the request.

Checkpoint and restore were more tricky, you needed to copy the table into a CSV and save the state of Cassandra into that CSV through that. Since all Cassandra needs is the table to determine its state, restore simply requires you to read that CSV into Cassandra and that's a state restore

I tested with up to 3 nodes and I was having unknown issues with both `IndexArrayOutOfBounds` or `Empty Assertion`. I also had some issues with `GraderConsistency`, cloning the repo again fixed the issue temporarily but the issue eventually returned. I am guessing it is caused due to the wacky interaction with Cassandra and Windows due to it running from Docker in WSL but I am not exactly sure.

The error was the following:

```
[main] INFO com.datastax.driver.core.NettyUtil - Did not find Netty's native epoll transport in the
classpath, defaulting to NIO. [main] WARN com.datastax.driver.core.Cluster - You listed
localhost/0:0:0:0:0:0:1:9042 in your contact points, but it wasn't found in the control host's
system.peers at startup [main] INFO com.datastax.driver.core.policies.DCAwareRoundRobinPolicy -
Using data-center name 'datacenter1' for DCAwareRoundRobinPolicy (if this is incorrect, please provide
the correct datacenter name with DCAwareRoundRobinPolicy constructor) [main] INFO
com.datastax.driver.core.Cluster - New Cassandra host localhost/127.0.0.1:9042 added Dec 03, 2021
11:18:22 PM edu.umass.cs.nio.NIOTransport initSelector INFO: MessageNIOTransport:null:0 listening on
channel sun.nio.ch.ServerSocketChannelImpl[/127.0.0.1:1999] with ssl mode CLEAR Dec 03, 2021
11:18:22 PM server.SingleServer <init> INFO: server.MyDBSingleServer@7334aada started client
messenger at localhost/127.0.0.1:1999 [main] INFO
com.datastax.driver.core.policies.DCAwareRoundRobinPolicy - Using data-center name 'datacenter1' for
DCAwareRoundRobinPolicy (if this is incorrect, please provide the correct datacenter name with
DCAwareRoundRobinPolicy constructor) [main] INFO com.datastax.driver.core.Cluster - New Cassandra
host /127.0.0.1:9042 added Dec 03, 2021 11:18:22 PM edu.umass.cs.nio.NIOTransport initSelector INFO:
MessageNIOTransport:null:0 listening on channel
sun.nio.ch.ServerSocketChannelImpl[/127.0.0.1:61367] with ssl mode CLEAR
test31_GracefulExecutionSingleRequest FAILED!!!!!!!!!!!!!! java.lang.ArrayIndexOutOfBoundsException:
0 java.lang.ArrayIndexOutOfBoundsException: 0
```

I think the tests were failing due to Gigapaxos and Cassandra interactions since commenting the code I wrote didn't make any changes.