Assignment Overview

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In this project, we extend our project 2 and implement the multiple server replication. This project is designed to understand replication, coordination, and some ideas of load balancer. As in the real life, for big companies, it needs to provide service to many users from different geographic location, and we also want to spread the usage of server, so for single server it will not be overloaded with traffic. To do this, we need multiple servers built in different geographic location, and balance the load of traffic. However, as users might make change to the database, we need to make sure data are consistent across different server. For example, for transactions, we want it to perform only once. As a result, we need a coordinator to synchronize updates to the database. For example, when one client updates the data, another client accessing different server should notice that change and get up-to-date data back. Data modification should be in timely order, which is FIFO. Servers should commit changes to the coordinator, and coordinator should collect those commits and perform changes in timely order to every replica server. Also, as change operation should be atomic, we need critical session to make sure everything works correctly. To achieve this, we use 2 phase commits, which will make sure our commit is sent and received by the coordinator, and the coordinator will perform updates to all the replica servers. Also, clients can switch to any server, if one fails, then it can connect to another one.