CMP2806M Scalable Database Systems

ASSIGNMENT 1 – Report

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*Introduction*

This is a report to help dive further into the process I took when choosing the overall design and implementation of the relational database (MYSQL) for a scenario bank. I will begin by talking about the general design process then move onto the variety of queries written on the database, finally touching on scalability and security concepts.

*Design process*

Entity-relationship diagram

*Security & Scalability*

When implementing any database, whether it is a relational or non-relational, it is always important to consider security and scalability. These are the two main concepts that can effectively “make or break” your database. Firstly I will mention how security was strongly considered in my database.

For this database I decided to create 2 basic users roles for now a read and write user (an admin) and a read only user. This would help stop those who shouldn’t need full access to the database the ability to read from the tables etc, however not make any major changes such a insert data, deleting data or dropping tables. This sort of user access can be left to the database administrator through the read and write role. Once this database scales further keywords such as “GRANT”, “DENY” and “REVOKE” can be use to control and manage user permissions to keep the database accessible only to the correct personnel. It is also important to involve the use of secure backups and transactions in order for the database to be rolled back in case of a outage or security attack.

Moving onto scalability, one of the first way I could scale my database implementation further is by considering adding more tables that suit a international banking firm, e.g. “branch” table for multiple banks. This would all better scalability of data, allowing for easier and more readable retrieval of information. However I felt for the scope of this assignment, adding tables to expand the geographical context of database was not necessary and would overcomplicate things. Another key method to expand scalability is to move the storage of the database to a cloud service, rather then on premise. This allows for much better hardware scalability to allow your database to easily expand to suit the demand of the banks growth, this is known as vertical scaling. Furthermore moving to the cloud allows for greater data redundancy and uptime, as your database can be easily replicated in case one of your virtual machines storing the companies data goes down. This is especially important for our banking scenario.