Computing Engineering School

IC-4302 Data Bases II

Homework 5 – No Relational

No Relational Databases investigation

Professor:

Erick Hernández Bonilla

Student:

Fabio Calderón Torres

Student ID:
2018156314

Group 40

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No Relational

1. What is a CAP theorem or Brewer's? Is it still valid today?

The CAP Theorem or also known as the Brewer theorem, claims that in the event of a network failure on a database, it is possible to provide either consistency or availability, but not both.

(Johnson, 2020) gets in deep with this concept, "The CAP theorem is comprised of three components as they relate to data stores:

- Consistency: All reads receive the most recent write or an error.
- Availability: All reads contain data, but it might not be the most recent.
- Partition tolerance: The system continues to operate network failures.

In normal operations, your data store provides all three functions. But the CAP theorem maintains that when a distributed database experiences a network failure, you can provide either consistency or availability.

In the theorem, partition tolerance is a must. Networks failures will happen, so to offer any kind of reliable service, partition tolerance is necessary. When a network failure happens, one can choose to guarantee consistency or availability.

The choice is really a matter of philosophical discussion that's rarely made in practice, consistency and availability comes with choosing which database to go with, such as SQL and NoSQL.

Consistent databases should be used when the value of the information returned need to be accurate, for example, Bank account balances and text messages, and you can use databases such as MongoDB, Redis and HBase.

Availability databases should be used when the service is more important than the information, like e-commerce business. Some Database options are Cassandra, DynamoDB, CosmosDB."

This theorem is still valid because nowadays we face a lot of specific problems, and we have to bring the best solution for every single one of them.

2. Why do you think No Relational Databases are more popular now than ever before?

Through the time passes, No Relational Databases are more popular because people have realized that there is a better optimal software made for specific problems and situations that we confront every day, for example, there is no need to use a Relational Database when you are creating a shopping cart, it is proved that it's better to work with a Key-Value Database for this specific case. Thus, No Relational Databases are more flexible than Relational Databases and are more friendly to developers.

3. Do you think No Relational Databases are old and they should change? Similar to NoSQL, explain your answer

Relational Databases are old but not useless, they should be used for any transactional application, for example, when there is a need to create and work with a software where a requirement says that you have to integrate payment methods in it; so there is no need to change them, what you should do when creating a new project is, sit and discuss what type of Database you really need for your application.

4. Provide an example of how we could use these types of DBs, Key / Value, Documents, Graphs and Columns.

- For Key-Value Databases, it is important to work with non-persistent data, for example, when you are creating a shopping cart.
- When developing an e-commerce, you should use Document databases to work with the products and orders schemas.
- There is a lot of uses for Graphs databases, like social media platforms, but it is also useful for Recommendation Engines.
- Family-Column Databases are good to work with Blogging Platforms.

Bibliography

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