Assignment 1

Toward

CMPE 226

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Q.1 What are the advantages and disadvantages of nosql(or MongoDB) over mysql?

Understanding MySql

MySqL is a representation of data which is stored in rows in tables. SQL stands for Structured Query Language, which is a string that is parsed by the db system. SQL injection can be done using this query string. Operations are performed in MySql, including the Join operation which allows you to query multiple tables. MySql supports atomic transactions, which means that multiple transactions can be treated as one transaction and can be rolled back. Typically, in MySql you are required to define the tables and attributes beforehand. All the tables must also have similar columns. MySql does not offer the flexibility to change the structure of your data, after normalization. To achieve a better performance using MySql, data indexing would be a good option.

When do we need to use MySql?

1. Performance
2. Transactional Support
3. Data Warehousing Capability
4. Scalability

Understanding MongoDB

In MongoDB, data is represented as a collection of JSON objects, called documents, and supports object querying. No support for joins is offered. Embedding objects within objects can be done. MongoDB does not require you to define a schema, you can include any no. of documents inside collections, and these do not necessarily need to have the same fields. Embedding and linking is used instead of joins. The schema will have to be optimized depending on how the data is going to be accessed. Indexing of data should be done.

When do we need to use MongoDB?

1. High Write Load: High insertion rate provided by MongoDB
2. Availability in an Unreliable Environment: Recovery from a failed node or data center is done instantly and automatic. Setting up of replica sets is faster.
3. Scaling Needs: MongoDB provides a solution to shard and partition your data.
4. Dealing with Location Based Data: With the help of built in spatial functions, MongoDB can be used to retrieve location specific data.
5. Unstable Schema: Schema modification is not an issue, when you need to add new fields, as MongoDB is schema-less. Adding of new fields to documents can be done instantly.

Advantages of MongoDB over MySql

1. Document Model: A document model that is supported by MongoDB , makes development easier. Documents do not include concepts such as rows, tables, schema, and can be created and manipulated using the CRUD operations for MongoDB. Any field can be added or removed in MongoDB, and hence schemas are created on the fly.
2. Flexible Schema: Dynamic schema support for highly unstructured data.
3. Performance: To achieve performance MongoDB reduces transactional semantics. Does not require platform changing. Embedding of data makes the reads and writes fast.
4. Safe Mode Insertions: MongoDB supports Safe mode insertions to ensure insertions are completed successfully.
5. Horizontal Scaling: NoSql databases are scaled by increasing the no. of database servers. This is done for the purpose of load balancing. No Alter Table, No rebuild indexing. Support auto sharding and auto failover. Alter Tables are expensive in RDBMS.
6. Map/Reduce: MongoDB has built in support for Map reduce.
7. Indexing: Indexing on any attributes can be done.
8. Support for rich queries and aggregators

Disadvantages of MongoDB over MySql

1. No support for transactions: MongoDB gives up the support for transaction
2. No support for a Join operation: Due to the support for horizontal scaling joins are not supported, as everything is included in a single document. Multiple queries can be used to perform join operations.
3. RAM limitation: The OS handles the caching, as MongoDB uses the memory mapped files. Insertions may fail without warnings, if data exceeds the capacity.