RESEARCH DOCUMENT

Database Choice

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Which is the better suited database for our application – Clickhouse vs MongoDB

What are the structural differences?

Clickhouse – Clickhouse is a column-orientated database. It is largely optimized for reading enormous amounts of data. In column database you can only read the data columns you need without going through the entire database like you would with a standard row-oriented database. This results in database performance increase and data that is easier to compress.

MongoDB – MongoDB store data in a flexible, JSON-like documents. This means that fields can vary from document to document and we do not have a fixed schema. The flexible schema allows us to make changes to the data structure over the development process of our application.

Advantages and Disadvantage

ClickHouse – ClickHouse is a Column-orientated database, meaning it was designed to read through massive databases in the fastest way possible. Clickhouse is typically involved in highly complex queries over all data (possibly petabytes). However, some work must be done to write data into a columnar database. Transactions (INSERT) must be separated into columns and compressed as they are stored, making it less suited for OLTP workloads. Clickhouse also does not support updating and deletion of data. While there are work arounds for that we would rather use a database that natively supports it.

MongoDB – MongoDB is a NoSQL database, meaning it was designed to handle a large number of requests. Where it particularly shines is its fast write speeds. This is a result of it being a document database that does not have many strict checks. This makes MongoDB the default choice for applications that need to ingest large amounts of data, making it ideal for applications that write in real time.

MongoDB is also horizontally scalable database that can be expanded by adding more nodes to it. It is an ideal choice for application that have large amount of users that are attempting to connect at the same time. It is infinitely scalable and on a large enough scale replica databases could be run in parallel with the original ones.

MongoDB has a more matured software and better, more documented, integration with Springboot.

Conclusion

While Clickhouse remains a viable option for our application the lack of documentation, software maturity and our team‘s lack of technical experience pushes us towards using MongoDB. MongoDB has better integration with Springboot with it being able to use the Hibernate OGM. It also natively supports updating and deleting data rows. And most importantly MongoDB has multi-cloud database service that simplifies deploying and managing databases (MongoDB Atlas).

References

C. (n.d.). *Overview | ClickHouse Documentation*. ClickHouse. https://clickhouse.com/docs/en/

Wikipedia contributors. (2021, October 13). *Column-oriented DBMS*. Wikipedia. https://en.wikipedia.org/wiki/Column-oriented_DBMS#Benefits

What is MongoDB Atlas? — MongoDB Atlas. (n.d.). MongoDB. https://docs.atlas.mongodb.com/#:%7E:text=MongoDB%20Atlas%20is%20a%20multi,cloud%20providers%20of%20your%20choice.

MongoDB vs. Postgres Benchmarks / Álvaro Hernández (OnGres). (2020, April 14). YouTube. https://www.youtube.com/watch?v=-AIjKrWi0x0&t=2091s

Taylor, D. (2021, November 1). *What is MongoDB? Introduction, Architecture, Features & Example*. Guru99. https://www.guru99.com/what-is-mongodb.html