



International Journal of Allied Practice, Research and Review

Website: www.ijaprr.com (ISSN 2350-1294)

NOSQL for Interactive Applications

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Abstract— The scalability and high performance are the key aspects for interactive applications. The traditional databases are not providing the necessary scalability and performance. NOSQL databases are the best choice for applications that need to read and write huge amount of data swiftly. For best output it is mandatory to pick scalable, fast and robust database.

Keywords— NOSQL; RDBMS; Big Data; Big Users; Auto-Sharding; ACID; BASE

I. INTRODUCTION

Data management is the key for success of any organization and enterprises use a special methodology for data management operations known as database management system which provides ways of storing and accessing data efficiently with the help of databases. DBMS helps industries to develop databases of their own choice for data management with the help of different models proposed by experts that specifies the organization of data within a database. From years we are using various data models for data management and the relational model is the most successful and adoptable by professionals. The relational model is highly efficient in terms of client server computing and very strong technology for storing structured data. In present era several database models are available for data management like network model, hierarchical model, object-oriented model, associative model, relational model and non-relational model but it is mandatory to choose an appropriate one. Relational databases supports all the essential characteristics of data management like simplicity, flexibility, compatibility and scalability but fails to provide options like handling huge volumes of unstructured data when implemented in cloud environment. The cloud computing is the modern type of computing that enables us to use resources like applications, infrastructure etc. on the basis of pay-as-you-go model. Most of the applications are database driven and strong database knowledge is required for efficient data management.

II. NOSQL AND BIG DATA

The internet is a familiar technology used across the globe and big data is a real challenge in present era. The organizations like facebook, google, amazon etc are also facing the big data problem. To overcome the big data issue experts proposed a new system of data management commonly known as NOSQL to meet the data management demands of present era. NOSQL databases are different from traditional ones like not using the famous SQL query language, no join operations and BASE support instead of ACID that is the core concept of relational databases. The internet produces huge amount of data and huge amount of storage is needed to

handle such data that is one of the dazzling feature of NOSQL. Not only handling system of record applications NOSQL is also an analytic and business intelligence system that is very important for the enterprise future, due to this reason most organizations have already espouse NOSQL databases. Migrating to NOSQL approach is also proficient for software based enterprises because reduced development time due to its simple data access terminology as compared to traditional database management systems.

NOSQL databases are efficient for developers also because sometimes they are not able to develop and test applications at locations other than offices due to lacking database resources. On the other hand NOSQL databases are efficient for cloud environment offers on demand resources, The NOSQL databases are efficient for small and medium enterprises because of database as a service can be deployed on affordable costs as compared to oracle or MS SQL Server that are costly. Due to easy deployment in cloud environment, NOSQL databases can be used to store data for backup processes also and provide automatic online backups of changed data in data centers.

No schema is required for NOSQL databases means data can be inserted in databases without any schema defined and the format of inserted data is changeable at any time. Auto-Sharding or elasticity is another aspect to shift towards NOSQL database approach because these databases automatically spread data across multiple servers without requiring applications assistance and the interesting thing is servers can be added or removed dynamically from the data layer. The NOSQL ensure high availability because with replication can store multiple copies of data in a cluster and is strong tool for disaster recovery. Partitioning in previous models can reduce the power to perform complex queries but NOSQL databases retain full query significant power even when distributed across thousands of servers.

There are three mega concepts that really obsessed the adoption of NOSQL technology Big Data, Big Users and the latest IT computing the cloud computing. Today most of the applications are hosted on cloud where they support global users 24 hours and more than 2 billion users are connected to the internet across the globe thus creating concurrent users in a great quantity. Huge volumes of data is generated through different applications like personal user information, user generated content, machine logging data, sensor generated data etc. for managing such data efficiently experts want a flexible data management that easily accommodates any new type of data they want to work with. NOSQL data model provides best to the applications organization of data and simplifies the interaction between the application and the database. Today most of the applications both consumers based and business based run in a cloud and support large no of users. Cloud is based on 3-tier application architecture and in this architecture application is accessed through a web browser or a mobile app and contains a load balancer that moves the incoming traffic to the application servers for processing. It is estimated for every 10,000 new concurrent users a new commodity server is added to the application tier for load balancing. Using relational databases at databases tier that was originally popular are now problematic because they are centralized and made them poor to support applications that require dynamic scalability on the other hand NOSQL technology is based on distributed concept and scale-out.

III.KEY DATABASE CRITERIA FOR INTERACTIVE APPLICATIONS

There are some important factors to keep in mind when choosing a database for interactive applications:

A. Scalability.

When website traffic increase suddenly and database is not responding because not having enough capacity, we need to scale database swiftly and without any changes in application. Also having possibility to decrease and optimize the resources when system is at rest. Database scaling needs to be very simple operation like not dealing with complicated database concepts or any change in application.

B. Performance.

For better performance the database needs to support low latencies regardless of the data size and load. The read and write latency of NOSQL databases is very low because of sharing of data across nodes in clusters that is also the demand of interactive applications.

C. Availability.

Availability is one of the immense feature required in modern applications. For high availability system should be able to support online upgrades, for maintenance it is very easy to remove a node without affecting the whole cluster and provide options for backups and disaster recovery in case the whole data center goes down.

E. Architecture.

Traditional databases are based on rigid schema and for any change in application we need to change database schema as well on the other side NOSQL databases support flexible schema and very simple query language.

IV.CONCLUSION

The database concept is very popular in application development. In present era of computing we need to deploy optimized databases for application development. The paper describes the key database features required for interactive applications. NOSQL databases are grooming day by day because of the features required for enterprises to tackle the problems observed in traditional databases.

V. ACKNOWLEDGMENT

I wish to acknowledge all the people who have worked in NOSQL Technology and whose work inspired me to do research in NOSQL Technology and whose documents gave me the path to write this research paper and developing my ideas for making the technology even better. I also would like to acknowledge my partner Miss Ruchira Barghava and my colleagues at RationalTabs Technologies Pvt. Ltd. who supported me to write one more research paper and put my ideas and research on paper as a contribution to coming generation.

Special wishes to Couchbase and other contributors for developing NOSQL based products.

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