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Comparative Analysis of MONGODB and Oracle NOSQL

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Abstract – Memory of Computer is its chief component. In today's structure of things, majority of the intelligent machines have the required necessary hardware for the management of the data present and save it in a risk free manner to be retrieved later on. To coordinate these actions, database management systems work in coordination with the API's at the lower level. To handle a variety of problems, a variety of data base management systems are there. In this paper I aim to provide an overview and a compare the Oracle NoSQL and MongoDB databases.

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INTRODUCTION AND LITERATURE SURVEY

In the previous years, the information was stored in the tables using relational database management systems. With the help of simple queries the data was saved onto the tables and with the help of similar fashioned queries the data was retrieved from the database (Han, et. al., 2011). This was a part of the traditional approach which had a number of drawbacks including the predefinition of the schema of DB, the bigger the size of the DB the poor the performance and the incapability of the database to store unstructured data. Due to the existing problems of the relational database management system, NOSQL came into the scenario. NOSQL have the capabilities to address the above mentioned drawbacks which existed in RDBMS (Chodorow and Dirolf, 2010).

NOSQL provides a solution to deal with the unorganized data. An example of NOSQL database is MONGODB and Oracle DB. MONGODB has the feature of storing and retrieving large data sets. It also has the feature of providing high availability with the feature of and facility if replica sets (Kaur, 2015). Coe et al. have discussed two main features which are its schema less structure and deprived of joins. Banker K et al. discussed its features including lesser number of migrations and requests as well as use of BSON (An Oracle White Paper, 2012). A lot of types of queries and drivers are also available to increase the compatibility. On the other hand, Oracle NOSQL is a distributed database having a distributed key value. It also provides high availability of the data by using the concept of replication nodes. These replication nodes are also known as storage nodes since they also provide storage for data. N. Leavitt et al. stated that Oracle NoSQL database have capability to handle large unstructured data.

Here the research objective is to perform the analysis that in a particular situation which database would be suitable. Therefore the main challenge is to identify the phenomenon for storage before analysis the types of operations which have to be performed on the data. Another research objective is to compare the performance of NOSQL databases (MongoDB and Oracle NOSQL) (An Oracle White Paper, 2014).

IMPLEMENTATION

The MongoDB database version 2.6.5 is downloaded and installed on the Windows 64 bit operating system. The folder named data folder is created to store the test which is the structured data and gridfs which is the unstructured data. Approximately the data collection of 1GB is saved into the folder named BIN. Java Application Program Interfaces are used with the help of Eclipse Integrated Development Environment to establish a connection between the MongoDB and the Eclipse. Data which is stored is of the format of JavaScript Object Notation.

The Oracle NOSQL database version kv-ce-3.2.5 is downloaded and installed. A connection is established with the database using the Java Archive Package files. Kvlite is a group store consisting of a single node and has only one replication. During the creation of the connection, the relevant information regarding the port number, host name, kvstore and the admin node is provided. This information which is provided above is therefore used by the integrated development Environment i.e. Eclipse to make a connection with the database. Whatever operations are performed, the logs of the same are generated and are saved in the kvroot.

By using the ECLIPSE, the basic operations of database management are performed which are insertion, deletion and retrieval. Performance of the databases is kept into account by the use of Timestamp, which are recorded when is the query is fired and also when the query has performed the assigned task. Multiple numbers of times the queries are executed to obtain a result and reach to a conclusion. The results obtained are in Nanoseconds. The coding part for MongoDB database is done using the MongoDB Java Application program Interface and the coding part for Oracle NoSQL database is done using the Oracle NoSQL Application program Interface. Figure 1 is the MongoDB start and connection. Figure 2 represents the MongoDB data storage.

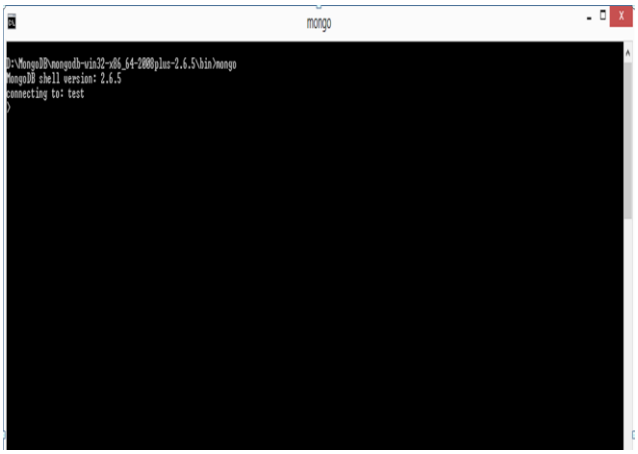

Figure 1: MongoDB start and connection

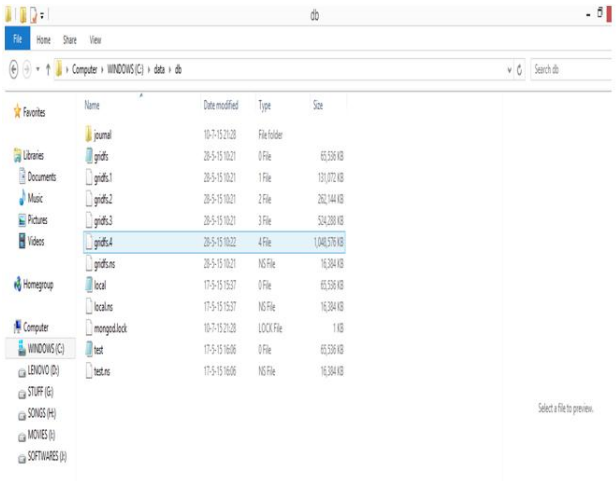

Figure 2 MongoDB data storage

Figure 3: Oracle Start

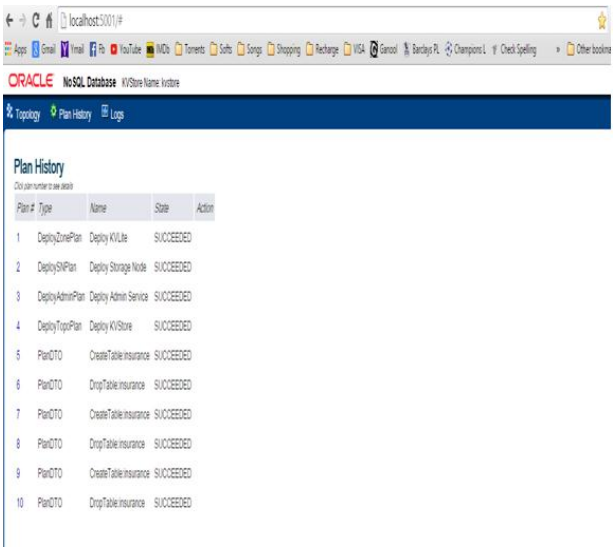

Figure 4 Oracle NoSQL Plan History

RESULTS AND CONCLUSIONS

Data is stored in the form of graphs and tables. X Axis represents the number of Iterations and Y Axis represents the Time in nanoseconds. Figure 5,7 and 9 represent the comparison graphs of operations performed on the Structured data using the MongoDB and Oracle NoSQL databases representing Insertion Time, Selection time and deletion time respectively. Figure 6,8 and 10 represent the comparison graphs of operations performed on the Unstructured data using the MongoDB and Oracle NoSQL databases representing Insertion Time, Selection time and deletion time respectively.

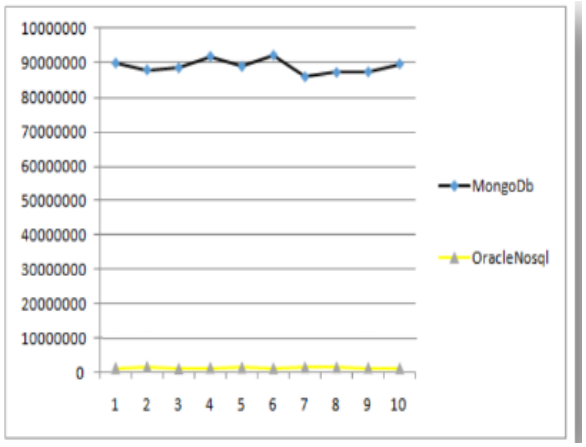

Figure 5 Selection Time (Structured Data)

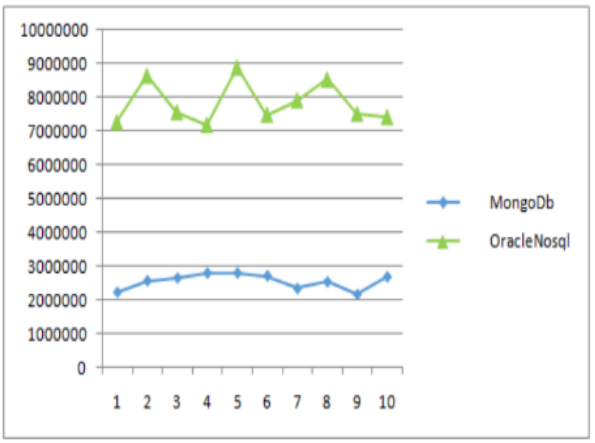

Figure 8 Insertion Time (UnStructured Data)

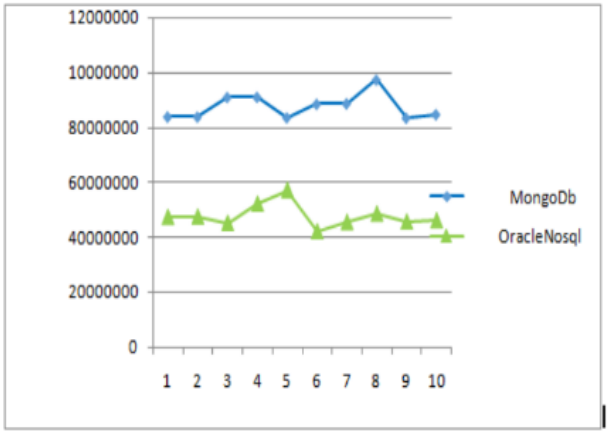

Figure 6 Selection Time (UnStructured Data)

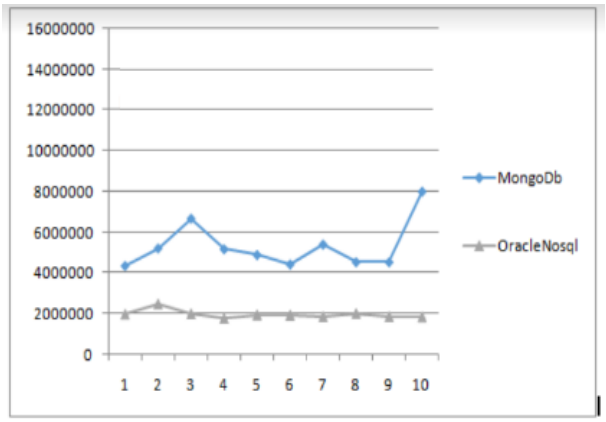

Figure 9 Deletion Time (Structured Data)

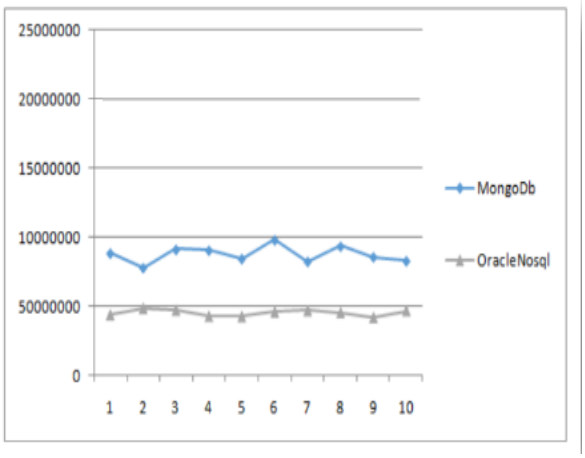

Figure 7 Insertion Time (Structured Data)

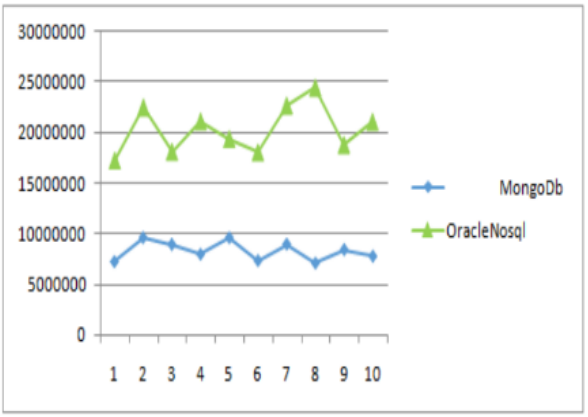

Figure10 Deletion Time (UnStructured Data)

Oracle NoSQL provides better results in inserting and retrieving data in case of structured data. Oracle NoSQL takes lesser time than MongoDB in inserting data in case of Unstructured data. In case of unstructured data, MongoDB provides better results for retrieving data than Oracle NoSQL. For both structured and unstructured data, Oracle NoSQL provides better results than other databases in

deleting data. Therefore this analysis helped in knowing the correct the database as per the applications requirement. Polyglot persistence is one such term in which these analysis is helpful. For applications requiring high data storage of unstructured data, Oracle NoSQL can be used as it provides better performance. For retrieving and deleting unstructured data, MongoDB can be used as it takes lesser time to provide search results. In case of storing, retrieving and deleting structured data, Oracle NoSQL has higher performance. Further in the Future scope of the entire analysis, Analysis can be performed using large datasets which may include videos, emails etc.

REFERENCES

[1] J. Han, E. Haihong, G. Le, and J. Du (2011). "Survey on NoSQL database," in Pervasive Computing and Applications (ICPCA), 2011 6th International Conference on, Oct. 2011, pp. 363 –366.

[2] K. Chodorow and M. Dirolf (2010). "MongoDB: The Definitive Guide. O'Reilly Media," September 2010.

[3] H. Kaur (2015). "Improvement in Load Balancing Technique for MongoDB Clusters," International Journal of Applied Information Systems (IJAIS) – ISSN : 2249-0868 Foundation of Computer Science FCS, New York, USA Volume 8– No.4, February 2015, pp 31- 35.

[4] B. Tudorica and C. Bucur (2011). "A comparison between several NoSQL databases with comments and notes," in Roedunet International Conference (RoEduNet), 2011 10th, june 2011, pp. 1 –5.

[5] An Oracle White Paper (2012). "Oracle NoSQL Database," November 2012.

[6] An Oracle White Paper (2014). "Back to the Future with Oracle Database 12c," April 2014

[7] MongoDB official guide. Available: http://www.mongodb.org.

[8] Kristina Chodorow and Michael Dirolf (2010). "MongoDB: The Definitive Guide," ÓReillyMedia, September 2010. p. 135.

[9] Oracle official guide. Available: http://www.oracle.com

[10] An Oracle White Paper (2013). "A Technical Overview of New Features for Automatic Storage Management in Oracle Database 12c", January 2013.

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