INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

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A REVIEW- IMPLEMENTING TRAINING AND PLACEMENT SYSTEM USING MONGODB AND REDIS

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Accepted Date: 15/03/2016; Published Date: 01/05/2016

Abstract*:* Demand for speed, manageability, ease leads to fixing of broken parts in relational databases by introducing next generation databases also termed as NoSQL. These are modern web-scale databases which are introduced to handle emerging applications such as social network analysis, semantic Web analysis, etc. where a wide variety of data is to be processed which needs continuous witness with a quick increase. A critical challenge these days is to have an effective management and analysis of data at a large-scale. The proposed system makes an effort to use a combination of NoSQL databases to replace traditional relational database like Oracle applied to information management system, comparing the traditional database system with combination of MongoDB and Redis and presents the performance comparison of these two schema. Comparison criteria include theoretical differences, features, restrictions, integrity, distribution, system requirements, and architecture, query and insertion times.

Keywords: MongoDB, Redis.

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Access Online On:

www.ijpret.com

How to Cite This Article:

Abha Rathod, IJPRET, 2016; Volume 4(9): 1670-1675

PAPER-QR CODE

INTRODUCTION

Database is a collection of related data and data is a collection of facts and figures that can be processed to produce information. Mostly data represents recordable facts. Data aids in producing information, which is based on facts. For example, if we have data about marks obtained by all students, we can then conclude about toppers and average marks. A database management system stores data in such a way that it becomes easier to retrieve, manipulate, and produce information. In the proposed system, NoSQL database system uses MongoDB, which is a cross-platform document -oriented database system, characterized by mass data storage and good query performance. MongoDB is merged with Redis which is another key-value store NoSQL database. It is combined with MongoDB for fast retrieval of data. REmote Dictionary Server is short termed as Redis. The implementation of Training & Placement System is based on MongoDB and Redis. [1] We will also try to compare the performance of Training & Placement System using various relational databases like Oracle MySql etc. and MongoDB.

It is often said that technology moves at a blazing pace. It’s true that there is an ever growing list of new technologies and techniques being released. What is striking though is the speed at which established technologies get replaced. Seemingly overnight, long-established technologies find themselves threatened by shifts in developer focus. Nothing could be more representative of this sudden shift than the progress of NoSQL technologies against well- established relational databases. It almost seems like one day the web was being driven by a few RDBMSs, and the next, five or so NoSQL solutions had established themselves as worthy solutions. MongoDB and Redis are such NoSQL databases which are being popularly used by many organizations like MetLife, Telefonica, Hike to manage their rapidly growing data in a flexible, scalable and secure manner. This motivated us to work with MongoDB & Redis, in implementing our system. [4][5]

II. LITERATURE REVIEW

MongoDB and Redis both fall into the NoSQL category, but that’s where the similarities end. Disk-based MongoDB is optimized for operational simplicity, schema-free design, and very large data volumes. Compared to relational databases, MongoDB works really well if data requires complex processing but doesn’t fit a rigid schema. MongoDB scales on commodity hardware easily and helps developers adapt to changing needs faster and more cost effectively than relational databases. Redis, while also schema-free, is an in-memory data structure store, frequently used as a database, cache, or message broker. Unlike other in-memory stores, Redis persists data. It is popular with developers because of its versatile, optimized data structures such as sets, sorted sets, hashes, lists, strings, bit arrays which deliver efficient in-database operations such as set comparisons, list pull-push operations, and range queries [3]. A growing number of use cases are emerging where MongoDB and Redis complement each other. The following are examples of real-world applications that combine MongoDB and Redis to store data at scale and process data incredibly fast. [3][4]

The following table describes various fields and their examples where MongoDB and Redis are being used to manage the rapidly growing data:

Sr. No	Application	Examples
1]	**Real-time analytics service.**	A Google Analytics-like service to large websites and Web-based applications provides insights into user behaviour by collecting millions of event data points and aggregating and segmenting.
2]	**Real-time navigation service.**	A navigation service, like Waze or Google Maps but with a focus on public transportation, combines MongoDB and Redis to support tens of millions of users.
3]	**Massively multiplayer online game.**	A game catering to thousands of teams with hundreds of players each. MongoDB stores information such as tournament profiles, resources, and resource profiles, while Redis manages game progress, user scores, and everything else that requires rapid updates and displays.
4]	**Internet of things application.**	The sensor data, temperature maps, and other variables needed for real-time

calculations and alerting are stored in Redis. Historical data is stored in MongoDB.

III. PROPOSED WORK

NoSQL Data Model:

The data model which is used here is based on MongoDB and Redis. Using NoSQL provides the benefit of storing data in schema less structure. As per the system's requirements; the basic information which is stored in MongoDB is about Training and Placement Department and information of various departments. Student_ID, Student_Department, can be set into the basic information of Training and Placement with embedded documents in collection. Students's embedded documents contains the information of student's personal details like name, address, student_id. Department is one other document which contains the department as per student_id.

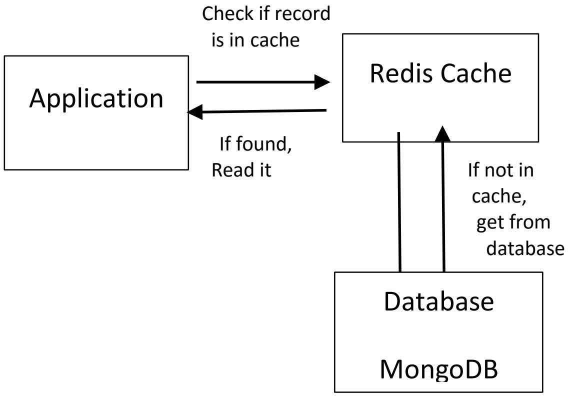

Fig: NoSQL data model.

B. System Implementation:

This work is done using Java language, MongoDB is used to store the data. This data is then made to split according to the department of the student. This data is made available at the different departments in the college. The categorized data according to the department is retrieved with the help of Redis and this is done for the fast access and operations on data. Thus two databases are merged in order to store and retrieve. MongoDB is used for large-scale data to be stored in schema-less structure and Redis is used for fast retrieval of data.

C .Performance Comparision:

To compare performance of MongoDB with other relational databases (for eg.,Oracle, Mysql, MariaDB) the same data will be saved, updated, deleted and retirevied using SQL queries. Comparison criteria includes theoretical differences, features, restrictions, integrity, distribution, system requirements, architecture, query and insertion times.

CONCLUSION:

Training and placement system will be implemented using combination of MongoDB and Redis at the backend. This will done in order to do fast transactions of data that is fast insertion and retrieval of data. Both MongoDB and Redis are scalable and Redis is used for its speed as it used KVS (Key Value store) whereas MongoDB is used for its flexibility, scalability, and efficient performance. With the help of MongoDB complex data into one field. An array or an object or a reference could be stored in a field in MongoDB. Relational databases are a bit complex, they have relations between tables and tables have a fix structure. These relations may be one to one or many to many. These relations may be helpful to join tables and create complex queries. The problem with relational databases is replication, if the database is to be copied, it is quite difficult. Even if the tools are considered for this purpose, they are not fast enough. This system would help compare the behaviour of relational databases in handling dynamically generated data with the non-relational databases MongoDB and Redis.

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