

Using MongoDB to Implement Blog Management System instead of RDBMS

Kirtesh Sharma, Pooja Parnami

Master of Technology (Computer Science)

Amity University Rajasthan, Jaipur Rajasthan, India.

Kirtesh90@gmail.com , pparnami@jpr.amity.edu

Abstract

For the development of the Web Application like social networking application, ERP, Blogs for such applications the traditional relation database is wildly use but the Traditional relational database system is not effective when we need to operate wild range of data. Especially when we deal with the multi-table joins query.

For such problems then new technologies are introduced --- NoSQL, the NoSQL is non-relational database management system which format loose data storage and this technology don't support any kind of joins operation and the effective query capability. For the replacement of the Traditional system this paper attempts to use NoSQL database

Keywords: MongoDB, MySQL, RDBMS, NoSQL

I. Introduction: -

The traditional Relational database system is deals with the two dimensional tables to store and represent the data and the consistency of the data in Traditional relational database is very strict so that the read and write implementation become so complex with SQL queries, especially in the multi table relational database management system. The NoSQL is not a relational database system and this system use a non-relational model of data structure. Usually it doesn't support the join operation.

This paper attempts to use the new database technology in the Blog Management System, to implement High-performance data queries. In this paper the relational database using Oracle database. As most popular database management system worldwide and the NoSQL database system used MongoDB, which is document oriented database and characterized by mass data storage, at the same time with good query performance. Section II of the paper we introduce the concepts of non-relational database and the characteristics of MongoDB. The implementation of Blog management system based on MongoDB will be described in section III. The fourth section we compare the performance of Blog management system based on Oracle and MongoDB. In the fifth part, we point out some drawbacks of the NoSQL implementation and future work to do.

II Non-Relational Database and MongoDB

NoSQL means non-relational database. The data structure of non-relational database is not fixed. There are key (key-value) storage type, document storage type

and soon. MongoDB is a document oriented database. It's schema-free, which contains Database, Collection, and Document. One Database can have multiple Collections.

Each Collection is a collection of Documents. The structure of MongoDB system is displayed in Figure 1. Collection can be created at any time, without predefined. It can also contains records with different schema documents, which means one record of a document has 3 attributes, and the next record in the document may has 10 attributes. The type of the property can be any basic data types, such as numbers, strings, dates, etc., or an array or hash, and even a sub-document. This can realize de-normalized data model and improve query speed. The Blog management system which is based on MongoDB will be used in this data model

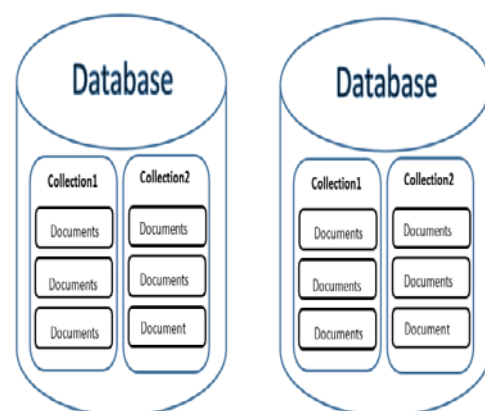


Figure 1: MongoDB document-oriented database
A. Blog Management System Data Model:-

a) Traditional Relational Data Model

The system use traditional data model is based on Oracle that mainly contain the users, Bloggers, comments, images, note, tags etc.

The E-R data model of the system is shown in Figure2,

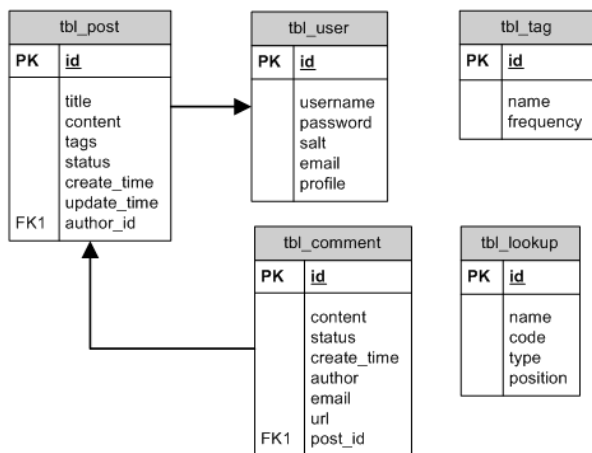


Figure 2: part of the relational data model of the system

b) NoSQL data model

Scheme free is one of the characteristics of NoSQL. According to system’s requirements; two basic information, User Collection and the Blog Collections will be created in MongoDB. Other tags and the comments are store in the basic information of the blog collection.

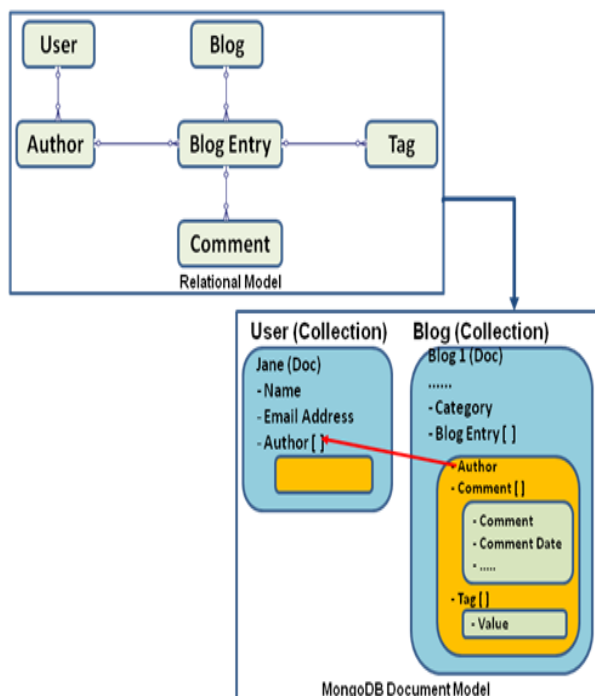


Figure 3: part of the system’s data model based on MongoDB.

B. System Implementation

For the implementation of this system first of all we need to develop the system which access the database and we also need to driver that provided by the MongoDB.

The main key step to connect the MongoDB database is the program that allows the blog to connect with the MongoDB database. For this the any language that is supported by the MongoDB can be use, here we are using Java program to connect the database, and then insert the data, finally, get the results sets by query condition

a) Establish a connection

For the connection first of all make java programs connects with the MongoDB database for that you need to install the MongoDB driver for the JAVA for setting up the environment for development.

The following code will use to connect the MongoDB Database with the Application.

```
Mongo m = new Mongo ("Database Server Address", 27017); // connect database with the database server name and port number
DB db= m.getDB("database name");//open database
```

b) Insert The Data

In the traditional JDBC development, Java program create the connection by specifying the connection type then establish the connection with database, then we need to pass the SQL statements to program, at last insert the data into the database, which deals with the process-oriented task. MongoDB database use object-oriented thinking to implement system, first, according "User" to create a DBCollection object coll, and then create a BasicDBObject object Bdbo, add User information to the object Bdbo, and finally add the object doc to the object coll, at last insert data into MonoDB database.

```
DBCollection coll = db.getCollection("User");
BasicDBObject Bdbo = new BasicDBObject();
Bdbo.put ("UserName", "XYZ");
Bdbo.put("Address", "Any Address ");
Bdbo.put("EmailAddress", "Any Email");
coll.insert(doc);
```

c) Query the data

For the query the data The DBOject is indicate the condition on which the query has to be fire, and use the nested multilayer to represent complex conditions then this query will return the results for the object of DBOject.

The Query data in MongoDB also follows the Object-oriented thinking for create the DBCollection object for now the scope of the query by getting Collection “Blog” in the database. After that create BasicDBObject object,

and write the query condition into the object, finally pass the object to the method findOne() of the object called.

The query object returns toDBObject object.

```
DBCcollection DBC=db.getCollecton("Blog");
```

```
BasicDBObject
```

```
DBO=new BasicDBObject();//for match the query
```

```
DBC.put("Name","Any Name of blog");
```

```
DBObject DBO=DBC.findOne(DBO);
```

Query Document Collections uses the DBCursor for return the result set. The following steps are same as above mentioned.

Put the object DBC into method find() of the object of DBC after that the query result results back to a cursor loop statement to process the data according to the demand.

```
DBO.put("BlogCommentCount",new
```

```
BasicDBObject("$gt",100));
```

```
DBCursor DBC=coll.find(cond);
```

```
While(DBC.hasNext())
```

```
{
```

```
DBC.next();
```

```
}
```

Above steps are the key to the implementation for the system. Comparing to using JDBC, MySQL solution, the system adopts the object-oriented method to implement, developers can easily develop and maintain. The following section will display the efficiency of two different implement methods.

IV. PERFORMANCE COMPARISON

In the performance testing, enter 100,000 Blog information data into database. The cost time of MongoDB and Oracle were recorded as shown in figure 4. The left columns show the average time cost for inserting 100,000 Blog information. The right columns show the average time cost for querying 2,000 records from 100,000 Blog records .In order to facilitate the graphical display, set original data multiply Coefficient for 100. In the performance of inserting data, MongoDB spends less times than Oracle, which testified it is improving query efficiency.

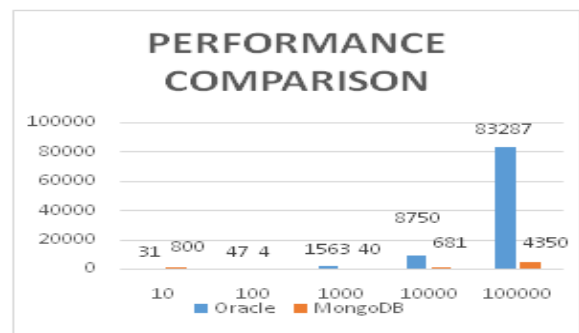


Figure 4 MySQL and MongoDB insert, query time

V. CONCLUSION

The System is developed based on the MongoDB, which is compare to the Oracle implement scheme, inserting and the querying the data by MongoDB is definitely advanced and much optimized. Based on the development is little bit complicated in compare to Oracle but the development process also encountered the reference of MongoDB which is less than the oracle, but the development of MongoDB in Application will continue to research

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