MES College of Engineering Pune-01

Department of Computer Engineering

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GROUP: B ASSIGNMENT NO: 01

AIM: Study of Open Source NOSQL Database: MongoDB (Installation, Basic CRUD operations, Execution).

OBJECTIVES:

- To develop basic, intermediate and advanced Database programming skills.
- To develop basic Database administration skill.

APPRATUS:

- Operating System recommended: 64-bit Open source Linux or its derivative
- Front End: Java/PHP/Python
- Backend: MongoDB

INSTALLATION STEP:

Step 1: First search for mongodb Package:

sudo apt-cache search mongodb

Step 2: Edit/Create file /etc/apt/sources.list.d/mongo.list

sudo vi /etc/apt/sources.list.d/mongo.list

OR

sudo nano /etc/apt/sources.list.d/mongo.list

And past below two lines in mongo.list file

##10gen package location

deb http://downloads-distro.mongodb.org/repo/ubuntu-upstart dist 10gen

To save type ctrl+x then type Key 'y' and Enter

Step 3: Add GPG Key

sudo apt-key adv --keyserver keyserver.ubuntu.com --recv 7F0CEB10

Step 4: Update package

sudo apt-get update

Step 5: Search for mongodb

sudo apt-cache search mongodb

It will show mongodb-10gen

Step 6: Install mongodb-10gen

sudo apt-get install mongodb-10gen

Step 7: Where is MongoDB? (Find mongodb on system)

ps -ef | grep mongo

For see the version use:*mongo –version*

Step 8: All MongoDB executable files are stored at /usr/bin/

ls -ls /usr/bin | grep mongo

The "mongodb control script" is generated at /etc/init.d/mongodb

ls -ls /etc/init.d | grep mongo

Step 9: Controlling MongoDB

- Starting MongoDB	sudo service mongodb start
- Stopping MongoDB	sudo service mongodb stop
- Restarting MongoDB	sudo service mongodb restart
- Check service is start or	sudo service mongodb status

Step 10: To Start Mongo Client

mongo

CONCLUSION:

QUESTIONS:
1. List Different NoSQL data models. Explain document based NoSQL data model.
2. Explain Sharding (Horizontal Scaling) in MongoDB.
3. What are different key feature of MongoDB.
4. Explain CAP & BASE Theorem in NoSQL with Suitable Example.
5. What is database, Collection and Document in MongoDB. How will you distinguish between them?
6. Explain CRUD operations in MongoDB database with suitable Example.

Q1 List different NoSQL data models. Explain document based NoSQL model.

Ans Different NoSQL data modes are:
1] Document databases
2] Key-value stores
3] Graph Databases
4] Column Oriented databases.

Document based data model or a NOSQL document store is a modern way to store data in JSON format rather than simple rows and columns. It allows you to express data in its natural form the way its meant to be. In contrast rows and columns are inherently rigid data structure.

Q2 Explain sharding (Horizontal Scaling) in Mongo DB.

Ans Sharding is a method for distributing data across multiple machines. Mongo DB uses sharding to support deployment with very large data set and high throughput operations.
Database systems with large sets or high throughput application can challenge the capacity of a single server. There are two methods for addressing system growth: horizontal and vertical
Horizontal scaling involves dividing the system data set and load over multiple servers to increase capacity as required. Mongo DB supports horizontal scaling through sharding.

Q3 What are different key features of Mongo DB.

Ans The key features of Mongo DB are :
1] Supports noc queries
2] Indexing
3] Replication
4] Duplication of Data
5] Load balancing
6] Supports map reduce and aggregation tools
7] Uses javascript instead of procedures
8] Providing high performance
9] It is a schema - less database.

Q4 Explain CAP and BASE theorem in NOSQL with suitable example.

Ans CAP theorem states that we can only achieve at most two out of the three guarantees for a database. Consistency means that all nodes in the network see the same data at the same time. Availability is a guarantee that every request recieves a response about whether it was successful or failed. Partition Tolerance is a guarantee that the system continues to operate deopite arbitrary message loss or failure of part of the system.
eg: HDFS having secondary namenode and even rational databases having regular backup.

The CAP theorem states that a distributed computer system cannot guarantee all three ie consistency, availability and partition tolerance, thus a BASE system gives up on consistency. Basically Available indicates that the system does guarantee availability, Soft state indicates that the state of the system may change over time. Eventual consistency indicates that the system will become consistent over time.

eg: BigTable.

Q5   What is database, Collection and Document in MongoDB. How will you distinguish between them?

Ans   <u>Databases</u>: In Mongo DB, databases hold collections of documents.

<u>Collections</u>: Mongo DB stores documents in collections. Collections are analogous to tables in relational databases.

<u>Documents</u>: Mongo DB documents are composed of field and value pairs. Mongo DB stores data records as BSON documents.

A database contains a collection, and a collection contains documents and documents contains data they are related to each other.

Q6 Explain CRUD operations in Mongo DB database with suitable example

Ans Create :

Create or insert operations add new documents to the collection.

eg db. collection. insertOne()

Read :

Read operations retrieve documents from collections

eg : db. collection. find()

Update :

Update operations modify existing documents in a collection

eg : db. collection. updateOne()

Delete :

Delete operations remove documents from a collection

Mongo DB provides the following methods to delete documents of a collection.

eg : db. collection. deleteOne().