MONGODB

MongoDB is a cross-platform, document oriented database that provides, high performance, high availability, and easy scalability. MongoDB works on concept of collection and document.

Database

Database is a physical container for collections. Each database gets its own set of files on the file system. A single MongoDB server typically has multiple databases.

Collection

Collection is a group of MongoDB documents. It is the equivalent of an RDBMS table. A collection exists within a single database. Collections do not enforce a schema. Documents within a collection can have different fields. Typically, all documents in a collection are of similar or related purpose.

Document

A document is a set of key-value pairs. Documents have dynamic schema. Dynamic schema means that documents in the same collection do not need to have the same set of fields or structure, and common fields in a collection's documents may hold different types of data.

The following table shows the relationship of RDBMS terminology with MongoDB.

RDBMS MongoDB

Database Database

Table Collection

Tuple/Row Document

column Field

Table Join Embedded Documents

Primary Key Primary Key (Default key _id provided by

mongodb itself)

Database Server and Client

Mysqld/Oracle mongod

1. MongoDB –Overview

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mysql/sqlplus mongo

Sample Document

Following example shows the document structure of a blog site, which is simply a comma separated key value pair.

```
{
 _id: ObjectId(7df78ad8902c)
 title: 'MongoDB Overview',
 description: 'MongoDB is no sql database',
 by: 'tutorials point',
 url: 'http://www.tutorialspoint.com',
 tags: ['mongodb', 'database', 'NoSQL'],
 likes: 100,
 comments: [
 {
 user:'user1',
 message: 'My first comment',
 dateCreated: new Date(2011,1,20,2,15),
 like: 0
 },
 {
 user:'user2',
 message: 'My second comments',
 dateCreated: new Date(2011,1,25,7,45),
 like: 5
 }
 ]
}
```

_id is a 12 bytes hexadecimal number which assures the uniqueness of every document. You

can provide _id while inserting the document. If you don’t provide then MongoDB provides a unique id for every document. These 12 bytes first 4 bytes for the current timestamp, next 3 bytes for machine id, next 2 bytes for process id of MongoDB server and remaining 3 bytes are simple incremental VALUE.

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Any relational database has a typical schema design that shows number of tables and the relationship between these tables. While in MongoDB, there is no concept of relationship.

Advantages of MongoDB over RDBMS

 Schema less: MongoDB is a document database in which one collection holds different documents. Number of fields, content and size of the document can differ from one document to another.

 Structure of a single object is clear.

 No complex joins.

 Deep query-ability. MongoDB supports dynamic queries on documents using a document-based query language that's nearly as powerful as SQL.

 Tuning.

 Ease of scale-out: MongoDB is easy to scale.

 Conversion/mapping of application objects to database objects not needed.

 Uses internal memory for storing the (windowed) working set, enabling faster access of data.

Why Use MongoDB?

 Document Oriented Storage: Data is stored in the form of JSON style documents.

 Index on any attribute

 Replication and high availability

 Auto-sharding

 Rich queries

 Fast in-place updates

 Professional support by MongoDB

Where to Use MongoDB?

 Big Data

 Content Management and Delivery

 Mobile and Social Infrastructure

2. MongoDB – Advantages

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 User Data Management

 Data Hub

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Let us now see how to install MongoDB on Windows.

Install MongoDB on Windows

To install MongoDB on Windows, first download the latest release of MongoDB from http://www.mongodb.org/downloads. Make sure you get correct version of MongoDB depending upon your Windows version. To get your Windows version, open command prompt and execute the following command.

```
C:\>wmic os get osarchitecture
OSArchitecture
64-bit
C:\>
```

32-bit versions of MongoDB only support databases smaller than 2GB and suitable only for testing and evaluation purposes.

Now extract your downloaded file to c:\ drive or any other location. Make sure the name of the extracted folder is mongodb-win32-i386-[version] or mongodb-win32-x86_64-[version]. Here [version] is the version of MongoDB download.

Next, open the command prompt and run the following command.

```
C:\>move mongodb-win64-* mongodb
 1 dir(s) moved.
```

C:\>

In case you have extracted the MongoDB at different location, then go to that path by using command cd FOOLDER/DIR and now run the above given process.

MongoDB requires a data folder to store its files. The default location for the MongoDB data directory is c:\data\db. So you need to create this folder using the Command Prompt. Execute the following command sequence.

C:\>md data

C:\md data\db

If you have to install the MongoDB at a different location, then you need to specify an alternate path for \data\db by setting the path dbpath in mongod.exe. For the same, issue the following commands.

3. MongoDB – Environment

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In the command prompt, navigate to the bin directory present in the MongoDB installation folder. Suppose my installation folder is D:\set up\mongodb

C:\Users\XYZ>d:

D:\>cd "set up"

D:\set up>cd mongodb

D:\set up\mongodb>cd bin

D:\set up\mongodb\bin>mongod.exe --dbpath "d:\set up\mongodb\data"

This will show waiting for connections message on the console output, which indicates that the mongod.exe process is running successfully.

Now to run the MongoDB, you need to open another command prompt and issue the following command.

D:\set up\mongodb\bin>mongo.exe

MongoDB shell version: 2.4.6

connecting to: test

>db.test.save({ a: 1 })

```
>db.test.find()
{ "_id" : ObjectId(5879b0f65a56a454), "a" : 1 }
>
```

This will show that MongoDB is installed and run successfully. Next time when you run MongoDB, you need to issue only commands.

```
D:\set up\mongodb\bin>mongod.exe --dbpath "d:\set up\mongodb\data"
D:\set up\mongodb\bin>mongo.exe
```

Install MongoDB on Ubuntu

Run the following command to import the MongoDB public GPG key −

```
sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv 7F0CEB10
```

Create a /etc/apt/sources.list.d/mongodb.list file using the following command.

```
echo 'deb http://downloads-distro.mongodb.org/repo/ubuntu-upstart dist 10gen'
 | sudo tee /etc/apt/sources.list.d/mongodb.list
```

Now issue the following command to update the repository −

```
sudo apt-get update
```


Next install the MongoDB by using the following command −

```
apt-get install mongodb-10gen=2.2.3
```

In the above installation, 2.2.3 is currently released MongoDB version. Make sure to install the latest version always. Now MongoDB is installed successfully.

Start MongoDB

```
sudo service mongodb start
```

Stop MongoDB

```
sudo service mongodb stop
```

Restart MongoDB

```
sudo service mongodb restart
```

To use MongoDB run the following command.

```
mongo
```

This will connect you to running MongoDB instance.

MongoDB Help

To get a list of commands, type db.help() in MongoDB client. This will give you a list of commands as shown in the following screenshot