MongoDB

MangoDB or MongoDB???

MongoDB

Humongous

extremely large : huge a humongous building humongous amounts of money.

MongoDB is the most popular and trending database.
The vendor: MongoDB

https://www.mongodb.com/

Where we can use MongoDB database?

We can use everywhere

For desktop applications, for mobile applications
For web applications, this database is more popular.

Full stack developer:

stack---->The technologies which can be used to develop web applications are called a stack.
The most popular stacks:
1. MEAN Stack
2. MERN Stack

1. MEAN Stack:

M --->MongoDB

E --->Express

A --->Angular

N --->Node JS

2. MERN Stack:

M --->MongoDB

E --->Express

R --->React JS

N --->Node JS

React or Angular is Front end framework.

Express JS is the backend server side framework

Node JS is responsible to provide server side runtime enviornment.

MongoDB -->Database

By using MEAN and MERN stacks we can build javascript based web applications.

Node JS is based on Java Script

React or Angular is based on Java Script

Express is based on Java Script

MongoDB is also based on Java Script.

MongoDB internally used Mozilla's Spider Monkey Java Scipt Engine.

Q. What is the type of MongoDB database?

It is Document Database/NoSql database.

Relational Database vs Document Database:

There are 2 most common types of databases.

1. Relational Databases/SQl Databases
2. Document Databases/NoSQl Databases

1. Relational Databases/SQl Databases

The data will be stored in tables and these tables has fixed schema.
Employee(eno,ename,esal,eaddr)

The data stored in tables has relationships like
The data stored in tables has relationships like
one to one
one to many
many to one
etc

To retrieve data from relational databases, we have to write join queries which collects data from different tables.

eg: Oracle,MySQL etc

2. Document Databases/NoSQl Databases:

Data will be stored in separate documents and each document is independent of others.

eg: MongoDB

MongoDB Structure:

MongoDB Physical database contains several logical databases.
Each database contains several collections. Collection is something like table in relational database.
Each collection contains several documents. Document is something like record/row in relational database.

eg:
Database: Shopping cart database
Collections: Customers, Products, Orders
Cusomer Collection: contains several documents

document1:

```
{
  "Name":"Sunny",
  "age":40,
  "Salary":10000
}
```

document2:

```
{
  "Name":"Durga"
}
```

document-3:

```
{
  "name":"Bunny",
  "age":30,
  "address":
     {
       "city":"Hyderabad"
     },
```

```
    "hobbies":[
            {"name":"Cricket playing"},
             {"name":"swimming"}
             ]
}
```

Q. How data represented in MongoDB?

In JSON (BSON) Format.
JSON--->Java Script Object Notation
BSON--->Binary JSON

Key Characteristics of MongoDB database:

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1. Installation and setup is very easy.

1. All information related to a document will be stored ina single place. To retrieve data, it is not required to perform join operations and hence retrieval is very fast.

2. Documents are independent of each other and no schema. Hence we can store unstructured data like videos, audio files etc

3. We can perform oprations like editing existing document, deleting document and inserting new documents very easily.

4. Retrieval data is in the form of json which can be understandable by any programming language without any conversion (interoperability)

5. We can store very huge amount of data and hence scalability is more.

Note: Performance and Flexibility are biggest assets of Mongodb.

MongoDB Shell vs MongoDB Server:

Once we installed MongoDB, we will get MongoDB Shell and MongoDB Server.

These are Javascript based applications.

- **MongoDB Server is responsible to store our data in database.**
- **MongoDB Shell is responsible to manage Server.**

By using this shell we can perform all required CRUD operations.

C --->Create
R --->Retrieve
U --->Update
D --->Delete

sir in mongo db all crud operations will be related to documents ?
Yes

MongoDB Server can be either local or remote.

To Launch/Start MongoDB Server --->mongod command

To Launch/Start MongoDB Shell --->mongo command

GUI Support is also there for MongoBD Shell--->

Compass

Robo T3

etc

MongoDB Drivers:

From Application(Java,Python,C# etc) if we want to communicate with database, some special software must be required, which is nothing but Driver software.

mongodb.com--->Docs-->Drivers

https://pymongo.readthedocs.io/en/stable/tutorial.html

27017

wat is difference between oracle DB nd Mango DB

if I learns mdb can I work on elastic search
Oracle-->MySQL

what is the difference between Enterprise and Community versions ??
any extra features in enterprise version ??

MongoDB Shell, Server and Driver

MongoDB Installation:

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https://www.mongodb.com/try/download/community

```
C:\Program Files\MongoDB\Server\4.4\bin>mongod -version
db version v4.4.2
Build Info: {
    "version": "4.4.2",
    "gitVersion": "15e73dc5738d2278b688f8929aee605fe4279b0e",
    "modules": [],
    "allocator": "tcmalloc",
    "environment": {
        "distmod": "windows",
        "distarch": "x86_64",
        "target_arch": "x86_64"
    }
}

C:\Program Files\MongoDB\Server\4.4\bin>mongo -version
MongoDB shell version v4.4.2
Build Info: {
    "version": "4.4.2",
    "gitVersion": "15e73dc5738d2278b688f8929aee605fe4279b0e",
    "modules": [],
    "allocator": "tcmalloc",
```

```
    "environment": {
        "distmod": "windows",
        "distarch": "x86_64",
        "target_arch": "x86_64"
    }
}
```

```
{"error":"NonExistentPath: Data directory D:\\data\\db\\ not found. Create the missing directory or specify another path using (1) the --dbpath command line option, or (2) by adding the 'storage.dbPath' option in the configuration file."}}
```

```
mongod --dbpath "C:\data\db"
```

```
> db.version()
4.4.2
> db.help()
DB methods:
        db.adminCommand(nameOrDocument) - switches to 'admin' db, and runs command [just calls db.runCommand(...)]
        db.aggregate([pipeline], {options}) - performs a collectionless aggregation on this database; returns a cursor
        db.auth(username, password)
```

db.cloneDatabase(fromhost) - will only function with MongoDB 4.0 and below

db.commandHelp(name) returns the help for the command

db.copyDatabase(fromdb, todb, fromhost) - will only function with MongoDB 4.0 and below

db.createCollection(name, {size: ..., capped: ..., max: ...})

db.createUser(userDocument)

db.createView(name, viewOn, [{$operator: {...}}, ...], {viewOptions})

db.currentOp() displays currently executing operations in the db

db.dropDatabase(writeConcern)

db.dropUser(username)

db.eval() - deprecated

db.fsyncLock() flush data to disk and lock server for backups

db.fsyncUnlock() unlocks server following a db.fsyncLock()

db.getCollection(cname) same as db['cname'] or db.cname

db.getCollectionInfos([filter]) - returns a list that contains the names and options of the db's collections

db.getCollectionNames()

db.getLastError() - just returns the err msg string

db.getLastErrorObj() - return full status object

db.getLogComponents()

db.getMongo() get the server connection object

db.getMongo().setSecondaryOk() allow queries on a replication secondary server

db.getName()

db.getProfilingLevel() - deprecated

db.getProfilingStatus() - returns if profiling is on and slow threshold

db.getReplicationInfo()

db.getSiblingDB(name) get the db at the same server as this one

db.getWriteConcern() - returns the write concern used for any operations on this db, inherited from server object if set

db.hostInfo() get details about the server's host

db.isMaster() check replica primary status

db.hello() check replica primary status

db.killOp(opid) kills the current operation in the db

db.listCommands() lists all the db commands

db.loadServerScripts() loads all the scripts in db.system.js

db.logout()

db.printCollectionStats()

db.printReplicationInfo()

db.printShardingStatus()

db.printSecondaryReplicationInfo()

db.resetError()

db.runCommand(cmdObj) run a database command. if cmdObj is a string, turns it into {cmdObj: 1}

db.serverStatus()

db.setLogLevel(level,<component>)

db.setProfilingLevel(level,slowms) 0=off 1=slow 2=all

db.setVerboseShell(flag) display extra information in shell output

db.setWriteConcern(<write concern doc>) - sets the write concern for writes to the db

db.shutdownServer()

db.stats()

db.unsetWriteConcern(<write concern doc>) - unsets the write concern for writes to the db

db.version() current version of the server

db.watch() - opens a change stream cursor for a database to report on all changes to its non-system collections.

```
> db.stats()
{
        "db" : "test",
        "collections" : 0,
        "views" : 0,
        "objects" : 0,
        "avgObjSize" : 0,
```

```
        "dataSize" : 0,
        "storageSize" : 0,
        "totalSize" : 0,
        "indexes" : 0,
        "indexSize" : 0,
        "scaleFactor" : 1,
        "fileSize" : 0,
        "fsUsedSize" : 0,
        "fsTotalSize" : 0,
        "ok" : 1
}
> show dbs
admin   0.000GB
config 0.000GB
local   0.000GB
> use  admin
switched to db admin
> show collections
system.version
> use  local
switched to db local
> show collections
startup_log
```

mongodb--->install-->Physical database

estoredb--->

collegedb-->

data/db everytime

Default Databases:

MongoDB Admin will use these default databases.

> show dbs

admin 0.000GB

config 0.000GB

local 0.000GB

1. admin:

----

admin database is used to store user authentication and authorization information like usernames,passwords,roles etc
This database is used by administrators while creating,deleting and updating users and while assigning roles.

2. config:

To store configuration information of mongodb server.

3. local:
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local database can be used by admin while performing replication process.

Data Formats in MongoDB:

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json: {name:'durga'}--->BSON and that BSON will be stored

BSON: Binary JSON
End user/Developer will provide data in json form.
In MongoDB server data will be stored in BSON Form.

1. In Javascript only 6 types are available.
String,Number,Object,Array,Boolean,Null

But BSON provides some extra types also like
32-Bit Integer-->NumberInt
ObjectId
Date
etc

2. BSON Format requires less memory.