Mongo DB

Report

Introduction:

# What is Database?

`A database is a collection of data that is organized, which is also called structured data. It can be accessed or stored in a computer system. It can be managed through a [Database Management System](https://www.geeksforgeeks.org/introduction-of-dbms-database-management-system-set-1/)(DBMS), a software used to manage data. Database refers to related data in a structured form.

How do Document Databases Work?

A document database has information retrieved or stored in the form of a document or other words semi-structured database. Since they are non-relational, so they are often referred to as NoSQL data.

The document database fetches and accumulates data in forms of key-value pairs but here, the values are called as Documents. A document can be stated as a complex data structure. Document here can be a form of text, arrays, strings, JSON, XML, or any such format. The use of nested documents is also very common. It is very effective as most of the data created is usually in the form of JSON and is unstructured.

MongoDB:

**MongoDB**, the most popular NoSQL database, is an open-source document-oriented database. The term ‘NoSQL’ means ‘non-relational’. It means that MongoDB isn’t based on the table-like relational database structure but provides an altogether different mechanism for storage and retrieval of data. This format of storage is called BSON ( similar to JSON format).

Features of Mongo DB:

* **Document Oriented**: MongoDB stores the main subject in the minimal number of documents and not by breaking it up into multiple relational structures like RDBMS. For example, it stores all the information of a computer in a single document called Computer and not in distinct relational structures like CPU, RAM, Hard disk, etc.
* **Indexing**: Without indexing, a database would have to scan every document of a collection to select those that match the query which would be inefficient. So, for efficient searching Indexing is a must and MongoDB uses it to process huge volumes of data in very less time.
* **Scalability**: MongoDB scales horizontally using sharding (partitioning data across various servers). Data is partitioned into data chunks using the shard key, and these data chunks are evenly distributed across shards that reside across many physical servers. Also, new machines can be added to a running database.
* **Replication and High Availability**: MongoDB increases the data availability with multiple copies of data on different servers. By providing redundancy, it protects the database from hardware failures. If one server goes down, the data can be retrieved easily from other active servers which also had the data stored on them.
* **Aggregation**: Aggregation operations process data records and return the computed results. It is similar to the GROUPBY clause in SQL. A few aggregation expressions are sum, avg, min, max, etc

Installation:

## Requirements to Install MongoDB on Windows:

* MongoDB 4.4and later only support 64-bit versions of Windows.
* MongoDB 7.0 Community Edition supports the following 64-bit versions of Windows on x86\_64 architecture:
  + Windows Server 2022
  + Windows Server 2019
  + Windows 11
* Ensure that the user is running mongod and mongos has the necessary permissions from the following groups:
  + Performance Monitor Users
  + Performance Log Users

## Steps to Install MongoDB on Windows using MSI:

To install MongoDB on Windows, first, download the MongoDB server and then install the MongoDB shell. The Steps below explain the installation process in detail and provide the required resources for the smooth **download and install MongoDB**.

**Step 1:** Go to the [MongoDB Download Center](https://www.mongodb.com/download-center/community) to download the MongoDB Community Server.

Here, You can select any version, Windows, and package according to your requirement. For Windows, we need to choose:

* Version: 7.0.4
* OS: Windows x64
* Package: msi

**Step 2:** When the download is complete open the msi file and click the next button in the startup screen:

**Step 3:** Now accept the End-User License Agreement and click the next button:

**Step 4:** Now select the complete option to install all the program features. Here, if you can want to install only selected program features and want to select the location of the installation, then use the Custom option:

**Step 5:**Select “Run service as Network Service user” and copy the path of the data directory. Click Next:

**Step 6:** Click the Install button to start the MongoDB installation process:

**Step 7:**After clicking on the install button installation of MongoDB begins:

**Step 8:** Now click the ***Finish button*** to complete the MongoDB installation process:

**Step 9:** Now we go to the location where MongoDB installed in step 5 in your system and copy the bin path:

**Step 10:** Now, to create an environment variable open system properties >> Environment Variable >> System variable >> path >> Edit Environment variable and paste the copied link to your environment system and click Ok:

**Step 11:**After setting the environment variable, we will run the MongoDB server, i.e. mongod.  So, open the command prompt and run the following command:

**mongod**

When you run this command you will get an error i.e. C:/data/db/ not found.

**Step 12:** Now, Open C drive and create a folder named “data” inside this folder create another folder named “db”. After creating these folders. Again open the command prompt and run the following command:

**mongod**

Now, this time the MongoDB server(i.e., mongod) will run successfully.

## **Run mongo Shell:**

**Step 13:**Now we are going to connect our server (mongod) with the mongo shell. So, keep that mongod window and open a new command prompt window and write **mongo.** Now, our mongo shell will successfully connect to the mongod.

### **Run MongoDB:**

Now you can make a new database, collections, and documents in your shell