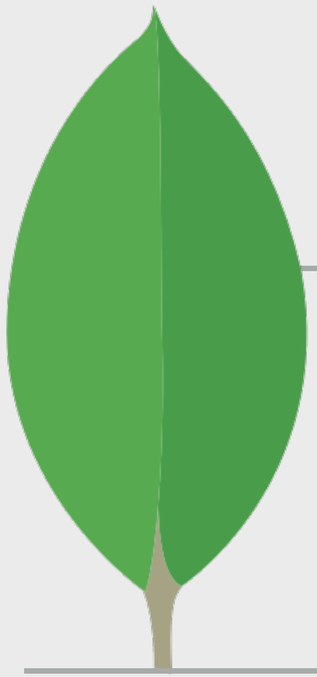


MongoDB

Types of DBs

- Relational database
- NoSQL database
- Centralized database
- Cloud database
- Commercial database
- Distributed database
- …

Relational DBs

TABLES

JOINS

ROWS

FOREIGN KEYS

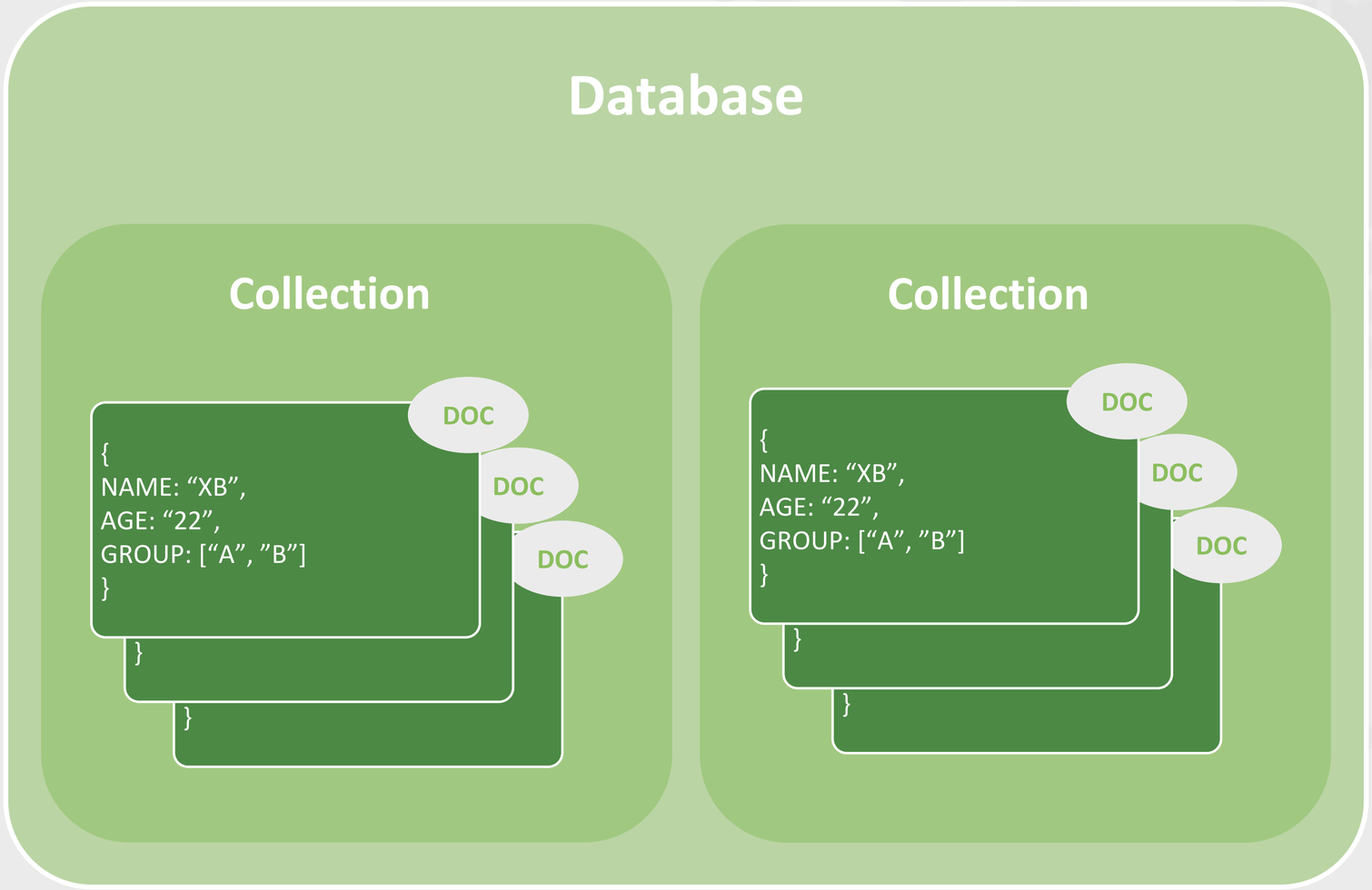
What is MongoDB?

- “MongoDB is a document database with the scalability and flexibility that you want with the querying and indexing that you need.”
- Features:
  - Built for speed
  - Rich Document based queries for easy readability
  - Full index support for High Performance
  - Replication and Failover for High Availability
  - Auto Sharing for Easy Scalability
  - Map/Reduce for Aggregation
- **JSON-style** data store with dynamic schema

https://www.mongodb.com/what-is-mongodb

Architecture of MongoDB

- You can think of
  - Database as Database
  - Collections as Tables
  - Documents as Record/Row



How to install MongoDB?

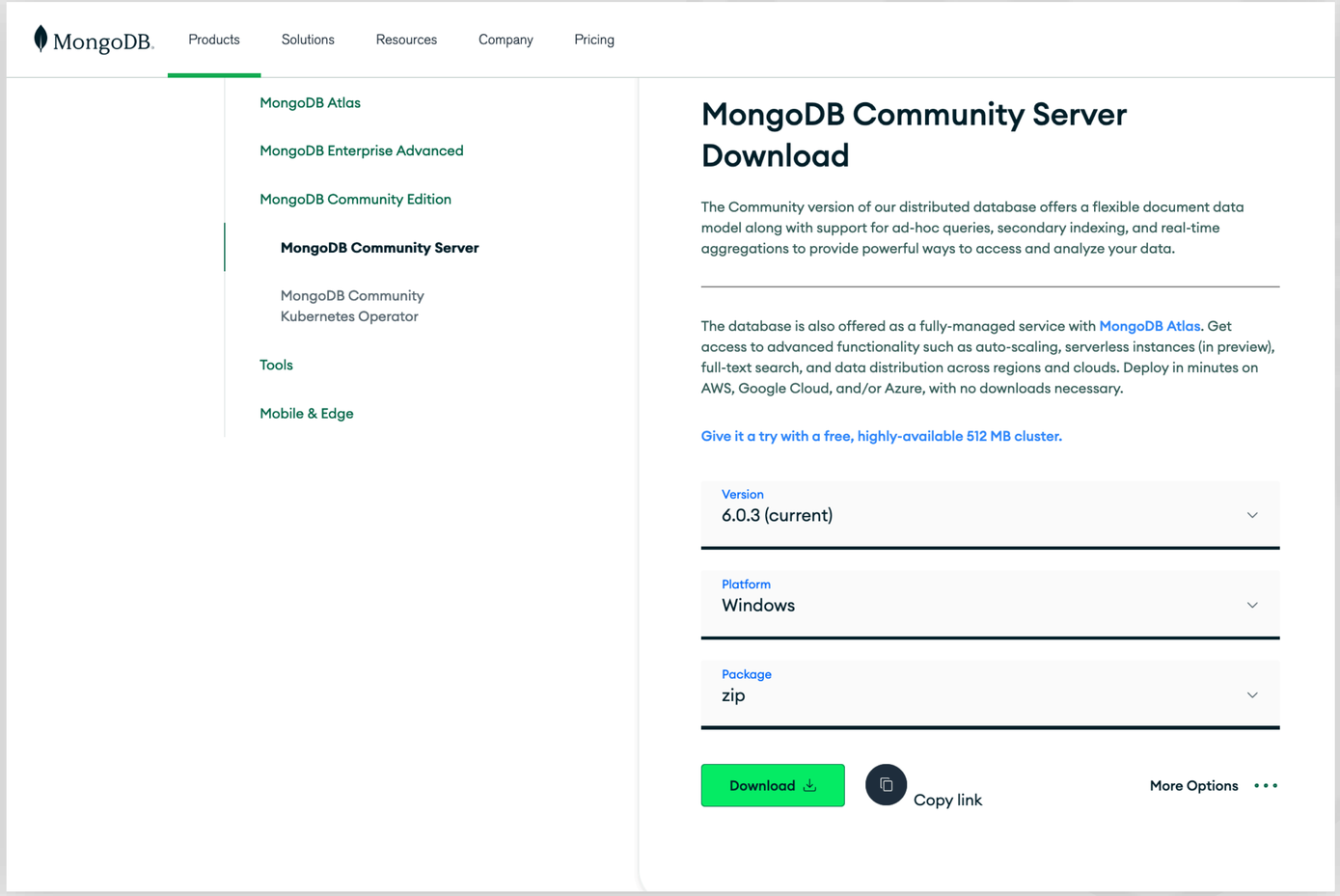
How to install MongoDB?

- Official MongoDB website
- Docker

How to install MongoDB?

WINDOWS

1. Go to [MongoDB Community Server Download]
2. Specify Version, Platform and Package format
3. Click **Download**
4. Wait for the download to finish

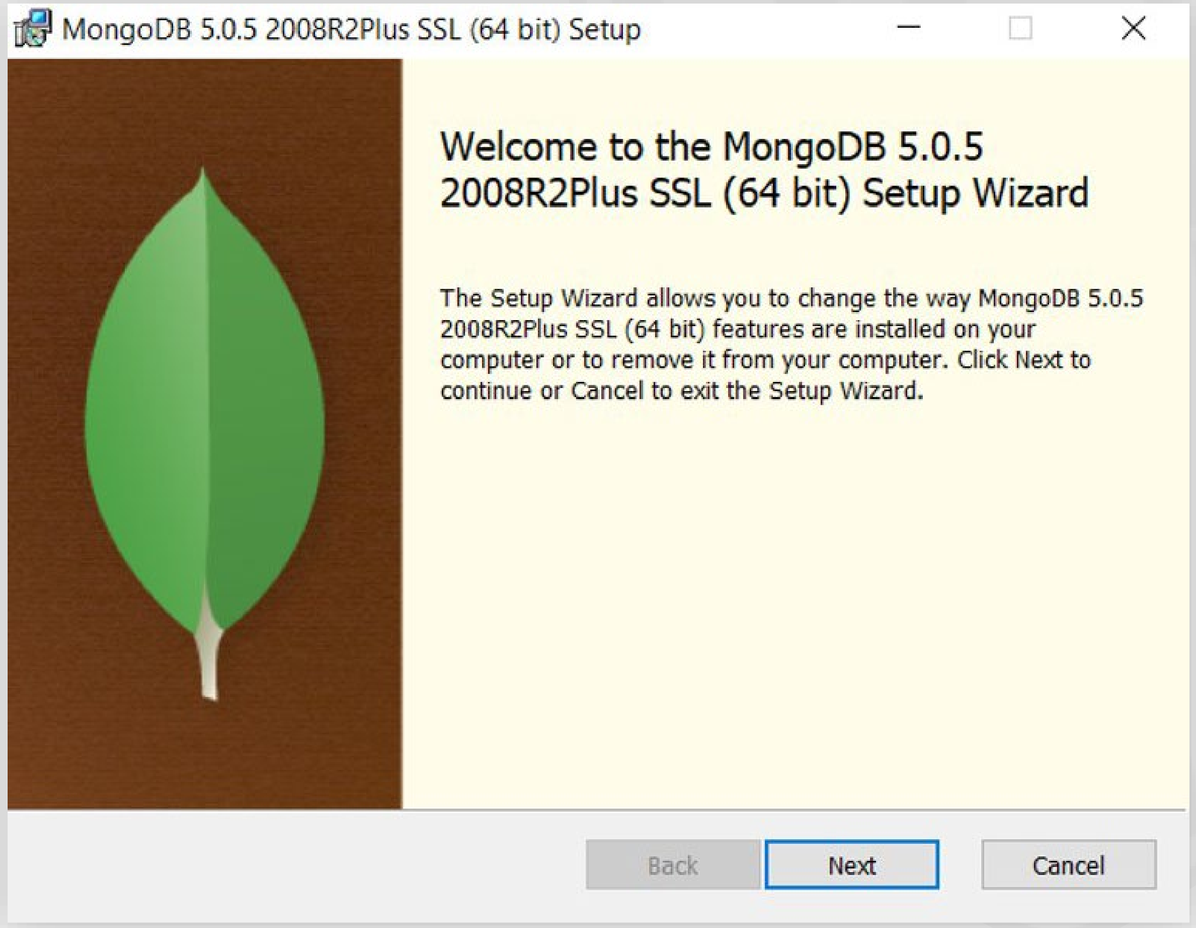


How to install MongoDB?

WINDOWS

5. Run the Installation Wizard

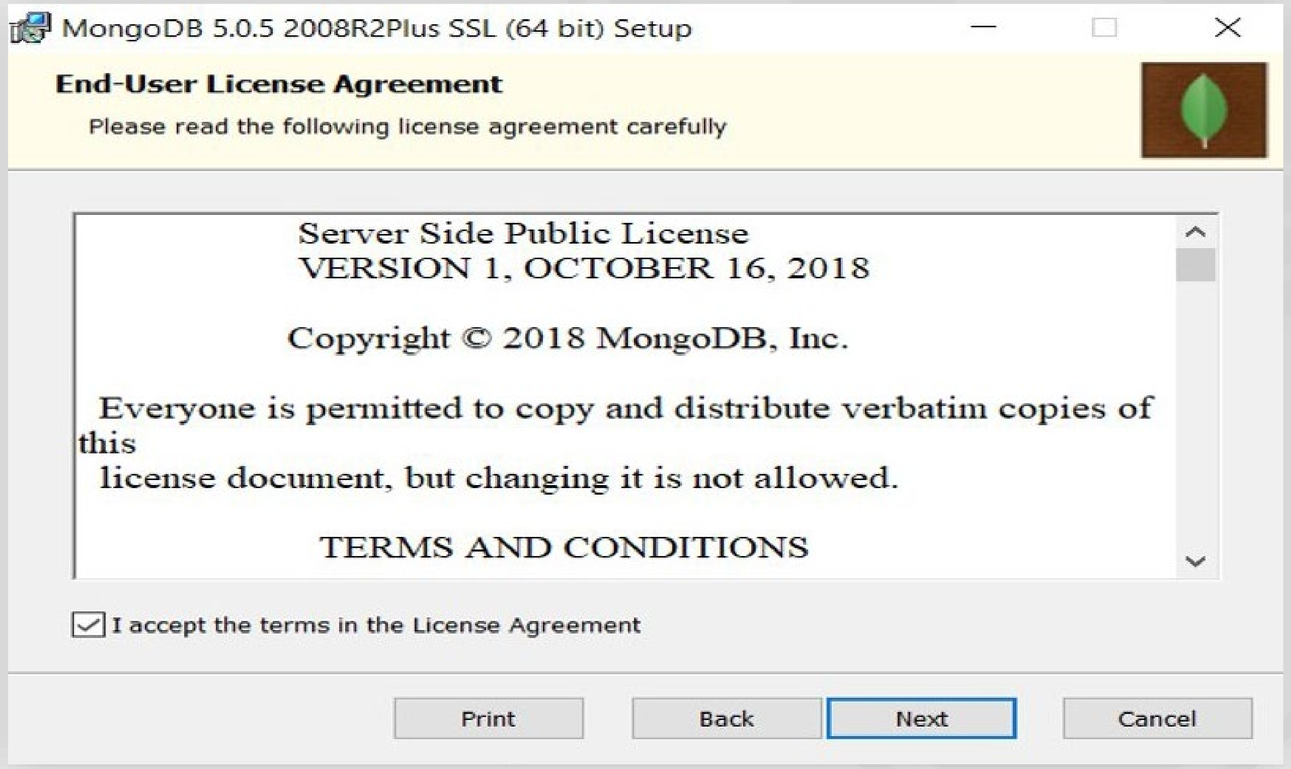
6. Click Next



How to install MongoDB?

WINDOWS

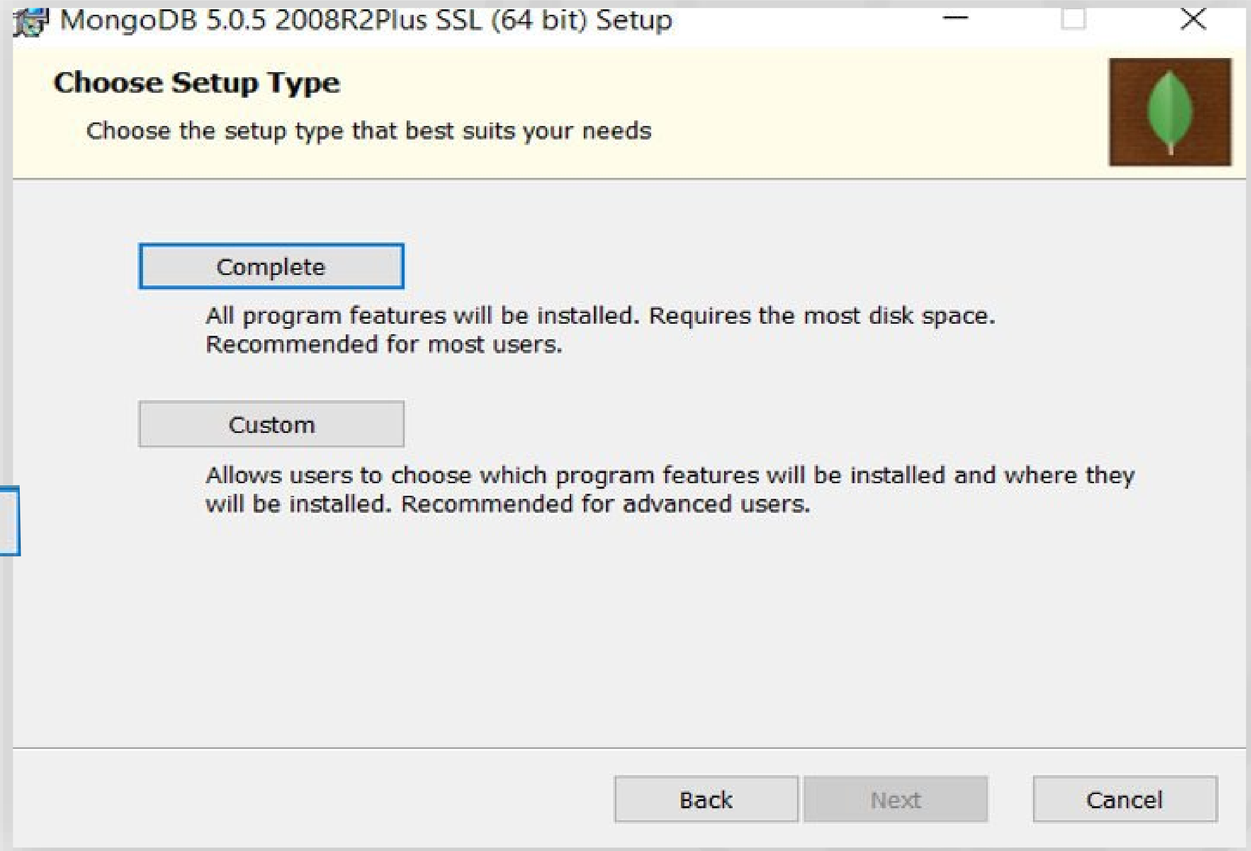
5. Run the Installation Wizard
6. Click Next
7. Accept the terms and click Next



How to install MongoDB?

WINDOWS

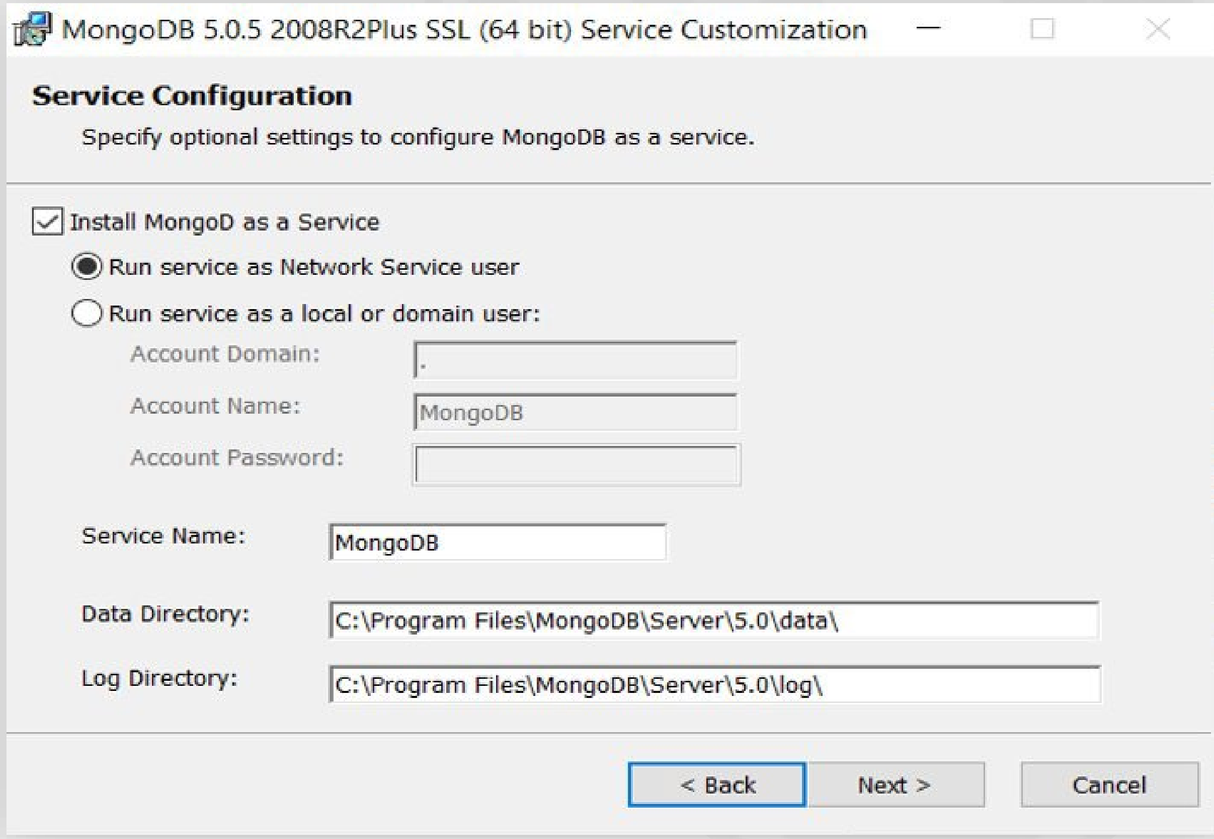
5. Run the Installation Wizard
6. Click Next
7. Accept the terms and click Next
8. Choose Complete Setup Type and click Next



How to install MongoDB?

WINDOWS

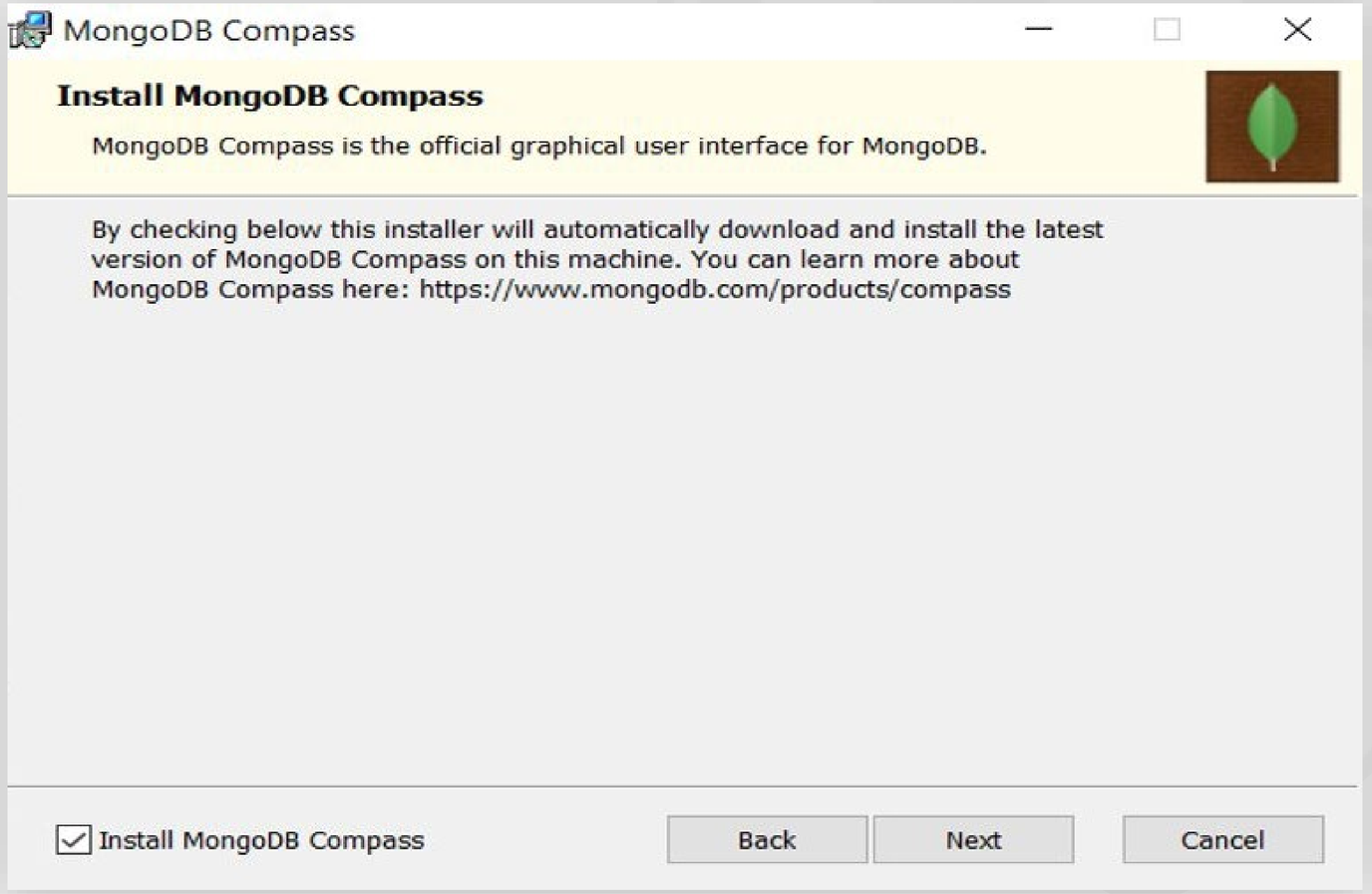
5. Run the Installation Wizard
6. Click Next
7. Accept the terms and click Next
8. Choose Complete Setup Type and click Next
9. Modify fields to your preferences and click Next



How to install MongoDB?

WINDOWS

10. Install MongoDB Compass for GUI administration and click Next

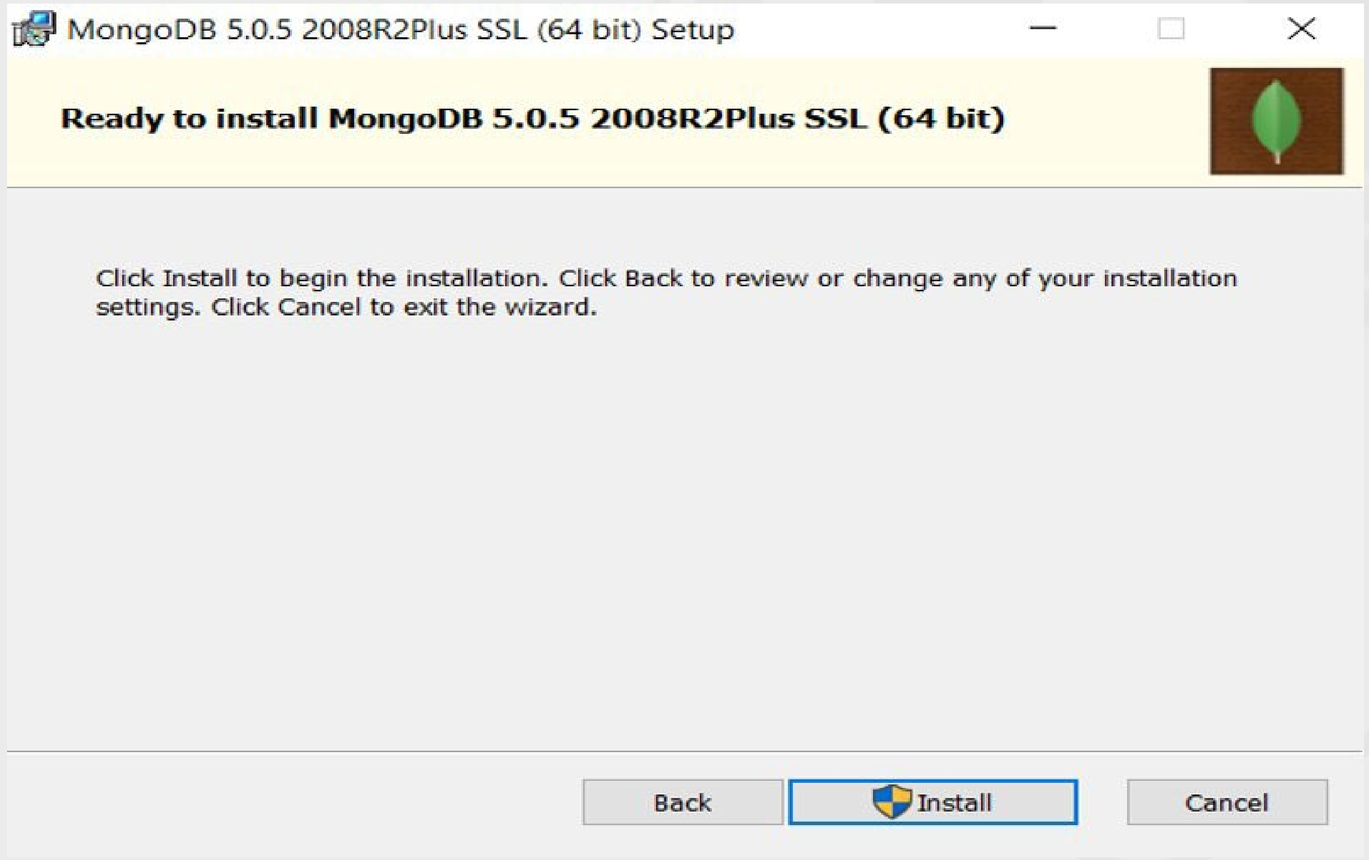


How to install MongoDB?

WINDOWS

10. Install MongoDB Compass for GUI administration and click Next

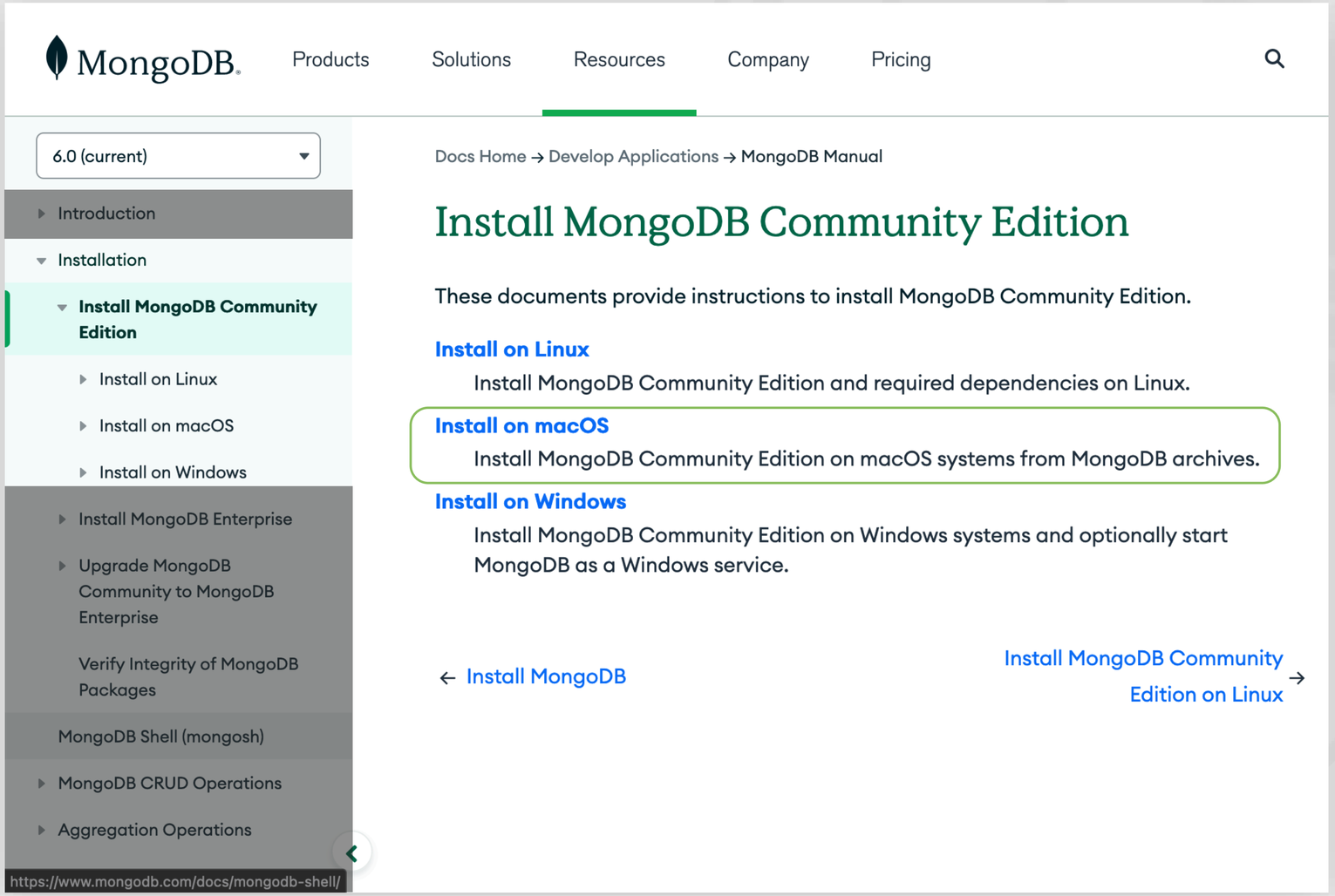
11. Click Install and then Finish



How to install MongoDB?

MACOS

1. Go to the Installation Guide Documents link
2. Go to your Platform Installation Guide
3. Follow the steps for installing XCode Command-Line Tools and Homebrew



https://www.mongodb.com/docs/manual/administration/install-community/

How to install MongoDB?

MACOS

4. Open the terminal and run the following commands:

- brew tap mongodb/brew
- brew install mongodb-community@6.0
- brew services start mongodb-community
- ==> Successfully started `mongodb-community` (label: homebrew.mxcl.mongodb-community)
- brew services stop mongodb-community #To stop server if needed
- ==> Successfully stopped `mongodb-community` (label: homebrew.mxcl.mongodb-community)
- brew services List #To check if MongoDB-community service is running

https://www.mongodb.com/docs/manual/administration/install-community/

How to install MongoDB?

MACOS

5. Installation creates the following files and directories at the location specified below, depending on your Apple hardware:

	Intel Processor	M1 Processor
Configuration File	/usr/local/etc/mongod.conf	/opt/homebrew/etc/mongod.conf
log directory	/usr/local/var/log/mongodb	/opt/homebrew/var/log/mongodb
data directory	/usr/local/var/mongodb	/opt/homebrew/var/mongodb

https://www.mongodb.com/docs/manual/administration/install-community/

How to install MongoDB?

MACOS

6. Run the Mongo daemon in one of your terminal windows to start the Mongo server using:

- mongosh

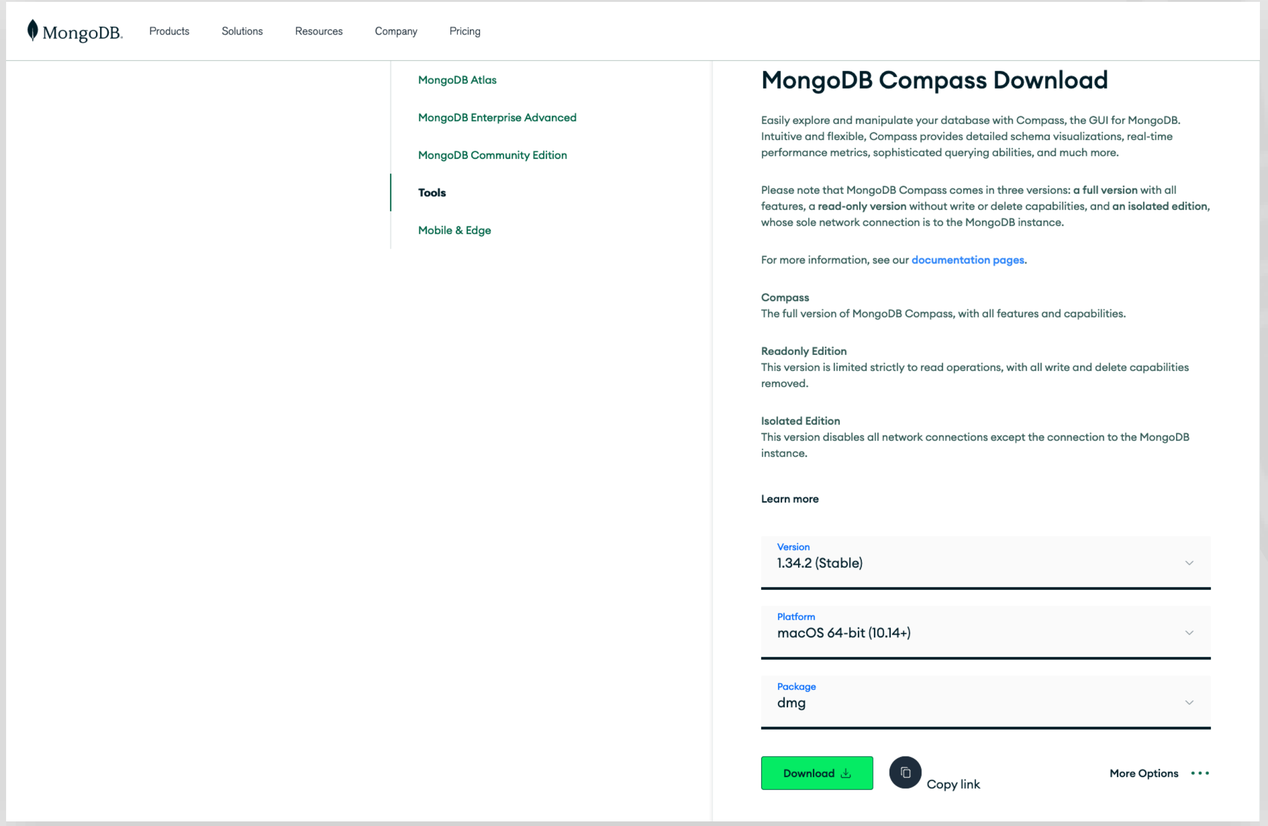
```
                                $ mongosh
Current Mongosh Log ID: 63bb133c57a2492bbc7e5c57
Connecting to:          mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+1.6.1
Using MongoDB:          6.0.3
Using Mongosh:          1.6.1

For mongosh info see: https://docs.mongodb.com/mongodb-shell/


To help improve our products, anonymous usage data is collected and sent to MongoDB periodically (https://www.mongodb.com/legal/privacy-policy).
You can opt-out by running the disableTelemetry() command.

------
   The server generated these startup warnings when booting
   2023-01-08T14:00:58.976-05:00: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted
------


------
   Enable MongoDB's free cloud-based monitoring service, which will then receive and display
   metrics about your deployment (disk utilization, CPU, operation statistics, etc).

   The monitoring data will be available on a MongoDB website with a unique URL accessible to you
   and anyone you share the URL with. MongoDB may use this information to make product
   improvements and to suggest MongoDB products and deployment options to you.

   To enable free monitoring, run the following command: db.enableFreeMonitoring()
   To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
------

test> show dbs
admin   40.00 KiB
config  12.00 KiB
local   72.00 KiB
test>
```

https://www.mongodb.com/docs/manual/administration/install-community/

How to install MongoDB?

MACOS

6. Go to [Mongo Compass download page](https://www.mongodb.com/try/download/compass) and download GUI for your macOS processor



How to install MongoDB?

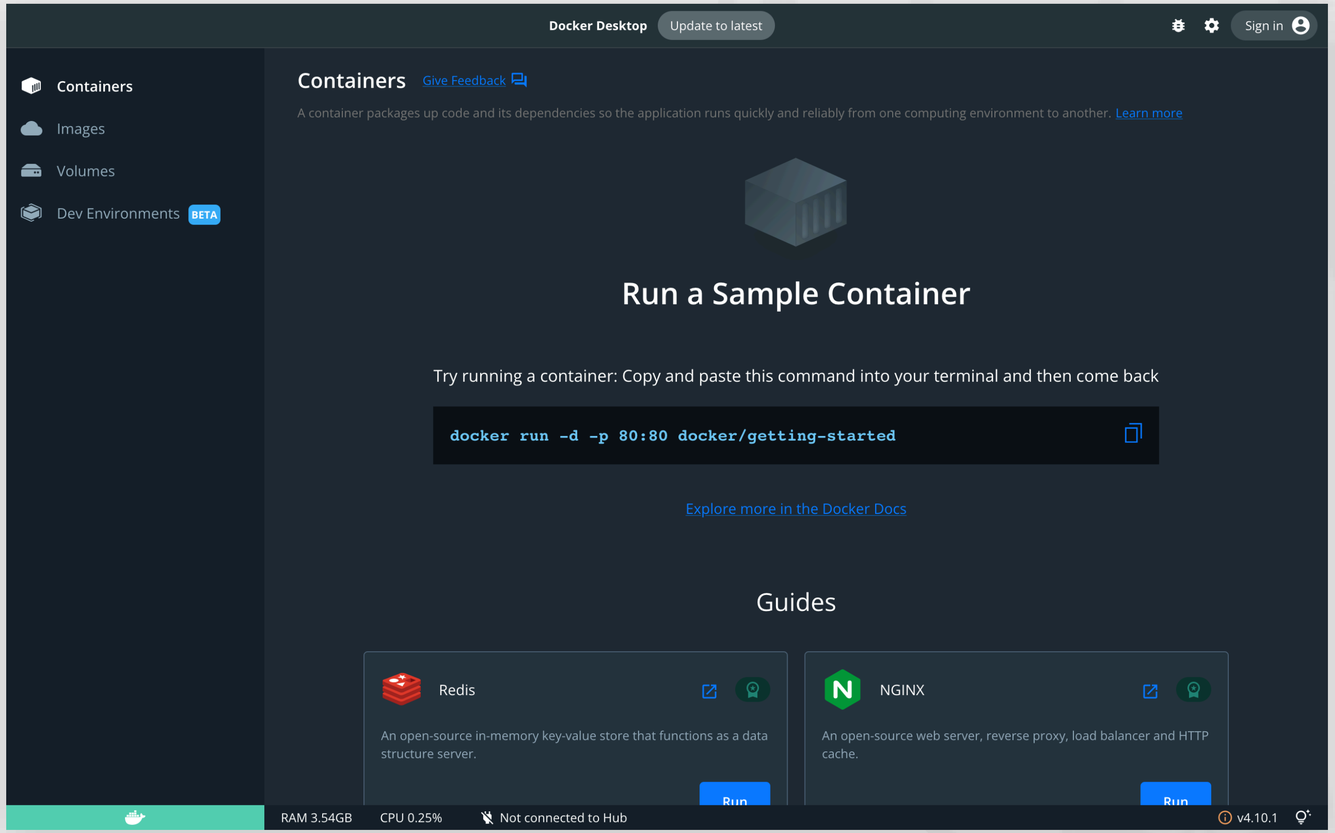
- Official MongoDB website
- Docker

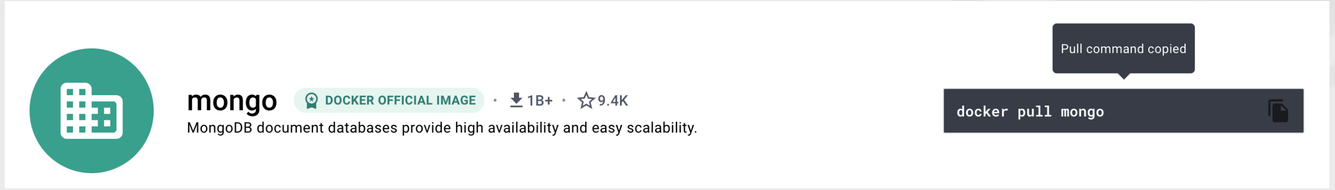
How to use MongoDB with Docker?

1. Download and Install Docker Desktop for your platform from the official docker website

2. Start your docker engine by opening Docker Desktop

3. Find The official image available on Docker Hub contains the community edition of MongoDB and is maintained by the Docker team.





How to use MongoDB with Docker?

4. Open your terminal and enter following command and wait for the image and its containars to download:

   - docker pull mongo

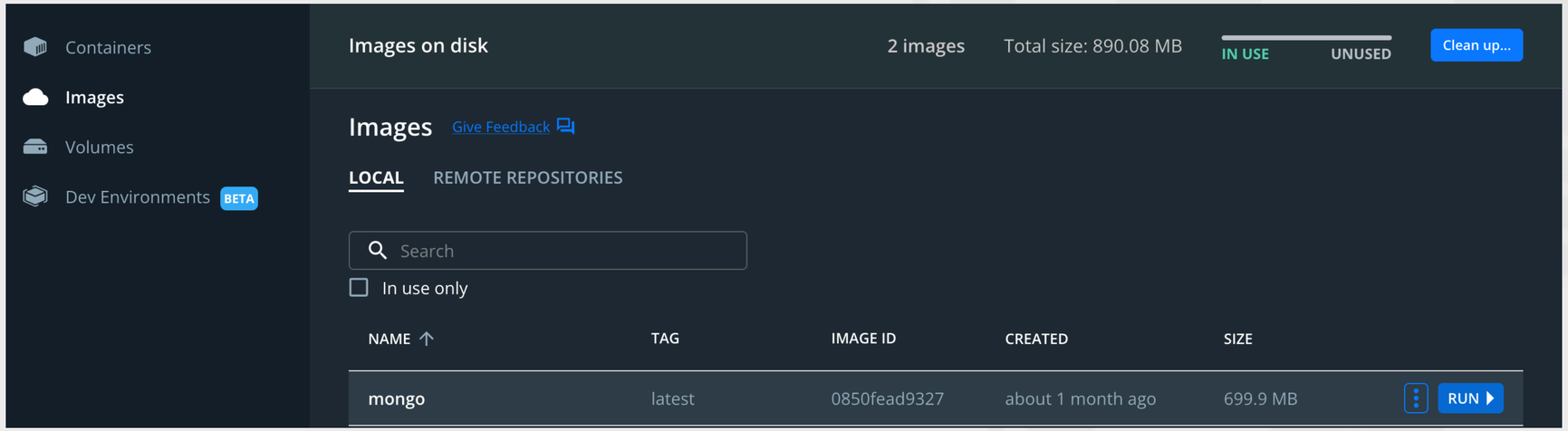
```
$ docker pull mongo
Using default tag: latest
latest: Pulling from library/mongo
846c0b181fff: Pull complete
ef773e84b43a: Pull complete
2bfad1efb664: Pull complete
84e59a6d63c9: Pull complete
d2f00ac700e0: Pull complete
96d33bf42f45: Pull complete
ebaa69d77b61: Pull complete
aa77b709a7d6: Pull complete
245bd0c9ace2: Pull complete
Digest: sha256:c015870b10451c414911aff5648495bd3fcc9fe0cec340f46bb852706697a72f
Status: Downloaded newer image for mongo:latest
docker.io/library/mongo:latest
```

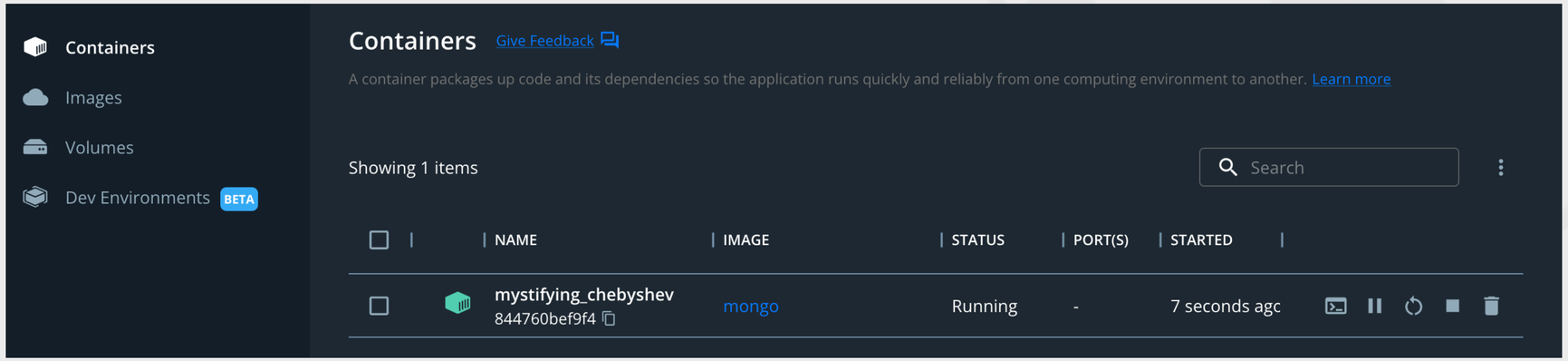
How to use MongoDB with Docker?

1. Run MongoDB containa:

- Go to your Docker Desktop and on the Images tab find mongo image

- Go to your containers tab and click RUN and Then open a terminal with





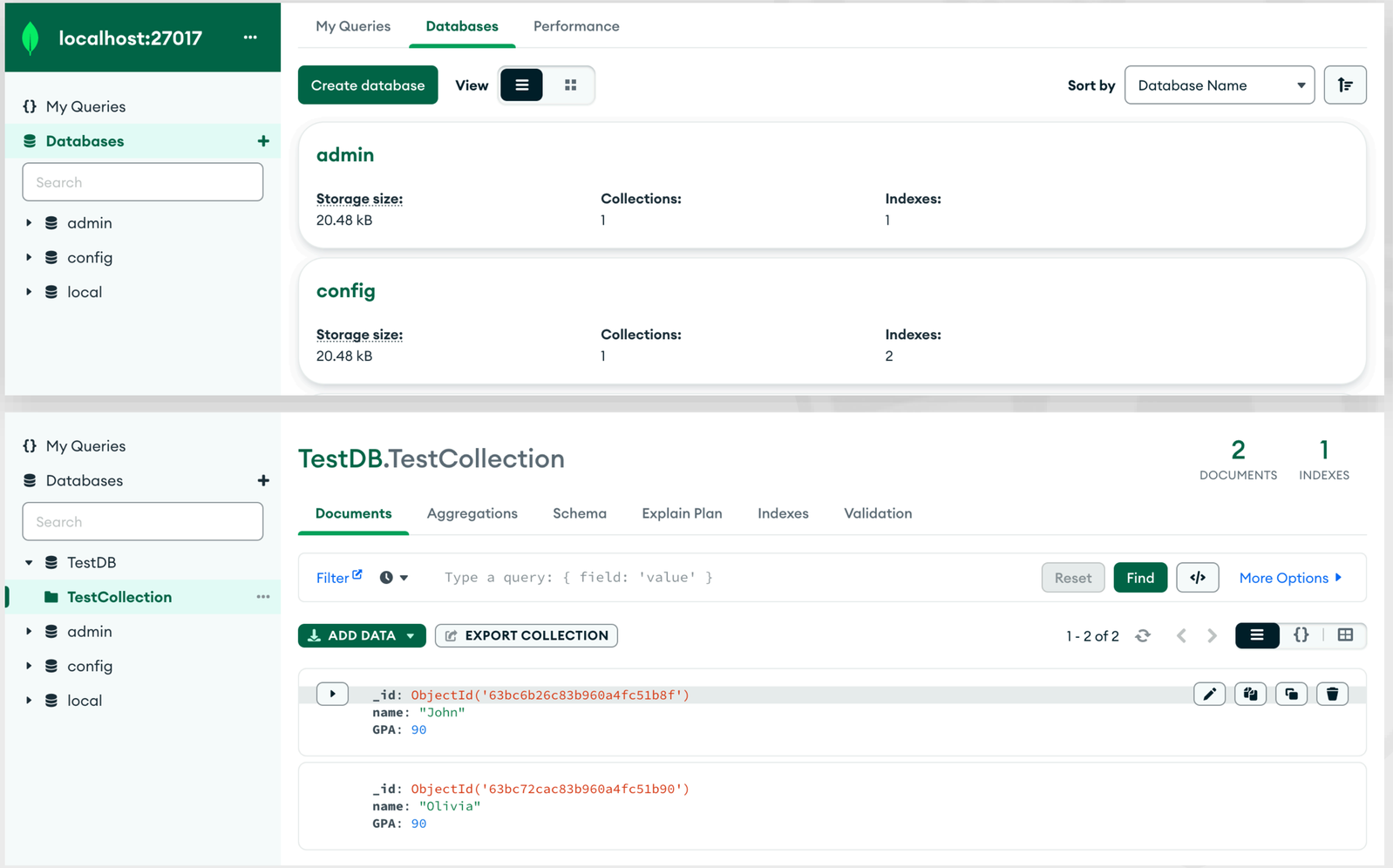
Create Database

Create Database

Using MongoDB Compass

1. Click Create database and name the database.

2. Click ADD DATA and create new documents



Create Database

Using Manosh

- Create database
  - use DATABSE_NAME
- To check selected database
  - db
- Check database list
  - show dbs

- Note: To display the created database in database list you need to add at least one Collection to it using following command
  - db.createCollection(“COLLECTION_NAME”, options)
- To remove a database
  - db.dropDatabase()

CRUD

Create,
Read,
Update,
Delete

Create

Create individual document:

- db.COLLECTION_NAME.insertOne({“FIELD_NAME”: value, … })

Create multiple document at once:

- db.COLLECTION_NAME.insertMany([{“FIELD_NAME”: value, … },{“FIELD_NAME”: value, … }, …])

example:

```
db.students.insertOne(
  {
    name: “John”,
    age: 26,
    GPA: 90
  })
```

collection

field : value

field : value

field : value

} document

Read

Retrieve a document from a collection

- db.COLLECTION_NAME.find(Query Criteria)

example:

```
db.students.find(
        { age: {$gt: 18} }
    ).limit(5)
```

students with age greater than 18

limit the results up to five instances

gt	greater than
gte	greater than equal
lt	less than
lte	less than equal
ne	not equal
in	in (array)
nin	not in (array)

Update

To modify a single document from a collection

- db.COLLECTION_NAME.updateOne()

To modify multiple documents from a collection

- db.COLLECTION_NAME.updateMany()

example:

```
db.students.updateMany(
        { age: {$lt: 18} }
        { set: {GPA: 80} }
    )
```

Only update the students with the age of less than 18 — update filter

Set the GPA of them equal to 80 — update action

Delete

To delete a single document from a collection

- db.COLLECTION_NAME.deleteOne()

To delete multiple documents from a collection

- db.COLLECTION_NAME.deleteMany()

example:

```
db.students.deleteMany(
        { name: “Alice” }
    )
```

delete student with the name of Alice delete filter

Assignment

- Take a look at the official MongoDB cheat sheet.
- Create a Database and name it with your name+”_”+surname
- Create a collection called “customers” and add 5 customers using the following template:

```
{
   customer_name: “”
   age: number
   email:””
   phone_number:””
   address:””
   city:””
   zipcode:””
   order_amount:””
   order_date:date
   order_status_completed:false/true
}
```