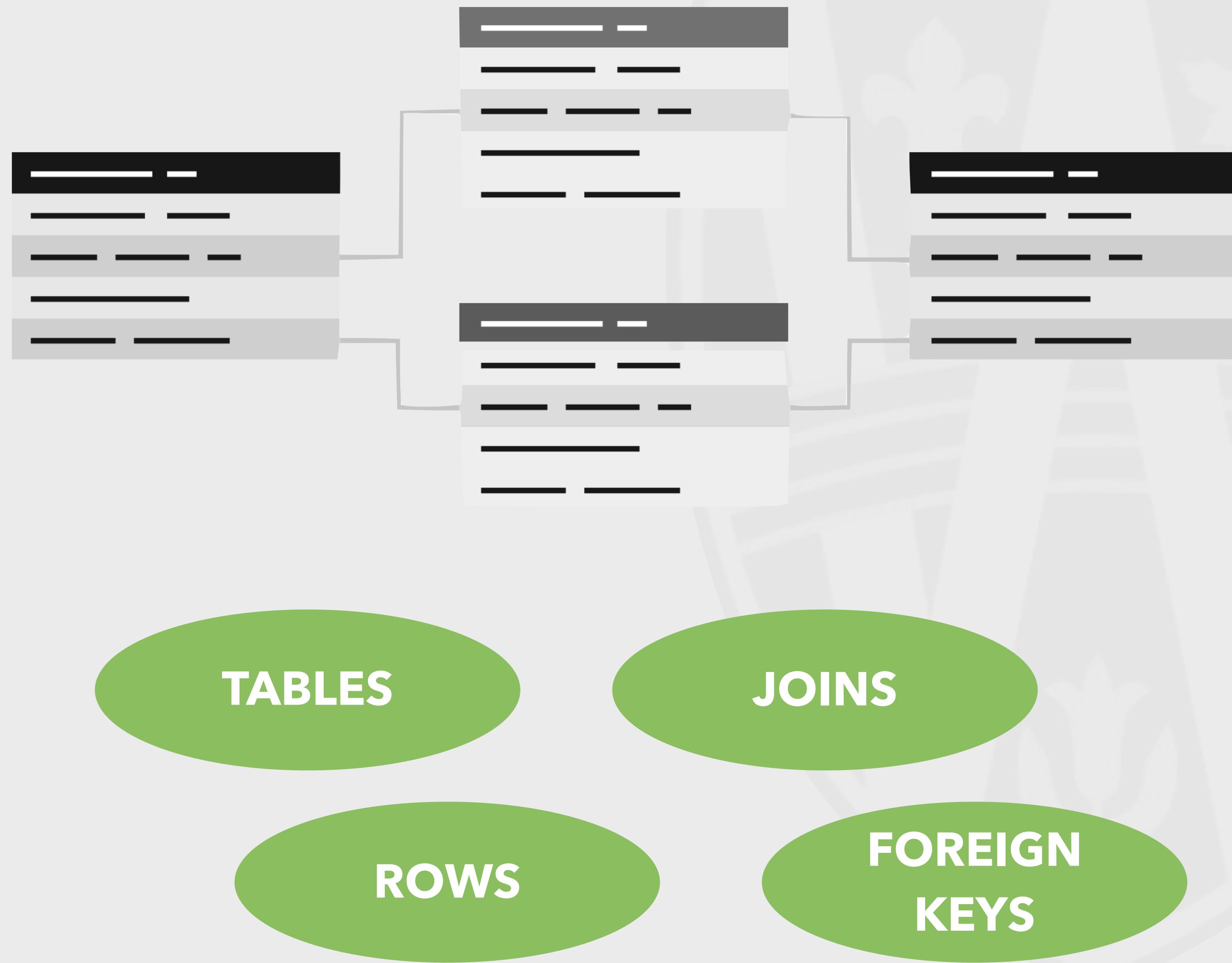
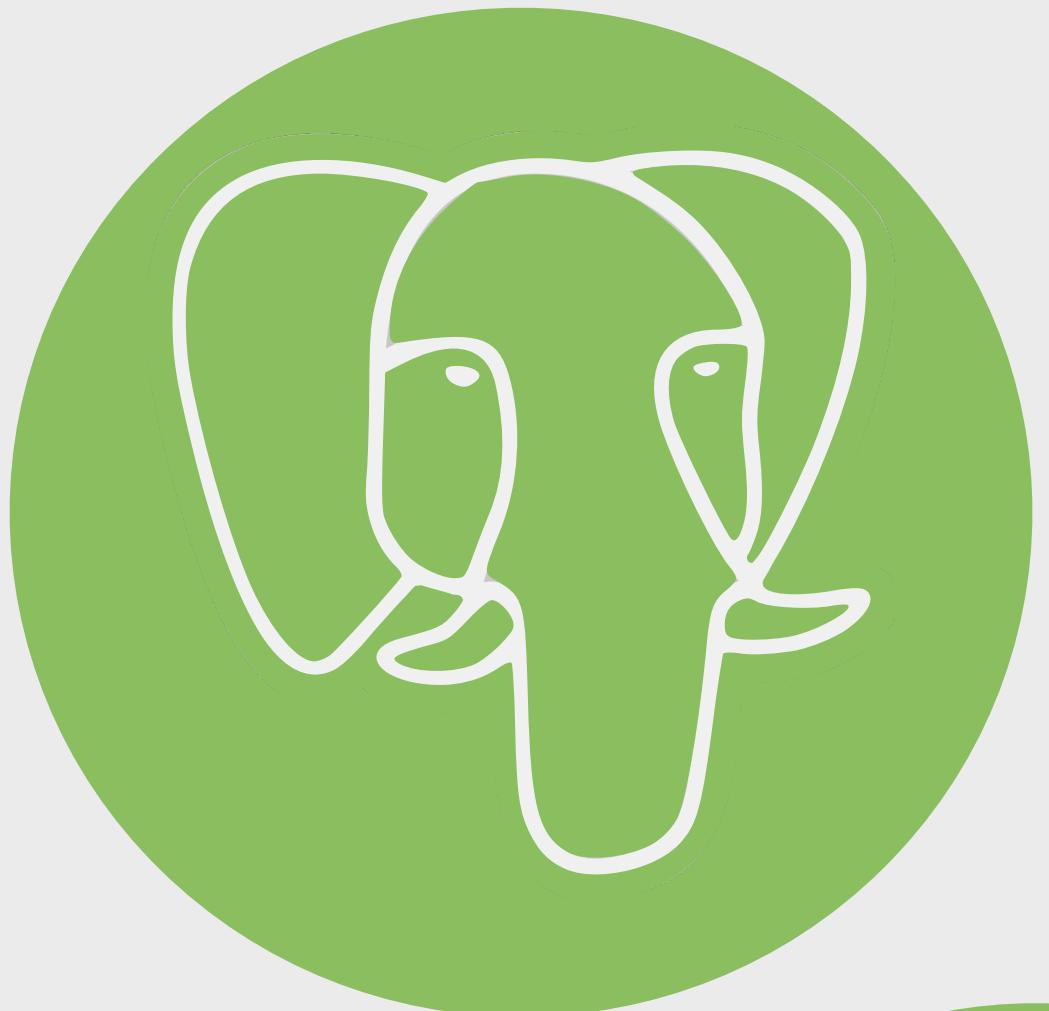


MongoDB

Types of DBs

- ▶ Relational database
- ▶ NoSQL database
- ▶ Centralized database
- ▶ Cloud database
- ▶ Commercial database
- ▶ Distributed database
- ▶ ...

Relational DBs

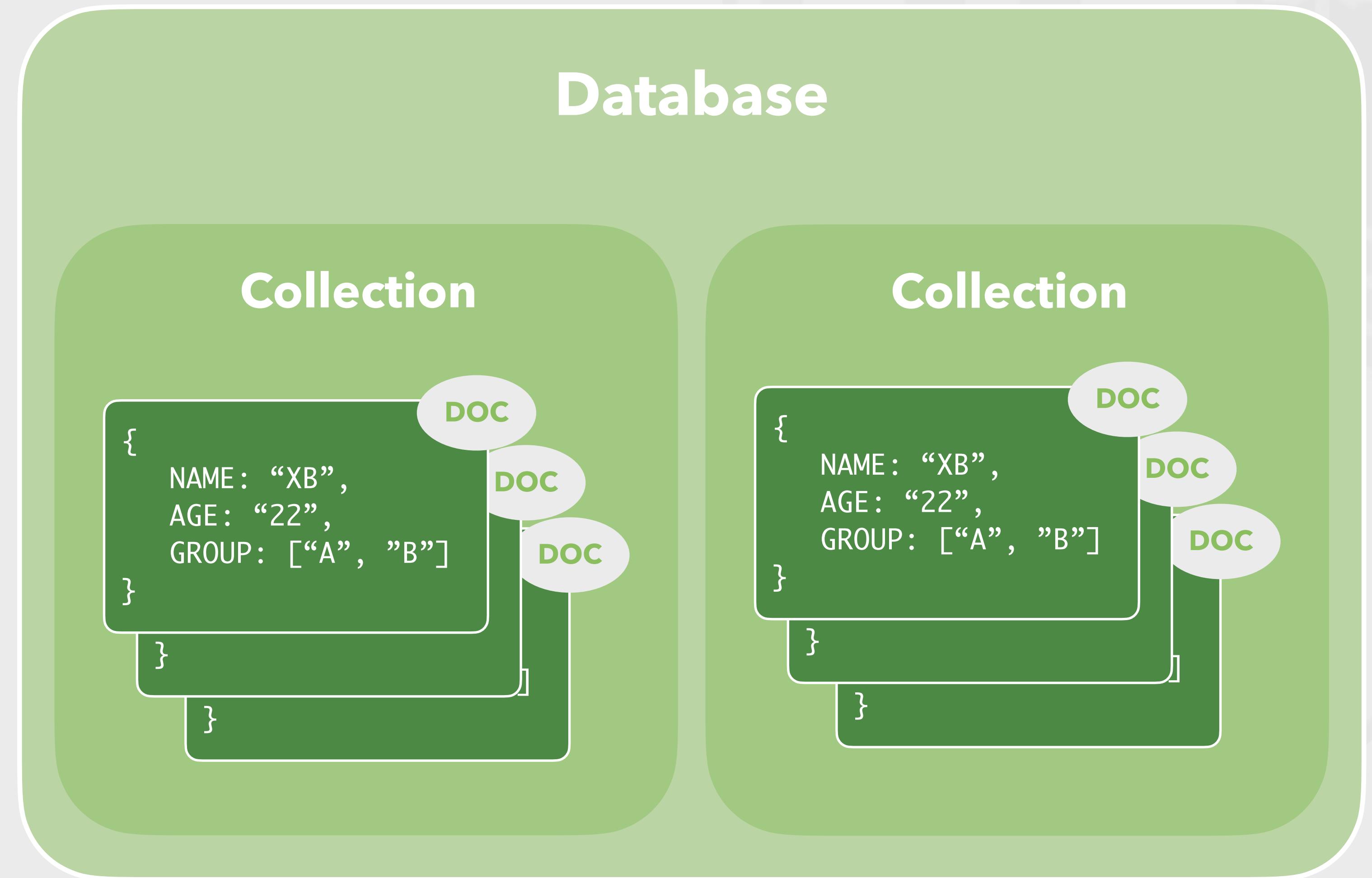


What Is MongoDB?

- ▶ “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

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?



1. Go to [MongoDB Community](#)

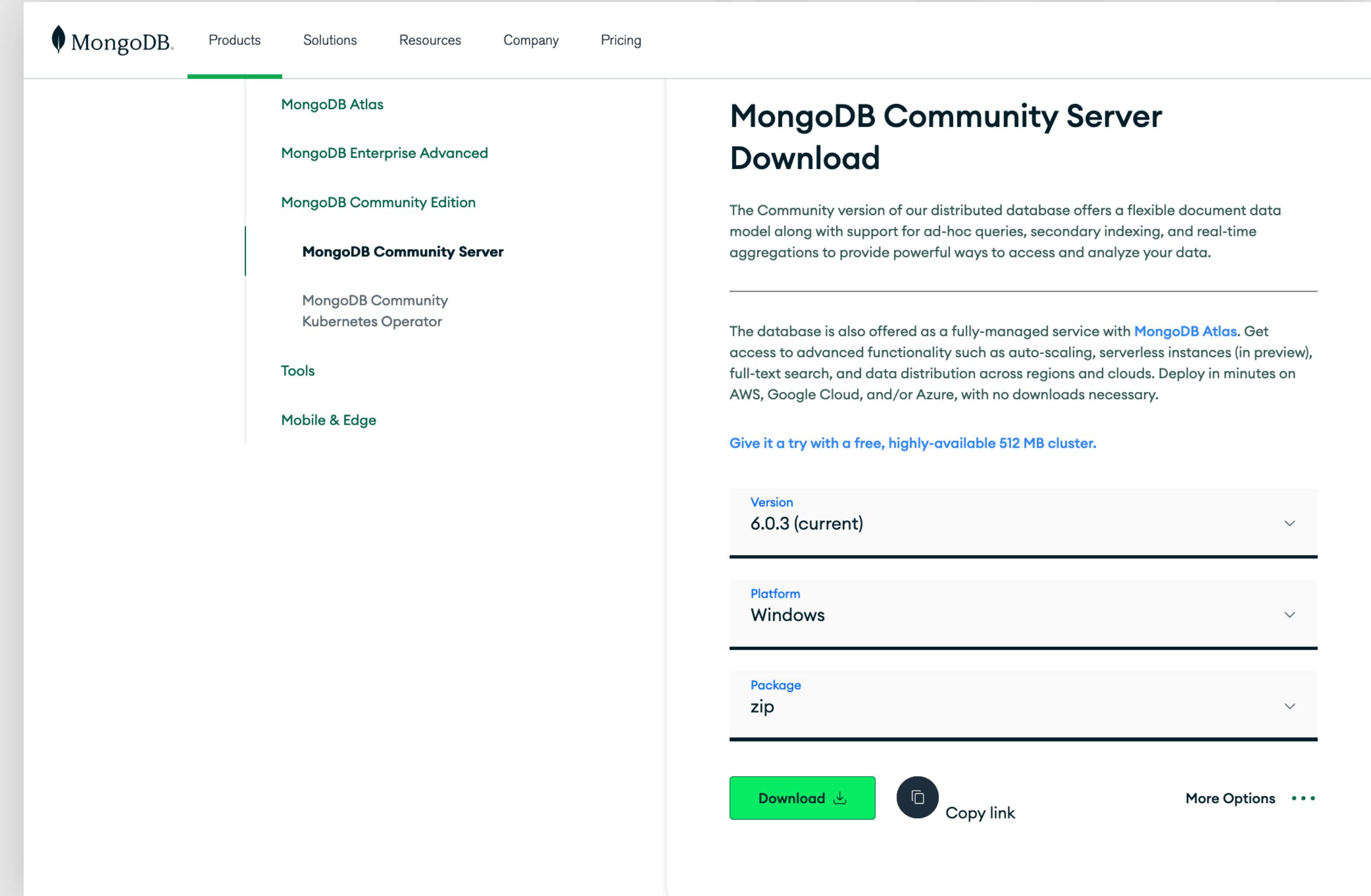
[Server Download](#)

2. Specify Version, Platform and

Package format

3. Click [Download](#)

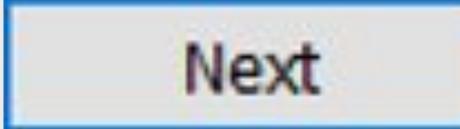
4. Wait for the download to finish

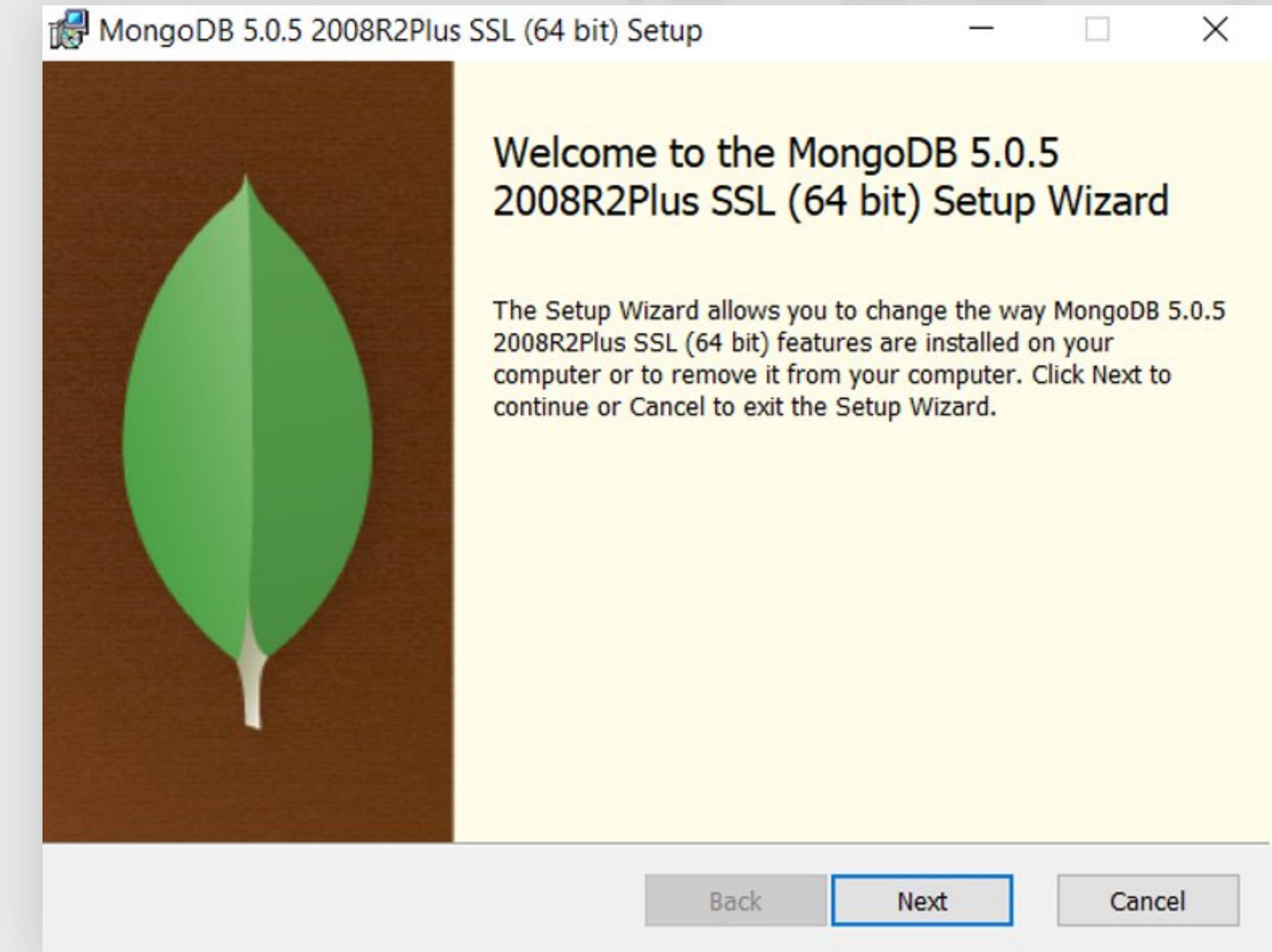


The screenshot shows the MongoDB website's product selection interface. On the left, a sidebar lists various MongoDB products: MongoDB Atlas, MongoDB Enterprise Advanced, MongoDB Community Edition, MongoDB Community Server (which is currently selected and highlighted in green), MongoDB Community Kubernetes Operator, Tools, and Mobile & Edge. The main content area is titled "MongoDB Community Server Download". It describes the Community version as a flexible document data model with support for ad-hoc queries, secondary indexing, and real-time aggregations. It also mentions MongoDB Atlas as a managed service. Below this is a section for trying a free cluster. At the bottom, there are dropdown menus for "Version" (set to "6.0.3 (current)"), "Platform" (set to "Windows"), and "Package" (set to "zip"). A large green "Download" button is at the bottom left, and "Copy link" and "More Options" buttons are at the bottom right.

How To Install MongoDB? WINDOWS

5. Run the **Installation Wizard**

6. Click 



How To Install MongoDB? WINDOWS

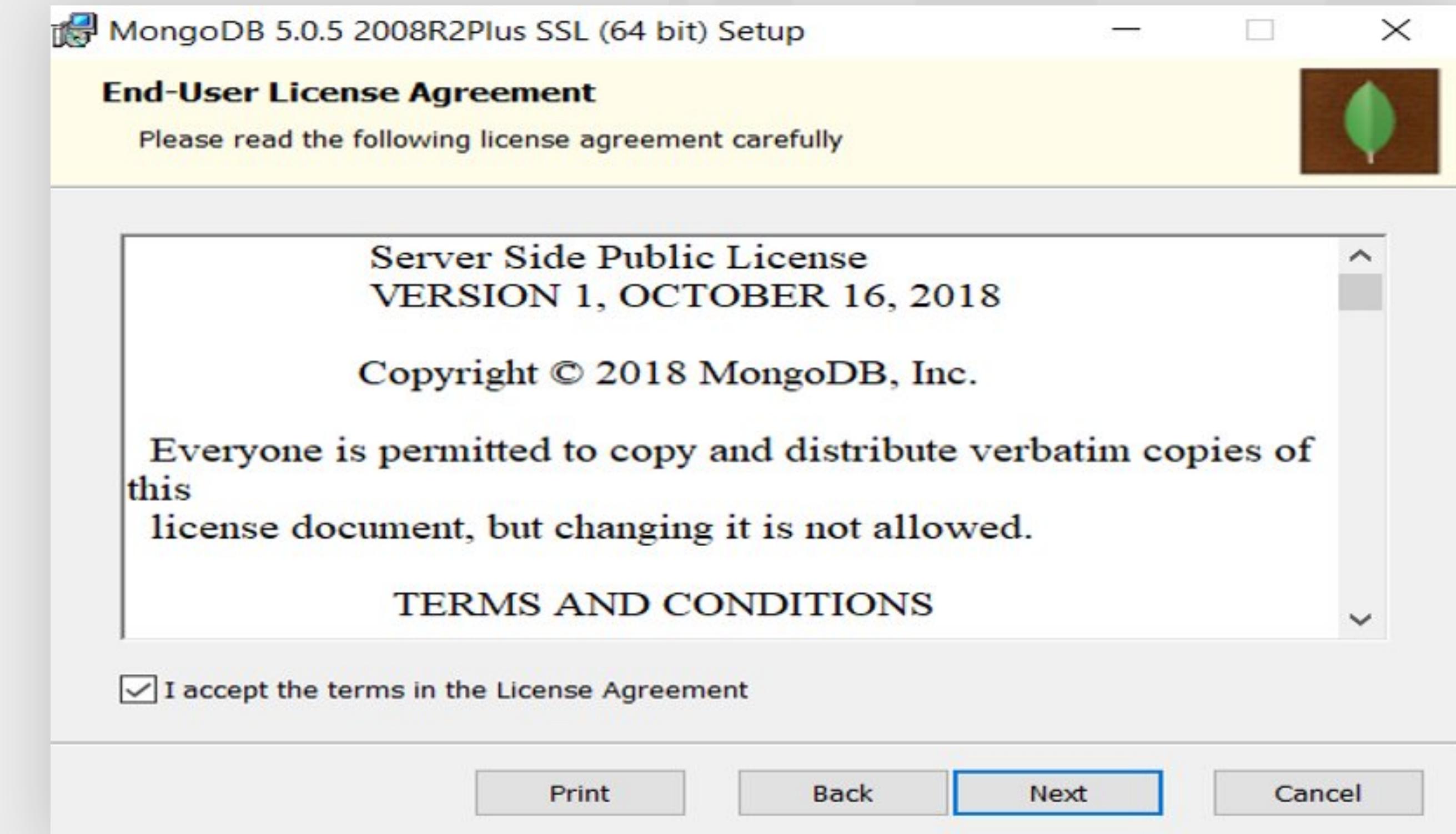
5. Run the Installation Wizard

6. Click

Next

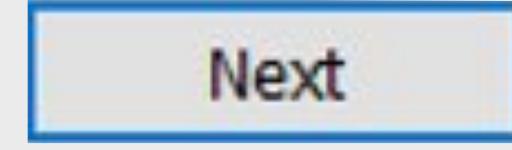
7. Accept the terms and click

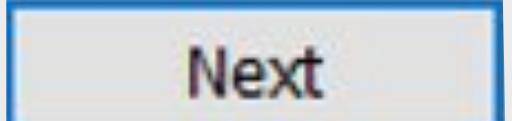
Next

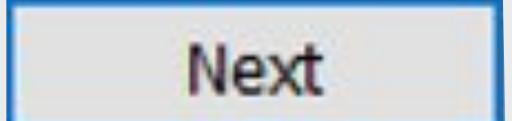


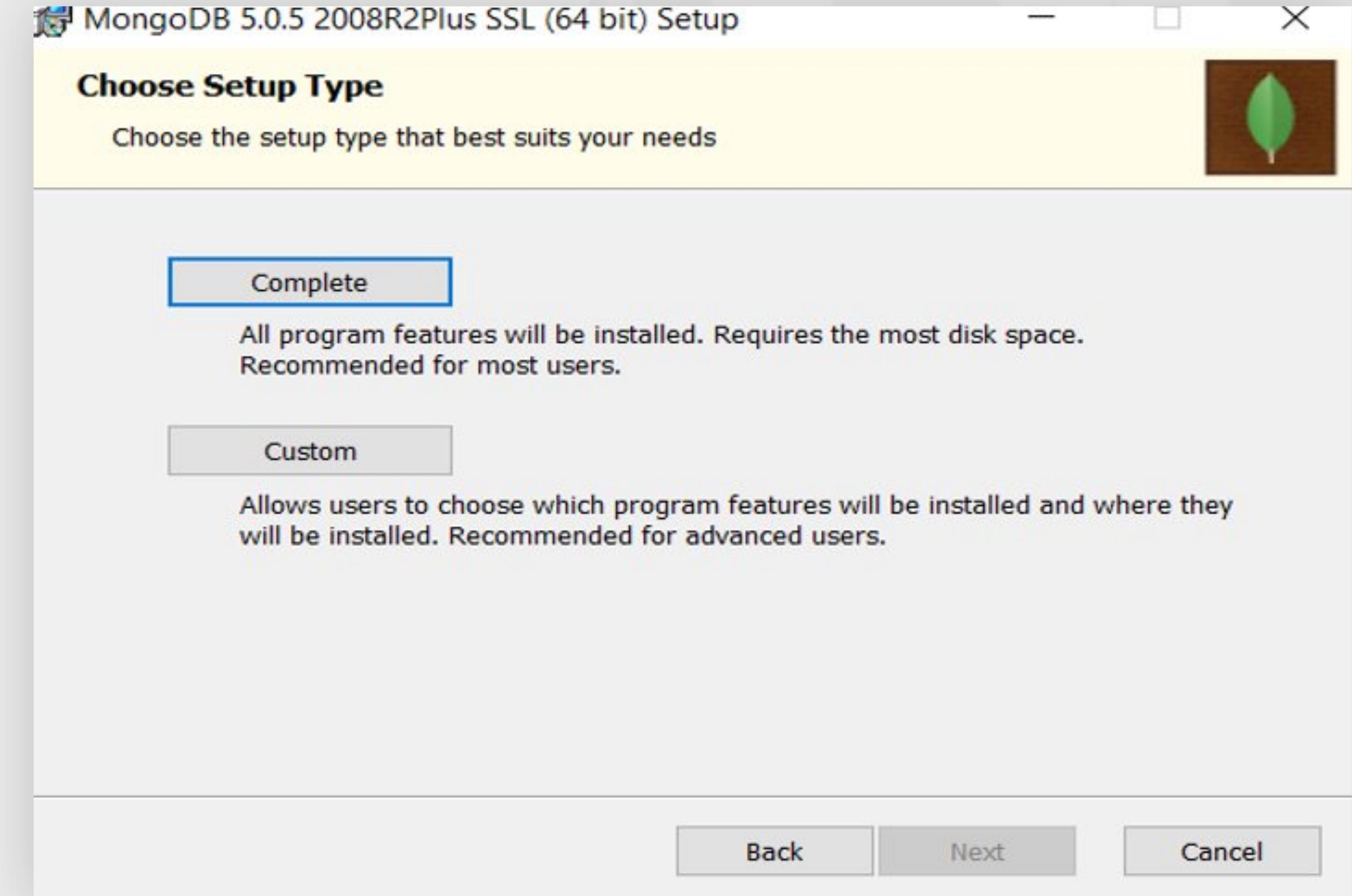
How To Install MongoDB? WINDOWS

5. Run the Installation Wizard

6. Click 

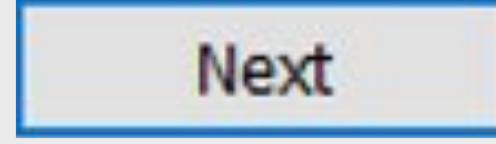
7. Accept the terms and click 

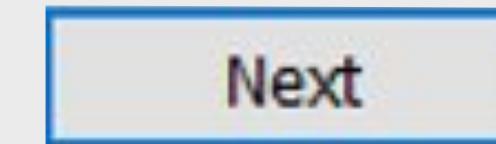
8. Choose  Setup Type and
click 

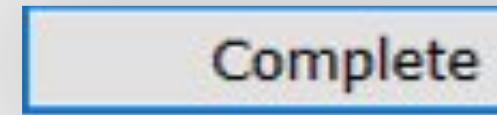


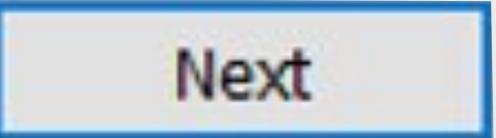
How To Install MongoDB? WINDOWS

5. Run the Installation Wizard

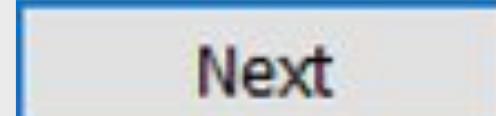
6. Click 

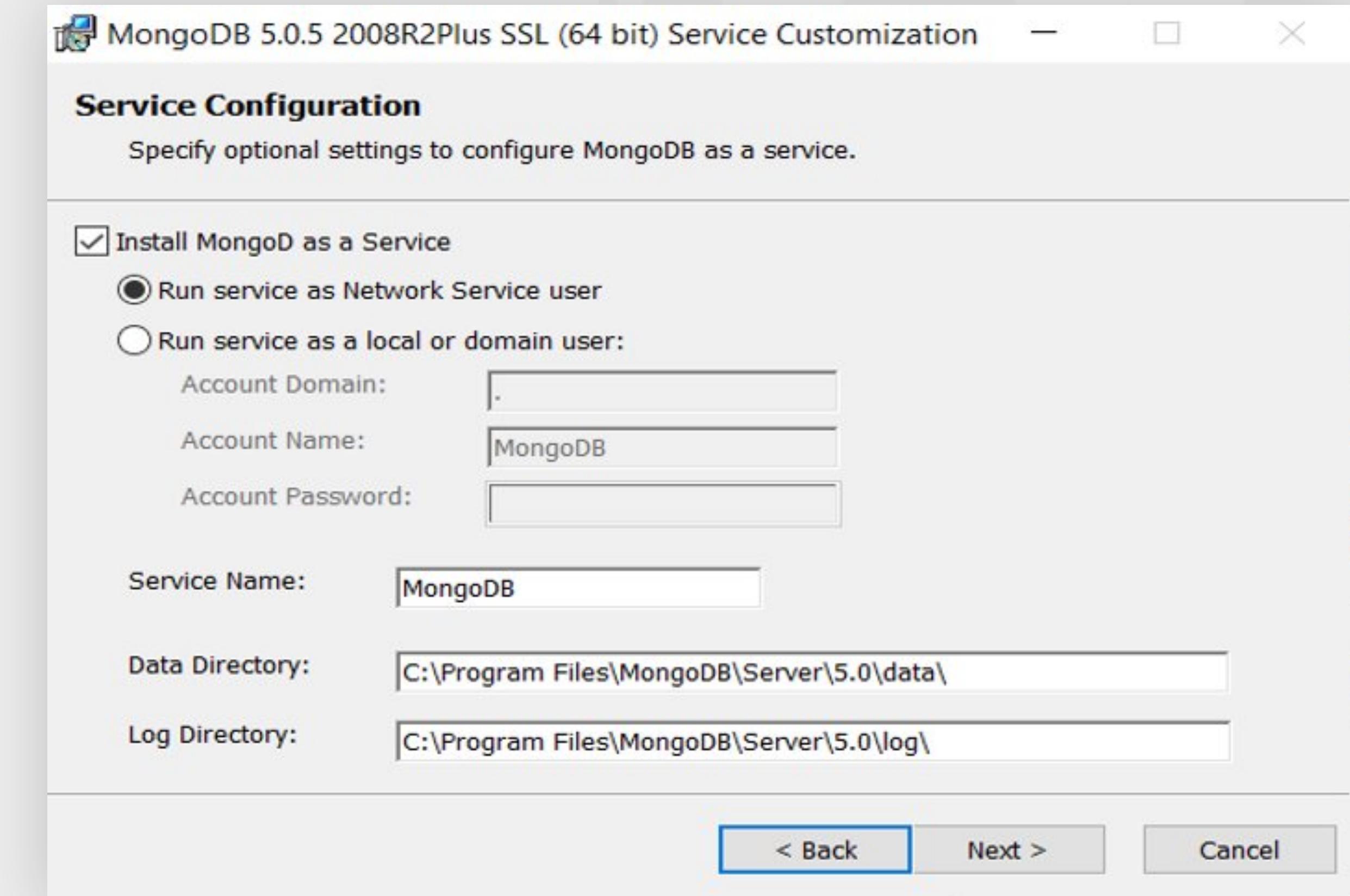
7. Accept the terms and click 

8. Choose  Setup Type and

click 

9. Modify fields to your preferences and

click 

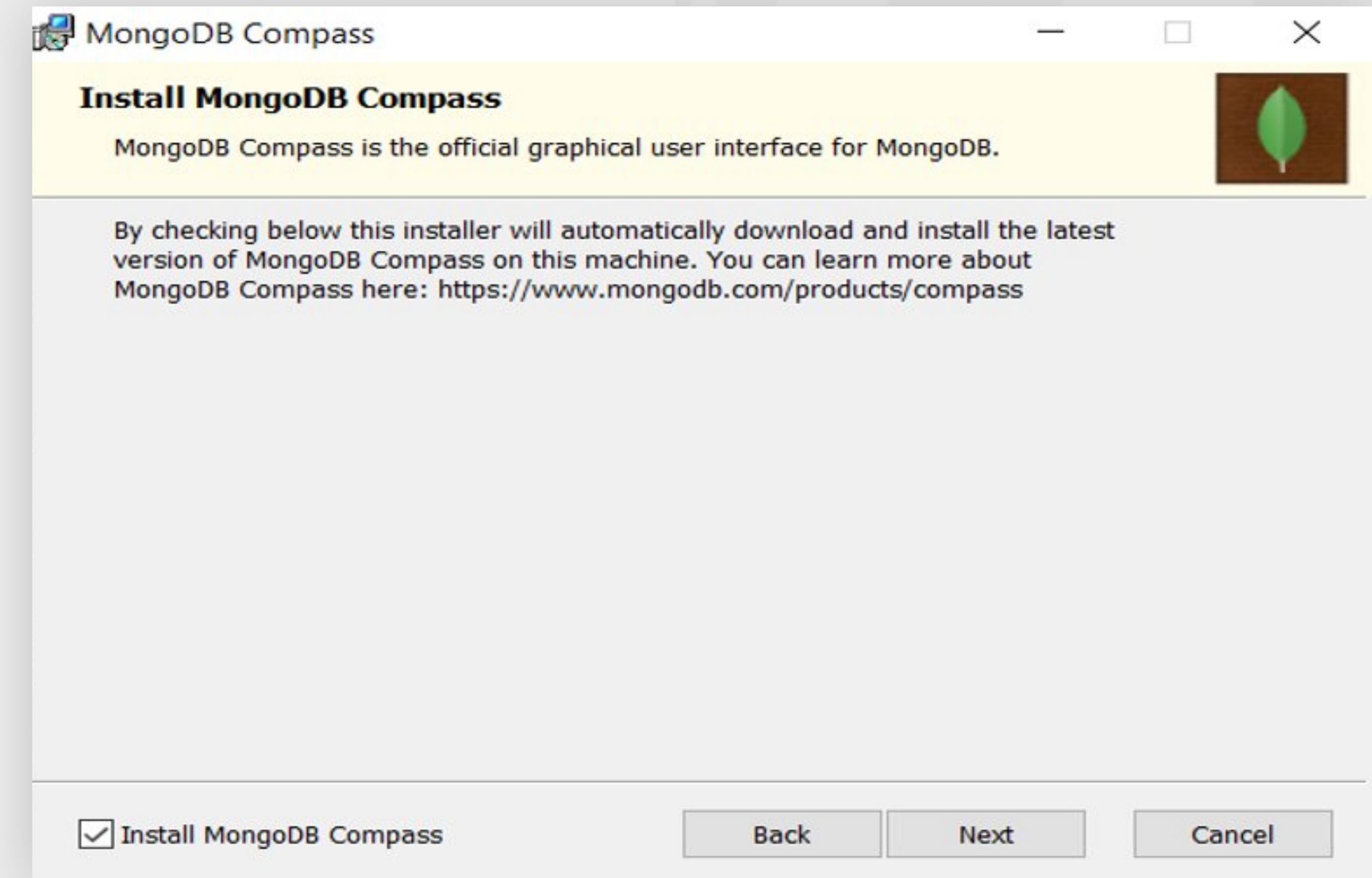


How To Install MongoDB? WINDOWS

10. Install MongoDB Compass for GUI

administration and click

Next



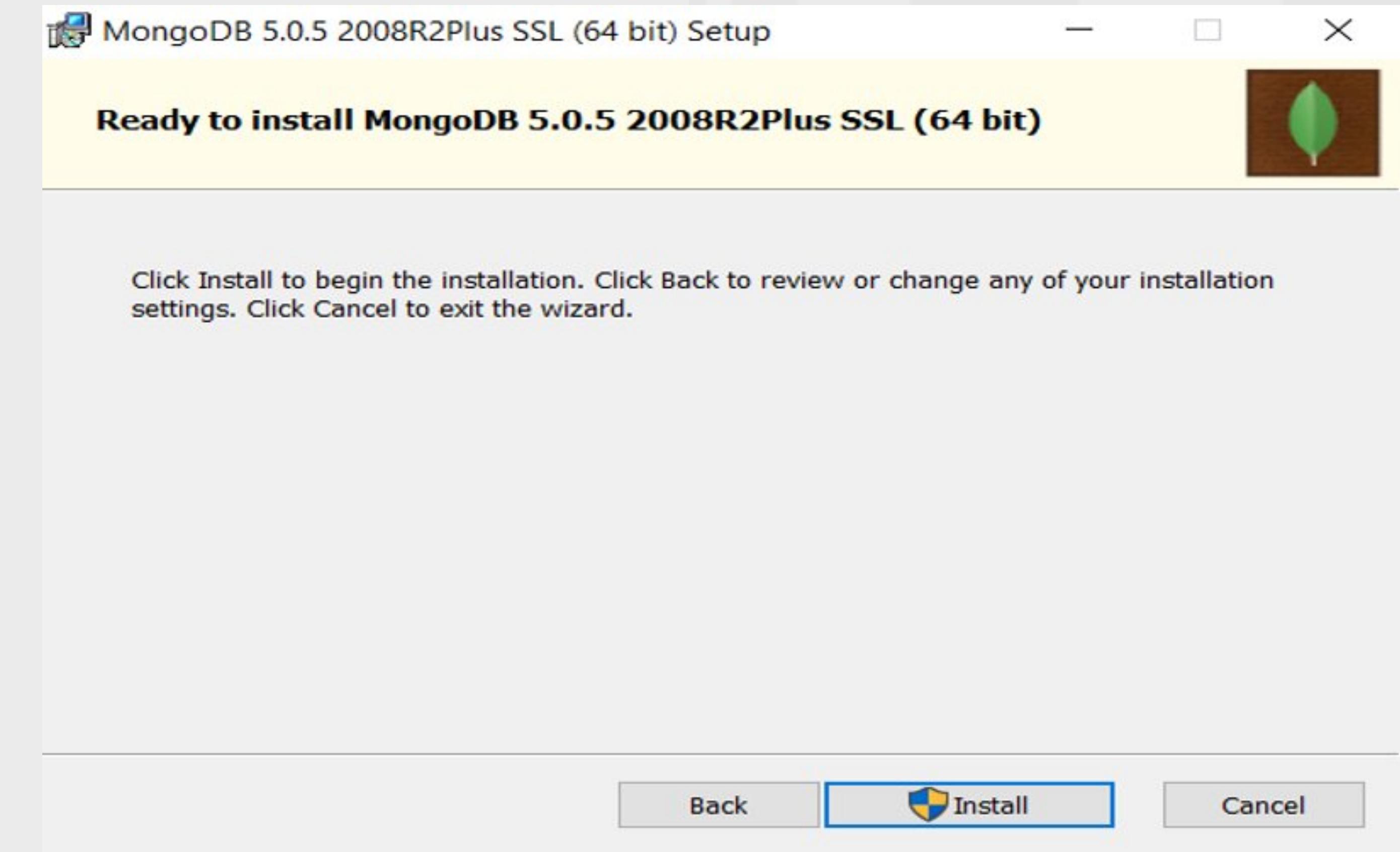
How To Install MongoDB? WINDOWS

10. Install MongoDB Compass for GUI

administration and click

 Next

11. Click and then



How To Install MongoDB?



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](#)

The screenshot shows the MongoDB Documentation website. At the top, there's a navigation bar with links for Products, Solutions, Resources (which is underlined in green), Company, and Pricing, along with a search icon. Below the navigation, a dropdown menu shows "6.0 (current)". The main content area has a breadcrumb trail: Docs Home → Develop Applications → MongoDB Manual. The title "Install MongoDB Community Edition" is displayed prominently. A sub-section titled "Install on macOS" is highlighted with a green rounded rectangle. Below it, other sections like "Install on Linux", "Install on Windows", and "Install MongoDB Enterprise" are listed. At the bottom of the page, there are links for "MongoDB Shell (mongosh)", "MongoDB CRUD Operations", and "Aggregation Operations". A URL at the bottom of the page is <https://www.mongodb.com/docs/mongodb-shell/>. On the right side, there are arrows pointing left and right, and a link "Install MongoDB Community Edition on Linux" with an arrow pointing right.

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

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

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).

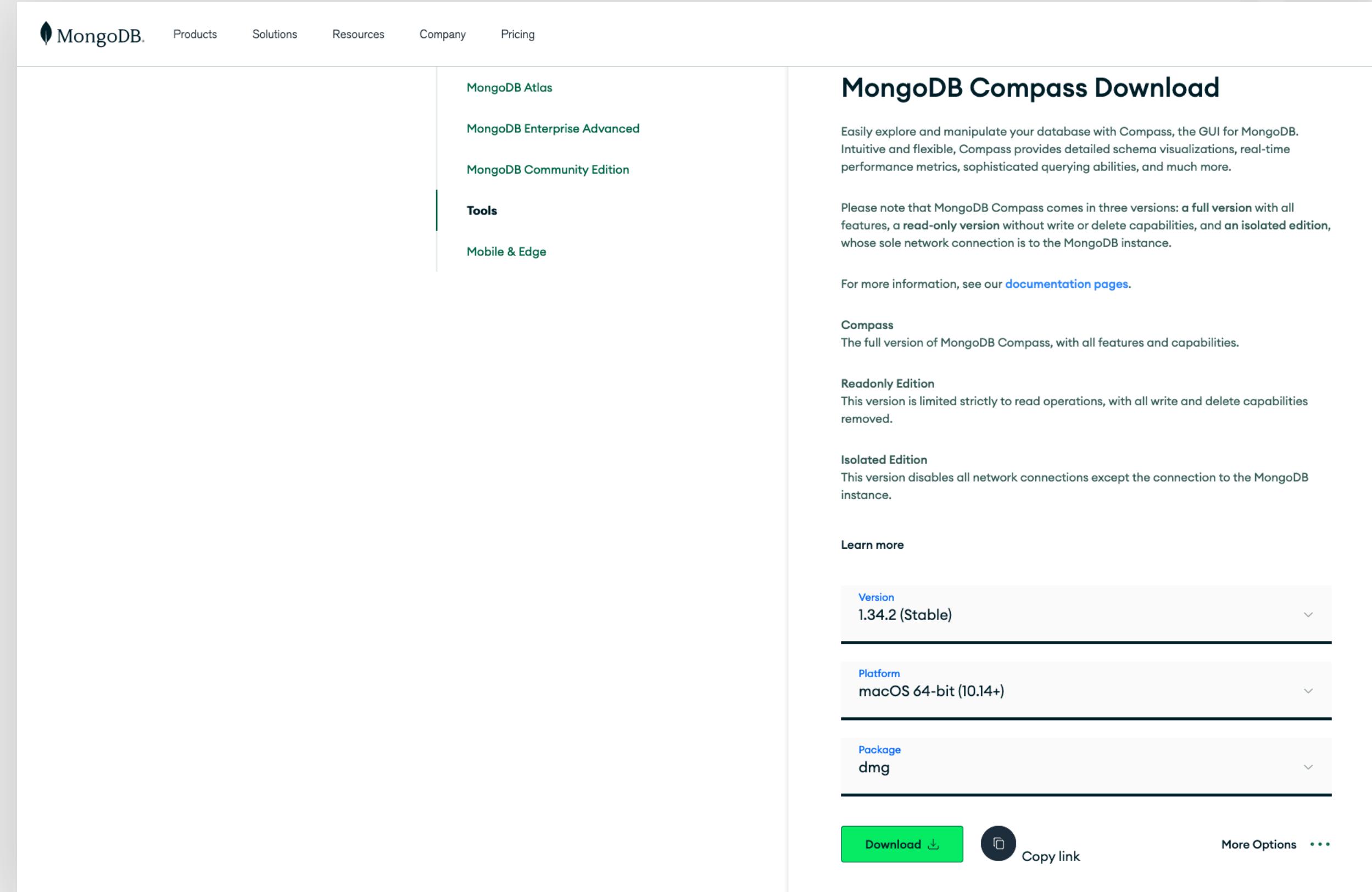
The monitoring data will be available on a MongoDB website with a unique URL accessible to you
and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

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>
```

How To Install MongoDB? MACOS

6. Go to [Mongo Compass download page](#) and download GUI for your macOS processor



The screenshot shows the MongoDB website's product page for Compass. The navigation bar includes links for Products, Solutions, Resources, Company, and Pricing. On the left, there's a sidebar with links for MongoDB Atlas, MongoDB Enterprise Advanced, MongoDB Community Edition, Tools (selected), and Mobile & Edge. The main content area is titled "MongoDB Compass Download" and describes the tool for exploring and manipulating databases. It notes that Compass comes in three versions: Full, Read-only, and Isolated. A "Learn more" section provides details about each. Below this are dropdown menus for "Version" (set to 1.34.2 (Stable)), "Platform" (set to macOS 64-bit (10.14+)), and "Package" (set to dmg). At the bottom are "Download" and "Copy link" buttons, along with a "More Options" menu.

How To Install MongoDB?

- ▶ Official MongoDB website
- ▶ Docker

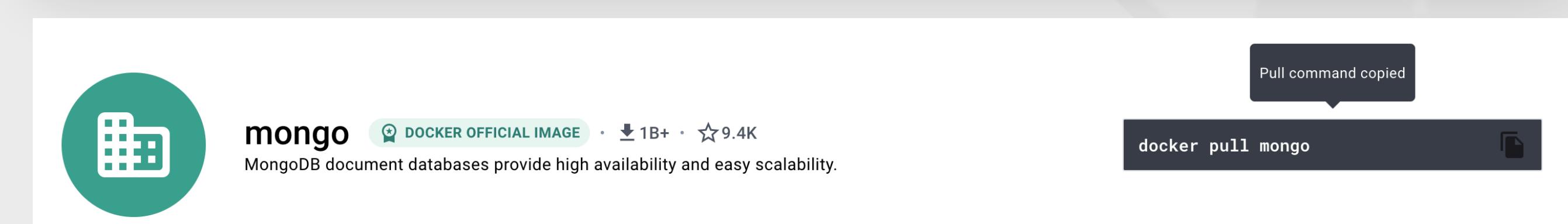
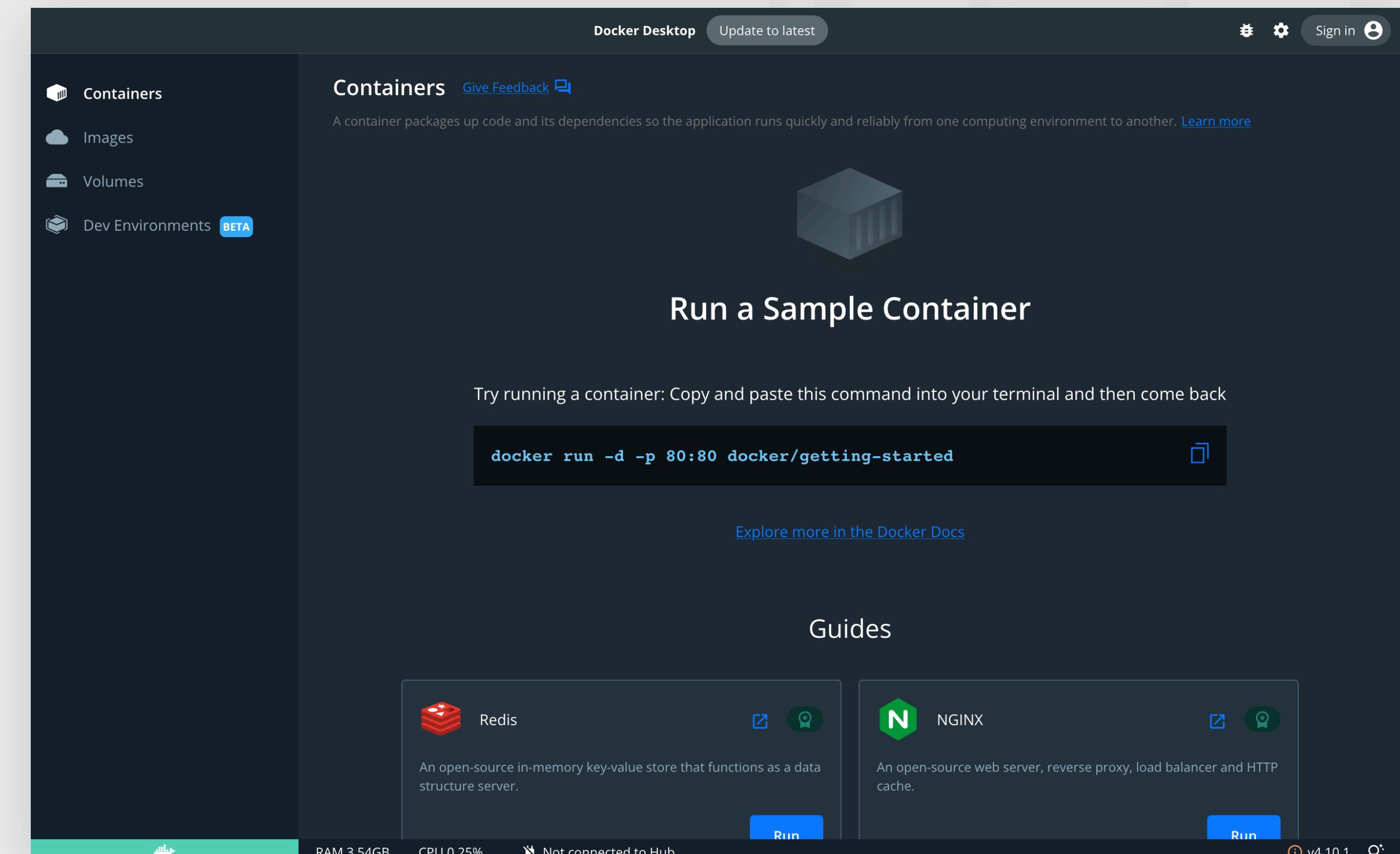
How To Use MongoDB With Docker?

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 containers 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 container:

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

The screenshot shows the Docker desktop interface with two main sections: 'Images on disk' and 'Containers'.

Images on disk: This section shows the mongo image details.

NAME	TAG	IMAGE ID	CREATED	SIZE
mongo	latest	0850fead9327	about 1 month ago	699.9 MB

Containers: This section shows the running mongo container.

NAME	IMAGE	STATUS	PORT(S)	STARTED
mystifying_chebyshev	mongo	Running	-	7 seconds ago

- ▶ 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

The screenshot shows the MongoDB Compass interface. The top section displays the 'Databases' tab with three databases listed: admin, config, and local. The 'admin' database has a storage size of 20.48 kB, one collection, and one index. The 'config' database has a storage size of 20.48 kB, one collection, and two indexes. The bottom section shows the 'TestDB.TestCollection' page. It has a 'Documents' tab selected, displaying two documents. The first document has an _id of ObjectId('63bc6b26c83b960a4fc51b8f'), a name of "John", and a GPA of 90. The second document has an _id of ObjectId('63bc72cac83b960a4fc51b90'), a name of "Olivia", and a GPA of 90. There are buttons for 'ADD DATA' and 'EXPORT COLLECTION' at the bottom of the document list.

Database	Storage size	Collections	Indexes
admin	20.48 kB	1	1
config	20.48 kB	1	2

Collection	Documents	Indexes
TestCollection	2	1

Create Database

Using Manosh

- ▶ Create database
 - use DATABASE_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(    collection
{
    name: “John”,          field : value
    age: 26,                field : value
    GPA: 90                 field : value
})
```



Read

Retrieve a document from a collection

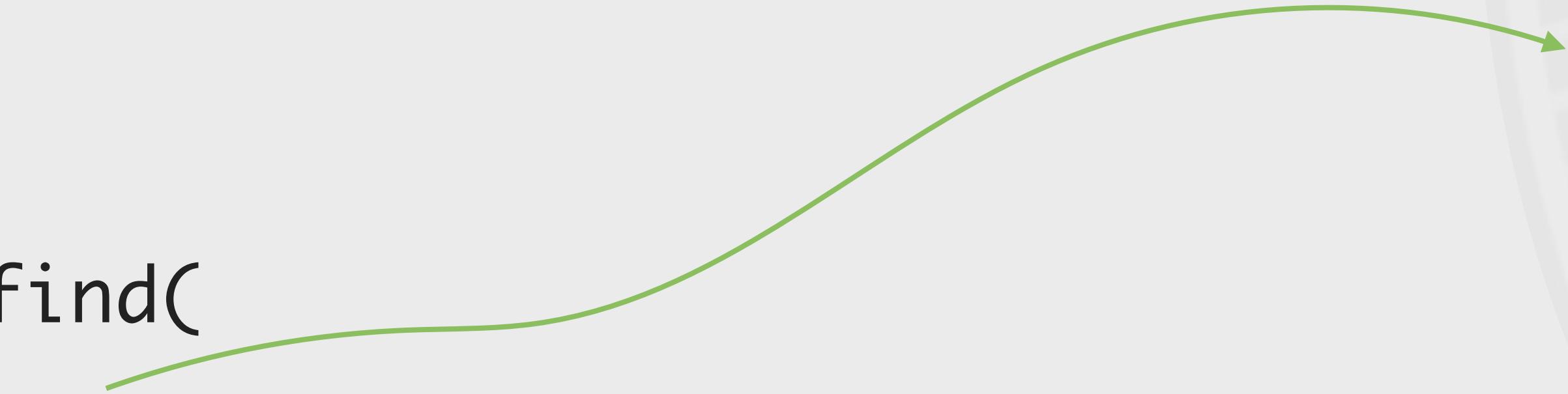
- db.COLLECTION_NAME.find(Query Criteria)

example:

db.students.find(

{ age: {\$gt: 18} } students with age greater than 18

).limit(5) 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} } Only update the students with the age of less than 18 update filter
```

```
  { set: {GPA: 80} } 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.
- ▶ **Take a snapshot of each of the following steps, including your commands and mongosh or MongoDB compass output.**
- ▶ Create a Database and name it with your `name+"_" +surname`
- ▶ Create a collection called "students" and add 5 students using the following template:

```
{  
    name: ""  
    surname: ""  
    age: number  
    status : active/deactive  
}
```

- ▶ Calculate the average of your student's age and find all students with more than the average.
- ▶ Find all of the students with **False** status and update their status to **True**