



TASK

Getting started with MongoDB

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Introduction

WELCOME TO THE GETTING STARTED WITH MONGODB TASK!

You now know more or less what MongoDB is and how we will be using it. In this task, you will learn how to install MongoDB. You will also learn about using MongoDB to create a database as a service.



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Our team is happy to offer you support that is tailored to your individual career or education needs. Do not hesitate to ask a question or for additional support!



MONGODB AS A SERVICE

A few years ago, in order to run a database, you had to have a server (or servers) with all the necessary software installed and configured. You would also need someone who would act as the database administrator. In many organisations, this is still the case and this may be a justified expense and effort. Today though, there is an attractive alternative: database as a service.

Since cloud computing has become more popular, there are more cloud-based options for developers. You can host your web app on the cloud (HEROKU, Azure, etc.) instead of on your own dedicated server. You can also use a database hosted by a cloud service provider (as in the case of MongoDB's Atlas), rather than having the hassle of setting up and maintaining your own database server. Below are some key benefits of this approach:

1. It is often cheaper than having your own database server because you only pay for what you use.
2. The cloud service provider deals with all the hassle of ensuring the configuration, backup, maintenance, security, etc. of the database server.
3. It is quick and easy to start using a database with minimal configuration.

In this bootcamp, we will be using MongoDB's Database as a service solution: Atlas.

In this task, you are going to create your first database using MongoDB. Before you can do this, though, you are first going to:

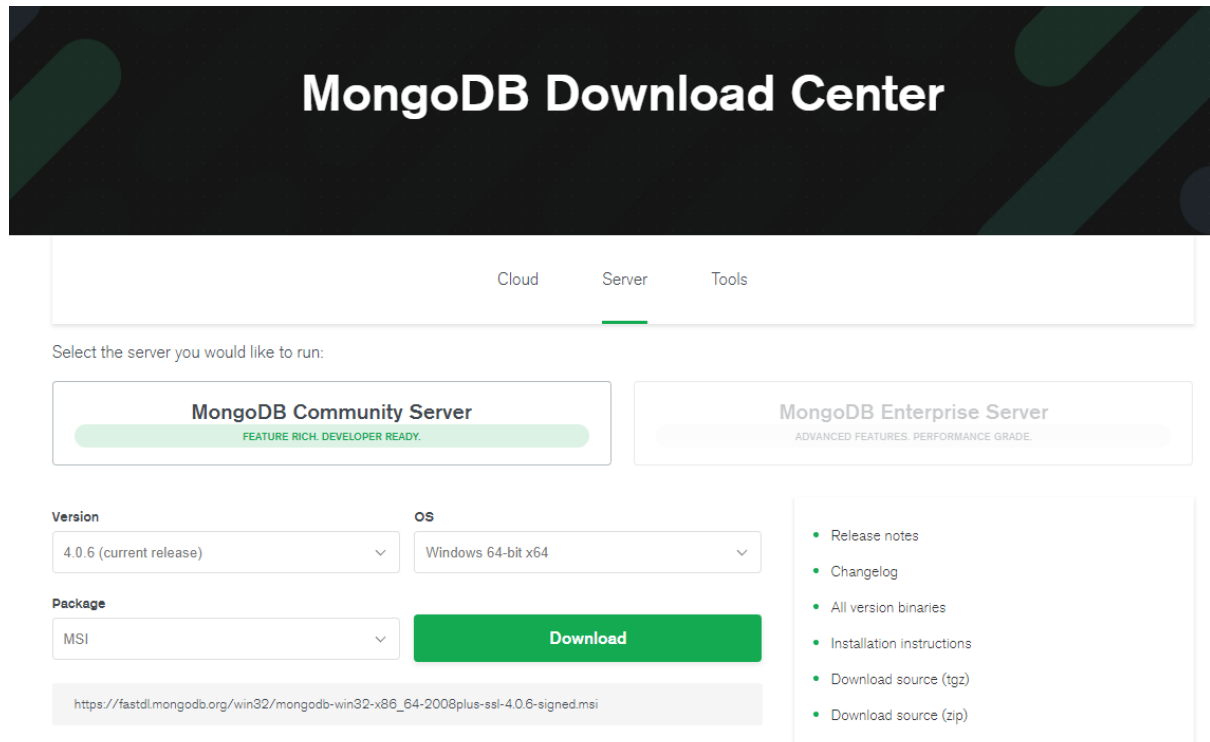
1. download and install MongoDB on your local machine so that you can use mongo, the administrative shell;
2. use Atlas to create and host a MongoDB on the cloud; and,
3. use Mongo to access and manipulate your database cluster on Atlas.

INSTALL MONGODB

To install MongoDB on your computer or server, download it from [MongoDB's download centre](#). From this page, you will be presented with a few options of what you would like to install.

We will be installing the free Community Server for this course. Your other main option for download is the Enterprise Server which you can download on a free trial.

Click on the Community Server tab and download the latest release of MongoDB for either Windows, Linux or OSX.



Select the correct version and click on the Download button to begin the download.

Once the download is complete, follow the installation instructions for installing MongoDB as a service for your specific operating system:

- macOS:
<https://docs.mongodb.com/manual/tutorial/install-mongodb-on-os-x/>
- Windows:
<https://docs.mongodb.com/manual/tutorial/install-mongodb-on-windows/>
- Linux:
<https://docs.mongodb.com/manual/tutorial/install-mongodb-on-linux/>

The steps to setup and configure MongoDB differ slightly depending on the OS you are using. The installation instructions given above contain instructions for running MongoDB on your specific operating system. Below are the steps for

running the Mongo shell on Windows (for Linux or macOS, see the documentation provided).

Once MongoDB has been installed, do the following:

- Step 1. Add the mongo executable to PATH, so the commands are accessible from outside the MongoDB bin folder.

To do this: Search for your MongoDB installation bin folder (it's location will depend on which folder you have installed MongoDB in) and copy the path (e.g.: C:\Program Files\MongoDB\bin). Right click This PC > Properties > Advanced system settings > Environment Variables > System variables > Look for "Path" > Edit > New > Paste in the path to your MongoDB bin folder > Restart your terminal.

- Step 3. Check that the Mongo shell has been correctly installed by typing `"mongo --version"` in your command-line interface. Your output should be something similar to what is shown in the image below. Note that the version number will be the version that you have installed

```
C:\Users\pierr>mongo --version
MongoDB shell version v4.4.4
Build Info: {
  "version": "4.4.4",
  "gitVersion": "8db30a63db1a9d84bdcad0c83369623f708e0397",
  "modules": [],
  "allocator": "tcmalloc",
  "environment": {
    "distmod": "windows",
    "distarch": "x86_64",
    "target_arch": "x86_64"
  }
}
```

Your Mongo shell is now ready to be used to connect to a database server. In this course, we will be using MongoDB Atlas which will provide the platform and infrastructure we need for a database server on the cloud.



Take note:

Mongo is MongoDB's administrative shell. It is a C++ program that allows you to execute instructions on the database from a command line interface. Mongo allows you to use the MongoDB query language.

SETUP MONGODB ATLAS

In this bootcamp, we will be using MongoDB's Database as a service solution: Atlas. To get a quick (2 minute) overview of what Atlas is and why we are using it, watch this [short video](#).

To configure MongoDB Atlas, do the following:

- Go [here](#) and enter your information to get started with Atlas.
- You will then be taken to the 'Create New Cluster' page.
 - Under Cloud provider select AWS.

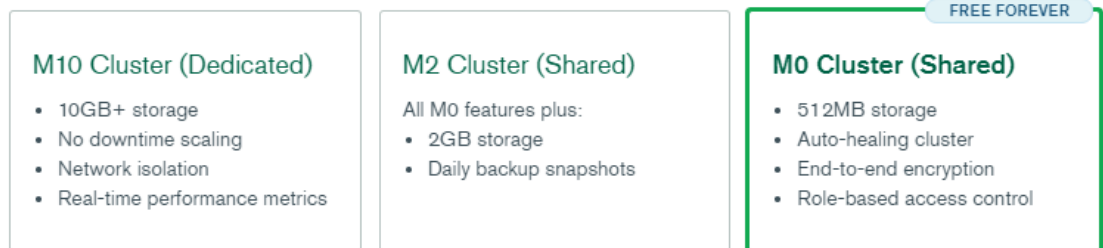


1 Select a cloud provider




- For cluster configuration select “M0 Cluster (Shared) - Free forever”

2 Select a cluster configuration



- Under “Country / Region” select any region closest to you

Feature	Your Cluster
Cloud Provider	AWS
Country / Region	 Europe / Frankfurt (eu-central-1) ▼
Cluster Tier	M0 Cluster (Shared)
RAM / Disc Size / vCPU	Shared / 512 MB / Shared
Backups	Only available for M2+ clusters See our backup solutions
Pricing	Starting at FREE

- You can rename your cluster under 'Cluster Name'.

Cluster Name

Hyperion-dev-1234 ▼

One time only: once your cluster is created, you won't be able to change its name.

Hyperion-dev-1234

Cluster names can only contain ASCII letters, numbers, and hyphens.

PREVIOUS: ADDITIONAL SETTINGS

- Click on the 'Build M0 cluster' button at the bottom of the page to create your cluster.

You have now successfully created a database cluster. You will need to add a username and password for a user to be used when trying to make a connection.

1 How would you like to authenticate your connection?

Your first user will have permission to read and write any data in your project.

Username and Password

Certificate

Create a database user using a username and password. You can update these permissions and/or create additional users later. Ensure these credentials are different to your MongoDB Cloud username and password.

Username

Password 

Enter username

Enter password

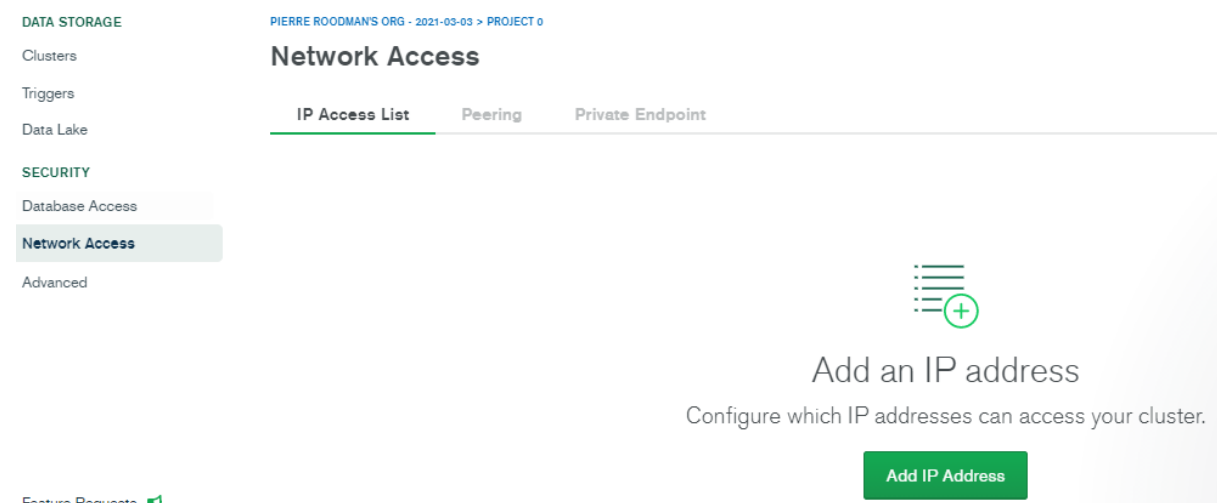
Create User



You will now use the administrative shell, Mongo, to add a database to this cluster. Before you do this though, there are some security settings you need to tweak to make sure that you can access the Atlas cluster from your computer.

Security settings

One of the ways that MongoDB ensures security is by only allowing certain machines (IP addresses) access to your cluster. The IPs that are allowed to access your cluster are listed under the category “Security” under the Network Access tab. Click on the “Network Access” tab and then click on the “+ Add IP Address” button.



In the “Add IP Access List Entry” popup window, click on the “Allow Access From Anywhere” button and then click “Confirm”.

×

Add IP Access List Entry

Atlas only allows client connections to a cluster from entries in the project's IP Access List. Each entry should either be a single IP address or a CIDR-notated range of addresses. [Learn more.](#)

ADD CURRENT IP ADDRESS

ALLOW ACCESS FROM ANYWHERE

Access List Entry:

0.0.0.0/0

Comment:

Optional comment describing this entry

☐

This entry is temporary and will be deleted in

6 hours ▾

Cancel

Confirm

[Learn more](#)

It is not good practice to allow all IP addresses to access your database for obvious security reasons, but for the purposes of the next few tasks, we are going to ask you to do this. The reason for this is that we are going to ask you to give a reviewer access to your database and you won't have that reviewer's IP address. In practice, however, it is advisable to have a limited IP whitelist.



Take note:

You should remember to configure this IP whitelist when you deploy your app. Remember that you will ultimately write code to access your database in your Express app (which you will soon learn to do). Therefore, your application server will be making requests to your database. If you deploy your back-end app to the cloud (e.g. deploy to Heroku) you do not necessarily know what the IP address of your web server will be! This could obviously be a problem - if your web server IP address isn't added to the Atlas IP whitelist, your Express app won't be allowed to communicate with your database!

To address this problem you can create a Heroku Private Space. According to an [article by Heroku](#), "Private Spaces are dedicated environments for running dynos and certain types of add-ons within an isolated network. Access to apps in a Private Space can be controlled at the network level. Outbound requests from apps in a Private Space

originate from a set of stable IP addresses, which allows you to securely communicate with IP white-listed services on-premise or on other networks.”

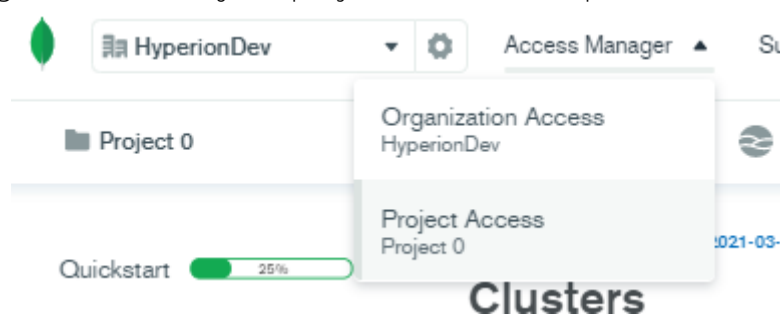
We recommend that you read [this guide](#) by MongoDB to see how to integrate Atlas with Heroku. At the time of writing this task, this was not possible with a free Atlas account. In such a case you would have to allow access to your database from any IP address to allow your back-end deployed on Heroku to communicate with your database on MongoDB Atlas.

If your machine is protected by a firewall, you also have to ensure that this doesn't block access to Atlas. Atlas servers run on **port 27017** on Amazon AWS. Check [here](#) to see if this port is blocked on your machine or not. If [this page](#) doesn't load, your firewall is probably blocking port 27017. If it is blocked, make sure to unblock it before you proceed. How this is done will depend on the firewall you are using. Google the appropriate instruction to unblock port 27017 for the firewall you are running.

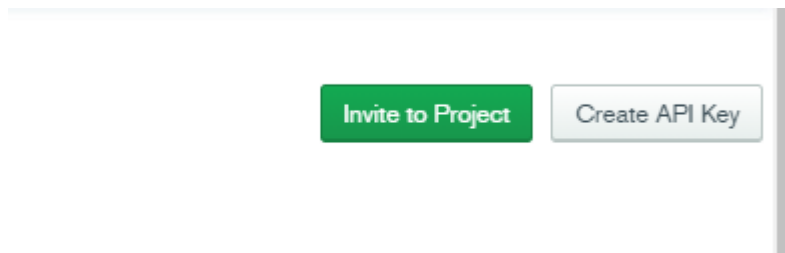
From the Security tab, you can also add users and manage the rights of the users you allow to access your database.

Manage users and teams

As the database administrator, you have to manage who is able to access your database and what they can do with your database. For your next MongoDB tasks, you are required to give a reviewer access to your database. To do this, select “Access manager” and select your project from the dropdown menu.button.



Click on the “Invite to project” button.



You can then invite a reviewer to be a user of your database by entering this email address - mentors@hyperiondev.com - into the invitation field similar to that depicted in the image below:

Invite to Project

Invite new or existing users, teams, and API keys to this project.

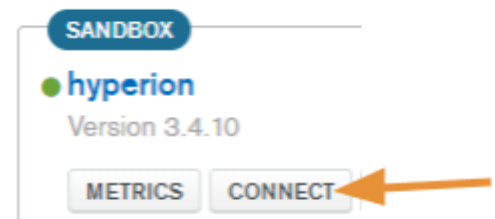
Search for existing users, teams, API key or invite new users via email address.

Search by email address, team name, or public key



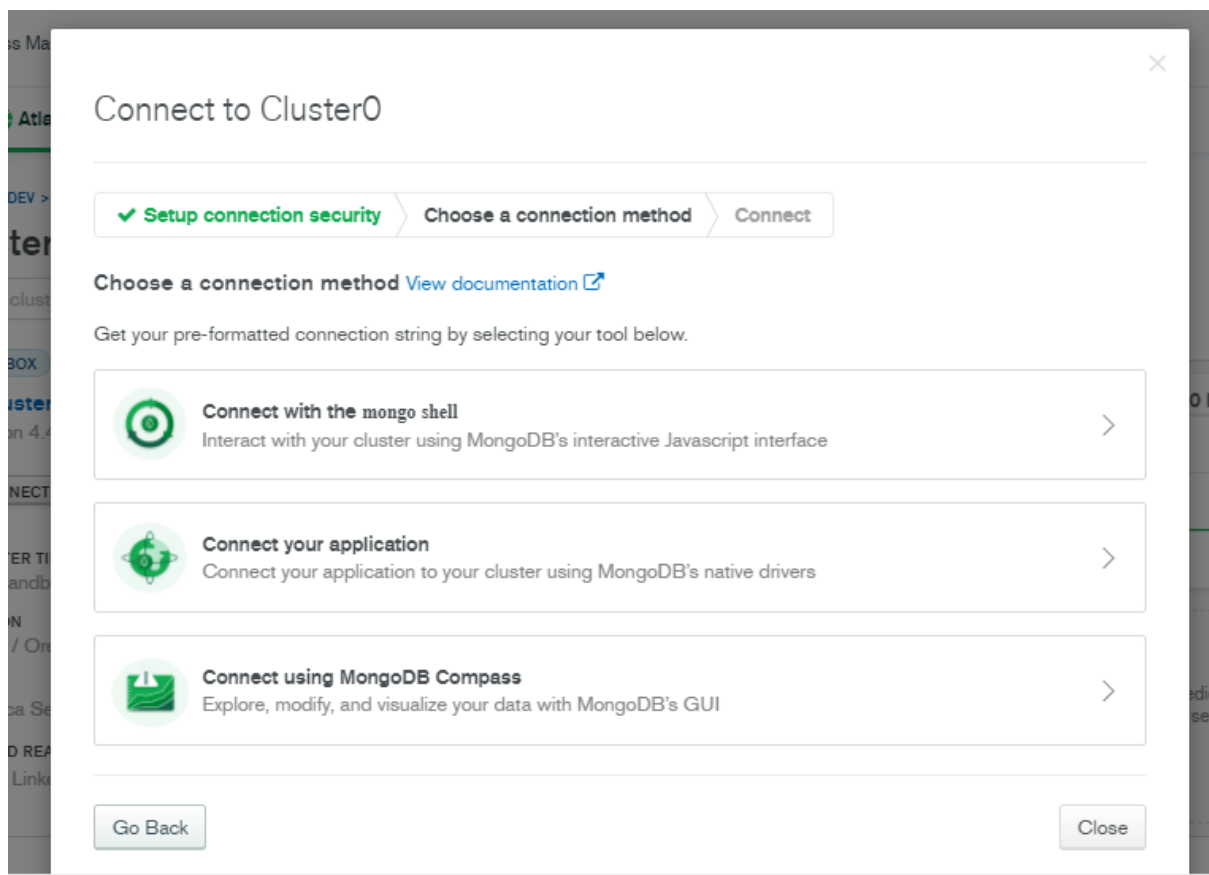
ACCESS THE DATABASE ON THE CLOUD USING THE MONGO SHELL

You are now ready to access the database server you have configured on MongoDB Atlas using the Mongo shell on your local machine. Remember that Mongo is the administrative shell used to run instructions on your MongoDB server.



To connect to the database server using mongo you need a connection string that specifies everything needed for this connection. Atlas provides this connection string for you. Select "Connect" as shown below to find the connection string.

The following popup window will appear:



From the window above select "Connect with the Mongo Shell".

Then select “I have the Mongo shell installed” and ensure that you have the correct version of Mongo shell selected.

×

Connect to Cluster0

✓ Setup connection security

✓ Choose a connection method

Connect

I do not have the mongo shell installed

I have the mongo shell installed

1

Select your mongo shell version

4.4

(To check your shell version, run `mongo --version`)

2

Run your connection string in your command line

Use this connection string in your application:

```
mongo "mongodb+srv://cluster0.ndon3.mongodb.net/myFirstDatabase" --username pierreroodman
```

Replace **myFirstDatabase** with the name of the database that connections will use by default. You will be prompted for the password for the Database User, **pierreroodman**. When entering your password, make sure all special characters are [URL encoded](#).

Having trouble connecting? [View our troubleshooting documentation](#)

You can then copy and paste the connection string that appears there into your command line interface. You should see output similar to that shown in the image below:

```
Command Prompt - mongo "mongodb+srv://cluster0.ndon3.mongodb.net/myFirstDatabase" --username pierrerooman
Microsoft Windows [Version 10.0.18363.1379]
(c) 2019 Microsoft Corporation. All rights reserved.


C:\Users\pierr>mongo "mongodb+srv://cluster0.ndon3.mongodb.net/myFirstDatabase" --username pierrerooman
MongoDB shell version v4.4.4
Enter password:
connecting to: mongodb://cluster0-shard-00-01.ndon3.mongodb.net:27017,cluster0-shard-00-02.ndon3.mongodb.net:27017,cluster0-shard-00-00.ndon3.mongodb.net:27017/myFirstDatabase?authSource=admin&compressors=disabled&gssapiServiceName=mongodb&replicaSet=atlas-5jf6vl-shard-0&ssl=true
{"t":{"$date":"2021-03-03T19:02:27.202Z"},"s":"W", "c":"NETWORK", "id":"23019", "ctx":"ReplicaSetMonitor-TaskExecutor", "msg":"DNS resolution while connecting to peer was slow","attr":{"peer":"cluster0-shard-00-02.ndon3.mongodb.net:27017", "durationMillis":2336}}

*** You have failed to connect to a MongoDB Atlas cluster. Please ensure that your IP whitelist allows connections from your network.

Error: can't connect to new replica set master [cluster0-shard-00-02.ndon3.mongodb.net:27017], err: AuthenticationFailed : bad auth : Authentication failed. :
connect@src/mongo/shell/mongo.js:374:17
@(connect):2:6
exception: connect failed
exiting with code 1

C:\Users\pierr>mongo "mongodb+srv://cluster0.ndon3.mongodb.net/myFirstDatabase" --username pierrerooman
MongoDB shell version v4.4.4
Enter password:
connecting to: mongodb://cluster0-shard-00-01.ndon3.mongodb.net:27017,cluster0-shard-00-02.ndon3.mongodb.net:27017,cluster0-shard-00-00.ndon3.mongodb.net:27017/myFirstDatabase?authSource=admin&compressors=disabled&gssapiServiceName=mongodb&replicaSet=atlas-5jf6vl-shard-0&ssl=true
```

You have connected to your MongoDB server hosted by Atlas. You are now able to use the Mongo shell to create and modify databases on your server!



Extra resource

Watch [this short video](#) to see how easily you can connect to your Atlas database with the mongo shell.

CREATE A DATABASE

Once you can access your database server (run by Atlas), you can issue instructions using mongo to change your database. We are going to create a database.

To do this type the following using the mongo shell: **use test** where *test* is the name of the database. If the database does not already exist, this instruction will create it.

```
MongoDB Enterprise hyperion-shard-0:PRIMARY> use test
switched to db test
MongoDB Enterprise hyperion-shard-0:PRIMARY>
```

MONGODB COMPASS

You may have noticed that when you installed MongoDB, MongoDB Compass was also installed. Compass allows you to interface with your database. You should be able to connect to your database using Compass too. Give it a try.

QUIT MONGO

To quit mongo, type `quit()` into the mongo shell.

Compulsory Task 1

Follow these steps:

- Install MongoDB. See appropriate detailed installation instructions on MongoDB's download centre for details.
- Create a cluster on MongoDB Atlas.
- Add the generic reviewer address (mentors@hyperiondev.com) as a user to your cluster on Atlas.
- Ensure that your firewall isn't blocking access to MongoDB.
- Connect to your cluster using the mongo shell.
- Make a database called "test"
- Open a word processor such as Word or LibreOffice and create a document called "myMongoDB" in which you include the following:
 - A screenshot that shows that you have added the generic reviewer address (mentors@hyperiondev.com) as a MongoDB user to your Atlas cluster.

- A screenshot of your command line interface that shows how you have used the Mongo shell to connect to your MongoDB Atlas cluster.
- A screenshot of your command line interface that shows that you have successfully created a database called “test” on your MongoDB Atlas cluster.

If you are having any difficulties, please feel free to contact our specialist team [on Discord](#) for support.

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