

Lab 8 Understanding MongoDB Atlas (V2)

Task 1: Setting up the MongoDB database

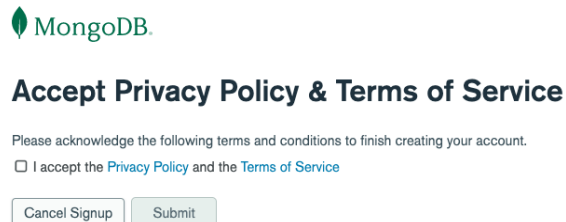
1.1 Create and Deploy an Atlas Cluster


You will first need to create an account with MongoDB Atlas (this is free, and just requires that you enter basic contact details and acknowledge their terms of service).

- <https://www.mongodb.com/cloud/atlas/register>

After logging in, you'll be taken to the home screen via <https://cloud.mongodb.com/v2>

- Accept privacy policy and the terms of service and click the Submit button.



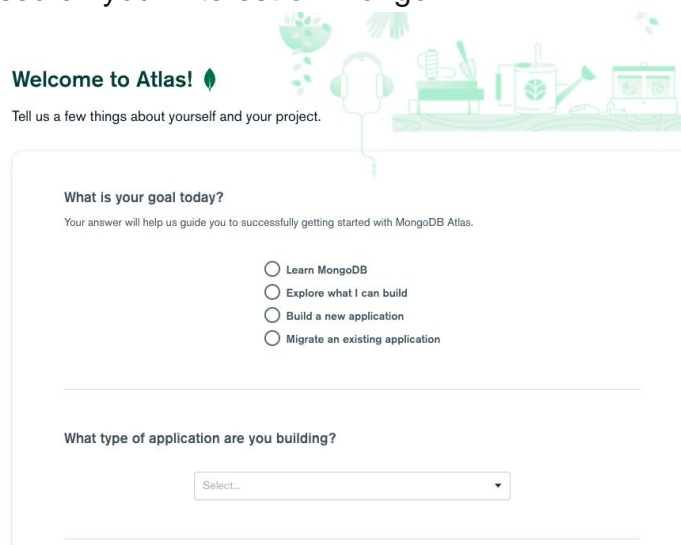
 MongoDB


Accept Privacy Policy & Terms of Service

Please acknowledge the following terms and conditions to finish creating your account.

☐ I accept the [Privacy Policy](#) and the [Terms of Service](#)

- Fill in data based on your interest on MongoDB



Welcome to Atlas! 

Tell us a few things about yourself and your project.

What is your goal today?
Your answer will help us guide you to successfully getting started with MongoDB Atlas.

- ☐ Learn MongoDB
- ☐ Explore what I can build
- ☐ Build a new application
- ☐ Migrate an existing application

What type of application are you building?

Select...

- Click **Build a Database** button in the Overview section.

Database Deployments

Find a database deployment...



Create a database

Choose your cloud provider, region, and specs.

Build a Database

Once your database is up and running, live migrate an existing MongoDB database into Atlas with our [Live Migration Service](#).

Note: If you cannot see the above button, you may need to create an organization first (specify an organization name as your first name) and create a new project (specify a project name as “project0”).

- Create a **shared** cluster (as free of charge)

Create a Shared Cluster

Welcome to MongoDB Atlas! We've recommended some of our most popular options, but feel free to customize your cluster to your needs. For more information, check our [documentation](#).

PREVIEW Serverless

Dedicated

FREE Shared

For learning and exploring MongoDB in a sandbox environment. Basic configuration controls.

No credit card required to start. Upgrade to dedicated clusters for full functionality.
Explore with sample datasets. Limit of one free cluster per project.

Cluster Tier

M0 Sandbox (Shared RAM, 512 MB Storage)

Encrypted

Base hourly rate is for a MongoDB replica set with 3 data bearing servers.

Shared Clusters for development environments and low-traffic applications

Tier	RAM	Storage	vCPU	Base Price
✓ M0 Sandbox	Shared	512 MB	Shared	Free forever

- Select any provider from the *Cloud Provider & Region* section. Different providers offer different regions.
- Select any region marked "FREE TIER AVAILABLE".

Cloud Provider & Region

AWS, N. Virginia (us-east-1) ▼

aws

Google Cloud

Azure

★ Recommended region ⓘ

🏷️ Paid tier region ⓘ

NORTH AMERICA

EUROPE

AUSTRALIA

🇺🇸 N. Virginia (us-east-1) ★

🇺🇸 Oregon (us-west-2) ★

🇺🇸 Ohio (us-east-2) ★🏷️

🇺🇸 N. California (us-west-1) 🏷️

🇨🇦 Montreal (ca-central-1) 🏷️

SOUTH AMERICA

🇧🇷 São Paulo (sa-east-1) 🏷️

🇮🇪 Ireland (eu-west-1) ★

🇸🇪 Stockholm (eu-north-1) ★

🇩🇪 Frankfurt (eu-central-1) ★

🇬🇧 London (eu-west-2) ★🏷️

🇫🇷 Paris (eu-west-3) ★🏷️

🇮🇹 Milan (eu-south-1) ★🏷️

🇦🇺 Sydney (ap-southeast-2) ★

ASIA

🇸🇬 Singapore (ap-southeast-1) ★

🇯🇵 Tokyo (ap-northeast-1) ★

🇮🇳 Mumbai (ap-south-1)

🇭🇰 Hong Kong (ap-east-1) ★🏷️

🇰🇷 Seoul (ap-northeast-2) 🏷️

- Specify the cluster named **MDB305**

Additional Settings

MongoDB 4.2, No Backup ▼

Turn on Backup (M2 and up)

See Backup Solutions for Paid Clusters (M2+)

☐

Cluster Name

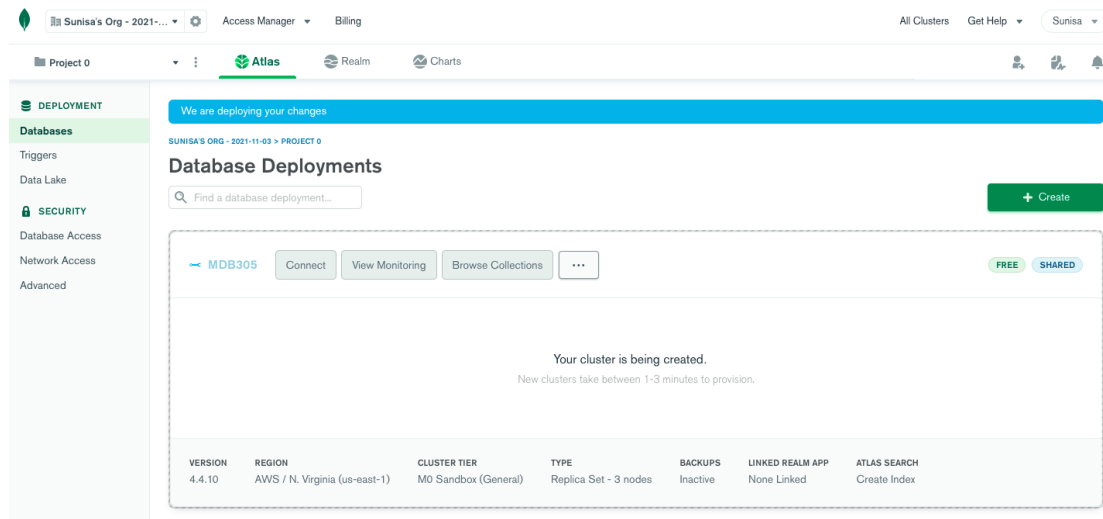
One time only: once your cluster is created, you won't be able to change its name.

MDB305

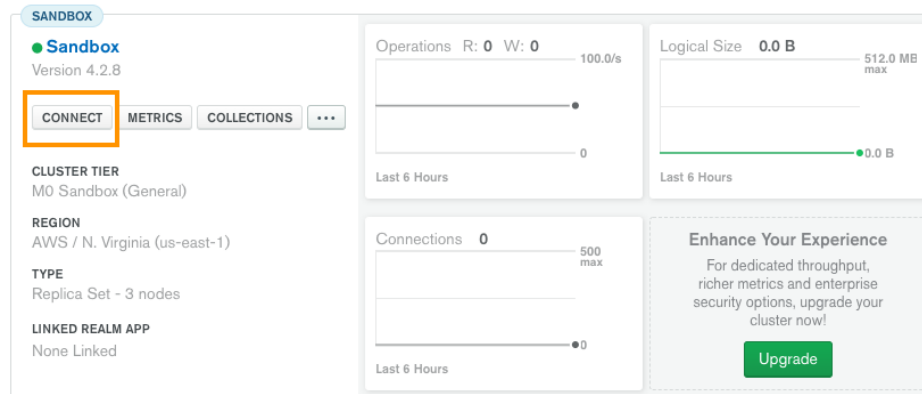
Cluster names can only contain ASCII letters, numbers, and hyphens.

MDB305 ▼

- Click the **Create Cluster** button (*This step might take a minute or two to complete*).



- Now that you have an Atlas cluster you need to grant access to your IP Address and create a Database User.
 - o Select **Connect** from the cluster view.



- o Select the *right-most* option **Allow Access from Anywhere**. This will open a form with `0.0.0.0/0` pre-seeded for the IP Address. and confirm your selection by clicking on **Add IP Address**. Allowing access from anywhere is not a good security practice. Clusters that are used for production should not have this enabled.

Connect to Sandbox

Setup connection security > Choose a connection method > Connect

You need to secure your MongoDB Atlas cluster before you can use it. Set which users and IP addresses can access your cluster now. [Read more](#)

You can't connect yet. Set up your firewall access and user security permission below.

1 Whitelist a connection IP address

Add Your Current IP Address Add a Different IP Address Allow Access from Anywhere

2 Create a Database User

This first user will have [atlasAdmin](#) permissions for this project. Keep your credentials handy, you'll need them for the next step.

Username Password Autogenerate Secure Password

ex. dbUser ex. dbUserPassword SHOW

Create Database User

Close Choose a connection method

- Create a Database User
 - **username:** mdb305-*<student-id>*
 - **password:** mdb305-mongodb
- Click on the **Create Database User** button

Connect to MDB305

Setup connection security > Choose a connection method > Connect

You need to secure your MongoDB Atlas cluster before you can use it. Set which users and IP addresses can access your cluster now. [Read more](#)

You can't connect yet. Set up your user security permission below.

1 Add a connection IP address

✓ An IP address has been added to the IP Access List. *Add another address in the [IP Access List](#) tab.*

2 Create a Database User

This first user will have [atlasAdmin](#) permissions for this project.

Keep your credentials handy, you'll need them for the next step.

Username	Password	Autogenerate Secure Password
<input type="text" value="mdb305-62xxxxxxxx"/>	<input type="text" value="mdb305-mongodb"/>	<input type="button" value="HIDE"/>
<input type="button" value="Create Database User"/>		

Close

Choose a connection method

- Close the Connection menu at the lower left corner of the window.

Connect to MDB305

Setup connection security > Choose a connection method > Connect

You need to secure your MongoDB Atlas cluster before you can use it. Set which users and IP addresses can access your cluster now. [Read more](#)

You're ready to connect. Choose how you want to connect in the next step.

1 Add a connection IP address

✓ An IP address has been added to the IP Access List. *Add another address in the [IP Access List](#) tab.*

2 Create a Database User

✓ A MongoDB user has been added to this project. *Not yours? Create one in the [MongoDB Users](#) tab.*

You'll need your MongoDB user's credentials in the next step.

Close

Choose a connection method

1.2 Load the Sample Dataset

Select the "..." option in the cluster menu -> choose the "Load Sample Dataset" option, then confirm your choice.

DEPLOYMENT

SUNISA'S ORG - 2021-11-03 > PROJECT 0

Database Deployments

Find a database deployment...

+ Create

MDB305

Connect View Monitoring Browse Collections

...

- Edit Configuration
- Command Line Tools
- Load Sample Dataset
- Terminate

R 0 W 0

Connections 0

Data Size 0.0 B

Last 41 minutes

100.0/s

100.0

512.0 MB

Enhance Your Experience

For production throughput and richer metrics, upgrade to a dedicated cluster now!

Upgrade

VERSION	REGION	CLUSTER TIER	TYPE	BACKUPS	LINKED REALM APP	ATLAS SEARCH
4.4.10	AWS / N. Virginia (us-east-1)	M0 Sandbox (General)	Replica Set - 3 nodes	Inactive	None Linked	Create Index

Load Sample Dataset

We've created a sample dataset to help you test features on Sandbox.

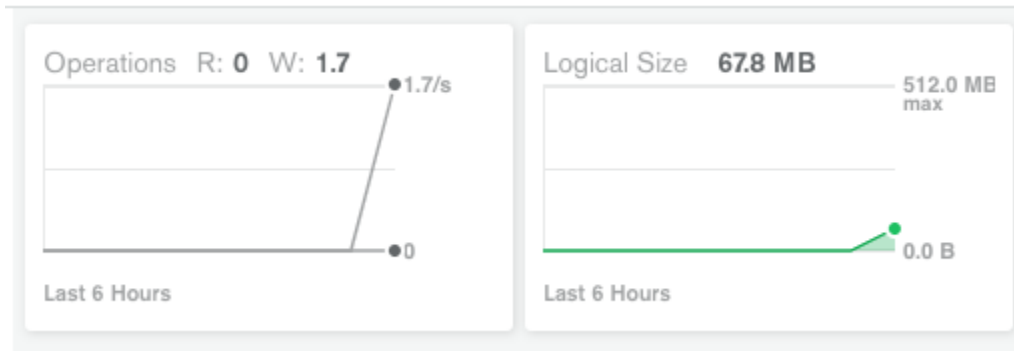
[Sample Dataset](#)

Size: ~350 MB

Please confirm that you want to load this sample dataset.

Cancel Load Sample Dataset

When the dataset is loaded the graph labeled "Logical Size" on the right side of the screen should go up and display the size of the dataset that is above zero and below 512 MB. Your graph may look different than the picture below.



- This step might take 5-10 minutes to complete.
- Click on the **Browse Collections** button to view the sample databases.

DEPLOYMENT

Databases

Triggers

Data Lake

SECURITY

Database Access

Network Access

Advanced

SUNISA'S ORG - 2021-11-03 > PROJECT 0

Database Deployments

Find a database deployment...

+ Create

Sample dataset successfully loaded. Access it in Data Explorer by clicking the Collections button, or with the Mongo Shell. [VIEW DATA TUTORIAL](#)

MDB305 **Connect** **View Monitoring** **Browse Collections** ...

FREE **SHARED**

R 0
Last 2 hours
958.2/s

W 0
Last 2 hours
4.0

Connections 4.0
Last 2 hours
4.0

In 90.6 B/s
Last 2 hours
900.7 KB/s

Out 18.3 KB/s
Last 2 hours
512.0 MB

Data Size 328.8 MB
Last 2 hours
512.0 MB

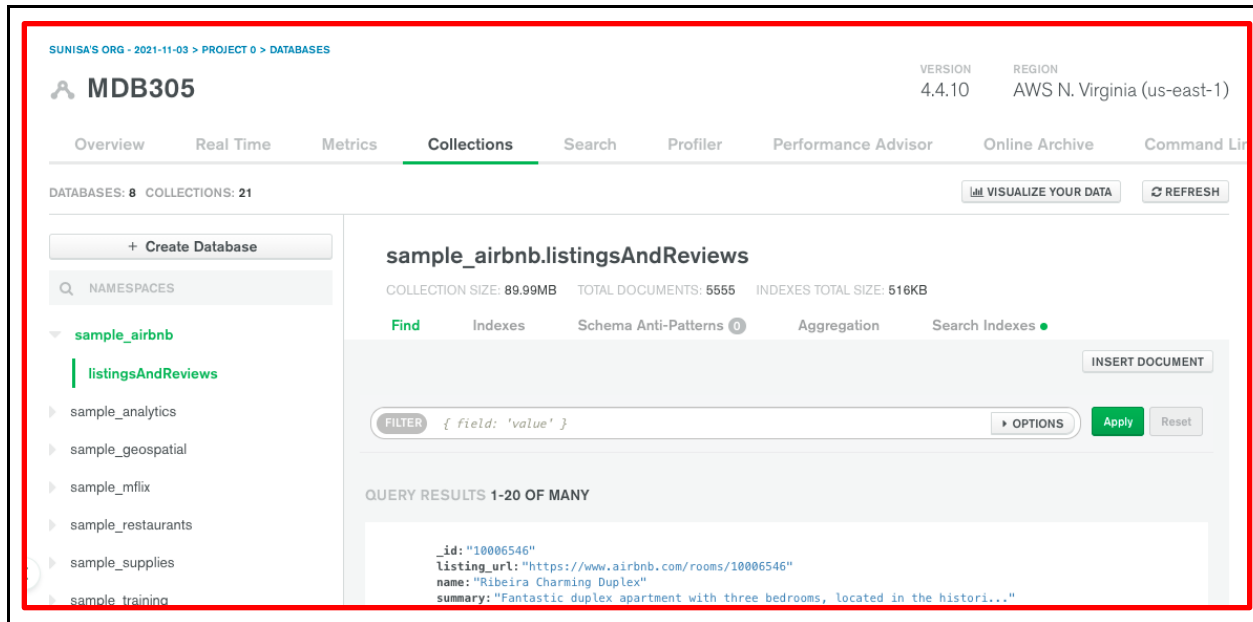
Enhance Your Experience
For production throughput and richer metrics, upgrade to a dedicated cluster now!
Upgrade

Get Started

VERSION	REGION	CLUSTER TIER	TYPE	BACKUPS	LINKED REALM APP	ATLAS SEARCH
4.4.10	AWS / N. Virginia (us-east-1)	M0 Sandbox (General)	Replica Set - 3 nodes	Inactive	None Linked	Create Index

*** Checkpoint 1***

After you completed the tasks 1.1-1.2, please capture “a screen of your cluster with Collections tab” here. The picture should show your organization name and project name

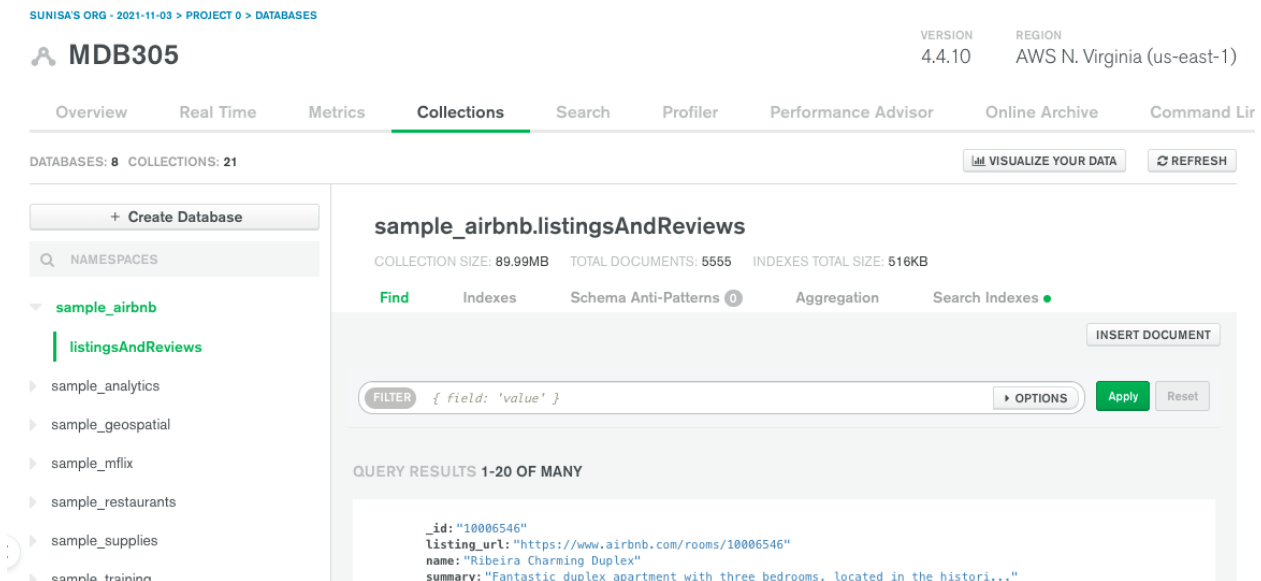


Place your screenshot below

1.3 Understand the Sample Dataset

*** Checkpoint 2***

- view documents in each collection of each database and **answer the following questions: A, B and C.**



A: How many databases are created in the sample dataset? Ans.: _____

B: How many collections are created in the database named SAMPLE_TRAINING?

Please identify the collection names in this database.

Ans.: _____

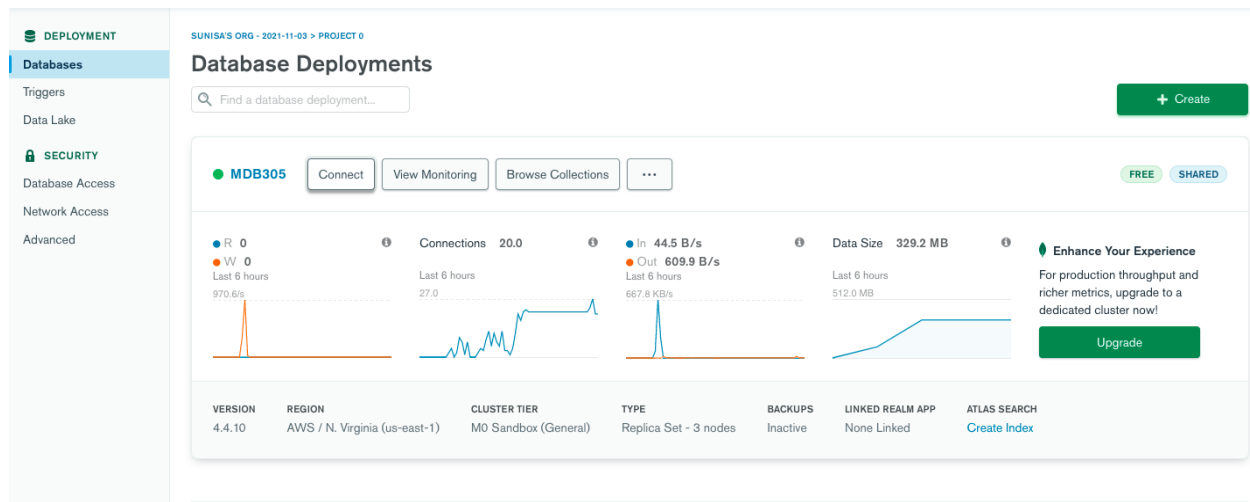
C: Please explain metadata (fields) stored in the SAMPLE_TRAINING.ZIPS namespace.

Ans.: _____

Task 2: Connect to your cluster using the MongoDB Compass

2.1 Install the MongoDB Compass

- Click on the **Database** menu to see the database view and click on the **Connect** button.



- Select a connection method as **Connect using MongoDB Compass**

Connect to MDB305

✓ Setup connection security > Choose a connection method > Connect

Choose a connection method [View documentation](#)

Get your pre-formatted connection string by selecting your tool below.



Connect with the MongoDB Shell

Interact with your cluster using MongoDB's interactive Javascript interface



Connect your application

Connect your application to your cluster using MongoDB's native drivers



Connect using MongoDB Compass

Explore, modify, and visualize your data with MongoDB's GUI



Go Back

Close

- Select the "I do not have MongoDB Compass" option.
- Download a MongoDB Compass depending on your OS and install it.

Connect to MDB305

✓ Setup connection security > ✓ Choose a connection method > Connect

I do not have MongoDB Compass

I have MongoDB Compass

1 Select your operating system and download MongoDB Compass

OS X 64-bit (10.10+)

OS X 64-bit (10.10+)

Windows 64-bit (7+)

Windows 64-bit (7+) (Zip)

Windows 64-bit (7+) (MSI)

Ubuntu 64-bit (14.04+)

Red Hat 64-bit (7+)

or [Copy download URL](#)

2 Open MongoDB Compass.

mongodb://<password>@mdb305.1gcgp.mongodb.net/test

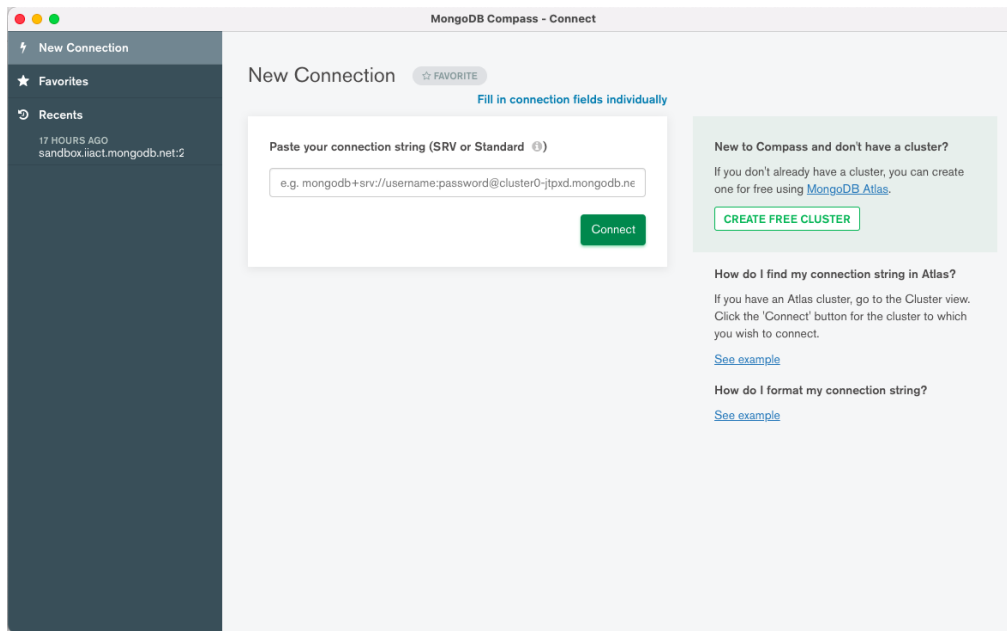
When entering your password, make sure that any special characters are [URL encoded](#).

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

Go Back

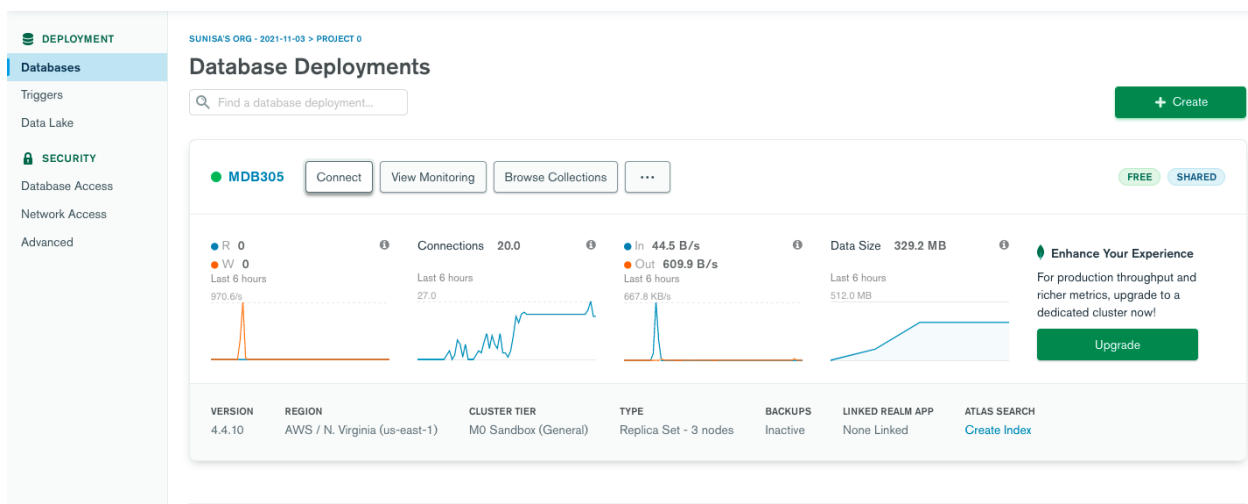
Close

- After the installation, open the MongoDB Compass program. You should specify the connection string to connect to your cluster. If you are not sure about the correct connection string, you will do the next step.



2.2 set up the MongoDB Compass connection

- Repeat these steps again
- Click on the **Database** menu to see the database homepage and click on the **Connect** button.




- Select a connection method as **Connect using MongoDB Compass**


Connect to MDB305


✓ Setup connection security > Choose a connection method > Connect

Choose a connection method [View documentation](#)

Get your pre-formatted connection string by selecting your tool below.

 **Connect with the MongoDB Shell**
Interact with your cluster using MongoDB's interactive Javascript interface >

 **Connect your application**
Connect your application to your cluster using MongoDB's native drivers >

 **Connect using MongoDB Compass**
Explore, modify, and visualize your data with MongoDB's GUI >

Go Back

Close

- You just copy the connection string in **no.2** only and close the window, then switch to the MongoDB Compass.

Connect to MDB305

✓ Setup connection security > ✓ Choose a connection method > Connect

I do not have MongoDB Compass

I have MongoDB Compass

1 Select your operating system and download MongoDB Compass

🍏 OS X 64-bit (10.10+) ▾

📄 Download Compass (1.28.4) or 📄 Copy download URL

2 Copy the connection string, then open MongoDB Compass.

mongodb+srv://mdb305-sunisa:<password>@mdb305.1gcgp.mongodb.net/test

You will be prompted for the password for the **mdb305-sunisa** user's (Database User) username.
When entering your password, make sure that any special characters are [URL encoded](#).

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

Go Back

Close

2.3 Connect to your cluster

- In the MongoDB Compass program, paste the connection string and specify your password.

New Connection ☆ FAVORITE

Fill in connection fields individually

Click edit to modify your connection string (SRV or Standard ⓘ)

mongodb+srv://mdb305-sunisa:*****@mdb305.1gcgp.mongodb.net/

Edit
 Connect

- If you can connect to your cluster via the MongoDB Compass, you will see the list of the databases as below:

MongoDB Compass - mdb305.1gcgp.mongodb.net

Local

11 DBS 31 COLLECTIONS

☆ FAVORITE

HOSTS
mdb305-shard-00-00.1gc...
mdb305-shard-00-01.1gc...
mdb305-shard-00-02.1gc...

CLUSTER
Replica Set (atlas-bi7jm2-s...
3 Nodes

EDITION
MongoDB 4.4.10 Enterprise

Filter your data

admin
config
local
sample_airbnb
sample_analytics
sample_geospatial
sample_mflix
sample_restaurants
sample_supplies
sample_traininn

+

> _MONGOSH

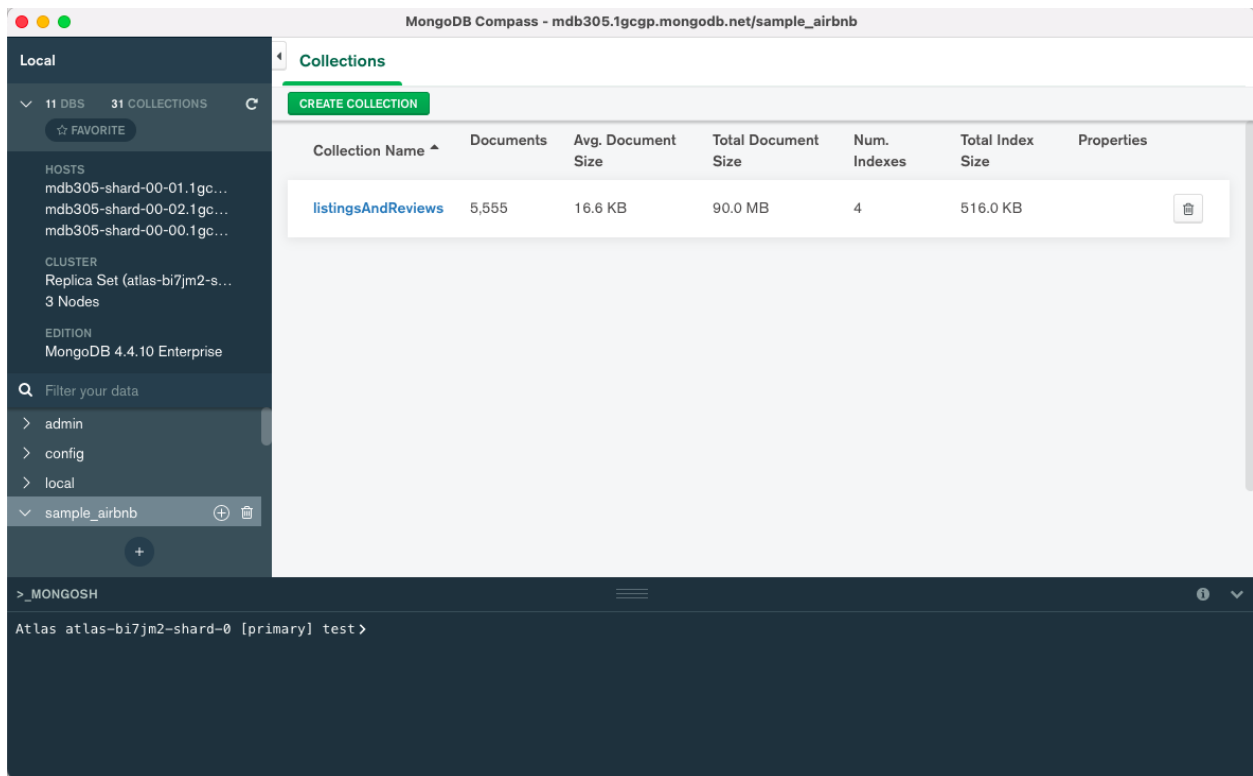
Databases Performance

CREATE DATABASE

Database Name	Storage Size	Collections	Indexes
admin	0.0B	0	0
config	0.0B	1	0
local	0.0B	8	0
sample_airbnb	52.1MB	1	4
sample_analytics	9.4MB	3	3
sample_geospatial	1.3MB	1	2
sample_mflix	27.6MB	5	9
sample_restaurants	5.7MB	2	2
sample_supplies	960.0KB	1	1

Task 3: Use basic MongoDB commands

- Run MongoDB commands by clicking on the **MONGOSH** (MongoDB Shell) menu at the lower left corner of the window.



- **Run the following commands**
 - > show dbs;
 - > use <database_name>;
 - > show collections;

FIND() Collection Method:

Resource:

<https://docs.mongodb.com/v4.2/reference/method/db.collection.find/>

`db.collection.find(query, projection)`: Selects documents in a collection or view and returns a [cursor](#) to the selected documents.

Parameter	Type	Description

<code>query</code>	document	Optional. Specifies selection filter using query operators . To return all documents in a collection, omit this parameter or pass an empty document (<code>{ }</code>).
<code>projection</code>	document	Optional. Specifies the fields to return in the documents that match the query filter. To return all fields in the matching documents, omit this parameter. For details, see Projection .

Returns: A cursor to the documents that match the `query` criteria. When the `find()` method “returns documents,” the method is actually returning a cursor to the documents.

Query

```
{ field1: <value> }
```

```
{ field:{<field>:<value>}} // $lt, $lte, $gt, $gte, $ne
```

```
{ field1: <value>, field2: <value> ... }
```

Projection

The `projection` parameter determines which fields are returned in the matching documents. The `projection` parameter takes a document of the following form:

```
{ field1: <value>, field2: <value> ... }
```

The `<value>` can be any of the following:

1 or true to include the field in the return documents.

0 or false to exclude the field.

Example:

- The following query uses `$gt` to return documents where the value of `qty` is greater than 4.

```
db.collection.find( { qty: { $gt: 4 } } )
```


- The following operation finds all documents in the bios collection and returns only the name field, contribs field and _id field:
`db.bios.find({ }, { name: 1, contribs: 1 })`

COUNT() Collection Method:

Resource: <https://docs.mongodb.com/v4.2/reference/method/db.collection.count/>

`db.collection.count(query, options)` Returns the count of documents that would match a `find()` query for the collection or view. The `db.collection.count()` method does not perform the `find()` operation but instead counts and returns the number of results that match a query.

Parameter	Type	Description
query	document	The query selection criteria.
options	document	Optional. Extra options for modifying the count.

Note: `count()` is equivalent to the `db.collection.find(query).count()` construct.

*** Checkpoint 3***

Write a mongoDB command to answer the following questions:

3.1 Write a command to use the SAMPLE_TRAINING database

```
> use sample_training
< 'switched to db sample_training'
```

3.2 Write a command to view documents of the zips collection that population is less than 10000.

```
> db.zips.find({pop: { $lt: 10000}})
< { _id: ObjectId("5c8eccc1caa187d17ca6ed16"),
  city: 'ALPINE',
  zip: '35014',
  loc: { y: 33.331165, x: 86.208934 },
  pop: 3062,
  state: 'AL' }
{ _id: ObjectId("5c8eccc1caa187d17ca6ed18"),
  city: 'ACMAR',
  zip: '35004',
  loc: { y: 33.584132, x: 86.51557 },
  pop: 6055,
  state: 'AL' }
{ _id: ObjectId("5c8eccc1caa187d17ca6ed19"),
  city: 'BAILEYTON',
```

3.3 Write a command to display `_id`, `city` and `pop` fields of documents in the `zips` collection that population is less than 10000.

```
> db.zips.find({pop: { $lt: 10000 }},{_id: 1 ,city: 1,pop: 1})
< { _id: ObjectId("5c8eccc1caa187d17ca6ed16"),
  city: 'ALPINE',
  pop: 3062 }
{ _id: ObjectId("5c8eccc1caa187d17ca6ed18"),
  city: 'ACMAR',
  pop: 6055 }
{ _id: ObjectId("5c8eccc1caa187d17ca6ed19"),
  city: 'BAILEYTON',
  pop: 1781 }
{ _id: ObjectId("5c8eccc1caa187d17ca6ed1b"),
  city: 'BLOUNTSVILLE',
  pop: 9058 }
{ _id: ObjectId("5c8eccc1caa187d17ca6ed1c"),
  city: 'BRIERFIELD',
```

3.4 Write a command to view all fields of documents excluding the end station location and the start station location fields in the `trips` collection that the user type is "Subscriber" and the start station id is 268.

```
> db.trips.find({usertype: "Subscriber","start station id": 268},{start station location": 0,"end station location": 0})
< { _id: ObjectId("572bb8222b288919b68abf5b"),
  tripduration: 889,
  'start station id': 268,
  'start station name': 'Howard St & Centre St',
  'end station id': 3002,
  'end station name': 'South End Ave & Liberty St',
  bikeid: 22794,
  usertype: 'Subscriber',
  'birth year': 1961,
  'start time': 2016-01-01T00:01:06.000Z,
  'stop time': 2016-01-01T00:15:56.000Z }
{ _id: ObjectId("572bb8222b288919b68abf5d"),
  tripduration: 923,
  'start station id': 268,
  'start station name': 'Howard St & Centre St',
  'end station id': 3002,
  'end station name': 'South End Ave & Liberty St',
  bikeid: 22285,
  usertype: 'Subscriber',
  'birth year': 1958,
  'start time': 2016-01-01T00:00:41.000Z,
  'stop time': 2016-01-01T00:16:04.000Z }
```

3.5 Write a command to answer "How many documents of the `trips` collection that have a user type named "Subscriber" and the birth year is equal to 1964 ?".

```
> db.trips.find({usertype: "Subscriber","birth year": 1964},{start_station_location: 0,end_station_location: 0}).count()
< 99
```