

Back-End Development



mongoDB

Exploration

Database

- A **database** is *an organized collection of data*.
- The **main purpose** of database is to operate large amount of information by storing, retrieving and managing.
- There are many dynamic websites on the world wide web nowadays which are handled through databases. For example, a model to checks the availability of rooms in a hotel. It is an example of dynamic website that uses database.



Non-RDBMS / NoSQL

- **NoSQL** or **Non-RDBMS** (*Non Relational Database Management Systems*) is database that is not modeled like relational model based.
- The data structure used by NoSQL databases are different from relational databases. It's faster and more flexible than relational db. That's why it's increasingly used in *big data* & *real time web application*.
- Here are the example of NoSQL database: MongoDB, Cassandra, CouchDB, OrientDB, IBM Domino, ArangoDB & Apache Ignite.

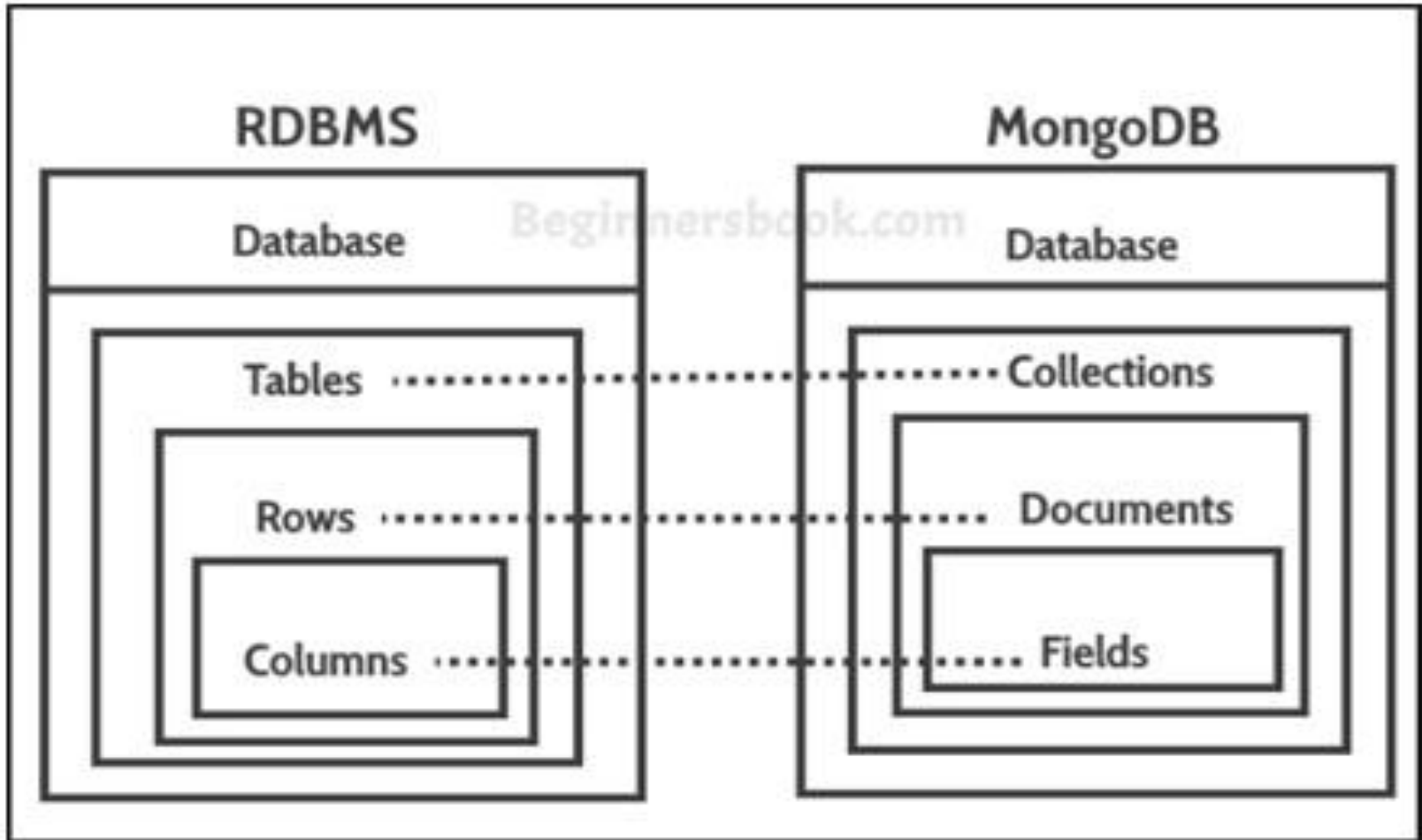


MongoDB

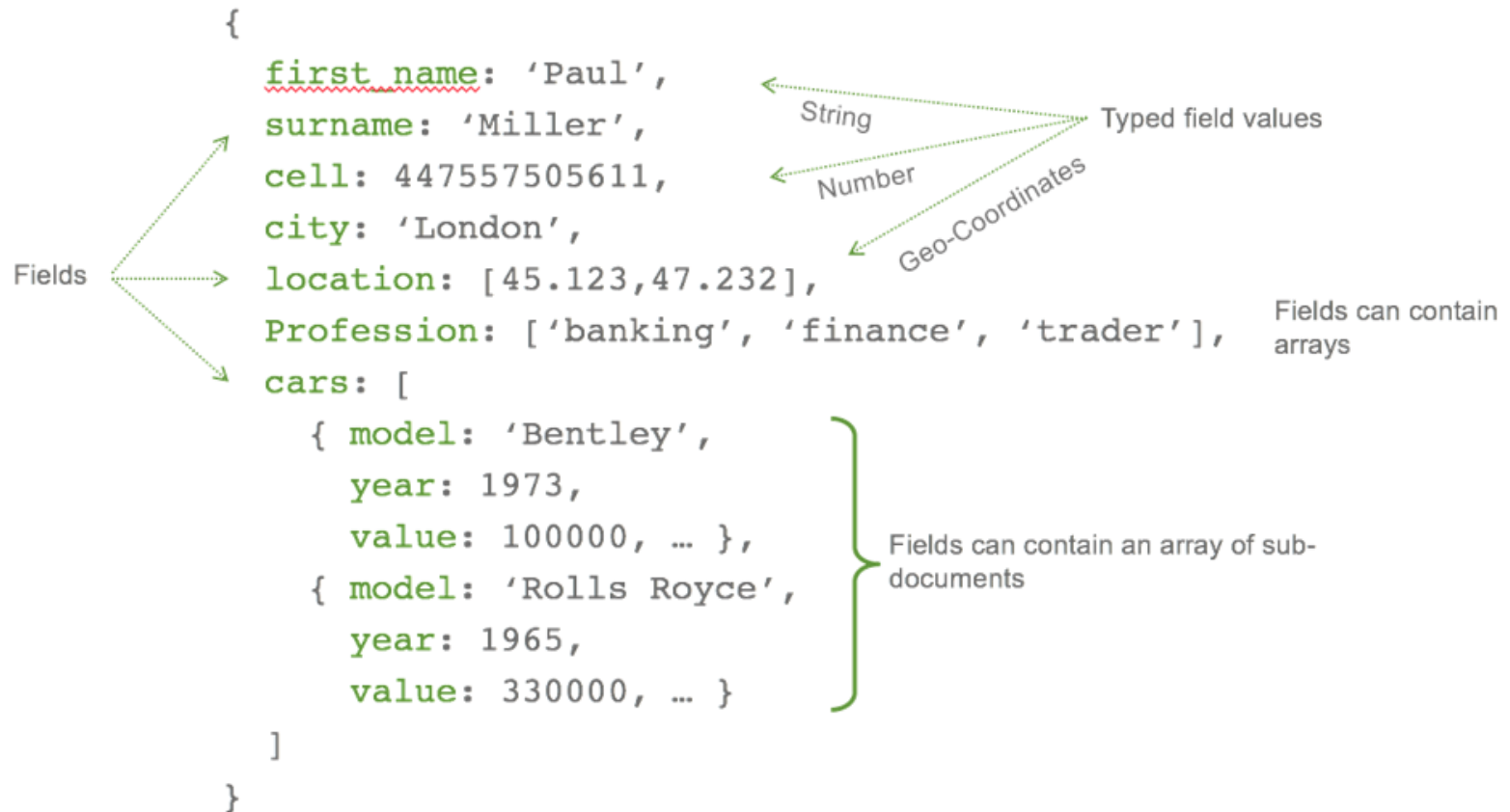
MongoDB is free & open source cross-platform document-oriented database. It's classified as NoSQL database & uses JSON-like documents with schemas.

MongoDB has been developed by MongoDB Inc. since 11th February 2009, and is published under GNU Affero General Public License & the Apache License.

Structure of RDBMS VS MongoDB



MongoDB's example document



Mongodb Data format

- it called Bson (Binary json)
- Because of that format data in MongoDB in the end look like json but its binary encoded.
- The purpose of this format is to make server efficient to work with all programming language.
- But BSON just uses in MongoDB internally. If we see MongoDB data It still JSON. But don't think data format in mongoDB is JSON



JSON vs BSON

	JSON	BSON
Encoding	UTF-8 String	Binary
Data Support	String, Boolean, Number, Array	String, Boolean, Number (Integer, Float, Long, Decimal128...), Array, Date, Raw Binary
Readability	Human and Machine	Machine Only

Source : <https://www.mongodb.com/json-and-bson>

Rank of Db engines

357 systems in ranking, May 2020

Rank			DBMS	Database Model	Score		
May 2020	Apr 2020	May 2019			May 2020	Apr 2020	May 2019
1.	1.	1.	Oracle +	Relational, Multi-model ⓘ	1345.44	+0.02	+59.89
2.	2.	2.	MySQL +	Relational, Multi-model ⓘ	1282.64	+14.29	+63.67
3.	3.	3.	Microsoft SQL Server +	Relational, Multi-model ⓘ	1078.30	-5.12	+6.12
4.	4.	4.	PostgreSQL +	Relational, Multi-model ⓘ	514.80	+4.95	+35.91
5.	5.	5.	MongoDB +	Document, Multi-model ⓘ	438.99	+0.57	+30.92
6.	6.	6.	IBM Db2 +	Relational, Multi-model ⓘ	162.64	-2.99	-11.80
7.	7.	7.	Elasticsearch +	Search engine, Multi-model ⓘ	149.13	+0.22	+0.51
8.	8.	8.	Redis +	Key-value, Multi-model ⓘ	143.48	-1.33	-4.93
9.	9.	↑ 11.	SQLite +	Relational	123.03	+0.84	+0.14
10.	10.	↓ 9.	Microsoft Access	Relational	119.90	-2.02	-23.88

Source : <https://db-engines.com/en/ranking>



Installation

- There is 2 ways to use mongodb:
 1. Install it in your PC or,
 2. Using MongoDB cloud Called MongoDB Atlas



Install Local in your Pc

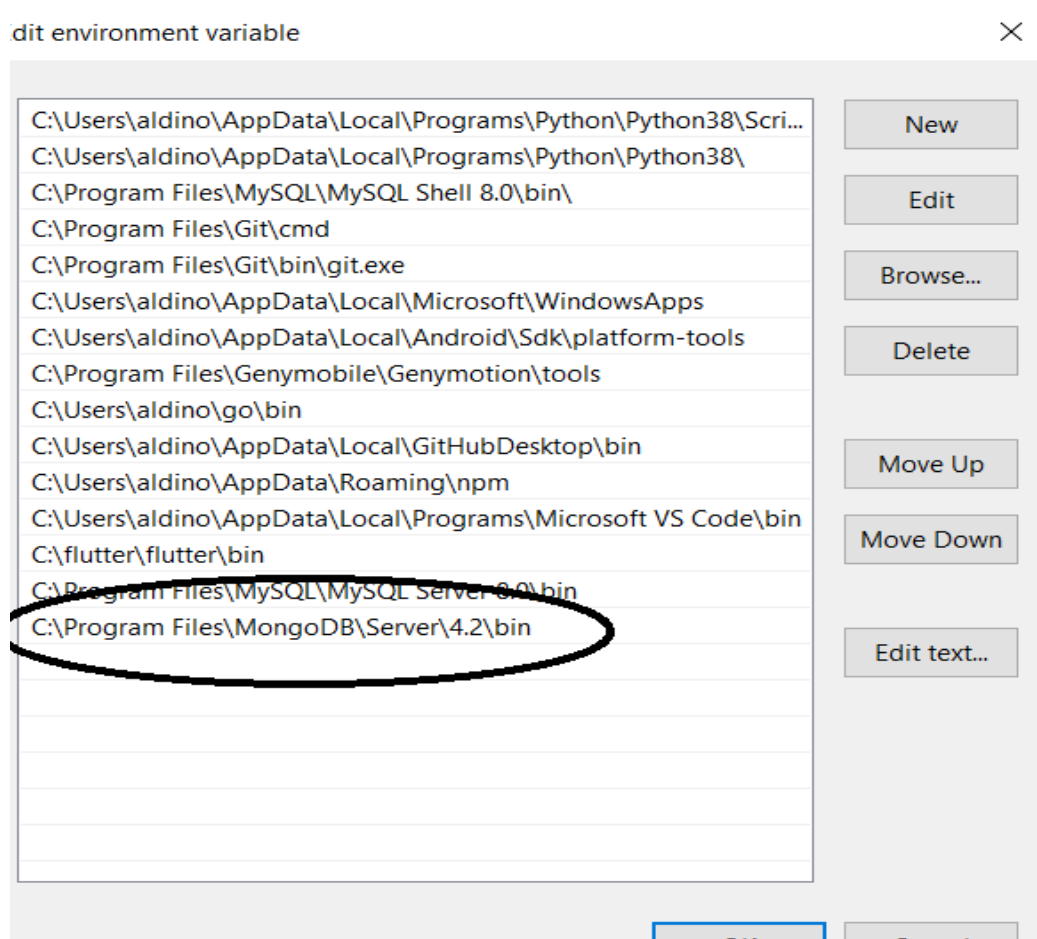
**Click this to see documentation
for installation base on your OS
:**

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



mongoDB

For windows add path





- Open terminal and

type : `$ mongod`

or

- Open terminal:
- `$ cd C:\Program Files\MongoDB\Server\3.6\bin`
- `$ mongod --dbpath C:\data\db`
- `$ mongod`

If OK, it will show "Waiting for connections on port 27017".



If work then you can open mongod in your terminal from windows with type:

mongo

or

```
$ cd C:\Program Files\MongoDB\Server\3.6\bin
```

```
$ mongo
```



mongoDB

```
Command Prompt - mongo
Microsoft Windows [Version 10.0.17763.1217]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\aldino>mongo
MongoDB shell version v4.2.6
connecting to: mongodb://127.0.0.1:27017/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("39036b7d-dcb1-4e86-ad2b-c18dcd7dc3d8") }
MongoDB server version: 4.2.6
Server has startup warnings:
2020-05-13T21:38:29.223+0700 I  CONTROL  [initandlisten]
2020-05-13T21:38:29.224+0700 I  CONTROL  [initandlisten] ** WARNING: Access control is not enabled for the database.
2020-05-13T21:38:29.224+0700 I  CONTROL  [initandlisten] **           Read and write access to data and configuration is
unrestricted.
2020-05-13T21:38:29.224+0700 I  CONTROL  [initandlisten]
---
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()
---
```

Work WITH MongoDB Database Full documentation:

<https://docs.mongodb.com/manual>

- Menampilkan daftar database

`$ show dbs`

- Menampilkan db aktif (default test)

`$db`

- Membuat sekaligus menggunakan db took jika tidak database tidak ada maka akan membuat database baru dan jika database sudah ada maka tidak akan membuat database baru

`$ use toko`

- Hapus db toko:

`$ use toko`

`$ db.dropDatabase`

Source: <https://docs.mongodb.com/manual/core/databases-and-collections/>

Collection

- Membuat collection “karyawan”:
`$ db.createCollection('karyawan')`
- Menampilkan daftar collection dalam db:
`$ show collections`
- Hapus collection “karyawan” :
`$ db.karyawan.drop();`

Source: <https://docs.mongodb.com/manual/core/databases-and-collections/>

- Add 1 data JSON ke collection "karyawan":

```
$ db.karyawan.insert({nama:"Adi",usia:24});
```

- Add multiple data ke collection "karyawan":

```
$ db.karyawan.insert([  
  {nama:"Budi",usia:23},  
  {nama:"Caca",usia:25}]);
```

- Menampilkan data pada collection "karyawan":

```
$ db.karyawan.find({}); // select * from karyawan  
$ db.karyawan.find().pretty(); pretty = to make easy to read  
$ db.karyawan.find({nama: "Adi"}).pretty();
```

- Update **semua** property data:

```
$ db.karyawan.update({nama: "Adi"},  
  {nama:"Adi",usia:21});
```

- Update property data tertentu:

```
$ db.karyawan.update({nama: "Budi"},  
  {$set:{usia:26}});
```

- Update nama property:

```
$ db.karyawan.update({nama: "Caca"},  
  {$rename:{"usia":"umur"}});
```

<https://docs.mongodb.com/manual/tutorial/update-documents/>

- Update **semua** property data:

```
$ db.karyawan.update({nama: "Adi"},  
  {nama:"Adi",usia:21});
```

- Update property data tertentu:

```
$ db.karyawan.update({nama: "Budi"},  
  {$set:{usia:26}});
```

- Update nama property:

```
$ db.karyawan.update({nama: "Caca"},  
  {$rename:{"usia":"umur"}});
```

- Update **semua** data isinya hanya usia = 21:

```
$ db.karyawan.updateMany({}, {usia:21});
```

- Update semua data property usia = 21:

```
$ db.karyawan.updateMany({},  
  {$set:{usia:21}});
```

- Update nama property di semua data:

```
$ db.karyawan.updateMany({},  
  {$rename:{ "usia" : "umur" }});
```



- Hapus 1 property dari sebuah data:

```
$ db.karyawan.update({nama: "Adi"},  
{$unset:{usia:true}});
```

```
$ db.karyawan.update({nama: "Budi"},  
{$unset:{usia:1}});
```

- Hapus 1 data:

```
$ db.karyawan.remove({nama: "Caca"});
```

- Hapus semua data:

```
$ db.karyawan.remove({});
```

<https://docs.mongodb.com/manual/tutorial/remove-documents/>

- Tampilkan data yang memiliki property value nama = Budi **dan** usia = 21:

```
$ db.karyawan.find({$and:  
[ {nama:"Budi"}, {usia:21} ] }).pretty();
```

- Tampilkan data yang memiliki property value nama = Adi **atau** nama = Budi:

```
$ db.karyawan.find({$or:  
[ {nama:"Adi"}, {nama:"Budi"} ] }).pretty();
```

<https://docs.mongodb.com/manual/tutorial/query-documents/>

Lower and Greater Than

- Tampilkan data yang property usianya < 25:

```
$ db.karyawan.find({usia:{$lt:25}})
.pretty();
```

- Tampilkan data yang property usianya > 25:

```
$ db.karyawan.find({usia:{$gt:25}})
.pretty();
```

Lower and Greater Than Equal

- Tampilkan data yang property usianya ≤ 25 :

```
$ db.karyawan.find({usia:{$lte:25}})
.pretty();
```

- Tampilkan data yang property usianya ≥ 25 :

```
$ db.karyawan.find({usia:{$gte:25}})
.pretty();
```

- Tampilkan 2 data pertama:

```
$ db.karyawan.find().limit(2);
```

- Tampilkan 1 data setelah 2 data pertama:

```
$ db.karyawan.find().limit(1).skip(2);
```

- Tampilkan 3 data setelah 3 data pertama:

```
$ db.karyawan.find().limit(3).skip(3);
```

- Urutkan data ***ascending*** berdasarkan ***nama***:

```
$ db.karyawan.find().sort({nama:1});
```

- Urutkan data ***descending*** berdasarkan ***nama***:

```
$ db.karyawan.find().sort({nama:-1});
```

- Urutkan data ***ascending*** berdasarkan ***usia***:

```
$ db.karyawan.find().sort({usia:1});
```

- Urutkan data ***descending*** berdasarkan ***usia***:

```
$ db.karyawan.find().sort({usia:-1});
```

- Hitung jumlah data di collection “karyawan”:

```
$ db.karyawan.find().count();
```

- Hitung jumlah data dg prop nama = Adi:

```
$ db.karyawan.find({nama:"Adi"}).count();
```

- Sql :

```
$ Select * from karyawan where nama like '%i';
```

Mongodb:

```
$ db.karyawan.find( {nama:{$regex: /i$/}})
```

- Sql:

```
$ select * FROM karyawan WHERE nama LIKE '%d%'
```

Mongodb:

```
$ db.karyawanfind({'name': {'$regex': 'd', '$options': 'i'}})
```

Note: Options:I mean incasesensitivity

Detail read in:

<https://docs.mongodb.com/manual/reference/operator/query/regex/>

How to Work With MongoDB GUI Tools



Install MongoDB Compass (local)

Open in browser to use MongoDB Compass

<https://www.mongodb.com/download-center/compass>

MongoDB Compass

The easiest way to explore and manipulate your MongoDB data

Try it now

The GUI for MongoDB. Visually explore your data. Run ad hoc queries in seconds. Interact with your data with full CRUD functionality. View and optimize your query performance. Available on Linux, Mac, or Windows.

Compass empowers you to make smarter decisions about indexing, document validation, and more.



Mongodb Compass

MongoDB Compass Community - Connect



Connect View Collection Help

⚡ New Connection

★ Favorites

6 HOURS AGO
localhost:27017 ...

🔄 Recents

FEB 3, 2020 12:24 PM
cluster0-hqc7b.mongodb.net
APR 20, 2020 3:22 PM
cluster0-ydv5x.mongodb.net

localhost:27017

★ FAVORITE

Fill in connection fields individually

Paste your connection string (SRV or Standard ⓘ)

mongodb://localhost:27017/?readPreference=primary&appName=MongoDB%20Compass

CONNECT

New to Compass and don't have a cluster?

If you don't already have a cluster, you can create one for free using [MongoDB Atlas](#).

CREATE FREE CLUSTER

How do I find my connection string in Atlas?

If you have an Atlas cluster, go to the Cluster view. Click the 'Connect' button for the cluster to which you wish to connect.

[See example](#)

How do I format my connection string?

[See example](#)



mongoDB

Connect with mongodb compass

MongoDB Compass Community - Connect

— □ ×

Connect View Help

⚡ New Connection

★ Favorites

MAY 17, 2020 4:03 PM
localhost:27017

🕒 Recents

FEB 3, 2020 12:24 PM
cluster0-hqc7b.mongodb.net

APR 20, 2020 3:22 PM
cluster0-ydv5x.mongodb.net

New Connection

☆ FAVORITE

Fill in connection fields individually

Paste your connection string (SRV or Standard)

e.g. mongodb+srv://cluster0-jtpxd.mongodb.net/admin

Click this

CONNECT

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MongoDB Compass Community - Connect

Connect View Help

New Connection

★ Favorites

MAY 17, 2020 4:03 PM
localhost:27017

🕒 Recents

FEB 3, 2020 12:24 PM
cluster0-hqc7b.mongodb.ne

APR 20, 2020 3:22 PM
cluster0-ydv5x.mongodb.net

New Connection

☆ FAVORITE

[Paste connection string](#)

Hostname

More Options

Hostname

localhost

Port

27017

SRV Record

☐

Authentication

None

CONNECT

New to Compass and don't have a cluster?

If you don't already have a cluster, you can create one for free using [MongoDB Atlas](#).

[CREATE FREE CLUSTER](#)

How do I find my username and password?

If your mongod instance has authentication set up, you'll need the credentials of the MongoDB user that is configured on the project.

Note: authentication able to be none or using password and username it depend which option that you select during installation

MongoDB Compass Community - localhost:27017

Connect View Help

Compass is now free for everyone! Migrate your Community Edition for everything Compass has to offer. [Here's how](#)

4 DBS 2 COLLECTIONS

★ FAVORITE

HOST
localhost:27017





CLUSTER
Standalone

EDITION
MongoDB 4.2.6 Community


Filter your data

- > admin
- > config
- > iflix
- > local

CREATE DATABASE

Database Name ^	Storage Size	Collections	Indexes	
admin	20.0KB	0	1	
config	24.0KB	0	2	
iflix	208.0KB	1	1	
local	36.0KB	1	1	

How to Work With MongoDB Cloud

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MongoDB Atlas

Move faster with a cloud MongoDB service. Built for agile teams who'd rather spend time building apps than managing databases. Available on AWS, Azure, and GCP.

[Start free](#)

Already have an account? [Log in here](#) →

Cloud Provider & Region

Choose your preferred cloud provider and the region nearest to clients

Select a cloud provider to see its region availability.



Configure a **free tier cluster** by first selecting a region labeled with **FREE TIER AVAILABLE** then choose the M0 option in the Cluster Tier below.

★ recommended region ⓘ

NORTH AMERICA	EUROPE	ASIA
 N. Virginia (us-east-1) ★ FREE TIER AVAILABLE	 Ireland (eu-west-1) ★	 Tokyo (ap-northeast-1)
 Ohio (us-west-1) ★	 London (eu-west-2)	 Seoul (ap-northeast-2)
 N. California (us-west-1)	 Frankfurt (eu-central-1) ★ FREE TIER AVAILABLE	 Singapore (ap-southeast-1)
 Oregon (us-west-2) ★		 Mumbai (ap-south-1)
 Montreal (ca-central-1)	 São Paulo (sa-east-1)	

[Pricing](#)[Getting started](#)[Migrate to MongoDB Atlas](#)[Frequently Asked Questions](#)

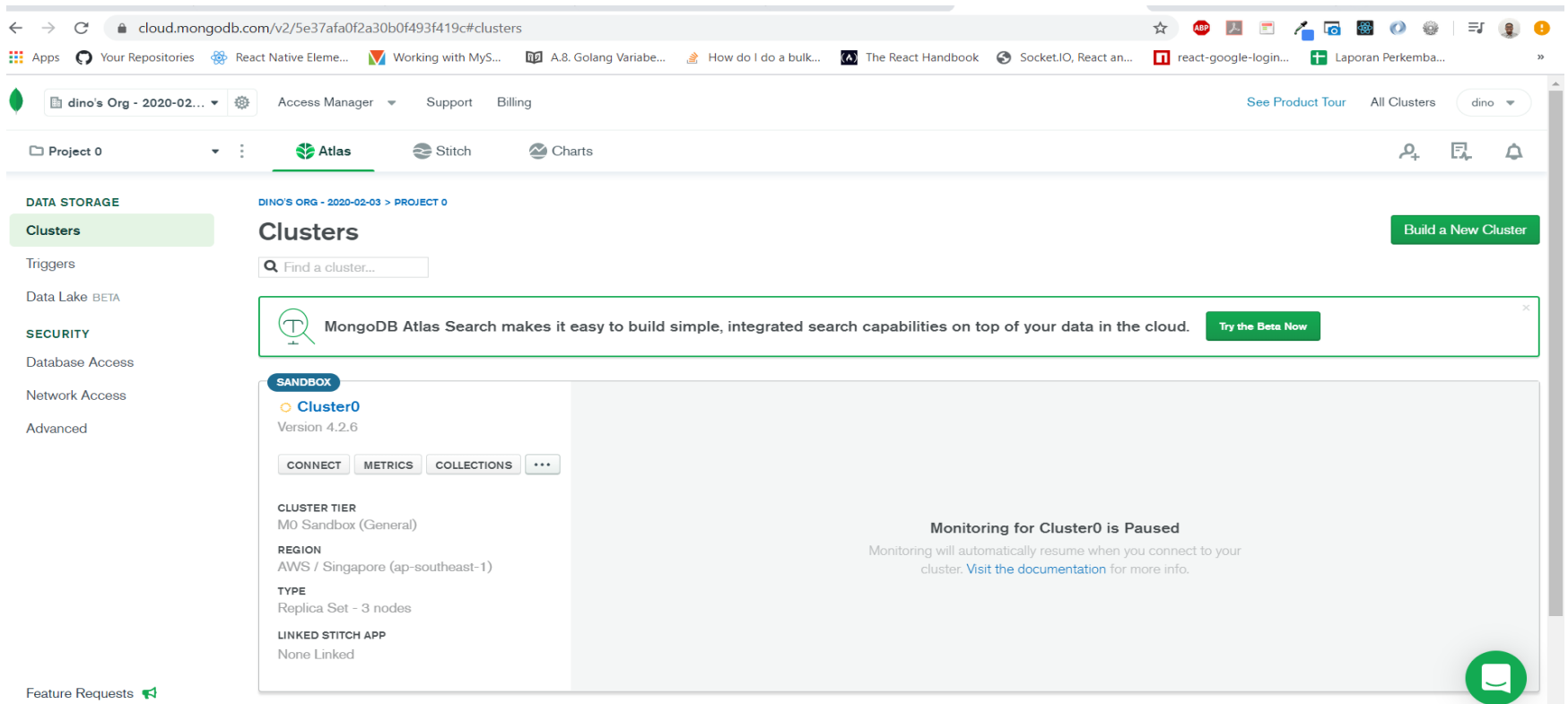


Sign Up MongoDB Atlas

Link to Register :

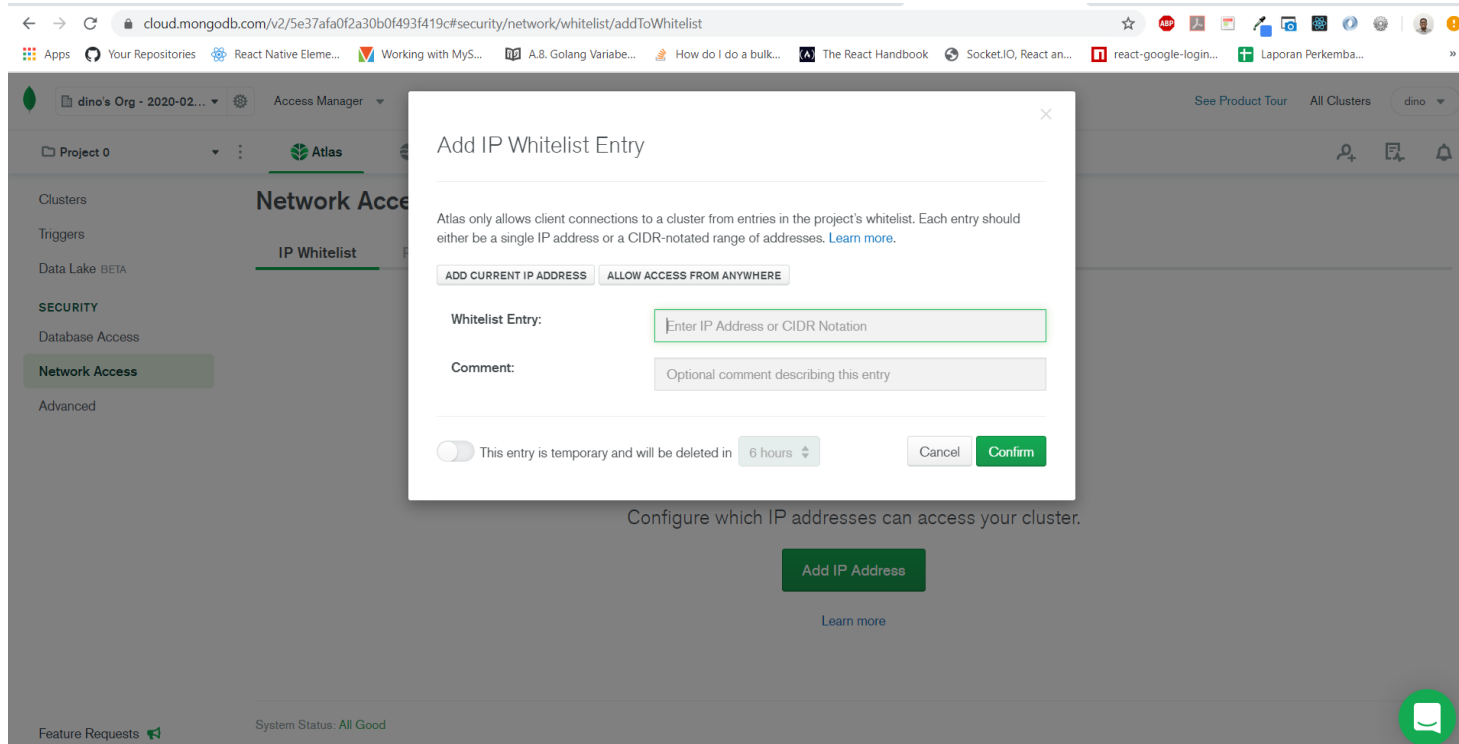
<https://account.mongodb.com/account/register>

View After Register



The screenshot shows the MongoDB Atlas web interface. The browser address bar displays the URL: `cloud.mongodb.com/v2/5e37afa0f2a30b0f493f419c#clusters`. The page header includes navigation links for 'Access Manager', 'Support', and 'Billing', along with a 'See Product Tour' link and a dropdown menu for 'All Clusters' showing 'dino'. The left sidebar contains a 'Project 0' dropdown and a menu with 'Atlas', 'Stitch', and 'Charts'. The main content area is titled 'Clusters' and features a search bar with the placeholder 'Find a cluster...'. A green button 'Build a New Cluster' is located in the top right corner. A banner for 'MongoDB Atlas Search' is displayed, stating 'MongoDB Atlas Search makes it easy to build simple, integrated search capabilities on top of your data in the cloud.' with a 'Try the Beta Now' button. Below the banner, a 'SANDBOX' section shows details for 'Cluster0' (Version 4.2.6). The cluster status is 'Monitoring for Cluster0 is Paused', with a note that monitoring will resume upon connection. The cluster tier is 'M0 Sandbox (General)', the region is 'AWS / Singapore (ap-southeast-1)', the type is 'Replica Set - 3 nodes', and the linked stitch app is 'None Linked'. A 'Feature Requests' link is visible in the bottom left corner.

- For all access, click Network Access -> click add ip -> click allow access from anywhere



- You can connect mongodb atlas to your shell, API, or mongo DB compass.

