



Overview over MongoDB basics and NON-SQL
databases

What is MongoDB ?

MongoDB is a document-based database that store data in collections of BSON objects



```
1  {  
2    _id: "5cf0029caff5056591b0ce7d",  
3    firstname: 'Jane',  
4    lastname: 'Wu',  
5    address: {  
6      street: '1 Circle Rd',  
7      city: 'Los Angeles',  
8      state: 'CA',  
9      zip: '90404'  
10   }  
11  }
```



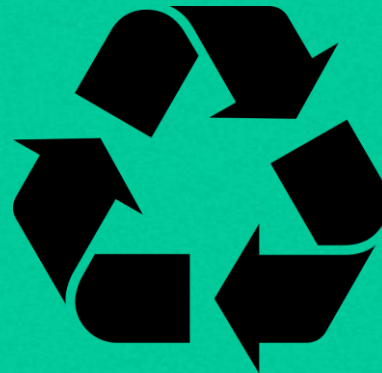
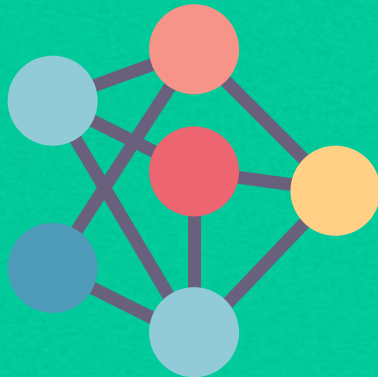
Purpose of MongoDB:

Scalability

Complex data structures

Polymorphism

Big Data



Database

Collections

Documents

Documents

Documents

Collections

Documents

Documents

Documents



SQL Terms/Concepts

database

tables

rows

columns

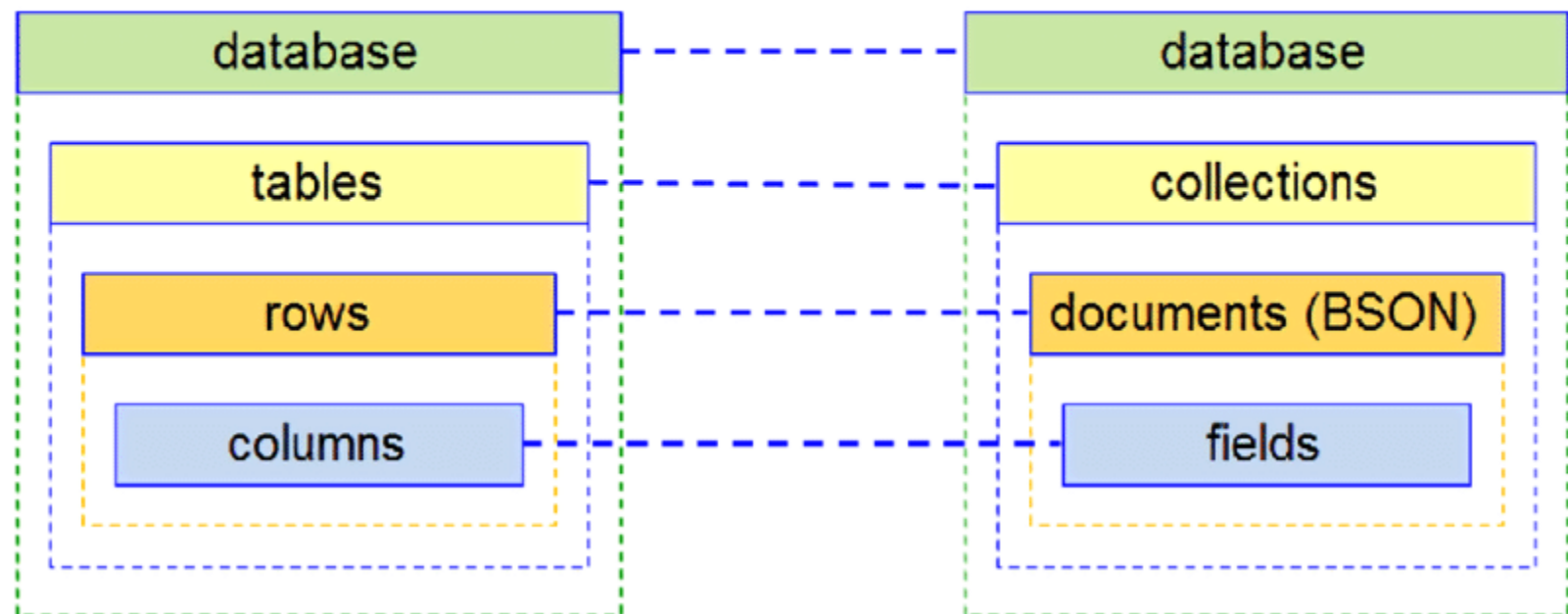
MongoDB Terms/Concepts

database

collections

documents (BSON)

fields



Document storing

MongoDB store the documents as **BSON** format

BSON (Binary JSON) add extra datatypes and provides a faster access to the data

- String
- Numbers
- Bool
- Null
- List
- Object
- Timestamp
- Binary

JSON

BSON

XML

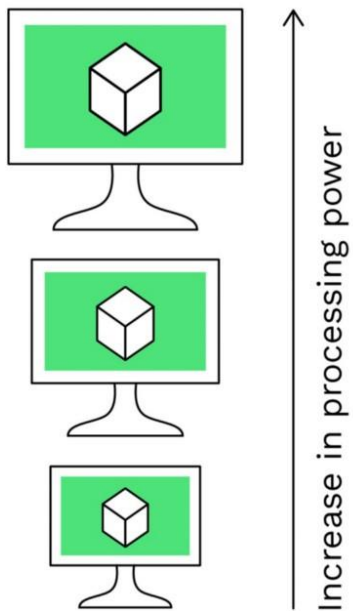
```
<book id="bk102">
  <author>Ralls, Kim</author>
  <title>Midnight Rain</title>
  <genre>Fantasy</genre>
  <price>5.95</price>
  <publish_date>2000-12-16</publish_date>
  <description>
    A former architect battles corporate zombies,
    an evil sorceress, and her own childhood to become queen
    of the world.
  </description>
</book>
```

JSON

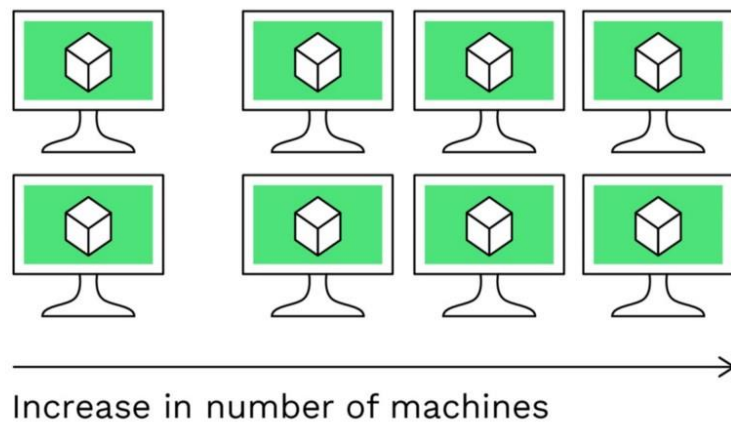
```
{
  "id": "bk102",
  "author": "Ralls, Kim",
  "title": "Midnight Rain",
  "genre": "Fantasy",
  "price": "5.95",
  "publish_date": "2000-12-16",
  "description": "A former architect ..."
}
```

Scalability

Vertical scaling



Horizontal scaling



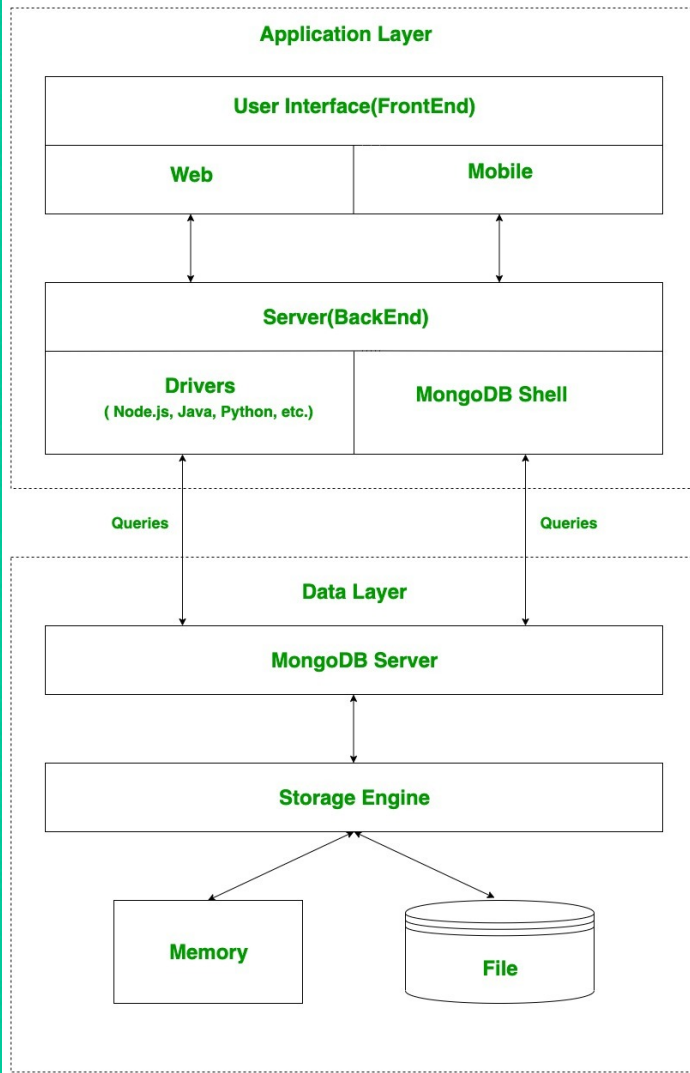
The client, with a mobile app or a web page, send requests to the server (due HTTP, socket ...)



The server make queries to the server through specific drivers or the integrated shell



The mongo DB server access storage using the integrated engine



Mongo Workflow





to

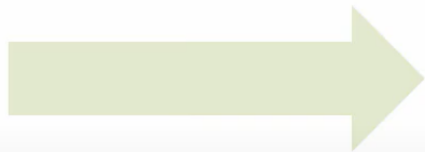


mongoDB®

id	name	surname	city
1	Alberto	Olla	Cagliari
2	Marta	Angioni	Cagliari
3	MarBerto

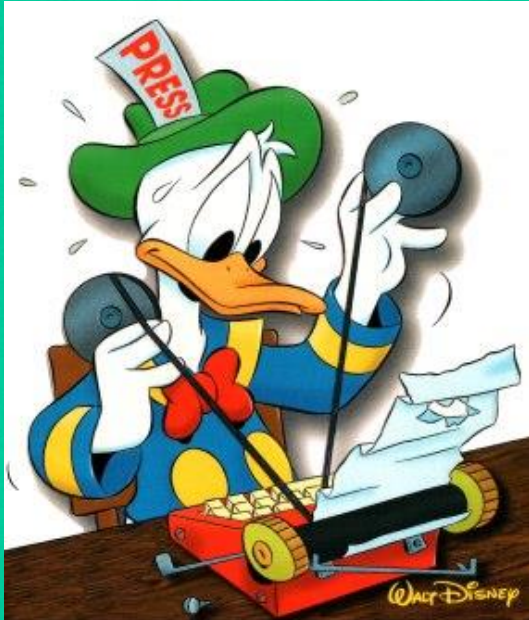
Tabella Cars

id	model	year	id_client
1	Smart	2010	1
2	Ferrari	1995	1
3	BMW	2015	2



```
{ name: "Alberto",  
  surname: "Olla",  
  city: "Cagliari",  
  cars: [  
    { model: "Smart",  
      year: 2010 },  
    { model: "Ferrari",  
      year: 1995 }  
  ],  
  location: {  
    type: "Point",  
    coordinates:  
      [39.216, 9.116]  
  },  
}
```

Syntax



MySQL	MongoDB
INSERT	
<pre>INSERT INTO account (`A/c number`, `first name`, `last name`) VALUES ('12345746352', 'Mark', 'Jacobs');</pre>	<pre>db.account.insert({ A/c number: "12345746352", first name: "Mark", last name: "Jacobs" });</pre>
UPDATE	
<pre>UPDATE account SET contact number = 9426227364 WHERE A/c number = '12345746352'</pre>	<pre>db.account.update({ A/c number: '12345746352' }, { \$set: {contact number: 9426227364 } });</pre>
DELETE	
<pre>DELETE FROM account WHERE e-mail address = 'jv1994@gmail.com';</pre>	<pre>db.account.remove({ "E-mail address": "jv1994@gmail.com" });</pre>



mongoDB

VS



	MONGO	SQL
INTENDED PURPOSE	Specific use cases	General purpose
API	SQL not required	SQL required
DATA MODEL	Collections with documents	Tables with fixed rows and columns
SCHEMA	Flexible	Rigid
SCALABILITY	Horizontal scale out	Vertical scale up
DATA INTEGRITY	BASE	ACID

GRAZIE PER L'ATTENZIONE

Carminati Giovanni

Marzo 2022