

Introduction to MongoDB & Setting up Database

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Types of Databases

There are two major types of Databases in that is used in the Software Industry

SQL

SQL databases are basically a collection of structured tables, where each row reflects a data item, and each column defines a specific information field. Relational databases are built using the structured query language (SQL) to create, store, update, and retrieve data.

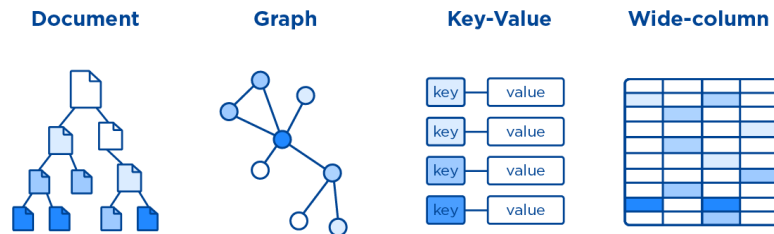
SQL is a domain-specific language used in programming and designed for managing data held in a relational database management system, or for stream processing in a relational data stream management system



No SQL

NoSQL databases, short for "not only SQL", are non-tabular databases and store data differently than relational tables. NoSQL databases come in a variety of types based on their data model. The main types are document, graph, key-value and wide-column.

A NoSQL database provides a mechanism for storage and retrieval of data that is modeled in means other than the tabular relations used in relational databases.



Some Key Differences b/w SQL & NoSQL Databases:

	SQL Databases	NoSQL Databases
Data Storage Model	Tables with fixed rows and columns	Document: JSON documents, Key-value: key-value pairs, Wide-column: tables with rows and dynamic columns, Graph: nodes and edges
Examples	Oracle, MySQL, Microsoft SQL Server, and PostgreSQL	Document: MongoDB and CouchDB, Key-value: Redis and DynamoDB, Wide-column: Cassandra and HBase, Graph: Neo4j and Amazon Neptune
Primary Purpose	General purpose	Document: general purpose, Key-value: large amounts of data with simple lookup queries, Wide-column: large amounts of data with predictable query patterns, Graph: analyzing and traversing relationships between connected data
Schemas	Rigid	Flexible
Scaling	Vertical (scale-up with a larger server)	Horizontal (scale-out across commodity servers)
Multi-Record ACID Transactions	Supported	Most do not support multi-record ACID transactions. However, some — like MongoDB — do.
Data to Object Mapping	Requires ORM (object-relational	Many do not require ORMs.

	mapping)	MongoDB documents map directly to data structures in most popular programming languages.
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MongoDB

MongoDB is a popular NoSQL database that is used for storing and managing large amounts of data. Unlike traditional relational databases, MongoDB stores data in a document-oriented way, which means that data is stored as JSON-like documents.

For example, let's say you wanted to store information about a user in a traditional relational database. You might have a table for users with columns for things like their name, email, and password. In MongoDB, you would instead store this information as a document that might look something like this:

```
{  
  "name": "John Smith",  
  "email": "john.smith@example.com",  
  "password": "password123"  
}
```

One of the benefits of using MongoDB is that it is very flexible and can handle different types of data. For example, you might also want to store information about a user's interests, which could be represented as an array of strings in the document:

```
{  
  "name": "John Smith",  
  "email": "john.smith@example.com",  
  "password": "password123",  
  "interests": ["hiking", "reading", "cooking"]  
}
```

Another benefit of using MongoDB is that it is very scalable. You can easily add more servers to your MongoDB cluster to handle more data as your application grows.

To interact with MongoDB, you can use a programming language like JavaScript or Python.

MongoDB Atlas

MongoDB Atlas is a fully-managed cloud database service that makes it easy to deploy, manage, and scale MongoDB databases. It's like having your own MongoDB server in the cloud without having to worry about hardware, software, or maintenance.

For that you have to follow the following steps :

1. Create an Atlas Account.
2. Deploy a free cluster on MongoDB Atlas
3. Add your connection IP Address to the list of your IP access list.
4. Install MongoDB Community Edition
5. Install MongoSH

Here's an example of how you might use MongoDB Atlas:

Let's say you're building a new web application that requires a database to store user information. You could create a MongoDB Atlas account and then use the Atlas dashboard to create a new MongoDB cluster. A cluster is a group of MongoDB servers that work together to store your data and provide high availability.

Once you've created your cluster, you can use the Atlas dashboard to configure security settings, set up automatic backups, and monitor the performance of your MongoDB instance.

You will have to add your connection IP Address to the list of your IP access list. The IP access list is a list of IP addresses that are allowed to connect to your MongoDB instance. By default, MongoDB does not allow remote connections, so you must add your IP address to the IP access list in order to connect to your database from outside your local network.

To connect to your MongoDB Atlas cluster, you'll need to use a connection string. This is a unique URL that includes information about your MongoDB cluster, such as the hostname, port, and authentication credentials. You can find the connection string in the Atlas dashboard and use it to connect to your MongoDB cluster from your web application.

Installing MongoDB Community edition

Here are the steps to install MongoDB Community Edition on a Windows-based system:

- Download the MongoDB Community Edition from the official website:
<https://www.mongodb.com/try/download/community>
- Choose the latest version of MongoDB for Windows, and select the MSI package.
- Run the MSI package and follow the prompts to install MongoDB. You can accept the default options, or customize the installation as needed.
- Once the installation is complete, MongoDB will be installed as a Windows service, which will start automatically whenever the system boots up.
- To confirm that MongoDB is running, you can open a command prompt and type "mongo". This will open the MongoDB shell, where you can execute commands and queries against your MongoDB instance.