

Web Applications & MongoDB Setup

Day 1: Understanding the Full Stack Journey & Environment Setup

Learning Goals

Mastering the fundamentals of MERN and Database Management

What You Will Learn Today



Web Architecture

Understand how Clients, Servers, and Databases interact in a modern web ecosystem.



MongoDB Mastery

Setup MongoDB Atlas and use Compass for visual data exploration and management.



Environment Setup

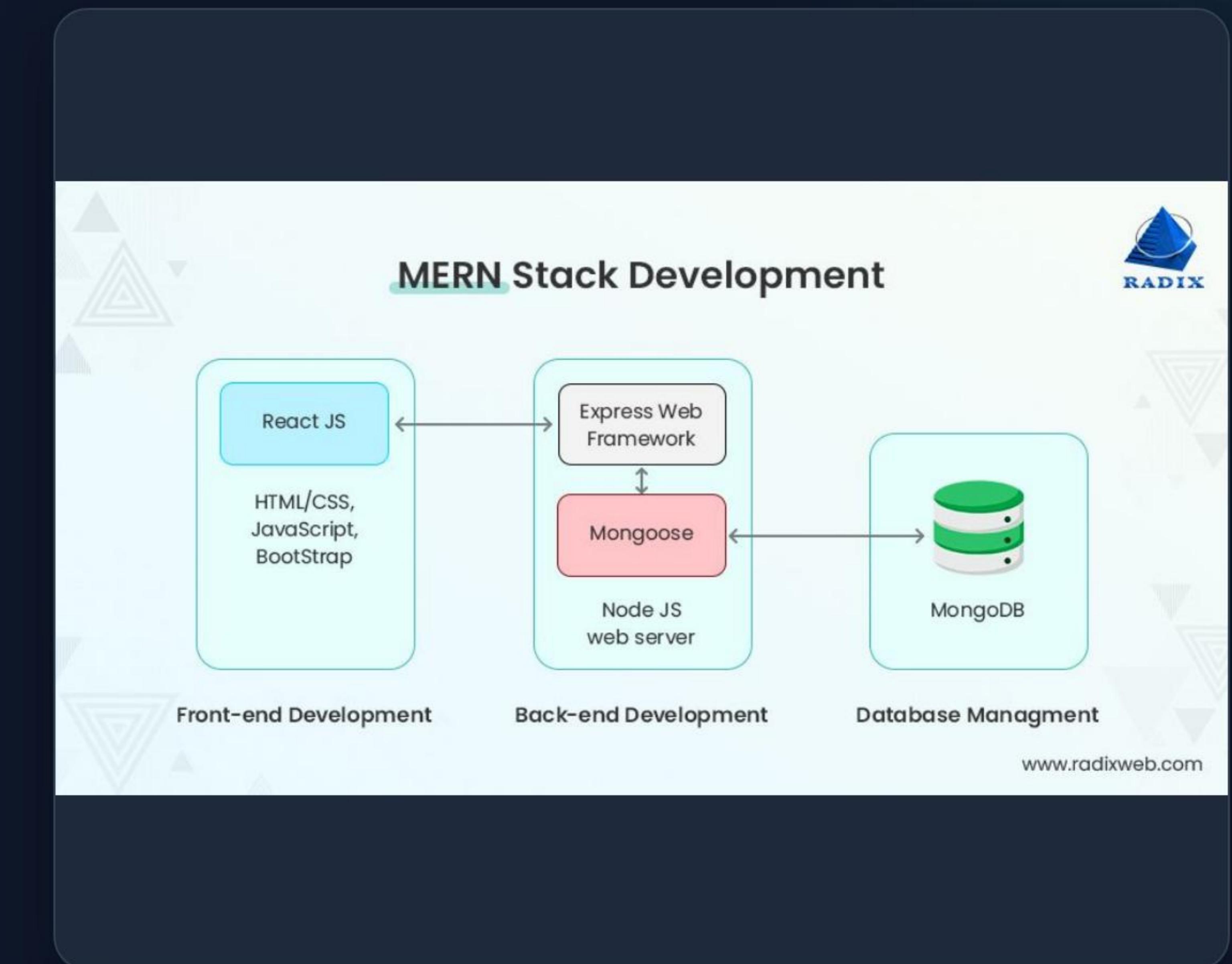
Install Node.js, VS Code, and launch your first React and Node projects.

How the Web Works

Main Components

- Client (Browser):** Built with React (HTML/CSS/JS) to show UI.
- Server:** Handles logic and requests using Node.js & Express.
- Database:** Stores persistent data like users via MongoDB.

Client → Server → Database



What is MERN Stack?

| Tech | Name | Role in the Stack |
|------|------------|--|
| M | MongoDB | NoSQL Database to store application data |
| E | Express.js | Backend web framework for Node.js |
| R | React | Frontend library for building User Interfaces |
| N | Node.js | JavaScript runtime for building scalable servers |

Key Advantage: "JavaScript Everywhere" – One language for the entire stack.

MongoDB Atlas Setup

- + Sign up at mongodb.com/atlas using Google or Email.
-  Create a **Free Shared Cluster** (AWS Provider).
-  Set up a Database User with a secure username and password.
-  Whitelist your IP (use `0.0.0.0/0` for easy dev).

Why Cloud?

Atlas handles backups, scaling, and security automatically, letting you focus on code instead of server maintenance.

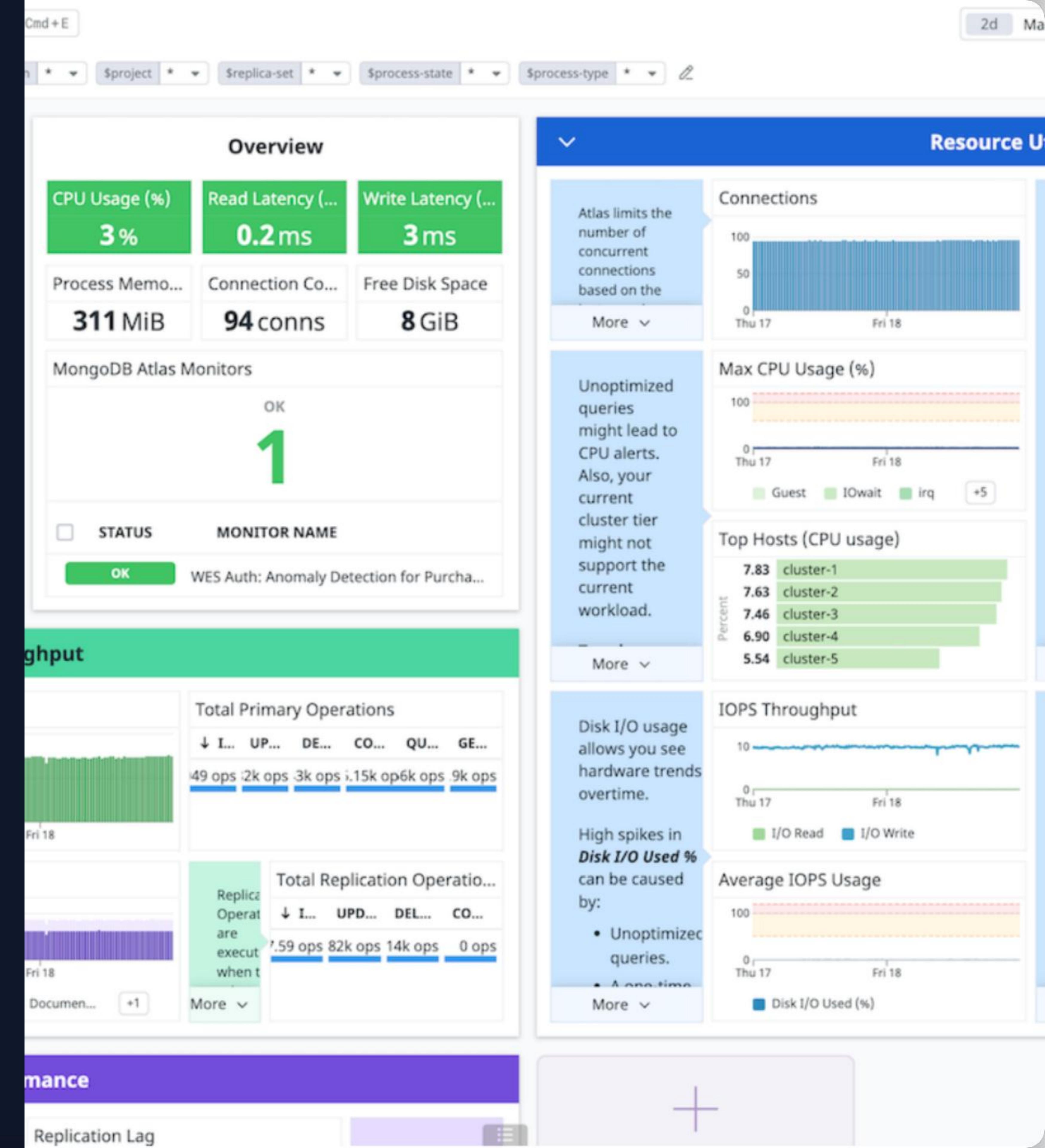
Atlas Dashboard

Clusters: Manage your database servers.

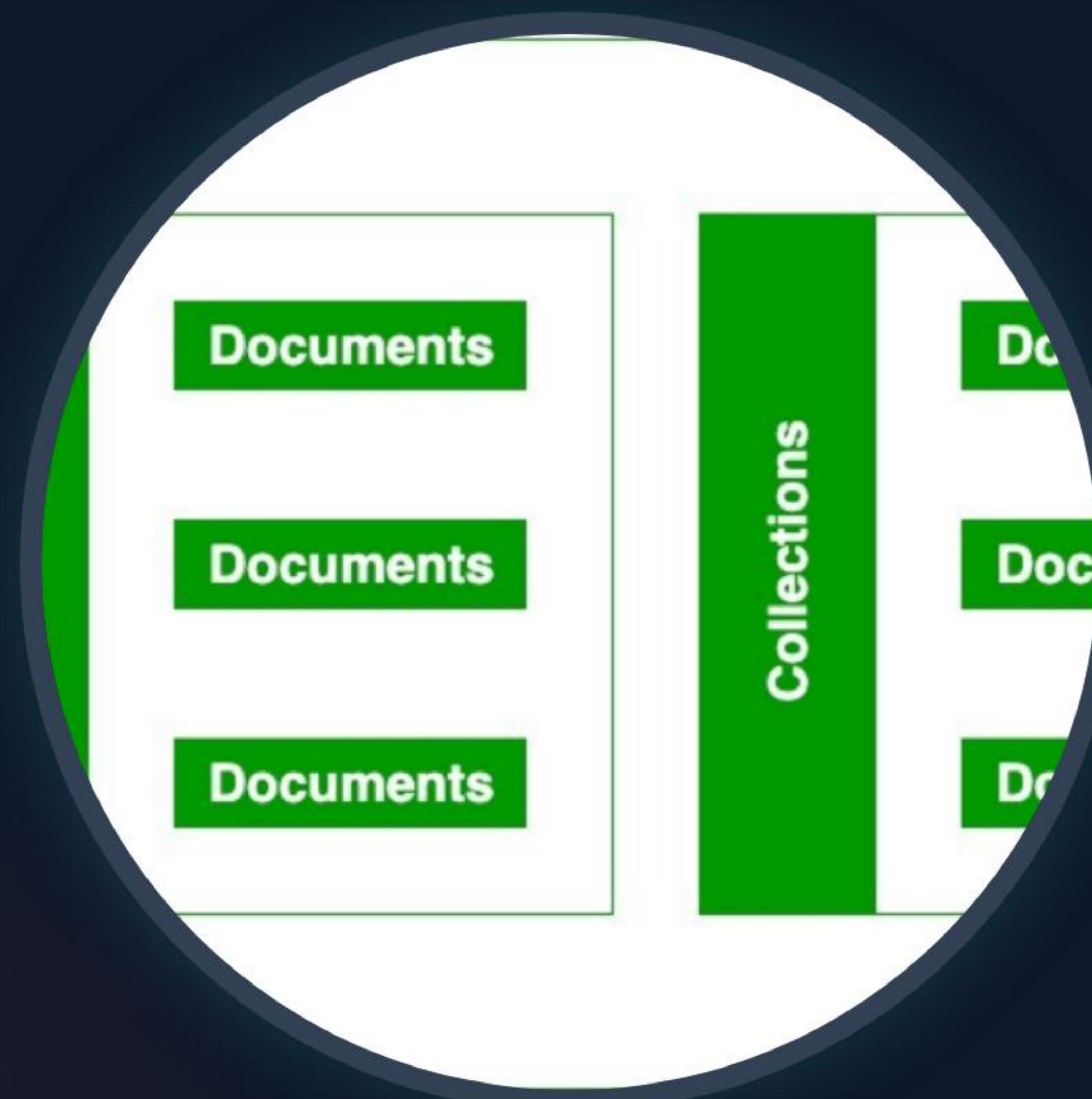
Collections: View and query your actual data.

Security: Manage users and network access.

The Atlas GUI provides a powerful overview of your database health and performance metrics in real-time.



Databases & Collections



Data Hierarchy

MongoDB uses a flexible structure:

Database: Container for collections (e.g., mern_app).

Collection: Group of documents (e.g., users).

Document: Individual records stored in JSON-like format.

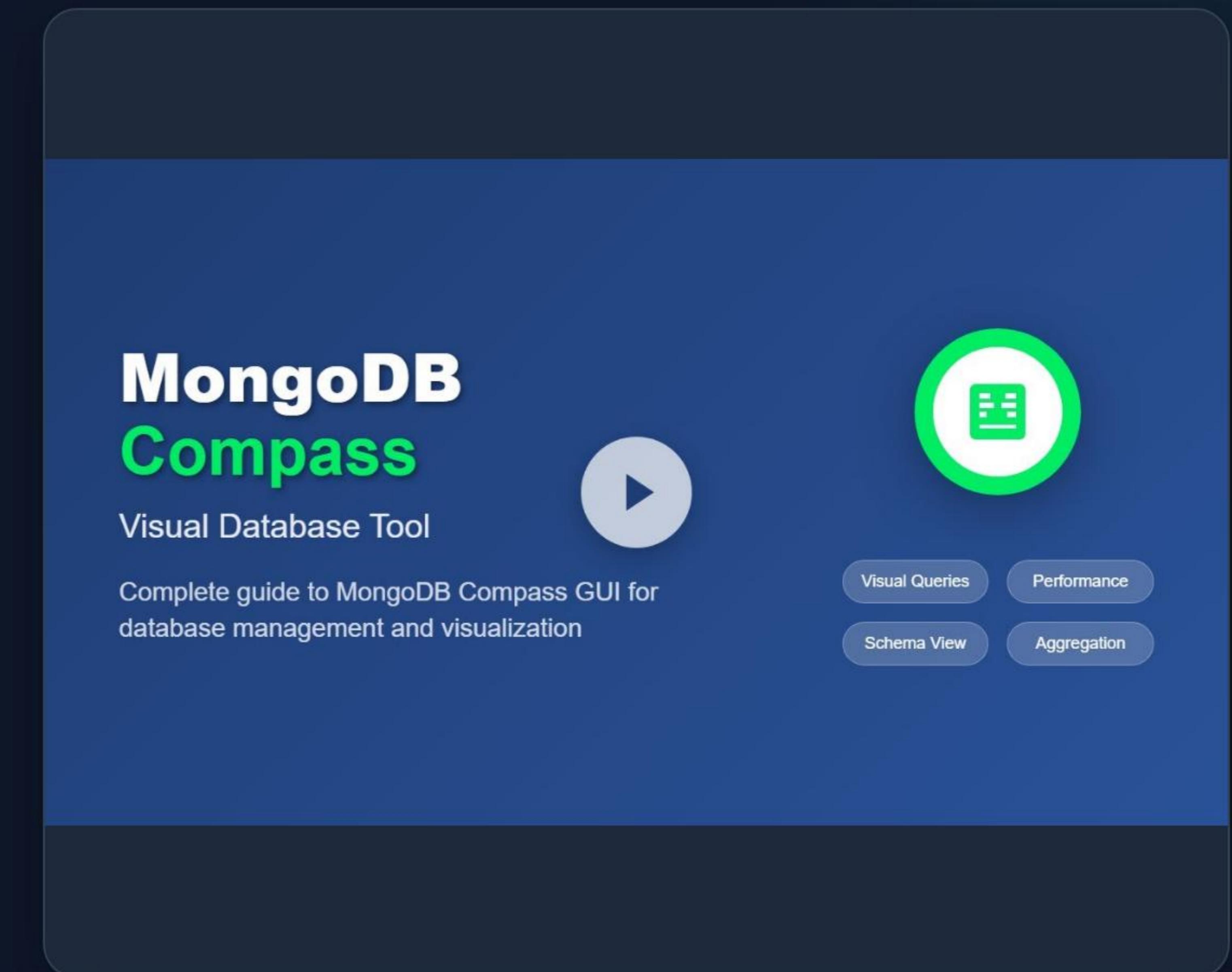
```
{ "name": "John Doe", "email": "john@example.com",  
  "age": 22 }
```

MongoDB Compass

Visual Data Handling

Compass is a GUI tool to manage your data locally without using the web dashboard.

- ⌚ Connect using your Atlas string.
- ✍️ Visual CRUD (Create, Read, Update, Delete).
- 🔍 Run complex filters and queries.
- 📊 Analyze data schemas and performance.



Installing Required Tools



Node.js

Download from nodejs.org.

Check version:

```
node -v
```



VS Code

The industry standard IDE. Install

ES7+ React Snippets for speed.



Vite

Modern build tool for React

projects. Fast and lightweight.

Hello World: React & Node.js

React (App.jsx)

```
function App() { return ( Hello from React!  
  ); } export default App;
```

Run using: npm run dev

Node.js (server.js)

```
const http = require("http"); const srv =  
http.createServer((q,r)⇒{ r.end("Hello from  
Node.js"); }); srv.listen(5000);
```

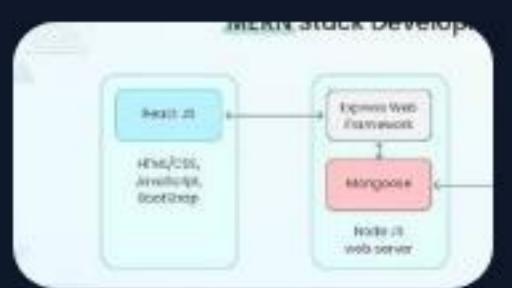
Run using: node server.js

Questions?

Next: Diving deeper into React Components and Express Routing

Reference: mongodb.com/atlas | nodejs.org | vitejs.dev

Image Sources



https://d2ms8rpfqc4h24.cloudfront.net/mern_stack_development_91bec79c96.jpg

Source: radixweb.com



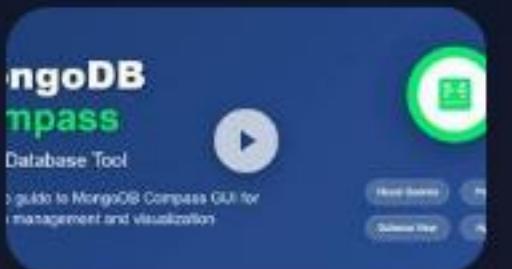
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Source: www.mongodb.com



<https://media.geeksforgeeks.org/wp-content/uploads/20200219180521/MongoDB-database-colection.png>

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