

# 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.

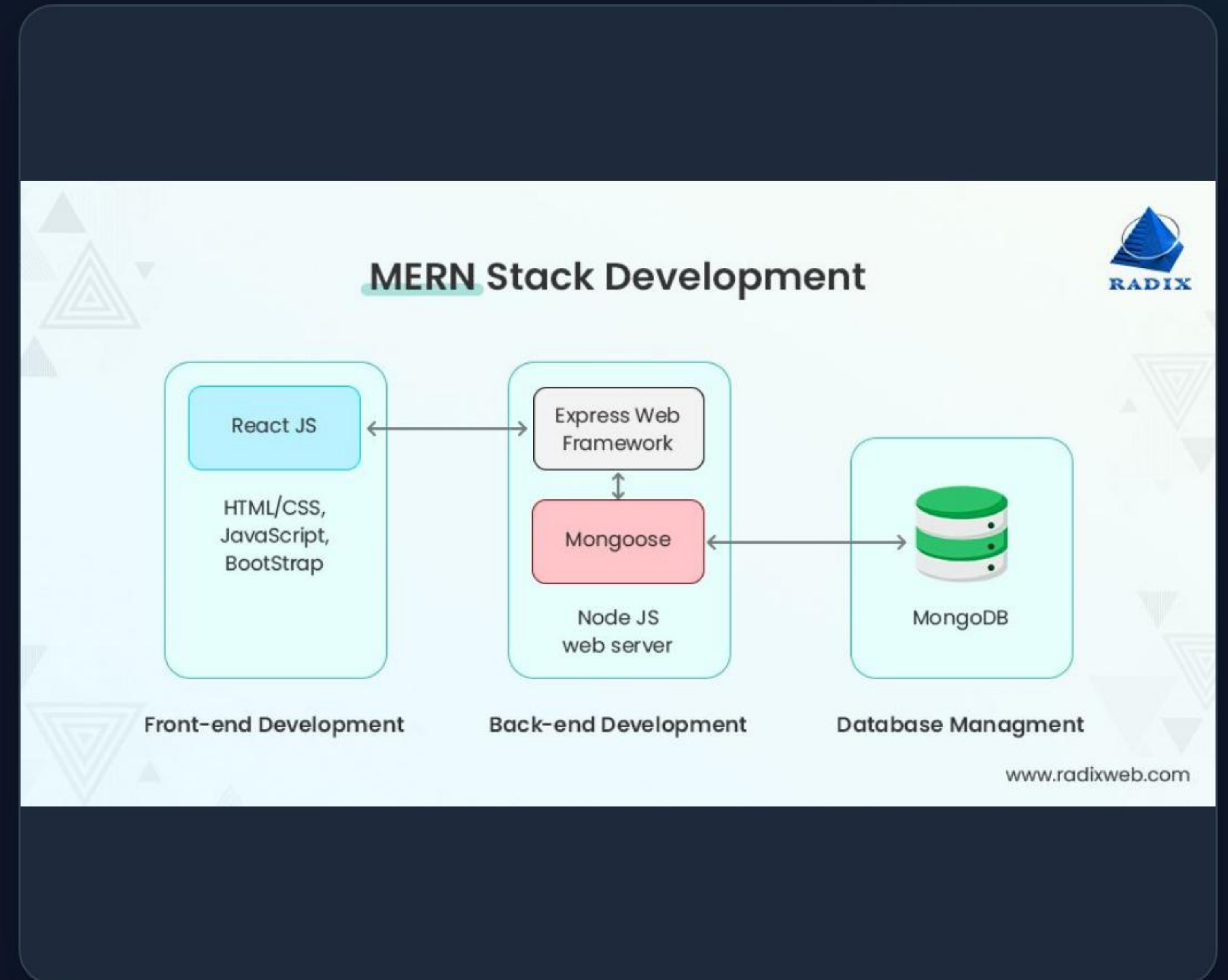


# How the Web Works

## 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](https://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.



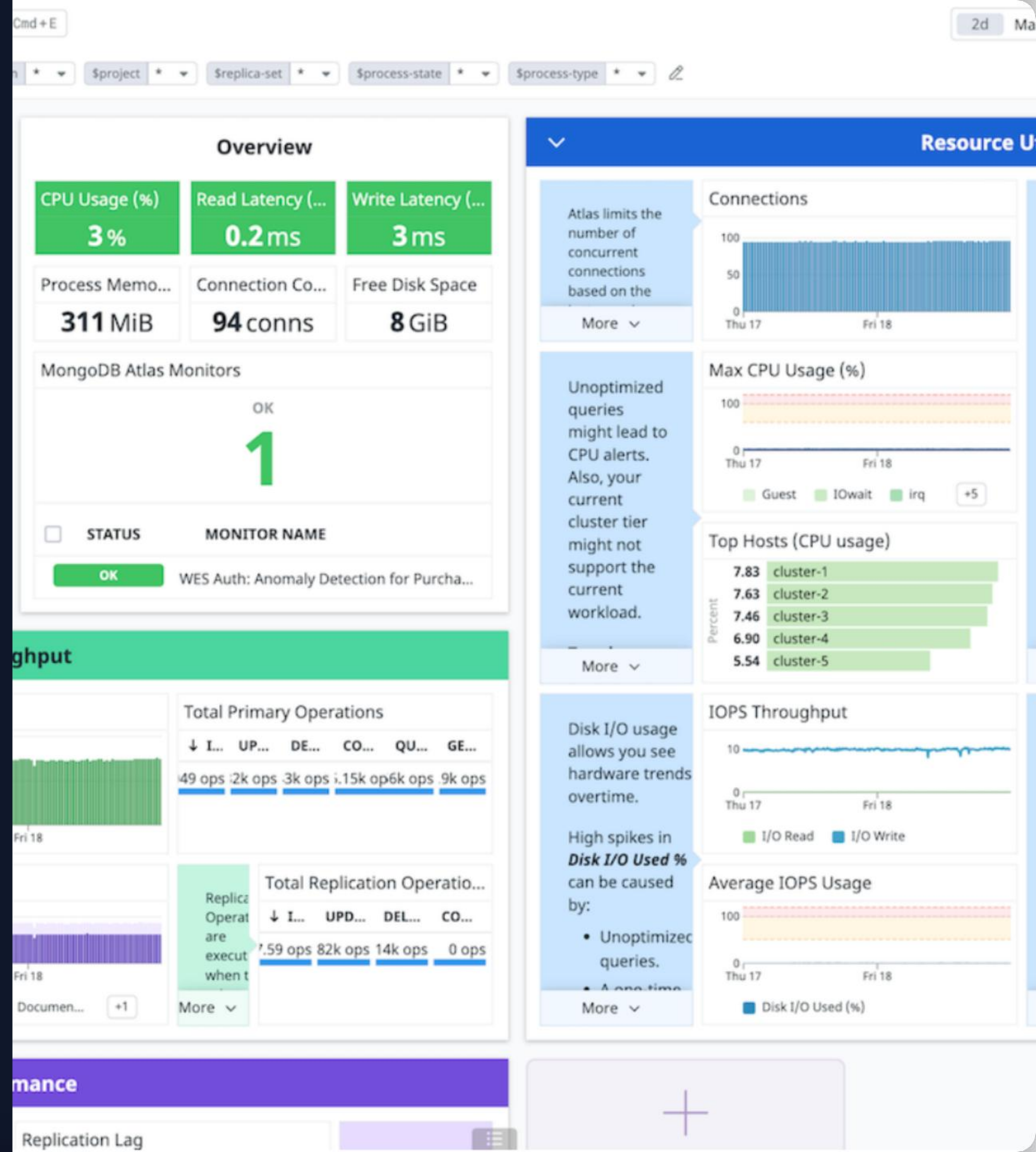
# Atlas Dashboard

**Clusters:** Manage your database servers.

**Collections:** View and query your actual data.

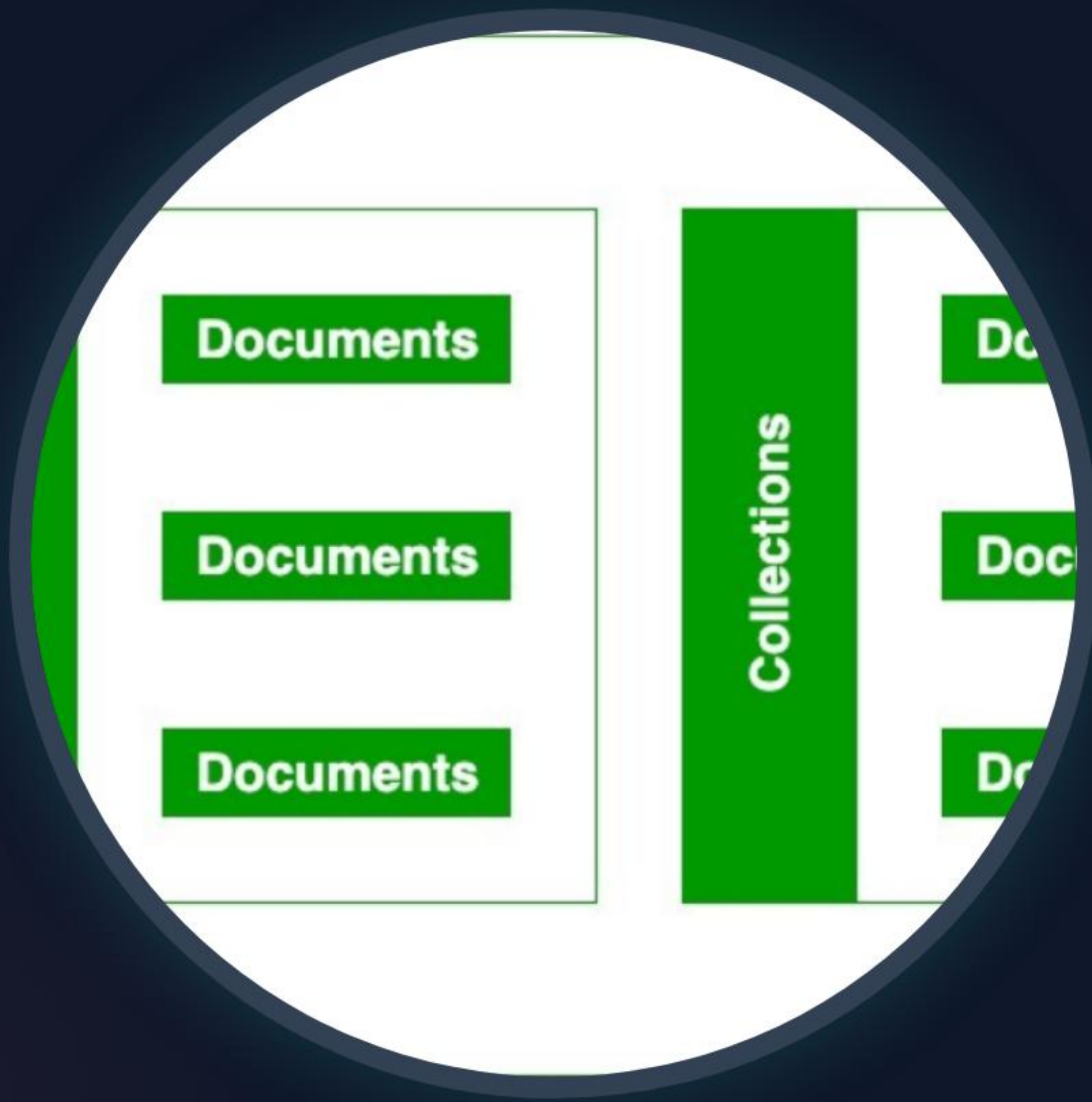
**Security:** Manage users and network access.

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](https://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



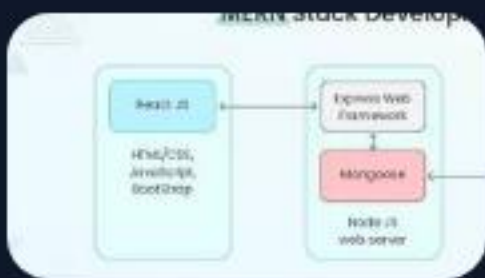
# Questions?

Next: Diving deeper into React Components and Express Routing

Reference: [mongodb.com/atlas](https://mongodb.com/atlas) | [nodejs.org](https://nodejs.org) | [vitejs.dev](https://vitejs.dev)



# Image Sources



[https://d2ms8rpfqc4h24.cloudfront.net/mern\\_stack\\_development\\_91bec79c96.jpg](https://d2ms8rpfqc4h24.cloudfront.net/mern_stack_development_91bec79c96.jpg)

Source: [radixweb.com](https://www.radixweb.com)

---



[https://webassets.mongodb.com/\\_com\\_assets/cms/Screenshot%202024-11-11%20at%208.26.27%E2%80%AFAM-yyaqd8sbwz.png](https://webassets.mongodb.com/_com_assets/cms/Screenshot%202024-11-11%20at%208.26.27%E2%80%AFAM-yyaqd8sbwz.png)

Source: [www.mongodb.com](https://www.mongodb.com)

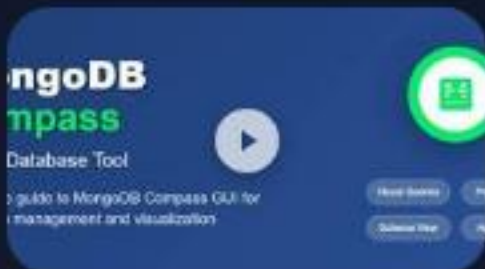
---



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

Source: [www.geeksforgeeks.org](https://www.geeksforgeeks.org)

---



<https://i.ytimg.com/vi/5gfcXA3z57Q/maxresdefault.jpg>

Source: [www.youtube.com](https://www.youtube.com)