

MEAN Stack Tutorial



The mean stack is designed for the developers who want to design the dynamic website and web application using Mean.js. Our tutorial covers all the components of Mean.js, such as **MongoDB**, **Express.js**, **Node.js**, and **Angular.js**.

The Mean.js can be considered a collection of various technologies for developing a dynamic website and web application. Mean.js is used for developing a web application where MongoDB is used as a database system, Express.js is used as a back-end web framework, node.js is used as a web server, and Angular.js is used as a front-end framework.

What is MEAN?

Each letter in the word MEAN has some specific meaning. Here, 'M' stands for MongoDB, 'E' stands for Express, 'A' stands for Angular, and 'N' stands for Node.js. It is one of the most popular stacks used for developing the full stack application. Let's understand the basic idea behind the mean stack.

As we can observe in the above figure that there is a front-end app, back-end app and database. The front-end app can be developed using either Angular.js or React.js, and back-end can be developed using Node.js, which is further connected to the MongoDB database. The front-end app and back-end app communicate with each other through the RestAPI. The back-end app exposes the RestAPI endpoints, whereas the front-end app consumes the RestAPI endpoints.

Node.js

Node.js is an open-source platform and provides a runtime environment for executing the javascript code. It is mainly used for building the back-end application. Since there are two types of apps, such as web apps and mobile apps, where web apps run on the browser and mobile apps run on mobile devices. Both web app and mobile app are the client apps to which the user interacts. These apps require to communicate with the backend services to store the data, send emails, push notifications. Node.js is an ideal platform to build highly scalable, data-intensive, and real-time applications. It can be used for agile development and highly-scalable services. For example, PayPal is a java and spring-based application using Node.js.

Advantages of Node.js

- The node.js applications are faster than the other framework-based applications and require fewer people to build the app.
- It requires fewer lines of code.

- The Node app has a 35% faster response time than the other apps.
- The major advantage of using node.js is that node.js uses javascript. If you are a front-end developer, then you can easily transit from the front-end to the full stack developer.

Angular.js

Angular.js is a JavaScript framework that is used to develop web applications. This framework is developed by the Google. Now, the question arises that there are many javascript frameworks available in the market. Why do we prefer angular.js over the other frameworks for developing the web application?.

Advantages of Angular.js

- It is a two-way data binding which means that it keeps the model and view in sync. If any changes are made in the model, then automatically view will also be updated accordingly.
- The Angular.js is designed with testing in mind. The components of angular.js application can be tested with both the testing, such as unit testing and end to end testing.

- With the help of Angular.js, it is easy to develop the application in an MVC architecture.

MongoDB

MongoDB is the database used in web development. It is a NoSQL database, and a NoSQL database can be defined as a non-relational and document-oriented database management system. As it is a document-oriented database management system, so it stores the data in the form of documents. The SQL databases use SQL query language to query the database, whereas the MongoDB is a NoSQL database that uses BSON language to query the database. JSON is a text-based format, but it is inefficient in terms of speed and space. In order to make MongoDB efficient in terms of space and speed, BSON was invented. BSON basically stores the JSON format in the binary form that optimizes the **space, speed, and complexity**.

Express.js

Express.js is a free and open-source software used as a back-end web application framework. It is commonly used in the popular development stacks like MEAN with a MongoDB database. The Express.js was developed by TJ Holowaychuk.

Advantages of Express.js

- It is simple and lightweight software. It is not heavy to get installed in the machine and make the application running.
- It is easy to customize and configure as we can see it provides the flexibility that we require.
- It is a better choice for creating the API as when the application requires various APIs to communicate with different people then the Express.js is a good option

Advantages of MeanStack

- Simple and fast: MeanStack is simple to use and fast as it allows the programmers to write the code in a single language for both the server and client-side.

- Universal coding is possible in MeanStack: In MeanStack, the code written in one framework can be easily transferred to another framework.
- Highly flexible: Once the development process of an application is completed, it is easier to test the application on the cloud platform.
- Cost-effective: Since the mean stack uses single language, i.e., javascript so a smaller number of developers required to develop the app using mean stack.
- Open source: All the technologies used in the mean stack are open-source and available for free

Architecture of Mean Stack

The MEAN.js is designed or developed to build a robust framework for helping developers use better practices when working with the popular JavaScript components, building a robust framework for supporting daily development needs, and solving common issues with connecting to MongoDB, Express.js, Node.js, AngularJS frameworks. For back-end and front-end, the MEAN stack is very simple

and easy to use. There are several technologies which use different languages for both client-side and server-side execution. In MEAN technology, we use only one language for both client and server-side.

For building an application, the MEAN stack includes the following four building blocks which are as follows:

MongoDB

MongoDB is a document database in which the data is stored in flexible, JSON-like documents.

Express.js

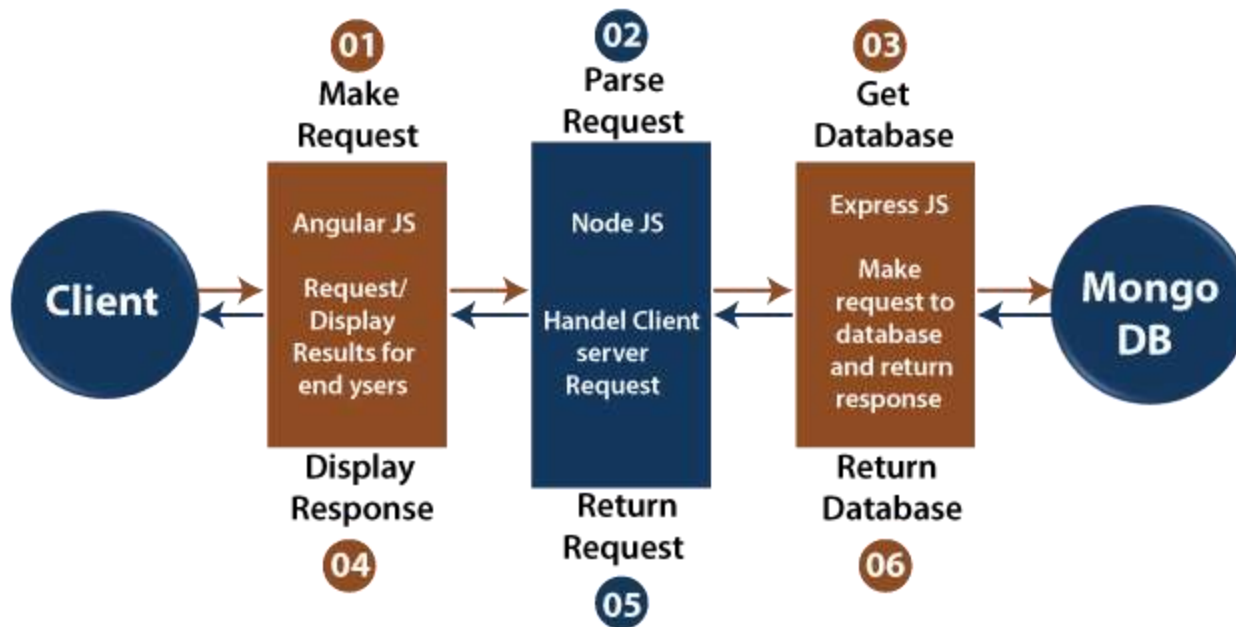
Express.js is a web application framework for Node.js. A flexible Node.js web application framework used for making the development process easy is referred to as Express.js.

AngularJS

AngularJS is a web front-end framework written in **JavaScript**. Using AngularJS, we can create a single page and dynamic applications in the MVC (MVC stands for Model View Controller) way.

Node.js

Node.js is a server-side platform for designing web applications such as single-page applications, video streaming sites, and other web applications. It gives us a rich library of various JavaScript modules.



- AngularJS is a client-side language written in JavaScript. So, firstly the client request is processed by it.
- After that, the request enters the server (Node.js), i.e., phase 2. Node.js is a server-side language written in JavaScript.
- After that, ExpressJS makes the request to the database, and it is treated as phase 3.
- After getting a request, MongoDB retrieves the data & returns the response back to the ExpressJS.

- A response is sent back to the Node.js from Express.js, and then it is forwarded to the AngularJS by Node.js for displaying the result.

Features of MEAN stack architecture

These are the following features of MEAN stack architecture:

1. One of the most important features of the MEAN stack architecture is that the developer writes the entire code from the client to the server in JavaScript.
2. MEAN stack architecture supports the MVC, i.e., Model View Controller architecture.
3. The MEAN components are free and open-source.
4. It is flexible to understand and easy to use.
5. It helps the developers to customize as per the requirement.
6. It uses JSON for data transferring and has a massive module library of node.js.

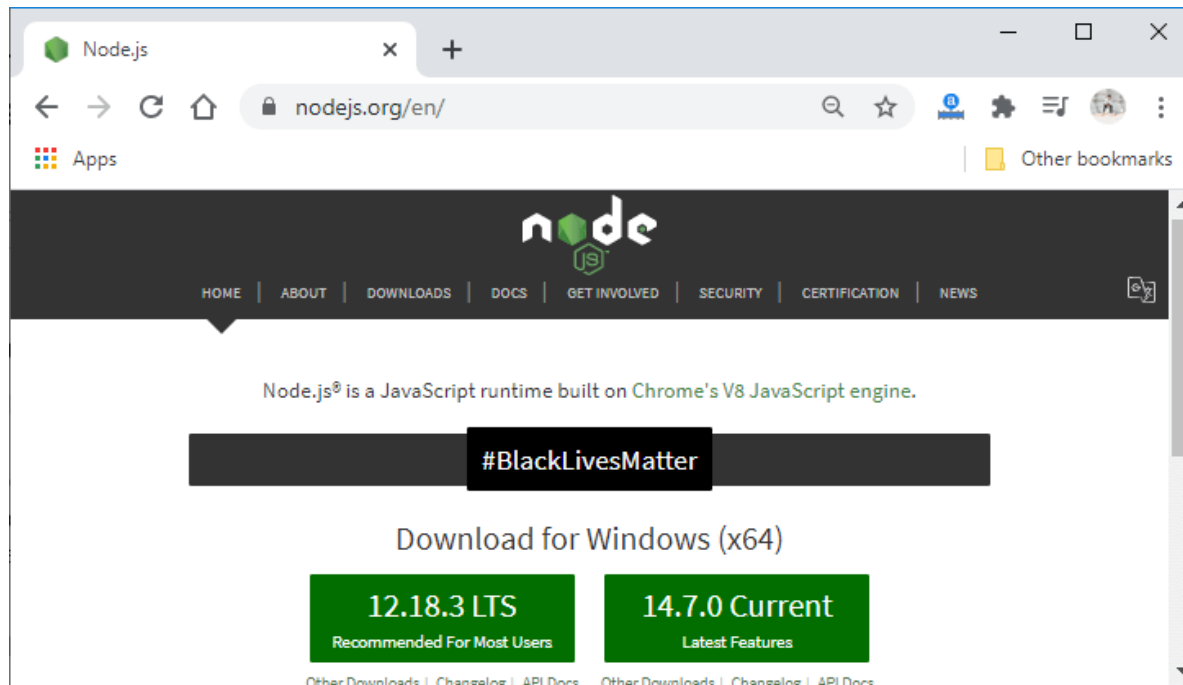
Setup components of MEAN stack

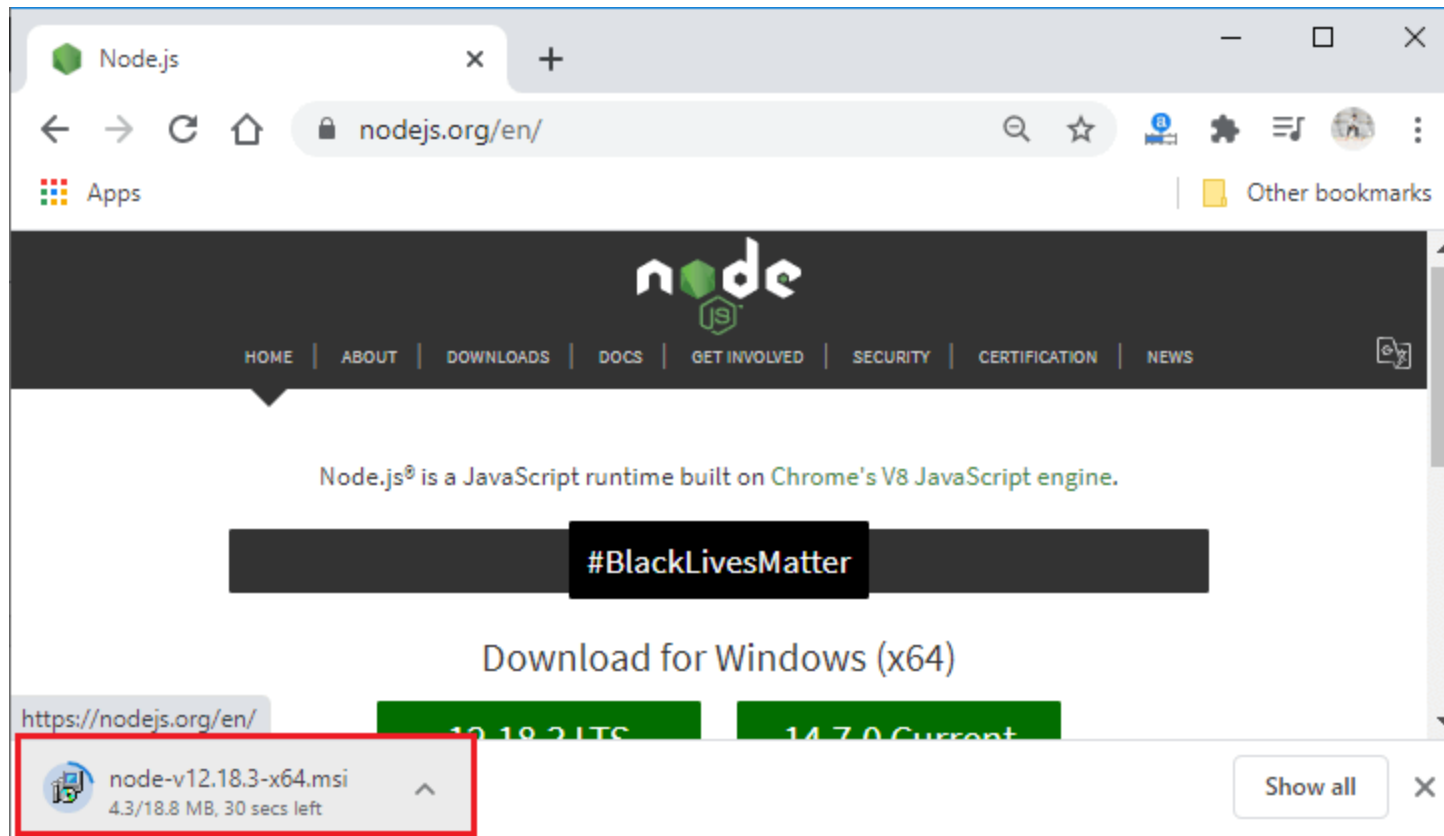
In our previous section, we learned about the architecture of MEAN stack, how its components are connected with each other, and some of the MEAN stack features. This section will set up our MEAN Stack framework or set up the MEAN stack components, i.e., [MongoDB](#), [ExpressJS](#), [AngularJS](#), and NodeJS.

Installing Node

We need [NodeJS](#) because we will write and run the NodeJS code for our project. It is required for our server-side logic, and even angular also needs it. A framework that has a more complex build workflow is referred to as Angular. So, we need Node for the NodeJS code. This NodeJS code is written for our back-end and for the Angular build workflow.

So, we will go to the <https://nodejs.org/en/> link and download the latest version of Node from there.





After downloading the Node's executable file, we will install the NodeJS by simply running its executable file.