

WEB APPLICATION DEVELOPMENT WITH MEAN

MEGHA

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Abstract-This paper discusses the four components of MEAN stack namely MongoDB, Express JS, Angular JS, Node Js which is used in Web application development. This paper also discusses how each component works and their benefits in webapplication development.This paper particularly focuses on roles of those 4 technologies in MEAN stack and the way they are implemented to build web development.

KeyWords: MEAN Angula.js, Node.js, MongoDb, Express.js, LAMP, Web development.

I.INTRODUCTION

MEAN is a full-stack JavaScript result that enables you construct speedy, robust, and maintainable manufacturing net applications using MongoDB, Express, AngularJS, and NodeJs.The four Technologies comprising the MEAN stackareMongoDb as database, Express because the Server Framework, Angular for front-end and NodeJs as an event-driven I/O(input/output) server-aspect JavaScript environment.The primary characteristic of the MEAN stack is that each of these four technologies are based totally on java script and JSON (JavaScript Object Notation) that is used to exchange data across those technologies saving ability time intake of JSON encoding. Why MEAN? - Simplicity, uniformity and most of all, overall performance. The learning curve is sharp as it does not require a programmer to learn more than one programming languages, simply JavaScript is enough.

II.THE MEAN STACK

Currently most popular and widely used open source web development stack is the LAMP (Linux, Apache, MySQL, and PHP) stack. Here Linux as OS,Apache as the internet server, MySQL as database and PHP as the programming language used for server-side scripting. A newly rising stack

is the MEAN stack which makes use of MongoDas database, Express as a server framework that provides

routing and handles request and response, Angular works on front-end development(client side).

1.Node.Js

NodeJs is the most essential issue of the MEAN stack. It provides the JavaScript development environment. It is built based on Google's V8 engine. Both Node and V8 are carried out in C and C++ for much less memory intake and faster overall performance. Node is primarily based on Asynchronous I/O eventing model designed for developing scalable community packages. It fires call-backs on activities, and each customer event generates its own call-back. If no work is to be done, Node is slumbering. While Node works on a single thread, it is able to serve many clients. Almost no feature in Node without delay performs I/O, they may be dealt with via higher order features.

Node affords the event-loop as a runtime assemble, however unlike some different technologies, node does not have a blocking start-the-occasion-loop name. It simply enters the loop and exits upon completion similar to browser JavaScript. Node also has different modules that takes advantage of a multiprocessor environment inclusive of creating toddler tactics, sharing sockets and so forth.

2.Express.js

Express is a server aspect framework built within the Nodejs surroundings. It allows you to handles the client requests to the server and manages routing and HTTP methods consisting of GET, POST, PUT and many others. Express configures Middleware's, which might be basically capabilities that use the request, response items and name the following middleware within the stack.It is the Middleware's duty to both cease the request-reaction-cycle or skip the decision next() to name the following middleware so the request isn't left placing.

An express application is created via calling the express() exported by using specific e.g. App = express(). The app object is used to perform numerous operations and offer services by way of specific. Express listens to a connection on a route or on a precise host and port quantity. So we use METHOD() features consisting of app. Get() is the METHOD characteristic, where in app is the objects of an express application which start the request-response-cycle of the suitable middleware.

To configure the app. Route() returns an example of a single path, which can be handles through HTTP techniques and optionally middle wares. The app. Render() is used to render HTML view documents the use of a call lower back. Express makes use of template view engines to render views.

4. Angular.js

AngularJS is certainly one of them, that is designed to work with data at front end. It allows developers to-use HTML as template language and enlarge HTML's syntax. It is an open source JavaScript library evolved and maintained through Google. It was evolved with abilities to address the entire client-side utility and interaction. Its mainly used to expand a SPA (Single Page Application) that hundreds the complete web webpage on an preliminary request. Angular has the capacity to perform client-side routing. This facilitates lighten the burden on the server with the aid of a tremendous margin. Another strong point of Angular is that it's far a MVW (Model View Whatever) structure i.e. The developers are loose to pick whichever manner they want to put into effect Angular for his or her tasks.

Angular makes use of Directives, that are HTML mark-ups which appear as html factors, attributes or even CSS training. The directives are used to bind facts, and DOM manipulations. The directive ng-app is used to outline the Angular application. Views and fashions are controlled by way of a controller. Further the software itself can be divided the usage of modules that assist code re-usability. Templates contain HTML and Angular elements which might be rendered by way of the controllers and fashions used to show dynamic perspectives to the client.

Angular can handle the whole client-side routing. This is achieved the usage of the directive ngRoutes. We can call controllers using the routes, and in addition render templates while important. The SPA capability of Angular is accomplished through routing.

3.MongoDB

MongoDb is a record orientated NoSQL form of database. It helps to loads thedata in JSON format. It has a dynamic schema and therefore very popularly used to develop scalable packages. Mongo-Db does not require its customers to realize a traditional relational language including SQL. Node has a package deal known as mongoose that handles the interplay among MongoDB and the node, Data in mongo is saved in the form of gadgets or files as they are refereed in mongo. BSON (binary encoded JSON) is the document layout. BSON is extended from JSON and has a few greater information sorts that aren't supported in JSON. Mongoose is used to carry out CRUD (Create Read Update Delete) operations on MongoDB.

III.IMPLEMENTATION AND EASE-OF-USE

JavaScript to be considered as a simple script that's supposed to be run via the browser. Now, but, JavaScript is anywhere. It can be discovered running on smartphones, servers, Arduino, RaspberryPi and in many greater technological trends. The Edge that JavaScript has over other languages is that, it is Non-blocking. A single non-blocking off thread in JavaScript is more effectual than the use of threads in languages like java. JSON is the not unusual layout used to exchange information between all 4 layers. Since JSON is local, no parsing is required at all. JSON is mild-weight and easily consumed by means of JavaScript.

Thecommon and efficient way to use the MEAN stack is to apply specific to create a RESTful API, while angular allows you to handles the client-side routes taking full gain its SPA characteristics. Only while information from the database is required, will the utility be required to make use of the API. This way maximum of the business logic can be implemented and accomplished at the client-side.

In the Express aspect of factors, app handlers are used to handle the requests and supply responses. These handlers receive the request and start request-reaction cycle with middlewares. User control, authentication, session management and the CRUD operations on MongoDB are dealt are managed by express. Technologies can be hindered in their development if it's miles too hard to analyze and the prices outweigh their uses.However,inside the MEAN stack, those four technologies seamlessly integrate with every other e.g. Specific reaction item can at once be provided to angular within any need for parsing.

MEAN.io and MEAN.Js are famous Node programs that have all 4 technologies already pre-compiled and may be used directly without having separate setup for them. This makes it especially clean for the builders considering a few elements of the integration is already automated directly out-of-the box.

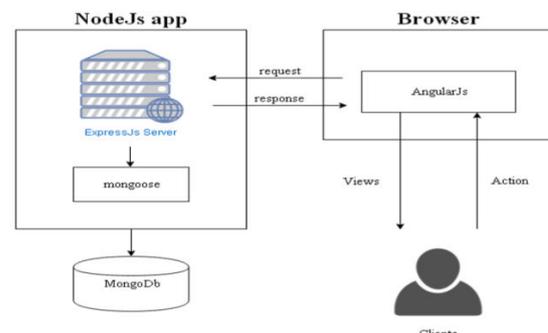


Fig-1: Workflow of MEAN stack

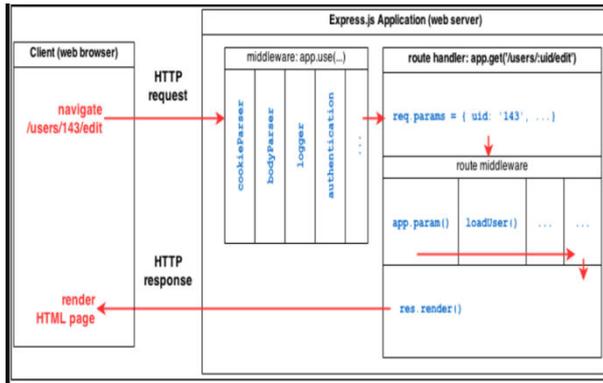


Fig-2: Sever architecture of Express

IV. LIMITATION

- 1)MongoDb is not recommended for complicated and bigger units of big data. It needs skillful person to work efficiently.
- 2)MEAN stack isn't always appropriator the initiatives that have large source code due to the fact as team get to a certain length, it gets bit of tough to hold and debug the code in JavaScript as it may get complicated which line of code is for the front-give up and that is for returned-end.
- 3)For the conversion of any mission from LAMP to MEAN stack isn't that smooth as it calls for rewriting of the present code in JavaScript.
- 4) NodeJs calls for a dedicated software system to run the utility on the way to get hard to installation the whole MEAN utility on shared website hosting.
- 5)JSON isn't always as dependable as XML while moving information among separate structures considering that there is no schema and namespace aid.
- 6)Proper training is to accept to developers concerning mongo given that it's miles very different from a conventional relational database. There aren't any joins and therefore data distribution has to take this into consideration. Many programmers fail to recognize this and replicate the current relational database into MongoDB and suffer for it.
- 7)NodeJs always runs on a single thread and removes issues of concurrency.Howeverif concurrency is wanted then the programmers themselves need to manage it.
- 8)The maturity degree of Node and npm packages is low as compared to antique battle tested libraries of PHP, JAVA and so on. It is tough to locate new reliable programs as absolutely everyone can submit a bundle in the npm libraries. Many applications have reached a peak level through the years, but it could be hard to find new dependable applications.

V.CONCLUSION

The use of JavaScript caused many technologies being developed around it. Today JavaScript is the pioneer in web development with technologies consisting of Angular, Node, React, and plenty of greater. While those technologies are much less mature to their traditional opposite numbers, but surpasses them in many methods.

MEAN stack in a essentially a combination of such technology that cross well together and their applicability tiers from aeveryday internet web page to technologies developed in Internet of Things.

VI. REFERENCES

1. <https://angular.io/docs>-angular.js documentation
2. <https://nodejs.org/en/docs>-node.js documentation
3. <https://www.tutorialspoint.com/angularjs/index.htm>-angular.js documentation
4. https://www.tutorialspoint.com/nodejs/nodejs_express_framework.htm-express documentation
5. <https://www.tutorialsteacher.com/nodejs/expressjs-express> documentation
6. <https://www.tutorialspoint.com/mongodb/index.htm>-mongo DB documentation
7. <https://acadgild.com/blog/an-enterprise-application-workflow-for-node> -architecture of express