

# Comparative Study of ReactJS and NodeJS

Gayathri .G

Maharani's Science college for Women, Bangalore-560001

**Abstract-** Today's browser based applications are dominating the world; java script is the most popular scripting language with the number of opened pull requests. Pull requests are an indicator of the amount of code being written. JavaScript frameworks play a vital role in web development, this research paper assist us in analyzing ReactJS and NodeJS.

**Keywords -** JavaScript, NodeJS, ReactJS

## I. INTRODUCTION

Scripting engines assist in compiling and executing codes, they differ based on environment and languages chosen by the user. Rendering engine (also known as layout engine) is software that works behind the Web browser to display web pages. Layout engines prints web pages written in markup languages in a way. Without invoking these engines web pages are displayed as plain text form with a lot of tags and words.

Browser	Rendering/Layout Engine	Scripting Engine
Chrome	Blink (C++)	V8 (C++) Famous
Mozilla	Gecko (C++)	SpiderMonkey (C/C++)
IE Edge	EdgeHTML (C++)	Chakra Javascript Engine (C++)
Opera	Blink (C++)	V8(C++)
Safari	Webkit (C++)	JavaScript Core (Nitro)

Browsers and Script-engine

## II. JAVASCRIPT FRAMEWORKS

### A. ReactJS

React is component based JavaScript library for building fast & interactive user interfaces developed by Facebook. Reactjs is used by front-end developers since it's very rich in libraries; it handles with View in the MVC (Model - View – Controller). The heart of reactjs is components that split the UI to build independent, reusable pieces, and assume each piece in isolation. React uses smarter techniques to minimize the number of costly DOM operations required to update the UI. It utilizes concept of virtual Dom on data Model, updates the portion of original DOM whenever data is manipulated. React will specifically optimize the performance of the user interface applications by conditional rendering.

**jsx:** java script extension for creating function calls, construction of objects. JavaScript xml uses transpilers takes source code of a program in one language and produces the output in another programming language.

**Virtual DOM:** Each time there is data change, React calculates the difference between two virtual DOM representations, differences are actually changed in the real DOM, and this concept increased performance compared to re-rendering entire sets of elements.

### B. NodeJS

Node.js is an open-source cross-platform for java script runtime environment that executes java script code outside of a browser developed by Ryan Dahl in 2009 and license by MIT. "Node.js is a java script runtime built on Chrome's V8 JavaScript engine. "It supports network applications, event-driven, non-blocking I/O model that makes lightweight and runtime for easily building faster and scalable applications. One advantage of non-blocking, asynchronous operations is that you can maximize the usage of a single CPU as well as memory. Can be used as same language on front and back end.

**Asynchronous and Event Driven:** Node application, it's created on a single thread of execution. It sits there, waiting for an application to come along and make a request. When Node gets a request, no other request can be processed until it's finished processing the code for the current one. Node operates asynchronously, via an event loop and callback functions. An event loop is nothing more than functionality that basically polls for specific events and invokes event handlers at the proper time. In Node, a callback function is this event handler. More than that number of requests means that a client needs to wait for a response. A second benefit to Node is that you minimize resource usage, but without having to resort to multithreaded development.

## III.COMPARISON

Reactjs and Nodejs, both are popular JavaScript UI frameworks.

Table -1 Comparison of ReactJS and Nodejs based on attributes parameter

Attributes	ReactJS	NodeJS
App Architecture	FLUX	Mean Stack Architecture
Packaging	strong	jxcore
Debugging	Good	good
Data Binding	Uni-directional	Bi-directional
Library	Rich	poor
MVC	View layer only	yes

Rendering	Both side	Client/server	Server side
Libraries	Rich		rich
UI	Easy & interactive		Simple UI
SEO of Web Ports	Good		Medium
DOM	Virtual DOM		Does not have Native DOM

**Node.js** is high performance platform that takes advantage of every aspect of your hardware, does an effective memory management decides how to architect a complex application. V8 open source Google project and javascript engine behind Node.js. This engine is responsible for compiling and executing JavaScript, manages memory needs has a profiler and one of best garbage collector this is key point for its performance. It compiles directly into machine code in the first execution. Architectural pattern avoids code duplication by creating kind of layer there is front controller pattern which handles many common tasks such as database access, session management, error logging etc., can build varieties of networked application services like HTTP proxy, DNS server, SMTP server, IRC server. They are used to stream data handling controls incoming and outgoing streams enable services to survive in mobile platforms.

**React.js** allows to create an imperative API with a declarative one. Through imperative programming style it guides computer what task to perform, popular mobile application their performance are like native apps, simultaneously development of multiple platforms and has excellent set of development tools. Debugging can be difficult another extra layer to deal with abstraction. React doesn't come with opinionated solutions for HTTP, routing, data modeling. React can be a great tool for small and large applications and teams alike. Benefits of React briefly summarized for a few typical roles: Individual developer, applications can be easier to rapidly build out. They will tend to be easier to work on for larger teams, and sophisticated features can be easier to implement and maintain. Engineering manager, as they learn React, be able to more easily and quickly develop complex applications. Top level management React, technology, is an investment with risks. But the eventual gains in productivity and reduced mental burdens. The developers need to learn JSX can be threatening effect to beginners. React only has a one-way binding. For developers this is better for complex apps and removes a lot of complexity. The metrics used is based on Performance, lines of codes and size and rendering of web-pages.

#### IV. CONCLUSION

Based on application requirement it's the developers who need to make a choice between Reactjs and Nodejs, the deliverables decides if server side then it's ideal to opt for

Nodejs, else client side to use Reactjs framework. React renders a new approach for front-end development. Nodejs is ideal for frontend and backend developers.

#### V. REFERENCES

- [1]. COMPARATIVE ANALYSIS OF ANGULARJS AND REACTJS Anurag Kumar and Ravi Kumar Singh International Journal of Latest Trends in Engineering and Technology Vol.(7)Issue(4), pp.225-227 DOI: <http://dx.doi.org/10.21172/1.74.030> e-ISSN:2278-621X
- [2]. ReactJS, "React Guide" [Online], <https://reactjs.org/tutorial/tutorial.html>
- [3]. Nodejs. <https://nodejs.org/en/>