



Introduction to Node.js

Mohamed Mukthar Ahmed

1



Introduction to Node



Outline

What is Node.js?

Why Node.js?

Advantages

Install Node.js

JavaScript Difference

V8 JavaScript Engine



Mohamed Mukthar Ahmed

2

What is Node.js?



- Node.js is an open-source and cross-platform **JavaScript runtime environment**.
- It is a **popular tool** for almost any kind of project!
- Node.js runs the **V8 JavaScript engine**, the core of Google Chrome, outside of the browser.

Mohamed Mukthar Ahmed

3

Why Node.js?



- Node.js is **very performant**.
- Node.js app runs in a **single process**
 - without creating a new thread for every request.
- Node.js **provides a set of asynchronous** I/O primitives
 - Prevent blocking of JavaScript code
 - Libraries in Node.js are written using non-blocking paradigms, making blocking behavior the exception rather than the norm.
- Node.js can handle thousands of **concurrent connections with a single server** without introducing the burden of managing thread concurrency

Mohamed Mukthar Ahmed

4

Advantages



- Developers are now able to write the **server-side code** in addition to the client-side code
 - without the need to learn a completely different language.
- New **ECMAScript standards** can be used without problems
 - Deciding which ECMAScript version to use by changing the Node.js version
- A **Vast Number of Libraries**
 - Over 1,000,000 open-source packages you can freely use.

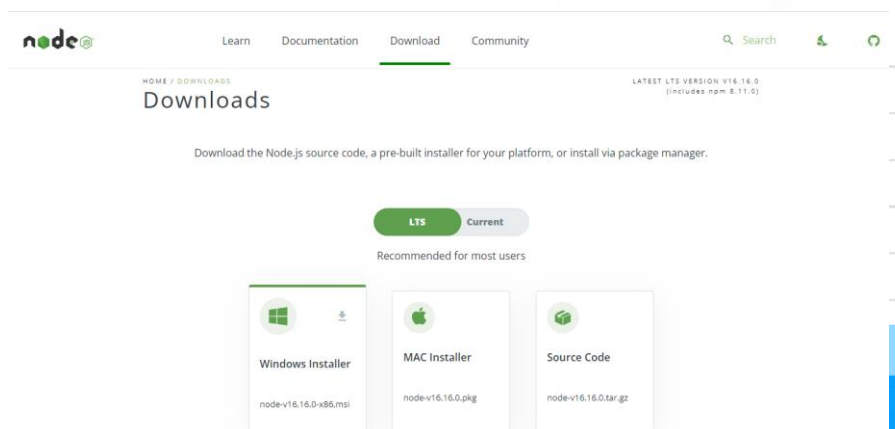
Mohamed Mukhtar Ahmed

5

Install Node.js



- Official packages for all the major platforms are available at <https://nodejs.dev/download/>



Mohamed Mukhtar Ahmed

6

Install Node.js



- Official packages for all the major platforms are available at <https://nodejs.dev/download/>
- Convenient way to install Node.js is through a package manager
- Package managers for MacOS, Linux, and Windows are listed in
- <https://nodejs.dev/download/package-manager/>

Mohamed Mukhtar Ahmed

7

JavaScript Difference



- Both the browser and Node.js use JavaScript as their programming language
- Building apps that run in the browser is a completely different thing than building a Node.js application..

Browser	Node.js
Interacting with DOM	No DOM and other...
Web Platform APIs like Cookies	Nice APIs provided by modules - fs, os, path, process etc.
Don't have the document, window and other objects	Controls the env
ES Modules standard are being implemented	Supports both CommonJS and ES module systems
limited to import	can use both require() and import

Mohamed Mukhtar Ahmed

8

V8 JavaScript Engine



- V8 is the name of the JavaScript engine that powers Google Chrome.
- It parses and executes JavaScript code.
 - The DOM, and the other Web Platform APIs (they all makeup runtime environment) are provided by the browser.
- JavaScript engine is independent of the browser in which it's hosted.
- V8 was chosen to be the engine that powered Node.js
 - V8 became the engine that now powers an incredible amount of server-side code written in JavaScript.

Mohamed Mukthar Ahmed

9

V8 JavaScript Engine



- Node.js ecosystem is huge. Thanks to V8 which also powers desktop apps
- The quest for performance
 - V8 is written in C++, and it's continuously improved.
 - It is portable and runs on Mac, Windows, Linux and several other systems.
- V8 is always evolving, just like the other JavaScript engines around, to speed up the Web and the Node.js ecosystem.
- JavaScript is internally compiled by V8 with just-in-time (JIT) compilation to speed up the execution.

Mohamed Mukthar Ahmed

10