



Getting Started

- Introduction to Node.js
 - How much JavaScript do you need to know to use Node.js?
 - Differences between Node.js and the Browser
 - The V8 JavaScript Engine
 - An introduction to the npm package manager
 - ECMAScript 2015 (ES6) and beyond
 - Node.js, the difference between development and production
 - Node.js with WebAssembly
- Debugging Node.js
- Profiling Node.js Applications
- Fetching data with Node.js
- WebSocket client with Node.js
- Security Best Practices

TypeScript

- Introduction to TypeScript
- Running TypeScript Natively
- Running TypeScript with a runner
- Running TypeScript code using

Introduction to 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. This allows Node.js to be very performant.

A 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 in its standard library that prevent JavaScript code from blocking and generally, libraries in Node.js are written using non-blocking paradigms, making blocking behavior the exception rather than the norm.

When Node.js performs an I/O operation, like reading from the network, accessing a database or the filesystem, instead of blocking the thread and wasting CPU cycles waiting, Node.js will resume the operations when the response comes back.

This allows Node.js to handle thousands of concurrent connections with a single server without introducing the burden of managing thread concurrency, which could be a significant source of bugs.

Node.js has a unique advantage because millions of frontend developers that write JavaScript for the browser 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.

- transpilation

- Publishing a TypeScript package

Asynchronous Work

- Asynchronous flow control

- Overview of Blocking vs Non-Blocking

- JavaScript

- Asynchronous Programming and Callbacks

- Discover Promises in Node.js

- Discover JavaScript Timers

- The Node.js Event Loop

- The Node.js Event Emitter

- Understanding process.nextTick()

- Understanding setImmediate()

- Don't Block the Event Loop

Manipulating Files

- Node.js file stats

- Node.js File Paths

- Working with file descriptors in Node.js

- Reading files with Node.js

- Writing files with Node.js

- Working with folders in Node.js

- How to work with Different Filesystems

In Node.js the new ECMAScript standards can be used without problems, as you don't have to wait for all your users to update their browsers - you are in charge of deciding which ECMAScript version to use by changing the Node.js version, and you can also enable specific experimental features by running Node.js with flags.

An Example Node.js Application

The most common example Hello World of Node.js is a web server:

CJS **MJS**

```
1 const { createServer } = require('node:http')
2
3 const hostname = '127.0.0.1';
4 const port = 3000;
5
6 const server = createServer((req, res) => {
7   res.statusCode = 200;
8   res.setHeader('Content-Type', 'text/plain');
9   res.end('Hello World');
10 });
11
12 server.listen(port, hostname, () => {
13   console.log(`Server running at http://${hostname}:${port}`);
14 });
```

JavaScript

Copy to clipboard

To run this snippet, save it as a **server.js** file and run **node server.js** in your terminal. If you use mjs version of the code, you should save it as a **server.mjs** file and run **node server.mjs** in your terminal.

This code first includes the Node.js **http module**.

Node.js has a fantastic **standard library**, including first-class support for networking.

The **createServer()** method of **http** creates a new HTTP server and returns it.

Command Line

- Run Node.js scripts
 - from the command line
- How to read environment variables from Node.js
- How to use the Node.js REPL
- Output to the command line using Node.js
- Accept input from the command line in Node.js

Userland Migrations

- Introduction to Userland Migrations

Modules

- Publishing a package
- How to publish a Node-API package
- Anatomy of an HTTP Transaction
- ABI Stability
- How to use streams
- Backpressuring in Streams

Diagnostics

- User Journey
- Memory
- Live Debugging
- Poor Performance
- Flame Graphs

Test Runner

The server is set to listen on the specified port and host name. When the server is ready, the callback function is called, in this case informing us that the server is running.

Whenever a new request is received, the **request event** is called, providing two objects: a request (an **http.IncomingMessage** object) and a response (an **http.ServerResponse** object).

Those 2 objects are essential to handle the HTTP call.

The first provides the request details. In this simple example, this is not used, but you could access the request headers and request data.

The second is used to return data to the caller.

In this case with:

```
1 res.statusCode = 200;
```

JavaScript

Copy to clipboard

we set the **statusCode** property to **200**, to indicate a successful response.

We set the **Content-Type** header:

```
1 res.setHeader('Content-Type', 'text/plain')
```

JavaScript

Copy to clipboard

and we close the response, adding the content as an argument to **end()** :

```
1 res.end('Hello World\n');
```

- Discovering Node.js's test runner
- Using Node.js's test runner
- Mocking in tests
- Collecting code coverage in Node.js

JavaScript

[Copy to clipboard](#)

If you haven't already done so, [download](#) Node.js.

[Next >](#)

How much JavaScript do you need to know to use Node.js?

[Home](#) > [Getting Started](#) > [Introduction to Node.js](#)

Reading time

3 min

Authors



Contribute

 [Edit this page](#)

[Table of Contents](#)

[An Example Node.js Application](#)

[Trademark Policy](#)[Privacy Policy](#)[Version Support](#)[Code of Conduct](#)[Security Policy](#)

© OpenJS Foundation

