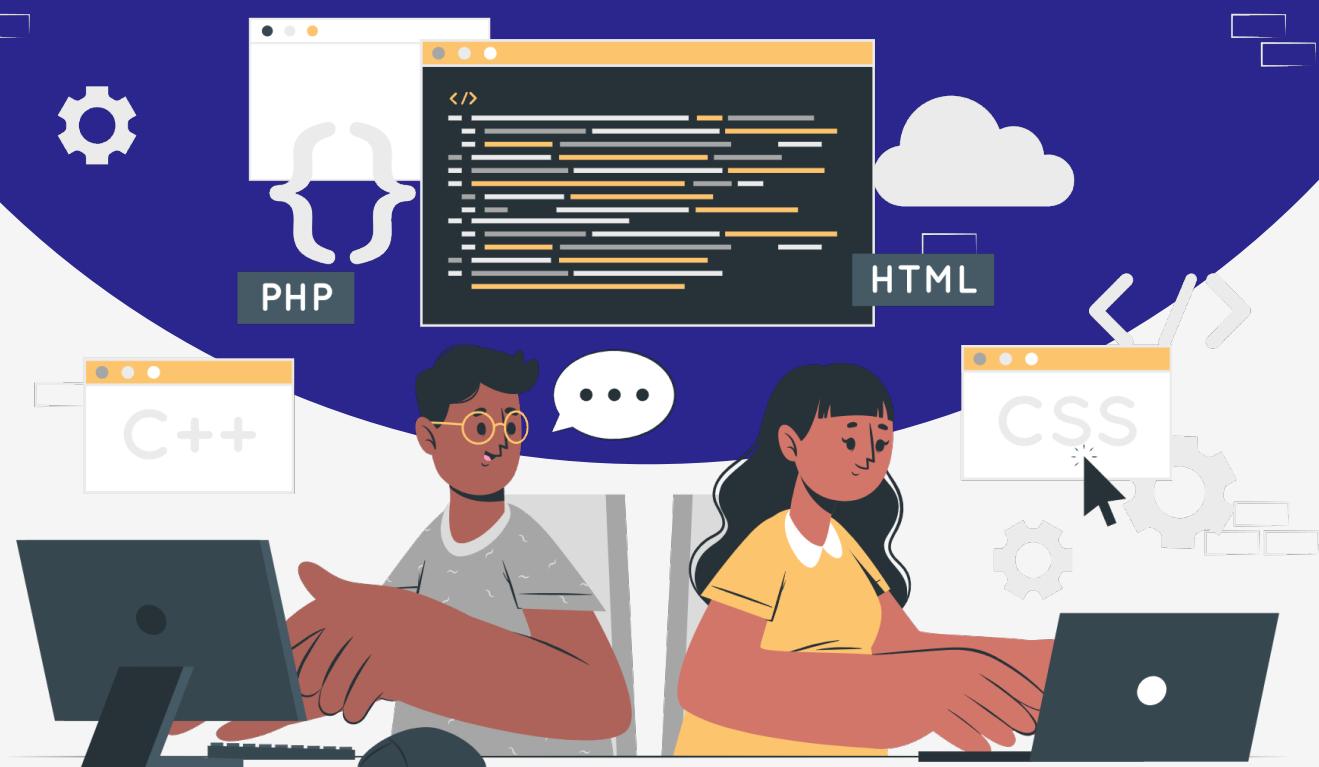


Lesson:

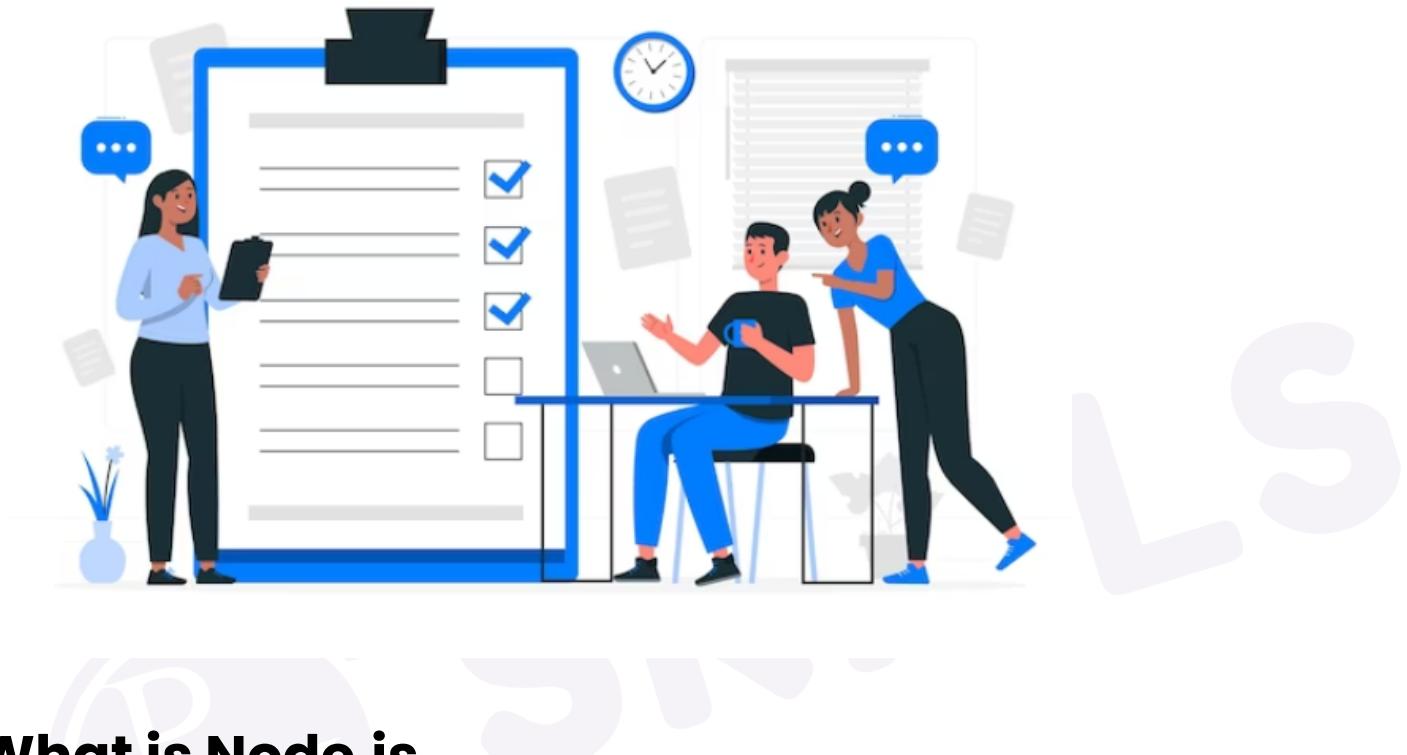
Introduction

Node.js



Topics

- What is Node.js
- Key features of Node.js
- Installation of Node.js



What is Node.js



Node.js is an open-source, cross-platform JavaScript runtime environment built on the V8 JavaScript engine. It allows developers to execute JavaScript code server-side, enabling the development of scalable and efficient web applications. Node.js is particularly well-suited for handling asynchronous operations, making it ideal for building real-time applications and APIs. Its event-driven, non-blocking architecture contributes to high performance and efficiency, while the extensive Node Package Manager (NPM) ecosystem provides a rich set of libraries and modules for easy integration into projects. Overall, Node.js extends the use of JavaScript beyond the browser, empowering developers to create robust server-side applications.

Key features of Node.js



Now that we know what is Node.js, let now have a look at some of the key features of Node.js

- **JavaScript Everywhere:** Node.js allows developers to use JavaScript for both server-side and client-side programming, promoting code reusability and consistency.
- **Event-Driven Architecture:** Operates on an event-driven, non-blocking model, allowing efficient handling of concurrent operations and providing high scalability for applications with many simultaneous connections.
- **Fast Execution:** Built on the V8 JavaScript engine, developed by Google, which compiles JavaScript code to native machine code, resulting in fast execution and performance.
- **NPM (Node Package Manager):** Utilizes NPM, the largest package manager for any programming language, providing a vast ecosystem of open-source libraries and modules that can be easily integrated into Node.js projects.

- **Scalability:** Designed for scalability, making it well-suited for applications requiring the handling of a large number of simultaneous connections, such as real-time applications and microservices.
- **Non-Blocking I/O:** Handles asynchronous operations efficiently, allowing Node.js to perform multiple tasks simultaneously without waiting for one to complete before moving on to the next.
- **Single-Threaded Event Loop:** Operates on a single-threaded event loop, which efficiently manages and delegates tasks, making optimal use of system resources.
- **Cross-Platform:** Node.js is cross-platform, meaning it can run on various operating systems, providing flexibility for developers to deploy applications on different environments.
- **CommonJS Modules:** Follows the CommonJS module system, allowing developers to organize code into modular components, enhancing maintainability and code structure.
- **Web Server and Networking:** Widely used for building web servers and handling networking tasks, making it a popular choice for developing web applications and APIs.

Installation of Node.js

Download Node.js®

20.10.0 LTS
Recommended For Most Users

21.4.0 Current
Latest Features

Let's go through the step-by-step installation Windows -

1. Download Node.js:

- Visit the official Node.js website: [Link](#)
- Click on the "LTS" button to download the Long-Term Support version, which is recommended for most users.

2. Run the Installer:

- Once the installer is downloaded, double-click on the downloaded file (e.g., node-v20.x.x-x64.msi) to launch the installer.

3. Follow Installation Wizard:

- The Node.js Setup Wizard will appear. Click "Next" to proceed.
- Accept the terms of the license agreement and click "Next."
- Choose the destination folder and click "Next."
- Select the components you want to install and click "Next."
- Click "Next" to start the installation.
- Once completed, click "Finish."

4. Verify Installation:

- Open a command prompt or PowerShell.
- Type node -v and press Enter. This should display the installed Node.js version.
- Type npm -v and press Enter. This should display the installed npm (Node Package Manager) version.

MacOS -

1. Download Node.js:

- Visit the official Node.js website: [Link](#)
- Click on the "LTS" button to download the Long-Term Support version, which is recommended for most users.

2. Run the Installer:

- Once the installer is downloaded, double-click on the downloaded file (e.g., node-v20.x.x.pkg) to launch the installer.

3. Follow Installation Wizard:

- The Node.js Package Installer will open. Click "Continue" to proceed.
- Accept the license agreement and click "Continue."
- Click "Install" to start the installation.
- Enter your macOS password when prompted and click "Install Software."
- Once completed, click "Close."

4. Verify Installation:

- Open a terminal.
- Type node -v and press Enter. This should display the installed Node.js version.
- Type npm -v and press Enter. This should display the installed npm (Node Package Manager) version.

Congratulations! You've successfully installed Node.js on both Windows and macOS. You are now ready to start building applications with Node.js.