

What is Vite?

Vite is a build tool created by Evan You, the creator of the Vue.js framework to provide a faster and leaner development experience for modern web projects.



Terminologies:

- **Compiler**

A **compiler** is a tool that transforms code written in one programming language into another language or format. In web development, compilers are often used to convert modern JavaScript (ES6+) or TypeScript into older versions of JavaScript (ES5) that are compatible with older browsers. Examples include:

- **Babel:** A JavaScript compiler that transforms modern JavaScript into backward-compatible versions.
- **TypeScript Compiler (tsc):** Converts TypeScript code into JavaScript.

- **Bundler**

A **bundler** is a tool that takes multiple files (JavaScript, CSS, images, etc.) and combines them into a smaller number of optimized files (bundles) for production. Bundlers also handle dependencies, tree-shaking (removing unused code), and code splitting. Examples include:

- **Webpack**: A highly configurable bundler widely used in the JavaScript ecosystem.
- **Rollup**: A bundler focused on creating smaller bundles, often used for libraries.
- **Parcel**: A zero-configuration bundler.
- **esbuild** is a modern, extremely fast JavaScript bundler and minifier. It is written in Go and is designed to be significantly faster than traditional bundlers like Webpack.

- **Create-React-App**

Create React App (CRA) is a toolchain and boilerplate for building React applications. It abstracts away the complexity of configuring tools like Webpack, Babel, and ESLint, providing a pre-configured setup for developers. CRA includes:

- A development server.
- A build tool (Webpack under the hood).
- Scripts for building, testing, and running the app.

CRA is a high-level tool that uses a bundler (Webpack) and a compiler (Babel) internally.

But why do I need a build tool?

- Your browser does not know what React, SASS, or Typescript is. It does not care about anything that is not HTML, CSS, and JavaScript.
- A compiler translates your React, SASS, Typescript, etc. to JS, CSS and Html so your browser can make use of the code.
- Compilers use Bundlers to merge multiple JavaScript files into a single file that can be run inside the browser. This bundle will contain the whole source code and all the imported dependencies needed to run your app.

- The goal is to get Javascript that Browsers understand. It's a step-by-step process.
 - Remove types (JSX left)
 - Change JSX in JS
 - Transform `node_modules` imports to relative paths with extensions

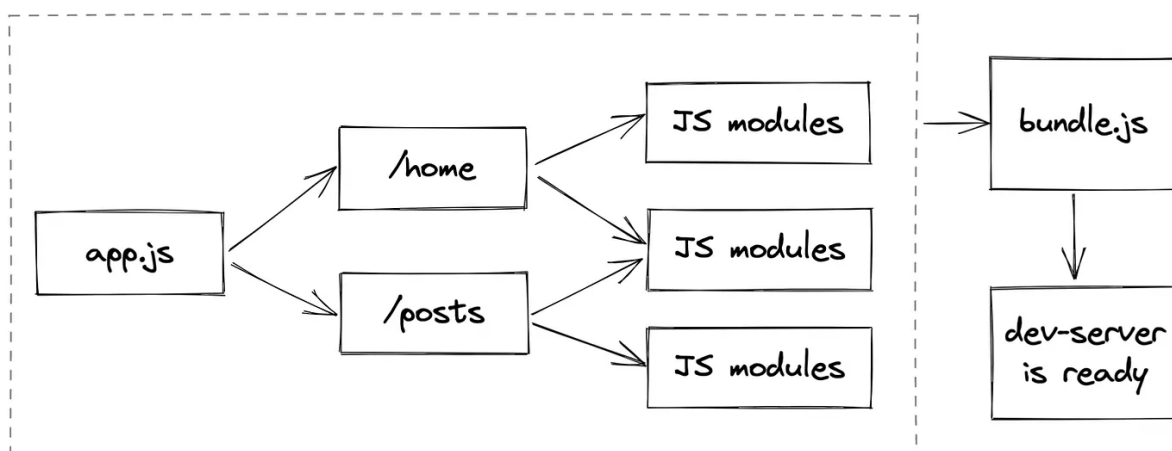
- **Vite**

Vite is a modern build tool and development server that focuses on speed and efficiency. It leverages native ES modules in the browser for faster development builds. It support frameworks like React, Vue, and Svelte.

Vite is often seen as a faster alternative to CRA because it avoids the overhead of traditional bundlers during development.

Earlier Build tools like CRA used to use **Webpack** for this. Because Webpack is a bundler-based build tool, it must crawl, process, and concatenate the whole JavaScript file to deliver your application. This applies to both your application code and your dependencies.

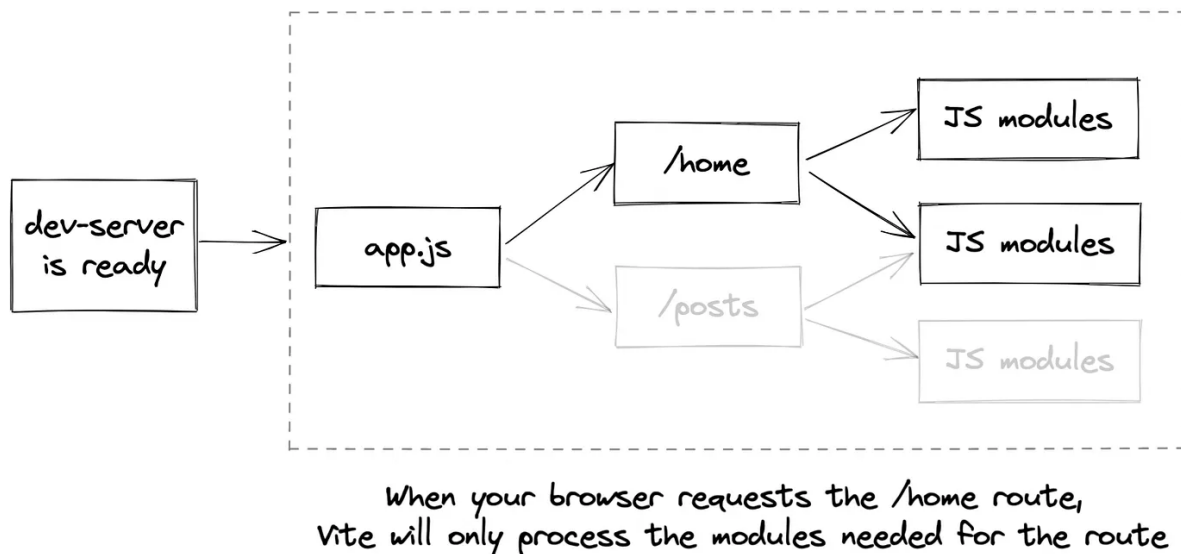
Webpack based dev-build



Webpack will crawl all your complete source code and all your dependencies before launching the dev-server

But now with Vite, It's so much faster. Vite only processes your dependency modules before a single browser request.

Vite based dev-build



Benefits of Vite

- Instead of first bundling the entire source code, Vite reacts to browser requests transforming your authored modules on the fly to native ESM modules that the browser can understand.
- It uses **esbuild** (written in Go) for lightning-fast TypeScript and JavaScript transpilation.
- Instant Hot Module Replacement (HMR)
- Optimized production build: highly efficient, **small-sized** bundles. Uses rollup for creating production builds.