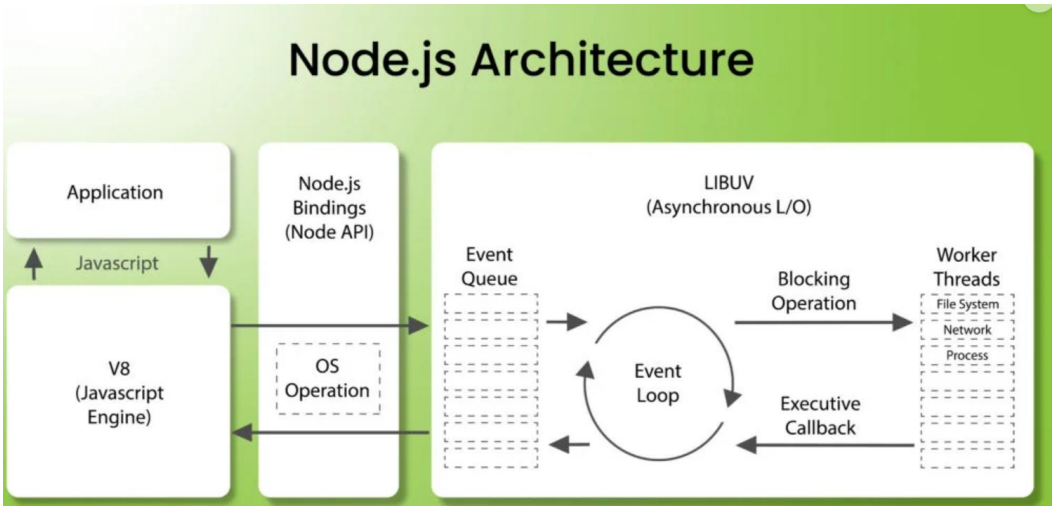
Node js Architecture



Node.js operates on a single-threaded, event-driven architecture. When a client sends a request, the Node.js runtime processes it through the event loop. Non-blocking operations like reading from a database or accessing a file are delegated to the LIBUV thread pool, which handles these tasks asynchronously. Once the task is completed, the results are placed in the event queue, where the event loop picks them up and executes the corresponding callback. This allows Node.js to efficiently handle multiple requests without creating new threads for each request, making it lightweight and highly scalable.

Advantages of Node.js

1. Non-blocking Asynchronous Model

- Node.js can handle many tasks at once without waiting for one to finish, making it faster and more efficient.

2. Single Language for Frontend and Backend

- You can use JavaScript for both the front-end and back-end of your application, simplifying development.

3. Fast Execution (V8 Engine)

- Node.js uses a super-fast engine (V8) to run JavaScript, making it perform tasks quickly.

4. Scalability

- Node.js is great for handling a lot of users or requests at the same time, making it ideal for big apps.

5. Rich Ecosystem (npm)

- Node.js has a huge library of ready-to-use code (npm packages) that can speed up development.

6. Real-time Capabilities

- It is perfect for building apps that need instant updates, like chat apps or live notifications.

7. Cross-platform Development

- Node.js can run on different operating systems like Windows, Linux, and macOS without issues.

8. Active Community and Support

- There is a large group of developers constantly improving Node.js, so you can always find help and resources.

9. Efficient Memory Usage

- Node.js uses less memory compared to other frameworks, making it more efficient in handling many tasks.

10. Easy to Learn for JavaScript Developers

- If you know JavaScript, you can easily start using Node.js since they both use the same language.

11. Microservices Architecture

- Node.js works well with microservices, where an app is split into smaller, independent services that are easier to manage.

12. Efficient for RESTful APIs

- Node.js is excellent for building APIs that let different apps communicate with each other efficiently.