

Node.JS

Extensive 6 days with JavaScript, JQuery and Kafka

FA-0340 · 6 days

Software Development · DevOps, Cloud & Infrastructure

Introduction

This comprehensive training program is meticulously designed and will be delivered by trainers who have extensive industry experience, having worked with top Research and Development bodies internationally. Their real-world expertise promises to enrich the learning experience with insights that transcend basic theoretical knowledge.

Learning Outcomes: By the end of this training, participants will be able to:

- Understand and apply modern JavaScript features in practical scenarios.
- Develop proficiency in both functional and object-oriented programming in JavaScript.
- Utilize jQuery to manipulate the DOM easily and efficiently.
- Create and manage complex Node.js projects, understanding the intricacies of packages, modules, and dependencies.
- Implement robust error handling practices.
- Understand and leverage the capabilities of the HTTP protocol in conjunction with Node.js.
- Perform file operations, both synchronously and asynchronously, in Node.js projects.
- Grasp the concepts behind Buffers, Streams, and Events in Node.js.
- Develop and deploy a RESTful API with associated CRUD operations.

- Connect Node.js applications with databases and execute operations.
- Implement real-time services using Kafka.

Prerequisites

- Basic understanding of programming concepts.
- Familiarity with web development (HTML/CSS).
- Any prior knowledge of JavaScript is advantageous but not mandatory.

Laptop with

- Any stable OS with GUI such as Windows / Mac / Linux
- Access to SSH Terminal (PowerShell or ConEMu or the new Command Prompt)
- VS Code with SSH plugin installed
- Internet access
- Google account (for accessing shared content)
- Willingness to learn

Training outline

1. Deep Dive into Modern JavaScript (ES5 and beyond):

1. Exploration of language features: variables, scopes, and hoisting.
2. Understanding JavaScript data types: Number, String, Boolean.
3. Mastering operators: arithmetic, assignment, comparison.
4. Control structures: if, else, switch, loops (for, while, do-while).
5. In-depth look at Arrays and operations, including ES6 methods.

2. Functional Programming in JavaScript:

1. Defining and invoking functions, scope, and closures.
2. Deep dive into higher-order functions, callbacks, and built-in methods.
3. Understanding and using recursive functions.
4. ES6 improvements: arrow functions, default parameters, rest, and spread operators.

3. Embracing Object-Oriented Programming:

1. Creating objects using various methods: constructors, object.create, ES6 classes.
2. Prototypes, properties, methods, and inheritance.

3. ES6 enhancements: getter/setter, computed property names, method definitions.
4. Practical OOP: design patterns and best practices.

4. Mastering jQuery:

1. Basics of jQuery: selectors, events, and effects.
2. DOM manipulation with jQuery: getting and setting information, altering document structure.
3. Efficient event handling using delegation.
4. AJAX with jQuery: Making requests and handling responses.

5. Exploring Node.js Fundamentals:

1. Node.js project setup: npm, package.json, and node modules.
2. Understanding and using modules: require, module exports, package scope.
3. Handling asynchronous operations with callbacks, promises, and async/await.
4. Events and Streams: utilizing in practical scenarios.

6. Networking and Data with Node.js:

1. HTTP protocol deep dive: creating servers, handling requests and responses.
2. File system interactions: reading, writing, streams, and promises.
3. Buffers and binary data: handling data beyond strings.
4. Connecting with databases: options in Node.js, executing CRUD operations.

7. Node.js with Databases:

1. Overview of database interactions with Node.js.
2. Setting up various databases (SQL, NoSQL).
3. Performing database operations in Node.js applications.

8. Creating RESTful APIs with Node.js:

1. Designing a RESTful API: best practices, structuring, and routing.
2. Building endpoints for CRUD operations.
3. Data validation and error handling.
4. Securing APIs: Authentication, JWT, OAuth.

9. Real-Time Services with Kafka:

1. Introduction to Kafka: architecture, components, and workflow.
2. Setting up a Kafka cluster: brokers, ZooKeeper, producers, and consumers.
3. Streaming data with Kafka: creating publishers and subscribers.
4. Integrating Kafka with Node.js applications.

10. Deep Dive into Kafka:

1. Understanding Kafka: Core concepts and fundamentals.
2. Importance of Kafka in distributed systems and real-time analytics.
3. Kafka architecture: Topics, partitions, brokers, producers, and consumers.

11. Integrating Kafka with Node.js:

1. Setting up a Kafka cluster and integrating it with Node.js applications.
2. Producing and consuming messages in Node.js using Kafka.
3. Managing real-time data processing flows.
4. Handling failures and reprocessing mechanisms.

12. Error Handling and Debugging:

1. Types of errors and handling them: try-catch, callback patterns, and promise rejections.
2. Debugging applications: tools, techniques, and best practices.
3. Custom errors: creating and using application-specific error types.

This comprehensive training ensures a deep understanding of Node.js and its synchronous interaction with systems like Kafka, JavaScript, JQuery and both RDBMS and NoSQL systems, preparing participants for the challenges faced in developing modern, real-time, data-driven applications. The structure encourages practical engagement, critical for mastering the concepts discussed.