REST Services & Web Services Using Java
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Overview:
This 5-day course offers a comprehensive exploration of RESTful services and SOAP-based web services using Java technologies. Participants will delve into the principles, design patterns, and implementation techniques for developing robust and scalable web services. Through a blend of theory, hands-on exercises, and practical examples, participants will gain proficiency in designing, developing, and consuming RESTful APIs and SOAP services using Java frameworks and libraries.

This class is for:

- Java developers interested in expanding their skill set to include web service development.
- Software engineers seeking to deepen their understanding of RESTful architecture and SOAP-based web services.
- System architects and designers aiming to incorporate web services into Java-based applications.
- IT professionals transitioning to roles involving web service development or integration.

Prerequisites:

- Proficiency in Java programming language, including core concepts like classes, objects, and inheritance.
- Basic understanding of HTTP protocol and web development principles.
- Familiarity with XML and JSON data formats.
- Experience with Java frameworks such as Spring or JAX-WS is beneficial but not mandatory.

Duration: 5 days (40 hours)

Objectives:

- Understand the concepts and principles of RESTful architecture and web services.
- Learn how to design RESTful APIs adhering to best practices and standards.
- Gain proficiency in implementing RESTful services using Java frameworks like Spring Boot.

- Explore the SOAP protocol and its role in web services.
- Learn how to create and consume SOAP-based web services using Java technologies like JAX-WS.
- Understand the usage of WSDL (Web Services Description Language) and XML schema in SOAP services.
- Develop skills in securing RESTful and SOAP-based web services.
- Gain insights into testing and debugging web services using Java-based tools and libraries.
- Explore emerging trends and technologies in web service development with Java.

What you will learn:

- Fundamentals of RESTful architecture and principles
- RESTful API design patterns and best practices
- Implementing RESTful services with Spring Boot
- Introduction to SOAP-based web services
- Creating and consuming SOAP web services with JAX-WS
- Working with WSDL and XML schema in SOAP services
- Securing web services using OAuth, SSL, or other mechanisms
- Testing and debugging web services using Java-based tools
- Error handling and exception management in web services
- Emerging trends and technologies in web service development with Java

Contents

Day 1: Introduction to RESTful Web Services

- Understanding REST architecture principles.
- Overview of RESTful API design and characteristics.
- Introduction to Java frameworks for building RESTful services (e.g., JAX-RS, Spring Boot).
- Setting up a development environment for RESTful service development.
- Exploring RESTful service conventions and best practices.
- Hands-on: Setting up a simple RESTful service project.

Day 2: Designing RESTful APIs

- Resource modeling and URI design for RESTful services.
- Understanding the significance of HTTP methods (GET, POST, PUT, DELETE) in RESTful APIs.
- Handling different HTTP status codes for responses.
- Implementing CRUD (Create, Read, Update, Delete)

operations in RESTful services.
- Versioning strategies for RESTful APIs.
- Documentation techniques for RESTful services.
- Hands-on: Designing a RESTful API for a specific use case.

Day 3: Implementing RESTful Services with JAX-RS
- Introduction to JAX-RS framework for building RESTful services in Java.
- Setting up a JAX-RS project.
- Creating resource classes and methods to handle HTTP requests.
- Working with request and response entities (e.g., JSON, XML).
- Error handling and exception mapping in JAX-RS.
- Hands-on: Implementing CRUD operations using JAX-RS.

Day 4: Implementing RESTful Services with Spring Boot
- Introduction to Spring Boot for developing RESTful services.
- Setting up a Spring Boot project for RESTful service development.
- Creating REST controllers to handle incoming requests.
- Dependency injection and bean management in Spring Boot.
- Security configuration for securing RESTful services.
- Hands-on: Building and securing RESTful services with Spring Boot.

Day 5: Advanced Topics and Best Practices
- Implementing security mechanisms such as OAuth, JWT, or SSL for RESTful services.
- Content negotiation and handling different media types (JSON, XML, etc.).
- Caching strategies for improving performance in RESTful services.
- Testing strategies for RESTful services (unit testing, integration testing).
- Debugging techniques for identifying and resolving issues in RESTful services.
- Monitoring and logging practices for maintaining and analyzing RESTful services.
- Hands-on: Applying advanced techniques and best practices to enhance existing RESTful services.