Web Services – Fundamentals and Architectures

Description

In this course, we will explore, explain, and create web services. Web services are a fundamental element of modern computing and rely on open standards such as TCP/IP, HTTP, JSON, and SOAP.

Whether you are a new software developer or already experienced, in this course you will learn the basics of web services and gain valuable knowledge. Web services are rapidly evolving and a real-world developer needs to know just how useful this tool is in creating modern applications.

Course Content
Module 1: Overview of Web Services

- Interoperable applications with SOA
- Designing a SOA integration architecture
- Implementing SOA with web services
- Standard Java API for web services
- Creating SOAP services with JAX-WS

Module 2: Defining SOAP Messages with WSDL

- Essential elements of XML
- XML namespaces
- XML description with schema
- Structure of SOAP messages
- Role of SOAP in web services
- Operations, messages and faults
- Anatomy of a WSDL document
- Defining the interfaces of a web service
- Specifying implementation

Module 3: Code-First Web Service Implementation

- Exposing simple Java objects (POJOs) as web services
- Applying JAX-WS annotations to POJOs
- Configuring and deploying a W service implementation
- Implementing SOAP clients in Java
- Generating client-side artifacts from WSDL
- Modifying client code to allow message monitoring
- Client authentication and authorization
- Enhancing SOAP-based services
- Integrating best practices for web services
- Implementing security, reliability and message optimization policies

Module 4: Contract-First Web Service Development

- Developing contract-based services
- Comparing contract-first and code-first services

- Creating portable Java artifacts
- Importing a WSDL document
- Creating interoperable applications in accordance with WS-I (Web Services Interoperability) standards
- Implementing a web service endpoint using JAX-WS

Module 5: Web Service Security (WS-Security)

- Definitions
- Challenges Public Key Infrastructure (PKI)
- Digital signature
- Certificates
- Overview of web service security
- SOAP message security
- Message integrity
- Message confidentiality
- Example of symmetric encryption
- Identity token-based authentication
- Authentication
- Audit tracking

Module 6: Introduction to REST (Representational State Transfer)

- Description of the REST architectural style
- Comparison of SOAP and RESTful web services

Module 7: RESTful Methods

- POST
- GET
- PUT
- DELETE
- Others...

Module 8: RESTful Architecture

- Distributed resources
- Client/server, stateless, layered, and cacheable

Module 9: Development of RESTful Web Services with JAX-RS

- Adding JAX-RS annotations to a POJO
- Configuring result types using HTTP request headers
- Deploying a JAX-WS service

Module 10: Server-side Support for Ajax Clients

- Handling JavaScript Object Notation (JSON)
- Applying JSON case studies to RESTful services
- Interpreting a JSON format message
- Mapping Java to JSON
- Controlling JSON generation with JAXB annotations
- Defining a JSON return type from a Java method

Module 11: Sending REST Messages with JAX-RS

- Building the client request
- Handling service response code and exceptions.

Documentation

- Digital Courseware included

Participant profiles

- Decision makers
- IT directors
- Project managers
- Developers

Prerequisites

- Basic knowledge of computer systems and programming

Objectives

- A deep understanding of the current architecture of web services and the technologies that support web services
- Subjects include: SOAP, WSDL, JAX-WS, XML, UDDI, REST, JSON, AJAX

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