

**SOA and Java Web Services (JAX-WS)**

**Course Number:** JWS-204  
**Duration:** 3 days

**Overview**

[Web Services](https://en.wikipedia.org/wiki/Web_service) are designed to allow web-based access to distributed software and business services using standard protocols such as HTTP and standard XML formats. This SOA and Java Web Services (JAX-WS) training course gives attendees a thorough understanding of current Web Services architecture and teaches them how to use supporting technologies including the new Java APIs such as JAX-WS and JSR-181.

**Prerequisites**

All JAX-WS training students must have a working knowledge of Java programming, including use of inheritance, interfaces, and exceptions.

**Materials**

Students receive comprehensive courseware.

**Software Needed on Each Student PC**

* JDK 8 or later
* Eclipse IDE (other IDEs can be accommodated upon request)
* Wildfly or JBoss EAP
* Modern web browser
* Related lab files that Accelebrate provides

**Objectives**

* SOAP - An XML based messaging mechanism.
* WSDL - Web services Description Language – An XML language that describes the interface and semantics of a Web service.
* JAX-WS – Accessing Web services using the latest Java APIs including JAX-WS, JSR-181, JAXB
* SAAJ – Soap with Attachments API for Java
* Soap Handlers
* JAXB - Java Architecture for XML Binding
* XML Web Services - Working with Web services directly at the XML level
* MTOM - Handling binary message data in an interoperable way
* Security – Basic Authentication, HTTPS, and Web Services Security (WS-Security)
* EJB based Web Services
* The WS-\* Standards – A Brief Overview

**Outline**

* Introduction
* Service Oriented Architecture (SOA) and Web Services
  + SOA (Service Oriented Architecture) Overview
  + Web Services Overview / Relationship to SOA
  + Web services Architecture
  + SOAP and WSDL Overview
* Introduction to Java Web Services
  + Overview
    - Java Web Services
    - JAX-WS and JSR-181
    - A Simple Service definition with @WebService
  + JSR-181
    - Overview
    - @WebService, Modifying the Generated Service
    - Other Annotations (@WebMethod, @SOAPBinding)
    - The SEI (Service Endpoint Interface
  + JAX-WS Capabilities
    - Overview
    - WSDL to Java Mapping
    - Capabilities (XML Messaging, Handlers, SOAP/HTTP, Client Programming
  + JAX-WS Clients
    - Programming Model, Generating Classes from WSDL
    - Writing a JAX-WS Client
    - Dynamic Clients
* WSDL – Web Services Description Language
  + Introduction
  + XML Namespace and XML Schema Overview
  + Namespaces and Schema in WSDL Documents
  + WSDL Structure and Elements
  + A WSDL Document
  + Definitions, Types, Messages, PortTypes, and Operations
  + Bindings, Ports, and Services
  + SOAP 1.1 Binding for WSDL
* SOAP
  + SOAP Overview
  + Message Structure
    - Envelope/Header/Body
    - Detailed Soap message structure
  + SOAP Faults, Attachments
  + SOAP Messaging and HTTP Binding
  + SOAP Styles and Encoding
* SAAJ, DOM, and SOAP Handlers
  + SAAJ Overview, Message Structure, and API
  + Creating/Sending Messages
  + DOM Overview
  + Using DOM with SAAJ
  + SOAP Handlers
    - Overview and Processing
    - Logical and Protocol Handlers
    - Writing/Configuring a SOAP Protocol Handler
    - Writing/Configuring a Logical Handler
* JAXB - Java Architecture for XML Binding
  + Overview and Architecture
  + Generating Java Classes from XML Schema
  + Customizing Generated Java
  + Generating XML Schema from Annotated Java Classes
  + Web Services, WSDL, and JAXB
* Start From WSDL / Start from WSDL & Java
  + Starting From WSDL
  + Binding Customizations
  + Starting From WSDL and Java
* XML-Based (Bare) Web Services
  + XML Messaging Overview
  + JAX-WS Providers
  + A SOAP Provider and Source Provider
  + XML Clients with Dispatch
  + XML/HTTP Messaging with Provider
  + Overview of REST and JAX-RS
* Handling Binary Data
  + Overview and Issues
  + Default handling
  + MTOM Overview
  + Using MTOM in Services and Clients
  + Using DataHandler
* Security
  + Java EE Security / Role-Based Security
  + Securing Web Services with BASIC Authentication
  + Transport Security / HTTPS
  + Securing Web Services with HTTPS
  + WSS (WS-Security) Overview
* EJB-Based Web Services
  + EJB Overview
  + Programming EJB
  + Creating/Configuring EJB-Based Web Services
* WS-\* Overview
  + WS-Interoperability (WS-I)
  + The WS-I Basic Profile
  + WS-Addressing
* Best Practices
  + Coarse Grained Web Services
  + Optimization and Caching
  + XML Handling
  + Interoperability
  + Top Down / Bottom Up
* Conclusion