

**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