Webservices – Course Outline

# Duration

3 days

# Objectives

* Overview of SOA and using web services for its implementation
* Basics of web services and its various specification
* Look at the various specifications that make it easier to develop web services using Java
* Understand ReST based architecture
* Application integration using SOAP and ReST
* When to use SOAP and when to use ReST

# Audience

This course is for Application developers and System Integration developers

# Pre-requisite

* Good programming skils. Web programming and exposure to HTTP would be preferable. Usage of XML.
* Experience in integrating two or more applications using any of the integration methodologies.

# Outline

## Day 1

### SOAP and Web services standards

* Overview

Why Web Services?

Service-Oriented Architecture

Simple Object Access Protocol (SOAP)

Web Service Description Language (WSDL)

Universal Description, Discovery and Integration (UDDI)

* The Simple Object Access Protocol (SOAP) overview

Messaging Model

Namespaces

SOAP over HTTP

The SOAP Envelope

The Message Header

The Message Body

SOAP Faults

Attachments

### Java API for XML Binding (JAXB)

The Need for Data Binding

XML Schema

Two Paths

JAXB Compilation

Mapping Schema Types to Java

Java-to-XML Mapping Using Annotations

Marshaling and Unmarshaling

**Hands-on:** Marshalling and Unmarshalling XML with JAXB

### Web Services Description Language (WSDL)

Web Services as Component-Based Software

The Need for an IDL

Web Services Description Language

WSDL Information Model

The Abstract Model - Service Semantics

Message Description

Messaging Styles

The Concrete Model - Ports, Services, Locations

Extending WSDL - Bindings

Service Description

### Java API for XML-Based Web Services (JAX-WS)

Two Paths

How It Works - Build Time and Runtime

The Service Endpoint Interface

Working from WSDL

Working from Java

RPC and Document Styles

**Hands-on:** Creating web service in standalone Java application using generated client code in both RPC and Document styles

**Hands-on:** Create web service client from scratch using WSDL

## Day 2

### Web Services for Java EE

The Automated Approach: JAX-WS and JAXB

Manual Options: SAAJ and JAXP

Portable Web-Services Metadata

Service Registries: JAXR

**Hands-on:** Creating web services in EJB and deploying them on container

### Overview of REST

Evolution of REST

REST operations

Overview of JAX-RS specification

Available JAX-RS implementations

### SOAP vs ReST

**Objective:** Participants to understand when to use SOAP and ReST in their architecture

Conceptual Comparison

Integration Style

Contract Design

Resource Identification

URI Design

Technology Comparison

Transport Protocol

Payload Format

Service Identification and Description

Reliability

Security

Transactions

Service Composition

Service Discovery

Dealing with heterogeneity

Loose coupling

## Day 3

### RESTful application with XML

Designing web service interfaces using JAX-RS specification

Mapping Java objects to XML using JAXB annotation

Testing web services using CURL command and browser plugins

### RESTful application with JSON

Designing web service interfaces using JAX-RS specification

Mapping Java objects to JSON

Testing web services using CURL command and browser plugins

### Deploying RESTful services in Weblogic

Deploying RESTful services on Weblogic

Handling sessions

Basic authentication of RESTful client

Setting up authentication security token

Testing deployed RESTful webservices

# Hardware & Network Requirements

* All participants to have individual desktops with at least dual core or higher CPU with 2GB RAM (In case participants needs Hands-on)
* All participants’ system to be connected to internet

# Software Requirements

* Windows XP/7/8 Operating System
* Java 1.7 (preferred)Eclipse IDE (preferably 4.2 or higher)