Java EE 6: Develop Web Services with JAX-WS & JAX-RS

Kód kurzu: D77754

Kurz tématicky pokrývá vývoj SOAP a RESTful web services s použitím javových technologií JAX-WS 2.2 a JAX-RS 2.0. Kurz nejprve probere XML, XML Schema, JSON a jejich zpracovávání z Javy pomocí JAXB. Vyjma běžného použití JAX-WS a JAX-RS také ukáže vzory použití web services, jak způsob vývoje contract-first, tak contract-last a principy REST. Součástí je i diskuse a zprovoznění základních bezpečnostních aspektů WS-Security a OAuth. Důraz je kladen na portabilitu řešení mezi jednotlivými aplikačními servery Java EE. Materiály kurzu jsou pro verzi Java EE 6, ale vše bude nasazováno na JDK 8, server kompatibilním s Java EE 7 (WebLogic, Payara, JBoss) a jsou zmíněna místa, kde jsou rozdíly mezi Java EE 6 a 7.

Čo vás naučíme

- Create XML documents and XML schemas while using XML Namespaces.
- Produce and consume JSON and XML using JAXB.
- Understand WSDL files and the role they play in SOAP based web services and select either a top-down (WSDL first) or bottom-up (code first) approach to the development of SOAP web services.
- Make calls to and implement web services based on SOAP standards using JAX-WS (Metro Stack).
- Implement REST practices in the creation of web services with the JAX-RS specification (Jersey Stack).
- Secure web services using Java EE Security standards, WS-Security extensions, and OAuth 1.0a.

Požadované vstupné znalosti

- Java SE7 Fundamentals
- Java SE 7 Programming
- Tutorials available on the Oracle Learning Library
- Oracle Certified Associate, Java SE 7 Programmer
- Oracle Certified Professional, Java SE 7 Programmer
- Java SE 7: Develop Rich Client Applications
- Java Design Patterns

Metódy výuby

Odborný výklad s praktickými ukážkami, cvienia na poítaoch.

Študijné materiály

Elektronické autorizované materiály Oracle v anglickom jazyku.

Osnova kurzu

An Introduction to Web Services

- Explaining the need for web services
- Defining web services
- Explaining the characteristics of a web service
- Explaining the use of both XML and JSON in web services
- Identifying the two major approaches to developing web services
- Explaining the advantages of developing web services within a Java EE container

XML

- Describing the Benefits of XML
- Creating an XML Declaration
- Assembling the Components of an XML Document
- Declaring and Apply XML Namespaces
- Validating XML Documents using XML Schemas
- Creating XML Schemas

JAXB

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- Listing the Different Java XML APIs
- Explaining the Benefits of JAXB
- Unmarshalling XML Data with JAXB
- Marshalling XML Data with JAXB
- Compiling XML Schema to Java
- Generating XML Schema from Java Classes
- Applying JAXB Binding Annotations
- Creating External Binding Configuration Files

SOAP Web Services

- SOAP message structure
- Using WSDL files to define web services
- WS-I Basic Profile and WS-Policy

Creating JAX-WS Clients

- Using tools to generate JAX-WS client artifacts
- Calling SOAP web services using JAX-WS in a Java SE environment
- Calling SOAP web services using JAX-WS in a Java EE environment
- Using JAXB Binding customization with a SOAP web service
- Creating a JAX-WS Dispatch client
- Creating a client that consumes a WS-Policy enhanced services (WS-MakeConnection)

RESTful Web Services

- Describing the RESTful architecture and how it can be applied to web services
- Designing a RESTful web service and identify resources
- Navigating a RESTful web service using hypermedia
- Selecting the correct HTTPethod to use when duplicate requests must be avoided
- Identifying Web Service result status by HTTP response code
- Version RESTful web services

Creating RESTful Clients in Java

- Using Java SE APIs to make HTTP requests
- Using the Jersey Client APIs to make HTTP requests
- Processing XML and JSON in a RESTful web service client

Bottom-Up JAX-WS Web Services

- Describing the benefits of Code First Design
- Creating JAX-WS POJO Endpoints
- Creating JAX-WS EJB Endpoints

Top-Down JAX-WS Web Services

- Describing the benefits of WSDL First Design
- Generating Service Endpoint Interfaces (SEIs) from WSDLs
- Implementing Service Endpoint Interfaces
- Customizing SEI Generation

JAX-RS RESTful Web Services

- Download, Install, and Configure Jersey
- Creating Application Subclasses
- Creating Resource Classes
- Creating Resource Methods, Sub-Resource Methods, and Sub-Resource Locator Methods
- Producing and Consume XML and JSON content with JAX-RS

Web Service Error Handling

- Describing how SOAP web services convey errors

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- Describing how REST web services convey errors
- Returning SOAP faults
- Returning HTTP error status codes
- Mapping thrown Exceptions to HTTP status codes
- Handling errors with SOAP clients
- Handling errors with Jersey clients

Security Concepts

- Explaining Authentication, Authorization, and Confidentiality
- Applying Basic Java EE Security by using deployment descriptors (web.xml)
- Creating users and groups and map them to application roles
- Detailing possible web service attack vectors

WS-Security

- Describing the purpose of WS-Policy, WS-SecurityPolicy, WS-Security
- Configuring WebLogic Server for WS-Security
- Applying WS-Policy to WebLogic JAX-WS Web Services
- Signing and Encrypt SOAP Messages using WS-Security

Web Service Security with Jersey

- Applying JSR-250 Security Annotations such as @RolesAllowed
- Enabling an assortment of filters including the RolesAllowedResourceFilterFactory
- Obtaining a SecurityContext and perform programmatic security
- Authenticating using the Jersey Client API

OAuth 1.1a with Jersey

- Describing the purpose of OAuth
- Describing the request lifecycle when using OAuth
- Creating OAuth enabled services using Jersey
- Creating OAuth enabled clients using Jersey

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