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"Charting the Course ...

... to Your Success!"

Mastering JEE with JSF2, EJB3, JPA, and Web Services

Course Summary

Description

This class combines lectures with hands-on experience that will help students to understand JSF 2, EJB 3 and RESTful Web Services.

Objectives
By the end of this course, participants will be able to:

- Program Web applications that use JavaServer Faces (JSF) including data tables and Ajax.
- Program Enterprise JavaBeans (EJB3) to form the transactional business-logic layer of an enterprise application.
- Use the Java Persistence API (JPA2) to access relational data as objects.
- Create reliable programs that execute units of work using EJB3 transaction support.
- Create RESTful APIs using JAX-RS, including the Create, Retrieve, Update and Delete (CRUD) verbs.

Topics

- Introduction to the Course
- Introduction to JSF
- Writing JavaBeans
- JEE Review
- JSF Architecture
- Request Processing and Navigation
- Managed Beans and the JSF EL
- JSF Components
- Conversion and Validation
- Event Handling
- Panels and Data Tables
- JSF and Internationalization
- Introduction to EJB
- EJB Fundamentals
- Stateless Session Beans
- Stateful Session Beans
- Introduction to JMS
- Message Driven EJBs
- Introduction to Java Persistence
- Developing with Java Persistence
- JPA Entity Relationships
- JPA Queries
- Transactions and Security
- Introduction to SOAP Web Services
- Introduction to REST
- Introduction to JAX-RS
- JAX-RS and CRUD

Audience

This course is designed for Intermediate Java Developers who are familiar with Java and HTML who want to understand JSF 2, EJB 3 and REST Web Services.

Prerequisites

Basic Java programming experience is required.

Duration

Five days

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Course Outline

I. Introduction
- A. What is JavaServer Faces?
- B. Main Components
- C. Benefits of JSF
- D. What is JSF Application?
- E. Why JSF?

II. JSF Architecture
- A. Physical Components
- B. How Does JSF Work?
- C. The FacesServlet
- D. The Lifecycle Object
- E. Reconstitute Component Tree
- F. Apply Request Values
- G. Process Validation
- H. Update Model Values
- I. Invoke Application
- J. Render Response

III. Managed Beans
- A. Overview
- B. Tree Part of the Bean
- C. Pre Populating Input Fields
- D. Named Beans
- E. Bean Scopes
- F. Request and Response Objects
- G. Dependency Injection

IV. Page Navigation
- A. Overview
- B. Faces-config File
- C. Navigation Rules
- D. Example
- E. Bean Declaration
- F. ManagedBean vs. faces-config.xml
- G. Wildcards in Navigation Rules
- H. Compute Destination Page

V. Internationalization
- A. Overview
- B. Properties Files
- C. Localization

VI. Event Model
- A. Overview
- B. Type Of Event Listeners
- C. ActionListener Event
- D. Example
- E. Changing the Locale Programmatically

VII. JSF Validation and Convertors
- A. Overview
- B. Validation Approaches
- C. Implicit Automatic Validation
- D. Precedence of Validity Tests
- E. Example
- F. Build in Validators
- G. Conversion vs. Validation
- H. Explicit Validation
- I. Validation using Custom Validator Methods
- J. Example
- K. Introduction To Convertor
- L. Implicit and Explicit Conversions
- M. Custom Conversions
- N. Custom Convertor Methods

VIII. EJB 3 Concepts
- A. What is new in EJB 3.0?
- B. EJB Roles
- C. Web Services
- D. Types of EJB
- E. Session Bean
- F. Entity Bean
- G. Message-Driven Bean
- H. Flexible Model

IX. Session Bean
- A. Session Bean Contract
- B. Classes and Interfaces
- C. The Stateless Session Bean
- D. Requirements for Stateless Session Bean
- E. The Life Cycle of a Stateless Bean
- F. Life in the Method-Ready Pool
- G. Life Cycle Methods
- H. Dependency Injection
- I. SessionContext Interface
- J. EJBContext Interface

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Course Outline (cont'd)

K. Example: Business Interface
L. Example: Bean Class
M. Steps to Compile
N. Run Application
O. Conversational State of a Stateful Session Bean
P. Requirements for Stateful Session Bean
Q. The Life Cycle of a Stateful Bean
R. Lifecycle Callbacks for Stateful Session Beans
S. Bean's Conversational State

X. Entity Bean
A. Entity Bean Overview
B. Domain Model
C. CMP and EntityManager Interface
D. Primary Keys
E. Developing CMP Entity Bean
F. CMP Entity Bean Details
G. Entity Bean Client
H. Dependency Injection
I. Dynamic Lookup
J. EntityManager
K. Security

XI. Message-Driven Beans
A. Overview of MDB
B. Overview of JMS
C. Using JMS
D. Type of Messages
E. Message Producer : Session Bean
F. MessageDriven
G. ActivationConfigPropert
H. Message Consumer: MDB

XII. Writing a Client
A. Overview
Locating Objects with JNDI
B. The Server Namespace
C. Locating JNDI Service
D. Environmental Object in the InitialContext
E. System Properties
F. Client View
G. Remote Client
H. Local Client
I. Obtaining a Session Bean's Business Interface
J. Client View: Entity Bean
K. Obtaining an EntityManager

XIII. Dependency Management
A. Overview
B. The JNDI ENC and Injections
C. What Can Be Registered in the ENC?
D. How is the JNDI ENC Populated?
E. Annotation Population
F. Dependency Lookup
G. Dependency Injection
H. Declaring Dependencies
I. EJB
J. PersistenceContext
K. Resource
L. Resources

XIV. Object-Relational Mapping
A. Field Access
B. Property Access
C. Mapping to a Table
D. Column Mapping
E. Mapping Simple Types
F. Mapping the Primary Key
G. Identifier Generation
H. Primary-Key Classes
I. Finding an Entity
J. Removing an Entity
K. Updating an Entity
L. Finding all Records

XV. Transactions
A. Overview
B. Distributed Transactions
C. Isolation Levels
D. Transactions in EJB
E. Managing Transactions
F. BMT
G. CMT
H. Transactions Attributes
I. Transactions Outside the Container

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Course Outline (cont'd)

XVI. Introduction To REST Web Services
- A. What is REST?
- B. Why is it Called Representation State Transfer?
- C. Rest – An Architectural Style.
- D. Example of Restful Web Service
- E. Two Fundamental Aspects of the REST Design Pattern
- F. Resource
- G. HTTP
- H. HTTP Methods
- I. Resources With Multiple Representations
- J. Components
- K. Connectors
- L. Communicate Statelessly

XVII. Examples
- A. Example 1: Parts Depot
- B. Logical URLs Versus Physical U
- C. Ls.
- D. Java, REST And RESTEasy.
- E. Example 2: Hello World
- F. Creating Project
- G. HelloWorldResource Class
- H. Registering Web Services
- I. Web.xml File
- J. Export WAR File
- K. Run Web Service
- L. Exercise
- M. Method With Parameter
- N. Method With More Then One Parameter

XVIII. Design Restful Service
- A. Path Annotation
- B. Path: Template Parameters
- C. Produces Annotation
- D. Consumes Annotation
- E. Application Class
- F. JAX-RS And Java Interfaces
- G. Customers Example
- H. Customer Class
- I. CustomersResource Class
- J. Retrieving Customers
- K. Updating a Customer
- L. The outputCustomer() Method
- M. The readCustomer() Method
- N. Run Example

XIX. JAX-RS Injection
- A. PathParam Annotation
- B. QueryParam Annotation
- C. HeaderParam
- D. Content Annotation
- E. Example With a Form
- F. Matrix Parameters
- G. PathSegment And Matrix Parameters
- H. FormParam Annotation
- I. Automatic Conversion
- J. DefaultValue Annotation