Mastering EJB 3.0 Applications

Course Summary

Description

Our training is "technology centric". Although a specific application server product will be used throughout the course, the comprehensive labs and lessons geared towards teaching advanced JPA programming techniques, rather than focusing on the finer points of the tools in use.

This course can be offered using any EJB 3.0 compliant application server. Our dedicated curriculum development team can easily customize our offerings to best suit your specific requirements.

Topics

- Enterprise JavaBeans 3.0
- Writing EJB 3.0 Session Beans
- Entities
- Transaction Management
- Security
- Messaging

Audience

This an intermediate level JavaEE training course, designed for developers who need to get up and running with EJB3 programming skills immediately.

Prerequisites

Students should have at least one year of application development experience, preferably in two and three tier distributed application, as well as some familiarity with the architecture of client-server systems. Students should have prior experience with or in-depth exposure to EJB 3.0.

Duration

Five days

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Course Outline

I. **Session : Enterprise JavaBeans 3.0 9**
  A. Lesson: Introducing Enterprise JavaBeans™ 3.0
    1. Defining Enterprise JavaBeans™
    2. EJB Development Stages
    3. Core Services Provided to EJB
    4. Benefits of an EJB Environment
    5. Key Features
    6. Roles in the EJB Environment
    7. EJB and Distributed Access Protocols
  B. Lesson: Components of the EJB Architecture
    1. Client Views
    2. EJB Architecture Overview
    3. EJB Server
    4. Services Provided by EJB Server
    5. EJB Container
    6. Enterprise Bean
    7. Session Beans
    8. Entities
    9. Message-Driven Beans
    10. The Decorator
    11. Deployment Information
    12. EJB-Jar File

II. **Session : Writing EJB 3.0 Session Beans**
  A. Lesson: Writing the Business Interface and Implementation
    1. Life Cycle: Session Bean
    2. Life Cycle of a Stateful Session Bean
    3. Client Views of a Session Bean
    4. Specifying the Business Interfaces
    5. Writing a Business Interface
    6. Writing the Session Bean Implementation
    7. Life Cycle Callback Methods
    8. Swapping Notifications
    9. Summary of Life Cycle Methods
    10. The SessionContext Object
    11. The SessionContext Methods
    12. Passing "this"
  B. Lesson: Exception Handling
    1. Business Methods and Related Exceptions
    2. Callback Methods and Related Exceptions
    3. Types of Exceptions

    4. Handling Container Callback Exceptions
    5. Handling RuntimeExceptions
    6. Handling Application Exceptions
    7. How Exceptions Effect Transactions
  C. Lesson: Configuration and Deployment
    1. Dependencies and Deployment
    2. Overview of Deployment Descriptors
    3. Purposes of Deployment Descriptors
    4. Format and Schema Makes DD Portable
    5. Contents of Deployment Descriptor
    6. Declaring Basic Bean Information
    7. Example of EJB Deployment Descriptor
    8. Bean Environment Namespace
    9. Accessing the EJB's Namespace
    10. Defining Environment Variables
    11. Accessing Environment Variables
    12. Types of Resource References
    13. Declared Using resource-ref Element
    14. resource-env-ref Used for JMS Destinations
    15. Using Dependency Injection (DI)
    16. Limitations of DI
    17. Bean References
    18. Notes on Bean References
    19. Using the Level of Indirection for Bean References
    20. Using Dependency Injection (DI)
    21. Resolving Bean References
  D. Lesson: Interceptors
    1. Introduction
    2. Assigning Interceptors: @Interceptors
    3. Assigning Interceptors: DD
    4. Overriding Class Interceptors
    5. Assigning Default Interceptors
    6. Overriding Default Interceptors
    7. Matching Interceptors to Methods
    8. Defining Interceptors With DD
    9. Defining Interceptors With Annotations
    10. Signature of Method Interceptor
    11. Transactions and Interceptor Exceptions
    12. InvocationContext
    13. Working with Interceptor Chain
    14. Handling Exceptions

E. Lesson: Timer Service
   1. Timer Service
   2. Timer Service and Different Bean Types
   3. Creating a Timer
   4. The Timer API
   5. Handling Timer Notification
F. Lesson: Exposing A Session Bean As A Web Service
   1. Web Services Characteristics
   2. Web Services Architecturally
   3. SOAP in a Nutshell
   4. SOAP Specification Provides
   5. Anatomy of a SOAP Message
   6. WSDL (Web Services Description Language)
   7. WSDL Types
   8. WSDL Messages
   9. JAXB 2.0 Supports Interoperability
   10. JAX-WS 2.0
   11. JAX-WS 2.0, SOAP, and WSDL
   12. JAX-WS 2.0 Endpoints
   13. WSEE
   14. WSEE Server Programming Model
   15. Server Programming Model
   16. Routing SOAP Requests To An EJB
   17. Exposing an EJB as a Web Service
   18. Defining a Web Service Business Interface
   19. Using the @Webservice Annotation
   20. @WebService Annotation Parameters
   21. Defining Exposed Methods
   22. Example of a Web Service Interface
   23. Defining a Stateless Session Bean as Web Service
   24. Deploying the Web Service
   25. The WSDL for the Deployed Web Service
   26. The Web Service Client
   27. Obtaining the Service
   28. Obtaining the Service Proxy
   29. A Web Service Client

III. Session: Entities
   A. Lesson: Introduction to Entities
      1. Persistent Manager
      2. Approaches to Handling ORM

   3. Overview of Mapping Capabilities
   4. Illustrative Example of Using ORM
   5. Processing Without Lazy Loading
   6. Benefits of EJB3 ORM : Lazy Loading
   7. Single Point Associations and Collections
   8. Benefits of EJB3 ORM: Locking & Scalar Queries
B. Lesson: Getting Started with Entities
   1. First Look at Entity Implementation
   2. Overview of the Configuration
   3. persistence.xml
   4. Hibernate Caching Behavior
   5. Mapping the Employee Class
   6. Providing Mapping Information
   7. Using Annotations for Mapping
   8. Using File for Mapping
   9. Using Annotations with Employee Mapping
   10. Mapping the Employee Primary Key
   11. Generating Primary Keys
   12. Mapping the Employee Properties
   13. Setting up Mapping in peristence.xml
   14. The EntityManager
   15. Obtaining the EntityManager Using DI
   16. Attaching and Detaching
   17. Persisting an Employee Instance
   18. Removing an Employee
   19. Merging Copies of the Same Employee
   20. Retrieving an Employee
   21. Retrieving Using EJB Query Language
   22. Using EJB QL
   23. Managing the EntityManager and State
C. Lesson: Basic ORM
   1. Entities: Types Mapped to Database
   2. Values Represent Simple State
   3. EJB 3.0 Supported Value Types
   4. Embeddable Classes Represent Aggregates
   5. Guidelines in Defining Entity Classes
   6. Simple Example of Entity Class Definition
   7. Using the Optional @Table Annotation

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Course Outline (cont'd)

8. Single Value Identifiers
9. Composite Keys or Identifiers
10. Composite Key Using an Embeddable
11. Mapping Attributes
12. Details of @Column Annotation
13. Joining Data with @SecondaryTable
14. Joining Data
15. Mapping Aggregates (one-to-one)
16. Approaches to Mapping Aggregates
17. Aggregates Using Default Approach
18. Aggregates Using a Separate Table
19. Example Using a Separate Table

D. Lesson: Entity Associations (Relations)
1. Multiplicity of Object Associations
2. Navigability of Object Associations
3. Qualified Object Associations
4. Shared Aggregate Object Associations
5. Composite Object Associations
6. Types of Multiplicity
7. Strategies for one-to-one Associations
8. one-to-one: Primary Key Association
9. one-to-one: Foreign Key Association
10. one-to-one: Join Table
11. Strategies for one-to-many or many-to-one
12. Strategies for one-to-many or many-to-one
13. one-to-many/many-to-one: Foreign Key
14. Uses One or Two Mapping Elements
15. one-to-many/many-to-one: Foreign Key
16. Bidirectional Associations
17. one-to-many/many-to-one: Join Table
18. Unidirectional one-to-many
19. Bidirectional one-to-many
20. Mapping many-to-many Associations
21. Specifying Table and Column Names
22. Cascading Life-Cycle Operation
23. Using Cascading Properly

E. Lesson: Mapping Inheritance
1. Inheritance Mapping
2. Table per Class Hierarchy Strategy
3. Joined Subclass Strategy
4. Table per Class Strategy
5. Additional Notes on Inheritance Mapping

6. Single Table Inheritance
7. Configuring Single Table Inheritance
8. Advantages of Single Table Inheritance
9. Disadvantages of Single Table Inheritance
10. Class Table Inheritance
11. Class Table Inheritance Mapping
12. Advantages of Class Table Inheritance
13. Disadvantage of Class Table Inheritance
14. Requires complex SQL statement to obtain data
15. Especially true in a large hierarchy
16. PM needs complex join structures
17. Statements ARE generated by ORM implementation, so less arduous than when using the "doing-it-yourself-orm"
18. When the hierarchy becomes large, the number of joins grows to obtain a leaf object
19. Concrete Table Inheritance
20. Advantage of Class Table Inheritance
21. Disadvantage of Class Table Inheritance
22. Casting and Equality Problems
23. Proxies and Lazy Loading
24. Solving the Proxy Problem
25. Revised Class Hierarchy
26. Problem Solved…Sort of

IV. Session: Transaction Management
A. Lesson: Fundamentals of EJB Transactions
1. Transactions
2. Transactions: Features and Commands
3. Isolation Levels
4. Access Control Through Isolation Level
5. Working With Isolation Levels
6. READ_COMMITED
7. REPEATABLE_READ and SERIALIZABLE
8. Container-Managed Transactions (CMT)
9. Bean-Managed Transactions (BMT)

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Course Outline (cont'd)

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VII. Lesson: EJB3.0 Message-Driven Beans
1. Lifecycle: Message Driven Bean
2. Message-Driven Beans
3. Destinations for MDBs
4. Benefits of MDBs
5. Message-Driven Bean Implementation
6. Message-Driven Bean Notes
7. Activation Configuration Using Annotations
8. Activation Configuration Using DD
9. Message Selectors
10. Message Selectors Defined in DD
11. Registering MDB to a Destination
12. Declaring Destination Type: Annotations
13. Declaring Destination Type: DD
14. Desintation Types
15. javax.jms.MessageListener Interface
16. Lifecycle Callback Methods for MDBs
17. PostConstruct and PreDestroy
18. PrePassivate and PostActivate
19. MessageDrivenBean Interface
20. The MessageDrivenContext Class
21. Methods of MessageDrivenContext
22. Writing the Message-Driven Bean Class
23. Runtime Environment of an MDB
24. Deployment Descriptor Example