

Fast Track to Enterprise JavaBeans 3.0 (EJB 3) on the JBoss® Application Server (3 Days)

Custom Training Institute

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Fast Track to Enterprise JavaBeans 3.0 (EJB 3) on the JBoss® Application Server (CTI 326)

Students will learn the basic concepts and APIs of EJB, stateless, and stateful session beans, as well as more complex topics such as message-driven beans and transactions. New technologies such as annotations and Dependency Injection are covered in depth, and students will get a solid introduction to the Java Persistence API (JPA). All labs will be written for and run on the JBoss App server.

Prerequisites: Good familiarity with Java programming. Some familiarity with JDBC and SQL.

Minimum software requirements: Java 5 (J2SE 5.0 SDK.), JBoss 4.2.x App Server, Eclipse IDE.

Minimum hardware requirements: Pentium at 1.5 GHz, 1 Gb RAM; 1 Gb free hard disk space before installation. Internet access.

Microsoft PowerPoint, Adobe Acrobat reader (pdf) on instructor's workstation for presentation purposes.

Module 1: Introduction

Overview of EJB and Java Persistence API (JPA)
Goals of EJB, EJB in the Java EE Architecture
EJB 3.0 Overview
Session Beans, Persistent Entities, Message-Driven Beans
Lab: JBoss AS Server Setup and Introduction

Module 2: Session Beans

Session Bean Overview
Services Provided, Stateless and Stateful Beans
Defining a Session Bean - EJB 3 Annotations
The Bean Implementation, Remote and Local Business Interface
Packaging and Deployment
ejb-jar File, Deployment Descriptors in EJB 3
EAR File
The EJB Container
Lab: Creating a Stateless Session Bean
JNDI Overview
Distributed Naming and Lookup Context and InitialContext
Using JNDI
Writing an EJB 3 Client
Client View of a Session Bean
PortableRemoteObject and Casting
Running the Client
Lab: Creating an EJB Client

Module 3: Additional Capabilities

Resources and Dependency Injection
EJB Referencing Another EJB
Referencing Resources, Environment Entries
Connection Factories (DataSource and Others)
Lab: Using Dependency Injection
Lab: Creating and Using Environment Entries
Session Bean Lifecycle and Interceptors
Stateless Session Bean Lifecycle
Business Method Interceptors, InvocationContext, Lifecycle Callback Interceptors, Inceptor Classes
Lab: Working with Interceptors
Stateful Session Beans
Overview
Defining, Client Relationship Lifecycle, Activation, Passivation
Lab: Stateful Session Beans
Timer Service
Overview and Usage

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Module 4: Message-Driven Beans

- Overview of Messaging Systems
 - Messaging, Loose Coupling
 - Pub/Sub, Point2Point
- Overview of JMS API
 - Overview and Structure
 - ConnectionFactory and Destination
 - JMS Producer and Consumer Client Example
 - JMS Messages
- Message-Driven Beans (MDB)
 - Overview and Goals
 - @MessageDriven and MDB Example
 - Configuring with activationConfig
 - State Diagram and Interceptors

Lab: Message-Driven Beans

Module 5: Transactions and Security

- Overview of Transactions and Transactional Systems
 - ACID, Transaction Managers, Resource Managers
- Transactions in EJB 3
 - Declarative Transaction Management
 - Transaction Attributes and Transactional Scope
 - Transaction Scenarios and Bean-Managed Tx

Lab: Working with Transactions

- Security
 - Java EE Security Overview (Role-based)
 - @RolesAllowed, @PermitAll
 - Programmatic Security

Lab: Integrating EJB and Java EE Security

Module 6: Exceptions

- Exception Overview
 - Checked and Unchecked Exceptions
- Exceptions in EJB 3
 - Application Exceptions, System Exceptions
- EJB 3 Best Practices
 - When to Use, Coarse-Grained Business Interfaces, Session Facade, Transaction Guidelines, Clustering

Module 7: Introduction to Java Persistence API (JPA)

- Overview
 - Persistence Layers, Object-Relational Mapping (ORM), JDBC
 - JAP Overview
- Mapping with JPA
 - Entities and @Entity, ids and @ID
 - Generated Id Values
 - Basic Mapping Types

Lab: Mapping an Entity Class

- EntityManager
 - Persisting to the DB, the EntityManager
 - Persistence Units and Configuration
 - Injecting an EntityManager
 - Retrieving Persistent Entities

Lab: Using the EntityManager to Persist and Find an Entity

Module 8: Updates and Queries

- Inserting and Updating
 - Transient, Persistent, Detached, Removed
 - Persisting New Entities, Updating a Persistent Instance

Lab: Inserting and Updating an Entity

- Querying and JPQL
 - Object Based Queries, Select Statement, WHERE Clause
 - Named Queries

Lab: Creating and Using JPQL Queries

- Versioning and Optimistic Locking
 - Detached Instances
 - Versioning and Optimistic Locking in EJB

Module 9: Overview of Entity Relationships

- Object Relationships Overview
 - Mapping Overview (1-1, 1-N, N-1, N-N)
 - Unidirectional and Bidirectional
 - Owner, Invoice and Join Columns
 - Lazy and Eager Loading, and Cascading
- Inheritance Mapping Overview

Module 10: Additional JPA Capabilities

- Versioning Overview
- Queries - Projection, Aggregate, Bulk Update/Delete
- Embedded Objects
- EJB 3 and Java SE

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