
Enterprise JavaBeans (EJB) Training (5 Days)

COURSE OVERVIEW

This Enterprise JavaBeans (EJB) Training course covers EJB 3.2 and JPA2 and provides thorough coverage of the EJB3 technology - presented in a clear and effective manner. It starts with the basic concepts and APIs of EJB and then continues on with complex topics such as message driven beans and transactions. New concepts such as the use of annotations and the use of CDI / dependency Injection to initialize references are covered in depth. The course also includes thorough coverage of managing persistence using the Java Persistence API 2 (JPA2).

The course uses hands-on labs and a well-paced approach to make this complex technology understandable in an accelerated fashion. You will come away with a comprehensive understanding of EJB and the important issues that need to be considered to use it in real world applications. This course can be customized to your requirements.

Course Topics

- Understand the EJB 3 architecture and API, and how it fits into the overall Java EE architecture
- Understand and use the EJB 3 annotations
- Create, deploy & use stateful & stateless session beans
- Use CDI (Contexts and Dependency Injection) to initialize resources
- Understand and use Interceptors (Lifecycle and Business Method)
- Use JNDI (Java Naming and Directory Interface) and be familiar with current portable naming conventions
- Write EJB clients (remote and local)
- Understand, deploy and use message-driven beans
- Understand distributed transactions, the Java Transaction API, and the EJB transaction model
- Understand and use the EJB security model
- Understand practical architectural issues associated with EJB applications
- Understand the new Java Persistence API (JPA)
- Create deploy and use JPA persistent Entities
- Map relational schemas to persistent entities, including the use of primary keys
- Understand and use the EntityManager
- Understand and use Java Persistence Query Language
- Use optimistic locking and versioning
- Use advanced JPA capabilities such as entity relationships (1-1, 1-N, N-N, unidirectional, bidirectional), inheritance, and embeddable classes
- Learn best practices associated with JPA applications

Prerequisites

Experience in the following *is required* for this Java EE class:

- Solid Java programming skills and understanding of OO Java and Java-5 language features is essential.
- Experience with developing Java web applications is very helpful for this course, but not strictly required.
- Some knowledge of XML will be useful for writing the occasional deployment descriptor, but is not required.

COURSE OUTLINE

Introduction

Overview of EJB and Java Persistence API (JPA)
EJB 3.2 Session Beans, Persistent Entities, Message Driven Beans
Lab: Server setup and introduction

Session Beans

Session Bean Overview
Package and Deployments
Lab: Creating a Stateless Session Bean
JNDI Overview
Writing an EJB 3 Client
Lab: Creating an EJB Client

Additional Capabilities

Resources and Dependency Injection
Lab: Using Dependency Injection
Lab: Creating and Using Environment Entries
Session Bean Lifecycle and Interceptors
Lab: Working with Interceptors
Asynchronous Methods, Singleton
Session Beans
Stateful Session Beans
Lab: Stateful Session Beans
Timer Service
Lab: Working with Timers

Message-Driven Beans

Overview of Messaging Systems
Overview of JMS API
Message-Driven Beans (MDB)
Lab: Message Driven Beans

Transactions and Security

Overview of Transactions and Transactional Systems
Transactions in EJB 3
Lab: Working with Transactions
Security
Lab: Integrating EJB and Java EE Security

Exceptions

Exception Overview
Exceptions in EJB 3
EJB 3 Best Practices

Introduction to Java Persistence API V2 (JPA2)

Overview
Persistence Layers, Object-Relational Mapping (ORM), JDBC
JPA Overview
Mapping with JPA
Entities and @Entity, ids and @Id, Generated Id Values
Basic Mapping Types
Lab: Mapping an Entity Class
EntityManager and Persistence Context
Persistence Unit and persistence.xml
Persisting to the DB, the EntityManager, Injecting an EntityManager
Retrieving Persistent Entities
Lab: Using the EntityManager to persist and find an Entity
More About Mappings
Lab: Refining your Mappings

Updates and Queries

- Inserting and Updating
 - Lab: Inserting and Updating an Entity
- Querying and JPQL
 - Lab: Creating and Using JPQL Queries
- Criteria API
 - Lab: Criteria Querying
- The Persistence Lifecycle - JPA Entity States, Lifecycle, and Persistence Context
- Versioning and Optimistic Locking
 - Lab: Optimistic Locking

Entity Relationships

- Relationships Overview
- Relationship Mapping
 - Lab: Mapping Entity Relationships
 - Lab: Querying Across Relationships
- Inheritance Mapping
 - Lab: Mapping Inheritance
- Other Mapping Capabilities - Embedded Objects, Compound Primary Keys, and Element Collections

Additional JPA Capabilities

- Queries - Projection, Aggregate, Bulk Update/Delete
- Extended Persistence Contexts
- XML Mapping Files
- EJB and Java SE
- Best Practices
- Primary Keys, Named Queries, Lazy/Eager Loading, Transactional Semantics, Encapsulation, Report Queries