Java EE, Part 4 of 8: EJB 3.0 in the Enterprise

Meet the expert: Susan Bryant is an experienced IT trainer and consultant with a broad array of skills. She has over 15 years experience in information systems with roles including systems consulting, project management, staff management, staff mentoring, and certified technical trainer. Susan has a strong technical knowledge of IBM WebSphere Application Server, WebSphere Portal Server, WebSphere Process Server, Lotus Domino, and web application development technologies including, Struts, JSF, EJBs and AJAX.

Prerequisites: This course is intended for intermediate to advanced Java programmers. System architects will find the advanced concepts especially beneficial in designing a framework. Students should have good Java programming knowledge and should be familiar with web application programming, including servlets and JSPs.

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Course description: This course takes you beyond the fundamentals of Enterprise Java Bean (EJB 3.0) programming using Eclipse. In this course, you will learn about building message-driven Beans, EJB Security, utilizing Web Services technologies like JAX-WS, and managing distributed transactions. You will also be exposed to Java Interceptors, EJB Timer service, Hibernate JPA caching, EJB design patterns, and deployment.

Course outline:

JPAQL
• Introduction
• JPAQL Interface
• Refactor
• Local Interface
• Summary

Intro to Relationships
• Introduction
• Relationship Between Entities
• Anatomy of a Relationship
• Foreign Key
• Example Schema
• One-to-One Unidirectional
• Creating Entity Instances
• Traversing the Relationship
• The Cascade Behavior
• One-to-One Bidirectional
• Traversing the Relationship
• Demo: Intro to Relationships
• Summary

Complex Relationships
• Introduction
• One-to-Many and Many-to-One
• Many-to-One Unidirectional
• Creating Entity Instances
• Traversing the Relationship
• Modeling One-to-Many
• Creating Entity Instances

Entity and Inheritance
• Introduction
• Inheritance
• Inheritance Example
• Inheritance and Entities
• Inheritance Strategies
• Single Table Per Class

More Inheritance Strategies
• Introduction
• Table Per Concrete Class
• JBoss Warning
• Table Structure
• Pros and Cons
• Joined Subclasses
• Table Structure
• Pros and Cons
• Which Approach to Use
• Demo: Inheritance Strategies
• Summary

Relationships and JPAQL
• Introduction
• Relationships in JPAQL
• Example: Relationship
• Fetching Optimizations
• Lazy vs. Eager Initialization
• Lazy Initialization
• Lazy Initialization Problems
• Fetch Join Query
• Demo: Relationships and JPAQL
• Summary

Demo: Complex Relationships

MDB Intro
• Introduction
• Trouble with RMI/IIOP
• Messaging to the Rescue
• Messaging Features
• Message Domains
• Publish/Subscribe
• Point-to-Point
• Java Message Service
• Overview
• JMS Interfaces
• Integrating JMS and EJB
• MDBs are Different
• MDBs Cannot Respond
• MDBs are Stateless
• Demo: MDBs
• Summary

MDB API
• Introduction
• Message-Driven Bean Interfaces
• javax.jms.MessageListener
• javax.jms.Message
• Lifecycle
• Example: Message Drive Bean
• MDB - Client Example
• Transactions
• Security
• Load Balancing
• Clustering and Topics
• Clustering and Queues
• A Few Tips
• Building a Response
• Potential Problems
• A Simple Alternative
• Type Checking and Messages
• Testing Message-Driven Beans
• Demo: MDB API
• Summary

MDB Advanced Topics
• Introduction
• Message-Oriented Middleware
• Durable Subscription
• javax.jms.Message

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### EJB Security
- Introduction
- How EJB Security Works
- Protecting Web Resources
- Setting Method Permission
- Defining Roles
- Defining Roles: Annotations
- Specify Methods Permission
- Disable Security Check
- Excludes List
- RunAs Security Identity
- RunAs: Configuration
- Programmatic EJB Security
- Security Role Reference
- Demo: EJB Security
- Summary

### Web Services and EJBs
- Introduction
- Web Services
- Operation and Implementation
- WSDL
- Typical Development Workflow
- Advantages of Web Services
- Web Service Clients
- JAX-WS Overview
- JAX-WS Framework
- Java to XML Data Conversion
- Main Goals of JAX-WS
- JAX-WS Server
- WSDL Overview
- WSDL Document Tags
- Web Services and EJB
- Web Service EJBs
- Annotate the Session Bean
- Annotate the Methods
- Service Endpoint Interface
- Package and Deploy
- Demo: Web Services and EJBs
- Summary

### Timer Service
- Introduction
- Container Managed Timer Service
- EJB Timer Service
- Timer Service and EJB
- Timer Service API
- The TimerService Interface
- Obtaining the Timer Service

### Design Patterns and EJB Data
- Introduction
- Session Facade Pattern
- JPA and Session Facade Pattern
- Facade Example
- Data Transfer Object Pattern
- JPA Entity as DTO
- Problem with JPA Entity as DTO
- Version Number Pattern
- JPA and Version Number Pattern
- Primary Key Generation
- JPA and Primary Key Generation
- Fast Lane Pattern
- JPA and Fast Lane Pattern
- Summary

### Interceptors
- Introduction
- Interceptors
- Internal Interceptor
- Example: Internal Interceptor
- External Interceptors
- Example: Default Interceptor
- Another Example
- Class-Level Interceptor
- Pre & Post Processing
- Excluding Interceptors
- Interceptors on Lifecycle Call
- Blocking Calls
- Demo: Interceptors
- Summary

### EJB3 Design Patterns
- Introduction
- Introduction