



DESCRIPTOR SYSTEMS

"We Bring You Up To Speed"

Enterprise JavaBeans, Version 3 (EJB3) Programming

- Description** This course teaches developers how to write Java Enterprise Edition (JEE) applications that use Enterprise JavaBeans, version 3.
- Audience** Developers who will write JEE applications using EJB3.
- Prerequisites** Java programming skills are mandatory.
- Length** 4 days
- Format** Instructor-led; lecture and hands-on lab exercises.

Detailed Topic List

1. Introduction to the Course

- Programming Enterprise JavaBeans (EJB3)
- Legal Information
- Programming Enterprise JavaBeans (EJB3)
- Introductions
- Course Description
- Course Objectives
- Sample Agenda
- Sample Agenda, cont'd
- Sample Agenda, cont'd
- Sample Agenda, cont'd

2. Introduction to JEE

- Introduction to JEE
- What is JEE?
- JEE Version History
- Benefits of JEE
- JEE Vendors
- JEE Development Tools
- JEE Technologies
- Deployment Descriptors
- JEE Development and Packaging
- Introduction to Servlets
- Introduction to JSPs
- Introduction to EJBs
- Introduction to JNDI
- Introduction to JDBC
- Introduction to JMS

- Introduction to JavaMail
- Introduction to JTA
- Introduction to Web Services
- Chapter Summary

3. Introduction to EJB

- Introduction to EJB
- Introduction to EJB
- JEE Architectures
- EJBs vs JavaBeans
- EJB History
- A Look Back at EJB2
- Introduction to EJB3
- What is a POJO?
- EJB Types
- Local and Remote Interfaces
- What are Session Beans?
- Stateless Session Beans
- Stateful Session Beans
- What are Message-Driven Beans?
- What are Entities?
- Development Steps for a Simple SSB
- The Business Interface
- The Implementation
- A Simple Client
- Chapter Summary

4. EJB Fundamentals

- EJB Fundamentals
- What is a Container?
- The Business Interface
- Local vs Remote Interface
- Using the Local Interface
- Using the Remote Interface
- Obtaining EJB References
- Using Dependency Injection
- Introduction to JNDI
- What is a JNDI Context?
- The JNDI InitialContext
- Creating an Initial Context
- Creating an Initial Context: Standalone
- Using a Properties File
- Looking Up Objects
- The Environmental Naming Context
- Providing Configuration Information
- EJB Annotation Summary
- EJB Annotation Summary, cont'd
- EJB Annotation Summary, cont'd
- Deployment Descriptors
- Packaging and Deploying EJB Applications
- Creating the JAR
- Creating the EAR
- Deploying the EJB Application
- EJBs and Exceptions
- Chapter Summary

5. Stateless Session Beans

- Stateless Session Beans
- What is a Stateless Session Bean?
- No Conversational State
- Stateless Session Bean Instance Pools
- The Benefit of Instance Pooling
- Stateless Session Bean State Lifecycle
- Container Starts Up
- Client Retrieves Reference
- Client Calls a Business Method
- The Container Shuts Down
- Lifecycle Event Notification
- Concurrency
- The Session Context
- Injecting the Session Context
- Stateless Session Beans and Web Services
- Chapter Summary

6. Stateful Session Beans

- Stateful Session Beans
- What is a Stateful Session Bean?
- Maintaining Conversational State
- Stateful Session Beans are Dedicated
- Stateful Session Bean Lifecycle
- Client Retrieves Reference
- Passivation
- Activation
- Client Removes Reference
- Rules for Conversational State
- Transient Fields
- Session Timeout
- Concurrency
- Lifecycle Notification
- The Session Context
- Injecting the Session Context
- Stateful Beans vs Stateless Beans
- Chapter Summary

7. Introduction to JMS

- Introduction to JMS
- What is Messaging?
- Messaging vs Method Calls
- Point to Point Messaging
- Publish and Subscribe Messaging
- What is the Java Message Service?
- JMS Message Types
- Inside of a JMS Message
- The Message Interface
- Standard Headers
- TextMessage
- ObjectMessage
- StreamMessage
- BytesMessage
- MapMessage
- Sample Pub/Sub Client
- Sample Pub/Sub Client, cont'd

- Sample Pub/Sub Client, cont'd
- Chapter Summary

8. Message Driven EJBs

- Message-Driven EJBs
- Messaging vs Method Calls
- Introduction to Message-Driven EJBs
- Invoking an MDB
- Message-Driven Bean Fundamentals
- The MessageDrivenContext
- Injecting the MessageDrivenContext
- Lifecycle Events
- Sample Message-Driven EJB
- Sample Message-Driven EJB, cont'd
- Deploying an MDB
- Chapter Summary

9. Introduction to Java Persistence

- Introduction to Java Persistence
- What is Object/Relational Mapping?
- O/R Techniques for Java
- The Impedance Mismatch
- O/R Issues
- Introduction to Java Persistence
- Java Persistence Ancestry
- Java Persistence Implementations
- Java Persistence Overview
- What is an Entity?
- Entity States
- What is the EntityManager?
- Introduction to Java Persistence Queries
- Configuration
- A Simple Example: Entity POJO
- A Simple Example: Entity POJO, cont'd
- A Simple Example: Database Table
- A Simple Example: Main
- A Simple Example: Main, cont'd
- A Simple Example: Main, cont'd
- A Simple Example: Session EJB Client
- A Simple Example: Session EJB , cont'd
- A Simple Example: Persistence.xml
- A Simple Example: Persistence.xml, cont'd
- Chapter Summary

10. Developing with Java Persistence

- Developing With Java Persistence
- Top Down vs Bottom Up
- Java Persistence Annotations
- Defining an Entity
- Rules for Entities
- Mapping State
- Mapping a Table's Columns
- Transient Fields
- The Primary Key
- Auto Generated Keys
- Auto and Identity Key Strategies

- Table and Sequence Key Strategies
- Inheritance Overview
- Inheritance Strategies
- Single Table Inheritance
- Table Per Subclass Inheritance
- Entity Lifecycle Callbacks
- Configuring the Persistence Provider
- Chapter Summary

11. Entity Relationships

- Entity Relationships
- Introduction to Relationships
- Relationship Cardinality
- Relationship Direction
- Relationship Types
- Relationship Ownership
- Rules for Bidirectional Relationships
- Mapping Relationships to the Database
- One-to-One Unidirectional
- One-to-One Unidirectional Mapping
- One-to-One Bidirectional
- One-to-One Bidirectional Mapping
- One-to-Many Unidirectional
- One-to-Many Unidirectional Mapping
- Many-to-One Unidirectional
- Many-to-One Unidirectional Mapping
- One-to-Many Bidirectional
- One-to-Many Bidirectional Mapping
- Many-to-Many Unidirectional
- Many-to-Many Unidirectional Mapping
- Many-to-Many Bidirectional
- Many-to-Many Bidirectional Mapping
- Eager vs Lazy Fetching
- Detached Objects and Lazy Fetching
- Cascading
- Chapter Summary

12. Persistence Queries

- Persistence Queries
- Introduction to Queries
- JP Query Language Overview
- JPQL vs SQL
- Query Types
- The Abstract Schema
- Creating a Query
- The Query Interface
- Single Result vs Multiple Results
- Sample Entities for Queries
- Query Parameters
- SELECT Query Syntax
- The DISTINCT Keyword
- JPQL Operators
- JPQL Operator Examples
- JPQL Functions
- JPQL Functions, cont'd
- JPQL Function Examples

- Ordering
- Constructor Expressions
- Constructor Expressions, cont'd
- Navigating Relationships
- FETCH Joins
- Subqueries
- Paging
- Paging, cont'd
- Bulk UPDATE and DELETE
- Bulk UPDATE and DELETE, cont'd
- Chapter Summary

13. Transactions and Security

- Transactions and Security
- Introduction to Transactions
- A Program with No Transactions
- Traditional Programmatic Transactions
- Transaction Properties
- Distributed Transactions
- Transaction Demarcation
- CM Transaction Demarcation
- Transaction Attributes
- Annotation Example
- Deployment Descriptor Example
- Specifying Methods in the Deployment Descriptor
- Transaction Propagation
- Rolling Back CM Transactions
- Programmatic Transaction Demarcation
- Programmatic Demarcation, cont'd
- Exceptions and Transactions
- Entities and Transactions
- What is a Persistence Context?
- Persistence Context and Stateless EJBs
- Persistence Context and Stateless EJBs, cont'd
- Transactions and Stateful Session EJBs
- Transaction Isolation
- Introduction to EJB Security
- Authentication and Authorization
- Security Roles
- Assigning Users to Roles
- Declarative Authorization Annotations
- Declarative Authorization Deployment Descriptor
- Deployment Descriptor, cont'd
- Programmatic Authorization
- Chapter Summary

14. Introduction to Web Services

- Introduction to Web Services
- What are Web Services?
- Benefits of Web Services
- Web Services Challenges
- Service Oriented Architectures
- What is SOAP?
- Example SOAP Message
- Example RPC Response
- What is WSDL?

- Example WSDL, Version 1.1
- Example WSDL, cont'd
- Example WSDL, cont'd
- What is UDDI?
- Using UDDI
- What is JAX-WS?
- JAX-WS Highlights
- JAX-WS Highlights, cont'd
- JAX-WS Clients
- A Simple, Non-EJB-Based Service
- A Simple, EJB-Based Service
- Deploying the Service
- A Client for the Simple Web Service
- Chapter Summary

15. Testing EJBs

- Testing EJBs
- Testing EJBs
- Unit Testing
- Benefits of Unit Testing
- EJB3 vs EJB2
- Testing EJB3 Challenges
- Unit Testing Issues
- Unit Testing Frameworks
- Introduction to JUnit
- History of JUnit
- JUnit IDE Integration
- Steps for Using JUnit
- Testing Session EJBs with JUnit
- Testing Session EJBs with JUnit, Example
- Testing Session EJBs with JUnit, Example, cont'd
- Automating JUnit Tests with Ant
- JUnit and Ant Integration
- Sample JUnit Ant Script
- The junitreport Ant Task
- The junitreport Ant Task, cont'd
- Introduction to TestNG
- TestNG vs JUnit
- Unit Testing JPA Entities
- Introduction to DBUnit
- Introduction to EJB3Unit
- Introduction to Cactus
- What is Acceptance Testing?
- Who Writes Acceptance Tests?
- Benefits of Acceptance Testing
- Acceptance Testing and the UI
- Acceptance Testing Toolkits
- Introduction to Fit
- Introduction to Selenium
- Chapter Summary