

EJB Development Using RAD v7.0

Course Summary

Description

This course teaches students how to develop Enterprise JavaBeans (EJBs) using IBM Rational Application Developer (RAD) v7.0. The course describes design patterns and "best practices" for building robust, distributed applications in an enterprise environment. The concepts taught in this course are reinforced by hands-on lab exercises.

Objectives

At the end of this course, students will be able to:

- Use RAD v7.0 to develop and test session, entity and message-driven EJBs and other J2EE components
- Understand how EJB 2.1 components fit into the J2EE architecture

Topics

- J2EE Architecture Overview
- Enterprise JavaBean Overview
- RAD: EJB Development
- Java Naming and Directory Interface
- Application Assembly and Packaging
- EJB Clients: Basics
- Object Serialization
- RAD: Server Tools (optional)
- RMI over IIOP
- RAD: Data Perspective (optional)
- Session Bean Development
- Stateless Session Beans
- RAD: Testing and Debugging EJBs
- Stateful Session Beans
- Entity Bean Development
- Container Managed Persistence
- RAD: CMP Tools
- EJB Query Language
- BMP Entity Beans
- Transaction Management
- EJB Timers
- Message-Driven Beans
- JMS Client Development
- WebSphere Security Overview
- Defining Security in RAD
- J2EE Design Patterns

Prerequisites

Students should be proficient as a Java programmer and have experience with developing server side components such as Servlets and JavaServer Pages.

Duration

Four or five days

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Course Outline

- I. J2EE Architecture Overview**
 - A. Enterprise Application Overview and Development Cycle
 - B. J2EE Architecture and Containers
 - C. Applet, Servlet and JSP Overviews
 - D. JDBC, JNDI and JTA
 - E. EJB, JMS and RMI Over IIOP
 - F. JavaMail, JAF, JAAS and JACC
 - G. XML and JAXP
 - H. New in J2EE 1.4
 - I. Web Services Support: JAX-RPC, SAAJ, Web Services for J2EE and JAXR
 - J. J2EE Connector, Management and Deployment
 - K. Development Roles and Deployment Descriptors
- II. Enterprise JavaBean Overview**
 - A. What are Enterprise JavaBeans and Why Use Them?
 - B. The EJB Container and EJB Server
 - C. Session Bean Overview
 - D. Entity Bean Overview
 - E. Message-Driven Bean Overview
 - F. EJB Classes and Interfaces
 - G. Local Versus Remote Client View
 - H. EJB Deployment
 - I. Looking Up and Invoking an EJB
- III. RAD: EJB Development**
 - A. Creating EJB Projects and EJB Client Projects
 - B. Annotation-Based Programming
 - C. Creating Session Beans and Message-Driven Beans
 - D. Promoting Methods and Using EJB Snippets
 - E. Editing the EJB Deployment Descriptor
 - F. Generating Deployment Code
 - G. Testing EJBs
- IV. Java Naming and Directory Interface**
 - A. JNDI Architecture
 - B. Naming and Directory Services
 - C. JNDI Terms and Packages
 - D. Initial Context
 - E. JNDI Subcontexts
 - F. JNDI Lookup Examples
 - G. Service Providers
- V. Application Assembly and Packaging**
 - A. J2EE Deployable Units
 - B. Assembly Process
 - C. Packaging Checklist
 - D. Creating Enterprise Application Projects
 - E. Importing Resources
 - F. Adding J2EE Modules and Utility JARs
 - G. JAR Dependency Editor
 - H. Using the Application Editor
 - I. Deployment Descriptor Elements (EJB, Web, Connector, Client and Application)
 - J. IBM Extensions and Bindings
 - K. Exporting Resources
- VI. EJB Clients: Basics**
 - A. Types of Client Access
 - B. Developing Remote Clients
 - C. Local Clients
 - D. Local Versus Remote Client View
 - E. Web Service Clients
 - F. Handles
 - G. EJB and Service References
- VII. Object Serialization**
 - A. What is Serialization?
 - B. Creating Serializable Objects
 - C. Object Variables
 - D. Transient Variables
 - E. Reading and Writing Serialized Objects
 - F. Customizing Serialization
 - G. Implementing writeObject() and readObject()
 - H. EJBs and Object Serialization

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Course Outline (cont'd)

VIII. RAD: Server Tools (optional)

- A. New Features
- B. Test Environments
- C. Server Types and Resources
- D. Defining a Server
- E. Running Applications on a Server
- F. Defining the Target Server
- G. Servers View and Actions
- H. Editing the Server Configuration for WebSphere V6 and V6.1
- I. Embedding Deployment Information in an Application
- J. Reloading Resources Running on the Server
- K. WebSphere Administration Command Assist
- L. WebSphere Profiles

IX. RMI over IIOP

- A. The History of RMI Over IIOP
- B. RMI/IIOP Basics
- C. Interfaces and Implementation Classes
- D. Remote Interfaces and Objects
- E. Stubs and Ties
- F. RMI/IIOP Architecture
- G. Passing Objects Using RMI/IIOP
- H. PortableRemoteObject
- I. The RMI over IIOP IDL Compiler (rmic)

X. RAD: Data Perspective (optional)

- A. Using the Database Explorer
- B. Creating and Connecting to a Database
- C. Creating Data Development and Data Design Projects
- D. Working with Data Diagrams
- E. Adding a Table or View
- F. Adding Keys, Columns, Indexes and Relationships
- G. Generating DDL and Deploying From RAD
- H. Using the Data Output and SQL Scrapbook Views

XI. Session Bean Development

- A. Session Bean Usage and Types
- B. Callback Methods
- C. Session Bean Classes and Interfaces
- D. SessionContext
- E. Adding Business Logic
- F. Home Interface and Component Interface Requirements
- G. Invoking and Removing a Session Bean
- H. Session Bean Design Guidelines
- I. Deployment

XII. Stateless Session Beans

- A. Proper Usage
- B. Lifecycle
- C. Instance Pooling
- D. Identity
- E. Defining a Web Service Endpoint Interface
- F. MessageContext

XIII. RAD: Testing and Debugging EJBs

- A. Using the RAD Debugger
- B. Debugging Options
- C. Testing an EJB
- D. Universal Test Client
- E. JNDI Explorer

XIV. Stateful Session Beans

- A. Proper Usage
- B. Lifecycle and Callback Methods
- C. Passivation and Activation
- D. Bean Identity
- E. Stateless Versus Stateful

XV. Entity Bean Development

- A. Entity Bean Usage
- B. Types of Persistence
- C. Lifecycle and Callback Methods
- D. Classes and Interfaces
- E. Relationships
- F. Creating and Removing an Entity
- G. Key Classes and Fields
- H. Finder and Select Methods
- I. Home Business Methods
- J. Deployment
- K. Entity Bean Design Guidelines

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Course Outline (cont'd)

XVI. Container Managed Persistence

- A. CMP Entity Beans
- B. Object-Relational Mapping
- C. CMP Fields and Relationships
- D. Relationship Direction and Multiplicity
- E. Object-Relational Mapping Approaches
- F. Deployment Descriptor Entries

XVII. RAD: CMP Tools

- A. Development Steps
- B. Adding CMP Files and Relationships
- C. Mapping Entity Beans: Top-Down, Bottom-Up and Meet-In-The-Middle
- D. Generated Files
- E. Defining EJB Queries
- F. CMP Deployment
- G. Controlling Activation and Passivation

XVII. EJB Query Language

- A. Query Methods
- B. Navigation and Selection
- C. SELECT Clauses and Returned Types
- D. FROM Clauses and Path Expressions
- E. WHERE Clause and Parameters
- F. Comparison Expressions and Functions
- G. Supported Operators and Reserved Identifiers
- H. ORDER BY Clause
- I. Defining Queries in the Deployment Descriptor

XVIII. BMP Entity Beans

- A. Developing BMP Entity Beans
- B. Persistent Fields
- C. Implementing Lifecycle Management Methods
- D. Implementing Finder Methods and Relationships
- E. Primary Key Class
- F. CMP Versus BMP

XIX. Transaction Management

- A. What is a Transaction?
- B. ACID
- C. Two-Phase Commit
- D. JTA and JTS
- E. Bean-Managed and Container-Managed Transactions
- F. Valid Transaction Types
- G. Transaction Demarcation
- H. Defining Transaction Attributes

XVII. Valid Attributes and Required Transactions

- A. Rolling back a Container-Managed Transaction
- B. Restrictions for Container-Managed Transactions
- C. Bean-Managed Transactions
- D. UserTransaction Interface
- E. Restrictions for Bean-Managed Transactions
- F. SessionSynchronization
- G. Transactions and Message-Driven Beans
- H. JDBC Isolation Levels
- I. WebSphere Access Intent and Read-Ahead Hints
- J. Guidelines

XVII. EJB Timers

- A. Timer Basics
- B. Timer Service Interfaces
- C. Creating and Saving Timers
- D. Timer Interface
- E. Transactions and Timers
- F. Considerations

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Course Outline (cont'd)

XVII. Message-Driven Beans

- A. Characteristics
- B. Message Processing
- C. Lifecycle Methods
- D. The MessageDrivenBean interface
- E. Class Requirements
- F. Message Listener Interfaces
- G. Activation Specification
- H. Defining the Messaging Type
- I. Transactions and Message Acknowledgment
- J. JMS Capabilities and Messaging Styles
- K. JMS Participants and Interactions
- L. JMS Runtime Environment
- M. JMS and Message-Driven Beans
- N. Sending Messages to an MDB

XVIII. JMS Client Development

- A. MDB Clients
- B. JMS Objects
- C. Development Steps
- D. Sending a Message
- E. Adding JMS References

XVII. WebSphere Security Overview

- A. Security: Declarative and Programmatic
- B. Container Based Security
- C. Secure Associations
- D. Security Roles and Role Mappings
- E. Authentication Versus Authorization
- F. Lazy Authentication
- G. LTPA
- H. User Registries and Supported LDAP Servers
- I. Run As Identity
- J. Secure Sockets Layer (SSL) and Transport Layer Security (TLS)
- K. Single Sign-On
- L. Java 2 Security
- M. Policy Files: Static and Dynamic

XVIII. Defining Security in RAD

- A. Enabling Security
- B. Defining Security Roles and Method Permissions
- C. Adding Security Constraints and Resource Collections
- D. Security Role References
- E. Security Identity
- F. Authentication Mechanisms
- G. Security Configuration Files

XIX. J2EE Design Patterns

- A. What Are Design Patterns and Why Use Them?
- B. MVC, Composite View, Front Controller, Intercepting Filter and View Helper Patterns
- C. Transfer Object, Session Façade, Business Delegate and Service Locator Patterns
- D. Data Access Object, Fast-Lane Reader and Value List Handler Patterns
- E. Composite Entity and Factory Design Patterns
- F. Putting It All Together