

JA1518 – Developing Enterprise Java Applications using IBM RAD 7.5

Course Synopsis

Duration:	Five (5) days.
Audience:	Geared for experienced programmers, attendees should have a working knowledge of developing basic Java software applications.
Prerequisites:	This is an introductory-level JEE 5 programming course, designed for experienced developers who wish to understand the architecture of a JEE web application and/or implement a web application taking advantage of what JEE brings to the table, using RAD 7.5.
Delivery Method:	Instructor led, Hands-on workshops

Brief Description

Developing Enterprise Java Applications Using RAD 7.5 is a lab-intensive, hands-on programming course geared for software developers who need to understand what JEE 5 is, what it means in terms of today's systems and architectures, and how to apply JEE 5 technologies and practices in implementing and deploying robust, flexible web-oriented enterprise applications. This is all done working within the context of RAD 7.5 and its tooling to support enterprise application development.

Java Enterprise Edition (JEE) is a powerful platform for building web-oriented enterprise applications. The JEE 5 platform offers all the advantages of developing in Java plus a comprehensive suite of server-side technologies. This course tells you what you need to know to design and build your own web applications. You'll learn the details of the key JEE 5 technologies and how to leverage the strengths of each. At the same time, you'll be learning about the big picture of JEE 5 and how to design web applications that are robust, efficient, secure, and maintainable. If you want to deliver an application on the web, you'll find this course essential.

New enhancements in JEE 5 simplify web application develop, supporting the use of annotations, dependency injection, and a Common Expression Language (for use with both JSPs and JSF). One of the most significant enhancements to JEE 5 is EJB 3.0 and the inclusion of the Java Persistence API (JPA).

Course Objectives What You'll Learn

Students will thoroughly explore core skills and best practices for developing well-designed web applications using key JEE 5 APIs such as Servlets, JavaServer Pages (JSPs), JDBC and more, all within the robust IBM WebSphere development environment.

This course immerses students in web application architecture skills and programming techniques, with heavy emphasis on core Servlets and JavaServer Pages (JSP) development. The course then guides students through the process of creating dynamic data applications, building interactive databases using JDBC, Java's database access technology. Students are guided through essential EJB development and testing skills, working with RAD, to an intermediate level of coverage. RAD's profiling and debugging capabilities are also examined in detail.

Throughout the course week, students will learn not only specific topics and APIs but also how to fit the pieces together into a complete application. In addition to tooling features and good coding practices, emphasis is placed on good software design skills and techniques.

Attendees will learn to effectively use RAD to:

- Design and build robust, secure, and maintainable web applications
- Access databases with JDBC
- Create dynamic HTML content with Servlets and Java Server Pages
- Make Servlets and JSP work together cleanly
- Troubleshoot and tune web applications
- Understand and work with JEE 5 persistence options, including JPA
- Work with new annotations included in JEE 5
- Expose web components as web services
- Recognize basic web security vulnerabilities and implement effective defenses

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I. Introduction to RAD 7.5

- RAD 7.5 Overview
- RAD 7.5 – Hands-on First look

II. Working with RAD 7.5

- Setting up and personalizing the RAD 7.5 Environment
- The RAD 7.5 Paradigm: Editors, Views, and Perspectives
- Projects in RAD 7.5
- Your first RAD 7.5 Project

III. Editing and Debugging Your Java Code

- RAD's Java Tooling: Java Perspective
- Refactoring
- RAD's Debugging Tooling: Debugging Perspective

IV. JEE Application Architectures

- Technical Overview of JEE
- Common Themes In JEE Framework
- JEE Containers and Components
- The JEE 1.5 Specification
- JEE Platform Roles
- Annotations
- Dependency Injection
- JEE Application Architectures (Web based)

V. Web Applications in RAD

- Understanding Web Applications
 - JEE Application Modules
 - Web Application Archive (WAR)
 - Directory Structure
 - Configuring Web Applications
 - Mapping an HTTP Request to a Resource
 - The web.xml File
 - Structure
 - Declaring Servlets and JSPs
 - Servlet Mapping
 - Servlet Init Parameters
 - Web Application init Parameters
 - Welcome Page
 - Error Page
 - RAD's Web Tooling: Web Perspective
 - Web Projects & Packaging
 - Working with WebSphere Profiles
 - RAD's Web Tooling: Site and Page Designer
- ### VI. Developing, Deploying and Testing Servlets in RAD 7
- Servlet Overview
 - Life Cycle of Servlets
 - Servlet Lifecycle is Handled by Web Container

- HttpServlet
- Deploying and Testing Servlets
- Data Access Considerations
- Several Options for Sharing Data
- Configuration and Context
- Servlet Variables
- HttpServlet Request
- Threading and Data Processing Input Data
- Server-side Control
- Client-side Control
- Maintaining Client State - Sessions
- Session Management
- Tracking Problem – Stateless HTTP
- Data Problem – Session Data
- Solving the Tracking Problem
- Cookies
- URL Rewriting
- Solving the Data Problem

VII. Debugging

- Debug Perspective and View
- Debugging Programs
- Debugging Web Applications
- Debugging JSP Pages

VIII. Filters

- Overview of Filters
- Filter Objects
- doFilter Method
- init Method
- Filter Life Cycle
- Cascading Filters
- Filtering the Request and Response

IX. Developing, Deploying and Testing JSPs using RAD 7.5

- JavaServer Pages Development with RAD 7.5
- Using JavaBeans with JSP
- Deploying and Testing JSPs
- Implicit Objects
- Lifecycle of a JSP
- Session Attributes
- Exception Handling
- Actions, JavaBeans, and Custom Tags
- The Expression Language
- Enable/Disable EL
- Implicit Objects in JSP EL
- EL Functions
- Pre-Built EL Functions
- Simple Tag Handlers

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X. JSTL

- JSTL Introduction and Core Library
- Expression Language (EL) in JSTL
- JSTL Format Library

XI. JavaServer Faces

- JSF User Interface
- Managed Beans
- Managed Properties
- Navigation Rules
- Navigation Cases
- Outcomes
- JSF Tag Libraries

XII. Database Integration: JDBC and JEE

- JDBC and Position in JEE
- Java JDBC Data Access API
- The DAO Pattern
- RAD's Data Tooling: Data Perspective

XIII. Persistence and EJB3

- Java Persistence API
- Entities and Metadata
- Entity Manager
- Finding Entities
- Deploying and Runtime Issues
- Implementation Options
- Working With Enterprise JavaBeans™ 3
- Defining Enterprise JavaBeans
- JavaBeans™ vs EJBs
- EJB Architecture Overview
- EJB Container & Types of EJBs
- Session Beans
 - Stateful and Stateless
 - Lifecycle
- Message-Driven Bean
 - Messaging Constructs
 - Lifecycle
 - Unique Aspects of MDBs
- Entity Beans and POJOs
- Entity Bean Lifecycle
- Entity Manager and Entities
- CRUD Operations with Entities
- ORM Options
- Transaction Definitions
- The ACID Transaction Properties
- Transaction Lifecycle
- Overview of a Transactional System
- JEE Transaction Support

XIV. RAD/WAS Best Practices

- Enhanced EAR Files
- Best Practices for Working with RAD
- RAD and WAS: Process Monitoring
- Working with WebSphere from Within RAD
- Working with WebSphere via the Admin Console
- Upgrading RAD and WAS

XV. Introduction to JMS

- JMS Architecture and WAS
- The JMS API
- The JMS Factory model overview
- Administered Objects
- JMS Queue Architecture
- Point-to-Point Interfaces
- Obtaining QueueFactory
- Obtaining Destination and Session
- Sending a message
- Topic Architecture
- Publish-Subscribe Interfaces
- Message Consumption
- Message Header Fields

XVI. Web Services Tooling in RAD 7.5 (Optional)

- What are Web Services?
- Web Services Architecturally
- XML and Web Service APIs
- Binding Using JAXB
- Web Service Interoperability – JAX-WS
- Web Services for JEE - WSEE
- Servlets as Web Services
- EJBs as Web Services
- Routing SOAP requests to an EJB
- Web Services Tooling Overview
- Tools for Web Service Providers
- Tools for Web Service Clients
- Web Service Development
- Wizards to the Rescue
- Handles Supporting Provider Technologies
- Web Services Client Development
- Web Services Testing and Compliance
- Web Services Explorer Used to Test
- SOAP Monitor Examines Wire Traffic

XVII. Additional JEE Topics

- Transactions
- JEE Security
- Other JEE APIs
- The JEE Blueprints