J2EE for ABAP Programmers

Jeff Gebo
SAP Labs, LLC
The central hub for the SAP technology community
- Everyone can connect, contribute and collaborate-
  consultants, administrators and developers
- Focus around SAP NetWeaver and SAP xApps

High quality of technical resources
- Articles, how-to guides, weblogs, collaborative areas, 
discussion forums and downloads, toolkits and code 
samples

A collaboration platform, not a one-way street
- SAP experts from customers, partners and SAP

SDN is powered by SAP NetWeaver™
- Built on the SAP Enterprise Portal
- Featuring collaboration capabilities of SAP 
  Knowledge Management

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Developer Areas
- SAP NetWeaver Platform
- Enterprise Portal
- Knowledge Management
- Business Information Warehouse
- Exchange Infrastructure
- Web Application Server
- Mobile Infrastructure
- SAP xApps
- Technologies

Welcome to the 
SAP Developer Netw
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few community networks th 
developers, by the develop 
development tools which ar 

Enjoy, contribute and conn
Learning Objectives

Focus: Get a J2EE Overview using the ABAP Paradigm

As a result of this Know How Call, you will be able to:

- Receive an understanding of J2EE and all the J2EE Buzz-Words
- Understand how J2EE compares to ABAP
- Learn what SAP is bringing from the ABAP World to the J2EE World
- Get a learning roadmap to take your ABAP skills to the J2EE world
Agenda

Web AS Overview
- J2EE & ABAP Combined
- System Architecture

Web Programming
- JSPs ~ BSPs
- Servlets ~ BSP Controllers

Business Programming
- Enterprise JavaBeans ~ BAPIs/RFMs

SAP Enhancements for Business Development
- Java Dictionary ~ ABAP Data Dictionary
- Open SQL for Java ~ Open SQL for ABAP
- Java Development Infrastructure ~ ABAP Development Infrastructure

ABAP to J2EE Learning Roadmap!
Two Personalities in One Web Application Server

**Web Application Server**
- Both, a Fully Compliant J2EE and an ABAP personality
- Single, comprehensive and unified environment

**Benefits**
- Preserve customer’s investments in the existing software and skills
- Offer customers business-strength access to J2EE
- Reducing deployment costs
  - Training
  - Administration & Monitoring
  - System and End User Support
- Bring Enterprise and Web Developers on One Common Platform
- Opens Larger Talent Pool
Use a central DB as configuration and application store -> stability

Use the Enqueue Server as reliable lock handler -> stability

Use the Message Server as message hub -> scalability

Use SDM (Software Delivery Manager) to keep track of deployed software components -> supportability
Java is an object-oriented programming language – So is ABAP!

- Source code is compiled into byte-code
- Byte-code is interpreted by a Java Virtual Machine (JVM)

Java is platform independent – So is ABAP!

J2EE (Java 2 Platform Enterprise Edition)

- Platform which simplifies and accelerates developing, deploying and managing n-tiered business applications using Java technologies
J2EE vs. ABAP – Programming Model

J2EE Server
- Web Container
  - JSP Pages / Servlets
- Enterprise JavaBeans
- Database

Java
- Web Browser
- Application Client

ABAP Stack
- ICM / ICF
  - BSP Pages / BSP Controllers
- Functions, Classes, & BAPIs
- Database

ABAP
- Web Browser
- SAP GUI

Java
- Database
- Application Client

Web Container

J2EE Server

ABAP Stack

J2EE Architecture Overview

Web container
- Manages the execution of JSP page and servlet components for J2EE applications

EJB container
- Manages the execution of enterprise beans for J2EE applications

J2EE Services
- Foundation for implementation of multi-tier enterprise applications
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JavaServer Pages (JSP)

JSP Page is text file that
- Is written with markup language (HTML, XML, WML)
- Includes Java code to bring dynamic information to the page
- Will always be converted to servlet at execution time

JSP Page hides HTTP complexity from programmer

```jsp
<%@ page import="flightdemo.generated.*" %>
<%@ page import="flightdemo.*" %>
<html>
<head>
<title>FlightAnswerList</title>
</head>
<body>
<jsp:useBean id="flightdemoBean" scope="session" class="flightdemo.FlightdemoBean" />
<h1>Answers for Request</h1>
<table border=1>
<tr>
<th>From</th>
<th>To</th>
<th>Date</th>
<th>Time</th>
</tr>
<% FlightdemoBean bean = new FlightdemoBean();
   bean.setAirportFrom("Frankfurt");
   bean.setAirportTo("New York");
   bean.searchFlights();
   BapisfldatTypeList list = bean.getFoundFlights();
   BapisfldatType[] entries = list.toArrayBapisfldatType();
   for (int i=0; i<entries.length; i++) { %>
   <tr>
   <td><%=entries[i].getAirline()%></td>
   <td><%=entries[i].getAirportfr()%></td>
   <td>….</td>
   <td><%=entries[i].getConnectid()%></td>
   </tr>
<% } %>
</table>
</body>
</html>
```
HTTP Servlet

Servlet is a Java class that
- Handles HTTP communication
- Runs on a Web server
- Generates dynamic Web pages

Servlets can directly access resources like Enterprise JavaBeans components, JDBC data sources ...

Diagram:
- HTTP Request
  - Browser
  - Servlet
  - Web Container
  - EJB Container
  - HTTP Response

Java ~ ABAP
Servlet ~ BSP Controller
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Enterprise JavaBeans Definition

An Enterprise Java Bean is a server-side component that encapsulates the business logic of an application.

EJBs always execute within an EJB container, which provides system services to EJBs.

These services include transaction management, persistence, pooling, clustering and other infrastructure.
Types of Enterprise Beans

- **Enterprise Java Bean**
  - **Session Bean**
    - Stateless Session Bean
    - Stateful Session Bean
  - **Entity Bean**
    - Container-managed persistence
    - Bean-managed Persistence
  - **Message-driven Bean**

- Related to the user session
- Session bean is not persistent
- Handles the persistence in a object-oriented manner
- Represent a business object
- Message based
- Receive asynchronous JMS messages
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ABAP to J2EE Learning Roadmap!
J2EE doesn’t cover everything!

To adopt J2EE for large business applications, SAP

- ... must extend the programming model
- ... has to provide new features
- ... must integrate existing non-J2EE open standards
- ... has to provide a highly productive development infrastructure
Eclipse is an Open Source project

Eclipse consists of
- a complete Java (J2SE) IDE
- an open Tool Integration Framework

SAP’s Java IDE can be extended by 3rd party Eclipse tools
- Already many tools available
- Strong industry drive

Your SAP Java IDE can be extended by 3rd party Eclipse tools and own Eclipse tools
Development Environment ABAP/Java

**ABAP**
- Complete central environment for build and test
- Instant build
  - Minimal
  - Complete
- Continuous integration test

**Java**
- Independent from central server
  - Availability
  - Performance
  - Offline usage
- Local files and folders
- Local test environment
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ABAP to J2EE Learning Roadmap!
ABAP to J2EE Learning Roadmap

Learn ABAP Objects and Object Oriented Programming!
- SAP Offers Course: BC401 ABAP Objects

Learn ABAP Web Programming – based on ABAP Objects
- SAP Offers Course: NET200 SAP Web Application Server: Developing BSP Applications
- Go to http://service.sap.com/education to sign up for the above classes

Take basic Java Courses

Take J2EE Classes – be on the look out for SAP’s own J2EE Class.
Java & J2EE Resources

Web Sites


More Java & J2EE Resources

Books

Core Servlets and JavaServer Pages – a great book showing how to do basic J2EE web programming.

Java for the Web with Servlets, JSP, and EJB: A Developer's Guide to J2EE Solutions – Web development using JSPs, Servlets, and EJBs.

Professional EJBs – learn all about the details of EJBs.
Summary

J2EE defines standards for developing multi-tier enterprise applications

J2EE handles many details of application behavior automatically, without complex programming
  - Like transaction and security handling

Take your time and follow the learning map if you want to have a crack at it

J2EE does not fulfill all requirements for business applications

SAP provides a sophisticated infrastructure for development and deployment

Take your time and follow the learning map if you to take your ABAP skills to the J2EE world
Questions?

Q&A