Software Development: Developer's guide to building Applications for WebSphere

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WAS Product Manager

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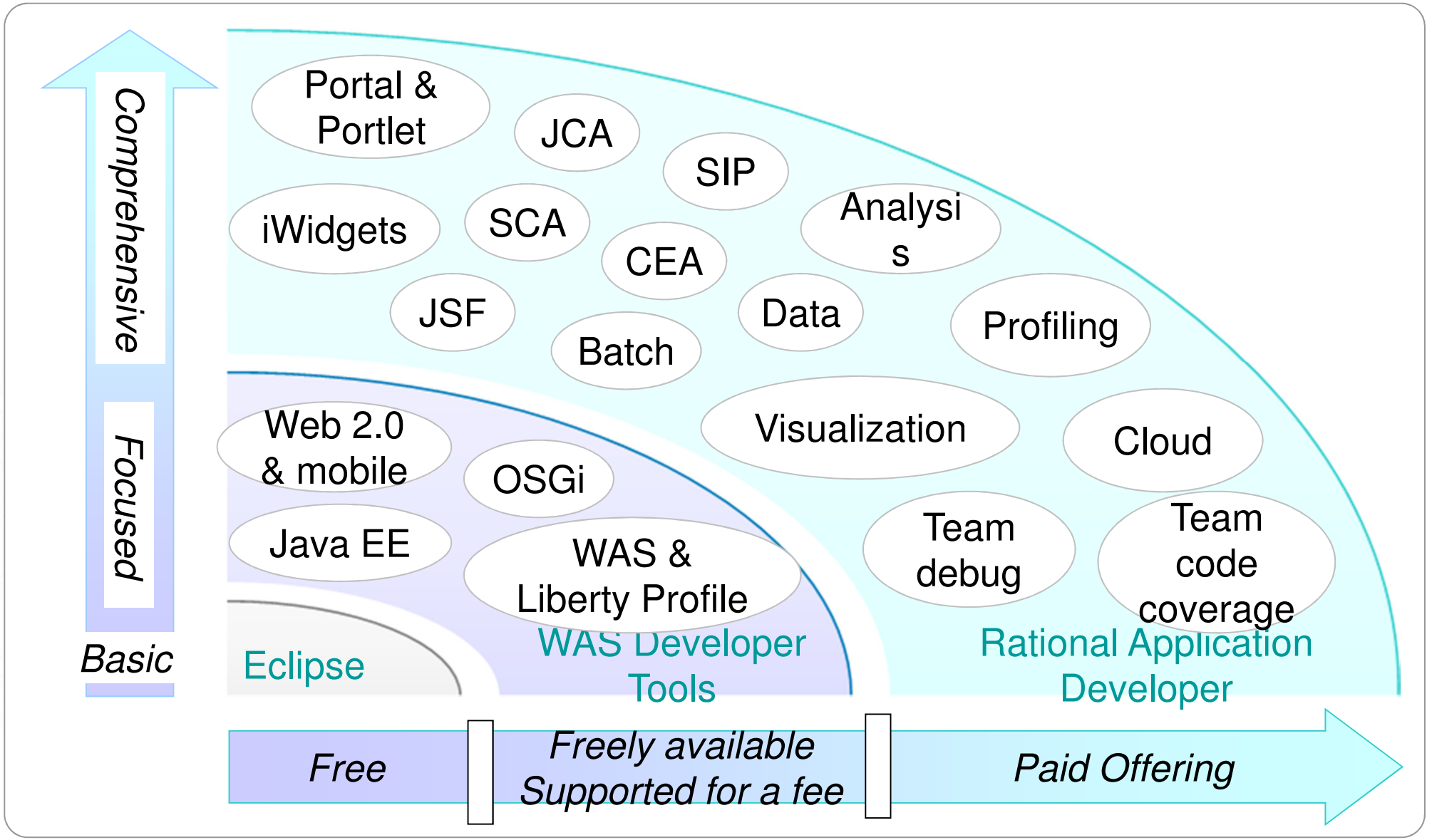
Rational Application Developer V8.5 and WAS Developer Tools v8.5



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Introducing the WAS Tools Edition Bundles

Team

Individual

WAS ND – Tools Edition

- Like “WAS – Tools Edition” but for WAS ND production use

WAS – Tools Edition

- Solution: Production WAS + unlimited tools (RAD or WAS Developer Tools)
- Terms (runtime): Production use
- Terms (tools): Unlimited use of tools for developing applications to be deployed on WAS included with this bundle.

WAS for Developers – Tools Edition for Eclipse

- Solution: WAS for Developers + WAS Developer Tools
- Terms: Single user. Development use only
- Freely available, supported for a fee
- Easily obtained for rapid development to WAS v7, v8, v8.5 and Liberty

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Tools for the Developer

- WebSphere Application Server Developer Tools for Eclipse (WDT)
- Rational Application Developer
- Worklight Studio
- Migration Toolkit
- Deployment

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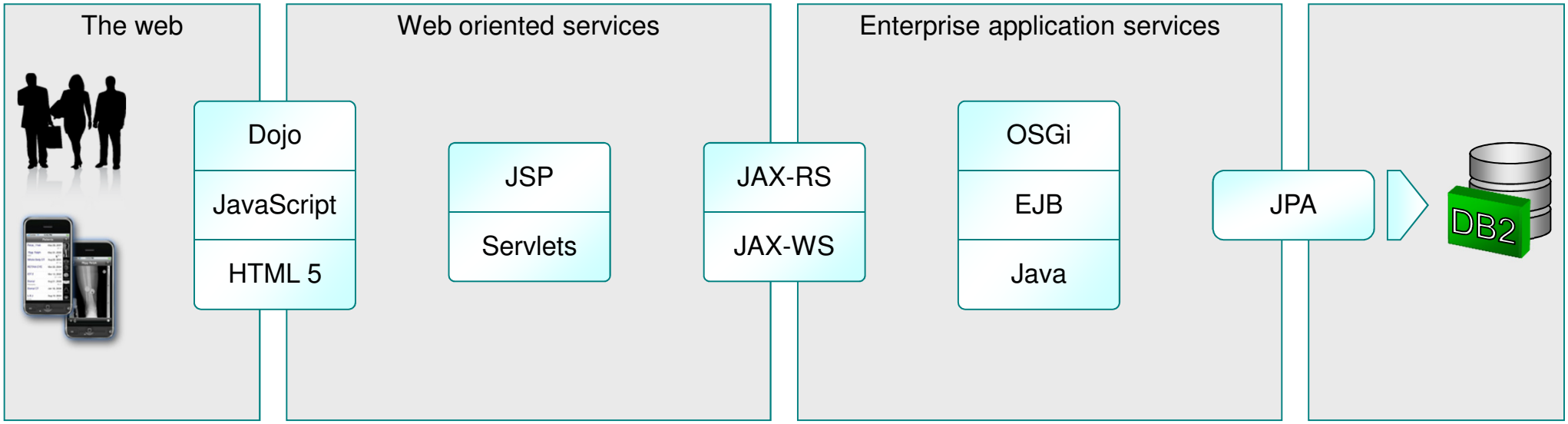
Unleash innovation with WDT 8.5

A cost effective IDE focused on web application and modern service development

Create & edit → Validate → Refine & refactor → Publish → Test → Debug

Design web, Java EE and OSGi applications with persistence



Available from the Eclipse Marketplace

WebSphere foundation

WebSphere. software

Web Application Development

- Modern culture expects a web that is fast, slick and runs anywhere
- Good news: Many technologies exist for building rich web apps
- Bad news: Many technologies exist for building rich web apps

The client side web	The server side web
• Dojo mobile • Dojo • JavaScript • HTML & CSS	• Portal and Portlet • JSF, JSP and Servlets • JAX-RS for REST services

Web and Mobile Development Made Efficient

CSS3 JavaScript

Portlet

Client-side Web

Server-side Web

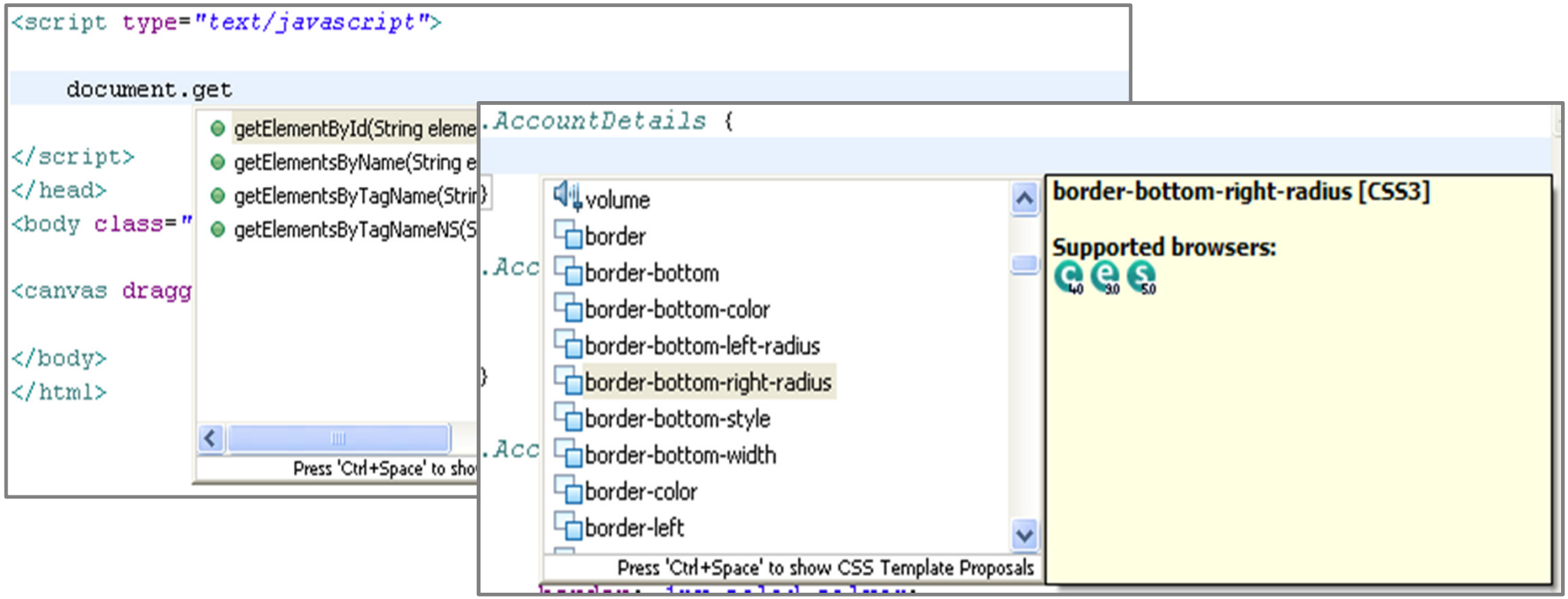
Source coding

Visual UI Construction

Server Deployment and Testing

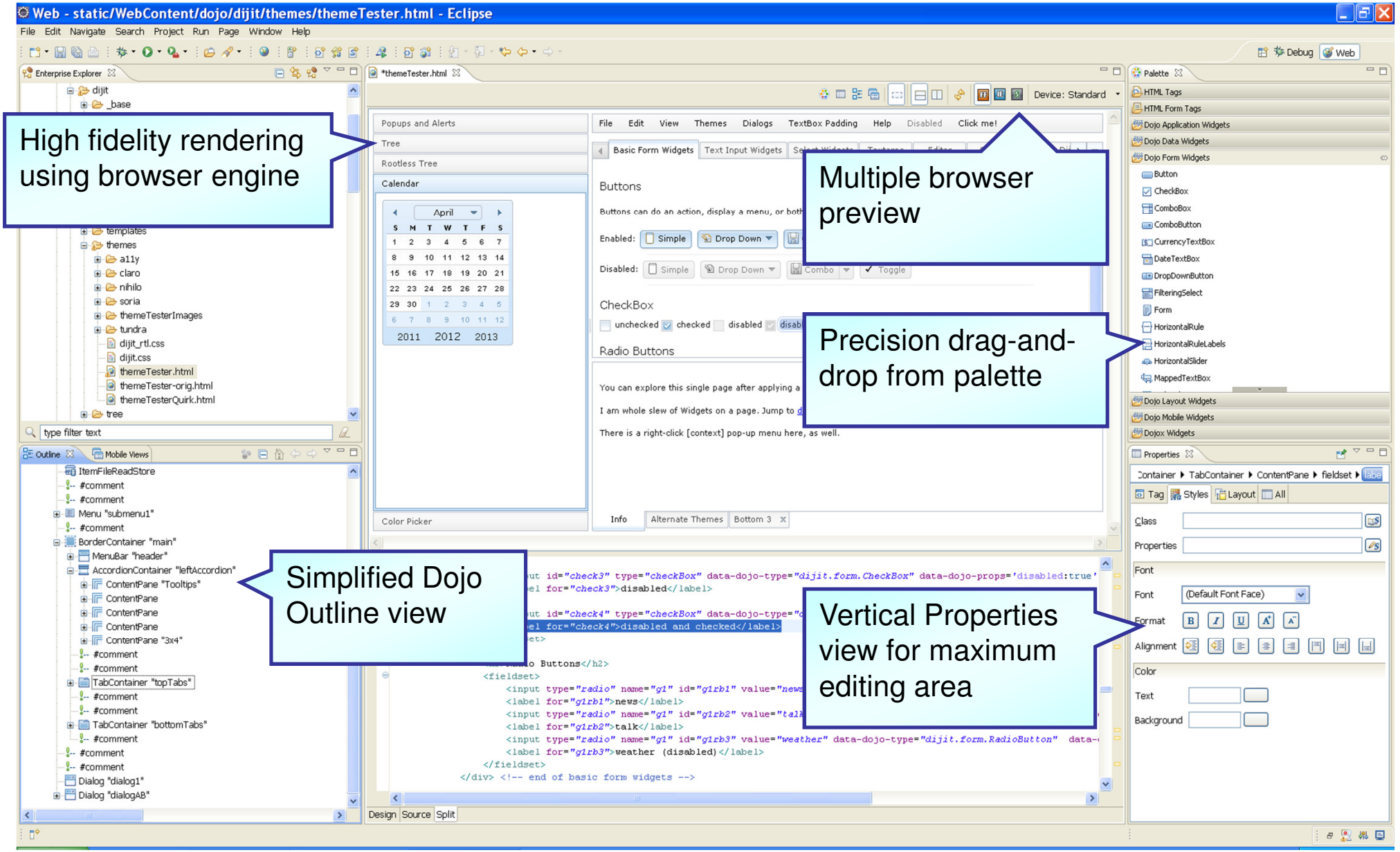
Source editing tools

	HTML5	JavaScript	Dojo	CSS3	JSON
Code Assist	✓	✓	✓	✓	✓
Validation	✓	✓	✓	✓	✓
Outline	✓	✓	✓	✓	✓



WebSphere. software

Introducing the new Rich Page Editor



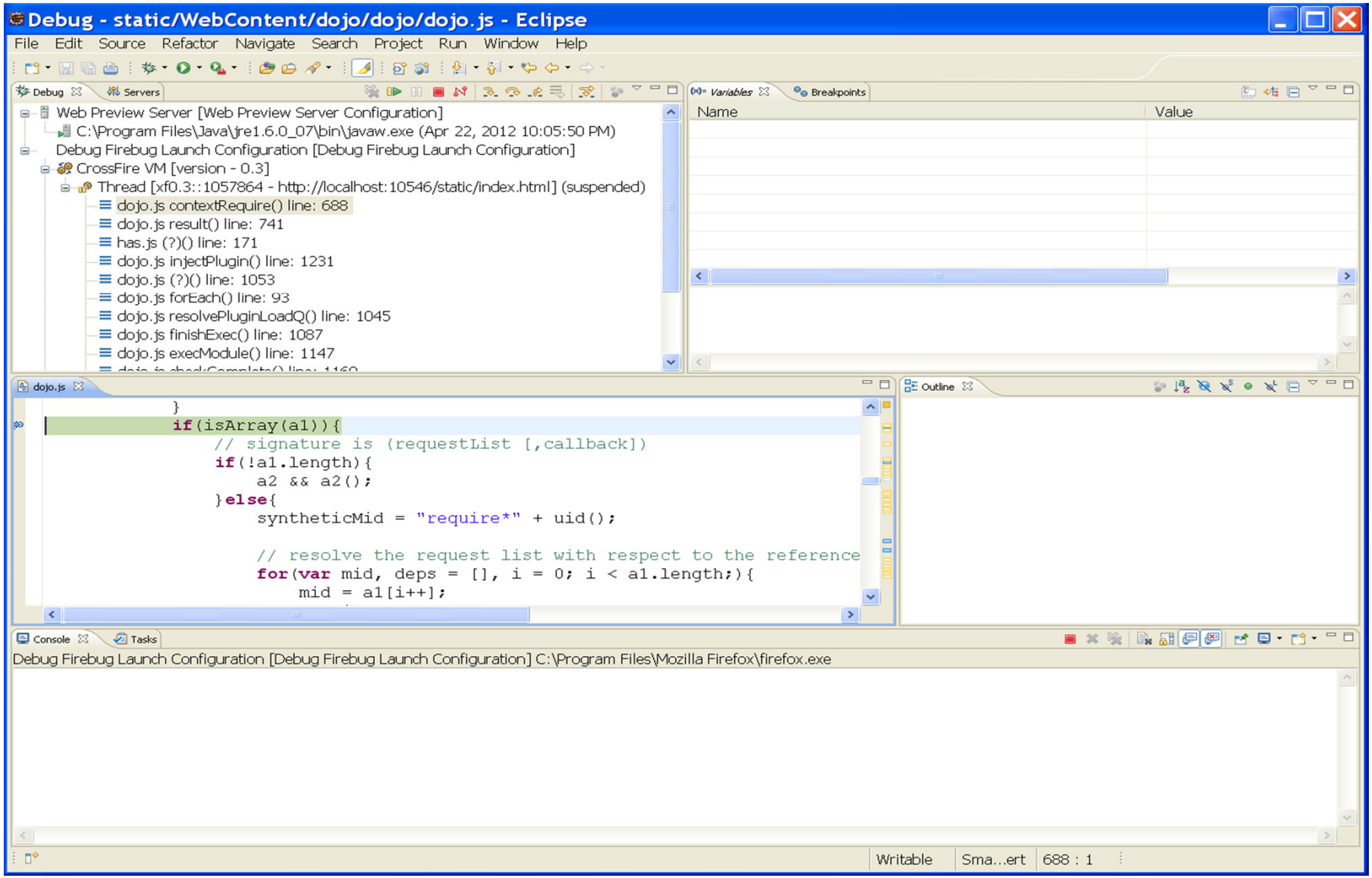
WebSphere. software

Building and Deploying Dojo Applications

IBM

- Where's my Dojo?
  - In the project that needs it, or
  - In a shared project, or
  - Remote, on a CDN
- Dojo custom build tool
  - Based on the Dojo profile builder
  - Consolidates loose Dojo modules
  - Minifies JavaScript and CSS
- Dojo Objective Harness (DOH!)
  - "JUnit for Dojo"
  - Part of Dojo Toolkit
  - Generate, run, and manage tests
- Web Preview Server
  - Fast and Lightweight!
    - Based on Liberty Profile
    - Starts up: < 5s
    - Deploys: < 5s
    - Stops: <1s
  - Static and dynamic web content
  - Built-in Ajax proxy
  - Built-in JAX-RS

Remote web code debugging
(*with desktop browser inside the workbench)*



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Mobile Application Development

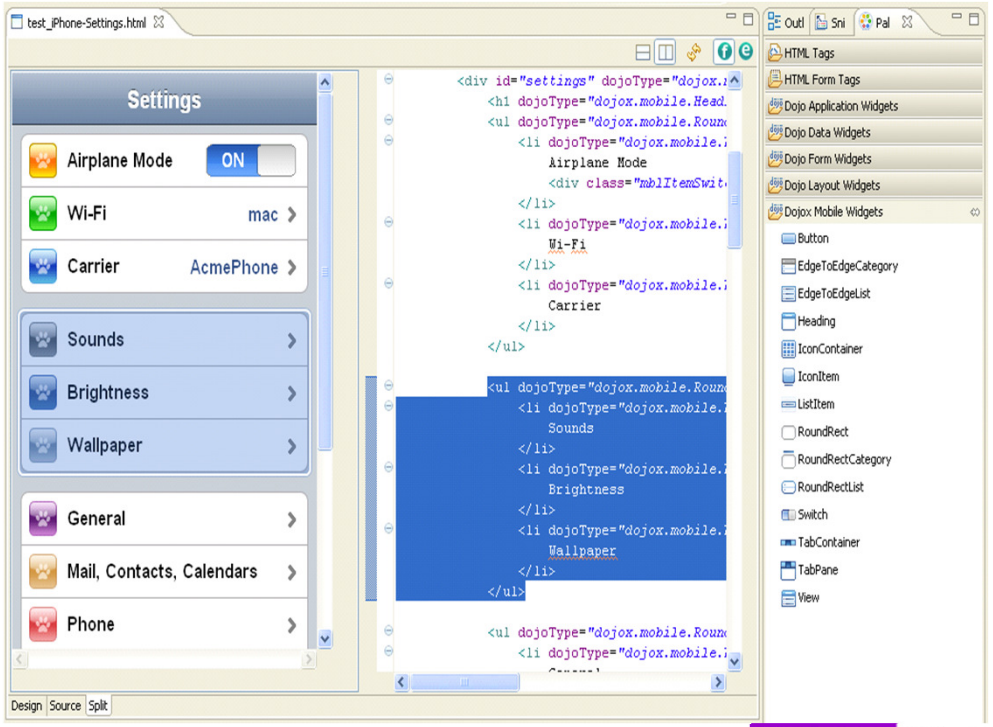
Worklight takes WAS mobile web applications to the next level

WAS	WAS + Web 2.0 and Mobile Toolkit	Worklight
Enterprise Web Applications • Java EE programming • Build, deploy and manage Enterprise applications and services • Server-side & Client-side development	**Mobile Web App development based on standard web technologies:** • Run application in mobile browser • Based on HTML5, CSS3, JavaScript • Native look and feel • Advanced mobile UI components **Feature Pack for WAS v6.1/7/8** **Toolkit in WAS v8.5**	**Application delivery in a variety of forms:** • Hybrid application • Native • Install through App Store • Access to native services
Desktop Web Applications	**Mobile Web Applications**	**Mobile Applications**

Taking your Business on the Road

Mobile web application development

- Competitive, compelling web access to your business from anywhere is becoming crucial. How do you develop and maintain an app once that runs well and looks good across desktops, tablets and smart phones?
- The RAD / WDT mobile web development tools
- A natural extension of the Web development tools
- Based on the Dojo mobile library (dojox.mobile)
- Rich Page Editor loaded device form factors



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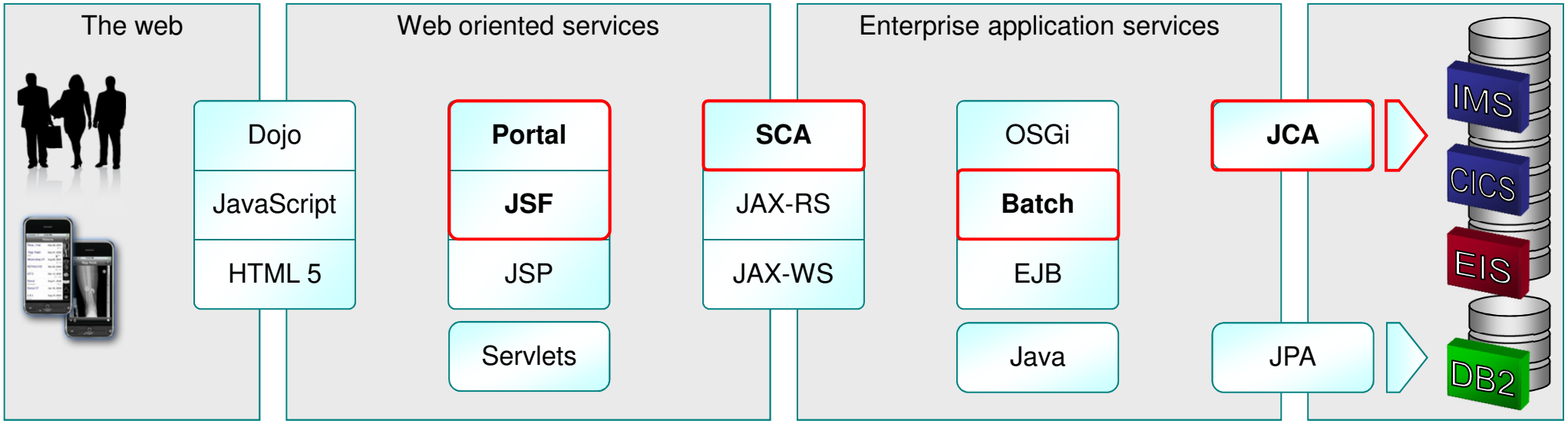
Enterprise Application Development with RAD

2012 Evans Data
IDE Users Choice Award
6 years in a row!

Optimize *team development of robust, high quality, enterprise integrated applications*

Create & edit → **Visualize** → Validate → Refine & refactor → **Analyze** → Publish → Test → Debug → **Profile**

Integrate *the enterprise to the social web using state of the art technology*



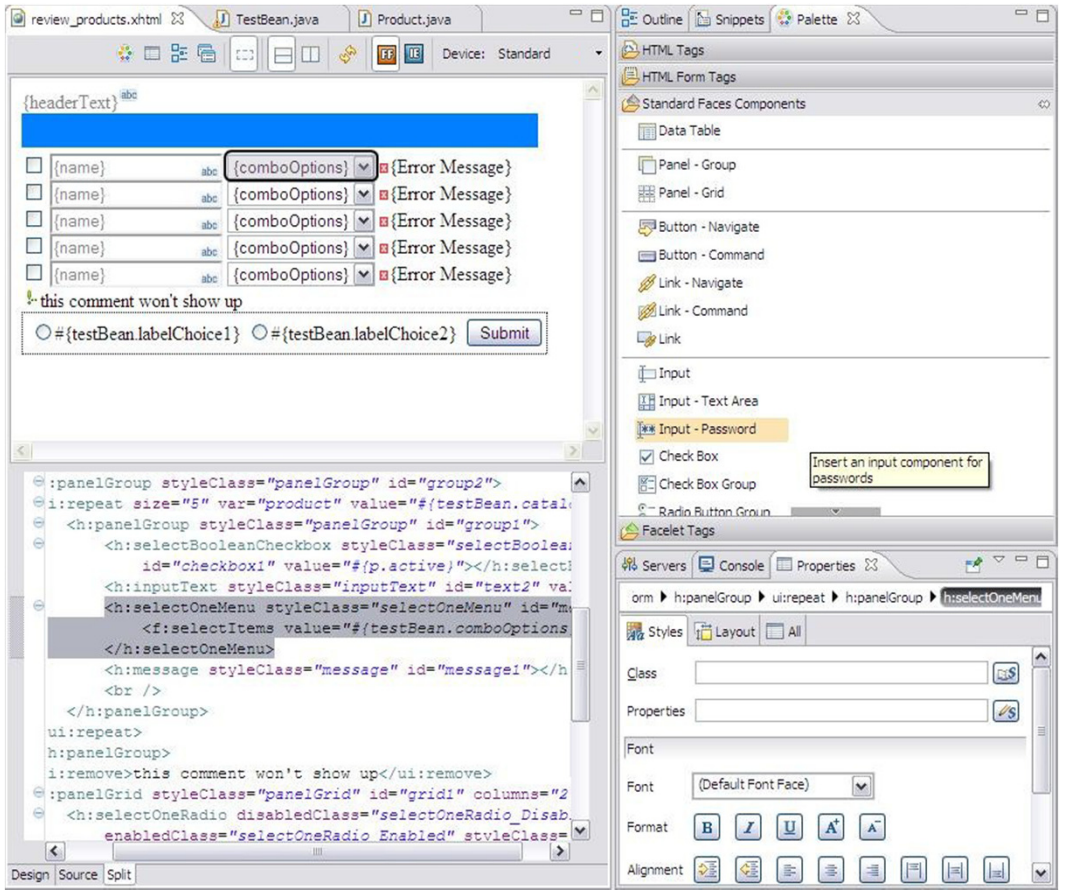
Collaborate *with agility, exploiting modern infrastructure and the Cloud*

Collaborative Lifecycle Management | WebSphere foundation | **Public and Private Clouds**

WebSphere. software

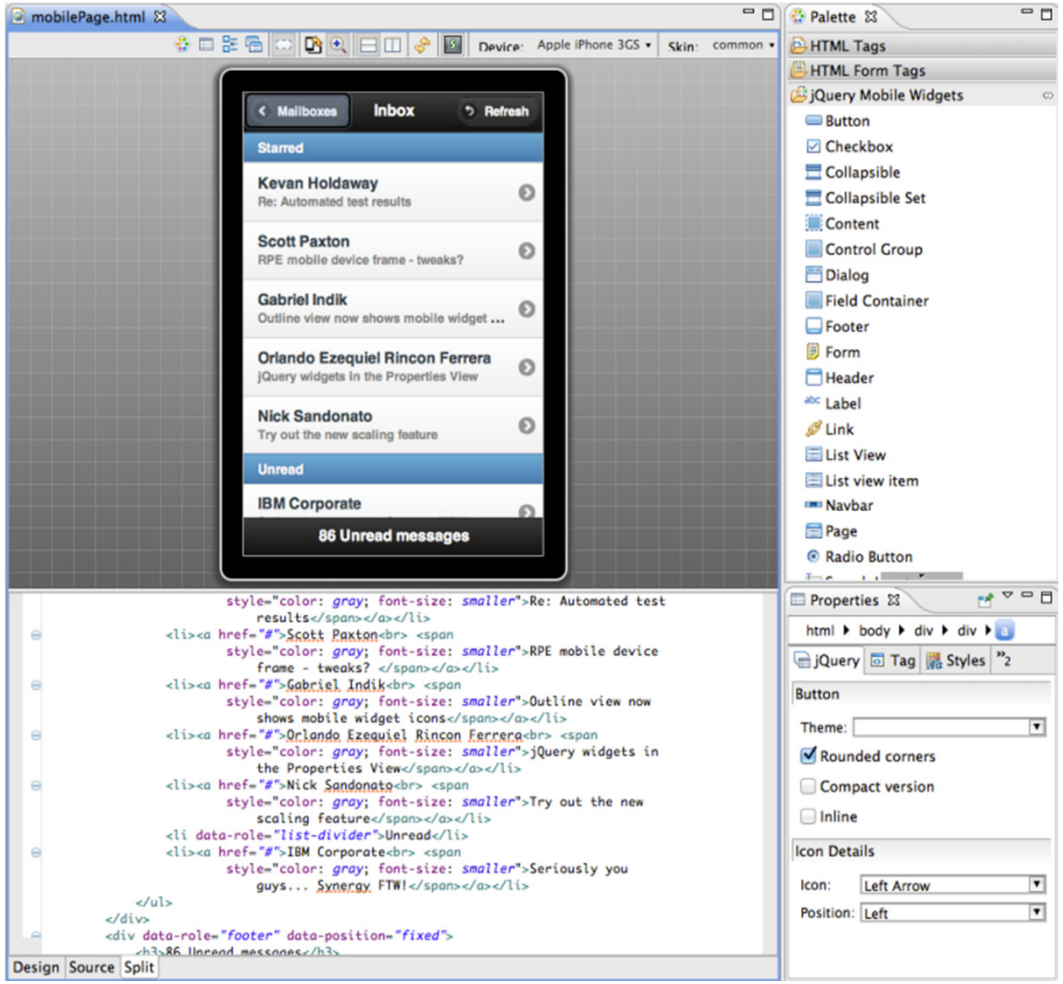
JSF - JavaServer Faces Tools

- Supports JSF 1.2 and Facelets with JSF 2.0
- Easily build custom components
- Any component can be configured to initiate Ajax requests
- JSF Trace tools aids in
- understanding and debugging
- Rich Page Editor support for JSF 2.0



What's New in RAD 8.5.1

- Development support for jQuery
  - Content assist on jQuery
  - RPE integration of jQuery mobile



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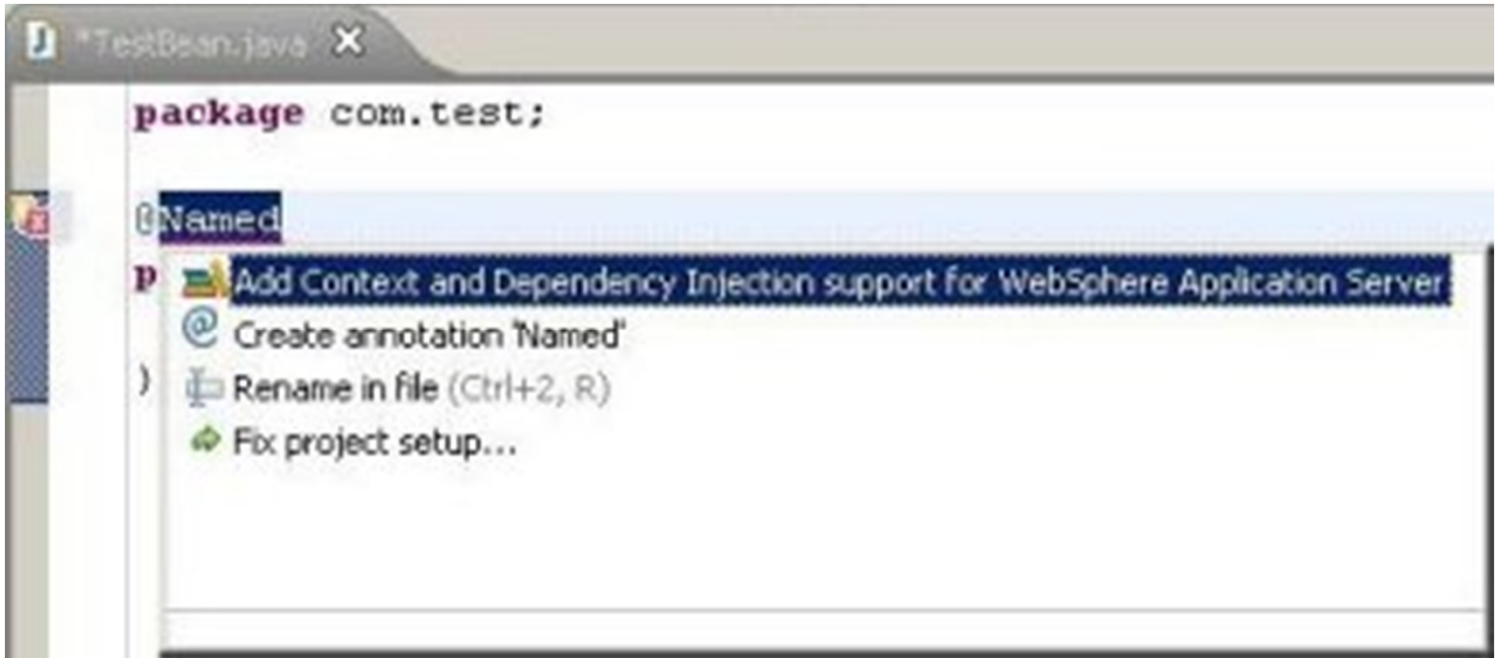
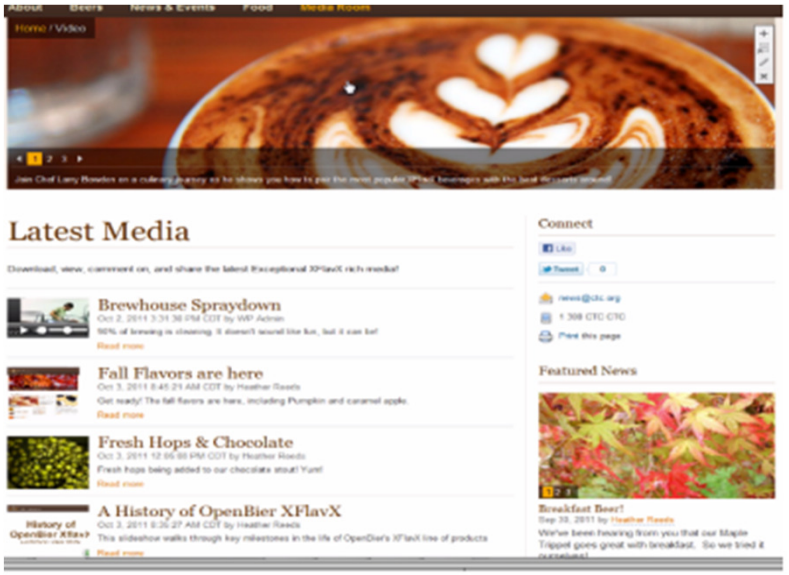
What's New in RAD 8.5.1

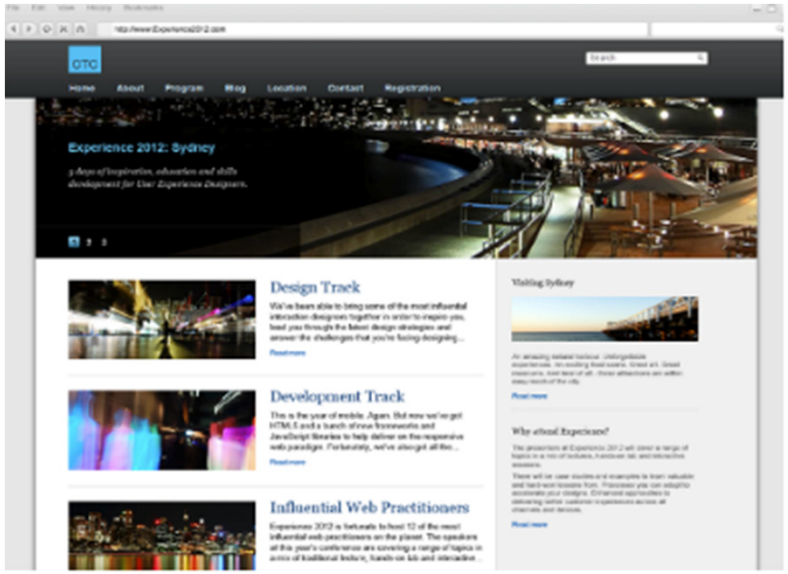
- Maven integration
  - Integration with m2e, easier project configuration
- Contexts and Dependency Injection (CDI) support



Portals and Portlets

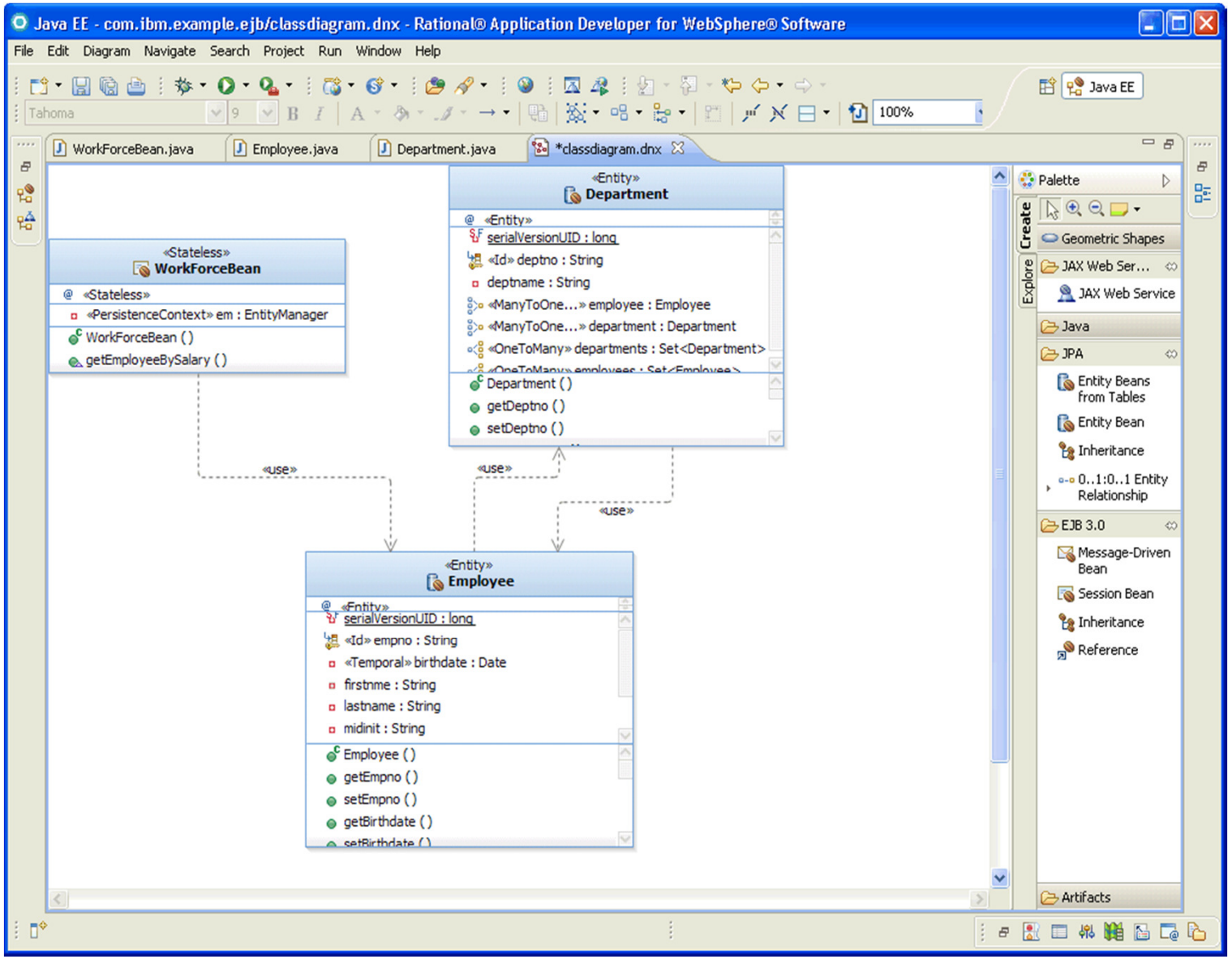
- New Tools for building an exceptional web experience
- Enable Ajax, JAX-RS, Dojo, analytics and more at a single click
- High-fidelity editing with the Rich Page Editor
- Smooth and seamless integration of JSF 2.0 content
- Latest platform: WebSphere Portal V8.0





Visualizing code with UML

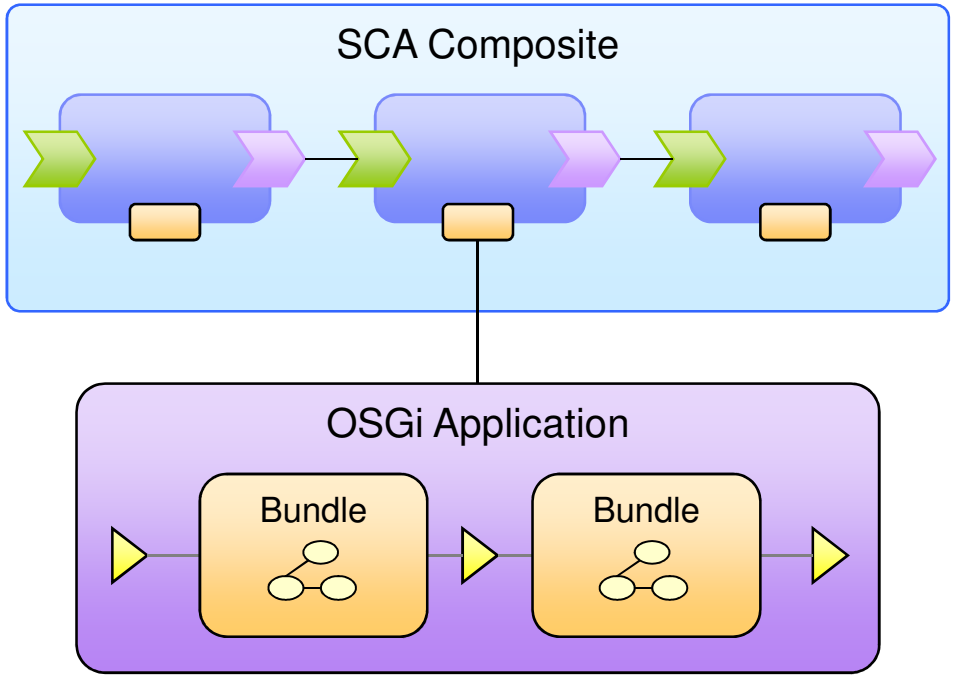
- How can I possibly understand this code I just inherited?
- Visualize classes, beans and web services with class, sequence and topic diagrams

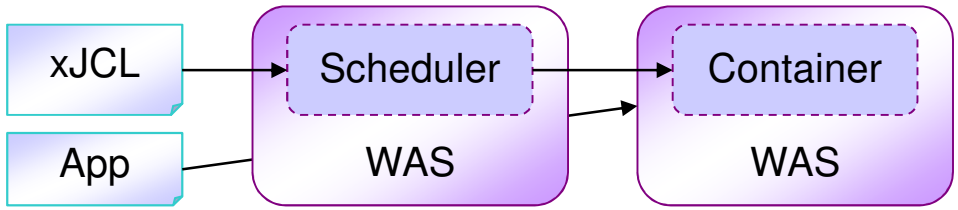


WebSphere. software

The Right Framework for the Right Job

- SCA
  - Heterogeneous SOA programming model
  - Java, OSGi, Spring, EAR, Widget impls
  - WS, EJB, JMS, HTTP, Atom bindings
- OSGi
  - Bundles of Java, JPA, EJB, JSF, JAX-RS
  - Blueprint services for fine grained SOA
- Java EE
  - EJB – JPA – JAX-WS – JAX-RS – JCA
  - Refined deployment assembly management
- Modern Batch
  - For compute or data intensive work



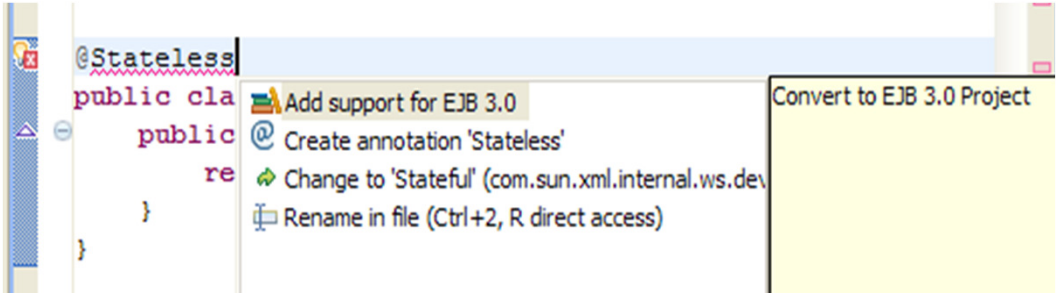


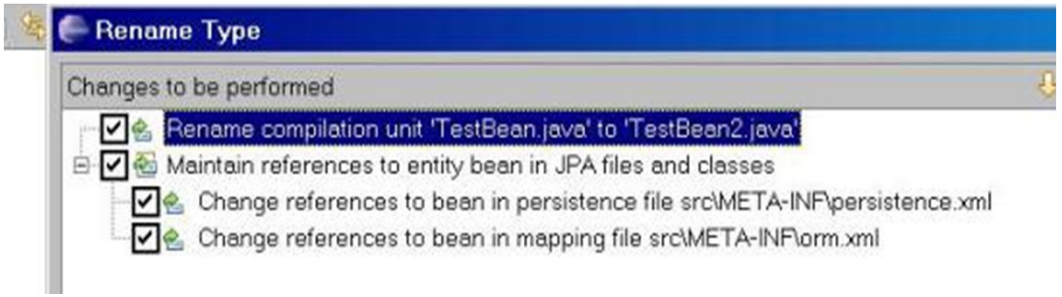
Features of Java EE 6 Include…

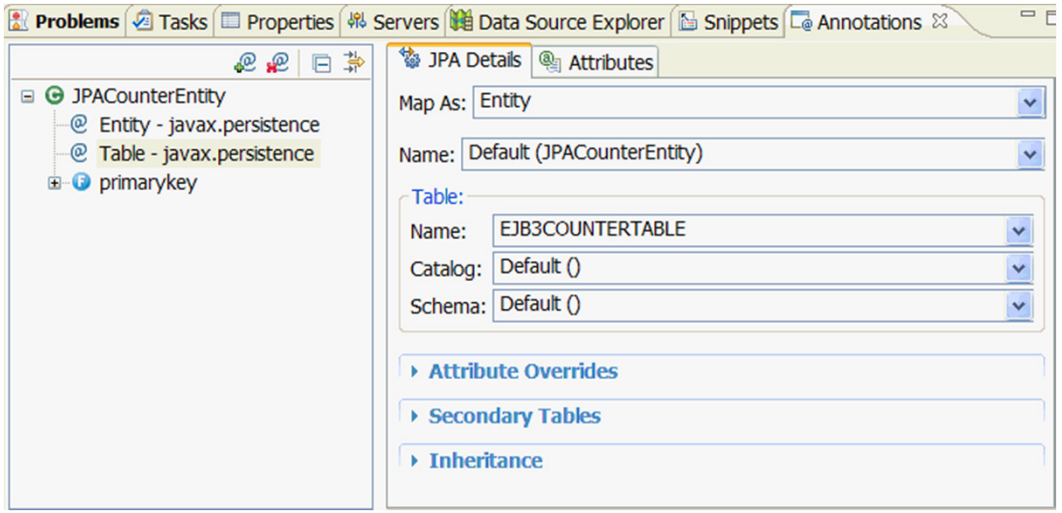
- Enterprise JavaBeans (EJB) 3.1
  - Timer and async enhancements
  - Ability to test outside of WAS
- Java Persistence API (JPA) 2.0
  - Improved locking and mapping
  - Improved query construction
  - Dynamic type-safe query building
- Java Servlet 3.0
  - Annotations
  - Easier integration with third party presentation frameworks
- JavaServer Faces (JSF) 2.0
  - Annotations; Facelets; Ajax
- Java API for RESTful Web Services (JAX-RS) 1.1
  - The service side of web 2.0
- Java Architecture for XML Binding (JAXB) 2.2
  - Default marshalling optimizations
- Enterprise Web Services 1.3
  - Better integration and reuse
- Java API for XML-Based Web Services (JAX-WS) 2.2
  - Productivity and security enhancements

Java EE 6 Development Made Intuitive

- Java EE navigation, content assist, validation and quick fixes keep you on track
- Keep cohesion throughout iterative development with the help of refactoring tools
- Use the annotations view to understand what all those annotations really do
- Organize enterprise modules with greater flexibility, leading to greater reuse and efficiency at run-time

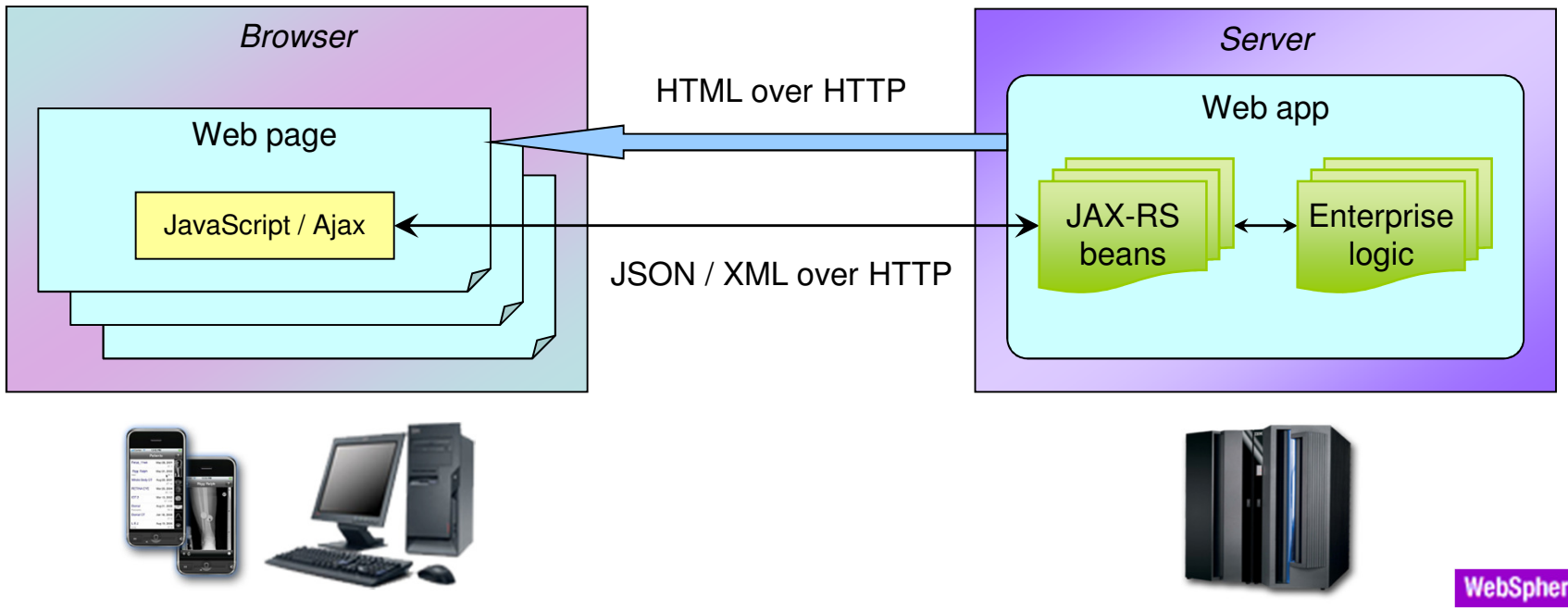






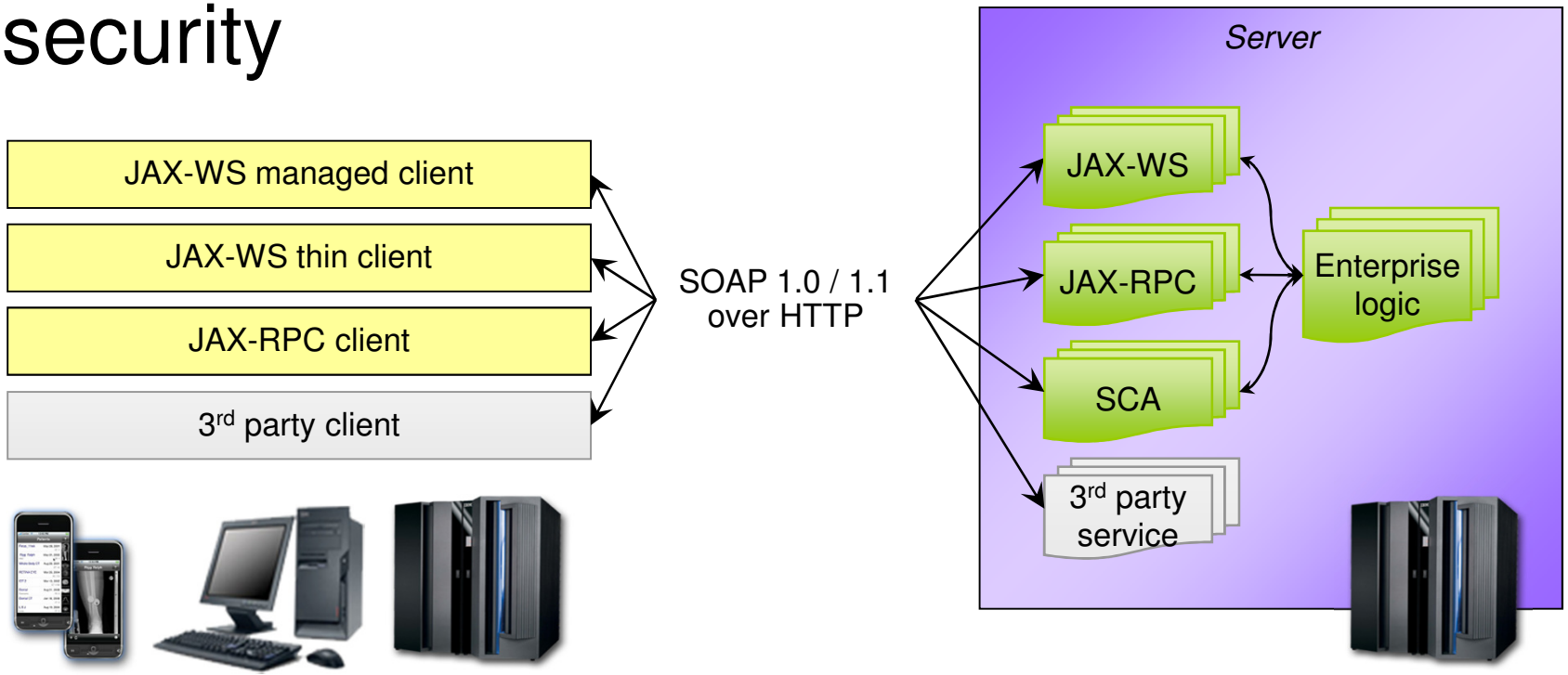
Java EE REST Services (JAX-RS)

- Supported by WAS V6.1, V7, V8 and V8.5 (Full and Liberty Profiles)
- Includes JAX-RS 1.1 library providers for the target run-times
- Easily enabled with the REST template in the Web Project Wizard
- Easily integrated with Dojo (or other JavaScript) Ajax applications



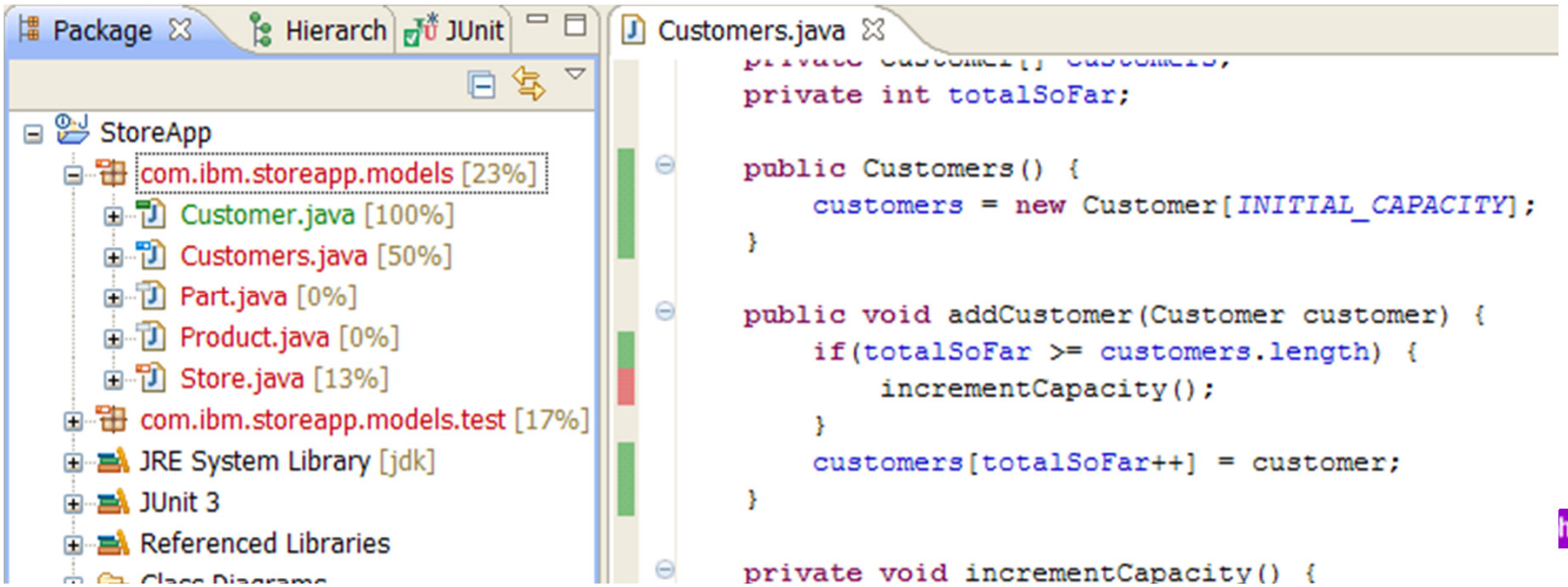
Java EE Web Services (JAX-WS)

- Supported on WAS V6.1, V7, V8 and V8.5 (Full Profile, JDK 6 or 7)
- Support for service, managed client and thin client development
- Support for transport and message level security



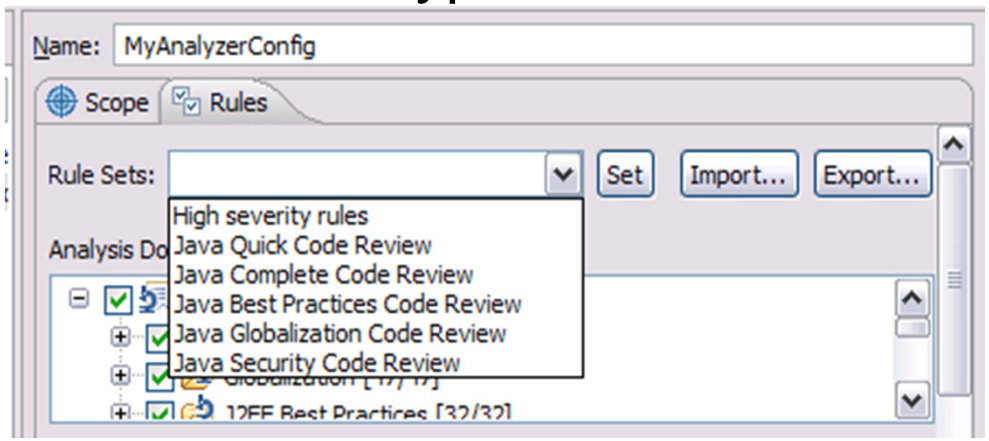
Dynamic code coverage

- Get detailed information on code paths traversed – or not – during program execution
- As users interact with a web app, the user will see coverage statistics get dynamically updated as they run through certain scenarios (instead of waiting for user's app to complete).
- Powerful tool to help determine xUnit test coverage, potential dead code
- Command line and Ant capability for build integration
  - JUnit, code coverage data collection and html report generation



Code quality assurance

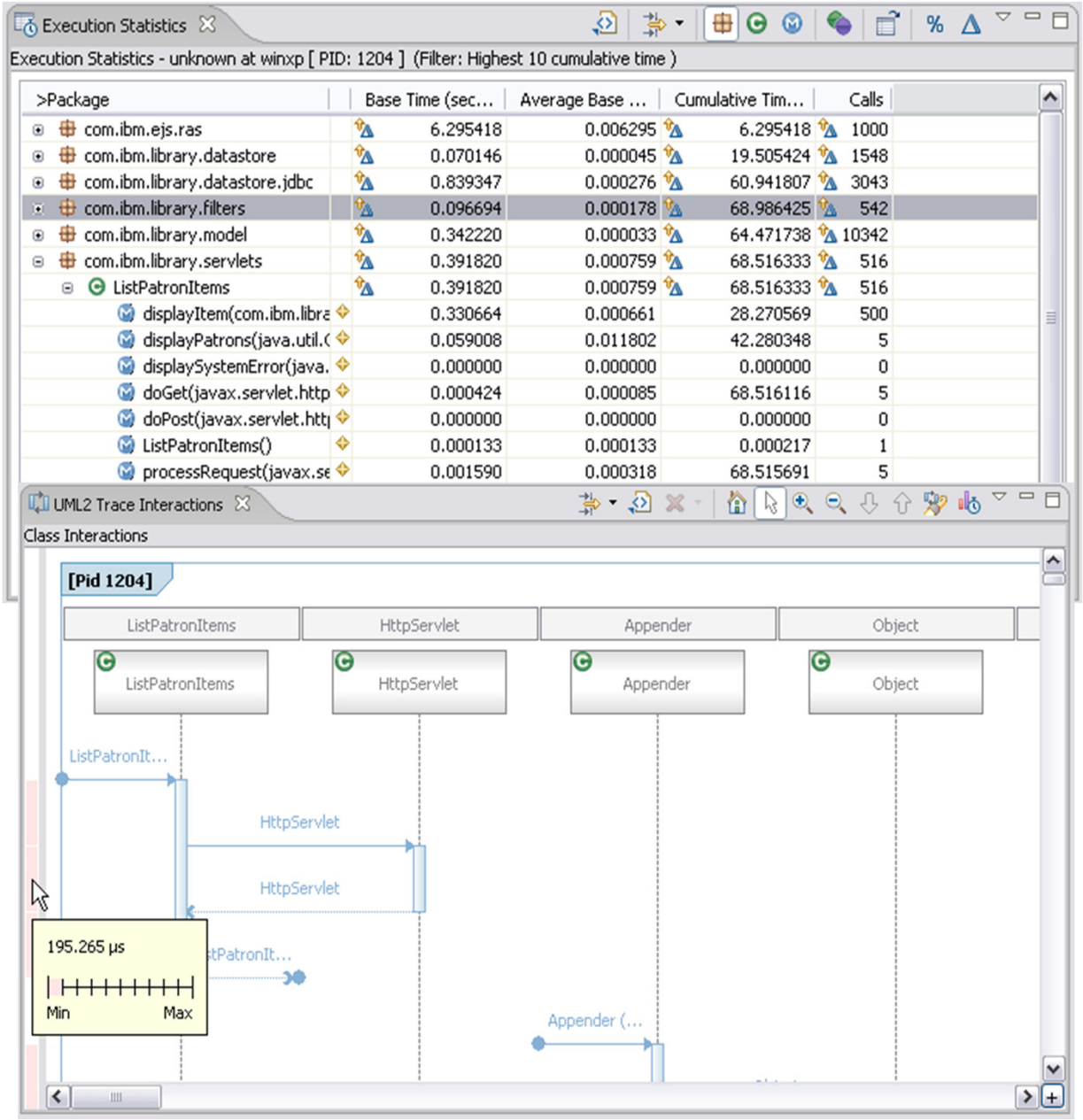
- Java Code Review to find problems of various types:
  - Design Principles
  - Globalization
  - J2EE & J2SE Best Practices
  - J2EE & J2SE Security
  - Naming
  - Performance
  - Private API



- Rich integrated results view where you can click to source code
  - Explanations, examples, and quick fixes for problems
- Allow users to create, enable and disable validation rules
- Allow users to create their own rules based on rule templates
- Produce HTML/PDF reports with violations and metrics
- Complete Java Code Review (200+ rules)

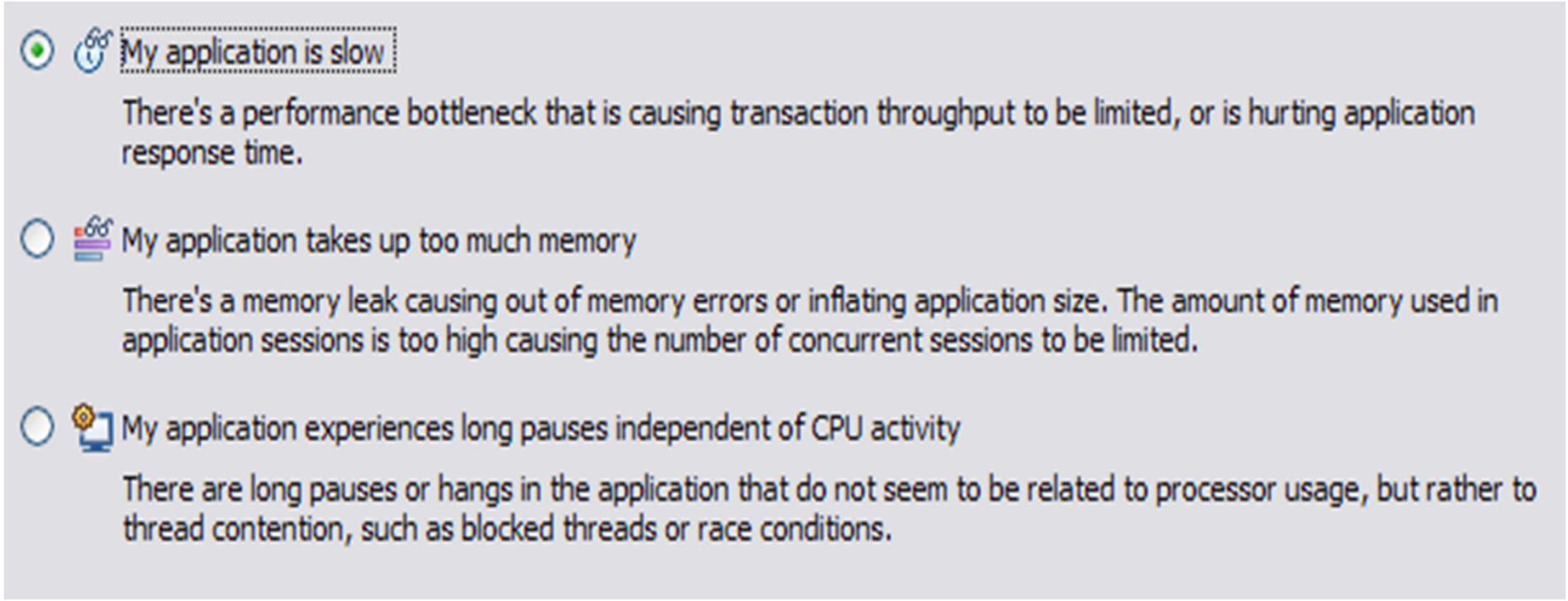
Performance and memory diagnosis

- Analyze
  - Tables and graph views to analyze profiling data
  - Tune Java code to address performance & memory issues
  - Timing
  - Memory usage statistics
  - Live heap instance data
- Launch WAS in Profile Mode
  - Execution time
  - Memory usage
  - Threads
- Profiling Quick Start wizard guides you thru common profiling scenarios and configures initial settings appropriately.
- Heap instance data round-tripping
- Probekit – Write your own probes



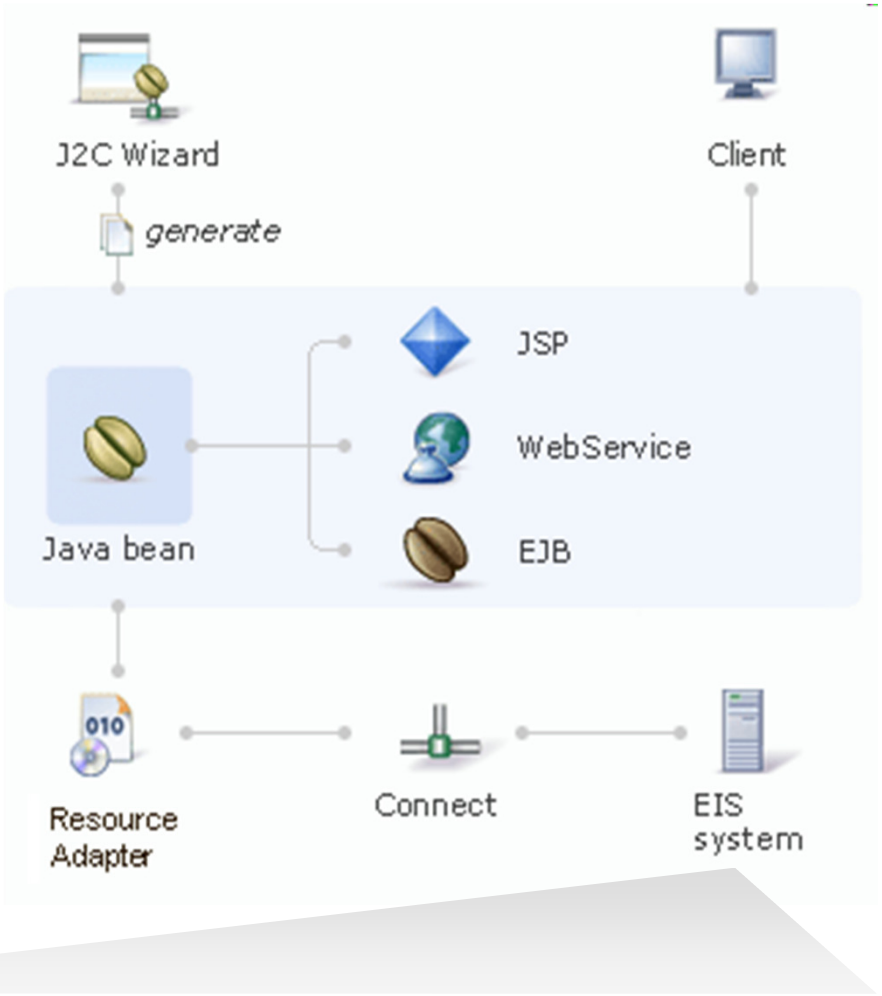
Profiling Quick Start Settings Wizard

- Guided, scenario based approach to resolving performance issues
- Helps configure profiling options to get started faster



Java EE – JCA
aka. J2C

- RAD can help integrate your enterprise information systems into web and other modern applications by its J2C wizard (see diagram)



- CICS/IMS
  - Languages - COBOL, C, MFS, PL/I
  - Record/playback generation of connection and data beans
- CICS
  - Development use only CICS Transaction Gateway included
  - JCA 1.6 for CICS 8.1

Siebel | SAP | Oracle E-Business Suite | IMS

PeopleSoft Enterprise | JD Edwards | CICS ECI

WebSphere. software

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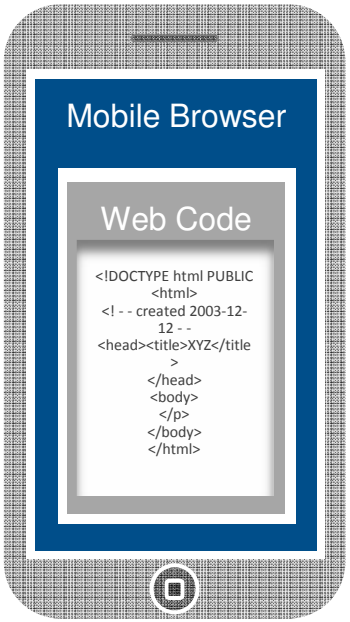
Worklight Application Types

Browser Access

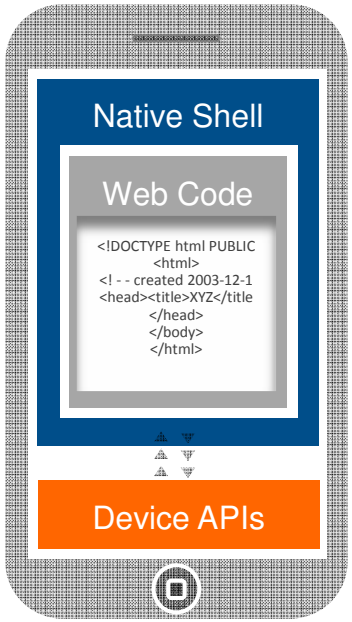
Written in HTML5 JavaScript and CSS3. Quick and cheap to develop, but less powerful than native.



Browser Access

Hybrid Apps - Web

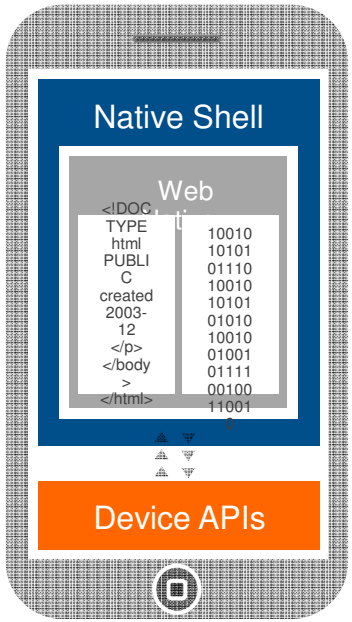
HTML5 code and Worklight runtime libraries packaged within the app and executed in a native shell.



Downloadable

Hybrid Apps - Mixed

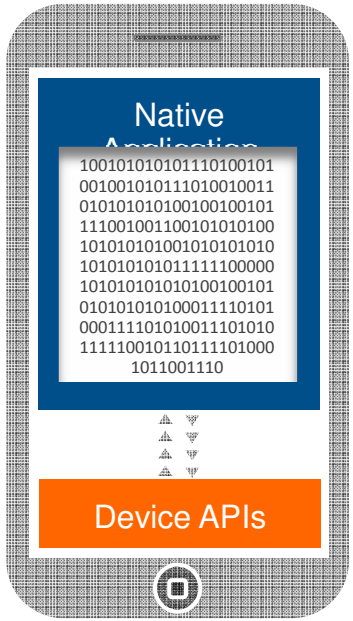
User augments web code with native language for unique needs and maximized user experience.



Downloadable

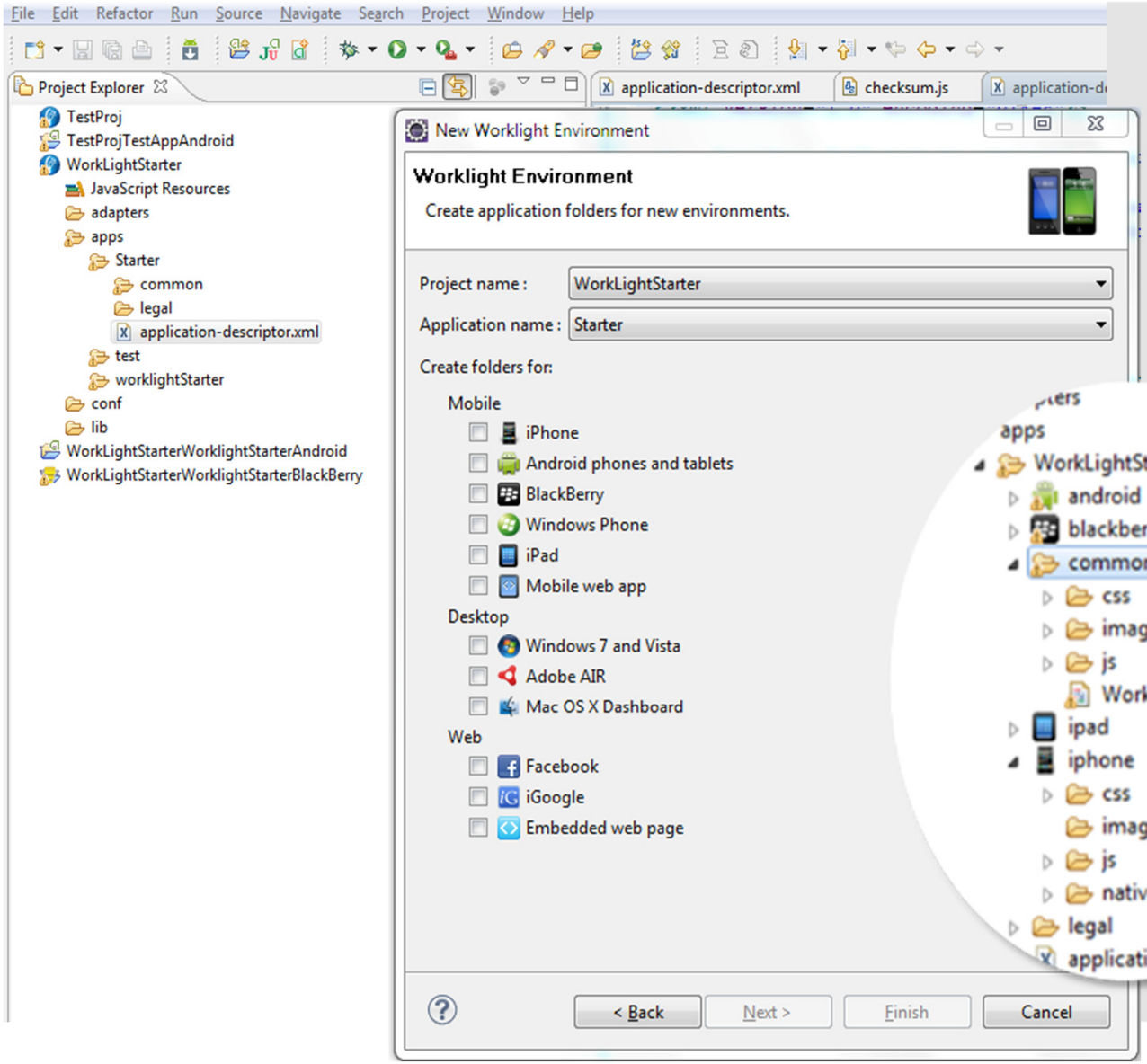
Native Apps

Platform-specific. Requires unique expertise, pricy and long to develop. Can deliver higher user experience.



Downloadable

Common web codebase facilitates reuse



Common code placed in primary file

Environment optimization code is maintained separately

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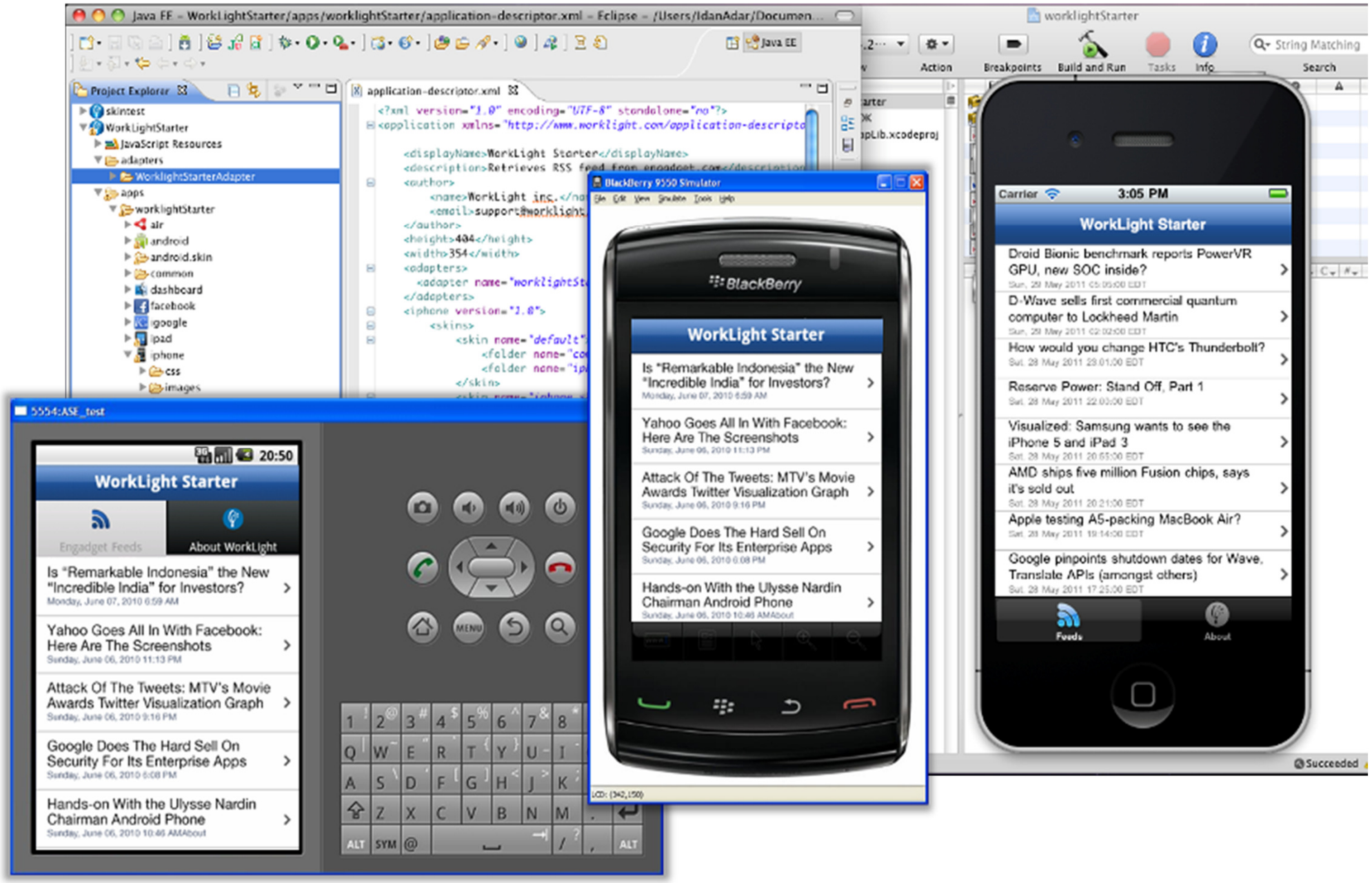
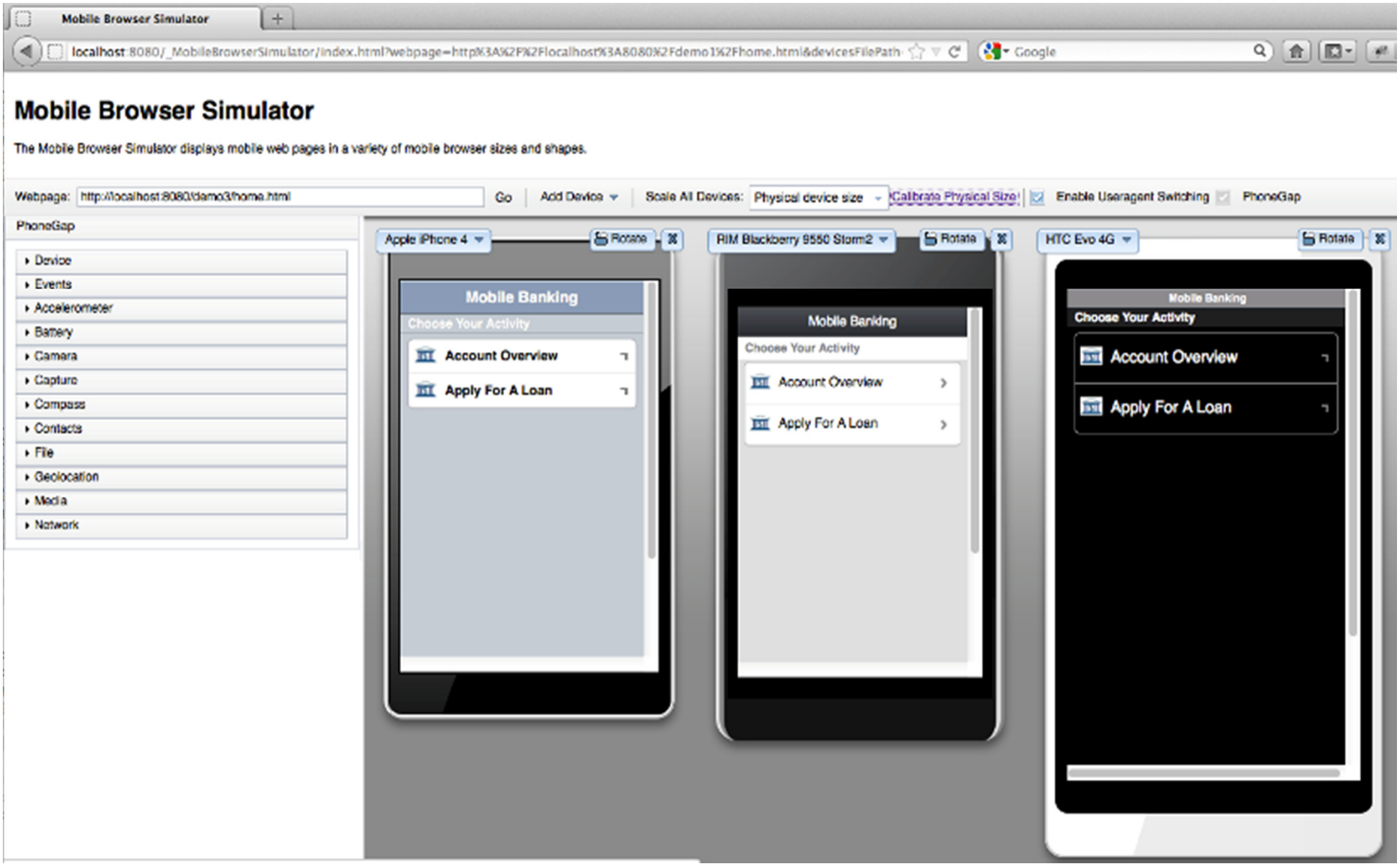
Incorporated Device SDKs and Emulators



WebSphere. software

Preview in browser



Perform device specific tests in the Mobile Browser Simulator: supports PhoneGap and Worklight client API

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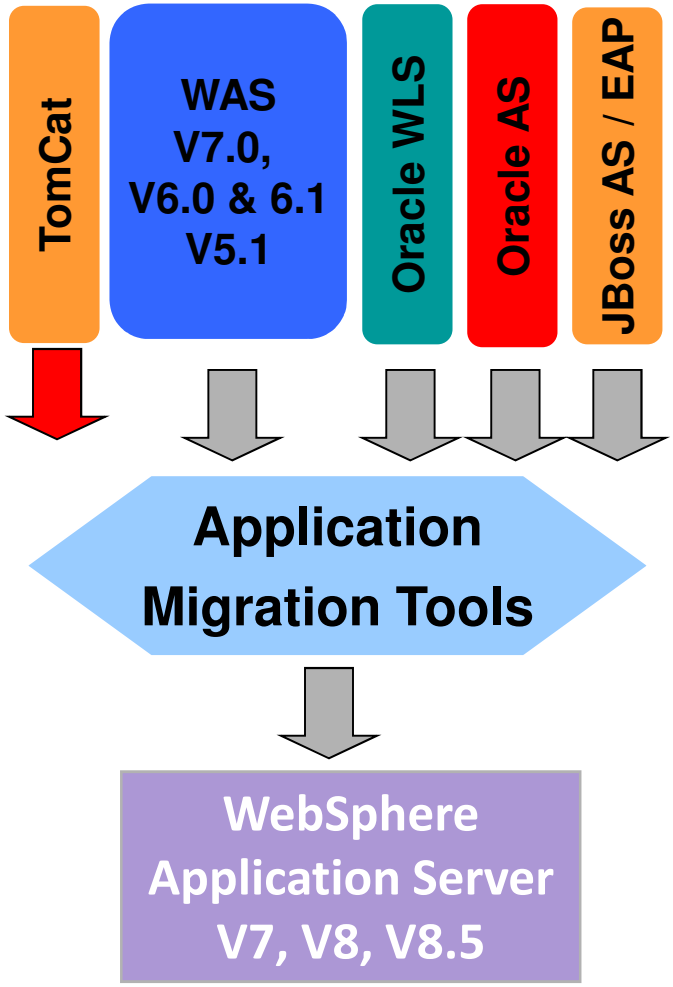
Application Migration Tools

New!

Migrate applications from WebSphere & other Java EE application servers to WebSphere faster with minimized risk

- **Support for Tomcat migration to WAS v8.5**
- Migrate applications from older releases to WAS V8 or V7
- Migrate from Oracle or JBoss faster and easier to WAS V8.5 Beta, V8 or V7
  - Migrate applications up to 2x as fast
  - Migrate web services up to 3x as fast
- Application Migration Tool
  - Analyzes source code to find potential migration problems:
    - Removed & deprecated features
    - Behavior changes
    - JRE 5 & JRE 6 differences
    - Java EE specification changes or enforcements
  - Capable of making some application changes
  - Provides guidance on how to make required changes
  - ✓ Works with Eclipse, WebSphere Developer Tools (WDT) or Rational Application Developer (RAD)



Get the Tool at No Charge: http://ibm.co/hqfkdj

✓ - Tools support available in RAD

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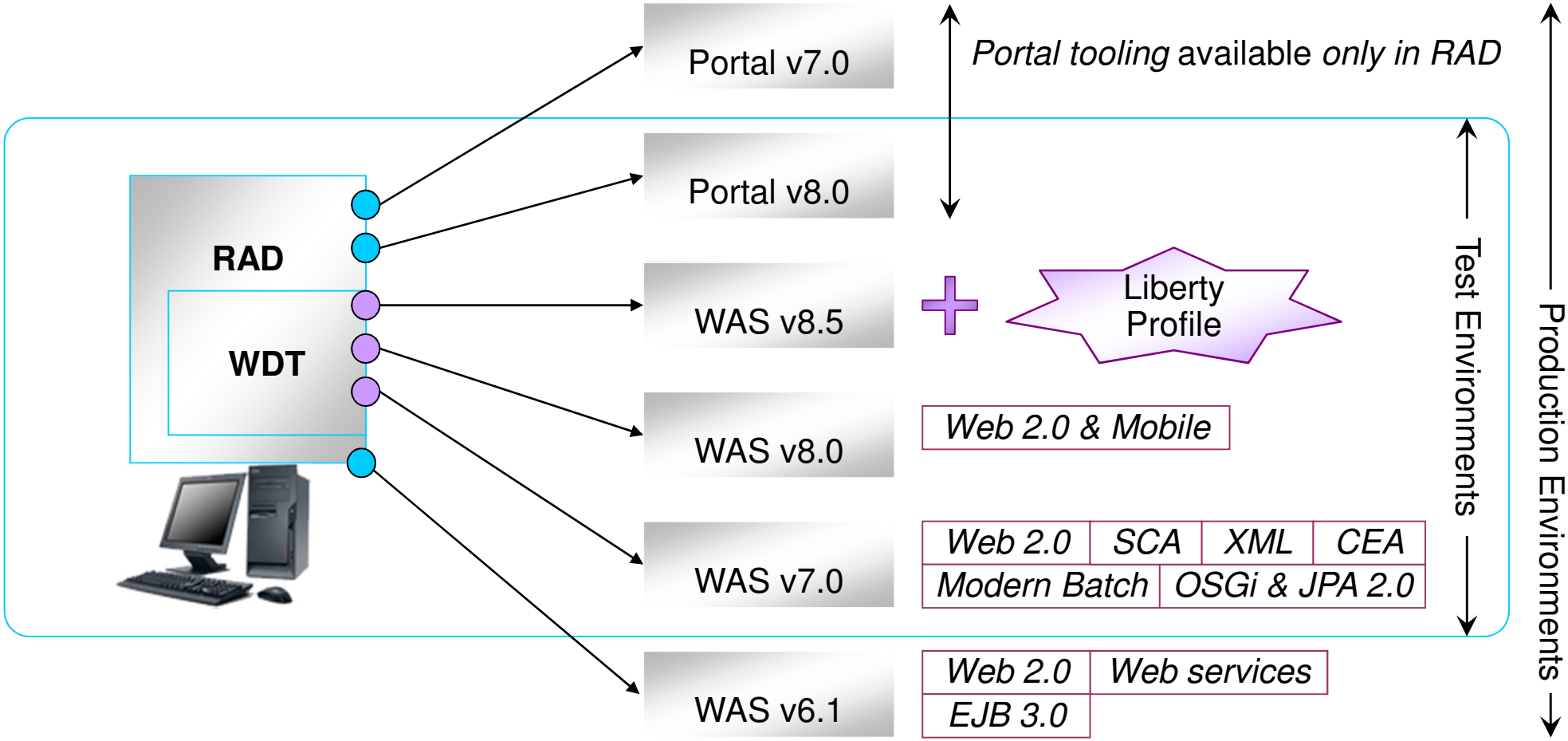
Deployment to WebSphere Application Server



- Remote deployment to all servers (except Liberty)
  - Web Preview server for Web apps
    - Universal Test Client

WebSphere. software

Backup

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FEATURED

WebSphere Application Server V8.5 Announced

Liberty Profile running on a Raspberry Pi - now with MQTT to control a house!

New and Noteworthy in the Rational Application Developer V8.5 Beta March Refresh

What's new on WASdev

WebSphere Application Server V8.5 Announced

This is an exciting day in WebSphere Application Server (WAS) history. Today, IBM officially announced a new developer friendly light-weight web app server called WAS V8.5 - Liberty Profile and a set of WAS ND enhancements that reset the bar on app server resiliency for mission critical applications. Read more...

The Liberty Profile, MQTT and RSMB running on the Raspberry Pi to control a house 50 miles away!

In this video, we see The liberty profile running a web front end which interfaces with Really Small Message Broker (RSMB) to ultimately monitor and control devices that are 50 miles away on the Isle of Wight! Read more...

Three Steps to Liberty

Follow these three steps to run your first web application on IBM® WebSphere Application Server V8.5 Liberty Profile Beta. Read more

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WebSphere. software

Tools for the Developer Desktop

RAD

Install: IM

WebSphere Integration
- Support for WAS v6.1
- Test Environments for WAS v7.0, v8.0, v8.5
- Portal Tools / Portal Svr supt
- Profile applications on WAS
- Deploy to WebSphere or Portal instances in IBM SBDT cloud
- IWD 3.1, 3.0

Problem Determination
- Code visualization - class, sequence and topic diagrams
- Static analysis (code review)
- Code coverage: optimize unit testing
- Profiling

Enterprise Connectivity
- J2C (EIS) tools
- CICS, and IMS Adapters
- Adapters for SAP, Siebel, JDE, Oracle, PeopleSoft

Team Productivity
- RTC integration
- Collaborative debug
- Collaborative code analysis

Programming Model Support
- SCA
- Java (WAS) Batch
- SIP/CEA
- XML (feature pack)

Extended Programming Model Support
- Advanced support for J2EE 1.4 and earlier:
  - EJB & Web Services deploy
  - DD editors
  - JAX-RPC
- Web:
  - Page designer
  - Struts, JSF support
  - iWidget support

WDT

Install: Eclipse update site or IM

JEE Tools
- Advanced support for JEE 5+
- DD editors, enhanced project explorer, additional validation

Web Tools
- Advanced web development tools
- Rich page (WYSIWYG) editor for HTML, JSP
- Web 2.0 and Mobile support

WebSphere Integration
- Support for WAS v7.0, v8.0, v8.5
- Publish, start/stop the server
- Debug Jython/wsadmin scripts

WAS Extensions Support
- Binding and extension editors
- Support for non-spec extensions

OSGi Tools
- Full creation and editing support
- Blueprint editor and validation
- Visual Bundle Explorer

Liberty Integration
- Publish, start/stop the server
- Edit & manage server configuration

Eclipse (WTP, DTP)

Programming Model Support
- Basic creation, editing, and validation support for JEE applications:
  - Web, XML, JPA, EJB, EAR
- Database tools

WDT adds support for Mac, possibly with exception of WebSphere Integration

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