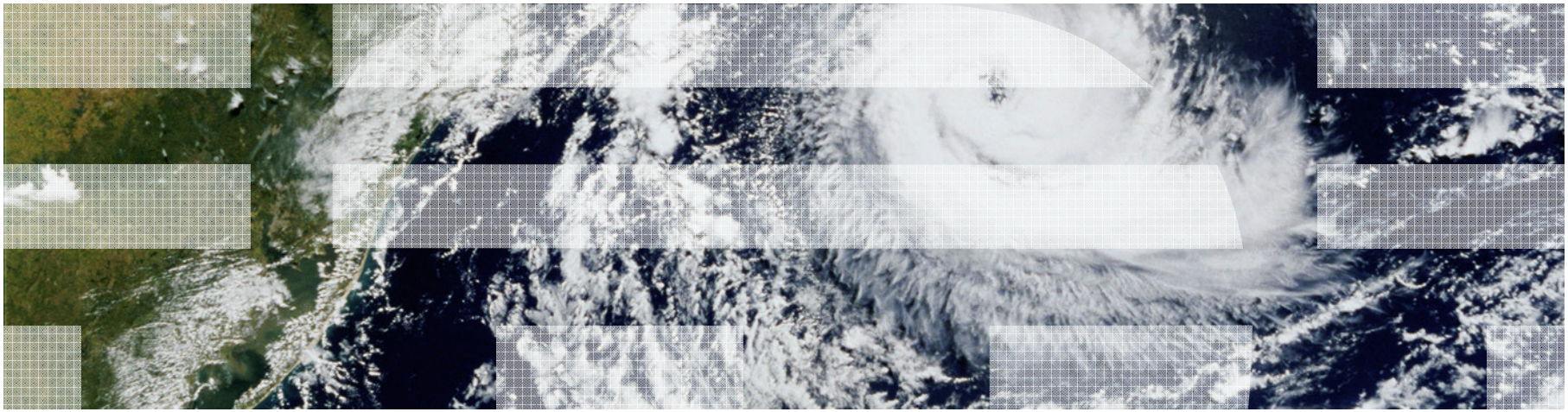
Application development for WAS with RAD and WDT!

Anita Rass Wan Product Manager, WebSphere Product Management



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Agenda

- Right Fit Development Tools
  - Introducing WAS Tools Editions
- Integrated Application Development for WAS
  - Using WDT & RAD
- What's Coming Up with WAS and Tools
  - WAS 8.5 Beta and Liberty

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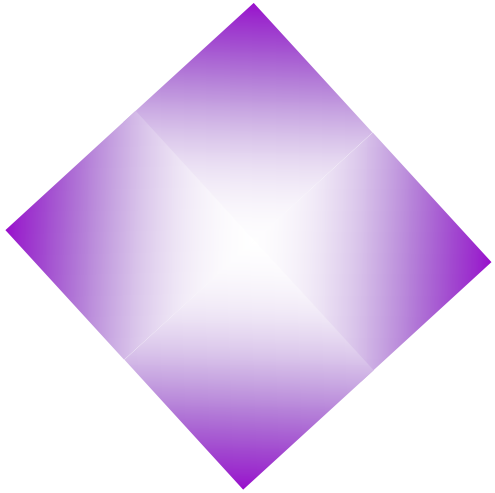
Enhanced Developer Productivity: Addressing Key Issues

Incremental Publishing

Faster, simpler debug when making changes to an application

Performance

Enhanced responsiveness to changes made during development



Simple Configuration

Simpler, lightweight tools, configuration and configuration sharing amongst a development team

Problem Determination

Simpler to identify and resolve problems as applications are always broken during development, due to bugs, missing or incomplete code, or bad configuration

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Accelerate application development with simple and comprehensive tools solutions for WebSphere

Eclipse based WAS Developer tools and Rational Application Developer available in the WebSphere Application Server bundles

- Expand the tools choices for different types of development for the WebSphere Application Server
- Support building a wide range of applications from large mission-critical projects to open source-based projects and projects with no up-front budgets
- Lower costs using these new solutions for tools and runtimes

- **Available: November 18, 2011 !!**

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Introducing: WAS Tools Editions

WAS for Developers – Tools Edition for Eclipse

Easily & quickly obtain WAS Developer Tools (server adapters) for WAS environments (V7.0 & V8.0) via Eclipse updater:

- ✓ Available for both unsupported (no charge) and supported (for fee).
- ✓ Deploy applications from Eclipse development environments directly to the WebSphere Application Server

WAS – Tools Edition

WAS ND – Tools Edition

WebSphere Application Server V7.0 & V8.0 bundled solutions more closely match customer needs:

- ✓ Production ready runtime and tools purchased together to provide an end to end environment.
- ✓ Unlimited use of RAD or WAS Developer Tools (server adapters) with the bundled WebSphere Application Server

WAS for Developers – Tools Edition for Eclipse

- **Unsupported (free)**

✓ Install directly into the Eclipse environment already on developer's machine

✓ Easily & quickly obtain Eclipse adapters for WAS environments (V7.0 and V8.0) via Eclipse updater

✓ Eclipse developers can now easily deploy newly developed apps to a WAS infrastructure

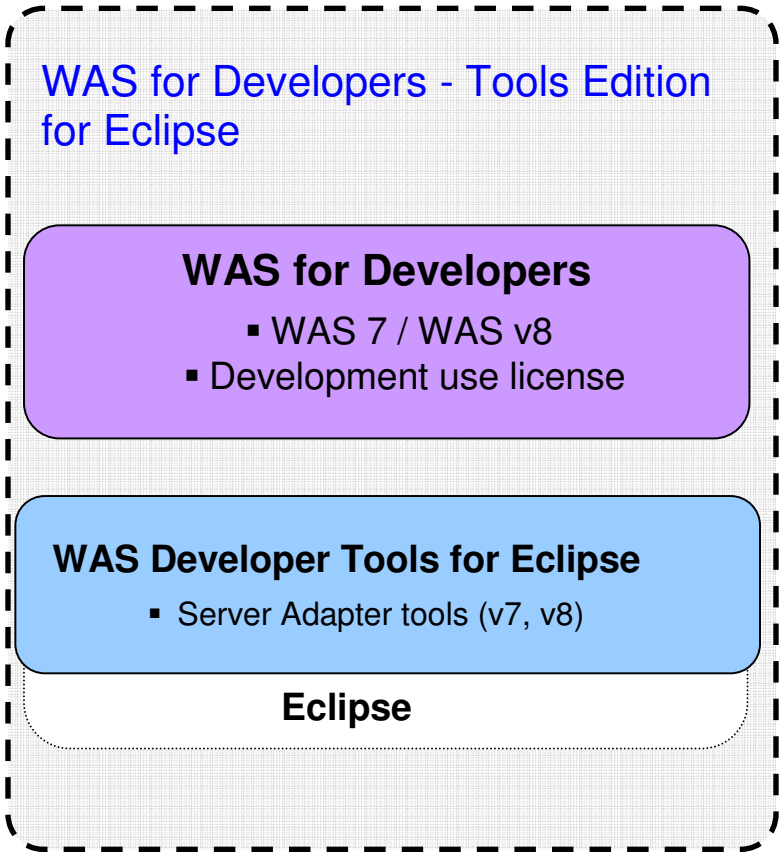
- **Supported**

✓ Delivery via an update site or IBM Install Mgr wrapped version

✓ Install directly into the Eclipse environment already on developer's machine

✓ Easily & quickly obtain Eclipse server adapters for WAS environments (V7.0 and V8.0) via Eclipse updater

✓ More easily match project development needs to tools of choice. Utilize diverse developer skills; use Eclipse-based environments to build simple applications.



✓*Runtime available from developerWorks download site*

✓*Tools available on Eclipse Marketplace*

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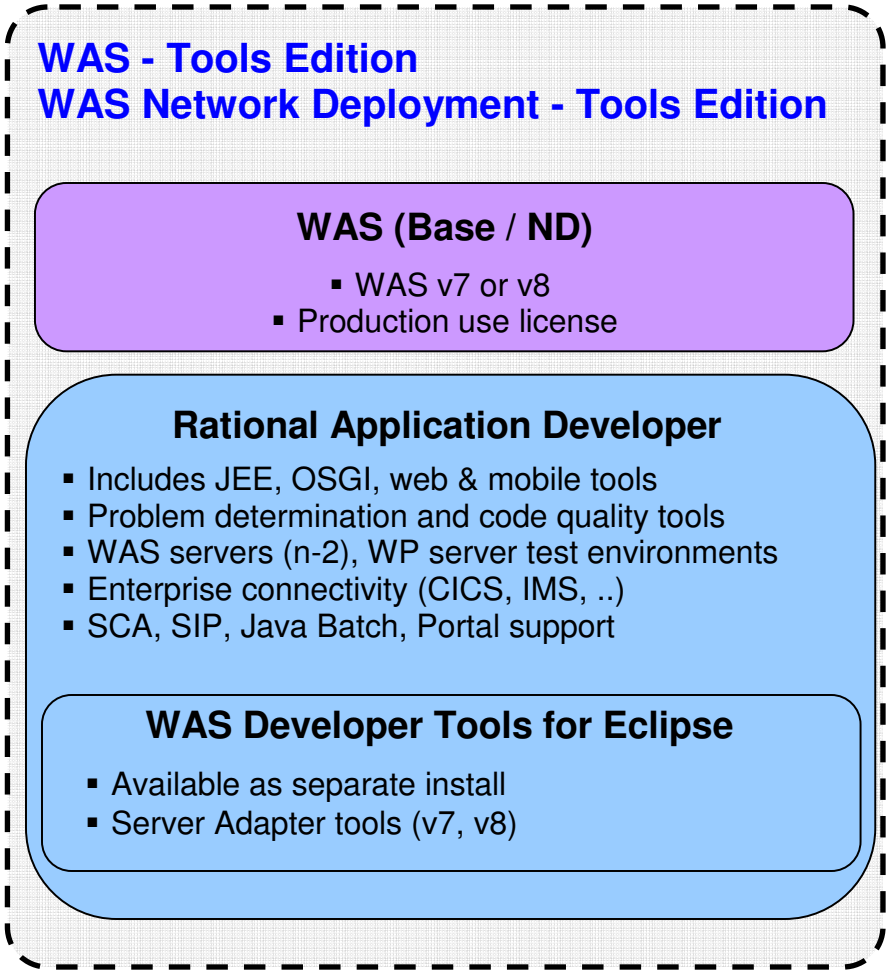
WAS - Tools Edition
WAS Network Deployment - Tools Edition

- ✓ Runtime and tools available in one bundle to provide an end to end development solution
- ✓ Unlimited licenses of RAD or WAS Developer Tools for Eclipse for developing applications for the production use WAS server in the bundle.
- ✓ Implement the "right-fit" desktop environment to meet varied development and application needs.
- ✓ Maximize productivity and project delivery speed by using RAD or WAS Developer Tools for Eclipse to help deliver high quality departmental through mission-critical applications for WAS environments.



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Agenda

- Right Fit Development Tools
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- Integrated Application Development for WAS
  - Programming Models and Integrated Tools and Runtime
- What's Coming Up with WAS and Tools
  - WAS 8.5 Beta and Liberty

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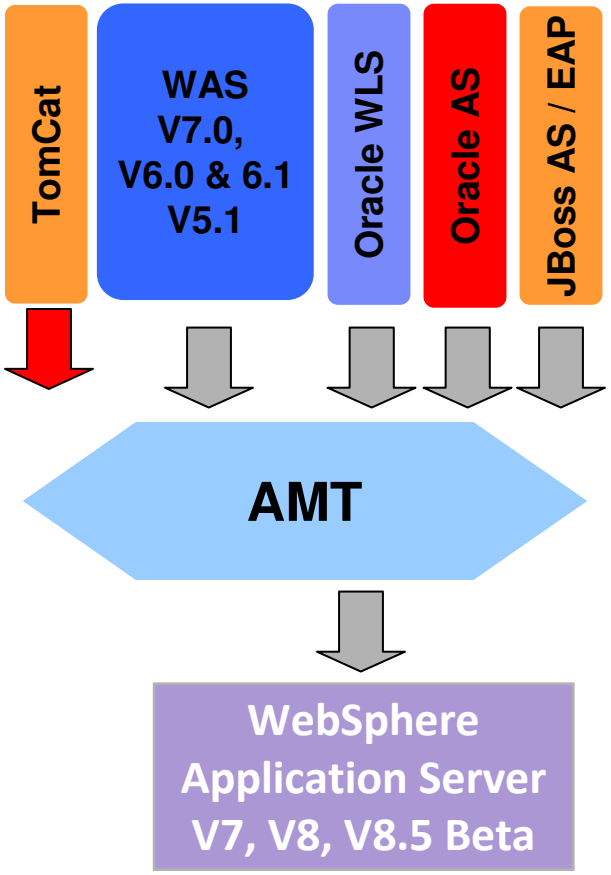
Application Migration Tooling - BETA

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

- **NEW for Beta – Support for Tomcat migration to WAS v8.5 Beta**
- 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 features
    - 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) ✓ - Tools support available in RAD

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



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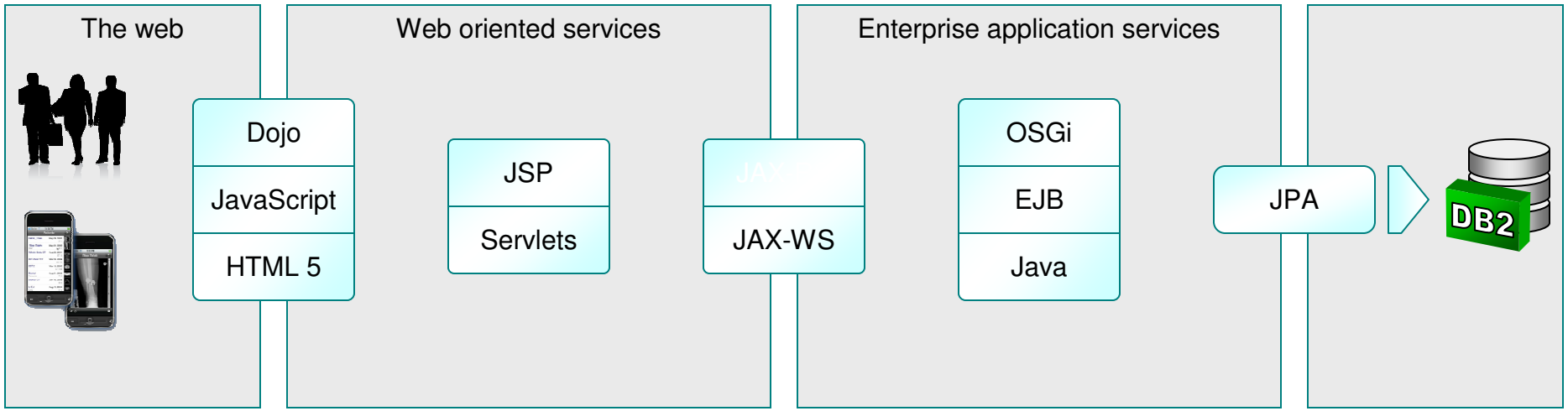
Unleash innovation with WDT 8.5 Beta

For developers that need core capabilities to develop simple web applications with modern services.

An intuitive, cost effective IDE bundled with the WebSphere Application Server

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

Design web, Java EE and OSGi applications with persistence



Made for the WebSphere Application Server and Liberty profile

WebSphere foundation

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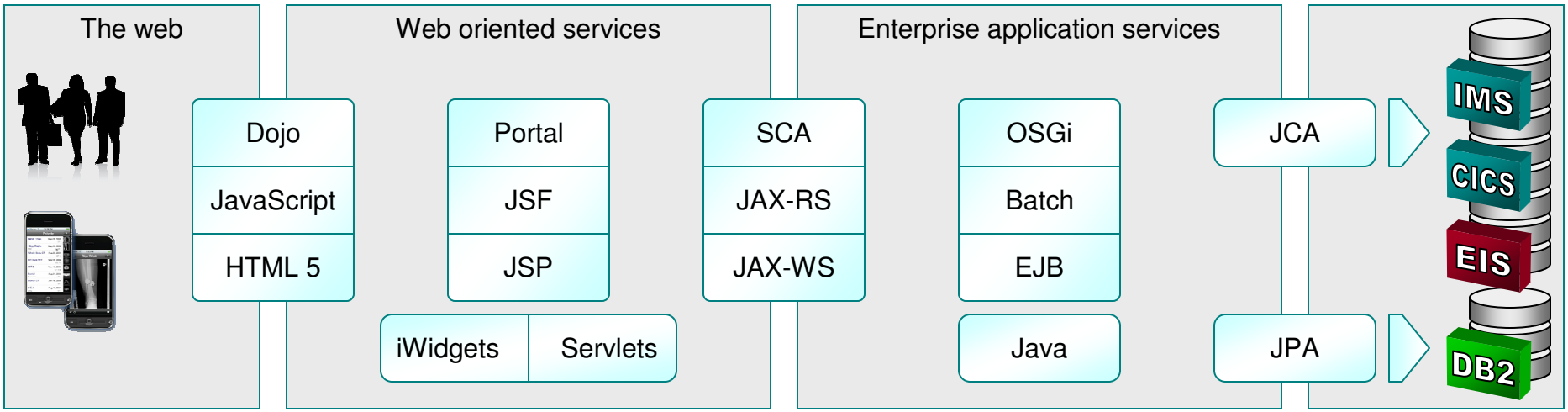
Enterprise Application Development with RAD

For enterprise developers that need advanced end to end capabilities to deliver robust, and scalable applications integrating modern and legacy systems

Evans Data IDE User Choice Award

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 | Public and Private Clouds | WebSphere foundation

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Tools for developing Web applications

- RAD helps lower the barriers of adoption of Web 2.0 technology, providing tools for building rich internet applications to improve online user experience and increase customer satisfaction

- Visual development of Web 2.0 pages
  - Page Designer for HTML, JSP, JSF and Dojo applications
  - Source level tools for JavaScript* and Dojo development
  - Dojo toolkit
  - iWidgets
- Test and debug with the help of
  - Lightweight Ajax Test Server to rapidly preview Web pages
  - Multiple browser previews
  - Firebug integration

- HTML 5
  - Content assist and validation in the source editor

** Inherited from Eclipse WTP*

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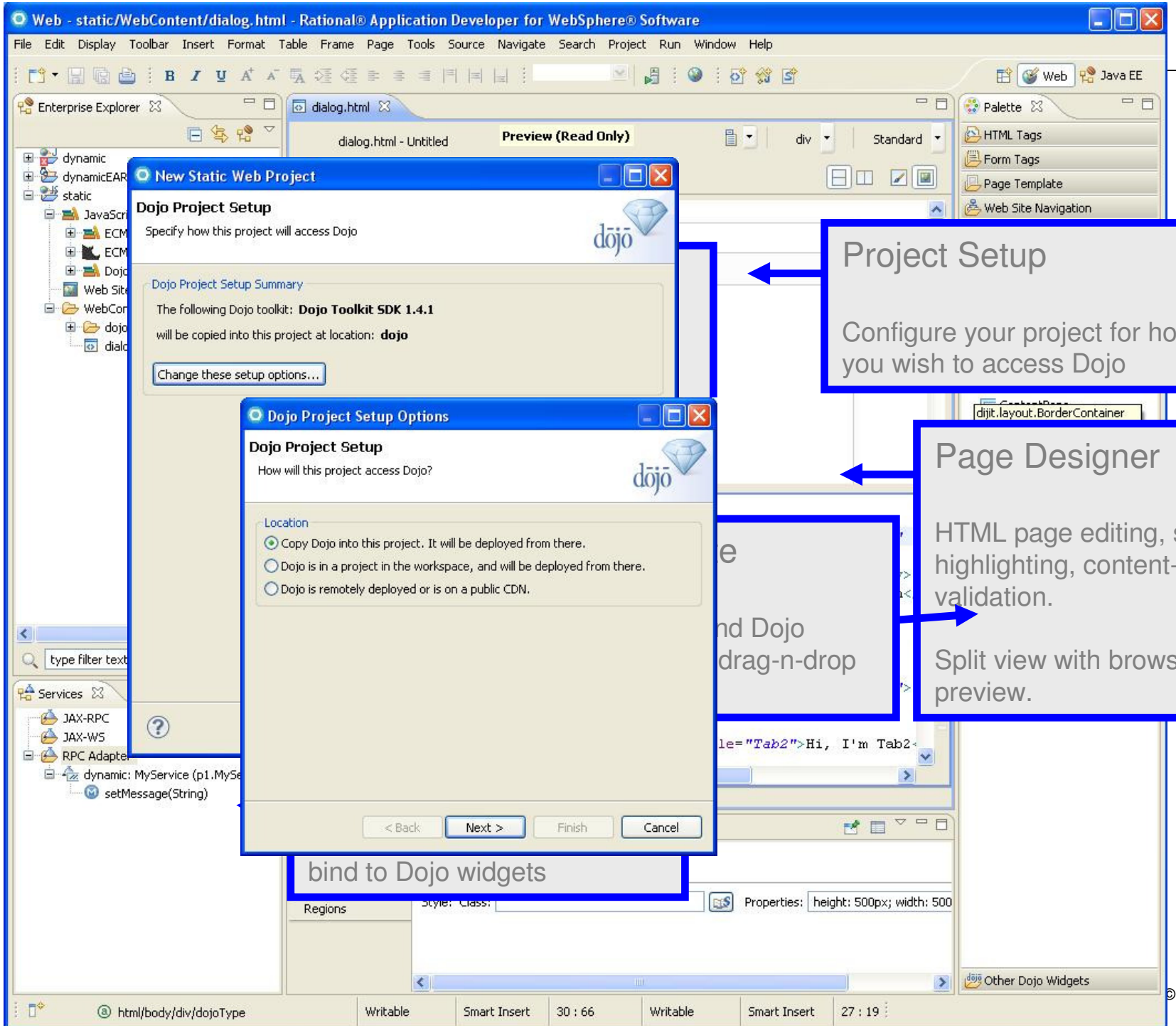

Project Setup

Configure your project for how you wish to access Dojo

Page Designer

HTML page editing, syntax highlighting, content-assist validation.

Split view with browser preview.

bind to Dojo widgets

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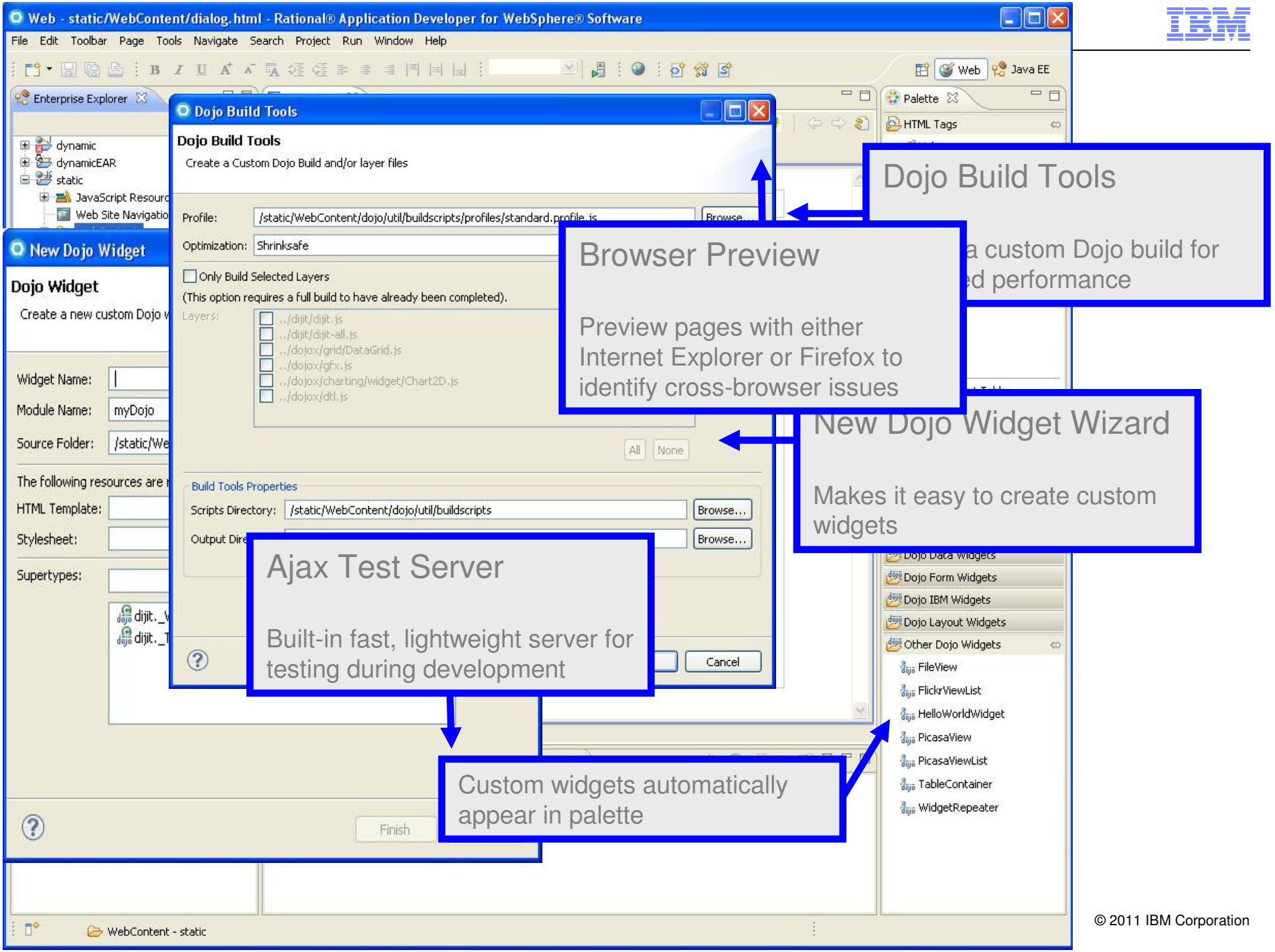

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The mobile application spectrum

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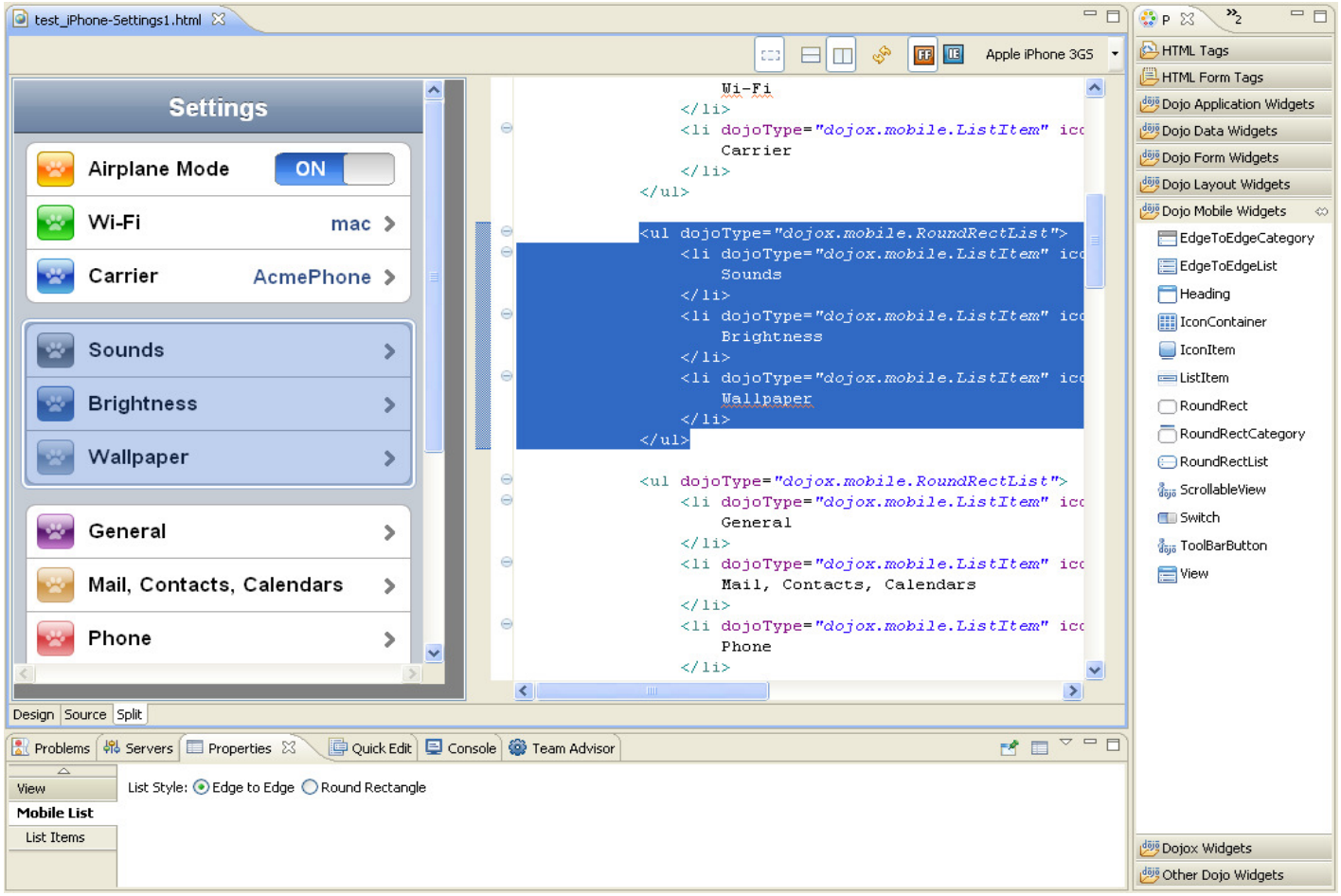
Core features for mobile tools



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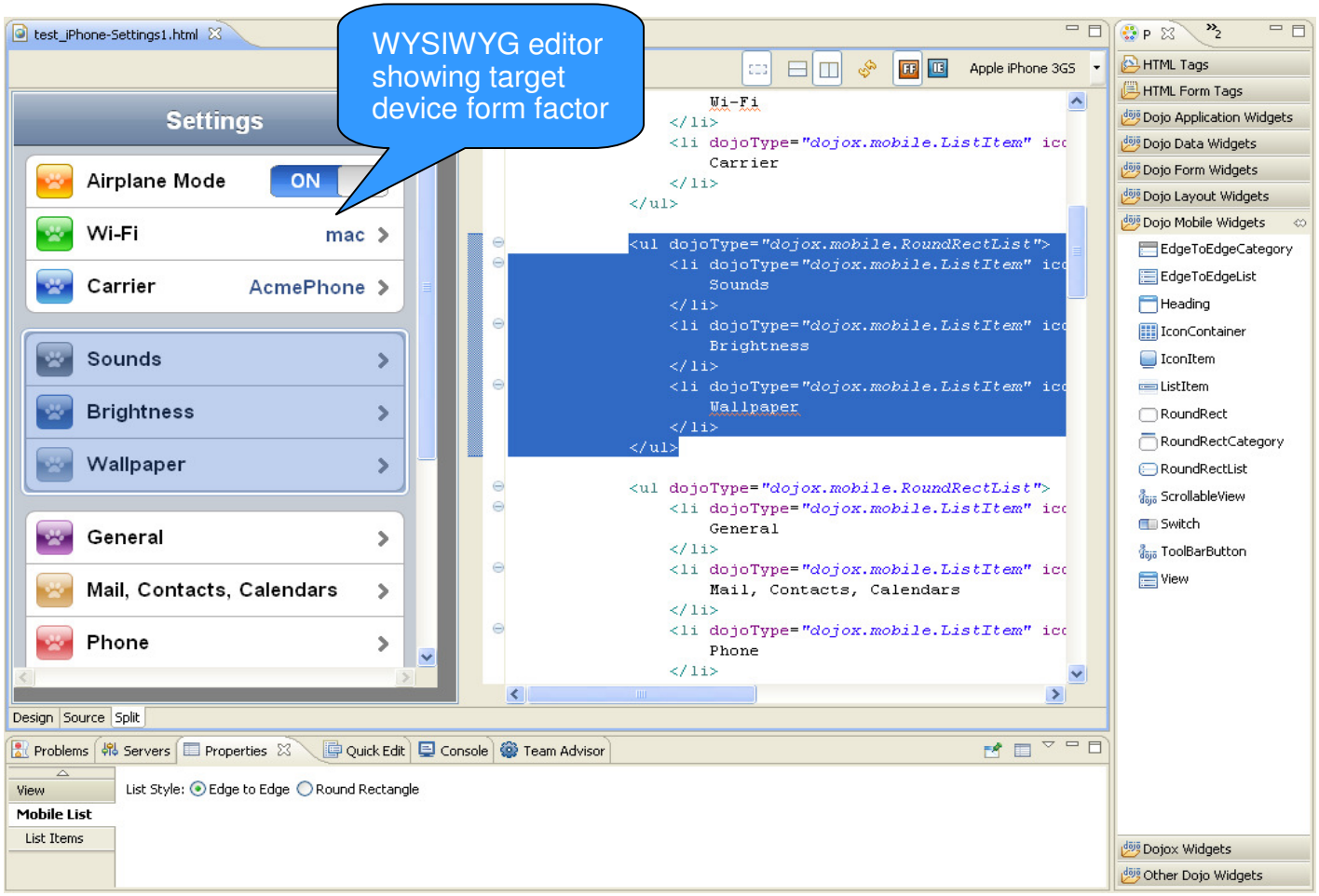
Core features for mobile tools



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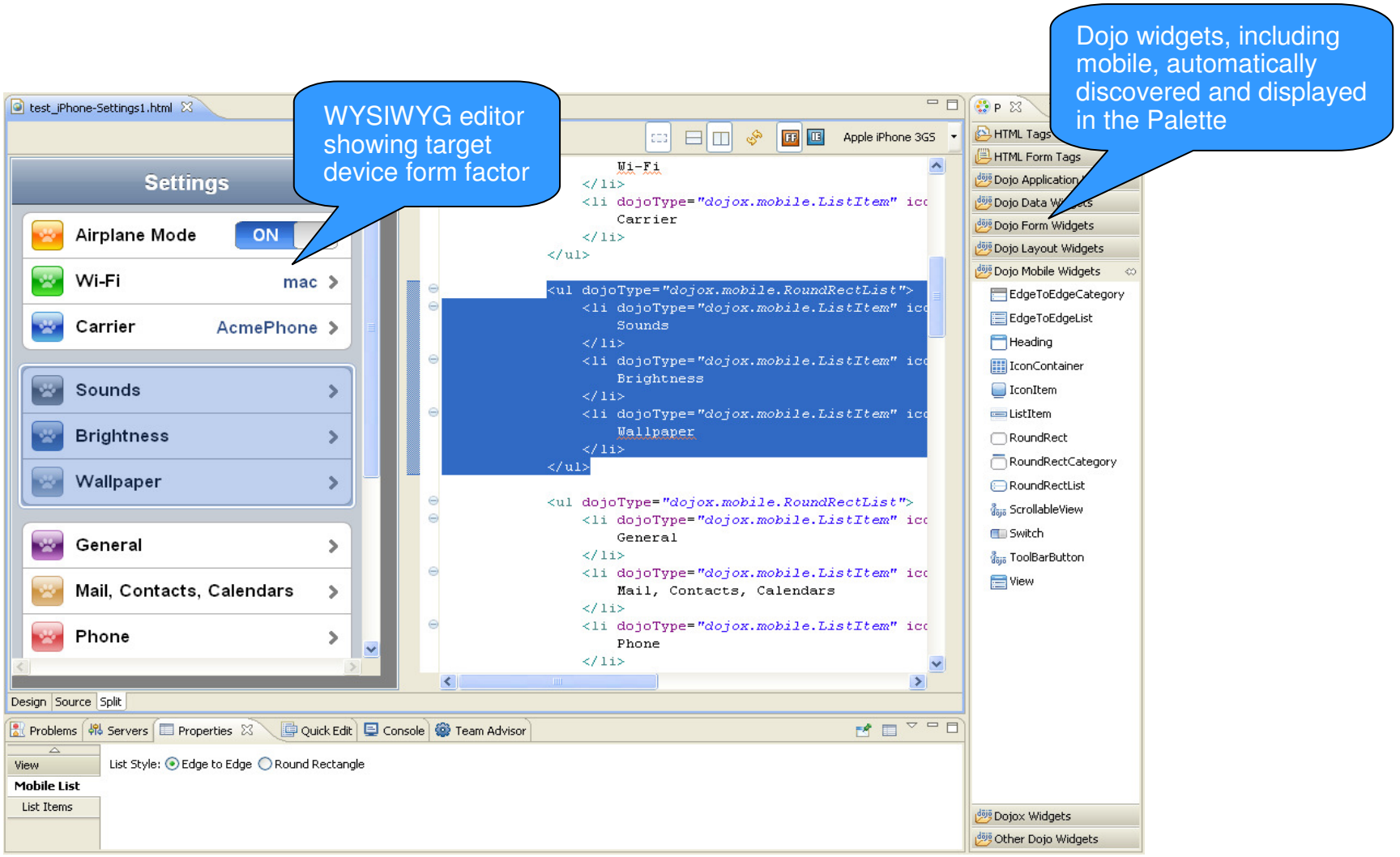
Core features for mobile tools



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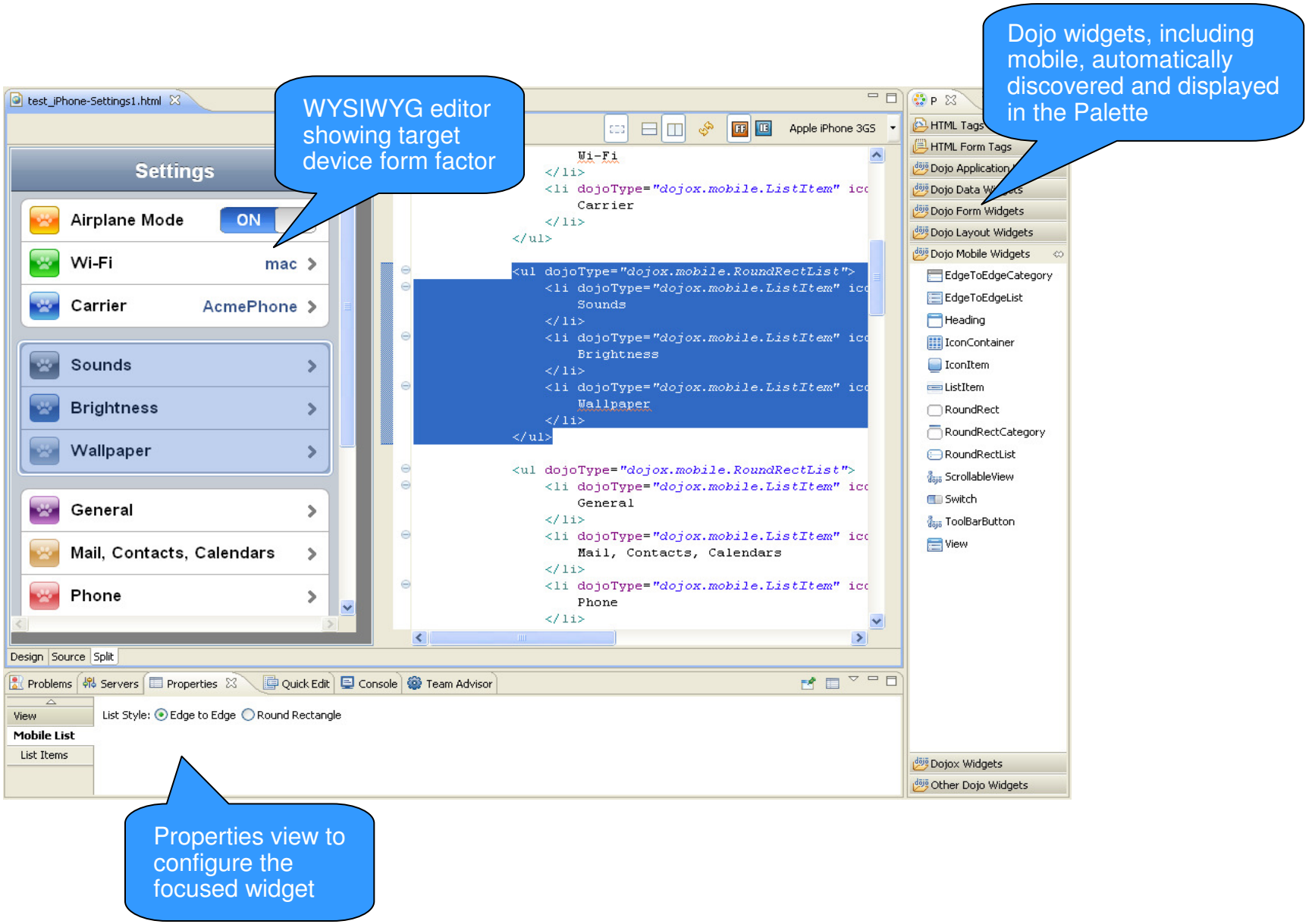
Core features for mobile tools



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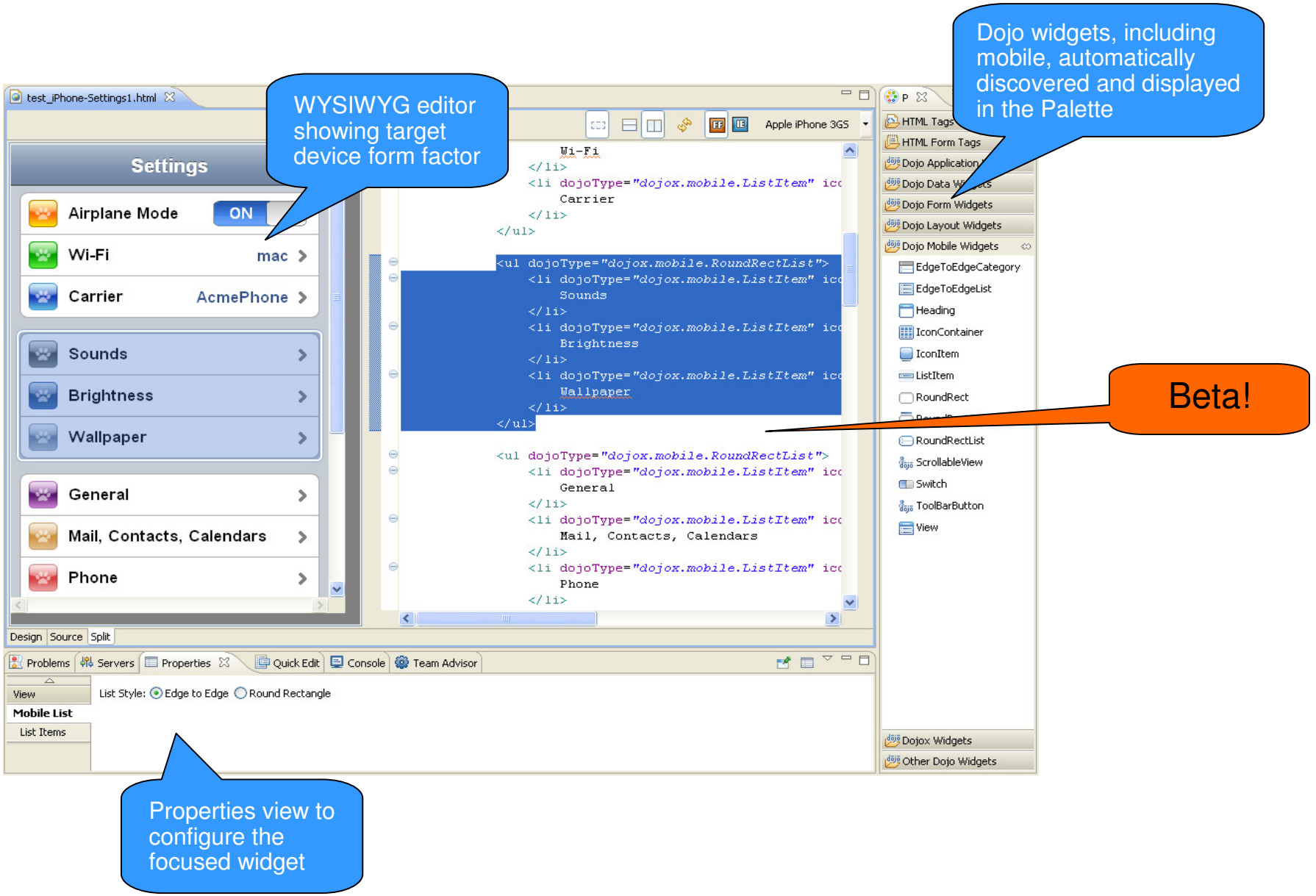
Core features for mobile tools



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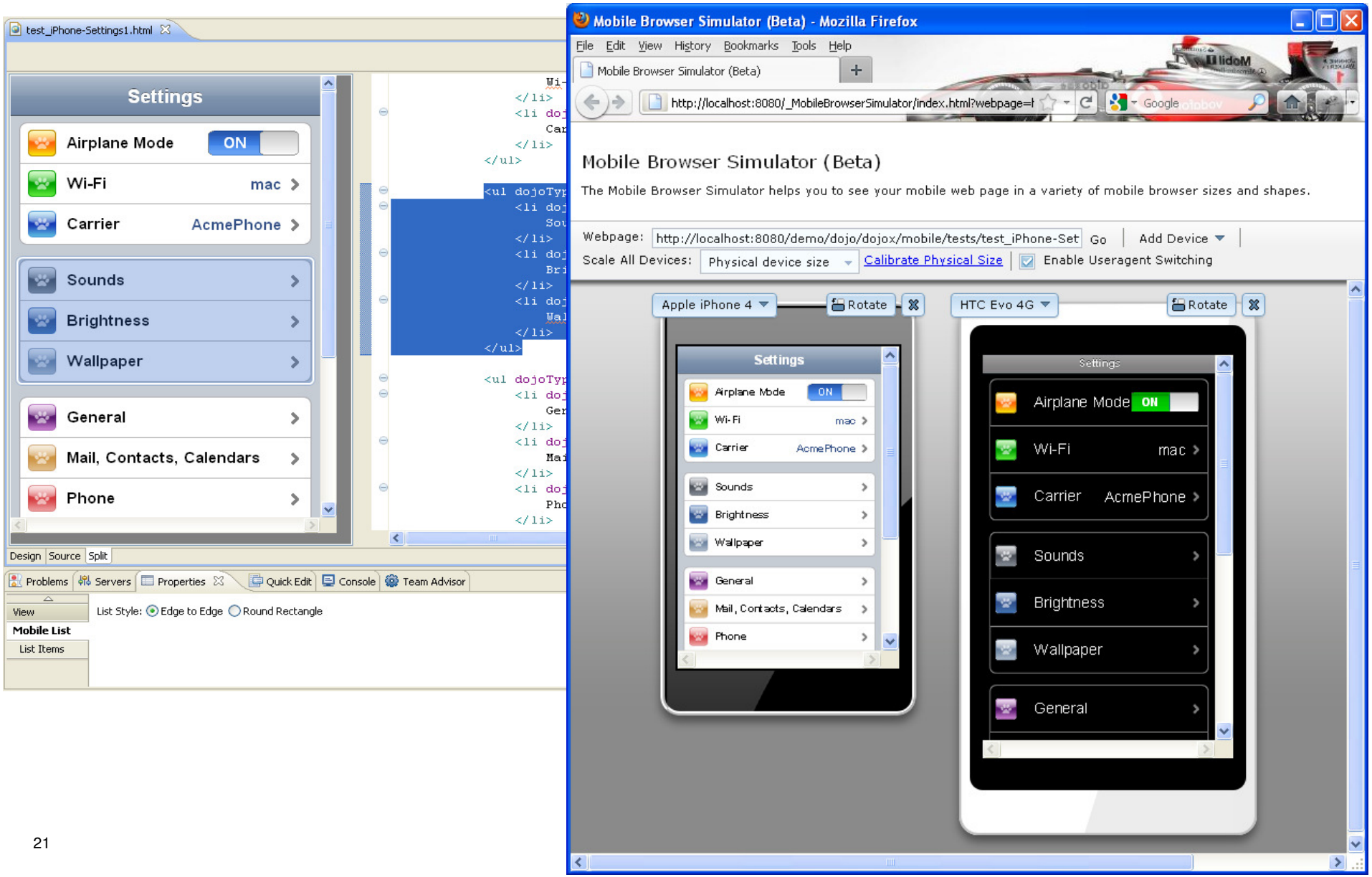
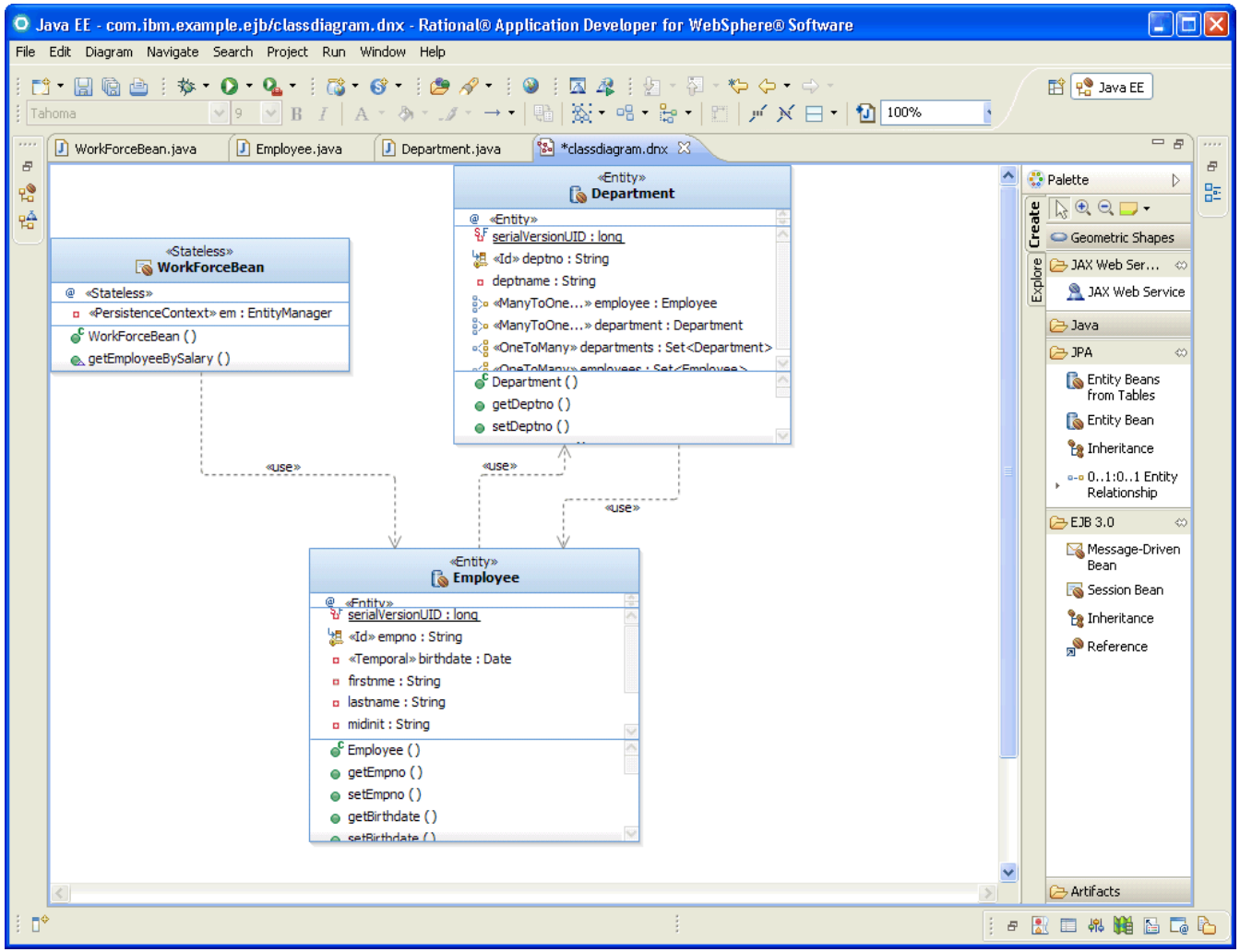
Core features for mobile tools



Code visualization

- Visualize Java classes, EJBs, JPA beans and web services.
- Diagrams include class, sequence and topic.
- RAD supports visualization.
- RSA supports full modeling.



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Programming Models Behind the Glass - Java EE 6

Simplify standards-based enterprise Java development for dept. to core business apps

Enhanced developer productivity, user experiences, performance & integration:

- ✓ **Enterprise JavaBeans (EJB) 3.1:** Enhanced developer productivity through simplification; including testing outside of the application server, new timer support & async enhancements
- **Contexts and Dependency Injection for Java (CDI) 1.0:** Faster time to value through tighter and simpler integration between Web & business logic tiers
- ✓ **Java Persistence API (JPA) 2.0:** Enhanced developer ease of use & app performance through improved locking, mapping support & dynamic query construction
- ✓ **Java Servlet 3.0:** Enhanced time to value through annotations and ease of integrating third party presentation frameworks

✓ Tools support available in RAD

- ✓ **Java API for RESTful Web Services (JAX-RS) 1.1:** Deliver better user experiences faster through integrated Web 2.0 prog model support
- ✓ **JavaServer Faces (JSF) 2.0:** Enhanced developer productivity & end user experience through annotations & Facelets support
- **Bean Validation 1.0:** Improved developer productivity through declarative means for describing validation constraints for data
- ✓ **Java Architecture for XML Binding (JAXB) 2.2:** Improved performance via new default marshalling optimizations
- ✓ **Enterprise Web Services 1.3:** Improved integration and reuse support
- ✓ **Java API for XML-Based Web Services (JAX-WS) 2.2**: Developer productivity and security enhancements

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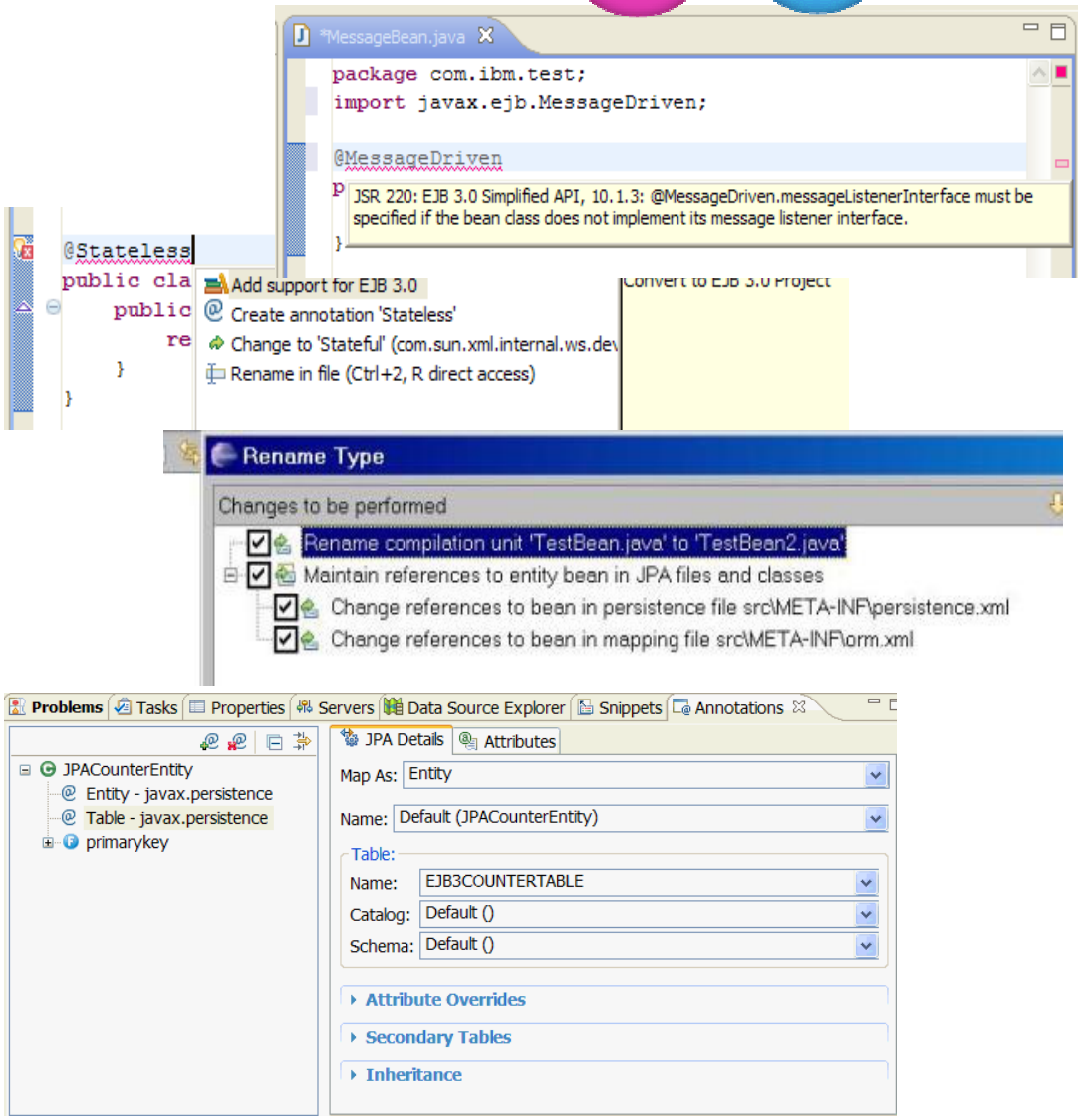
Java EE 6 Development

Beyond Eclipse

New in v8.0

- Content assist and as you type validation
- Quick fixes for code and project configuration
- Advanced refactoring options to
  allow you to modify and maintain
  code in an iterative manner
- Annotation view to manage and modify annotation properties
- More flexible assembly of modules into EARs.
- Develop EJBs directly within Web projects (for WAS v8).



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OSGi Applications

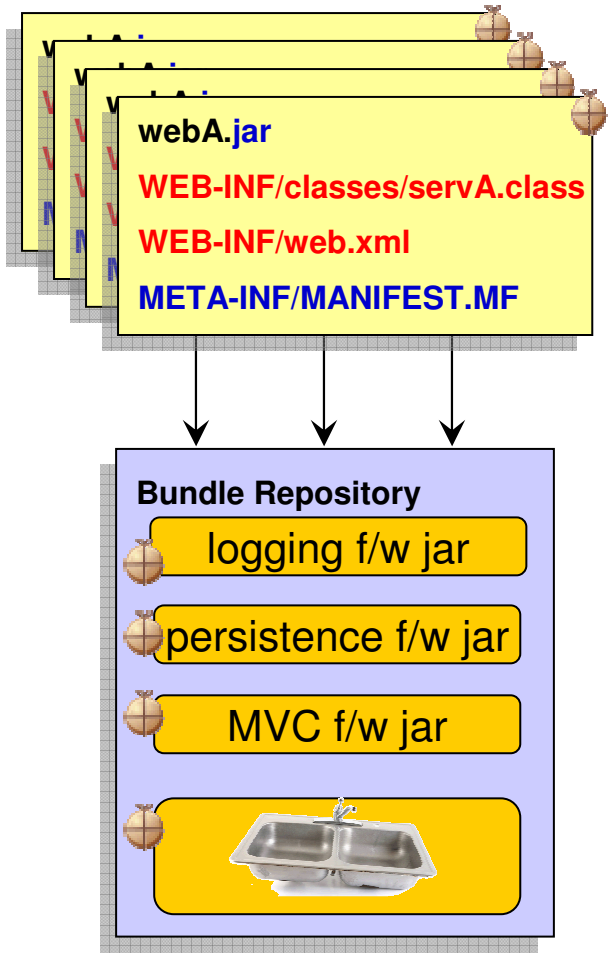
Speed development, increase ease of use and reuse through the modularity, dynamism, and versioning capabilities of OSGi applied to web & enterprise applications

Key Features:

- **Modular deployment and management:** Separate common libraries from application archives; manage them centrally and across many versions
- **Standards Based DI Framework:** POJO development model, integrated with the server to control injection, activation & deactivation.
- **Update applications modules without restarting the application**
- **SCA Integration:** Components can be decorated as SCA components to provide coarse grain SOA services

Development productivity tools with RAD:

- ✓ **Content assist, validation and wizards and editors** to define OSGi application manifests
- ✓ **Projects for OSGi applications bundles**, composite bundles and blueprint files.
- ✓ **Wizards and editors** to define OSGi application manifests, including validation.
- ✓ **WAS / RAD 8.5 beta:** Supporting EJBs in OSGi bundles



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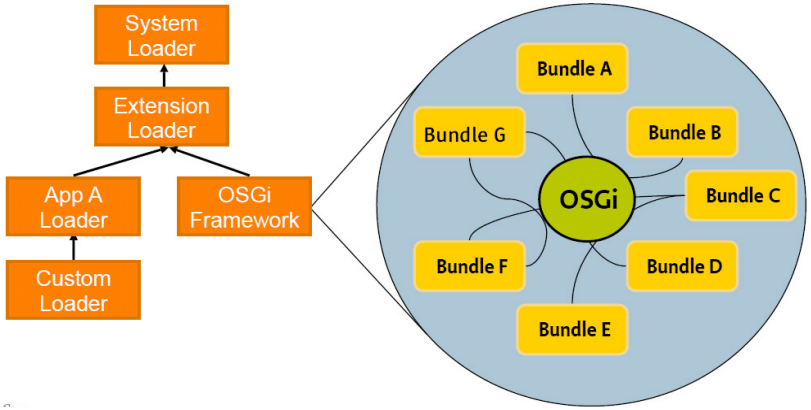
OSGi Bundles and Class Loading

- OSGi Bundle – jar containing:
  - Classes and resources.
  - OSGi Bundle manifest.
- What's in the manifest:
  - Bundle-Version: Multiple versions of bundles can live concurrently.
  - Import-Package: What packages from other bundles does this bundle depend upon?
  - Export-Package: What packages from this bundle are visible and reusable outside of the bundle?

```
Manifest-Version: 1.0
Bundle-ManifestVersion: 2
Bundle-Name: MyService bundle
Bundle-SymbolicName: com.sample.myservice
Bundle-Version: 1.0.0
Bundle-Activator: com.sample.myservice.Activator
Import-Package: com.something.i.need;version=1.1.2
Export-Package: com.myservice.api;version=1.0.0
```

- Class Loading
  - Each bundle has its own loader.
  - No flat or monolithic classpath.
  - Class sharing and visibility decided by declarative dependencies, not by class loader hierarchies.
  - OSGi framework works out the dependencies including versions.



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Service Component Architecture (SCA)

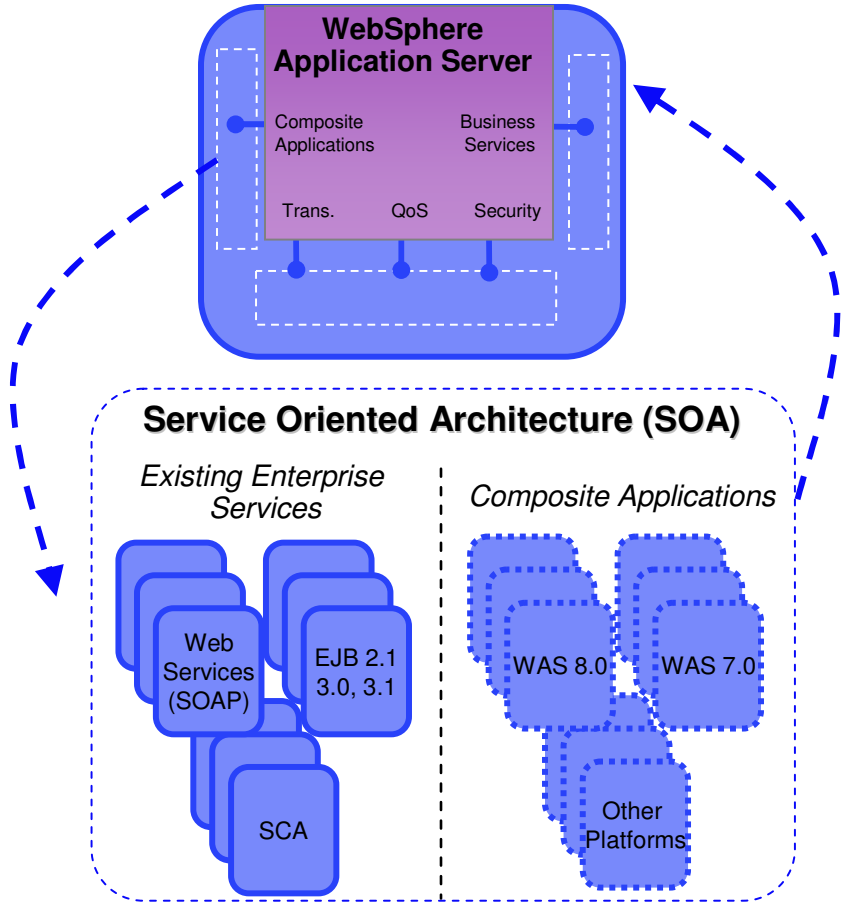
Speed SOA application delivery and customization by separating business logic from implementation considerations

Key Features:

- **Compose:** Create SCA service compositions using POJOs, EJB 3.1, 3.0 or 2.1 components, Spring, Java Servlets, OSGi bundles & AJAX/JavaScript
- **Wire Services:** Bindings for Web Services, JMS, SCA and EJB 3.1, 3.0, 2.1 & 2.0
- **RIA/Web 2.0 Support:** Expose business logic to Web 2.0 apps via JSON-RPC & ATOM feeds
- **Simplified Deployment:** Flexible service deployment as a JAR

Developer productivity tools with RAD:

- ✓ Create, configure and explore SCA artifacts
- ✓ Assemble SCA components using a graphical composite editor
- ✓ Package into a contributions;
- ✓ Test, debug and manage the application.
- ✓ **WAS / RAD 8.5 beta:** OASIS standard, SCA v1.1,



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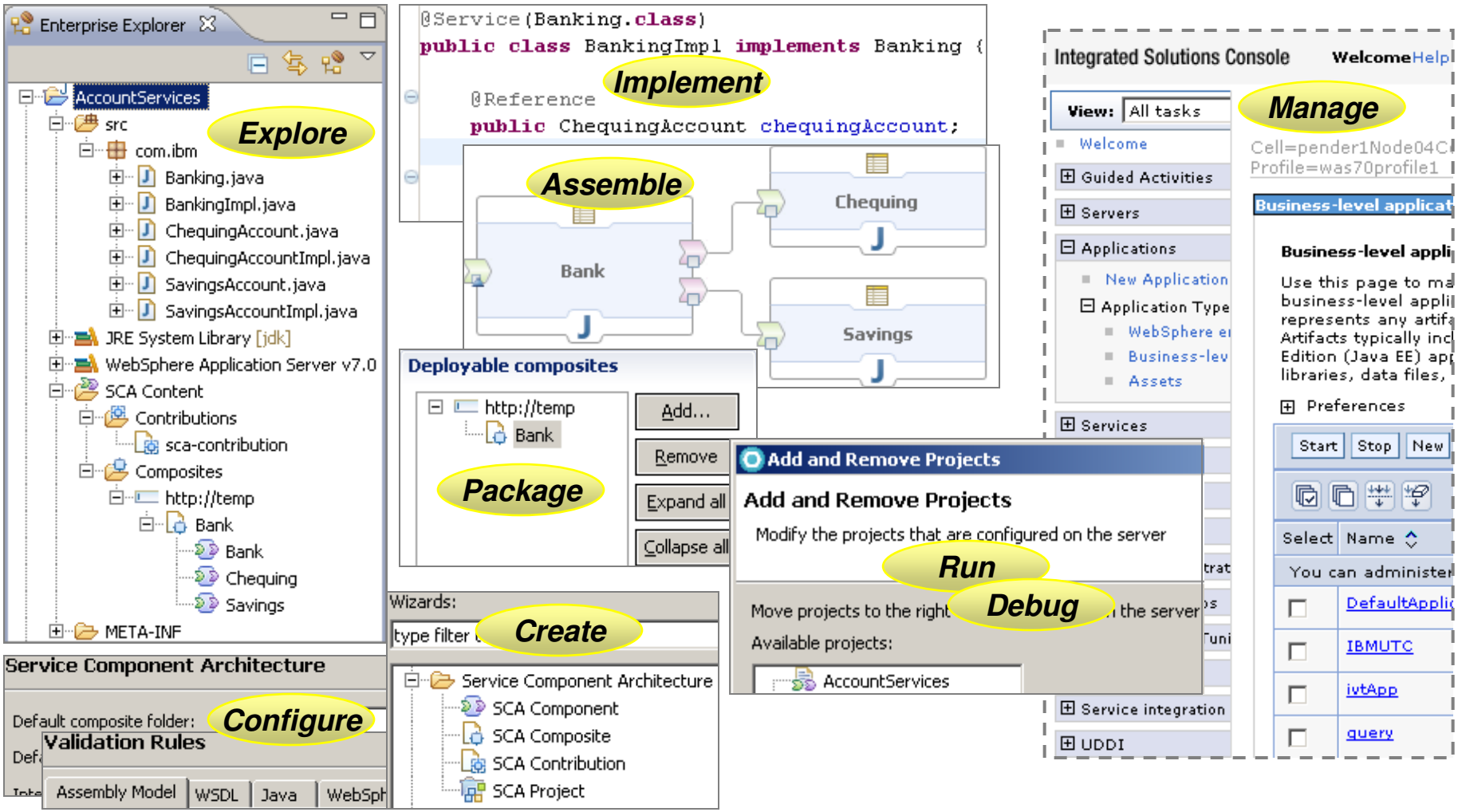
Bringing real services to life



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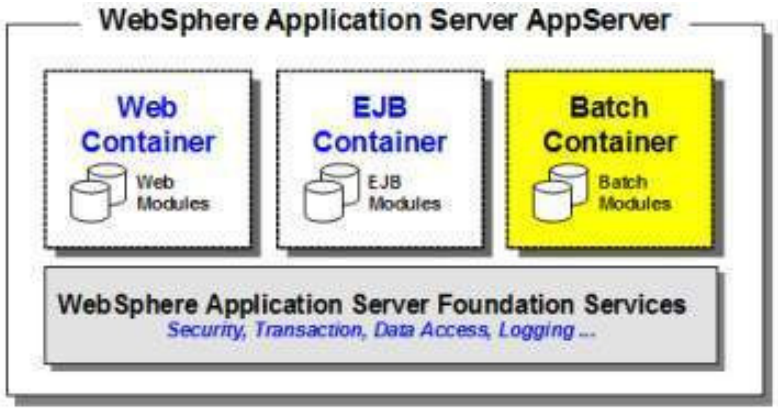
Java Batch

Quickly develop and deploy batch applications and dramatically reduce infrastructure and operational costs

Key Features:

- **Lower TCO:** Concurrent execution of batch & online transaction processing (OLTP) workloads using shared business logic on a shared infrastructure;
- **Enhanced Developer Productivity:** Pre-integrated app framework, Java batch programming model and tools to manage batch life cycle
- **Automation & Admin:** Container managed services for checkpoint & restart capabilities in addition to reliable, highly available, secure and scalable infrastructure. Integrated admin of OLTP apps & batch jobs
- **Packaging utility:** Utility to package batch application that can be deployed using JEE runtime



Developer productivity tools with RAD:

- ✓ Project and Job Creation Wizards guide you through batch programming model semantics
- ✓ Create xJCL scripts based on provided patterns
- ✓ Source code wizards for Java code skeletons
- ✓ Menu choices for
  - ✓ Deploying to WAS v7 with the Feature Pack for Modern Batch and WAS v8
  - ✓ Submitting the batch job, and launching Job Monitor
- ✓ See the Job in action via the output log viewer
- ✓ Samples and Help to get you started

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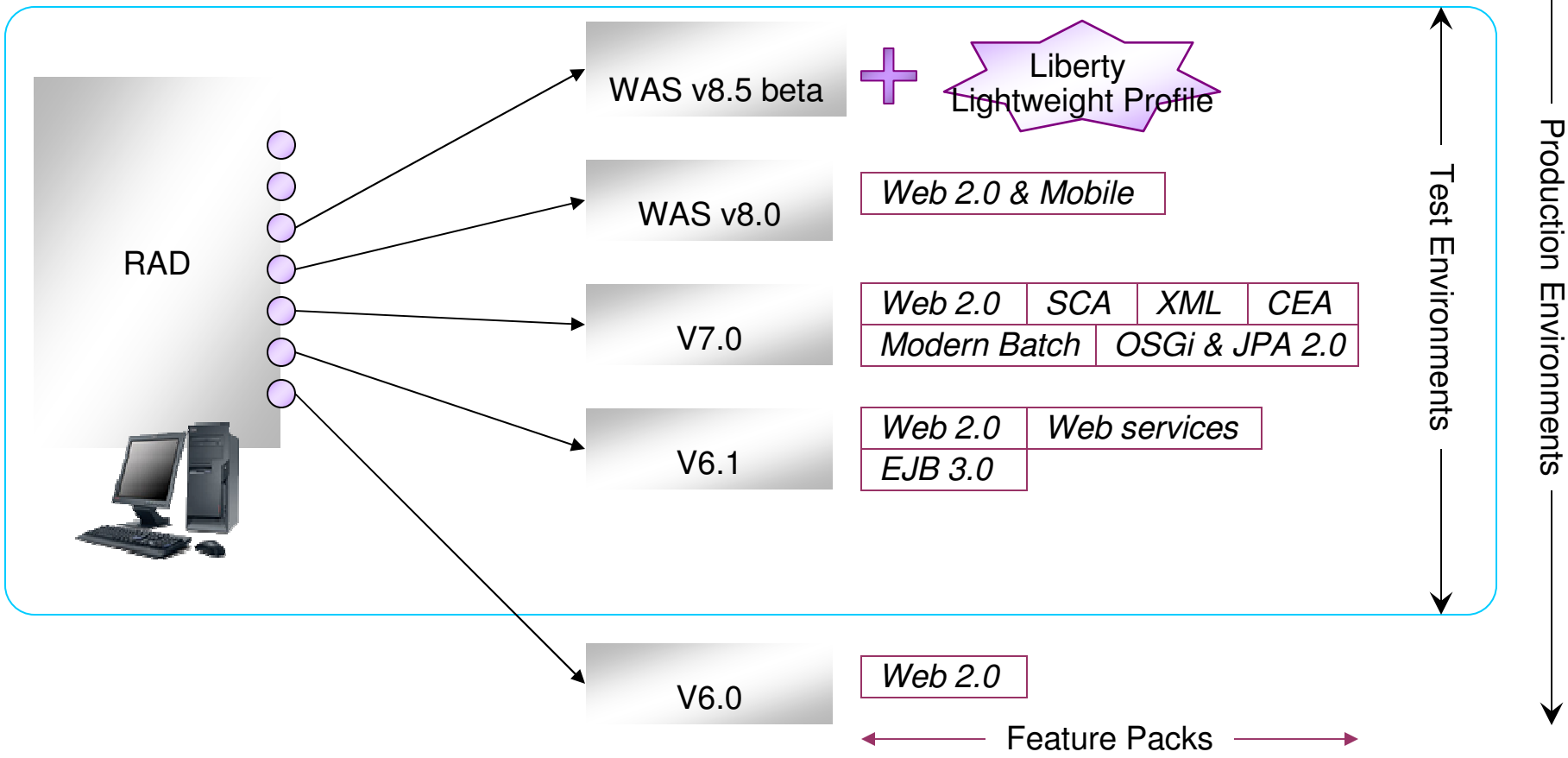
WebSphere Application Server Test Environments

RAD supports multiple WAS test environments including Feature pack support.
Developers can also target remote a WAS v6.0 test environment



- Remote deployment to all servers.
- Universal Test Client.
- Ajax test server for Web apps.

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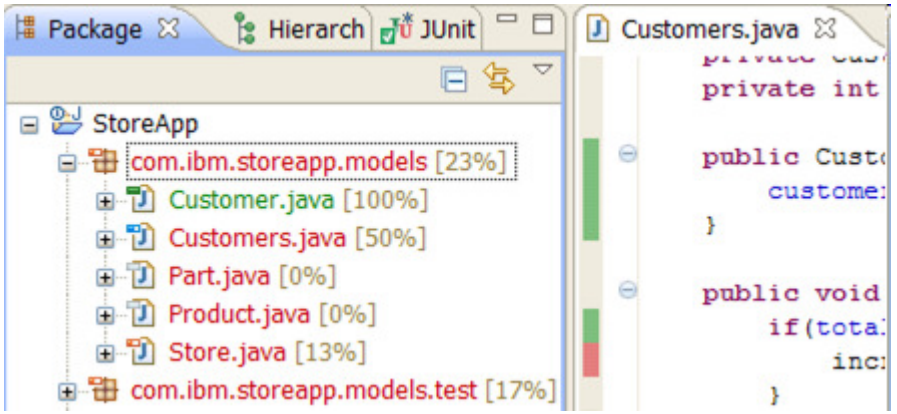
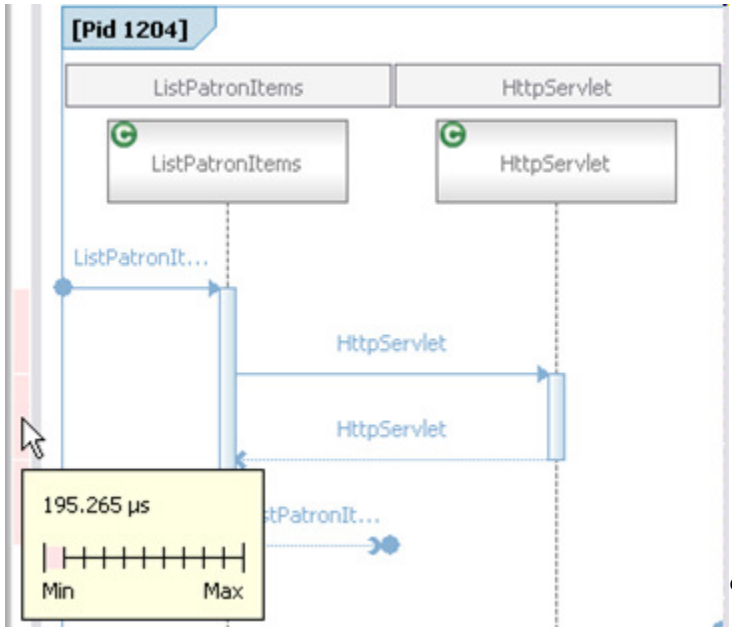
Problem Determination with RAD

Validate code at development time with static analysis, line level code coverage and profiling

- Productivity is hard to measure, especially when it is being lost a few seconds at a time.
  - UML based code visualization.
  - Validators, quick fixes, refactorings.
  - Rapid deployment to WAS.
- The longer a bug lives the bigger it gets and the more expensive it is to exterminate.
  - Extensible static code analysis tools. Over 200 rules with quick fixes.
  - Dynamic code coverage tools. Manual or automated (build). Coverage comparison reports.
  - Cross language debugging tools.
  - Memory, performance, thread profiling.

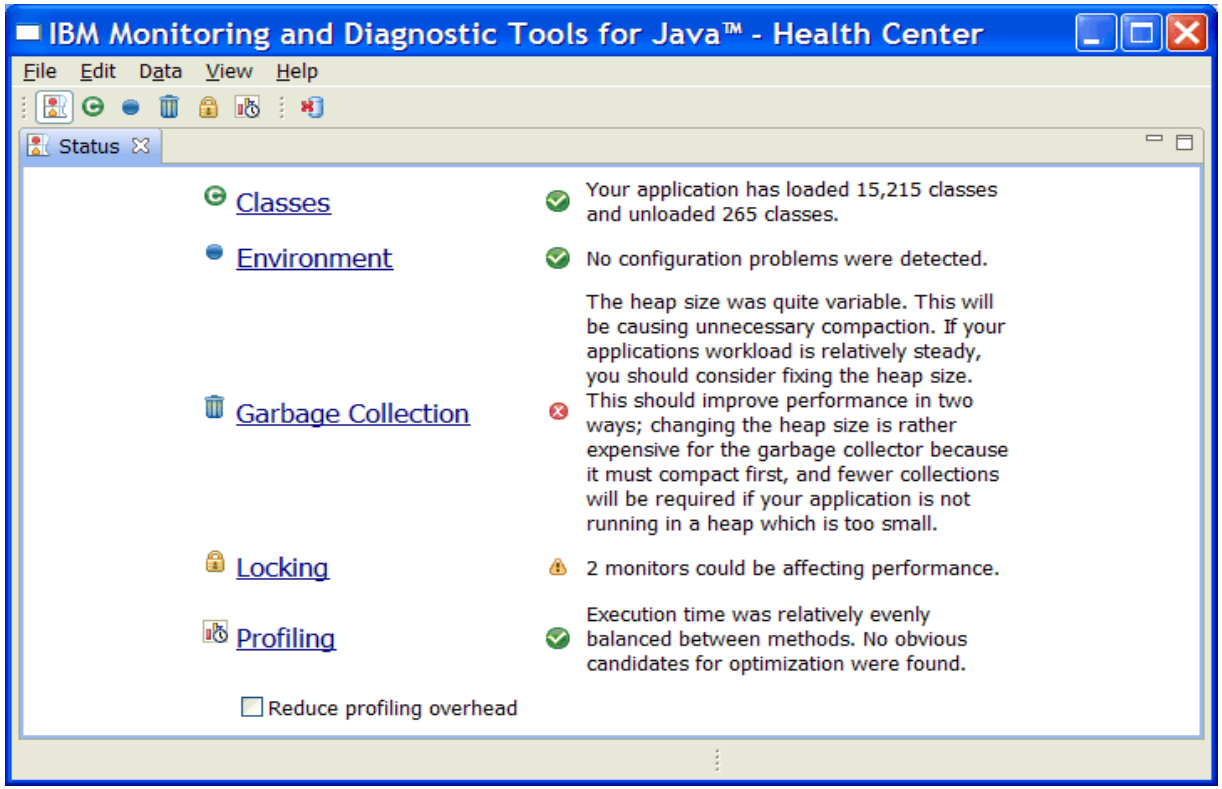




Problem Determination: IBM Support Assistant

IBM Monitoring and Diagnostics Tools for Java that includes many tools including JVM Health Centre, Memory Analyzer and Thread & Monitor Dump Analyzer

The JVM Health Centre provides: whole application health, lightweight profiling, heap size graphs, classes loaded, garbage collection information, …



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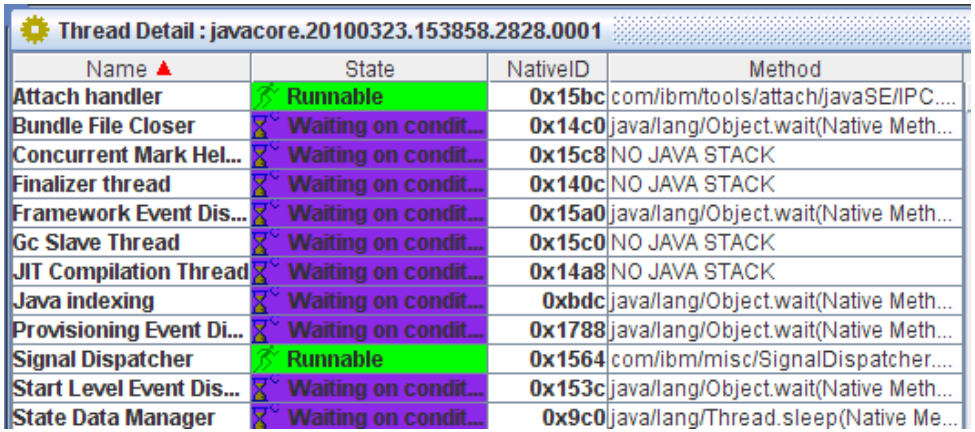
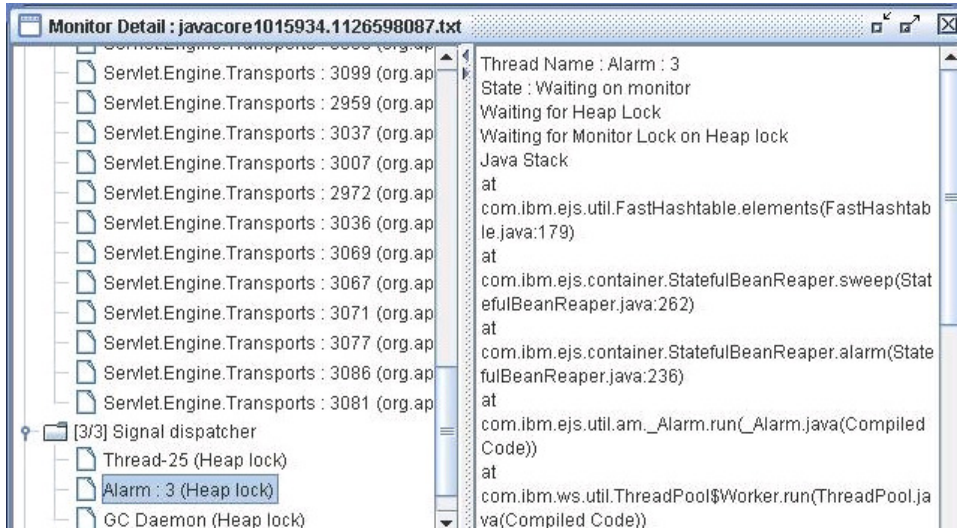
Thread And Monitor Dump Analyzer

- Input - javacore files
- Provides information about threads and monitors at the point the javacore was created





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JVM Tuning – Garbage Collection Strategy and Heap size

- Potential Issues:
  - Pause times – server unable to process requests due to GC pause times
  - Factors affected GC frequency and size/number of session objects supported
    - Garbage collection policies
    - Heap size parameters
- Use Health Center – live recommendations for GC strategy and heap size
  - Execute a reasonable portion of your application first
- Use Garbage Collection and Memory Visualizer
  - Enable verbose GC output
  - Provides more detailed tuning recommendations

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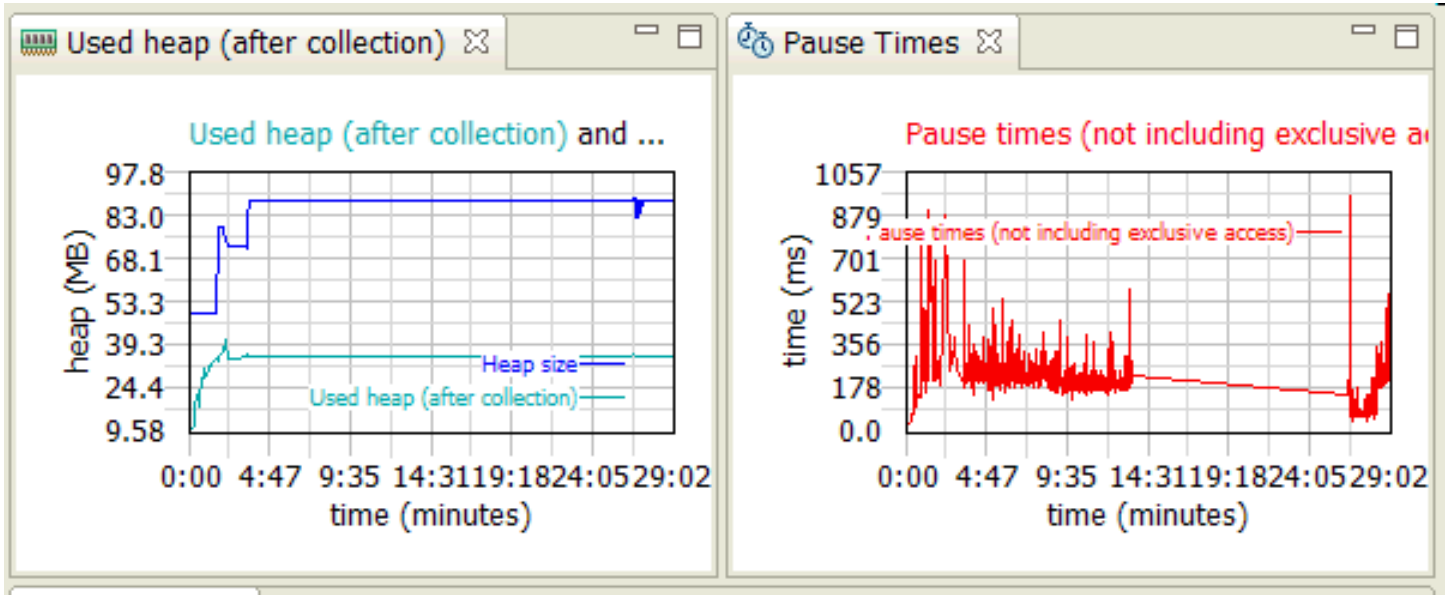
Health Center

- Requires application be started with the Health Center agent
- Configurable filte
- Tuning suggestions based on live analysis
  - GC
  - Method execution
    - Call stacks
    - Lock contention



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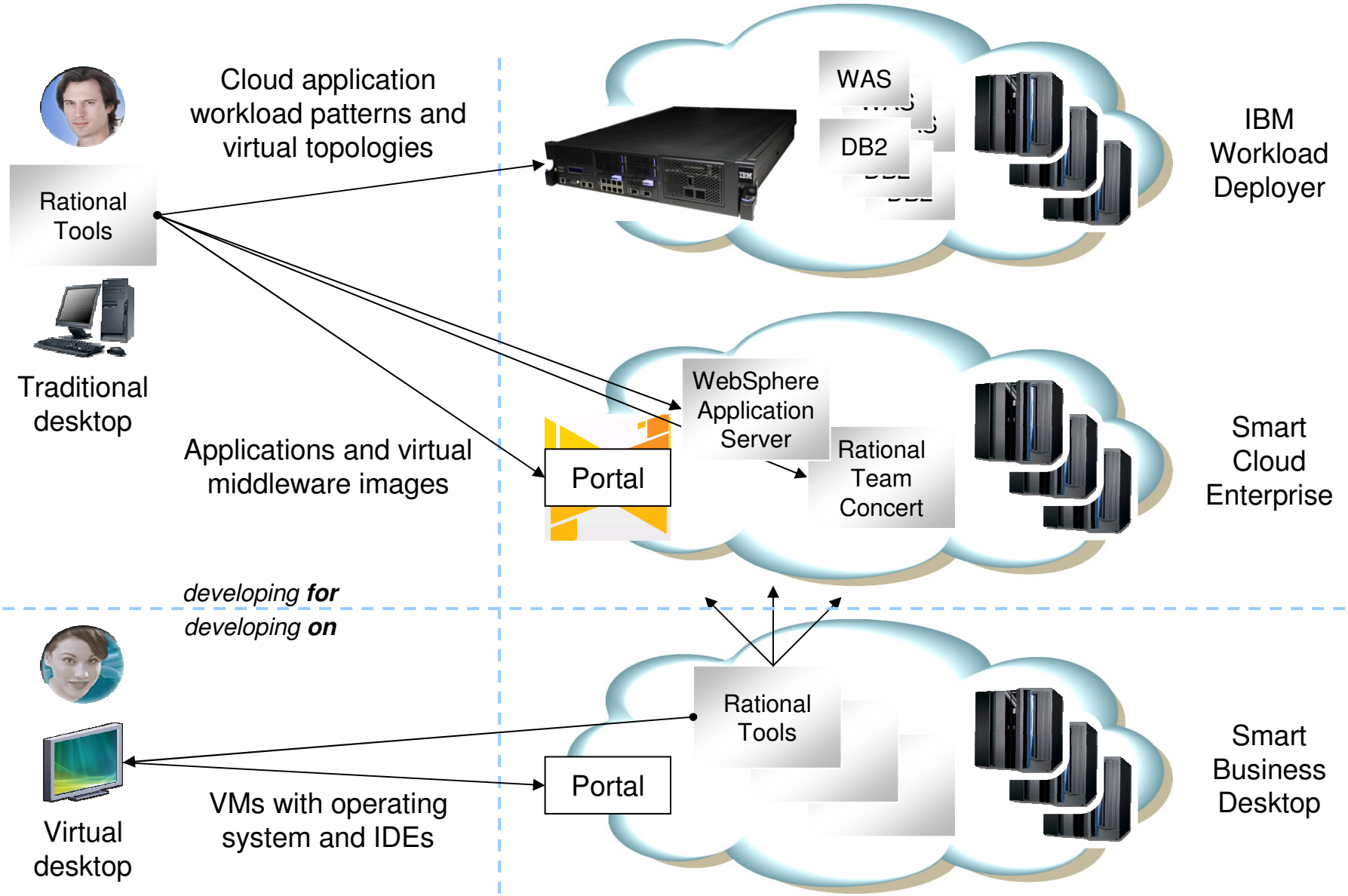
Developing for vs. on clouds



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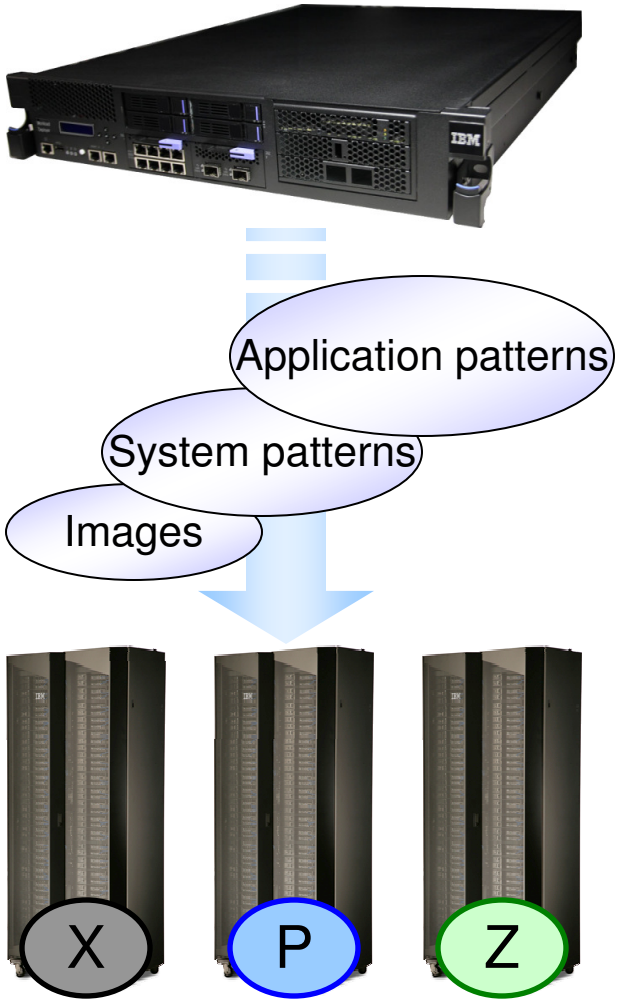
IBM Workload Deployer

- Evolution of WebSphere Cloudburst Appliance.
- Secure, self-service cloud management appliance.
- “Bring your own cloud”.
- Unmatched IBM middleware management
  - Apply maintenance, federate cells, etc.
- Can manage black-box images to support other products.
- Consistent and repeatable deployment of pattern-based application environments
  - X86, Power, and System z pools.
- Dispenses hardened middleware patterns into a cloud of external virtualized hardware running a supported hypervisor
  - VMware ESX, z/VM, or PowerVM.
- Lower total cost of ownership and time to value.



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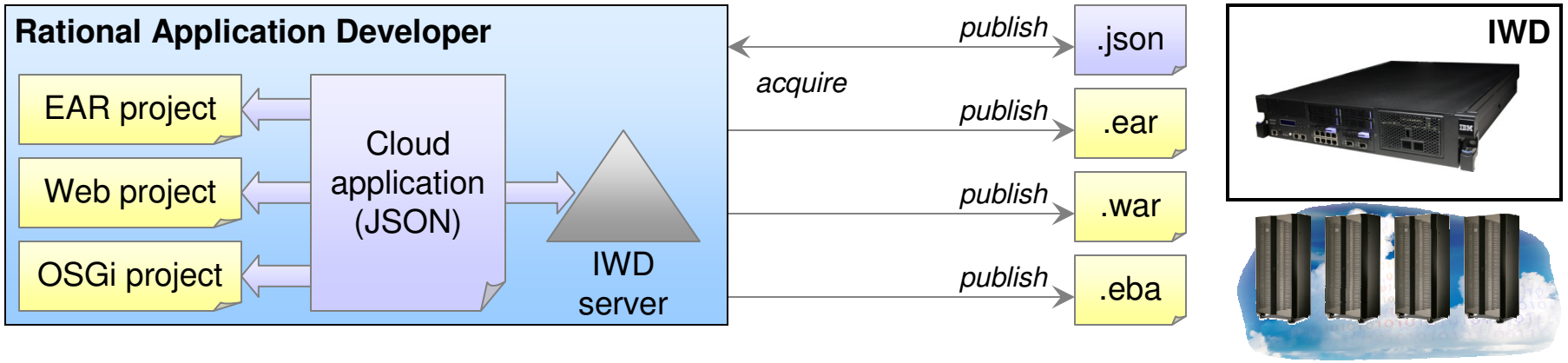
RAD support for IBM Workload Deployer



- Create and edit IWD servers.
- Create skeletal app patterns from workspace projects.
- Acquire app patterns from IWD and associate projects.
- Publish, run, update, stop and remove app patterns.
- Export app patterns to file system.
- Launch dashboard (external).
- Manage multiple versions of IWD.
- Support IWD pattern type and plug-in extensibility.
- Notification and acquisition of changes to app patterns on IWD.
- Import app pattern from file system.
- Get information about app patterns and virtual apps.
- Preferences.
- Launch dashboard (embedded).

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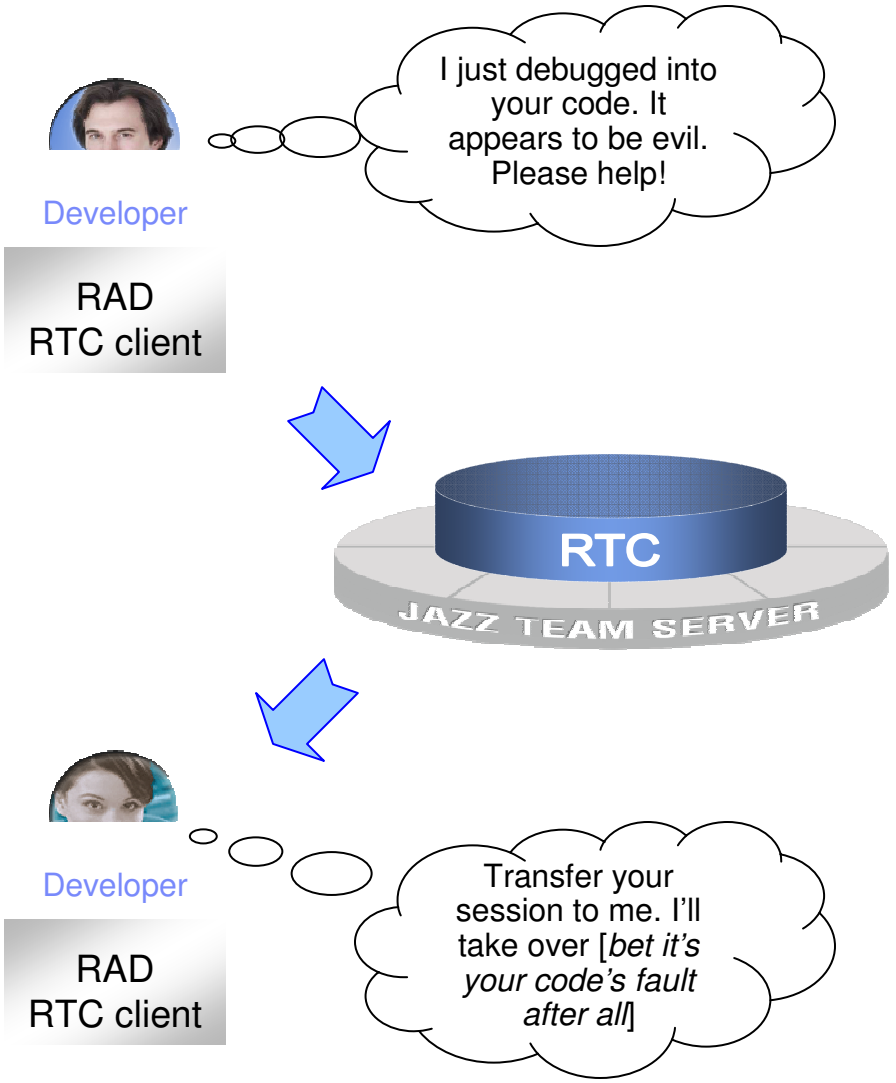
Quality through teamwork – Debugging with RAD and Rational Team concert

- Debugging is a global, 24/7 issue.
- Diagnosis may lead you into somebody else's code…
  - You could spend hours or days learning their code.
  - They could spend hours or days reproducing the bug (or not).
- Don't bring the bug to them.
  Bring them to the bug.
  - Park or transfer debug sessions in real time.
  - Transfer the source.



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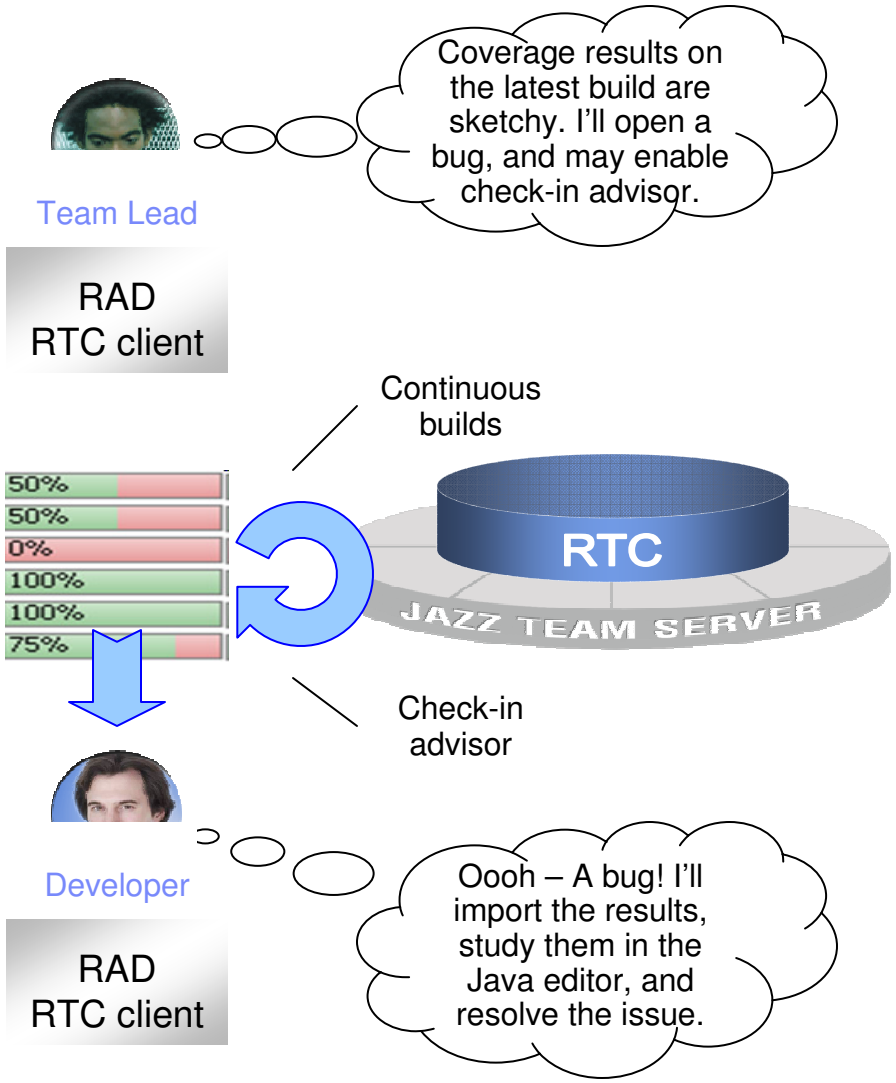
Quality through teamwork – Code coverage with RAD and Rational Team Concert

- Infuse quality from day one.
- Code coverage
  - Run on demand, UI or headless.
  - Integrated into RTC builds.
  - Find dead or incorrect code.
  - Find gaps in the test suite.
- Context sensitive work items.
  - Import results to workspace.
  - Check-in advisor.
  - Prevent checking in of code with missing or inadequate results.



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Agenda

- Right Fit Development Tools
  - Introducing WAS Tools Editions
- Integrated Application Development for WAS
  - Programming Models and Integrated Tools and Runtime
- What's Coming Up with WAS and Tools
  - WAS 8.5 Beta and Liberty

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Developer Feedback

- Developers are looking for more (or less) from the test server runtime in the tools.
  - Greater test simplicity
    - Config model (hard to edit, backup, share)
    - Admin console is for operational mgmt rather than development
    - Problem determination (including within customer apps)
  - Responsiveness
    - Primarily incremental publishing, app install, server startup time
  - Footprint
    - WAS server types defined to RAD have a WAS production server footprint and memory use, for all types of applications

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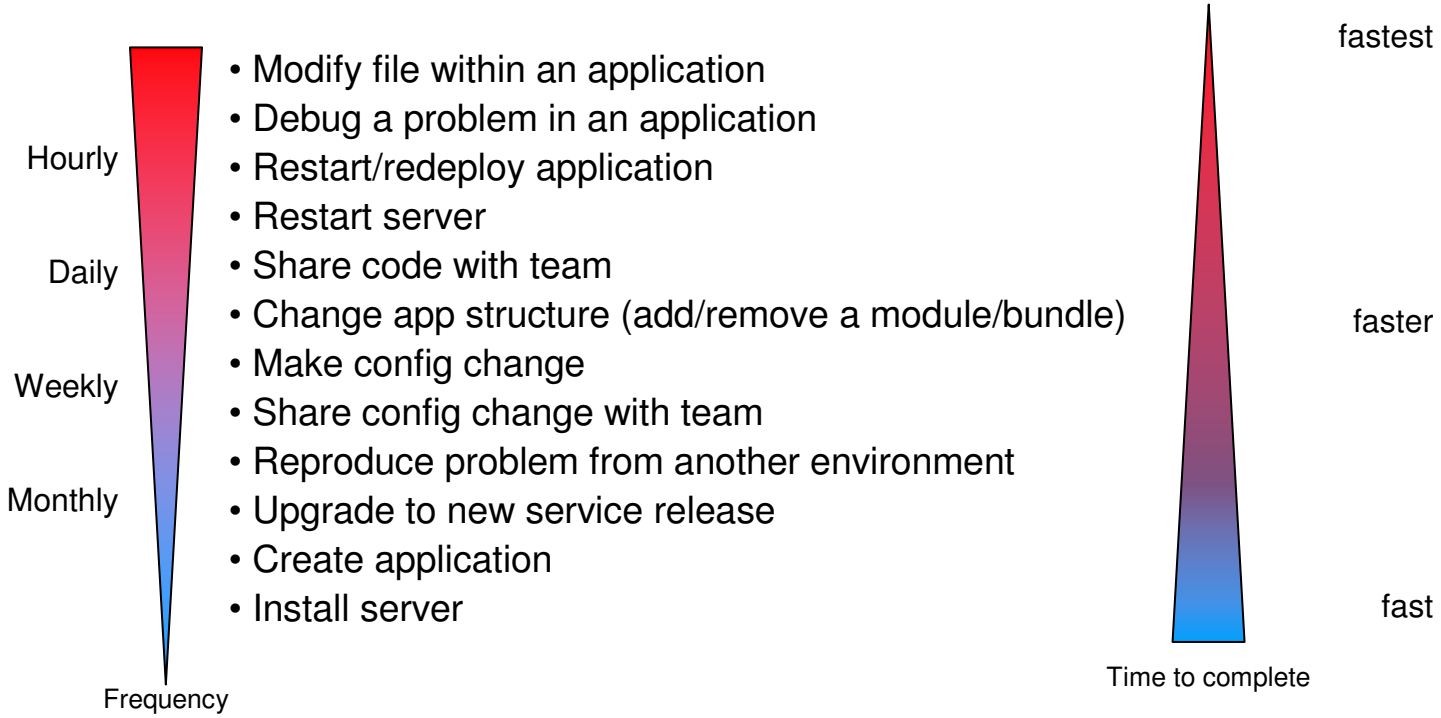
Frequency of Development Tasks

- Common development tasks include:



  - All tasks should be as painless as possible, with special emphasis on the more frequent ones. If the time taken to accomplish these tasks is an impediment to the development, the cost of the fidelity of the test server runtime is challenged.

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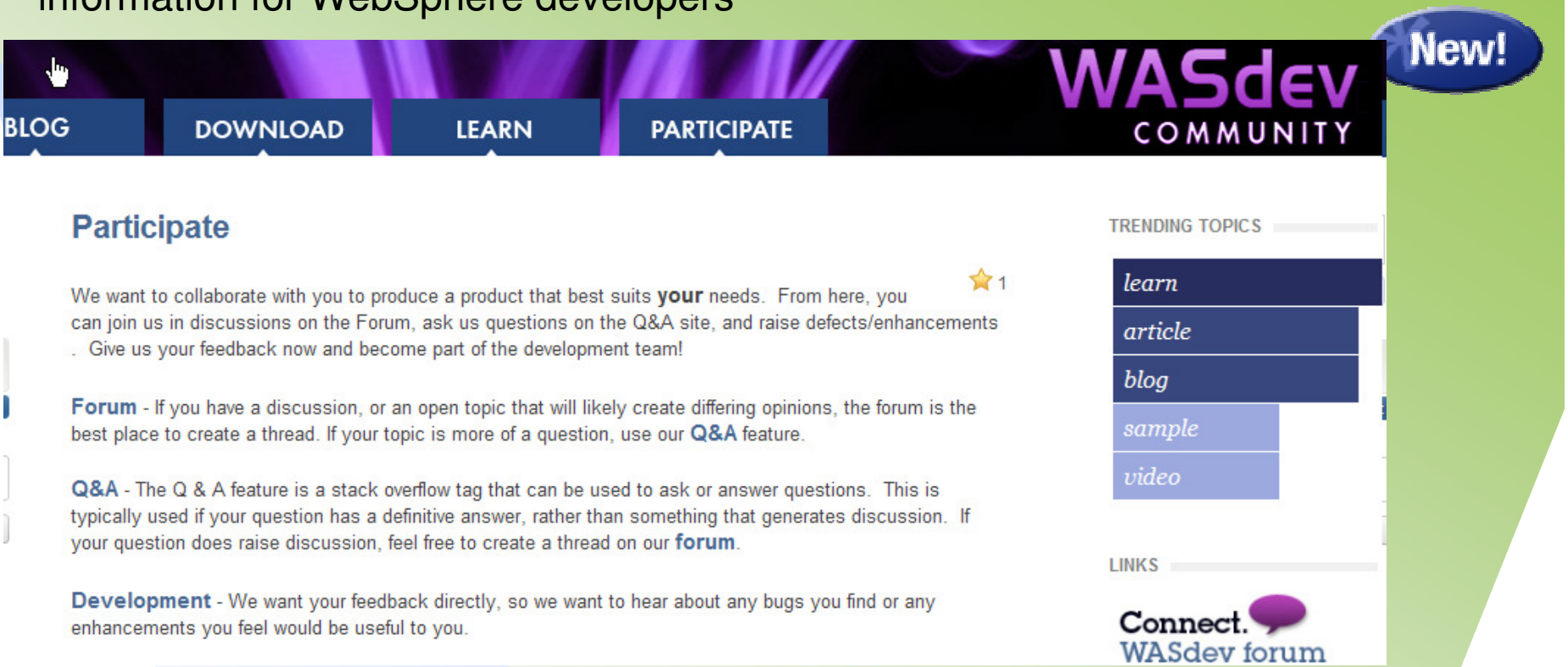
WASDEV Community – www.wasdev.net

- WebSphere has introduced a new website that provides detailed information for WebSphere developers



WAS V8.5 Beta: Introducing WAS "Liberty" Profile

- Not a single static profile: rather a dynamic, flexible profile of the runtime to load only what the application needs
  - Memory footprint (web feature): < 60 MB
  - Profile is dynamic - switch parts of the server on & off w/out restart
- Extremely lightweight
  - Incredibly fast (re)start times: <5 seconds
- Simplified configuration for quick time to productivity; one single config file or modular config (as desired)
  - Easy to share / diff / manage in version control
  - Easy to componentize config across larger development teams
- Easy access
  - smaller download, unzip install, eclipse plugin, mac support, jdk flexibility

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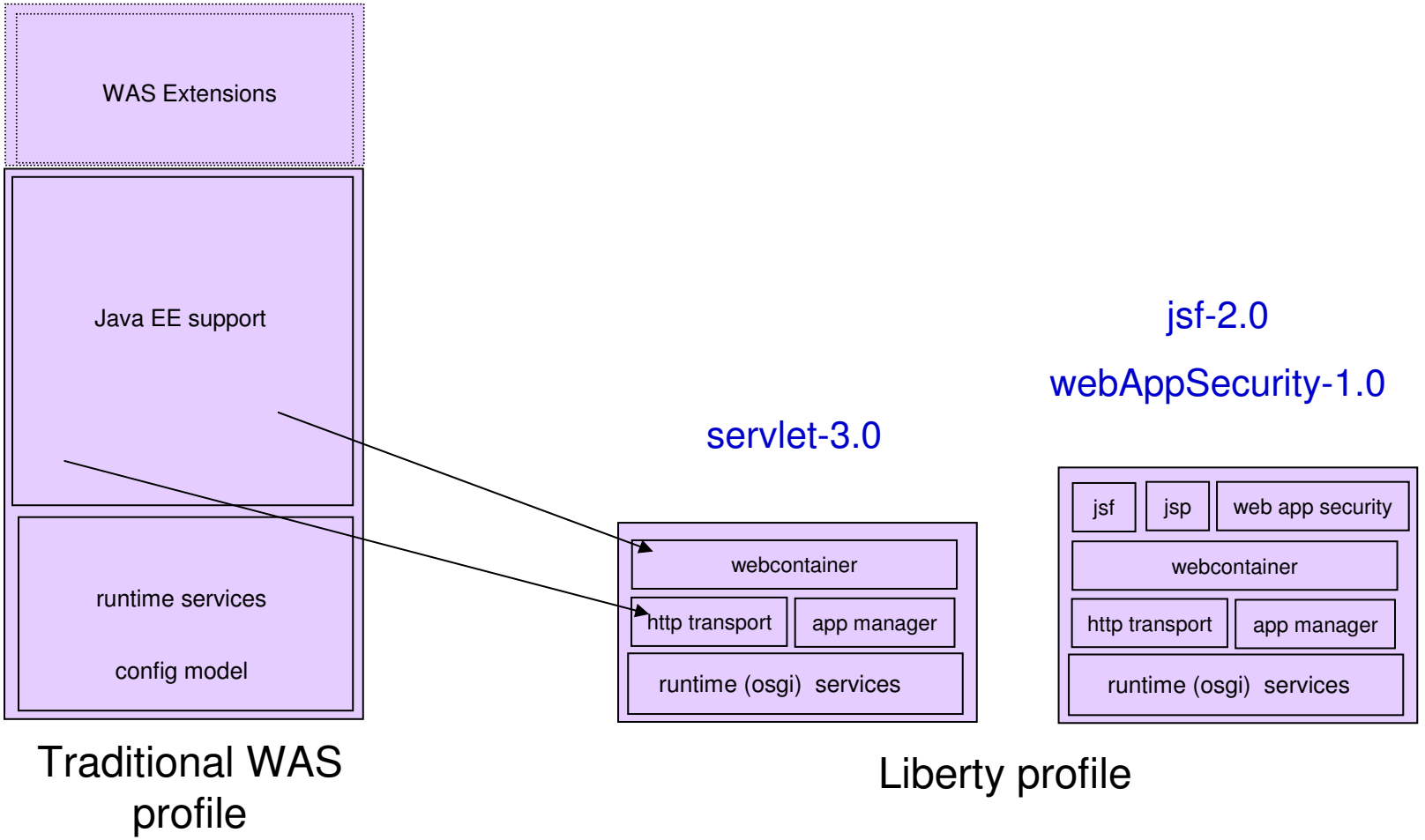
Highly composable runtime based on ‘features’



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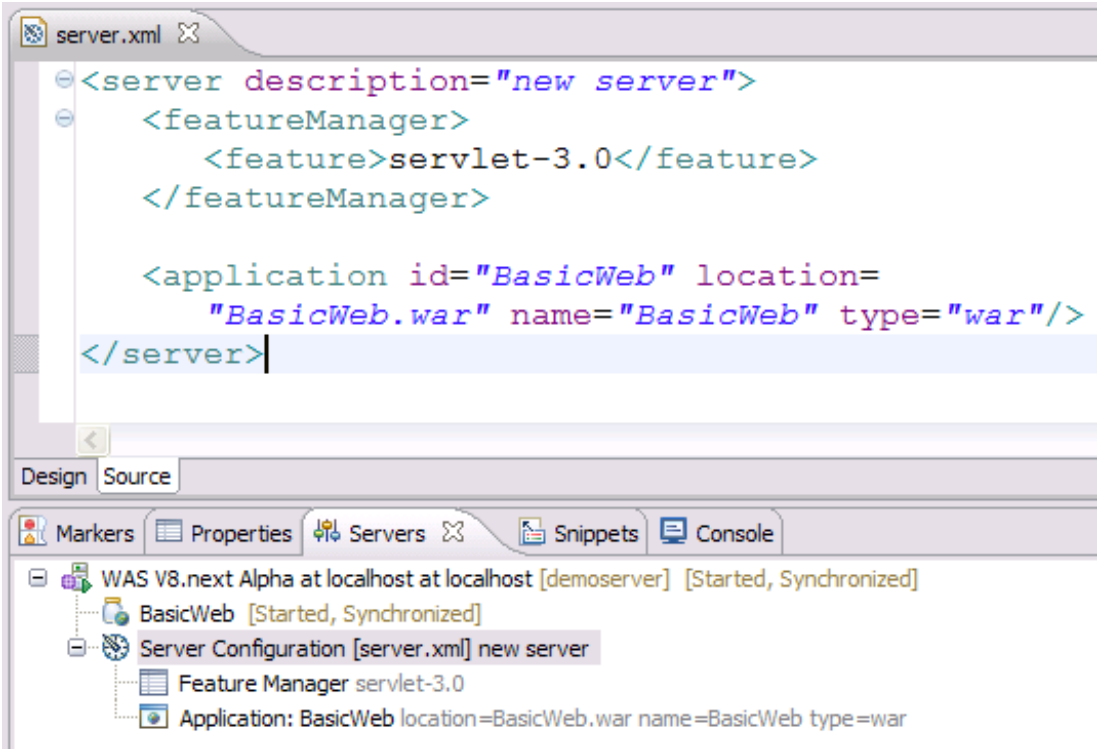
Simplified Sever Configuration

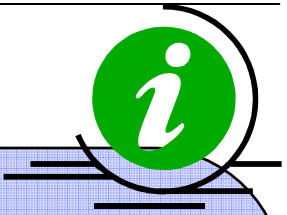
New!

- Simplest case: 1 XML file for all server config
- Editable within the workspace
- Exportable, shareable, versionable



No need for Admin Console, wsadmin, or extended EARs

Key Resources



- RAD site:
  http://www-01.ibm.com/software/awdtools/developer/application/
- RAD Wiki:
  http://www.ibm.com/developerworks/wikis/display/rad/Home
- WASDEV developer community:
  https://www.wasdev.net
- WebSphere Tools Bundles:
  http://www-01.ibm.com/software/webservers/appserv/was/tools/
- WAS for Developers download site:
  http://www.ibm.com/developerworks/downloads/ws/wasdevelopers/
- WAS site:
  http://www.ibm.com/software/webservers/appserv/was/
- Redbooks (RAD v8 and WAS v7 available):
  http://www.redbooks.ibm.com/

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BACKUP

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XML

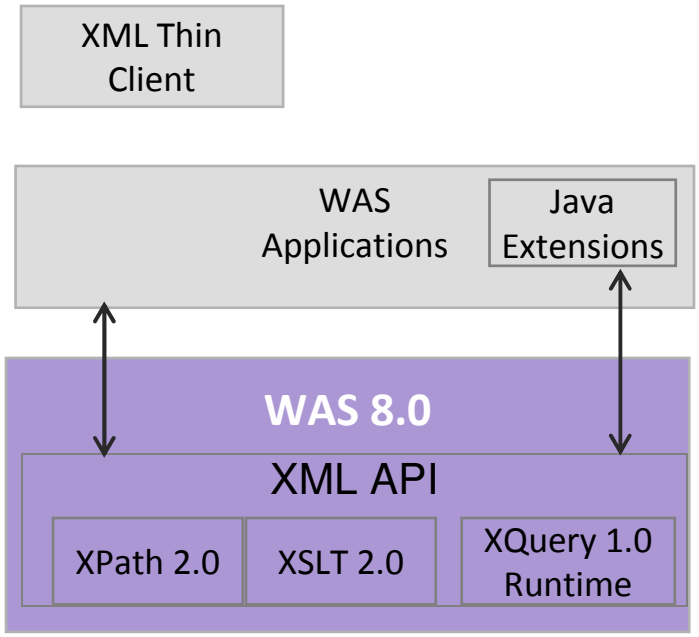
Integrated!

Reuse Java skills & improve ease of use while developing applications to process structured data

Key Features:

- **Speed & Simplicity:** Work with structured data using high performance tools optimized for XML data processing and querying
- **Standards Based:** Support for the XPath 2.0, XSLT 2.0, and XQuery 1.0 W3C standards
- **Consistency:** XML runtime API that offers consistent execution and data navigation API while allowing access to existing Java logic
- **Enterprise grade:** Enterprise class multi-threaded scalability & serviceability with IBM support
- **Samples:** 40+ samples including 4 end to end scenarios
- **Ease of Access & Use:** Integrated with WAS V8

✓ **Developer productivity tools with RAD**: Wizards, and editors to create XPath 2.0 expressions, and XSLT 2.0 files including mapping tools to graphically connect elements between documents



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Communications Enabled Applications (CEA)

Integrated!

Simply and rapidly add communications capabilities, like Click to Call and Cobrowsing, to any Web application leveraging existing skills and an SOA approach

Key Features:

- **Simplicity:** 3 lines of code to add CEA into web app
- **Existing Skills:** Java & JavaScript
- **Mobile Browser Widgets:** Enable native look & feel
- **Telephony Access:** REST & Web service interfaces to Make call, disconnect call & incoming call notifications
- **Web 2.0 Widgets:** Customizable & extensible with iWidget support
  - Click to Call
  - Call Notifications
  - Collaboration Dialog
  - Contact Center and Peer to Peer Cobrowsing
  - Two-way Synchronized Forms
- **PoC Friendly:** Unit test environment & pre-tested with Avaya, Cisco & Nortel unified communications products
- **Ease of Access & Use:** Integrated with WAS V8

✓ **Developer productivity tools with RAD**: Visual construction of web pages with the CEA Web 2.0 Widgets to build communications enabled applications.

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