



# The Eclipse Web Tools Platform Project

Tim Wagner,  
WTP PMC Lead

September 26, 2005

# Eclipse WebTools Project



Open Standards + Open Source

Deliver vendor-neutral tools and frameworks for Web applications on the Eclipse platform.

## Major WTP Themes (0.7 Release)

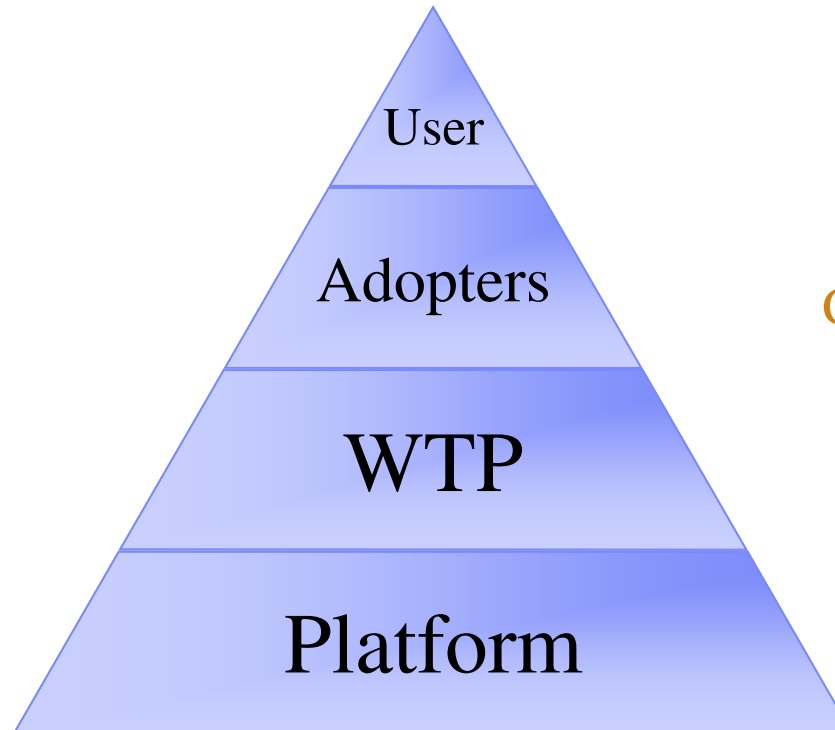


- Extend Eclipse into the domain of J2EE Web Application Development
- Model servers, runtimes, and modules
- Provide platform API and suitable models for tool developers
- Provide core tools for application developers
  - High quality tools in their own right, plus exemplars for tool developers
  - Collection of high-fidelity editing services for Web and J2EE-related languages

# Delivery Model



Ubiquity  
Shared Costs  
“Plumbing”



Value-add  
Proprietary  
Customer-centric

# Contributing Organizations



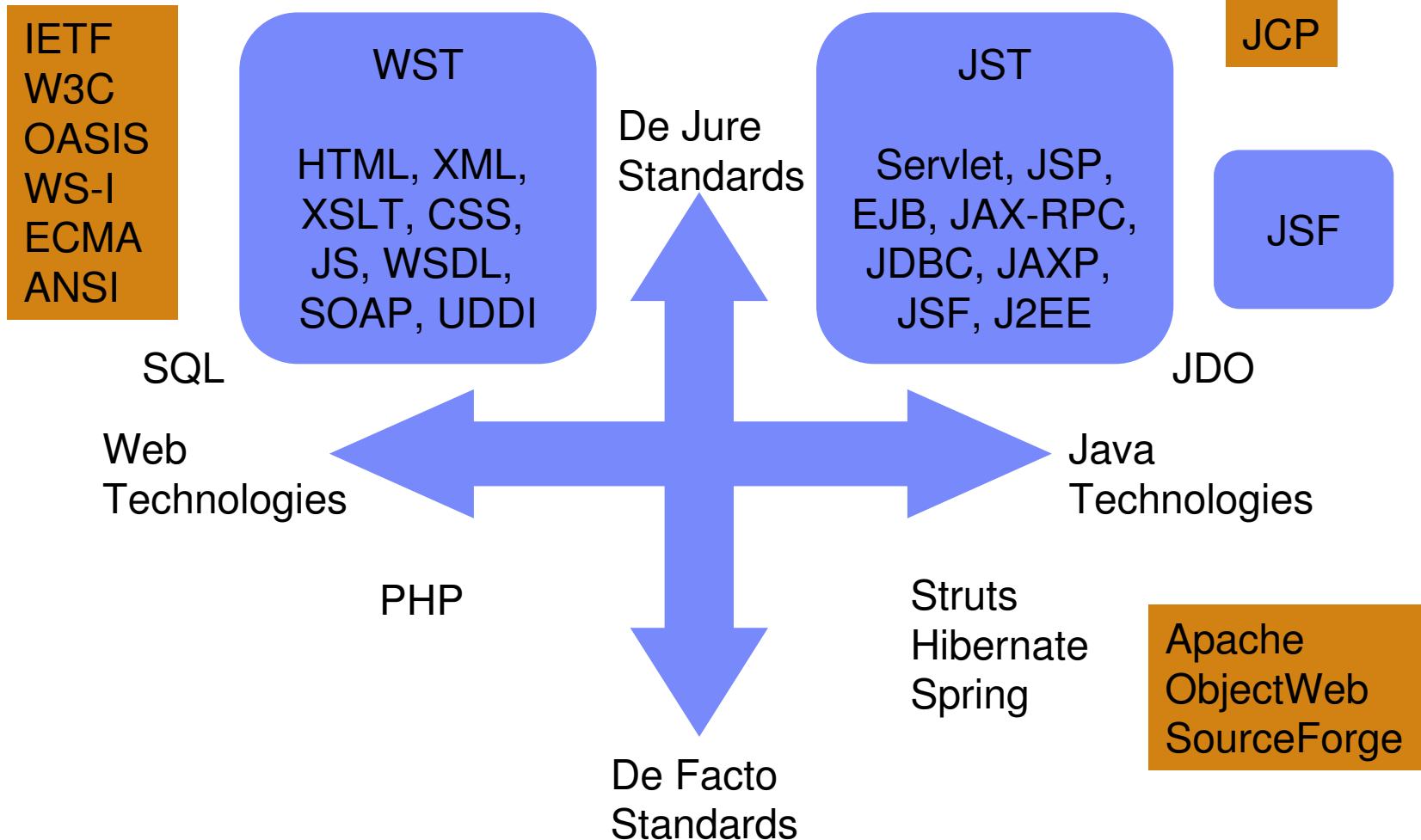
- BEA
- Eteration
- Exadel
- IBM
- Inoopract
- JBoss
- ObjectWeb
- SAS
- Thales
- Turkcell
- University of Karlsruhe
- Oracle

# Commercial Product Adopters

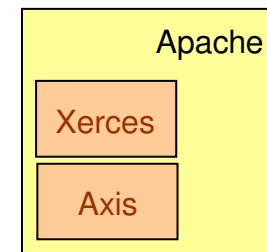
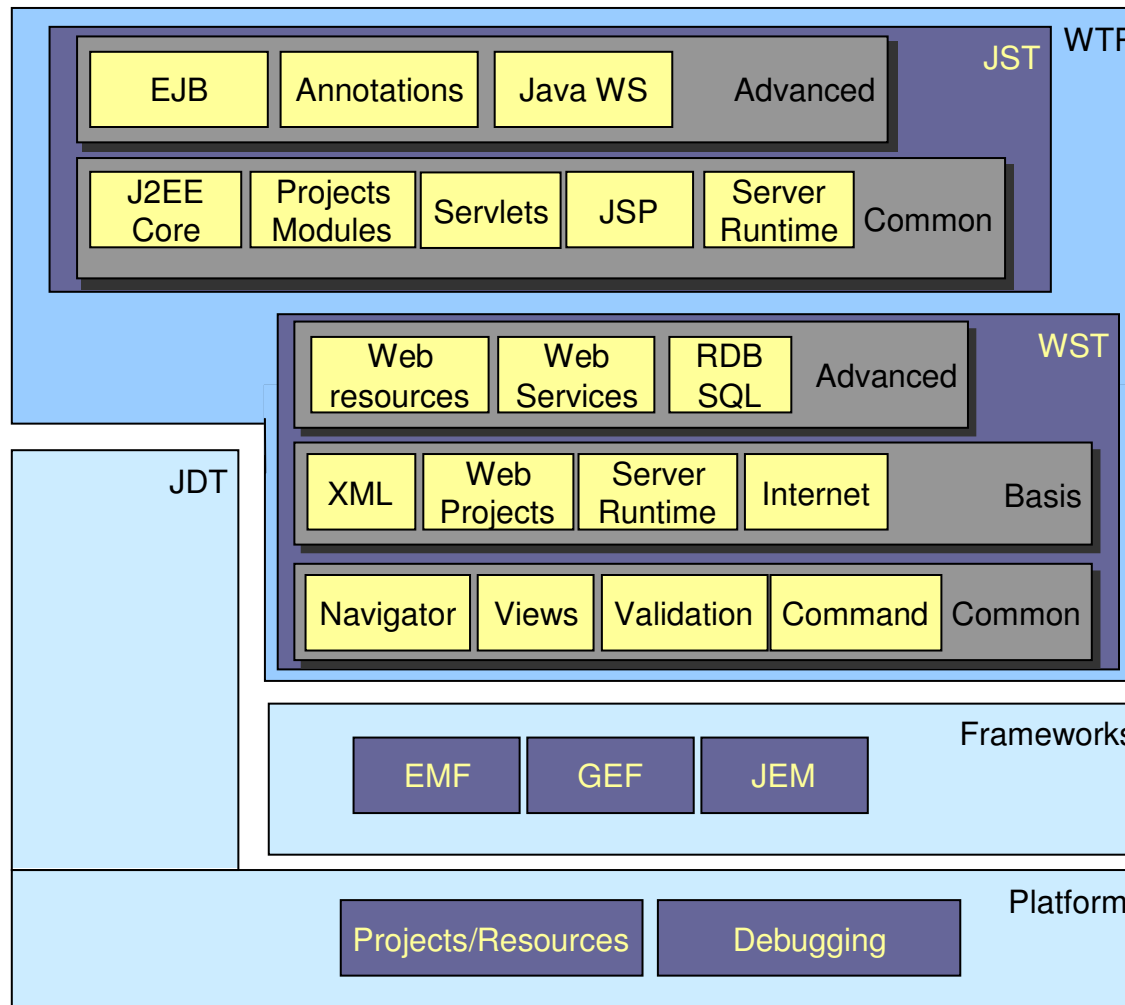


- IBM – Rational Application Developer
- BEA – WebLogic Workshop
- Eteration – Lombok
- Genuitec – myEclipse
- Innoopract – Yoxos
- Exadel – Exadel Studio
- JBoss – JBoss IDE
- SAP – NetWeaver Studio
- Oracle
- Borland

# WTP Project Scopes



# WTP Architecture

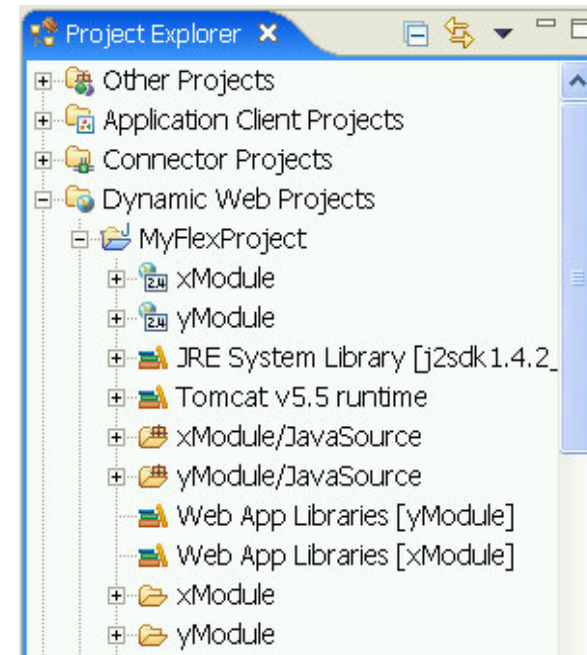
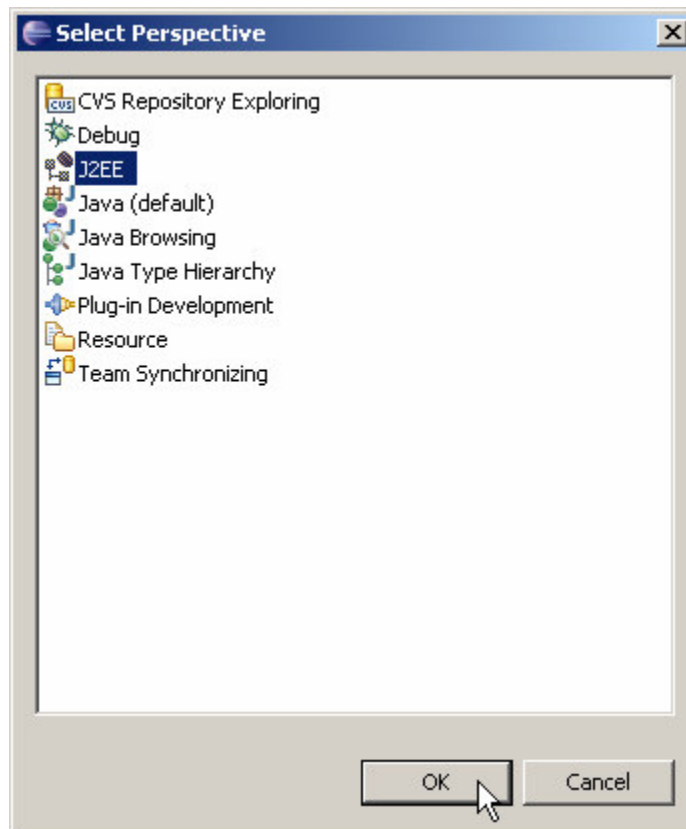




# New Perspective and View



- Navigator provides “virtual” directory of projects, modules



# Language Editing



The screenshot displays the Eclipse IDE interface with the following components:

- Editor:** Shows the XML file `Catalogue.xml` with the following content:

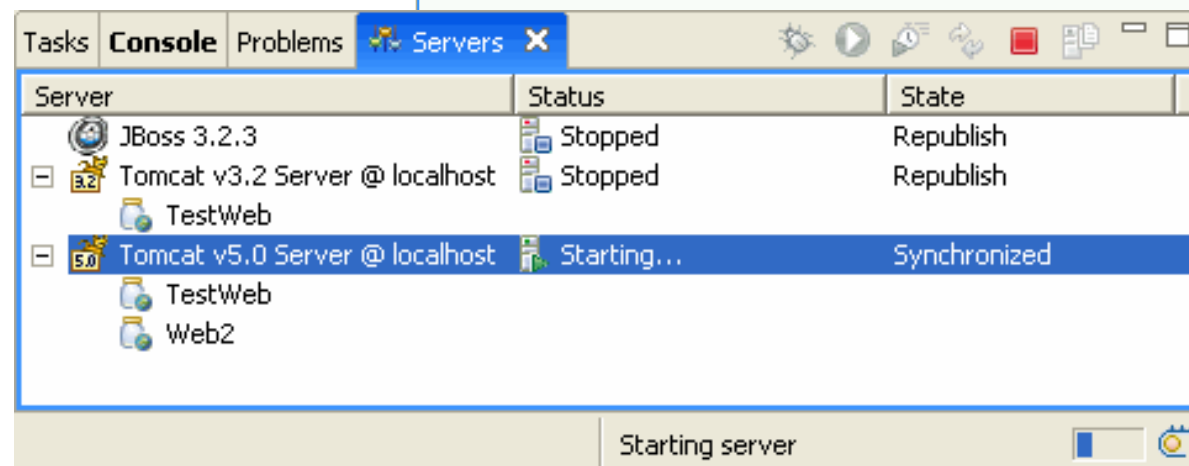
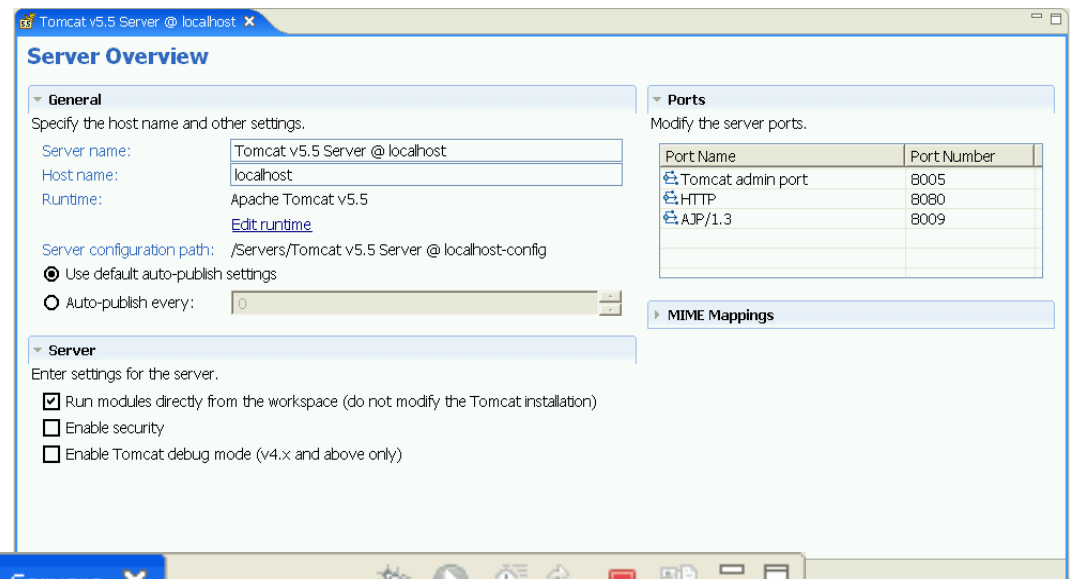
```
<?xml version="1.0" encoding="UTF-8"?>
<c:Catalogue xmlns:c="http://www.eclipse.org/webtools/Catalogue"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
    "http://www.eclipse.org/webtools/Catalogue Catalogue.xsd ">
  <c:Book>
    <title>Professional XML Schema</title>
    <date>2001</date>
    <isbn>1-861005-47-4</isbn>
    <publisher>Wrox Press</publisher>
  </c:Book>
  <c:Magazine>
    <title>WebSphere Developer's Journal</title>
    <date>2001</date>
  </c:Magazine>
  <c:Book>
    <title>Java and XSLT</title>
    <date>2001</date>
    <isbn>0-596-00143-6</isbn>
    <publisher>O'Reilly</publisher>
  </c:Book>
</c:Catalogue>
```
- Outline:** Shows a tree view of the XML document structure:
  - xml
  - c:Catalogue
    - c:Book
      - title
      - date
      - isbn
      - publisher
    - c:Magazine
      - title
      - date
    - c:Book
      - title
      - date
- Properties:** Shows the attributes of the selected `c:Catalogue` element:

Property	Value
Attributes	
xmlns:c	http://www.eclipse.org/webtools/Catalogue
xmlns:xsi	http://www.w3.org/2001/XMLSchema-instance
xsi:schemaLocation	http://www.eclipse.org/webtools/Catalogue Catalogue.xsd
- Context Menu:** A right-click menu is open over the `c:Magazine` element, with the `Comment` option selected.

# Server Functionality



- Actions: start, stop, deploy, debug, add/remove modules
- View: current server status, module deployment

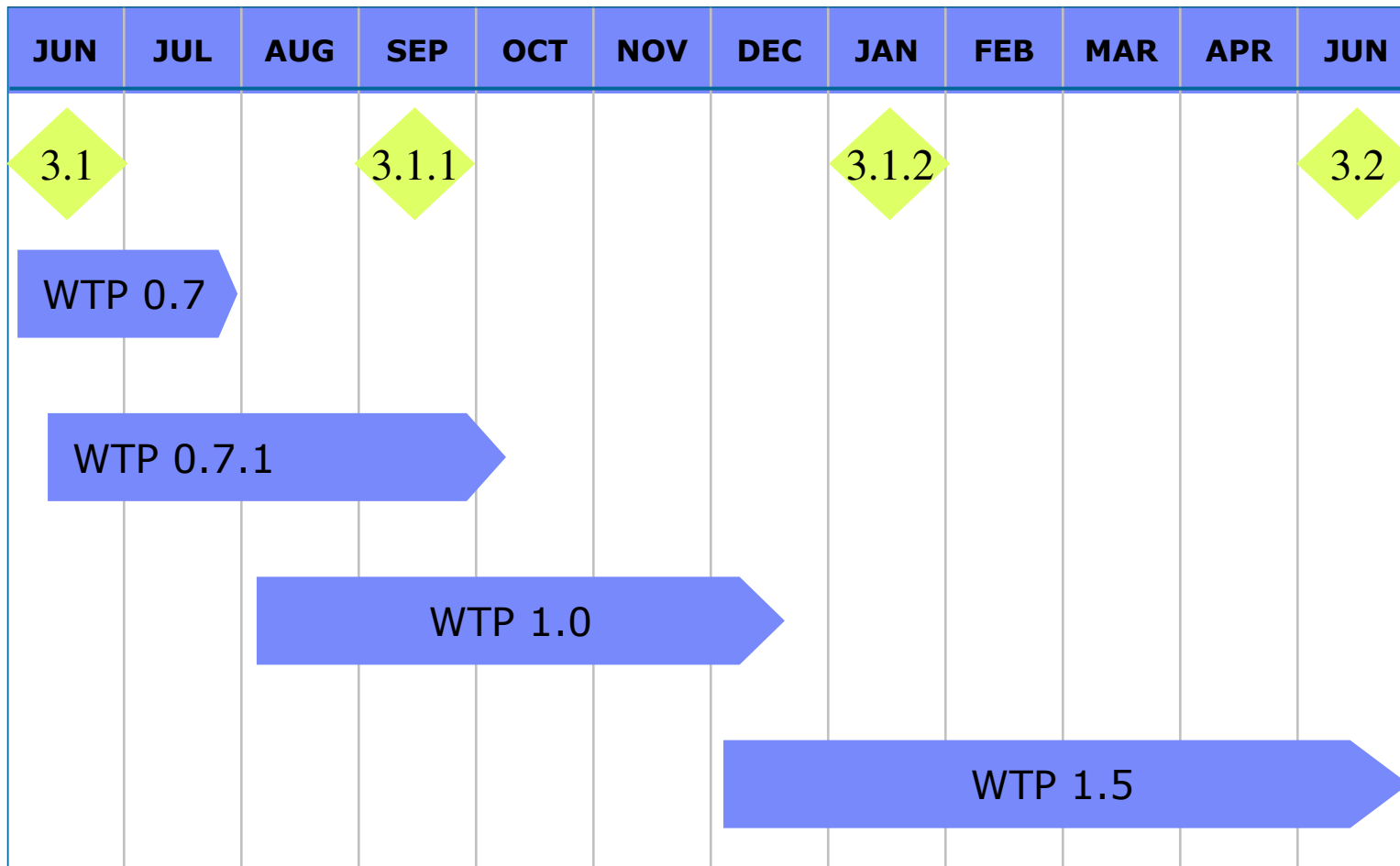


# Supported Servers



- Generic server definitions
  - JBoss 3.2.3
  - JONaS
  - WebLogic 8.1 and 9.0
- Custom server definitions
  - Tomcat
  - Geronimo

# Release Timeline



## WTP 0.7.1 Release (Early October)



- Documentation follow-on to 0.7 release
- NLS bug fixes
- High priority bug fixes

## WTP 1.0 Release (December)



- Roadmap for flexible project model and enhancements to server functionality modeling
- Capture platform point release (3.1.1)
- Extend documentation coverage
- Hardening: bug fixes, performance
- **Initial API declaration**
  - Based on feedback from 0.7 release
  - Only in areas where APIs are sufficiently hardened
  - Not in areas where known changes will occur in 1.5

## WTP 1.5 Release (June Release Train)



- Support J2EE 1.5
  - JSR 181, e.g.
- Rev other standards/supported versions
- Additional server types in distribution
- Architectural harmonization with other projects
- New features: JSR 88, WS-\*, ...



# For More Information



- [www.eclipse.org/webtools](http://www.eclipse.org/webtools)
  - Download v0.7 now
  - Tutorials and presentations available online
  - Planning and requirements gathering (1.0, 1.5)
  - Community information: newsgroups, mailing lists, developer support
    - Report bugs, write docs, help develop
- Attend EclipseCon 2006 in March!



# The Eclipse Web Tools Platform Project

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# WTP Feature Tour

# XML Editing



The screenshot displays the Eclipse IDE interface for editing an XML file named `Catalogue.xml`. The main editor shows the following XML code:

```
<?xml version="1.0" encoding="UTF-8"?>
<c:Catalogue xmlns:c="http://www.eclipse.org/webtools/Catalogue"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="
    "http://www.eclipse.org/webtools/Catalogue Catalogue.xsd ">
  <c:Book>
    <title>Professional XML Schema</title>
    <date>2001</date>
    <isbn>1-861005-47-4</isbn>
    <publisher>Wrox Press</publisher>
  </c:Book>
  <c:Magazine>
    <title>WebSphere Developer's Journal</title>
    <date>2001</date>
  </c:Magazine>
  <c:Book>
    <title>Java and XSLT</title>
    <date>2001</date>
    <isbn>0-596-00143-6</isbn>
    <publisher>O'Reilly</publisher>
  </c:Book>
</c:Catalogue>
```

The Outline view on the right shows the XML tree structure:

- xml
  - c:Catalogue
    - c:Book
      - title
      - date
      - isbn
      - publisher
    - c:Magazine
      - title
      - date
    - c:Book
      - title
      - date

A context menu is open over the `c:Magazine` element in the Outline view, showing options such as `Remove`, `Add DTD Information...`, `Edit Namespaces...`, `Add Child`, `Add Before`, `Add After`, `Replace With`, `Comment`, and `Add Processing Instruction`.

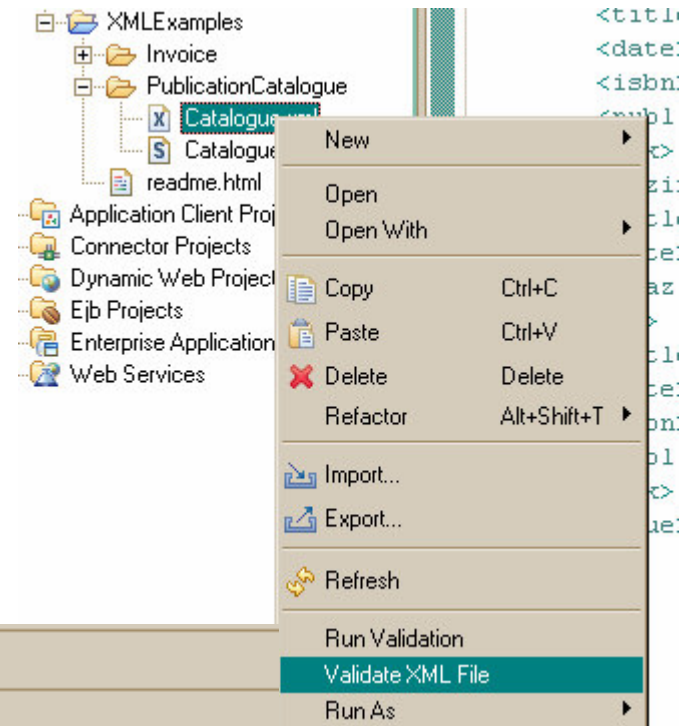
The Properties view at the bottom shows the attributes of the selected `c:Catalogue` element:

Property	Value
Attributes	
xmlns:c	http://www.eclipse.org/webtools/Catalogue
xmlns:xsi	http://www.w3.org/2001/XMLSchema-instance
xsi:schemaLocation	http://www.eclipse.org/webtools/Catalogue Catalogue.xsd

# XML Error Checking



- As-you-type checking and problem reports
- Well-formedness checks and schema validation (when available)



Tasks	Servers	Snippets	Console	Error Log	Search	Problems	
1 error, 0 warnings, 0 infos							
Description	Resource	In Folder	Location				
cvc-complex-type.2.4.d: Invalid conte...	Catalogue...	XMLexamples/Publication...	line 11				

```
<wrong>stuff</wrong>
</c:B cvc-complex-type.2.4.d: Invalid content was found starting with element 'wrong'. No child element
<c:Ma expected at this point.
<
```

# XML Content Assist



- Schema-based
- DTD-based
- Inferred

```
<c:Book>
```

```
<ti
```

```
<dat < > title
```

```
<isb
```

```
<pub
```

**Element** : title  
**Data Type** : string

# Schema Editing



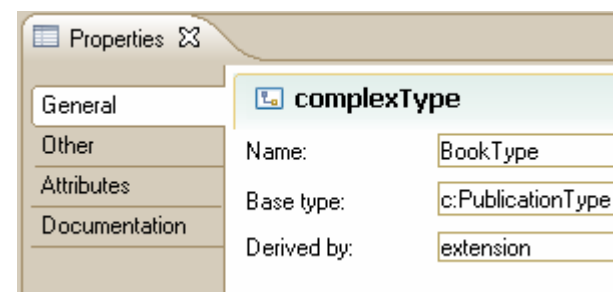
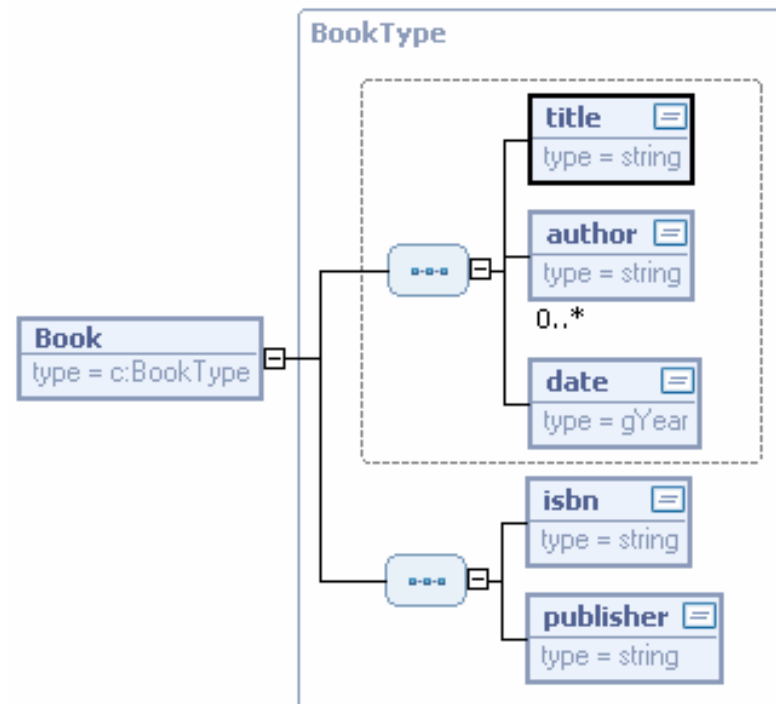
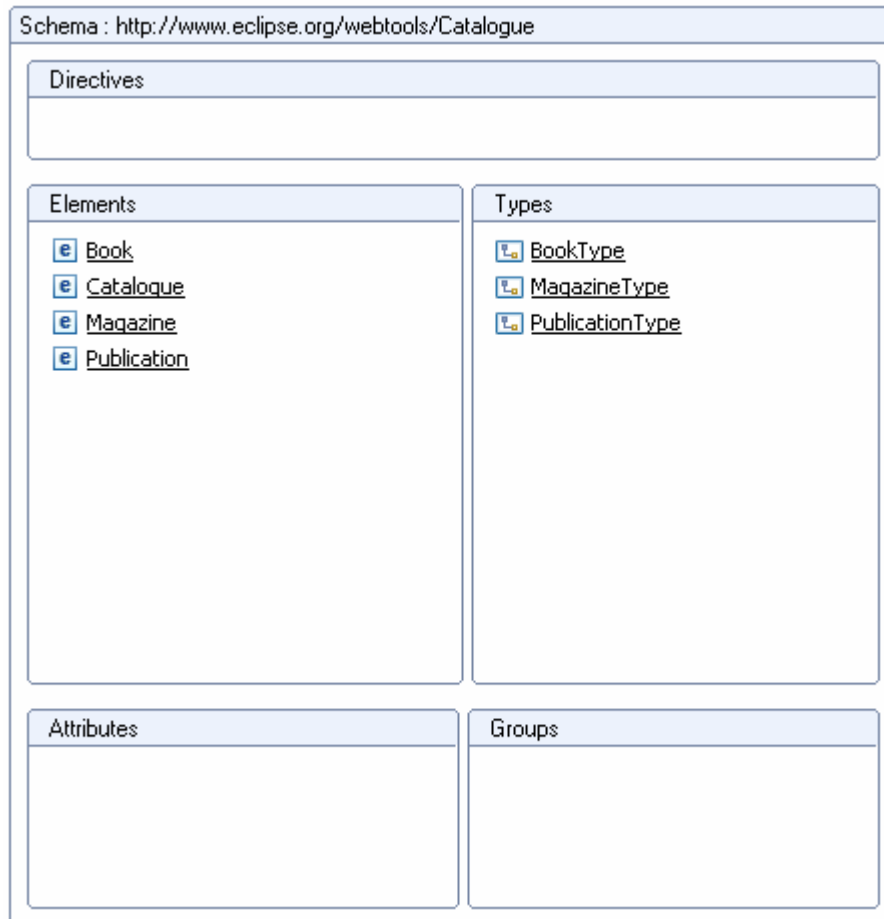
```
readme Catalogue.xsd Catalogue.xml
<schema xmlns="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://www.eclipse.org/webtools/Catalo

  <complexType name="PublicationType">
    <sequence>
      <element name="title" type="string"/>
      <element name="author" type="string" minOccurs="0"
      <element name="date" type="gYear"/>
    </sequence>
  </complexType>

  <complexType name="BookType">
    <complexContent>
      <extension base="c:PublicationType">
        <sequence>
          <element name="isbn" type="string" />
          <element name="publisher" type="string"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

  <complexType name="MagazineType">
    <complexContent>
      <restriction base="c:PublicationType">
        <sequence>
```

# Schema Graphical View





# Schema Content Assist



- Schema-informed content assist is available while editing
- F3 can also be used to locate the target of a type reference

```
<complexType name="BookType">
  <complexContent>
    <extension base="c:">
      <sequence>
        <element name="author" type="c:BookType"/>
        <element name="magazine" type="c:MagazineType"/>
        <element name="publication" type="c:PublicationType"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

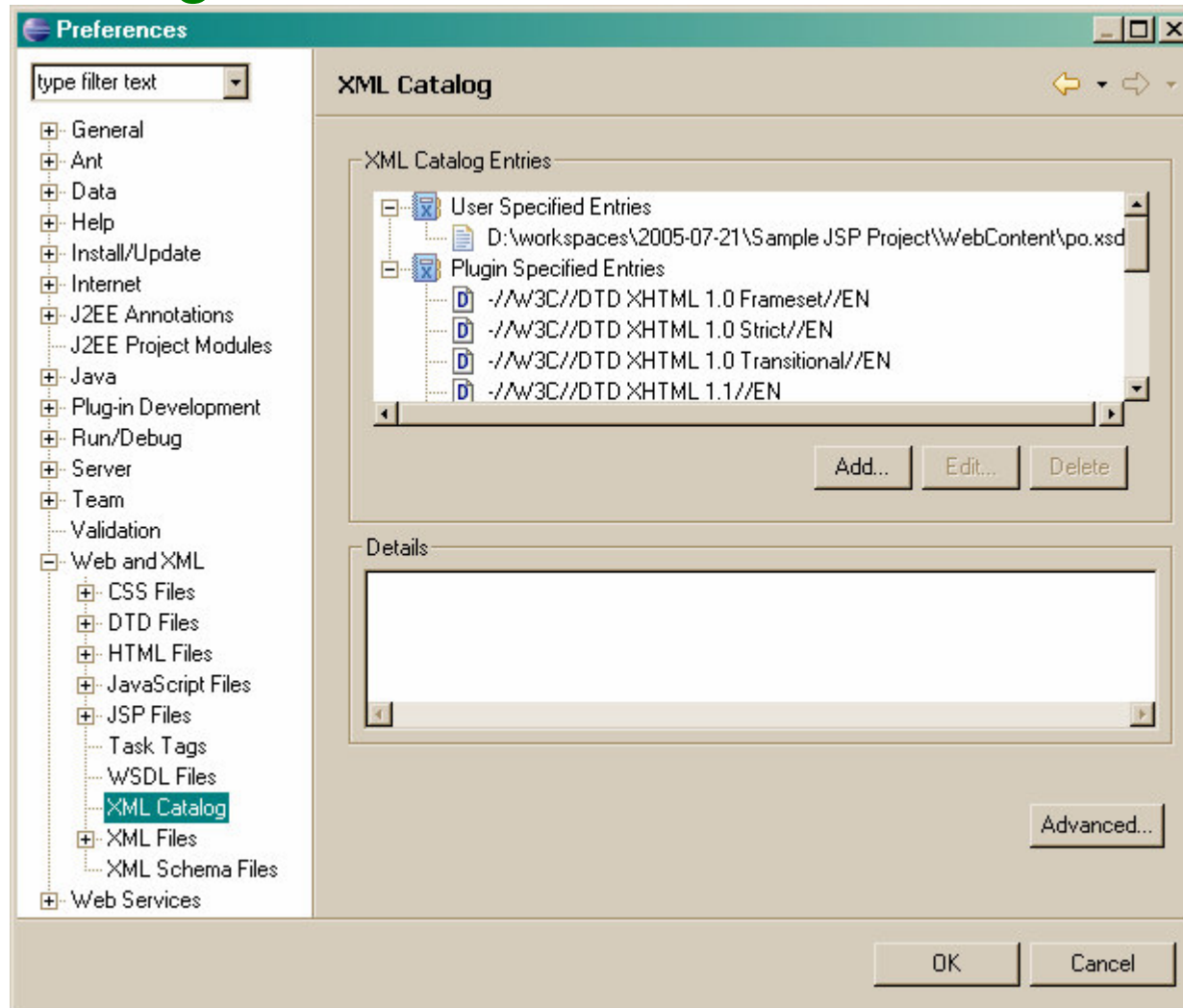
<complexType name="MagazineType">
  <complexContent>
    <restriction base="c:PublicationType">

```

@c:BookType  
@c:MagazineType  
@c:PublicationType

**Attribute** : base  
**Data Type** : QName

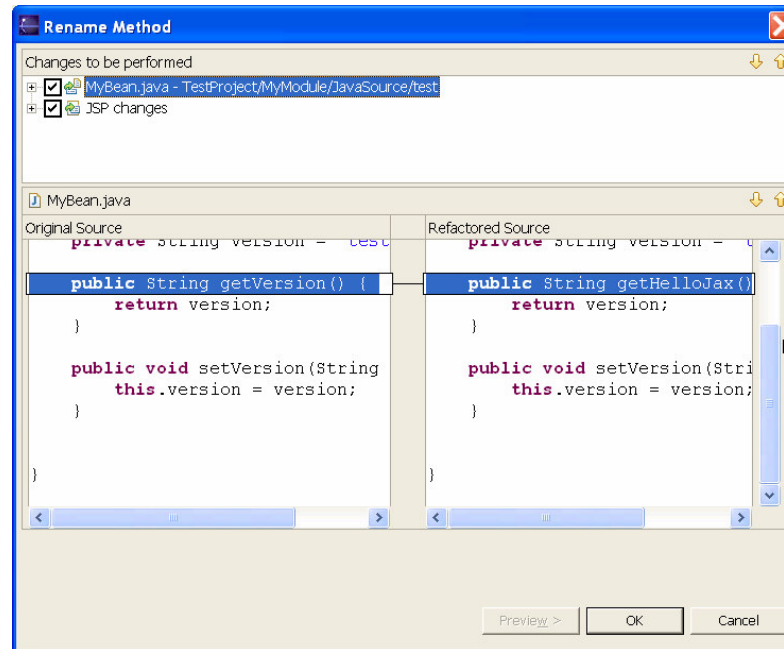
# Schema Storage



# JSP Editing



- Content assist
- As-you-type checking
- Custom tag support
- Refactoring participation
- JSP 2.0 EL support



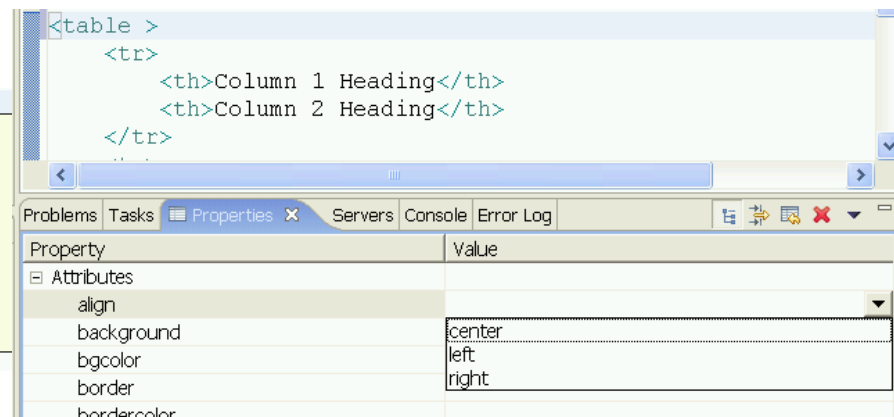
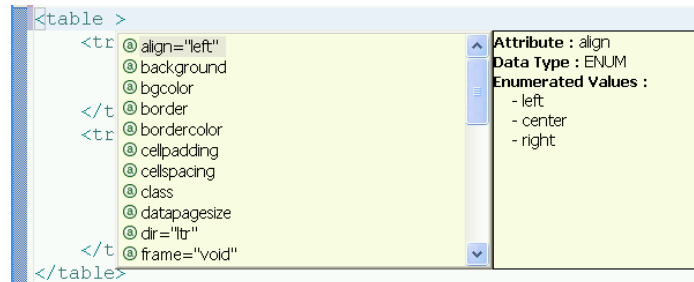
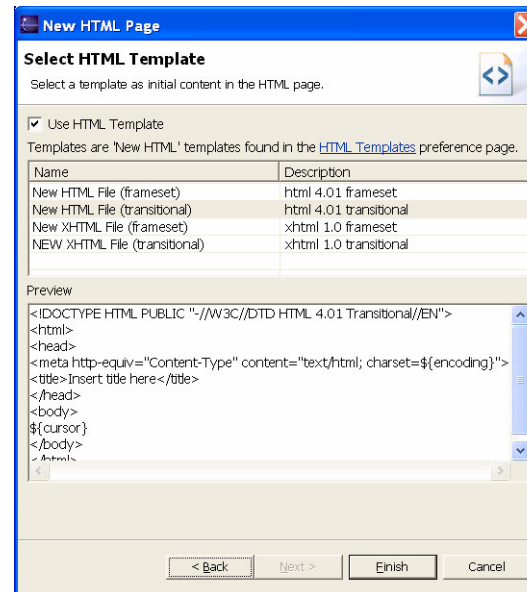
```
<center><br>
<display:table name="pageScope.results.rows" pagesize="10" sort="list"
  <display:column property="dfs" sortable=""/>
  <display:column property="id" sortable="true"/>
  <display:column property="name" sortable="true"/>
  <display:column property="price" sortable="true"/>
</display:table>
</ce
<cent
<%
</ce
</body>
</html>
```

Displays a list in an html table, formatting each item in the list according to the Column tags nested inside of this tag. Use the list attribute to indicate the Collection of data, in some scope, that the tag should operate on. Supports the export of the list data to alternative formats such as CSV, Excel, and XML. The contents of the list can be sorted, and the list can be broken into individual pages for display. If you use this tag in Struts, or in some other framework where the page is included via a jsp:include, you should use the requestURI attribute to indicate where tag generated links should point.

# HTML Editing



- Wizards for file creation
- Delimiter completion
- As-you-type checking
- Property editing



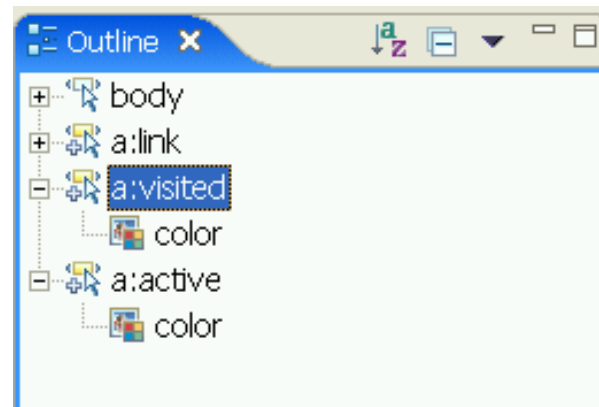
# CSS Editing



- Content assist
- Outline view
- Bracket matching
- Property view
- Structured selection

```
*wtp.css x
body {
  font-family:
  color: rgb(0,
  background-co
 alink="#ff000
link="#0000ee
vlink="#551a8
}
a:link {
  color: #0000e
}
```

The screenshot shows the Eclipse IDE with a CSS file named \*wtp.css. The code defines styles for the body and a:link. A content assist popup is visible for the font-family property, listing options: serif, sans-serif, cursive, fantasy, monospace, and inherit.



# ECMAScript Editing

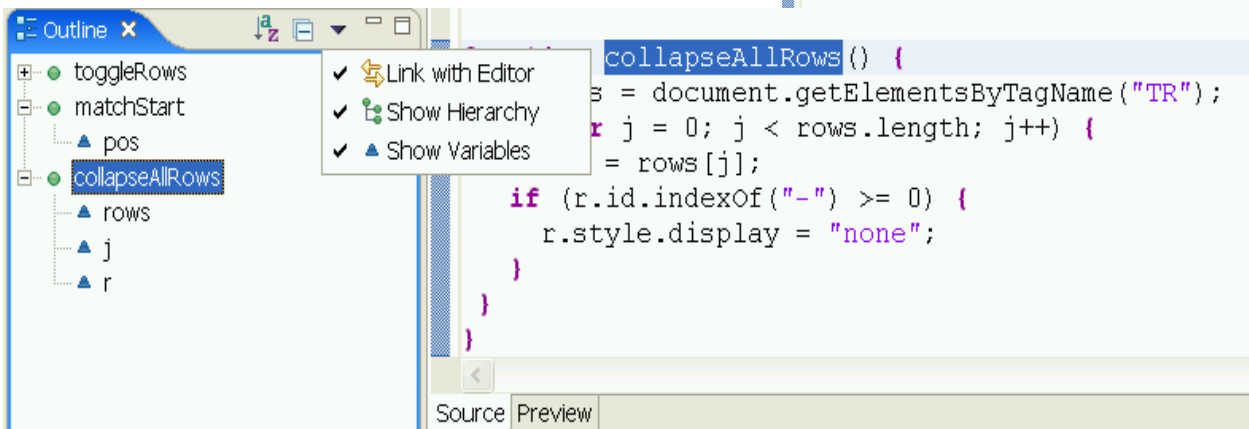


- Syntax highlighting
- Content assist
- Delimiter highlighting
- Outline view

```
function toggleRows(element) {
    var rows = document.getElementsByTagName("TR");
    element.style.backgroundColor = "url(images/folder-closed.gif)";
    var newDisplay = "none";
    var thisID = element.parentNode.parentNode.parentNode.id + "-";
    // Are we expanding or contracting? If the first child is hidden, we expand
    for (var i = 0; i < rows.length; i++) {
        var r = rows[i];

        if (matchStart(r.id, thisID, true)) {
            if (r.style.display == "none") {
                if (document.all) newDisplay = "block"; //IE4+ specific code
                else newDisplay = "table-row"; //Netscape and Mozilla
                element.style.backgroundColor = "url(images/folder-open.gif)";
            }
            break;
            collapseAllRows();
        }
    }

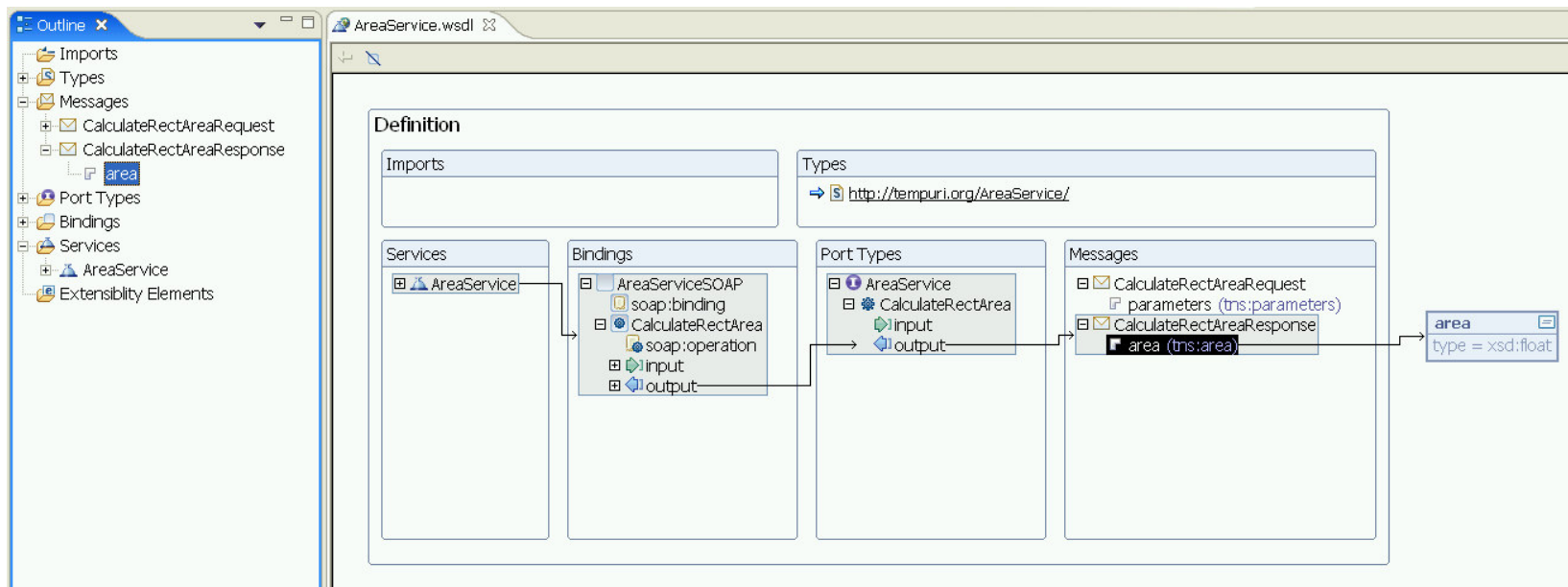
    // When expanding, only expand one level. Collapse all descendants.
    var matchDirectChildrenOnly = (newDisplay != "none");
}
```



# WSDL Editor



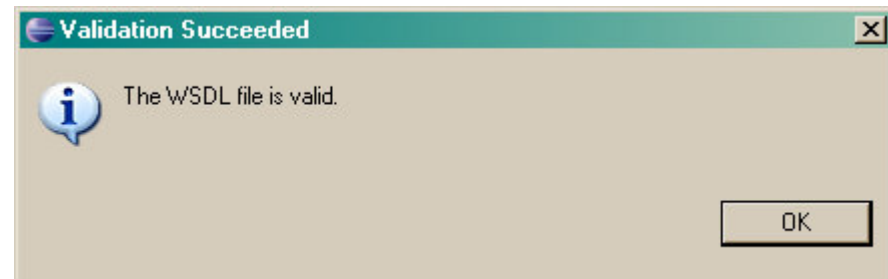
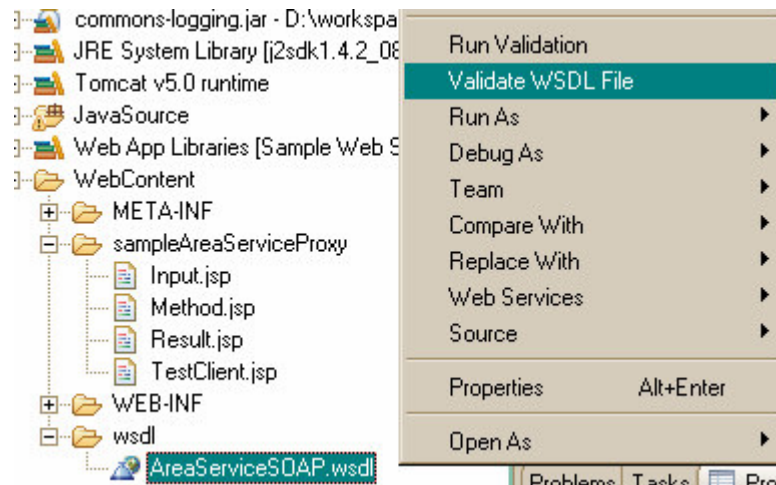
- Graphical and source editing modes
- GEF/EMF-based
- Integrated XSD editor



# Validation



- WTP includes WS-I basic profile validation
- To validate, select “Validate the WSDL file” from the Project Navigator’s context menu





# Internet Tools

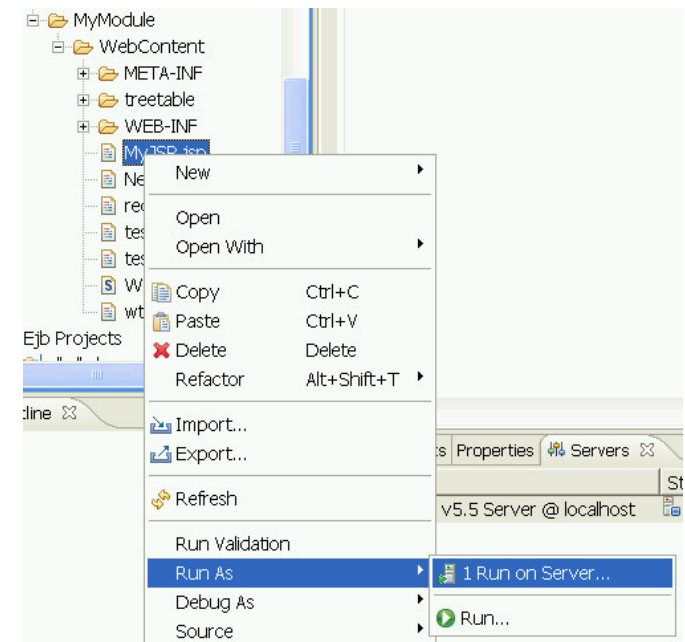


- Built-in browser and caching support
  - Moved to platform in 3.1
- TCP/IP monitor
- Proxy settings reflected in Eclipse preferences

# Basic Server Framework



- Models types of servers, installed server runtimes, deployable units (modules)
- Language- and deployment-neutral
- Provides extensible, vendor-neutral framework for implementing new server types



# Server View



- Actions: start, stop, deploy, debug, add/remove modules
- View: current server status, module deployment

The screenshot displays the Eclipse IDE interface. The top window, titled "Tomcat v5.5 Server @ localhost", shows the "Server Overview" configuration page. It includes sections for "General" (Server name, Host name, Runtime), "Ports" (a table of port names and numbers), and "Server" (checkboxes for running modules directly, security, and debug mode). Below this, the "Servers" view is visible, showing a list of servers with their status and state. The "Tomcat v5.0 Server @ localhost" is highlighted, showing a status of "Starting..." and a state of "Synchronized".

Port Name	Port Number
Tomcat admin port	8005
HTTP	8080
AJP/1.3	8009

Server	Status	State
JBoss 3.2.3	Stopped	Republish
Tomcat v3.2 Server @ localhost	Stopped	Republish
TestWeb		
Tomcat v5.0 Server @ localhost	Starting...	Synchronized
TestWeb		
Web2		

# Server Integration



- Generic (XML based)
  - Runtime definition (start, stop, publisher, classpath)
  - Properties (per-server values)
  - ANT build file-based publisher
  - Generic server definitions for JBoss 3.2.3, JONaS, WebLogic 8.1 and 9.0
- Custom (API-based)
  - Extension points for build, assembly, publish/[re]deploy, run/debug, monitor
  - Tomcat, Geronimo support included

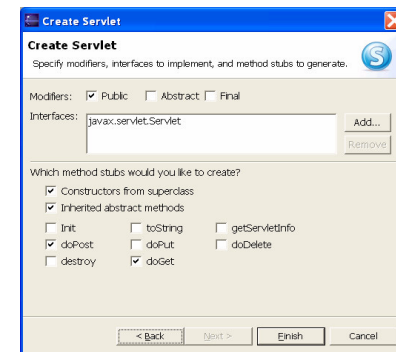
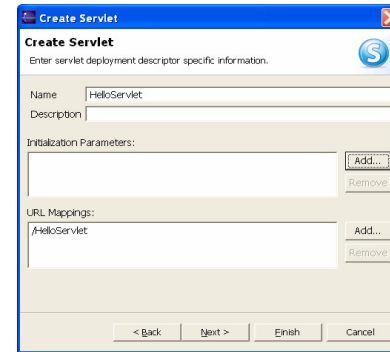
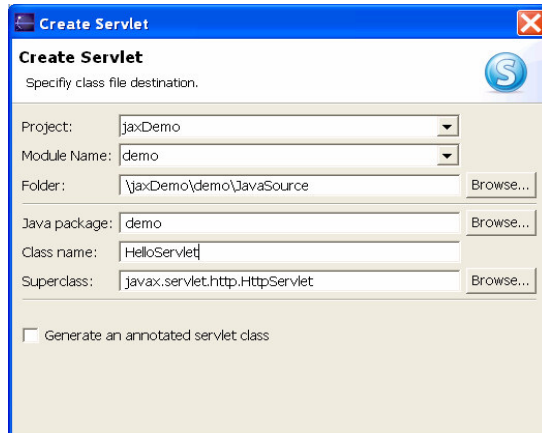
The image shows two overlapping dialog boxes from the Eclipse IDE. The top dialog is titled 'New Server' and contains the following sections:

- Define a New Server**: Choose the type of server to create.
- Specify the host where you want to pu**: Host name: localhost
- Select the server type:**: A tree view showing folders for Apache, BEA Systems, and Generic. Under BEA Systems, 'BEA Weblogic Server (Enhanced)' is selected.
- Installed Server Runtime Environments**: A section for managing installed server runtime definitions, with buttons for Add, Edit, and Remove.

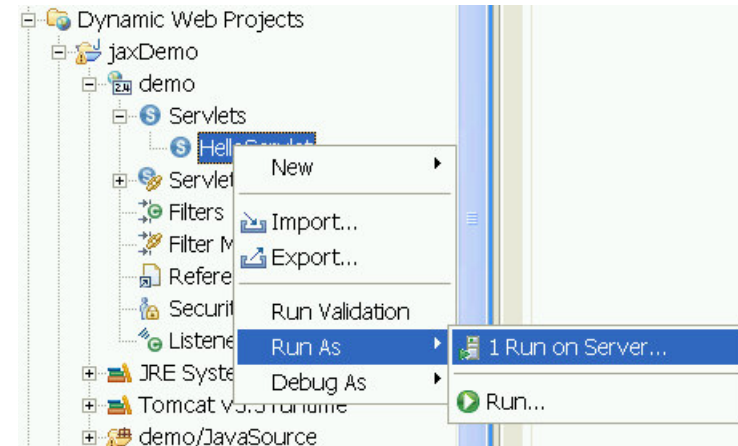
The bottom dialog is titled 'New Server Runtime' and contains the following sections:

- New Server Runtime**: Define a new installed server runtime environment.
- Runtimes are used at build time to compile projects.**
- Select the type of runtime that you want to define:**: A tree view showing folders for Apache, Basic, BEA Systems, and Generic. Under BEA Systems, 'BEA Weblogic Server Runtime' is selected.
- View By:** Vendor

# Servlets – Wizards and “Run As...”



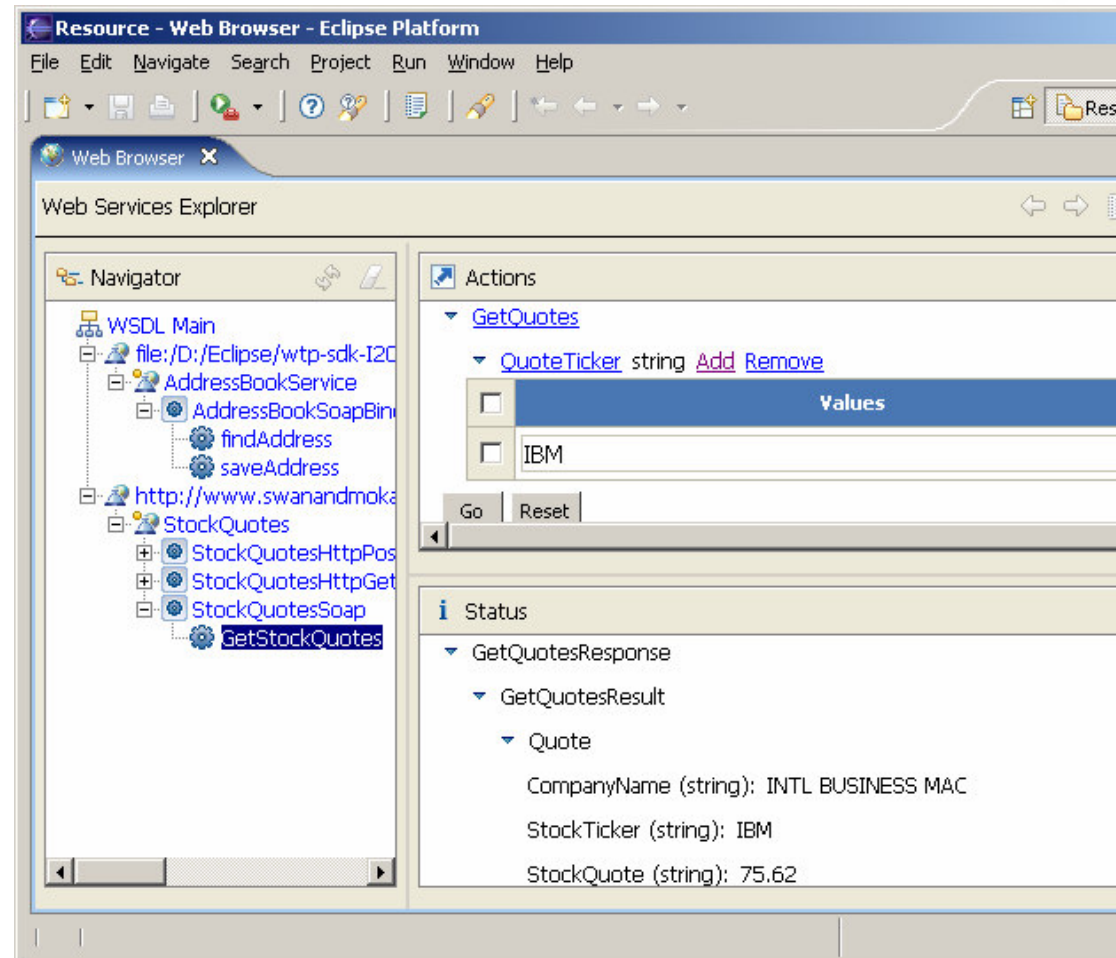
```
<?xml version="1.0" encoding="UTF-8"?>
<web-app id="WebApp_ID" version="2.4" xmlns="http://java
<display-name>demo</display-name>
<servlet>
  <description/>
  <display-name>HelloServlet</display-name>
  <servlet-name>HelloServlet</servlet-name>
  <servlet-class>demo.HelloServlet</servlet-class>
</servlet>
<servlet-mapping>
  <servlet-name>HelloServlet</servlet-name>
  <url-pattern>/HelloServlet</url-pattern>
</servlet-mapping>
```



# Web Services Explorer



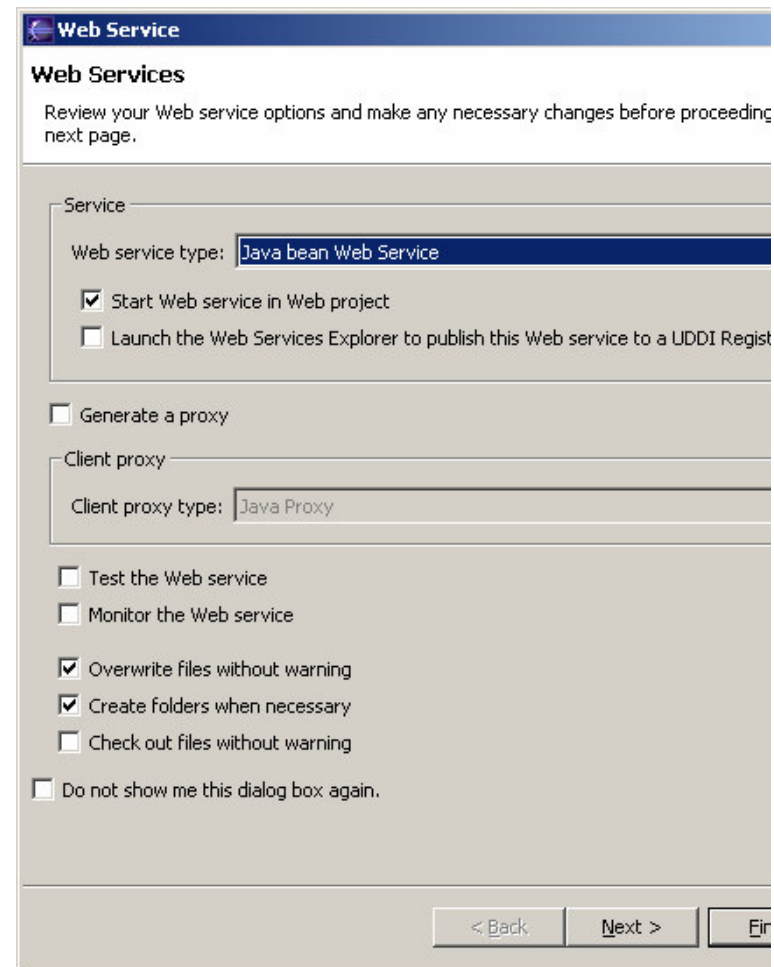
- Integrated Web application
- UDDI publish and query
- Dynamically execute WSDL



# Web Service Wizards



- Top-down (start from WSDL)
- Bottom-up
  - JAX-RPC codegen, support for Apache Axis
  - JSR 109 deployment
  - Servlet- or EJB-based



# J2EE Tooling



- Ability to create J2EE module structures and artifacts within projects
- Import/export J2EE deployable archives
- Validate J2EE artifacts to ensure compliance with the specification



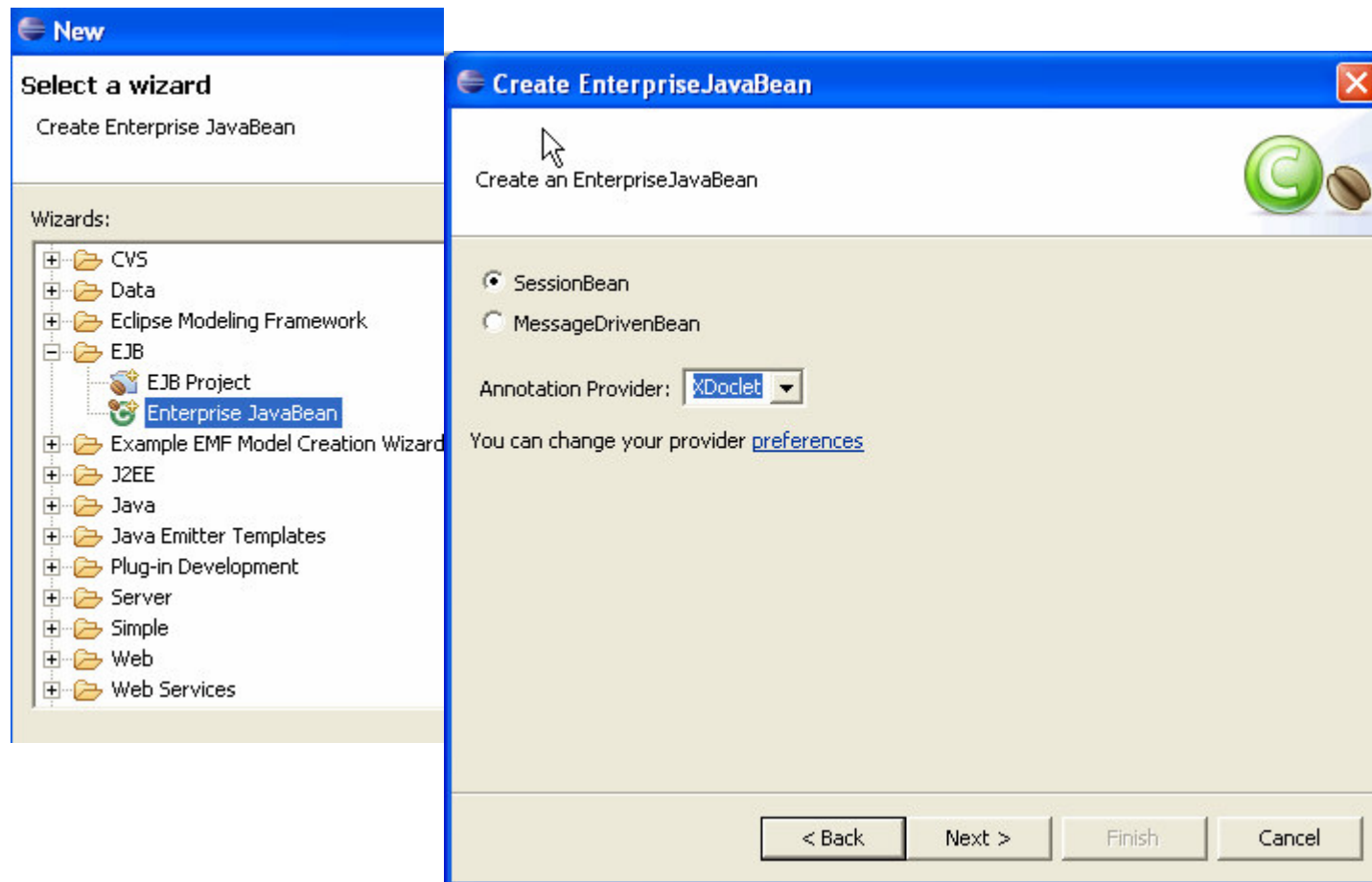
# Creating an EAR project



The screenshot illustrates the process of creating an EAR project in Eclipse. It shows three overlapping windows:

- New Project Wizard:** The 'Enterprise Application Project' wizard is selected under the 'J2EE' category.
- New EAR Application Project Dialog:** The 'Name' is 'AreaApplication', 'Project location' is 'D:\eclipseworld\workspaces\dryrun', 'Target server' is 'Generic BEA WebLogic Server 9.0(Generic)', and 'Module Version' is '1.4'. A 'Hide Advanced <<' button is visible.
- J2EE Modules to Add to the EAR Dialog:** Two modules are selected: 'Area EJB' and 'Sample Web Service Project'. 'Select All' and 'Deselect' buttons are at the bottom.

# EJB Support (Session, MBeans)



# Bean Package and Class Name



**Create EnterpriseJavaBean**

EnterpriseJavaBean  
Specify class file destination.

Project: Area EJB

Module Name: Area EJB

Folder: \Area EJB\ejbModule

Java package: area

Class name: AreaCalculatorBean

Superclass: java.lang.Object

Generate an annotated bean class

< Back 

- EJB Projects
  - Area EJB
    - Area EJB
      - Session Beans
        - AreaCalculator
          - AreaCalculatorHome
          - AreaCalculator
          - AreaCalculatorLocalHome
          - AreaCalculatorLocal
          - AreaCalculatorSession
        - Entity Beans
        - Message-Driven Beans
        - AssemblyDescriptor
      - JRE System Library [JDK 1.5]
      - BEA WebLogic Server v9.0
      - ejbModule
        - area
          - AreaCalculator.java
          - AreaCalculatorBean.java
          - AreaCalculatorHome.java
          - AreaCalculatorLocal.java
          - AreaCalculatorLocalHome.j
          - AreaCalculatorSession.java
          - AreaCalculatorUtil.java
        - META-INF
          - ejb-jar.xml
          - MANIFEST.MF