



Web 2.0 and Mobile Development
Fast and Easy with IBM® Rational®
Application Developer 8.0

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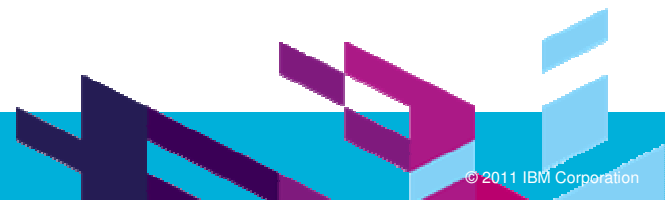
Agenda

- Web 2.0 development challenges
- WebSphere feature pack for web 2.0 and mobile - key technologies to success
- How does Rational Application Developer 8.0 help me?
- Mobile development tools
- Demo
- Q&A

Challenges

- The center piece is the browser
 - ▶ It's difficult to make a web page look and behave the same across all browsers
 - ▶ HTML5 is promising, but won't help if need to support older browsers
- 3 approaches to develop dynamic web pages: Open Web (Ajax), Flex, Silverlight
 - ▶ Only the Open Web way avoids vendor lock-in
 - ▶ But which one to use among the 200+ Ajax libraries?
- Support
 - ▶ Most Ajax libraries rely on the community for support
- Enterprise readiness
 - ▶ Architectural scalability, code maintainability
 - ▶ Accessibility (a11n), internationalization (i18n)
 - ▶ Packaging, extensibility, unit testing framework

And the answer lies in...



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External Web Services



Event-Driven Data

IBM \$125.25 +\$2.50... MSFT \$43.75 -\$1.50 ...



Web Feeds

POJO, EJB

Web Services

PLANTS BY WEBSHERE

Home Flowers Trees Vegetables Accessories

Gardens of summer
They all start with the right flowers...

Tips
Preserve extra grass seed by keeping it dry. Tape boxes and bags closed, or seal them into plastic bags. Be sure to remove extra air from the bags. Store all seed in a cool, dry area such as a garage or basement.

Specials

Bonsai Tree	\$30.00 each
Red Delicious	\$3.50 (5)

Powered by WebSphere e-business software

Ajax Application

Accessories Login Options

Web 2.0 Feature Pack for WebSphere Application Server

Ajax Development

Based on Dojo (dojotoolkit.org) with IBM extensions. Reduces time to market and helps lower Ajax adoption costs.

Web 2.0 to SOA Connectivity

For enabling connectivity from Ajax clients to SOA and JEE assets (Web Remoting, JAX-RS). Extends enterprise data to customers and partners through web feeds.

Ajax Messaging

For connecting Ajax clients to real-time updated data like stock quotes or instant messaging.

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The many ways Rational Application Developer can help you

- JavaScript tools and Dojo tools
- Integrated unit testing and debugging tools
- Front-end and back-end development all in one IDE
 - ▶ Ajax/Dojo, HTML/CSS, JSF, Struts
 - ▶ REST, OSGi, Java EE
- Full software development lifecycle support
 - ▶ Coding, unit testing, code analysis, test coverage
 - ▶ Integrates with Rational Team Concert
- Supports technologies in the IBM WebSphere Application Server Feature Pack for Web 2.0
- Ease of testing, one-click deployment and profiling

Overview of RAD Web 2.0 tools

- For the “code warriors”
 - ▶ HTML, CSS, JavaScript, Dojo, JSON
 - ▶ syntax highlighting, code assist, validation, outline, formatting
- For the “visual minds”
 - ▶ Visual editing of HTML, CSS files
- First class Dojo support
 - ▶ Project set-up, Dojo Object-Oriented paradigm, deployment optimization
- RESTful backend development
 - ▶ JAX-RS, HTTP RPC

Tools for the code warriors

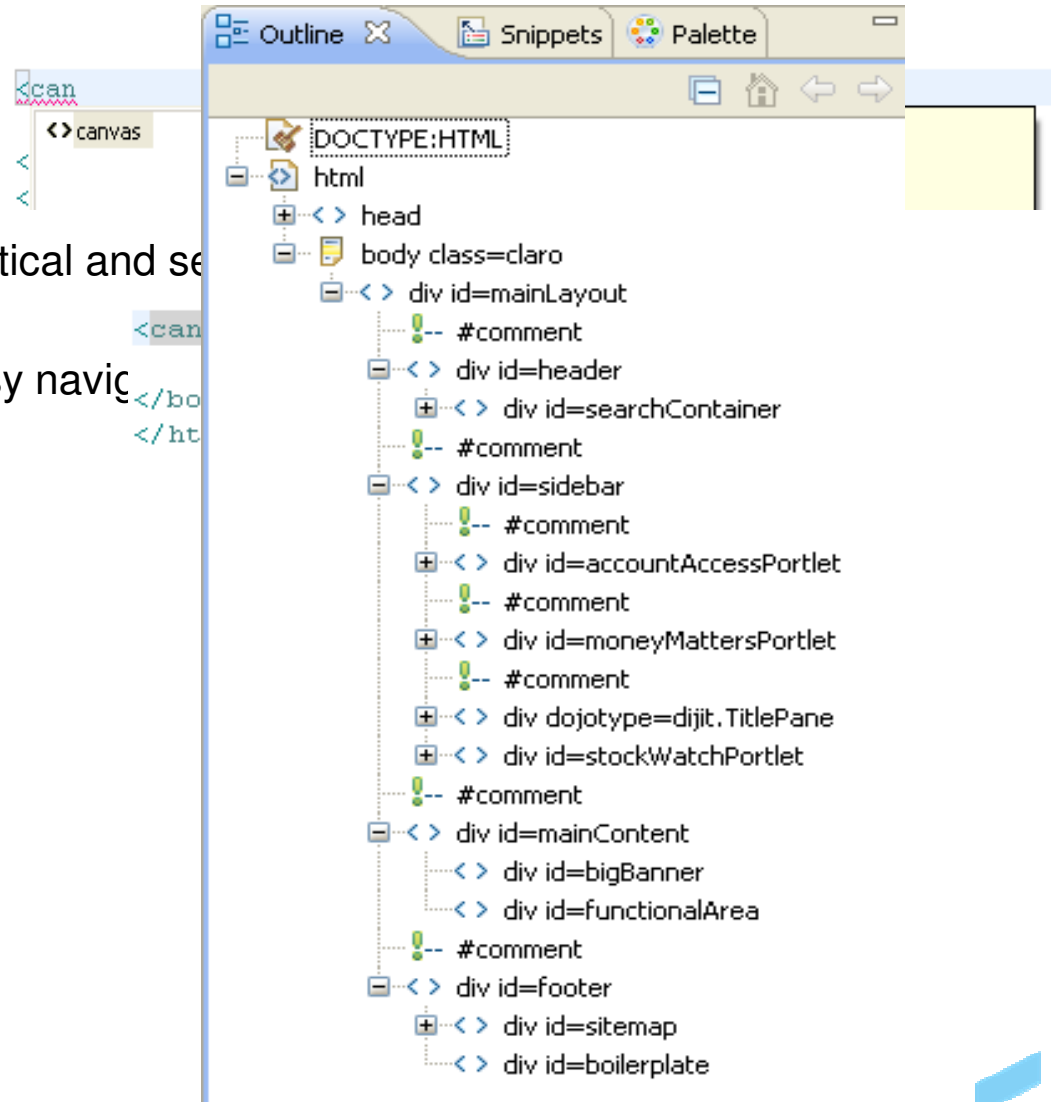


by Wiertz Sébastien
<http://www.flickr.com/photos/wiertz/4604140980/sizes/z/in/photostream/>

Source code tools

- HTML code

- ▶ HTML5 support
- ▶ Code assist everywhere!
- ▶ Validation catches syntactical and semantic errors
- ▶ Outline view provides easy navigation



Source code tools

JavaScript code

- ▶ Syntax highlight
- ▶ JSDoc support
- ▶ Code assist
- ▶ Syntactical validation
- ▶ Semantic validation
- ▶ Outline

The screenshot shows an IDE interface with several components:

- Code Editor:** Displays JavaScript code with syntax highlighting. Visible code includes:

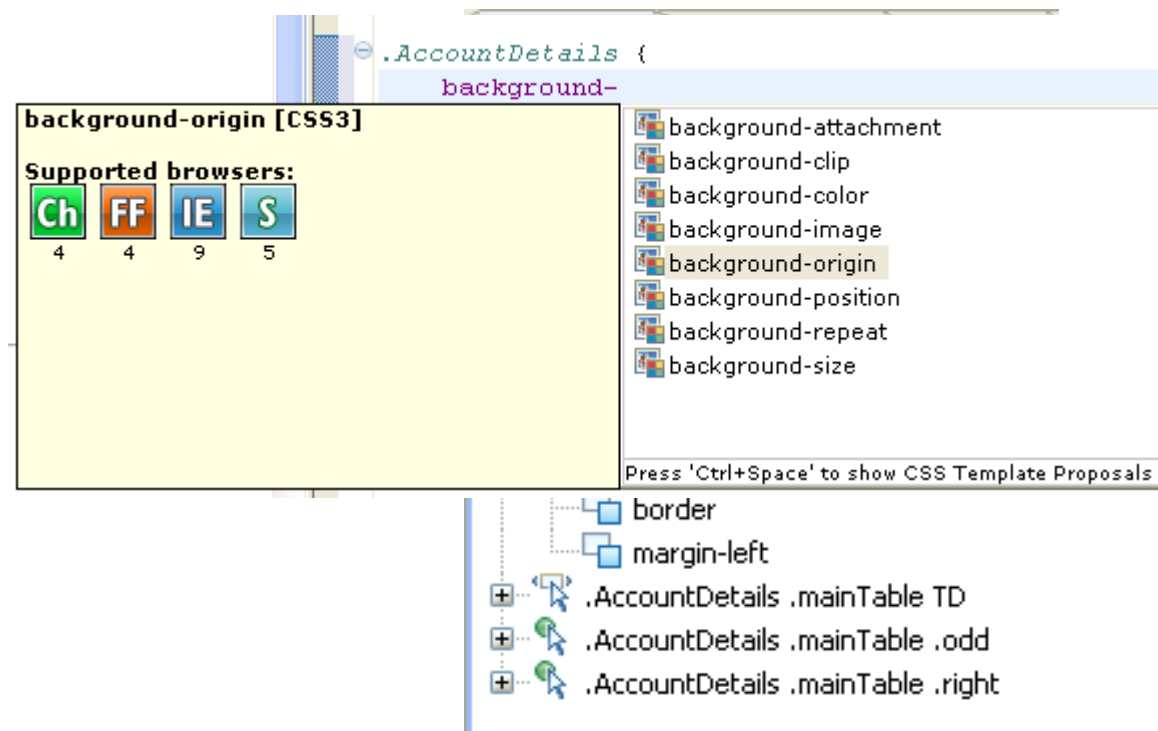

```

            <script type="text/javascript">
            document.getElementById("myForm").submit();
            </script>
            </head>
            <body class="page">
            <canvas data-...
            </body>
            </html>
            
```
- Outline View:** Shows a tree structure for the class `com.jkebank.AppController`. Methods listed include:
 - `_showAccountDetails(user, accountNumber)`
 - `callback(response, ioArgs)`
 - `_showAccountSummary(user)`
 - `accountSummary : AccountSummary`
 - `_showLandingPage()`
 - `landingPage : LandingPage`
 - `_showLoggedIn(user)`
 - `usernameSpan : any`
 - `_showTransactions(user)`
 - `widget : TransactionHistory`
 - `getLoggedInUser()`
 - `userCookie : any`
 - `login()`
 - `logout()`
 - `navigate(state)`
 - `reloadPage()`
 - `accountNumber : any`
 - `hash : any`
 - `state : any`
 - `user : any`
 - `showTransactionHistory()`
- Properties Window:** Shows details for the selected `ElementById(elementId)` function, including a reference to `ECMA-262 3rd. Edition` and `Document Object Model Core`.
- Left Panel:** Contains settings for JavaScript code, including a checked `Enable JavaScript` option and a list of severity levels for code style, potential problems, name shadows, deprecated/restricted API, and unnecessary code.

Source code tools

■ CSS code

- ▶ Supports CSS3
- ▶ Indicates specific browser support (Chrome, Firefox, IE, Safari)
- ▶ Outline



Dojo source code tools

- Dojo in HTML markup
 - ▶ Code-assist for Dojo widget types and attributes
 - ▶ Description texts are parsed out of the inline documentation in source
 - ▶ Semantic validation
 - ▶ Supports data-* style attributes

The screenshot shows an IDE with HTML code for a Dojo widget. The code includes attributes like `dojoType="dijit.form.Button"` and `label="Search"`. A tooltip is displayed over the `badlabel` attribute, stating "Undefined attribute name (badlabel). Press 'F2' for focus". A search dropdown menu is also visible, listing various Dojo widget types such as `tabindex`, `togglesplitteropen`, `togglesplitteropensize`, `tooltip`, `tostring`, and `type`. A prompt at the bottom of the dropdown says "Press 'Ctrl+Space' to show HTML Template Proposals".

Dojo source code tools

- Dojo in javascript
 - ▶ Code-assist
 - ▶ Description texts are parsed out of inline documentation in source
 - ▶ Supports Dojo API

```

com.jkebank AppController reloadPage = function () {
    var widget = new com.jkebank.widgets.TransactionHistory(user);
    widget.placeAt("functionalArea", "only");
}
    
```

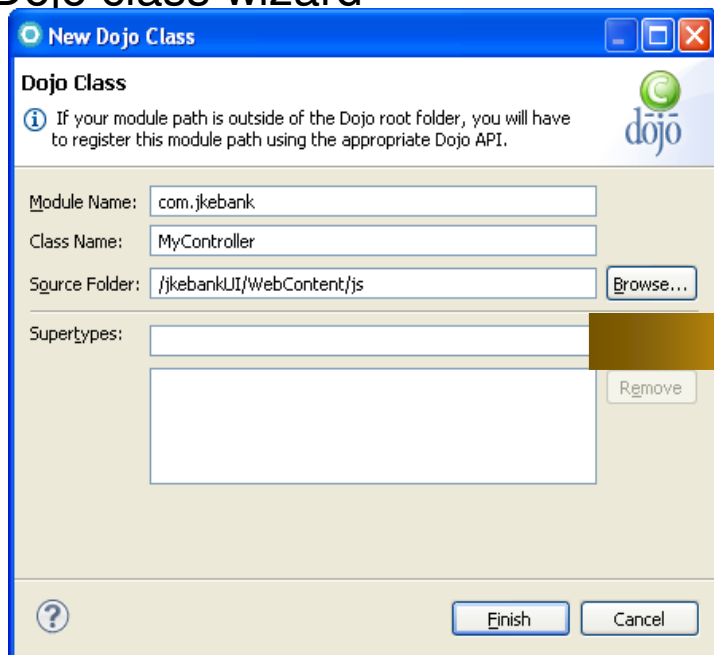
- `_attrToDom(String attr, String value) void - dijit._Widget`
- `attr(Object name, Object value) - dijit._Widget`
- ◆ `connect(Object obj, Object event, Object method) - dijit._Widget`
- `create(Object params, Object srcNodeRef) void - dijit._Widget`
- `placeAt(Object reference, Object position) _Widget`
- `postscript(Object params, Object srcNodeRef) void - dijit._Widget`
- `set(name, value) - dijit._Widget`
- `setAttribute(String attr, value) void - dijit._Widget`
- `subscribe(String topic, Object method) - dijit._Widget`

Set or get properties on a widget instance. name: The property to get or set. If an object is passed here and not a string, its keys are used as names of attributes to be set and the value of the object as values to set in the widget. value: Optional. If provided, attr() operates as a setter. If omitted, the current value of the named property is returned. description: This method is deprecated, use get() or set() directly. Print deprecation warning but only once per calling function

Press 'Ctrl+Space' to show Template Proposals

Dojo source code tools

Dojo class wizard



```
// dojo.provide allows pages to use all of the types declared in this resource.
dojo.provide("com.jkebank.MyController");

dojo.declare("com.jkebank.MyController", [], {
    // Place comma-separated class attributes here. Note, instance attributes
    // should be initialized in the constructor. Variables initialized here
    // will be treated as 'static' class variables.

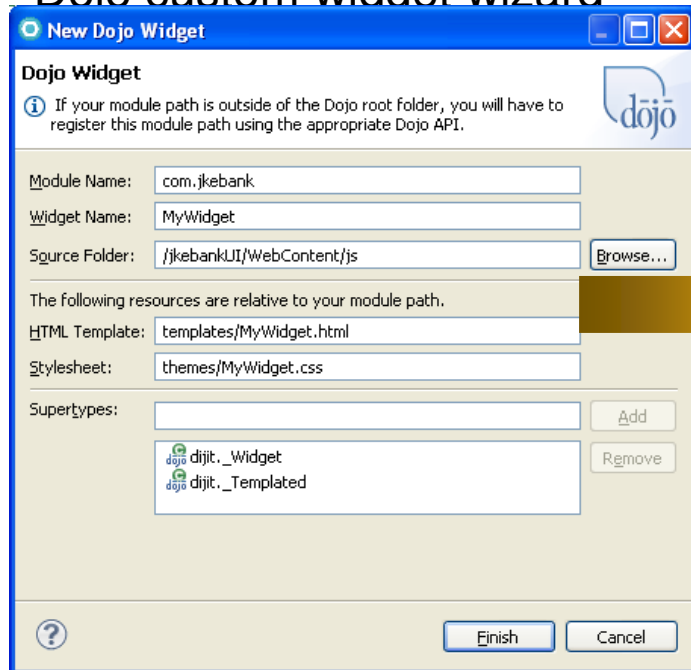
    // Constructor function. Called when instance of this class is created
    constructor : function() {

    }

    //,
    //Uncomment above comma and add comma-separated functions here. Do not leave a
    // trailing comma after last element.
});
```

Dojo source code tools

■ Dojo custom widget wizard



```

// dojo.provide allows pages to use all of the types declared in this resource.
dojo.provide("com.jkebank.MyWidget");

//dojo.require the necessary dijit hierarchy
dojo.require("dijit._Widget");
dojo.require("dijit._Templated");

dojo.declare("com.jkebank.MyWidget", [ dijit._Widget, dijit._Templated ], {
    // Path to the template
    templateString : dojo.cache("com.jkebank", "templates/MyWidget.html"),

    // Set this to true if your widget contains other widgets
    widgetsInTemplate : false,

    // Override this method to perform custom behavior during dijit construction.
    // Common operations for constructor:
    // 1) Initialize non-primitive types (i.e. objects and arrays)
    // 2) Add additional properties needed by succeeding lifecycle methods
    constructor : function() {
    },

    // When this method is called, all variables inherited from superclasses are 'mixed in'.
    // Common operations for postMixInProperties
    // 1) Modify or assign values for widget property variables defined in the template HTML file
    postMixInProperties : function() {
    },

    // postCreate() is called after buildRendering(). This is useful to override when
    // you need to access and/or manipulate DOM nodes included with your widget.
    // DOM nodes and widgets with the dojoAttachPoint attribute specified can now be directly
    // accessed as fields on "this".
    // Common operations for postCreate
    // 1) Access and manipulate DOM nodes created in buildRendering()
    // 2) Add new DOM nodes or widgets
    postCreate : function() {
    }
});
    
```

... + css file + HTML template

JSON source code editor

- Syntax highlighting
- Bracket matching
- Formatting
 - ▶ Human-readable
 - ▶ Compact
- Syntax validation

```

{
  "accountList": {
    "items": [
      {
        "contributionsetd": "80.0",
        "dividendsetd": "1000.0",
        "balance": "1920.0",
        "contributions": "80.0",
        "accounttype": "Checking",
        "dividends": "500.0",
        "accountnumber": "200",
        "username": "jbbrown"
      },
      {
        "contributionsetd": "0.0",
        "dividendsetd": "1000.0",
        "balance": "50000.0",
        "contributions": "80.0"
      }
    ]
  }
}
    
```

Shift Right

Shift Left

Source

Add to Snippets...

Format Ctrl+Shift+F

Compress Ctrl+Shift+G

✖

Syntax error on token ""200"", ? expected after this token

{ "account

Tools for the visual minds



by laffy4k
<http://www.flickr.com/photos/laffy4k/404298099/sizes/z/in/photostream/>

Preview supports IE and Firefox

Visual design with Page Designer

Split pane - preview

Palette – all dojo widgets are automatically discovered

Split pane – source view

Properties view configures the widget or tag in focus

The screenshot displays the IBM Page Designer IDE interface. The main workspace is split into two panes: a 'Preview (Read Only)' pane on top showing a web page with a search bar, login form, and a banner for 'Auto Loans Rates as low as 4.9%'; and a 'Source' pane on the bottom showing the corresponding HTML and Dojo widget markup. A 'Properties' view is visible at the bottom left, showing a table for 'Add regions to this BorderContainer'.

Id	Title	Region
header		top
sidebar		left
mainContent		center
footer		bottom

The right-hand side of the IDE features a 'Widget Palette' containing a list of Dojo widgets such as CheckBox, ComboBox, CurrencyTextBox, DateTextBox, DropDownButton, FilteringSelect, Form, HorizontalRule, HorizontalRuleLabels, HorizontalSlider, MappedTextBox, MultiSelect, NumberSpinner, NumberTextBox, RadioButton, RangeBoundTextBox, Select, SimpleTextarea, TextBox, Textarea, TimeTextBox, ToggleButton, ValidationTextBox, VerticalRule, VerticalRuleLabels, and VerticalSlider.

CSS style design with CSS editor

Selected Style

	Style of .AccountDetails .mainTable TD	

Standard HTML Elements

Text in Body Text in Body
Text in Body Text in Body

Heading 1 Heading 1

Heading 2 Heading 2

Heading 3 Heading 3

Heading 4 Heading 4

Heading 5 Heading 5

Heading 6 Heading 6

Text in Paragraph Text in Paragraph
Text in Paragraph Text in Paragraph

[Link Text](#) [Link Text](#) [Link Text](#)
[Link Text](#) [Link Text](#) [Link Text](#)

- Bulleted List
- Bulleted List
 - Bulleted List
 - Bulleted List

1. Ordered List
2. Ordered List
 1. Ordered List
 2. Ordered List

```

.AccountDetails {
}

.AccountDetails H3 {
  margin-bottom: .2em;
  margin-top: 1em;
}

.AccountDetails .mainTable {
  width: 400px;
  border-collapse: collapse;
  background-color: white;
  border: 1px solid silver;
  margin-left: 20px;
}

.AccountDetails .mainTable TD {
  padding-right: 1em;
  padding-left: 1em;
}

.AccountDetails .mainTable .odd {
  background-color: #efefef;
}

.AccountDetails .mainTable .right {
  text-align: right;
}
    
```

Shows how the current style will be rendered

Shows all computed styles for HTML elements

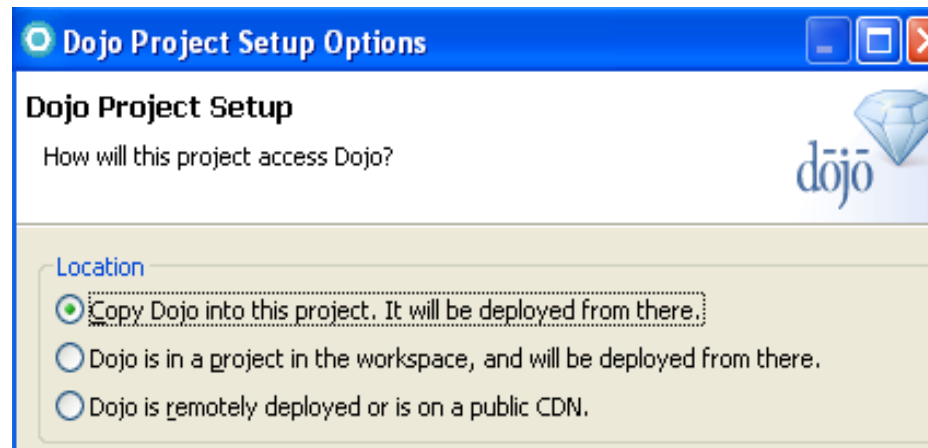
Source editor has syntax highlighting, content assist, formatting

Dojo support “Soup to nuts”

dōjō
toolkit

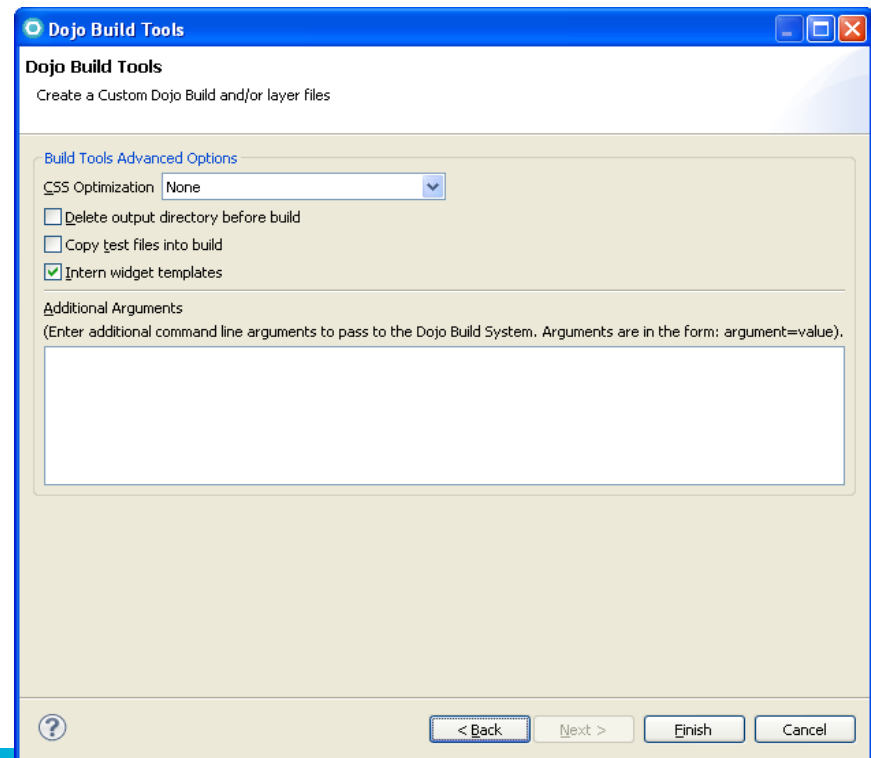
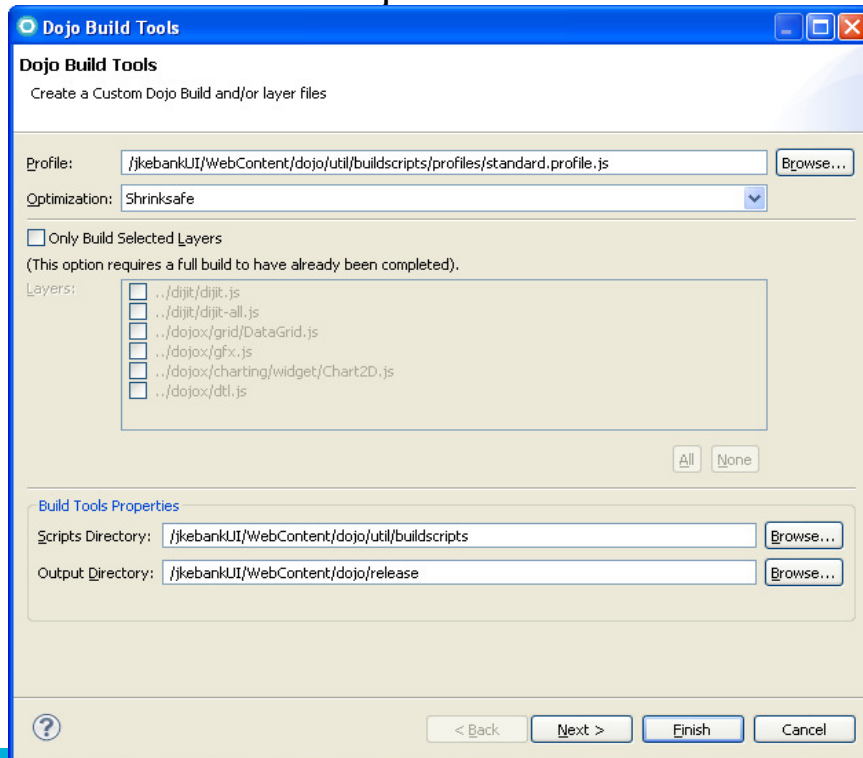
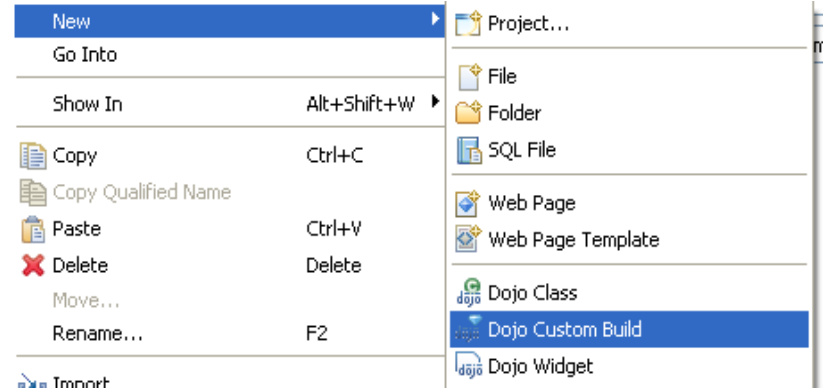
Set up Dojo in any of the following ways

- Copy Dojo into the project
 - ▶ Versions supplied: 1.3.2, 1.4.1, 1.5.0, 1.7.0 Beta 1
 - ▶ Or use your own copy
- Share Dojo among multiple projects
- Use a Dojo already deployed somewhere
 - ▶ And specify a local copy as “source attachment”



Optimize for runtime

- Dojo custom build tool
 - ▶ Based on the Dojo profile builder
 - ▶ Consolidates loose dojo modules
 - ▶ Minifies js and css contents



Tools for unit testing

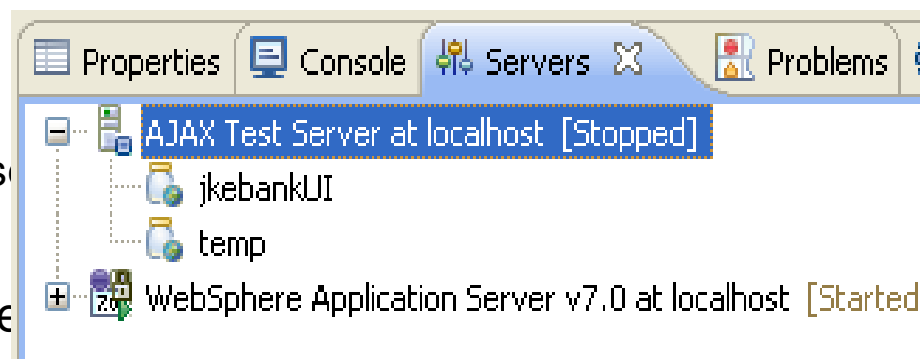
- Ajax Test Server – fast unit test server for Web 2.0 applications

- ▶ Starts up in <5 sec
- ▶ Deploys new projects in < 5 s
- ▶ Shuts down in 1 sec

- Supports both static and dynamic web projects

- Built-in Ajax proxy for access to cross-domain services

- Built-in JAX-RS support



▼ Ajax Proxy

Ajax Proxy allows you to specify paths that map to a URL on a remote domain.

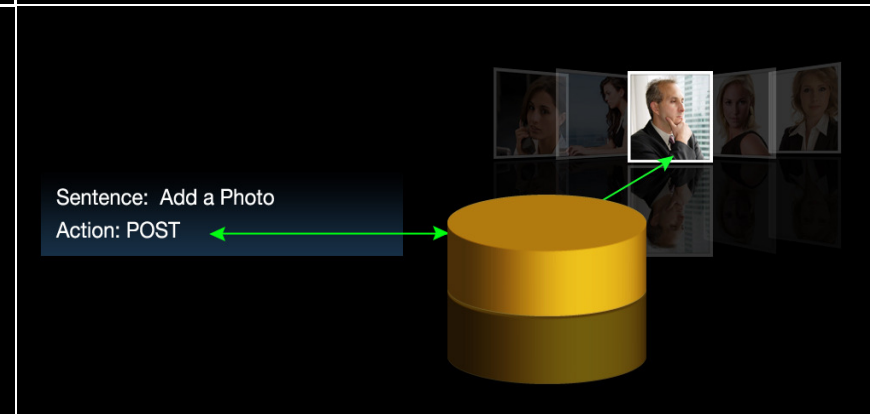
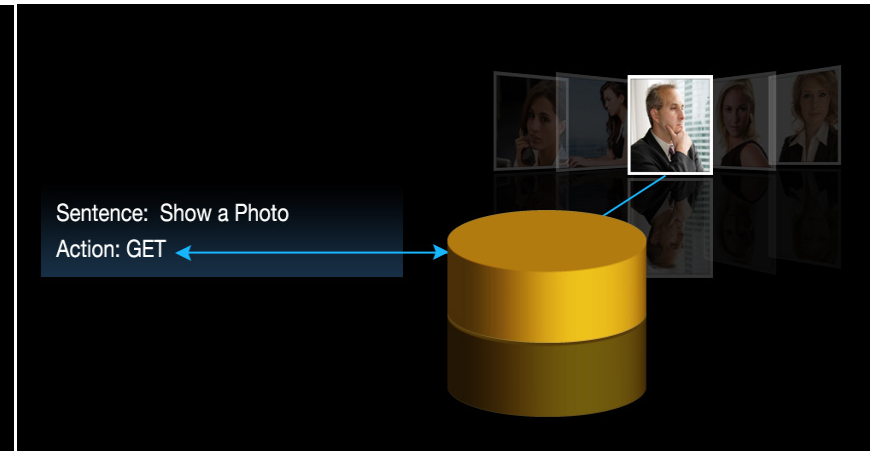
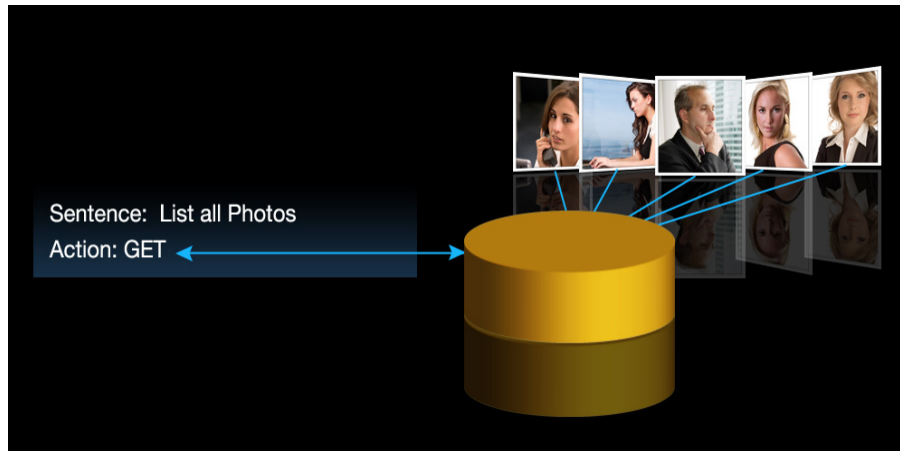
Context Root: proxy
 ProxyServlet Mapping: /*

The following access proxies have been configured to AJAX their target URLs.

Access URL	Target URL
[proxy/jkebankServices/*	http://realmatrix.raleigh.ibm.com:9080/jkebankServices/*
proxy/quotestreamer/*	http://realmatrix.raleigh.ibm.com:9080/quotestreamer/*

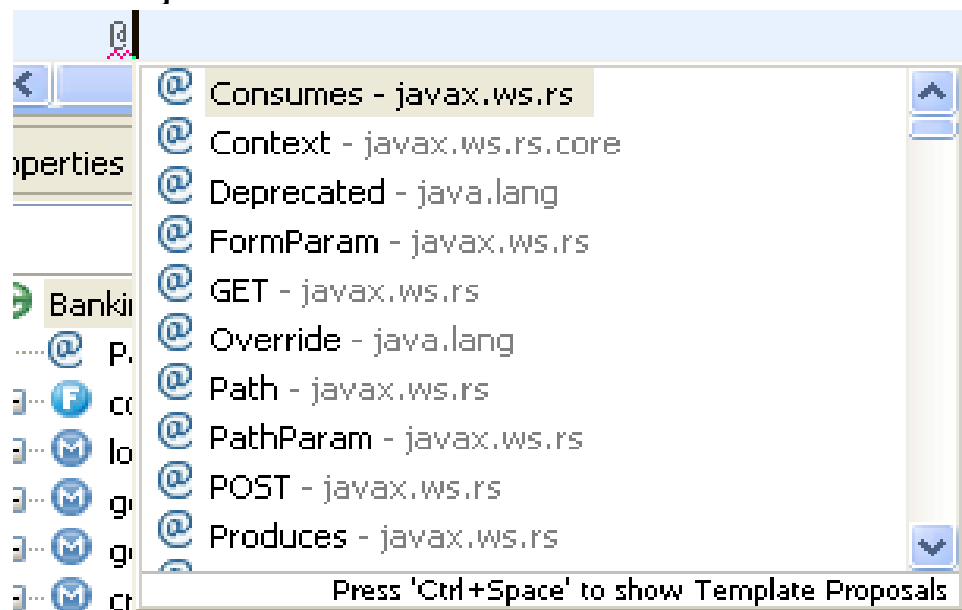
[Configure Proxy URLs](#)

RESTful services development



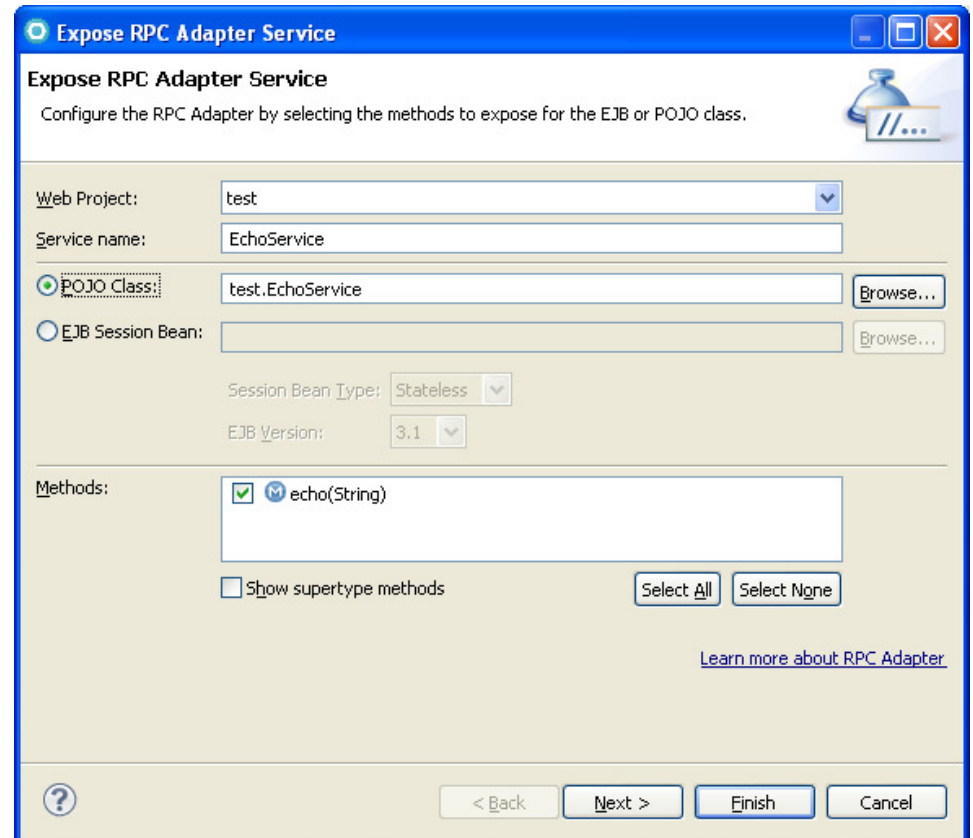
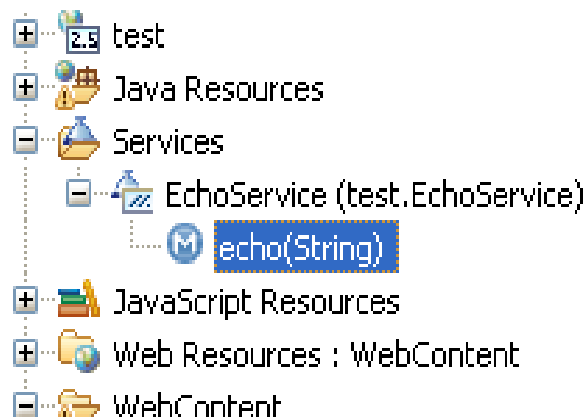
Tools for services development

- RESTful services
 - ▶ Recommended way is JAX-RS
 - ▶ RAD project setup supports any JAX-RS implementation
 - ▶ Editor support for JAX-RS annotations
 - ▶ Validation and Quick Fixes for java code, and the web.xml file
- Deploy and Test in Ajax Test Server



Tools for services development, cont'd

- HTTP-RPC services
 - ▶ Web remoting pattern
 - ▶ Use IBM RPC Adapter
 - ▶ No coding needed
 - ▶ POJOs, EJBs
- Simple wizard to go through, and it's accessible via HTTP

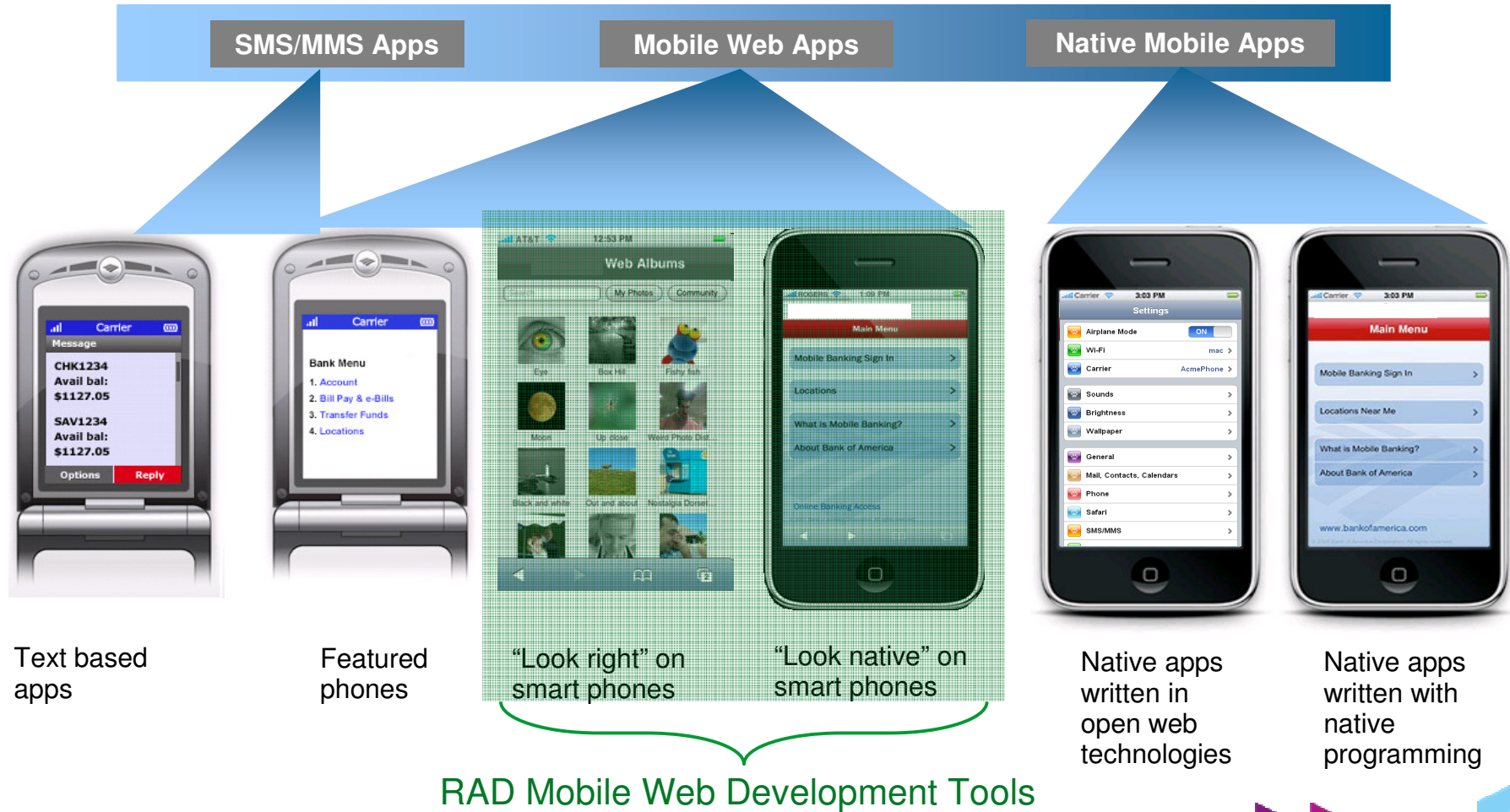


<http://hostname:9080/test/RPCAdapter/httprpc/EchoService/echo>

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The mobile application spectrum



Mobile development tools

- Web-based mobile applications
 - ▶ Accessed via the device's browser
 - ▶ UI design based on “views” with transition effects such as slide, flip or fade
 - ▶ Usually designed to achieve native look-and-feel
 - dojox.mobile
 - ▶ Requires different UI design and coding than full browser
 - ▶ HTML5 and CSS3 for best performance, especially animation effects
 - ▶ Coded, tested, debugged just like a web app
 - Javascript/dojo tools, ATS, Firebug
- No longer categorized as beta functionality as of the 8.0.3 iFix 1 release.

Core features for mobile tools

The image displays a development environment with three main components:

- WYSIWYG editor showing target device form factor:** A visual representation of an iPhone settings page with sections for Airplane Mode, Wi-Fi, Carrier, Sounds, Brightness, Wallpaper, General, Mail, Contacts, Calendars, and Phone.
- Dojo widgets, including mobile, automatically discovered and displayed in the Palette:** A list of widgets on the right side of the editor, including HTML Tags, Dojo Application, Dojo Data Widgets, Dojo Form Widgets, Dojo Layout Widgets, Dojo Mobile Widgets, EdgeToEdgeCategory, and EdgeToEdgeList.
- Simulator enabled UI testing inside browsers:** A Mozilla Firefox browser window displaying the Mobile Browser Simulator (Beta) interface. It shows the same settings page rendered on two different mobile devices: an Apple iPhone 4 and an HTC Evo 4G.

Additional features visible in the editor include a code editor with Dojo widget markup, a Properties view at the bottom left for configuring the focused widget, and a Mobile List panel at the bottom left.



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