RAP (The Rich Ajax Platform)

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Why RAP?

RAP enables component oriented development and assembly of web applications

using SWT, JFace and Workbench technology
What we like about Eclipse

plug-ins, plug-ins, plug-ins – bundles too ...

- dependency management
- extension points
- life cycle management

contribution to a common ui (workbench)
- this is called “mashup” in web 2.0
what we like about Eclipse (cont'd)
what we like about Eclipse (cont'd)
How does that translate to the web?

**RAP - enabling plug-in reuse**

- 70% - 90% reuse is possible
- RAP provides only a subset of RCP!
- needs separation of code that is not compatible
  - can be addressed with fragments
- application needs to become multi-user enabled

**getting all the things we like about Eclipse**
Nice idea – but I don’t like RCP in a browser
o.k. - but it does not have to be this way
Web L&F and workbench technology

commands

perspectives

selection service
Web L&F and workbench technology (cont'd)

Editors

Views

This RCP Application was generated from the PDE Plug-in Project wizard.
- add a top-level menu and toolbar with actions
- create views that can't be closed and multiple instances of the same view
- perspectives with placeholders for new views
- use the default about dialog
How does it work?

- replacing SWT with an implementation that can render to browsers
- everything else is pretty much the same
- RWT uses qooxdoo Javascript library to render widgets in the browser
- differences:
  - multi-user environment: OSGi bundles shared between sessions
  - Additional API for web specifics
RWT widgets
RWT Layouts

- All usual layouts:
  - GridLayout,
  - RowLayout
  - FillLayout
  - FormLayout
  - StackLayout
  - and a lot more ...

- mostly verbatim copies of SWT (OS independent)
- Layout algorithms work exactly as in SWT
- Layouts are computed on the server, e.g. after a Shell has been resized
RWT Events and Listeners

- Typed and untyped Listeners are supported
- Many Listeners implemented:
  - SelectionListener
  - ControlListener
  - ShellListener (supports doit flag now)
  - MenuListener
  - ModifyListener
  - VerifyListener
- More in future:
  - MouseListener
  - KeyListener
  - Drag/DropListener
Developer's View on a RAP Application

- JDT: content assist, refactoring, etc., PDE, Javadoc available
- Developer does not get in touch with Javascript, CSS, HTTP ...
Developer's View on a RAP Application cont'd
Looks familiar, so what are the differences?

- No GC
  - Determining text size is possible by using the Graphics class
  - If you want to draw you need to implement a custom widget
- No constructors, dispose for Font, Image
  - For performance & memory consumption reasons the same fonts and images are shared between all sessions
  - Using higher level API (JFace) abstracts the problem away, Graphics class provides factory methods
More differences – multi user

- SINGLETONS in RCP are shared between ALL users in RAP
  - RAP provides a class called SessionSingletonBase, that can be subclassed to provide Singletons by Session
  - MySessionSingleton extends SessionSingletonBase
    getInstance() {
      super.getInstance( MySessionSingleton.class );
    }
  - Access to SessionSingletons is simple within the UI thread, but need special care in background processes (jobs)
RWT Theming

- Objective: allow for a custom look of web applications
- Predefined properties of widgets can be customized
- Dimensions, Colors, Borders, Fonts, Images
- Simple Java .properties file
- Themeable custom widgets
NEW: individual styles

SWT Code:
button1.setData( WidgetUtil.CUSTOM_VARIANT, "mybutton" );

Theme file:
mybutton/button.border: 2px #169531
mybutton/button.background: #9dd044

Result:

button1
Composed Widgets – just like SWT

- Composition of existing widgets
- Custom layouts, event handling
- Application developers uses composition as a control
Custom Widgets – the shortcut

Use the browser widget!

```java
public YoutubeShell( final Display display ) {
    this.display = display;
    bgColor = display.getSystemColor( SWT.COLOR_BLACK );
    ...
    createShield();
    createShell();
}

public void setId( final String id ) {
    browser.setText( getHtml( id ) );
}

private static String getHtml( final String id ) {
    String html = "<html><body>"
    + "<object width="425\" height="373\">"
    + "<param name="movie\" value="http://www.youtube.com/v/" + id
    + "&rel=1\&border=1"></param>"
    + "<param name="wmode\" value="transparent\">"
    + "<embed src="http://www.youtube.com/v/" + id + "&rel=1\&border=1"
```
Custom Widgets – the shortcut
Custom Widgets (the real thing)

- Like in SWT, requires good knowledge of the platform
- Component developer needs Javascript, qooxdoo and RAP knowledge
- Allows do embed all sort of client side technologies: JS frameworks, Flash, Applets, ...
- Application developer simply uses Java API
- Tutorial in RAP Help

```java
GMap map = new GMap( shell, SWT.NONE );
map.getAddress( "5001 Great America Pkwy, Santa Clara" );
```
### Demo

![Image of teamCRM interface](http://teamcrmpreview.cas.de:9080/eim/teamCRM?token=75F32DEEFA7E3CFFF807946555668527B)

#### Contacts

**Ansichten**
- All contacts
- All single contacts
- All organisations
- Kontakte PLZ-Bereich 2

**Bearbeiten**

<table>
<thead>
<tr>
<th>Name</th>
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<td>CAS Software AG</td>
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<td>Bauer</td>
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<td>CAS Software AG</td>
</tr>
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JFace

- Support for all JFace viewers
  - TableViewer
  - TreeViewer
  - ...

- Support for most Viewer concepts
  - Provider (Content, Label, Color...)
  - Sorter
  - Filter
  - Decorator (new: Image decoration)
  - ....

- Support for Field Decorations
- No Cell-Editors (yet)

- Dialogs
  - All standard JFace dialogs like
    - ErrorDialog
    - TrayDialog
  - Support for own Dialogs

- Wizards

![Create New Project](image-url)
Workbench: Parts, Perspectives & Interaction

- Full support for views
  - Additional views
    - Outline
    - Properties
- Editor support
  - Multi-page editors available
  - ISaveablePart available
- SelectionService
- Jobs (UIJobs, ProgressView)

- Support for perspectives
  - Perspective Switcher
  - Extensions
- Eclipse 3.3 Menus Framework
  - Commands & Handler
  - Expression support for visibleWhen and enabledWhen

New: ScopedPreferenceStore
New: Activity Support
Additional bundles

- Data Binding
- Eclipse UI Forms
- Help
- Sandbox:
  - Search
  - PDE Runtime
Outlook
Moving to the new Eclipse RT project

- The new Eclipse RT (Runtime, not Realtime) top level project helps to coordinate the runtime efforts
- The Equinox Community will foster and promote runtime technologies at Eclipse – independently of their location in a top level project
- RAP is one of the initial six projects of RT
- Integration with other runtime technologies is key

http://eclipse.org/equinox-portal/
**RAP & e4**

- Platform and RAP team will work together on next generation of Eclipse platform, community is invited to join
draw2d

- prototype using Flash in the browser
qooxdoo 0.8

- Decoration
  - Customization mechanism of the widget’s look & feel
  - support of rounded corners, shadow, etc.
  - widgets can have different decoration renderers
Get the RAP -  http://eclipse.org/rap

Demos
See some demos here

Downloads
Get the latest RAP release

The RAP project enables developers to build rich, Ajax-enabled Web applications by using the Eclipse development model, plug-ins with the well known Eclipse workbench extension points, JFace, and a widget toolkit with SWT API (using qooxdoo for the client-side presentation). The project has graduated from incubation and released its 1.0 release.

Learn more ...
References

- http://www.eclipse.org/rap - RAP project page
- http://wiki.eclipse.org/RAP - RAP project wiki
- http://www.qooxdoo.org - qooxdoo js library