

Plug-in Development 201 Rich Client Applications

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Tutorial Outline



The Rich Client Platform
Exercise Two: The Eclipse Browser Product
Fragments
Exercise Three: Internationalization
Q&A

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Rich Client Platform (RCP)





- Equinox is the runtime
- Standard Widget Toolkit (SWT) is a portable and native widget toolkit for Java
- JFace is a framework for common UI programming tasks
- Generic Workbench provides the UI personality of the Eclipse platform

Equinox



- OSGi is a framework that manages bundles
- Plug-in == Bundle
- The extension registry manages extensions and extension points
- The concurrency infrastructure allows for running background jobs
- Other runtime facilities include tracing, logging and preferences

Standard Widget Toolkit (SWT)





- SWT is a low-level graphics library that provides UI controls such as buttons, trees, combo boxes,...
- SWT uses native widgets as much as possible
- SWT has OS-independent API and is thus portable
- SWT is independent of the Eclipse runtime

JFace



- eclipse
- Built on top of SWT, JFace adds the model layer to the SWT widgets, e.g. tree viewers
- JFace provides common UI constructs such as wizards and dialogs
- JFace can be used standalone without the need for the Eclipse runtime

Generic Workbench





- The Workbench defines common user-defined paradigms:
 - Views, e.g. the Package Explorer
 - Editors, e.g. the Java and plug-in manifest editors
 - Perspectives: arrangement of views and editor

Contribution-Based Extensibility





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Why Use Eclipse RCP?



- An elegant plug-in architecture
 - Eclipse RCP does the middleware. You do your job.
 - From servers to embedded devices, RCP applications are portable
 - RCP applications provide a native user experience
 - JDT and PDE provide a first-class development environment

A Plug-in is a Plug-in is a Plug-in



- Developing plug-ins for a rich client application is identical to writing plug-ins for the Eclipse SDK
- Notable differences include:
 - Target Platform
 - Workbench configuration
 - Defining an application
 - Defining a product

A Smaller Target





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Customizing the Generic Workbench



Sam Curman/Chicago/Renovations - Started: 9:03:04 PM	- 0 🗙
File Edit View Actions Help	
🪳 👌 🖻 🥵 🖘	
B Kelly Hardart - Chicago, IL USA Sales Representative Work: (617) 555-6782 Local Time:11:04 A	
Sam Curman Good moming Kelly. • Are you available to discuss the presentation today? • Just let me know when you're free, I'm hoping to wrap • this up before noon. • Does that sound reasonable?	09:03:04 A
Kelly Hardart Hi Sam!	09:04:58 A
Sam Curman Excellent!	09:05:11 A
Kelly Hardart Oh no! I forgot I have a lunch meeting with Larry! Would you be able to meet at 1:00 instead?	09:08:27 A
Sam Curman Okay, let me check my calendar. « I prefer to meet earlier than later.	09:06:54 A
:: Sam Curman is away from the computer ::	09:15:33 A
:: Sam Curman is now available :::	10:22:15 A
Kelly Hardart Okay. • Yes, 2:00 works for me. I'll send you an invite. • Do you think we should invite Monifa? I think she will have some valuable insight on the presentaion?	10:12:45 A
	0
Hey Sam, I'm going to schedule a follow up meeting to discuss the feedbal seeem to remember you saying that you are you on vacation the week of 17th? If so, I will be sure to schedule a meeting the week after.	ck. Send the
Kelly is typing a message	2

- When writing a plug-in for the SDK, you can extend (i.e. add) to the workbench, but you cannot remove or override
- When writing an RCP application, you can configure every aspect of the workbench

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Applications





- An application is to Eclipse what to the main() method is to a regular Java program
- To run Eclipse, an application has to be specified
- When you launch Eclipse, an application supplied by the IDE is run
- In an RCP scenario, you supply your own application

Products





- A product is the Eclipse unit of branding
- Branding gives the rich client application a personality
- Branding encompasses window images, splash screen, a custom launcher
- A product is defined declaratively as an Eclipse extension

Tutorial Outline



- The Rich Client Platform



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Exercise Two: The Eclipse Browser Product





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Part I: Create an Eclipse Application



Create an RCP application

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~	*	Open the plug-in manifest editor	
	•	Define an application extension	

To define an application extension, perform the following steps:

On the "Extensions" page of the plug-in manifest editor, press the "Add..." button to open the "New Extension" wizard.

Select "org.eclipse.core.runtime.applications" from the [-"Extension Points" list box and press "Finish".

In the "Extension Details" section, set the contents of the "ID" field to "application"

Right-dick on the

"org.eclipse.core.runtime.applications" node in the "All Extensions" section and select "New->application" from the context menu.

Right-dick on the "(application)" node in the "All Extensions" section and select "New->run" from the context menu.

Replace the content of the "class" text box with "org-eclipse.browser.application.Application". Select "File->Save" from the main menu.

Run the application

- This exercise is structured as a 3step cheat sheet
- You use the plug-in manifest editor to create an application extension
- You launch the new application and you see that the same Browser view has seamlessly integrated into a different application

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Define an Application Extension

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Add ...

Edit...

Up

Down



- An application is an org.eclipse.core.runtime.applications extension
 - It specifies a class which serves as the entry point to the application
 - For a typical UI application, the application creates, configures and runs a workbench
 - The application exits when the workbench exits

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All Extensions

type filter text

Define extensions for this plug-in in the following section:

Image: org.eclipse.browser.usefuLinks
Image: org.eclipse.ui.perspectives

org.eclipse.core.runtime.applications

X org.eclipse.browser.application.Application (run)

Image: Org.edipse.ui.views

B X (application)

Eclipse Browser Application



PHED	
Edgese Browser	9 J
Eclipse Browser	
Project Links Double-click on a node to open the associate	d web site in a browser.
Edgen Project So Pation So Barris So Source So Source So Source Source Source Source	
Open source industry platform for the deve integrated tools	lopment of highly
 Useful Links 	
Click on a link to open the associated web sits	e in a browser.
Edgee Downloads	
Colperade Colperade	
* Search	
Enter a query into the text field and press en search.	iter to perform a Google
	Gaanch

- The RCP application provides a standalone window with File and Help menus
- The Browser plug-in integrates seamlessly with the application without any code changes
- Don't underestimate this minimalistic application. It can go toe-to-toe with any other RCP application. It is configurable, extensible, ...

Part II: Create an Eclipse Product



Create an Eclipse Product

	b .	Test	4.0		1.00	ti man
J		.un	ITT	$\mathbf{D}\mathbf{D}$		DOFI
*						

~	Þ	Create the product configuration	?
---	---	----------------------------------	---

Define the product

To define the product, perform the following steps:

- On the "Overview" page of the product editor, input "Eclipse Browser Product" into the "Product Name" text box.
- Press the "New..." button next to the "Product ID" R drop down menu to open the "New Product Definition[®] dialog box.
- ✓ Select "org.edipse.browser.application" from the ist of available applications in the "Application" section. Press "Finish".
- Add window images (?) Customize the About dialog (?) **Run the RCP product** 2 Customize the launcher (Windows Only) 2 2
 - ▶ Export the product
 - Browse the finished product

- This exercise is structured as a 8step cheat sheet
- You use the product editor to define every aspect of your product: launcher, window images, About Dialog
- You export and run a fully-branded standalone product

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2

A New Product Configuration



roduct Configuration	-	
reate a new product configuration file file name must end with '.prod	on and initialize its content.	ل
inter or select the parent folder:		
org.edipse.browser		
	ension th basic settings	
Greate a configuration file will	ension th basic settings org.edipse.browser.product	

- A product configuration is the central place to manage all aspects of your product
- A product configuration is used by PDE to define and assemble a product
- A product configuration is neither read nor interpreted by the runtime

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Product Definition



Specify the nam	e that appears in the title bar of the application	1:
Product Name:	Eclipse Browser Product	
Specify the proc		
Specify the proc		
Specify the proc	are adare braurer product	ar New

- A product is associated with an application
- A product provides branding and customization for the application
- A product name appears in the title bar of the application
- PDE uses this data to create an

org.eclipse.core.runtime.products extension in the plug-in's manifest file

Building Blocks



Plug-ins and Fragments List all the plug-ins and fragments that constitute the product:



- A product must list all its constituent plug-ins. This list is only used by PDE to determine what to build and package
- Plug-ins that are in source form in the workspace are compiled and packaged
- Plug-ins that are already built (e.g. target plug-ins) are assembled asis into the final product

Window Images



Window Images

Specify the images that will be associated with the application window. These GIF images are typically located in the product's defining plug-in.

16x16 Image:	/org.eclpse.browser/branding/world_16-16_windows	Browse
32x32 Image:	/org.eclipse.browser/branding/world_32-32_windows	Browse
48x48 Image:		Browse
64x64 Image:		Browse
128x128 Image:		Browse



- Window Images are shown in the application window, task bar, ... depending on the windowing system
- On Windows, the 16x16 GIF image is used for the task bar and the 32x32 GIF is used in the Alt-Tab application switcher

Customizing the About Dialog



About Dialog

Customize the text and image of the About dialog. The GIF image is typically located in the product's defining plug-in and its size must not exceed 500x330 pixels. The text is not shown if the image size exceeds 250x330 pixels.

Image:	/org.edipse.browser/branding/world_about.gif	Browse
Text:	This is a blurb about my product.	



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One-click Export



Export			×
Eclipse produc Use an existing Ed in one of the avail	t pse product configuration to export able formats.	t the prod	ut 1
Product Configu	ration		
Configuration:	/org.eclipse.browser/browser.proc	luct 🛩	Browse
Root directory:	browser		
Synchron Destination	ize before exporting		
Oirectory:	D:\Destination	~	Browse
O Archive file:		×	Browse
Export Options	e code		
0		Finish	Cancel

- PDE provides a Product Export wizard that takes a product configuration file as input
- The name of the root directory of the product is customizable
- Options to export the product as a directory structure or an archive

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One-click Export to Multiple Platforms



Export	
Cross-platform export Select the platforms to which you want to deploy your pro	xduct.
Available platforms:	
 ✓ aix (motif/ppc) ✓ hpux (motif/PA_RISC) ✓ linux (gtk/ppc) ✓ linux (gtk/x86_64) ✓ linux (gtk/x86) ✓ linux (motif/x86) ✓ macosx (carbon/ppc) ✓ solaris (gtk/sparc) ✓ solaris (motif/sparc) ✓ win32 (win32/x86) 	Select All
10 out of 10 selected.	
⑦ < Back Next > Einish	Cancel

- The RCP delta pack is a separately downloaded archive that contains all OS-specific fragments and executables
- When present, you are able to export your plug-ins to all supported platforms in a single step





le Heb	
Edipse Browser	9 Ø °
Eclipse Browser	
Project Links	
Double-click on a node to open the associated	web site in a browser.
Edgese Project Sig Platform Eig Egunox Sig 201	
Open source industry platform for the develo	pment of highly
* Useful Links	
Useful Links Clok on a link to open the associated web site	n a browser.
Useful Links Clob on a link to open the associated web site Edgee Downloads Edgee Downloads Edgee Duce	n a browser.
Useful Links Clok on a link to open the associated web site Gope Downloads Edgee Downloads Edgee Bugs Edgee Bugs Edgeepedia	n a browser.
Vseful Links Cick on a link to open the associated web site Gebre Downloads Edose Dugs Gebrepedie Search	n a browser.
Vseful Links Clok on a link to open the associated web site Edgee Downloads Edgee Dugs Edgee Dugs folgoepedia Search Enter a guery into the text field and press entr search.	n a browser. ar to perform a Google
Useful Links Click on a link to open the associated web site Edgee Downloads Edgee Bugs Edgee Bugs Edgeepedia Search Enter a query into the text field and press enter search.	n a browser. er to perform a Google Search

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Fragments



- A fragment adds functionality to an existing plug-in (host)
 - Content (extensions, code) is merged with the host content at runtime
 - Fragments augment their host content. Fragments do NOT override.
- Fragments typically house:
 - Platform-specific content
 - Locale-specific content: translation files
- PDE provides a New Fragment Project creation wizard



How is a Fragment different from a Plug-in?

- Fragments need a host to attach to
- Fragments have no activator and no lifecycle
- Dependencies cannot be expressed on a fragment
- Fragments do not expose API
- Extensions and extension points are contained in fragment.xml

First Fragment – Step 1



New Fragment Project	X
Fragment Project Create a new fragment project	
Project name: com.example.french	
Use gefault location	
Location: D:/Edipse/edipse/workspace/co	m.example.french growse
Project Settings	
Create a Java project	
Source folder: src	
Qutput foldier: bin	
Target Platform This fragment is targeted to run with:	~
(7) < gack	: Next > Brish Cancel

- The first page looks very familiar.
- Same project settings as the one for a New Plug-in Project
- Same naming conventions, etc.

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First Fragment – Step 2



New Fragment	Project	
Fragment Content Enter the data required to generate the fragment.		
Fragment Propertie	8	
Fragment [D:	com.example.french	
Fragment jersion:	1.0.0	
Fragment Name:	French Fragment	
Fragment Provider:	EXAMPLE	
Qasspath:		
Host Plug-In		
Bing-in ID:	com.example.xyz	Browse
Minimum Version:	1.0.0	Inclusive 🛩
Maginum Version:	2.0.0	Exclusive 🗸
Ð	<gadk next=""> Eni</gadk>	sh Cancel

- We need the usual fragment ID, version, name, …
- No Activator. Fragments have no lifecycle.
- Specify the host to which the fragment will attach
- The fragment will only be matched up with a host that matches the version range constraint

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Externalizing Strings





- Externalize strings so locale specific values can be substituted at runtime
- JDT provides an externalization wizard for java code while PDE provides an externalization wizard for plug-in data

Add locale specific icons



Add required dependencies (this may be a long-running operation)

General Manifest Cleanup

Remove unnecessary lazy activation headers

Internationalization

Prefix icon paths in plug-in extensions with an \$nl\$ segment

Remove unused keys from the plug-in's properties file

 The Organize Manifest wizard helps you to add the "\$nl\$" prefix to your icon paths which allows you to substitute custom icons based on locale

Language fragments





- Language fragments contain locale specific values in properties files.
- The properties files must follow the naming convention of "<host's filename>_<locale>.properties"

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Questions and Answers?



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