# Understanding Eclipse.org

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# Outline

- Overview
- Plug-in based architecture
- Core plug-ins
- Eclipse.org organization
- Modeling project

# Several IDE's today

- Java, C
  - NetBeans
  - 🗆 Idea
  - 🗆 InteliJ
  - Visual C++
- .Net
  - Visual Studio
- Multi-platform
  - Eclipse
  - □ vi, notepad, xemacs

# History

# End of 90's - IBM and OTI VisualAge Smalltalk, Java

1999 – Eclipse is born

### 2001 – Eclipse becomes open source (v1.0)

 $\Box$  Creation of the Eclipse.org board

Btw, why naming *Eclipse*??

# What is Eclipse?

- Open platform for application development
   Implemented in Java
- Language independent
  - □ Java, C++, JSP, Ruby, XML, HTML
  - □ Business logic, databases, workflow, GUI, web sites
- Core extensible workbench
  - $\Box$  Based on plug-ins
- Open source organization
  - □ Eclipse.org

### Architecture

# Eclipse platform = JVM + runtimeJDT + PDE : plug-ins



Plug-ins, plug-ins of plug-ins, plug-ins of plug-ins of plug-ins, plug-ins of plug-ins of plug-ins of plug-ins of plug-ins of

# Plug-ins as contributions

### Plug-in

 $\Box$  the building block : everything is a plug-in

Examples : Java code editor

#### Extension point

- Declaration of a "contribution point"
- $\Box$  Example: a Java editor MAY have several menus

### Extension

- Implementation of a contribution
- $\Box$  Examples: The "Run" menu, the "Debug" menu, the "Help" menu

### Established conventions

- One plug-in A contributes to one or more plug-ins (B or/and C)
- Plug-in A may declare extension points
- Plug-in life cycle based on OSGi
  - Discovery
  - Instatiation
  - Caching
- Other
  - Does not crashes B or any other plug-in
  - Lazy loading
  - Uses a manifest file
  - $\Box$  Installation using update site or manually (plugins folder)

### Manifest file (sample from UML plug-in)

```
<plugin>
  <extension
     point( = "org.eclipse.ui.editors">
    <editor
       id = "org.eclipse.uml2.uml.editor.presentation.UMLEditorID"
       name = "% UI UMLEditor label"
       icon = "icons/full/obj16/UMLModelFile.gif"
       class = "org.eclipse.uml2.uml.editor.presentation.UMLEditor"
      contributorClass=
           "org.eclipse.uml2.uml.editor.presentation.UMLActionBarContributor">
</editor>
</extension>
  <extension
     point="org.eclipse.ui.editorActions">
    <editorContribution
       targetID="org.eclipse.uml2.uml.editor.presentation.UMLEditorID"
       id="org.eclipse.uml2.uml.editor.UMLEditorContributionID">
      <menu
         label="% UI StereotypeMenu label"
         path="org.eclipse.uml2.umlMenuID/additions"
         id="org.eclipse.uml2.uml.editor.StereotypeMenuID">
        <separator name="additions"/>
      </menu>
```

</plugin>

# Workbench extension points

#### Workbench

- org.eclipse.ui.acceleratorConfigurations
- org.eclipse.ui.acceleratorScopes
- org.eclipse.ui.acceleratorSets
- org.eclipse.ui.actionDefinitions
- org.eclipse.ui.actionSetPartAssociations
- org.eclipse.ui.actionSets
- org.eclipse.ui.activities
- org.eclipse.ui.activitySupport
- org.eclipse.ui.bindings
- org.eclipse.ui.browser.browsers
- org.eclipse.ui.browserSupport
- org.eclipse.ui.commands
- org.eclipse.ui.commandImages
- org.eclipse.ui.contexts
- org.eclipse.ui.decorators
- org.eclipse.ui.dropActions
- org.eclipse.ui.editorActions
- org.eclipse.ui.editors
- org.eclipse.ui.elementFactories
- org.eclipse.ui.encodings
- org.eclipse.ui.exportWizards
- org.eclipse.ui.fontDefinitions
- org.eclipse.ui.handlers
- org.eclipse.ui.helpSupport
  - . . . . . .

# One Eclipse bundle

🝃 Java - br.inf.c3sl.helloworld/src/br/inf/c3sl/HelloWorld.java - Eclipse						
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<ul> <li>➡ br.inf.c3sl</li> <li>➡ HelloWorld.java</li> <li>➡ JRE System Library [JavaSE-1.6]</li> </ul>	<pre>     public void sh     System.out     } }</pre>	owMessage(Strin .println(messa	ig message) { je);		showMessage(Strin	
	Console 🛛 📳 Problems	e.		4		
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# Simple bundle

### Support to simple tasks



### Modeling bundle: Several functionalities



# Key plug-ins (1/4)

Workspace
 Store user files
 Couple with a resource API
 Load, save, update files
 Separated into projects



# Key plug-ins (2/4)

### Editors : edit a given object



# Key plug-ins (3/4)

### Views : information on some object



# Key plug-ins (4/4)

### Perspectives

Organization of views and editors

 $\Box$  One perspective per scenario (Java, UML, C++, PDE, etc.)

Java - br.inf.c3sl.helloworld/src/br/inf/c3sl/He	elloWorld.java - I	Eclipse				
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E System Library [JavaSE-1.6]	<pre>package public  public  pub  }  Console X No consoles to d </pre>	br.inf.c3s1; class HelloWo lic void show System.out.p	rld { Message(Strin rintln(messac	ng message) { ge);		<ul> <li>J<sup>2</sup><sub>2</sub> × × • • × <sup>⊥</sup></li> <li>⇒ J<sup>2</sup><sub>2</sub> × × • • × <sup>⊥</sup></li> <li>⇒ br.inf.c3sl</li> <li>⊖ HelloWorld</li> <li>● showMessage(Strin</li> </ul>
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### Perspectives

### Development



### Perspectives

### Debug

Debug - br.inf.c3sl.helloworld/src/br/inf/c3sl/HelloWorld.java - Eclipse						
File Edit Source Refactor Navigate Search Project Run Window Help						
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HelloWorld [Java Application]	Name	Va	Value			
br.inf.c3sl.HelloWorld at localhost:50460	I args	ring[0] (id=16)				
Ihread [main] (Suspended (breakpoint at line 6 in HelloWorld))						
C:\Program Files\Java\ire6\bin\iavaw.exe (14/01/2011 16:03:06)	4		4			
D HelloWorld.java 23						
package br.inf.c3sl;		<u>^</u>				
public class HelloWorld {			trinf.c3sl			
			Helloworld			
<pre>     public static void main(String args[]) {</pre>			<ul> <li><sup>S</sup> showMessage(String) : volu</li> </ul>			
<pre>showMessage("Hello");</pre>			,			
public static void showMessage(String message) {						
System.out.println(message);						
}						
}						
		-				
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# **Eclipse foundation**

#### Open source community

EPL – Eclipse Public License

Non-profit

- Hosts open-source projects and sub-projects
  - JDT: Core, Debug, UI, PDE
  - Data Tools: Connectivity, SQL Dev
  - Platform: Workbench, RelEng, SWT
  - □ Mylyn: Build, Commons
  - Technology: BPLE, Cloud, JGit
  - □ Web tools: EJB, JSF, Web services
  - Modeling: EMF, CDO, M2M, Compare

# Eclipse foundation: who is who?

### Board

- Policies and strategies
- IBM, Nokia, Obeo, SAP, Oracle, etc.
- Staff
  - Services and infrastructure

### Committers

- Coding
- Take care of the different projects
- Community of users
  - $\Box$  How to participate?
  - BTW: C3SL has an Eclipse mirror

# Modeling project

- Promoting and development of modelbased development
- MDE Model Driven Engineering

# Model Driven Engineering

#### From the art of coding ...

- Software complexity goes exponential!
- $\hfill\square$  « One-size fits all » solutions not appropriate
  - UML drawings do not help much for design
  - Design patterns not enough
- To the science of modeling
  - □ Higher level of abstraction: coordinated set of models
  - Domain specific languages (DSLs)
  - $\Box$  Supported by many tools
    - Language engineering, model transformations, graphical representations, etc.
  - $\Box$  MDE is endorsed by industry
    - IBM, Microsoft, SAP, TATA, Eclipse.org

# Some modeling projects

#### Eclipse Modeling Framework (EMF)

- $\square$  API for model manipulation
- Model-to-Model (M2M)
  - Operations between models
    - Model Transformations (ATL)
- GMT : research modeling project
  - □ Model Weaving (AMW)
  - MoDisco
- XText
  - Creation of Domain Specific Languages
- EMF Compare
  - □ Comparison of models

# Summary

### Open source community

#### Architecture

- $\Box$  Based on plug-ins
- Principle of contribution
- Delivered with some core plug-ins
- Really good for development
  - $\Box$  Several plug-ins to support you
- Organized in projects
  - $\Box$  Modeling is an important part
- The future?
  - $\Box$  Eclipse + Eclipse Orion  $\rightarrow$  Web-based Eclipse