Understanding Eclipse.org

Marcos Didonet Del Fabro
marcos.ddf _at_ inf.ufpr.br

C3SL – LBD labs
Universidade Federal do Parana'

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)**
  - 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
  - Based on plug-ins
- Open source organization
  - Eclipse.org

Architecture

- Eclipse platform = JVM + runtime
- JDT + PDE : plug-ins

JDT	PDE

→ Plug-ins, plug-ins of plug-ins, plug-ins of plug-ins of plug-ins, plug-ins, plug-ins, plug-ins of plug-ins plug-ins of plug-ins of plug-ins ....

Platform runtime (OSGi)

Workspace	Workbench (SWT)

Core plug-ins

- Help
- Team
- Editors

JVM

Plug-ins as *contributions*

- **Plug-in**
  - the building block : everything is a plug-in
  - Examples : Java code editor

- **Extension point**
  - Declaration of a "contribution point"
  - Example: a Java editor MAY have several menus

- **Extension**
  - Implementation of a contribution
  - 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
  - Installation using update site or manually (plugins folder)

Manifest file (sample from UML plug-in)

```xml
<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>
```
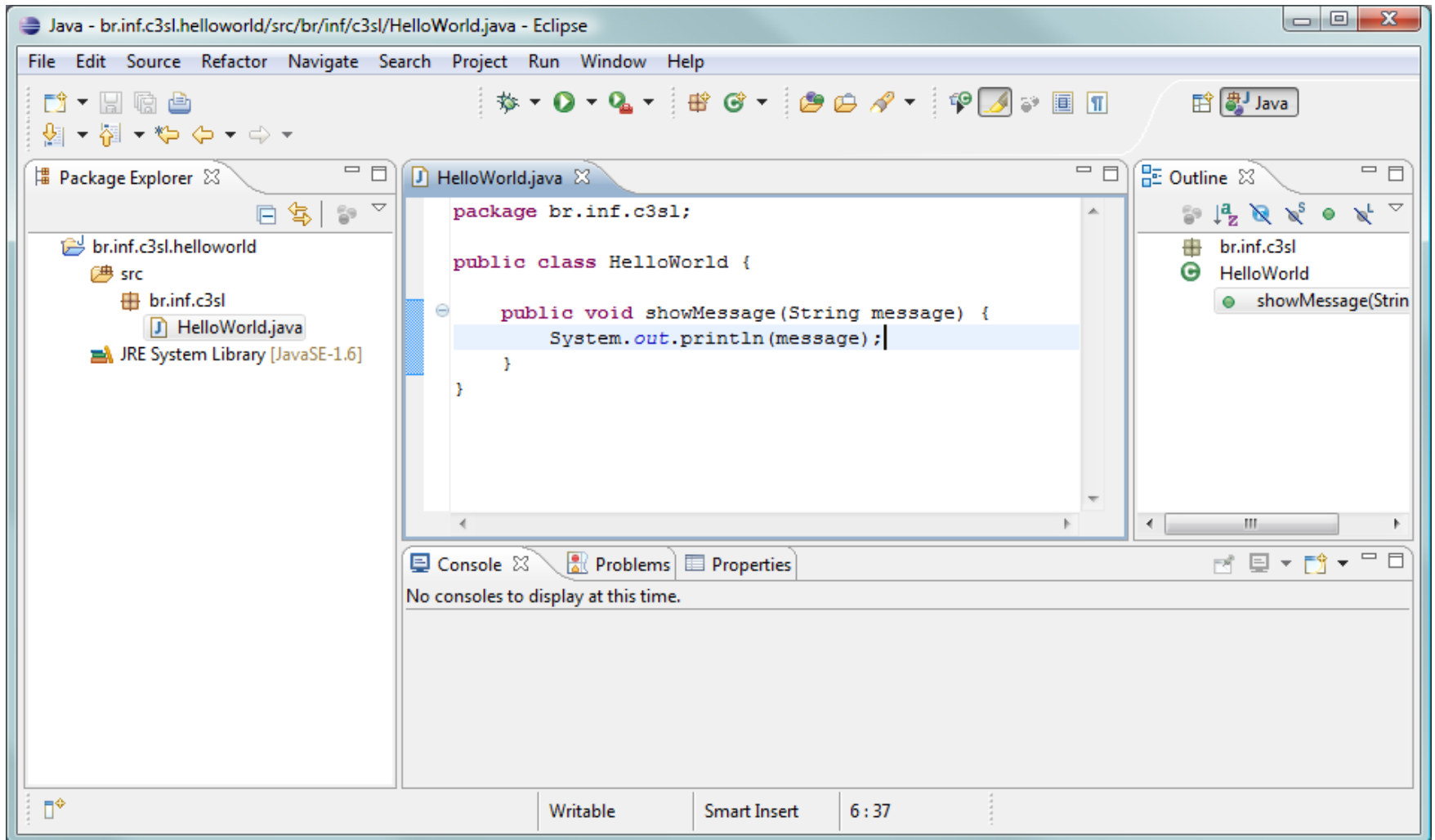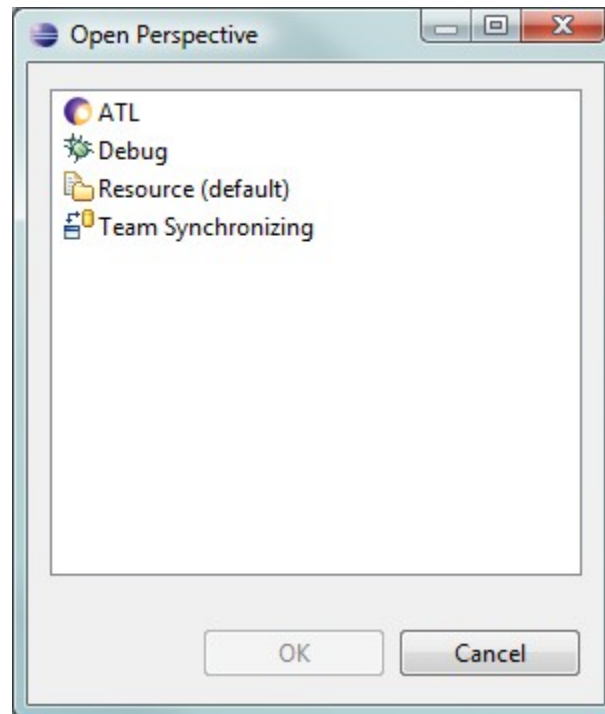
Workbench extension points

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

Simple bundle
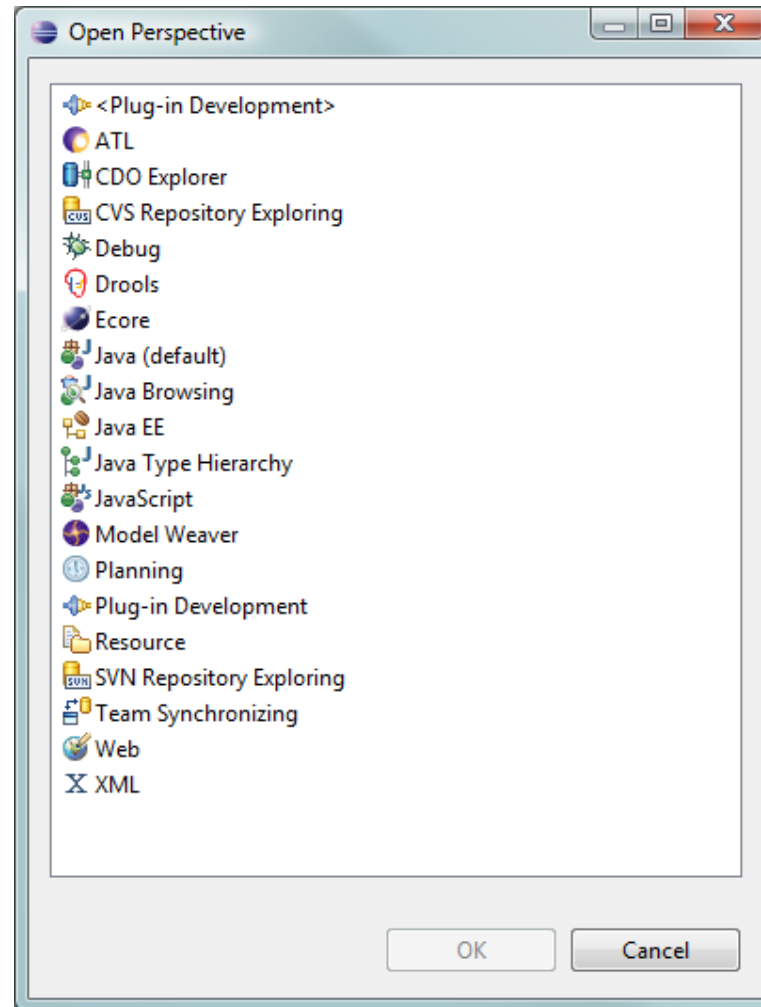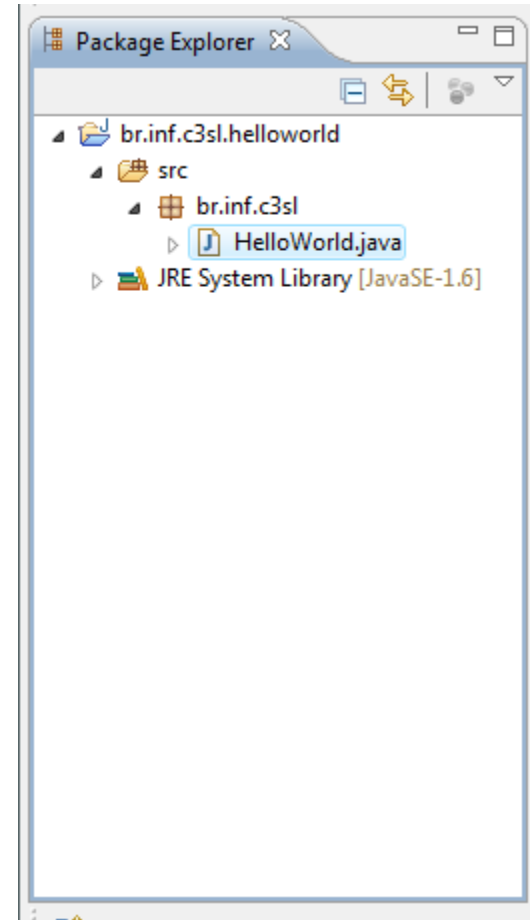
- Support to simple tasks

Modeling bundle:
Several functionalities
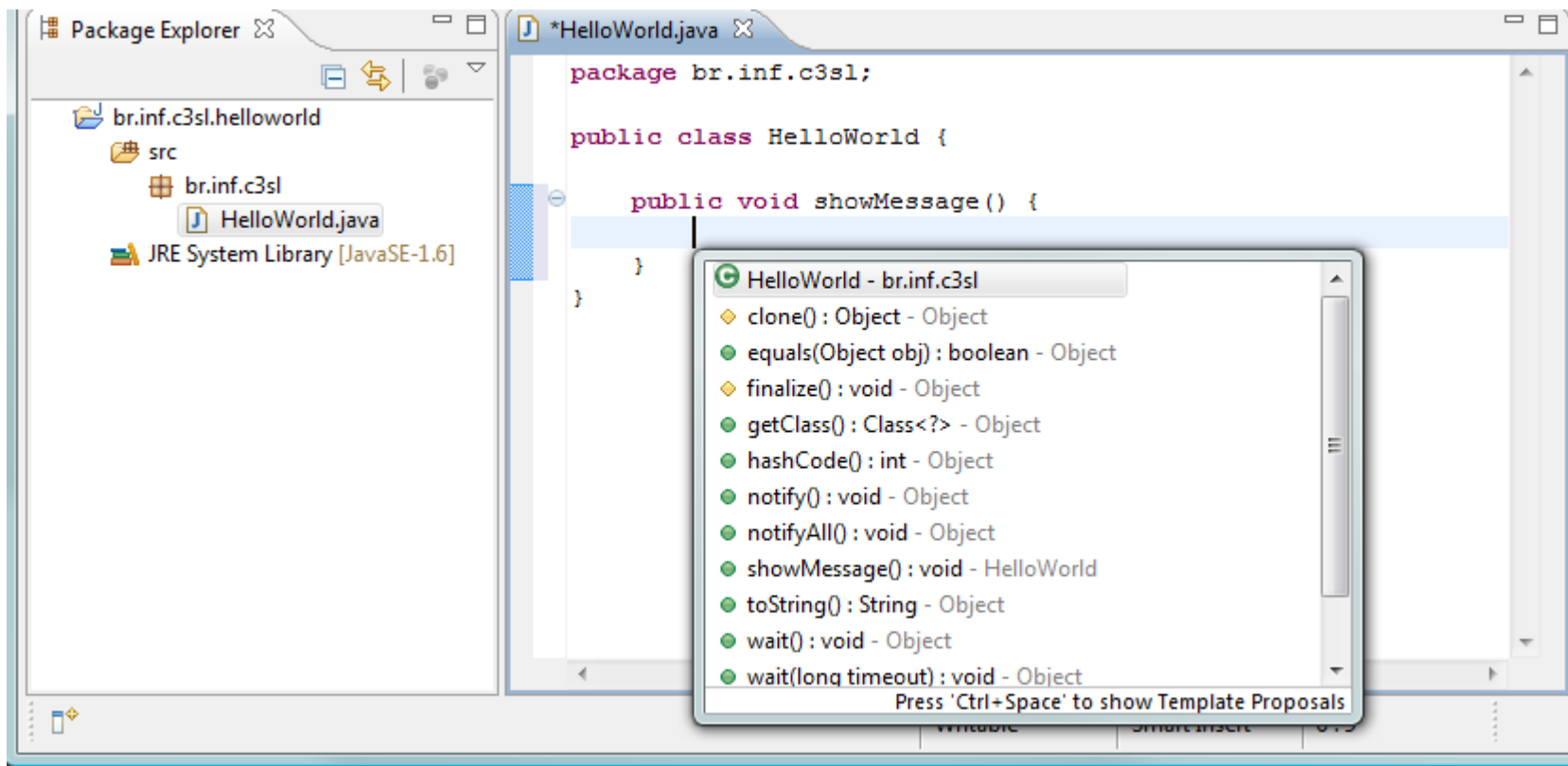
Key plug-ins (1/4)

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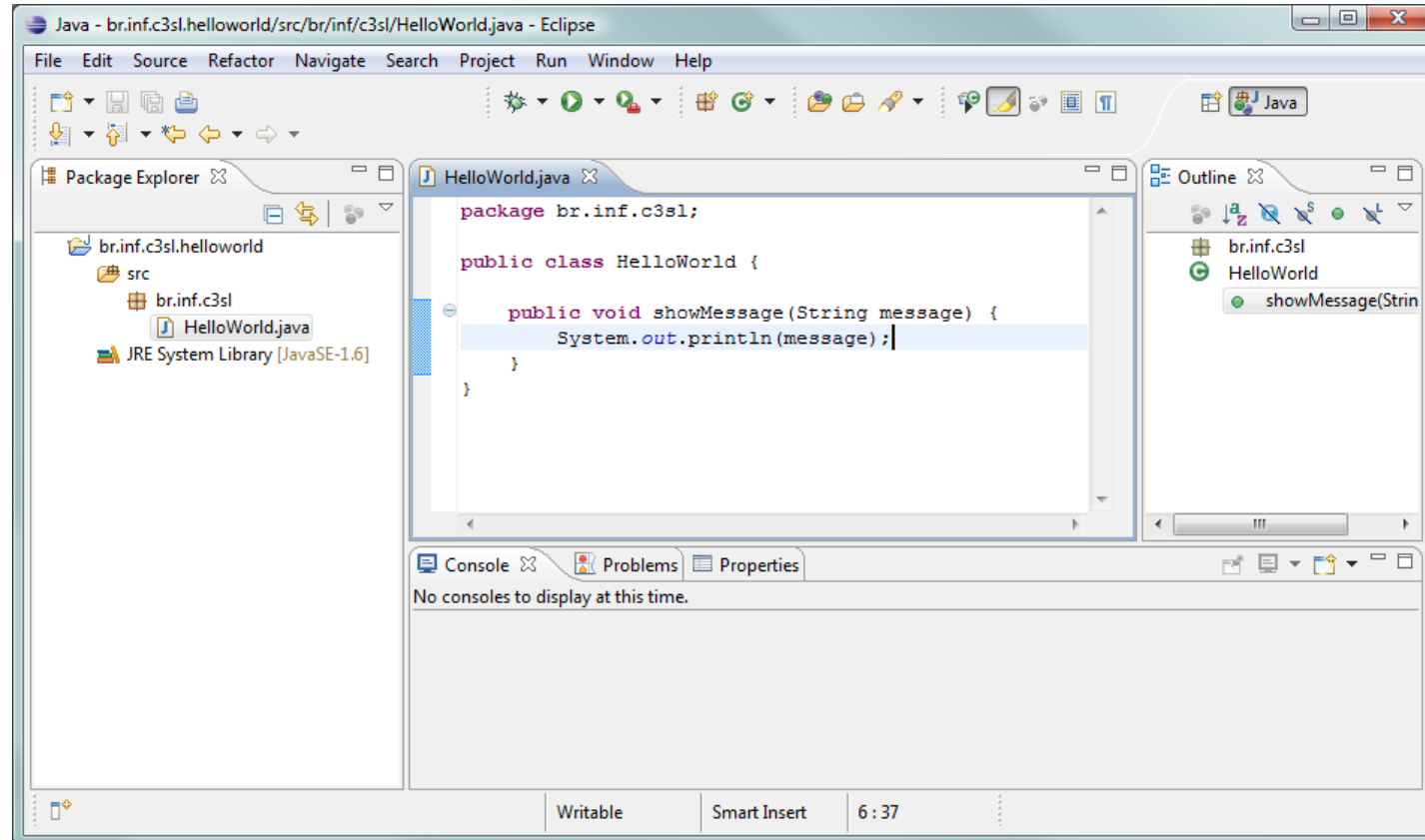 - Separated into projects

Key plug-ins (2/4)

- Editors : edit a given object
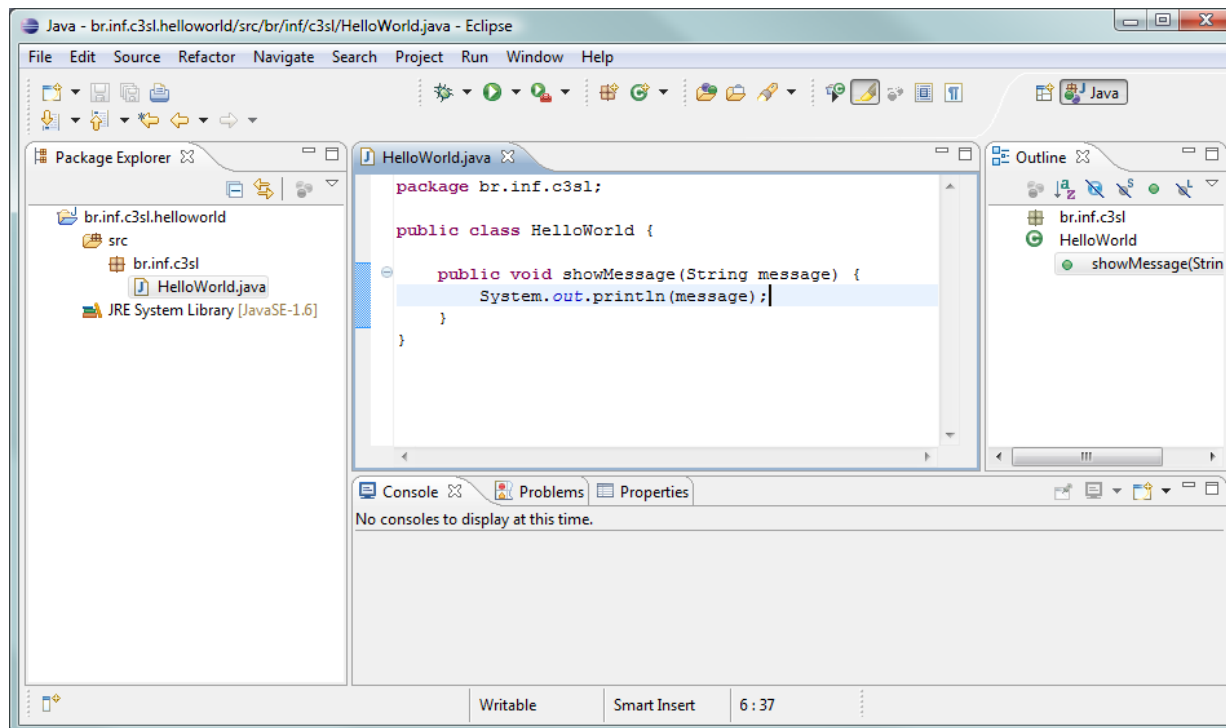
Key plug-ins (3/4)

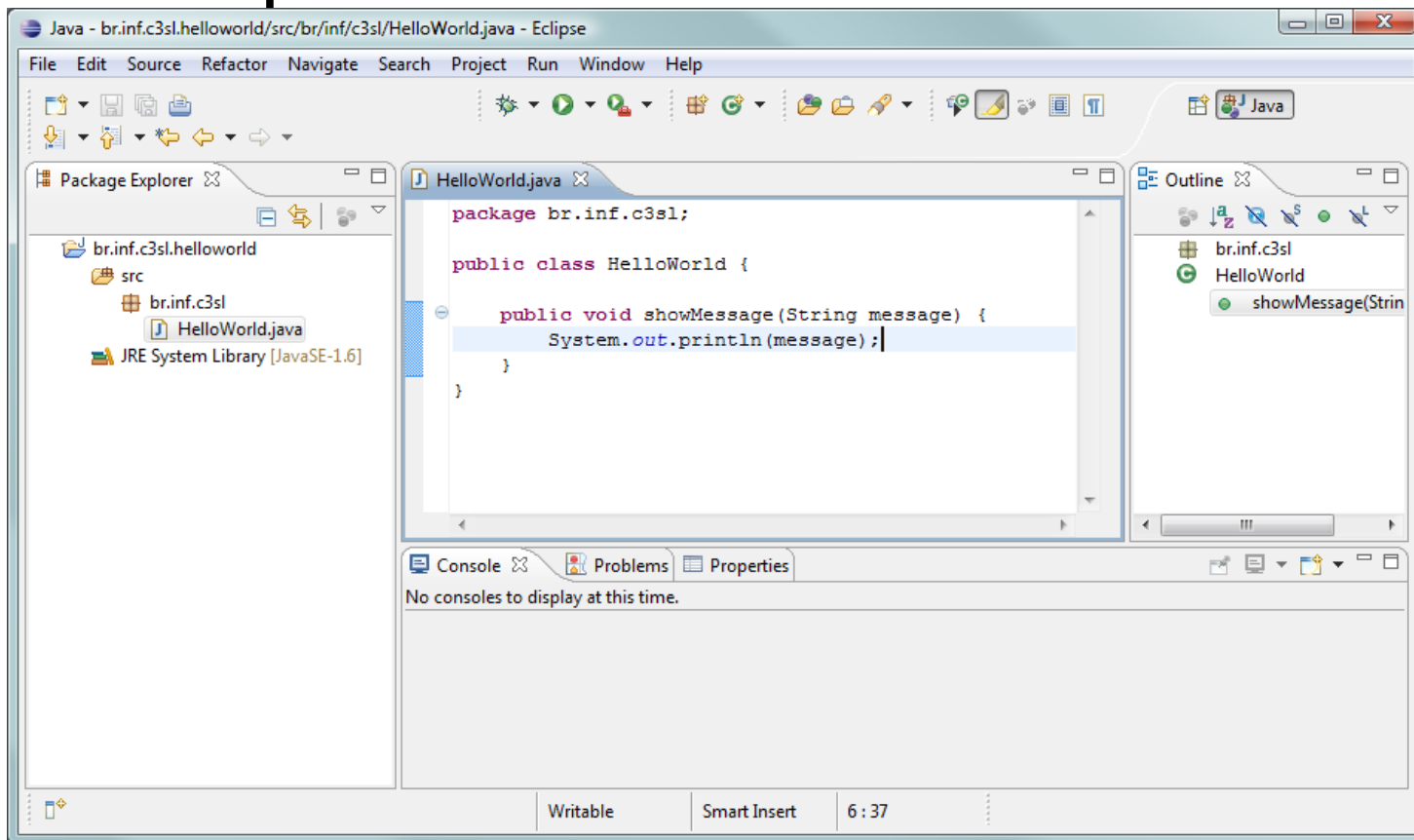- Views : information on some object

Key plug-ins (4/4)

- Perspectives
  - Organization of views and editors
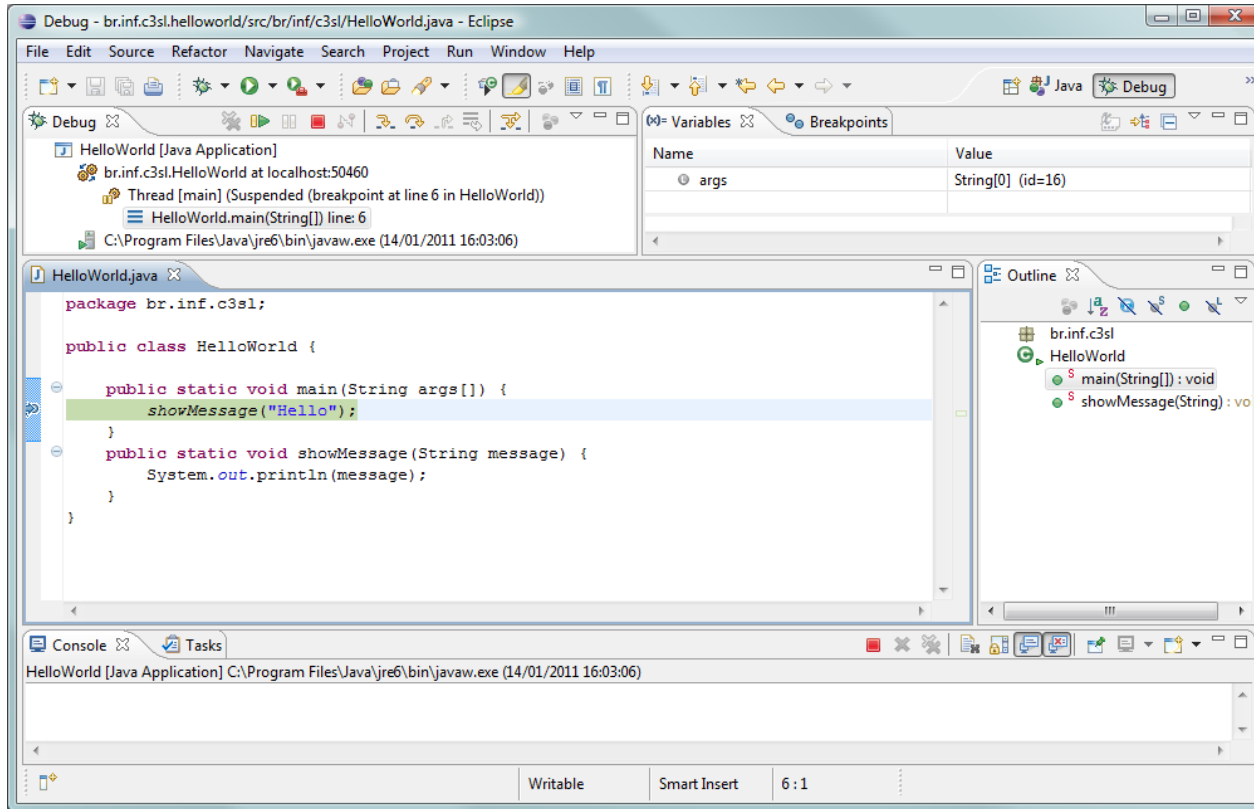 - One perspective per scenario (Java, UML, C++, PDE, etc.)

Perspectives

- Development

Perspectives

- Debug

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
  - How to participate?
  - **BTW: C3SL has an Eclipse mirror**

Modeling project

- Promoting and development of model-based development
- MDE – Model Driven Engineering

Model Driven Engineering

- From the art of coding …
    - Software complexity goes exponential!
    - « 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)
    - Supported by many tools
        - Language engineering, model transformations, graphical representations, etc.
    - MDE is endorsed by industry
        - IBM, Microsoft, SAP, TATA, Eclipse.org

Some modeling projects

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