PROJECT: BOGOR – JAVA ENVIRONMENT FOR ECLIPSE

DELIVERABLE: ARCHITECTURE DESIGN

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1. Introduction

The purpose of this document is to provide an architectural design for the Bogor Java Environment for Eclipse. The design will show component and class diagrams. Each class will have a brief description about its purpose. In section 6, FSM will be provided for each plug-in.

The architecture of Eclipse platform is built on the concept of plug-ins. The Eclipse platform provides frameworks and common services to support a complete tool integration platform. This project uses Eclipse provided frameworks and services to develop Bytecode-to-BIR nature, Bytecode-to-BIR incremental builder, and Bogor launcher. Project natures allow a plug-in to tag a project as a particular kind and are defined by plug-ins. A project can have more than one nature. Bytecode-to-BIR incremental builder are used to apply a transformation on Bytecode to produce BIR file. Bogor launcher uses Eclipse platform debug plug-ins to extend the platform so that Bogor can be launched from the workbench.

2. Incremental Compilation Plug-in

2.1. Overview

This plug-in has three packages. Figure 2.1.1 is a component diagram that shows the relationships among three packages. Figure 2.1.2 is a class diagram. Since there are many dependencies to the Eclipse API, the class diagram does not show all the relationships.

![Figure 2.1.1](image-url)
2.2. Package - edu.ksu.cis.projects.bogor.incremental

This package includes the main plug-in class.

2.2.1. Class – BytecodeToBirIncrementalPlugin

This is the main plug-in class to be used on desktop. It extends the AbstractUIPlugin class, which is provided by the Eclipse API. This class handles the life cycle for the plug-in. It provides the error and log method to log errors.

2.3. Package - edu.ksu.cis.projects.bogor.incremental.builder

This package includes the builder classes. The classes in this package are the core for this plug-in.

2.3.1. Class – BytecodeToBirBuilder

This class defines the incremental builder. It extends the IncrementalProjectBuilder class, which is provided by the Eclipse API. This class handles full and delta build.
There are two helper methods to create and delete BIR by calling methods from class BirHandler.

2.3.2. Class – BytecodeToBirNature

This class is used to configure “Bytecode to BIR” nature for Java project. It handles add and remove “Bytecode to BIR” nature from menu. This class implements the IProjectNature interface, which is provided by the Eclipse API.

2.3.3. Class – ToggleNatureAction

This class adds the nature into project. It implements the ObjectActionDelegate interface, which is provided by Eclipse API.

2.4. Package - edu.ksu.cis.projects.bogor.vm.translator

2.4.1. Class – BirHandler

This is the helper class to delete and write BIR. This class is used by the BytecodeToBirBuilder to create and delete BIR from file system.

3. Bogor VM Viewer Plug-in

3.1. Overview

This plug-in has three packages. Figure 3.1.1 is a component diagram that shows the relationships. Figure 3.1.2 is a class diagram. Since there are many dependencies to the eclipse API, the class diagram does not show all the relationships.

Figure 3.1.1
Figure 3.1.2
3.2. Package - edu.ksu.cis.projects.bogor.util

3.2.1. Class – EclipseUtils
   This is a helper class. BytecodeToBirView class uses this class to highlight Java code in Java editor. BytecodeToBirView class also uses it to obtain Java editors, Java elements, selected texts in Java editor, and Java package names.

3.2.2. Class – JdtUtils
   This is a helper class. BytecodeToBirView class uses this class to obtain the enclosing type for given Java elements, to create input stream from Java elements, and to obtain the Java elements from given offset.

3.3. Package - edu.ksu.cis.projects.bogor.views

3.3.1. Class – BytecodeToBirPlugin
   This is the main plug-in class to be used on desktop. It extends the AbstractUIPlugin class, which is provided by the Eclipse API. This class handles the life cycle for the plug-in. It provides the error and log method to log errors. It also equips methods to retrieve values from resource bundlers.

3.3.2. Class – BytecodeToBirView
   This class creates the viewer. It extends the ViewPart class, which is provided by the Eclipse API. This class builds the user interface to display BIR. It makes use class EditorListener to catch the user or eclipse event and handles them accordingly.

3.3.3. Class – EditorListener
   This class listens all events. This class implements eclipse API interface ISelectionChangedListener, ISelectionListener, IFileBufferListener, and IPartListener2.

3.4. Package - edu.ksu.cis.projects.bogor.vm.translator

3.4.1. Class – BBVisitor
   BytecodeToBirView uses this class to obtain GeneratedBir.
3.4.2. Class – GeneratedBir

This class contains the information of BIR. BytecodeToBirView uses this class to retrieve BIR information, such as to get source line, to get offset in BIR.

4. Launcher Plug-in

4.1. Overview

This plug-in has two packages. Figure 4.1.1 is a component diagram that shows the relationships. Figure 4.1.2 is a class diagram. Since there are many dependencies to the eclipse API, the class diagram does not show all the relationships.
4.2. Package - edu.ksu.cis.projects.bogor.launchConfigurations

4.2.1. Class – BogorVMConfigTab

This class creates the configure tab for launcher. It builds the interface for config tab, listens to user’s actions, and performs the task accordingly. This class extends eclipse AbstractLaunchConfigurationTab.

4.2.2. Class – BogorVMMainTab

This class creates the main tab for launcher. It builds the interface for main tab, listens to user’s actions, and performs the task according to user’s action. This class extends eclipse JavaLaunchConfigurationTab.

4.3. Package - edu.ksu.cis.projects.bogor.launching

4.3.1. Class – BogorVMLaunchConfigurationDelegate

This configuration delegate receives information from tabs and invokes Bogor. This class implements the IlaunchConfigurationDelegate interface, which is provided by Eclipse API. The launch method retrieves configuration from work copy and then invokes Bogor to do model checking.

4.3.2. Class – BogorVMTabGroup

This class groups application tabs into launcher. This class extends AbstractLaunchConfigurationTabGroup. The createTabs method creates all required tabs for Bogor VM launcher.

4.3.3. Class – LauncherMessages

This class contains all messages used in launcher. It reads the information from LauncherMessages.properties. It extends the NLS class, which is provided by the Eclipse API.

4.3.4. Class – LaunchingPlugin

This is the main plug-in class to be used in desktop. It extends the AbstractUIPlugin class, which is provided by the Eclipse API. It handles the life cycle of launching plug-in.
5. Error Trace Plug-in

This error trace plug-in reuses Bogor UI plug-in and makes changes on Java class of CounterExampleView to highlight Java code instead of highlighting Bogor trails file. The updates to this class add open Java file in active editor, and highlight Java code in editor.

CounterExampleView
(from views)

- openJavaFile() : IEditorPart
- highlightLoc(reset : boolean, lineNumber : int) : void
- updateLoc() : void
- updateTrees() : void

Figure 5

6. FSM