



Eclipse Plug-ins Development

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Plug-in Development Concepts



- Plug-in
 - Used to group your code into a modular, extendable and sharable unit.
- Feature
 - Used to package a group of plug-ins together into a single installable and updatable unit
- Extensions and Extension Points
 - When a plug-in wants to allow other plug-ins to extend or customize portions of its functionality, it will declare an extension point
 - Plug-ins that want to connect to that extension point must implement that contract in their extension
- Fragment
 - Used to replace or extend the functionality of an existing plug-in
- Target Platform
 - Refers to the plug-ins which your workspace will be built and run against



Process Viewer Example



- **Requirement:** Create an Eclipse view with the following functionality:
 - Display the list of processes on the current Linux platform
 - Offer the possibility to attach and display PC for a process
 - Capture system calls made by a Linux process
- **Background:** System call
- **Background:** ptrace



Create the Processes Plug-in



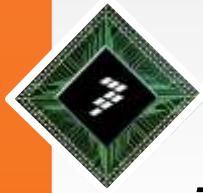
- Use New Project Wizard and create a new plug-in with a view
 - Name the view “Processes”
- Create the following actions:
 - Refresh
 - Attach
 - Capture system calls
- Add the following columns to the table in the Processes view
 - PID
 - Command
 - PC



Brief Look at SWT and JFace



- **SWT** is a graphical widget toolkit for use with the Java platform (currently maintained by Eclipse Foundation)
 - Creation of Dialogs, Windows, Combos, Lists, Buttons, etc.
 - Same look and feel as the native widgets on any platform
- **JFace** provides classes and frameworks which simplify common *SWT* use cases
 - simplify the mapping of a data model to a visual representation
 - *Viewers* are used to display a model in a SWT widget (list, combo, tree or table). **TableViewer** is used in our example.
- Provide content for the viewer :
 - *IStructuredContentProvider* – provides the items of a table, list or combo
 - *ILabelProvider* – provides icons and labels for every element



JFace in Processes View



- *TableViewer* is created in *createPartControl()* method
- Provide content for the view:
 - *viewer.setContentProvider(new ViewContentProvider());*
 - *public Object[] getElements(Object parent)*
 - *viewer.setLabelProvider(new ViewLabelProvider());*
 - *public String getColumnText(Object obj, int index)*
 - *public Image getColumnImage(Object obj, int index)*
- Provide a different implementation for the *TableViewer*
 - *ProcessesTableViewer* with three columns



Provide Content for Processes View



- Declare and create an array of objects that will hold the information about processes (PID, Command and PC)
 - ProcessData class and array of processes
- Return the array of processes as the elements for our table
 - *ViewContentProvider.getElements(Object parent)*
 - Return process information as text for every column of the table
 - *ViewLabelProvider.getColumnText(Object obj, int index)*
 - PID for column 0, Command for column 1 and PC for column 2
 - Return an icon only for column 0
 - *ViewLabelProvider.getColumnImage(Object obj, int index)*



Linux Interactor Class



- Wrapper over ProcessBuilder Java lang class
 - ProcessBuilder - class is used to create and interact with operating system processes
- LinuxInteractor interface
 - *executeCommand(String, boolean)*
 - *convertStreamToStr(InputStream)*
 - *postCommand(String)*
- Command to obtain process list
 - *“ps ax -o pid= -o comm=“*
- Command to attach to a process
 - *sudo ~/linux_tools/ptrace_attach %s*
- Command to obtain system calls for a process
 - *sudo strace -p %s 2> /tmp/%s*



How Do I Work with Extension Points?



- Find extension points
 - - Documentation
 - - Plugin.xml editor – ‘Add...’
 - - Plug-ins registry editor
 - - Load SDK plug-in as projects with source folders
- Read extension point description
- Look for examples
 - - Existing places where the extension points have been previously used
- Deploying your solution
 - - export wizard via *File* → *Export* → *Plug-in Development* → *Deployable plug-ins and fragments*.