



Parallel Environment Developer Edition

ETFw and adding a Simple Custom GUI Control

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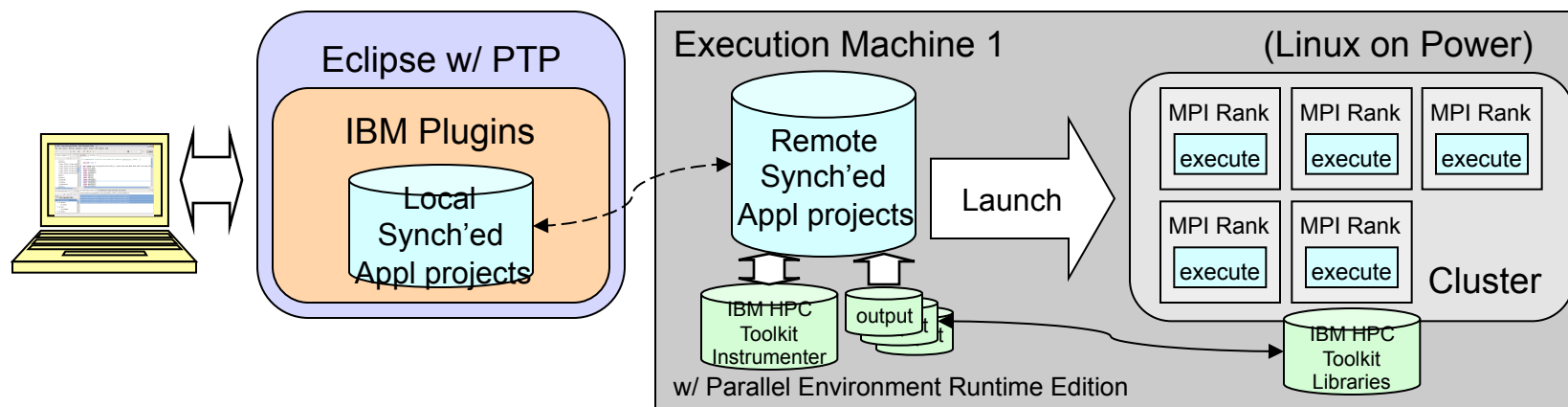
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IBM Parallel Environment Developer Edition Contents

- Eclipse 4.2 with PTP 6.0
- IBM Plugins
 - PLDT (Programming Language Development Tools) Plugins
 - HPC Toolkit Plugin – HPCT Perspective w/ Profile Launcher
- IBM HPC Toolkit – instrumenter, supporting libraries and GUI applications written in C/C++ Language
 - Hardware performance monitoring using hardware counters
 - MPI performance and tracing
 - OpenMP performance
 - I/O performance and tracing
 - CPU profiling (using -pg/GMON)

Uses ETFw for profile launch

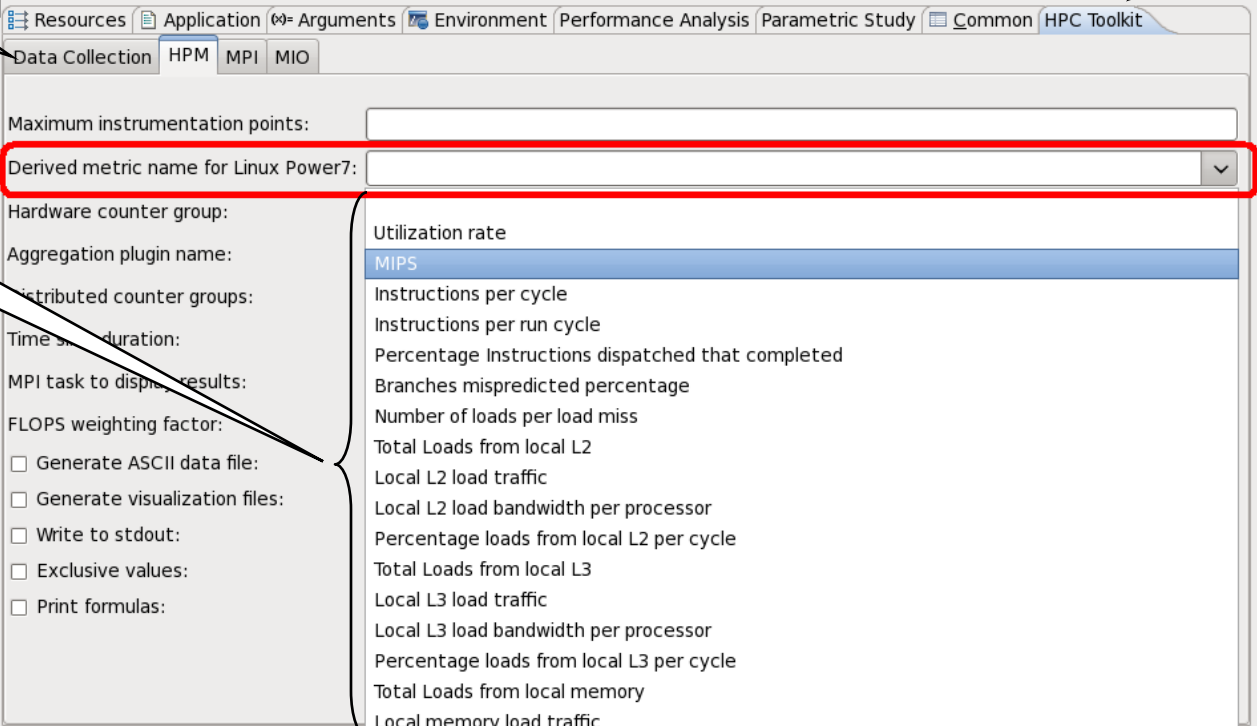


ETFw – External Tools Framework

- Integrate existing external tools into Eclipse
- Parses XML file
- Creates launch configuration panes with checkbox, text, combo selection list, file, dir, etc.
- Can invoke code around launch
- Sets arguments lists and/or environment variables for launch
- Extension points
 - org.eclipse.ptp.etfw.workflows – XML specification
 - org.eclipse.ptp.etfw.configurationTabs – added tabs and UI features
 - org.eclipse.ptp.etfw.dataManagers – pre/post processing
- See: http://wiki.eclipse.org/PTP/ETFw/PTP_External_Tools_Framework
- Developed by Wyatt Spear wspear@cs.uoregon.edu et al

Adding Simple Custom GUI Control to Existing Pane

- Multiple panes described in ETFw's XML, one common (Data Collection) and one per tool (HPM, MPI, and MIO) all of which set environment variables
- Need: On one pane add a single-selection drop-down list (Derived metric names) that is dynamically populated (see red highlight) which sets an environment variable at launch along with all the other options



The screenshot shows the HPC Toolkit GUI with the 'Data Collection' pane selected. The pane contains several configuration options, including a new drop-down list for 'Derived metric name for Linux Power7'. The drop-down list is highlighted in red and contains a list of metrics, with 'MIPS' selected. The GUI also shows secondary tabs (Data Collection, HPM, MPI, MIO) and a new primary tab (HPC Toolkit). A callout box labeled 'Sets environment variables' points to the drop-down list.

Secondary tabs

New Primary tab

Drop-down list

Sets environment variables

Solution - Plugin.xml

Specifies
XML file

Old `<extension point="org.eclipse.ptp.etfw.workflows">`
`<workflowDefinitionXML XMLFile="HPCTOptions.xml"></workflowDefinitionXML>`
`</extension>`

Add to
"Performance
Analysis" tab's list

`<extension point="org.eclipse.ptp.etfw.configurationTabs">`
`<perfconfigurationtab class="com.ibm.ppedev.hpct.etfw.ProfileLaunchTab"></perfconfigurationtab>`
`</extension>`

Add to Launch
Configuration tabs

`<extension point="org.eclipse.debug.ui.launchConfigurationTabs">`
`<tab class="com.ibm.ppedev.hpct.etfw.ProfileLaunchTab"`
`group="org.eclipse.ptp.etfw.launchConfigurationTabGroup"`
`id="com.ibm.ppedev.hpct.etfw.ProfileLaunchTab" name="HPC Toolkit">`
`<placement after="org.eclipse.ptp.etfw.ui.ToolLaunchConfigurationTabGroup"></placement>`
`</tab>`
`</extension>`

Specifies before and
after operations –
ignore

Old `<extension point="org.eclipse.ptp.etfw.dataManagers">`
`<PerformanceDataManager class="com.ibm.ppedev.hpct.etfw.ProfileLaunchOperationBeforeInvocation"></`
`PerformanceDataManager>`
`</extension>`

`<extension point="org.eclipse.ptp.etfw.dataManagers">`
`<PerformanceDataManager class="com.ibm.ppedev.hpct.etfw.ProfileLaunchOperationAfterInvocation"></`
`PerformanceDataManager>`
`</extension>`

Solution - XML (w/ empty tagged HPM pane)

```

<?xml version="1.0" encoding="UTF-8"?>
<toolset.01>
  <tool name="HPC Toolkit" explicitexecution="true">
    <analyze>
      <utility command="HPCTMarkJob" group="internal" />
    </analyze>
    <execute>
      <global name="HPC Toolkit">
        <optionpane title="Data Collection" virtual="true" displayoptions="false">
          <togoption label="Output file name:" optname="HPC_OUTPUT_NAME" envvar="true"
            required="true" tooltip="Specify output file name (HPC_OUTPUT_NAME)">
            <optvalue type="text" fieldrequired="true" />
          </togoption>
          ...
        </optionpane>
        <optionpane title="HPM" virtual="true" displayoptions="false">
          <!-- This optionpane's content is generated by the ProfileLaunchTab class -->
        </optionpane>
        ...
      </global>
    </execute>
    <analyze>
      <utility command="HPCTJobMonitor" group="internal" />
    </analyze>
  </tool>
</toolset.01>

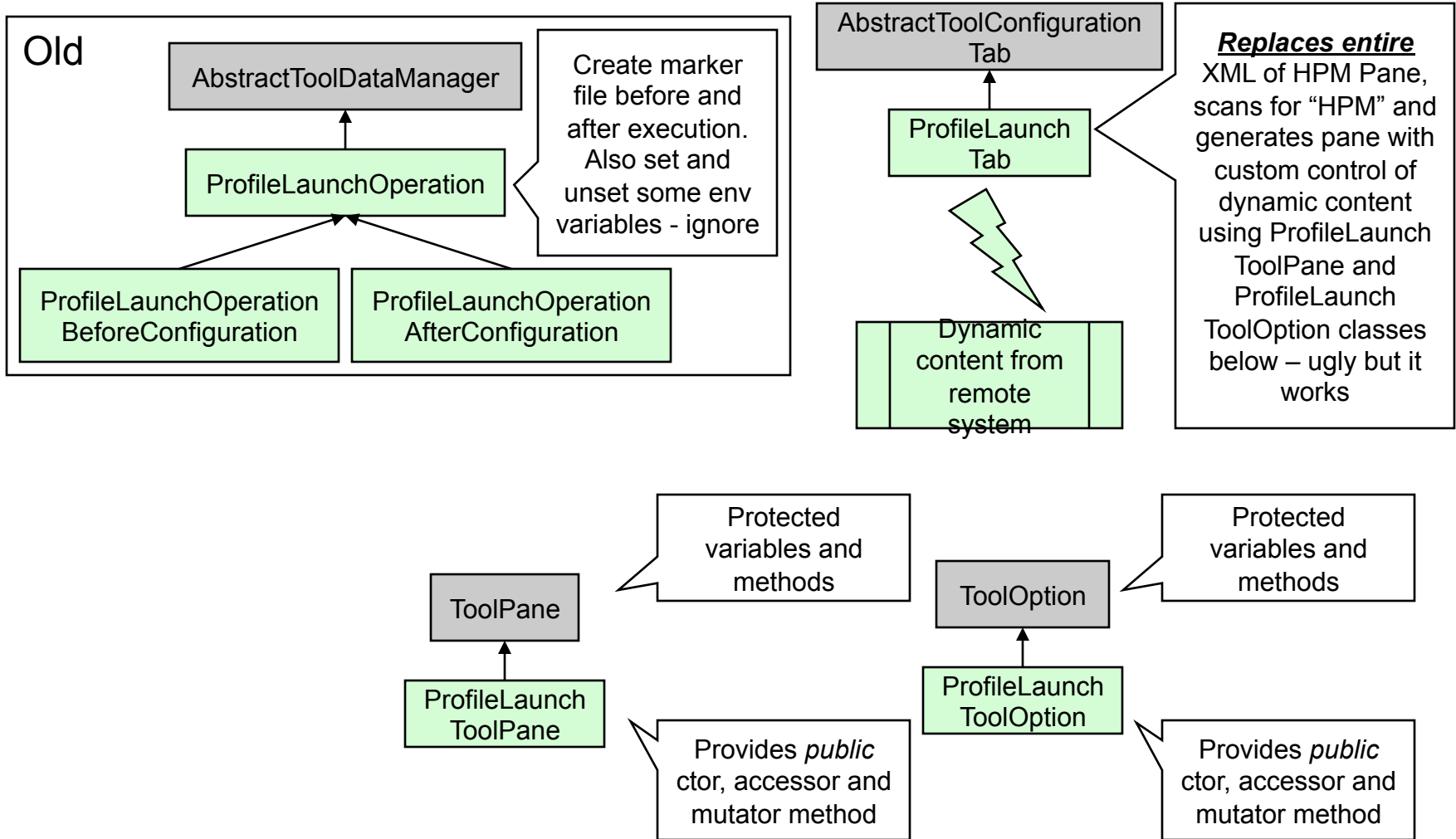
```

Bound to
ProfileLaunchOperationBeforeConfiguration class

Tagged with "HPM" title for ProfileLaunchTab

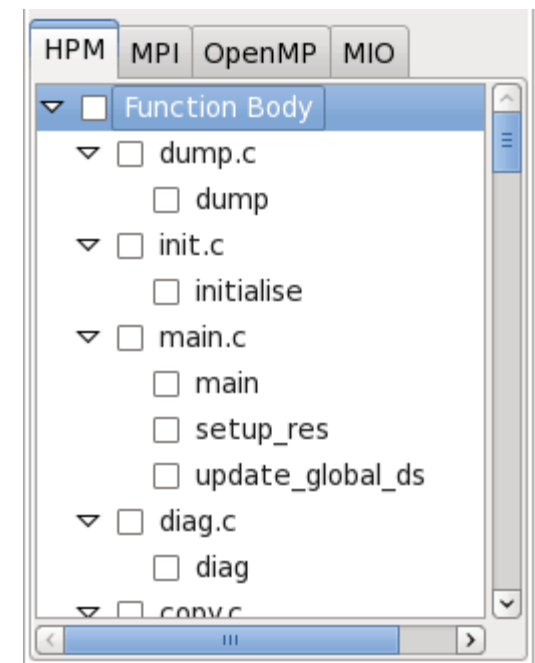
Bound to
ProfileLaunchOperationAfterConfiguration class

Solution – Class Diagrams



Desired Next Step

- Add a more complex custom GUI control to an existing pane
 - GUI Control to be resident within an existing ETFw pane – specified among XML
 - Dynamically generated from analysis of executable and from existing file(s) on remote system of instrumentation points
 - Display multi-tab control of instrumentation points and their selections (sample on right)
 - Produces file(s) on remote system
 - Causes executable to be instrumented prior to launch if selections have changed



Bugzillas

- [Bug 382294](#) - ToolOption extension point for ETFw
 - Presently ETFw provides extension points for workflows, data managers, and configuration tabs. This is to request a new extension point for providing a custom ToolOption.
 - For example, please allow a plugin developer to provide a ToolOption which could do a query of a remote system, and then populate the option with dynamic content, such as, a drop-down list of customized items. When one of the items is selected, and the application launched then the option may set an environment variable or argument (depending upon settings in the workflow).
 - Alternatively, allow a ToolOption which queries a remote executable, and then populates the option with a unique GUI, such as, a checkbox tree view. After any number of boxes are checked, and as the application is launched then the option may write a file to the remote system, which controls the application's profiling through reading the contents of the file.
- Minor
 - [Bug 382292](#) - Gray-out ETFw tab when tool not selected
 - [Bug 385241](#) - ToolOption method name setlsArgumetn misspelled
 - [Bug 385242](#) - NullPointerException in ExternalToolSelectionTab
 - [Bug 385244](#) - IllegalArgumentException: Index out of bounds if nothing selected in ToolOption