Scripting Eclipse With Python
Scripting Eclipse With Python

- Introduction to Eclipse Advanced Scripting Environment (EASE)
- EASE for Scientific Use Cases
- C-Python for EASE Project
- Conclusion & Questions
A scripting framework for easy extension and control of Eclipse IDE and RCP applications using your favourite scripting language.
Hack Your IDE With Python & EASE

1. Improve your code quality
2. Automate tedious tasks
3. Prototype new features
4. Quickly extend the user interface
5. Integrate with third-party tools

https://opensource.com/life/16/2/how-use-python-hack-your-ide
How To Extend Eclipse (Traditional)

1. Code: Java only plug-in
2. Test: Separate Eclipse instance
3. Build: Build & deploy plug-in
4. Install: Install plug-in & restart Eclipse
5. Success
How To Extend Eclipse with EASE

Code: Python Script (or choice of language)

Deploy: Point EASE at script in running Eclipse instance

Success
1. Exploratory computation & data analysis
2. Collaboration
3. Reproducible Research
loadModule('/System/Platform')

# Get the core service from ICE for creating and accessing objects.
coreService = getService(org.eclipse.ice.core.iCore.IContainer);
nickelThickness = 250;

for i in xrange(1, 5):
    reflectModel = coreService.getItem(int(coreService.createItem("Reflectivity Model")))
    listComp = reflectModel.getComponent(2);
    nickel = listComp.get(2);
    nickel.setProperty("Thickness (A)", nickelThickness);
    nickelThickness += 250;
    coreService.processItem(reflectModel.getId(), "Calculate Reflectivity", 1);
ps = dnp.plot.getPlottingSystem("ref-testscale_1_001.img")

trace_X_Profile_1 = ps.getTrace("X Profile 1")

color1 = dnp.plot.createColor(0, 0, 255)

trace_X_Profile_1.setTraceColor(color1)

ps.setTitle('Plot of Y Profile 1 against Y Pixel')
To achieve more reproducible research, tools need to make it easier to access and rerun all the software involved.
JYTHON vs C-PYTHON

Java Implementation of Python Language

C Implementation of Python Language

Version 2.*

Version 2.*, 3.*

No real access to C extension modules (JyNi)

Support for C extensions

Integrates with the JVM

Numpy, scikit-learn, Octave, scipy, opencv...
Integrating Python & Java

Py4J:

✓ “A Bridge between Java and Python”
✓ Allows Python to access JAVA classes
✓ Used by Apache Spark for PySpark
✓ Developed by Barthelemy Dagenais
Here There Be Dragons

Integrating Python & Java

```
Button

Editor

handleEvent

script.py

loadModule("/System/UI")
...
editor = getActiveEditor();
...```

...

...
Integrating Python & Java

Here There Be Dragons

```python
loadModule("/System/UI")
...
editor = getActiveEditor();
...```

Diagram:
- Button
- Editor
- `handleEvent`
- `Invalid Thread Access`
- `script.py`
Recursion between Java and Python can be done on a single thread (Pinned Thread Model)
https://github.com/bartdag/py4j/issues/192
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Python Scripting Schedule

- Early June Release (EclipseCon France)
Conclusion

- EASE is a powerful framework for boosting developer and user productivity
- EASE + CPython can be even more powerful by leveraging the Python ecosystem
- Now is a good time to get involved!
Get Involved

- EASE
  - Try it out, feedback & contribute features

- Science Working Group
  - Mailing list & discussions

- Project Sponsors
  - Let’s talk

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