EASE-ily Make the Most of Eclipse with Python

Tracy Miranda, Jonah Graham
EclipseCon Europe 2016

https://github.com/jonahkichwacoders/EASE-Python-Examples
AGENDA

- Python & EASE Background

- Demo
  - Automate, Extend, Integrate & Share with EASE

- Python & EASE: The Vision & The Roadmap

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EASE & PYTHON BACKGROUND

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EASE Scripting Framework

Allows for easy extension and control of Eclipse IDE using your favourite scripting language.

Eclipse Advanced Scripting Environment

- Python (Py4J)
- Jython
- Javascript (Rhino, Nashorn)
- Groovy
- Native Java
- [Your Interpreter Here]

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Python & EASE: A brief history

EclipseCon France, June 2015:
“Integrating Python and Java in Eclipse”

EclipseCon Europe, October 2015:
“I Love Scripting”

EclipseCon France, June 2016:
“EASE-ily Making the Most of Eclipse with Python”

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Why Python?

• Great beginner language
• Heavily used for Science
• Heavily used for Embedded e.g. GDB
• Lots and lots of fast, powerful libraries e.g. numpy

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Enabling Technology: Py4J

☑ “A Bridge between Java and Python”
☑ Allows Python to access JAVA classes and vice versa
☑ Open source, BSD licence
☑ Used by Apache Spark for PySpark
☑ Developed by Barthelemy Dagenais
☑ New ‘Pinned-thread’ threading model to work with Eclipse/SWT

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EASE MODULES

• Logical groupings of functionality
• Provide easy access to Eclipse and Java APIs

UI  Resources  Platform
Launch  Charting  Modeling

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PYTHON & EASE: VISION AND ROADMAP

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Extending Eclipse (Traditional)

- Code: Java only plug-in
- Test: Separate Eclipse instance
- Build: Build & deploy plug-in
- Install: Install plug-in & restart Eclipse
- Success

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Extending Eclipse with EASE

Code: Python Script (or choice of language)

Deploy: Point EASE at script in running Eclipse instance

Success

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Extending Eclipse with EASE

Open up Eclipse extensibility to a whole new world of developers!

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Python Scripting with EASE

- Be more productive
- Extend Eclipse quickly
- Integrate Python libraries
- Share scripts with others easily

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EASE-ily Make The Most of Eclipse

- AUTOMATE
- EXTEND
- INTEGRATE
- SHARE

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Python Scripting RoadMap

**Short Term (Funded)**
- Py4J Interpreter Integration
- Critical bug fixes
- Release Engineering

**Near Term**
- Pythonic Behaviour (Usability)
- PyDev Integration
- AnalysisRPC
- CDT Integration

**Future**
- Remote Support
- Debugging Support
- IPython Notebook
- Recording

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Pythonic Behaviour (Usability)

Namespace pollution
Running scripts with Python directly
More Python-friendly API

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PyDev Integration

Autocompletion in console
Autocompletion in editor
Integration of PyDev Console
IPython terminal support
Shared/Automatic Interpreter Configuration

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AnalysisRPC

Custom solution to move data around
Enhanced Remote Procedure Call
- Datasets (ndarrays)
- Regions Of Interest (ROIs)
- Exceptions

Language Independent
Server and client written for Java and Python

Integration with Science WG Projects
(Visualisation, Workflows and Data Structures)

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Python

```python
x = numpy.ndarray(...)
y = numpy.ndarray(...)  
rpcclient.Plotter.line(x, y)
```

---

Java

```java
import org.eclipse.dawnsci.IDataset
class Plotter {
    public void line(IDataset x, IDataset y) {
        // ...
    }
}
```

---

Transport (XML-RPC + Disk/Memory)

Meta and simple data:
- Target → Plotter
- Method → line
- x → /tmp/x
- y → /tmp/y

Datasets:
- /tmp/x
- /tmp/y
Java

interface IFilter {
    IDataset filter(IDataset data);
}

// create client for PyFilter
client.newProxyInstance(IFilter.class)
IDataset result = proxy.filter(data)

Python

class PyFilter:
    def filter(data):
        # manipulate ndarray data
        return data

# create server
server.add_handler(PyFilter())

Transport
(XML-RPC + Disk/Memory)

Datasets: /tmp/data

Meta and simple data:
Target → PyFilter
Method → filter
data → /tmp/data
CDT Integration

Visual Studio Macro-like support
Debug Module
C Editor Support Module
GDB Python Interface Integration

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AUTOMATE

EXTEND

INTEGRATE

SHARE

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Thank you & Questions

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