Instruments for studying proteins (Cancer Research)

Protein separation by pH

Gel Imaging
Architecture for an Instrument and Application

Robotics and Imaging System

- Embedded SBC
  - Linux (Ubuntu)
  - Python, Django

- Remote Control Client
  - Windows and Mac OS X
  - Eclipse RCP, Java

Soap, Rest, Zeroconf
Architecture for an Appliance Instrument

Imaging System and Data Web Server

- **Embedded SBC**
  - Linux (Ubuntu)
  - Python, Django

- **Touch screen**
  - Chrome kiosk mode
Who we are:

Company: ~100 employees

Software Group: ~6 people

- 1 manager, (UI design)
- 2 engineers (Java, Python, JavaScript)
- 1 engineer (legacy .NET)
- 1 contractor (coding and builds, tests, installers, tools.)
- 1 SQA person
Software development at a small company

- Not many resources
  - Everyone does many tasks
  - Little time to learn
  - Tasks should add immediate value

- Use known tools where one can
  - Need to use a specialized tool for a week
Our software tool needs

Instruments usually require diverse technologies.

- **Embedded Computers**
  - Linux, Python, Django, (C++ for drivers)

- **Desktop applications**
  - Windows, Mac OS X, Java (Eclipse RCP)

On a good day one can work on Java, Python and JavaScript
...on a bad day, it includes C++
Eclipse IDE for small teams and diverse products

Use one IDE across many technologies

**OS**
- Linux
- Windows
- Mac OS X

**Language**
- Great=Java.refactor()
- [Python for debug in code]
- Aptana=JavaScript.plugin
- `<HTML/>

C+++-=

Don’t need to move the F3 key!!!
Eclipse plugins we use

- Eclipse for RCP Developers, version 3.5
- PyDev
- Subclipse
- EGit
- JUnit
- SWT Bot
- TPTP Test and Performance
- SOAP WSDL editing
- Aptana
Easy to setup development environment

- Easy to publish our Eclipse environment
  - Install Eclipse
  - Install all plug-ins
  - Zip it!
  - Push to server

- Easy to install for all engineers
  - Unzip

- The coolest...
  - A breeze to install on any lab machine to debug
  - Install remotely with a USB key
Eclipse RCP for scientific applications

RCP: Using the framework of Eclipse for something entirely different

- Cross platform desktop application for Windows and Mac OS X
  - Native looking application
- Leverage existing Framework
  - Perspectives map to different steps in data acquisition and analysis
- Did I mention cross platform?
  - We have to support ubiquitous Windows
  - There are many users in academia who love their Macs
Compass: an Eclipse RCP

- Graphs
- Images
- Different data slices
- Colored coded data features
Application Perspectives -> Experiment Stages

Setup

Data Run Progress

Analyze Data
Eclipse RCP Custom Views

Images

Pseudo Gel

Graph (JFreeChart)
Where Eclipse RCP could do better

- **Builds**
  - Used PDE when we started, works OK
  - Currently many solutions available: PDE, Athena, Buckminster, B2
  - Not able to investigate them all

- **Updates**
  - Use basic updates
  - Tried an early version of P2, did not succeed

- **Installers**
  - Require complete installation: shortcuts, dependencies, ...
  - Use 3\textsuperscript{rd} party tool: Advanced Installer
Other tools we use

- We use hosted services where we can
  - Fogbuz, defect tracking, project management
  - Wush.net (SVN hosting)
- Firebug (JavaScript debugging)
- bpython, great Python shell
  - Can have your ssh and auto-completion too.

In the Cloud, if it rains, will our bugs float or get squashed?
Things we love about Eclipse

- Low entry cost, in time and money, to try new technologies
- Framework to leverage for our UI
- Easy to deploy
- Fast refactoring of Java Code
- Debugging of Python
Take Aways

Eclipse works well for our a small group

- Great when using diverse technologies
  - One IDE for multiple platforms and languages
  - Easy to reproduce development environment

- RCP is well suited for desktop scientific applications
  - Leverage Framework for UI
  - RCP application installer and build system are hurdles
Software Engineer for our new imaging product line

- Like working in a small team wearing many hats.
- Eclipse
- Python, Java, JavaScript, Django
- Real time/Instrument control
- Being a runner is a plus (some of us run at lunch)

```java
for (i=0; i<distance; i++) {
    left += step;
    right += step;
}
I need an Android app for this!
```
Further questions
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Job opening
- Steve Gallagher
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Thank you for all the great work on Eclipse !!!