The Name

• Needed a name

• Saw Discovery channel about Siafu ant.
  – Largest colony of any social insect
  – Eat everything (up to 100k animals in a single raid)
  – Ants build things and work together (like Siafoo)
What is it?

- Code / Knowledge sharing site
- A sort of a wiki, but not really
- Store
  - Useful scripts
  - Utility functions
  - Boilerplate code (like GUI startups)
Motivation

• Reduce wasted time looking for:
  – Boilerplate code
  – Random bugs

• Home for:
  – Useful scripts and small code (too small for SVN)
  – Prototypes
  – Misc programming information (like tips, and tricks)
What can it do?

- Post code Snippets
- Write Articles
- Organize stuff into Libraries
- Collaborate using Groups
Siafoo vs Blogs

• Anyone can edit code and articles
  – Information doesn't age as much
  – Bugs are fixed without the author's intervention
  – No need to look at comments
• Easy to locate and organize snippets/articles/etc
• License, original source and author
Features

- Code highlighting
- reStructured Text
- Access Controls
- All content is versioned
- Update stream (like Trac timeline)
Features (cont.)

- Algorithms
- Sharing
  - Sending
  - Embedding
    - Dynamic (with JavaScript)
    - Static (Copy/Paste highlighted HTML)
- Subscriptions
- XMLRPC
Visitors with Firefox

Firefox 2.0.0.14 (55.40%)
Firefox 2 (8.3%)
Firefox 3 (36.0%)
Other

\[
\nabla \cdot E = \frac{1}{\varepsilon_0} \rho \\
\nabla \cdot B = 0 \\
\n\nabla \times E = -\frac{\partial B}{\partial t} \\
\n\nabla \times B = \mu_0 J + \mu_0 \varepsilon_0 \frac{\partial E}{\partial t}
\]

```
import java.io.*;
import javax.servlet.*;

public class Hello extends GenericServlet {
    public void service(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html");
        final PrintWriter pw = response.getWriter();
        pw.println("Hello, World!");
        pw.close();
    }
}
```
reST (cont)

- A text formatting “language”
- Looser / Cleaner syntax than Wikis
- Expandable
- Directives (.. foo:: ) for “complex” operations
Siafoo specific reST

- Graph::Easy (PyPerl)
  - Graphviz, Graph::Easy syntax
  - Database caching
- LaTeX
- Misc
  - Code blocks, Snippets, etc.
  - Charts
  - Amazon
  - YouTube
Code highlighting

- Pygments
- ~110 languages
- Easily extendible
  - New languages (like GLSL and COBOL)
  - Built-ins for new languages (NumPy, Blender-Python, Nodebox, etc.)
Access Controls

• View/Edit/Etc permissions
  – User / Group ownership
  – “Friends” permission

• Moving to ACLs soon
Versioning

Quick and dirty wxPython and PyOpenGL Volume Rendering Skeleton

Revision 1 vs. Revision 2

```
Description

r1  r2
6   6
7   7
8   8
9   9
10  10
11  11
11  11
12  12
13  13
14  14
15  15
16  16

To extend it into something that can view MRI (or similar) data you can do something like:

```
```
```

Code

r1  r2
1   1
2   2
2   2
3   3
3   3
4   4
4   4
5   5
6   6
6   6
```

```
```

```
Update Stream

Atom feed with the filters you've selected

Filter activities by action type

Filter activities by object type
Full Screen Editor

- Preview Pane
- Generate Preview
- Edit Pane
- Exit Full Screen mode
- Drag bar to change pane size
Social Networking?

- Siafoo is not a social networking site, but it has some of the same elements
  - Friends and Groups (mostly for access control)
  - Messages
- Useful without the social networking part
- The point is to “Do Stuff”
How it works...
Application Stack

- Fairly straight forward web app
- Apache httpd
- PostgreSQL
- Python (Perl and Java)
- Runs on SL (but it doesn't matter)
Scientific Linux

- We know SL from UCD work
- Cool:
  - Just RHEL / CentOS
  - Stable (1 year release cycle)
  - Good hardware vendor support
  - Xen Virtualization
- Not So Cool:
  - Older Python, PostgreSQL, Apache, etc.
  - Xen GUI is archaic
Why Python?

- A general purpose programming language
- Lots of libraries and features
- Not too slow
- We already knew Python...
Why PostgreSQL?

- “Real” database server (sorry)
- Data integrity comes first
- High performance / scalability
- XML Support
- Full Text Search (TSearch2)
- Single storage engine (InnoDB/MyISAM/... ?!)
SQLAlchemy

- **Object Relational Mapper (ORM)**
  - Object-based representation of database
  - Relation setup (one-one, many-one, one-many)

- **SQL Expressions (SE)**
  - Execute arbitrary SQL statements with automatic data coercion
  - Example: `func.foo('bar', 1337, [1,2,3,4])`

- (Tip: Freeze required version in setup.py)
Elixir

- Thin wrapper around SQLAlchemy's ORM
- Extensions: Versioning, Encryption, List plugin
- Cleaner code (than pure SA)

```python
class Person(Entity):
    name = Field(String(128))
    addresses = OneToMany('Address')

class Address(Entity):
    email = Field(Unicode(128))
    owner = ManyToOne('Person')
```
Pylons

- MVC Framework
- Choice of template engines
- Out of the box SQLAlchemy or SQLObject
- Ruby On Rails style routing and AJAX
- Slightly harder to setup (than cherrypy or php) but easier to manage in the long run
- Unit testing integration (nose)
Genshi

- Parse, generate, and process HTML, XML
- Clean XML-like templates (feels like JSP)
- Stream filters and match templates
- Not as fast as text-based engines
- Static includes (since v0.5)
XSLT

- **Good**
  - Very very fast
  - Less code
  - Easy updates

- **Bad**
  - Hard to maintain for complex stuff
  - Stay away from LXML
  - libXML2/libXSLT are hard to use
Eastwood

- **Google Charts API**
  - Encodes chart in request string
- **jFreeChart**
- **Bad**
  - Dataset size limits
  - Values are not exact
  - No caching (yet)
Front-End

- Mootools
- Asynchronous Requests / Responses
  - AJAX
  - JSON
Mootools

- Lightweight and modular
- Very well documented
- Clean API
- Compatible with Safari 2+, FF2+, Opera 9+, IE6+
- Fixes IE bugs
Future Plans

- Pastebin (private/public)
- Blogs (hosted and/or aggregated)
- Eclipse Plugin (other plugins)
- Todos / Tasks / Micro-bugs
- Code lint (other analysis and stats)
Feedback

- What wastes your time (other than meetings)?
- What can Siafoo do to save you time?
- How can it be more useful to groups?
More Information

- Siafoo: http://www.siafoo.net/help/about
- Pylons: http://www.pylonshq.com
- Elixir: http://elixir.ematia.de
- Eastwood: http://www.jfree.org/eastwood/