Using Open Source Software in Synchrophasor Applications

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OSS Development Model

Goal: Active Community Development

From David A. Wheeler Presentation, 11/4/2009
Black Duck OSS Survey

• An annual survey on the future of open source software

• From 822 respondents in April 2013 – 42% vendors, 58% non-vendor

OSS on a strong growth curve

Source: Black Duck Software. The 2013 Future of Open Source Software Survey Results
Energy On the Low-Side of Use

8.9% Financial

4.2% Energy

7.5% Automotive

2.2% Aerospace

15.2% Medical

13% Media

5.9% Retail

8.0% Other

Source: Black Duck Software. The 2013 Future of Open Source Software Survey Results
Business Drivers for OSS

Source: Black Duck Software. *The 2013 Future of Open Source Software Survey Results*
Other Outcomes of OSS Development

Source: Black Duck Software. The 2013 Future of Open Source Software Survey Results
WHY ENGAGE DIRECTLY WITH AN OPEN SOURCE COMMUNITY

1. REDUCE YOUR OWN DEVELOPMENT & MAINTENANCE COSTS

2. ATTRACT & RETAIN TOP DEVELOPMENT TALENT

3. INFLUENCE PROJECTS

Source: Black Duck Software. *The 2013 Future of Open Source Software Survey Results*
Engaging in OSS

• Create a new open source project
  – Select a license
  – Pick a web-based OSS hosting service

• Contribute to an open source project that already exists
  – Understand governance / community culture
  – Engage
  – Periodically review benefits / continued participation
New Project - Select a License

• Popular business friendly licenses
  – Apache (License 2)
  – MIT
  – BSD
  – Eclipse
  – Mozilla
  – CPL (Common Public License)
New Projects - OSS Hosting

- CodePlex (2006)
  35K projects, 151K users
- Bitbucket (2008)
  94K projects, 1M users
- SourceForge (1999)
  430K projects, 3.4M users
- Github (2008)
  11M repositories, 5.2M users
  Not Reported

FEATURES

- Bug Tracking
- Web Hosting
- Discussion Forum
- Mailing List Mgmt
- Binary Release Posting
- Version Control / SCM
  - Subversion
  - MS TFS
  - Git
Contributing – Synchrophasor OSS

GPA
• Grid Solutions Framework
• openPDC
• SIEGate (openPG)
• openHistorian
• PMU Connection Tester
• Phasor Data Stream Splitter

OTHERS
• Synchrophasor Analytics
  (Kevin Jones, Dominion)
• Macomber Map
  (Mike Legatt, ERCOT)
• OpenPMU Project
  (Queens Univ. / KTH)
• Cisco/SISCO open source synchrophasor framework
• iPDC (India)
• More ??
Tools Becoming Available to Gauge OSS quality

http://www.ohloh.net/
Ohloh Results for openPDC

The open source phasor data concentrator is a system that is used to manage, process and respond to dynamic changes in fast moving streaming phasor data. More specifically, the openPDC can process any kind of data that can be described as "time-stamped measured values". These measured values are simply numeric quantities that have been...

Mostly written in C#

1.3M lines of code
7 current contributors
13 days since last commit
1 user on Ohloh

-- has had 5,777 commits made by 22 contributors representing 1,309,620 lines of code
-- is mostly written in C# with a very well-commented source code
-- has a codebase with a long source history maintained by a large development team with decreasing Y-O-Y commits
-- took an estimated 363 years of effort (COCOMO model) starting with its first commit in August, 2009 ending with its most recent commit 13 days ago
Multiple Ways to Participate in Synchrophasor OSS

- Public / Guest
- Networking (Forums)
- Follower
- Editor
- Developer
- Coordinator (Project owner)

Get Engaged
Guest – Download/Experiment

https://www.codeplex.com/
Register and Network

Please Note: The answers to many problems and questions, especially if you are new to the openPDC, can be found in the Getting Started and FAQ pages.

**help with the historian playback utility**

**FIRST POST:** felipefreitaz wrote: Hello, I'm new and I need to read a .d archive and convert it to ...

**LATEST POST:** stephen wrote: Hello felipefreitaz, For converting archives to CSV, I would say ... 

**Running Hadoop Jobs on OpenPDC data**

**FIRST POST:** tseabra wrote: I am a 2nd year Electrical Engineering student and along with a pro...

**LATEST POST:** smafra wrote: Hello, We are writing some code in python to read the .d files in ...

**Real-time Monitoring**

**FIRST POST:** dcroix wrote: Hello, I am new to the world of PMU's and am learning everyday. I...

**LATEST POST:** dcroix wrote: Ritchie, Thanks for the recommendations! Yes the software provides...
Register and Log/Track Issues

![Image of issue tracker interface]

**Results**

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<th>Status</th>
<th>ID</th>
<th>Title</th>
<th>Assigned To</th>
<th>Status</th>
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<td>Switching windows when adding devices to output stream results in devices becoming unselectable</td>
<td>staphen</td>
<td>Proposed</td>
<td>issue</td>
<td>Low</td>
<td>Jan 30 at 4:15 PM</td>
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<tr>
<td></td>
<td>11544</td>
<td>Searching in output stream -&gt; Add device clears selection</td>
<td>staphen</td>
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<td>Low</td>
<td>Jan 30 at 4:13 PM</td>
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Add / Edit Documentation

User’s Documentation
- Getting Started
- Frequently Asked Questions
- Use and Configuration Guides
- Overview of the openPDC Management System
- How to Use the openPDC Manager
- The GEP Subscription Tester NEW
- Using a “Gateway Style Connection” between openPDCs and/or openPGs
- Controlling UDP data loss UPDATED
- Remote Console Security NEW
- Help Me Choose Diagrams
- Configuration File Settings
- Setting for Uniform CPU Utilization
- openPDC Console Commands to Adjust Configuration Settings
- openPDC OSI-PI Adapters NEW
- Data Quality Monitoring Adapters
- Adapter Connection String Syntax
- openHistorian 1.0 Archive Size Calculator
- Distributed Historian Setup Notes
- Automated Archive Data Recovery Operation (a.k.a., Missing Data Gap Filling)
- Automated Connection Failover Operation
- Adjusting Output Stream Labels to Meet ISO Naming Standard
- PMU Connection Tester (accessed via host site)
- How to Manually Configure the openPDC
- How to Bulk Apply line-to-line Sqrt(3) Adjustment to all Voltage Magnitudes
- Single Page Overview

FOR USE
- .NET 4.0

FOR DEVELOPMENT
- Visual Studio 2010 (Team Edition)