Brief Bio and (PR)^2: Problems & Pitches – Rants & Raves by *Marlon Pierce*

Self Introduction

Pierce is the Assistant Director for the Science Gateways Group in Research Technologies Applications at Indiana University. Pierce received his Ph.D. Florida State University (Physics) in 1998 in computational condensed matter physics. His current research and development work focuses on computational sciences with an emphasis on Grid computing and computational Web portals. Prior to forming the Science Gateway Group, Pierce served as assistant director for the Community Grids Laboratory at Indiana University's Pervasive Technologies Institute. Pierce supervises the research activities of software engineering staff and Ph.D. students, and serves as principal investigator on multiple federally-funded research projects. Pierce leads research efforts in the following areas: the application of service-oriented architectures and real-time streaming techniques to geographical information systems and sensor networks; the development of open source science Web portal software for accessing Grid computing and data resources; and Grid-based distributed computing applications in computational chemistry and material science, chemical informatics, and geophysics.

Publications
http://scholar.google.com/citations?user=jAIppVwAAAAJ&hl=en

Homepage
http://pti.iu.edu/sgg/

Tools and Services
http://airavata.apache.org/
 http://rave.apache.org/

General Questions

1) What are your main interests in attending the workshop?
My group's interest is in software for Web-based science gateways and executing scientific workflows on Grids and Clouds. We are interested in matching our general purpose consulting efforts within the NSF XSEDE program; our software develop efforts within Apache; and our general approaches to software architectures, development, and governance to the requirements of the workshop's goals.

We are interested in presenting the NSF XSEDE program, which incorporates supercomputing centers across the country to provide shared facilities for academic computing, and specifically the XSEDE Science Gateway program, which provides advanced consulting expertise on building web-based

communities to access XSEDE resources.   XSEDE's Gateway Hosting Environment (led by IU) provides virtual machines for hosting gateway servers.

Our team's efforts also include software development within the Apache Software Foundation, where we have co-founded two top level projects.   Apache Rave is a general-purpose social networking platform on which we are building science gateway plugins. We are also developers and contributors to Apache Airavata, a comprehensive scientific workflow system.

2) What are the tools or services you would like to share at the workshop?
Apache Airavata (airavata.apache.org) and Apache Rave (rave.apache.org), described above.

3) Please list three features or functions of your tools or services that are most important for the users.
* Packaging and low startup barriers for using the software.
* Providing simpler access mechanisms to complicated systems.
* Reliability of production capabilities within complicated systems.

4) What are the major concerns for the architect design of the tools and services?
Interfacing with independently developed and operated software systems and integrating a wide variety of independently developed applications into a consistent framework. We believe there is a need to provide much better information flow across software stacks in distributed systems. Otherwise, debugging operational problems in production systems becomes very difficult.

5) Are you aware of especially innovative approaches to plug-and-play feature where algorithms and plugins can be shared between different tools? If yes, please list down the approaches.
Our Apache Rave software is based on the Spring MVC framework, which implements the Inversion of Control pattern for plug and play. Our Apache Airavata software is based on distributed Service Oriented Architecture principles, which provide pluggable services that can be incorporated into a comprehensive workflow.

6) What are the challenges in developing the tools and services?
Poorly conceived standards that are difficult to implement, dependence on other services in complicated environment.

7) Are you or your group working on any of these challenges? If yes, please explain.
Yes. We believe that, among other issues, much academic software suffers from poor governance models that discourage real cooperation across developer groups. We are participating in and encouraging others in academic software development to join the Apache Software Foundation to provide a neutral collaboration ground. In relation to question #6, our goal is to encourage more collaborative reference implementations of standards and better collaboration on implementing core software for large systems.

8) Does your development team contain volunteer developers? If yes, please explain how they are involved.
Yes. The Apache Software Foundation model encourages volunteer and joint development through its governance model, intellectual property policies, and licensing. We also have taken advantage of Google Summer of Code developers through Apache.

9) What would you like to learn and achieve at the workshop?

I would like to achieve better collaboration with the workshop attendees on mutually interesting problems.