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TUTORIAL II

Web 2.0, Grids and Cyberinfrastructure / e-Infrastructure

Geoffrey C. Fox
Director and Professor
Community Grids Laboratory, Indiana University
Bloomington, Indiana
USA

TUTORIAL DESCRIPTION

Numerous online services such as Facebook, MySpaces, Flickr, Wikipedia, and Google Maps have enabled the Internet to become participatory and user-driven, creating a phenomenon commonly called Web 2.0. These Internet services are primarily known for their abilities to create social networks, to provide a high level of customization and personalization by users, and to have a rich level of interactivity between the user and the Web interface. Consequently, the most popular of these sites are attracting millions of users. Less commonly used but also important are the exposed programming interfaces and multiple access methods that many of these services provide. Google Maps is a famous example, providing high level JavaScript libraries that encapsulate complex map manipulations and other operations. This enables enthusiast developers to create their own sophisticated Web interfaces. Combining multiple such online services into a single new Web interface is commonly called a "mash-up". Thus Web 2.0 services blur the distinction between users and developers. It is our position that these concepts need to be examined and, where appropriate, adopted by the Grid computing and e-Science communities, particularly by the developers of science gateways and portals. In this tutorial, we present the main concepts of Web 2.0 services from the point of view of classic distributed and Grid computing. As we show, the two are closely related, sharing many of the same basic concepts. The differences typically lie in the implementation, with Web 2.0 favoring simplicity over sophistication.

TUTORIAL OUTLINE

We cover the following topics:

- Web 2.0 as a Web architecture: message formats, data models, service models, workflows, presentation layers, and virtual communities.
- Using JavaScript libraries for AJAX, JSON, and other effects: YUI, Scriptaculous, etc.

- Mashups as workflows or service compositions: examples and tools
- Social networks with Open Social and Facebook APIs
- OpenID and Web 2.0 security
- Social bookmarking with del.icio.us and MSI-CIEC portal examples
- Analysis techniques for folksonomies
- Principles of REST Web services with Amazon, Flickr, and IBM Project Zero examples
- RSS/Atom content feeds: creating and consuming syndicated XML
- Microformats for e-Science with examples from the Polar Grid and e-Chemistry projects
- Content creation, management, and syndication with Blogs and Wikis
- Tying it all together: what makes a good Web 2.0 service?

REFERENCES

An earlier version of this tutorial can be found at
http://grids.ucs.indiana.edu/ptliupages/presentations/sc07tutorial/Web20Tutorial_SC07.ppt
Papers on the subjects of e-Science Grids and Web 2.0 are
http://grids.ucs.indiana.edu/ptliupages/publications/GridSandwich.pdf
http://grids.ucs.indiana.edu/ptliupages/publications/INGRIDFinal.pdf
http://grids.ucs.indiana.edu/ptliupages/publications/Web20ChapterFinal.pdf

REQUIREMENTS AND TARGET AUDIENCE

No special prerequisites required. Level will be technical but elementary.
Other requirements: Interest and familiarity with basic Internet technologies such as HTML and HTTP.
Audience: People building or responsible for building distributed systems.

TUTORIAL DURATION

The tutorial material will be presented in a 2 to 3-hour session.

INSTRUCTOR BIOGRAPHY

Geoffrey C. Fox (8122194643, gcf@indiana.edu, http://www.infomall.org).
Professor Fox received a Ph.D. in Theoretical Physics from Cambridge University **a**nd is now professor of Computer Science, Informatics, and Physics at Indiana University. He is director of the Community Grids Laboratory of the Pervasive Technology Laboratories at Indiana University. He previously held positions at Caltech, Syracuse University and Florida State University. He has published over 550 papers in physics and computer science and been a major author on four books. Professor Fox has worked in a variety of applied computer science fields with his work on computational physics evolving into contributions to parallel computing and now to Grid and multicore chip systems. He has worked on the computing issues in several application areas – currently focusing on Defense, Earthquake and Ice-sheet Science and Chemical Informatics. He is involved in several projects to enhance the capabilities of Minority Serving Institutions.