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The Taverna Workflow Suite: Designing, Running and Sharing Workflows for Science on the Web, Grid or Cloud

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Impact

Taverna is used worldwide and by a range of EU projects relevant to EGI. E.g:
- Biodiversity –BioVeL (www.biovel.eu) for ecological niche and population modelling and a key part of the ESFRI LifeWatch programme;
- Helio Physics –HELIO (www.helio-vo.eu) for solar and heliospheric observations using Grid infrastructures;
- Document preservation –SCAPE (www.scape-project.eu) for semi-automated workflows for preservation of digital collections, using cloud;
- Virtual Physiological Human –VPH-Share (www.vph-share.eu) for data/image processing and mathematical modeling, recently producing an Application Hosting Environment Taverna plugin.
- Biology –OpenTox (www.opentox.org) for predictive toxicology and XworX (http://www.xworx.org) a cloud enabled biology analysis platform;
Taverna is the reference implementation platform for the EU Wf4Ever (www.wf4eve-project.org) investigating workflow publishing and preservation, and a collaborator with the SHIWA programme (www.shiwa-workflow.eu).

Summary

Taverna is a suite of workflow management software designed to combine distributed services into complex analysis pipelines. It supports: the design, execution and sharing of workflows; services; and integration with other platforms (e.g. Eclipse) and infrastructures (e.g. AWS and Grid). The Taverna Server is deployed on AWS and EGI resources. The Workbench runs on Linux, OS and Windows. A Taverna Player, Command-line tool and a OSGi platform enables integration with third party tools. The myExperiment workflow repository supports libraries of Taverna workflows and Taverna workflow components (families of packaged workflows used as simplifying "blocks"in a workflows assembly).

Taverna is widely used in a range of EU projects including Biodiversity, HelioPhysics, Biology, Chemistry and Document preservation. We will present the Taverna Suite and its application to projects relevant to EGI. We will also highlight our requirements for data management relevant to the EUDAT project.

URL

http://www.taverna.org.uk

Description

Taverna is a workflow management system designed to combine distributed services into complex analysis pipelines. Taverna has matured into an open source suite of software:
- A Workbench for assembling workflows and packaging them into higher-order blocks to shield users from service complexities;
- A Workflow Engine for high throughput and long running workflows with looping, data streaming, and interaction with range of service types, e.g. REST, SOAP and Grid services, Cloud services, R-Scripts, command-line scripts, and interaction with users for semi-automated workflows. A plug- framework adds custom services such as Spreadsheets, AWS, UNICORE, Globus, PBS, Opal, AHE, BioMart, and SADI;
- A Server for deploying the engine on large scale or enterprise infrastructures such as Amazon Cloud or EGI;
- An OSGi-based platform of tools, documentation and Java libraries to help integrate the engine into third party applications, services and libraries;

- Security support for OAuth1 and 2, username/password and certificates.
- A web-based Taverna Lite for building wizards for simple workflow launching and editing;
- A Player for executing workflows embedded in web applications;

Taverna supports provenance collection compatible with the W3C PROV standard. Integrated tools include: Community Web service Catalogues (BioCatalogue.org, BiodiversityCatalogue.org) built using our ServiceCatalographer; and myExperiment.org, for storing and sharing workflows (and Taverna components) openly and in branded groups. Third party tool integrations include: Galaxy (for Next Generation Genome Sequencing), the Chemistry Development Toolkit; and International Virtual Observatory for Astronomy feature tables.

This presentation will update the EGI User Forum with the current features of Taverna, with particular respect to EGI and Cloud infrastructures, and on-going work with EU science communities.

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