An Innovative Proposal for the CTA Science Gateway

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This CTA science gateway prototype presents a graphical user interface based on a workflow-oriented framework (gUSE/WS-PGRADE). It is equipped with a flexible SSO (SAML based) Authentication and Authorization access control.

An interactive desktop environment: the Astronomical & Physics Cloud Interactive Desktop (ACID) is available through the science gateway.The user will be able to exploit the native graphical interface of the tools provided by the ACID environment. A cloud data service shares and synchronizes data files and output results between the user desktop and the science gateway.

Wider impact and conclusions

We used a set of wide adopted standards and tools such as Java Portlet Specification, SAML 2.0, Shibboleth 2.0, WS-PGRADE/gUSE, with the aim of enlarging the developer community and improving the sustainability of the software project. This solution provides an ecosystem of new technologies: mobile access, federated authentication, workflow engine and cloud services with an high level of flexibility in order to tailor a product that suits the present and future requirements of the CTA community.

URL(s) for further info

CTA Science Gateway :
https://cta-sg.oact.inaf.it/

CTA Portal :
https://www.cta-observatory.org/

ACID Interactive Desktop Environment for CTA:
http://acid.oact.inaf.it/ACID/Home_page.html

WS-PGRADE/gUSE grid and cloud Science Gateway framework:
http://sourceforge.net/projects/guse/

Description of work

Scientific Gateways allow users to store, manage and share large data collections easily exploiting new applications and resources. This technology aims at allowing scientists to focus on the actual applications instead of learning and managing the required infrastructures to execute them.

The product presented here is based on the workflow-oriented framework (gUSE/WS-PGRADE). This framework provides operation and maintenance of a generic-purpose science gateway framework accessing to the major computing, data and networking infrastructures and services including clusters, supercomputers, grids, desktop grids, academic and commercial clouds.

We designed and implemented an application-specific gateway tailored to the CTA user community. Our first customization open new possibility to the federated authentication and authorization. We implemented a Web Browser Single Sign On Profile using Shibboleth 2.0. This is an open-source implementation for identity management and federated authentication and authorization based on SAML 2.0 (Security Assertion Markup Language).

A new set of services are provided by The Astronomical Physics Cloud Interactive Desktop (ACID). This technology makes available an interactive desktop where the user can exploit the native Graphical User Interface of the available programs. The platform includes the following tools: Heasoft Unified Release with more than 100 subprograms like Ftools, FV, Profit, Xanadu, Xspec, Xronos, Ximage and then DS9, Sextractor, Tempo2, IRAF, Topcat, Aladin, ROOT, EUTelescope, Geant4, IDL, GammaLib, Ctools.

A new access to the remote desktop environment is now available for mobile devices (tablets or smartphones). We provide cloud data services to share and synchronize a workflow outcome, or the result of an interactive section in ACID, between the user desktop and the science gateway.

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