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Repository of services

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Abstract

The deliverable presents a catalogue for a series of services providing a framework for the analysis and integration of data for large-scale infrastructures. These services have been developed or evaluated under the ASTERICS/OBELICS work package. The repository is publicly available on http://repository.asterics2020.eu/services .

I. COPYRIGHT NOTICE

II. DELIVERY SLIP

	Name	Partner/WP	Date
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III. DOCUMENT LOG

Issue	Date	Comment	Author/Partner
1	21/04/2018	First Draft	Thomas Vuillaume (LAPP)
2	26/04/2018	Second Draft	Thomas Vuillaume (LAPP)
3	22/06/2018	Third Draft	Jayesh Wagh (LAPP)
4	04/09/2018	Fourth Draft	Jayesh Wagh (LAPP)
5	11/09/2018	Final	Rob van der Meer

IV.   TERMINOLOGY

ASTERICS	Astronomy ESFRI & Research Infrastructure Cluster
CTA	Cherenkov Telescope Array
ESFRI	European Strategy Forum on Research Infrastructures
KM3NeT	Cubic Kilometre Neutrino Telescope
LOFAR	The Low Frequency Array
LSST	The Large Synoptic Survey Telescope
DIRAC	Distributed Infrastructure with Remote Agent Control
OBELICS	Observatory E-environments LInked by common ChallengeS

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1. Scope of the repository

As we enter the era of Big Data, astronomy and astroparticle infrastructures will be facing new challenges and changing their data models accordingly. The raw data cannot be retrieved and analysed on the final user computer or computing infrastructure. Therefore, solutions to deal with data on large scales must be used and with them, services to help the users have to be provided.

Astronomy and Astroparticle physics are composed of large sub-communities, organised around specific research topics (exoplanets, high-energy universe, galaxy or stars evolution…) or observation methods (light from radio to gamma-rays, particles or gravitational waves). These communities, despite having different science goals, have common technical needs. The main purpose of the ASTERICS project is to bring together these communities in order to create a common environment to share developments and, if needed, drive these developments. To our knowledge, there is no common repository of services in Astronomy and Astroparticle physics to date. OBELICS work package has delivered such catalogue of the services for the scientific community across the world to refer to and discover services already developed within H2020 ASTERICS.

Some of the technologies listed in the repository have been developed in the ASTERICS project to offer a service to the associated scientific projects, namely CTA, LSST, LOFAR. They are delivered as part of the repository of services available at http://repository.asterics2020.eu/services. In addition, other services developed externally are catalogued under OBELICS services repository. These services are under evaluation in astronomy ESFRI projects associated to OBELICS such as *DIRAC* (currently used by CTA and LSST) and *Rucio* (under review by the CTA collaboration).

Facing new challenges on data management, large astronomy and Astroparticle infrastructures have been developing innovative solutions and services to ease the data integration, retrieval and analysis by end-user. Some of these solutions (such as DIRAC or RUCIO) are generic enough and can be adopted by other infrastructures than the ones they were originally developed for.

Whereas some of these solutions have been developed to respond to very specific problems, for which no generic solutions existed (Qserv), or tuned for specific research infrastructures (J4G, gammapy, CTA A&A, IRODS for APERITIF). ASTERICS has played a major role in the development, testing and the integration of these services, as well as presenting them in an open source inventory for the astronomy communities.

Common aspects of all these technologies is that they enable user interaction with large datasets that are stored on a remotely located cluster (or several clusters) from the user. Some aspects of the integration frameworks that need attention are A&A (Authorization & Authentication), user interface, and reproducibility of scientific results.

The repository delivered here present services explicitly developed by the OBELICS community with specific scientific purposes. DIRAC and Rucio are worth listing under OBELICS repository as they are generic. These services are also very well maintained services as they are routinely used and could be helpful to the whole astronomy and Astroparticle community. The repository is dynamic and will be updated regularly until the end of the ASTERICS project and will point to services that will continue to evolve long after.

1.1 Intended Audience

The intended audience for this repository of services are scientists working on data integration activities in astronomy, astroparticle physics field as well members of the public who may have a need or interest in such services, for commercial or non-commercial applications.

2. Development of the repository

The repository presented here is the result of the developments done in the ASTERICS-OBELICS work package but also the result of all the discussions and exchanges enabled by the creation of a larger community through the organisation of events such as workshops and training events. Such a community regroup not only the ASTERICS ESFRI partners, but also other academic partners and industrial partners. In fact, the development of the repository page itself has been possible through partnership with the industrial partner Trust-IT.

2.1 Weblink for OBELICS repository of services

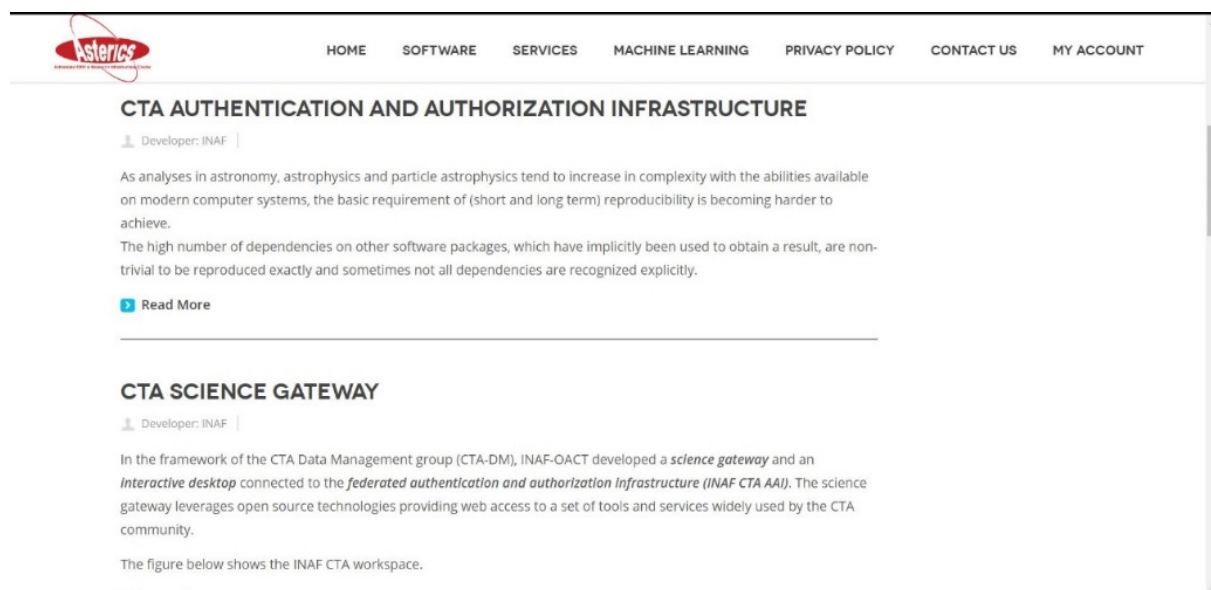OBELICS repository of services is publicly available on following url

http://repository.asterics2020.eu/services

Figure 1 Web interface for OBELICS repository of services

2.2 Citing request

If you use services developed or improved within the D-INT task, we would appreciate it if you include a link to http://repository.asterics2020.eu/services in the documentation and/or any derived publications so that the readers are able to locate the original services easily. This will also help us gauge the public interest and use of these services. The current url is the permanent url of the repository.