The EGI-Engage EPOS Competence Center – Interoperating heterogeneous AAI mechanisms and Orchestrating distributed computational resources

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The mission of EGI-Engage project [1] is to accelerate the implementation of the Open Science Commons vision, where researchers from all disciplines have easy and open access to the innovative digital services, data, knowledge and expertise they need for collaborative and excellent research. The Open Science Commons is grounded on three pillars: the e-Infrastructure Commons, an ecosystem of services that constitute the foundation layer of distributed infrastructures; the Open Data Commons, where observations, results and applications are increasingly available for scientific research and for anyone to use and reuse; and the Knowledge Commons, in which communities have shared ownership of knowledge, participate in the co-development of software and are technically supported to exploit state-of-the-art digital services.

To develop the Knowledge Commons, EGI-Engage is supporting the work of a set of community-specific Competence Centres, with participants from user communities (scientific institutes), National Grid Initiatives (NGIs), technology and service providers. Competence Centres collect and analyse requirements, integrate community-specific applications into state-of-the-art services, foster interoperability across e-Infrastructures, and evolve services through a user-centric development model. One of these Competence Centres is focussed on the European Plate Observing System (EPOS) [2] as representative of the solid earth science communities.

EPOS is a pan-European long-term plan to integrate data, software and services from the distributed (and already existing) Research Infrastructures all over Europe, in the domain of the solid earth science. EPOS will enable innovative multidisciplinary research for a better understanding of the Earth's physical and chemical processes that control earthquakes, volcanic eruptions, ground instability and tsunami as well as the processes driving tectonics and Earth's surface dynamics. EPOS will improve our ability to better manage the use of the subsurface of the Earth. EPOS started its Implementation Phase in October 2015 and is now actively working in order to integrate multidisciplinary data into a single e-infrastructure. Multidisciplinary data are organized and governed by the Thematic Core Services (TCS) – European wide organizations and e-Infrastructure providing community specific data and data products - and are driven by various scientific communities encompassing a wide spectrum of Earth science disciplines. TCS data, data products and services will be integrated into the Integrated Core Services (ICS) system, that will ensure their interoperability and access to these services by the scientific community as well as other users within the society.

The EPOS competence center (EPOS CC) goal is to tackle two of the main challenges that the ICS are going to face in the near future, by taking advantage of the technical solutions provided by EGI. In order to do this, we will present the two pilot use cases the EGI-EPOS CC is developing:

1) The AAI pilot, dealing with the provision of transparent and homogeneous access to the ICS infrastructure to users owning different kind of credentials (e.g. eduGain, OpenID Connect, X509 certificates etc.). Here the focus is on the mechanisms which allow the credential delegation.

2) The computational pilot, Improve the back-end services of an existing application in the field of Computational Seismology, developed in the context of the EC funded project VERCE. The application allows the processing and the comparison of data resulting from the simulation of seismic wave propagation following a real earthquake and real measurements recorded by seismographs. While the simulation data is produced directly by the users and stored in a Data Management System, the observations need to be pre-staged from institutional data-services, which are maintained by the community itself. This use case aims at exploiting the EGI FedCloud e-infrastructure for Data Intensive analysis and also explores possible interaction with other Common Data Infrastructure initiatives as EUDAT.

In the presentation, the state of the art of the two use cases, together with the open challenges and the future application will be discussed. Also, possible integration of EGI solutions with EPOS and other e-infrastructure providers will be considered.

[1] EGI-ENGAGE https://www.egi.eu/about/egi-engage/
[2] EPOS http://www.epos-eu.org/