Demonstrating ICS-C Functionalities

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ICS-C (Integrated Core Services-Central) is the heart of EPOS; it provides end-users with their view of what EPOS has to offer and it allows TCS (Thematic Core Services) to expose their assets for (re-)use by users. Functionalities and usage of the system have been demonstrated by the EPOS Portal User Interface demonstrator (Fig. 1).

The user interface enables a user to search and browse the Data, Data products, Software and Services provided by the communities, and to perform visualisation and processing on the selected resources.

Both satisfaction of end-user requests and exposing TCS assets depends on the main EPOS ICS System, which include a canonical metadata catalog: it is a rich superset representation of the various subset metadata standards used by the TCS (and provisioned by conversion from them) allowing representation of the TCS assets in a consistent form. The superset canonical metadata format is CERIF (http://www.eurocris.org/cerif/main-features-cerif). This provides the interoperability.

The ICS-C components may be represented (Fig. 2). Most of the acronyms are already known to the EPOS community, but perhaps it needs explaining that GUI is Graphical User Interface and AAAI is Authentication, Authorisation, Accounting Infrastructure. The design takes advantage of messaging between components so that they may be separated into different subsystems if required and even replicated, as prescribed by the Microservices paradigm.

ICS-C provides the following functions:

1. harvesting of metadata (or accepting “push” of metadata) from the TCS;
2. authenticating a user and setting up the appropriate authorisations and accounting;
3. user request expressed via the user interface. The end-user – with assistance from the ICS-C – defines the workflow of
operations to be done on datasets using particular resources. Two modes are envisaged:

1. The workflow is executed with monitoring information passed to the user. This is efficient since the ICS-C can optimise the workflow deployment but the end-user is disconnected once the execution starts;

2. The first step is executed and the user then interacts to accept the results of that step and initiate the next successively through the workflow. This is less efficient (since optimisation of the deployment cannot be done) but the end-user controls each step.

4. The results are passed back to the end-user and the results, any derived datasets, the workflow may be curated for later re-use.

"Behind the scenes" ICS-C does more. It has, in the catalog, information about ICS-D (ICS-Distributed) facilities such as supercomputers. In composing the workflow ICS-C may bring in these assets to perform (some of) the execution. Similarly (and related) it has information about CES (Computational Earth Science) facilities offered by the TCS and/or e-Is (e-Infrastructures) such as EGI, EUDAT and PRACE. Already prototypes have been demonstrated in the latter stages of EPOS-PP and during the first years of EPOS-IP. The initial ICS-C for "real use" is planned for end-September 2017 with evolutive development thereafter.

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