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The EPOS ICT Architecture

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The EPOS-PP Project 2010-2014 proposed an architecture and demonstrated feasibility with a prototype. Requirements based on use cases were collected and an inventory of assets (e.g. datasets, software, users, computing resources, equipment/detectors, laboratory services) (RIDE) was developed. The architecture evolved through three stages of refinement with much consultation both with the EPOS community representing EPOS users and participants in geoscience and with the overall ICT community especially those working on research such as the RDA (Research Data Alliance) community. The architecture consists of a central ICS (Integrated Core Services) consisting of a portal and catalog, the latter providing to end-users a 'map' of all EPOS resources (datasets, software, users, computing, equipment/detectors etc.). ICS is extended to ICS-d (distributed ICS) for certain services (such as visualisation software services or Cloud computing resources) and CES (Computational Earth Science) for specific simulation or analytical processing. ICS also communicates with TCS (Thematic Core Services) which represent European-wide portals to national and local assets, resources and services in the various specific domains (e.g. seismology, volcanology, geodesy) of EPOS.

The EPOS-IP project 2015-2019 started October 2015. Two work-packages cover the ICT aspects; WP6 involves interaction with the TCS while WP7 concentrates on ICS including interoperation with ICS-d and CES offerings: in short the ICT architecture. Based on the experience and results of EPOS-PP the ICT team held a pre-meeting in July 2015 and set out a project plan. The first major activity involved requirements (re-)collection with use cases and also updating the inventory of assets held by the various TCS in EPOS. The RIDE database of assets is currently being converted to CERIF (Common European Research Information Format – an EU Recommendation to Member States) to provide the basis for the EPOS-IP ICS Catalog.

In parallel the ICT team is tracking developments in ICT for relevance to EPOS-IP. In particular, the potential utilisation of e-Is (e-Infrastructures) such as GEANT(network), AARC (security), EGI (GRID computing), EUDAT (data curation), PRACE (High Performance Computing), HELIX-Nebula / Open Science Cloud (Cloud computing) are being assessed. Similarly relationships to other e-RIs (e-Research Infrastructures) such as ENVRI+, EXCELERATE and other ESFRI (European Strategic Forum for Research Infrastructures) projects are developed to share experience and technology and to promote interoperability. EPOS ICT team members are also involved in VRE4EIC, a project developing a reference architecture and component software services for a Virtual Research Environment to be superimposed on EPOS-ICS.
The challenge which is being tackled now is therefore to keep consistency and interoperability among the different modules, initiatives and actors which participate to the process of running the EPOS platform. It implies both a continuous update about IT aspects of mentioned initiatives and a refinement of the e-architecture designed so far.

One major aspect of EPOS-IP is the ICT support for legalistic, financial and governance aspects of the EPOS ERIC to be initiated during EPOS-IP. This implies a sophisticated AAAI (Authentication, authorization, accounting infrastructure) with consistency throughout the software, communications and data stack.