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VRE4EIC: A Reference Architecture and Components for Research Access

Daniele Bailo (1), Keith G Jeffery (2), Kuvvet Atakan (3), and Matt Harrison (4)

(1) EPOS - INGV - Istituto Nazionale di Geofisica e Vulcanologia, Roma, Italy (daniele.bailo@ingv.it), (2) Keith Jeffery Consultants, (3) Universitetet i Bergen, (4) British Geological Survey

VRE4EIC (www. Vre4eic.eu) is a EC H2020 project with the objective of providing a reference architecture and components for a VRE (Virtual Research Environment). SGs (Science gateways) in North America and VLs (Virtual Laboratories) in Australasia are similar – but significantly different – concepts. A VRE provides not only access to ICT services, data, software components and equipment but also provides a collaborative working environment for cooperation and supports the research lifecycle from idea to publication.

Europe has a large number of RIs (Research infrastructures); the major ones are coordinated and planned through the ESFRI (European Strategy Forum on Research Infrastructures) roadmap. Most RIs - such as EPOS - provide a user interface portal function, ranging from (1) a simple list of assets (such as services, datasets, software components, workflows, equipment, experts.. although many provide only information about data) with URLs upon which the user can click to download; (2) to an end-user facility for constructing queries to find relevant assets and subsets of them more-or-less integrated as a downloaded combined dataset; (3) in a few cases – for constructing workflows to achieve the scientific objective. The portal has the scope of the individual RI.

The aim of VRE4EIC is to provide a reference architecture, software components and a prototype implementation VRE which allows user access and all the portal functions (and more) not only to an individual RI – such as EPOS - but across RIs thus encouraging multidisciplinary research. Two RIs: EPOS and ENVRIplus (itself spanning 21 RIs) are represented within the project as requirements stakeholders , validators of the architecture and evaluators of the prototype system developed. The characterisation of many more RIs – and their requirements – has been done to ensure wide applicability.

The virtualisation across RIs is achieved by using a rich metadata catalog based on CERIF (Common European Research Information Format: a EU Recommendation to Member States and supported, developed and promoted by euroCRIS www.eurocris.org). The VRE4EIC catalog system harvests from individual RI catalogs (with conversion since they use many different metadata formats) to give the user of VRE4IC a ‘canonical view’ over the RIs and their assets. The VRE4IC user interface provides portal functions for each and all RIs but also a workflow construction facility. The project expects the RIs to use middleware developed in other projects to facilitate workflow deployment across the eIs (e-Infrastructures) such as GEANT, EUDAT, EGI, OpenAIRE and will itself use the same mechanisms.

After 15 months of the project we have validated the requirements from the RIs, defined the architecture and started work on the metadata mapping and conversion. The intention is to have the prototype at M24 for evaluation by the RI partners (and some external Ris) leading to a refined architecture and software stack for production use after M36.