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# Towards a single seismological service infrastructure in Europe

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In the last five year services and data providers, within the seismological community in Europe, focused their efforts in migrating the way of opening their archives towards a Service Oriented Architecture (SOA). This process tries to follow pragmatically the technological trends and available solutions aiming at effectively improving all the data stewardship activities. These advancements are possible thanks to the cooperation and the follow-ups of several EC infrastructural projects that, by looking at general purpose techniques, combine their developments envisioning a multidisciplinary platform for the earth observation as the final common objective (EPOS, Earth Plate Observation System)

One of the first results of this effort is the Earthquake Data Portal (http://www.seismicportal.eu), which provides a collection of tools to discover, visualize and access a variety of seismological data sets like seismic waveform, accelerometric data, earthquake catalogs and parameters. The Portal offers a cohesive distributed search environment, linking data search and access across multiple data providers through interactive web-services, map-based tools and diverse command-line clients.

Our work continues under other EU FP7 projects. Here we will address initiatives in two of those projects. The NERA, (Network of European Research Infrastructures for Earthquake Risk Assessment and Mitigation) project will implement a Common Services Architecture based on OGC services APIs, in order to provide Resource-Oriented common interfaces across the data access and processing services. This will improve inter-operability between tools and across projects, enabling the development of higher-level applications that can uniformly access the data and processing services of all participants.

This effort will be conducted jointly with the VERCE project (Virtual Earthquake and Seismology Research Community for Europe). VERCE aims to enable seismologists to exploit the wealth of seismic data within a data-intensive computation framework, which will be tailored to the specific needs of the community. It will provide a new interoperable infrastructure, as the computational backbone laying behind the publicly available interfaces. VERCE will have to face the challenges of implementing a service oriented architecture providing an efficient layer between the Data and the Grid infrastructures, coupling HPC data analysis and HPC data modeling applications through the execution of workflows and data sharing mechanism. Online registries of interoperable worklflow components, storage of intermediate results and data provenance are those aspects that are currently under investigations to make the VERCE facilities usable from a large scale of users, data and service providers. For such purposes the adoption of a Digital Object Architecture, to create online catalogs referencing and describing semantically all these distributed resources, such as datasets, computational processes and derivative products, is seen as one of the viable solution to monitor and steer the usage of the infrastructure, increasing its efficiency and the cooperation among the community.