Geophysical Research Abstracts
Vol. 13, EGU2011-4616, 2011
EGU General Assembly 2011

The EPOS e-Science Concept and the Planned e-Infrastructure

Keith Jeffery (1), Jean Pierre Vilotte (), and Alberto Michelini ()

(1) STFC Rutherford Appleton Laboratory, Director International Relations, Didcot, United Kingdom (keith.jeffery@stfc.ac.uk), (2) Department of Seismology , Institut de Physique du Globe de Paris , (CNRS UMR-7154), (3) Instituto Nazionale di Geofisica e Volcanologia

SM1.2: Large Scale European Research Facilities/Infrastructures: Data acquisition; Data Storage; Data Access

The EPOS e-Science Concept and the Planned e-Infrastructure
Keith G Jeffery, Jean-Pierre Vilotte, Alberto Michelini

The fabric of solid Earth science is rapidly changing, driven by a revolution in observation and digital technologies (wireless multiple sensors arrays, satellites, powerful computational modeling) that produces an increasing cornucopia of massive data sets. This data-driven paradigm shift transforms all elements of the solid Earth science pillars: observations, experiments, theory and modeling. At the same time e-Science technology, driven by the rapid evolution for high-speed, high-capacity networked connectivity, is changing the distributed, collaborative science capabilities.

These new challenges led to the EPOS project, an ESFRI-recognised research infrastructure currently in the preparatory stage funded by the EC. The main objective is to integrate, interconnect and coordinate existing and future Pan-European solid Earth science observational and analytical research infrastructures into a data-driven science environment in which the creation, collection, documentation, preservation, analysis and dissemination can be appropriately and reliably managed. The EPOS strategy is to create a comprehensive framework of transparent, evolvable, extensible policies and management and organizational structures that provide reliable, effective access and retrieval to the full fields spectrum of public digital Earth science data together with the appropriate interoperability that support discovery-based science and learning. The final goal is to provide an integrative approach, combining the concepts and tools of many disciplines to boost our physical understanding and modeling capabilities of the most important and difficult scientific and societal problems in solid Earth sciences, such as those related to natural hazards (earthquakes, volcanoes, landslides and tsunamis). The EPOS framework will serve as a driving force for European leadership in solid Earth sciences.

The e-infrastructure will be based on existing and emerging pan-European ICT initiatives and coordinated with the other ESFRI roadmap research infrastructures. These include the Environmental Sciences Cluster (ENVRI), the EUDAT Collaborative Data Infrastructure and the Virtual Earthquake and seismology Research Community e-Environment in Europe (VERCE) initiatives. Key technologies will be the definition and use of standard interoperation formats with associated software to wrap existing data centre systems and interface to analysis, simulation and visualisation facilities into an appropriate service-oriented architecture. Middleware for virtualisation of the underlying physical infrastructure (networks, detectors and instruments, data centres, supercomputers) will ensure the EPOS environment is easy to use for the end-user.
The EPOS team working on this aspect will:
a) Catalogue and characterise existing detector systems, data centres and supercomputers already in use;
b) Anticipate future and emerging systems;
c) Design – in conjunction with other ESFRI research infrastructures – an appropriate e-infrastructure and e-Science environment;
d) Implement a pilot of the e-infrastructure and e-Science environment to demonstrate technical and management feasibility;
e) Characterise the full development to production status of the e-infrastructure and e-Science environment for the full EPOS implementation.