Geophysical Research Abstracts
Vol. 16, EGU2014-6141-1, 2014
EGU General Assembly 2014

The VERCE Science Gateway: enabling user friendly seismic waves simulations across European HPC infrastructures

Alessandro Spinuso (1), Amy Krause (2), Clàudia Ramos Garcia (1), Emanuele Casarotti (3), Federica Magnoni (3), Iraklis A. Klampanos (2), Laurent Frobert (7), Lion Krischer (4), Luca Trani (1), Mario David (5), Siew Hoon Leong (6), and Visakh Muraleedharan (5)

(1) Koninklijk Nederlands Meteorologisch Instituut, de Bilt, Netherlands, (2) School of Informatics, University of Edinburgh, Edinburgh, UK, (3) Istituto Nazionale Geofisica e Vulcanologia, Rome, Italy, (7) Centre Sismologique Euro-Méditerranéen, Paris, France, (4) Ludwig-Maximilians-Universität, Munich, Germany, (5) Institut de Physique du Globe de Paris, Paris, France, (6) Leibniz-Rechenzentrum, Munich, Germany

The EU-funded project VERCE (Virtual Earthquake and seismology Research Community in Europe) aims to deploy technologies which satisfy the HPC and data-intensive requirements of modern seismology. As a result of VERCE's official collaboration with the EU project SCI-BUS, access to computational resources, like local clusters and international infrastructures (EGI and PRACE), is made homogeneous and integrated within a dedicated science gateway based on the gUSE framework. In this presentation we give a detailed overview on the progress achieved with the developments of the VERCE Science Gateway, according to a use-case driven implementation strategy. More specifically, we show how the computational technologies and data services have been integrated within a tool for Seismic Forward Modelling, whose objective is to offer the possibility to perform simulations of seismic waves as a service to the seismological community.

We will introduce the interactive components of the OGC map based web interface and how it supports the user with setting up the simulation. We will go through the selection of input data, which are either fetched from federated seismological web services, adopting community standards, or provided by the users themselves by accessing their own document data store. The HPC scientific codes can be selected from a number of waveform simulators, currently available to the seismological community as batch tools or with limited configuration capabilities in their interactive online versions.

The results will be staged out from the HPC via a secure GridFTP transfer to a VERCE data layer managed by iRODS. The provenance information of the simulation will be automatically cataloged by the data layer via NoSQL techonologies. We will try to demonstrate how data access, validation and visualisation can be supported by a general purpose provenance framework which, besides common provenance concepts imported from the OPM and the W3C-PROV initiatives, also offers an extensible metadata archive including community and user defined metadata and annotations.

Finally, we will show how the VERCE Gateway platform will allow the customisation of pre and post processing phases of the simulation workflows, thanks to the availability of a registry of processing elements (PEs,) which are easily developed and maintained by the seismologists.