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ABSTRACT OF THE TUTORIAL 1

BIGEARTH - Flexible Description and Adaptive Processing of Massive Earth Observation Data on High Performance Computation Architectures

Duration:

Full day – 11 July 2016

Convener:

Prof. Dr. Eng. Dorian Gorgan

Keywords:

adaptive processing, satellite image processing, cloud computing

Target Group:

The participants are EO specialists interested on processing and analyzing massive spatial data. They imperatively need and expect to use HPC resources on distributed massive data, without carrying about technical details on management of computing infrastructure, and data management. Just on their low performance computer (e.g. laptop), they describe in a flexible and easy manner the processing and then execute remotely massive EO data on adaptive HPC resources. The complex processing is built up by basic operators already available. A few practical use cases will be developed and experimented by the participants through the cloud infrastructures.

Abstract:

The Earth Observation (EO) data repositories increasing dramatically by several terabytes each day become a big issue for organizations. The administration of the storage capacity of big datasets, access policy, data governance, protection, searching, fetching, and complex processing require high costs that force the organization to search for solutions to balance the cost and value of data. Data can create value only when it is used, and the data protection has to be oriented toward allowing innovation that sometimes depends on creative people, which achieve unexpected valuable results through a flexible and adaptive manner. The users need to describe and experiment themselves different complex algorithms through analytics in order to valorize data. The analytics uses descriptive and predictive models to gain valuable knowledge and information from data analysis. Possible solutions for advanced processing of big Earth Observation data are given by the High Performance Computation (HPC) platforms such as Cloud and Cluster. With platforms becoming more complex and heterogeneous, the developing of applications is even harder and the efficient mapping of these applications to a suitable and optimum platform, working on huge distributed data repositories, is challenging and complex as well, even by using specialized software services. From the user point of view, an optimum environment gives acceptable execution times, offers a high level of usability by hiding the complexity of computing infrastructure, and supports an open accessibility and control to application entities and functionality. This presentation exemplifies some EO use cases based on flexible description of processing, and adaptive and portable execution over HPC infrastructures.

Curriculum Vitae:

Dorian Gorgan is Professor in Computer Science Department of the Technical University of Cluj-Napoca, PhD supervisor in Computers and Information Technology, and coordinator of the Computer Graphics and Interactive System Laboratory (<http://cgis.utcluj.ro>). The fields of interest involve parallel and distributed processing on HPC infrastructures such as Cloud, Grid, Multicore, and cluster, development of platforms and applications for spatial data processing and visualization, interdisciplinary research in the domains of Earth Sciences and Earth Observations. He has been involved as scientific coordinator and WP leader in national and international research projects such as enviroGRIDS, IASON, BIGEARTH, PECSA, SEE-GRID-SCI, GiSHEO, mEducator, iTRACE,

MedioGrid, COMPLEXHPC, and KEYSTONE. He has been member of scientific and reviewing committees of many ISI journals and international conferences, and gave more than 300 papers and presentations in journals and prestigious conferences in the domains of Computer Science and Earth Observation.