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GRIDA3 problem-solving platform for environmental monitoring, management and planning

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The leading challenges of environmental sciences require computing power, sensing devices and storage capacity that hardly a single organization, public or private, might acquire. GRIDA3 (Shared Resources Manager for Environmental Data Analysis and Applications, <http://grida3.crs4.it>) is a multidisciplinary project designed to deliver an integrated system to support the solution of a variety of environmental issues. To cite some of the environmental challenges addressed by the project, consider the constant increase of contaminated sites, the non-rational use of natural resources, and the hydrogeological risk related to meteorological extreme events and climate variability. The expected result will be an advanced problem-solving platform allowing the integration of human know-how, simulation and visualization software, instrumentation and high performance resources for data communication, storage, and computation. The GRIDA3 portal will expose to the end-user a Grid infrastructure for collaborative work, built for the sharing of both data and applications located at multiple sites across federated domains. The Grid-enabled Web applications under development span from AGISGRID concerned with distributed GIS services; to AQUAGRID focused on sub-surface hydrology and water resources management, allowing water professionals to model groundwater flow and contaminant transport problems and perform geochemical data analysis and interpretation; to BONGRID related to remediation and monitoring of contaminated sites, enabling users to identify the most adequate remediation technique; to EIAGRID aiming to create a platform accessible from the acquisition

field that enables the explorationist to perform a real-time subsurface characterization by on-the-fly seismic data processing and fast optimization of the application workflow; and to PREMIAGRID centered on the implementation of a probabilistic forecast system based on an eight member ensemble of meteorological models. The GRIDA3 compute portal, based on the EnginFrame technology, provides end-users with intuitive Web interfaces that greatly simplify job submission to virtualized compute resources with the appropriate access policies, monitoring of application execution and output visualization. The adopted solutions apply also Web 2.0 technologies, enabling users to access data and Grid services simply via the browser without any other desktop application. Diverse functionalities and capabilities of the GRIDA3 services: AQUAGRID, EIAGRID and PREMIAGRID will be presented with live demos.