GRID integration of oceanographic remote instrumentation

S. Salon, G. Bolzon, E. Mauri, and P.-M. Poulain

Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS, Sgonico (Trieste), Italy (ssalon@inogs.it)

The observations provided by oceanographic remote instruments are essential for the purposes of the operational oceanography, nowadays a constantly growing and powerful tool to monitor, analyze and predict the state of the marine resources as well as the sustainable development of coastal areas [1]. Near real time (NRT) observations at the sea surface and in the water column, e.g., temperature and salinity (T/S) profiles, are of central importance for the operational forecasting system in the Mediterranean Sea. The management of the network of floats deployed in the Mediterranean Sea and handled by the MedArgo Regional Argo Centre at OGS [2][3] is a complex task that may be greatly supported by the fast developing ICT infrastructures. Such workflow includes the communication system, the data downloading and treatment, the post-processing and the visualization of the information gathered by the observations.

GRID technology may greatly help in providing a remote control of the entire flow of information associated with the observational instruments, from the raw data measured by the sensor at sea (i.e. temperature, salinity, current velocity) to the data-processing software running on the researcher's laptop. In particular, interactive applications of the GRID technology could support the management of the complex workflow related to the instrument interconnections (i.e. buoys, floats, autonomous vehicles), to the eventual technical problems bound to appear intermittently and the subsequent NRT corrections and/or adjustments of the sensors. Moreover, the communication to operative structures such as the Civil Protection, Coast Guards or local/regional administrations represents a composite multi-task process that involves different actors and that could be successfully integrated in a GRID environment.

We will present the activity done so far and planned in the framework of the DORII EU-FP7 project [4] concerning the GRID integration of the MedArgo floats managed by OGS. The main goal of DORII is the deployment of an eInfrastructure for those scientific communities where ICT technology and the concept of GRID is perceived as a big opportunity to boost their research but that, at present, results not fully exploited. The oceanographic community may greatly benefit from the resources being offered by the GRID technology, in particular concerning the data driven control/interaction workflow and the post-processing/visualization issues that characterize the remote instruments.

[1] N.C. Flemming, S. Vallerga, N. Pinardi, H.W.A. Behrens, G. Manzella, D. Prandle and J.H. Stel (eds), Operational Oceanography - Implementation at the European and Regional Scales, Elsevier Oceanography Vol. 66. Elsevier, Amsterdam (2002).

[2] http://poseidon.ogs.trieste.it/sire/medargo

[3] P.-M. Poulain, R. Barbanti, J. Font, A. Cruzado, C. Millot, I. Gertman, A. Griffa, A. Molcard, V. Rupolo, S. Le Bras and L. Petit de la Villeon, MedArgo: a drifting profiler program in the Mediterranean Sea, Ocean Science 3, 379–395 (2007).

[4] http://www.dorii.eu/home