



Red española de e-Ciencia

Acceso a Instrumentación Científica Remota en un entorno Grid

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Entidad Coordinadora:



UNIVERSITAT
POLITECNICA
DE VALÈNCIA

Acceso a Instrumentación Remota en un entorno GRID

- Interés y problemática
- Experiencia en el proyecto DORII
- Perspectiva

e-IRG "Blue Paper" 2010

3.5 Remote Access and Remote Instrumentation

Remote, authenticated and authorised access to laboratory equipment is an essential enabler for the ERA. Access to unique and expensive equipment is often a precondition for successful research; however, this kind of equipment is increasingly unavailable locally. Shared access, regardless of researcher and resource location and instead based primarily on (peer-reviewed) research quality, is an essential component of the trust that must be built if we are to deliver the ERA vision of common, shared, research infrastructure.

The remote use of scientific equipment enables cost-effective sharing by substantially reducing the human and financial costs of research. Much research instrumentation is widely distributed or located in remote areas by necessity. In these cases, the ability to remotely access instruments improves efficient use of researchers' time and increases return on investment for large installations (such as many of those in the ESFRI roadmap). Remote instrumentation is an important component of ESFRI RI projects across all thematic areas.

Interés y problemática

- Interés:
 - Monitorización es el paso previo a Modelado y Análisis:
 - A todas las escalas, desde locales a ESFRI (ej. EMSO, LifeWatch)
 - **El entorno GRID ofrece agilidad y escalabilidad para la integración**
 - Amplitud del campo técnico:
 - Integración de sensores, adquisición, bases de datos, monitorización, transmisión de datos, control de calidad
- Problemas:
 - INTRÍNSECO: acceso “REMOTO” (**sin presencia física**)
 - Control (energía, acceso, estado, etc.)
 - Comunicación: “beyond last mile”
 - Diversidad de iniciativas, tecnologías, protocolos (*reinventar la rueda*)
 - Integración de desarrolladores y usuarios

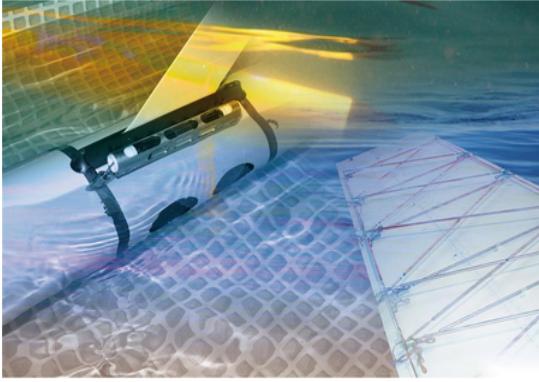
www.dorii.eu/home



DEPLOYMENT OF REMOTE INSTRUMENTATION INFRASTRUCTURE

DORII

Deployment of Remote Instrumentation Infrastructure



DORII's objectives are:

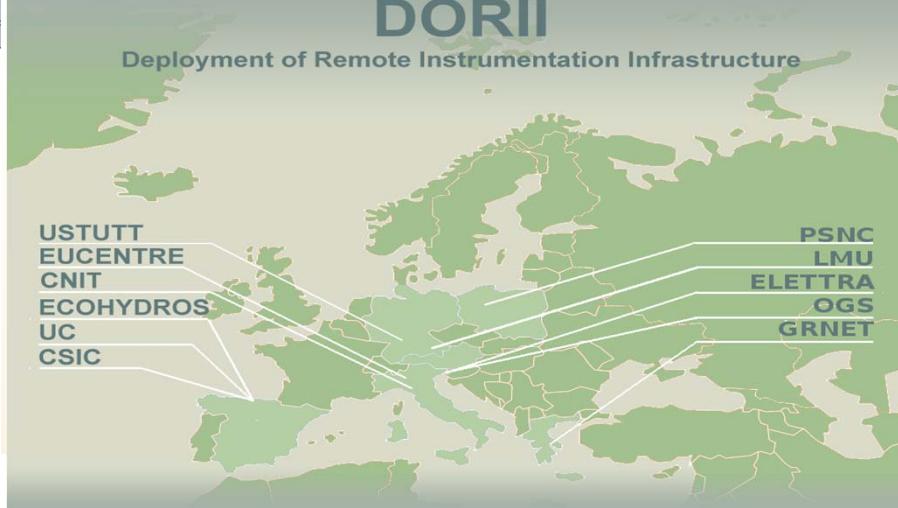
1. Adopt e-Infrastructure functionality across selected areas of science and engineering.
2. Deploy and operate persistent, production quality, distributed instrumentation integrated with e-Infrastructure.
3. Adopt a framework environment that can be used for fast prototyping.

Partners:

- POZNAN UNIVERSITY OF ECONOMICS AND BUSINESS
- OGS - Osservatorio Geofisico di Sicilia
- LMU MUNICH
- CNIT
- ECOHYDROS
- CSIC
- USTU USTUFT
- EUCENTRE
- GRNET
- PSNC
- LMU
- ELETTRA
- OGS
- GRNET

DORII

Deployment of Remote Instrumentation Infrastructure



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Partners:

- HLRIS
- ecohydros ecología avanzada del agua
- IHCANTABRIA
- e-infrastrucure
- EUROPEAN UNION
- CARALDES
- CSIC
- claria
- consorzio nazionale interuniversitario per le telecomunicazioni
- POZNAN UNIVERSITY OF ECONOMICS AND BUSINESS

Monitoring inland waters and reservoirs

WHAT: Monitoring water quality in a large reservoir

WHERE: "Cuerda del Pozo", 800 ha., water supply for Soria city (40K inh.)

REAL Remote site: 25 km to Soria, mountain area, sensor platform near dam



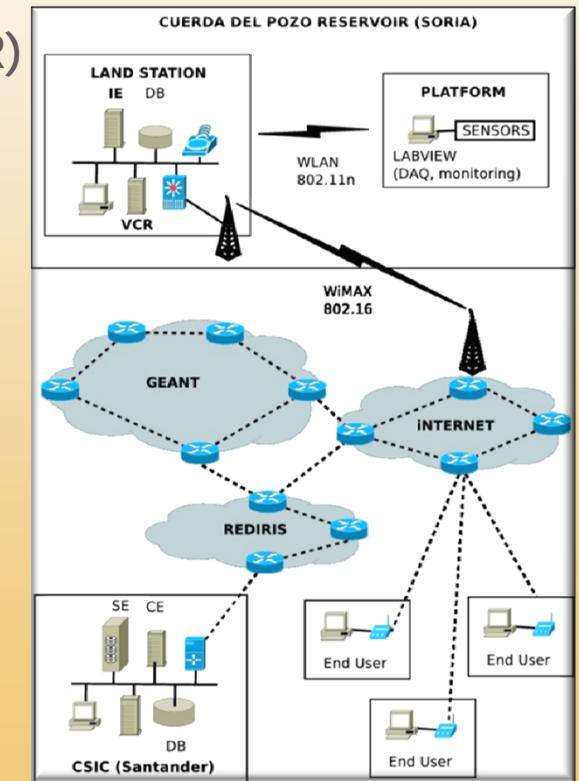
HOW (OBJECTIVES): Use DORII e-Infrastructure for continuous monitoring using a multi-sensor platform and coupling data to model simulations

Integration of remote instrumentation (using IE & VCR)

Meteorological and underwater sensor integration

Labview DAQ system connected through Web Services to DORII Instrument Element

Operation of the profiling system from the VCR interface



DETAIL OF ACHIEVEMENTS IN COLLABORATION WITH CSIC TEAM:

Integration and “homogenization” of instrumentation



Integration of a complete multi-sensor platform based on Labview connected to the Instrument Element through Web Services.

Data acquisition and management system controlled using the VCR that allows us to work remotely from any Web platform.

Deployment of infrastructure

Full exploitation phase achieved.

Field work reduced up to a 75% (estimated) due to remote capabilities. Huge costs reduction, as well as huge data acquisition scale-up (real time), which allows us to provide answers to an unsolved problem.

Important community benefit expected.

DORII
Deployment of Remote Instrumentation Infrastructure

myWSIM - on
IE Id: http://phedex2:8080/testIE/services/IEService
Context: root
IM Id: myWSIM

CONTROL

Status: on
Transitions List: Choose Trans...
Arguments: No Transition Selected

COMMANDS

Commands List: RunVI, Switch, SetVaisalaSamplingRate, SetTriboxSamplingRate, SetCNR2SamplingRate, StopVI, MoveWincher, WincherEmergencyStop
Arguments: No Command Selected

MONITORING

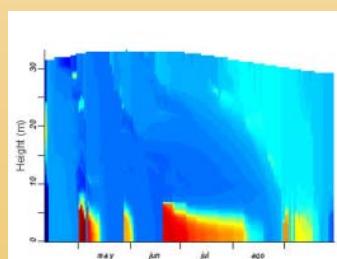
Name	Min	Max	Value	Unit	Op.	JMS
VaisalaStatus	--	--	Current_Status: WXT520 1	--	Set...	Subscribe
CNR2Status	--	--	Current_Status: EasyLog (1)	--	Set...	Subscribe
WincherStatus	--	--	Current_Status: 258,0645J	--	Set...	Subscribe
TriboxStatus	--	--	Current_Status: 9188 Tribox	--	Set...	Subscribe

Add Time chart, Add Bar chart, Add Scatter plot, Add Time chart (with JMS),

COUPLING TO WATER RESERVOIR MODEL (DYRESM)

Data access, storage, management and processing, with no need of human presence in-site.

Distributed computing capabilities, due to remote access to data, which allows us to model and predict reservoir behavior (OUR MAIN OBJECTIVE)



Computing Element

CE: https://wms03.egee-see.org:7443/glite_wms_wmp proxy_server
Listing successful: 3 job(s)
Create New Job, Update Jobs List

JOB LIST

Job ID	Status	Submission Date
https://wms04.egee-see.org:9000/YjXKc64QcRbWSeqJgB_0Ww	UNKNOWN	2010-03-04 05:45:12
https://wms01.grid.elettra.trieste.it:9000/5oPiXZucezXirVaoy8lFGg	DONE	2010-03-04 05:41:29
https://wms01.grid.elettra.trieste.it:9000/lHW5ZW-CeEloN3cEG9EQ_Q	DONE	2010-03-04 05:44:08

DEMO SCHEME:

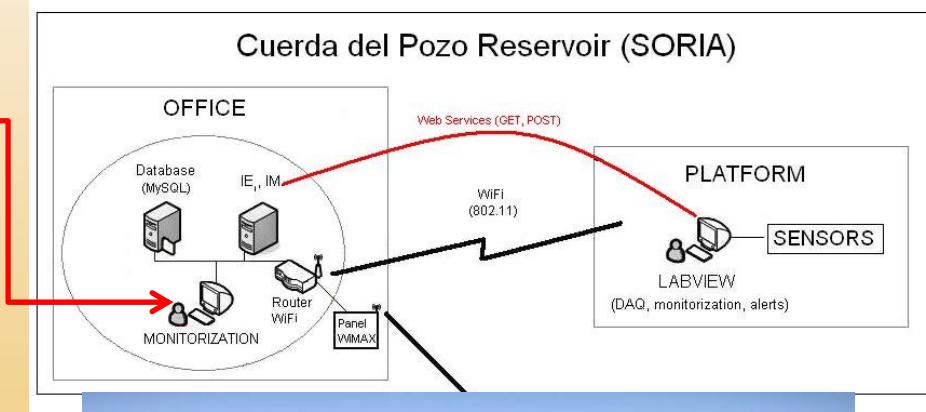
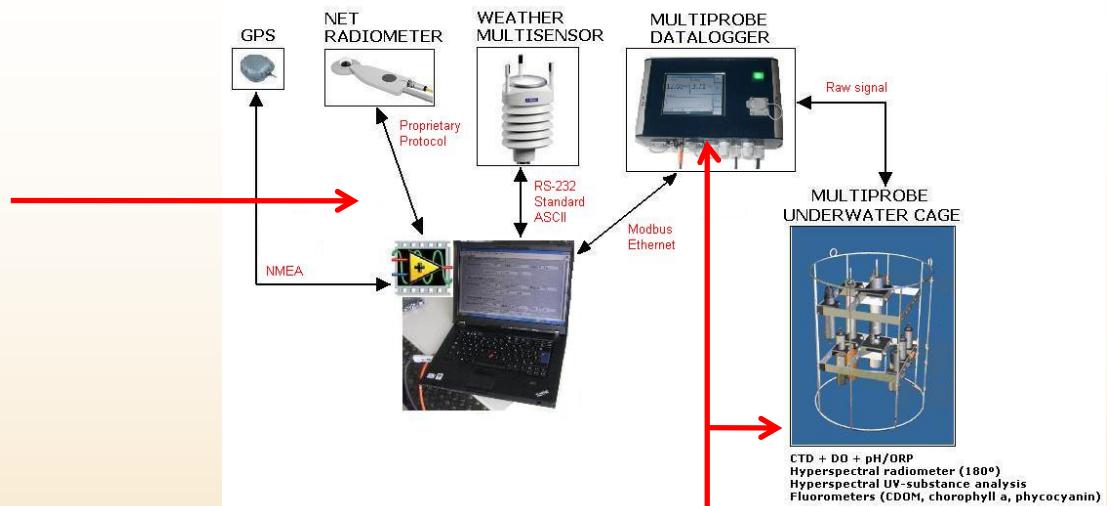
1- Video introducing the experimental system
Filmed last week in-situ, shows the real system

2- User connection to VCR
Showing the Instrument controlling
the experimental system

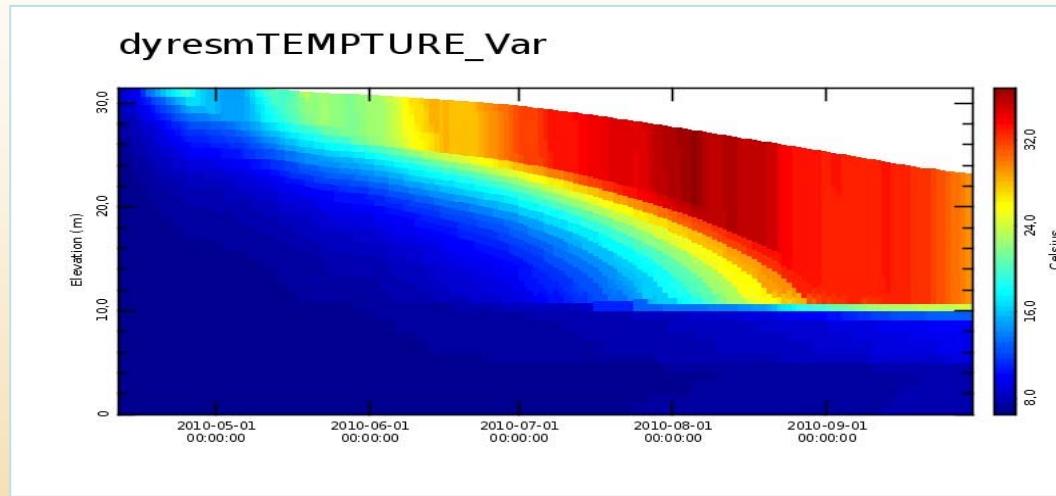
3- Remote execution of a vertical profile
Order to wincher system to descend cage 20m
Video showing what happens in the platform
(cage descending and local panel)
Monitoring the change of Pressure and
Temperature through the instrument
connected to the database.
Monitoring Web page for general public.

4- Simulation of evolution in the DORII e-infrastructure
Submission of a DYRESM/CAEDYM job for
execution

5- Results of the simulation and comparison to real data
Plots obtained after job execution



Initial results: Physical Data evolution and shape “qualitatively” reproduced by model

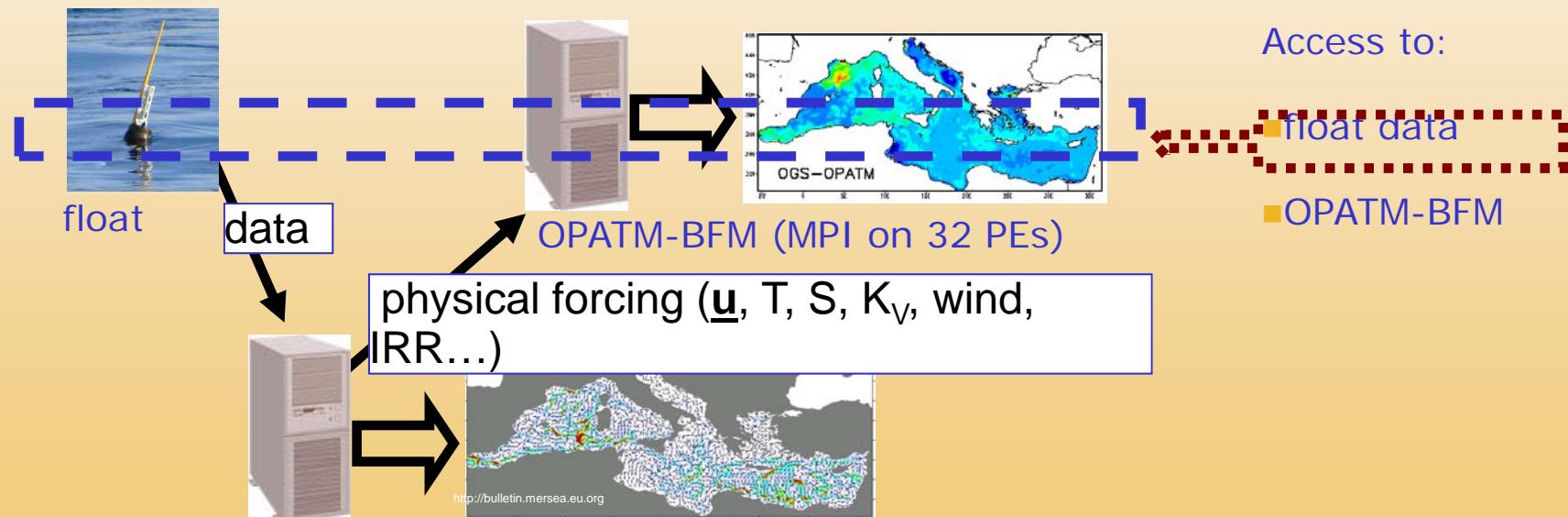


Ongoing work on calibration of biological parameters to
confirm Cyanophyceae evolution...

PROMISING R&D ACTIVITIES AND EXPLOITATION OF THE
PLATFORM INTEGRATED IN THE e-INFRASTRUCTURE
in close collaboration ECOHYDROS-CSIC

OCOM MOON Application

- Involves instruments, computing, storage resources, collectively used, the application and the workflow manager, interactivity, remote visualisation



En

Perspectiva

- Algunos foros internacionales:
 - Grupos en RISGE/ARI en OGF
 - EEF para iniciativas ESFRI
 - INGRID meeting (próximo en Santander en junio 2011)
 - Problema: diversidad de iniciativas por temática!
- Proyectos:
 - Locales, Regionales, Nacionales?
 - ESFRI
 - FP7 RI , ICT (Internet of Things)
- **Foro/Grupo dentro de la red de e-Ciencia?**
 - Experiencias
 - Soporte aplicaciones/infraestructura

The screenshot shows two parts of the OpenGridForum website. On the left is the login page with fields for User and Password, and buttons for Search, Login, Register, and Forget Password. Below that is a dropdown menu labeled 'Select by area:' with 'Applications' selected. On the right is a page titled 'OGF Areas and Groups' under the heading 'Management'. It features a section for 'Access To Remote Instrumentation In A Distributed Environment – Working Group (ARI-WG)' with details about the group type (Working Group), chair(s) (Duane Edgington, Marcin Plociennik, Milan Prica), and email (ari-wg@ogf.org). There are also links for subscribing, archiving by date, and archiving by thread.