INFRA - Progetti europei verso altre regioni e verso altre comunità scientifiche

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Outline

- agINFRA
- CHAIN-Reds
- DCH-RP
- BioVeL
- We-NMR
- MAE-India
- Summary table
- Conclusion

The project's numbers

Project title:	A data infrastructure to support agricultural scientific communities Promoting data sharing and development of trust in agricultural sciences
Funded by:	FP7 – Research Infrastructures, Capacities Programme Objective INFRA 2011 1.2.2: Data infrastructures for e-Science
Duration:	36 months
Starting	15/10/2011
Ending	14/10/2014
Overall budget	4.285.480 €
Community funding	3.750.000 € (INFN 420.000 €)

The agINFRA project objectives

- A **data infrastructure** to support agricultural scientific communities. Promoting **data sharing** and development of trust in agricultural sciences - RI
  - agINFRA will **design** and **develop** a scientific **data infrastructure** for agricultural sciences
  - agINFRA will **deploy services** that will promote sharing of data among agricultural scientist

The partners

University of Alcala (UAH) – http://www.uah.es, http://www.ieru.org/
Food & Agriculture Organization of the United Nations (FAO) – http://www.fao.org
National Institute of Nuclear Physics (INFN) - http://www.infn.it
Salzburg Research Forschungsgesellschaft (SRFG) – http://www.salzburgresearch.at/en/
Institute of Physics, Belgrade (IPB) - http://www.ipb.ac.rs/, http://www.scl.rs/
Computer and Automation Research Institute, Hungarian Academy of Sciences (SZTAKI) – http://www.lpds.sztaki.hu, http://www.sztaki.hu/?en
Agro-Know Technologies (AK) - http://wiki.agroknow.gr
21c Consultancy (21c) - www.21cconsultancy.com
Chinese Academy of Agricultural Sciences (CAAS) - http://aii.caas.net.cn/
The Open University (OU) - http://www.open.ac.uk
Indian Statistical Institute

What the Project is doing

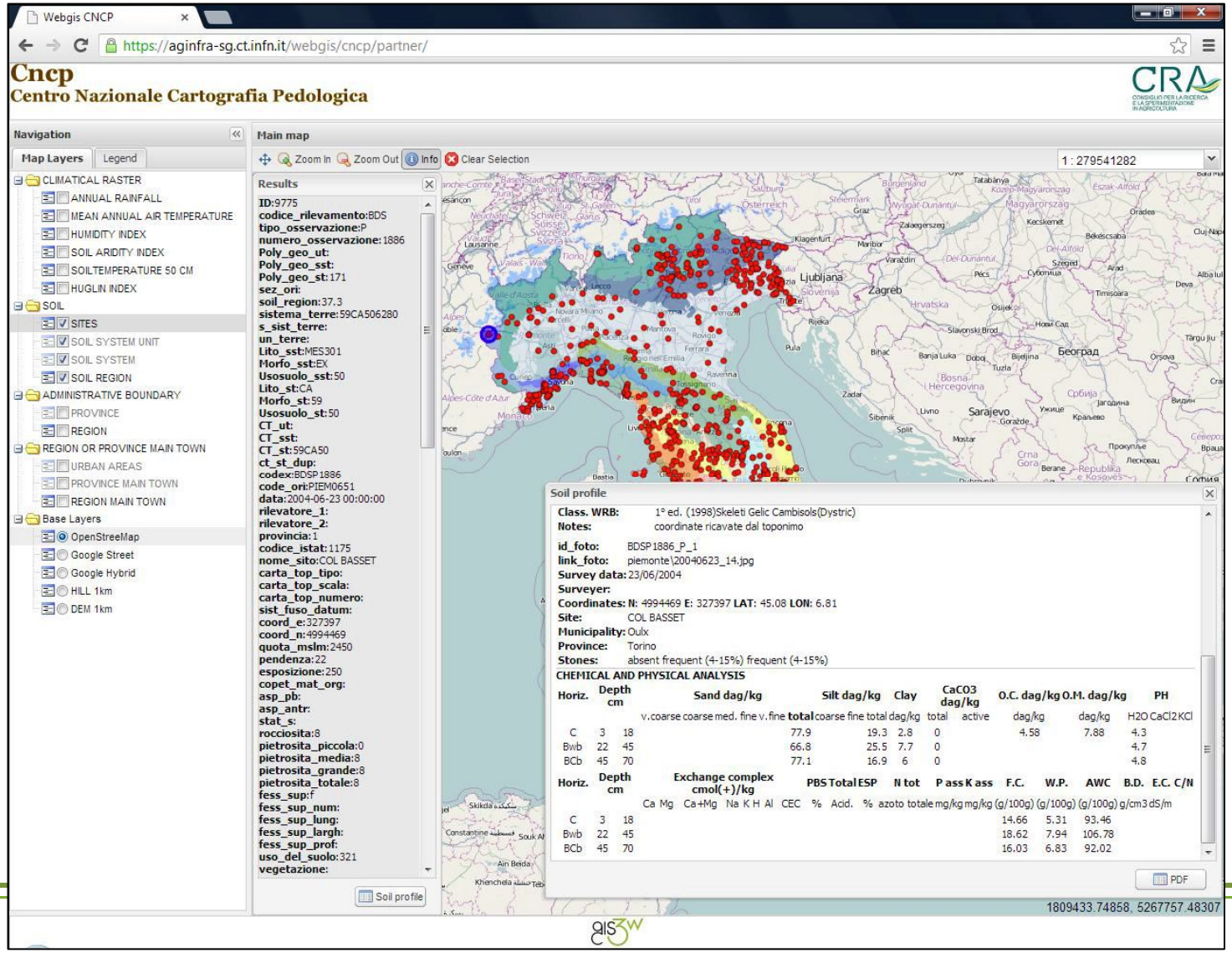
- **Capture the needs** of the target user communities with regards to the data, knowledge organization schemes, services and applications
- **Adapt existing infrastructures** that the technical partners can make available with customization if needed
- Develop and offer a set of customized APIs that will support the deployment of **sharable components**
- Explore, identify, design & specify the **data management**, processing, visualization & navigation components that will be deployed over agINFRA
- Study the existing **policies & lifecycles** of data management in the virtual communities that the integrated services will support
- Cross-community migration of the repositories loosely connected with agINFRA
- Promote agINFRA through a series of **dissemination/publicity** activities and training events

Role of INFN and CRA

- INFN is providing:
  - The Grid infrastructure
  - Data repository technologies (gLibrary)
  - Preliminary Virtual Machines and Cloud services
  - Adaptation of existing services
- CRA (Council for Research & experimentation in Agriculture) is a third party of INFN and provides:
  - Knowledge on Agricultural research
  - Data and information repositories
  - Tools and applications

The agINFRA Science Gateway

The Italian Soil Information System (SISI)



www.chain-project.eu

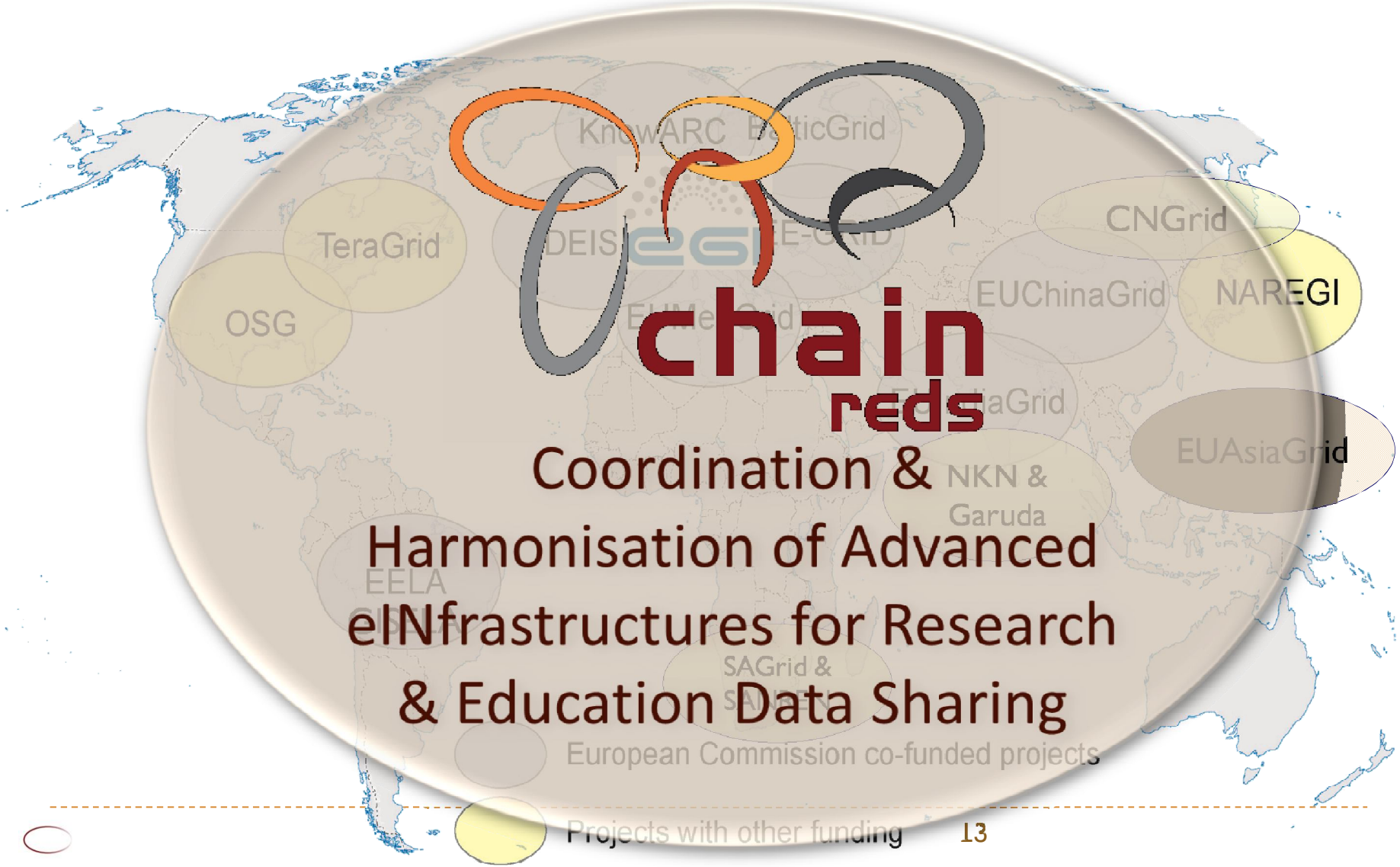
Project Numbers

- Co-ordination & Harmonisation of Advanced e-Infrastructures for Research and Education Data Sharing
- Research Infrastructures – Support Action
- FP7 Grant Agreement n. 306819
- Total Costs of € 2.3 M
- Max. EC contribution: € 1.52 M
- INFN budget: € 419.400
- Start date: 1 December 2012
- Duration: 30 Months

Partners and roles

- INFN (IT) – Coordinator
- CIEMAT (ES) – WP4 Leader
- GRNET (GR) – WP3 Leader
- CESNET (CZ) – WP5 Leader
- UBUNTUNET (MW) – Africa
- CLARA (UR) – Latin America
- IHEP (CN) – China
- ASREN (DE) – Arab States
- SIGMA-ORIONIS (FR) – WP2 Leader

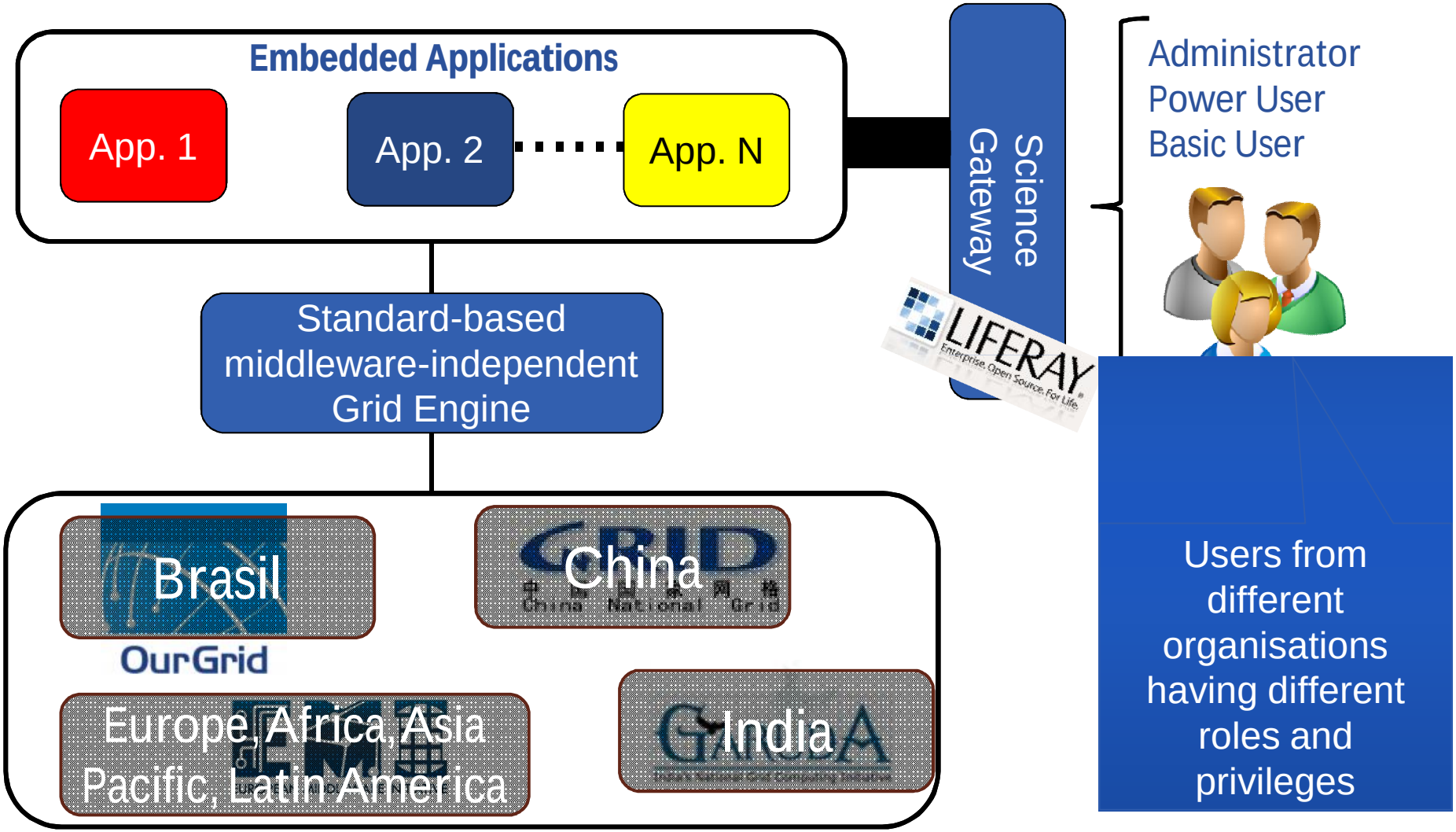
Regional Grid infrastructures



CHAIN-REDS Objectives

- Extend and consolidate international cooperation of Europe with other regions of the world in the domain of e-Infrastructures for Research and Education
- Promote, coordinate and support the effort of a critical mass of non-European e-Infrastructures for R&E to collaborate with Europe addressing interoperability and interoperation of Grids and other DCIs
- **Study the opportunities of data sharing across different e-Infrastructures** and continents widening the scope of the existing CHAIN Knowledge Base to Data Infrastructures and Cloud implementations
- Promote trust building towards open Scientific Data infrastructures across the world regions, including organisational, operational and technical aspects
- **Demonstrate the relevance of intercontinental cooperation in several scientific data fields addressing existing and emerging VRCs** and propose pragmatic approaches that could impact the everyday work of the single researcher, even if not structured in a VRC
- **Provide guidance and recommendations for roadmaps** for long-term global collaboration in e-Infrastructures and harmonization of existing polices

Promote the Science Gateway model



Co-ordination & Harmonisation of Advanced e-INfrastructures

Science Gateway

science-gateway.chain-project.eu

Total number of users submitting jobs: **14**

Total number of running jobs: **23**

Total number of done jobs: **1733**

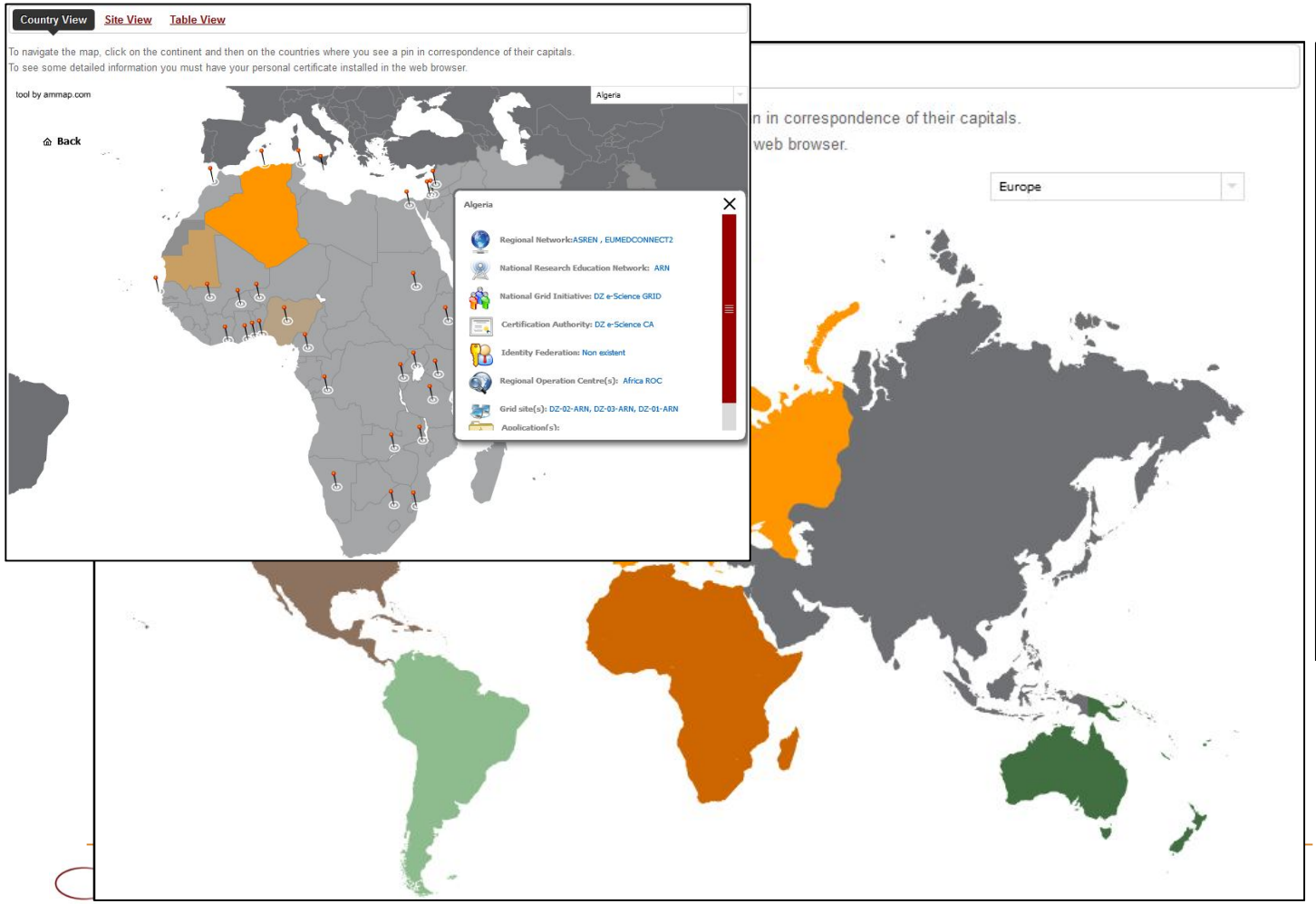
Legend

	EMI-gLite sites
	EMI-UNICORE sites
	GARUDA sites
	Genesis II sites
	GOS sites
	OurGrid sites
	split close sites
	unsplit close sites

The CHAIN Knowledge Base

(www.chain-project.eu/knowledge-base)

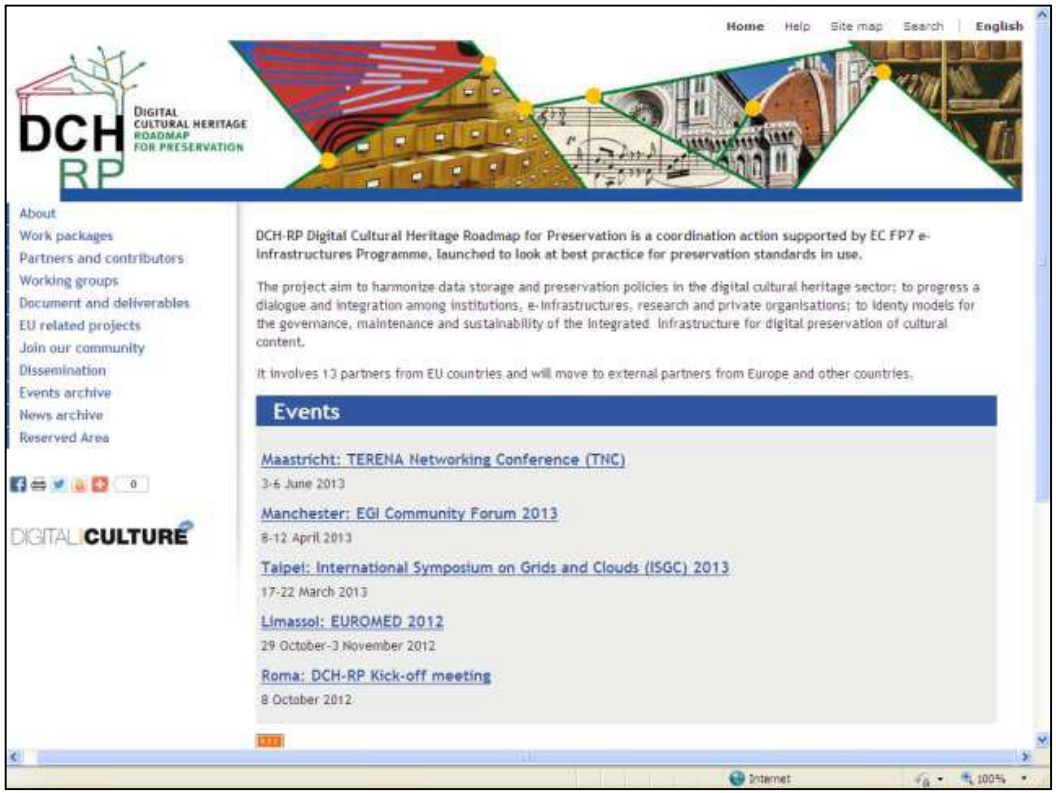
Largest e-Infrastructure related knowledge base. Information both from the survey and other sources for more than half of the countries of the world



- RREN(s)
- NREN
- NGI
- CA(s)
- Id.Fed(s)
- ROC(s)
- Grid site(s)
- Application(s)
- OADR(s)
- DR(s)

The DCH-RP project
(www.dch-rp.eu)

Digital Cultural Heritage Roadmap for Preservation



1.	ICCU	Italy
2.	RIKSARKIVET	Sweden
3.	BELSPO	Belgium
4.	EVK	Estonia
5.	COLLECTIONS TRUST	United Kingdom
6.	Promoter	Italy
7.	EGI.eu	The Netherlands
8.	INFN	Italy
9.	PSNC	Poland
10.	NIIFI	Hungary
11.	EDItEUR	United Kingdom
12.	TERENA	The Netherlands
13.	Michael Culture	Belgium

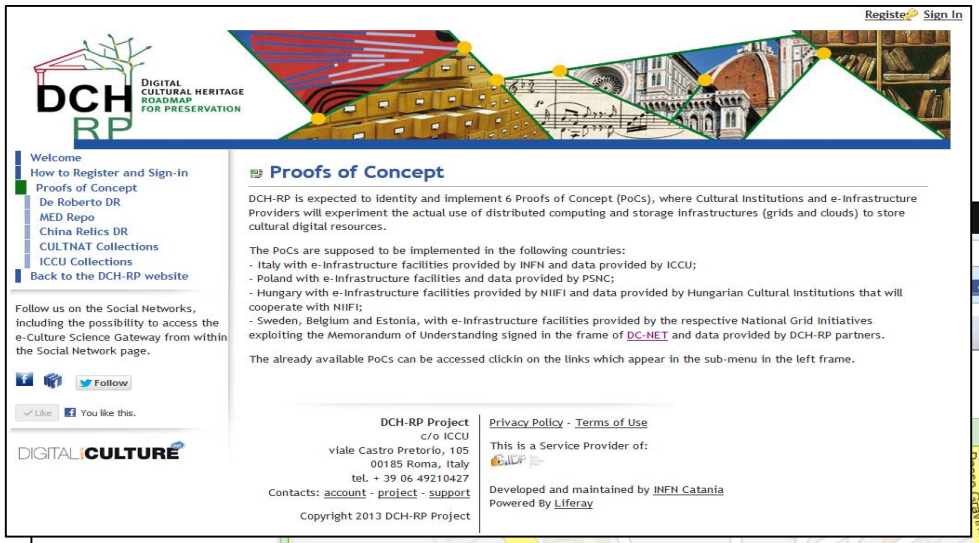
DCH-RP project numbers

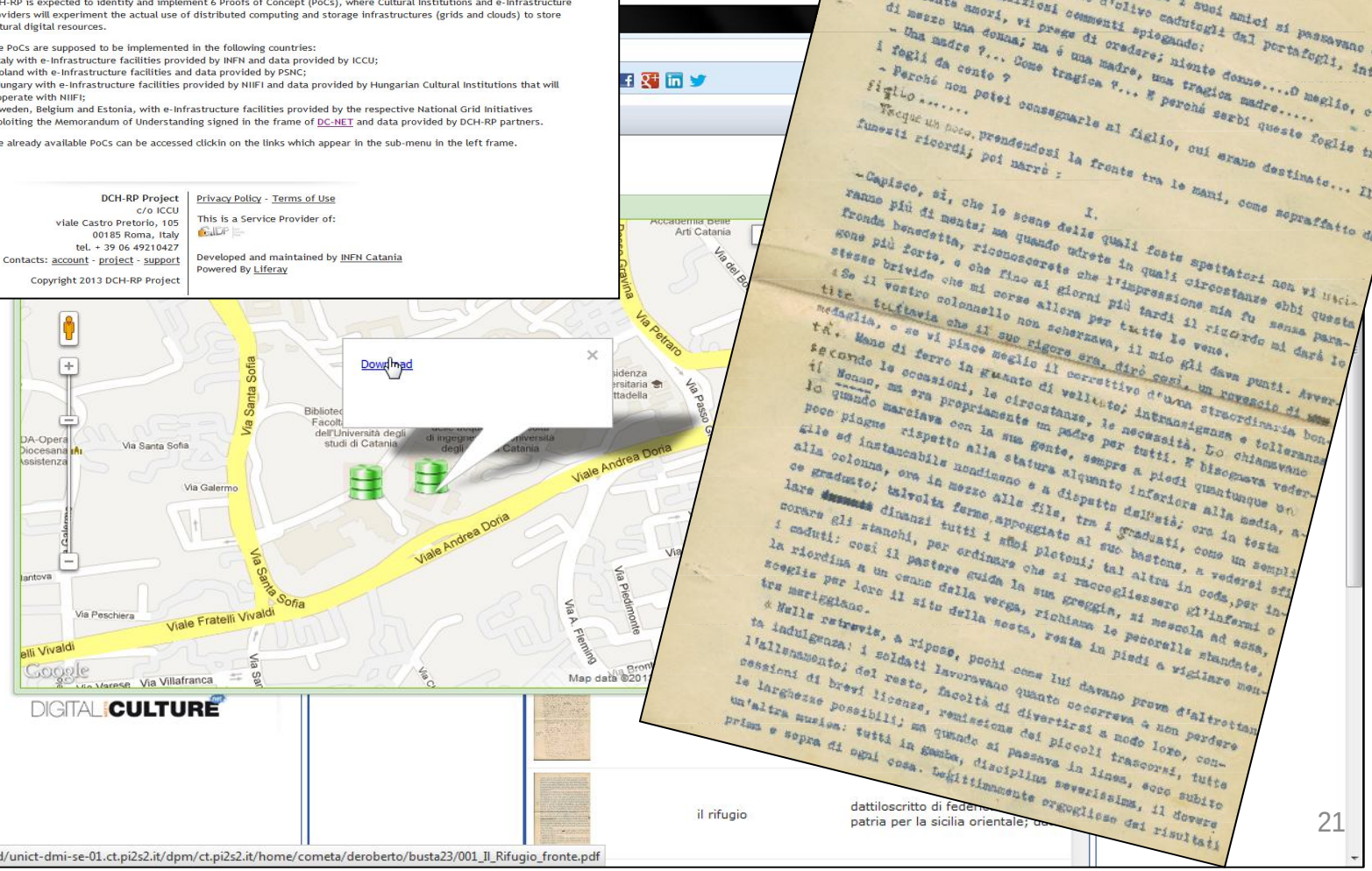
Project title:	Digital Cultural Heritage Roadmap for Preservation - Open Science Infrastructure for DCH in 2020
Funded by:	FP7 - INFRA-2012-3.3
Duration:	24 months
Starting	01/10/2012
Ending	30/09/2014
Overall budget	1,005,476 €
Community funding	809,800 €
INFN funding	40,660 €

DCH-RP objectives

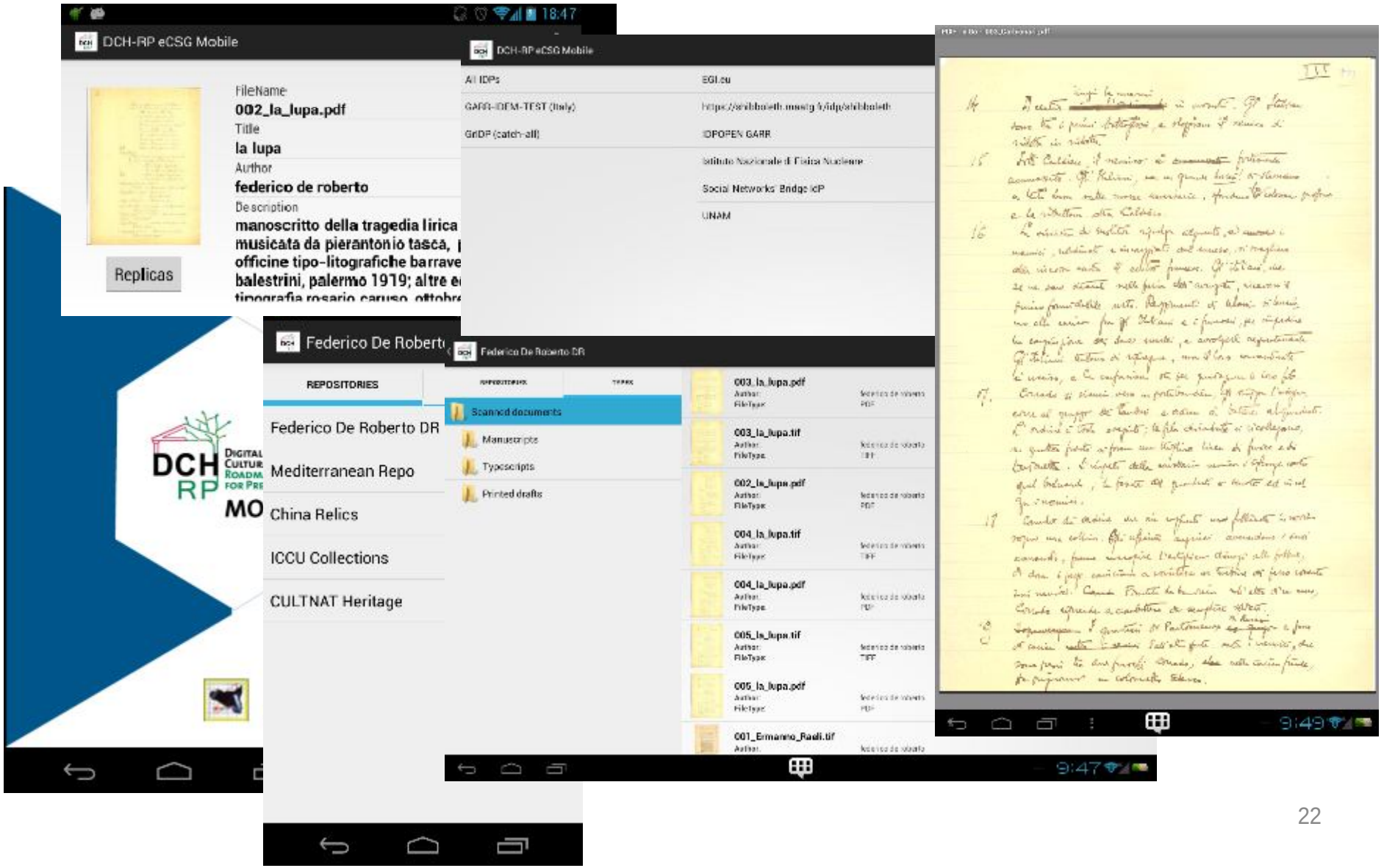
- To share the implementation of **common e-infrastructure layers** for the **DCH community** of researchers
- To develop and validate a **Roadmap** for **implementation** of an e-Infrastructure for DCH through at least 6 well defined proofs of concept
- To build upon the knowledge generated by the DC-NET and the INDICATE projects
- To coordinate with other initiatives, such as CLARIN, DARIAH, SCIDIP-ES and EU-DAT

The DCH-RP e-Culture Science Gateway developed by INFN Catania over gLibrary





The DCH-RP e-Culture Science Gateway mobile developed by INFN Catania



Biodiversity Virtual e-Laboratory

BioVeL is funded by the European Commission 7th Framework Programme (FP7).
It is part of its e-Infrastructures activity.

Under FP7, the e-Infrastructures activity is part of the Research Infrastructures programme, funded under the FP7 'Capacities' Specific Programme. It focuses on the further development and evolution of the high-capacity and high-performance communication network (GÉANT), distributed computing infrastructures (grids and clouds), supercomputer infrastructures, simulation software, scientific data infrastructures, e-Science services as well as on the adoption of e-Infrastructures by user communities.

BioVeL is free and available via internet.

CAPACITIES

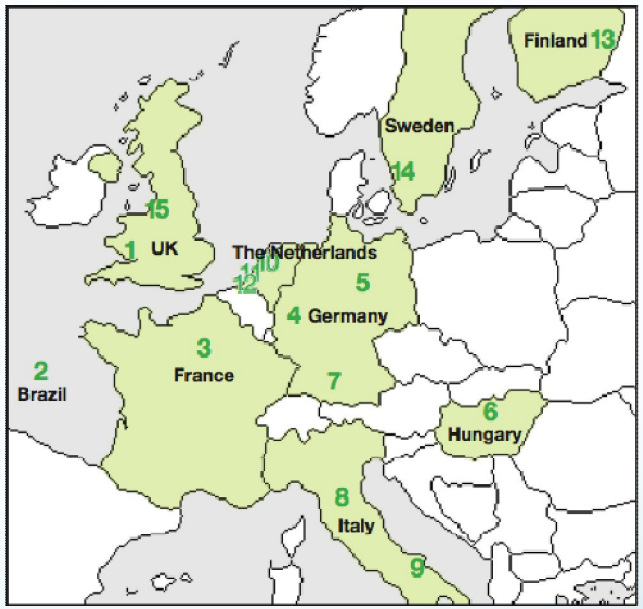
e-infrastructure

www.biovel.eu, contact Alex Hardisty: HardistyAR@cardiff.ac.uk

Biodiversity Virtual e-Laboratory

BioVeL è un consorzio di 15 partners appartenenti a 9 nazioni

1. Cardiff University, UK – Coordinator
2. Centro de Referência em Informação Ambiental, Brazil
3. Foundation for Research on Biodiversity, France
4. Fraunhofer-Gesellschaft, Institute IAIS, Germany
5. Free University of Berlin – Botanical Gardens and Botanical Museum, Germany
6. Hungarian Academy of Sciences Institute of Ecology and Botany, Hungary
7. Max Planck Society, MPI for Marine Microbiology, Germany
8. National Institute of Nuclear Physics, Italy
9. National Research Council: Institute for Biomedical Technologies and Institute of Biomembrane and Bioenergetics, Italy
10. Netherlands Centre for Biodiversity (NCB Naturalis), The Netherlands
11. Stichting European Grid Initiative, The Netherlands
12. University of Amsterdam, Institute of Biodiversity and Ecosystem Dynamics, The Netherlands



13. University of Eastern Finland, Finland
14. University of Gothenburg, Sweden
15. University of Manchester, UK

Biodiversity Virtual e-Laboratory

BioVeL is one of a number of projects across Europe contributing to **LifeWatch**, and it will make a key contribution to it by enabling better sharing of skills and data, and faster production of outputs in biodiversity science.

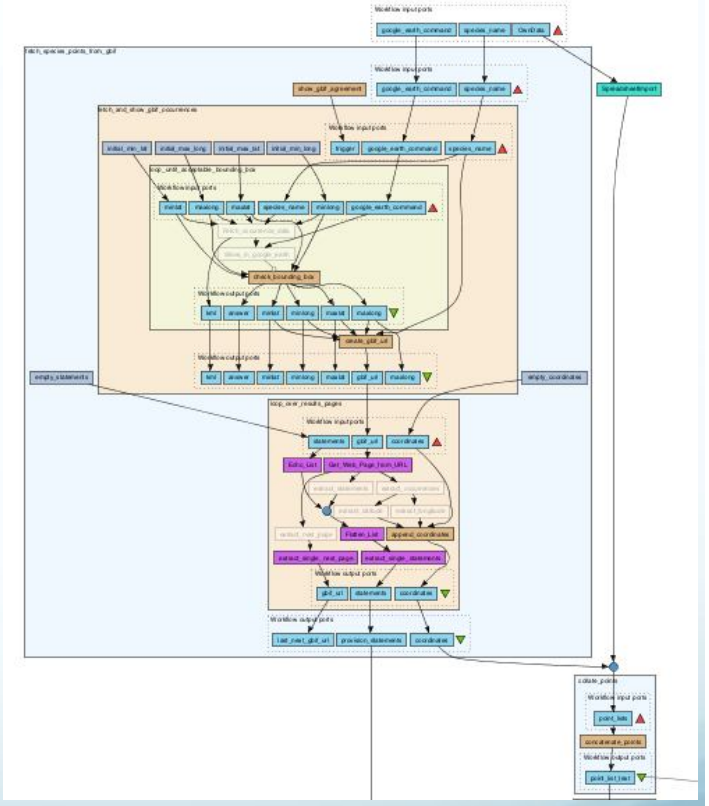
LifeWatch is the research infrastructure programme, initiated in the European Strategy Forum on Research Infrastructures (ESFRI), to construct and operate facilities, including new virtual laboratories, for biodiversity research.

The ultimate objective of the LifeWatch project is to explore patterns of biodiversity and processes of biodiversity across time and space-scales.

Biodiversity Virtual e-Laboratory

BioVeL is a powerful data processing tool

- Semplificare la possibilità di importare dati dalle proprie librerie o da quelle di altri ricercatori
- “Workflow” (serie di step di data-analisi) che consentono di processare una grande quantità di dati
- Costruire il proprio workflow con la possibilità di selezionare e applicare successivi “servizi” di data processing
- Accedere a librerie di workflow e ri-usare workflow esistenti
- Ridurre i tempi di ricerca e l’overhead per imparare ad usare i tool
- Contribuire al progetto LifeWatch e GEO BON.



Part of a workflow to study the ecological niche of the horseshoe crab

Biodiversity Virtual e-Laboratory e INFN

FROM DoW

- **118k€ di finanziamento per l'INFN (su 5M€ di budget totale)**
- **Impegno su due WP:**
- **WP4 (Outreach, dissemination and support) 1.5PM**
- Outreach activities to the communities, international initiatives and other projects;
- Dissemination of tools and results available with participation to conferences and biodiversity related events
- **WP7 (Services access, operation and management) 14PM**
- Deploy, commission and operate services on behalf of the biodiversity science community;
- Gain access (where necessary) to underlying e-infrastructures (e.g., NGIs/EGI) for the execution of computationally intensive services.
- **INFN brings Grid and other distributed computing expertise to the provision of services.**
- **INFN brings software engineering effort and expertise and capability for hosting services**

Biodiversity Virtual e-Laboratory e INFN

- L'INFN, sfruttando dei tool sviluppati con progetti precedenti ha sviluppato e sta offrendo un servizio di Software as a Service per applicazioni scientifiche
- Attraverso l'uso di Web Service (SOAP&REST)
- I singoli servizi possono essere usati per comporre complessi workflow
- usando qualsiasi workflow manager
- Gli sviluppi fatti con BioVeL sono stati immediatamente ri-usabili in altri contesti scientifici
- sia nell'INFN che in altri enti di ricerca (CNR, UNIBA, etc)
- Acquisita esperienza nel fornire servizi Cloud ad un livello diverso dal solito IaaS
- Molto più facile fornire questi servizi (alle comunità scientifiche) piuttosto che quelli semplicemente IaaS

Biodiversity Virtual e-Laboratory and Services

- Al momento il progetto BioVeL sta **pagando Amazon** per usare la sua piattaforma di Cloud per i servizi Core
- É già chiaro al progetto che questo modello non è applicabile nei casi in cui è richiesta una cospicua quantità di calcolo o di storage
- In questo caso è necessario trovare **partner** che siano **specializzati** nel **calcolo scientifico**
- **Ci siamo proposti come fornitori di questo tipo di servizio almeno per il periodo coperto dal progetto**
- Ci sarebbe interesse da parte della comunità di BioVeL/Lifewatch (e in particolare della componente italiana) a continuare questo rapporto anche dopo
- Un partner del progetto (Centro de Referência em Informação Ambiental, Brazil) ha già fatto domanda alla **EGI Cloud Task Force** di poter provare quell'infrastruttura per ospitare il loro software
- Altri "scientific cloud providers" si stanno avvicinando al progetto per offrire supporto (SARA, Olanda) anche se non sono partner del proggetto
- **L'interesse dell'INFN-Bari è anche legata alla possibilità di sfruttare risorse computazionali legate al PON ReCaS e expertise legato al progetto PRISMA**

The WeNMR Project

A Worldwide e-Infrastructure for NMR and structural biology

Project Coordinator:
Prof. Alexandre M.J.J. Bonvin, Utrecht University, NL

Contract n ° : RI-261572
Project type: CP-CSA
Duration: 36 months (Oct.2013)
Total budget: 2'434'000 €
EC Funding: 2'150'000 €
Di cui all'INFN: 363'000 €

The team

Utrecht University, Bijvoet Center for Biomolecular Research, NL

Johann Wolfgang Goethe Universität Frankfurt a.M., Center for Biomolecular Magnetic Resonance DE

University of Florence, Magnetic Resonance Center, IT

Istituto Nazionale di Fisica Nucleare , Padova, IT

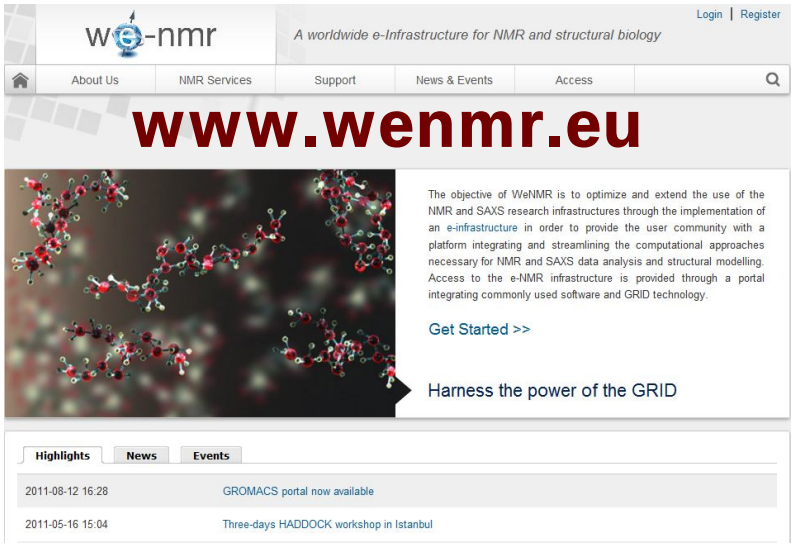
Raboud University, Nijmegen, NL

University of Cambridge UK

European Molecular Biology Laboratory, Hamburg, DE

Spronk NMR Consultancy, LT

+ Academia Sinica,TW, since 2012

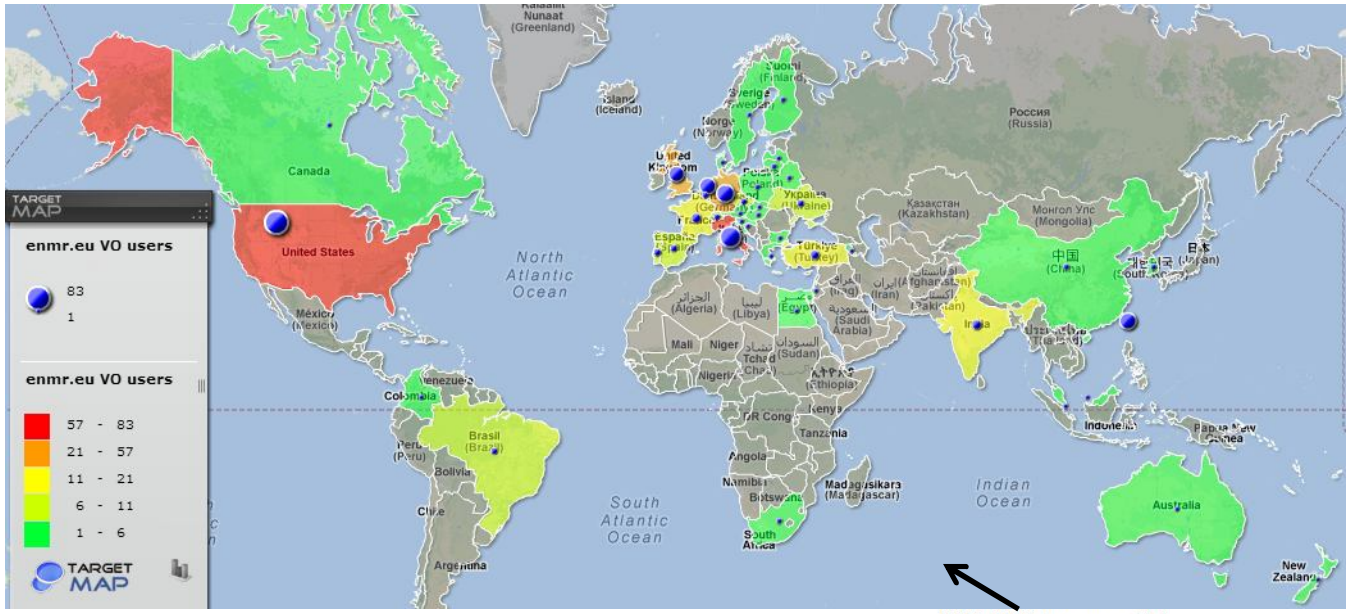


- Linked with Bio-NMR and EAST-NMR EU reserch infrastructure projects and INSTRUCT ESFRI
- 1st VRC recognized by EGI

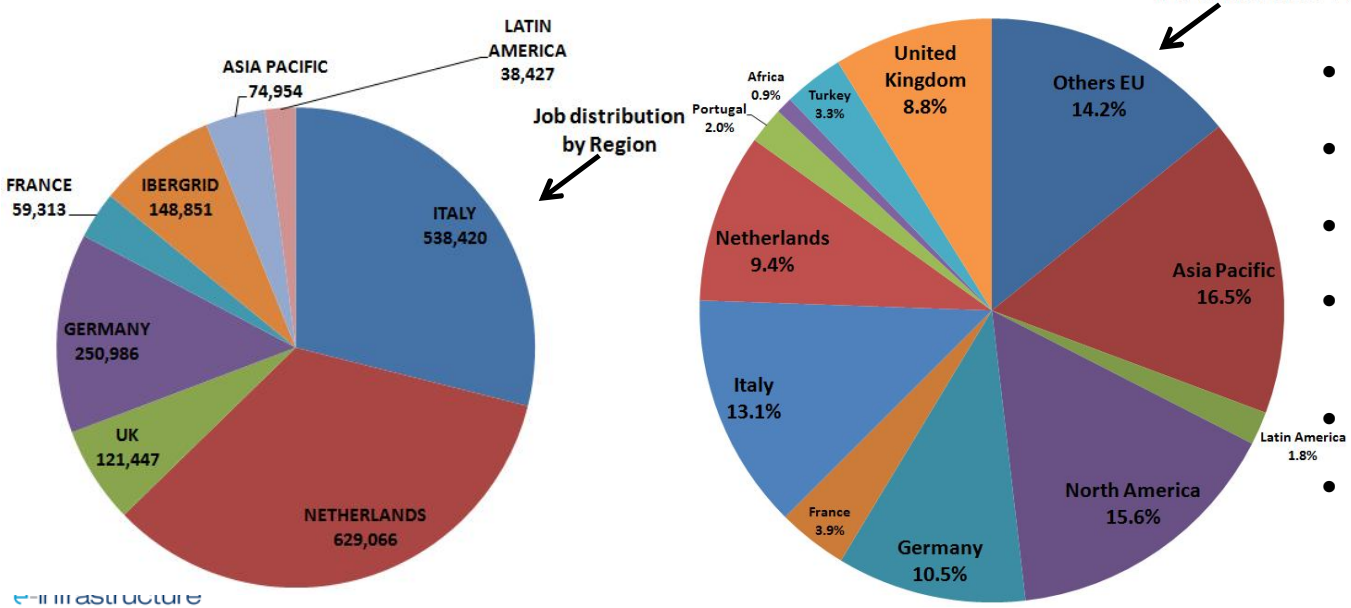
The WeNMR Project

- **Progetto di supporto alla comunita' della Biologia Strutturale che usa le tecniche sperimentali NMR e SAXS (complementari alla cristallografia a raggi X)**
- **L'INFN (sez. di Padova) e' coinvolto dal 2007 (precedente progetto e-NMR) con 2 FTE nel ruolo di coordinatore delle Service Activities e leader del WP5**
  - ✓ Riferimento per il networking con la comunita' grid
  - ✓ Creazione e mantenimento operativo di una infrastruttura grid dapprima dedicata e successivamente integrata in EGEE/EGI
  - ✓ Consulenza e training nel porting delle applicazioni NMR alla grid
  - ✓ Estensione e interoperabilita' dell'infrastruttura con altre grid (SAGrid, OSG, GARUDA, Latin America, PRACE) grazie alla collaborazione con CHAIN (e CHAIN-REDS), EU-IndiaGrid, EUMED-Connect, GISELA, SBGrid, EMI.
- **Partner principali sono i tre laboratori europei NMR di Utrecht, Francoforte e Firenze (Consorzio Interuniversitario Risonanze Magnetiche di Metallo Proteine)**
- **Politica di fornire le applicazioni NMR e SAXS all'utente finale attraverso portali web**
  - ✓ Nasconde all'utente la complessita' del middleware
  - ✓ Accesso alla grid protocollizzato, tramite certificati robot, in accordo con le policy di EGI
  - ✓ 29 portali (11 che beneficiano della grid) accessibili dal gateway d'ingresso www.wenmr.eu

Statistiche di VO al 30 Aprile 2013



WeNMR users : 544



- >500 users from 50 countries
- 35% outside Europe
- 10 users/month steady growth
- enmr.eu is the largest VO in Life Sciences
- 5M CPU.hrs and 2M jobs / year
- 60k CPU-cores opportunistic

Risultati e prospettive

- **WeNMR spesso citata come esempio di successo di VRC (Virtual Research Community) nel modello EGI**
  - ✓ Prima VRC riconosciuta da EGI nel 2011
  - ✓ 60 pubblicazioni scientifiche dal 2011 che riconoscono il contributo di WeNMR
  - ✓ Primo use-case dimostrato sulla EGI Federated Cloud al Cloudscape V Workshop in Febbraio 2013, e all'EGI Community Forum in Aprile 2013.
  - ✓ Premio "Excellent Science" al 10th e-Infrastructure Concertation Meeting, Marzo 2013
- **WeNMR collabora con il consorzio SBGrid in USA che ha un ruolo complementare (supporta principalmente cristallografia X) ma una infrastruttura grid analoga basata su OSG**
  - ✓ Interoperabilita' dimostrata tramite standard SAGA e uso di glideinWMS front-end operato dalla VO SBGrid di OSG
  - ✓ Collaborative use-case proposto ad EGI & XSEDE in Aprile 2013 per passare dalla fase di test alla produzione
- **Fine progetto in Ottobre 2013**
  - ✓ Sostenibilita' dell'infrastruttura grid basata sulla sopravvivenza di EGI e le NGIs
  - ✓ Sostenibilita' dei portali e delle applicazioni WeNMR garantita dai fondi di ricerca nazionali raccolti dai laboratori NMR
  - ✓ Progetto follow-up con gli stessi core partners (Utrecht, Francoforte, Firenze e INFN-Padova) gia' in preparazione per Horizon 2020

MAE India

Cooperazione India Italia sul supporto alle e-INfrastructures per Applicazioni HEP

Uno dei 6 **Progetti di Grande Rilevanza** selezionati nell'ambito del Programma di Cooperazione Italia-India in Scienza e Tecnologia del MAE
Contributo: **30.0000€** annui per tre anni 2012-2014
Partner Italiano: **INFN**
Partner Indiano: **Office of Principal Scientific Adviser to Indian Government**

Ministero degli Affari Esteri

OBIETTIVI

- Supporto e-Infrastructures per HEP, in particolare esperimenti LHC, favorendo la cooperazione India-EU e India-Italia in particolare

- Supporto azioni di cooperazione S&T fra Italia ed India con particolare focus su LHC e settori di interesse per INFN

- Integrazione e sinergia con progetti EU-IndiaGrid2 CHAIN e CHAIN-REDS coordinati da INFN ed eventuali altre rilevanti iniziative italiane ed europee

RISULTATI

Importanti contatti stabiliti ad alto livello in India con:

- **Istituzioni Governative**
  - Office of Principal Scientific Adviser to Indian Government
  - Department of Atomic Energy
  - Department of Information Technology
- **Istituti di Ricerca:**
  - Tata Institute for Fundamental Research
  - Babha Atomic Research Centre
  - Indian Institute of Technology
  - Saha Institute of Nuclear Physics
  - Variable Energy Cyclotron Centre

RISULTATI

- Analisi e **monitoraggio esigenze connettività EU-India** e supporto ad interventi dove necessario
  - Eccellente livello di cooperazione stabilito con DANTE, NKN (equivalente indiano di GEANT) e TEIN (TransEurasia Information Network) e APAN (Asia Pacific Advanced Network)
- Supporto **interoperabilità** infrastrutture di grid
- Supporto cooperazione con istituti indiani su **WNoDES**
- Eccellente cooperazione e **sinergia con CHAIN** e CHAIN-REDS

IMPATTO PER INFN

Con questo progetto l'INFN dirige uno dei sei progetti di Grande Rilevanza all'interno del Programma Esecutivo Science & Technology Italia-India

Visibilità verso Ministeri in Italia e Commissione Europea

INOLTRE:

- **Supporto ad attività specifiche di interesse per INFN legate al calcolo per LHC**
- **Canale privilegiato di rapporto con l'India nel settore S&T**

Summary Table

Project Name	Title	Total Cost/ EC contrib.(€)	INFN Funding(€)	Funded by	Start Date	End Date	Duration (months)
agINFRA	A data infrastructure to support agricultural scientific communities Promoting data sharing and development of trust in agricultural sciences	4.480.828 / 3.750.000	420.000	FP7 - INFRA	15/10/2011	14/10/2014	36
CHAIN-REDS	Co-ordination & Harmonisation of Advanced e-Infrastructures for Research and Education Data Sharing	2.08 M / 1.52 M	419.400	FP7 - INFRA	01/12/2012	31/05/2015	30
DCH-RP	Digital Cultural Heritage Roadmap for Preservation - Open Science Infrastructure for DCH in 2020	1.005.476/ 809.800	40.660	FP7-INFRA	01/10/2012	30/09/2014	24
BioVeL	Biodiversity Virtual e-Laboratory	6.104.865/ 5 M	118.000	FP7 - e-Infrastructures activity	01/09/2011	31/08/2014	36
We-NMR	A Worldwide e-Infrastructure for NMR and structural biology	2.434.000 / 2.150.000	363.000	FP7	01/11/2010	31/10/2013	36
MAE-INDIA	Cooperazione India Italia sul supporto alle e-INfrastructures per Applicazioni HEP	90 k	90.000	Programma di Cooperazione Italia-India in Scienza e Tecnologia del MAE	2012	2014	36

TOT INFN = 1.5M

Considerazioni Finali

- Importanza progetti verso nuove comunità/nazioni
  - Creazione nuovi contatti e collaborazioni per ulteriori progetti
  - Incremento visibilità verso Ministero e Comunità Europea
  - Budget per nuovi contratti o mantenimento dei TD esistenti
  - Riutilizzo di strumenti sviluppati in contesti diversi per nuovi utenti
    - Crescita base utenti
    - Sostenibilità degli strumenti stessi
  - Acquisizione know-how riutilizzabile per use case interni (workflow, cloud, science gateway, etc)

References

- http://aginfra.eu
- http://www.chain-project.eu
- http://www.dch-rp.eu/
- http://www.wenmr.eu/
- http://www.biovel.eu/

References BioVeL

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  - http://indico.egi.eu/indico/conferenceDisplay.py?ovw=True&confId=656
- EGI Community Forum 2012
  - https://indico.egi.eu/indico/conferenceDisplay.py?confId=679
  - Proceedings:
    - http://pos.sissa.it/cgi-bin/reader/conf.cgi?confid=162
- BITS 2012
  - http://bits2012.dmi.unict.it/program.html
- NETTAB 2012
  - http://www.nettab.org/2012/progr.html
- EGI Community Forum 2013