

**GARR**

The Italian Academic & Research Network



www.garr.it

# GARR Science Gateway

Esempio di utilizzo di un  
framework per la creazione di  
portali web 2.0.

Riccardo Rotondo

III Borsisti Day, Roma, 06.12.2012



# Outline

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- What is a Science Gateway ?
- The Catania Science Gateway Framework
  - General Architecture
  - DOGS: Data On Grid Services
- Use Case:
  - The GARR Science Gateway
- Conclusions & Future Work

# Users in the net

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# Requisiti fondamentali

- ⊗ Autenticazione e autorizzazione
  - ⊗ SAML, LDAP
- ⊗ Interazione con le applicazioni in modo indipendente dal middleware
  - ⊗ iSAGA, SAGA
  - Adozione di standard
- ⊗ Tecnologie Java Standard
  - ⊗ JSR 168/286
  - Semplificazione
- ⊗ Tecnologie web
  - Facilità di utilizzo
  - Riutilizzabilità
- ⊗ Portal Framework
  - ⊗ Web CMS
  - ⊗ Wiki, Blog, Messages Board, Vconf, Adobe Connect



# Reference Model

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Science  
Gateway



Scientific  
Application

E-Collaboration

Social  
Application

Standard Services

**GRID**



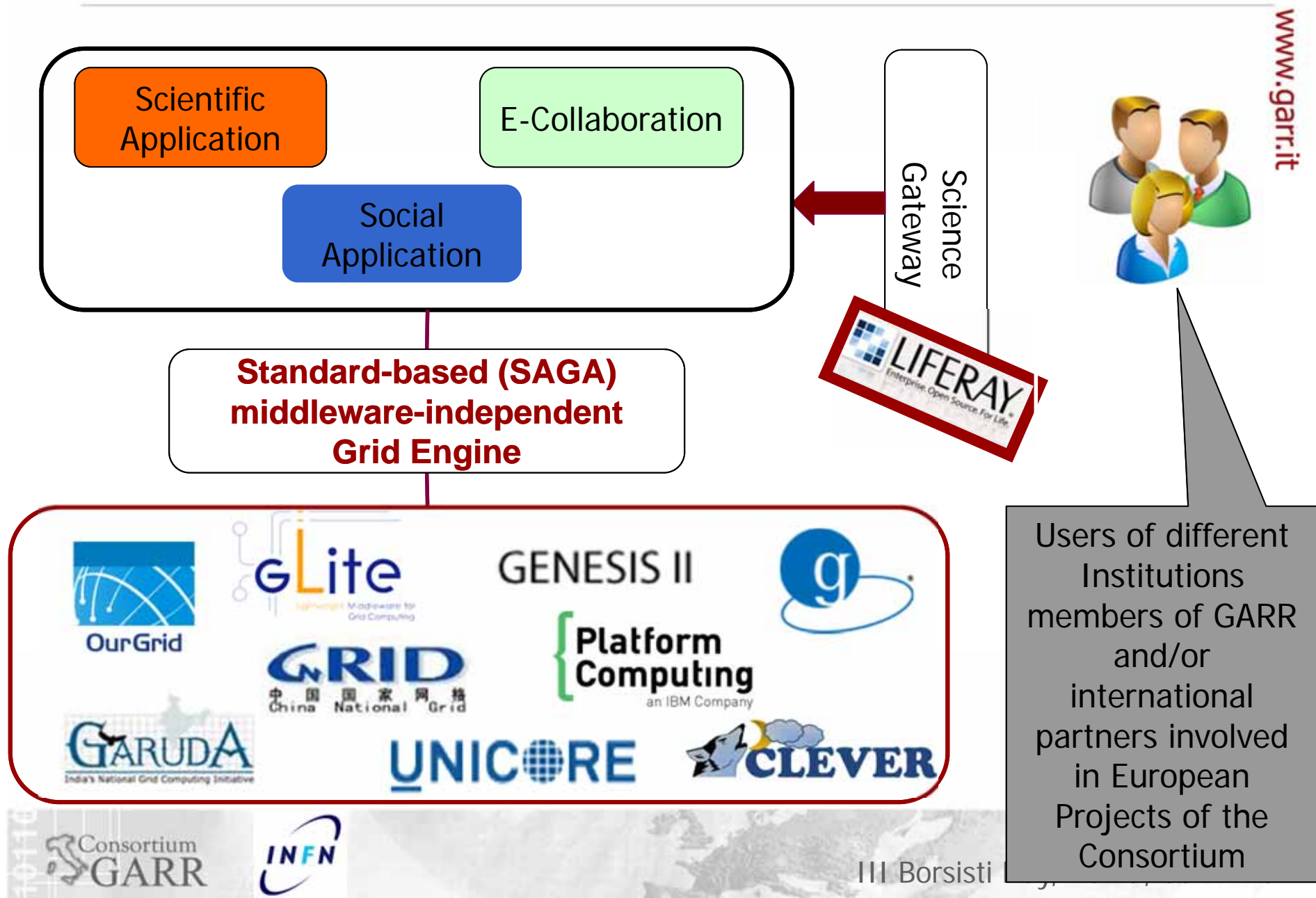
**Local Cluster**

**CLOUD**

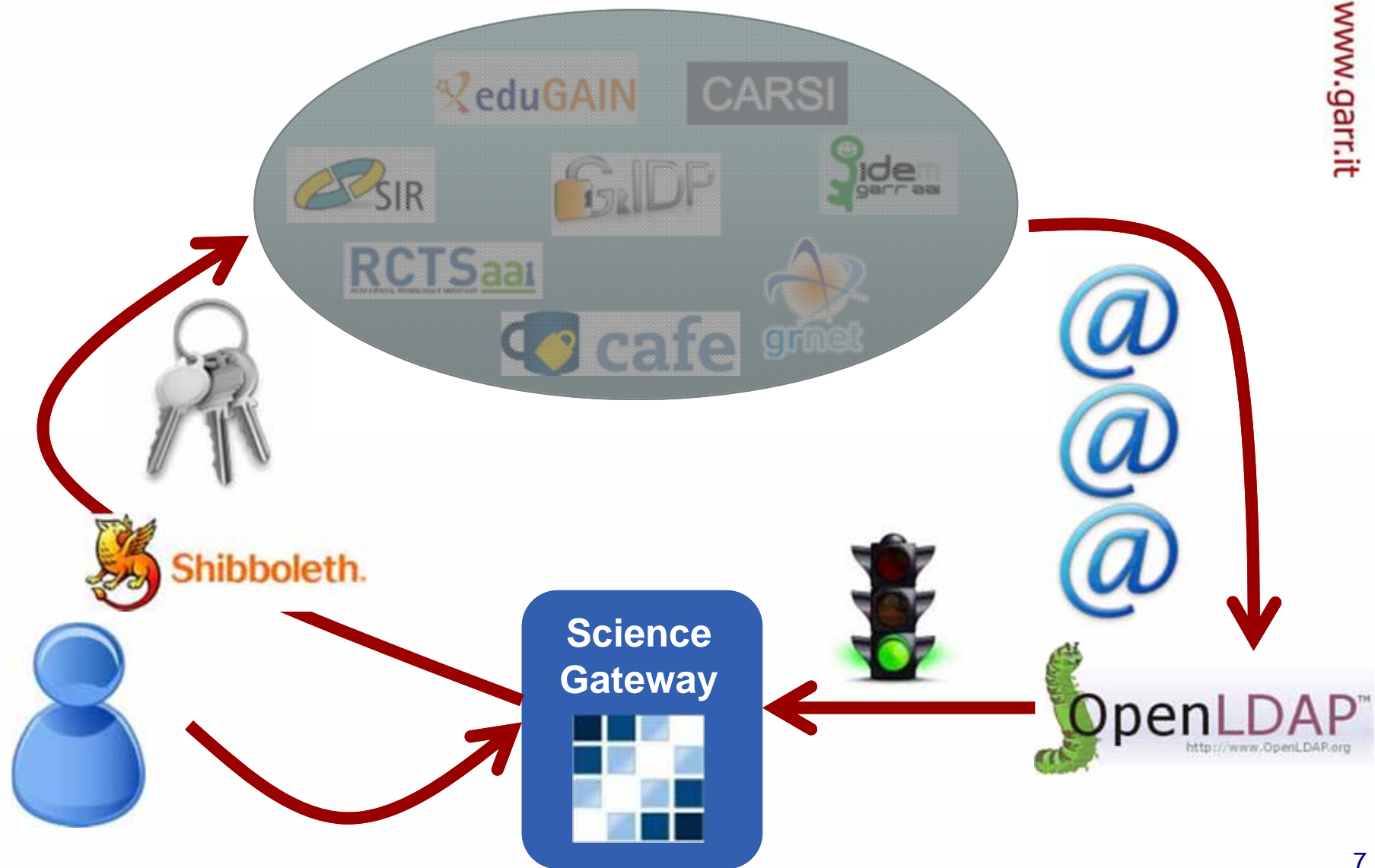
Users of different  
Institutions  
members of GARR  
and/or  
international  
partners involved  
in European  
Projects of the  
Consortium



# Reference Model

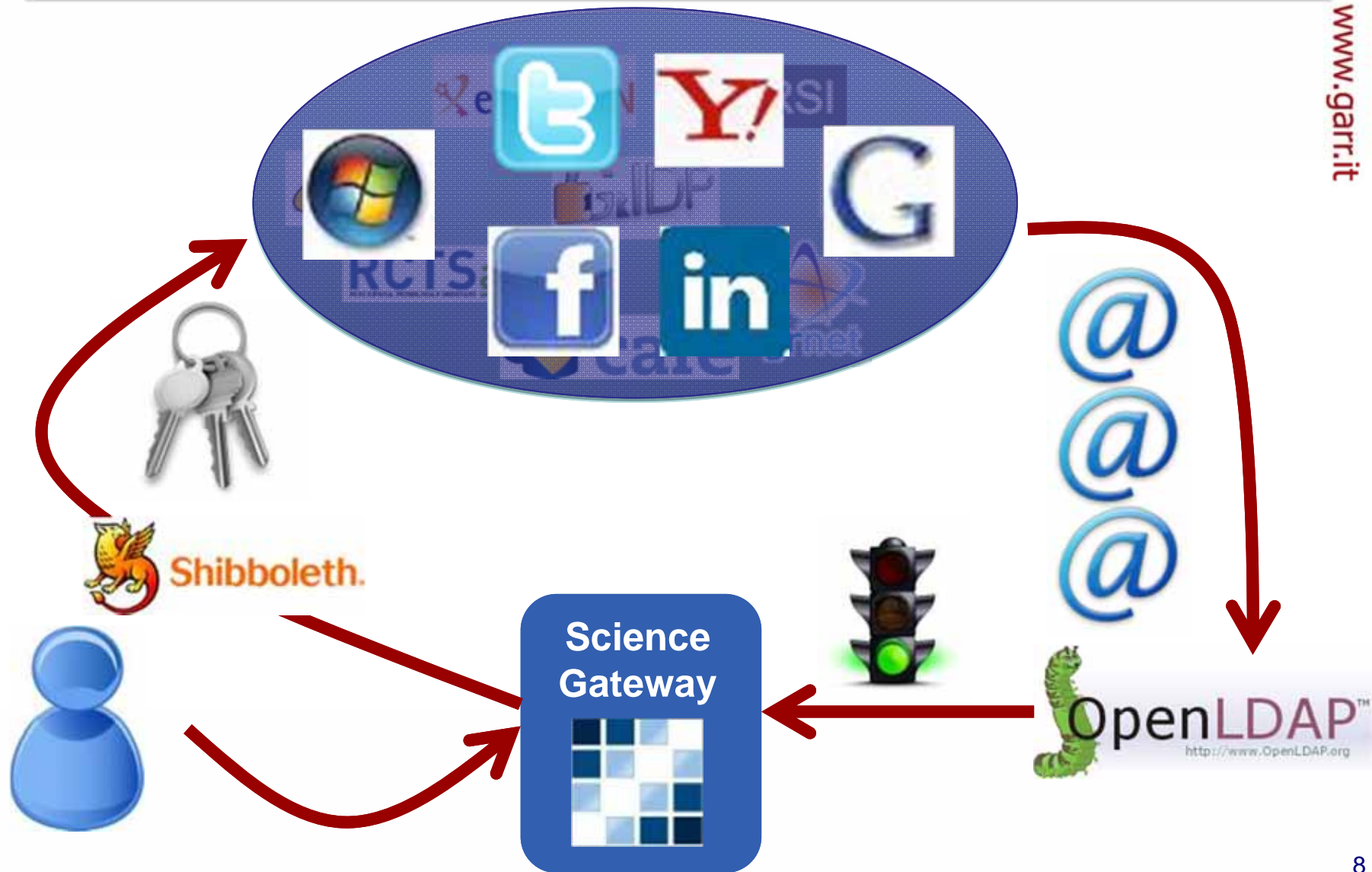


# Federated User



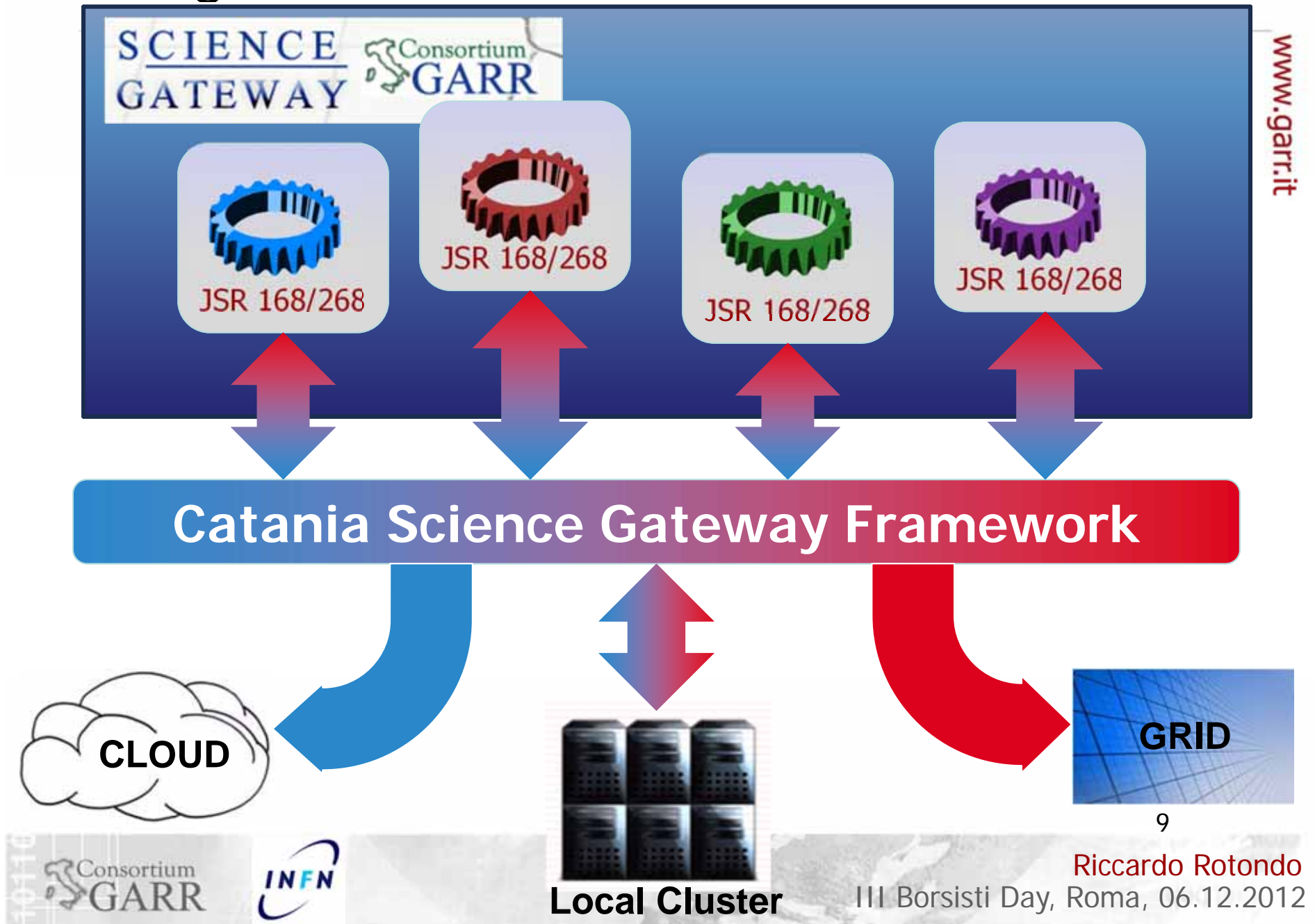
7

# Social User



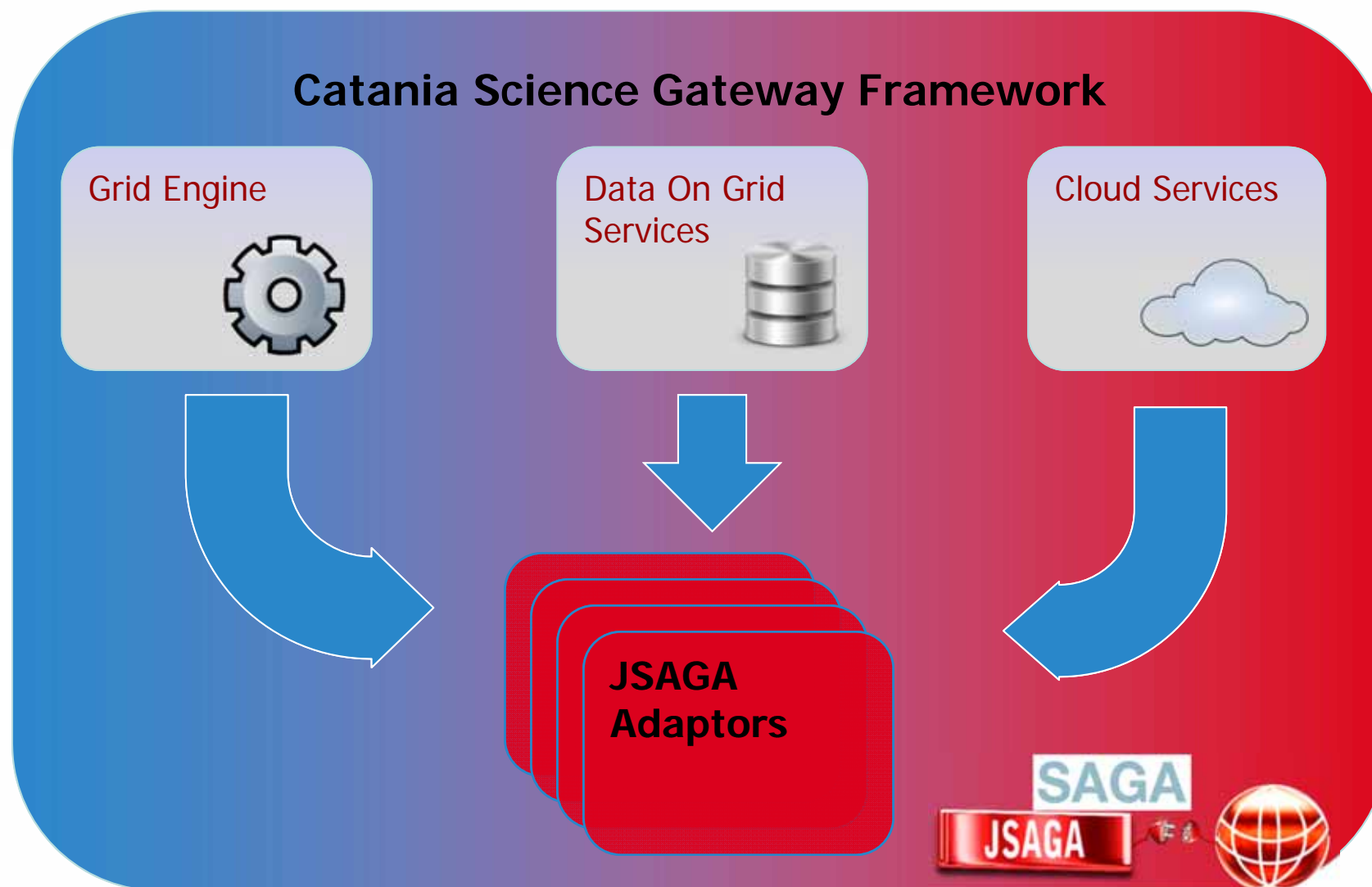


# Integrated Services



# Catania Science Gateway Framework

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# Grid Data Management Challenges

- Make interfaces simple for non expert users
  - CLI-based Grid storage interface is not straightforward
- Grid transactions require user certificates
- Complexity of current protocols to manage grid storage elements
  - Very little or no support for access through modern browsers or others web-based applications

# Requirements

- Grid Storage complexity hidden to end users
  - Users move files from/to a portal and see it as simple external storage accessible from a web interface and do not care about grid (or any other) technologies behind
- File management smoothly integrated with all the services provided in the SG
- Underlining architecture exposes a file-system-like view (i.e., a **Virtual File System - VFS**) through which users can perform the following actions:
  - Create, move, delete files/directories with the desired structure
  - Share files with other users
  - Set the number of backup copies desired



# Data On Grid Services: DOGS


- A file browser shows Grid files in a tree
- File system exposed by the SG is virtual
- Easy transfer from/to Grid (by SG) is done in a few clicks
- Users do not need to care about how and where their files are really located

# Back-end technical details

- JSAGA API used to transfer data from/to storage elements
- Hibernate to manage the VFS collecting information on files stored on Grid; any changes/actions in the user view affect the VFS
- MySQL as underlying RDBMS
- An additional component has been developed in order to keep track of each transaction in the users tracking DB (to be compliant with the EGI Portal and User Traceability Policies)

# Front-end technical details

- A portlet has been created for the Liferay-based portal to allow access only to federated users with specific privileges
  - <http://www.liferay.com>
- The portlet view component is a web-based file manager using jQuery UI for a clean and intuitive interface
  - <http://elrte.org/elfinder>

PROCEEDINGS  
OF SCIENCE

## A Data Engine for Science Gateways: enabling easy data transfer and sharing

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Grid infrastructures allow users to access and use computational and storage facilities distributed in different locations around the world. Science Gateways (SG) are recently emerging as high-level web environments that ease Grid access and use. However, although SGs simplify job management, providing a web interface by which jobs can be submitted with a few “clicks”, their capabilities to do an effective and intuitive data management are still at an early stage. Actually, Grid storage elements use dedicated protocols not supported by common applications such as web browsers. This makes a smooth integration of data management services in a Science Gateway quite difficult. In this work we show the Data Engine, a new SG component providing users with the ability to move data to storage elements and share them in an easy and clever way. The component operates between the Grid storage and the user, providing a file-system-like experience.

*The International Symposium on Grids and Clouds (ISGC) 2012*  
*Academia Sinica, Taipei, Taiwan*  
*February 26 – March 2, 2012*

  
ndo  
2012

# The GARR Science Gateway

The image displays two overlapping screenshots of the GARR Science Gateway website. The top screenshot shows the home page with the URL `garr-sg.ct.infn.it` in the browser address bar. The 'Registrati' button is circled in red. The bottom screenshot shows the 'Richiesta Account' page with the URL `garr-sg.ct.infn.it/request-account`. The page contains a registration form with the following fields:

- Titolo (dropdown menu)
- Organizzazione\* (text input)
- Nome\* (text input)
- Indirizzo (text input)
- Cognome\* (text input)
- Nazione\* (dropdown menu)
- Contatto Skype (text input)
- Telefono (text input)
- E-mail\* (text input)

Below the form, there is a note: "Se sei già membro di una Federazione di Identità, assicurati di inserire lo stesso indirizzo email con il quale sei registrato nella Federazione". At the bottom, there is a section titled "Se sei membro di una delle Federazioni di Identità" with instructions on how to select a federation or choose "(none)".

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# Access



home - GARR Science Gateway

garr-sg.ct.infn.it

cometa Apple Yahoo! YouTube Wikipedia Google Maps

SCIENCE GATEWAY Consortium GARR

home applicazioni servizi cloud GARR

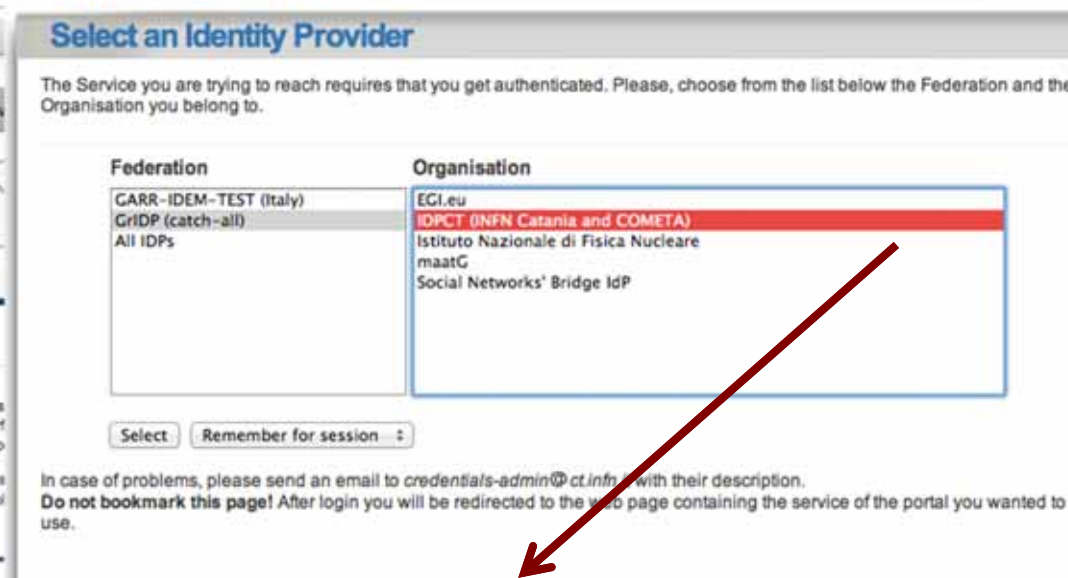
NUMERICAL COMPUTATIONS MADE EASY

Benvenuti

Per definizione, uno Science Gateway, è un "set di s integrati in un portale, solitamente grazie ad un interf personalizzabili per incontrare le necessità di una sp

Da questo portale è possibile accedere in maniera s eseguire mediante le risorse disponibili un set di appl scientifico.

RSS



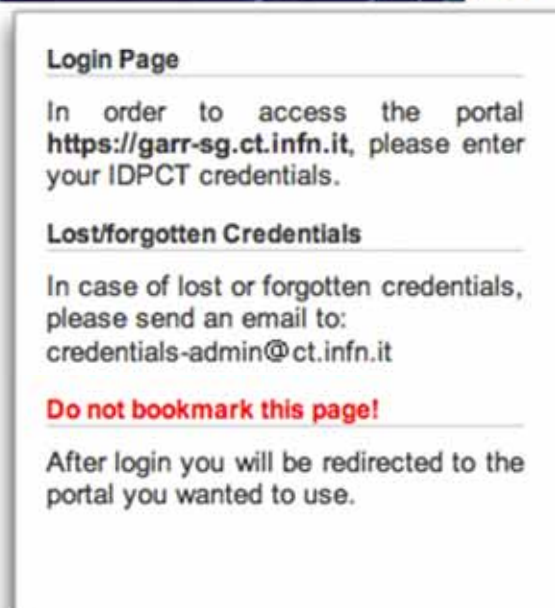
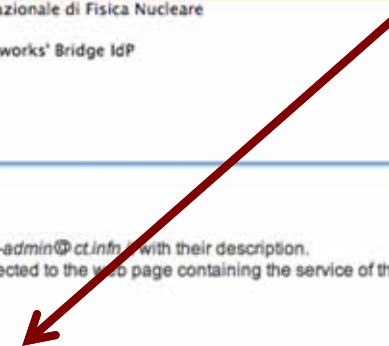
Select an Identity Provider

The Service you are trying to reach requires that you get authenticated. Please, choose from the list below the Federation and the Organisation you belong to.

Federation	Organisation
GARR-IDEM-TEST (Italy)	EGI.eu
GridP (catch-all)	IDPCT (INFN Catania and COMETA)
All IDPs	Istituto Nazionale di Fisica Nucleare
	maatG
	Social Networks' Bridge IdP

Select Remember for session

In case of problems, please send an email to [credentials-admin@ct.infn.it](mailto:credentials-admin@ct.infn.it) with their description.  
Do not bookmark this page! After login you will be redirected to the web page containing the service of the portal you wanted to use.



Login Page

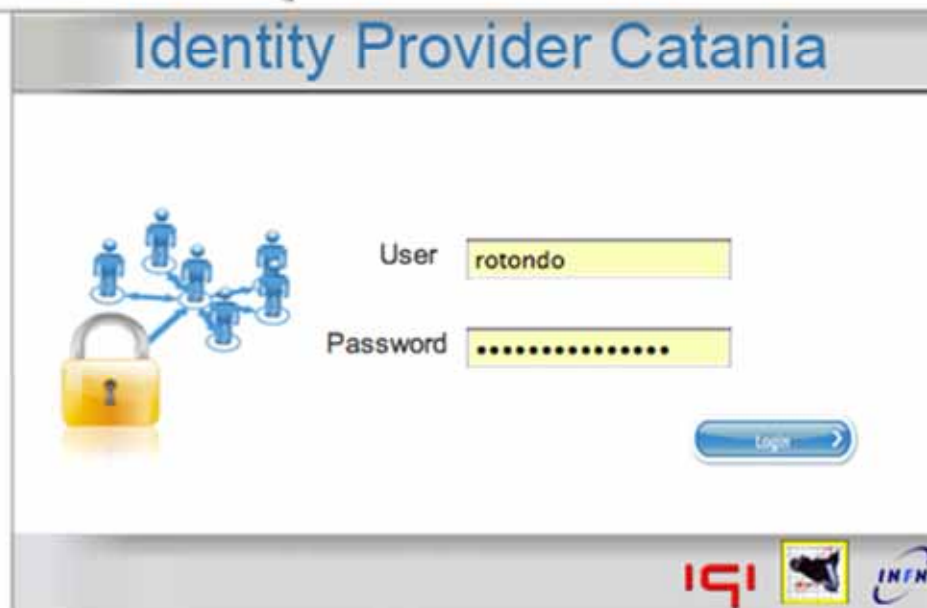
In order to access the portal <https://garr-sg.ct.infn.it>, please enter your IDPCT credentials.

Lost/forgotten Credentials

In case of lost or forgotten credentials, please send an email to: [credentials-admin@ct.infn.it](mailto:credentials-admin@ct.infn.it)

**Do not bookmark this page!**

After login you will be redirected to the portal you wanted to use.



Identity Provider Catania

User

Password

Login

# Applications accessing grid services

The screenshot shows the GARR Science Gateway interface. The main page displays a list of applications with columns for NAME, RUN PAGE, DOMAIN, and MID. The GROMACS application is highlighted in the list. Two detailed windows for GROMACS are shown, providing general information, technical details, and collaborator information.

**Application List:**

NAME	RUN PAGE	DOMAIN	MID
ASTRA		Others	EMI-...
BES		High-Energy Physics	...
G-HMMER		Life Sciences	...
GROMACS		Life Sciences	EMI-...
jModelTest		Life Sciences	gLite, GAR...
Octave		Computer Science and Mathematics	EMI-...
Parallel		Demo	EM UNIO
ProtTest		Life Sciences	EMI-...
R		Computer Science and Mathematics	EMI-gLite
Sequential		Demo	EM UNICORE, II, G

Showing 1 to 10 of 11 entries

**GROMACS General Info:**

- Acronym: GROMACS
- Name: GROMACS
- Project Application: GISELA/EUMedGrid-Support/EGEE
- Region: Africa

**GROMACS Collaborators:**

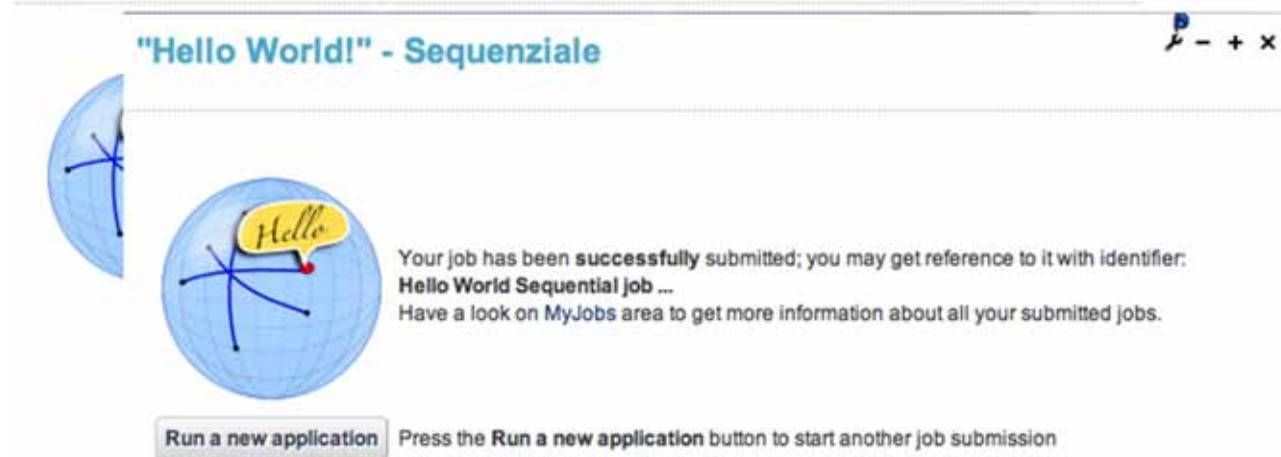
- Name:** Tore Maset  
**Institute:** UNINETT Sigma  
**Country:**   
**Contact:** email
- Name:** Tore Maset  
**Institute:** SARA  
**Country:**   
**Contact:** email
- Name:** Alessandro Costantini  
**Institute:** UNIPG  
**Country:**   
**Contact:** email
- Name:** Riccardo Rotondo  
**Institute:** Consortium GARR  
**Country:**   
**Contact:** email
- Name:** Eliana Alejandra Bohórquez Puentes  
**Institute:** UNIANDES  
**Country:**   
**Contact:** email

# Job Submission



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"Hello World!" - Sequenziale



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# Job Submission

BES - GARR Science Gateway

garr-sg.ct.infn.it/bes

Reader

cometa Apple Yahoo! YouTube Wikipedia Google Maps News

Add Manage Toggle Edit Controls Go to Riccardo Rotondo Sign Out

SCIENCE GATEWAY Consortium GARR

Home applicazioni servizi cloud my workspace my cloud GARR

Applicazioni

- "Hello World!" Fisica delle Alte Energie
  - BES
    - Run
- Informatica e Matematica Scienze della vita Altre

Lista completa

BES

## BESIII Experiment

The purpose of BESIII experiment is to study basic elements made of matter, interaction among elements and matter, basic rules of particles, etc. The BESIII data processing includes simulation, reconstruction and physics analysis, which consume a huge amount of computing power and storage space (200TB/year). Therefore, the BESIII experiment plans to make use of distributed computing resources for its simulation and physics analysis. The simulation process is the most suitable activity to be ported to the distributed computing environment since the simulation process don't need a large amount of data as input. Therefore, the BESIII science way used the BESIII simulation as a use case. The BESIII science gateway is to provide BESIII physics users a friendly

Sign-In to RUN

BES



Run a new application

Your job has been **successfully** submitted; you may get reference to it with identifier: **BESIII job execution of Tue Dec 04 20:44:32 CET 2012**  
Have a look on MyJobs area to get more information about all your submitted jobs.

Press the Run a new application button to start another job submission

BES

## BESIII Experiment

Please fill the following form and then press "SUBMIT" button to launch BESIII application. Requested inputs are:

- jobOptions file (its text or a file to upload)
- BOSS version
- MaxEvents
- Events Per job

Pressing the "Reset" Button all input fields will be initialized.  
Pressing the "About" Button information about the application will be shown

jobOptions file

BOSS Version

Max Events



Events Per job


Insert here your text file, or upload a file


Insert below your job identifier





# My Workspace – Active Job List



**Jobs**

**JobsMap**

**Data**







**Help**

**Active Jobs List** **Done Jobs List**

The table below shows the status of your jobs. Statuses are automatically updated every 15 minutes so there is no need to reload this page more frequently. However, if you don't see your jobs in the table within a reasonable amount of time (a couple of hours at most), click on Help in the MyWorkspace portlet and notify us the problem. Once your jobs have finished, you have 96 hours to retrieve their output. Beyond that time, the output of your jobs will automatically be deleted from the Science Gateway in order not to fill its storage with undesired stuff.

Copy Print Save Download Job output Search:

Show 10 entries

Application Name	User Description	Started on (UTC)	Status
Sequential	Hello World Sequential job ...	2012-12-04 20:34:40.0	RUNNING
Sequential	Hello World Sequential job ...	2012-12-04 20:11:49.0	RUNNING
Sequential	Hello World Sequential job ...	2012-12-04 19:35:36.0	RUNNING
GROMACS	Gromacs analysis ...	2012-12-04 19:33:48.0	
Sequential	Hello World Sequential job ...	2012-12-04 19:27:26.0	
GROMACS	Gromacs analysis ...	2012-12-04 18:45:02.0	
GROMACS	Gromacs analysis ...	2012-12-04 18:41:09.0	
Sequential	Hello World Sequential job ...	2012-12-04 18:38:34.0	
Sequential	Hello World Sequential job ...	2012-12-04 18:38:32.0	

Showing 1 to 9 of 9 entries

First Previous -1 Next Last

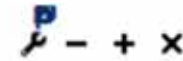
Reader Downloads Clear

Gromacsanalysis...\_58620.tgz Show In Finder

Open Show in Finder Copy Address Remove From List

# My Workspace - Done Job List

MyJobs



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Active Jobs List

Done Jobs List

The table below shows your done jobs list.

Copy Print Save

Search:

Show 10 entries

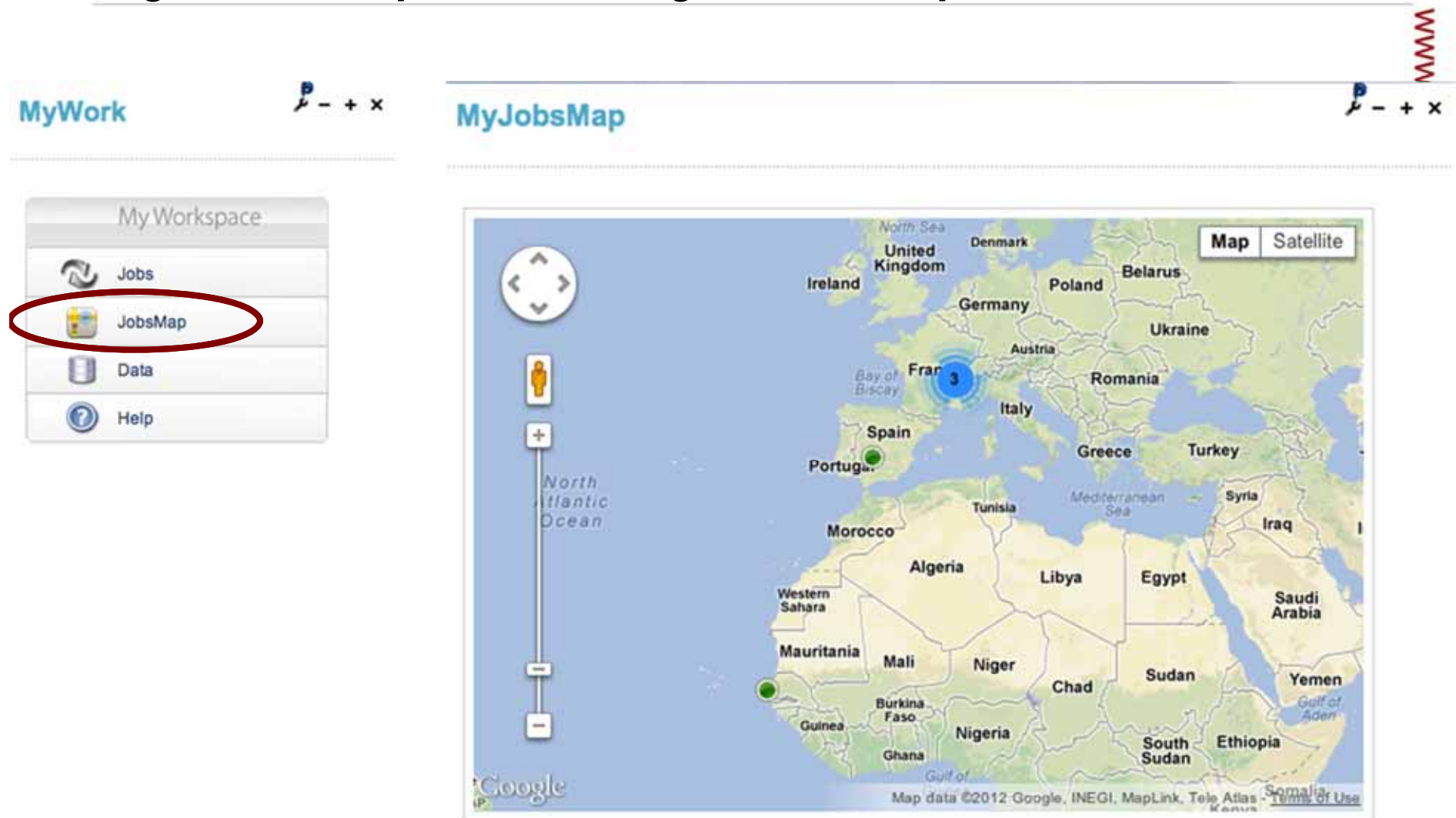
First Previous 1 Next Last

Application Name	User Description	Started on (UTC)
Sequential	Hello World Sequential job ...	2012-12-04 19:35:35.0
GROMACS	Gromacs analysis ...	2012-12-04 19:33:48.0
Sequential	Hello World Sequential job ...	2012-12-04 19:27:14.0
Sequential	Hello World Sequential job ...	2012-11-21 15:50:33.0

Showing 1 to 4 of 4 entries

First Previous 1 Next Last

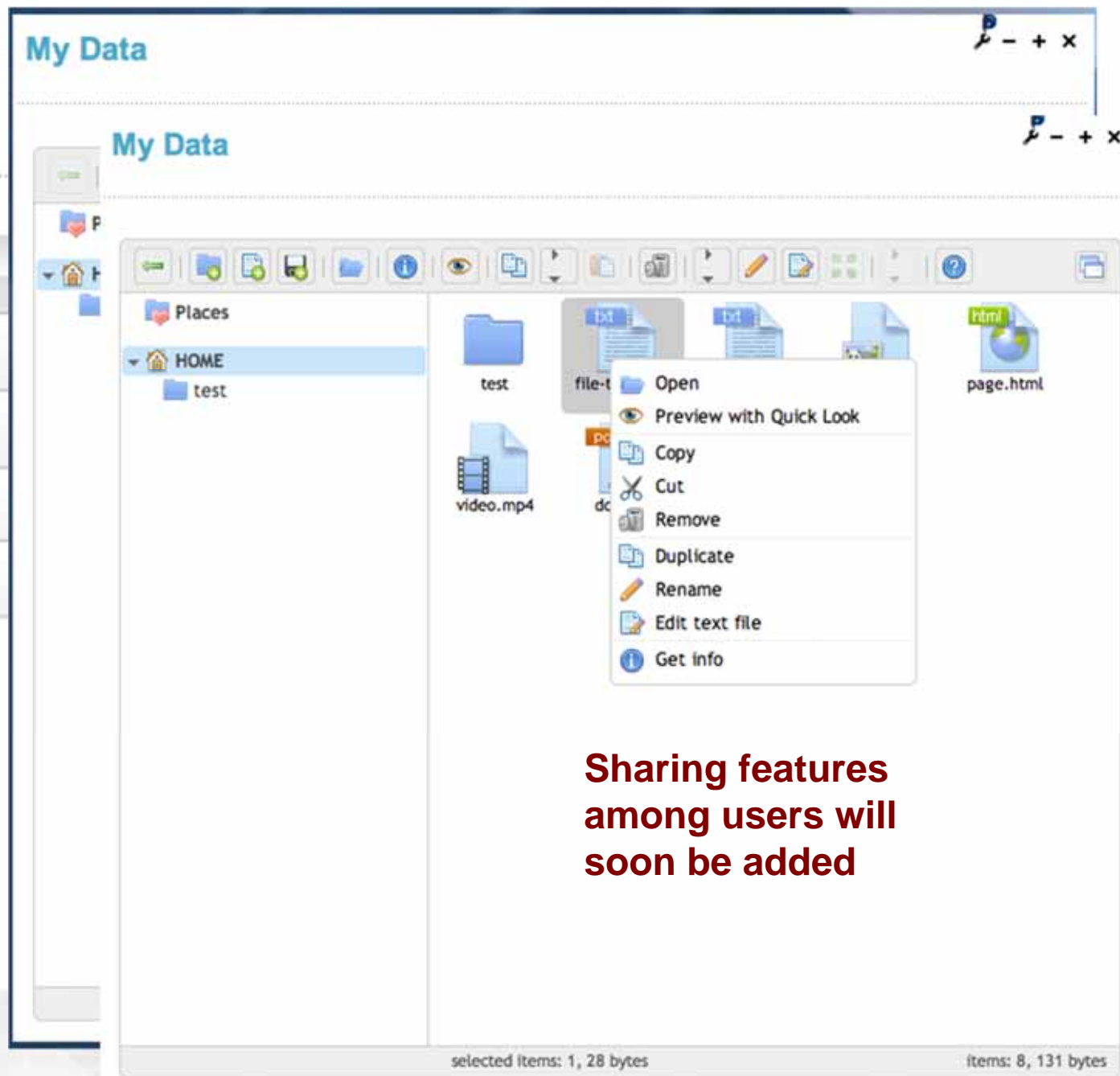
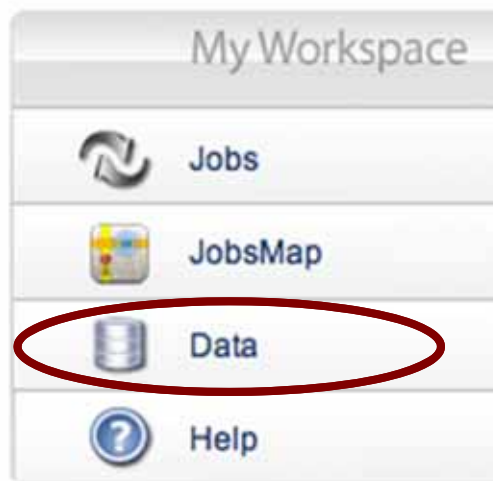
# My Workspace – MyJobsMap



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# My Data

MyWork



**Sharing features  
among users will  
soon be added**



# My Cloud

My Cloud

Cloud Node(s) ? ↻



infn-wn-25.ct.pi2s2.it ↻

AGLRTool



unime-wn-12.me.pi2s2.it

myCloudStation

See  
Andrea Fornaia's  
presentation for a detailed description

# Facebook Integration

(1) GARR ScienceGateway Community

https://www.facebook.com/GarrScienceGatewayCommunity/?ref=ts

Search for people, places and things

You are posting, commenting and liking as GARR ScienceGateway Community — Change to Riccardo Rotondo

**facebook**

**GARR ScienceGateway Community**  
33 likes

Only 1 day left for The GARR Borsisti Day. Follow our works and presentations online! More info on <http://www.garr.it/>  
Like · Comment

Get More Likes

Now  
November

Add Information About GARR ScienceGateway Community

About

Photos

Likes

Highlights

Status Photo / Video Event, Milestone +

Only 1 day left for The GARR Borsisti Day. Follow our works and presentations online! More info on <http://www.garr.it/>

Emidio Giorgio likes GARR ScienceGateway Community's status: "Only 1 day left for The GARR Borsisti..."

Post

28 Friends  
Like GARR ScienceGateway Community

ECI +19

# Conclusion

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- A unique web portal is able to access to Grid and Cloud services in few clicks with single-sign-on in an easy, intuitive interface
- Users are able to share their experiences even with Social Networks support
- The activities of dissemination contributed to the spread of these technologies increasing the number of applications available

# Future Work

- Better and deeper integrations in GARR Services:
  - Access with GARR-IDEM Credentials
  - Application will be customised for GARR partners and members
  - Deeper integration of Cloud Services:
    - **DOGS and GARRBOX are similar tools that may collaborate to extend their functionalities**
- Dissemination of this paradigm:
  - Event & School to train new developer and identify new applications
  - Training Material and Documentation will be soon available on the portal

# References & Acknowledgments

- GARR Science Gateway: <https://garr-sg.ct.infn.it>
- GARR Science Gateway Facebook Community Page:  
<https://www.facebook.com/GarrScienceGatewayCommunity>
- How to contribute:  
<http://applications.epikh.eu/survey4sciencegateways>
- R. Barbera, supervisor of the project.
- Special thanks to R. Ricceri for the support in the web design



# Questions ?



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