



Potential connections to e-Infrastructure projects

*...focusing on science gateways and
volunteer computing*

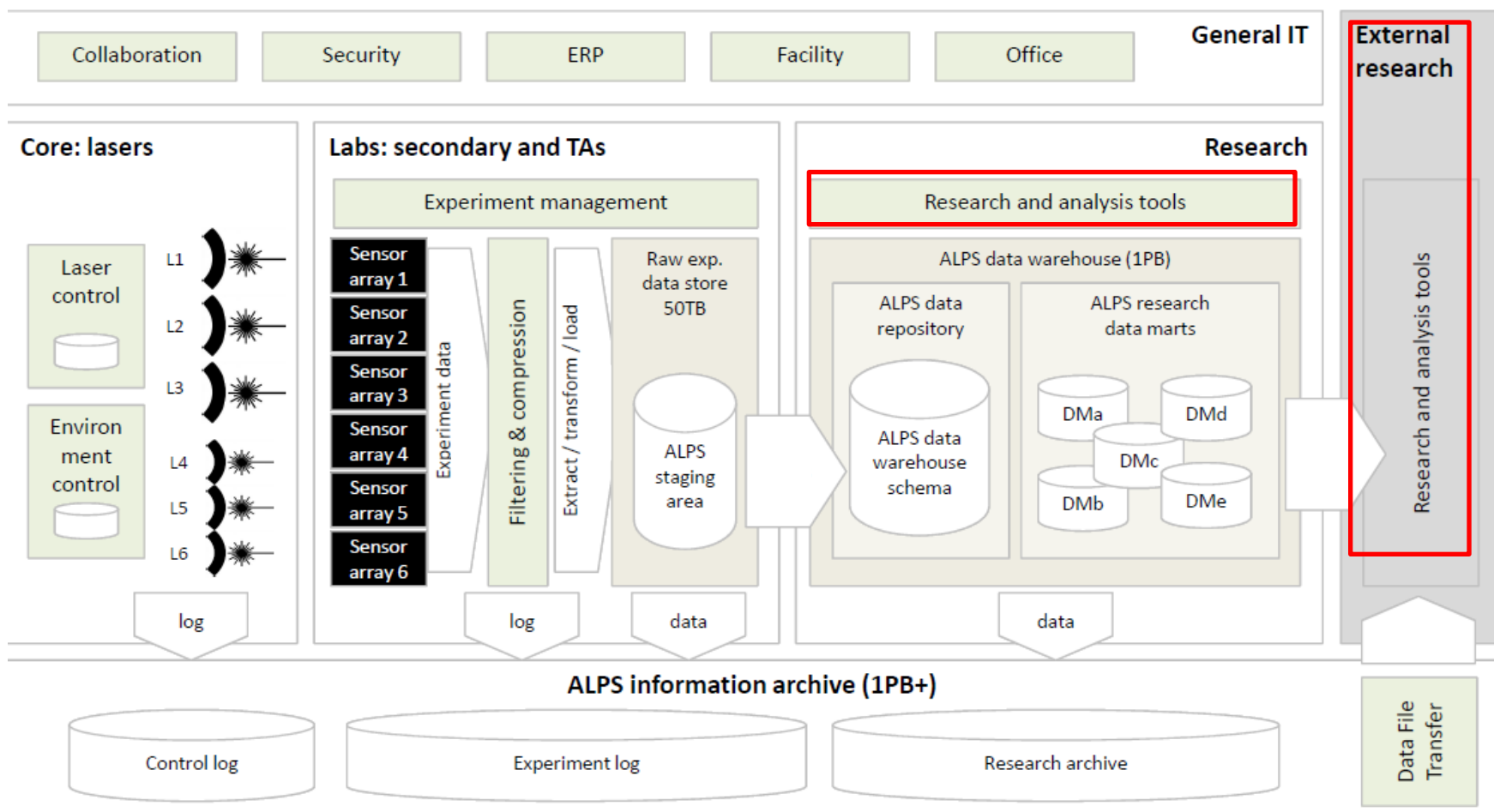
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Distributed Systems



ELI ALPS - High level IT architecture design (2012)





From the H2020 questionnaire

Objective: Stronger **engagement** with and focus on the **beneficiaries**:

- Direct beneficiaries: **Scientists** (Physicists, etc.)
 - interfaces, i.e. science gateways for data access, management and processing, to extract the knowledge from the “data tsunami” → help access critical mass of scientists
 - share information: application and workflow repositories and further mechanisms
- Indirect beneficiaries: **Citizens**
 - Green/financial aspects: volunteer-based distributed computing as a sustainable and cost-efficient computing/storage infrastructure
 - Higher acceptance/visibility among citizens: volunteer distributed computing as communication channel toward citizens and citizens scientists



From the H2020 questionnaire (FP7 background)

Science Gateways related research and development:

- A cluster of on on-going FP7 projects; SCI-BUS (www.sci-bus.eu), ER-FLOW (www.erflow.eu), and new CloudSME (all-together 10 MEUR budget) provide solid background for dozens of research communities.

Volunteer Grids:

- Series of past/on-going FP7 projects: EDGeS, EDGI (www.edgi-project.eu), DEGISCO (www.degisco.eu), IDGF-SP (www.idgf-sp.eu) (all-together 6 MEUR budget) provide solid background, and further large scale projects are already in production such as LHC@home, EDGeS@home (e.g. fusion research), and climateprediction.net.

➔ **both directions supported by the European Grid Infrastructure (EGI) in FP7**



Excellence > **1200** publications (2010-2014)
 > **100** research collaborations

Transnational access **1/3** of the compute capacity offered by foreign countries

Maximization of investment **5.42 M** years CPU time
 > **0.5** billion jobs/year

Integrated VRC > **490** integrated applications



VO ELI Beams

The VO eli-beams.eu was setup for members of the [ELI-beams project](#). To become a member, you must be a member of the collaboration, obtain a personal certificate from your national certification authority and fill a [registration form](#).

VO Acceptable Use Policy

This Acceptable Use Policy applies to all members of the [eli-beams.eu](#) Virtual Organisation, hereafter referred to as the VO, with reference to use of the EGI Grid infrastructure, hereafter referred to as the Grid. The VO management owns and gives authority to this policy.

The goal of the VO is to allow the members of the ELI project to perform computing activities relevant for the project. Members and Managers of the VO agree to be bound by the Grid Acceptable [Usage Rules](#), VO Security Policy and other relevant Grid Policies, and to use the Grid only in the furtherance of the stated goal of the VO.

Registration

To be able to access [registration form](#), you need a valid certificate loaded in your browser. When you fill all fields and press the first button below the form, an email is sent to the address specified in the form. You must visit the web page given in the email for a confirmation. In a new form, fill your desired username and password for an account on the global user interface [ui1.grid.cesnet.cz](#) and [ui2.grid.cesnet.cz](#). We expect that this UI will be used only for first tests and that users will install their own UI. When you fill the second form, email is sent to the VO manager. You can expect an approval within several days (we have to check that you are eligible). A confirmation email is sent when the request is approved or rejected.

Approval of a new member

Procedure of the approval of a new auger member is the following: registration form generates an entry in the database and a mail to the VO manager.

Account extension

Your VO membership is bound to the extension of your VO account required at the end of each year. Your VO account can be extended online by filling form field, in which you have to describe your current activities including new, planned ones.

Computing resources

Computing resources provided for VO will be either dedicated resources of groups taking part in the collaboration or "opportunistic" resources of other organizations offered on the voluntary basis.

Resources for the VO infrastructure (registration server, voms and ldap server) are provided by [CESNET](#) (within the EGI project) and by [Institute of Physics](#) of the Academy of Sciences of the Czech Republic.

About MetaCentrum

National Grid advantages

Virtual Organizations

MetaCentrum VO

VO Auger

VOCE

EUAsia VO

MPI

VO ELI Beams

Resources

Research & Development

NGI News

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More info: https://wiki.egi.eu/wiki/NGI_CZ:VO_eli



Research and (data) analysis tools: Science Gateways

- According to the preliminary plans some tasks of ELI-ALPS will include

“new software development, tailoring current software and *integrating* all the tools to be accessible *from one interface* for the different research groups of ELI.”



Associated partnership from SCI-BUS

- The [SCI-BUS](#) (SCientific gateway Based User Support) project creates a **generic-purpose gateway technology based on workflows** that provides seamless **access to** major European DCIs including **clusters, supercomputers, grids, desktop grids, academic and commercial clouds**. SCI-BUS elaborates an application-specific gateway building technology and a customisation methodology based on which user communities can easily develop their customised gateways.
- [Associated partnership](#) is to be offered to ELI partners with all of its benefits. The short list of benefits (commitments) from the SCI-BUS project: training, dissemination, joint events, support for designing/developing the science gateway of the associated partner.



Framework suggested by the *High-Level Group on Scientific Data*



Research Data e-Infrastructures: Framework for Action in H2020

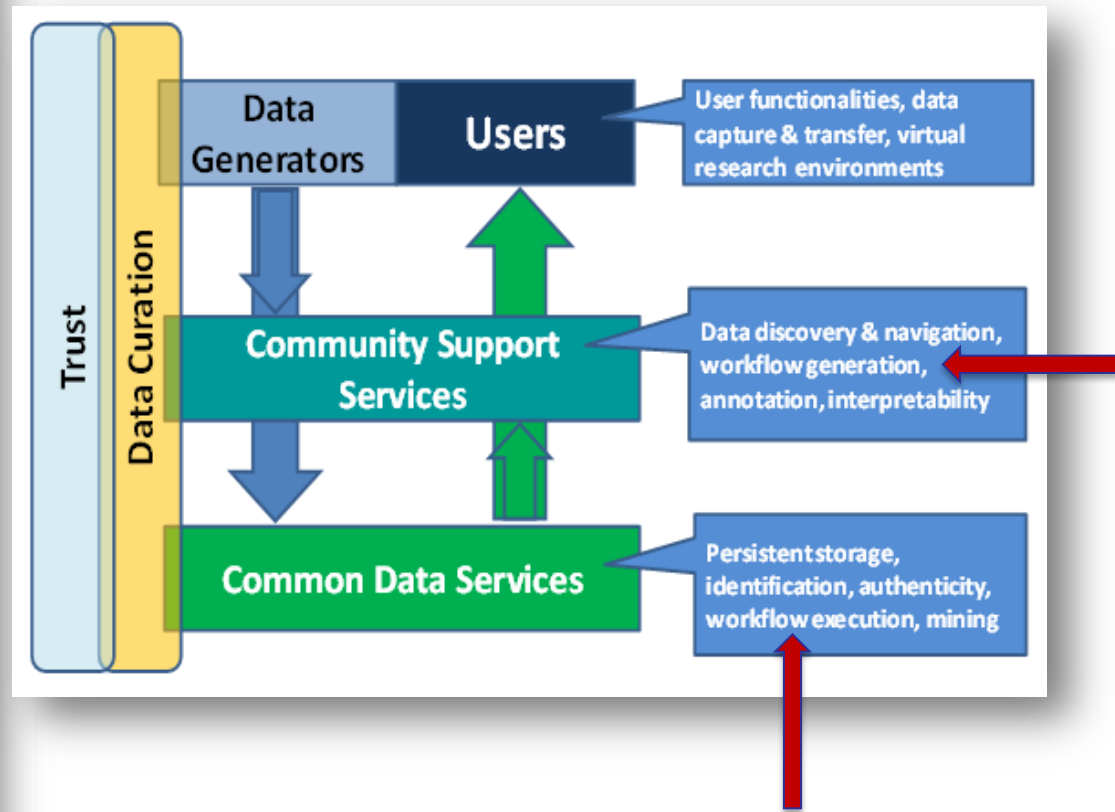
How policy makers and funders can target their limited resources at so many points of the data sharing ecosystem for maximum social and economic benefit is an enormous question to which there are no simple answers.

But two things are clear: that investment at all these points is necessary to create a fully realised data sharing system; and that gaps and redundancies in investment can best be avoided by a co-ordinated approach on the part of all agencies – governmental and non-governmental – that make research policy and fund research activities.¹

European Commission
Directorate General CNECT
Directorate C: Excellence in Science
Unit C1 - e-Infrastructures

¹ From the project Opportunities for Data Exchange (ODE).

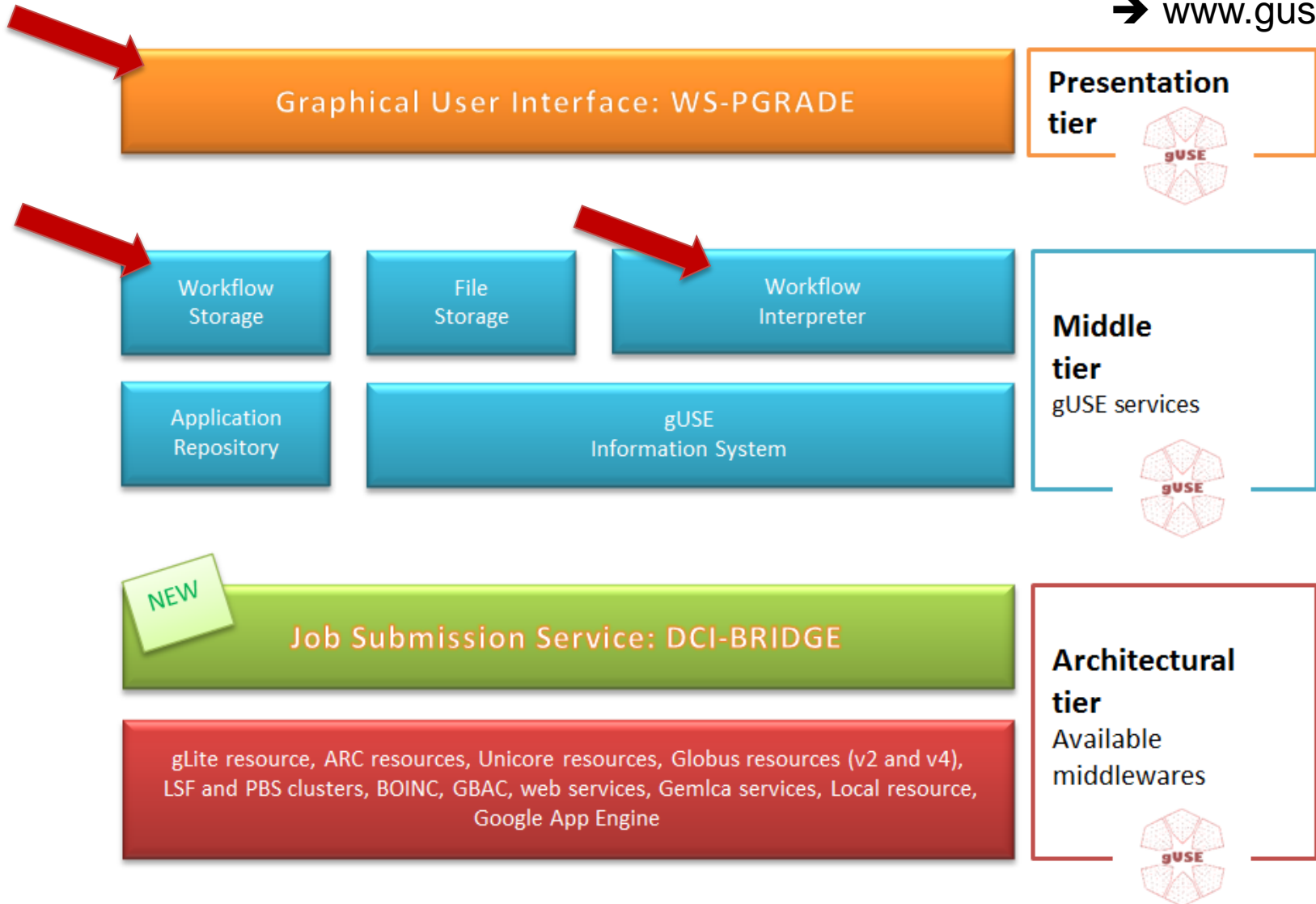
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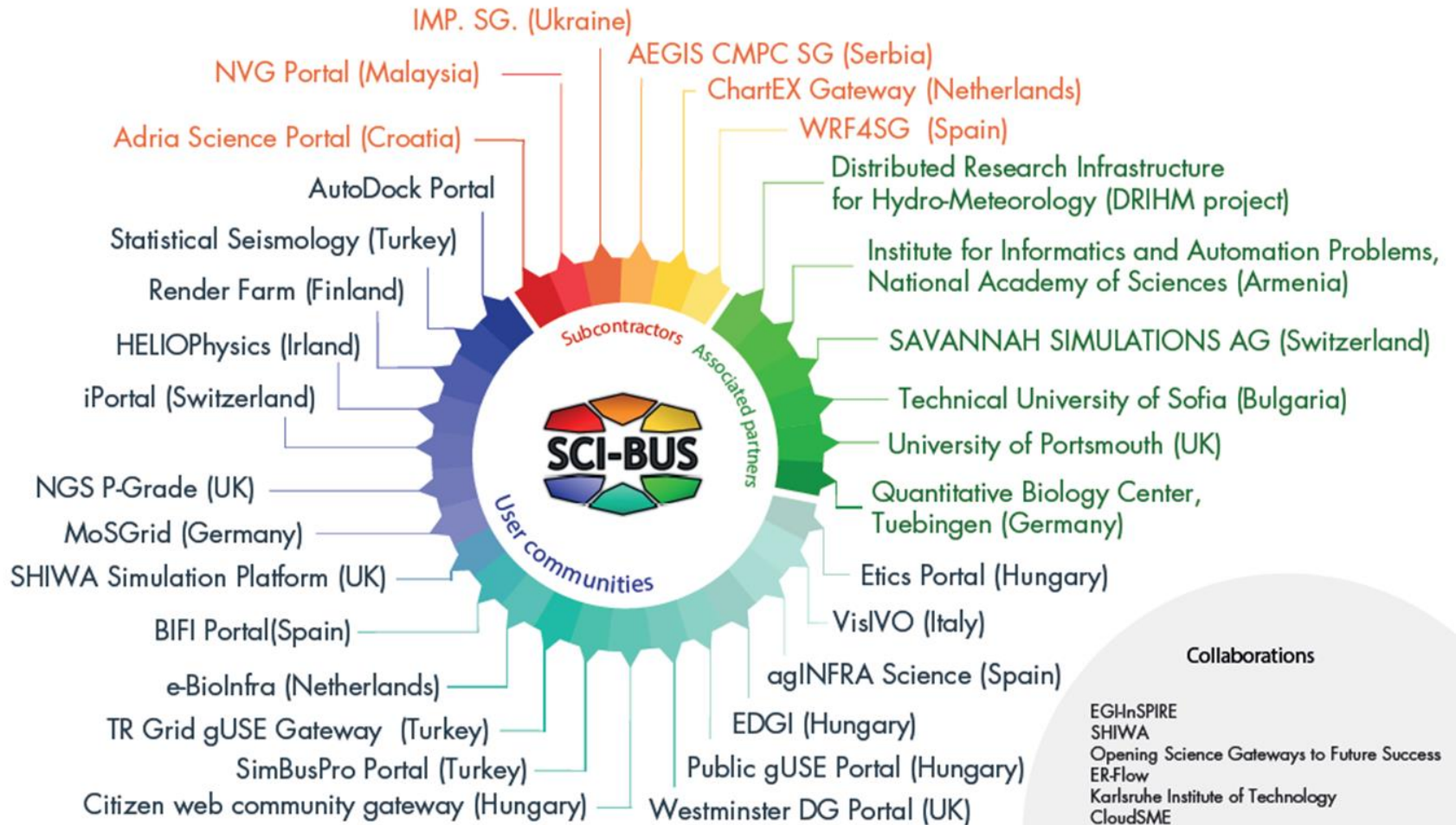
gUSE architecture in large

→ www.guse.hu





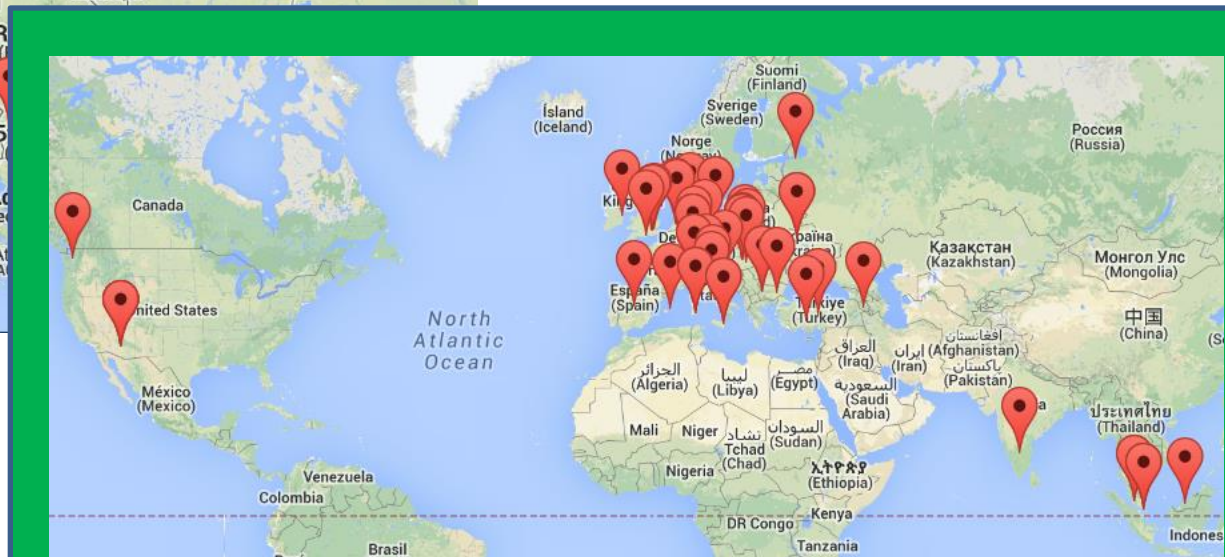
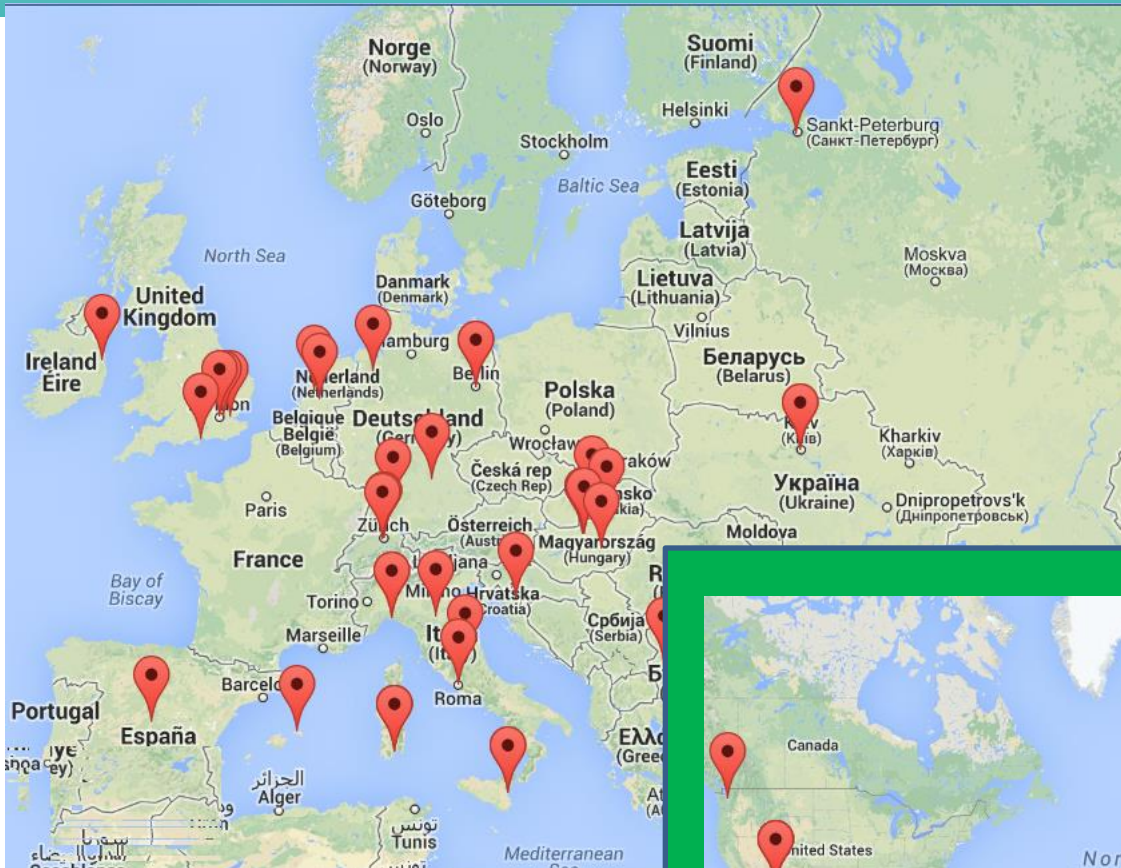
Supported e-Science communities





gUSE based science gateways

80+
deployments
world-wide





e-Infrastructure for the 21st Century

applications, by providing easier access to data and to leading-edge HPC platforms, by broaden the user base (e.g., through Cloud Computing and Software as a Service (SaaS), and by responding to new and challenging technologies."

So, as well as sharing expertise, the services offered by the *Research Accelerator Hubs* and the PRACE Tier-0 and Tier-1 centres should be federated to form part of the overall e-infrastructure ecosystem. This will require the PRACE HPC centres to participate in the federated identity management scheme and data sharing services if the PRACE centres are to be fully federated as service providers within this model.

EGI

The experience gathered by EGI in managing a federated grid infrastructure will be directly relevant to the network of *Research Accelerator Hubs* model. EGI has also been evaluating cloud technologies via the EGI federated cloud²⁵. It is proposed that a consolidated set of EGI sites become *Research Accelerator Hubs*. This will give the EGI distributed computing infrastructure a clear direction for how to contribute its experience and make a larger portfolio of services accessible to its existing user-base, while introducing the innovation potential created by the uptake of cloud computing in research and business sectors.

Volunteer computing

Volunteer computing initiatives across Europe have established production structures which serve a range of research communities. Such structures allow research and education organisations, as well as individuals and citizen scientists, to contribute and participate in research activities. Significant computing resources are assembled by structures such as the International Desktop Grid Federation²⁶ that can support a growing range of application types with very modest operational and coordination overheads. It is important that such structures become an integral part of the e-infrastructure commons.

EUDAT data services

It is expected that data services currently under development by various projects, notably EUDAT, will provide candidates for future services and potentially additional e-infrastructure *Research Accelerator Hubs*. A goal will be to introduce services that can profit from the co-location of data and compute services to support multi-disciplinary research. Metadata and indexing facilities across the set of services in all the e-infrastructure *Research Accelerator Hubs* are seen as being particularly relevant. It is essential that new services are fully integrated with existing services to preserve the data and compute continuum of the exploitation platform and support the e-infrastructure commons.

²⁵ <http://wiki.egi.eu/wiki/Fedcloud-tf-User-Communities>
²⁶ <http://desktopgridfederation.org>



EIROforum

Serving European Science



An e-Infrastructure for the 21st Century



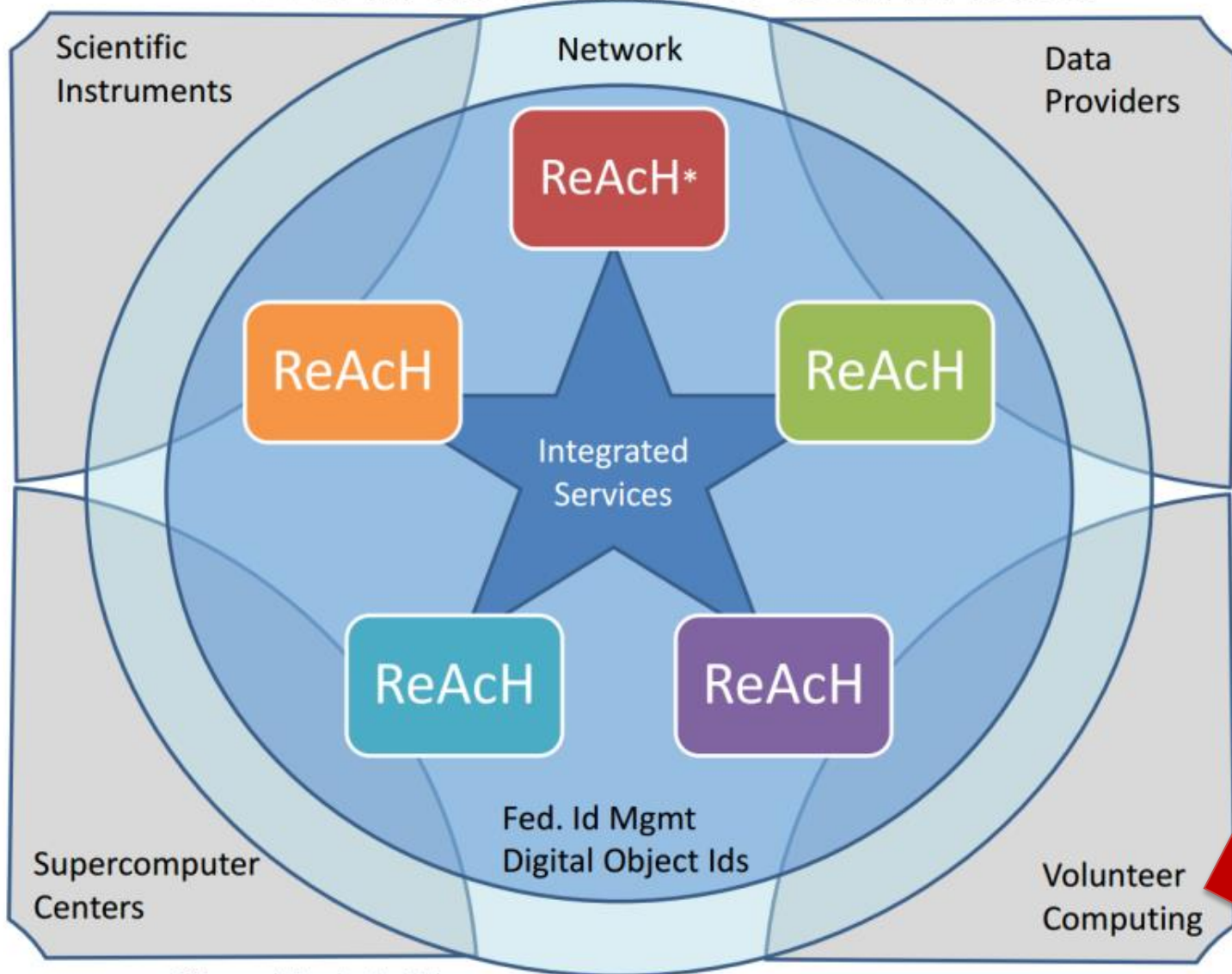
eIRG workshop

Vilnius

4th November 2013

Bob Jones, CERN

E-infrastructure commons



* Research Accelerator Hub





What happens to DCI sites that do not become ReAch?

- Many sites joined DCI projects in order to contribute to scientific challenges, get training and international exposure
- Volunteer computing structures offer an avenue by which they can continue to contribute but with reduced operational costs
 - DEGISCO project and International Desktop Grid Federation
- Integrate volunteer computing into the overall e-infrastructure commons
 - EDGI developed bridge between volunteer computing & grids & clouds
 - Offer a channel for engaging the general public and citizen scientists
- ReAch will offer training/secondment opportunities





International Desktop Grid Federation - Support Project

Fostering interoperability, dissemination, and sustainability of DCIs

DEGISCO, EDGI & EDGeS →



Supercomputer based service grids

Cluster based service grids



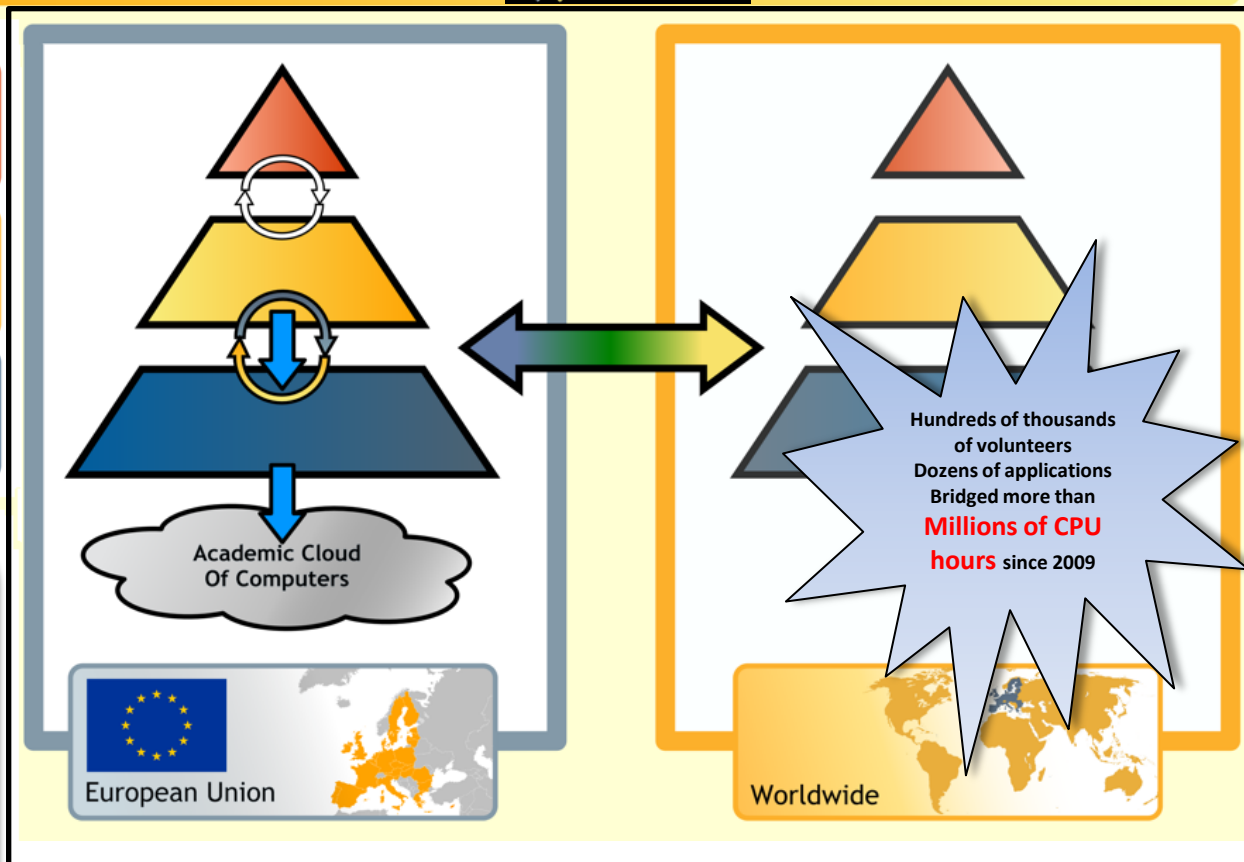


Volunteer or organisational desktop grids





- Bridged to other e-Infrastructures
- **Sustainability** by self-maintained resource pool from volunteers (not FP7/H2020 funds), studies on green aspects & cost-efficiency
- **Roadmap** available



→ desktopgridfederation.eu



GOCD 5.2

Browse

- My Sites
- Projects
- NGIs
- Sites
- Service Groups
- Services

Add

- Add Site
- Add Service Group
- Add Service
- Add Downtime

Downtimes

- Active & Imminent

About GOCD 5.2

- Doc, Help & Support

Search

User Status

Registered as:
Robert Lovas

[View Details](#)
[Manage Roles](#)



NGIs

National Grid Initiatives

What is an NGI?

Filter (clear)

Scope:

41 NGIs

Name	E-Mail	Scope(s)
IDGF	idgf-egi-oc-mgmt@lpds.sztaki.hu	Local
AfricaArabia	operations-africa-grid@africa-grid.org	EGI, Local
NGI_ZA	bbecker@csir.co.za	EGI, Local
NGI_CHINA	roc@china-roc.cn	EGI
Russia	roc-support@theory.sinp.msu.ru	EGI
ROC_LA	support@roc-la.org	EGI
ROC_Canada	roc@lcg.triumf.ca	EGI
NGI_UK	UKNGI-OPERATIONS@jiscmail.ac.uk	EGI
NGI_UA	ngi-ua-operations@grid.org.ua	EGI
NGI_TR	grid-pm@ulakbim.gov.tr	EGI
NGI_SK	management@slovakgrid.sk	EGI
NGI_SI	management@sling.si	EGI



Browse

- My Sites
- Projects
- NGIs
- Sites
- Service Groups
- Services
- Add**
- Add Site
- Add Service Group
- Add Service
- Add Downtime
- Downtimes**
- Active & Imminent
- About GOCDB5**
- Doc, Help & Support

Search

User Status

Registered as:
Robert Lovas

[View Details](#)
[Manage Roles](#)



IDGF



Edit

What is an NGI?

Contacts

E-Mail	idgf-egi-oc-mgmt@lpds.sztaki.hu
ROD E-Mail	idgf-support@lpds.sztaki.hu
Helpdesk E-Mail	idgf-support@lpds.sztaki.hu
Security E-Mail	idgf-support@lpds.sztaki.hu

Project memberships

Scope(s)

EGI ?

2 Sites

Name	Certification Status	Production Status	Scope(s)
SZDG	Certified	Production	EGI
EdgesAtHome	Certified	Production	EGI



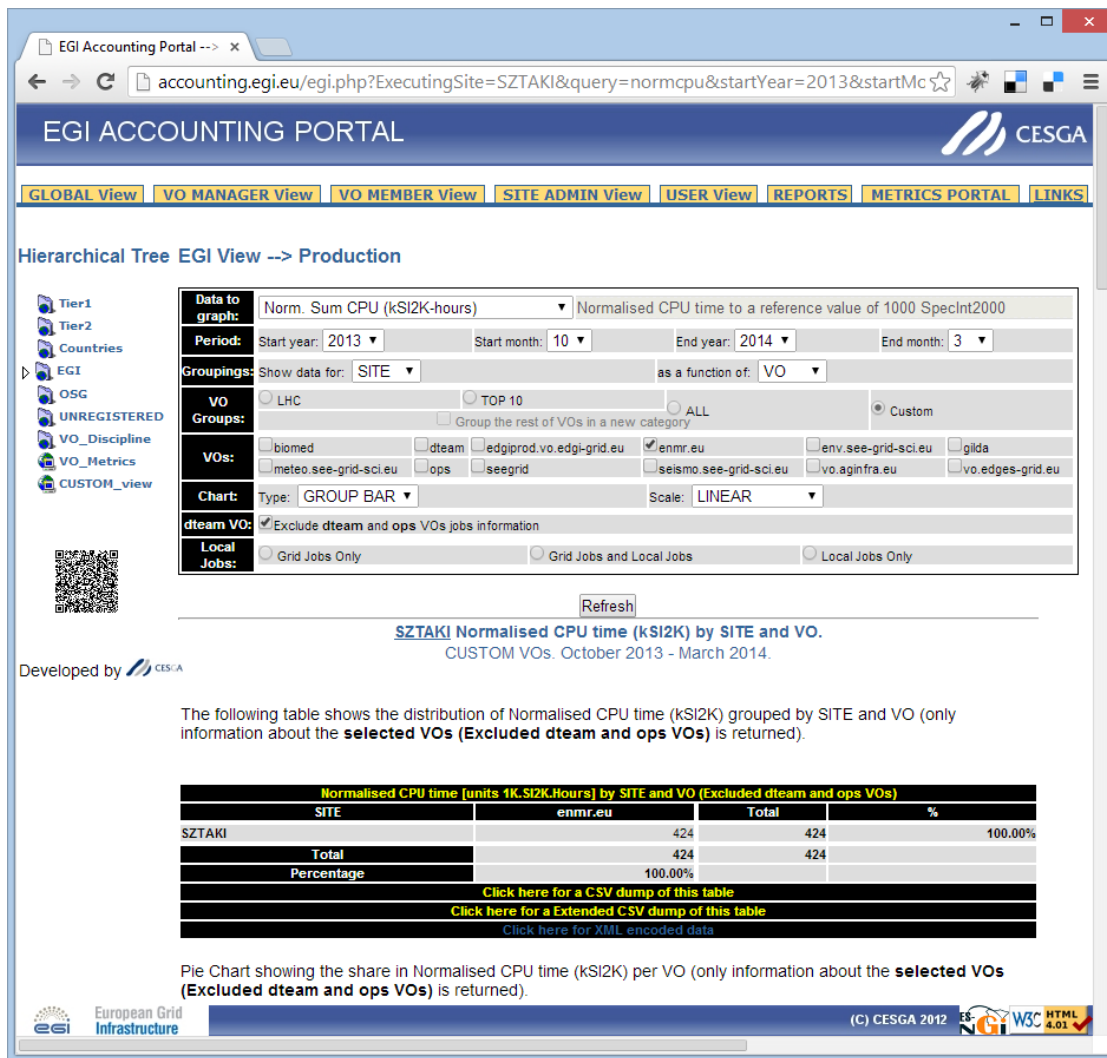
6 Users

Name	Role
Jozsef Kovacs	NGI Operations Deputy Manager
Jozsef Kovacs	NGI Security Officer
Robert Lovas	NGI Operations Manager
Csaba Hajdu	Regional Staff (ROD)
Jozsef Kovacs	Regional Staff (ROD)

WeNMR/Haddock portal is sending 1 out of 10 jobs to **EDGeS@home** volunteer desktop Grid through a **modified computing element** (Bridge).



The recently provided CPU hours in the **EGI accounting portal** for executing the workunits originated from WeNMR (nuclear magnetic resonance community).



EGI ACCOUNTING PORTAL

Hierarchical Tree EGI View --> Production

Refresh

SZTAKI Normalised CPU time (kSI2K) by SITE and VO.
CUSTOM VOs. October 2013 - March 2014.

The following table shows the distribution of Normalised CPU time (kSI2K) grouped by SITE and VO (only information about the **selected VOs (Excluded dteam and ops VOs)** is returned).

Normalised CPU time [units 1K.SI2K.Hours] by SITE and VO (Excluded dteam and ops VOs)			
SITE	enmr.eu	Total	%
SZTAKI	424	424	100.00%
Total	424	424	
Percentage	100.00%		

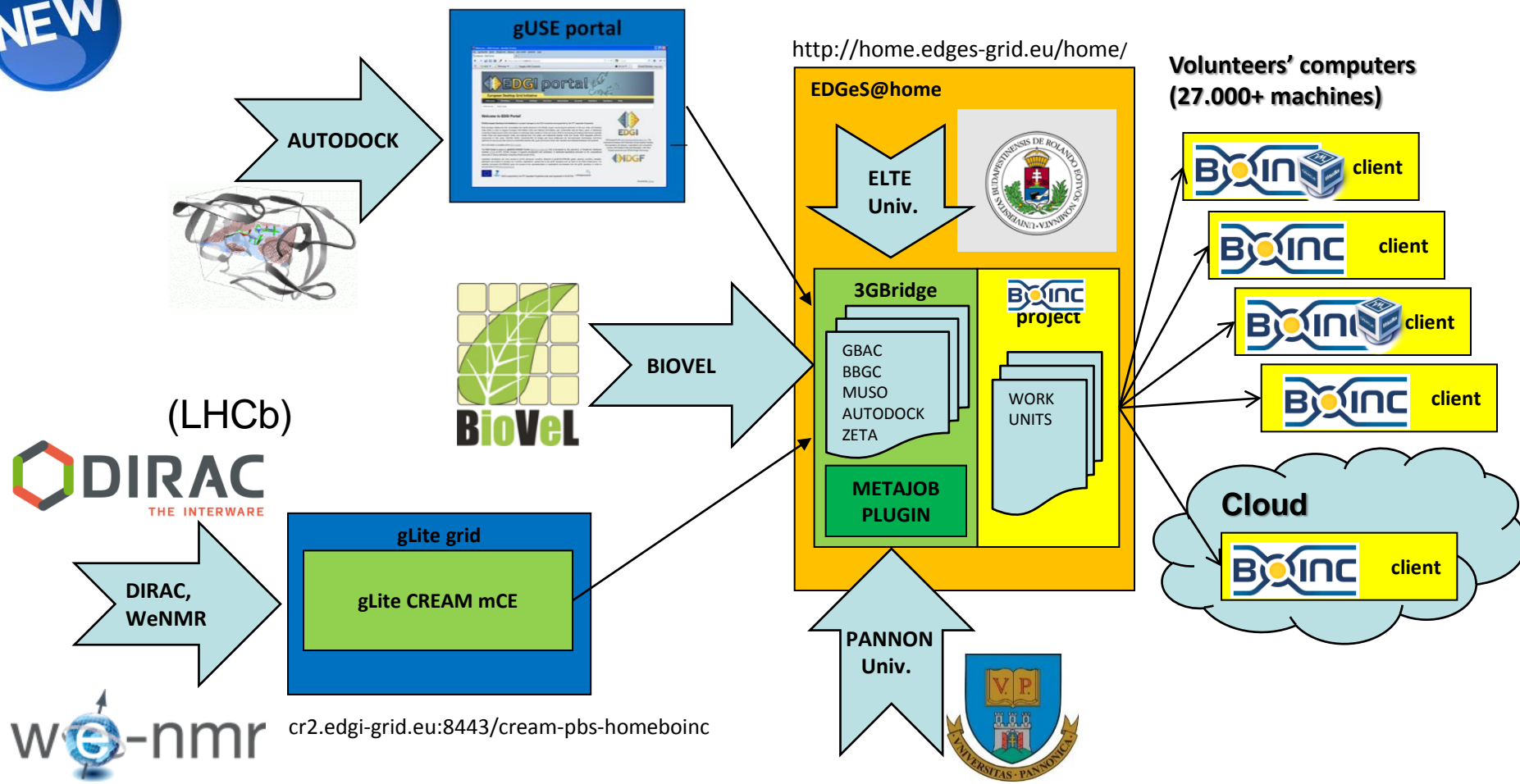
[Click here for a CSV dump of this table](#)
[Click here for an Extended CSV dump of this table](#)
[Click here for XML encoded data](#)

Pie Chart showing the share in Normalised CPU time (kSI2K) per VO (only information about the **selected VOs (Excluded dteam and ops VOs)** is returned).

European Grid Infrastructure (C) CESGA 2012

Overview of job submission alternatives for EDGeS@home

NEW





Collaboration and development – progress/plans and opportunities:

Science Gateways
Volunteer computing
(Grid / Cloud technologies)

...we are open to support other experiments/facilities as well.

P.S. some Atlas simulations (Monte Carlo type) from CERN to be put on volunteer computing infrastructure to save up more computing elements for time-critical data processing