Inspired

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news from the EGI community

(Nicholas A. Tonelli / wikicommons)

TOP STORIES

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European Grid Infrastructure

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This Issue

Welcome to Issue 11 of *Inspired*! What is new in EGI?

> Michel Drescher writes about the benefits of the EGI Federated Cloud for the WeNMR project
> Gergely Sipos explains how technology support will work from May 2013, after the end of EMI and IGE
> Kostas Koumantaros and Marios Chatziangelou write about the Community Software Repository
> Tiziana Ferrari and Małgorzata Krakowian look at the infrastructure's trends and performance
> Sy Holsinger introduces the new tree of scientific disciplines

Plus:

> What GÉANT is doing in Central Asia
> ...and an overview of the EGI-InSPIRE Mini-Projects

Your thoughts and comments are always welcome!

Sara Coelho, sara.coelho@egi.eu

This issue's photo is a view of cummulus clouds over a corn field in the Northampton County, Pennsylvania.
(Illustration: Nicholas A. Tonelli / wikicommons)

The EGI Technical Forum 2013 in Madrid

Providing an integrated sustainable Open Compute and Data Infrastructure for Open Science in the digital European Research Area

The EGI Technical Forum, hosted by EGI.eu and IBERGRID, will take place in Madrid, Spain from 16 to 20 September.

Over the last decade, EGI has established an open compute and data infrastructure built by federating national computing and storage resources across Europe and around the world. Through the support provided by national governments and the European Commission, the EGI Technical Forum in Madrid will reflect on the current achievements and the plans for the future around:

> Bringing leading research communities and researchers together to tackle societal challenges through the use of innovative technology
> Sustaining the existing infrastructure and bringing into production a federated infrastructure cloud that will enable the work of a diverse new generation of users
> Continuing to build and coordinate the community of experts that use, operate, manage, develop, support and provide outreach
> Refining the financial, technical and political governance of the EGI ecosystem so that it continues to thrive for the decades to come

The EGITF 2013 will be co-located with international workshops and meetings relating to the research challenges and technical interoperability needed to operate and exploit an open compute and data infrastructure. These include IBERGRID 2013, EU-Brazil OpenBIO, Open Grid Forum 39, GlobusEUROPE and the CloudPlugFest interoperability workshops.

More information

EGI Technical Forum website - *http://tf2013.egi.eu*

The EGI Federated Cloud, from theory to practice

Michel Drescher explains how the grid of clouds is helping the WeNMR project

Over the last year, EGI has been working to assemble a new type of infrastructure for the research community, built on top of clouds and virtualisation technologies.

If you are not a computer scientist, your first reaction might as well be: "Yeah, so what?" So let me answer this with an example.

The WeNMR use case

Within WeNMR, structural biologists use computing resources to achieve two goals: (a) compute structural models of molecules, and (b) use old and new nuclear magnetic resonance (NMR) data to validate protein simulation and modelling using advanced algorithms and techniques. This involves a number of applications that ingest raw NMR data to return a validated (or not) protein model. The applications are maintained by the CING community (Common Interface for NMR Structure Generation).

The mechanisms used to get all these applications deployed directly in the same e-infrastructure, shared with many other colleagues from other scientific domains, are complex. A key issue here is the difficulty to contain (mostly) unintentional misuse in such a shared infrastructure. Researchers aren't happy with this, and the infrastructure providers aren't really happy either.

The federated cloud solution

Together with EGI, the WeNMR project looked at how these issues could be addressed using cloud computing. Here is what they have done, and how it benefits their research.

The basic premise is the fact that NMR data analysis can be massively parallelised. The NMR database consists of thousands of different proteins, and for each protein many independent NMR data sets exist. So, while one data set is processed, a second one could be running at the same time and that is also possible with many, many more in parallel.

The WeNMR project did exactly that: they packaged all necessary applications into one Virtual Machine (VM), and built a lightweight infrastructure around it so that many Virtual Servers could run from that one VM at maximum efficiency.

The only required inputs are:

> Request a data set from the NMR database, and

> Upload the results to the NMR database.

This allows for a lightweight architecture, requiring only three key components:

1. The central NMR database
2. The VM image (the 'VirtualCING' image) at the cloud providers
3. A service that tells the Virtual Servers which dataset to process next (provided by SURFsara)

So here you have a virtual infrastructure deployed on a real, physical infrastructure; both are quite different yet neatly integrate with each other – that is the beauty of virtualisation!

The benefits for WeNMR

> Total control over the exact set of applications assembled into the Virtual Machine

> Flexible deployment and instantiation of the VirtualCING image across EGI

> Elastic resource consumption based on real need (think of a bubble that can expand and contract again as required)

> Finish the computational effort in less than 10% of the time compared to a conventional, local resource based approach.

EGI is Federated Cloud Computing available for you and your team's research needs.

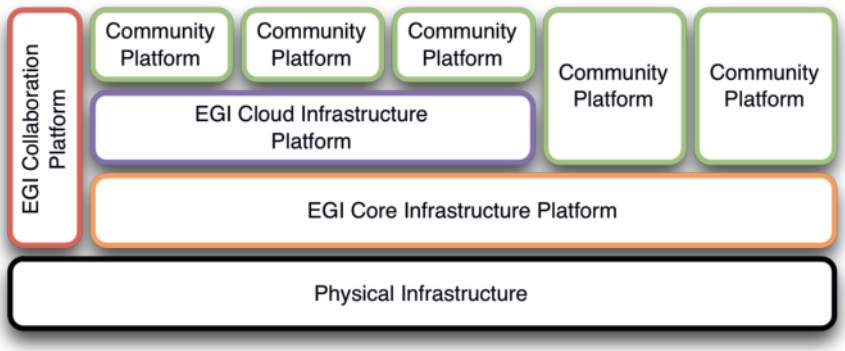
More information

To learn more, or to try the EGI cloud resources, email: ucst@egi.eu.

Or download the flyer at: http://go.egi.eu/fc-flyer

The EGI Platform Architecture

Gergely Sipos discusses how technology support will work from May 2013, after the end of the European Middleware Initiative and the Initiative for Globus in Europe



In April 2013, with the end of the EMI and IGE projects, the EGI community lost its two largest technology providers and contributors to the Unified Middleware Distribution.

This is a milestone for EGI and grid computing in Europe: for the first time since 2001, we will have no dedicated project for grid middleware development. But just because EMI and IGE are over, development is not finished. Most of the teams involved in EMI and in IGE are still active, fixing bugs for the communities who depend on their products. Some teams even implement new functionalities in their software, but the coordination and integration provided by EMI and IGE are gone.

For EGI, the answer is the EGI Platform Architecture - a new software integration and provisioning process.

A platform-based EGI

EGI started developing its platform architecture in early 2012 and refined it over the last 14 months. The platform-based EGI is capable of supporting a broad customer base with a very diverse set of requirements, and with a much smaller central coordination effort.

The platform-based EGI consists of:

(1) EGI Core Infrastructure Platform, to operate and manage a distributed infrastructure (e.g. accounting);

(2) EGI Cloud Infrastructure Platform, to operate a federated cloud based infrastructure;

(3) EGI Collaboration Platform, for information exchange and community coordination (e.g. AppDB), and

(4) Community Platforms, service portfolios customised for scientific communities.

The Platform Architecture allows any type and any number of community platform to co-exist on the physical infrastructure. Some can provide a grid functionality – similar to EMI's and IGE's services. Others can include completely unique services that run, for example, in Virtual Machines.

A flexible system

EMI's and IGE's distributions included a large number of services that very few communities required in bulk. In practice, most user groups require a relatively simple, but variable set (e.g. a service for job execution and a file storage service, plus some services for security and access control).

The flexibility of the new system allows the 'long tail of scientists' to be better represented in the platform-based EGI.

More choice for developers

EGI.eu will support the development of community platforms integrated and operated by scientific communities in collaboration with the NGIs. EGI.eu will facilitate the interaction of software developers, scientific communities and platform integrators within EGI. Software developers will be able to choose from three levels of involvement in this process.

- 'Integrated providers' have the strongest ties with EGI and scientific communities, via MoUs and SLAs, and support is provided by the EGI Helpdesk. They are represented in the Technical Coordination Board and can influence EGI's evolution.

- 'Community providers' simply make their software available via AppDB, now extended to incorporate a Community Software Repository.

- 'Contributing providers' are in between – they will offer guarantees on the quality of their software and user support, but not as regimented as for integrated providers.

EGI will move to the platform-based model gradually. The focus will now be on establishing new links between software developers, software integrators and operators across the community.

The conceptual change is big but what scientists will notice is the added freedom and options offered by the EGI Platform Architecture.

The Community Software Repository is now available through AppDB

Kostas Koumantaros and Marios Chatziangelou

The EGI Application Database (AppDB) has been extended with newly developed Community Software support features.

The extension will support the Community Technology Providers, grid/cloud software developers who will become part of the EGI ecosystem from May 2013.

Community providers do not need a formal agreement to engage with EGI. They will simply upload their software into the EGI Community Software Repository through the AppDB service, where potential user communities can access the packages and can integrate the software into their own Community Platforms.

The Community Software Repository

> offers the ability to manage and publish an unlimited series of releases per registered software item;

> supports a light-weight & community driven release management process;

> populates software metadata required by administrators as well as software developers;

> disseminates new releases through established communication channels.

Technically speaking, the new system offers, for example:

> support for generic tarballs, RPM & DEB binaries;

> support for multiple flavour / operating system combinations;

> simplified, web-based, process for uploading the binary artifacts;

> YUM & APT repositories for automatic deployment of the software;

> mechanisms for initiating, updating, removing, renaming, publishing, even cloning releases and their associated repositories.

The extension to the AppDB service is part of the roadmap to a platform-based EGI and was developed in collaboration with the EGI Software repository.

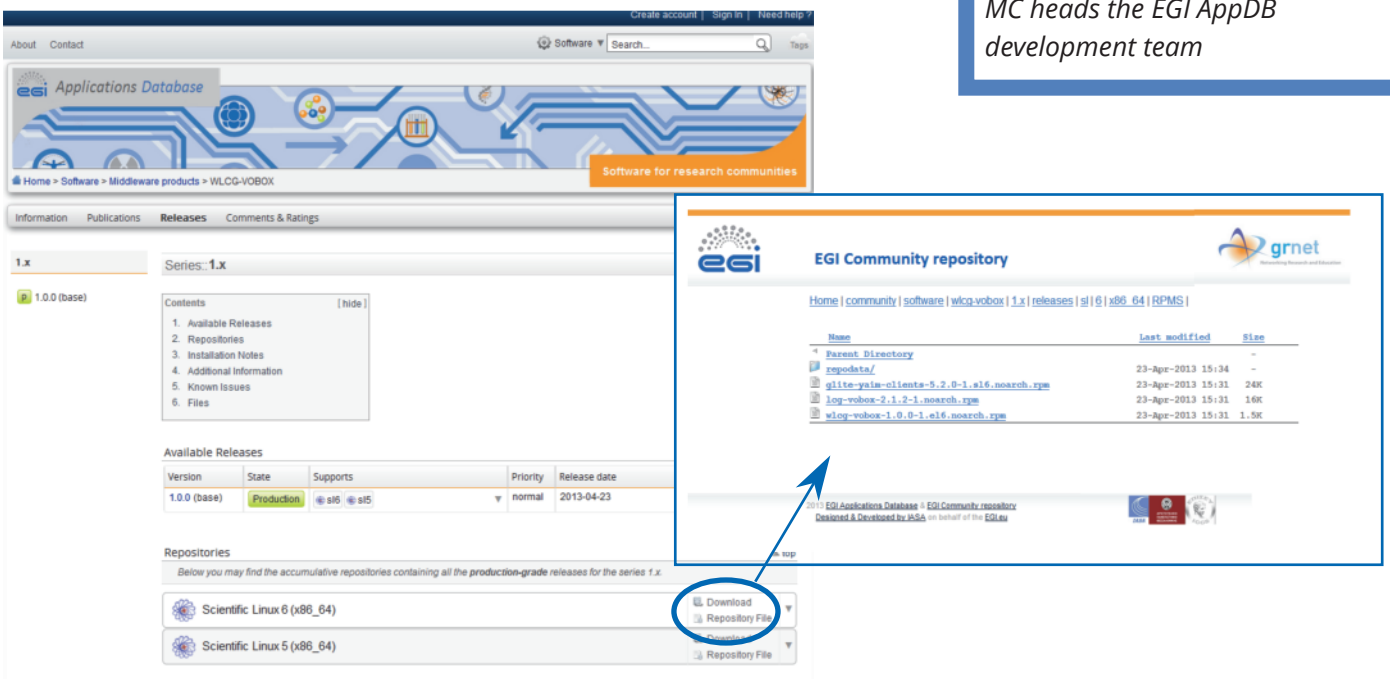
More information

Your feedback is valuable in the continuing development of the service.

EGI Applications Database
http://appdb.egi.eu/
> appdb-support@iasa.gr

EGI Community Software Repository
http://repository.egi.eu/community
> inspire-sa2@mailman.egi.eu

KK leads the EGI Software Repository and Support tools team
MC heads the EGI AppDB development team



EGI celebrates ten years of production activity

Tiziana Ferrari and Małgorzata Krakowian look at the infrastructure's trends and performance

Over the past decade EGI has evolved from a testbed of few thousands of CPUs, to an infrastructure that provides more than 373,000 CPU cores to support international research collaborations. Since 2004, EGI has delivered the equivalent of about 4.4 million years of compute time (38.8 billion CPU wall time hours) to scientists around the world. Compare and contrast with the state-of-the-art at the first EGEE conference in Cork, when the infrastructure was reported to include 1841 CPUs.

Today EGI with its integrated resource infrastructure providers is probably the largest multidisciplinary distributed e-infrastructure for science in the world, bringing together 27 national and 9 federated operations centres, 340 certified Resource Centres across 55 countries in Europe, Asia and North and South America, and CERN an European Intergovernmental Research Organisation.

Compute capacity and utilisation

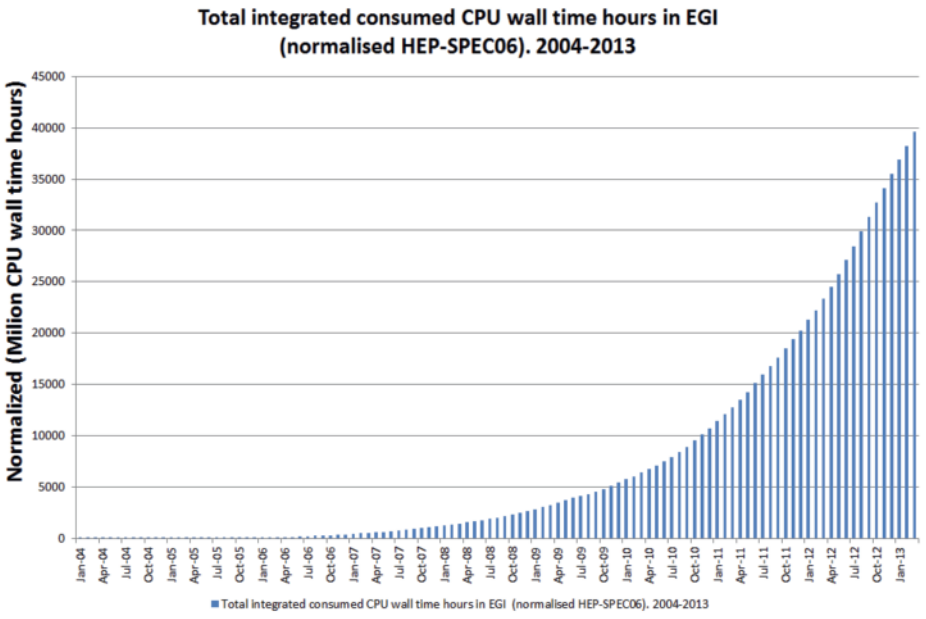
During EGI-InSPIRE's third project year the infrastructure has been running steadily with an increase in capacity and use driven by High Energy Physics, Astronomy and Astrophysics and Life Sciences. The relative yearly usage of EGI resources significantly increased for various disciplines.

To date EGI provides more than 370,000 logical CPU cores (+33.6% yearly increase since May 2012) and 170 PB of disk space that are made accessible by a software services that allow secure data access, transfer, replication and processing.

During 2012, EGI engaged with one new partner infrastructure – the Ukrainian National Grid, but unfortunately the Irish NGI stopped its operations services.

From January 2004 to date EGI executed more than 1.6 billion compute jobs amounting to 38.8 billion CPU wall time hours (normalised elapsed time to a reference value of HEP-SPEC06) for an average daily job submission rate of 1.6 million grid compute jobs/day since March 2012.

Capacity	April 2010	March 2011	March 2012	March 2013
Logical CPUs (increase)	192,000	207,203 (+7.9%)	270,800 (+30.7%)	373,235 (+33.6%)
million HEP-SPEC06 (yearly increase)	1.34	1.98 (+47.7%)	2.96 (+49.5%)	3.86 (+44.7%)



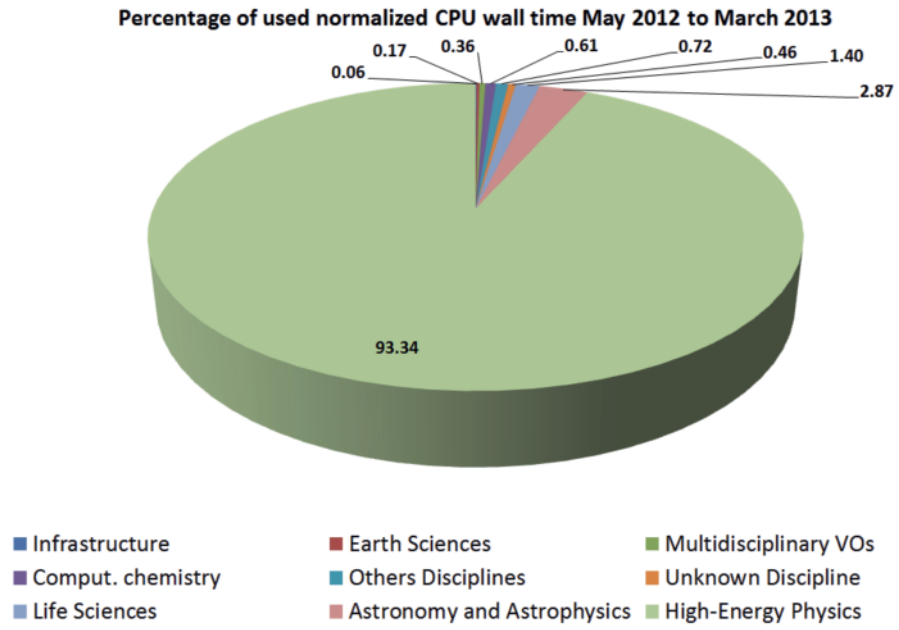
Key numbers

> Operations Centres : 36, of which 9 are federated
> Resource Centres : 340 in 56 countries and CERN
> CPU cores : 373,800
> HEP-SPEC06 : 3.86 million
> Disk capacity : 170 PB
> 212 VOs with 22,067 users
> Usage: 1.67 million (grid only) and 2.25 million (grid and local) jobs per day
> Availability : 97.3%
> Reliability : 99.0%

Users and usage

EGI has in total 22,067 users (+5.4%), distributed in 212 Virtual Organisations (VOs) (-6.2% from March 2012) listed in the EGI Operations Portal. The decrease reflects the campaign for decommissioning inactive VOs which has started in 2013.

Almost all disciplines registered an increase of users from May 2012: the Multidisciplinary VOs (+14.0%), Computer science and mathematics (+11.9%), Fusion (+4.2%), High-Energy Physics (+3.9%), Earth Sciences (+2. 8%), Computational Chemistry (+1.7%) and Life Sciences (+0.9%).



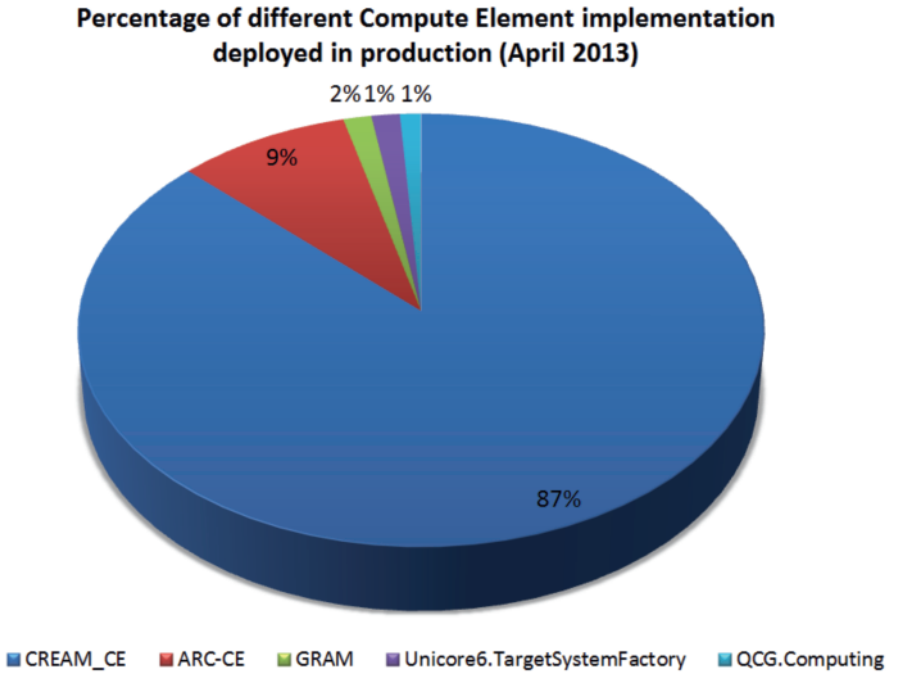
High-Energy Physics (38.6% of the user community) is consuming the majority of EGI resources: 93.3% of the normalised CPU wall time available in the infrastructure (+37.6%, since May 2012).

However, the relative resource utilisation of other disciplines has been significantly increasing as well. The Astronomy and Astrophysics discipline is the second in terms of usage, consuming 2.9% of the overall EGI used CPU wall clock time, with a +74.8% yearly utilisation increase, followed by the Life Sciences community who saw a +105.62% yearly increase to 1.4% of the overall resource consumption.

Middleware

A major upgrade campaign to replace unsupported gLite software was successfully completed in 2013 and involved more than 350 production service end-points. Administrators now have a policy framework, procedures and support in the operations tools to support their task of keeping the software up to date.

Various middleware stacks are in production in EGI. An indication of their distribution is given by the various Compute Element deployed by Resource Centres. CREAM-CE is in production in the 89.41% of the infrastructure, ARC-CE is second in deployment (0.11%) followed by GRAM (1.49%), Unicore6.TargetSystemFactory (1.49%) and QCG.Computing (1.12%).



In a large-scale distributed infrastructure, deployment of software updates requires coordination and needs to follow a well-defined process.

EGI does this through Staged Rollout, i.e. by gradually installing updates that successfully passed internal verification, by a group of expert Resource Centres.

From May 2012 the staged rollout community performed 178 tests in preparation to the releases of the Unified Middleware Distribution of EGI. Staged Rollout is a community effort which is currently contributed by 74 distributed teams.

The EGI-InSPIRE mini-projects

Following the endorsement in June 2012 of the EGI strategy as a framework for the future, the EGI-InSPIRE project asked the consortium to suggest mini-projects to accelerate:

> Coordination and community building across EGI and its stakeholders

> Maintaining and expanding the operational infrastructure and its management tools to support other research infrastructures and cloud technologies.

> Promote the deployment of customisable Virtual Research Environments.

Over 30 suggestions were received and peer-reviewed by the Project Management and Activity Management Boards, of which eleven were prioritised for implementation.

The mini-projects are in essence funded Virtual Teams working to promote EGI's strategic goals and reduce the barriers for researchers to access the resources that they need wherever they may be located. Detailed information is available online: http://go.egi.eu/mini-projects

A new approach to computing Availability/Reliability reports for EGI

As it is, the Availability/Reliability (A/R) service is a closed-source solution built on top of a commercial database system which cannot be easily extendable to meet the needs of the NGIs and EGI Operations to introduce the new middleware services or regional calculations.

The goal of the mini-project is to develop a new open source A/R reporting service, extended to include figures from VOs, NGIs, services or resource centres. NGIs, VO administrators and the broader operations community will benefit from an elastic, customisable A/R reporting service with metrics tailored to different requirements.

Consortium: GRNET (lead), IN2P3, CNRS, SRCE

GOCDB scoping extensions and management interface

The current scoping implementation in GOCDB provides only mutually exclusive 'local' and 'EGI' tags – in practice a site or service can only be tagged with a single scope. Additionally, GOCDB does not provide a management interface for daily operational tasks. The goals of the mini-project are to:

> enhance scoping by introducing multiple, non-exclusive scopes and create a tag cloud. Single objects will be able to be tagged by multiple projects, allowing projects to store topology data in a single GOCDB.

> introduce a management interface to simplify daily tasks to reduce the introduction of errors and operational costs.

The main beneficiaries are GOCDB users, the EGI operations community and other e-Infrastructures such PRACE and large distributed projects (e.g. EUDAT or wLCG). The work will facilitate more flexible use of a single GOCDB instance that means operational costs can be distributed across more stakeholders and therefore reduced for each of them.

Consortium: STFC

Massive open online course development

The goal of this project is to develop massive open online courses (MOOCs) to grow the knowledge base of grid users across Europe and the world, increase the visibility of EGI with high-quality content and enhance knowledge transfer. MOOCs take the shape of virtual classes offered online for free. They are available for current and future users, and also provide a scalable approach to training new users.

The mini-project's aims include the selection of an existing MOOC environment (e.g. Coursera) and the development of a number of courses on e-infrastructure topics covering, for example, EGI's existing production infrastructure, the capabilities of EGI's Federated Cloud infrastructure, and Hadoop with NoSQL.

Consortium: SURFsara

Tools for automating applying for and allocating federated resources

A coordinated resource allocation mechanism is essential to a federated infrastructure such as EGI. Efficient allocation systems ease the matching of resource demand and offer to support collaborations and ensure that the usage of EGI resources and services is properly acknowledged.

This mini-project will develop a tool to automate

how applications negotiate the usage of resources offered by federated resource providers. The expected output is a web-based operations application, integrated with existing production operations tools, that will be able to: 1) trace demand and offer, 2) authenticate customers and providers, 3) programmatic scalable processing of demand and offer, 4) reduce costs by automating the human processes around service offering following ITIL best practices. User community testing will be provided by the Biomed VO.

Consortium: Cyfronet (lead), CNRS

VO administration and operational portal - VAPOR

Small to medium-size grid user communities have to perform administrative and operational tasks that can become time consuming for staff focused on research activities rather than system administration.

The goal of the mini-project is to develop VAPOR, a generic VO administration and operations portal. VAPOR will help existing user research communities to sustain their operational models by sharing the administrative and operational costs. It will also lower entry barriers for new communities by easing the administration and operations start up curve. This portal will be available to any community wishing to deploy it, and licensed as open source software.

The VAPOR portal will also help to identify the users behind robot certificates, and to keep track of the articles produced by the users within the community.

Consortium: CNRS (several institutes), GRyCAP, IPHC

Evaluation of Liferay modules

Web portals, and particularly Liferay-based web portals, are the main choice to provide user-friendly access to EGI infrastructure services. In addition to the Liferay portal framework, there are a large number of community supported modules (e.g. Liferay Social Office and Sync modules). These modules could contribute to the adoption and use of portals by both current and new users to EGI, and could also replace or supplement some of the existing EGI portals, which would help their sustainability.

Consortium: EGI.eu (lead), INFN, MTA STAKI, CESNET

Providing OCCI support for arbitrary Cloud Management Frameworks

This project will maintain and extend the rOCCI framework as an interoperability layer, using the Ruby cloud services library to provide support for arbitrary cloud frameworks across compute, storage and network capabilities. The additional support will be achieved by incorporating an established open-source tool into the rOCCI implementation.

The main beneficiaries of this work are resource providers unable to join the federation due to unavailable or obsolete OCCI implementation and researchers and user communities who will get a bigger pool of usable resources. The federation will benefit from better sustainability and opportunities for synergies in the technologies used.

Consortium: CESNET

CDMI Support in Cloud Management Frameworks

CDMI will be used to build a standards-based storage solution to allow different Cloud Management Frameworks within the EGI Federated Cloud to attach data files and block devices to the deployed VMs. The prototype will be integrated with EGI's Federated AAI model and will offer block storage to OCCI-compliant services. A browser-friendly interface will be developed on the basis of the CDMI HTTP based RESTful protocol to enable end-users to access and manage their files in an easy way.

The beneficiaries will be the sites and communities willing to provide or consume resources using standards-based cloud APIs. An additional benefit for the communities is the ability to migrate between EGI and public cloud offerings more easily due to the existence of similar services.

Consortium: KTH

Dynamic Deployments for OCCI Compliant Clouds

This task will adapt the open-source SlipStream software to enable users to dynamically provision complex multi-VM applications, with elements of elastic behaviour and automatic image factory. All results from this project will be contributed to the SlipStream Apache 2.0 open source repository.

The result will be an end-to-end solution that

will enable the on-demand provisioning of a scientific analysis environment on federated cloud resources to meet the needs of scientific end-users.

The work will benefit resource centres who will be able to offer complex cloud resources to end-users, and platform integrators who will be able to deploy complex scientific applications in the cloud, in a parameterised, repeatable and systematic way.

Consortium: CNRS

Automatic Deployment and Execution of Applications using Cloud Services

Setting up the required computing environment is a serious overhead for the everyday work of researchers. This mini-project will design and implement a new user service model that will allow researchers to use the EGI Federated Cloud to deploy the Virtual Research Environments they need for their resources.

The service is oriented to advanced users and application managers within research communities. It will enhance the adoption of the infrastructure by large projects, which have complicated software stacks to deploy. From an operational point of view, it will reduce the overhead of the local site administrators when it comes to install application software and support complicated software stacks for different user communities.

Consortium: CSIC (lead), FCTSG

Transforming Scientific Research Platforms to Exploit Cloud Capacity

The mini-project will create the means to make scientific applications cloud-ready. This will be done by analysing a set of use cases and compiling a set of best practices to ease the uptake of cloud technologies by research communities.

The initial beneficiaries of this work will be the user communities whose use cases are selected for analysis. In addition and in the long term, the lessons learnt from the exercise will benefit the entire community of end-users and application developers.

Consortium: FZJ (lead), CESNET

The EGI Webinar series

http://go.egi.eu/webinars

What?

Web-based presentations and workshops hosted by a guest lecturer specialised in a field relevant to the EGI community.

Each lecture will be followed by a Q&A session.

Why?

> EGI Webinars provide first hand information about established and/or emerging services that can help you to use EGI's grid and cloud services.

> EGI Webinars are an opportunity to interact with user support teams, developers, site managers, platform integrators, researchers and NGIs.

> EGI Webinars are free and are open to anyone. Pre-registration required as participation is limited to a set number of connections)

Next event: Catania Science Gateway Framework - 15 May, 16:00-18:00 CET

VT Report: A new scientific classification for EGI

Sy Holsinger on the new tree of scientific disciplines

EGI is a multidisciplinary e-Infrastructure used by thousands of researchers working on a variety of scientific disciplines. Throughout the years, new technological advances and collaboration opportunities have continuously evolved the diversity of its users and the nature of EGI itself.

The evolution left us with a legacy - the way scientific disciplines were classified in EGI five years ago is no longer indicative of the current usage. Half of users now fall into the 'other', 'multidisciplinary' and 'infrastructure' categories, with the rest spread across only seven disciplines.

This is clearly not very helpful when we report our usage activity.

Due to these issues, it has become essential to agree on a common, coherent classification that is consistent across all infrastructure tools and allows for smooth inclusion of both current and future user communities. An updated scientific classification would make it easier for new researchers to engage others in their field of interest as well as in communicating externally with funding agencies, resource centres and potential research communities.

This was the task of the Scientific Discipline Classification VT. The virtual team investigated the current usage of scientific disciplines in EGI, looked into more than ten available classifications, and analysed how the classification impacts each EGI tool. Ultimately, the Frascati FOS Classification was selected as a foundation for EGI's scheme.

The result is a hierarchy of scientific disciplines encompassing all fields of research and verified by forty EGI Virtual Organisation Managers and was open for public comments. The new classification will be implemented in all EGI services, from the website to the Operations Database over the coming months.

More information

contact: policy@egi.eu

url: http://go.egi.eu/SDC-VT

This list contains only the first two tiers of the new classification. Third level (e.g. high-energy physics in physics, or zoology in biological sciences), fourth level (e.g. b-physics in HEP, or entomology in zoology) and below are also considered but not listed here.

Natural Sciences
> Mathematics
> Computer sciences
> Information sciences
> Earth sciences
> Biological sciences
> Space science

Physical Sciences
> Physics
> Chemical sciences

Medical and Health Sciences
> Basic medicine
> Clinical medicine
> Health sciences
> Medical biotechnology

Social Sciences
> Psychology
> Economics, finance & business
> Educational sciences
> Sociology
> Law
> Political science
> Social & economic geography
> Media and communications

Engineering and Technology
> Civil engineering
> Electrical, electronic and information engineering
> Mechanical engineering
> Aerospace engineering
> Chemical engineering
> Materials engineering & science
> Biomedical engineering
> Environmental engineering
> Environmental biotechnology
> Industrial biotechnology
> Nano-technology

Humanities
> History and archaeology
> Languages and literature
> Philosophy, ethics and religion
> Arts

Agricultural Sciences
> Agriculture, forestry & fisheries
> Animal and dairy science
> Veterinary science
> Agricultural biotechnology

Interdisciplinary
> Analytical Facilities
> Training/Demonstrations
> Infrastructure development

Partner Spotlight: GÉANT

The Merzbacher Station and Inylchek Glacier in central Tien Shan, Asia.
Credit: Julia Neelmeijer

The European grid does not work in a vacuum - it needs a multitude of partners around the globe supporting the work it does. Within Europe one of the key organisations is GÉANT, the data network built for the research and education community. Without the GÉANT infrastructure it would not be possible, for example, to shift datasets around the grid. But GÉANT provides more than just transporting high-volumes of data around EGI. Its work enables easy communication and data sharing, even from remote mountaintops.

GÉANT's expertise is vital to monitor climate change and to provide early flood warning, particularly in Central Asia where glacier retreat is likely to be an issue. Last year meltwater from the Tien Shan glacier caused lake Tez-Tor in Kyrgyzstan to break its banks and flood the inhabited Ala Archa valley. This was not an isolated incident. Retreating glaciers are leading to large scale flooding, avalanches and mudslides around the region, often with disastrous results.

This is where the Gottfried Merzbacher Global Change Observatory comes in. Perched atop the Tien Shan glacier, the observatory is part of a project monitoring glaciers across Europe and Central Asia and collects meteorological and hydrological data, as well as ice thickness, glacier speed and seismic activities. Once put together with satellite observations, the data allows researchers to get a robust view of the changing conditions. But it's not that simple, the project is generating large amounts of data, in very remote locations and time is of the essence.

GÉANT has been working with its Central Asia counterpart CAREN to build a high-speed network connecting all the participating institutes and monitoring stations. "Thanks to GÉANT and CAREN we can quickly share information with our European partners," says Bolot Moldobekov, co-director of Central Asian Institute of Applied Geosciences. "Speeding up the processing of monitoring data and enabling us to work together to predict the impact of climate change and protect our local environment."

Now the Central Asian Institute of Applied Geosciences (CAIAG) is putting all this data into its Geo Database of Central Asia (GDB). The GDB brings together digitised maps, satellite and aerial images along with geophysical data into a single, searchable and accessible location, making it the central reference source on climate change in Central Asia.

Projects such as this demonstrate that research is transformed by connecting regional resources with global infrastructures. This is an overlapping aim for both EGI and GÉANT and has led to an ongoing partnership, formalised with an agreement to strengthen the service offering to the global research community in January 2013.

GÉANT

More information

http://www.geant.net/