

# EGI-InSPIRE Project Presentation

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- EGI: European Grid Infrastructure
- EGI.eu: European Grid Initiative organisation
- EIRO: European International Research Organisation
- ESFRI: European Strategy Forum on Research Infrastructures
- HUC: Heavy User Community
- NGI: National Grid Infrastructure/Initiative
- RP: Resource infrastructure Provider
- SSC: Specialised Support Centre
- UMD: Unified Middleware Distribution
- VO: Virtual Organisation
- VRC: Virtual Research Community

## Why build a European Grid Infrastructure?

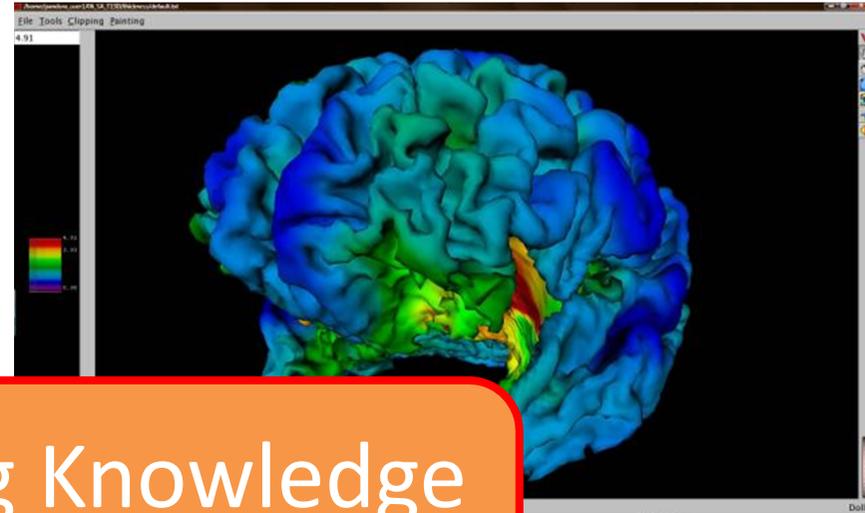
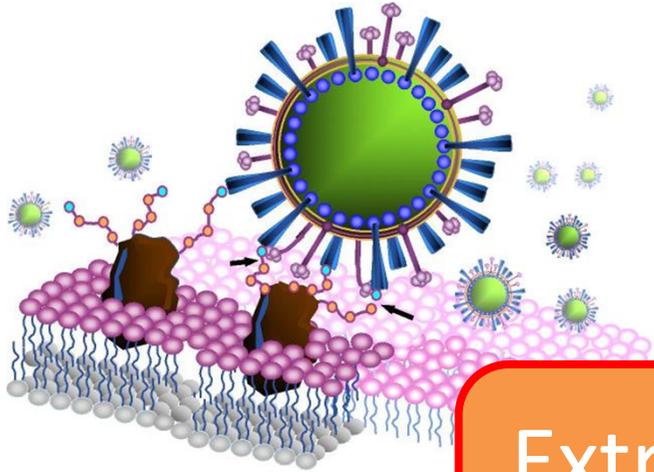
Infrastructure is the basic physical and organisational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function

The Enterprise is the European Research Area

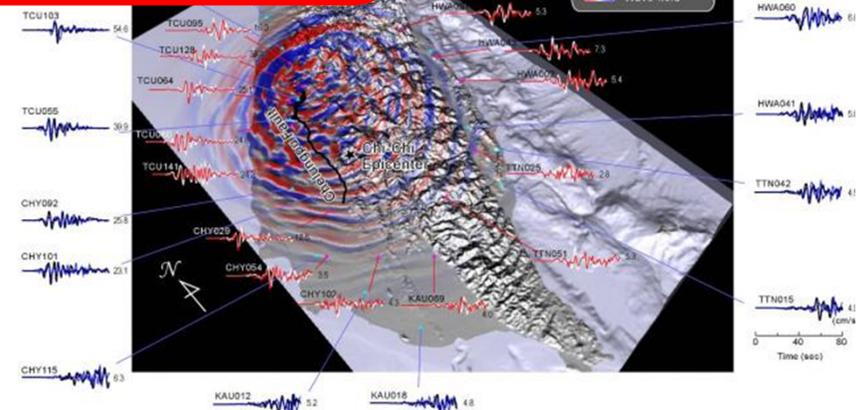
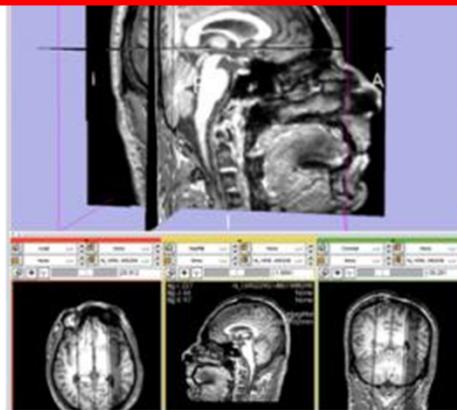
EGI provides a service infrastructure that exposes and helps coordinate a resource infrastructure

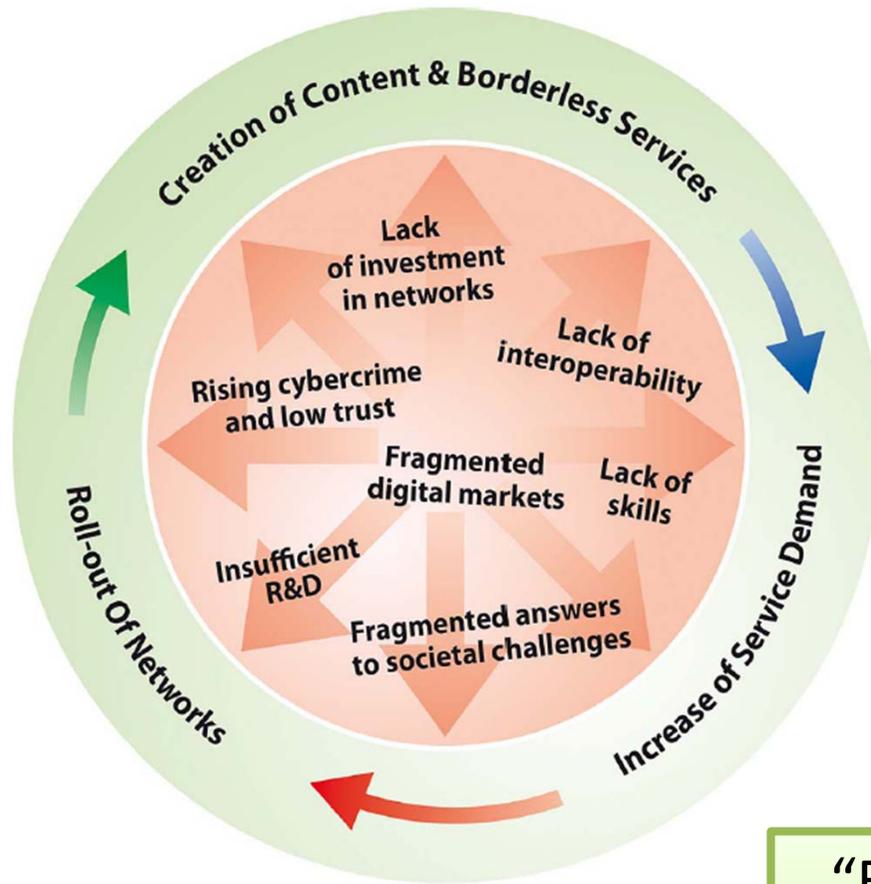
# What is a Grid?

- A grid consists of distributed resources controlled by separate organisations that be systematically used securely by users external to that organisation
- Resources can include:
  - Commodity or HPC clusters
  - Disk or tape storage
  - Instruments
  - Data Archives or Digital Libraries



Extracting Knowledge  
from the Data Deluge





Digital Agenda for Europe

- Borderless Services
- Interoperability
- Supporting Innovation

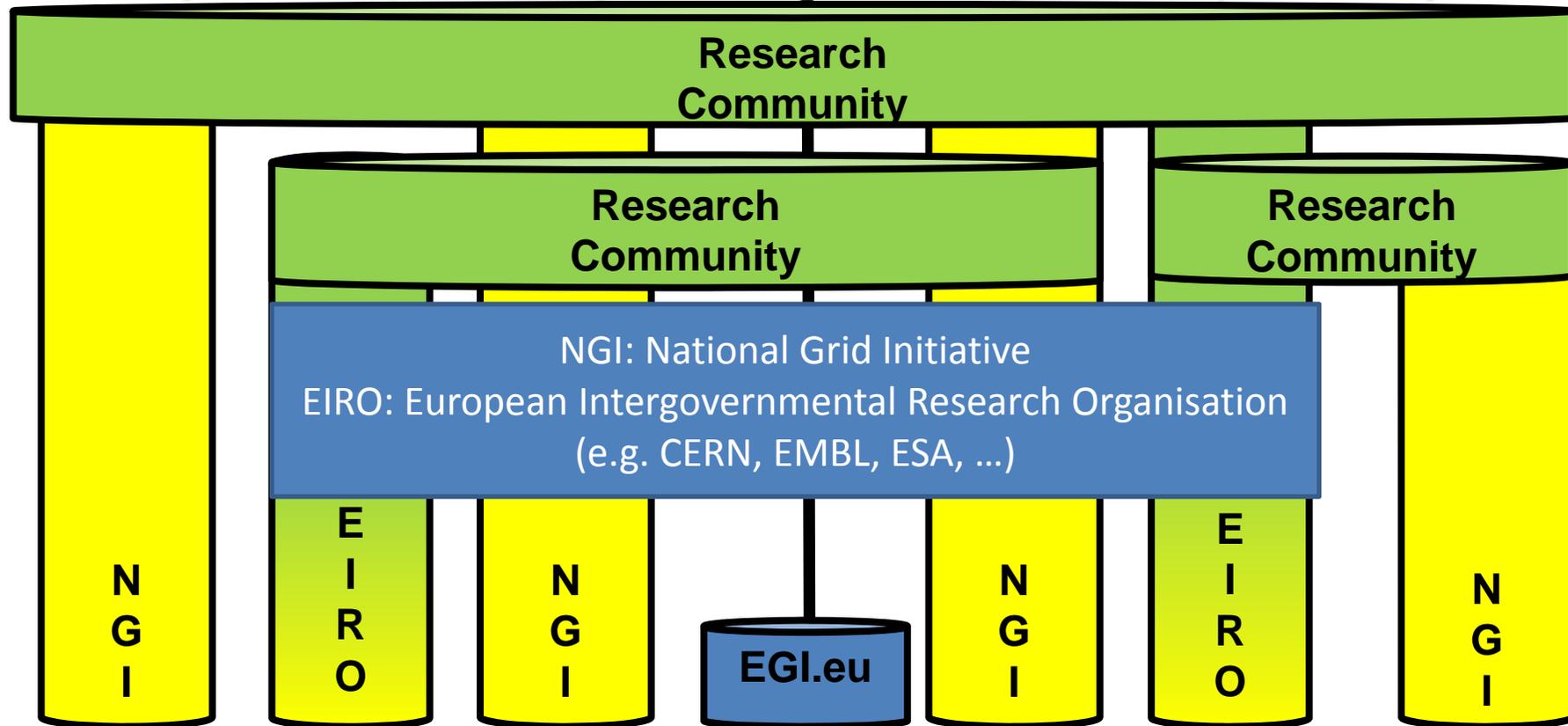
remove barriers to the free movement of knowledge

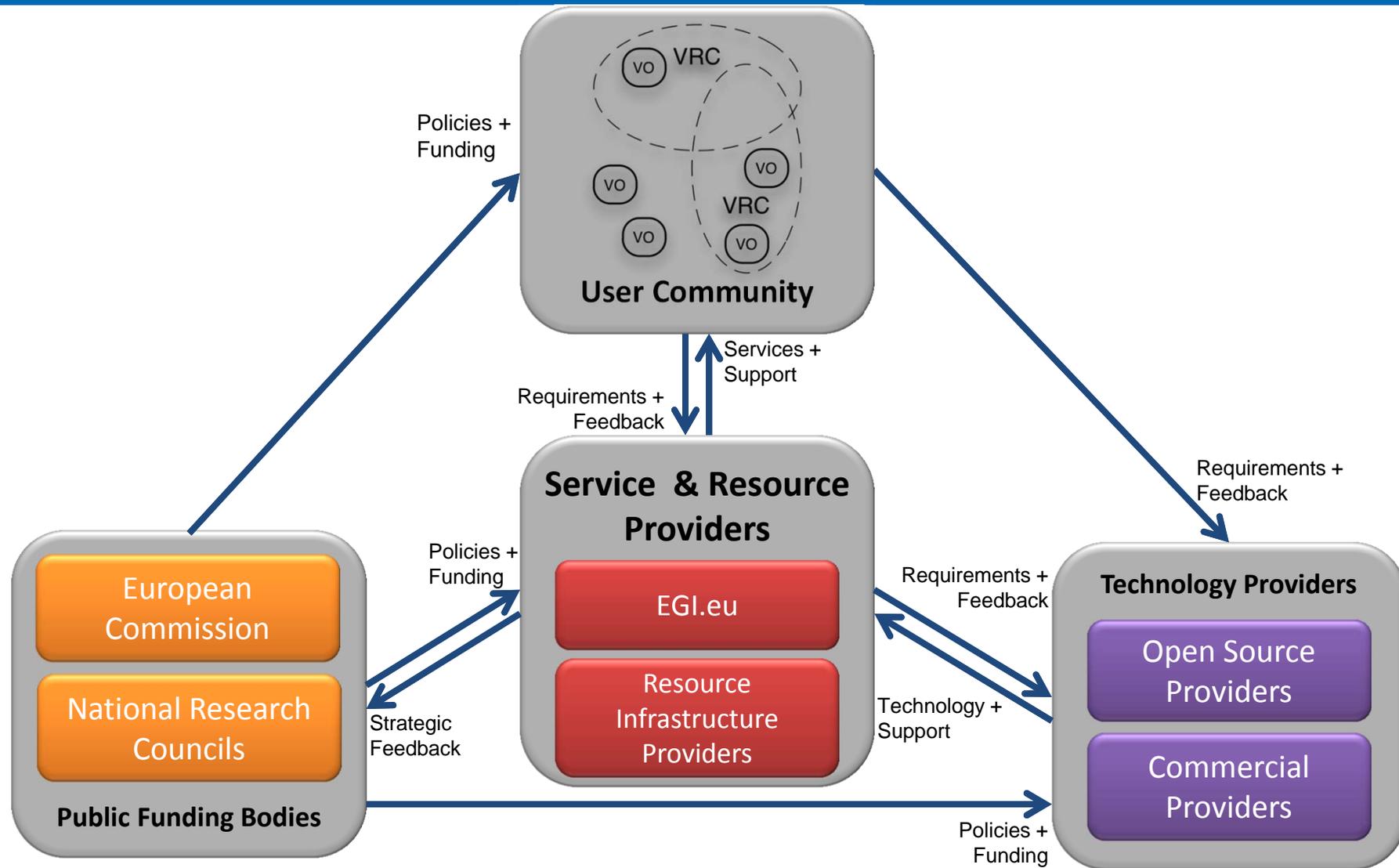
“Europe should also build its innovative advantage in key areas through reinforced e-Infrastructures (i.e. GEANT & EGI)”



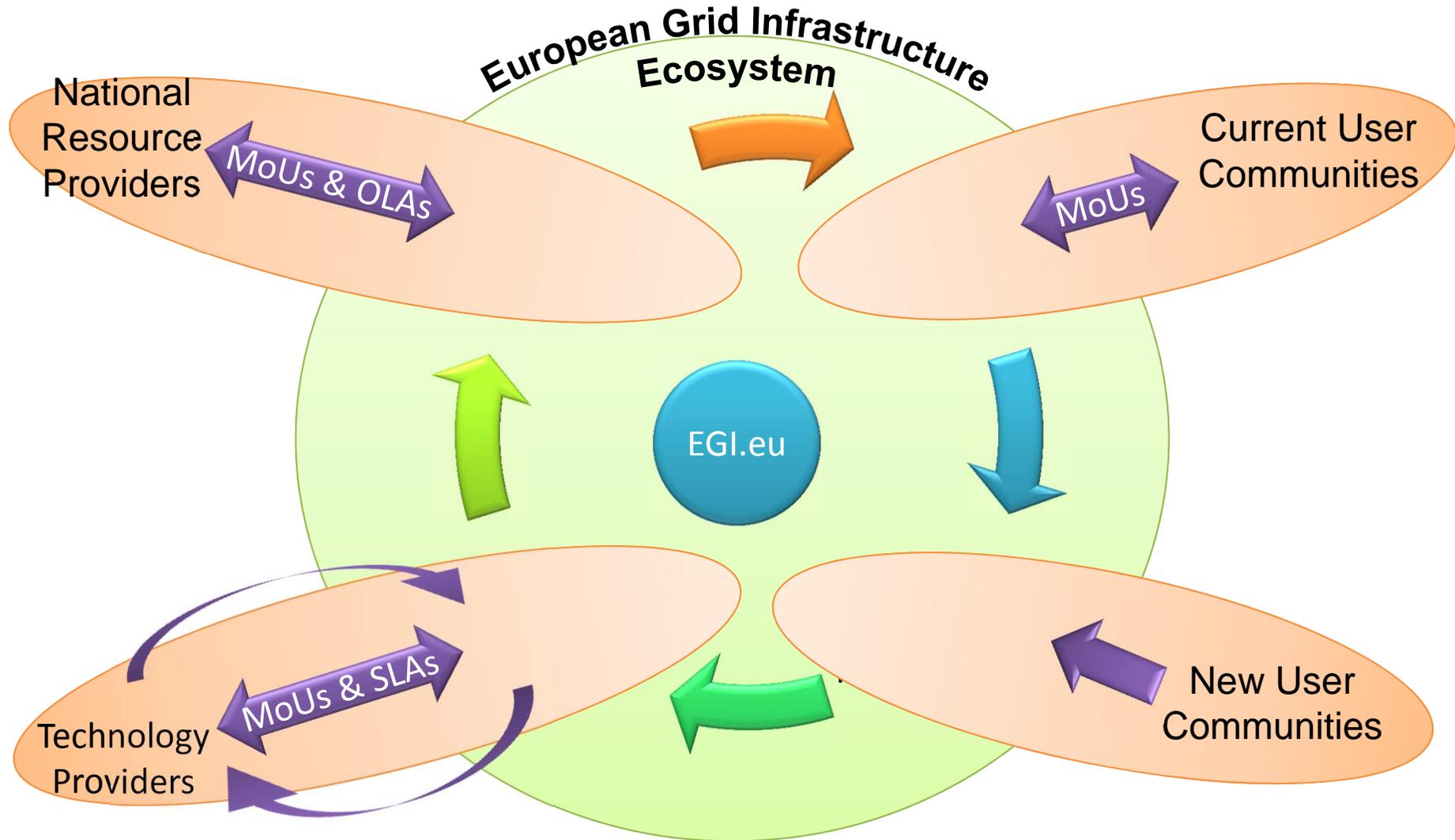
# The EGI Model

# Collaboration



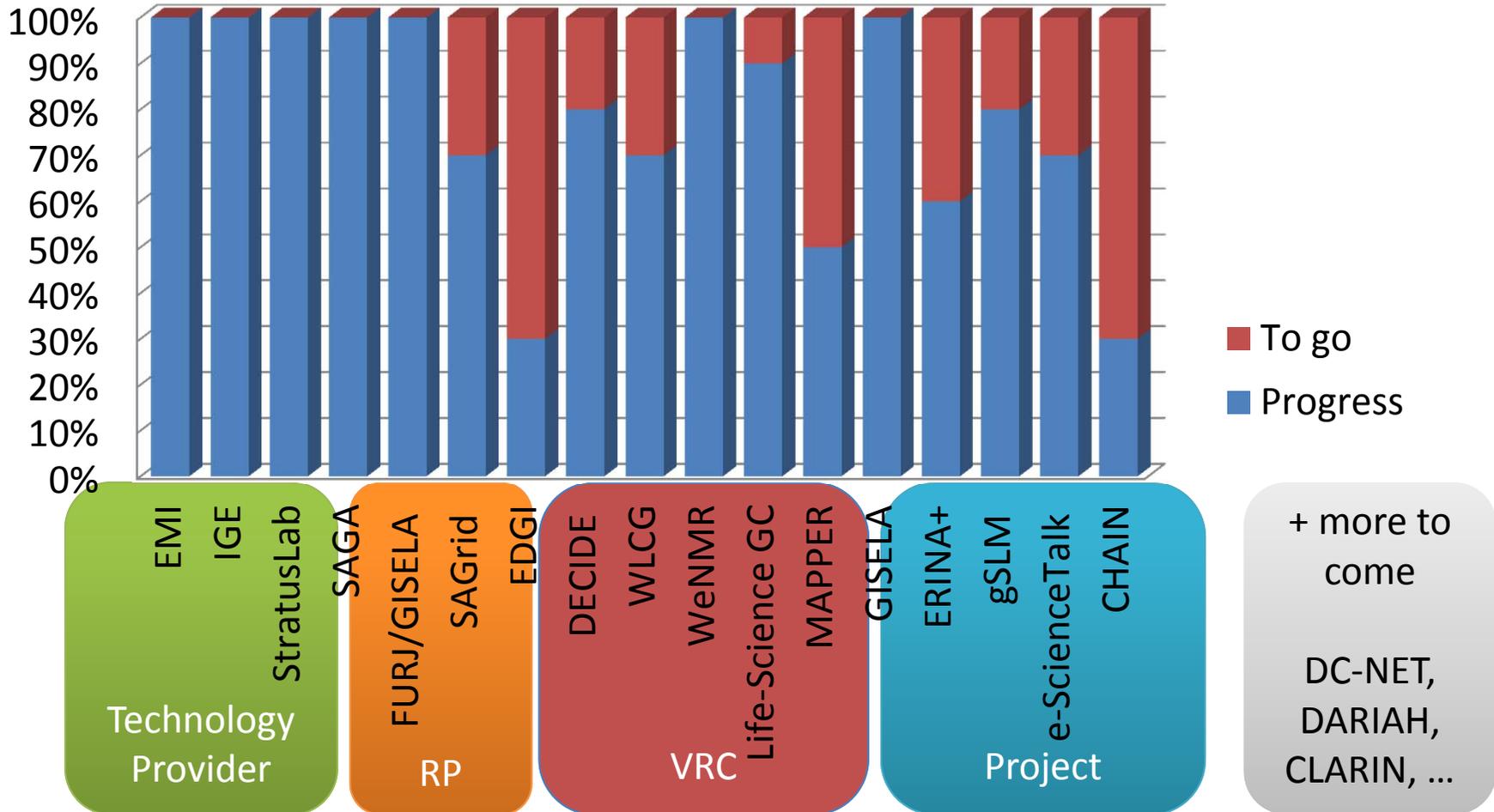


# A Virtuous Service Cycle



# MoUs Structure Ecosystem

<http://www.egi.eu/collaboration/>



- Coordination for European Grid resources
  - Established February 8th 2010
  - Central policy & services needed to run a grid
  - Sustainable small coordinating organisation
- Based in Amsterdam
  - Coordinating core (~20 people) in Amsterdam
  - Technical services from partners (~20 people)

EGI and EGI.eu: Supported by the EGI-InSPIRE project

- EGI.eu established as non-profit foundation
- Governance & ownership by its participants
  - Participants:
    - European NGIs
  - Associated participants:
    - Organisations aligned with EGI.eu's objectives
- EGI Council contains all participants
  - Votes linked to fees



# EGI Technical Governance

EGI Council

EGI.eu Executive Board

Terms of Reference (ToR)

Common Process (PDP)

Common Glossary (GCG)

Technology

TCB

SVG/RAT

Security

SPG

SCG

CSIRT

Operations

OMB

OTAG

OAT

Users

UCB

USAG

<http://www.egi.eu/policy/groups/>  
[http://go.egi.eu/policies\\_and\\_procedures](http://go.egi.eu/policies_and_procedures)

## Integrated Sustainable Pan-European Infrastructure for Researchers in Europe

A 4 year project with €25M EC contribution

- Project cost €72M
- Total Effort ~€330M
- Effort: 9261PMs

### Project Partners (50)

EGI.eu, 38 NGIs, 2 EIROs

Asia Pacific (9 partners)



# Project Objectives

- A sustainable production infrastructure
  - Resource providers in Europe and worldwide
  - With new technologies as they mature
- Support structured international research
  - Sustain current domain specific services
  - Attract new user communities (e.g. ESFRI)

- NA1: Project & Consortium Management
  - Project Office and Quality Assurance
- NA2: External Relations
  - Policy Development and Dissemination
  - Community Building Events
- NA3: User Community Coordination
  - EGI.eu and NGI support teams
  - Supporting Technical Services for Virtual Research Communities
- JRA1: Support for Operational Tools
  - Maintenance and Development
  - Support for new resources and their accounting

- SA1: Operation of the production infrastructure
  - Infrastructure oversight and quality control
  - Operational security
  - Operational Tools, monitoring & accounting
  - Helpdesk & Support teams (NGI & centrally)
  - Validation and integration of new technology
- SA2: Provisioning the Software Infrastructure
  - Definition of software coming from external projects
  - Validation of delivered software
  - Software repository and support tools
- SA3: Support for Heavy User Communities
  - Services & tools for all users of the infrastructure
  - Domain specific support for current heavy users

## What does EGI do?



- **Support User Communities**
  - Researchers in International Collaborations
  - National Research Collaborations through the NGI
  - Scale up from the single VO to a community
- **Provide core services to support users**
  - Manage VOs, AppDB, Training Services
- **Support teams**
  - EGI.eu User Community Support Team
  - NGI User Support Teams
  - NGI Operations Teams
  - Experts within user communities or projects

# A Virtuous User Cycle

Aka: "the chicken and egg conundrum..."

Feedback through  
VRCs in the User  
Community Board

## Discover

Where is the community?

- VRCs
- Mailing lists
- Workshops
- Forums
- Blogs
- Projects
- Sharing stories
- Collaborating

## Deliver

Integrated Services

- Human
- Technical
- Infrastructure

## Design

How can I contribute?

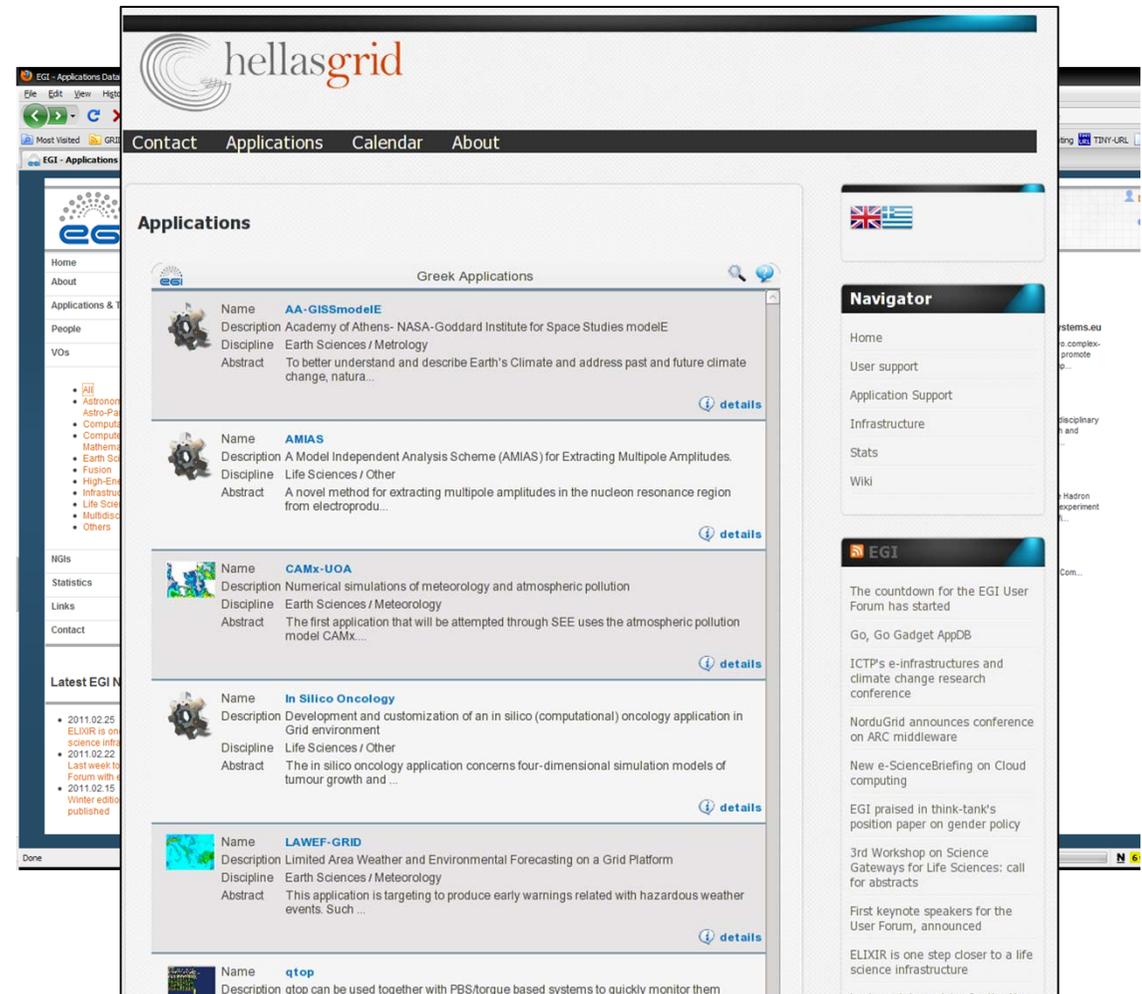
- Applications
- Data collections
- Requirements
- Proposals
- Projects
- Success stories

How do I use these resources?

- Attend training courses
- Utilise training material
- Access data
- Run applications on the grid

User Services  
Advisory Group to  
drive detailed design

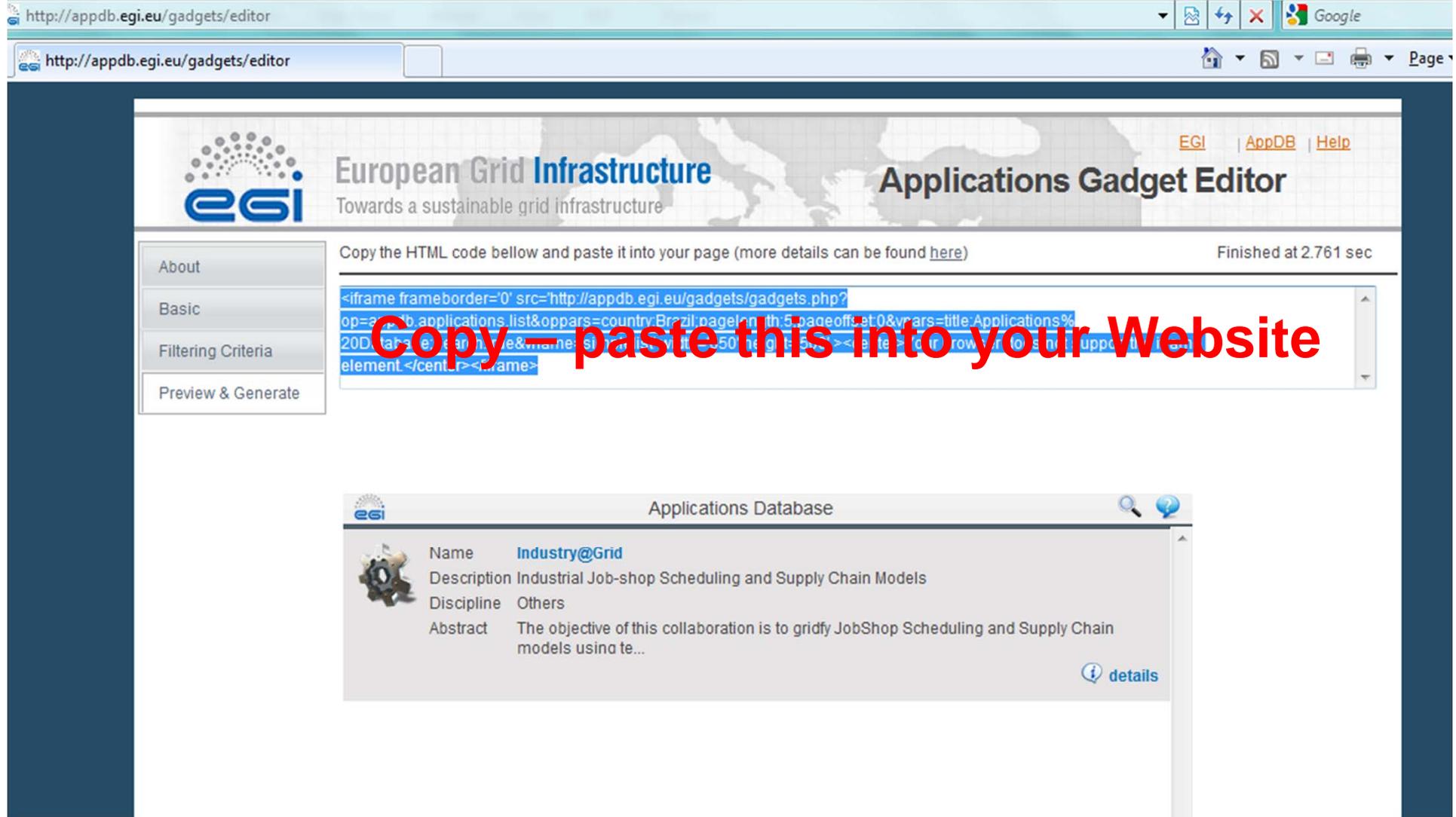
- To give recognition to reusable applications
- To give recognition for application developers
- How to get involved
  - Register applications
  - Reuse applications
  - **Integrate AppDB through its gadget into any Webpage!**
- <http://appdb.egi.eu>



The screenshot shows the 'hellasgrid' Applications Database website. The main content area is titled 'Applications' and displays a list of 'Greek Applications'. Each application entry includes its name, description, discipline, and abstract, along with a 'details' link. The applications listed are:

- AA-GISSmodelE**: Academy of Athens- NASA-Goddard Institute for Space Studies modelE. Discipline: Earth Sciences / Metrology. Abstract: To better understand and describe Earth's Climate and address past and future climate change, natura...
- AMIAS**: A Model Independent Analysis Scheme (AMIAS) for Extracting Multipole Amplitudes. Discipline: Life Sciences / Other. Abstract: A novel method for extracting multipole amplitudes in the nucleon resonance region from electroprodu...
- CAMx-UOA**: Numerical simulations of meteorology and atmospheric pollution. Discipline: Earth Sciences / Meteorology. Abstract: The first application that will be attempted through SEE uses the atmospheric pollution model CAMx...
- In Silico Oncology**: Development and customization of an in silico (computational) oncology application in Grid environment. Discipline: Life Sciences / Other. Abstract: The in silico oncology application concerns four-dimensional simulation models of tumour growth and ...
- LAWEF-GRID**: Limited Area Weather and Environmental Forecasting on a Grid Platform. Discipline: Earth Sciences / Meteorology. Abstract: This application is targeting to produce early warnings related with hazardous weather events. Such ...
- qtop**: qtop can be used together with PBS/torque based systems to quickly monitor them.

The website also features a 'Navigator' sidebar with links to Home, User support, Application Support, Infrastructure, Stats, and Wiki. A 'Latest EGIN' section is visible on the left side of the main content area.



The screenshot shows a web browser window with the URL `http://appdb.egi.eu/gadgets/editor`. The page header includes the EGI logo, the text "European Grid Infrastructure Towards a sustainable grid infrastructure", and navigation links for "EGi", "AppDB", and "Help". The main heading is "Applications Gadget Editor".

On the left, there is a sidebar menu with the following items: "About", "Basic", "Filtering Criteria", and "Preview & Generate".

The main content area contains the instruction: "Copy the HTML code bellow and paste it into your page (more details can be found [here](#))". To the right of this instruction, it says "Finished at 2.761 sec".

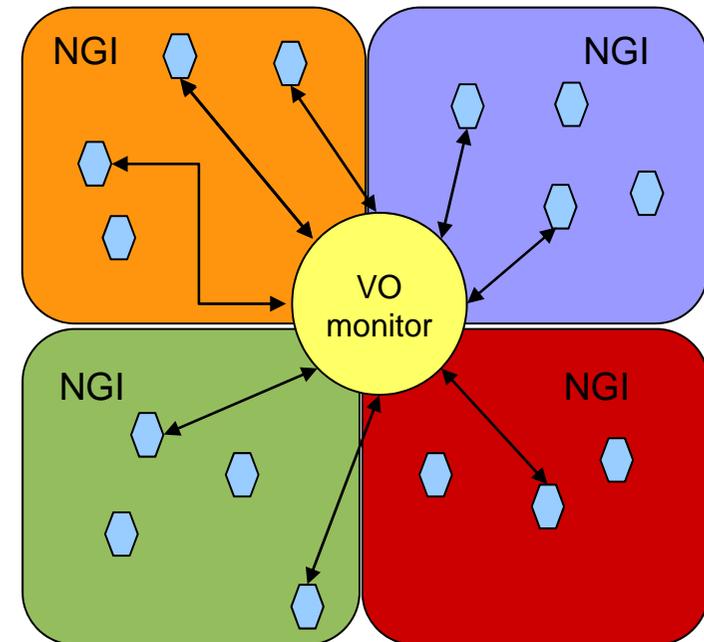
Below the instruction is a text area containing HTML code for an iframe. A large red text overlay reads "Copy - paste this into your Website".

Below the code area is a preview window titled "Applications Database". It displays a search result for "Industry@Grid" with the following details:

Name	Industry@Grid
Description	Industrial Job-shop Scheduling and Supply Chain Models
Discipline	Others
Abstract	The objective of this collaboration is to gridify JobShop Scheduling and Supply Chain models using te...

A "details" link is visible at the bottom right of the preview window.

- Activities
  - Consultancy and helpdesk for VO managers
  - Evaluation of VO management, monitor and accounting tools
  - Provision of VO support software for VRCs
- VO-specific monitoring
  - Monitor only those sites that support you
  - Create and plug-in VO-specific probes
- How to get involved?
  - Request support
  - Prepare and share reviews of VO tools
  - Offer local solutions for VOs through the group

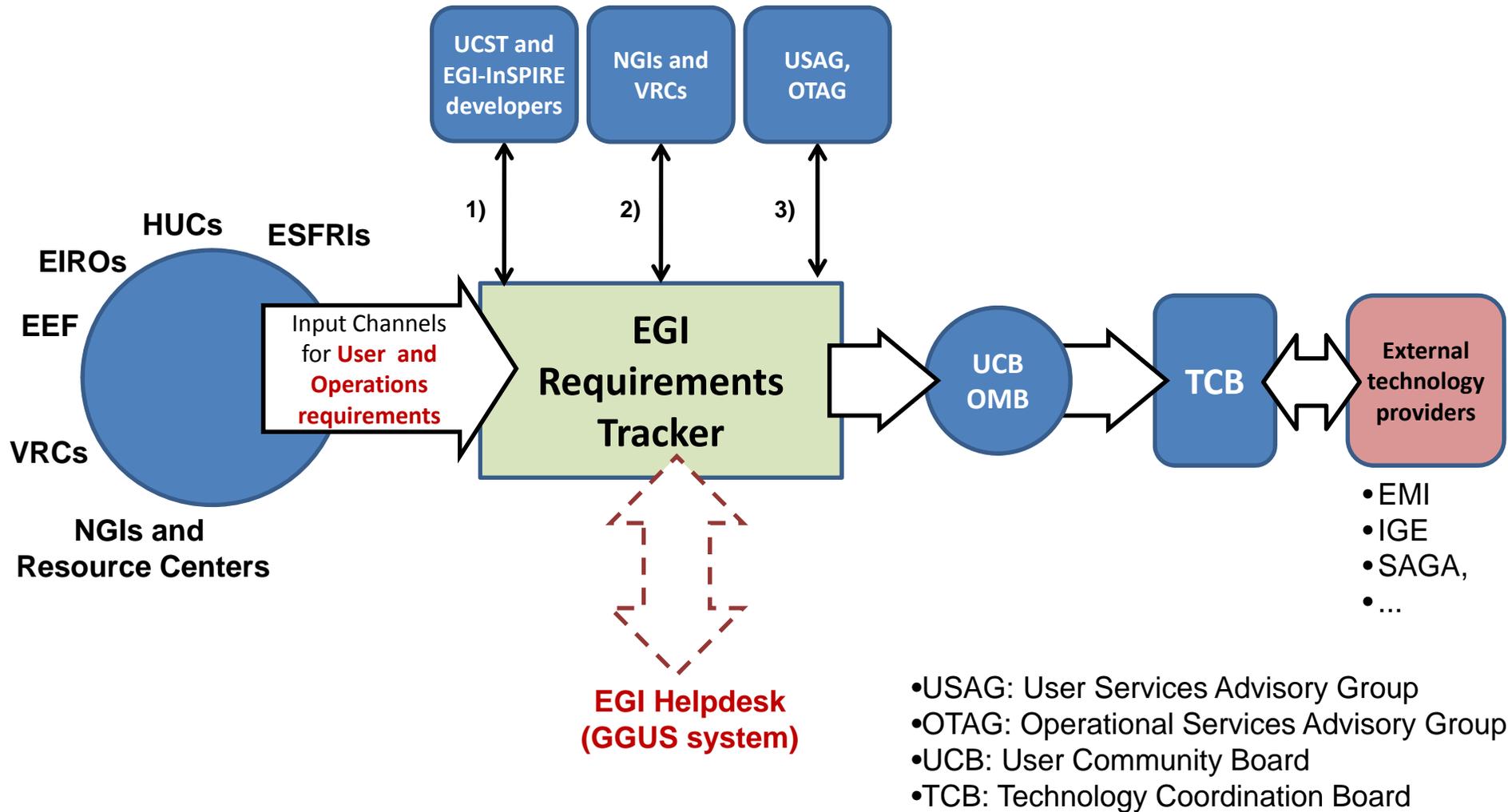


[https://wiki.egi.eu/wiki/VO\\_Services](https://wiki.egi.eu/wiki/VO_Services)

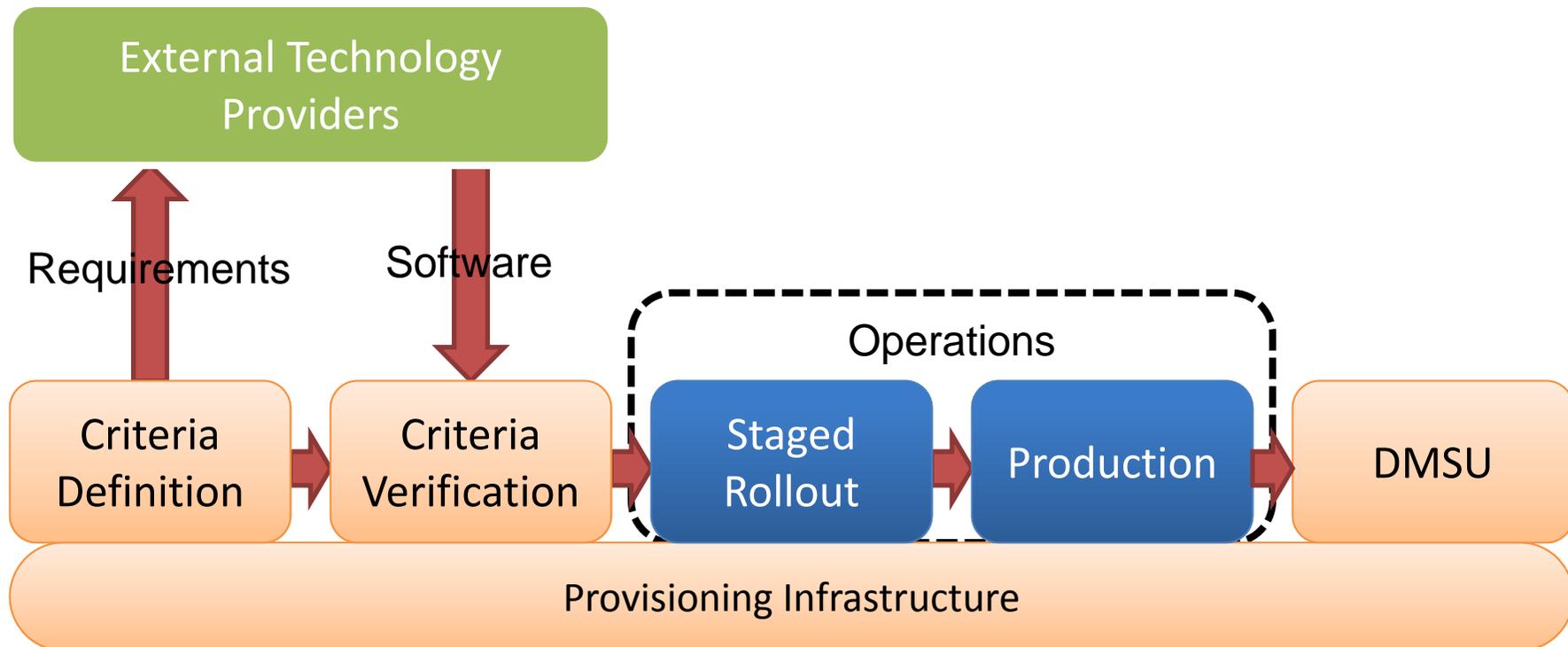
- Integration of...
  - Training event calendar
  - Digital library (of training materials)
  - Service offering and requesting form
  - Plus: community contributed evaluation and reviews
- How to get involved?
  - Register training events
  - Use, reuse and share training materials
  - Offer training-related services (infrastructure, VO, CA, ...)
  - Contribute training-requirements
  - Delegate representative to EGI Training Working Group

<http://training.egi.eu>

# Requirements Lifecycle



## Integrated processes for efficient software provisioning



- EGI Technology Roadmap
  - Technical environment & its evolution
  - Mainstream open-source components
  - Open to commercial components
- Unified Middleware Distribution (UMD)
  - Components from within the EGI community
    - External technology provider: EMI, IGE, SAGA, ...
    - Details contained in the UMD Roadmap
  - To meet the unique needs of EGI users

- Infrastructure for verifying UMD components
  - Technology Provider triggers the process
- Criteria Verification organises and executes the verification workplan
- StagedRollout exposes verified software in the production infrastructure
- UMD release is assembled and published

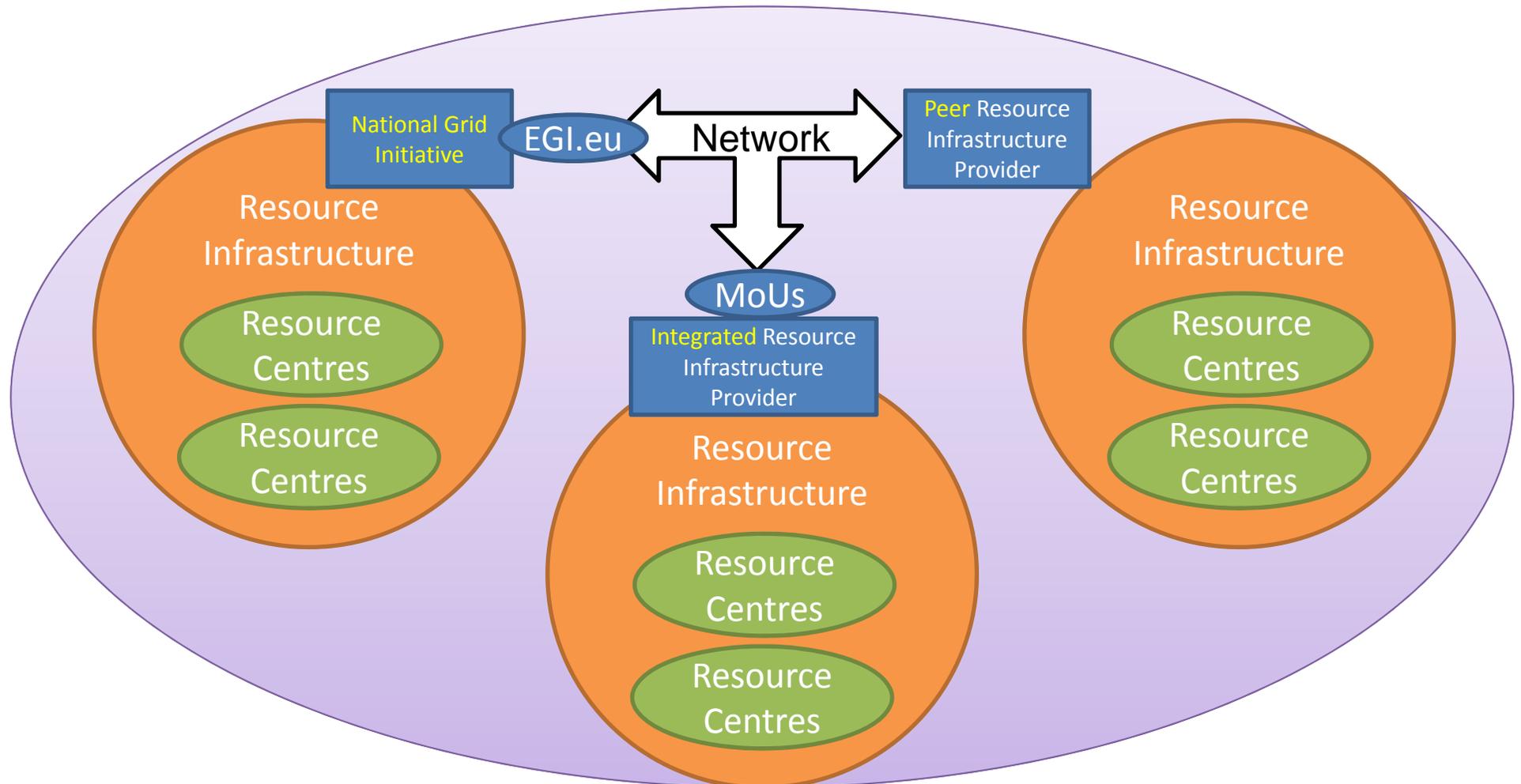
- Comprehensive library of Quality Criteria
- Defines EGI's minimum acceptance level of any delivered software
- Library with defined lifetime, and version
- Liaising with Technology Providers for
  - Proactive Quality Assurance
  - Quality Criteria Review and improvement
  - Timely preparation for software changes

- Formal verification of software using the Quality Criteria library valid at that time
- Publishes verification reports
- Verification reports provides feedback to
  - Criteria definition
  - Technology Providers
  - StagedRollout
  - Deployed Middleware Support Unit (DMSU)
  - UMD Release Notes

- UMD Repository (<http://repository.egi.eu/>)
  - Frontend publishes release notes etc.
  - Temporary internal repositories for:
    - Verification & StagedRollout
  - Composite repository for public UMD updates
- Process management infrastructure
  - GGUS → External Technology Providers
  - RT → Internal Verification and StagedRollout

- Second level support unit for middleware
- Resolves issues with documentation, configuration
- Provides workarounds for known issues
- Develops and publishes best practices for popular components
- Provides recommendations for Technology Providers via the TCB

- Supporting major production computing
  - At an unprecedented scale – both quantitatively and qualitatively
- Delivering common solutions across multiple communities
  - Identifying areas for future work
- Broadening the use of grid technology and HUC services to related projects within the HUC domain
  - Especially unfunded Life Science & Earth Science projects
- Developing a S.W.A.T. analysis of each HUC
  - Focus steps on the road to sustainability

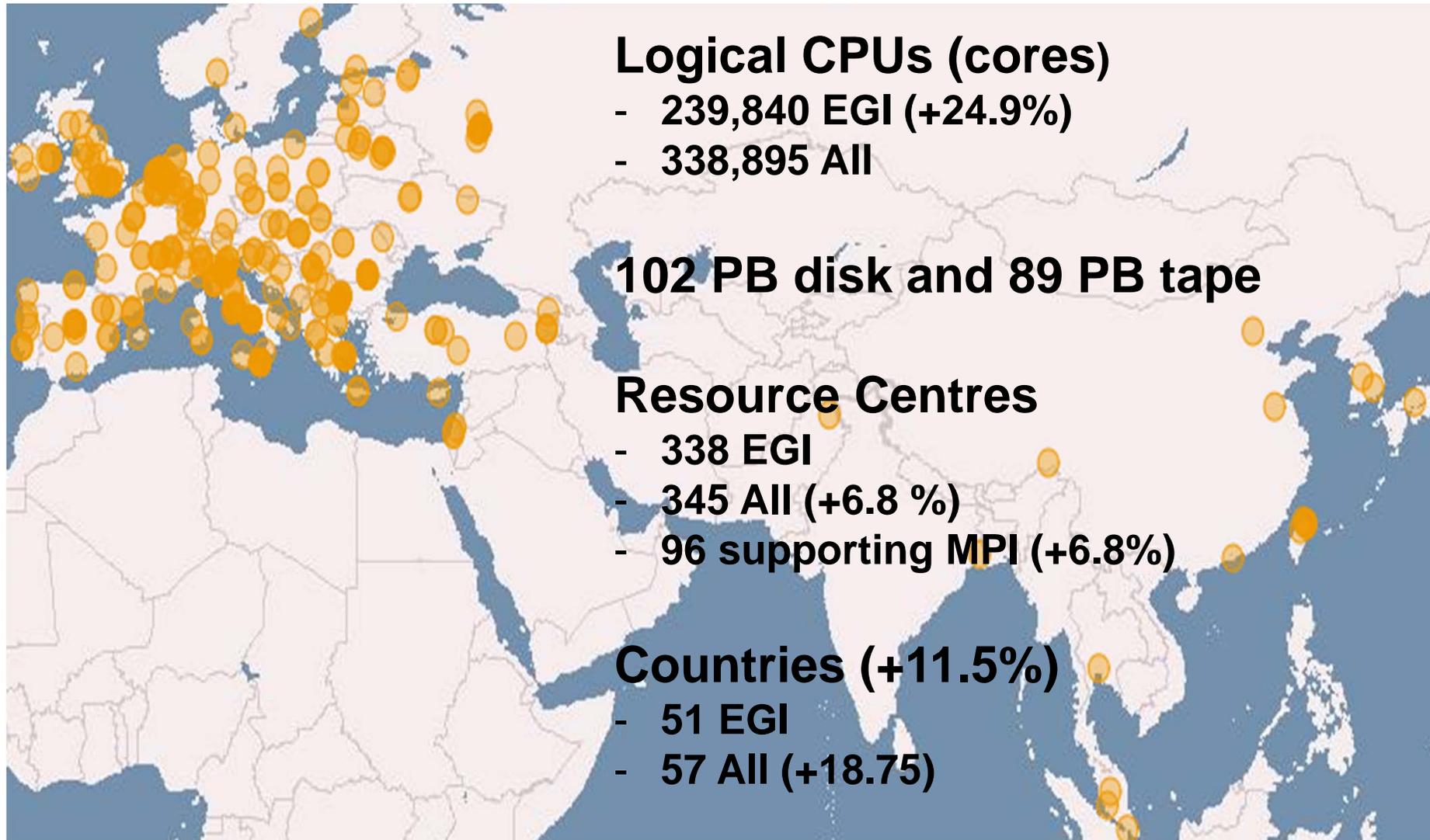


**Integrated:** infrastructure operated by a non-EGI-InSPIRE partner but relying on EGI operational services (MoU)

**Peer:** infrastructure accessible to EGI users, but relying on own operational services

# European Grid Infrastructure

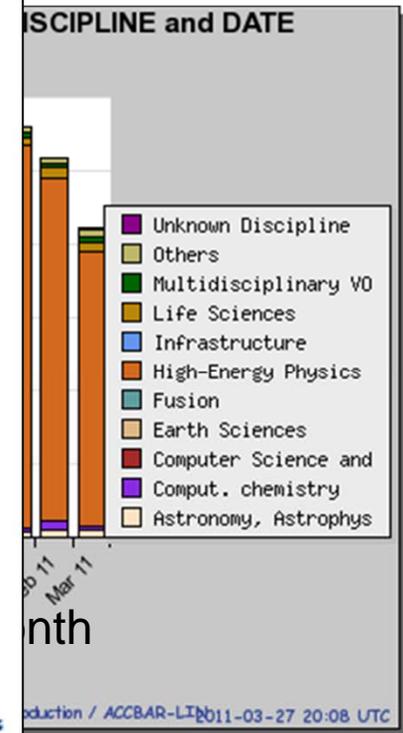
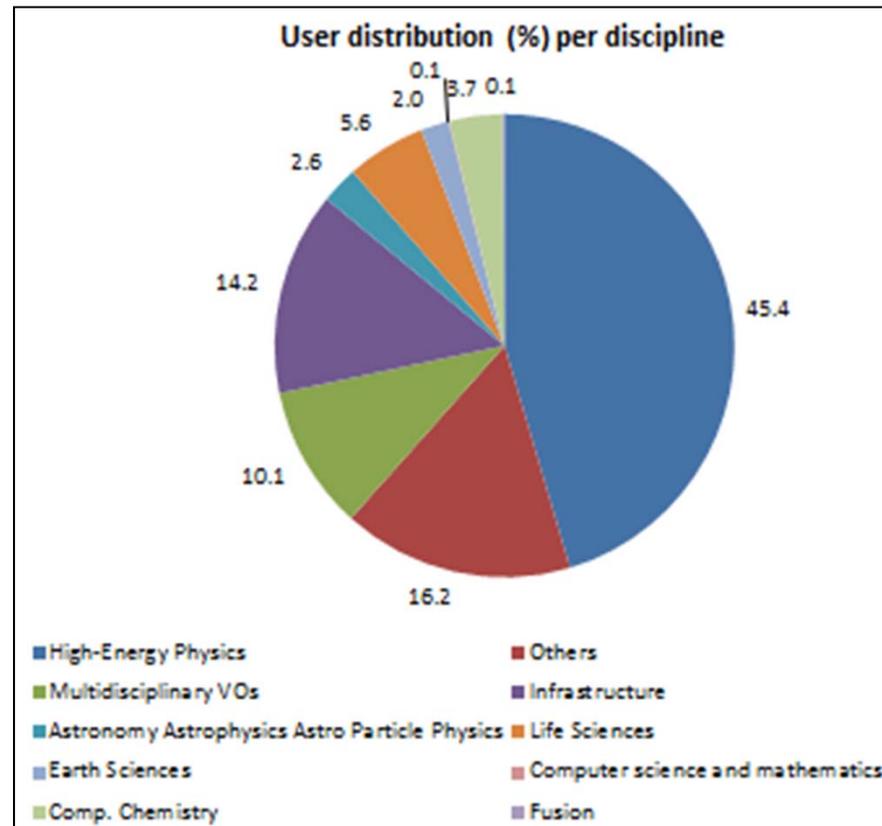
(April 2011 and yearly increase)



11226 End-users (-7.7%)  
 219 VOs (+17.7%)  
 ~30 active VOs: constant

## User Communities

- Archeology
- Astronomy
- Astrophysics
- Civil Protection
- Comp. Chemistry
- Earth Sciences
- Finance
- Fusion
- Geophysics
- High Energy Physics
- Life Sciences
- Multimedia
- Material Sciences



Average usage 2010-2011 vs 2009-2010

- 26.6M jobs/month, 873,400 jobs/day (+420%)
- 74.6M CPU wall clock hours/month (+86.5%)
- 551M HEP-SPEC06 CPU wall clock hours/month (+99.4%)

- **22 National Operations Centres**
  - Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Cyprus, Croatia, Czech Republic, France, FYR of Macedonia, Germany, Georgia, Greece, Hungary, Israel, Italy, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Turkey
- **5 Federated Operations Centres (16 NGIs)**
  - IberGrid (Portugal and Spain)
  - The Netherlands Federation (Belgium and The Netherlands)
  - Russian Federation (Russia and Ukraine)
  - NDGF Federation (Austria, Denmark, Estonia, Finland, Latvia, Lithuania, Norway and Sweden)
  - United Kingdom/Ireland Federation

- **1 EIRO Operations Centre: CERN**
- **4 Non-European Operations Centres**
  - *Asia Pacific Federation*: Australia, China, India, Japan, Malaysia, Philippines, South Korea, Taiwan and Thailand
  - *Canada Federation*: Canada and China
  - *GISELA Consortium (IGALC Federation)*: Argentina, Brazil, and Venezuela
  - *Latin America*: Brazil, Chile, Colombia and Mexico

- Develops and maintains operational tools
  - Regionalised for NGI deployment

Tool	Link	Partner
Operations Portal	<a href="https://operations-portal.egi.eu/">https://operations-portal.egi.eu/</a> <u>The old CIC portal</u>	CNRS
Service Availability Monitoring	Nagios and MyEGI portals fully regionalised at NGIs <a href="https://wiki.egi.eu/wiki/SAM_Instances">https://wiki.egi.eu/wiki/SAM_Instances</a>	CERN/SRCE
Grid Configuration database (GOADB)	<a href="https://goc.egi.eu/">https://goc.egi.eu/</a>	SFTC
EGI Helpdesk (GGUS)	<a href="http://helpdesk.egi.eu/">http://helpdesk.egi.eu/</a>	KIT
Accounting Portal	<a href="http://accounting.egi.eu/">http://accounting.egi.eu/</a>	FCTSG
Metrics Portal	<a href="http://metrics.egi.eu/">http://metrics.egi.eu/</a>	FCTSG



# Ops Tools Screenshots

**WELCOME TO GOCDB CENTRAL VISUALISATION PORTAL**

GOCDB is the official repository for storing and presenting EGI topology and resources information.

**What information is presented here?**

This portal presents a view of topology and resources information for the whole EGI infrastructure. This consists of:

- Participating National Grid Initiatives (NGI)
- Grid Sites providing resources to the infrastructure
- Resources and services, including maintenance plans for these resources
- Participating people, and their roles within EGI operations

This is a visualisation tool. Data are provided and updated in this central interface.

**How to update**

Unless your NGI uses a regional interface, you can update your data through the central interface.

**myEGI**

Home | Gridmap | Services | Metric Status | History | Service Availability

**EGI ACCOUNTING PORTAL**

GLOBAL View | VO MANAGER View | VO MEMBER View | SITE ADMIN View | USER View | REPORTS | METRICS PORTAL | LINKS

**EGI View -> Production**

Data to graph: Norm. Sum CPU (kSI2K-hours) | Normalised CPU time to a reference value of 1000 SpecInt20

Period: Start year: 2010 | Start month: 6 | End year: 2011 | End month: 5

Groupings: Show data for: REGION | as a function of: VO

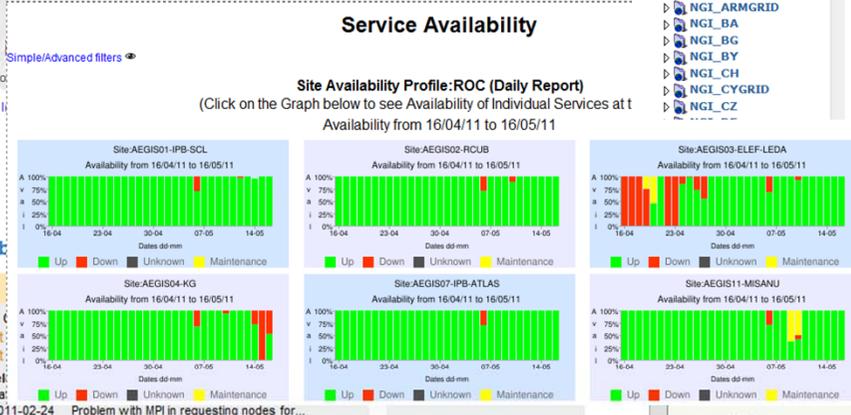
VO Groups: LHC | TOP 10 | ALL | Custom

Chart: Type: ACCUM BAR | Scale: LINEAR

dteam VO:  Exclude dteam and ops VOs jobs information

Refresh

**PRODUCTION Normalised CPU time (kSI2K) by REGION and VO.**  
LHC VOs. June 2010 - May 2011.



**GGUS**

Did you know...  
FAQ & Wiki  
Documentation  
Training  
Registration

Search ticket  
Submit ticket  
Support staff

Navigation on top

**Welcome to Globus**

**Tickets @ GGUS**

Information on your tickets  
Submit a new ticket  
Submit a new ticket

**GGUS tickets for Daniele**

ID	Status	Date	Description
67870	assigned	2011-02-24	Problem with MPI in requesting nodes for...

Show my complete ticket list (open/closed/subscribed)

Search ticket database

**Latest open tickets**

ID	VO	Info
70679	ops	Add "pilot" role for OPS VO
70678	none	NAGIOS "org.sam.SRM-LsDir-/ops/Role-lcadmin" fail...
70677	atlas	INFN-NAPOLI-ATLAS: failed to contact on remote SRM
70676	atlas	transfers from INFN-NAPOLI-ATLAS_PRODDISK to INFN-...
70675	none	NAGIOS "org.sam.CREAMCE-JobSubmit-/ops/Role-lcga..."
70673	atlas	Transfer efficiency is low on UKI-SCOTGRID-GLASGOW...
70672	atlas	Failed to complete PrepareToPut request on UKI-LT2...
70671	atlas	globus_ftp_client: Connection timed out from AGLT2...
70670	none	RU-Protvino-IHEP does not publish a required attri...

**GGUS tools/reports**

- Report Generator
- GGUS ticket timeline tool
- Escalation reports
- Metrics reports

**GGUS development plans**

- Description of development
- Submit a request for a new
- Browse current open features
- Ongoing worklist & Release

**GGUS Search**

**CENTRAL OPERATIONS PORTAL**  
Master Instance

Handover | User List | Regional List | Metrics

Welcome Daniele Cesini

NGI: Italy | Open site boxes with ticket or alarm

OR one ticket

18 site(s) found

<b>AUVERGRID</b>	IN2P3-LPC, Clermont-Ferrand, France	APEL
<b>BRGM-ORLEANS</b>	Bureau Recherches Geologiques Minieres	APEL
<b>GRIF</b>	Grille de Recherche d'Ile de France (GRIF)	APEL

- Message Broker Network Configuration to support tools and operations
- Development of the Central Accounting Repository (clients provided by the EMI project)
- Development of accounting systems needed for “new” resource types
  - Billing
  - Accounting of application usage
  - Accounting of data usage
  - Accounting of capacity and cloud computing usage

- Disseminate EGI's activity within the project and worldwide through its regionally dispersed dissemination contacts.
- Developed the EGI branding and content for the project and event websites.
- Produced 12 monthly Director's Letters, 4 issues of the EGI *Inspired* newsletter, published success stories in *International Science Grid This Week* and *Public Service Review*.
- Produced a range of brochures and posters.
- EGI website received over 30,000 visitors in its first year, around 365,000 page views.
- Attended a range of international events, including ISC2010 in Germany, ICT 2010 in Brussels, eChallenges in Warsaw, SciTech in Brussels, ISGC in Taipei, and SC10 in the US.
- Hosted booths at the EGI Technical and User Forums, and ran outreach campaigns that included printed materials, press releases, social media feeds and blogs.
- NGIs in the International task contributed events, websites, materials, publications, papers, translations, press releases and outreach to policy makers.



# Communications

- Website
- Wiki
- Blogs
- Newsletters
- Letters
- Social Media

The screenshot shows the EGI website homepage. At the top left is the EGI logo and the text "European Grid Infrastructure Towards a sustainable grid infrastructure". A navigation menu on the left lists: About us, User Support, Technology, Policy, Infrastructure, Publications, Projects, and Collaboration. The main content area features a "Welcome" message: "The European Grid Infrastructure enables access to computing resources for European researchers from all fields of science, from High Energy Physics to Humanities." Below this is a "Video presentation" link. A map of Europe is visible on the right. At the bottom, there are sections for "Latest News" (Software Sustainability Institute holds Collaborations Workshop) and "Events" (vrijdag, 4. februari).

The screenshot shows the header of the "Inspired" newsletter for Summer 2010. It features the EGI logo and the text "Inspired Summer 2010 News from the EGI community". Below the header, there are two main articles: "User Community Applications database is up and running" and "Operations Central European ROC evolves into NGIs".

The screenshot shows the main page of the EGI wiki. It includes a navigation sidebar with links like "Main Page", "Community portal", and "Current events". The main content area is titled "Main Page" and "Welcome to the EGI.eu wiki." It lists various "EGE Areas" such as Technology, Operations, User Community, and Security, each with sub-links to specific resources and documents.

The screenshot shows a blog post on "The EGI blog". The post title is "Clouds and Complex Systems in Paris". The content describes a meeting in Paris organized by the ASSYST project. The post is dated February 2, 2011. The blog page also features a "Login" section with fields for "Username" and "Password", and a "Subscribe" button.



- Held in Amsterdam at the Beurs van Berlage, 14 - 17 September 2010 in partnership with the BiG Grid project, and attracted 570 delegates.
- First major event for the EGI community and brought together European distributed computing projects and their collaborators in academia and businesses.
- Aimed to establish collaborations between the new and the current European DCI projects to meet the needs and requirements of the research community.
- Included 290 contributions in the form of presentations, demos, posters and workshops.
- 22% of delegates used the iPhone application, 28% used Twitter, 10% Flickr, 25% YouTube, 8% the GLOBAL webcast of the plenaries and 28% read the GridCast blog.
- Two press releases were issued leading to 27 press cuttings, including *HPCwire*, *iSGTW*, *ZDNet*, *Yahoo News*, *ITnews* in Australia, *Science Business* and *Environment & Energy Management*.
- GridCast team from e-ScienceTalk produced 26 posts on the blog and 6 videos on YouTube.



- Organised by EGI.eu, Vilnius University and LITNET in Vilnius, Lithuania, 11-14 April 2011, with the support of the European Middleware Initiative (EMI) and local secretariat BAIP.
- Held at the Radisson Blu Lietuva in Vilnius, Lithuania, showcasing the diversity of the EGI user community, attended by 427 delegates.
- Programme included networking and opportunities to 'meet the EMI experts'.
- Featured 196 contributions, 173 speakers and 34 session conveners.
- Over 250 images on Flickr, 30 posts on the GridCast blog, including 14 videos and slide shows. Over 2,600 unique visitors visited the main event website, representing 20,000 page views.
- Press articles appeared in *HPCWire*, the SSI blog, the GÉANT newsletter and *iSGTW*.
- Book of Abstracts published for distribution at the event.

- Deploy Technology Innovation
  - Distributed Computing continues to evolve
    - To include: Grids, Desktops, Virtualisation, Clouds, ...
- Enable Software Innovation
  - Provide reliable persistent technology platform
    - Tools built on gLite/UNICORE/ARC/Globus
- Support Research Innovation
  - Infrastructure for data driven research
    - Support for international research (e.g. ESFRI)

- Will come from outside EGI
  - Moving research technologies into production
- Partnership with technology projects
  - EMI (European Middleware Initiative)
  - IGE (Initiative for Globus in Europe)
  - EDGI (European Desktop Grid Initiative)
  - StratusLab
  - VenusC
  - SAGA



- Will also come from outside EGI
  - EGI is a neutral platform for applications
- EGI cannot support all services for all users
  - Every community needs something different
- Foster innovation within different ‘sectors’
  - e.g. Digital Libraries
    - gCube from D4Science



- An infrastructure to support European Researchers
  - Within the EU27
  - Geographical Europe
  - Interoperability worldwide for collaboration
- Work with Virtual Research Communities
  - Groupings of aligned Virtual Organisations
  - Enable their community specific support activity:
    - Support, training, consultancy, requirements etc.



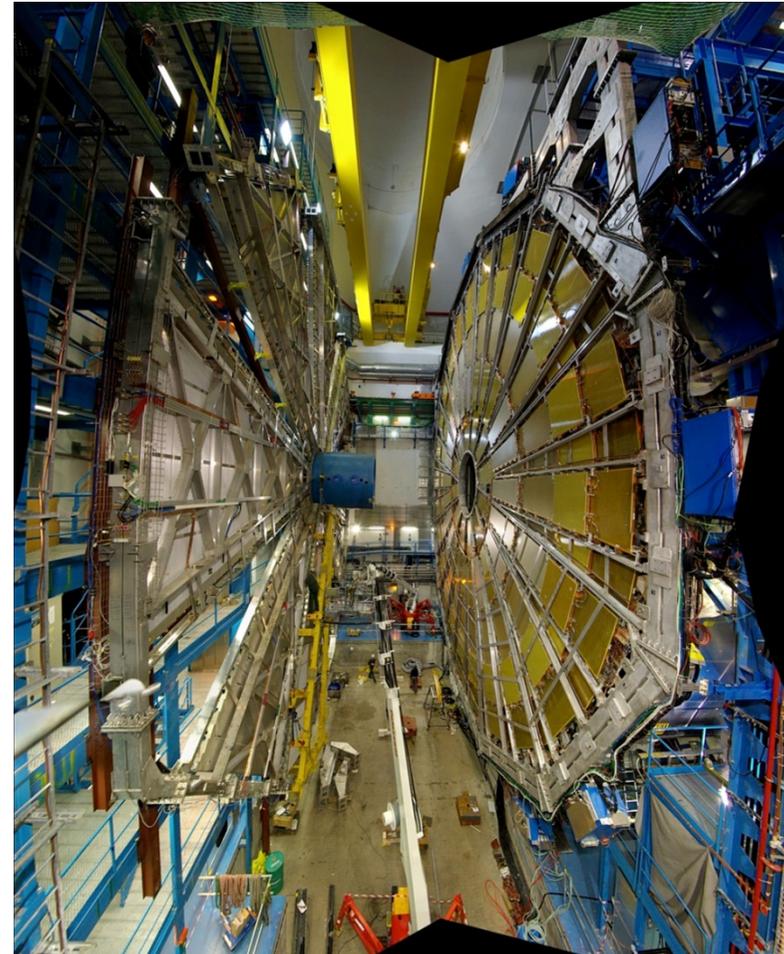
# Grid Use Cases



These case studies show some of the advantages of using the grid:

- allows world-wide multi-disciplinary collaboration;
- integrate distributed resources into a single whole;
- customised grid services to meet the unique demands of researchers;
- reliable service for computation, data transfer and storage of large data sets;
- reduced analysis time and analysis on-demand;
- scientifically useful results are generated more quickly;
- long term support;
- sharing sensitive data securely among a trusted community;
- allows member institutions to contribute computing power to the community;
- generate data-intensive stimulations in a shorter amount of time;
- reduce technical workload (by following grid standards), so scientists can concentrate more effort on the science

- World's largest particle accelerator
- Supports 8,000 researchers
- 1 billion CPU hours in the last 12 months
- 15Pb of data created annually





# Use Case: Large Hadron Collider

Some advantages of using the grid:

- allows worldwide mass collaboration with thousands of physicists;
- customised grid services to meet the unique demands of the experiments;
- large data storage facility;
- physicists can access the data using their own computer locally.

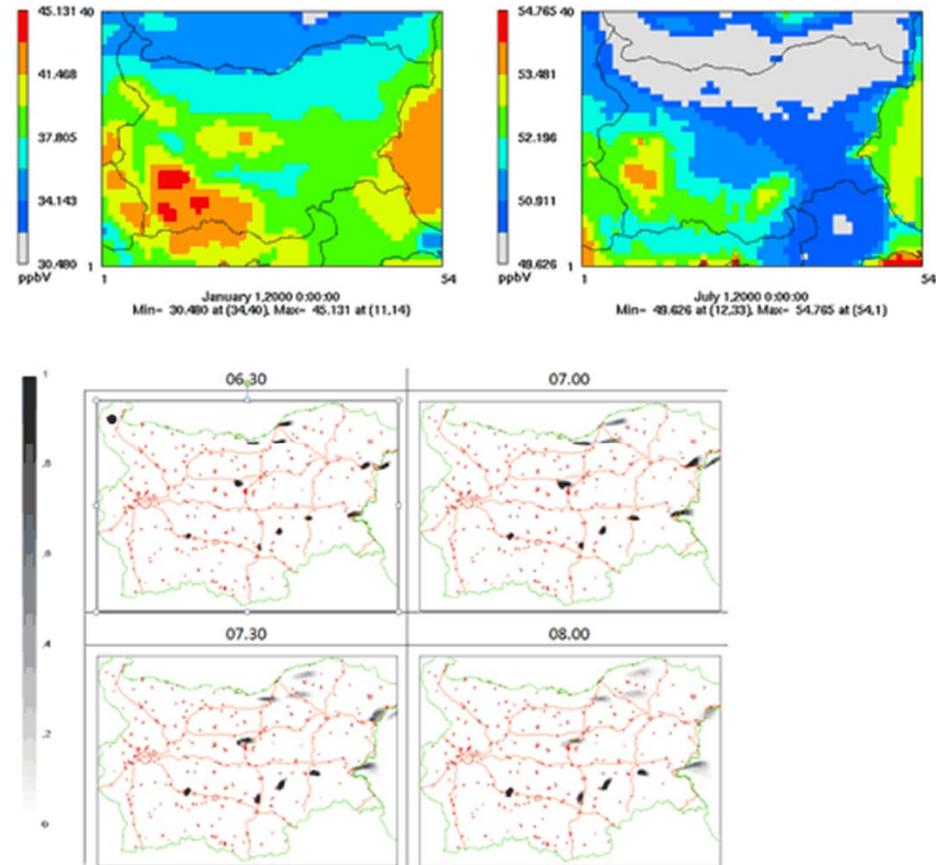


- Mapping the genome of the Netherlands
- Plan to sequence the genomes of 750 Dutch people
- Currently 30Tb of data
- Will generate 20 times that amount

Some advantages of using the grid:

- analysis time reduced by 80%;
- on-demand analysis – can be carried out as and when researchers need it;
- provide development and support to help researchers get the most out of using the grid.

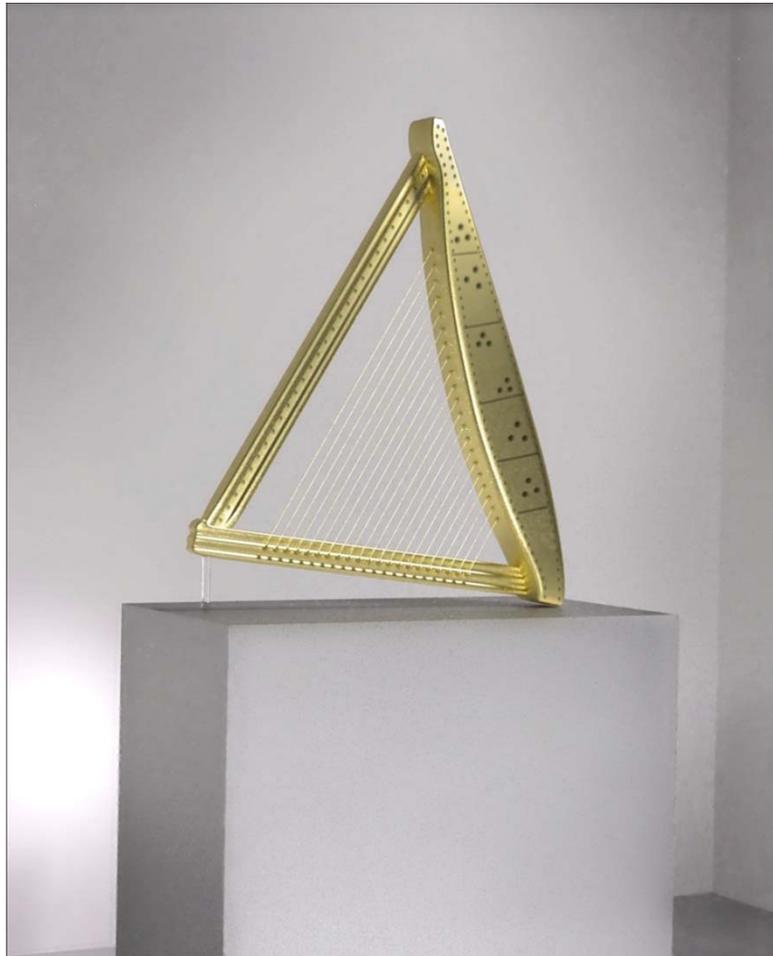
- Bulgarian researchers have ported three applications to the grid
  - Study the impact of climate change on air quality
  - Model atmospheric composition
  - Investigate emergency responses to the release of harmful substances into the atmosphere



Some advantages of using the grid:

- improved response times and decreased failure rate, so scientifically useful results are generated more quickly;
- reliable service for computation, data transfer and storage of large sets of data;
- using existing software with standard protocol means a quicker start-up time and compatibility between resource providers.

# Use Case: ASTRA

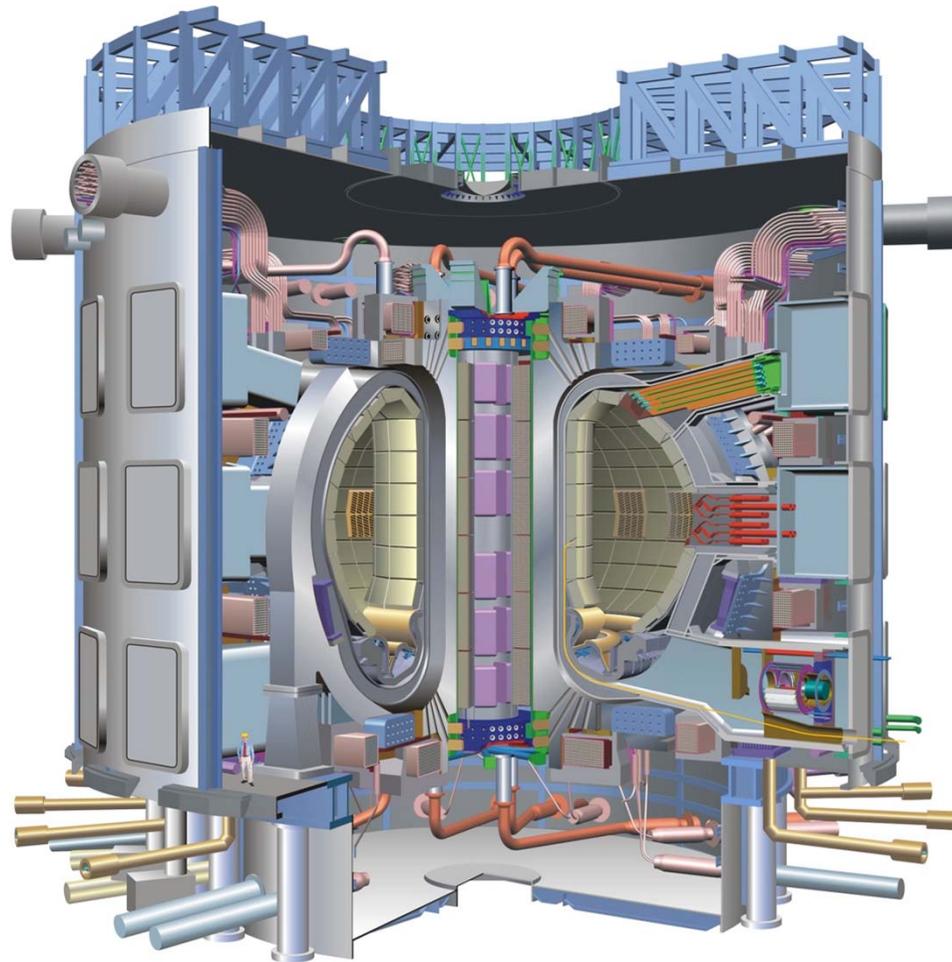


- Ancient instruments  
Sound/Timbre  
Reconstruction  
Application
- Has recreated 4 instruments so far
- Held concerts using these instruments

Some advantages of using the grid:

- can meet high demand for network and computing requirements;
- high reliability;
- allow multi-disciplinary collaboration between researchers, musicians and historians;
- longevity: ASTRA running since 2006.

- Investigating viability of fusion as a power source
- Modelling and simulating the reactor
- Used 1 million CPU hours in the last 12 months



Some advantages of using the grid:

- perform the intensive computations needed to test the feasibility of fusion power before building the reactor;
- open to future development: dedicated project 'EUPHORIA' was set up to further push the limits of existing state-of-the-art computing resources.

# Use Case: DECIDE

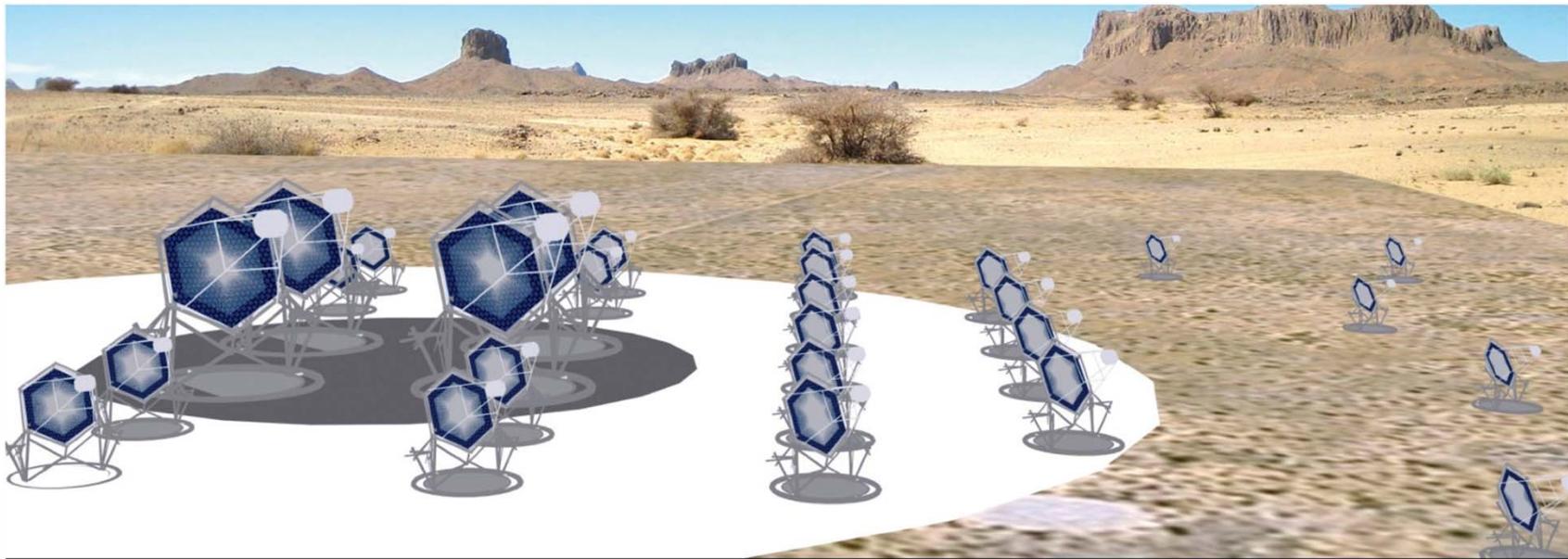


- Diagnostic Enhancement of Confidence by an International Distributed Environment
- Diagnostic tools for the medical community
- Example: Their Statistical Parametric Mapping application can help doctors to diagnose Alzheimer's disease in its early stages and track the progress of the symptoms over time

Some advantages of using the grid:

- a single European-wide master database of images stored on the grid for doctors to use;
- can set up diagnostic tools with a dedicated grid infrastructure;
- customisable: dedicated software to track progression of the disease over time;
- sharing medical data securely.

- The Cherenkov Telescope Array
- Future ground-based high energy gamma-ray instrument
- 132 institutes in 25 countries
- Using applications and grid technology provided by the European grid



Some advantages of using the grid:

- allows member institutions to contribute computing power to the CTA community;
- generate data-intensive stimulations in a shorter amount of time;
- reduce technical workload (by following grid standards), so scientists can concentrate more effort on the science.

# Future Plans



- Grids have benefited from commoditisation
  - Hardware: HTC & HPC affordable to all
  - Networking: GBs can be moved over WAN
  - Software: Open source software comes of age
- The impact of commodity virtualisation...
  - For transactional models →
    - The ‘Cloud’: A model based on compute not data
  - For large distributed data-oriented models →
    - The emergence of true ‘function shipping’?

- Be a neutral resource provider
  - Any application, any domain, any technology
  - A platform for domain specific innovation & use
  - Integration of any compliant resource
- End-user needs and technologies change
  - Allow VOs to deploy their own services
    - VOs will then need to manage **their** infrastructure
  - Give VOs the power to meet their own needs

# Standards Needed Here!

- Data Layer
  - Secure reliable data movement
  - Access to data resources
- Virtualisation Layer
  - Span trust domains within agreed policies
  - Monitoring as important as lifecycle control
- Service Layer
  - The services that go into the virtual machine
  - Avoid domain specific silos & promote reuse

Consensus  
Openness  
Balance  
Transparency

# What will EGI do?

- Continue with a secure reliable infrastructure
  - Integrated: gLite & ARC
  - Underway: Globus & UNICORE
- Support its user communities
  - Maintain user services & tools
  - Engage with structured (virtual) user communities
    - Encourage structuring in unstructured user communities
    - Defined representatives within EGI bodies
  - Engage with the ESFRI projects

- EGI.eu established in Amsterdam
  - Supported through EGI-InSPIRE project
- EGI has transitioned from a federation of regional to national resource providers
- EGI will work with technology providers to have a standards based open architecture
- EGI will evolve to support the needs of its current and new user communities

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