

EGI-InSPIRE Project Presentation

Steven Newhouse
Project Director, EGI.eu

- 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 (Wikipedia)

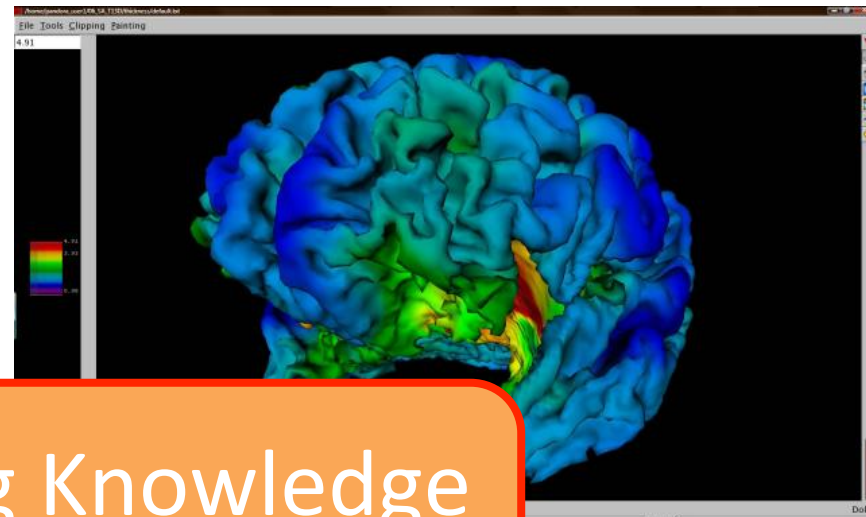
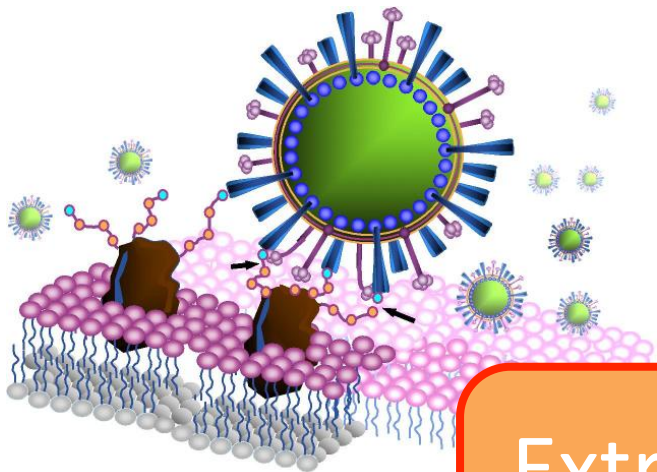
Infrastructure is the basic physical and organisational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function

The Enterprise is the European Research Area

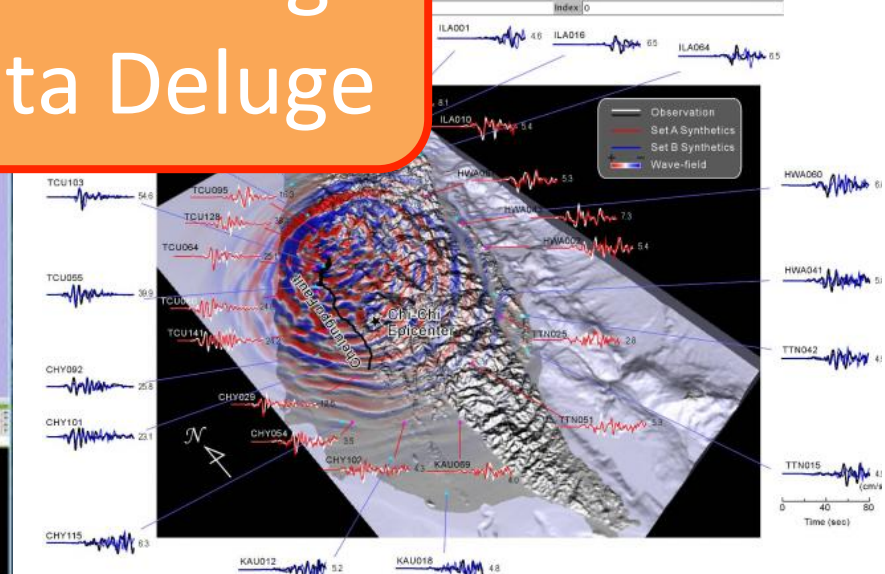
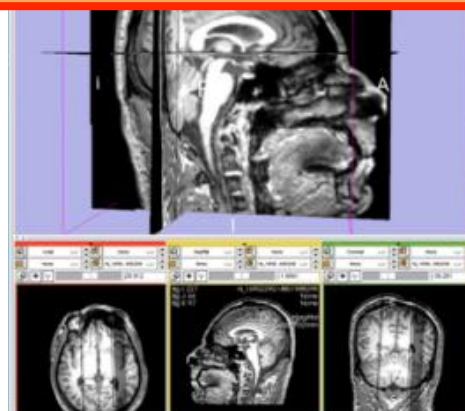
EGI provides a service infrastructure that exposes and helps coordinate a resource infrastructure

What is a Grid?

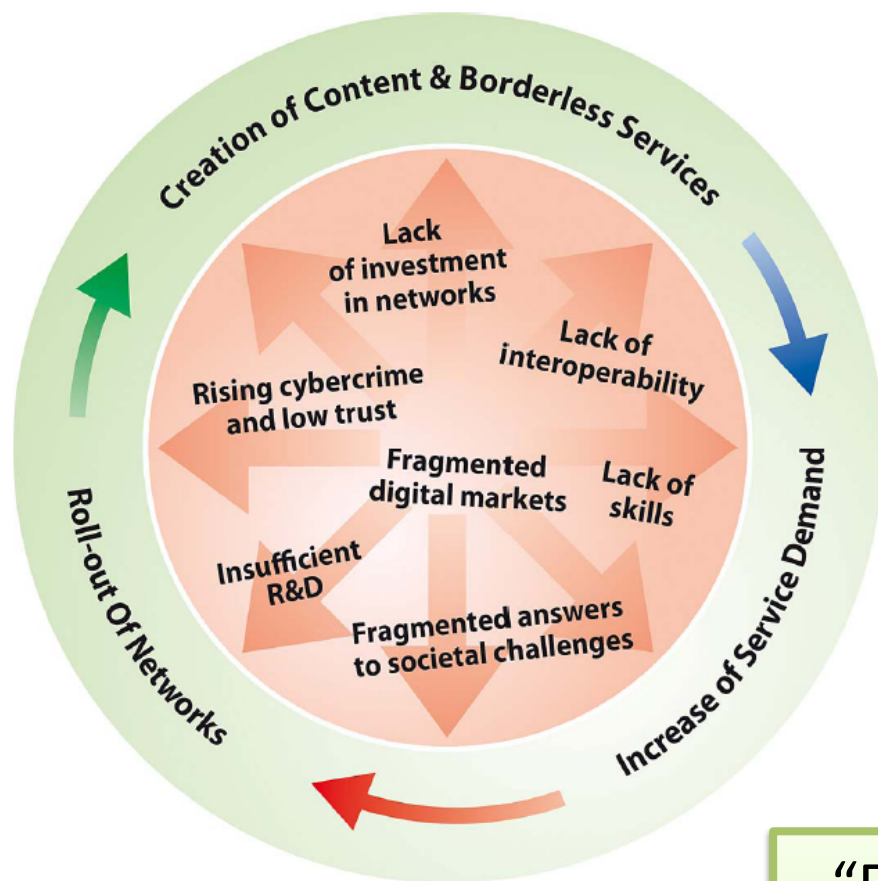
- A grid consists of distributed resources controlled by separate organisations that be systematically used securely by users external to that organisation
- Resources can include:
 - Commodity or HPC clusters
 - Disk or tape storage
 - Instruments
 - Data Archives or Digital Libraries



Extracting Knowledge
from the Data Deluge



Digital Agenda for Europe



Digital Agenda for Europe

- Borderless Services
- Interoperability
- Supporting Innovation

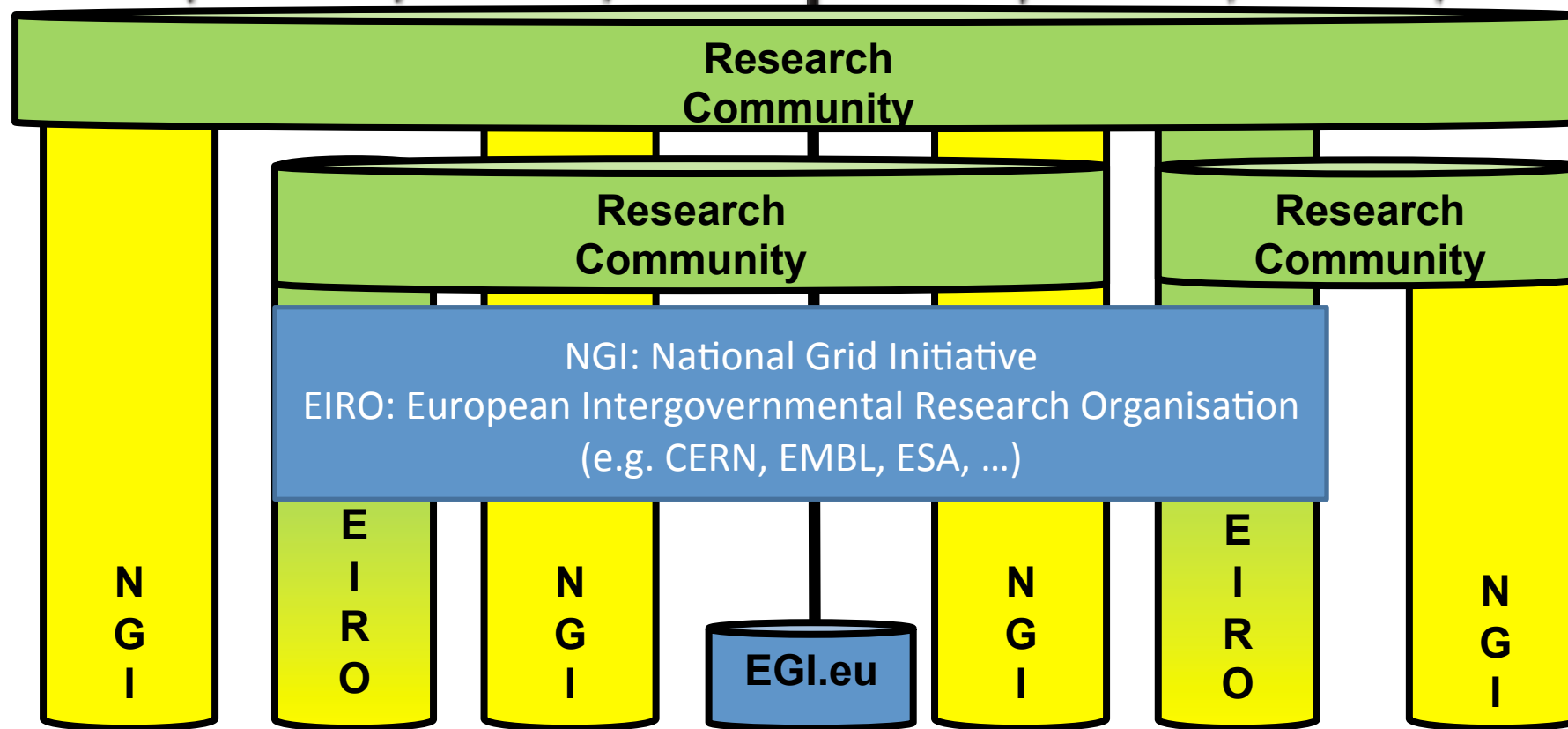
remove barriers to
the free movement
of knowledge

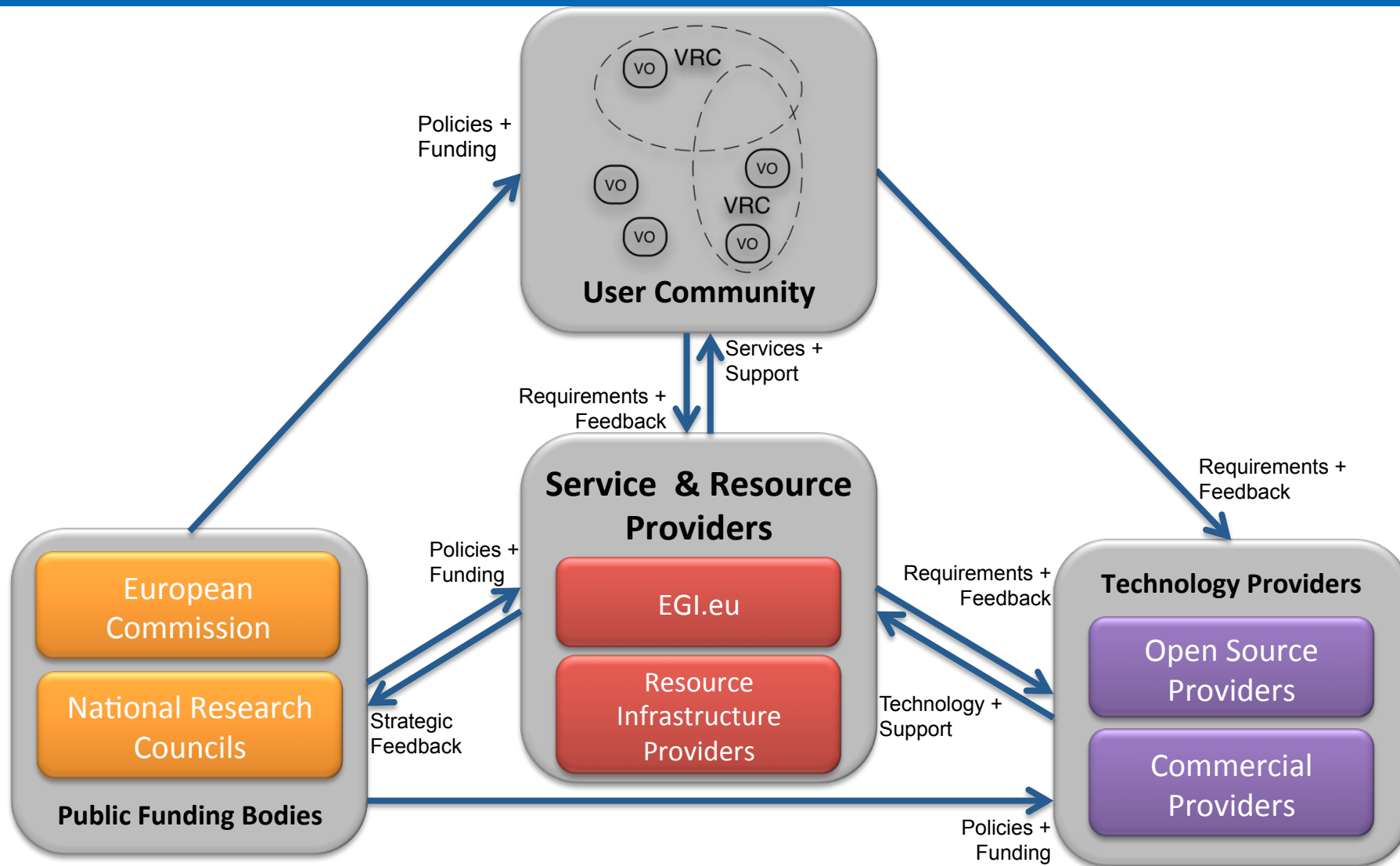
“Europe should also build its innovative advantage in key areas through reinforced e-Infrastructures (i.e. GEANT & EGI)”

The EGI Model

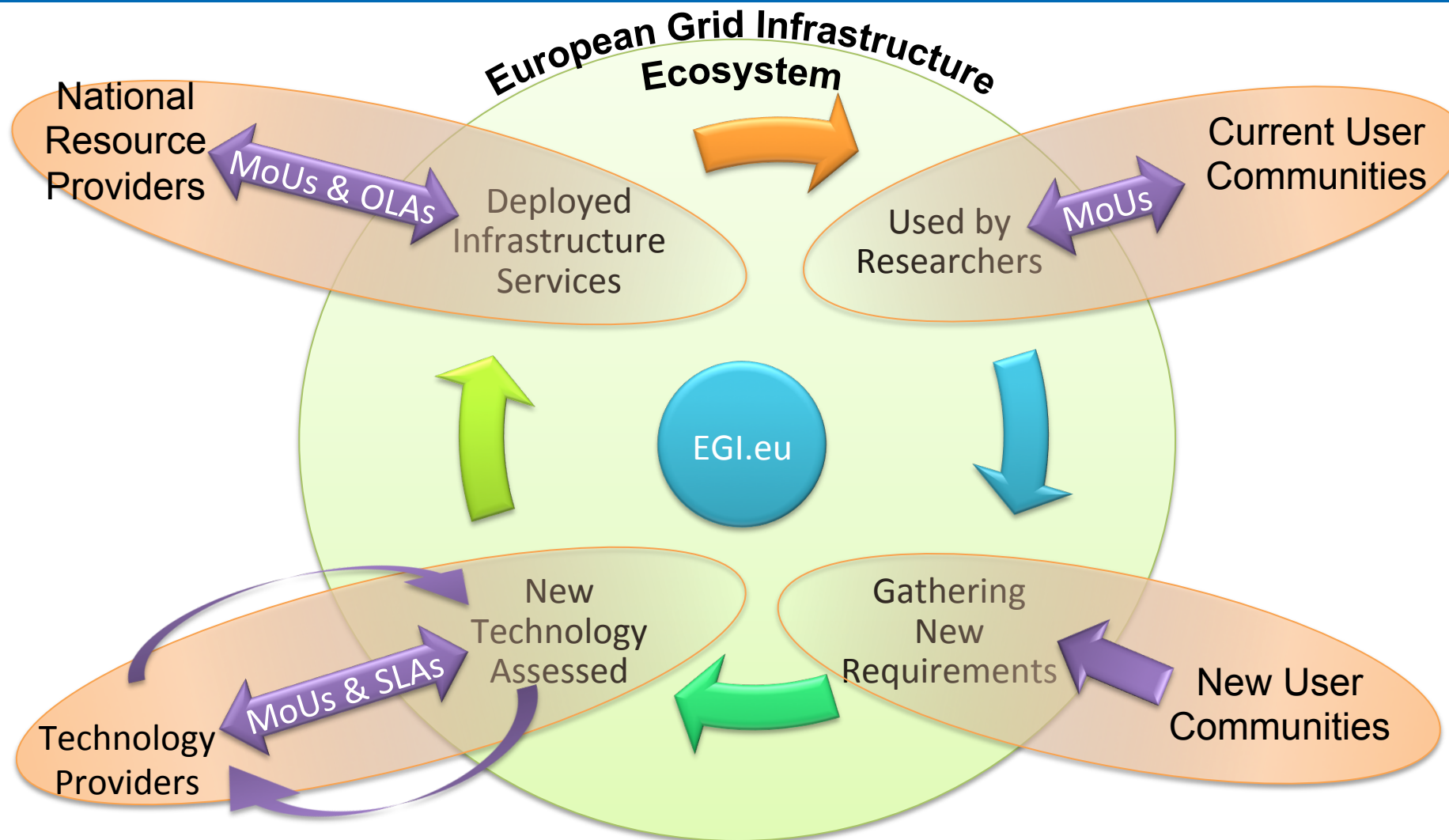
EGI

Collaboration



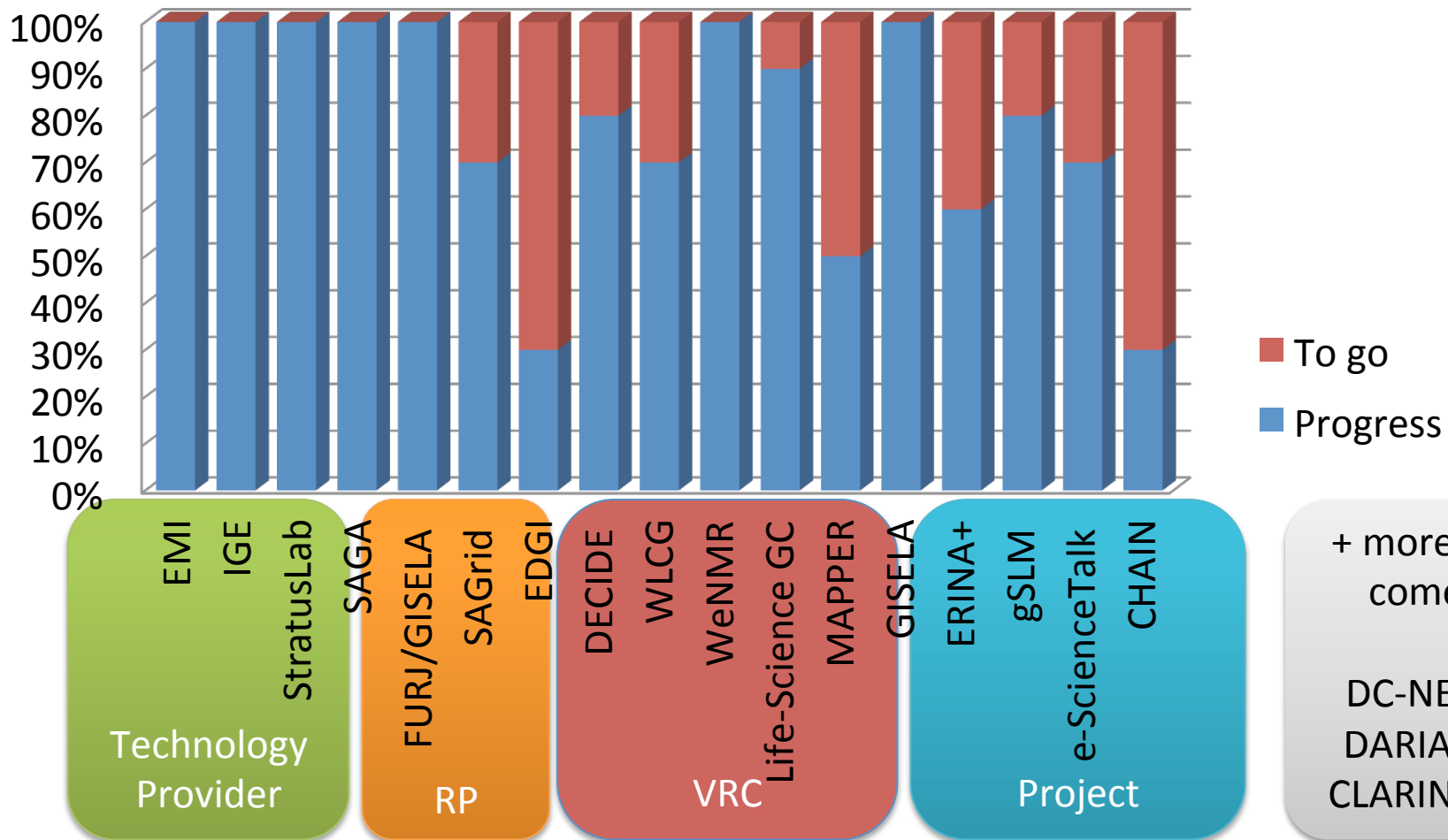


A Virtuous Service Cycle



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

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



User Services
Advisory Group to
drive detailed design

Design

How can I contribute?

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



Deliver

Integrated Services

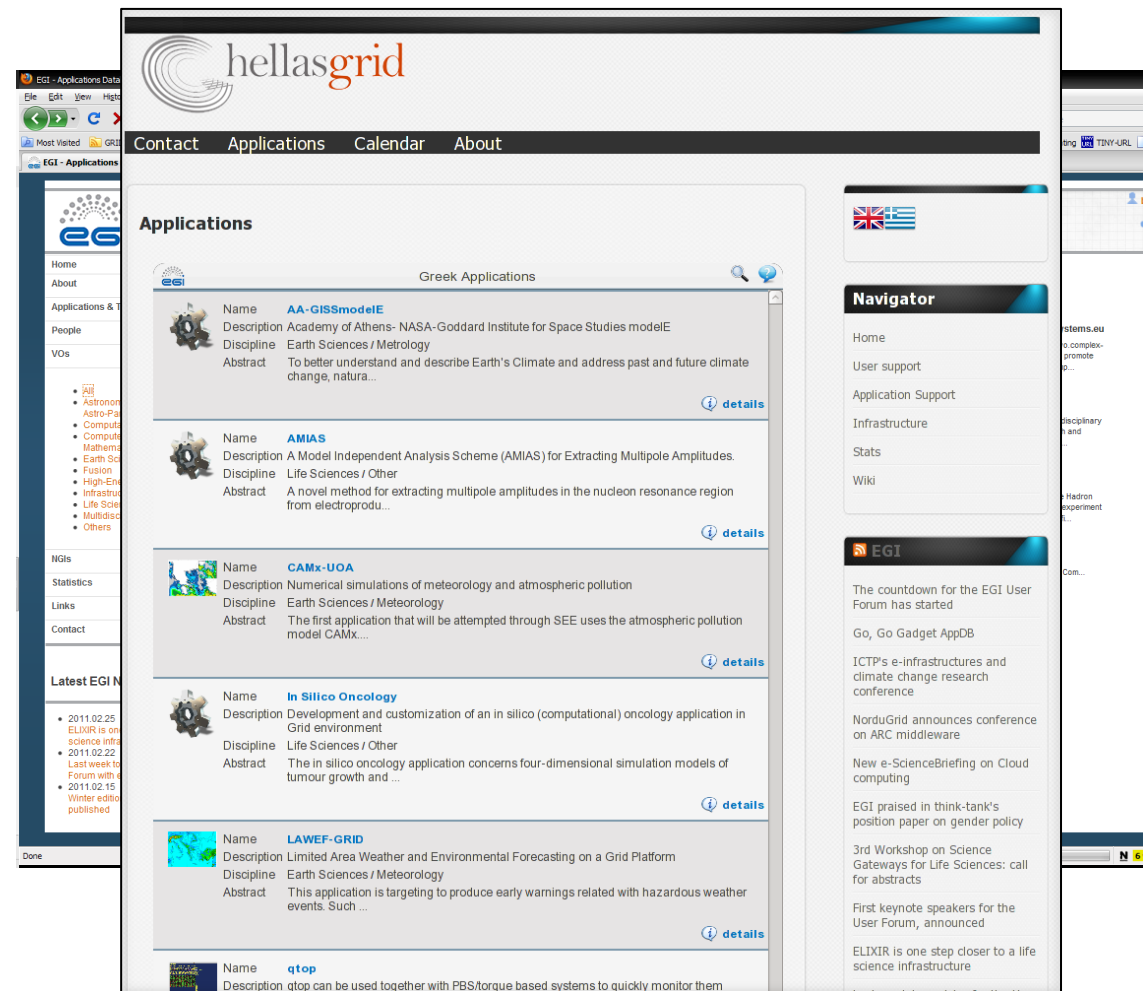
- Human
- Technical
- Infrastructure

How do I use these resources?

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



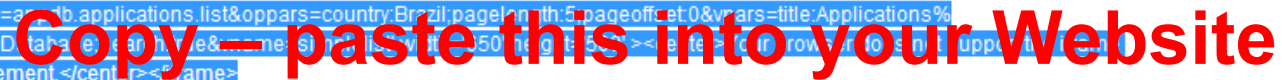
- To give recognition to reusable applications
- To give recognition for application developers
- How to get involved
 - Register applications
 - Reuse applications
 - **Integrate AppDB through its gadget into any Webpage!**
- <http://appdb.egi.eu>



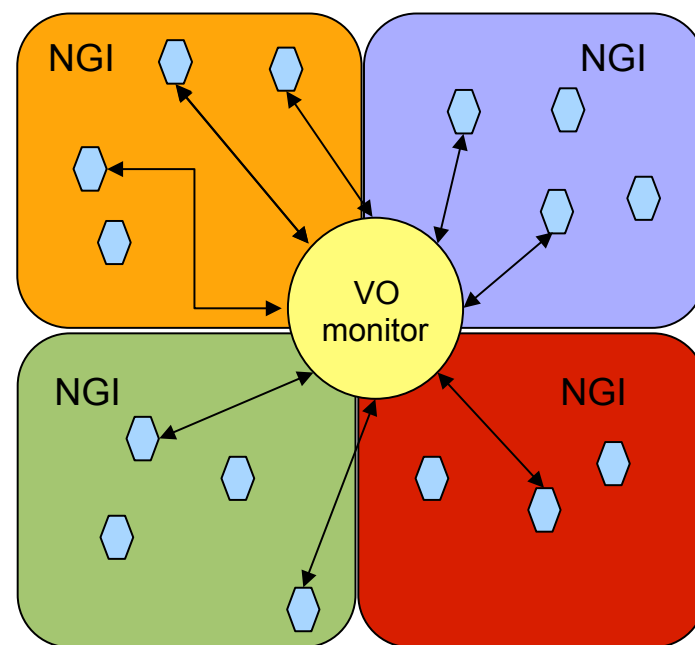
The screenshot shows the 'hellasgrid' website's 'Applications' section. It features a list of applications with details such as Name, Description, Discipline, and Abstract. The applications listed are:

- AA-GISSmodelE**: Academy of Athens- NASA-Goddard Institute for Space Studies modelE. Discipline: Earth Sciences / Meteorology. 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**: Description qtop can be used together with PBS/torque based systems to quickly monitor them

The page also includes a 'Navigator' sidebar with links like Home, User support, Application Support, Infrastructure, Stats, and Wiki. At the bottom, there's a section for 'Latest EGI N' with recent news items.



- 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

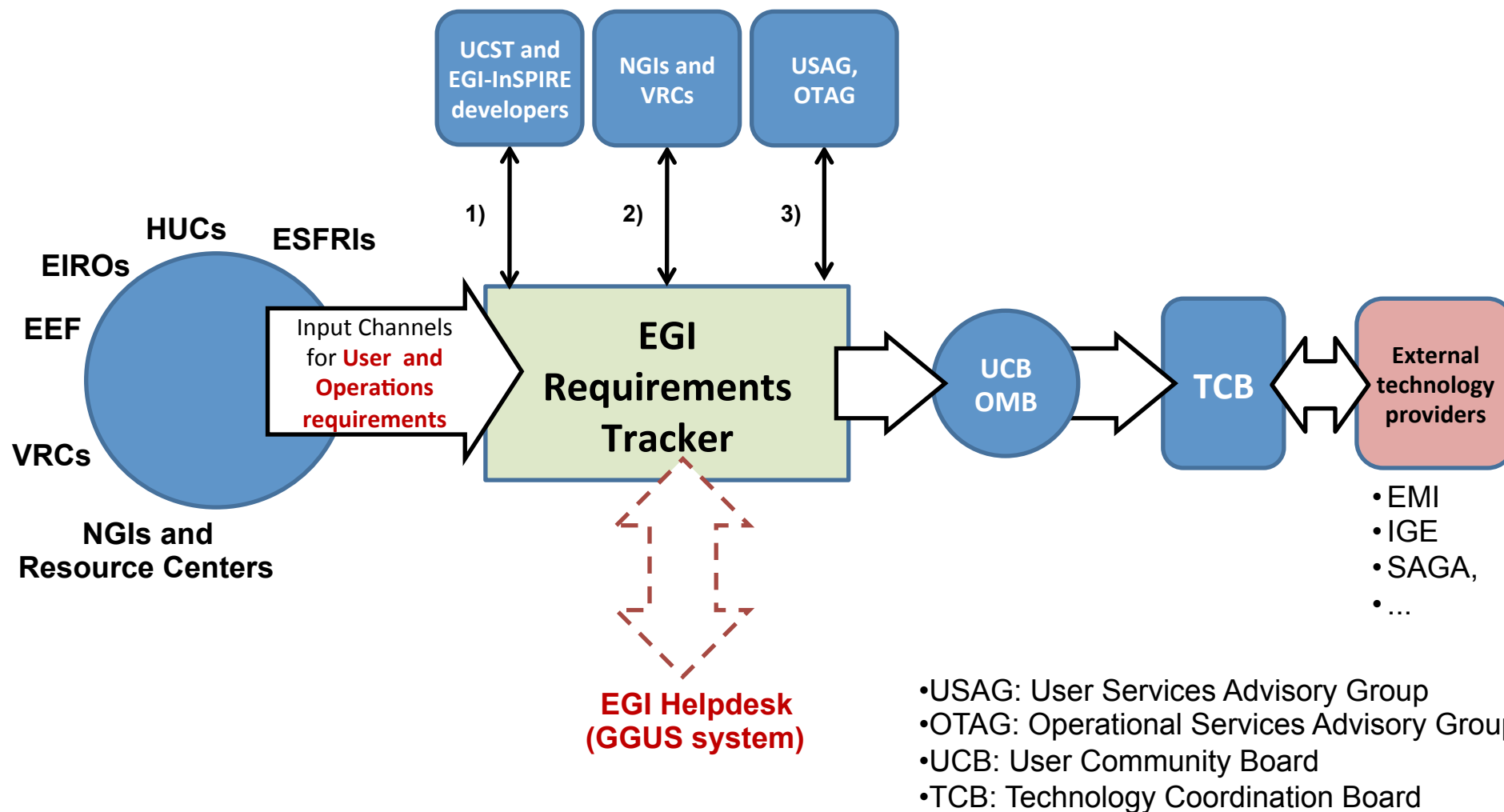


https://wiki.egi.eu/wiki/VO_Services

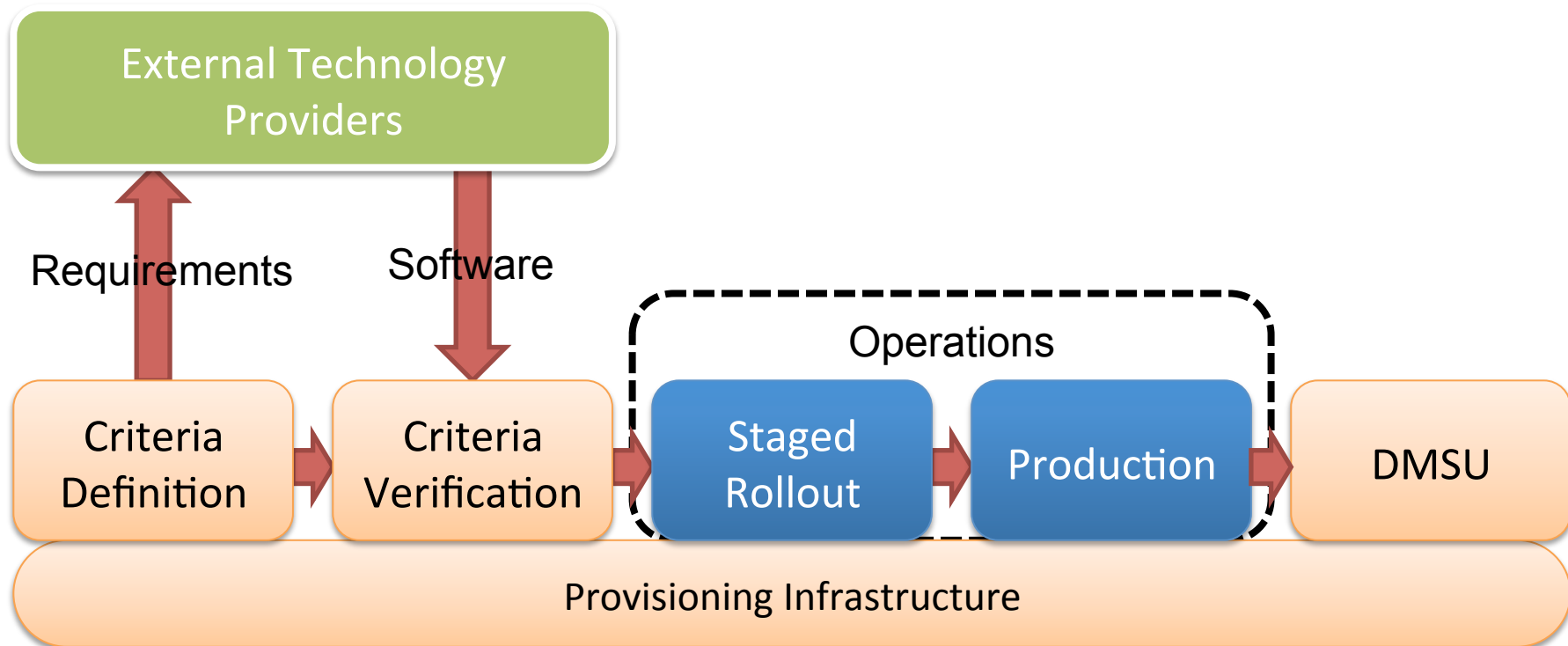
- Integration of...
 - Training event calendar
 - Digital library (of training materials)
 - Service offering and requesting form
 - Plus: community contributed evaluation and reviews
- How to get involved?
 - Register training events
 - Use, reuse and share training materials
 - Offer training-related 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

Quality Criteria Definition

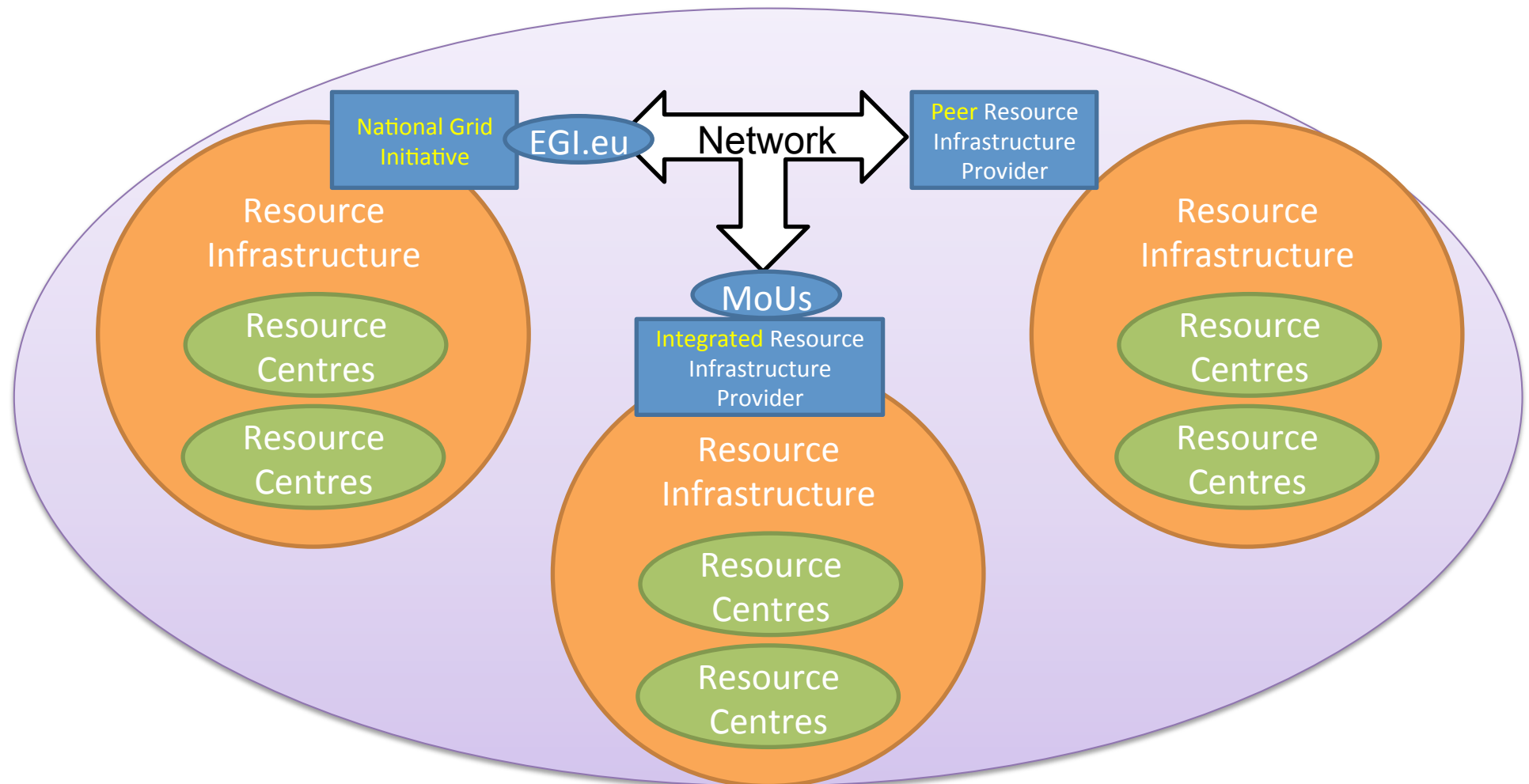
- Comprehensive library of Quality Criteria
- Defines EGI's minimum acceptance level of any delivered software
- Library with defined lifetime, and version
- Liaising with Technology Providers for
 - Proactive Quality Assurance
 - Quality Criteria Review and improvement
 - Timely preparation for software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

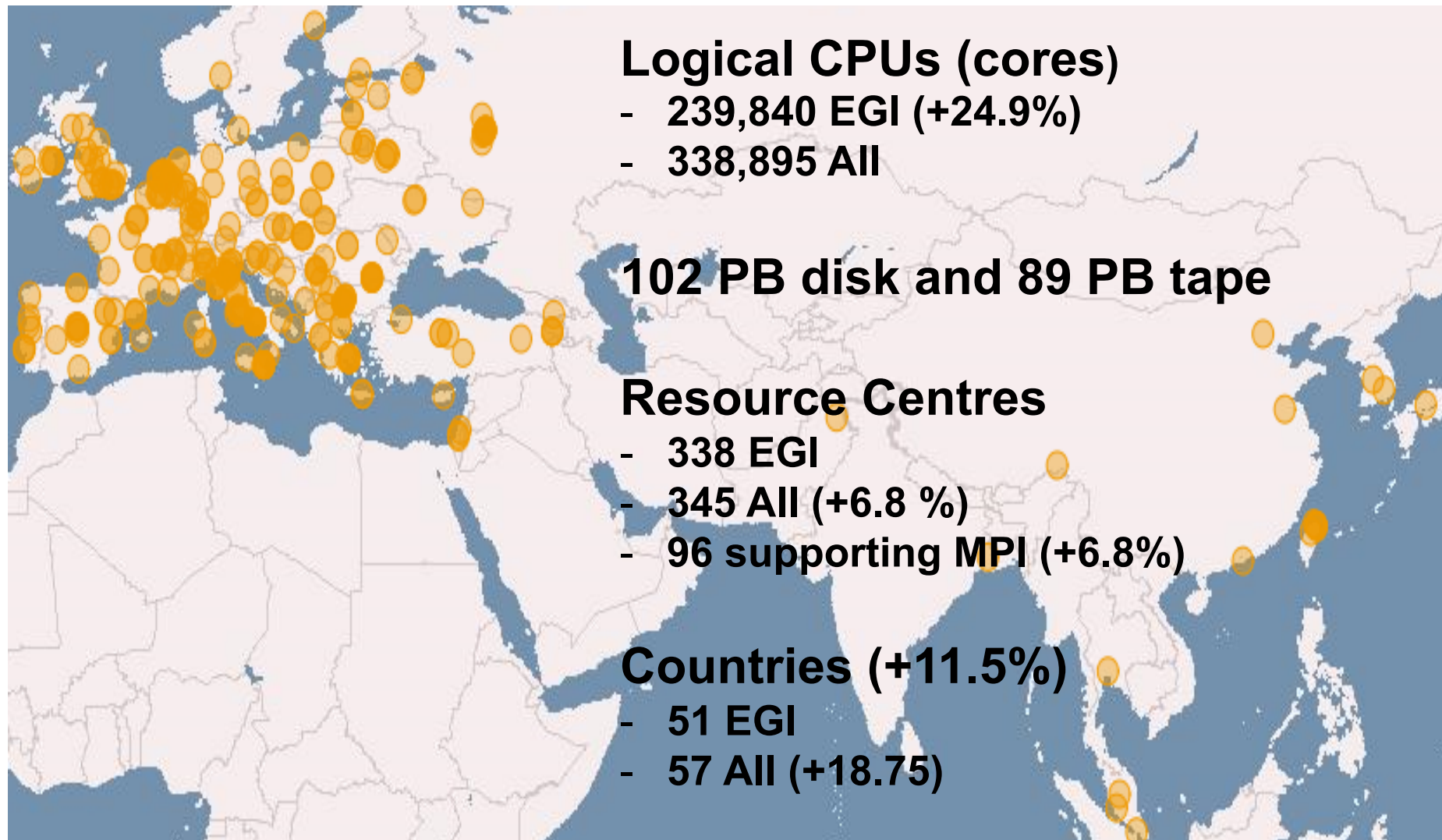


Integrated: infrastructure operated by a non-EGI-InSPIRE partner but relying on EGI operational services (MoU)

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

European Grid Infrastructure

(April 2011 and yearly increase)



EGI Usage (April 2011)

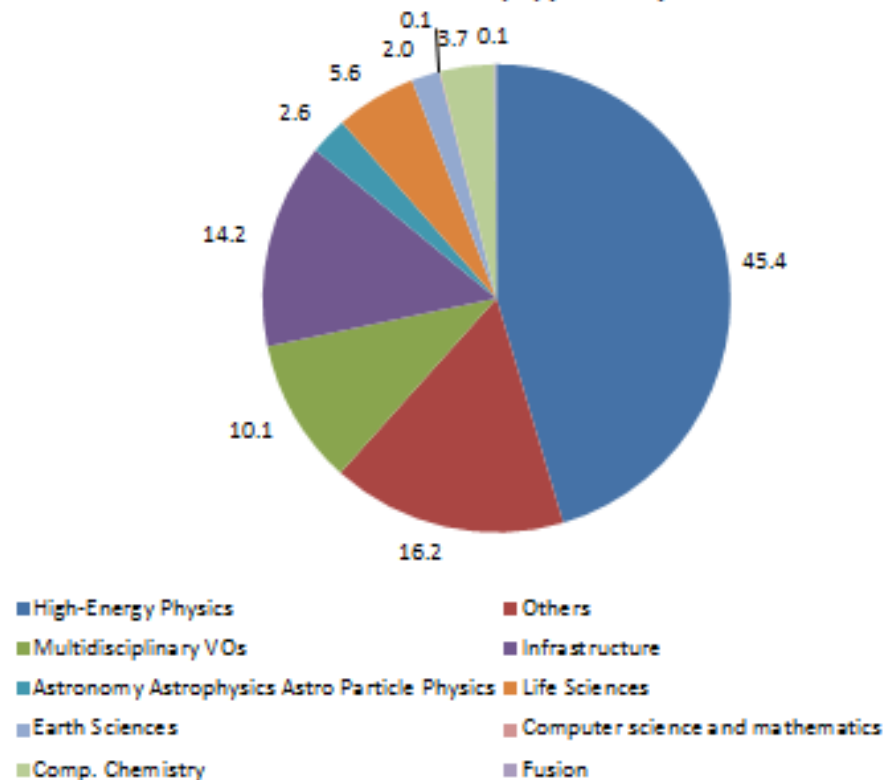
Average usage 2010-2011 vs 2009-2010

- 27.8M jobs/month, 91,000 jobs/month (+82%)
- 74.8M CPU wall clock hours/month (+35%)
- 2.8M jobs/month for non-HEP users (+47%)

Year to Year Increase

- 18,271 End-users (+47%)
- 219 VOs (+17.7%)
- ~30 high activity VOs (no change)

User distribution (%) per discipline



User Communities

Archeology
Astronomy
Astrophysics
Civil Protection
Comp. Chemistry
Earth Sciences
Finance


Fusion
Geophysics
High Energy Physics
Life Sciences
Multimedia
Material Sciences
...

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


GOCDB4
 Visualisation Portal

Resources

- Browse Sites
- Browse Services
- Browse ROCs/NGIs

Downtimes

- Recent & Planned
- Archives

About GOCDB4

- Doc, Help & Support
- Development Status
- Credits

Search

User Status
 Registered...

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
 this central interface.

How to update
 Unless your NGI uses a region...

- the GOCDB4 Central

EGI ACCOUNTING PORTAL
 

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

Hierarchical Tree

- Tier1
- Tier2
- Countries
- EGI
 - Production
 - AsiaPacific
 - CERN
 - GermanySwitzerland
 - Italy
 - NGI_AEGIS
 - NGI_AL
 - NGI_ARMGRID
 - NGI_BA
 - NGI_BG
 - NGI_BY
 - NGI_CH
 - NGI_CYGRID
 - NGI_CZ

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

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



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

Navigation on top

Welcome to Globus

Tickets @ GGUS

- Information on your...
- Submit a new ticket
- Submit a new ticket

GGUS tickets for Daniel

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=lcgadmin* 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=lcgadm...
70673	atlas	Transfer efficiency is low on UKI-SCOTGRID-GLASGOW...
70672	atlas	Failed to complete PrepareToPut request on UK-LT2...
70671	atlas	globus_ftp_client: Connection timed out from AGLT2...
70670	none	RU-Provino-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 feature
- Ongoing worklist & Release

GGUS Search

Dashboard | VO Information | EGI Broadcast | VO Management | About Us

Welcome Daniele Cesini

CENTRAL OPERATIONS PORTAL
 Master Instance




Handover | User List | Regional List | Metrics

NGI: Italy | Open site boxes with ticket or alarm

OR one ticket | -no floor-

Loading...

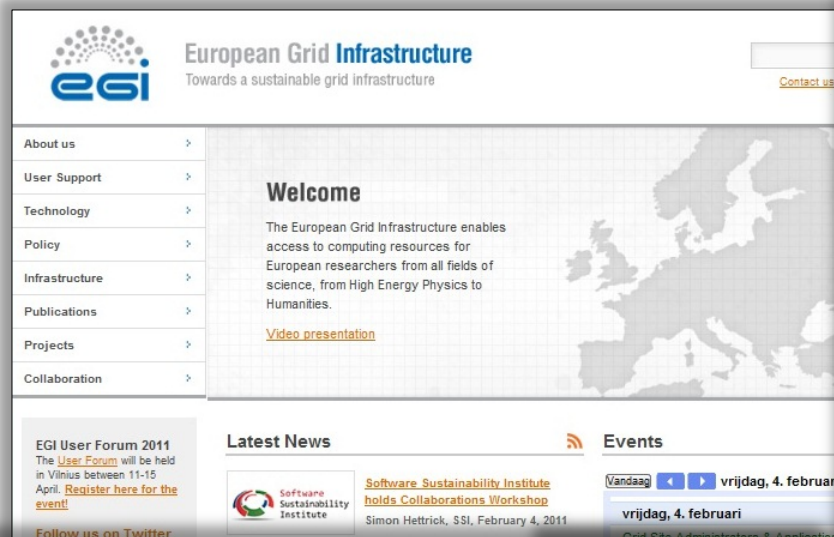
18 site(s) found

	IN2P3-LPC, Clermont-Ferrand, France	APEL
	Bureau Recherches Geologiques Minieres	APEL
	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.

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



European Grid Infrastructure
Towards a sustainable grid infrastructure

[Contact us](#)

About us >
User Support >
Technology >
Policy >
Infrastructure >
Publications >
Projects >
Collaboration >

Welcome

The European Grid Infrastructure enables access to computing resources for European researchers from all fields of science, from High Energy Physics to Humanities.

[Video presentation](#)

EGI User Forum 2011
The [User Forum](#) will be held in Vilnius between 11-15 April. [Register here for the event!](#)

Latest News

[Software Sustainability Institute holds Collaborations Workshop](#)
Simon Hettrick, SSI, February 4, 2011

Events

Vandaag < > vrijdag, 4. februari
vrijdag, 4. februari

[Follow us on Twitter](#)



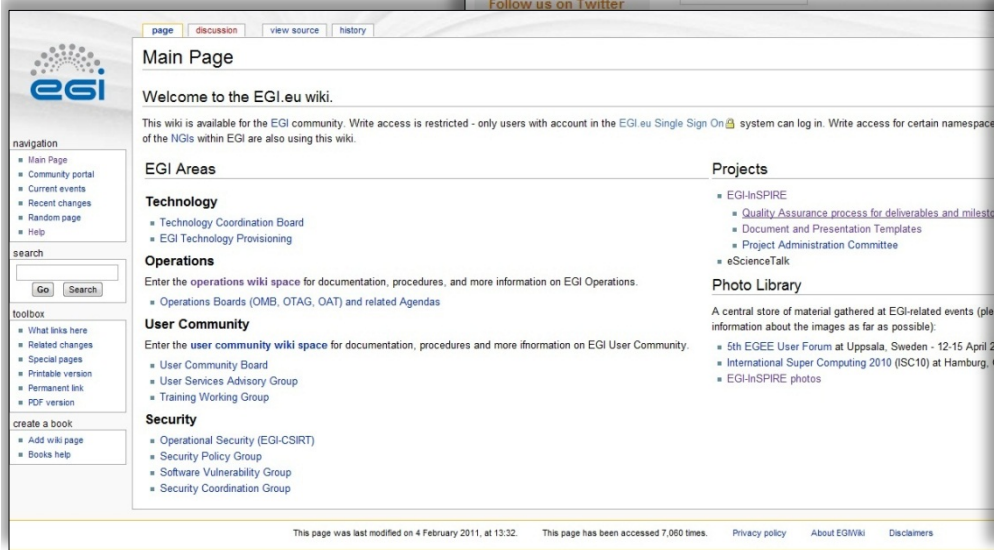
Inspired
Summer 2010

News from the EGI community

User Community
Applications database is up and running
Looking for grid applications to make the difference?
// page 1

Operations
Central European ROC evolves into NGIs
CE-ROC shut up shop on 31 July, after providing core services in eight European countries for more than six years.
// page 2

Distributed monitoring service is operational
Grid monitoring has become the first fully-distributed



Main Page

Welcome to the EGI.eu wiki.

This wiki is available for the EGI community. Write access is restricted - only users with account in the EGI.eu Single Sign On system can log in. Write access for certain namespaces of the NGIs within EGI are also using this wiki.

EGI Areas

Technology

- Technology Coordination Board
- EGI Technology Provisioning

Operations

Enter the operations wiki space for documentation, procedures, and more information on EGI Operations.

- Operations Boards (OMB, OTAG, OAT) and related Agendas

User Community

Enter the user community wiki space for documentation, procedures and more information on EGI User Community.

- User Community Board
- User Services Advisory Group
- Training Working Group

Security

- Operational Security (EGI-CSIRT)
- Security Policy Group
- Software Vulnerability Group
- Security Coordination Group

Projects

- EGI-InSPIRE
 - Quality Assurance process for deliverables and milestones
 - Document and Presentation Templates
 - Project Administration Committee
- eScienceTalk

Photo Library

A central store of material gathered at EGI-related events (please inform about the images as far as possible):

- 5th EGEE User Forum at Uppsala, Sweden - 12-15 April 2010
- International Super Computing 2010 (ISC10) at Hamburg, Germany
- EGI-InSPIRE photos

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The EGI blog
Behind the scenes of EGI

[Blog Home](#)

Clouds and Complex Systems in Paris

On Monday I visited a bright but chilly Paris for a meeting with the complex systems community, to talk about grids and clouds. The event was organised by the ASSYST project, which is coordinated by Jeff Johnson of the Open University and funded from the ...

Posted by [Catherine Gater](#) on February 2, 2011 1:39:00 PM CET # [Add a comment](#)

EGI Training Working Group

Support for training is a key user community service that helps EGI expand the size and expertise of user communities. Training within EGI is distributed by nature: NGIs organise training events and NGIs develop training materials. However, EGI.eu contributes to the success of these activities with...

[Read more...](#)

About the blog

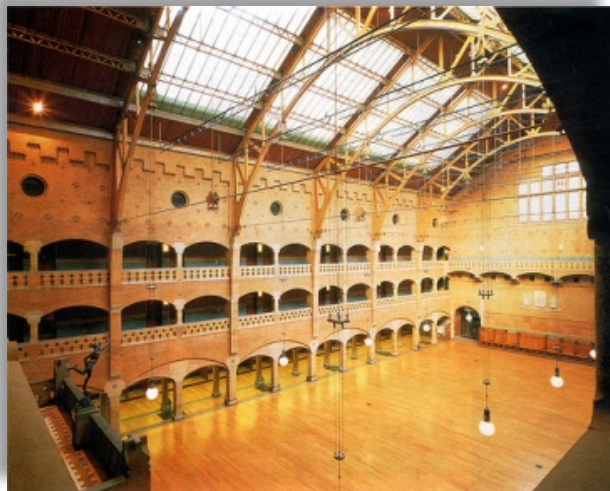
Welcome to the EGI blog, the place to share your ideas, thoughts and activities with the rest of the EGI community. To comment on a post simply login with your SSO account.

If you want to blog regularly please email blog-admin@egi.eu and you will be given access to post with your SSO account.

Login

Username
Password
☐ Remember me

[Subscribe](#)



- 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

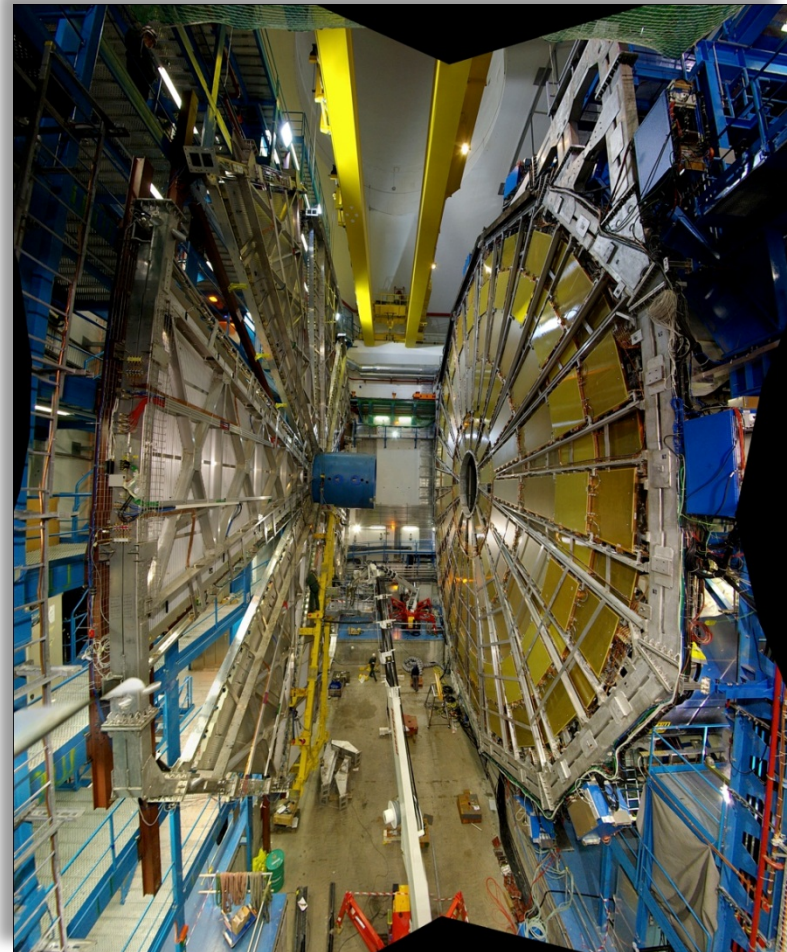
Grid Use Cases

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

Use Case: Large Hadron Collider

- 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.



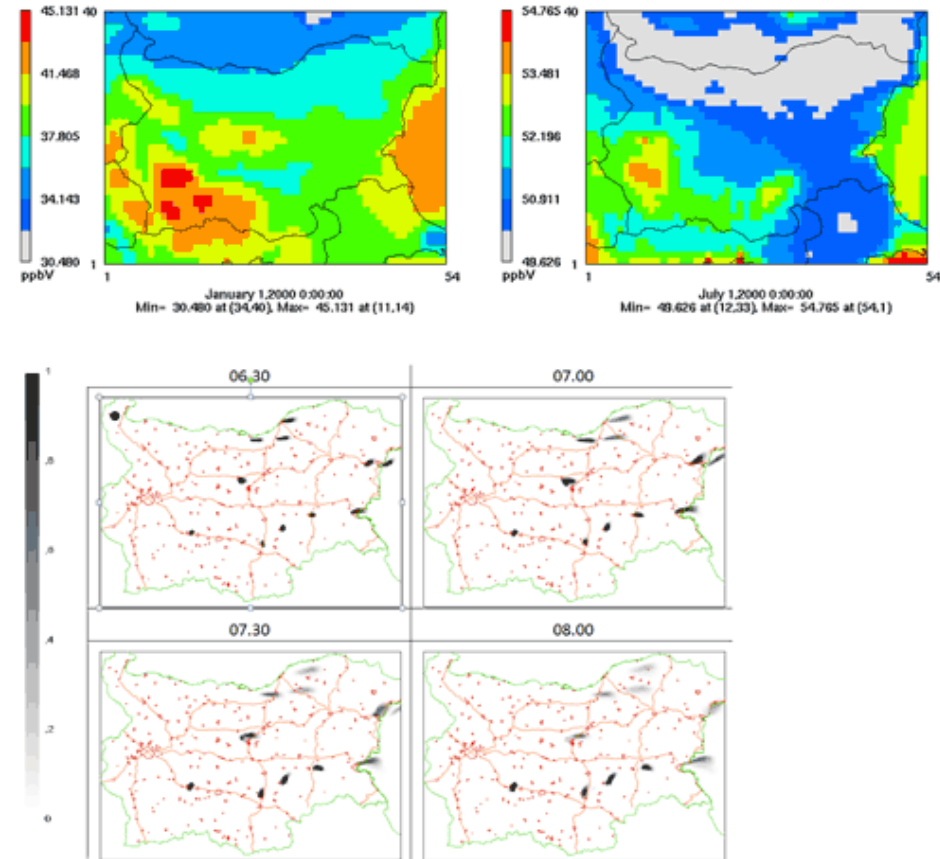
- Mapping the genome of the Netherlands
- Plan to sequence the genomes of 750 Dutch people
- Currently 30Tb of data
- Will generate 20 times that amount

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.

Use Case: Environmental Modelling

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



Use Case: Environmental Modelling

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

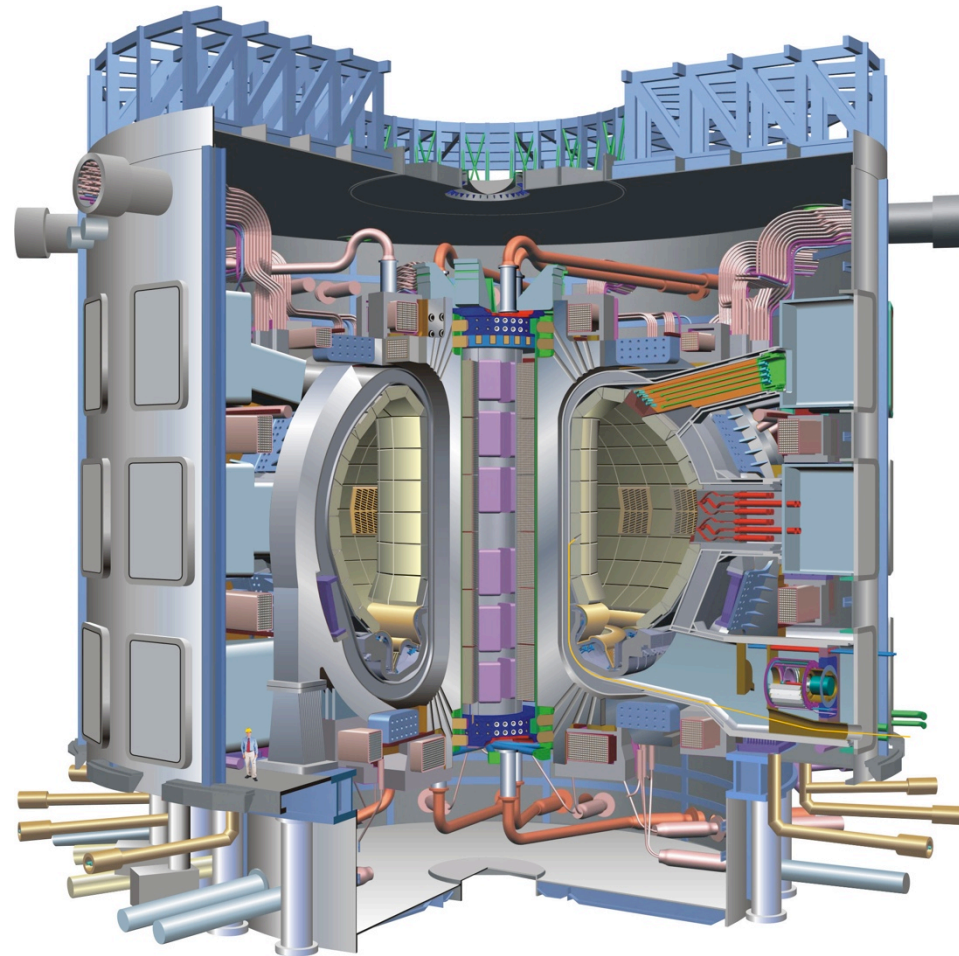
Use Case: ASTRA

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.

Use Case: ITER

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



Use Case: ITER

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

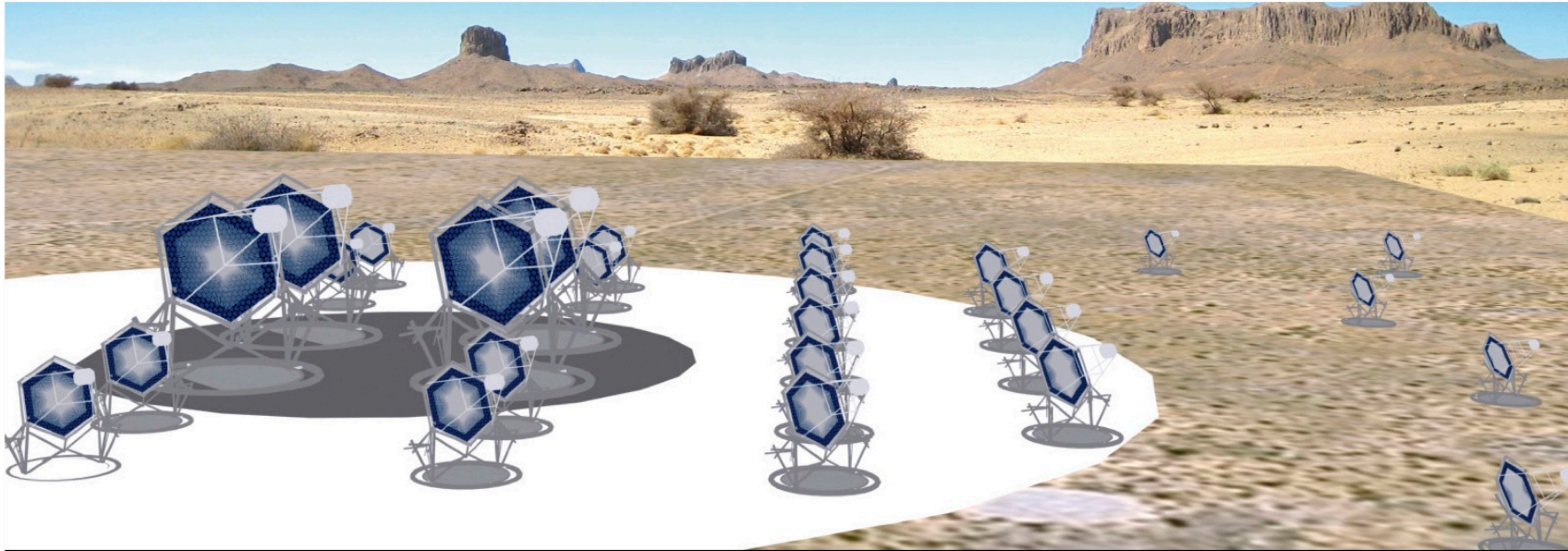
Use Case: DECIDE

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.

Use Case: CTA

- 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

- EGI.eu Director
 - director@egi.eu
- EGI.eu Operations Team
 - operations@egi.eu
- EGI.eu User Community Support Team
 - ucst@egi.eu
- EGI.eu Policy Team
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- EGI.eu Dissemination Team
 - press@egi.eu
- EGI.eu Secretariat
 - contact@egi.eu