

The Open Access initiative in the context of the European ICT Research Infrastructure Service

Open Access Conference

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e-infrastructure



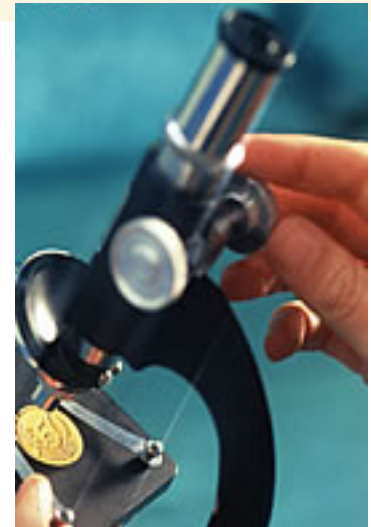
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Political context and role of Science



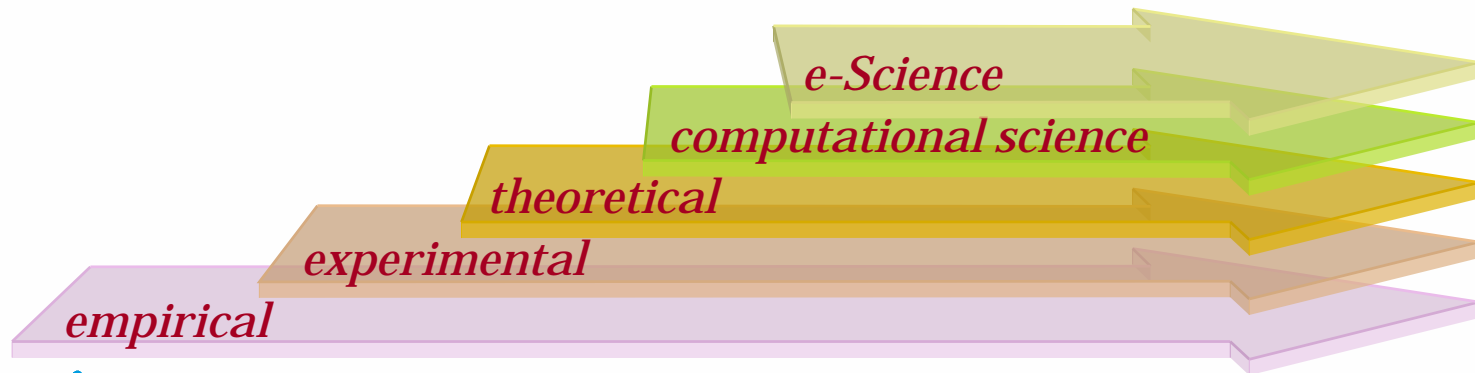
Research & Innovation defines the future of the nations – role of ICT

- Lisbon strategy: Innovation is the most important factor in determining Europe's success through next decades
- Innovation is the societal and economic manifestation of hope (*"Innovate America"*, Dec 2004)
- Innovation is fuelled by scientific research
- ICT: EU's most innovative and research intensive sector (standing for 25% of total EU research effort, 5.6% of GDP, and 45% of EU productivity growth in 2000-2004) (*EU i2010 Annual Report 2006*)



Science in the 21st century

- Global challenges with high societal impact (e.g. climate, environment, energy...)
- Big challenges... need of multi/inter-disciplinary research... global collaborations (spread of skills and knowledge)... sharing of resources
- Data deluge... born digital material
- Mediating/enabling role of ICT... addressing complexity



***e-Infrastructure:
- ICT facilities and services
enabling scientific research
- supporting Open Access
implementation***

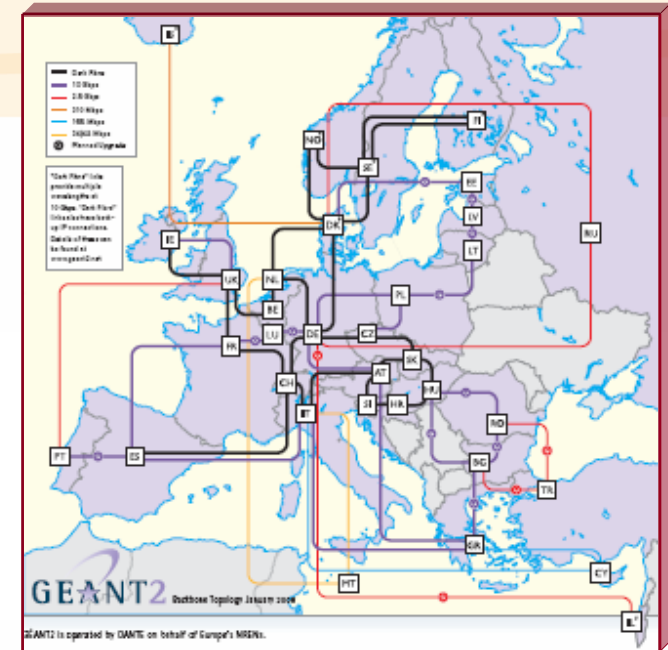
e-Infrastructure - main service categories

- **Connectivity**
- **Access to mash commodity computing & storage resources (grids...)**
- **Access to High End Computing (HEC)**
- **Access to data across organisational and scientific-discipline boundaries**
- **International links**

Connectivity service (GÉANT)

Connectivity service model

- Full-fledged operational service to all research institutes in Europe
- “One-stop-shop” service provision on National (NREN) & EU-level (DANTE)
- Model: agreed sharing of connectivity-costs among partner-countries; stable funding scheme



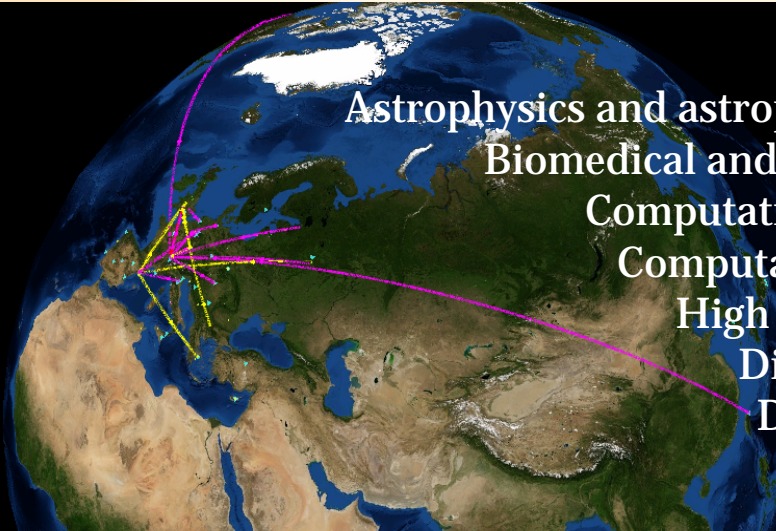
- Pan-European coverage
(40+ countries / 3900 universities / 30+ million students)
- Hybrid architecture:
 - connectivity at 10 Gb/s (aggregated traffic)
 - dark fiber wavelengths (demanding communities)



Access to mass commodity computing & storage (EGEE III)

EGEE
Enabling Grids
for E-science

Scheduled = 17356
Running = 18359



Astrophysics and astroparticle physics
Biomedical and bioinformatics
Computational chemistry
Computational sciences
High Energy Physics
Disaster recovery
Digital Libraries
Earth sciences
Infrastructure

- >250 sites
 - >60 000 CPUs, 25 Pbyte of storage
 - ~150 000 jobs successfully completed per day
 - 200 Virtual Organisations
 - >8000 registered users, representing 1000s of scientists
- Geophysics
Finance
Fusion

- *Model based on pooling of computing resources using common or interoperable middleware platforms*
- *Middleware developments heavily based on Open Source model*

EGEE/National service provisioning model

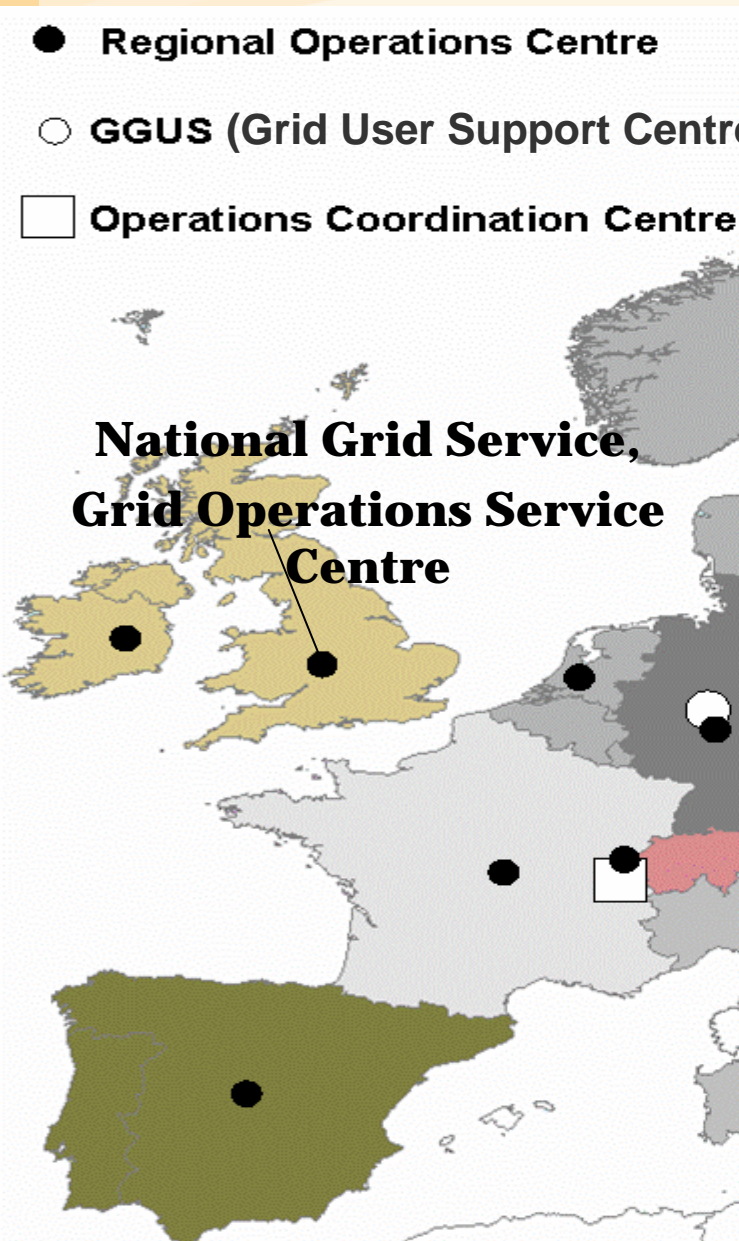
● Regional Operations Centre

○ GGUS (Grid User Support Centre)

□ Operations Coordination Centre

National Grid Service,
Grid Operations Service
Centre

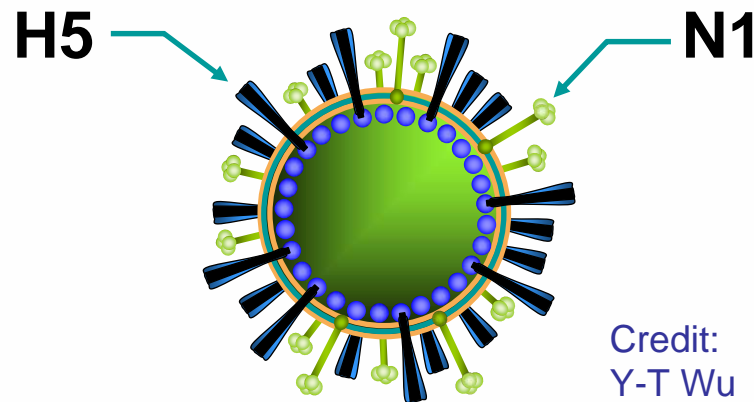
- **Regional Operation Centres (ROCs) and Regional Support Teams** for basic service operation and first level support on the national or regional level; those are based on national or regional grid service centres
- **Operations Coordination Centres (OCCs)** as more central entities that manage the operation of the entire EGEE Grid from a single centralised location
- **Grid User Support centres (GGUSs)** coordination and oversight for user support in EGEE; they provide a well-known place where all user queries may be directed to ensure that they are addressed
- **VO Support** registration, treatment of VO issues



Example press article on EGEE

EGEE Grid attacks Avian Flu

During April 2006, a collaboration of Asian and EU laboratories has analysed 300,000 possible drug components against the avian flu virus H5N1 using the EGEE Grid infrastructure (for the docking of 300,000 compounds against 8 different target structures of Influenza A neuraminidases, 2000 computers were used during 4 weeks – the equivalent of 100 years on a single computer)



Current grid-based resource-provisioning model under evolution

EGI_DS (Design study)



NGI-
Nordic States

Key elements of new scheme:

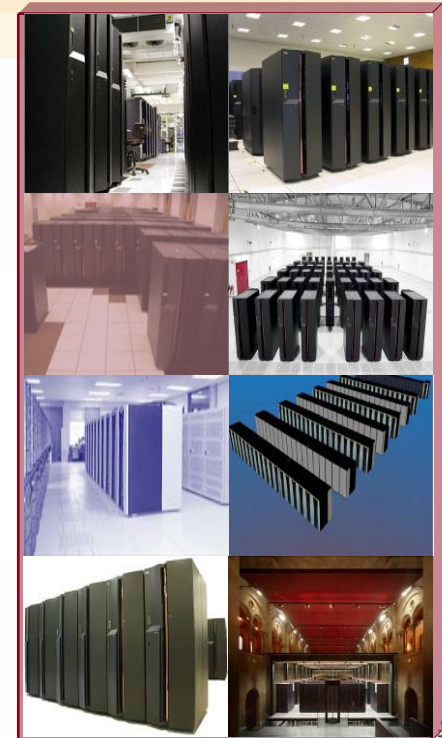
- Coordination/pooling of National and European funding for sustainable service provision and for more efficient planning of investments
- Service provisioning beyond project cycles
- One-stop-shop service provisioning (including training) to users who want to access grid-based resources


NGI-GR



DEISA2: access to virtual HEC resources

- 11 sites/7 countries connected at 10 Gb/s
- Model: *pooling* of HEC-time for grand scientific applications (EU level)
- *Aggregated* peak performance close to 1 Petaflop
- Global data management service



 Distributed
European
Infrastructure for
Supercomputing
Applications

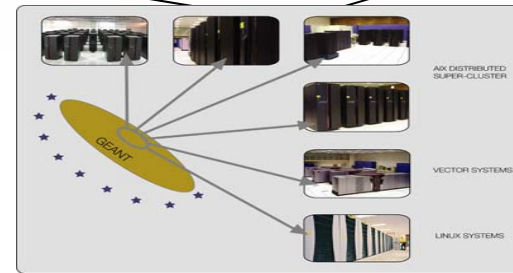
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DEISA2 service provisioning model

Service layer on top of National supercomputing service schemes using grids

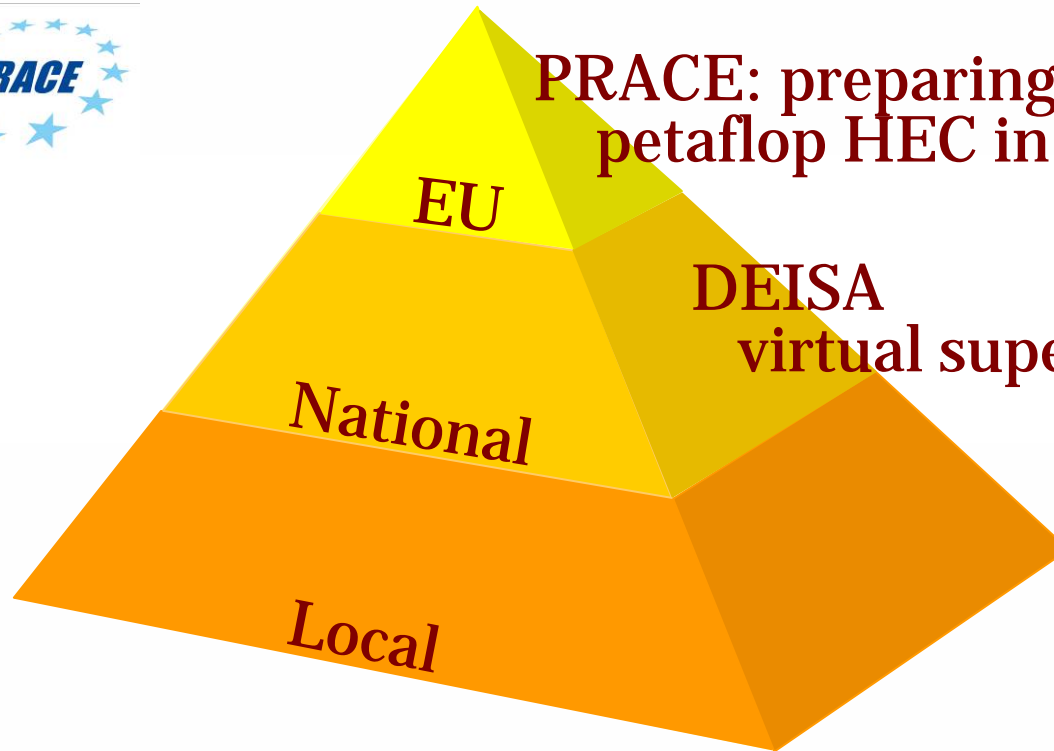
Enabling new applications through re-engineering national production quality codes to operate on DEISA (EU-level) grid



DEISA Extreme Computing Initiative (DECI) enables use of DEISA by “grand challenge” applications in science and engineering

- Calls for proposals to select new applications (many in operation, e.g. Cosmology, Materials Science, Fluid Dynamics, Biophysics)
- Support by Applications Task Force (ATASKF) (consultancy...)
- Service differentiation for different classes of applications

PRACE: new generation HEC resource (petaflop scale)



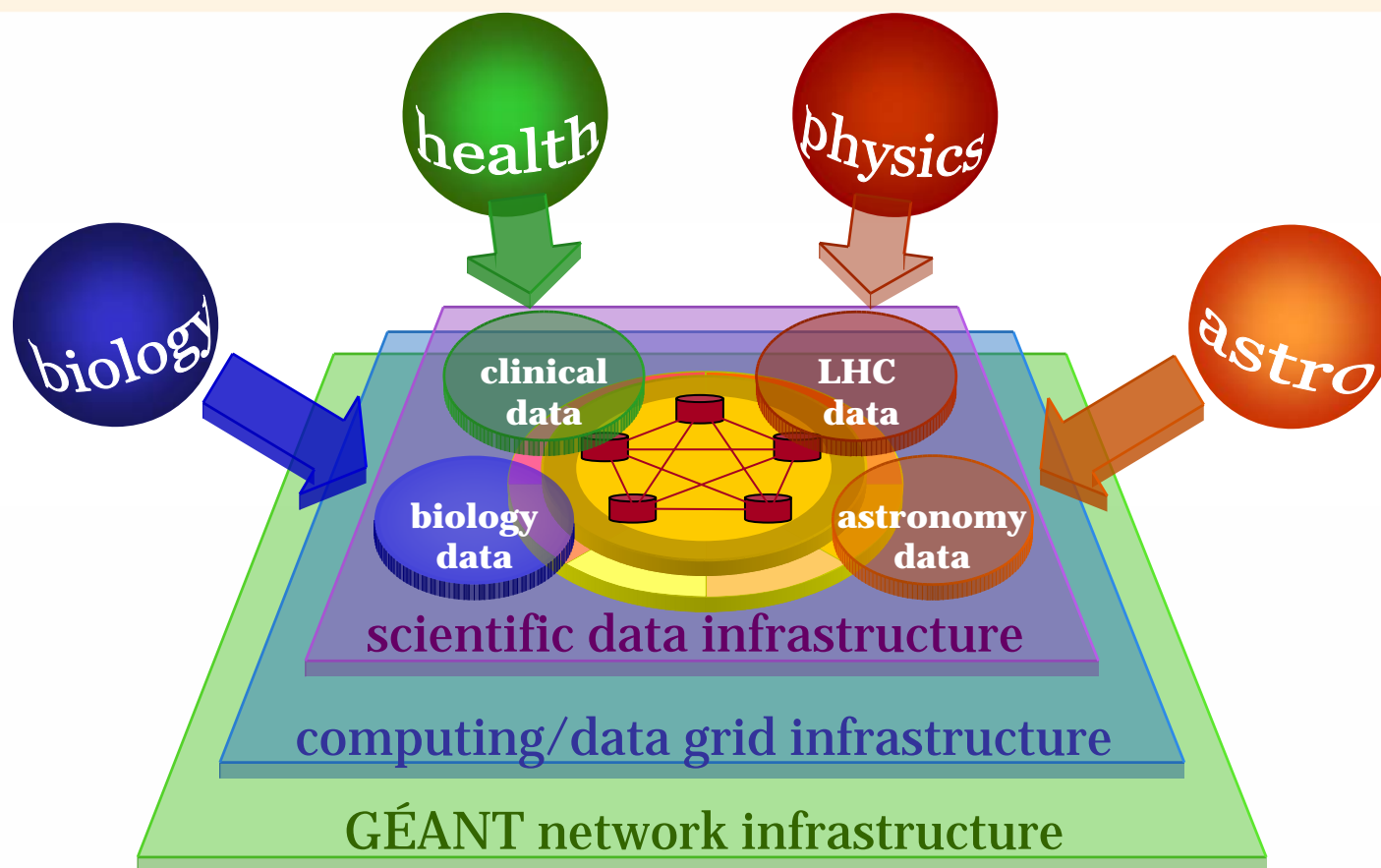
PRACE: preparing framework for
petaflop HEC in Europe

DEISA
virtual supercomputer access

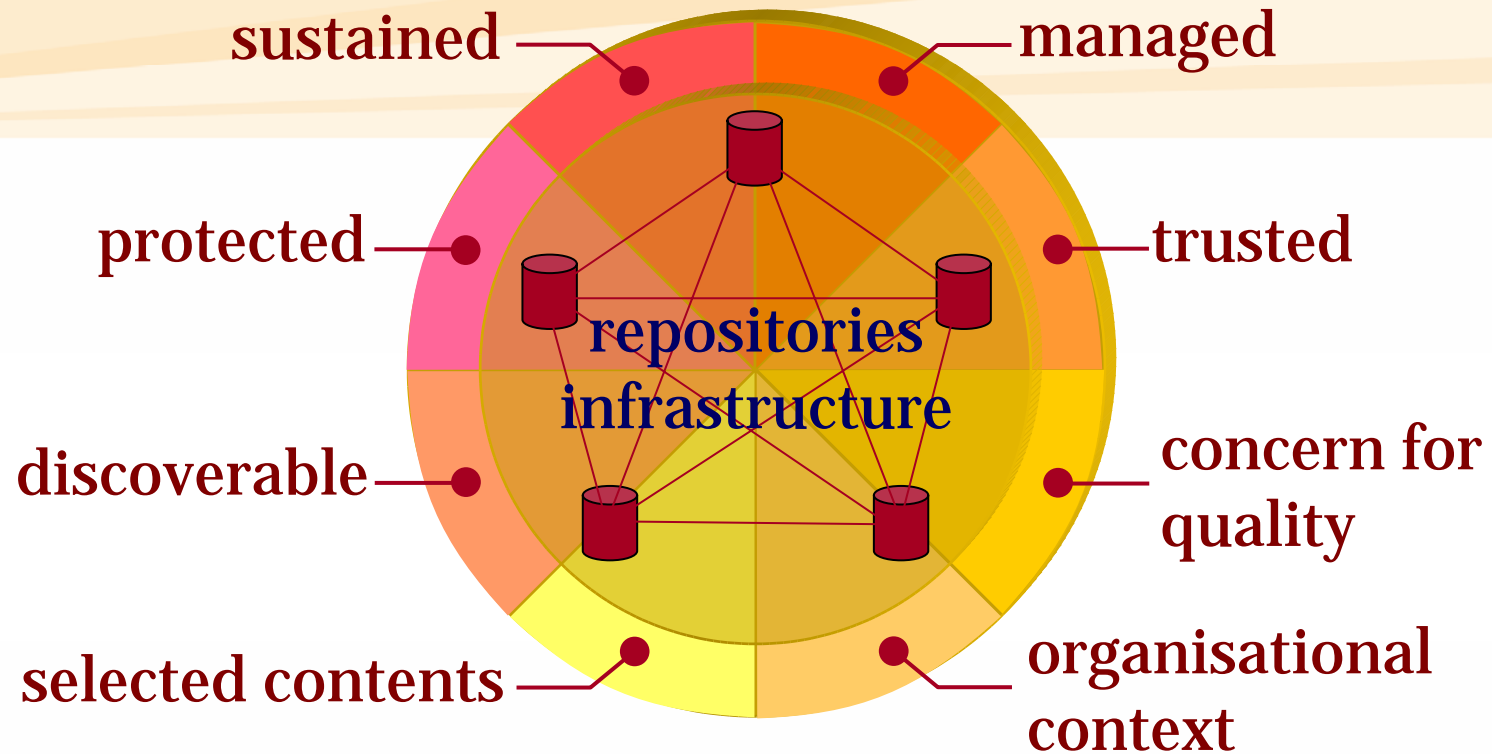
- *For the first time agreement among Europeans to co-fund such an infrastructure*
 - *Shared use model*



Access to data (data as an infrastructure)



Focus: repositories, enhanced use, sharing



Address key requirements on data infrastructures:

- Data preservation, curation
- Enhance extraction of meaning from & use of data within scientific disciplines and across them
- Incentives for sharing

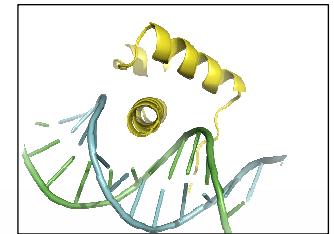
Examples of data infrastructure projects



Flexible, robust, scalable and cohesive pan-European infrastructure of Digital Repositories

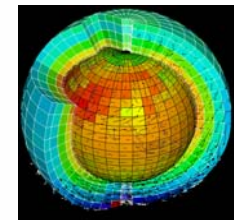


Improving protein annotation through coordination and integration of databases



METAFOR

Common Information Model and tools for using climate data and models



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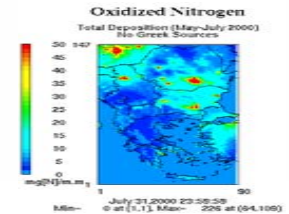
e-Infrastructure Prog. supporting further the involvement of user communities

- **Funding provided for linking of new user communities to existing infrastructures (“User Communities” calls for proposals of e-Infrastructure programme)**

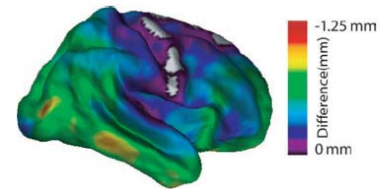
Examples: involvement of new user communities using targeted funding



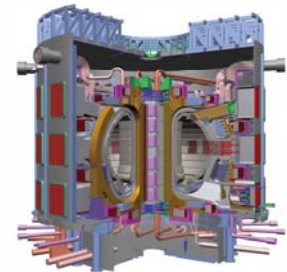
VOs on seismology, meteorology and environment, supported by south-eastern Europe grids



Grid for European neuroscientists working in the field of imaging of Alzheimer's disease



Modelling capabilities for ITER and future fusion devices using parallel Grid computing and HPC



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New EU initiative: Open Access (OA)

http://ec.europa.eu/research/science-society/open_access



What is Open Access?

- **Alternative mechanism (e.g. to that of peer reviewed publications in scientific journals) for scientific information to be openly accessible at no cost over the internet**
 - **Scientific information can be of any form (articles, data etc)**



Open Access and e-Infrastructure

In implementing the Open Access policy there is a need to address questions like:

- **Where to store my scientific information if no on-line facility is available?**
- **How to ensure common EU-level standards in accessing such scientific information?**
- **Where to get help/training?**



Call for Proposals to support technical implementation of OA-pilot

Call: INFRA-2009-1.2.3 - Scientific Information Repository supporting FP7

- **Call published on 9 Dec 2008; deadline 17 March 2008; budget: €4 m**
- **Seeks projects to support the establishment & operation of a technical infrastructure of digital repositories to deposit & access scientific articles & data produced under FP7 (incl. those of European Research Council)**



Call for Proposals to support technical implementation of OA-pilot

Facility should among other services provide:

- **Helpdesk and 24/7 operational service**
- **Post print authoring tool to allow researchers to convert articles into more readable & user friendly formats**
- **Monitoring data and statistics on use**
- **Information and guidance on use (training...)**
- **Preparatory action towards extension of e-Infrastructure ability to cope with storage, management & access of scientific data**

Further information: <http://cordis.europa.eu/fp7/ict/e-infrastructure/>

Relevant Work Programme: Research Infrastructures 2009

ftp://ftp.cordis.europa.eu/pub/fp7/docs/wp/capacities/infrastructures/n_wp_200901_en.pdf

Summary

- **It is important to further support the Research and Innovation process in Europe**
- **New *Open Access* EU-policy aims at accelerating and enhancing innovation**
- **e-Infrastructure in the front line of supporting pilot implementation of Open Access policy**

***The real voyage is not about discovering new
lands but about looking things with new
eyes...***

Thank you