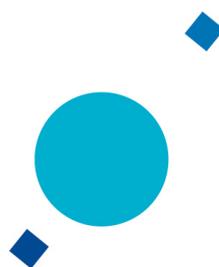# EuroVO DCA WP5

Dr. Giuliano Taffoni

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INFORMATION
SYSTEMS UNIT

Topics

- Describe the Activity of WP5;
- Summarize the results of the kickoff
  - IVOA position on computational GRIDs;
  - Astronomers and the GRIDs;
  - Short-time activity plans;
- Know more about France community.

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EuroVO Data Center Alliance

- Coordinate and assist European Data Centers;
- Produce a knowledge GRID (data + services)
- Coordinate with national and international GRID projects

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What is WP5?

- Interest area: massive and distributed computing, Grid computing;
- Promote coordination between GRID(s) and VObs;
- Point of view of Data Centers;
- GRID(s) through Data Centers.

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...in practice

- How can Data Centers benefit of of GRID computing?

- How can Astronomers can benefit of Grid computing?

- We can give suggestions....in principle!

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Activity Plan

A. **Knowledge acquisition;**

B. **Interactions/Interoperation;**

C. **Coordination;**

D. **Suggestions and guidelines;**

E. **Dissemination.**

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A. Knowledge Acquisition

- Survey of European/National/Campus GRID initiatives.

- Astronomers that use the GRID, do they exist?

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GRID(s) Initiatives in EU

- We currently see different flavors of GRIDs deployed
  - Because of application needs, legacy constraints, funding, etc. (ex IVO)
  - Diversity is essential to find best solutions;
- Grid computing standards are only being defined (OGF);

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"Wise" analysis

- Grid => evolving standards
- Grid => de facto standards
- Not always a production environment follows **the** standards!
- We shall be careful.

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GRID Initiatives: the census

- Location and "distribution";
- Middleware tools;
  - Authentication and Authorization
  - Data Management
  - Job Management
  - Information system
- Production status.
- Census already started...some help?

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Astronomers and the GRID

- Who is using the GRID
- Which GRID we are using
- How we use the GRID
- What is our expectations towards the GRIDs

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Objection, objection, objection, objection

Grid Definitions

- "A computational grid is a hardware and software infrastructure that provides dependable, consistent, pervasive, and inexpensive access to high-end computational capabilities.
    - Carl Kesselman & Ian Foster in "The Grid: Blueprint for a New Computing Infrastructure" 1998

- "Grid computing is coordinated resource sharing and problem solving in dynamic, multi-institutional virtual organizations"
    - Carl Kesselman & Ian Foster in "The Anatomy of the Grid" 2000

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Grid essentials

- "You can't be a real country unless you have a beer and an airline. It helps if you have some kind of a football team, or some nuclear weapons, but at the very least you need a beer".
  - » Frank Zappa

- You can't be a real Grid unless you have a **commodity** and a **discovery** mechanism. It helps if you have some kind of **middleware** or some supercomputers, but at the very least you need a commodity.

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IVO is a GRID

by Guy Rixon @ kickoff meeting

- ☑ Commodity
- ☑ Discovery
- ☑ Middleware
- ☐ Computational resources
- ☐ Supercomputers
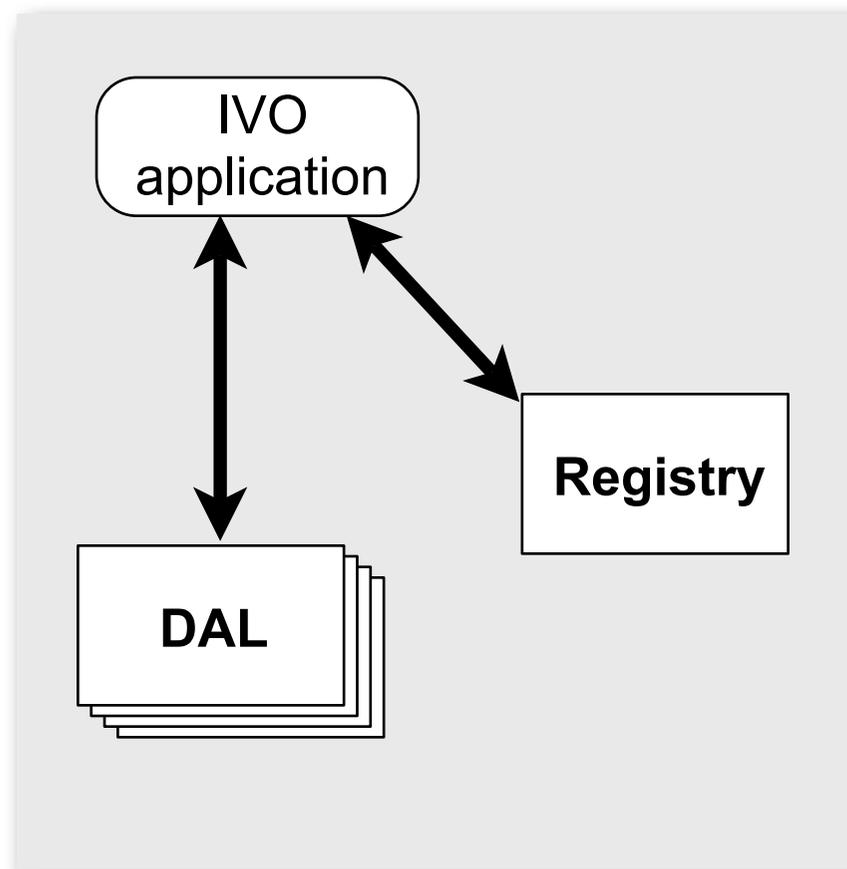
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IVOA standards for computational GRIDs

by Guy Rixon @ kickoff meeting

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IVOA standards for computational GRIDs

by Guy Rixon @ kickoff meeting

NO ONE!!!

Reasons

by Guy Rixon @ kickoff meeting

1. It's hard
2. How could we choose between competing systems?
3. ...
4. Compute Grid knows no Astronomy

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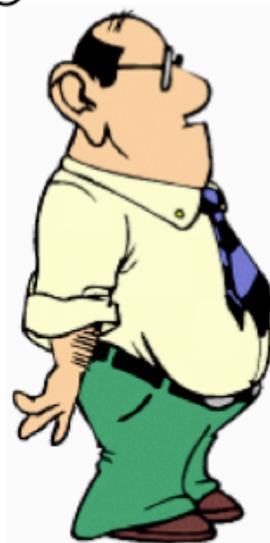
Applications VS. Compute

Theory in the IVO

- Theory is becoming important in the VObs
- Inclusion of theory data in the IVO
  - data already produced;
  - data produced on the fly;
- Virtual telescope.
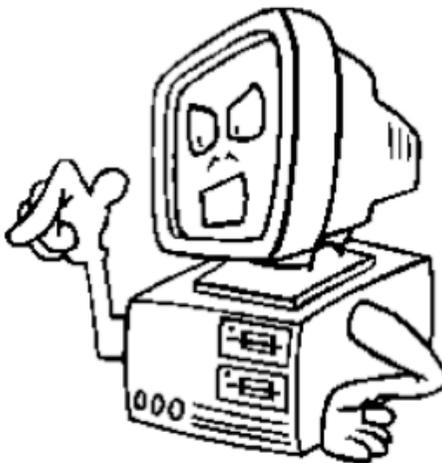- Theory:
  - BaSTI, S.A.M for Galaxy formation etc...

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Service provider problem

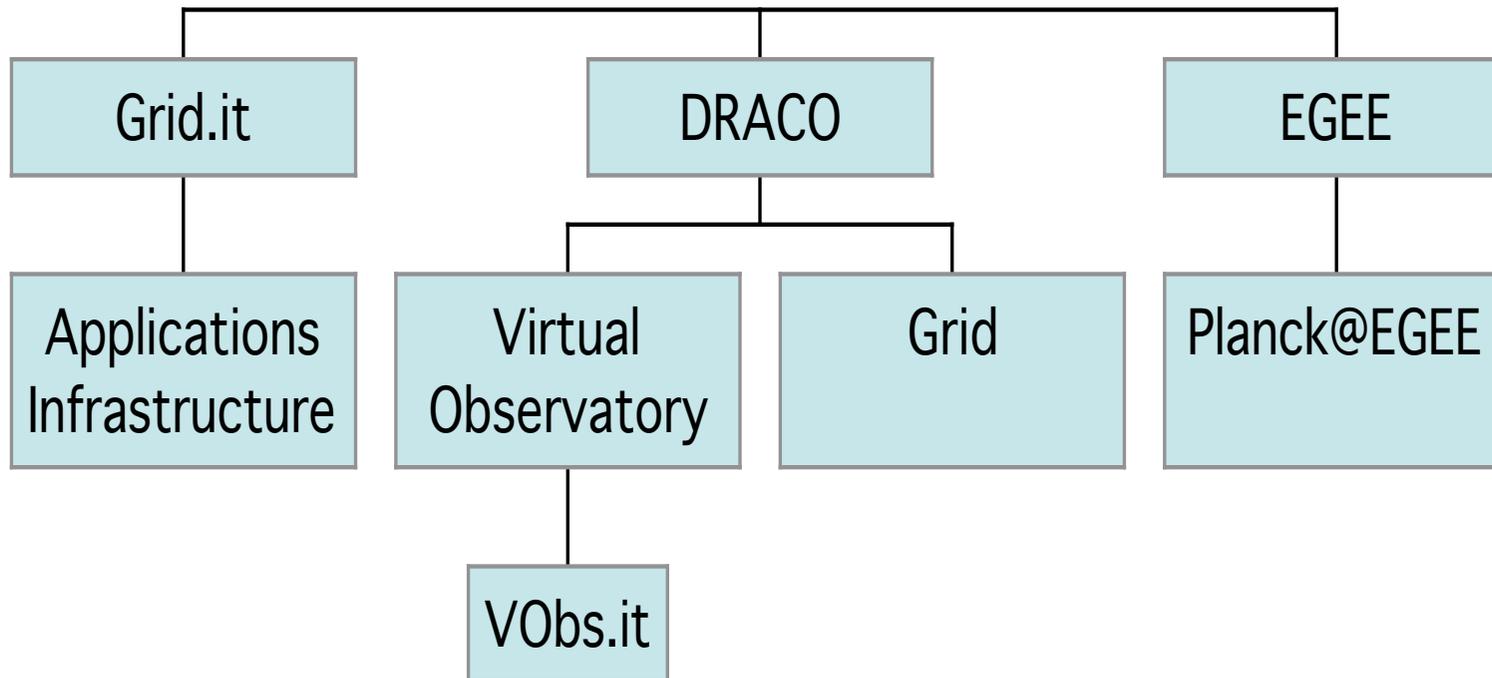# Astronomical Grid Users

- Happy and growing Astronomical community that uses GRID.

- Different experiences in different countries

I need to run this code X (which I wrote) and I don't care where it runs. It's big; deal with it. Don't bother me with the details.

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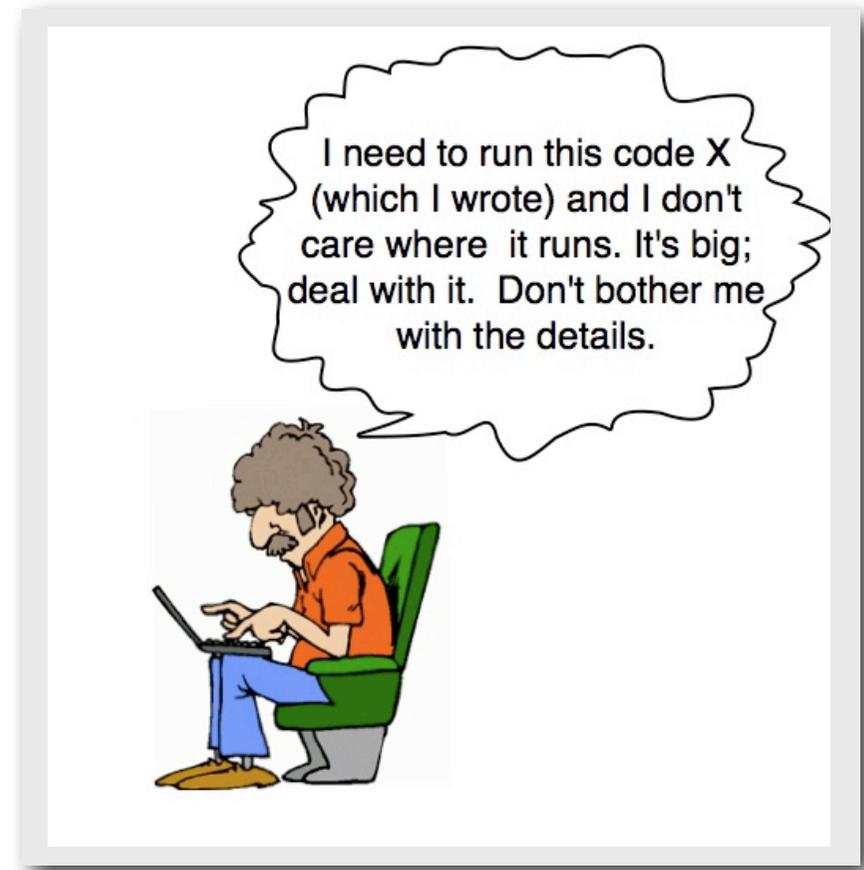
Astronomers Experience

- ITALY

Astronomers Experience

- ESA:
  - Local GRID
  - GaiaGRID
  - GRID for Hearth Observations
  - Exploring the use of computational GRID(s) for Data Centers (ESAC)

- Particularly appealing as they can experience GRID computing on ESA fast network

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Astronomers Experience

- Germany:
  - AstroGrid-D
  - Globus 4 and GADGET
  - Exploring the use of the GRID for Astronomers
  - Exploring the Use of the GRID for Theoretical Data Centers

- They are looking at the GRIDs evolution...

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Astronomers Experience

- Spain: just starting;
- Planck@EGEE;
- MAGIC (@EGEE)
- etc...

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Users experience

...what we need...

- Let emerge the different experiences
  - national and local level;
  - difficult to count, they do not deal with specific projects;
- Collect suggestions;
- New tools: gridftp driver for CFITSIO

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B. Coordination

- Keywords
  - Interoperability
  - Usability
  - Re-usability

- Identification of partners and counterparts

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Keywords

- Useful Informations from GRIDs:
  - tools and services already developed!
  - problems already faced
  - dead-end already encountered
- Why not to use them instead of re-inventing?
  - the SSO example (see later)
- EuroVO Tech DS3 collaboration!

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Customers & Collaborators

- IVO
  - GRID and Web Services
  - Theory Group
- EuroVO community
  - WP4 (theory)
  - VOtech DS3
- Grid communities
  - EGEE, OGF, DEISA, "national/local" initiatives.

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The new ERA for e-infrastructure

GARR Conference
18 May 2006

Moving e-Infrastructure into a new era
the FP7 challenge

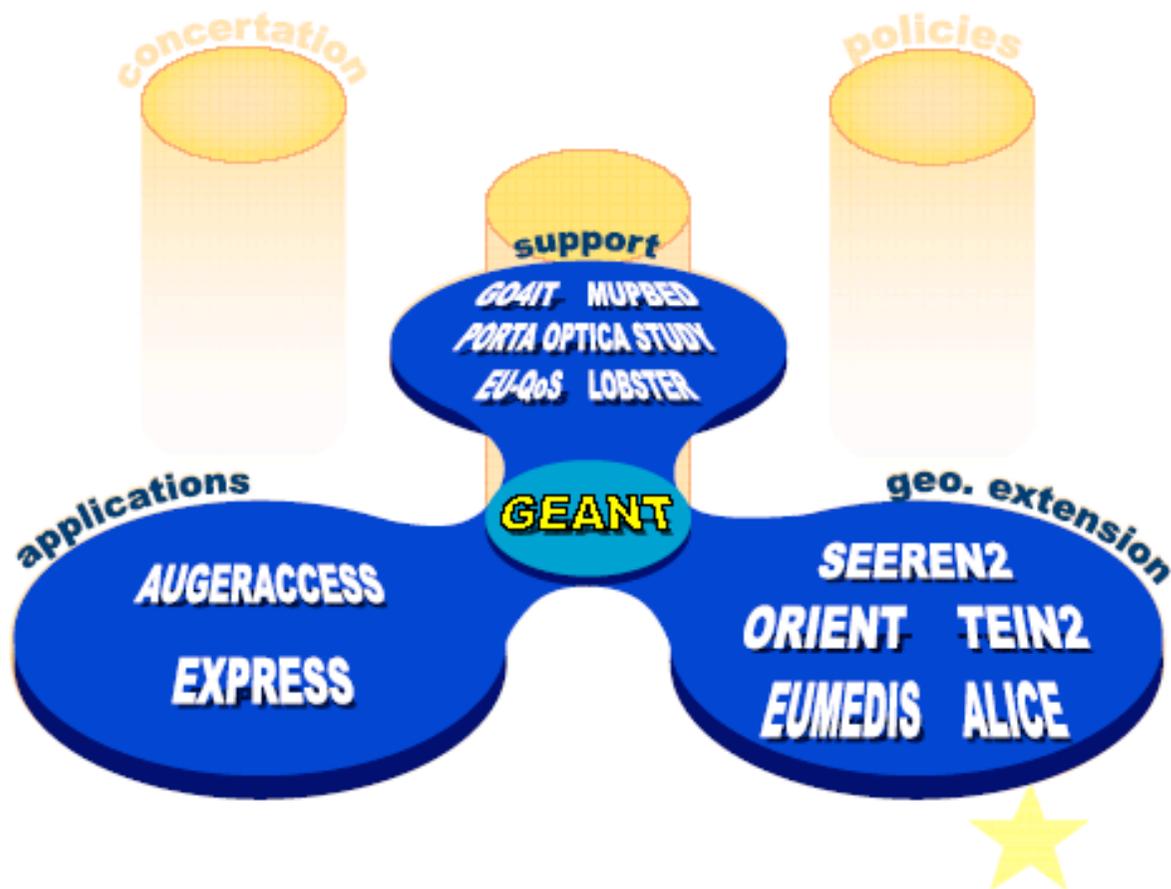Mário Campolargo

European Commission - DG INFSO
Head of Unit Research Infrastructures

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E-Sci Network Layer

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E-Sci Grid Layer

Scientific Data Layer

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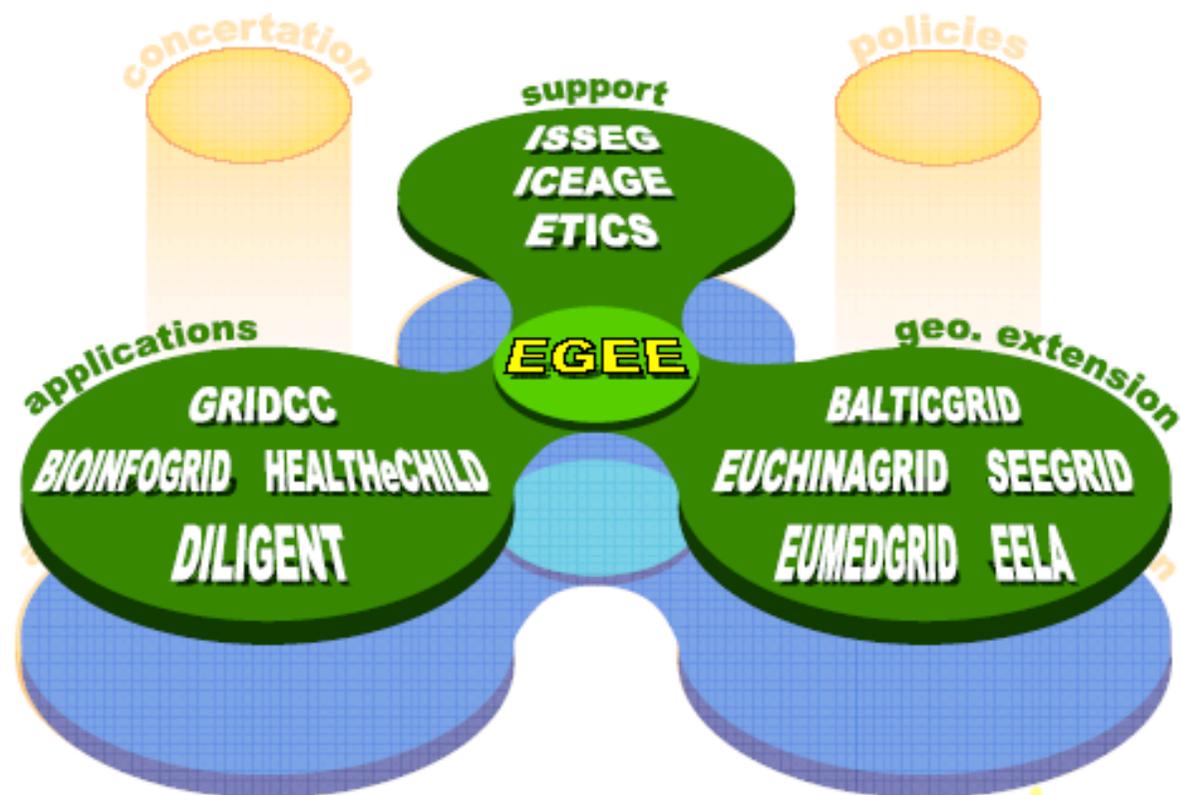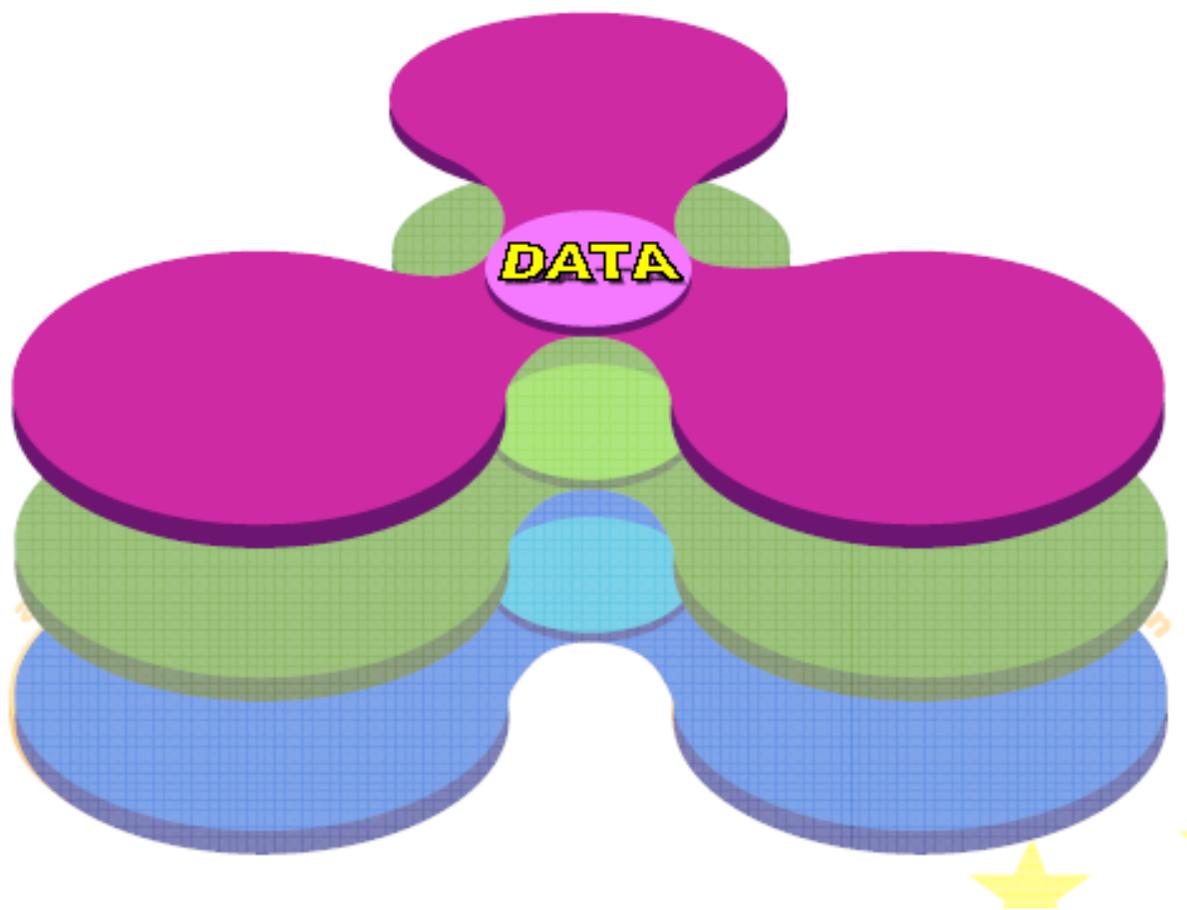
EuroVO DCA and EGEE

- Important to interoperate;
- Demonstrate that we can (and we will) use EGEE infrastructure;
- New EGEE Virtual Organization: EuroVO;
- Interoperability envelop over gLite
- A new application specific environment for EGEE

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Not only EGEE

- DEISA;
- ex: AstroGrid-D will use Globus
- what are the other Grid projects and what are their peculiarities?
  - We already make a preliminary census
    - for country, middleware, production status
- How can we access also those resources?

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Core Topics

- Authentication & Authorization
- Data Management;
- Job Management

- Single-sign-on

- VOSpace
- Workflows

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A first problem

Auth&Auth

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Auth&Auth

- Authentication and authorization mechanisms:
  - VOMS
  - Shibboleth
  - etc...

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Auth&Auth

- Authentication and authorization mechanisms:
  - VOMS
  - Shibboleth
  - etc...

- Single-sign-on

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Auth&Auth

- Authentication and authorization mechanisms:
    - VOMS
    - Shibboleth
    - etc...

- Single-sign-on-double-functionality

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Auth&Auth

- Authentication and authorization mechanisms:
  - VOMS
  - Shibboleth
  - etc...

- Single-sign-on-double-functionality

- User certificate, host certificate, application certificate...

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C. Suggestion and Guideline

- HOWTOs
  - best practice procedures to access Grid facilities from DCs
- Suggestions (e.g.):
  - Similar/compatible auth&auth procedures ?
  - Data sharing between DCs and Grid ?
  - Interoperable workload management systems ?
- First example:
  - Technical Document on Auth&Auth
  - Collaboration with DS3

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Documents are not Enough

- We must test before making suggestions;
- We identify two use cases:
  - data oriented
  - theory oriented
- Experiences, experiences, experiences

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D. Dissemination

- Pervasive knowledge of Grid systems to DCs:
  - HOWTOs
  - Single knowledge repository: up-to-date pointers to documents on Grid Initiatives
  - Workshop
  - Schools (in coordination with Grid projects)

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Knowledge Repository

- Information on Grid is also distributed ...
- Grid info for DCs:
  - Documentation;
  - API + CLI;
  - Examples
- Grid info for users
- Very complex and time-consuming

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Re-Dissemination

- Collections of VObs requirements;
- Make Grid initiatives aware of the VObs requirements;
- Interoperating is a two way interaction!!!

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Conclusions

- Census and Questionnaire
- Catalyze energy on GRIDs
- Interactions with DS3
- EuroVO: experience to port/export to IVOA

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Thanks for your attention