Enabling Grids for E-science in Europe

www.eu-egee.org

Induction to Grid Computing and the EGEE Project, Vilnius, 5-6.10.2004

GENIUS and GILDA

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NeSC Training Team

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Contents

Enabling Grids for E-science in Europe

- Why GENIUS is needed
- GILDA
- GENIUS (functionality and how it works)
- Example Applications
- Introduction to the Practical

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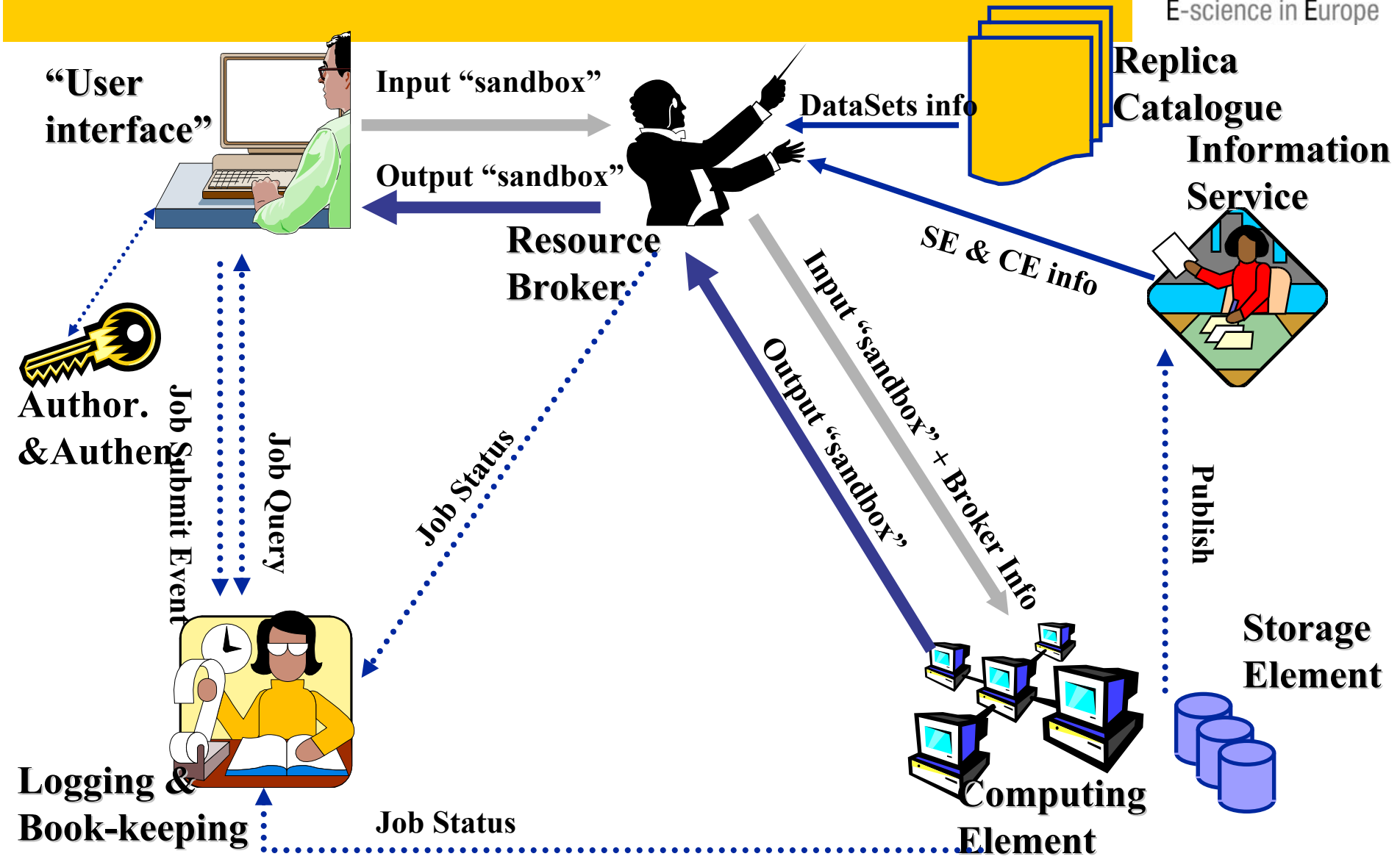
Middleware components



LCG2 Command Line

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- edg-job-list-match –vo gilda HelloWorld.jdl
- edg-job-submit --vo gilda -o job.id HelloWorld.jdl
- edg-job-status -v 1 -i job.id
- edg-job-get-output -i job.id --dir .

The New EGEE Middleware

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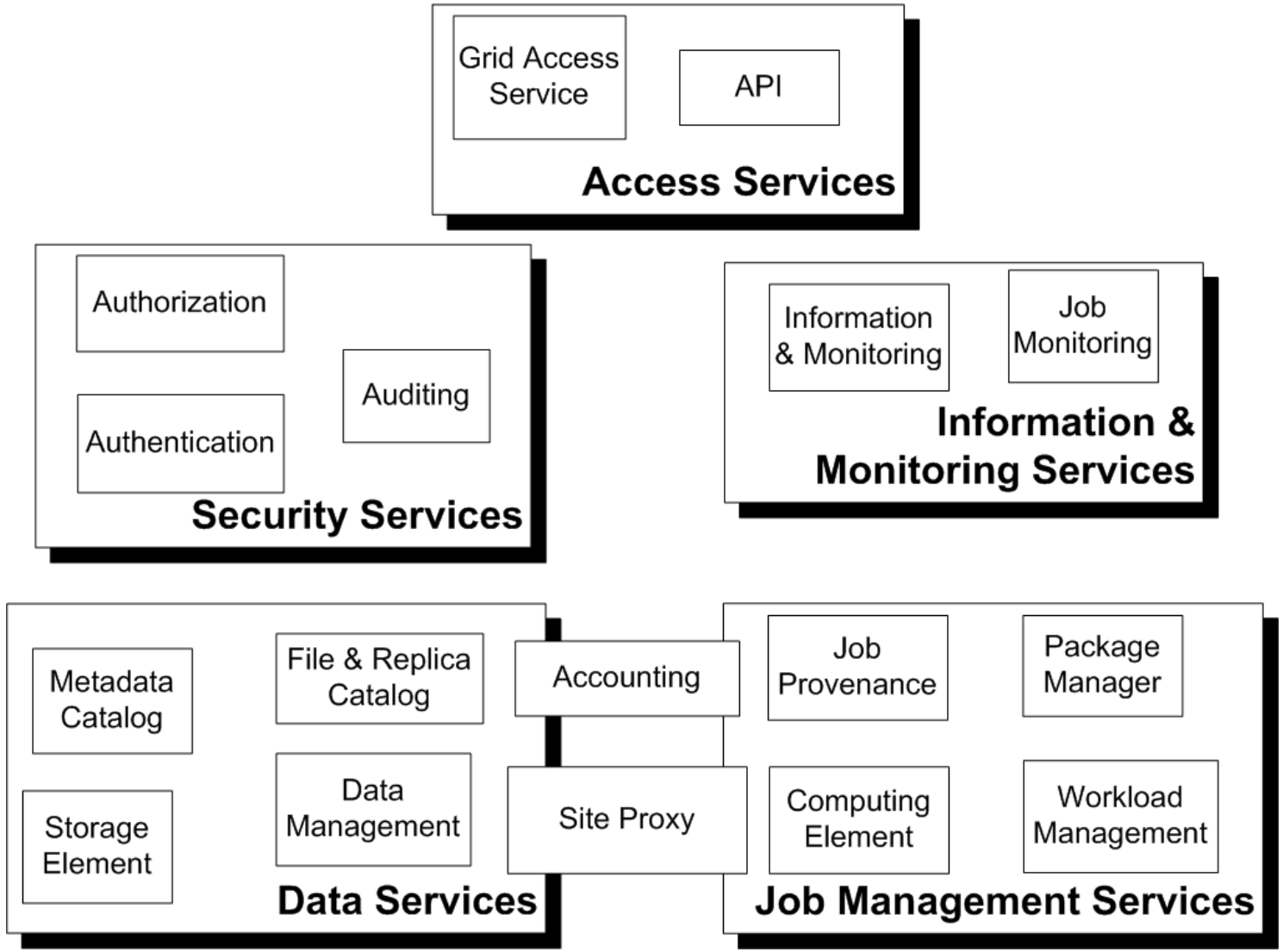

GENIUS: A grid portal

Grid Enabled web eNvironment for site Independent User job Submission

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- Avoids users needing to learn complex command line interfaces to the Grid
- It can be accessed from everywhere and by “everything” (desktop, laptop, PDA, mobile phone).
- It can keep the same user interface to several back-ends (including the switch to new EGEE middleware).
- It must be redundantly “secure” at all levels
- Grid services “a mouse click away”.

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GILDA

Grid INFN Laboratory for Dissemination Activities

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A virtual laboratory to demonstrate/disseminate the strong capabilities of grid computing.

GILDA incorporates:

- The Gilda Testbed
- GENIUS
- Grid-Demonstrator
- Grid-tutor
- A monitoring system using GridICE

The GILDA home page (https://gilda.ct.infn.it)

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The GILDA Virtual Organization

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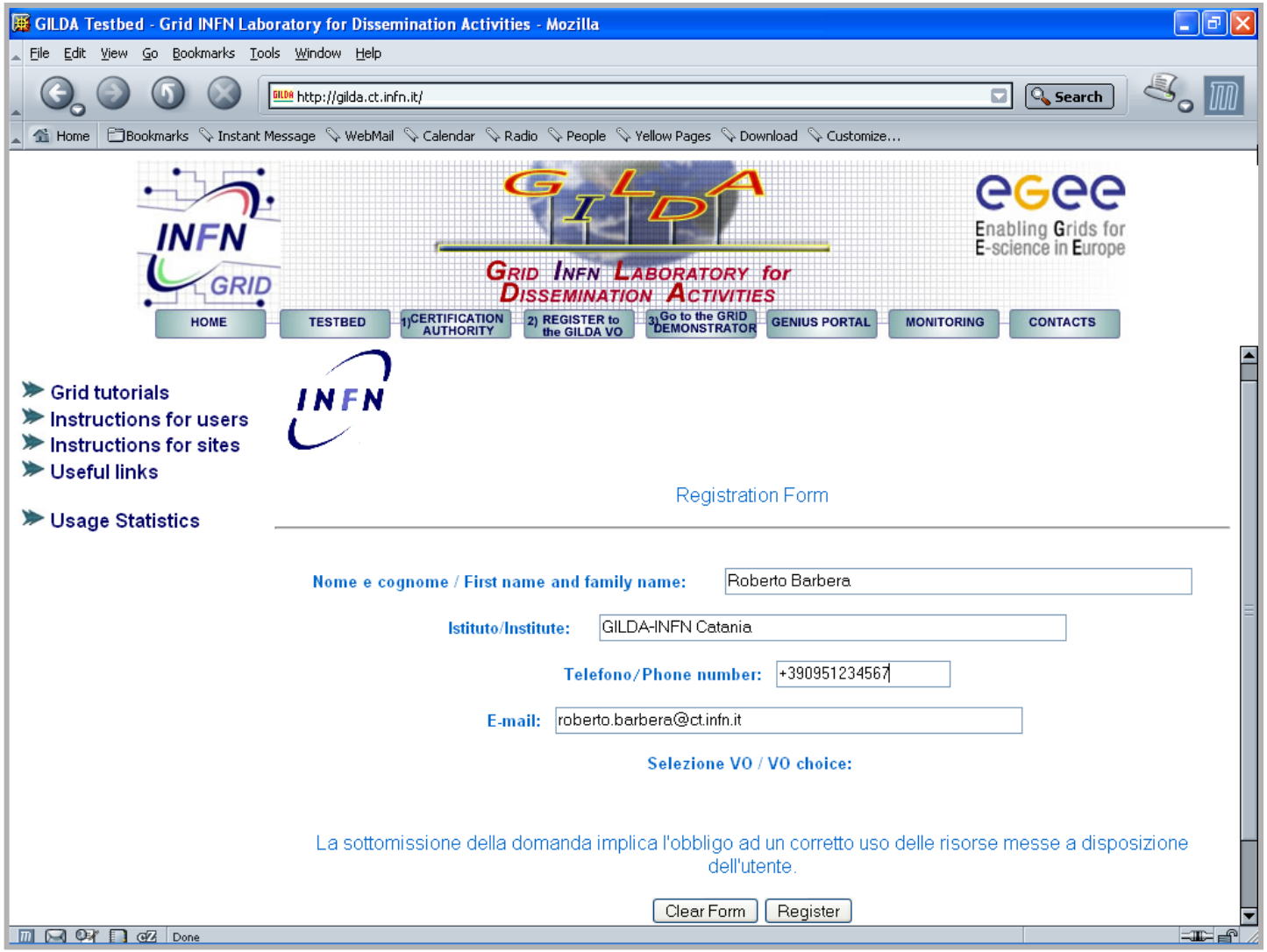

The GILDA Certification Authority

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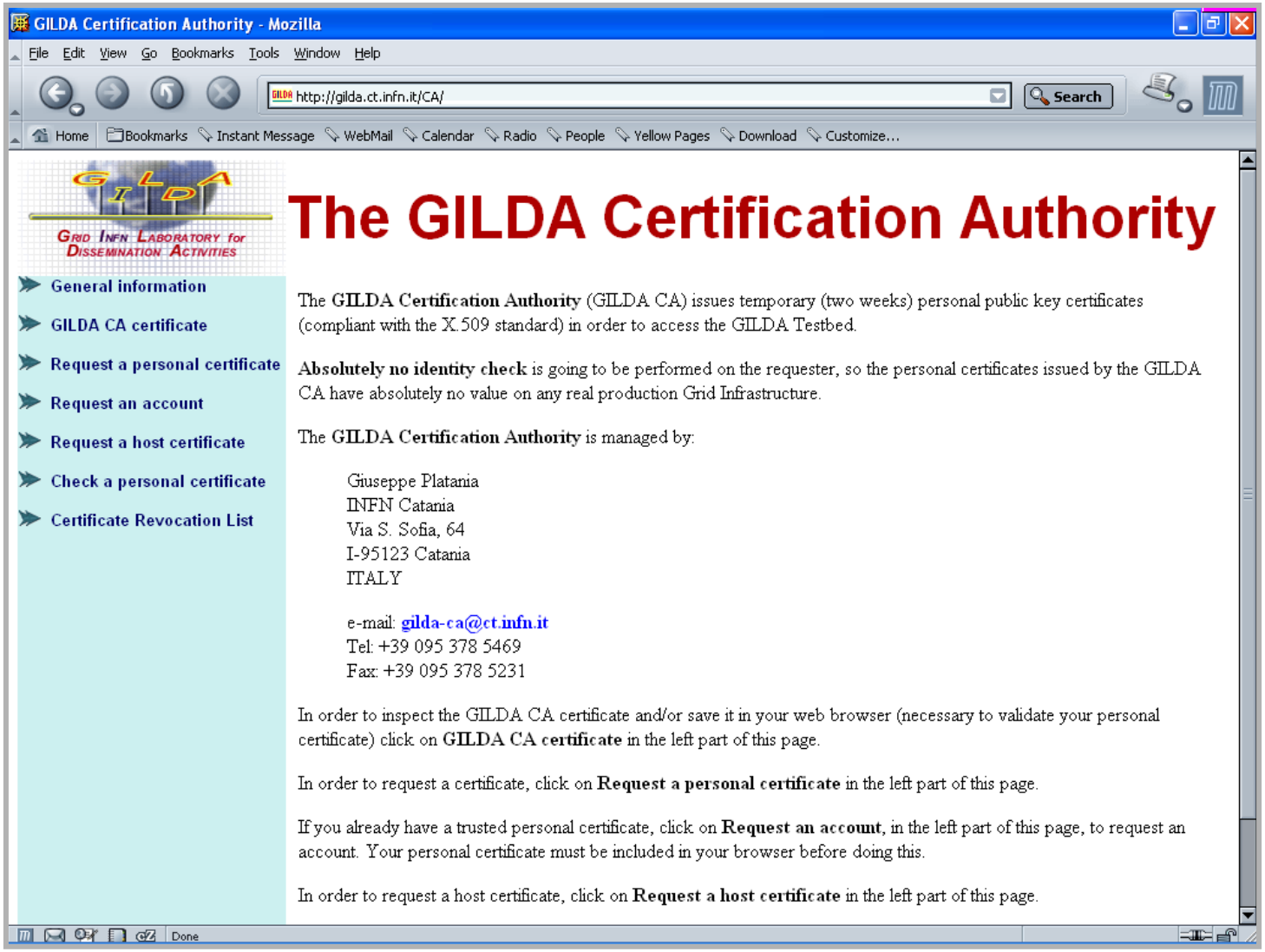

The GILDA Certification Authority 2

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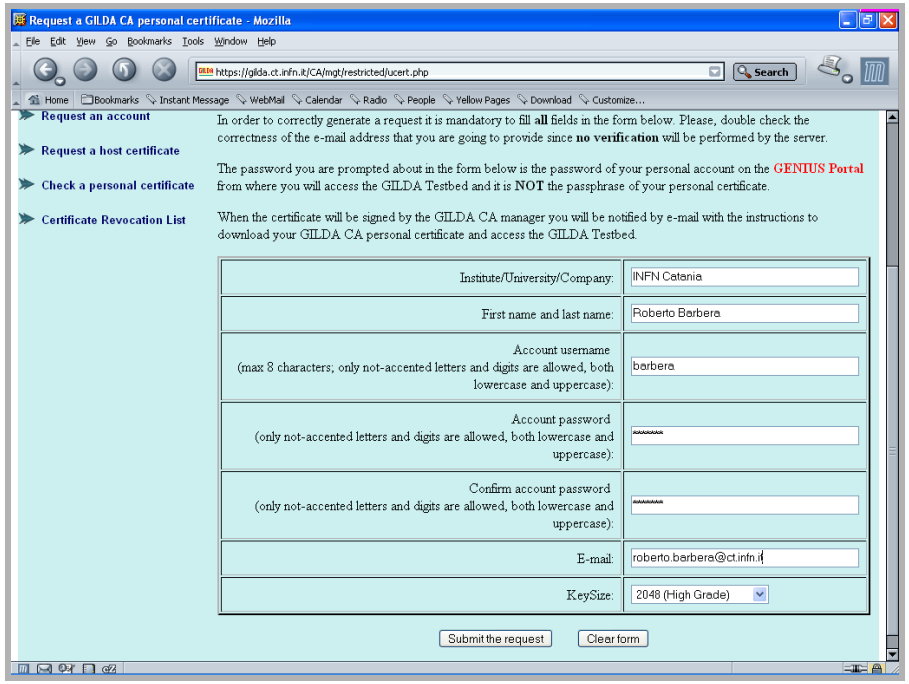

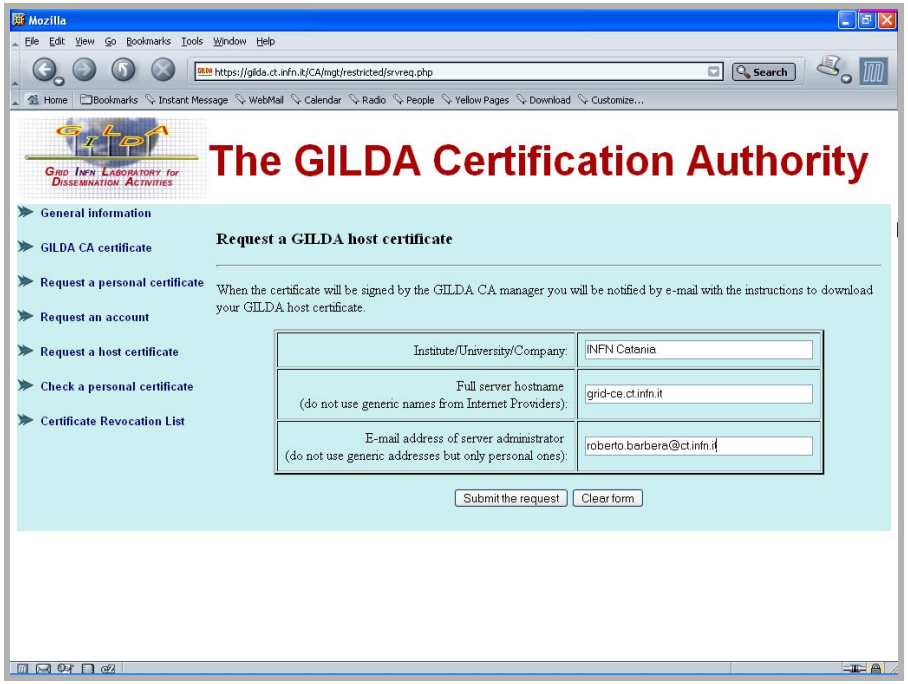

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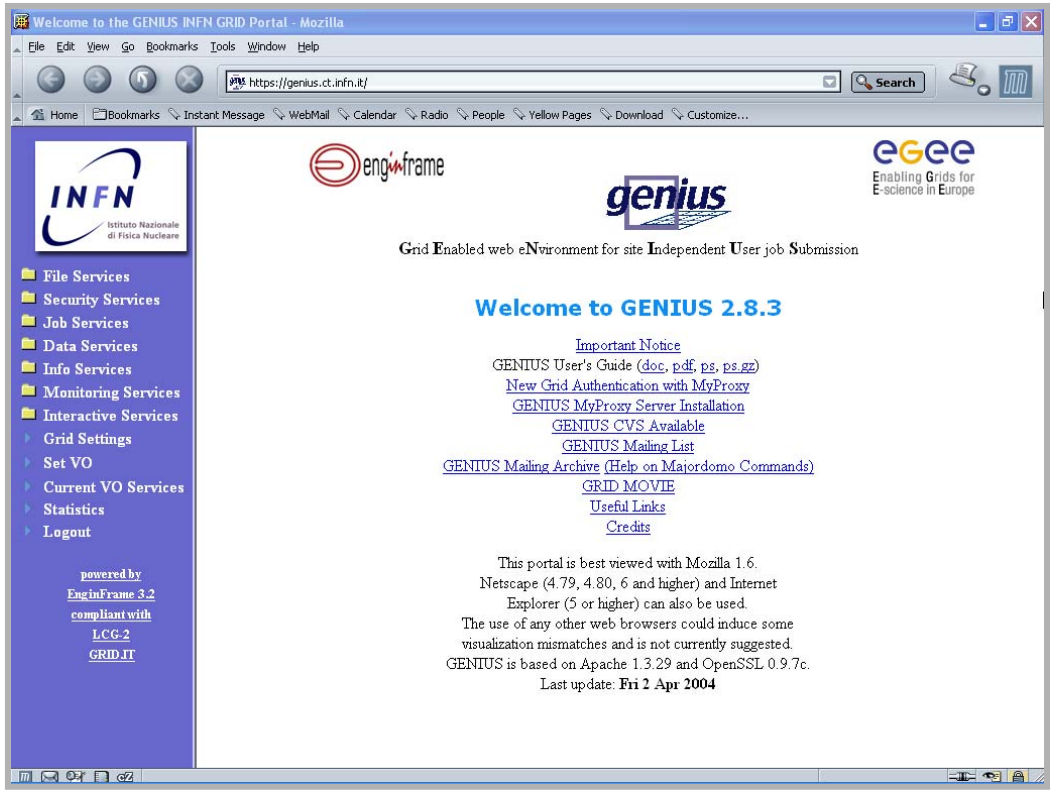
Accessing GENIUS 1

Enabling Grids for E-science in Europe

Web Sites using Secure http

- GENIUS
  https://genius.ct.infn.it
- Grid Demonstrator
  https://grid-demo.ct.infn.it
  (open access)
- Grid Tutor
  https://grid-tutor.ct.infn.it



Accessing GENIUS 2

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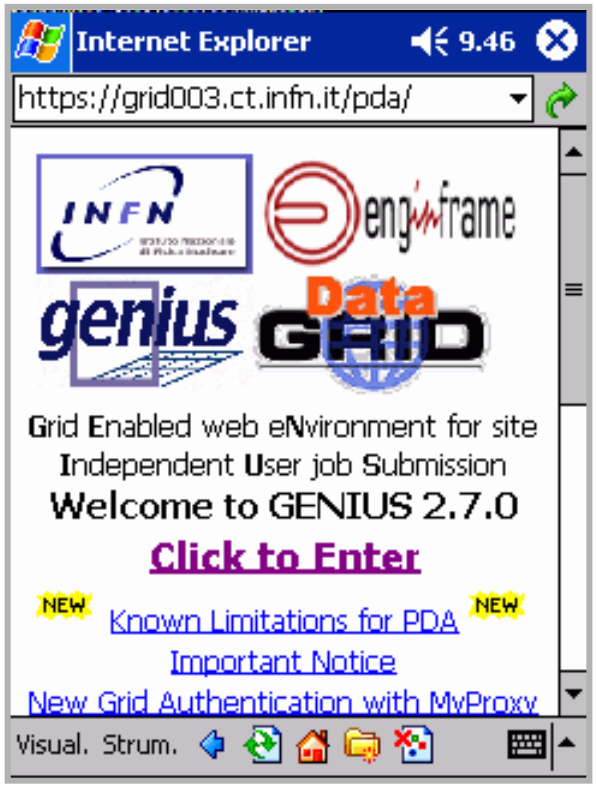
PDA



Mobile Phone

The GENIUS hourglass model

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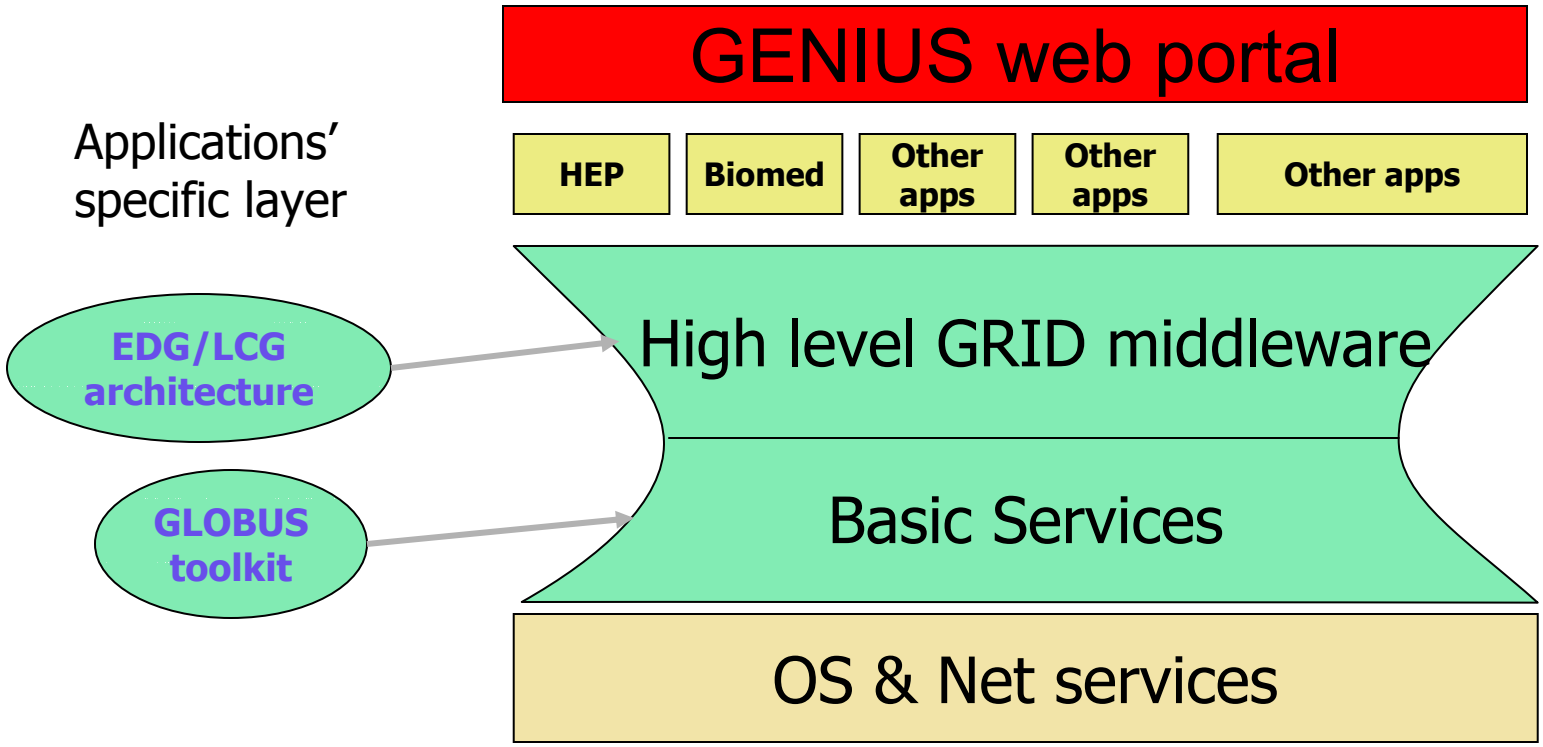
GENIUS®

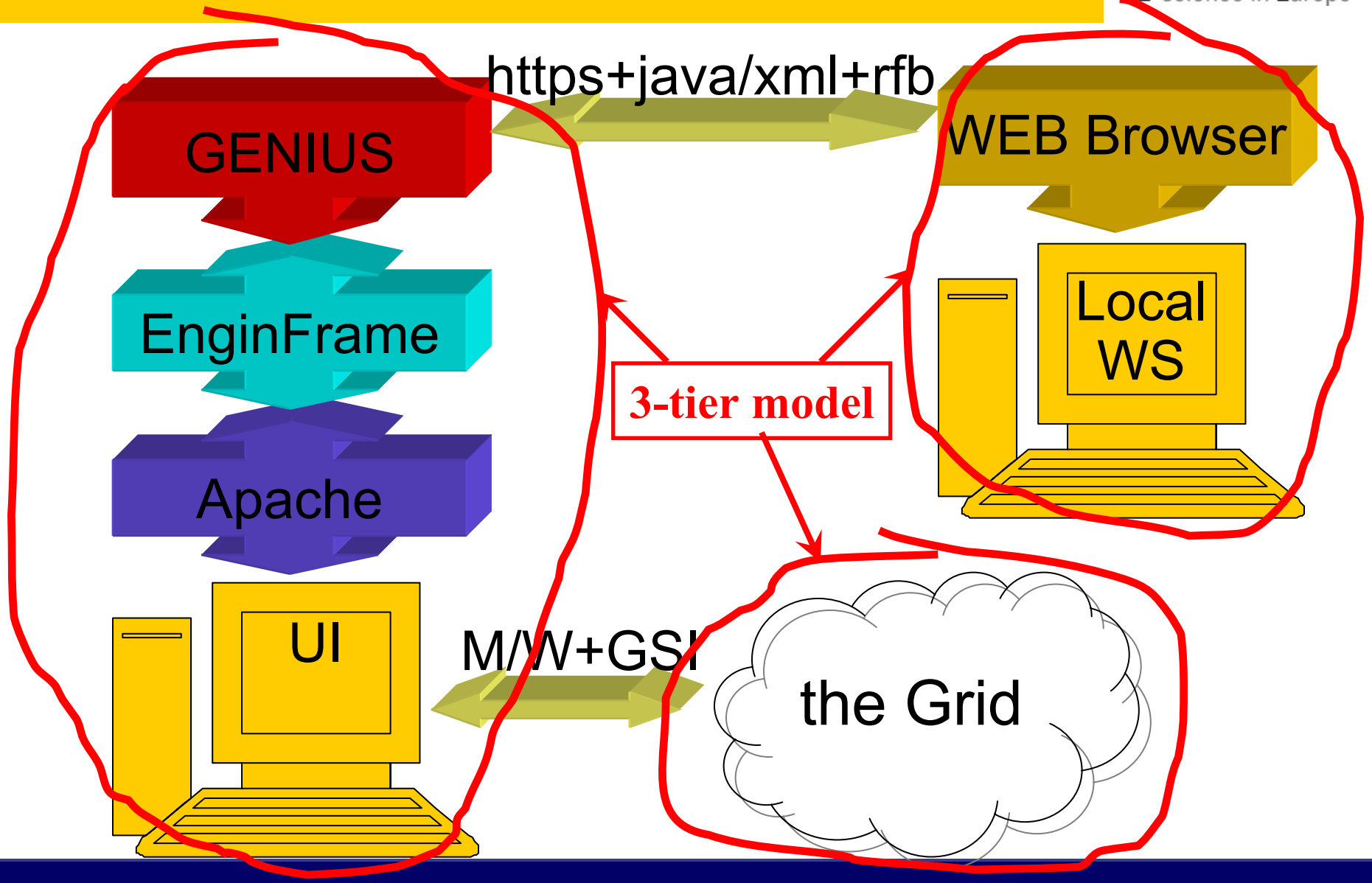
(Grid Enabled web eNvironment for site Independent User job Submission)

[https://genius.ct.infn.it]

INFN/NICEsrl collaboration



GENIUS: how it works



GENIUS graphic job editor (work in collaboration with DATAMAT)

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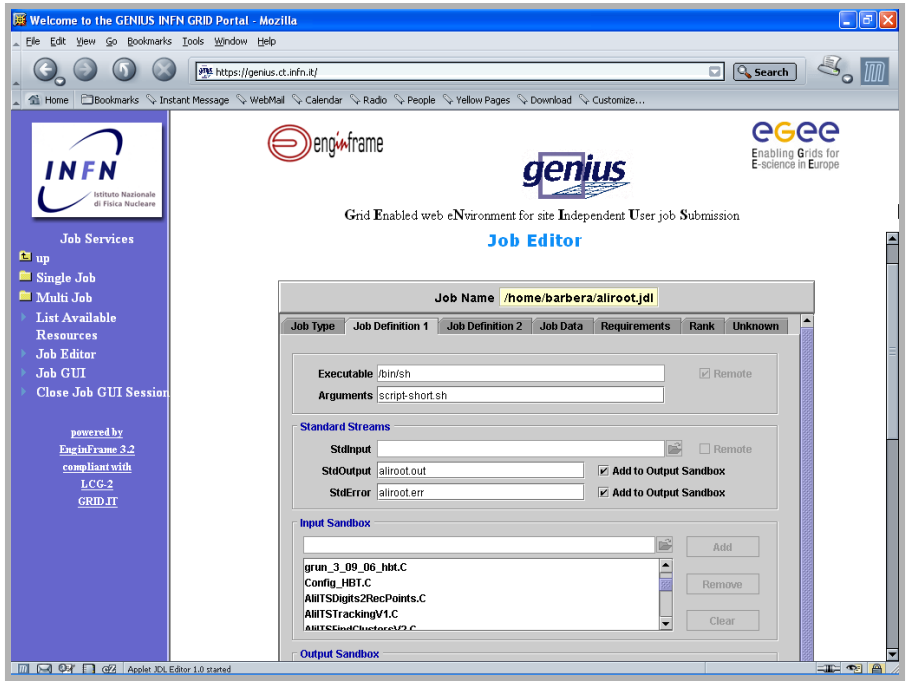

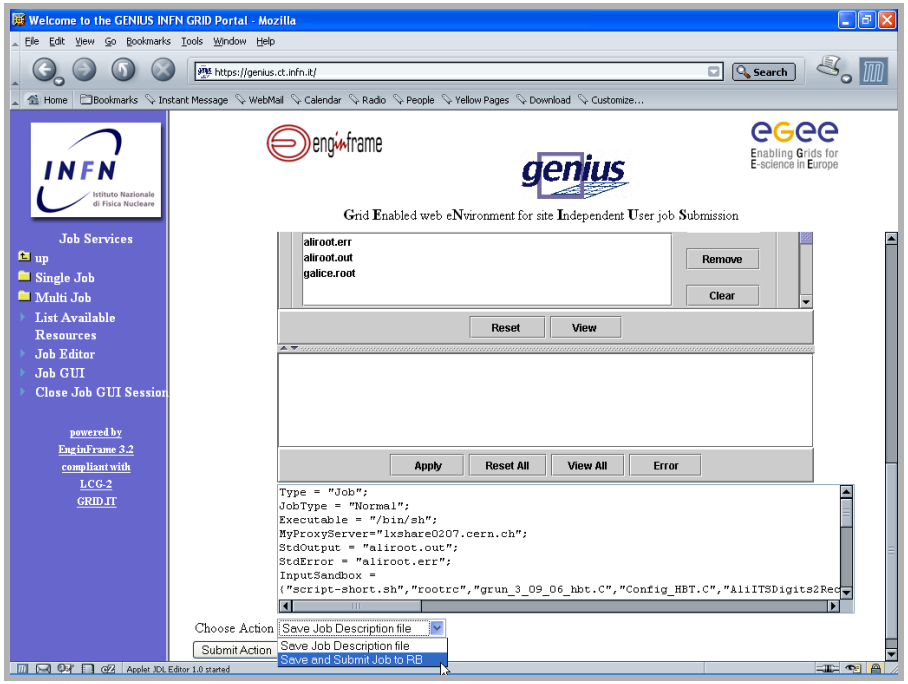

GENIUS graphic workflow editor (integration of TRIANA from GridLab)

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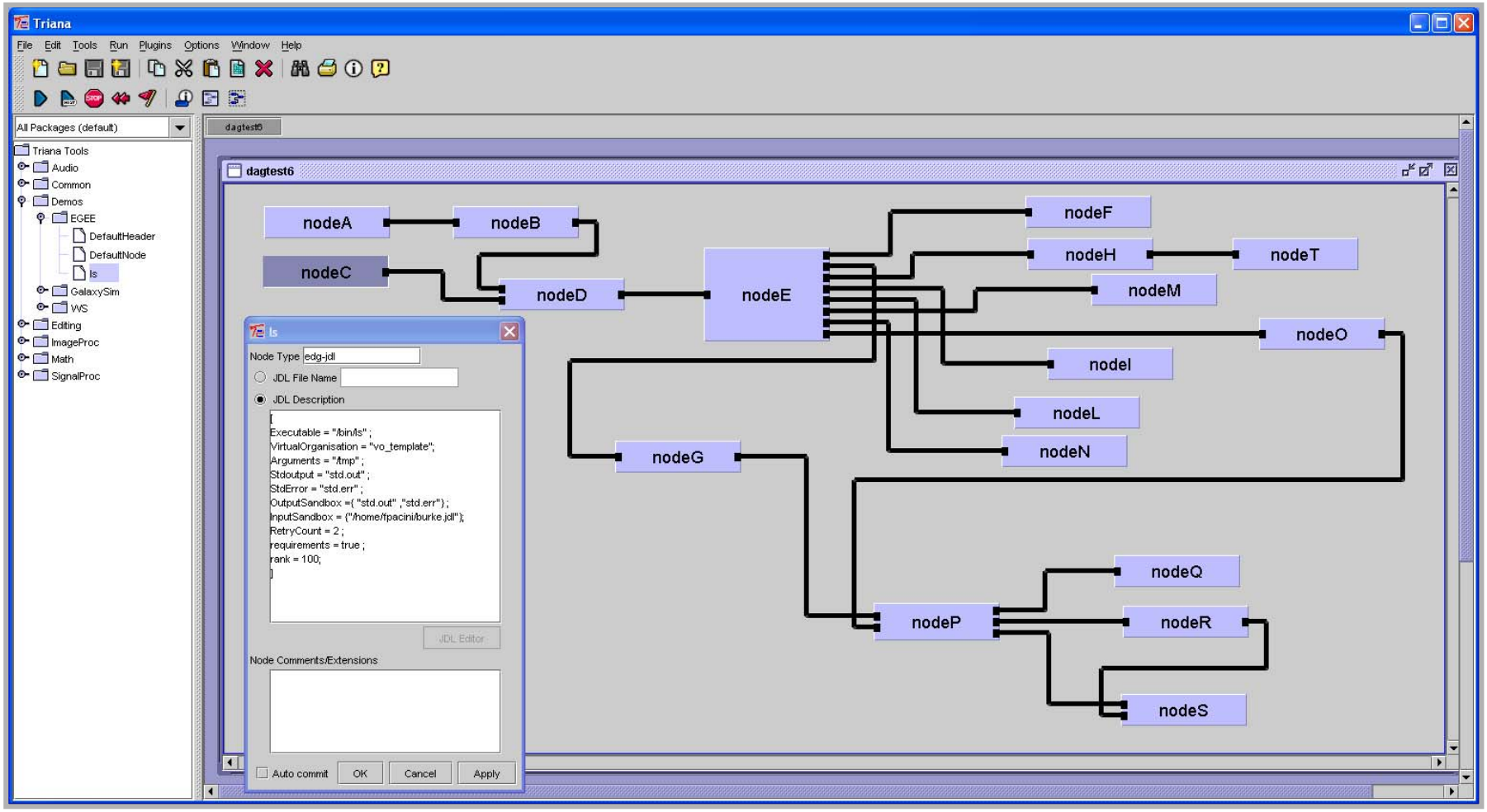
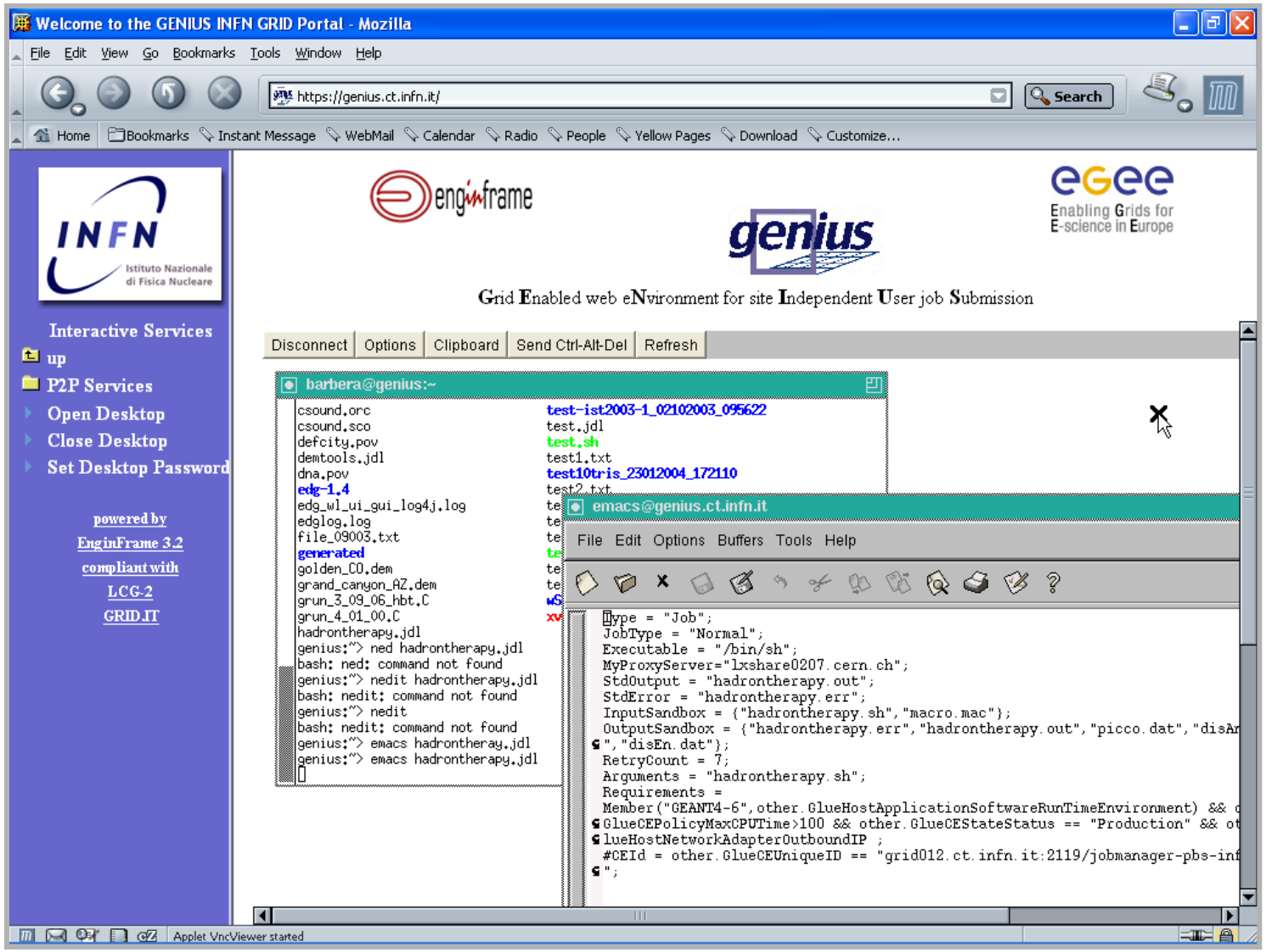
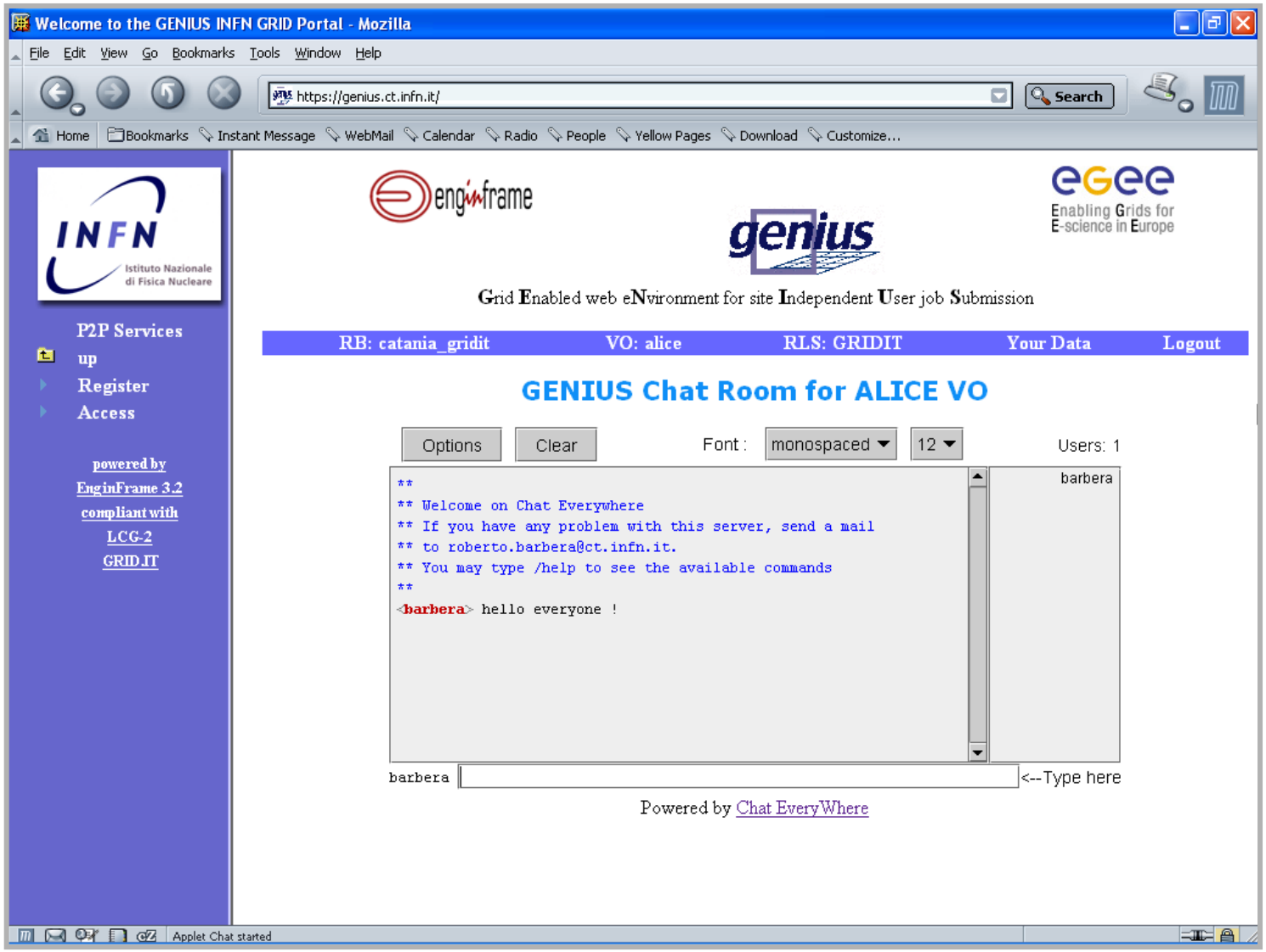


GENIUS interactive services



GENIUS P2P services



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Example Application: ALICE

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A Large Ion Collider Experiment

- Collide heavy nuclei to attempt to melt them into Quark-Gluon Plasma (the state of the universe before particles had formed).
- Each collision (event) will generate a data file approximately 2GB large.
- There is expected to be about 10^9 events per year.
- Expected data produced of order 2 PetaBytes per year.

GENIUS and ALICE

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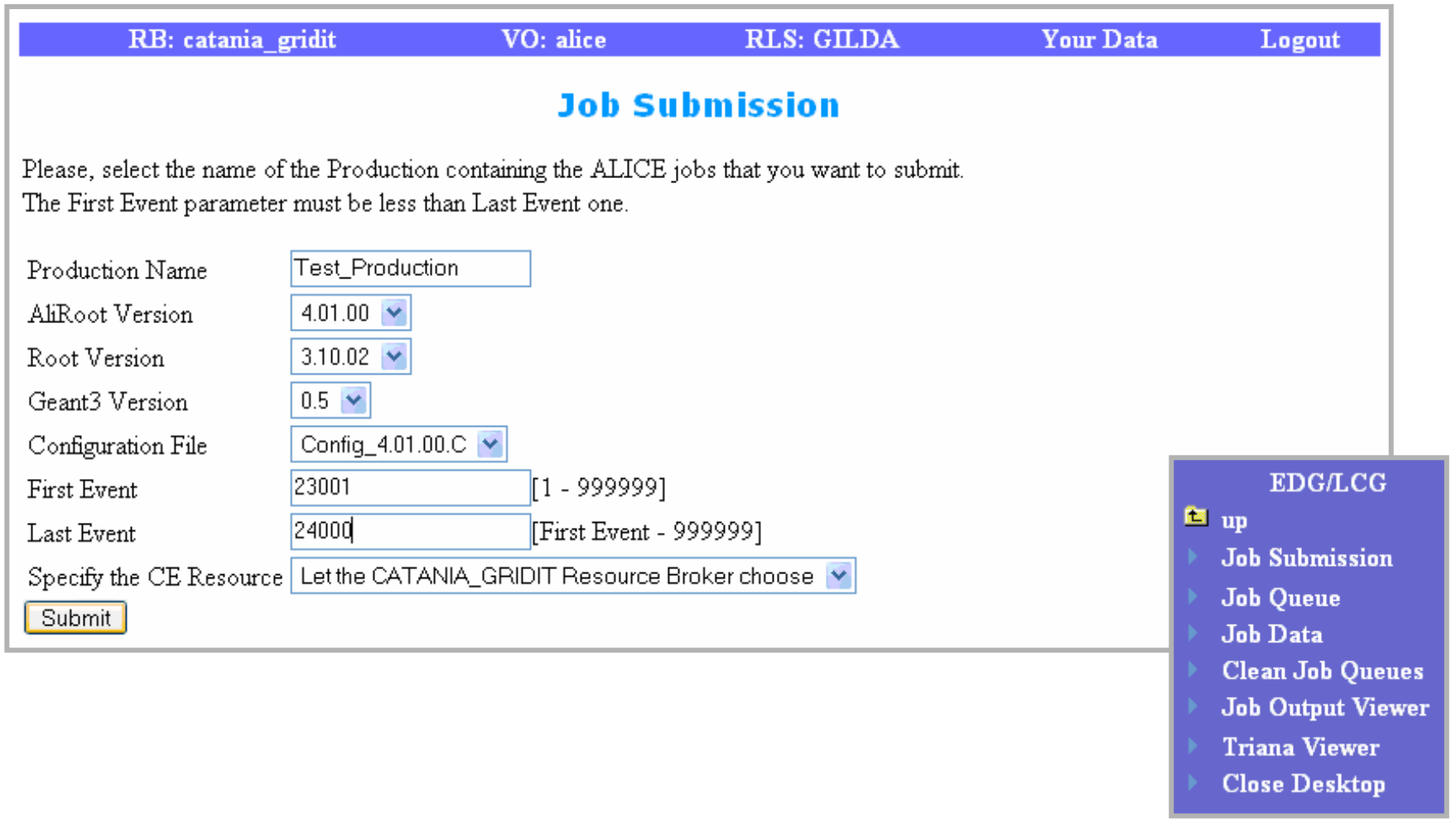

ALICE and Aliroot

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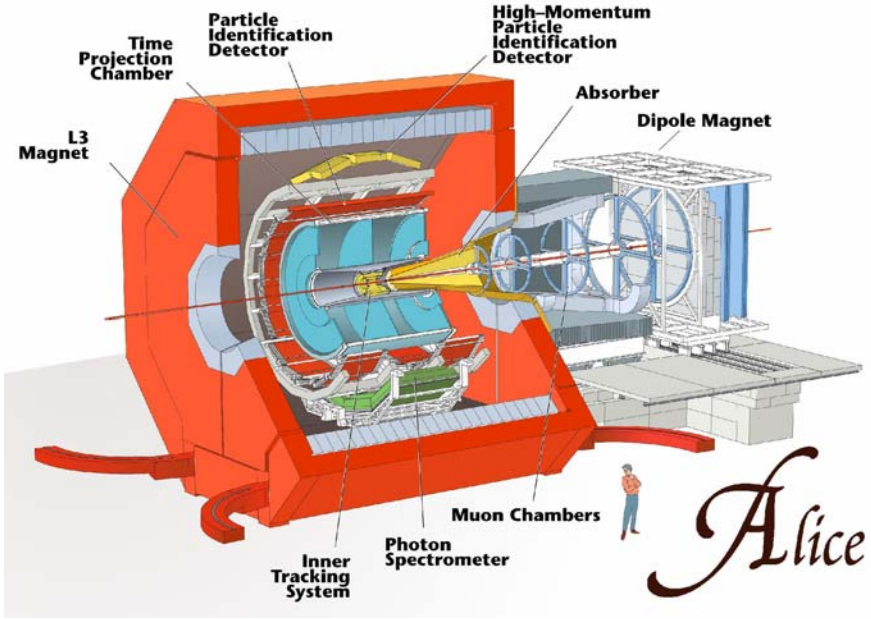
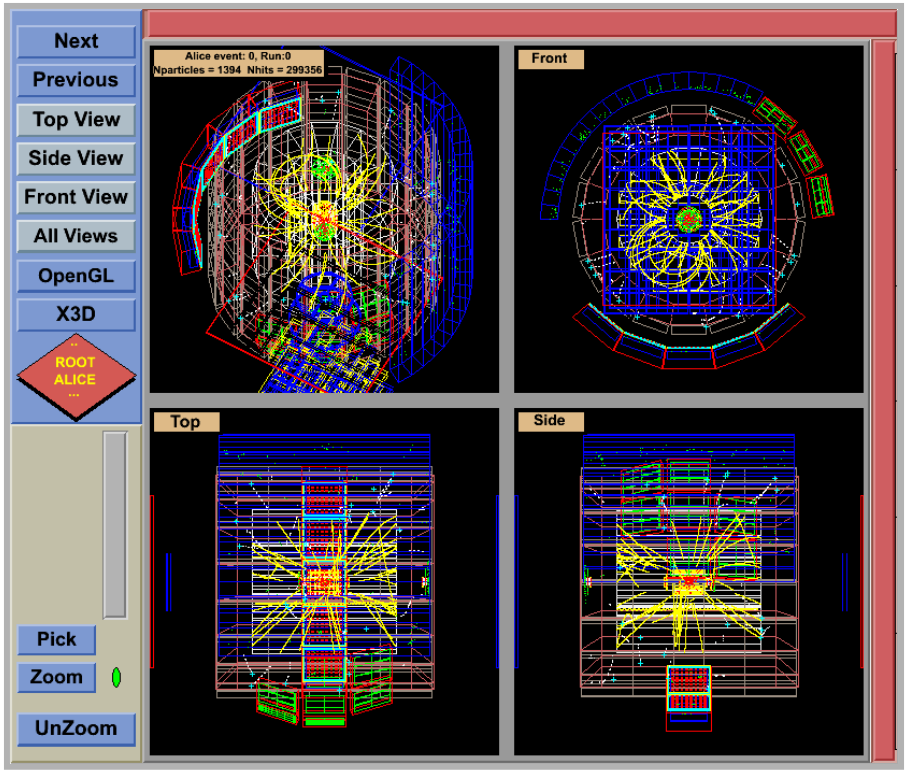
ALICE and its visualisation in Aliroot





Example Application: GATE, A BioMed Application

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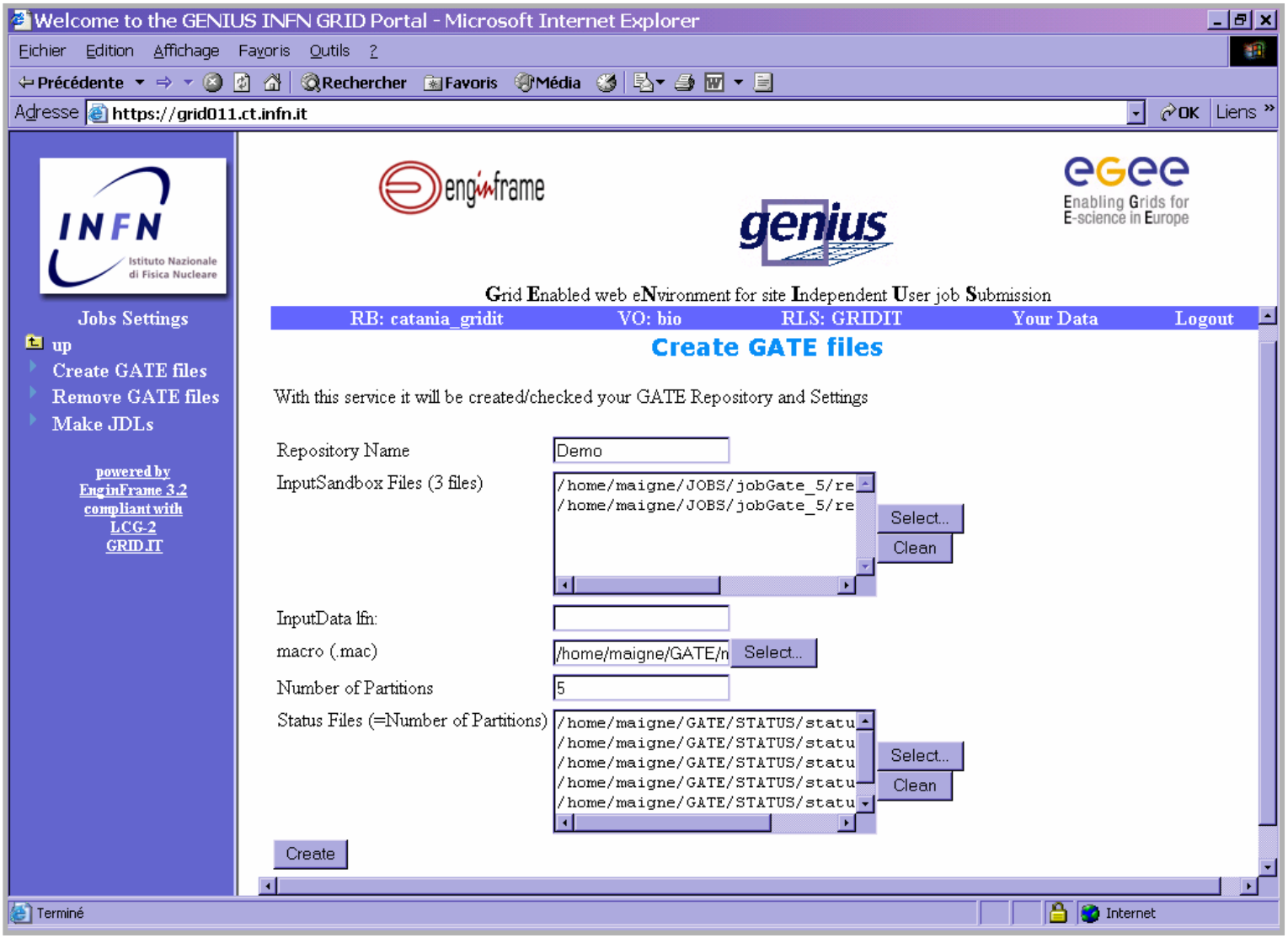

GENIUS and GATE

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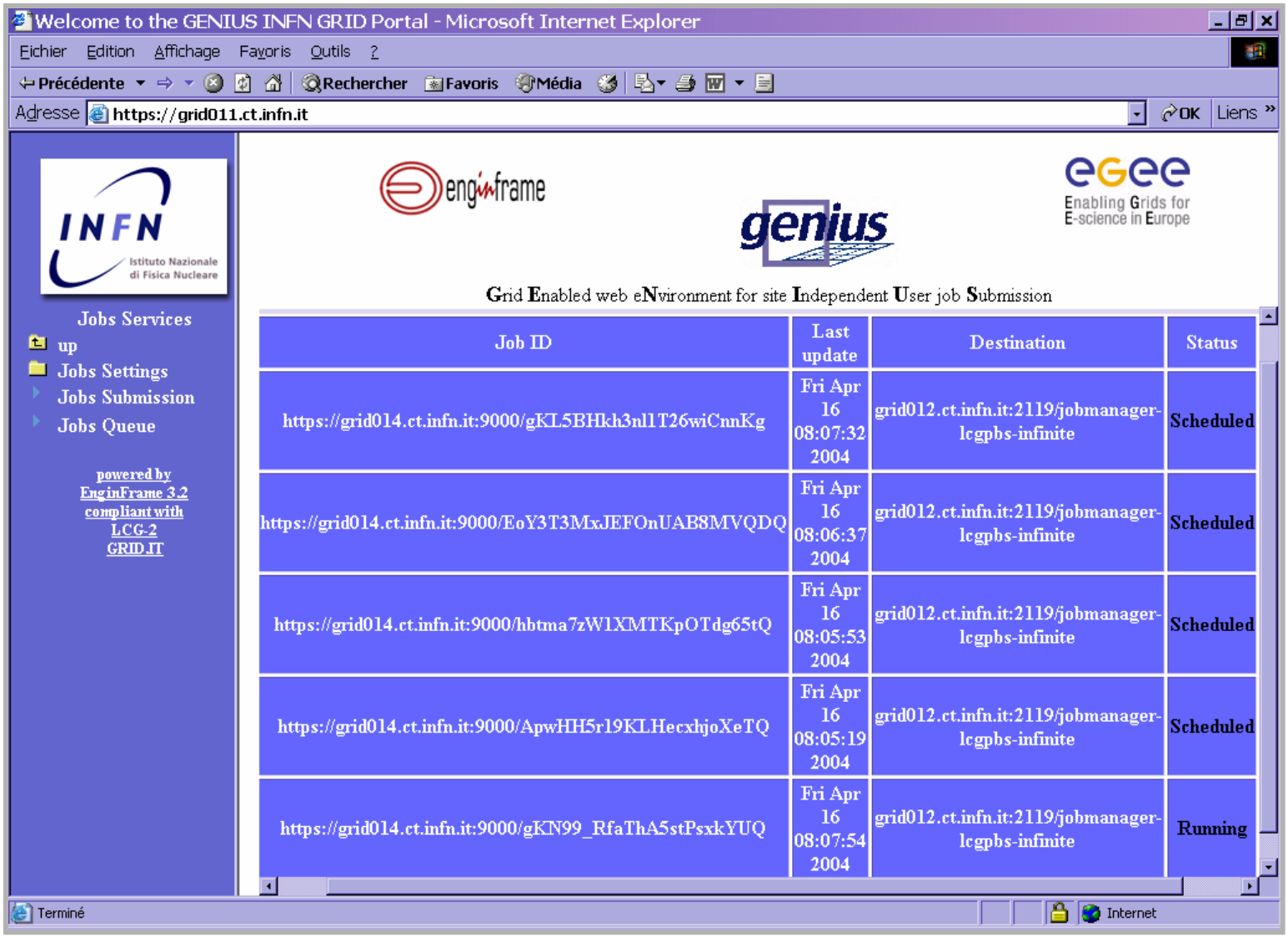

Summary

Enabling Grids for E-science in Europe

- GILDA is a complete suite of grid elements (RB, BDII, RLS, CA, VO, monitoring system, web portal) and applications fully dedicated to dissemination purposes.
- GILDA runs and will run the last production (stable) version of the grid middleware (currently Grid.it 2.2.0 based on LCG 2.2.0).
- GILDA is the dissemination tool which will be used during induction courses and tutorials
- GENIUS is a well established tool which will be fundamental in the process of interfacing new applications with the EGEE middleware hiding its complex internals to non-experts users from new communities.

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Job Description Language (JDL)

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- The supported attributes are grouped in two categories:
  - Job Attributes
    - Define the job itself
  - Resources
    - Taken into account by the RB for carrying out the matchmaking algorithm (to choose the “best” resource where to submit the job)
    - *Computing Resource*
      - Used to build expressions of Requirements and/or Rank attributes by the user
    - *Data and Storage resources*
      - Input data to process, SE where to store output data, protocols spoken by application when accessing SEs