

The text 'G-DSE' is displayed in a 3D, blocky font. The 'G' is green, the 'D' is yellow, and the 'SE' is blue. The text is positioned on a black grid that recedes into the distance, creating a perspective effect.

# Query Element Demo

The Grid Query Element for gLite

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- **What is a G-DSE?**
- **Use and Admin a DB: the Query Element;**
- **Upcoming Features;**

## People:

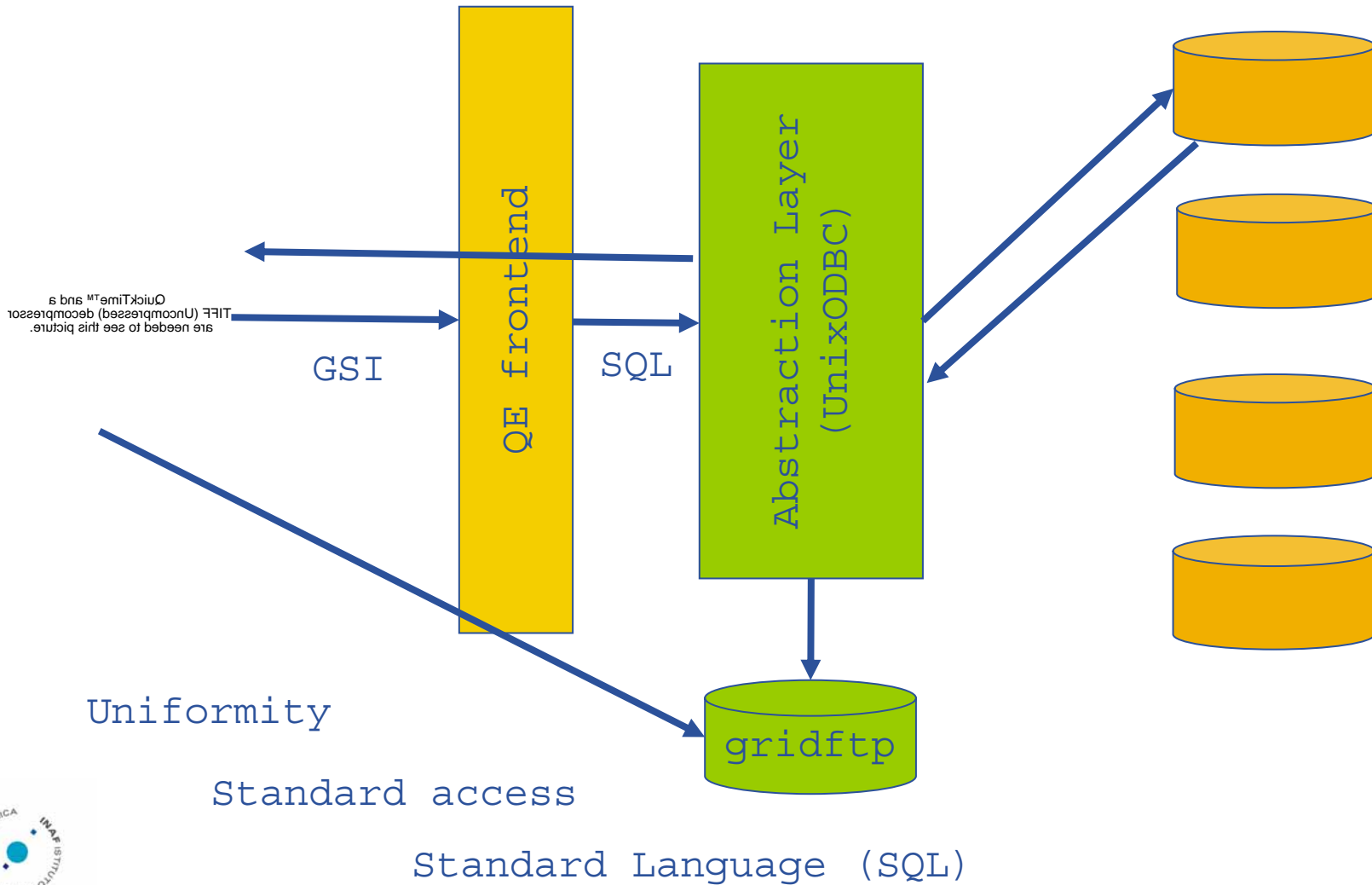
- ✓ Edgardo Ambrosi
- ✓ Giuliano Taffoni
- ✓ Andrea Barisani
- ✓ Claudio Vuerli
- ✓ Antonia Ghiselli



- **The Grid Resource Framework Layer, Information System and Data Model** is extended so that a software virtual machine as a Data Source Engine becomes a valid instance for a Grid computing model.
- A **new Grid component (G- DSE)** that enables the access to a Data Source Engine and Data Source, totally integrated with the Grid Monitoring and Discovery System and Resource Broker is defined
- A new **Grid Element, the Query Element**, can be built on top of the G-DSE component.

- **Modify the Job Management component** to access new kind of resources;
- **Integrate the Information system** with the “description” of the new resource;
- **Use the Grid Security Infrastructure**
- **No modification on the client and server side:** if I can submit a job I can also submit a query!
- **No modification on the Brokering/Workflow systems:** if I can direct the CE I can direct also a QE.

- **We are not developing a new middleware for data access;**
- **No need to learn new APIs or New software;**
- **Use everything the Grid can provide: and it's a lot...**
- **Easy to integrate in any grid environment.**

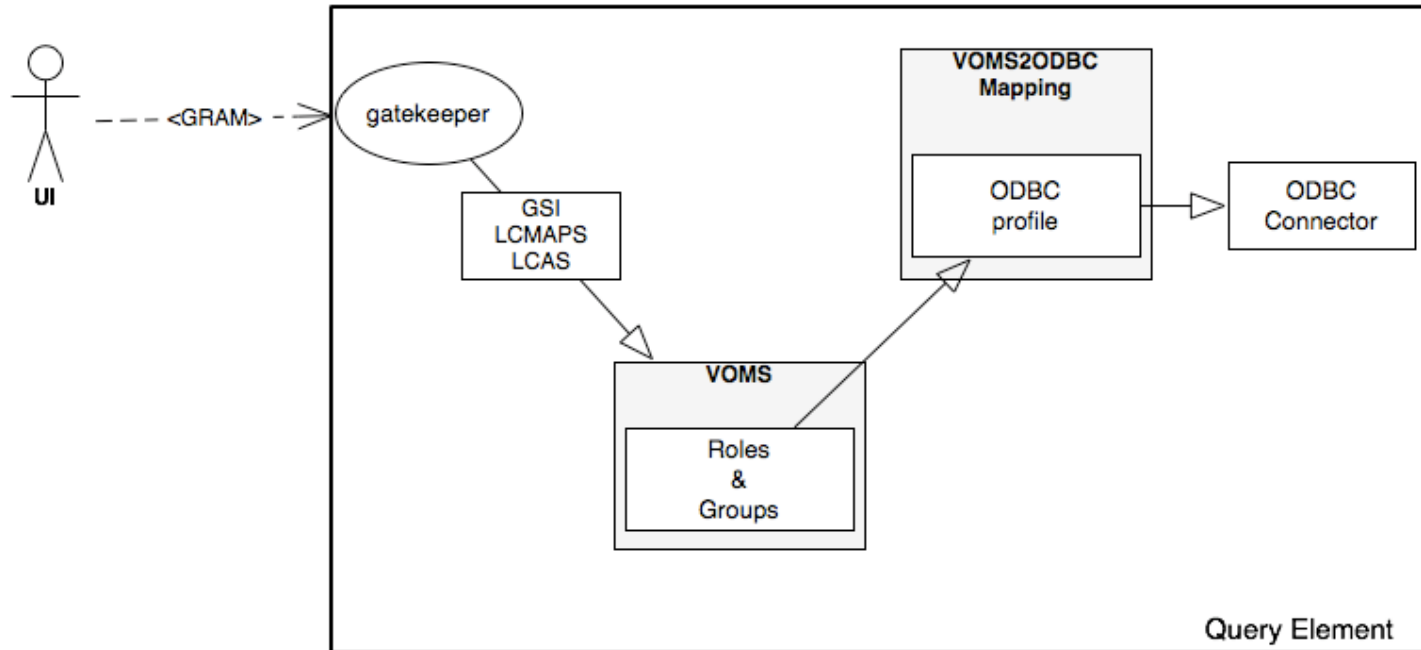


- **Backend: any DB vendor**
  - MySQL, Oracle, PostgreSQL, firebird, db2, etc...
  - XML
  - flat files
- **Two protocols: GRAM or WS**
- **Runs on several OS (globus)**
  - Linux
  - Unix
  - MacOSx
  - Windows (Client java and GUI)
- **Runs on different platforms: i386, x86\_64, etc...**
- **API: C, C++, python, Java, perl**
- **Fully integrated on gLite and lcg:**
  - Configuration based on YAIM.

```
> voms-proxy-init --voms planck:/planck/dbms/Role=DBManager
Enter GRID pass phrase:
Your identity: /C=IT/O=INFN/OU=Personal Certificate/L=INAF Trieste/CN=Giuliano
Taffoni
Cannot find file or dir: /home/morgan/.glite/vomses
Creating temporary proxy ..... Done
Contacting voms.cnaf.infn.it:15002
[/C=IT/O=INFN/OU=Host/L=CNAF/CN=voms.cnaf.infn.it] "planck" Done
Creating proxy ..... Done
Your proxy is valid until Fri May 18 03:12:16 2007
```



```
> voms-proxy-info --all
subject  : /C=IT/O=INFN/OU=Personal Certificate/L=INAF Trieste/CN=Giuliano
Taffoni/CN=proxy
issuer   : /C=IT/O=INFN/OU=Personal Certificate/L=INAF Trieste/CN=Giuliano Taffoni
identity : /C=IT/O=INFN/OU=Personal Certificate/L=INAF Trieste/CN=Giuliano Taffoni
type     : proxy
strength : 512 bits
path     : /tmp/x509up_u2001
timeleft : 11:59:08
=== VO planck extension information ===
VO       : planck
subject  : /C=IT/O=INFN/OU=Personal Certificate/L=INAF Trieste/CN=Giuliano
Taffoni
issuer   : /C=IT/O=INFN/OU=Host/L=CNAF/CN=voms.cnaf.infn.it
attribute : /planck/dbms/Role=DBManager/Capability=NULL
attribute : /planck/Role=NULL/Capability=NULL
attribute : /planck/dbms/Role=NULL/Capability=NULL
timeleft : 11:59:08
```



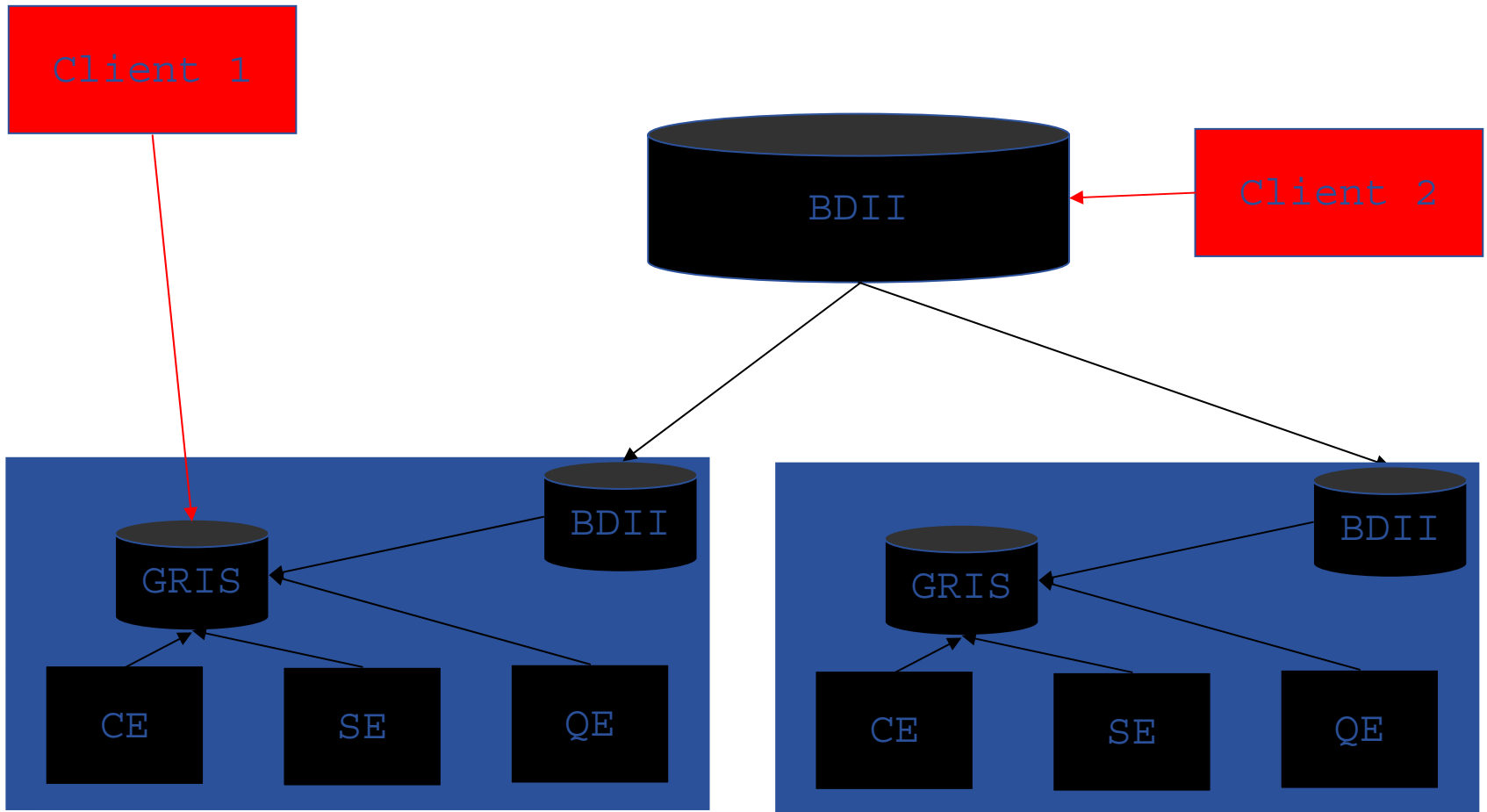
Authorization on:

VO level + DB level

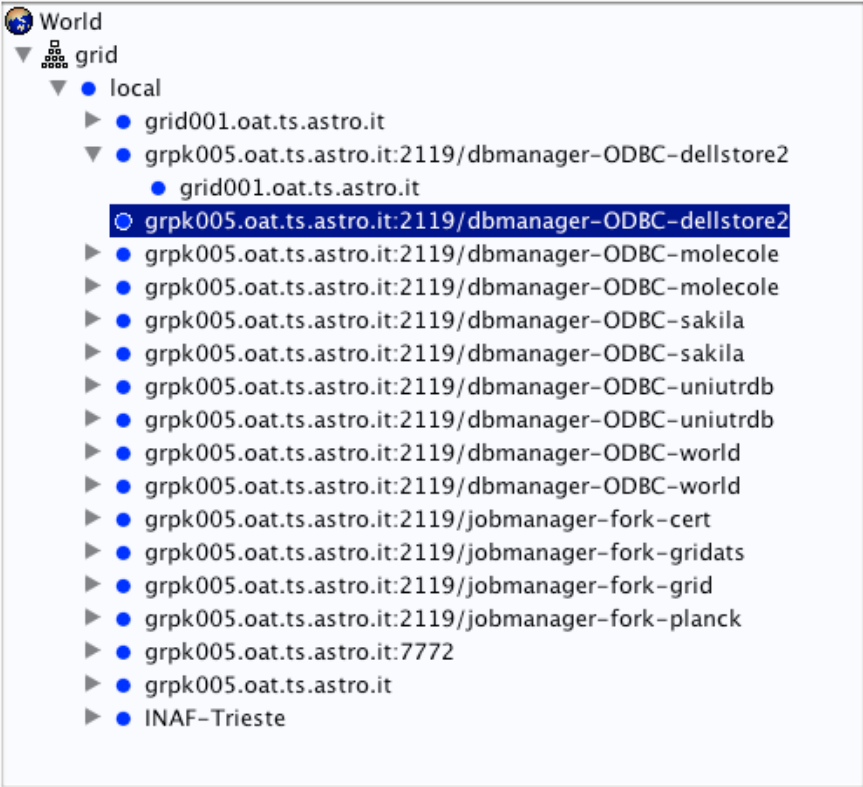
VOMS roles and groups mapping with db user:

Attribute: /vo/**GROUP=dbuser/ROLE=astrouser/CAPABILITY=select**





- Glue schema extensions for new resource



World

- grid
  - local
    - grid001.oat.ts.astro.it
    - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-dellstore2
      - grid001.oat.ts.astro.it
      - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-dellstore2**
      - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-molecole
      - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-molecole
      - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-sakila
      - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-sakila
      - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-uniutrd
      - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-uniutrd
      - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-world
      - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-world
      - grpk005.oat.ts.astro.it:2119/jobmanager-fork-cert
      - grpk005.oat.ts.astro.it:2119/jobmanager-fork-gridats
      - grpk005.oat.ts.astro.it:2119/jobmanager-fork-grid
      - grpk005.oat.ts.astro.it:2119/jobmanager-fork-planck
      - grpk005.oat.ts.astro.it:7772
      - grpk005.oat.ts.astro.it
      - INAF-Trieste

attribute type	value
GlueDSEInfoLRMSType	PSQL
GlueDSEInfoLRMSVersion	8.2
GlueDSEName	dellstore2
GlueDSEUniqueID	<a href="#">grpk005.oat.ts.astro.it:2119/dbmana...</a>
GlueForeignKey	GlueClusterUniqueID=grpk005.oat.ts.a...
GlueHostApplicationSoftwareRunTimeE...	GLITE-3_0_0
GlueHostApplicationSoftwareRunTimeE...	ICC
GlueHostApplicationSoftwareRunTimeE...	IFC
GlueHostApplicationSoftwareRunTimeE...	LCG-2
GlueHostApplicationSoftwareRunTimeE...	LCG-2_1_0
GlueHostApplicationSoftwareRunTimeE...	LCG-2_1_1
GlueHostApplicationSoftwareRunTimeE...	LCG-2_2_0
GlueHostApplicationSoftwareRunTimeE...	LCG-2_3_0
GlueHostApplicationSoftwareRunTimeE...	LCG-2_3_1
GlueHostApplicationSoftwareRunTimeE...	LCG-2_4_0
GlueHostApplicationSoftwareRunTimeE...	LCG-2_5_0
GlueHostApplicationSoftwareRunTimeE...	LCG-2_6_0
GlueHostApplicationSoftwareRunTimeE...	LCG-2_7_0
GlueHostApplicationSoftwareRunTimeE...	MPICH
GlueHostApplicationSoftwareRunTimeE...	R-GMA
GlueHostApplicationSoftwareRunTimeE...	SCISOFT05
GlueHostApplicationSoftwareRunTimeE...	SF00MeanPerCPU=450
GlueHostApplicationSoftwareRunTimeE...	SI00MeanPerCPU=600
GlueInformationServiceURL	

Submit    Reset    Change Class    Properties



grid

- INAF-Trieste
  - grid001.oat.ts.astro.it:2119/jobmanager-lcgpbs-cert
    - grid002.oat.ts.astro.it**
    - grid001.oat.ts.astro.it:2119/jobmanager-lcgpbs-cert
    - grid001.oat.ts.astro.it:2119/jobmanager-lcgpbs-gridats
    - grid001.oat.ts.astro.it:2119/jobmanager-lcgpbs-gridats
    - grid001.oat.ts.astro.it:2119/jobmanager-lcgpbs-grid
    - grid001.oat.ts.astro.it:2119/jobmanager-lcgpbs-grid
    - grid001.oat.ts.astro.it:2119/jobmanager-lcgpbs-planck
    - grid001.oat.ts.astro.it:2119/jobmanager-lcgpbs-planck
  - grid001.oat.ts.astro.it
    - grid001.oat.ts.astro.it
    - grid001.oat.ts.astro.it
  - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-dellstore2
    - grid001.oat.ts.astro.it
  - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-molecole
  - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-sakila
  - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-uniutrd
  - grpk005.oat.ts.astro.it:2119/dbmanager-ODBC-world
  - grpk005.oat.ts.astro.it:2119/jobmanager-fork-cert
  - grpk005.oat.ts.astro.it:2119/jobmanager-fork-grid
  - grpk005.oat.ts.astro.it:7772

attribute type	value
GlueCESEBindCEUniqueID	grid001.oat.ts.astro.it:2119/jobmanag...
GlueCESEBindSEUniqueID	<a href="#">grid002.oat.ts.astro.it</a>
GlueSchemaVersionMajor	1
GlueSchemaVersionMinor	2
objectClass	GlueGeneralTop
objectClass	GlueCESEBind
objectClass	GlueSchemaVersion
GlueCESEBindCEAccesspoint	/flatfiles/SE00
GlueCESEBindMountInfo	/flatfiles/SE00
GlueCESEBindWeight	0

Submit    Reset    Change Class    Properties

- UI/QE interactions through a STANDARD LANGUAGE
- RSL(SQL)

```
> globus-job-run grpk005.oat.ts.astro.it:2119/jobmanager-odbc -queue dellstore2  
"select orderid from orders where orderid < 10"
```

1  
2  
3  
4  
5  
6  
7  
8  
9

```
> globus-job-run grpk005.oat.ts.astro.it:2119/jobmanager-odbc -queue dellstore2
"select products.title, categories.categoryname, products.actor from
products, categories where products.category = categories.category;" -CSV
```

ACADEMY ACADEMY, Sci-Fi, PENELOPE GUINNESS,  
 ACADEMY ACE, Documentary, EWAN RICKMAN,  
 ACADEMY ADAPTATION, Documentary, VIVIEN KAHN,  
 ACADEMY AFFAIR, Children, ALAN MARX,  
 ACADEMY AFRICAN, Children, CARRIE HANNAH,  
 ACADEMY AGENT, Foreign, LISA SPACEK,  
 ACADEMY AIRPLANE, Family, FRANCES WINFREY,  
 ACADEMY AIRPORT, Drama, FARRAH TOMEI,  
 ACADEMY ALABAMA, Animation, JULIETTE WEAVER,

....



```
> globus-job-run grpk005.oat.ts.astro.it:2119/jobmanager-odbc -queue dellstore2
"select products.title, categories.categoryname, products.actor from
products, categories where products.category = categories.category and
categories.categoryname='Sci-Fi';" -table
```

title	categoryname
ACADEMY ACADEMY	Sci-Fi
ACADEMY ALIEN	Sci-Fi
ACADEMY ARABIA	Sci-Fi
ACADEMY BACKLASH	Sci-Fi
ACADEMY BEETHOVEN	Sci-Fi
ACADEMY CLASH	Sci-Fi
ACADEMY CREEPERS	Sci-Fi
ACADEMY DAISY	Sci-Fi

....



```
> globus-job-run grpk005.oat.ts.astro.it:2119/jobmanager-odbc -queue dellstore2
"select products.title, categories.categoryname, products.actor from
products, categories where products.category = categories.category and
categories.categoryname='Sci-Fi';" -XML
```

```
<table>
<row>
<title>ACADEMY ACADEMY</title>
<categoryname>Sci-Fi</categoryname>
<actor>PENELOPE GUINNESS</actor>
</row>
<row>
<title>ACADEMY ACE</title>
<categoryname>Documentary</categoryname>
<actor>EWAN RICKMAN</actor>
</row>
```

....



## Off line access

```
> globus-job-submit grpk005.oat.ts.astro.it:2119/jobmanager-odbc -queue dellstore2
"select products.title, categories.categoryname, products.actor from
products, categories where products.category = categories.category;" -xml
https://grpk005.oat.ts.astro.it:20001/20279/1179410384/
```

```
> globus-job-status https://grpk005.oat.ts.astro.it:20001/20279/1179410384/
DONE
```

```
> globus-job-get-output https://grpk005.oat.ts.astro.it:20001/20279/1179410384
```

```
<table>
<row>
<title>ACADEMY ACADEMY</title>
<categoryname>Sci-Fi</categoryname>
<actor>PENELOPE GUINNESS</actor>
</row>
```

....



```
> globus-job-submit -stdout /flatfiles/SE00/planck/delstore2
grpk005.oat.ts.astro.it:2119/jobmanager-odbc -queue dellstore2 "select
products.title, categories.categoryname, products.actor from products, categories where
https://grpk005.oat.ts.astro.it:20001/25543/1179410605/
```

```
> globus-job-status https://grpk005.oat.ts.astro.it:20001/25543/1179410605/
DONE
```

```
> glite-gridftp-ls gsiftp://grpk005.oat.ts.astro.it/flatfiles/SE00/planck/delstore2
/flatfiles/SE00/planck/delstore2
```

```
> globus-url-copy gsiftp://grpk005.oat.ts.astro.it/flatfiles/SE00/planck/dellstore2
file://$PWD/dellstore2
```

```
> more dellstore2
```

```
<table>
```

```
<row>
```

```
<title>ACADEMY ACADEMY</title>
```

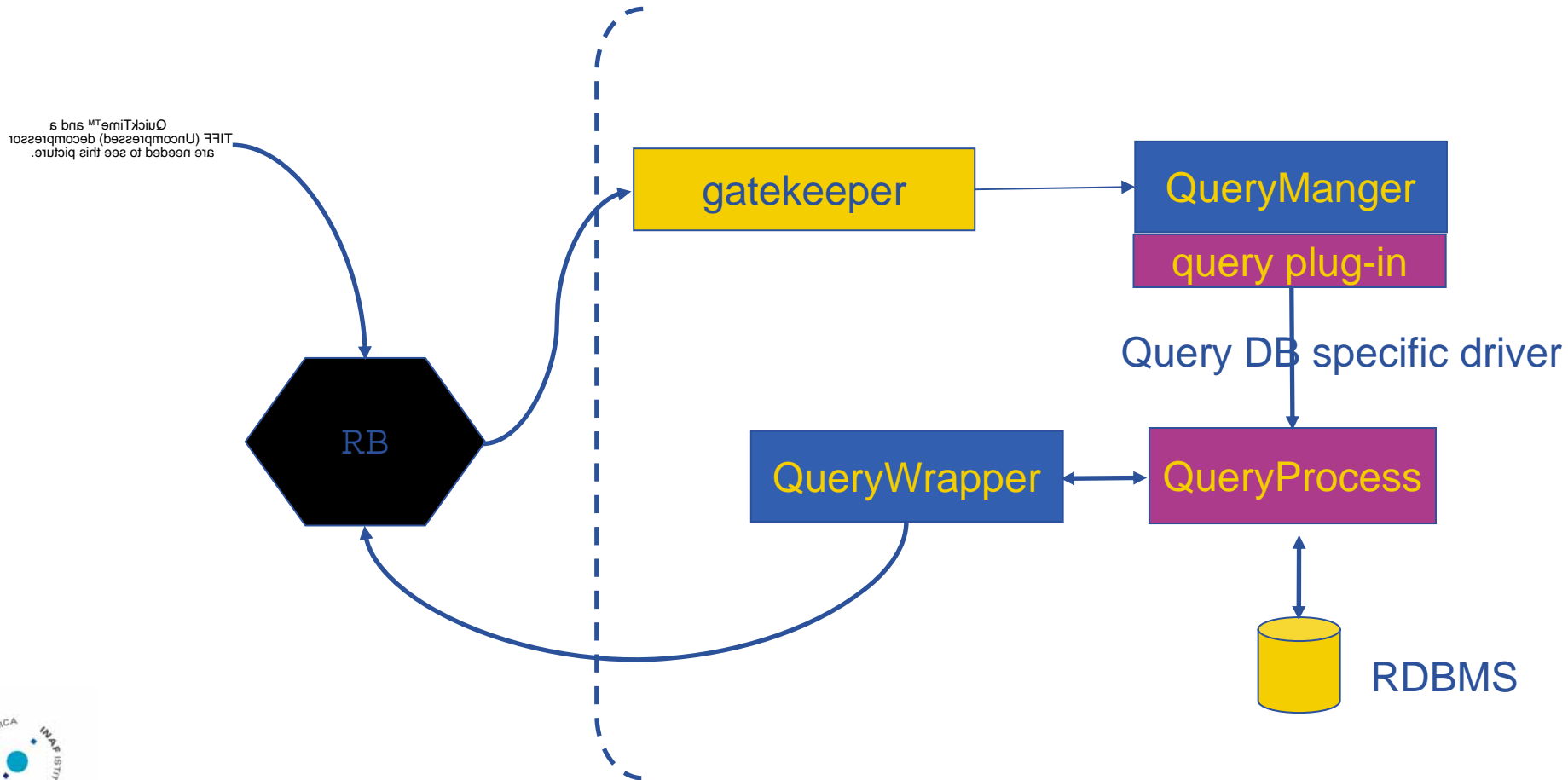
```
<categoryname>Sci-Fi</categoryname>
```

```
<actor>PENELOPE GUINNESS</actor>
```

```
</row>
```

```
....
```

- New job wrapper for dbmanager



QuickTime™ and a  
TIFF (Uncompressed) decompressor  
are needed to see this picture.



```
Type = "Job";  
JobType = "Normal";  
Executable = "select orderid from orders where orderid < 10;";  
StdOutput = "dellstore2.out";  
StdError = "dellstore2.err";  
Output Sandbox = ("dellstore2.err" "dellstore2.out");
```

glite-job-submit -r grpk005.oat.ts.astro.it:2119/jobmanager-odbc-dellstore2 -cdsimple idl

```
> glite-job-status https://grid005.oat.ts.astro.it:9000/HCYW5nhQuQN8dl6plu-cdw
```

\*\*\*\*\*

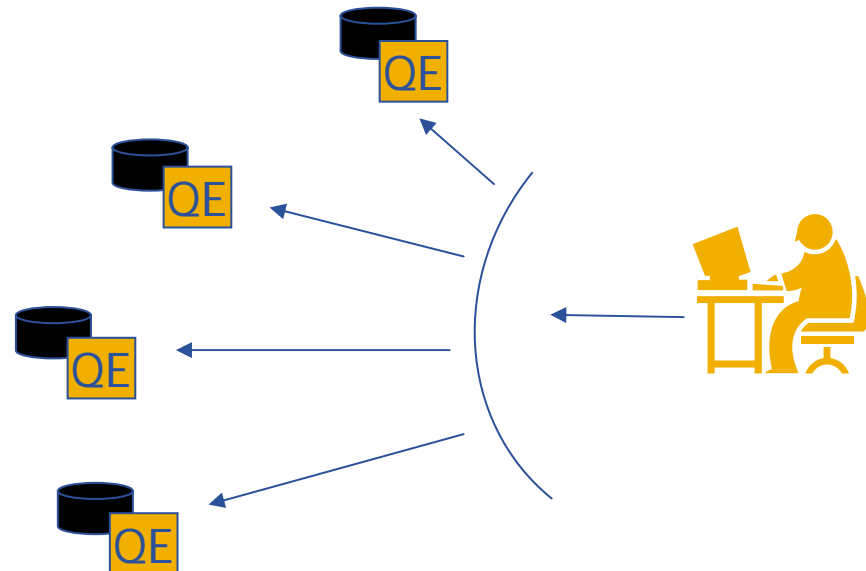
## BOOKKEEPING INFORMATION:

```
Status info for the Job : https://grid005.oat.ts.astro.it:9000/HCYW5nhQuQN8dl6plu-cdw  
Current Status:    Running  
Status Reason:    Job successfully submitted to Globus  
Destination:      grpk005.oat.ts.astro.it:2119/jobmanager-odbc-dellstore2  
Submitted:        Thu May 17 16:19:39 2007 CEST
```

\*\*\*\*\*

- **Single SQL on multiple data**
- **Multiple SQL on same data**

```
> globus-job-submit -: g.dse.host/dbmanager-ODBC -queue PSQL
"select a,b from table where a < 10;" -: g.dse2.host/dbmanager-
ODBC -queue PSQL "select a,b from table where a between 10 and
20;" -: g.dse.host3/dbmanager-ODBC -queue PSQL "select a,b from
table where a > 20;"
```



Biomed	
<b>Private</b>	<b>medinfo</b>
<b>Code</b>	<b>Code</b>
<b>Family_name</b>	<b>Occupation</b>
<b>Name</b>	<b>disease</b>
<b>Address</b>	<b>Hospital</b>
<b>Telephone</b>	

```
> voms-proxy-init -voms gilda:/gilda/GROUP=dbuser/Role=DBAdmin
Your Identity ...

> globus-job-run g.dse.host/dbmanager-ODBC -queue PSQL1 \
"CREATE TABLE Private (
    Code            integer NOT NULL,
    FamilyName     char(10) NOT NULL,
    Name           char(10) NOT NULL,
    Address        varchar(20) DEFAULT 'unknown',
    Telephone      varchar(20),
    PRIMARY KEY (Code) );"

> globus-job-run g.dse.host/dbmanager-ODBC -queue PSQL1 \
"CREATE TABLE medinf (
    Code            integer NOT NULL,
    Occupation     varchar(20),
    Disease        varchar(20) NOT NULL,
    Hospital       varchar(20) NOT NULL);"
```

```
> globus-job-run g.dse.host/dbmanager-ODBC -queue PSQL1 \  
  "INSERT INTO Private VALUES (...);  
- - -  
> globus-job-run g.dse.host/dbmanager-ODBC -queue PSQL1 \  
  "SELECT Private.familyname, Private.name,  
  medinfo.occupations, medinfo.disease FROM Private , medinfo  
  WHERE Private.code = medinfo.code ... ;"
```

```
-----  
| Family Name | Name | Work | Disease |  
-----  
| Rossi | Ugo | Ricercatore | gastrite |  
| etc .. |  
-----
```



```
> globus-job-run g.dse.host/dbmanager-ODBC -queue PSQL1 \  
"GRANT SELECT on medinfo to inafdbuser;"
```

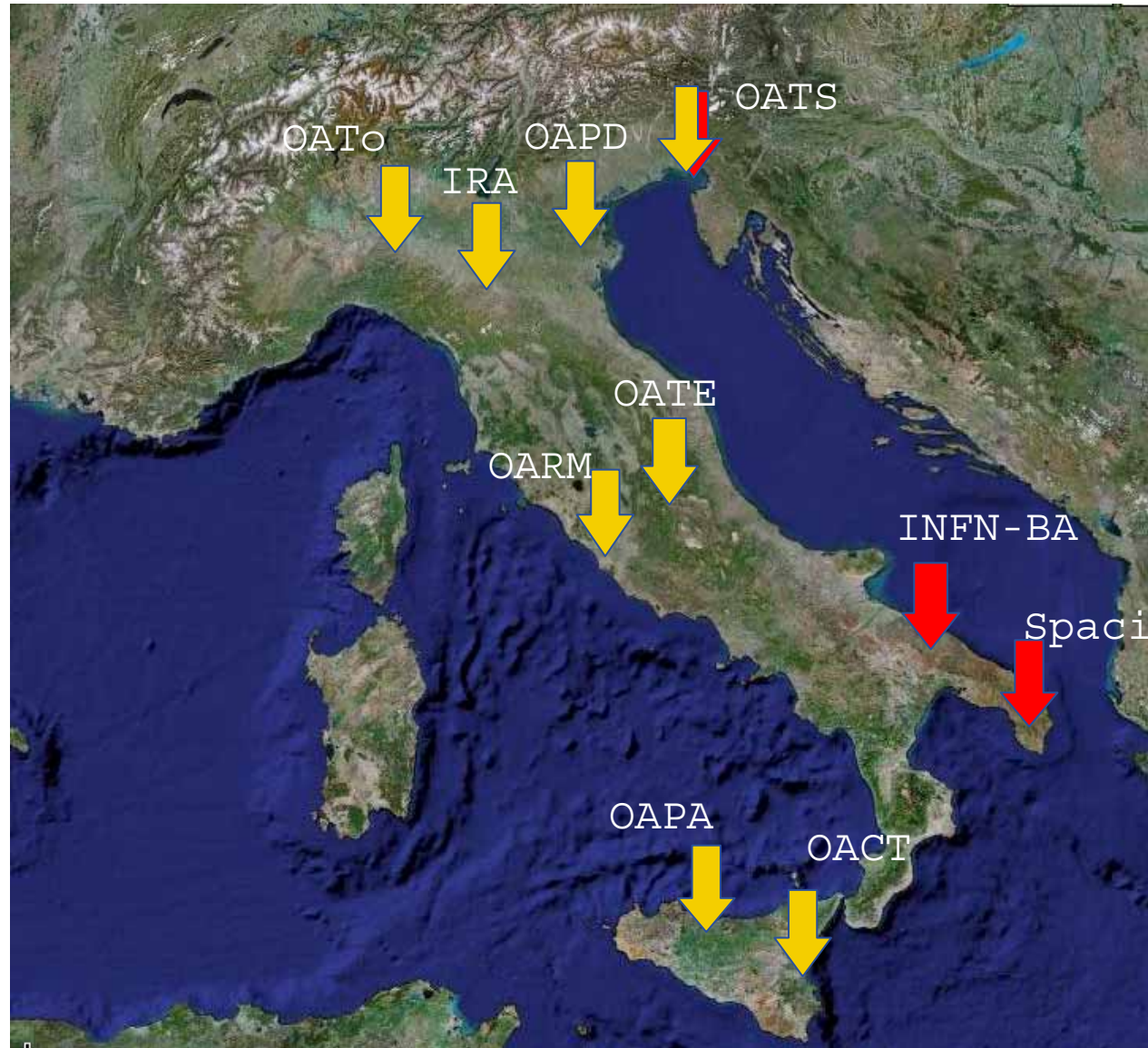
```
> globus-job-run g.dse.host/dbmanager-ODBC -queue PSQL1 \  
"CREATE VIEW flue AS SELECT Private.name, Private.Telephone  
WHERE medinfo.disease = 'flue';  
SELECT name from flue;  
START TRANSACTION; INSERT INTO Private VALUES (...); INSERT  
INTO medinfo VALUES (...); COMMIT;  
" -table
```

```
-----  
Name
```

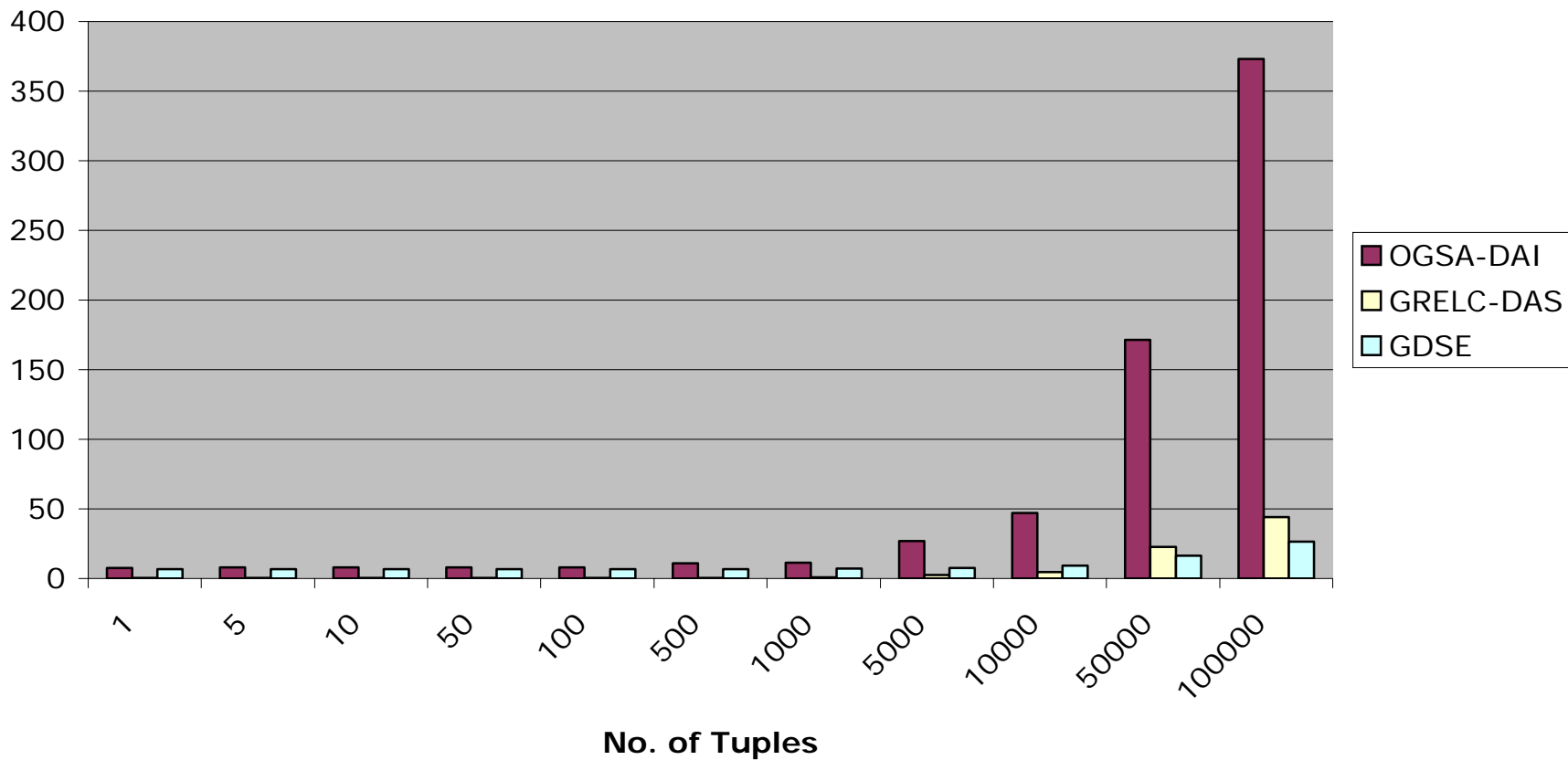
```
-----  
Bianchi
```

```
Rossi
```

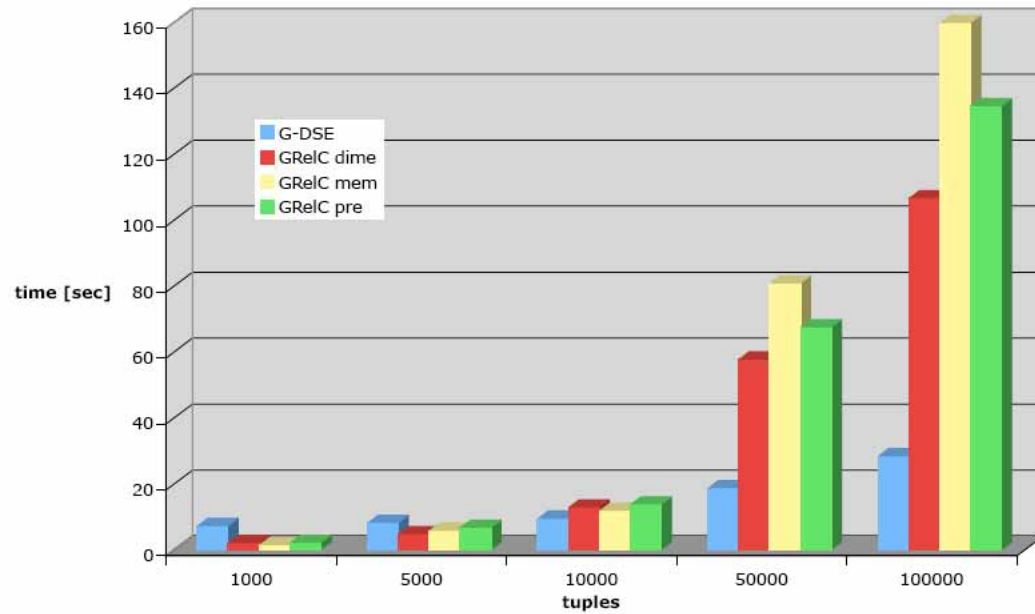
```
Neri  
-----
```



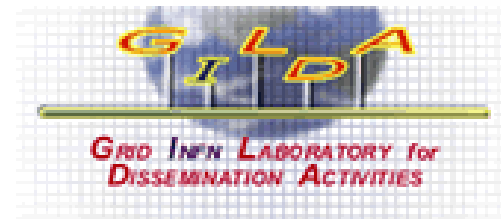
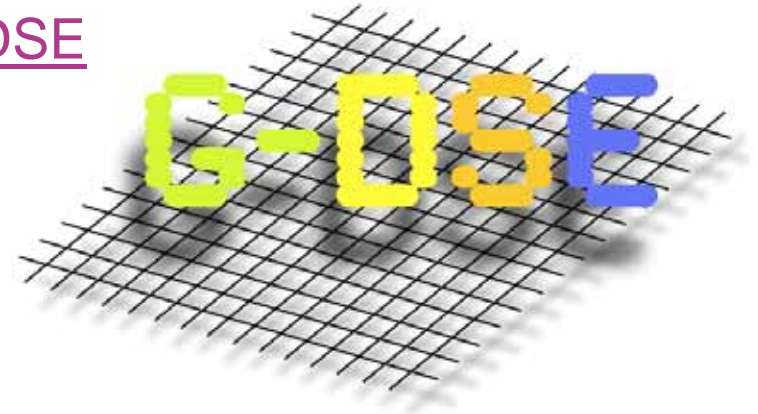
**"select \* from molecule where id < Y"  
Y from 1 to 100000**



GDSE vs GRelC



- **G-DSE site:**
  - <http://wwwas.oat.ts.astro.it/grid/G-DSE>
  - RPM, sources and docs
- **G-DSE @ Gilda**
  - Wiki page for installation
  - Wiki Page for usage
  - Wiki page for API
- **Tests and Comparison**



- Abstraction over heterogeneous DB;
- Simple federation mechanisms;
- Easy to embed in any environment;
- GSI + VOMS for security and authentication;

*End of Presentation*  
**Thank you for your attention**