Contribution ID: **99** Type: **Demonstration**

# The G-DSE (Grid-Data Source Engine)

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The I/O of Astronomical Applications almost always involve one or more databases. Grids unable to directly access databases force users to access databases off-line and transfer data of interest in classical SEs before the execution of the applications. Similarly, output will be stored in classical SEs and transferred to a database off-line after the termination of the application. This way of working is extremely uncomfortable and discourage users to choose the Grid as a collaborative tool. The G-DSE is one of the proposed solutions; with G-DSE a database becomes an embedded resource of the Grid. Grids extended through the G-DSE allow users to submit special jobs containing instructions to get data from databases, process them and store the processing results in one or more databases. In this way users can intermix database-related and processing related directives in their jobs. A databases in fact is one of the shared resources in Grid as a CPU, a disk space storage and so on.

## 3. Impact

The G-DSE is an extension of the Grid middleware. Unlike other proposed solutions to access databases via Grid, G-DSE is entirely based on the Grid technology. Its implementation was achieved by modifying some components of the middleware. The GRAM component was extended by introducing the new "Query Manager"besides the original "Job Manager"; this new manager takes in charge all jobs that require to access databases. The MDS Grid service, in particular its Glue Schema, is also extended; a new set of metadata characterizing and describing the new database resource is introduced so that users can take advantage of the Grid discovery capabilities to find and locate these new resources in Grid. The authentication and authorization mechanism of the Grid, instead, was left unchanged. In Grids extended with the G-DSE, users continue to authenticate as usual and user's rights defined in VOMS are mapped at DBMS level. The most recent releases of the G-DSE are both GTk and gLite compatible.

## URL for further information:

http://wwwas.oats.inaf.it/grid/G-DSE

## 4. Conclusions / Future plans

The main target for the deployment of the G-DSE is the EGEE Grid infrastructure. The final goal is to make possible the exploitation of the G-DSE by all EGEE users and this requires that all Grid sites of all EGEE VOs install the G-DSE. Intermediate scenarios are also possible where only some of the EGEE VOs provide the G-DSE support (the VOs of those communities for which the interoperability between the Grid and databases are relevant like the astro VO).

## Provide a set of generic keywords that define your contribution (e.g. Data Management, Workflows, High Energy Physics)

Database, Interoperability, Query Manager, Metadata, Glue Schema, Authentication, Authorization.

## 1. Short overview

Astronomical Database resources are of crucial importance for astronomical community and their applications; almost all of them need to access a database to get input data and/or to store final results. Therefore Grid infrastructures that don't offer this capability are not particularly useful for astronomers. The G-DSE extends the Grid middleware so that databases become a new embedded resource in Grid. Any scientific community can benefit of the G-DSE to access database resources via Grid.

## If demonstration is requested please explain what visual or interactive aspects of the contribution necessitate a demonstration rather than a presentation or poster?

Because the G-DSE is an extension of some components of the Grid middleware it is important to show how final users who are interested to use jointly the Grid and databases can practically operate to exploit in the best possible way the capabilities of such extended Grid. Recently the G-DSE has also been integrated in the EnginFrame Grid portal; it is therefore extremely important to show how this greatly improves the way users can interact with databases via Grid.

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