

GENIUS Portal – Overview

All the services provided by the LCG2-EGEE middle-ware are currently exposed to the users through rather complex Command Line Interfaces (CLI). There are tens of different commands with many options and rigid sequences, and even the description of jobs has a dedicated language (the Job Description Language or JDL) to be learned. All this lead the negative effect of discouraging many potential users from learning how to profit from the Grid advantage. It is just to overcome these drawbacks, that, at the beginning of 2002, the Italian INFN Grid Project started the GENIUS Portal Project in conjunction with the Italian web company NICE srl. Thanks to this portal users can browse their files, submit jobs inspecting their status and get back their output. Users are also able to browse the computing resources distributed all over the present test-beds and monitor the status of the network.

Each user can directly access to the GENIUS portal through the “secure” URL <https://genius.ct.infn.it>. GENIUS home page is here shown

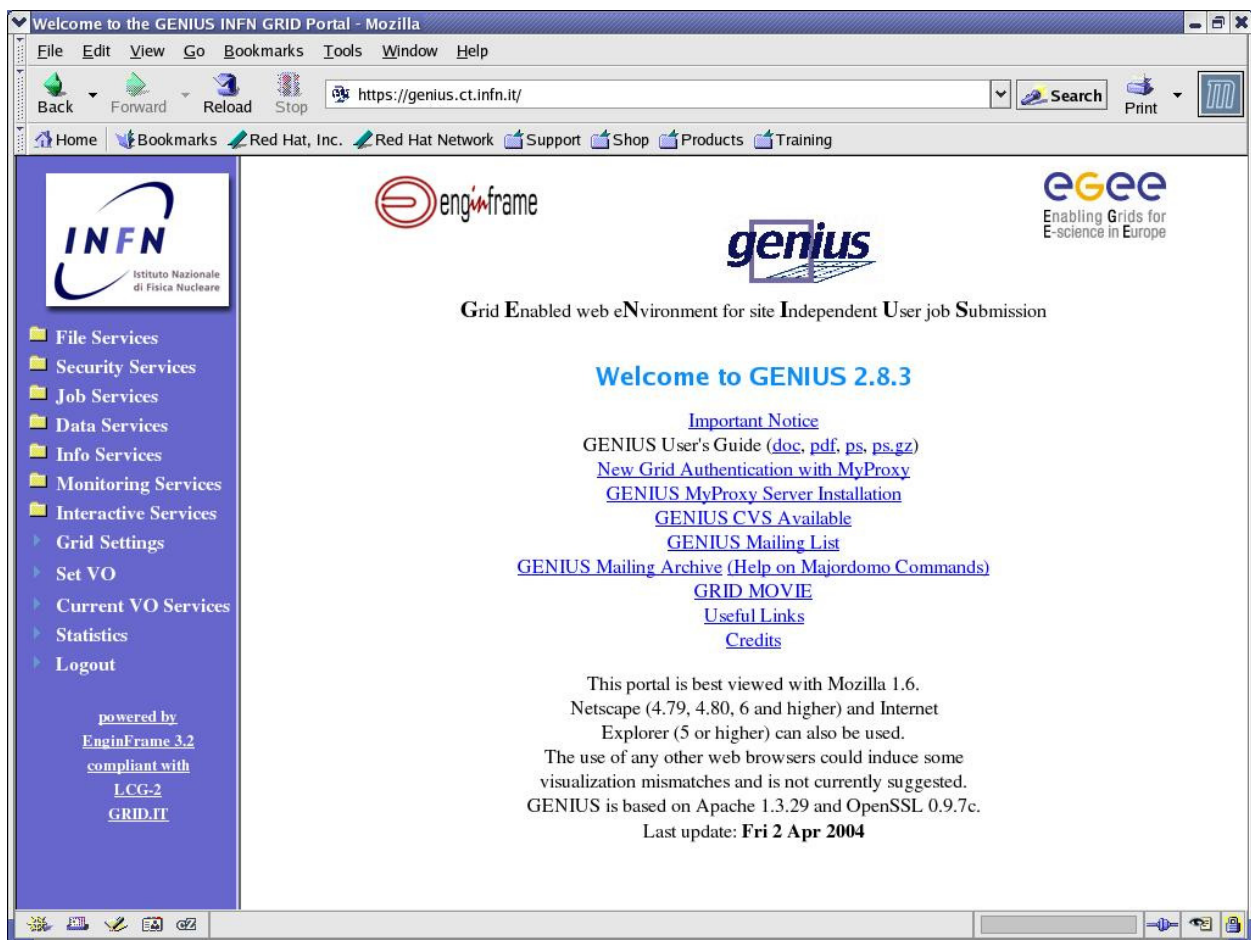


Figure 1.1 - GENIUS Portal home page.

As shown, portal layout is made of two frames : in the left one services are grouped, users can browse them choosing the desired one; its details are shown in central frame, from which users can manage service.

1 GENIUS Portal – Functionalities

Goal of this section is to describe in details the guidelines to accesst functionalities provided from the GENIUS portal.

To submit job, or use any other of GENIUS services, users have to autenticate themselves twice : one to access to operating system functionalities (see fig. 2), and the second one to access grid functionalities (see fig. 3). Anyway, when users request one of them for the first time, the needed authentication is required by GENIUS; this authentication will be valid for 30 minutes from the last user operation on GENIUS (not necessarily a service request). So, if user's browser sleeps for this period, to access GENIUS services a new authentication will be required.

1.1 Grid Settings

To submit job, grid authentication is required (see fig. 3)

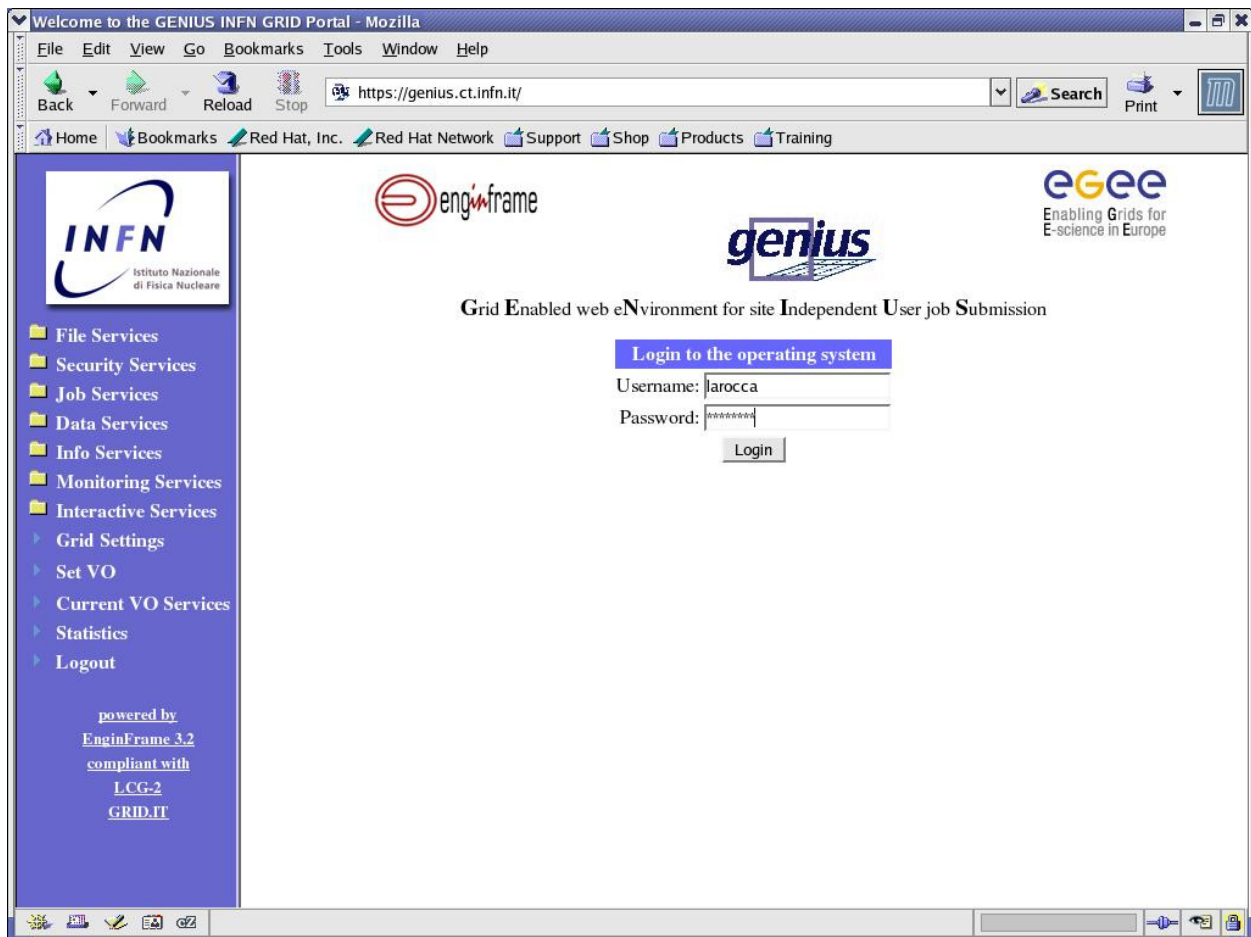


Figure 1.2 - Authentication to Operating System.

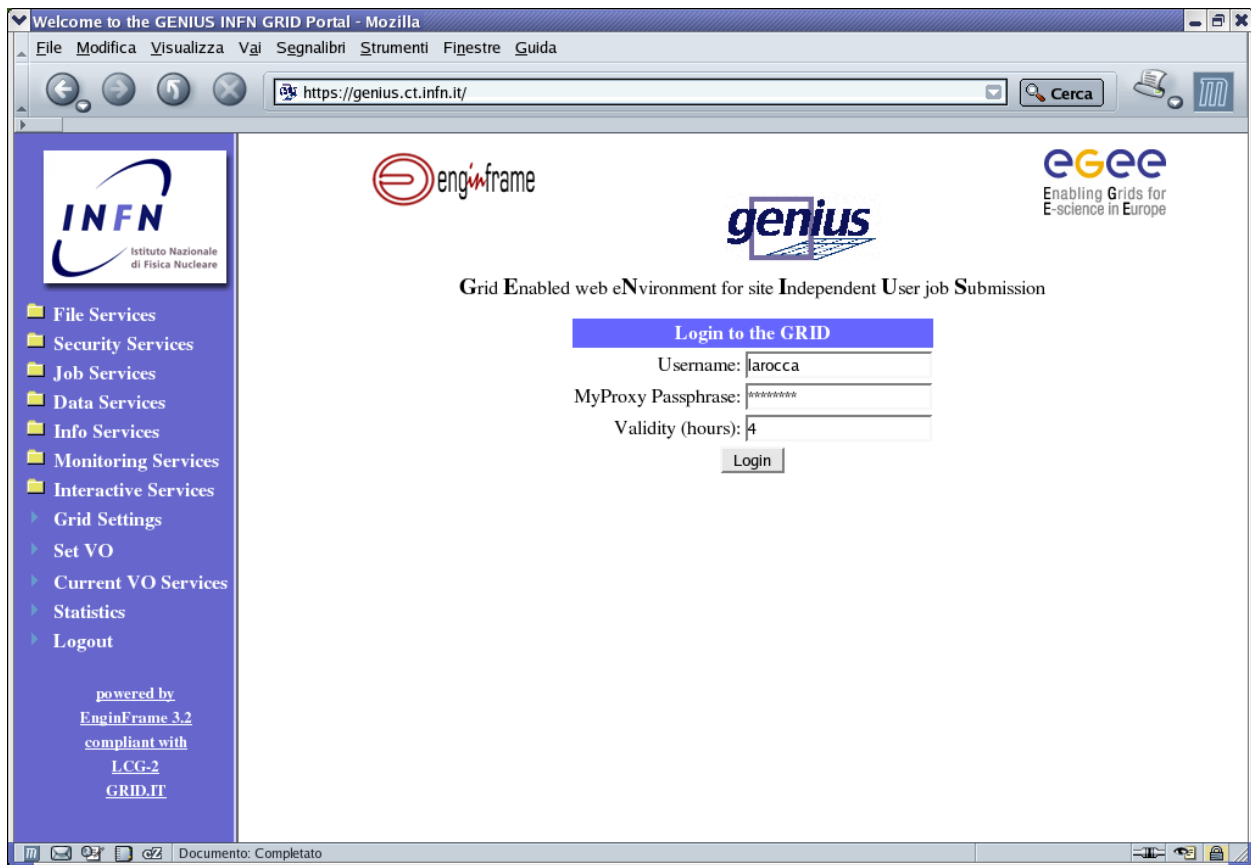


Figure 1.3 – GRID authentication

When authenticated, users have the possibility to specify the values of some attributes that are necessary for job submission. Users can set these attributes : *Resource Broker (RB)*, *Replica Location Server (RLS)* and *MyProxy Server*, as shown in the next screenshot.

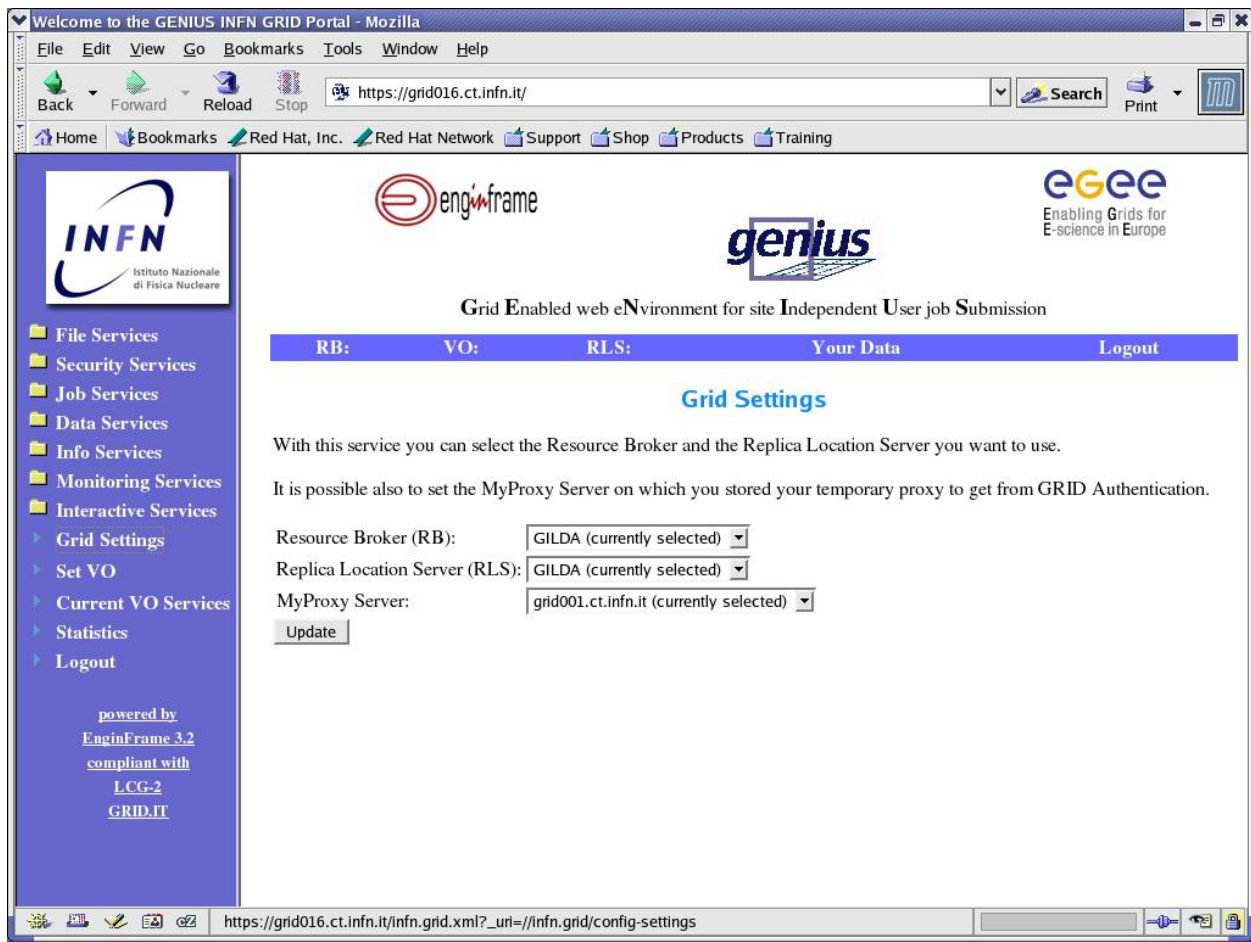


Figure 1.4 - Grid Settings Configuration.

Once selected the best desirable values for the attributes users had to confirm them through the *Update* button. A confirmation frame that resumes user choice is displayed, as shown in this screenshot.

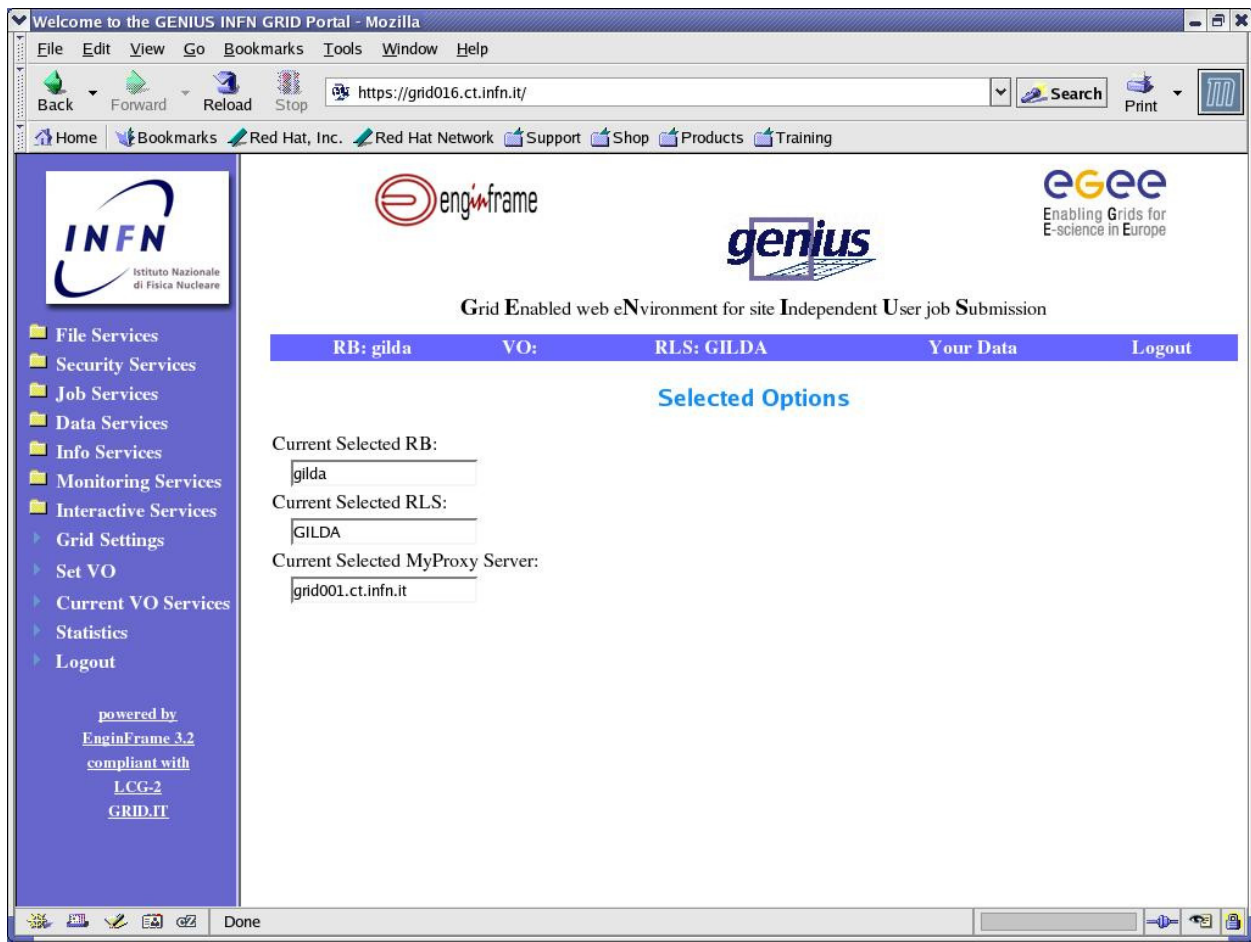


Figure 1.5 - Grid Settings conformation.

1.2 Set VO

The next step is to select a *Virtual Organization* (VO). To do so hit the button *Set VO* and choose your own VO.

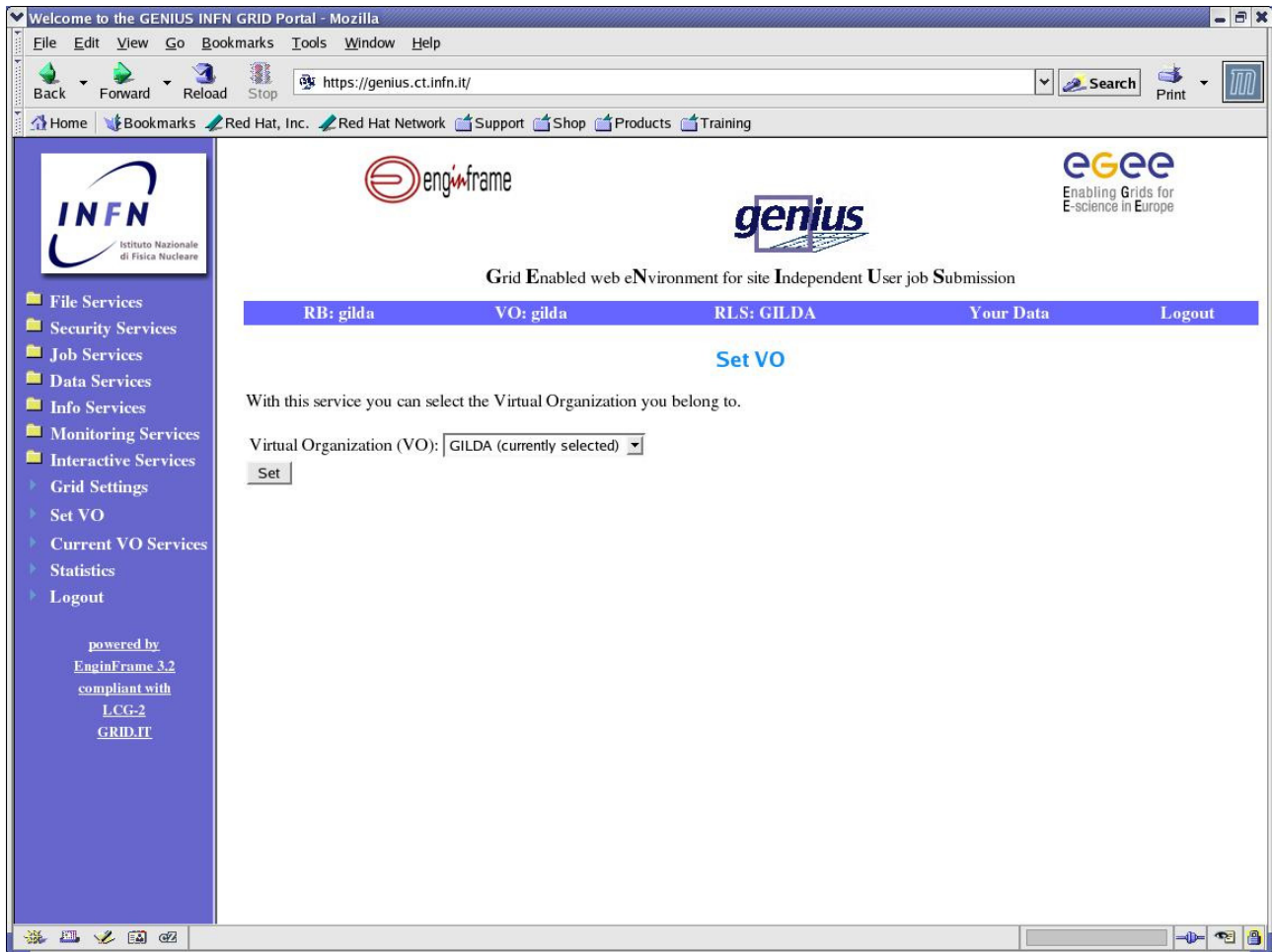


Figure 1.6 - Virtual Organization setting.

Now users are ready to access Grid resources. There are different group of functionalities that the GENIUS portal makes available to users: among these the *job submission system function*, which allows to submit jobs, check their status, and retrieve any output obtained during their execution. To access this service users have to click-on the *Job Services* button. *File Services* let users manage their filesystem in the remote UI machine, allowing download of their local files. *Security Services* allows to users to manage the proxy needed to run jobs on the grid. *Info Services* are meant to let the user browse the testbed he/she can use. With the *Data Services* the users can navigate the Replica Location Server of the selected Virtual Organization and decide to view, replicate, remove or download a file from it. *Interactive Services* allow the users to access the remote *User Interface* (UI) in order to perform interactive analysis. *Monitoring Services* allow users to monitor/measure significant GRID resources in order to analyze usage, behavior and grid performances, detect and notify faulty situations. *VO services* are those services expressly customized for the various Virtual Organizations (VO's).

After this brief introduction in the next sections we try to describe in more details all of these services.

2 File Services

These services are intended to let the user interact with his files stored on the remote UI machine. To use this services, the user must be logged on the operating system.

2.1 Create a File

With this service, the user can create a file on the remote UI machine. The user has to provide the filename (e.g *textFile.txt*.) and the text of the file, that will be created in the user home directory on the UI machine, with the specified name. Users can also “cut and paste” from another file located on the local machine that is executing the web browser. In both cases, when the **Save** button is hit, the file is created on the UI machine.

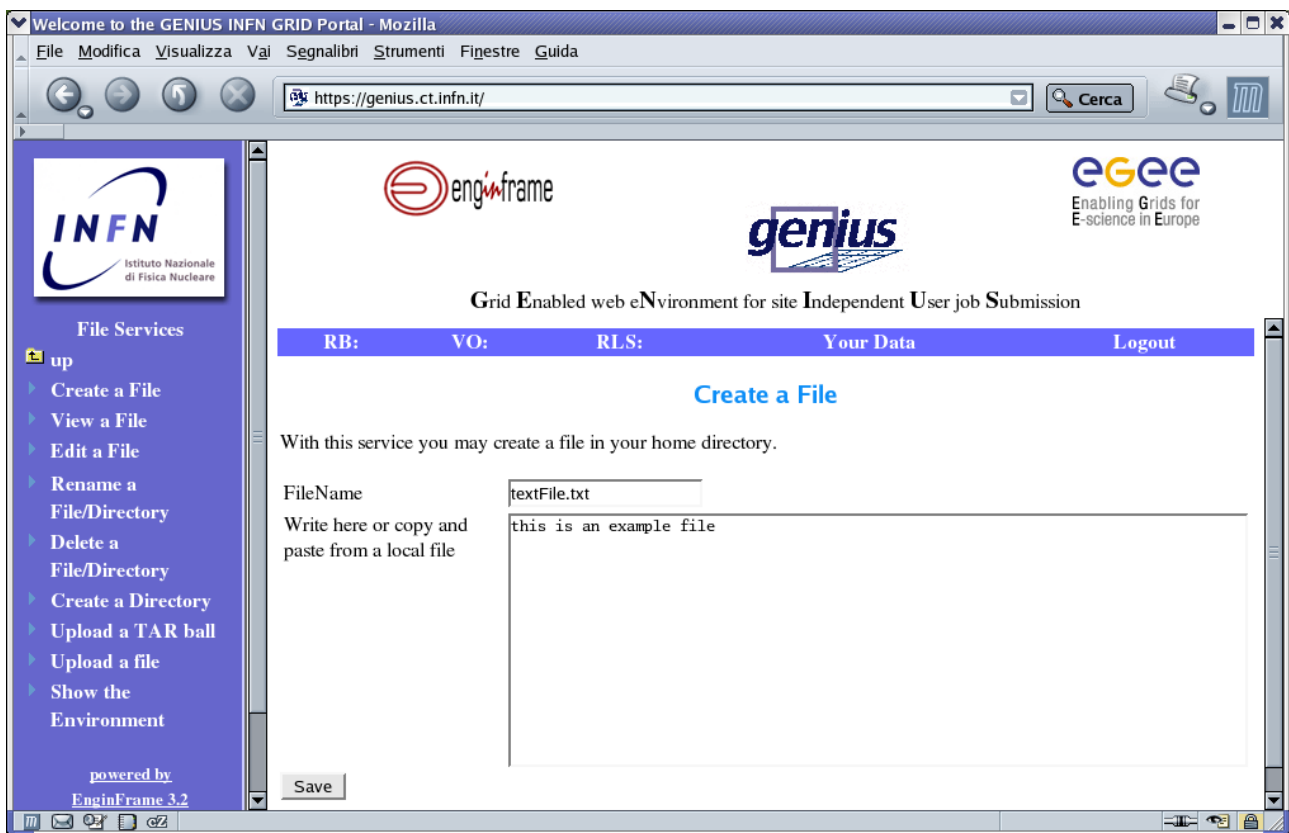


Figure 2.1 Create a file

2.2 View a File

With this service, user can view, but not modify, one of his/her file stored in the UI machine. In order to choose the file, the user has two possibilities :

1. Provide the full path of the file in the dialog box
2. Click on the Select button, to list all his/her file (including subdirectories) in the UI machine, and select the desired one.

Hit on the View button, and the file contents will be shown on the screen.

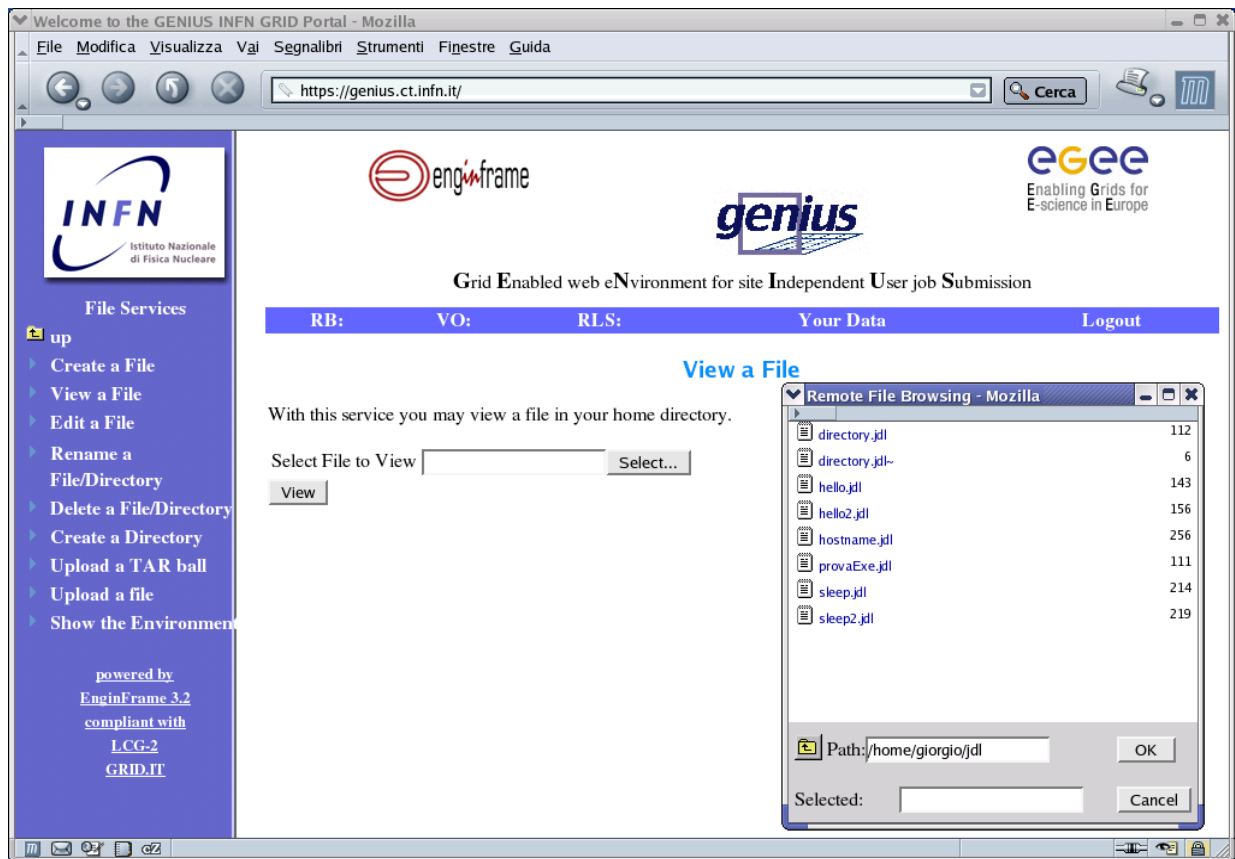
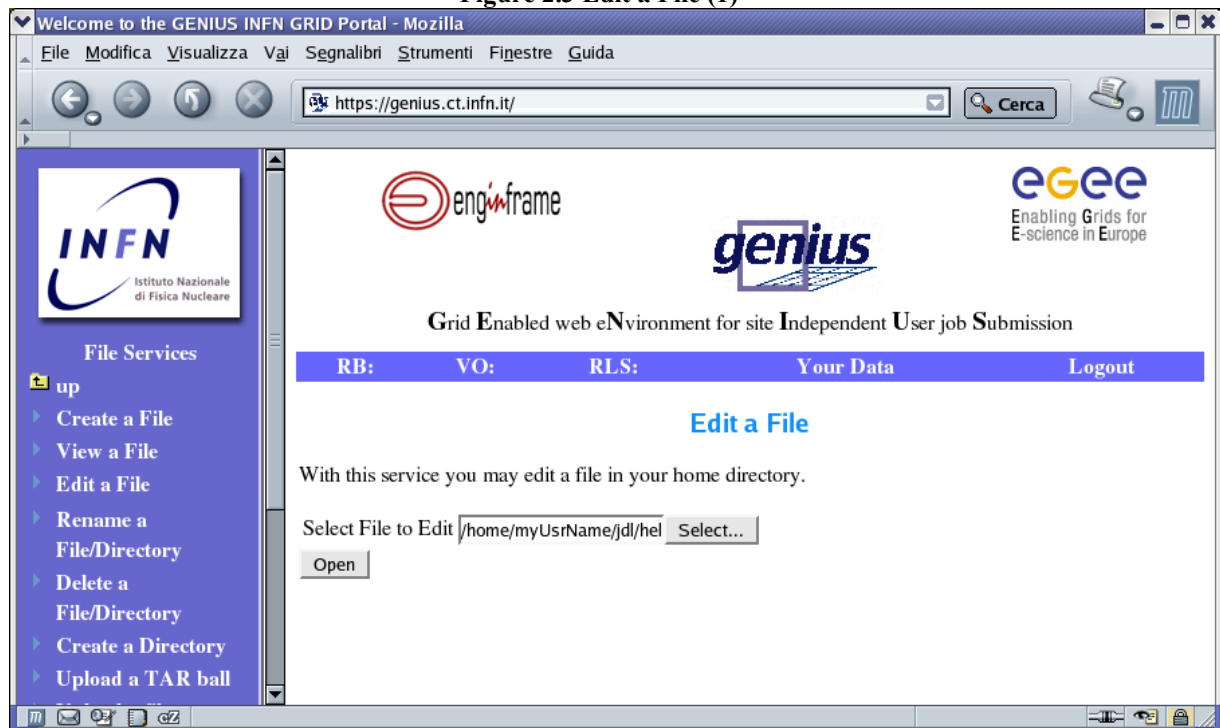


Figure 2.2 View file

2.3 Edit a File

This service allow users to view and modify his/her files stored on the UI machine. To do so, the user has to select the file, by specifying the full path of the file in the text box or selecting the file with the file browser that is opened when the Select button is hit.

Figure 2.3 Edit a File (1)



When the file is chosen, clicking on the Open button the text of the file will be shown in a text area, from which user can modify file name or file contents. When finished, a click on Save button will update the file on the UI machine.

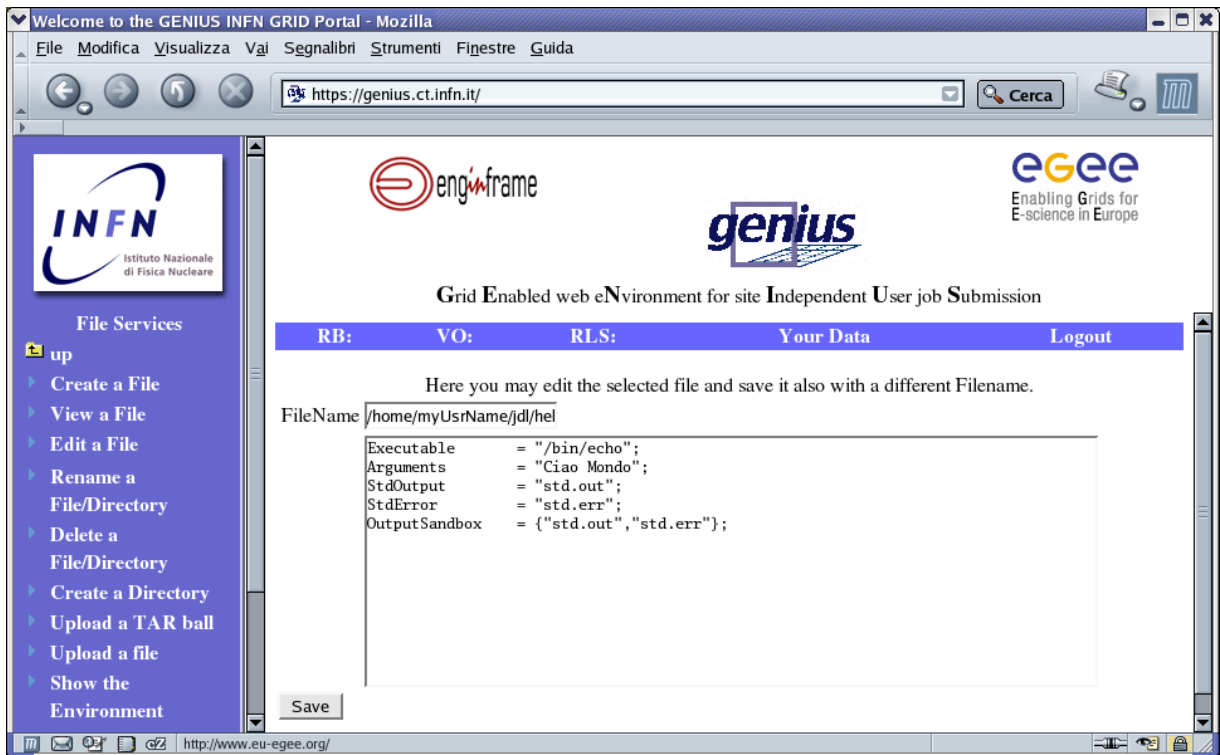


Figure 2.4 Edit a file (2)

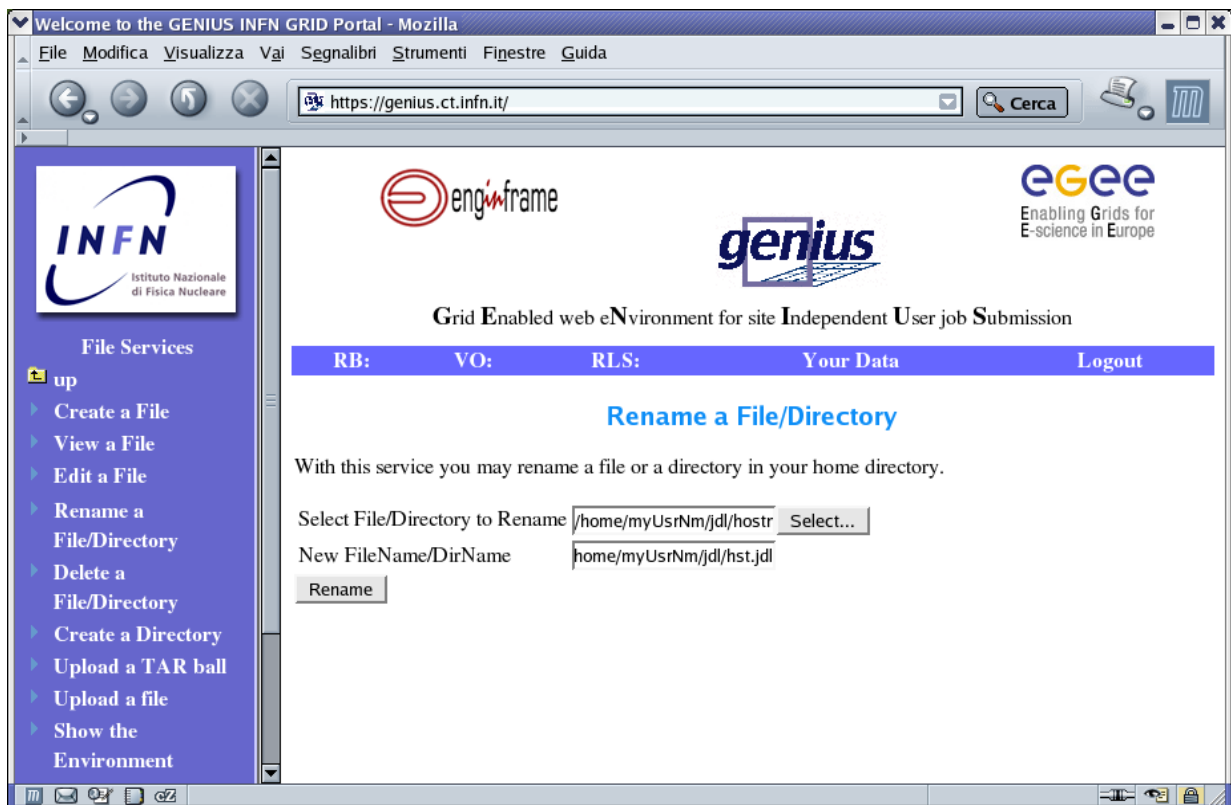


Figure 2.5 Rename a File/Directory

2.4 Rename a File (or Directory)

With this service, user can rename their files o directories. As usual, the file or directory can be chosen by specifying its full path in the first text field or using the UI File Browser fired by the

Select button. The second text field must contain the new filename (or dir name), and optionally its path.

By default the file or directory will be placed in the user home directory on the UI, and so, if user wants to rename a file contained in a subdirectory, without changing its location, must specify also the relative path from home. When **Rename** button is hit, the selected file/directory will be renamed in the UI machine.

2.5 Delete a File (or a Directory)

This service allows users to delete his/her files or directories stored in the UI machine. To do so, users has to choose the file/directory using one of the usual ways (see precedent subsections) and then, once the file/directory is selected, delete it by clicking **Delete** button.

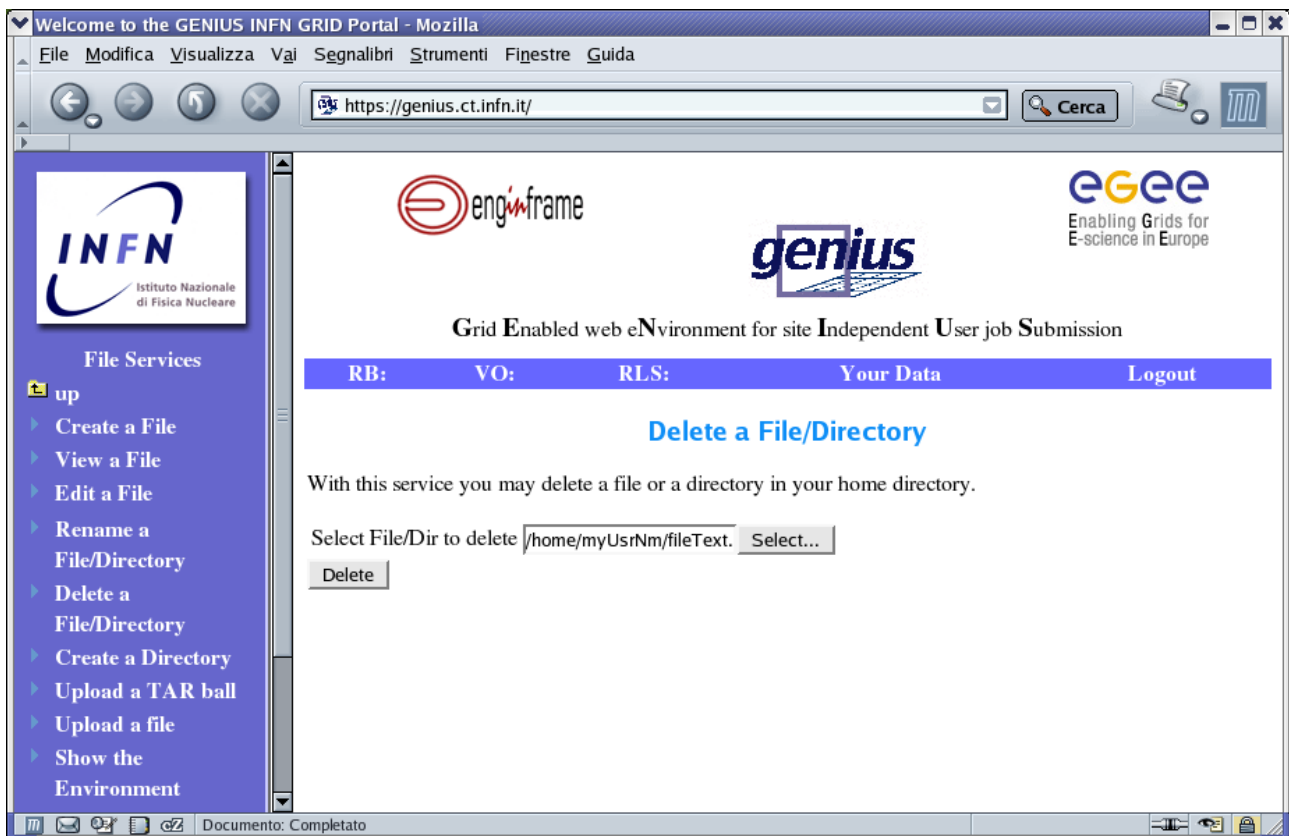


Figure 2.6 Delete a file/directory

2.6 Create a directory

With this service users can create a subdirectory for his/her home directory. To do so, user must provide the absolute path of the directory (e.g. /home/<username>/newdirectory) and then click on the **Create** button, which creates the new directory in the specified location.

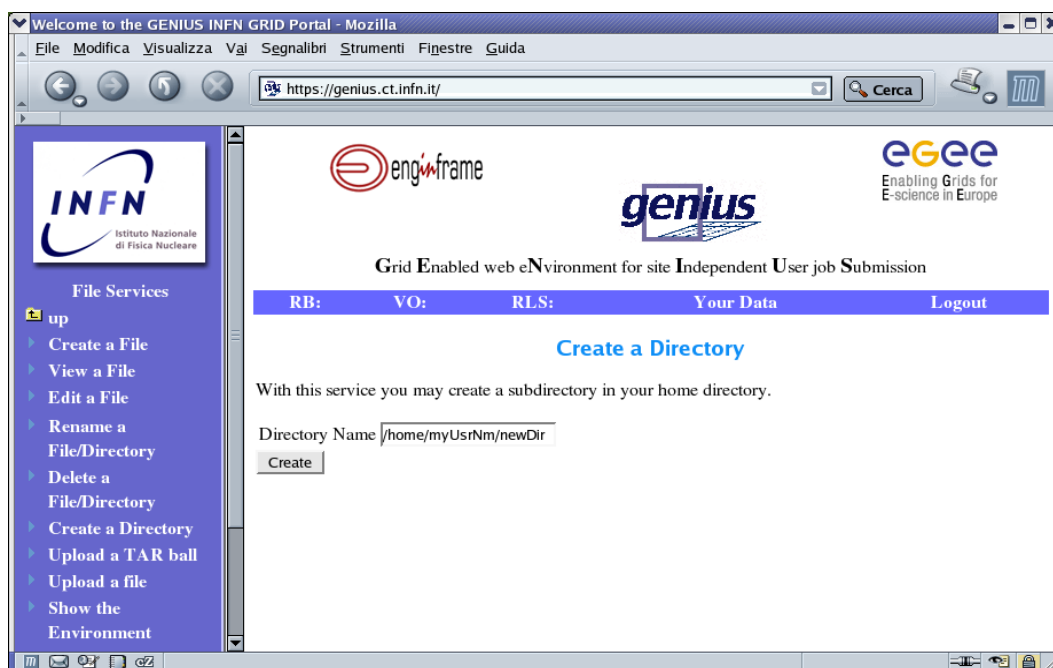


Figure 2.7 Create a file/directory

2.7 Upload a TAR ball

With this service, users can upload the contents of a TAR ball file on the remote UI machine. The TAR ball must have extensions .tar, .tar.gz, .tgz, .zip. On a Unix machine, a TAR ball file can be created with the commands

- `tar cvf tarball.tar <file 1><file 2>...<file N>` (normal TAR ball)
- `tar cvfz tarball.tar.gz <file 1><file 2>...<file N>` (compressed TAR ball)

On a Windows machine a TAR ball can be created, for example, with WinZip.

The user has to indicate the TAR ball located on his/her local machine, by providing its absolute local path to the Select text field or selecting the file with the Local File Browser fired by the Browse button. Then user has to specify the remote destination of the TAR ball file, providing its relative path from his/her home area on the UI machine (e.g /tarBall/archive1.tar.gz in the field destination path will put the file in /home/<username>/tarBall/archive1.tar.gz). User can also specify if the TAR ball file has to be deleted after its uploading and extraction or not. In fact, when the Upload button is hit, the TAR ball is transferred to the remote UI machine, in the specified location, and here files contained into the archive are extracted.

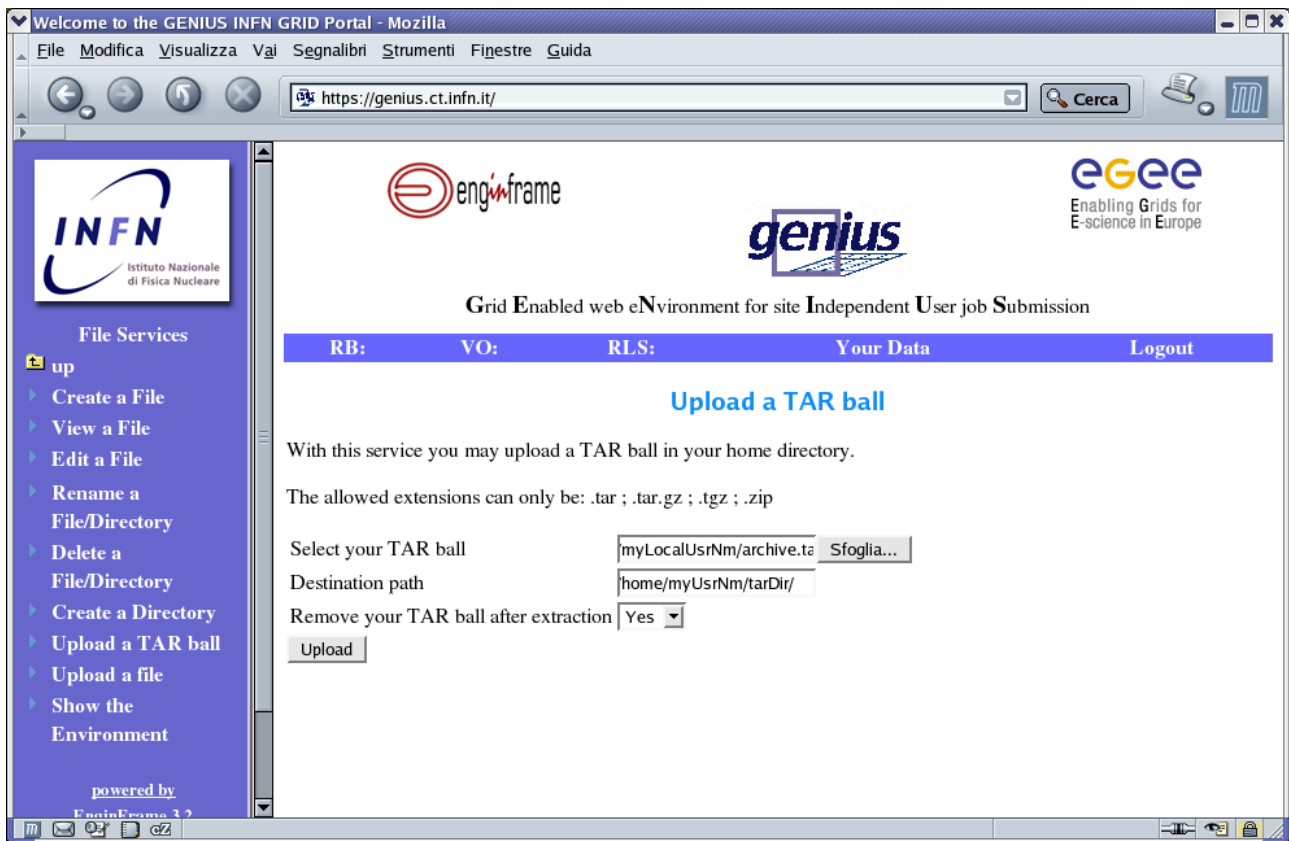


Figure 2.8 Upload a TAR ball

2.8 Upload a File

With this service, users can upload a single file to the remote UI machine. The local file to be uploaded is specified by providing its local full path to the Select text field or using the Local File Browser activated by the Browse button. Then user choose the file remote location on the UI machine, even renaming the file, and when **Upload** button is hit, the upload process get start.

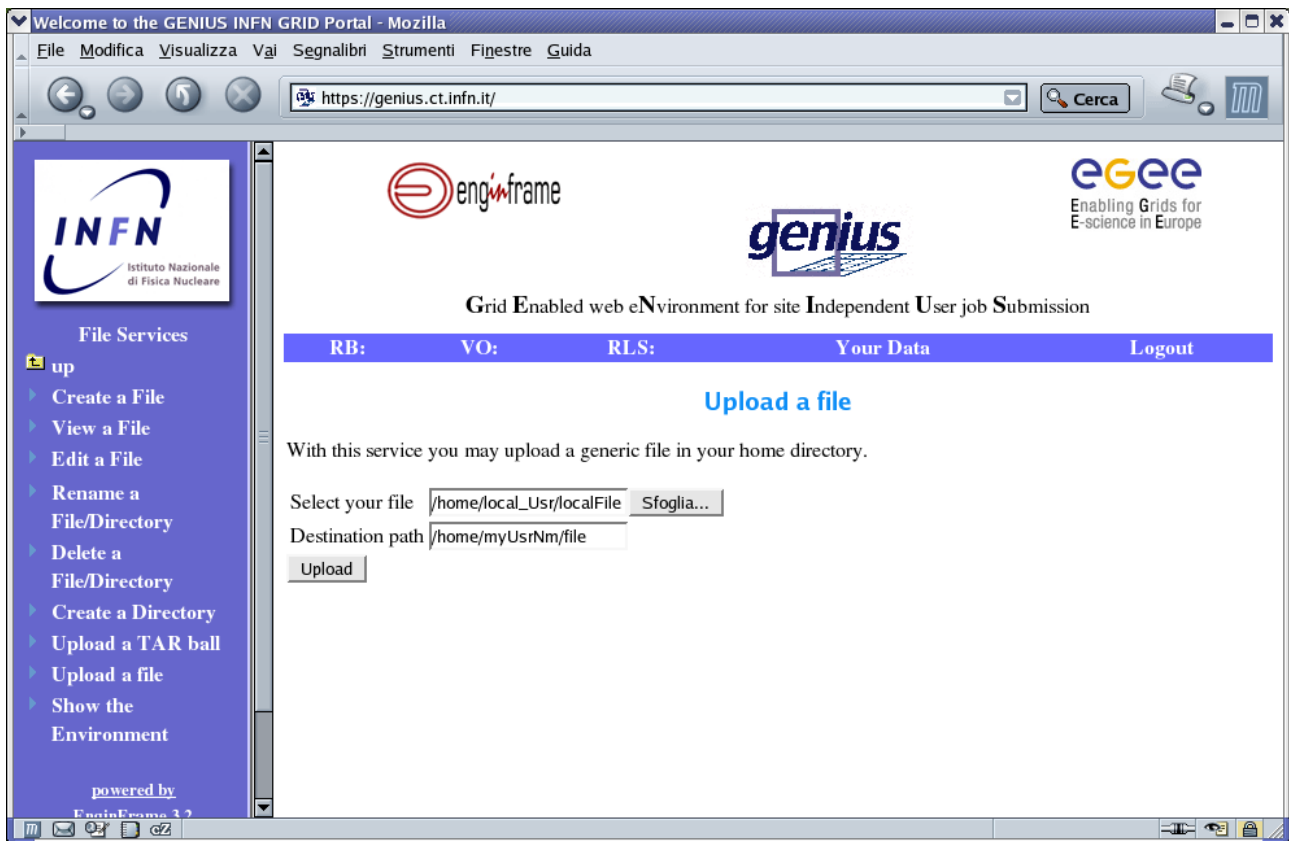


Figure 2.9 Upload a file

2.9 Show Environment

With this service the user can inspect the environment variables available on the UI machine. This can be useful in conjunction with the use of Interactive Services.

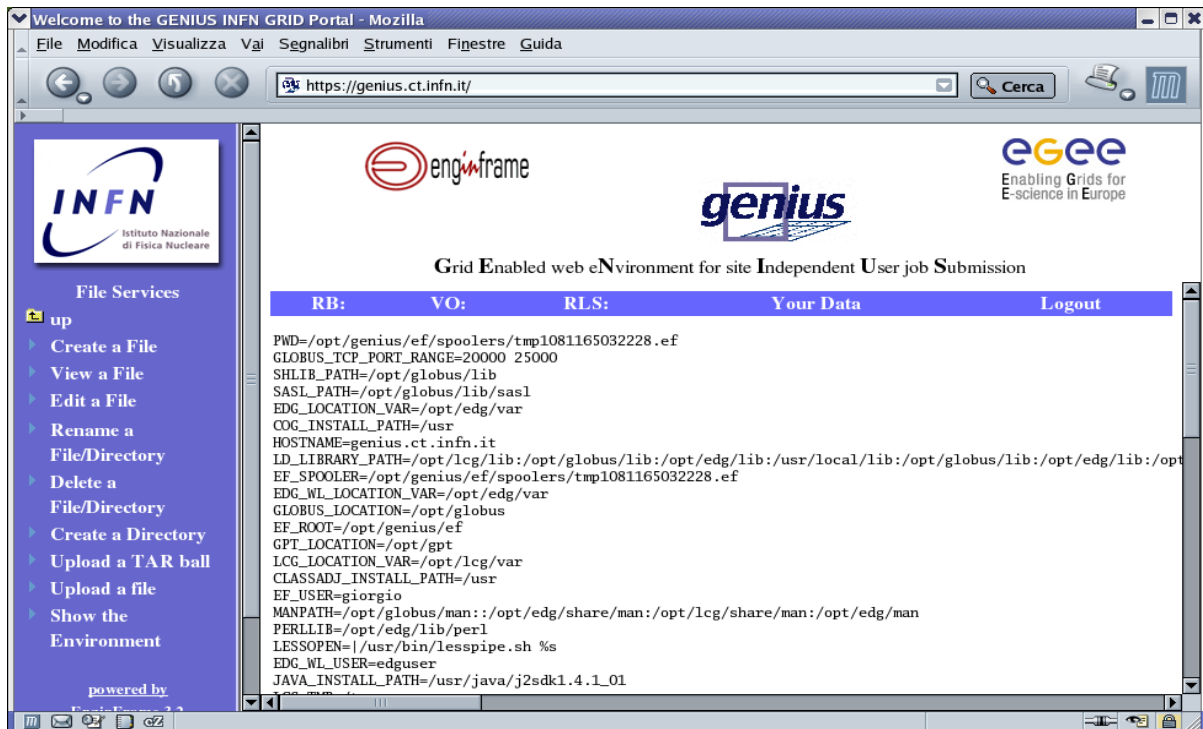


Figure 2.10 Show environment

3 Security Services

This services are meant to let users manage their passwords and the token needed to run jobs on the grid. To use this service, the user needs to be logged in the Grid.

3.1 Info on Proxy

With this service, users can get information about their grid proxy, the temporary token needed to run jobs on the grid. The subject of the certificate, the issuer, the type, strength and the remaining validity are shown.

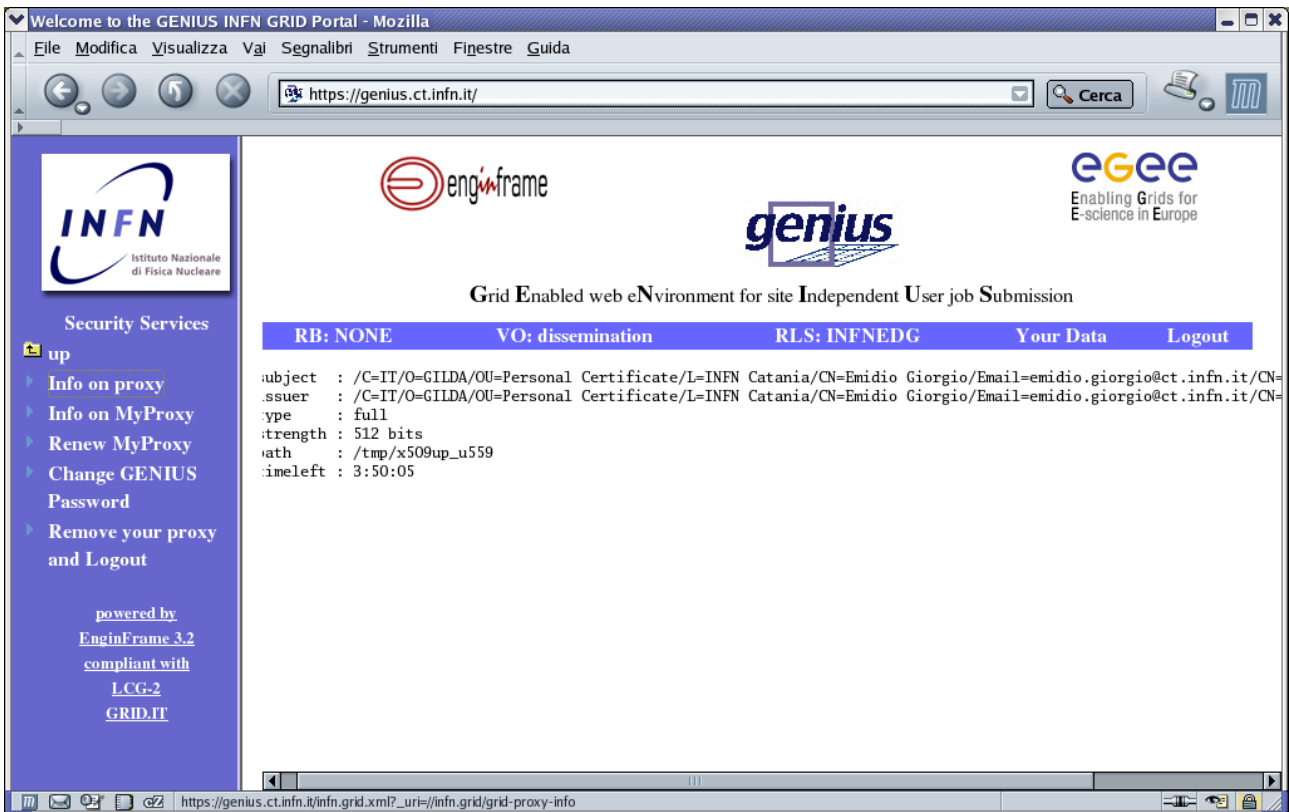


Figure 3.1 Info on proxy

3.2 Info on MyProxy

This services let users retrieve information about their my-proxy, its owner and its remaining time.

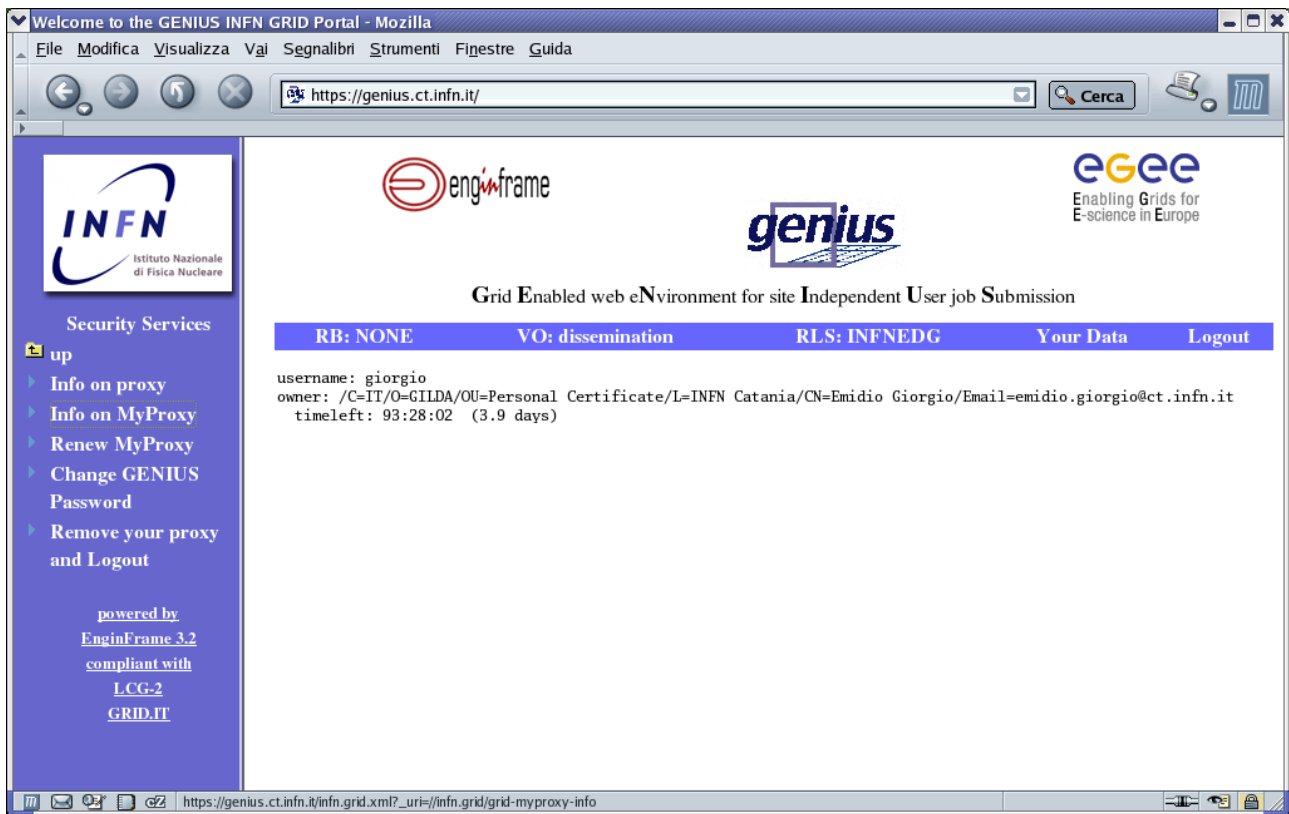


Figure 3.2 Info on MyProxy

3.3 Change Genius Password

With this service, users can change their system password on the UI machine Genius is running on. This is the first operation a new user should do at his/her first use of Genius. The user must provide the old password and the new one (twice).

3.4 Remove your proxy and Logout

When the user request this service, he/she is automatically logged out of the Grid, while his/her temporary proxy (not their MyProxy) is destroyed.

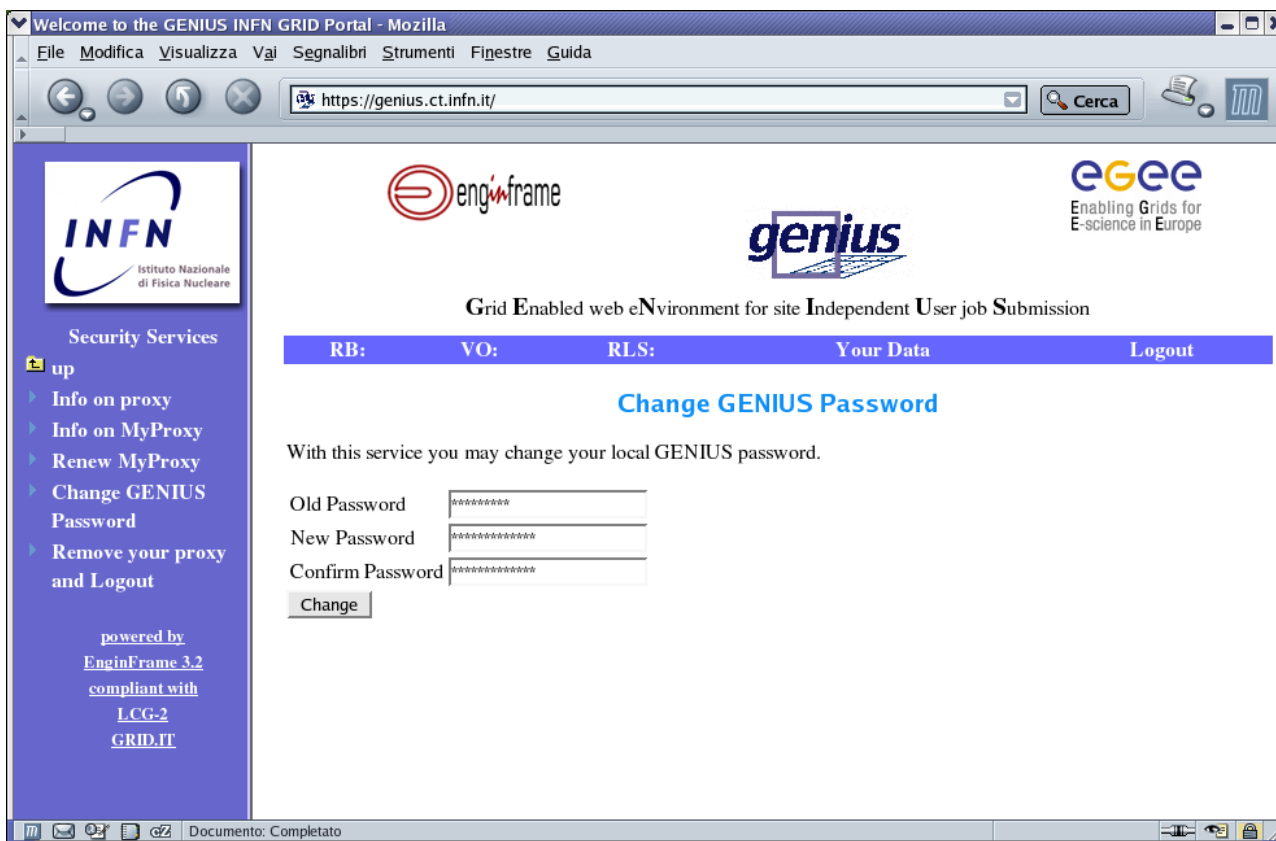


Figure 3.3 Change GENIUS password

4 Job Services

Job Services are meant to supply an ensemble of commands to submit jobs, to cancel jobs, check their status, and retrieve any output obtained during their execution. In particular this service allows users to choose between single or multi jobs, and allows users to list all the available resources fulfilling job requirements.

4.1 Single Job

In this sub-section we will supply the indication to submit a single job. To do this click on *Single Job* folder and you will see the following screenshot:

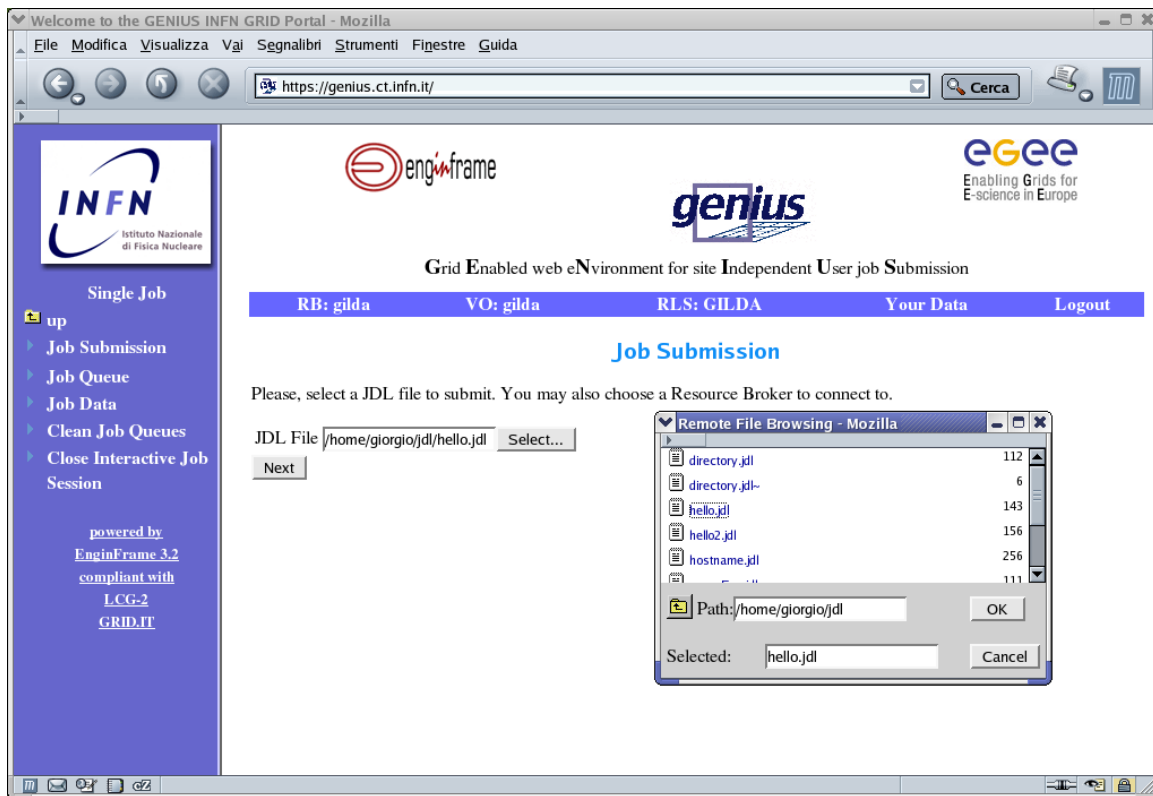


Figure 4.1 – Single Job Submission (step 1)

4.1.1 Job Submission

With this service the user can submit a job on the grid. Job submission is done in two steps.

– *Step 1*

The user has to provide the JDL file which describes the job he/she wants to submit. This can be done in two ways:

- providing the full path of the file in the dialog box (e.g., /home/<username>/myjob.jdl);
- clicking on Remote File Browse to list all his/her remote files on the UI machine (including subdirectory navigation) and selecting the desired JDL files (see fig 4.1).

Clicking button « Next » will end the first step.

– *Step 2*

The JDL file which describes the job and the Resource Broker selected are shown on the screen (they cannot be changed anymore) and a menu gives the possibility to select one of the Computing Elements where the job will be executed.

When the button « Submit job » is hit, if everything is OK, the job is submitted to the Grid and the user is notified about the submission status and gets the job identifier. If an error occurs or there is a problem of connectivity with the Resource Broker the user is notified and an email containing the error log is automatically sent by GENIUS to the relevant site managers.

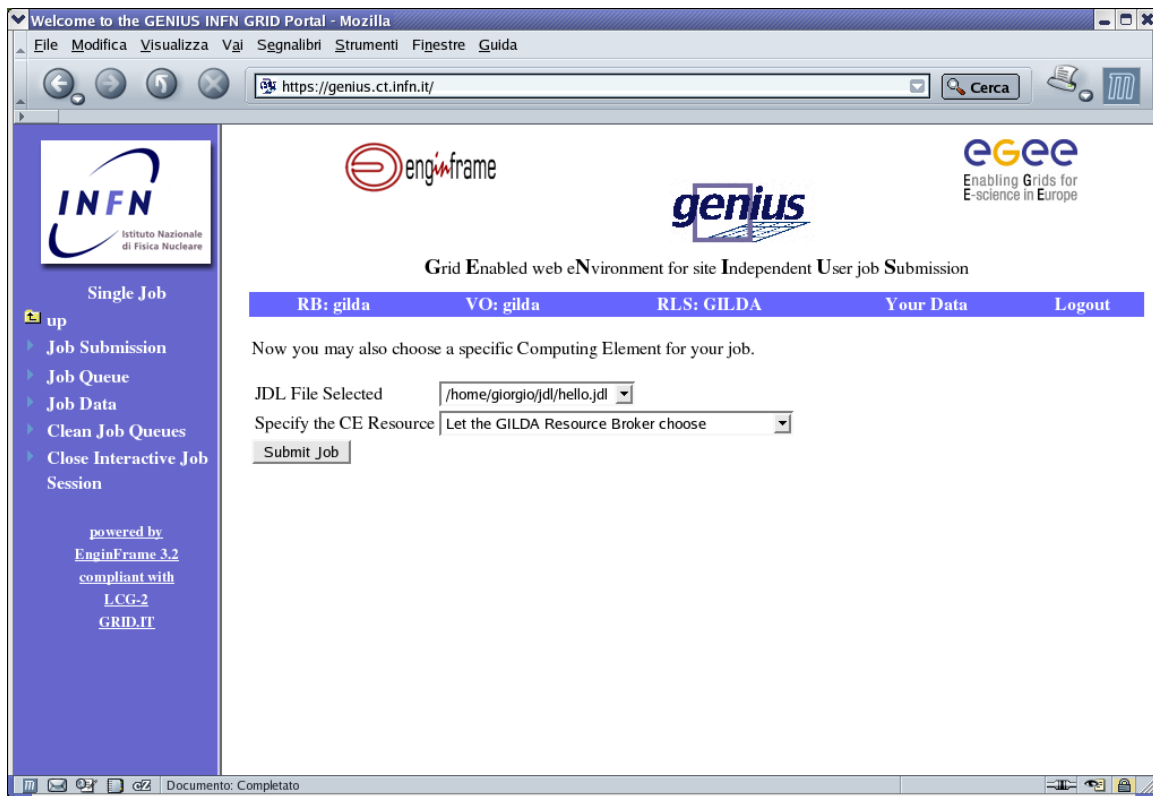


Figure 4.2 – SingleJob Submission (step 2)

Clicking the *Submit Job* button, if everything goes right, users will see some of this kind.

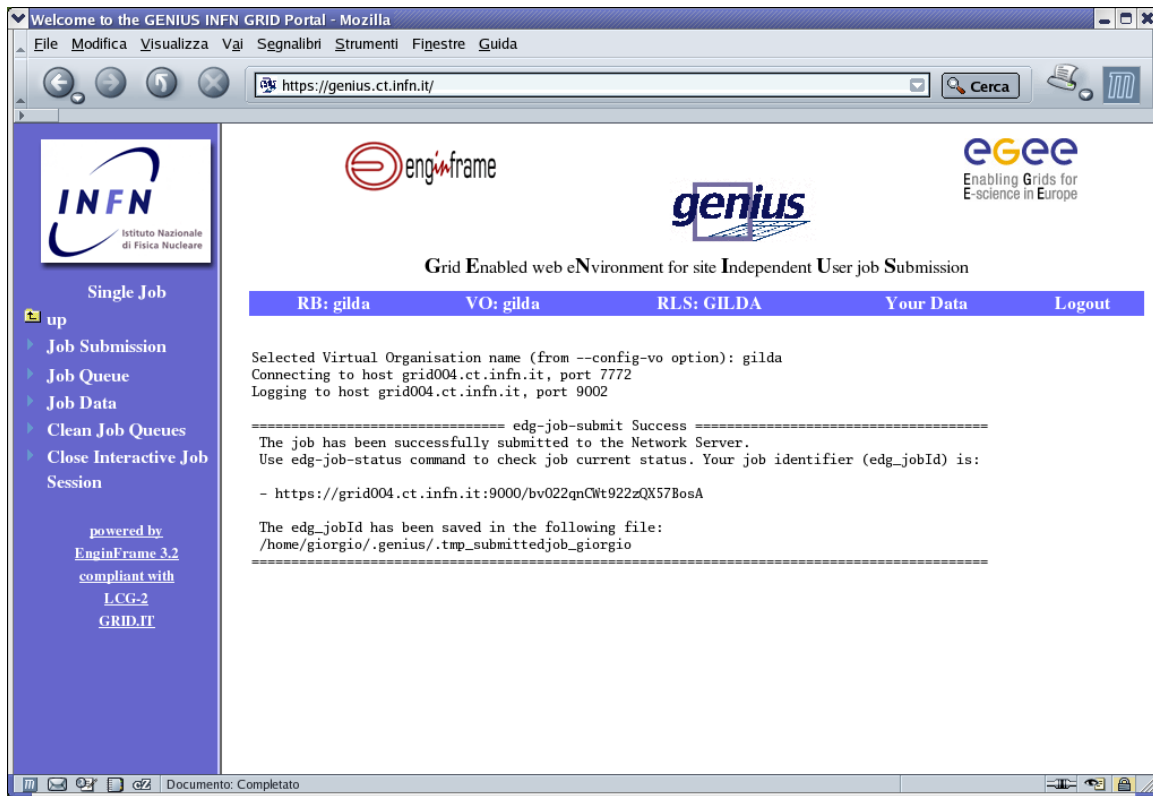


Figure 4.3 – SingleJob submission (step 3)

4.1.2 Job Queue

If the job has been successfully submitted to the Network Server, a job identifier (jobId) is returned, which can be used to determine the status of the job and eventually retrieve its output. With the *Job Queue* service (fig. 4.3) users can query the status of the job they have submitted to the grid. So when the button Job Queue is hit users get the list of all the job they have submitted.

Each row of this list contains the following information:

- job identifier : clicking on it users retrieve every step that the job has reached since its life-cycle gets started
- JDL filename : clicking on it user can read jdl file content
- the time of job status last update (Ready, Running, Scheduled...)
- the Computing Element where it is actually running on : note that this CE may change during job life-cycle
- the present status of the job
- actions possible on the job: as long as the job has not reached the status “Ready” clicking on “Cancel” will abort it.

Job queue shows user jobs in order, starting from the most recent one. The frame is refreshed every five minutes. However, user can always refresh the frame manually, by right-clicking with mouse and selecting in the appearing browser pop-up menu “Reload frame” (with Mozilla/Netscape; with MSIE right-click and “Refresh”).

As said, to retrieve job logging information submitted previously the user can click on the Job ID. This kind of information is stored permanently by the Logging and Bookkeeping service and can be retrieved also after the job has terminated its life-cycle.

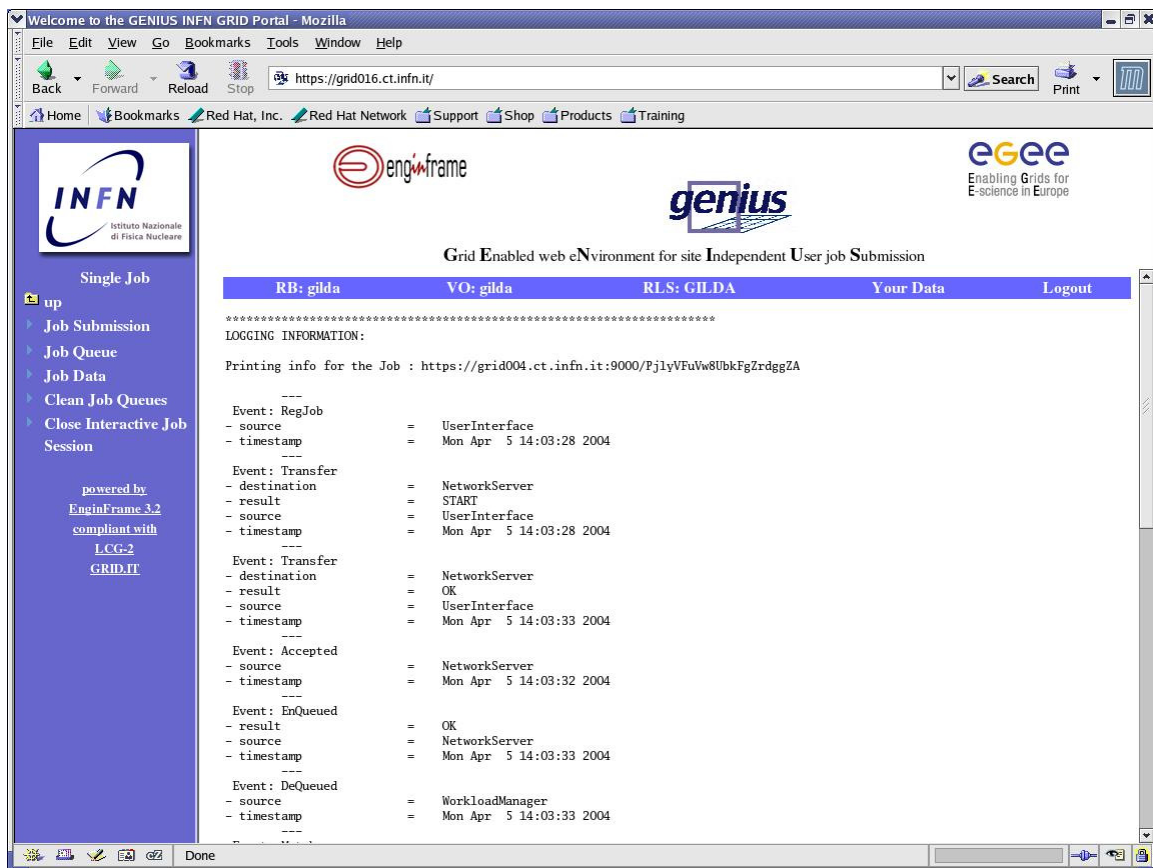


Figure 4.4 - Logging Information for the job.

In the same way, by clicking on the JDL filename, user can see the JDL file of the job.

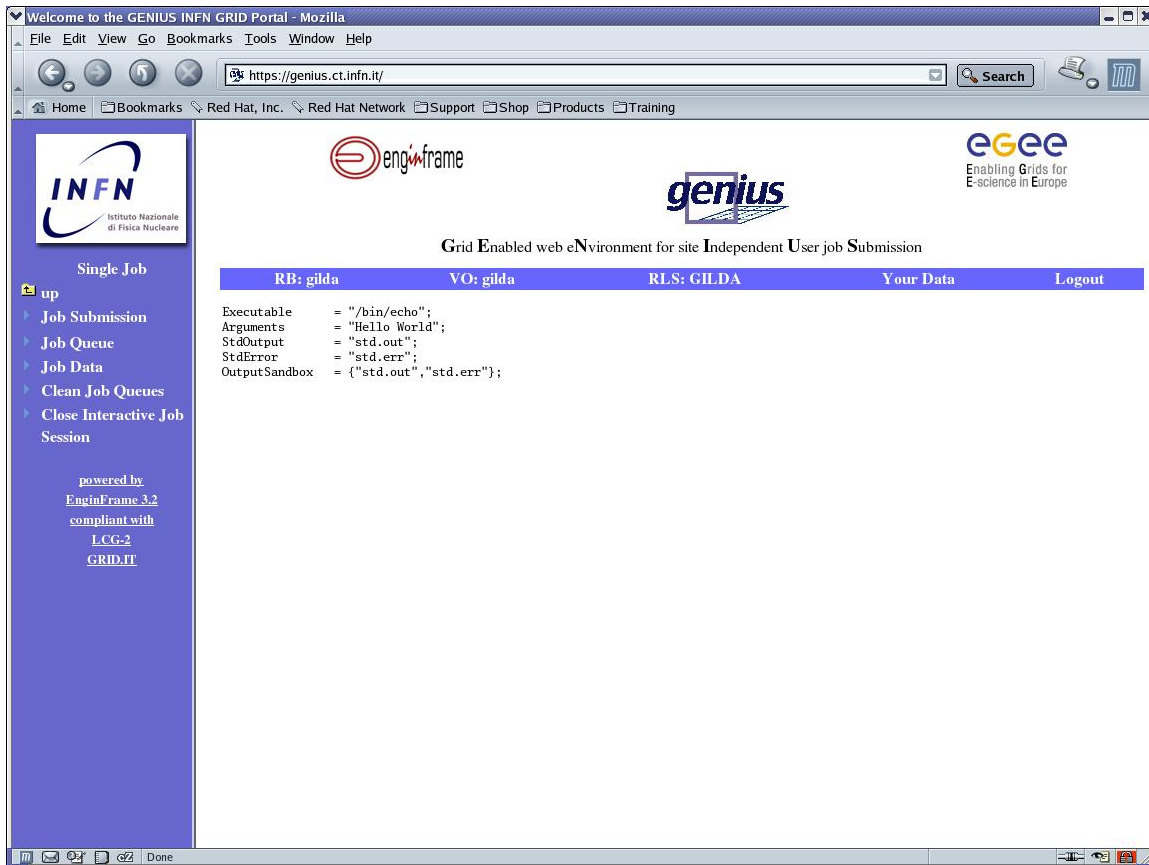


Figure 4.5 - JDL file of the submitted job.

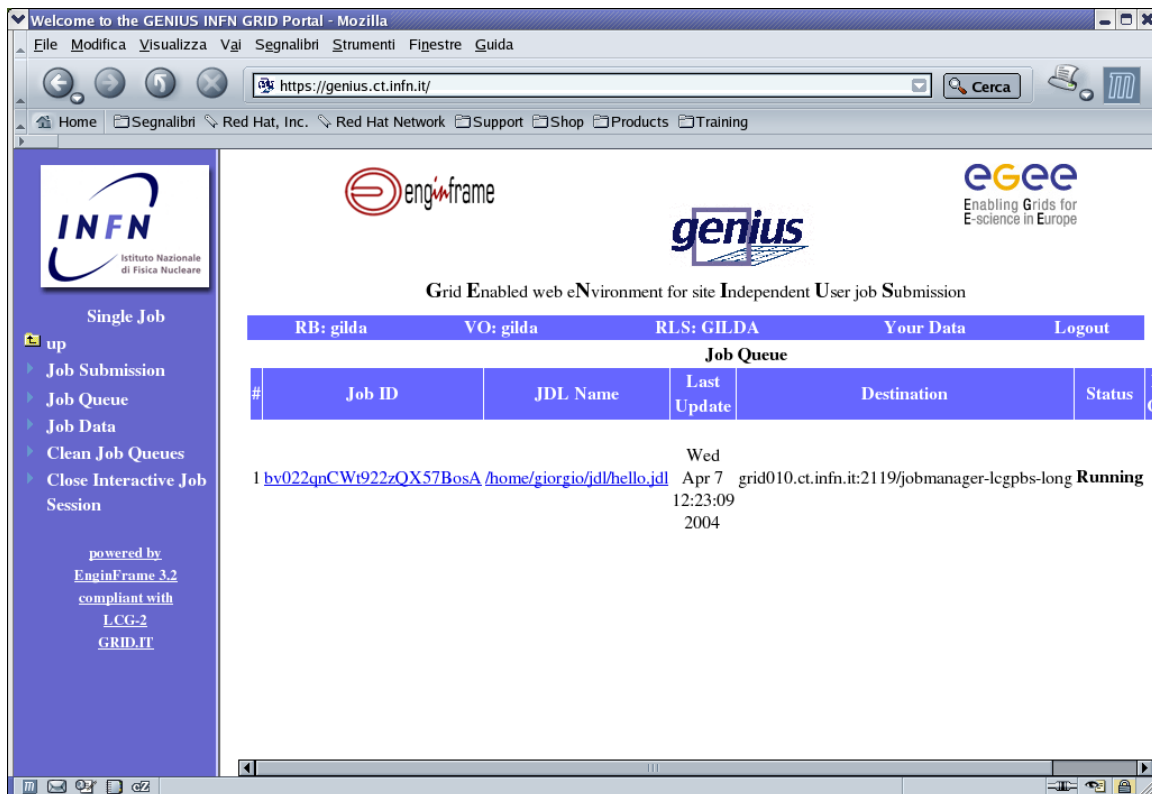


Figure 4.6 - Job Running.

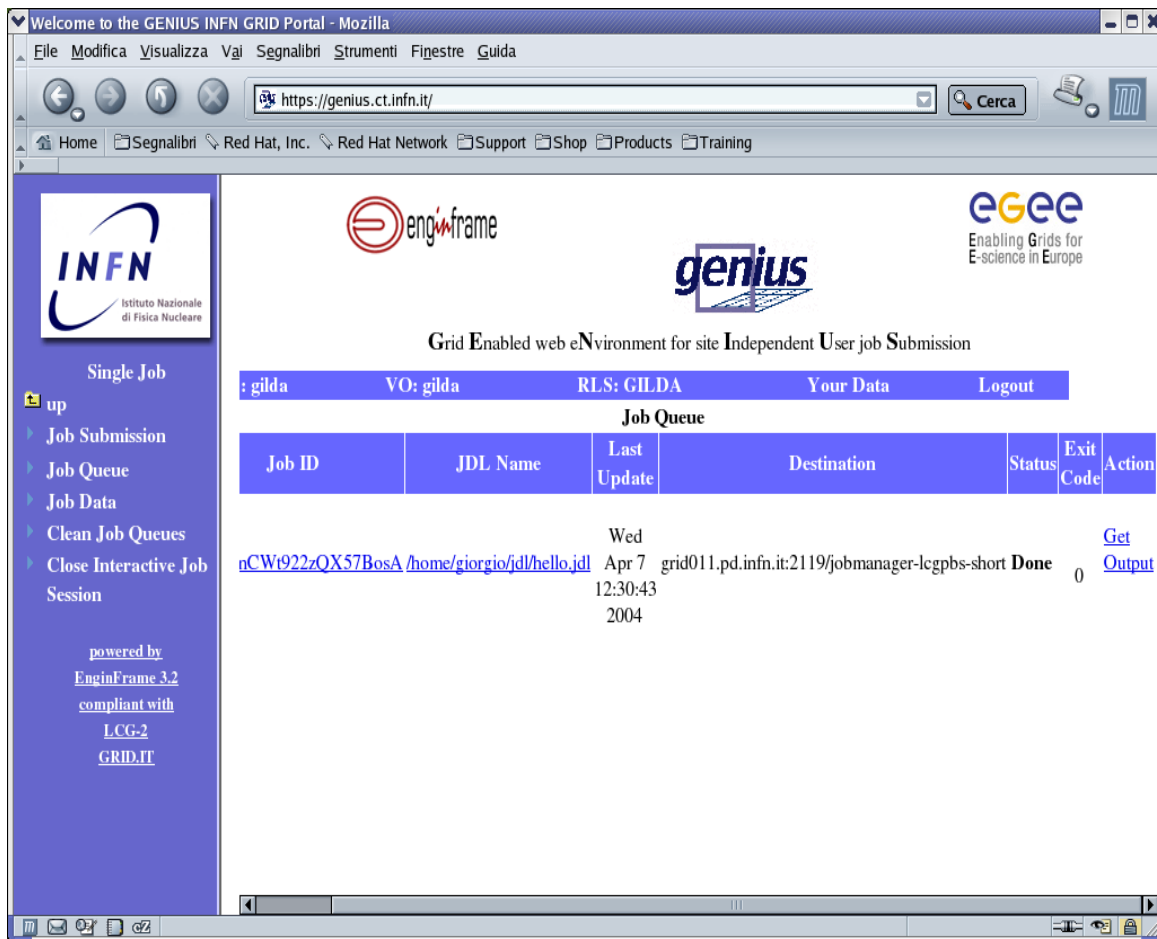


Figure 4.7 – Job Done

4.1.2.1 Job Output

When the action button “Get Output” is hit, the output file are copied by the RB to the temporary spooler system of GENIUS and to the user's home directory on the remote UI machine; they can be inspected through the web browser (by clicking on the file name) or copied on the user's local machine (by clicking on “Save Link Target As...” on Netscape/Mozilla, “Save destination on MSIE”) from the pop-up menu that appears right-clicking on the file name; in the UI machine, the output files are put in a directory which has the same name of the job identifier (as example, if the job identifier is *abcd_3119311982* the output files will be stored in the directory */home/<username>/<username>_abcd_3119311982/* on the UI machine);

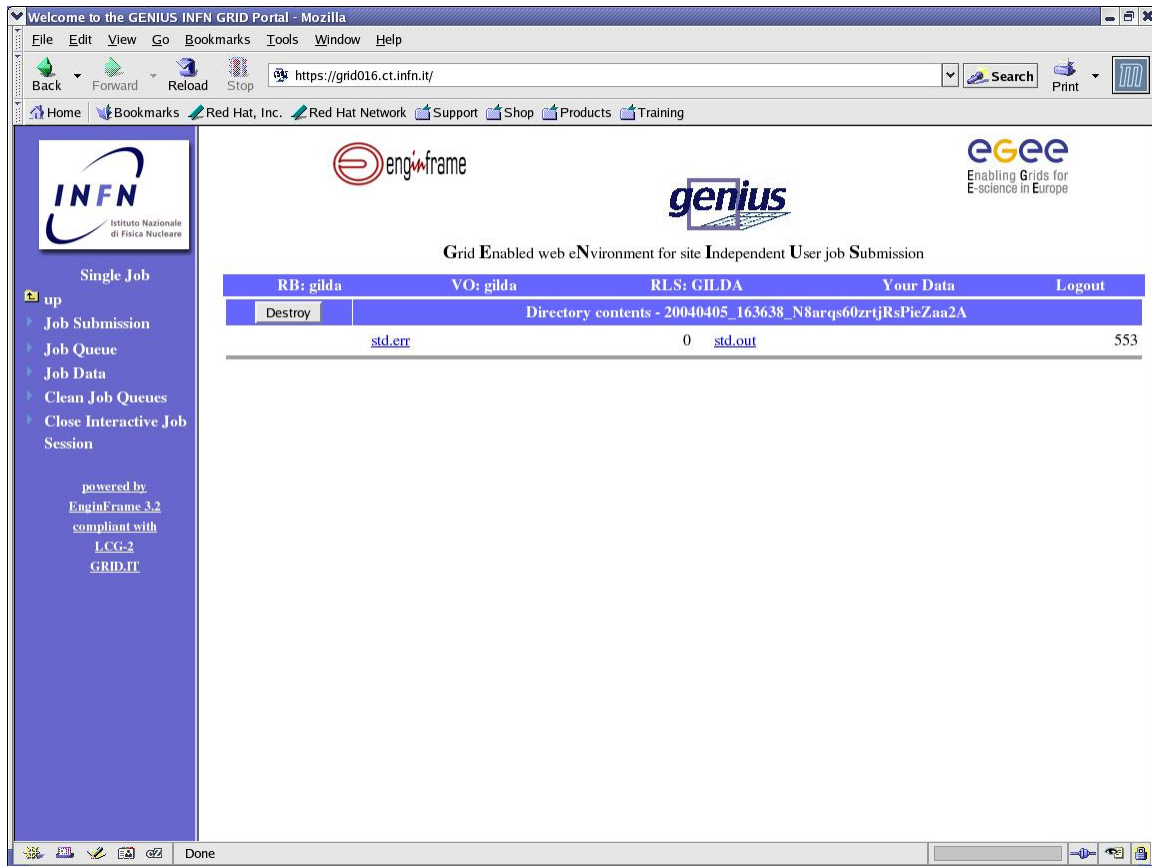


Figure 4.8 - Retrieve job output files.

4.1.3 Job Data

With this service the user can view his/her personal spooler area. This is a virtual disk where the output files of all the jobs can be inspected through the web browser (clicking on the file names with the left button of the mouse) and/or copied on the user's local machine (clicking on the file names with the right button of the mouse). For obvious reasons of disk space, job output files stay in the spooler area only for a week (168 hours). After this time, they are removed. This service shows a list of jobs available in the spooler area. Each row in the list contains the following information:

- the job identifier; clicking on it user accesses job spooler area
- data and time of job creation
- the number of output file (items) of the particular job

- the action possible on the job spooler area; if the action button “Destroy” is hit the job spooler area relative will be deleted; this will not affect the job directory on the user's home directory.

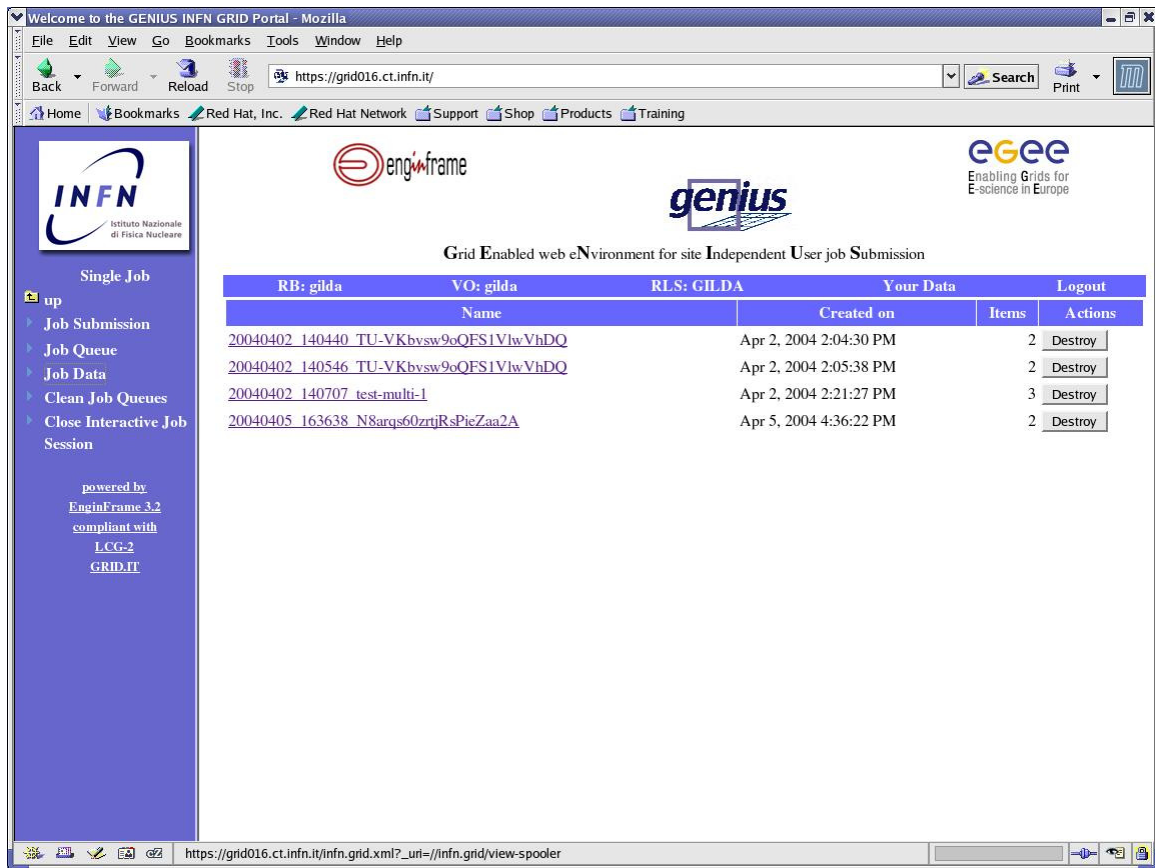
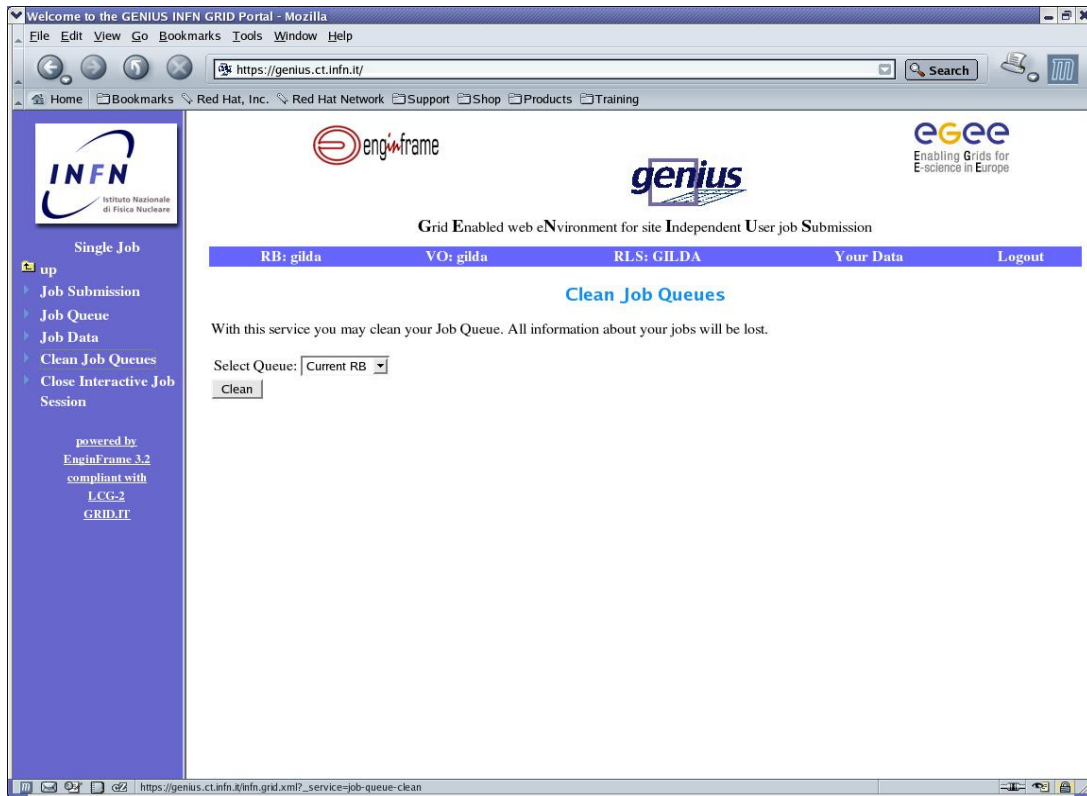


Figure 4.9 - Job Data

4.1.4 Clean Job Queue

With this service users can clean their job queue list on the current Resource Broker; users can also specify to delete their queues on all Resource Brokers.



Before selecting the job queue to clean up, users (if they didn't) had to be logged into the GRID. At the moment, selective cleaning of jobs is not possible and the whole job list is deleted. So, use this service with care.

Figure 4.10 - Clean Job Queues.

4.2 Multi Job

In this section we will supply the indication to submit a multi-job, i.e. an unique super-job composed by two or more jobs.

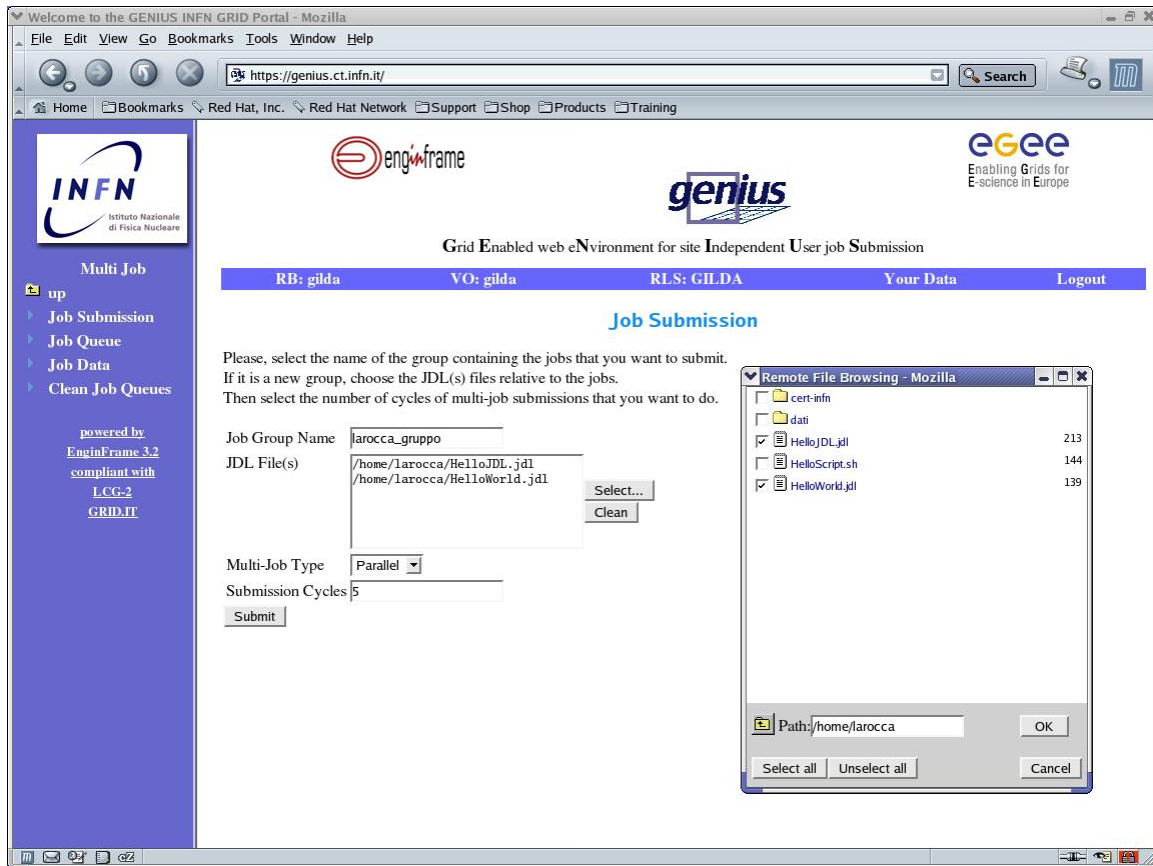


Figure 4.11 - Multi Job Submission.

4.2.1 Job Submission

To submit multi jobs user have to specify:

- a Job Group Name used, subsequently, to identify all the jobs in the group;
- the JDL file for each single job belonging to the group ; user can select different JDL files or just any one (note that in the file browser multi selection is enabled);
- multi job type (parallel means that the jobs will be executed in parallel mode);
- the Submission Cycle which specifies how many times each sub-job in the group has to be submitted.

As example, selecting "HelloWorld.jdl" and "HelloJDL.jdl" and setting Submission Cycle at 3, will give a multi-job group formed by 6 jobs, three executing "HelloWorld.jdl" and three "Hello.JDL". Clicking on **Submit** button will start execution of multi-job.

4.2.2 Job Queue

Through *Job Queue* service users can query the status of their multi-jobs.

Grid Enabled web eNvironment for site Independent User job Submission

RB: gilda VO: gilda RLS: GILDA Your Data Logout

Job Queue					
#	Type	Group Name	Number of Jobs	Number of Cycles	Last Submission Time
1	parallel	20040407_130806_larocca_gruppo	2	5	Wed Apr 7 13:08:06 2004

powered by
EnginFrame 3.2
compliant with
LCG-2
GRID.IT

Figure 4.12 - Multi Job's queue(1).

If users click on a group name he/she will see a list formed by all the job composing the multi-job they submitted (see fig 4.13). On each job he/she can execute the same operation as for a single job (see section 4.1.2).

Welcome to the GENIUS INFN GRID Portal - Mozilla

File Edit View Go Bookmarks Tools Window Help

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

Home Bookmarks Red Hat, Inc. Red Hat Network Support Shop Products Training

enginframe

genius

EGEE
Enabling Grids for
E-science in Europe

Grid Enabled web eNvironment for site Independent User job Submission

RB: gilda VO: gilda RLS: GILDA Your Data Logout

Multi Job

- up
- Job Submission
- Job Queue
- Job Data
- Clean Job Queues

powered by
EnginFrame 3.2
compliant with
L.C.G.-2
GRID.IT

Job Queue						
#	Job ID	Last Update	Destination	Status	Exit Code	Action
10	wy5TutRvupo9qyvT5ckzoQ	Wed Apr 7 11:12:58 2004	grid010.ct.infn.it:2119/jobmanager-lcgpbs-short	Running		Cancel
9	LzLq2F6E-zam90DxYoB_Xg	Wed Apr 7 11:13:10 2004	grid010.ct.infn.it:2119/jobmanager-lcgpbs-long	Running		Cancel
8	MVGQcFZOGyutJ0lbp8FpMA	Wed Apr 7 11:13:10 2004	grid010.ct.infn.it:2119/jobmanager-lcgpbs-short	Running		Cancel
7	WjwHx8X39B9LPMtNhngMdA	Wed Apr 7 11:13:11 2004	grid011.pd.infn.it:2119/jobmanager-lcgpbs-infinite	Running		Cancel
6	R89-WIVWqFW60PcrZ5tmQ	Wed Apr 7 11:13:09 2004	grid010.ct.infn.it:2119/jobmanager-lcgpbs-long	Running		Cancel
5	pINuLv9CNvPuMDaacOltMQ	Wed Apr 7 11:13:11 2004	grid010.ct.infn.it:2119/jobmanager-lcgpbs-long	Running		Cancel
4	2MY5Kac8dFAD9OigzsmqwA	Wed Apr 7 11:13:12 2004	grid011.pd.infn.it:2119/jobmanager-lcgpbs-infinite	Running		Cancel
3	yDQ_ogaE6Thoda6lpRcuQQ	Wed Apr 7 11:13:11 2004	grid010.ct.infn.it:2119/jobmanager-lcgpbs-long	Running		Cancel
2	BxoQ9VuBZ9Rf3LWZYLi_OO	Wed Apr 7 11:13:10 2004	grid011.pd.infn.it:2119/jobmanager-lcgpbs-long	Running		Cancel
1	BxoQ9VuBZ9Rf3LWZYLi_OO	Wed Apr 7 11:13:12 2004	grid011.pd.infn.it:2119/jobmanager-lcgpbs-long	Running		Cancel

Figure 4.13 - Multi Job's queue (2)

For each job, when 'Done' status is reached, the possible Action switches from Cancel to GetOutput. Clicking on GetOutput will allow to retrieve the job output files in way similar to the single job case (see section 4.1.2.1).

4.2.3 Job Data and Clean Job Queues

Clicking on Job Data, the same spooler described in section .. is shown, with the same option. Also Clean Job Queues offers the same functions described in the single job case. See section 4.1.3 and 4.1.4 for more details.

4.3 List Available Resources

This service allows the user to seek for the Computing Element that best matches his/her job requirements. This service is very useful when some requirements, such as CPU number or similar, are specified in the job JDL file. Of course, first of all, the JDL file describing the job has to be supplied, and this can be done in the two usual ways

- by providing the full path of the file in the dialog box (e.g. /home/<username>/myjob.jdl);
- by clicking on Remote File Browse to list all his/her remote files on the UI machine (including subdirectory navigation) and selecting the desired JDL file.

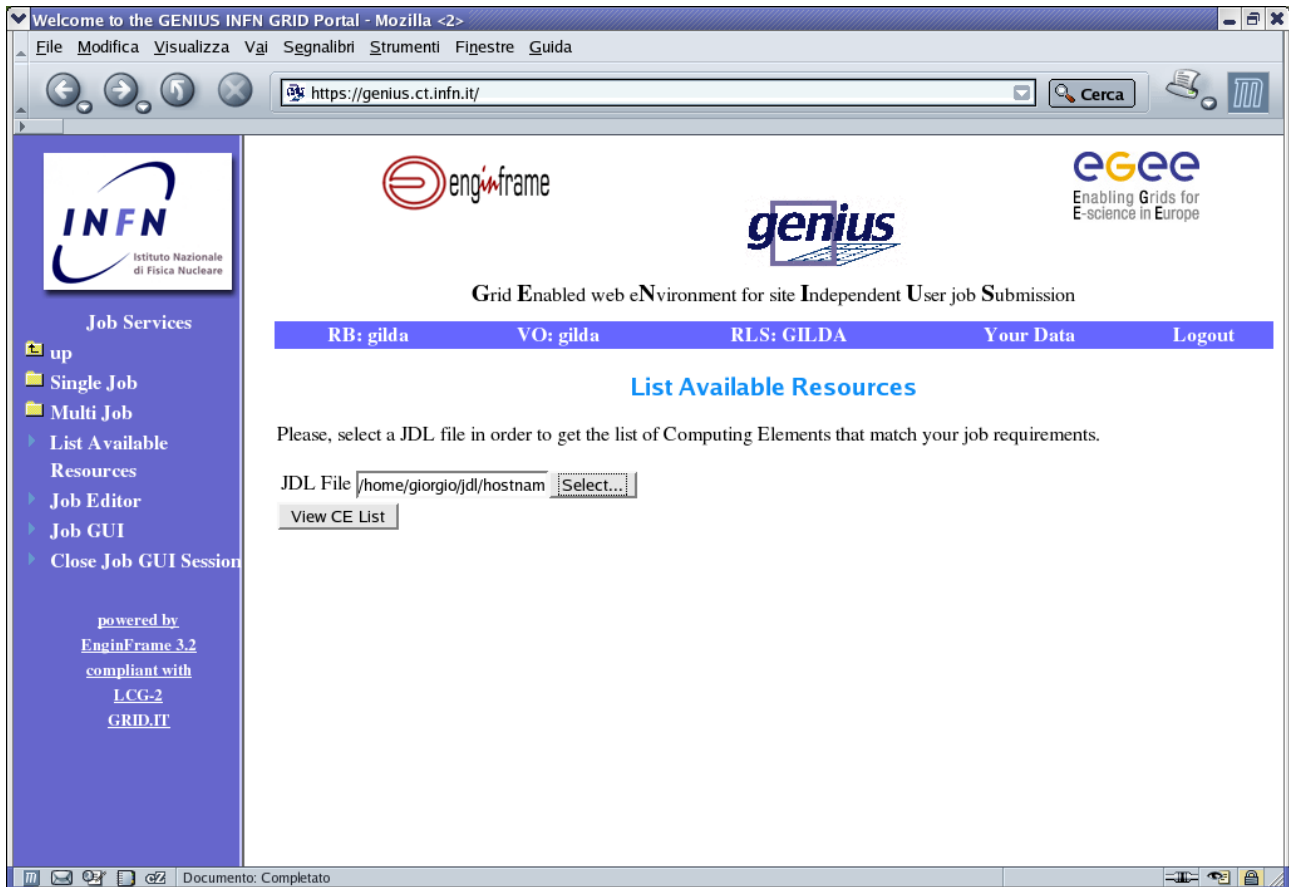


Figure 4.14 - List Available Resources for a job(1).

When the button “View CE List” is hit the list Computing Elements which matches user's job requirements is printed on the screen. If an error occurs or there is a problem of connectivity with the Resource Broker the user is notified and an email containing the error log is automatically sent by GENIUS to the relevant site managers.

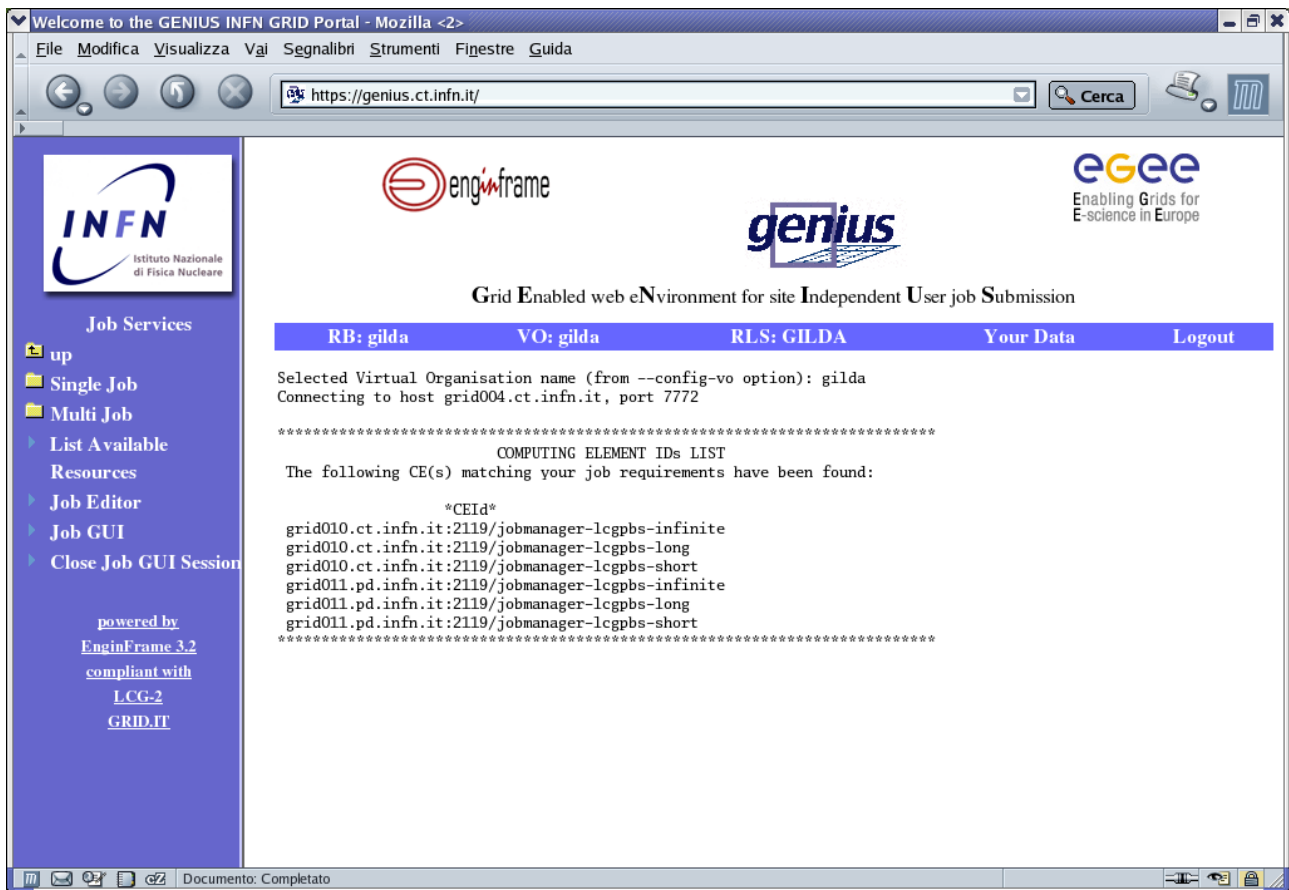


Figure 4.15 - List Available Resources for a job(2).

4.4 Job Editor

Requesting this service, users may edit a new JDL file, or re-edit a pre-existing one. First of all, user must supply filename. If an existing file is chosen, that file will be re-edited, otherwise a new one will be created. The filename is supplied in the usual ways, by specifying entire path or using file-browser fired by Select button. Clicking on the Next button, a new frame is opened (fig 4.16), which contains some field describing the job requirements read in the jdl file just supplied. Of course, if jdl file is a new one, all fields will be empty. Filling this field, user could specify some basic characteristic of their jobs. When Next button is hit, the Job Editor is launched. Job Editor is a Java applet, which allows to set almost of the job attributes, acting so as a front-end to the Job Description Language.

The Job Editor is composed by different panels, that give to user the possibility to insert the values of all supported attributes. The panels group the attributes according to their specific meaning. For a further description of Job Editor and Job Description Language, see <http://server11.infn.it/workload-grid/documents.html>, section GUI user guide and Job Description Language.

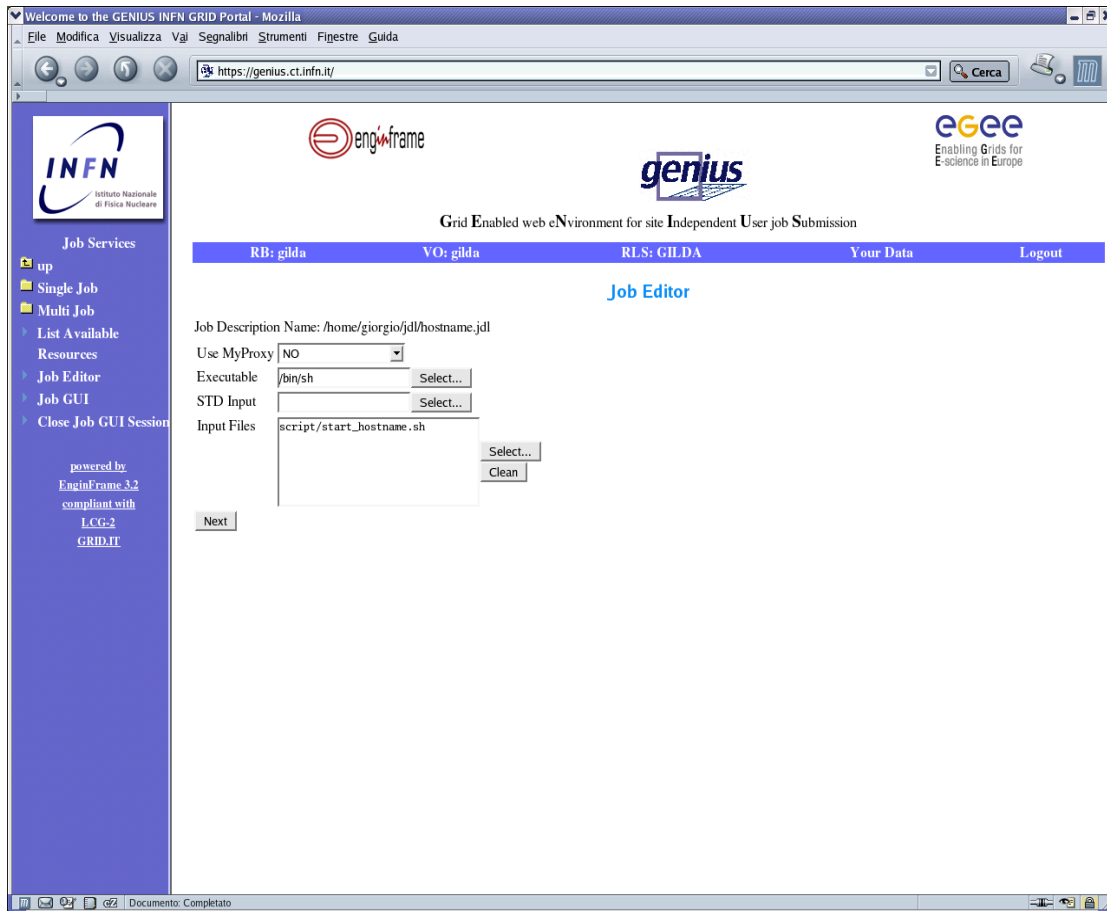


Figure 4.16 Job Editor (1)

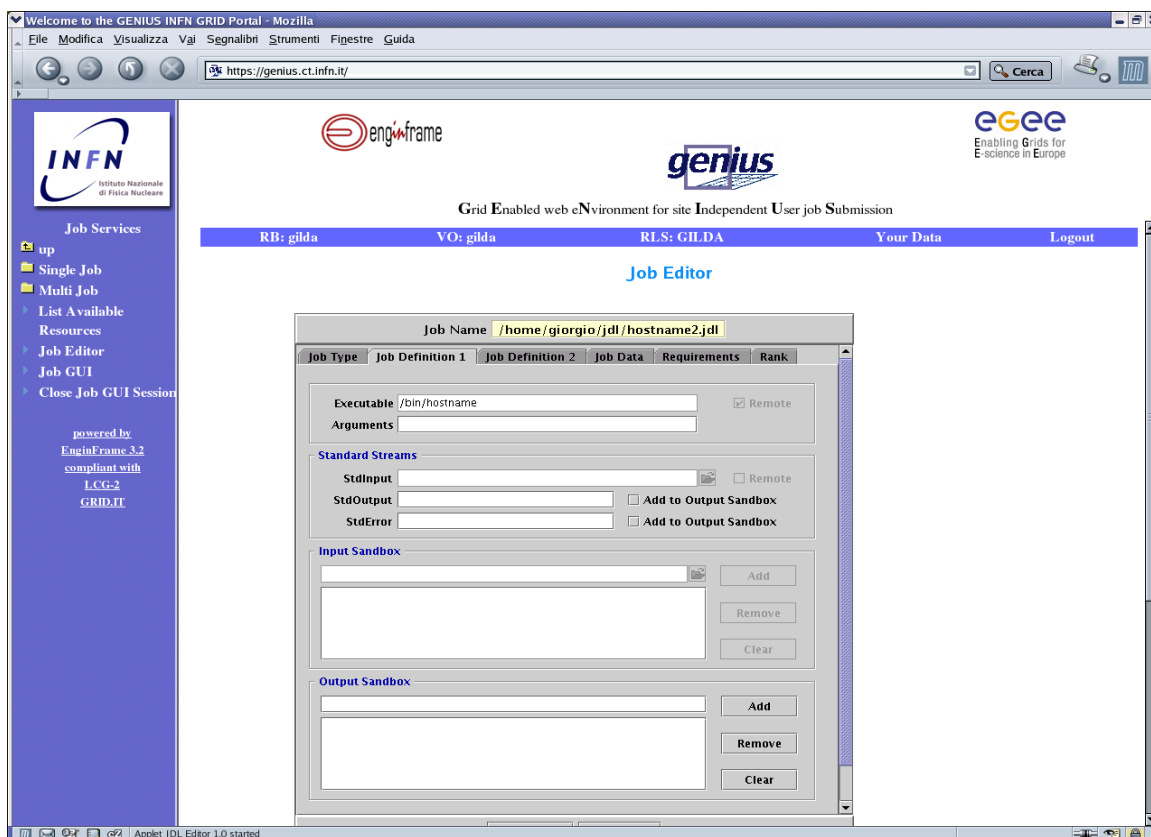


Figure 4.17 Job Editor (2)

4.5 Job Gui

Requesting this service, after a VNC authentication, will be prompted the user virtual desktop on the UI Machine, identical to the other one described in the section X.x. (the only one difference is that here no X-term shell is opened. However, invoking it in the apposite item of the pop-up menu that appears by right clicking). When the remote X-session is finished, user **MUST** close the interactive session through the service Close Job Gui Session.

5 Data Services

A large part of users tasks on the grid consist of access to data and management of the files containing data. Users would like to access the Grid service from all kind of appliances (as desktop, laptop, PDA, cell phone...) and from everywhere in the world, as they does it through the World

Wilde Web. They would like to manage their data in a transparent way as if these were local, independently of the physical storage elements where data are saved. Through GENIUS it is possible to satisfy this customer's requirements in relatively simple but efficient way. The section Data Service provided for data management in particular, manage the creation, replication and deletion of data files in the Grid and their registration in a Replica Catalog.

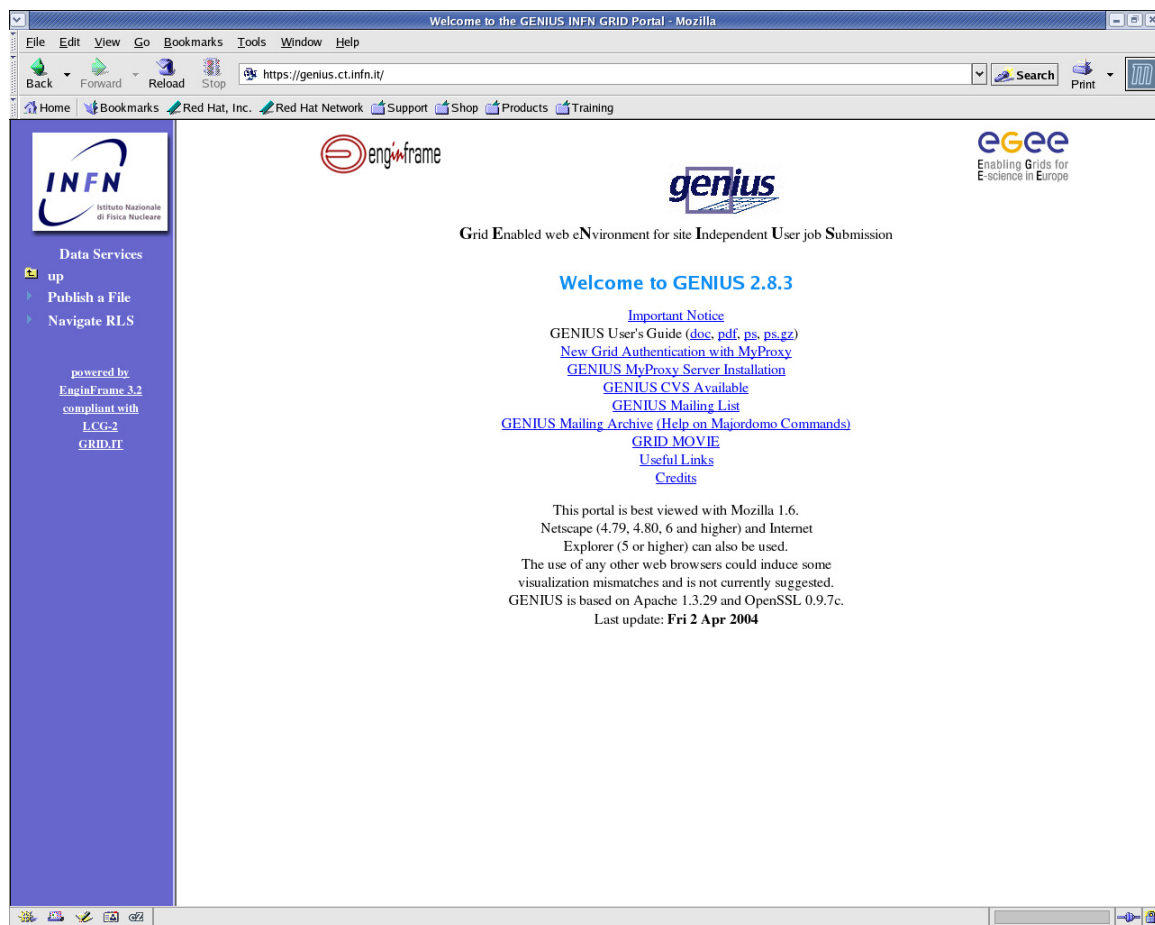


Figure 5.1 Data service menu

5.1 Publish a File

Often data files are created first in temporary scratch space or on a computer outside the grid. To make these data grid-accessible, they must be moved from local workstation to a Storage Element. Inside the Grid, a user shares his/her data with all Virtual Organization's members he/she belongs to, through data publication inside a Catalog.

To use these services, users must be logged to the Grid.

Data publication can proceed in various ways, in relation to their physical position; in fact there are three possible choices :

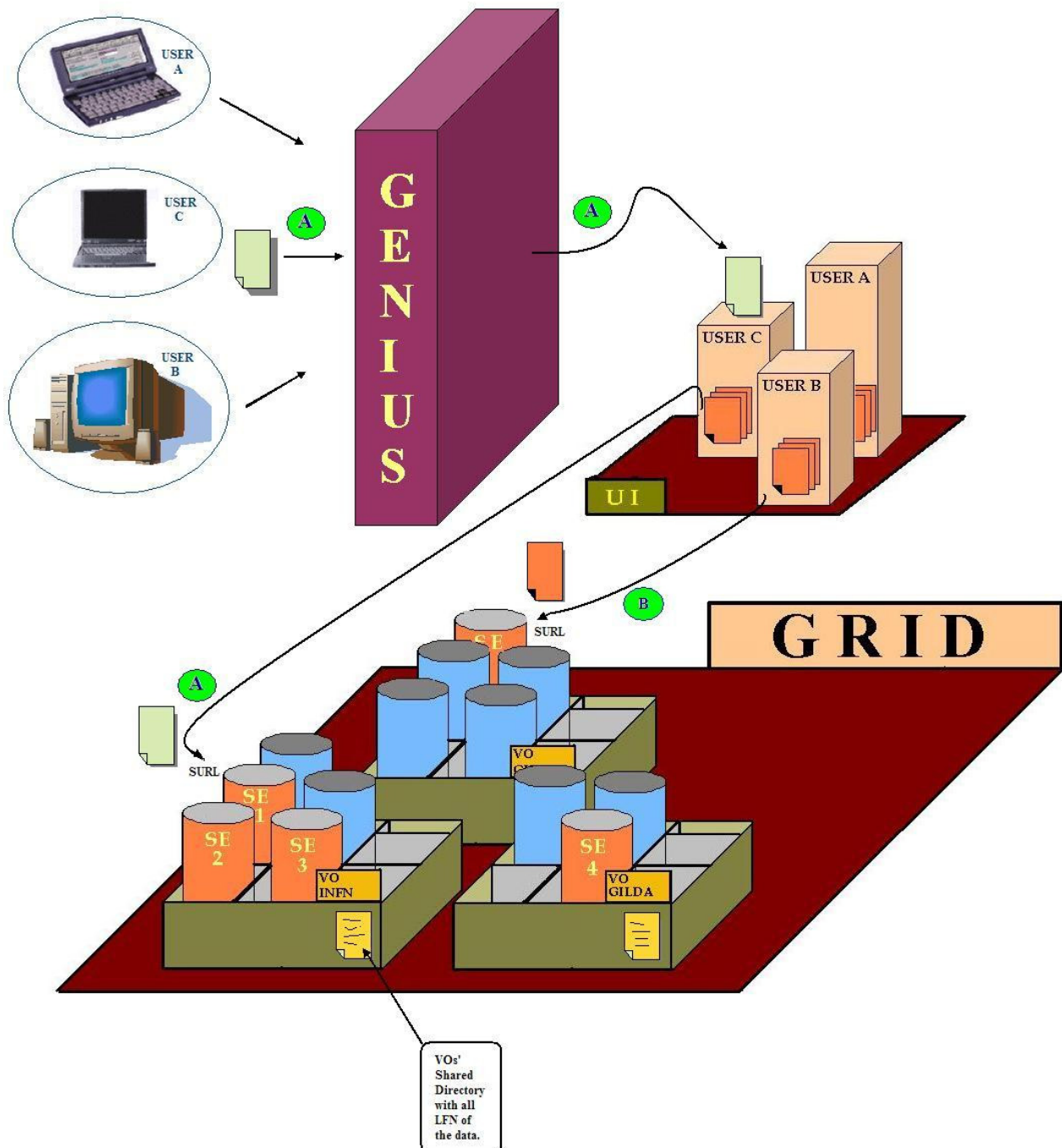
- A. Publishing data that physically are in the device from which user is connected to Genius
- B. Publishing data that physically are in user's home directory in the User Interface machine
- C. Publishing data which are both on the UI and on the user local workstation.

In order to understand this service it is necessary to introduce three terms with which the user must take confidence to manage its data. They are:

- LFN (Logical File Name): it is a user-specified label for a file, usually a more intuitive tag which gives some indication of the file's content.

- SURL(Storage URL):an url which uniquely identifies a file contained in a Storage Element. For example: “<srm://grid02.la1.in2p3.fr/iteam/nomefile>”.
- TURL(Transport URL):a temporary url which can be used to access a particular data file contained in a Storage Element via a certain protocol. For example: “<rfio://grid02.la1.in2p3.fr/iteam/nomefile>”.

The below figure synthetically reassumes the distance carried out from user 's data for being



published in the shared directory of the belonging VO:

Figure 5.2 data publishing schema

When the user is logged into the Grid, he/she has to choose some parameters to copy and register a file from his/her local workstation (WS) to a grid-aware storage and to register them in the VO catalog:

- **Choose SE:** in this menu are listed all Storage Elements available to the VO which the user belongs to; for each SE is also indicated its free space in MB and its mount point;
- **Choose File/Directory:** in this text field user may insert the local path (on his/her WS) of the file that he/she wants to copy to the SE. As usual, file choice this can be also done with the local file browser.
- **Choose Remote File/Directory:** user may choose, for being transferred to the SE, a file/directory actually stored on his/her home area on the UI; file/directory choice can be done in the two usual ways, and of course user must be logged into the OS.

Anyway, the file name will become its LFN.

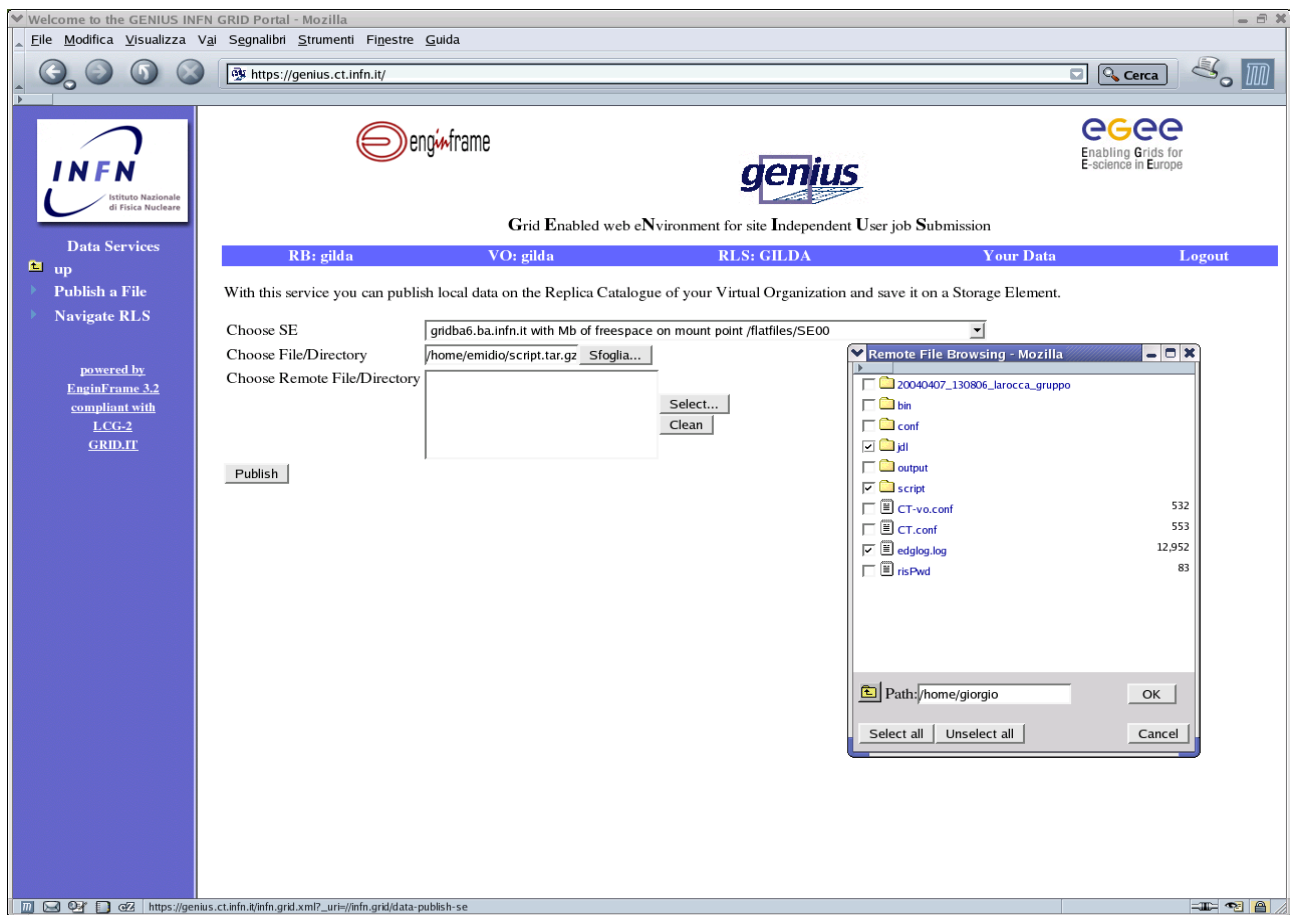


Figure 5.3 Publish a File (1)

By clicking on the **Publish** button, the file(s) chosen will be published to the SE, and a page like the one in fig 5.4 will be printed on the screen. If anything goes bad, a similar page, but reporting the kind of problems, will be shown.

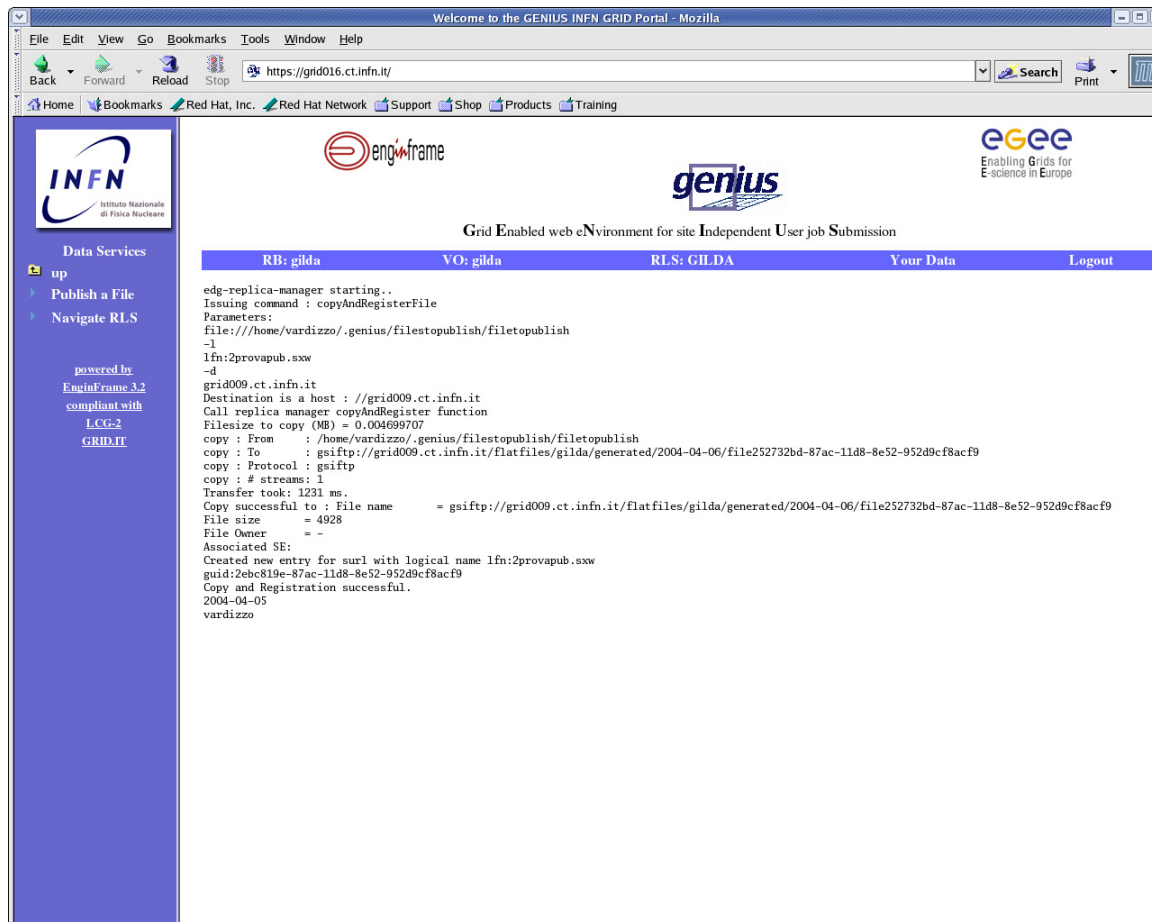


Figure 5.4 publish a file (2)

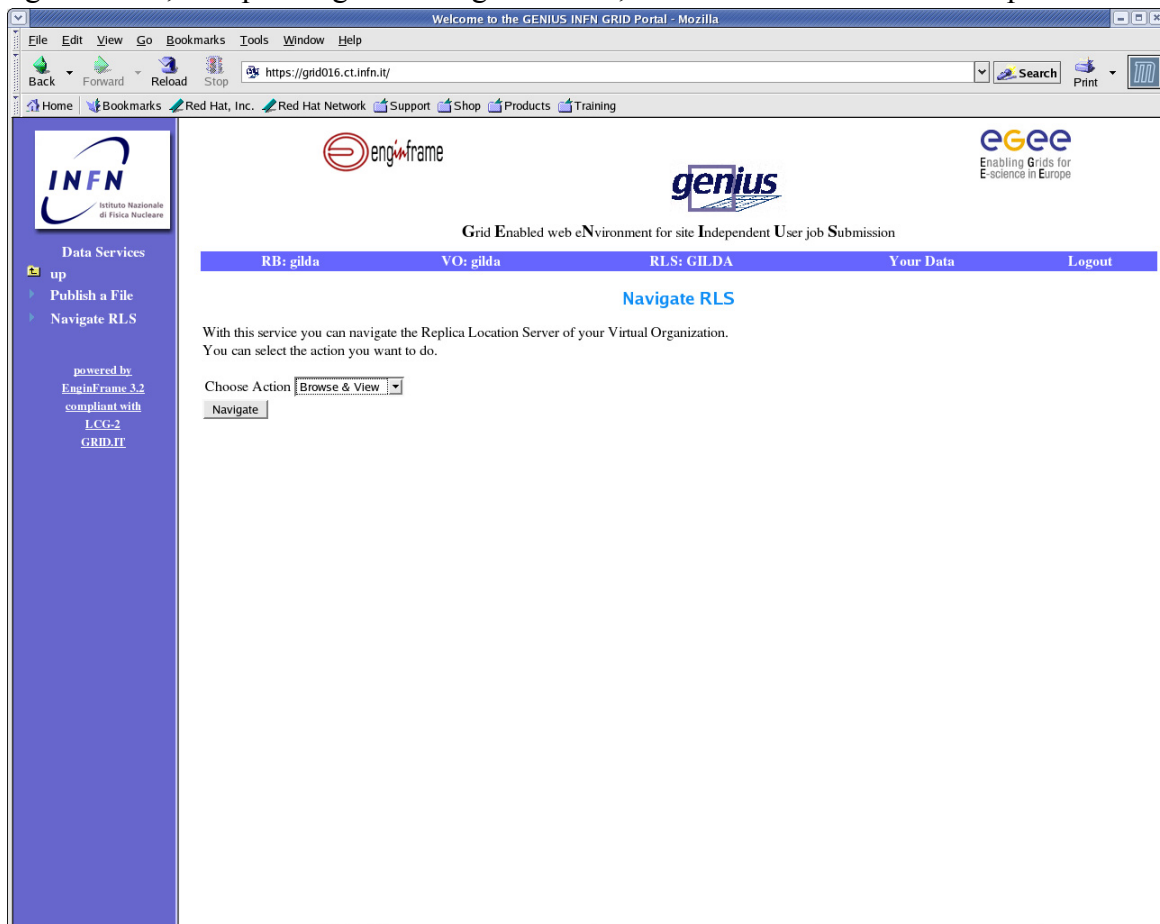
5.2 Navigate RLS

This service provides to user a support for choosing how to manage its data. In this case user can choose to do one of the following tasks:

- Browse & View;
- Replicate a File
- Remove a File
- Download a File

5.2.1 Browse & View

Selecting this item, and pressing the Navigate button, the user will obtain the complete list of the



files published from any members of the VO which he/she belongs to (see fig. 5.7). Clicking on one of this file name, he/she can know one or more SURLS of this file in Storage Elements.

Figure 5.5 Navigate RLS -- Browse and view

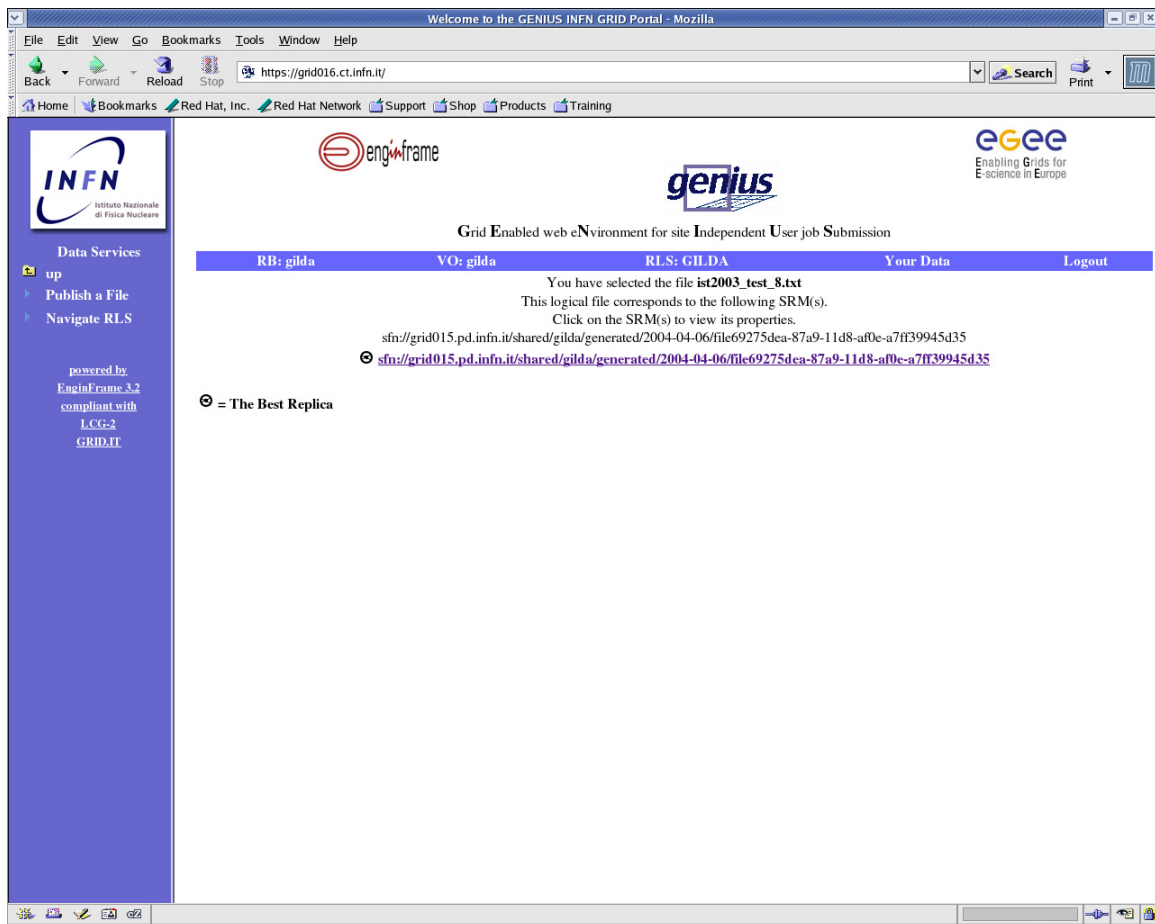


Figure 5.6 Navigate RLS – Browse and View (2)

Clicking on the SRM(s) is possible to view its properties. At this time, only ASCII file is supported, so user cannot see it here any other kind of file. It is worth noting that it's indicated Best Replica's SURL, i.e. the SURL of the Storage Element closest, in terms of total transfer time.

5.2.2 Replicate a File

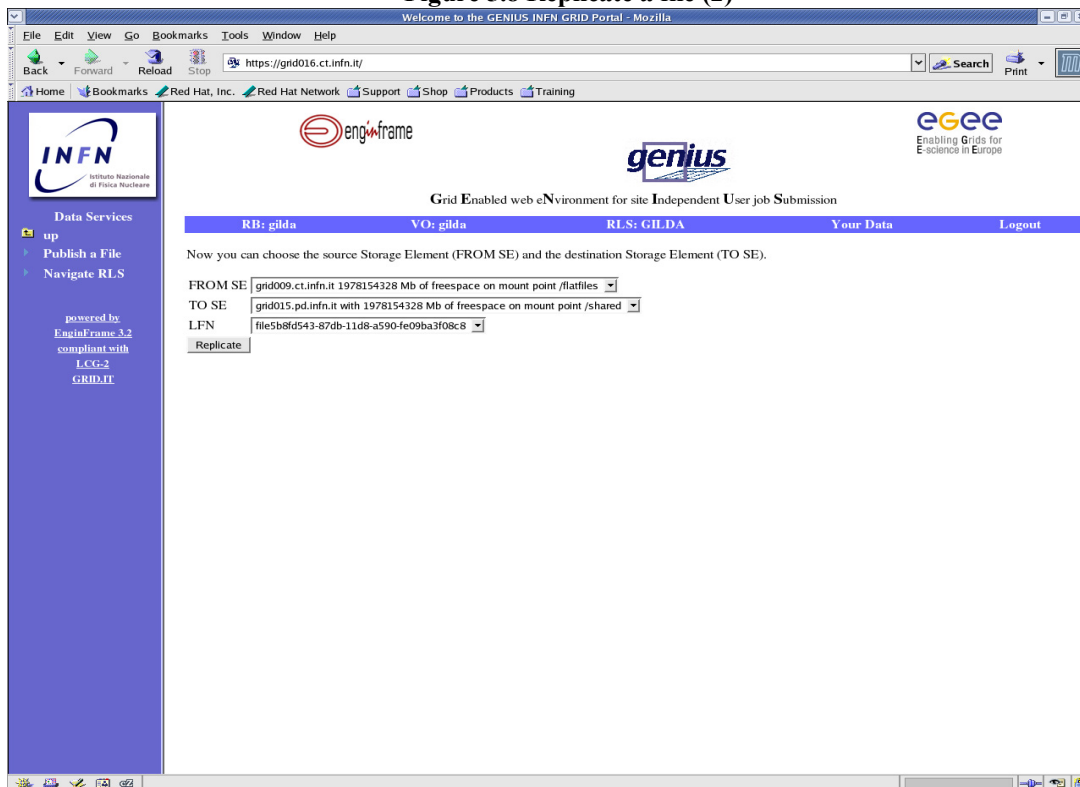
This service is indicated for user who wants to copy (replicate) a file already stored in a SE to another Storage Element. Select Replicate a File in the menu item of the starting page in Navigate RLS and click on the navigate button.



Figure 5.7 Replicate a File (list of LFN in SE)

Clicking on **Navigate** button, a list of all files published by VO's members is returned to the user. To replicate a file user has to click on its name in this list; a new page is shown, reporting the file(s) SURL('s). As indicated, to replicate the file, click on one of its SURL, and another page is open, showing the Storage Element where is actually the file, the destination SE and the file's LFN.

Figure 5.8 Replicate a file (2)



By clicking on **Replicate**, the file indicated in the LFN field, which is stored in the SE specified in the FROM SE field, will be copied to the SE indicated in the TO SE field.

A page reporting the result of this operation is then shown.

5.3 Remove a File

With this service the user can remove a file choosing it in the list of published files of its VO. As usual, select Remove a File in the menu item of the starting page of Navigate RLS service, and click on Navigate button. The complete list of the file published by in the VO which the user is belong to is shown, and clicking on one of this file name, the user chooses the file to be deleted. After clicking, a new page is shown, where the usual list of all files SURL is printed. Click on the desired SURL and the corresponding file will be deleted. A page reporting the result of operation is then shown.

5.4 Download a File

This service can be used to copy a Grid file to a non-grid storage resource; this may be useful for users who wants a local copy of their files. The procedure for selecting a file is identical to the ones described in previous sections, and as usual an output page is shown to user with the result of operation.

6 Info services

These services are meant to let the user browse the testbed he/she can use, depending on his/her belonging VO.

6.1 Check testbed

This service allows user to retrieve general information about the sites accessible by his/her VO; for any CE of the site, is shown the number of CPU, number of job running and waiting, the application that can be runned on, and how much is the time limit of the queue. For any SE of the site, is shown the amount of free space.

The screenshot shows a web browser window titled "Welcome to the GENIUS INFN GRID Portal - Mozilla <2>". The address bar shows "https://genius.ct.infn.it/". The page content includes logos for INFN (Istituto Nazionale di Fisica Nucleare), EnginFrame, genius, and egee (Enabling Grids for E-science in Europe). Below the logos, it says "Grid Enabled web eNvironment for site Independent User job Submission". A navigation bar contains links: "RB: gilda", "VO: gilda", "RLS: GILDA", "Your Data", and "Logout". The main content area shows "Site: INFN-CATANIA" and lists three CE (grid010) and one SE (grid009) with their respective configurations and resource status.

```
Site: INFN-CATANIA

CE grid010.ct.infn.it:2119/jobmanager-lcgpbs-infinite:
- pbs queue infinite with 172800 seconds time limit
- Software installed: ALICE-3.09.06 ALIEN-1.32.14 ATLAS-6.0.4 CATANIA CMKIN-1.1.0 CMKIN-VALID CMS-1.1.0 C
- There are 0 jobs running and 0 waiting
- There are 18 CPUs free

Close SE grid009.ct.infn.it with mount point /flatfiles and 1978146032 Mb of free space

CE grid010.ct.infn.it:2119/jobmanager-lcgpbs-long:
- pbs queue long with 43200 seconds time limit
- Software installed: ALICE-3.09.06 ALIEN-1.32.14 ATLAS-6.0.4 CATANIA CMKIN-1.1.0 CMKIN-VALID CMS-1.1.0 C
- There are 0 jobs running and 0 waiting
- There are 18 CPUs free

Close SE grid009.ct.infn.it with mount point /flatfiles and 1978146032 Mb of free space

CE grid010.ct.infn.it:2119/jobmanager-lcgpbs-short:
- pbs queue short with 900 seconds time limit
- Software installed: ALICE-3.09.06 ALIEN-1.32.14 ATLAS-6.0.4 CATANIA CMKIN-1.1.0 CMKIN-VALID CMS-1.1.0 C
- There are 0 jobs running and 0 waiting
```

Figure 6.1 Check Testbed

6.2 Explore Testbed

This services allows user to browse an LDAP server containing detailed info for any resource and service in the testbeds accessible from users, depending on the VO they are logged in. These resources are hierarchically organized, with a tree structure; root tree is the Information Index machine which that the currently selected RB is pointing to.

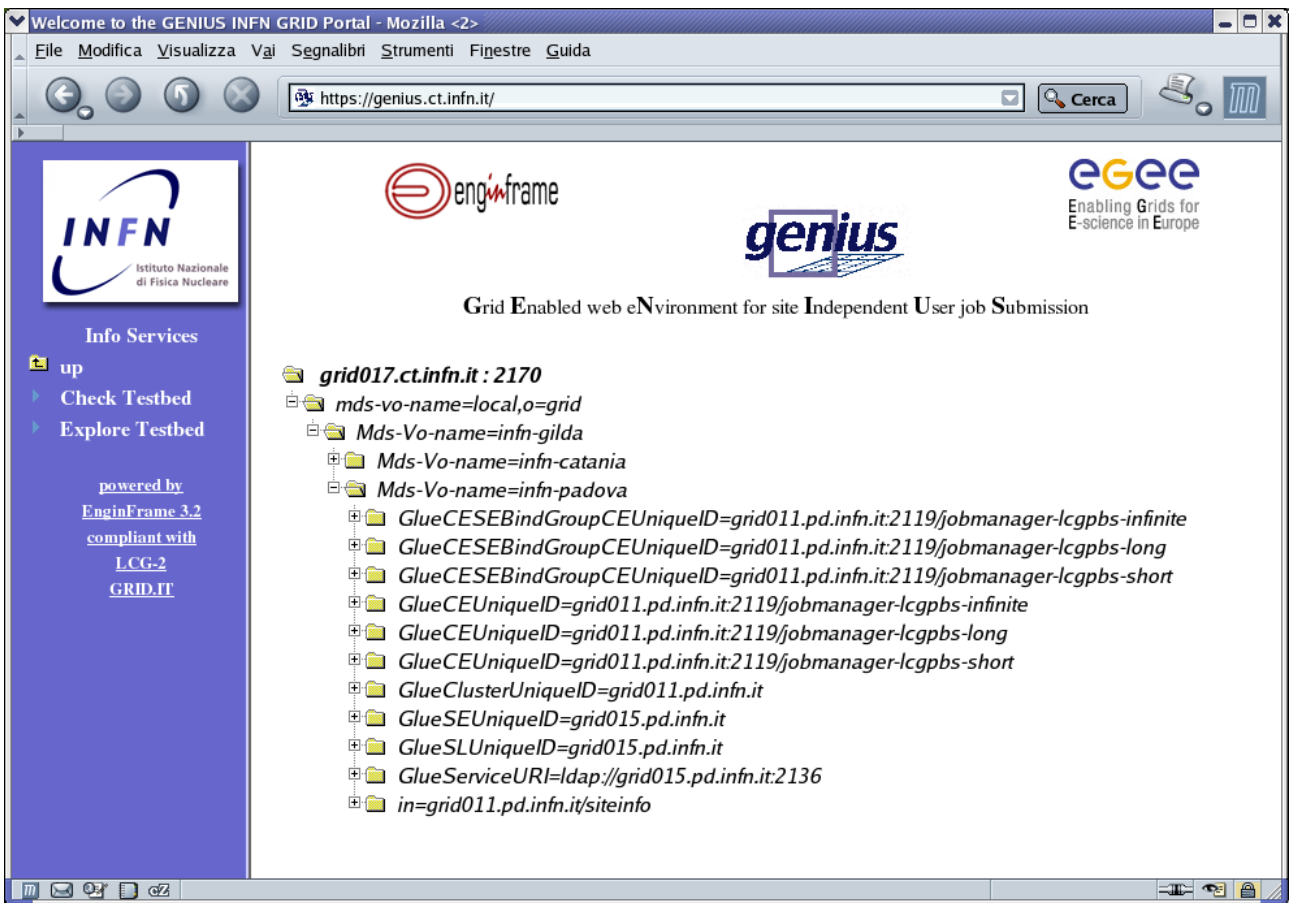


Figure 6.2 Explore Testbed (1)

Any node of the tree has a label reflecting element name in the GLUE Schema, and when this label is hit, a lot of useful information about the element is shown. If the node is not a leaf it could be expanded, showing a subtree which represents all elements “logically” composing the node.

Figure 6.3 Explore Testbed (2)



7 Monitoring Services

These type of services allows user to monitor/measure significant grid resources in order to analyze usage, behavior and performance of the grid, and eventually detect faulty situations.

As you can see in the screenshot, many services are available, offering views of different testbeds or different grids. They are usually divided geographically or by VO; in this cases you must select before the interesting region or VO, and then access a lot of information about resources.

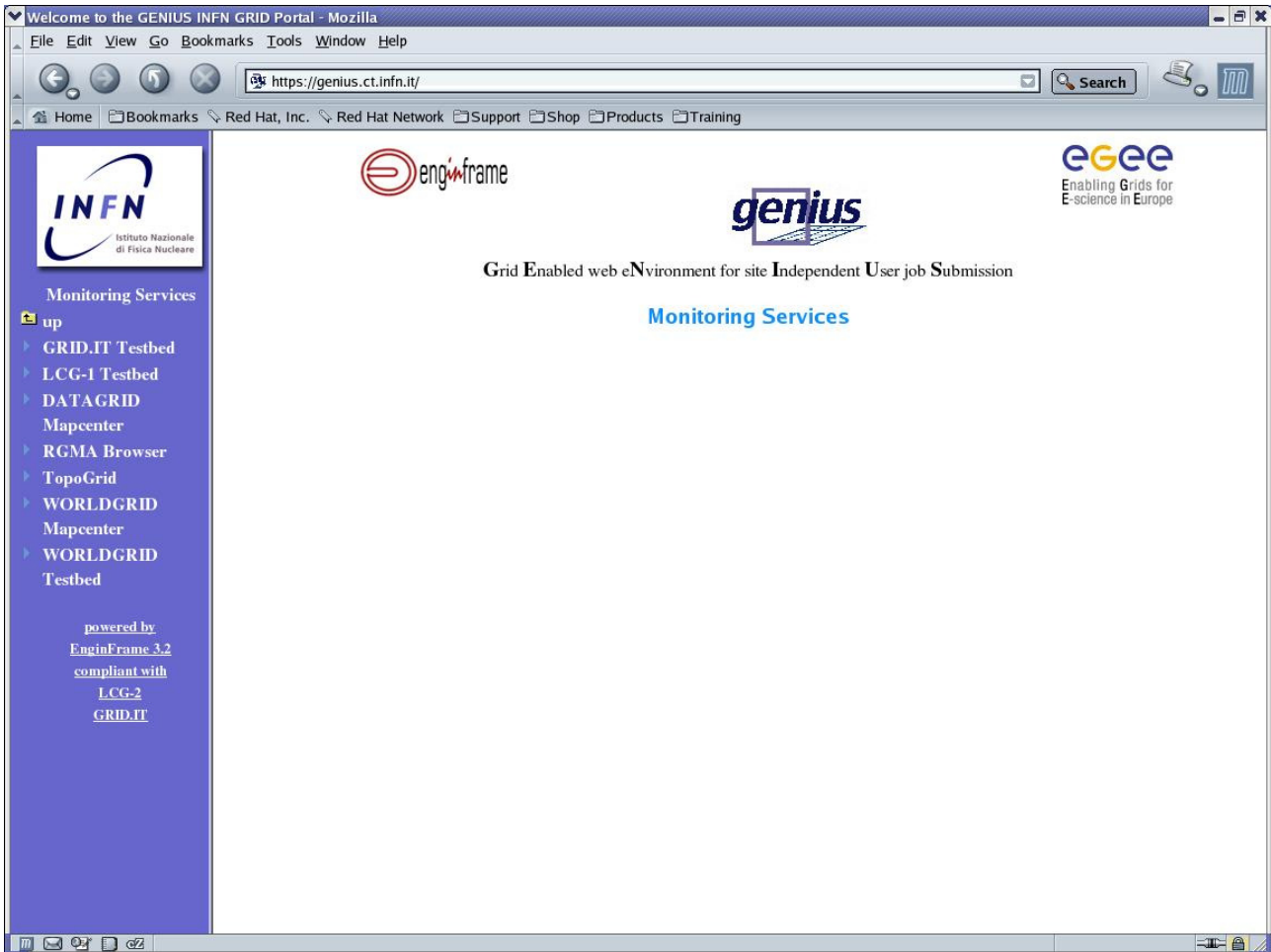


Figure 7.1 - Monitoring Services.

You can also access *R-GMA* browser, through you can have detailed information about every CE, SE or services on the grid.

8 Interactive Services

This services let the user access from the web portal to the remote UI machine in order to perform interactive analysis. For services described in this section, GENIUS wraps TightVNC (Virtual Net Computing), a service which allows exporting an entire virtual desktop through the Internet. All information about Virtual Net Computing can be found at the URL <http://www.uk.research.att.com/vnc>.

8.1 P2P services

At the moment, the P2P (peer-to-peer) service users can access is a chat. There is a different chat room for each VO; to access the chat (only for the first time), registration is required. Registration is done supplying a password (twice).

8.1.1 Open Desktop

With this service, user can open his/her desktop on the remote UI machine from within the browser window. If it is the first time, the user is asked to set a password to access the virtual desktop; this is done invoking the service Set Desktop Password (see later). Otherwise, the user is just prompted for his/her password, and when he/she correctly send it, a remote desktop with an x-term shell opened is shown.

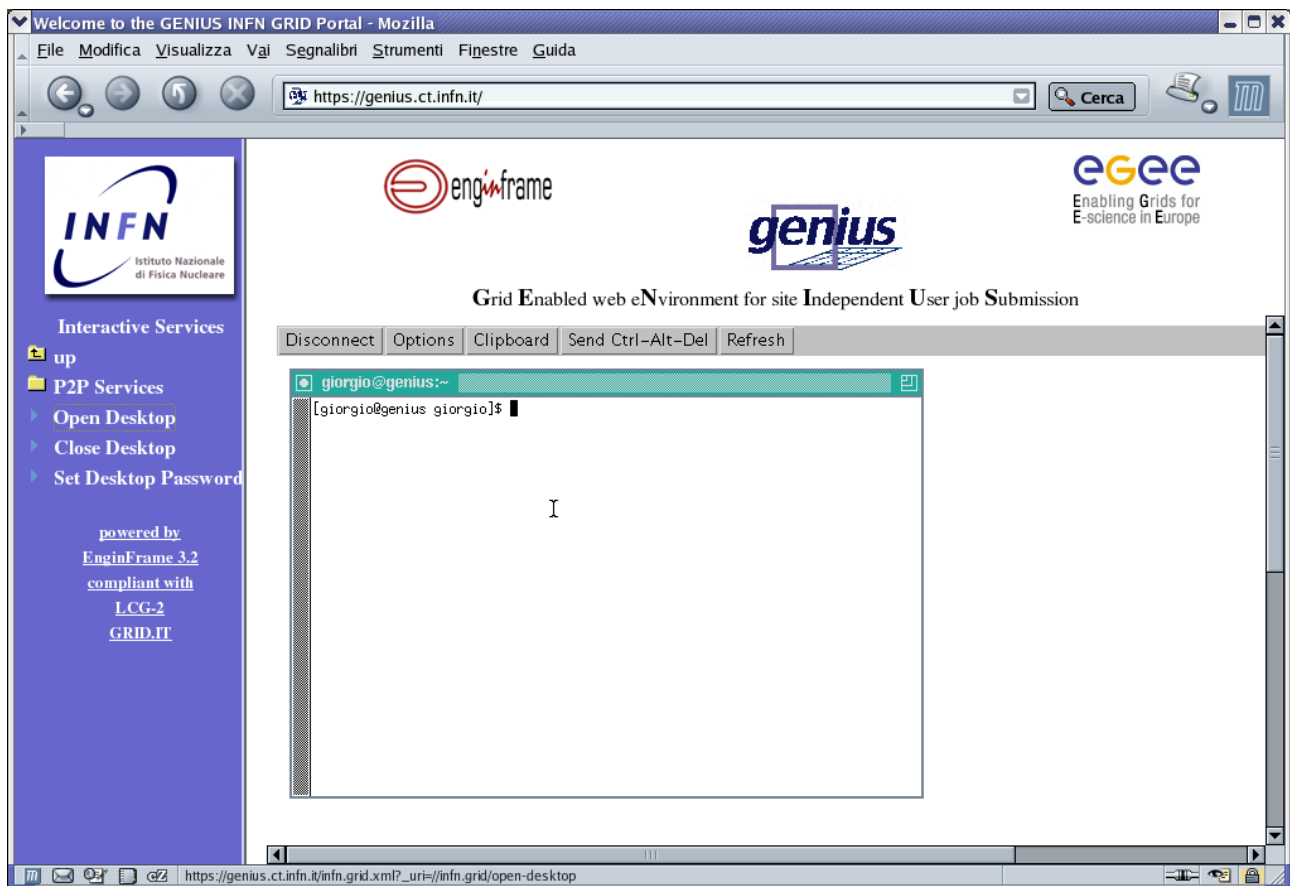


Figure 8.1 Open Desktop

From this shell users can run applications installed on the UI, as if they were locally logged to the UI. Other useful applet are included in the bar over the x-term shell; among these, Disconnect close the VNC session, Options allows to set some graphical options.

8.1.2 Close Desktop

This service allows the user to close the virtual desktop killing all unneeded processes running on the remote UI machine.

8.1.3 Set Desktop Password

With this service user can set or modify the password to access his/her virtual desktop at the remote UI machine through TightVNC. Just a password and its confirmation have to be provided. This is the first operation that user does when tries to access for first time their remote desktop on UI machine.

9 Current VO Services

VO services are those services expressly customized for the various Virtual Organizations (VO's). At present, the following VO's have been included into GENIUS: ALICE, ATLAS, CMS, LHCb,

VIRGO, Earth Observation and Biomedical. The following sections explain how to use the services common to all those VO's.

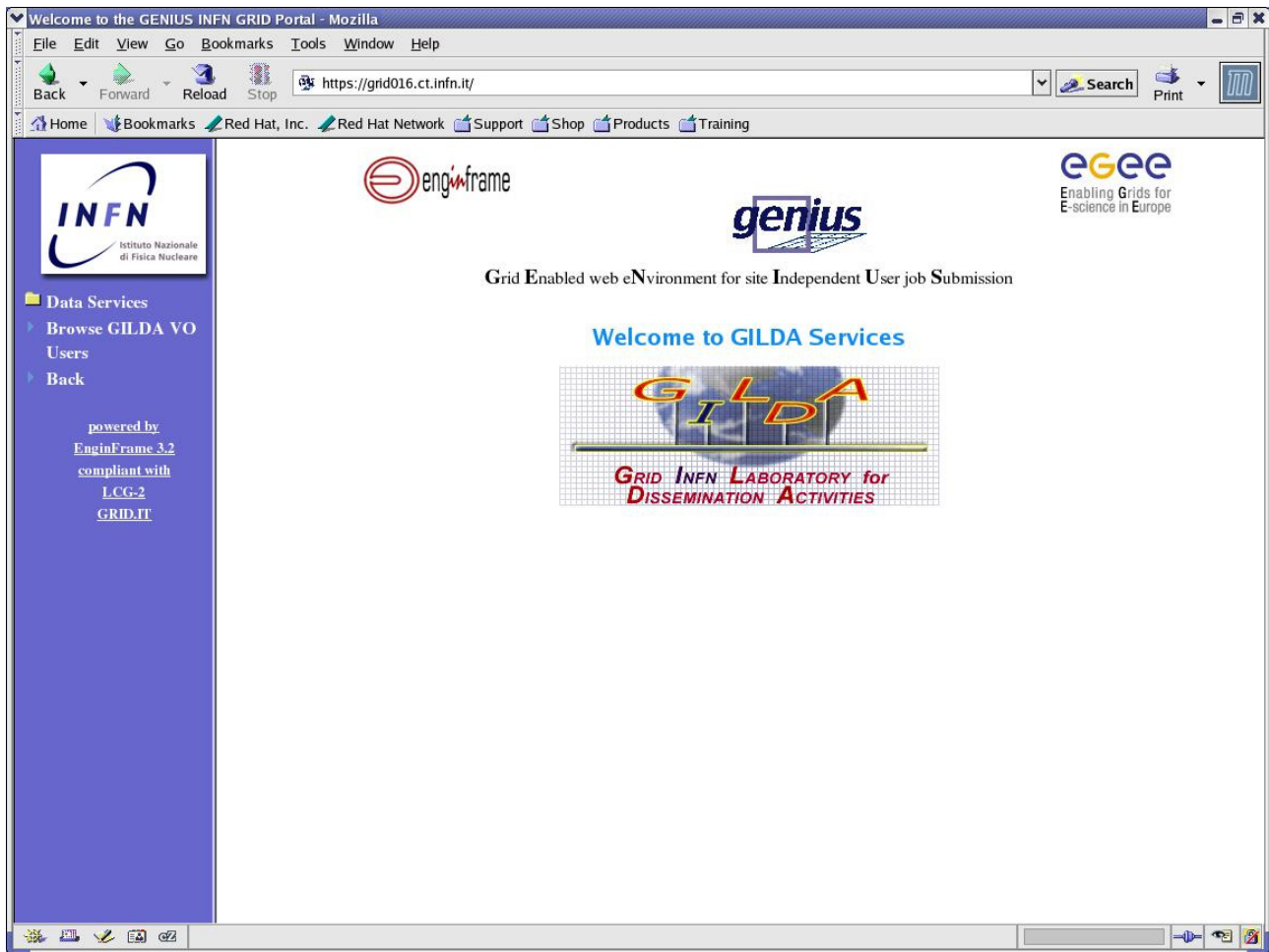


Figure 9.1 - Data Services.

9.1 Browse VO Users

With this service the user can browse the LDAP server containing the personal certificates of all VO users. This service is known to have problem when executed with Internet Explorer as web browser.

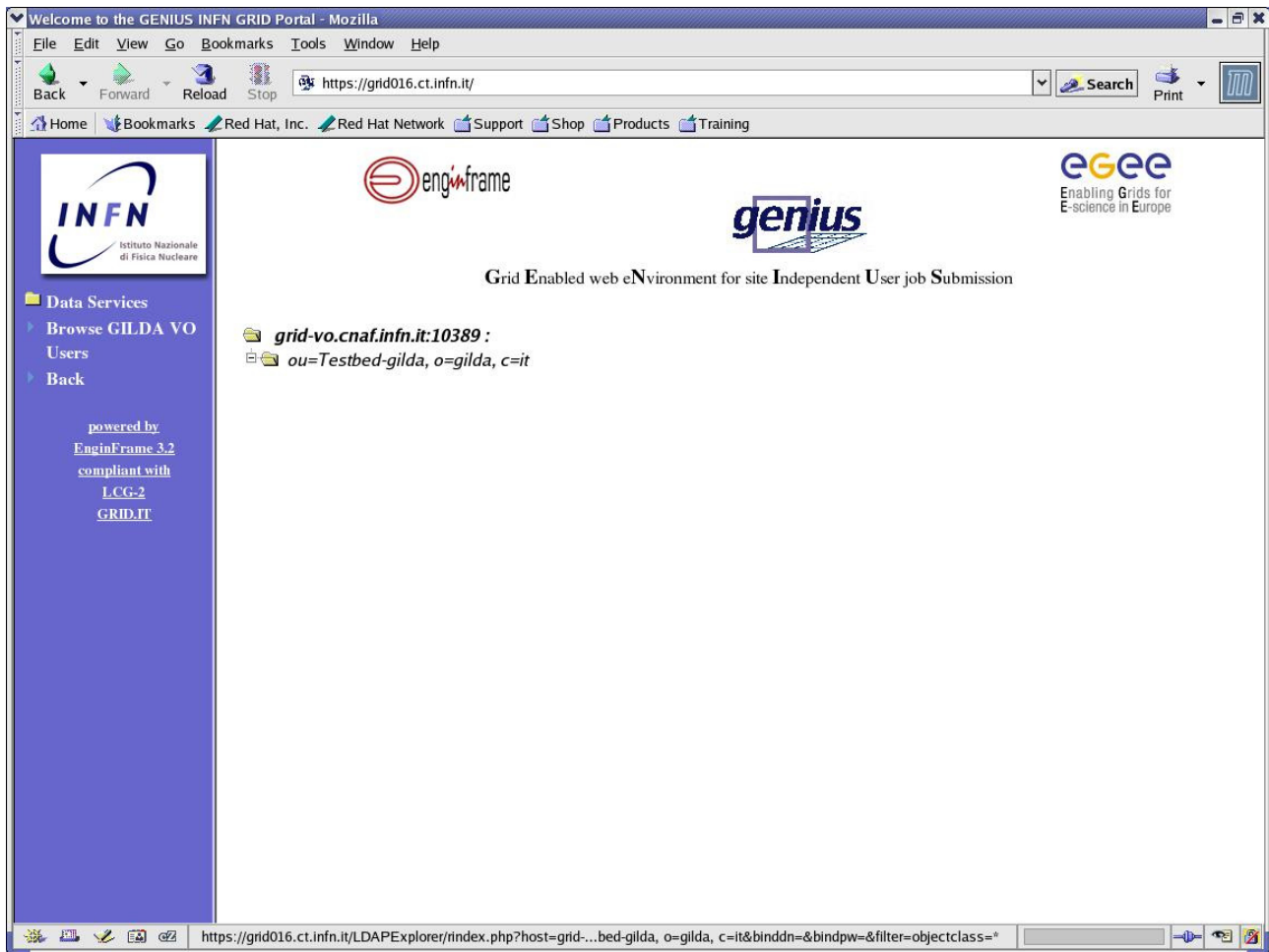


Figure 9.2 - Browse GILDA VO.

For some details user can click on the testbed folder, it will be shown a page of this kind, which gives detailed informations on user VO and its members.

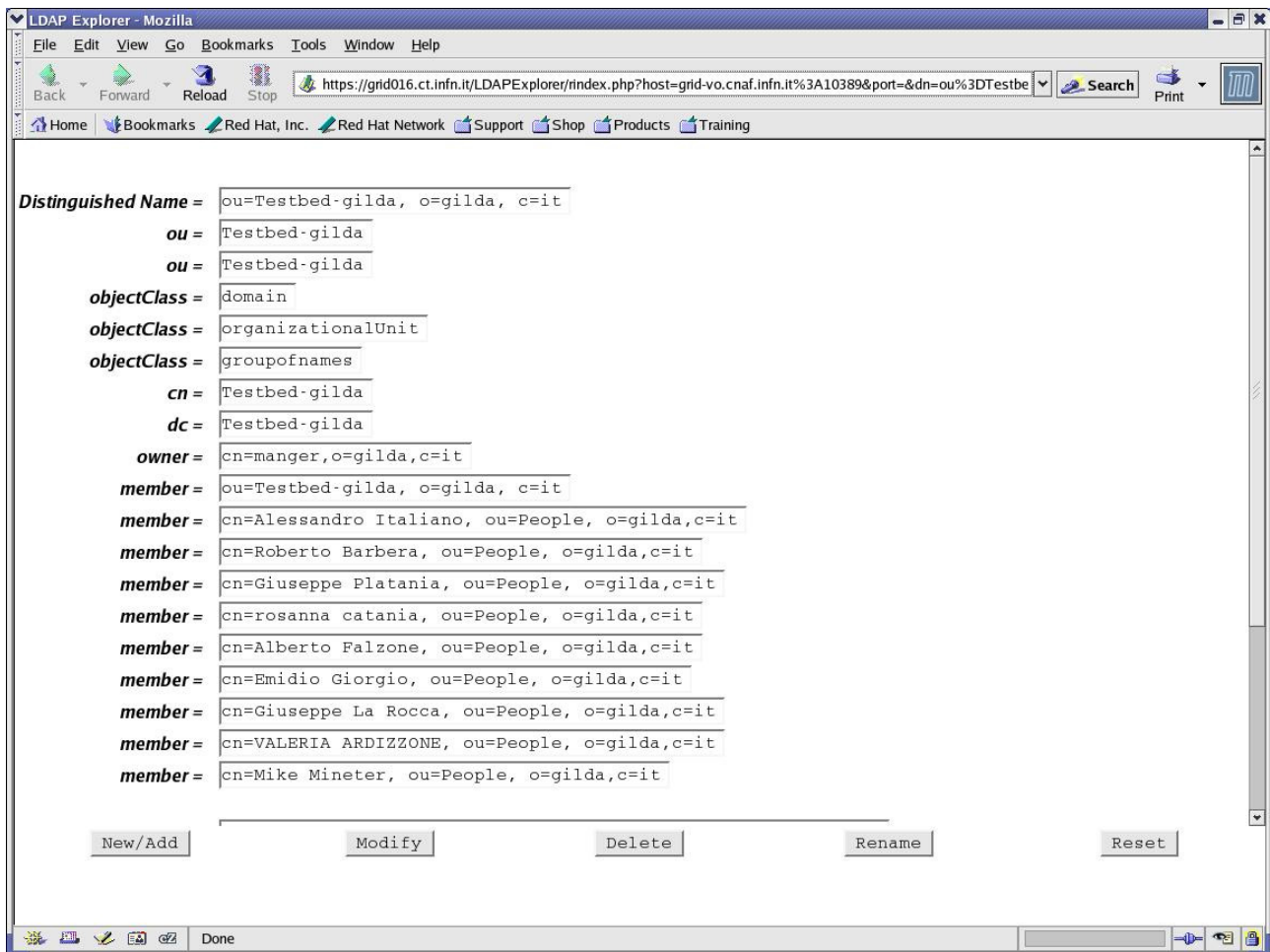


Figure 9.3 - Personal certificates of VO GILDA.

10 Statistics

With this service the user can inspect the graphics of the connection statics of the web server GENIUS is running on. For this purpose GENIUS uses the free tool Webalizer version 2.01 (<http://www.mrunix.net/webalizer/>).

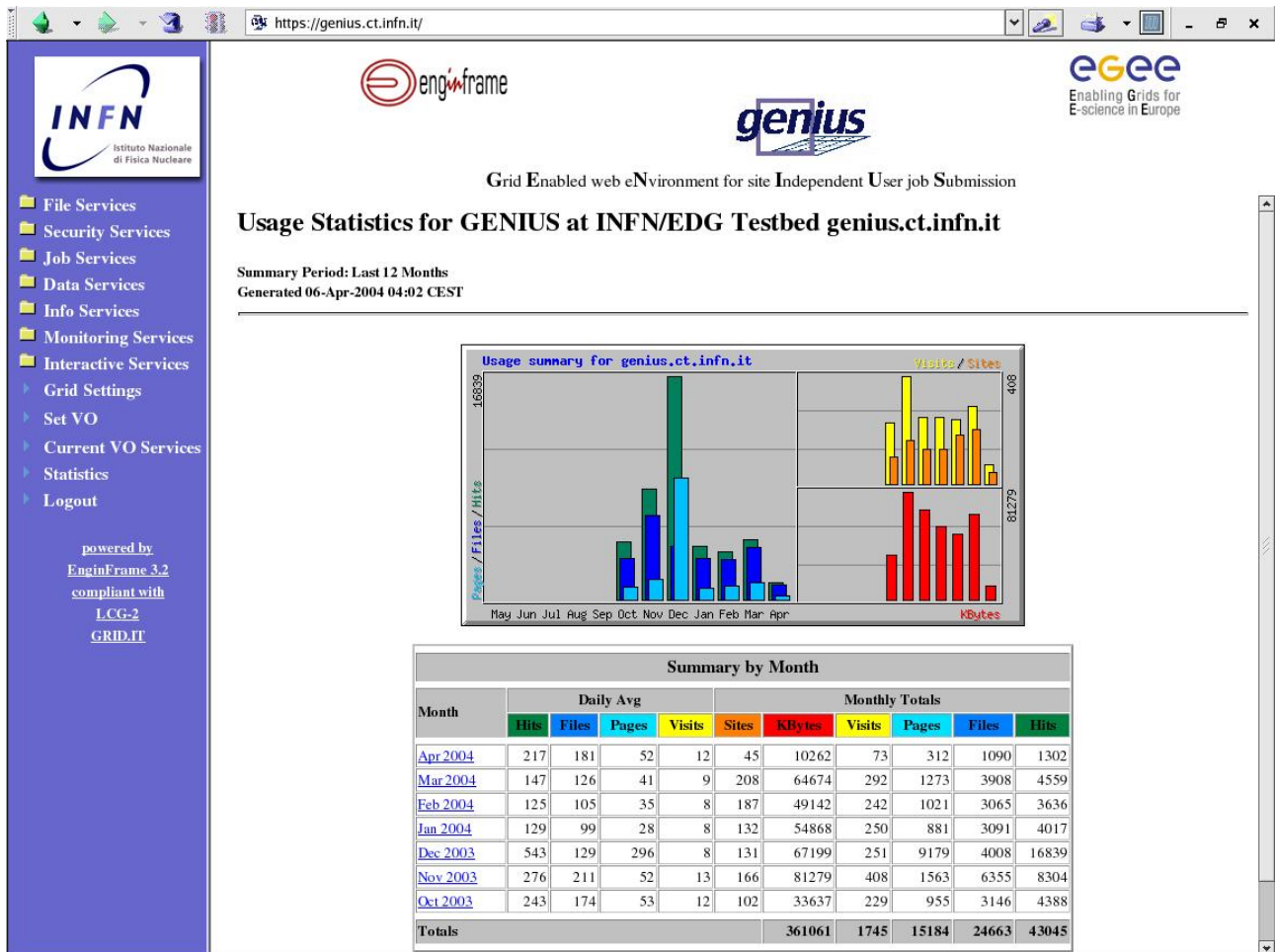


Figure 10.1 - Statics for GENIUS at INFN/EDG Testbed genius.ct.infn.it.

11 Logout GENIUS

With this service you can logout from GENIUS still keeping your browser open.