



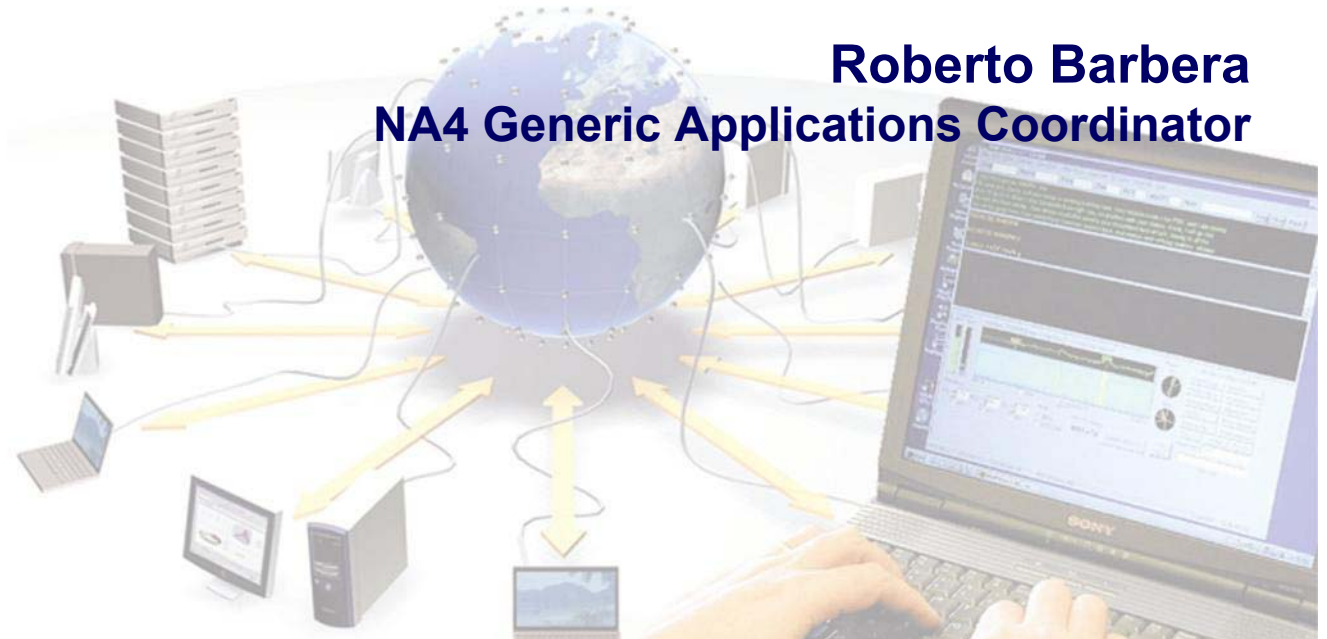
Enabling Grids for
E-science in Europe

www.eu-egee.org

NA4/SA1 Meeting, CERN, 14.10.2004

Status of NA4 Generic Applications

Roberto Barbera
NA4 Generic Applications Coordinator

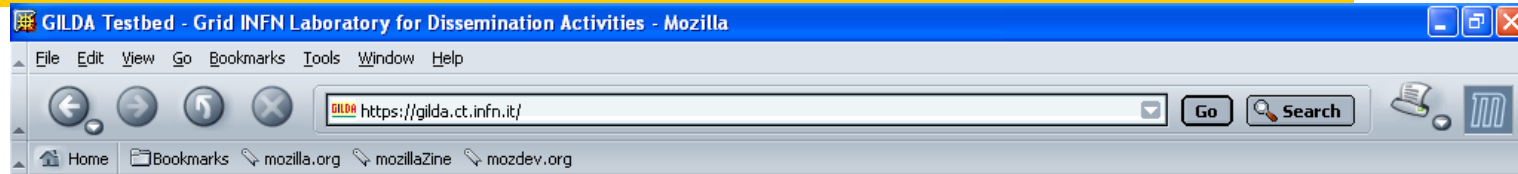


EGEE is a project funded by the European Union under contract IST-2003-508833

- Status of GILDA
- New demonstrative applications in GILDA
- Status of “official” Generic Applications
- How to move from GILDA to EGEE-0
- Summary



The present GILDA Testbed (<https://gilda.ct.infn.it/testbed.html>)



- Grid tutorials
- Video tutorials **NEW**
- Instructions for users
- Instructions for sites **NEW**
- Useful links

- Sponsors
- Usage Statistics



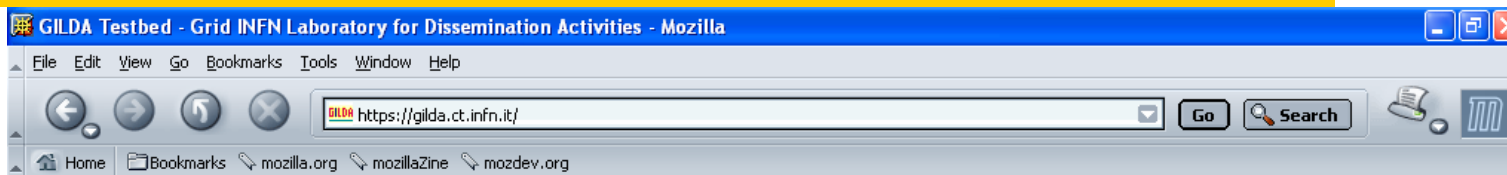
Grid services

This is a table of the general Grid Services nodes running.

The present GILDA sponsors



Enabling Grids for
E-science in Europe



GILDA is sponsored by:

- Grid tutorials
- Video tutorials
- Instructions for users
- Instructions for sites 
- Useful links
- Sponsors
- Usage Statistics



INSTITUTE OF INFORMATICS
SLOVAK ACADEMY OF SCIENCES



The GILDA Tutorials/Demonstrations (<https://gilda.ct.infn.it/tutorials.html>)

- Catania, 4-8 October 2004, [home page](#), [agenda](#)
- Vilnius, 5-6 October 2004, [agenda](#)
- London, 6 October 2004
- Madrid, 6-7 October 2004, [agenda](#)
- Heidelberg, 11-14 October 2004
- CERN, 16 October 2004
- Prague, 26 October 2004, [home page](#)
- Warsaw, 4-6 November 2004, [home page](#), [agenda](#)
- The Hague, 15-17 November 2004
- Merida, 15-19 November 2004
- Bochum, 7-10 December 2004
- Istanbul, 9-10 December 2004
- Prague, 13 December 2004

The GILDA Video Tutorials (<https://gilda.ct.infn.it/video.html>)

- How to join GILDA
- Certificate: conversion and manipulation
- The GILDA Grid Demonstrator
- **The GILDA Grid Tutor: how to install it**
- The GILDA Grid Tutor: how to use it

NEW !



New functionalities of GILDA

- Complete support for MPI jobs
- Complete support for DAG jobs
 - DAG UI: grid-demo1.ct.infn.it
 - DAG RB: grid007.ct.infn.it
 - CMS example demonstrated at the last EDG Review successfully reproduced
 - Integration of DAG's in TRIANA re-started
- SciLab (<http://www.scilab.org>, a MathLab clone) installed on all sites and successfully tested
- GEANT4 installed on all sites and successfully tested
- GNU G95 Fortran 90/95 compiler (<http://www.g95.org>) under test in Catania. Will be available on all sites in a few days along with a series of working examples
- Complete support for DGAS accounting system foreseen in a few weeks

MPI jobs: site configuration recipe (valid for PBS as LRM)

- Edit `/etc/ssh/sshd_config` and add the following lines at the end:
HostbasedAuthentication yes
IgnoreUserKnownHosts yes
IgnoreRhosts yes
- Copy the file `/etc/ssh/shosts.equiv` from CE on all WN's.
- On the CE generate an updated version of `/etc/ssh/ssh_known_hosts` by running `/opt/edg/sbin/edg-pbs-knownhosts`.
- Copy that file into all your WN's.
- Restart the server with: `/sbin/service sshd restart`

MPI jobs: JDL example

(see <http://grid-it.cnaf.infn.it/index.php?mpihowto&type=1>)

```
Type = "Job";  
JobType = "MPICH";  
NodeNumber = 4;  
Executable = "MPItest.sh";  
Arguments = "cpi 4";  
StdOutput = "test.out";  
StdError = "test.err";  
InputSandbox = {"MPItest.sh", "cpi"};  
OutputSandbox = {"test.err", "test.out", "executable.out"};  
Requirements = other.GlueCEInfoLRMSType == "PBS" ||  
    other.GlueCEInfoLRMSType == "LSF";
```

MPI jobs: execution script example (1/2)

(see <http://grid-it.cnaf.infn.it/index.php?mpihowto&type=1>)

```
#!/bin/sh
# this parameter is the binary to be executed
EXE=$1
# this parameter is the number of CPU's to be reserved for parallel execution
CPU_NEEDED=$2
# prints the name of the master node
echo "Running on: $HOSTNAME"
echo "*****"
if [ -f "$PWD/.BrokerInfo" ] ; then
TEST_LSF=`edg-brokerinfo getCE | cut -d/ -f2 | grep lsf`
else
TEST_LSF=`ps -ef | grep sbatchd | grep -v grep`
fi
if [ "x$TEST_LSF" = "x" ] ; then
# prints the name of the file containing the nodes allocated for parallel execution
echo "PBS Nodefile: $PBS_NODEFILE"
# print the names of the nodes allocated for parallel execution
cat $PBS_NODEFILE
echo "*****"
HOST_NODEFILE=$PBS_NODEFILE
else
# print the names of the nodes allocated for parallel execution
echo "LSF Hosts: $LSB_HOSTS"
# loops over the nodes allocated for parallel execution
HOST_NODEFILE=`pwd`/lsf_nodefile.$$
for host in ${LSB_HOSTS}
do
echo $host >> ${HOST_NODEFILE}
done
fi
```

MPI jobs: execution script example (2/2)

(see <http://grid-it.cnaf.infn.it/index.php?mpihowto&type=1>)

```
echo "*****"
# prints the working directory on the master node
echo "Current dir: $PWD"
echo "*****"
for i in `cat $HOST_NODEFILE` ; do
echo "Mirroring via SSH to $i"
# creates the working directories on all the nodes allocated for parallel execution
ssh $i mkdir -p `pwd`
# copies the needed files on all the nodes allocated for parallel execution
/usr/bin/scp -rp ./ * $i: `pwd`
# checks that all files are present on all the nodes allocated for parallel execution
echo `pwd`
ssh $i ls `pwd`
# sets the permissions of the files
ssh $i chmod 755 `pwd`/$EXE
ssh $i ls -alR `pwd`
echo "@@@@@@@@@@@@@@@@@@"
done
# execute the parallel job with mpirun
echo "*****"
echo "Executing $EXE"
chmod 755 $EXE
ls -l
mpirun -np $CPU_NEEDED -machinefile $HOST_NODEFILE `pwd`/$EXE > executable.out
echo "*****"
```

New demonstrative applications on GILDA

- GATE (demonstrated at the last GEANT4 Workshop by Lydia Maigne)
- MPI examples
- Raster-3D (chemical application: 3D modelling/rendering of molecules)
- SciLab examples (general application: data presentation using SciLab, the MathLab clone)
- GEANT4 examples (general application: examples of GEANT4 applications)

MPI example

Welcome to the GENIUS INFN GRID Portal - Mozilla

File Edit View Go Bookmarks Tools Window Help

https://grid-demo.ct.infn.it/ Go Search

Home Bookmarks mozilla.org mozillaZine mozdev.org

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Grid Enabled web eNvironment for site Independent User job Submission

```
Process 0 of 2 on testbed010.cnaf.infn.it  
pi is approximately 3.1415926544231318, Error is 0.0000000008333387  
wall clock time = 10.010470  
Process 1 of 2 on grid011f.cnaf.infn.it
```

Other Job Services
up
▶ Job Submission
▶ Job Queue
▶ Job Data
▶ Clean Job Queue

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[EnginFrame 3.2](#)
compliant with
[LCG-2](#)
[GRID.IT](#)

Raster-3D example

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Raster-3D

up

- Generate a Raster Image
- Show Raster Queue
- Raster Job Data
- Clean Raster Queue

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compliant with
[LCG-2](#)
[GRID.IT](#)

Done

SciLab example

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https://grid-demo.ct.infn.it/ Go Search

Home Bookmarks mozilla.org mozillaZine mozdev.org

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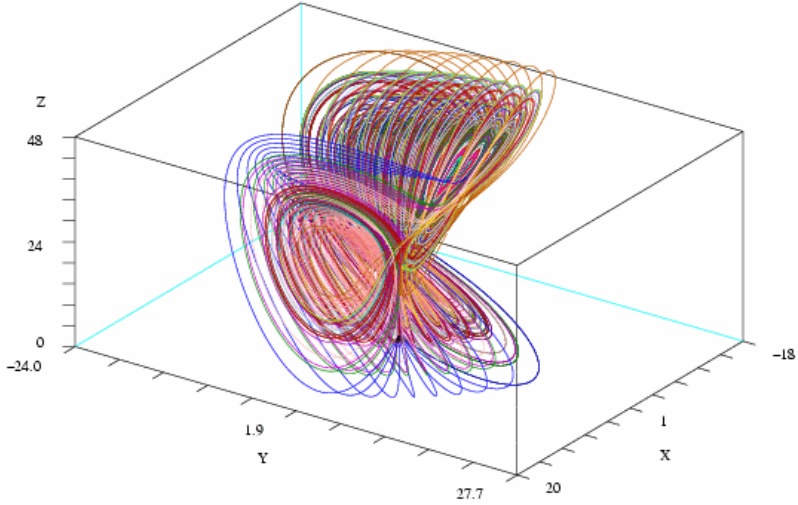
Grid Enabled web eNvironment for site Independent User job Submission

SCILAB

up

- Select Scilab macro
- Show Scilab Queue
- Scilab Job Data
- Clean Scilab Queue

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The 3D plot shows a complex, multi-colored trajectory in a 3D coordinate system. The axes are labeled X, Y, and Z. The Z-axis ranges from 0 to 48, the Y-axis from -24.0 to 27.7, and the X-axis from -18 to 20. The trajectory is a dense, multi-colored loop, suggesting a complex, possibly chaotic, system.

Done

GEANT4 example

Welcome to the GENIUS INFN GRID Portal - Mozilla

File Edit View Go Bookmarks Tools Window Help

https://grid-demo.ct.infn.it/

Home Bookmarks mozilla.org mozillaZine mozdev.org

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Grid Enabled web eNvironment for site Independent User job Submission

RB: gilda VO: gilda RLS: GILDA Logout

Destroy

hits.out.txt
g4_00.wrl

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

Directory contents - 20041012_130557_eX81nsM_7L0v.119Cvffr4A

C:\Documents and Settings\barbera\Impostazioni locali\Temp\g4_00.wrl - Microso...

File Modifica Visualizza Preferiti Strumenti ?

Indietro

Indirizzo C:\Documents and Settings\barbera\Impostazioni locali\Temp\g4_00.wrl

Google Search Web

Operazione completata

Risorse del computer

Status of Generic Applications (Earth Science)



External presentation

Status of Generic Applications (Earth Science)

- COMMUNITY

Earth Observations: ESA(IT), IPSL(FR), KNMI(NL), UTV(IT), SRON(NL), RIVM(NL)

Climate: DKRZ (DE), BADC(UK), IPSL(FR), KNMI(NL) (information)

Solid Earth Physics : IPGP(FR), laboratory (Munche, DE)

Hydrology: UNINE (CH), CRS4(Sardinia), Laboratory in Tunisie

Geosciences:CGG(FR)

Status of Generic Applications (Earth Science)



VIRTUAL ORGANISATION

CERTIFICATES: large delay for some users

VO: **ESR (Earth Sciences Research)**: at Sara(NL) since the end of July

VO Manager: W. Som de Cerff(KNMI); VO administrator:T. Trompert (Sara)

Connection problem between the registration at CERN and the VO manager, solved only on 4 October.

7 persons registered and at least 4 not yet registered waiting for certificates or being registered at CERN before the 4 October-they need to do it again.

VO: **EGEODE(Expanding GEOsciences on Demand)**; being created at IN2P3 (Lyon, FR) since a few days

VO Manager: D. Thomas (CGG)

Status of Generic Applications (Earth Science)

ES ORGANISATION

Large variety of partners as it concerns the applications and Grid experience

⇒ Development of tools to collaborate, discuss and solve common problems, and share knowledge

➤ The **ESR web site** is a Twiki site that permits communication and collaboration between the ES partners.

<http://datagrid.nadc.nl/twiki/bin/view/ESR/WebHome>

➤ **Phone conference** on monday (14h-15h) every two weeks (2)

➤ Creation of **temporary working groups** about: Metadata access, MPI and, software installation and licensing like idl, fortran77 and 90, Geocluster

➤ The metadata and software installation **WG** have proposed some actions and take some decisions (see Twiki site)

Status of Generic Applications (Earth Science)

ES SITES

IPSL + IPGP: LCG2 deployed on UI, CE and SE with the help of the French ROC. Administrator: David Weissenbach (IPSL)

The site has belonged to the test zone since October 6.

ESA: Cluster of 8PC By the end of the week the last hardware part will be there

CGG; 10WN available

SCAI: available CE & 14 WN, SE with 0.5 TB (within October)

Sites that accept ESR VO: Nikhef, Sara, IN2P3 (Lyon) , CERN

Status of Generic Applications (Earth Science)

APPLICATION DEPLOYMENT

Earth Observation:

(1) The application deployed on Datagrid is not yet entirely deployed on EGEE but it will occur in a near future.

- Delay due to registration problem, site installation, environment installation like IDL, no tools for application metadata catalogue....
- Metadata database access by SQL script and test to be done with OGSA-DAI
- IDL is installed at IPSL site; other sites will install it
- Satellite data registered on the Replica catalogue
- Lidar data registered this week

(2) The portal developed by ESRIN was upgraded and works

Climate:

Discussions DKRZ with BADC on security token exchange mechanisms

Next video conference with BADC on 1.Nov

Status of Generic Applications (Earth Science)



APPLICATION DEPLOYMENT (part 2)

Hydrology:

Definition of an application and the corresponding software.

Solid Earth Physics:

Tomography application ported in June: 110 jobs

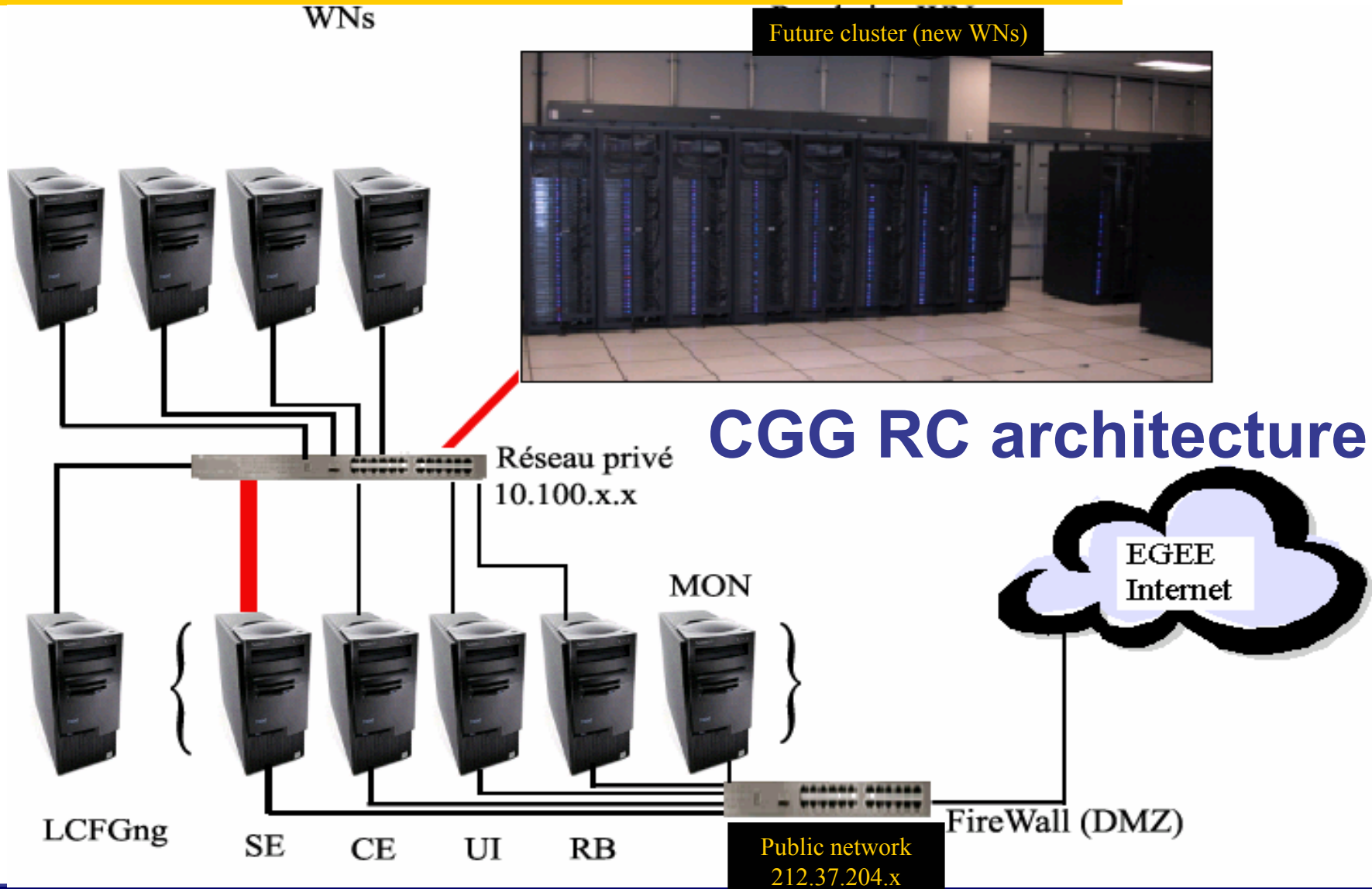
Planning for deployment of the proposed applications on 14 October

Geosciences: Geocluster

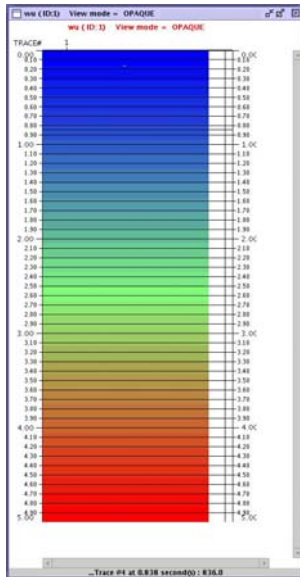
Successful Tests on Gilda and EGEE (see next slides)

Contact with Academic and industrial partners

Status of Generic Applications (Earth Science)



Status of Generic Applications (Earth Science)



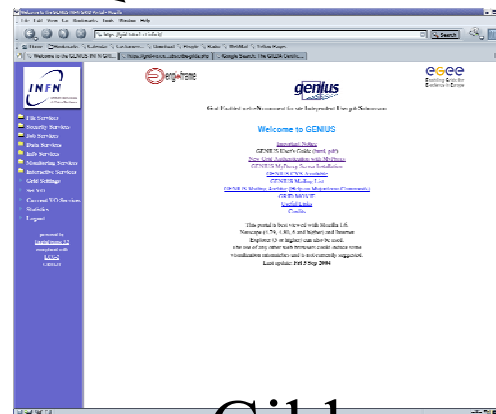
+
Geocluster
(egeode)

JDL +

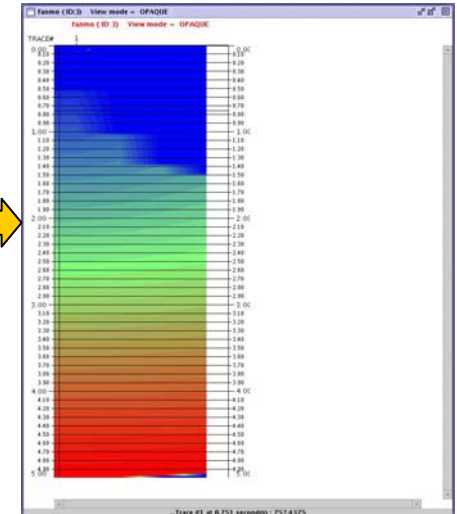
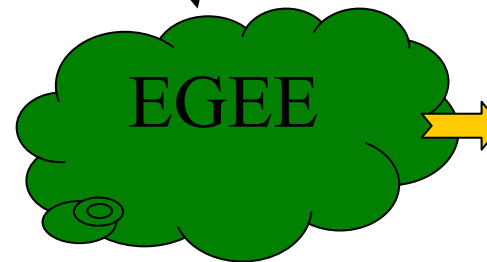
```
Type = "job";
JobType = "normal";
Executable = "run.sh";
VirtualOrganisation = "dteam";
#-----
RetryCount = 100;
OutputData={ [
OutputFile="gct_job.out.tar.bz2";
LogicalFileName={"Ifn:gct_job.out.tar.bz2"}
] };
#-----
StdOutput = "log";
StdError = "err";
OutputSandbox = {"log","err"};
#-----
InputSandbox = {"run.sh","gct.in.tar.bz2"};
```

```
edg-job-submit -vo dteam -o Status.1 egeode.jdl
edg-job-status -i $HOME/EGEODE/Status.1
edg-job-get-output -i $HOME/EGEODE/Status.1
```

or



Gilda



GEOCLUSTER
Job submission

Status of Generic Applications (Earth Science)

REQUIREMENTS

- List with priority for each domain in the EGAAP documents
- User case for « outbound Connectivity » on september to NA3
- Actions: update of ES list and user cases, check the biomed requirement site and update it if needed

DISSEMINATION

- Demonstration with the ESRIN portal
- Oral presentation, posters to new ES domains and partners during scientific meetings

Status of Generic Applications (Computational Chemistry)

Scientific area	Computational chemistry
Contact	Antonio Laganà, Dipartimento di Chimica, University of Perugia, Italy, lag@unipg.it
VO manager	Oswaldo Gervasi, osvaldo@unipg.it
VO services	VO administration, Resource Broker and Replica Location Service located at CNAF
Application(s) deployed	“A priori” atomic and molecular simulations.
Status on GILDA	First cluster in Perugia added to GILDA next week. First brainstorming meeting scheduled for october 18-19 at CNAF.
Status on EGEE-0	
Main requirements	Deployment of licensed software on the grid infrastructure. Commercial software will initially be deployed on the Perugia cluster.
Main issues related to deployment	

Status of Generic Applications (Astroparticle Physics)

Scientific area	Astro-particle Physics
Contact	Harald Kornmayer, FZK, Germany, harald.kornmayer@iwr.fzk.de
VO manager	Harald Kornmayer, KZK, Germany, harald.kornmayer@iwr.fzk.de
VO services	VO administration, Resource Broker and Replica Location Service located at SARA
Application(s) deployed	MAGIC telescope Montecarlo simulations
Status on GILDA	Realisation of RPM(s) of Magic Montecarlo in progress.
Status on EGEE-0	
Number of nodes accessible on EGEE infrastructure	
Desired infrastructure usage	
Main requirements	
Main issues related to deployment	

Move from GILDA to EGEE-0 (UI points to another default RB)

- In the file `/var/obj/conf/server/source/` of your LCFGng server add the needed information in the lines:

```
#ifdef UI_RESBROKER  
#undef UI_RESBROKER  
#define UI_RESBROKER  
#endif
```

< RB to point to >

.....

.....

```
#ifdef UI_LOGBOOK  
#undef UI_LOGBOOK  
#define UI_LOGBOOK  
>:7846  
#endif
```

[https://< RB to point to](https://< RB to point to >)

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 1)

- In the file site-cfg.h on your LCFGng server add the needed information in the lines:

```
#define SE_VO_<vo name>
```

```
.....
```

```
#define SA_PATH_<vo name>      <vo name>
```

```
.....
```

```
#define WN_AREA_<vo name>      /opt/exp_software/<vo name>
```

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 2)

- In the file ComputingElement-cfg.h on your LCFGng server add the needed information in the lines:

```
#ifdef SE_VO_<vo name>
EXTRA(ceinfo.SUPPORTEDVOS)          <vo name>
#endif

.....
#ifdef SE_VO_<vo name>
EXTRA(dirperm.ents)                  <vo name>sgmce
dirperm.path_<vo name>sgmce          SW_PATH/<vo name>
dirperm.owner_<vo name>sgmce         <vo name>sgm:<vo name>
dirperm.perm_<vo name>sgmce          0775
dirperm.type_<vo name>sgmce          d
#endif
```

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 3)

- In the files:
 - ComputingElement-novoms-cfg.h
 - StorageElementClassic-cfg.h
 - StorageElement-cfg.h

on your LCFGng server add the needed information in the line:

```
#include "poolaccounts-<vo name>-cfg.h"
```

where poolaccounts-<vo name>-cfg.h looks like

```
#ifdef SE_VO_<vo name>
EXTRA(poolaccounts.usernames) <vo name>sgm <vo name>001 \
                                <vo name>002 .....<vo name>100
EXTRA(poolaccounts.nolock)      <vo name>sgm
#endif
```

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 4)

- In the file flatfiles-dirs-SECLASSIC-cfg.h on your LCFGng server add the needed information in the lines:

```
#ifdef SE_VO_<vo name>
EXTRA(dirperm.ents)           <vo name>
dirperm.path_<vo name>      SE_FILE_CACHE_AREA/<vo name>
dirperm.owner_<vo name>    root:<vo name>
dirperm.perm_<vo name>    0775
dirperm.type_<vo name>    d
#endif
```

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 5)

In the file `lcginfo-seclassic-cfg.h` on your LCFGng server add the needed information in the lines:

```
#ifdef SE_VO_<vo name>
#define PATH_<vo name>          <vo name>:SA_PATH_<vo name>
#define PATH_DYN_<vo name>    <vo name>:CE_CLOSE_SE_MOUNTPOINT/SA_PATH_<vo name>
#else
#define PATH_<vo name>
#define PATH_DYN_<vo name>
#endif
.....
#ifdef SE_DYNAMIC_CLASSIC
+lcginfo.args_classic SE_HOSTNAME PATH_DYN_ALICE PATH_DYN_ATLAS PATH_DYN_CMS PATH_DYN_LHCB
  PATH_DYN_DTEAM PATH_DYN_<vo name>
#endif
.....
EXTRA(lcginfo.value_GlueSARoot)          PATH_<vo name>
EXTRA(lcginfo.names_GlueSAAccessControlBaseRule)  <vo name>
EXTRA(lcginfo.names_GlueSAPolicyFileLifeTime)    <vo name>
.....
#ifdef SE_VO_<vo name>
lcginfo.prefix_GlueSAAccessControlBaseRule_<vo name>  PATH_<vo name>
lcginfo.value_GlueSAAccessControlBaseRule_<vo name>   <vo name>
lcginfo.prefix_GlueSAPolicyFileLifeTime_<vo name>     PATH_<vo name>
lcginfo.value_GlueSAPolicyFileLifeTime_<vo name>     permanent
#endif
```

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 6)

- In the file mkgridmap-cfg.h on your LCFGng server add the needed information in the lines:

```
#ifdef SE_VO_<vo name>
EXTRA(mkgridmap.groups)    <vo name>
mkgridmap.uri_gilda      ldap://<vo server name>:<vo server
port>/ou=<vo name ou>,o=<vo name o>,c=<vo name c>
mkgridmap.user_<vo name>  .<vo name>
#endif
```

Example: ldap://grid-vo.cnaf.infn.it:10389/ou=Testbed-gilda,o=gilda,c=it

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 7)

- In the file se-cfg.h on your LCFGng server add the needed information in the lines:

```
#ifdef SE_VO_<vo name>  
EXTRA(se.vos)      <vo name>  
#endif
```


Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 8)

- In the file seinfo-cfg.h on your LCFGng server add the needed information in the lines:

```
#ifdef SE_VO_<vo name>
EXTRA(seinfo.vos)                <vo name>
seinfo.SARoot_<vo name>         <vo name>:/<vo name>
seinfo.SAPolicyMaxFileSize_<vo name> 10000
seinfo.SAPolicyMinFileSize_<vo name> 1
seinfo.SAPolicyMaxData_<vo name> 1000000
seinfo.SAPolicyMaxNumFiles_<vo name> 10000
seinfo.SAPolicyMaxPinDuration_<vo name> 10000
#endif
```

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 9)

- In the file user-edguser-cfg.h on your LCFGng server add the needed information in the lines:

```
#ifdef SE_VO_<vo name>  
EXTRA(auth.usersuppgroups_edguser) <vo name>  
#endif
```

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 10)

- In the file voenv-cfg.h on your LCFGng server add the needed information in the lines:

```
#ifdef SE_VO_<vo name>
EXTRA(voenv.vo)           <vo name>
voenv.swroot_<vo name>  /opt/<vo name>
#endif
```

Move from GILDA to EGEE-0 (allow a new VO to run on a site – step 11)

- In the file vomswmgr-dirs-cfg.h on your LCFGng server add the needed information in the lines:

```
#ifdef SE_VO_<vo name>
EXTRA(dirperm.ents)           <vo name>sgm
dirperm.path_<vo name>sgm    INFO_PATH/<vo name>
dirperm.owner_<vo name>sgm   <vo name>sgm:<vo name>
dirperm.perm_<vo name>sgm    0755
dirperm.type_<vo name>sgm    d
#endif
```

Summary

- GILDA testbed is expanding and it is now an inter-continental facility
- Some applications' requirements in terms of commercial software (MathLab, F90) are being addressed in GILDA using free/open source clones (SciLab, G95)
- The portfolio of demonstrative applications is growing every day and can stand very nice and complex demonstrations
- Official Generic Applications are doing well and they are on track for the First Review
- The technical procedure to move from GILDA to EGEE-0 is very simple. Accepting a new VO on a given site takes just a few minutes (just 12 steps to the Heaven ☺)
- We envisage to deploy the accepted Generic Applications on EGEE-0 by the end of the year (to be in time with DNA4.3.1)