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[?WRF](#) for GRID (**WRF4G**) is a framework for the execution and monitoring of the WRF Modelling System in distributed computer resources (see this presentation). It provides a flexible and easy way of designing complex experiments involving many simulations (multiple start/end dates, multiparametric simulations, long climate runs, ...). The monitor allows a precise control of the state of the experiment, where broken simulations are automatically detected and relaunched on the next submission. **WRF4G** uses [?GridWay](#) to access to heterogeneous resources in a transparent way.

Installation on the User Interface (UI)

General Requirements

WRF4G needs the following software preinstalled on the UI:

- GNU/Linux (**x86_64**)
- **Python**, version ≥ 2.4 and < 3.0
- [? GridFTP](#) server

Download

Download and unpack the distribution file [?WRF4G.tar.gz](#) to the installation directory, for example your \$HOME directory.

```
[user@ui~]$ cd $HOME
[user@ui~]$ wget http://meteo.macc.unican.es/work/WRF4G.tar.gz
[user@ui~]$ tar xzvf WRF4G.tar.gz
```

Environment Configuration

Set up the environment variables "WRF4G_LOCATION" and "PATH" for WRF4G.

```
[user@ui~]$ export WRF4G_LOCATION=$WRF4G_INSTALL_PATH/WRF4G
[user@ui~]$ export PATH=$WRF4G_LOCATION/bin:$PATH
[user@ui~]$ export LD_LIBRARY_PATH=$WRF4G_LOCATION/lib/shared_libs:$LD_LIBRARY_PATH
```

And set up the environment for **GISELA**:

Create a file (i.e. *gisela_environment.sh*) with these variables:

```
export LCG_CATALOG_TYPE=lfc
export LFC_HOST=lfc.eela.ufrj.br
export LCG_GFAL_INFOSYS=bdii.eela.ufrj.br:2170
export LFC_HOME=/grid/prod.vo.eu-eela.eu
export VO="prod.vo.eu-eela.eu"
```

Execute commands from *gisela_environment.sh* in the current shell environment.

```
[user@ui~]$ source gisela_environment.sh
```

GISELA Available Resources

[?lcg-infosites](#) command can be used to obtain VO information on Grid resources. Before using *lcg-infosites* you have to execute *gisela_environment.sh* file for **GISELA** Infrastructure. Some using examples are showed below:

- Find out the CEs of your VO:

```
[user@ui~]$ lcg-infosites --vo $VO ce
#CPU    Free    Total Jobs    Running Waiting ComputingElement
-----
 16      16      0              0      0    gantt.cefet-rj.br:8443/cream-pbs-prod
21561    0    3409              7    3402    ce206.cern.ch:8443/cream-lsf-grid-eela
```

```

21561 826 3409 7 3402 ce204.cern.ch:8443/cream-lsf-grid_eela
21561 826 3409 7 3402 ce203.cern.ch:8443/cream-lsf-grid_eela
21561 0 3409 7 3402 ce205.cern.ch:8443/cream-lsf-grid_eela
21561 826 3409 7 3402 ce208.cern.ch:8443/cream-lsf-grid_eela
21561 0 3409 7 3402 ce207.cern.ch:8443/cream-lsf-grid_eela
21561 826 3409 7 3402 ce130.cern.ch:2119/jobmanager-lcglsf-grid_eela
21561 826 3409 7 3402 ce132.cern.ch:2119/jobmanager-lcglsf-grid_eela
21561 826 3409 7 3402 ce131.cern.ch:2119/jobmanager-lcglsf-grid_eela
21561 826 3409 7 3402 ce133.cern.ch:2119/jobmanager-lcglsf-grid_eela
260 107 4 4 0 ce01-tic.ciemat.es:2119/jobmanager-lcgpbs-prod_eela
1160 467 0 0 0 gridgate.cs.tcd.ie:2119/jobmanager-pbs-sixhour
1160 467 0 0 0 gridgate.cs.tcd.ie:2119/jobmanager-pbs-thirtym
1160 467 5 4 1 gridgate.cs.tcd.ie:2119/jobmanager-pbs-threeday
1160 467 2 2 0 gridgate.cs.tcd.ie:2119/jobmanager-pbs-oneday
10 10 0 0 0 ce01.unlp.edu.ar:2119/jobmanager-lcgpbs-long
.....

```

- Find out CE list with running jobs, free cpus, and maximum wallclock and CPU time.

```

[user@ui~]$ lcg-info --vo $VO --list-ce --attrs RunningJobs,FreeCPUs,MaxWCTime,MaxCPUTime
- CE: axon-g01.ieeta.pt:2119/jobmanager-lcgpbs-prod
- RunningJobs      0
- FreeCPUs         5
- MaxWCTime        4320
- MaxCPUTime       2880

- CE: cale.uniandes.edu.co:8443/cream-pbs-prod
- RunningJobs      3
- FreeCPUs         94
- MaxWCTime        4320
- MaxCPUTime       2880
.....

```

- Find out the SEs of your VO.

```

[user@ui~]$ lcg-infosites --vo $VO se
Avail Space(Kb) Used Space(Kb) Type SEs
-----
1258363960 8651392 n.a se.labmc.inf.utfsm.cl
288012854 11517683563 n.a lnx097.eela.if.ufrj.br
187037782 27605724 n.a se01.macc.unican.es

```

For more information you could execute `lcg-infosites --help` or see [?qLite information](#)

Configuration of WRF4G to access to GISELA Resources

Next steps describe a specific configuration of the CEs for **GISELA** Infrastructure.

Firstly, you must remove [default computing resource](#). Comment the line "mycomputer" (#) in `$WRF4G_LOCATION/etc/framework4g.conf` file.

?GridWay configuration

If you want to configure **Globus** and **CREAM** resources of **GISELA**, you have to add the following lines to

`$WRF4G_LOCATION/opt/drm4g_gridway/etc/gwd.conf` file:

```

# Example MAD Configuration for GISELA
# GT2
IM_MAD = gisela_gt2:gw_im_mad_bdii:-q (GlueCEAccessControlBaseRule=VO\;prod.vo.eu-eela.eu)(GlueCEImplementationName=LCG-CE
EM_MAD = em_gt2:gw_em_mad_gram2::rsl_nsh

```

```

TM_MAD = tm_gt2:gw_tm_mad_dummy:-u gsiftp\://ui01.macc.unican.es

# CREAM
IM_MAD = gisela_cream:gw_im_mad_bdii:-q (GlueCEAccessControlBaseRule=VO\:prod.vo.eu-eela.eu)(GlueCEImplementationName=CREAM)
EM_MAD = em_cream:gw_em_mad_cream.py::jdl
TM_MAD = tm_cream:gw_tm_mad_dummy:-g

```

There are two options for the configuration of IM MAD:

- -q: it is possible to configure a GridWay instance to only use queues authorized to your VO by filtering them.
- -s: information server in a hierarchical configuration.

```

IM_MAD = glisela_gt2:gw_im_mad_bdii:-q (GlueCEAccessControlBaseRule=VO\:prod.vo.eu-eela.eu)(GlueCEImplementationName=LC

```

There are two options for the configuration of the TM MAD:

-g: starts a [? GASS](#) server for each user.

```

TM_MAD = tm_gt2:gw_tm_mad_dummy:-g

```

-u: specifies the URL of a [? GridFTP](#) server running in the client. For example:

```

TM_MAD = tm_gt2:gw_tm_mad_dummy:-u gsiftp\://ui01.macc.unican.es

```

For more information about MAD configuration see [?GridWay Configuration Guide](#)

Running environment configuration

The WRF4G_BASEPATH, WRF4G_DOMAINPATH, WRF4G_INPUT and WRF4G_APPS variables must be updated in \$WRF4G_LOCATION/etc/resources.wrf4g (see [resources.wrf4g](#) for more details). The new supported URL syntaxes will be:

```

gsiftp://host[:port]/file

```

The example below shows an possible resources.wrf4g files:

```

WRF4G_VERSION="1.0beta"
WRF_VERSION="3.1.1_r832INTEL_OMPI"
WRF4G_BASEPATH="gsiftp://ui01.macc.unican.es/$WRF4G_LOCATION/repository/output"
WRF4G_DOMAINPATH="gsiftp://ui01.macc.unican.es/$WRF4G_LOCATION/repository/domains"
WRF4G_INPUT="gsiftp://ui01.macc.unican.es/$WRF4G_LOCATION/repository/input"
WRF4G_APPS="gsiftp://ui01.macc.unican.es/$WRF4G_LOCATION/repository/apps"
REQUIREMENTS='ARCH = "x86_64"'
NP=1

```

Accessing the VOMS servers

To use the **GISELA** resources, the user should initialize the proxy through voms server:

```

[user@ui~]$ voms-proxy-init --voms prod.vo.eu-eela.eu
Cannot find file or dir: /ocean0/gmeteo/users/carlos/.glite/vomses
Enter GRID pass phrase:
Your identity: /DC=es/DC=irisgrid/O=unican/CN=josecarlos.blanco
Creating temporary proxy ..... Done
Contacting voms.eela.ufrj.br:15003 [/C=BR/O=ICPEDU/O=UFF BrGrid CA/O=UFRJ/OU=IF/CN=host/voms.eela.ufrj.br] "prod.vo.eu-ee
Creating proxy ..... Done
Your proxy is valid until Tue Aug 23 22:15:06 2011

```

Testing installation

- Start up the WRF4G Framework. This command will start the services needed by WRF4G to run.

```
[user@ui~]$ wrf4g_framework start
```

- List the computing available resources.

```
[user@ui~]$ wrf4g_resources
```

HID	PRIO	OS	ARCH	MHZ	%CPU	MEM(F/T)	DISK(F/T)	N(U/F/T)	LRMS	HOSTNAME
0	1	ScientificSLBer	x86_6	3200	0	1024/1024	0/0	0/78/260	jobmanager-lcgpbs	ce01-tic.ciemat.es
1	1	ScientificSLBer	i686	1865	0	900/900	0/0	0/10/10	jobmanager-lcgpbs	ce01.unlp.edu.ar
2	1	ScientificSLBer	x86_6	1600	0	2048/2048	0/0	0/116/132	jobmanager-lcgpbs	ce.labmc.inf.utfsm.
3	1	ScientificSLBer	i686	2400	0	3072/3072	0/0	0/4/4	jobmanager-lcgpbs	tochtli.nucleares.ur
4	1	ScientificSLBer	i686	2193	0	4096/4096	0/0	0/43/115	jobmanager-lcglsf	grid012.ct.infn.it
5	1	Scientific Linu	x86_6	2000	0	8150/8150	0/0	0/17/48	cream-pbs	ce01.eela.if.ufrj.br
6	1	ScientificCERNS	i386	2330	0	512/512	0/0	0/12/12	jobmanager-lcgpbs	ce.cp.di.uminho.pt
7	1	CentOSFinal	x86_6	2400	0	16000/16000	0/0	0/229/454	jobmanager-lcgpbs	ce01.macc.unican.es
8	1	ScientificSLSL	x86_6	2400	0	4058/4058	0/0	0/34/36	jobmanager-lcgsge	ce01.up.pt
9	1	ScientificSLSL	x86_6	2400	0	4058/4058	0/0	0/22/22	jobmanager-lcgsge	grid001.fe.up.pt
10	1	ScientificSLBer	i686	2330	0	2048/2048	0/0	0/18/18	cream-pbs	gantt.cefet-rj.br
11	1			0	0	0/0	0/0	0/0/21818	cream-lsf	ce206.cern.ch
12	1			0	0	0/0	0/0	0/833/21818	cream-lsf	ce204.cern.ch
13	1			0	0	0/0	0/0	0/0/21818	cream-lsf	ce205.cern.ch
14	1			0	0	0/0	0/0	0/0/21818	cream-lsf	ce207.cern.ch
15	1			0	0	0/0	0/0	0/833/21818	cream-lsf	ce208.cern.ch
16	1	CentOSFinal	x86_6	2670	0	12000/12000	0/0	0/25/40	cream-pbs	tochtli64.nucleares
17	1	Scientific Linu	x86_6	2000	0	8178/8178	0/0	0/55/200	cream-pbs	ce02.eela.if.ufrj.br
18	1	ScientificSLBer	x86_6	3000	0	2048/2048	0/0	0/24/24	cream-pbs	cream01.cecalc.ula.
19	1			0	0	0/0	0/0	0/0/0		ce.geeg.di.uminho.pt
20	1	ScientificCERNS	x86_6	1600	0	4096/4096	0/0	0/138/188	cream-pbs	cale.uniandes.edu.co
21	1	ScientificSLSL	x86_6	2400	0	4058/4058	0/0	0/20/22	cream-sge	grid001.fc.up.pt

Go to the folder where the **test experiment** is located:

```
[user@ui~]$ cd $WRF4G_LOCATION/experiments/single_test
```

- Prepare and submit the experiment:

```
[user@ui~]$ wrf4g_prepare
[user@ui~]$ wrf4g_submit
```

- Run `wrf4g_status` to see the jobs' status

```
[user@ui~]$ wrf4g_status -e test
```

Realization	Status	Chunks	Comp.Res	WN	Run.Sta	ext	%
testc	Done	3/3	ce01.macc.unican.es	wn002.macc.unican.es	Finished	0	100.00

For more specific information about commands see [?WRF4G CLI](#)

Problems

If you find any problem, please [?submit us a ticket!!](#)