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## About DRM4G

**DRM4G** is an open platform, based on [?GridWay](#), to define, submit, and manage computational jobs. DRM4G is a [?Python \(2.6+, 3.3+\)](#) implementation that provides a single point of control for computing resources without installing any intermediate middlewares. As a result, a user is able to run the same job on laptops, desktops, workstations, clusters, supercomputers, and any grid.

## Start Guide

In order to install DRM4G, an installation script is provided. Type the command below on your shell terminal:

```
$ wget --no-check-certificate -O- https://meteo.unican.es/work/DRM4G/install.sh | bash

=====
DRM4G installation script
=====

--> Checking the last version of DRM4G ...

--> DRM4G version selected: 2.4.1

--> Downloading drm4g-2.4.1.tar.gz ...

--> Unpacking drm4g-2.4.1.tar.gz in directory /home/USER ...

--> Installing DRM4G python requirements locally ...

=====
Installation of DRM4G 2.4.1 is done!
=====

In order to work with DRM4G you have to enable its
environment with the command:

    . /home/USER/drm4g/bin/drm4g_init.sh

You need to run the above command on every new shell you
open before using DRM4G, but just once per session.
```

By default, it will install DRM4G on your current directory. But, you can download the installation script:

```
$ wget --no-check-certificate https://meteo.unican.es/work/DRM4G/install.sh
```

And run it manually:

```
$ bash ./install.sh [options]
```

The options available are:

- -d, --dir DIRECTORY: Install DRM4G into a directory.
- -V, --version: Version to install.
- -h, --help: Print help text.

## My first job

If the the directory `~/ .drm4g` does not exist, `drm4g` will create one with a local configuration

1. Enable DRM4G:

```
[user@mycomputer~]$ . /home/user/drm4g/bin/drm4g_init.sh
```

### 1. Start up DRM4G :

```
[user@mycomputer~]$ drm4g start
Creating a DRM4G local configuration in '/home/user/.drm4g'
Creating '/home/user/.drm4g/var/acct' directory
Coping from '/home/user/drm4g/etc' to '/home/user/.drm4g/etc'
Starting DRM4G ....
OK
Starting ssh-agent ...
OK
```

### 2. Show information about all available resources and their host :

```
[user@mycomputer~]$ drm4g resource list
RESOURCE          STATE
localmachine      enabled

[user@mycomputer~]$ drm4g host list
HID ARCH          JOBS(R/T) LRMS      HOST
0  x86_64          0/0 fork    localmachine

[user@mycomputer~]$ drm4g host list 0
HID ARCH          JOBS(R/T) LRMS      HOST
0  x86_64          0/0 fork    localmachine

[QUEUENAME        JOBS(R/T) WALLT CPU   MAXR  MAXQ
default           0/0 0     0     1     1
```

### 3. Create a job template :

```
[user@mycomputer~]$ echo "EXECUTABLE=/bin/date" > date.job
```

### 4. Submit the job :

```
[user@mycomputer~]$ drm4g job submit date.job
ID: 0
```

### 5. Check the evolution of the job :

```
[user@mycomputer~]$ drm4g job list 0
JID DM  EM   START   END     EXEC   XFER   EXIT NAME      HOST
0  pend ---- 19:39:09 --:--:-- 0:00:00 0:00:00 --  date.job      --
```

If you execute successive `drm4g job list 0`, you will see the different states of this job:

```
0  pend ---- 19:39:09 --:--:-- 0:00:00 0:00:00 --  date.job      --
0  prol ---- 19:39:09 --:--:-- 0:00:00 0:00:00 --  date.job      --
0  wrap pend 19:39:09 --:--:-- 0:00:00 0:00:00 --  date.job localhost/fork
0  wrap actv 19:39:09 --:--:-- 0:00:05 0:00:00 --  date.job localhost/fork
0  epil ---- 19:39:09 --:--:-- 0:00:10 0:00:00 --  date.job localhost/fork
0  done ---- 19:39:09 19:39:27 0:00:10 0:00:01 0   date.job localhost/fork
```

- `pend`: The job is waiting for a resource to run on.
- `prol`: The remote system is being prepared for execution.
- `wrap pend`: The job has been successfully submitted to the computing resource and it is waiting.
- `wrap actv`: The job is being executed by the computing resource.
- `epil`: The job is finalizing.

- done:The job has finished.
6. Results are standard output (stdout) and standard error (stderr), both files will be in the same directory of job template:

```
[user@mycomputer~]$ cat stdout.0
Mon Jul 28 12:29:43 CEST 2014

[user@mycomputer~]$ cat stderr.0
```

## How to configure a TORQUE/PBS resource

In order to configure a TORQUE/PBS cluster accessed through ssh protocol, you can follow the next steps:

1. Generate a public/private key pair without password :

```
[user@mycomputer~]$ ssh-keygen -t rsa -b 2048 -f $HOME/.ssh/meteo_rsa -N ""
```

Configure the meteo resource :

```
[user@mycomputer~]$ drm4g resource edit
[meteo]
enable                = true
communicator          = ssh
username              = user
frontend              = ui.macc.unican.es
private_key            = ~/.ssh/meteo_rsa
lrms                   = pbs
queue                 = grid
max_jobs_running      = 1
max_jobs_in_queue     = 2
```

3. List and check if resource has been created successfully :

```
[user@mycomputer~]$ drm4g resource list
RESOURCE      STATE
meteo         enabled

[user@mycomputer~]$ drm4g host list
HID ARCH      JOBS(R/T) LRMS      HOST
0   x86_64      0/0 pbs       meteo
```

That's it! Now, you can submit jobs to meteo.

## User Scenarios

### Single Jobs

### Array Jobs

### MPI Jobs