

DIRAC

The DIRAC (**D**istributed **I**nfrastructure with **R**emote **A**gent **C**ontrol) project is a complete Grid solution for a community of users needing access to distributed computing resources. DIRAC forms a layer between a particular community and various compute resources to allow optimized, transparent and reliable usage.

The Workload Management System with Pilot Jobs introduced by the DIRAC project is now widely used in various grid infrastructures. This concept allows aggregating in a single system computing resources of different nature, such as computational grids, clouds or clusters, transparently for the users.

The volunteer grid resources provided by the IDGF-SP project were recently integrated as one of the components to the pool of computing resources managed by the DIRAC service of the France-Grilles project (FG-DIRAC). This was mostly done as a technology demonstration. The use of IDGF-SP by FG-DIRAC rests limited and should be still explored by the users of the service.

The EDGI project has implemented a gateway to the volunteer computer network which implements the CREAM Computing Element interface as specified by the gLite middleware. The CREAM service ran on the host cr2.edgi-grid.eu. This interface was used by the DIRAC Workload Management System (WMS) to reserve volunteer nodes for the user tasks. This was achieved in the following way:

- The EDGI CREAM service was described in the DIRAC Configuration Service as normal Site. The total capacity of the DIRAC/EDGI Site was set to 10 nodes. The maximum length of jobs was set to 2 hours of a CPU equivalent to the power of 10 HEPSPC 2006 units. The Site was allowed for usage by members of the biomed Virtual Organization.
- A dedicated Site Director was started to serve the DIRAC/EDGI Site. This is a daemon process which is submitting pilot jobs to the target resource once there are suitable tasks in the DIRAC WMS Task Queue.
- Pilot jobs were submitted in a form of self-extracting executable archive containing the pilot script, DIRAC client installation tool and the proxy of the Pilot Job responsible person for the biomed VO. This executable was delivered to a volunteer node Virtual Machine (VM), unpacked and started as a usual Pilot Job. No changes to the standard pilot script were necessary.
- Once Pilot Jobs were running on the volunteer node VM, they perform all the standard tasks of the user jobs life cycle: asking for a suitable user job to the DIRAC WMS Matcher service presenting the node capacity, getting the user job, downloading the job input sandboxes, running the job executable application and finally uploading the outputs.