University of Westminster and University of Portsmouth, private desktop grids in academy environments

Dario Ferrer

FST Faculty of Science and Technology
School of Electronics and Computer Science
University of Westminster

25 September 2013
Overview

UoW and University of Portsmouth Desktop Grids

The Local Desktop Grids connect laboratory PCs of the universities into their respective BOINC based Desktop Grid infrastructures.

It includes over 3000 registered machines over all the campuses.
Server Side

Debian packages
We use .deb packages compiled by SZTAKI optimized for local Desktop grids.

deb http://www.desktopgrid.hu/debian/ squeeze szdg

The 3G-Bridge middleware run as BOINC daemons:

DAEMON pid status lockfile disabled commandline
1 23477 running locked no feeder -d 3
2 23479 running locked no transitioner -d 3
3 23481 running locked no file_deleter -d 3
4 23483 running locked no 3g-bridge
5 23487 running locked no wssubmitter
6 23504 running locked no wsmonitor
7 23508 running locked no validator_autodock -app autodock_vina
...
3G-Bridge

We use a special submitting interface called 3G-Bridge. This middleware was been developed by SZTAKI (Hungary) within the EDGES and EDGI European projects.

The bridge is able to connect lots of different grid technologies. It has interface for EGI (Globus & gLite) infrastructure, interface for cloud submission, interface portal based submission, etc.
Server Side

Users
We use "BOINC users" to distribute different applications to specific labs, specially for licensed apps.

Ex: Those licensed Desktops able to run a particular rendering app are registered in the project as user "render".
**Boinc Clients**

**ZENworks**

Every single desktop at the Universities is managed using ZENworks or similar automatic software deploy systems.

BOINC clients are preconfigured in a so called ”ZEN object”. We customize the version and parameters of the BOINC client depending on the lab it’s going to be installed. All the rest is done automatically.
Credits, Statistics

No Credits
As our desktop grids are formed only by the University computers, we do not grant credits.

We also do not spend effort in decorating the apps with progress bars, we neither take care about large input/output sizes.
Green IT

As the majority of PC labs are used by students, the policy is to completely switch off BOINC during class time.

We also have environmental policies and scripts that switch off the machines if there are no BOINC jobs running.
WS-PGRADE portal

Is a web portal capable of submitting jobs in BOINC and many other grids. Has been developed by the SZTAKI, Hungary in collaboration with many partners under the umbrella of a number of European projects such as EDGI, SCI-BUS, SHIWA ...

It does communicate with desktop grids using the 3G-Bridge
WS-PGRADE Specific Portlets

Most of users are students who submit through app oriented specific GUls. They are extremely easy to use, such as upload input → download output. Users are mainly video production students and bio-computing PhDs.
wsclient is a command line tool. Some WminDG users prefer this method to submit their jobs, this way they can also integrate it with their own scripts.

UoW developed its own scripts based on this tool and they have been used by some scientists.

```bash
COMMAND="wsclient --mode=add --endpoint=${WSSUBMITTER_URL}"
for i in ${INPUT_LOGICAL_NAMES}
do
    FILE_NAME="${i}_${EXP_NUMBER}_${WU_NUMBER}"
    ln -s `pwd`/$1 ${DIRECTORY_TO_BASE_URL}/${APPLICATION_NAME}_${EXP_NUMBER}/${FILE_NAME}
    URL="${BASE_URL}/${APPLICATION_NAME}_${EXP_NUMBER}/${FILE_NAME}"
    COMMAND="${COMMAND} --in=${i}=${URL}"
done
...
```
Wmin and U of Portsmouth apps ex

Mentalray
Used in teaching to render student projects
Specific testbed of 40 PCs fully licensed for the AutoDesk package
Custom user interface in the WS-PGRADE portal
Browse and upload the project zip file
Wmin and U of Portsmouth apps ex

AutoDock Vina
Outputs possible ligands of a family 38 mannosidase.
Approximately 180,000 small molecules have been docked consuming one computer year of processing within a couple of weeks.
exit(0);