Challenges, problems and solutions for institutional desktop grids

Dario Ferrer

CPC Centre for Parallel Computing
University of Westminster

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Overview

Challenges, problems and solutions for institutional desktop grids

Title

Overview

Server Side

Clientside

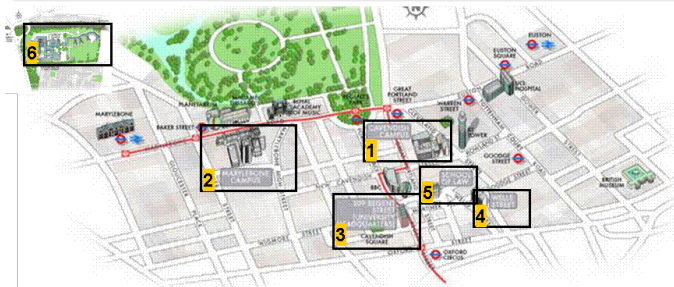Private DG

Cloud

User Interfaces

Apps

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UoW Desktop Grid

The University of Westminster Local Desktop Grid connects laboratory PCs of the university into a BOINC based Desktop Grid infrastructure

It includes over 1900 registered machines over all the campuses.

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Debian packages

WminDG uses .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

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3G-Bridge

WminDG uses 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

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Using Different projects (not any more)

WminDG used different BOINC projects for licensed and unlicensed applications.

Labs with the licensed software installed were subscribed to a particular project.

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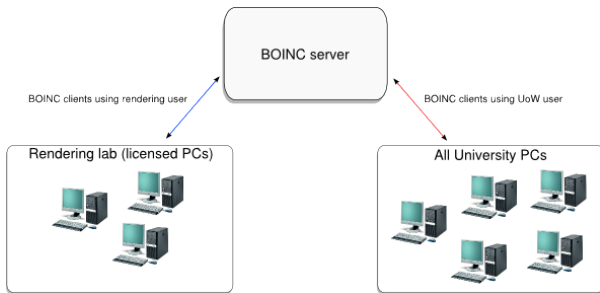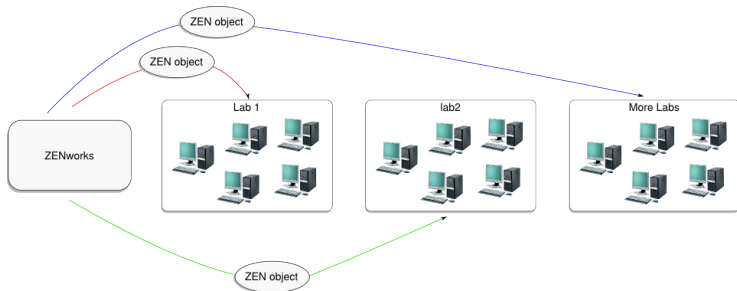**Server Side**
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Users

WminDG uses "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".

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ZENworks
Every single desktop in the University is managed using ZENworks

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

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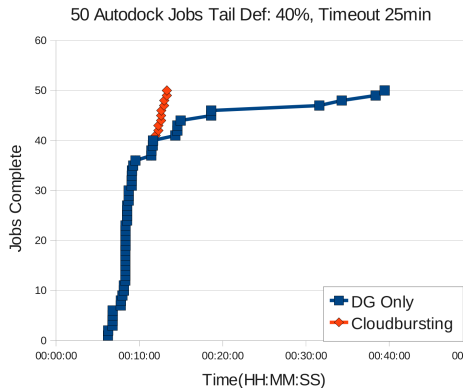Server Side
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No Credits

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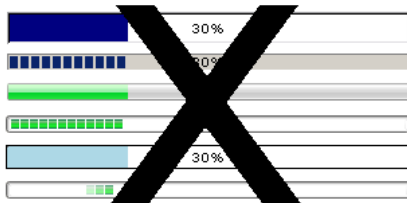
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As the majority of PC labs are used by students, the policy is to completely switch off BOINC during class time.

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

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Quality of Service

No Tail problem

In the last months, thanks to Speculos, developed within EDGI. We have added QoS to the DG.

The system monitors the remaining results and launches instances on our own cloud infrastructure (Openstack) when 90% are over.

This technology is still in testing phase.

50 Autodock Jobs Tail Def: 40%, Timeout 25min

WS-PGRADE portal

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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 in the framework of European projects such as EDGI, SCI-BUS, SHIWA ...
It does communicate with desktop grids using the 3G-Bridge

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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.

```
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
```

...

WminDG apps ex

Mentalray

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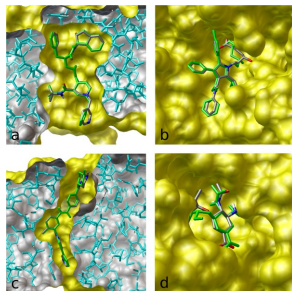Custom user interface in the WS-PGRADE portal
Browse and upload the project zip file

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);