Synergies between Service Grids and Desktop Grids

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MTA SZTAKI

The EDGeS project receives Community research funding
The problem we address

- Very expensive,
- small number of sites and large number of CPUs
  - MPI apps
- Moderately expensive,
- moderate number of sites and CPUs
  - any apps
- Inexpensive,
- very large number of CPUs (~100K – 1M)
  - Bag of task apps

Supercomputer based SGs (DEISA, TeraGrid)

Cluster based service grids (SGs) (EGEE, OSG, etc.)

Desktop grids (DGs) (volunteer DGs – home computers, organizational DGs – institutional desktops)

OGF GIN

EDGeS

EDGeS
EDGeS: Enabling Desktop Grids for e-Science

1. EDGeS is a 2-year FP7 project started on the 1st of January 2008
   - Research on integrating (bridging) SGs and DGs
   - Creates infrastructure
   - Provides services

2. EDGeS is an infrastructure
   - EDGeS VO interconnected with various DGs
   - Application repository

3. EDGeS is a service for
   - Application porting and validation
## Project partners

<table>
<thead>
<tr>
<th>Partic. No.</th>
<th>Participant name</th>
<th>Participant short name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Computer and Automation Research Institute of the Hungarian Academy of Sciences</td>
<td>MTA SZTAKI</td>
<td>Hungary</td>
</tr>
<tr>
<td>2</td>
<td>Centro de Investigaciones Energéticas Medio Ambientales y Tecnológicas</td>
<td>CIEMAT</td>
<td>Spain</td>
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<td>3</td>
<td>Foundation for the Development of Science and Technology in Extremadura</td>
<td>Fundecyt</td>
<td>Spain</td>
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<td>4</td>
<td>The French National Institute for Research in Computer Science and Control</td>
<td>INRIA</td>
<td>France</td>
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<td>5</td>
<td>University of Westminster</td>
<td>UoW</td>
<td>UK</td>
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<td>Cardiff University</td>
<td>CU</td>
<td>UK</td>
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<td>7</td>
<td>Faculty of Sciences and Technology of the University of Coimbra</td>
<td>FCTUC</td>
<td>Portugal</td>
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<td>8</td>
<td>Stichting AlmereGrid</td>
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<td>The Netherlands</td>
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<td>Centre National de la Recherche Scientifique - Institut National de Physique Nucleaire et de Physique des Hautes Energies</td>
<td>IN2P3</td>
<td>France</td>
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</tbody>
</table>
Generic Grid-Grid (3G) Bridge to integrate SGs and DGs

- BOINC
- EGEE
- gUSE/WS-PGRADE portal

Job source
- BOINC client
- EGEE GRAM
- gUSE submitter

Job Database

Queue Manager

3G Bridge

Job Handler Interface

GridHandler Interface

DC-API Plugin

EGEE Plugin

XtremWe Plugin

BOINC

EGEE

Xtrem Web
Production DG-EGEE Infrastructure

- gLite based service grid VO
  - voms
  - bdii
  - lb
  - wms
  - AR

XtremWeb-EGEE bridge
BOINC-EGEE bridge

XtremWeb-based DGs
- IN2P3 local DG (200)
- IN2P3 public DG (300)

XtremWeb-EGEE based DGs
- SzTAKI 16 cpus
- CIEMAT 20 cpus
- CNRS 1554 cpus

BOINC-based DGs
- UoW (1.700), Corr. Systems (10)
- SzDG (72.000), Almere (1.000), IberCivis (14.000)

UI/bridge
Core service
Resource
EDGeS VO activity according to EGEE Accounting Portal
Work Units bridged to EGEE from different DGs

Detailed User statistics - Boinc all project statistics - Distributed computing statistics


Search results for user EDGeS User

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Total credit</th>
<th>Member of team</th>
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<tr>
<td>39,714</td>
<td>EDGeS User</td>
<td>369,582</td>
<td>SZDG</td>
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<tr>
<td>518,658</td>
<td>EDGeS User</td>
<td>11,238</td>
<td>SETI@home</td>
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<td>873,263</td>
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<td>1,599,751</td>
<td>EDGeS User</td>
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<td>Virtual Prairie</td>
</tr>
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ecasound2.2 - Sourcecode

Done
EDGeS bridge and SZDG
EGEE User access to various grids
EGEE - BOINC bridge with a single DG
EGEE -> BOINC direction
How to join by a new DG?

EDGeS VO

EDGeS CE machine
- QM WS client
- QM WS client

UI machine
- EGEE plugin
- QM
- JW Client

LCG-CE
- W
- W
- W
- W
- W
- W

BOINC1 server
- WS Interface
- QM
- DC-API plugin
- DB

BOINC2 server
- WS Interface
- QM
- DC-API plugin
- DB

WMS Machine
Other EGEE services

UI machine

services

UI machine
How to join by a new SG?
User access to various grids

EDGeS

EDGeS Appl. Repository

WS-PGRADE

gUSE

LocalDEG

University DG

GlobalDEG

Volunteer DG

LocalDEG

LocalDEG

LocalDEG

LocalDEG

Service Grid

EGEE
Accessing EDGeS by WS-PGRADE portal

EDGeS VO
- EDGeS CE1 machine
  - QM WS client
- UI machine
  - EGEE plugin
  - QM
  - JW Client
- LCG-CE
  - W
  - N
  - W
  - N
  - W
  - N

Other EGEE services
- WMS Machine

BOINC server
- DB
- QM
- DC-API plugin
- DG
- Interfacet
- submit

Accessing WS-PGRADE
Integration of SG and DG systems

SG interoperation/interoperability: Task of OGF GIN

EDGeS

- gLite (EGEE)
- ARC (NorduGrid)
- VDT (OSG)
- Unicore (DEISA)

Solving the DG-SG
- interoperation (EDGeS)
- interoperability (EDGeS and PGI)

Boinc (Berkeley)
XtremWeb (INRIA/IN2P3)
Xgrid (Apple)
Generic Grid-Grid (3G) Bridge to integrate SGs and DGs
MoUs with other projects

Signed MoU with EGEE III
- Jointly select EGEE applications that should be migrated to EDGeS
- Collaboration in porting apps to EDGeS
- EGEE support for the establishment and operation of the EDGeS VO
- Organizing joint events (summer school, user forum meetings)

Signed MoU with
- EELA-2
- SEE-GRID-SCI
- Russia Grid

Preparing MoUs with
- IberCivis DG
- Univ. of Houston (Virtual Prairie DG)
- Grid Kazakhstan
Summary

- **EDGeS connects**
  - BOINC or XtremWeb DGs
  - and gLite based SGs

- **EDGeS is an open infrastructure:**
  - Any BOINC or XtremWeb DG can join
  - Any gLite based SG can join

- Any EGEE user can access EDGeS

- Any EGEE VO can be extended with DGs based on EDGeS bridge technology

- EDGeS helps any EGEE user community in porting their applications into EDGeS
Joint EGEE and EDGeS Summer School

- Topic: Grid Application Support
- Budapest, Hungary, 29 June - 4 July 2009
- http://www.egee.hu/grid09/

- Learn more about EGEE and EDGeS technologies!
Thank you for your attention ...

For more information please visit the EDGeS Website:
Join the EDGeS User & Industry Forum here!

http://www.edges-grid.eu/

Please contact us if you need support in porting your application to EDGeS!

Email: kacsuk@sztaki.hu