Catania Science Gateway Framework

Motivations, architecture, features

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Catania Science Gateway Framerwork

- Authentication & Authorisation
- Job Management
- e-Infrastructure Service & Data Service
- Cloud
Authentication & Authorisation
AuthN/AuthZ Schema

1. Try to login

2. Forwarded to the IdP

3. Identity attributes

4. Check authorisations

Federation

Sync user roles

OpenLDAP

Retrieve e-Infrastructure credentials

Science Gateway

e-Infrastructures

VAMP Workshop 2013 – Helsinki, 30/9-1/10/2013
Federated User

Science Gateway

OpenLDAP

http://www.OpenLDAP.org
Social User

Science Gateway

OpenLDAP

http://www.OpenLDAP.org
Surfing a Science Gateway changes according to different roles.

Mapping between Liferay roles and LDAP group similar mapping available on grid (i.e. voms roles).

Liferay allows administrators to fully customize users experience by assigning different roles to each component (pages, wikis, plugins, data).

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>Regular</td>
<td>Administrators are super users who can do anything.</td>
</tr>
<tr>
<td>Community Administrator</td>
<td>Community</td>
<td>Community Administrators are super users of their community but cannot make other users into Community Administrators.</td>
</tr>
<tr>
<td>Community Member</td>
<td>Community</td>
<td>All users who belong to a community have this role within that community.</td>
</tr>
<tr>
<td>Community Owner</td>
<td>Community</td>
<td>Community Owners are super users of their community and can assign community roles to users.</td>
</tr>
<tr>
<td>genericuser</td>
<td>Regular</td>
<td>Autogenerated role from LDAP import</td>
</tr>
<tr>
<td>gridann4nd_datamanager</td>
<td>Regular</td>
<td>Autogenerated role from LDAP import</td>
</tr>
<tr>
<td>gridann4nd_neurologist</td>
<td>Regular</td>
<td>Autogenerated role from LDAP import</td>
</tr>
<tr>
<td>gridann4nd_physician</td>
<td>Regular</td>
<td>Autogenerated role from LDAP import</td>
</tr>
<tr>
<td>gridann4nd_scientist</td>
<td>Regular</td>
<td>Autogenerated role from LDAP import</td>
</tr>
<tr>
<td>gridann4nd_trainees</td>
<td>Regular</td>
<td>Autogenerated role from LDAP import</td>
</tr>
</tbody>
</table>
Liferay user database

- Liferay supports several system to store users data, both local and remote
- Supporting the largest number of users in the easiest way
- A modular way to distinguish between different services and privileges is need
- Science Gateways stores users on an LDAP server
Authentication

- Authentication is demanded on external IDP
- Communication between Liferay and the IDP happens thanks to Shibboleth
- Shibboleth plugin, installed on Liferay, is responsible to read the token coming from the IDP and to pass it to Liferay
Authorisation

- Authorisation is demanded to the LDAP server
- Liferay, through a plugin implemented, request to Shibboleth the mail address(es) and try a match with the ones stored (local, remote)
Registration

- In the act of registration user data must be written on the LDAP connected to Liferay
- A portlet has been developed to perform this actions
Job Management
Job Engine at work

1. Sign in
2. Grid Request
3. Proxy request*
4. Proxy transfer*
5. e-Infra Interactions
6. Getting Results

* or equivalent e-Infra auth
Glassfish Integration

- Access to database is not direct but make use of Glassfish connection pools and hibernate
- JNDI resource are used as well in order to offer some functionalities working behind the scene of job submission:
  - Thread pool responsible for job submission
  - Thread pool responsible for job status updates
  - Thread pool responsible for retrieving job output
e-Infrastructures & Data Service
Science Gateway paradigm

- Efforts to grant easy yet secure access to remote services and related resources brought to the birth of Science Gateways
- Virtual Research Communities access remote resources in a collaboration environment that hides the underlying complexity
- SGs help many users to better use the enormous grid computational power

**Is large grid&cloud data storage accessible as well in such an easy way?**
Motivations

Um... isn't your computer on fire?

It's ok, my files are stored in a safer place.
Grid Data Management Challenges

- Make interfaces simple for non expert users
  - CLI-based Grid storage interface is not straightforward
- Transactions to different e-Infrastructures require different authentication method
- Should this transaction involve the Science Gateway directly?
- Complexity of current protocols to manage different storage elements
- Offer an easy intuitive interface to the end users
Requirements

- Storage complexity hidden to end users
  - Users move files from/to a portal and see it as simple external storage accessible from a web interface and do not care about grid (or any other) technologies behind

- File management smoothly integrated with all the services provided in the SG

- Underlining architecture exposes a file-system-like view (i.e., a Virtual File System or VFS) through which users can perform the following actions:
  - Create, move, delete files/directories with the desired structure
  - Share files with other users
  - Set the number of backup copies desired
Implementations

- Virtual File System requires a database to map users, virtual resource and real resource
- Object-relation mapping approach
- Liferay Service Builder
- Database tables are not used only to keep trace of resource (file) but to define referring e-Infrastructures too
- Planning to support up to 4 different e-Infrastructures: local, remote, grid, cloud
References

- Catania Science Gateways url: http://www.catania-science-gateways.it
- Catania Science Gateway Sourceforge Project: http://sourceforge.net/projects/ctsciencegtwys/
- Gilda Portal (for developers): http://gilda.ct.infn.it/
Cloud
My Cloud (cloud interoperability based on OCCI Standard)
Questions?