FedCloud TCB report

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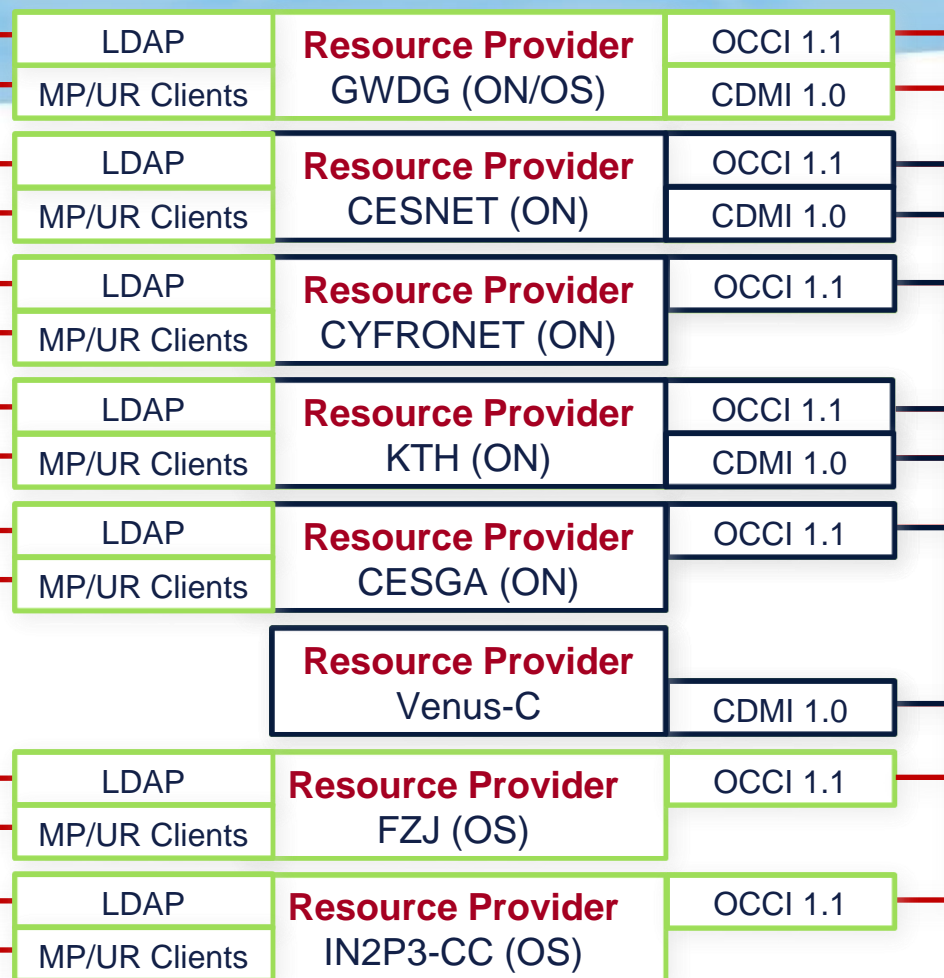matteo.turilli@oerc.ox.ac.uk

Outline

- Interoperability achieved among different cloud management platforms: Prague test bed demo.

- New Resource and Technology Providers after Prague and testing of the joining procedure.

- EGI support unit dedicated to FedCloud Task, support protocol and current use cases.

- FedCloud Phase #3: integration. Roadmap for the relevant FedCloud Work Groups (WGs)

- Issues.

From Task Force to Task within EGI-InSPIRE

May 1st 2012: the Task Force becomes an official Task within EGI-InSPIRE.

- **Effort**: Effort officially contributed by: IIAS, KTH, Jülich, LUH, SARA, CISC, INFN, CNRS, CESNET and OeRC.

- **EGI Technical Outreach team**: Collaboration with the EGI Technical Outreach team to coordinate and promote the support of Virtual Research Communities that need or could benefit from Cloud Computing.

- **Community Engagement**: Collaboration with the EGI Community Engagement to organise the TF community activities.
    - 1st EGI Federated Clouds TF PlugFest, July 12th/13th, Amsterdam.
    - Set up of a track for requirement gathering dedicated to Cloud Computing.

Federation Demo – Prague

LDAP	**Resource Provider** GWDG (ON/OS)	OCCI 1.1
MP/UR Clients		CDMI 1.0
LDAP	**Resource Provider** CESNET (ON)	OCCI 1.1
MP/UR Clients		CDMI 1.0
LDAP	**Resource Provider** CYFRONET (ON)	OCCI 1.1
MP/UR Clients		
LDAP	**Resource Provider** KTH (ON)	OCCI 1.1
MP/UR Clients		CDMI 1.0
LDAP	**Resource Provider** CESGA (ON)	OCCI 1.1
MP/UR Clients		
	Resource Provider Venus-C	CDMI 1.0
LDAP	**Resource Provider** FZJ (OS)	OCCI 1.1
MP/UR Clients		
LDAP	**Resource Provider** IN2P3-CC (OS)	OCCI 1.1
MP/UR Clients		

Information
GLUE 2.0
BDII

Monitoring
Nagios

VM metadata
Marketplace

Accounting
OGF UR
UR+ & StAR

ON = OpenNebula.

OS = OpenStack.

MP = Marketplace.

UR = Usage Records.

Message Bus

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Engagement – Oct 2012

Resource Providers

- INFN, Naples – Silvio Spardi.

- IISAS, Slovak Academy of Sciences – Viet Tran.

- SZTAKI, Hungarian Academy of Sciences – Sandor Acs.

- Imperial College – David Colling (expression of interest).

Technology Providers

- Vmcatcher, DESY – Owen Synge; Image Management WG.

- SAGA, Rutgers University – Andre Merzky; Clients/Brokering WG.

- CONTRAIL, STFC – Jens Jensen; AAI, Clients/Brokering WG.

- LB, CESNET – Zdenek Sustr (expression of interest); Notification WG.

Join the FedCloud Test Bed

2 mail templates, tested with RPs that have joined after Prague.

1. Expose an OCCI interface.

2. Install an LDAP server with a GLUE2 schema tailored for cloud resources.

3. Allows the Nagios probes to monitor the interfaces and services.

4. Upload usage records to the EGI centralised repository.

5. Publish the image metadata into the federation Marketplace.

6. Install, if needed, a CDMI server.

The procedure will be gradually extended from April 2013 onwards so to include the new central services and the increasingly formal agreements between EGI and the Resource Providers.

Use Cases – Oct 2012

- Support unit dedicated to the FedCloud Task and Included into the GGUS relise, Oct 24th.

- Created a list with a responsible for each Resource Provider federated to the FedCloud test bed.

Support protocol

1. Single user/user community contact the dedicated support unit.

2. The support unit collects the use case and requirements.

3. The support unit evaluates the requirements with the FedCloud Task and a decision is made whether to support the new user/user community.

4. In case, the new use case is published on the FedCloud Wiki site.

5. An image is tailored for the new use case and each RP decides whether to support it by publishing its metadata on the Marketplace.
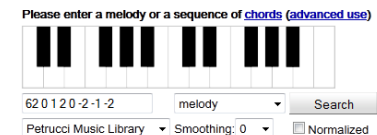
Use Cases – Oct 2012

- **Structural biology** – We-NMR

    1. Validating biomolecular NMR structures. VM images pre-packaged with VirtualCing and ToPoS.

    2. Training. VM images pre-packaged with Gromacs.

- **Musicology** – Peachnote

    1. Music score processing. VM image pre-packaged with processing software (convert images into music XML) and communicating with Amazon's SQS and HBase.

    2. Hadoop and Hbase. Deploy H+HBase clusters on multiple providers.

Use Cases – Oct 2012

- **Linguistics** – CLARIN

  British National Corpus service (BNCWeb). VM image
  pre-package with the BNC and a analytics software.

  - Distribution.

  - Teaching.

  - Development.

  - Federation.

- **Ecology** – BioVel
  remote hosting of OpenModeller service.

- **Space science** – ASTRA-GAIA
  data integration with scalable workflows.

Use Cases – Oct 2012

- **Software Engineering** – SCI-BUS

  – Gateway services for user communities (gUSE/WS-PGRADE portal). Adapting tools for interoperability among grids environments to multiple/federated clouds.

- **Software Engineering** – DIRAC

  – framework for building ready to use distributed computing systems. Already ported to EC2 and other proprietary cloud management interfaces, use the federation as yet another back end.

https://wiki.egi.eu/wiki/Fedcloud-tf:UserCommunities

Task Force Phase #3

1. **Setup**: Sep 2011 – Mar 2012.

2. **Consolidation**: Mar 2012 – Sep 2012.

3. **Integration**: Sep 2012 – Mar 2013.

   - Use cases support. Between Oct 2012 and Mar 2013 increase the number of use cases supported via the FedCloud test bed.

   - set of images tailored to support the use cases and some 'real' usage of the test bed.

   - Integration of the FedCloud core services into the existing EGI infrastructure. Two 'new' services: GOCDB, SAM.

   - Evaluations of new technologies.

   - **Goals**
     - Demo EGI CF2013.
     - Opening the test bed to generic early adopters by April 2013.
     - Publish version 0.3 of the blueprint document by April 2013.

Information System

- **Technologies**
  - **Deployed**. BDII + ladap servers. Each cloud infrastructure exposes a LDAP server publishing information by means of a customised GLUE2 schema. Each LDAP server is polled by a top-BDII server for static information. ldap://test03.egi.cesga.es:2170
  - **Evaluating**. EMIR.

- **TO DOs**
  - Add a new service group and new service endpoints (OCCI, CDMI) to GOCDB and register the sited federated into the FedCloud test bed.
  - Refine cloud resource descriptions.
  - Contribute GLUE2 extensions to OGF.

Accounting

- **Technologies**
  - **Deployed**. MySQL + uploader + filters. Each cloud infrastructure generates usage records based on an extended version of the EGI UR format recommendation. Records are uploaded to a central server by means of a uploader+filter customised for each type of infrastructure.
- **TO DOs**
  - Integration with the APEL portal. Creating a section dedicated to cloud resources.
  - Define new metrics in line with those used/discussed by other initiatives/liasons.
  - Contribute modifications to the RP standard to OGF.
- **News**
  - FermiCloud to use APEL to upload cloud usage records.

Monitoring

- **Technologies**

  - **Deployed**. Nagios. Monitor the availability of the management interfaces exposed by each cloud infrastructure and of the core services. https://test30.egi.cesga.es/nagios/

- **TO DOs**

  - Integration of probes with EGI SAM.

  - Define integration of FedCloud Nagios installation with the production EGI nagios infrastructure.

  - Define distribution and maintenance of FedCloud Nagios probes.

Image Provision

- **Technologies**
    - **Deployed**. Marketplace. Resource Providers and EGI can publish metadata about images for VMs. http://marketplace.egi.eu/metadata/
    - **Under evaluation**. Vmcatcher. CLI tool for X509 signing lists of virtual machine image metadata. Developed to satisfy the need to securely exchange virtual machine images between High Energy Physics sites.

- **TO-DOs**
    - A single image is supported/endorsed/signed by multiple RPs.
    - Different images are supported/endorsed/signed by different RPs.
    - EGI supported/endorsed/signed one or more images.

- **Potential issues**
    - Upgrading/updating procedure for images.
    - Fine-grained authorisation for user images, licensed software.

Other Work Groups

- **Data**
  - **Evaluating**. New implementations of CDMI as the one available is unmaintained.
- **Notification**
  - **Evaluating**. L&B (Logging and Bookkeeping). Used until now for job monitoring, extended by CESNET to monitor also VMs.
- **AAI**
  - Created a VO dedicated to cloud users: fedcloud.egi.eu.
  - Installed a VOMS server for the test bed (maintened by CESNET).
  - VO support for OpenStack (developed by IN2P3).
  - Missing VO support for OpenNebula.
- **Brokering/clients**
  - **Evaluating**. Compatible One cloud broker.
  - **Evaluating**. CONTRAIL web portal with federated authentication.

Using the FedCloud Test Bed – Apr 2012

Mar 2012 – Apr 2013

- End users: curl bindings.
- Platform users: OCCI connectors/bindings.

Apr 2013 – Sep 2013

- End users:
    - ruby-based command line interface (rOCCI client).
    - CONTRAIL portal.
- Platform users:
    - Community specific platforms;
    - Generic APIs;

Issues

- Critical. Lack of unified CLI/portal client tools. Without at least one solution we cannot effectively open the test bed to early adopters.

- Critical. VOs support for OpenNebula. Requested to the rOCCI team but no precise time line for its implementation. EGI may want to consider direct support.

- Critical. Public SSH key injection at VM instantiation time.

- Warning. Lack of capabilities for data management. Specifically, EBS volumes for OpenNebula RPs.

- Warning. Lack of capabilities for VM contextualisation. Specifically, passing metadata to a VM at instantiation time.

- Warning. Advanced federated methods for image management.

- Warning. Better tracking of the effort contributed by co-funded NGIs.