

# The EGI Cloud Federation

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#### Introduction

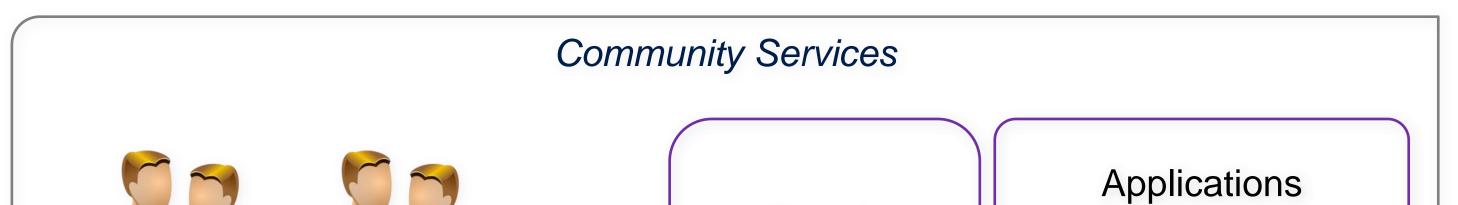
EGI is a federation of national and domain specific resource infrastructure providers comprised of individual resource centres. Many of these resource centres have been experimenting with the deployment of cloud infrastructures to improve the local delivery of services. Federating these local cloud resources is a priority for EGI as several of its current and new user communities need a service-oriented and ondemand computing and data infrastructure. The Task Force activities are organised in six, six-month long phases. During each phase, the Task Force evaluates a set of scenarios that an EGI federation of clouds should support.

## **Objectives**

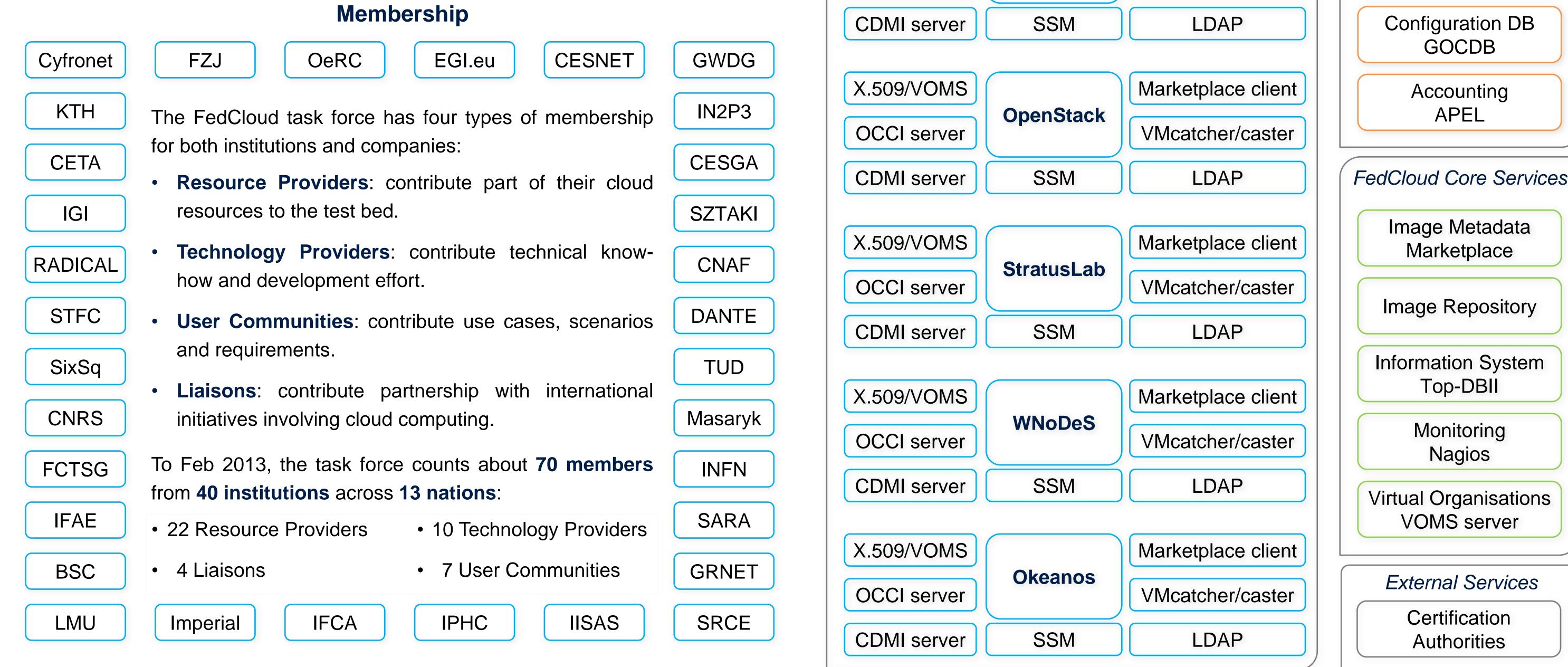
- Deploy a test bed to evaluate the integration of cloud resources within the existing EGI production infrastructure.
- Write a blueprint document for EGI Resource Providers that wish to securely federate and share their cloud platforms as part of the EGI production infrastructure.

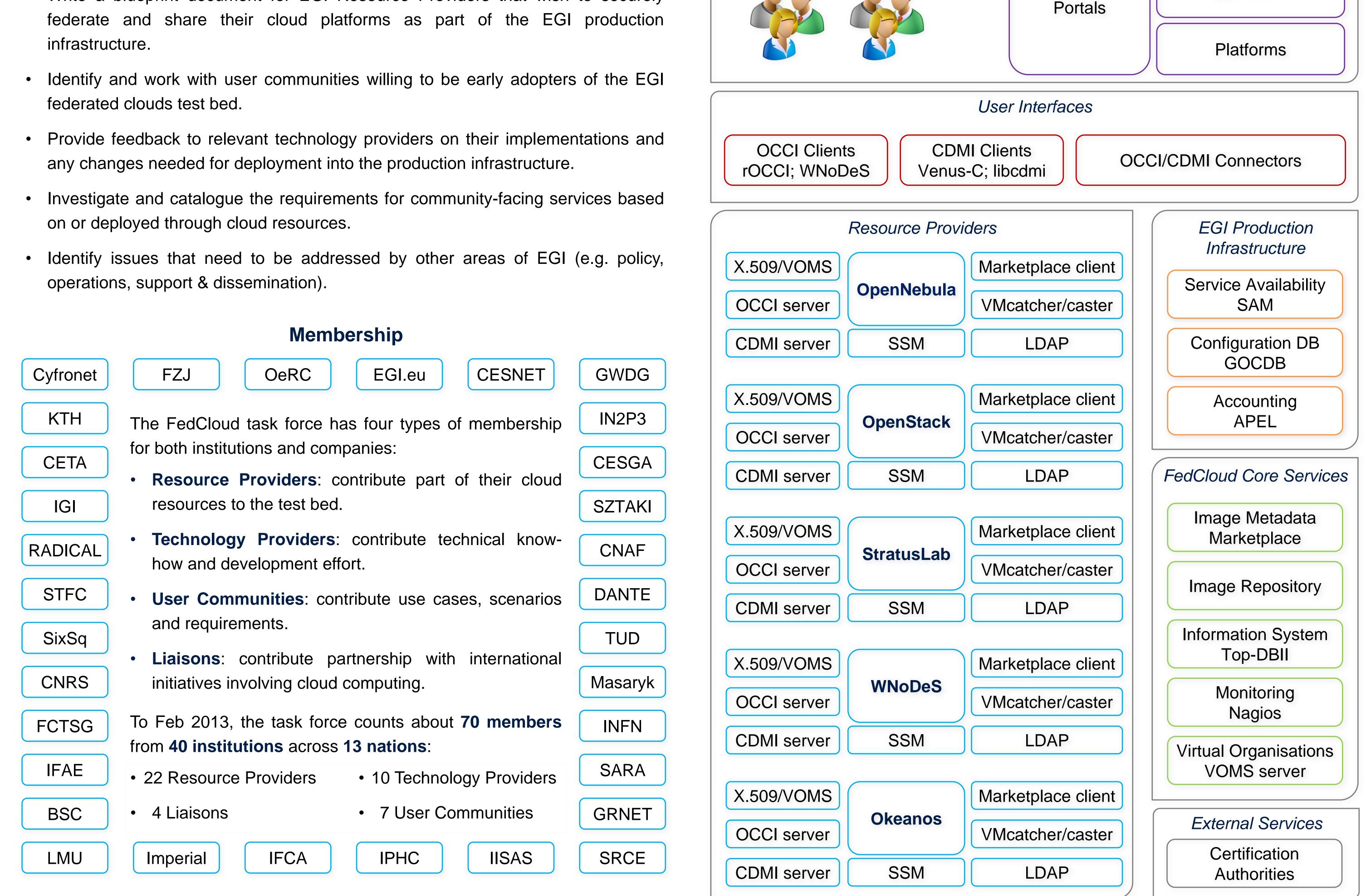
### **Deployed Federation Test Bed**

The test bed deployed by the task force allows for the EGI user communities to transparently heterogeneous cloud infrastructures via standardised access interfaces. The test bed is integrated within the EGI production infrastructure so that users can utilise their personal certificates and their VO memberships to access both cloud and grid resources. Accounting, service availability, monitoring and information discovery are obtained by extending the existing infrastructure while new services are offered for image sharing and metadata publishing. Users may directly access the federation via OCCI and CDMI clients but APIs are also available so that the federation may be used as a backend for platforms and portals.



- Identify and work with user communities willing to be early adopters of the EGI federated clouds test bed.
- Provide feedback to relevant technology providers on their implementations and any changes needed for deployment into the production infrastructure.
- Investigate and catalogue the requirements for community-facing services based on or deployed through cloud resources.
- operations, support & dissemination).





#### Figure 1. Architecture of the federation test bed deployed by the FedCloud Task Force.

#### Sites publishing cloud accounting records

#### Page last updated: 2013-02-18 13:03:59.528700

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Site	ZoneName	NumberOfMachines	Cloud Type	LastUpdated		
CESGA	EU	1132	OpenNebula	2013-02-13 08:00:55		
CESNET	EU	456	OpenNebula	2013-02-13 17:56:25		
CYFRONET	EU	25	OpenNebula	2012-09-17 20:36:58		
FZJ	EU	68	Openstack	2013-02-13 12:05:14		
GWDG	EU	270	OpenNebula	2013-02-13 17:55:25		
IN2P3-CC	FU	100	Openstack	2012-12-17 16-42-48		

Metadata	
EGI-Demo-CYFRONET	
Endorser: jan.meizner@cyfronet.pl Identifier: GcN4vUAL6rIqb3WpCkUvdjyy1bV Created: 2012-09-16T20:04:45Z	

# **Use Cases**

- **Structural biology** We-NMR: Gromacs training environments.
- **Musicology** Peachnote project: music score search engine and analysis platform.
- **Linguistics** CLARIN:





scalable 'British National Corpus' service (BNCWeb).

- **Ecology** BioVel: remote hosting of OpenModeller service.
- **Space science** ASTRA-GAIA: data integration with scalable workflows.
- **Software Engineering** SCI-BUS: simulated environments for portal testing.
- **Software Engineering** DIRAC:

deploying ready-to-use distributed computing systems.

#### EGI-InSPIRE INFSO-RI-261323









INZPS-CC	EU	100	Openstack	2012-12-17 10.42.48
INFN CNAF	EU	1	WNoDeS	2013-01-03 16:25:54
KTH CLOUD	EU	13	OpenNebula	2012-09-17 22:06:02
LAL	EU	28	StratusLab	2013-02-13 17:08:12

Figure 2. APEL federated accounting with extended Usage Record (UR) schema.

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LDAP Browser	Q   🔗   🗖 🔄 🗖		GLUE2EndpointID=https://ccocci.in2p3.fr:8788_OCCI_1.1_X	509, GLUE2ServiceID=cloud.service.CC-IN2P3_service, GLUE2GroupID=re
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A Root DSE (5)	-		ttribute Description	Value
4 & o=glue (3)		-	· · · · · · · · · · · · · · · · · · ·	
GLUE2GroupID=grid			objectClass	GLUE2ComputingEndpoint (auxiliary)
<ul> <li>GLUE2GroupID=cloud (11)</li> <li>GLUE2DomainID=CC-IN2P3 (1)</li> <li>GLUE2GroupID=resource (1)</li> </ul>	(11)		objectClass	GLUE2Endpoint (structural)
			objectClass	GLUE2Entity (abstract)
			GLUE2EndpointHealthState	ok
	iceID=cloud.service.CC-IN2P3 service (3)		GLUE2EndpointID	https://ccocci.in2p3.fr:8788_OCCI_1.1_X509
_	ResourceID=CC-IN2P3_Scientific Linux		GLUE2EndpointInterfaceName	OCCI
	AanagerID=cloud.service.CC-IN2P3 manager		GLUE2EndpointQualityLevel	production
_			GLUE2EndpointServiceForeignKey	:Y2xvdWQuc2VydmljZS5DQy1JTjJQM19zZXJ2aWNIIA==
	indpointID=https://c2p3.fr:8788_OCCI_1.1_X509		GLUE2EndpointServingState	production
GLUE2DomainID=			GLUE2EndpointURL	https://ccocci.in2p3.fr:8788
⊿ GLUE2DomainID=			GLUE2ComputingEndpointComputingServiceForeignKey	cloud.service.CC-IN2P3_service
⊿ 🗀 GLUE2GroupIE			GLUE2EndpointCapability	cloud.managementSystem, cloud.vm.uploadImage, cloud.data.cdmi
_	iceID=cloud.service.CESNET_service (9)		GLUE2EndpointImplementationName	OpenStack
_	ResourceID=CESNET_Debian		GLUE2EndpointImplementationVersion	Essex
GLUE2ResourceID=CESNET			GLUE2EndpointImplementor	openstack.org
	ManagerID=cloud.service.CESNET_manager		GLUE2EndpointInterfaceVersion	1.1
	indpointID=http://cai.cz:3333/_OCCI_1.1_PLAIN		GLUE2EndpointTechnology	REST
_	indpointID=https://cni.cz:8080/_CDMI_1.0_X509		GLUE2EntityOtherInfo	Authn=X509
_	indpointID=https://ccz/_Sunstone_3.4.1_PLAIN			
	indpointID=https://ci.cz:10443/_OCCI_1.1_X509			
🗀 GLUE28	ndpointID=https://c6443/RPC2_OCA_3.4.1_PLAIN 🔻	-		

Figure 4. Top-BDII with extended Glue2 schema to describe cloud resources...



**Figure 3.** Marketplace service for the publication of image metadata.



Figure 5. Nagios probes to monitor the central and local services of the cloud federation.

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