

## 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 on-demand 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.
- 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.
- Identify issues that need to be addressed by other areas of EGI (e.g. policy, operations, support & dissemination).

## Membership

Cyfronet	FZJ	OeRC	EGI.eu	CESNET	GWGDG
KTH	The FedCloud task force has four types of membership for both institutions and companies:				IN2P3
CETA	<ul style="list-style-type: none"> <li>• <b>Resource Providers:</b> contribute part of their cloud resources to the test bed.</li> <li>• <b>Technology Providers:</b> contribute technical know-how and development effort.</li> <li>• <b>User Communities:</b> contribute use cases, scenarios and requirements.</li> <li>• <b>Liaisons:</b> contribute partnership with international initiatives involving cloud computing.</li> </ul>				CESGA
IGI	To Feb 2013, the task force counts about <b>70 members</b> from <b>40 institutions</b> across <b>13 nations</b> :				SZTAKI
RADICAL	<ul style="list-style-type: none"> <li>• 22 Resource Providers</li> <li>• 10 Technology Providers</li> <li>• 4 Liaisons</li> <li>• 7 User Communities</li> </ul>				CNAF
STFC					DANTE
SixSq					TUD
CNRS					Masaryk
FCTSG					INFN
IFAE					SARA
BSC					GRNET
LMU	Imperial	IFCA	IPHC	IISAS	SRCE

## 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).
- **Biodiversity** – BioVeL / EU-BrazilOpenBio: 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.



## Deployed Federation Test Bed

The test bed deployed by the task force allows for the EGI user communities to access transparently heterogeneous cloud infrastructures via standardised 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.

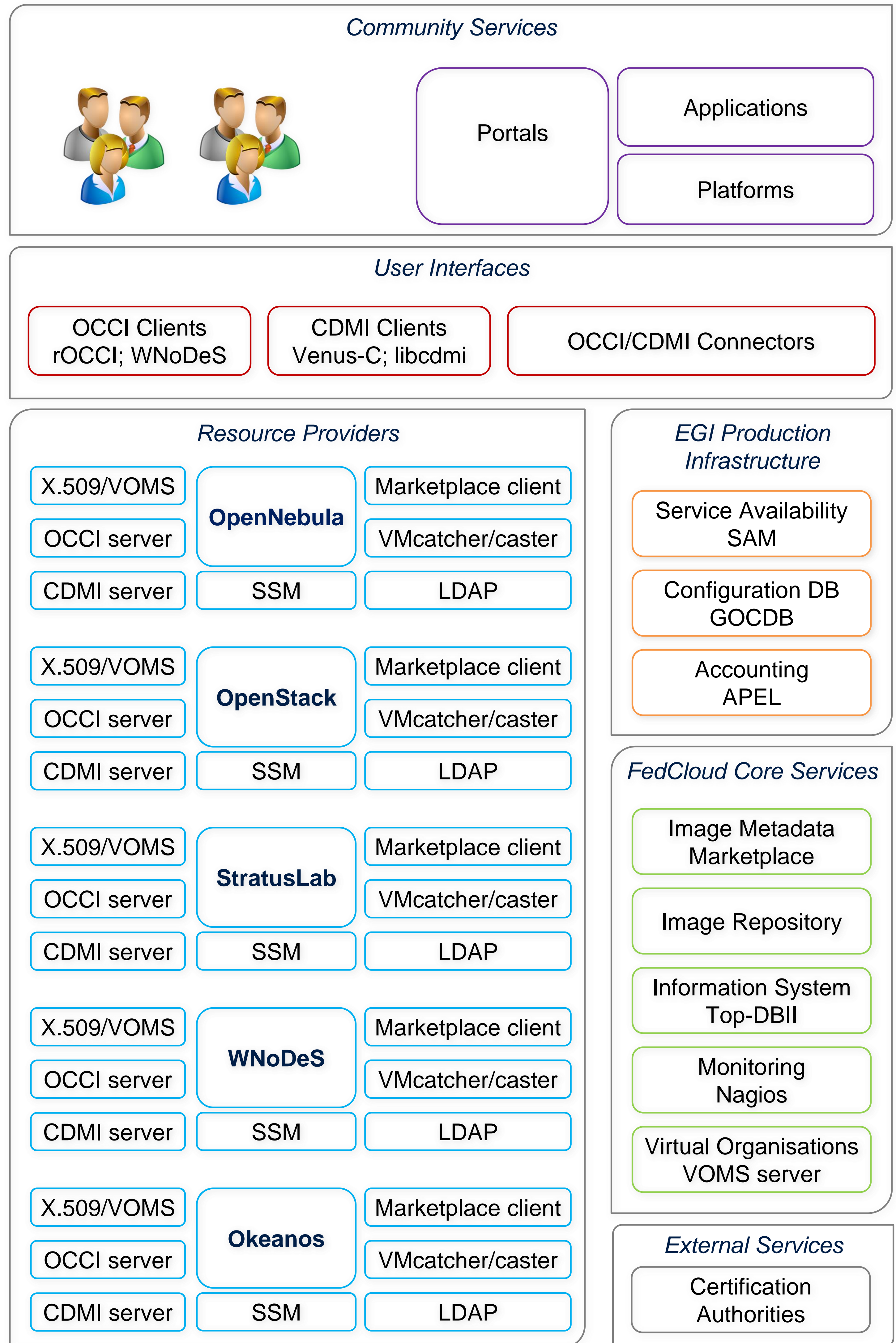


Figure 1. Architecture of the federation test bed deployed by the FedCloud Task Force.

Sites publishing cloud accounting records

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Site	ZoneName	NumberOfMachines	CloudType	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
GWGDG	EU	270	OpenNebula	2013-02-13 17:55:25
IN2P3-CC	EU	100	Openstack	2012-12-17 16:42:48
INFN CNAF	EU	1	WNoDeS	2013-01-03 16:25:54
KTH CLOUD	EU	13	OpenNebula	2013-09-17 22:06:02
LAL	EU	28	StratusLab	2013-02-13 17:08:12

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

Figure 4. Top-DBII 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.