

A European Cloud federation

EGI's Cloud strategy for 2020

EGI position paper:

<https://documents.egi.eu/document/2050>

EGI Federated Cloud

From Pilot to Production

EGI's Cloud strategy for 2020

Data, Sharing, Innovation: Safe infrastructures for the ERA

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To support the digital European Research Area through a pan-European research infrastructure based on an open federation of reliable services that provide uniform access to national computing, storage and data resources.

EGI Council vision for the federated Cloud:

10M cores Cloud compute

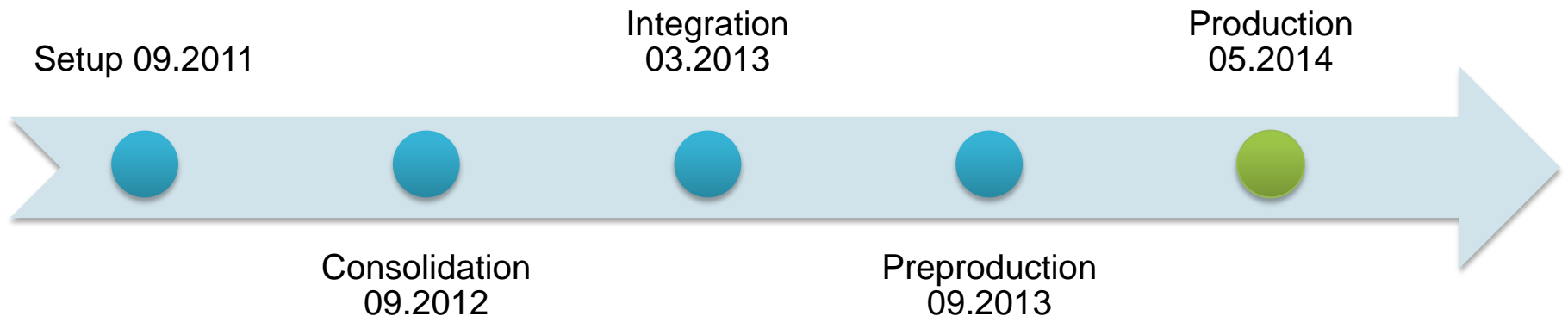
1 EB Cloud storage

- **Objectives:**

- Identify and investigate the capabilities needed to federate private clouds
- Identify the technical solutions, deploy proof of concepts in a pre production testbed, test the solutions with real use cases

- **Capabilities**

1. Manage VM instances
2. Data access/transfer interface
3. Cloud service information federation
4. Resource consumption management
5. Cloud service availability
6. Notification & Automation
7. Federated AAI
8. VM Image Management
9. Brokering
10. Contextualisation
11. Service Agreements & Management



Cyfronet

FZJ

OeRC

EGI.eu

CESNET

GWDG

INFN-BARI

CNRS



IN2P3

KTH

Members

- ~70 individuals
- ~40 institutions
- >13 countries

Technologies

- OpenNebula
- StratusLab
- OpenStack
- Synnefo
- WNoDeS
- PERUN
- SlipStream

Stakeholders

- 23 Resource Providers
 - 10 production
- 10 Technology Providers
- 8 User Communities
- 4 Liaisons

FCTSG

CETA

IGI



ISRGrid

STFC

BSC

BIFI



Masaryk

INFN-CNAF

CESGA

SARA

IFCA



SZTAKI

GRNET

DANTE



LMU

IPHC

IISAS

SixSq

100%IT

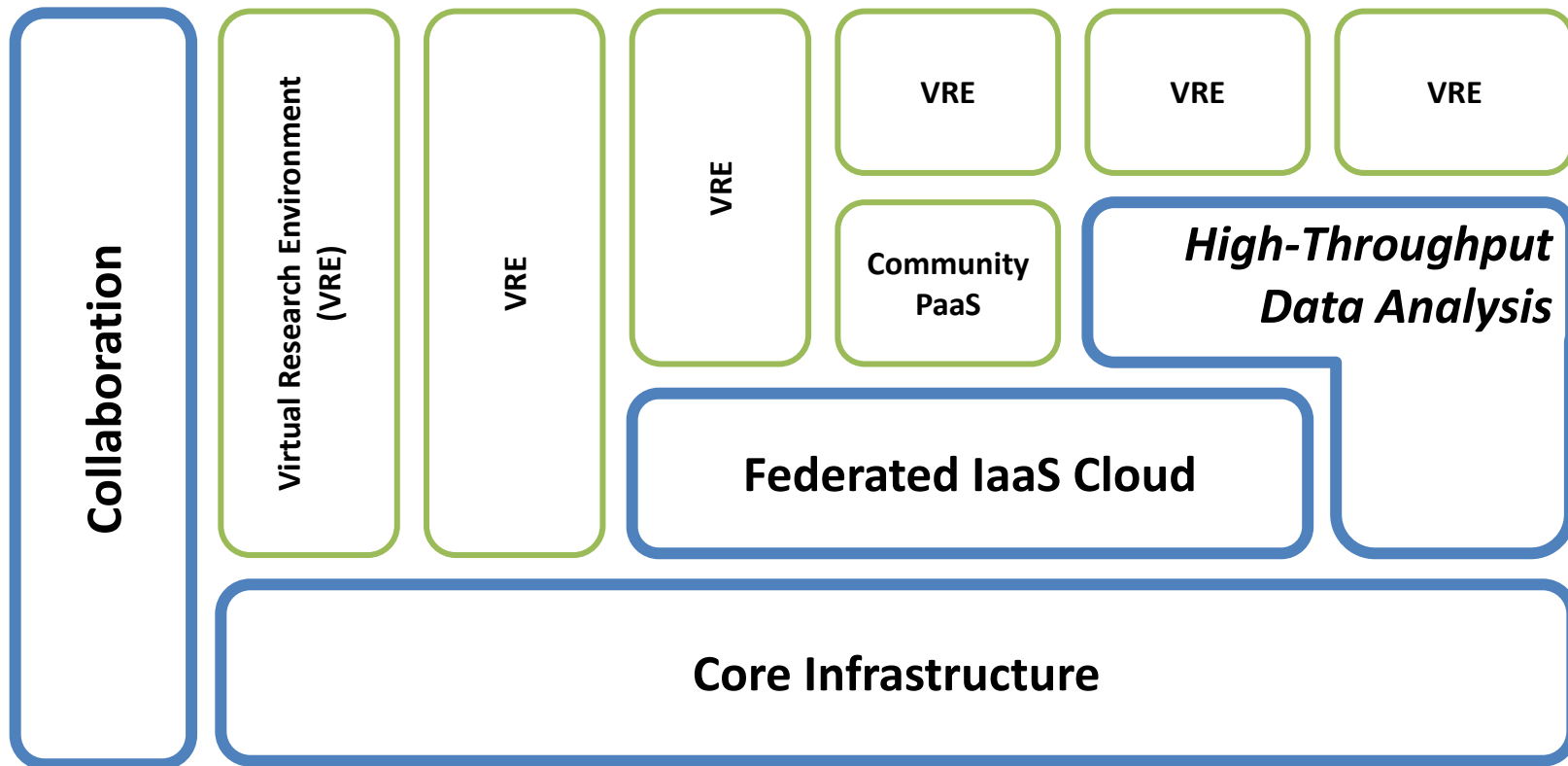
CSC

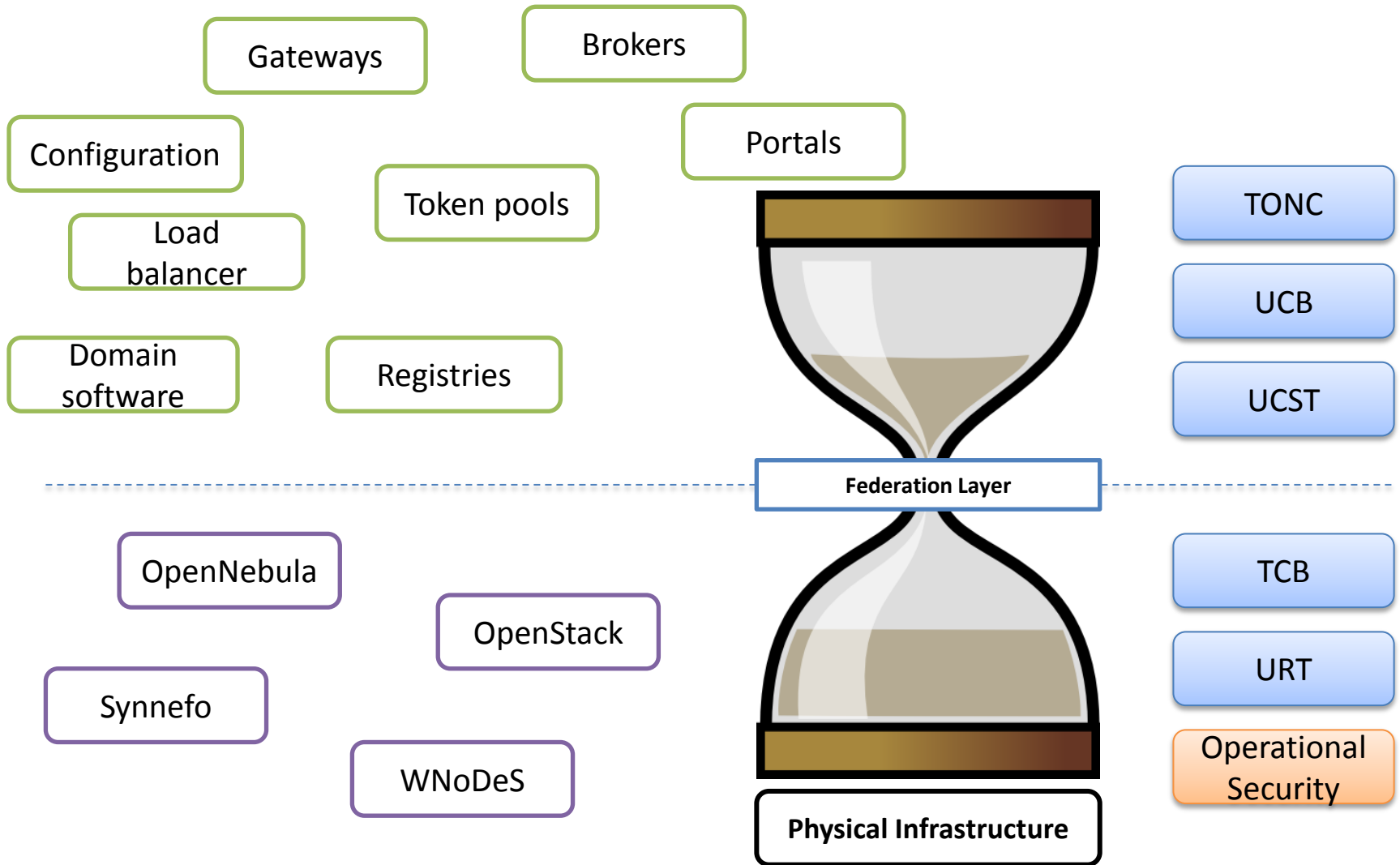
IFAE

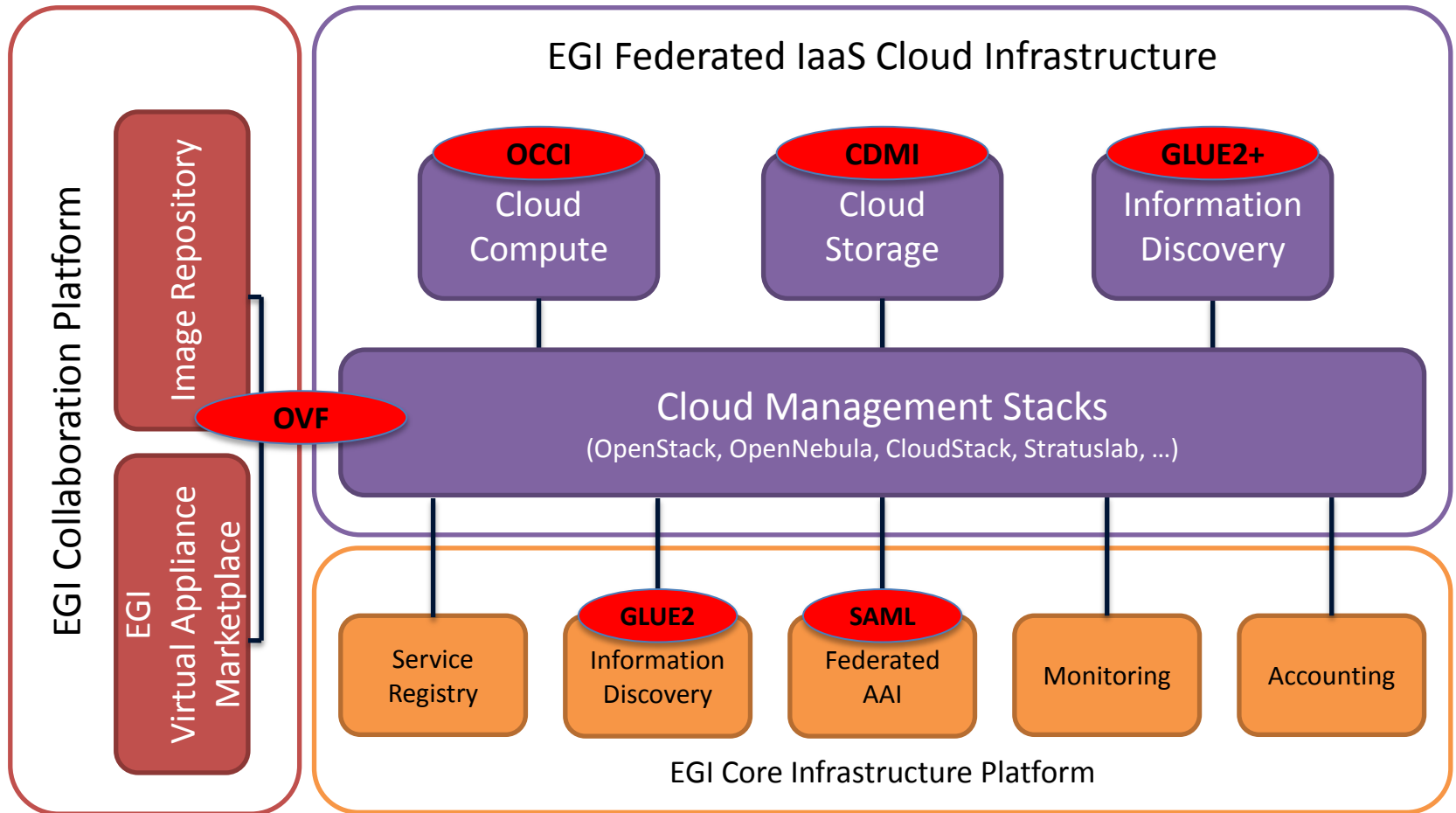
SRCE



1. Service architecture with Cloud characteristics (NIST SP 800-145)
 - On-demand self-service
 - Broad network access
 - Resource pooling
 - Rapid elasticity
 - Measured service
2. Extensive federation expertise in EGI
3. Extend EGI's service portfolio
4. Embrace Resource Provider heterogeneity
5. Thin federation layer lowers barriers to adoption
 - Interface-level integration
 - Open Standards: Consistency through control



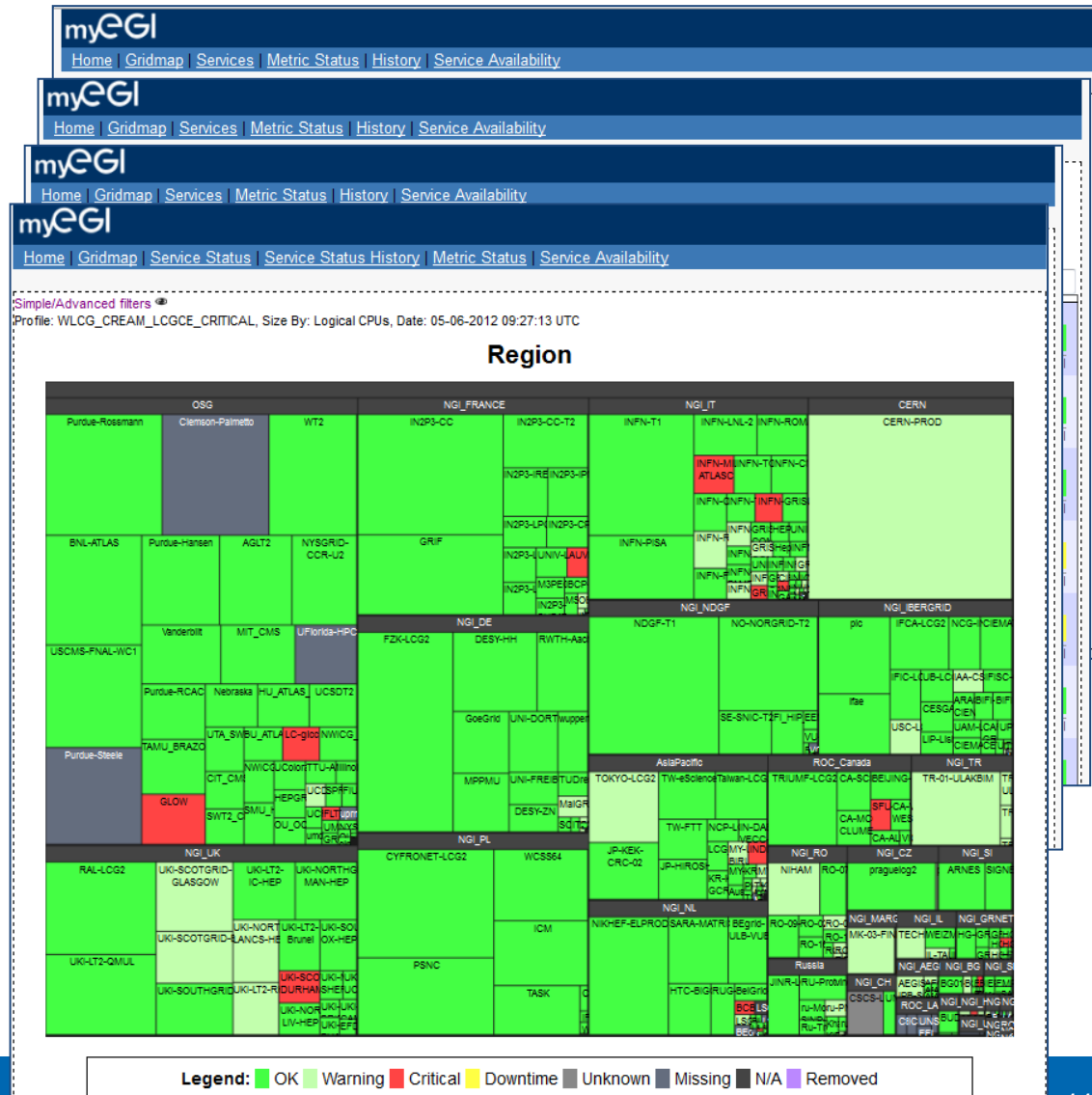


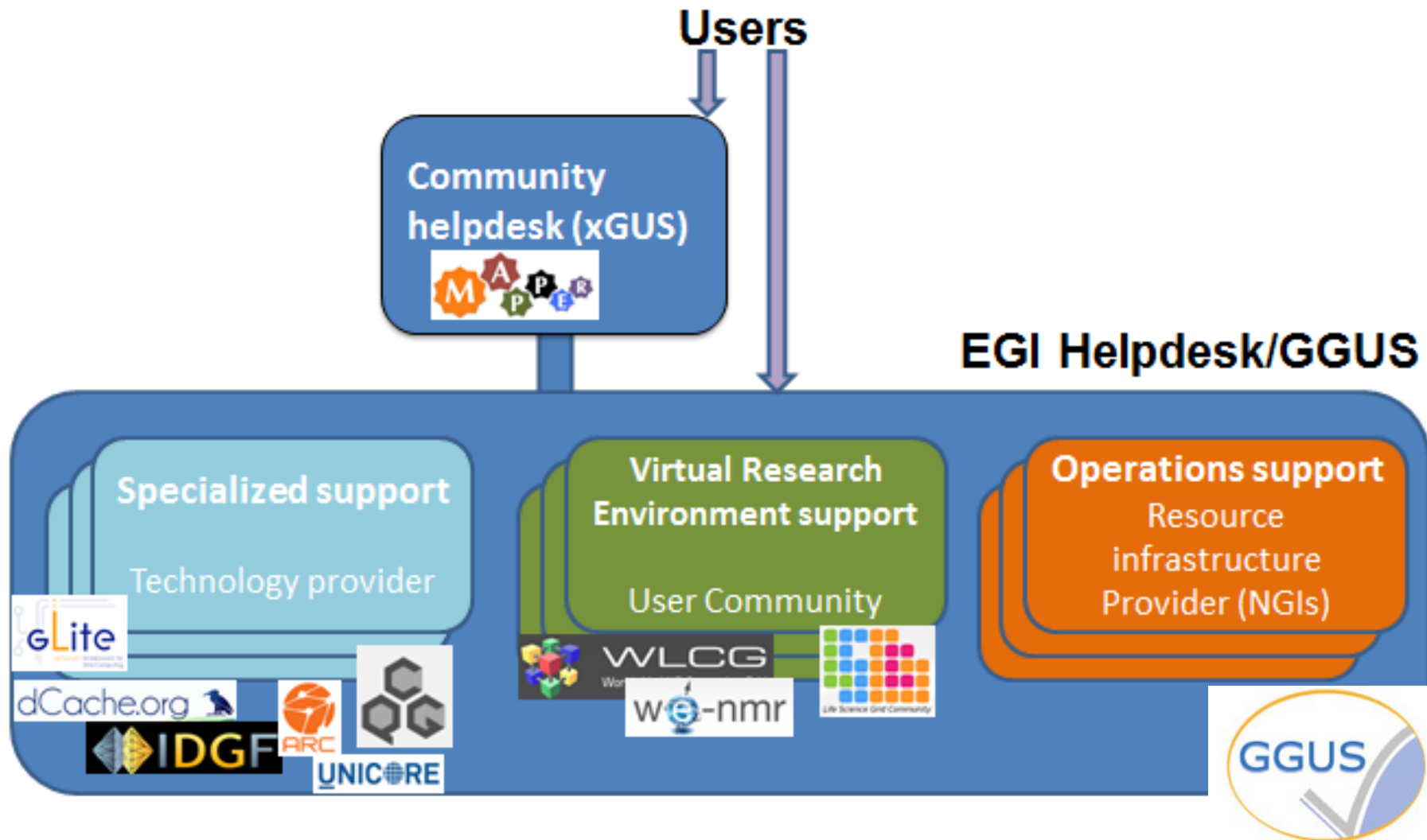


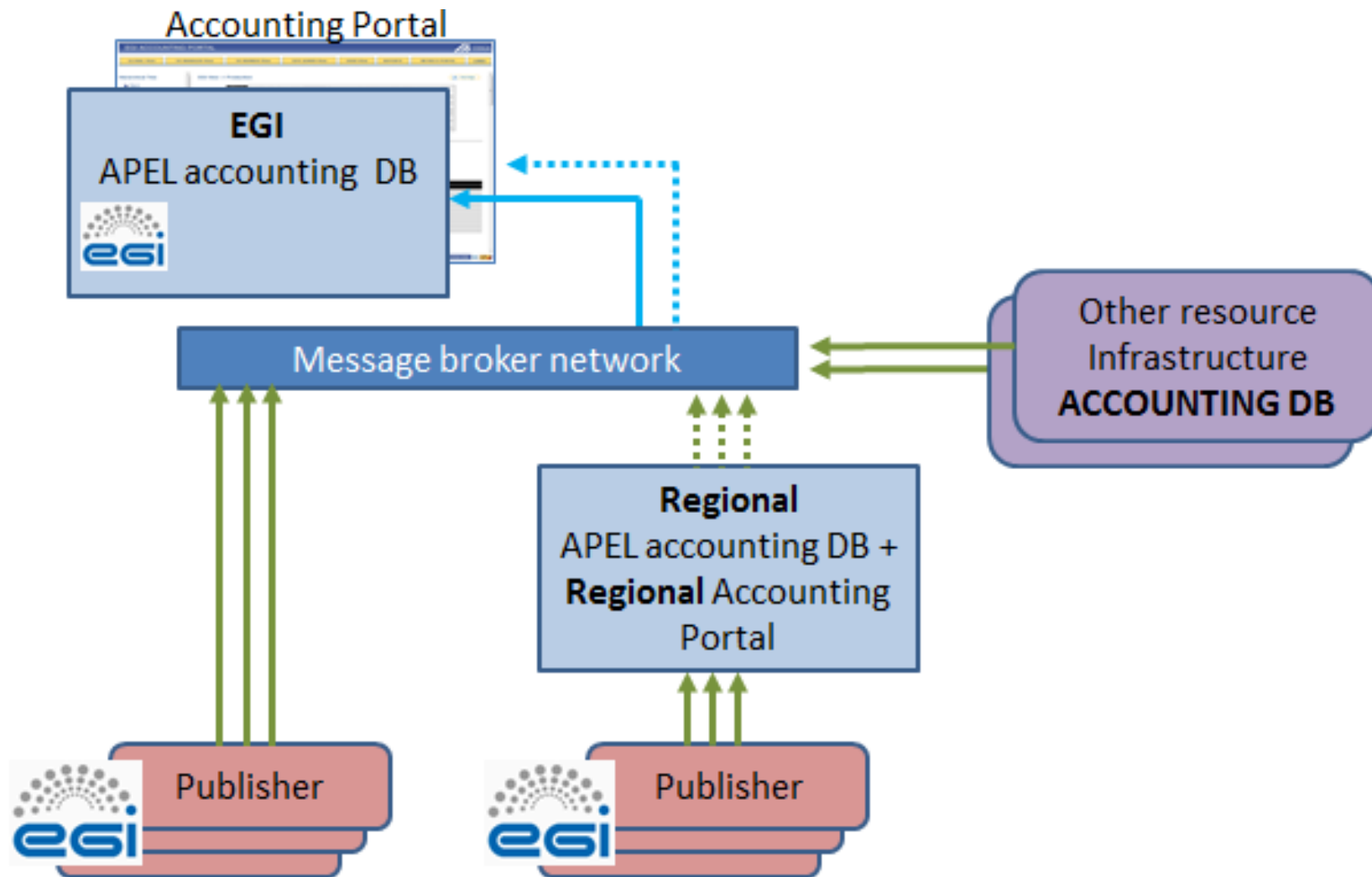
Example: Service Availability Monitoring (SAM)

Framework for resource centres and service operators

- Based on Nagios
- Service-specific probes
- Database to store service topology
- Connected to a messaging network
- Aggregate and browse results:
 - Operations Dashboard, MyEGI, etc.







Cloud View --> Production

Data to graph:	Number of VMs	Total number of VM run		
Period:	Start year: 2013	Start month: 2	End year: 2014	End month: 1
Groupings:	Show data for: SITE		as a function of: DATE	

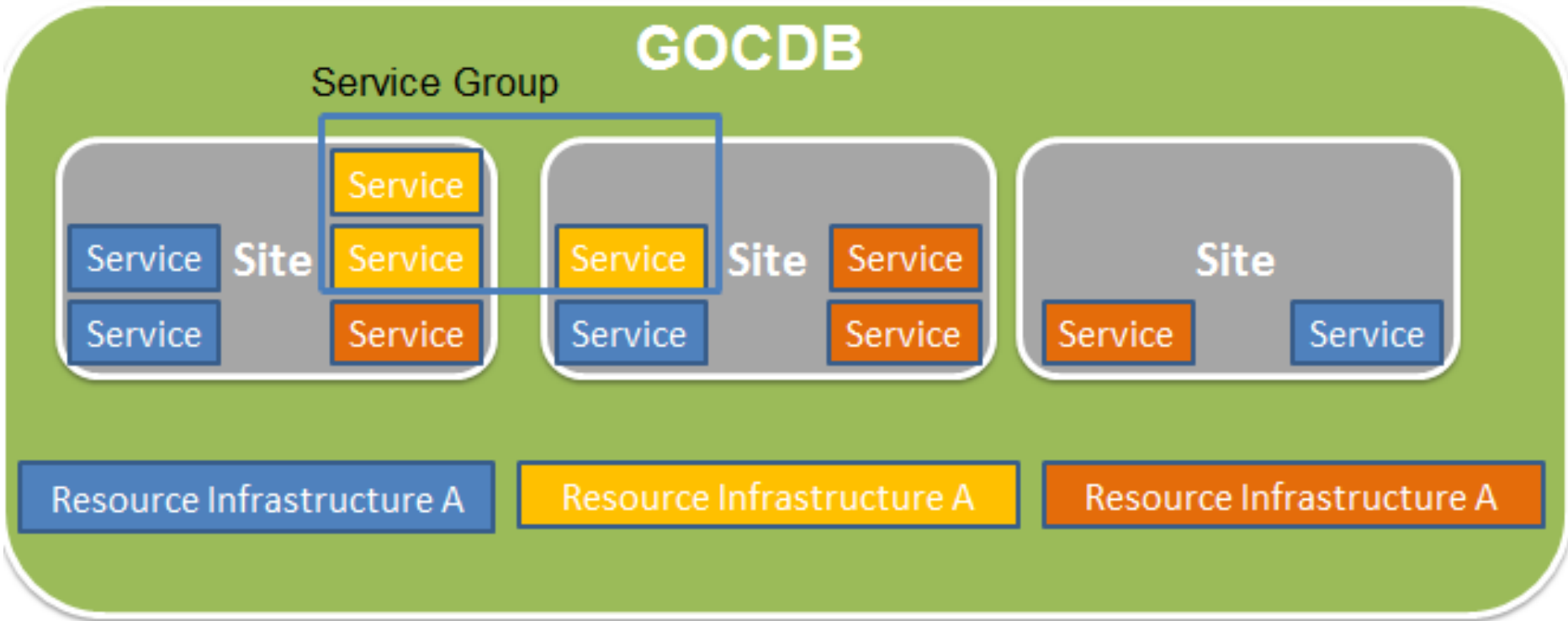
Refresh

Total number of VM run by SITE and DATE.

The following table shows the distribution of Total number of VM run grouped by SITE and DATE.

Total number of VM run by SITE and DATE														Total	%
SITE	Feb 2013	Mar 2013	Apr 2013	May 2013	Jun 2013	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	Dec 2013	Jan 2014			
100IT	0	0	0	1	2	0	1	3	0	0	647	0	654	7.25%	
BIFI	0	0	0	0	0	0	0	0	0	0	0	417	417	4.62%	
CESGA	26	454	34	180	474	28	2	61	74	95	763	403	2,594	28.75%	
CESNET	46	817	30	132	77	170	13	343	108	190	188	0	2,114	23.43%	
FZJ	0	1	24	9	10	2	10	31	341	2	761	14	1,205	13.35%	
GWDG	17	0	8	0	0	0	0	11	7	2	766	14	825	9.14%	
IFCA-LCG2	0	0	0	0	0	0	2	12	80	0	0	0	94	1.04%	
IISAS-Bratislava	0	0	40	0	0	0	0	0	0	0	0	0	40	0.44%	
IISAS-FedCloud	0	0	0	0	0	0	0	0	9	0	0	4	13	0.14%	
IN2P3-CC	0	11	0	0	0	0	0	0	0	0	0	0	11	0.12%	
KTH CLOUD	120	39	2	29	14	18	65	1	0	0	0	0	288	3.19%	
KTH-CLOUD	119	32	2	29	14	18	65	4	0	0	0	0	283	3.14%	
PRISMA-INFN-BARI	0	0	0	0	0	0	0	0	0	0	0	272	272	3.01%	
TW-EMI-PPS	0	0	0	0	0	0	0	213	0	0	0	0	213	2.36%	
Total	328	1,354	140	380	591	236	158	679	619	289	3,125	1,124	9,023		
Percentage	3.64%	15.01%	1.55%	4.21%	6.55%	2.62%	1.75%	7.53%	6.86%	3.20%	34.63%	12.46%			

[Click here for XML encoded data](#)





Browse

- My Sites
- Projects
- NGIs
- Sites
- Service Groups
- Services

Add

- Add Site
- Add Service Group
- Add Service
- Add Downtime

Downtimes

- Recent & Planned
- Active & Imminent

About GOCDB5

- Doc, Help & Support

Search

User Status

Registered as:
Tiziana Ferrari

[View Details](#)
[Manage Roles](#)



Services

All Services in GOCDB

Filter (clear)

Service Type: NGI: Search:

Production: Monitored: Scope: Certification: Include Closed Sites:

11 Services (Showing 1 - 30)

Hostname	Service Type	Production	Monitored	Scope(s)	Host Site
> carach5.ics.muni.cz	eu.egi.cloud.vm-management.occ	✘	✔	EGI	CESNET-MetaCloud
> cloud.cesga.es	eu.egi.cloud.vm-management.occ	✘	✔	EGI	CESGA
> cloud.ifca.es	eu.egi.cloud.vm-management.occ	✘	✔	EGI	IFCA-LCG2
> egi-cloud.zam.kfa-juelich.de	eu.egi.cloud.vm-management.occ	✘	✔	EGI	FZJ
> egi.cloud.pdc.kth.se	eu.egi.cloud.vm-management.occ	✘	✔	EGI	KTH-CLOUD
> nebula-server-01.ct.infn.it	eu.egi.cloud.vm-management.occ	✘	✘	EGI	INFN-CATANIA-NEBULA
> nova.ui.savba.sk	eu.egi.cloud.vm-management.occ	✘	✔	EGI	IISAS-FedCloud
> occi.cloud.gwdg.de	eu.egi.cloud.vm-management.occ	✘	✔	EGI	GoeGrid
> okeanos-occi.hellasgrid.gr	eu.egi.cloud.vm-management.occ	✘	✘	EGI	HG-09-Okeanos-Cloud
> okeanos-occi2.hellasgrid.gr	eu.egi.cloud.vm-management.occ	✘	✔	EGI	HG-09-Okeanos-Cloud
> server4-epsh.unizar.es	eu.egi.cloud.vm-management.occ	✘	✔	EGI	BIFI

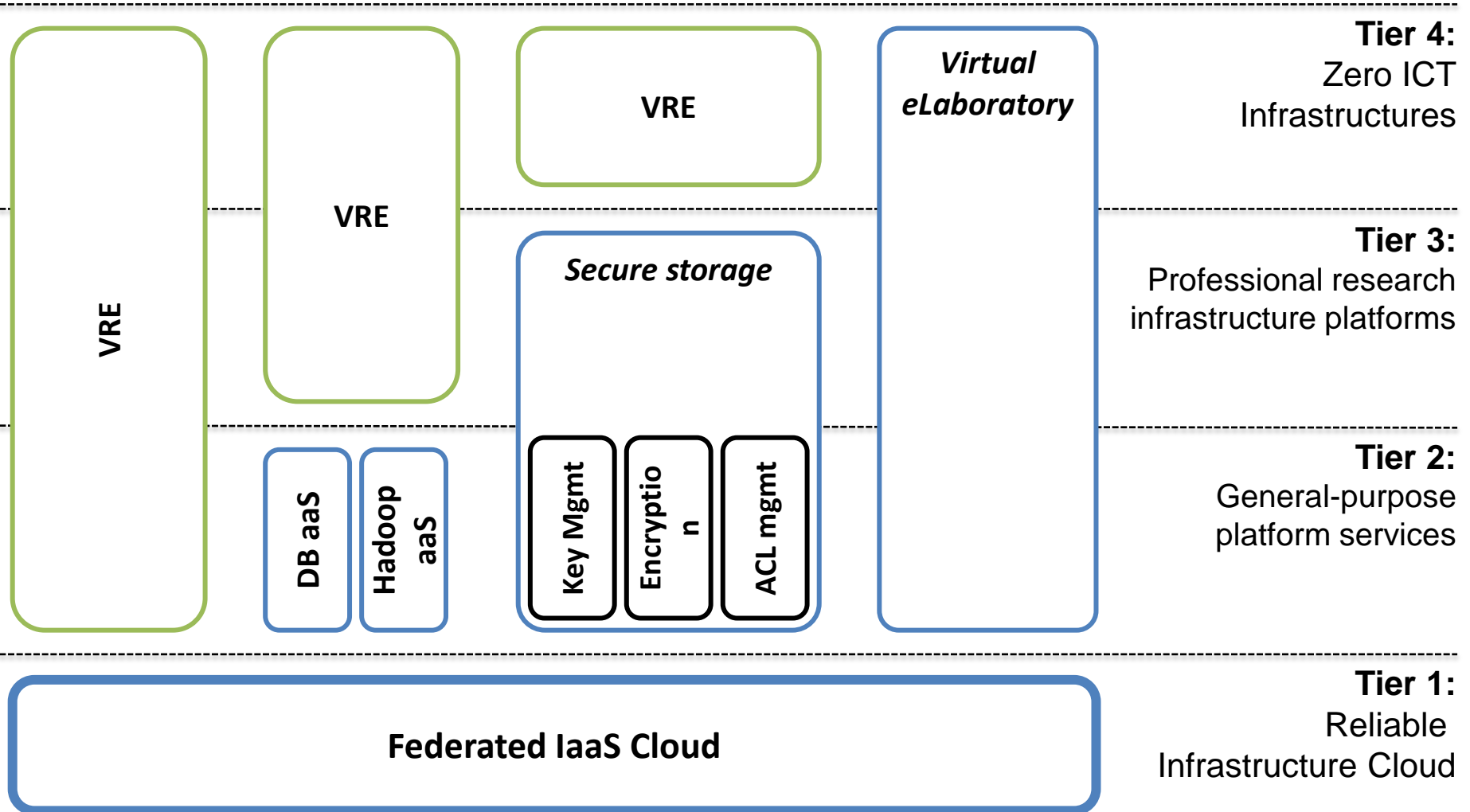
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Federated Cloud service tiers



1. Free
 - a. Spot Market
2. Pay As You Go
3. Wholesale
4. Wholesale with Bursting

Model	Certification	API	Consultancy	Allocation	MSA	Accounting Reports	Invoicing
Invisible Federator	✓	✓					
Advisor	✓	✓	✓				
Matchmaker	✓	✓	✓	✓	(✓)		
Trusted Third Party	✓	✓	✓	✓	✓	✓	
One Stop Shop	✓	✓	✓	✓	✓	✓	✓

Each role has different implications in the functions and structure of EGI.eu

- **Basic**
 - Managed through EGI OLA framework
 - Available at all Cloud service providers
 - “Free at the point of use” billing plan and higher
- **Advanced**
 - Available on all Cloud service providers
 - “Pay-as-you-go” plan or higher
- **Custom/Premier**
 - Tailored to community requirements
 - Advanced SLAs subject to research and innovation
 - Applicable to subset of providers

- Broader support for open standards in Cloud management frameworks
- Federated Network as a Service (incl. SDN)
- Messaging network as a Service
- Improve Application Database to App Marketplace
 - Stable market for cloud services, cloud products and applications between providers and consumers from the academia, public sector and enterprise
- Engaging in PoCs
- Strategic EC project proposals

A large, light purple arrow with a 3D effect, pointing to the right. It is positioned below the list of bullet points and contains the text 'Strengthening the underpinning platform' in the center.

Strengthening the underpinning platform

A large, light purple arrow pointing upwards, positioned on the left side of the slide. The text 'Value added services for VRCs' is written vertically inside the arrow.

Value added services for VRCs

- Use federated IaaS Cloud as EGIs backbone
- Open standards for open platforms
- Innovate and deploy PaaS & SaaS on top
 - Innovate on EGI service tiers 2, 3 and 4
- Engaging in PoCs
- Strategic EC project proposals

Standardisation of Cloud interfaces empowers freedom of choice for customers, better competition among providers and emergence of cloud marketplaces

- **EGI Marketplace**
 - Rich and diverse set of individual offerings
 - Application/VM Image repository
 - User community choice of provider at all levels
 - Academic and commercial resource & service providers
 - Extend to a service marketplace
- **Helix Nebula Marketplace**
 - EGI Federated Cloud as service provider
 - “Hidden” behind a single technical and policy broker
- **EU Cloud for Europe marketplace**
 - Integrate EGI’s solution and service portfolio
 - Provide services for academia, government and business

- **Open standards, open technologies**
 - Use of Open Standards is key to the establishment of an effective, fair and transparent cloud market in Europe
 - Open Source components raise the barrier for hidden backdoors, thus lead to more trusted services
- **Firmly rooted in Europe**
 - Strong public sector involvement through NRENs, NGIs, EIROs are EGI's members
 - European commercial Cloud resource providers, including SME
- **A single cross-border market**
 - Reaching out for research, government & business sectors
 - Level playing field for innovation and services on multi-service tiers

- Action 1:** Interoperable, federated IaaS Cloud infrastructure
- Action 2:** Public sector Cloud federation for Cloud for Europe marketplace
- Action 3:** Engage in and lead H2020 e-Infrastructure, ICT LEIT & CEF projects to boost Cloud service market
- Action 4:** Transparent, accounting, billing & SLA
- Action 5:** EGI maintain through strategic CloudWATCH meetings (e.g. ICT, Cloudscape series)

Neelie Kroes: "A Cloud for Europe"
14 Nov 2013, Cloud4Europe Berlin
<http://bit.ly/1dOoRk8>

- **EGI:** Community of resource providers with long-term tradition in providing federated ICT services for research
- **EGI Federated Cloud:** Paving the way for a federated cloud in Europe
 - Open standards, open technology
 - Open membership, open processes
- **Driver for innovation in Europe**
- **International perspective:** Although EGI activity, a global federation is in scope, with global concrete interest
 - **Korea, South Africa, Canada, Taiwan, Australia**
 - **large public Cloud providers**

Thank you!



Questions?