Federation work in EGI, French NGI and IBERGRID

CERN/IN2P3 Openstack team meeting

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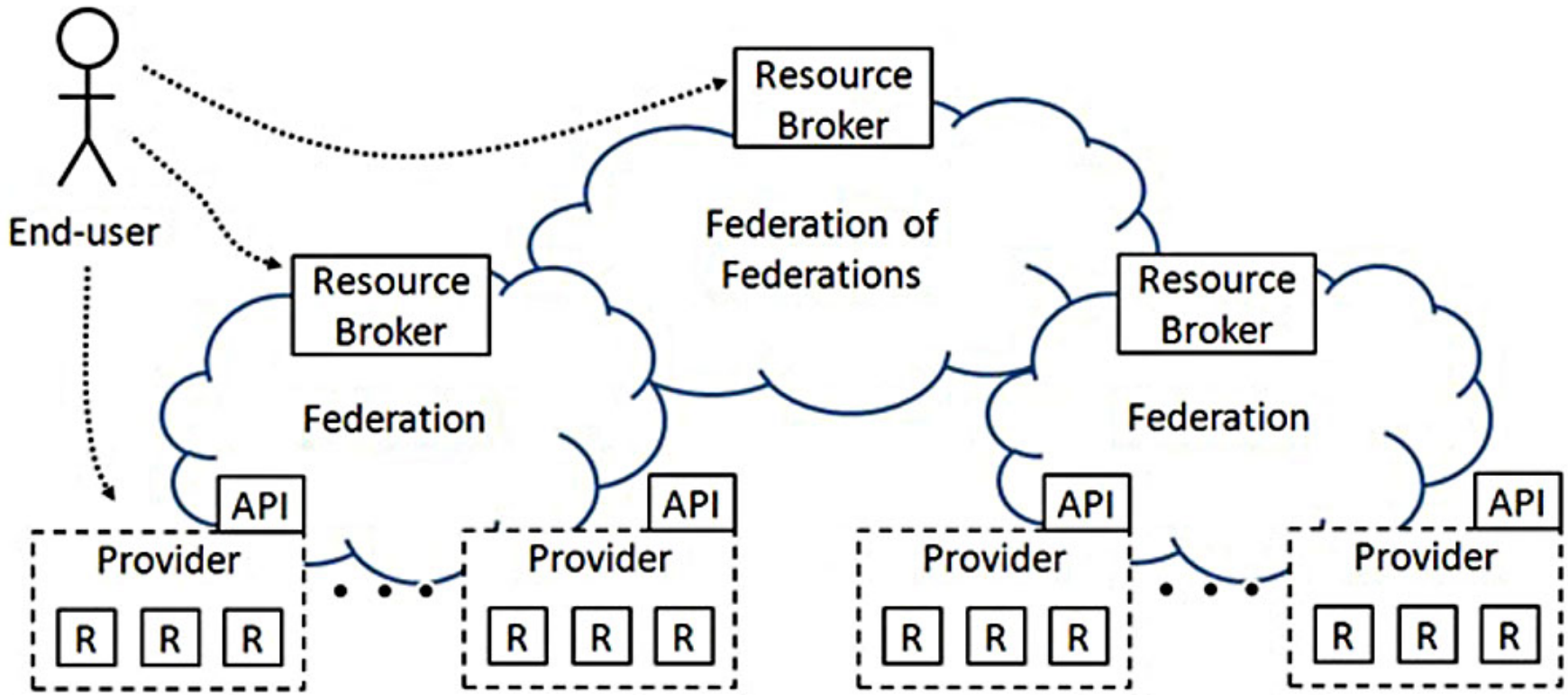
Outline

Outline

Cloud Federation Outlook



Federation

- EGI and the NGIs are already a federation of resources providers.
- Many of the resource providers have some virtualized and/or cloud resources.
  - Many different software stacks.
  - Different interfaces.
  - Different capabilities.
- Many users are interested in accessing those resources.
  - Profit from flexibility.
  - Deploy its own software environment.
- Same situation as the beginning of the Grid model.

Challenges

Open questions.

- API: Different interfaces: EC2, OpenStack, OCCI, S3, CDMI, etc.
- Authentication and authorization.
- Data Management.
- Accounting.
- Monitoring.
- Information Systems.
- Image managing, catalog, distribution and endorsal.
- Brokering.

Federation Efforts

Federation efforts aim to unify the access to the many "scientific clouds" around France and Europe, trying to profit from acquired Grid experience.

- EGI: Federated Cloud Task Force.
- France Grilles.
- Collaboration CNRS and CSIC (Spain).

Different types of federation:

- Strong federation: access trough a broker (a-la-grid).
- Loose federation: only a set of common services (accounting, authentication, etc.), but no brokering.

Outline

EGI Federated Cloud Task Force

- Objectives:
  - Write a blueprint for RPs willing to stablish a federation.
  - Deploy a testbed to evaluate the technologies.
  - Investigate the requirements from the user communities.
  - Give feedback to the technology providers.
  - Identify issues that need to be addressed in a broader scope (EGI): security policies, etc.
- 20 Resource Providers:
  - BSC, CESGA, CESNET, Cyfronet, FZ Jlich, GRIF, GRNET, GWDG, IFCA, IGI, IPHC, CC-IN2P3, Oxford, SARA, STFC, TCD, KTH, SZTAKI, INFN-Napoli, IISAS:
- 7 technology providers, 6 user communities.

Workpackages outlook

9 workpackages have been identified.

1. VM Management.
2. Data Management.
3. Information systems.
4. Accounting.
5. Monitoring.
6. Notification.
7. Federated AAI.
8. VM marketplace.
9. Brokering.

Workpackages outlook

9 workpackages have been identified.

1. VM Management.
2. Data Management.
3. Information systems.
4. **Accounting**. $\rightarrow$ **CC-IN2P3**
5. Monitoring.
6. Notification.
7. **Federated AAI**. $\rightarrow$ **CC-IN2P3/CSIC**
8. VM marketplace.
9. **Brokering**. $\rightarrow$ **CC-IN2P3**

Workpackages technologies

APIs	OCCI, CDMI
Information System	BDII, evaluating EMIR
Monitoring	Nagios
Accounting	APEL/SSM
AuthN/AuthZ	X.509 based, VOMS
Images Catalog	Stratuslab marketplace, VMCatcher
Notification	Logging & Bookeeping
Brokering	evaluating solutions

Accounting

- Based on the SSM (Secure STOM Messaging).
- APEL/SSM Openstack connector developed by CC-IN2P3.
  - `https://github.com/EGI-FCTF/osssm`

Federated Identity

Problems identified:

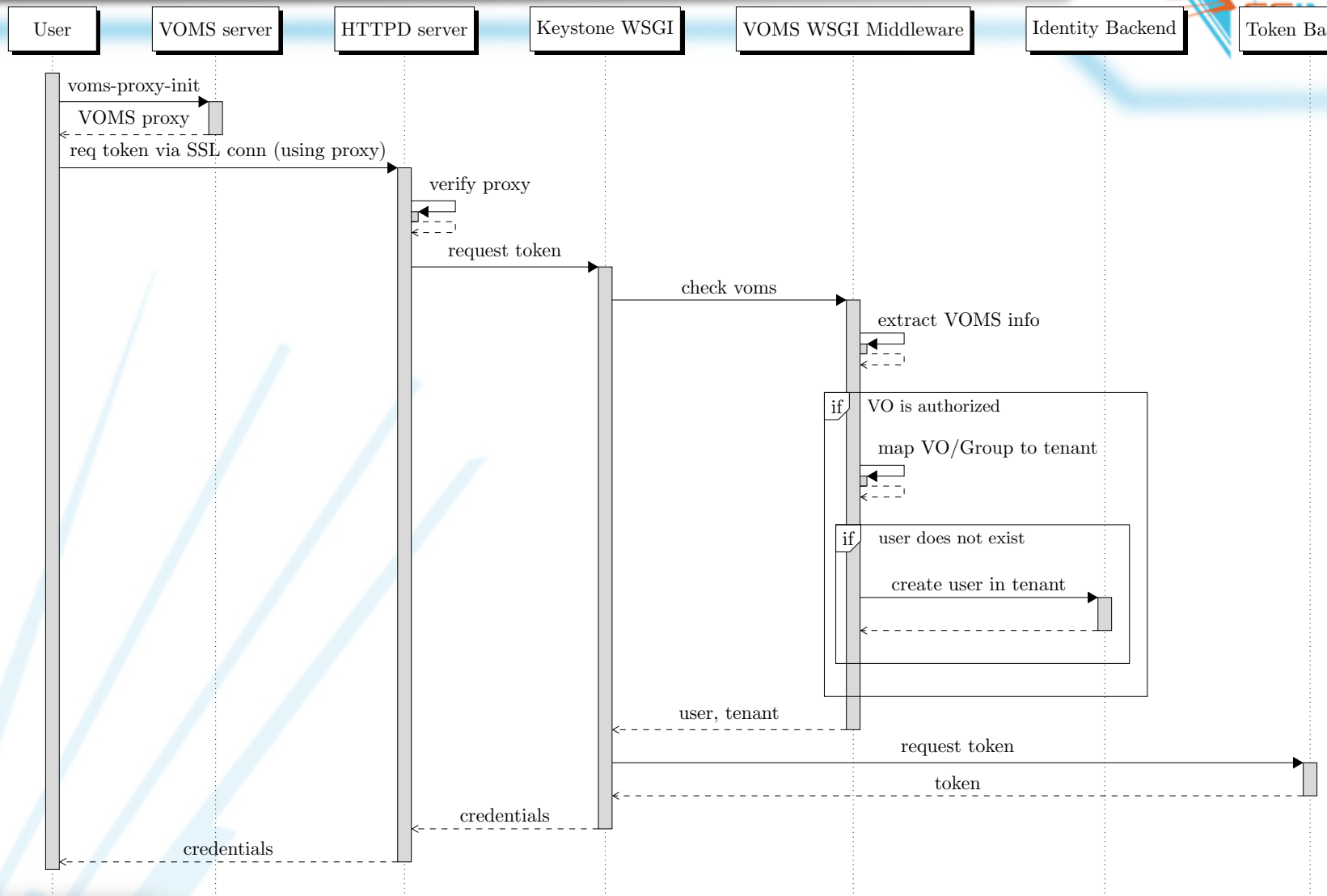
- Manage large numbers of users, in different (sometimes overlapping) groups.
- Populate the user base to each of the RPs.
- Each cloud middleware has its own AuthN/AuthZ mechanism.
- EGI Fedcloud requires that it is X.509 and not user/password based.
- Same problems as in the Grid $\rightarrow$ VO based.

Federated Identity

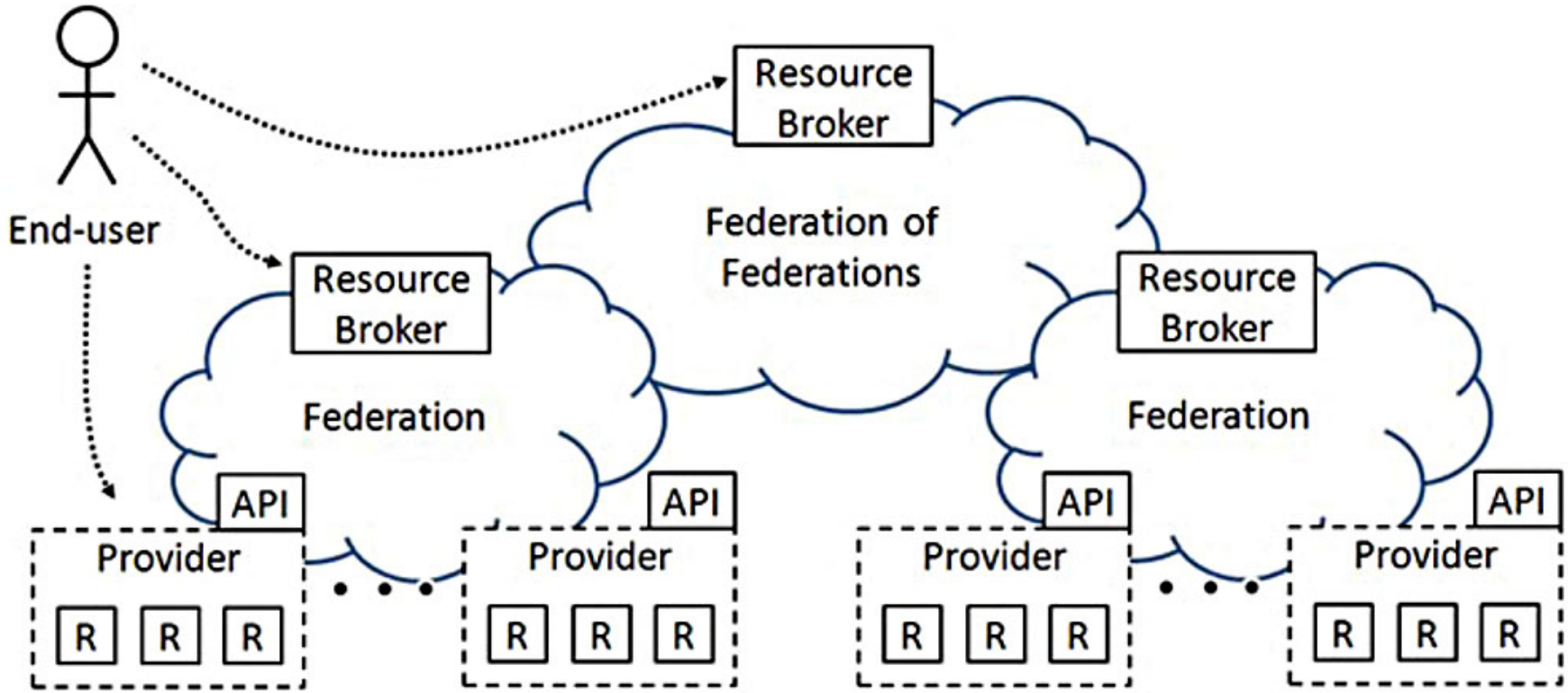
Apply the Grid VOs to the Cloud using VOMS-based authentication

- Widely used in the Grid. Infrastructure already in place (PKI, VOMS servers, portals, etc.)
- User communities are familiar with it.
  - No extra credentials for users
  - No extra effort for managers.
  - No transition effort.
- Resource providers are familiar with it.
  - No extra effort for configuration.
  - No extra effort on their side to allow a VO to execute.
- Grid tools can be adapted to interact with cloud testbeds
- Integrated (or possible integration) with other operational tools.
- Extensible (for example, SAML).

VO support in Openstack



Cloud Brokering



Brokering

Cloud brokering is a problematic issue.

- Different interfaces.
- Different hypervisors.
- Different capabilities.
- Image distribution and placement.
- Placement policies (price, proximity, etc.).

Image distribution and trust:

- VMcatcher.

Outline

Future work

Authentication/Authorization:

- Federated authorization (roles).
- Extend authentication to other federation methods.
  - Study the possibility of SAML instead of proxies.
  - Other federated identity providers (Shibboleth, OpenID).
- Attribute based AuthN/AuthZ.

Contextualization:

- How can a user manage contextualization transparently?

This is the end

Thanks!