

Openlab major review

Marek Denis

Openlab research fellow



CERNopenlab

CERN & Rackspace collaboration

■ Collaboration project

- Started 1st October 2013
- Full time research fellow (Marek Denis) working together with the OpenStack community.

■ Joint research and work on the Cloud Federation

- Referential architecture for building cloud federations
- Blueprints, code contributions, code reviews, active participation in design and implementation process
- Whitepapers and presentations to allow others to build on our findings

Rackspace

- OpenStack founder (together with NASA)
- More than 5000 rackers
- Over 205,000 customers
 - › 98,000+ SERVERS
 - › 26 000 VMs
 - › 70PB storage
- 120+ countries
- 9 global data centres
 - › Chicago, Washington, Dallas, London, Hong Kong, Sydney



rackspace[®]
the open cloud company

The Rackspace Vision

„To be recognised as one of the world’s greatest service companies.”



Meet our team...



Toby Owen

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...and the rest of the community involved in federation work

- **Dolph Matthews** (Rackspace) – Keystone PTL
- **Steve Martinelli** (IBM)
- **Adam Young** (RedHat)
- **David Chadwick** (University of Kent)
- **Kristy Siu** (University of Kent)
-and many more!

How do we work on the OpenStack?

- **OpenStack** is Open Source – everybody can contribute
- **Very powerful community**
 - Rackspace, IBM, RedHat, AT&T, Cisco, HP, Intel, Ubuntu...

(full list: <http://www.openstack.org/foundation/companies/>)

How do we work on the OpenStack?

- **Blueprints**
 - Proposals for new features, high level designs
- **Summits (every 6 months)**
 - Choose blueprints for the next release
 - We can work in one room, with a real whiteboard
- **Design phase** (markdowns, IRC discussions, mailing list threads, design sessions, hackathons)
- **Implementation/code reviews**
- **Code merge**
- **Bugfixing**


How do we work on the OpenStack?

openstack-identity-api/v3/src/markdown/identity-api-v3-os-idp-ext.md

```

Commit Message                                ↑ Up to change
-----
Old Version                                     New Version
(Download)                                     (Download)
1 OpenStack Identity API v3 OS-IDP Extension   1 OpenStack Identity API v3 OS-FEDERATION Extension
2-----2-----
3-----3-----
4 Provide the ability for users to manage Identity Providers (IdPs). This   4 Provide the ability for users to manage Identity Providers (IdPs) and establish
5 Extension requires v3.0+ of the Identity API.                             5 a set of rules to map federation protocol attributes to Identity API
6-----6-----
7-----8 Definitions
8 Definitions
9-----9-----
10-----10-----
11 *Trusted Identity Provider: An identity provider setup within the Identity 11 *Trusted Identity Provider: An identity provider setup within the Identity
12 Service API that is trusted to provide authenticated user information.      12 Service API that is trusted to provide authenticated user information.
13 *Service Provider: A system entity that provides services to principals or 13 *Service Provider: A system entity that provides services to principals or
14 other system entities, in this case, the OpenStack Identity Service API is 14 other system entities, in this case, the OpenStack Identity Service API is
15 the Service Provider.                                                      15 the Service Provider.
16-----16-----
17 *Attribute Mapping: The user information passed by a federation protocol for 17 *Attribute Mapping: The user information passed by a federation protocol for
18 an already authenticated identity are called 'attributes'. Those 'attributes' 18 may not align 1:1 with the Identity API concepts. To help overcome such
19 may not align 1:1 with the Identity API concepts. To help overcome such     19 mismatches, a mapping can be done either on the sending side (third party
20 mismatches, a mapping can be done either on the sending side (third party   20 identity provider), on the consuming side (Identity API service), or both.
21 identity provider), on the consuming side (Identity API service), or both.
22-----22-----
23 API Resources
24-----24-----
25-----25-----
26-----26-----
27 An Identity Provider is a third party service that is trusted by the Identity 27 An Identity Provider is a third
28 Service to authenticate identities. For OpenStack, the ID of the identity   28 Service to authenticate identities.
29 provider is the key. Each IdP the 'protocol_data' field can be used to add IdP 29 provider is the key.
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Podgląd  wto, 17:17

Change ID: ce6272: Identity API v3 OS-FEDERATION Extension

https://review.openstack.org/#/c/60244/22

Patch Set 19 b066d5f3ac342c80061a65f48e8890462 (gitweb)

Author: Marek Denis <marek.denis@cern.ch> Jan 6, 2014 3:26 PM

Committer: Marek Denis <marek.denis@cern.ch> Jan 21, 2014 5:26 PM

Parents: b78b1344786:f54b962aac1148df97fb0a5fa04 Merge "Remove unused variables"

Download: [checkout](#) | [pull](#) | [cherry-pick](#) | [patch](#) | [Anonymous HTTP](#)

git fetch https://review.openstack.org/openstack/keystone refs/changes/44/60244/19 66 git checkout FETCH_HEAD

File Path	Comments	Size	Diff	Side-by-Side	Unified
Commit Message					
M doc/source/configuration rst	+9, 0		Side-by-Side	Unified	
A doc/source/extensions/federation-configuration rst	40 lines		Side-by-Side	Unified	
M etc/keystone-paste.ini	+3, 0		Side-by-Side	Unified	
M etc/keystone.conf.sample	+3, 0		Side-by-Side	Unified	
M etc/policy.json	+13, 1		Side-by-Side	Unified	
M etc/policy/2cloudsample.json	+13, 1		Side-by-Side	Unified	
M keystone/common/config.py	+6, 0		Side-by-Side	Unified	
A keystone/contrib/federation/_init_.py	17 lines		Side-by-Side	Unified	
A keystone/contrib/federation/backends/_init_.py	15 lines		Side-by-Side	Unified	
A keystone/contrib/federation/backends/sqj.py	181 lines		Side-by-Side	Unified	
A keystone/contrib/federation/controllers.py	269 lines		Side-by-Side	Unified	
A keystone/contrib/federation/core.py	54 lines		Side-by-Side	Unified	
A keystone/contrib/federation/migrate_repo/_init_.py	15 lines		Side-by-Side	Unified	
A keystone/contrib/federation/migrate_repo/migrate.ctg	25 lines		Side-by-Side	Unified	
A keystone/contrib/federation/migrate_repo/versions/001_add_identity_provider_table.py	52 lines		Side-by-Side	Unified	
A keystone/contrib/federation/migrate_repo/versions/_init_.py	15 lines		Side-by-Side	Unified	
A keystone/contrib/federation/routers.py	116 lines		Side-by-Side	Unified	
M keystone/exception.py	+14, 0		Side-by-Side	Unified	
M keystone/seneca.py	+0, 1		Side-by-Side	Unified	
M keystone/tests/core.py	+3, 0		Side-by-Side	Unified	
A keystone/tests/test_backend_federation_sqj.py	40 lines		Side-by-Side	Unified	
M keystone/tests/test_sqj_migrate_extensions.py	+37, 0		Side-by-Side	Unified	
A keystone/tests/test_v3_federation.py	436 lines		Side-by-Side	Unified	
	+1376, 3				

Change-Id: I0ce62e720e797718d6fde6bfc44b22e213985867

Owner: Marek Denis

Project: openstack/keystone

Branch: master

Topic: bp/identity-providers

Uploaded: Dec 5, 2013 3:12 PM

Updated: Jan 24, 2014 3:29 AM

Status: **Merged**

Permalink

Reviewer	Verified	Code-Review	Approved
Marek Denis			
ayoung		✓	
Dolph Mathews		✓	✓
Steve Martinelli		✓	
Brant Knudson		✓	
Jenkins	✓		
Morgan Fainberg			
Arvind Tiwari			
Joe Savak			
Matthieu Huin			
Idbragst			
David Chadwick			
Brad Topol			
Alvaro Lopez Garcia			
Kristy Siu			

Identity Providers CRUD operations

Implementation of CRUD operations for:

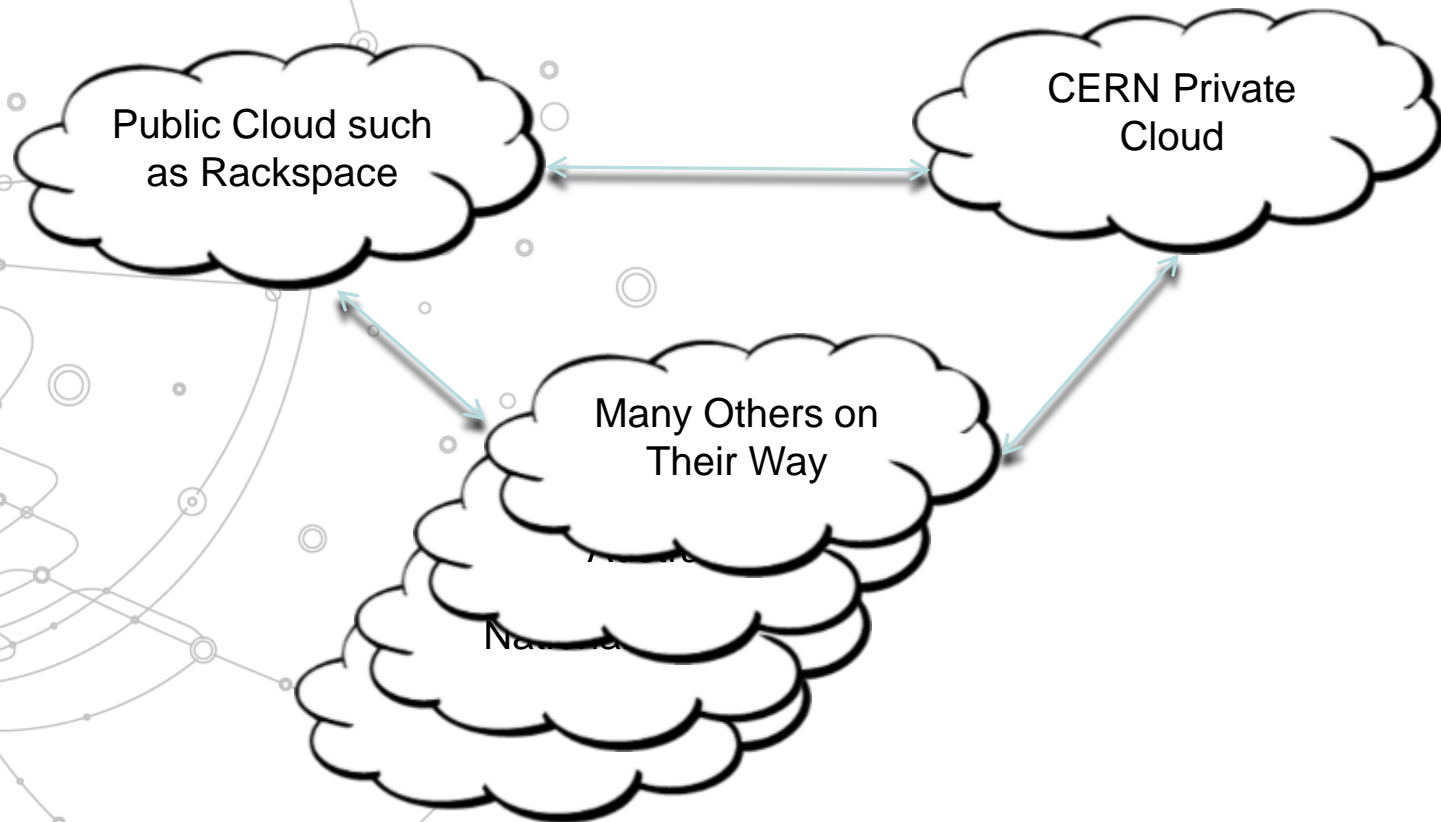
- Identity Providers
- Protocols used to authenticate remote users (SAML, OpenId, etc)

Change-Id: I0ce62e720e797718d6fde6bfc44b22e213985867

Implements: blueprint identity-providers

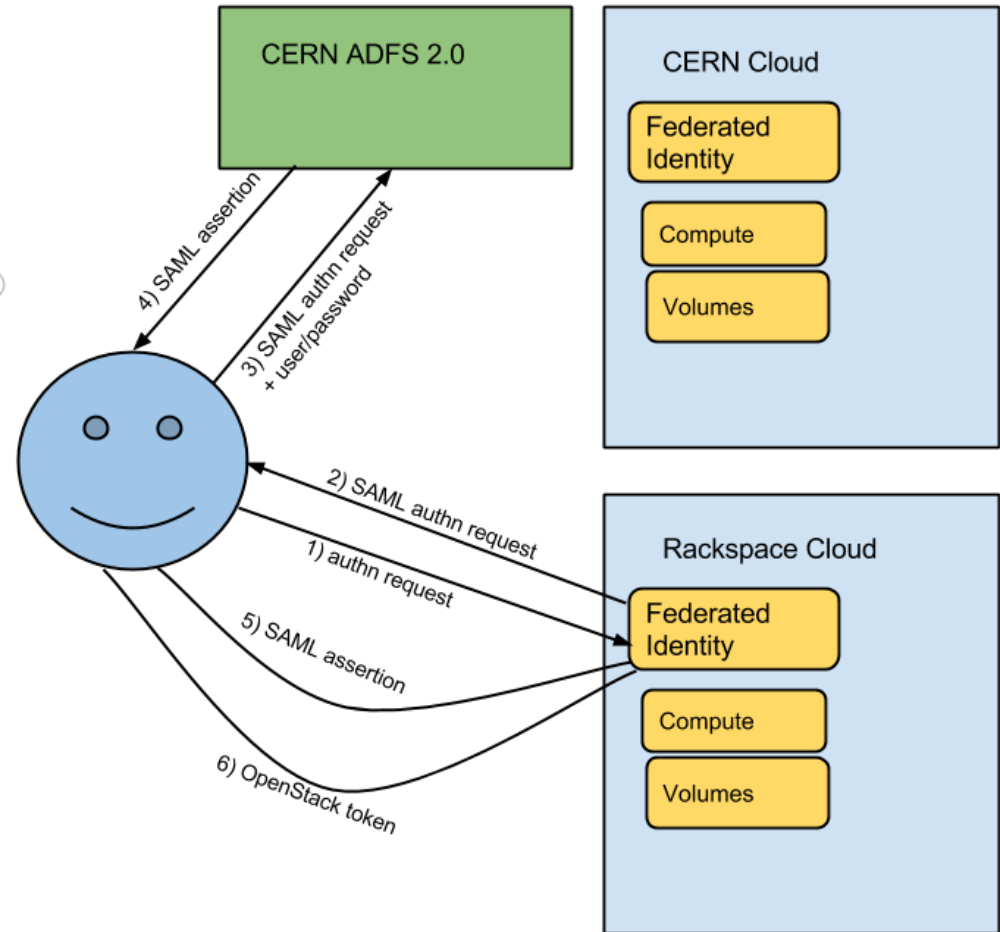
Cloud Federation – the basics

Cloud resources are isolated



Cloud Federation – Single Sign On

As a user I want to use my single set of existing credentials to access services across multiple clouds.



Cloud Federation – technical details

- Use existing protocol – SAML2
- Use established software for handling communication between federated peers (at the OpenStack side)
- We are building mechanisms that map SAML assertion parameters into local users/groups/roles

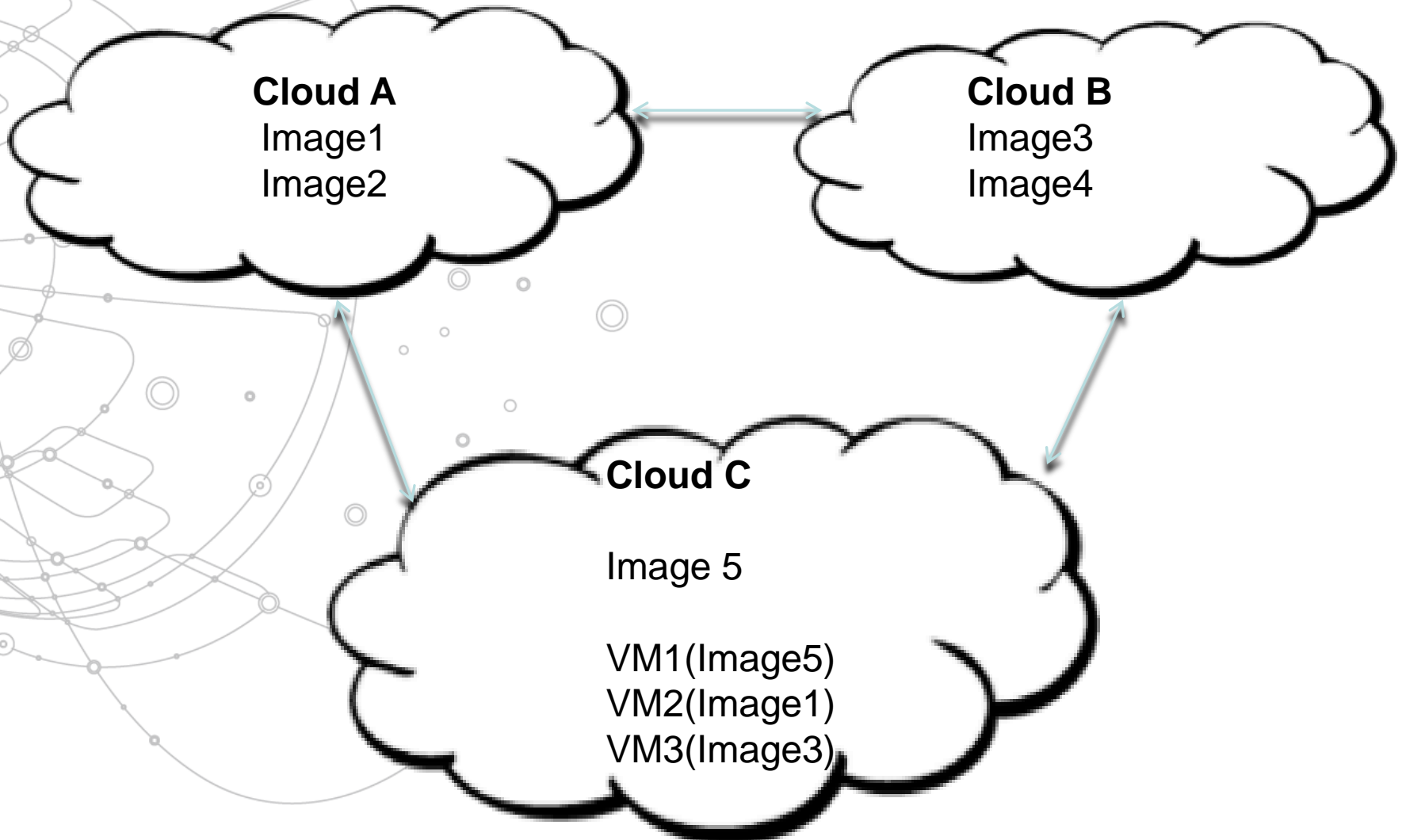
Our aim for the Icehouse release (Spring 2014)

- Implement all parts required to handle federated authn/authz in the **Keystone**
 - Identity Providers and Protocols CRUD operations (**already merged**)
 - Mapping rules CRUD operations (**already merged**)
 - Rules mapping algorithm (work in progress)
 - Consuming SAML assertions (work in progress)
 - Token generation after the local groups are returned (work in progress)

Next steps

- Extend basic federation use-case so clients can experience a real cloud of clouds
- Work on image cloud federation (**project glance**)
- Prepare a working federated cloud infrastructure

Cloud federation – image sharing



Questions

Q & A

If you are interested...

- SAML2 specification

- <http://docs.oasis-open.org/security/saml/v2.0/saml-core-2.0-os.pdf>

- Shibboleth

- <http://shibboleth.net/>

- External Identity Providers blueprint

- <https://blueprints.launchpad.net/keystone/+spec/identity-providers>

- Identity Providers and Mapping rules CRUD specification

- <https://review.openstack.org/#/c/59848/>