OCCI & Interoperability

Andy Edmonds
ICCLab, ZHAW
Hello!

- OCCI Co-chair
- OCCI OpenStack implementer
- Senior Researcher@ICCLab - cloudcomp.ch
  - Zurich University of Applied Sciences
- @dizz

www.cloudcomp.ch
TL;DR

Does enable interoperability.
True open specification.
Is the second API...

API of interop insurance

www.occi-wg.org
What is OCCI?

"Protocol and API for Management Of Cloud Service Resources."

"It's just a CGI-script, init?"

www.occi-wg.org
OCCI in Action

Python

```python
comp = client.create_vm(token, [
    'tiny; scheme="http://schemas.openstack.org/template/resource#"',
    'cirros; scheme="http://schemas.openstack.org/template/os#"'])
```

Ruby

```ruby
cmpt = client.get_resource "compute"
cmpt.mixins << client.find_mixin 'cirros', 'os_tpl'
    << client.find_mixin 'tiny', 'resource_tpl'
client.create cmpt
```

On-the-wire

```plaintext
> POST /compute/ HTTP/1.1
> User-Agent: occi-client/1.1 (linux) libcurl/7.19.4 OCCI/1.1
> Host: localhost:8888
> Accept: text/plain
> Content-type: text/plain
>
> Category: compute; scheme="http://schemas.ogf.org/occi/infrastructure#"
> Category: cirros; scheme="http://example.com/templates/os#"
> Category: tiny; scheme="http://example.com/templates/compute#"
```

www.occi-wg.org
Does it matter?

- **Compliments** does not Compete
- Works with other specifications
  - e.g. CDMI, OVF
- Participates in Cloud Plugfests
  - Join the Madrid interoperability event: [cloudplugfest.org](http://cloudplugfest.org)

[www.occi-wg.org](http://www.occi-wg.org)
Does it matter?

1. Has implementations
2. Is an open specification
3. It poses questions...
1. OCCI

Implementations

CompatibleOne

OpenNebula.org

Recommendations

National Institute of Standards and Technology
U.S. Department of Commerce

siena

EGI

Cabinet Office
2. An Open What?

**Open Standard** elements:

- Organisation
- Specification
- Implementation
- Adoption

OCI
Ken Krechmer
OpenStand

www.occi-wg.org
## 2. IaaS Specification Scorecard

<table>
<thead>
<tr>
<th></th>
<th>EC2</th>
<th>OCC</th>
<th>CIMI/OVF</th>
<th>OpenStack</th>
<th>CDMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Meeting</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Consensus</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Due Process</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Open IPR</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>One World</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Open Change</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Open Documents</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Open Interface</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Open Access</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ongoing support</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Open Formats</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Implementations</td>
<td>&gt; 2</td>
<td>&gt; 2</td>
<td>2</td>
<td>1*</td>
<td>&gt; 2</td>
</tr>
</tbody>
</table>
2. You Can Influence/Innovate!
3a. Do SDO Specs Matter?
Yes and No

SDO specs are essential but know where they come!
Where?

No

- Standards are not needed for many activities related to:
  - Start-ups
  - Prototyping

Yes

- Interoperability
  - Look at EGI FedCloud, CompatibleOne
- Compliance, Large IT organisations, Government

www.occi-wg.org
3b. Continue Ghettoisation of "Clouds"?
Ghettoisation?

● Leverage lots of resources collectively?
● A Commons?
  ○ How to avoid "tragedy of the commons"?
● How best to federate?
● How to interoperate?
● How to integrate services?

How can we create a Multi-Cloud?

www.occi-wg.org
Q: Federate?


www.occi-wg.org
Q: Interoperable, Really?!!

OpenStack?  
Amazon EC2?  
OpenNebula? etc....

Who's interoperable? **No one is!**

Even **OpenStack's** are not*...


www.occi-wg.org
Some Possible Answers...
A Problem?

Fed & Interop Challenge!

- **Members**
  - 60 individuals.
  - 23 institutions.
  - 13 countries.

- **Technologies**
  - 7 OpenNebula.
  - 3 StratusLab.
  - 3 OpenStack.
  - 1 Okeanos.
  - 1 WNoDeS.

- **Stakeholders**
  - 15 Resource Providers.
  - 7 Technology Providers.
  - 5 User Communities.
  - 3 Liaisons.

![Diagram of stakeholders and technologies associated with EGI.eu and other organizations like KTH, GWDG, FZJ, CESNET, Cyfronet, Masaryk, LMU, SRCE, INFN, GRNET.](image)
A Solution: EGI FedCloud

Federation, Integration & Interop in Action!
A Solution: CompatibleOne

This is an interop scenario for IaaS and PaaS with some Monitoring and SLA 'sauce'.

www.occi-wg.org
The Future...

- Monitoring
- Billing
- Contextualisation
- Inter-domain Networking

"Enabling End-to-End cross domain cloudified telco services"

www.occi-wg.org

mobile-cloud-networking.eu
Does enable interoperability. True open specification. Is the second API...

API of interop insurance

www.occi-wg.org
Thanks!
Questions?

www.occi-wg.org
Backups
Open Standards

Defined by:

- Ken Krechmer, Colorado University - KK
  - Paper: "Open Standards: a Call for Action"

- Open Cloud Initiative - OCI

- OpenStand - OS

www.cloudcomp.ch
Open Standards

- Open Meeting (**KK, OS**)
  - All can join in without barrier, **no "pay-to-play"**

- Consensus (**KK, OS**)
  - **All views** considered

- Due Process (**KK, OS**)
  - Provide **time** for objections/updates, process in place to oversee document creation/updates
Open Standards

- Open IPR (KK, OCI)
  - Copyright, Trademarks, Patents
  - IPR must **not** be used as an offensive strategy

- One World (KK)
  - **Not** specific to a geographic region

- Open Change (KK, OS)
  - process, modifications are documented

www.cloudcomp.ch
Open Standards

- Open Documents (**KK, OS**)
  - All documents easily and publicly accessible

- Open Interface (**KK, OCI**)
  - IPR unencumbered interface, supports backward compatibility

- Open Access (**KK, OCI**)
  - Publicly accessible, **minimal barriers** to access

[www.cloudcomp.ch](http://www.cloudcomp.ch)
Open Standards

- **Ongoing Support (KK)**
  - remain open to *adjustments* from implementers

- **Open Formats (OCI)**
  - Data and meta data must be represented in Open Standards formats
BUT!

- A "standard" in these terms is only a specification

- To be a "standard" it requires adoption
  - The beginning of adoption comes with reference implementations (OCI)

- An open standard requires implementations
  - IETF "running code"
  - Multiple - one is not enough
  - At least one under Open Source License (OCI)

www.cloudcomp.ch