Open Standards in the Cloud

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Hello!

ICCLab

- Zurich University for Applied Sciences
- Cloud Computing Research

“From Research Themes to Projects creating Impact and Transfer for Educational Excellence”

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Standards...

How Standards Proliferate:
(See: A/C chargers, character encodings, instant messaging, etc)

**Situation:** There are 14 competing standards.

14?! Ridiculous! We need to develop one universal standard that covers everyone's use cases. Yeah!

**Soon:**

**Situation:** There are 15 competing standards.
Lots of Cloud Standards

Booz & Co. finds* 160 cloud standards!!

EC calls it the "Standards Jungle"

So...

What is a Standard?

More importantly, What is an Open Standard?

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What?

The elements:

**Organisation** +
**Specification** +
**Implementation** +
**Adoption** ==

Open Standard

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Open Standards

Defined by:

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

● Open Cloud Initiative - OCI

● OpenStand - OS

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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

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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**

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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
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)

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Recap: What?

**Open Standard** elements:

- **Organisation** +
- **Specification** +
- **Implementation** +
- **Adoption** ==

What about today's specs?

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# IaaS Specification Scorecard

<table>
<thead>
<tr>
<th></th>
<th>EC2</th>
<th>OCCI</th>
<th>CIMI/OVF</th>
<th>OpenStack</th>
<th>CDMI</th>
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The Reality: *De Facto vs. De Jure*

The market dictates the standards

- It selects the API that makes sense collectively
- *That is de facto!*
  - Win for Amazon in the world of IaaS

- *de jure*
  - Specification by committee/community
  - e.g. OpenStack OCCI, CIMI

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Impasse

EC2 is *de facto* but **not** an Open Standard!
Google Compute Engine is coming!

Solutions:
- Accept EC2?
- Demand EC2 submit to the open standards definition?
- Recommend/require a different API?
- Compromise?

European Cloud Partnership aims to tackle this via ETSI
Must avoid monopolistic power
Do They Matter?
Yes and No

Standards 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 CompatibleOne, EGI FedCloud

• Compliance, large IT organisations, government

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Questions?

Thanks!

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Backup
EGI FedCloud

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.
EGI FedCloud Implementation Details

Resource Providers:
- LDAP
- MP/UR Clients
- GWDG (ON/OS)
- CESNET (ON)
- CYFRONET (ON)
- KTH (ON)
- CESGA (ON)
- Venus-C
- FZJ (OS)
- IN2P3-CC (OS)

OCCI 1.1
CDMI 1.0

Information
GLUE 2.0
BDII

Monitoring
Nagios

VM metadata
Marketplace

Accounting
OGF UR
UR+ & StAR

Message Bus

Interop Implemented!

ON = OpenNebula.
OS = OpenStack.
MP = Marketplace.
UR = Usage Records.