



Open Standards in the Cloud

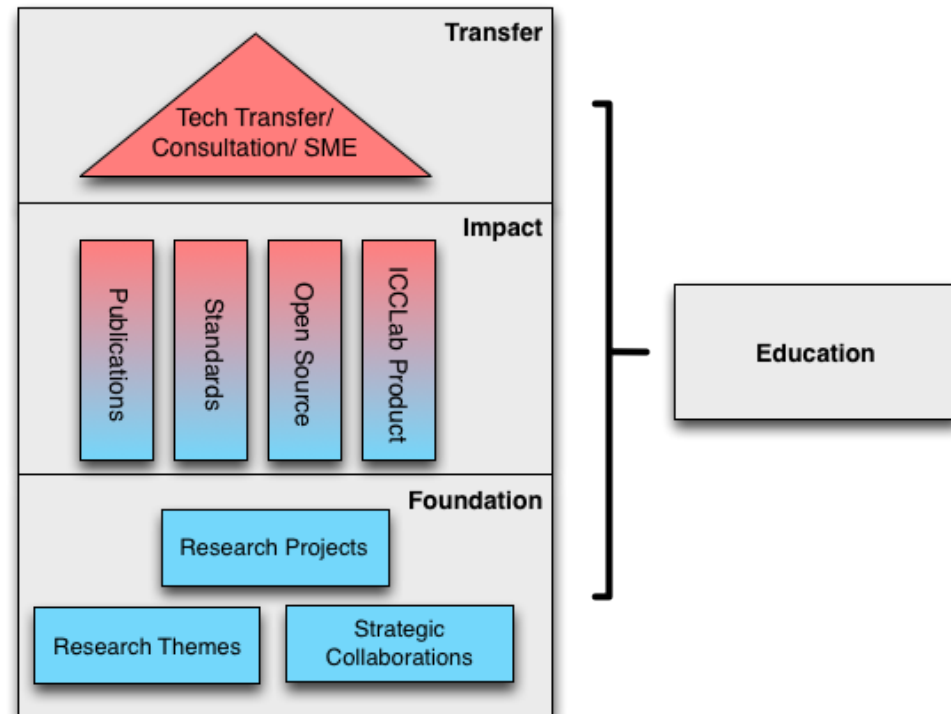
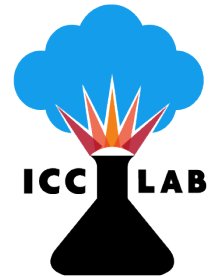
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Hello!

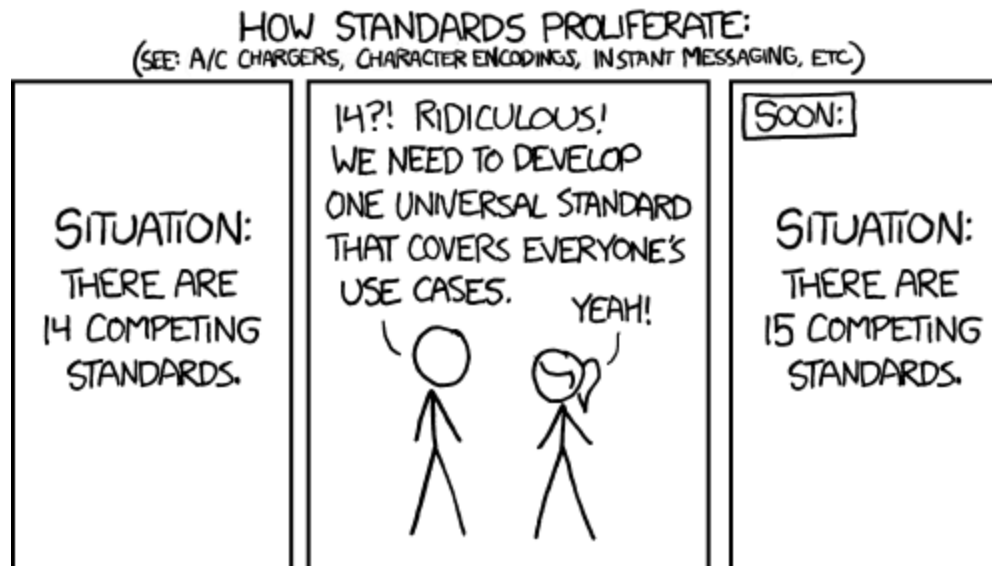
ICCLab

- Zurich University for Applied Sciences
- Cloud Computing Research



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

Standards...



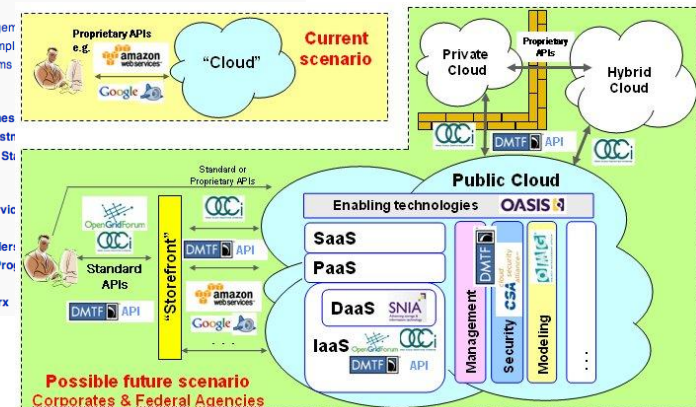


Lots of Cloud Standards

Booz & Co. finds*
160 cloud
 standards!!!

EC calls it the
"Standards Jungle"

- 1 Distributed Management Task Force (DMTF)
 - 1.1 Open Virtualization Format (OVF)
 - 1.2 Open Cloud Standards Incubator
 - 1.2.1 Interoperable Clouds White Paper
 - 1.2.2 Architecture for Managing Clouds White Paper
 - 1.2.3 Use Cases and Interactions for Managing Clouds White Paper
 - 1.3 Cloud Management Working Group (CMWG)
 - 1.3.1 Cloud Infrastructure Management Interface (CIMI)
 - 1.3.2 Cloud Infrastructure Management Interface (CIMI) Primer
 - 1.3.3 Cloud Infrastructure Management Interface – CIM (CIMI-CIM)
 - 1.4 Cloud Auditing Data Federation Working Group (CADF)
- 2 The European Telecommunications Standards Institute (ETSI)
 - 2.1 TC CLOUD
 - 2.1.1 ETSI Terms and Diagrams
- 3 National Institute of Standards and Technology (NIST)
 - 3.1 NIST Working Definition of Cloud Computing
 - 3.2 Standards Acceleration to Jumpstart Adoption of Cloud Computing (SAJACC)
 - 3.2.1 Cloud Computing Use Cases
- 4 Open Grid Forum (OGF)
 - 4.1 Open Cloud Computing Interface (OCCI) Working Group
 - 4.1.1 Open Cloud Computing Interface Core Specification
 - 4.1.2 Open Cloud Computing Interface Infrastructure Specification
 - 4.1.3 Open Cloud Computing Interface HTTP Rendering Specification
 - 4.1.4 Other OCCI-related Documents
- 5 Object Management Group (OMG)
- 6 Open Cloud Consortium (OCC)
- 7 Organization for the Advancement of Structured Information Standards (OASIS)
 - 7.1 OASIS Cloud-Specific or Extended Technical Committees
 - 7.1.1 OASIS Identity in the Cloud (IDCloud) TC
 - 7.1.2 OASIS Symptoms Automation Framework (SAF) TC
 - 7.1.3 OASIS Topology and Orchestration Specification for Cloud Applications (TOSCA)
- 8 Storage Networking Industry Association (SNIA)
 - 8.1 SNIA Cloud TWG
 - 8.1.1 SNIA Cloud Data Manager
 - 8.1.2 SNIA CDMI Reference Impl
 - 8.1.3 SNIA Terms and Diagrams
- 9 The Open Group
 - 9.1 Cloud Work Group
 - 9.1.1 Cloud Computing Business
 - 9.1.2 Building Return on Investment
- 10 Association for Retail Technology Standards
- 11 TM Forum
 - 11.1 Cloud Services Initiative
 - 11.1.1 TM Forum's Cloud Service
 - 11.1.2 Barriers to Success
 - 11.1.3 Enterprise Cloud Leadership
 - 11.1.4 Future Collaborative Programs
 - 11.2 About the TM Forum
 - 11.2.1 TM Forum's Framework



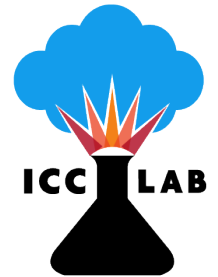
So...



What is a Standard?

More importantly,

**What is an
Open Standard?**



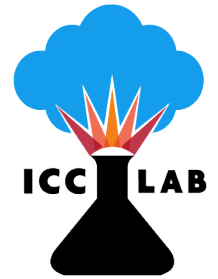
What?

The elements:

Organisation +
Specification +
Implementation +
Adoption ==

Open Standard

Open Standards



Defined by:

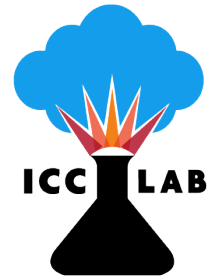
- Ken Krechmer, Colorado University - **KK**
 - Paper: "Open Standards: a Call for Action"

- Open Cloud Initiative - **OCI**



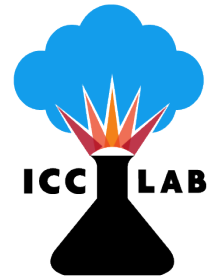
- OpenStand - **OS**





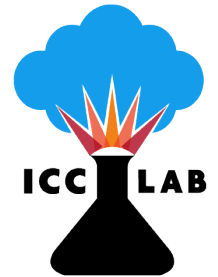
Open Standards

- 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



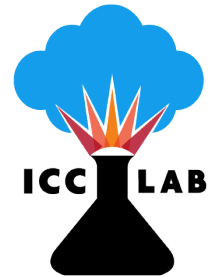
Open Standards

- 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**



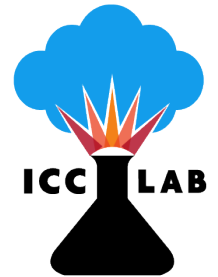
Open Standards

- 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



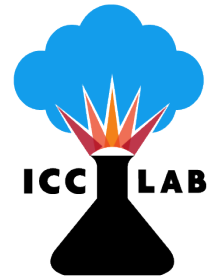
Open Standards

- 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**)



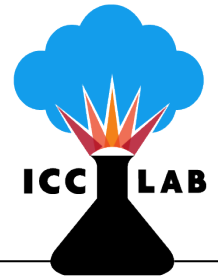
Recap: What?

Open Standard elements:

Organisation +
Specification +
Implementation +
Adoption ==

What about today's specs?

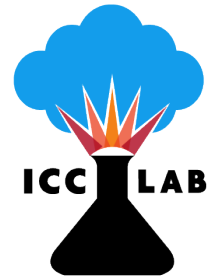
IaaS Specification Scorecard



	EC2	OCCI	CIMI/OVF	OpenStack	CDMI
Open Meeting	No	Yes	No	Yes	No
Consensus	No	Yes	Yes	Yes	Yes
Due Process	No	Yes	Yes	Yes	Yes
Open IPR	No	Yes	Yes	Yes	Yes
One World	Yes	Yes	Yes	Yes	Yes
Open Change	No	Yes	Yes	Yes	Yes
Open Documents	Yes	Yes	Yes	Yes	Yes
Open Interface	Yes	Yes	Yes	Yes	Yes
Open Access	Yes	Yes	Yes	Yes	Yes
Ongoing support	Yes	Yes	Yes	Yes	Yes
Open Formats	Yes	Yes	Yes	Yes	Yes
Implementations	> 2	> 2	2	1*	>2

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



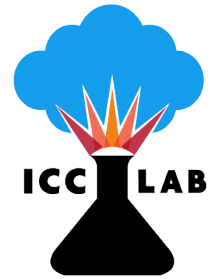
Impasse

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

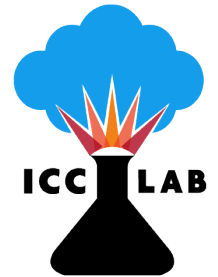
Solutions:

- 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

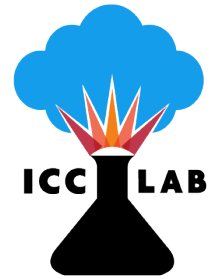


Do They Matter?



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



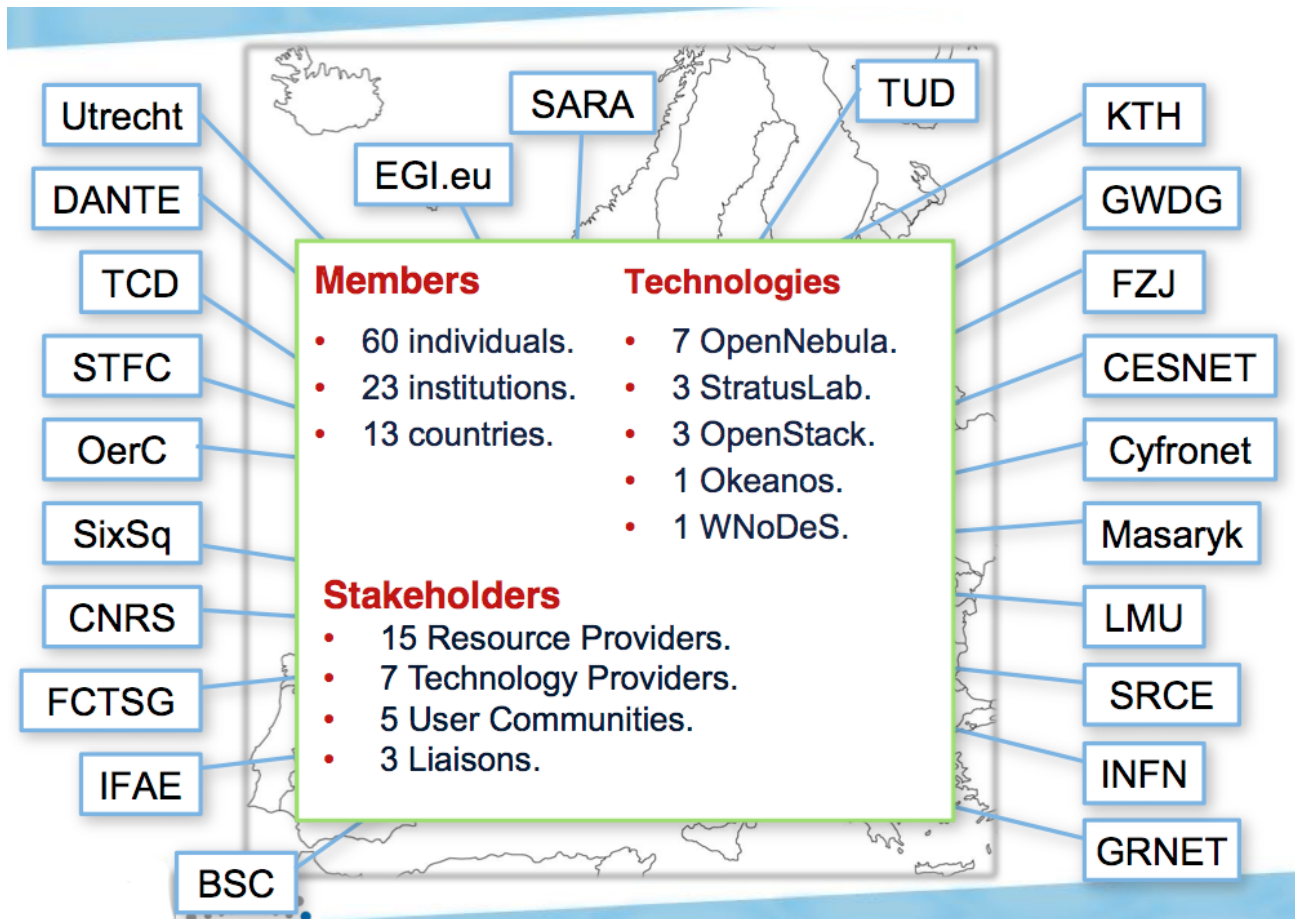
Questions?

Thanks!

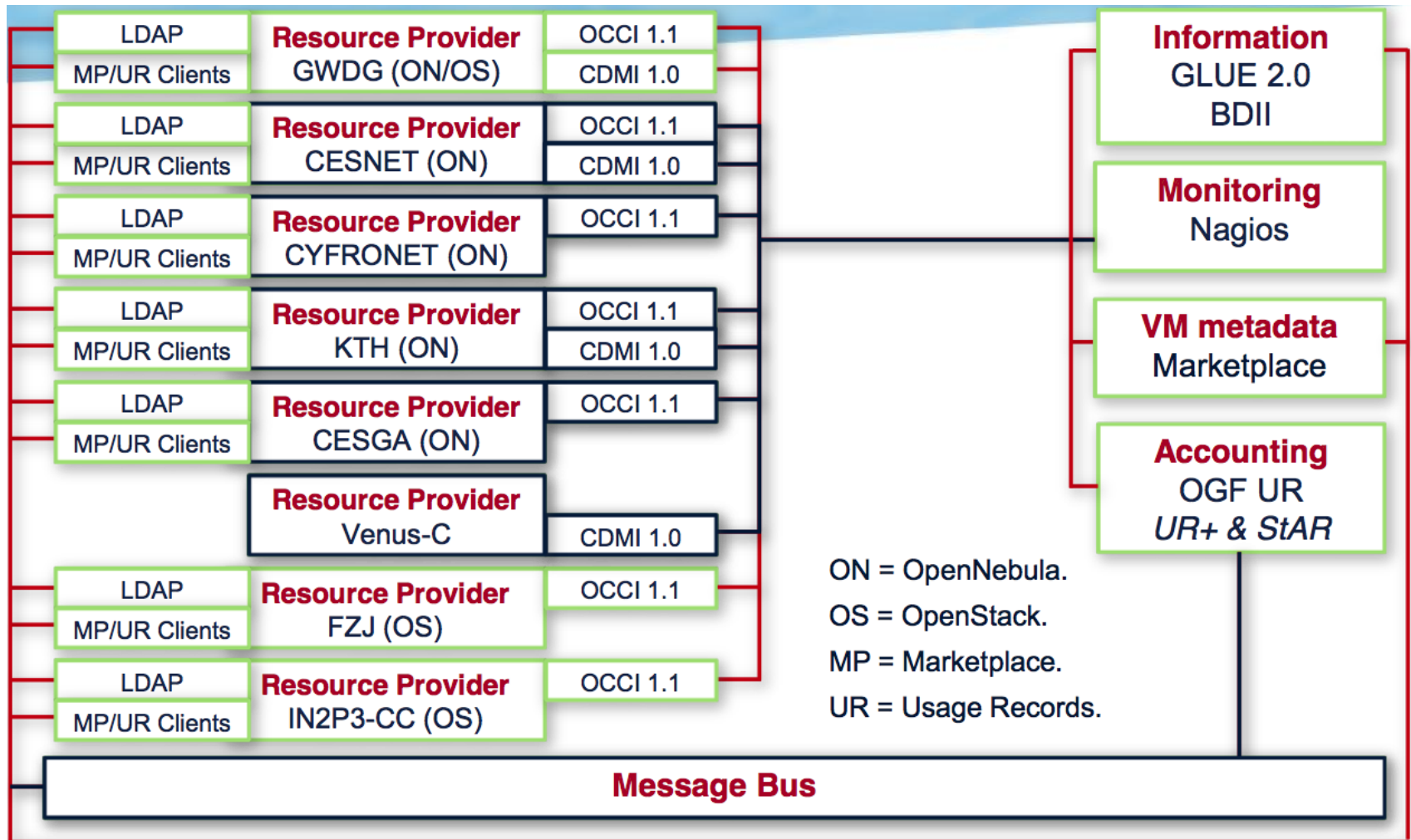
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Backup

EGI FedCloud



EGI FedCloud Implementation Details



Interop Implemented!