User Requirements & Interoperability
Silvana Muscella, OGF.eeig

Session 2.3: Interoperability between Clouds at Several Levels
The role of the SIENA initiative

The SIENA Roadmap

The aim of the SIENA Roadmap is to reduce the required time to reach consensus in distributed computing standardisation initiatives by focusing attention on the main challenges and charting the possible paths to follow.

I therefore welcome the SIENA Roadmap and invite all stakeholders to use it as a reference.

Neelie Kroes, Vice-President of the European Commission

Input & Synergies

Restricted public comment period to:
- Industry Expert Group,
- Special Liaison Group
- Roadmap Editorial Board
- High calibre cloud, grid and standards experts across the globe

Commitment to & follow up on 11 Call for Actions:
- All relevant EU projects
- Standards groups

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The European DCI ecosystem

- Supporting a sustainable pan-European e-infrastructure through federated resources
- Grid middleware components for EGI
- Drives Globus developments for European users
- Joint Cooperation Report identifying common priorities defined by specific agreements
- Leveraging 10 years of R&D and standards development
- Middleware for extension of Service Grids with Desktop computing & cloud computing validation (2 VENUS-C pilots)

DCI representatives are part of the Roadmap Editorial Board

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Standards today

The landscape is dynamic & complex with almost 40 organisations involved in some form of cloud standardisation effort.

Early Cloud specific standards include a core suite developed by DMTF, SNIA & OGF: OCCI, OVF, CDMI

Emerging standards, e.g. IEEE SG (P2301 & P2302), ISO/IEC (JTC1 SC38). ETSI strategic role, W3C is adapting the Web to the capabilities needed for any device interfaces

NIST has classified OCCI, OVF, CDMI & SAML as “high-level” standards in the current landscape

Standards from other domains e.g. OASIS (SAML, privacy & security, portability of applications)

Established protocols from OGF e.g. BES/JSDL, UR

The Cloud Security Alliance (CSA) has analysed cloud-specific and internet-related interoperability challenges

Issues surrounding standards & interoperability are a very different matter when it comes to working in a sustainable environment compared with a project, Godmund Hest, e-IRG Chair
Roadmap – Calls for Action

#2 – strengthen collaborative international dialogue for achieving interoperability & portability

SNIA CDMI interface deployed by multiple DCI projects & other OS initiatives like OpenNebula & OpenStack, Mark Carlson, SNIA

W3C is one of these international activities. We very much welcome that the EC & NSF see the importance of international coordination around interoperability, Rigo Wenning, W3C

CompatibleOne supports this action & will participate actively in this dialogue, Jean-Pierre Laisne, OW2

The DMTF is dedicating efforts to engaging with Telecom cloud suppliers & SDOs, Robert Marcus, DMTF

OASIS has appointed a single point of contact for all cloud related standardisation matters & liaison activities, John Borras, OASIS

#5 – introduce measures to provide open access to all relevant SDO standard documentation

A repository of supporting data would be very helpful, Ian Osborne, Intellect UK
DCI standards implementation

**EGI Federated Cloud Task Force**
- OCC, OVF & CDMI; UR & GLUE; SAML, XACML (OASIS)

**StratusLab**
- OCC & OVF; RDF, XML-RPC, X509v3

**VENUS-C**
- OCC, OVF & CDMI; BES & JSDL; SAML, WS-Security

**TF members**
- StratusLab: CNRS, GRNET, SixSq partners plus the StratusLab marketplace
- VENUS-C: KTH as resource provider plus efforts around CDMI (KTH, BSC)

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Cooperating on standards development & implementation, issues, gaps

Users demand interoperability to avoid lock-in, broaden choice (best performance/cost) and drive innovation

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**Mapping requirements**
- Six key federated cloud capabilities & NIST use cases
- Fraunhofer FOKUS: comparing VENUS-C user requirements with requirements in the German public sector

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Microsoft Open Technologies, Inc.
interoperability, open standards and open source: [http://ur1.ca/978o9](http://ur1.ca/978o9)

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EGI Federated Cloud Test Bed

- EGI Federated Cloud Task Force
  Producing a blueprint by leveraging existing assets & expertise

- Test Bed Demo, EGI Community Forum, March 2012

Tangible assets

Contribute to enabling the support of real-life use cases for the Task Force user communities.

VENUS-C contributed the CDMI proxy server installed on multiple resource providers to expose repositories on different infrastructures and the CDMI client to illustrate 3 use cases for federating.

Matteo Turilli, EGI Task Force

Mark Carlson, SNIA

The CDMI standard is also applicable to cloud-cloud interactions such as federation. There are currently several deployments taking advantage of this feature.
Application developers & interoperability

- VENUS-C: easing migration across different platforms

VENUS-C BLAST client runs on any platform supporting java. The service is easily ported to different IaaS and PaaS providers using VENUS-C components. The use of BES reduces the changes in the porting of the service. It enables targeting Bioinformaticians, regardless of the client platform they use.
Challenges not yet fully addressed

- **EGI**
  - Full standards coverage in the EGI federated IaaS platform is a priority
  - This standards based foundation will enable a collaboration platform with common services

- **StratusLab**
  - Globally accepted standard format for packaging for VMs (OVF seems to be step in the right direction)
  - Different contextualization procedures used for IaaS hinder interoperability
  - Standards defining & sharing appliance metadata for VMs

- **VENUS-C**
  - Common framework for user identification would ease process of federating infrastructures & migrating from different providers
  - Standardizations of APIs at PaaS level would increase impact & reduce dependencies of applications to specific platforms
  - Users should play a more prominent role in defining e-infrastructure requirements

- **Full Interoperability Stack**
  - Political context (compatible visions, aligned priorities and focused objectives)
  - Legal interoperability (legislative alignment so that the data exchanged has legal weight)
  - Organization & process alignment (coordinated processes so different organizations achieve a previously agreed and mutually beneficial goal)
  - Semantic interoperability (precise meaning of exchanged information preserved and understood by all parties)
  - Technical interoperability (planning of technical issues involved in linking computer systems and services)

More focus on PaaS layer is needed, especially as application portability becomes greater concern regarding vendor lock-in at this layer.

Research in data analysis, real-time response & social infrastructures call for global cooperation. Regarding federation, Europe can share its significant experiences in e-infrastructures with NIST, NSF & peers globally.