IEEE Cloud Computing Standards
Presentation to CS SAB

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2 February 2011
## Agenda

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Benefits of Cloud Model

Q. Rate the benefits of the Cloud model
(scale: 1-5; 1=not at all important, 5=very important)

- Pay only for what you use: 77.9%
- Easy/fast to deploy to end-users: 77.7%
- Pay-as-you-go: 75.3%
- Encourages standard systems: 69%
- Requires less IT staff, costs: 67.0%
- Always offers latest functionality: 64.6%
- Sharing systems with partners simpler: 63.9%
- Seems like the way of the future: 54.0%

Source: IDC Enterprise Panel 3Q09 N=263
What’s Worrisome about Cloud?

Q. Rate the **challenges/Issues** of Cloud model
(scale: 1-5; 1=not at all concerned, 5=very concerned)

- Security
- Availability
- Performance
- May cost more
- Lack of interoperability standards
- Bringing back in-house may be difficult
- Hard to integrate with in-house IT
- Not enough ability to customize

70% 75% 80% 85% 90%

% responding 3, 4 or 5

Source: IDC Enterprise Panel 3Q09 N=263
Déjà vu All over Again

- "I’m seeing the possibility of inter-cloud problems mirroring the Internet problems we had thirty or forty years ago."

- "We don't have any inter-cloud standards. The current cloud situation is similar to the lack of communication and familiarity among computer networks in 1973."

- Vint Cerf
## Organizations

- **W3C**
- **IETF**
- **OCC**
- **OMG**
- **CSA**
- **Oasis**
- **Open Group**
- **ITU-T Focus Group on Cloud**
- **ANSI**
- **Intellect-UK**

- **BSA**
- **ECMA**
- **ISO/JTC 1/SC 38**
- **Open Data Center Alliance**
- **NIST**
- **GICTF**
- **IEEE**
- **SNIA**
- **DMTF**
- **OGF**

- **EC FP7, Siena, ..**
- **TM Forum**
- **ENISA**
- **ETSI TC Cloud**
- **Cloud-Standards.org**
- **DISA AFCEA**
- **WEF Cloud Computing Working Group**
- **G Cloud Initiative**
- **J-”too early”**
P2301 Guide for Cloud Portability and Interoperability Profiles (CPIP)

- This guide advises cloud computing ecosystem participants (cloud vendors, service providers, and users) of standards-based choices in areas such as application interfaces, portability interfaces, management interfaces, interoperability interfaces, file formats, and operation conventions.

- This guide groups these choices into multiple logical profiles, which are organized to address different cloud personalities.
P2302 Standard for Intercloud Interoperability and Federation (SIIF)

- This standard defines topology, functions, and governance for cloud-to-cloud interoperability and federation.
  - Topological elements include clouds, roots, exchanges (which mediate governance between clouds), and gateways (which mediate data exchange between clouds).
  - Functional elements include name spaces, presence, messaging, resource ontologies (including standardized units of measurement), and trust infrastructure.
  - Governance elements include registration, geo-independence, trust anchor, and potentially compliance and audit.

- The standard does not address intra-cloud (within cloud) operation, as this is cloud implementation-specific, nor does it address proprietary hybrid-cloud implementations.
Potential Future Cloud Computing PARs

- Standard for Units of Measurement in Cloud Computing
- Guide for Service Levels and Quality of Service in Cloud Computing
- Guide for Industry Specific Regulatory Compliance in Cloud Computing
- Standard for OpenStack Interface Compatibility in Cloud Computing
Suggestions for Going Forward vis-à-vis Sponsorship

- P23XX is sponsored by SAB Sponsored Projects
  - Steve can act as ad hoc sponsor chair
  - David Bernstein willing to chair P2301, P2302

- Proposal to commission a new sponsor: Cloud Computing Standards Committee
  - Seek approval at 25 May SAB if Audcom deadline allows
Cloud Computing Standards Committee Proposal Draft Scope

The Cloud Computing Standards Committee (CCSC) will promote the development of standards in all aspects of the cloud computing ecosystem. It will facilitate the development and use of standards-based choices by cloud computing ecosystem participants (cloud vendors, service providers, and users) in areas such as cloud application interfaces, cloud portability interfaces, cloud management interfaces, cloud interoperability interfaces, cloud file formats, and cloud operation conventions.
Dates

- **SAB**
  - 2 February 2011 (Long Beach)
  - 25 May 2011 (Albuquerque)

- **Audcom**
  - 29 March
    - Submittal deadline 18 February 2011
  - ?? June
    - Submittal deadline ?? May 2011
James Gosling

- Unix emacs (1981) – Programmable editor

- Co-developer of NeWS (1985) – Programmable window system

- Inventor of Java (1994) – Programmable browser
Phase Relationships in the Standardization Process
James Gosling, August, 1990

Ta = Technical Activity Pa = Political Activity
Phase Relationships in the Standardization Process

K = Knowledge
C = Calcification
S = Sensibility of Standardization
Phase Relationships in the Standardization Process

K = Knowledge    C = Calcification

S = Sensibility of Standardization
Phase Relationships in the Standardization Process

$K = \text{Knowledge} \quad C = \text{Calcification}$

$S = \text{Sensibility of Standardization}$
“This standard is too early.”
“This standard is too late.”
“This standard is just right.”
Another Lesson

The Internet

mashup 1  mashup 2  mashup 3  mashup 4

music  video  mapping  photo  search  shopping  reference  travel  weather

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The Web Services Standards Set

- Additional Capabilities
  - Management
  - Portals

- Business Process Orchestration
  - Composition/Orchestration

- Composable Service Elements
  - Security
  - Reliable Messaging
  - Transactionality
  - Endpoint Identification, Publish/Subscribe
    - XML Schema, WSDL, UDDI, SOAP with Attachments
    - XML, SOAP
    - HTTP, HTTPS, Others
Detail of Web Services Security

**WS-Security: SAML Token Profile**
1.1
OASIS
Public Review Draft


**WS-Trust**

WS-Trust describes a framework for trust models that enables Web Services to securely interoperate. It uses WS-Security base mechanisms and defines additional primitives and extensions for security token exchange to enable the issuance and dissemination of credentials within different trust domains.

**WS-Security: X.509 Certificate Token Profile**
1.1
OASIS
Public Review Draft


**WS-SecureConversation**

WS-SecureConversation specifies how to manage and authenticate message exchanges between parties including security context exchange and establishing and deriving session keys.
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Some Relevant Standards

Credit: yellow standards suggested by Mark Carlson and others at the Nov. 5, 2010 NIST Forum.
Open Source

- Open Stack
- Open Nebula
- Reservoir
- Eucalyptus
- Cloud.com
- ...

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