Common Standards in Cloud Computing

1. Working Groups
2. Open Cloud Consortium
3. The Distributed Management Task Force
4. Standards for Application Developers
5. Standards for Messaging
6. Standards for Security

Working Groups

1. A working group is an assembled, cooperative collaboration of researchers working on new research activities that would be difficult for any one member to develop alone.

2. A working group can exist for anywhere between a few months to many years.

3. Working groups generally strive to create an informational document a standard, or find some resolution for problems related to a system or network.

4. Working groups are sometimes also referred to as task groups or technical advisory groups.

Working Groups

- Working groups support the interest and activities of OCC Members. The current working groups include:
- The Open Science Data Cloud (OSDC) Working Group
- Project Matsu
- The Open Cloud Testbed Working Group
- Biomedical Commons Cloud (BCC)
- Working Group on Standards and Interoperability for Clouds
- Working Group on Wide Area Clouds and the Impact of Network Protocols on Clouds.
- Working Group on Information Sharing, Security, and Clouds has a primary focus on standards and standards-based architectures for sharing information between clouds.

Open Cloud Consortium

- The Open Cloud Consortium (OCC) is
  - A not for profit
  - Manages and operates cloud computing infrastructure to support scientific, medical, health care and environmental research.

- OCC members span the globe and include over 10 universities, over 15 companies, and over 5 government agencies and national laboratories.
- The OCC is organized into several different working groups.

The OCC Mission

- The purpose of the Open Cloud Consortium is to support the development of standards for cloud computing and to develop a framework for interoperability among various clouds.
- The OCC supports the development of benchmarks for cloud computing.
- Manages cloud computing testbeds, such as the Open Cloud Testbed, to improve cloud computing software and services.
- Develops reference implementations, benchmarks and standards, such as the MalStone Benchmark, to improve the state of the art of cloud computing.
- Sponsors workshops and other events related to cloud computing to educate the community.

The Distributed Management Task Force (DMTF)

- DMTF enables more effective management of millions of IT systems worldwide by bringing the IT industry together to collaborate on the development, validation and promotion of systems management standards.
- The group spans the industry with 160 member companies and organizations, and more than 4,000 active participants crossing 43 countries.
- The DMTF board of directors is led by 16 innovative, industry-leading technology companies.

The Distributed Management Task Force (DMTF)

DMTF management standards are critical to enabling management interoperability among multi vendor systems, tools and solutions within the enterprise.

The DMTF started the Virtualization Management Initiative (VMAN).

The Open Virtualization Format (OVF) is a fairly new standard that has emerged within the VMAN Initiative.

Benefits of VMAN are

* Lowering the IT learning curve, and

* Lowering complexity for vendors implementing their solutions

Standardized Approaches available to Companies due to VMAN Initiative

1. Deploy virtual computer systems
2. Discover and take inventory of virtual computer systems
3. Manage the life cycle of virtual computer systems
4. Add/change/delete virtual resources
5. Monitor virtual systems for health and performance

Open Virtualization Format (OVF) Features & Benefits

- The OVF simplifies interoperability, security, and virtual machine life-cycle management by describing an open, secure, portable, efficient, and extensible format for the packaging and distribution of one or more virtual appliances.
- The OVF specifies procedures and technologies to permit integrity checking of the virtual machines (VM).
- The OVF also provides mechanisms that support license checking for the enclosed Vms.
- The OVF allows an installed VM to acquire information about its host virtualization platform and runtime environment.

Open Virtualization Format (OVF) Features & Benefits

- One key feature of the OVF is virtual machine packaging portability.
- OVF is, by design, virtualization platform-neutral.
- The OVF streamlined & simplified installation and deployment process using metadata.
- The OVF is designed to be extended as the industry moves forward with virtual appliance technology.

Standards for Application Developers

- The purpose of application development standards is to ensure uniform, consistent, high-quality software solutions.
- Programming standards help to improve the readability of the software, allowing developers to understand new code more quickly and thoroughly.
- Commonly used application standards are available for the Internet in browsers, for transferring data, sending messages, and securing data.

Standards for Browsers (Ajax)

- AJAX (Asynchronous JavaScript and XML), is a group of interrelated web development techniques used to create interactive web applications or rich Internet applications.
- Using Ajax, web applications can retrieve data from the server asynchronously, without interfering with the display and behavior of the browser page currently being displayed to the user.
- The use of Ajax has led to an increase in interactive animation on web pages.

Standards for Browsers (Ajax)

- Using Ajax, a web application can request only the content that needs to be updated in the web pages. This greatly reduces networking bandwidth usage and page load times.
- Sections of pages can be reloaded individually.
- An Ajax framework helps developers to build dynamic web pages on the client side. Data is sent to or from the server using requests, usually written in JavaScript.
- ICEfaces is an open source Ajax framework developed as Java product and maintained by http://icefaces.org.

ICEfaces Ajax Application Framework

1. ICEfaces is an integrated Ajax application framework that enables Java EE application developers to easily create and deploy thin-client rich Internet applications in pure Java.
2. To run ICEfaces applications, users need to download and install the following products:

- Java 2 Platform, Standard Edition
- Ant
- Tomcat
- ICEfaces
- Web browser (if you don’t already have one installed)

Security Features in ICEfaces Ajax Application Framework

1. ICEfaces is the one of the most secure Ajax solutions available.
2. It is Compatible with SSL (Secure Sockets Layer) protocol.
3. It prevents cross-site scripting, malicious code injection, and unauthorized data mining.
4. ICEfaces does not expose application logic or user data.
5. It is effective in preventing fake form submits and SQL (Structured Query Language) injection attacks.

Data (XML, JSON)

1. Extensible Markup Language (XML) allows to define markup elements.
2. Its purpose is to enable sharing of structured data.
3. XML is often used to describe structured data and to serialize Objects.
4. XML provides a basic syntax that can be used to share information among different kinds of computers, different applications, and different organizations without needing to be converted from one to another.

Data (XML, JSON)

1. JSON is a lightweight computer data interchange format. It is a text-based, human-readable format for representing simple data structures and associative arrays (called objects).
2. The JSON format is often used for transmitting structured data over a network connection in a process called serialization. Its main application is in Ajax web application programming, where it serves as an alternative to the XML format.

Solution Stacks (LAMP and LAPP)

1. LAMP is a popular open source solution commonly used to run dynamic web sites and servers. The acronym derives from the fact that it includes Linux, Apache, MySQL, and PHP (or Perl or Python) and is considered by many to be the platform of choice for development and deployment of high-performance web applications which require a solid and reliable foundation.
2. When used in combination, they represent a solution stack of technologies that support application servers.
3.

Linux, Apache, PostgreSQL, and PHP(or Perl or Python) (LAPP)

1. The LAPP stack is an open source web platform that can be used to run dynamic web sites and servers. It is considered by many to be a more powerful alternative to the more popular LAMP stack.
2. LAPP offers SSL
3. Many consider the LAPP stack a more secure out-of-the-box solution than the LAMP stack.