CLOUD STANDARDS INTEROPERABILITY: STATUS UPDATE ON OCCI & CDMI IMPLEMENTATIONS

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Overview OCCI

- RESTful API for Service Management (IaaS and more)
- consisting of 3 parts (OGF proposed recommendations)
  - Core – defines the OCCI model
  - Rendering – defines RESTful rendering using text/plain or text/occi (JSON and XML in next version)
  - Infrastructure – defines IaaS resource parameters
    - compute
    - storage
    - network
- easily extendible by
  - linking to new or external objects and services
  - adding new attributes to existing objects
- very flexible API
- active development and existing implementations
Overview CDMI

- RESTful API for Cloud Data management
- developed by SNIA
- main concepts
  - object storage
  - support for legacy storage
  - containers for grouping
  - metadata
  - simple management
SNIA Cloud Plugfest

- purpose is for vendors to bring their implementations of CDMI and OCCI to test, identify, and fix bugs in a collaborative setting
- organised by Storage Networking Industry Association
  - 1st plugfest April 2011 at SNIA Technology Center
  - 2nd plugfest July 2011 at SNIA Technology Center
  - 3rd plugfest will be Sep. 19 – Sep 22. 2011 in Santa Clara
  - 4th plugfest will be spring 2012 in Europe
- remote participation encouraged
- implementations and test instances will be collected in a wiki
Status OCCI Implementations

- OCCI 1.1 Client / Server frameworks
  - OCCI for OpenNebula – Ruby framework, OpenNebula, SLA@SOI
  - occi-py – Python Framework, developed by OGF (Ralf Nyren)
  - occi4java – Java Framework, developed by TU Dortmund University
  - pyocci – Python module, part of Service Sharing Facility developed by Platform Computing

- OCCI Client libraries
  - R2AD-Cloud-Client – JavaFX + Android implementation developed by R2AD
  - jClouds integration – soon to be released by SLA@SOI EU project

- OCCI Verification Suite
  - developed by OGF OCCI WG to verify standard conformity

- more implementations and information:
  - http://occi-wg.org/community/implementations/
OCCI / CDMI usage

SLA Management

Webservice

OCCI / CDMI Client

OVF

Template

OS

Resource

Storage

Network

Compute

OCCI Server

CDMI Server
OCCI / CDMI Client

Upload OVF file: /Path/to/my.ovf

Create VM from OVF

Select Operating System template:
- Red Hat Enterprise Linux 5.6
- Red Hat Enterprise Linux 6
- SUSE Enterprise Linux 11 SP 1
- Ubuntu 10.04 LTS

Select architecture:
- 32bit
- 64bit

Select Resource template:
- Small instance
- Medium instance
- Large instance
- HPC instance

Create VM

Create customized VM
Storage

- Use CDMI object
- Create empty storage
- Upload image

Use CDMI Storage Object

CDMI Object ID
Search / upload CDMI Object

Create empty Storage object

40 GB

Upload Image

/MyImages/Ubuntu.img
Browse

Create Storage object
OCCI for OpenNebula
OCCI compute object GET

X-OCCI-Attribute: occi.compute.cores="1"
X-OCCI-Attribute: occi.core.summary="A short summary"
X-OCCI-Attribute: occi.core.title="My VM"
X-OCCI-Attribute: opennebula.vm.web_vnc=
  http://localhost:5900/vnc_auto.html?host=localhost&port=5900
X-OCCI-Attribute: occi.core.id=
  "38381d16-b001-11e0-8d67-00163e211160"
X-OCCI-Attribute: occi.compute.memory="4096"
X-OCCI-Attribute: occi.compute.state="active"
X-OCCI-Attribute: occi.compute.architecture="x86"
Link: </storage/...>;... 
Link: </network/...>;...
Link: </compute/...?action=restart>;... 
Link: </compute/...?action=start>;... 
Link: </compute/...?action=stop>;... 
Link: </compute...?action=suspend>;... 
Category: compute; ...
Category: vnc; ...
> hostname: ttylinux_host

/dev/hda1: clean, 744/10200 files, 9468/40792 blocks
root file system checked ................................................... [ OK ]
file systems checked .......................................................... [ OK ]
mounting local file systems .................................................. [ OK ]
setting up system clock (Mon Jul 18 05:41:12 UTC 2011) ............... [ OK ]
mount: mounting /dev/hdc on /mnt/context failed: No such device or address
umount: can't umount /mnt/context: Invalid argument
initializing random number generator ..................................... [ OK ]
startup klogd ................................................................. [ OK ]
startup syslogd ............................................................... [ OK ]
bringing up loopback interface lo ......................................... [ OK ]
bringing up Ethernet interface eth0 ..................................... [ OK ]
set up default gateway ...................................................... [ OK ]
/etc/rc.d/rc.startup/10.network: line 78: ./ifup-eth0.template: No such file or directory
startup dropbear ............................................................ [ OK ]
startup inetd ................................................................. [ OK ]

ttylinux ver 9.0 [RC1]
i486 class Linux kernel 2.6.20 (tty1)
The initial root password is "password".
ttylinux_host login: _
Status CDMI Implementations

- **SNIA CDMI Reference Implementation**
  - reference implementation & installation with OCCI / CDMI support
  - developed by **SNIA**

- **NetApp CDMI Server**
  - developed as closed source by **NetApp**, but testing instance available to Plugfest participants

- **CDMI-Proxy**
  - CDMI proxy server for public cloud backends e.g. AWS, Azure
  - developed as part of **VENUS-C EU project** under BSD license

- **CDMI client libraries**
  - Python – developed by **VENUS-C**, BSD license
  - Java – developed by **VENUS-C**, BSD license
  - Ruby (under dev.) – developed by **OpenNebula**, Apache 2.0 license
OCCI / CDMI Integration Scenario Hadoop
Outlook

- several active OCCI and CDMI implementations
  - progressing well into production ready solutions
- integration of OCCI and CDMI works well
- OVF integration under active development
- SNIA Cloud Plugfest important for testing interoperability
- next steps:
  - advance standards using experience from implementations
  - write implementation experience guides
  - develop combined OCCI / CDMI / OVF verification suite
  - stress/scaling testing
  - interoperability testing
  - extending OCCI with monitoring / reservation capabilities
More information

- OCCI WG website: http://www.occi-wg.org
- SNIA CDMI website: http://www.sniacloud.com/
- OCCI specification: http://www.ogf.org/gf/docs/
- CDMI specification: http://cdmi.sniacloud.com/
- Cloud Standards Wiki
- OCCI Mailinglist
  - http://www.ogf.org/mailman/listinfo/occi-wg
- Cloud-Demo Google Group
  - http://groups.google.com/group/cloud-demo
Thank you for your attention!