CLOUD STANDARDS INTEROPERABILITY: STATUS UPDATE ON OCCI & CDMI IMPLEMENTATIONS

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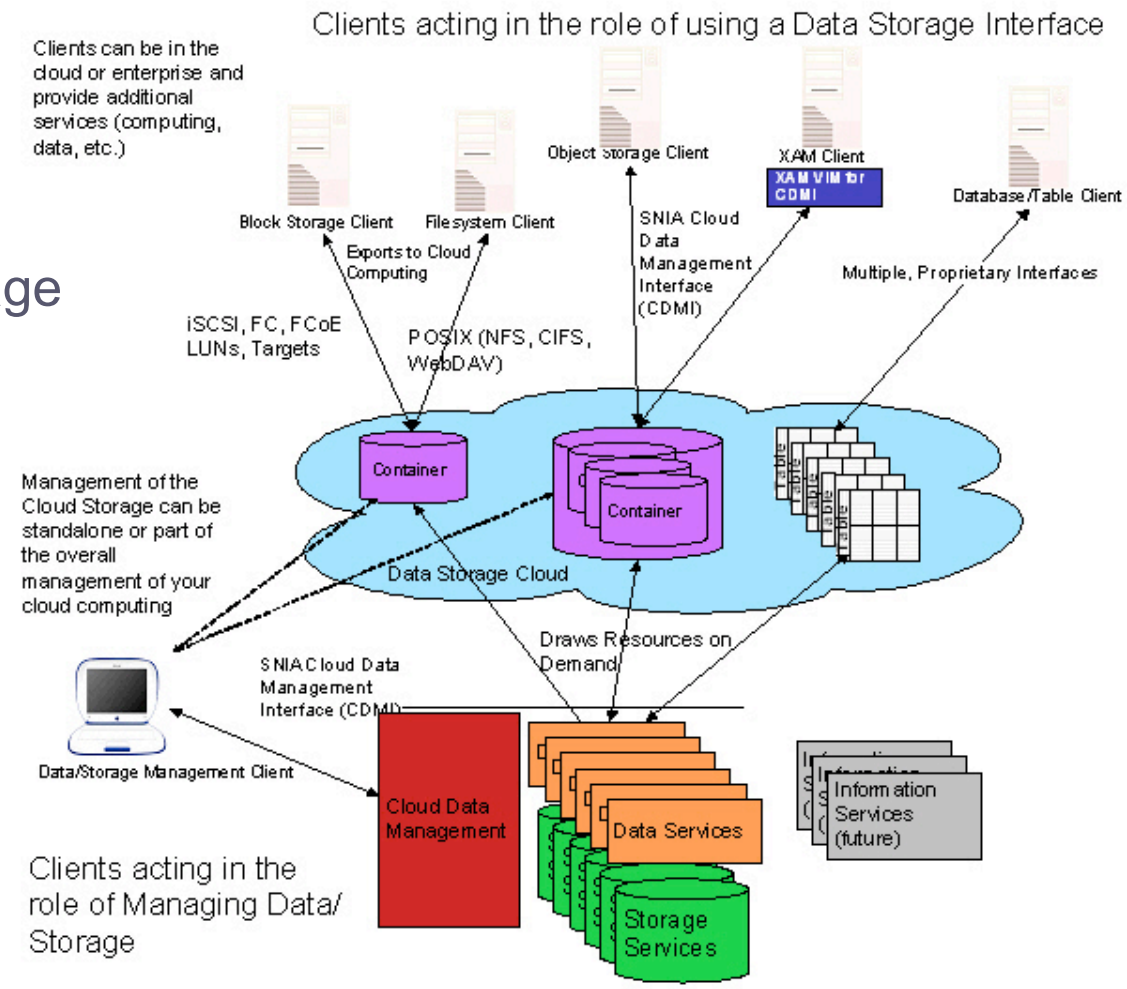
Overview OCCI

- 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



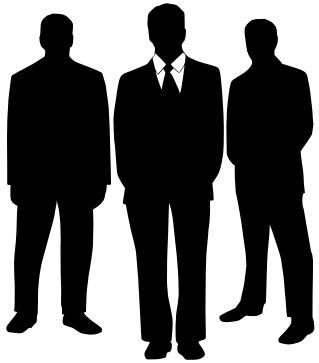
SNIA Cloud Plugfest

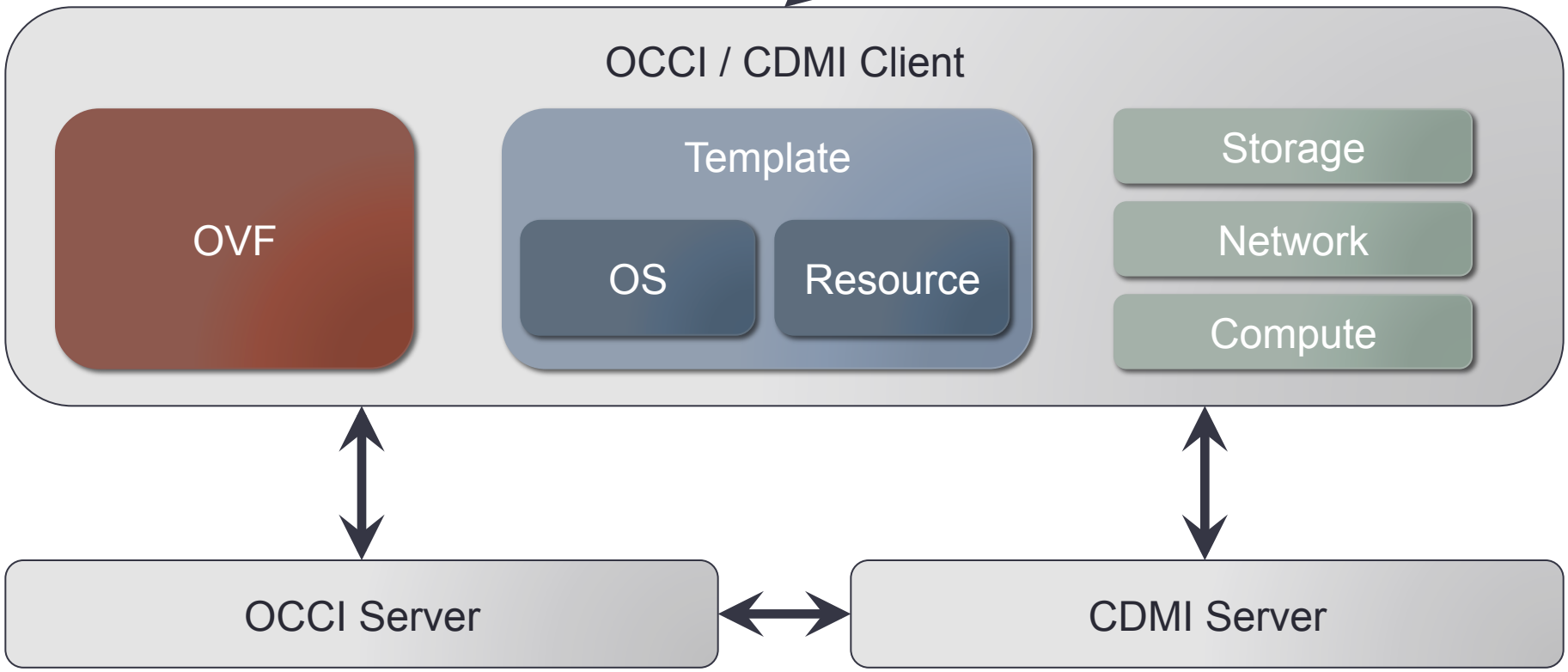
- purpose is for vendors to to bring their implementations of CDMI and OCCI to test, identify, and fix bugs in a collaborative setting
- organised by Storage Networking Industry Association
  - 1st plugfest April 2011 at SNIA Technology Center
  - 2nd plugfest July 2011 at SNIA Technology Center
  - 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
  - http://plugfest.sniacloud.com/wiki/index.php

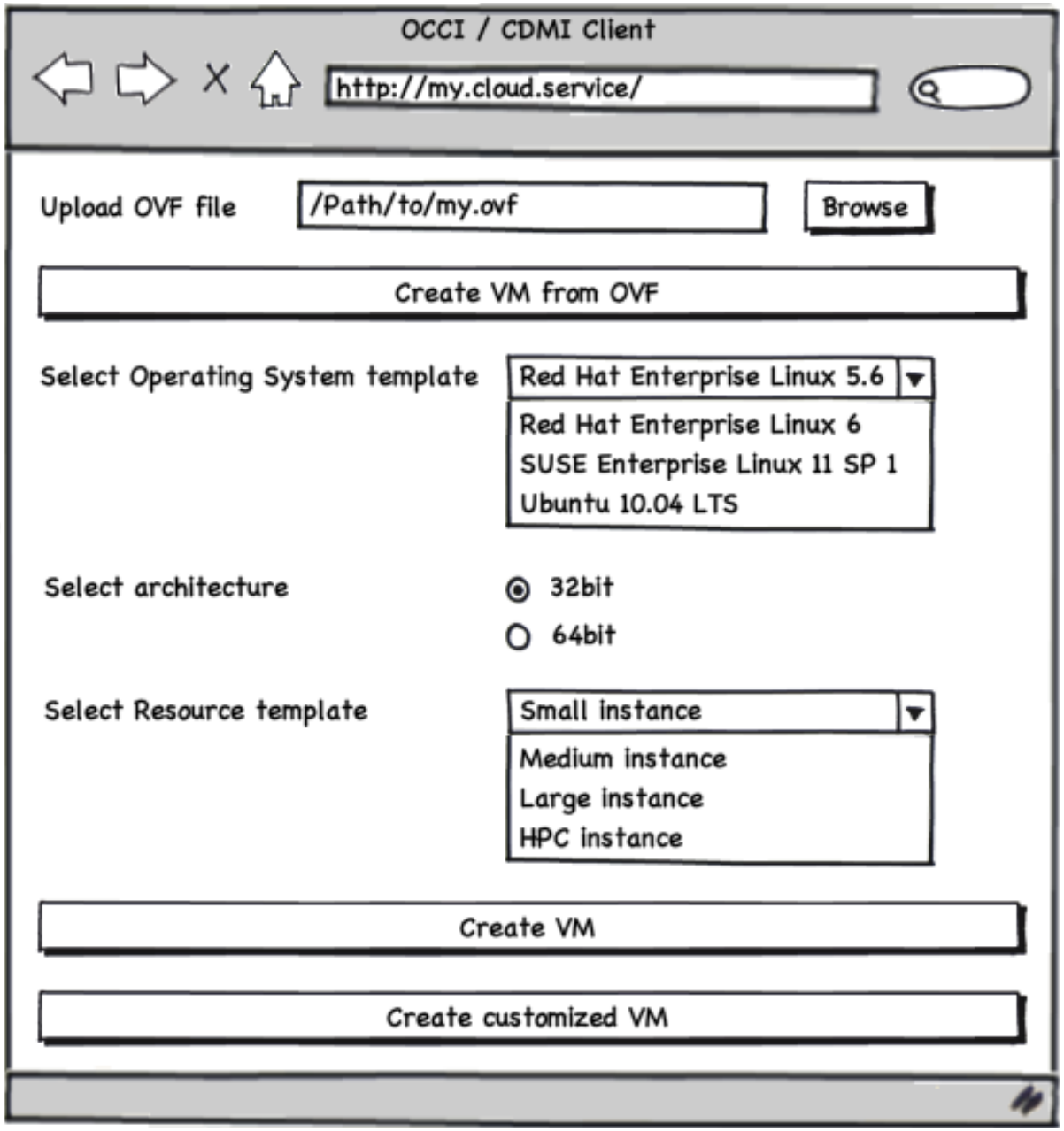
Status OCCI Implementations

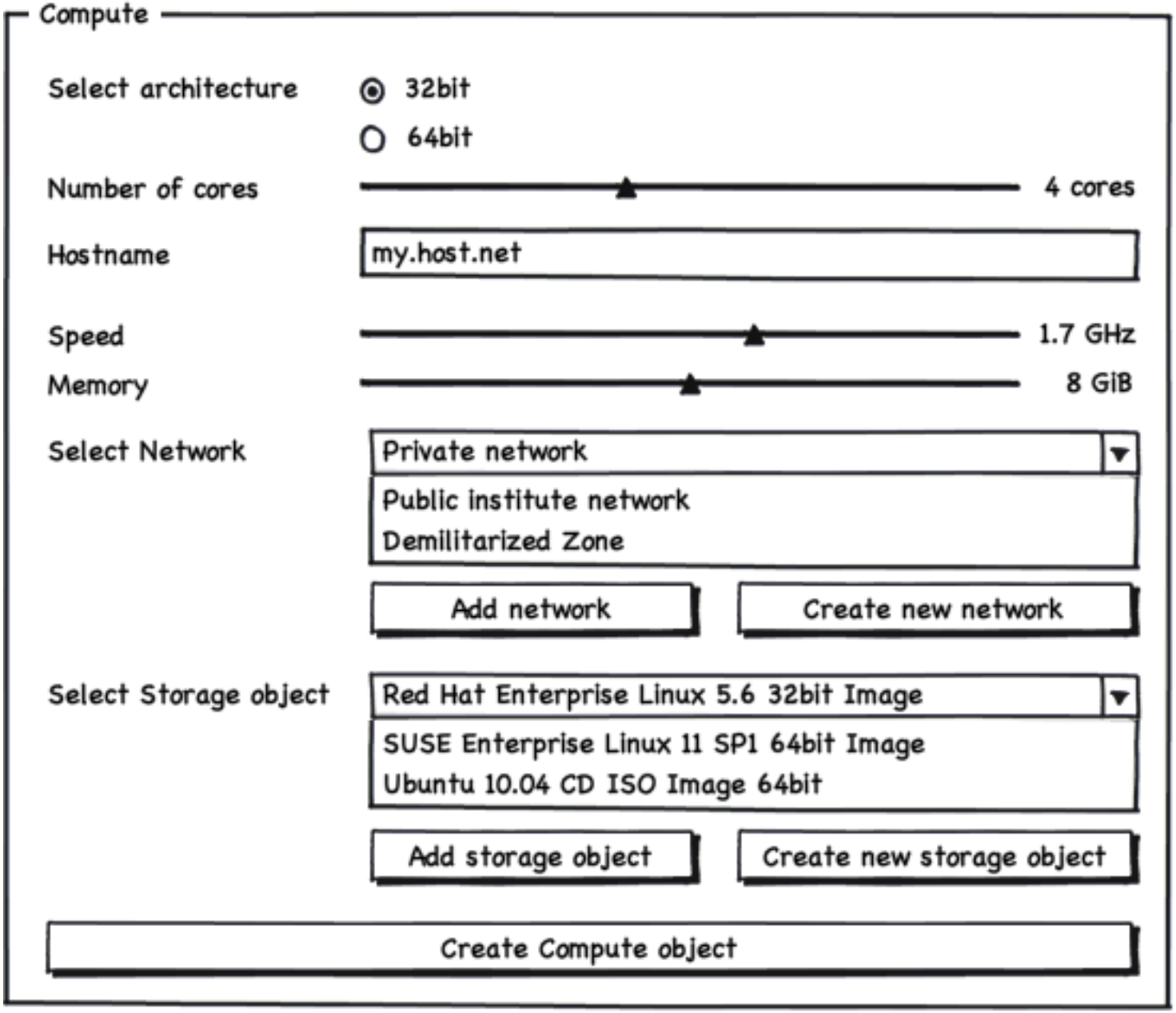
- OCCI 1.1 Client / Server frameworks
  - pyocci – Python module, part of Service Sharing Facility developed by **Platform Computing**
  - OCCI for OpenNebula – Ruby framework, **OpenNebula Ecosystem project**
  - occi-py – Python Framework, developed by **OGF (Ralf Nyren)**
- OCCI Client libraries
  - 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/

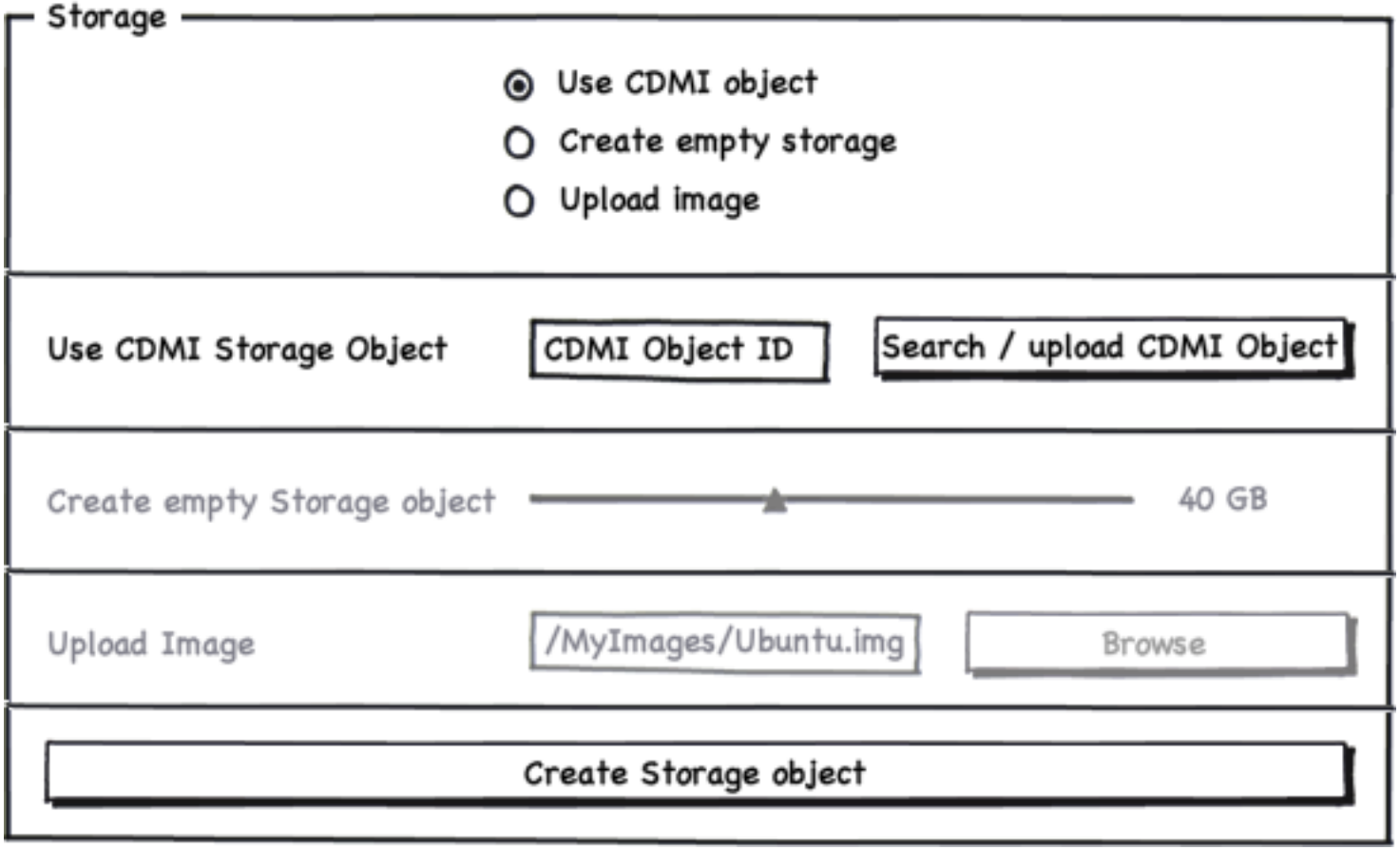
OCCI / CDMI usage

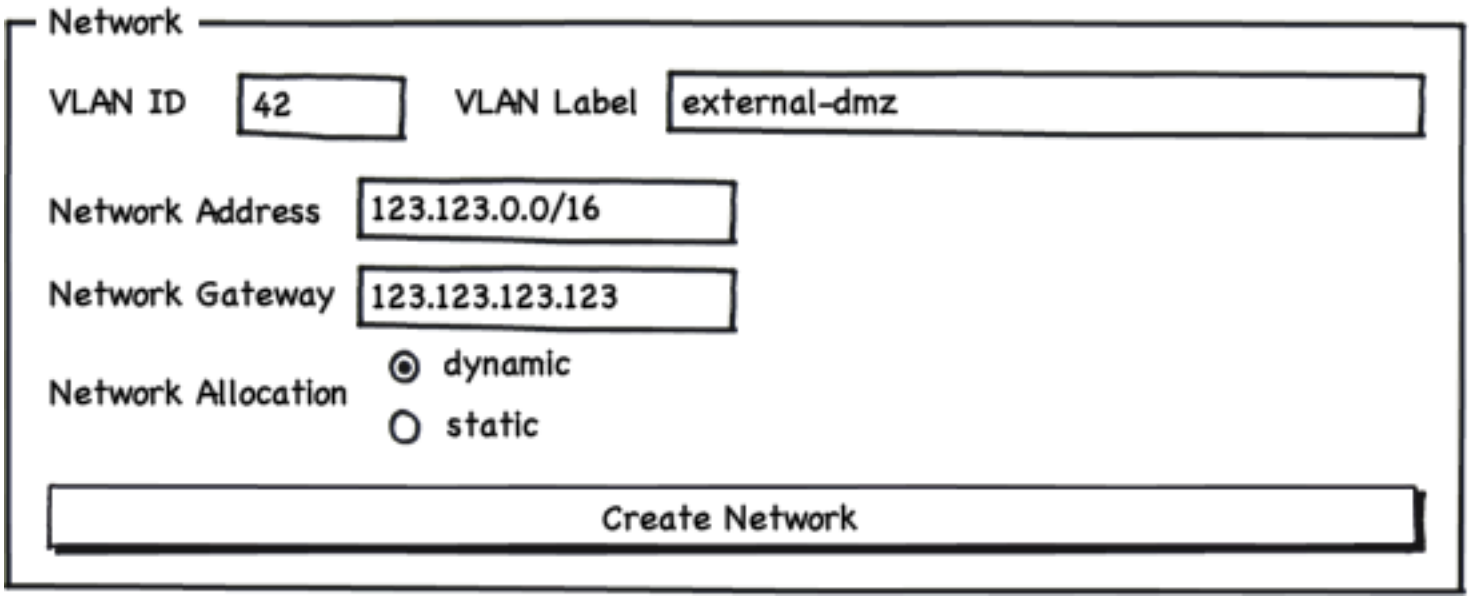




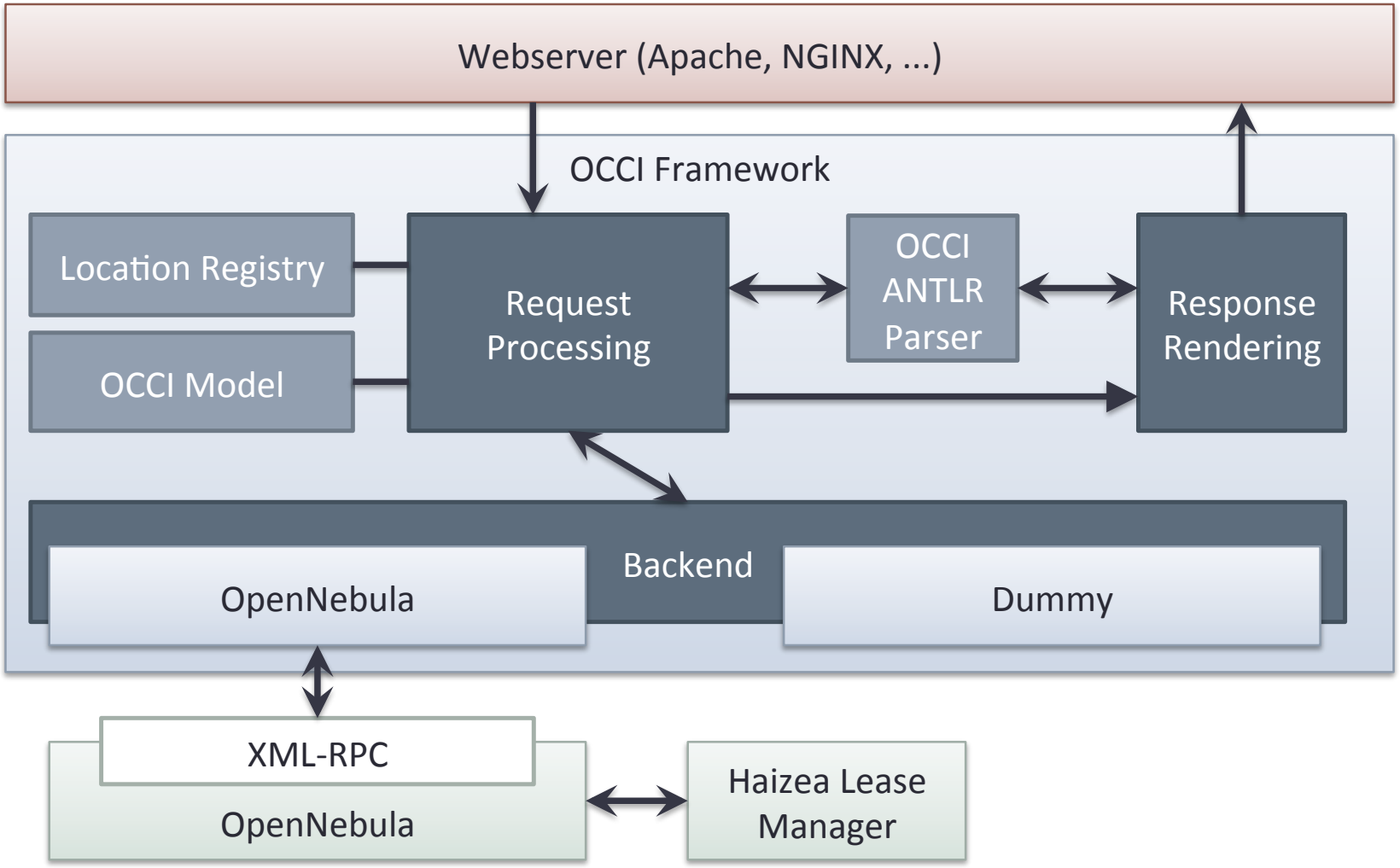

OCCI / CDMI Client
http://my.cloud.service/
Upload OVF file
/Path/to/my.ovf
Browse
Create VM from OVF
Select Operating System template
Red Hat Enterprise Linux 5.6
Red Hat Enterprise Linux 6
SUSE Enterprise Linux 11 SP 1
Ubuntu 10.04 LTS
Select architecture
32bit
64bit
Select Resource template
Small instance
Medium instance
Large instance
HPC instance
Create VM
Create customized VM


Compute
Select architecture
32bit
64bit
Number of cores
4 cores
Hostname
my.host.net
Speed
1.7 GHz
Memory
8 GiB
Select Network
Private network
Public institute network
Demilitarized Zone
Add network
Create new network
Select Storage object
Red Hat Enterprise Linux 5.6 32bit Image
SUSE Enterprise Linux 11 SP1 64bit Image
Ubuntu 10.04 CD ISO Image 64bit
Add storage object
Create new storage object
Create Compute object


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

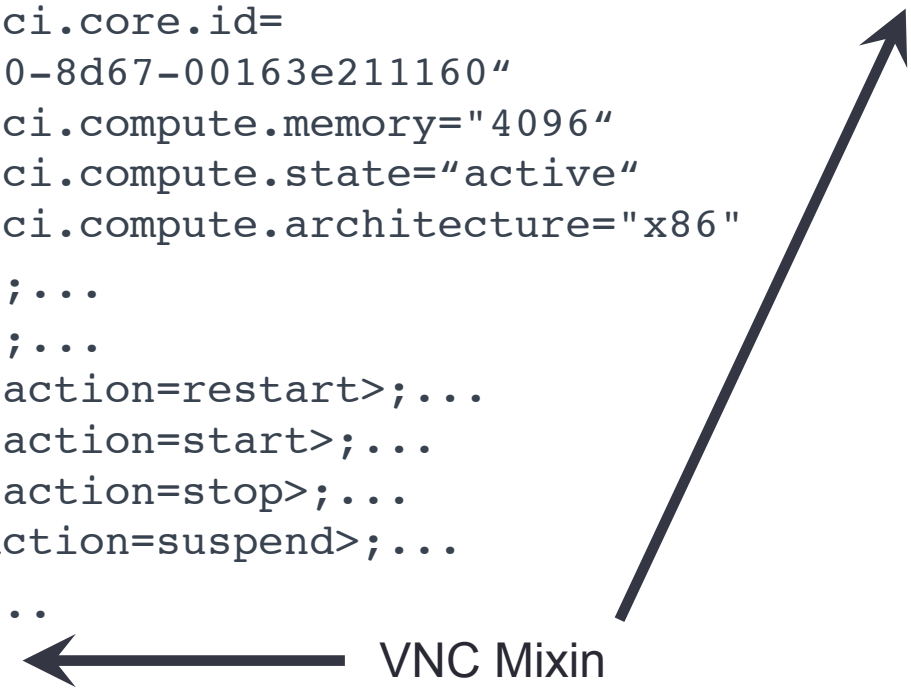

Network
VLAN ID
42
VLAN Label
external-dmz
Network Address
123.123.0.0/16
Network Gateway
123.123.123.123
Network Allocation
dynamic
static
Create Network

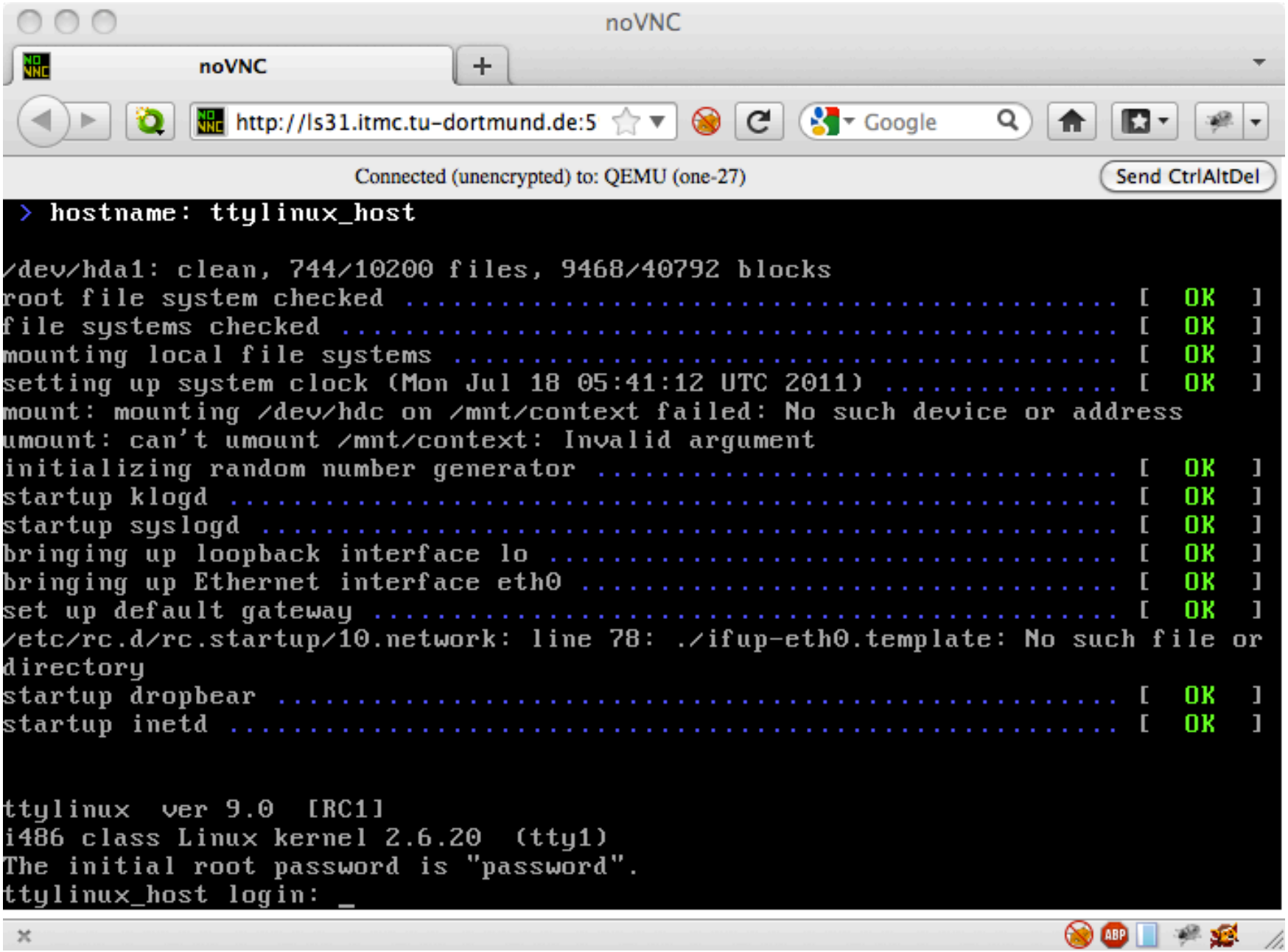
OCCI for OpenNebula



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; ...
```

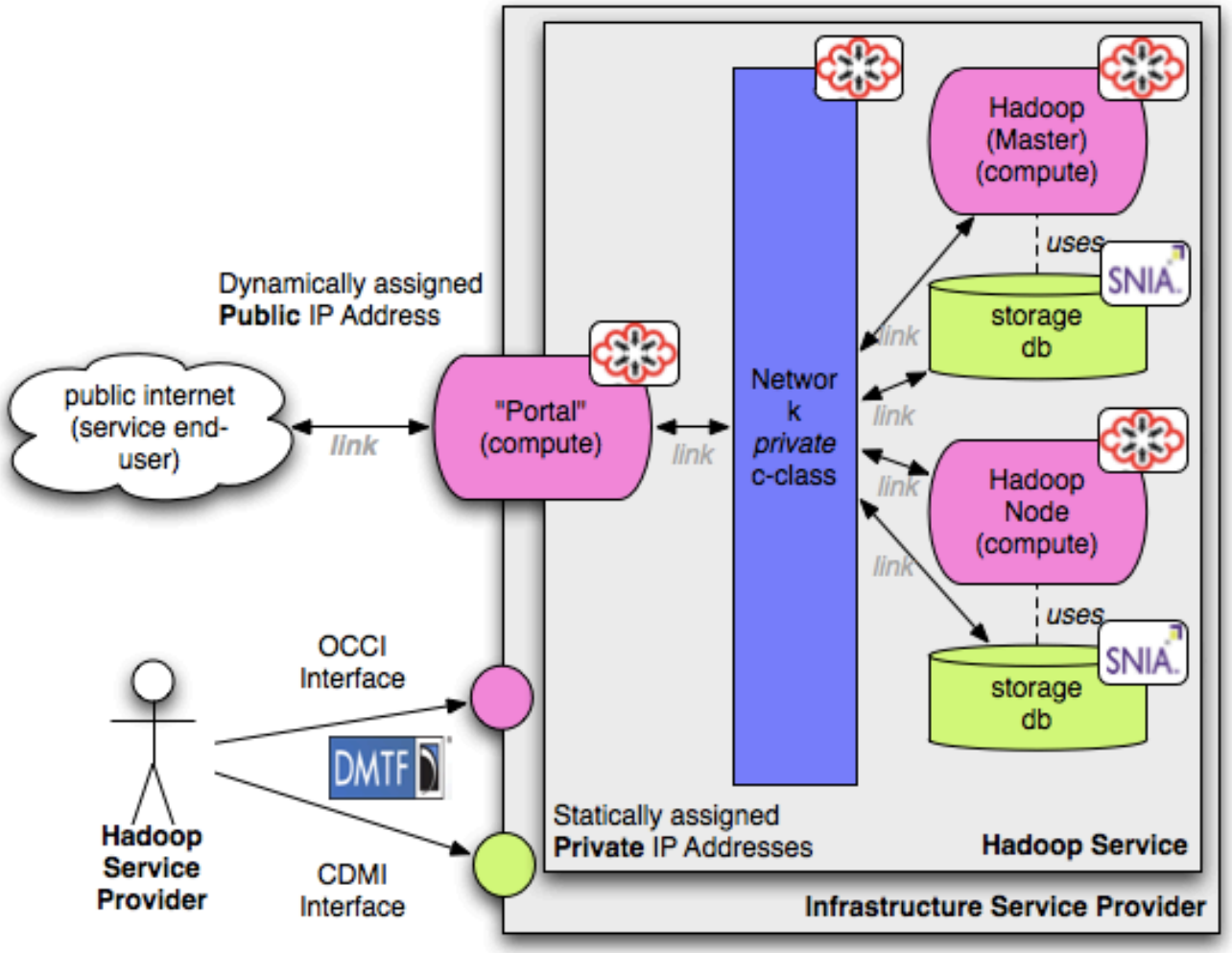



noVNC
noVNC
http://ls31.itmc.tu-dortmund.de:5
Google
Connected (unencrypted) to: QEMU (one-27)
Send CtrlAltDel
> hostname: ttylinux_host
/dev/hda1: clean, 744/10200 files, 9468/40792 blocks
root file system checked ..... [OK]
file systems checked ..... [OK]
mounting local file systems ..... [OK]
setting 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 exerpience from implementations
  - write implementation experience guides
  - develop combined OCCI / CDMI / OVF verification suite
  - stress/scaling testing
  - interoperability testing

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
  - http://cloud-standards.org/wiki/index.php
- OCCI Mailinglist
  - http://www.ogf.org/mailman/listinfo/occi-wg
- Cloud-Demo Google Group
  - http://groups.google.com/group/cloud-demo
- Open Standards, An Open Cloud – DMTF APTS mtg. 2011 by Andy Edmonds, Thijs Metsch, Eugene Luster

Thank you for your attention!