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OCCI implementation on top of OpenNebula

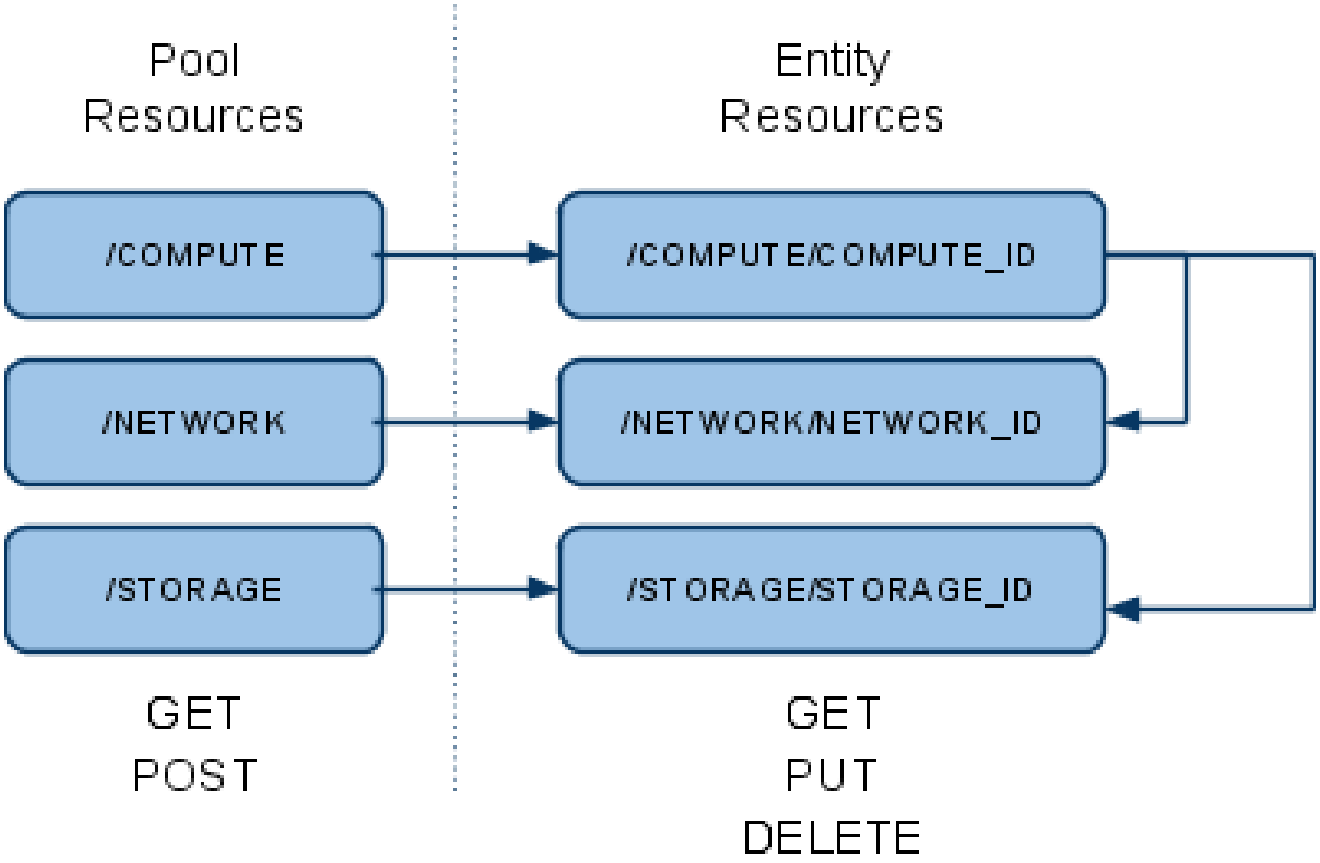
Constantino Vázquez Blanco

dsa-research.org

Distributed Systems Architecture Research Group
Universidad Complutense de Madrid

OpenNebula OCCI Design

- OpenNebula OCCI RESTful web service
  - Launches and manages images, virtual networks and virtual machines
  - Uses the latest draft of the OGF OCCI API specification



OpenNebula OCCI Design

Command Line Interface

- Managing “compute” resources
  - occi-compute {create, list, show, update, delete}
- Managing “network” resources
  - occi-network {create, list, show, delete}
- Managing “storage” resources
  - occi-storage {create, list, show, delete}

OpenNebula OCCI Design

Pool Resources

The “COMPUTE” Pool

- HTTP Methods : GET, POST

```
<COMPUTES>
  <COMPUTE href="http://www.occi.org/compute/234">
  <COMPUTE href="http://www.occi.org/compute/432">
  <COMPUTE href="http://www.occi.org/compute/123">
</COMPUTES>
```

The “STORAGE” and “NETWORK” Pool

- HTTP Methods : GET, POST
- Similar structure

OpenNebula OCCI Design

Entity Resources

The “STORAGE” Object

- HTTP Methods : GET, DELETE

```
<DISK>
  <ID>123</ID>
  <NAME>Ubuntu 9.04 LAMP</NAME>
  <SIZE>2048</SIZE>
  <URL>file:///images/ubuntu/jaunty.img</URL>
</DISK>
```

The “NETWORK” Object

- HTTP Methods : GET, DELETE

```
<NETWORK>
  <ID>123</ID>
  <NAME>Blue Network</NAME>
  <ADDRESS>192.168.0.1</ADDRESS>
  <SIZE>C</SIZE>
</NETWORK>
```

Entity Resources

The “COMPUTE” Object

- HTTP Methods : GET, PUT, DELETE

```
<COMPUTE>
  <ID>123AF</ID>
  <NAME>Web Server</NAME>
  <TYPE>small</TYPE>
  <STATE>running</STATE>
   <DISKS>
     <DISK image=http://www.occi.org/storage/234 dev=sda1/>
     <SWAP size=1024 dev=sda2/>
     <FS size=1024 format=ext3 dev=sda3/>
   </DISKS>
   <NICS>
     <NIC network=http://www.occi.org/network/4567f
ip="19.12.1.1"/>
     <NIC network=0/>
   </NICS>
</COMPUTE>
```

OpenNebula OCCI Design

Implementation choices

- OCCI Specification incomplete (at the time)
- Assumptions:
  - Representation format
    - XML
    - Resource attributes set by OpenNebula needs
  - Specification not clear about linking resouces
    - XML nesting
  - Specification of local devices
    - Again, OpenNebula uses unix devices with “dev” attributes
      - e.g. : <DISK image="ab5c9770-7ade-012c-f1d5-00254bd6f386" dev="sda1"/>
  - Management verbs not well defined (for stop, resume, etc)
    - Update representation through PUT chosen
      - More RESTful
      - Sometimes can be misleading
  - Storage POST not well defined
    - Upload image through HTTP multipart