

Open Cloud Computing Interface - Infrastructure Models

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Abstract

This document is part of the Open Cloud Computing Interface (OCCI) specification document series. The OCCI document series describes what each OCCI compatible interface needs to provide. The overall OCCI specification itself is setup modular to be extensible and includes the following parts:

- The OCCI Core & Models
- The OCCI Infrastructure Models
- OCCI XHTML5 rendering
- OCCI HTTP Header rendering

Each of these parts is described in a separate document so the overall specification comes in the form of a document series. Where as this document describes the OCCI Infrastructure models.

All these parts and the information within are mandatory for implementors (unless otherwise specified).

1. OCCI Infrastructure

1.1. Introduction

OCCI Infrastructure defines three kinds and various extensions relating to management of cloud infrastructure services (IaaS). With the help of these kinds and possible extensions Virtual Machine deployment, management and monitoring can be described.

1.2. Example

```
> GET /us-east/webapp/vm01 HTTP/1.1
> User-Agent: occi-client/1.0 (linux) libcurl/7.19.4 OCCI/1.0
> Host: cloud.example.com
> Accept: */*
>
< HTTP/1.1 200 OK
```

```
< Date: Sat, 10 Oct 2009 12:56:51 GMT
< Content-Type: application/ovf
< Link: </us-east/webapp/vm01;start>;
<   rel="http://purl.org/occi/action#start";
<   title="Start"
< Link: </networks/dmz>;
<   rel="http://purl.org/occi/kind#network";
<   title="DMZ";
<   address="192.168.0.1/24";
<   interface="eth0"
< Link: </storage/disk1>;
<   rel="http://purl.org/occi/kind#storage";
<   title="Quorum Disk";
<   device="sda"
< Link: </us-east/webapp/build.pdf>;
<   rel="related";
<   title="Documentation";
<   type="application/pdf"
< Category: compute;
<   label="Compute Resource";
<   scheme="http://purl.org/occi/kind#"
< Server: occi-server/1.0 (linux) OCCI/1.0
< Connection: close
<
< <?xml version="1.0" encoding="UTF-8"?>
...
```

1.3. Kinds

Cloud infrastructure can be modeled using three primary kinds: compute, network and storage.

Table 1. Kinds

Kind	URI	Description
compute	http://purl.org/occi/kind#compute	Information processing resources
network	http://purl.org/occi/kind#network	Interconnection resources
storage	http://purl.org/occi/kind#storage	Recorded information resources

1.3.1. Compute

A compute resource is capable of conducting computations (e.g. a virtual machine).

1.3.1.1. Attributes

The following attributes apply to this kind:

Table 2. Compute Attributes

Attribute	Type	Description
occi.compute.architecture	Enum (x86, x64)	CPU Architecture (e.g. x64)
occi.compute.cores	Float	Number of CPU cores (e.g. 1, 2)
occi.compute.hostname	String	Valid DNS hostname for the resource.

Attribute	Type	Description
occi.compute.speed	Float (10 ⁹ Hertz)	Clock speed in gigahertz (e.g. 2.4)
occi.compute.memory	Float (10 ⁹ bytes)	RAM in megabytes (e.g. 16, 0.512)
occi.compute.status	Enum (active, inactive, suspended)	Status of the compute resource

1.3.1.2. Actions

A number of common states are defined:

Table 3. Compute Actions

Actions	Target State	Parameters
http://purl.org/occi/action#start	active	None
http://purl.org/occi/action#stop	inactive	<i>type</i> Enum (<i>graceful</i> [default], <i>acploff</i> , <i>poweroff</i>)
http://purl.org/occi/action#restart	active	<i>type</i> Enum (<i>graceful</i> [default], <i>warm</i> , <i>cold</i>)
http://purl.org/occi/action#suspend	suspended	<i>type</i> Enum (<i>hibernate</i> [default], <i>suspend</i>)

TODO: Check supported suspend states.

1.3.2. Network

A network resource is capable of transferring data (e.g. a virtual network or VLAN).

1.3.2.1. Attributes

The following attributes apply to this kind:

Table 4. Network Attributes

Attribute	Type	Description
occi.network.vlan	Integer (0..4095)	802.1q VLAN ID (e.g. 4095)
occi.network.label	Token	Tag based VLANs (e.g. external-dmz)
occi.network.address	IPv4 or IPv6 Address (in CIDR notation)	Internet Protocol (IP) network address (e.g. 192.168.0.1/24, fc00::/7)
occi.network.gateway	IPv4 or IPv6 Address (in CIDR notation)	Internet Protocol (IP) network address (e.g. 192.168.0.1/24, fc00::1/64)
occi.network.allocation	Enum (auto, dhcp, manual)	Address allocation mechanism: • auto is handled by

Attribute	Type	Description
		infrastructure and/or guest agent • dhcp uses network-based allocation protocol(s) • manual requires preconfiguration or manual allocation

1.3.2.2. Actions

A number of common states are defined:

Table 5. Network Actions

Actions	Target State	Parameters
http://purl.org/occi/action#down	inactive	None
http://purl.org/occi/action#up	active	None

1.3.3. Storage

A storage resource is capable of mass storage of data (e.g. a virtual hard drive).

1.3.3.1. Attributes

The following attributes apply to this kind:

Table 6. Storage Attributes

Attribute	Type	Description
<code>occi.storage.size</code>	Float (10 ⁹ bytes)	Drive size in gigabytes (e.g. 40, 0.00144)
<code>occi.storage.status</code>	Enum (<i>online</i> , <i>offline</i> , <i>degraded</i>)	Currenty status of the storage resource

1.3.3.2. Actions

A number of common states are defined:

Table 7. Storage Actions

Actions	Target State	Parameters
http://purl.org/occi/action#backup	unchanged	None
http://purl.org/occi/action#offline	offline	None
http://purl.org/occi/action#online	online	None
http://purl.org/occi/action#resize	unchanged	<i>size</i> float (10 ⁹ bytes)
http://purl.org/occi/action#snapshot	unchanged	None

1.4. Extensions

Various extensions provide for more advanced management functionality such as billing, monitoring and reporting.

Bibliography

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