

Open Cloud Computing Interface - XHTML5 rendering

1. OCCI XHTML5 rendering	1
1.1. Introduction	1
1.2. XHTML5	1
1.3. Javascript	5
2. Contributors	6
3. Intellectual Property Statement	6
4. Disclaimer	6
5. Full Copyright Notice	6

Status of This Document

This document provides information to the Cloud and Grid community. Distribution is unlimited.

Copyright Notice

Copyright (c) Open Grid Forum (2009). All Rights Reserved.

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 XHTML5 rendering. This can be used as a User Interface rendering for OCCI.

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

1. OCCI XHTML5 rendering

1.1. Introduction

XHTML5 is an XML-based “concrete syntax” of the HTML5 “abstract language” (the “World Wide Web's markup language”). For the purposes of this rendering specification we mandate XHTML5 as opposed to HTML5. This is because XHTML5 must be well-formed, whereas HTML5 need not be, and the protocol's accessibility to machine parsers is greatly facilitated by requiring a well-formed rendering. The XHTML5 response is served using the application/xhtml+xml internet media type.*HTML5*

1.2. XHTML5

XHTML5 is used to describe a user-friendly rendering of the object, optionally with images, icons, javascript, etc. embedded. It is also marked up with RDFa attributes so as it is also machine readable. The use of RDFa to demarcate semantic content is used throughout the XHTML5 renderings where ever appropriate. This combination of RDFa and XHTML5 is a W3C Recommendation.

Pages are typically either lists of resources (e.g. , , <tr> etc.) or a rendering of an individual resource. To declare an OCCI attribute (e.g. *compute.memory*), the RDFa

property attribute is used. Links in the <head> are specified using the HTML5 <link> element. Links in the <body> are specified using the HTML5 <a> element. Properties and links that are defined to be read-only will appear in the head or body of the appropriate document. To signal to clients that a property is read-write (i.e. modifiable), the set of modifiable properties must be encapsulated in a form *<!--| there is some work remaining to be specified here as all specifications are somewhat deficient - discuss at confcall |-->*.

1.2.1. Examples

What follows is an example representation of an OCCI compute resource rendered as XHTML5. The resource contains read-only and read-write attributes as well as link attributes of the resource.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>OCCI: My Virtual Machine</title>
    <meta http-equiv="Content-Type" content="text/
html; charset=utf-8" />
    <!-- Here links to related resources are inserted -->

  </head>

  <body xmlns:dc="http://purl.org/dc/elements/1.1/"
        xmlns:occi="http://purl.org/occi/"

    <!--
      Here we add all properties related to the compute resource
      Properties that are read/write are enclosed by the <FORM>
      element
      Properties that are read-only are enclosed by any valid HTML5
      element EXCEPT <FORM>
      Whether a property is read/write or read-only is an
      implementation
      detail settled by the provider
    -->

    <!-- Here a set of read-only properties are exposed using RDFa
      vocabularily to signal semantics -->
    <h1 property="occi:title">My Virtual Machine</h1>
    <span property="occi:summary">A simple sample virtual machine</
span>

    Console:
    <a href="/myvm/console.png" rel="http://purl.org/occi/
compute#console"
      type="image/png"></a>
    <a href="ssh://myvm:22"
      rel="http://purl.org/occi/compute#console">SSH</a>

    <!-- Here a set of read/write properties are exposed via a
      HTML5 form. -->
    <!-- The HTML5 FORM supports all the basic HTTP verbs required
      by REST -->
    Attributes:
    <form method="POST" action="/myvm">
      <ul>
```

```

        <li>ID: <input type="text" name="id"
            value="urn:uuid:164a3064-1176-4de3-b24e-e16dc8c2d4ed" /
    >
        </li>
        <li>Cores:
            <select name="compute.cores">
                <option>1</option><option selected>2</
option><option>3</option>
            </select>
        </li>
        <li>Memory: <span property="occi:compute.memory">2048</
span>
        </li>
    </ul>
    <input type="submit" value="Save" />
</form>

<!-- OCCI actions are equivocal and map to HTML5 forms -->
Actions:
<form class="action" method="POST" action="/myvm/start">
    <input type="image" src="occi-start.png" alt="Start" />
</form>
<form class="action" method="POST" action="/myvm/stop">
    <input type="image" src="occi-stop.png" alt="Stop" />
</form>
<form class="action" method="POST" action="/myvm/restart">
    <input type="image" src="occi-restart.png" alt="Restart" />
</form>
<form class="action" method="POST" action="/myvm/resize">
    <select name="compute.cores">
        <option>1</option><option>2</option><option>4</option>
    </select>
    <input type="text" name="compute.memory" value="2048" />
    <input type="image" src="occi-resize.png" alt="Resize" >
</form>
<form class="action" method="DELETE" action="/myvm">
    <input type="image" src="occi-delete.png" alt="Delete" />
</form>

Download
<a href="/myvm.ovf" rel="alternate" type="application/ovf+xml">
    
</a>
<a href="/myvm.xen" rel="alternate" type="application/xen+xml">
    
</a>

</body>
</html>

```

1.2.1.1. Collections

What follows is an example representation of an OCCI compute resource collection rendered as XHTML5. The resources of the collection are displayed with read-only attributes.

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html>

<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en">

```

```

<head>
  <title>OCCL: My Cloud</title>
  <meta http-equiv="Content-Type" content="text/
html; charset=utf-8" />
</head>

<body xmlns:dc="http://purl.org/dc/elements/1.1/"
      xmlns:occl="http://purl.org/occl/">
<h1>My Cloud</h1>

Compute Resources:
<table>
  <th>
    <td>Console</td>
    <td>ID</td>
    <td>Cores</td>
    <td>Memory</td>
    <td>Actions</td>
    <td>Formats</td>
  </th>
  <tr typeof="occl:compute" about="/myvm">
    <td>
      <a href="/myvm/console.png"
        rel="http://purl.org/occl/compute#console" type="image/
png">
        
      </a>
      <a href="ssh://myvm:22"
        rel="http://purl.org/occl/compute#console">SSH</a>
    </td>
    <td property="occl:title">
      urn:uuid:164a3064-1176-4de3-b24e-e16dc8c2d4ed
    </td>
    <td>
      <span property="occl:title">
        My Virtual Machine
      </span><br/>
      <span property="occl:summary">
        A simple sample virtual machine
      </span><br/>
    </td>
    <td property="occl:compute.cores">2</td>
    <td property="occl:compute.memory">2048</td>
    <td>
      <form class="action" method="POST" action="/myvm/start">
        <input type="image" src="occl-start.png" alt="Start" />
      </form>
      <form class="action" method="POST" action="/myvm/stop">
        <input type="image" src="occl-stop.png" alt="Stop" />
      </form>
      <form class="action" method="POST" action="/myvm/restart">
        <input type="image" src="occl-restart.png" alt="Restart" />
      </form>
    </td>
    <td>
      <a href="/myvm.ovf" rel="alternate" type="application/ovf
+xml">
        

```

```
        </a>
        <a href="/myvm.xen" rel="alternate" type="application/xen
+xml">
            
        </a>
    </td>
</tr>
</table>

</body>
</html>
```

1.3. Javascript

Asynchronous Javascript may be used to deliver interactivity without having to reload the page.

1.3.1. Example

In this example, a HTTP request for a resource is asked for and using the OCCI JavaScript client, demonstrates the ability of reading HTML5 headers.

```
var OCCIClient = {};

OCCIClient.URI = document.location.href;
OCCIClient.XHR = null;

if (window.XMLHttpRequest) {
    // code for Firefox, Mozilla, IE7, etc.
    OCCIClient.XHR = new XMLHttpRequest();
} else if (window.ActiveXObject) {
    // code for IE6, IE5
    OCCIClient.XHR = new ActiveXObject("Microsoft.XMLHTTP");
}

if (OCCIClient.XHR!=null) {
    OCCIClient.XHR.onreadystatechange = function() {
        if(OCCIClient.XHR.readyState == 4) {
            x = OCCIClient.XHR.getAllResponseHeaders();
            document.getElementById("header").innerHTML = x;
        }
    }
    OCCIClient.XHR.open("HEAD",OCCIClient.URI, true);
    OCCIClient.XHR.send();
} else {
    alert("Your browser does not support XMLHTTP.");
}
```

Bibliography

Normative References

[HTML5] *HTML 5*. <http://www.w3.org/TR/html5/> [http://tools.ietf.org/html/rfc4287]. Ian Hickson. David Hyatt. World Wide Web Consortium (W3C) 2009-08-25.

[RDFa] *RDFa*. <http://www.w3.org/TR/xhtml-rdfa-primer/> [http://tools.ietf.org/html/rfc4287]. Ben Adida, Creative Commons. World Wide Web Consortium (W3C) 2008-10-14.

Informative References

[http-article] *Is HTTP the HTTP of cloud computing?*. <http://samj.net/2009/05/is-http-http-of-cloud-computing.html> [http://samj.net/2009/05/is-atompub-already-http-of-cloud.html]. Sam Johnston. Australian Online Solutions 2009-05-25.

[HTML5-article] *Misunderstanding Markup: XHTML 2/HTML 5 Comic Strip*. <http://www.smashingmagazine.com/2009/07/29/misunderstanding-markup-xhtml-2-comic-strip/>. Jeremy Keith. Brad Colbow. 2009-07-29.

2. Contributors

The following people have contributed to this document.

Table 1. List of contributors

Name	Affiliation	Contact
Andy Edmonds	Intel - SLA@SOI project	andy@edmonds.be
Sam Johnston	Australian Online Solutions	samj@samj.net
Thijs Metsch	Sun Microsystems - RESERVOIR project	thijs.metsch@sun.com
Gary Mazzaferro	OCCI Counselour - Exxia, Inc.	garymazzaferro@gmail.com

3. Intellectual Property Statement

The OGF takes no position regarding the validity or scope of any intellectual property or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; neither does it represent that it has made any effort to identify any such rights. Copies of claims of rights made available for publication and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the OGF Secretariat.

The OGF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights which may cover technology that may be required to practice this recommendation. Please address the information to the OGF Executive Director.

4. Disclaimer

This document and the information contained herein is provided on an "As Is" basis and the OGF disclaims all warranties, express or implied, including but not limited to any warranty that the use of the information herein will not infringe any rights or any implied warranties of merchantability or fitness for a particular purpose.

5. Full Copyright Notice

Copyright (C) Open Grid Forum (2009). All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the OGF or other organizations, except as needed for the purpose of developing Grid Recommendations in which case the procedures for copyrights defined in the OGF Document process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the OGF or its successors or assignees.