The Site Architecture You Can Edit

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Varnish

Users ➔ GeoDNS ➔ Image server (Squid Web Server) ➔ Distributed object cache (Memcached)

LVS

Varnish

Swift ➔ Membase?

Mobile?

Core databases (MySQL)

External Storage

Search (Lucene)

Invalidation notification
Profiling
Logging

HTTP
MySQL
NFS
Memcache
DNS
HTCP
UDP
'OpenStack' is a [IaaS] [cloud computing] project by [Rackspace Cloud] and [NASA] joined by several companies such as [Cloud.com], [Citrix Systems], [Dell], [enStratus], [NTT Data], [PEER 1], [RightScale], [Cloudkick], [Zenoss], [Limelight], [Scalr], [Advanced Micro Devices|AMD]], [Intel Corporation|Intel]], [Spiceworks], [Canonical] and [Cisco]. It is [Free software|free]] [open source] software released under the terms of the [Apache License]].

[http://openstack.org/projects/compute/ OpenStack Compute (Nova)] is a cloud computing fabric controller (the main part of an IaaS system). It is written in [Python (programming language)|Python]], using the [Eventlet] and [Twisted (software)|Twisted]] frameworks, and relies on the standard [Advanced Message Queuing Protocol|AMQP]] messaging protocol, and [SQLAlchemy]] for data store access. [http://openstack.org/projects/storage/ OpenStack Object Store (Swift)]] is a massively redundant storage system leveraged in cloud solutions.

It will have [Open Virtualization Format] (OVF) support. It integrates code from NASA's [Nebula (computing platform)|Nebula]] platform as well as [Rackspace Cloud#Cloud Files[Rackspace's Cloud Files platform]].

== History ==
In July 2010, Rackspace Hosting and NASA jointly launched a new open source cloud initiative known as OpenStack. The mission of the OpenStack project is to enable any organization to create and offer cloud computing services running on standard hardware. The community’s first official release, code-named Austin, was made available just 4 months later with plans to release regular updates of the software every few months.
Interface

MediaWiki:Common.css

This is the CSS for all skins. Any major changes to this page should first be proposed on its talk page or the Village pump. Please note that changes are visible within minutes. Errors you make here can disrupt the entire encyclopedia, so make sure you know what you are doing. Always check with the W3C CSS Validation Service before and after any changes.

Testing can be done on your personal skin.css. In Mozilla Firefox and Opera, you can also test style changes dynamically with the test styles bookmarklet from squarefree.com. It pops up a window for adding style rules, and updates the page as you type.

If you add or modify anything here, please update the catalogue of CSS classes.

Note: After saving, you have to bypass your browser's cache to see the changes. Internet Explorer: hold down the Ctrl key and click the Refresh or Reload button. Firefox: hold down the Shift key while clicking Reload (or press Ctrl-Shift-R). Google Chrome and Safari users can just click the Reload button. For details and instructions about other browsers, see Wikipedia:Bypass your cache.

```css
/* Main page fixes */
#interwiki-completestlist {
  font-weight: bold;
}
```

MediaWiki:Common.js

This is JavaScript for all users. Any changes to this page should first be proposed on its talk page or the Village pump. Please note that changes are visible within minutes. Errors you make here can disrupt the entire encyclopedia, so make sure you know what you are doing.

Testing can be done on your personal vector.js.

Note: After saving, you have to bypass your browser's cache to see the changes. Internet Explorer: hold down the Ctrl key and click the Refresh or Reload button. Firefox: hold down the Shift key while clicking Reload (or press Ctrl-Shift-R). Google Chrome and Safari users can just click the Reload button. For details and instructions about other browsers, see Wikipedia:Bypass your cache.

```javascript
window.addPortletLink = mw.util.addPortletLink;
/**
 * Redirect User:Name/skin.js and skin.css to the current skin's pages
 * (unless the 'skin' page really exists)
 * @source: http://www.mediawiki.org/wiki/Snippets/Redirect_skin.js
 * @rev: 2
 */
```
Software Development

How to become a MediaWiki hacker

This article is written to help novice developers learn the skills needed to contribute to MediaWiki development.

If you are an experienced developer, visit the developer hub instead.

Overview

The MediaWiki software is written in PHP and uses the MySQL database. Both have been ported to a variety of operating systems, including, but not limited to, most Unix variants (Linux, Mac OS X, etc.) and Microsoft Windows. It is possible to install and use MediaWiki on Linux, Mac OS X and Windows. Note: if you do use Windows, certain features involving external utilities will be unavailable, or only available with special downloads and configuration. Operating system dependent bugs are occasionally observed, it is best to have some knowledge of the difference between the various platforms regardless of which operating system you develop on.

The PHP programming language

If you have no knowledge of PHP (PHP stands for “PHP: Hypertext Preprocessor”) but know how to program in other object-oriented programming languages, have no fear, PHP will be easy for you to learn.
Localization

**Translatewiki.net is a localisation platform for translation communities, language communities, and free and open source projects.**

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Who and what are we?
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Projects using translatewiki.net

- MediaWiki
  - MediaWiki software and extensions
- FreeCol
  - a turn-based strategy game
- Wikiqa
  - MediaWiki extensions used by Wikiqa
- MantisBT
  - web-based bugtracking system
- Pediapress
  - exporting MediWiki pages as PDF documents
Architecture Documentation

Main Page

Boxes: Server roles
Servers: Apaches | Squids | Scalers | NFS | DNS | PowerDNS | Memcached | MySQL | LDAP | Multicast HTCP purging | Virtualization
Backups: CurrentStatus | Disaster Recovery | XMLDatabaseDumps | Offsite
OSs: Ubuntu | Automated installation | Distribution upgrades | Puppet | APT repository | Solaris
Inner: Sensors | console server | switches | APC (remote power strip) | Ipmi | SSL Certificates
War: Security | spider blocks
Maps: batch jobs | Locations of backups, mirrors, etc. | Scripts
Email: Mail | IMAP | Mailing lists | OTRS
Guides: How-Tos | Misc scripts | Wiki farm | Profiling (web interface) | Using the local certificate authority
Network: Design | Switches | BGP | IPs | Utils | 802.1Q | RANCID | NOC Phones
Other: Volunteer Squid Sites | Collected Status | Platform-specific documentation

- Bot and monitoring
- Clusters
Admin logs

Server admin log

March 14

- 19:57 logmsgbot: catrope synchronized php-1.17/extensions/ArticleFeedback/modules/jquery.articleFeedback/jquery.articleFeedback.css 'r83954'
- 19:33 logmsgbot: catrope synchronized php-1.17/extensions/ClickTracking/modules/ext.clickTracking.js 'r83952'
- 19:33 logmsgbot: catrope synchronized php-1.17/extensions/ClickTracking/modules/jquery.clickTracking.js 'r83952'
- 19:28 logmsgbot: catrope synchronized php-1.17/wmf-config/InitialiseSettings.php 'Enable ArticleFeedback on enwiki'
- 19:23 logmsgbot: catrope ran sync-common-all
- 19:22 RoanKattouw: Got sudo weirdness on scap again, running sync-common-all
- 19:21 logmsgbot: catrope synchronizing Wikimedia installation... Revision: 83949:
- 19:20 logmsgbot: catrope synchronized php-1.17/extensions/Collection/Collection.suggest.php 'Syntax error'
- 19:19 RoanKattouw: Running scap to deploy ArticleFeedback (only enabled on test for now, will enable on enwiki after this)
- 18:38 Ryan_Lane: installing sudo schema on nova-controller.tesla and restarting opendj
- 18:14 logmsgbot: catrope ran sync-common-all
- 18:12 RoanKattouw: Running sync-common-all to deploy r83934
- 09:55 Tim: increased memcached read timeout from 100ms to 500ms. This reduced the read timeout rate from 51/s to 3.4/s.
- 09:50 logmsgbot: tstarling synchronized php-1.17/wmf-config/mc.php 'increasing memcached timeout from 100ms to 500ms while monitoring timeout rate'
- 09:44 logmsgbot: tstarling synchronized php-1.17/wmf-config/InitialiseSettings.php 'log memcached timeout errors'
- 09:40 logmsgbot: tstarling synchronized php-1.17/includes/memcached_client.php 'log memcached timeout errors'
Here are some Wikimedia configuration files which are not in Subversion. The files are dynamically generated and are perfectly up-to-date.

Apache configuration

- en2.conf
- foundation.conf
- ganglia.conf
- httpd.conf
- main.conf
- nagios.conf
- nonexistent.conf
- postrewrites.conf
- redirects.conf
- remnant.conf
- wikipedia.conf
- www.wikipedia.conf

MediaWiki configuration

- abusefilter.php (raw text)
- CommonSettings.php (raw text)
Monitoring

Current status Wikimedia Foundation - Core services

Current Performance and Availability Status

<table>
<thead>
<tr>
<th>Service / Website</th>
<th>Performance and Availability Status</th>
<th>Current Performance</th>
<th>Uptime Last 24h</th>
</tr>
</thead>
<tbody>
<tr>
<td>API</td>
<td>Service is operating normally</td>
<td>741 ms</td>
<td>100.0%</td>
</tr>
<tr>
<td>DNS</td>
<td>Service is operating normally</td>
<td>257 ms</td>
<td>100.0%</td>
</tr>
<tr>
<td>Dumps download</td>
<td>Service is operating normally</td>
<td>834 ms</td>
<td>100.0%</td>
</tr>
<tr>
<td>GeoIP lookup</td>
<td>Service is operating normally</td>
<td>149 ms</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Current Network Status

Service Status Details For All Hosts

<table>
<thead>
<tr>
<th>Host</th>
<th>Service</th>
<th>Status</th>
<th>Last Check</th>
<th>Duration</th>
<th>Attempt</th>
<th>Status Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>db10</td>
<td></td>
<td>CRITICAL</td>
<td>03-14-2011 22:45:00</td>
<td>109d 22h 34m 28s</td>
<td>3/3</td>
<td>CRITICAL: Read only: expected ON, got OFF</td>
</tr>
<tr>
<td>db22</td>
<td>RAID</td>
<td>CRITICAL</td>
<td>03-14-2011 22:45:11</td>
<td>53d 23h 56m 20s</td>
<td>3/3</td>
<td>CRITICAL: Defunct disk drive count: 1</td>
</tr>
<tr>
<td>db30</td>
<td>RAID</td>
<td>CRITICAL</td>
<td>03-14-2011 22:45:11</td>
<td>107d 22h 37m 41s</td>
<td>3/3</td>
<td>CRITICAL: logical disas: 1 disassected</td>
</tr>
</tbody>
</table>
Performance Statistics

Wikimedia Cloud Report for Mon, 14 Mar 2011 22:41:35 +0000

Last: hour, Sorted: descending

Wikimedia Cloud (17 sources) (see view)

CPUs Total: 2422
Hosts up: 379
Hosts down: 0

Avg Load (15, 5, 1m): 50%, 51%, 50%
Localtime: 2011-03-14 22:41

Wikimedia Cloud CPU last hour

Wikimedia Cloud Memory last hour

Leaf nodes:
Philosophy: Community Empowerment
Early Community: No staff
Current Ops Situation:
No new non-staff
Current Dev Situation: Minimal staff and community project collaboration
OpenStack: An Empowerment Technology
Community Oriented Test and Development
Goals

- Improved staff and volunteer collaboration
- Privilege escalation for non-ops
- Environment for testing major changes
How to achieve these goals

- Build a production cluster clone
- Allow liberal access to the clone
- Provide a way to add new architecture without affecting clone
- Provide a way to make changes without root
- Provide a way to migrate changes to production
Basic use case

- Ops makes initial default project
  - Clone of production cluster
  - Move puppet configuration to git repo
    - Production and test/dev branches
Basic use case

- New projects mirror community or foundation initiatives
  - Devs build architecture in new project
  - Devs request merge for puppet changes via gerrit
  - Project instances moved to default project and tested
  - Project moved to production cluster
Implementation Details
Test/Dev Architecture
Test/Dev Architecture
OpenStack Configuration

- **Current:**
  - One zone: 1 controller, 3 compute nodes

- **Future:**
  - Test/dev zone per datacenter
  - Production zone per datacenter
  - Wikimedia Labs
OpenStackManager

- MediaWiki extension
- Support for instance, security group, address, volume, key, sudo, DNS, and LDAP management
- Using EC2 API
- Self-documenting via MediaWiki templates
Semantic MediaWiki Integration

- Templates contain semantic annotations
- Nova information queryable via annotations
- Queries displayable via numerous outputs
- Example: Display the sum of storage in GB used for instances in project “tesla” who have the puppet variable “storage_server” set to “true”
<table>
<thead>
<tr>
<th><strong>Resource Type</strong></th>
<th>instance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instance Name</strong></td>
<td>inst13</td>
</tr>
<tr>
<td><strong>Reservation Id</strong></td>
<td>r-4qk0bzg0</td>
</tr>
<tr>
<td><strong>Instance Id</strong></td>
<td>i-000000011</td>
</tr>
<tr>
<td><strong>Instance State</strong></td>
<td>running</td>
</tr>
<tr>
<td><strong>Instance Host</strong></td>
<td>nova-compute1</td>
</tr>
<tr>
<td><strong>Instance Type</strong></td>
<td>m1.tiny</td>
</tr>
<tr>
<td><strong>RAM Size</strong></td>
<td>512</td>
</tr>
<tr>
<td><strong>Number of CPUs</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Amount of Storage</strong></td>
<td>0</td>
</tr>
<tr>
<td><strong>Image Id</strong></td>
<td>ami-00000003</td>
</tr>
<tr>
<td><strong>Project</strong></td>
<td>tesla</td>
</tr>
<tr>
<td><strong>Availability Zone</strong></td>
<td>nova</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Security Group</strong></td>
<td>default</td>
</tr>
<tr>
<td><strong>Launch Time</strong></td>
<td>2011-04-13T20:36:14Z</td>
</tr>
<tr>
<td><strong>FQDN</strong></td>
<td>i-000000011.sdtpa.tesla.wmnet</td>
</tr>
<tr>
<td><strong>Public IP</strong></td>
<td>208.80.152.242</td>
</tr>
<tr>
<td><strong>Private IP</strong></td>
<td>10.0.0.4</td>
</tr>
<tr>
<td><strong>Puppet Class</strong></td>
<td>base, ldap::client::wmf-cluster, exim::simple-mail-sender, ganglia</td>
</tr>
<tr>
<td><strong>Puppet Var</strong></td>
<td>ldap_all=true, lvs_realslver_ips=, cluster=</td>
</tr>
<tr>
<td>Instance Name</td>
<td>Instance Type</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>i-000000012</td>
<td>inst14</td>
</tr>
<tr>
<td>i-000000011</td>
<td>inst13</td>
</tr>
</tbody>
</table>
Test/Dev Architecture
LDAP Integration

- MediaWiki/Gerrit/Nova/Puppet/DNS with LDAP backend
  - Using OpenDJ from ForgeRock
- Instances configured by puppet to use LDAP
  - Wiki account = Shell account
  - Nova projects = Posix Groups
  - Special project role = Sudo access
Authn/Authz Design

- User accounts stored in LDAP
  - Managed by MediaWiki (LdapAuthentication and OpenStackManager extensions)
- MediaWiki account = Nova/Gerrit/Shell account
  - UUIDs for Nova, passwords for Gerrit/MediaWiki/sudo, SSH keys for shell access
  - Default gid/shell via MediaWiki configuration
  - Sudo policies managed via puppet and LDAP
dn: cn=laner,ou=people,dc=tesla,dc.wikimedia,dc=org
sshPublicKey: ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAQEA5i6EW2Qwvv8bEEV0M9UQnSU9i+83pz0tmJ9zU37jimdMNmuxUb/2hi1mzmJlDRYDiZ08dII002MhkkQROQ629kJWU+Dyx2RkxAthF+vDmS
hp/PSnPs6+3qDJ89Af7SRvAQJ3jVmqJ1TzniiLu1A87TDJoFNE2WjqlPlUWDLZa88023C065dL8e907QR70HYPLxbpiJMLYFvdJ1nByquo9t+iV3lu8/WQS1J0PsGriN282qyc3EErir03et75kS7h+1Zhr+Z6BB0MO2cd6SJdl1cChClrHls4zpufUzWXq9ELBIaxYBH5iUYYM4ezSyA+pEbDnEpwe
EiW5w== laner@kaji
uid: laner
loginShell: /bin/bash
secretKey: b97b1daa-4471-4763-be6a-f44adfa80c08
accessKey: 447ca864-041b-4437-8db7-e246297b9b3b
isNovaAdmin: FALSE
objectClass: person
objectClass: organizationalPerson
objectClass: inetorgperson
objectClass: ldappublickey
objectClass: shadowaccount
objectClass: novuser
objectClass: posixaccount
objectClass: top
cn: laner
sn: laner
homeDirectory: /home/laner
uidNumber: 500
mail: rlane@wikimedia.org
gidNumber: 500
displayName: Ryan Lane
Test/Dev Architecture
Puppet Integration

- Puppet w/ LDAP backend
  - Instance creation = Puppet node LDAP entry
  - Variables always added via MediaWiki:
    - Project
    - Instance creator's wiki user name, email address, and language
- More puppet classes and variables via MediaWiki config
Test/Dev Architecture
PowerDNS Integration

- PowerDNS w/LDAP backend
  - Manages public and private domains
  - Instance creation = Private DNS LDAP entry
  - Can add public DNS entries to floating IPs
dn: dc=i-00000007,dc=sdtpa,ou=hosts,dc=tesla,dc=wikimedia,dc=org
objectClass: domainrelatedobject
objectClass: dnsdomain
objectClass: domain
objectClass: puppetclient
objectClass: dcoberject
objectClass: top
puppetVar: ldap_all="true"
puppetVar: lvs_realserver_ips="192.168.1.100"
puppetVar: cluster="tesla"
puppetVar: instancecreator_email=rlane@wikimedia.org
puppetVar: instancecreator_username=Laner
puppetVar: instancecreator_lang=en
puppetClass: base
puppetClass: ldap::client::wmf-cluster
puppetClass: exim::simple-mail-sender
puppetClass: nagios::monitor
puppetClass: lvs::realserver
puppetClass: cache::bits
l: sdtpa
associatedDomain: i-00000007.sdtpa.tesla.wmnet
associatedDomain: testarticle3.sdtpa.tesla.wmnet
dc: i-00000007
aRecord: 10.0.0.6
CloudInit Integration

- Extensive use of CloudInit
  - Default cloud init via MediaWiki config options
  - Cloud-config, scripts, and upstarts supported
  - Using to connect instances with puppet
Test/Dev Architecture
Gerrit Integration

- Puppet config in gerrit
  - All test/dev members can branch
  - First change approval by community
  - Final approvals and merges by ops team
Join our community

• We are hiring
• We love contributors
Uses outside of Wikimedia

- Way to balance ops sanity and developer access
- Our architecture as a reference use
Uses outside of Wikimedia

- Self-documenting architecture
- Queryable architecture
Questions? Comments?

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