

Apache Libcloud

Tomaz Muraus
tomaz@apache.org



Spletne urice #7

Agenda

- Kdo sem jaz
- Zakaj?
- Zgodovina
- Apache Libcloud
- Zgradba projekta
- Compute API
- Storage API
- Load-balancer API
- Primer
- Vprasanja

Kdo sem jaz

- Tomaz Muraus / @KamiSLO
- Student racunalništva in informatike
- Delam za [Cloudkick](#) / [Rackspace](#)
- Vecinoma se ukvarjam z backend zadevami (Python, JavaScript / Node.js, C, ...) in sistemsko administracijo
- avtor vecih odprto-kodnih projektov - <http://github.com/Kami>
- Apache Libcloud committer

Apache libcloud

"Komunikacija z različnimi ponudniki oblacnih storitev preko enotnega in preprostega vmesnika."

```
from libcloud.types import Provider
from libcloud.providers import get_driver
```

```
driver = get_driver(Provider.RACKSPACE)
conn = driver('username', 'api key')
```

```
node = conn.create_node(name='i can has a server!',size=conn.list_sizes()[0],
image=conn.list_images()[0])
```

Apache libcloud

The screenshot shows the Rackspace Cloud Servers management interface. At the top, the Rackspace logo is on the left, and support links (Cloud Status, Knowledge Base, Forums, Tickets, Live Chat) and phone numbers (1-877-934-0407, 0800-083-3012) are on the right. A left sidebar contains navigation links: Home, Hosting, Cloud Files, Cloud Servers (selected), Load Balancers, Your Account, Support, and Logout. The main content area is titled 'Cloud Servers' and contains a blue informational box. Below the box are tabs for 'Server Instances' and 'My Server Images'. A summary bar shows '1 Server(s) (Showing 1 to 1)' with 'Add Server' and 'Delete Selected' buttons and a search input. A table lists the server details.

Cloud Servers

The cloud servers in your account are listed below. Click on the link in the Server Name column to manage the server and its settings. Please note that servers in this list accumulate usage fees regardless of their operational status. If you no longer wish to be billed for a server you must delete the server from your account.

Server Instances My Server Images

1 Server(s) (Showing 1 to 1) Add Server Delete Selected

Status	Server Name	RAM Amount	Primary IP	Distribution	Datacenter	
	icanhasaserver	256	50.56.30.90	Arch 2010.05	ORD1	

Zakaj

- Potreba po standardizaciji
 - Razlicni vmesniki
 - Razlicni formati odgovora (xml, json, text, ...)
 - Razlicni nacini avtentikacije

Zakaj (razlicni formati odgovora - XML)

```
<DescribeInstancesResponse xmlns="http://ec2.amazonaws.com/doc/2010-08-31/">
  <requestId>56d0fffa-8819-4658-bdd7-548f143a86d2</requestId>
  <reservationSet>
    <item>
      <reservationId>r-07adf66e</reservationId>
      <instancesSet>
        <item>
          <instanceId>i-4382922a</instanceId>
          <imageId>ami-0d57b264</imageId>
          <instanceState>
            <code>0</code>
            <name>pending</name>
          </instanceState>
          <privateDnsName/>
          ...
        </item>
      </instancesSet>
    </item>
  </reservationSet>
</DescribeInstancesResponse>
```

Zakaj (razlicni formati odgovora - text based)

```
de:0:0:write:requests 466
rx 760681
vnc:password testpass
ide:0:0 f0202f1c-0b4f-4cfc-8ae3-e30951d09ef0
ide:0:0:read:requests 7467
ide:0:0:read:bytes 165395968
vnc:ip 178.22.66.28
boot ide:0:0
smp 1
started 1286568422
nic:0:model virtio
status active
user 93b34fd9-7986-4b25-8bfd-98a50383605d
ide:0:0:media disk
name cloudsigma node
...
```

Zakaj (razlicni formati odgovora - JSON)

```
[  
  {"ips":[ {"address":"67.214.214.212"} ],  
   "memory":1073741824,"id":"99df878c-6e5c-4945-a635-d94da9fd3146",  
   "storage":21474836480,  
   "hostname":"foo.apitest.blueboxgrid.com",  
   "description":"1 GB RAM + 20 GB Disk",  
   "cpu":0.5,  
   "status":"running"  
}]  
...
```

Zakaj (razlicni nacini avtentikacije)

- Shared secret / token
- HMAC based
- Username & password based
- X509 certificate based

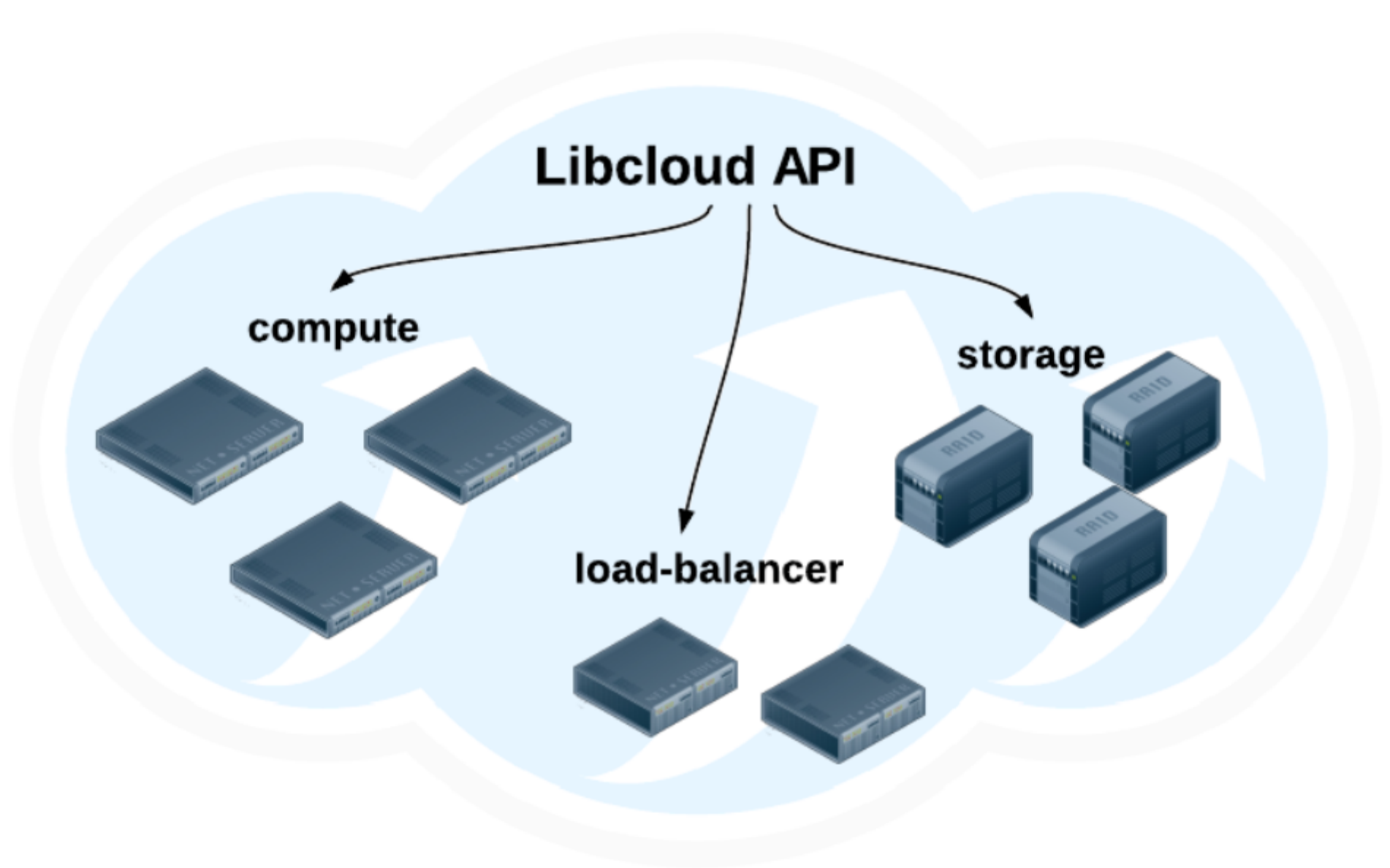
Apache Libcloud

- Knjižnica je nastala leta 2009 v podjetju Cloudkick
- Napisana v programskem jeziku Python
- Se istega leta se je projekt pridružil Apache fundaciji
- Trenutna stabilna različica je **0.4.2** (17. Januar, 2011)
- V razvoju je različica **0.5.0** - veliko novosti (storage API, load-balancer API, novi compute gonilniki) - že na voljo v trunk-u!

Apache Libcloud

- ~10 committerjev, od tega je v zadnjem času aktivnih okoli 5
- kar nekaj prispevkov s strani skupnosti (večinoma so to razni gonilniki)
- Mailing lista - libcloud@incubator.apache.org
- IRC kanal - [#libcloud @ freenode](https://freenode.net/rooms/#libcloud)

Libcloud API



Libcloud API (Compute)



Libcloud API (Compute - terminologija)

- **image**

<NodeImage: id=aki-17765c63, name=ubuntu-kernels-milestone-eu/ubuntu-lucid-amd64-linux-image-2.6.32-305-ec2-v-2.6.32-305.9-kernel.img.manifest.xml, driver=Amazon EC2 (eu-west-1) ...>

- **size**

<NodeSize: id=m1.large, name=Large Instance, ram=7680 disk=850 bandwidth=None price=0.34 driver=Amazon EC2 (us-east-1) ...>

Libcloud API (Compute - terminologija)

- **location**

<EC2NodeLocation: id=0, name=Amazon Europe Ireland, country=IE, availability_zone=eu-west-1a driver=Amazon EC2 (eu-west-1)>

- **node**

<Node: uuid=7e25ff022bfa952d15558d1c362e258d274b747e, name=i-db3fbcad, state=0, public_ip=['46.137.19.67'], provider=Amazon EC2 (eu-west-1) ...>

Libcloud API (Compute - metode)

- `list_images()`
- `list_sizes()`
- `list_locations()`
- `list_nodes()`
- `create_node()`
- `destroy_node()`
- `reboot_node()`
- `deploy_node()`
- `ex_*` - funkcionalnosti, ki so specifične nekemu ponudniku

Libcloud API (Storage) - v razvoju



Libcloud API (Storage) - v razvoju

- `list_containers()`
- `list_container_objects()`
- `get_container()`
- `get_object()`
- `download_object()`
- `download_objects_as_stream()`
- `upload_object()`
- `upload_objects_via_stream()`
- `delete_object()`

Libcloud API (Storage) - v razvoju

- `delete_container()`
- `create_container()`

Libcloud API (Load Balancer) - v razvoju



Libcloud API (load-balancer) - v razvoju

- `list_balancers()`
- `create_balancer()`
- `destroy_balancer()`
- `balancer_detail()`
- `balancer_attach_node()`
- `balancer_detach_node()`
- `balancer_list_nodes()`

Show me teh code

- True multi-cloud demo!



Show me teh code

- OK, maybe not :(

```
libcloud.common.types.LibcloudError: <LibcloudError in <libcloud.resource.lb.drivers.gogrid.GoGridLBDriver object at 0x1015e4b10> 'Exception: An unexpected server error has occurred. Please email this error to apisupport@gogrid.com. Error Message : null'>
```

Show me teh code

- multi-cloud deployment demo!



Show me teh code

- Na Rackspace CloudFiles naloži naso demo aplikacijo
- Pri Amazonu (EC2) zazeni dva streznika
- Na streznika prenesi prej naloženo aplikacijo in jo zazeni
- Ustvari loadbalancer pri GoGrid Rackspace in dodaj novo pravilo za random balancing nasih aplikacij
- Test it!

Show me teh code

- Demo app: Preprost HTTP streznik, ki na vsako zahtevo odgovori z "Hello World <server name>"

```
#!/usr/bin/env node
```

```
var http = require('http');  
var serverName = process.argv[2];  
  
http.createServer(function (req, res) {  
  res.writeHead(200, {'Content-Type': 'text/plain'});  
  res.end('Hello World from ' + serverName + '\n');  
}).listen(80, '0.0.0.0');  
console.log('Server listening on http://0.0.0.0:80');
```

Show me teh code

- Demo: <https://gist.github.com/964654>

Orodja zgrajena na Libcloud

- Silverlining - <http://cloudsilverlining.org>
- felicity - <https://github.com/mig5/felicity>
- overmind - <https://github.com/tobami/overmind>
- ...
- clone it and build your own app on top! :)

Podobne knjiznjice v drugih jezikih

- fog (Ruby)
- deltalclouds (Java)
- jclouds (Java)

Vprasanja



Vprasanja

- **Stran:** <http://libcloud.org>
- **Github:** <https://github.com/apache/libcloud>
- **Issues:** <https://issues.apache.org/jira/browse/LIBCLOUD>
- **Mailing list:** libcloud@incubator.apache.org
- **IRC:** #libcloud @ Freenode