Apache Libcloud

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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 racunalnistva 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 razlicnimi 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

Zakaj

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

Zakaj (razlicni formati odgovora - XML)

```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/>
          ...
```

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

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

Apache Libcloud

- ~10 committerjev, od tega je v zadnjem casu aktivnih okoli 5
- kar nekaj prispevkov s strani skupnosti (vecinoma so to razni gonilniki)
- Mailing lista - libcloud@incubator.apache.org
- IRC kanal - #libcloud @ freenode

Libcloud API
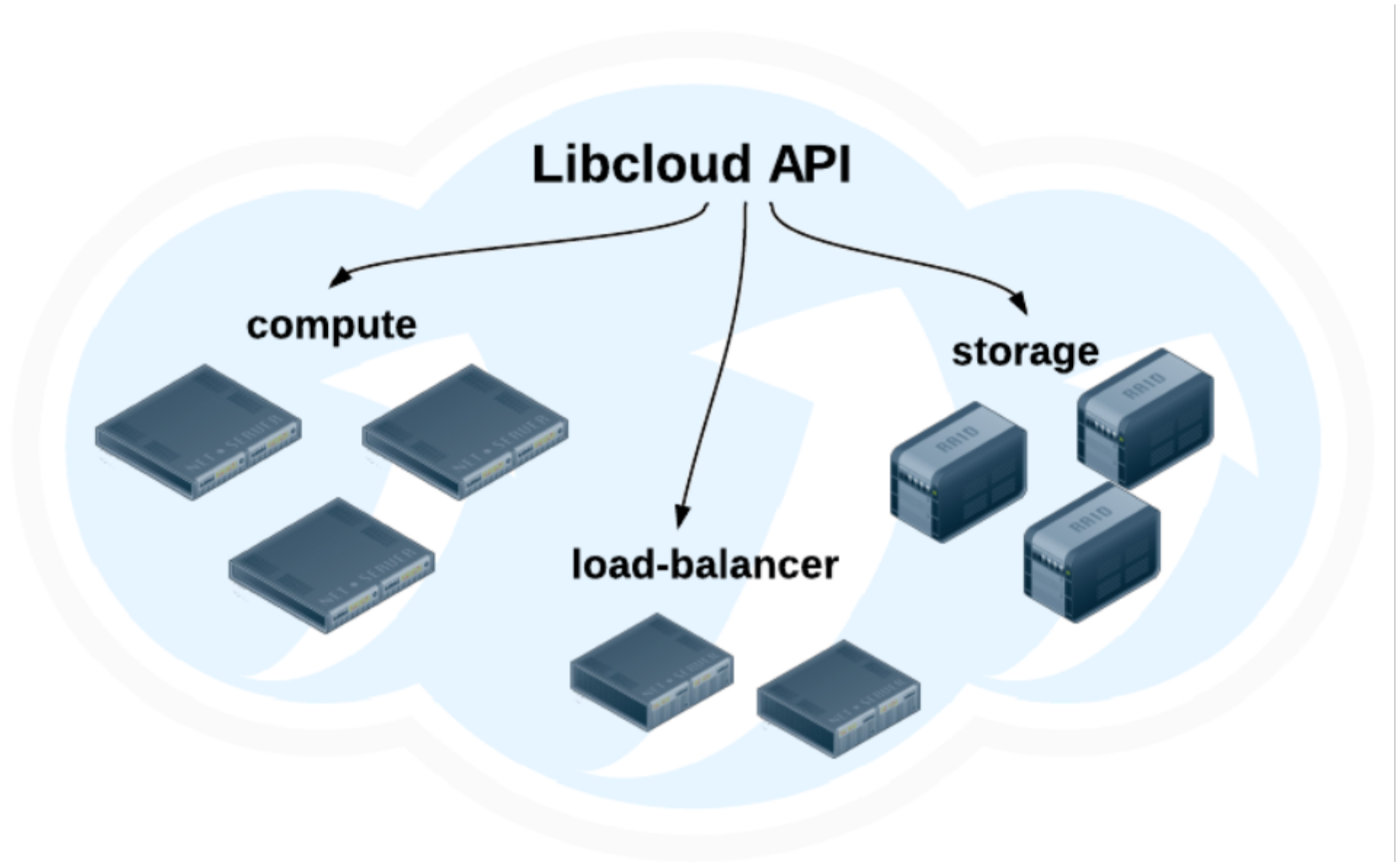
Libcloud API (Compute)

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 specificne 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 occured. 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 nalozi naso demo aplikacijo
- Pri Amazonu (EC2) zazeni dva streznika
- Na streznika prenesi prej nalozeno 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)
- deltaclouds (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