

CS 7001-03: Report for Lab 4: InterCloud Web Services for OpenStackbased Cloud Orchestration

Chanmann Lim
c19p8@mail.missouri.edu

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1. Screenshot of the "Network Topology" in CloudLab:

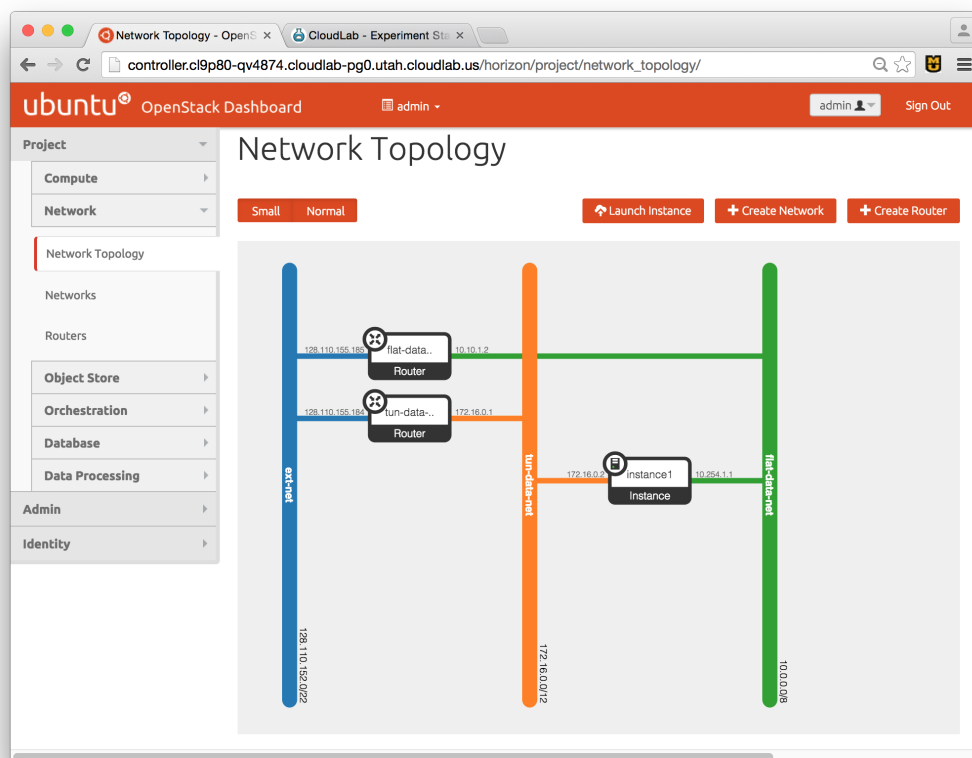
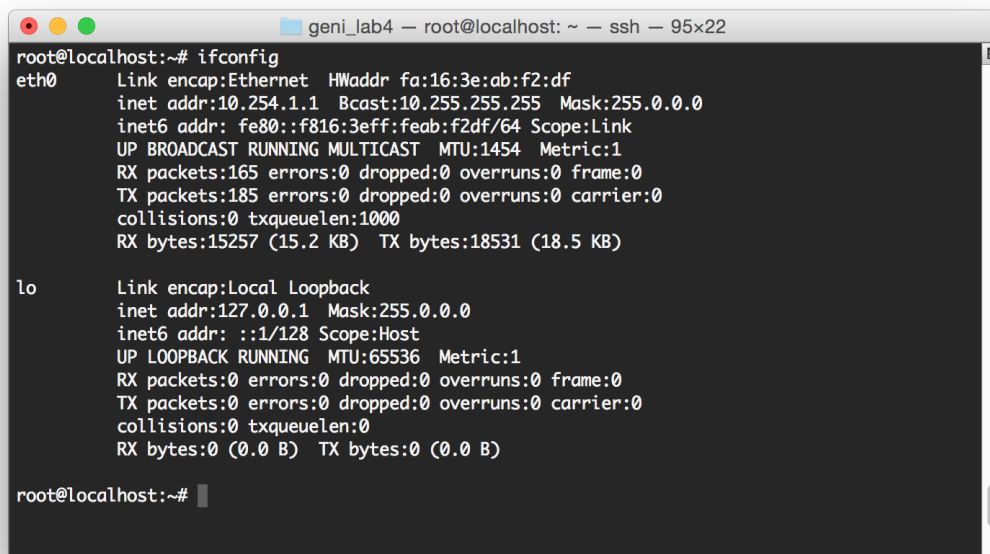


Figure 1: Network Topology in CloudLab

The "Network Topology" tab under the Network section in the above Figure shows the three networks represented by three columns in different colors connected with each others through two routers and a newly launched instance connected to two networks namely "flat-data-net" and "tun-data-net".

2. Screenshot of the "controller" node's MAC address:

A terminal window titled 'geni_lab4 — root@localhost: ~ — ssh — 95x22'. The prompt is 'root@localhost:~#'. The command 'ifconfig' has been executed, showing details for two interfaces: 'eth0' and 'lo'. The 'eth0' interface is an Ethernet card with MAC address 'fa:16:3e:ab:f2:df', IP address '10.254.1.1', and various statistics. The 'lo' interface is a local loopback with IP address '127.0.0.1' and no statistics.

```
root@localhost:~# ifconfig
eth0      Link encap:Ethernet  HWaddr fa:16:3e:ab:f2:df
          inet addr:10.254.1.1  Bcast:10.255.255.255  Mask:255.0.0.0
          inet6 addr: fe80::f816:3eff:feab:f2df/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1454  Metric:1
          RX packets:165 errors:0 dropped:0 overruns:0 frame:0
          TX packets:185 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:15257 (15.2 KB)  TX bytes:18531 (18.5 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128  Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

root@localhost:~#
```

Figure 2: Controller node's MAC address

3. The available resources of the deployed cloud infrastructure are summarized in the "Overview" tab under "Project > Compute" section:

vCPUs: 20.

RAM: 50GB.

Floating IPs: 50.

Security Groups: 10.

Volumes: 10.

Volume Storage: 1000GB.

Instances: 10.

4. To add an extra compute node to the "Tutorial-OpenStack" profile, we need to copy it to create a new profile then change the "rspec" as follow:

Add compute node 2:

```
<node client_id="compute2">
  <sliver_type name="raw">
    <disk_image name="urn:publicid:IDN+utah.cloudlab.us+image+emulab-ops//UBUNTU14-10-64-OSCPF"/>
  </sliver_type>
  <services>
    <execute shell="sh" command="sudo /tmp/setup/setup-driver.sh"/>
    <install url="http://www.emulab.net/downloads/openstack-setup-v2.tar.gz"
      install_path="/tmp"/>
  </services>
  <interface client_id="compute2:if0"/>
  <site xmlns="http://www.protogeni.net/resources/rspec/ext/jacks/1" id="28"/>
</node>
```

```
<link client_id="lan-1">
  <link_type name="lan"/>
  <interface_ref client_id="controller:if0"/>
  <interface_ref client_id="networkmanager:if0"/>
  <interface_ref client_id="compute1:if0"/>
  <interface_ref client_id="compute2:if0"/>
</link>
```

```

geni_lab4 — mann@lchanmann-kh: ~/Desktop/CS 7001-03 - Cloud Computing/github/geni_lab4 — zsh — 122x38
cli9p80@controller: ~/cloud-api ssh... root@controller: ~ ..hub/geni_lab4

➔ geni_lab4 git:(master) ✗ curl -u clouduser:EasyPassword15 -i http://128.110.152.120:8090/list_user
HTTP/1.0 200 OK
Content-Type: application/json
Content-Length: 1236
Server: Werkzeug/0.10.4 Python/2.7.8
Date: Sun, 19 Apr 2015 22:17:59 GMT

{
  "output": "+-----+-----+\n\n                                     id\n               | name | enabled | email | \n+-----+-----+\n| 047ce11ce4e95bd08f68fb6ce91d1 | ceilometer | True | | admin | True | cli9p8@mail.missouri.edu |\n| nder | True | | bc6bc2c55e5e435cbec9c1366d99498e | glance | True | |\n|  | \n| c082db8abc7 | neutron | True | | a0a233ed179c4898899edb2ba20a774b | nova | True |\n|  | \n| d5920aad4f2bbdaac2cc3e1e00ad | swift | True | | b0f69dcc6bd84415b361ac8980d74d0f | tr\n| ove | True | | \n+-----+-----+\n}\n"}
➔ geni_lab4 git:(master) ✗
```

- Web service client (written in ruby) to use the JSON web service created in the experiment.

3

Source code:

web_client/app.rb

```
require 'sinatra'
require 'httparty'

configure :production do
  set :port, 80
end

get '/' do
  @cloudlab = CloudLab.new
  @aws = Aws.new

  erb :index
end

class CloudLab
  BASE_URL = 'http://128.110.152.120:8090'
  BASIC_AUTH = { username: 'clouduser', password: 'EasyPassword15' }

  def list
    web_request 'list' do |row|
      yield row
    end
  end

  def list_user
    web_request 'list_user' do |row|
      yield row
    end
  end

  private
  def web_request service
    response = HTTParty.get("#{BASE_URL}/#{service}", basic_auth: BASIC_AUTH)
    output = response['output'].split "\n"

    i = 3 # Start from row i + 1
    while i < output.length - 1
      row = output[i].split "|"
      yield row[1..-1]
      i = i + 1
    end
  end
end

class Aws
  attr_reader :hostname, :instance_id, :zone, :secgroup

  def initialize
    @hostname = HTTParty.get('http://169.254.169.254/latest/meta-data/public-hostname').to_s
    @instance_id = HTTParty.get('http://169.254.169.254/latest/meta-data/instance-id').to_s
    @zone = HTTParty.get('http://169.254.169.254/latest/meta-data/placement/availability-zone').to_s
    @secgroup = HTTParty.get('http://169.254.169.254/latest/meta-data/security-groups').to_s
  end
end
```

web_client/views/index.erb

```
<html>
<head>
  <title>Lab 4: CloudLab</title>
</head>
<body>
  <h1>Lab 4: CloudLab</h1>
  Name: Chanmann Lim <br/>
  PawPrint: cl9p8

  <h1>AWS AMAZON</h1>
  <h2>Instance Information</h2>
  <h3>Hostname : <%= @aws.hostname %></h3>
```

```

<h3>Instance ID : <%= @aws.instance_id %></h3>
<h3>Zone : <%= @aws.zone %></h3>
<h3>Security Group : <%= @aws.secgroupp %></h3>

<h1>CloudLab</h1>
<h2>Instance Information</h2>
<table border="1">
  <thead>
    <tr>
      <td>Instance ID</td>
      <td>Instance Name</td>
      <td>Status</td>
      <td>Task State</td>
      <td>Power State</td>
      <td>Networks</td></tr>
  </thead>
  <tbody>
    <%= @cloudlab.list do |instance| %>
      <tr>
        <td><%= instance[0] %></td>
        <td><%= instance[1] %></td>
        <td><%= instance[2] %></td>
        <td><%= instance[3] %></td>
        <td><%= instance[4] %></td>
        <td><%= instance[5] %></td></tr>
      <%= end %>
    </tbody>
  </table>

<h2>User Information</h2>
<table border="1">
  <thead>
    <tr>
      <td>ID</td>
      <td>Name</td>
      <td>Enabled</td>
      <td>Email</td></tr>
  </thead>
  <tbody>
    <%= @cloudlab.list_user do |user| %>
      <tr>
        <td><%= user[0] %></td>
        <td><%= user[1] %></td>
        <td><%= user[2] %></td>
        <td><%= user[3] %></td></tr>
      <%= end %>
    </tbody>
  </table>
</body>
</html>

```