Openstack Installation with Puppet Modules

# Introduction

Deploying Openstack using Puppet modules is a quick and easy process. Setting up an OpenStack cloud takes approximately 20 minutes. Current installation uses openstack stable Juno release. Below, we'll explain how to setup OpenStack on a single server and multi server using virtual box.

In present deployment four network adapters are used for Management, Data, External/API networks and one NAT interface.

# Prerequisites

1. Virutal box 64-bit architecture
2. Operating system (Ubuntu 14.04, Centos 7, RDO 7 & Fedora 20)
3. RAM : Min 4GB for Single Node; (prefered 8GB)
4. Basic understanding of Openstack
5. Basics of Puppet master-agent setup

# Scope of this document

Documents covers only basics of Puppet master-agent setup. Basic templates of Puppet manifests are provided. Default Hiera data files are used which are provided by the puppet modules.

Nested KVM is not used for the VM’s, QEMU hypervisor is used instead.

# Single-Node Architecture

# Untitled drawing.jpg

# 

# 

# 

# 

# Mutli-Node Architecture

# Untitled drawing (1) (2).jpg

# Installation Procedure

## Virtual box setup

### Network settings

For openstack puppet setup four networks are used. They are as follows:

1. NAT Interface: IP will not visible, it will be in promiscuous mode

\* eth0: Share with my Mac

1. External & API Network: The external network typically provides Internet access for your instances. By default, this network only allows Internet access *from* instances using [Network Address Translation (NAT)](http://docs.openstack.org/juno/install-guide/install/apt/content/neutron_initial-external-network.html). You can enable Internet access *to* individual instances using a [floating IP address](http://docs.openstack.org/juno/install-guide/install/apt/content/neutron_initial-external-network.html) and suitable [security group](http://docs.openstack.org/juno/install-guide/install/apt/content/neutron_initial-external-network.html) rules.

\* eth1: 172.16.19.0/24 (netmask 255.255.255.0)

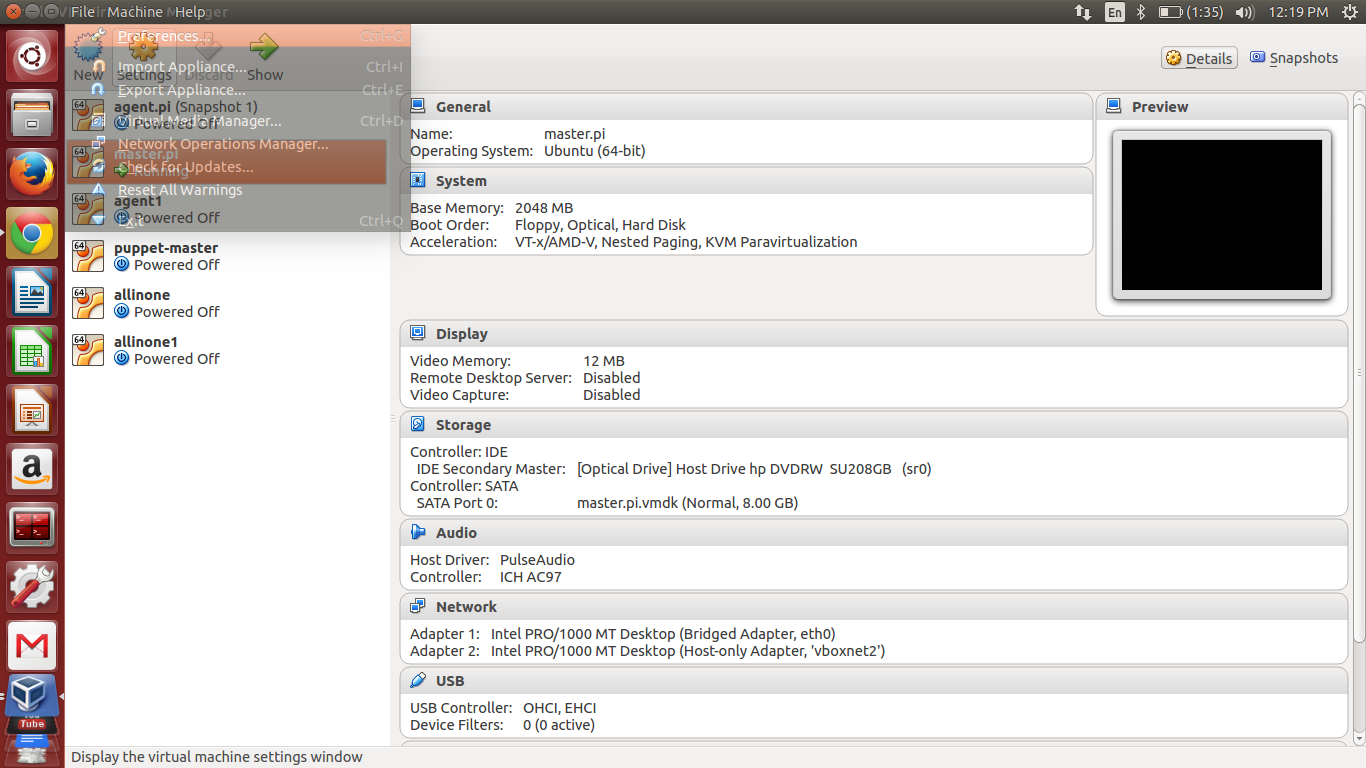
1. Management Network: A [management network](http://docs.openstack.org/openstack-ops/content/network_design.html) (a separate network for use by your cloud operators) typically consists of a separate switch and separate NICs. This segregation prevents system administration and the monitoring of system access from being disrupted by traffic generated by guests.

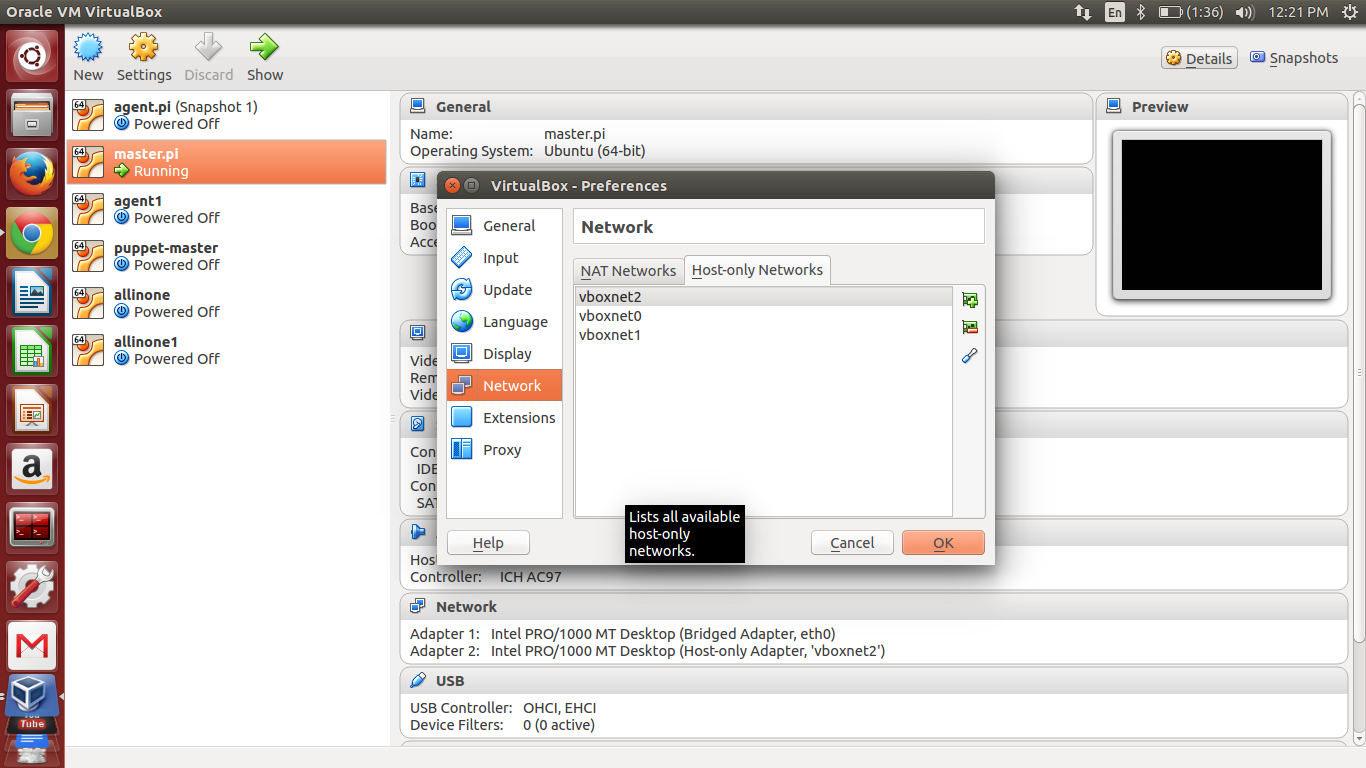
\* eth2: 192.168.58.0/24 (netmask 255.255.255.0)

1. Data Network:

\* eth3: 172.16.56.0/24 (netmask 255.255.255.0)

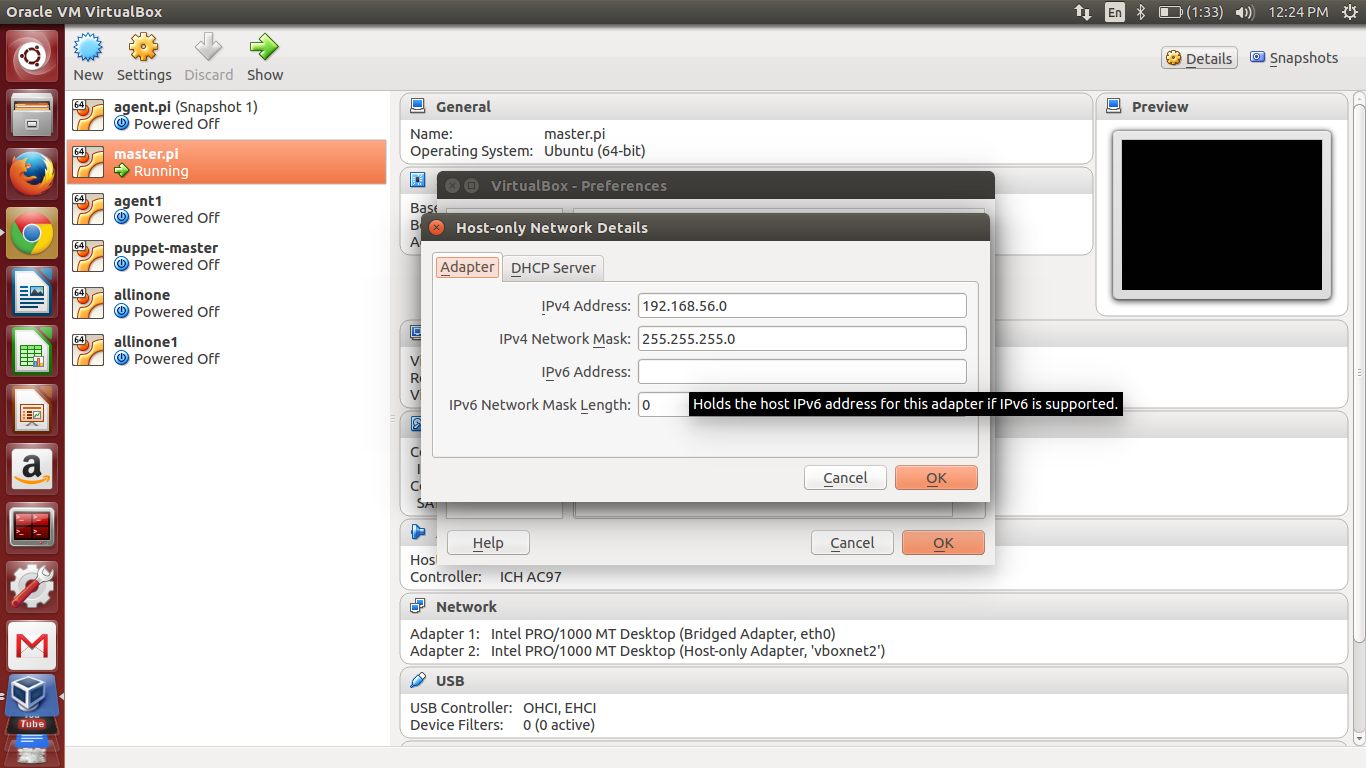
#### Setting network preferences

1. File -> Preferences 1. 
2. Select “Network” & Select “Host-Only Network”

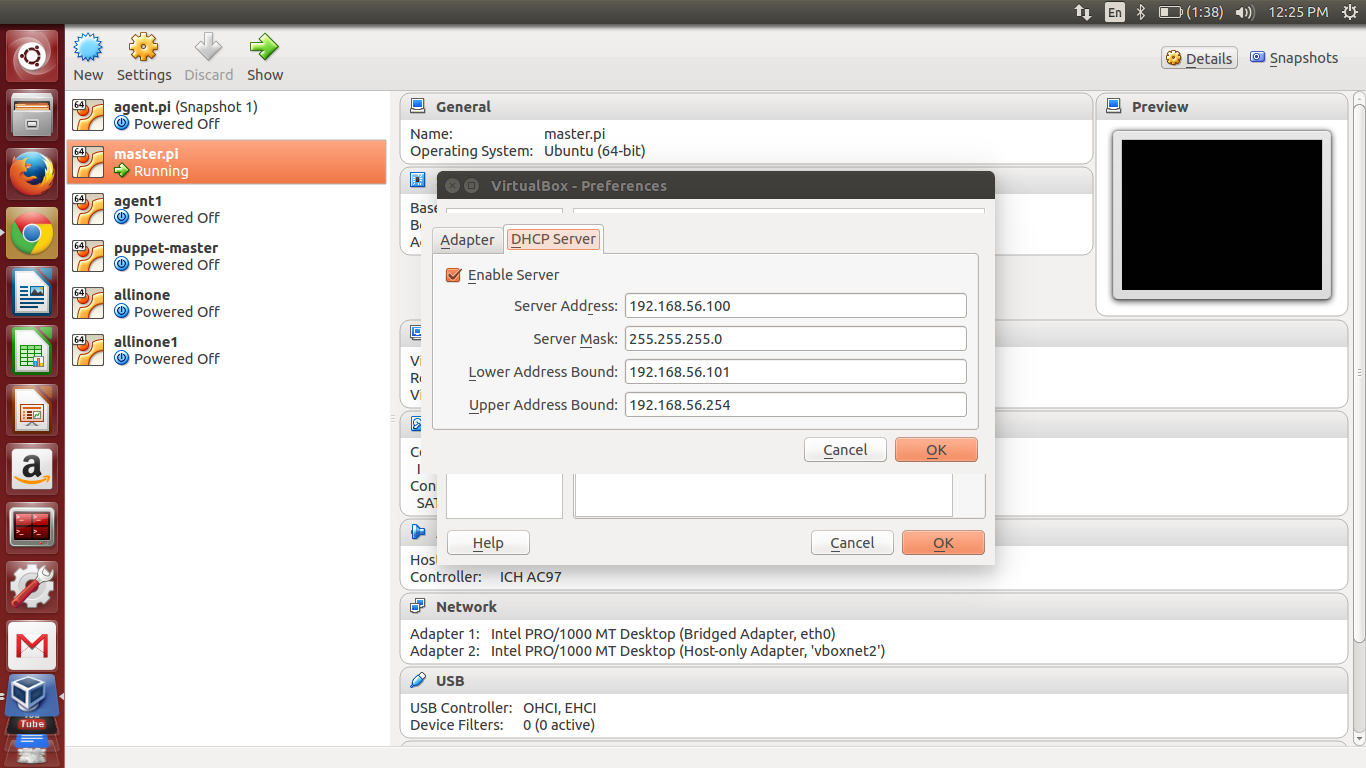


3. Click on Icon on the right side and add Adapter “Vboxnet0”, “Vboxnet1” & “Vboxnet2”

4. Set the IP range for each Adapter



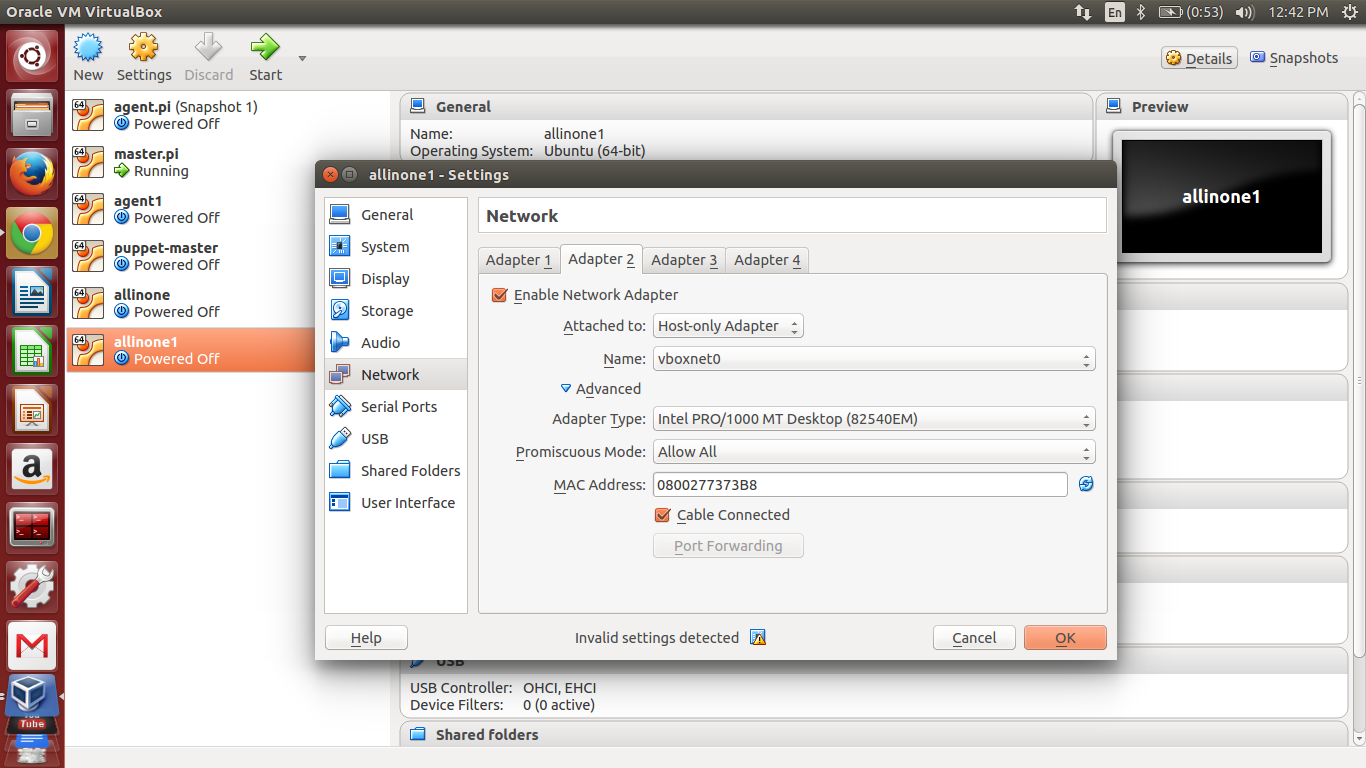
5. Enable DHCP and set start and end range



### System configuration

1. Launch a new VM for Puppet-master
2. Set 2 network interfaces (eth0 -> NAT & eth1 -> Host-Only Adapter)
3. RAM -> 2 GB
4. Storage -> 50GB
5. Launch a new VM for Openstack “Allinone”
6. Set 4 network interfaces (eth0 -> NAT & eth1, eth2, eth3 -> Host-only Adapter)
7. RAM -> more than 4GB (preferably 8GB)
8. Storage -> 200GB

Note: To avoid connectivity issues select “Allow All” in Promiscuous Mode. Do the same for all Adapters



# Puppet Master-Agent setup:

One can follow this resource for master agent setup

<https://www.digitalocean.com/community/tutorials/how-to-install-puppet-to-manage-your-server-infrastructure>

Note:

1. Configure Host-Only interfaces in VM with Static IP, so they will not change the IP on reboot.
2. Avoid version compatiblity issues in Puppet master and Agent nodes. Puppet-master node version should be equal or less than puppet-agent node.

# Openstack module Installation

1. Set the host name with FQDN and remove localhost. (Please check connectivity and cert sync between Puppet-master/agent nodes)

eg.,

#127.0.0.1 localhost

#127.0.1.1 ubuntu

192.168.58.100 puppet-master.pramati.com puppet-master

192.168.58.101 allinone.pramati.com allinone

1. In Master node, download all Openstack modules

**#puppet module install puppetlabs-openstack**

1. Edit file “/etc/hiera.yaml” and copy paste below script

|  |
| --- |
| ---  :backends:  - yaml  :yaml:  :datadir: /etc/puppet/hieradata  :hierarchy:  - allinone  - common  - ldap  - vmware |

1. Copy “/etc/hiera.yaml” file to “/etc/puppet/hiera.yaml”
2. Create a soft link between these file

# **ln -s /etc/puppet/hiera.yaml /etc/hiera.yaml**

1. Hiera data setup:
   1. # mkdir /etc/puppet/hieradata
   2. Create file allinone.yaml (single node) and common.yaml (multi node)

|  |
| --- |
| openstack::region: 'openstack'  ######## Networks #################  openstack::network::api: '192.168.56.0/24'  openstack::network::external: '192.168.56.0/24'  openstack::network::management: '192.168.58.0/24'  openstack::network::data: '192.168.58.0/24'  openstack::network::external::ippool::start: 192.168.56.150  openstack::network::external::ippool::end: 192.168.56.170  openstack::network::external::gateway: 192.168.56.2  openstack::network::external::dns: 192.168.56.3  ######## Private Neutron Network  openstack::network::neutron::private: '10.0.0.0/24'  ######## Fixed IPs (controllers)  openstack::controller::address::api: '192.168.56.102'  openstack::controller::address::management: '192.168.58.102'  openstack::storage::address::api: '192.168.56.102'  openstack::storage::address::management: '192.168.58.102'  ######## Database  openstack::mysql::root\_password: 'root'  openstack::mysql::service\_password: 'root'  openstack::mysql::allowed\_hosts: ['localhost', '127.0.0.1', '192.168.58.%']  openstack::mysql::keystone::user: 'keystone'  openstack::mysql::keystone::pass: 'keystone-dbpass'  openstack::mysql::cinder::user: 'cinder'  openstack::mysql::cinder::pass: 'cinder-dbpass'  openstack::mysql::glance::user: 'glance'  openstack::mysql::glance::pass: 'glance-dbpass'  openstack::glance::api\_servers: ['192.168.58.102:9292']  openstack::mysql::nova::user: 'nova'  openstack::mysql::nova::pass: 'nova-dbpass'  openstack::mysql::neutron::user: 'neutron'  openstack::mysql::neutron::pass: 'neutron-dbpass'  openstack::mysql::heat::user: 'heat'  openstack::mysql::heat::pass: 'heat-dbpass'  ######## RabbitMQ  openstack::rabbitmq::user: 'openstack'  openstack::rabbitmq::password: 'rabbit-pass'  openstack::rabbitmq::hosts: ['192.168.58.102:5672']  ######## Keystone  openstack::keystone::admin\_token: 'admin-token'  openstack::keystone::admin\_email: 'kranthim@puppetlabs.com'  openstack::keystone::admin\_password: 'admin'  openstack::keystone::tenants:  "test":  description: "Test tenant"  "test2":  description: "Test tenant"  openstack::keystone::users:  "test":  password: "abc123"  tenant: "test"  email: "test@example.com"  admin: true  "demo":  password: "abc123"  tenant: "test"  email: "demo@example.com"  admin: false  "demo2":  password: "abc123"  tenant: "test2"  email: "demo@example.com"  admin: false  ######## Glance  openstack::glance::password: 'glance-pass'  ######## Cinder  openstack::cinder::password: 'cinder-pass'  openstack::cinder::volume\_size: '8G'  ######## Swift  openstack::swift::password: 'swift-pass'  openstack::swift::hash\_suffix: 'pop-bang'  ######## Nova  openstack::nova::libvirt\_type: 'kvm'  openstack::nova::password: 'nova-pass'  ######## Neutron  openstack::neutron::password: 'neutron-pass'  openstack::neutron::shared\_secret: 'neutronsecretkey'  openstack::neutron::core\_plugin: 'ml2'  openstack::neutron::service\_plugins: ['router', 'firewall', 'lbaas', 'vpnaas', 'metering']  ######## Ceilometer  openstack::ceilometer::address::management: '192.168.58.102'  openstack::ceilometer::mongo::username: 'mongo'  openstack::ceilometer::mongo::password: 'mongosecretkey123'  openstack::ceilometer::password: 'ceilometer-pass'  openstack::ceilometer::meteringsecret: 'ceilometersecretkey'  ######## Heat  openstack::heat::password: 'heat-pass'  openstack::heat::encryption\_key: 'heatsecretkey123'  ######## Horizon  openstack::horizon::secret\_key: 'horizonsecretkey'  ######## Tempest  openstack::tempest::configure\_images : true  openstack::tempest::image\_name : 'Cirros'  openstack::tempest::image\_name\_alt : 'Cirros'  openstack::tempest::username : 'demo'  openstack::tempest::username\_alt : 'demo2'  openstack::tempest::username\_admin : 'test'  openstack::tempest::configure\_network : true  openstack::tempest::public\_network\_name : 'public'  openstack::tempest::cinder\_available : true  openstack::tempest::glance\_available : true  openstack::tempest::horizon\_available : true  openstack::tempest::nova\_available : true  openstack::tempest::neutron\_available : true  openstack::tempest::heat\_available : false  openstack::tempest::swift\_available : false  ######## Log levels  openstack::verbose: 'True'  openstack::debug: 'True' |

On Virtual box, nested KVM is not set. Change configurations in /etc/nova/nova.conf and restart nova services.

|  |
| --- |
| [libvirt]  ...  virt\_type=qemu  #virt\_type=kvm |

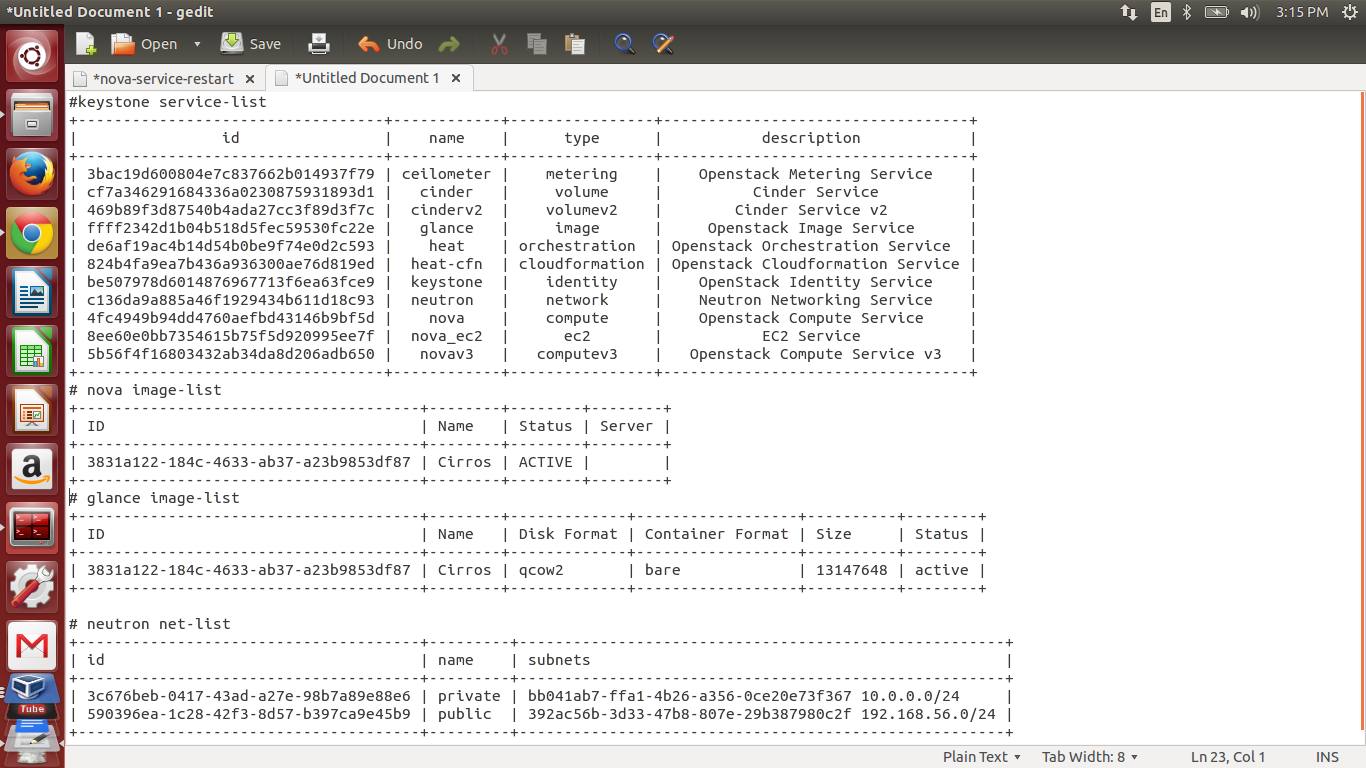
1. Check Openrc files for exporting environment variables

|  |
| --- |
| # cat /root/openrc  #!/bin/sh  export OS\_NO\_CACHE='true'  export OS\_TENANT\_NAME='admin'  export OS\_USERNAME='admin'  export OS\_PASSWORD='admin'  export OS\_AUTH\_URL='http://192.168.56.102:5000/v2.0/'  export OS\_AUTH\_STRATEGY='keystone'  export OS\_REGION\_NAME='openstack'  export CINDER\_ENDPOINT\_TYPE='publicURL'  export GLANCE\_ENDPOINT\_TYPE='publicURL'  export KEYSTONE\_ENDPOINT\_TYPE='publicURL'  export NOVA\_ENDPOINT\_TYPE='publicURL'  export NEUTRON\_ENDPOINT\_TYPE='publicURL' |

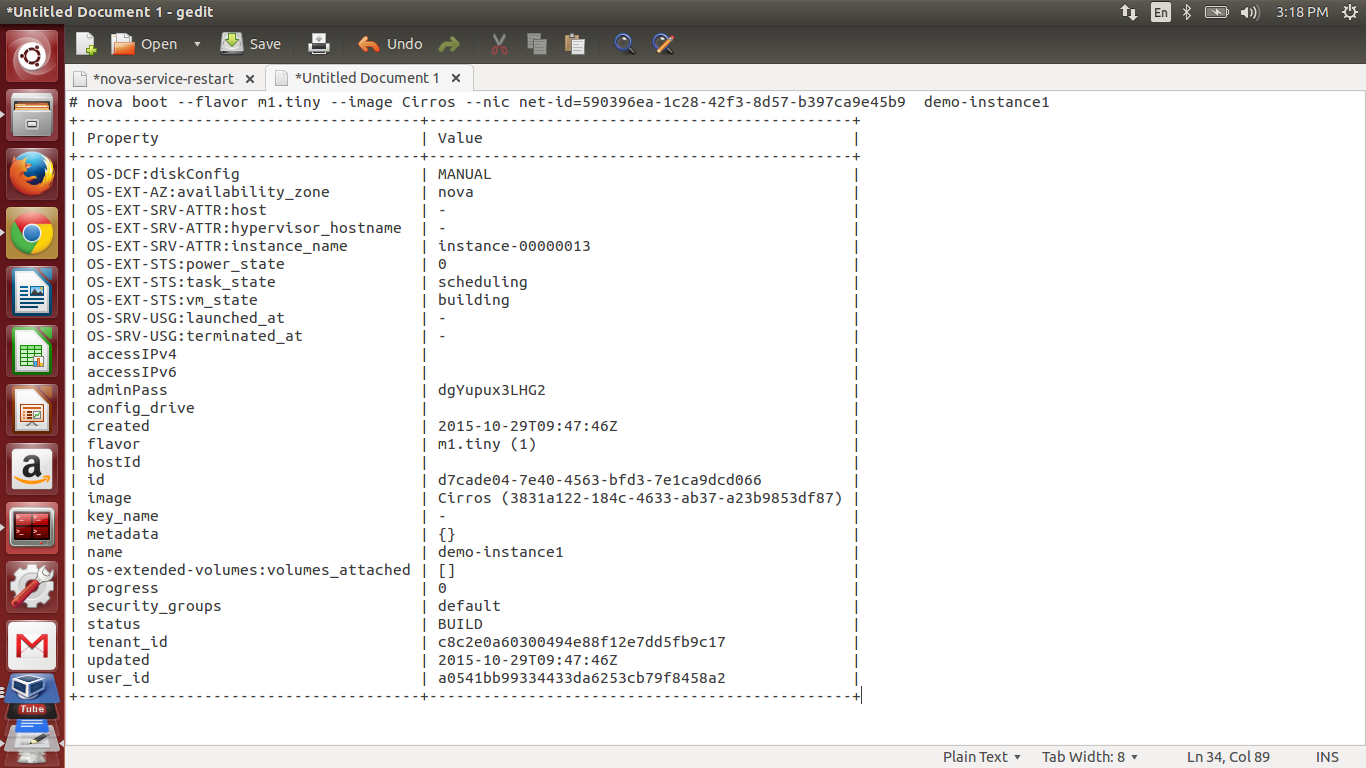
1. Set environment variables:

**# source /root/openrc**

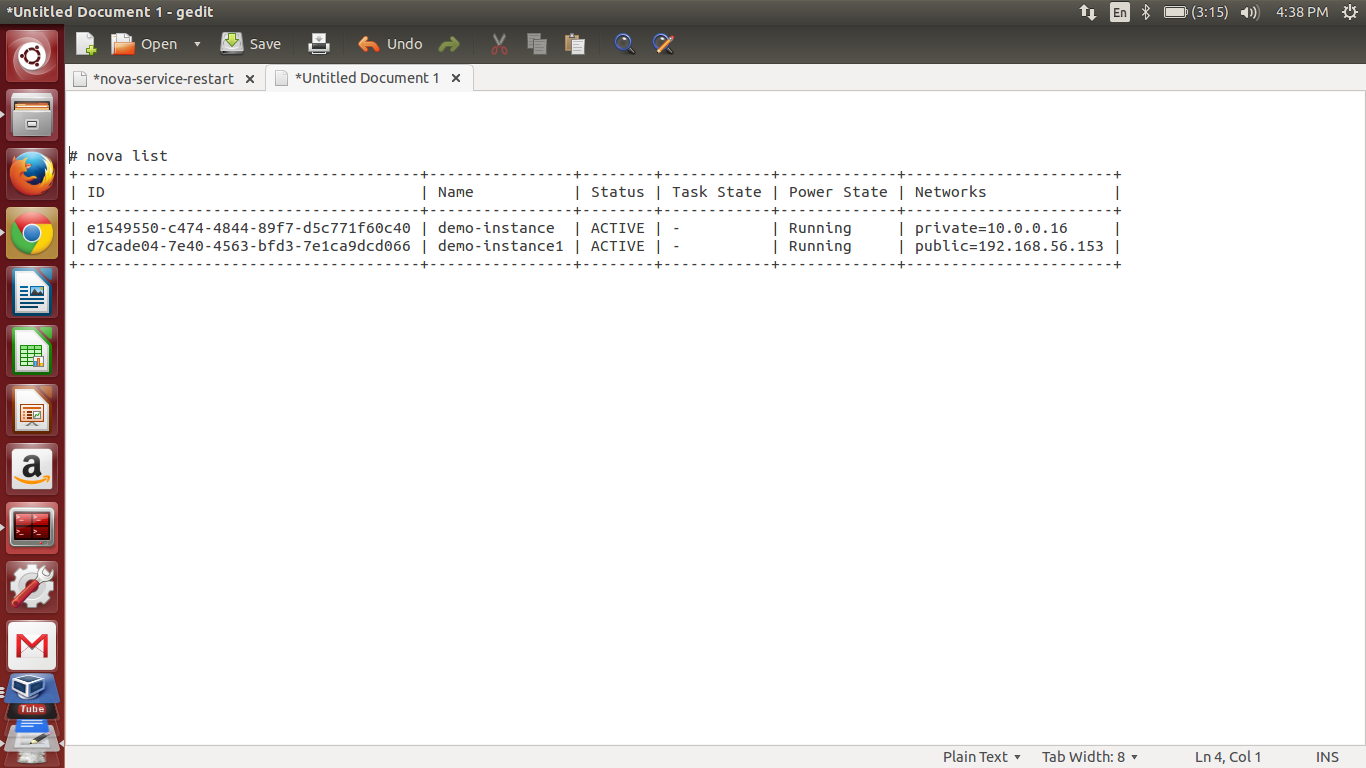
1. Check following commands:



1. Launch VM



1. Check the status of VM launched.



1. Puppet code for allinone node in /etc/puppet/manifests/site.pp

|  |
| --- |
| node 'allinone1' {  include ::openstack::role::allinone  } |

1. Puppet code for HA and Mutlinode setup

|  |
| --- |
| node 'cms-node1' {  include ::openstack::role::controller  }  node 'cms-node2' {  include ::openstack::role::controller  }  node 'neutron-net' {  include ::openstack::role::neutron  }  node 'compute1' {  include ::openstack::role::compute  }  node 'compute2' {  include ::openstack::role::compute  } |

1. Puppet code for specific services in each node

|  |
| --- |
| node 'cms-node3' {  include ::openstack::role::keystone  include ::openstack::role::glance  include ::openstack::role::nova-api  } |

1. Floating points and external connectivity of VM’s
2. Use Bridge adapter for eth1 interface instead of Host-only adapter
3. Configure floating IP range
4. Assign floating IP’s to the VM’s and check external connectivity.