

Cloud based IT Infra with Central Identity

Phase II – Project Report

Project Guide

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Abstract

The main objective of “Cloud based IT Infra with Central Identity” Phase II is provide the implementation to our objectives.

Implementing the Web based central identity, network based central identity, achieve the combination and deploy all these in the private cloud

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Chapter 1

Introduction

1.1 Introduction

“Cloud Based IT Infra with Central Identity” is a complete solution, based on private cloud to enhance and efficient utilization the IT Infrastructure of an emerging Universities and Organizations with Central Identity for all its users to access its services.

It is going to be developed in 3 phases

- *Private cloud*
- *Deploying Network Services*
- *Central Identity*

1.1.1 Private Cloud

Private Cloud establishment is targeted for hardware resource pooling, providing high computational and scalable virtual machines for deploying network based applications (smtp, proxy, ftp), web application and Network storage.

1.1.2 Deploying Network Services

Configuration of Uniform hardware experience over the complete university includes single sign on on every device, configuration of mail servers etc.

1.1.3 Central Identity

Essential part that combines normal network services(proxy, mail, etc.) and organizational web & native applications. In addition to that this central identity is available to thrid party developers as API with dynamic based role user authentication protocols.

Chapter 2

Phase I Work

As part of Phase I, we have done literature survey and analyzed feasibility of the several components

2.1 Components

- Central Identity
 - Single Sign-On with REST API
 - Identity Management
 - Dynamic Role Based Access Control
- Network Based Central Identity
 - LDAP Servers
 - NFS Servers
- Cloud Computing
 - Cloud Characteristics
 - Service Models
 - Deployment Models
- Private Clouds
 - Introduction
 - Open Source Tools

Chapter 3

Phase II Work

As part of Phase II, we have tried to implement some of the above mention components

3.1 Components

- Web based Signle Sign On
 - OAuth Provider
 - University Users Profiles
 - REST API
 - Support of assign roles to users with their permission set
 - Testing oauth client library in PHP using php-curl
- Network Components
 - LDAP Server
 - NFS Server
 - Haproxy
 - GlusterFS
 - XtreamFS
- Private Infrastructure Cloud
 - Openstack Architecture
 - Installation
 - Virtual Machines

Chapter 4

Private Infrastructure Cloud

To support this central identity both the network and web network central identity we want to go for the private cloud deployment it includes creating the Private Infrastructure Cloud with openstack and creating Virtual Machines for instaling these services and assign them the IP address.

4.1 Openstack Architecture

Openstack is a cloud operating system that provides the 3 main services for the Infrastructure clouds namely Stoage, Compute, Networking and some other components are can be added later as addons

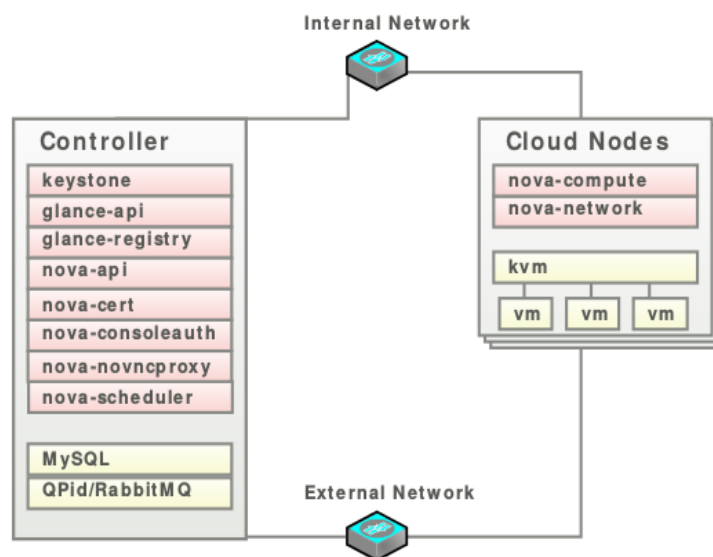


Figure 4.1: Openstack Architecture.

4.2 Installation

Installing openstack includes component wise installation namely NTP, MySQL, Rabbitmq-Server, Keystone, Nova, Cinder, Glance, Neutron

4.2.1 NTP

```
# apt-get install ntp
```

4.2.2 MySQL

```
# apt-get install mysql-server
```

4.2.3 Rabbitmq-server

```
# apt-get install rabbitmq-server
```

4.2.4 Keystone

```
# apt-get install keystone
```

4.2.5 Glance

```
# apt-get install glance python-glanceclient
```

4.2.6 Nova

```
# apt-get install nova-api nova-cert nova-conductor nova-consoleauth nova-novncproxy  
nova-scheduler python-novaclient
```

4.2.7 Neutron

```
# apt-get install neutron-server neutron-plugin-ml2
```

4.3 Virtual Machines

This Virtual Machines are created from the resource pool after successful installation openstack

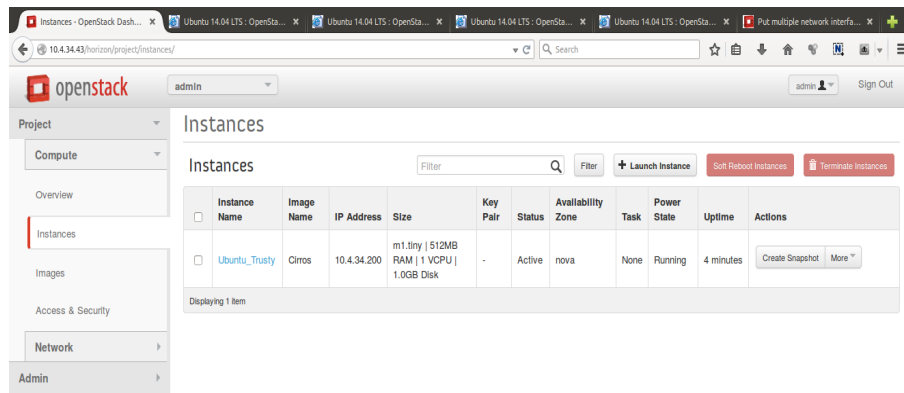


Figure 4.2: Openstack Virtual Machines.

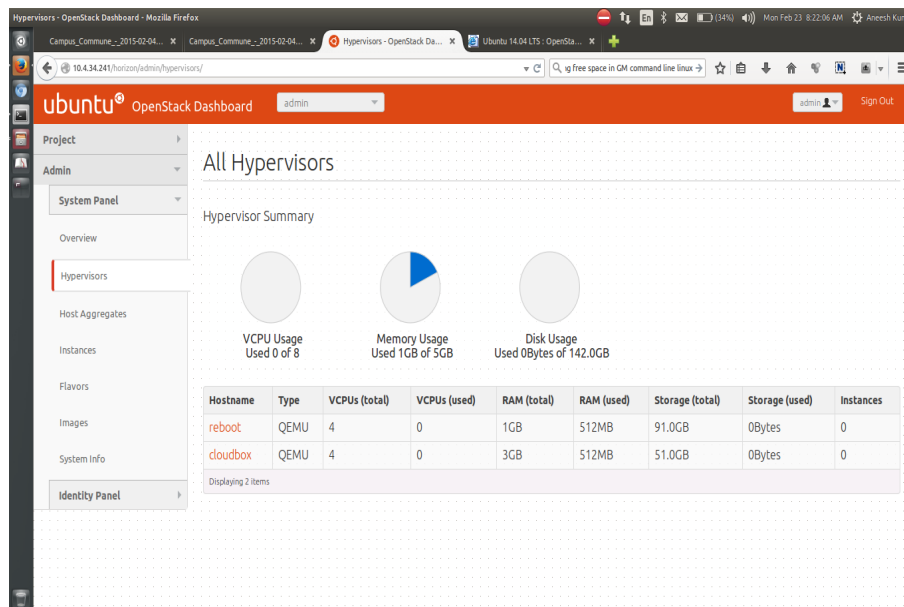


Figure 4.3: Openstack Resource Pool.

Chapter 5

Conclusion & Future Work

5.1 Conclusion

We tried GlusterFS for replication among systems, but its not working if any one of the system fails. Then we found that XtreamFS works well in distributed system and provides fault tolerant solution.

We developed network based sign on using LDAP and web based single sign on along with REST API using Oauth 2.0 and Django. We tried to create private cloud using openstack but lot of errors came because of proxy based internet and low configured PCs.

5.2 Future Work

We would like to combine Network single sign-on with Web based single sign on along with XtreamFS and HAProxy. Creating virtual machines and Private cloud is not possible with the available systems. But if we could provide systems with enough configuration, sure we can create better sophisticated solution

Chapter 6

References