OpenStack

Objective:

To setup a private cloud using Openstack in CentOS-7, and to deploy Buymart services in the cloud.

Requirements:

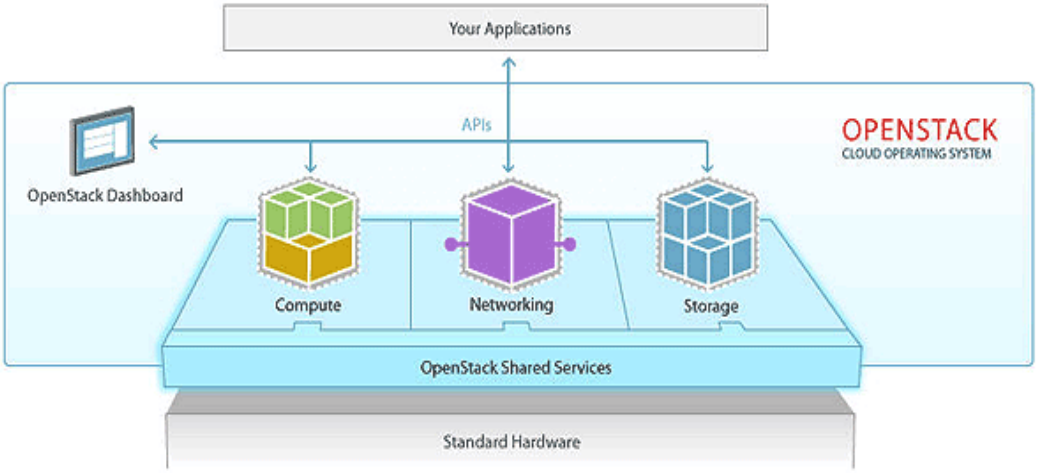
Hardware:-

Controller Node: 1 processor, 2GB memory and 5GB storage.
Network Node: 1 processor, 512MB memory and 5GBstorage.
Compute Node: 1 processor, 2GB memory and 10GB storage.

Software:-

All nodes: CentOS-7 with Internet Connectivity,
Openstack-mitaka software.

Design:



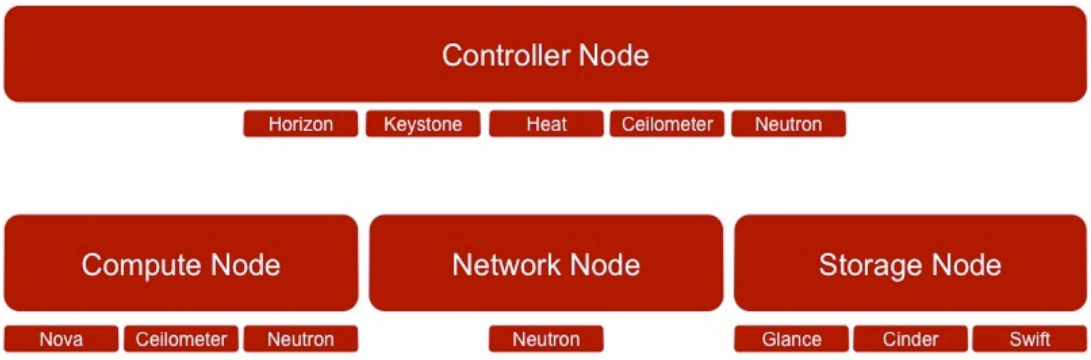
Description of Nodes:-

Controller Node: This node monitors the overall functioning of each of the virtual machines in the design configurations. In this node we will deploy services like Horizon, Keystone, Neutron and Heat.

Compute Node: This node is for performing computations and processes in the cloud. This requires good memory and storage capacity. The services deployed in this node are Neutron and Nova.

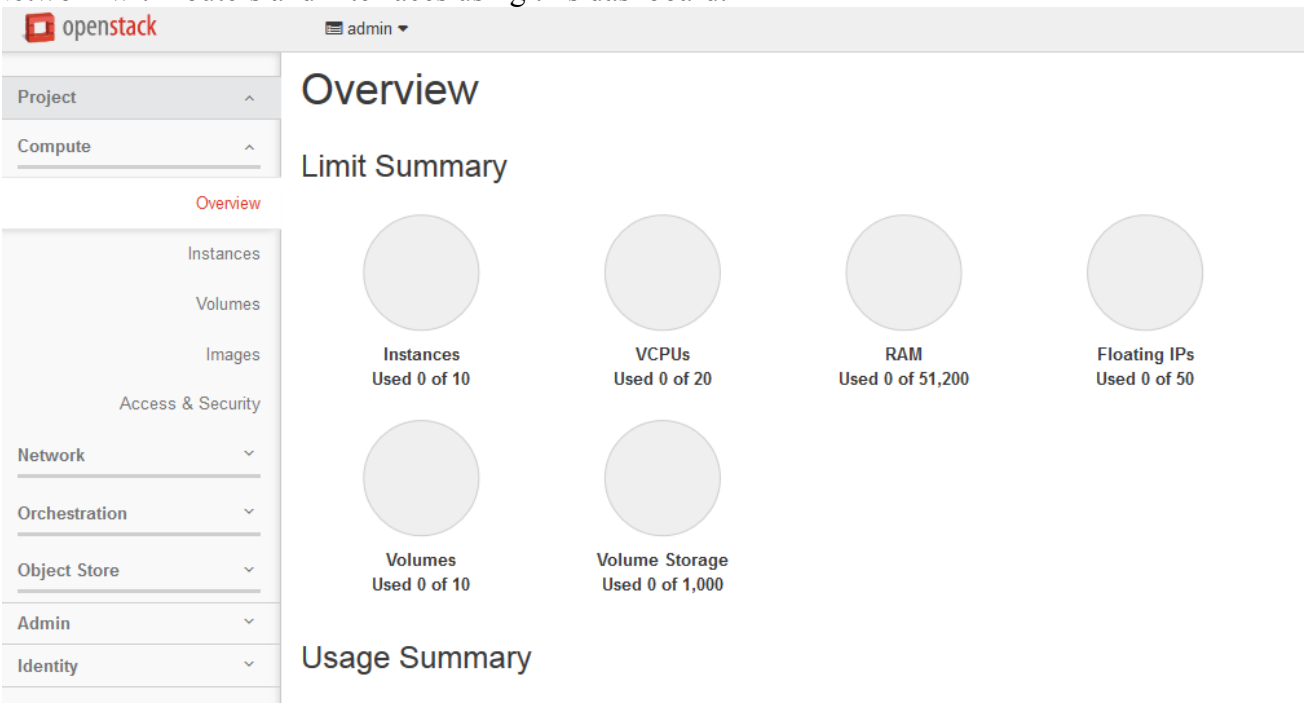
Network Node: This is for overall networking in the cloud. Only Neutron service is deployed here.

We are not using any storage nodes in this setup.

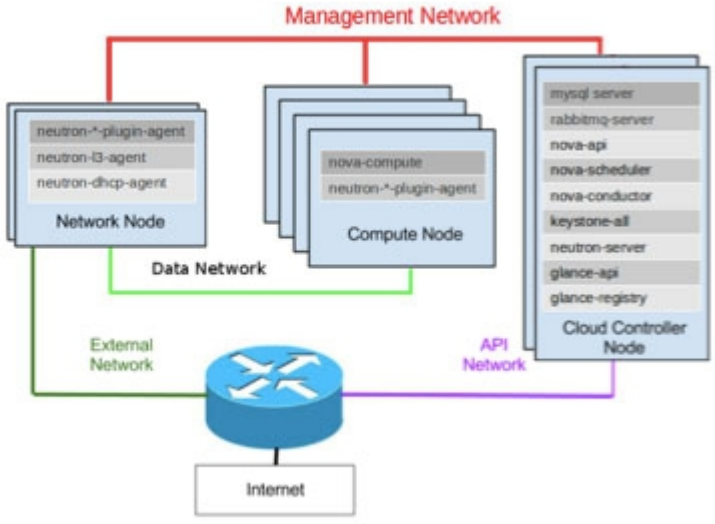


Implementation:

In Controller node, by deploying the Horizon services the dashoard(web interface) of the OpenStack can be obtained. The dashboard gives the overview of the services deployed. It gives the details about Instances, RAM usage, Number of Floating IPs, Volume storages,etc. Using dashboard, we can view and manage the resources in a project including images and instances,etc. One can create Network with routers and interfaces using this dashboard.



The OpenStack Networking service is called **Neutron**. This Neutron service allows to create and manage network objects like networks, subnets and ports. This Neutron provides API that allows



us to define network connectivity and addressing in the cloud. In this setup we are using Neutron to configure the networking between the Controller and Compute nodes. A separate node is setup as Network node and only neutron service deployed in that node. An external and Internal network is created with a router connecting both the networks.

The **Nova** service is used for computing and processing inside the cloud. It is deployed in compute nodes. This nova service requires **Keystone, Glance** and **Neutron** services. Nova supports creating virtual machines, bare-metal servers and limited support for system containers.

The OpenStack identity service is **Keystone**. It is deployed in Controller node. It is used for authentication and authorization. Different users can access the OpenStack dashboard using this Keystone service.

The OpenStack Orchestration is done using **Heat** service. Heat service is used to orchestrate composite cloud applications. After deploying all the services the Heat is deployed.

Deployment of Buymart:-

Buymart services can be run in one of the compute nodes (Nova service). All these services will be present in a private cloud.

Development and Integration :

In addition to Buymart services, the Databases of Buymart products can be stored in Trove(DB of OpenStack). Some storage functions can also be made using different storage services available in OpenStack.

Testing:

Running the critical services of Buymart over the cloud and checking response time and scalability aspects.

Measuring the level of security and effectiveness of the authentication mechanisms by examining keystone services improvised by some machine learning algorithms.