**Implementation of Openstack with user and private network creation.**

penStack is a cloud OS that is used to control the large pools of computing, storage, and networking resources within a data center. OpenStack is an open-source and free software platform. This is essentially used and implemented as an IaaS for cloud computing

Basic Principles of OpenStack

**Open Source:** Under the Apache 2.0 license, OpenStack is coded and published. Apache allows the community to use it for free.

**Open Design:** For the forthcoming update, the development group holds a Design Summit every 6 months.

**Open Development:** The developers maintain a source code repository that is freely accessible through projects like the Ubuntu [Linux](https://www.javatpoint.com/linux-tutorial) distribution via entig100s.

## **Components of OpenStack**

Major components of OpenStack are given below:

**Compute (Nova):** Compute is a controller that is used to manage resources in virtualized environments. It handles several virtual machines and other instances that perform computing tasks.

**Object Storage (Swift):** To store and retrieve arbitrary data in the cloud, object storage is used. In Swift, it is possible to store the files, objects, backups, images, videos, virtual machines, and other unstructured data.

**lock Storage (Cinder):** This works in the traditional way of attaching and detaching an external hard drive to the OS for its local use.

**Networking (Neutron):** This component is used for networking in OpenStack. Neutron manages all the network-related queries, such as IP address management, routers, subnets, firewalls, VPNs, etc. It confirms that all the other components are well connected with the OpenStack.

**Dashboard (Horizon):** This is the first component that the user sees in the OpenStack. Horizon is the web UI (user interface) component used to access the other back-end services.

**Identity Service (Keystone):** It is the central repository of all the users and their permissions for the OpenStack services they use.

**Image Service (Glance):** The glance component is used to provide the image services to OpenStack. Here, image service means the images or virtual copies of hard disk.

**Telemetry (Ceilometer):** It is used to meter the usage and report it to OpenStack's individual users. So basically, Telementry provides billing services to OpenStack's individual users.

**Orchestration (Heat):** It allows the developers to store the cloud application's necessities as a file so that all-important resources are available in handy. This component organizes many complex applications of the cloud through the templates, via both the local OpenStack REST API and Query API.

**Shared File System (Manila):** It offers storage of the file to a virtual machine. This component gives an infrastructure for managing and provisioning file shares.

**Elastic Map-reduce (Sahara):** The Sahara component offers a simple method to the users to preplanned Hadoop clusters by referring to the multiple options such as the Hadoop version, cluster topology and hardware details of nodes and some more.

**How to Install Openstack:**

### Installation of OpenStack

In order to install the DevStack in a system, first, you have to create a Linux VM on your computer (such as using VirtualBox or VMware) or remotely in the cloud (such as using AWS).

The VM must have at least 4GB of memory, and the proper internet connection is also important. Here, we are going to use one version of the ubuntu, i.e., 18.04.

Follow the following steps to install the OpenStack in your ubuntu virtual machine :

**Step 1: Update Ubuntu System**

Open the terminal and run the following command to ensure that the system is up to date :

1. $ sudo apt update
2. $ sudo apt -y upgrade
3. $ sudo apt -y dist-upgrade





