Module 4: Openstack Fundamentals

Agenda

* Openstack Horizon
* OpenStack CLI
* Managing Users
* Managing Images
* Managing Flavors
* Managing Network

Openstack Horizon

The OpenStack Platform dashboard is a browser-based graphical user interface for managing OpenStack services.

This dashboard is also known as Horizon and can be customized.

Check out the Auth url in default adminrc file created after installation.

Login into Dashboard

In OpenStack, the authentication and authorization services are provided by the OpenStack identity service, code-named Keystone.

Users authenticate via the identity service API endpoint before they request other OpenStack services.

Terminologies of Keystone

Project

Users

Roles

Authentication Parameters

Region

Domain

Group

Quota

Project

A project is a collection of resources, such as networks, images and instances.

Depending on the OpenStack implementation, projects can map to a customer, an account, an organizational unit, or a development project.

OpenStack Platform installs with two default projects named admin and service. These projects exist in the default domain named default

Users

Users represent the end user, operator or administrator who uses the OpenStack services.

OpenStack Platform installs with a default admin user with an admin role assigned in the admin project.

Roles

Roles define a set of user privileges to perform specific actions on OpenStack services.

OpenStack Platform installs with several default roles, including admin and _member_.

The _member_ role provides normal user access to all of a project's resources.

The admin role provides additional administrative privileges throughout the user's domain.

Quota

An OpenStack administrator can configure quotas to prevent system resources from being exhausted.

Project quotas are set on a per-project basis, and limit the resources that can be assigned.

These operational limits enable the cloud administrator to finite control over OpenStack projects

Openstack CLI

OpenStack Platform includes the OpenStack client CLI that is designed to implement all the common, necessary functionality offered by the OpenStack services APIs.

As OpenStack core and extended service are enhanced, new functionality is added to the unified CLI.

Openstack Images

An image is a file containing a virtual disk installed with a bootable operating system. Images are managed by the Image Service (Glance).

An image is one of the fundamental requirements for deploying instances.

Images format Supported

Format	Description
AKI	An Amazon kernel image, supported by Amazon EC2.
AMI	An Amazon machine image, supported by Amazon EC2.
ARI	An Amazon RAM disk image, supported by Amazon EC2.
ISO	An archive format for the data contents of an optical disc (for example, a CD).
PLOOP	A container format used by Virtuozzo.
QCOW2	A disk format supported by the QEMU emulator that can expand dynamically and supports the copy-on-write feature.
RAW	An unstructured disk image format.
VDI	A disk format supported by VirtualBox virtual machine monitor and the QEMU emulator.
VHD	A common disk format used by virtual machine monitors from VMware, Xen, Microsoft, VirtualBox, and others.
VHDX	An enhanced version of the VHD format that supports larger disks, and has data corruption protection.
VMDK	Another common disk format supported by many common virtual machine monitors.

Openstack Flavors

Flavors are hardware specification profiles for deploying instances.

These specifications include the disk and memory size and the number of cores to be used for each instance deployed.

Flavors can also specify sizes for additional ephemeral storage or a swap disk, plus metadata to restrict usage or to provide special project access.

Openstack Networking

Tenant networks are the most common network type that cloud users interact with. They are also self-service, meaning that cloud users create the network themselves.

Cloud users are not expected to be familiar with network design, and so tenant networks were designed to be isolated. Overlapping IP address ranges for tenant networks are allowed within the OpenStack cluster, and DHCP is also configured independently.

You can implement a typical 3-tier application architecture by creating a network for each tier, connecting the networks to routers, and configuring security group rules to allow the required access.

Network Types in Openstack

- **Project Network**

- **External Network**

- **Provider Network**

Router

For the instances to communicate with any external subnet, a router must be deployed.

Virtual routers are similar to physical routers, and they require one subnet per interface.

The traffic received by the router uses the router's default gateway as the next hop, which is one portion of the path between the source and the destination.

Key - Pair

SSH key pairs allow passwordless secure and trusted access to remote servers.

SSH keys are created in a key pair set, comprised of a private key and a public key.

Security Group

Security groups are used by OpenStack to provide network packet access control to and from instances.

Security groups are packet filtering rules that define the networks and protocols authorized to access the instances.

Floating IP’s

A floating IP is an IP address allocated from a pool for a network marked as external.

A floating IP is a routable IP address which is publicly reachable.

Floating IPs enable communication from the external network to the instance.