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CLOUD APPLICATION DEVELOPMENT

OPENSTACK LAB EXPERIMENT – 05

OBJECTIVE: Deploying OpenStack on a Hypervisor using KVM.

Introduction:

OpenStack is a cloud computing platform that provides infrastructure as a service (IaaS) for virtual machines, storage, and networking. In this lab report, we will describe the process of deploying OpenStack on a hypervisor using the KVM virtualization technology.

Objectives:

The objectives of this lab are:

1. To set up a hypervisor using KVM.

2. To install and configure OpenStack services on the hypervisor.

3. To create and launch a virtual machine instance.

Materials:

- A server with hardware virtualization support

- Ubuntu Server 20.04 LTS ISO image

- Internet connection

- SSH client (eg. PuTTY)

Procedure:

1. Install Ubuntu Server on the server using the ISO image. During the installation, make sure to select the "OpenSSH server" option to enable remote access to the server via SSH.

2. Verify that hardware virtualization support is enabled on the server by running the following command:

bashCopy code

```
grep -E 'svm|vmx' /proc/cpuinfo
```

If the output contains the words "svm" or "vmx", then hardware virtualization support is enabled.

3. Install KVM and related packages on the server by running the following command:

sqlCopy code

```
sudo apt-get install qemu-kvm libvirt-daemon-system libvirt-clients bridge-utils
```
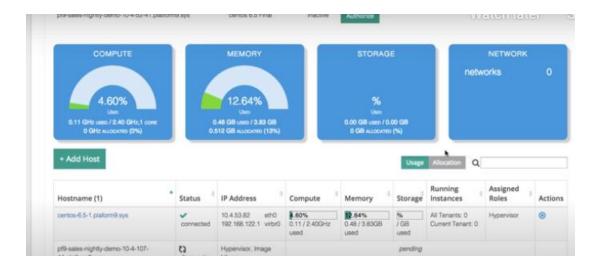
4. Verify that KVM is installed and running by running the following command:

cssCopy code

```
sudo virsh list --all
```

This command should display a list of virtual machines, which should be empty at this point.

5. Install and configure OpenStack services on the server by following the official OpenStack installation guide for Ubuntu 20.04. This involves installing various packages and configuring the OpenStack services, such as Keystone, Nova, Glance, and Neutron.

6. Once the OpenStack services are installed and configured, create a virtual network and a virtual machine instance. This can be done using the OpenStack dashboard or the command line interface.

7. Launch the virtual machine instance and verify that it is running by logging in to the virtual machine using SSH.

COMPUTE	MEMORY	STORAGE	NETWORK
4.60% Used	12.64% Used	% Used	networks 0
0.11 GHz used / 2.40 GHz,1 core 0 GHz ALLOCATED (0%)	0.48 GB used / 3.83 GB 0.512 GB ALLOCATED (13%)	0.00 GB used / 0.00 GB 0 GB ALLOCATED (%)	

+ Add Host   Usage Allocation Q

Hostname (1)	Status	IP Address	Compute	Memory	Storage	Running Instances	Assigned Roles	Actions
centos-6.5-1.platform9.sys	✓ connected	10.4.53.82 eth0 192.168.122.1 virbr0	4.60% 0.11 / 2.40GHz used	12.64% 0.48 / 3.83GB used	% / GB used	All Tenants: 0 Current Tenant: 0	Hypervisor	⊙
pf9-sales-nightly-demo-10-4-107-	↻	Hypervisor, Image			pending			

Results:

We successfully deployed OpenStack on a hypervisor using KVM. We installed Ubuntu Server on the server, verified that hardware virtualization support was enabled, and installed KVM and related packages. We then installed and configured the OpenStack services, which involved installing various packages and configuring the services.

Once the OpenStack services were installed and configured, we created a virtual network and a virtual machine instance. We launched the virtual machine instance and verified that it was running by logging in to the virtual machine using SSH.

Conclusion:

Deploying OpenStack on a hypervisor using KVM provides a powerful and flexible cloud computing platform that can be used to deploy virtual machines, storage, and networking resources on demand. While the installation and configuration process can be complex, following the official documentation and best practices can help ensure a successful deployment. Once deployed, OpenStack provides a robust platform for managing virtual resources and can be used for a variety of use cases, such as testing and development, production workloads, and research projects.