**CS 3132 Cloud Computing Lab Report (2024-25) (Jul-Dec)**

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**Assignment Date: 18-11-2024**

**Completion Date** *(when you completed the lab assignment)***:** *04-12-2024*

**1. Lab Assignment #7:** Setting Up OpenStack All-In-One Single VM for Cloud Infrastructure Management

**Objectives**: The objective of this lab assignment is to gain practical experience in deploying cloud infrastructure by setting up OpenStack as an All-In-One Single VM. Through this exercise, you will learn how to configure OpenStack to manage compute, storage, and networking resources within a single virtual machine environment. OpenStack, a leading open-source cloud computing platform, supports virtual machines, containers, and bare metal, making it a versatile tool for cloud-based infrastructure. By the end of this lab, you will have a fully operational OpenStack instance on a single VM and will be able to create and manage sample virtual instances. This hands-on experience will deepen your understanding of cloud infrastructure management, API-driven resource control, and the OpenStack dashboard interface, laying a strong foundation for further exploration in cloud computing and virtualization.

**References**:

1. <https://www.openstack.org/>
2. <https://www.openstack.org/software/project-navigator/openstack-components#openstack-services>
3. IMPORTANT: <https://docs.openstack.org/developer/dragonflow/installation.html>
4. <https://medium.com/@ollste/openstack-local-development-how-to-install-test-and-use-openstack-in-virtualbox-b60b667886c4>
5. <https://docs.openstack.org/devstack/queens/guides/single-vm.html>

**2. Hardware Requirement: min 8GB ram and 50GB storage**

**3. Software Requirement:**

**4. Lab Tasks:**

* Run sudo apt update in ubuntu

A computer screen shot of a computer code

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* clone the openstack repo

A computer screen shot of a program

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* Edit the config file

A computer screen shot of a program

Description automatically generated

* Go to the devstack folder and run the stack file

A screenshot of a computer program

Description automatically generated

* **After some time the installation is completed**

**A screenshot of a computer

Description automatically generated**

* Signin page

A screenshot of a computer

Description automatically generated

Username: admin

Password: admin

* After signing in.

A screenshot of a computer

Description automatically generated

* In this you can create instances and projects

A screenshot of a computer

Description automatically generated

**5. Observations:**

* System Requirements: Ensure sufficient resources and dependencies are installed for OpenStack to function correctly
* etworking Setup: Proper configuration of network bridges and IP allocations is critical for connectivity.
* Installation Tools: Tools like DevStack simplify setup but may require manual adjustments for customization.
* Troubleshooting: Resolving service errors requires careful analysis of logs and configurations.

**6. Results and Analysis:**

* OpenStack was successfully installed and configured on Ubuntu with essential services operational.
* Network connectivity and resource orchestration functioned as expected after resolving initial setup challenges.
* The use of DevStack significantly reduced installation complexity, making it suitable for testing environments.
* System performance and service responsiveness depended on hardware resources and proper configuration.

**7. Conclusion:**

OpenStack installation on Ubuntu demonstrates the platform's flexibility and scalability but requires careful attention to prerequisites, network configurations, and service integration. Automation tools like DevStack streamline the process for testing and learning environments, though production setups demand more meticulous customization. Effective troubleshooting is key to addressing the challenges posed by OpenStack's multi-service architecture, making it a powerful yet complex cloud management solution*.*