



الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يونیورسiti اسلام انتارا عشما ملدينيا

Garden of Knowledge and Virtue

KULLIYAH OF INFORMATION AND COMMUNICATION TECHNOLOGY

CSCI 3300: OPERATING SYSTEM

SEMESTER 2 2023/2024

SECTION: 01

LECTURER'S NAME:

DR. RIZAL BIN MOHD.NOR

NAME: NUR QISTINA ALIESA BINTI YULFA ANDRI

MATRIC NO:2215272

1.0 INTRODUCTION

1.1 Basic information about your PC

Before you start in building your private cloud, get a print screen of your system of the following information:

- i. Memory- size;
- ii. Disk - type, size;



The screenshot shows the 'Hardware Overview' section of the System Information window. It lists various hardware components and their specifications:

Hardware Overview:	
Model Name:	MacBook Pro
Model Identifier:	MacBookPro17,1
Model Number:	MYD92ZA/A
Chip:	Apple M1
Total Number of Cores:	8 (2 performance and 4 efficiency)
Memory:	8 GB
System Firmware Version:	10151.1.1
OS Loader Version:	10151.1.1
Serial Number (system):	C02G4015Q05F
Hardware UUID:	A96487B5-DA0C-5B6D-96E9-B69F09A34DFB
Provisioning UDI:	00000103-001C28EE020B001E
Activation Lock Status:	Enabled

The left sidebar shows a tree view of other hardware categories like Network, Software, and Accessibility.

iii. Network card – type, speed.

The screenshot shows the Mac OS X System Preferences window. The left sidebar is expanded to show the 'Network' section, which includes options like Firewall, Locations, Volumes, WWAN, Wi-Fi, Software, Accessibility, Applications, Developer, Disabled Software, and Extensions. The 'Network' section is highlighted with a blue selection bar. The main pane displays a table of active services:

	Type	Hardware	BSD Device Name	IPv4 Addresses
AX88179A:	Ethernet	Ethernet	en7	
Ethernet Adapter (en3)	Ethernet	Ethernet	en3	
Ethernet Adapter (en4)	Ethernet	Ethernet	en4	
Ethernet Adapter (en3)	Ethernet	Ethernet	en5	
Ethernet Adapter (en4)	Ethernet	Ethernet	en6	
iPhone USB	Ethernet	Ethernet	en8	
Thunderbolt Bridge	Ethernet	Ethernet	bridge0	
Wi-Fi	AirPort	AirPort	en0	10.121.155.240

Below this, there is a detailed configuration panel for the AX88179A service, showing Type: Ethernet, Hardware: Ethernet, BSD Device Name: en7, and IPv4 Configuration Method: DHCP. It also lists IPv6, Proxies, Exceptions List: *local, 169.254/16, FTP Passive Mode: Yes, and Service Order: 4.

At the bottom of the System Preferences window, the status bar shows 'nur's MacBook Pro (2) > Network > AX88179A' and 'MACINTOSH HD 14.3.3 (UD) Available at 494.00 GB'.

The second part of the screenshot shows the 'Disk Speed Test' application window. It features two large analog-style gauges: one for 'WRITE' showing 2826.5 MB/s and one for 'READ' showing 2750.9 MB/s. Below the gauges is a 'SPEED TEST START' button. The window title is 'Disk Speed Test' and it has a 'Blackmagicdesign' logo in the top right corner.

At the bottom of the 'Disk Speed Test' window, there are two tables: 'Will It Work?' and 'How Fast?'. The 'Will It Work?' table compares file formats (NTSC/PAL, 720p60, 1080i60, 1080p25, 1080p60, 2K DCI 24, 2160p25, 2160p60, 4320p25, 4320p60, 8K DCI 24, 8K DCI 60, 12K DCI 24, 12K DCI 60) across three formats: Blackmagic RAW, ProRes 422 HQ, and H.265. The 'How Fast?' table provides specific write and read speeds for NTSC/PAL, 1080 HD, 2160 4K, 4320 8K, 6480 12K, ProRes 422 HQ, 1080 HD, 2160 4K, 4320 8K, 6480 12K, and H.265 formats at various resolutions.

iv. OS (Linux) – version, number of bits, other general properties.

The screenshot shows the Mac OS X System Preferences window. The left sidebar is expanded to show the 'Software' section, which includes options like Accessibility, Applications, Developer, Disabled Software, Extensions, Fonts, Frameworks, Installations, Language & Region, and Legacy Software. The 'Software' section is highlighted with a blue selection bar. The main pane displays a 'System Software Overview' table:

	System Version:	macOS 14.0 (23A344)
	Kernel Version:	Darwin 23.0.0
	Boot Volume:	Macintosh HD
	Boot Mode:	Normal
	Computer Name:	nur's MacBook Pro (2)
	Username:	nur (nur ist eine lokale Benutzergruppe)
	Secure Virtual Memory:	Enabled
	System Integrity Protection:	Enabled
	Time since boot:	54 days, 18 hours, 52 minutes

At the bottom of the System Preferences window, the status bar shows 'nur's MacBook Pro (2) > Software'.

- v. What are the steps to build a private cloud using OpenStack on an Ubuntu operating system?
1. Install VM workstation and Ubuntu newest version.
 2. Create Virtual Machine.
 3. Go to DevStack official documentation, install the OpenStack using the needed commands.
 4. Use the package manager to install OpenStack components such as Keystone, Glance, Nova, Neutron, and others.
 5. Configure OpenStack Services. Configure each OpenStack service with appropriate settings, including database connections, authentication, and networking.
 6. After the installation is done, use the given IP address, user name and password to get into OpenStack
 7. Launch Instances. Use the OpenStack dashboard (Horizon) or command-line tools to launch virtual instances.
 8. Login to the openStack using the information gathered in the previous section, you will find the main dashboard looks like
 9. Create a Project in OpenStack Horizon
 10. Create a Project in OpenStack Horizon, use YOUR_NAME_CSCI3300 as a project name
 11. Create a User and associate it with the new Project. Change the User Name to YOUR_NAME,
 - Password, Primary Project, and Role
 12. Create an Instance (or virtual machines) with OpenStack's compute service called Nova.

(5 marks)

1.2 Getting started with Cloud Computing

To start with your assignment, answer BRIEFLY the following questions:

- 1) What empirical evidence supports the benefits of cloud computing, and how do these benefits compare to traditional computing models? **(5 marks)**

1. Cost Savings

Organizations can achieve cost savings through the pay-as-you-go model, avoiding upfront infrastructure costs.

2. Scalability

Cloud services allow for easy scalability to meet changing demand, preventing the overprovisioning common in traditional models.

3. Flexibility and Accessibility

Cloud services enable remote access to resources, fostering collaboration and flexibility in work arrangements.

4. Innovation

Cloud platforms often provide a wide range of tools and services, promoting innovation and faster time-to-market.

- 2) What are the various deployment models available in cloud computing, and what are the relative advantages and disadvantages of each model in terms of scalability, security, and cost-effectiveness? **(2 marks)**

Deployment Model	Description	Advantages	Advantages
Public Cloud	Services provided by third-party providers over the internet, shared among multiple users.	- Scalability -Cost-effectiveness - Accessibility	Security and Compliance, Dependency on Provider, Limited Customization
Private Cloud	Cloud infrastructure dedicated to a single organization, offering greater control and security.	Control and Security, Customization, Performance	Cost, Scalability, Complexity
Hybrid Cloud	Combination of public and private cloud environments, providing flexibility and scalability.	Flexibility, Scalability, Disaster Recovery	Complexity, Data Movement and Latency, Security and Compliance
Multi cloud	Use of multiple cloud providers for different workloads, avoiding vendor lock-in and increasing resilience.	Vendor Flexibility, Risk Mitigation, Innovation	Complexity, Cost Management, Interoperability

- 3) What empirical evidence supports the advantages of implementing a private cloud infrastructure for a company, and how do these benefits compare to those of a public or hybrid cloud deployment? Additionally, what are the potential risks and challenges associated with private cloud adoption and how can they be mitigated? **(6 marks)**

Advantages of Private Cloud:

1. Control and Security: Private clouds offer tight control over data and infrastructure, ensuring high levels of security and compliance.
2. Customization: Organizations can tailor private cloud environments to their specific needs, optimizing performance and resource allocation.
3. Data Sovereignty: Private clouds are preferred by industries with strict data sovereignty requirements, ensuring data remains within jurisdictional boundaries.

Comparison with Public and Hybrid Cloud:

- Public Cloud: While public clouds offer scalability and cost-effectiveness, private clouds provide greater control and security.
- Hybrid Cloud: Hybrid clouds combine benefits of both public and private clouds but introduce complexity in integration and management.

Risks and Challenges:

1. Cost: Private clouds require upfront investment, and cost management can be challenging compared to pay-as-you-go public cloud models.
2. Complexity: Setting up and managing private clouds can be complex, requiring specialized skills and expertise.
3. Scalability: Private clouds may have limited scalability compared to public clouds, requiring careful planning for growth.

Mitigation Strategies:

- Cost Management: Conduct cost-benefit analysis and optimize resource utilization.
- Skills and Training: Invest in employee training and automation tools.
- Automation: Implement automation to streamline deployment and management tasks.
- Security Measures: Implement robust security measures and regular audits to ensure data integrity and compliance.

In this assignment, we will be using OpenStack which is an open source cloud computing platform that is used by organizations to manage and control large scale deployments of virtual machines, such as in a cloud computing or virtual private server environment. Besides being used to manage deployments of virtual machines, OpenStack can also be used to manage storage and networking resources in a cloud environment.

- What are some alternative cloud computing platforms available in the market, and how do they compare to each other in terms of performance, scalability, reliability, and cost-effectiveness? **(6 marks)**
- **Amazon Web Services (AWS):**
 - o Performance: AWS offers high-performance computing resources, including compute instances, storage options, and networking services.
 - o Scalability: AWS is known for its scalability, offering auto-scaling features that allow users to dynamically adjust resources based on demand.
 - o Reliability: AWS boasts a robust global infrastructure with multiple availability zones and regions, providing high availability and fault tolerance.
 - o Cost-effectiveness: AWS offers a pay-as-you-go pricing model, allowing users to pay only for the resources they consume, which can be cost-effective for variable workloads.
- **Microsoft Azure:**
 - o Performance: Azure provides a wide range of compute, storage, and networking services with high-performance capabilities.
 - o Scalability: Azure offers scalable solutions for both cloud-native and traditional applications, with built-in auto-scaling features.
 - o Reliability: Azure ensures high availability and reliability through its global network of data centers and redundancy options.
 - o Cost-effectiveness: Azure offers competitive pricing and flexible pricing models, including pay-as-you-go and reserved instances, which can be cost-effective for various workloads.
- **Google Cloud Platform (GCP):**

- o Performance: GCP offers high-performance computing resources, including compute engine, storage, and networking services optimized for speed and efficiency.
 - o Scalability: GCP provides scalable solutions for cloud-native applications, with auto-scaling features and global load balancing.
 - o Reliability: GCP offers a reliable infrastructure with multiple data centers and regions, ensuring high availability and fault tolerance.
 - o Cost-effectiveness: GCP offers competitive pricing and discounts for sustained usage, making it cost-effective for various workloads.
 - **IBM Cloud:**
 - o Performance: IBM Cloud offers a wide range of performance-optimized compute, storage, and networking services, including AI and analytics capabilities.
 - o Scalability: IBM Cloud provides scalable solutions for cloud-native and traditional applications, with built-in auto-scaling features and flexible resource options.
 - o Reliability: IBM Cloud ensures high availability and reliability through its global network of data centers and redundant infrastructure.
 - o Cost-effectiveness: IBM Cloud offers flexible pricing options, including pay-as-you-go and reserved instances, with discounts for long-term commitments.
 - **Alibaba Cloud:**
 - o Performance: Alibaba Cloud offers high-performance computing resources, including compute instances, storage options, and networking services optimized for speed and efficiency.
 - o Scalability: Alibaba Cloud provides scalable solutions for cloud-native applications, with auto-scaling features and global load balancing.
 - o Reliability: Alibaba Cloud ensures high availability and reliability through its global network of data centers and redundant infrastructure.
 - o Cost-effectiveness: Alibaba Cloud offers competitive pricing and discounts for sustained usage, making it cost-effective for various workloads.
- Based on empirical evidence, what are the comparative advantages and disadvantages of using OpenStack as a cloud computing platform in comparison to other available options, with respect to factors such as scalability, security, interoperability, and cost-effectiveness? Additionally, how can the adoption and implementation of OpenStack be optimized for maximum benefits and efficiency? **(6 marks)**

Advantages of OpenStack:

1. Scalability: OpenStack provides scalable solutions for compute, storage, and networking, allowing users to dynamically scale resources up or down based on demand.
2. Security: OpenStack offers robust security features, including role-based access control (RBAC), encryption, and security groups, ensuring data protection and compliance with security standards.
3. Interoperability: OpenStack is an open-source platform with a large ecosystem of contributors and integrations, enabling interoperability with other cloud platforms, tools, and services.
4. Cost-effectiveness: OpenStack offers cost-effective solutions for building and managing private, public, or hybrid clouds, allowing organizations to leverage existing hardware and infrastructure investments.

Disadvantages of OpenStack:

1. Complexity: OpenStack has a steep learning curve and can be complex to deploy, configure, and manage, requiring specialized skills and expertise.
2. Resource Intensiveness: OpenStack deployments require significant hardware resources and infrastructure, leading to high upfront costs and ongoing maintenance overhead.
3. Limited Native Services: OpenStack may have fewer native services and features compared to proprietary cloud platforms, requiring additional integrations or custom development for specific use cases.
4. Community Support: While OpenStack has a large and active community of contributors, users may face challenges in terms of community support, documentation, and resources compared to commercial cloud providers.

Optimization Strategies for OpenStack Adoption:

Planning and Assessment: Conduct thorough planning and assessment to determine the suitability of OpenStack for your organization's needs, considering factors such as workload requirements, resource availability, and skill sets.

Training and Skill Development: Invest in employee training and skill development to ensure that your team has the necessary expertise to deploy, configure, and manage OpenStack environments effectively.

Automation and Orchestration: Implement automation and orchestration tools to streamline deployment, provisioning, and management tasks, reducing manual effort and improving operational efficiency.

Performance Optimization: Optimize performance by fine-tuning OpenStack configurations, optimizing resource allocation, and leveraging caching and acceleration technologies.

Security and Compliance: Implement robust security measures, including RBAC, encryption, and security auditing, to protect data and ensure compliance with regulatory requirements.

Cost Management: Implement cost management and monitoring tools to track resource usage, identify cost-saving opportunities, and optimize resource allocation for maximum efficiency.

Community Engagement: Engage with the OpenStack community through forums, user groups, and conferences to share knowledge, exchange best practices, and leverage community support for troubleshooting and problem-solving.

INSTRUCTIONS

Installing your private cloud on your Ubuntu

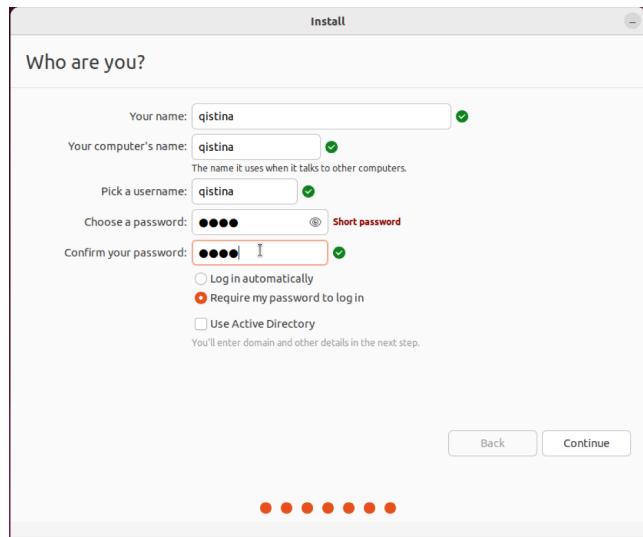
To start your private cloud on your PC, you need to create the right environment for DevStack/OpenStack which is one of the cloud open source solution, you need to install VMware Workstation or Virtual box to run our virtual machine

** You may skip some steps if Ubuntu is already installed in your device since Assignment 1. However, everything should be stated in details in this assignment as well*

2.1 Installing VMWare and build your Virtual Machine

You can download the VMWare Workstation on your device from VMWare website, Install it on your device then start building your virtual machine which will have your private cloud

- 1) run vmware workstation, click on “Create a new virtual Machine
- 2) download Ubuntu image file (.iso) from this website: <https://releases.ubuntu.com>
- 3) use the above file to install Ubuntu operating system on your new virtual machine
*Use your first name as your “Virtual machine name”, it should appear in the screen shots you take from now on

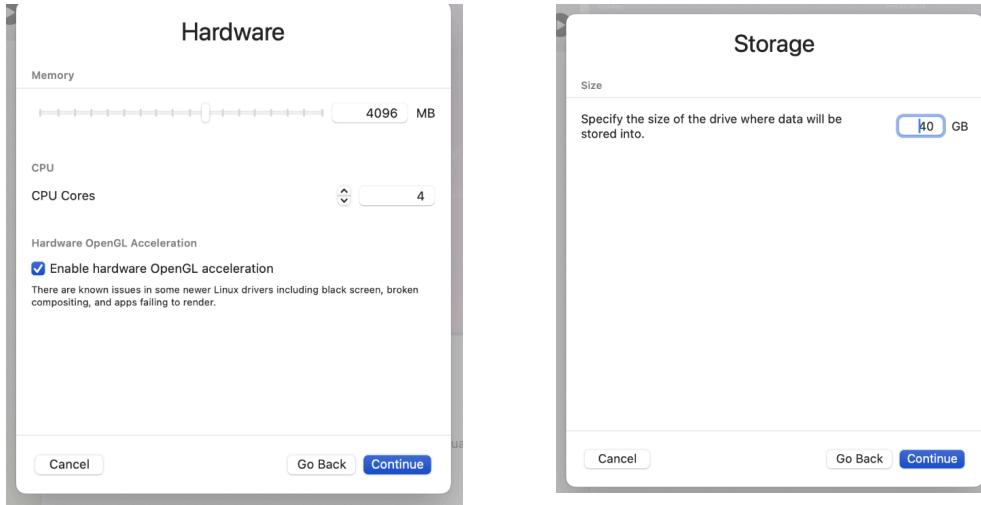


When you are done, answer the following:

- Why do we need to use virtual machine for the private cloud? Why don't we install it directly in our computer?

Using virtual machines (VMs) in a private cloud offers advantages like resource optimization, isolation for security, flexibility for scaling, hardware independence, fault tolerance, and simplified backup and recovery. VMs enable better use of hardware resources, secure isolation between applications, easy scalability, hardware independence, and enhanced fault tolerance compared to running services directly on physical computers.

- How much disk size did you give to your VM? How much memory did you give it?
Show Screen shot of the steps



2.2 Installing OpenStack using DevStack

DevStack is a series of extensible scripts used to quickly bring up a complete OpenStack. It is used interactively as a development environment and as the basis for much of the OpenStack project's functional testing.

- 1) Go to DevStack official documentation in the bellow link, where you will find how to install the OpenStack and the needed commands: <https://docs.openstack.org/devstack/latest/>
- 2) After following the steps in the DevStack documentation, your devstack will have installed **keystone, glance, nova, placement, cinder, neutron, and horizon**. Briefly explain the answers based on these questions:

- a. What is Keystone and what services does it provide in the OpenStack family?

-Keystone is the identity service in the OpenStack family, providing authentication, authorization, and token-based validation services. It manages user and service identities, along with role-based access control (RBAC) policies. Keystone ensures secure access to OpenStack services by authenticating users and verifying their permissions.

- b. What is the role of Glance in the OpenStack cloud computing platform?

-Glance is the image service in the OpenStack cloud computing platform. Its role is to manage virtual machine (VM) images, such as operating system images and snapshots. Glance provides a catalog of available images that users can use to deploy VMs, making it a critical component for launching instances in OpenStack.

- c. How does Nova service provide Infrastructure as a Service (IaaS) in the OpenStack cloud computing platform?

-Nova is the compute service in the OpenStack cloud computing platform, providing Infrastructure as a Service (IaaS). Nova manages and orchestrates the lifecycle of virtual machines (VMs), including provisioning, scheduling, and termination. It allows users to create and manage instances (VMs) on demand, providing scalable compute resources.

- d. What is Placement and what is its responsibility in the OpenStack cloud computing platform?

-Placement is responsible for resource allocation and tracking in the OpenStack cloud computing platform. It provides a RESTful API for managing and tracking resource usage, including CPU, memory, and disk allocations. Placement ensures efficient resource utilization by allocating resources to instances based on availability and user-defined policies.

- e. What are the block storage services provided by Cinder in the OpenStack cloud computing platform?

-Cinder is the block storage service in the OpenStack cloud computing platform, providing persistent storage for instances (VMs). It allows users to create and manage block storage volumes, attaching them to instances as additional storage. Cinder supports various storage backends, including local disks, network-attached storage (NAS), and storage area networks (SANs).

- f. What is Neutron and how does it provide networking as a service (NaaS) in the OpenStack cloud computing platform?

-Neutron is the networking service in the OpenStack cloud computing platform, providing Networking as a Service (NaaS). Neutron manages virtual networks, subnets, routers, and other networking resources required for connecting instances (VMs) to the external world and to each other. It supports a pluggable architecture that allows users to integrate with various networking technologies and vendors.

- g. What is Horizon and how does it allow users to manage their cloud resources in the OpenStack cloud computing platform?

-Horizon is the web-based dashboard in the OpenStack cloud computing platform, providing a graphical user interface (GUI) for managing cloud resources. Horizon allows users to view, create, and manage instances, volumes, networks, and other resources in their OpenStack environment. It provides a user-friendly interface for administrators and end-users to interact with OpenStack services

- h. How does OpenStack use Keystone for authentication and verification of services?

-OpenStack uses Keystone for authentication and verification of services. When users access OpenStack services, they authenticate with Keystone to obtain an authentication token. Keystone verifies the user's identity and permissions, allowing them to access the requested services.

- i. How does the Placement API enable resource allocation in an OpenStack cloud?

-The Placement API enables resource allocation in an OpenStack cloud by providing a centralized resource tracking and allocation service. It allows OpenStack services such as

Nova to query Placement for available resources and request allocations based on user demand and resource availability.

- j. How does Neutron's pluggable architecture allow users to manage various networking technologies?

-Neutron's pluggable architecture allows users to manage various networking technologies by supporting multiple plugins and drivers. Users can choose and integrate with different networking technologies, such as virtual switches, VLANs, VXLANS, and software-defined networking (SDN) solutions, to meet their specific networking requirements.

- 3) at the end of your installation process, some important details will appear, state the following:

- a. The host IP address assigned to your VM

10.0.2.15

- b. The directory of Horizon & Keystone?

Horizon-<http://10.0.2.15/dashboard>

Keystone-<http://10.0.2.15/identity/>

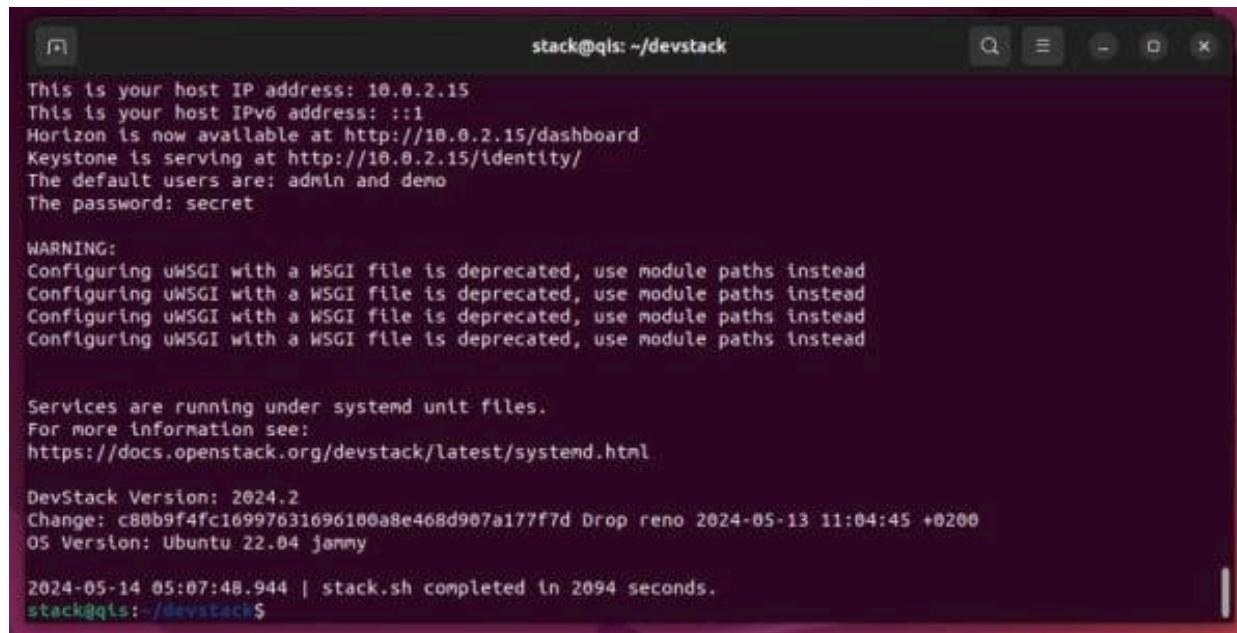
- c. The default users?

admin and demo

- d. The password

secret

- 4) after the installation is done, use the given IP address, user name and password to get into OpenStack



```
stack@qls: ~/devstack
This is your host IP address: 10.0.2.15
This is your host IPv6 address: ::1
Horizon is now available at http://10.0.2.15/dashboard
Keystone is serving at http://10.0.2.15/identity/
The default users are: admin and demo
The password: secret

WARNING:
Configuring uWSGI with a WSGI file is deprecated, use module paths instead
Configuring uWSGI with a WSGI file is deprecated, use module paths instead
Configuring uWSGI with a WSGI file is deprecated, use module paths instead
Configuring uWSGI with a WSGI file is deprecated, use module paths instead

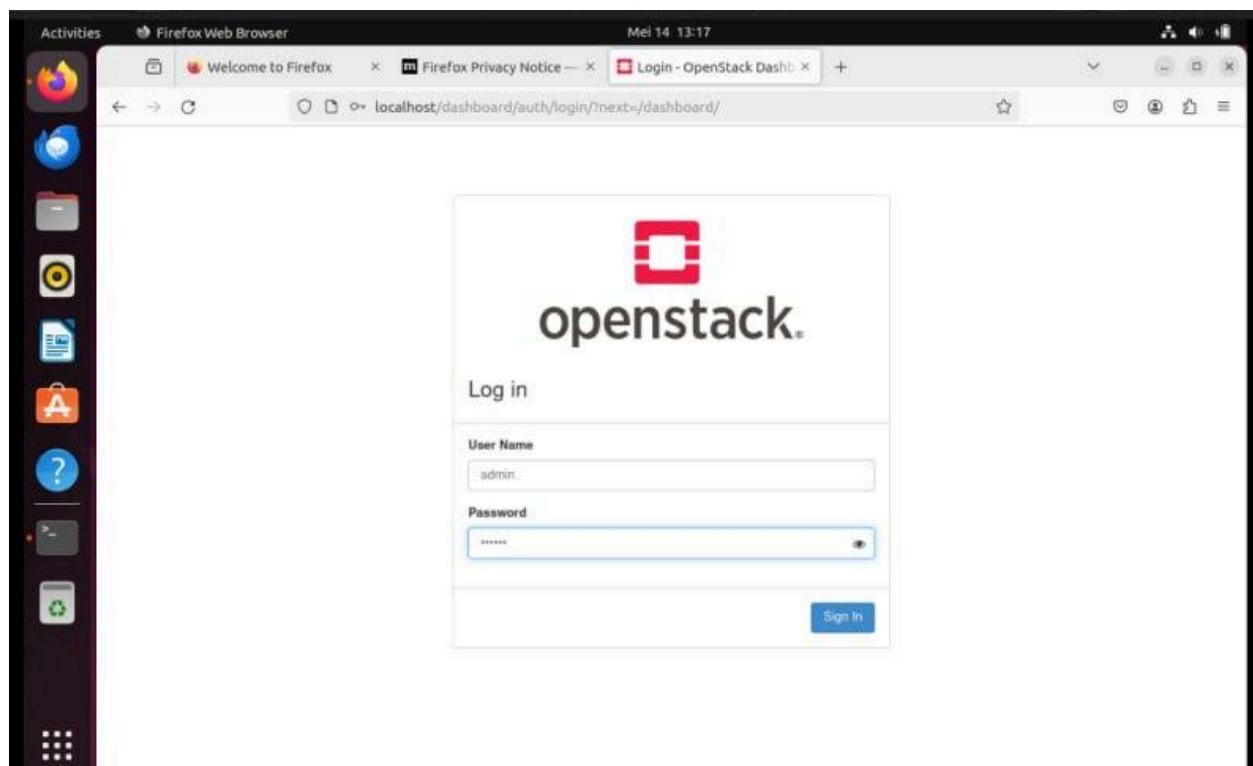
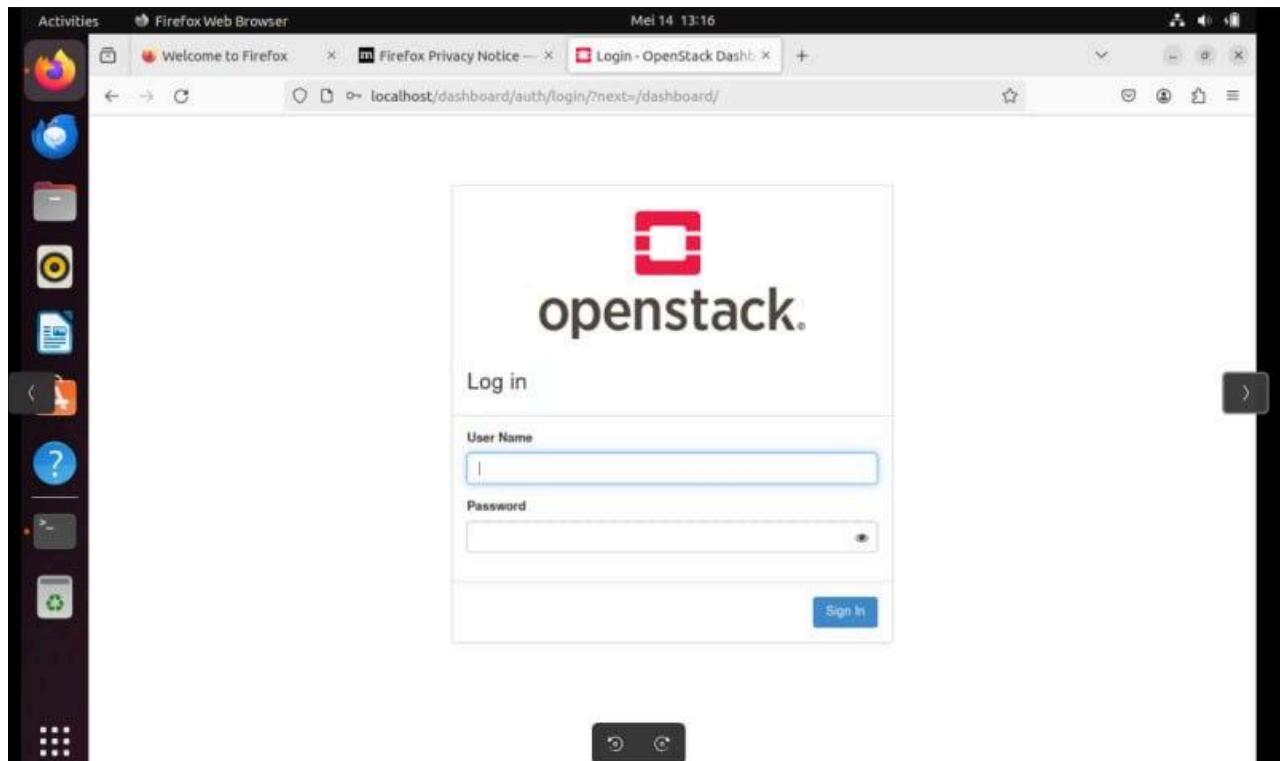
Services are running under systemd unit files.
For more information see:
https://docs.openstack.org/devstack/latest/systemd.html

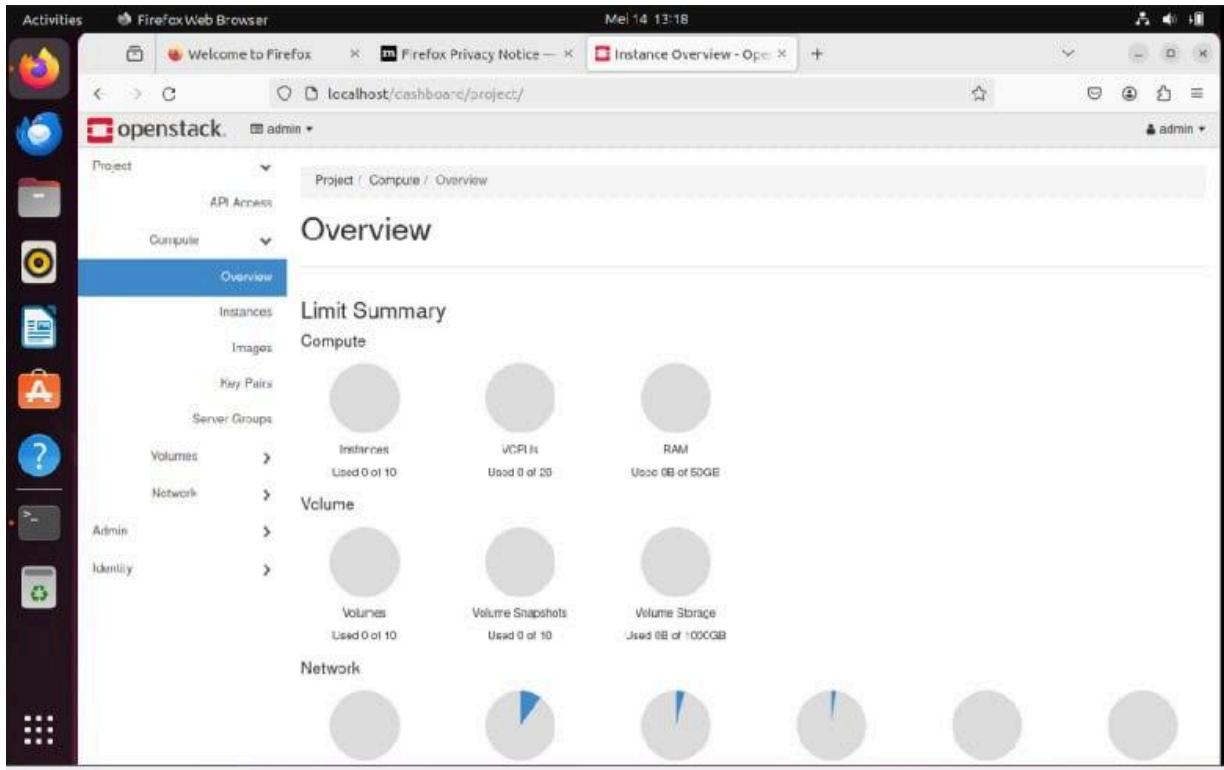
DevStack Version: 2024.2
Change: c80b9f4fc16997631696106a8e468d907a177f7d Drop reno 2024-05-13 11:04:45 +0200
OS Version: Ubuntu 22.04 jammy

2024-05-14 05:07:48.944 | stack.sh completed in 2094 seconds.
stack@qls:~/devstack$
```

1.3 Private Cloud configurations

Login to the openStack using the information gathered in the previous section, you will find the main dashboard looks like:





- 1) State the values you find in your own OpenStack Horizon dashboard, and find out what these terms means:

- Instances-**used 0 out 10**
- VCPUs-**used 0 out 20**
- RAM-**used 0 out 50**
- Floating IPs-**used 0 out 50**
- Security Groups-**used 1 out 10**
- Volumes-**used 0 out 10**
- Volume Storage-**used 0 out 1000**

*** Include a screen shot of the Horizon dashboard – state the day and time of that screen shorts as the example below:**

Activities Firefox Web Browser

Mei 14 13:18

Welcome to Firefox × Firefox Privacy Notice × Instance Overview - OpenStack Project Overview

Project admin

openstack. admin

Compute API Access

Compute Overview Limit Summary

Instances Instances Used 0 of 10

Images VCPUs Used 0 of 20

Key Pairs RAM Used 0B of 50GB

Server Groups

Volumes Volume

Volumes Used 0 of 10

Volume Snapshots Volume Storage Used 0B of 1000GB

Network Admin Identity

Floating IPs Network

Allocated 0 of 50 Security Groups Used 1 of 10

Security Group Rules Used 4 of 100 Networks Used 2 of 100

Ports Used 2 of 500 Routers Used 0 of 10

This screenshot shows the 'Instance Overview' page of the OpenStack dashboard. The top navigation bar includes links for 'Welcome to Firefox', 'Firefox Privacy Notice', and 'Instance Overview'. The left sidebar has sections for 'Project' (admin), 'Compute', 'Volume', 'Network', 'Admin', and 'Identity'. Under 'Compute', there are tabs for 'Overview' (selected) and 'Limit Summary'. The 'Limit Summary' section is divided into three main categories: Compute, Volume, and Network. Each category contains three circular progress bars with associated text. For Compute, the metrics are Instances (Used 0 of 10), VCPUs (Used 0 of 20), and RAM (Used 0B of 50GB). For Volume, the metrics are Volumes (Used 0 of 10), Volume Snapshots (Used 0 of 10), and Volume Storage (Used 0B of 1000GB). For Network, the metrics are Floating IPs (Allocated 0 of 50), Security Groups (Used 1 of 10), Security Group Rules (Used 4 of 100), Networks (Used 2 of 100), Ports (Used 2 of 500), and Routers (Used 0 of 10).

- 2) Create a Project in OpenStack Horizon, use YOUR_NAME_CSCI3300 as a project name

*** Include a screen shot of the Horizon dashboard – state the day and time of that screen shorts as the example below:**

The screenshot shows the OpenStack Horizon dashboard running in a Firefox browser on a Linux desktop. The title bar indicates it's 14 13:22. The left sidebar has 'openstack.' and 'admin' selected. The main content area is titled 'Projects' and displays a table of existing projects. The table columns are Name, Description, Project ID, Domain Name, Enabled, and Actions. The projects listed are:

Name	Description	Project ID	Domain Name	Enabled	Actions
invisible_to_admin		29f5a2f68a78418099b571953cd7b837	Default	Yes	Manage Members
service		2e6f224eed0740879f26e14242aa7ed8	Default	Yes	Manage Members
QISTINA_ALIESA_22_15272	INDIVIDUAL ASSIGNMENT	a97637c07e974ce4afcd6fc76cba0214	Default	Yes	Manage Members
alt_demo		a1t67d19c3394289bae9ccdc70d7696a	Default	Yes	Manage Members
admin	Bootstrap project for initializing the cloud.	c73f6a6e0d945680ff1fc34278142571	Default	Yes	Manage Members
demo		cece5e16a0e94c67aa673849fb5688b1	Default	Yes	Manage Members

- 3) Create a User and associate it with the new Project. Change the User Name to YOUR_NAME, Password, Primary Project, and Role

*** Include a screen shot of the Horizon dashboard – state the day and time of that screen shorts as the example below:**

Create User

Domain ID
default

Domain Name
Default

User Name *
QISTINA_ALIESA

Description
individual assignment

Email

Password *
secret

Confirm Password *

Primary Project

Role

Enabled

Lock password

Description:
Create a new user and set related properties including the Primary Project and Role.

Description
individual assignment

Email

Password *
secret

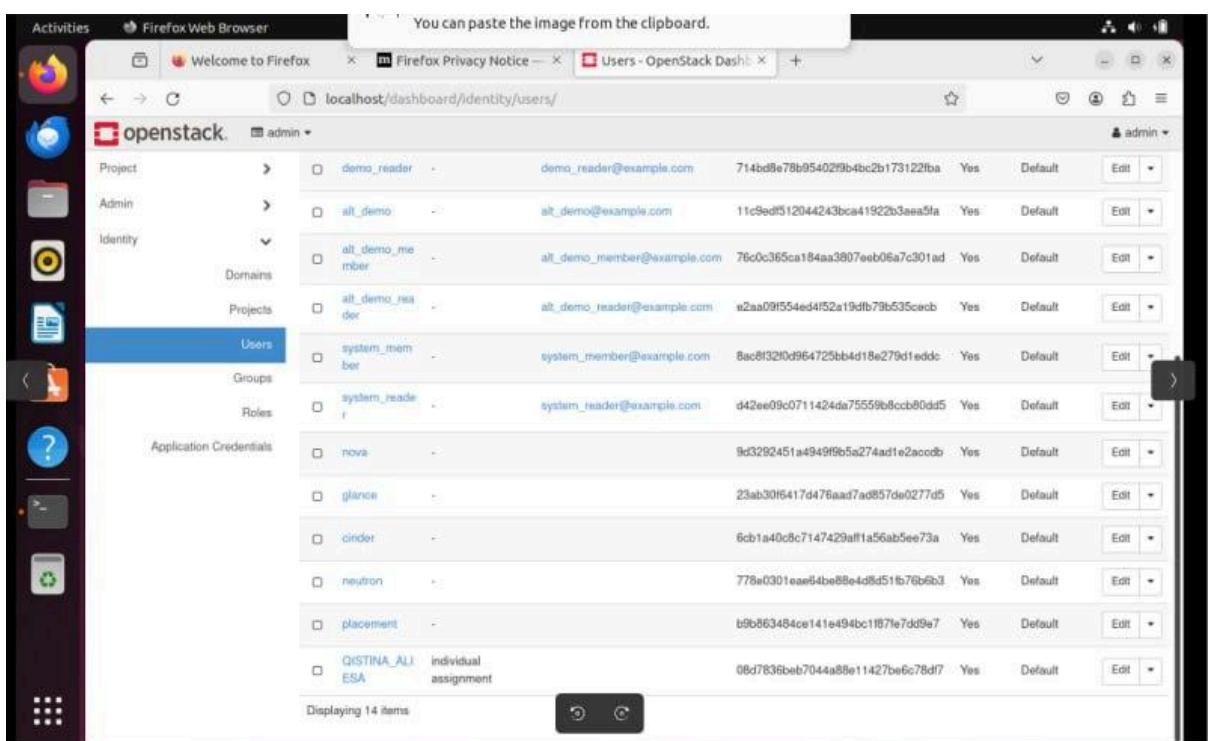
Confirm Password *

Primary Project

Role

Enabled

Lock password



- 4) Create an Instance (or virtual machines) with OpenStack's compute service called Nova.

The screenshot shows the OpenStack dashboard in a Firefox browser window. The URL is `localhost/dashboard/project/instances/`. The dashboard has a left sidebar with icons for Project, API Access, Compute, Network, Volumes, Admin, and Identity. The Compute section is expanded, and the Instances tab is selected. The main content area is titled "Instances" and displays a table with one item. The table columns are: Instance Name, Image Name, IP Address, Flavor, Key Pair, Status, Availability Zone, Task, Power State, Age, and Actions. The single row shows an instance named "QISTINA_ALI_ESA_2215272" with the following details: Image Name "ALIESA_2", IP Address "192.168.233.71", Flavor "m1.nano", Key Pair "", Status "Build", Availability Zone "nova", Task "Block Device Mapping", Power State "No State", Age "0 minutes", and Actions "Associate Floating IP".

This screenshot is identical to the one above, showing the OpenStack dashboard in a Firefox browser window. The URL is `localhost/dashboard/project/instances/`. The dashboard structure and the Instances table are the same, but the status of the instance has changed. The instance "QISTINA_ALI_ESA_2215272" now has a status of "Active" and a task of "None". The power state is "Running" and the age is "0 minutes". The "Actions" column still includes "Associate Floating IP" and "Create Snapshot".

