



**MALAD KANDIVALI EDUCATION SOCIETY'S
NAGINDAS KHANDWALA COLLEGE OF COMMERCE,
ARTS & MANAGEMENT STUDIES & SHANTABEN NAGINDAS
KHANDWALA COLLEGE OF SCIENCE
MALAD [W], MUMBAI – 64
(AUTONOMOUS)**

**(Reaccredited 'A' Grade by NAAC)
(AFFILIATED TO UNIVERSITY OF MUMBAI)
(ISO 9001:2015)**

CERTIFICATE

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Programme: BSc CS

Semester: VI

This is certified to be a bonafide record of practical works done by the above student in the college laboratory for the course **Cloud Computing** (Course Code: **1862UCSPR**) for the partial fulfillment of Sixth Semester of BSc CS during the academic year 2020-2021. The journal work is the original study work that has been duly approved in the year 2020-2021 by the undersigned.

External Examiner

Ms. Niramaye Deshpande

(Subject-In-Charge)

Date of Examination:

(College Stamp)

Name: kuldeep sushil patelRoll No: 574Subject: **Cloud Computing**Class: **T. Y. BSc. CS****INDEX**

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3	25-01-2021	Study and Implementation of Infrastructure as a service.	
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7	08-03-2021	Write a program for web feed.	
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Practical No 1

Aim : Study of Cloud Computing & Architecture.

OBJECTIVE:

The objective of cloud computing is that to host web services, store and backup data, high performance computing, host and stream media, build search engines, server-side of mobile applications & many more.

No matter what cloud service you choose, they focus on synchronisation & concurrency. At the end they look for consistency (agreement protocols based on quorums), availability (replicate) & partition tolerance (the above are true when network partitions).

Example: Consider Amazon Dynamo's key-value storage system

THEORY:

Cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet (“the cloud”) to offer faster innovation, flexible resources, and economies of scale. You typically pay only for cloud services you use, helping lower your operating costs, run your infrastructure more efficiently and scale as your business needs change.

Cloud computing is a big shift from the traditional way businesses think about IT resources. Here are seven common reasons organisations are turning to cloud computing services:

Cost

Cloud computing eliminates the capital expense of buying hardware and software and setting up and running on-site datacentres—the racks of servers, the round-the-clock electricity for power and cooling, the IT experts for managing the infrastructure. It adds up fast.

Speed

Most cloud computing services are provided self-service and on demand, so even vast amounts of computing resources can be provisioned in minutes, typically with just a few mouse clicks, giving businesses a lot of flexibility and taking the pressure off capacity planning.

Global scale

The benefits of cloud computing services include the ability to scale elastically. In cloud speak, that means delivering the right amount of IT resources—for example, more or less computing power, storage, bandwidth—right when it is needed and from the right geographic location.

Productivity

On-site datacenters typically require a lot of “racking and stacking”—hardware setup, software patching, and other time-consuming IT management chores. Cloud computing removes the need for many of these tasks, so IT teams can spend time on achieving more important business goals.

Performance

The biggest cloud computing services run on a worldwide network of secure datacenters, which are regularly upgraded to the latest generation of fast and efficient computing hardware. This offers several benefits over a single corporate datacenter, including reduced network latency for applications and greater economies of scale.

Reliability

Cloud computing makes data backup, disaster recovery and business continuity easier and less expensive because data can be mirrored at multiple redundant sites on the cloud provider’s network.

Security

Many cloud providers offer a broad set of policies, technologies and controls that strengthen your security posture overall, helping protect your data, apps and infrastructure from potential threats.

Types of cloud computing

Not all clouds are the same and not one type of cloud computing is right for everyone. Several different models, types and services have evolved to help offer the right solution for your needs.

First, you need to determine the type of cloud deployment or cloud computing architecture, that your cloud services will be implemented on. There are three different ways to deploy cloud services: on a public cloud, private cloud or hybrid cloud. Learn more about public, private and hybrid clouds.

Public cloud

Public clouds are owned and operated by a third-party cloud service provider, which deliver their computing resources like servers and storage over the Internet. Microsoft Azure is an example of a public cloud. With a public cloud, all hardware, software and other supporting infrastructure is owned and managed by the cloud provider. You access these services and manage your account using a web browser. Learn more about the public cloud.

Private cloud

A private cloud refers to cloud computing resources used exclusively by a single business or organisation. A private cloud can be physically located on the company's on-site datacenter. Some companies also pay third-party service providers to host their private cloud. A private cloud is one in which the services and infrastructure are maintained on a private network. Learn more about the private cloud.

Hybrid cloud

Hybrid clouds combine public and private clouds, bound together by technology that allows data and applications to be shared between them. By allowing data and applications to move between private and public clouds, a hybrid cloud gives your business greater flexibility, more deployment options and helps optimise your existing infrastructure, security and compliance. Learn more about the hybrid cloud.

Types of cloud services: IaaS, PaaS, serverless and SaaS

Uses of cloud computing

You are probably using cloud computing right now, even if you don't realise it. If you use an online service to send email, edit documents, watch movies or TV, listen to music, play games or store pictures and other files, it is likely that cloud computing is making it all possible behind the scenes. The first cloud computing services are barely a decade old, but already a variety of organisations— from tiny start-ups to global corporations, government agencies to non-profits—are embracing the technology for all sorts of reasons

CONCLUSION :

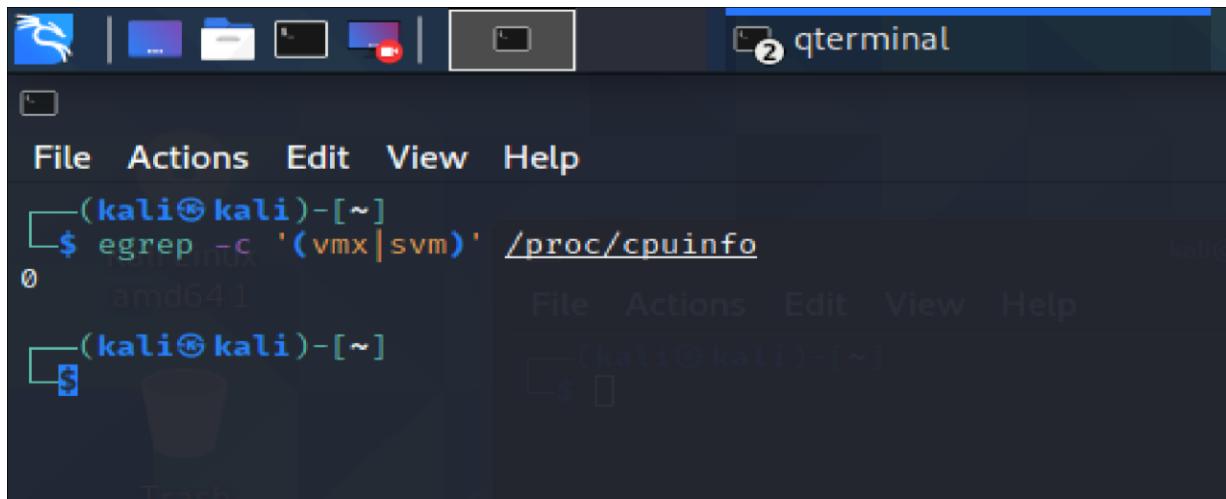
In conclusion, cloud computing is recently new technological development that has the potential to have a great impact on the world. It has many benefits that it provides to its users and businesses. For example, some of the benefits that it provides to businesses, is that it reduces operating cost by spending less on maintenance and software upgrades and focus more on the businesses itself. But there are other challenges the cloud computing must overcome. People are very sceptical about whether their data is secure and private. There are no standards or regulations worldwide provided data through cloud computing. Europe has data protection laws but the US, being one of the most technological advanced nation, does not have any data protection laws. Users also worry about who can disclose their data and have ownership of their data. But once, there are standards and regulation worldwide, cloud computing will revolutionize the future.

Practical No. 2

AIM: Installation and configuration of virtualization using KVM.

PROCEDURE:

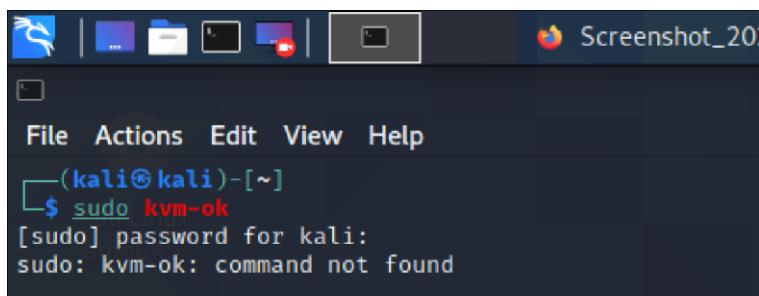
Step 1: Pre-Installation Checks, before diving into the installation, you must ensure that your CPU supports virtualization. \$ egrep -c '(vmx|svm)' /proc/cpuinfo



```
(kali㉿kali)-[~]
$ egrep -c '(vmx|svm)' /proc/cpuinfo
1
0      amd64

(kali㉿kali)-[~]
$
```

\$ sudo kvm-ok



```
(kali㉿kali)-[~]
$ sudo kvm-ok
[sudo] password for kali:
sudo: kvm-ok: command not found
```

Step 2: Install Necessary Package

\$ sudo apt install qemu-kvm libvirt-clients libvirt-daemon-system bridge-utils

```
(kali㉿kali)-[~]
└─$ sudo apt install qemu-kvm libvirt-clients libvirt-daemon-system bridge-utils
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, selecting 'qemu-system-x86' instead of 'qemu-kvm'
The following additional packages will be installed:
  augeas-lenses dmeventd dmsetup dns-root-data dnsmasq-base ibverbs-providers ipxe-qemu jq libaugeas0 libbrlapi0.8 libcacard0 libdaxctl1 libdevmapper-event1
  libnss-my machines libnss-systemd libonig5 libpam-systemd libpmem1 librdmacm1 libslirp0 libspice-server1 libsystemd0 libusbredirparser1 libvdeplug2 libvirt-
  libvirt-daemon-config-nwfilter libvirt-daemon-driver-lxc libvirt-daemon-driver-qemu libvirt-daemon-driver-vbox libvirt-daemon-driver-xen libvirt-daemon-sy
  libxenforeignmemory1 libxengnttab1 libxenhypfs1 libxenmisc4.14 libxenstore3.0 libxentoolcore1 libxentoollog1 libyajl2 lvm2 mdevctl netcat-openbsd ovmf qem
  systemd-container thin-provisioning-tools
Suggested packages:
  augeas-doc augeas-tools libvirt-login-shell libvirt-daemon-driver-storage-gluster libvirt-daemon-driver-storage-iscsi-direct libvirt-daemon-driver-storage-
  systemtap zfsutils vde2 qemu-block-extra debootstrap
The following NEW packages will be installed:
  augeas-lenses bridge-utils dmeventd dns-root-data dnsmasq-base ibverbs-providers ipxe-qemu jq libaugeas0 libbrlapi0.8 libcacard0 libdaxctl1 libdevmapper-e
  libnetcf1 libnss-my machines libonig5 libpmem1 librdmacm1 libslirp0 libspice-server1 libusbredirparser1 libvdeplug2 libvirtgrendrer1 libvirt-clients libvi
  libvirt-daemon-driver-lxc libvirt-daemon-driver-qemu libvirt-daemon-driver-vbox libvirt-daemon-driver-xen libvirt-daemon-system libvirt-daemon-system-syst
  libxengnttab1 libxenhypfs1 libxenmisc4.14 libxenstore3.0 libxentoolcore1 libxentoollog1 libyajl2 lvm2 mdevctl netcat-openbsd ovmf qemu-system-common qem
  systemd-container thin-provisioning-tools
The following packages will be upgraded:
  dmsetup libnss-systemd libpam-systemd libsystemd0 system
5 upgraded, 63 newly installed, 0 to remove and 429 not upgraded.
Need to get 39.6 MB of archives.
After this operation, 129 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:2 http://kali.download/kali kali-rolling/main amd64 libpam-systemd amd64 247.3-3 [282 kB]
Get:1 http://mirrors.dotsrc.org/kali kali-rolling/main amd64 libnss-systemd amd64 247.3-3 [197 kB]
Get:3 http://kali.download/kali kali-rolling/main amd64 dnsmasq-base amd64 2.84-1 [456 kB]
Get:4 http://mirror-1.truenetwork.ru/kali kali-rolling/main amd64 libsystemd0 amd64 247.3-3 [375 kB]
Get:5 http://ftppl.nluug.nl/os/linux/distr/kali kali-rolling/main amd64 lvm2 amd64 2.03.11-2.1 [1194 kB]
Get:7 http://mirror.karneval.cz/pub/linux/kali kali-rolling/main amd64 liblvm2cmd2.03 amd64 2.03.11-2.1 [711 kB]
Get:8 http://ftp.acc.umu.se/mirror/Kali.org/kali kali-rolling/main amd64 dmeventd amd64 2:1.02.175-2.1 [69.4 kB]
Get:15 http://kali.download/kali kali-rolling/main amd64 ibverbs-providers amd64 33.1-1 [252 kB]
Get:5 http://mirrors.dotsrc.org/kali kali-rolling/main amd64 libdevmapper-event1.02.1 amd64 2:1.02.175-2.1 [23.2 kB]
Get:6 http://mirror.serverius.net/kali kali-rolling/main amd64 ipxe-qemu all 1.0.0+git-20190125.36a4c85-5.1 [766 kB]
Get:6 http://mirrors.dotsrc.org/kali kali-rolling/main amd64 dmsetup amd64 2:1.02.175-2.1 [92.1 kB]
```

Step 3: Add Users to Groups

\$ sudo adduser kali kvm

The screenshot shows a Kali Linux desktop interface. At the top, there's a dock with icons for terminal, file manager, browser, and others. A file manager window titled 'Screenshot_2' is open, showing a list of files. Below it, a terminal window is active with the command '\$ sudo adduser kali kvm' entered and its output displayed:

```
(kali㉿kali)-[~]
└─$ sudo adduser kali kvm
Adding user `kali' to group `kvm' ...
Adding user kali to group kvm
Done.
```

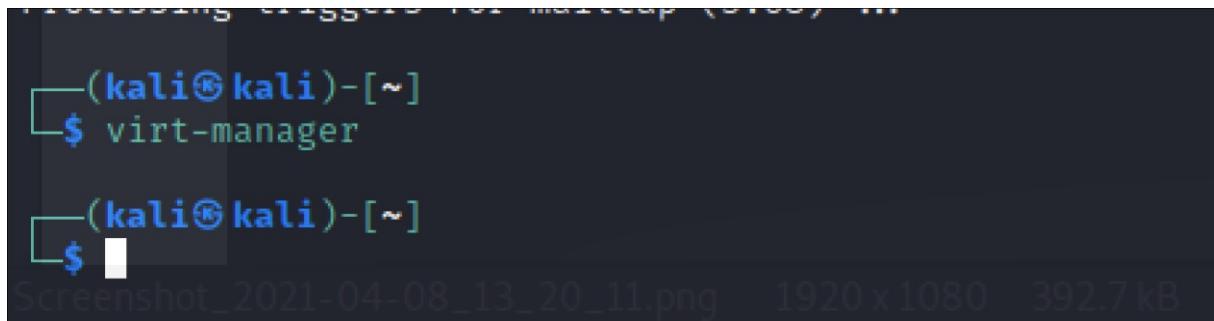
Step 4: Install Virtual Machine Manager.

The virt-manager application is a GUI tool to manage virtual machines through libvirt. It presents a summary view of running domains, their live performance, and resource utilization statistics. \$ sudo apt install virt-manager

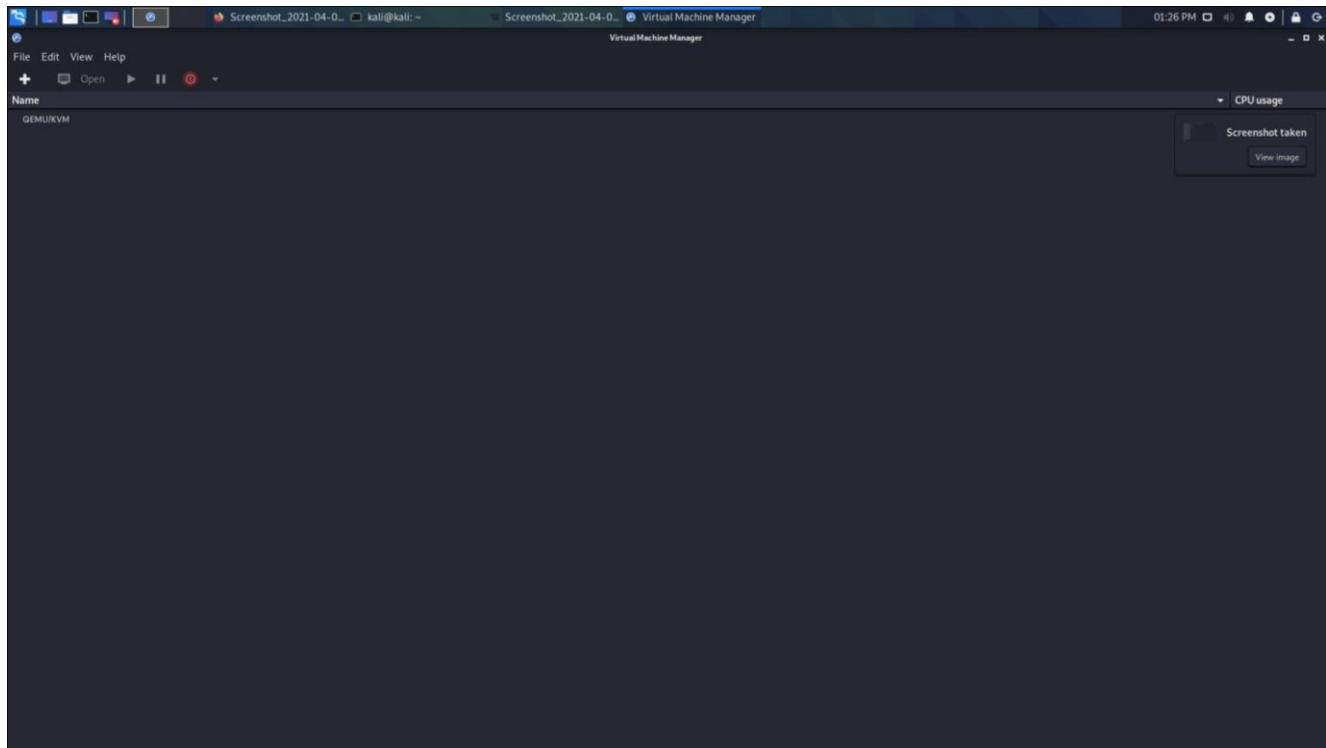
```
[kali㉿kali] ~]
└─$ sudo apt install virt-manager
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
genisoimage gir1.2-gtk-vnc-2.0 gir1.2-gtksource-4 gir1.2-libosinfo-1.0 gir1.2-libvirt-glib-1.0 gir1.2-spiceclientglib-2.0 gir1.2-spiceclientgtk-3.0 libgovirt-
libgtsourceview-4-common libgvnc-1.0-0 libosinfo-1.0-0 libphodav-2.0-0 libphodav-2.0-common libspice-client-glib-2.0-8 libspice-client-gtk-3.0-5 libusbredir-
spice-client-glib-usb-acl-helper virt-viewer virtinst
Suggested packages:
wodim cdrkit-doc libosinfo-l10n gstreamer1.0-plugins-bad gir1.2-secret-1 python3-guestfs ssh-askpass python3-argcomplete
The following NEW packages will be installed:
genisoimage gir1.2-gtk-vnc-2.0 gir1.2-gtksource-4 gir1.2-libosinfo-1.0 gir1.2-libvirt-glib-1.0 gir1.2-spiceclientglib-2.0 gir1.2-spiceclientgtk-3.0 libgovirt-
libgtsourceview-4-common libgvnc-1.0-0 libosinfo-1.0-0 libphodav-2.0-0 libphodav-2.0-common libspice-client-glib-2.0-8 libspice-client-gtk-3.0-5 libusbredir-
spice-client-glib-usb-acl-helper virt-manager virt-viewer virtinst
0 upgraded, 27 newly installed, 0 to remove and 429 not upgraded.
Need to get 4543 kB of archives.
After this operation, 24.5 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://wlglam.fsmg.org.nz/kali kali-rolling/main amd64 genisoimage amd64 9:1.11-3.2 [380 kB]
Get:2 http://mirror.lagoon.nc/kali kali-rolling/main amd64 libgvnc-1.0-0 amd64 1.0.0-1 [101 kB]
Get:5 http://mirror.pyratelan.org/kali kali-rolling/main amd64 libgtsourceview-4-common all 4.8.0-1 [553 kB]
Get:3 http://ftpi.nlug.nl/os/Linux/distr/kali kali-rolling/main amd64 libgtk-vnc-2.0-0 amd64 1.0.0-1 [72.9 kB]
Get:4 http://mirror.neostrada.nl/kali kali-rolling/main amd64 gir1.2-gtk-vnc-2.0 amd64 1.0.0-1 [57.1 kB]
Get:8 http://mirror.cspacehostings.com/kali kali-rolling/main amd64 osinfo-db all 0.20210215-1 [119 kB]
Get:11 http://mirror.serverius.net/kali kali-rolling/main amd64 libvirt-glib-1.0-0 amd64 3.0.0-1 [168 kB]
Get:9 http://mirror.neostrada.nl/kali kali-rolling/main amd64 libosinfo-1.0-0 amd64 1.8.0-1 [211 kB]
Get:10 http://kali.download/kali kali-rolling/main amd64 libphodav-2.0-common all 2.5-1 [12.5 kB]
Get:13 http://mirrors.dotsrc.org/kali kali-rolling/main amd64 spice-client-glib-usb-acl-helper amd64 0.39-1 [23.7 kB]
Get:12 http://mirror.neostrada.nl/kali kali-rolling/main amd64 gir1.2-libvirt-glib-1.0-0 amd64 3.0.0-1 [79.7 kB]
Get:15 http://ftp.free.fr/pub/kali kali-rolling/main amd64 libphodav-2.0-0 amd64 2.5-1 [28.5 kB]
Get:25 http://mirror.cspacehostings.com/kali kali-rolling/main amd64 virtinst all 1:3.2.0-3 [750 kB]
Get:6 http://mirror.lagoon.nc/kali kali-rolling/main amd64 libgtsourceview-4-0 amd64 4.8.0-1 [224 kB]
Get:17 http://ftp.halifax.rwth-aachen.de/kali kali-rolling/main amd64 libspice-client-glib-2.0-8 amd64 0.39-1 [324 kB]
Get:7 http://mirror.pyratelan.org/kali kali-rolling/main amd64 gir1.2-gtksource-4 amd64 4.8.0-1 [28.0 kB]
Get:18 http://mirror-1.truenetwork.ru/kali kali-rolling/main amd64 gir1.2-spiceclientglib-2.0 amd64 0.39-1 [27.8 kB]
Get:19 http://mirror-1.truenetwork.ru/kali kali-rolling/main amd64 libspice-client-gtk-3.0-5 amd64 0.39-1 [71.4 kB]
Get:20 http://mirror-1.truenetwork.ru/kali kali-rolling/main amd64 gir1.2-spiceclientgtk-3.0 amd64 0.39-1 [20.1 kB]
Get:10 http://wlglam.fsmg.org.nz/kali kali-rolling/main amd64 gir1.2-libosinfo-1.0 amd64 1.8.0-1 [143 kB]
Get:23 http://wlglam.fsmg.org.nz/kali kali-rolling/main amd64 python3-libvirt amd64 7.0.0-2 [231 kB]
Get:21 http://ftp.acc.umu.se/mirror/kali.org/kali kali-rolling/main amd64 libgovirt-common all 0.3.7-2 [16.5 kB]
Get:22 http://mirror-1.truenetwork.ru/kali kali-rolling/main amd64 libgovirt2 amd64 0.3.7-2 [41.3 kB]
Get:24 http://mirror.karneval.cz/pub/linux/kali kali-rolling/main amd64 python3-libxml2 amd64 2.9.10+dfsg-6.3+b1 [197 kB]
Get:26 http://ftp2.nlug.nl/os/Linux/distr/kali kali-rolling/main amd64 virt-manager all 1:3.2.0-3 [287 kB]
Get:27 http://ftp.halifax.rwth-aachen.de/kali kali-rolling/main amd64 virt-viewer amd64 7.0.2-2 [352 kB]
Fetched 4543 kB in 31s (147 kB/s)
Selecting previously unselected package genisoimage.
(Reading database ... 269024 files and directories currently installed.)
Preparing to unpack .../00-genisoimage_9k3a1.1.11-3.2_amd64.deb ...
Unpacking genisoimage (9:1.11-3.2) ...
Selecting previously unselected package libgvnc-1.0-0:amd64.
Preparing to unpack .../01-libgvnc-1.0-0.1.0-0.1_amd64.deb ...

```

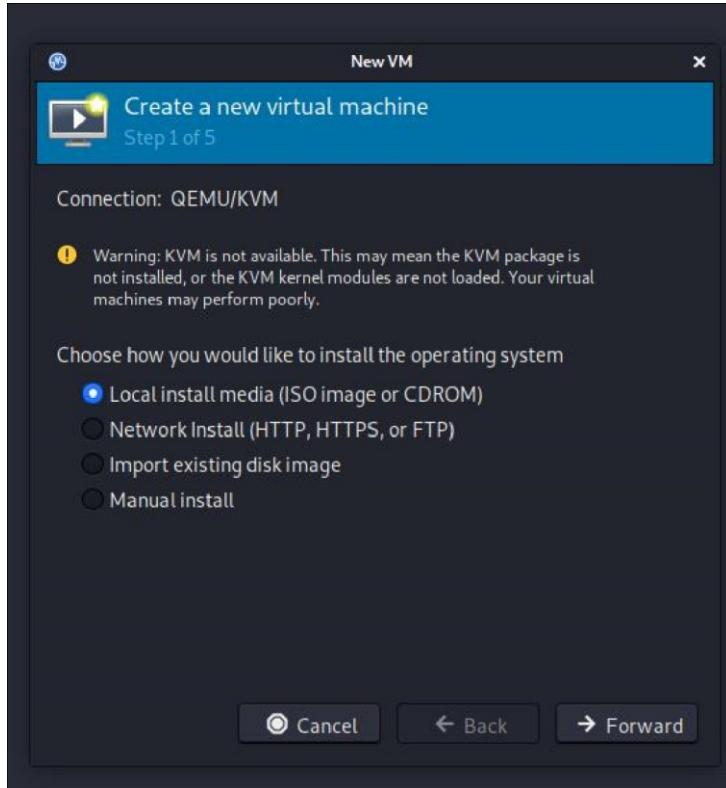
Step 5: You can now open the Virtual Machine Manager through the command line by ‘virtmanager’ command or go to activities and search for virt-manager and click open.



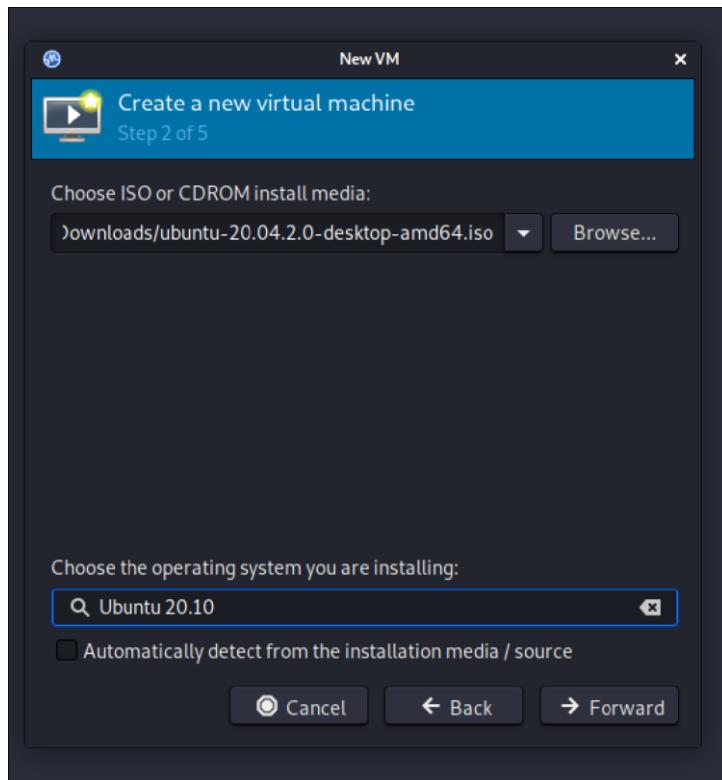
Step 6: Virtual Machine Configuration using virt-manager. Upon opening, Your Virtual Machine Manager will be connected to QEMU/KVM.



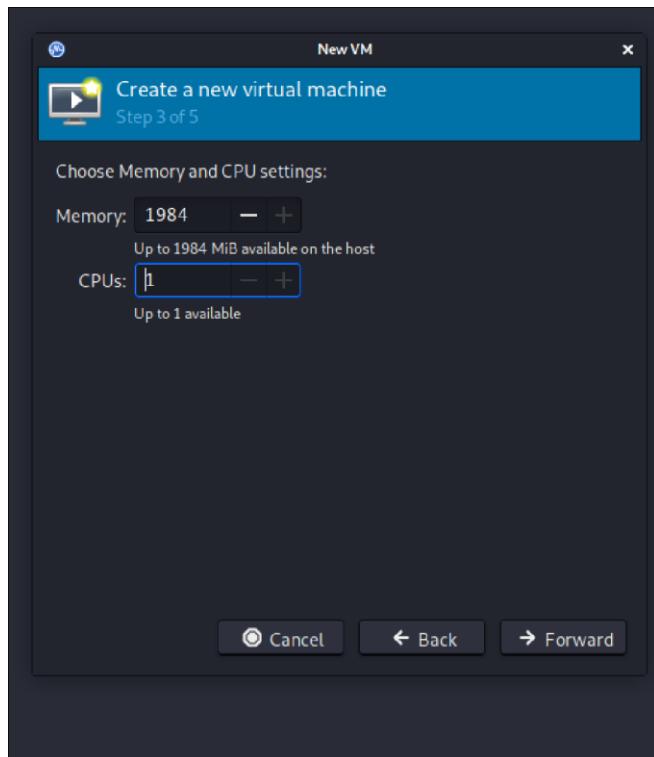
Step 7: You can start a new virtual machine setup by either opening the file tab and choosing 'New Virtual Machine' from the options or by clicking the plus icon on the left side of the 2nd row.



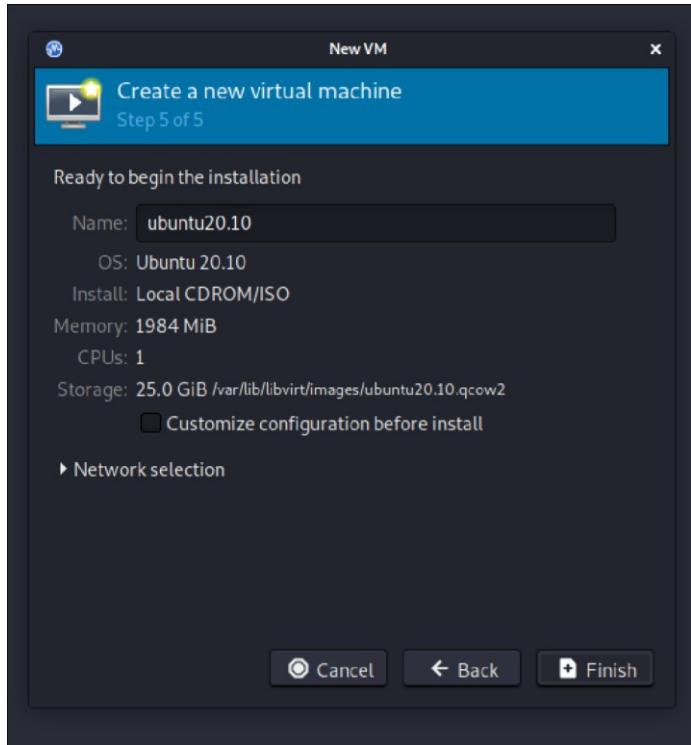
Step 8: Now, you will be prompted to browse or enter the path of your disk image. When you enter the path, the wizard will most probably detect the given operating system.

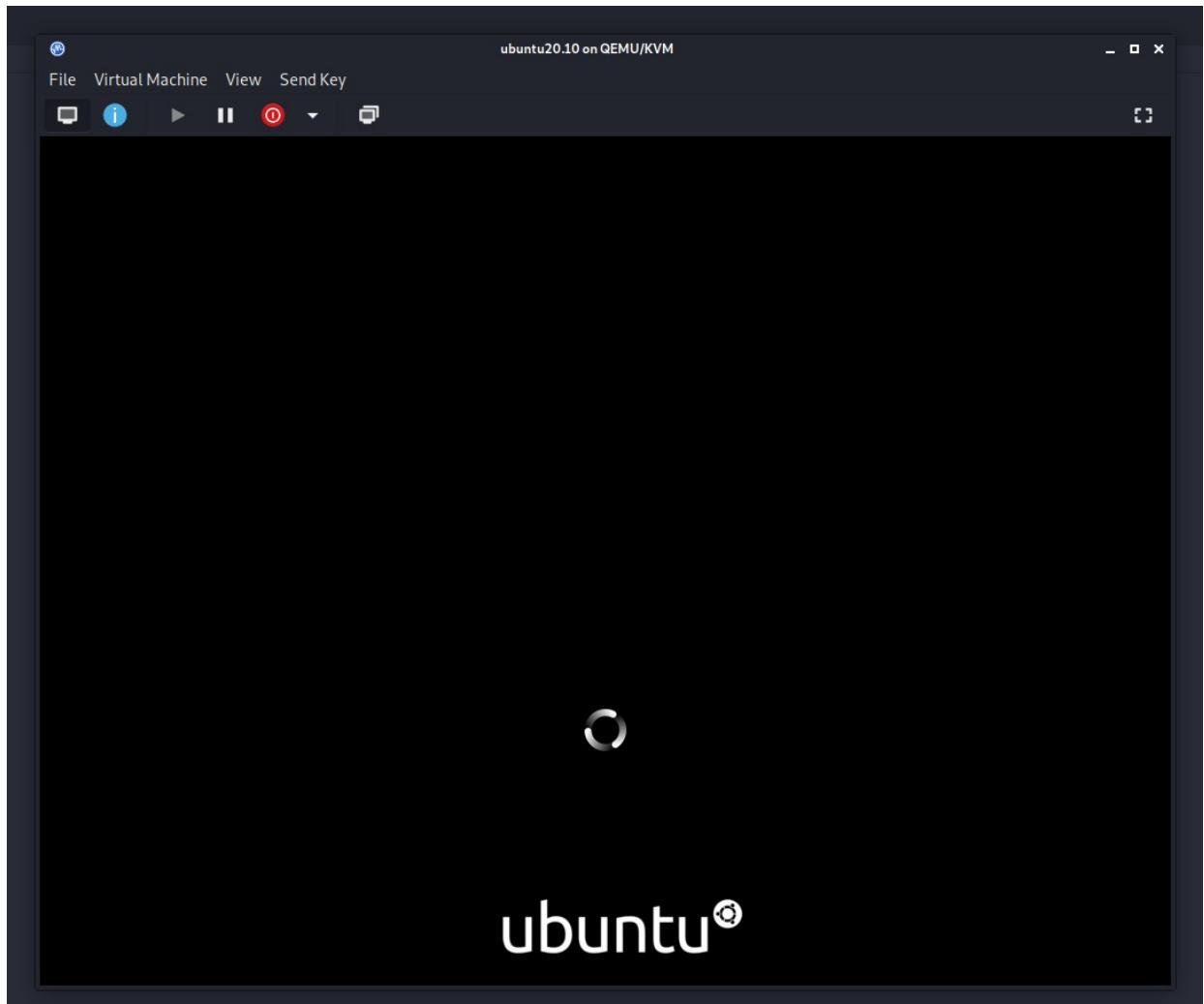


Step 9: Press 'Forward' to continue and then customize the name and network of your virtual machine.



As soon as you press 'Finish' the virtual machine will start running and finally start installing the system from the image disk that you provided earlier.



Output :

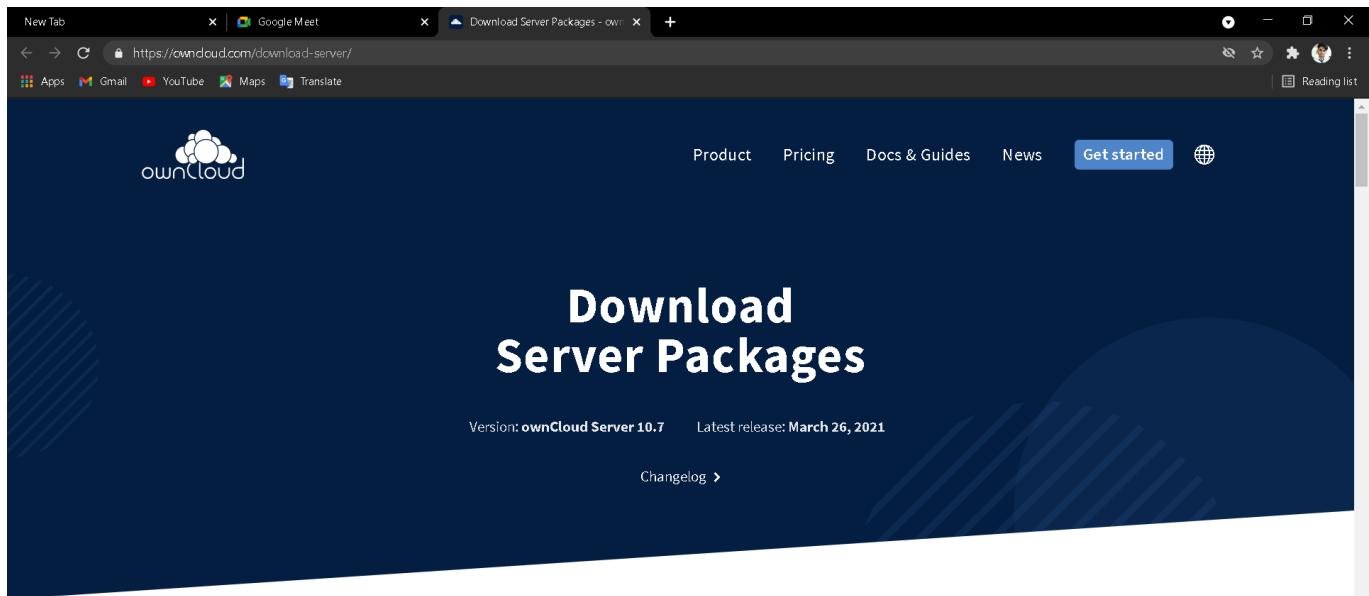
PRACTICAL NO: 3

AIM : To study and implementation of Infrastructure as a Service

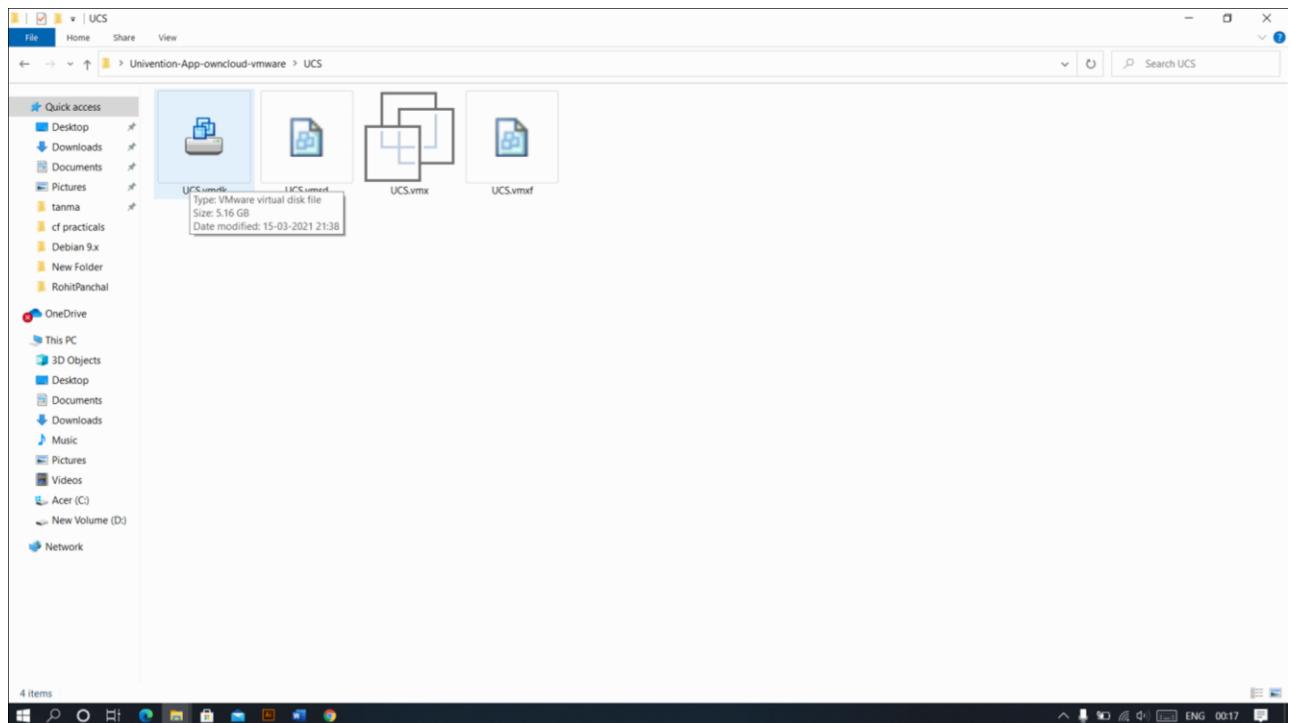
PROCEDURE:

Step 1 : Download the OwnCloud X Server from the link (It only works with 64bit system).

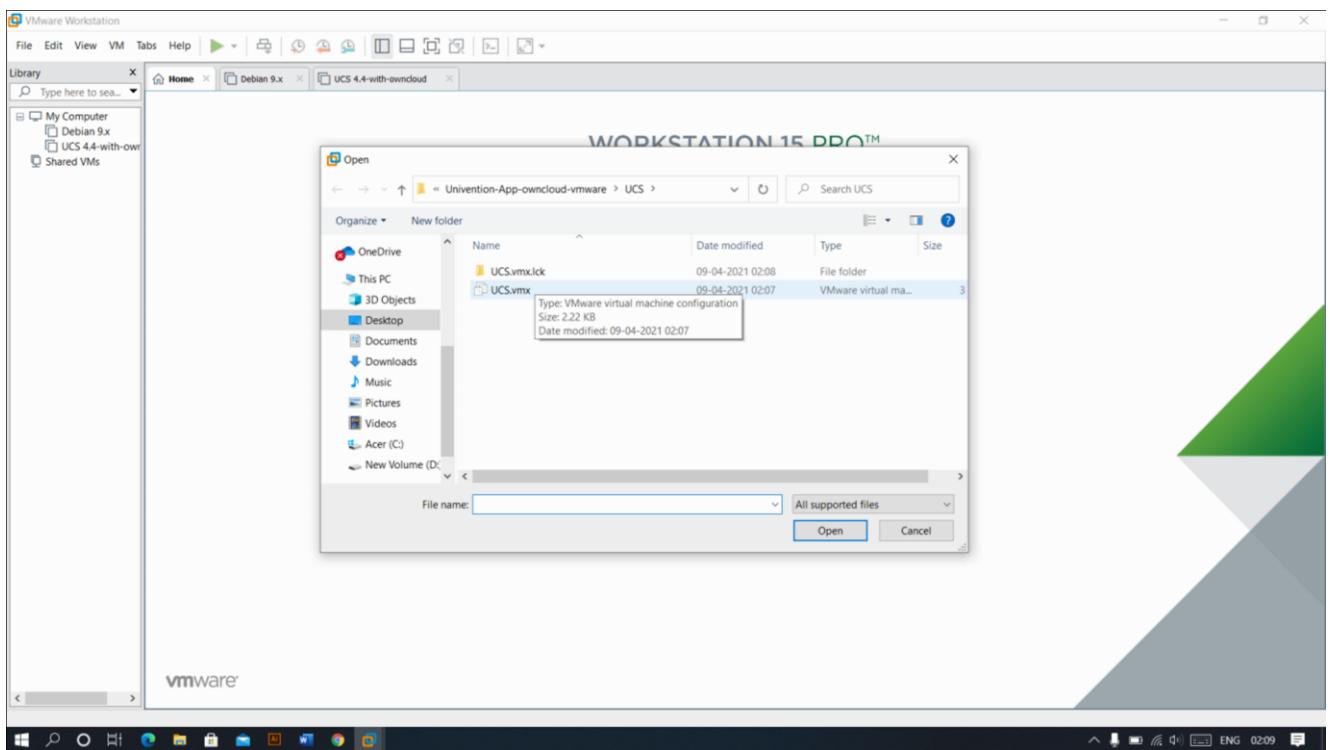
<https://owncloud.com/download/> Here I've demonstrated for VMWare. So click the VMWare button.



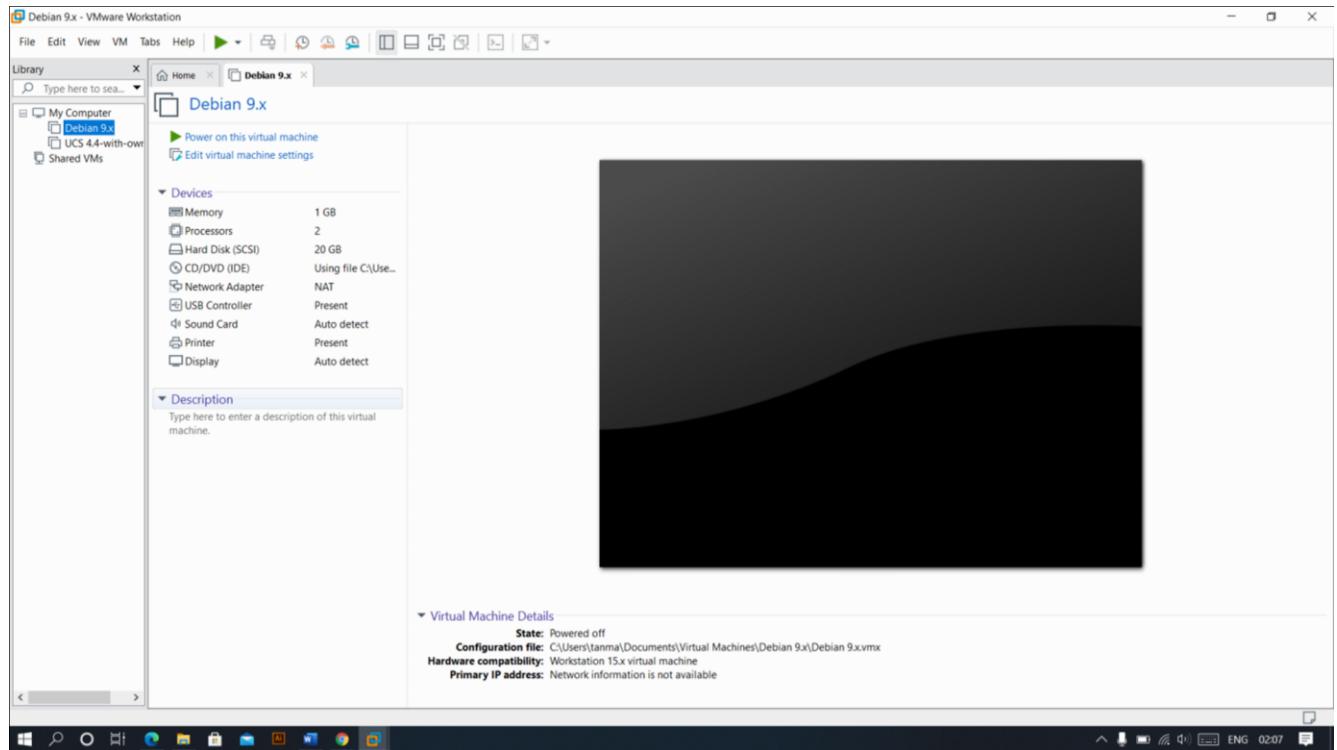
Step 2: Now Double click the application. It will directly take you to the VirtualBox



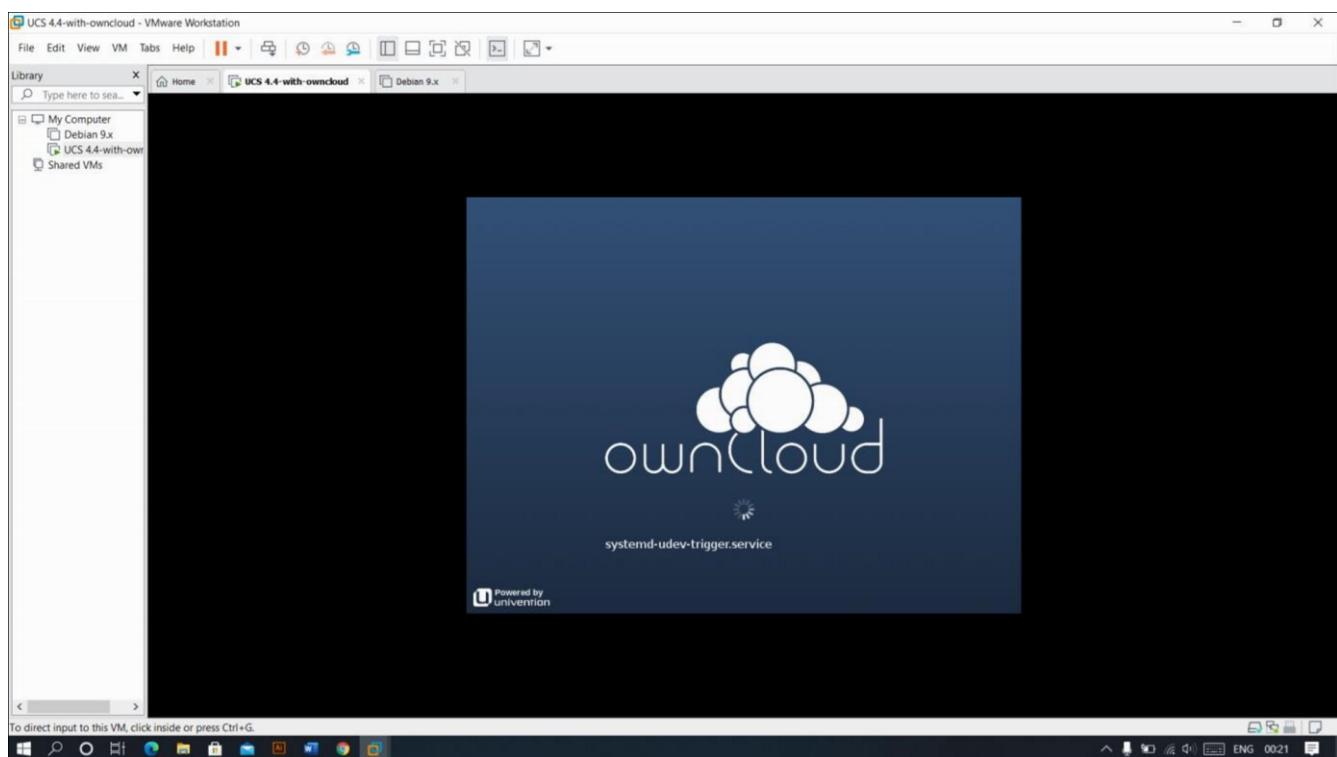
Step 3: Click on Import. Wait till the importing gets finished.



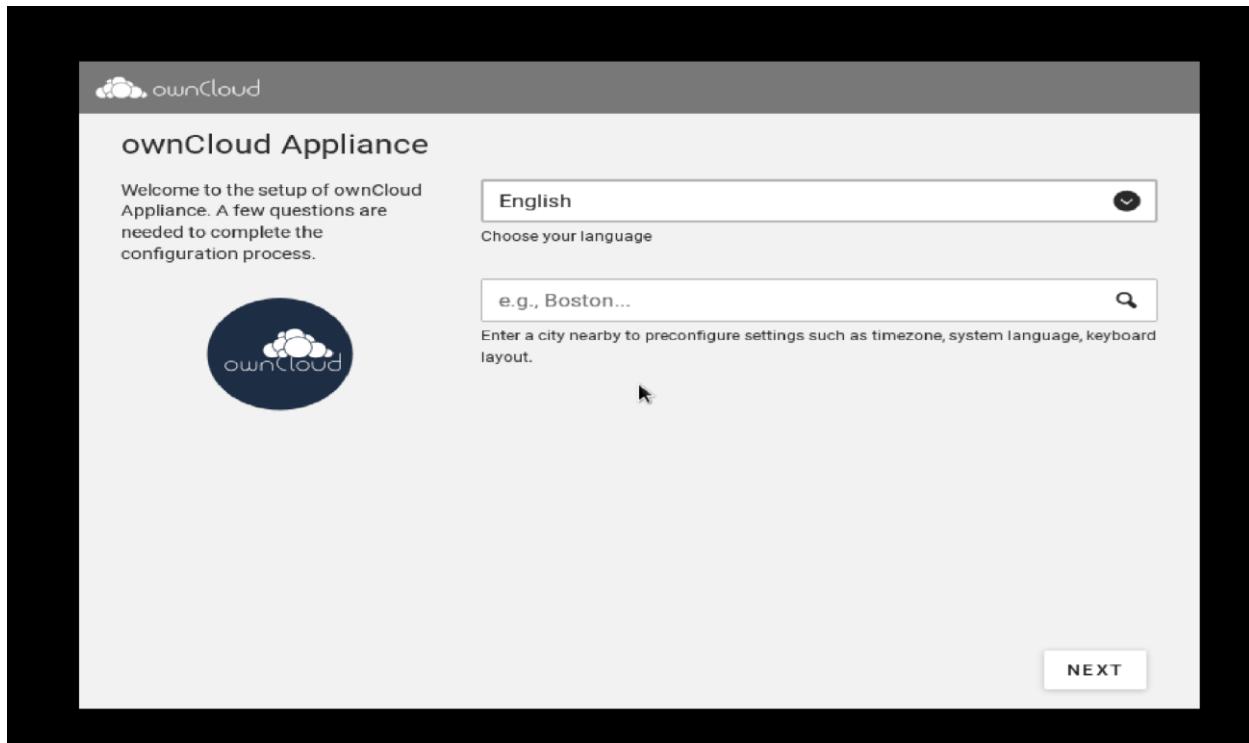
Step 4: Once import is done agree T&C



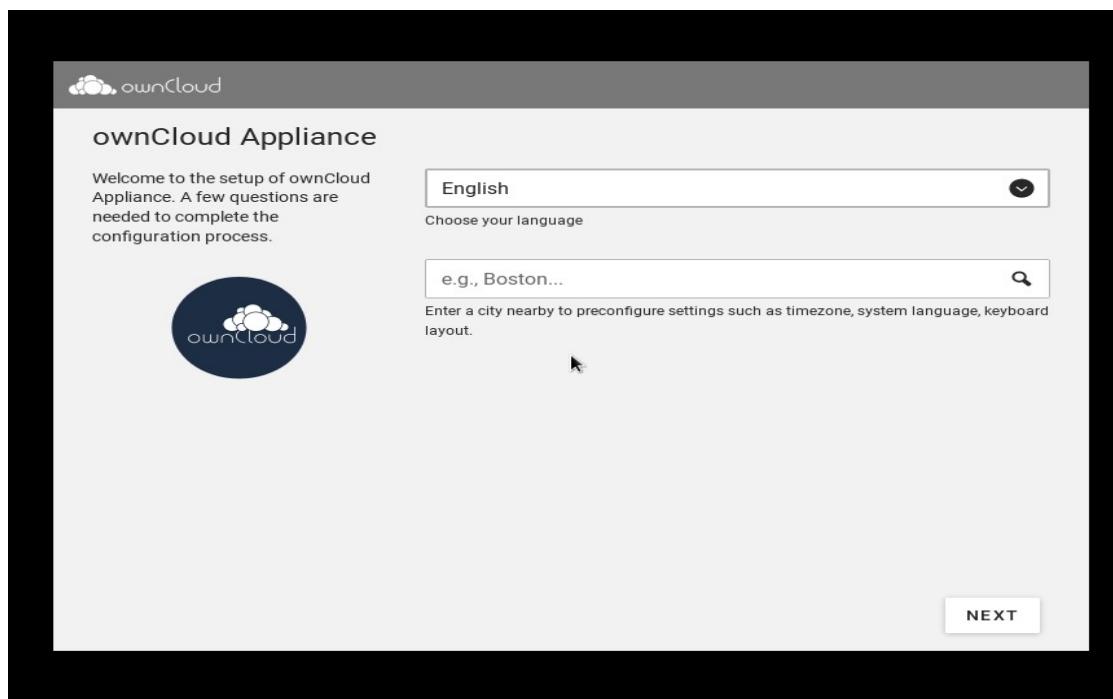
Step 5: Click on "Power on this virtual machine" and following window will appear.



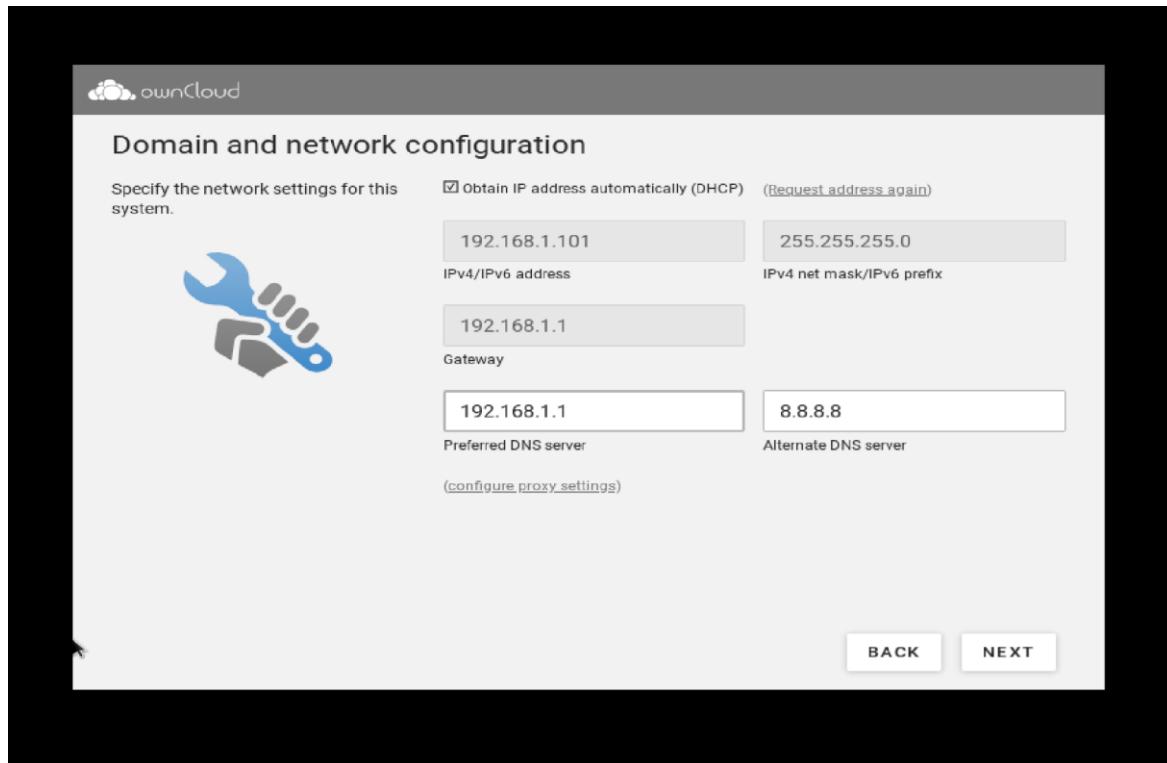
Step 6: On next window it will ask you for your “city”, don’t enter any city name in it and just click “NEXT” (Most important step please don’t enter any city name in it otherwise it will not read keyboard entries).



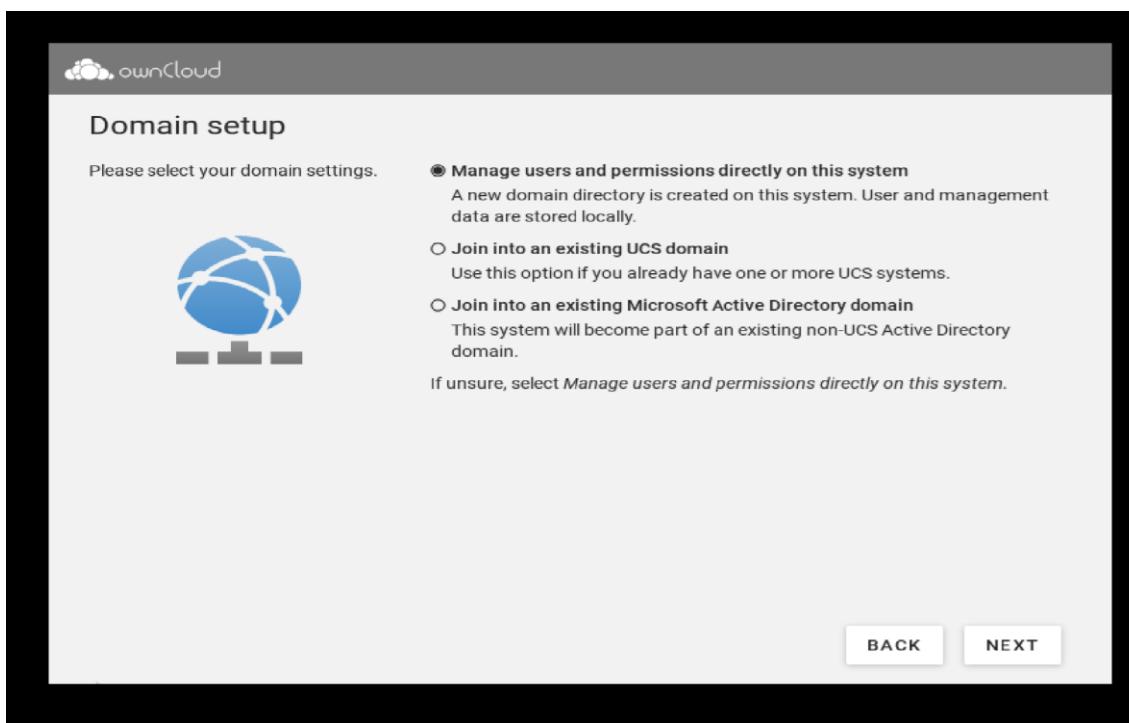
step 7: Just click “NEXT” on “Localization settings” window.



Step 8: It will fetch IP Address, Net Mask and Gateway from DHCP, don't change anything, also uncheck "Obtain IP address automatically (DHCP)", mention an "Alternate DNS Server" and just click "NEXT".



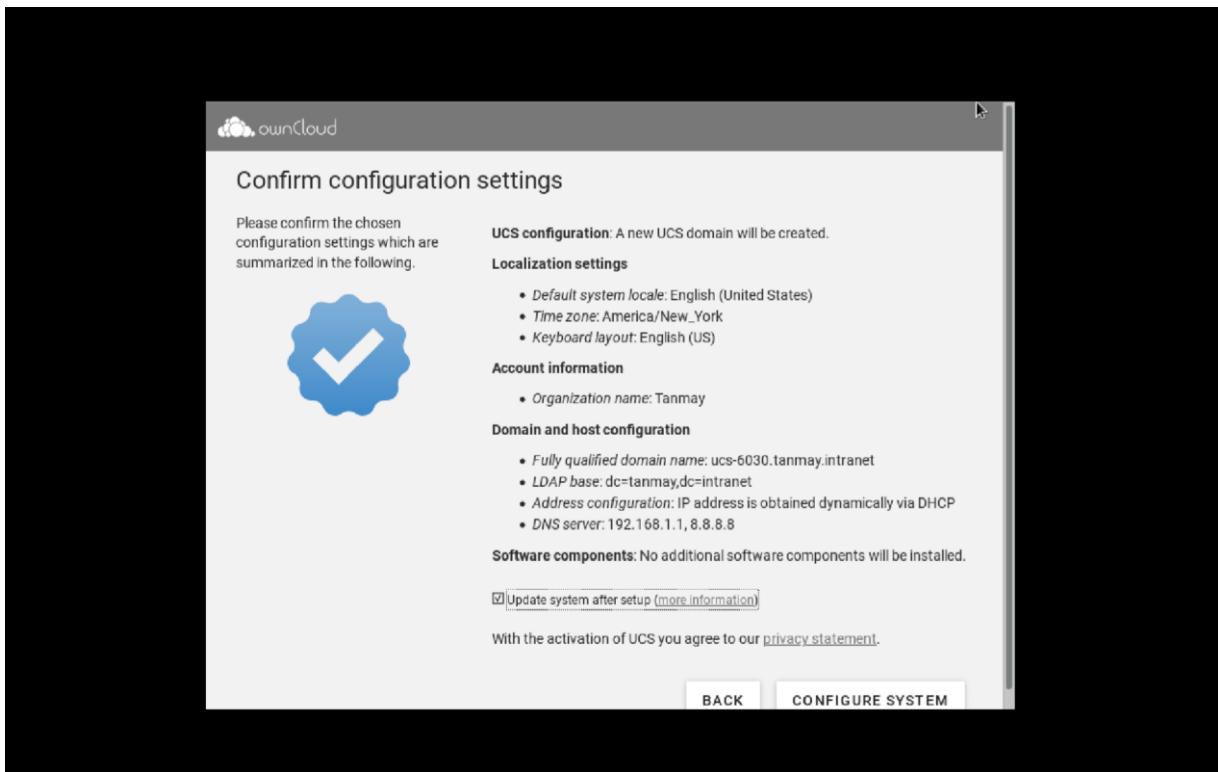
Step 9: In Domain setup click "NEXT"



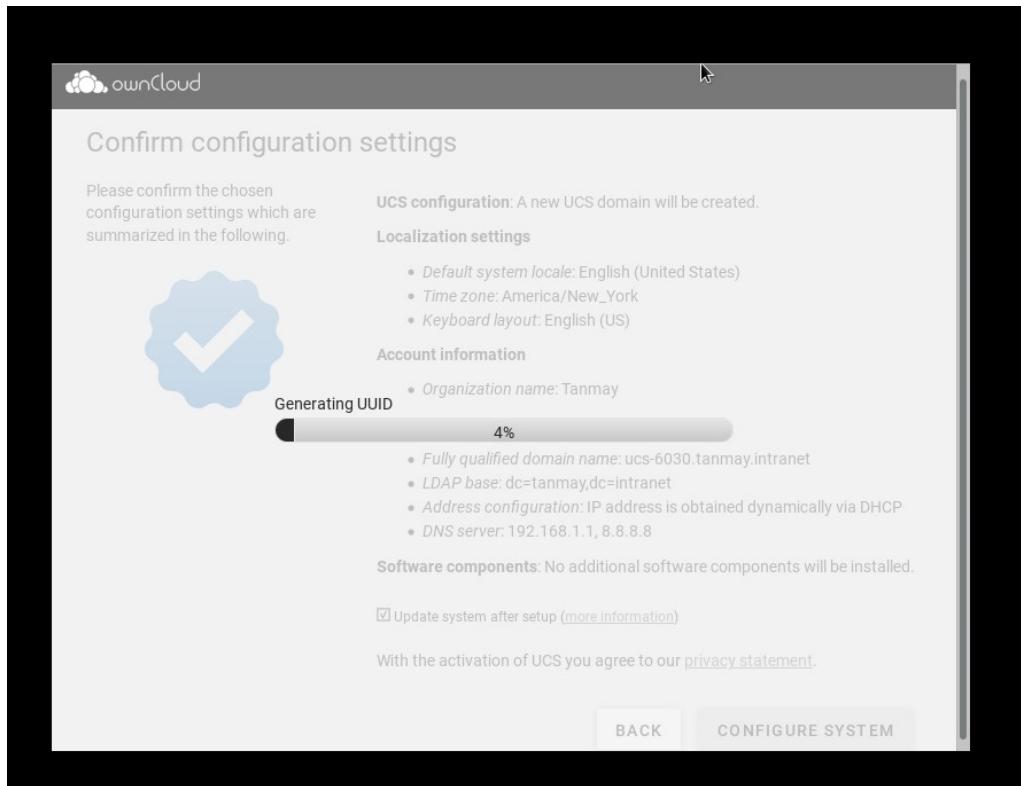
Step 10: Now Account information window will appear, enter details in it. Remember that password we are setting is for “root” and “Administrator”, click on “NEXT”

Step 11: On next window it will show you Fully Qualified domain name and LDAP base, click on “NEXT”

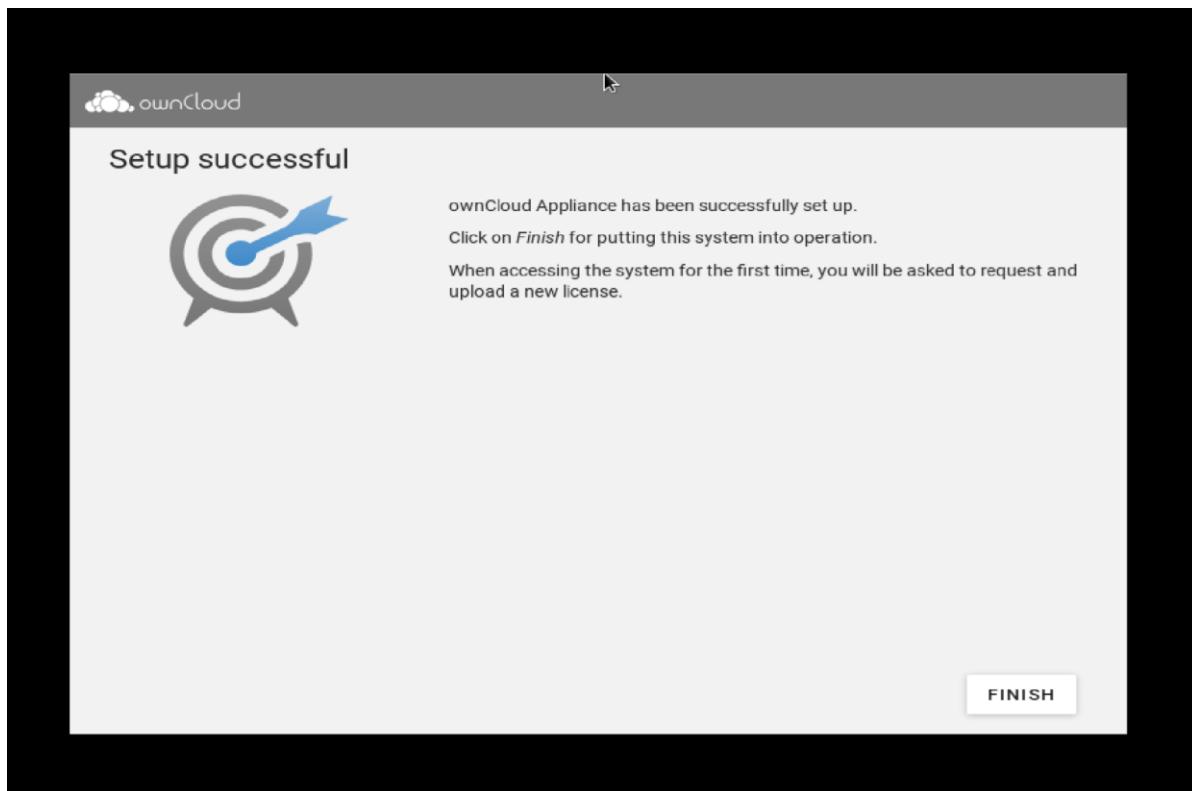
Step 12: It will show the configuration settings for own cloud scroll down a little and click on “CONFIGURE SYSTEM”



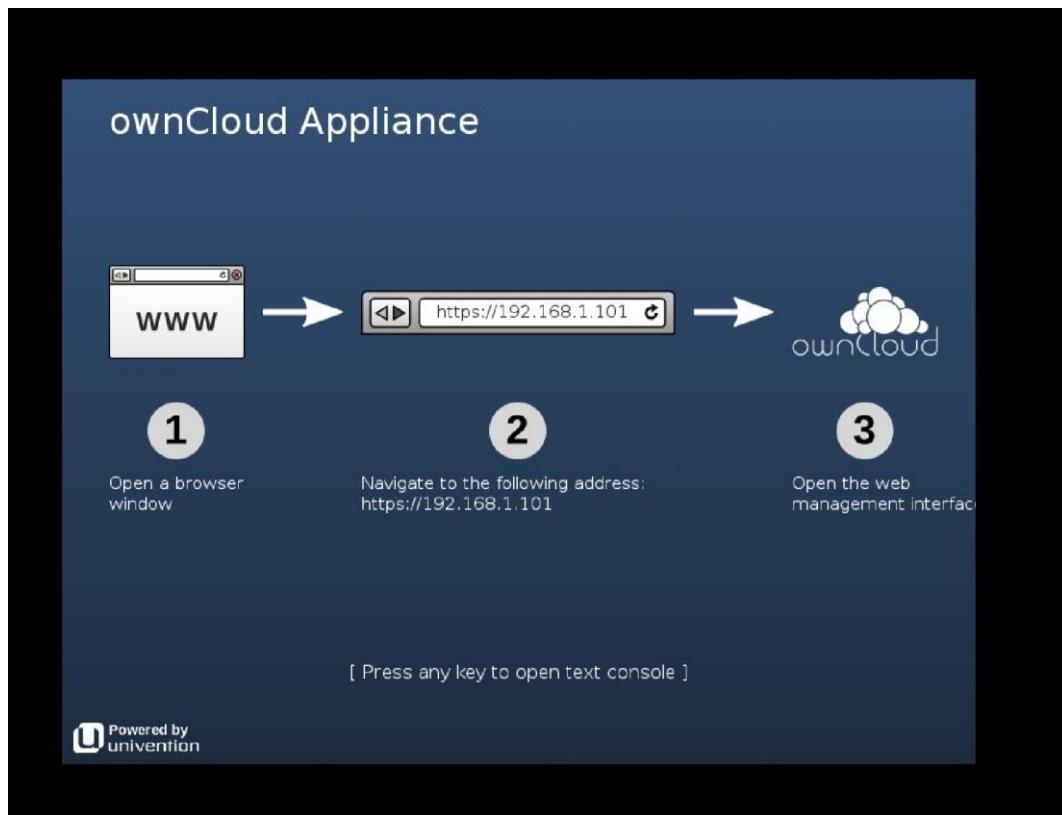
Step 13: It will take time to setup.



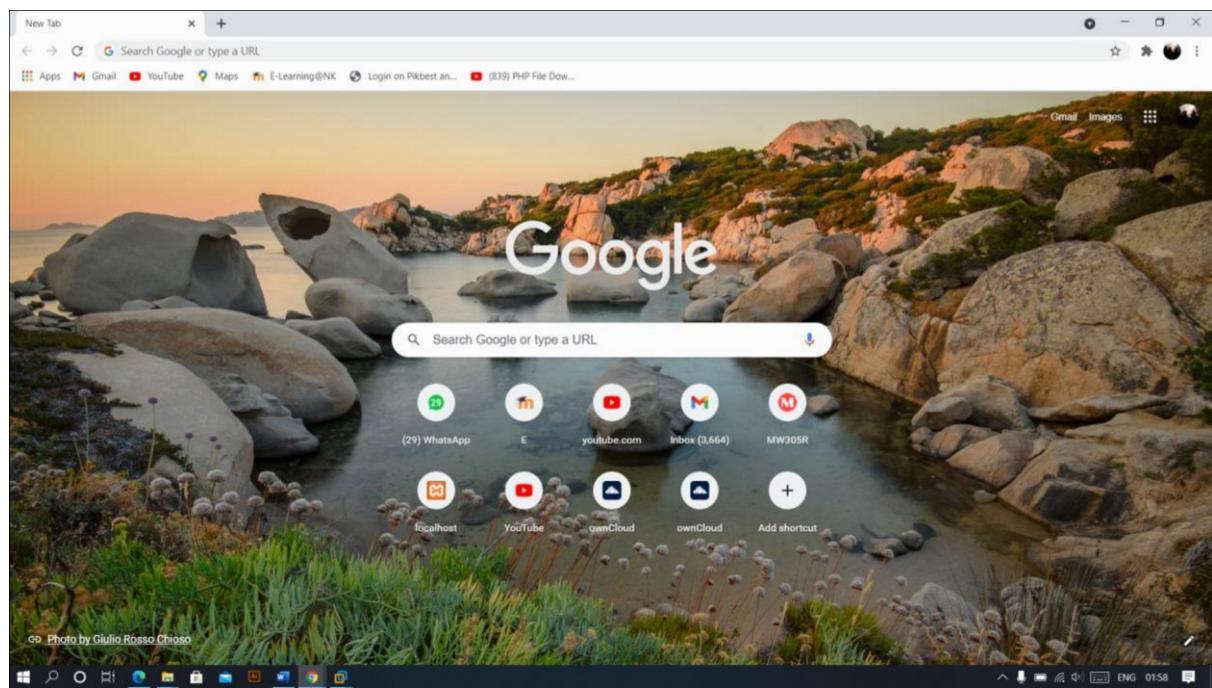
Step 14: The setup is done now click on “FINISH”



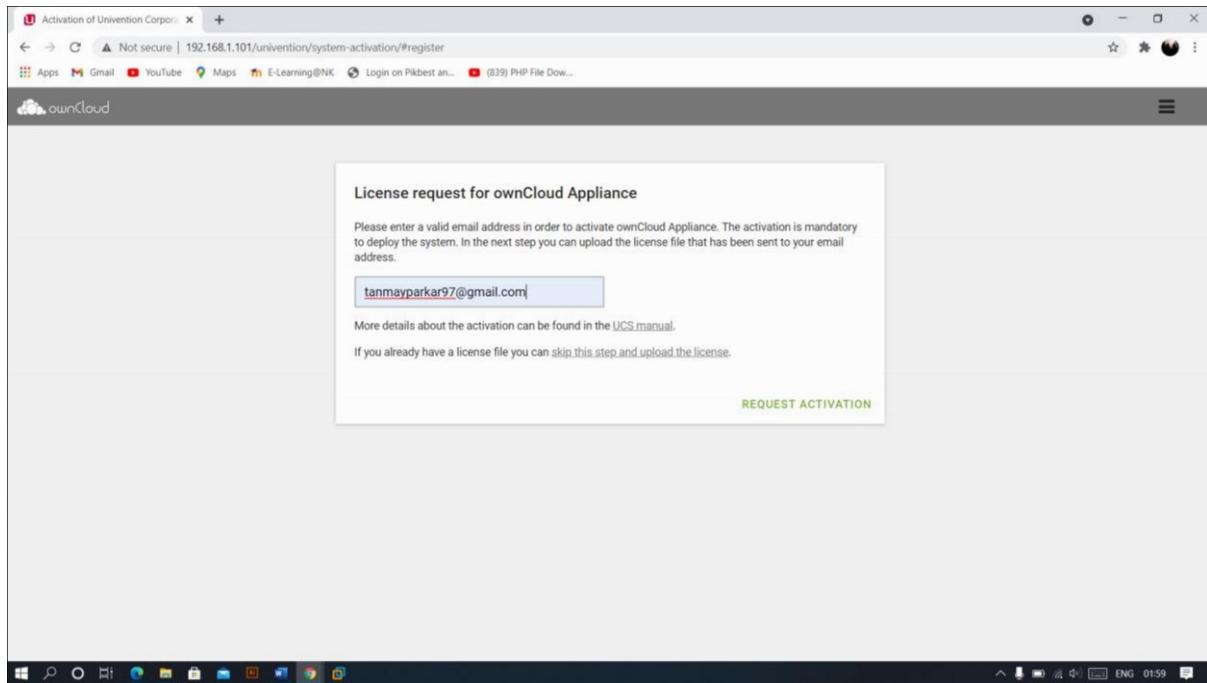
Step 15: Now on next window press any button



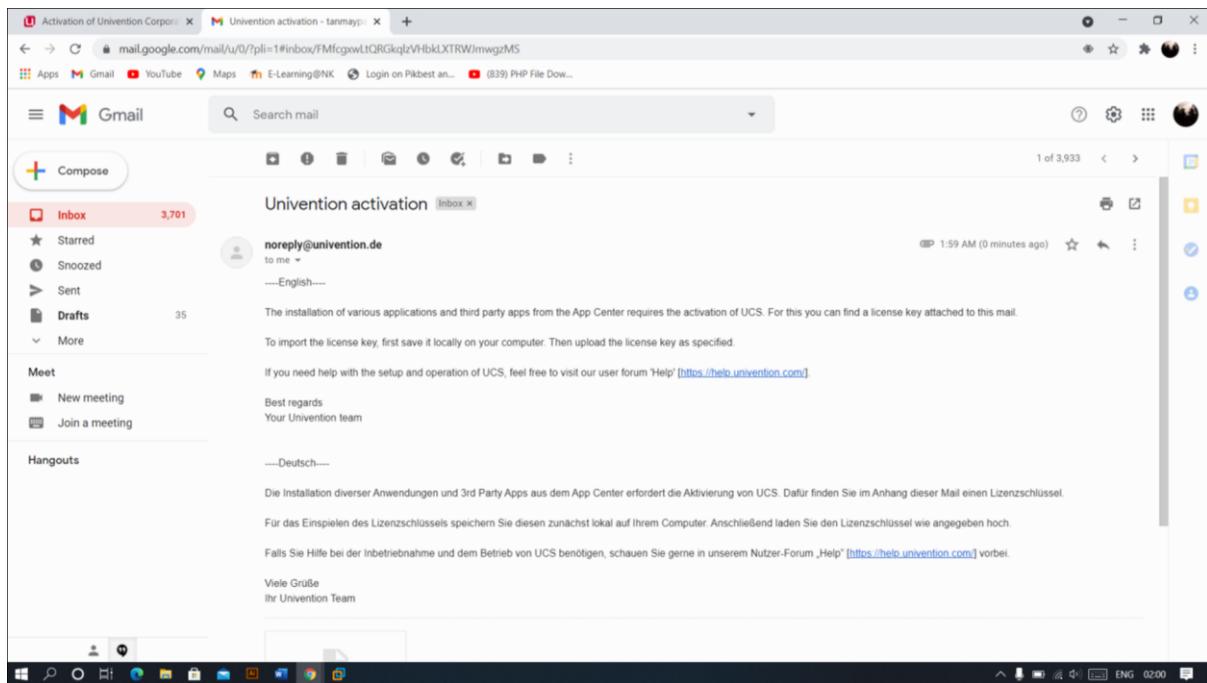
Step 16: Now you can see the IP address on top right-hand side, open the browser and enter system's IP address in URL bar and press enter.



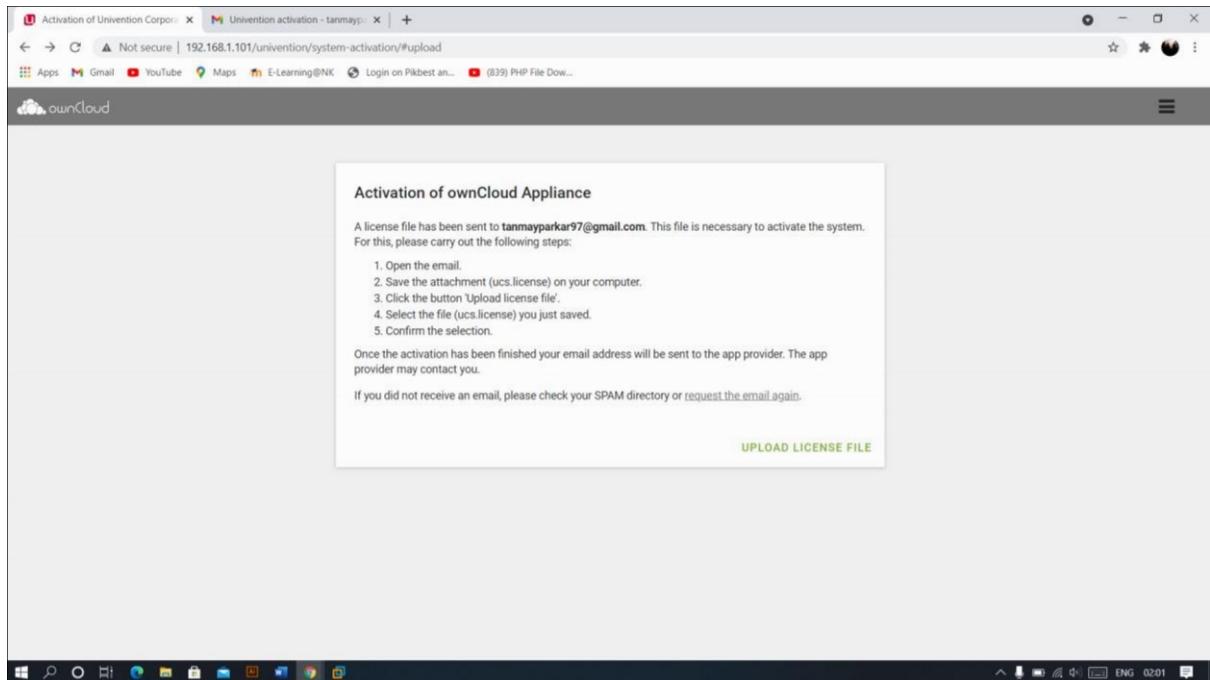
Step 17: It will ask you for Email ID to send license, enter your Email ID and click “REQUEST ACTIVATION”.



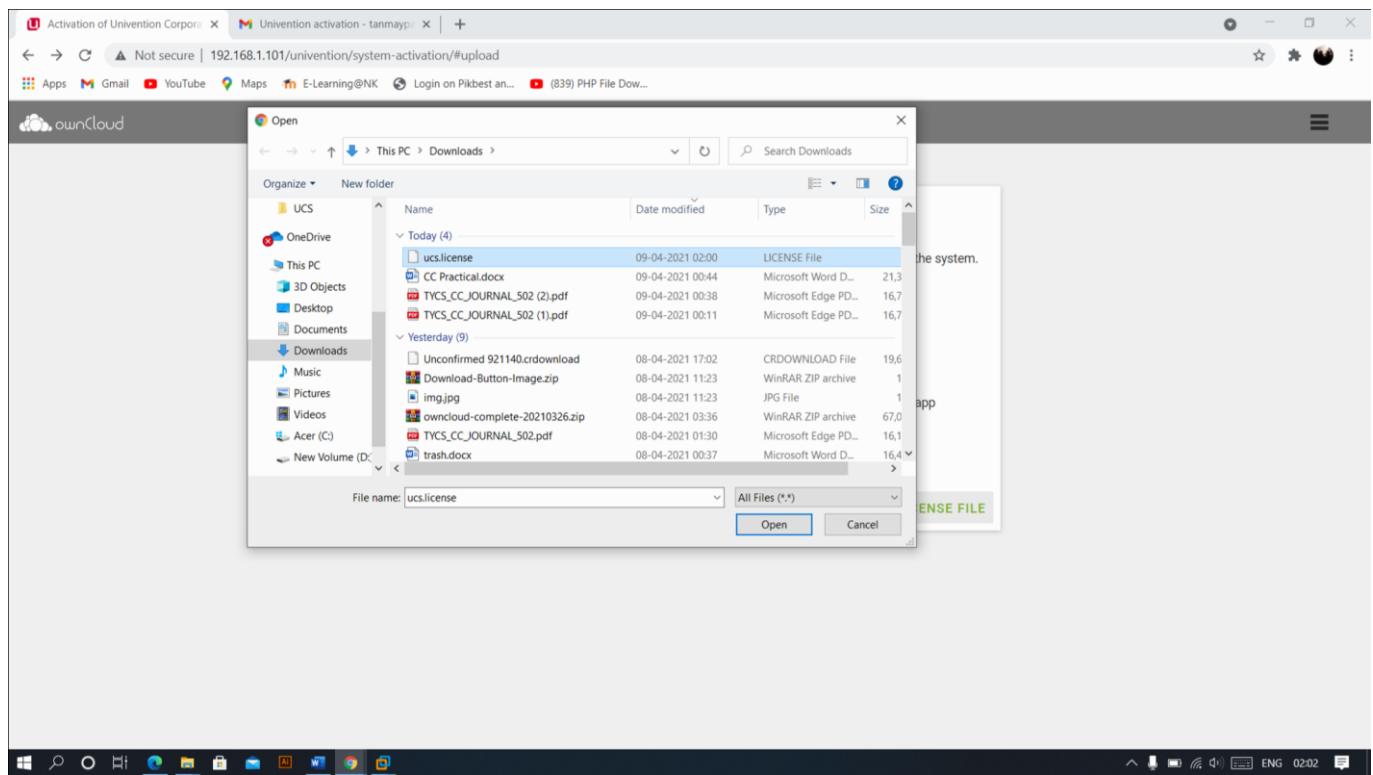
Step 18: Check your mail box you will receive the license from OwnCloud, download it .



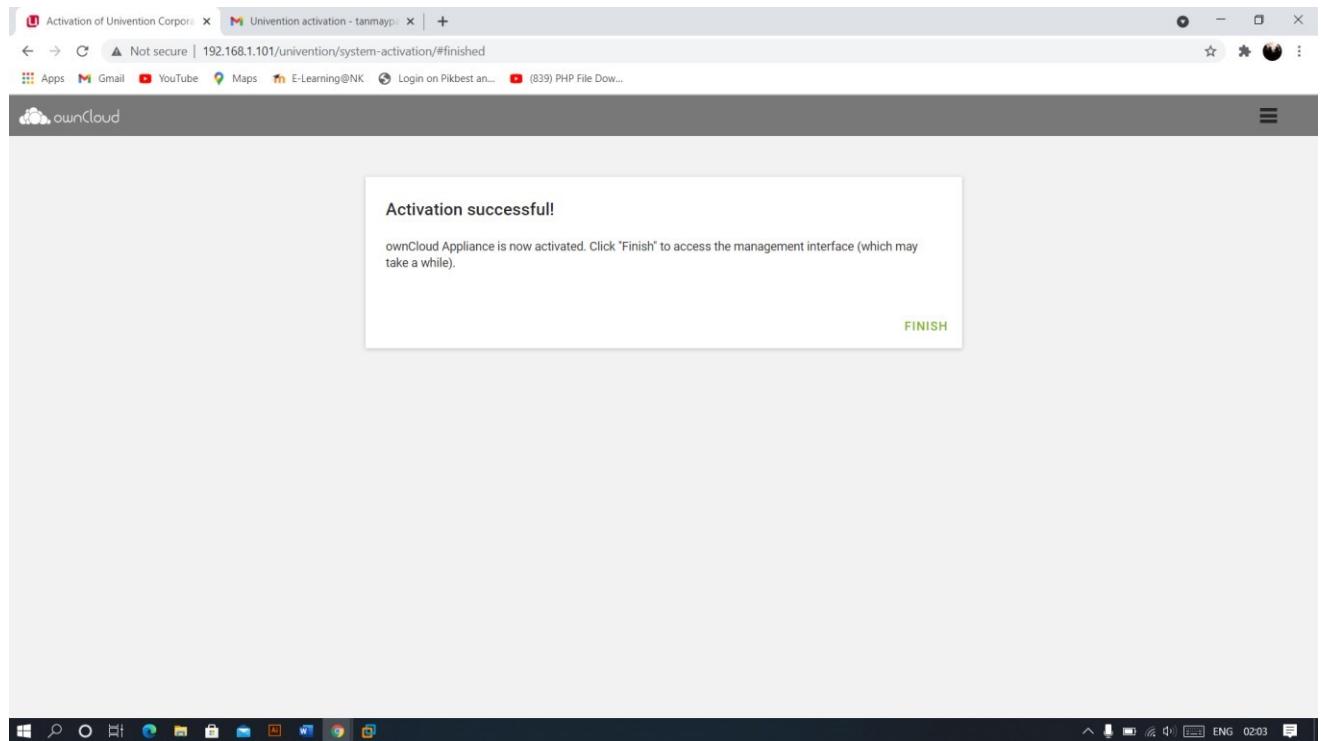
Step 19: Get back to OwnCloud and click on “UPLOAD LICENSE FILE” .



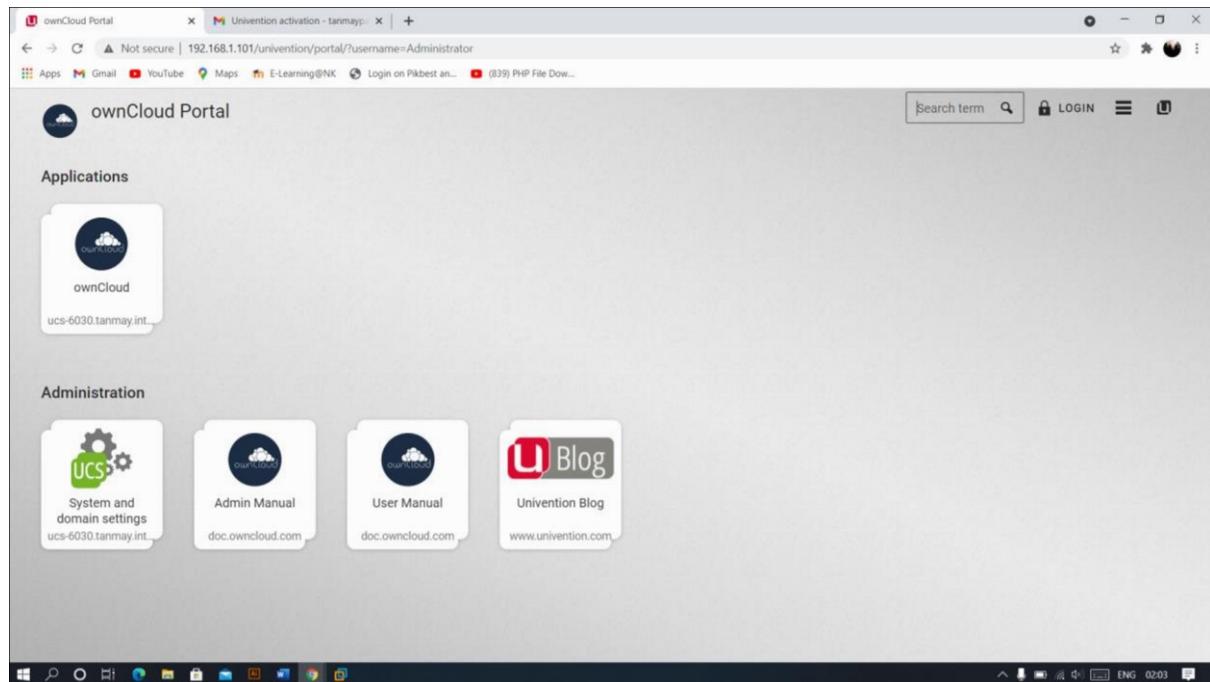
Step 20: Now select the license file and click “Open” .



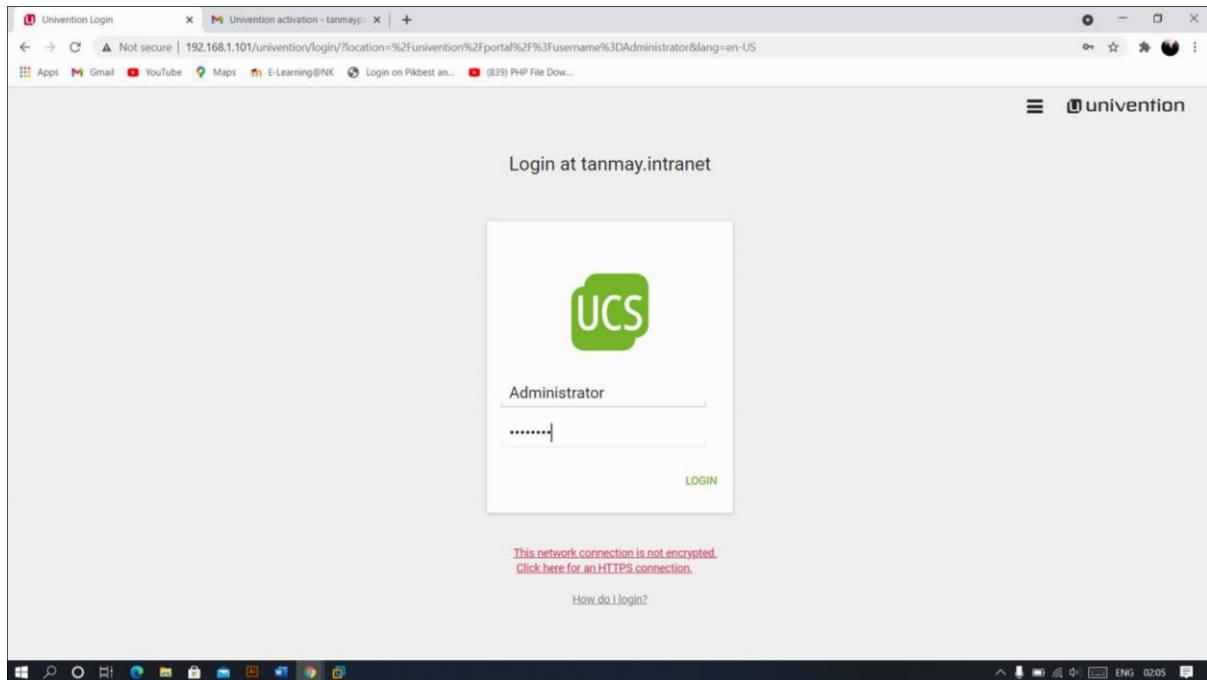
Step 21: On next page click on “FINISH”



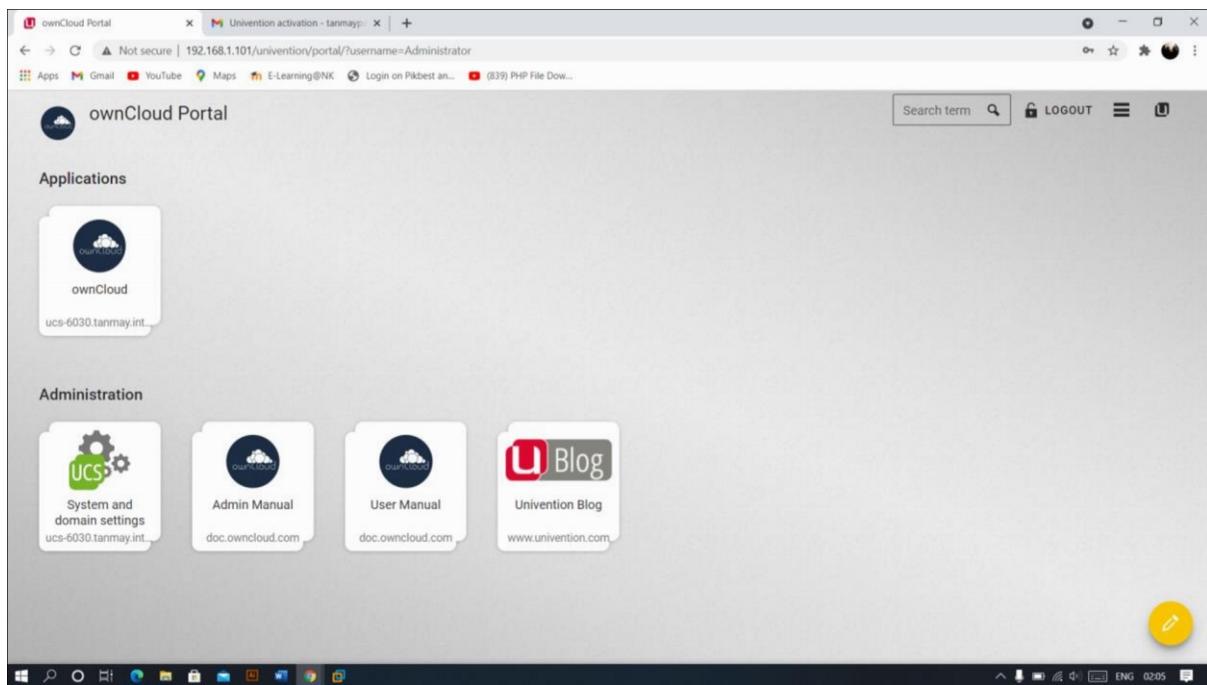
Step 22: We have installed OwnCloud, now just try logging in with “Administrator” as user for that click on “LOGIN” button.



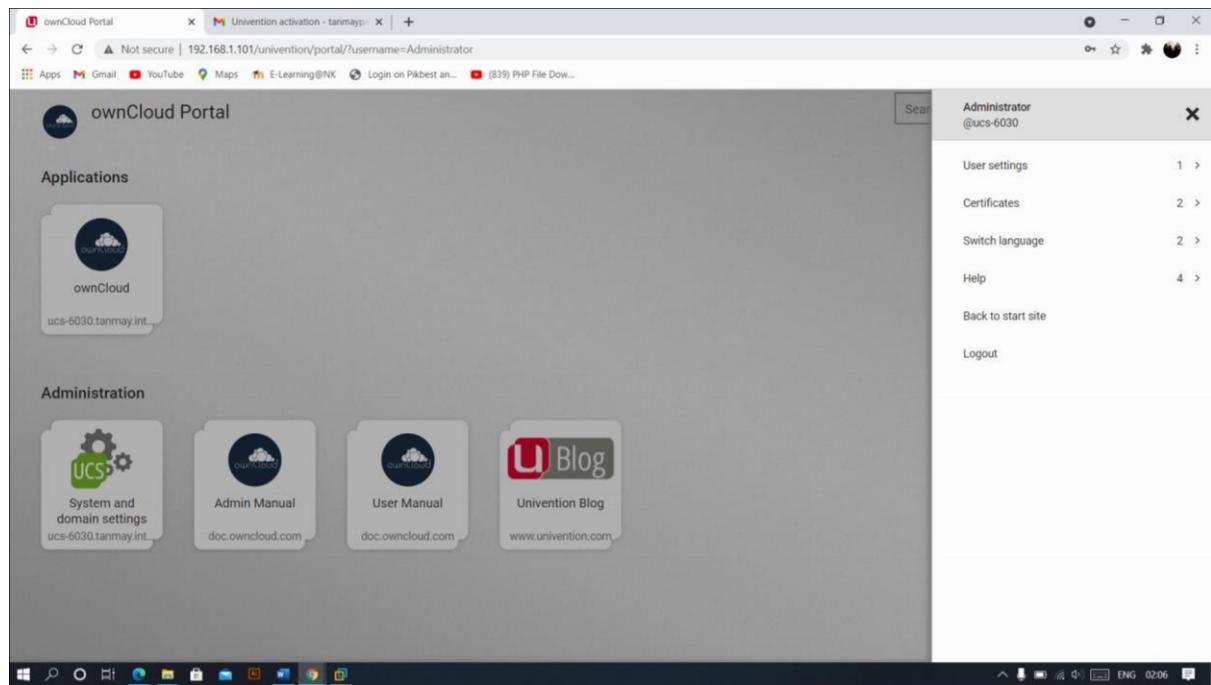
Step 23: Enter “Administrator” as user name and the password which you set during setting up process and click on “LOGIN”.



Step 24: After we have logged in successfully, now click on hamburger menu button.



Step 25: Now we successfully completed OwnCloud installation



Practical No 4

AIM: Study and implementation of Storage as a Service.

OBJECTIVE: Implementation of storage on google drive.

OUTCOME: Presentation created on google drive , stored, shared link.

SOFTWARE REQUIRED: Google Chrome or any browser

THEORY:

Introduction to Google drive:

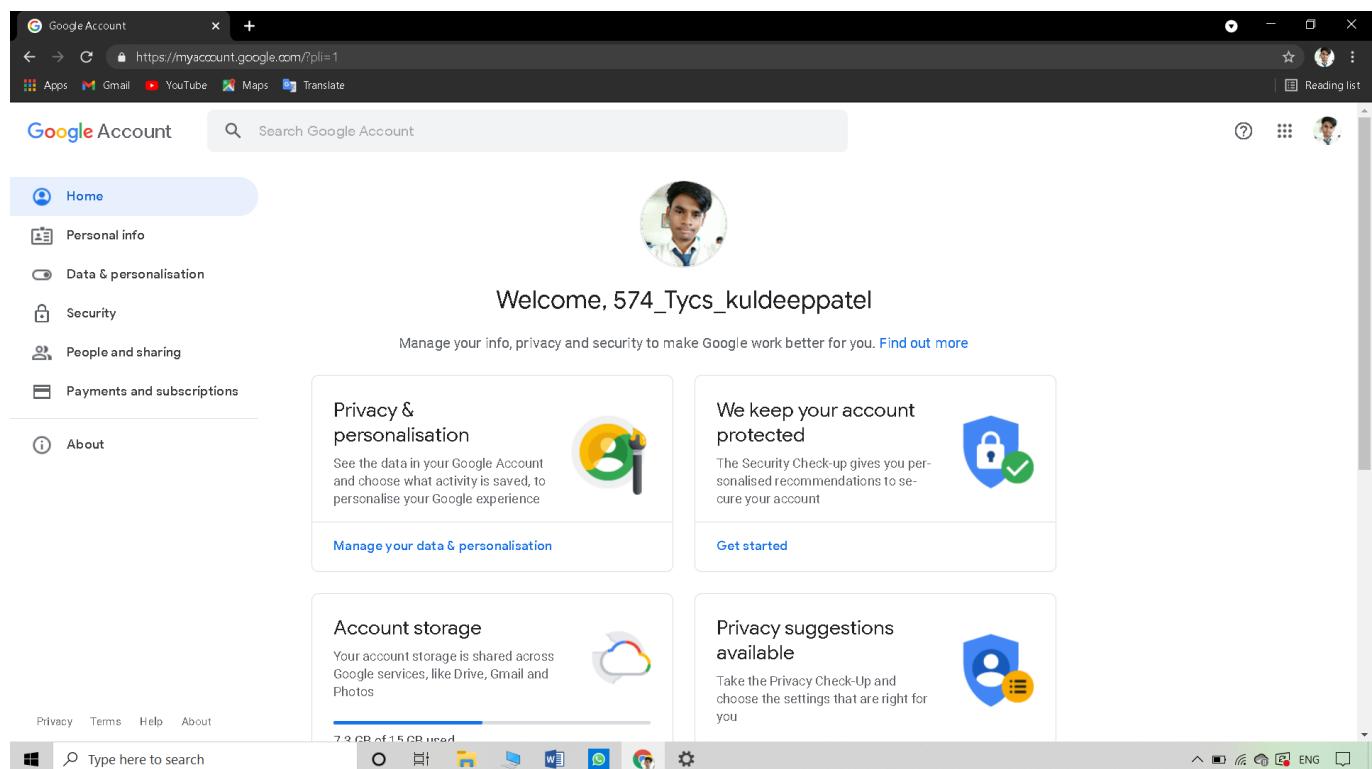
Collaborating on Presentations:

Collaborating on Word Processing:

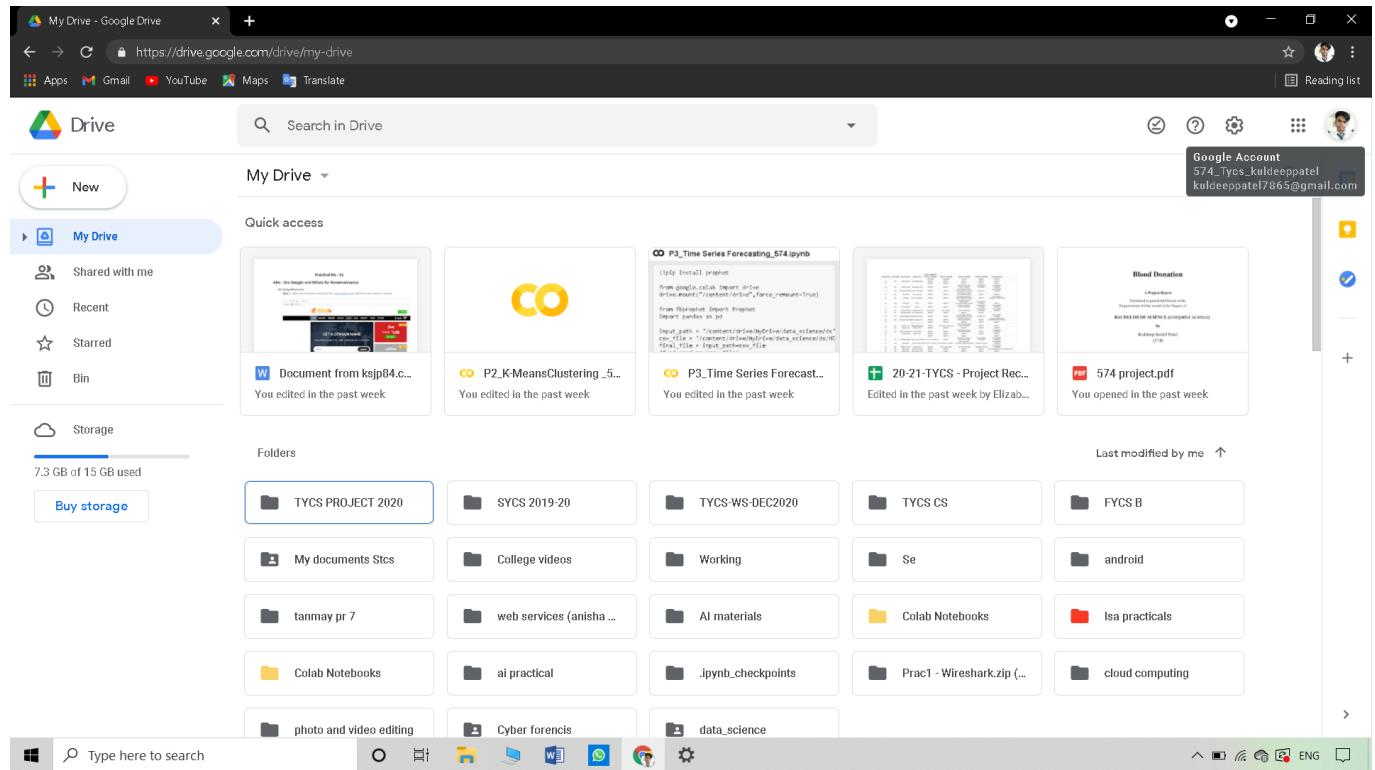
Collaborating on Spreadsheets:

PROCEDURE:

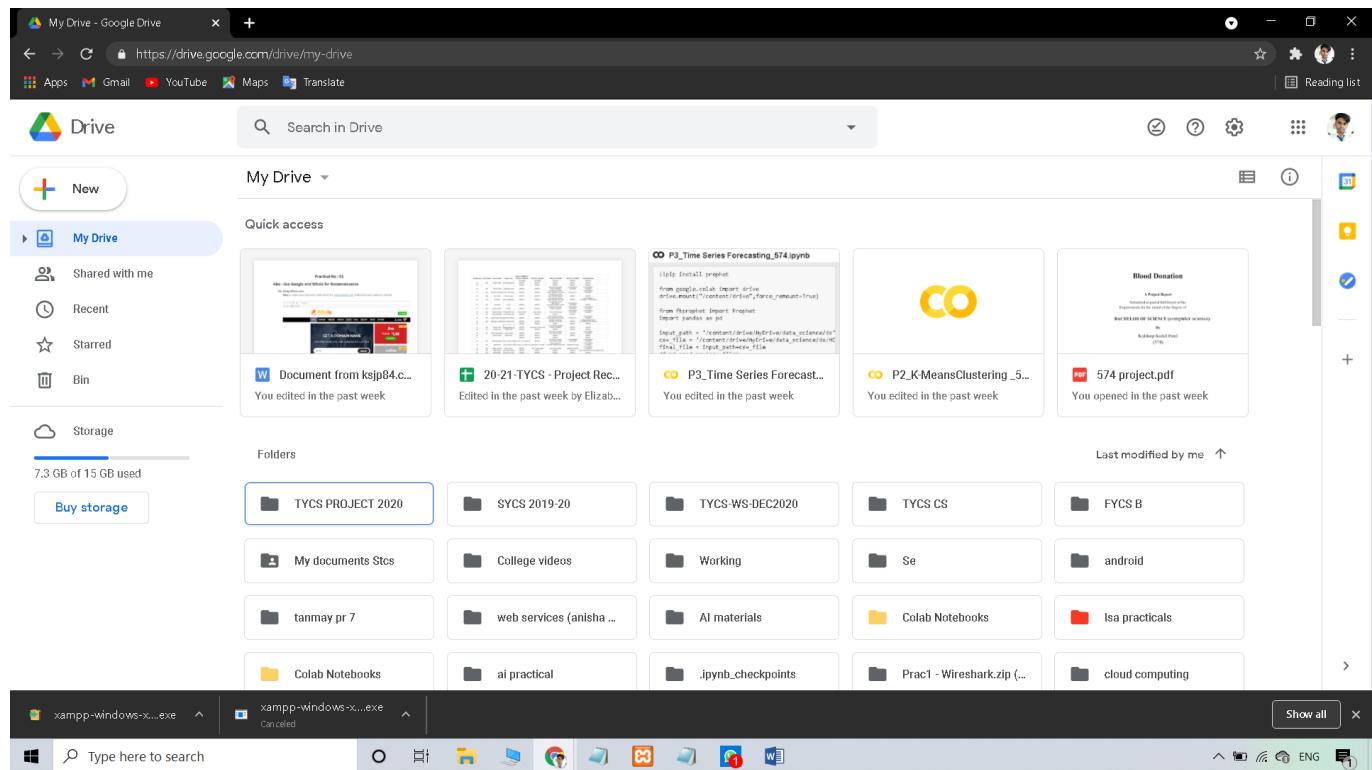
Step 1:



Step 2:

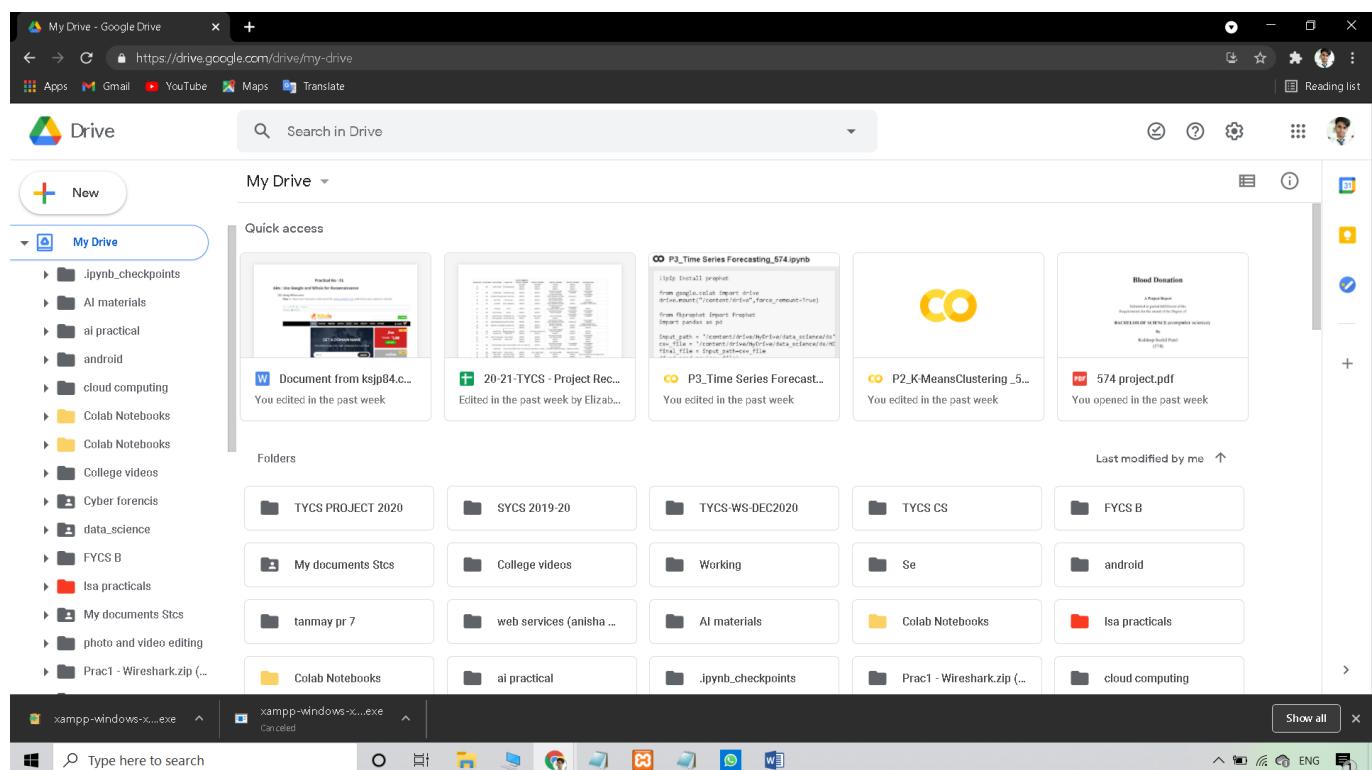


Step 3:



Grid View:

Step 4:



Step 5:

The screenshot shows a Google Docs document titled "kuldeep patel_574". The content of the document is as follows:

```

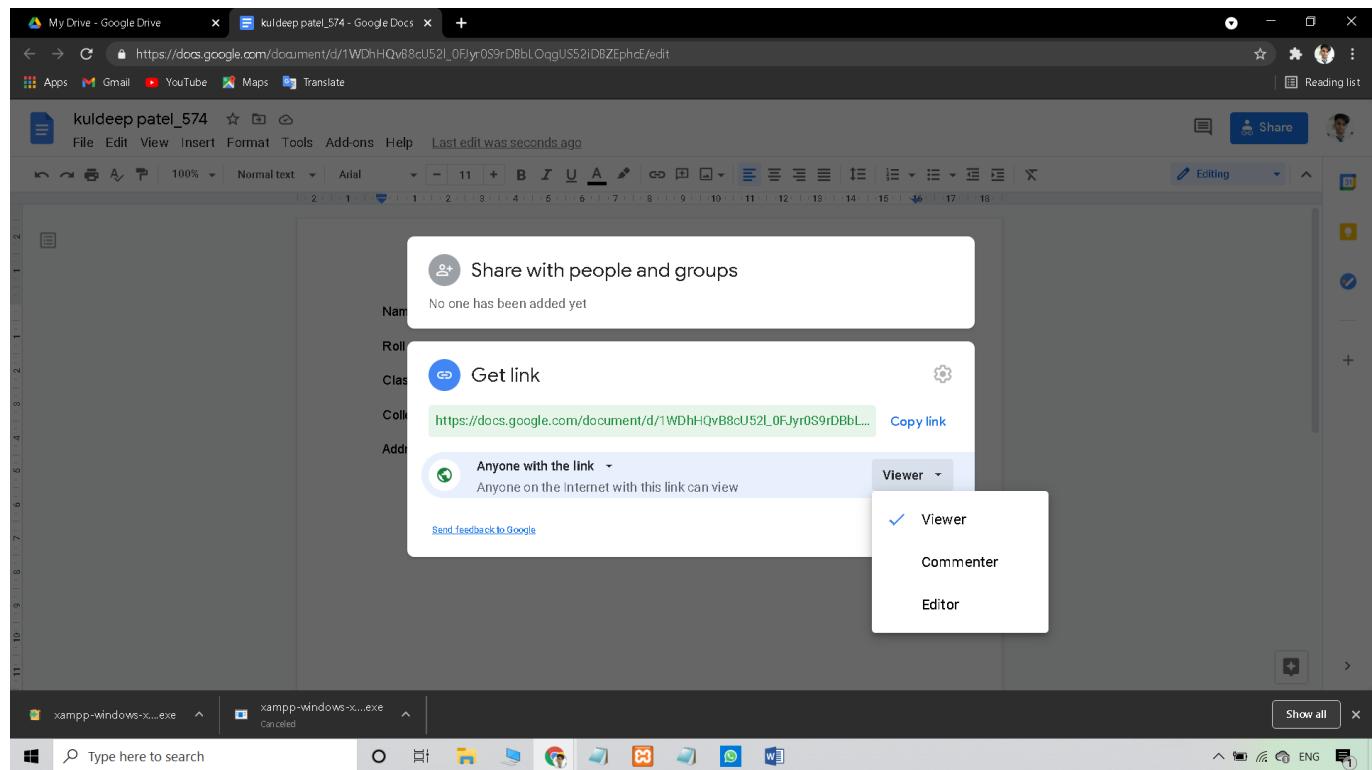
Name = kuldeep sushi Patel
Roll no = 574
Class = tycs
College name = NKC
Address = India
  
```

The document is in editing mode, indicated by the "Editing" button in the top right corner. Below the document, the Windows taskbar is visible, showing the XAMPP control panel.

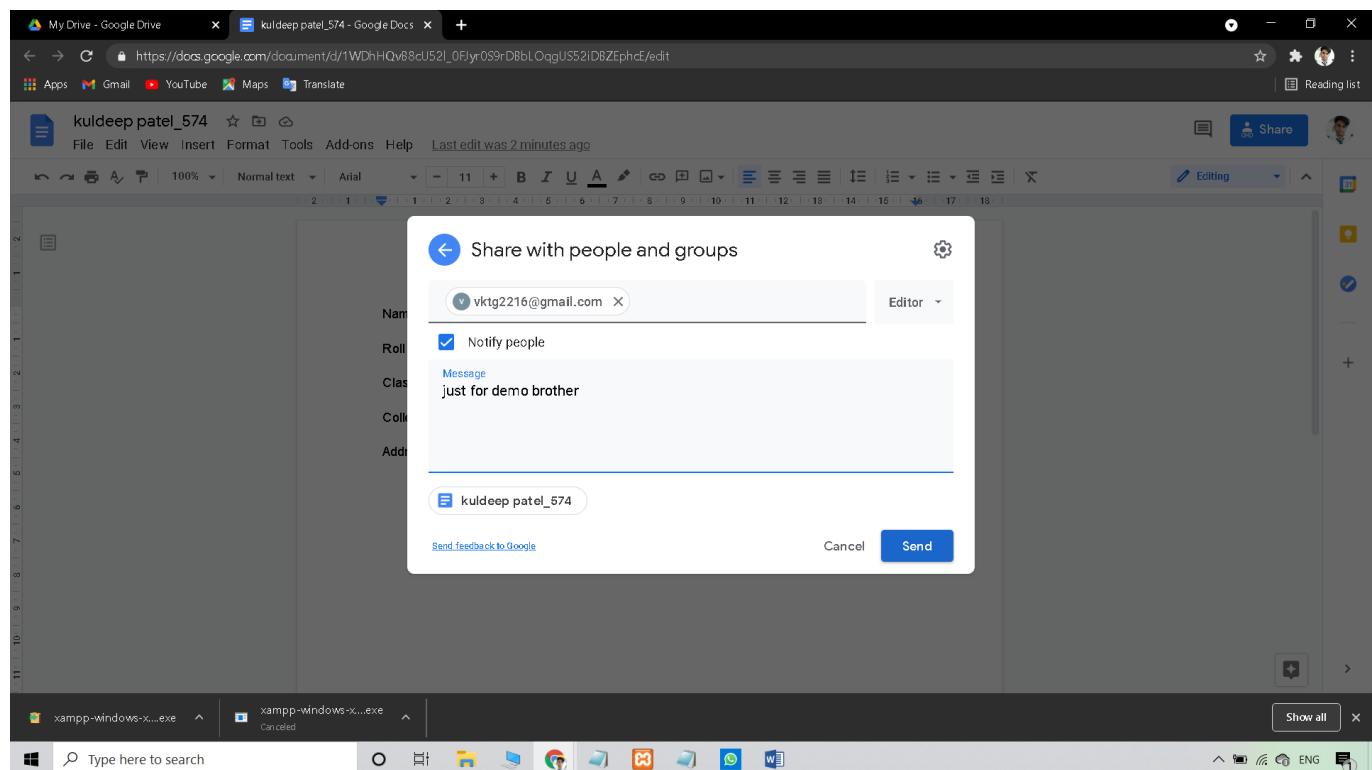
STEP 6

The screenshot shows the "Share with people and groups" dialog box in Google Docs. The "Owner" section lists "574_Tycs_kuldeppatel (you)" with the email "kuldeppatel7865@gmail.com". There is a "Done" button at the bottom right of the dialog. Below the dialog, there is a "Get link" section with a "Copy link" button.

STEP 7 :



STEP 8 :



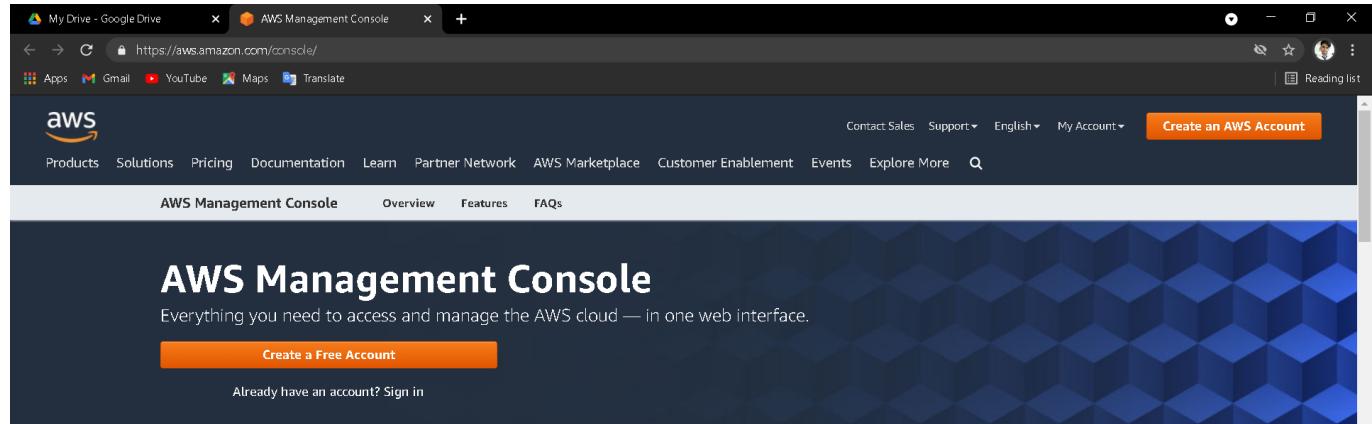
Practical No. 5

AIM: Study and implementation of identity management in AWS.

PROCEDURE:

Click on link : <https://aws.amazon.com/console/>

Step 1 : Go to “My Account” > “AWS Management Console”.



The AWS Management Console brings the unmatched breadth and depth of AWS right to your computer or mobile phone with a secure, easy-to-access, web-based portal. Discover new services, manage your entire account, build new applications, and learn how to do even more with AWS.



Console Overview

- Discover and experiment with over 150 AWS services, many of which have [free trials](#)
- Build your cloud-based applications in [any AWS data center throughout the world](#)
- Manage and monitor [users, service usage, health, and monthly billing](#)
- Get [in-console help](#) from AWS Support

Step 2 : created the account

The screenshot shows the AWS Billing Management Console interface. The top navigation bar includes links for My Drive - Google Drive, IAM Management Console, Billing Management Console, and AWS security credentials - AWS. The main content area is titled "Account Settings". It displays the following account details:

Account Id:	459228385294
Account Name:	kuldeep sushil patel
Password:	*****

Below this, the "Contact Information" section is expanded, showing the following details:

Full Name:	Kuldeep Sushil Patel
Address:	Ambedkar Road
City:	Mumbai
State:	Maharashtra
Postal Code:	400067
Country:	IN
Phone Number:	08424809034
Company Name:	NKC
Website URL:	

At the bottom of the contact information, there is a note: "Please note that updating your contact information on this page will not update the information displayed on your PDF Invoices. If you wish to update the billing address information associated with your invoice, please edit it through the Payment Methods page, located [here](#)".

The left sidebar contains a navigation menu with the following items:

- Cost Management
- Cost Explorer
- Budgets
- Budgets Reports
- Savings Plans
- Cost & Usage Reports
- Cost Categories
- Cost allocation tags
- Billing** (selected)
- Bills
- Orders and invoices
- Credits
- Purchase orders
- Preferences
- Billing preferences
- Payment methods
- Consolidated billing
- Tax settings

The bottom of the screen shows the Windows taskbar with icons for File Explorer, Task View, Start, Taskbar settings, and Settings. The system tray shows battery level, signal strength, and network status.

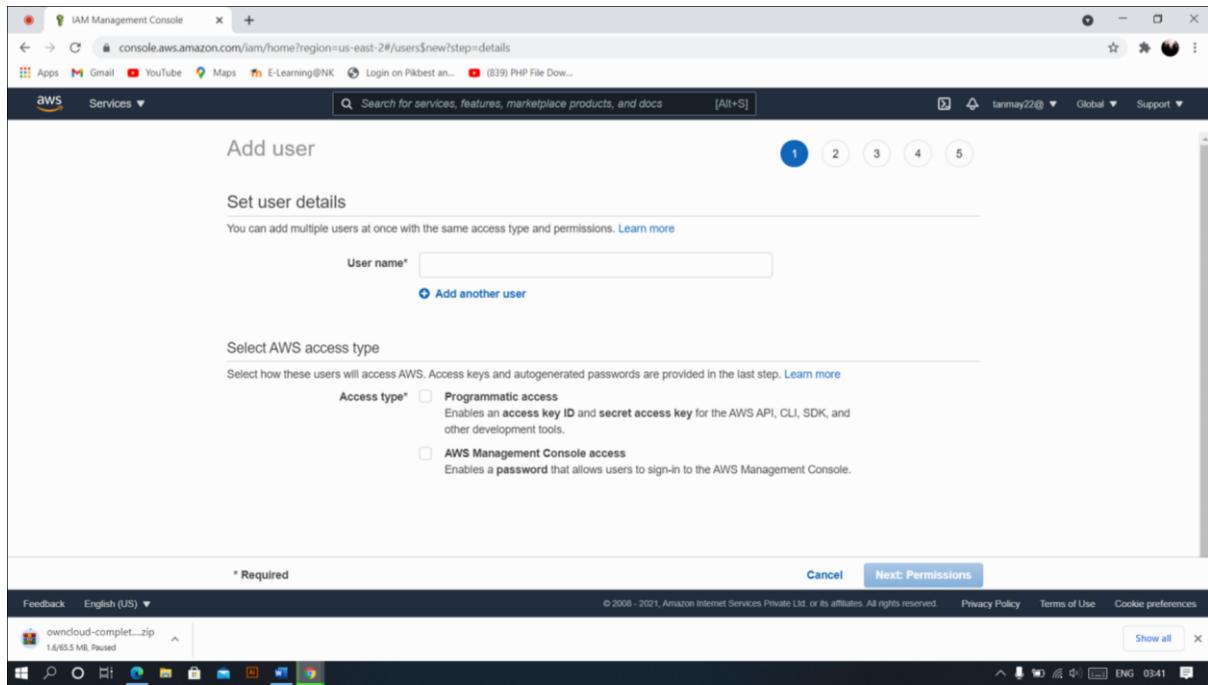
Step 3 : Go to “My Security Credentials”

The screenshot shows the AWS Management Console homepage. In the top right corner, there is a navigation bar with several links: "My Account" (077918721056), "My Organization", "My Service Quotas", "My Billing Dashboard", "My Security Credentials" (which is highlighted in blue), and "Sign Out". Below this, there is a section titled "Stay connected" with a link to the "AWS Console Mobile App". On the left side, there is a sidebar titled "AWS services" with a "Build a solution" section containing links to "Launch a virtual machine", "Build a web app", "Build using virtual servers", "Register a domain", "Connect an IoT device", and "Start migrating to AWS". On the right side, there is a "Explore AWS" section with links to "Modernize Your APIs with GraphQL" and "AWS Certification". At the bottom of the page, there is a search bar and links for "Privacy Policy", "Terms of Use", and "Cookie preferences".

Step 4 : Click on “Users”.

The screenshot shows the IAM Management Console. The left sidebar has a tree view of IAM features: "Identity and Access Management (IAM)" (selected), "Access management" (selected), "Groups", "Users" (selected and highlighted in orange), "Roles", "Policies", "Identity providers", "Account settings", "Access reports" (selected), "Archive rules", "Analyzers", "Settings", "Credential report", "Organization activity", and "Service control policies". The main content area has a header with "Add user" and "Delete user" buttons. Below this is a search bar and a table with columns: "User name", "Groups", "Access key age", "Password age", "Last activity", and "MFA". A message at the bottom of the table says "Showing 0 results" and "There are no IAM users. Learn more". At the bottom of the page, there is a search bar and links for "Privacy Policy", "Terms of Use", and "Cookie preferences".

Step 5: Click on “Add user”. Enter the name for the user. Check the check box in front of “Programmatic access” and “AWS Management Console access”



Step 6 : Scroll down and select “Custom password” and enter the password for the new user and click on “Next: Permissions”.

Set user details

You can add multiple users at once with the same access type and permissions. [Learn more](#)

User name*

[+ Add another user](#)

Select AWS access type

Select how these users will access AWS. Access keys and autogenerated passwords are provided in the last step. [Learn more](#)

Access type* **Programmatic access**
Enables an access key ID and secret access key for the AWS API, CLI, SDK, and other development tools.

AWS Management Console access
Enables a password that allows users to sign-in to the AWS Management Console.

Console password* Autogenerated password Custom password

 Show password

Require password reset User must create a new password at next sign-in
Please automatically set the IAM `ResetPassword` policy to allow them to change their password.

* Required Cancel [Next: Permissions](#)

Step 7 : Give name to group, assign their permissions and click on “Create group”

The screenshot shows the AWS IAM Management Console interface. The top navigation bar includes tabs for 'My Drive - Google Drive', 'IAM Management Console', 'AWS security credentials - AWS', and 'AWS security credentials - AWS'. The main content area is titled 'Add user' and displays the 'Set permissions' step. Three options are available: 'Add user to group' (selected), 'Copy permissions from existing user', and 'Attach existing policies directly'. A note below states: 'Add user to an existing group or create a new one. Using groups is a best-practice way to manage user's permissions by job functions.' A 'Learn more' link is provided. The 'Add user to group' section shows a search bar and a table with one result: 'kuldeepGROUP' (selected) with 'None' attached policies. The bottom of the screen shows the Windows taskbar with various pinned icons.

Step 8 : Click on “Next: Review”.

Step 9 : Check the Review for the user and click on “Create user”.

Review

Review your choices. After you create the user, you can view and download the autogenerated password and access key.

User details

User name	kuldeep
AWS access type	Programmatic access and AWS Management Console access
Console password type	Custom
Require password reset	Yes
Permissions boundary	Permissions boundary is not set

Permissions summary

The user shown above will be added to the following groups.

Type	Name
Group	kuldeepGROUP
Managed policy	IAMUserChangePassword

Tags

Create user

Step 10 : Click on “Close”.

Success

You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.

Users with AWS Management Console access can sign-in at: <https://459228385294.signin.aws.amazon.com/console>

User	Access key ID	Secret access key	Email login instructions
kuldeep	AKIAWV3BFCAHJTTSUBGX	***** Show	Send email

Close

Step 11 : Click on “Group”. You will see the group you just created.

The screenshot shows the AWS IAM Management Console. The left sidebar has 'Identity and Access Management (IAM)' selected. Under 'Users', 'kuldeep' is listed. The main table shows a single result:

User name	Groups	Access key age	Password age	Last activity	MFA
kuldeep	kuldeepGROUP	None	Today	None	Not enabled

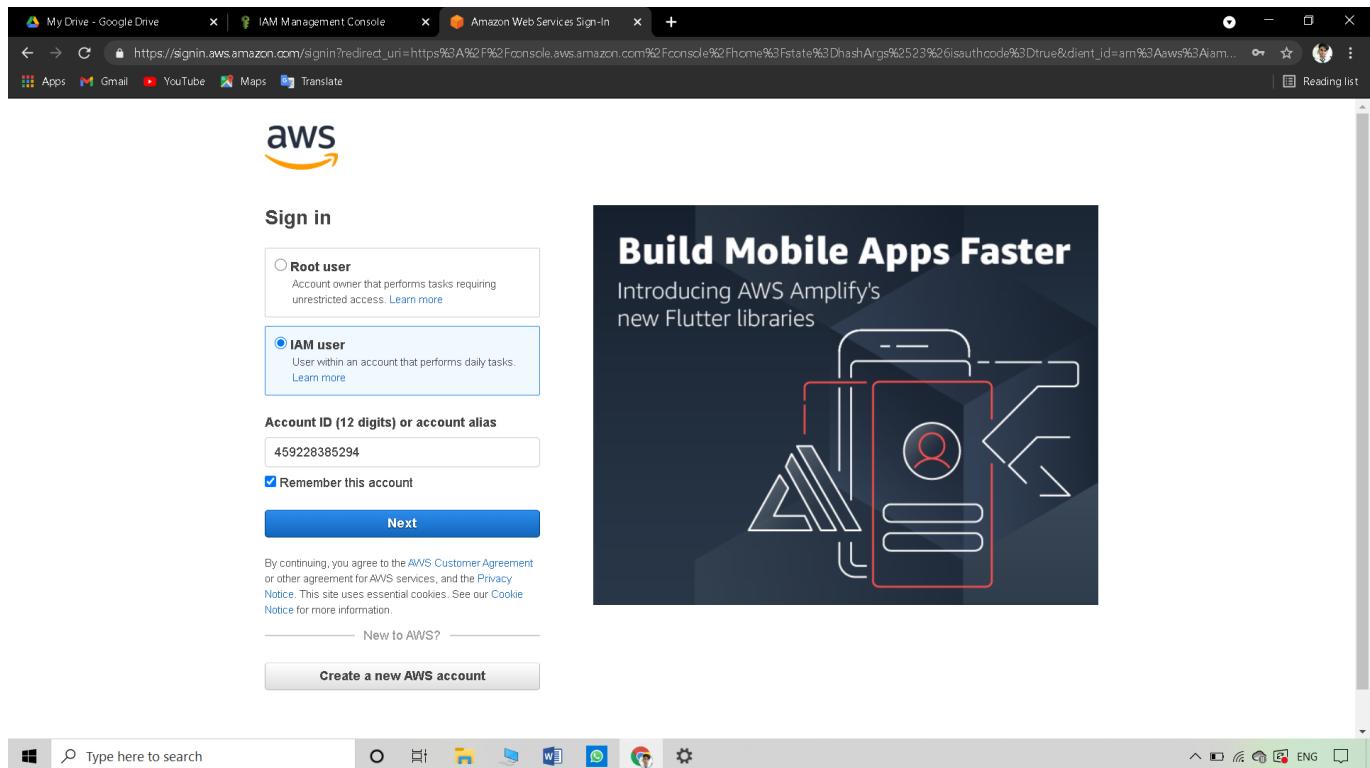
Step 12: Now log out of admin account and try to login as user (newly created).

The screenshot shows the AWS IAM Management Console. The left sidebar has 'Identity and Access Management (IAM)' selected. Under 'Users', 'kuldeep' is listed. A context menu is open over the 'kuldeep' row, with 'Sign Out' highlighted. Other options in the menu include:

- My Account 459228385294
- My Organization
- My Service Quotas
- My Billing Dashboard
- My Security Credentials
- MFA

Step13: Navigate to link: <https://aws.amazon.com/console/> Go to "My Account" > "AWS Management Console".

Step 14: Just login to your user's account.



Step 15: It will ask you to change the password which is been set by administrator.

Step 16: You will be redirected to home screen.

The screenshot shows the AWS Management Console home page. At the top, there are three tabs: "My Drive - Google Drive", "IAM Management Console", and "AWS Management Console". The "AWS Management Console" tab is active. The URL in the address bar is <https://us-east-2.console.aws.amazon.com/console/home?region=us-east-2#>. The top navigation bar includes links for "Apps", "Gmail", "YouTube", "Maps", "Translate", a search bar with placeholder "Search for services, features, marketplace products, and docs", and keyboard shortcut "[Alt+S]". On the far right of the top bar are icons for "Reading list", "kuldeep @ 4592-2838-5294", "Ohio", and "Support".

The main content area has a header "AWS Management Console". Below it is a sidebar titled "AWS services" with sections for "Recently visited services" (IAM, Billing) and "All services".

A central panel titled "Build a solution" offers three quick-start options:

- Launch a virtual machine**: With EC2, 2-3 minutes, represented by a CPU icon.
- Build a web app**: With Elastic Beanstalk, 6 minutes, represented by a cloud icon.
- Build using virtual servers**: With Lightsail, 1-2 minutes, represented by a server icon.

On the right side, there's a "Explore AWS" section with links to "Amazon Redshift", "Run Serverless Containers with AWS Fargate", and other services like "My Service Quotas", "My Billing Dashboard", and "My Security Credentials".

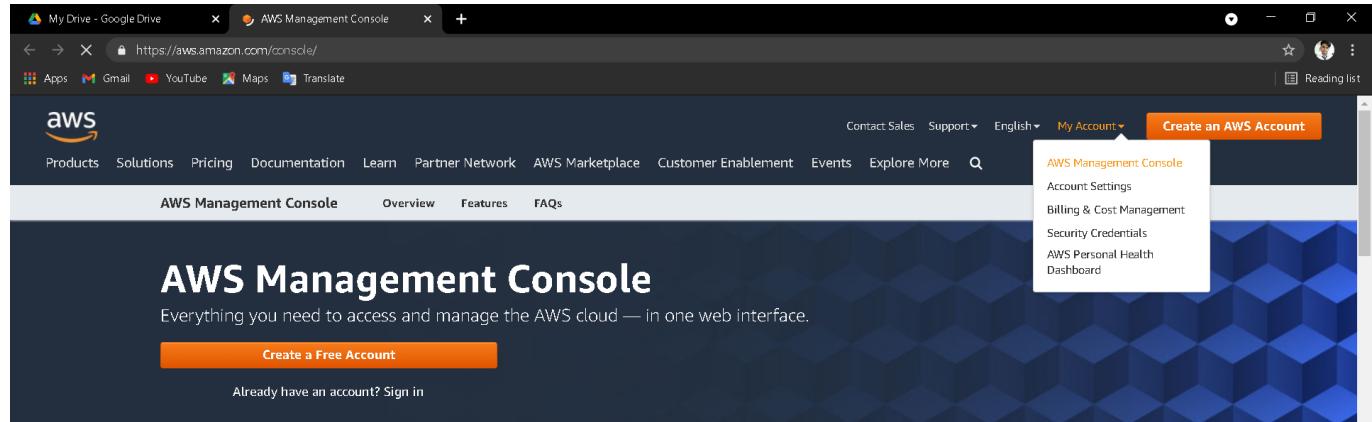
At the bottom of the page are links for "Feedback", "English (US)", "Type here to search", and various system status indicators (Wi-Fi, battery, etc.). The footer contains copyright information: "© 2008-2021, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved." and links for "Privacy Policy", "Terms of Use", and "Cookie preferences".

Practical No. 6

AIM: Study Cloud Security management.

PROCEDURE: Click on the link: <https://aws.amazon.com/console/> Step

1: Go to “My Account” > “AWS Management Console”.



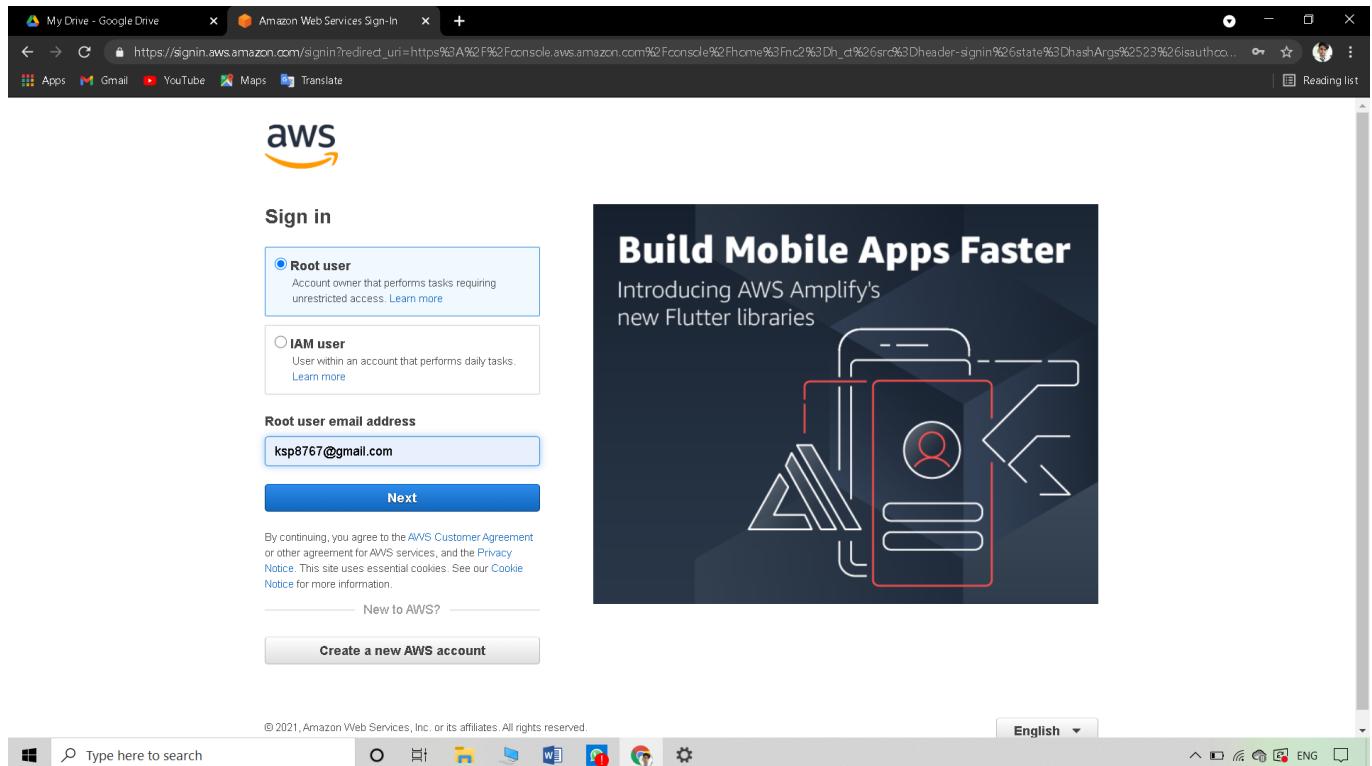
The AWS Management Console brings the unmatched breadth and depth of AWS right to your computer or mobile phone with a secure, easy-to-access, web-based portal. Discover new services, manage your entire account, build new applications, and learn how to do even more with AWS.



Console Overview

- Discover and experiment with over 150 AWS services, many of which have [free trials](#)
- Build your cloud-based applications in [any AWS data center throughout the world](#)
- Manage and monitor [users, service usage, health, and monthly billing](#)
- Get [in-console help](#) from AWS Support

Step 2: Just login to your user's account.



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English ▾

Step 3: Click on "Sign In".

The screenshot shows the AWS Sign-In page. The URL is https://signin.aws.amazon.com/signin?redirect_un=https%3A%2F%2Fconsole.aws.amazon.com%2Fconsole%2Fhome%3Dh_ct%26src%3Dheader-signin%26state%3DhashArgs%2523%26isauthco... . The page has a header with the AWS logo and navigation links. The main form is titled 'Root user sign in' and includes fields for 'Email' (ksp8767@gmail.com) and 'Password' (redacted). It also features a 'Forgot password?' link, a 'Sign in' button, and links for 'Sign in to a different account' and 'Create a new AWS account'. To the right, there is a dark-themed promotional banner for 'Build Mobile Apps Faster' which introduces AWS Amplify's new Flutter libraries. The banner features a smartphone icon with a magnifying glass over it. At the bottom of the page, there is a copyright notice (© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.) and a language selection dropdown set to 'English'.

Step 4: Once you logged in go to "My security credentials".

The screenshot shows the AWS Management Console homepage. The URL is https://us-east-2.console.aws.amazon.com/console/home?nc2=h_ct®ion=us-east-2&src=header-signin#. The page has a header with the AWS logo and navigation links. The main content area is titled 'AWS Management Console' and includes sections for 'AWS services' (with 'IAM' selected under 'Recently visited services'), 'Build a solution' (with options for launching a virtual machine, building a web app, or using virtual servers), and 'Explore AWS' (with sections for document processing, certification, and more). On the right side, there is a sidebar with user information (kuldeep_sushil Patel, Ohio) and links for 'My Account', 'My Organization', 'My Service Quotas', 'My Billing Dashboard', 'My Security Credentials' (which is highlighted in orange), and 'Sign Out'. The bottom of the page shows the browser's address bar with the URL https://console.aws.amazon.com/iam/home?region=us-east-2#security_credential and the standard Windows taskbar.

Step 5: Scroll down you will find “Multi-factor authentication (MFA)”. Click on “Assign MFA device”

Your Security Credentials

Use this page to manage the credentials for your AWS account. To manage credentials for AWS Identity and Access Management (IAM) users, use the [IAM Console](#).

To learn more about the types of AWS credentials and how they're used, see [AWS Security Credentials](#) in AWS General Reference.

- Multi-factor authentication (MFA)**

Use MFA to increase the security of your AWS environments. Signing in to MFA-protected accounts requires a user name, password, and an authentication code from an MFA device.

Activate MFA

- Access keys (access key ID and secret access key)
- CloudFront key pairs
- X.509 certificate
- Account identifiers

Step 6: We will select first option “Virtual MFA device” and click on “Continue”

Manage MFA device

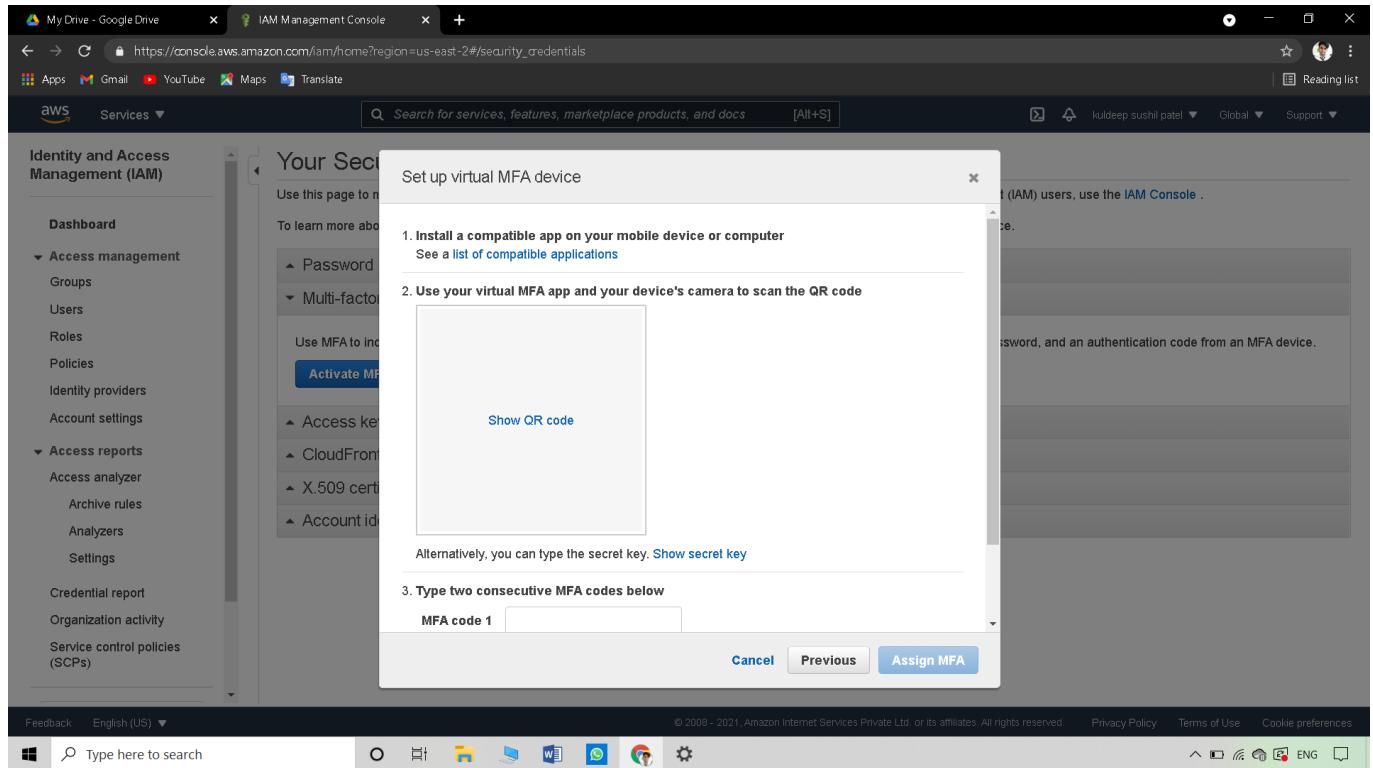
Choose the type of MFA device to assign:

- Virtual MFA device**
Authenticator app installed on your mobile device or computer
- U2F security key**
YubiKey or any other compliant U2F device
- Other hardware MFA device**
Gemalto token

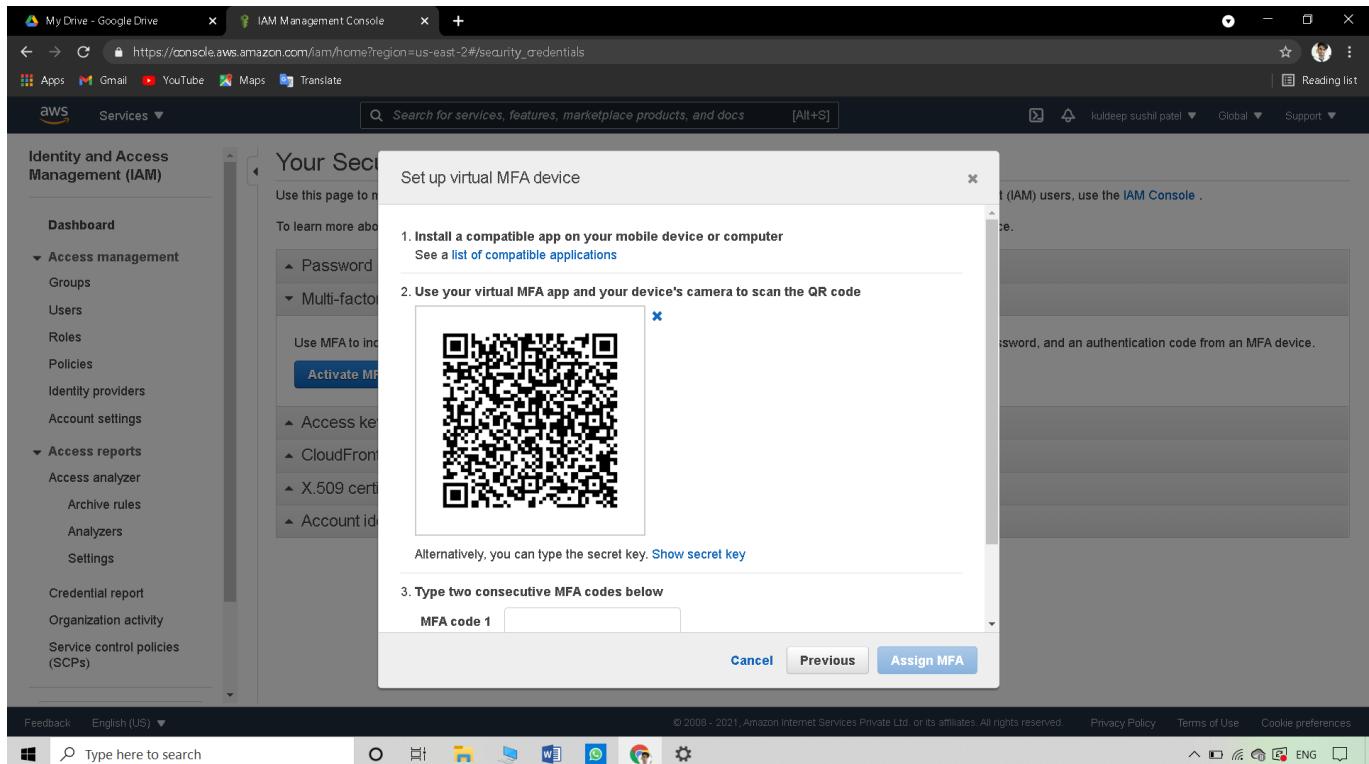
For more information about supported MFA devices, see [AWS Multi-Factor Authentication](#)

Cancel Continue

Step 7: So, concept is we will use third party app to generate OTP which will help us to authenticate ourselves during logging in. It will add a security layer to our account. Now we have to download “2FA Authenticator (2FAS)” app on our mobile.



Step 8: Click on “Show QR code” to display QR code



Step 9: Open the Google Authenticator app click on continue.

Step 10: And click on “+” and Scan the qr code .

Step 11: First, we have to enter 2 OTP which we will receive on app and click “Assign MFA”.

Step 12: It will ask for MFA code. You get new code after every 30 seconds, just enter the valid MFA code and click on “Submit” to login.

Step 13 : Click on "Close"

The screenshot shows the AWS IAM Management Console with a modal dialog titled "Your Security Credentials" open. The modal is titled "Set up virtual MFA device" and contains a success message: "You have successfully assigned virtual MFA". It explains that this virtual MFA will be required during sign-in. Below the message, there's a table with one row showing a "Virtual" device type and its serial number. A "Manage" button is next to the serial number. The background shows the IAM service dashboard with various navigation options like Dashboard, Access management, and Multi-factor authentication.

Step 14: Log out from the account.

The screenshot shows the AWS IAM Management Console with the user menu open on the right side. The "Sign Out" option is highlighted with a yellow box. The main content area shows the "Your Security Credentials" page, which includes a table for managing MFA devices. The user menu also lists "My Account" (459228385294), "My Organization", "My Service Quotas", "My Billing Dashboard", and "My Security Credentials".

Step 15: It will ask for MFA code. You get new code after every 30 seconds, just enter the valid MFA code and click on “Submit” to login.

NAME : KULDEEP PATEL

ROLL NO : 574

PRACTICAL NO: 7

AIM: Write a program for Web Feed.

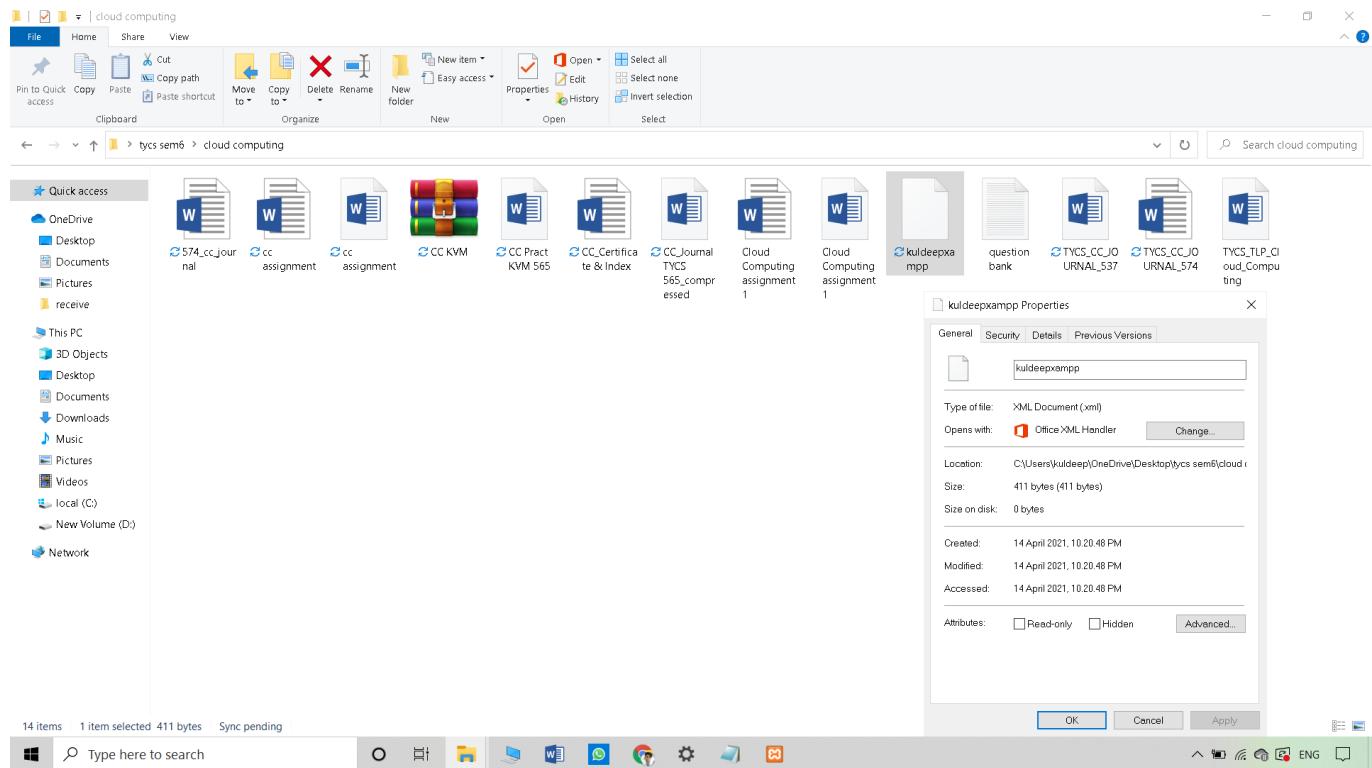
PROCEDURE:

Step 1: First open Notepad and write the following XML code in it

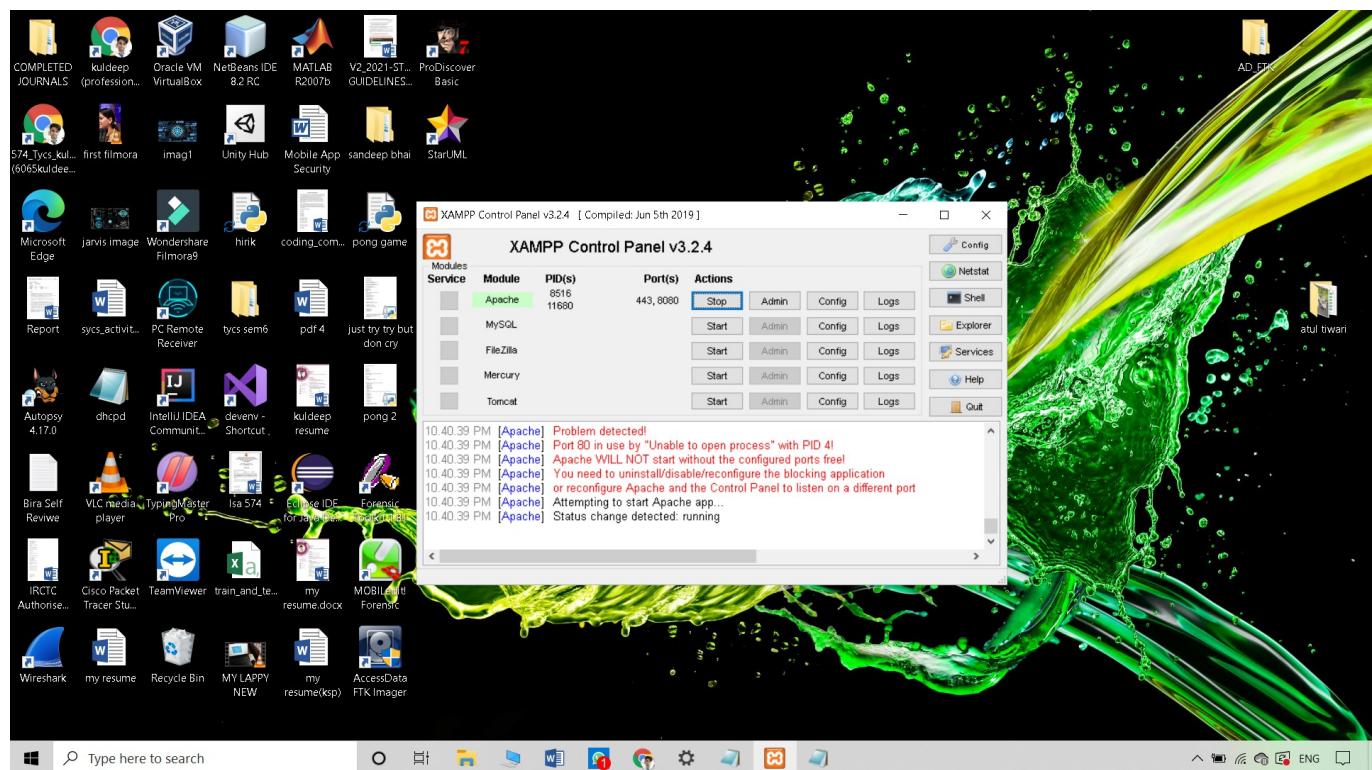
```
File Edit Format View Help
<?xml version="1.0" encoding="UTF-8"?>
<rss version="2.0">
<channel>
<title>TY BSc. Computer Science</title>
<link>https://classroom.google.com/h</link>
<description>Cloud Computing Practical for Web Feed</description>
<item>
<title>Ethical Hacking</title>
<link>https://classroom.google.com/u/0/c/MjQ5NTY4NDczMDc3</link>
<description>Google Classroom for Ethical hacking</description>
</item>
<item>
<title>Cyber Forensics</title>
<link>https://classroom.google.com/u/0/c/MjQ5NDg1MTQyMzA1</link>
<description>Google Classroom for Cyber Forensics</description>
</item>
<item>
<title>Data Science</title>
<link>https://classroom.google.com/u/0/c/MjQWNZMIOTAyODM1</link>
<description>Google Classroom for Data Science</description>
</item>
</channel>
</rss>
```



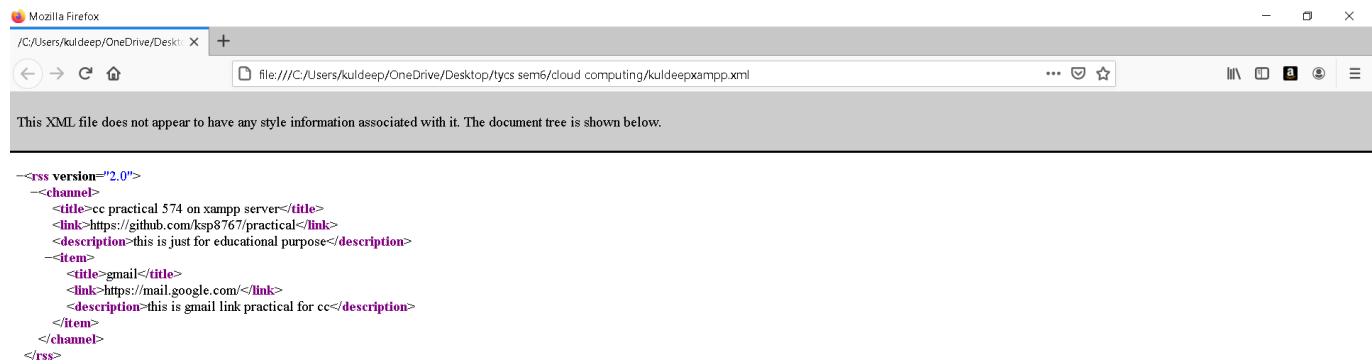
Step 2: Save as the name you like I have given “kuldeepxampp.xml” file in
“C:\Users\kuldeep\OneDrive\Desktop\tycs sem6\cloud computing” directory. (Please remember you can change file name but save the file in “.xml” format).



Step 3: Now start “Apache” server from “XAMPP Control Panel”.



Step 4: Open Google Chrome and enter “<http://localhost:8080/kuldeepxampp.xml>” in URL bar. If your output looks like the one shown below, then you have to add RSS subscription extension.



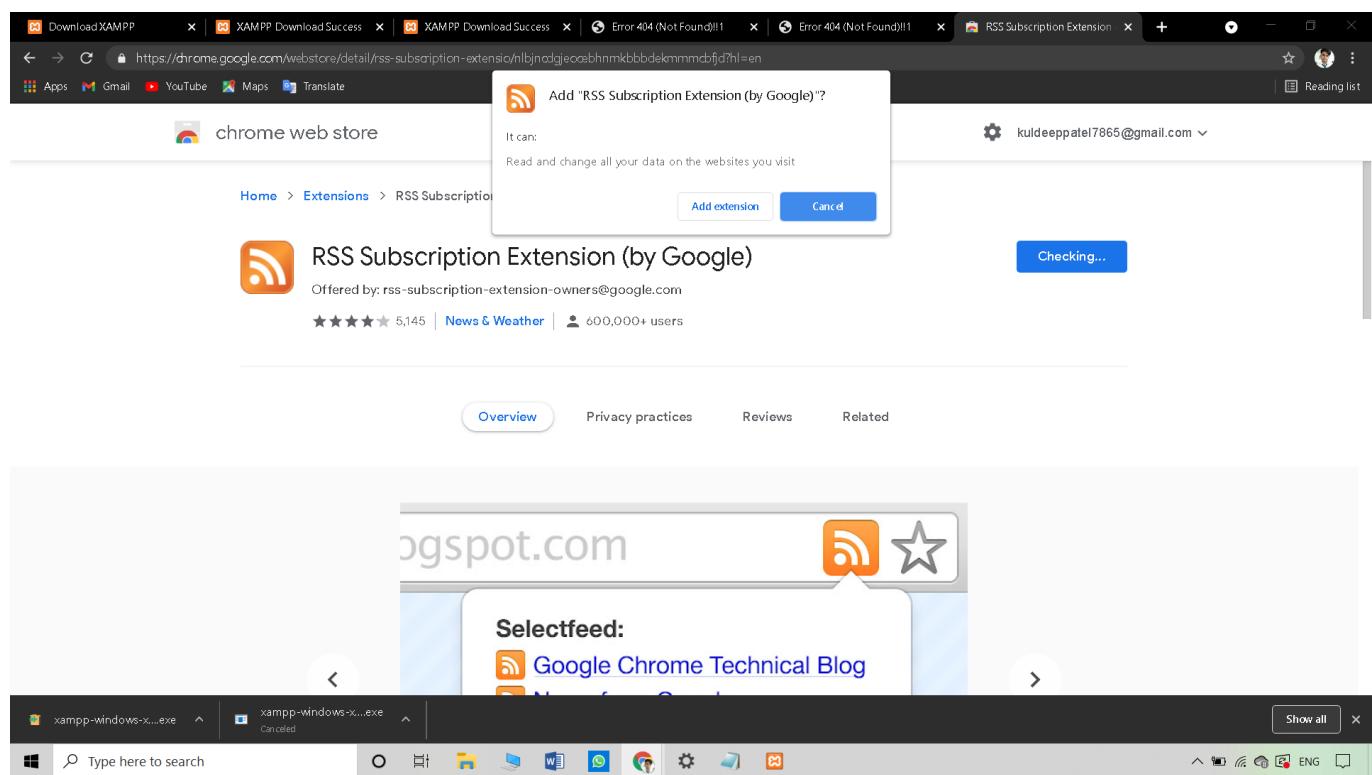
This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
--<rss version="2.0">
-<channel>
  <title>cc practical 574 on xampp server</title>
  <link>https://github.com/ksp876/practical</link>
  <description>this is just for educational purpose</description>
  -<item>
    <title>gmail</title>
    <link>https://mail.google.com/</link>
    <description>this is gmail link practical for cc</description>
  </item>
-</channel>
</rss>
```



Step 5: To add extension go to following link.

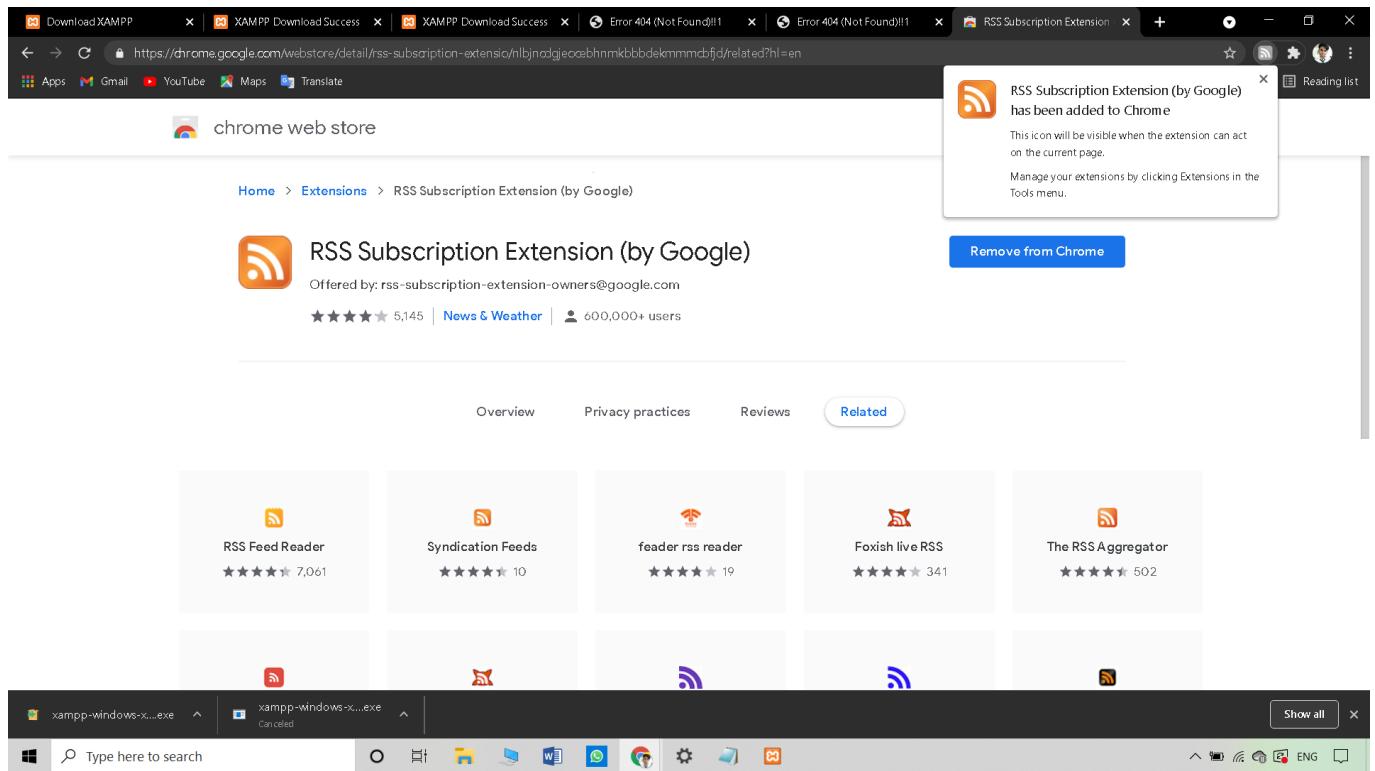
<https://chrome.google.com/webstore/detail/rsssubscriptionextensio/nlbjncdgjeocebhnmkbbdekm mmcblfd?hl=en> Click on “Add to Chrome”.



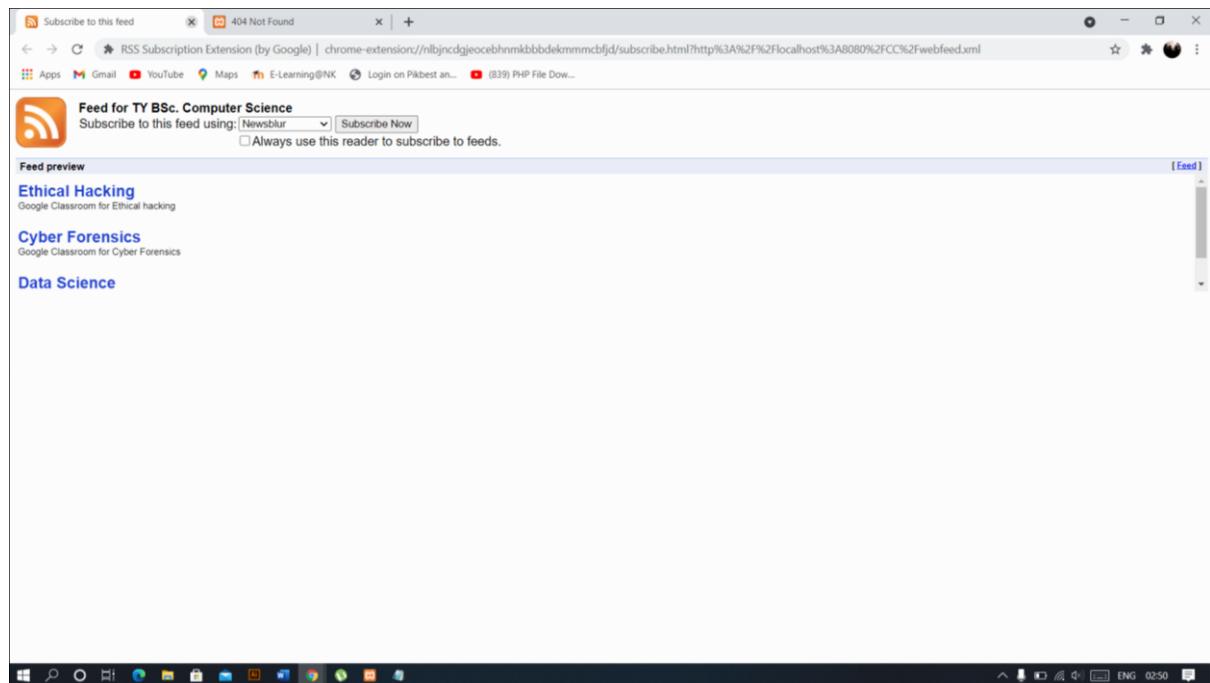
The screenshot shows the Google Chrome browser with several tabs open. A modal window is displayed over the main content area, prompting the user to "Add 'RSS Subscription Extension (by Google)'". The modal includes a description stating "It can: Read and change all your data on the websites you visit" and two buttons: "Add extension" and "Cancel". Below the modal, the extension's page on the Chrome Web Store is visible, showing its name, developer, rating, and user count. The extension has a 5-star rating and over 600,000 users. At the bottom of the page, there are links for "Overview", "Privacy practices", "Reviews", and "Related". The background of the browser shows a news feed from "ogspot.com" featuring a story about "Selectfeed: Google Chrome Technical Blog".

Step 6: Pop-up will show up and now click on “Add extension”

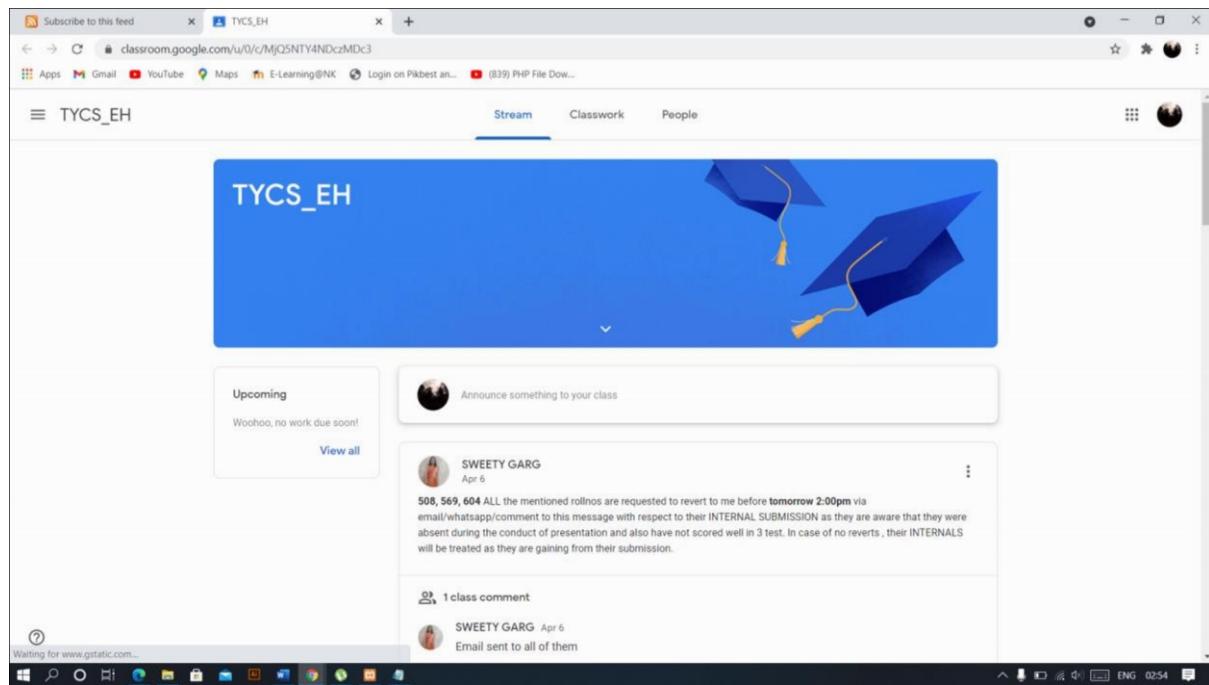
Step 7: Now just refresh the page.



Step 8: The output will be displayed and also Click on any link to check if it is working.



Step 9: If it redirects you to the respective page then your practical is over.

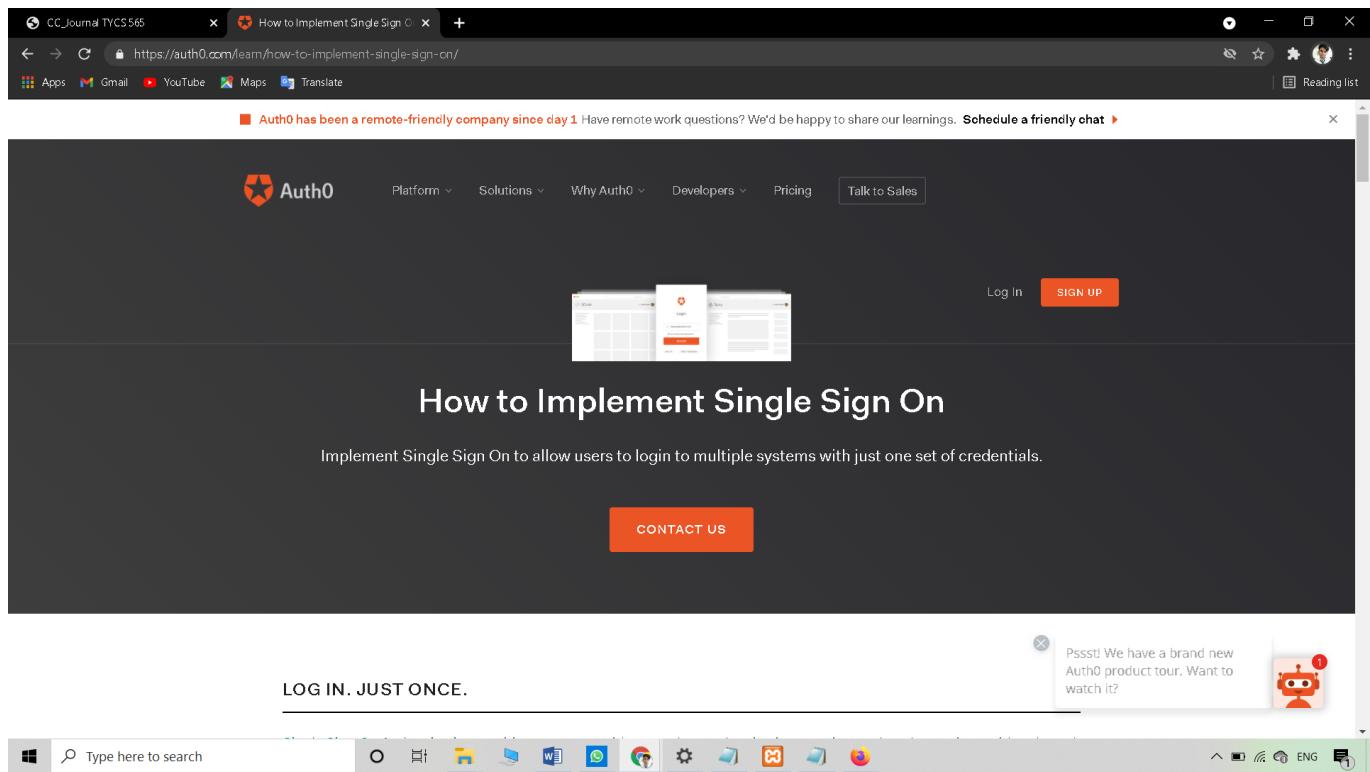


PRACTICAL NO: 8

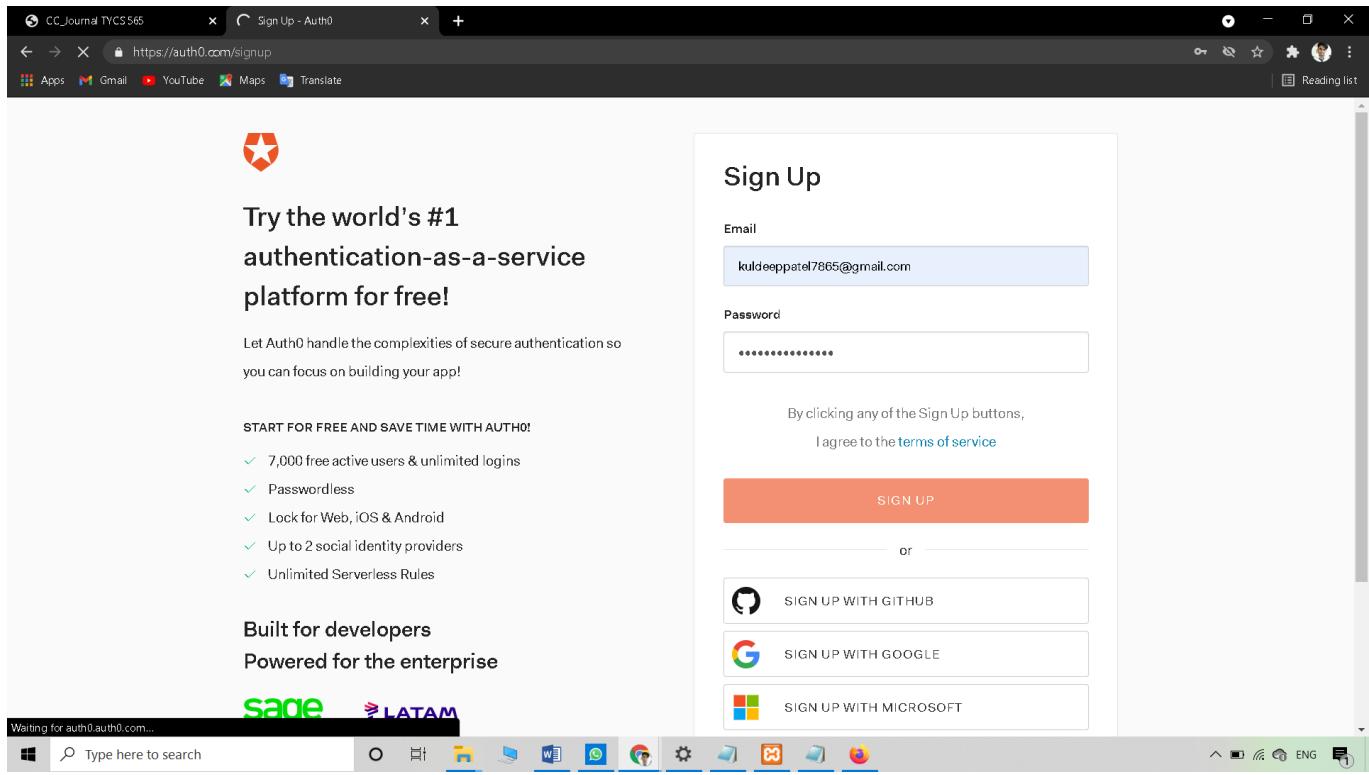
AIM: Study and implementation of Single-Sign-On.

PROCEDURE:

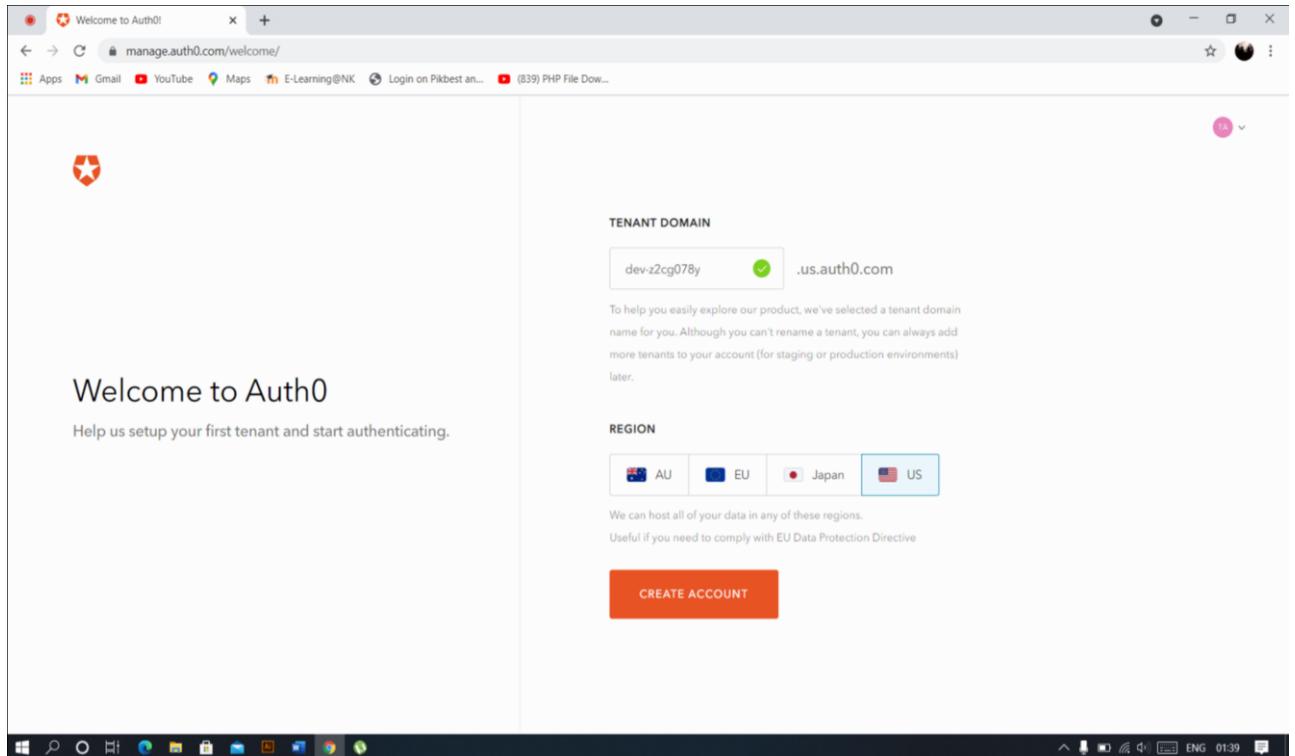
Step 1: Go to following link. <https://auth0.com/learn/how-to-implement-single-sign-on/>



Step 2: Enter ID and password for your account and click ok “SIGN UP” or you can use any other platform to sign up (GitHub, Facebook, Google, Apple).



Step 3: Now enter “TENANT DOMAIN” and select “REGION” for your account and click on “NEXT”.



Step 4: Now, you will get redirect to your “Dashboard”.

Getting Started

Thank you for purchasing the Free Auth0 plan. You have 22 days left in your trial to experiment with features that are not in the Free plan. Like what you're seeing? Please enter your [billing information here](#).

BILLING

Getting Started

Try your Login box

With Auth0 your authentication experience is ready to go. Customize it to match your brand identity and try it now to see how it works.

[Try it out](#) → [Customize](#) →

Integrate Auth0 into your application

Add Auth0 to any kind of application and technology or use one of our sample apps to get you started in minutes.

[Create Application](#) →

Learn more about [How Auth0 works](#)

Add a social login provider

Step 5: Now go to “Authentication” > “Social”.

Social Connections

Thank you for purchasing the Free Auth0 plan. You have 22 days left in your trial to experiment with features that are not in the Free plan. Like what you're seeing? Please enter your [billing information here](#).

BILLING

Social Connections

Configure social connections like Facebook, Twitter, Github and others so that you can let your users login with them. [Learn more](#) ▶

+ CREATE CONNECTION

google-oauth2 ▲
Google / Gmail • 1 Application enabled

Step 6: You will see many social accounts there we are going to try it with Google. Click on “TRY >” button.

The screenshot shows the Auth0 dashboard under the domain 'dev-z2cg078y'. The left sidebar has 'Authentication' selected. The main area is titled 'Social Connections' and shows a single application named 'google-oauth2' which is 'Google / Gmail'. A context menu is open over this application, listing options: 'Settings', 'Applications', 'Try Connection', and 'Delete'. A message at the top of the page congratulates the user on purchasing the Free Auth0 plan and encourages them to enter their billing information.

Step 7: You will get redirected to Google Accounts. Now enter your Email ID and password and submit.

The screenshot shows a browser window with the URL 'https://accounts.google.com/o/oauth2/auth?auth_type=accountselection&prompt=login&response_type=code&redirect_uri=https%3A%2F%2Flogin.us.auth0.com%2Fcallback&scope=email%20profile'. The main content is a 'Sign in with Google' dialog box asking the user to choose an account. It shows the account 'kuldeepatel7865@gmail.com' selected. There is also a link to 'Use another account'. Below the account list, there is a note: 'To continue, Google will share your name, email address, language preference and profile picture with auth0.com. Before using this app, you can review auth0.com's [privacy policy](#) and [Terms of Service](#)'. At the bottom of the dialog, there are links for 'English (United Kingdom)', 'Help', 'Privacy', and 'Terms'.

Step 8: If you get the following window then your practical is completed successfully.

The screenshot shows a web browser window with two tabs: "Social Connections" and "Result". The "Result" tab is active, displaying the URL <https://manage.auth0.com/tester/callback?connection=google-oauth2&code=rdCDT-WGqCYOfrr#>. Below the URL is a circular profile picture placeholder with a smiley face. The main content area says "It Works!".

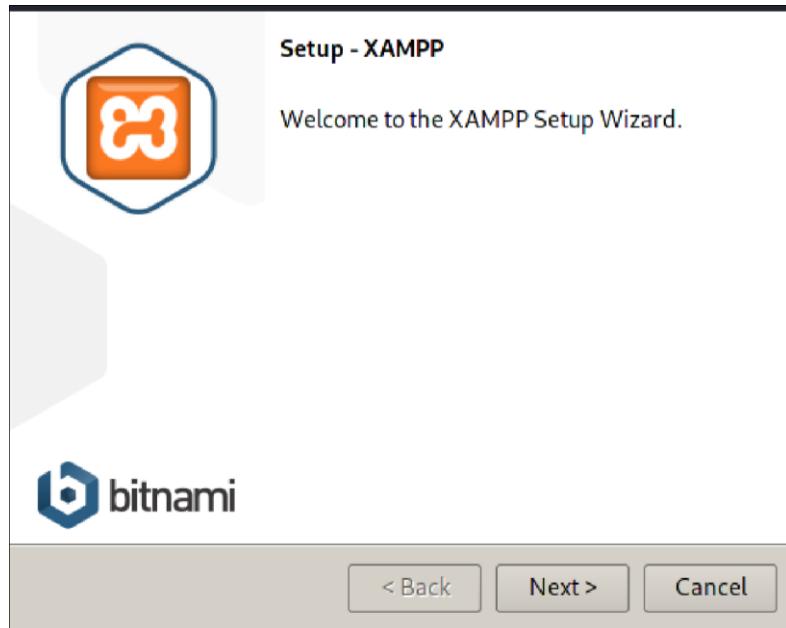
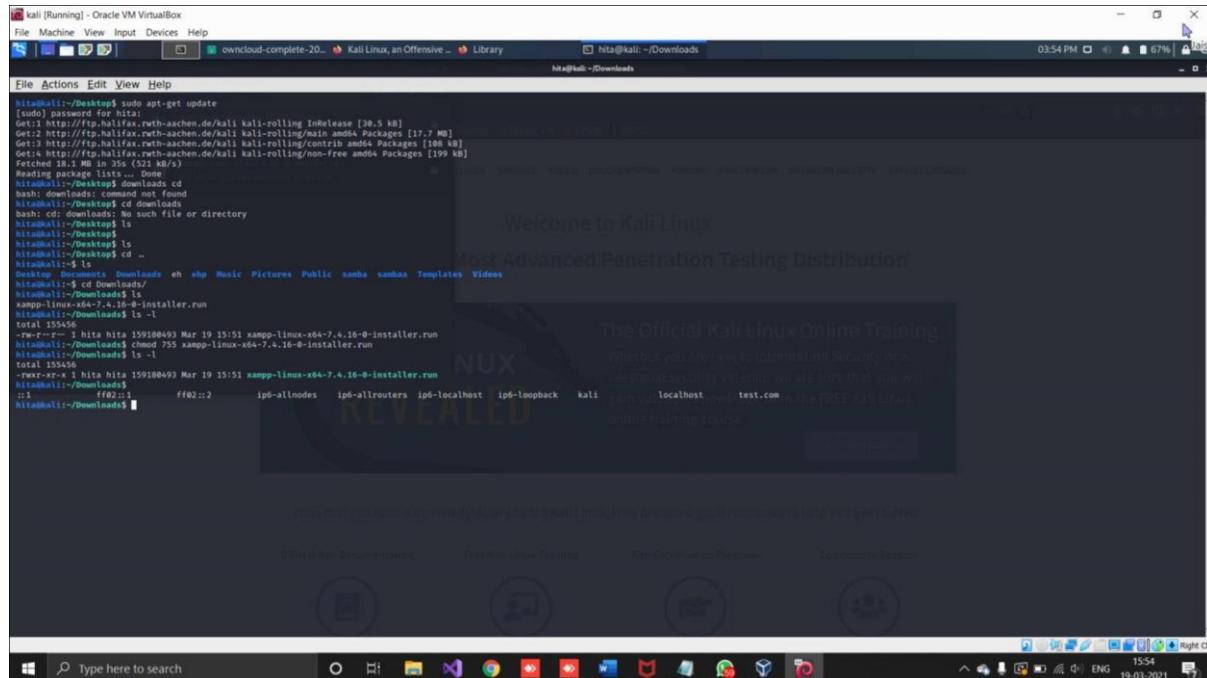
If you can see this page, it means that your connection works.

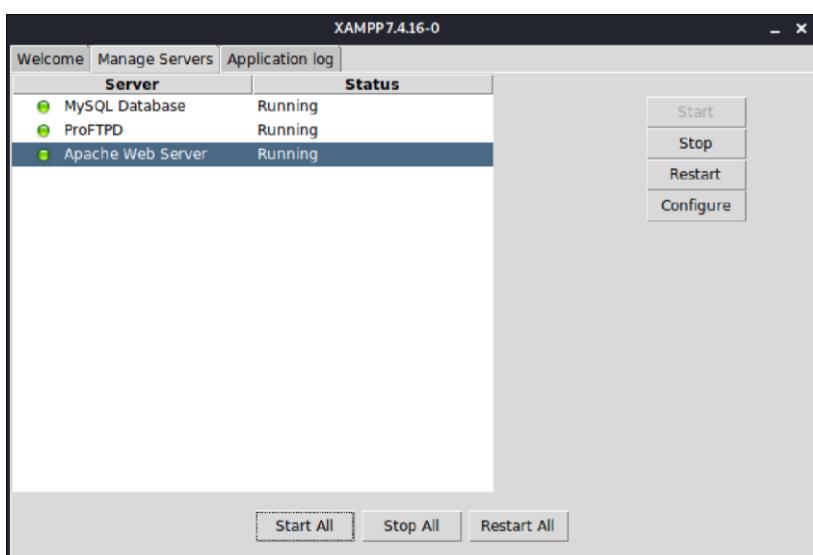
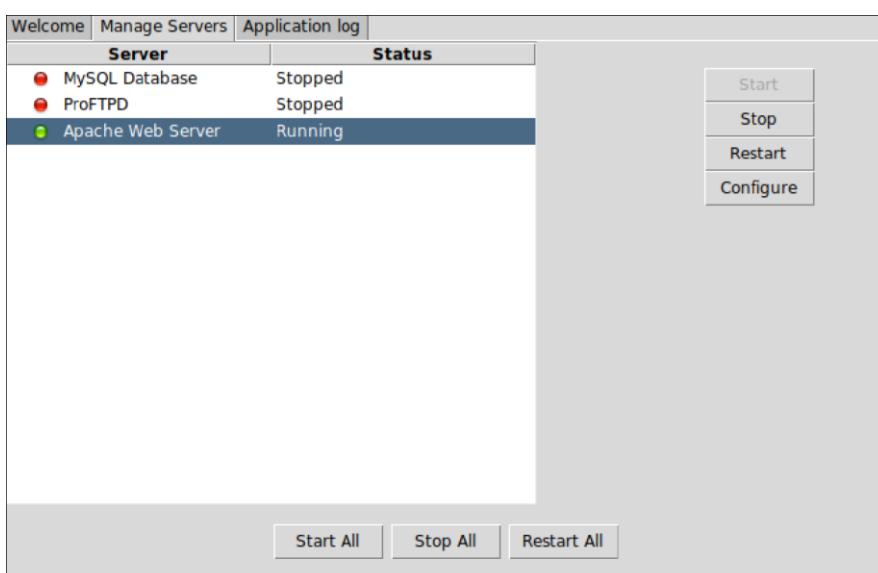
This is the user profile the application will receive:

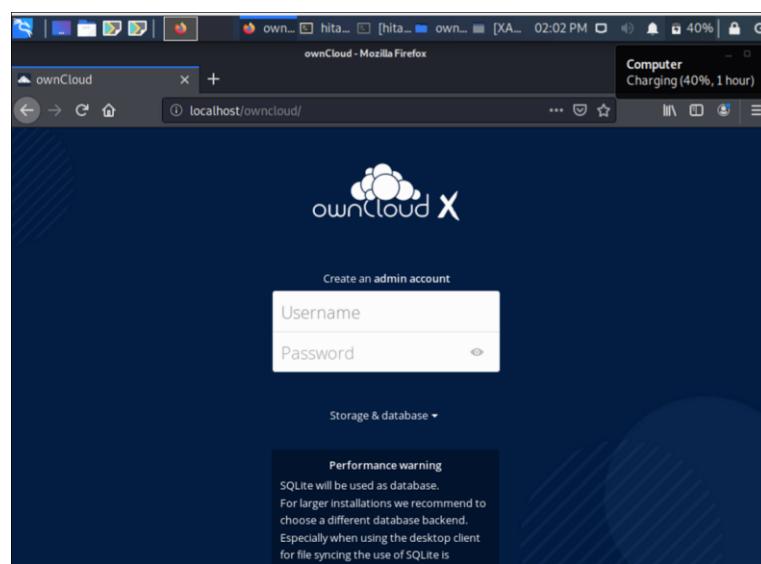
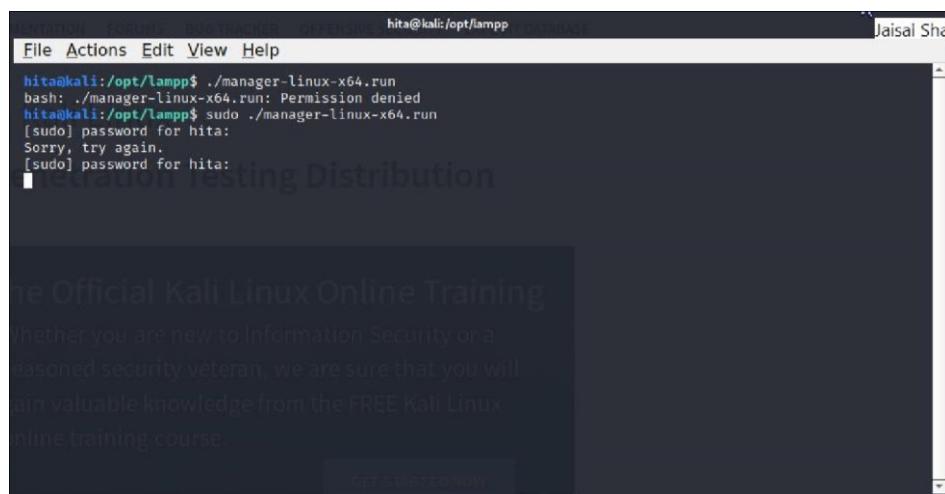
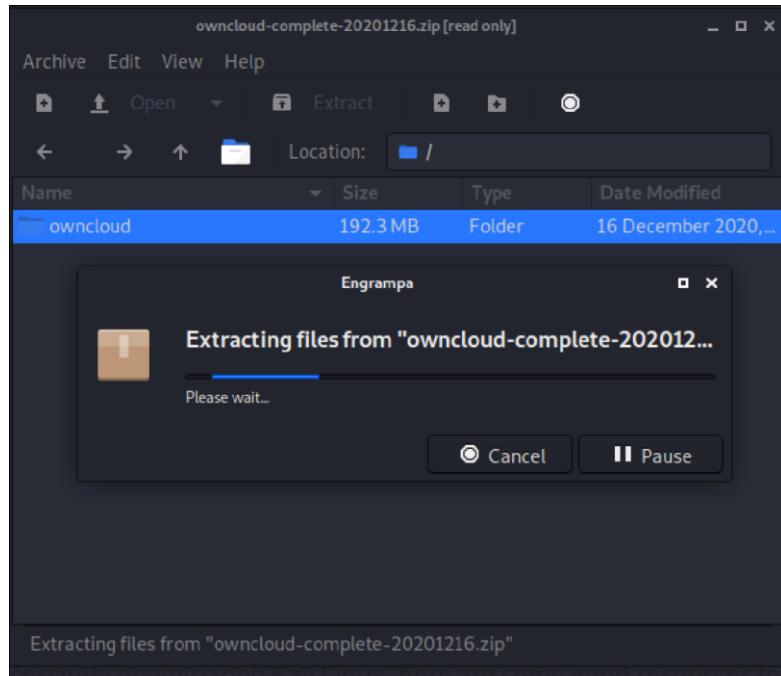
```
{  
  "sub": "google-oauth2|102875860791649066069",  
  "given_name": "574_Tycs_kuldeepatel",  
  "nickname": "kuldeepatel7865",  
  "name": "574_Tycs_kuldeepatel",  
  "picture": "https://lh3.googleusercontent.com/a-/AOh1AGgj2ycPPkTuyj761hC0eRZS0qI+k_pFs5qyBNgt=s96-c",  
  "locale": "en-GB",  
  "updated_at": "2021-04-15T00:12:40.080Z"  
}
```

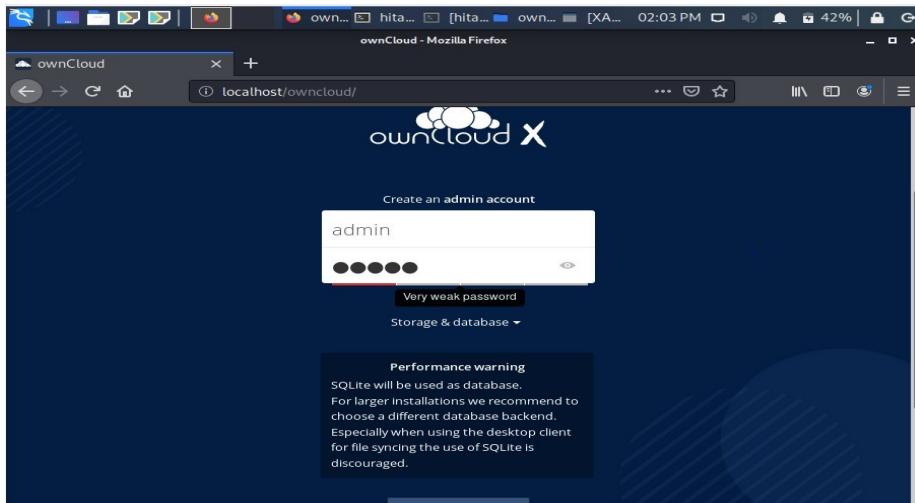
PRACTICAL 9

Aim - User Management on Cloud.









The screenshot shows the "Users" management page. A table lists a single user entry:

	Username	E-Mail	Groups	Create
1	admin	admin	admin	Group Admin for no group

The screenshot shows the "Files" management page. The left sidebar includes links for "Favorites", "Shared with you", "Shared with others", "Shared by link", "Tags", "Deleted files", and "Settings". The main area displays a list of files and folders:

Name	Size	Modified
Documents	35 KB	seconds ago
Photos	988 KB	seconds ago
ownCloud Manual.pdf	6.4 MB	seconds ago

Total: 2 folders and 1 file, 7.4 MB.

Users - ownCloud

localhost/owncloud/index.php/settings/users

Users

Everyone

Admins

john doe

jhon@gmail.com

admin

admin

manager

+ add group

Create

Group Admin for

no group

Settings

Users - ownCloud

localhost/owncloud/index.php/settings/users

Users

Everyone

Admins

manager

test

test@test.com

manager

admin

manager

+ add group

Create

Group Admin for

no group

no group

Settings

The screenshot shows the 'Users' page of the ownCloud administration interface. The URL is `localhost/owncloud/index.php/settings/users`. The page displays a table of users with the following data:

	Username	E-Mail	Groups	Group Admin for
3	admin	admin	admin	no group
2	qwerty	qwerty	admin	no group
1	test	test	manager	no group

The screenshot shows the ownCloud login page. The URL is `localhost/owncloud/index.php/login`. A login form is displayed with the username 'qwerty' and a masked password.

The screenshot shows the 'Files' page of the ownCloud interface. The URL is `localhost/owncloud/index.php/apps/files/?dir=&fileId=15`. The page displays a list of files and folders:

Name	Type	Size	Last Modified
Documents	Folder	35 KB	seconds ago
Photos	Folder	988 KB	seconds ago
ownCloud Manual.pdf	File	6.4 MB	seconds ago

The sidebar on the left includes links for 'Favorites', 'Shared with you', 'Shared with others', 'Shared by link', and 'Tags'. The top right corner shows 'Settings' and 'Log out' options.

Practical 10

Aim - Case study on understanding OpenStack Platform

Case study

WHAT IS OPENSTACK?

- OpenStack is a cloud operating system that controls large pools of compute, storage, and networking resources throughout a datacenter, all managed and provisioned through APIs with common authentication mechanisms.
- A dashboard is also available, giving administrators control while empowering their users to provision resources through a web interface.
- Beyond standard infrastructure-as-a-service functionality, additional components provide orchestration, fault management and service management amongst other services to ensure high availability of user applications.

How does OpenStack work?

- OpenStack is essentially a series of commands known as scripts. Those scripts are bundled into packages called projects that relay tasks that create cloud environments. In order to create those environments, OpenStack relies on 2 other types of software:
- Virtualization that creates a layer of virtual resources abstracted from hardware
- A base operating system (OS) that carries out commands given by OpenStack scripts
- Think about it like this: OpenStack itself doesn't virtualize resources, but rather uses them to build clouds. OpenStack also doesn't execute commands, but rather relays them to the base OS. All 3 technologies—OpenStack, virtualization, and the base OS—must work together. That interdependency is why so many OpenStack clouds are deployed using Linux®, which was the inspiration behind RackSpace and NASA's decision to release OpenStack as open source software.

OpenStack components

The OpenStack cloud platform is not a single thing, but an amalgam of software modules that serve different purposes. OpenStack components are shaped by open source contributions from the developer community, and adopters can implement some or all of these components. Key OpenStack components, by category, include:

- Compute

- Glance --a service that discovers, registers and retrieves virtual machine (VM) images;
- Ironic --a bare-metal provisioning service;
- Magnum --a container orchestration and provisioning engine;

- Nova --a service that provides scalable, on-demand and self-service access to compute resources, such as VMs and containers;
- Storlets--a computable object storage service;
- Zun--a service that provides an API to launch and manage containers.

Open stack pros and cons Pros

- OpenStack is available freely as open source software released under the Apache 2.0 license. This means there is no upfront cost to acquire and use OpenStack. Considering all of its modular components.
- OpenStack provides a comprehensive and production-ready platform upon which an enterprise can build and operate a private or public cloud.
- Because of its open source nature, some organizations also see OpenStack as a way to avoid vendor lock-in.
- An OpenStack distribution is a version of the open source platform that is packaged with other components, such as an installation program and management tools, and often comes with technical support options.
- Common OpenStack distributions include the Red Hat OpenStack platform, the MirantisCloud Platform and the Rackspace OpenStack private cloud.

Cons

- Potential enterprise adopters must also consider some drawbacks. Perhaps the biggest disadvantage of OpenStack is its very size and scope --such complexity requires an IT staff to have significant knowledge to deploy the platform and make it work.
- In some cases, an organization might require additional staff or a consulting firm to deploy OpenStack, which adds time and cost.
- As open source software, OpenStack is not owned or directed by any one vendor or team.
- This can make it difficult to obtain support for the technology --other than support from the open source community.

OpenStack Development

- The OpenStack community collaborates around a six-month, time-based release cycle with frequent development milestones.

- During the planning phase of each release, the community would gather for an OpenStack Design Summit to facilitate developer working sessions and to assemble plans. These Design Summits would coincide with the OpenStack Summit conference.
- Starting with the Pike development cycle the design meetup activity has been separated out into a separate Project Teams Gathering (PTG) event. This was done to avoid the developer distractions caused by presentations and customer meetings that were happening at the OpenStack Summit and to allow the design discussions to happen ahead of the start of the next cycle.
- Recent OpenStack Summits have taken place in Shanghai on 4–6 November 2019, Denver on 29 April 2019, Berlin on 13–19 November 2018, Vancouver on 21–25 May 2018, Sydney on 6–8 November 2017, Boston on 8–11 May 2017, Austin on 25–29 April 2016, and Barcelona on 25–28 October 2016. Earlier OpenStack Summits have taken place also in Tokyo in October 2015, Vancouver in May 2015, and Paris in November 2014. The summit in May 2014 in Atlanta drew 4,500 attendees—a 50% increase from the Hong Kong summit six months earlier.