Cloud Computing

Vidya Vikas Education Society's

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This is to certify that,

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Student of T.Y.B.Sc. (Computer Science) (Sem-VI) with college enrolled Roll no._____ has satisfactorily completed the practical work for the Subject Cloud Computing in the program of Computer Science from the UNIVERSITY OF MUMBAI for the academic year 2022-2023.

Guided By

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Head of Department

_____ _____

Internal Examiner **External Examiner**

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Ex 1: Study of Cloud Computing & Architecture

1. **Aim:** To study cloud architecture and cloud computing model.

2. **Objectives:** From this experiment, the student will be able to
   - provide an overview of concepts of Cloud Computing.
   - To encourage students to indulge into research in Cloud Computing.

3. **Outcomes:** The learner will be able to
   - understand and appreciate cloud architecture.
   - analyze the local and global impact of computing on individuals, organizations, and society.
   - recognize the need for, and an ability to engage in life-long learning.

4. **Hardware / Software Required:** Ubuntu operating system, Internet

5. **Theory:**

   Cloud computing enables companies to consume compute resources as a utility -- just like electricity -- rather than having to build and maintain computing infrastructures in-house. Cloud computing promises several attractive benefits for businesses and end users.

   Three of the main benefits of cloud computing include:

   • Self-service provisioning: End users can spin up computing resources for almost any type of workload on-demand.

   • Elasticity: Companies can scale up as computing needs increase and then scale down again as demands decreases.

   Pay per use: Computing resources are measured at a granular level, allowing users to pay only for the resources and workloads they use.

   Cloud computing services can be Private, Public or Hybrid.

   Private cloud services are delivered from a business' data center to internal users. This model offers versatility and convenience, while preserving management, control and security. Internal customers may or may not be billed for services through IT chargeback.

   In the Public cloud model, a third-party provider delivers the cloud service over the Internet. Public cloud services are sold on-demand, typically by the minute or the hour. Customers only pay for the CPU cycles, storage or bandwidth they consume.

Leading public cloud providers include Amazon Web Services (AWS), Microsoft Azure, IBM/SoftLayer and Google Compute Engine.

Hybrid cloud is a combination of public cloud services and on-premises private cloud – with orchestration and automation between the two.

Companies can run mission-critical workloads or sensitive applications on the private cloud while using the public cloud for workloads that must scale on-demand. The goal of hybrid cloud is to create a unified, automated, scalable environment which takes advantage of all that a public cloud infrastructure can provide, while still maintaining control over mission-critical data.

Types of cloud computing:

IT people talk about three different kinds of cloud computing, where different services are being provided for you. Note that there's a certain amount of vagueness about how these things are defined and some overlap between them.

- Infrastructure as a Service (IaaS) means you're buying access to raw computing hardware over the Net, such as servers or storage. Since you buy what you need and pay-as-you-go, this is often referred to as utility computing. Ordinary web hosting is a simple example of IaaS: you pay a monthly subscription or a per-megabyte/gigabyte fee to have a hosting company serve up files for your website from their servers.

- Software as a Service (SaaS) means you use a complete application running on someone else's system. Web-based email and Google Documents are perhaps the best-known examples. Zoho is another well-known SaaS provider offering a variety of office applications online.

- Platform as a Service (PaaS) means you develop applications using Web-based tools so they run on systems software and hardware provided by another company. So, for example, you might develop your own ecommerce website but have the whole thing, including the shopping cart, checkout, and payment mechanism running on a merchant's server. Force.com (from salesforce.com) and the Google App Engine are examples of PaaS.

- Advantages and disadvantages of cloud computing

  Advantages: The pros of cloud computing are obvious and compelling. If your business is selling books or repairing shoes, why get involved in the nitty gritty of buying and maintaining a complex computer system? If you run an insurance office, do you really want your sales agents wasting time running anti-virus software, upgrading word-processors, or worrying about hard-drive crashes? Do you really want them cluttering your expensive computers with their personal emails, illegally shared MP3 files, and naughty YouTube videos—when you could leave that responsibility to someone else? Cloud computing allows you to buy in

only the services you want, when you want them, cutting the upfront capital costs of computers and peripherals. You avoid equipment going out of date and other familiar IT problems like ensuring system security and reliability. You can add extra services (or take them away) at a moment's notice as your business needs change. It's really quick and easy to add new applications or services to your business without waiting weeks or months for the new computer (and its software) to arrive.

Disadvantages: Instant convenience comes at a price. Instead of purchasing computers and software, cloud computing means you buy services, so one-off, upfront capital costs become ongoing operating costs instead. That might work out much more expensive in the long-term.

If you're using software as a service (for example, writing a report using an online word processor or sending emails through webmail), you need a reliable, high-speed, broadband Internet connection functioning the whole time you're working. That's something we take for granted in countries such as the United States, but it's much more of an issue in developing countries or rural areas where broadband is unavailable.

If you're buying in services, you can buy only what people are providing, so you may be restricted to off-the-peg solutions rather than ones that precisely meet your needs. Not only that, but you're completely at the mercy of your suppliers if they suddenly decide to stop supporting a product you've come to depend on. (Google, for example, upset many users when it announced in September 2012 that its cloud-based Google Docs would drop support for old but de facto standard Microsoft Office file formats such as .DOC, .XLS, and .PPT, giving a mere one week's notice of the change—although, after public pressure, it later extended the deadline by three months.) Critics charge that cloud-computing is a return to the bad-old days of mainframes and proprietary systems, where businesses are locked into unsuitable, long-term arrangements with big, inflexible companies. Instead of using "generative" systems (ones that can be added to and extended in exciting ways the developers never envisaged), you're effectively using "dumb terminals" whose uses are severely limited by the supplier. Good for convenience and security, perhaps, but what will you lose in flexibility? And is such a restrained approach good for the future of the Internet as a whole? (To see why it may not be, take a look at Jonathan Zittrain's eloquent book The Future of the Internet—And How to Stop It.)

6. Conclusion:

Cloud computing enables a convenient and on-demand network access to a wide range of resources. The different services and also the deployment models allow flexible service provider interaction with minimal human intervention. It saves costs but also can lead to risk issues and suspension of resources when in huge quantity.

Practical no: -02

Ex 2. Installation and Configuration of virtualization using KVM.

1. **Aim:** Installation and Configuration of virtualization using KVM

2. **Objectives:** From this experiment, the student will be able to,
   - Understand the concepts of virtualization.
   - Understand KVM architecture and its configuration.

3. **Outcomes:** The learner will be able**,**

   - To analyze user models and develop user centric interfaces
   - To analyze the local and global impact of computing on individuals, organizations, and society.
   - To engage in life-long learning development and higher studies.
   - To understand, identify, analyze and design the problem, implement and validate the solution including both hardware and software.

4. **Hardware / Software Required:** Ubuntu operating system, open-source software KVM, Internet.

5. **Theory:**

   Virtualization is software that separates physical infrastructures to create various dedicated resources. It is the fundamental technology that powers cloud computing.

   The technology behind virtualization is known as a virtual machine monitor (VMM) or virtual manager, which separates compute environments from the actual physical infrastructure.

   Virtualization makes servers, workstations, storage and other systems independent of the physical hardware layer. This is done by installing a Hypervisor on top of the hardware layer, where the systems are then installed.

   There are three areas of IT where virtualization is making headroads, network virtualization, storage virtualization and server virtualization:

   • Network virtualization is a method of combining the available resources in a network by splitting up the available bandwidth into channels, each of which is independent from the others, and each of which can be assigned (or reassigned) to a particular server or device in real time. The idea is that virtualization disguises the true complexity of the network by separating it into manageable parts, much like your partitioned hard drive makes it easier to manage your files.

   • Storage virtualization is the pooling of physical storage from multiple network storage devices into what appears to be a single storage device that is

managed from a central console. Storage virtualization is commonly used in storage area networks (SANs).

• Server virtualization is the masking of server resources (including the number and identity of individual physical servers, processors, and operating systems) from server users. The intention is to spare the user from having to understand and manage complicated details of server resources while increasing resource sharing and utilization and maintaining the capacity to expand later.

Virtualization can be viewed as part of an overall trend in enterprise IT that includes autonomic computing, a scenario in which the IT environment will be able to manage itself based on perceived activity, and utility computing, in which computer processing power is seen as a utility that clients can pay for only as needed. The usual goal of virtualization is to centralize administrative tasks while improving scalability and workloads.

6. Procedure:

Installation Steps:

1. #sudogrep -c "svm\|vmx" /proc/cpuinfo
2. #sudo apt-get installqemu-kvmlibvirt-bin bridge-utilsvirt-manager
3. #sudoadduserrait

#sudoadduserraitlibvirtd

After running this command, log out and log back in as rait

4. Run following command after logging back in as rait and you should see an empty list of virtual machines. This indicates that everything is working correctly.

#virsh -c qemu:///system list

5. Open Virtual Machine Manager application and Create Virtual Machine

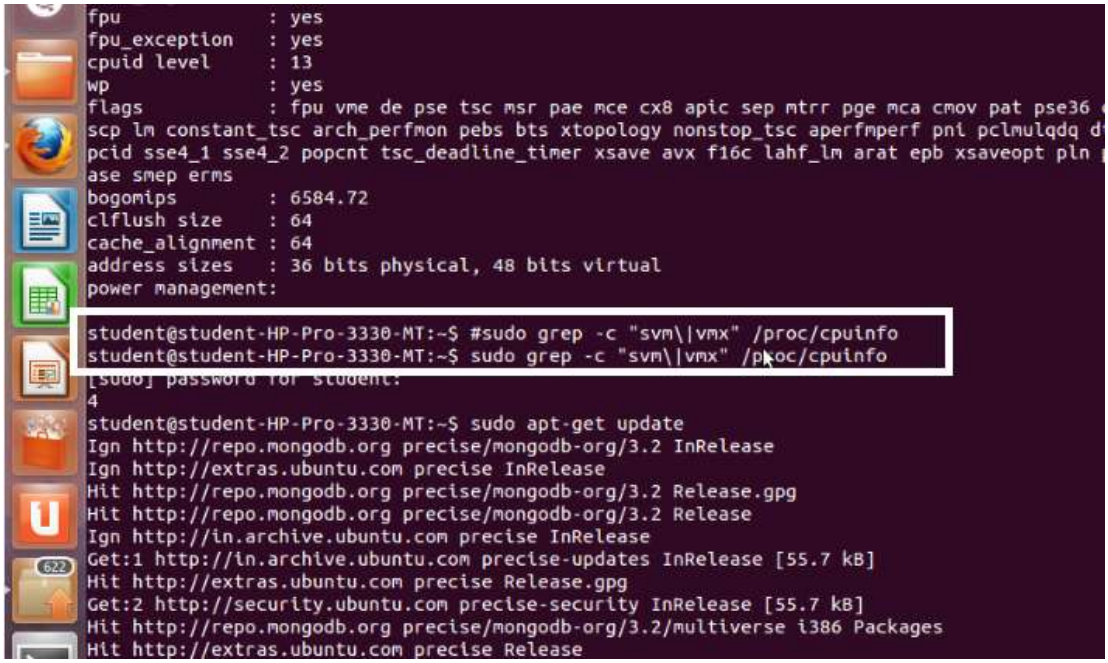
#virt-manager

7. Result:

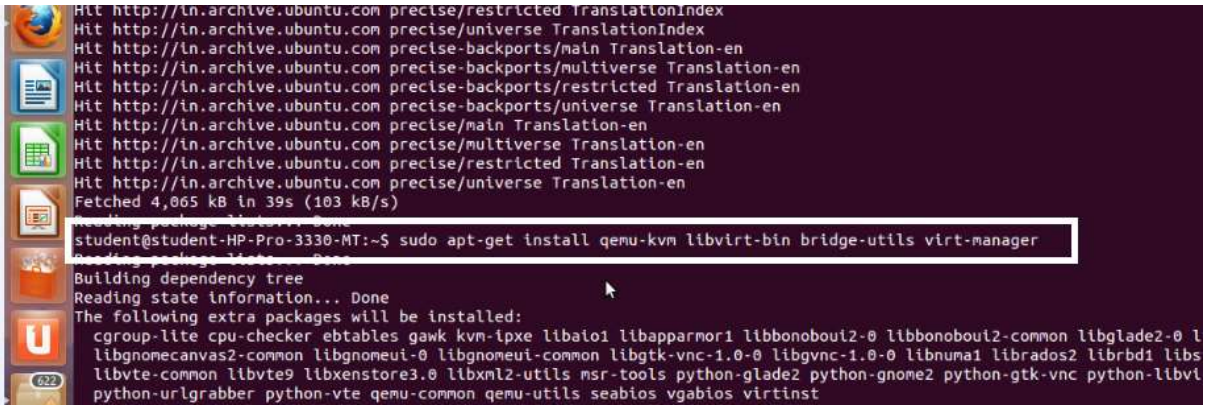
_____SNAPSHOTS_____

Step 1: #sudogrep -c "svm\|vmx" /proc/cpuinfo

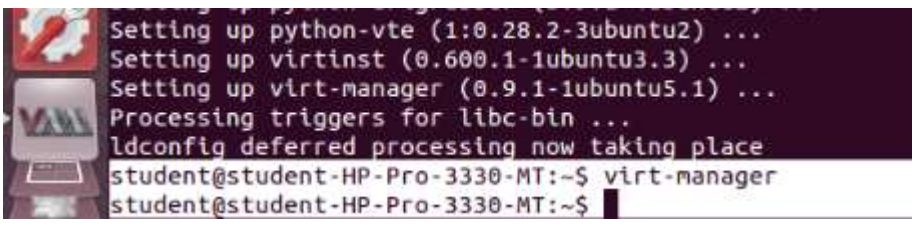
Step 2: #sudo apt-get install qemu-kvmlibvirt-bin bridge-utilsvirt-manager



Step 3: #sudoadduserrait
After running this command, log out and log back in as rait

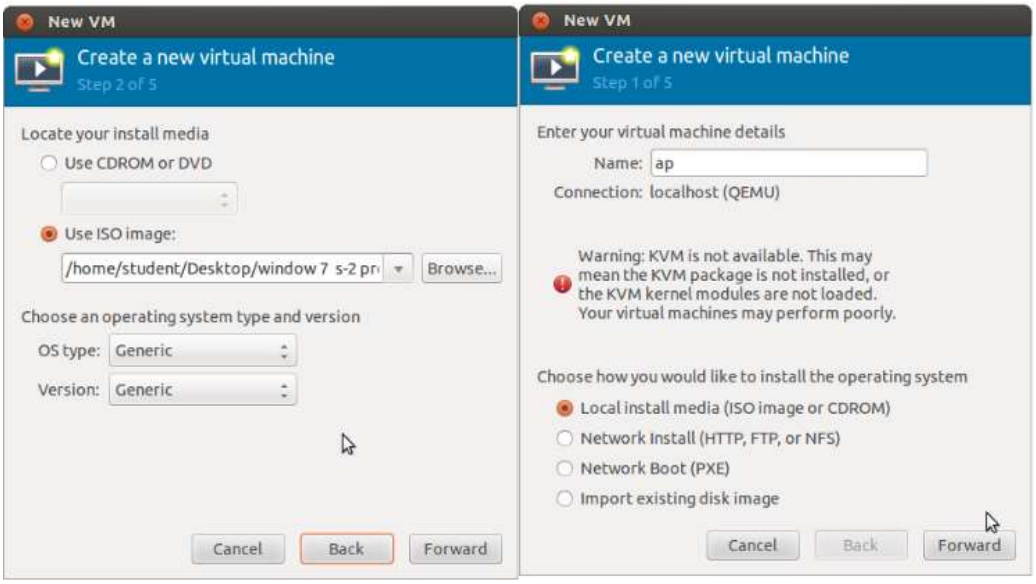


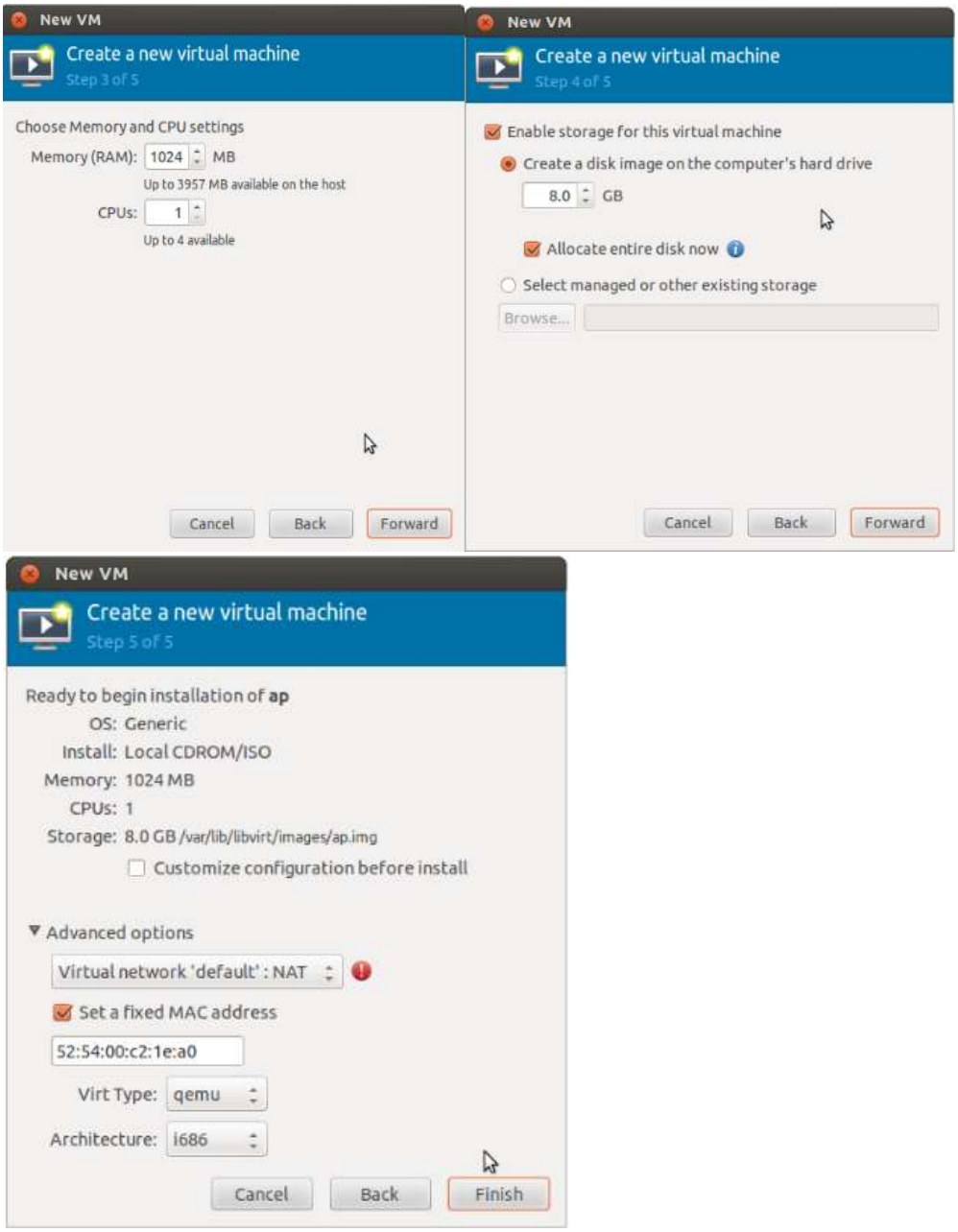
Step 4: #sudoadduserraitlibvirtd
After running this command, log out and log back in as rait



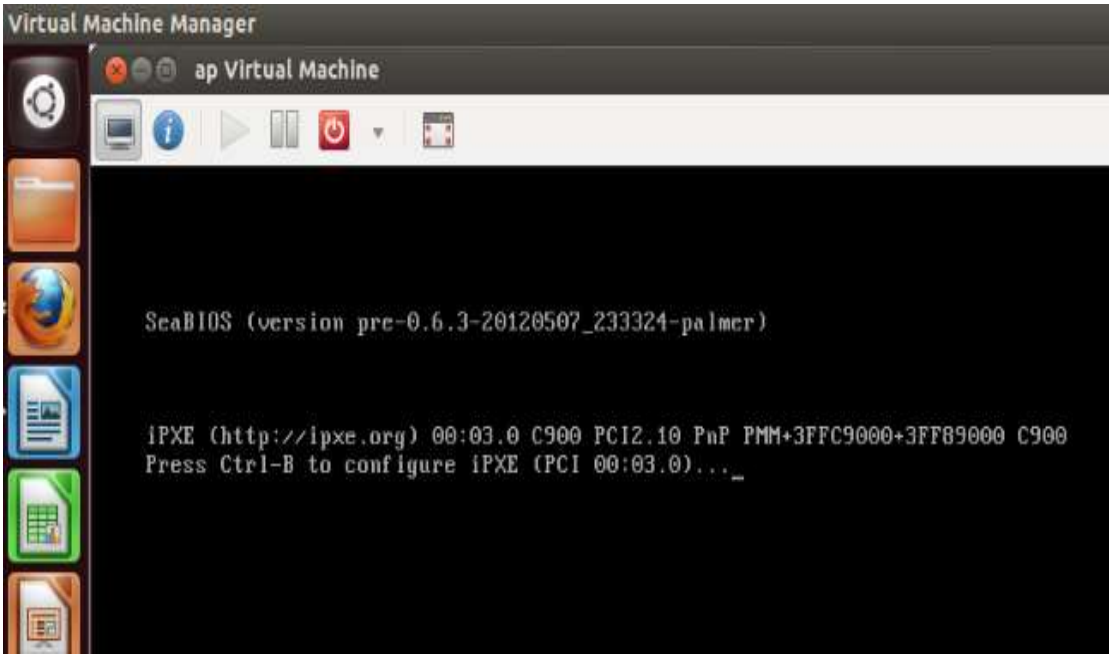
Step 5: Open Virtual Machine Manager application and Create Virtual Machine #virt-manager as shown below

Step 6: Create a new virtual machine as shown below

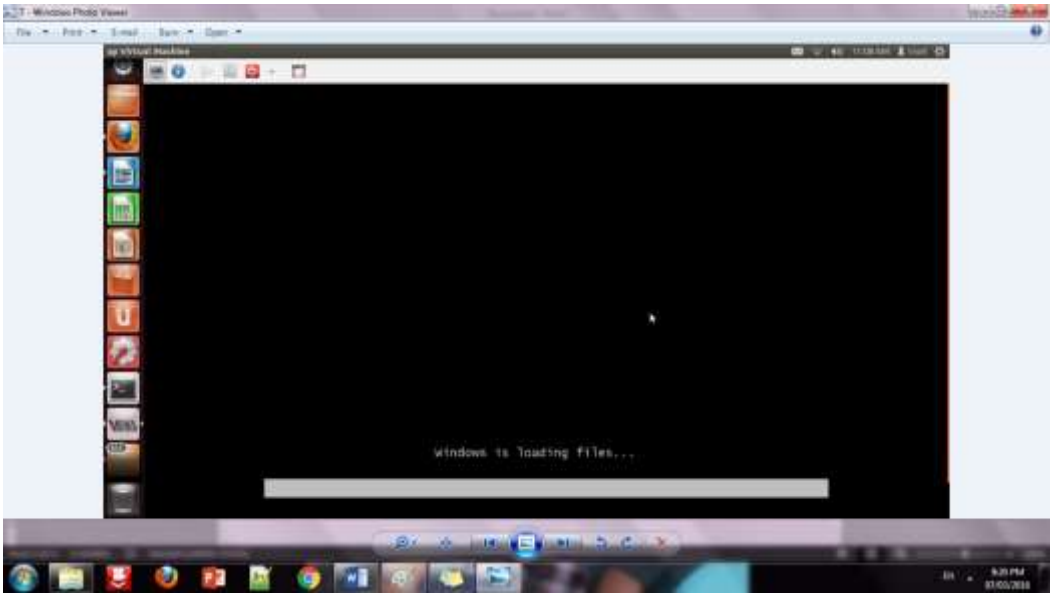




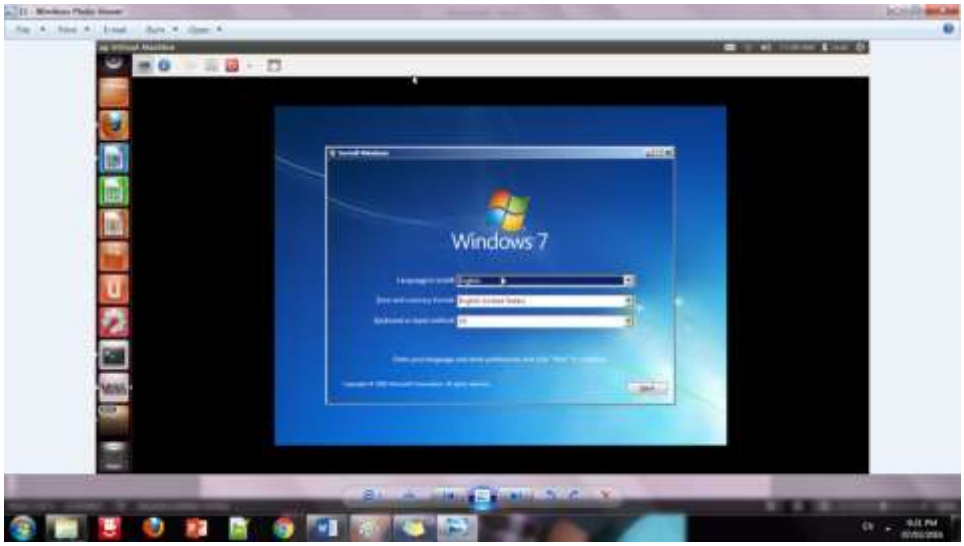
Step 7: Install windows operating system on virtual machine



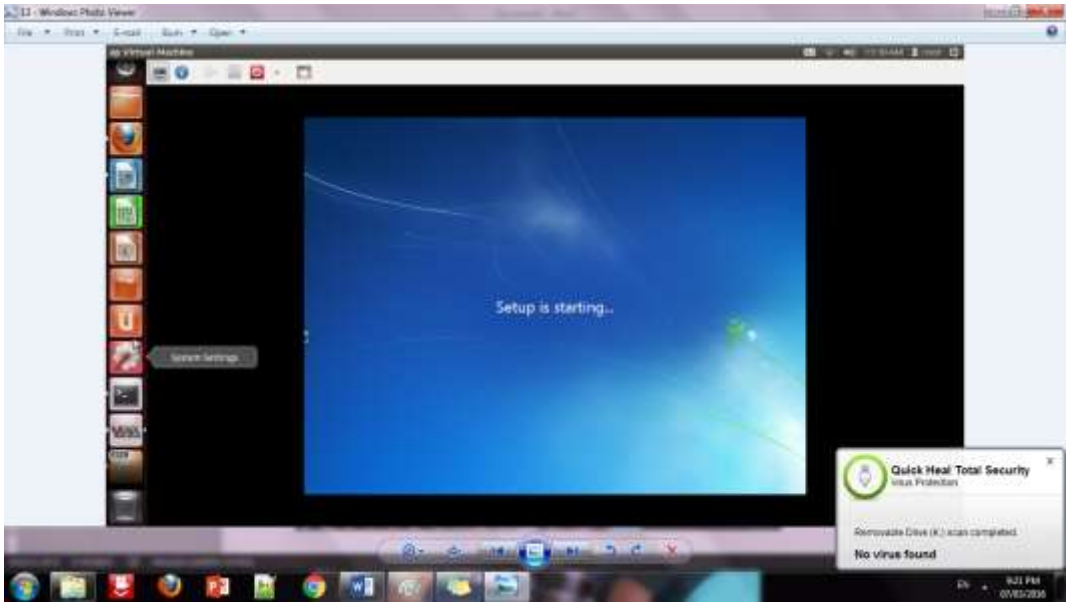
Step 8: Installation of windows on virtual machine



Step 9: Installation of windows 7 on virtual machine



Step 10: Initialization of windows on virtual machine



8. Conclusion:

Installation and configuration of KVM have been done successfully onto Ubuntu and users added. Like this we can create as many virtual machines as possible on OS and can install any windows onto it.

Practical no: -03

Ex 3. Study and implementation of Infrastructure as a Service

1. **Aim:** To study and implementation of Infrastructure as a Service

2. **Objectives:** From this experiment, the student will be able to,
    - Understand concepts of virtualization and to use cloud as Infrastructure as a service.
    - Learn the technique and its complexity
    - Understand the importance of this technique from application point of view

3. **Outcomes:** The learner will be able,

    - To match the industry requirements in the domains of Database management, Programming and Networking with limited infrastructure.
    - To analyze the local and global impact of computing on individuals, organizations, and society.
    - To use current techniques, skills, and tools necessary for computing practice.

4. **Hardware / Software Required:** Ubuntu operating system, Virtual machine, WAMP/ZAMP server, any tool or technology can be used for implementation of web application e.g., JAVA, PHP, etc.

5. **Theory:**

6. **Procedure:**

Installation Steps:(https://docs.openstack.org/devstack/latest/guides/single-machine.html)

Add user

useradd -s /bin/bash -d /opt/stack -m stack

apt-get install sudo -y

echo "stack ALL=(ALL) NOPASSWD: ALL" >> /etc/sudoers

login as stack user

Download DevStack

sudoapt-getinstallgit -y || sudoyuminstall -ygit

gitclonehttps://git.openstack.org/openstack-dev/devstack

cddevstack

Run DevStack

Now to configure **stack.sh**. DevStack includes a sample in **devstack/samples/local.conf**. Create **local.conf** as shown below to do the following:

- Set **FLOATING_RANGE** to a range not used on the local network, i.e., 192.168.1.224/27. This configures IP addresses ending in 225-254 to be used as floating IPs.
- Set **FIXED_RANGE** and **FIXED_NETWORK_SIZE** to configure the internal address space used by the instances.
- Set **FLAT_INTERFACE** to the Ethernet interface that connects the host to your local network. This is the interface that should be configured with the static IP address mentioned above.
- Set the administrative password. This password is used for the **admin** and **demo** accounts set up as OpenStack users.
- Set the MySQL administrative password. The default here is a random hex string which is inconvenient if you need to look at the database directly for anything.
- Set the RabbitMQ password.
- Set the service password. This is used by the OpenStack services (Nova, Glance, etc.) to authenticate with Keystone.

local.conf should look something like this:

```
[[local|localrc]]

FLOATING_RANGE=192.168.1.224/27

FIXED_RANGE=10.11.12.0/24

FIXED_NETWORK_SIZE=256

FLAT_INTERFACE=eth0

ADMIN_PASSWORD=supersecret

DATABASE_PASSWORD=iheartdatabases

RABBIT_PASSWORD=flopsymopsy

SERVICE_PASSWORD=iheartksl
```

Run DevStack:

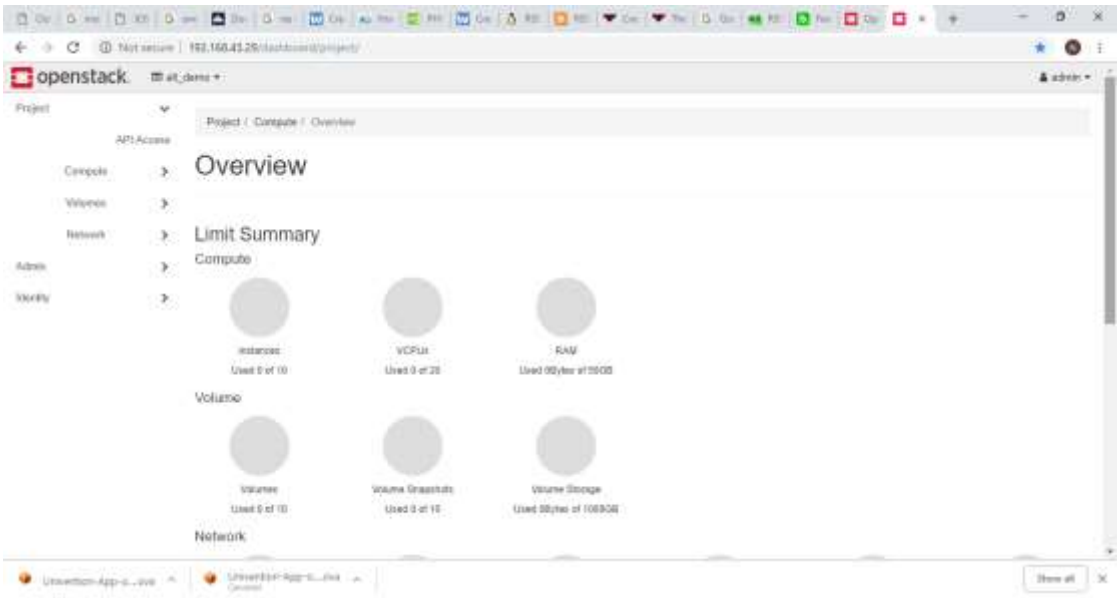
```
./stack.sh
```

A seemingly endless stream of activity ensues. When complete you will see a summary of **stack.sh**'s work, including the relevant URLs, accounts and passwords to poke at your shiny new OpenStack.

Using OpenStack

At this point you should be able to access the dashboard from other computers on the local network. In this example that would behttp://192.168.43.29/ for the dashboard (aka Horizon).

Launch VMs and if you give them floating IPs and security group access those VMs will be accessible from other machines on your network.



7. Conclusion:

We have installed Ubuntu/Xen as bare metal hypervisor and implemented it. It provides access to computing resources in a virtual environment. With the help of Infrastructure as a service we can build our own IT platform. We can install Windows Operating System on Ubuntu and vice versa.

Practical no: -04

Ex 4: Study and implementation of Storage as a Service

1. **Aim:** To study and implementation of Storage as a Service

2. **Objectives:** From this experiment, the student will be able to

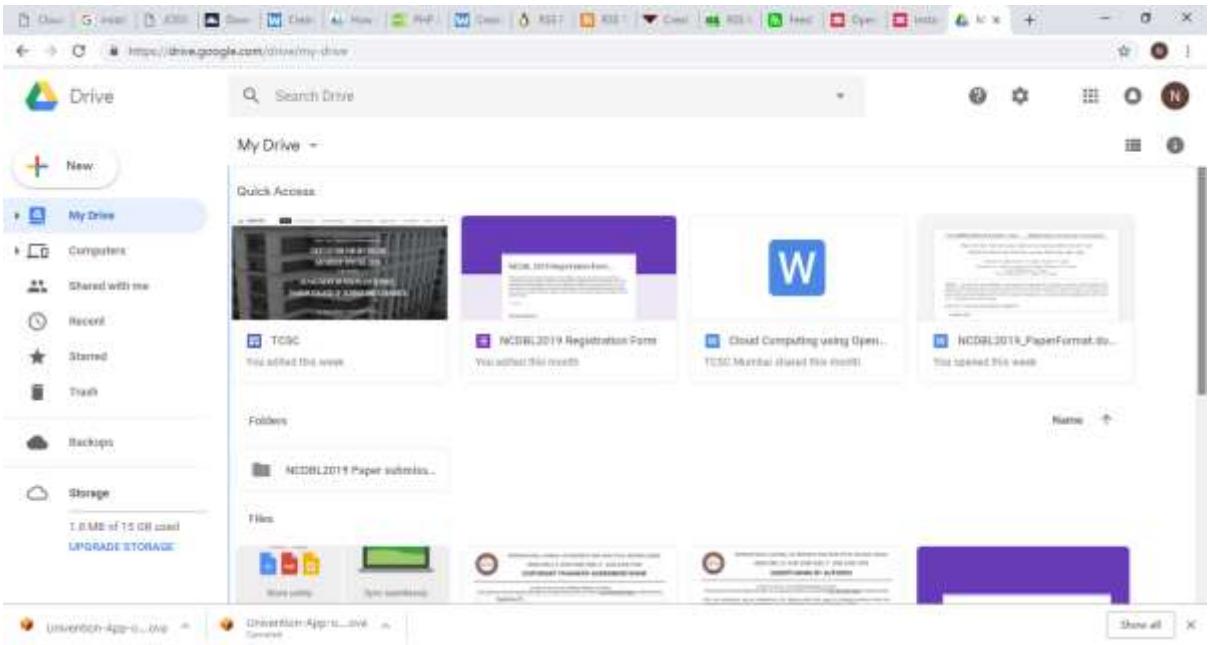
    - To make the students understand use of cloud as Platform, Storage as a service.
    - To learn the efficient tools to implement the technique

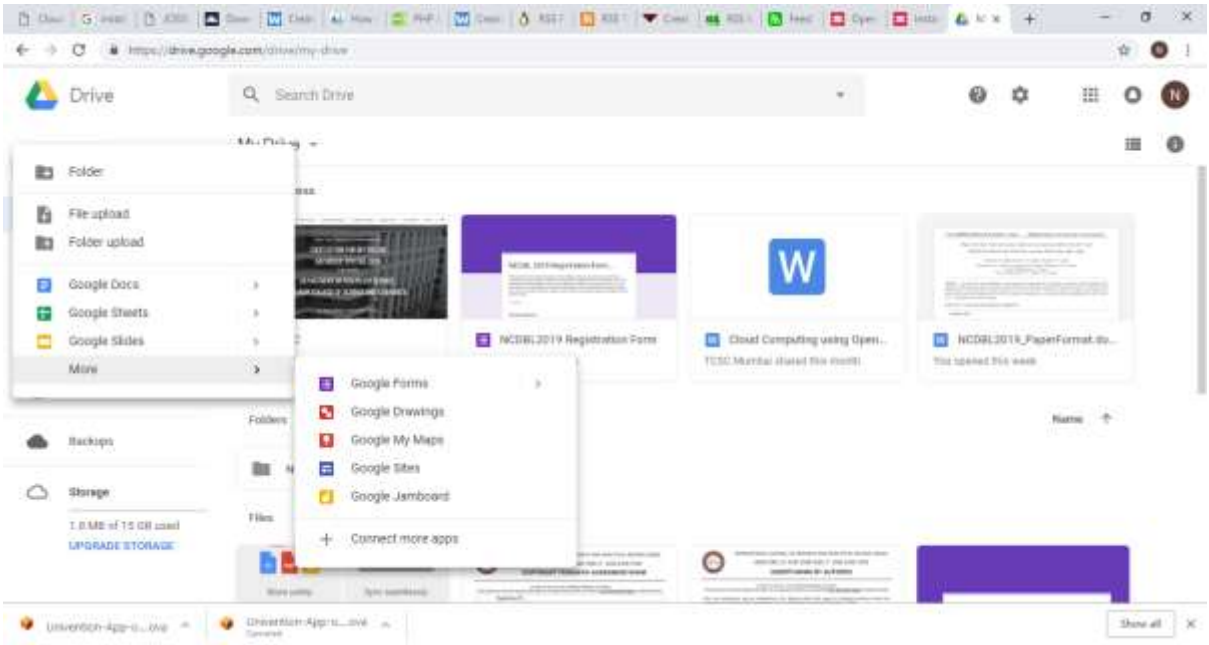
3. **Outcomes:** The learner will be able to

4. **Hardware / Software Required:**

5. **Theory:**

6. **Result:**





7. Conclusion:

Google Docs provide an efficient way for storage of data. It fits well in Storage as a service (SaaS). It has varied options to create documents, presentations and also spreadsheets. It saves documents automatically after a few seconds and can be shared anywhere on the Internet at the click of a button.

Practical no: -05

Ex 5: Study and implementation of identity management

1. **Aim:** To study and implementation of identity management

2. **Objectives:** From this experiment, the student will be able to,
   - Understand concepts of virtualization and to use cloud as Infrastructure as a service.
   - Learn the technique and its complexity
   - Understand the importance of this technique from application point of view

3. **Outcomes:**

4. **Hardware / Software Required:**

5. **Theory:**

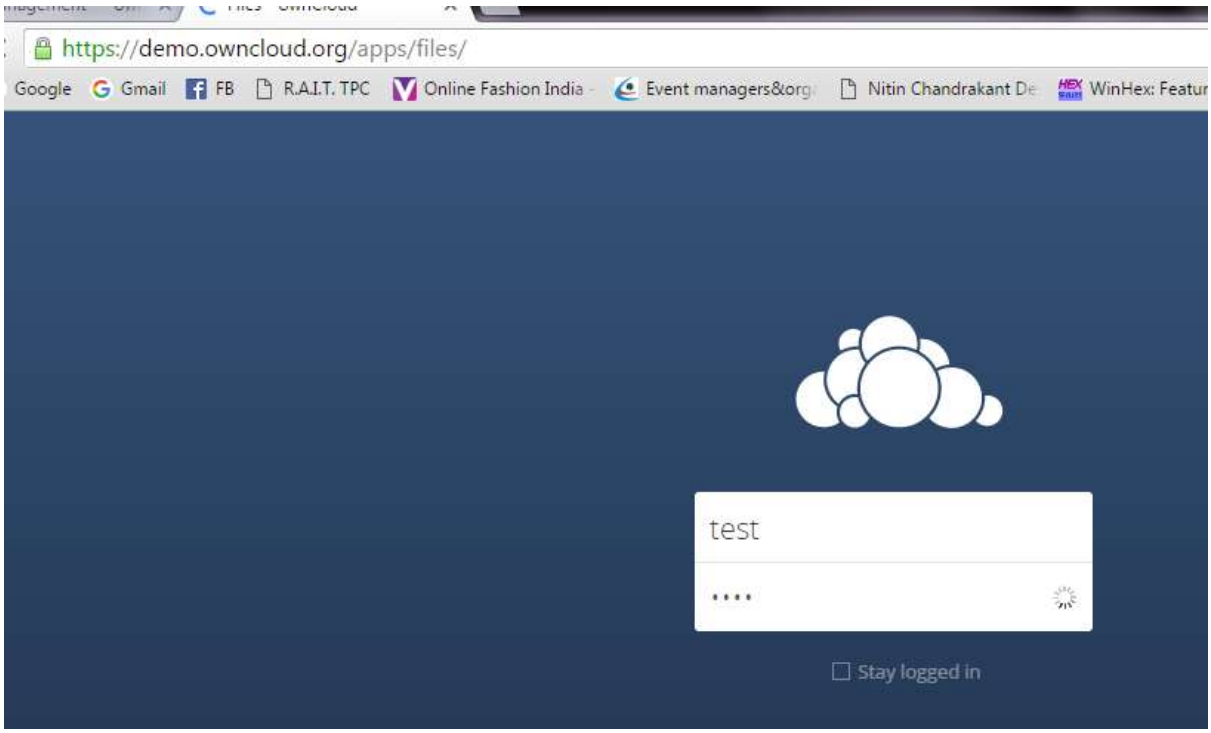
   Identity Management

6. **Procedure:**

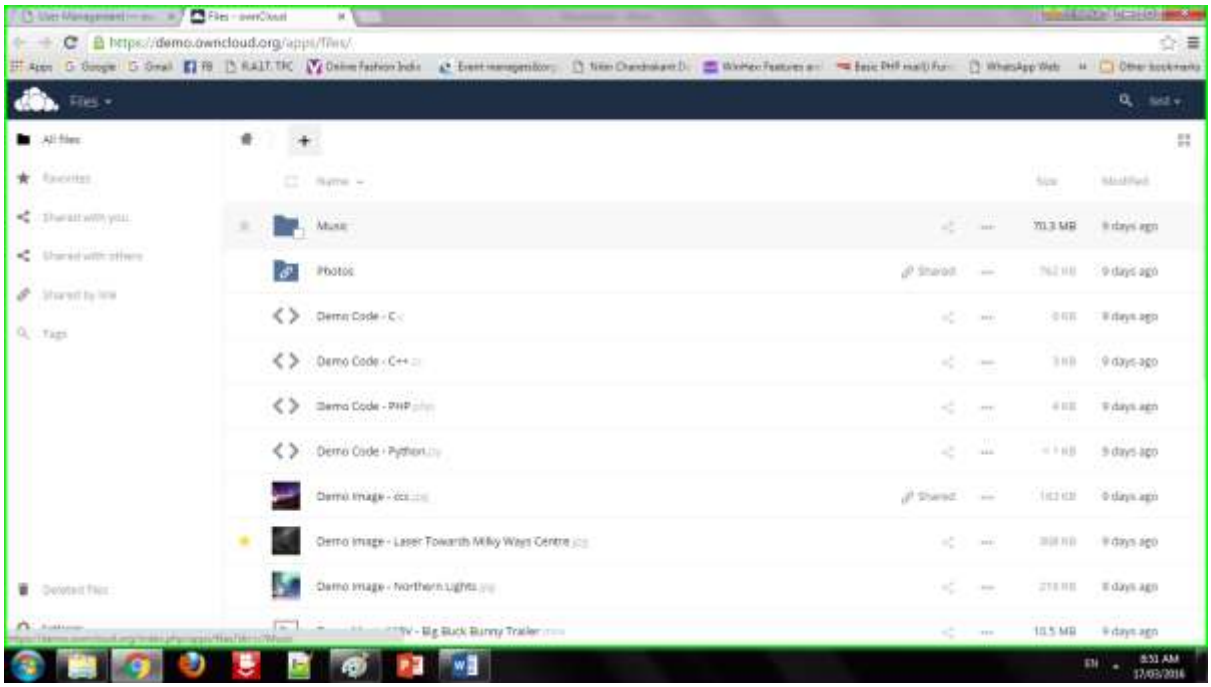
7. **Result:**

   _____SNAPSHOTS_____

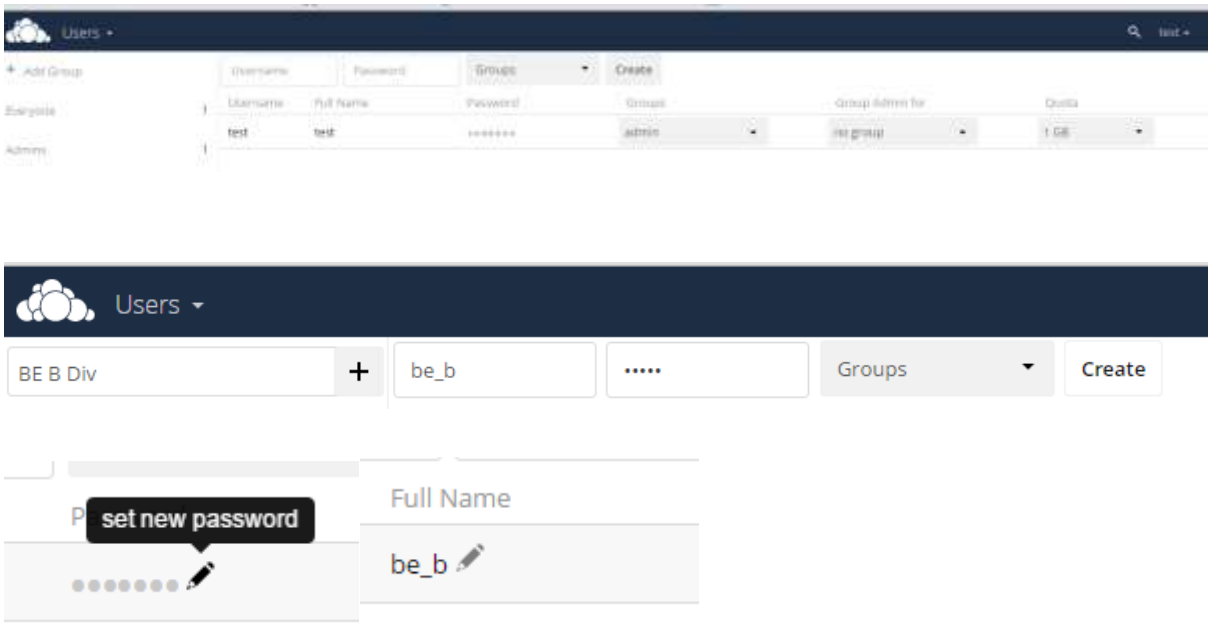
   OwnCloud is open-source file sync and share software for everyone from individuals operating the free ownCloud Server edition, to large enterprises and service providers operating the ownCloud Enterprise Subscription. ownCloud provides a safe, secure, and compliant file synchronization and sharing solution on servers that you control. You can share one or more files and folders on your computer, and synchronize them with your ownCloud server.



Step 2: By default, the ownCloud Web interface opens to your Files page. You can add, remove, and share files, and make changes based on the access privileges set by you (if you are administering the server) or by your server administrator. You can access your ownCloud files with the ownCloud web interface and create, preview, edit, delete, share, and re-share files. Your ownCloud administrator has the option to disable these features, so if any of them are missing on your system ask your server administrator.



Step 3: **Apps Selection Menu:** Located in the upper left corner, click the arrow to open a dropdown menu to navigate to your various available apps. **Apps Information field:** Located in the left sidebar, this provides filters and tasks associated with your selected app. **Application View:** The main central field in the ownCloud user interface. This field displays the contents or user features of your selected app.



Step 4: Share the file or folder with a group or other users, and create public shares with hyperlinks. You can also see who you have shared with already, and revoke shares by clicking the trash can icon. If username auto-completion is enabled, when you start typing the user or group name ownCloud will automatically complete it for you. If your administrator has enabled email notifications, you can send an email notification of the new share from the sharing screen.

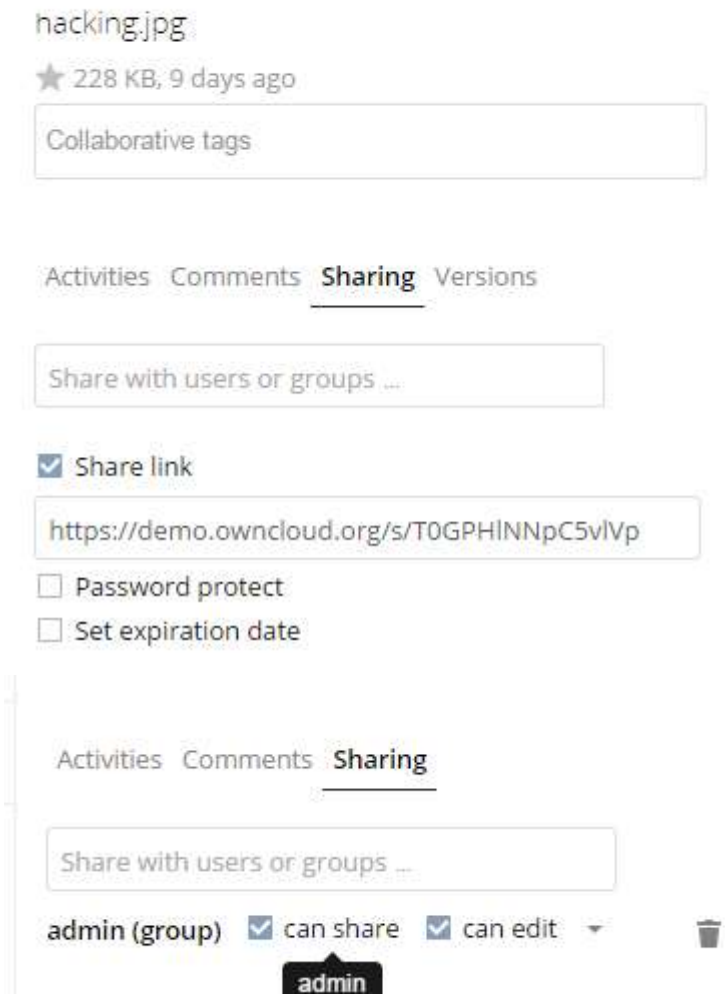
Sharing

- [x] Allow apps to use the Share API
- [x] Allow users to share via link
  - [x] Enforce password protection
  - [x] Allow public uploads
  - [x] Set default expiration date

    Expire after 7 days [x] Enforce expiration date
- [x] Allow resharing
- [x] Restrict users to only share with users in their groups
- [x] Allow users to send mail notification for shared files
- [x] Exclude groups from sharing

  Groups ▾

  These groups will still be able to receive shares, but not to initiate them.



Step 5: Five Share permissions are:
Can share; allows the users you share with to re-share.
Can edit; allows the users you share with to edit your shared files, and to collaborate using the Documents app.
Create; allows the users you share with to create new files and add them to the share.
Change; allows uploading a new version of a shared file and replacing it.
Delete; allows the users you share with to delete shared files.

8. Conclusion:

We have studied how to use ownCloud for ensuring identity management of the users. We can create multiple groups and provide privileges to view or modify data as per defined permissions. It also enables simplified look and feel to be used by anyone.

Practical no: -06

Ex 6: Study Cloud Security management

1. **Aim:** To Study Cloud Security management

2. **Objectives:** From this experiment, the student will be able,
   - To understand the security features of Cloud.
   - To learn the technique of application security management and its complexity
   - To understand the importance of cloud security management from application point of view

3. **Outcomes:** The learner will be able to
   - Student can study and implement single-sign-on.
   - To use current techniques, skills, and tools necessary for computing practice.
   - To match the industry requirements in the domains of Database management, Programming and Networking with the required management skills.

4. **Hardware / Software Required:** Ubuntu operating system, Virtual machine, WAMP/ZAMP server, any tool or technology can be used for implementation of web application e.g., JAVA, PHP, etc.

5. **Theory:**

   Cloud computing security is the set of control-based technologies and policies designed to adhere to regulatory compliance rules and protect information, data applications and infrastructure associated with cloud computing use. Because of the cloud's very nature as a shared resource, identity management, privacy and access control are of particular concern. With more organizations using cloud computing and associated cloud providers for data operations, proper security in these and other potentially vulnerable areas have become a priority for organizations contracting with a cloud computing provider.

   Cloud computing security processes should address the security controls the cloud provider will incorporate to maintain the customer's data security, privacy and compliance with necessary regulations. The processes will also likely include a business continuity and data backup plan in the case of a cloud security breach.

   Physical security

Cloud service providers physically secure the IT hardware (servers, routers, cables etc.) against unauthorized access, interference, theft, fires, floods etc. and ensure that essential supplies (such as electricity) are sufficiently robust to minimize the possibility of disruption. This is normally achieved by serving cloud applications from 'world-class' (i.e. professionally specified, designed, constructed, managed, monitored and maintained) data centers.

Personnel security

Various information security concerns relating to the IT and other professionals associated with cloud services are typically handled through pre-, para- and post-employment activities such as security screening potential recruits, security awareness and training programs, proactive security monitoring and supervision, disciplinary procedures and contractual obligations embedded in employment contracts, service level agreements, codes of conduct, policies etc.

Application security

Cloud providers ensure that applications available as a service via the cloud (SaaS) are secure by specifying, designing, implementing, testing and maintaining appropriate application security measures in the production environment. Note that - as with any commercial software - the controls they implement may not necessarily fully mitigate all the risks they have identified, and that they may not necessarily have identified all the risks that are of concern to customers. Consequently, customers may also need to assure themselves that cloud applications are adequately secured for their specific purposes, including their compliance obligations.

6. Procedure:

Security using MFA (Multi Factor Authentication) device code:

1) go to aws.amazon.com

2) click on "My Account"

3) select "AWS management console" and click on it

4) Give Email id in the required field

if you are registering first time then select "I am a new user" radio button
5) click on "sign in using our secure server" button
6) follow the instruction and complete the formalities
(Note: do not provide any credit card details or bank details)
sign out from
7) Again, go to "My Account"
select "AWS management console" and click on it
Sign in again by entering the user name and valid password (check “I am returning user and my password is" radio button)
Now you are logged in as a Root User
All AWS project can be viewed by you, but you can’t make any changes in it or you can’t create new thing as you are not paying any charges to amazon (for reason refer step:6)

To create the user in a root user, follow the steps mentioned below:

1) click on "Identity and Access Management" in security and identity project
2) click in "Users" from dashboard
It will take you to "Create New Users"
click on create new user button
enter the "User Name"
(select "Generate and access key for each user" checkbox, it will create a user with a specific key)
click on "Create" button at right bottom
3) once the user is created click on it
4) goto security credentials tab
5) click on "Create Access Key", it will create an access key for user.
6) click on "Manage MFA device" it will give you one QR code displayed on the screen
you need to scan that QR code on your mobile phone using barcode scanner (install it in mobile phone) you also need to install "Google Authenticator" in your mobile phone to generate the MFA code
7) Google authenticator will keep on generating a new MFA code after every 60 seconds
that code you will have to enter while logging as a user.
Hence, the security is maintained by MFA device code...

One cannot use your AWS account even if it may have your user name and password, because MFA code is on your MFA device (mobile phone in this case) and it is getting changed after every 60 seconds.

Permissions in user account:

After creating the user by following above mentioned steps; you can give certain permissions to specific user

1) click on created user

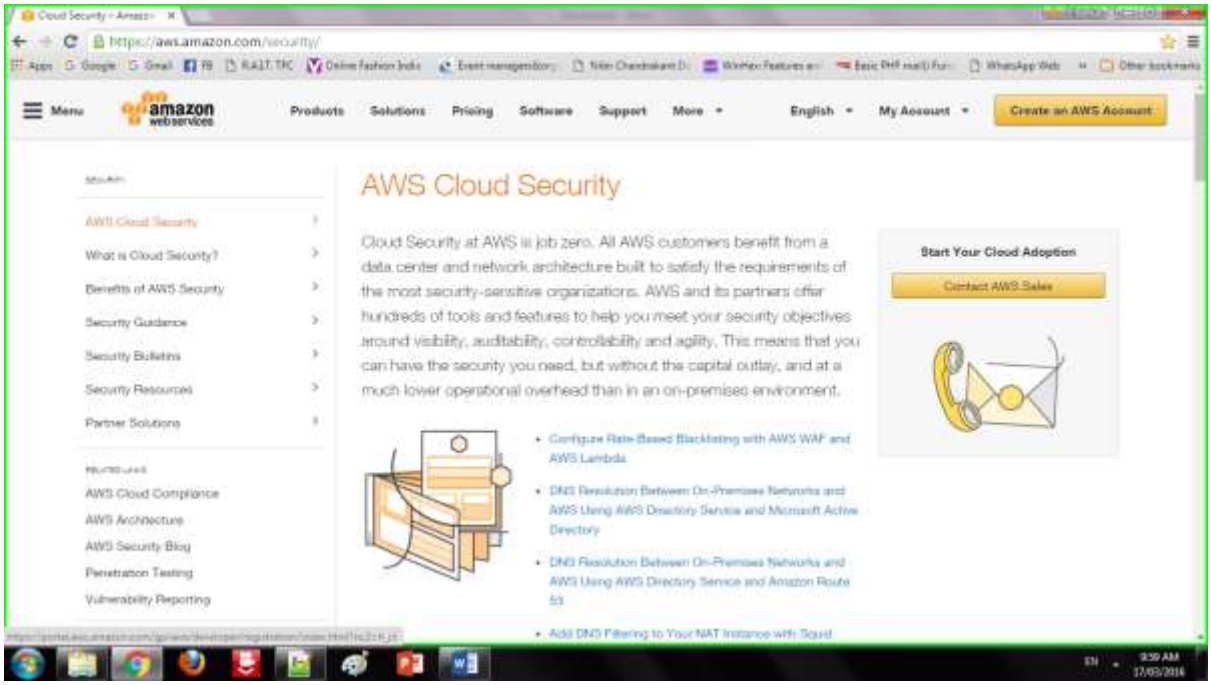
2) go to "Permissions" tab

3) click on "Attach Policy" button

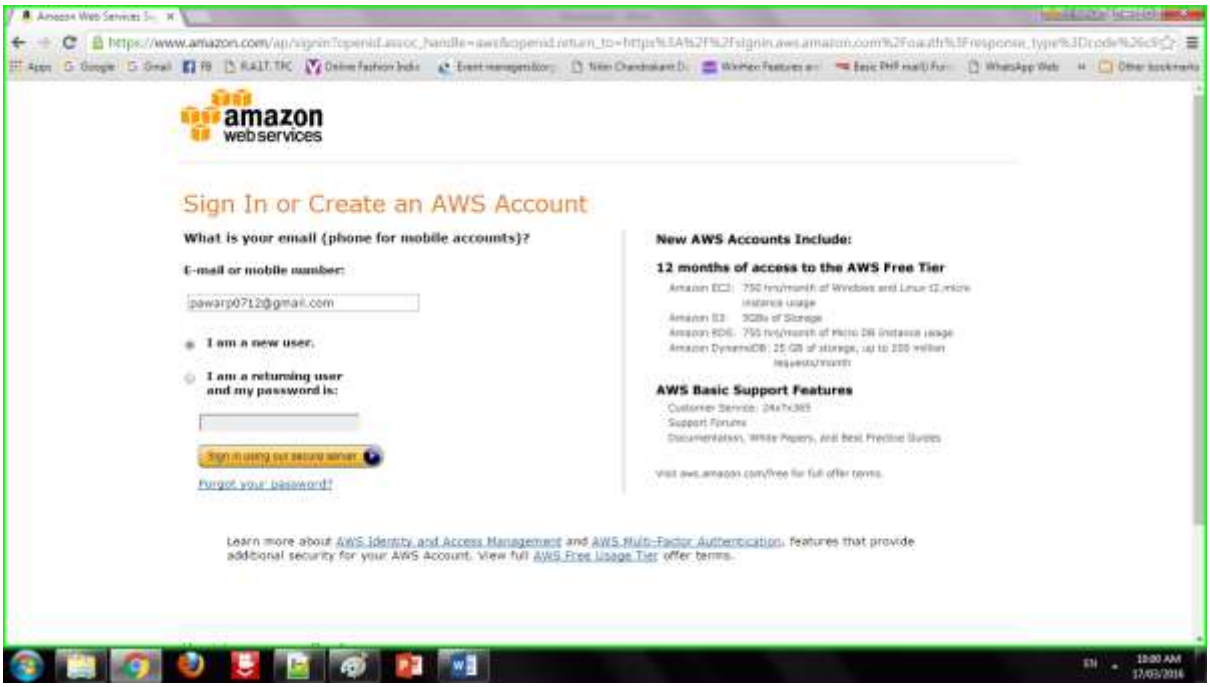
4) select the needed policy from given list and click on apply.

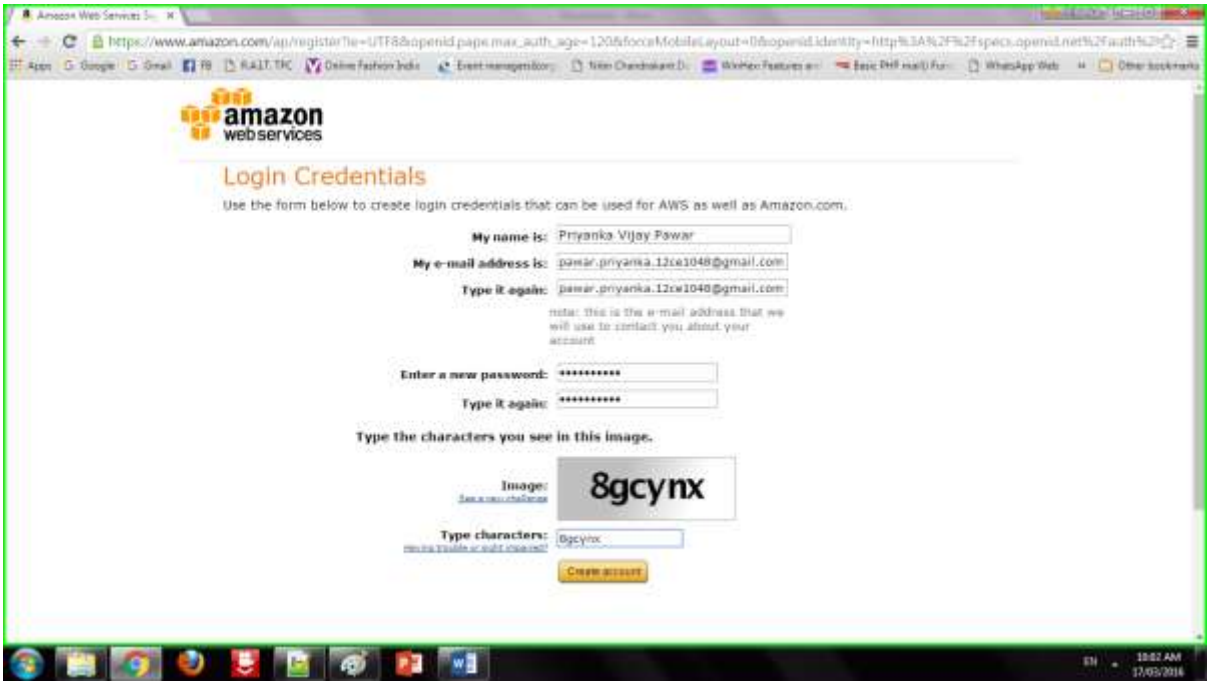
7. Result:

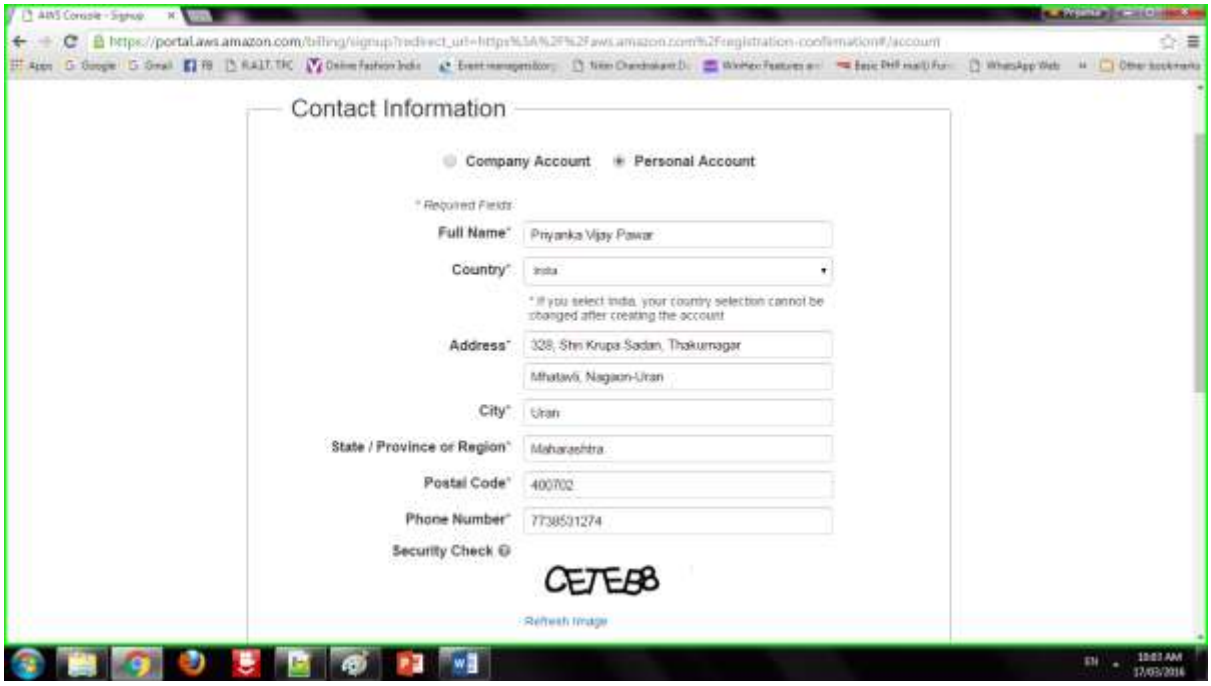
Step 1: go to aws.amazon.com



Step 2: Click on "My Account". Select "AWS management console" and click on it. Give Email id in the required field

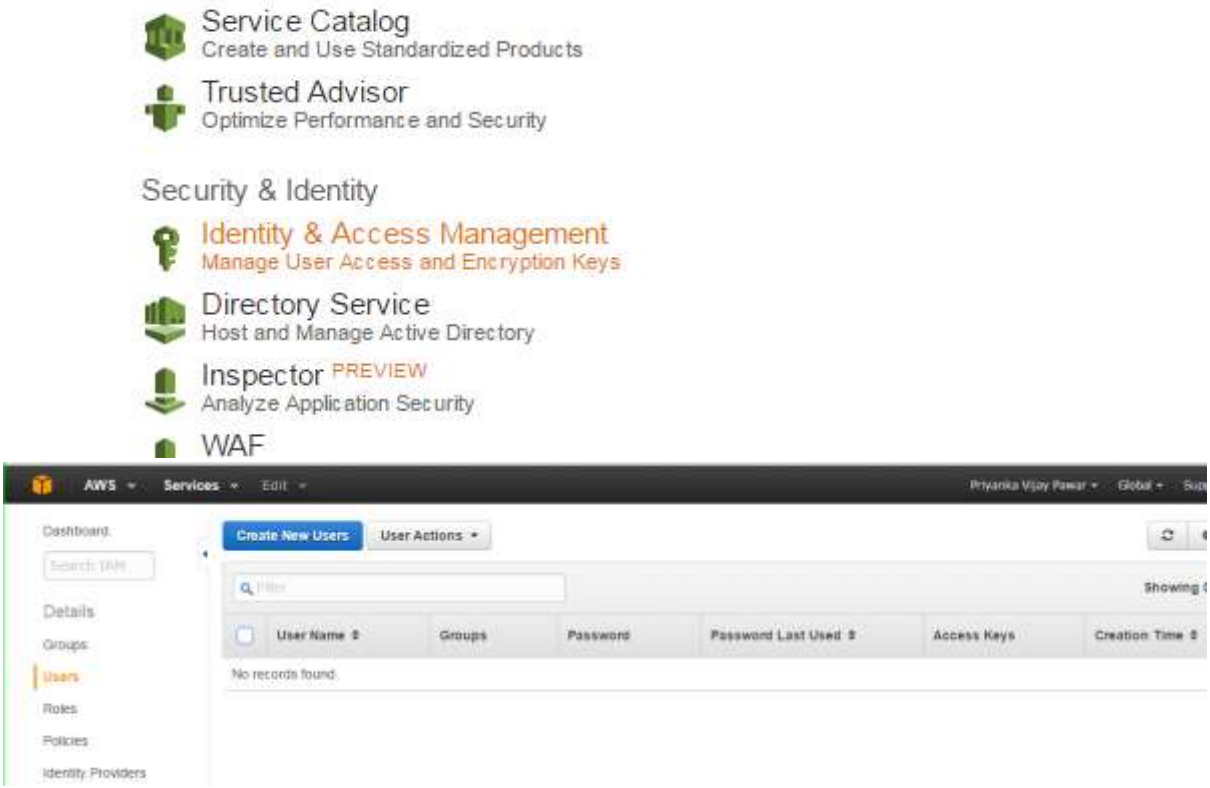




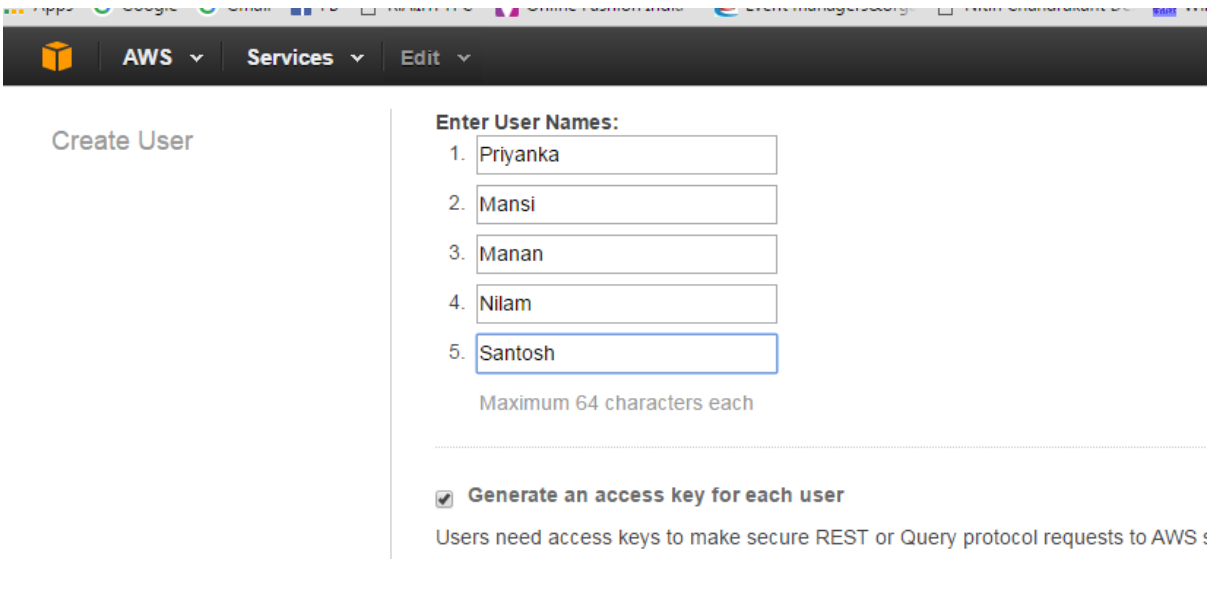


Step 3: Addition of security features

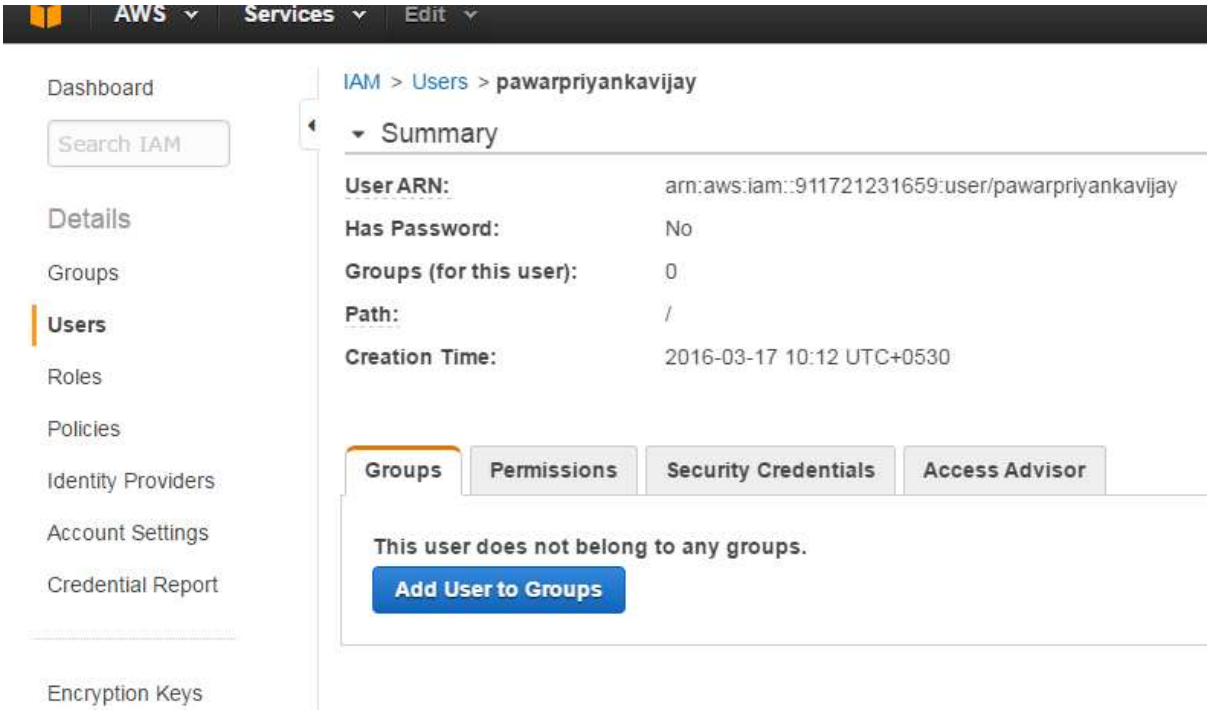
Step 4: Sign in to an AWS account



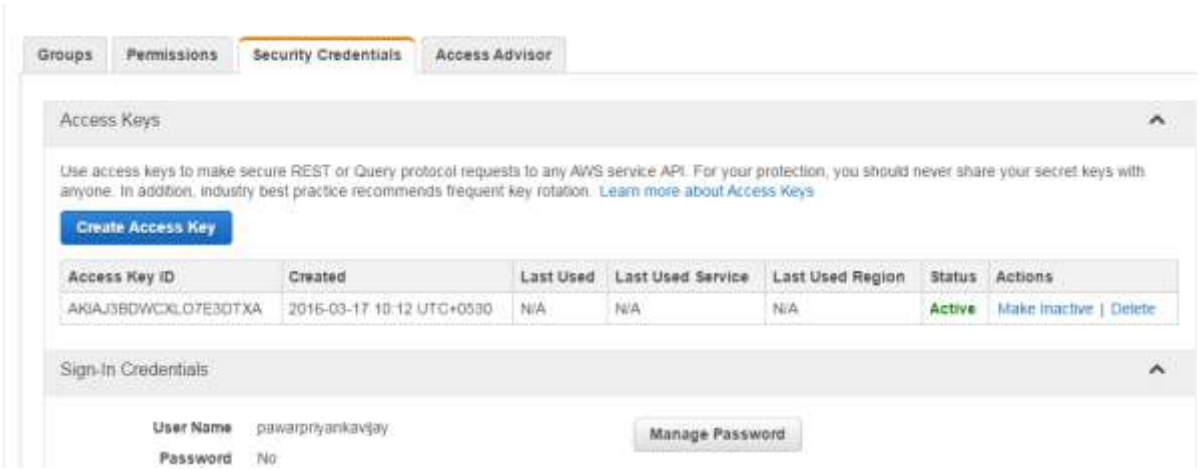
Step 5: Creation of users

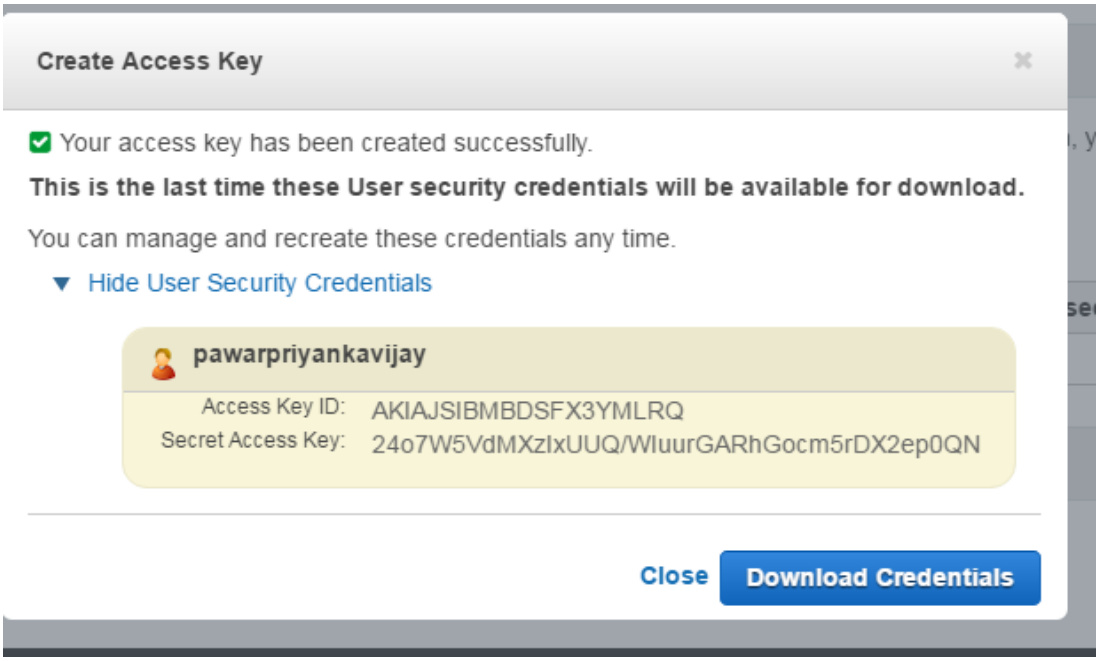


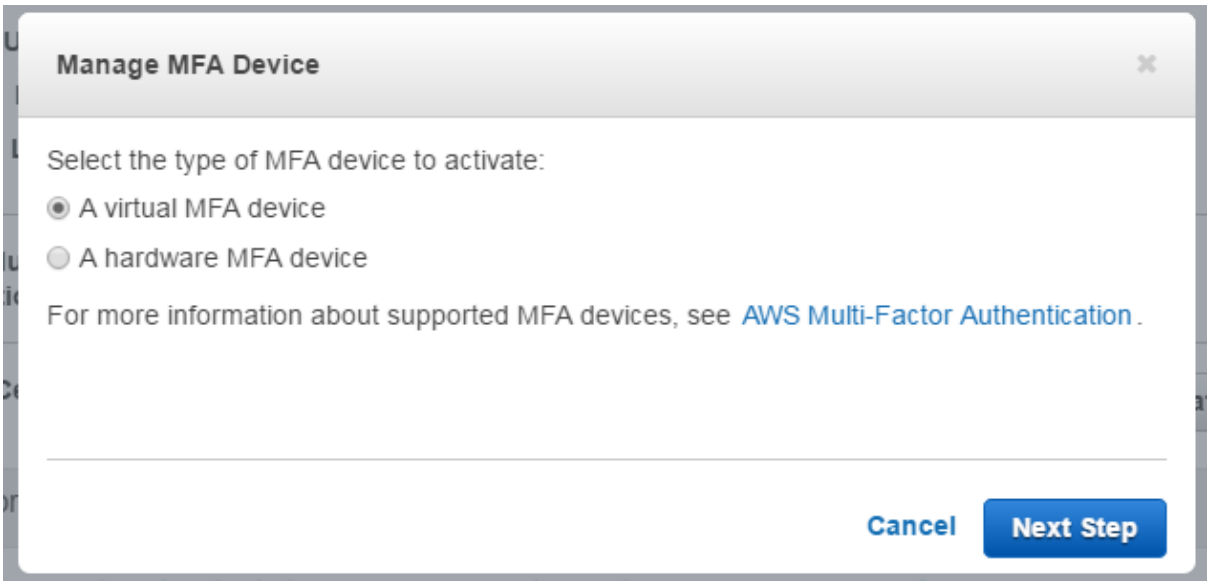
Step 6: Adding users to group

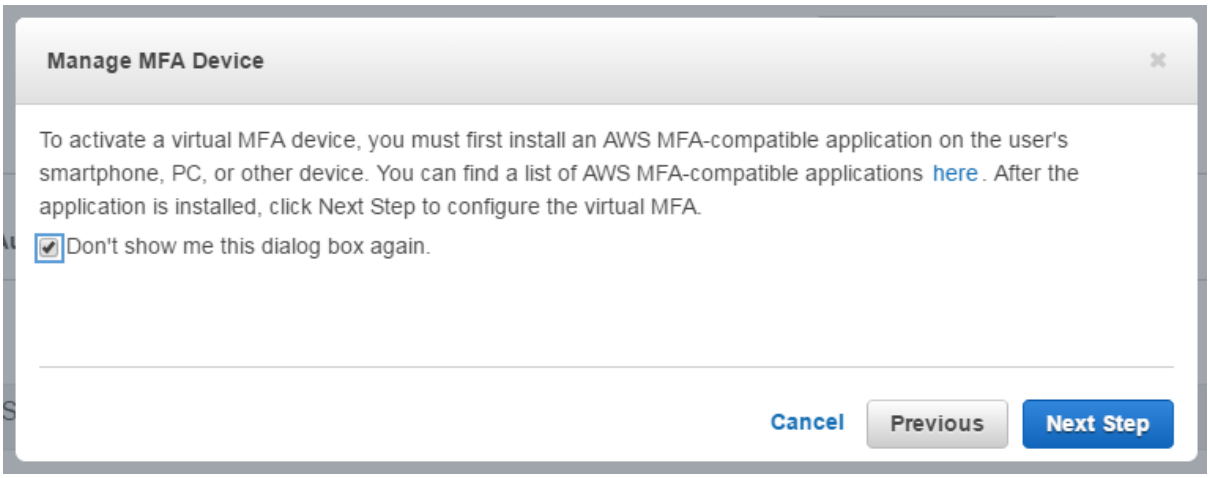


Step 7: Creating Access key

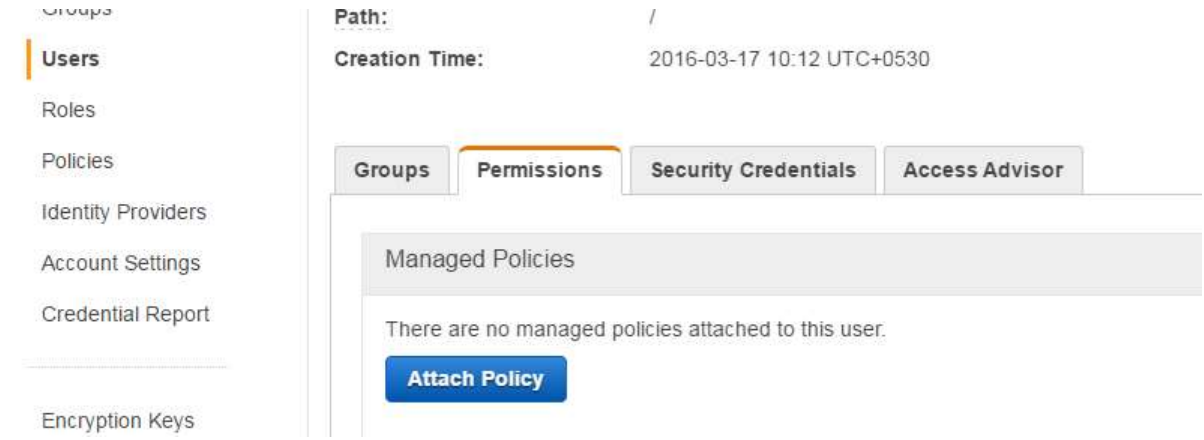


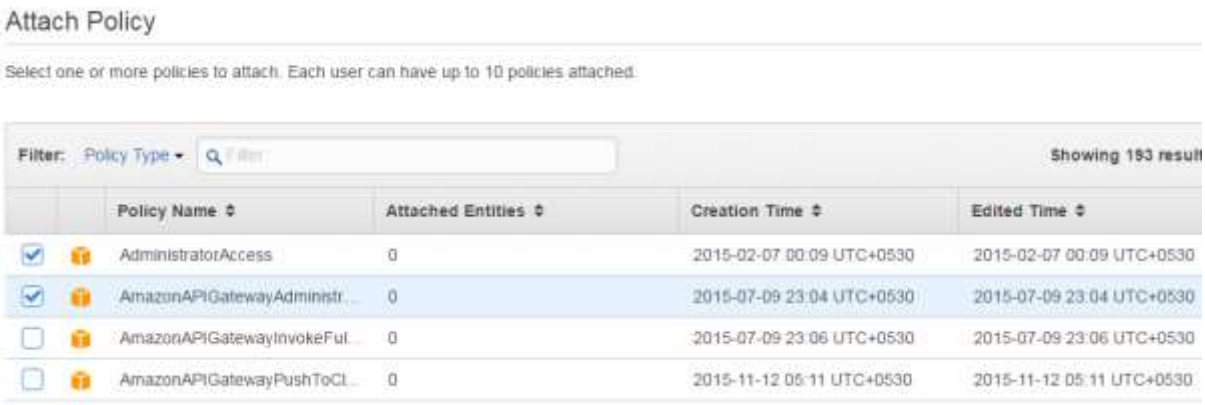

Create Access Key
Your access key has been created successfully.
This is the last time these User security credentials will be available for download.
You can manage and recreate these credentials any time.
Hide User Security Credentials
pawarpriyankavijay
Access Key ID: AKIAJSIBMBDSFX3YMLRQ
Secret Access Key: 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
Close
Download Credentials

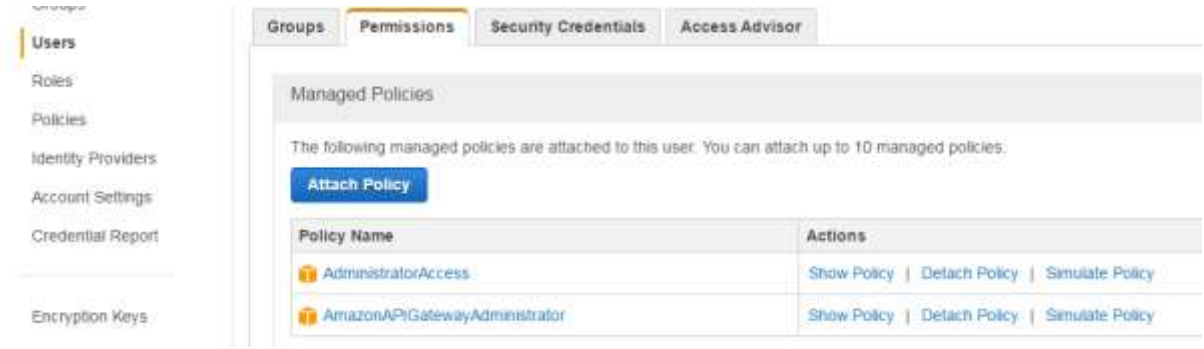

Manage MFA Device
Select the type of MFA device to activate:
A virtual MFA device
A hardware MFA device
For more information about supported MFA devices, see AWS Multi-Factor Authentication.
Cancel
Next Step

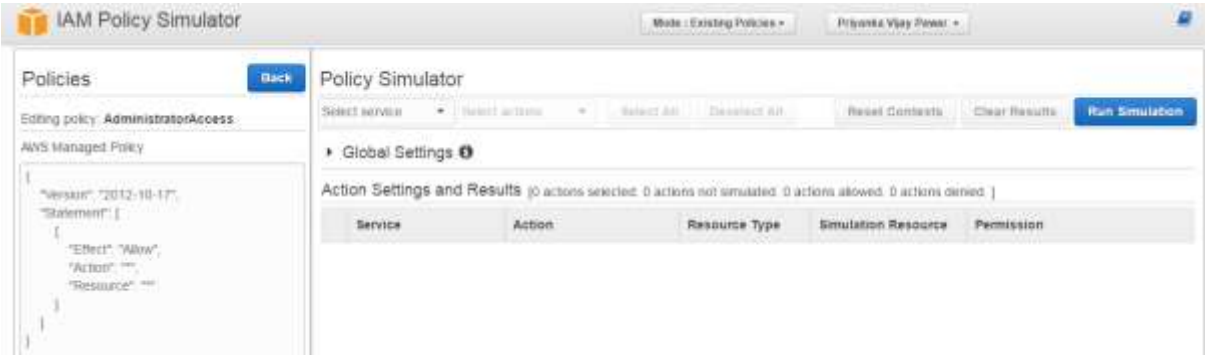

Manage MFA Device
To activate a virtual MFA device, you must first install an AWS MFA-compatible application on the user's smartphone, PC, or other device. You can find a list of AWS MFA-compatible applications here. After the application is installed, click Next Step to configure the virtual MFA.
Don't show me this dialog box again.
Cancel
Previous
Next Step

Step 8: Setting permissions to users









8. Conclusion:

We have studied how to secure the cloud and its data. Amazon EWS provides the best security with its extended facilities and services like MFA device. It also gives you the ability to add your own permissions and policies for securing data more encrypted.

Practical No 7

Aim: Write a Program for Web Feed.

Theory:

- On the World Wide Web, a **web feed** (or **news feed**) is a data format used for providing users with frequently updated content. Content distributors *syndicate* a web feed, thereby allowing users to *subscribe* a channel to it.
- Making a collection of web feeds accessible in one spot is known as *aggregation*, which is performed by a news aggregator. A web feed is also sometimes referred to as a *syndicated feed*.
- A typical scenario of web-feed use might involve the following: a content provider publishes a feed link on its site which end users can register with an aggregator program (also called a *feed reader* or a *news reader*) running on their own machines; doing this is usually as simple as dragging the link from the web browser to the aggregator.
- When instructed, the aggregator asks all the servers in its feed list if they have new content; if so, the aggregator either makes a note of the new content or downloads it. One can schedule aggregators to check for new content periodically.

Procedure:

Step 1: open notepad and type following code

```
<?xml version="1.0" encoding="UTF-8"?>

<rss version="2.0">

<channel>

<title>W3Schools Home Page</title>

<link>https://www.w3schools.com</link>

<description>Free web building tutorials</description>

<item>

<title>RSS Tutorial</title>

<link>https://www.w3schools.com/xml/xml_rss.asp</link>

<description>New RSS tutorial on W3Schools</description>

</item>

 -<item>

<title>XML Tutorial</title>
```

<link>https://www.w3schools.com/xml</link>

<description>New XML tutorial on W3Schools</description>

</item>

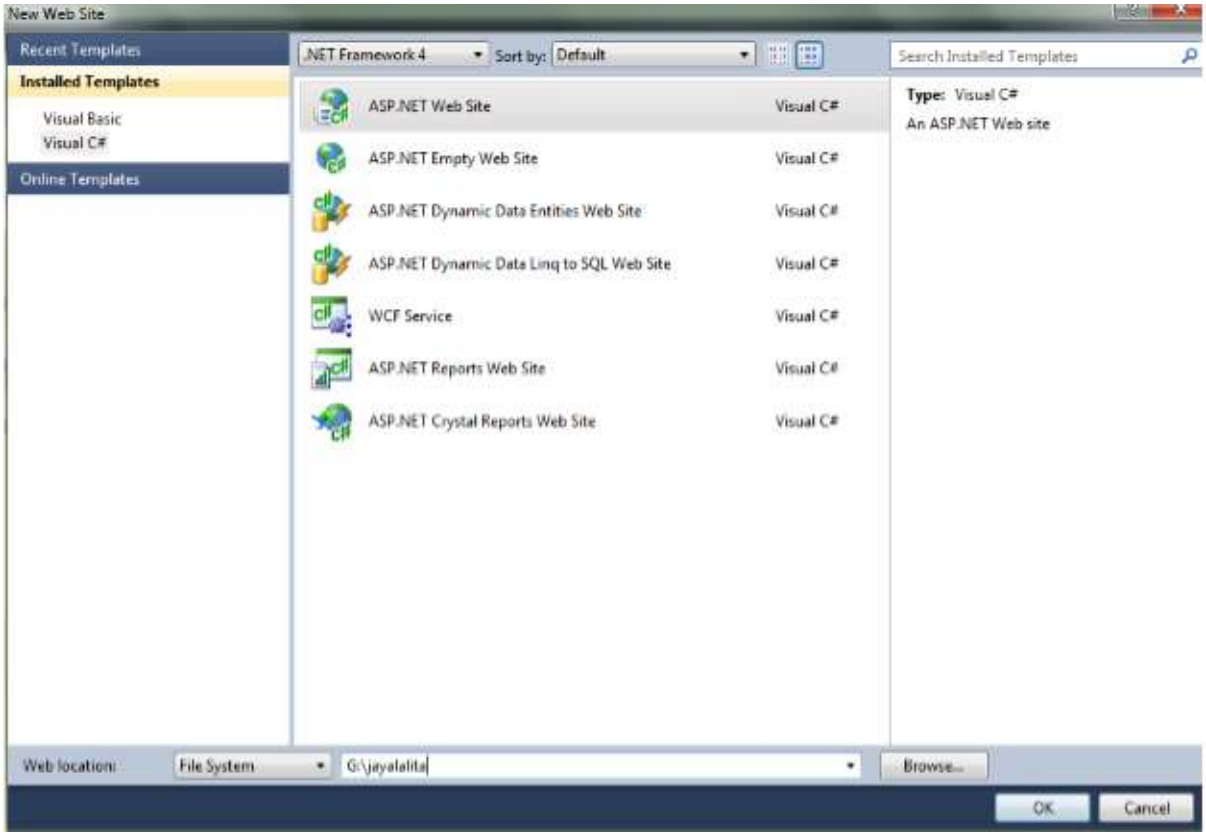
</channel>

</rss>

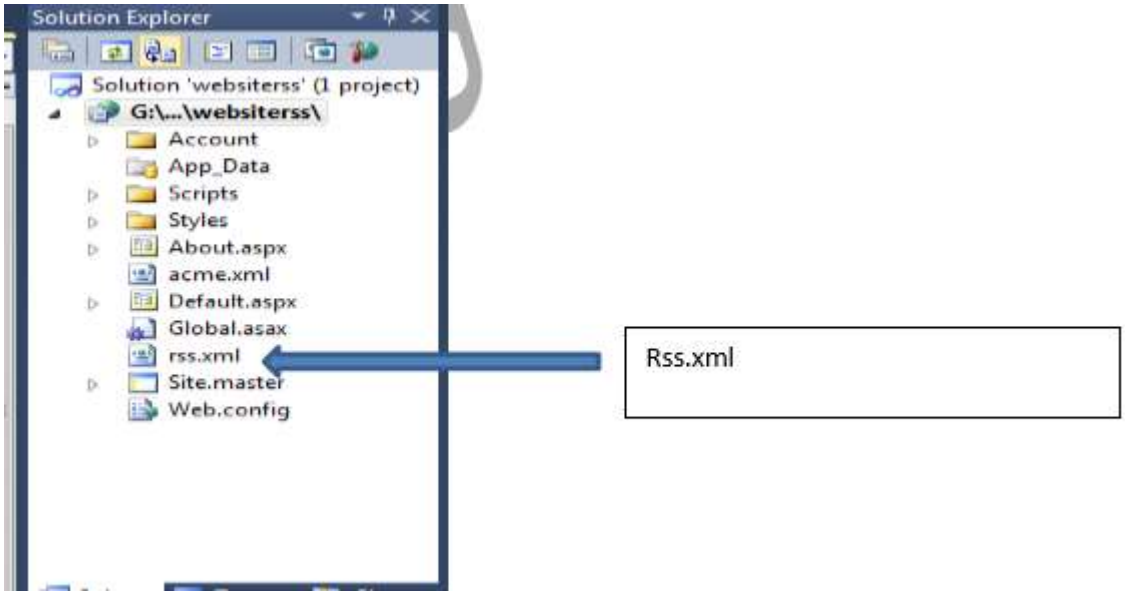
Step 2: save the following code with .xml extension **(For example rss.xml)**

STEP 3: Open the software visual studio 2010 Do the following

File –> new –> website –> visual C# –> ASP.NET website –> Ok



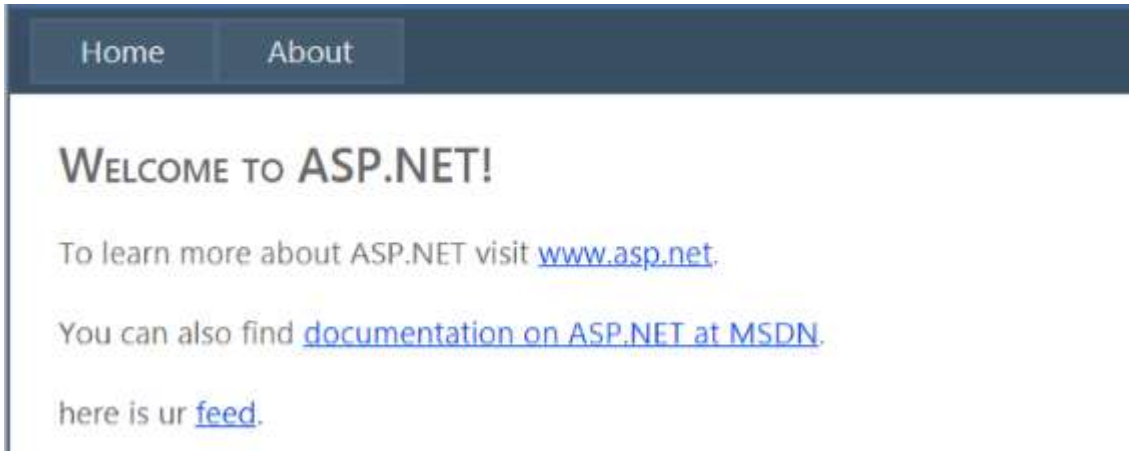
STEP 4: Now copy that rss file which was saved with .xml extension inside your website folder



STEP 5: Type this here is ur feed.

STEP 6: Run the page

STEP 7: output



Click On feed

STEP 8: The RSS web feed as output

Practical no: -08

Aim: - Study and Implementation of Single-Sign-on

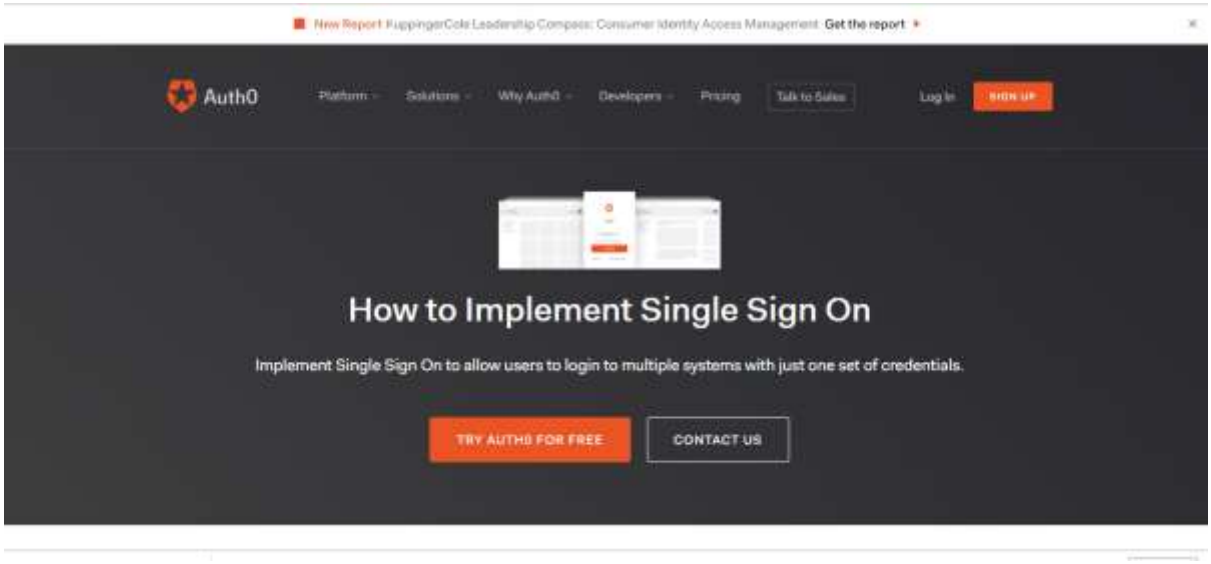
Theory: -

- Single sign-on (SSO) is a session and user authentication service that permits a user to use one set of login credentials (e.g., name and password) to access multiple applications.
- The service authenticates the end user for all the applications the user has been given rights to and eliminates further prompts when the user switches applications during the same session. On the back end, SSO is helpful for logging user activities as well as monitoring user accounts.
- In a basic web SSO service, an agent module on the application server retrieves the specific authentication credentials for an individual user from a dedicated SSO policy server, while authenticating the user against a user repository such as a lightweight directory access protocol (LDAP) directory.

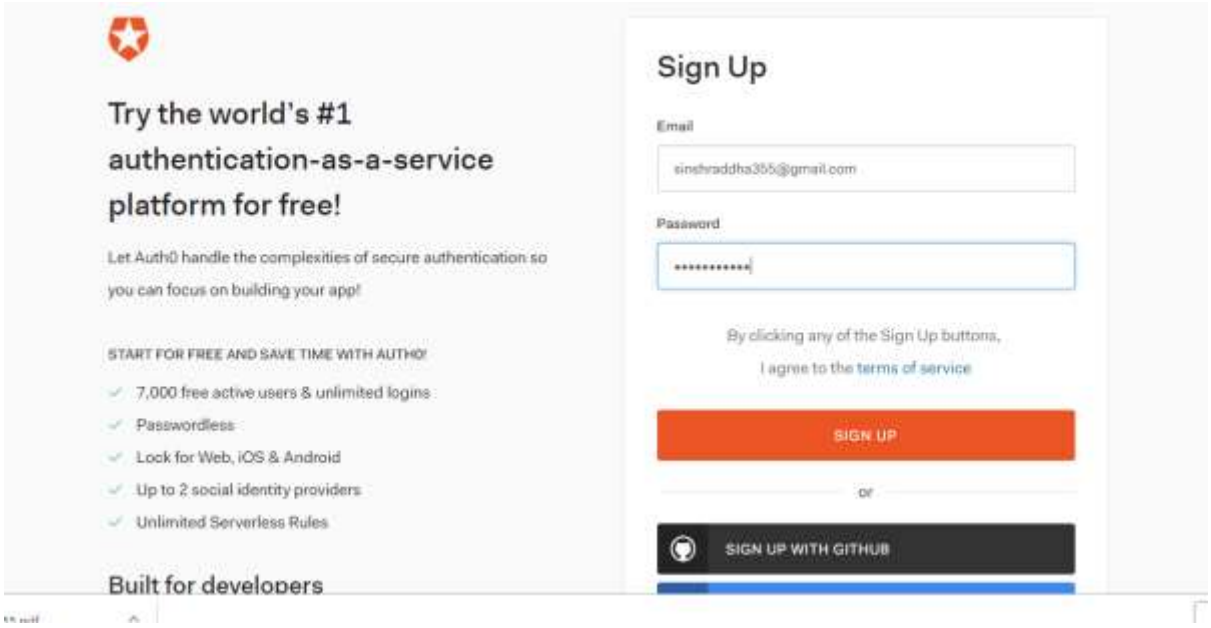
Procedure: -

Step1: got to the following link https://auth0.com/learn/how-to-implement-single-sign-on/

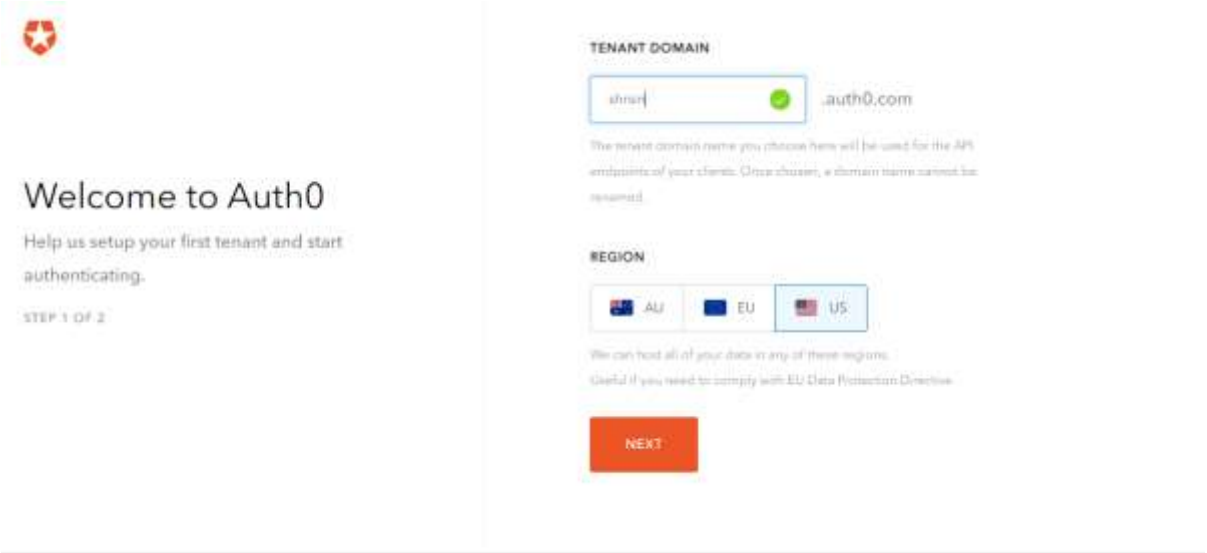
Step2: click on try autho for free → fill the details



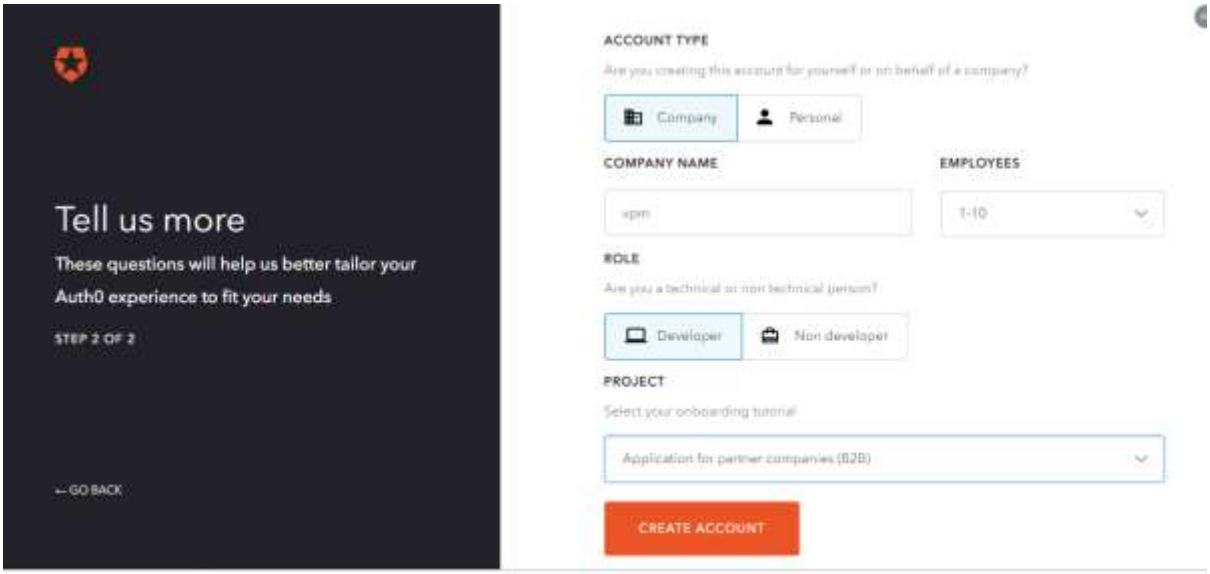
Step3: Provide the username and Password and click on Signup



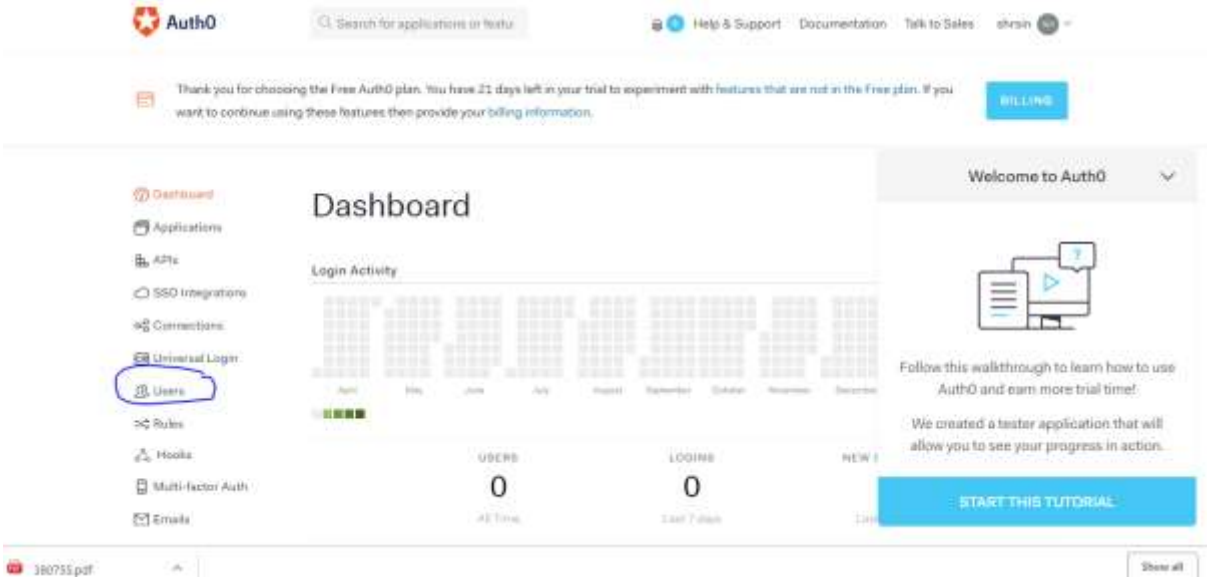
Step 4: Provide the tenant's name and click on next



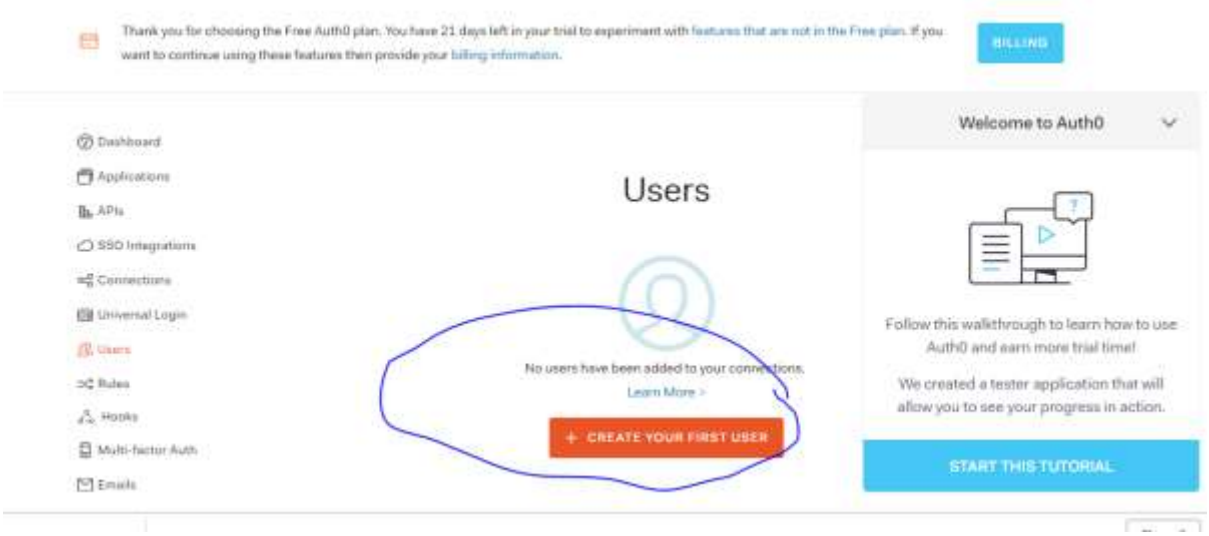
Step5: Fill all the Details and click on create account



Step6: In this step you will get Dashboard. First create one user

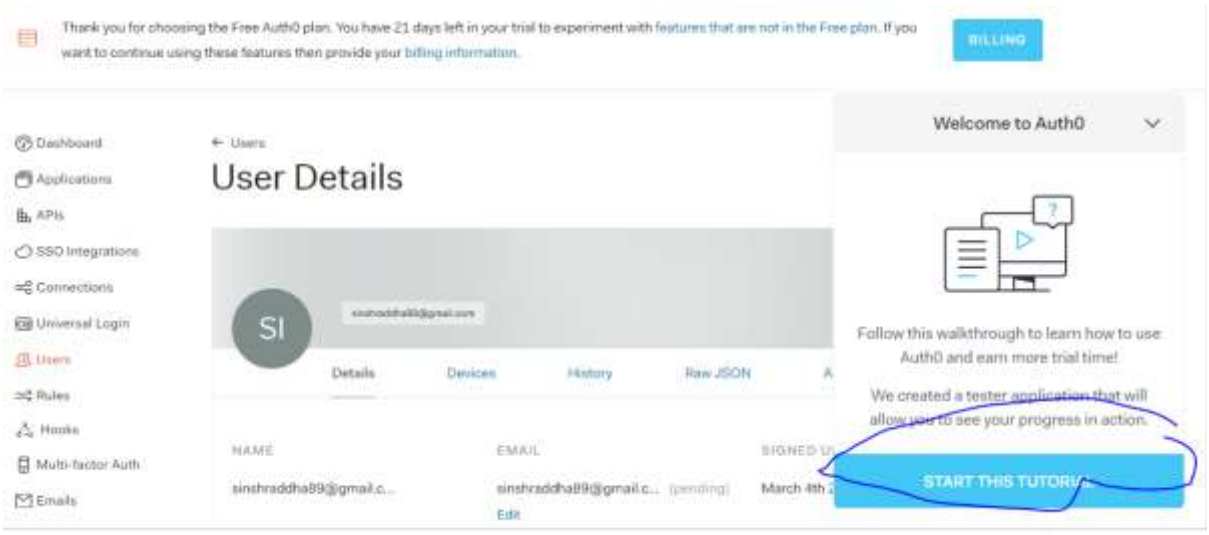


Step 7: click on create user



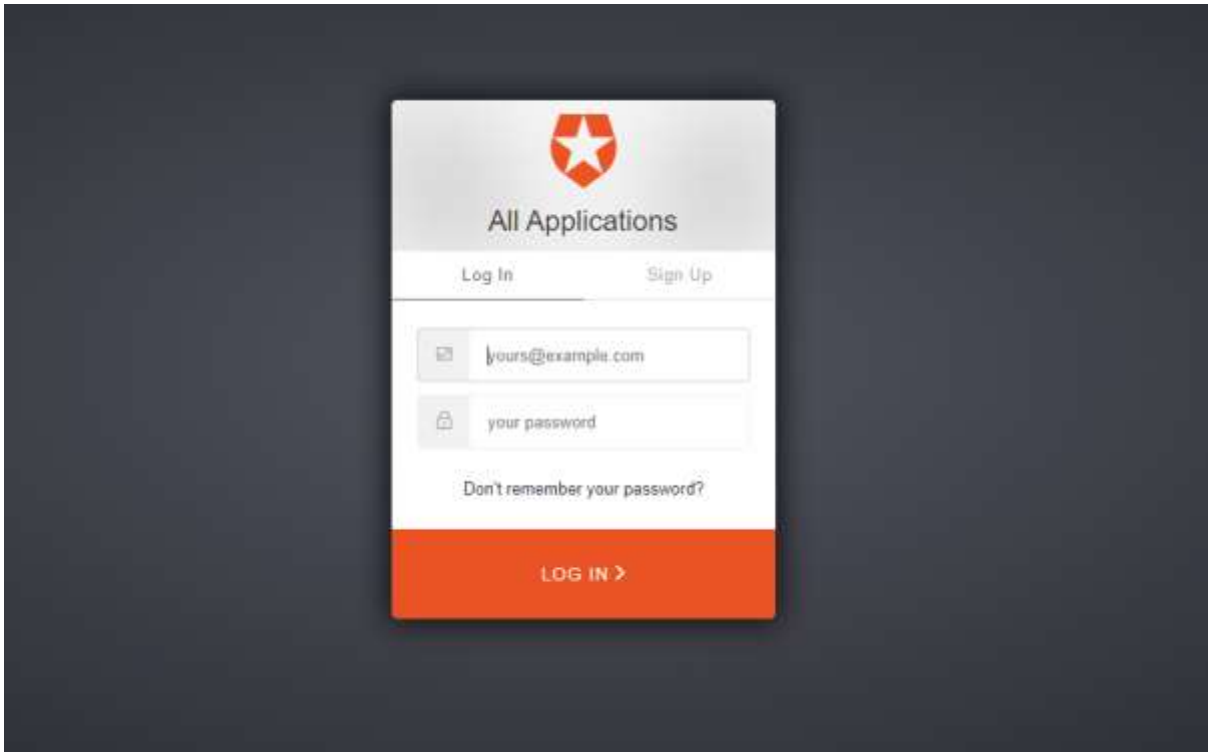
Step 8: fill all the details and click on save

Step 9: now click on Start this tutorial and click on next.

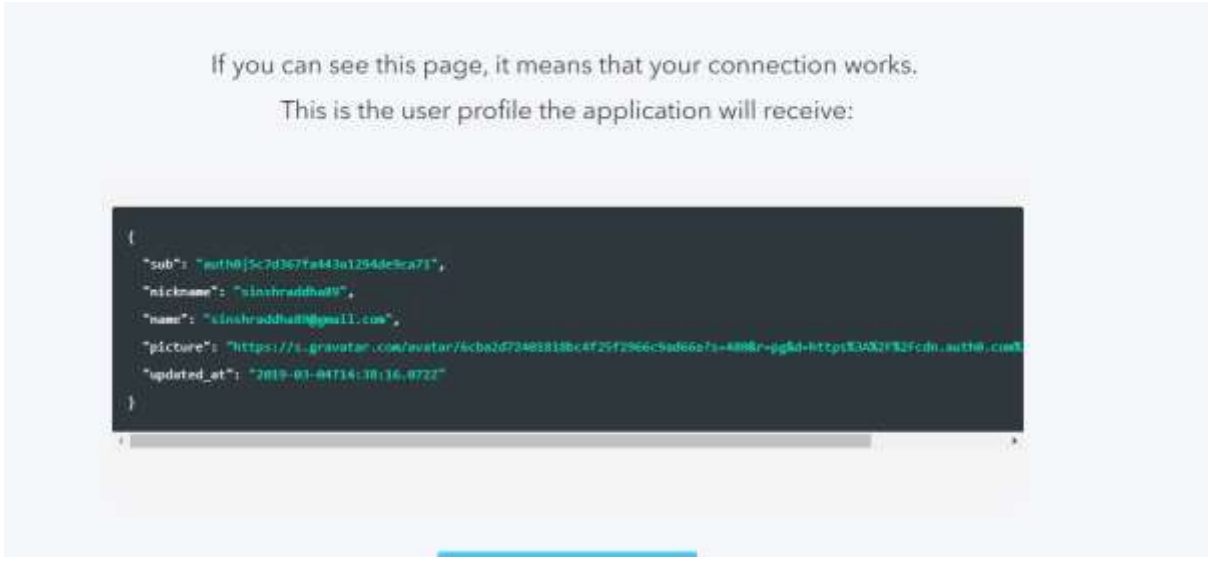


Step 10: - In this step click on test new user login and click on next

Step11: in this step provide username and password



Step 12: Result



Practical No 9

Aim: User management in cloud

Theory:

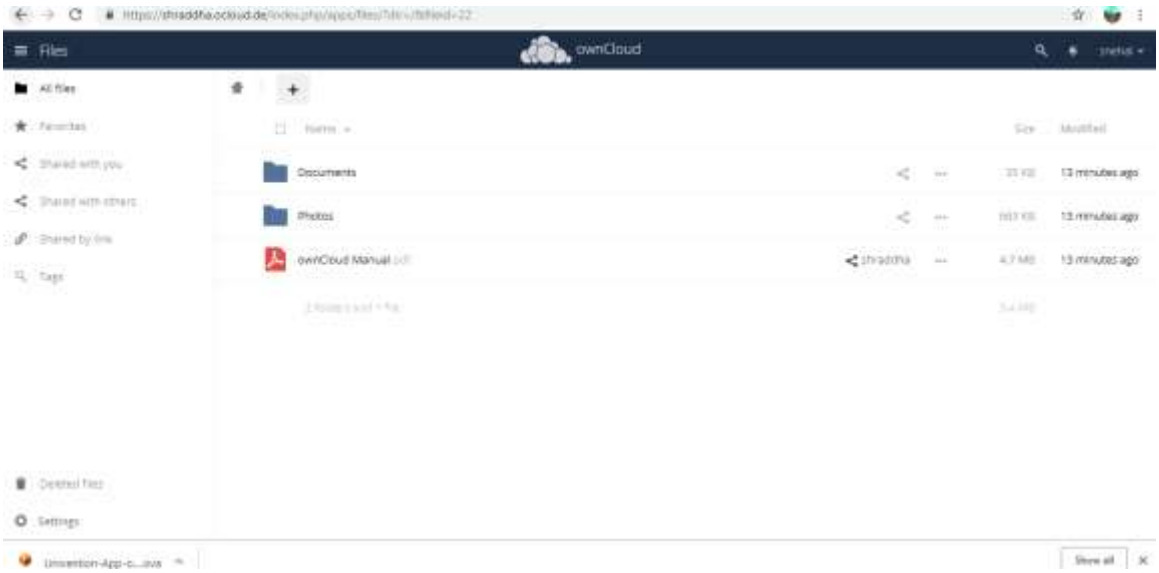
- User management describes the ability for administrators to manage user access to various IT resources like systems, devices, applications, storage systems, networks, SaaS services, and more.
- User management is a core part to any directory service and is a basic security essential for any organization.
- User management enables admins to control user access and on-board and off-board users to and from IT resources.
- Subsequently a directory service will then authenticate, authorize, and audit user access to IT resources based on what the IT admin had dictated.
- Traditionally, user management has been grounded with on-prem servers, databases, and closed virtual private networks (VPN). However, recent trends are seeing a shift towards cloud-based identity and access management (IAM), granting administrators even greater control over digital assets.

Procedure:

Step 1:

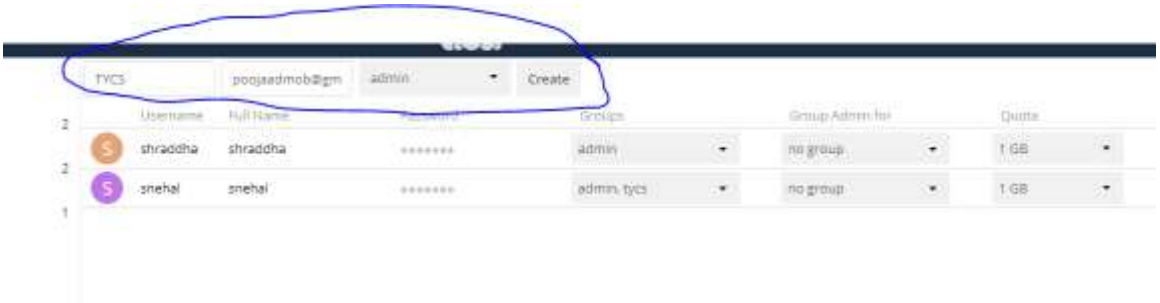
open the following link:

https://shraddha.ocloud.de/index.php/apps/files/?dir=/&fileid=22



step 2: Now go to account name and click on User

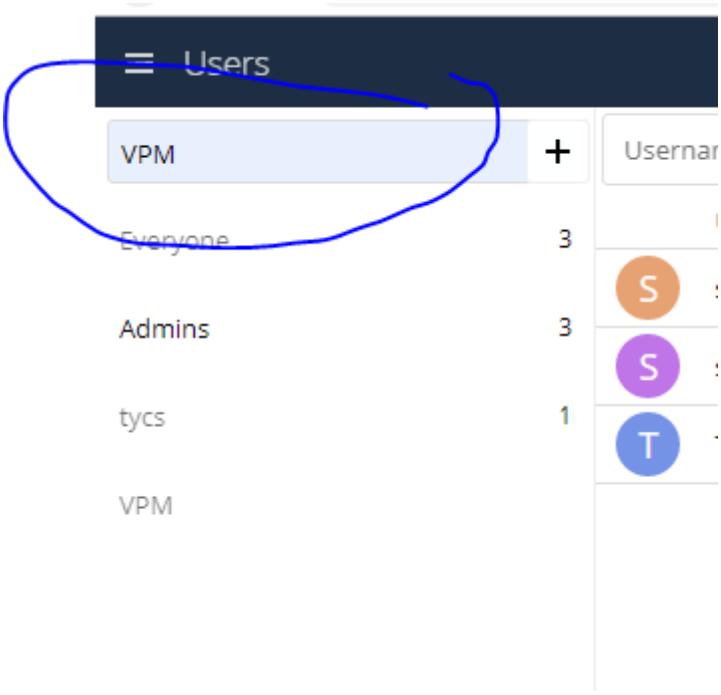
Step 3: fill all the details and click on Create button.



Step 4: user is created successfully

Step 6: Now click on Add Group Give the group name and click on Add button

Step 7: Group Created Successfully



Step 8: Now logout to main Account

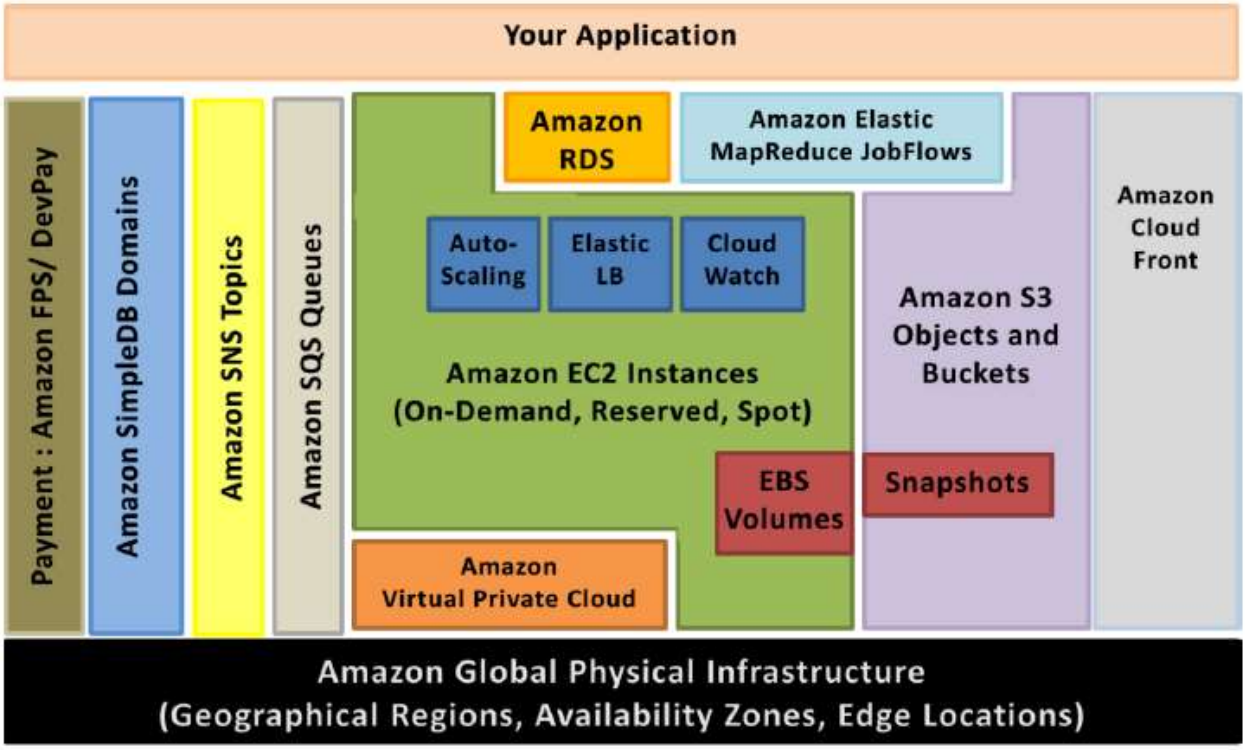
And Login back into newly created User

PRACTICAL NO. 10

AIM: Case study on Amazon EC2/Microsoft Azure/Google Cloud Platform.

Solution:

AMAZON EC2



- **Elastic IP addresses** allow you to allocate a static IP address and programmatically assign it to an instance. You can enable monitoring on an Amazon EC2 instance using Amazon CloudWatch2 in order to gain visibility into resource utilization, operational performance, and overall demand patterns (including metrics such as CPU utilization, disk reads and writes, and network traffic). You can create Auto-scaling Group using the Auto-scaling feature3 to automatically scale our capacity on certain conditions based on metric that Amazon CloudWatch collects. You can also distribute incoming traffic by creating an elastic load balancer using the Elastic Load Balancing4 service. Amazon Elastic Block Storage (EBS)5 volumes provide network-attached persistent storage to Amazon EC2 instances. Point-in-time consistent snapshots of EBS volumes

can be created and stored on Amazon Simple Storage Service (Amazon S3)6. Amazon S3 is highly durable and distributed data store. With a simple web services interface, we can store and retrieve large amounts of data as objects in buckets (containers) at any time, from anywhere on the web using standard HTTP verbs. Copies of objects can be distributed and cached at 14 edge locations around the world by creating a distribution using Amazon CloudFront7 service – a web service for content delivery (static or streaming content). Amazon SimpleDB8 is a web service that provides the core functionality of a database- real-time lookup and simple querying of structured data – without the operational complexity. You can organize the dataset into domains and can run queries across all of the data stored in a particular domain. Domains are collections of items that are described by attribute-value pairs.

- **Amazon Relational Database Service9 (Amazon RDS)** provides an easy way to setup, operate and scale a relational database in the cloud. We can launch a DB Instance and get access to a full-featured MySQL database and not worry about common database administration tasks like backups, patch management etc. Amazon Simple Queue Service (Amazon SQS)10 is a reliable, highly scalable, hosted distributed queue for storing messages as they travel between computers and application components.
- **Amazon Simple Notifications Service (Amazon SNS)** provides a simple way to notify applications or people from the cloud by creating Topics and using a publish-subscribe protocol.
- **Amazon Elastic MapReduce** provides a hosted Hadoop framework running on the web-scale infrastructure of Amazon Elastic Compute Cloud (Amazon EC2) and Amazon Simple Storage Service (Amazon S3) and allows you to create customized JobFlows. JobFlow is a sequence of MapReduce steps.

- **Amazon Virtual Private Cloud (Amazon VPC)** allows you to extend your corporate network into a private cloud contained within AWS. Amazon VPC uses IPsec tunnel mode that enables you to create a secure connection between a gateway in your data centre and a gateway in AWS.
- **Amazon Route53** is a highly scalable DNS service that allows you manage your DNS records by creating a Hosted Zone for every domain you would like to manage.
- **AWS Identity and Access Management (IAM)** enable you to create multiple Users with unique security credentials and manage the permissions for each of these Users within your AWS Account. IAM is natively integrated into AWS Services. No service APIs have changed to support IAM, and exiting applications and tools built on top of the AWS service APIs will continue to work when using IAM.

  AWS also offers various payment and billing services that leverages Amazon's payment infrastructure.
- All AWS infrastructure services offer utility-style pricing that require no long-term commitments or contracts. For example, you pay by the hour for Amazon EC2 instance usage and pay by the gigabyte for storage and data transfer in the case of Amazon S3. More information about each of these services and their pay-as-you-go pricing is available on the AWS Website.

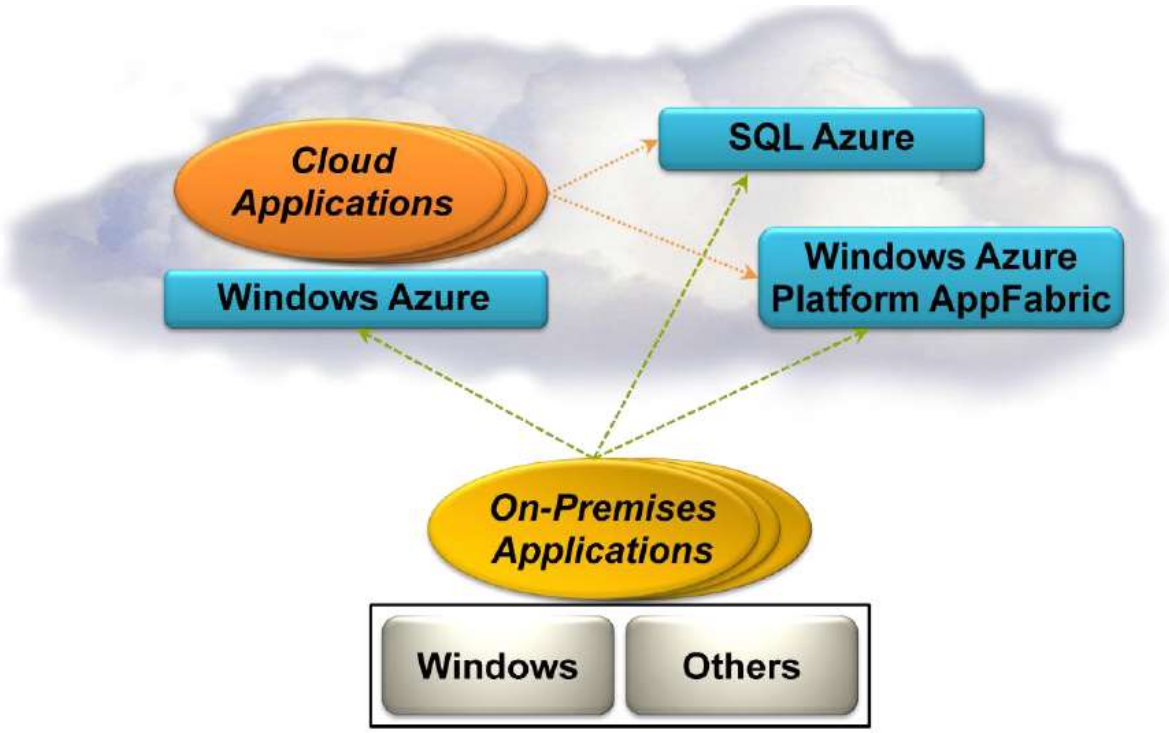
  Note that using the AWS cloud doesn't require sacrificing the flexibility and control you've grown accustomed to:

  You are free to use the programming model, language, or operating system (Windows, OpenSolaris or any flavor of Linux) of your choice.

  You are free to pick and choose the AWS products that best satisfy your requirements—you can use any of the services individually or in any combination.

  Because AWS provides resizable (storage, bandwidth and computing) resources, you are free to consume as much or as little and only pay for what you consume.

Microsoft Azure



Execution Environment

The Windows Azure execution environment consists of a platform for applications and services hosted within one or more roles. The types of roles you can implement in Windows Azure are:

Azure Compute (Web and Worker Roles). A Windows Azure application consists of one or more hosted roles running within the Azure data centers. Typically, there will be at least one Web role that is exposed for access by users of the application. The application may contain additional roles, including Worker roles that are typically used to perform background processing and support tasks for Web roles. For more detailed information see "Overview of Creating a Hosted Service for Windows Azure" at **http://technet.microsoft.com/en-au/library/gg432976.aspx** and "Building an Application that Runs in a Hosted Service" at **http://technet.microsoft.com/en-au/library/hh180152.aspx**.

Virtual Machine (VM role). This role allows you to host your own custom instance of the Windows Server 2008 R2 Enterprise or Windows Server 2008 R2 Standard operating system within a Windows Azure data center. For more detailed information see "Creating

Applications by Using a VM Role in Windows Azure" at **http://technet.microsoft.com/en-au/library/gg465398.aspx**.

Data Management

Windows Azure, SQL Azure, and the associated services provide opportunities for storing and managing data in a range of ways. The following data management services and features are available:

Azure Storage: This provides four core services for persistent and durable data storage in the cloud. The services support a REST interface that can be accessed from within Azure-hosted or on-premises (remote) applications. For information about the REST API, see "Windows Azure Storage Services REST API Reference" at **http://msdn.microsoft.com/en-us/library/dd179355.aspx**. The four storage services are:

- **The Azure Table Service** provides a table-structured storage mechanism based on the familiar rows and columns format, and supports queries for managing the data. It is primarily aimed at scenarios where large volumes of data must be stored, while being easy to access and update. For more detailed information see "Table Service Concepts" at **http://msdn.microsoft.com/en-us/library/dd179463.aspx** and "Table Service API" at **http://msdn.microsoft.com/en-us/library/dd179423.aspx**.
- **The Binary Large Object (BLOB) Service** provides a series of containers aimed at storing text or binary data. It provides both Block BLOB containers for streaming data, and Page BLOB containers for random read/write operations. For more detailed information see "Understanding Block Blobs and Page Blobs" at **http://msdn.microsoft.com/en-us/library/ee691964.aspx** and "Blob Service API" at **http://msdn.microsoft.com/en-us/library/dd135733.aspx**.
- **The Queue Service** provides a mechanism for reliable, persistent messaging between role instances, such as between a Web role and a Worker role. For more detailed information see "Queue Service Concepts" at **http://msdn.microsoft.com/en-us/library/dd179353.aspx** and "Queue Service API" at **http://msdn.microsoft.com/en-us/library/dd179363.aspx**.
- Windows Azure Drives provide a mechanism for applications to mount a single volume NTFS VHD as a Page BLOB, and upload and download VHDs via the BLOB. For more detailed information see "Windows Azure Drive" (PDF) at **http://go.microsoft.com/?linkid=9710117**.

SQL Azure Database: This is a highly available and scalable cloud database service built on SQL Server technologies, and supports the familiar T-SQL based relational database model. It can be used with applications hosted in Windows Azure, and with other applications running on-premises or hosted elsewhere. For more detailed information see "SQL Azure Database" at **http://msdn.microsoft.com/en-us/library/ee336279.aspx**.

Data Synchronization: SQL Azure Data Sync is a cloud-based data synchronization service built on Microsoft Sync Framework technologies. It provides bi-directional data synchronization and data management capabilities allowing data to be easily shared between multiple SQL Azure databases and between on-premises and SQL Azure databases. For more detailed information see "Microsoft Sync Framework Developer Center" at **http://msdn.microsoft.com/en-us/sync**.

Caching: This service provides a distributed, in-memory, low latency and high throughput application cache service that requires no installation or management, and dynamically increases and decreases the cache size automatically as required. It can be used to cache application data, ASP.NET session state information, and for ASP.NET page output caching. For more detailed information see "Caching Service (Windows Azure AppFabric)" at **http://msdn.microsoft.com/en-us/library/gg278356.aspx**.

Networking Services

Windows Azure provides several networking services that you can take advantage of to maximize performance, implement authentication, and improve manageability of your hosted applications. These services include the following:

Content Delivery Network (CDN). The CDN allows you to cache publicly available static data for applications at strategic locations that are closer (in network delivery terms) to end users. The CDN uses a number of data centers at many locations around the world, which store the data in BLOB storage that has anonymous access. These do not need to be locations where the application is actually running. For more detailed information see "Delivering High-Bandwidth Content with the Windows Azure CDN" at **http://msdn.microsoft.com/en-us/library/ee795176.aspx**.

Virtual Network Connect. This service allows you to configure roles of an application running in Windows Azure and computers on your on-premises network so that they appear to be on the same network. It uses a software agent running on the on-premises

computer to establish an IPsec-protected connection to the Windows Azure roles in the cloud, and provides the capability to administer, manage, monitor, and debug the roles directly. For more detailed information see "Connecting Local Computers to Windows Azure Roles" at **http://msdn.microsoft.com/en-us/library/gg433122.aspx**.

Virtual Network Traffic Manager. This is a service that allows you to set up request redirection and load balancing based on three different methods. Typically, you will use Traffic Manager to maximize performance by redirecting requests from users to the instance in the closest data center using the Performance method. Alternative load balancing methods available are Failover and Round Robin. For more detailed information see "Windows Azure Traffic Manager" at **http://msdn.microsoft.com/en-us/WAZPlatformTrainingCourse_WindowsAzureTrafficManager**.

Access Control. This is a standards-based service for identity and access control that makes use of a range of identity providers (IdPs) that can authenticate users. ACS acts as a Security Token Service (STS), or token issuer, and makes it easier to take advantage of federation authentication techniques where user identity is validated in a realm or domain other than that in which the application resides. An example is controlling user access based on an identity verified by an identity provider such as Windows Live ID or Google. For more detailed information see "Access Control Service 2.0" at **http://msdn.microsoft.com/en-us/library/gg429786.aspx** and "Claims Based Identity & Access Control Guide" at **http://claimsid.codeplex.com/**.

Service Bus. This provides a secure messaging and data flow capability for distributed and hybrid applications, such as communication between Windows Azure hosted applications and on-premises applications and services, without requiring complex firewall and security infrastructures. It can use a range of communication and messaging protocols and patterns to provide delivery assurance, reliable messaging; can scale to accommodate varying loads; and can be integrated with on-premises BizTalk Server artifacts.

Google Cloud Platform

One of the most rewarding parts of working on Google App Engine is seeing our developers create groundbreaking new applications on top of our infrastructure. To help our current and prospective users gain insight into the vast array of these applications, we recently added a section to the Google Cloud Platform site with a collection of case studies.

Rovio

Creator of the blockbuster "Angry Birds" game series used App Engine when creating web versions of their game. They were able to create customized versions of their game in just 2 weeks using App Engine, allowing them to capitalize on opportunities to grow their business.

Get Around
TechCrunch Disrupt award-winning car sharing service used App Engine to build a marketplace connecting car owners to people looking to rent cars. They scaled their product without adding additional staff.

MAG Interactive
Developer of mobile casual games, including the hit game Ruzzle, scaled their backend using App Engine. They grew to over 5 million users, and experienced "no scalability issues at all."

Nubbius
The Cloud Gate used App Engine to create nubbius, a software-as-a-service offering for lawyers to manage their workflow from anywhere. They saved more than $130,000 per year while scaling rapidly.

RedBus
Online travel agency used Google BigQuery to unify tens of thousands of bus schedules into a single booking operation. They analyzed data sets as large as 2 TB in less than 30 seconds, and spent 80% less than they would have on a Hadoop infrastructure,

This is a sample of the many case studies we have on our site. Check out **cloud.google.com/customers** to see the full list. You can read about companies varying in size, industry, and use cases, who are using Google Cloud Platform to build their products and businesses.