

DEVELOP A NEW WEB SERVICE FOR A CALCULATOR

EX.NO. : 1

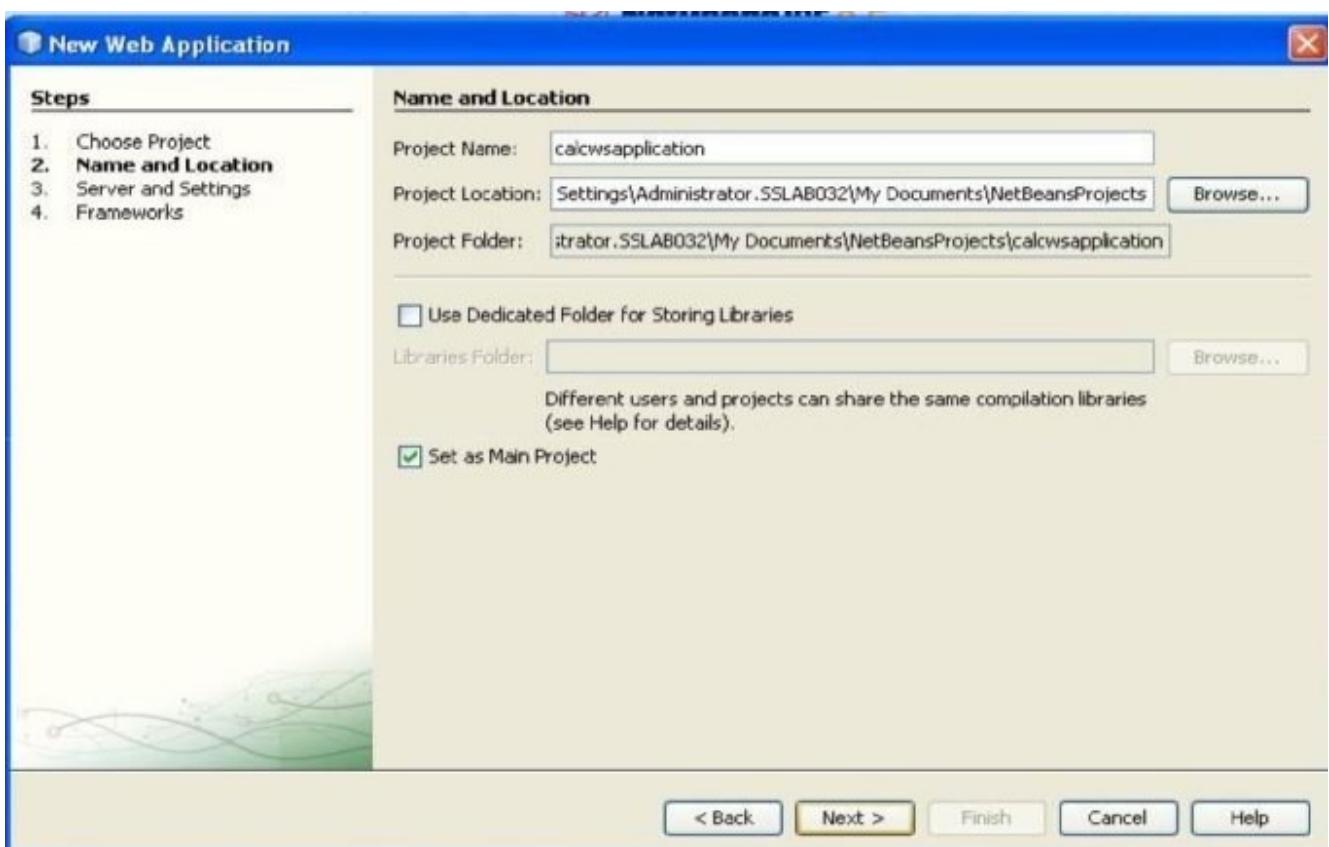
DATE :

AIM:

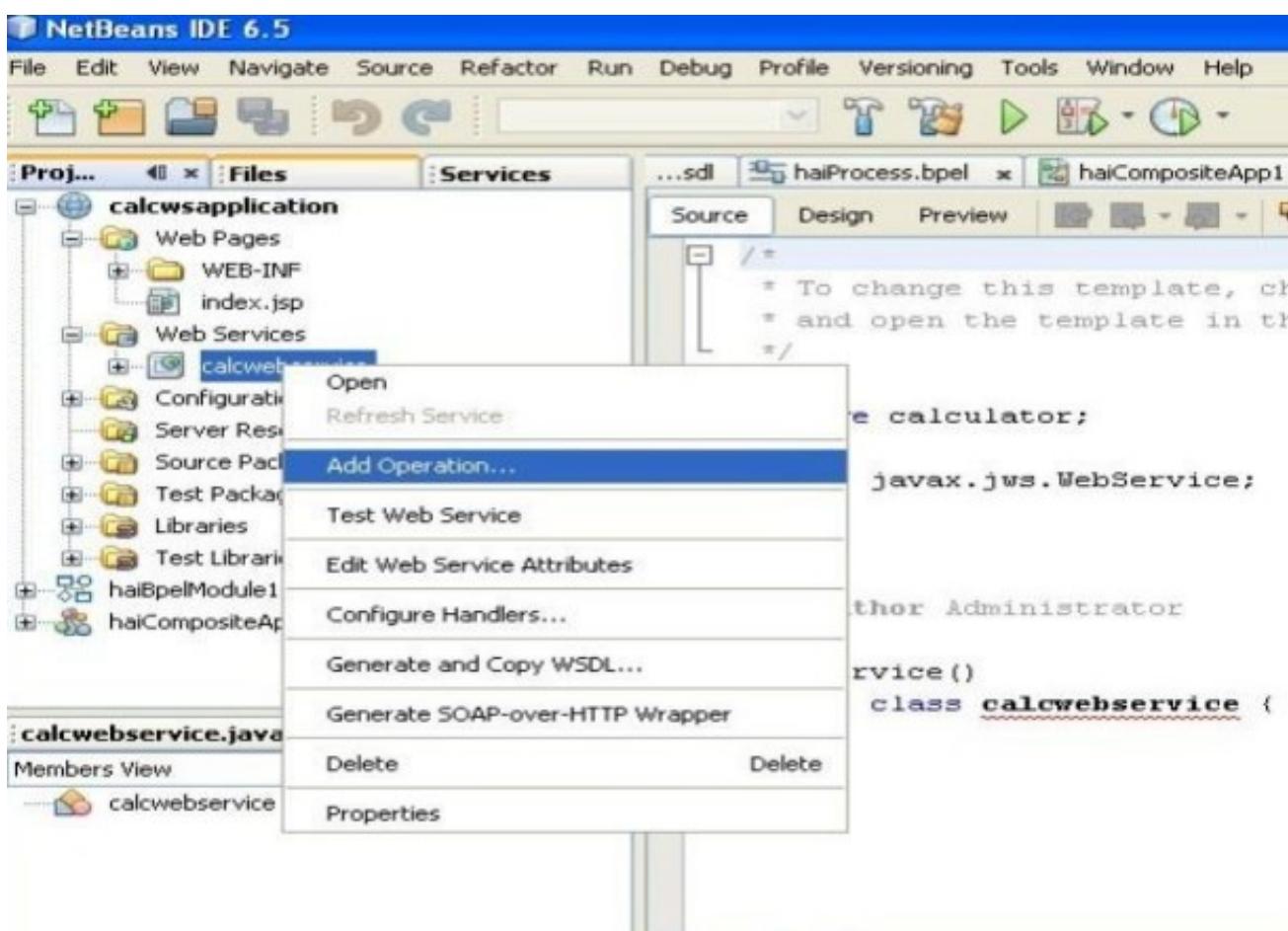
To develop a new Web Service for Calculator using SOAP Protocol

PROCEDURE:

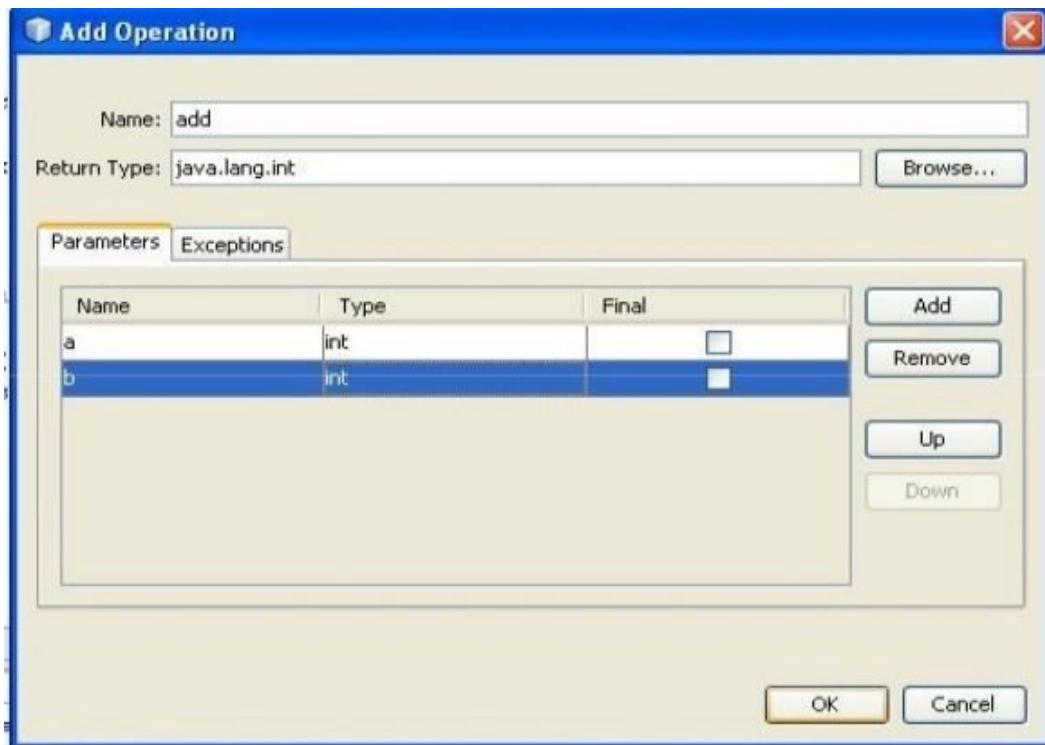
1. Open NetBeans IDE 8.1
2. Click File -> New Project
3. Give project name as calcwsapplication and click next.
4. In new web application dialog box, ensure that glassfish v2 server and Java EE 5 are selected and click next and then finish



5. Right click calcwsapplication and select New -> web service. Give web service name as calwebservice and package name as calculator and click Finish
6. Expand web service folder. Right click calwebservice and click Add Operation. Give operation name as add and return type as int
7. Click add button and give parameter as a and data type as int. Again Click add button and give parameter name as b and its data type as b and Click OK



Step 6 and 7:



8. Instead of return 0, change it as return a+b

```

@WebService()
public class calcwebservice {

    /**
     * Web service operation
     */
    @WebMethod(operationName = "add")
    public int add(@WebParam(name = "a")
    int a, @WebParam(name = "b")
    int b) {
        //TODO write your implementation code here
        return a+b;
    }
}

```

9. Similarly, add operations for subtraction(sub), multiplication(mul),division(div)
10. Right Click calwsapplication and click clean and build.It will show **BUILDSUCCESSFUL**.
11. Again right Click calwsapplication and click deploy.It will show **BUILD SUCCESSFUL**.

```

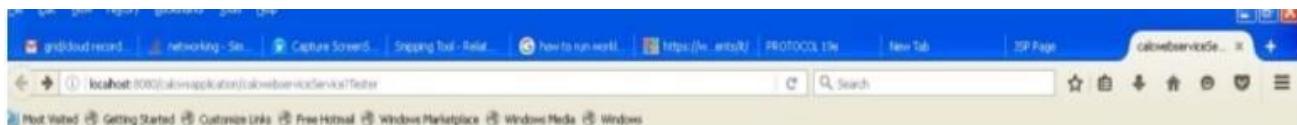
XML check x calwsapplication (clean,dist) x
Compiling 1 source file to C:\Documents and Settings\Administrator.SSLAB032\My Documents\NetBeansProjects\calwsapplication
compile:
compile-jsp:
Created dir: C:\Documents and Settings\Administrator.SSLAB032\My Documents\NetBeansProjects\calwsapplication
Building jar: C:\Documents and Settings\Administrator.SSLAB032\My Documents\NetBeansProjects\calwsapplication
do-dist:
dist:
BUILD SUCCESSFUL (total time: 2 seconds)

```

12. Select calwsapplication -> web services -> calculatorws.Right click and select Test WebService
13. Give input values and click add button to check output

Go to back and click WSDL to open it. Now, Server is running...

Web Service tester page:



calcwebserviceService Web Service Tester

This form will allow you to test your web service implementation ([WSDL File](#))

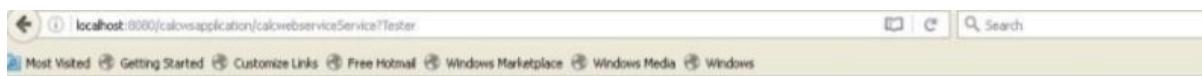
To invoke an operation, fill the method parameter(s) input boxes and click on the button labeled with the method name.

Methods :

```
public abstract int calculator.Calcwebservice.add(int,int)
```

(5 ,2)

Output:



Method parameter(s)

Type	Value
int	5
int	2

Method returned

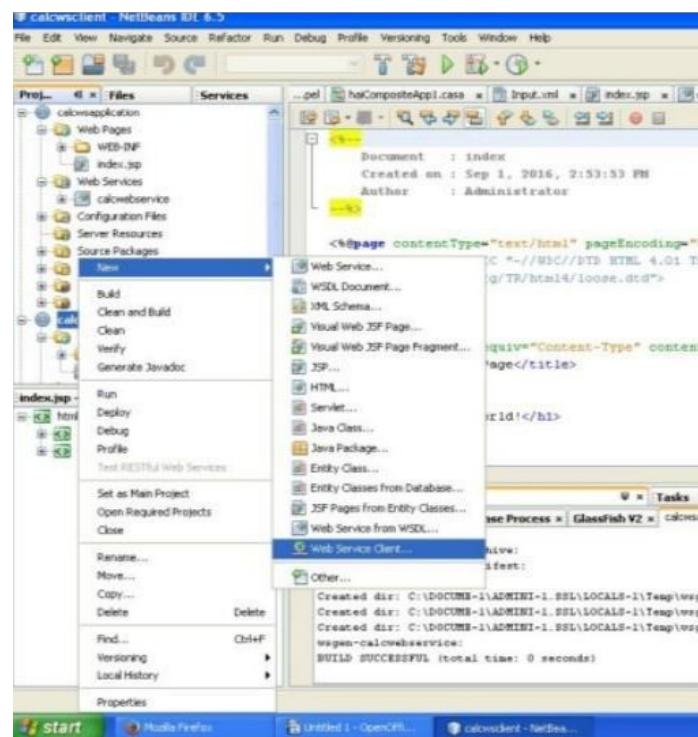
int : "7"

SOAP Request

```
<?xml version="1.0" encoding="UTF-8"?>
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Header/>
  <S:Body>
```

Invoking Web Service Client

1. Click File -> New Project.Select web application from java web category
2. Give file name as calcwsclient.click next and then finish.
3. Right Click calcwsclient and Select New -> web service client



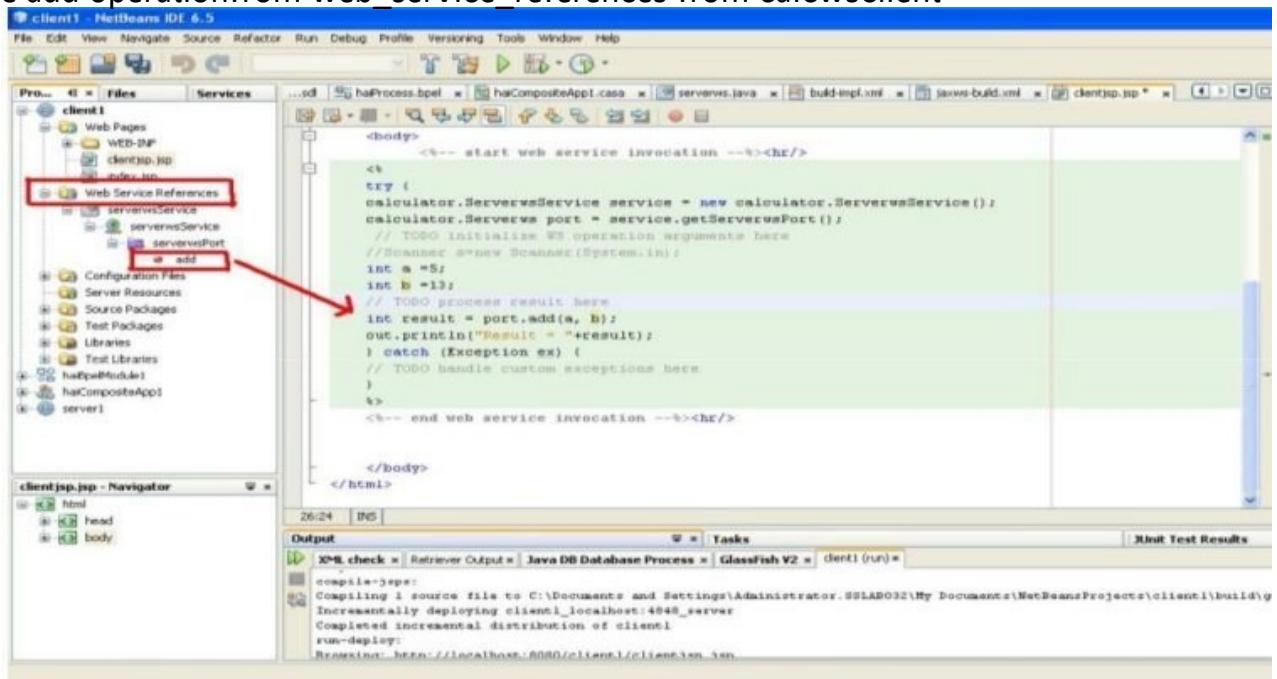
4. Select Project and click browse. Browse the web service that we did in the previous step. Ensure that client style is JAX- WS style.



5. Click Finish. Code will appear and it will show some error.
 5. Click on error. At end of line add: `xendorsed="true"` and save it.

```
//localhost:8080/calcwsapplication/calcwebserviceService?wsdl" xnocompile="true" xendorseed="true"/>
```

6. Right Click calcwsclient -> web pages and select new -> JSP
7. Give file name as client and click finish.
8. In client.jsp page, inside the body tag, remove h1 tag and drag and drop the add operation from web_service_references from calcwsclient



10. In the code appeared, change the values.(For instance, a=5,b=13)
11. Right Click calcwsclient and click Clean and build
12. Again Right click calcwsclient and click deploy. It will show BUILD SUCCESSFUL.
13. Right Client Client.jsp and click Run file
14. It will show the output as follows:



Result = 18

15. Similarly create jsp files for subtraction, multiplication and division.

RESULT:

Thus, calculator is implemented as a web service using SOAP protocol.

DEVELOP A CLOUD ENVIRONMENT USING CLOUDSIM SIMULATOR

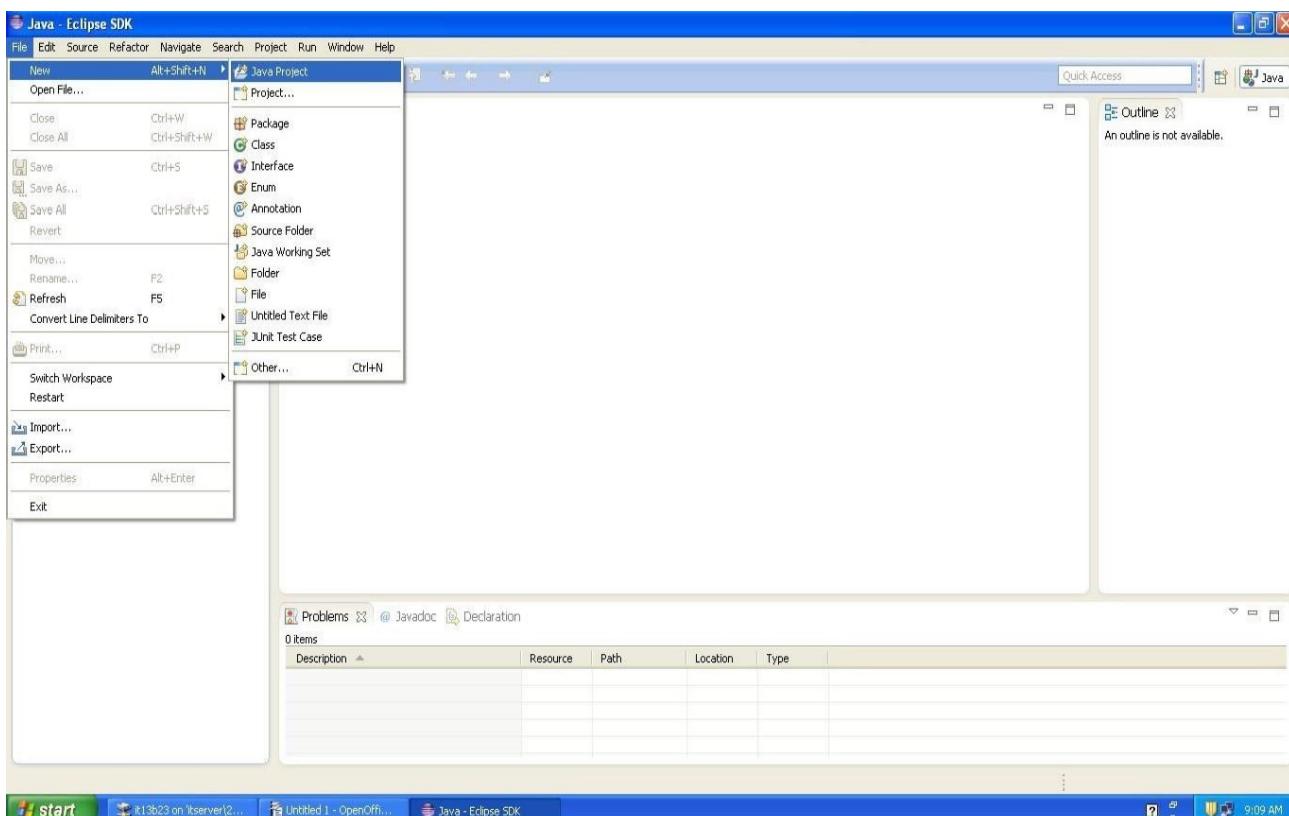
EX.NO. : 2
DATE :

AIM:

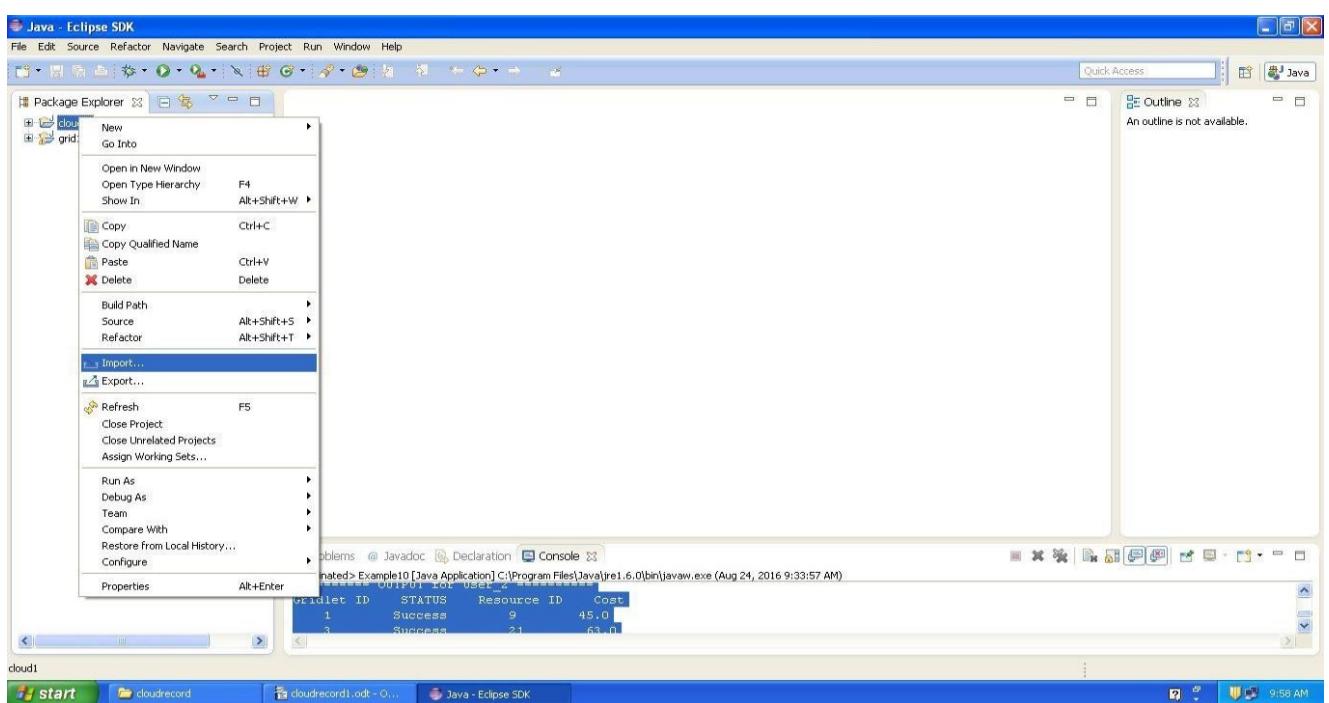
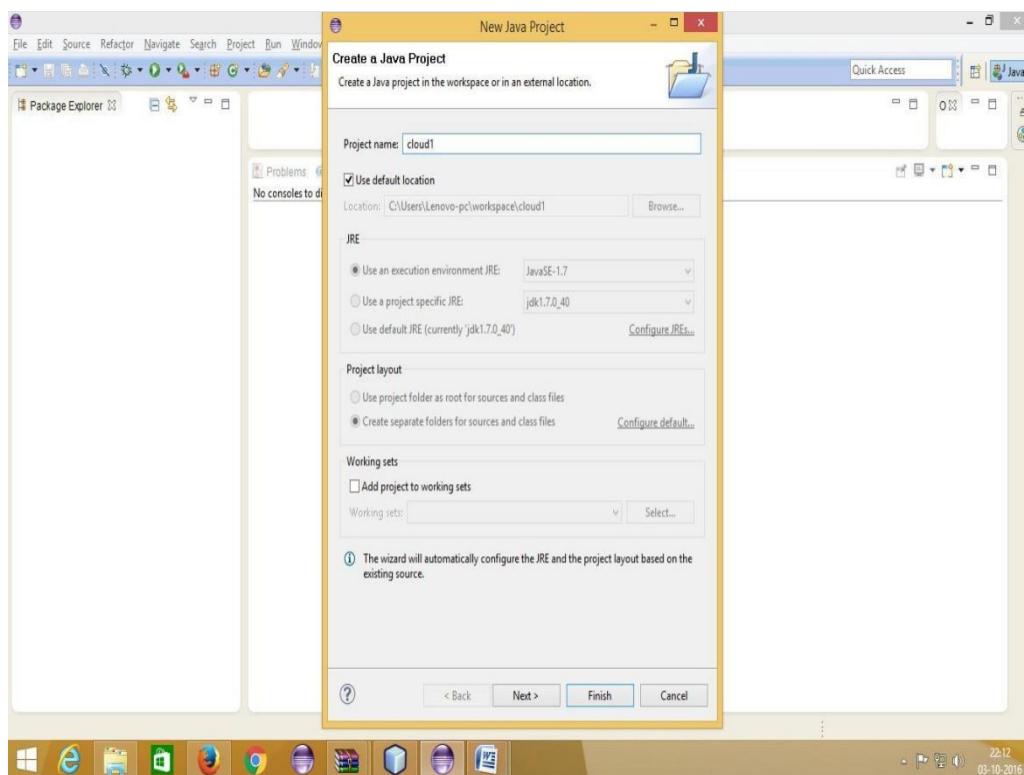
To install CloudSim and to implement the java code to create cloudlets and to execute the cloudlets in data centers.

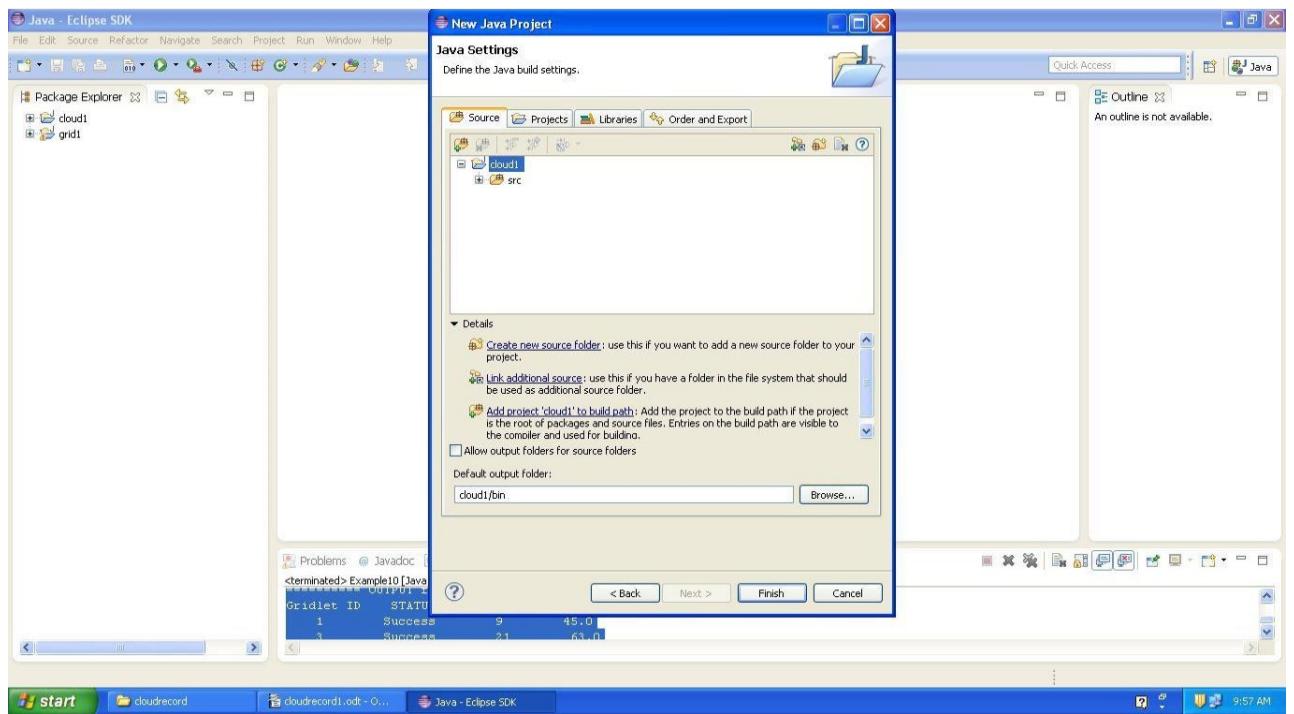
PROCEDURE:

1. Open the eclipse tool using the path **E:\cloud grid\eclipse-SDK-4.2.2-win32x86_64\eclipse\eclipse.exe**
2. Click on File Menu → New → Java Project

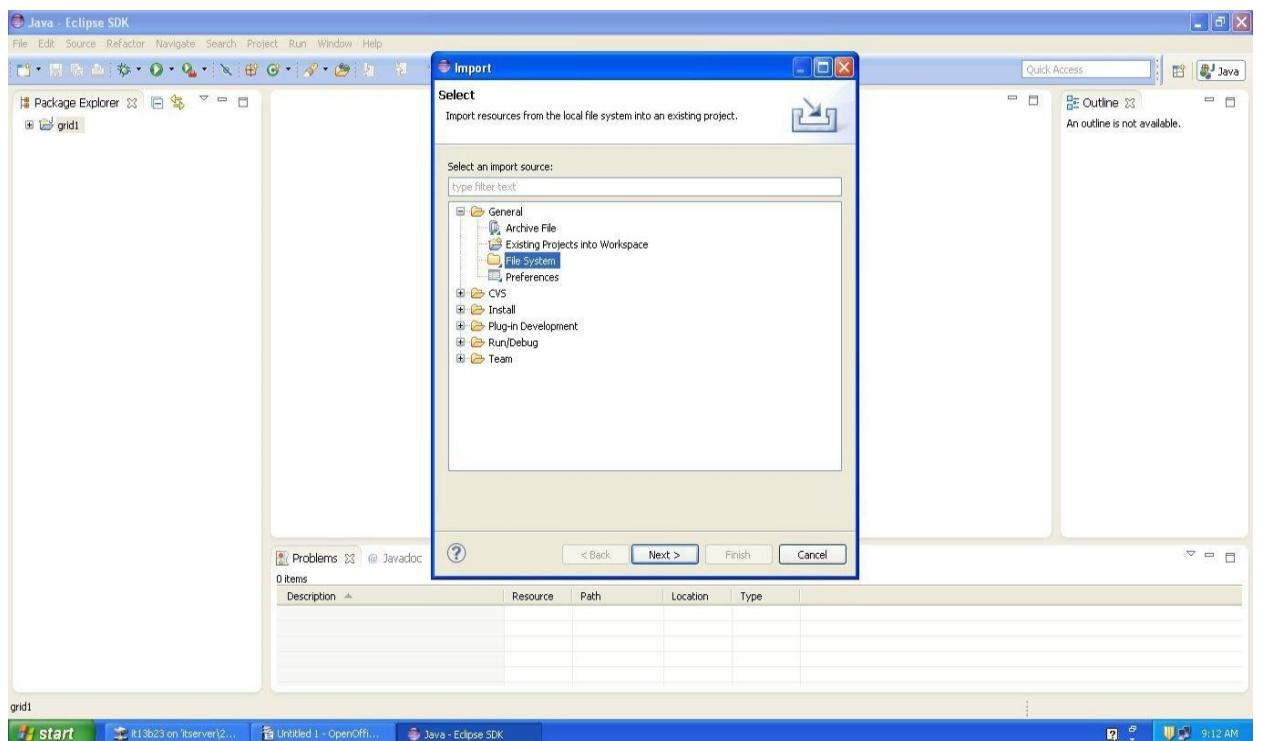


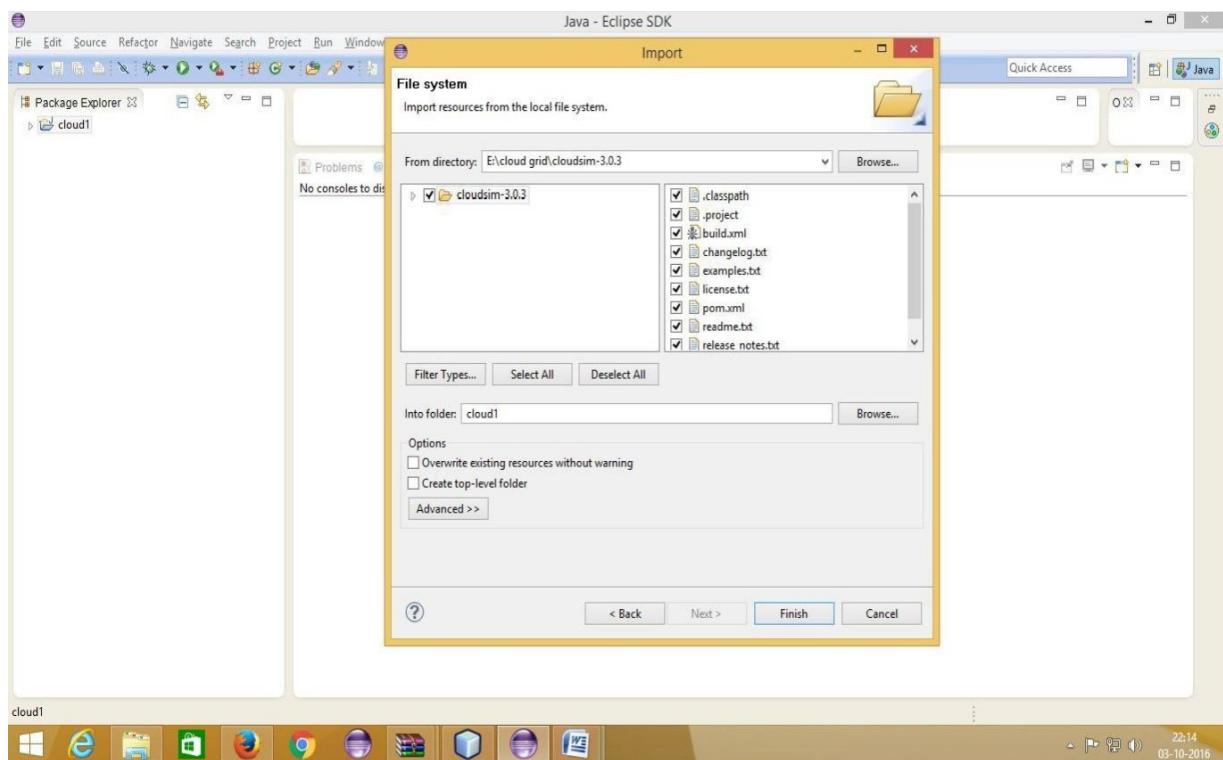
3. Give name to the project (for instance, cloud1) and click on **Next** Button





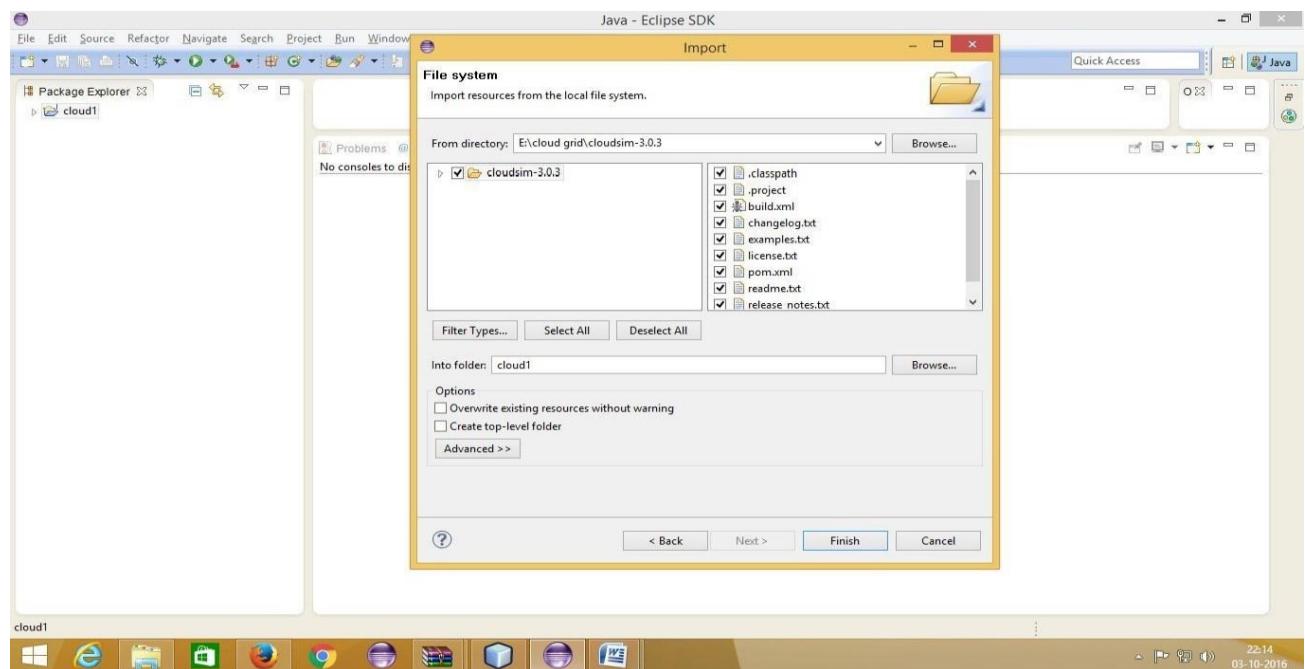
4. Click **Finish** Button
5. Right Click on the project in project explorer and click **Import**
6. Select General → File System and click Next
7. Click **Browse** and browse the CloudSim-3.0.3 folder and Select the folder.



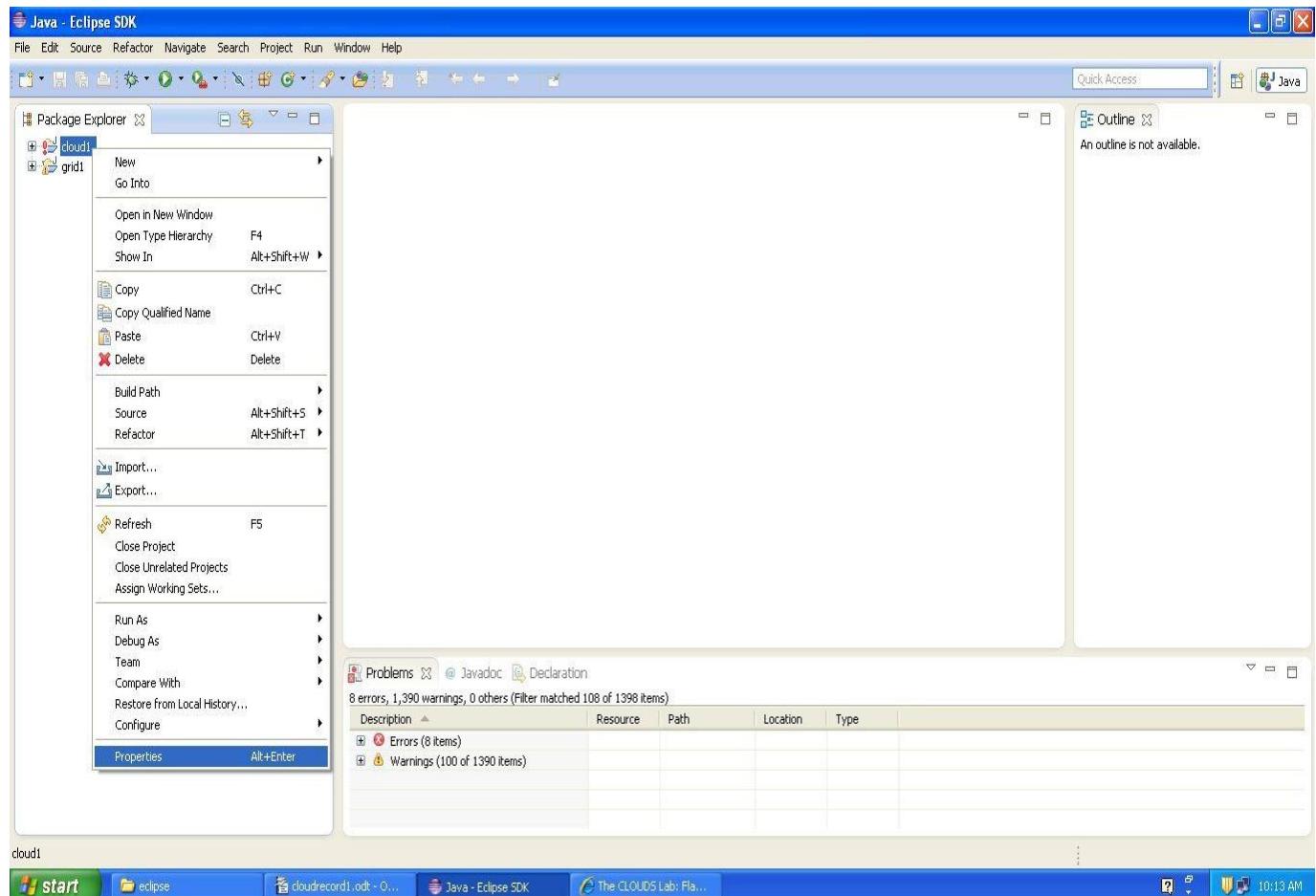


8. Click OK

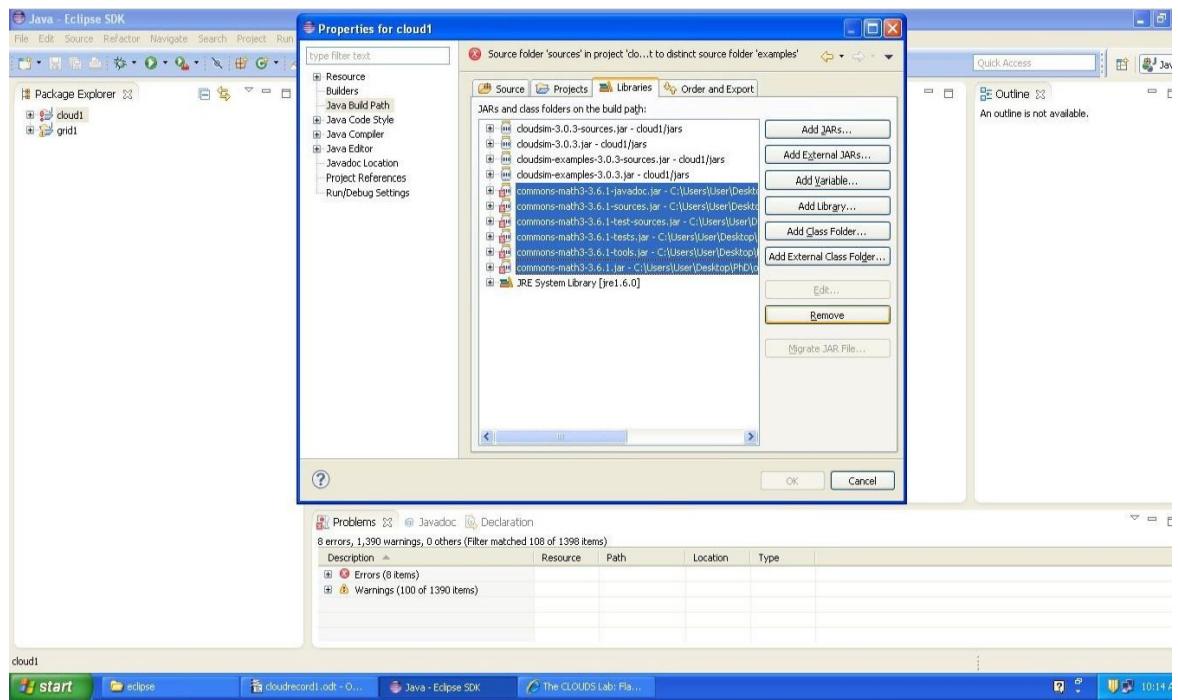
9. Then Select the CloudSim folder



10. Click **Finish** Button

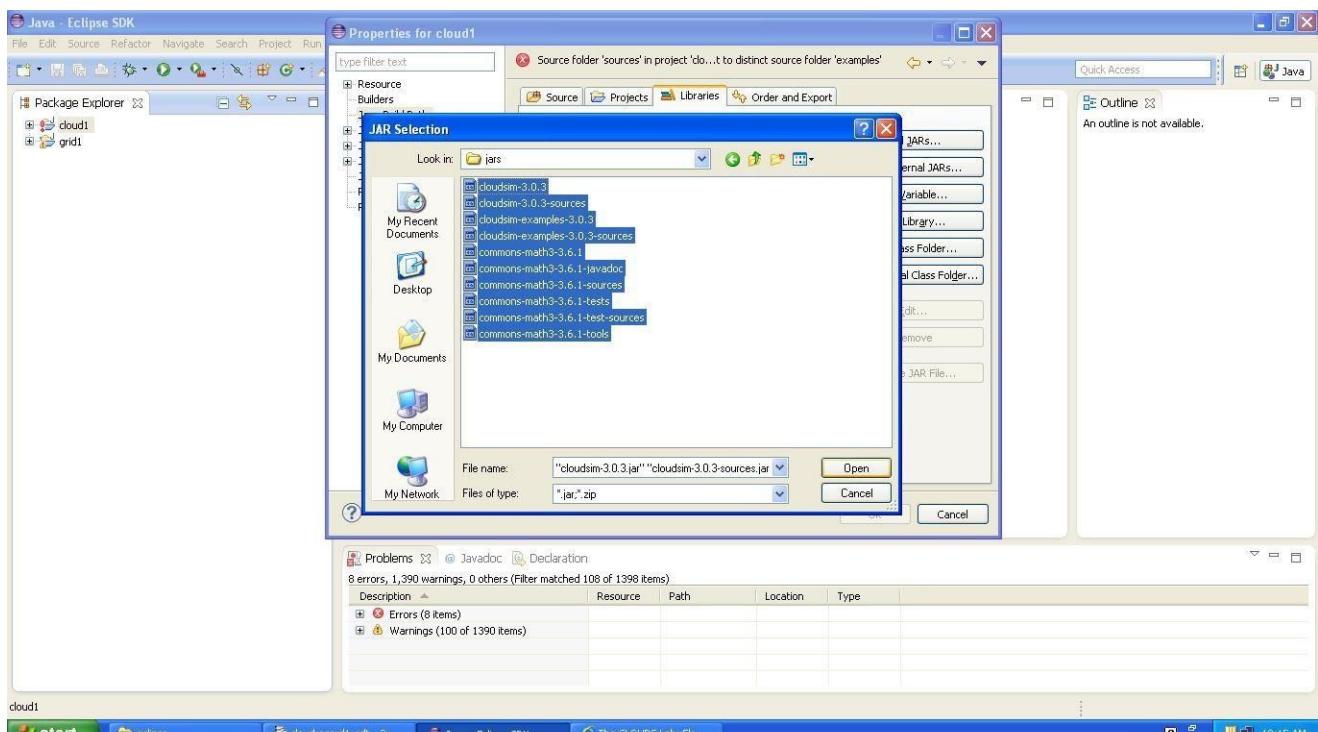


11. Click **yes to All** to import
12. Right Click the project in project explorer and click **properties**
13. Click on **Java Build Path** and then **libraries** tab
14. Remove Error showing Jar files

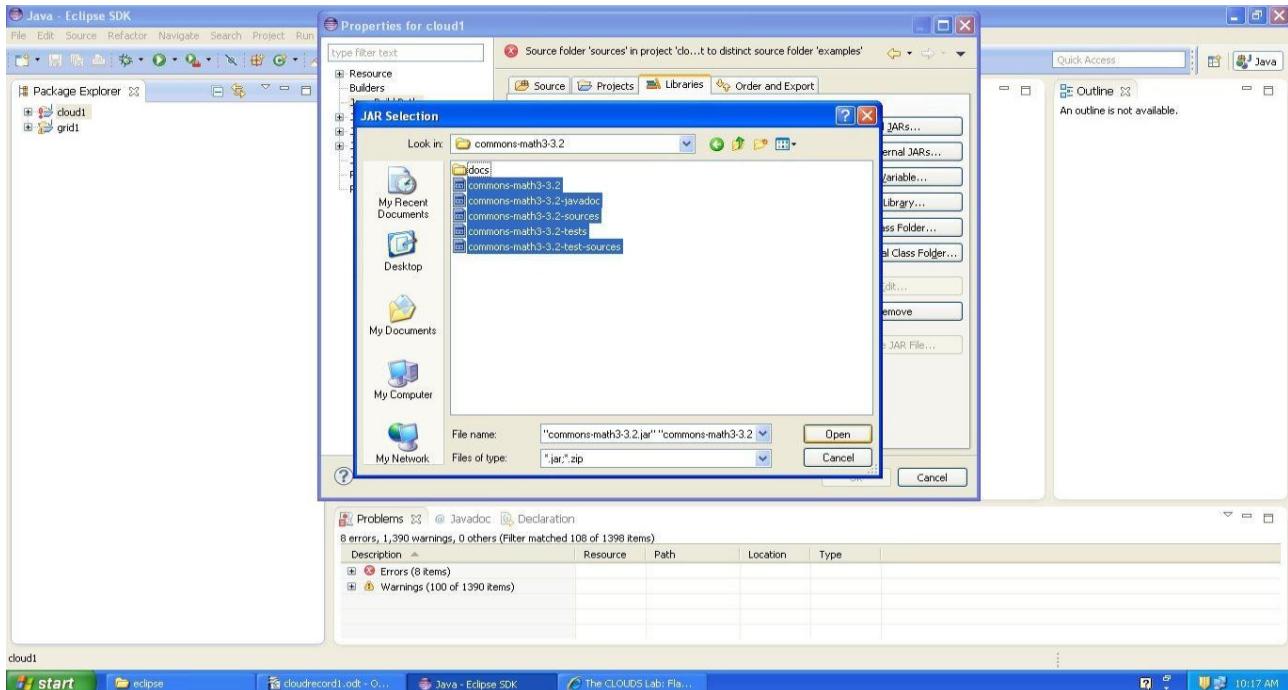


15. Click on Add External Jars

16. Browse and Select all the jar files within CloudSim folder → jars



17. Again Click on Add External Jars to include common math jars



18. It will show Error. Click on Source tab and followed by **Browse** button

19. Click on Create New Folder

20. Give folder name (for instance, output)

21. Click OK and again click OK

22. Expand the project and Navigate into

cloud1 → examples → org.cloudbus.cloudSim.examples →
CloudSimExample1.java

23. Open the source code by double clicking the CloudSimExample1.java

Java code:

A simple program showing how to create a datacenter with two hosts and run two cloudlets on it.

The cloudlets run in VMs with different MIPS requirements. The cloudlets will take different time to complete the execution depending on the requested VM performance.

Source Code:

```
package org.cloudbus.cloudsim.examples;import  
java.text.DecimalFormat;
```

```

import java.util.ArrayList; import
java.util.Calendar; import
java.util.LinkedList;import
java.util.List;

import org.cloudbus.cloudsim.Cloudlet;
import org.cloudbus.cloudsim.CloudletSchedulerTimeShared;import
org.cloudbus.cloudsim.Datacenter;
import org.cloudbus.cloudsim.DatacenterBroker;
import org.cloudbus.cloudsim.DatacenterCharacteristics;
import org.cloudbus.cloudsim.Host;
import org.cloudbus.cloudsim.Log; import
org.cloudbus.cloudsim.Pe; import
org.cloudbus.cloudsim.Storage;
import org.cloudbus.cloudsim.UtilizationModel; import
org.cloudbus.cloudsim.UtilizationModelFull;import
org.cloudbus.cloudsim.Vm;
import org.cloudbus.cloudsim.VmAllocationPolicySimple;
import org.cloudbus.cloudsim.VmSchedulerTimeShared;
import org.cloudbus.cloudsim.core.CloudSim;
import org.cloudbus.cloudsim.provisioners.BwProvisionerSimple;
import org.cloudbus.cloudsim.provisioners.PeProvisionerSimple;
import org.cloudbus.cloudsim.provisioners.RamProvisionerSimple;
public class CloudSimExample3 {

/** The cloudlet list. */
private static List<Cloudlet> cloudletList;
/** The vmlist. */
private static List<Vm> vmlist;
/**
 * Creates main() to run this example
 */
public static void main(String[] args) {
Log.printLine("Starting CloudSimExample3...");try {
// First step: Initialize the CloudSim package. It should be called

```

```

// before creating any entities.

int num_user = 1; // number of cloud users
Calendar calendar = Calendar.getInstance();

boolean trace_flag = false; // mean trace events
// Initialize the CloudSim library
CloudSim.init(num_user, calendar, trace_flag);

// Second step: Create Datacenters

//Datacenters are the resource providers in CloudSim. We need at least one of
them to run a CloudSim simulation

@SuppressWarnings("unused")

Datacenter datacenter0 = createDatacenter("Datacenter_0");//Third step: Create Broker
DatacenterBroker broker = createBroker();

int brokerId = broker.getId();

//Fourth step: Create one virtual machinevmlist
= new ArrayList<Vm>();

//VM descriptionint vmid =
0;

int mips = 250;

long size = 10000; //image size (MB)int ram
= 2048; //vm memory (MB) long bw = 1000;

int pesNumber = 1; //number of cpusString
vmm = "Xen"; //VMM name

//create two VMs

Vm vm1 = new Vm(vmid, brokerId, mips, pesNumber, ram, bw, size,
vmm, new CloudletSchedulerTimeShared());

//the second VM will have twice the priority of VM1 and so will receive
twice CPU time

vmid++;

Vm vm2 = new Vm(vmid, brokerId, mips * 2, pesNumber, ram, bw, size,
vmm, new CloudletSchedulerTimeShared());

//add the VMs to the vmlist
vmlist.add(vm1); vmlist.add(vm2);

```

```

//submit vm list to the broker
broker.submitVmList(vmlist);

//Fifth step: Create two Cloudlets cloudletList =
new ArrayList<Cloudlet>();

//Cloudlet properties int id = 0;
long length = 40000; long
fileSize = 300; long outputSize
= 300;
UtilizationModel utilizationModel = new UtilizationModelFull();Cloudlet cloudlet1 = new
Cloudlet(id, length, pesNumber, fileSize,
outputSize, utilizationModel, utilizationModel, utilizationModel);
cloudlet1.setUserId(brokerId);

id++;

Cloudlet cloudlet2 = new Cloudlet(id, length, pesNumber, fileSize,
outputSize, utilizationModel, utilizationModel, utilizationModel);
cloudlet2.setUserId(brokerId);

//add the cloudlets to the list
cloudletList.add(cloudlet1);

cloudletList.add(cloudlet2);
//submit cloudlet list to the broker
broker.submitCloudletList(cloudletList);

//bind the cloudlets to the vms. This way, the broker
// will submit the bound cloudlets only to the specific VM
broker.bindCloudletToVm(cloudlet1.getCloudletId(),vm1.getId());
broker.bindCloudletToVm(cloudlet2.getCloudletId(),vm2.getId());

// Sixth step: Starts the simulation
CloudSim.startSimulation();

// Final step: Print results when simulation is over
List<Cloudlet> newList = broker.getCloudletReceivedList();
CloudSim.stopSimulation();

printCloudletList(newList);
Log.println("CloudSimExample3 finished!");
}

```

```

        catch (Exception e) {
            e.printStackTrace();
        }
    }

    private static Datacenter createDatacenter(String name){
        // Here are the steps needed to create a PowerDatacenter:
        // 1. We need to create a list to store
        // our machine

        List<Host> hostList = new ArrayList<Host>(); // 2. A Machine contains one or more PEs or
        CPUs/Cores.

        // In this example, it will have only one core.
        List<Pe> peList = new ArrayList<Pe>();

        int mips = 1000;
        // 3. Create PEs and add these into a list.

        peList.add(new Pe(0, new PeProvisionerSimple(mips))); // need to store Pe id andMIPS
        Rating

        //4. Create Hosts with its id and list of PEs and add them to the list of machines
        int hostId=0;

        int ram = 2048; //host memory (MB)
        long storage = 1000000; //host storage
        int bw = 10000;

        hostList.add(new Host(
            hostId,
            new RamProvisionerSimple(ram),new
            BwProvisionerSimple(bw), storage,
            peList,
            new VmSchedulerTimeShared(peList)
        ));
        // This is our first machine

        //create another machine in the Data center
        List<Pe> peList2 = new ArrayList<Pe>();
    }
}

```

```

peList2.add(new Pe(0, new PeProvisionerSimple(mips)));
hostId++;
hostList.add(new Host(
hostId,
new RamProvisionerSimple(ram),new
BwProvisionerSimple(bw), storage,
peList2,
new VmSchedulerTimeShared(peList2)
);
}); // This is our second machine// 5. Create a DatacenterCharacteristics object that stores the
// properties of a data center: architecture, OS, list of
// Machines, allocation policy: time- or space-shared, time zone
// and its price (G$/Pe time unit).

String arch = "x86"; // system architectureString
os = "Linux";

// operating system String vmm =
"Xen"; double time_zone = 10.0;

// time zone this resource locateddouble
cost = 3.0;

// the cost of using processing in this resourcedouble
costPerMem = 0.05;

// the cost of using memory in this resourcedouble
costPerStorage = 0.001;

// the cost of using storage in this resourcedouble
costPerBw = 0.0;

// the cost of using bw in thisresource

LinkedList<Storage> storageList = new LinkedList<Storage>();
adding SAN devices by now

//we are not

DatacenterCharacteristics characteristics = new DatacenterCharacteristics(
arch, os, vmm, hostList, time_zone, cost, costPerMem, costPerStorage, costPerBw);

```

```

// 6. Finally, we need to create a PowerDatacenter object.
Datacenter datacenter = null;

try {
    datacenter = new Datacenter(name, characteristics, new
VmAllocationPolicySimple(hostList), storageList, 0);
} catch (Exception e) {
    e.printStackTrace();
}

return datacenter;
}

//We strongly encourage users to develop their own broker policies, to submit vms and
cloudlets according

//to the specific rules of the simulated scenario
private static DatacenterBroker createBroker(){
    DatacenterBroker broker = null;

    try {
        broker = new DatacenterBroker("Broker");
    } catch (Exception e) {
        e.printStackTrace(); return null;
    }

    return broker;
}

/**
 * Prints the Cloudlet objects
 * @param list list of Cloudlets
 */
private static void printCloudletList(List<Cloudlet> list) {int
size = list.size();

Cloudlet cloudlet; String
indent = " ";Log.printLine();

Log.printLine("===== OUTPUT =====");

Log.printLine("Cloudlet ID" + indent + "STATUS" + indent + "Data
center ID" + indent + "VM ID" + indent + "Time" + indent +"Start
Time" + indent + "Finish Time");

```

```

DecimalFormat dft = new DecimalFormat("###.##");for
(int i = 0; i < size; i++) {
    cloudlet = list.get(i);
    Log.print(indent + cloudlet.getCloudletId() + indent + indent);if
    (cloudlet.getCloudletStatus() == Cloudlet.SUCCESS){
        Log.print("SUCCESS");
        Log.newLine( indent + indent + cloudlet.getResourceId() + indent
        + indent + indent + cloudlet.getVmId() + indent
        + indent +
        dft.format(cloudlet.getActualCPUTime()) + indent + indent +
        dft.format(cloudlet.getExecStartTime())+
        indent + indent +
        dft.format(cloudlet.getFinishTime())));
    }
}
}
}
}

```

Output:

Starting CloudSimExample3...

Initialising...

Starting CloudSim version 3.0

Datacenter_0 is starting...

Broker is starting...

Entities started.

0.0: Broker: Cloud Resource List received with 1 resource(s)

. . . : Broker: Trying to Create VM #0 in Datacenter_0 0.0: Broker: Trying to Create VM #1
inDatacenter_0

.1 : Broker: VM #0 has been created in Datacenter #2, Host #0

0.1: Broker: VM #1 has been created in Datacenter #2, Host #1

0.1: Broker: Sending cloudlet 0 to VM #0

0.1: Broker: Sending cloudlet 1 to VM #1

80.1: Broker: Cloudlet 1 received

160.1: Broker: Cloudlet 0 received

160.1: Broker: All Cloudlets executed. Finishing...

160.1: Broker: Destroying VM #0

160.1: Broker: Destroying VM #1Broker
is shutting down...

Simulation: No more future events

CloudInformationService: Notify all CloudSim entities for shutting down.
Datacenter_0 is shutting down...

Broker is shutting down...

Simulation completed.

Simulation completed.

===== OUTPUT =====

Cloudlet IDSTATUS

Data center ID

1 SUCCESS 2 1 80

0 SUCCESS 2 0 160

VM ID Time0.1

0.1

Start Time Finish Time

80.1

160.1

CloudSimExample3 finished!

RESULT:

Thus, cloud is simulated in CloudSim Environment and the program is executed

PROCEDURE TO RUN A VIRTUAL MACHINE WITH DIFFERENT CONFIGURATION AND TO CHECK HOW MANY VIRTUAL MACHINES CAN BE UTILIZED AT A PARTICULAR TIME

EX.NO. : 3

DATE :

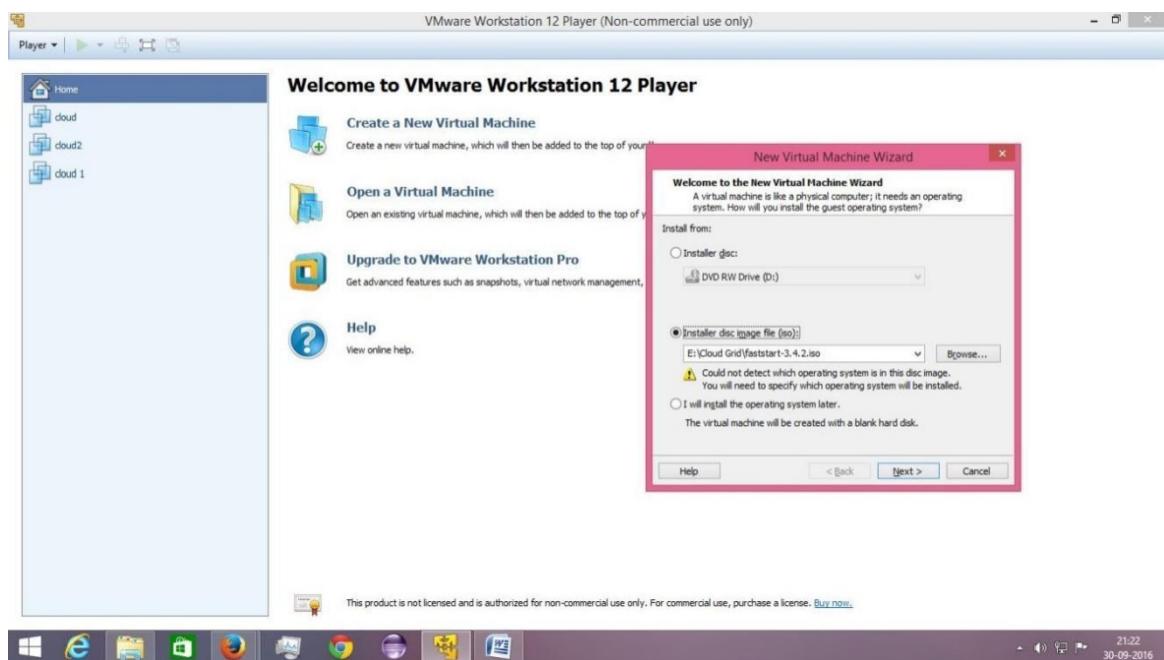
AIM:

Use Eucalyptus and to demonstrate the following and Find procedure to run the virtual machine of different configuration. Check how many virtual machines can be utilized at particular time.

PROCEDURE:

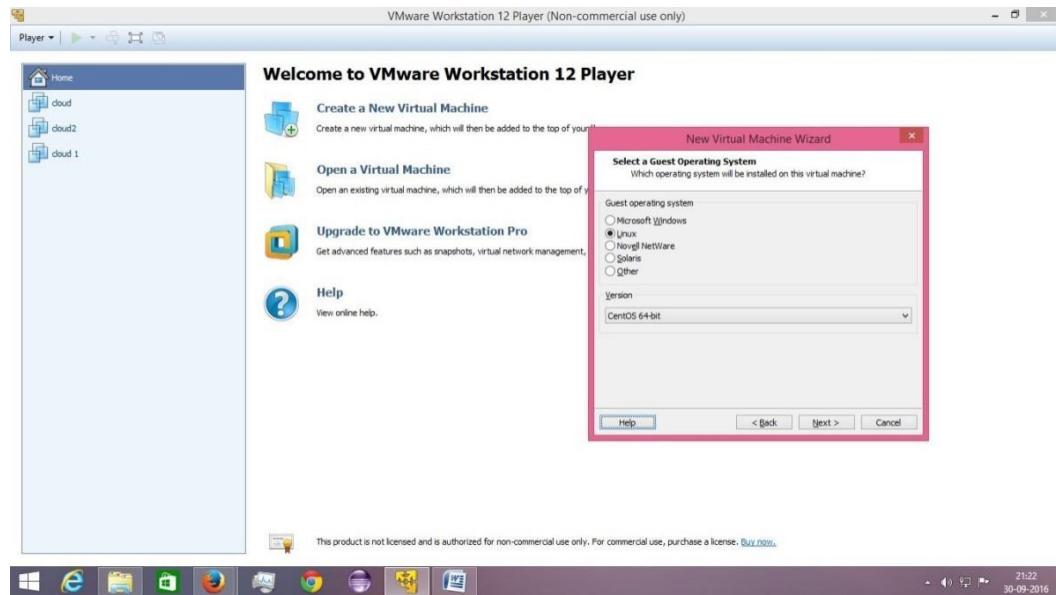
STEP 1:

- Install the virtual machine (vmware workstation 12)
- Click **create new virtual machine**.
- New virtual machine wizard dialog box appear, check the installer disk image file (iso). Browse the faststat1.3.4.2.iso file from the path **E:\Cloud Grid\faststat1.3.4.2.iso**
- Click **next**



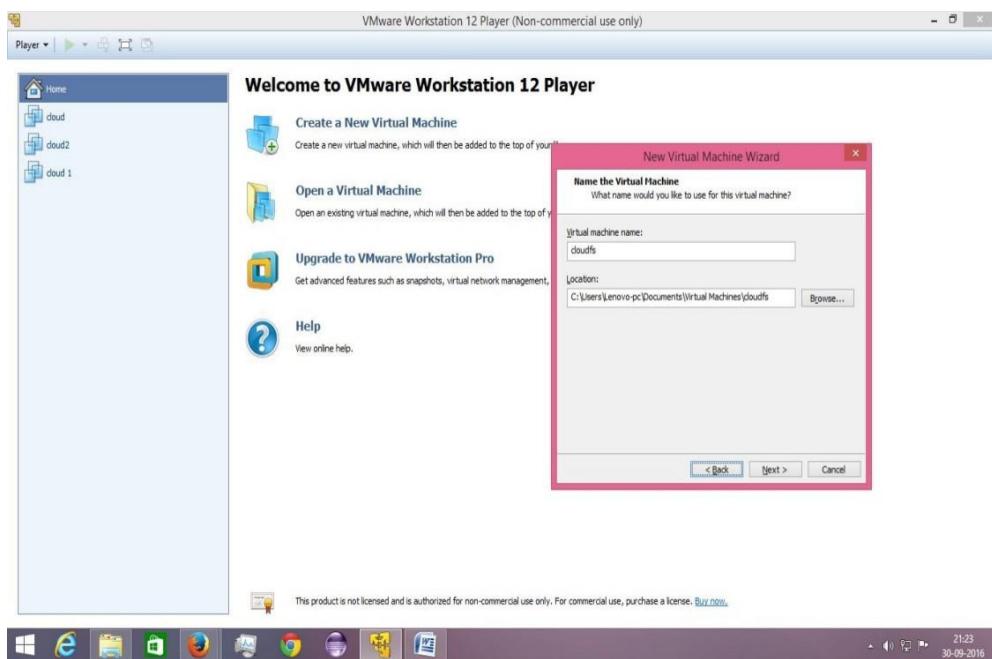
STEP 2:

- Select the **LINUX** operating system.
- Version: **CENTOS 64-bit**
- Click **next**



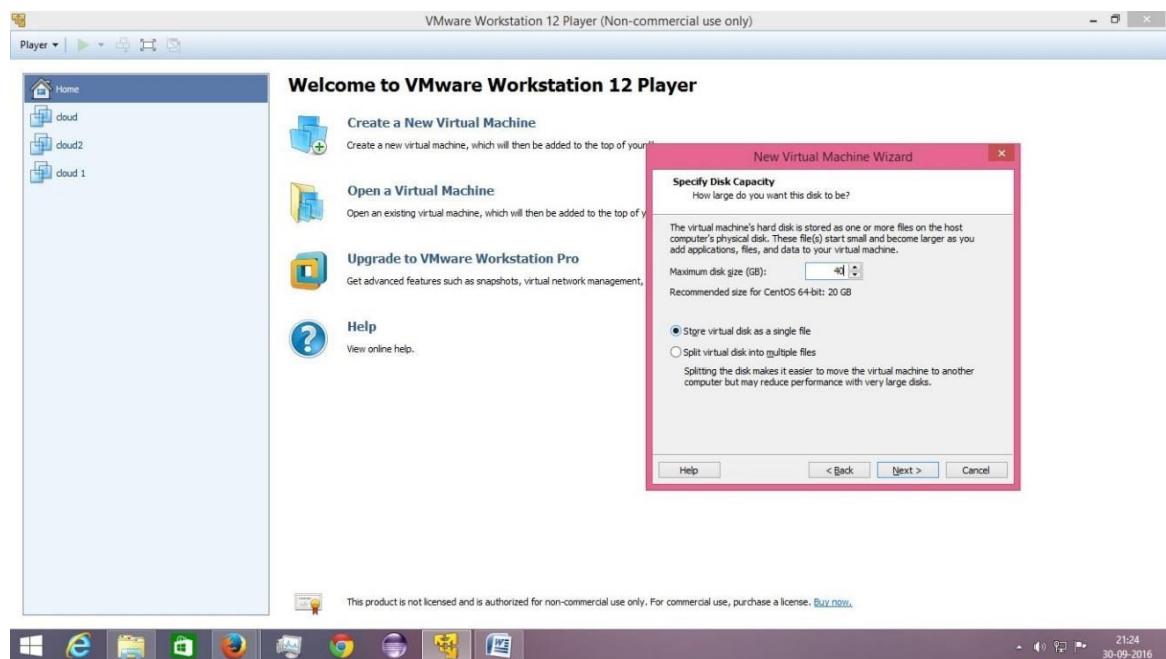
STEP 3:

- Create a virtual machine name as **cloud**(any name).
 - Browse the location for the virtual machine **E:\clougrid**
6. To make the folder, click
browse 2.select **E:**
3.Click make new folder
4.Give the name for folder



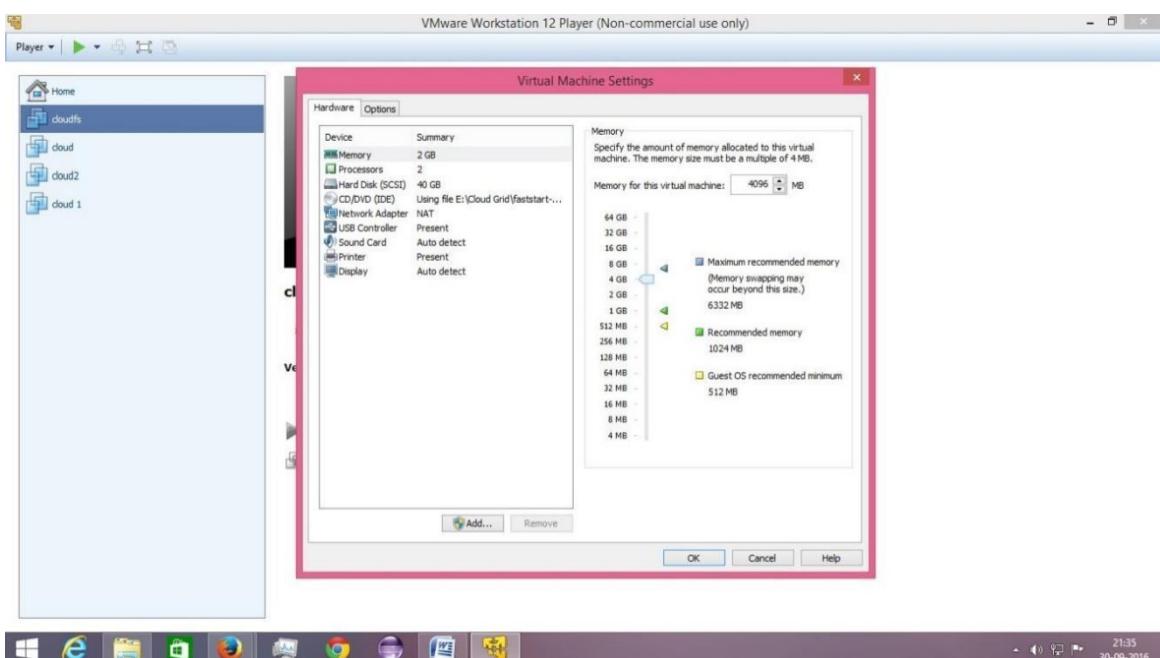
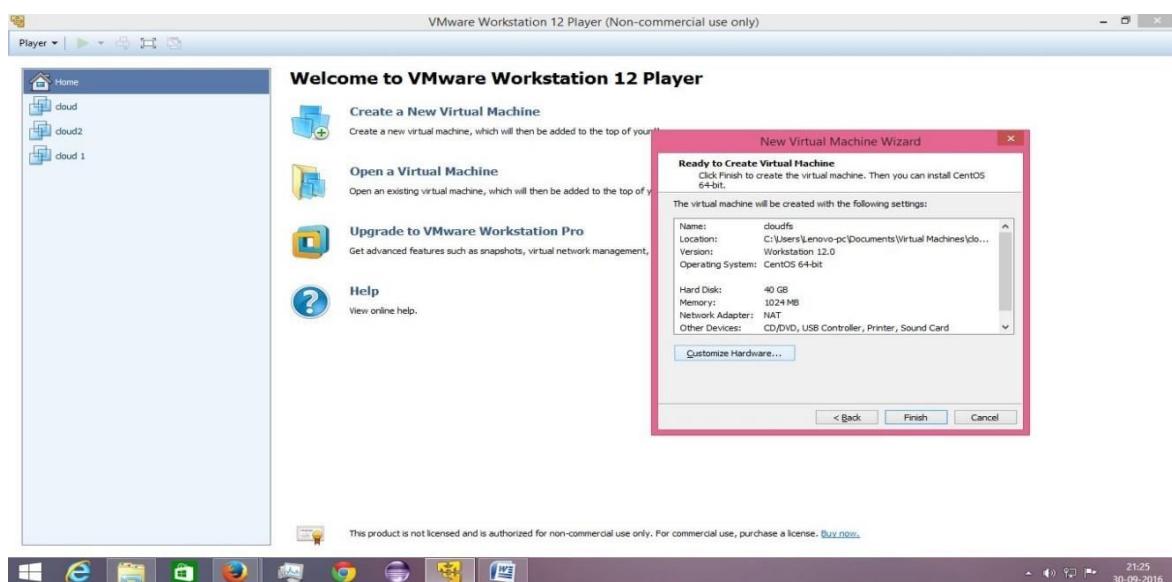
STEP 4:

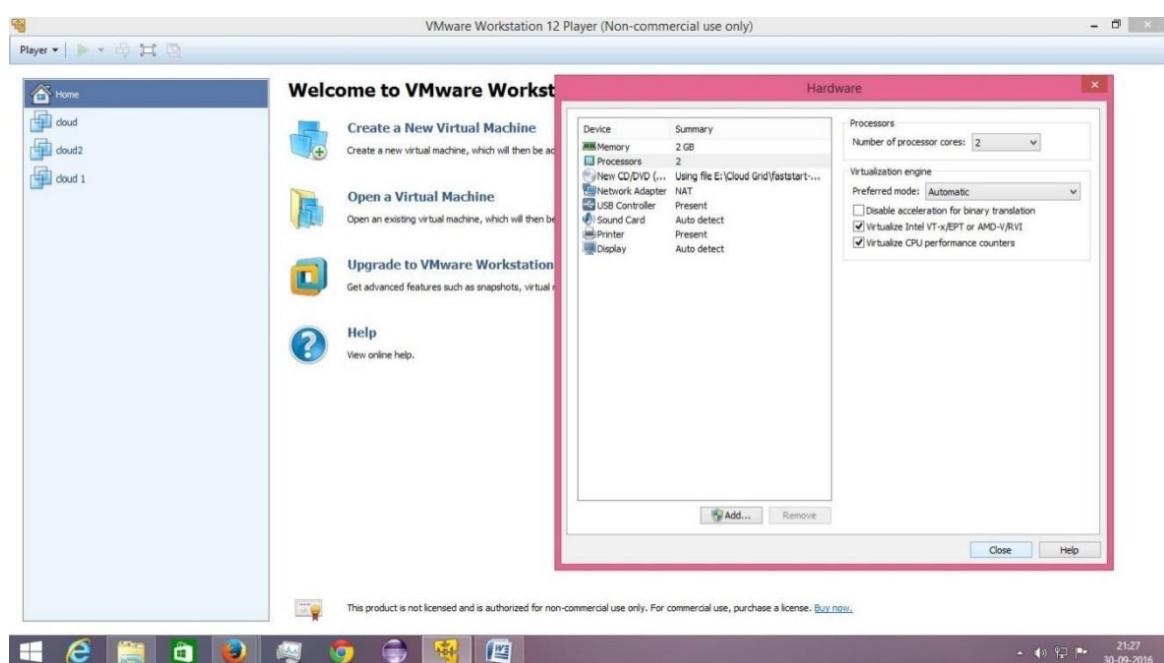
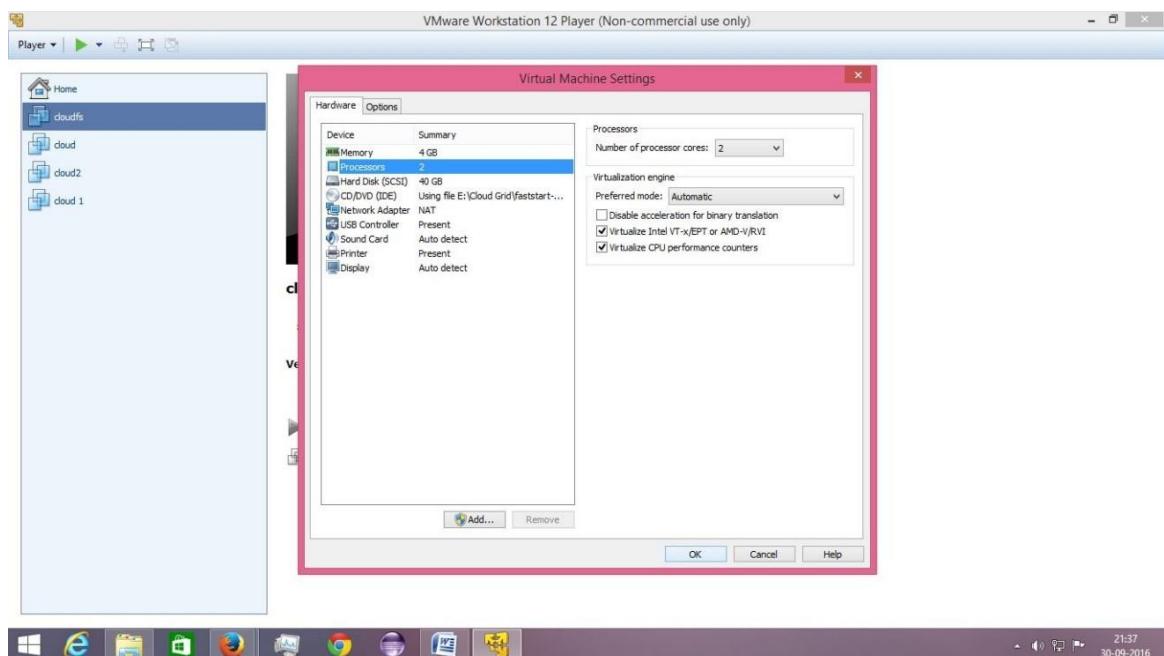
- Set maximum disk size as **40 GB**.
- Select the “**Store virtual disk as single file**”option.
- Click **next**



STEP 5:

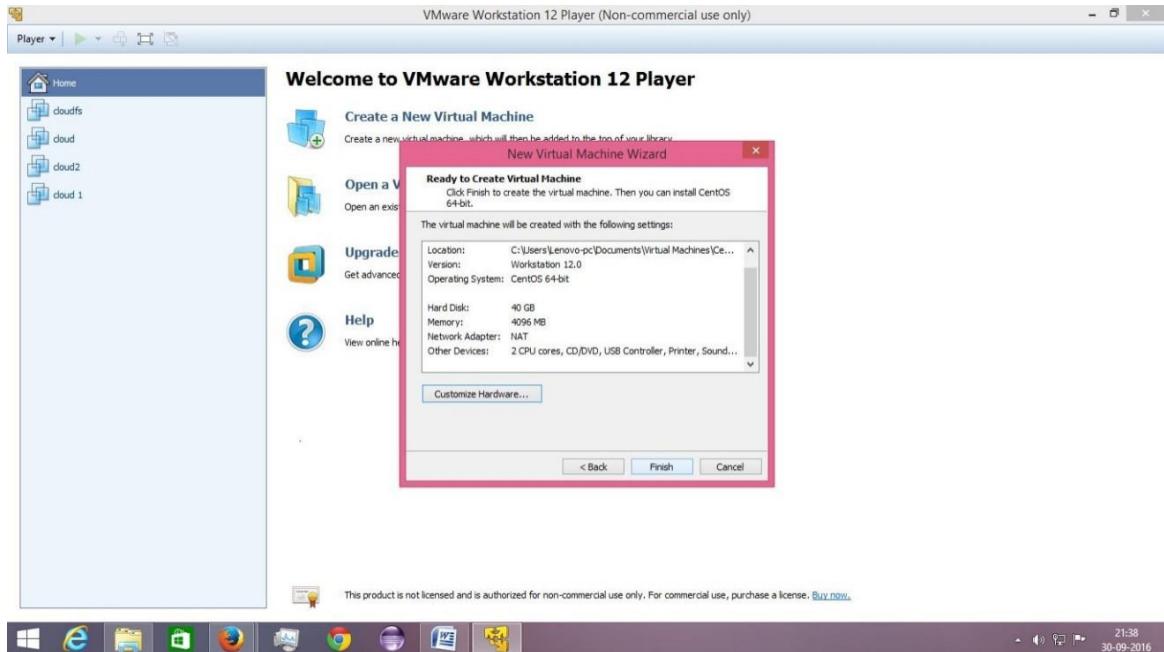
- Select the “**customize hardware option**”.
- Select Memory as **4GB**.
- Select number of processors as 2 and select the two options “**Virtualize Intel**” and “**Virtualize CPU**”.
- Click **close** when all changes are done.





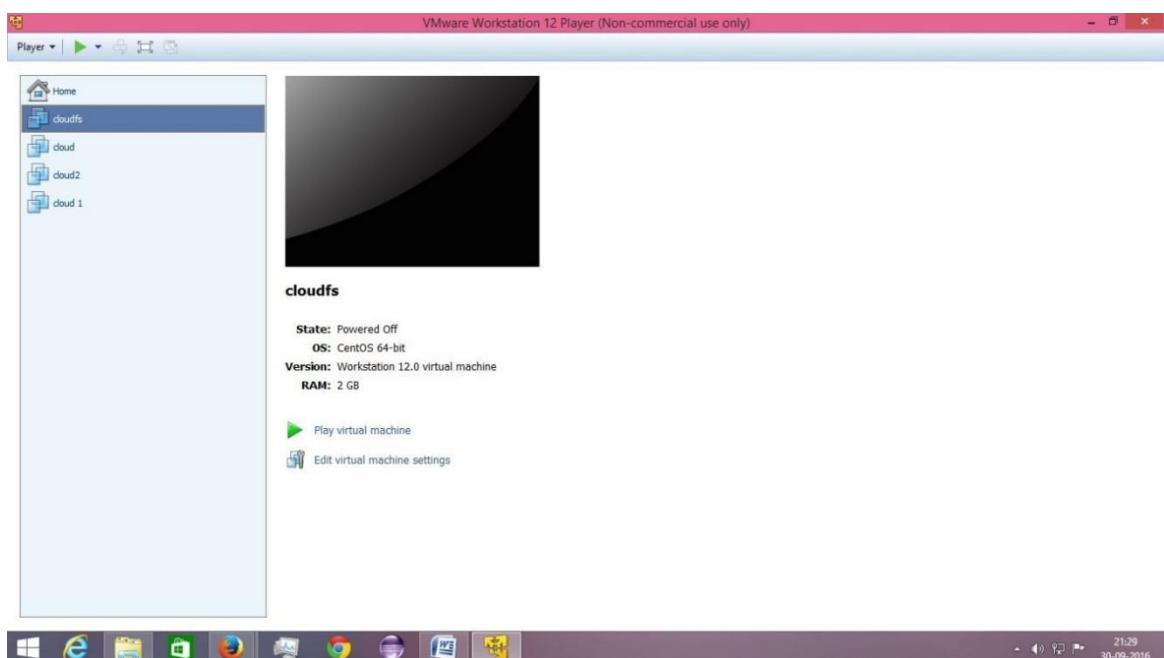
STEP 6:

1. Click "Finish" on the next Screen.



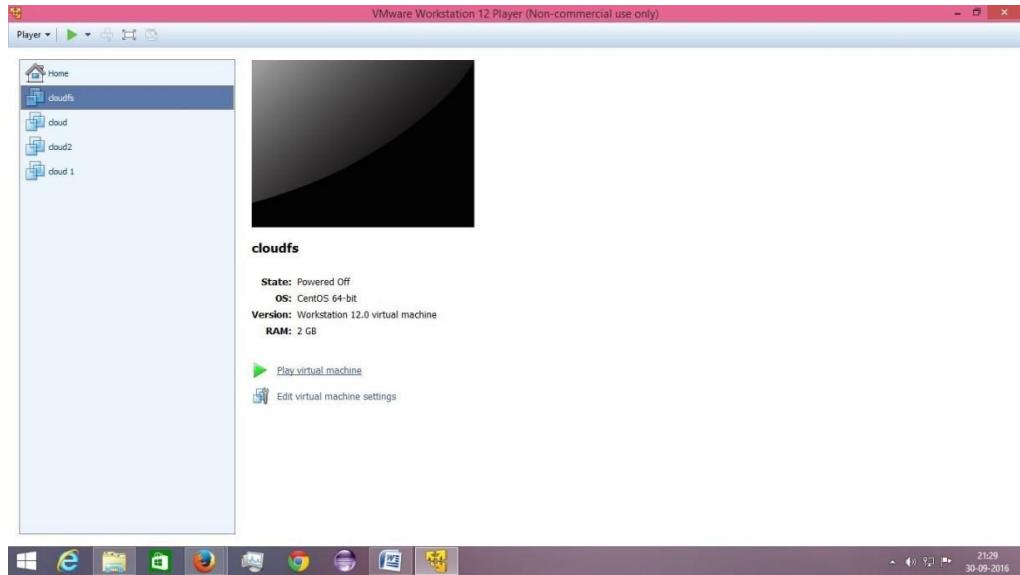
STEP 7:

- Select the recently created virtual image and click on "Play Virtual Machine"

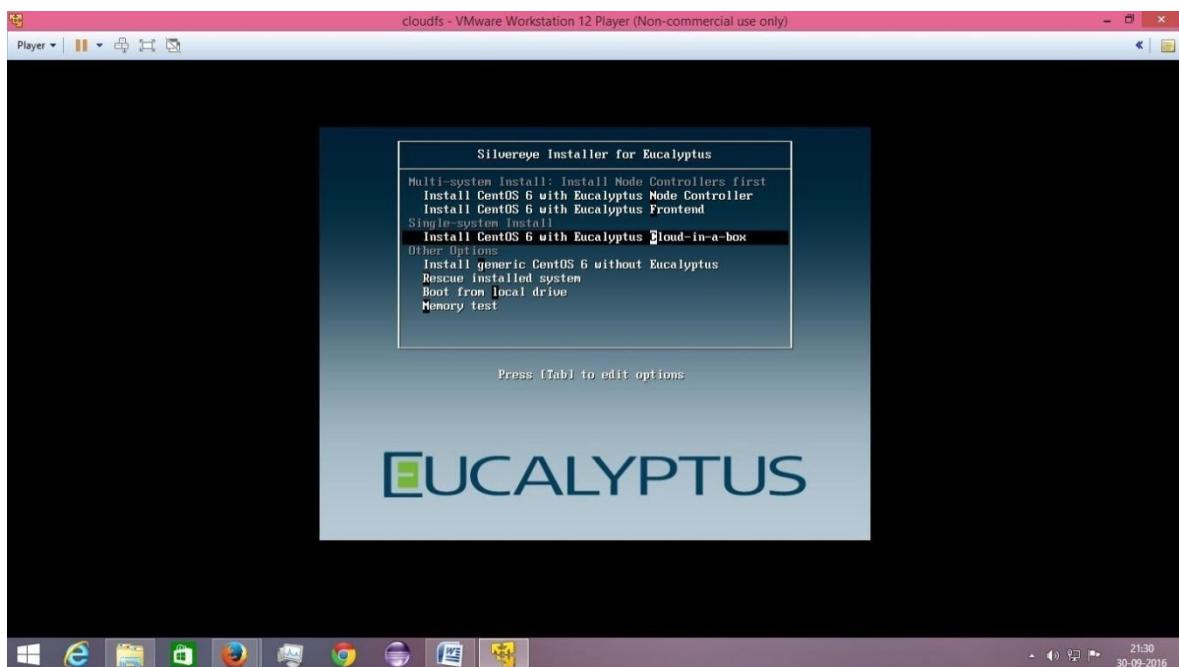


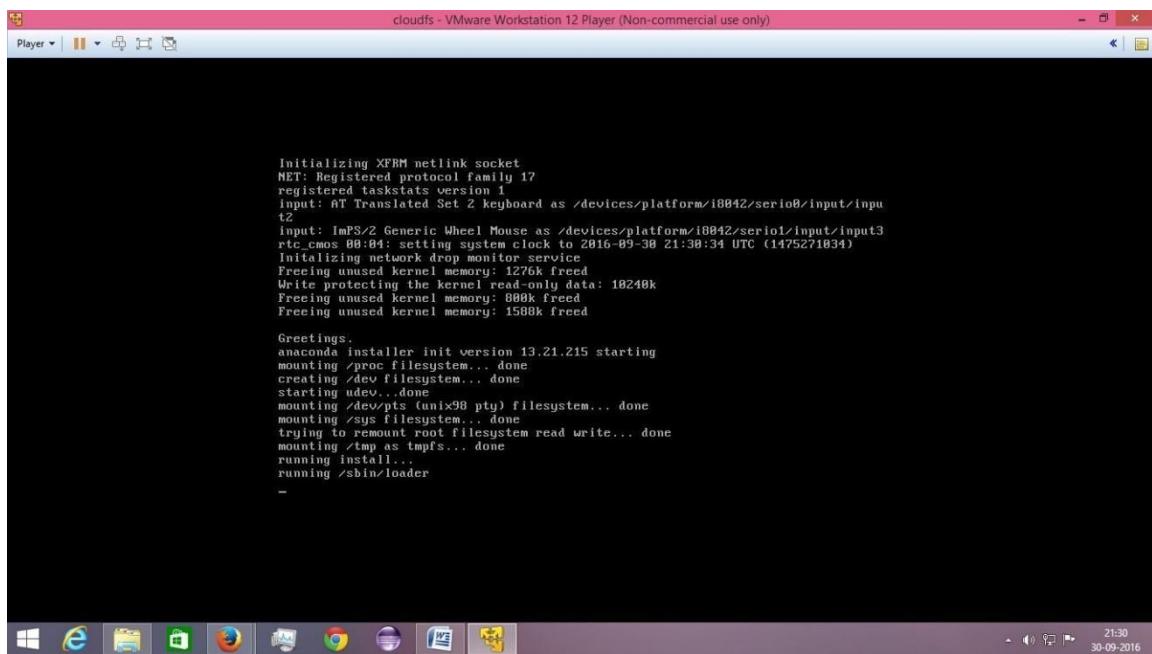
STEP 8:

- Click on "Install CentOS 6 with Eucalyptus Cloud-in-a-box".



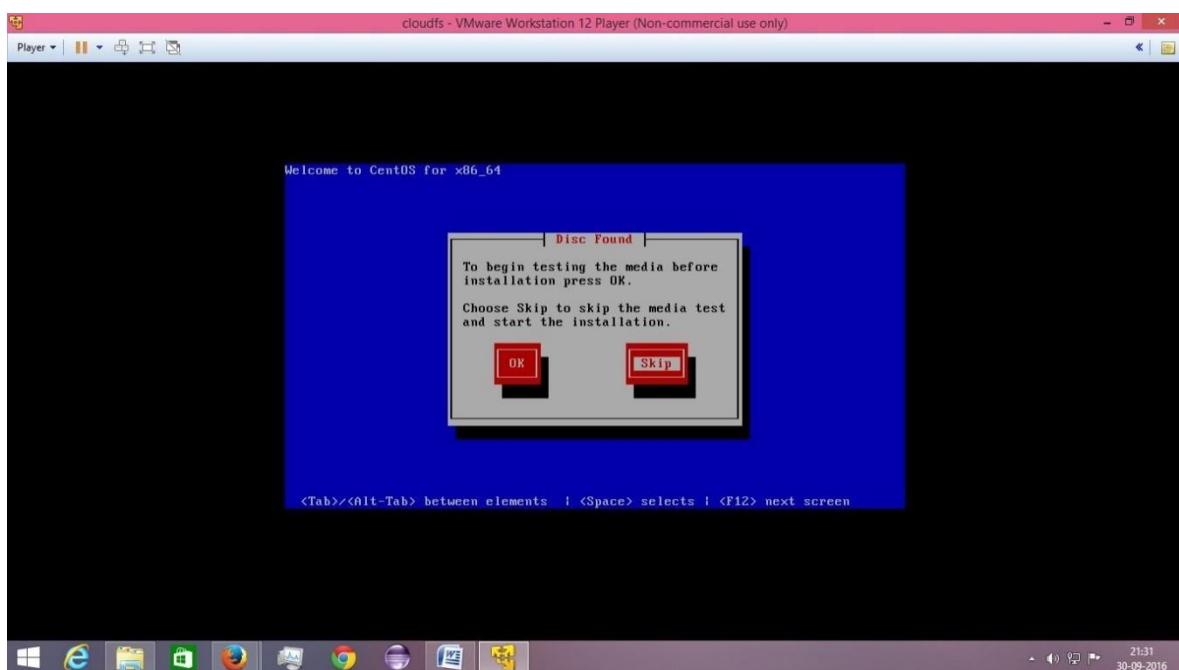
- Wait for it.

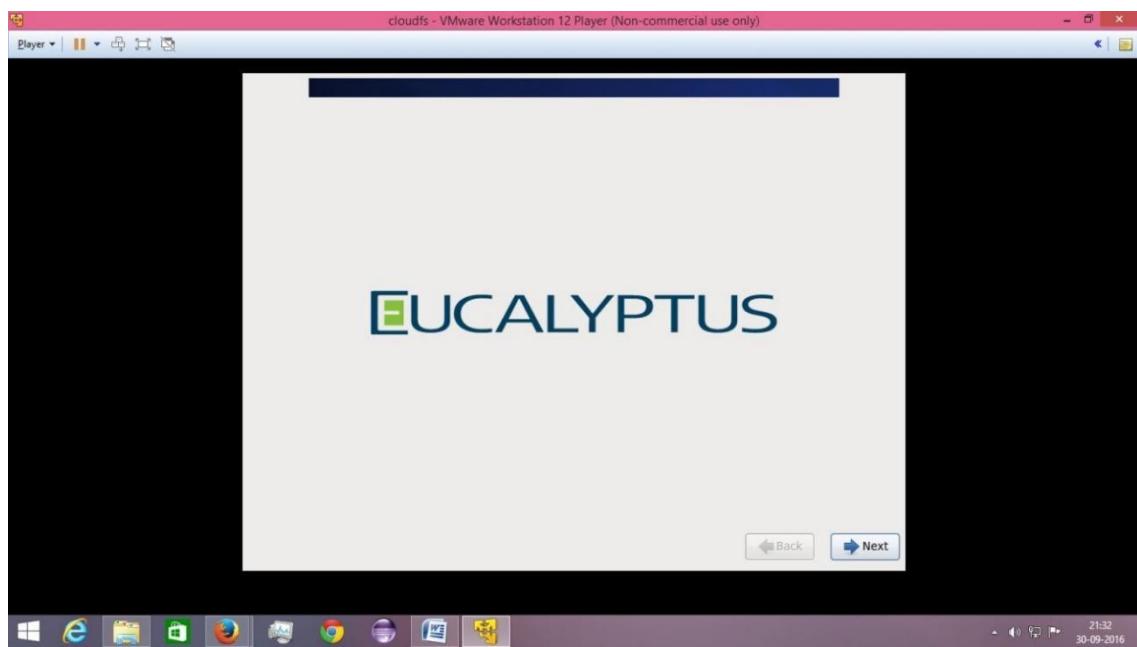


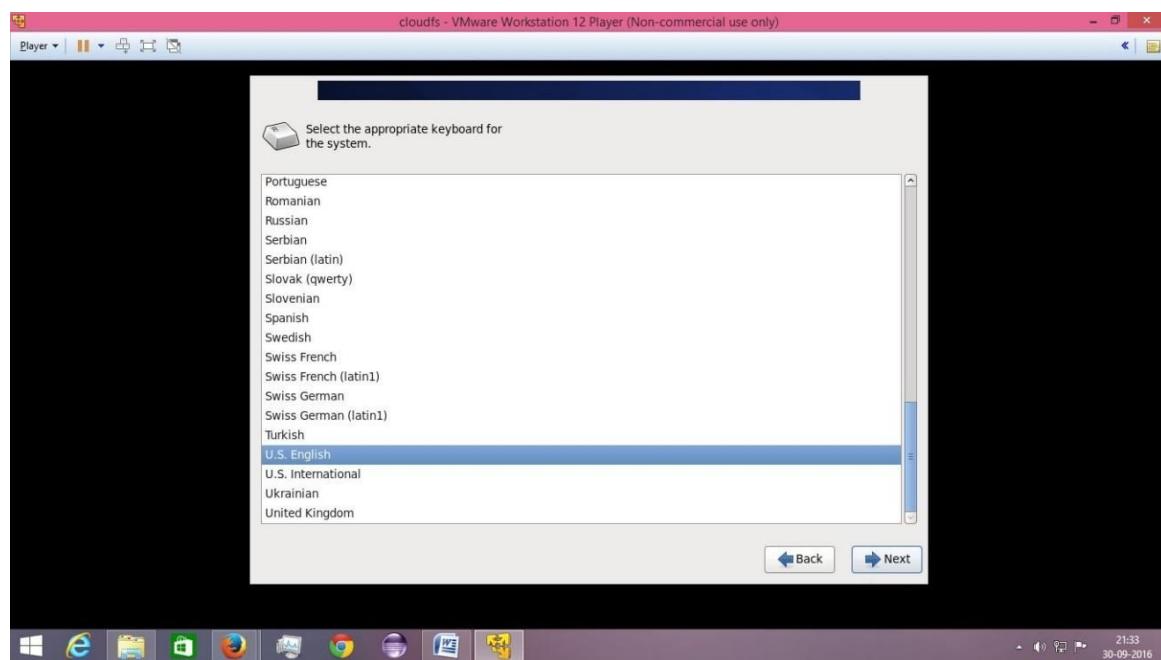
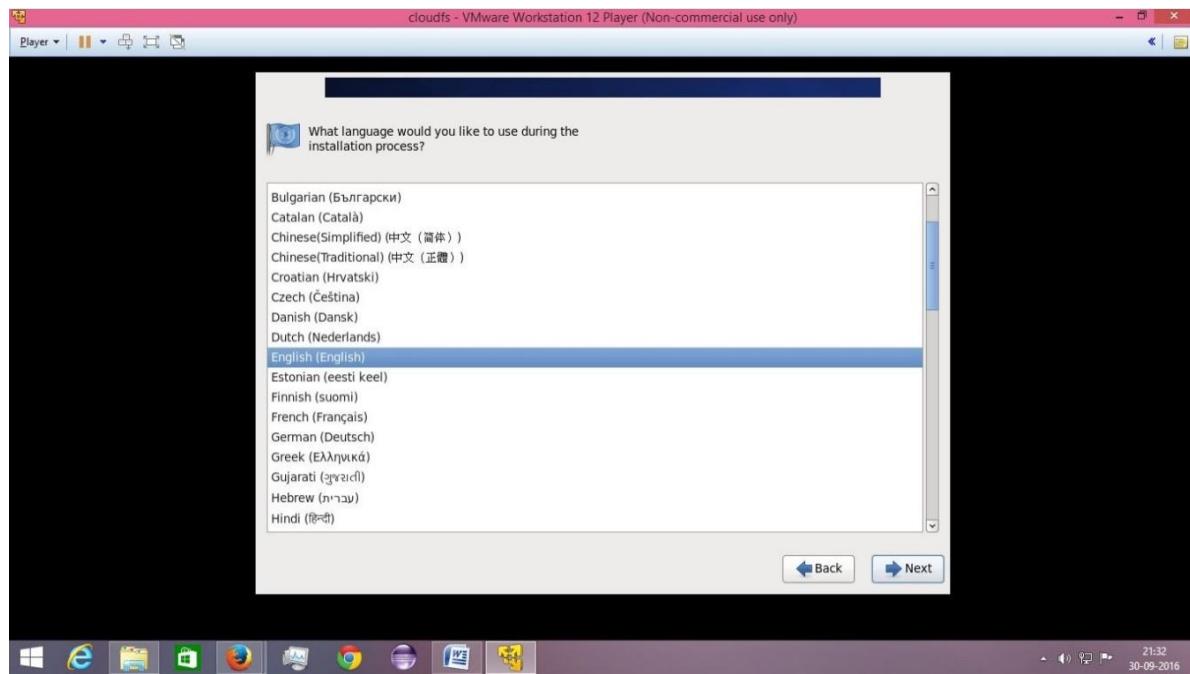


STEP 9:

- Click on "**Skip**" in the screen which asks for media test.

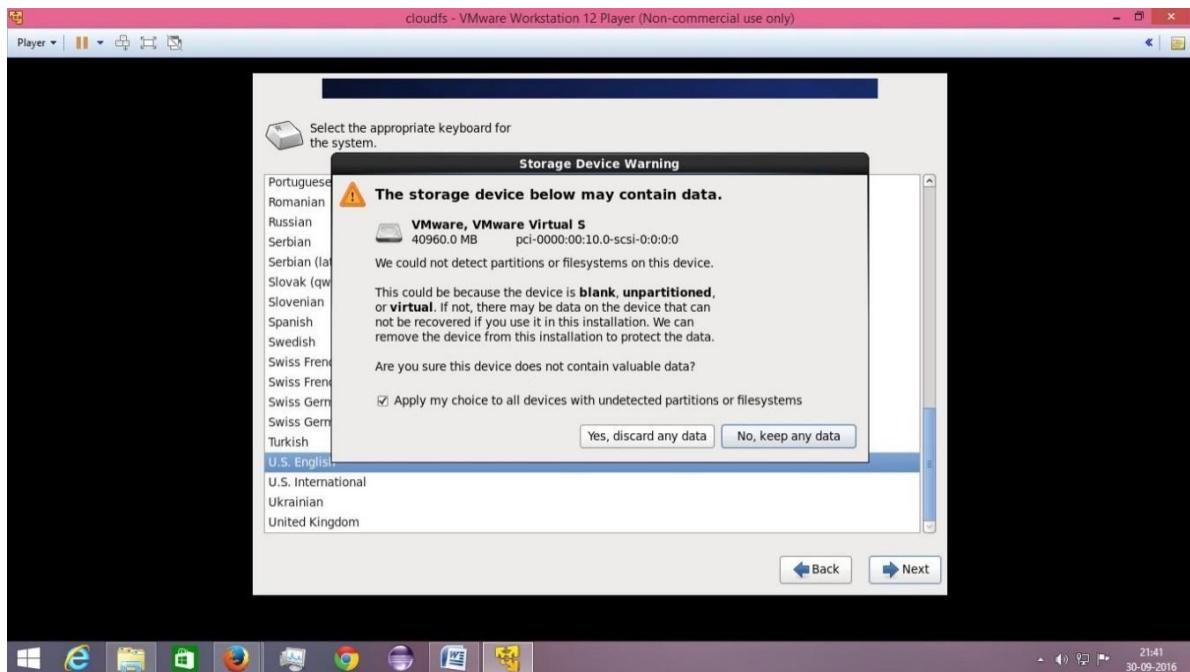






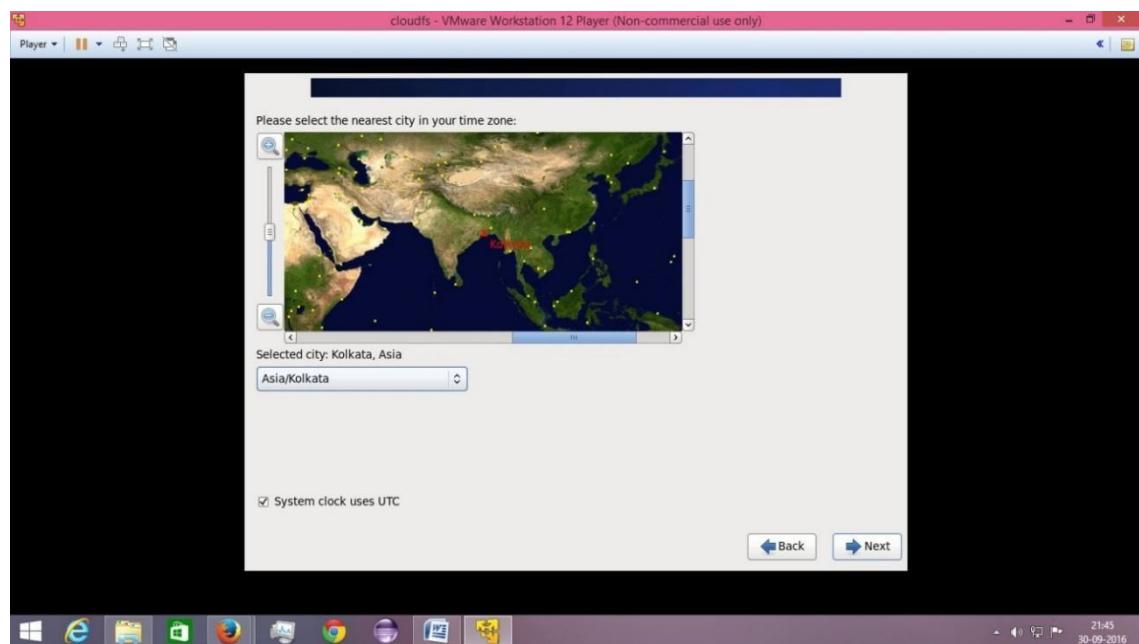
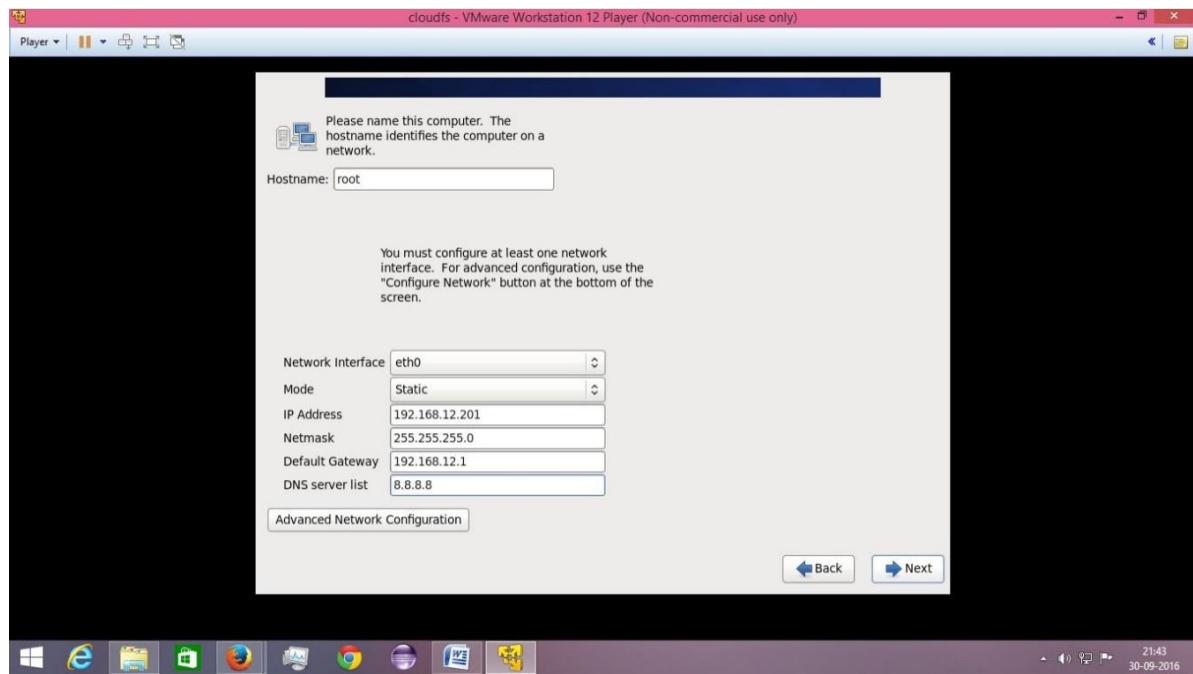
STEP 10:

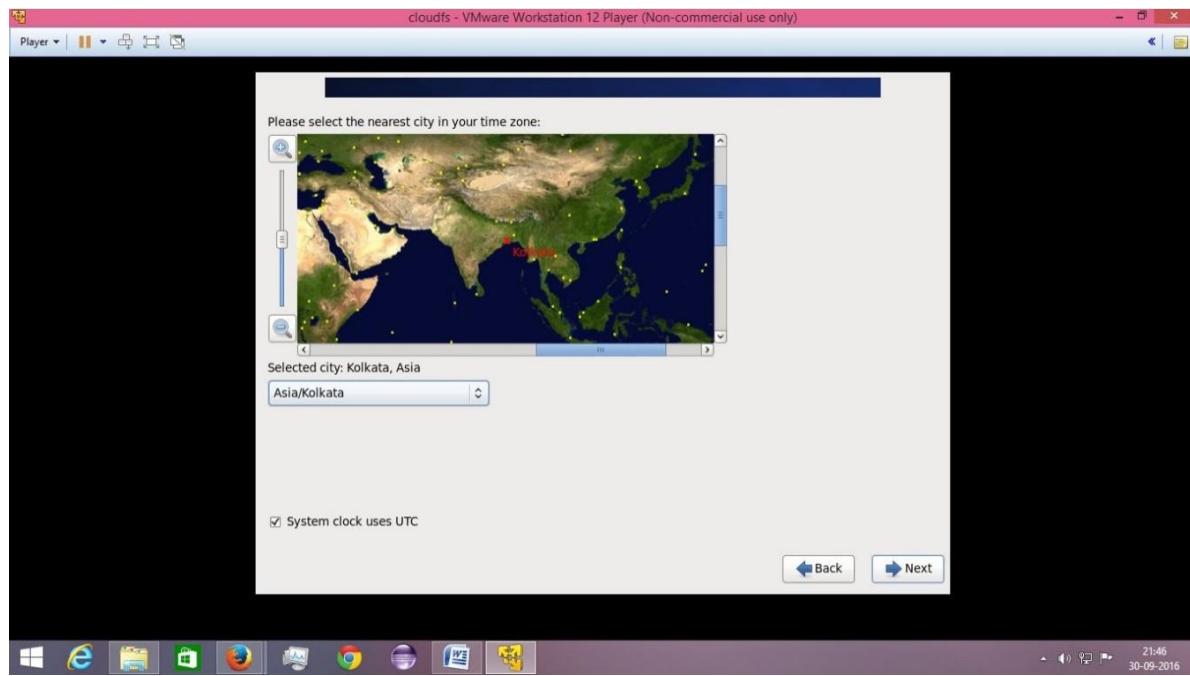
- Click On "**Next**" in the previous screens till you arrive at a **Storage Device Warning**.
- Click on "**Yes, Discard any data**".



STEP 11:

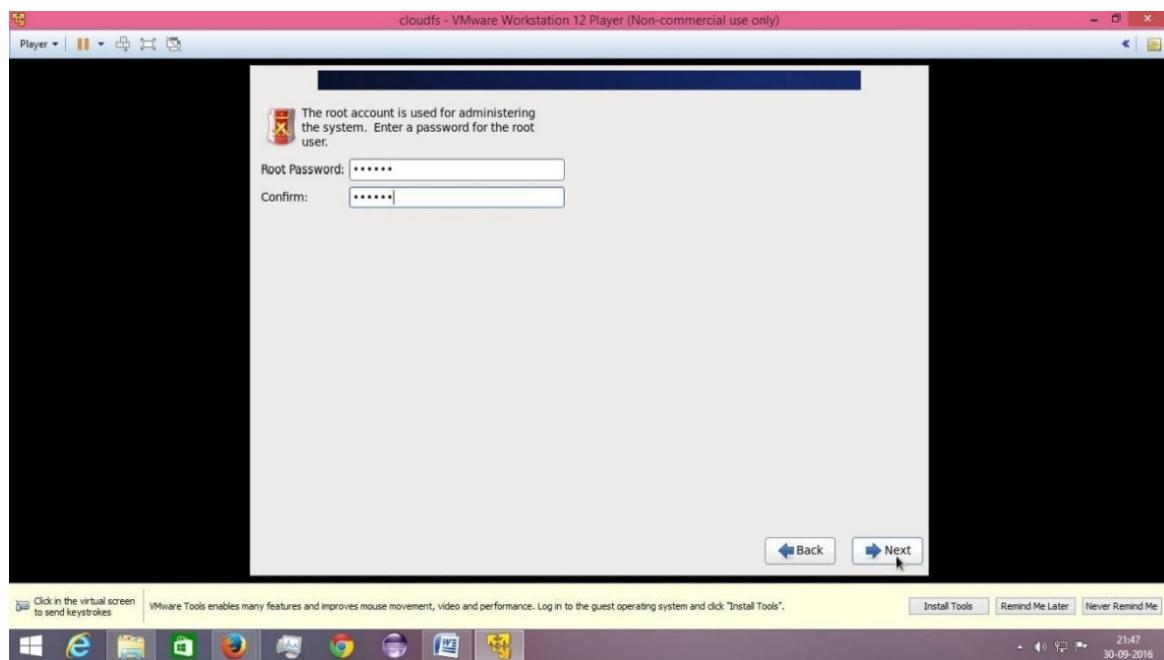
- Select hostname as "**root**".
- Select Network Interface as "**eth0**" and mode as "**Static**".
- Enter the IP Address as "**192.168.12.201**" and Netmask "**255.255.255.0**".
- Enter Default Gateway as "**192.168.12.1**" and DNS as "**8.8.8.8**".
- Click **Next**.
- Select city as "**Kolkota/Asia**".
- Click **Next**.

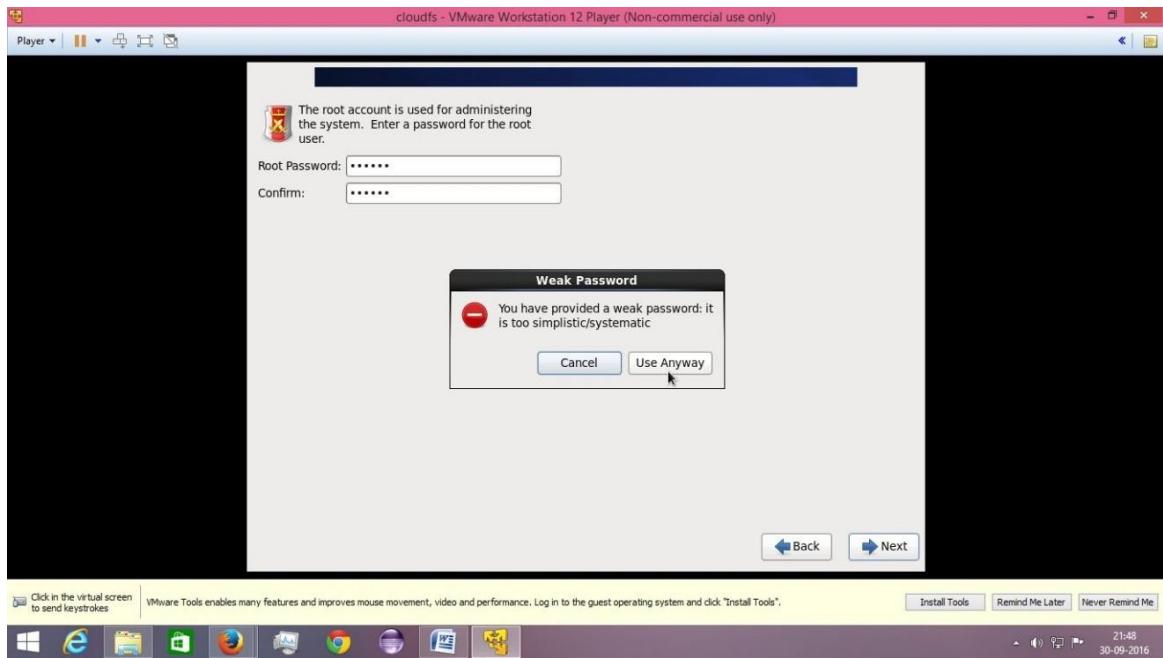




STEP 12:

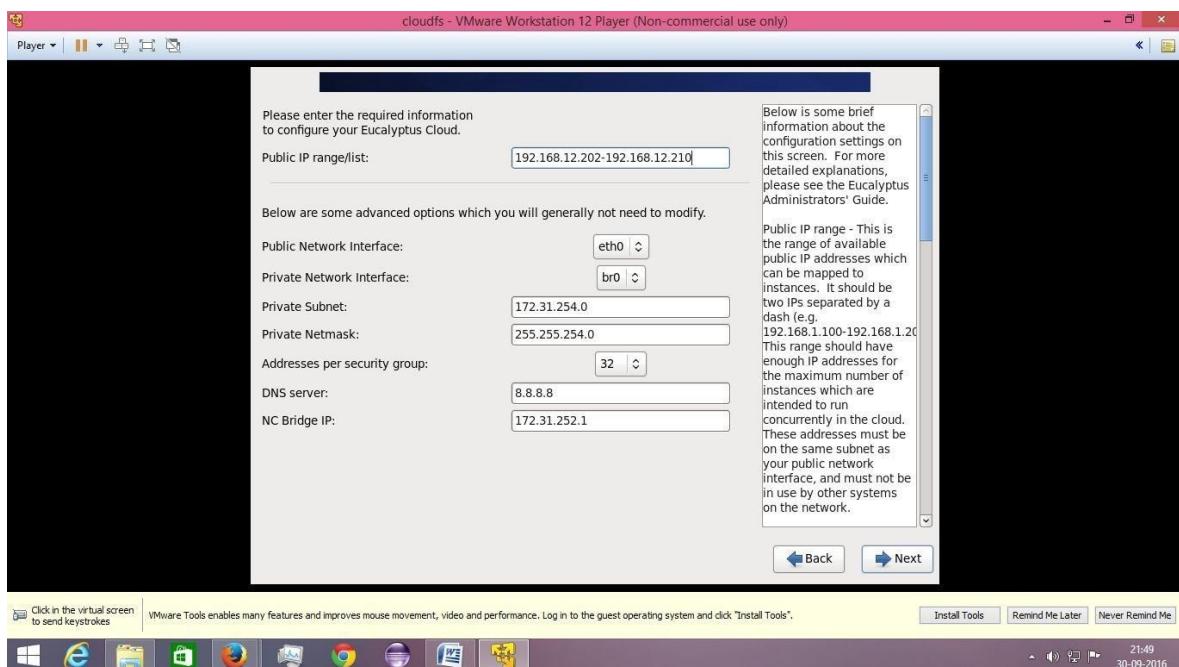
- Enter your **root password:123456** and click **Next**.
- Click on "**Use Anyway**".





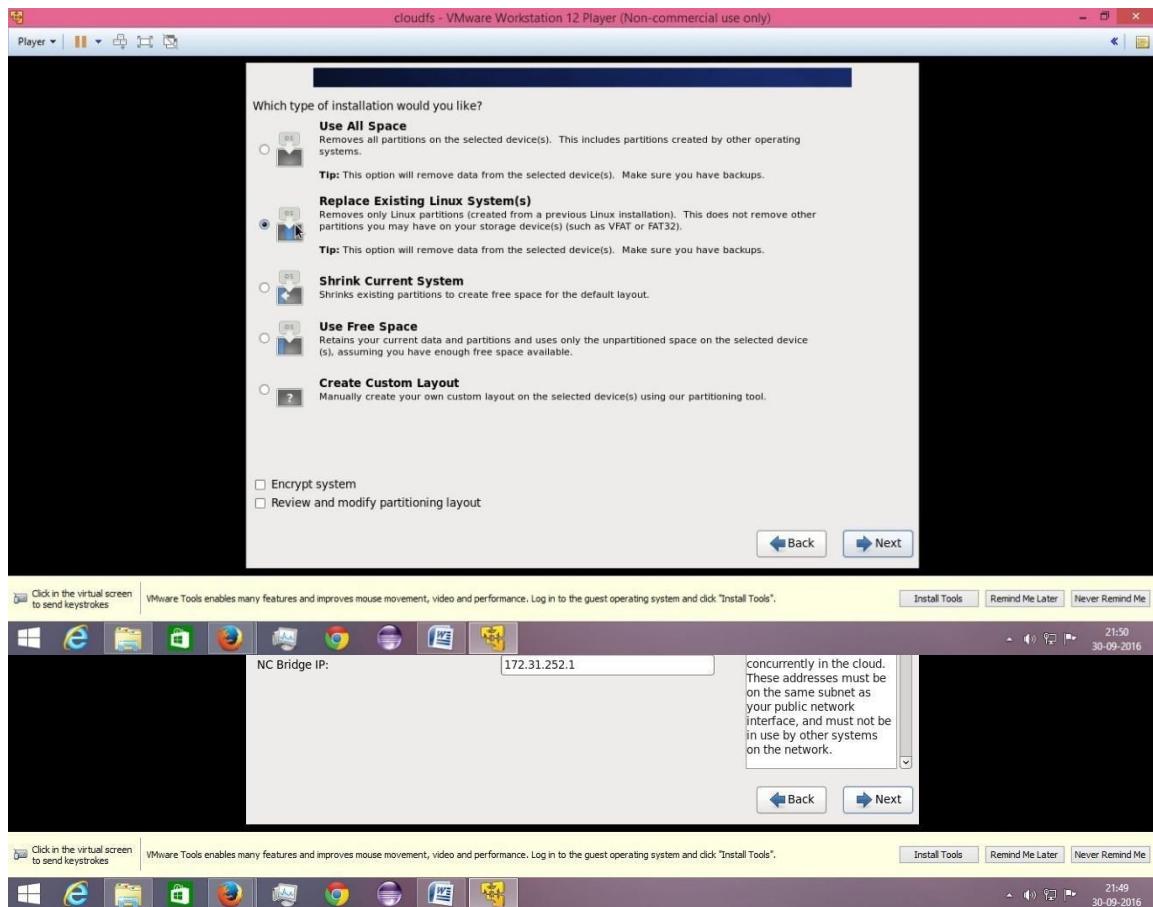
STEP 13:

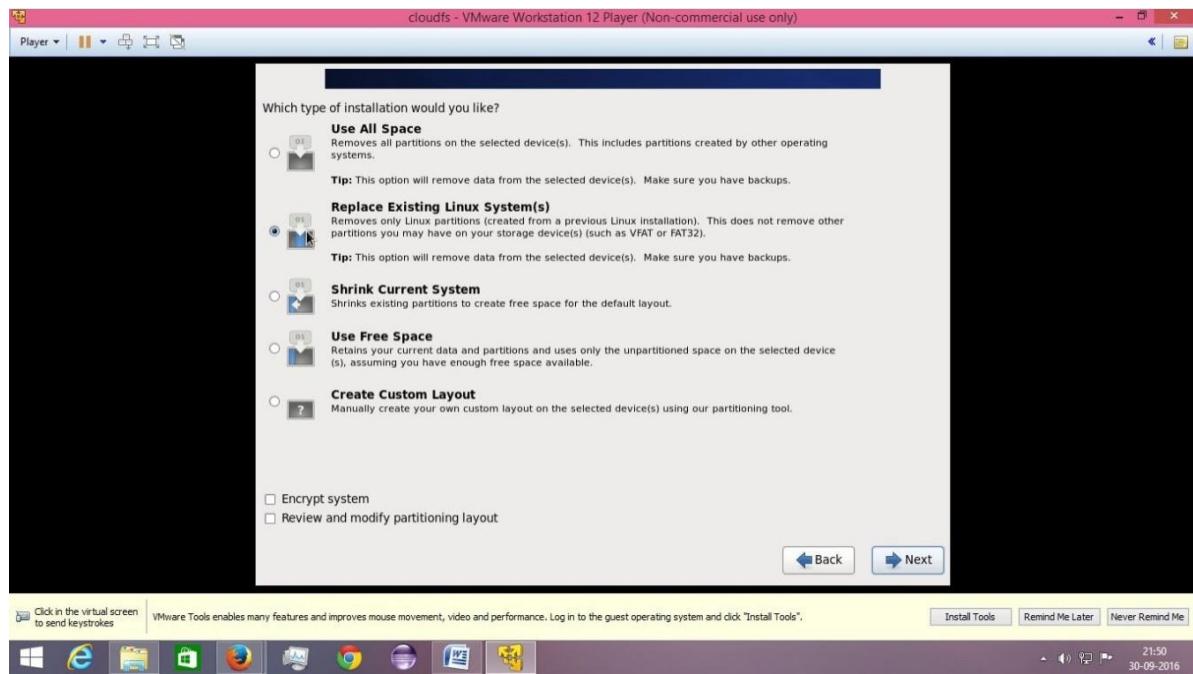
- Enter the Public IP range as "**192.168.12.202-192.168.12.210**".
- Click on **Next**.



STEP 14:

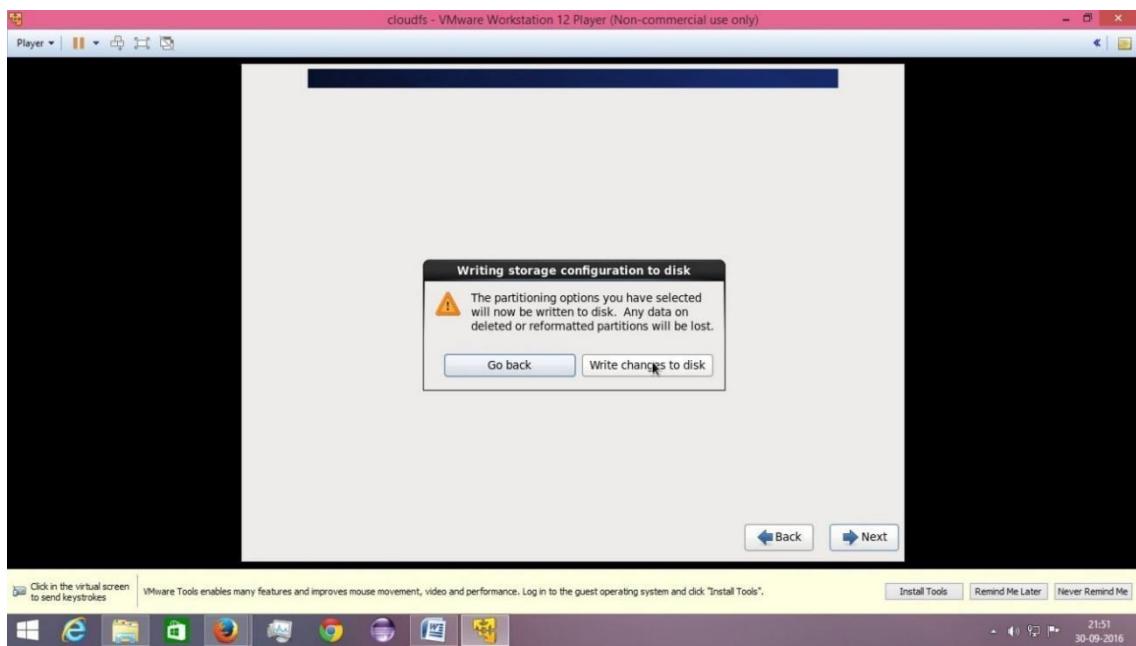
- Select **Replace Existing Linux Systems** and click on **Next**.

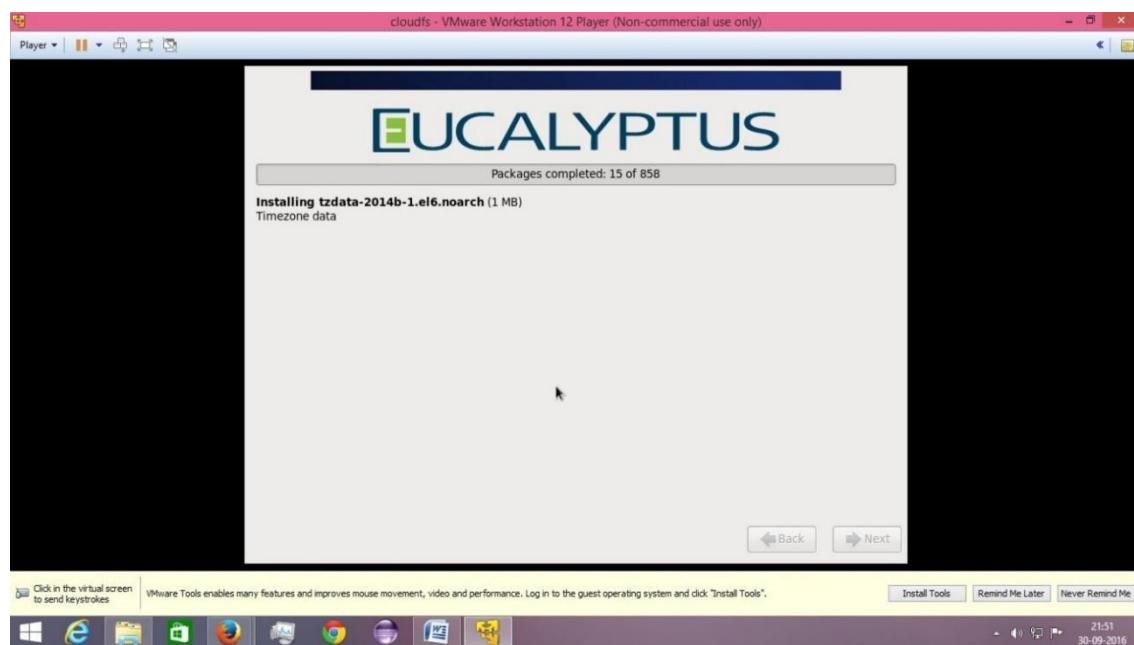
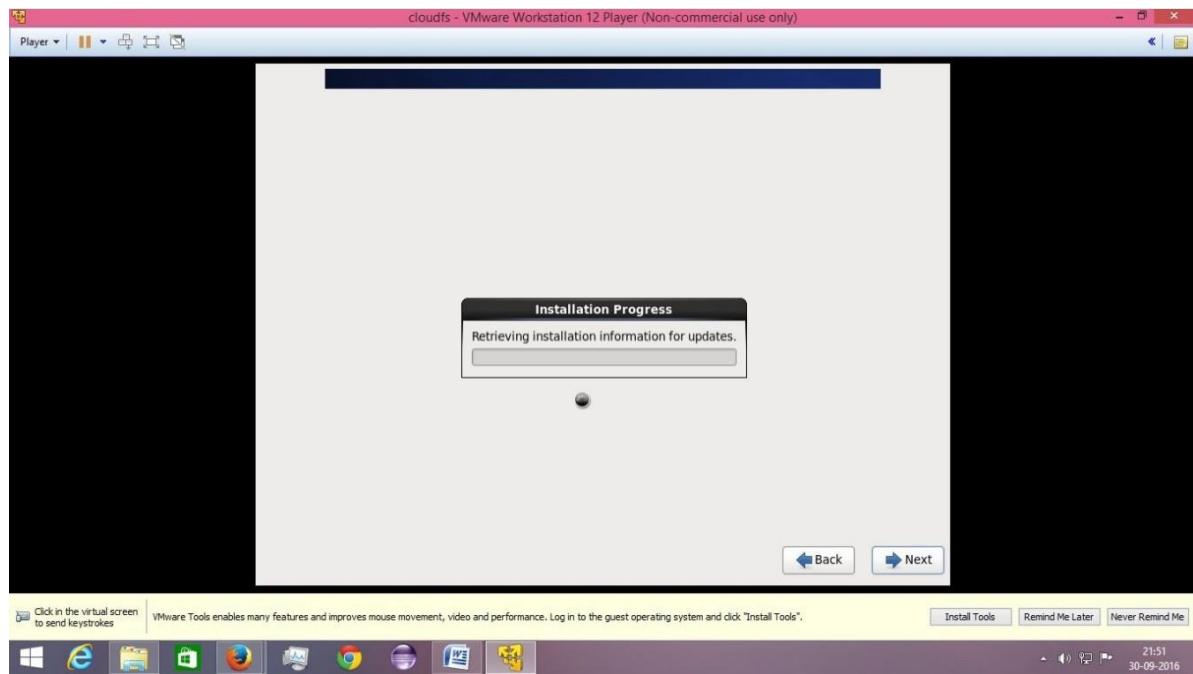


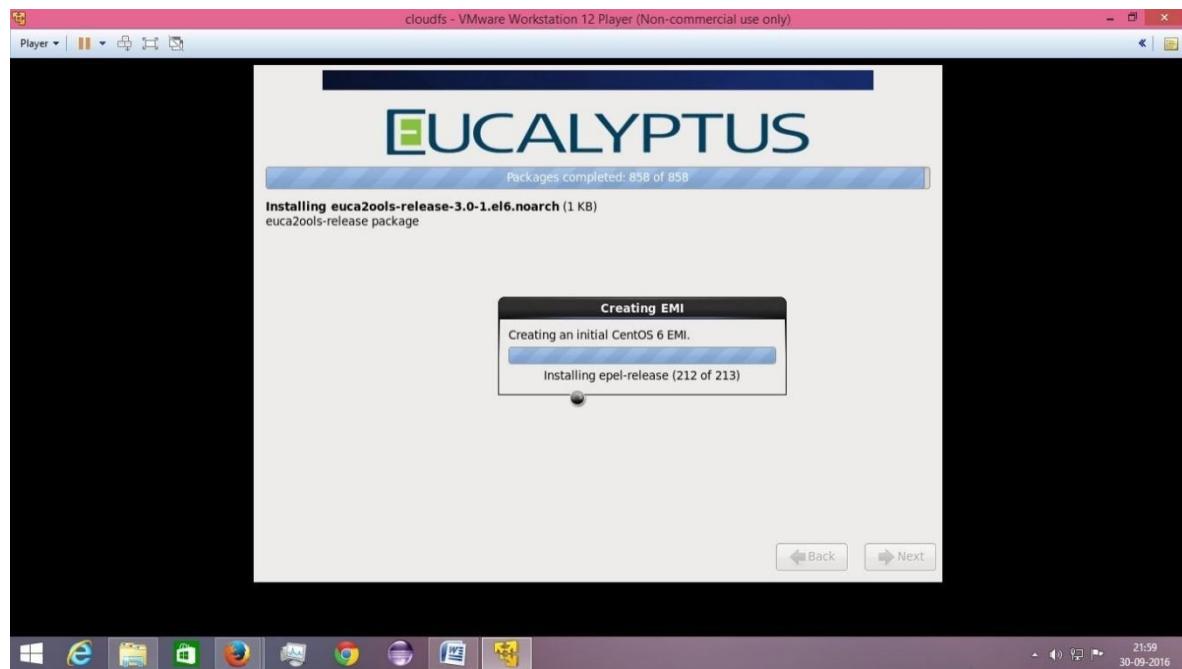
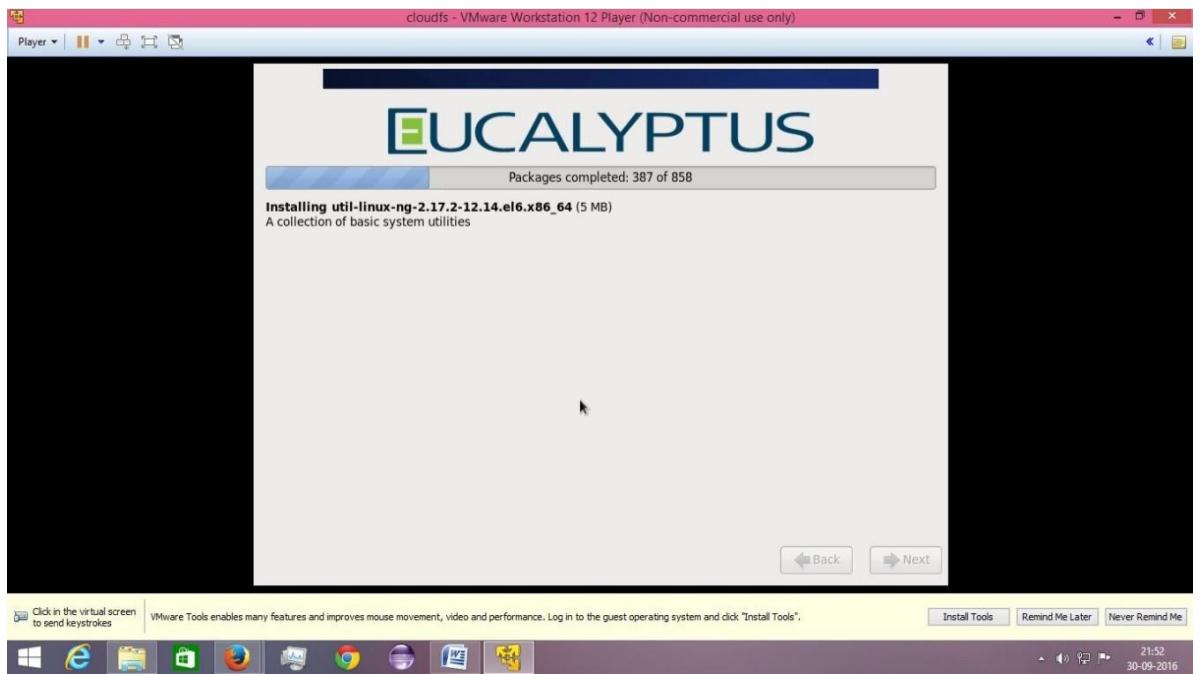


STEP 15:

- Click on **Write Changes to Disk**.
- Wait for installation to complete.

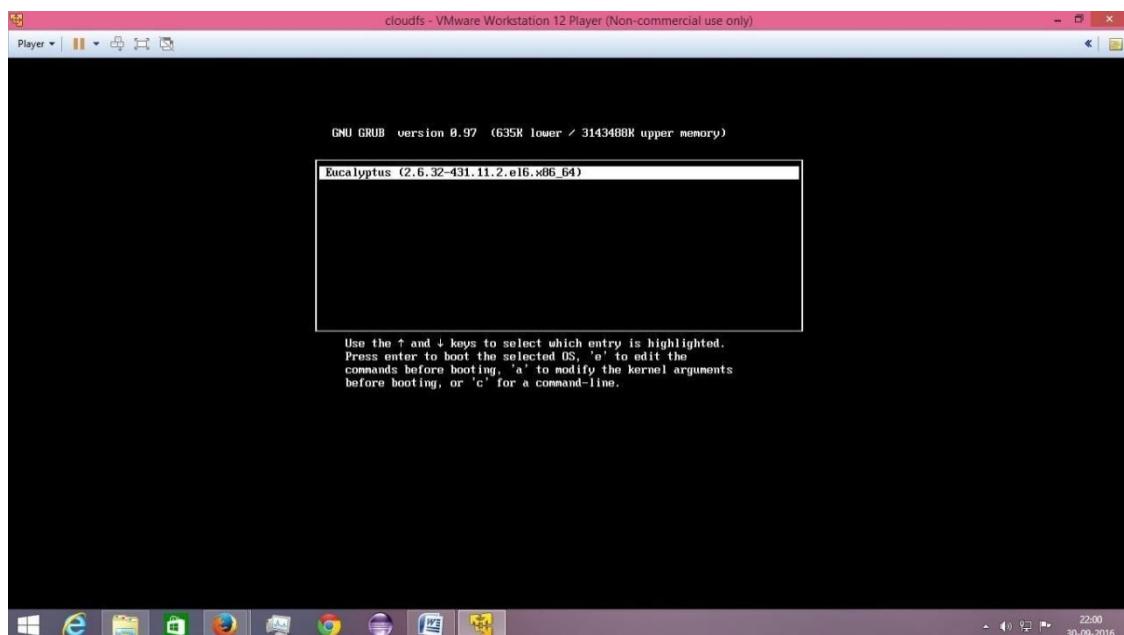
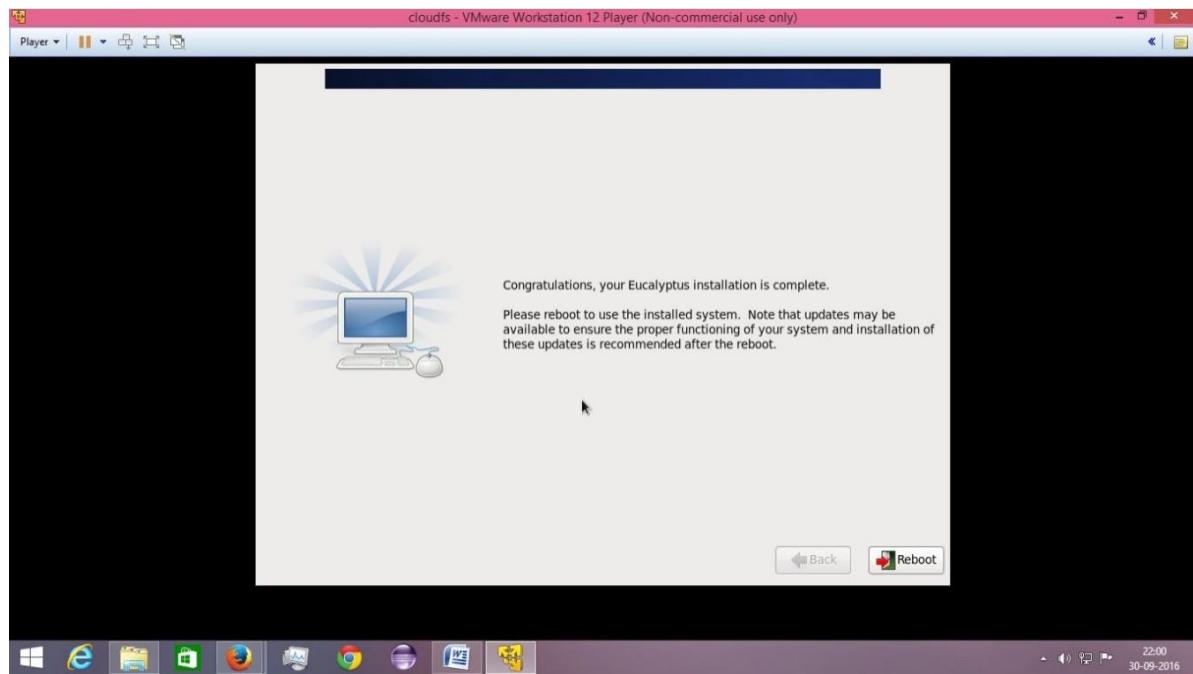






STEP 16:

- Click on Reboot.
- Wait for CentOS to boot up.



```

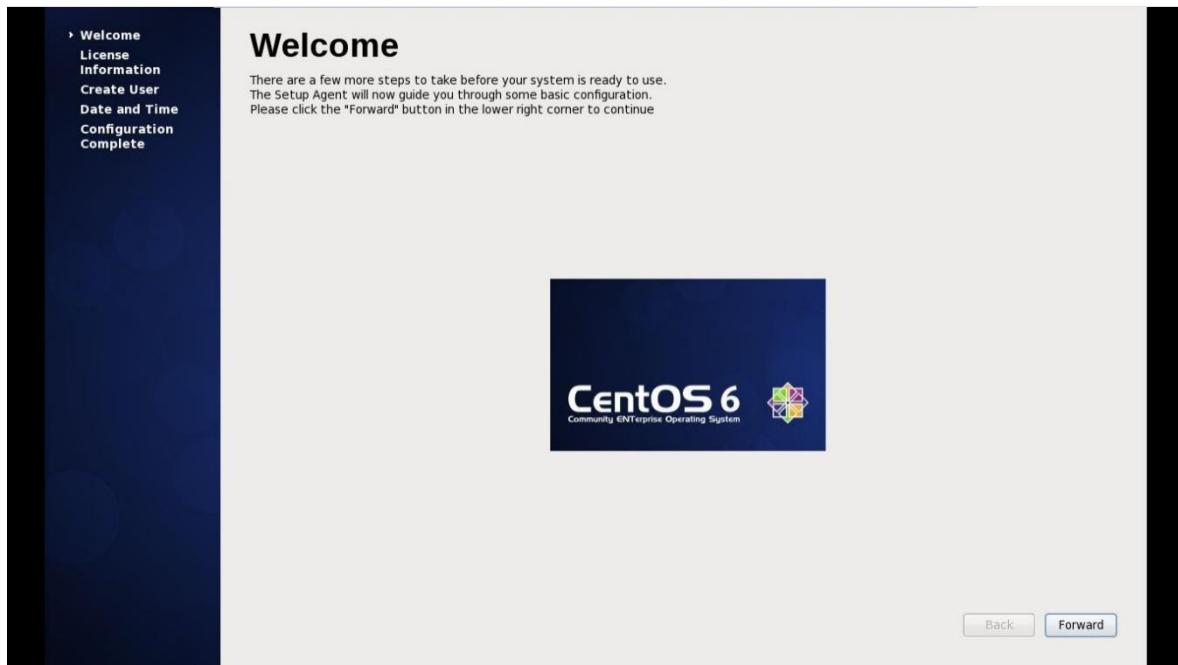
Starting ksm: [ OK ]
Starting ksmtuned: [ OK ]
Starting crond: [ OK ]
Generating public/private rsa key pair.
Created directory '/root/.ssh'.
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
d1:4d:a3:1f:56:d7:fb:34:da:2f:9a:b1:35:fe:c2:a8 root@root
The key's randomart image is:
+--[ RSA 2048]---+
|          o . = |
|         . o ..o |
|        . . . .o |
|         . oo |
|          S o.o |
|         . . . |
|          . oo |
|         E + . |
|        + . + |
+-----+
Sat Oct 1 03:37:00 IST 2016- Generated root's SSH keys
Sat Oct 1 03:37:00 IST 2016- Appended root's public key to authorized_keys
Warning: Permanently added '192.168.12.201' (RSA) to the list of known hosts.

```

STEP 17:

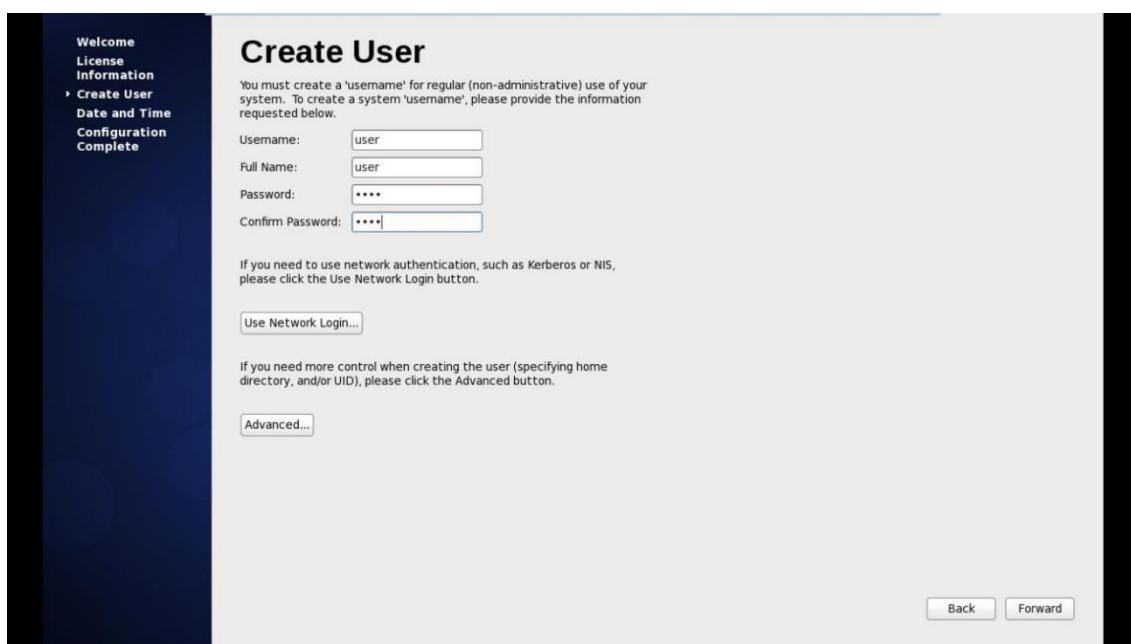
- Click on Forward.





STEP 18:

- Type your Username:**user**, FullName:**user**, Password:**user** and Confirm Password:**user**.
- Click on **Forward** when you are done.
- Select "**Yes**" if dialog box appears.
- Click **Forward** and **Finish** when Configuration Complete Window appears.



Welcome
License
Information
Create User
Date and Time
Configuration
Complete

Create User

You must create a 'username' for regular (non-administrative) use of your system. To create a system 'username', please provide the information requested below.

Username:

Full Name:

Password:

Confirm Password:

If you need to use network authentication, such as Kerberos or NIS, please click the Use Network Login button.

If you need more control when creating the user (specifying home directory, and/or UID), please click the Advanced button.

Welcome
License
Information
Create User
Date and Time
Configuration
Complete

Create User

You must create a 'username' for regular (non-administrative) use of your system. To create a system 'username', please provide the information requested below.

Username:

Full Name:

Password:

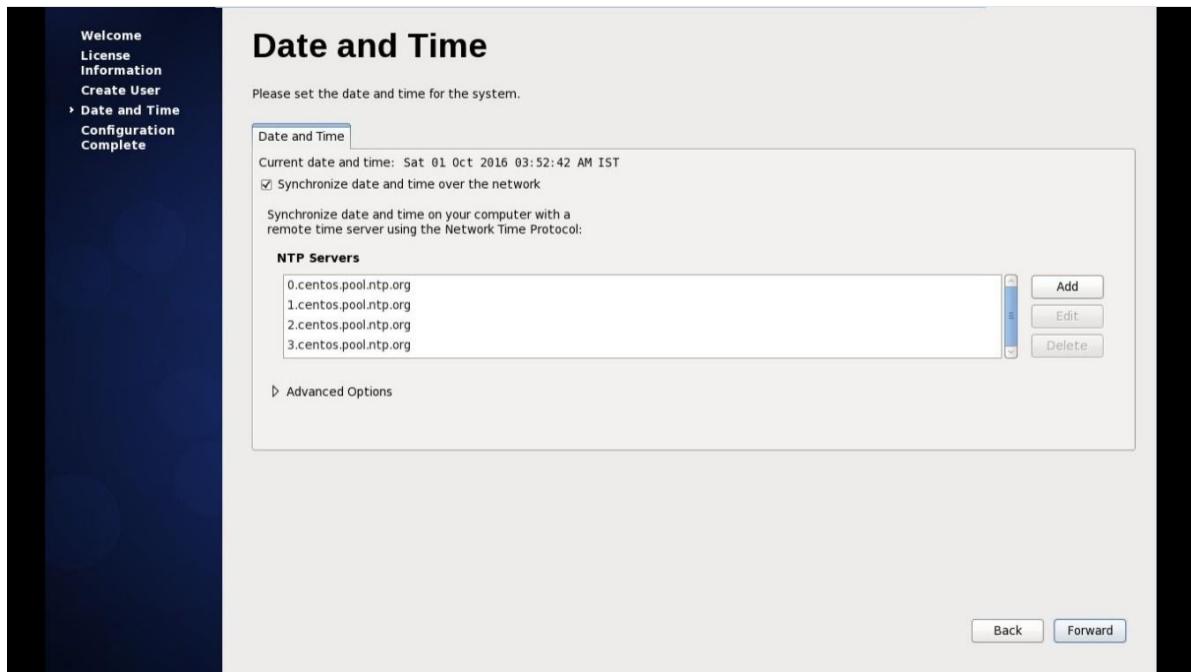
Confirm Password:

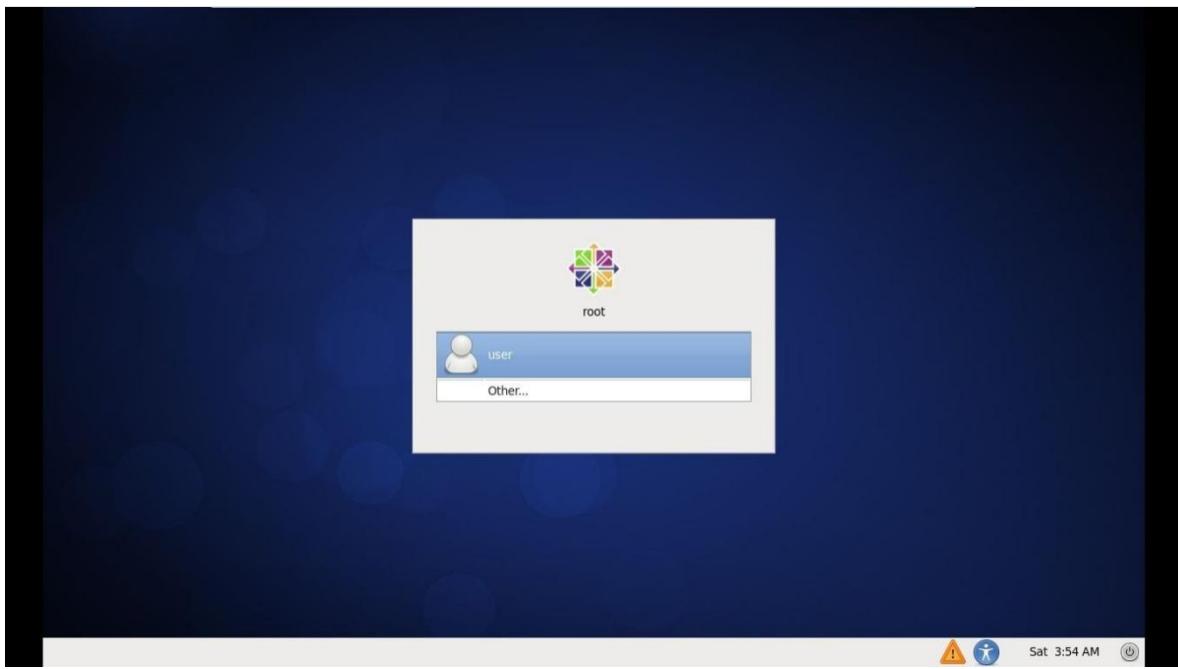
If you need to use network authentication, such as Kerberos or NIS, please click the Use Network Login button.

If you need more control when creating the user (specifying home directory, and/or UID), please click the Advanced button.

The chosen password is too weak: it is too short. Do you want to use it anyway?

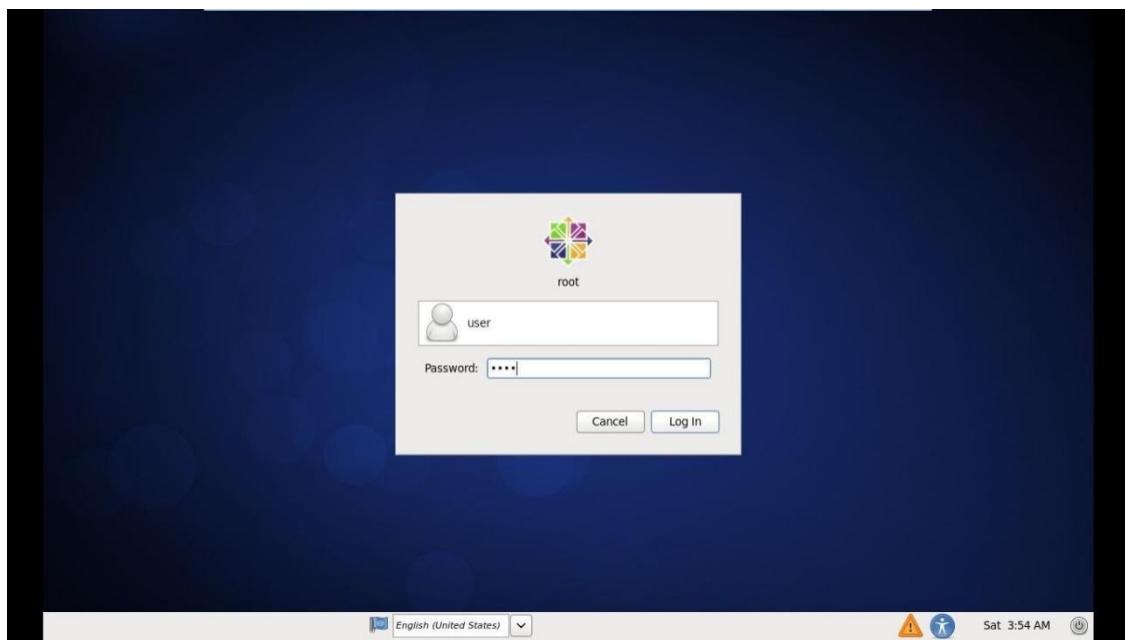
No Yes

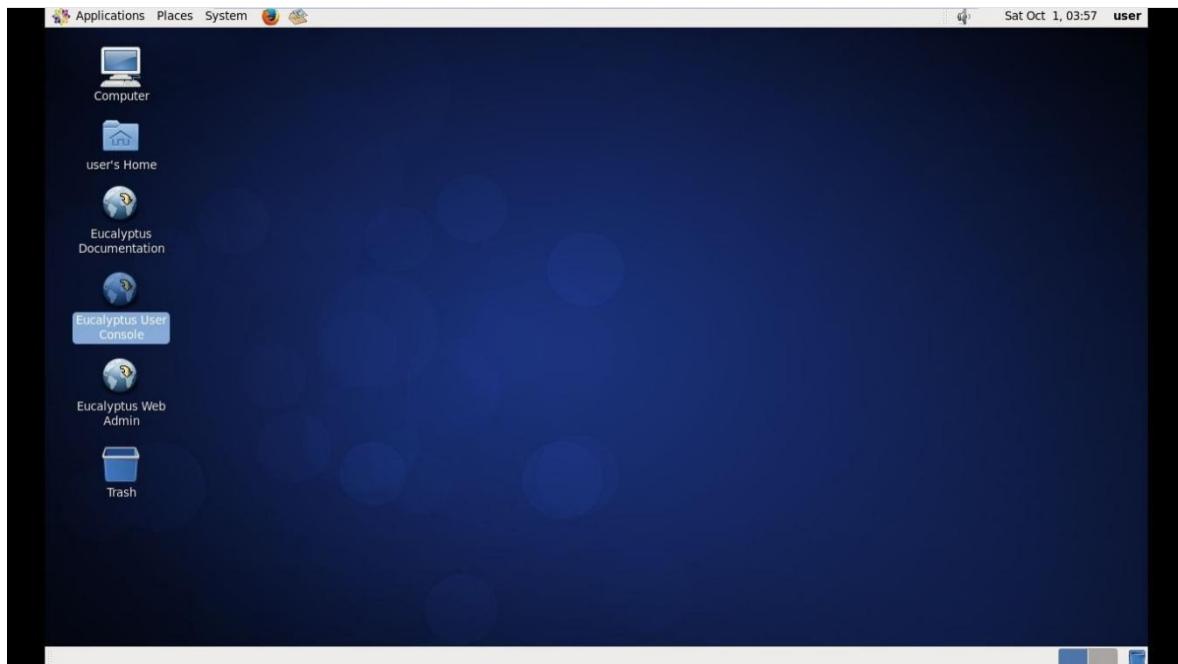




STEP 19:

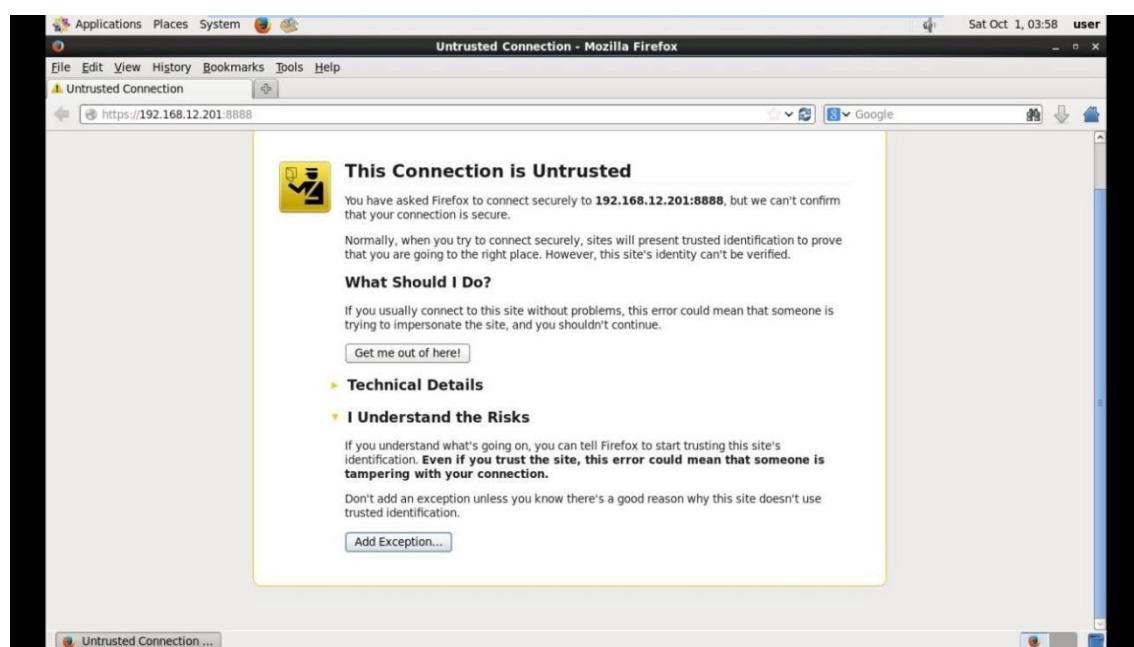
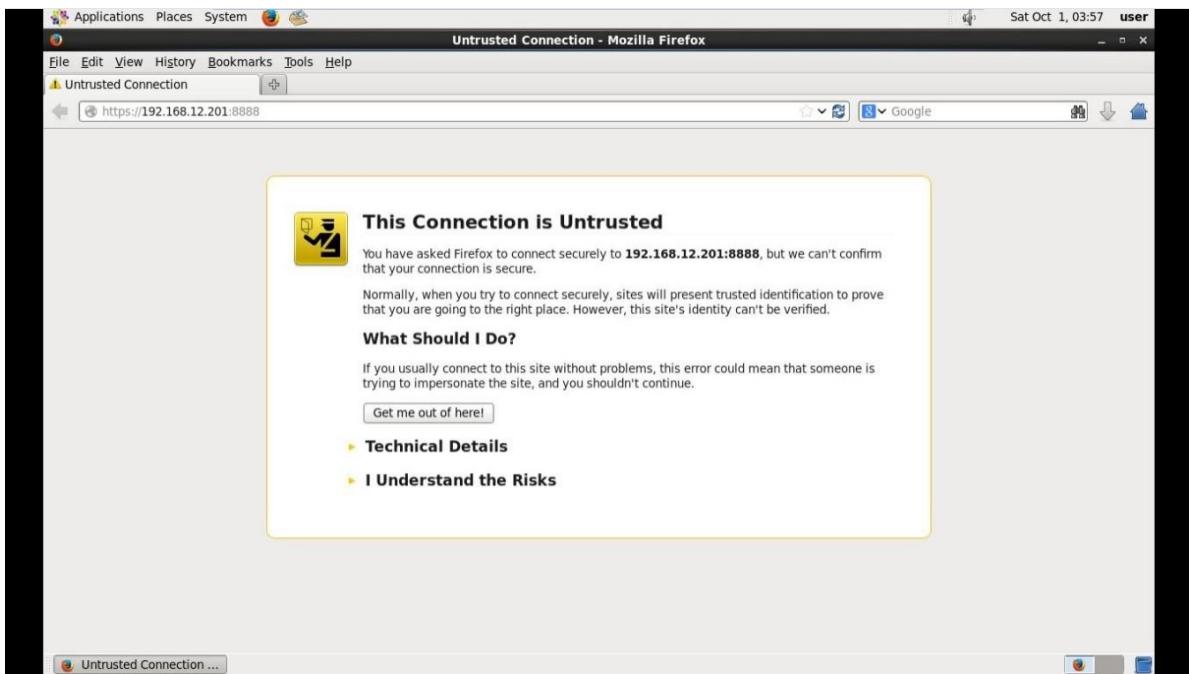
- Enter your password and Login into the system.
- User name:user
- Password:user

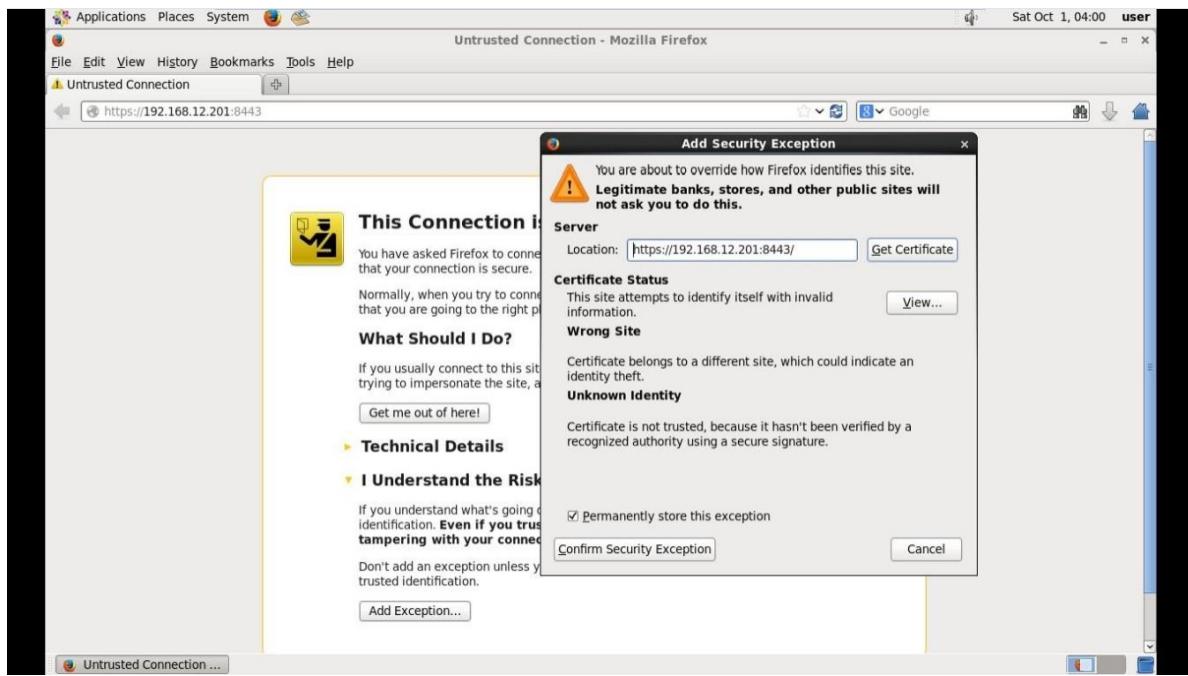




STEP 20:

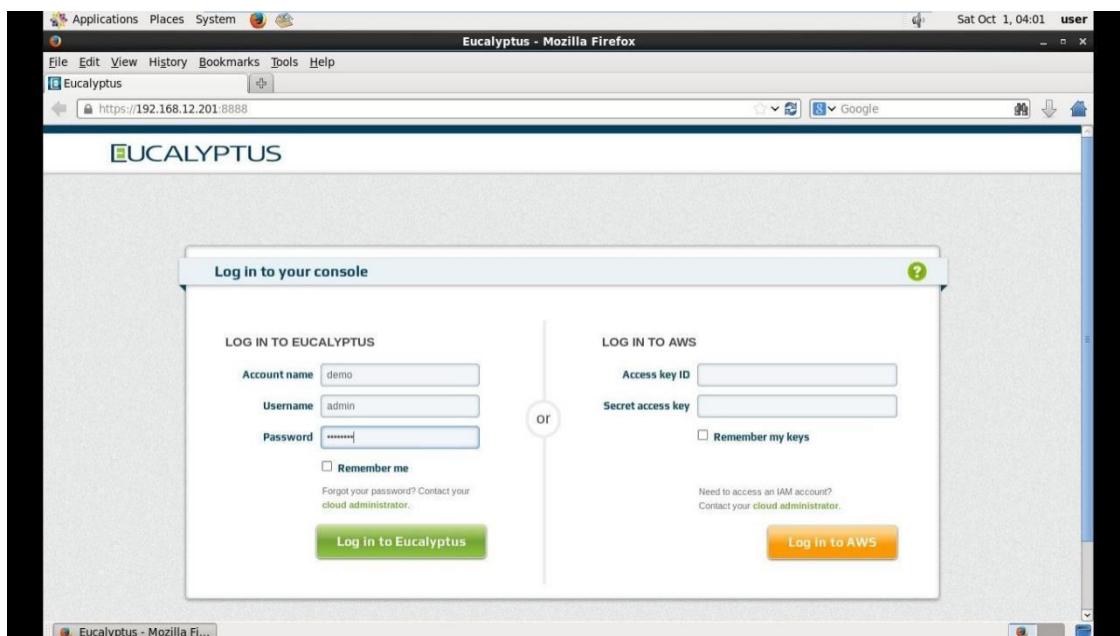
- Open Firefox and go to the URL - "**192.168.12.201:8888**" (Or) click the eucalyptus user console
- Click on "**I Understand the Risks**" and then click on "**Add Exception**".
- Click on "**Confirm Security Exception**".

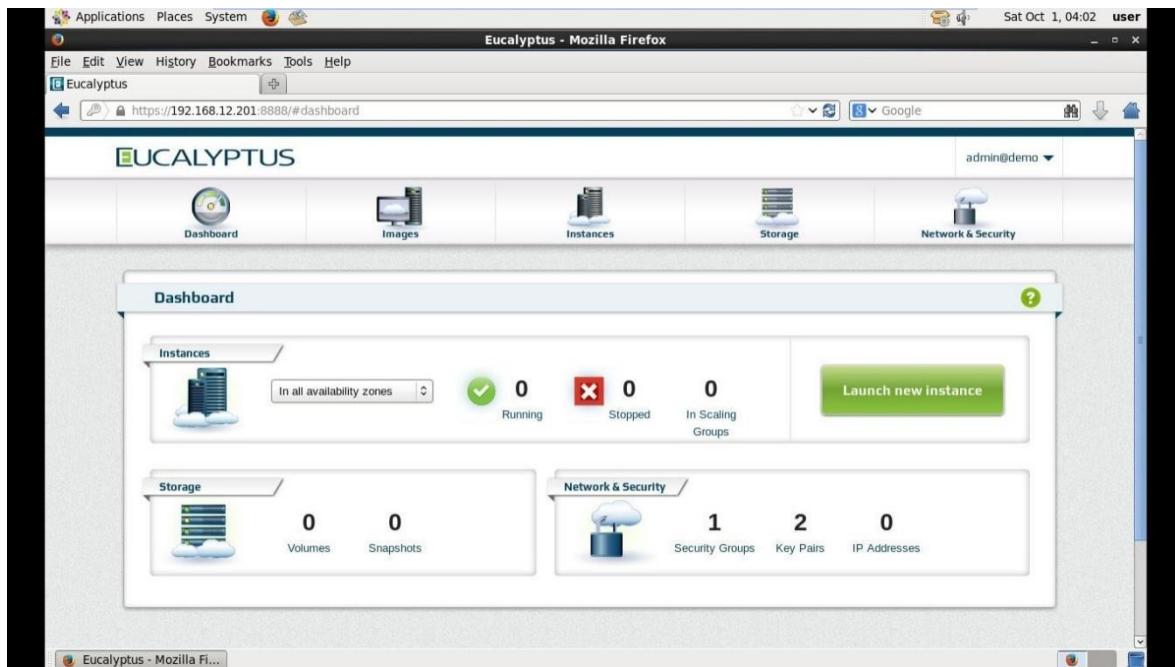




STEP 21:

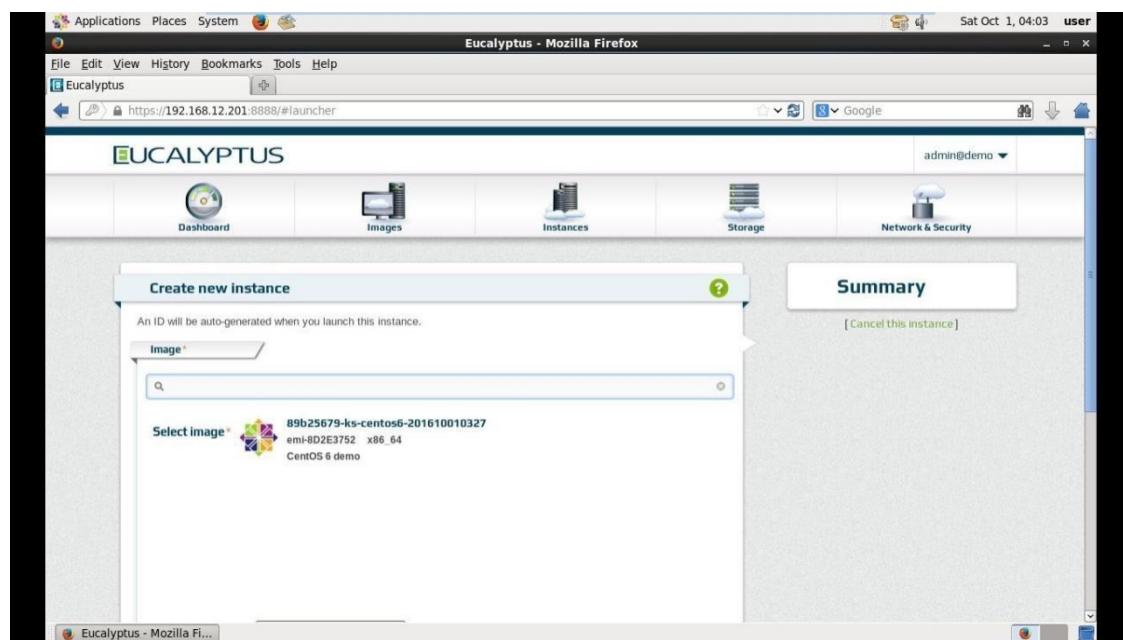
- Log into the Eucalyptus
- Account name:**demo**, username: **admin** , password: **123456**
- Click on "Launch new Instance"

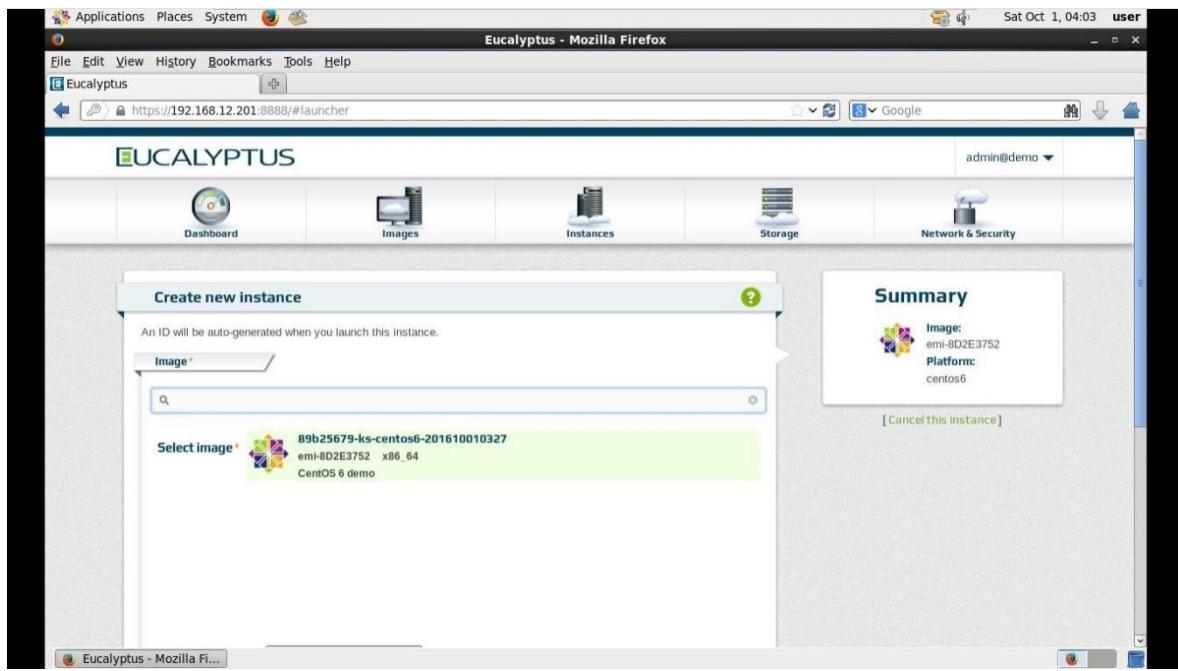




STEP 22:

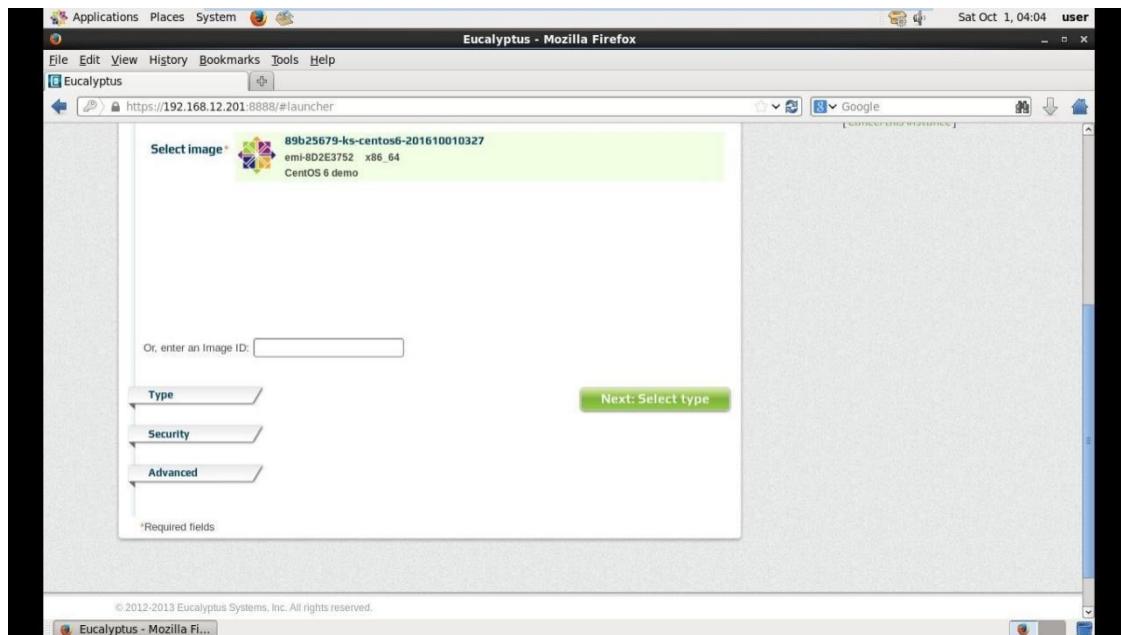
- Select the Image to be used.





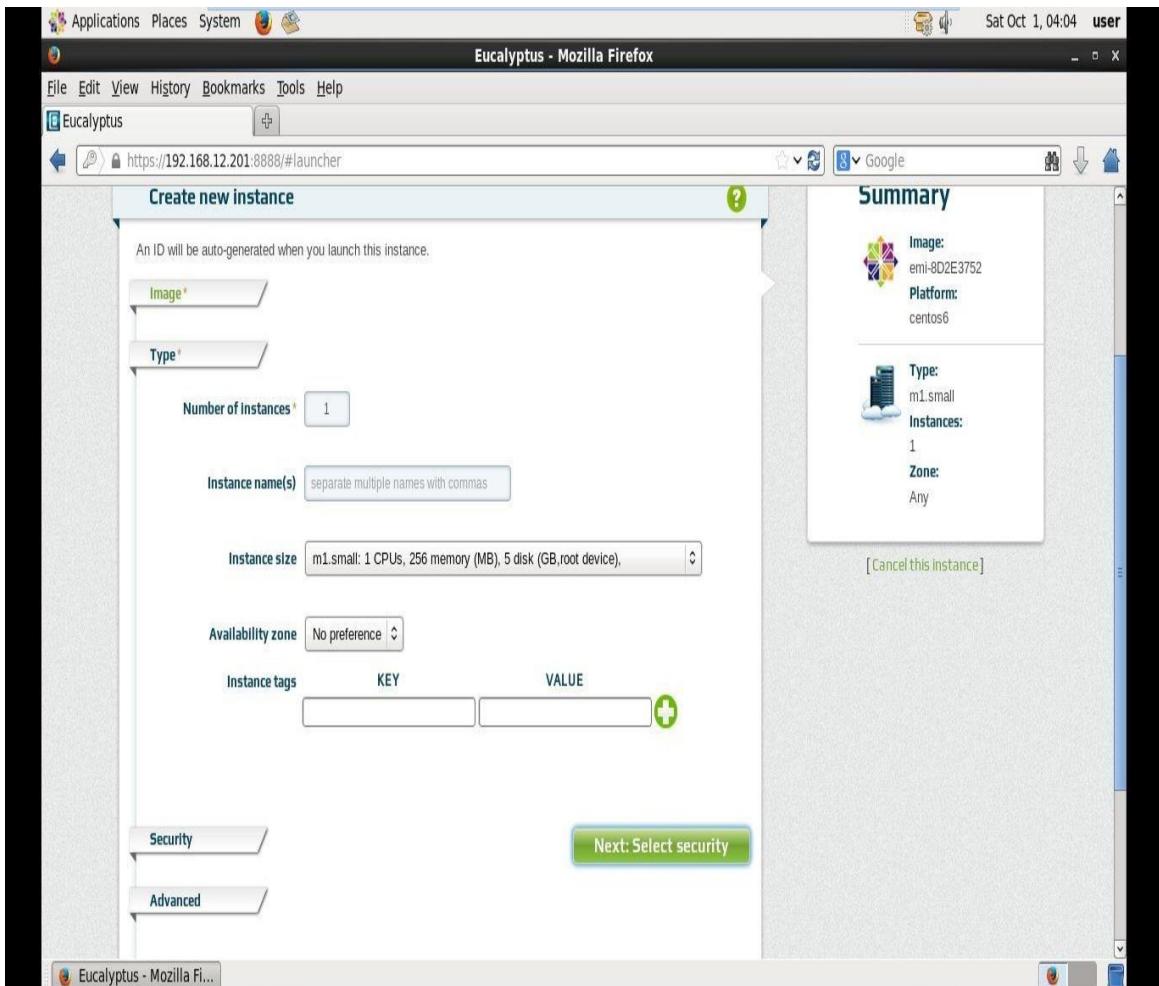
STEP 23:

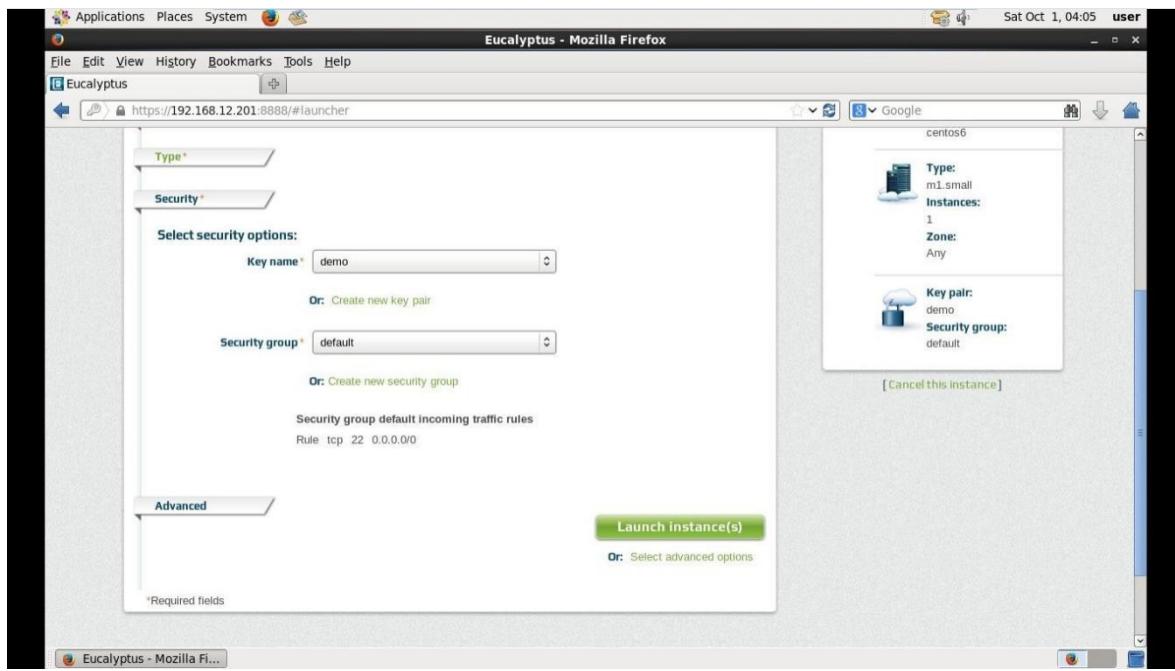
- Select the "**Select Type**".



STEP 24:

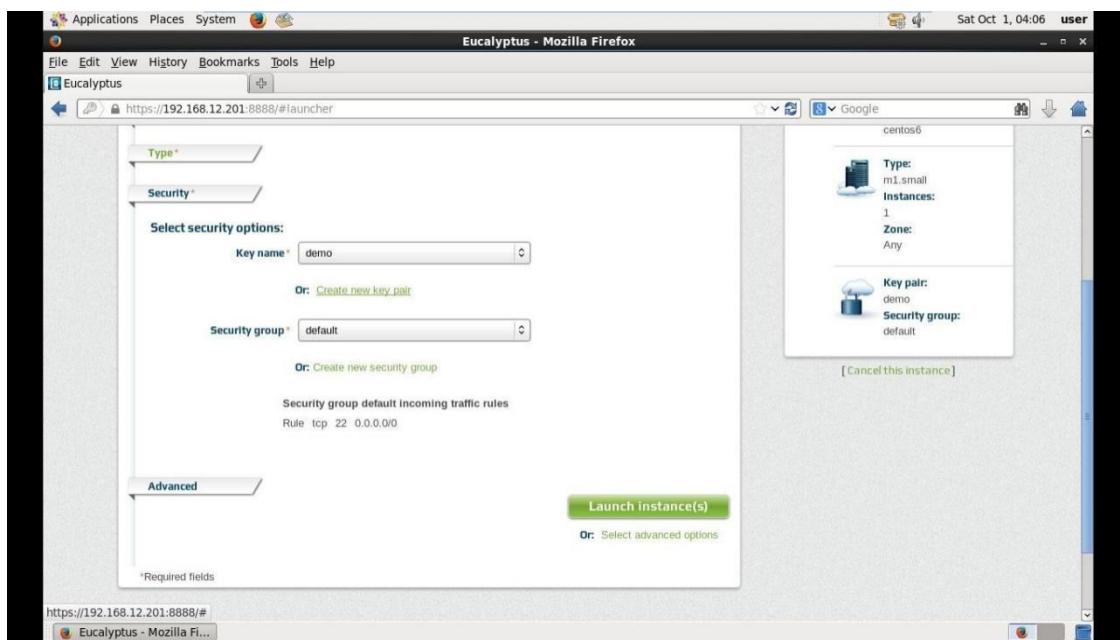
- Select the "Select Security".

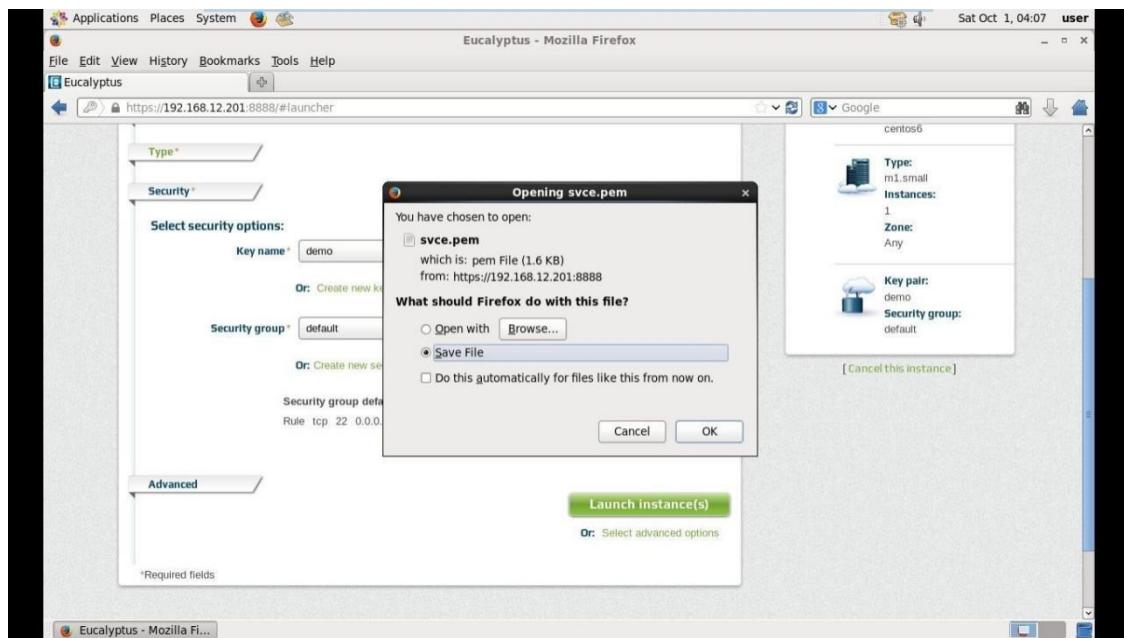
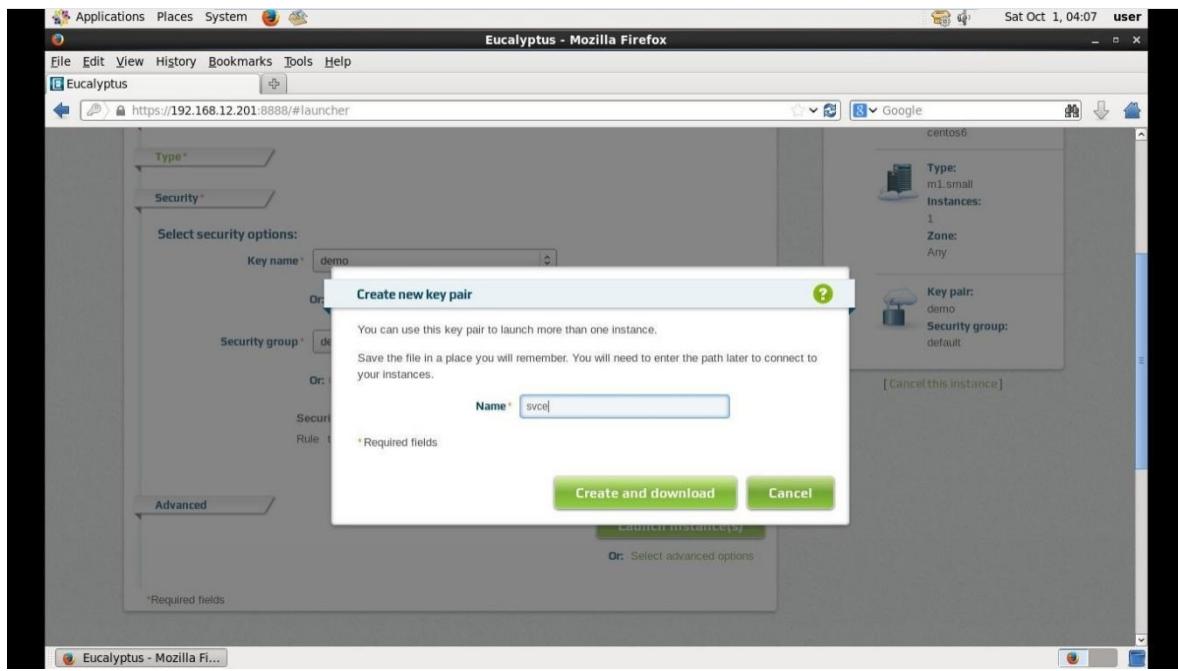


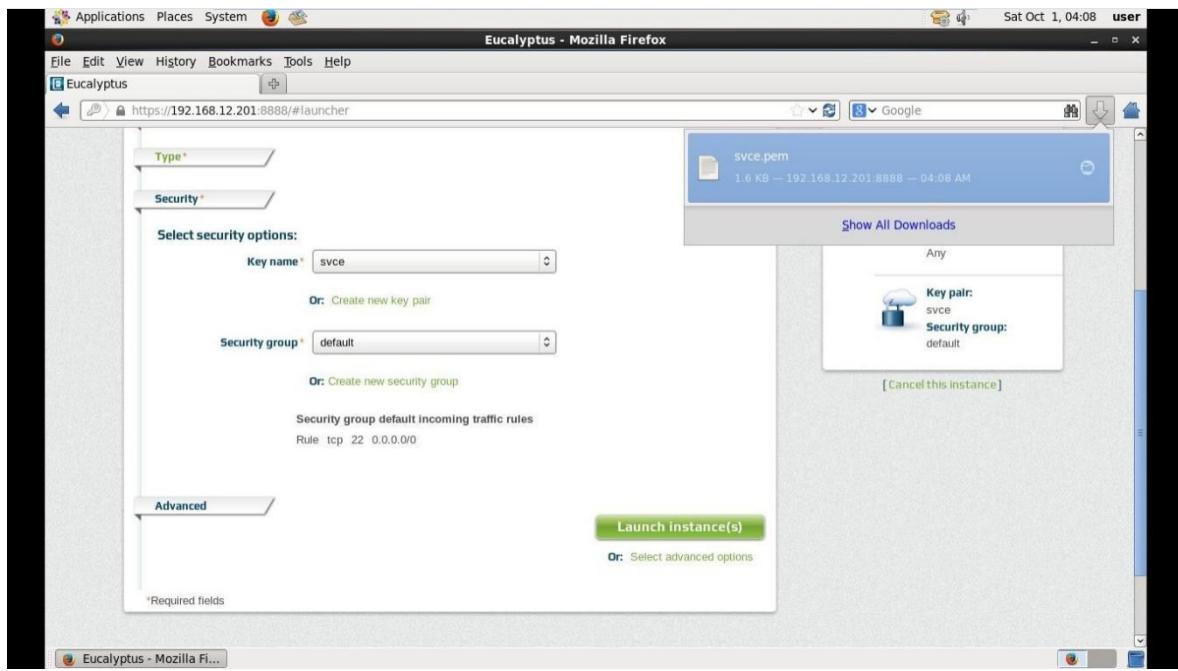


STEP 25:

- Select the "**Create new key pair**".
- Give a name for your key pair and click on create and download and then on "**Save .pem File**" on the window that appears.

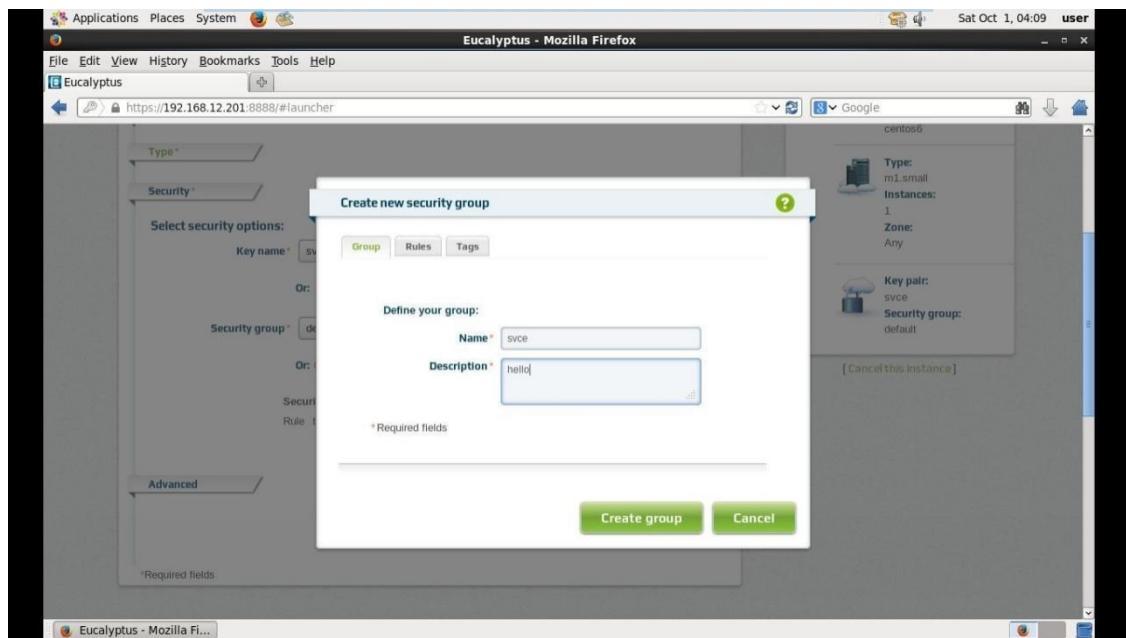
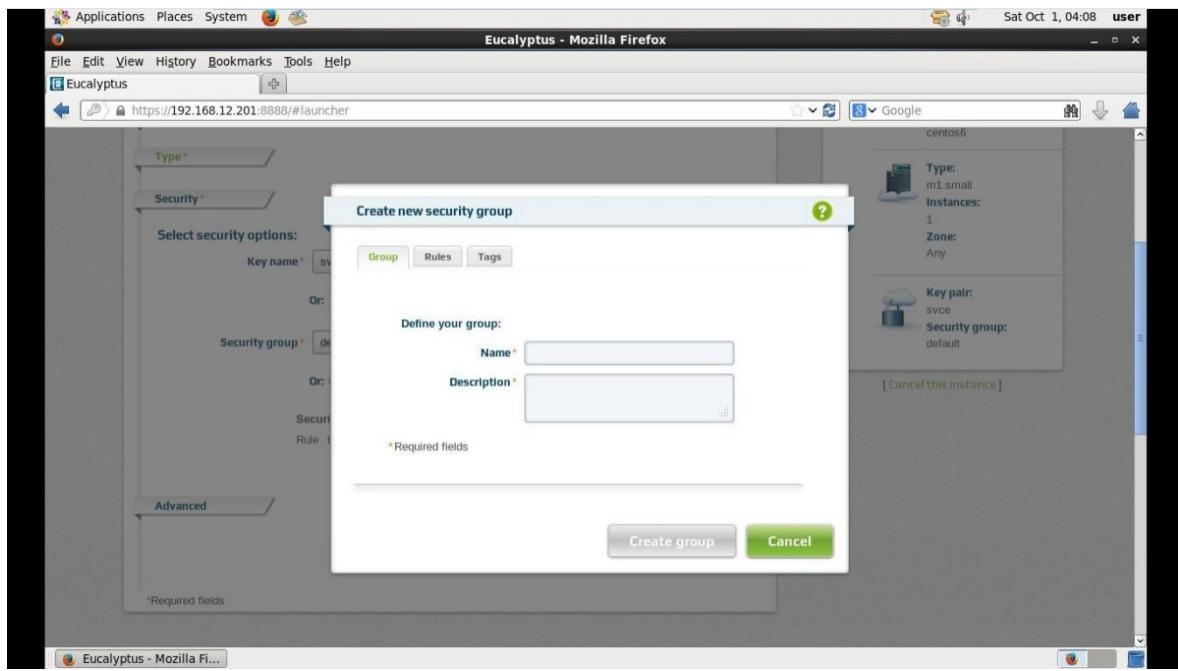


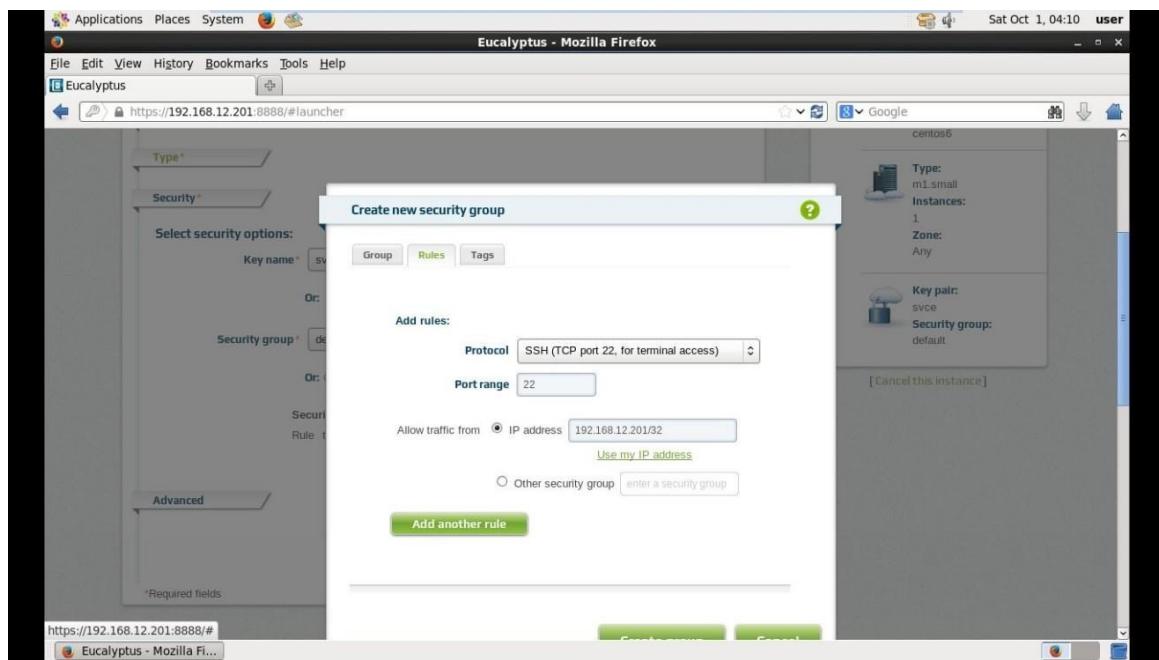
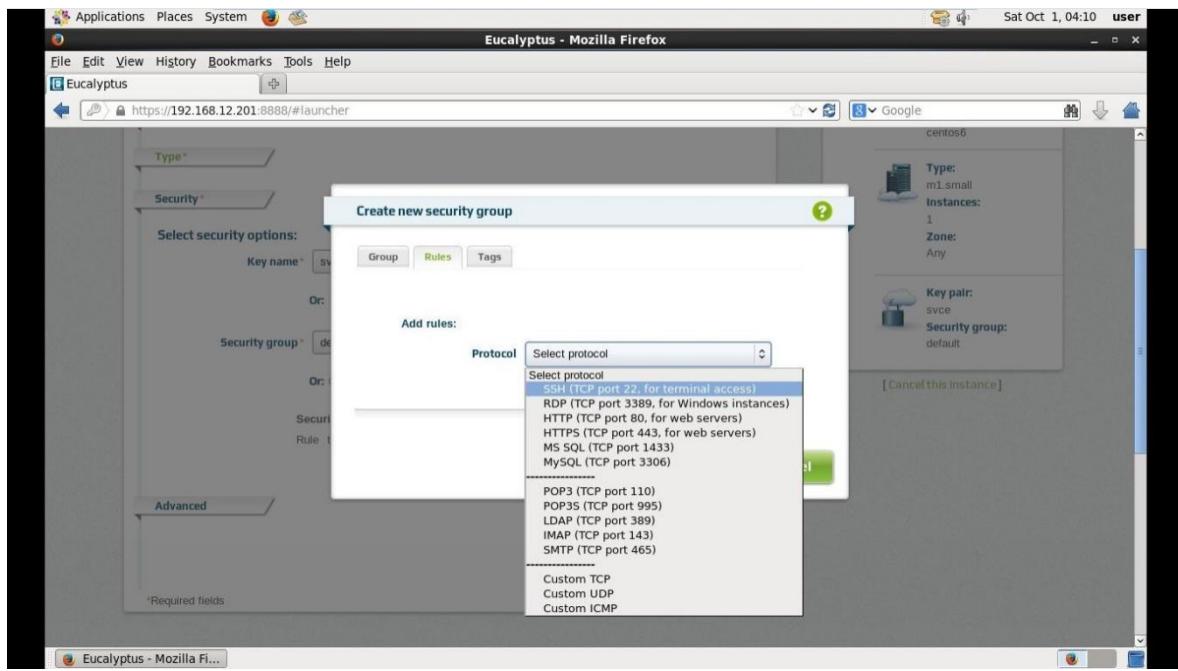




STEP 26:

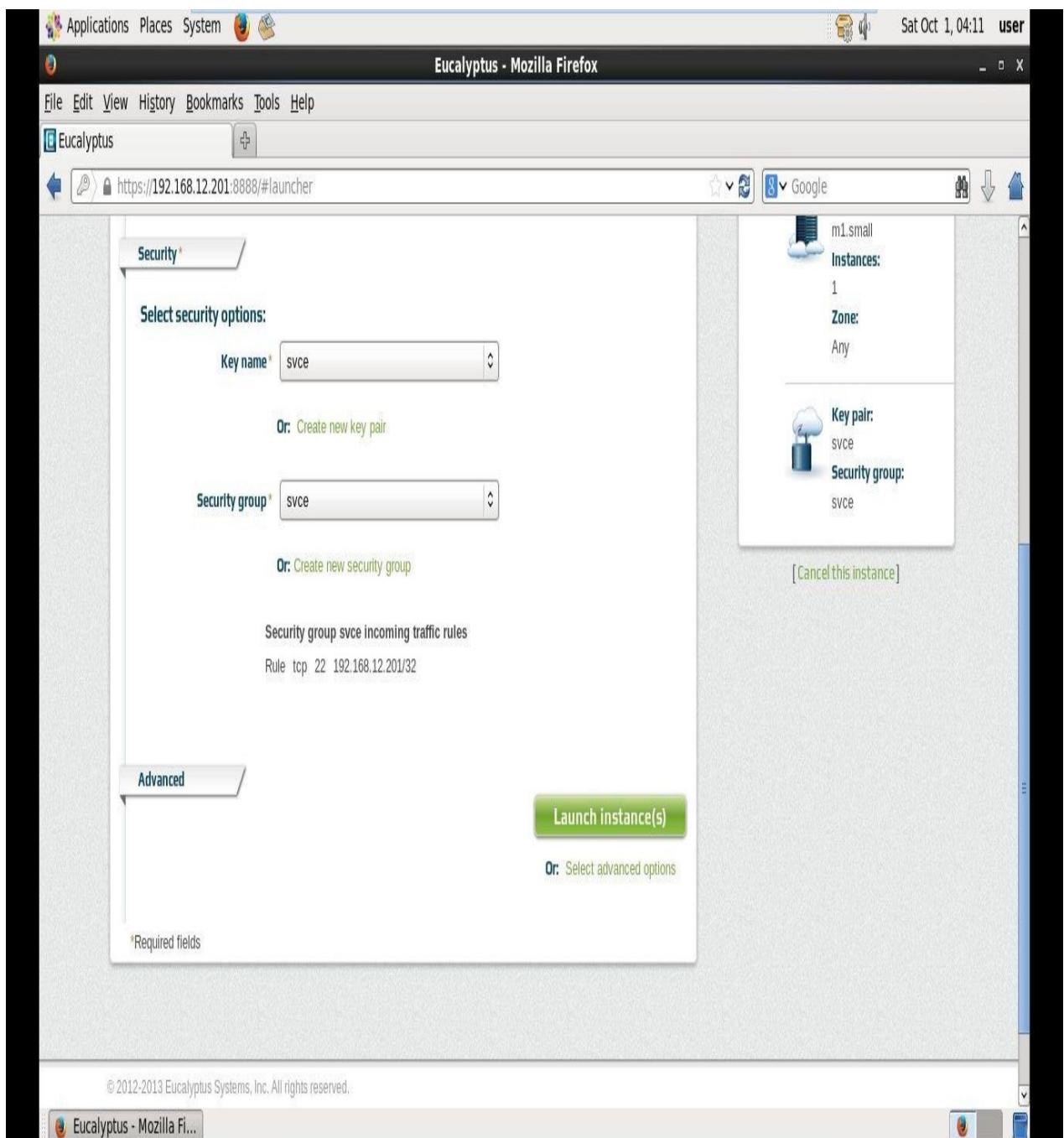
- Select the "**Create new Security Group**".
- Enter name as **svce** and description as "**Hello**".
- Select **Rules Tab** and create a rule for the **SSH protocol**
- Enter IP address as "**192.168.12.202/32**" (or) click **use my ip** and click on "**Create Group**".





STEP 27:

- Click on **Launch Instance** and wait for the instance for launching.



Applications Places System Eucalyptus Mozilla Firefox Sat Oct 1, 04:11 user

Eucalyptus - Mozilla Firefox https://192.168.12.201:8888/#instance

Manage instances

Launch new instance More actions

INSTANCE STATUS IMAGE ID AVAILABILITY ZONE PUBLIC ADDRESS PRIVATE ADDRESS KEY NAME SECURITY GROUP LAUNCH TIME

Running Pending Stopping Stopped Shutting-down Terminated

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Eucalyptus - Mozilla Fi...

This screenshot shows the Eucalyptus Management Console interface. The title bar indicates it's running on Mozilla Firefox. The main window is titled 'Manage instances' and contains a search bar and a 'Launch new instance' button. Below the search bar is a table header with columns: INSTANCE, STATUS, IMAGE ID, AVAILABILITY ZONE, PUBLIC ADDRESS, PRIVATE ADDRESS, KEY NAME, SECURITY GROUP, and LAUNCH TIME. A status bar at the bottom shows various instance states: Running, Pending, Stopping, Stopped, Shutting-down, and Terminated. The message 'Loading instances ... Showing: 10 | 25 | 50 | 100' is displayed above the table. The table itself is currently empty.

Applications Places System Eucalyptus Mozilla Firefox Sat Oct 1, 04:12 user

Eucalyptus - Mozilla Firefox https://192.168.12.201:8888/#instance

Manage instances

Launch new instance More actions

1 instances found. Showing: 10 | 25 | 50 | 100

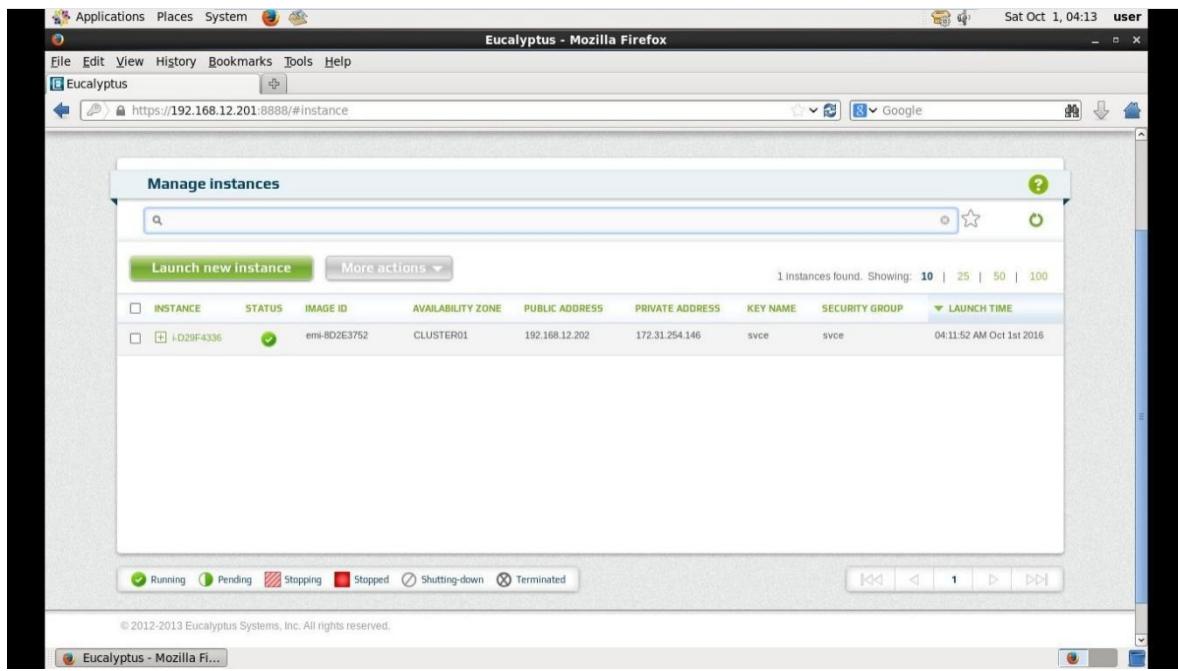
INSTANCE	STATUS	IMAGE ID	AVAILABILITY ZONE	PUBLIC ADDRESS	PRIVATE ADDRESS	KEY NAME	SECURITY GROUP	LAUNCH TIME
+D29f4336	Running	emi-8D2E3752	CLUSTER01	192.168.12.202	172.31.254.146	svce	svce	04:11:52 AM Oct 1st 2016

Running Pending Stopping Stopped Shutting-down Terminated

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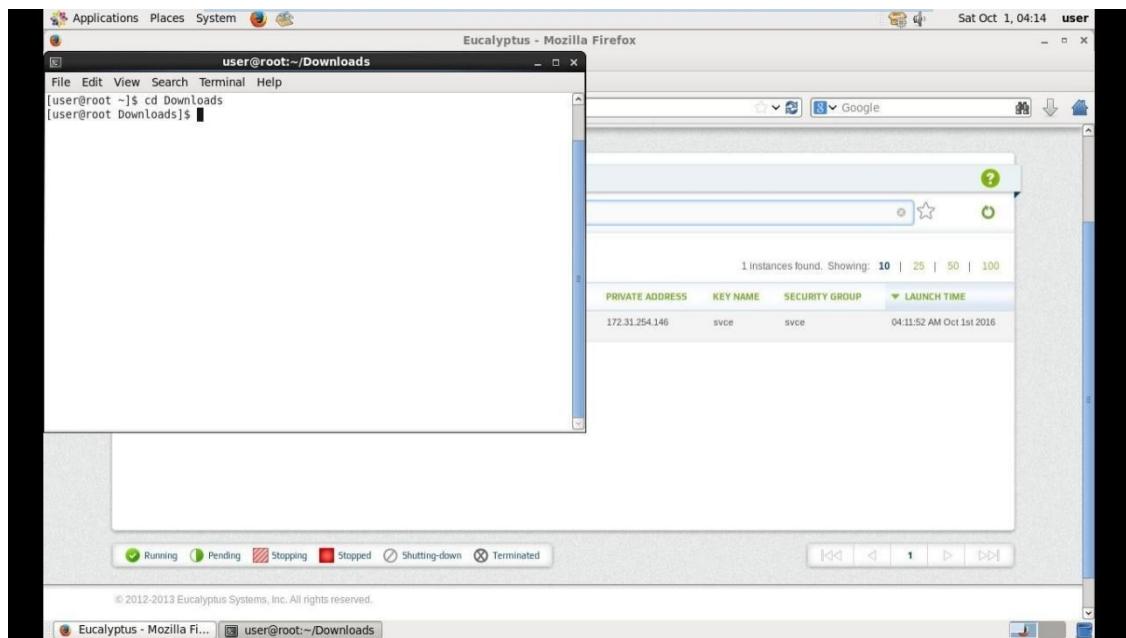
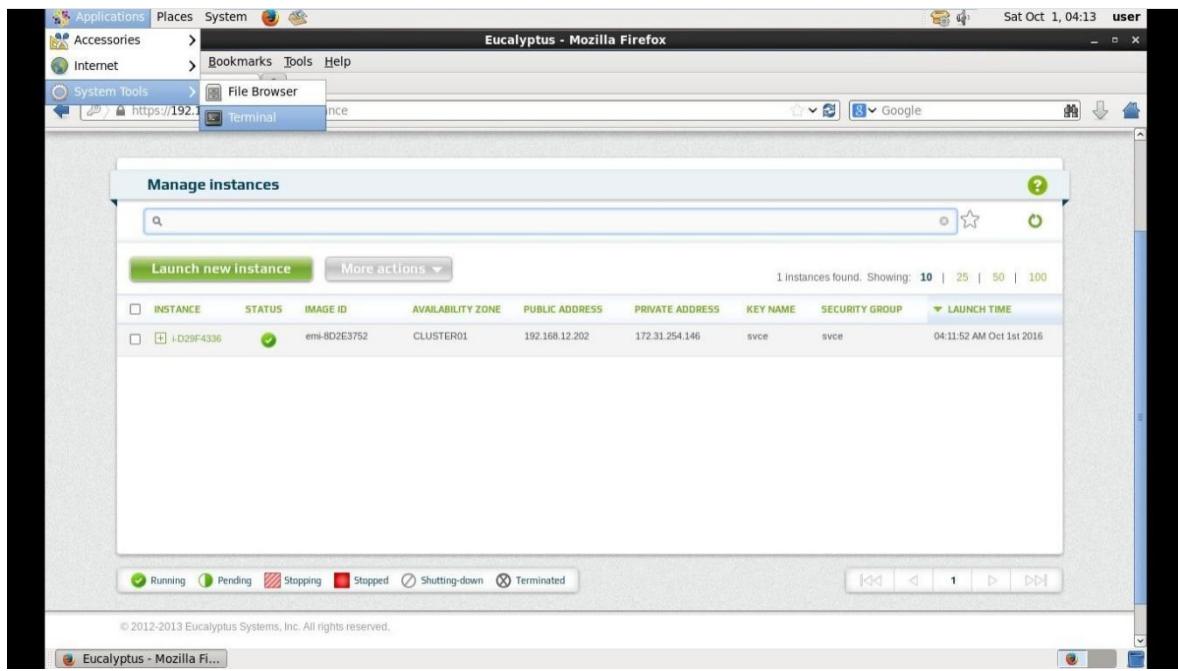
Eucalyptus - Mozilla Fi...

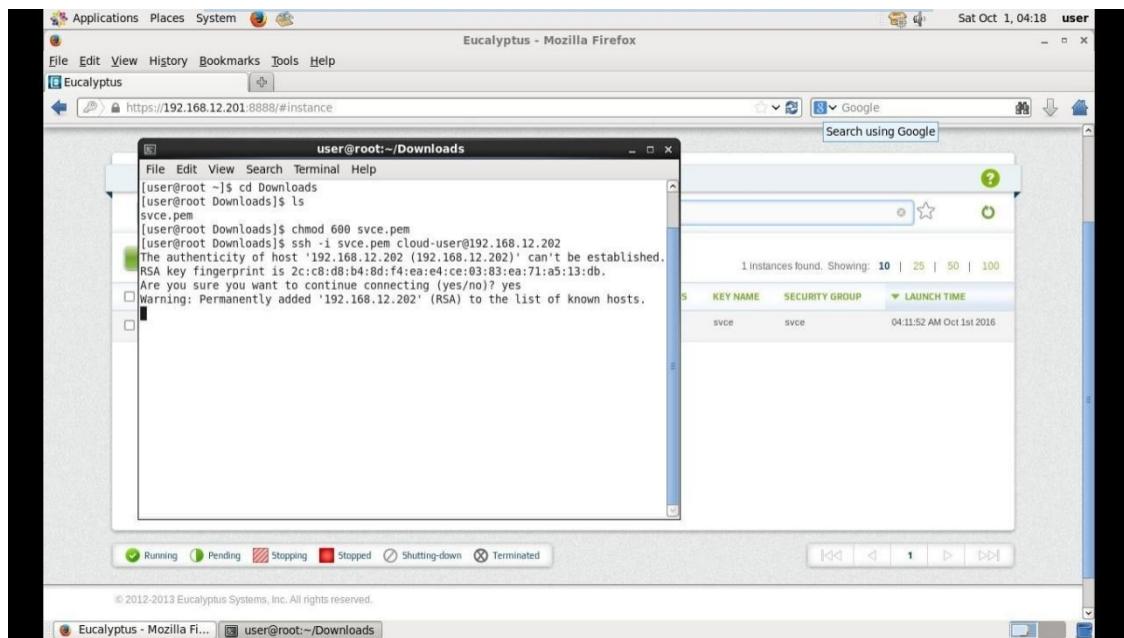
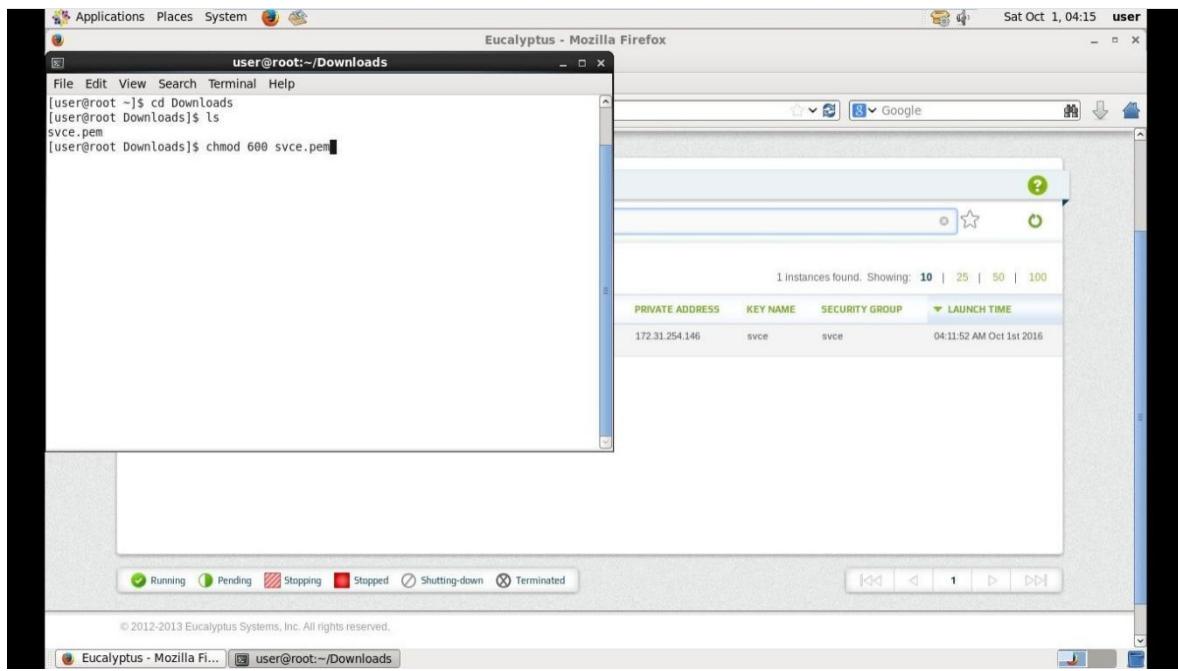
This screenshot shows the Eucalyptus Management Console interface after launching an instance. The title bar indicates it's running on Mozilla Firefox. The main window is titled 'Manage instances' and contains a search bar and a 'Launch new instance' button. Below the search bar is a table header with columns: INSTANCE, STATUS, IMAGE ID, AVAILABILITY ZONE, PUBLIC ADDRESS, PRIVATE ADDRESS, KEY NAME, SECURITY GROUP, and LAUNCH TIME. A status bar at the bottom shows various instance states: Running, Pending, Stopping, Stopped, Shutting-down, and Terminated. The message '1 instances found. Showing: 10 | 25 | 50 | 100' is displayed above the table. The table now contains one row for the newly launched instance, which is in the 'Running' state. The instance details include its ID (+D29f4336), image ID (emi-8D2E3752), availability zone (CLUSTER01), public address (192.168.12.202), private address (172.31.254.146), key name (svce), security group (svce), and launch time (04:11:52 AM Oct 1st 2016).

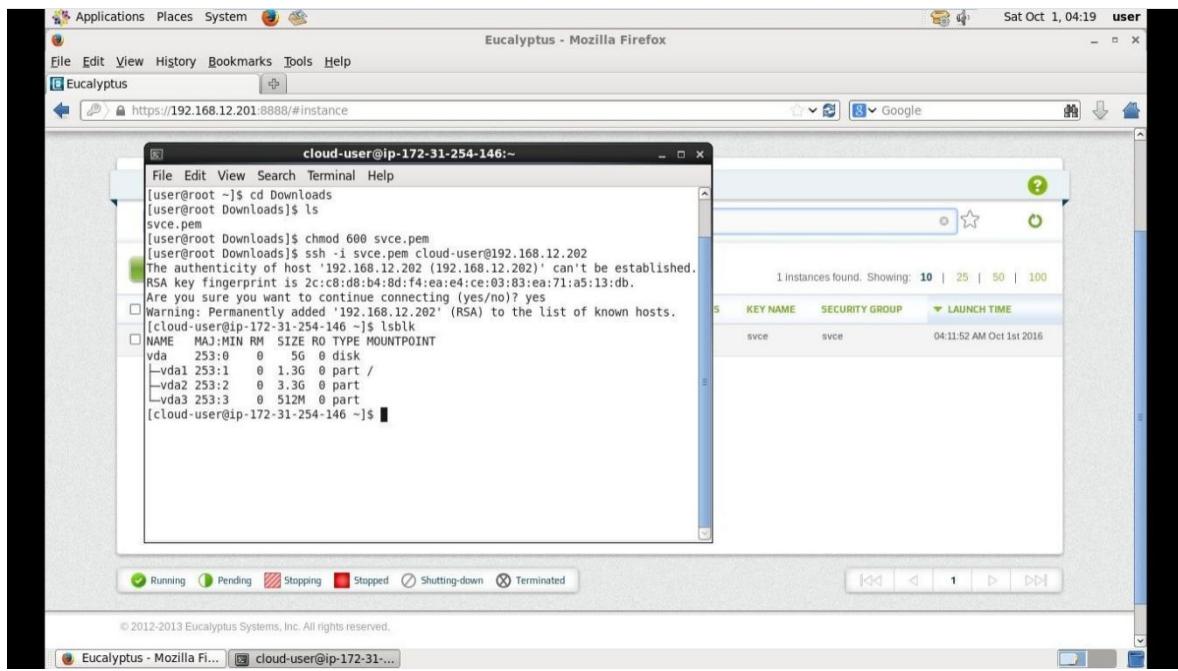


STEP 28:

- Open a new Terminal.
- Type the following
1.cd Downloads 2.ls
(This list all the files from the downloads)
3.chmod 400 svce.pem
4.ssh -i svce.pem cloud-user@192.168.12.202
5.lsblk







RESULT:

Thus the Eucalyptus is installed and used to run the virtual machine of different configuration and instance creation has been executed successfully.

PROCEDURE TO ATTACH A VIRTUAL BLOCK TO THE VIRTUAL MACHINE AND CHECK WHETHER IT HOLDS DATA EVEN AFTER THE RELEASE OF THE VIRTUAL MACHINE

EX.NO. : 4

DATE :

AIM:

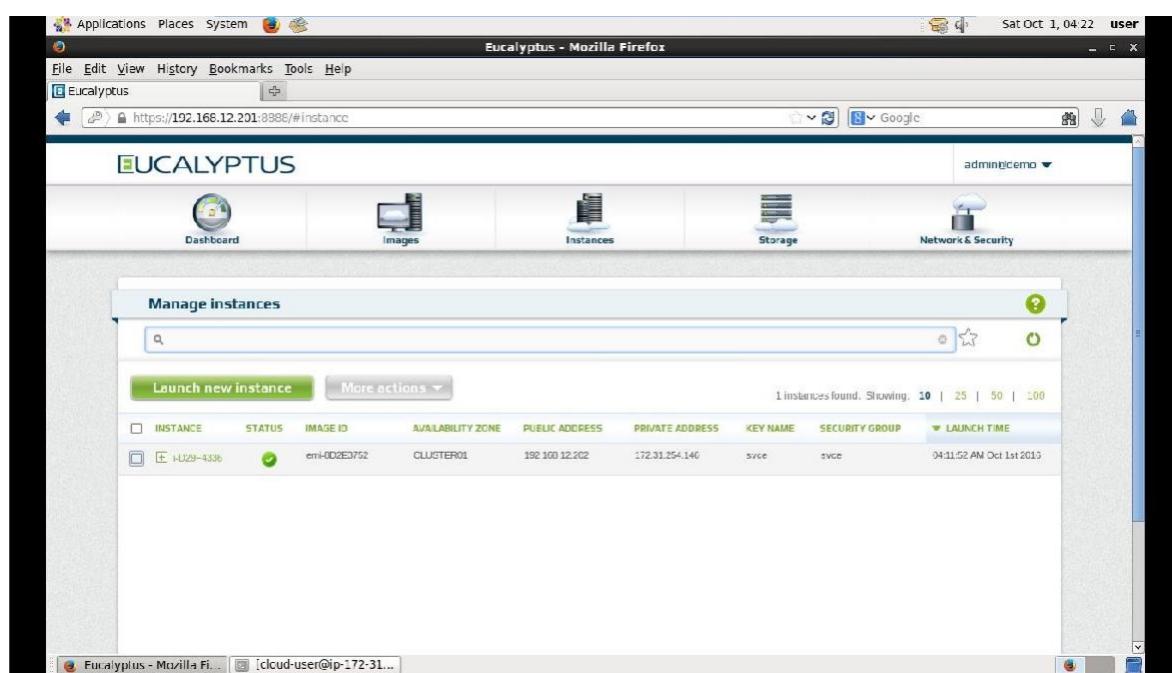
To attach virtual block to the virtual machine and check whether it holds the data even after the release of the virtual machine.

PROCEDURE:

STEP 1:

1.create the **virtual machine installed** with centos.

2.create an **instance**(follow the previous exercise step).



STEP 2:

1.Click **Storage** and select **volume**.

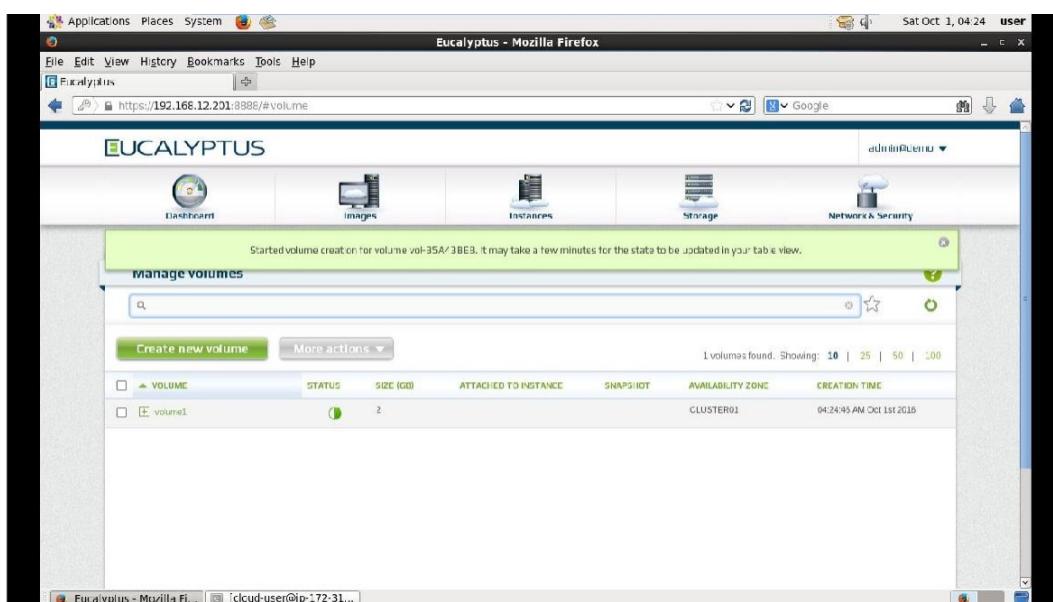
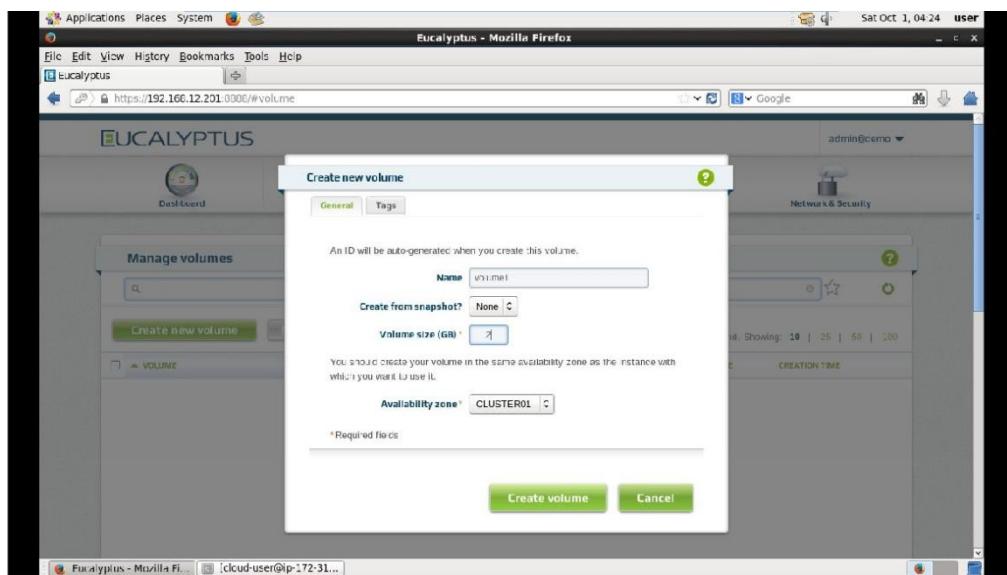
2. Click create new volume.

The screenshot shows the Eucalyptus Management Console interface. The top navigation bar includes 'File', 'Edit', 'View', 'History', 'Bookmarks', 'Tools', and 'Help'. The title bar says 'Eucalyptus - Mozilla Firefox'. The main menu has tabs for 'Dashboard', 'Images', 'Instances', 'Storage', and 'Network & Security'. A dropdown menu is open over the 'Storage' tab, showing options: 'Volumes' (highlighted in green), 'Snapshots', and a question mark icon. Below this, the 'Manage instances' section displays a table with one row of data. The columns are: INSTANCE, STATUS, IMAGE ID, AVAILABILITY ZONE, PUBLIC ADDRESS, PRIVATE ADDRESS, KEY NAME, SECURITY GROUP, and LAUNCH TIME. The single instance listed is 'i-L298-4336' with status 'Running', image ID 'ami-0C2E3752', availability zone 'CLUSTER01', public address '192.100.12.202', private address '172.31.254.146', key name 'svse', security group 'svse', and launch time '04:11:52 AM Oct 1st 2010'. The URL in the browser is <https://192.168.12.201:8888/#instance>.

The screenshot shows the Eucalyptus Management Console interface. The top navigation bar includes 'File', 'Edit', 'View', 'History', 'Bookmarks', 'Tools', and 'Help'. The title bar says 'Eucalyptus - Mozilla Firefox'. The main menu has tabs for 'Dashboard', 'Images', 'Instances', 'Storage' (highlighted in green), and 'Network & Security'. A dropdown menu is open over the 'Storage' tab, showing options: 'Volumes' (highlighted in green), 'Snapshots', and a question mark icon. Below this, the 'Manage volumes' section displays a table with one row of data. The columns are: ▲ VOLUME, STATUS, SIZE (GB), ATTACHED TO INSTANCE, SNAPSHOT, AVAILABILITY ZONE, and CREATION TIME. The single volume listed is 'vol-00000000' with status 'Available', size '0 GB', and creation time 'Loading volumes'. The URL in the browser is <https://192.168.12.201:8888/#volume>.

STEP 3:

1. Create new volume dialog box will appear
2. Click general tab
3. Enter name : any name
4. Create from snapshot : none
5. Volume size : 1GB
6. Availability zone :cluster 01
7. Click create volume



STEP 4:

1. After volume is created successfully click more actions button
2. Select attach to instance from drop down menu.
3. Attach volume to instance dialog box will appear
4. Ensure value is Entered for volume name, Instance(select from dropdown the instace which was created),attach as volume (/dev/sda).
5. Click attach.

Eucalyptus - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Eucalyptus https://192.168.12.201:8886/#volume

Google

EUCALYPTUS

Dashboard Images Instances Storage Network & Security

Manage volumes

Create new volume More actions ▾

ATTACHED TO INSTANCE SNAPSHOT AVAILABILITY ZONE CREATION TIME

CLUSTER01 04:24:45 AM Oct 1st 2018

volume1

Attach to instance
Detach from instance
Create snapshot from volume
Delete
Manage tags

1 volumes found. Showing: 10 | 25 | 50 | 100

CREATION TIME

04:24:45 AM Oct 1st 2018

https://192.168.12.201:8886/#

Eucalyptus - Mozilla Fi... [cloud-user@ip-172-31...]

Eucalyptus - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Eucalyptus https://192.168.12.201:8886/#volume

Google

EUCALYPTUS

Dashboard Images Instances Storage Network & Security

Manage volumes

Volume: vol 35A43BE3 (volume1)

Instance: i-D29=1338

Attach as device: /dev/sdf

Enter a device name to use when attaching the volume.

CREATION TIME

04:24:45 AM Oct 1st 2018

Required fields

Attach Cancel

Eucalyptus - Mozilla Fi... [cloud-user@ip-172-31...]

STEP 5:

1. Ensure the status is in “in use”.

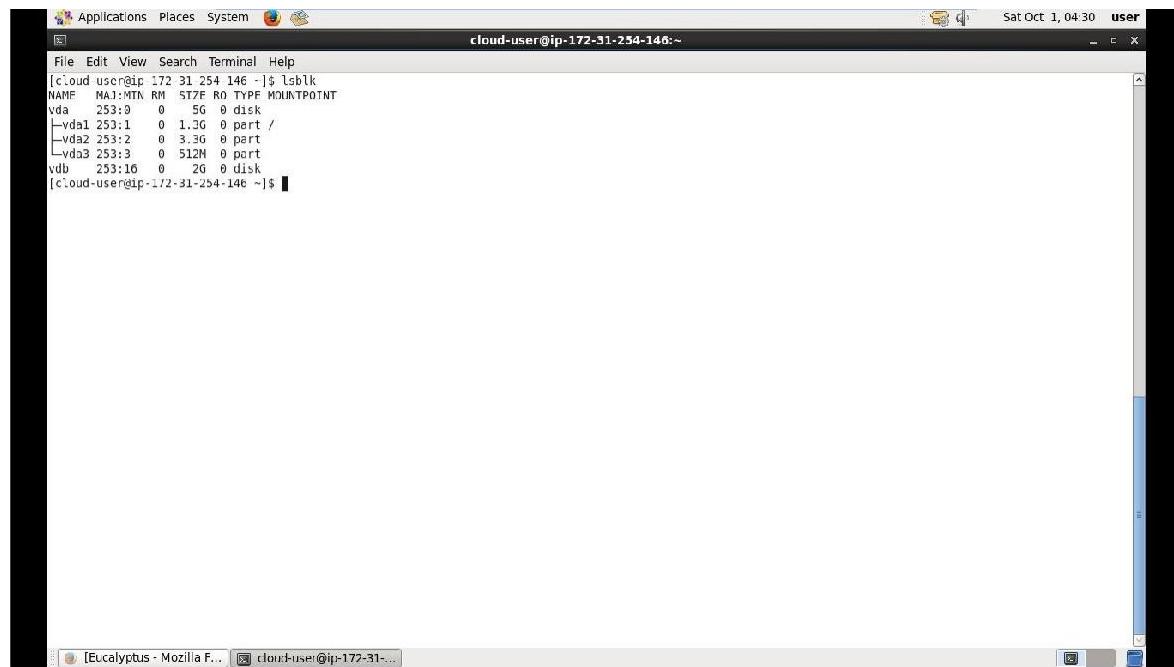
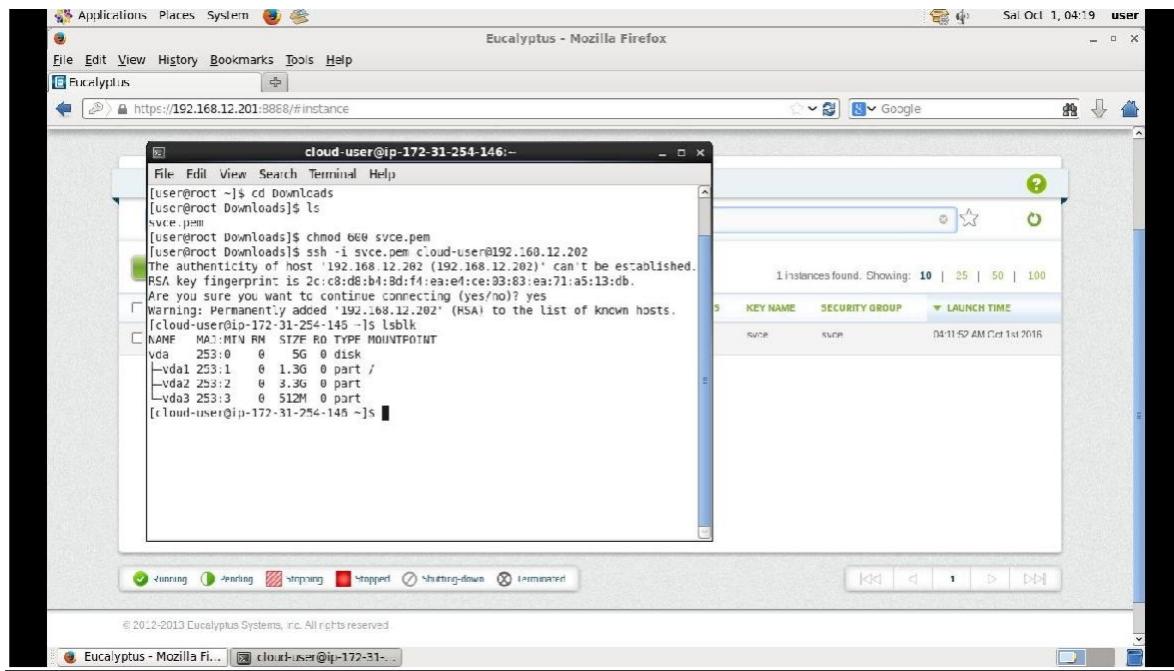
The screenshot shows a Mozilla Firefox browser window displaying the Eucalyptus Management Console. The URL in the address bar is <https://192.168.12.201:3996/#volume>. The page title is "EUCALYPTUS". The main navigation menu includes "Dashboard", "Images", "Instances", "Storage", and "Network & Security". Below the menu, a sub-menu titled "Manage volumes" is open, showing a table of volumes. The table has columns: VOLUME, STATUS, SIZE (GB), ATTACHED TO INSTANCE, SNAPSHOT, AVAILABILITY ZONE, and CREATION TIME. There is one entry: "volume1" with a yellow "in use" icon in the STATUS column, size 2 GB, attached to instance i-C29F4336, in CLUSTER01, and created at 04:24:45 AM Oct 1st 2010.

VOLUME	STATUS	SIZE (GB)	ATTACHED TO INSTANCE	SNAPSHOT	AVAILABILITY ZONE	CREATION TIME
volume1	in use	2	i-C29F4336		CLUSTER01	04:24:45 AM Oct 1st 2010

STEP 6:

1. open terminal 2. Type the following

```
cd Downloads ls  
chmod 400 svce.pem  
ssh -i svce.pem cloud-user@192.168.12.202  
lsblk
```



RESULT:

Thus the volume has been successfully attached to the instance created and verified whether it holds the data even after the release of the virtual machine.

USE EUCALYPTUS AND CREATE AN IMAGE AND EXECUTE THE INSTANCE WITH A STORAGE CONTROLLER AND INTERACT WITH IT

EX.NO. : 5

DATE :

AIM:

To create a virtual image execute the instance with a storage controller and interact with it.

PROCEDURE:

STEP 1:

- Open new terminal
- Type the following

Creating the kernel image:

2. source credentials/admin/eucarc

3.euca-bundle-image -i ~/Desktop/Eucaimage/ vmlinuz-2.6.32-642.3.1.el6.x86_64 -r x86_64 - -kernel true

After this step the following will be created /var/tmp/bundle-hfWXvk/ vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml

4.euca-upload-bundle -b kerimg -m /var/tmp/bundle-hfWXvk/ vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml

(Note: kerimg is the user defined name

/var/tmp/bundle-hfWXvk/ vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml which is created under the bundle step (i.e)2)

After this step the following wil be created/vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml)

5.euca-register kerimg/vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml -a x86_64 -n gcckernel

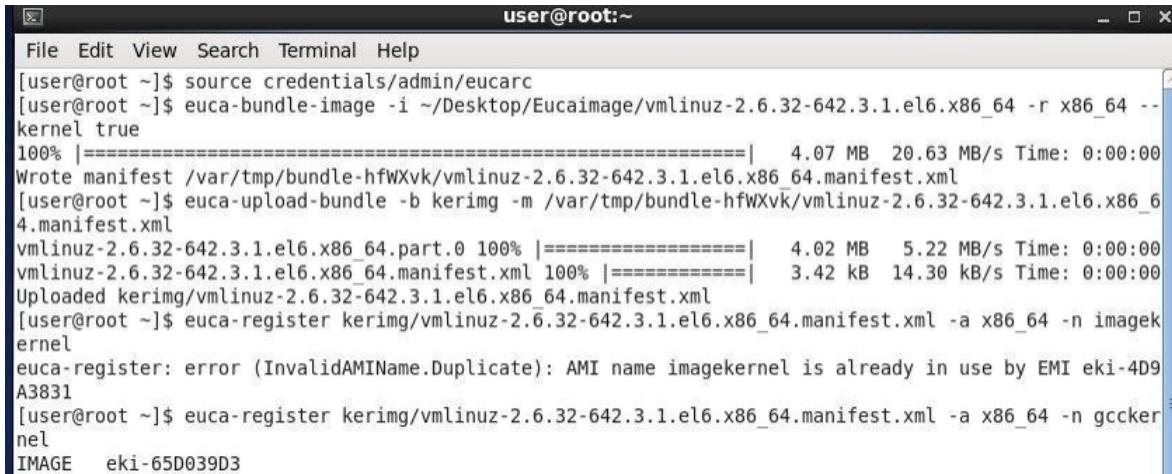
(Note: /vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml which is created under upload step (i.e) 3.

Gcckernel is also user defined name.

The two user defined names should not be same)

6. EKI image will be created eki-6SD039D3(refer the screen shot)

Screenshot for creating kernel image(eki image)



The screenshot shows a terminal window titled "user@root:~". The terminal displays the following command-line session:

```
[user@root ~]$ source credentials/admin/eucarc
[user@root ~]$ euca-bundle-image -i ~/Desktop/Eucaimage/vmlinuz-2.6.32-642.3.1.el6.x86_64 -r x86_64 --kernel true
100% |===== 4.07 MB 20.63 MB/s Time: 0:00:00
Wrote manifest /var/tmp/bundle-hfWXvk/vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml
[user@root ~]$ euca-upload-bundle -b kerimg -m /var/tmp/bundle-hfWXvk/vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml
vmlinuz-2.6.32-642.3.1.el6.x86_64.part.0 100% |===== 4.02 MB 5.22 MB/s Time: 0:00:00
vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml 100% |===== 3.42 kB 14.30 kB/s Time: 0:00:00
Uploaded kerimg/vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml
[user@root ~]$ euca-register kerimg/vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml -a x86_64 -n imagekernel
euca-register: error (InvalidAMIName.Duplicate): AMI name imagekernel is already in use by EMI eki-4D9A3831
[user@root ~]$ euca-register kerimg/vmlinuz-2.6.32-642.3.1.el6.x86_64.manifest.xml -a x86_64 -n gcckernel
IMAGE eki-6SD039D3
```

STEP 2:

Creating the RAM image:

Type the following in the same terminal

**5.euca-bundle-image -i ~/Desktop/Eucaimage/initramfs-2.6.32-642.3.1.el6.x86_64.img
-r x86_64 --ramdisk true**

After this step the following will be created /var/tmp/bundle-PnF6Y4/initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml

**6.euca-upload-bundle -b ramimg/var/tmp/bundle-PnF6Y4/initramfs-
2.6.32-642.3.1.el6.x86_64.img.manifest.xml**

(Note: ramimg is the user defined name

/var/tmp/bundle-PnF6Y4/initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml which is created under the bundle step (i.e)1)

After this step the following wil be createdramimg/initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml)

**7.euca-register ramimg/initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml -n gccram
-a x86_64**

(Note: /initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml which is created under upload step (i.e) 2.

gccram is also user defined name.

The two user defined names should not be same)

8. ERI image will be created **eri-67F9346B3**(refer the screen shot)

Screenshot for creating RAM image(eri image)

```
[user@root ~]$ euca-bundle-image -i ~/Desktop/Eucaimage/initramfs-2.6.32-642.3.1.el6.x86_64.img -r x86_64 --ramdisk true  
100% |=====| 26.71 MB 25.54 MB/s Time: 0:00:01  
Wrote manifest /var/tmp/bundle-PnF6Y4/initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml  
[user@root ~]$ euca-upload-bundle -b ramimg -m /var/tmp/bundle-PnF6Y4/initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml  
initramfs-2.6.32-642.3.1.el6.x86_64.img.part.0 (1/3) 100% |=====| 10.00 MB 56.94 MB/s Time: 0:00:00  
initramfs-2.6.32-642.3.1.el6.x86_64.img.part.1 (2/3) 100% |=====| 10.00 MB 70.76 MB/s Time: 0:00:00  
initramfs-2.6.32-642.3.1.el6.x86_64.img.part.2 (3/3) 100% |=====| 6.57 MB 50.94 MB/s Time: 0:00:00  
initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml 100% |=====| 3.70 kB 39.77 kB/s Time: 0:00:00  
Uploaded ramimg/initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml  
[user@root ~]$ euca-register ramimg/initramfs-2.6.32-642.3.1.el6.x86_64.img.manifest.xml -n gccram -a x86_64  
IMAGE eri-67F9346B
```

STEP 3:

Creating the MANIFEST image:

161
~/Desktop/Eucaimage/root1.img
6SD039D3 --ramdisk eri-67F9346B3

**euca-bundle-image -i
-r x86_64 --kernel eki-**

After this step the following will be created /var/tmp/bundle-Z61gwm/root1.img.manifest.xml

162 **euca-upload-bundle-b rootimg -m /var/tmp/bundle-Z61gwm**
/root1.img.manifest.xml

(Note: rootimg is the user defined name

/var/tmp/bundle-Z61gwm /root1.img.manifest.xml which is created under the bundle
step (i.e)1) After this step the following wil be created

rootimg/root1.img.manifest.xml)

163 **euca-register**
rootimg/root1.img.manifest.xml -n gccroot -a x86_64 (Note:

rootimg/root1.img.manifest.xml which is created under upload step (i.e) 2.

gccroot is also user defined name.

The two user defined names should not be same)

164 EMI image will be created **emi-3E633FB3**(refer the screen shot) Screenshot for creating MANIFEST image(emi image)

```
[user@root ~]$ euca-bundle-image -i ~/Desktop/Eucaimage/root1.img -r x86_64 --kernel eki-65D039D3 --ra  
mdisk eri-67F9346B  
100% |=====| 2.00 GB 24.74 MB/s Time: 0:01:26  
Wrote manifest /var/tmp/bundle-Z61gwm/root1.img.manifest.xml  
[user@root ~]$ euca-upload-bundle -b rootimg -m /var/tmp/bundle-Z61gwm/root1.img.manifest.xml  
root1.img.part.0 ( 1/59) 100% |=====| 10.00 MB 53.19 MB/s Time: 0:00:00  
root1.img.part.1 ( 2/59) 100% |=====| 10.00 MB 56.14 MB/s Time: 0:00:00  
root1.img.part.2 ( 3/59) 100% |=====| 10.00 MB 59.06 MB/s Time: 0:00:00  
root1.img.part.3 ( 4/59) 100% |=====| 10.00 MB 52.35 MB/s Time: 0:00:00  
root1.img.part.4 ( 5/59) 100% |=====| 10.00 MB 52.79 MB/s Time: 0:00:00  
root1.img.part.5 ( 6/59) 100% |=====| 10.00 MB 50.33 MB/s Time: 0:00:00  
root1.img.part.6 ( 7/59) 100% |=====| 10.00 MB 52.43 MB/s Time: 0:00:00  
root1.img.part.7 ( 8/59) 100% |=====| 10.00 MB 49.16 MB/s Time: 0:00:00  
root1.img.part.8 ( 9/59) 100% |=====| 10.00 MB 40.36 MB/s Time: 0:00:00  
root1.img.part.9 (10/59) 100% |=====| 10.00 MB 51.04 MB/s Time: 0:00:00  
root1.img.part.10 (11/59) 100% |=====| 10.00 MB 46.51 MB/s Time: 0:00:00  
root1.img.part.11 (12/59) 100% |=====| 10.00 MB 50.90 MB/s Time: 0:00:00  
root1.img.part.12 (13/59) 100% |=====| 10.00 MB 51.25 MB/s Time: 0:00:00  
root1.img.part.13 (14/59) 100% |=====| 10.00 MB 38.22 MB/s Time: 0:00:00  
root1.img.part.14 (15/59) 100% |=====| 10.00 MB 49.68 MB/s Time: 0:00:00  
root1.img.part.15 (16/59) 100% |=====| 10.00 MB 35.49 MB/s Time: 0:00:00  
root1.img.part.16 (17/59) 100% |=====| 10.00 MB 45.73 MB/s Time: 0:00:00  
root1.img.part.17 (18/59) 100% |=====| 10.00 MB 54.09 MB/s Time: 0:00:00  
root1.img.part.18 (19/59) 100% |=====| 10.00 MB 51.23 MB/s Time: 0:00:00  
root1.img.part.19 (20/59) 100% |=====| 10.00 MB 47.56 MB/s Time: 0:00:00  
root1.img.part.20 (21/59) 100% |=====| 10.00 MB 52.41 MB/s Time: 0:00:00
```

```
root1.img.part.35 (36/59) 100% |=====| 10.00 MB 15.02 MB/s Time: 0:00:00  
root1.img.part.36 (37/59) 100% |=====| 10.00 MB 22.81 MB/s Time: 0:00:00  
root1.img.part.37 (38/59) 100% |=====| 10.00 MB 22.86 MB/s Time: 0:00:00  
root1.img.part.38 (39/59) 100% |=====| 10.00 MB 35.51 MB/s Time: 0:00:00  
root1.img.part.39 (40/59) 100% |=====| 10.00 MB 33.05 MB/s Time: 0:00:00  
root1.img.part.40 (41/59) 100% |=====| 10.00 MB 18.83 MB/s Time: 0:00:00  
root1.img.part.41 (42/59) 100% |=====| 10.00 MB 47.37 MB/s Time: 0:00:00  
root1.img.part.42 (43/59) 100% |=====| 10.00 MB 15.23 MB/s Time: 0:00:00  
root1.img.part.43 (44/59) 100% |=====| 10.00 MB 2.13 MB/s Time: 0:00:04  
root1.img.part.44 (45/59) 100% |=====| 10.00 MB 3.17 MB/s Time: 0:00:03  
root1.img.part.45 (46/59) 100% |=====| 10.00 MB 52.56 MB/s Time: 0:00:00  
root1.img.part.46 (47/59) 100% |=====| 10.00 MB 57.38 MB/s Time: 0:00:00  
root1.img.part.47 (48/59) 100% |=====| 10.00 MB 24.34 MB/s Time: 0:00:00  
root1.img.part.48 (49/59) 100% |=====| 10.00 MB 29.52 MB/s Time: 0:00:00  
root1.img.part.49 (50/59) 100% |=====| 10.00 MB 60.84 MB/s Time: 0:00:00  
root1.img.part.50 (51/59) 100% |=====| 10.00 MB 47.03 MB/s Time: 0:00:00  
root1.img.part.51 (52/59) 100% |=====| 10.00 MB 53.60 MB/s Time: 0:00:00  
root1.img.part.52 (53/59) 100% |=====| 10.00 MB 65.70 MB/s Time: 0:00:00  
root1.img.part.53 (54/59) 100% |=====| 10.00 MB 59.01 MB/s Time: 0:00:00  
root1.img.part.54 (55/59) 100% |=====| 10.00 MB 59.33 MB/s Time: 0:00:00  
root1.img.part.55 (56/59) 100% |=====| 10.00 MB 51.89 MB/s Time: 0:00:00  
root1.img.part.56 (57/59) 100% |=====| 10.00 MB 52.88 MB/s Time: 0:00:00  
root1.img.part.57 (58/59) 100% |=====| 10.00 MB 51.84 MB/s Time: 0:00:00  
root1.img.part.58 (59/59) 100% |=====| 7.25 MB 46.20 MB/s Time: 0:00:00  
root1.img.manifest.xml 100% |=====| 11.05 kB 135.54 kB/s Time: 0:00:00  
Uploaded rootimg/root1.img.manifest.xml  
[user@root ~]$ euca-register rootimg/root1.img.manifest.xml -n gccroot -a x86_64  
IMAGE emi-3E633FB3
```

STEP 4:

This EMI image can be accessed only by the ADMIN.

This access privilege can be extended to all user by the following steps.

164.1 euca-modify-image-attribute -l -a all emi-
3E633FB3
(launch permission will be given to all groups)

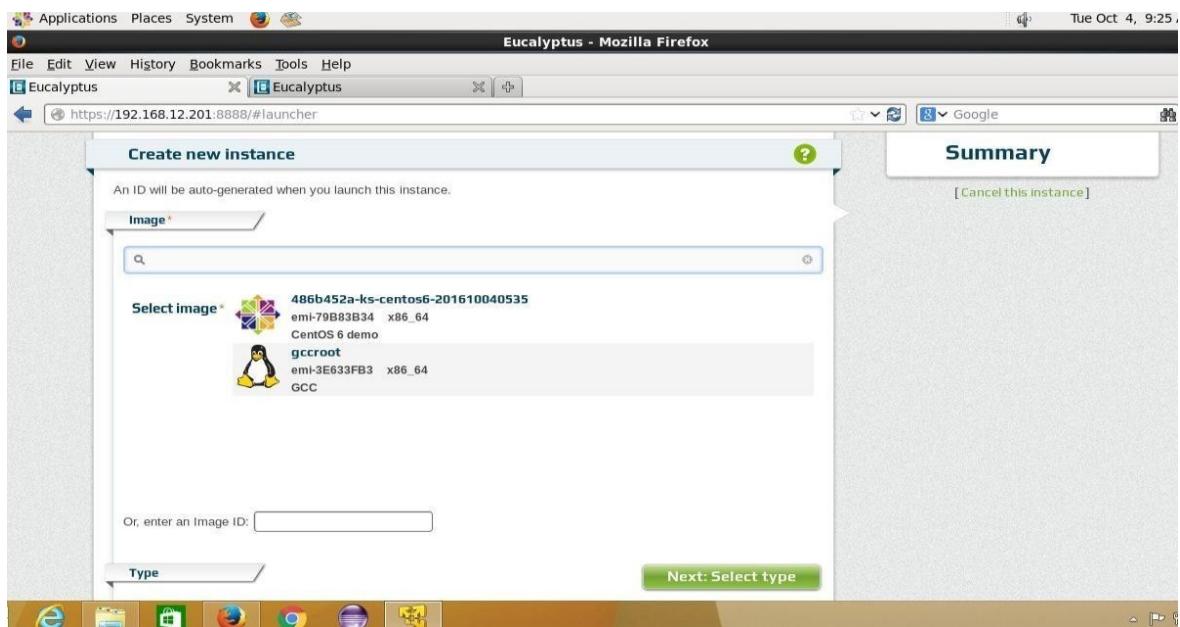
164.2 euca-modify-image-attribute - --description GCC emi-3E633FB3
(description name is assigned to emi image.
GCC is user defined name
Refer the screenshot)

Screenshot for launch permission

```
[user@root ~]$ euca-modify-image-attribute -l -a all emi-3E633FB3  
| launchPermission          emi-3E633FB3      ADD      Group    all  
[user@root ~]$ euca-modify-image-attribute --description GCC emi-3E633FB3  
| description          emi-3E633FB3      GCC  
[user@root ~]$  
[user@root ~]$ █
```

STEP 5:

- 1 Open browser and type: <https://192.168.12.201:8888> (or) click the eucalyptus user console directly.
 - 2 Click Create new instance
 - 3 You will find two image
 - centos6 demo(already existed image)
 - 2.gccroot(created image)
 - 4 For creating an instance follow the procedure of eucalyptus instance creation,instead of selecting centos 6 demo **select gccroot**



STEP 6:

- 5 Give instance name, instance size.
- 6 Next select security type where you will click.
 6. create new pair(create and download it)
 - 6.1 create new security group(create group and assign rules to it)
- 7 Click launch instance.
- 8 Instance will be created.



Create new security group ?

Group **Rules** **Tags**

Define your group:

Name * newroot

Description * aaa

* Required fields

Create group **Cancel**

The dialog box has a light blue header bar with the title 'Create new security group' and a question mark icon. Below the header are three tabs: 'Group' (selected), 'Rules', and 'Tags'. The main area is titled 'Define your group:' and contains two input fields: 'Name *' with value 'newroot' and 'Description *' with value 'aaa'. A note below the fields says '* Required fields'. At the bottom are two green buttons: 'Create group' and 'Cancel'.

Group Rules Tags

Add rules:

Protocol: SSH (TCP port 22, for terminal access)

Port range: 22

Allow traffic from: IP address: 192.168.12.201/32
 Use my IP address

Other security group: enter a security group.

Add another rule

Create group **Cancel**

INSTANCE	STATUS	IMAGE ID	AVAILABILITY ZONE	PUBLIC ADDRESS	PRIVATE ADDRESS	KEY NAME	SECURITY GROUP	LAUNCH TIME
<input type="checkbox"/> newimg	✓	emi-3E633FB3	CLUSTER01	192.168.12.202	172.31.254.26	root	newroot	09:31:07 AM Oct 4th 2016

STEP 7:

9 Open terminal

10 Type the following

1.Ping 192.168.12.202

(check whether public address is establish connection)

> **chmod 400 root.pem**

(changing the permission of pem file which is created when instance launched)

> **ssh -i root.pem centos@192.168.12.202**

> **Su -**

Password: centos

(It changes from user to root)

```
root@ip-172-31-255-85:~ - □
File Edit View Search Terminal Help
[user@root ~]$ ping 192.168.12.202
PING 192.168.12.202 (192.168.12.202) 56(84) bytes of data.
64 bytes from 192.168.12.202: icmp_seq=1 ttl=64 time=0.177 ms
64 bytes from 192.168.12.202: icmp_seq=2 ttl=64 time=0.332 ms
64 bytes from 192.168.12.202: icmp_seq=3 ttl=64 time=0.311 ms
^Z
[1]+  Stopped                  ping 192.168.12.202
[user@root ~]$ ls
credentials  Documents  Music    Public    Videos
Desktop      Downloads   Pictures  Templates
[user@root ~]$ cd Downloads
[user@root Downloads]$ ls
kumara.pem  root.pem
[user@root Downloads]$ chmod 400 root.pem
[user@root Downloads]$ ssh -i root.pem    centos@192.168.12.202
[centos@ip-172-31-255-85 ~]$ su -
Password:
[root@ip-172-31-255-85 ~]#
```

RESULT :

Thus an image is created and the instance is executed with a storage controller and interact with it

INSTALL A C COMPILER IN THE VIRTUAL MACHINE AND EXECUTE A SAMPLE PROGRAM

EX.NO. : 6

DATE :

AIM:

To install a C compiler in the virtual machine and execute a sample program

PROCEDURE:

Step 1: Installation of G C C compiler

1.Yum install gcc

(GCC will be installed from the local repository. After completion of gcc compiler, ready to run the C program)

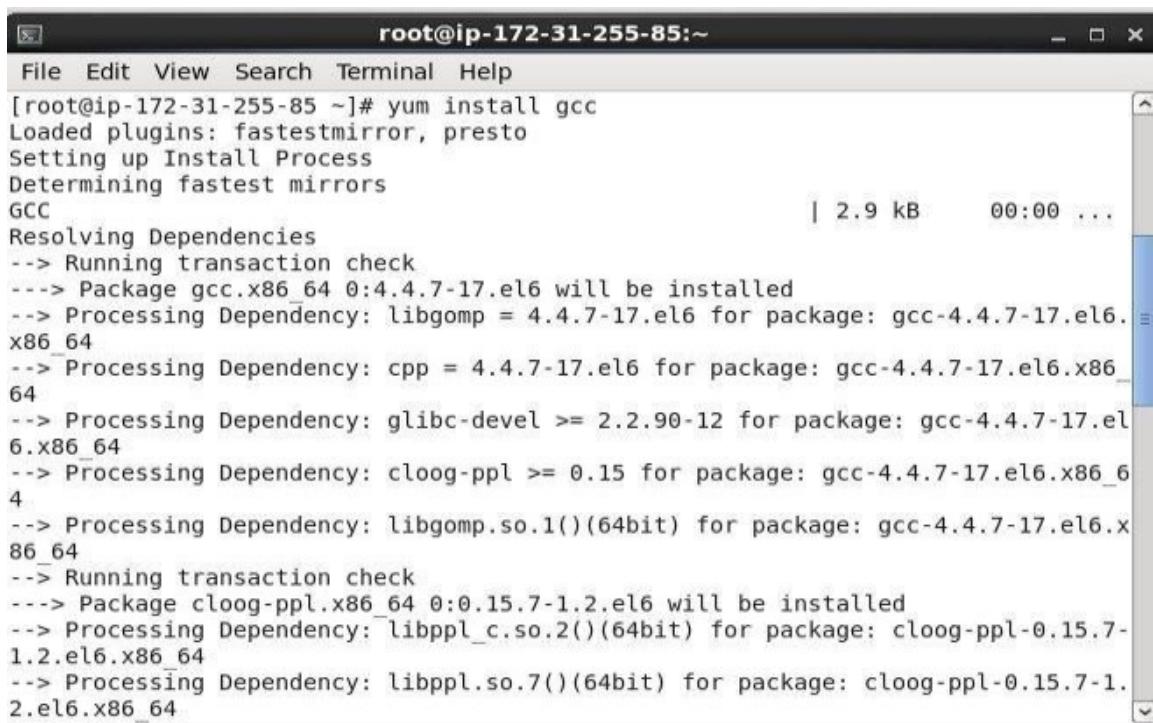
11 To run the C program

12 Open the terminal

13 Execute the c program

* vi programname.c (for opening the program)

* Press esc:wq (saving the program)



```
root@ip-172-31-255-85:~#
File Edit View Search Terminal Help
[root@ip-172-31-255-85 ~]# yum install gcc
Loaded plugins: fastestmirror, presto
Setting up Install Process
Determining fastest mirrors
GCC | 2.9 kB     00:00 ...
Resolving Dependencies
--> Running transaction check
--> Package gcc.x86_64 0:4.4.7-17.el6 will be installed
--> Processing Dependency: libgomp = 4.4.7-17.el6 for package: gcc-4.4.7-17.el6.x86_64
--> Processing Dependency: cpp = 4.4.7-17.el6 for package: gcc-4.4.7-17.el6.x86_64
--> Processing Dependency: glibc-devel >= 2.2.90-12 for package: gcc-4.4.7-17.el6.x86_64
--> Processing Dependency: cloog-ppl >= 0.15 for package: gcc-4.4.7-17.el6.x86_64
--> Processing Dependency: libgomp.so.1()(64bit) for package: gcc-4.4.7-17.el6.x86_64
--> Running transaction check
--> Package cloog-ppl.x86_64 0:0.15.7-1.2.el6 will be installed
--> Processing Dependency: libppl_c.so.2()(64bit) for package: cloog-ppl-0.15.7-1.2.el6.x86_64
--> Processing Dependency: libppl.so.7()(64bit) for package: cloog-ppl-0.15.7-1.2.el6.x86_64
```

```
[root@ip-172-31-255-85:~]# yum install -y gcc
File Edit View Search Terminal Help
Dependencies Resolved

=====
Package           Arch      Version       Repository   Size
=====
Installing:
gcc              x86_64    4.4.7-17.el6  GCC          10 M
Installing for dependencies:
cloog-ppl        x86_64    0.15.7-1.2.el6  GCC          93 k
cpp              x86_64    4.4.7-17.el6  GCC          3.7 M
glibc-devel      x86_64    2.12-1.192.el6  GCC         988 k
glibc-headers    x86_64    2.12-1.192.el6  GCC          617 k
kernel-headers   x86_64    2.6.32-642.3.1.el6  GCC          4.4 M
libgomp          x86_64    4.4.7-17.el6  GCC          134 k
ppl              x86_64    0.10.2-11.el6  GCC          1.3 M

Transaction Summary
=====
Install     8 Package(s)

Total download size: 21 M
Installed size: 38 M
Is this ok [Y/N]: y
```

* cc programname.c (for compiling the program)

5 ./a.out (to see the output)

Result:

Thus the image(gcc) has been created and the C program has been compiled successfully.

FIND THE PROCEDURE TO SET UP THE ONE NODE HADOOP CLUSTER:

EX.NO. : 7

DATE :

AIM:

To find procedure to set up the one node hadoop cluster.

PROCEDURE:

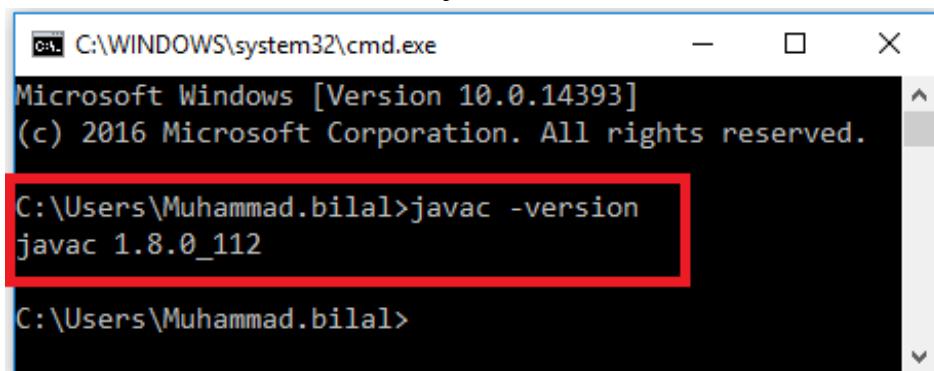
STEP 1:

These softwares should be prepared to install Hadoop 2.8.0 on window 10 64bit

Download Hadoop 2.8.0 (Link: <http://www-eu.apache.org/dist/hadoop/common/hadoop-2.8.0/hadoop-2.8.0.tar.gz>
OR <http://archive.apache.org/dist/hadoop/core//hadoop-2.8.0/hadoop-2.8.0.tar.gz>) Java JDK 1.8.0.zip (Link:
<http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>)

STEP 2:

Check either Java 1.8.0 is already installed on your system or not, use "Javac - version" to check. java version

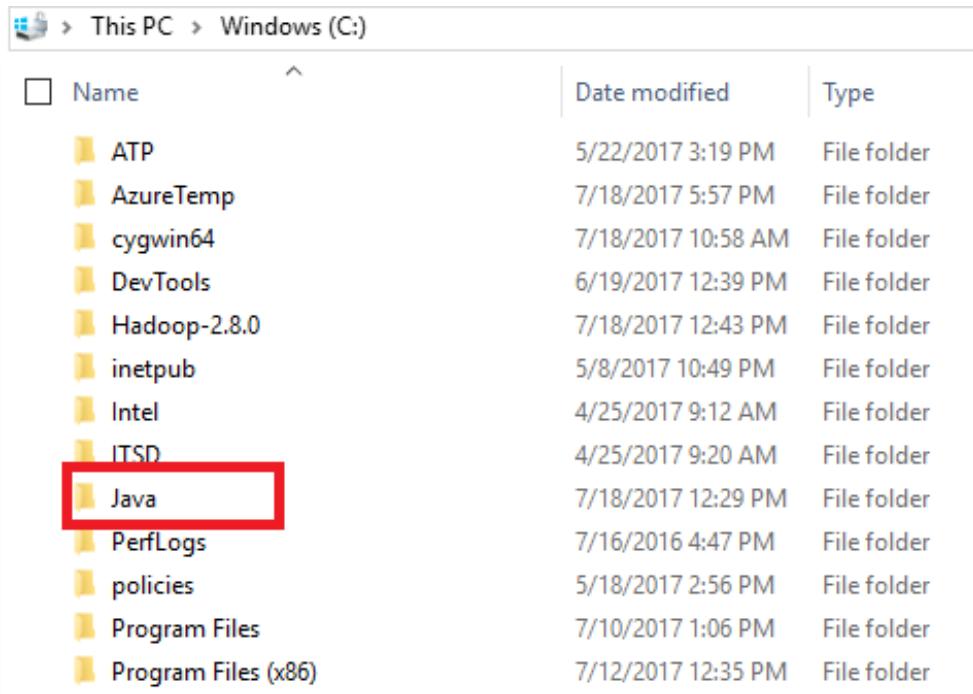


The screenshot shows a Windows Command Prompt window titled 'C:\WINDOWS\system32\cmd.exe'. The window displays the following text:
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.
C:\Users\Muhammad.bilal>javac -version
javac 1.8.0_112
C:\Users\Muhammad.bilal>

A red rectangular box highlights the command 'javac -version' and its output 'javac 1.8.0_112'.

If Java is not installed on your system then first install java under "C:\JAVA" Java setup

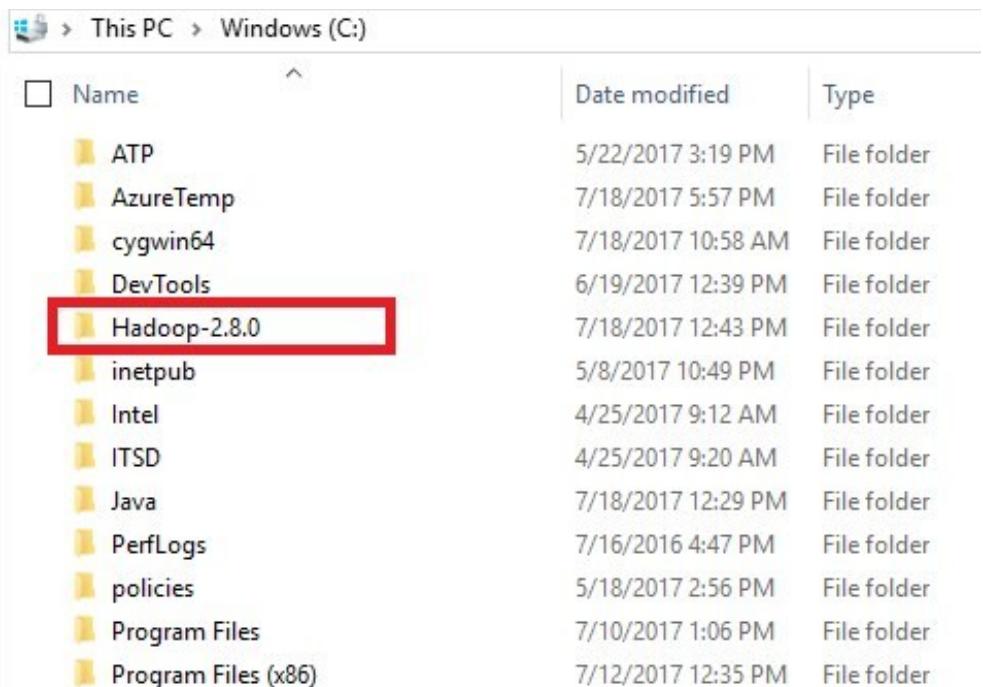
File Explorer view of C:\ drive:



<input type="checkbox"/> Name	Date modified	Type
ATP	5/22/2017 3:19 PM	File folder
AzureTemp	7/18/2017 5:57 PM	File folder
cygwin64	7/18/2017 10:58 AM	File folder
DevTools	6/19/2017 12:39 PM	File folder
Hadoop-2.8.0	7/18/2017 12:43 PM	File folder
inetpub	5/8/2017 10:49 PM	File folder
Intel	4/25/2017 9:12 AM	File folder
ITSD	4/25/2017 9:20 AM	File folder
Java	7/18/2017 12:29 PM	File folder
PerfLogs	7/16/2016 4:47 PM	File folder
policies	5/18/2017 2:56 PM	File folder
Program Files	7/10/2017 1:06 PM	File folder
Program Files (x86)	7/12/2017 12:35 PM	File folder

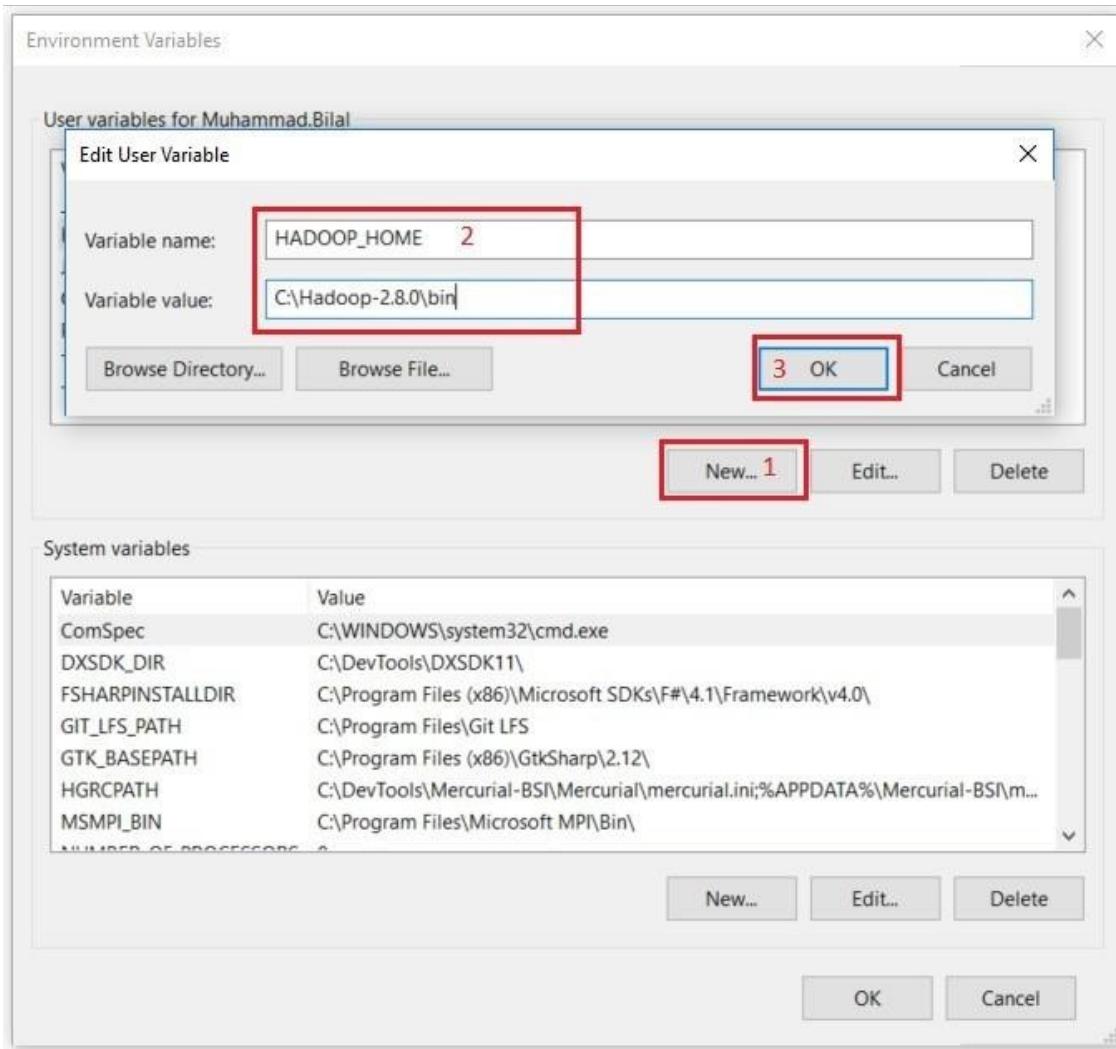
Extract file Hadoop 2.8.0.tar.gz or Hadoop-2.8.0.zip and place under "C:\Hadoop- 2.8.0"

File Explorer view of C:\ drive after extraction:

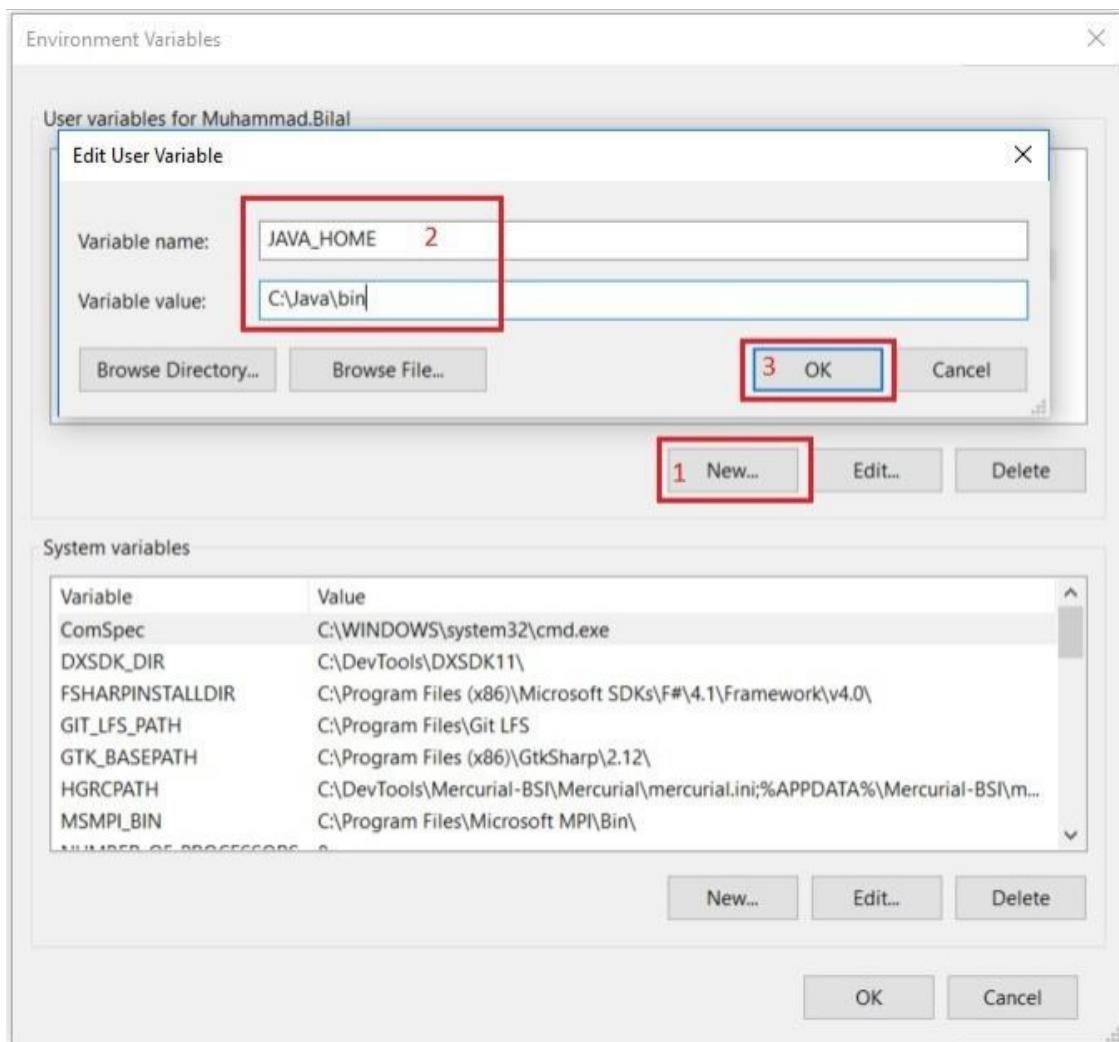


<input type="checkbox"/> Name	Date modified	Type
ATP	5/22/2017 3:19 PM	File folder
AzureTemp	7/18/2017 5:57 PM	File folder
cygwin64	7/18/2017 10:58 AM	File folder
DevTools	6/19/2017 12:39 PM	File folder
Hadoop-2.8.0	7/18/2017 12:43 PM	File folder
inetpub	5/8/2017 10:49 PM	File folder
Intel	4/25/2017 9:12 AM	File folder
ITSD	4/25/2017 9:20 AM	File folder
Java	7/18/2017 12:29 PM	File folder
PerfLogs	7/16/2016 4:47 PM	File folder
policies	5/18/2017 2:56 PM	File folder
Program Files	7/10/2017 1:06 PM	File folder
Program Files (x86)	7/12/2017 12:35 PM	File folder

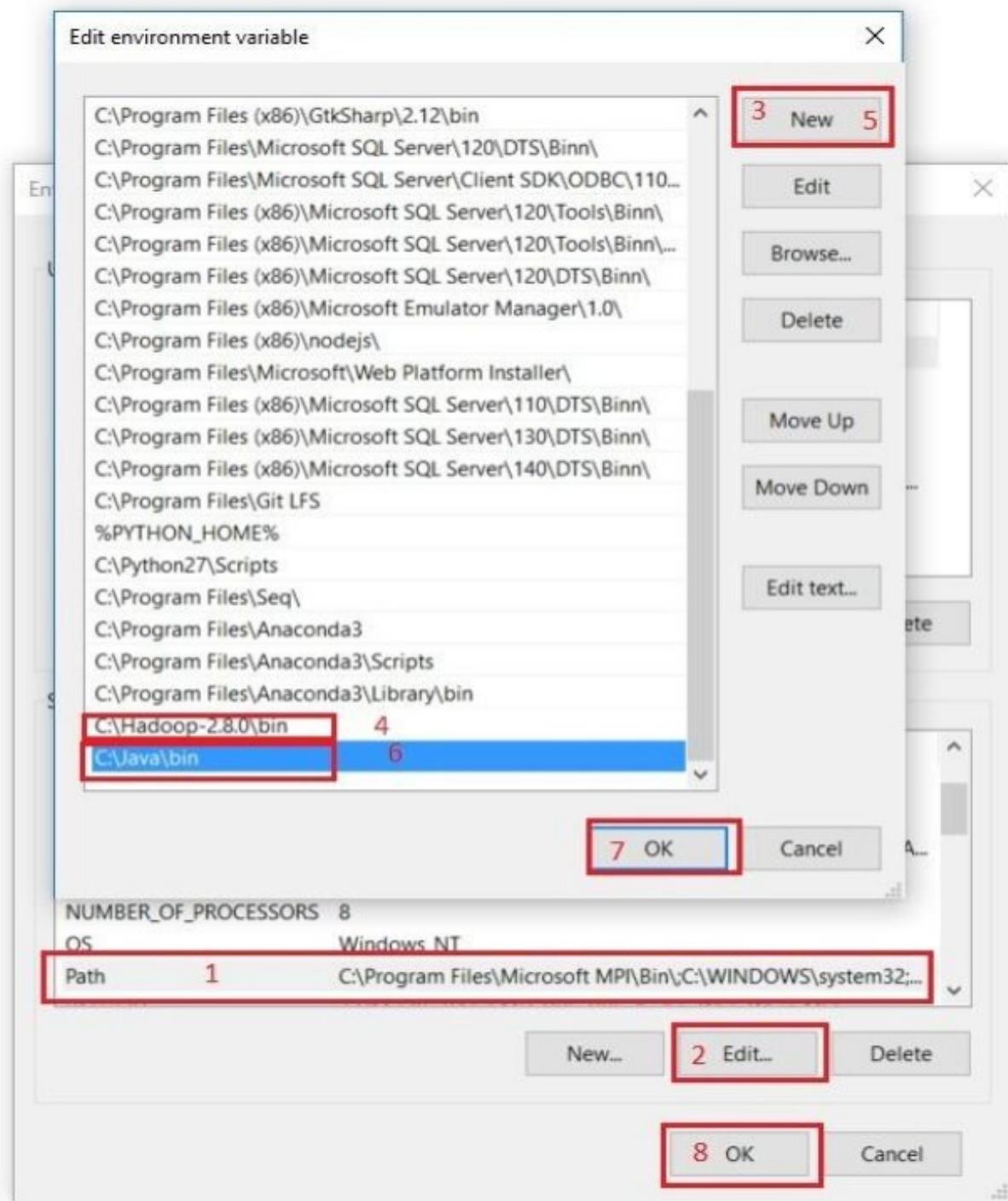
Set the path HADOOP_HOME Environment variable on windows 10(see Step 1,2,3 and 4 below).



Set the path JAVA_HOME Environment variable on windows 10(see Step 1,2,3 and 4 below).



Next we set the Hadoop bin directory path and JAVA bin directory path.



STEP 3 : Configuration

Edit file **C:/Hadoop-2.8.0/etc/hadoop/core-site.xml**, paste below xml paragraph and save this file.

```
<configuration>
  <property>
    <name>fs.defaultFS</name>
```

```
<value>hdfs://localhost:9000</value>
</property>
</configuration>
```

Rename "mapred-site.xml.template" to "mapred-site.xml" and edit this file **C:/Hadoop- 2.8.0/etc/hadoop/mapred-site.xml**, paste below xml paragraph and save this file.

```
<configuration>
<property>
  <name>mapreduce.framework.name</name>
  <value>yarn</value>
</property>
</configuration>
```

Create folder "**data**" under "**C:\Hadoop-2.8.0**"
Create folder "**datanode**" under "**C:\Hadoop-2.8.0\data**"
Create folder "**namenode**" under "**C:\Hadoop-2.8.0\data**"

<input type="checkbox"/> Name	Date modified	Type	Size
bin	7/20/2017 2:14 PM	File folder	
<input checked="" type="checkbox"/> data	7/20/2017 2:47 PM	File folder	
etc	7/20/2017 2:14 PM	File folder	
include	7/20/2017 2:14 PM	File folder	
lib	7/20/2017 2:14 PM	File folder	
libexec	7/20/2017 2:14 PM	File folder	
sbin	7/20/2017 2:14 PM	File folder	
share	7/20/2017 2:20 PM	File folder	
LICENSE.txt	3/17/2017 10:31 AM	TXT File	97 KB
NOTICE.txt	3/17/2017 10:31 AM	TXT File	16 KB
README.txt	3/17/2017 10:31 AM	TXT File	2 KB

Edit file **C:/Hadoop-2.8.0/etc/hadoop/hdfs-site.xml**, paste below xml paragraph and save this file.

```
<configuration>
```

```

<property>
    <name>dfs.replication</name>
    <value>1</value>
</property>
<property>
    <name>dfs.namenode.name.dir</name>
    <value>/hadoop-
2.8.0/data/namenode</value> </property>
<property>
    <name>dfs.datanode.data.dir</name>
    <value>/hadoop-
2.8.0/data/datanode</value>
</property>
</configuration>

```

Edit file **C:/Hadoop-2.8.0/etc/hadoop/yarn-site.xml**, paste below xml paragraph and save this file.

```

<configuration>
<property>
    <name>yarn.nodemanager.aux-services</name>
    <value>mapreduce_shuffle</value>
</property>
<property>
    <name>yarn.nodemanager.auxservices.mapreduce.shuffle.class</name>
    <value>org.apache.hadoop.mapred.ShuffleHandler</value>
</property>
</configuration>

```

Edit file **C:/Hadoop-2.8.0/etc/hadoop/hadoop-env.cmd** by closing the command line "**JAVA_HOME=%JAVA_HOME%**" instead of set "**JAVA_HOME=C:\Java**" (On C:\java this is path to file jdk.18.0)


```
rem The java implementation to use. Required.  
rem set JAVA_HOME=%JAVA_HOME%  
set JAVA_HOME=C:\java
```

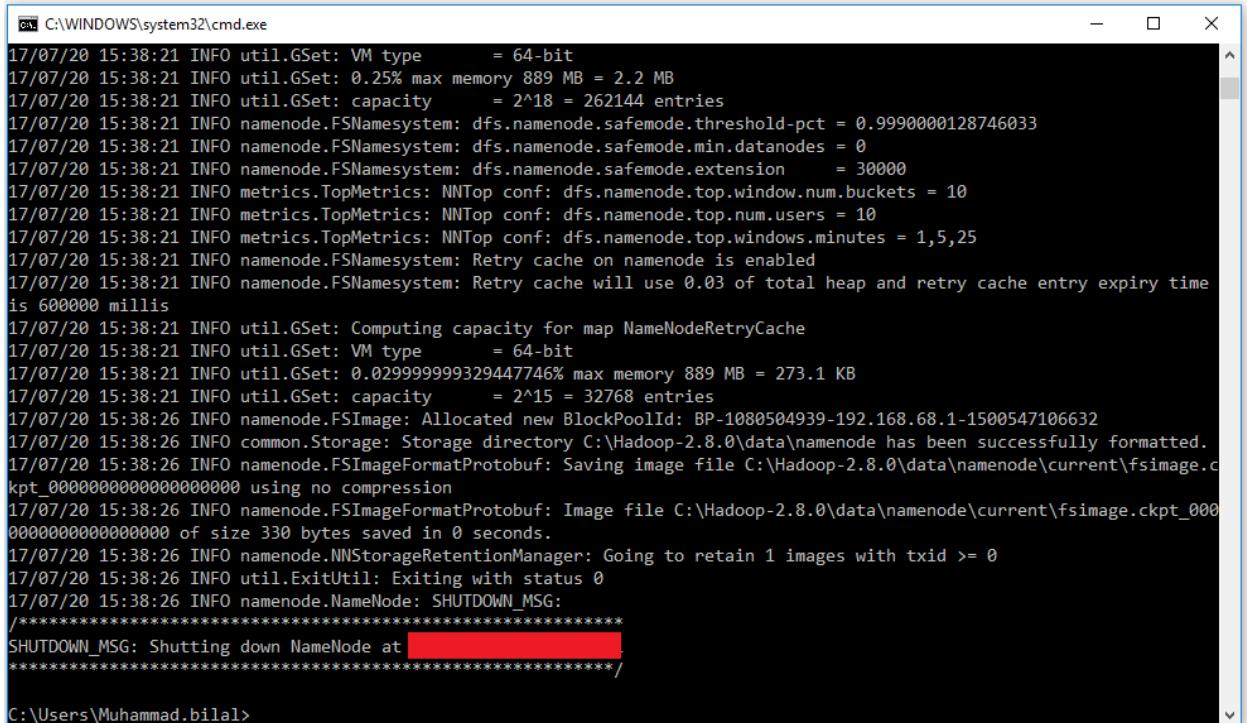
STEP 4 : Hadoop Configuration

Download file Hadoop Configuration.zip (Link:

<https://github.com/MuhammadBilalYar/HADOOP-INSTALLATION-ON-WINDOW-10/blob/master/Hadoop%20Configuration.zip>)

Delete file bin on C:\Hadoop-2.8.0\bin, replaced by file bin on file just download (from Hadoop Configuration.zip).

Open cmd and typing command "**hdfs namenode –format**" . You will see



```
C:\WINDOWS\system32\cmd.exe  
17/07/20 15:38:21 INFO util.GSet: VM type      = 64-bit  
17/07/20 15:38:21 INFO util.GSet: 0.25% max memory 889 MB = 2.2 MB  
17/07/20 15:38:21 INFO util.GSet: capacity      = 2^18 = 262144 entries  
17/07/20 15:38:21 INFO namenode.FSNamesystem: dfs.namenode.safemode.threshold-pct = 0.9990000128746033  
17/07/20 15:38:21 INFO namenode.FSNamesystem: dfs.namenode.safemode.min.datanodes = 0  
17/07/20 15:38:21 INFO namenode.FSNamesystem: dfs.namenode.safemode.extension      = 30000  
17/07/20 15:38:21 INFO metrics.TopMetrics: NNTop conf: dfs.namenode.top.window.num.buckets = 10  
17/07/20 15:38:21 INFO metrics.TopMetrics: NNTop conf: dfs.namenode.top.num.users = 10  
17/07/20 15:38:21 INFO metrics.TopMetrics: NNTop conf: dfs.namenode.top.windows.minutes = 1,5,25  
17/07/20 15:38:21 INFO namenode.FSNamesystem: Retry cache on namenode is enabled  
17/07/20 15:38:21 INFO namenode.FSNamesystem: Retry cache will use 0.03 of total heap and retry cache entry expiry time  
is 60000 millis  
17/07/20 15:38:21 INFO util.GSet: Computing capacity for map NameNodeRetryCache  
17/07/20 15:38:21 INFO util.GSet: VM type      = 64-bit  
17/07/20 15:38:21 INFO util.GSet: 0.029999999329447746% max memory 889 MB = 273.1 KB  
17/07/20 15:38:21 INFO util.GSet: capacity      = 2^15 = 32768 entries  
17/07/20 15:38:26 INFO namenode.FSImage: Allocated new BlockPoolId: BP-1080504939-192.168.68.1-1500547106632  
17/07/20 15:38:26 INFO common.Storage: Storage directory C:\Hadoop-2.8.0\data\namenode has been successfully formatted.  
17/07/20 15:38:26 INFO namenode.FSImageFormatProtobuf: Saving image file C:\Hadoop-2.8.0\data\namenode\current\fimage.c  
kpt_0000000000000000 using no compression  
17/07/20 15:38:26 INFO namenode.FSImageFormatProtobuf: Image file C:\Hadoop-2.8.0\data\namenode\current\fimage.ckpt_000  
000000000000000000 of size 330 bytes saved in 0 seconds.  
17/07/20 15:38:26 INFO namenode.NNStorageRetentionManager: Going to retain 1 images with txid >= 0  
17/07/20 15:38:26 INFO util.ExitUtil: Exiting with status 0  
17/07/20 15:38:26 INFO namenode.NameNode: SHUTDOWN_MSG:  
*****  
SHUTDOWN_MSG: Shutting down NameNode at [REDACTED]  
*****  
C:\Users\Muhammad.bilal>
```

STEP 5 : Testing

Open cmd and change directory to "C:\Hadoop-2.8.0\sbin" and type "**start-all.cmd**" to start apache.

```
cmd Select C:\WINDOWS\system32\cmd.exe
C:\>cd Hadoop-2.8.0\sbin

C:\Hadoop-2.8.0\sbin>start-all.cmd
This script is Deprecated. Instead use start-dfs.cmd and start-yarn.cmd
starting yarn daemons

C:\Hadoop-2.8.0\sbin>
```

Make sure these apps are running

2. Hadoop Namenode
3. Hadoop datanode
4. YARN Resource Manager
5. YARN Node Manager

```
Apache Hadoop Distribution - hadoop_namenode
17/07/17 15:50:09 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
Apache Hadoop Distribution - hadoop_datanode
17/07/17 15:50:12 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
Apache Hadoop Distribution - yarn_resourcemanager
17/07/17 15:50:15 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
Apache Hadoop Distribution - yarn_nodemanager
17/07/17 15:50:18 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:21 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:24 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:27 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:30 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:33 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:36 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:39 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:42 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:46 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:49 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:52 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:55 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:50:58 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:01 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:04 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:07 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:10 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:13 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:16 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:19 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:22 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:25 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:29 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:32 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
17/07/17 15:51:35 WARN util.SysInfoWindows: Expected split length of sysInfo to be 11. Got 7
```

Open: <http://localhost:8088>

Open: <http://localhost:50070>

Overview 'localhost:9000' (active)

Started:	Thu Jul 20 15:44:11 +0500 2017
Version:	2.8.0, r91f2b7a13d1e97b [REDACTED] 7cc29ac0009
Compiled:	Fri Mar 17 09:12:00 +0500 2017 by jdu from branch-2.8.0
Cluster ID:	CID-098b09fc-fc [REDACTED] df7b674
Block Pool ID:	BP-10805049 [REDACTED] 47106632

Summary

Security is off.

Safemode is off.

1 files and directories, 0 blocks = 1 total filesystem object(s).

Heap Memory used 36.53 MB of 311 MB Heap Memory. Max Heap Memory is 889 MB.

Non Heap Memory used 40.68 MB of 41.53 MB Committed Non Heap Memory. Max Non Heap Memory is <unbounded>.

Configured Capacity:	475.24 GB
DFS Used:	321 B (0%)
Non DFS Used:	261.08 GB

RESULT:

Thus, the one node hadoop cluster has been set up successfully.

WRITE A PROGRAM TO USE THE APIS OF HADOOP TO INTERACT WITH IT

EX.NO. : 8

DATE :

AIM:

To write a program to use the API's of hadoop to interact with it

PROCEDURE:

STEP 1.

Prepare

Download Input_file.txt (Link: https://github.com/MuhammadBilalYar/HADOOP-INSTALLATION-ON-WINDOW-10/blob/master/input_file.txt)

Place both files in "C:/"

STEP 2:

Hadoop Operation

1. Open cmd in Administrative mode and move to "C:/Hadoop-2.8.0/sbin" and start cluster
Start-all.cmd

```
Apache Hadoop Distribution - yarn.resourcemanager
Apache Hadoop Distribution - hadoop.datanode
Apache Hadoop Distribution - hadoop.nameservice
[...]
10/07/17 10:57:24 INFO net.NetworkingTopology: Adding a new node: /default@cock/192.16.0.1:50010
10/07/17 10:57:24 INFO blockmanagement.LockedPortResourceManager: registered DN 0998062h+510e+41b+bf1-blues-1086744 (127.0.0.1:50010)
10/07/17 10:57:24 INFO blockmanagement.LockedPortResourceManager: adding new storage ID 09-08976-10c-26748464d0C: Processing first storage report for 09-10-08fb-10c-26748464d0C from datanode 0998062h+510e+41b+bf1-blues-1086744
10/07/17 10:57:24 INFO hdfs.StateChange: STATE_A safely made extension entered.

Administrator Command Prompt
CONNECTION=8
ID_ERROR=8
WRONG_LENGTH=8
WRONG_NUM=8
WRONG_REDUCE=8
File Input Format Counters
Bytes Read=122
File Output Format Counters
Bytes Written=8
C:\hadoop\2.8.0\hadoop\hadoop-2.8.0\bin>hadoop fs -cat knowoutput1.txt/part-r-00000
h
i
t
C:\hadoop\2.8.0\hadoop\hadoop-2.8.0\bin>stop all.cmd
This script is Deprecated. Instead use stop dts.cmd and stop yarn.cmd
SUCCESS: Sent termination signal to the process with PID 3584.
SUCCESS: Sent termination signal to the process with PID 10584.
stopping yarn daemons
SUCCESS: Sent termination signal to the process with PID 10828.
SUCCESS: Sent termination signal to the process with PID 10152.

INFO: No tasks running with the specified criteria.

C:\hadoop\2.8.0\hadoop\hadoop-2.8.0\bin>start all.cmd
This script is Deprecated. Instead use start dts.cmd and start yarn.cmd
starting yarn daemons
C:\hadoop\2.8.0\hadoop\hadoop-2.8.0\bin>
```

2. Create an input directory in HDFS.

```
hadoop fs -mkdir /input_dir
```

3. Copy the input text file named input_file.txt in the input directory

```
(input_dir)of HDFS. hadoop fs -put C:/input_file.txt /input_dir
```

4. Verify input_file.txt available in HDFS input directory

```
(input_dir). hadoop fs -ls /input_dir/
```

5. Verify content of the copied file.

```
hadoop dfs -cat /input_dir/input_file.txt
```

```
C:\Windows\system32> hadoop 2.6.0\bin\hadoop ls -cat \mcwcloud\outputnew.txt part-r-00000
cat: /mcwcloud/outputnew.txt: Is a directory
cat: 'part-r-00000': No such file or directory

C:\Windows\system32> hadoop 2.6.0\bin\hadoop ls -cat \mcwcloud\outputnew.txt part-r-00000
cat: /mcwcloud/outputnew.txt: Is a directory
cat: 'part-r-00000': No such file or directory

C:\Windows\system32> hadoop 2.6.0\bin\hadoop ls -cat \mcwcloud\outputnew.txt part-r-00000
hadoop ls
MAPREDUCE
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RESULT:

Thus the program to use the apis of hadoop to interact with it are executed successfully

WRITE A WORDCOUNT PROGRAM TO DEMONSTRATE THE USE OF MAP AND REDUCE TASKS

EX.NO. : 9

DATE :

AIM:

To write a program to use the API's of hadoop to interact with it and write a wordcount program to demonstrate the use of map and reduce task.

PROCEDURE:

STEP 1.

Prepare

Download MapReduceClient.jar (Link:

<https://github.com/MuhammadBilalYar/HADOOP-INSTALLATION-ON-WINDOW-10/blob/master/MapReduceClient.jar>)

Download Input_file.txt (Link: https://github.com/MuhammadBilalYar/HADOOP-INSTALLATION-ON-WINDOW-10/blob/master/input_file.txt)

Place both files in "C:/"

STEP 2:

Hadoop Operation

16. Open cmd in Administrative mode and move to "C:/Hadoop-2.8.0/sbin" and start cluster

Start-all.cmd

```

11:47:48 [4] Apache Hadoop Distribution - yarn - namenode
11:47:48 [5] Apache Hadoop Distribution - hadoop - datanode
11:47:48 [6] Apache Hadoop Distribution - hadoop - namecache
11:47:48 [7] hadoop fs -cat /input/output/part-r-00000
11:47:48 [8] C:\hadoop\2.8.0\hadoop\hadoop-2.8.0\bin\hadoop
11:47:48 [9] C:\hadoop\2.8.0\hadoop\hadoop-2.8.0\bin\stop-all.cmd
11:47:48 [10] C:\hadoop\2.8.0\hadoop\hadoop-2.8.0\bin\start-all.cmd
11:47:48 [11] C:\hadoop\2.8.0\hadoop\hadoop-2.8.0\bin\yarn

```

17. Create an input directory in HDFS.

```
hadoop fs -mkdir /input_dir
```

18. Copy the input text file named input_file.txt in the input directory

```
(input_dir)of HDFS. hadoop fs -put C:/input_file.txt /input_dir
```

19. Verify input_file.txt available in HDFS input directory

```
(input_dir). hadoop fs -ls /input_dir/
```

20. Verify content of the copied file.

```
hadoop dfs -cat /input_dir/input_file.txt
```

```
Administrator: Command Prompt
WRONG REDUCE=6
File Input Format Counters
    Bytes Read=164
File Output Format Counters
    Bytes Written=164

C:\hadoop-2.8.0\bin>hadoop fs -cat hnccloudoutputnow.txt |part r 66666
cat: 'hnccloudoutputnow.txt': Is a directory
cat: 'part r 66666': No such file or directory

C:\hadoop-2.8.0\bin>hadoop fs -cat hnccloudoutputnow/part |part r 66666
cat: 'hnccloudoutputnow/part': No such file or directory

C:\hadoop-2.8.0\bin>hadoop fs -cat hnccloudoutputnow.txt|part r 66666
hadoop
  mapreduce
    input
      2
    set
      1
    tag
      1
    tot
      1
    nc
      1
    nullc
      1
    ri
      3
    nulli
      1
    ts
      1
    tsd
      1
    tsr
      1
    tsu
      2

C:\hadoop-2.8.0\bin>hadoop fs -cat /input dir/input file.txt
DEPRECATED! Use of this script to execute hads command is deprecated.
Instead use the hads command for it.
cat: '/input dir/input file.txt': No such file or directory

C:\hadoop-2.8.0\bin>hadoop fs -cat /hnccloudnow file.txt
DEPRECATED! Use of this script to execute hads command is deprecated.
Instead use the hads command for it.
Welcome to Hadoop MAPREDUCE
  ri
  nullc
  now are you
  ri
  tot
  tag
  ts
  nulli
  who are you
  tot
  cat
  tag
  bog

C:\hadoop-2.8.0\bin>hadoop fs -
```

21. Run MapReduceClient.jar and also provide input and output
directories. hadoop jar C:/MapReduceClient.jar wordcount
/input_dir /output_dir

22. Verify content for generated output file.

```
hadoop dfs -cat /output_dir/*
```

RESULT:

Thus the map and reduce tasks to implement word count in hadoop is executed successfully.

WRITE A GREP PROGRAM TO DEMONSTRATE THE USE OF MAP AND REDUCE TASKS

EX.NO. : 10

DATE :

AIM:

To write a program to use the API's of hadoop to interact with it and write a grep program to demonstrate the use of map and reduce task

PROCEDURE:

STEP 1.

Prepare

Download MapReduceClient.jar (Link: <https://github.com/MuhammadBilalYar/HADOOP-INSTALLATION-ON-WINDOW-10/blob/master/MapReduceClient.jar>)

Download Input_file.txt (Link: https://github.com/MuhammadBilalYar/HADOOP-INSTALLATION-ON-WINDOW-10/blob/master/input_file.txt)

Place both files in "C:/"

STEP 2:

Hadoop Operation

9. Open cmd in Administrative mode and move to "C:/Hadoop-2.8.0/sbin" and start cluster Start-all.cmd
10. Create an input directory in HDFS.

```
hadoop fs -mkdir /input_dir
```

11. Copy the input text file named input_file.txt in the input directory

```
(input_dir)of HDFS. hadoop fs -put C:/input_file.txt /input_dir
```

12. Verify input_file.txt available in HDFS input directory

```
(input_dir). hadoop fs -ls /input_dir/
```

13. Verify content of the copied file.

```
hadoop dfs -cat /input_dir/input_file.txt
```

14. Run MapReduceClient.jar and also provide input and out directories.

```
hadoop jar "C:/MapReduceClient.jar" grep /input_dir /output1_dir
```

"hi"

```
C:\>Administrator Command Prompt
      MRONW REDUCE=0
      File Input Format Counters
        Bytes Read=161
      File Output Format Counters
        Bytes Written=164

C:\>hadoop-2.8.0\bin\hadoop fs -cat /new/output.txt/part-r-00000
hadoop 1
MAPREDUCE 1
Hellooo 1
are 2
cat 1
dog 1
go 1
he 1
hello 1
hi 3
lilili 1
tom 1
to 1
who 1
you 2

C:\>hadoop-2.8.0\bin\hadoop jar "C:\Bigdata\hadoop\hadoop-2.8.0\share\hadoop\mapreduce\hadoop-mapreduce-examples-2.8.0.jar" grep /new/new_file.txt /new/output
File
```

- #### **15. Verify content for generated output file.**

```
hadoop dfs -cat /output1_dir/*
```

```
Administrator: Command Prompt
    HDFS: number of large read operations=0
    HDFS: number of write operations=1
Job Counters
    Launched map tasks=1
    Launched reduce tasks=1
    Data local map tasks=1
    Total time spent by all maps in occupied slots (ms)=2406
    Total time spent by all reduces in occupied slots (ms)=3651
    Total time spent by all map tasks (ms)=3406
    Total time spent by all reduce tasks (ms)=3651
    Total worker milliseconds taken by all map tasks=3406
    Total worker milliseconds taken by all reduce tasks=3651
    Total mapabyte milliseconds taken by all map tasks=3573706
    Total mapabyte milliseconds taken by all reduce tasks=3063404
Map Reduce Framework
    Map Input records=2
    Map output records=2
    Map output bytes=0
    Map output totalized bytes=0
    Input split bytes=33
    Combining input records=0
    Combining output records=0
    Reduce input groups=2
    Reduce shuffle bytes=36
    Reduce input records=2
    Reduce output records=2
    Split input bytes=4
    Shuffled Maps=1
    Merged Map outputs=0
    CPU time elapsed (ms)=672
    Physical memory (bytes) snapshot=447662400
    Virtual memory (bytes) snapshot=836986444
    Total committed heap usage (bytes)=360684260
Shuffle Errors
    BAD_ID=0
    CONNECTION=0
    IO_ERROR=0
    INCORRECT_LENGTH=0
    INCORRECT_PARTITION=0
    INCORRECT_REDUCE=0
File Input Format Counters
    Bytes Read=12
File Output Format Counters
    Bytes Written=0

C:\hadoop\2.6.0\hadoop\hadoop-2.6.0\bin>hadoop ls -cat \hadoop\output1.txt\part-r-00000
h
i

C:\hadoop\2.6.0\hadoop\hadoop-2.6.0\bin>
```

Activate Windows
Go to Settings to activate Windows.

RESULT:

Thus the map and reduce tasks to implement grep in hadoop is executed successfully.