Task 01. Install Virtualbox / VMware Workstation with different flavours of linux or windows OS on top of windows.

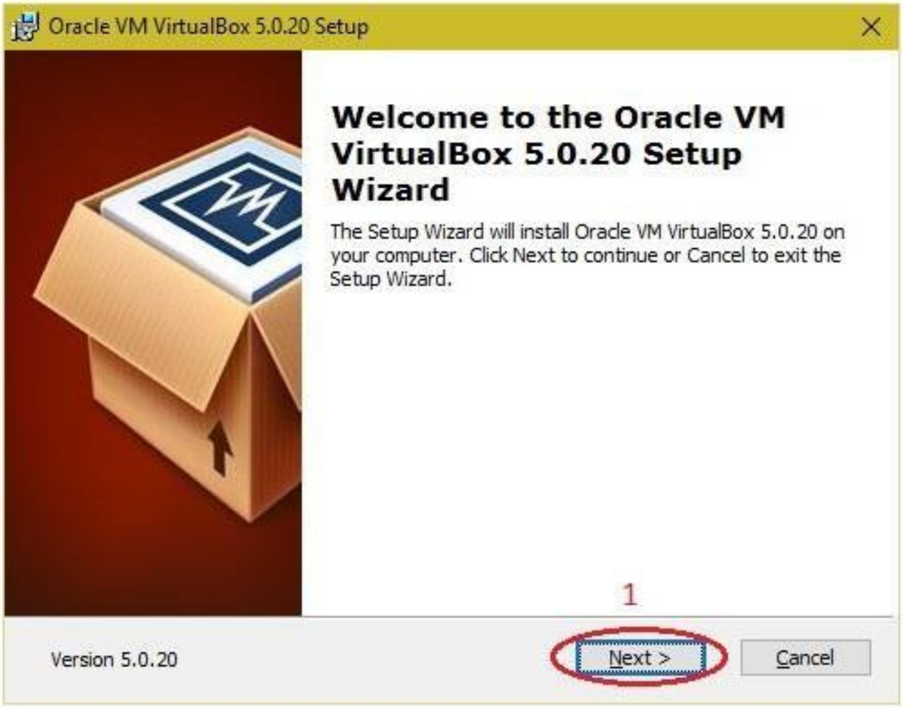
VirtualBox is an open-source virtualization software that allows you to run multiple operating systems on a single physical machine. It enables you to create and run virtual machines (VMs), which are isolated environments that simulate an entire computer system, including the hardware, operating system, and applications.

When you install VirtualBox on your host system, it creates a virtual environment where you can install various guest operating systems. This environment is isolated, meaning the guest OS behaves like it's running on its own hardware. You allocate resources like CPU, memory, and storage to each VM, and VirtualBox manages the interactions between the virtual machines and the host

PROCEDURE:

Steps to install Virtual Box:

1. Download the Virtual box exe and click the exe file…and select next button..



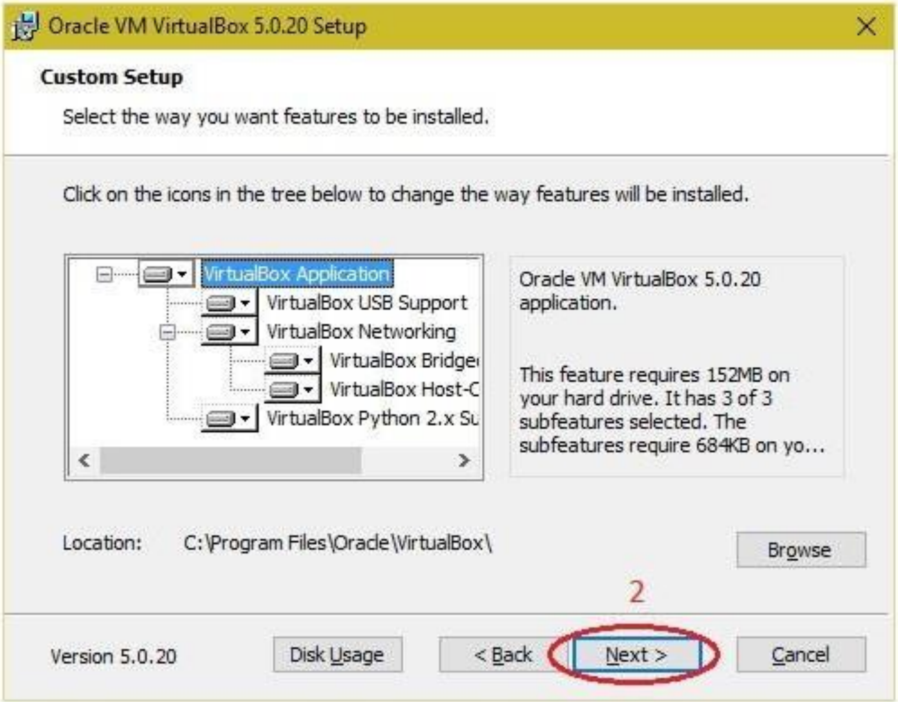
Oracle VM VirtualBox 5.0.20 Setup

Welcome to the Oracle VM VirtualBox 5.0.20 Setup Wizard

The Setup Wizard will install Oracle VM VirtualBox 5.0.20 on your computer. Click Next to continue or Cancel to exit the Setup Wizard.

Version 5.0.20

2. Click the next button..



Oracle VM VirtualBox 5.0.20 Setup

Custom Setup

Select the way you want features to be installed.

Click on the icons in the tree below to change the way features will be installed.

- VirtualBox Application
  - VirtualBox USB Support
  - VirtualBox Networking
    - VirtualBox Bridge
    - VirtualBox Host-C
  - VirtualBox Python 2.x Su

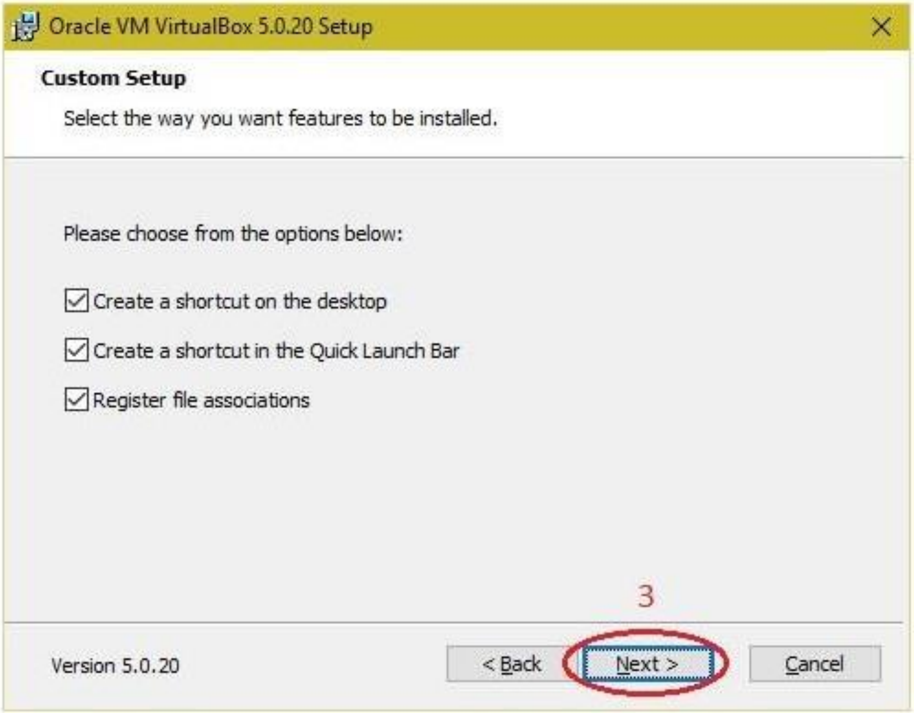
Oracle VM VirtualBox 5.0.20 application.

This feature requires 152MB on your hard drive. It has 3 of 3 subfeatures selected. The subfeatures require 684KB on yo...

Location: C:\Program Files\Oracle\VirtualBox\

Version 5.0.20

3. Click the next button



Oracle VM VirtualBox 5.0.20 Setup

Custom Setup

Select the way you want features to be installed.

Please choose from the options below:

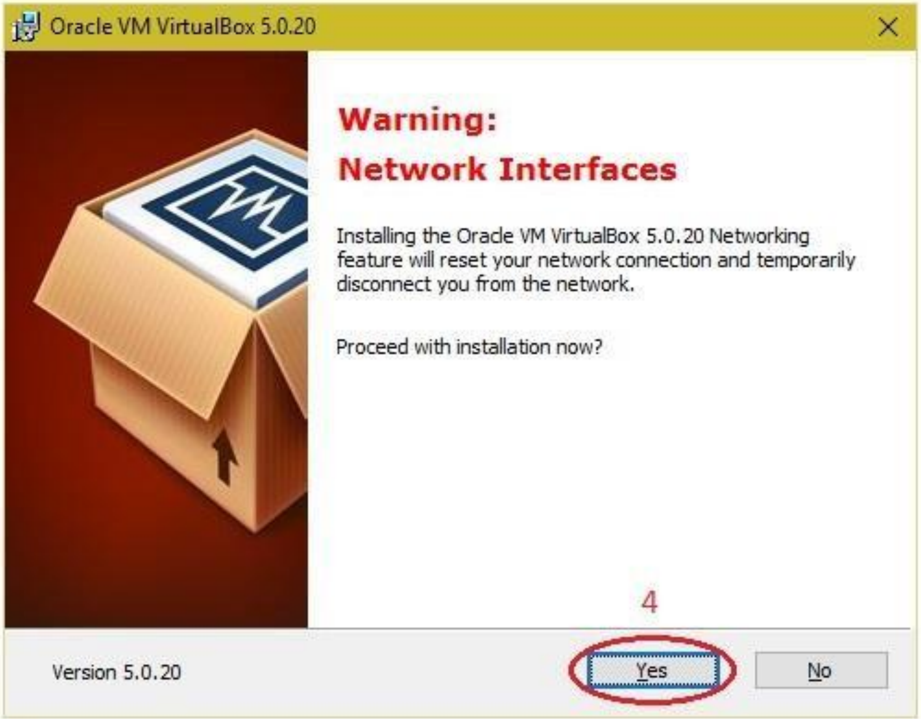
☑ Create a shortcut on the desktop

☑ Create a shortcut in the Quick Launch Bar

☑ Register file associations

Version 5.0.20

4. Click the YES button..



Oracle VM VirtualBox 5.0.20

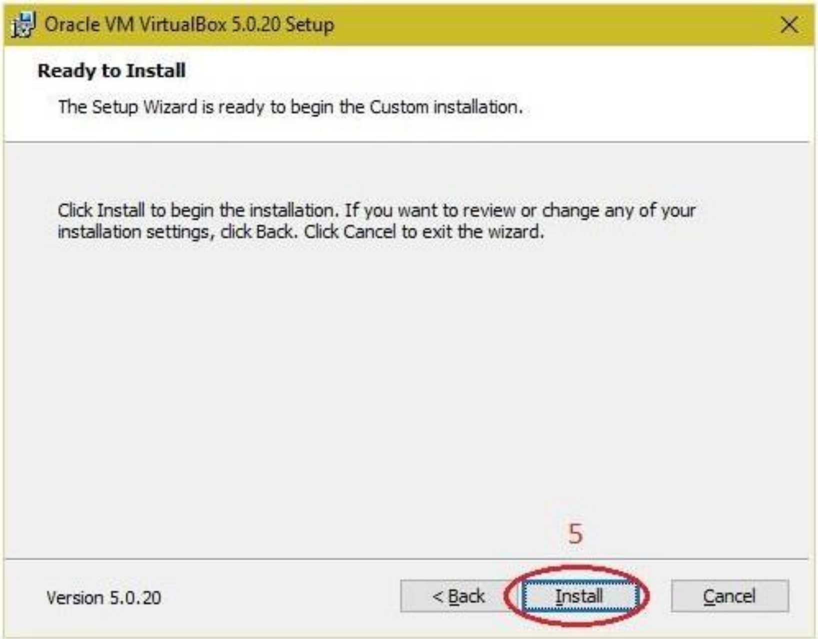
Warning:
Network Interfaces

Installing the Oracle VM VirtualBox 5.0.20 Networking feature will reset your network connection and temporarily disconnect you from the network.

Proceed with installation now?

Version 5.0.20

5. Click the install button



Oracle VM VirtualBox 5.0.20 Setup

Ready to Install

The Setup Wizard is ready to begin the Custom installation.

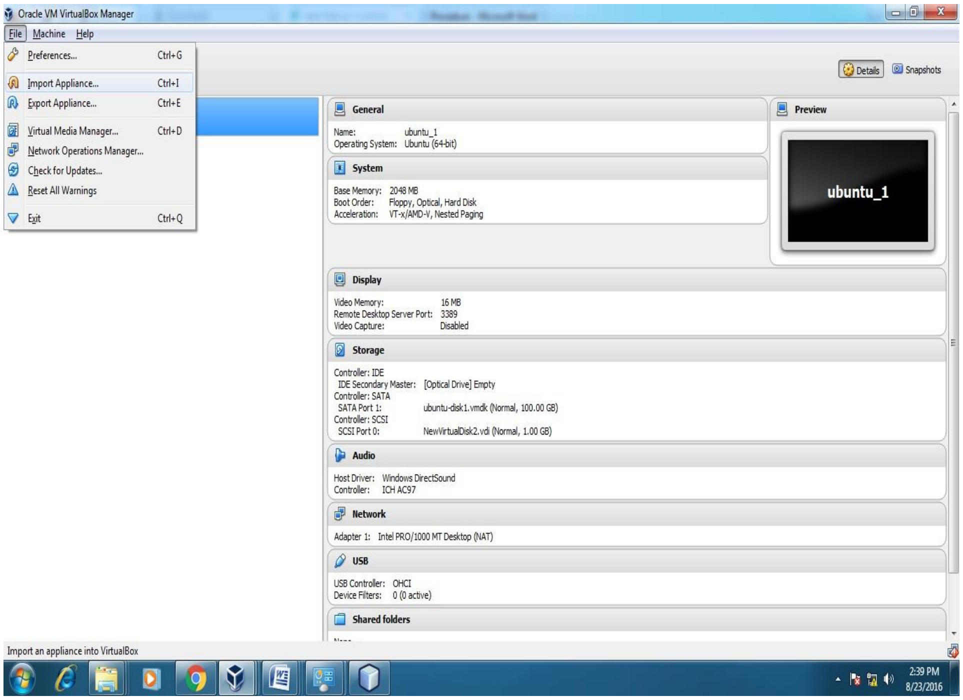
Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.

Version 5.0.20

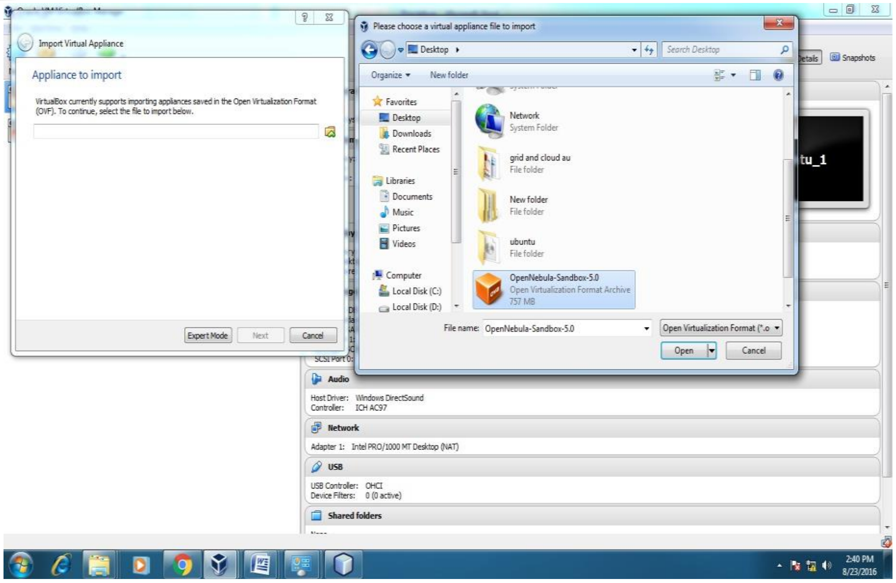
6. Then installation was completed shows virtual box icon on desktop screen.

Steps to import Open nebula sandbox:

1. Open Virtual box
2. File □import Appliance
3. Browse OpenNebula-Sandbox-5.0.ova file
4. Then go to setting, select Usb and choose USB 1.1
5. Then Start the Open Nebula
6. Login using username: root, password:opennebula


Oracle VM VirtualBox Manager
File
Machine
Help
Preferences... Ctrl+G
Import Appliance... Ctrl+I
Export Appliance... Ctrl+E
Virtual Media Manager... Ctrl+D
Network Operations Manager...
Check for Updates...
Reset All Warnings
Exit Ctrl+Q
Details
Snapshots
Preview
ubuntu_1
2:39 PM
8/23/2016

```
General
Name:               ubuntu_1
Operating System:   Ubuntu (64-bit)

System
Base Memory:   2048 MB
Boot Order:    Floppy, Optical, Hard Disk
Acceleration:  VT-x/AMD-V, Nested Paging

Display
Video Memory:               16 MB
Remote Desktop Server Port: 3389
Video Capture:              Disabled

Storage
Controller: IDE
 IDE Secondary Master:   [Optical Drive] Empty
Controller: SATA
 SATA Port 1:            ubuntu-disk1.vmdk (Normal, 100.00 GB)
Controller: SCSI
 SCSI Port 0:            NewVirtualDisk2.vdi (Normal, 1.00 GB)

Audio
Host Driver:   Windows DirectSound
Controller:    ICH AC97

Network
Adapter 1:   Intel PRO/1000 MT Desktop (NAT)

USB
USB Controller:   OHCI
Device Filters:   0 (0 active)

Shared folders

Import an appliance into VirtualBox
```



Import Virtual Appliance

Appliance to import

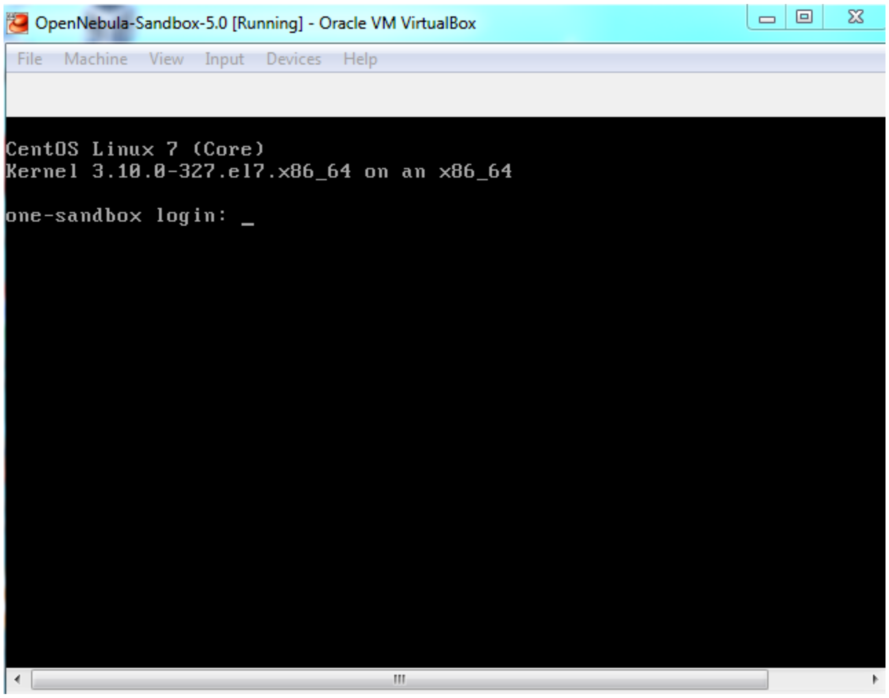
VirtualBox currently supports importing appliances saved in the Open Virtualization Format (OVF). To continue, select the file to import below.

Please choose a virtual appliance file to import

File name: OpenNebula-Sandbox-5.0

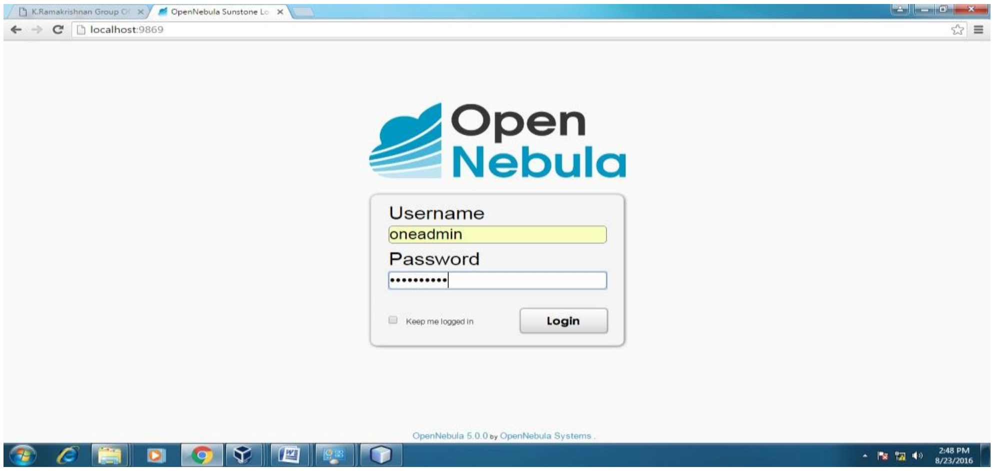
Steps to create Virtual Machine through opennebula

1. Open Browser, type localhost:9869
2. Login using username: oneadmin, password: opennebula
3. Click on instances, select VMs then follow the steps to create Virtaul machine
   a. Expand the + symbol
   b. Select user oneadmin
   c. Then enter the VM name,no.of instance, cpu.
   d. Then click on create button.
   e. Repeat the steps the C,D for creating more than one VMs.

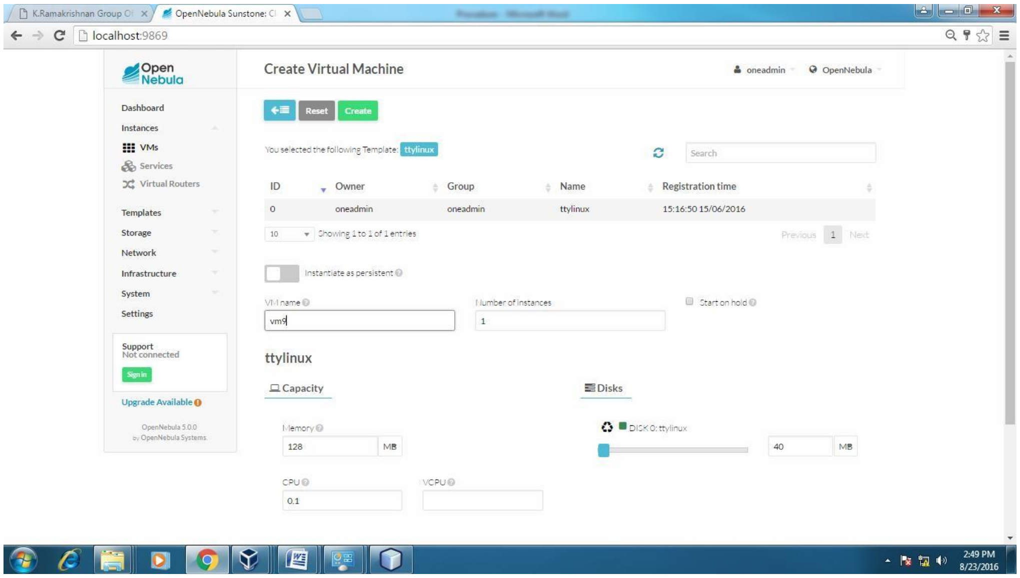


OpenNebula-Sandbox-5.0 [Running] - Oracle VM VirtualBox

```
CentOS Linux 7 (Core)
Kernel 3.10.0-327.el7.x86_64 on an x86_64

one-sandbox login: _
```



Username
oneadmin
Password
••••••••••



Create Virtual Machine

You selected the following Template: ttylinux

ID	Owner	Group	Name	Registration time
0	oneadmin	oneadmin	ttylinux	15:16:50 15/06/2016

10 Showing 1 to 1 of 1 entries

Instantiate as persistent

VM name: vm9
Number of instances: 1
□ Start on hold

ttylinux

Memory: 128 MB
CPU: 0.1
VCPU:

DISK 0: ttylinux 40 MB

Applications:

There are various applications of cloud computing in today’s network world. Many search engines and socialwebsites are using the concept of cloud computing like www.amazon.com, hotmail.com, facebook.com, linkedln.com etc. the advantages of cloud computing in context to scalability is like reduced risk , low cost testing ,ability to segment the customer base and auto-scaling based on application load.

Result:

Thus the procedure to run the virtual machine of different configuration.

Task 02: Install a C compiler in the virtual machine created using virtual box and execute Simple Programs

About OpenNebula

OpenNebula is an open-source cloud computing platform that provides a comprehensive solution for managing virtualized data centers. It enables organizations to build private, public, and hybrid clouds by managing the lifecycle of virtual machines (VMs), storage, and networking in an efficient and user-friendly manner. OpenNebula is designed to be simple, flexible, and scalable, making it suitable for both small environments and large enterprise-grade infrastructures.

Steps involved in the execution of C program in a VM

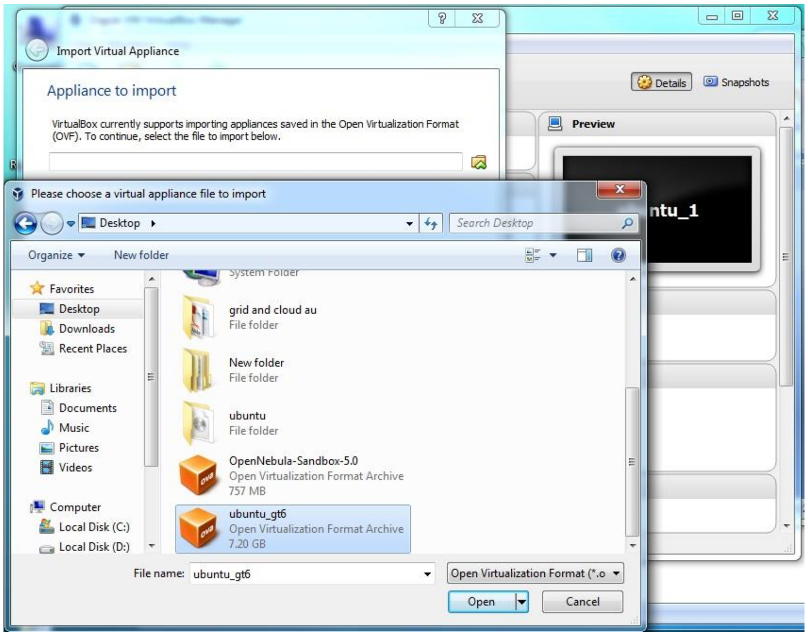
- The C source code is **compiled** into machine code using a **C compiler** This produces an **executable file**. The compilation happens in the VM just like it would on a physical machine, where the source code is translated into machine-level instructions that the **VM's operating system** can understand.
- When we run the C compiled executable on the VM, the operating system on the VM loads the program into memory. The program might use **system calls** which the **VM's operating system** handles. The VM's OS acts as an intermediary between the program and the underlying hardware or hypervisor.
- Inside the VM, the operating system executes the program's machine code on the virtual CPU, allocating virtual memory and managing virtual resources (CPU cycles, RAM, I/O operations).Any system-level tasks (like I/O operations) are managed by the guest OS in the VM, which may communicate with the **host OS** through the hypervisor if necessary.

PROCEDURE:

Steps to import .ova file:

1. Open Virtual box
2. File -> import Appliance
3. Browse ubuntu_gt6.ova file
4. Then go to setting, select Usb and choose USB 1.1

5. Then Start the ubuntu_gt6
6. Login using username: dinesh, password:99425.



Appliance to import

VirtualBox currently supports importing appliances saved in the Open Virtualization Format (OVF). To continue, select the file to import below.

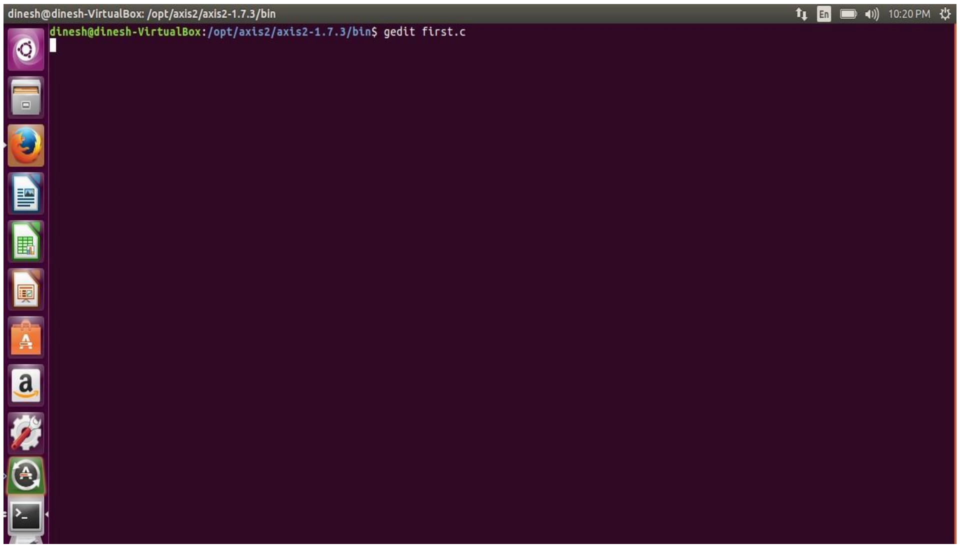
File name: ubuntu_gt6

Open Virtualization Format (*.o

Steps to run c program:

1. Open the terminal
2. gedit hello.c
3. gcc hello.c
4. ./a.out

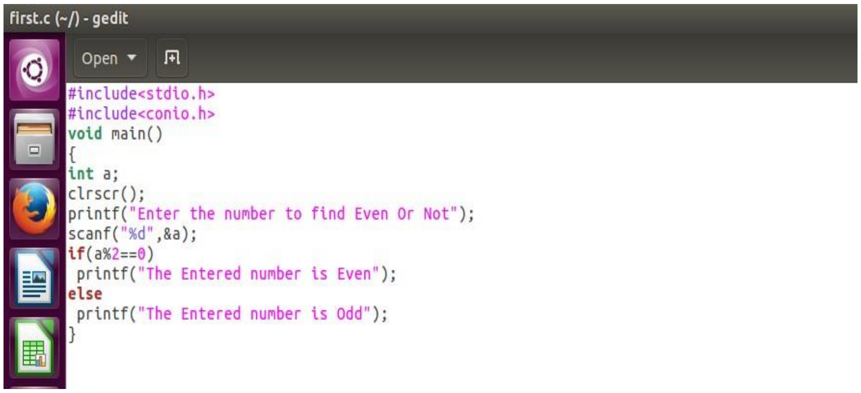
1. **Type gedit first.c**



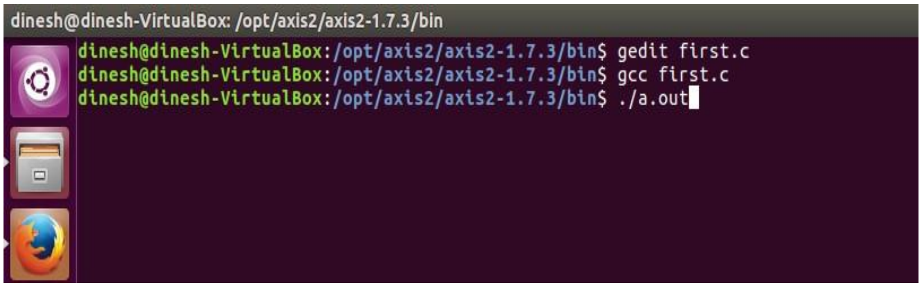
```
dinesh@dinesh-VirtualBox:/opt/axis2/axis2-1.7.3/bin$ gedit first.c
```

2. Type the c program (Write it in the right side page of the record)

3. **Running the C program**



```
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
printf("Enter the number to find Even Or Not");
scanf("%d",&a);
if(a%2==0)
 printf("The Entered number is Even");
else
 printf("The Entered number is Odd");
}
```



```
dinesh@dinesh-VirtualBox:/opt/axis2/axis2-1.7.3/bin$ gedit first.c
dinesh@dinesh-VirtualBox:/opt/axis2/axis2-1.7.3/bin$ gcc first.c
dinesh@dinesh-VirtualBox:/opt/axis2/axis2-1.7.3/bin$ ./a.out
```

APPLICATIONS:

Simply running all programs in grid environment.

Task 03: Exploring Cloudshell

About Cloud shell

AWS CloudShell is a browser-based shell that provides you with a command-line environment for managing your AWS resources. It allows you to access your AWS environment without needing to install or configure any local tools like the AWS CLI or SDKs.

Accessing AWS CloudShell

To access CloudShell:

1. Log in to the AWS Management Console.
2. Click on the **CloudShell** icon at the top of the console or visit the **CloudShell** service page.
3. The CloudShell environment will open in your browser with a pre-configured shell.

Key features of AWS CloudShell:

1. Fully Managed Environment

- **No installation**: It comes pre-configured with the AWS CLI, AWS SDKs, and other development tools, so you don't need to install or configure anything yourself.
- **Access to AWS resources**: You can use it directly from your browser to manage and interact with AWS services without needing to set up EC2 instances or SSH into your environment.

2. Command-Line Interface

- AWS CloudShell provides a **Linux-based shell** where you can run bash commands and scripts, and interact with AWS resources using the AWS CLI.

3. Persistent Storage

- CloudShell provides **5 GB of persistent storage** for each user. This allows you to store scripts, configurations, or any files you might need for your AWS tasks.

4. Pre-installed Tools

- CloudShell comes with various pre-installed tools, such as:
  - **AWS CLI** for managing AWS services.
  - **Git** for version control.
  - **Python**, **Node.js**, and other programming languages for scripting and development.
  - **Text editors** like vim or nano for editing files directly in the shell.

5. Security and Access Control

- **IAM Integration**: CloudShell runs with the permissions of your IAM user or role, and the permissions are inherited from your AWS environment. You can control access via IAM policies.
- **No need for key management**: Since it's a browser-based service, you don't need to manage SSH keys for access.

6. Session Management

- Each CloudShell session is automatically **terminated after one hour of inactivity**. However, all your files and scripts stored within your CloudShell environment are persisted across sessions, meaning your work isn't lost after logging out.

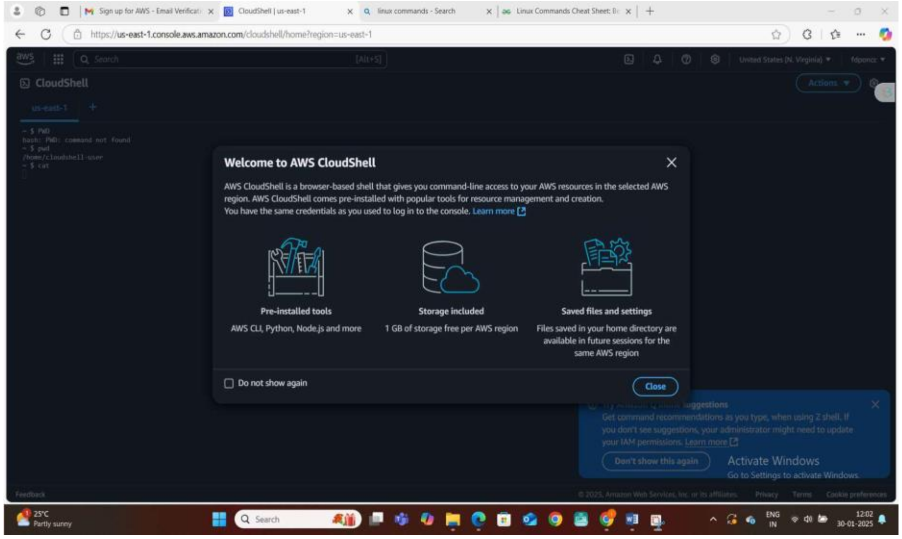
7. Use Cases

- **Running CLI Commands**: Quickly interact with AWS resources, run commands, and make changes using the AWS CLI.
- **Script Development**: Write and test scripts (e.g., Python, Bash) to automate AWS infrastructure tasks.
- **DevOps Tasks**: Manage and deploy infrastructure as code, run configuration management tools, and perform CI/CD pipeline operations.
- **Learning and experimentation**: It's great for experimenting with AWS services in a simple, hassle-free environment.

8. Free to Use (with Limits)

- AWS CloudShell is **free** for AWS users, though there are some limitations, such as the persistent storage size (5GB) and usage limits per account. It doesn't incur additional charges unless you exceed the allocated resources.

SELECT CLOUDSHELL



```
~ $ PWD
bash: PWD: command not found
~ $ pwd
/home/cloudshell-user
~ $ cat
```

Welcome to AWS CloudShell

AWS CloudShell is a browser-based shell that gives you command-line access to your AWS resources in the selected AWS region. AWS CloudShell comes pre-installed with popular tools for resource management and creation. You have the same credentials as you used to log in to the console. Learn more

Pre-installed tools: AWS CLI, Python, Node.js and more

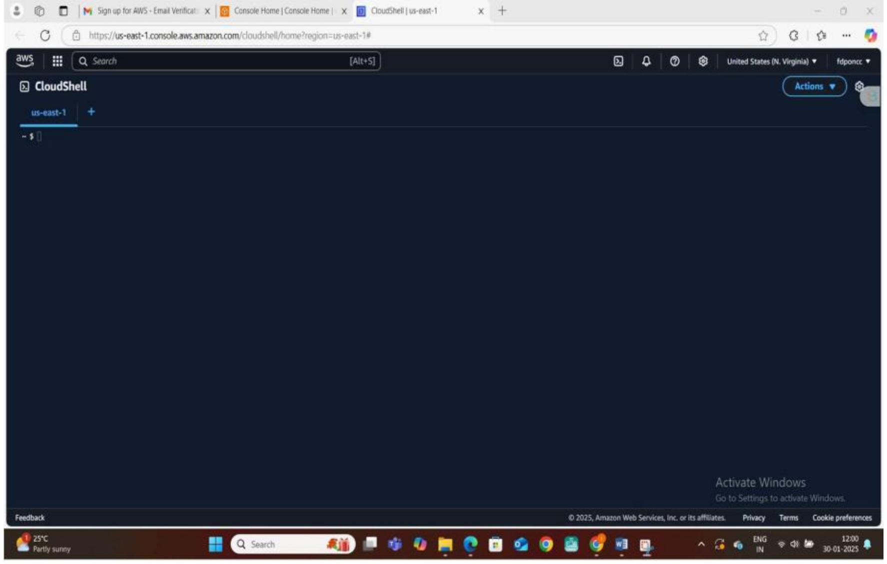
Storage included: 1 GB of storage free per AWS region

Saved files and settings: Files saved in your home directory are available in future sessions for the same AWS region

☐ Do not show again

https://us-east-1.console.aws.amazon.com/cloudshell/home?region=us-east-1
CloudShell
us-east-1
Actions
United States (N. Virginia)
Close
Activate Windows
Go to Settings to activate Windows.

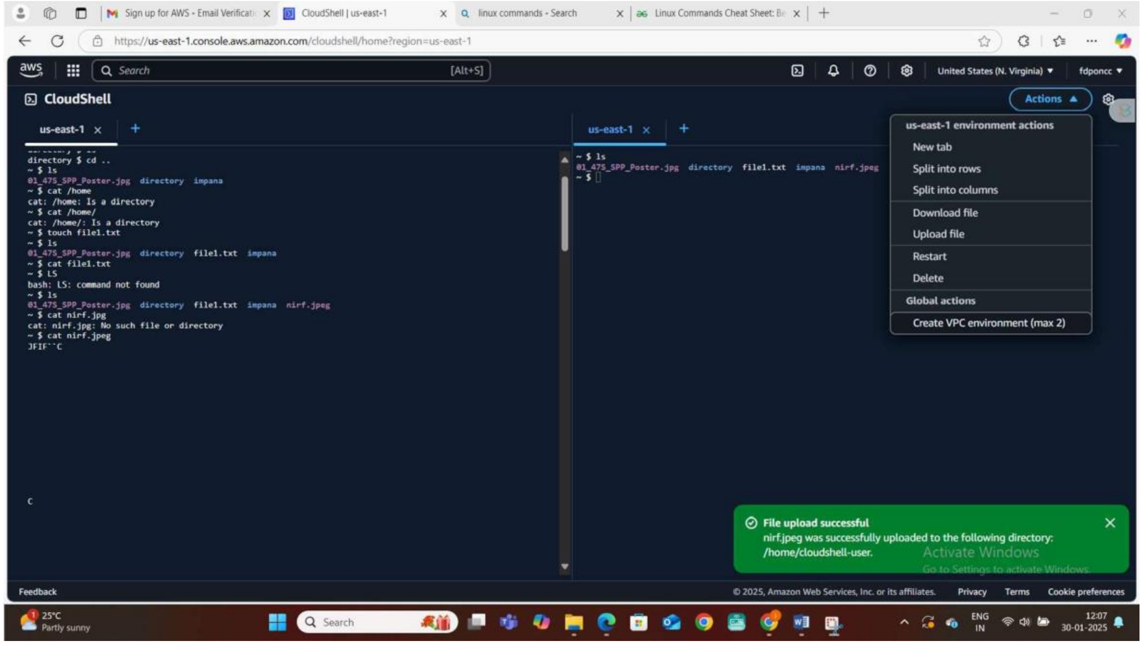
CREATE USING AN INSTANCE



Sign up for AWS - Email Verificat
Console Home | Console Home |
CloudShell | us-east-1
https://us-east-1.console.aws.amazon.com/cloudshell/home?region=us-east-1#
aws
Search
[Alt+S]
United States (N. Virginia) ▾
fdponcc ▾
CloudShell
Actions ▾
us-east-1
+
Activate Windows
Go to Settings to activate Windows.
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
25°C
Partly sunny
Search
ENG
IN
12:00
30-01-2025

```
~ $
```

UPLOAD A FILE

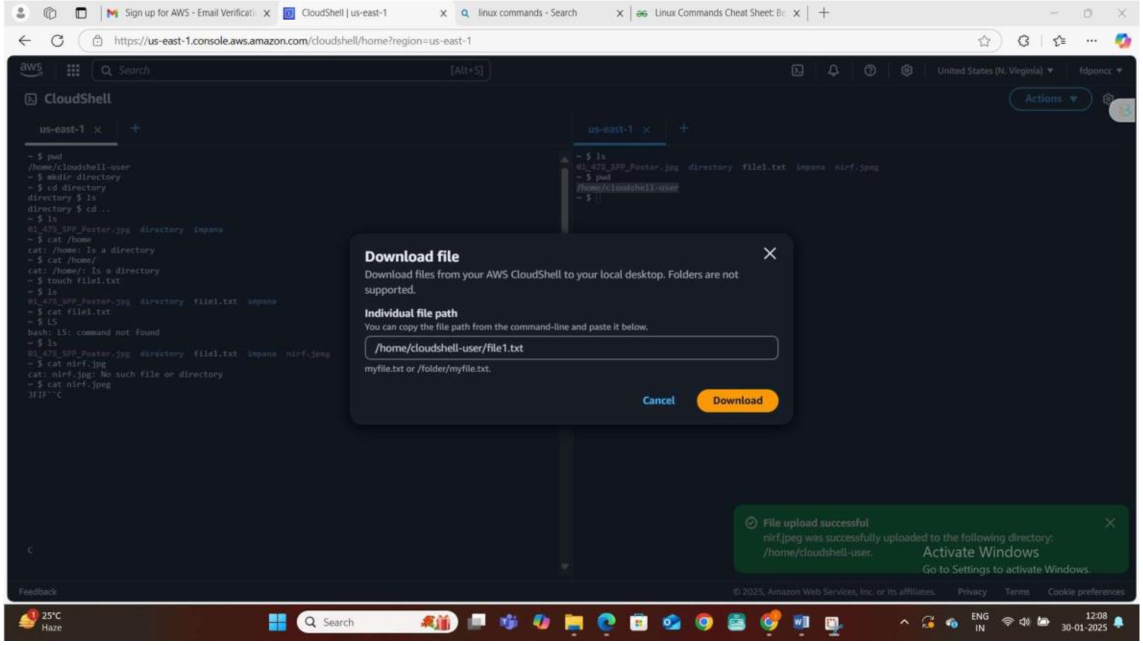


```
directory $ cd ..
~ $ ls
01_475_SPP_Poster.jpg  directory  impana
~ $ cat /home
cat: /home: Is a directory
~ $ cat /home/
cat: /home/: Is a directory
~ $ touch file1.txt
~ $ ls
01_475_SPP_Poster.jpg  directory  file1.txt  impana
~ $ cat file1.txt
~ $ LS
bash: LS: command not found
~ $ ls
01_475_SPP_Poster.jpg  directory  file1.txt  impana  nirf.jpeg
~ $ cat nirf.jpg
cat: nirf.jpg: No such file or directory
~ $ cat nirf.jpeg
JFIF``C
```

```
~ $ ls
01_475_SPP_Poster.jpg  directory  file1.txt  impana  nirf.jpeg
~ $
```

File upload successful
nirf.jpeg was successfully uploaded to the following directory: /home/cloudshell-user.

DOWNLOAD A FILE



```
~ $ pwd
/home/cloudshell-user
~ $ mkdir directory
~ $ cd directory
directory $ ls
directory $ cd ..
~ $ ls
01_475_SPP_Poster.jpg  directory  impana
~ $ cat /home
cat: /home: Is a directory
~ $ cat /home/
cat: /home/: Is a directory
~ $ touch file1.txt
~ $ ls
01_475_SPP_Poster.jpg  directory  file1.txt  impana
~ $ cat file1.txt
~ $ LS
bash: LS: command not found
~ $ ls
01_475_SPP_Poster.jpg  directory  file1.txt  impana  nirf.jpeg
~ $ cat nirf.jpg
cat: nirf.jpg: No such file or directory
~ $ cat nirf.jpeg
JFIF``C
```

```
~ $ ls
01_475_SPP_Poster.jpg  directory  file1.txt  impana  nirf.jpeg
~ $ pwd
/home/cloudshell-user
~ $
```

Download file

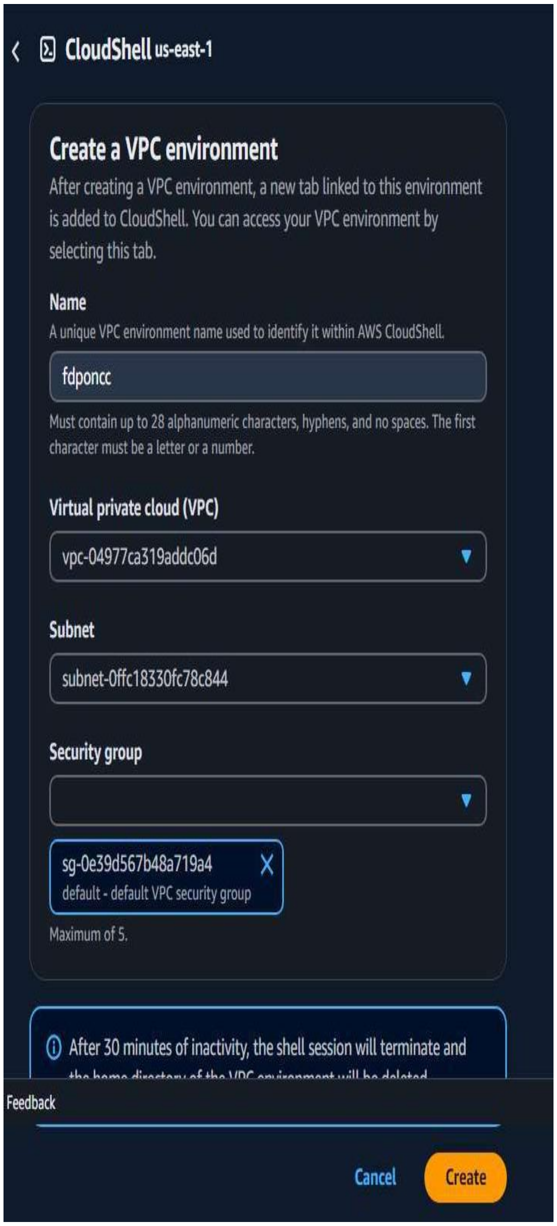
Download files from your AWS CloudShell to your local desktop. Folders are not supported.

Individual file path

You can copy the file path from the command-line and paste it below.

/home/cloudshell-user/file1.txt

myfile.txt or /folder/myfile.txt.



Create a VPC environment

After creating a VPC environment, a new tab linked to this environment is added to CloudShell. You can access your VPC environment by selecting this tab.

Name

A unique VPC environment name used to identify it within AWS CloudShell.

fdponcc

Must contain up to 28 alphanumeric characters, hyphens, and no spaces. The first character must be a letter or a number.

Virtual private cloud (VPC): vpc-04977ca319addc06d

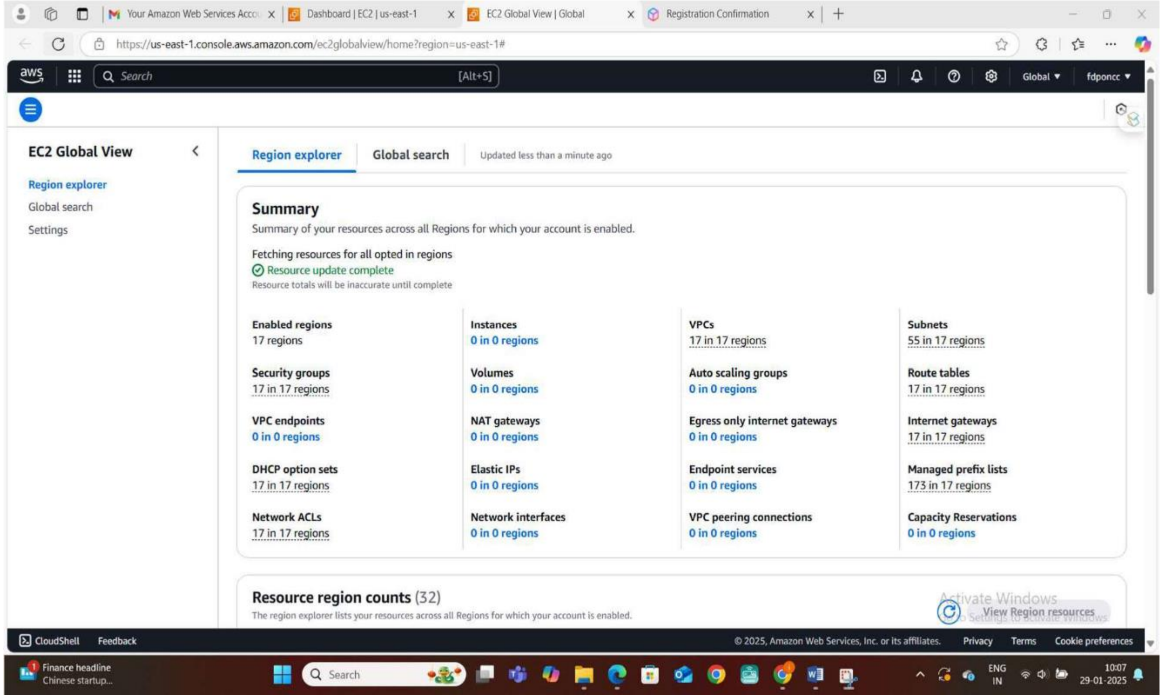
Subnet: subnet-0ffc18330fc78c844

Security group

sg-0e39d567b48a719a4 X
default - default VPC security group

Maximum of 5.

After 30 minutes of inactivity, the shell session will terminate and the home directory of the VPC environment will be deleted.


Your Amazon Web Services Acco
Dashboard | EC2 | us-east-1
EC2 Global View | Global
Registration Confirmation
https://us-east-1.console.aws.amazon.com/ec2globalview/home?region=us-east-1#
aws
Search
[Alt+S]
Global ▾
fdponcc ▾
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Activate Windows
Go to Settings to activate Windows
Finance headline
Chinese startup...
Search
ENG
IN
10:07
29-01-2025

EC2 Global View

- Region explorer
- Global search
- Settings

Region explorer | Global search | Updated less than a minute ago

Summary

Summary of your resources across all Regions for which your account is enabled.

Fetching resources for all opted in regions

✓ Resource update complete

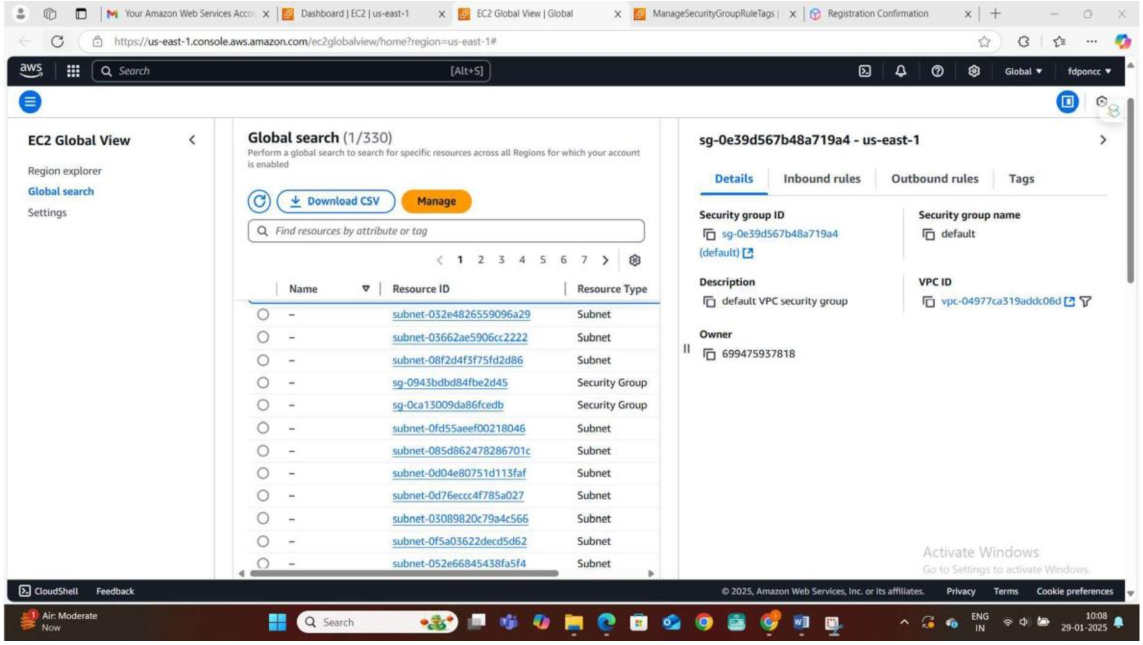
Resource totals will be inaccurate until complete

Enabled regions 17 regions	**Instances** 0 in 0 regions	**VPCs** 17 in 17 regions	**Subnets** 55 in 17 regions
Security groups 17 in 17 regions	**Volumes** 0 in 0 regions	**Auto scaling groups** 0 in 0 regions	**Route tables** 17 in 17 regions
VPC endpoints 0 in 0 regions	**NAT gateways** 0 in 0 regions	**Egress only internet gateways** 0 in 0 regions	**Internet gateways** 17 in 17 regions
DHCP option sets 17 in 17 regions	**Elastic IPs** 0 in 0 regions	**Endpoint services** 0 in 0 regions	**Managed prefix lists** 173 in 17 regions
Network ACLs 17 in 17 regions	**Network interfaces** 0 in 0 regions	**VPC peering connections** 0 in 0 regions	**Capacity Reservations** 0 in 0 regions

Resource region counts (32)

The region explorer lists your resources across all Regions for which your account is enabled.

View Region resources


Your Amazon Web Services Acco
Dashboard | EC2 | us-east-1
EC2 Global View | Global
ManageSecurityGroupRuleTags |
Registration Confirmation
https://us-east-1.console.aws.amazon.com/ec2globalview/home?region=us-east-1#
aws
Search
[Alt+S]
Global ▾
fdponcc ▾
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Activate Windows
Go to Settings to activate Windows
Air: Moderate
Now
Search
ENG
IN
10:08
29-01-2025

EC2 Global View

- Region explorer
- Global search
- Settings

Global search (1/330)

Perform a global search to search for specific resources across all Regions for which your account is enabled

Download CSV | Manage

Find resources by attribute or tag

< 1 2 3 4 5 6 7 >

	Name	Resource ID	Resource Type
○	–	subnet-032e4826559096a29	Subnet
○	–	subnet-03662ae5906cc2222	Subnet
○	–	subnet-08f2d4f3f75fd2d86	Subnet
○	–	sg-0943bdbd84fbe2d45	Security Group
○	–	sg-0ca13009da86fcedb	Security Group
○	–	subnet-0fd55aeef00218046	Subnet
○	–	subnet-085d862478286701c	Subnet
○	–	subnet-0d04e80751d113faf	Subnet
○	–	subnet-0d76eccc4f785a027	Subnet
○	–	subnet-03089820c79a4c566	Subnet
○	–	subnet-0f5a03622decd5d62	Subnet
○	–	subnet-052e66845438fa5f4	Subnet

sg-0e39d567b48a719a4 - us-east-1

Details | Inbound rules | Outbound rules | Tags

Security group ID
sg-0e39d567b48a719a4 (default)

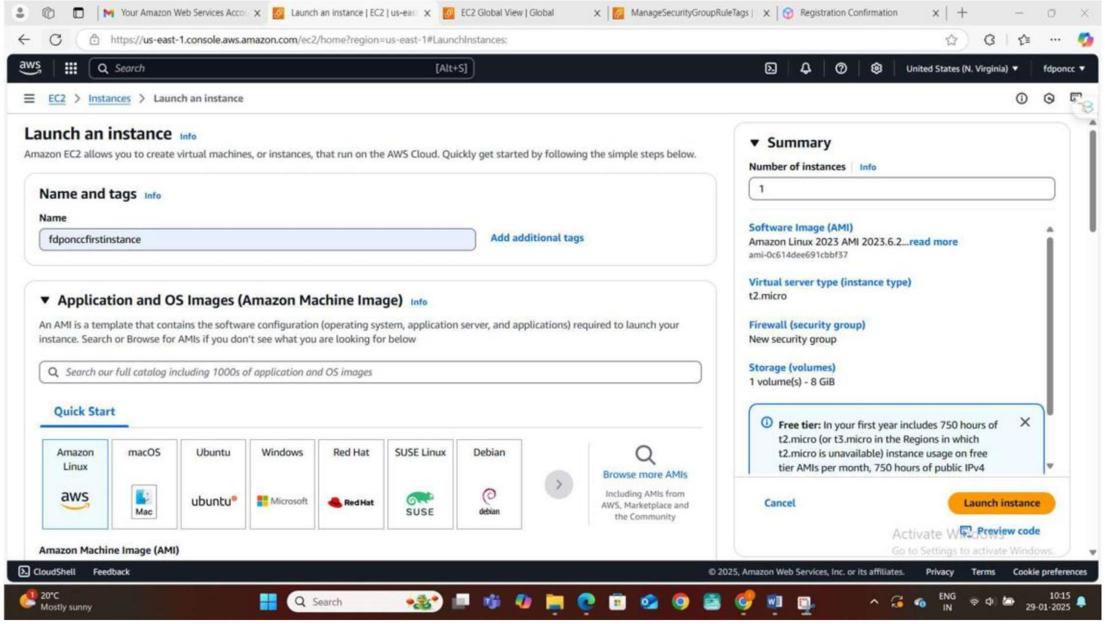
Security group name
default

Description
default VPC security group

VPC ID
vpc-04977ca319addc06d

Owner
699475937818

Launch Instance



EC2 > Instances > Launch an instance

Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name: fdponccfirstinstance

Application and OS Images (Amazon Machine Image) Info

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Quick Start: Amazon Linux, macOS, Ubuntu, Windows, Red Hat, SUSE Linux, Debian

Browse more AMIs – Including AMIs from AWS, Marketplace and the Community

Amazon Machine Image (AMI)

Summary

Number of instances: 1

Software Image (AMI): Amazon Linux 2023 AMI 2023.6.2...read more
ami-0c614dee691cbbf37

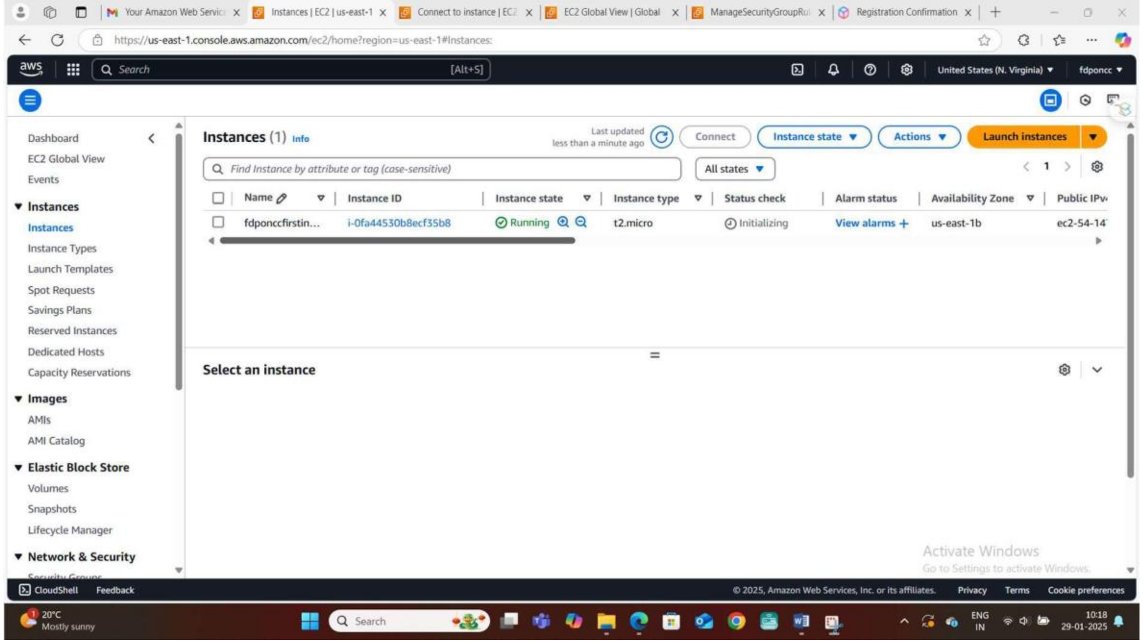
Virtual server type (instance type): t2.micro

Firewall (security group): New security group

Storage (volumes): 1 volume(s) - 8 GiB

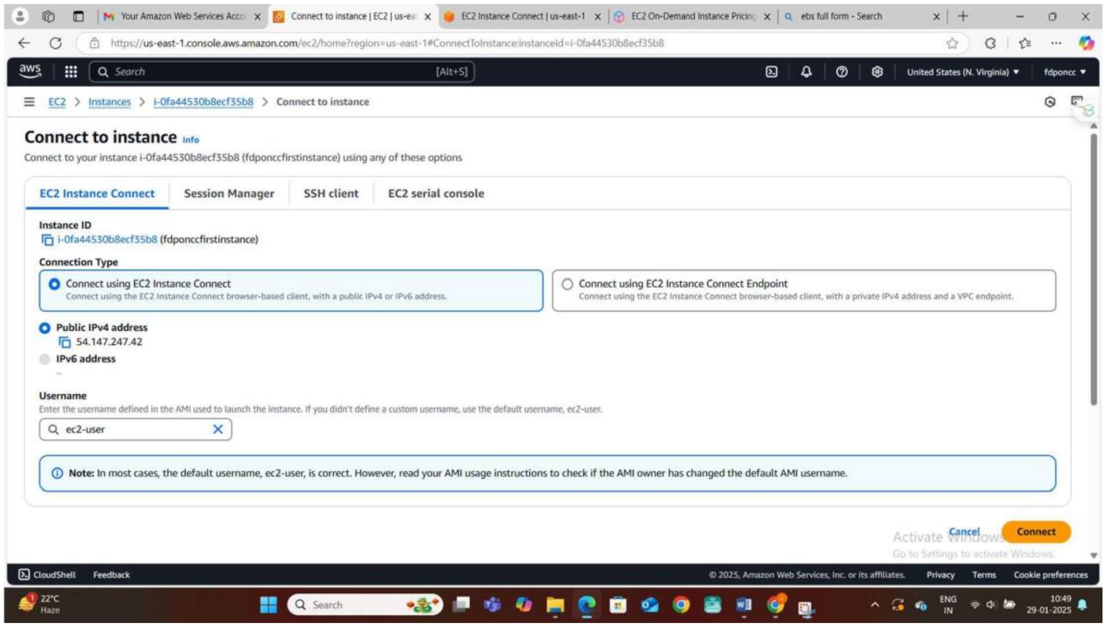
Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4

Connect to Instance



Instances (1) Info

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv
fdponccfirstin...	i-0fa44530b8ecf35b8	Running	t2.micro	Initializing	View alarms +	us-east-1b	ec2-54-14



Connect to instance

Connect to your instance i-0fa44530b8ecf35b8 (fdponccfirstinstance) using any of these options

Instance ID
i-0fa44530b8ecf35b8 (fdponccfirstinstance)

Connection Type

● Connect using EC2 Instance Connect
Connect using the EC2 Instance Connect browser-based client, with a public IPv4 or IPv6 address.

○ Connect using EC2 Instance Connect Endpoint
Connect using the EC2 Instance Connect browser-based client, with a private IPv4 address and a VPC endpoint.

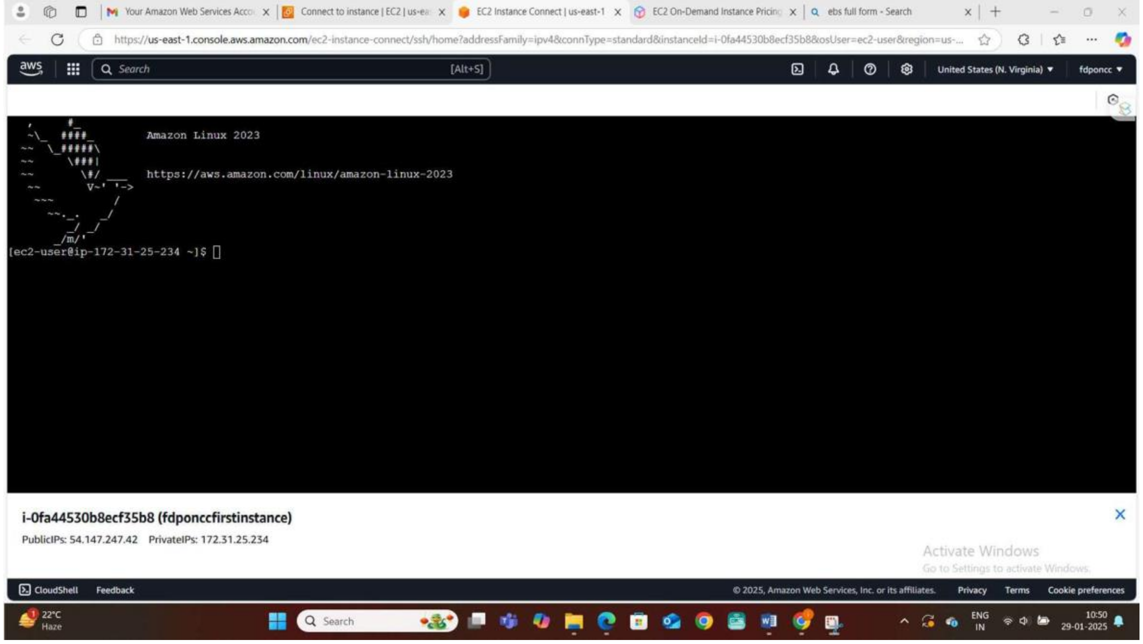
● Public IPv4 address
54.147.247.42

○ IPv6 address

Username
Enter the username defined in the AMI used to launch the instance. If you didn't define a custom username, use the default username, ec2-user.

ec2-user

Note: In most cases, the default username, ec2-user, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username.



```
   ,     #_
   ~\_  ####_        Amazon Linux 2023
  ~~  \_#####\
  ~~     \###|
  ~~       \#/ ___   https://aws.amazon.com/linux/amazon-linux-2023
   ~~       V~' '->
    ~~~         /
      ~~._.   _/
         _/ _/
       _/m/'
[ec2-user@ip-172-31-25-234 ~]$ 
```

i-0fa44530b8ecf35b8 (fdponccfirstinstance)

PublicIPs: 54.147.247.42 PrivateIPs: 172.31.25.234