

Placement Empowerment Program

Cloud Computing and DevOps Centre

Set Up a Virtual Machine in the Cloud

“Create a free-tier AWS, Azure, or GCP account. Launch a virtual machine and SSH into it.”

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Introduction

Cloud computing has revolutionized how businesses and individuals deploy applications, reducing the need for physical hardware and providing scalable solutions. One of the fundamental tasks in cloud computing is setting up a Virtual Machine (VM), which allows users to run applications in an isolated environment.

Overview

A Virtual Machine (VM) is a software-based computer that runs an operating system and applications just like a physical machine. Cloud providers such as AWS, Azure, and GCP offer virtual machines with different configurations to suit various needs. This guide will walk you through creating a VM on the cloud and connecting to it via SSH.

Objective

The primary objectives of this POC are:

- Set up a free-tier cloud account on AWS, Azure, or GCP.
- Launch a virtual machine using the respective cloud platform.
- Connect to the virtual machine using SSH.
- Understand the basic operations of a cloud-hosted VM.

Important

- **Cost-Effective:** Free-tier cloud services allow users to experiment without incurring costs.

- **Scalability:** VMs can be easily scaled up or down as per requirements.
- **Security:** Cloud providers offer built-in security features for VMs.
- **Accessibility:** VMs can be accessed from anywhere, enabling remote work and development.

Step-by-Step Overview

Step 1:

Create a Free-Tier Cloud Account

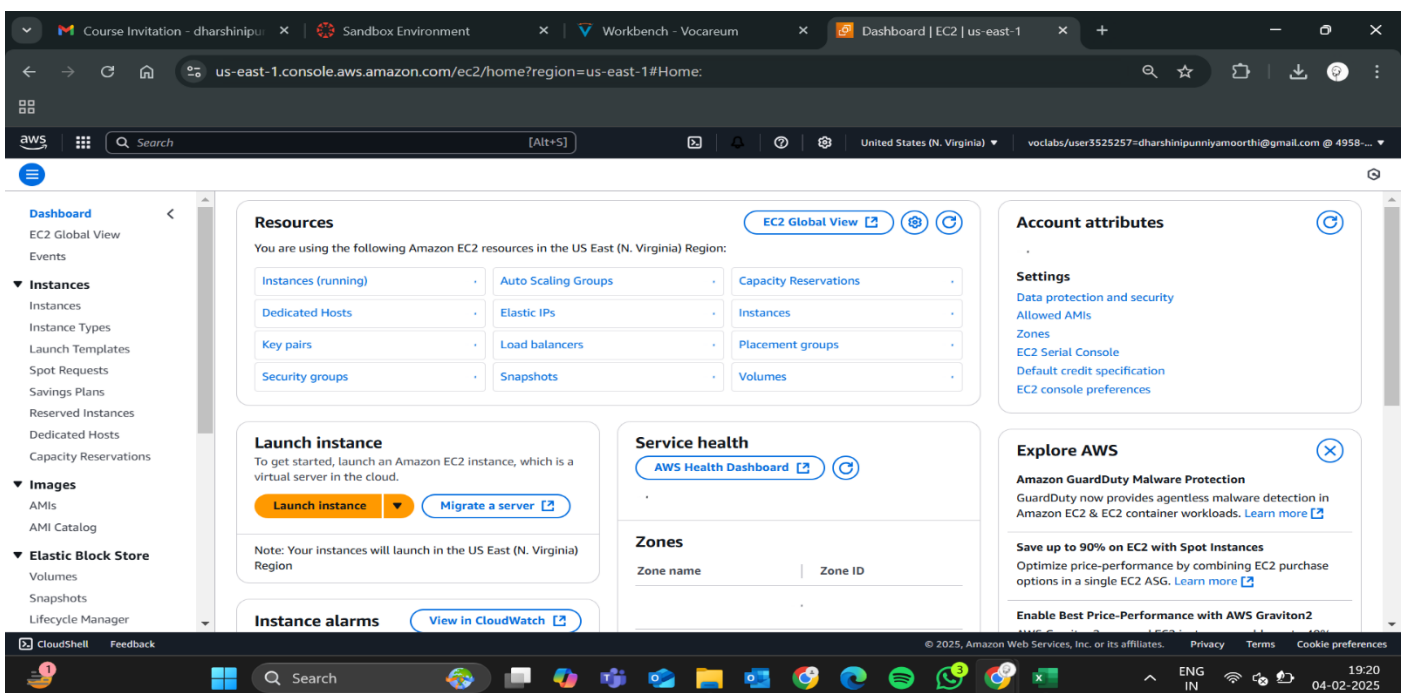
Choose a cloud provider and create an account:

Step 2:

Launch a Virtual Machine

AWS (EC2 Instance)

1. Sign in to AWS Console.
2. Navigate to **EC2 Dashboard** → Click **Launch Instance**.



3. Choose an OS (e.g., Amazon Linux, Ubuntu).

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Amazon Machine Image (AMI)

Ubuntu Server 24.04 LTS (HVM), SSD Volume Type
ami-04b4f1a9cf54c11d0 (64-bit (x86)) / ami-0a7a4e87939439934 (64-bit (Arm))
Virtualization: hvm ENA enabled: true Root device type: ebs

Free tier eligible

4. Select an Instance Type (e.g., t2.micro for free-tier).

▼ Instance type Info | Get advice

Instance type

t2.micro

Free tier eligible

Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Windows base pricing: 0.0162 USD per Hour
On-Demand Ubuntu Pro base pricing: 0.0134 USD per Hour On-Demand SUSE base pricing: 0.0116 USD per Hour
On-Demand RHEL base pricing: 0.026 USD per Hour On-Demand Linux base pricing: 0.0116 USD per Hour

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

▼ Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - required

Select

Create new key pair

5. Configure security settings (allow SSH on port 22).

vpc-05bb3c5130e2eff8c

Subnet

Info

No preference (Default subnet in any availability zone)

Auto-assign public IP

Info

Enable

Additional charges apply when outside of free tier allowance

Firewall (security groups)

Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group

Select existing security group

We'll create a new security group called 'launch-wizard-1' with the following rules:

Allow SSH traffic from

Helps you connect to your instance

Anywhere
0.0.0.0/0

Allow HTTPS traffic from the internet

To set up an endpoint, for example when creating a web server

6. Generate and download a key pair for SSH authentication.

▼ Key pair (login) [Info](#)

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

[Create new key pair](#)

▼ Network settings [Info](#) [Edit](#)

Network | [Info](#)

vpc-05bb3c5130e2eff8c

Subnet | [Info](#)

No preference (Default subnet in any availability zone)

7. Click **Launch Instance** and wait for it to initialize.

[EC2](#) > [Instances](#) > Launch an instance

Success

Successfully initiated launch of instance (i-0f900de5cdc728583)

► Launch log

Next Steps

Create billing and free tier usage alerts

To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.

Create billing alerts

Connect to your instance

Once your instance is running, log into it from your local computer.

Connect to instance

[Learn more](#)

Connect an RDS database

Configure the connection between an EC2 instance and a database to allow traffic flow between them.

Connect an RDS database

[Create a new RDS database](#)

[Learn more](#)

Create EBS snapshot policy

Create a policy that automates the creation, retention, and deletion of EBS snapshots

Create EBS snapshot policy

Step 3:

SSH into the EC2 Instance

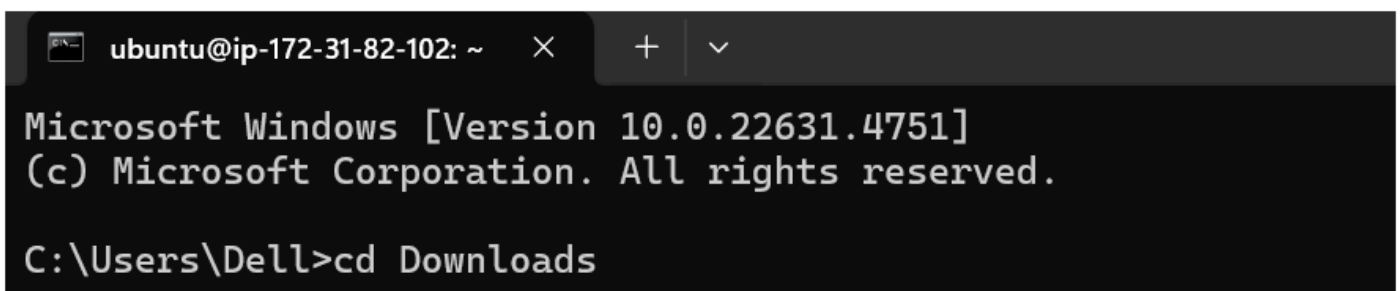
Once your EC2 instance is running, follow these steps to connect to it using SSH.

1. Open Command Prompt or Terminal

- **Windows:** Open **Command Prompt** or **Git Bash** (recommended).
- **Mac/Linux:** Open **Terminal**.

2. Navigate to the Key Pair Location

When you launched your EC2 instance, you downloaded a **private key file** (.pem). Navigate to the folder where it is stored:

A screenshot of a Windows Command Prompt window. The title bar shows 'ubuntu@ip-172-31-82-102: ~' with standard window controls. The command prompt displays the Windows version '10.0.22631.4751' and copyright information for Microsoft Corporation. The current directory is 'C:\Users\Dell' and the user has entered the command 'cd Downloads' to navigate to the Downloads folder.

```
ubuntu@ip-172-31-82-102: ~ × + v
Microsoft Windows [Version 10.0.22631.4751]
(c) Microsoft Corporation. All rights reserved.
C:\Users\Dell>cd Downloads
```

3. Find Your Public IP

- Go to **AWS EC2 Console** → **Instances**.
- Copy the **Public IPv4 Address** of your instance.

4. Connect to the Instance via SSH

For Ubuntu

```
ssh -i your-key.pem ubuntu@your-public-ip
```

```
ubuntu@ip-172-31-82-102: ~  
Microsoft Windows [Version 10.0.22631.4751]  
(c) Microsoft Corporation. All rights reserved.  
  
C:\Users\Dell>cd Downloads  
  
C:\Users\Dell\Downloads>ssh -i "dha-key.pem" ubuntu@ec2-3-93-58-80.compute-1.amazonaws.com  
The authenticity of host 'ec2-3-93-58-80.compute-1.amazonaws.com (3.93.58.80)' can't be established.  
ED25519 key fingerprint is SHA256:DD5liCWcfwxLE0myJiiqvkmqHhTMAxglAP9vCiqMsa4.  
This host key is known by the following other names/addresses:  
C:\Users\Dell/.ssh/known_hosts:2: 3.93.58.80  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added 'ec2-3-93-58-80.compute-1.amazonaws.com' (ED25519) to the list of known hosts.  
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1021-aws x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/pro  
  
System information as of Tue Feb  4 15:56:57 UTC 2025  
  
System load:  0.0      Processes:            103  
Usage of /:   24.8% of 6.71GB   Users logged in:     0  
Memory usage: 20%      IPv4 address for enX0: 172.31.82.102  
Swap usage:   0%  
  
Expanded Security Maintenance for Applications is not enabled.  
  
0 updates can be applied immediately.  
  
Enable ESM Apps to receive additional future security updates.  
See https://ubuntu.com/esm or run: sudo pro status  
  
[Taskbar icons: 1 notification, Windows Start, Search, Task View, File Explorer, Edge, Chrome, Spotify, WhatsApp, Teams, OneDrive, Outlook, Mail, Calendar, Clock, 21:27, 04-02-2025]
```

Expected Outcome:

By the end of this process, you will have:

- A virtual machine running in the cloud.
- Secure SSH access to the VM.
- A foundational understanding of cloud-based virtual machines.