St. JOSEPH'S GROUP OF INSTITUTIONS
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aws

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 and Overview

Setting up a virtual machine (VM) in AWS allows you to create a flexible, scalable environment for running Linux-based instances, which can be used for development, testing, or hosting various applications. By signing up for the AWS Free Tier, you can launch a basic Linux VM (like Amazon Linux 2) at no cost within the free-tier limits. After configuring security groups to allow SSH access, you can securely connect to the instance via SSH, enabling you to manage and deploy applications remotely. This approach offers a powerful cloud infrastructure solution with minimal expense, ideal for those looking to get started with cloud computing or scale their projects efficiently.

Objective

The goal of this project is to:

1. **Launch a Linux Virtual Machine**: Set up a basic Linux instance on AWS using the Free Tier to run applications or services in the cloud.
2. **Configure Security and Access**: Set up security groups to allow SSH access for secure, remote management of the VM.
3. **Efficient Cloud Management**: Use SSH to connect and manage the instance, enabling seamless development, testing, or hosting of applications in a scalable environment.

Importance

1. **Cost-Effective Cloud Solution**: The AWS Free Tier allows you to set up and run a Linux VM with minimal cost, providing an affordable way to experiment with cloud computing and infrastructure.
2. **Scalability and Flexibility**: AWS provides the ability to easily scale your resources as needed, ensuring your VM can grow alongside your project requirements or usage.
3. **Remote Access and Management**: SSH access allows you to manage and deploy applications remotely, offering convenience and flexibility in development, testing, or production environments.

Step-by-Step Overview

Step1: **Sign up for AWS Free Tier Account**

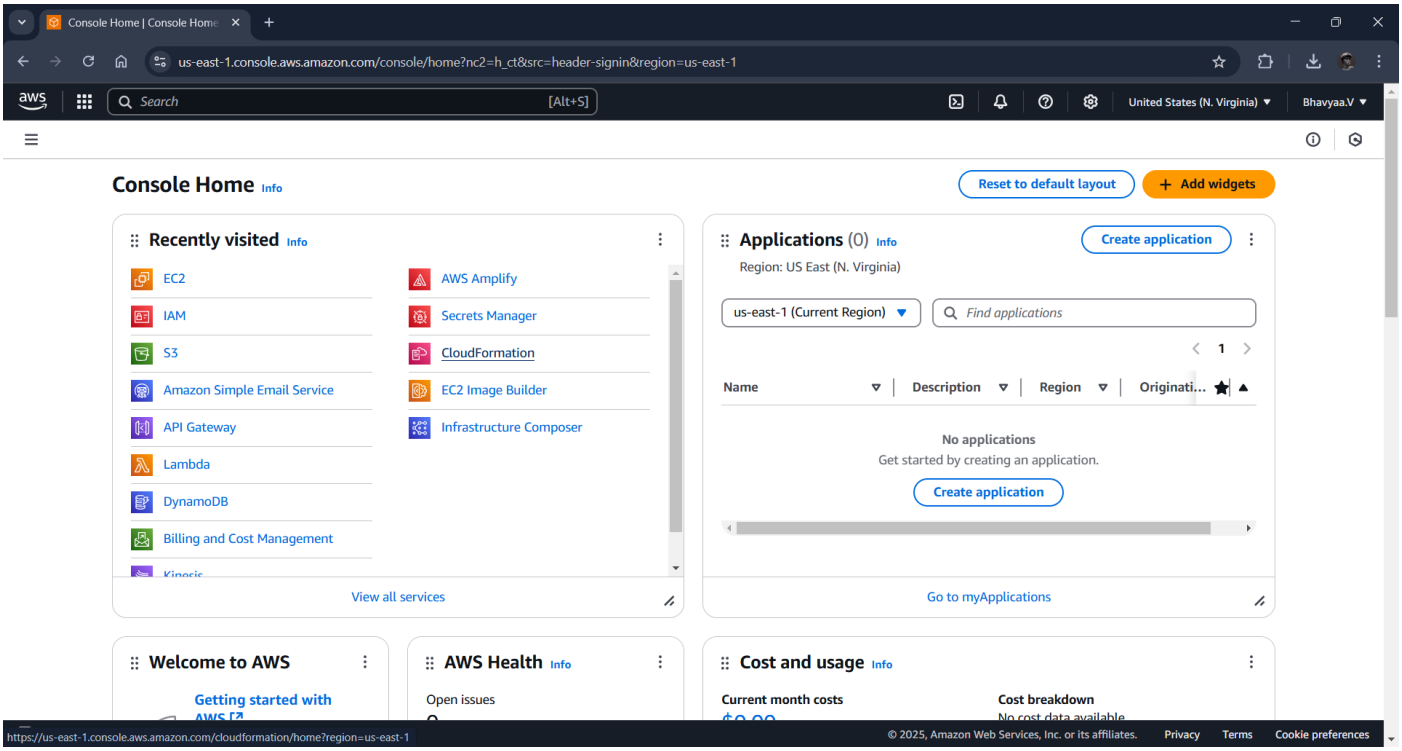
1. **Go to the AWS Sign-Up Page**:
   Visit AWS Free Tier and sign up for an account if you don't have one. You'll need to provide a credit card, but you will not be charged as long as you stay within the Free Tier limits.
2. **Verify Your Identity**:
   AWS will ask for your phone number for identity verification via SMS.
3. **Select a Support Plan**:
   Choose the "Basic Support" plan, which is free.

Once your account is created, you can access the AWS Management Console.

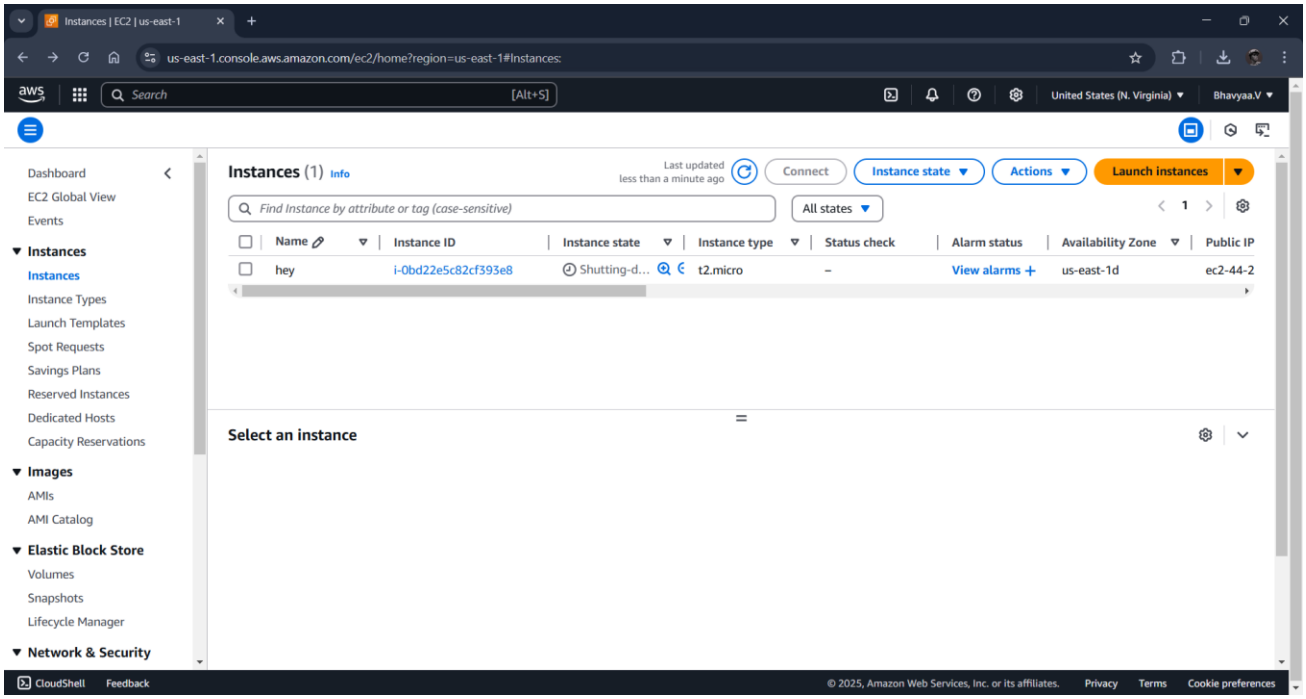
Step 2: **Launch a Basic Linux Virtual Machine**

- **Log into the AWS Management Console**:

After signing up, log into the AWS Management Console at AWS Console.

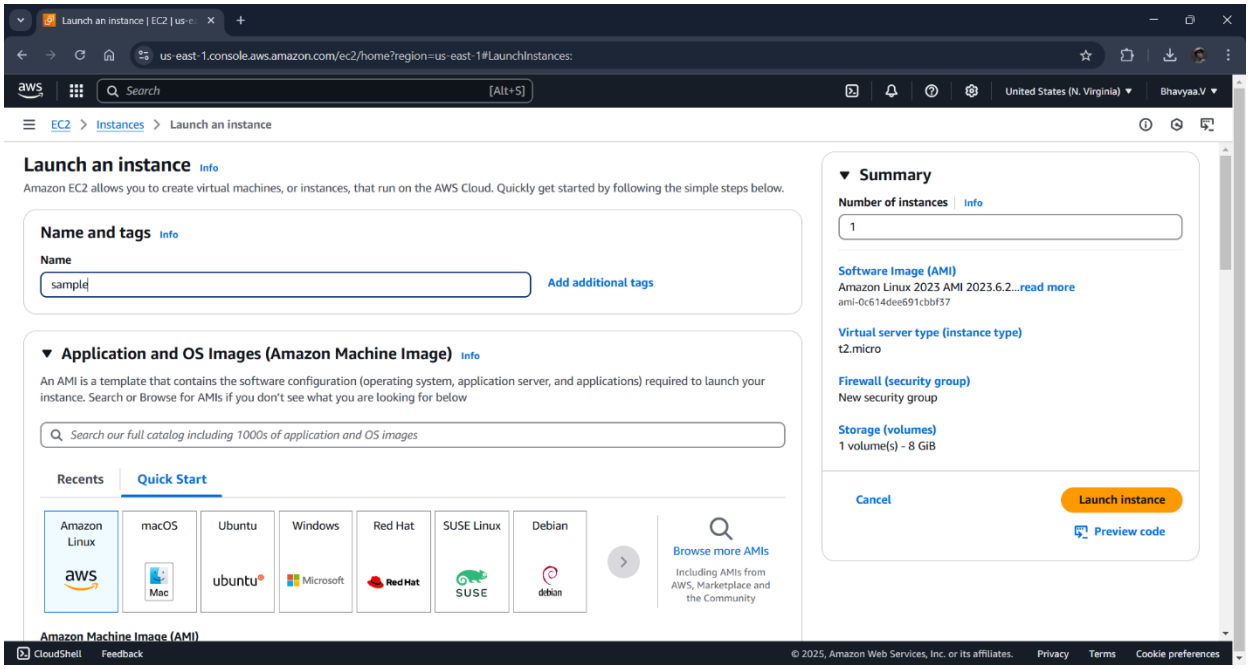


- **Navigate to EC2 Dashboard**:
  - In the search bar at the top, search for **EC2** and click on **EC2** under the "Services" tab.
  - This will take you to the EC2 Dashboard.

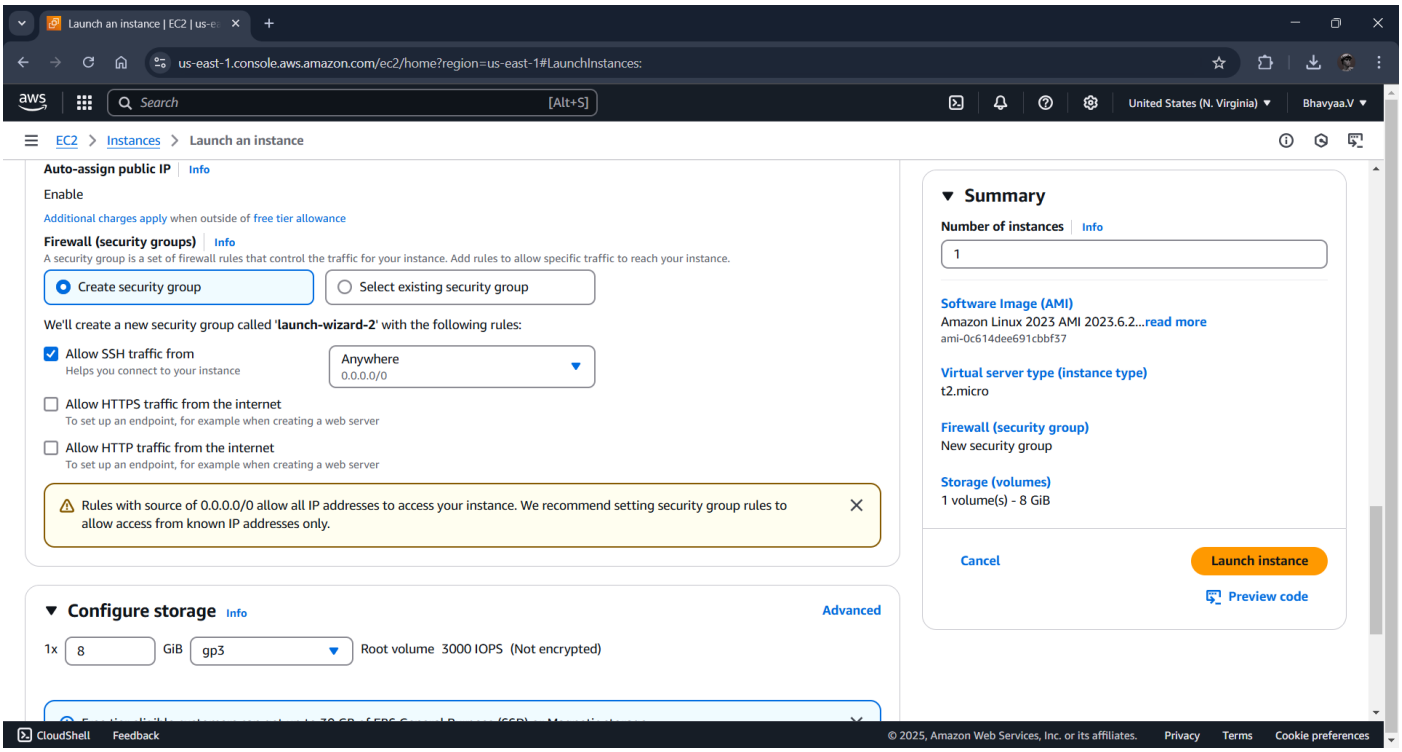


- **Launch a New Instance**:
  - Click **Launch Instance** to create a new virtual machine.
  - In the "Choose an Amazon Machine Image (AMI)" screen, select **Amazon Linux 2 AMI** (this is a Linux distribution provided by AWS and is eligible for the Free Tier).
  - Click **Select**.
  -

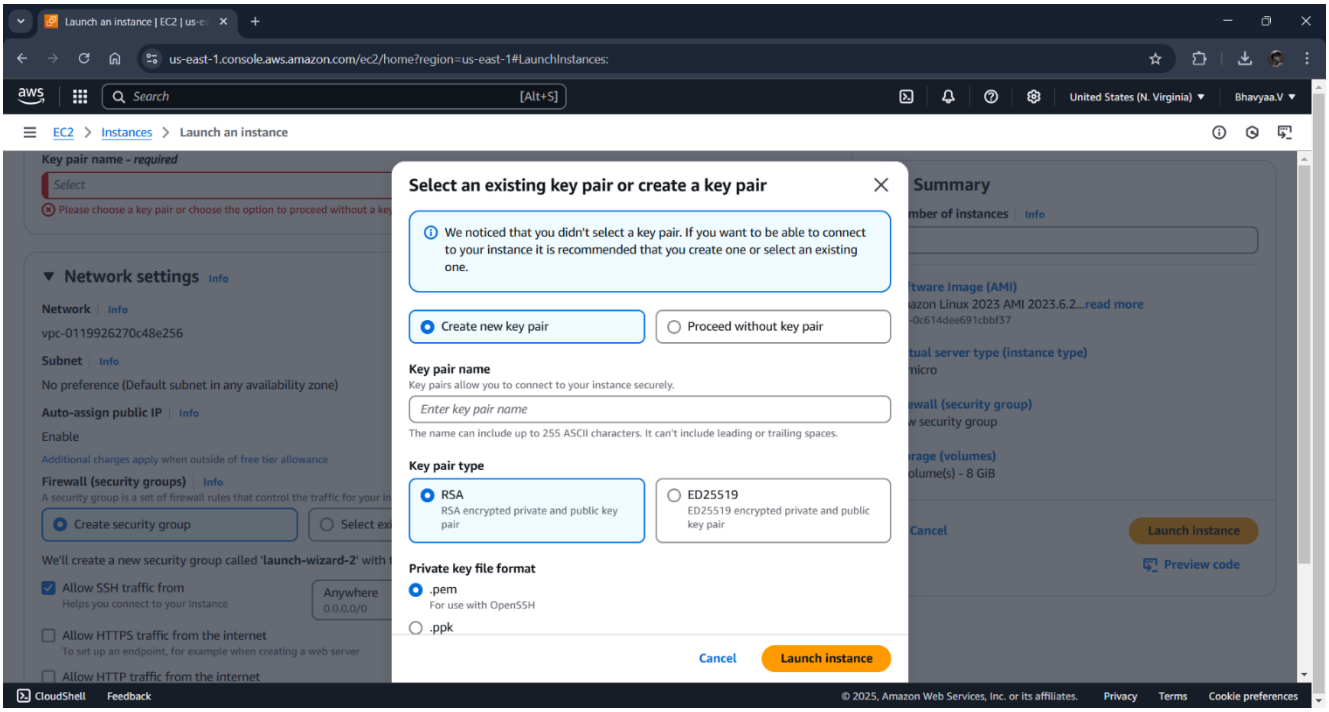
- **Choose an Instance Type**:
  - For Free Tier eligibility, select the **t2.micro** instance type, which is free for up to 750 hours per month.
  - Click **Next: Configure Instance Details**.



- **Configure Security Group**:
  - Create a new security group to allow SSH connections.
  - Add a rule to allow **SSH** from your IP. Select **SSH**, **Port 22**, and set **Source** to **My IP**. This will ensure you can connect securely using SSH.
  - Click **Review and Launch**.



- **Launch Instance**:
  - Review your settings and click **Launch**.
  - AWS will ask you to create or select a **Key Pair**. If you don't have one, create a new key pair:
    - Choose **Create a new key pair**.
    - Download the key file (`.pem`) to your computer. This file is necessary to SSH into your instance, so keep it safe.
    - Check the box to acknowledge you have the private key, and click **Launch Instances**.



Step 3:Connect to Your Instance via SSH

1. **Find the Public IP**:
   - Go back to the EC2 Dashboard.
   - In the **Instances** section, find the instance you just launched.
   - Note the **Public IPv4 address** of your instance. You'll need this for SSH.
2. **Set Permissions for the Key**: Before you can use the `.pem` key file to connect, you need to set the correct permissions:

   ```
   chmod 400 /path/to/your-key.pem
   ```

3. **SSH into the Instance**:
    - Open your terminal (or use an SSH client like PuTTY if you're on Windows).
    - Run the following command to connect to your EC2 instance via SSH. Replace `<your-key.pem>` with the path to your downloaded key, and `<Public_IP>` with the public IP address you noted earlier.

    For Windows (using PuTTY):

    - Convert the `.pem` file to `.ppk` format using PuTTYgen.
    - In PuTTY, enter the IP address and select your private key file under **Connection > SSH > Auth**.
    - Click **Open** to initiate the connection.
4. **Accept the SSH Key Fingerprint**:
    - The first time you connect, you'll be asked to confirm the host's authenticity. Type `yes` to continue.

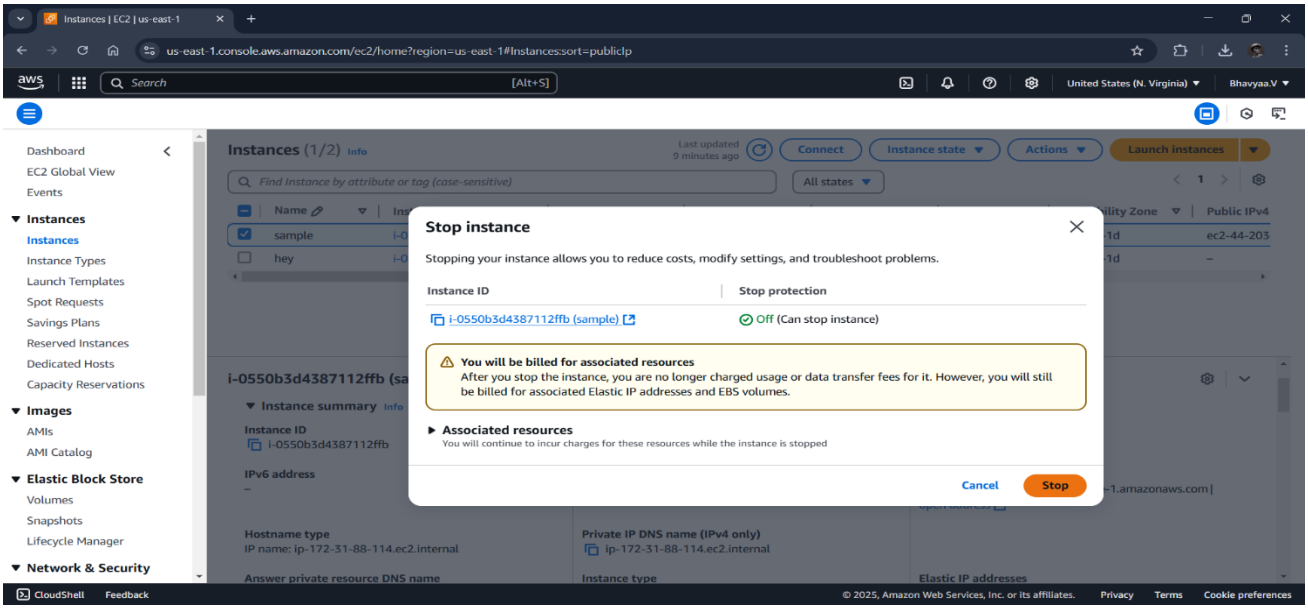
    You should now be logged into your EC2 instance!

Step 4: Manage Your Instance

Once connected, you can perform various tasks on your Linux VM, such as installing software, configuring settings, or serving a website.

To stop the instance:

1. Go back to the **EC2 Dashboard**.
2. Select your instance and click **Actions** > **Instance State** > **Stop** (or **Terminate** if you want to delete it).Stopping the instance will not incur any charges, but terminating it will.



Expected Outcome

By completing this POC, you will:

1. **Successful VM Deployment**: You will have a fully functional Linux virtual machine running on AWS, ready for use in development, testing, or hosting applications.
2. **Secure Remote Access**: SSH access will be configured, allowing you to securely connect to the VM from any device for management and deployment purposes.
3. **Cost Management**: By using the AWS Free Tier, you will maintain minimal costs while gaining hands-on experience with cloud infrastructure.
4. **Scalable Environment**: You will have a scalable cloud environment that can be easily adjusted to accommodate growing application needs or additional resources in the future.