 

**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**

### A Virtual Machine (VM) in the cloud is a scalable, on-demand computing resource that allows users to run applications without investing in physical hardware. Cloud platforms such as AWS, Azure, and Google Cloud Platform (GCP) provide VMs that can be easily created, configured, and accessed remotely.

### In this guide, we will create a free-tier cloud account, launch a virtual machine, and connect to it via SSH.

### ****Overview****

### This tutorial will cover:

### Creating a free-tier account on AWS, Azure, or GCP.

### Launching a Virtual Machine (VM) with a Linux OS.

### Configuring security settings (firewall rules, SSH keys).

### Connecting to the VM using Secure Shell (SSH).

### Cloud VMs are widely used for hosting applications, running development environments, and performing computing tasks.

### **Objectives**

 Set up a free-tier cloud account (AWS, Azure, or GCP).

 Launch a Virtual Machine with a Linux OS.

 Configure security settings such as SSH key pairs and firewall rules.

 Access the VM remotely using SSH from a local machine.

**Importance**

Scalability – Cloud VMs can be resized, upgraded, or replicated easily.  
✅ Cost-Effective – Free-tier instances provide a no-cost learning experience.  
✅ Security – Cloud providers offer built-in security measures like IAM roles and firewall rules.  
✅ Flexibility – VMs can be customized for various applications (web hosting, development, testing, etc.).

**Step-by-Step Overview**

**Step 1: Create a Free-Tier Cloud Account**

**For AWS (Amazon Web Services)**

1. **Go to AWS Free Tier** (<https://aws.amazon.com/free>).
2. Click **Create a Free Account** and enter your details.
3. Provide **credit card information** (AWS won’t charge unless you exceed the free tier).
4. Verify your phone number and complete account setup.

**For Azure (Microsoft Cloud)**

1. **Go to Azure Free Trial** (<https://azure.microsoft.com/en-us/free>).
2. Click **Start Free** and sign up using a Microsoft account.
3. Enter **billing information** and complete verification.
4. Get **$200 credit for 30 days** with free-tier services.

**For Google Cloud (GCP)**

1. **Go to Google Cloud Free Tier** (https://cloud.google.com/free).
2. Click **Get Started for Free** and sign in with a Google account.
3. Enter **billing details** (Google gives **$300 in free credits**).
4. Complete account setup.

**Step 2: Launch a Virtual Machine (VM)**

**For AWS EC2 (Elastic Compute Cloud)**

1. **Log in to AWS Console** → Navigate to **EC2 Dashboard**.
2. Click **Launch Instance** → Name your instance.
3. Choose an **Amazon Machine Image (AMI)**:
   * **Ubuntu** (Recommended for beginners)
   * **Amazon Linux** (Optimized for AWS)
4. Select **Instance Type** → Choose **t2.micro** (Free-tier eligible).
5. Click **Create New Key Pair** → Download the **.pem** file.
6. Configure **Security Group**:
   * **Allow SSH (port 22)** → Your IP only.
   * **Allow HTTP (port 80)** if planning to host a web app.
7. Click **Launch Instance** → Wait for the VM to start.

**For Azure Virtual Machine**

1. **Log in to Azure Portal** → Navigate to **Virtual Machines**.
2. Click **Create a Virtual Machine**.
3. Select an **Ubuntu Server** image.
4. Choose a free-tier **VM size** (e.g., **B1s**).
5. Under **Administrator Account**, select **SSH public key**.
6. Generate an SSH key or upload an existing one.
7. Configure **Network Security Group (NSG)** to allow **SSH (port 22)**.
8. Click **Create** and wait for the VM to deploy.

**For Google Cloud Compute Engine**

1. **Go to Compute Engine** → Click **Create Instance**.
2. Choose an **Ubuntu 22.04 LTS** image.
3. Select **e2-micro** (Free-tier eligible).
4. Under **Firewall settings**, enable **Allow HTTP & HTTPS traffic**.
5. Click **Create** and wait for the VM to start.

**Step 3: Connect to the VM via SSH**

**Using Linux/Mac Terminal**

1. Open a terminal and navigate to the folder containing the **key file**.
2. Run the following SSH command

 Replace your-key.pem with your actual key file.

 Replace your-vm-public-ip with your VM's external IP address.

**Using Windows (PowerShell or Git Bash)**

1. Install **OpenSSH** (if not installed).
2. Run the SSH command

**Using Google Cloud Console (Built-in SSH)**

1. Navigate to **Compute Engine**.
2. Click **SSH** next to your instance (No need for key management).

**Step 4: Verify the VM is Running**

1. After connecting via SSH, check system info
2. Update system packages
3. Verify available storage
4. Check active services

**Outcome**

After completing this setup, you will have:  
✅ **A cloud-based Virtual Machine running** on AWS, Azure, or GCP.  
✅ **Successfully connected to the VM using SSH**.  
✅ **Basic system configurations completed**.  
✅ **A secure and scalable cloud environment** ready for further deployment.