Introduction to Cloud Service Providers

Cloud Service providers are vendors who provide Information Technology (IT) as a service over the Internet. Cloud computing is a term which is used for storing and accessing data over the internet. It doesn't store any data on the hard disk of your PC. Cloud companies helps you to access your data from a remote server

Cloud computing companies' services range from full application development platforms to servers, storage, and virtual desktops. Here is a handpicked cloud service providers list. This cloud provider list contains various types of cloud computing services that are available in the market.

As a whole, the top 10 cloud service providers globally in 2022 are Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), Alibaba Cloud, Oracle Cloud, IBM Cloud (Kyndryl), Tencent Cloud, OVHcloud, DigitalOcean, and Linode (owned by Akamai).

Amazon Web Services (AWS)

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 200 fully featured services from data centers globally. Millions of customers including the fastest-growing startups, largest enterprises, and leading government agencies are using AWS to lower costs, become more agile, and innovate faster.

Setting up AWS Environment

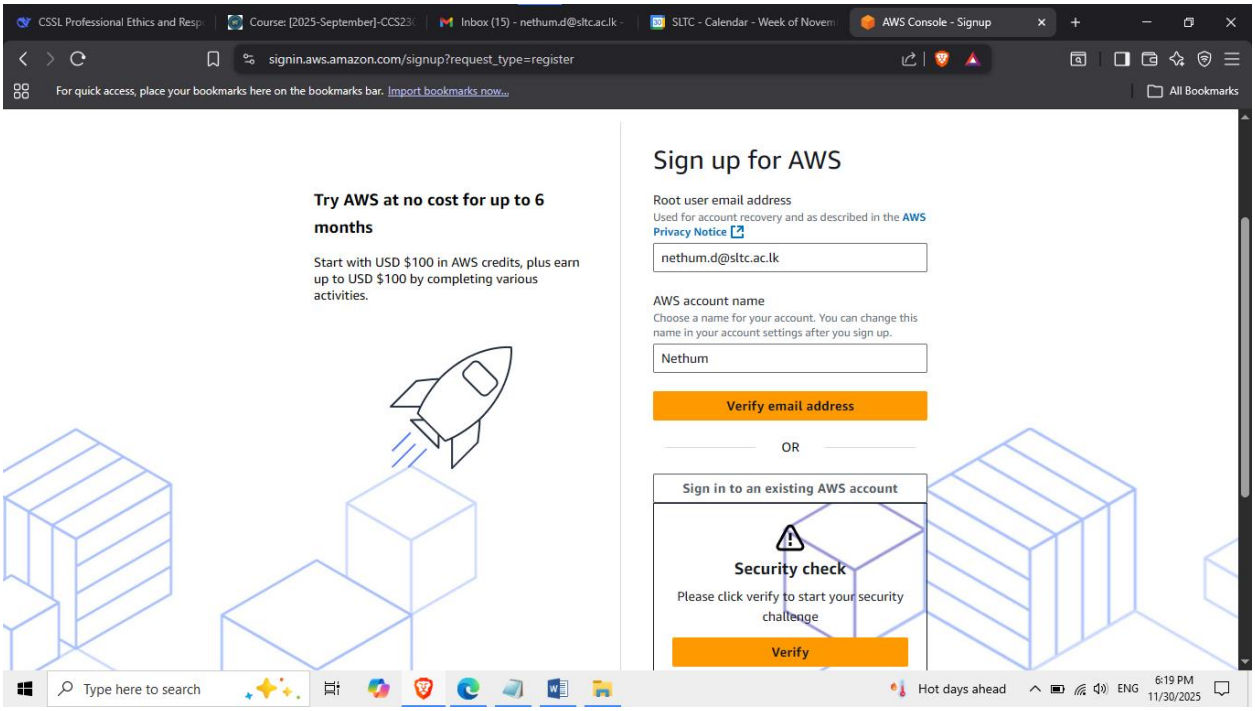
In this practical sheet, we will take you through setting up your AWS account and development environment. This will allow you to interact with your AWS account and provision any resources you need for building a system programmatically.

Step by step how create AWS free tire Account

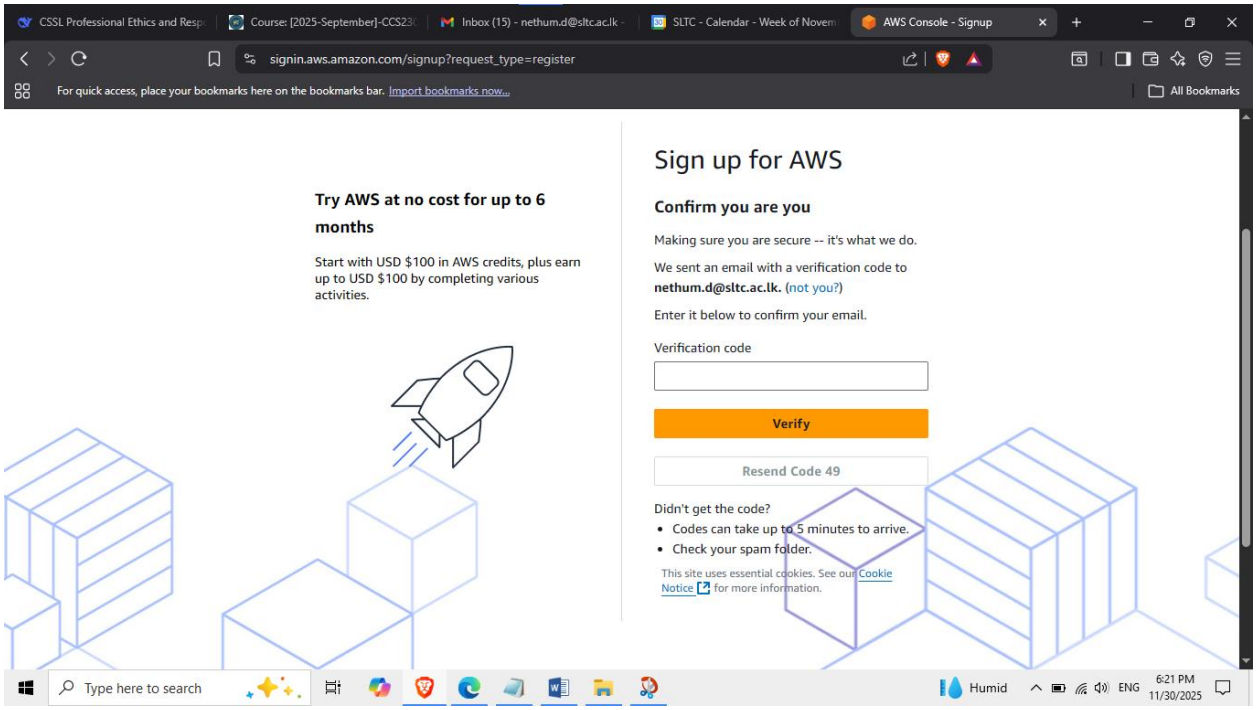
An AWS Free tire account is the starting point to allow provisioning infrastructure. In this step, we will cover how to set up your account.

https://www.youtube.com/watch?v=Q6eMTgUDPXg&t=2s

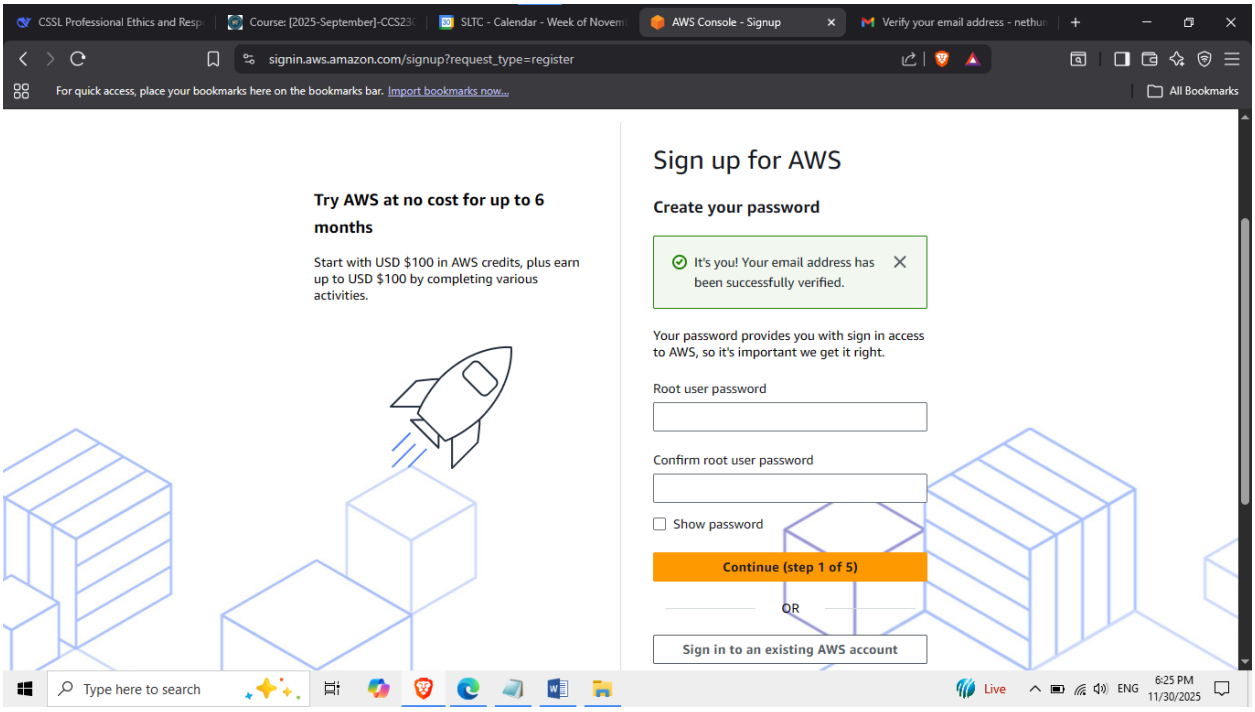
Step 1 – Visit the official AWS website and set up an email account



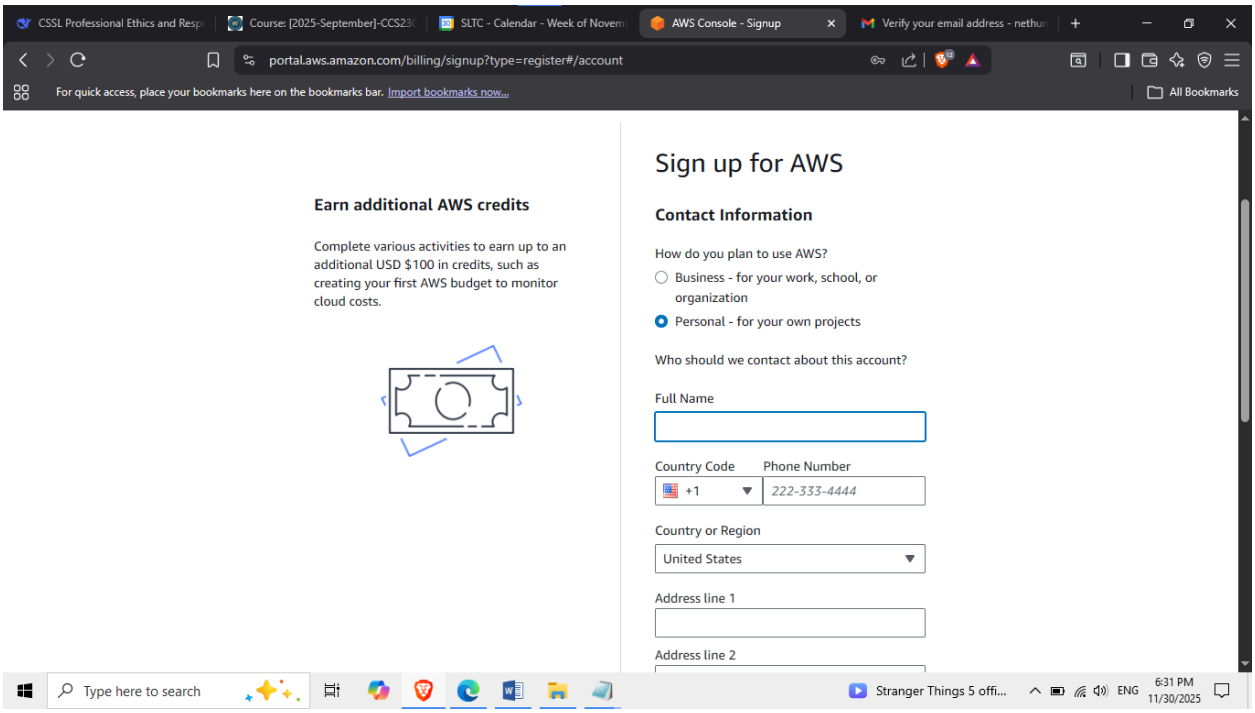
Step 2 – Get Email Verification code and put your AWS account.



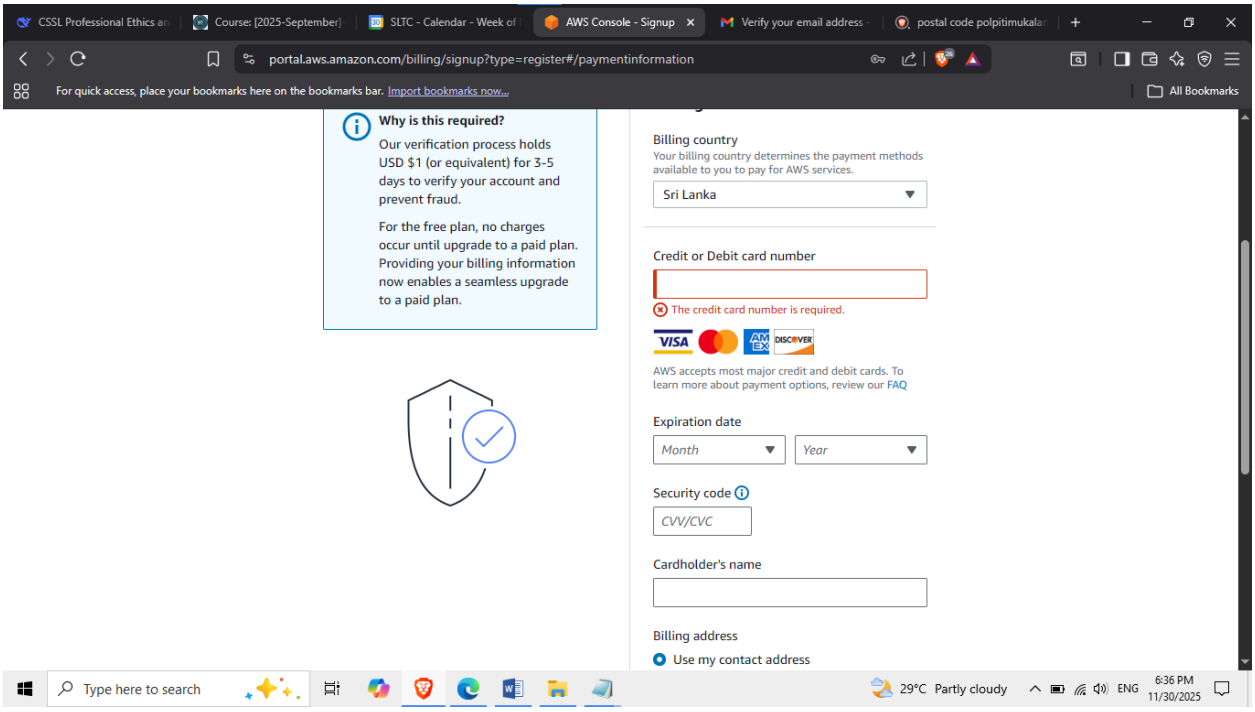
Step 3 - Set a password for the root user of your AWS account



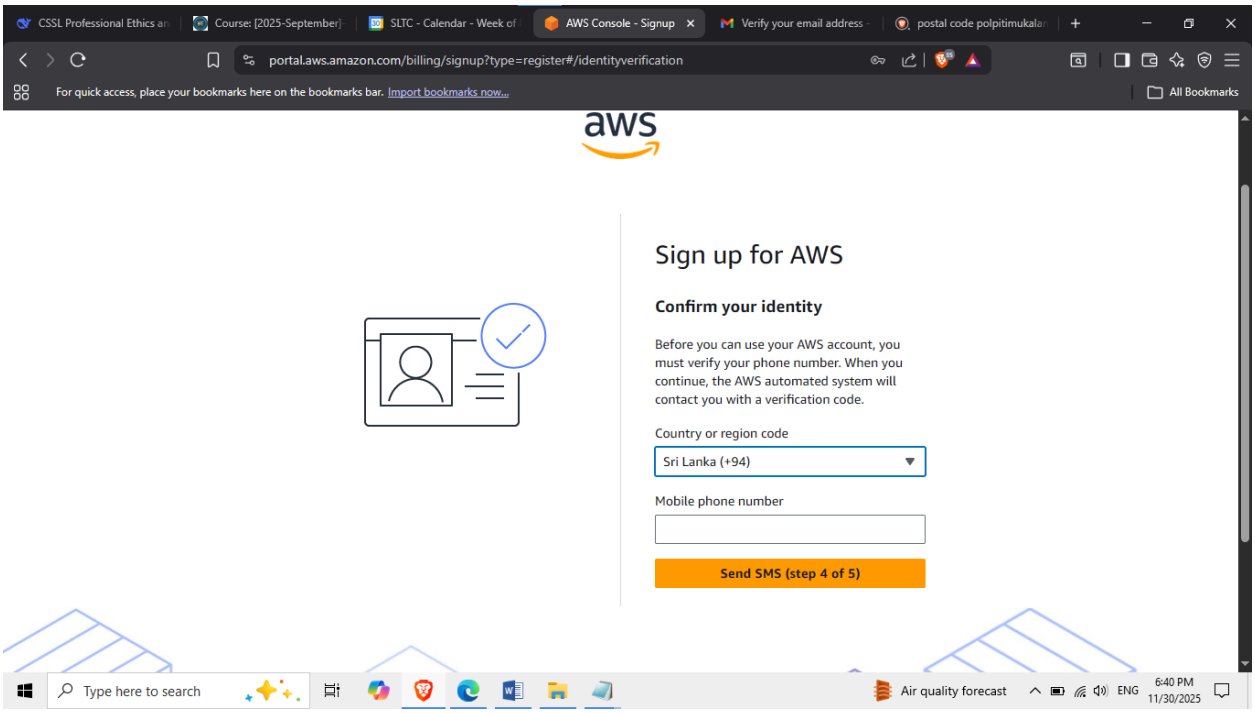
Step 4 – Choose the AWS Free Tier account and provide your personal details



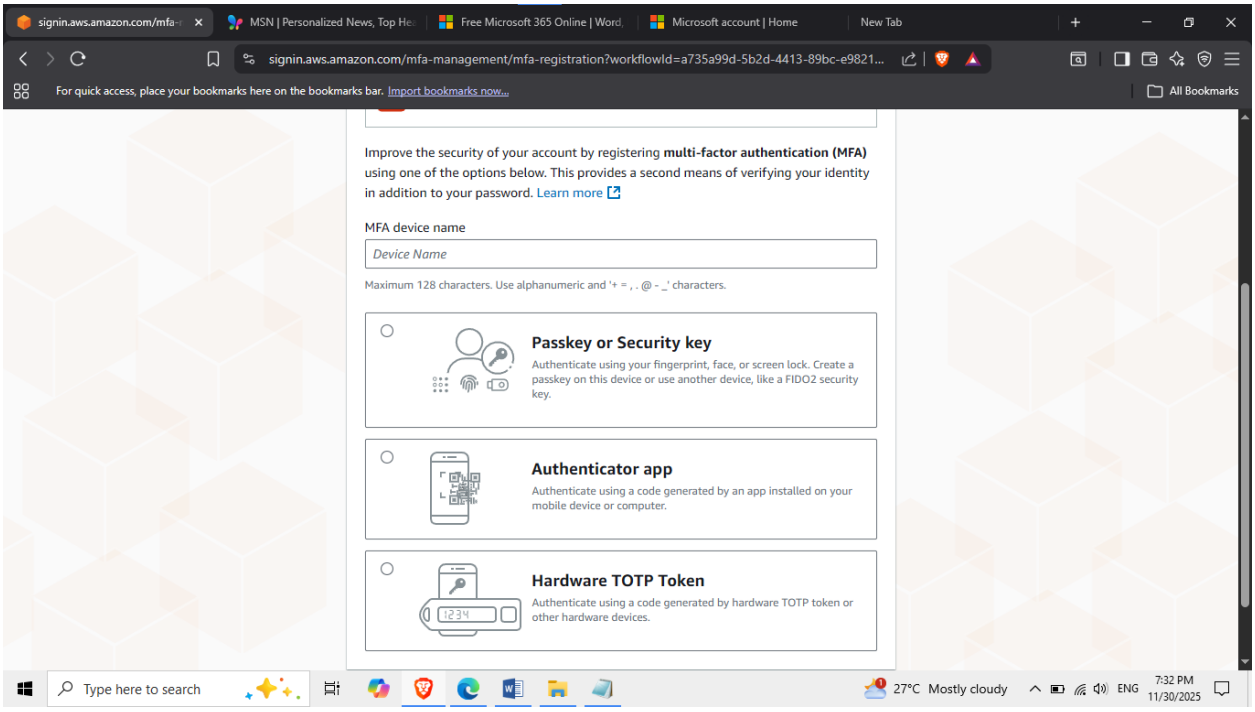
Step 5 – Enter your billing details, including your credit card information.



Step 6 – Put your phone number and verify the identity details.



Step 7 – To secure your AWS account, connect an authenticator app to enable Multi-Factor Authentication (MFA).

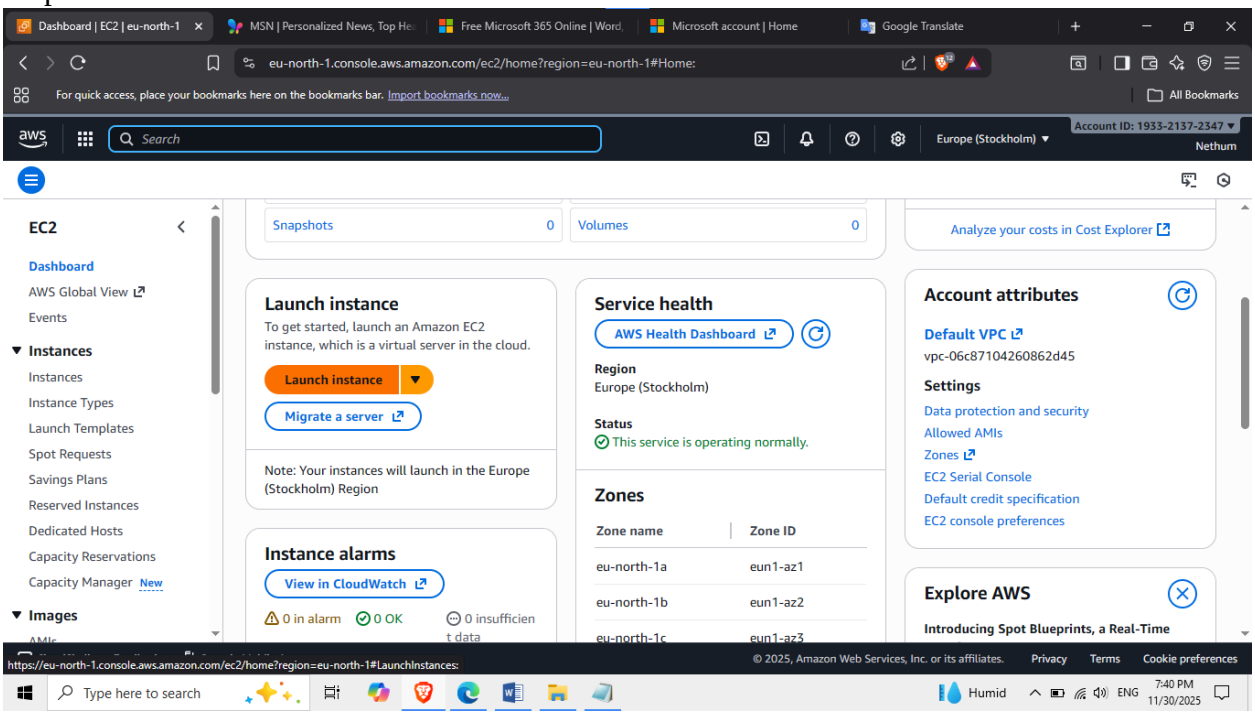


Launch EC2 Instance

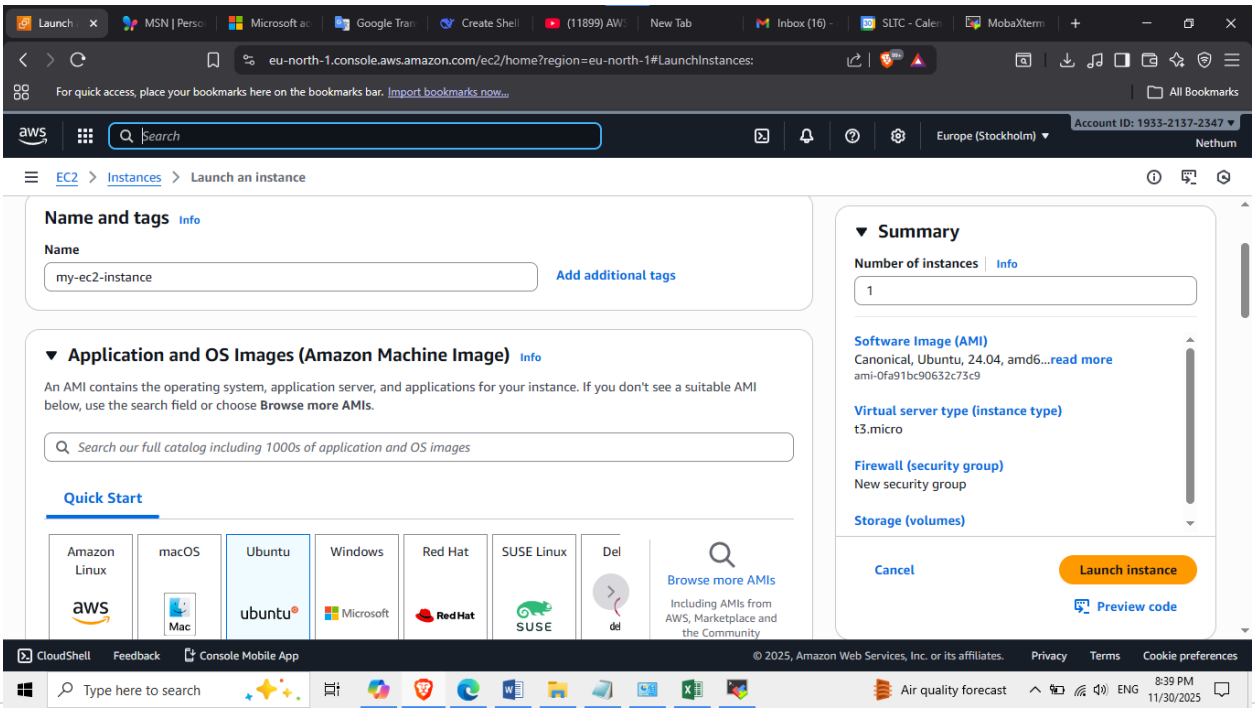
Amazon EC2 (Elastic Compute Cloud) is a web service from Amazon Web Services (AWS) that provides secure, resizable compute capacity in the cloud.

https://www.youtube.com/watch?v=2zeoNC4cdTA&t=3s

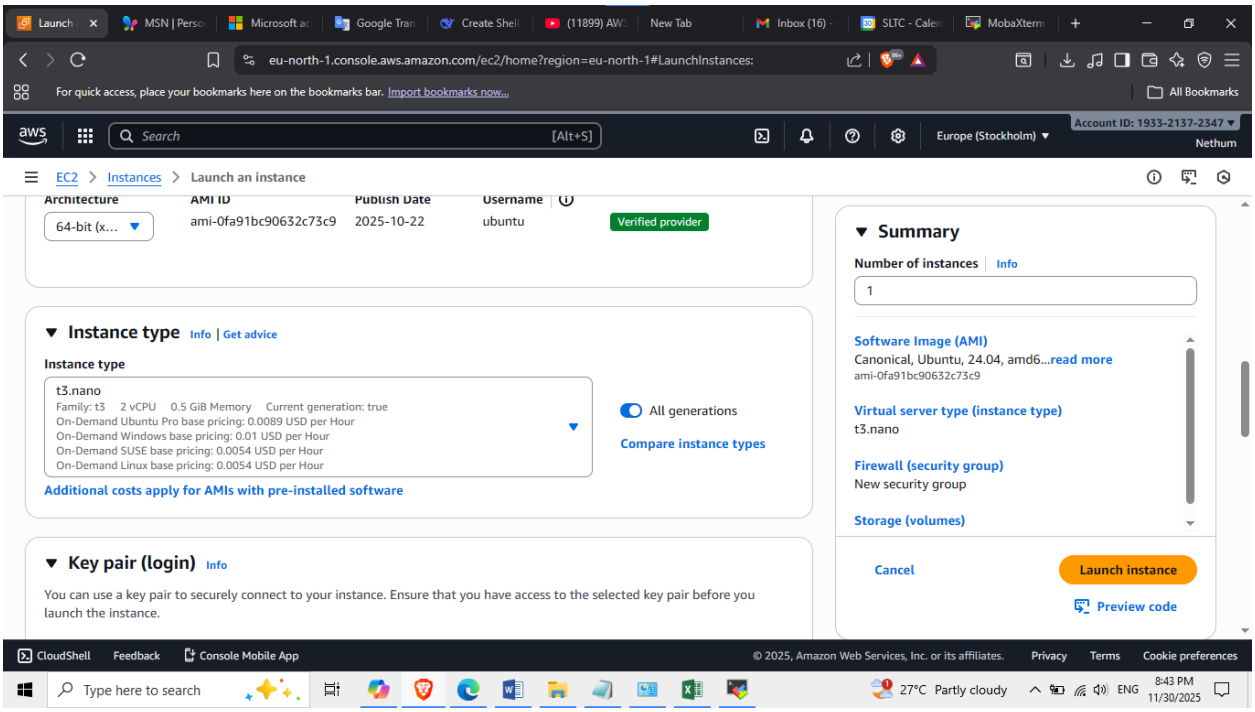
Step 1 – Search Ec2 Instance in search bar and launch Instance.



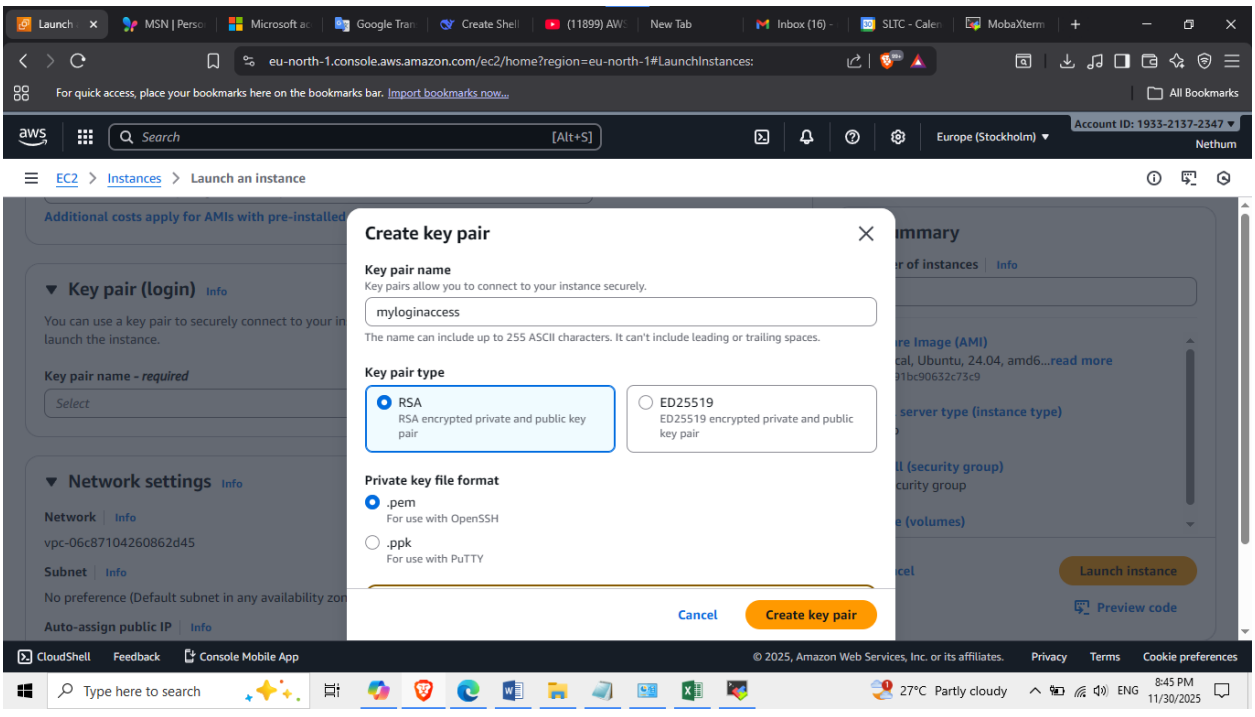
Step 2 – Assign a name to the EC2 instance and select its operating system (e.g., Ubuntu).



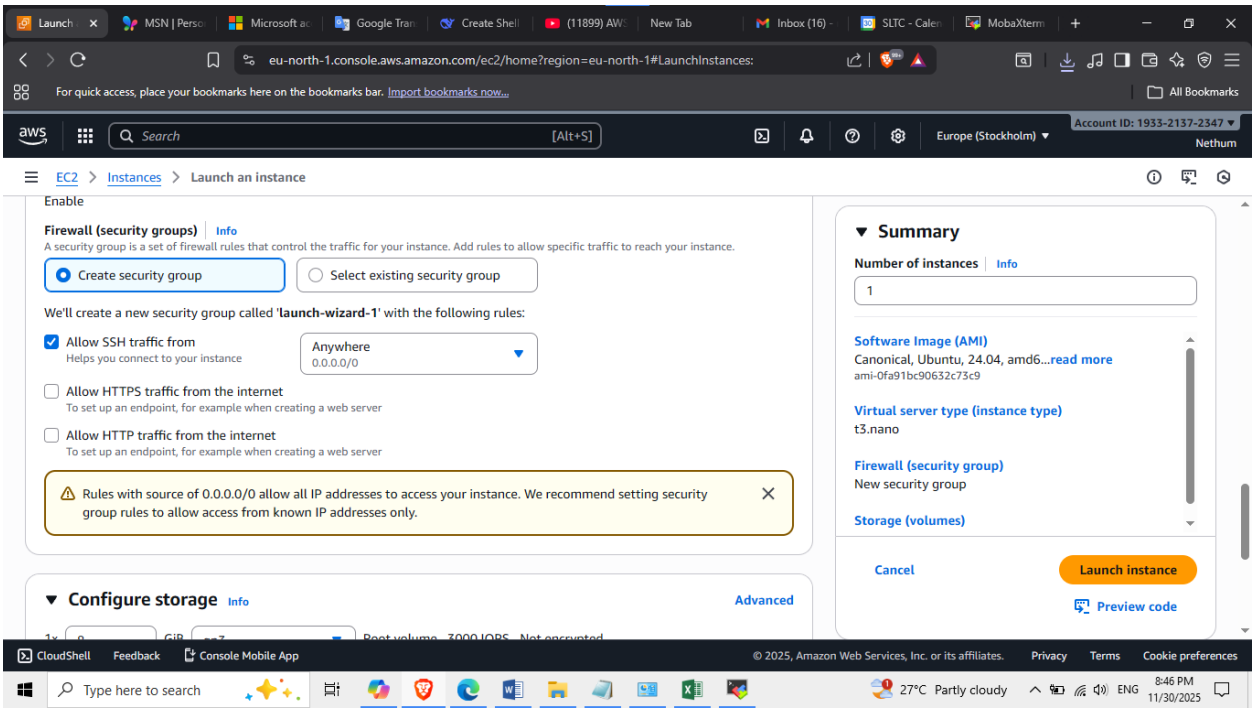
Step 3 – Provide Instance type, When your choose Free tire account choose recommended type. (T2.micro).



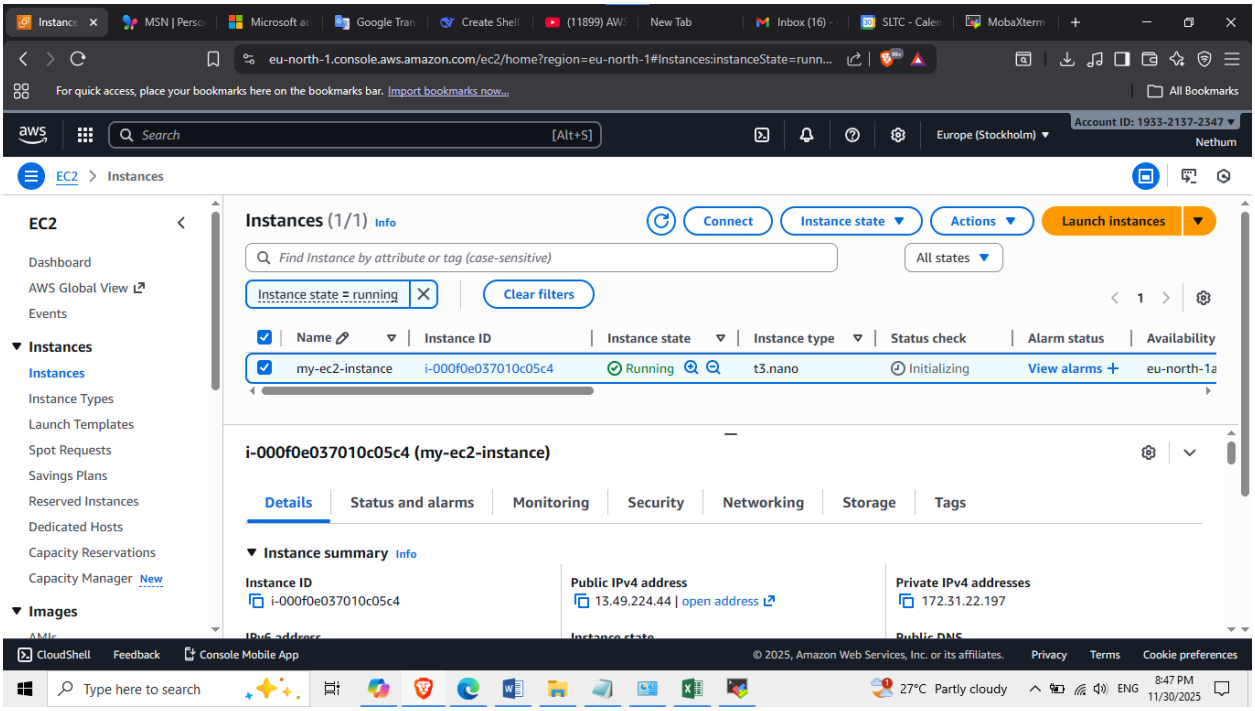
Step 4 - Generate a key pair to connect to the VM remotely. If you are using PuTTY, choose the .ppk



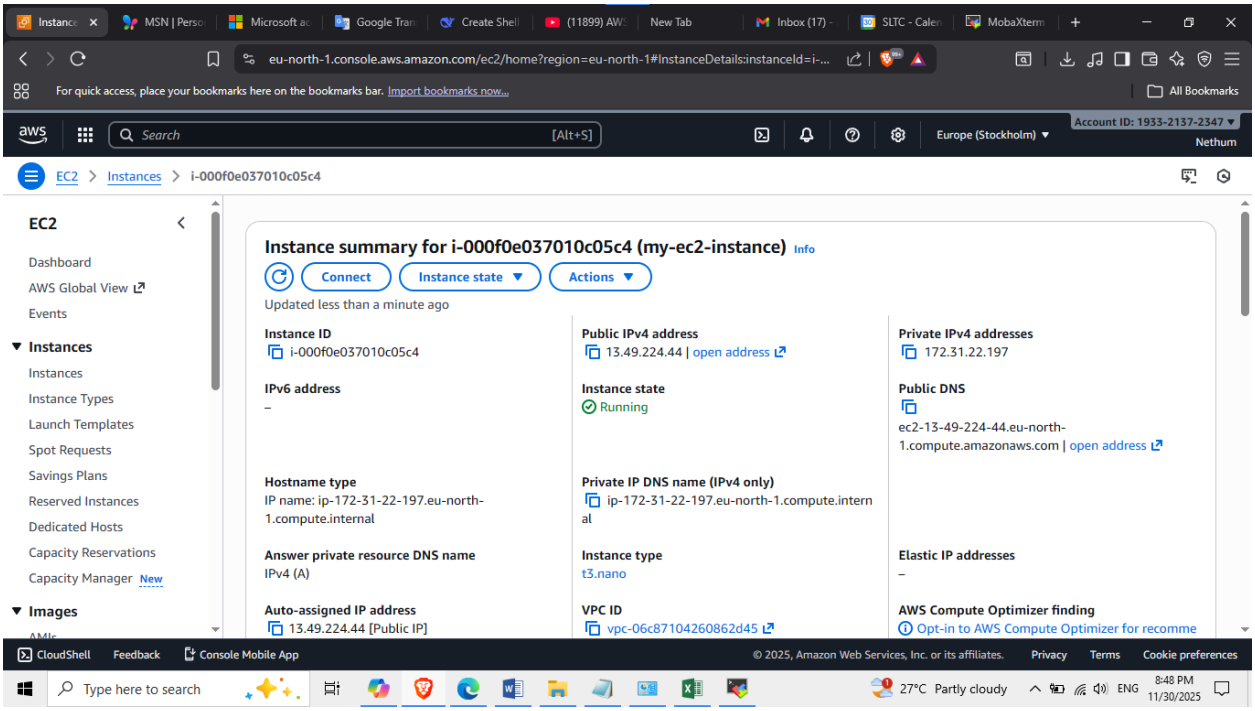
Step 5 – Click Allow SSH traffic



Step 6 – After completed above stages, then launch the EC2 Instance.



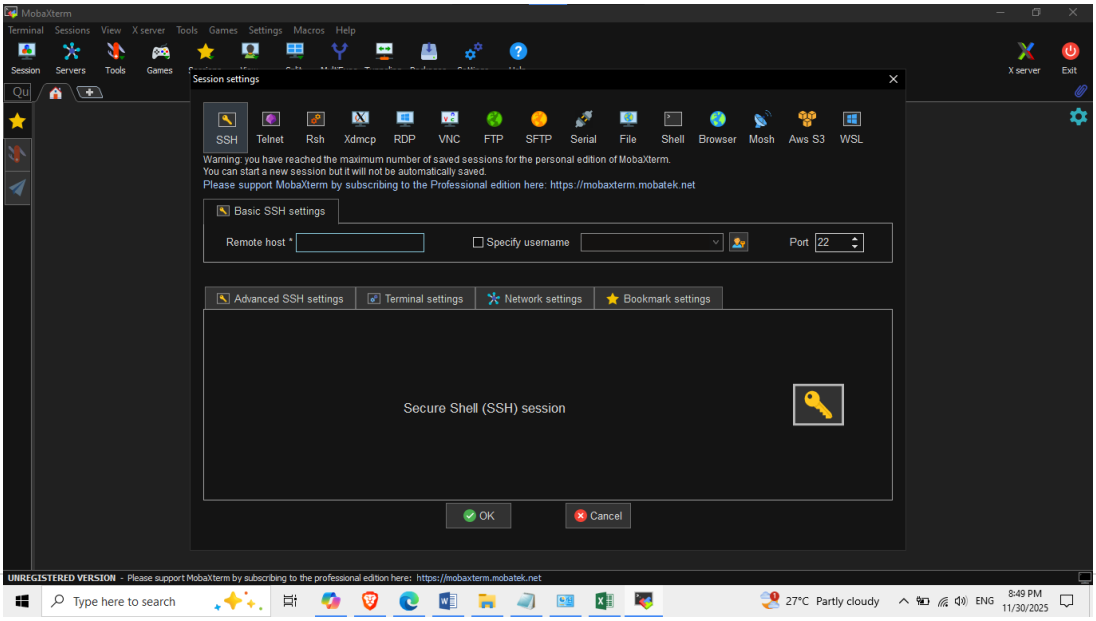
Step 7 – EC2 Instance Details,



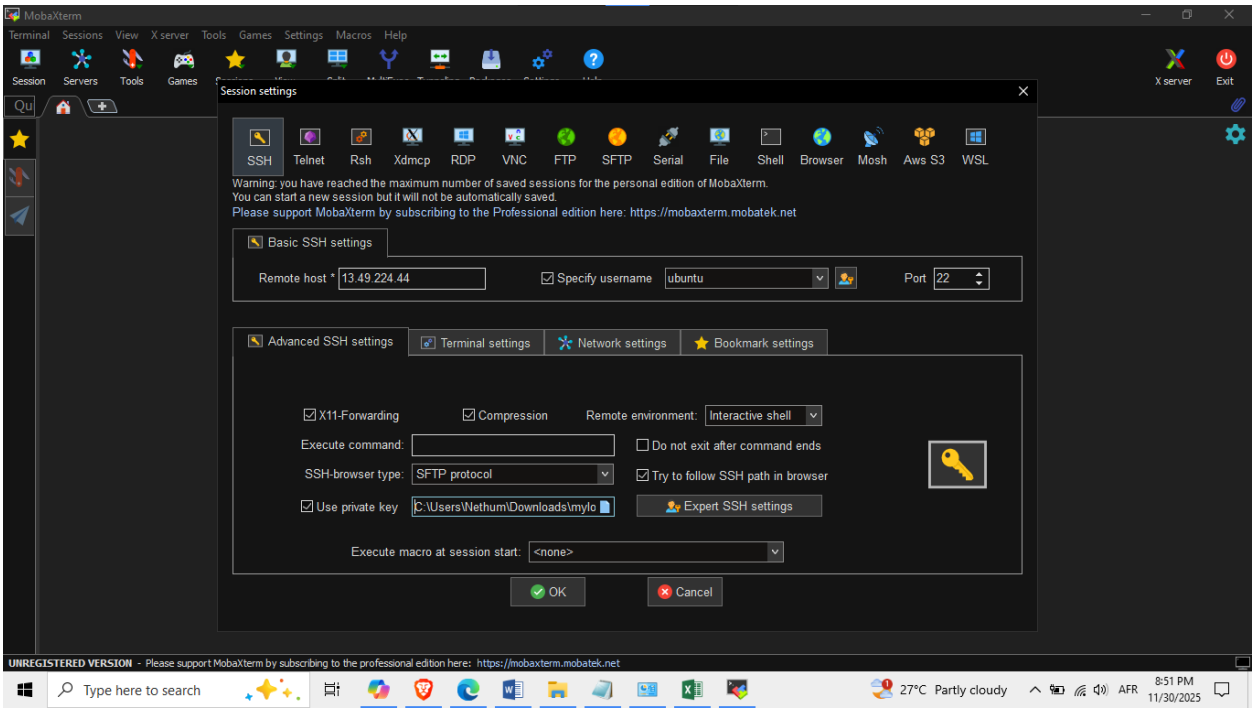
Connect Remote Server (EC2 Instance) using SSH Key (Private Key)

This process allows you to securely log in to your Amazon EC2 instance in the cloud from your local computer.

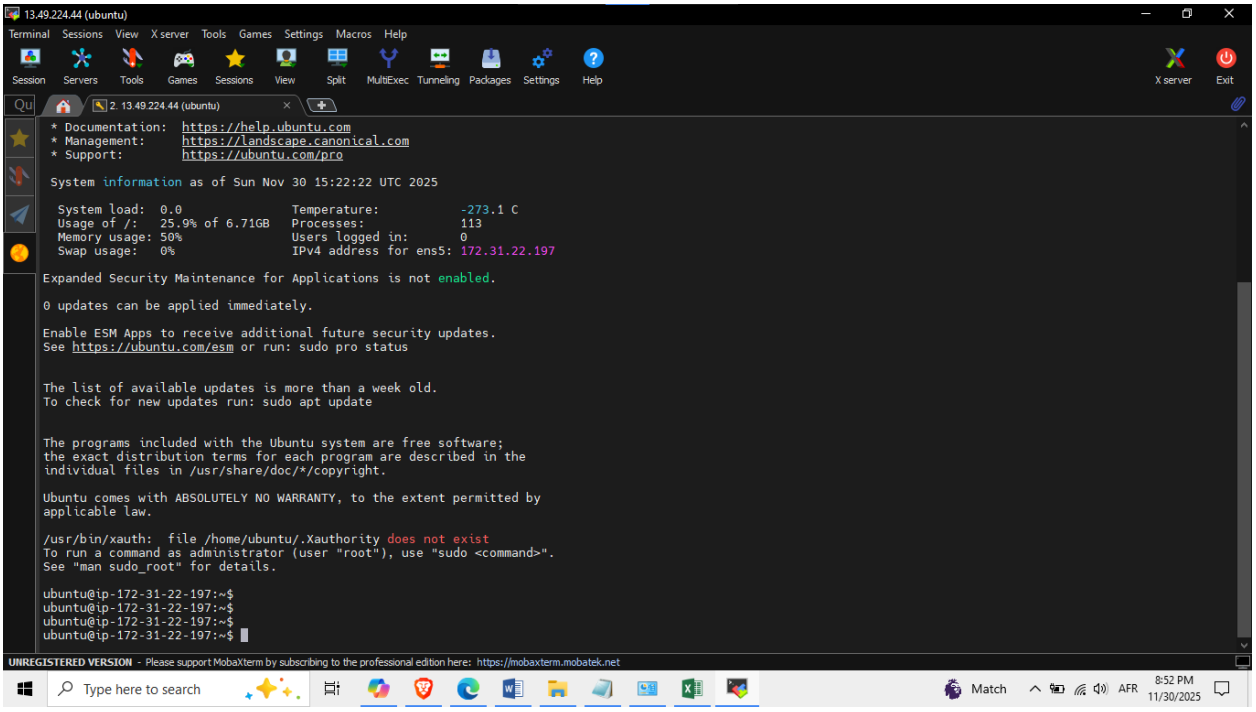
Step 1 – Downloaded and Open Mobaxterm Software Then Open SSH – https://mobaxterm.mobatek.net/download-home-edition.html



Step 2 – To connect, enter your EC2 instance's IPv4 address, use "ubuntu" as the username, and provide the path to your downloaded key pair file.



Step 3 – After done above part and press OK button then automatically connect to remote Virtual machine.



Create simple HTML code and connect to the web server via EC2 Instance

- Create and open html file in to your EC2 instance.
  Code :- Sudo vi welcome.html

- Copy and paste to HTML code inside the welcome.html folder

```
<!DOCTYPE html>
<html>
<head>
  <title>AWS Welcome CCS2302-Cloud Computing Fundamentals</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      text-align: center;
      margin: 100px;
      background: #232f3e;
      color: white;
    }
    .welcome {
      font-size: 2.5em;
      color: #ff9900;
      margin-bottom: 30px;
    }
    .info {
      background: #334155;
      padding: 15px;
      margin: 10px;
      border-radius: 5px;
      display: inline-block;
    }
  </style>
</head>
<body>
  <div class="welcome">Hello Welcome AWS</div>
  <div class="info" id="dateInfo">Loading date...</div>
  <div class="info" id="instanceInfo">My Student ID Is " "</div>

  <script>
    document.getElementById('dateInfo').textContent = 'Current date: ' + new Date().toLocaleString();
    // EC2 metadata would be fetched here in a real EC2 environment
  </script>
```

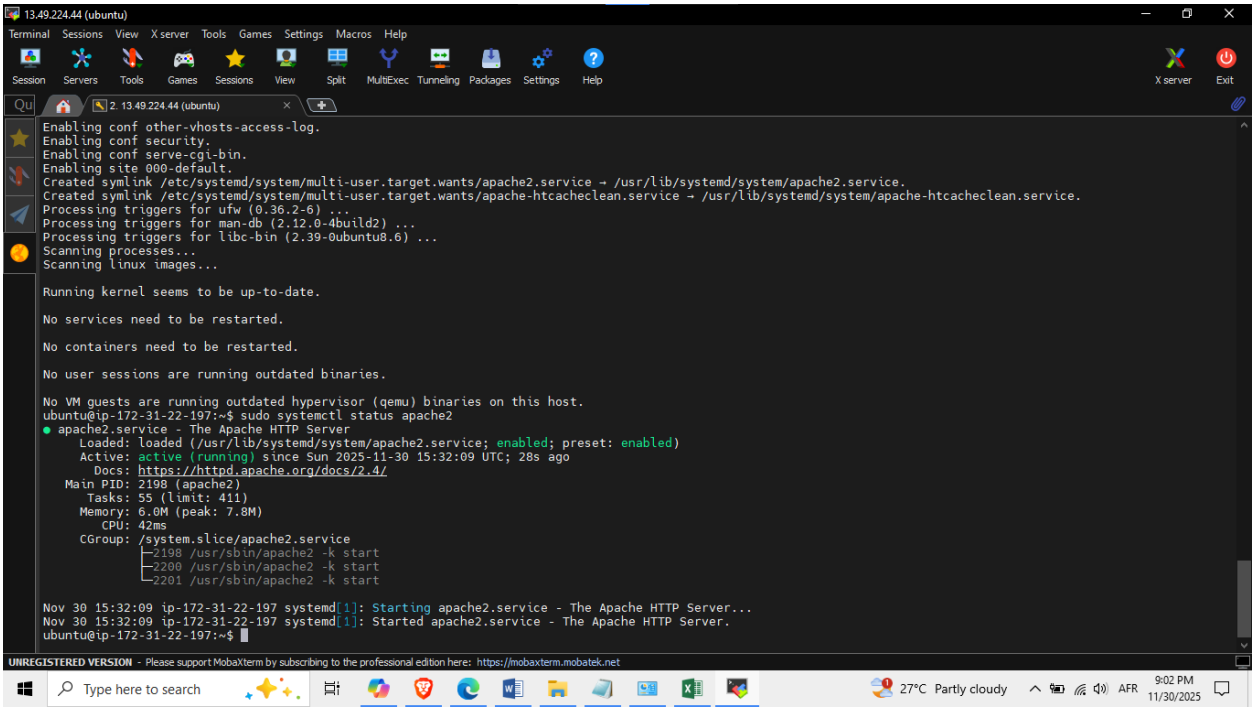
</body>
</html>

- Serve the HTML file using a web server (Apache2 web server)
  # Install Apache
  sudo apt update
  sudo apt install -y apache2

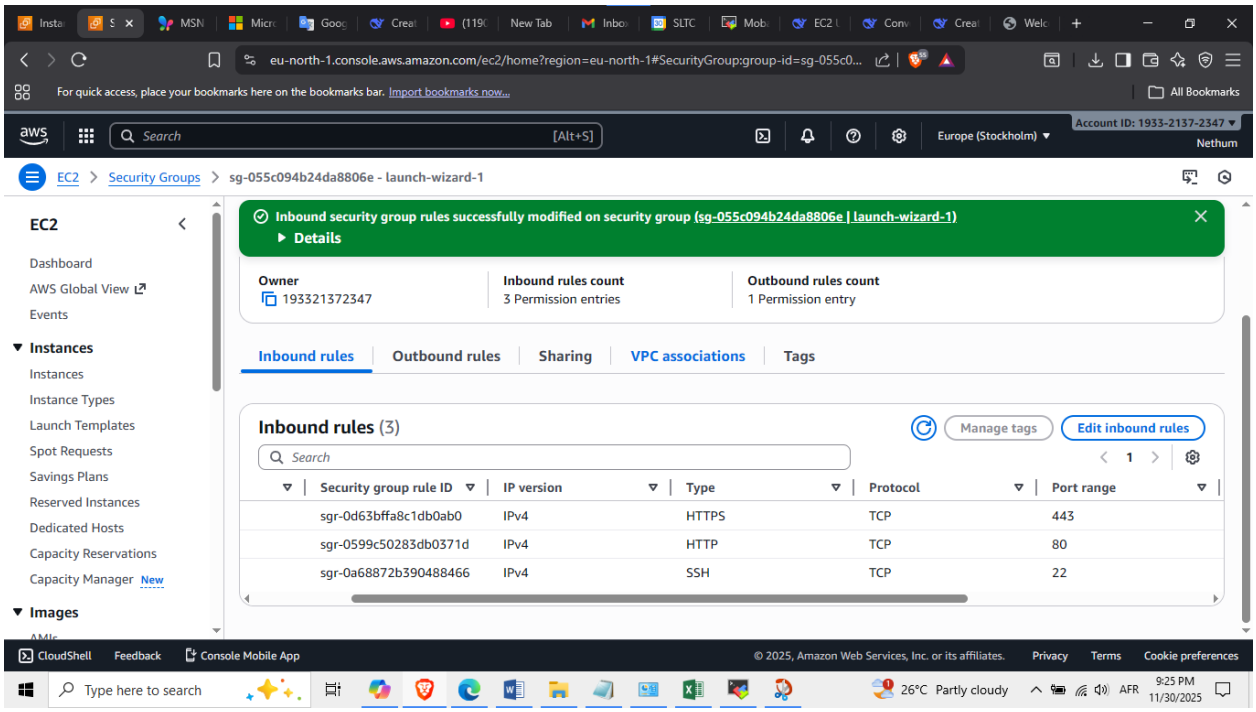
  # Copy HTML file to web directory
  sudo cp welcome.html /var/www/html/

  # Start Apache
  sudo systemctl start apache2
  sudo systemctl enable apache2

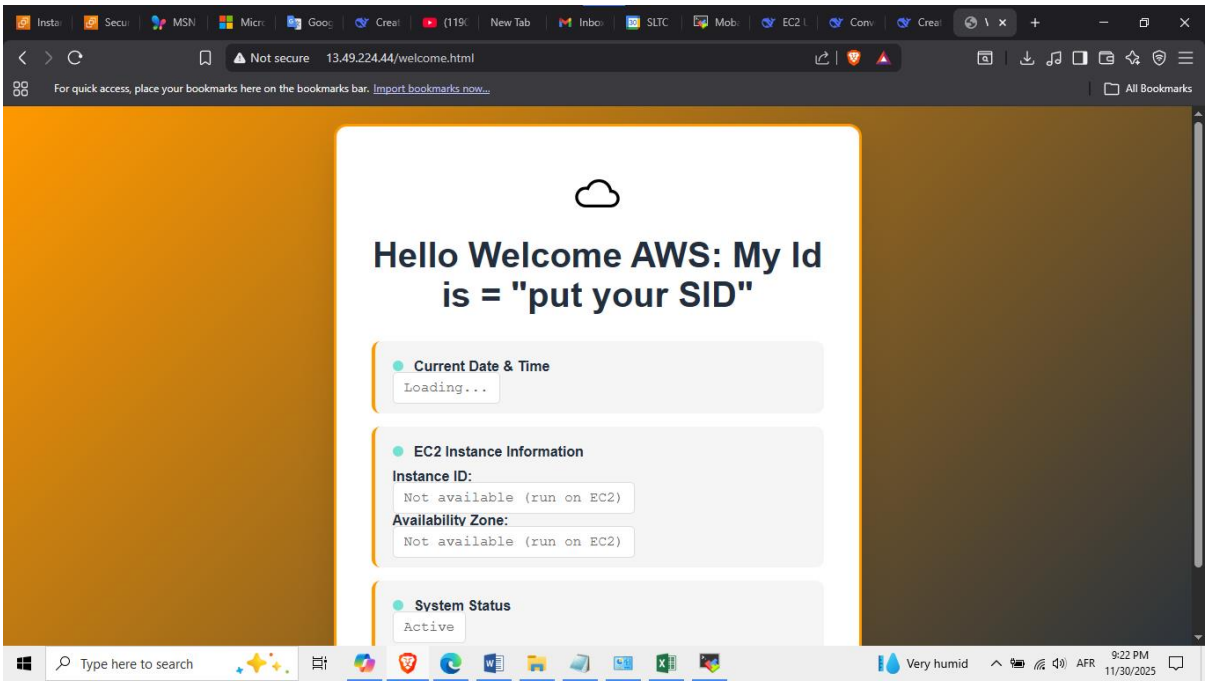
- Installed apache and check the status
  sudo systemctl status apache2



- Go to EC2 Instances and add these Inbound rules,
  # Type: SSH, Port: 22, Source: 0.0.0.0/0 (or your IP)
  # Type: HTTP, Port: 80, Source: 0.0.0.0/0
  # Type: HTTPS, Port: 443, Source: 0.0.0.0/0



- Open your Browser and copy IPV4 address and navigate this;
  http://your-ec2-public-ip/welcome.html



AWS S3 Bucket Creation

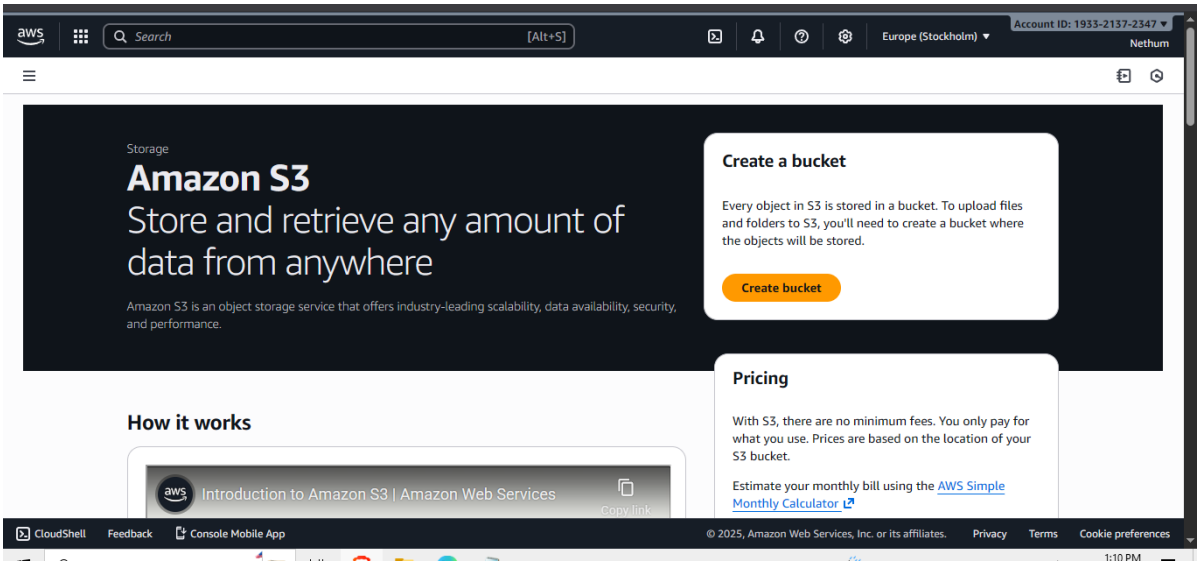
An AWS S3 bucket is a logical container in Amazon Web Services (AWS) Simple Storage Service (S3) used to store and manage objects, which are files along with their associated metadata and a unique key identifier. Each object must reside within a bucket, as it cannot exist independently. Buckets are designed to be globally unique in name and are associated with a specific AWS region. They provide scalable, durable, and secure object-based storage, capable of holding an unlimited amount of data.

Azure also provides a similarly diverse set of storage services. serves as the primary object storage solution, suitable for storing large amounts of unstructured data such as documents, media files, and application installers.

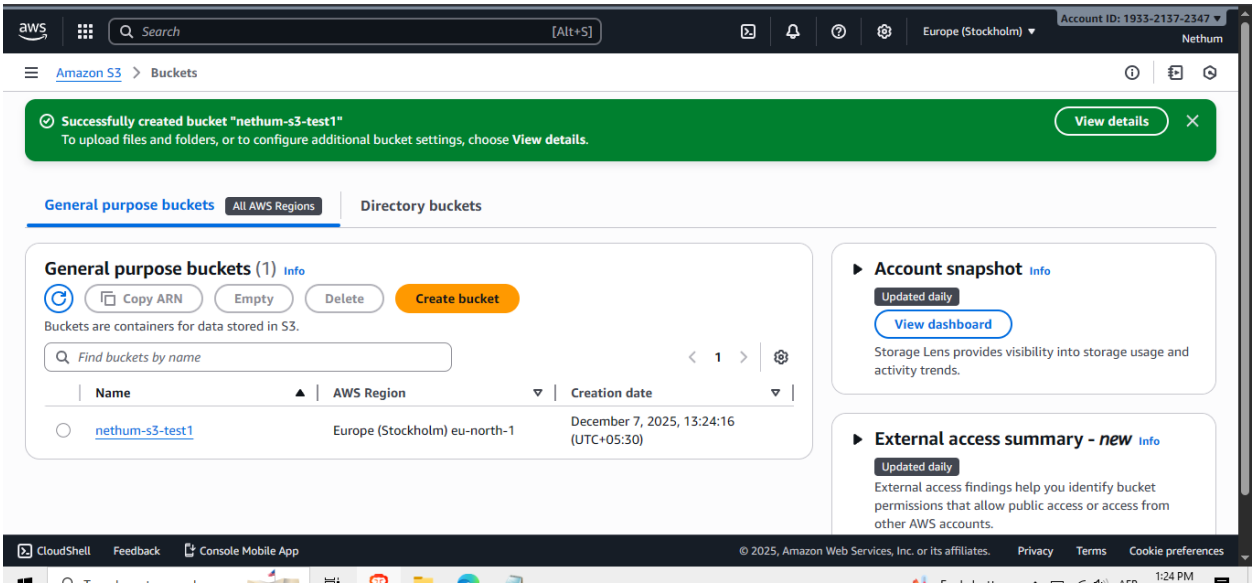
Setting up AWS Environment

Step by step create a S3 bucket

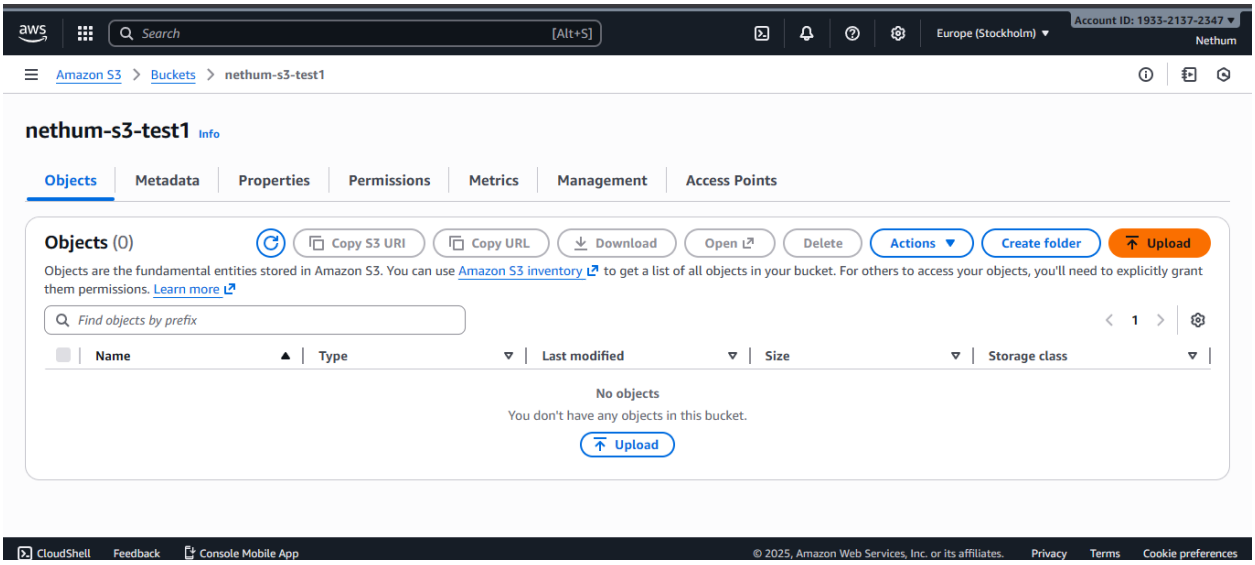
- Log into the AWS Console, navigate to the S3 service, and click "Create bucket."
  - AWS Account Login - https://aws.amazon.com/console/



❖ Created a S3 bucket -> when you create it choose a unique name (e.g., my-website-123)



❖ Navigate the S3 bucket and click upload,

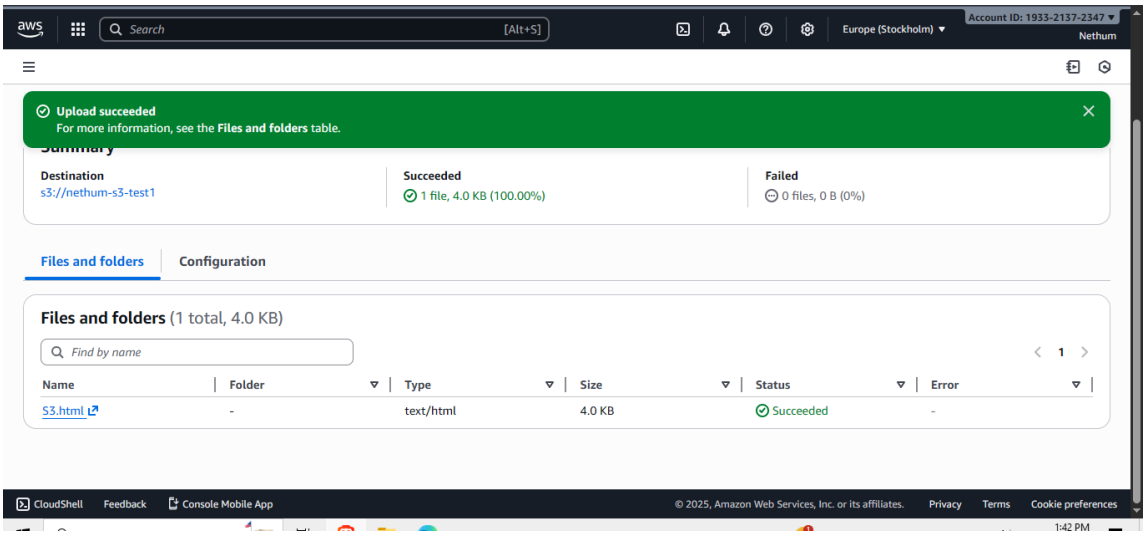


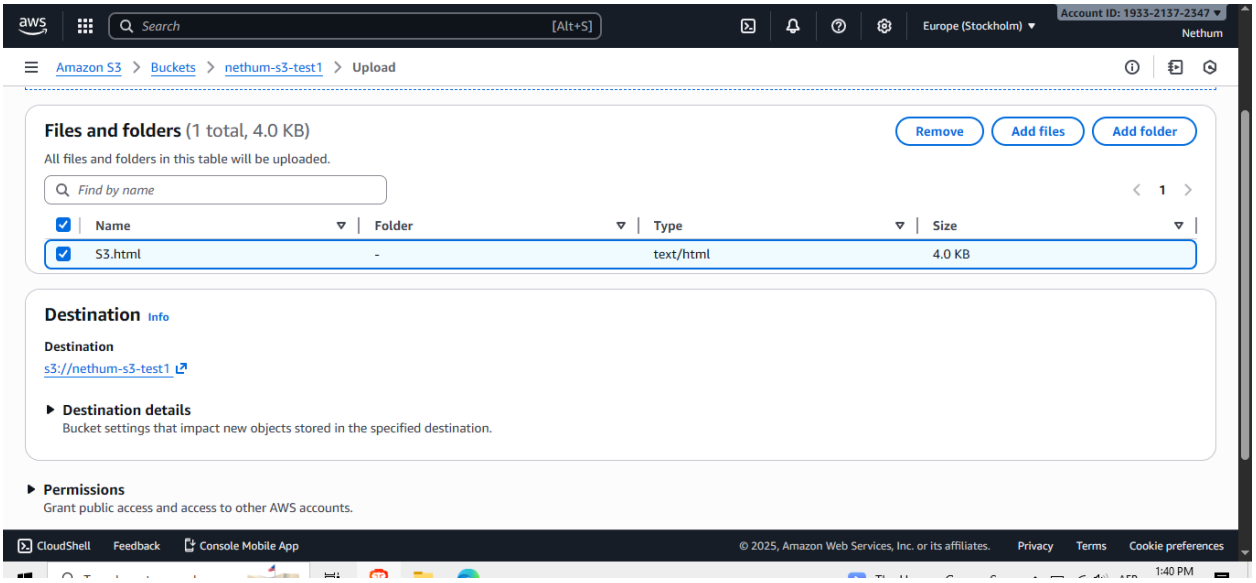
❖ Add the simple html base file in to the bucket, (Copy the code below to create an HTML file)

```
<!DOCTYPE html>
<html>
<head>
  <title>My S3 Website</title>
  <style>
    /* Simple CSS */
    body {
      font-family: Arial, sans-serif;
      background-color: #f5f5f5;
      margin: 0;
      padding: 0;
      display: flex;
      justify-content: center;
      align-items: center;
      min-height: 100vh;
      text-align: center;
    }

    .container {
      background-color: white;
      padding: 30px;
      border-radius: 10px;
      box-shadow: 0 2px 10px rgba(0,0,0,0.1);
      max-width: 500px;
    }

    h1 {
      color: #FF9900; /* AWS orange */
      margin-bottom: 20px;
    }

    p {
      color: #333;
      font-size: 18px;
      margin-bottom: 20px;
    }

    button {
      background-color: #FF9900;
      color: white;
      border: none;
      padding: 10px 20px;
      border-radius: 5px;
```

```
            cursor: pointer;
            font-size: 16px;
        }

        button:hover {
            background-color: #e68a00;
        }

        .hidden {
            display: none;
        }

        .message {
            background-color: #f0f8ff;
            padding: 10px;
            border-radius: 5px;
            margin-top: 20px;
            border-left: 4px solid #FF9900;
        }
    </style>
</head>
<body>
    <div class="container">
        <h1>Hello from AWS S3!</h1>
        <p>My static website is now live.</p>

        <button id="toggleButton">Click for more info</button>

        <div id="moreInfo" class="hidden">
            <p>This site is hosted on Amazon S3, a scalable cloud storage service.</p>
        </div>

        <div id="message" class="message hidden"></div>
    </div>

    <script>
        // Simple JavaScript
        document.addEventListener('DOMContentLoaded', function() {
            const toggleButton = document.getElementById('toggleButton');
            const moreInfo = document.getElementById('moreInfo');
            const messageDiv = document.getElementById('message');

            toggleButton.addEventListener('click', function() {
                // Toggle the hidden info
                if (moreInfo.classList.contains('hidden')) {
```

```
                moreInfo.classList.remove('hidden');
                toggleButton.textContent = 'Show less';

                // Update the message
                messageDiv.textContent = 'Amazon S3 provides secure, durable, and scalable object storage.';
                messageDiv.classList.remove('hidden');
            } else {
                moreInfo.classList.add('hidden');
                toggleButton.textContent = 'Click for more info';
                messageDiv.classList.add('hidden');
            }
        });

        // Change background color on mouse move
        document.addEventListener('mousemove', function(e) {
            const x = e.clientX / window.innerWidth;
            const y = e.clientY / window.innerHeight;

            // Very subtle color change
            document.body.style.backgroundColor = `rgb(${245 + x * 10}, ${245 + y * 10}, 245)`;
        });

        // Simple page load animation
        const container = document.querySelector('.container');
        container.style.opacity = '0';
        container.style.transform = 'translateY(20px)';

        setTimeout(() => {
            container.style.transition = 'opacity 0.5s, transform 0.5s';
            container.style.opacity = '1';
            container.style.transform = 'translateY(0)';
        }, 100);
    });
  </script>
</body>
</html>
```





- If unable to code run in S3 bucket, To set the bucket policy to public, go to the Permissions tab, find the Bucket policy section, click Edit, and add the following policy (ensuring you replace BUCKET_NAME).

  - Copy and paste under the policy,

```
{
 "Version": "2012-10-17",
 "Statement": [
  {
   "Sid": "PublicReadGetObject",
   "Effect": "Allow",
   "Principal": "*",
   "Action": "s3:GetObject",
   "Resource": "arn:aws:s3:::BUCKET_NAME/*",
   "Condition": {
    "StringEquals": {
     "aws:Referer": "https://your-domain.com"
    }
   }
  }
 ]
}
```

❖ Copy the Bucket website endpoint URL and access the website.