



### 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

The screenshot shows the AWS sign-up page in a web browser. The browser's address bar displays 'signin.aws.amazon.com/signup?request\_type=register'. The page features a promotional banner on the left: 'Try AWS at no cost for up to 6 months' with details about USD \$100 in credits. The main sign-up form on the right includes fields for 'Root user email address' (containing 'nethum.d@sltc.ac.lk') and 'AWS account name' (containing 'Nethum'). Below these fields is an orange 'Verify email address' button. An 'OR' separator is followed by a 'Sign in to an existing AWS account' section, which contains a 'Security check' warning and a 'Verify' button. The background of the page has a blue wireframe illustration of a rocket launching from a stack of blocks. The Windows taskbar at the bottom shows the time as 6:19 PM on 11/30/2025.

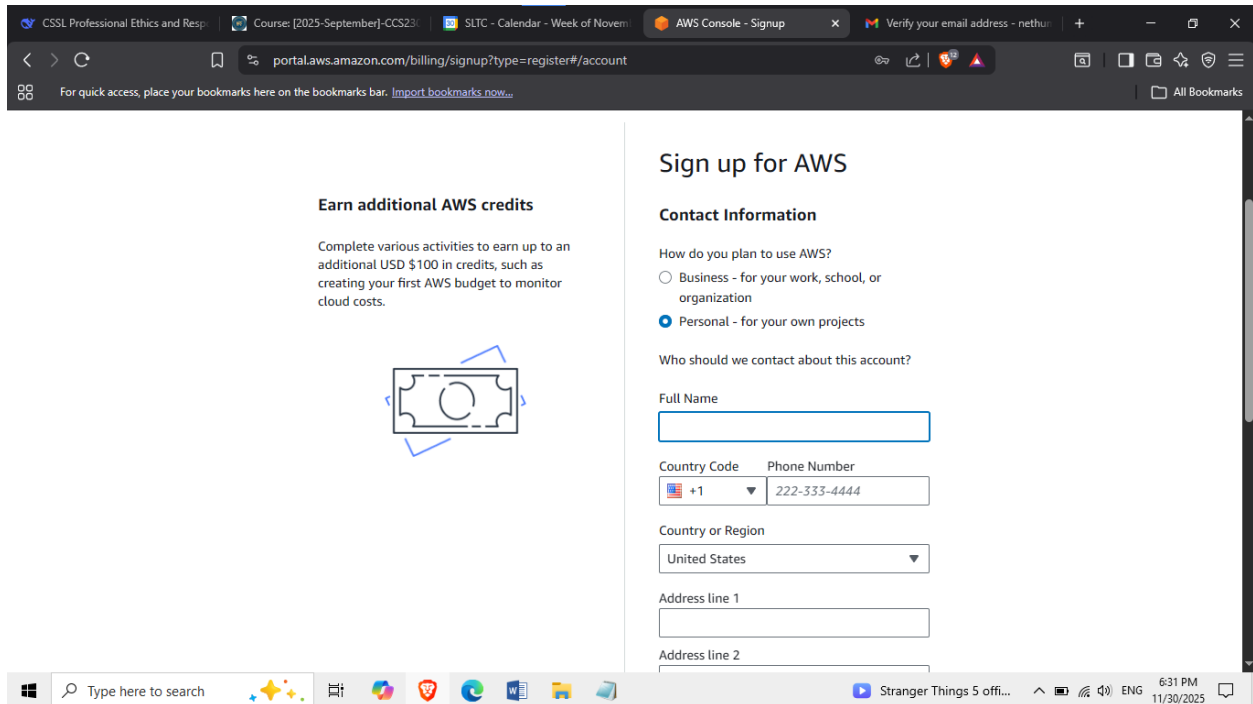
## Step 2 – Get Email Verification code and put your AWS account.

The screenshot shows the AWS sign-up page at `signin.aws.amazon.com/signup?request_type=register`. On the left, a promotional banner states: "Try AWS at no cost for up to 6 months. Start with USD \$100 in AWS credits, plus earn up to USD \$100 by completing various activities." The main heading is "Sign up for AWS". Under "Confirm you are you", it says: "Making sure you are secure -- it's what we do. We sent an email with a verification code to `nethum.d@sltc.ac.lk`. (not you?) Enter it below to confirm your email." There is a text input field for the "Verification code" and an orange "Verify" button. Below the button is a "Resend Code 49" link. A section titled "Didn't get the code?" lists: "Codes can take up to 5 minutes to arrive." and "Check your spam folder." with links to "Cookie Notice" and "more information". The Windows taskbar at the bottom shows the time as 6:21 PM on 11/30/2023.

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

The screenshot shows the AWS sign-up page at the same URL. The promotional banner and "Sign up for AWS" heading are the same. Under "Create your password", a green success message box says: "It's you! Your email address has been successfully verified." Below this, it says: "Your password provides you with sign in access to AWS, so it's important we get it right." There are two text input fields for "Root user password" and "Confirm root user password". A "Show password" checkbox is present. An orange "Continue (step 1 of 5)" button is below the fields. Below the button is an "OR" separator and a "Sign in to an existing AWS account" link. The Windows taskbar at the bottom shows the time as 6:25 PM on 11/30/2023.

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



The screenshot shows the 'Sign up for AWS' page in a web browser. The browser's address bar displays 'portalaws.amazon.com/billing/signup?type=register#/account'. On the left side, there is a section titled 'Earn additional AWS credits' with a sub-header 'Complete various activities to earn up to an additional USD \$100 in credits, such as creating your first AWS budget to monitor cloud costs.' Below this text is an illustration of a US dollar bill. The main content area is titled 'Sign up for AWS' and contains a 'Contact Information' section. This section includes a radio button selection for 'How do you plan to use AWS?' with options 'Business - for your work, school, or organization' and 'Personal - for your own projects' (which is selected). Below this is a question 'Who should we contact about this account?'. The form fields include 'Full Name', 'Country Code' (set to '+1'), 'Phone Number' (set to '222-333-4444'), 'Country or Region' (set to 'United States'), 'Address line 1', and 'Address line 2'. The Windows taskbar at the bottom shows the search bar, task view button, and several application icons. The system tray on the right indicates the time as 6:31 PM on 11/30/2025.

**Earn additional AWS credits**

Complete various activities to earn up to an additional USD \$100 in credits, such as creating your first AWS budget to monitor cloud costs.

**Sign up for AWS**

**Contact Information**

How do you plan to use AWS?

☐ Business - for your work, school, or organization

☒ Personal - for your own projects

Who should we contact about this account?

Full Name

Country Code Phone Number

+1 222-333-4444

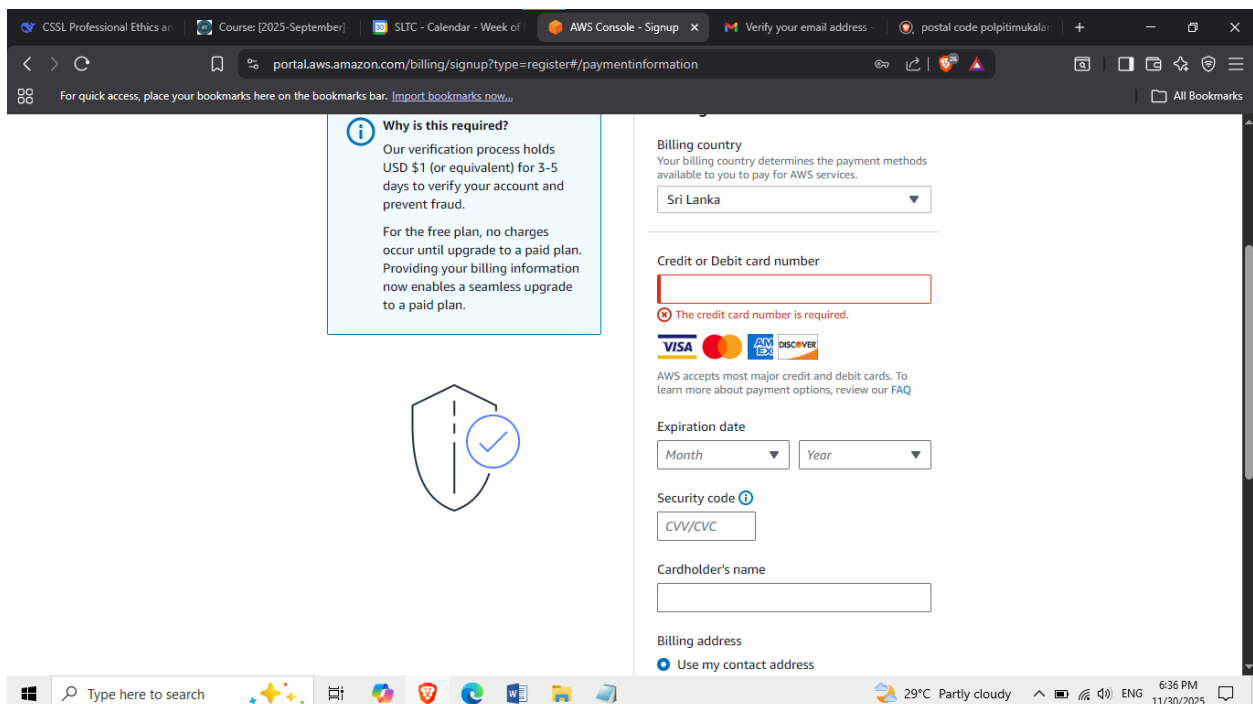
Country or Region

United States

Address line 1

Address line 2

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



The screenshot shows the 'Billing Information' page in the AWS console. The browser's address bar displays 'portalaws.amazon.com/billing/signup?type=register#/paymentinformation'. On the left, a blue information box titled 'Why is this required?' explains that the verification process holds USD \$1 for 3-5 days and that providing billing information enables a seamless upgrade to a paid plan. Below this box is an illustration of a shield with a checkmark. The main form area is titled 'Billing country' and includes a dropdown menu set to 'Sri Lanka'. Below this is a 'Credit or Debit card number' field, which is currently empty and has a red error message: 'The credit card number is required.' Below the card number field are logos for VISA, Mastercard, and Discover. A note states 'AWS accepts most major credit and debit cards. To learn more about payment options, review our FAQ'. The form also includes fields for 'Expiration date' (Month and Year), 'Security code' (CVV/CVC), 'Cardholder's name', and 'Billing address'. The 'Billing address' section has a radio button option 'Use my contact address' which is selected. The Windows taskbar at the bottom shows the search bar, task view button, and application icons. The system tray on the right indicates the weather as 29°C Partly cloudy, the time as 6:36 PM, and the date as 11/30/2025.

**Why is this required?**

Our verification process holds USD \$1 (or equivalent) for 3-5 days to verify your account and prevent fraud.

For the free plan, no charges occur until upgrade to a paid plan. Providing your billing information now enables a seamless upgrade to a paid plan.

**Billing country**

Your billing country determines the payment methods available to you to pay for AWS services.

Sri Lanka

**Credit or Debit card number**

The credit card number is required.

VISA Mastercard DISCOVER

AWS accepts most major credit and debit cards. To learn more about payment options, review our [FAQ](#)

**Expiration date**

Month Year

**Security code**

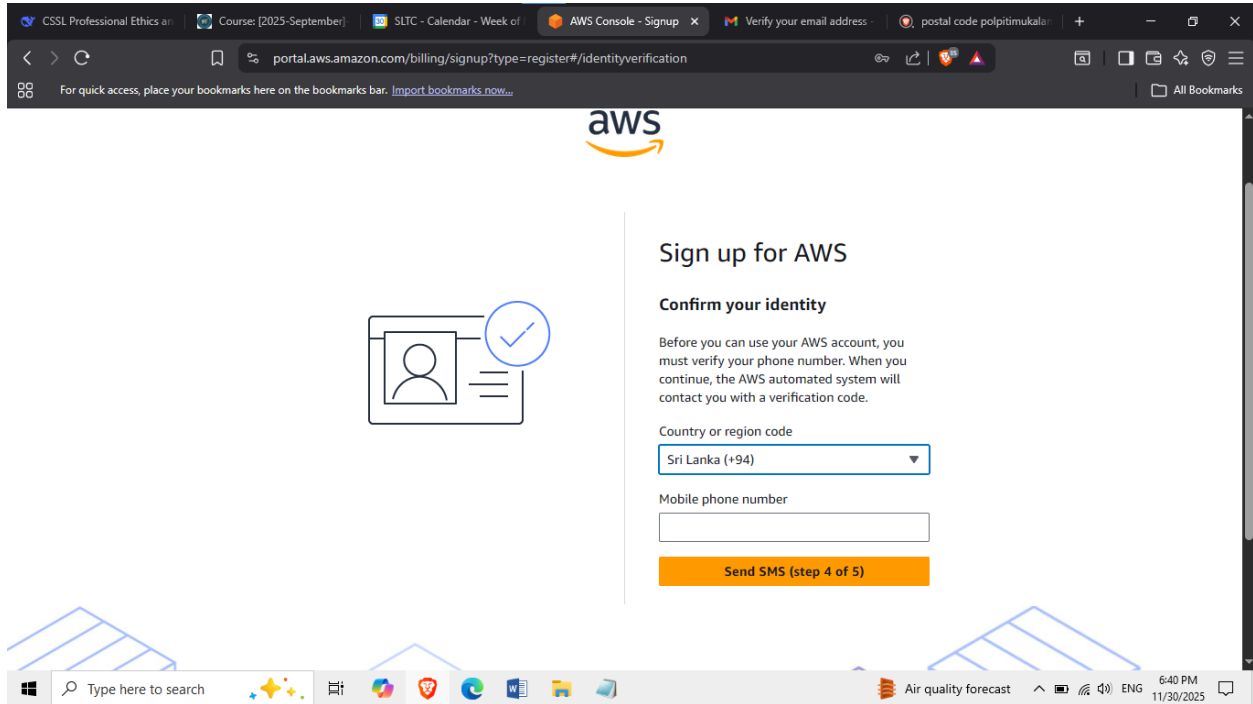
CVV/CVC

**Cardholder's name**

**Billing address**

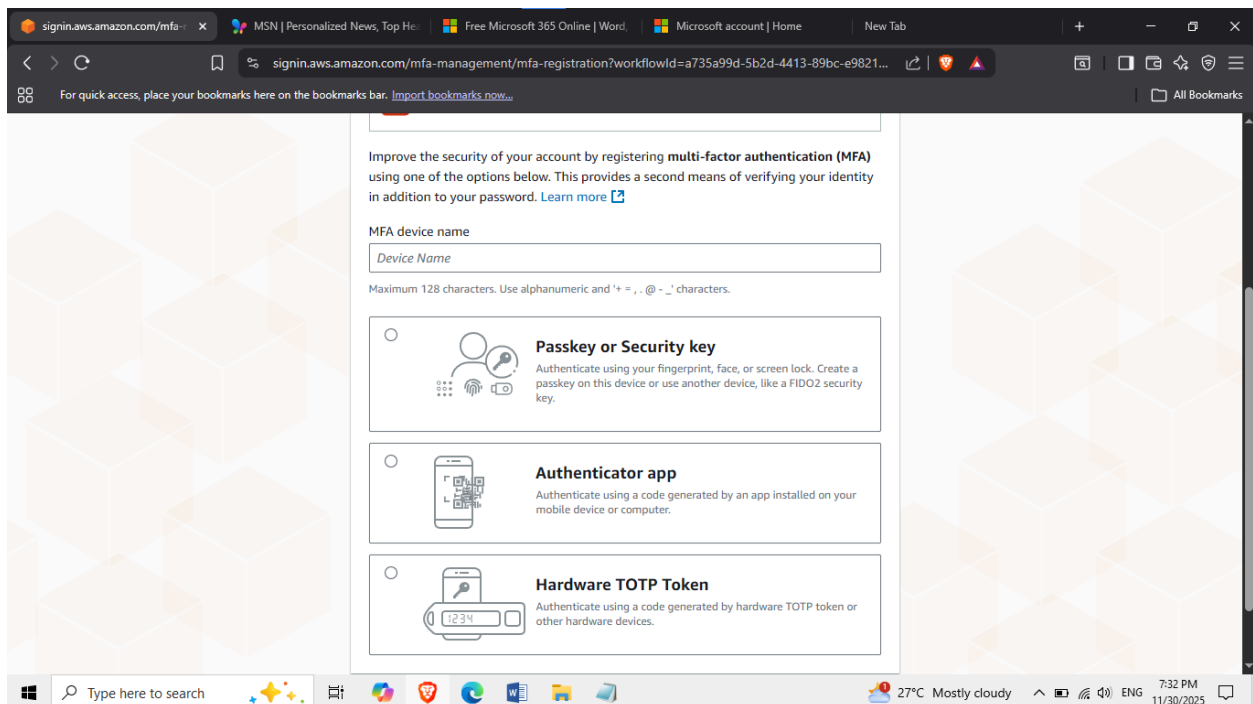
☒ Use my contact address

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



The screenshot shows the AWS sign-up page for identity verification. The browser address bar displays `portalaws.amazon.com/billing/signup?type=register#/identityverification`. The page features the AWS logo and a heading "Sign up for AWS". Below this is a section titled "Confirm your identity" with a sub-heading "Confirm your identity". A text block states: "Before you can use your AWS account, you must verify your phone number. When you continue, the AWS automated system will contact you with a verification code." The form includes a "Country or region code" dropdown menu set to "Sri Lanka (+94)", a "Mobile phone number" input field, and a "Send SMS (step 4 of 5)" button. An illustration of a person's profile with a checkmark is shown on the left.

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



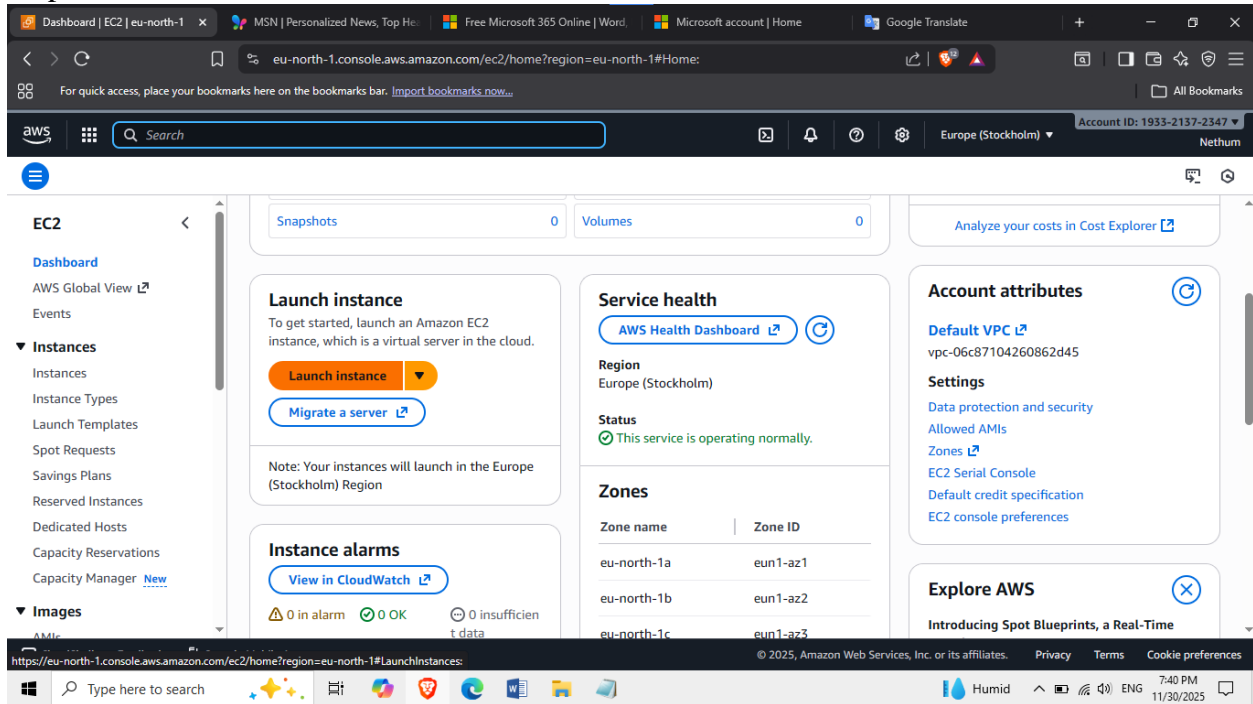
The screenshot shows the AWS MFA registration page. The browser address bar displays `signin.aws.amazon.com/mfa-management/mfa-registration?workflowId=a735a99d-5b2d-4413-89bc-e9821...`. The page has a heading "Improve the security of your account by registering multi-factor authentication (MFA) using one of the options below. This provides a second means of verifying your identity in addition to your password. [Learn more](#)". Below this is a form for "MFA device name" with a "Device Name" input field and a note: "Maximum 128 characters. Use alphanumeric and '+', '.', '@', '-' characters." There are three radio button options for MFA methods: "Passkey or Security key" (with a note: "Authenticate using your fingerprint, face, or screen lock. Create a passkey on this device or use another device, like a FIDO2 security key."), "Authenticator app" (with a note: "Authenticate using a code generated by an app installed on your mobile device or computer."), and "Hardware TOTP Token" (with a note: "Authenticate using a code generated by hardware TOTP token or other hardware devices.").

## Launch EC2 Instance

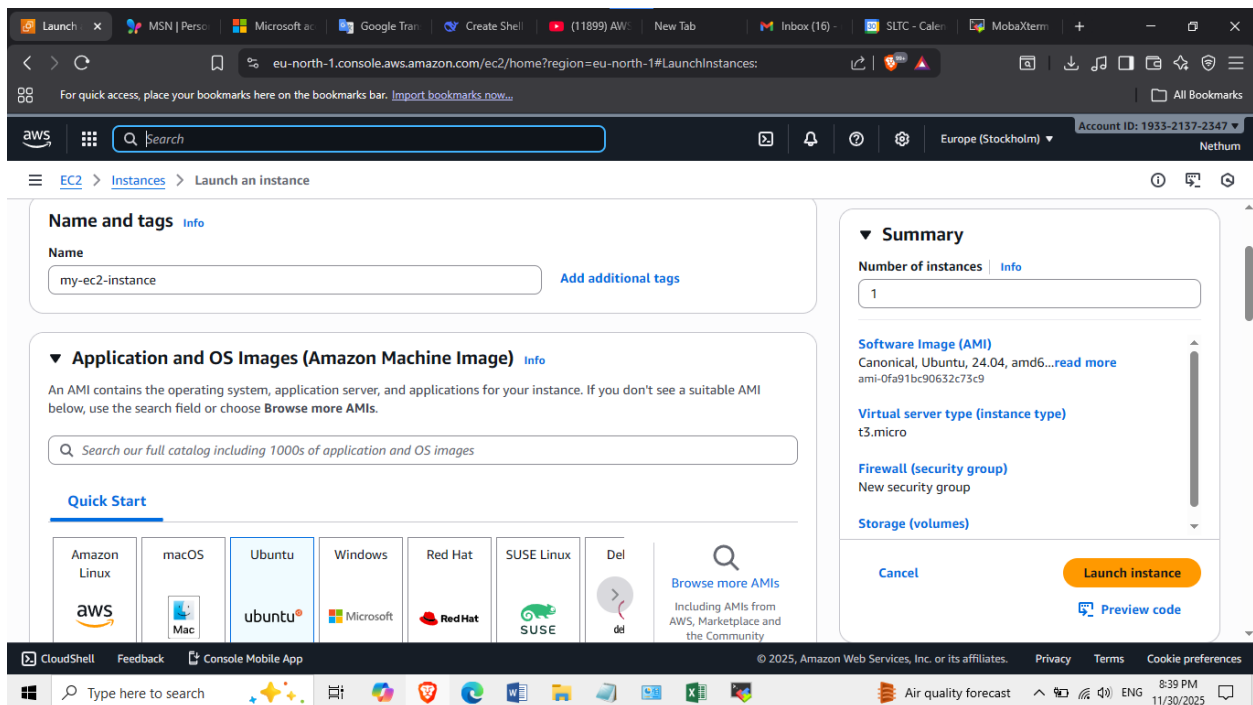
Amazon EC2 (Elastic Compute Cloud) is a web service from Amazon Web Services (AWS) that provides secure, resizable compute capacity in the cloud.

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

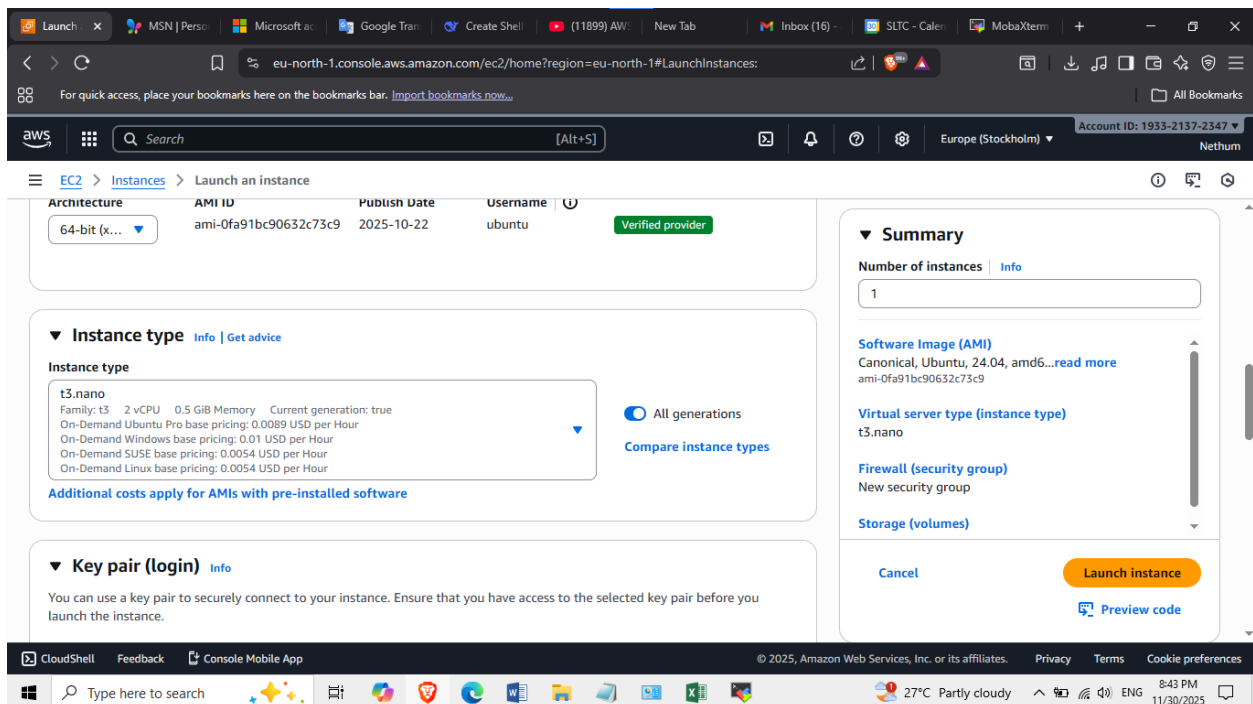
Step 1 – Search Ec2 Instance in search bar and launch Instance.



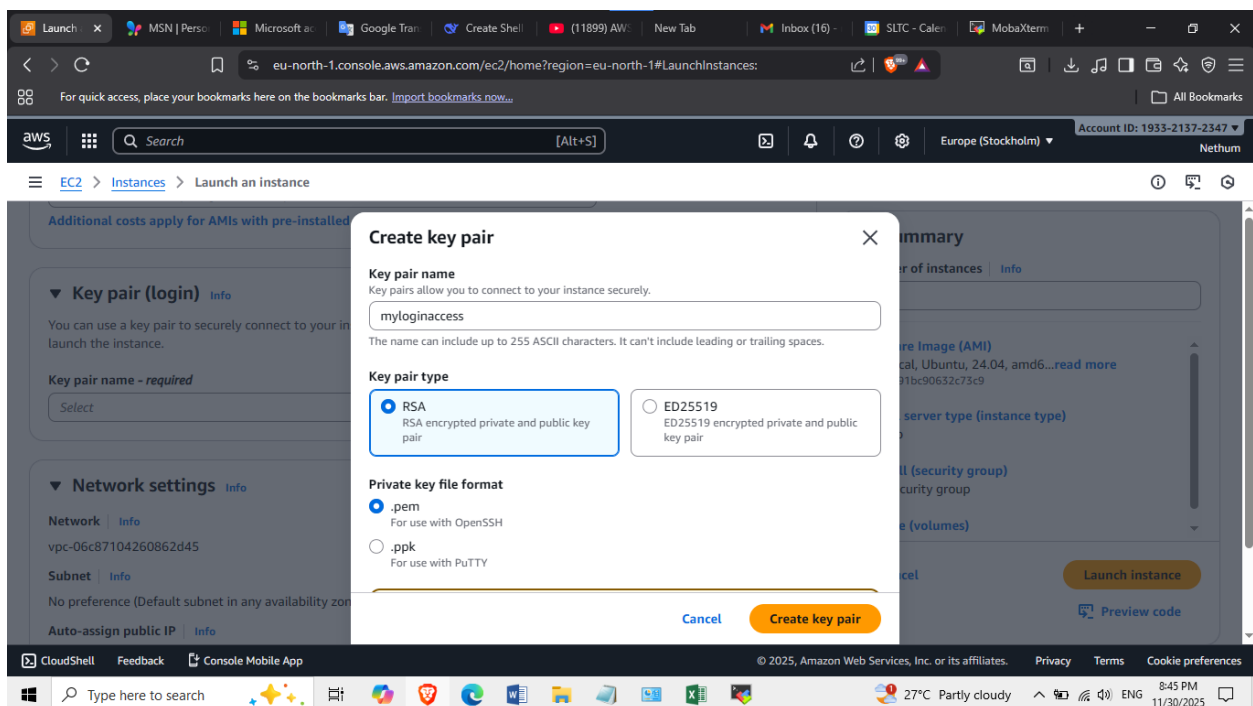
Step 2 – Assign a name to the EC2 instance and select its operating system (e.g., Ubuntu).



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

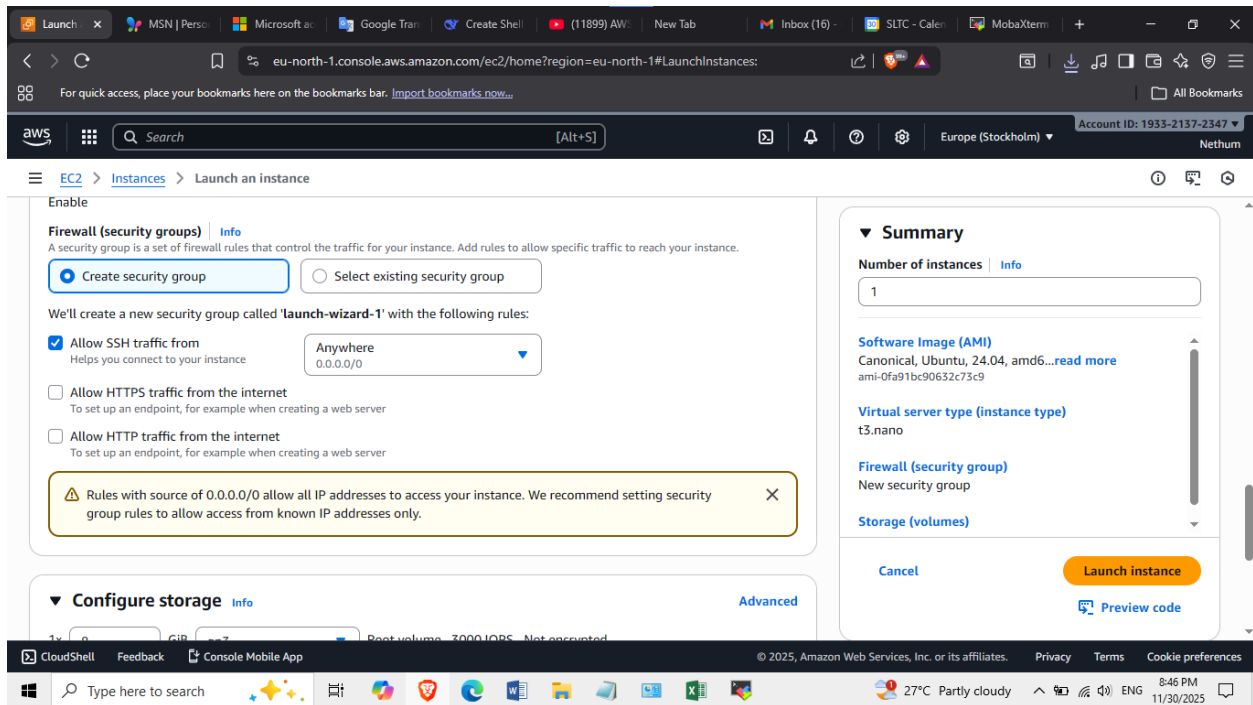


Step 4 - Generate a key pair to connect to the VM remotely. If you are using PuTTY, choose the .ppk

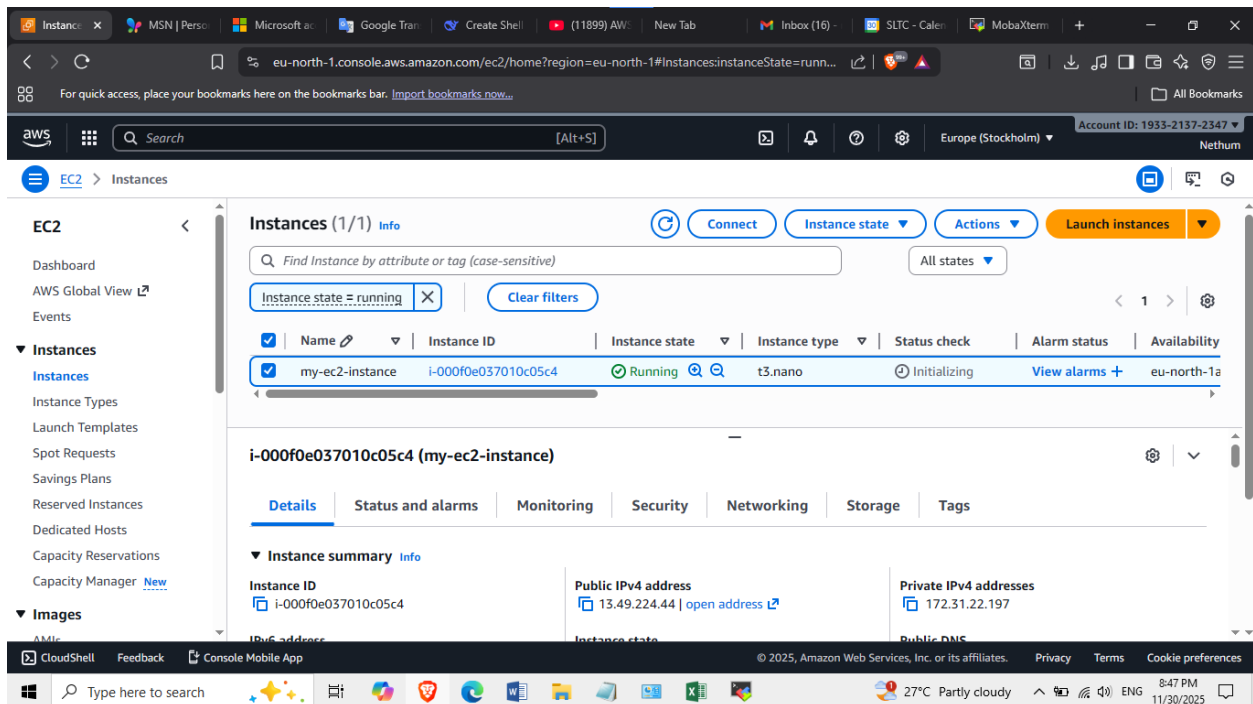




## Step 5 – Click Allow SSH traffic

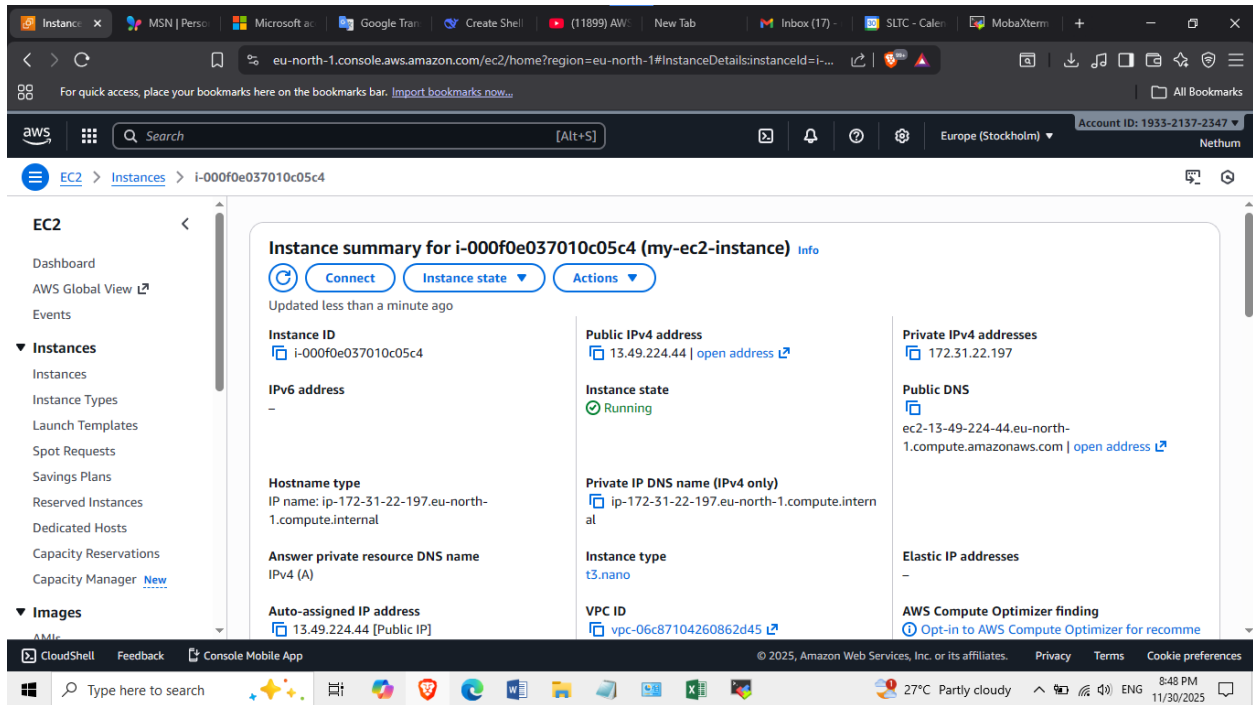


## Step 6 – After completed above stages, then launch the EC2 Instance.





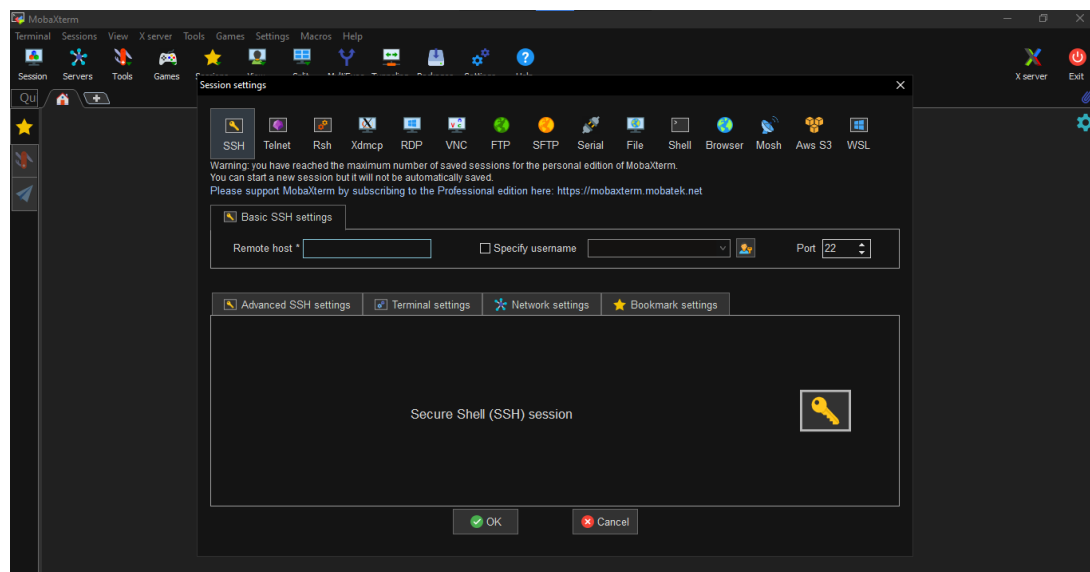
## Step 7 – EC2 Instance Details,



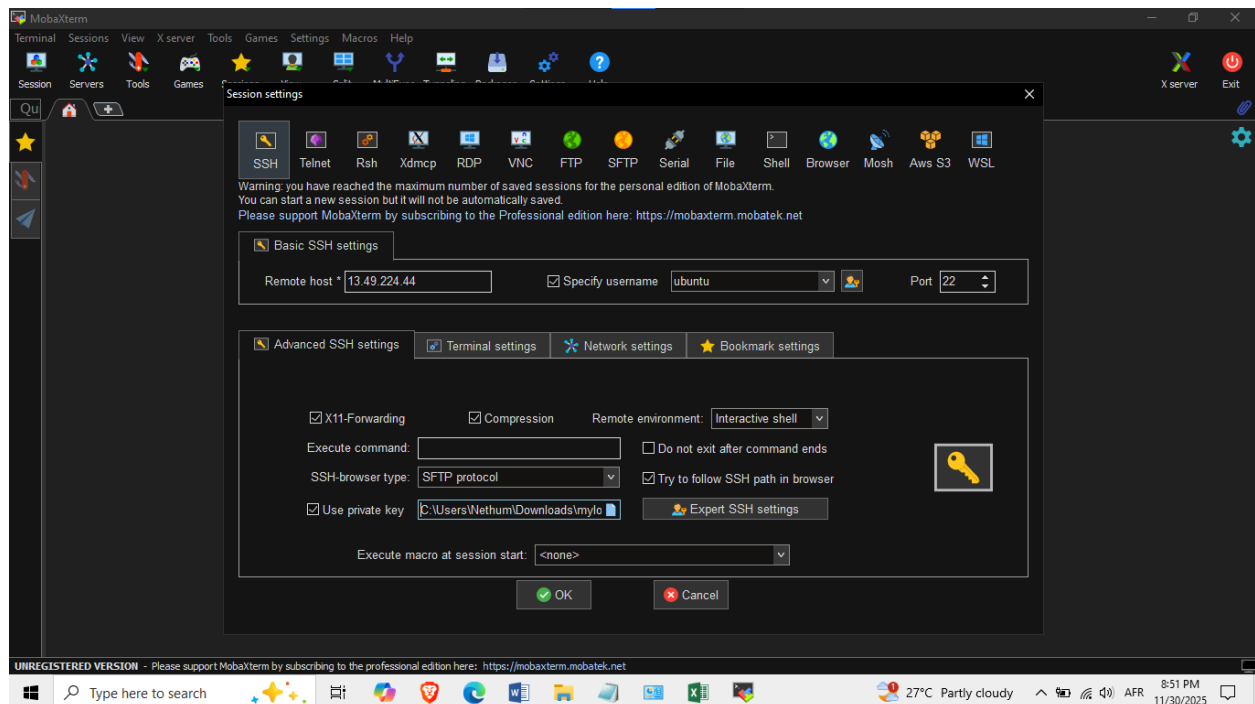
## Connect Remote Server (EC2 Instance) using SSH Key (Private Key)

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

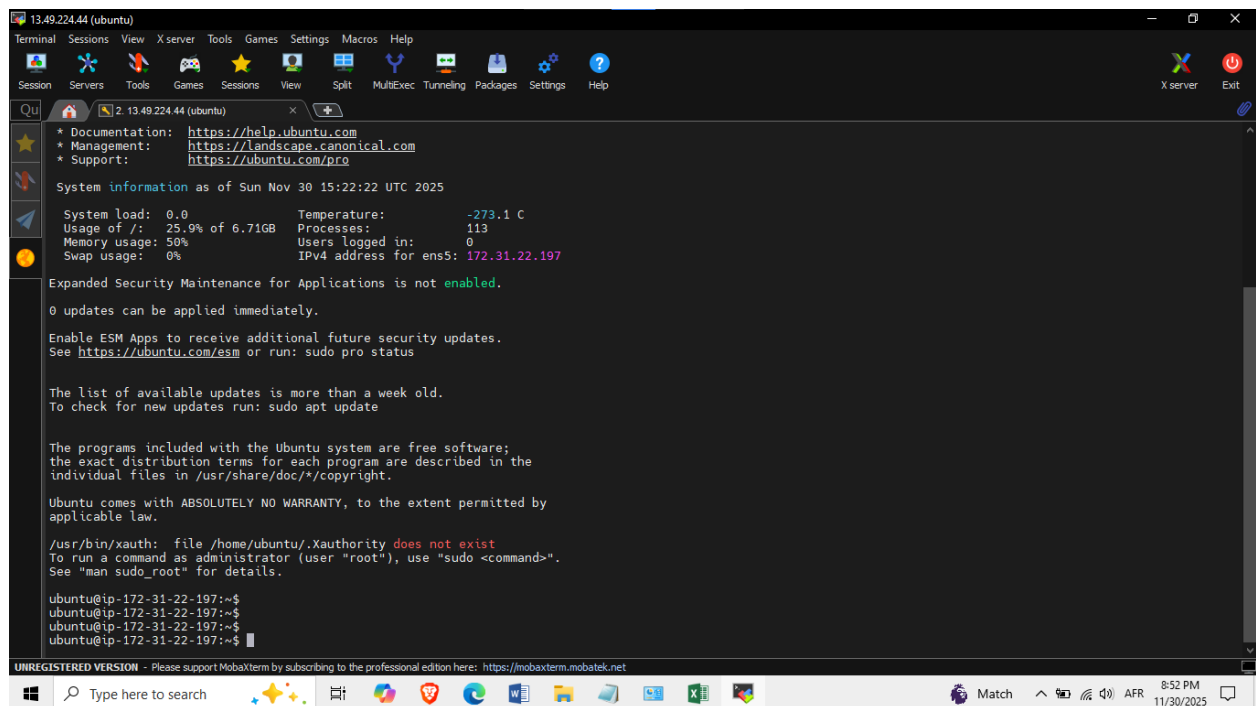
Step 1 – Downloaded and Open MobaXterm Software Then Open SSH – <https://mobaxterm.mobatek.net/download-home-edition.html>



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/`

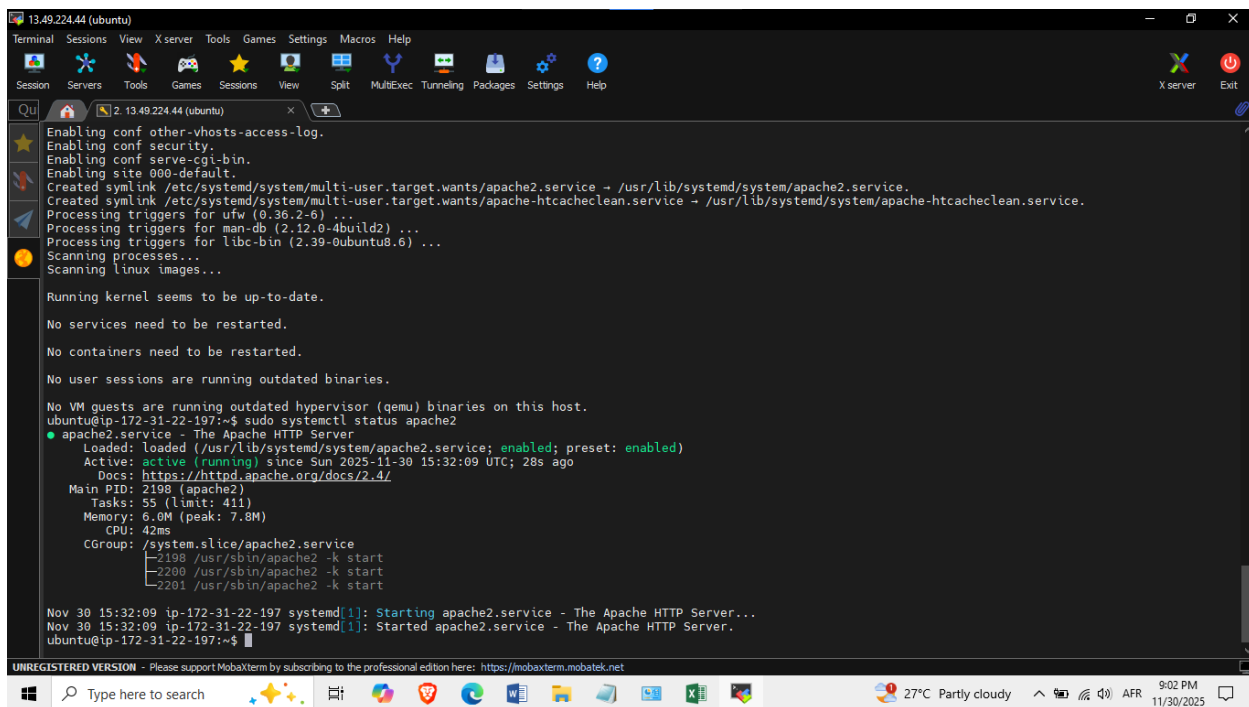
# Start Apache

`sudo systemctl start apache2`

`sudo systemctl enable apache2`

- Installed apache and check the status

`sudo systemctl status apache2`



```
13.49.224.44 (ubuntu)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
Qu 2. 13.49.224.44 (ubuntu) x
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /usr/lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /usr/lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36-2.6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.6) ...
Scanning processes...
Scanning linux images...

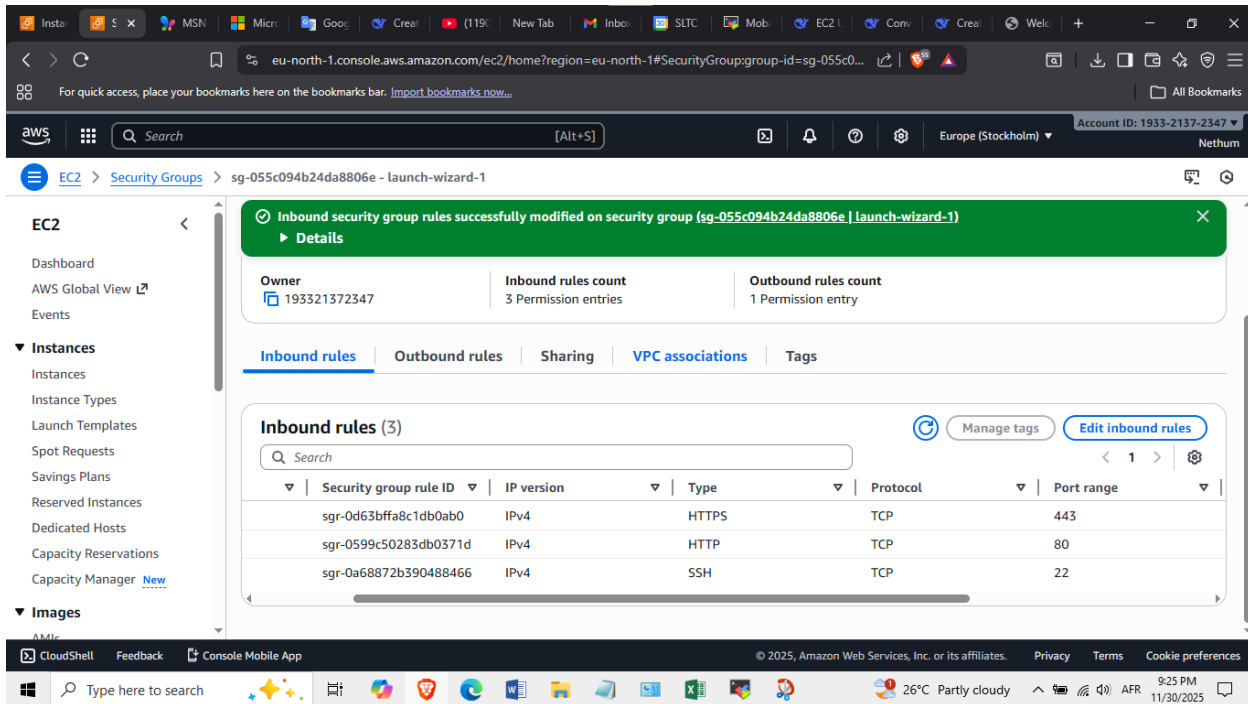
Running kernel seems to be up-to-date.
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.
No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-22-197:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
   Active: active (running) since Sun 2025-11-30 15:32:09 UTC; 28s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 2198 (apache2)
    Tasks: 55 (limit: 411)
   Memory: 6.0M (peak: 7.8M)
      CPU: 42ms
   CGroup: /system.slice/apache2.service
           └─2198 /usr/sbin/apache2 -k start
             └─2200 /usr/sbin/apache2 -k start
               └─2201 /usr/sbin/apache2 -k start

Nov 30 15:32:09 ip-172-31-22-197 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Nov 30 15:32:09 ip-172-31-22-197 systemd[1]: Started apache2.service - The Apache HTTP Server.
ubuntu@ip-172-31-22-197:~$
```

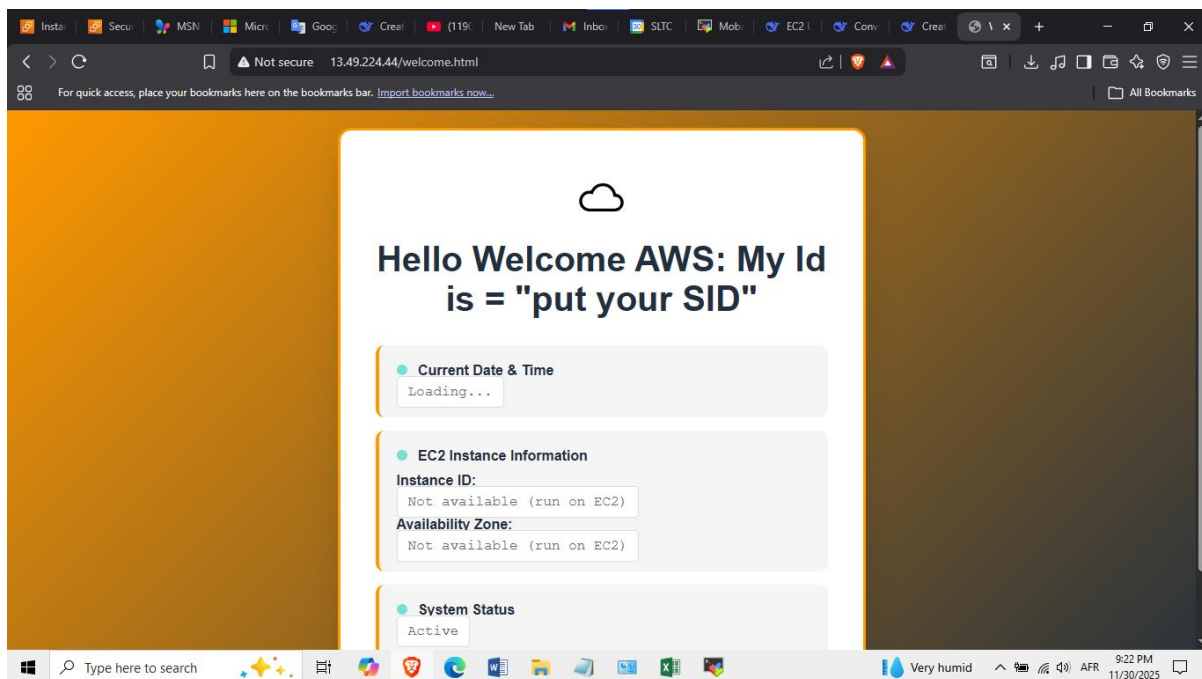
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>

Type here to search 27°C Partly cloudy 9:02 PM 11/30/2025

- 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.

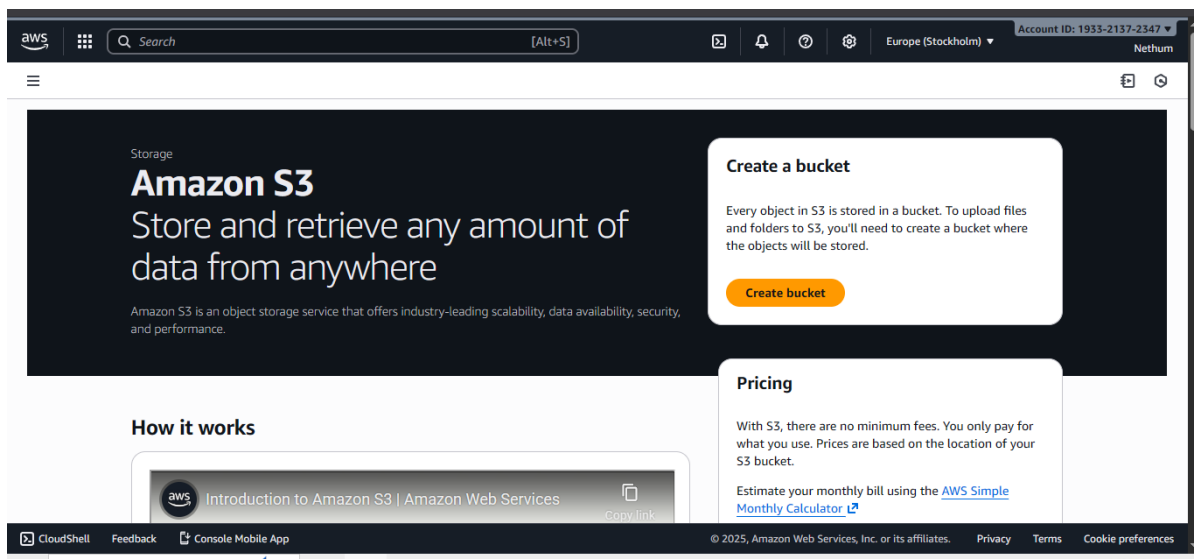
Azure also provides a similarly diverse set of storage services. serves as the primary object storage solution, suitable for storing large amounts of unstructured data such as documents, media files, and application installers.

## Setting up AWS Environment

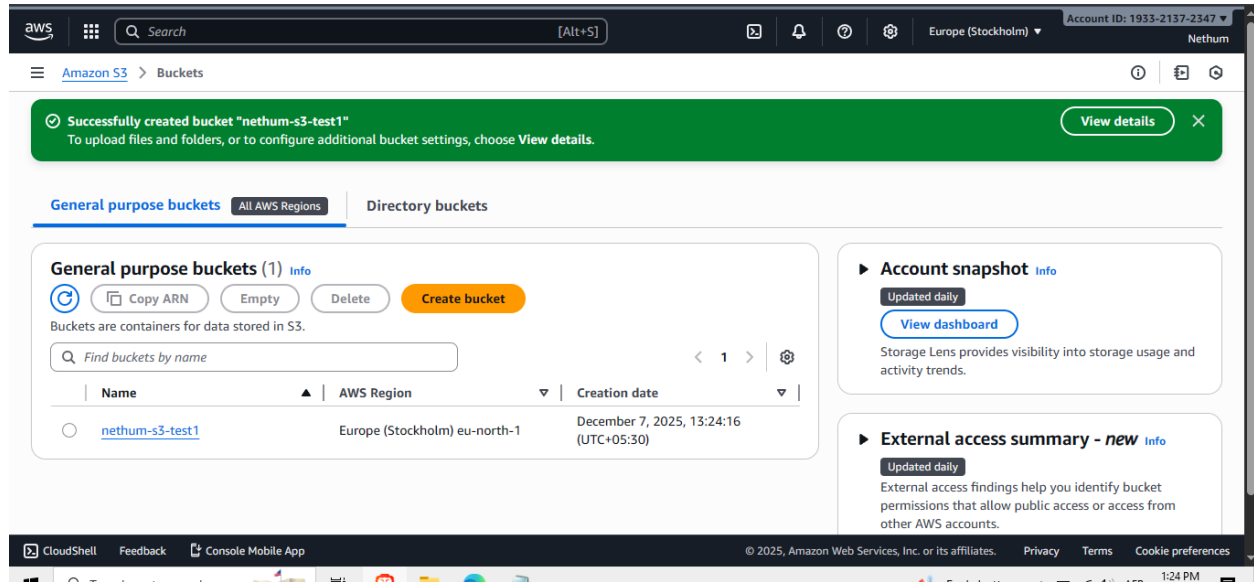


## Step by step create a S3 bucket

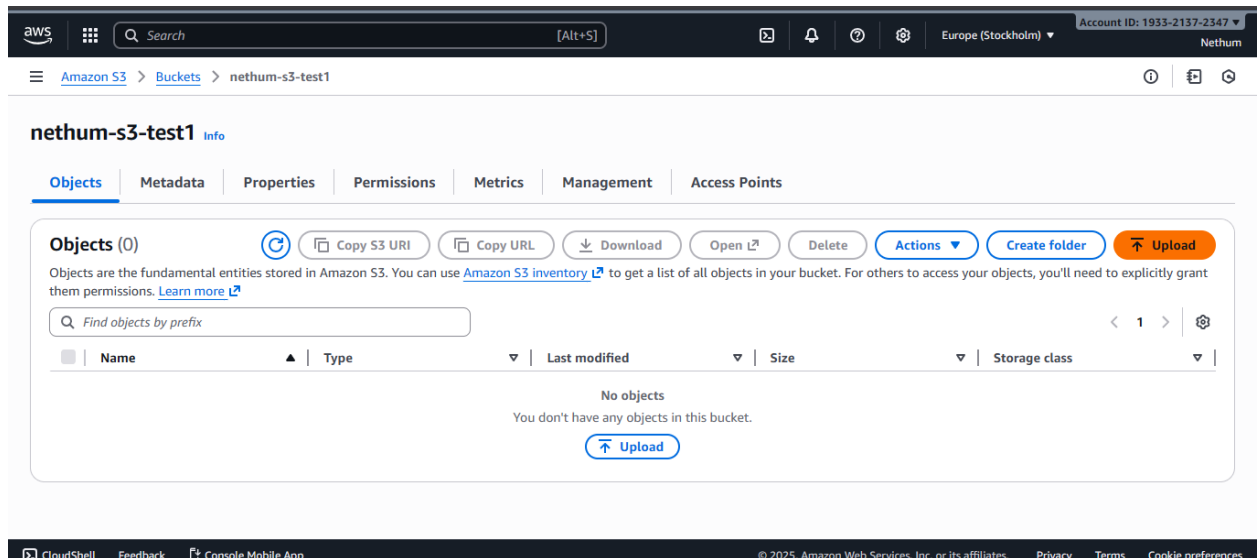
- ❖ Log into the AWS Console, navigate to the S3 service, and click "Create bucket."
  - AWS Account Login - <https://aws.amazon.com/console/>



- ❖ 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;
    }
  </style>
</head>
<body>
  <div class="container">
    <h1>My S3 Website</h1>
    <p>This is a simple website created using S3 and CloudFront.</p>
    <button>Click Me</button>
  </div>
</body>
</html>
```

```

        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');
    }
});

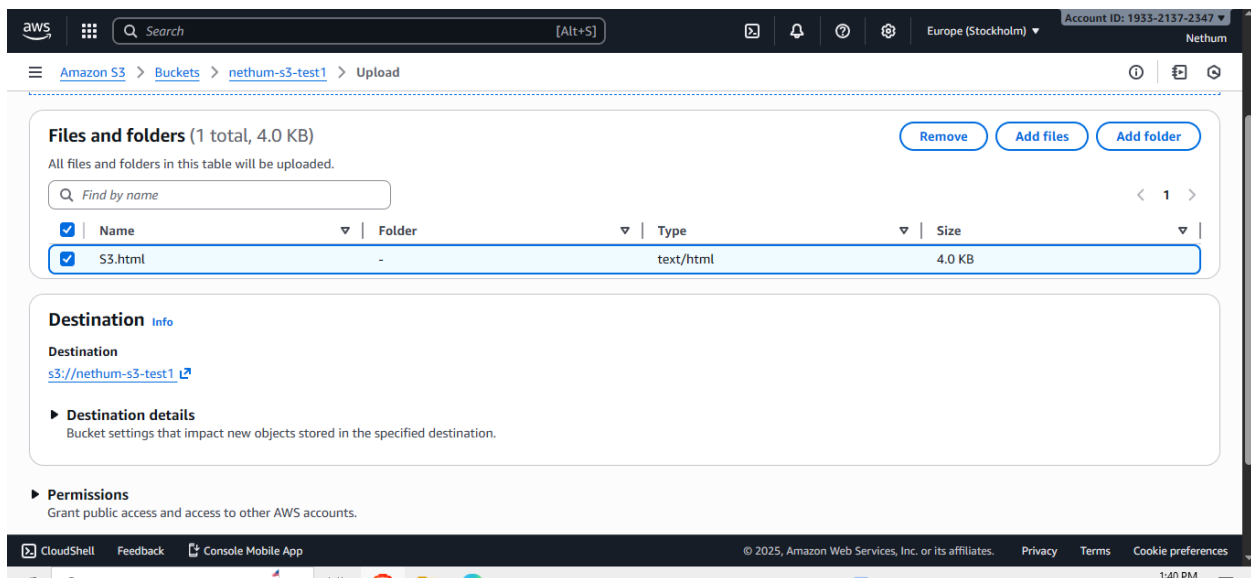
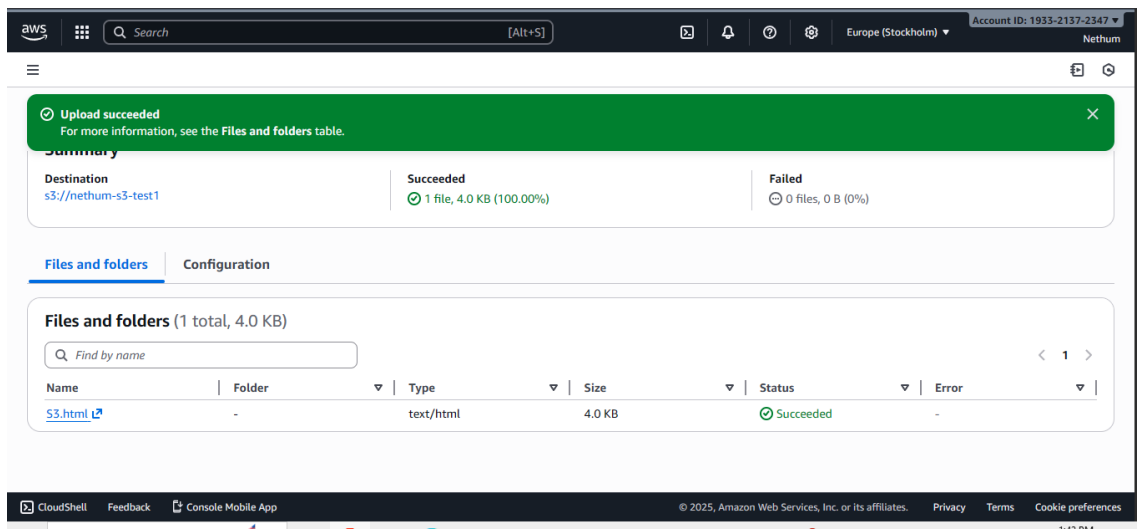
// Change background color on mouse move
document.addEventListener('mousemove', function(e) {
    const x = e.clientX / window.innerWidth;
    const y = e.clientY / window.innerHeight;

    // 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>

```



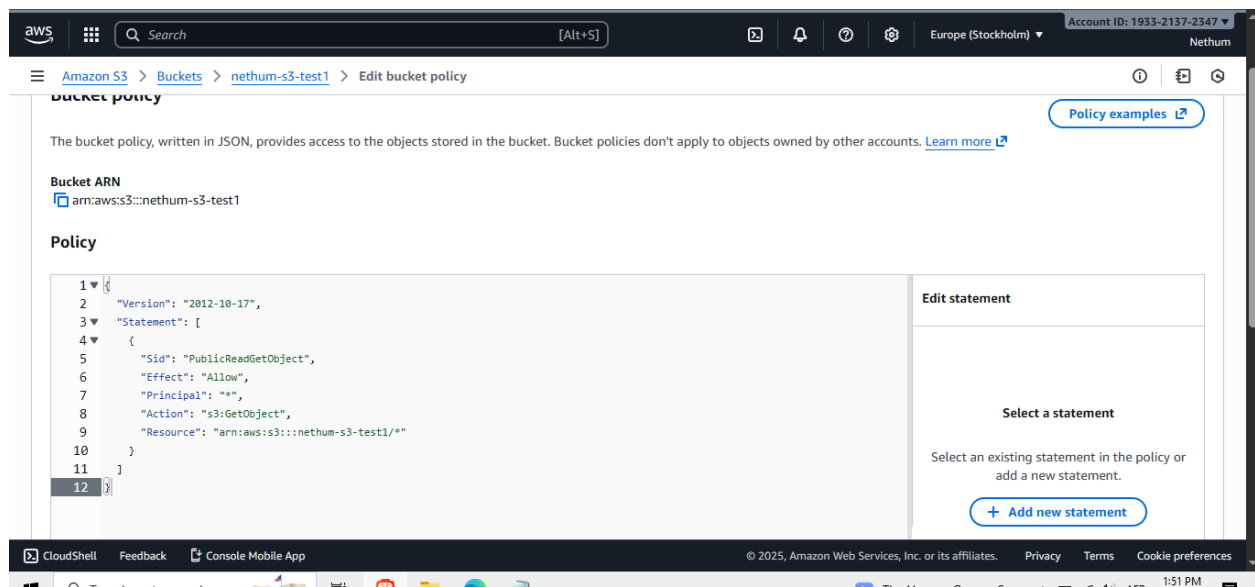
- ❖ If unable to code run in S3 bucket, To set the bucket policy to public, go to the Permissions tab, find the Bucket policy section, click Edit, and add the following policy (ensuring you replace BUCKET\_NAME).

➤ 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.

