📓 AWS EC2 Web Server Deployment Practical Report

Name : Rituraj Singh

Qid : 24030835

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1. Aim

To deploy a basic web server using Amazon EC2, connect to it securely using SSH via Windows PowerShell, install Apache Web Server, and host a static webpage displaying student details.

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2. Objective

- To understand AWS EC2 service and cloud infrastructure deployment
- To configure Security Groups (Firewall Rules)
- To connect to EC2 using SSH
- To install and manage Apache Web Server
- To deploy and access a website using Public IP
- To troubleshoot cloud environment connection issues

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3. Tools & Technologies Used

- Amazon Web Services (AWS)
- EC2 (Elastic Compute Cloud)
- Amazon Linux 2023 AMI
- Apache HTTP Server (httpd)
- Windows PowerShell
- SSH (Secure Shell Protocol)
- Web Browser (Chrome/Edge)

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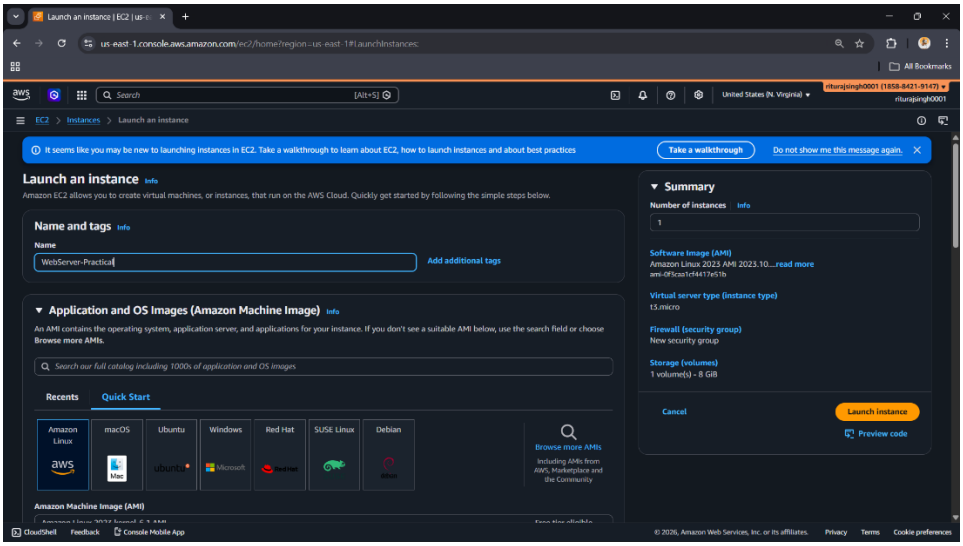
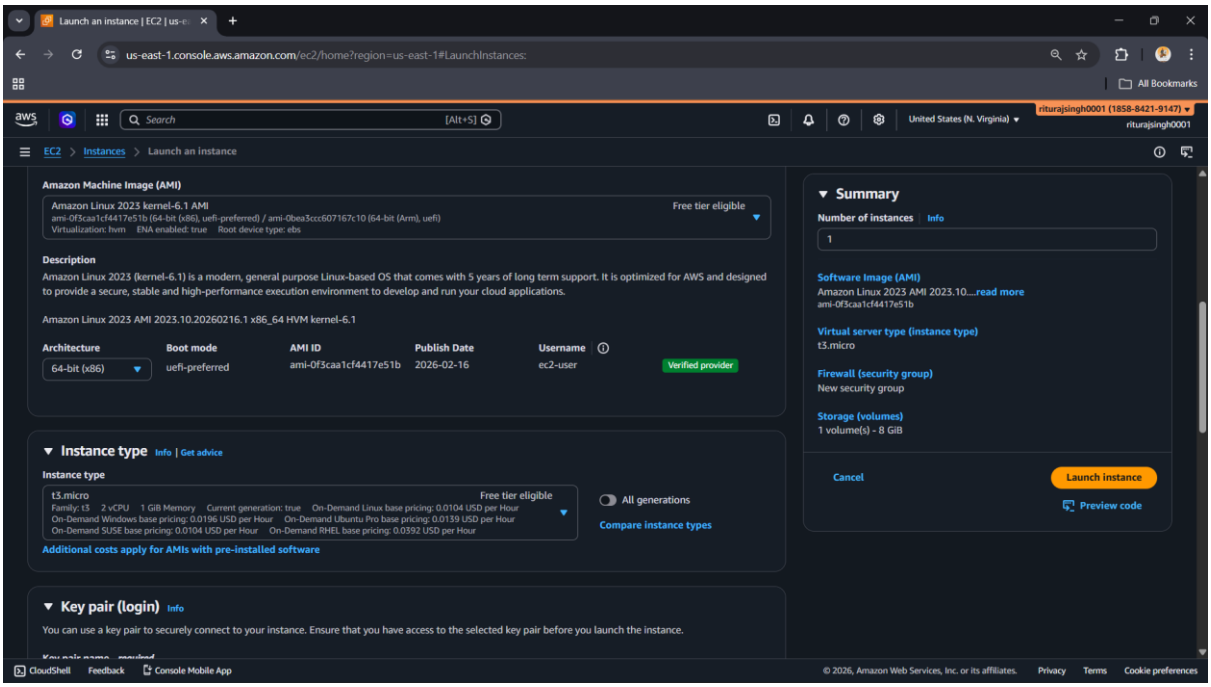
4. Procedure

Step 1: Launch EC2 Instance

1. Logged into AWS Management Console.
2. Navigated to EC2 Dashboard.
3. Clicked on **Launch Instance**.
4. Instance Name : WebServer-Practical



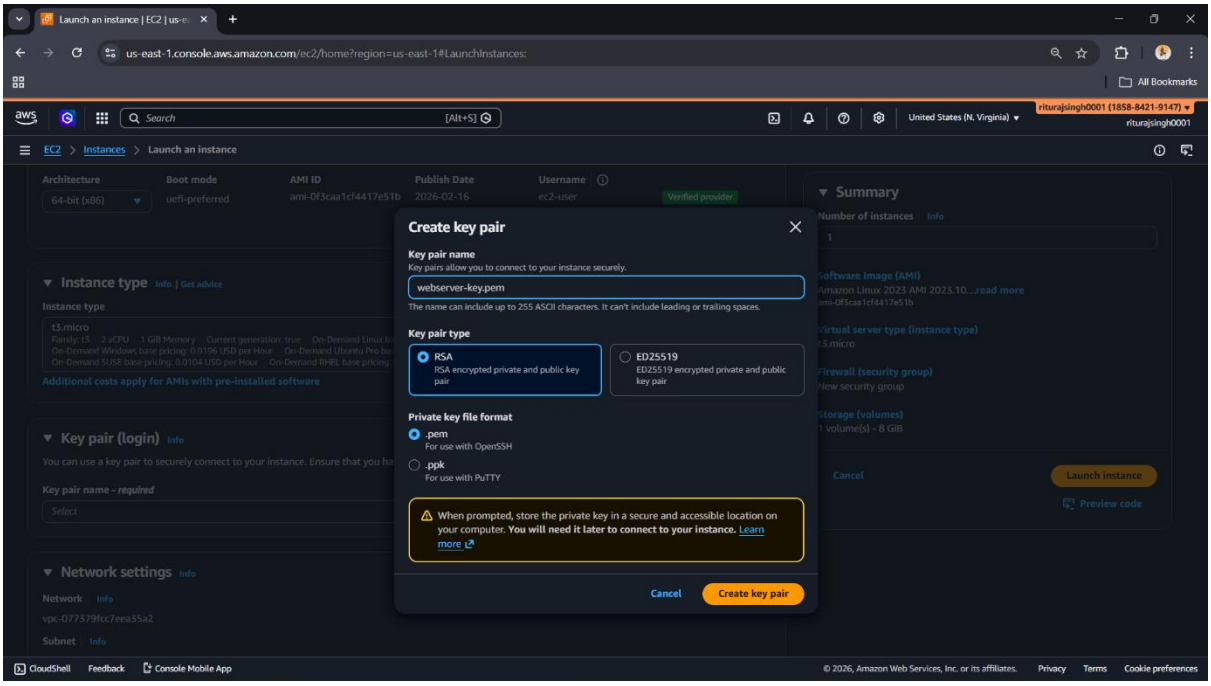
5. Selected:
    - AMI: Amazon Linux 2023
    - Instance Type: t3.micro



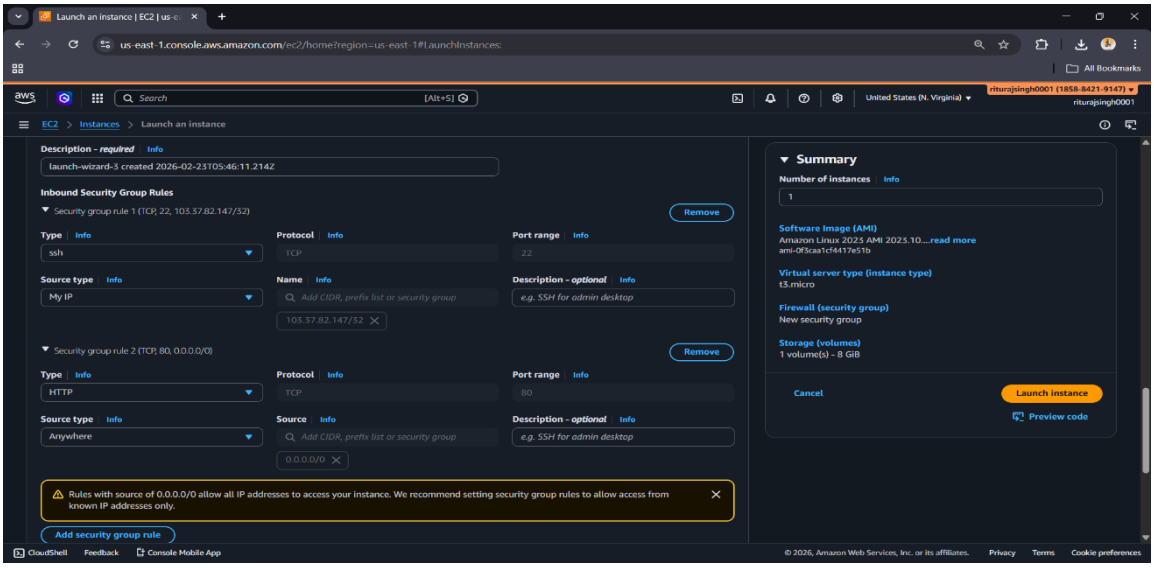
6. Created a new Key Pair (webserver-key.pem).

Under Key Pair:

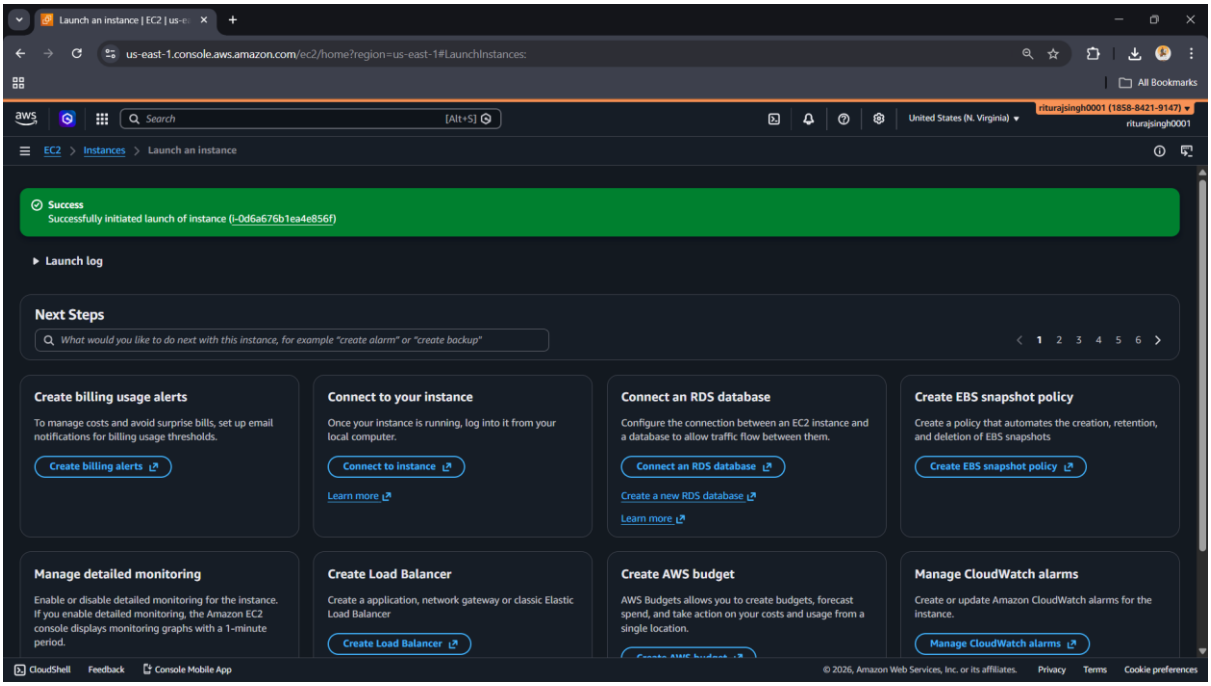
1. Click **Create new key pair**
2. Name: webserver-key
3. Key pair type: RSA
4. File format: .pem
5. Click **Create Key Pair**



7. Configured Security Group:
    - SSH (Port 22) – Source: My IP
    - HTTP (Port 80) – Source: Anywhere



8. Launched the instance and waited until status showed:
   Running (3/3 checks passed)

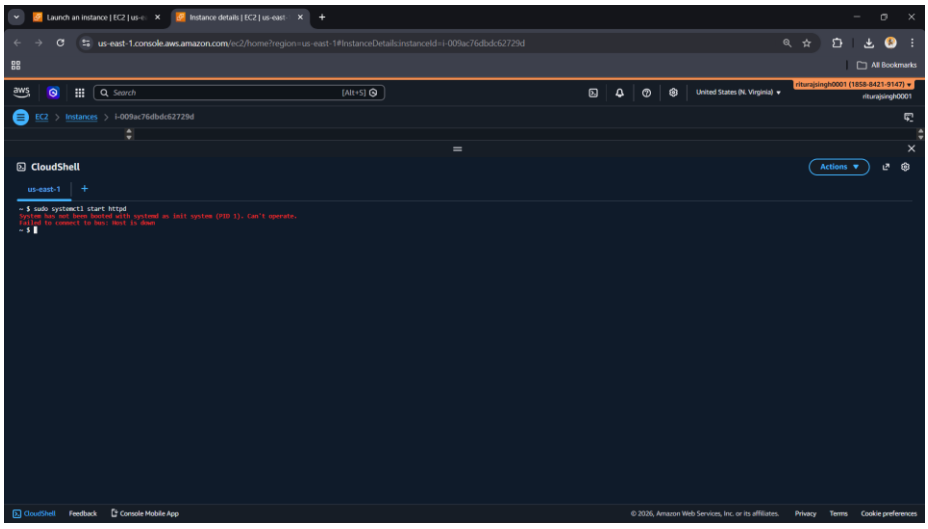


Step 2: Initial Attempt Using AWS CloudShell

Initially, Apache installation commands were executed inside **AWS CloudShell**.

When running:

sudo systemctl start httpd



The following error was encountered:

System has not been booted with systemd as init system (PID 1). Can't operate.

Failed to connect to bus: Host is down

Reason for Error:

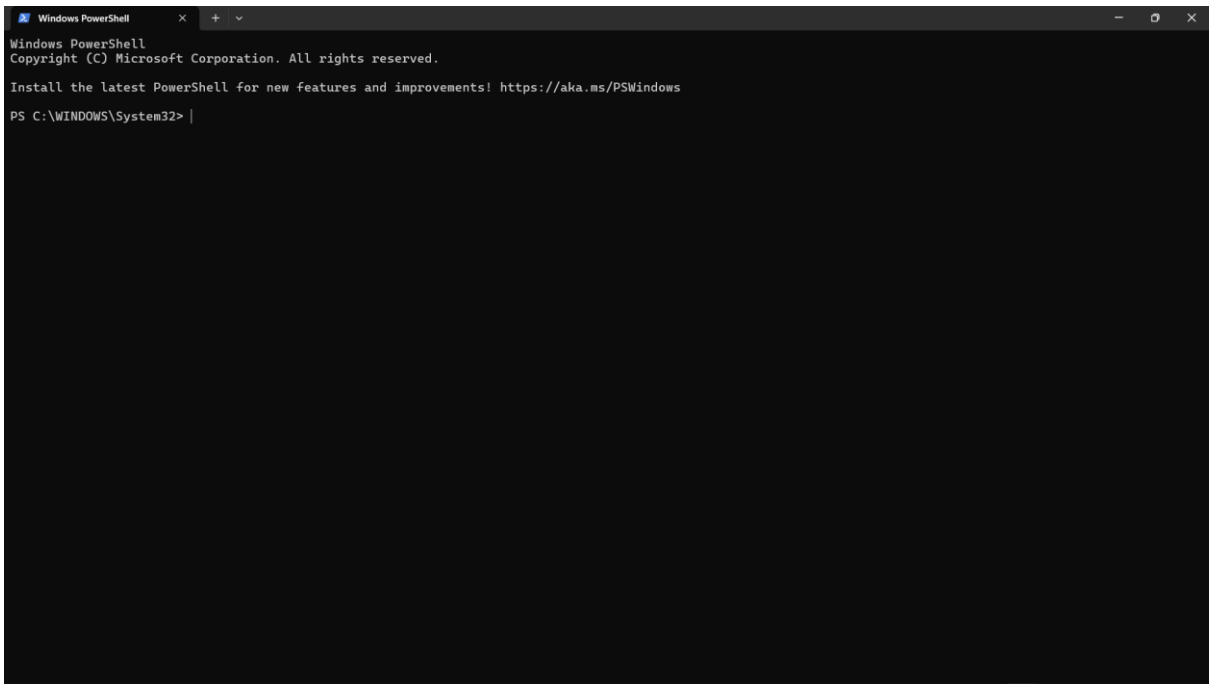
- AWS CloudShell is a managed shell environment.
- It does not operate as the EC2 instance operating system.
- It does not support system service control using systemctl.
- Apache service must be installed inside the actual EC2 instance.

This demonstrated that CloudShell is different from the EC2 server environment.

Step 3: Connecting to EC2 Using Windows PowerShell (Correct Method)

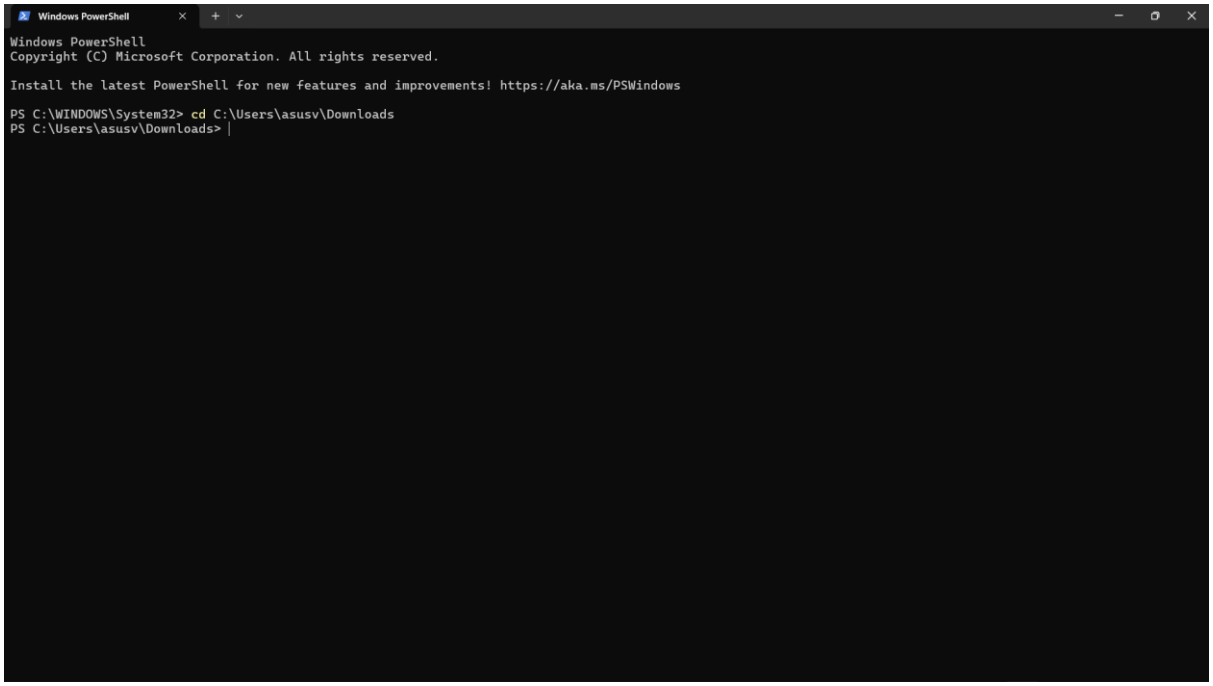
To resolve the issue, a direct SSH connection was established using Windows PowerShell.

1. Opened Windows PowerShell.

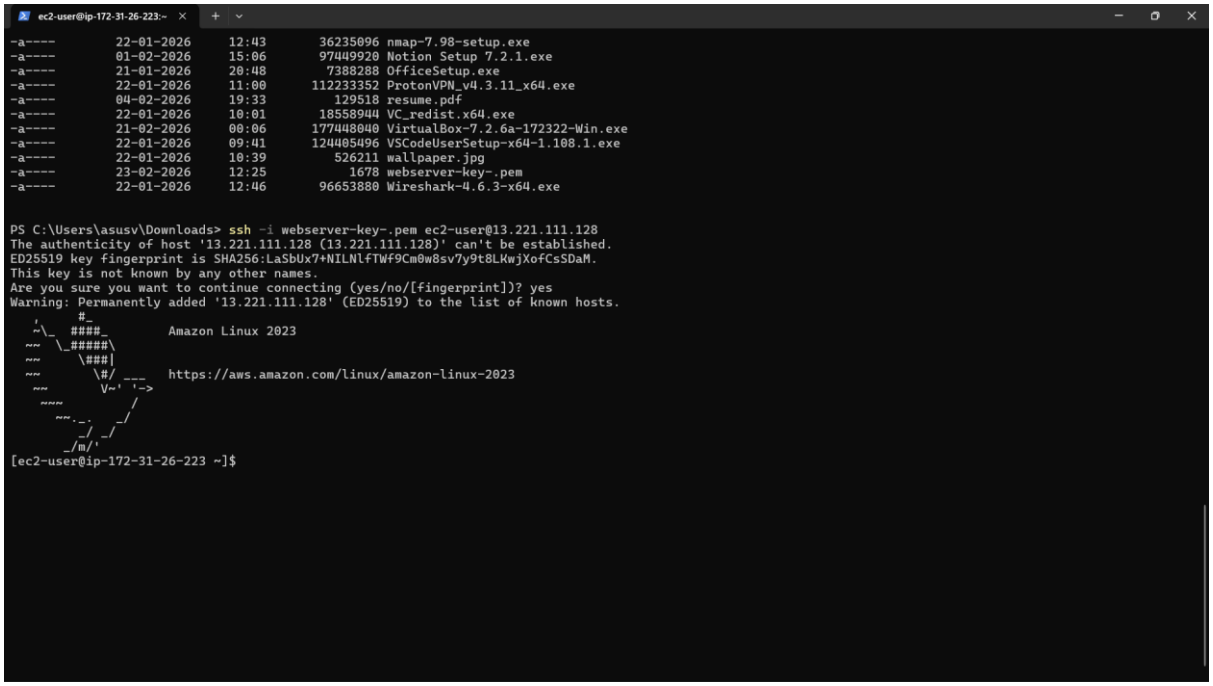


2. Navigated to the folder where the key file was downloaded:

   cd C:\Users\YourName\Downloads



3. Connected using SSH:
   ssh -i webserver-key.pem ec2-user@Public-IP



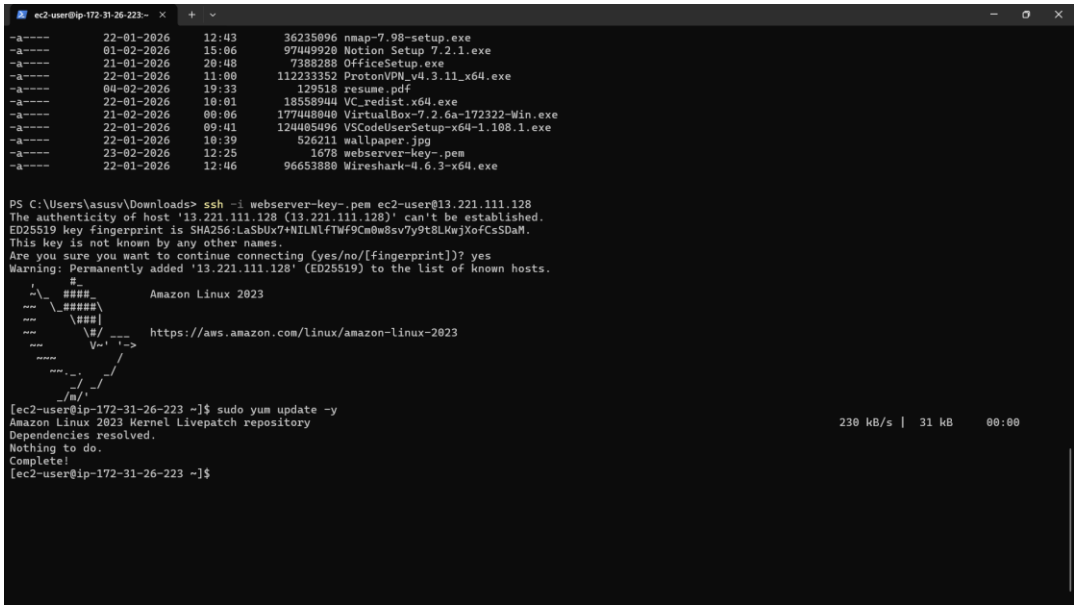
4. Accepted the fingerprint confirmation by typing:
   Yes

   Successfully connected to the EC2 instance (Amazon Linux terminal appeared).

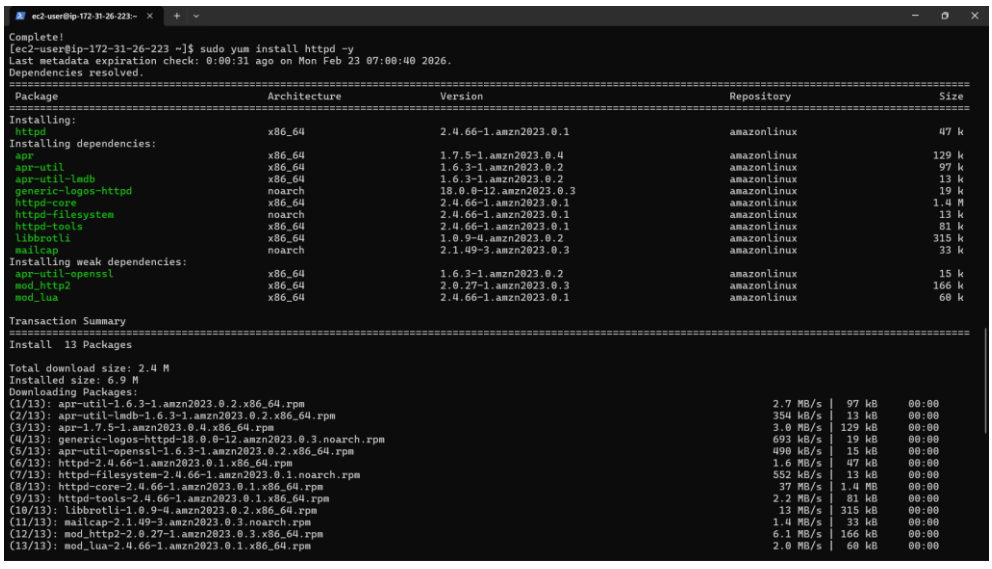
   Step 4: Install Apache Web Server

   Inside the EC2 terminal, the following commands were executed:

   sudo yum update -y

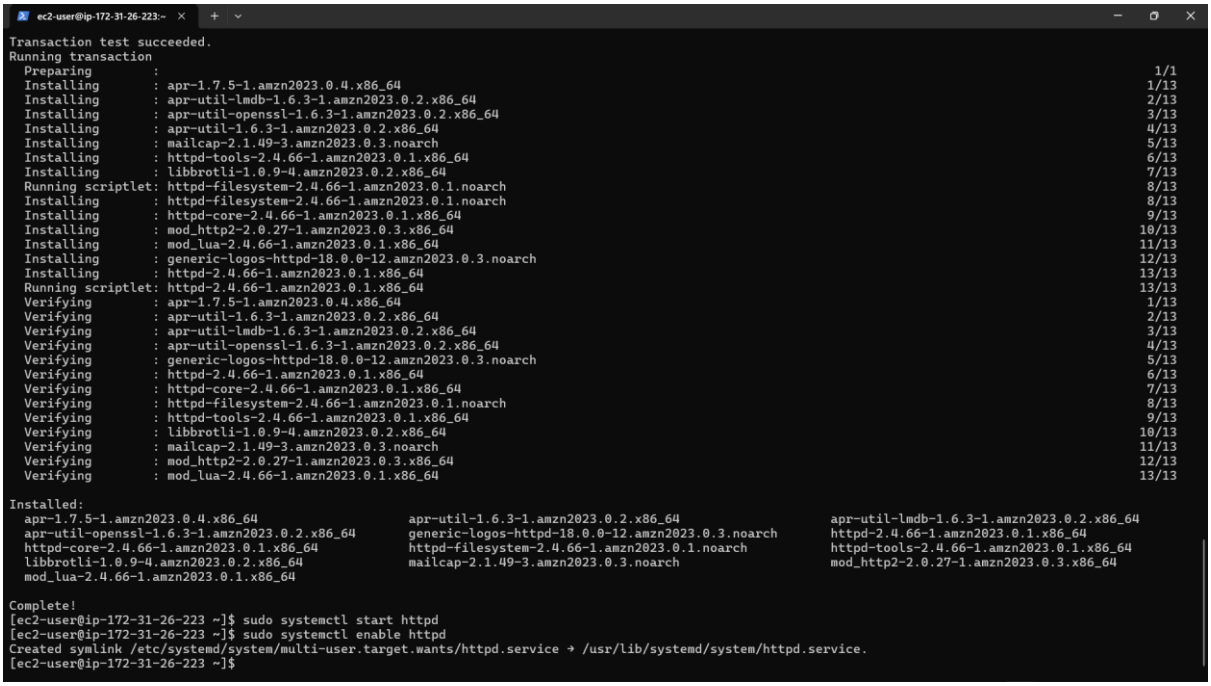


   sudo yum install httpd -y



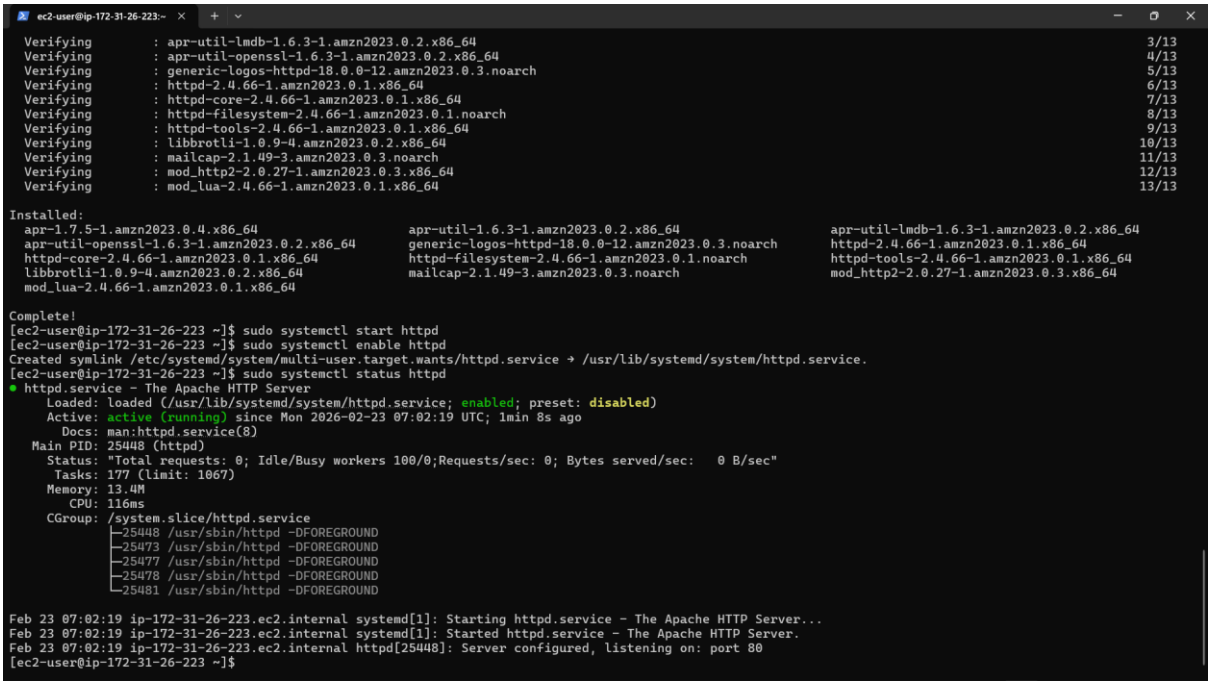
sudo systemctl start httpd

sudo systemctl enable httpd



Apache service status was verified using:

sudo systemctl status httpd



Service showed:
active (running)

Step 5: Create Webpage
Navigated to the web root directory:

cd /var/www/html

Created and edited index file:

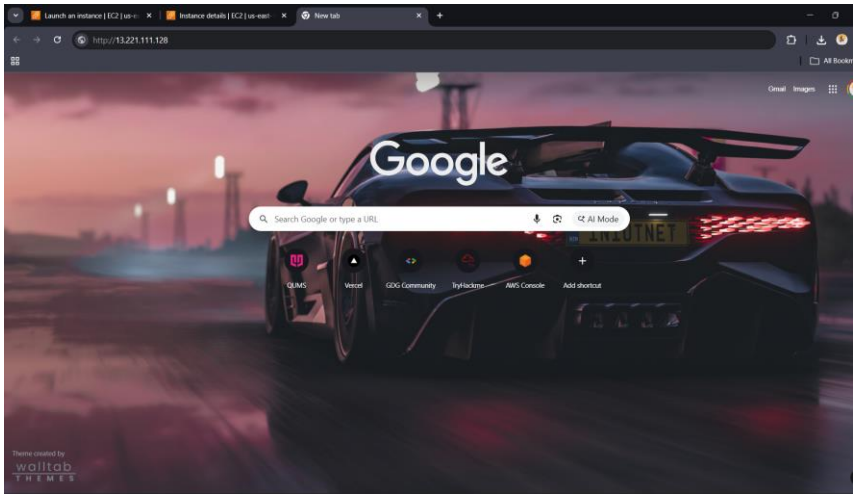
sudo nano index.html

Added HTML content including:

- Title: AWS EC2 Web Server Practical
- Student Name
- Student ID
  Saved and exited the file.

Step 6: Access Website

1. Copied Public IPv4 address from EC2 dashboard.
2. Opened web browser.
3. Entered:
   http://Public-IP



The webpage loaded successfully displaying the student details.

5. Security Configuration

- SSH access restricted to "My IP"
- HTTP (Port 80) allowed for public access
- Instance health checks: 3/3 passed

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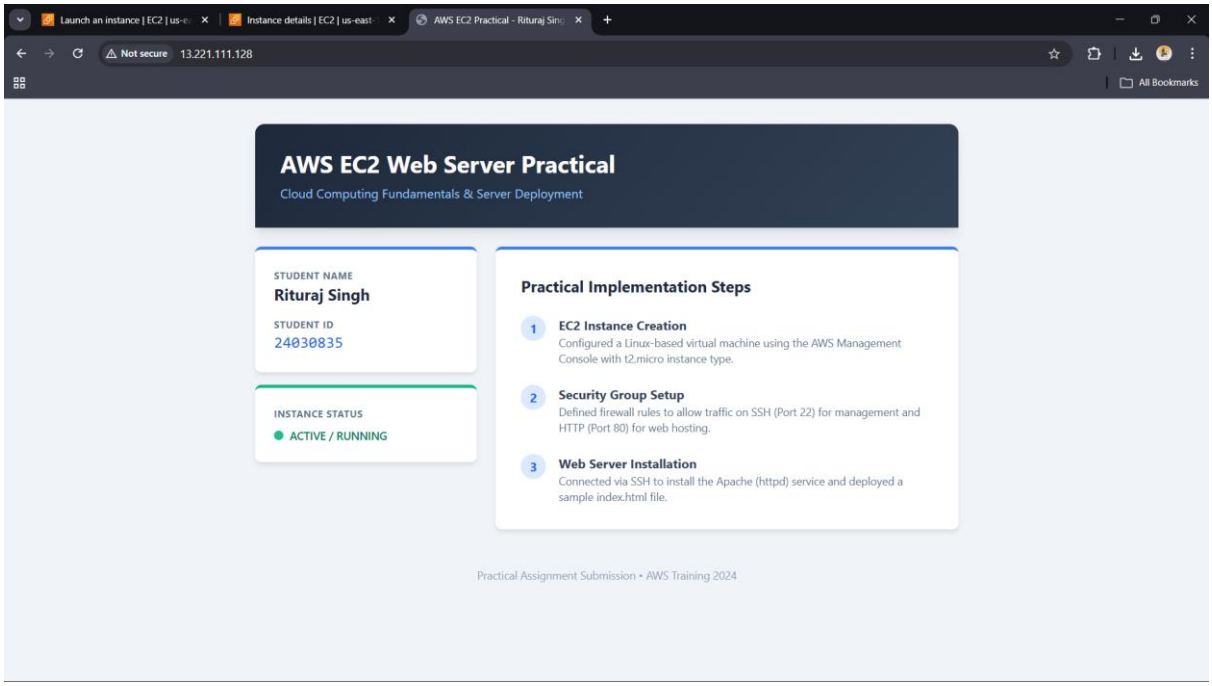
6. Output

The Apache Web Server was successfully deployed on Amazon EC2.
The website was accessible through the public IP address and displayed:

- AWS EC2 Web Server Practical
- Student Name
- Student ID



7. Troubleshooting & Learning

During the practical, an error was encountered while using AWS CloudShell for service management. The issue was analyzed and resolved by switching to a direct SSH connection via Windows PowerShell.

This demonstrated:

- Understanding of difference between CloudShell and EC2
- Troubleshooting ability
- Practical knowledge of system service management
- Real-time cloud server handling

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8. Conclusion

The practical was successfully completed. An EC2 instance was launched, Apache Web Server was installed and configured, and a static webpage was deployed and accessed via public IP.

The task enhanced understanding of cloud-based server deployment, Linux command-line operations, SSH connectivity, and troubleshooting in AWS environments.