

Kyndryl AWS Bootcamp Training – 2024 Batch - 2

Task Assignment 1: Monitoring and Logging using AWS
CloudWatch and SNS Notification

Presented by:

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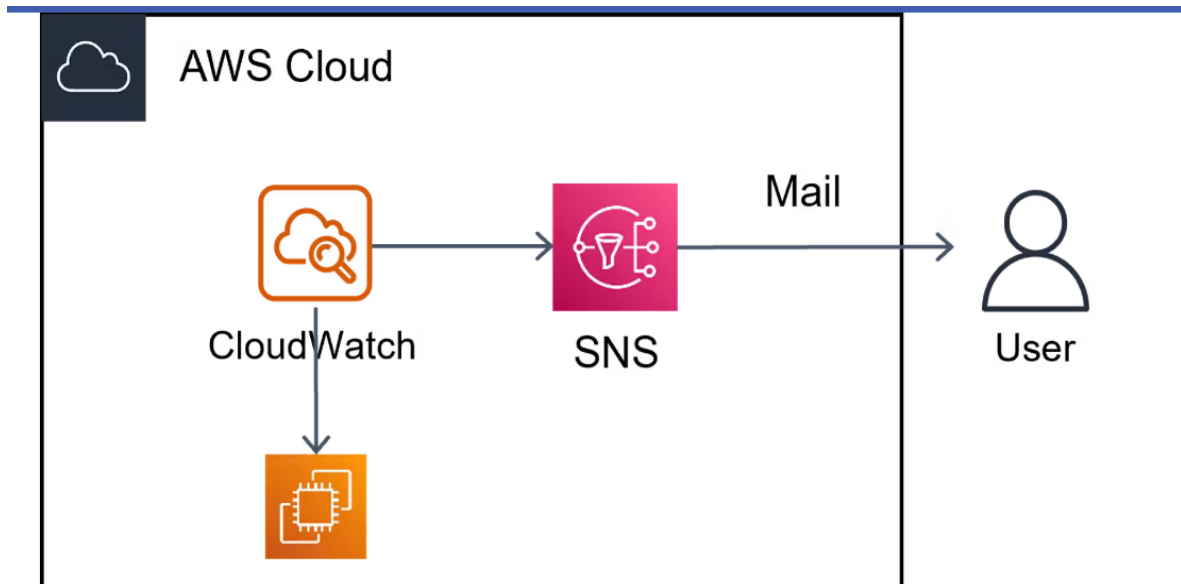
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Documentation: Setting Up EC2 Instance with CloudWatch Alarm

Overview:

This documentation outlines the steps to:

1. Launch an EC2 instance.
2. Install necessary packages and generate CPU load.
3. Set up a CloudWatch alarm to monitor CPU Utilization.
4. Configure SNS to send email notifications when the CPU utilization exceeds a threshold.
5. Clean up resources after testing.

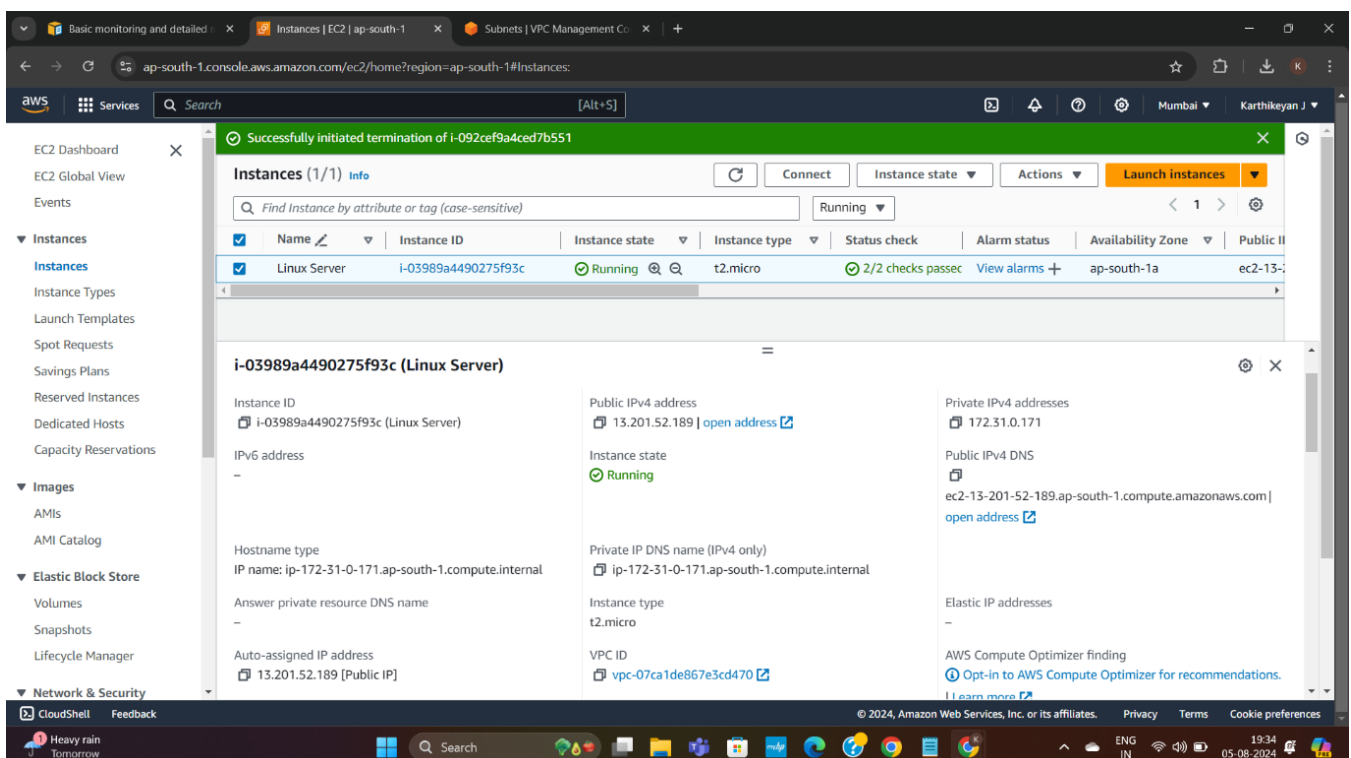


Set up CloudWatch alarms and SNS topic in AWS

Steps:

Step 1: Launch an EC2 Instance

1. **Log in** to the AWS Management Console and go to the EC2 Dashboard.
2. **Launch Instance:**
 - Click “Launch Instance”, choose Amazon Linux 2 AMI, and select t2.micro.
3. **Configure Instance:**
 - Set to default VPC, ensure a public IP, and use default storage and VPC.
4. **Set Security Group:**
 - Create or select a security group with rules for SSH (port 22) and optionally HTTP (port 80).
5. **Review and Launch:**
 - Review settings, click “Launch”, and select or create a key pair for access.

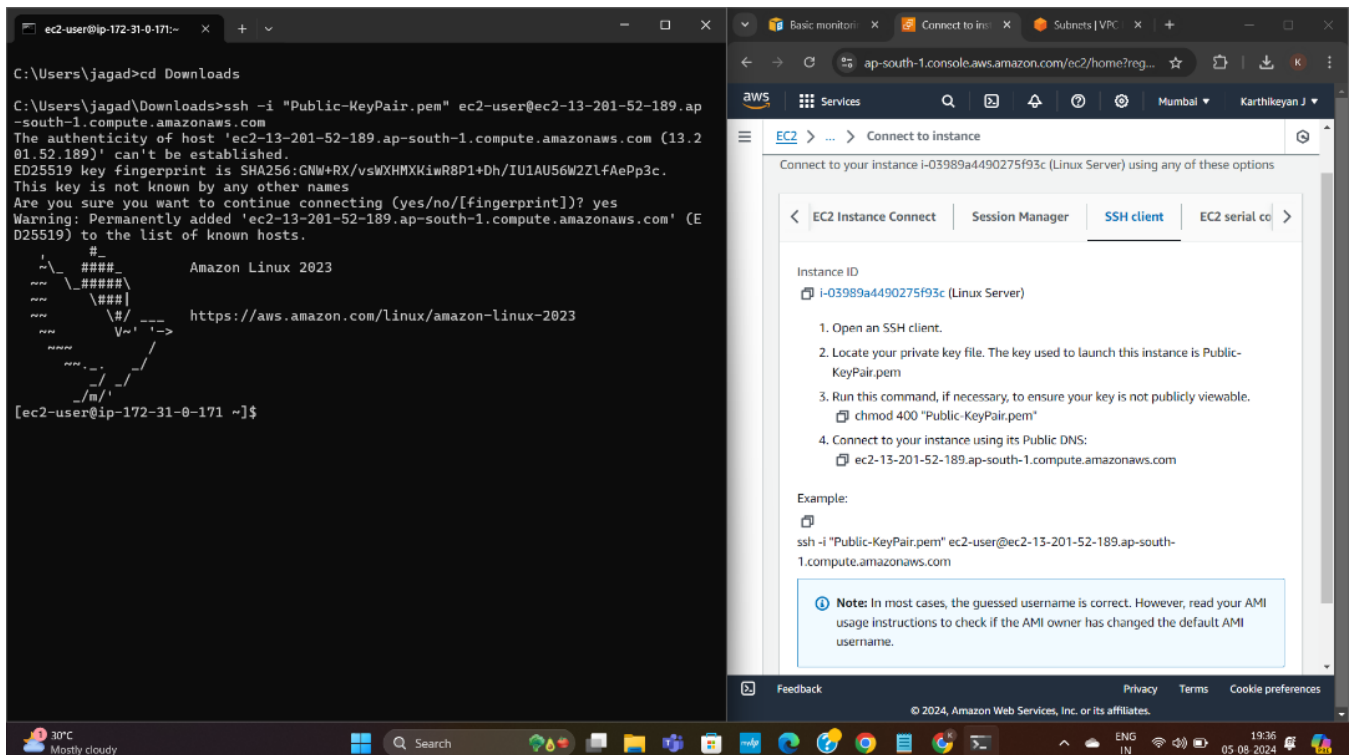


Step 2: Connect to the Instance

1. Connect to Your Instance:

- Open your terminal (or use an SSH client).
- If you're using a macOS or Linux system, you can open the terminal application.
- If you're using Windows, you can use a tool like PuTTY or the built-in Command Prompt/PowerShell (if you have OpenSSH installed).
- Ensure you have your key pair file (your-key-pair.pem) downloaded.
- Replace /path/to/your-key-pair.pem with the actual path to your .pem file.
- Connect using the following command:

ssh -i /path/to/your-key-pair.pem ec2-user@<Public-IP-of-your-EC2-instance>



2. Install the stress Package:

- Run the following commands to install the stress package:

Command: `sudo yum install -y stress`

- This command will install the stress package, which is a simple workload generator for testing your system.
- This command will install the stress package, which is a simple workload generator for testing your system.
- To Confirm that the 'stress' package has been installed correctly, you can run

Command: `stress --version`

```
ec2-user@ip-172-31-0-171:~$ sudo yum install -y stress
Last metadata expiration check: 0:05:58 ago on Mon Aug 5 14:00:59 2024.
Dependencies resolved.
=====
Package                        Architecture      Version           Repository        Size
=====
Installing:
stress                         x86_64            1.0.4-28.amzn2023.0.2  amazonlinux       37 k
=====
Transaction Summary
=====
Install 1 Package

Total download size: 37 k
Installed size: 78 k
Downloading Packages:
stress-1.0.4-28.amzn2023.0.2.x86_64.rpm                                398 kB/s | 37 kB  00:00
-----
Total
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      : stress-1.0.4-28.amzn2023.0.2.x86_64                1/1
  Installing     : stress-1.0.4-28.amzn2023.0.2.x86_64                1/1
  Running scriptlet: stress-1.0.4-28.amzn2023.0.2.x86_64                1/1
  Verifying      : stress-1.0.4-28.amzn2023.0.2.x86_64                1/1

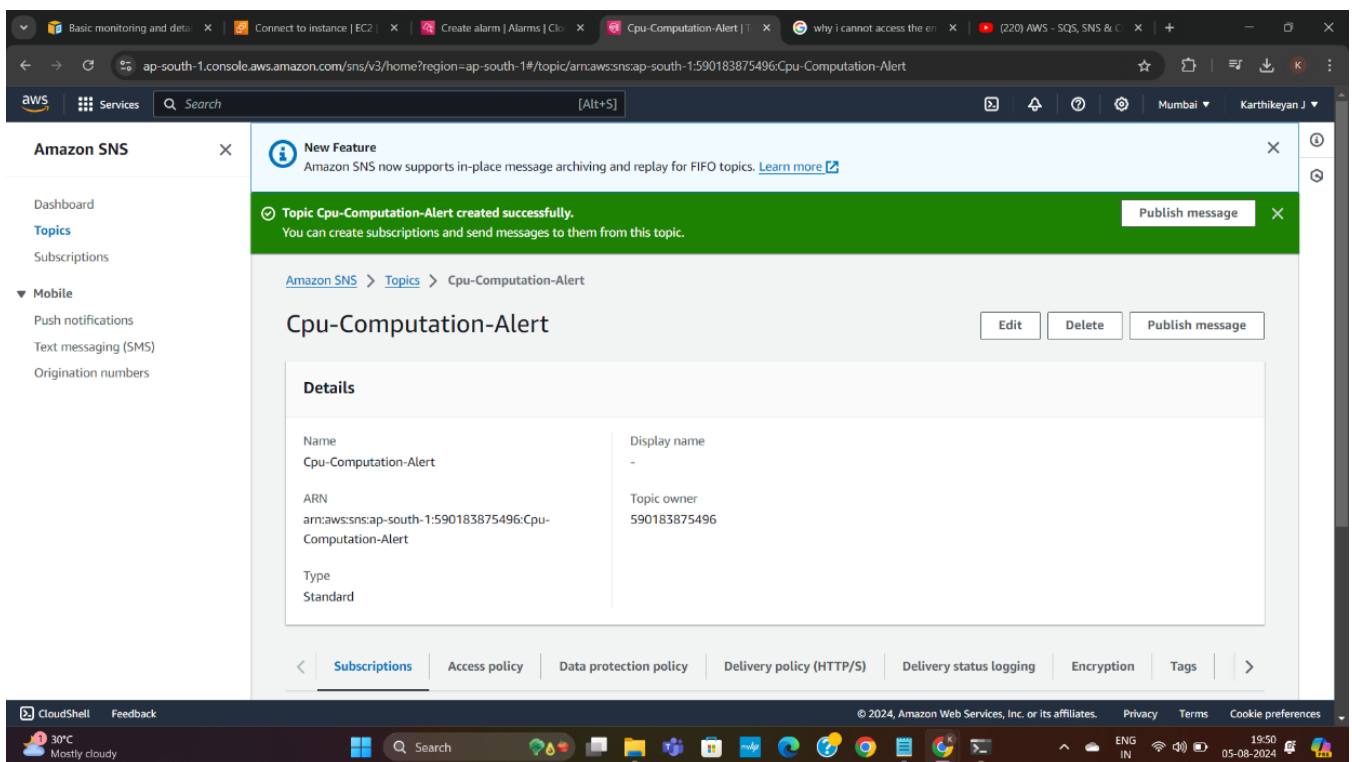
Installed:
stress-1.0.4-28.amzn2023.0.2.x86_64

Complete!
[ec2-user@ip-172-31-0-171 ~]$
```

Step 3. Create SNS Topic and Subscribe Email

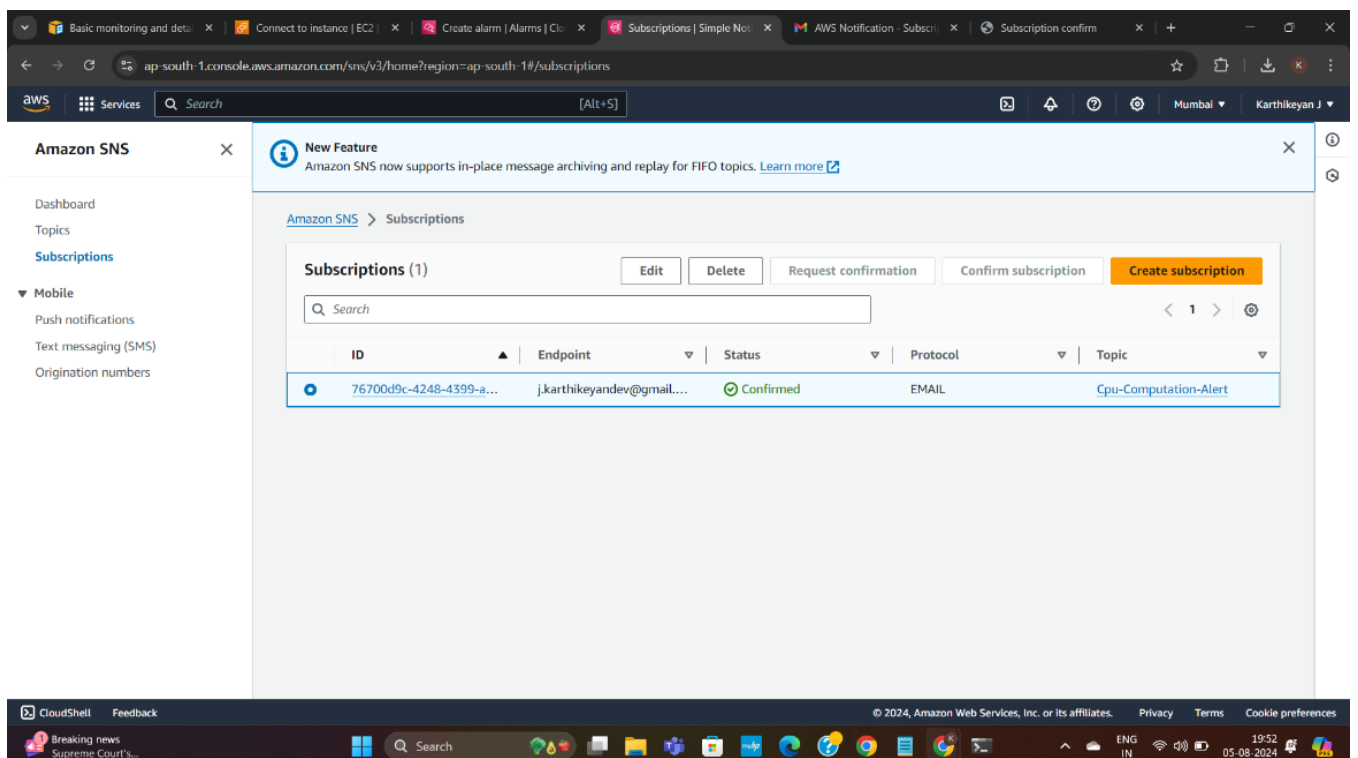
1. Create SNS Topic:

- Go to SNS Dashboard:
- Click the Create topic button.
- Select Standard as the topic button.
- Enter a topic Name that provides a name for your topic.
- Click the Create topic button to finalize your topic.



2. Subscribe Email:

- Select the topic, click “Create subscription”.
- Choose “Email” for protocol and enter your email address.
- In the “Endpoint” field, enter your email address.
- Click the Create Subscription button.
- Check your email inbox for a confirmation message from AWS SNS.
- Open the email and click the confirmation link to confirm your subscription.



Step 4: Create a CloudWatch Alarm

1. Go to the CloudWatch Console:

- In the AWS Management Console, go to CloudWatch.

2. Create an Alarm:

- In the left-hand menu, click on “Alarms” and then “Create Alarm”.
- Click on “Select metric” and then “Browse” to select the metric.
- Choose “EC2” and then “Per-Instance Metrics”.
- Select the instance you created and then select the “CPU Utilization” metric.
- Click on “Select metric”.

The screenshot shows the AWS CloudWatch console with the 'Select metric' dialog box open. The dialog displays a graph of CPU Utilization for a Linux Server instance (i-03989a4490275f93c) over a 14:00 period. The 'Browse' tab is selected, and the 'CPUUtilization' metric is chosen. The 'Select metric' button is highlighted in orange.

| | Linux Server | i-03989a4490275f93c | NetworkPacketsOut | No alarms |
|-------------------------------------|--------------|---------------------|-------------------|-----------|
| <input type="checkbox"/> | Linux Server | i-03989a4490275f93c | DiskReadBytes | No alarms |
| <input checked="" type="checkbox"/> | Linux Server | i-03989a4490275f93c | CPUUtilization | No alarms |
| <input type="checkbox"/> | Linux Server | i-03989a4490275f93c | DiskWriteOps | No alarms |
| <input type="checkbox"/> | Linux Server | i-03989a4490275f93c | DiskReadOps | No alarms |

3. Configure the Alarm:

- Set the threshold type to “Static”.
- Set the condition to “Greater than” and the threshold value to 15%.
- Set the period to 5 minutes.
- Click on “Next”.

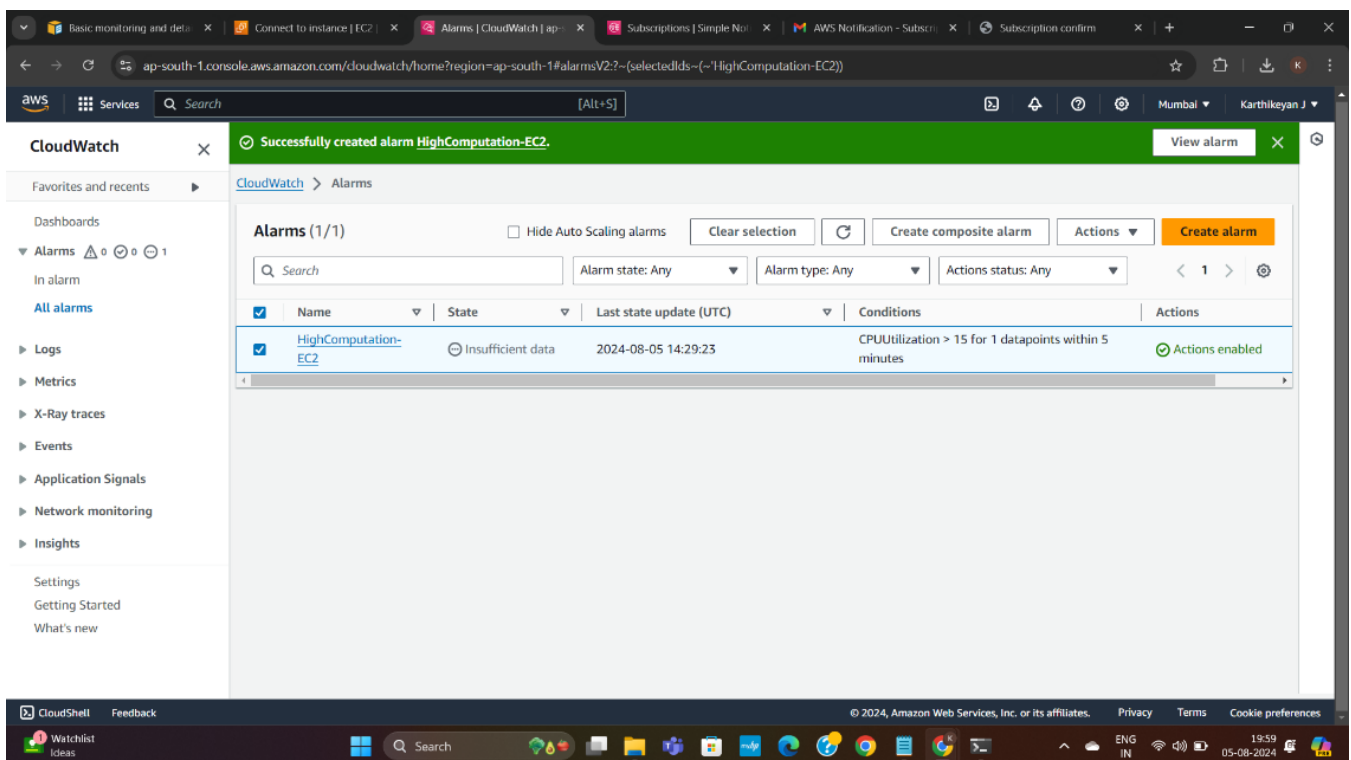
The screenshot shows the AWS CloudWatch 'Create alarm' console. The 'Period' is set to '5 minutes'. Under the 'Conditions' section, the 'Threshold type' is set to 'Static' (Use a value as a threshold). The condition is configured as 'Whenever CPUUtilization is... Define the alarm condition.' with the operator 'Greater > threshold'. The threshold value is set to '15' (Must be a number). The 'Additional configuration' section is collapsed. At the bottom right, there are 'Cancel' and 'Next' buttons.

4. Add Notification:

- Under “Notification”, click on “Add notification”.
- For “Select an SNS topic”, choose the SNS topic you created earlier (e.g., Cpu-Computation-Alert).
- Click on “Next”.

5. Name the Alarm:

- Provide a clear and detailed description of name for your alarm to easily identify its purpose, such as 'HighComputation-EC2'
- **Click “Next”:**
- Proceed to the Next configuration step by clicking the “Next” button.
- **Create the Alarm:**
- Review your settings and click “Create alarm” to finalize and activate the alarm.



Step 5: Generate Load and Test the Alarm

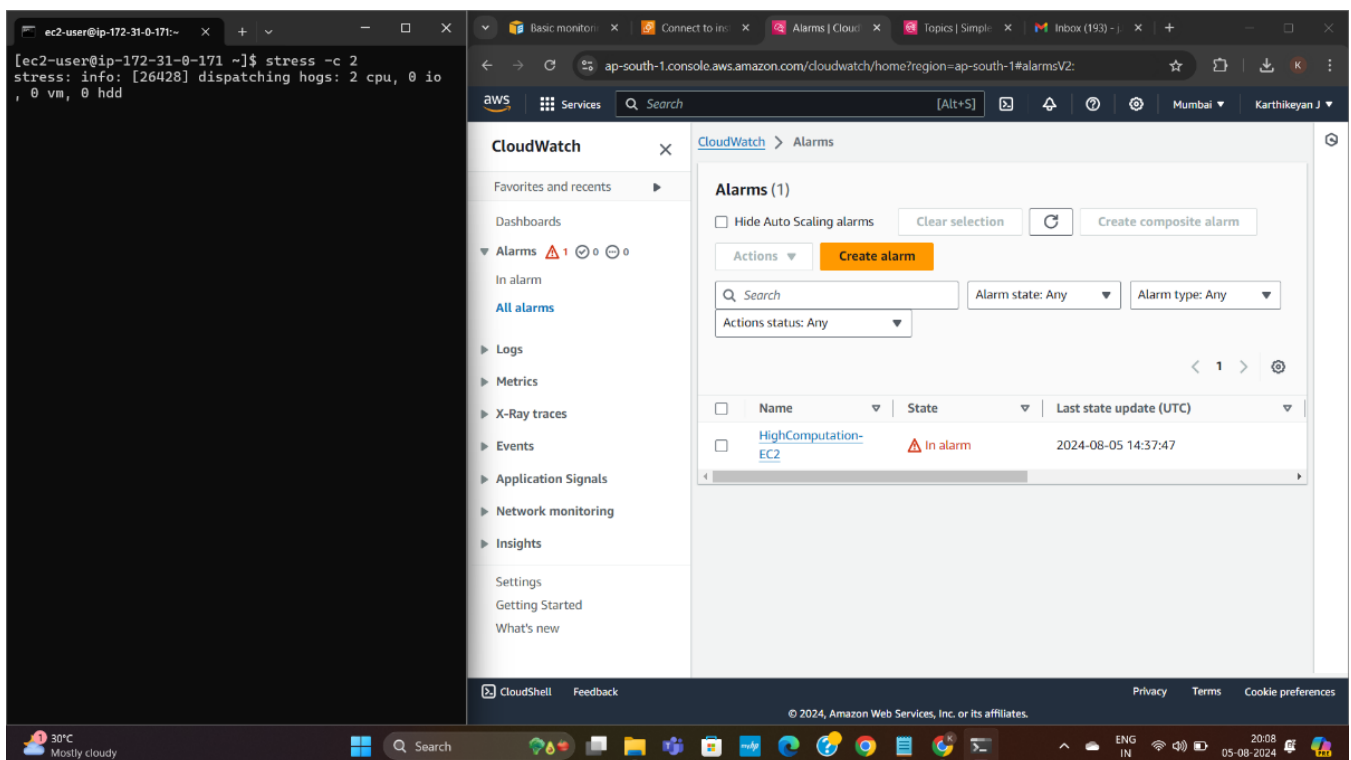
1. Run stress Command:

- On your EC2 instance, run the following command to generate higher CPU load:

`stress -c 2`

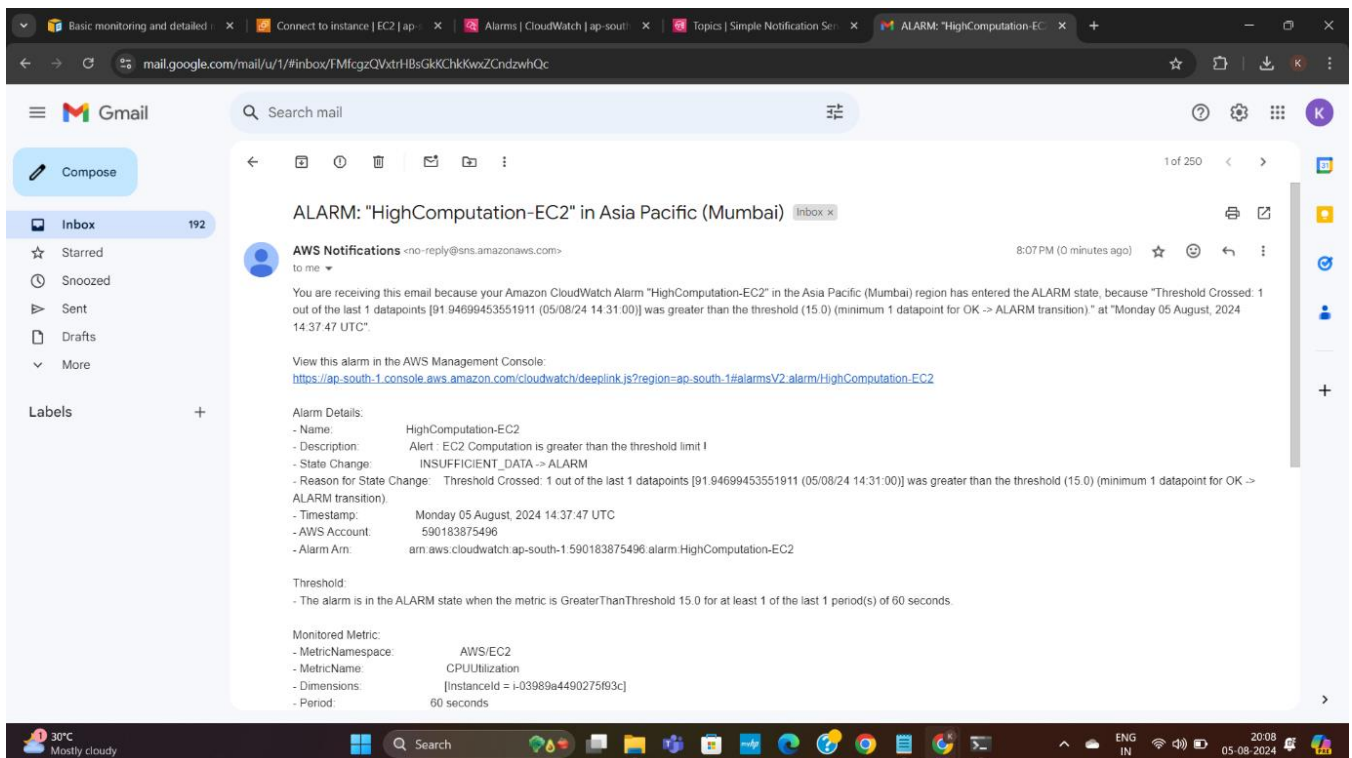
2. Wait for the Alarm:

- Wait for the alarm to trigger in the CloudWatch console. This should cause the CPU utilization to exceed 15%.



3. Monitor the Alarm:

- You should receive an alert email from SNS to the email address you subscribed when the CPU utilization exceeds the threshold.



4. Stop the Stress Command:

- Use Ctrl + C to stop the stress command.

5. Wait for the Alarm to Return to OK:

- Wait for the alarm to go back to the "OK" state in the CloudWatch console.

Step 6: Clean Up

1. Delete the Alarm:

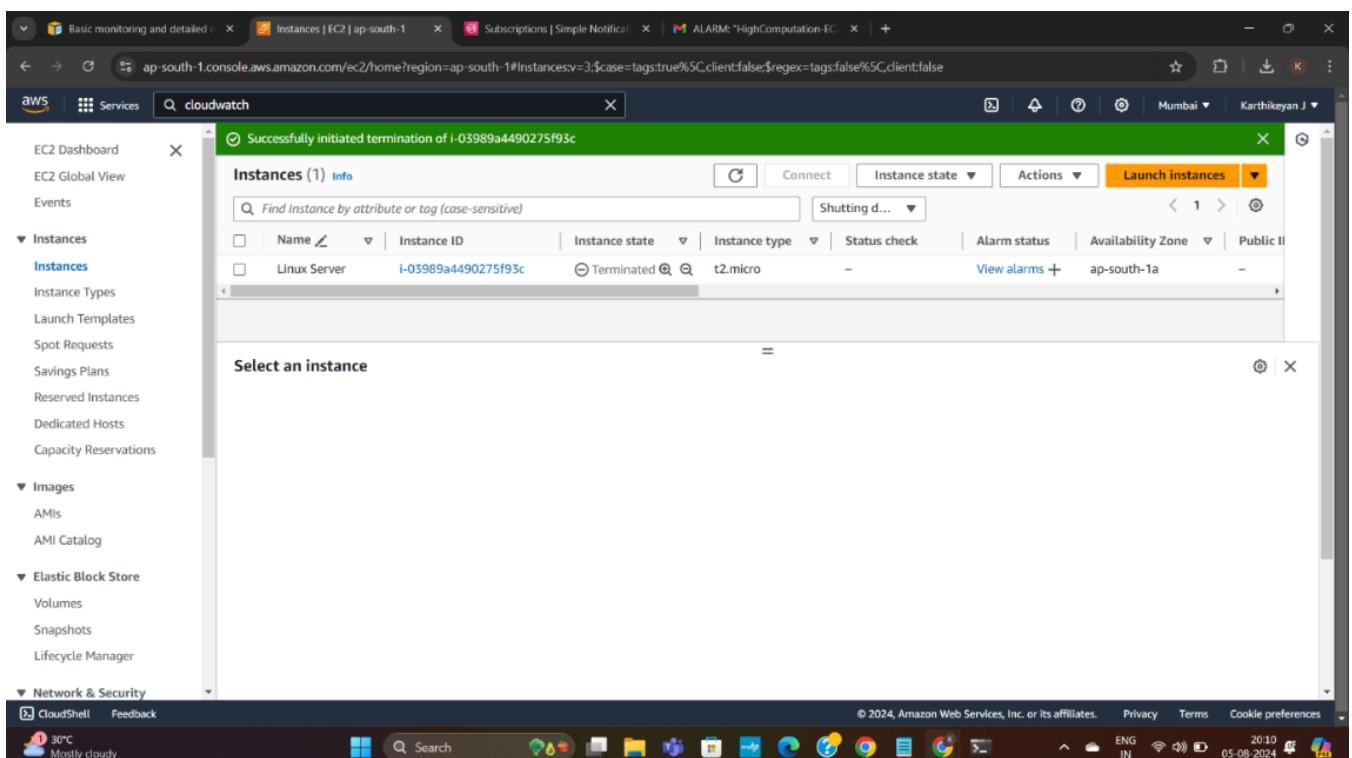
- In the CloudWatch console, go to “Alarms”.
- Select the alarm you created and click on “Actions” and then “Delete”.

2. Delete the SNS Subscription and Topic:

- In the SNS console, navigate to the “Subscriptions” section.
- Find your subscription and click on “Actions” and then “Delete subscription”.
- Go to the “Topics” section, select your topic, and click on “Actions” and then “Delete topic”.

3. Terminate the EC2 Instance:

- Go to the EC2 dashboard.
- Select the instance you created.
- Click on “Actions” and then “Instance State” > “Terminate”.



Result and Resources Used:

Result

- EC2 instance launched and configured.
 - Stress tool installed to generate CPU load.
 - CloudWatch alarm set for CPU utilization exceeding 15%.
 - SNS email notifications configured for alarm alerts.
-

Resources Used

- Amazon EC2: t2.micro instance, Amazon Linux 2 AMI, security group with SSH (port 22) and HTTP (port 80) rules.
- Amazon CloudWatch: CPU Utilization metrics, alarm for 15% threshold.
- Amazon SNS: Topic created, email subscription for notifications.
- Software: stress, epel-release for installation.