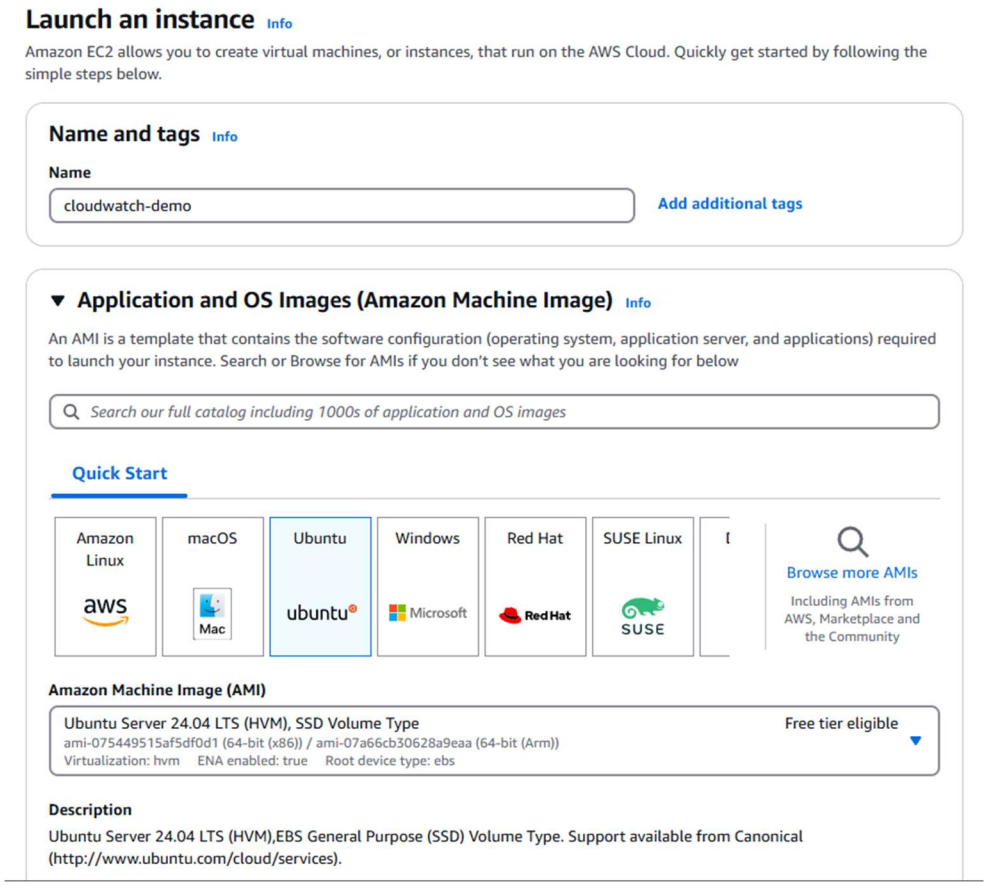
AWS CLOUD WATCH

Lets understand the applications using a small example:

1.Create an EC2 Instance



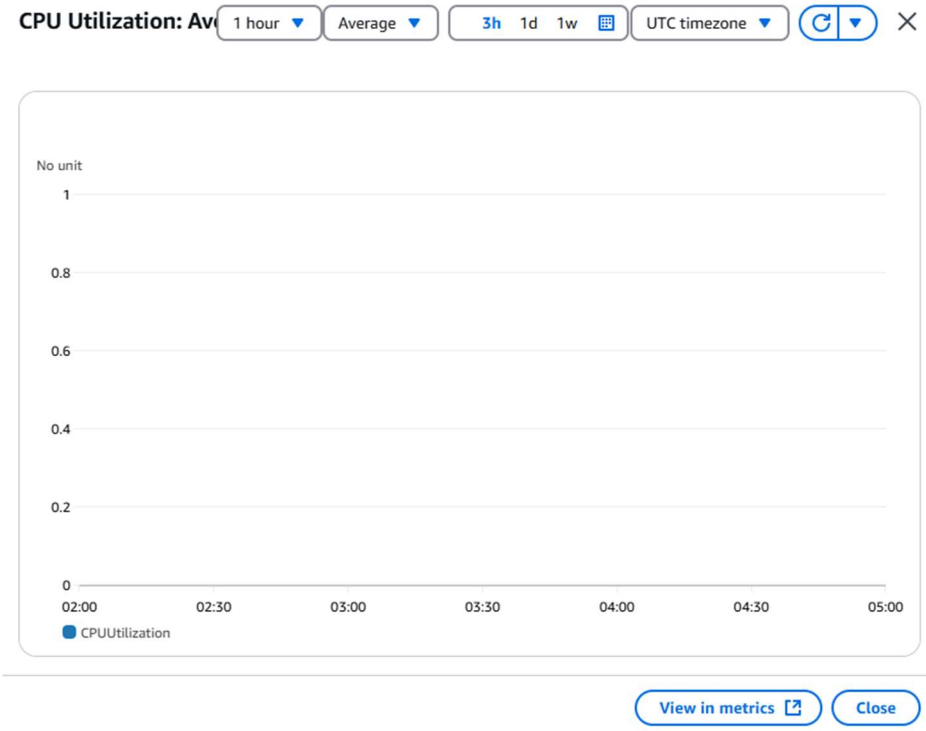
2. Login to instance through terminal using ssh command.

```
C:\Users\ORANGE\Downloads>ssh -i aws-login.pem ubuntu@13.60.220.8
The authenticity of host '13.60.220.8 (13.60.220.8)' can't be established.
ECDSA key fingerprint is SHA256:3O1CzEZltxrriZKPyCLufnpzh2/uza7W4fx9HbvTTkY.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '13.60.220.8' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1018-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

 System information as of Thu Dec 26 05:30:09 UTC 2024

  System load:  0.0               Temperature:           -273.1 C
  Usage of /:   24.7% of 6.71GB   Processes:             107
  Memory usage: 24%               Users logged in:       0
  Swap usage:   0%                IPv4 address for ens5: 172.31.26.50

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


The list of available updates is more than a week old.
To check for new updates run: sudo apt update


The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-26-50:~$
```

3. Check CPU utilization usin top command

```
ubuntu@ip-172-31-26-50:~$ top
top - 05:31:31 up 16 min,  1 user,  load average: 0.02, 0.01, 0.00
Tasks: 107 total,   1 running, 106 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.2 us,  0.0 sy,  0.0 ni, 99.8 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :    914.2 total,    419.3 free,    360.5 used,    287.1 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.    553.6 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
   1214 ubuntu    20   0   12396   5760   3584 R   0.3   0.6   0:00.01 top
      1 root      20   0   22480  13416   9448 S   0.0   1.4   0:01.78 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
      3 root      20   0       0      0      0 S   0.0   0.0   0:00.00 pool_workqueue_release
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-rcu_g
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-rcu_p
      6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-slub_
      7 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-netns
      9 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
     11 root      20   0       0      0      0 I   0.0   0.0   0:00.07 kworker/u4:0-events_power_efficient
     12 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-mm_pe
     13 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_rude_kthread
     14 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_trace_kthread
     15 root      20   0       0      0      0 S   0.0   0.0   0:00.01 ksoftirqd/0
     16 root      20   0       0      0      0 I   0.0   0.0   0:00.05 rcu_sched
     17 root      rt   0       0      0      0 S   0.0   0.0   0:00.00 migration/0
     18 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle_inject/0
     19 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
     20 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/1
     21 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle_inject/1
     22 root      rt   0       0      0      0 S   0.0   0.0   0:00.06 migration/1
     23 root      20   0       0      0      0 S   0.0   0.0   0:00.02 ksoftirqd/1
     25 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/1:0H-events_highpri
     26 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kdevtmpfs
     27 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-inet_
     28 root      20   0       0      0      0 I   0.0   0.0   0:00.13 kworker/u4:1-events_power_efficient
     29 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kauditd
     30 root      20   0       0      0      0 I   0.0   0.0   0:00.19 kworker/1:1-cgroup_destroy
     31 root      20   0       0      0      0 S   0.0   0.0   0:00.00 khungtaskd
     32 root      20   0       0      0      0 S   0.0   0.0   0:00.00 oom_reaper
     34 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-write
     35 root      20   0       0      0      0 S   0.0   0.0   0:00.03 kcompactd0
     36 root      25   5       0      0      0 S   0.0   0.0   0:00.00 ksmd
     37 root      39  19       0      0      0 S   0.0   0.0   0:00.00 khugepaged
     38 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-kinte
     39 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-kbloc
     40 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-blkcg
     41 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 irq/9-acpi
     42 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-tpm_d
     43 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-ata_s
     44 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-md_
     45 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-md_bi
     46 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-edac-
     47 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-devfr
     48 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 watchdogd
     49 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/1:1H-kblockd
     50 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kswapd0
     51 root      20   0       0      0      0 S   0.0   0.0   0:00.00 ecryptfs-kthread
```

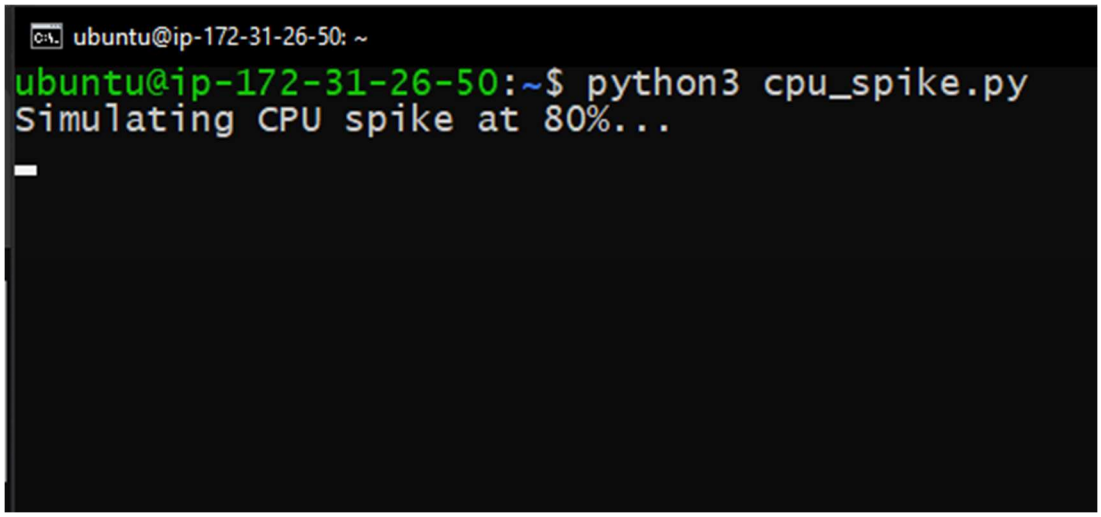
4. CPU utilization in AWS Cloudwatch



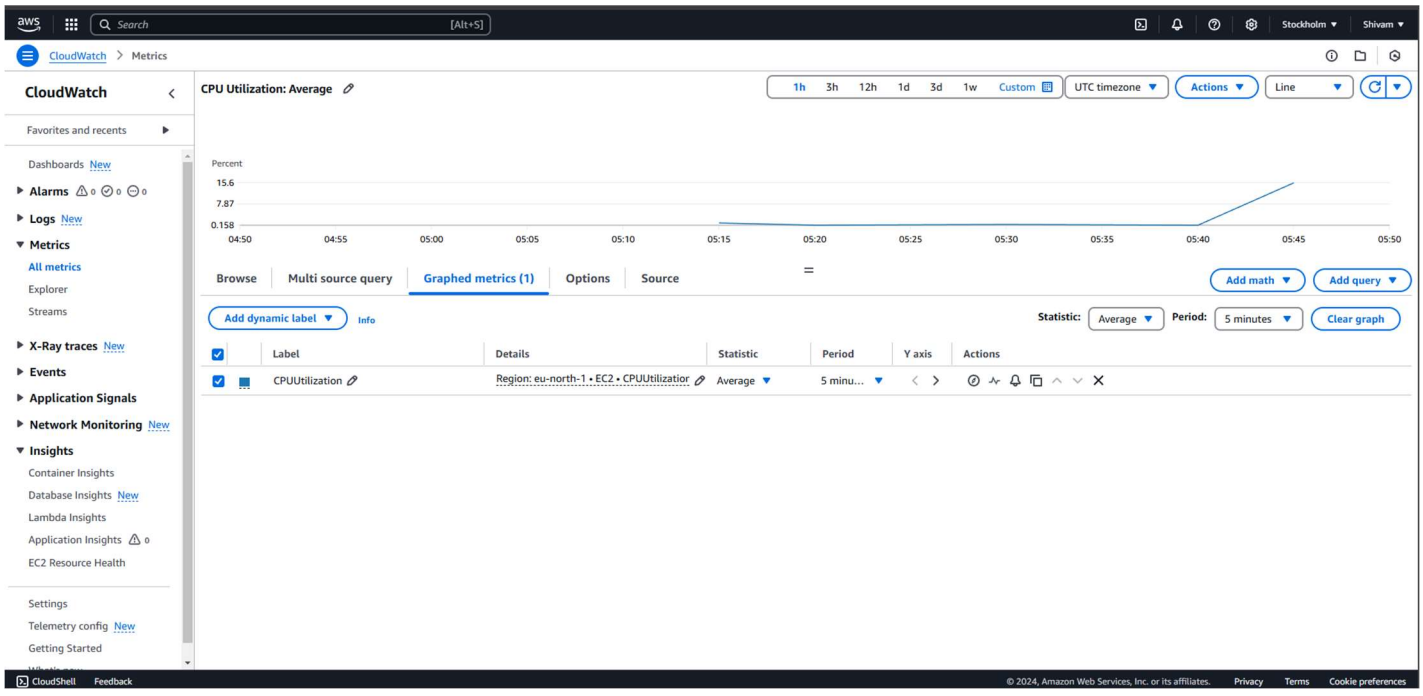
5. Use a custom python script for CPU Simulation

```python
import time

def simulate_cpu_spike(duration=30, cpu_percent=80):
    print(f"Simulating CPU spike at {cpu_percent}%...")
    start_time = time.time()

    # Calculate the number of iterations needed to achieve the desired CPU utilization
    target_percent = cpu_percent / 100
    total_iterations = int(target_percent * 5_000_000)  # Adjust the number as needed

    # Perform simple arithmetic operations to spike CPU utilization
    for _ in range(total_iterations):
        result = 0
        for i in range(1, 1001):
            result += i

    # Wait for the rest of the time interval
    elapsed_time = time.time() - start_time
    remaining_time = max(0, duration - elapsed_time)
    time.sleep(remaining_time)

    print("CPU spike simulation completed.")

if __name__ == '__main__':
    # Simulate a CPU spike for 30 seconds with 80% CPU utilization
    simulate_cpu_spike(duration=30, cpu_percent=80)
```

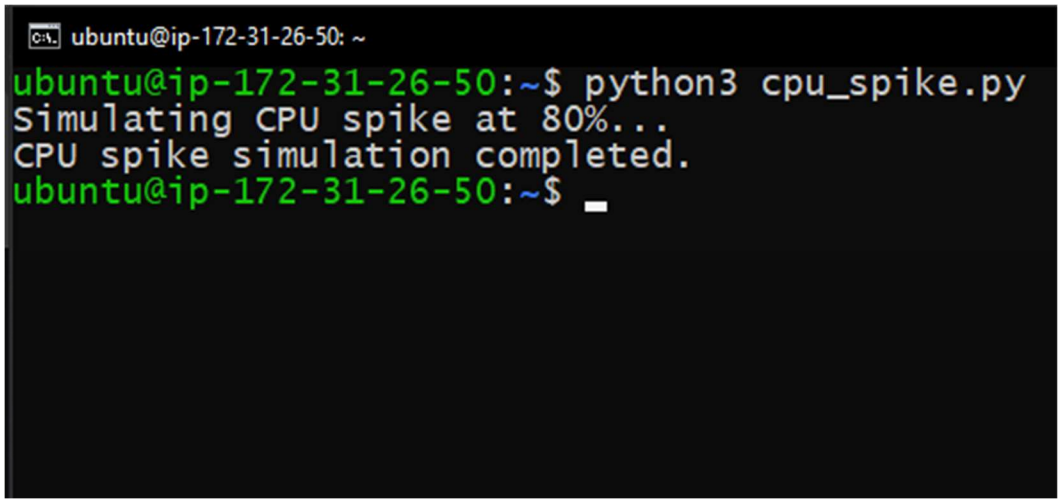
6. Run the Script to trigger CPU Simulation



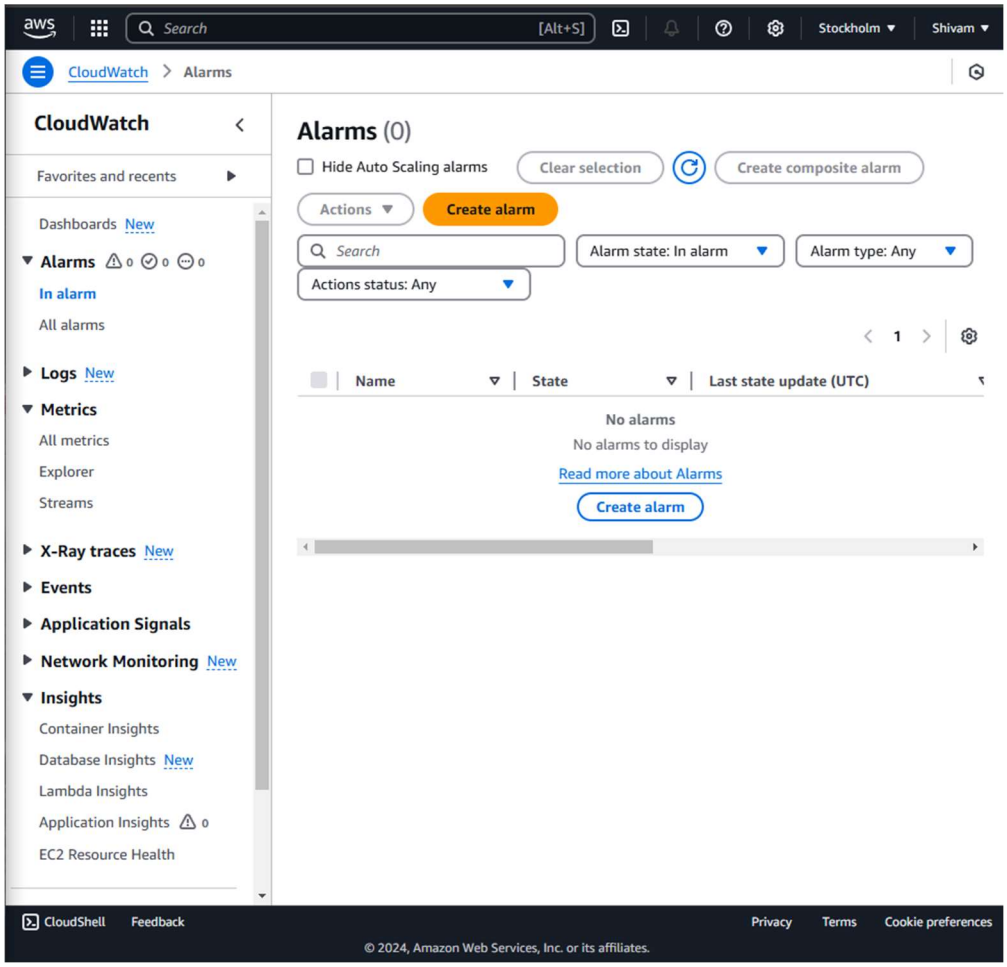
7. EC2 overview on Cloudwatch after running script



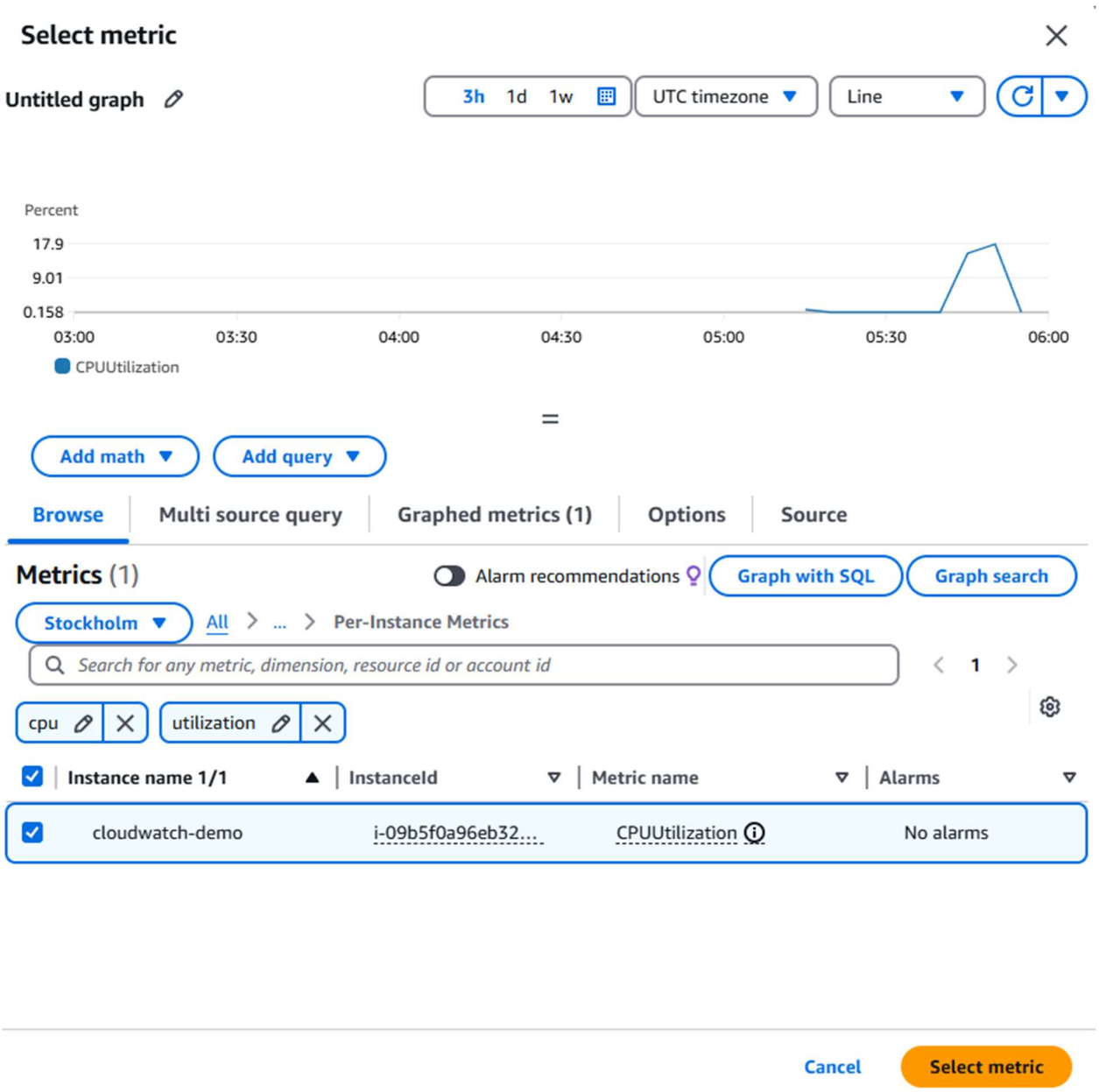
8. CPU spike simulation completion



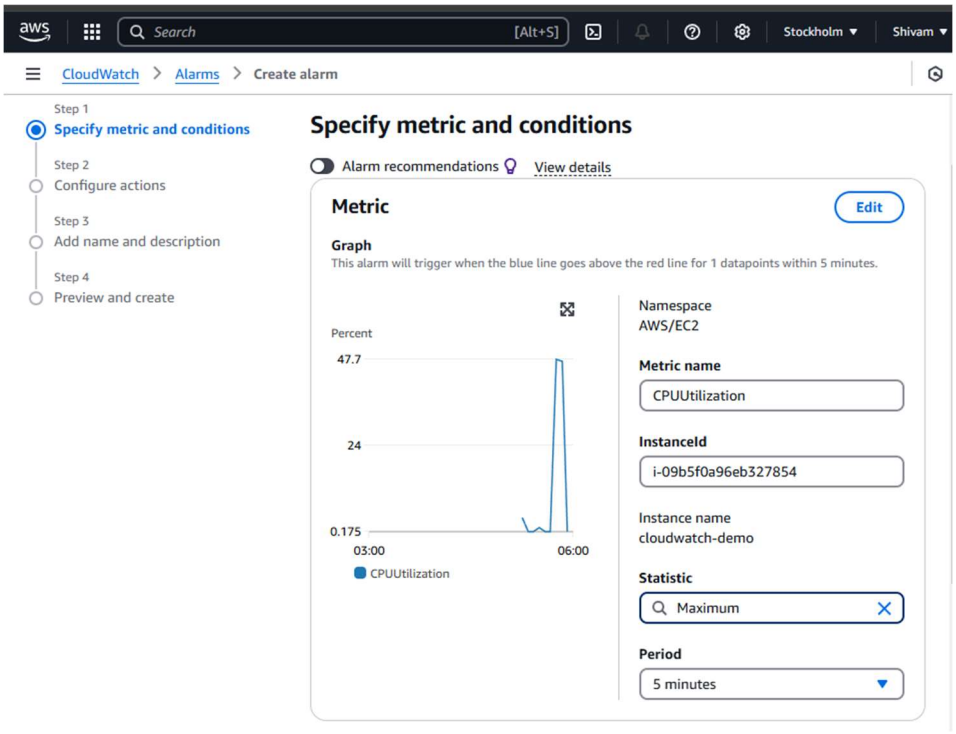
9. Create an alarm that triggers when CPU utilization reaches at 50 percent of its limit.



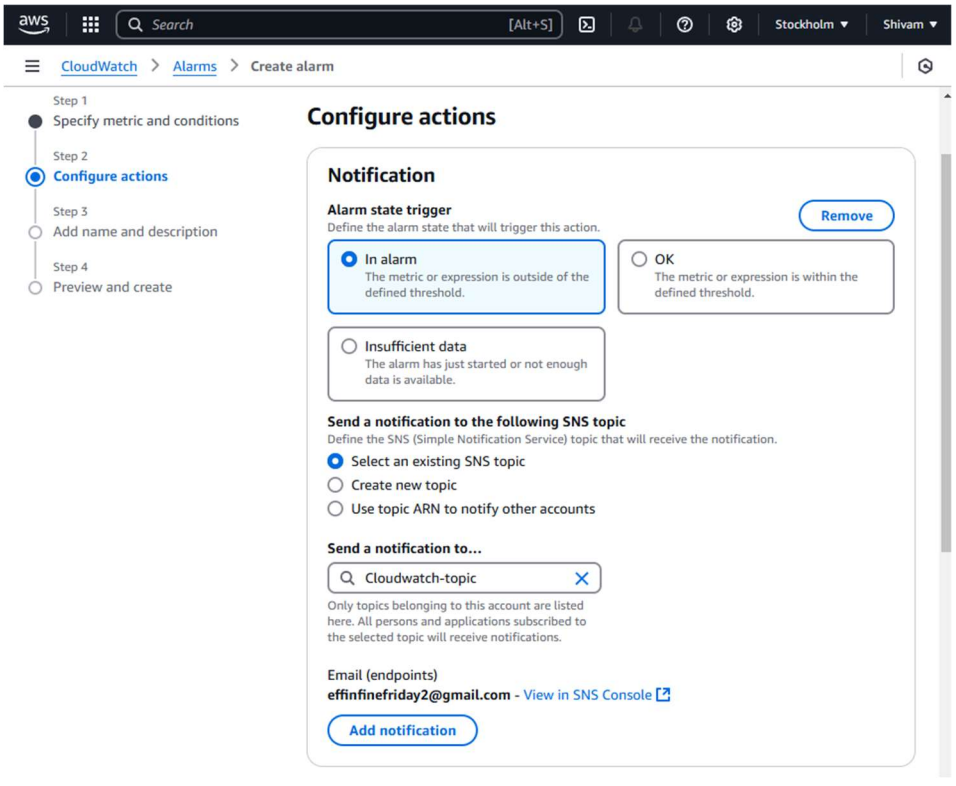
10. Select Metrices



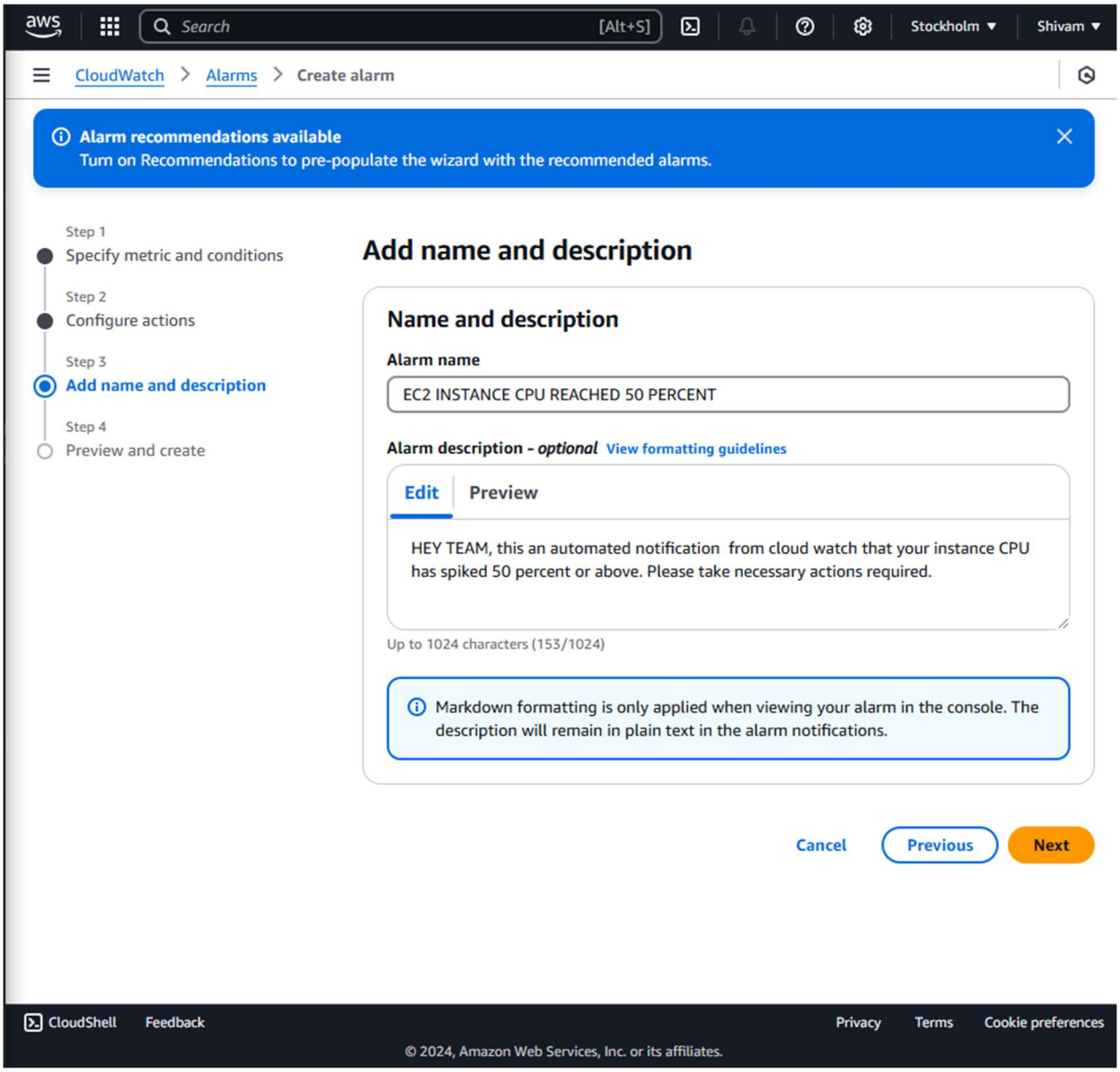
11. Configure metrices



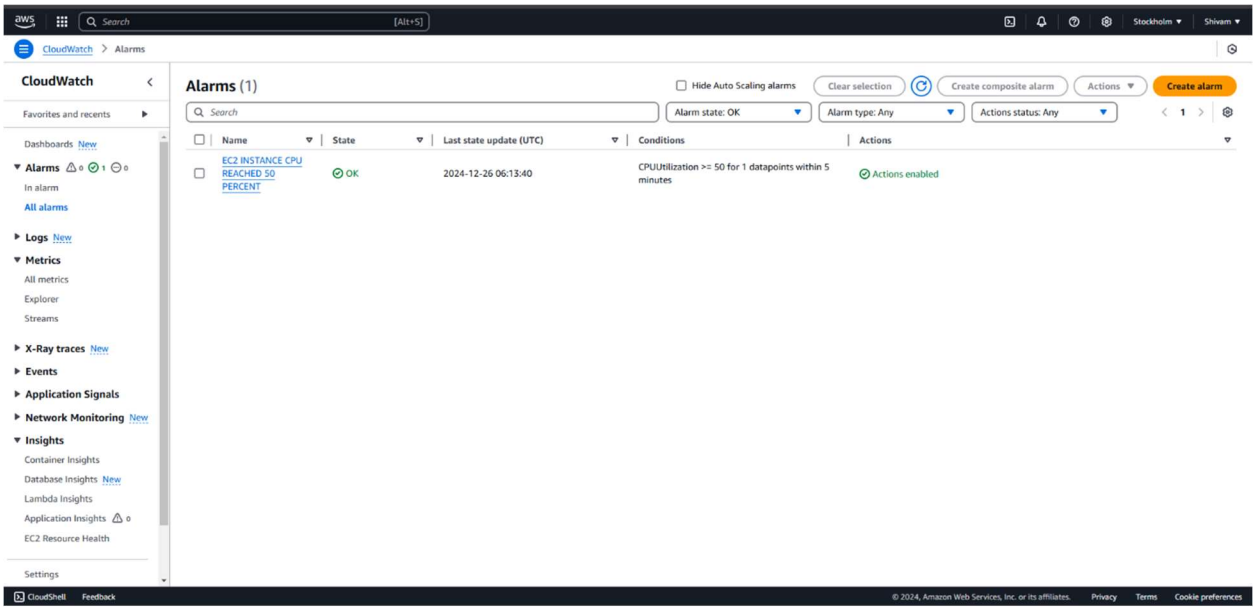
12. Create notification actions



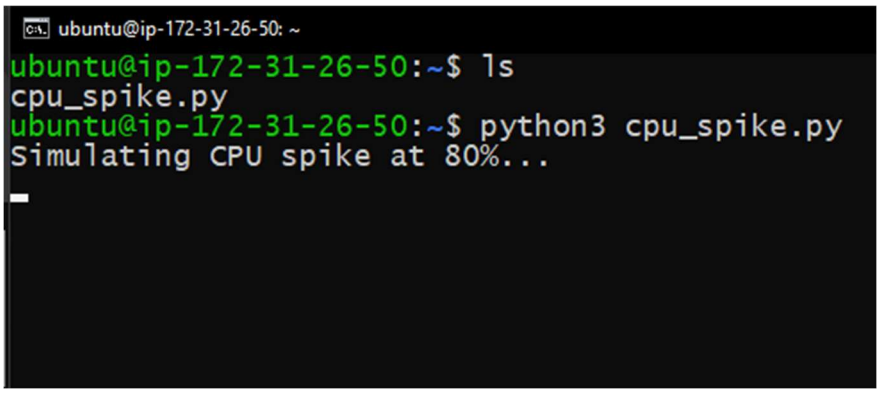
13. Add specifications of alarm



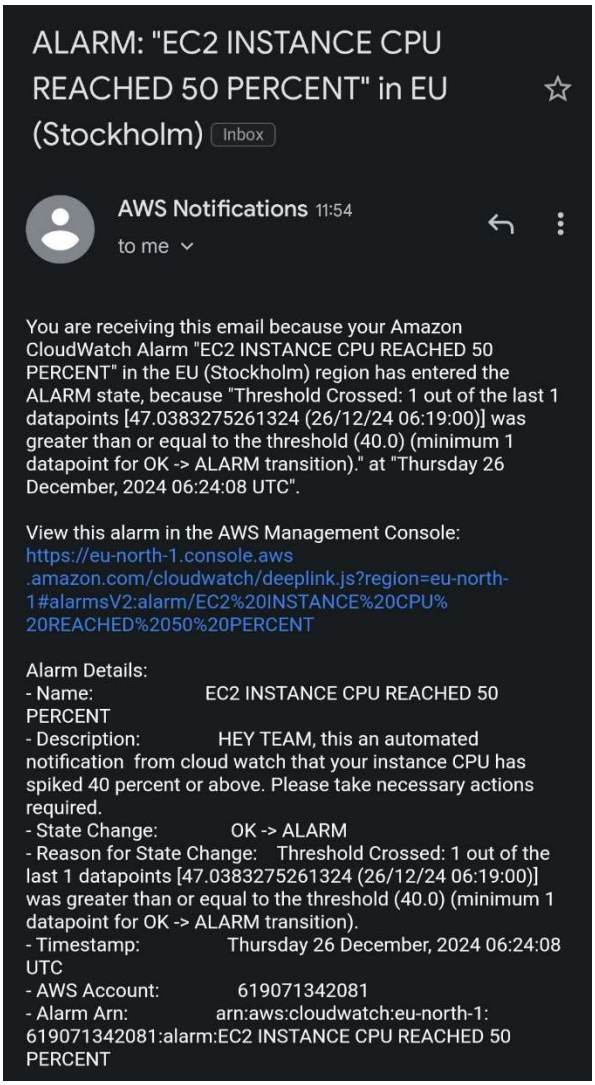
14. Alarm will be created after confirming the subscription from email address



15. Run the script for testing



16. Mail received regarding alarm



ALARM: "EC2 INSTANCE CPU REACHED 50 PERCENT" in EU (Stockholm) Inbox

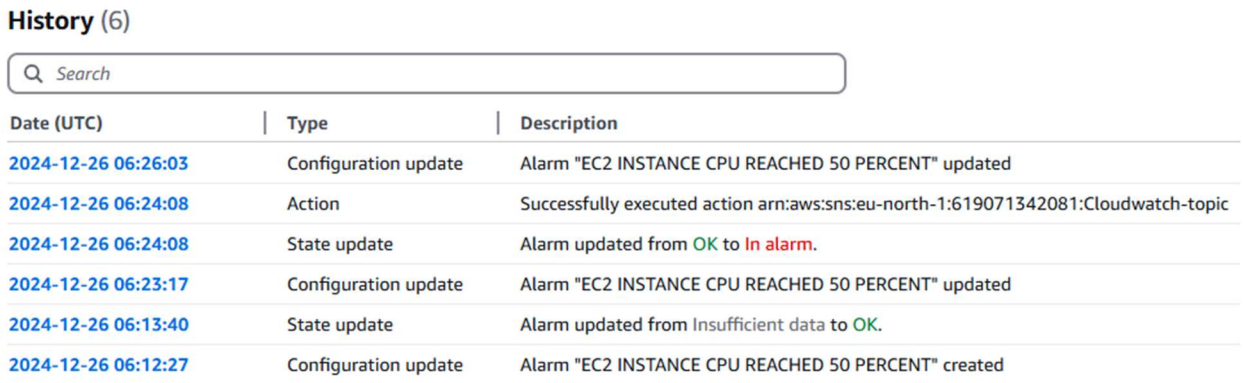
AWS Notifications 11:54
to me

You are receiving this email because your Amazon CloudWatch Alarm "EC2 INSTANCE CPU REACHED 50 PERCENT" in the EU (Stockholm) region has entered the ALARM state, because "Threshold Crossed: 1 out of the last 1 datapoints [47.0383275261324 (26/12/24 06:19:00)] was greater than or equal to the threshold (40.0) (minimum 1 datapoint for OK -> ALARM transition)." at "Thursday 26 December, 2024 06:24:08 UTC".

View this alarm in the AWS Management Console:
https://eu-north-1.console.aws.amazon.com/cloudwatch/deeplink.js?region=eu-north-1#alarmsV2:alarm/EC2%20INSTANCE%20CPU%20REACHED%2050%20PERCENT

Alarm Details:
- Name: EC2 INSTANCE CPU REACHED 50 PERCENT
- Description: HEY TEAM, this an automated notification from cloud watch that your instance CPU has spiked 40 percent or above. Please take necessary actions required.
- State Change: OK -> ALARM
- Reason for State Change: Threshold Crossed: 1 out of the last 1 datapoints [47.0383275261324 (26/12/24 06:19:00)] was greater than or equal to the threshold (40.0) (minimum 1 datapoint for OK -> ALARM transition).
- Timestamp: Thursday 26 December, 2024 06:24:08 UTC
- AWS Account: 619071342081
- Alarm Arn: arn:aws:cloudwatch:eu-north-1:619071342081:alarm:EC2 INSTANCE CPU REACHED 50 PERCENT

17. Test log in alarm history



History (6)

Search

Date (UTC)	Type	Description
2024-12-26 06:26:03	Configuration update	Alarm "EC2 INSTANCE CPU REACHED 50 PERCENT" updated
2024-12-26 06:24:08	Action	Successfully executed action arn:aws:sns:eu-north-1:619071342081:Cloudwatch-topic
2024-12-26 06:24:08	State update	Alarm updated from OK to In alarm.
2024-12-26 06:23:17	Configuration update	Alarm "EC2 INSTANCE CPU REACHED 50 PERCENT" updated
2024-12-26 06:13:40	State update	Alarm updated from Insufficient data to OK.
2024-12-26 06:12:27	Configuration update	Alarm "EC2 INSTANCE CPU REACHED 50 PERCENT" created