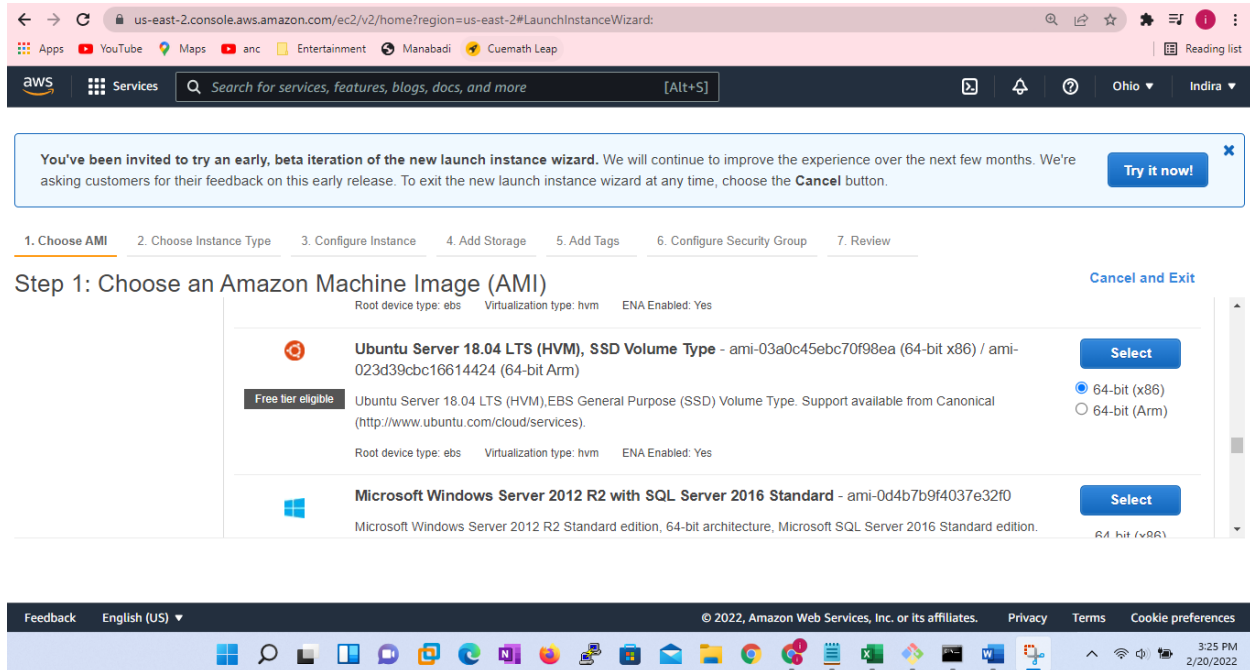
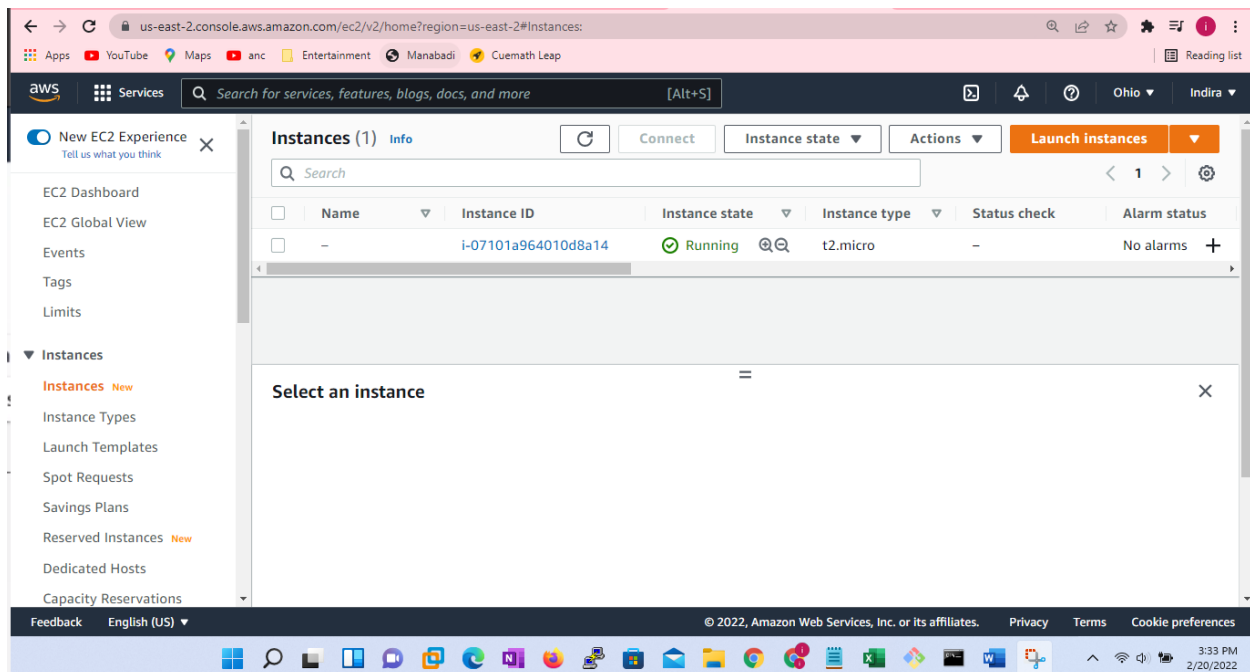


# Ec2 Instance

First go to the aws console select ec2 then select launch Instance then selected the Ubuntu server 18.04



And I flowed the steps launched the Instances



Ec2 instance connected to the putty

```
ubuntu@ip-172-31-0-132: ~  
Using username "ubuntu".  
Authenticating with public key "imported-openssh-key"  
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-1060-aws x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/advantage  
  
System information as of Sun Feb 20 22:00:33 UTC 2022  
  
System load:  0.0           Processes:      93  
Usage of /:   14.9% of 7.69GB Users logged in:  0  
Memory usage: 20%          IP address for eth0: 172.31.0.132  
Swap usage:   0%  
  
0 updates can be applied immediately.  
  
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-172-31-0-132:~$ who am i  
ubuntu pts/0      2022-02-20 22:00 (76.92.203.211)  
ubuntu@ip-172-31-0-132:~$
```

Now Install Apache on the Ubuntu machine. Login and run these commands to install and start the Apache Web server.

```
sudo apt update
```

```
sudo apt install -y apache2
```

```
sudo systemctl status apache2
```

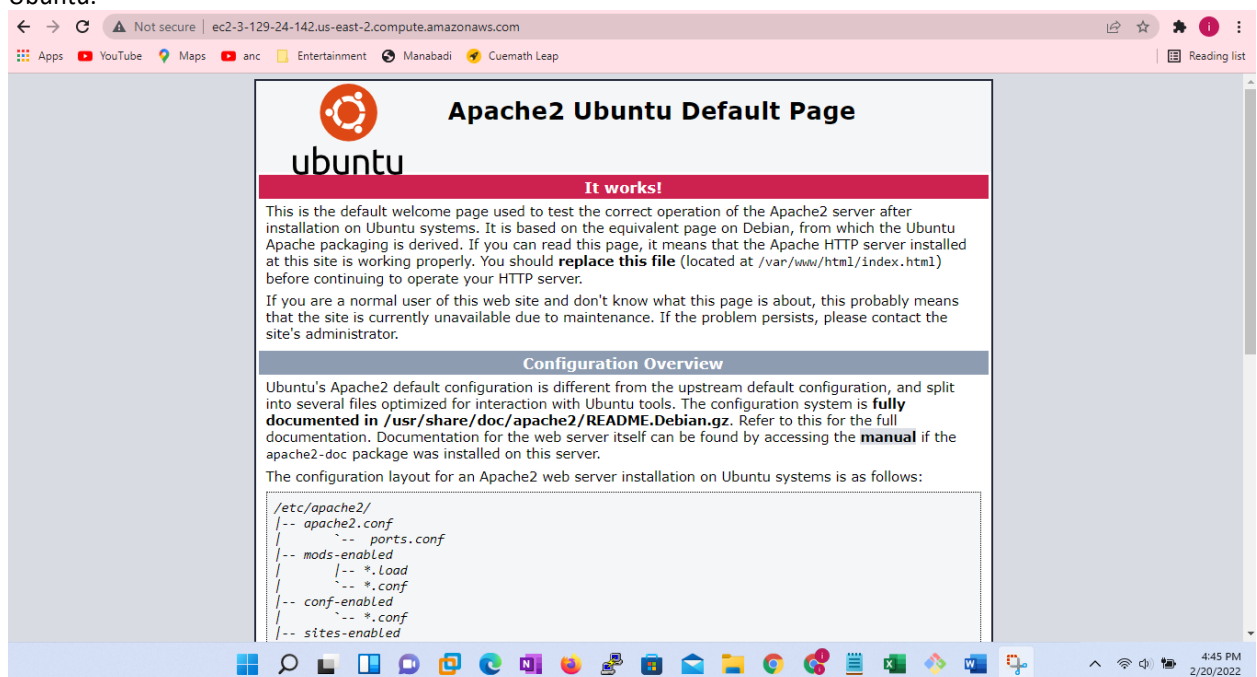
```
Processing triggers for systemd (237-3ubuntu0.52) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ufw (0.36-0ubuntu0.18.04.2) ...
Processing triggers for ureadahead (0.100.0-21) ...
ubuntu@ip-172-31-0-132:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Drop-In: /lib/systemd/system/apache2.service.d
            └─apache2-systemd.conf
   Active: active (running) since Sun 2022-02-20 22:29:37 UTC; 1min 5s ago
     Main PID: 2810 (apache2)
        Tasks: 55 (limit: 1140)
      CGroup: /system.slice/apache2.service
              └─2810 /usr/sbin/apache2 -k start
                └─2813 /usr/sbin/apache2 -k start
                  └─2814 /usr/sbin/apache2 -k start

Feb 20 22:29:37 ip-172-31-0-132 systemd[1]: Starting The Apache HTTP Server...
Feb 20 22:29:37 ip-172-31-0-132 systemd[1]: Started The Apache HTTP Server.
ubuntu@ip-172-31-0-132:~$ telnet localhost 80
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
^J
HTTP/1.1 400 Bad Request
Date: Sun, 20 Feb 2022 22:32:05 GMT
Server: Apache/2.4.29 (Ubuntu)
Content-Length: 334
Connection: close
Content-Type: text/html; charset=iso-8859-1

<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>400 Bad Request</title>
</head><body>
<h1>Bad Request</h1>
<p>Your browser sent a request that this server could not understand.<br />
</p>
<hr>
<address>Apache/2.4.29 (Ubuntu) Server at ip-172-31-0-132.us-east-2.compute.internal Port 80</address>
</body></html>
Connection closed by foreign host.
ubuntu@ip-172-31-0-132:~$
```

Go to the browser and try to access Apache Web Server using `http://<public_ip>`.

- If it is not opened then the link will not work. Now go to the security group and the new rule for port number 80 using **My IP**.
- Now the link should work without any issues. It will launch the default Apache Web Server Page for Ubuntu.



## Public and Private IP Addresses:

Let us understand the concepts behind public and private IP addresses associated with AWS EC2 Instances.

- Typically, 2 IP Addresses and corresponding DNS aliases will be attached to each AWS EC2 Instance.
- Public DNS aliases start with **ec2** and Private DNS aliases start with **ip**.
- Public DNS alias or underlying Public IP address can be used to access EC2 instances or services running on it via the internet from outside of AWS.
- Private DNS alias or underlying Private IP address can be used for internal communication between EC2 instances within AWS VPC.
- By default, the Public DNS alias or Public IP address is ephemeral. It means if you stop and start an EC2 instance, most likely the Public DNS alias and Public IP address will change.

## EC2 Life Cycle

Let us go through the life cycle of EC2 Instance. EC2 instance will be in one of these states as long as it is not terminated.

- Running
- Stopped
- Restarting

If you stop the EC2 instance, the public IP might be reset as it is ephemeral by default. You need to lease elastic IP and assign it to the EC2 instance so that public IP does not change.

As long as EC2 Instance is stopped you will not be charged for the instance. But, if you use EBS for storage, you have to pay for it.

## Allocating and Assigning Elastic IP Addresses:

- Go to AWS Web Console and then go to EC2 Console. Go to **Elastic IPs** under **Network & Security**.
- Click on **Allocate Elastic IP address** to lease the IP address so that we can associate with the ec2 instance created earlier.

Select newly allocated elastic IP address, go to **Actions** and click on **Associate Elastic IP address**

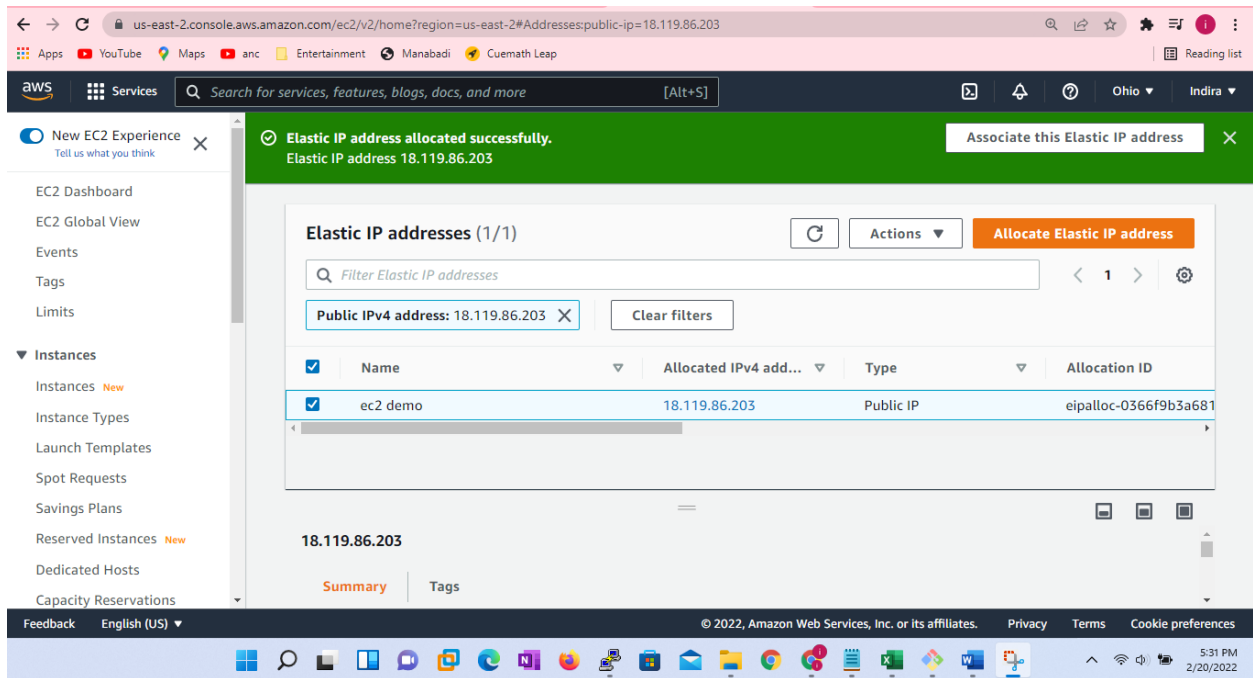
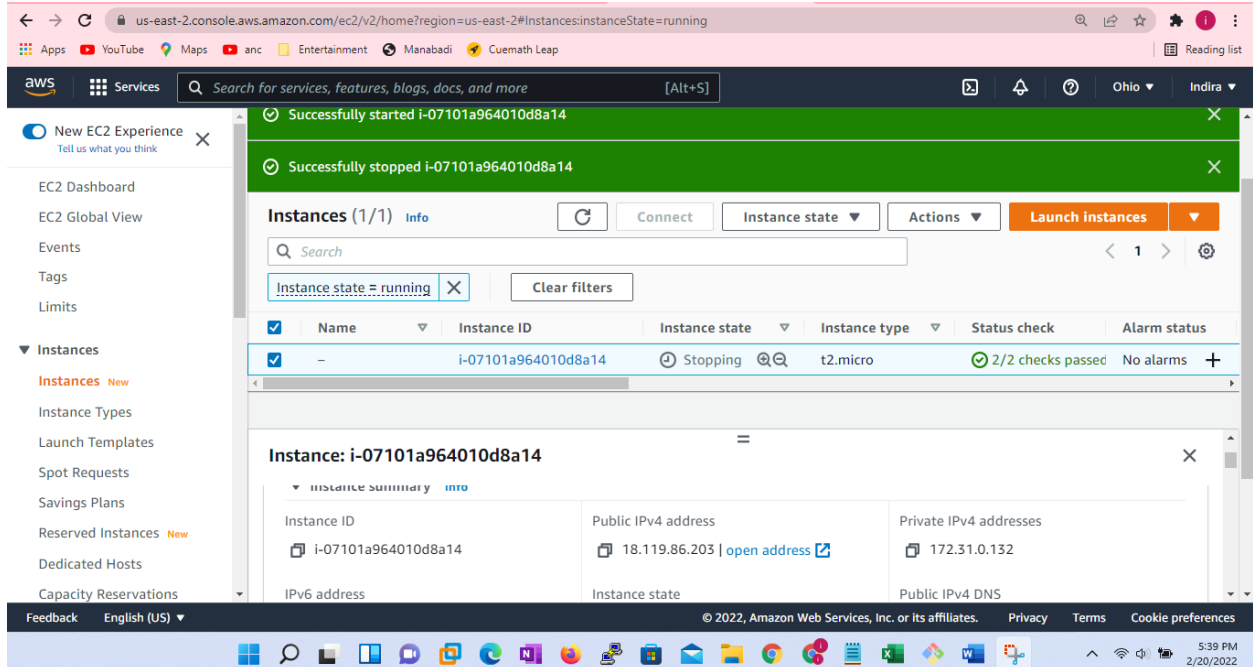
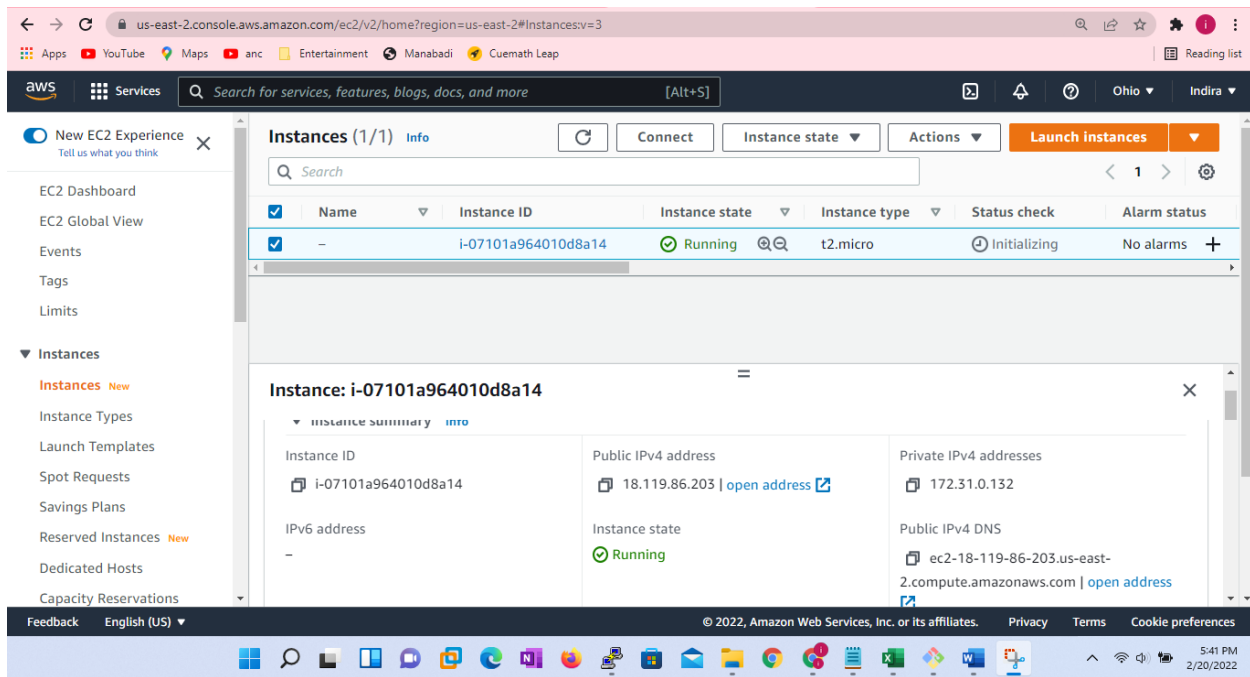


Figure 1 This is the allocated ipaddress

- Select the EC2 instance in the drop-down related to Instance.



Again started the instances



Now we can observe that when the instances is stopped and started again the public DNS did not changed because of the Elastic ip address is allocated to that instance.

## Upgrade or Downgrade EC2 Instances

- Increasing Memory or CPU or both is called Upgrading the EC2 Instance.
- Go to EC2 Console and choose the instance to which you want to upgrade.
- Go to **Instance State** and stop the instance. You can also use CLI to stop the instance.
- Go to **Actions**, then choose **Instance Settings** and then click on **Change Instance Type**.
- As of now, the EC2 Instance is of type **t2. Micro**, upgrade it to **t2. medium**.

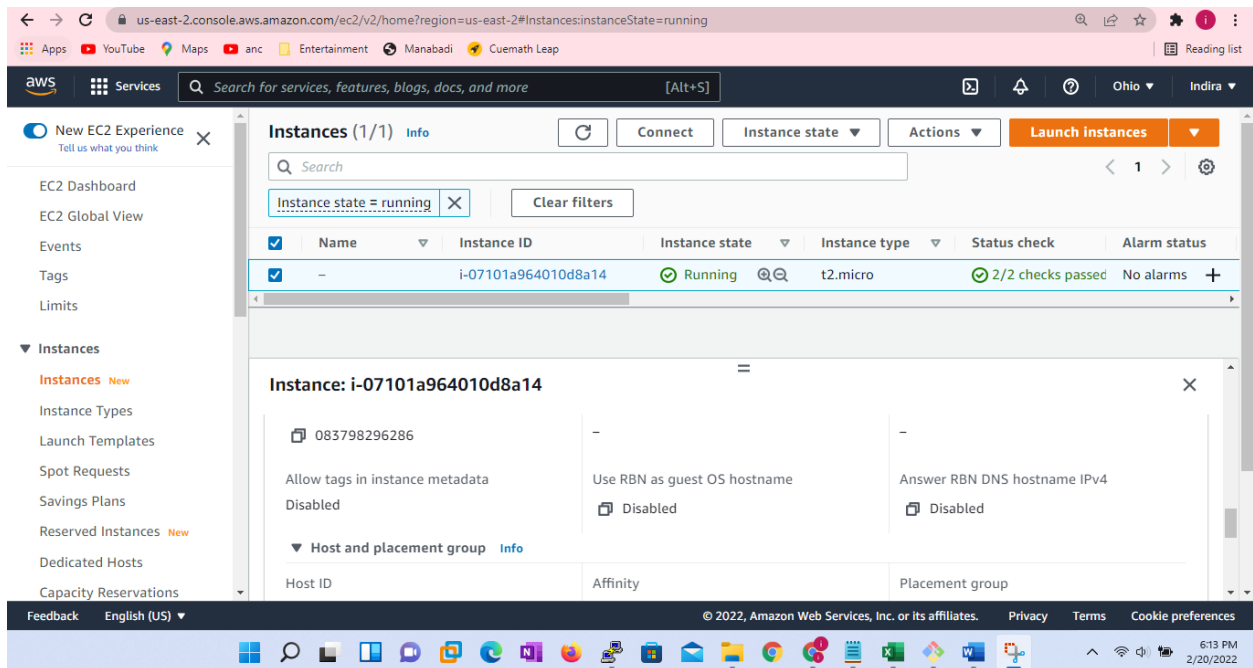


Figure 2 Instance type is t2.micro

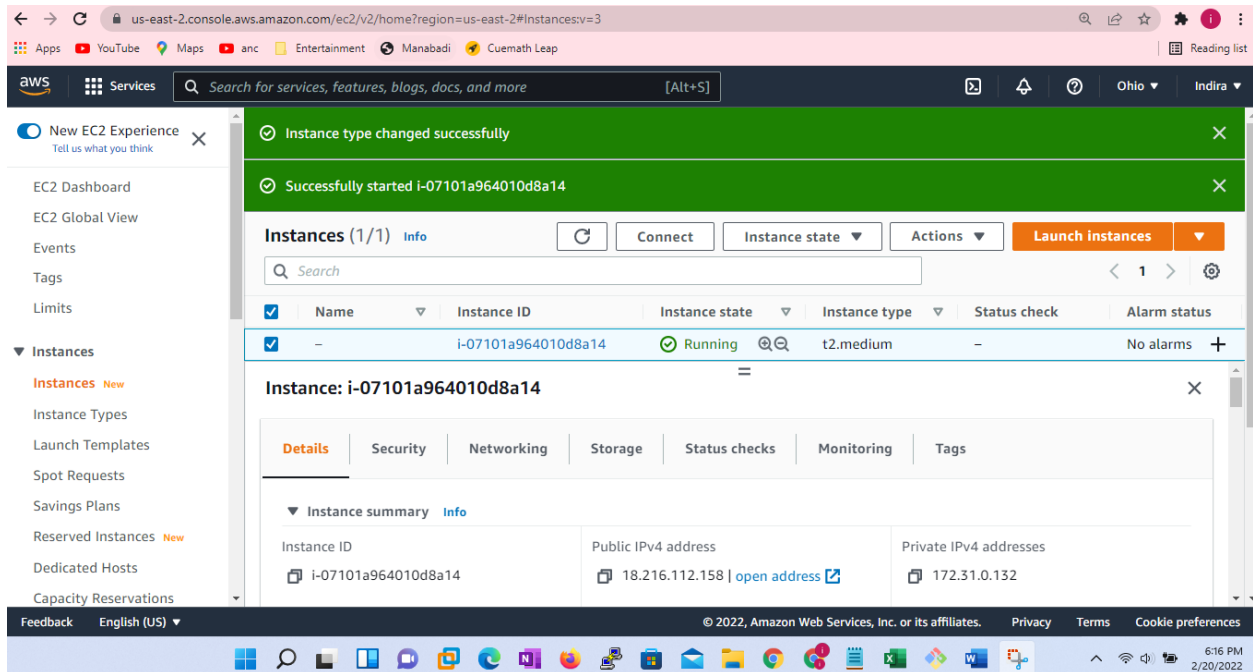


Figure 3 Here the instance type is t2.medium

Now the instance is downgrade

- We can run the below commands to confirm the memory and CPU configuration from within the server.

```
base login: Sun Feb 20 23:30:00 2022 from 10.32.129.211
ubuntu@ip-172-31-0-132:~$ free -h
              total        used        free      shared  buff/cache        available
Mem:           3.8G         140M         3.4G         1.0M         330M         3.5G
Swap:          0B           0B           0B
ubuntu@ip-172-31-0-132:~$ ls cpu
ls: cannot access 'cpu': No such file or directory
ubuntu@ip-172-31-0-132:~$ lscpu
Architecture:        x86_64
CPU op-mode(s):      32-bit, 64-bit
Byte Order:           Little Endian
CPU(s):               2
On-line CPU(s) list: 0,1
Thread(s) per core:   1
Core(s) per socket:   2
Socket(s):            1
NUMA node(s):         1
Vendor ID:            GenuineIntel
CPU family:           6
Model:                79
Model name:           Intel(R) Xeon(R) CPU E5-2686 v4 @ 2.30GHz
Stepping:             1
CPU MHz:              2299.920
BogoMIPS:             4600.14
Hypervisor vendor:    Xen
Virtualization type:  full
L1d cache:            32K
L1i cache:            32K
L2 cache:             256K
L3 cache:             46080K
NUMA node0 CPU(s):    0,1
Flags:                fpu vme de pse tsc mtrr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx rdtscp lm constant_tsc rep_good nopl
xtopology cpuid pni pclmulqdq ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand hypervisor lahf_lm abm cpuid_fault in
vpcid single_pti fsgsbase bmi1 avx2 smep bmi2 erms invpcid xsaveopt
ubuntu@ip-172-31-0-132:~$
```

Generate the JSON and review it to understand the structure of the metadata.

aws ec2 describe-instances-status

```
C:\Users\pchra>aws ec2 describe-instance-status
{
  "InstanceStatuses": [
    {
      "AvailabilityZone": "us-east-2a",
      "InstanceId": "i-07101a964010d8a14",
      "InstanceState": {
        "Code": 16,
        "Name": "running"
      },
      "InstanceStatus": {
        "Details": [
          {
            "Name": "reachability",
            "Status": "passed"
          }
        ],
        "Status": "ok"
      },
      "SystemStatus": {
        "Details": [
          {
            "Name": "reachability",
            "Status": "passed"
          }
        ],
        "Status": "ok"
      }
    },
    {
      "AvailabilityZone": "us-east-2a",
      "InstanceId": "i-0b97e544392fd3a51",
      "InstanceState": {
        "Code": 16,
        "Name": "running"
      },
      "InstanceStatus": {
        "Details": [
          {
            "Name": "reachability",
            "Status": "passed"
          }
        ],
        "Status": "ok"
      },
      "SystemStatus": {
        "Details": [
          {
            "Name": "reachability",
            "Status": "passed"
          }
        ],
        "Status": "ok"
      }
    }
  ]
}
```