

AWS EC2 + AMI + EBS Mini Project — Web Server Deployment

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Objective

This mini project demonstrates how to launch an EC2 instance with Ubuntu, configure a web server using Apache and PHP, attach an EBS volume, create an AMI, and then launch a new EC2 instance from that AMI.

We will:

- ✓ Launch an EC2 instance (Ubuntu)
 - ✓ Install Apache2 + PHP
 - ✓ Attach and mount an EBS volume
 - ✓ Create a simple PHP app
 - ✓ Create an AMI of the configured EC2
 - ✓ Launch a new EC2 from that AMI
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Tools Used

- AWS Management Console
- EC2 (Ubuntu 24.04 LTS)
- Amazon EBS
- Amazon AMI
- Apache2 + PHP
- Web browser

Steps and Screenshots

1 EC2 Instance Launch

- Launched EC2 instance using Ubuntu 24.04 LTS AMI
- Selected t2.micro (Free Tier)
- Configured Security Group: SSH (22), HTTP (80)

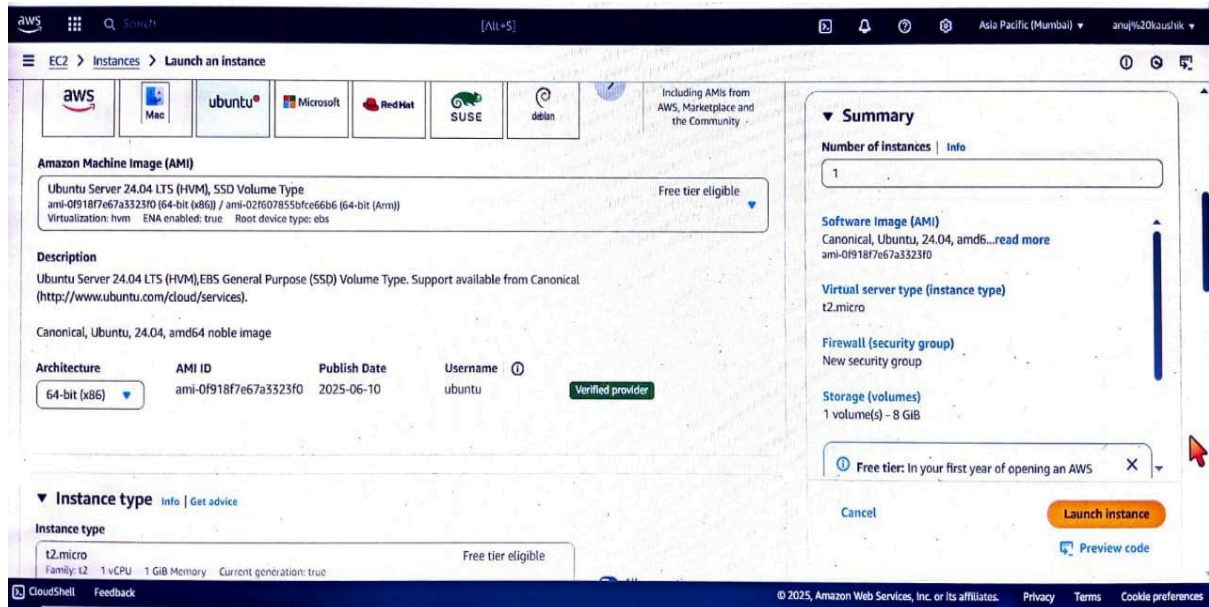


Figure 1: EC2 Instance Launch Page (t2.micro)

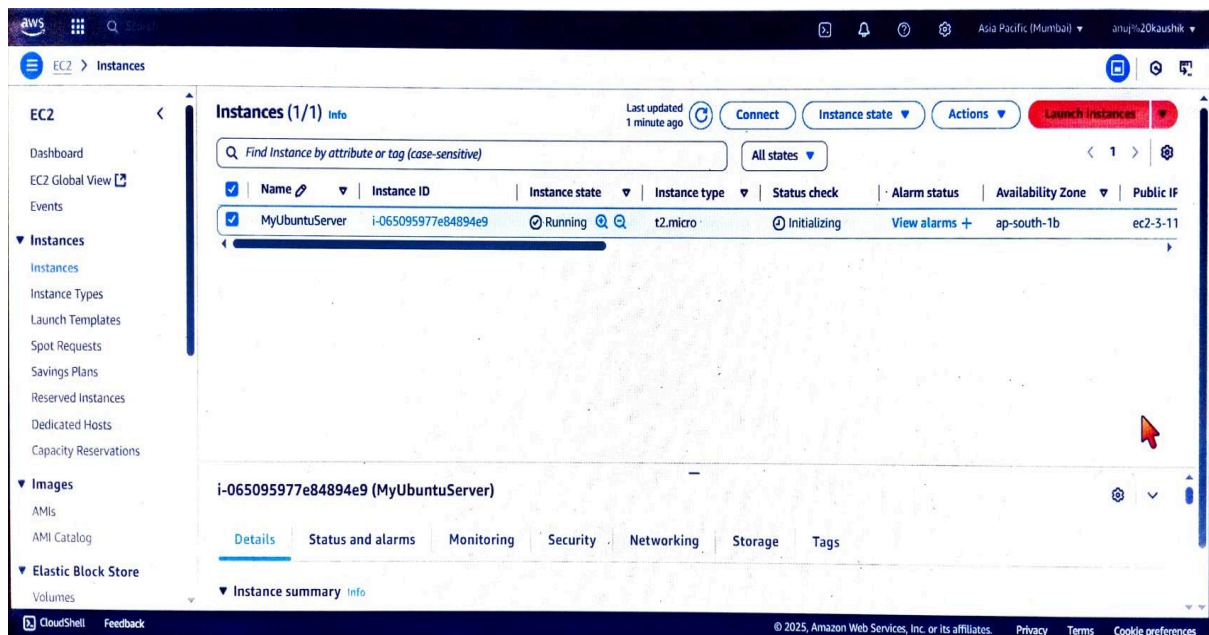


Figure 2: EC2 Instance in Running State

2 Connect to EC2 & Install Apache + PHP

SSH connection:

```
ssh -i "key.pem" ubuntu@<EC2-Public-IP>
```

Update & install:

```
sudo apt update && sudo apt upgrade -y
sudo apt install apache2 -y
sudo apt install php libapache2-mod-php -y
sudo systemctl status apache2
```

```
see "man sudo_root" for details.
ubuntu@ip-172-31-11-220:~$ sudo apt update && sudo apt install apache2 -y
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:9 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:10 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:11 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:12 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1155 kB]
Get:13 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [243 kB]
Get:14 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [161 kB]
Get:15 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [1088 kB]
Get:16 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [276 kB]
Get:17 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [376 kB]
Get:18 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [26.0 kB]
Get:19 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [1250 kB]
Get:20 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [265 kB]
Get:21 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:22 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [21.7 kB]
Get:23 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [4788 B]
Get:24 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:25 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [592 B]
Get:26 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Packages [39.2 kB]
Get:27 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main Translation-en [8676 B]
Get:28 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7096 B]
Get:29 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [272 B]
```

Figure 3: SSH Terminal — Apache Install Output

```

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-172-31-11-220:~$ 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 Tue 2025-06-24 10:28:13 UTC; 10s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 8702 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
  Main PID: 8705 (apache2)
    Tasks: 6 (limit: 1124)
   Memory: 10.6M (peak: 10.8M)
      CPU: 41ms
   CGroup: /system.slice/apache2.service
           └─8705 /usr/sbin/apache2 -k start
             └─8708 /usr/sbin/apache2 -k start
               └─8709 /usr/sbin/apache2 -k start
                 └─8710 /usr/sbin/apache2 -k start
                   └─8711 /usr/sbin/apache2 -k start
                     └─8712 /usr/sbin/apache2 -k start

Jun 24 10:28:13 ip-172-31-11-220 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Jun 24 10:28:13 ip-172-31-11-220 systemd[1]: Started apache2.service - The Apache HTTP Server.
ubuntu@ip-172-31-11-220:~$
```

Figure 4: Apache Service Status

3 EBS Volume Create + Attach + Mount

- Created new EBS volume and attached to EC2
- Verified

lsblk

sudo mkfs.ext4 /dev/xvdf

sudo mkdir /data

sudo mount /dev/xvdf /data

sudo df -h

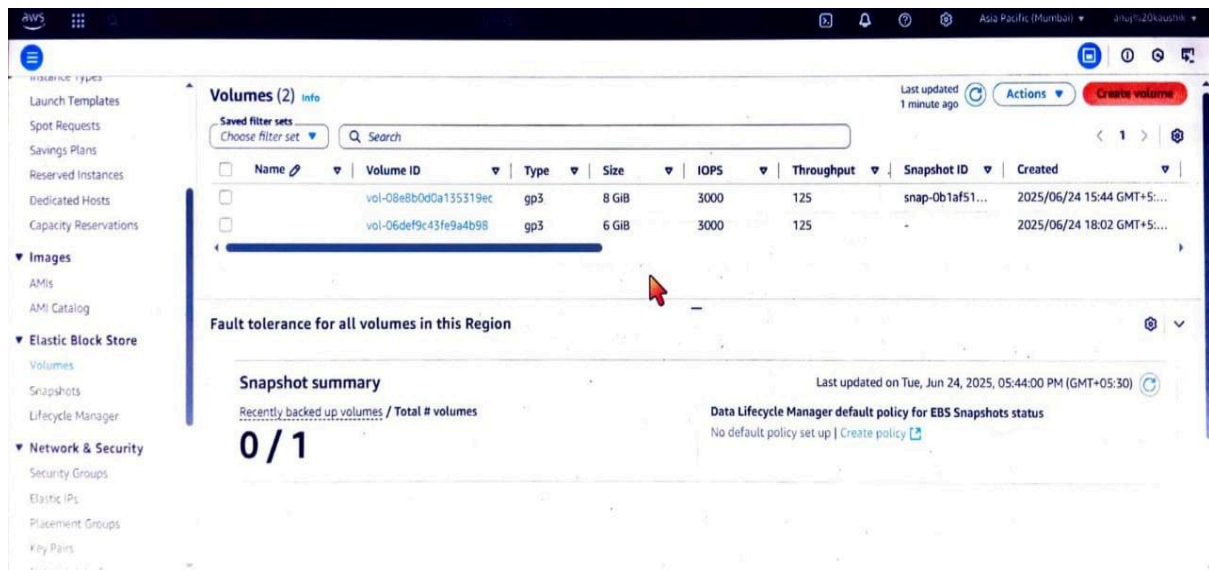


Figure 5: EBS Created and Attached (AWS Console)

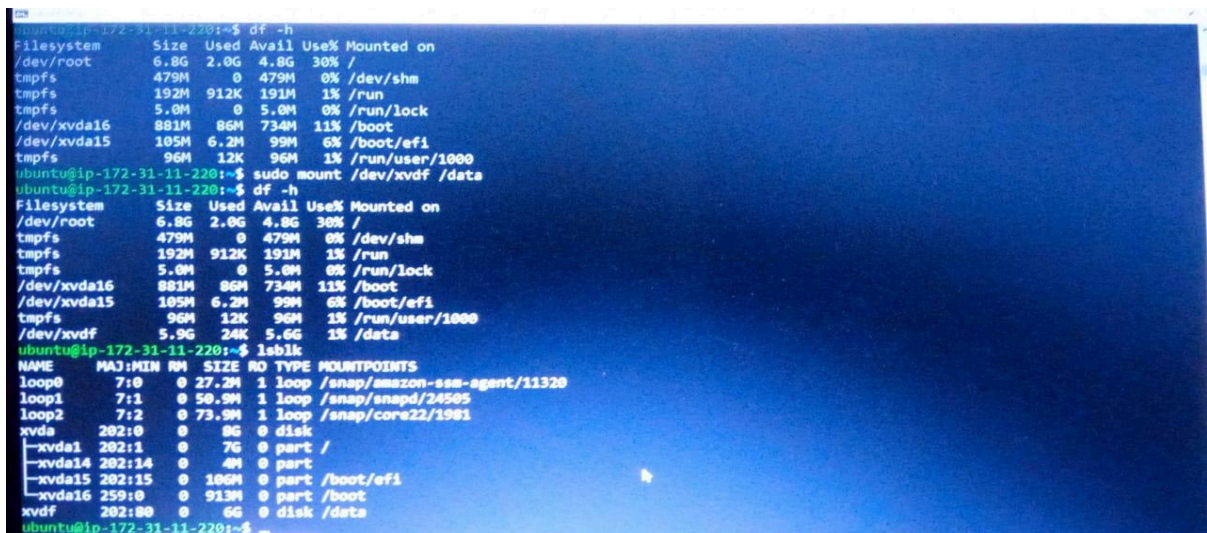


Figure 6: Terminal Output (lsblk and mount)

4 Simple PHP App

Created index.php:

```
sudo nano /var/www/html/index.php
```

Code:

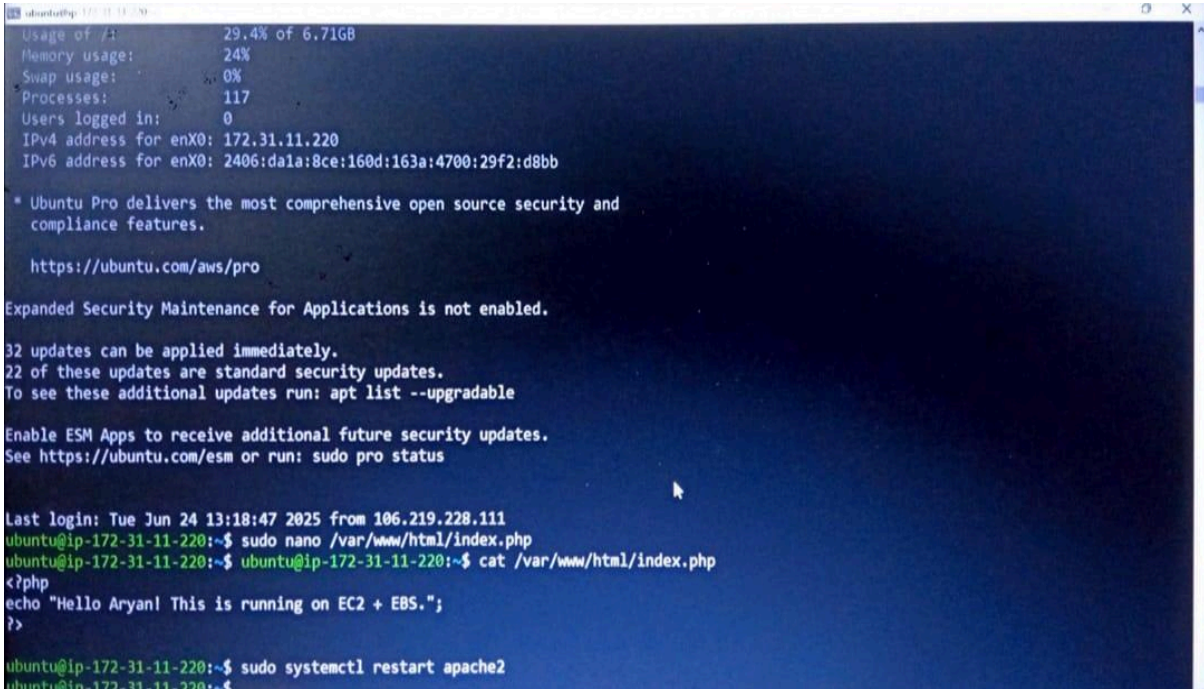
```
<?php
echo "Hello Aryan! EC2 + EBS + AMI is working.";
?>
```

Restart Apache:

```
sudo systemctl restart apache2
```

Test in browser:

```
http://<EC2-Public-IP>
```



```
ubuntu@ip-172-31-11-220:~$
Usage of /:          29.4% of 6.71GB
Memory usage:       24%
Swap usage:         0%
Processes:          117
Users logged in:    0
IPv4 address for enX0: 172.31.11.220
IPv6 address for enX0: 2406:dala:8ce:160d:163a:4700:29f2:d8bb

* Ubuntu Pro delivers the most comprehensive open source security and
compliance features.

https://ubuntu.com/aws/pro

Expanded Security Maintenance for Applications is not enabled.

32 updates can be applied immediately.
22 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

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

Last login: Tue Jun 24 13:18:47 2025 from 106.219.228.111
ubuntu@ip-172-31-11-220:~$ sudo nano /var/www/html/index.php
ubuntu@ip-172-31-11-220:~$ cat /var/www/html/index.php
<?php
echo "Hello Aryan! This is running on EC2 + EBS.";
?>

ubuntu@ip-172-31-11-220:~$ sudo systemctl restart apache2
ubuntu@ip-172-31-11-220:~$
```

Figure 7: index.php Source Code

Hello Aryan! This is running on EC2 + EBS.

Figure 8: Final App Output in Browser

5 Create AMI

- EC2 → Actions → Create Image
- Name: **Aryan-EC2-PHP-App**

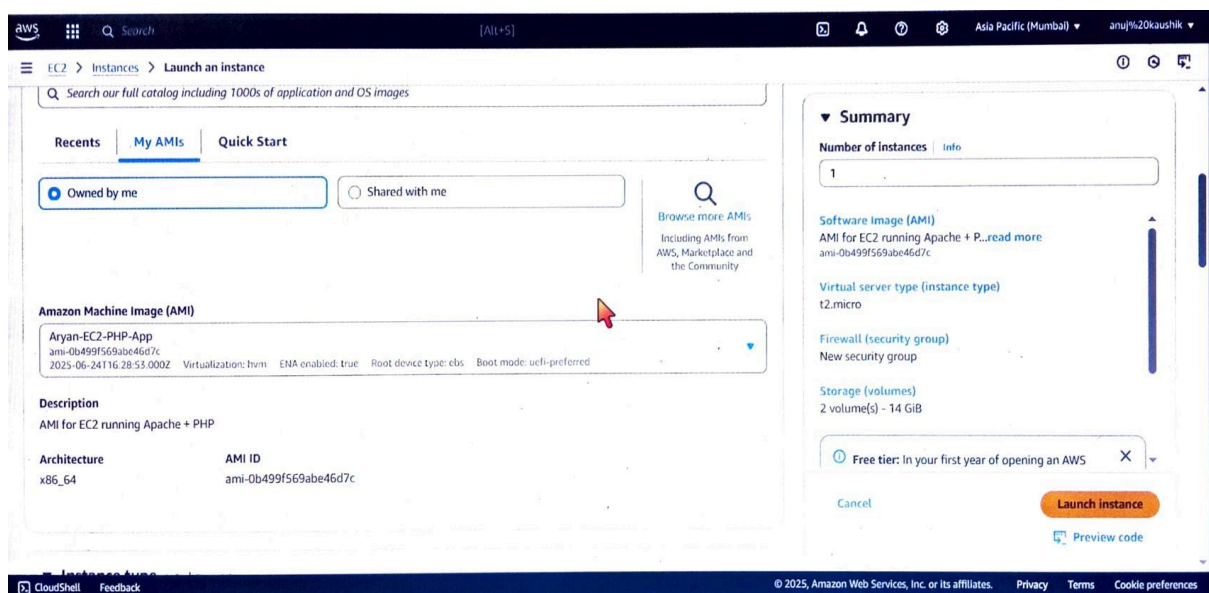


Figure 9: AMI Creation Page

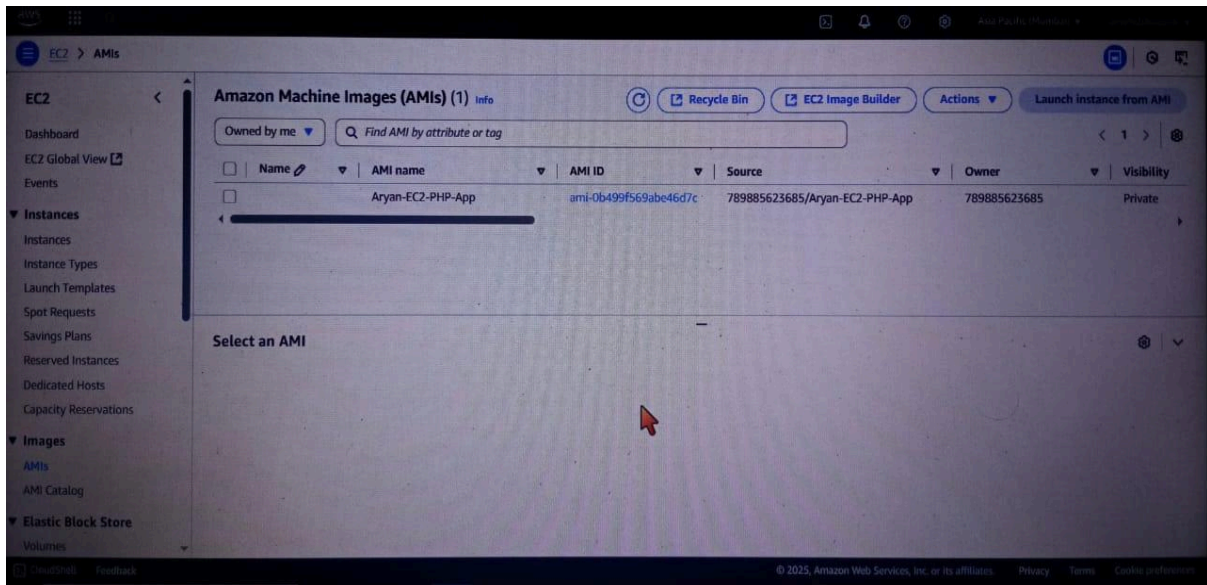


Figure 10: AMI Created and Available in AMIs List

6 Launch New EC2 From AMI

- Launched EC2 using created AMI
- Connected and verified app

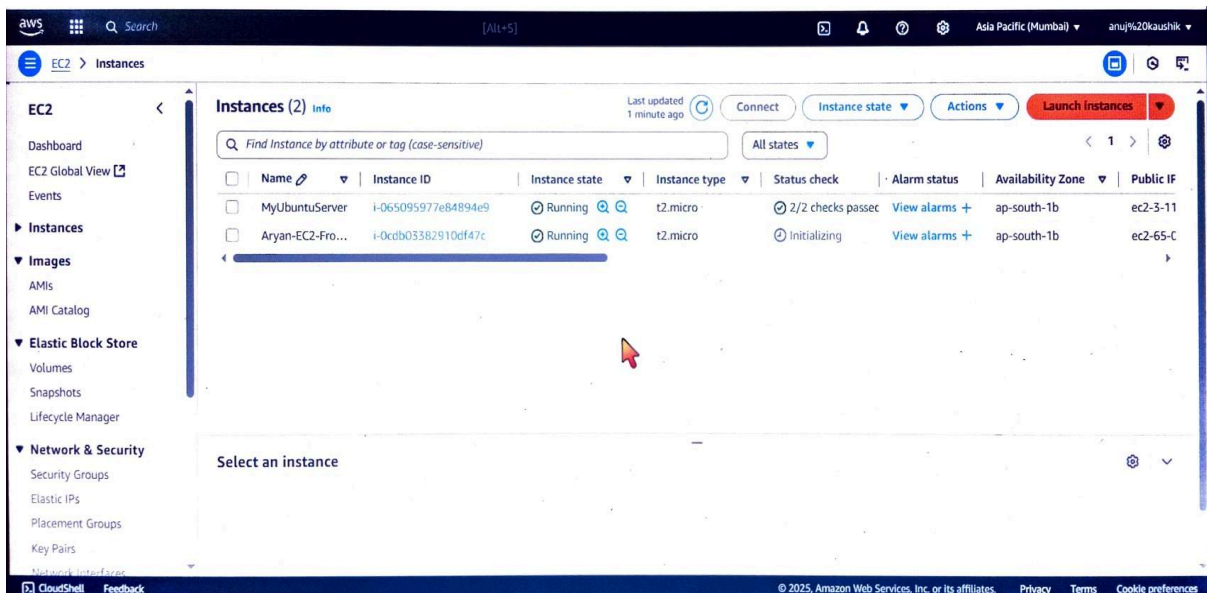


Figure 11: New EC2 Created from AMI



Hello Aryan! This is running on EC2 + EBS.

Figure 12: Final App Output in Browser from New EC2

Conclusion

This project successfully demonstrated:

- ✓ Launching an EC2 instance with Apache2 + PHP
- ✓ Attaching and using EBS for storage
- ✓ Creating an AMI for backup/reuse
- ✓ Launching new EC2 instance using AMI

This ensures that server setups can be replicated quickly and reliably in AWS.