AWS Cloud Infrastructure Deployment and Automation

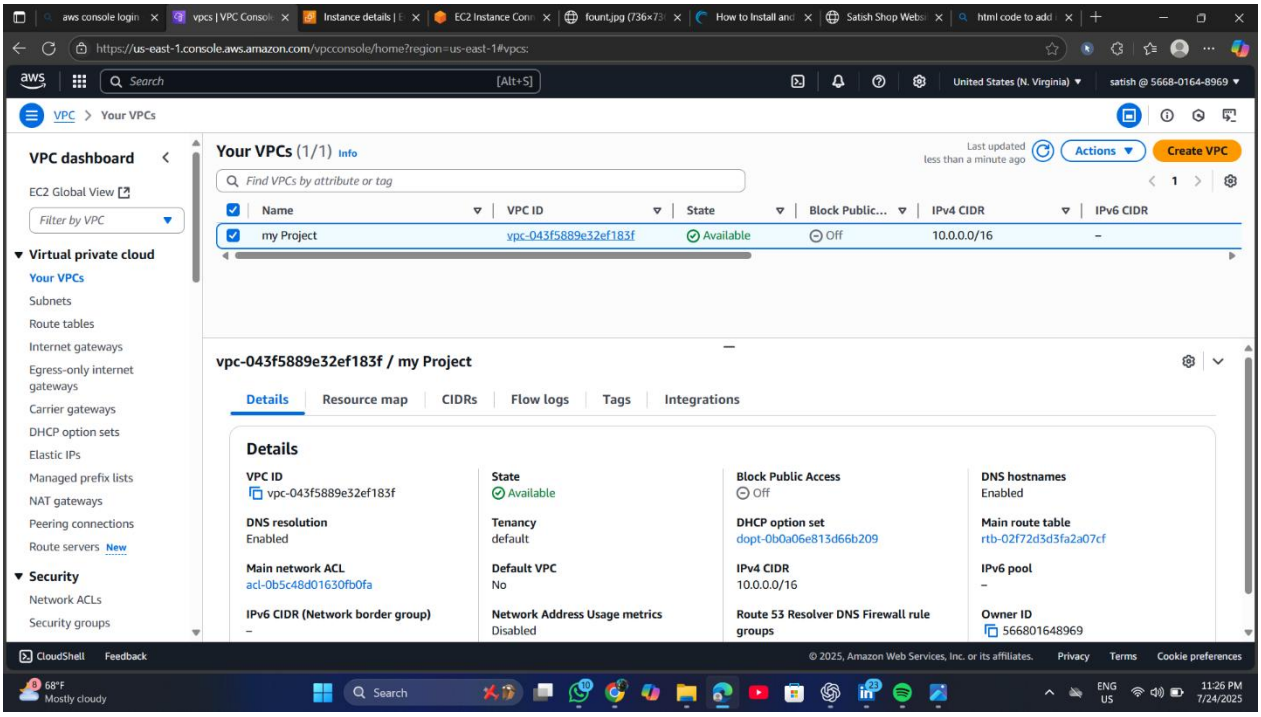
1. Create a VPC

What:
A Virtual Private Cloud (VPC) is a logically isolated section of AWS where you launch AWS resources.

How:

- In AWS Console, go to **VPC**, click **Create VPC**.
- Choose default or custom settings (CIDR block, subnets, etc).

Why:
This isolates your application's network for security and control.



2. Create S3 and Upload File

What:
S3 is Amazon's object storage.

How:

- In AWS Console, go to **S3**, **Create Bucket**.
- Upload files (e.g., static assets or media for your app).

Why:
S3 is used for storing files, static data, backups, etc.

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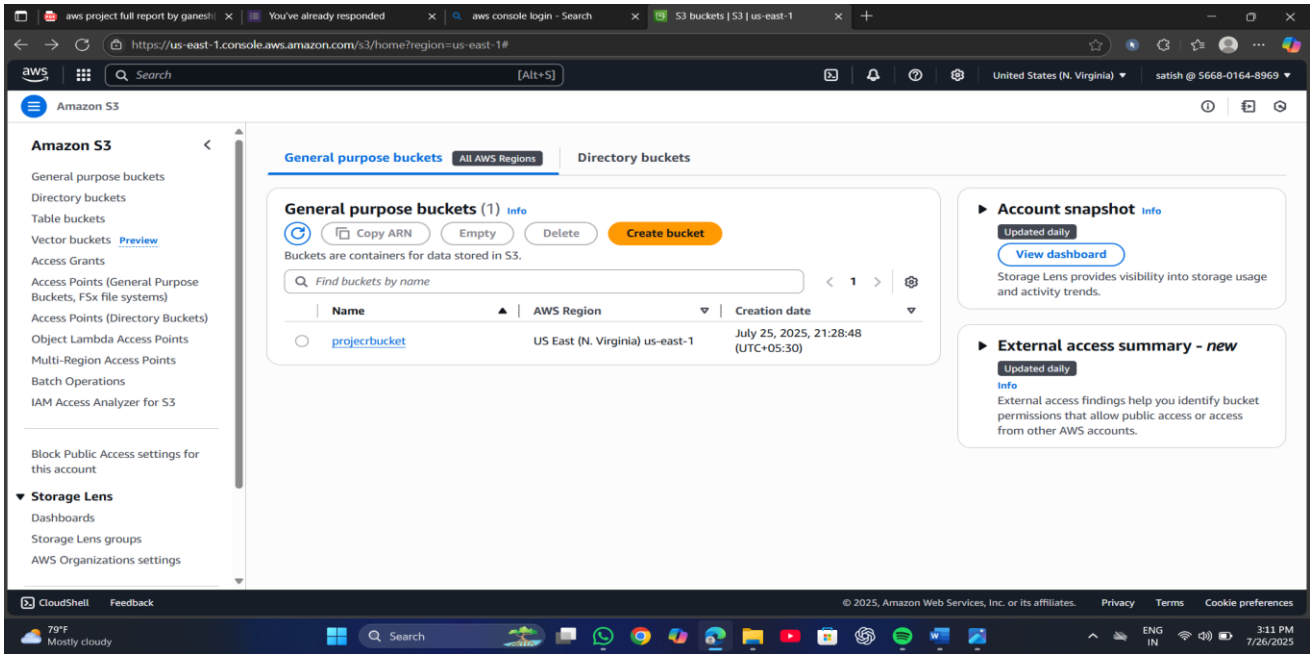


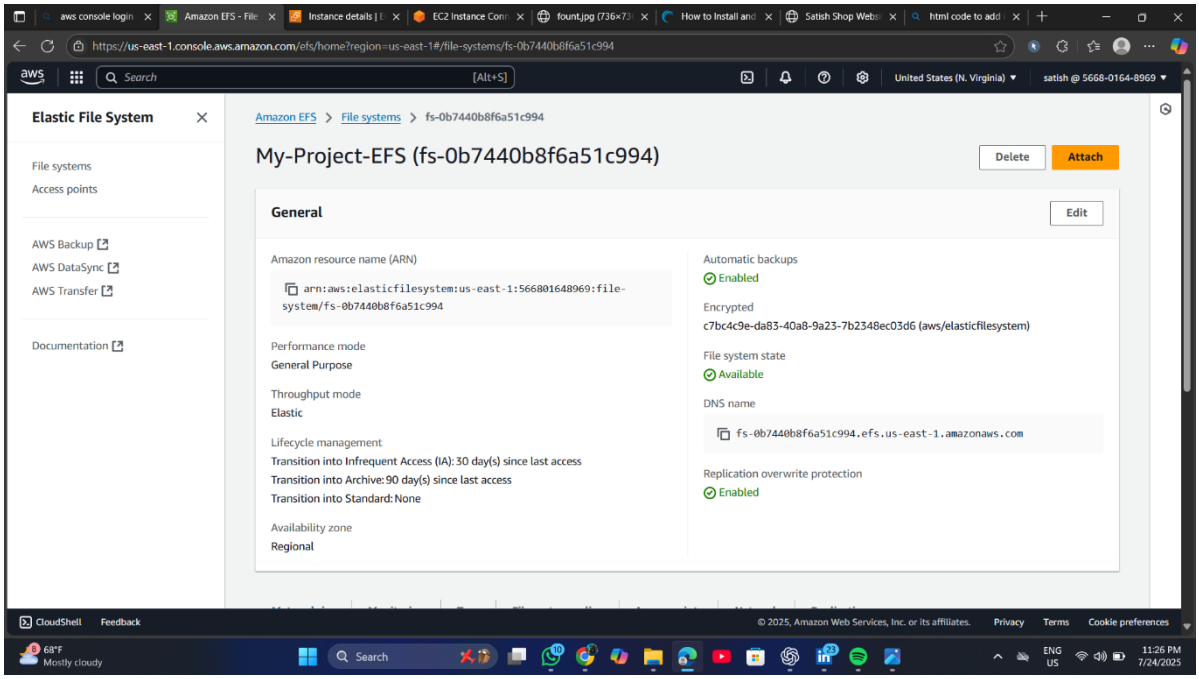
3. Create EFS

What:
EFS (Elastic File System) is scalable file storage for use with EC2.

How:

- Go to EFS, **Create file system**.
- Set up mount targets, security groups.

Why:
EFS can be mounted on multiple EC2s at once, useful for sharing files or app data.



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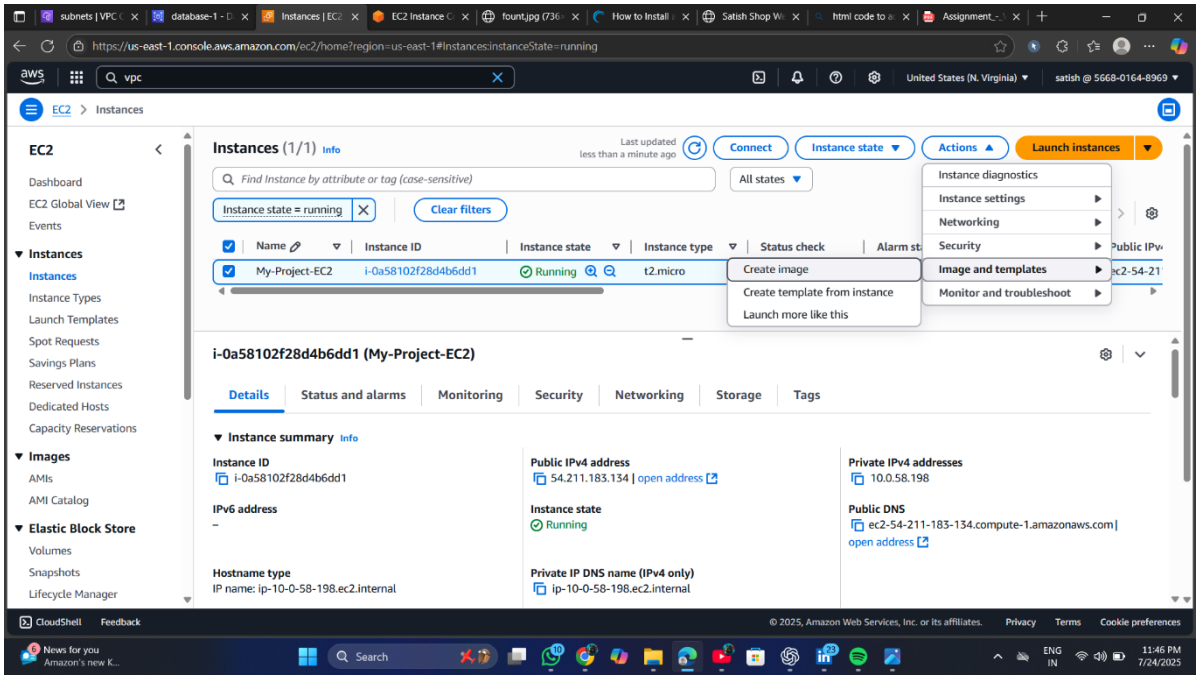
4. Launch EC2, Install Nginx, Configure index.html

What:
EC2 are the virtual servers. Nginx is a web server.

How:

- Launch an EC2 instance (Amazon Linux/Ubuntu).
- SSH into instance.
- Install nginx: #bash sudo apt update sudo apt upgrade sudo apt install nginx sudo systemctl status nginx
- Create and edit /var/www/html/index.html.

Why:
This is your web server that will host your app site.



5. Login to Your Ubuntu Instance

What:
SSH into your EC2 machine to perform administrative tasks.

How: bash ssh -i your-key.pem

ubuntu@<public-ip>

Use your PEM key and the public IP from the AWS console.

6. Update & Upgrade OS (on EC2)

What:

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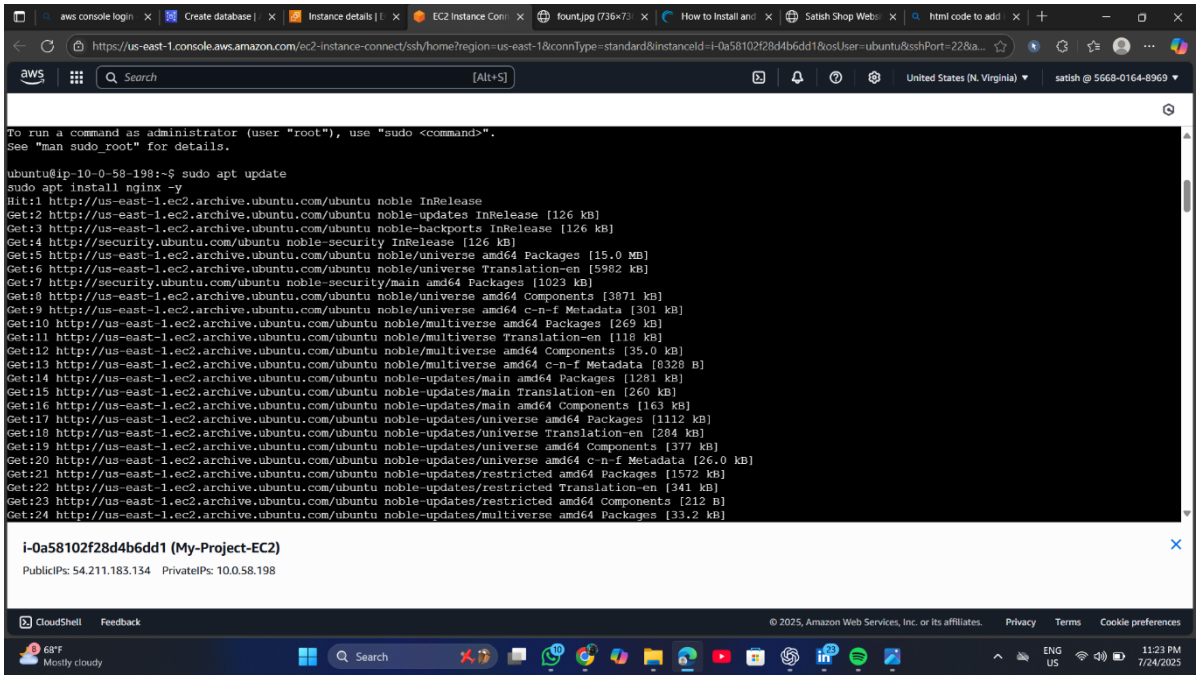
Keeps your system secure and up to date.

How: bash sudo

apt update sudo

apt upgrade



7. Install and Check Nginx

How: #bash

sudo apt install nginx sudo systemctl status

nginx This installs and checks if nginx is

running. sudo unlink /etc/nginx/sites-

enabled/default sudo apt update

sudo systemctl status nginx

sudo mkdir -p /var/www/satish.shop/html sudo ln -s /etc/nginx/sites-

available/satish.shop /etc/nginx/sites-enabled/

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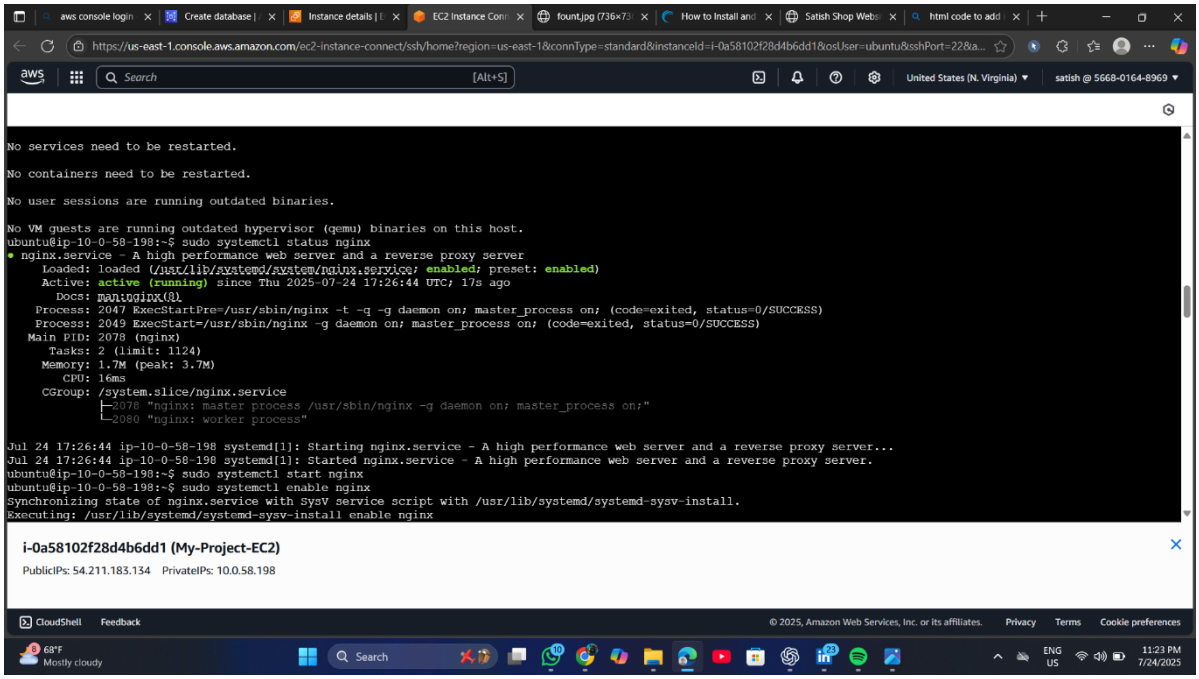

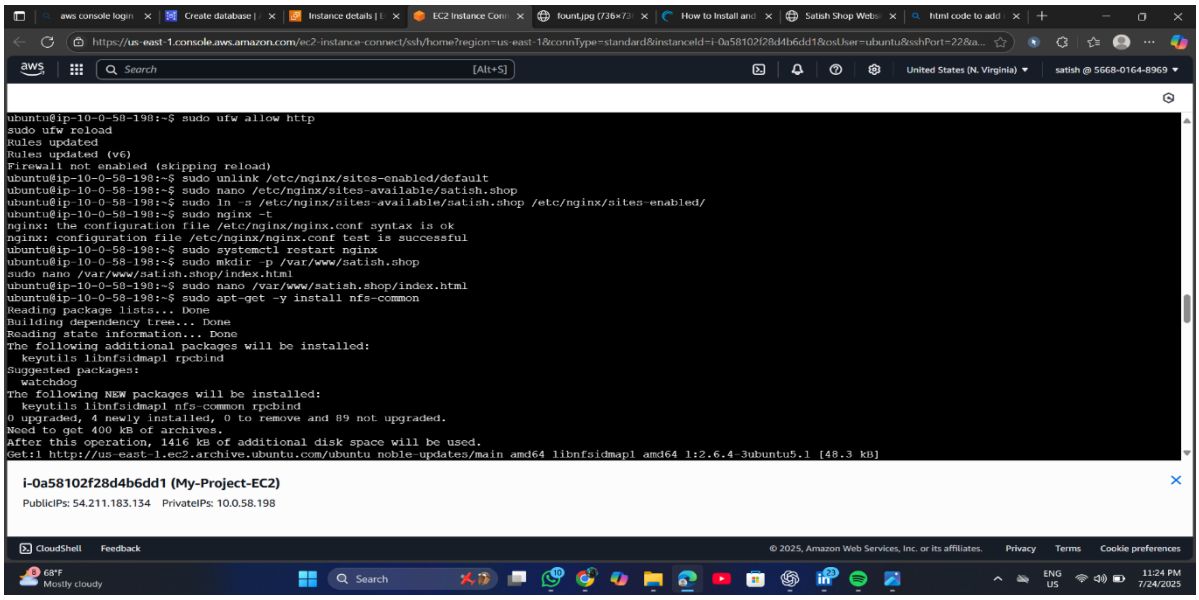

8. Continue Nginx Setup (via Blog)

Follow the instructions from the linked Linode blog (from the "Use NGINX #" step onwards) for further nginx configuration.

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bash

sudo apt-get -y install nfs-common

2. **Mount EFS volume** (replace fs-xxxx with your EFS file system id):

bash

3. Create or move your index.html as needed.

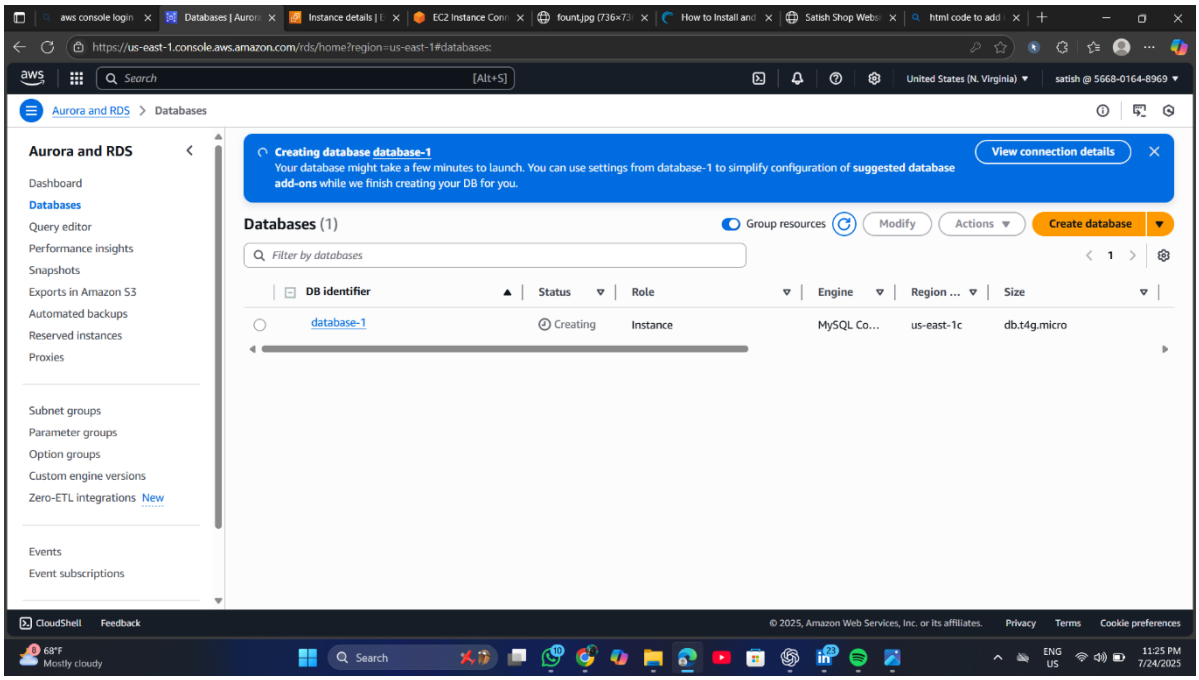
10. Create RDS Database

What:

RDS is AWS's managed relational database.

How:

- Go to **RDS** > **Create database**
- Choose DB engine (MySQL, Postgres, etc.)
- Set username, password, instance type.
- Create data base



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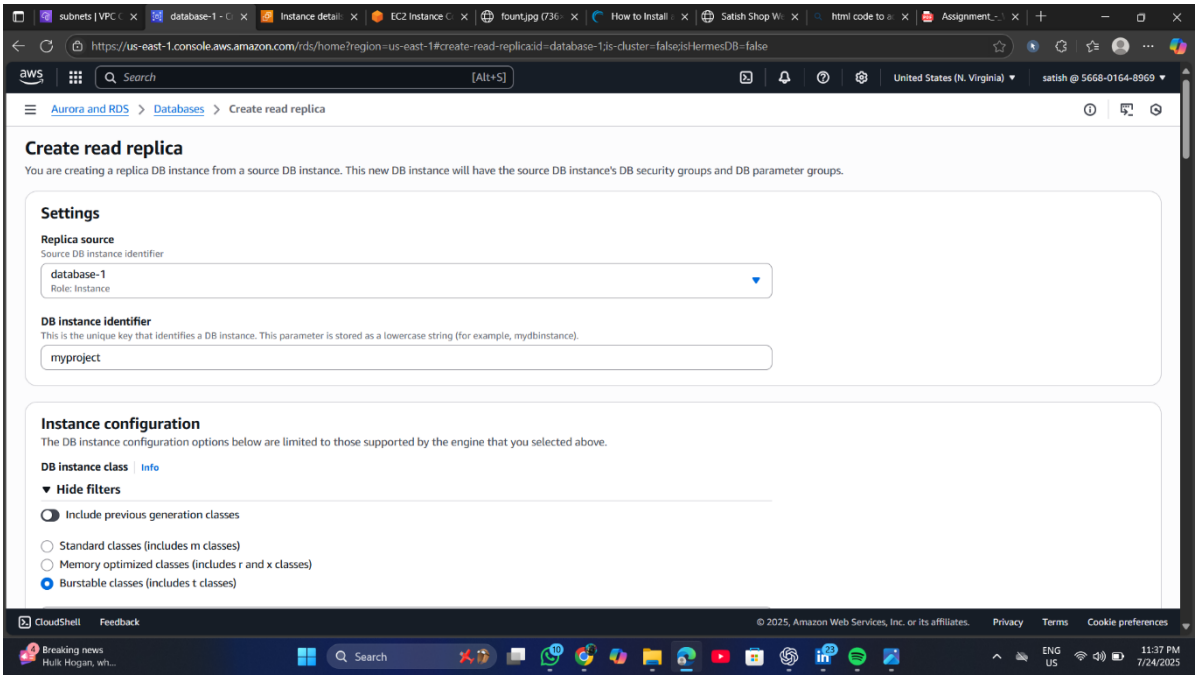
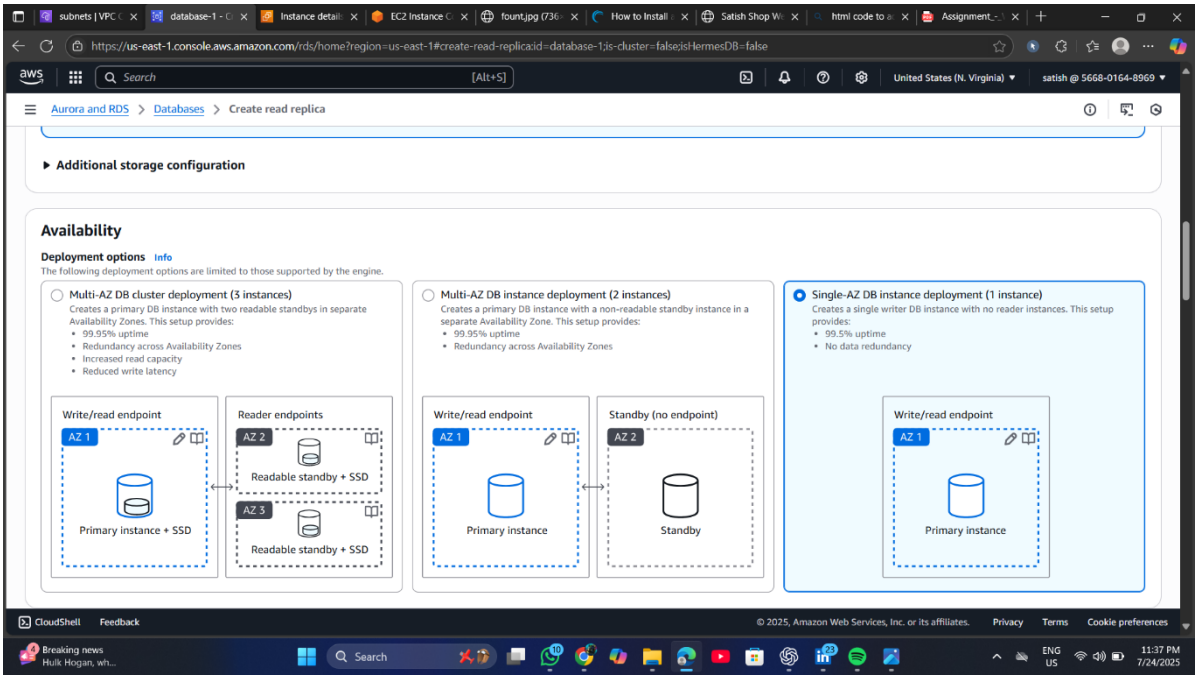
11. Create a Read Replica (Optional)

What/Why:
Improves scalability by offloading reads from the primary database.

How:

- In your RDS instance, select **Create read replica**.





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12. Connect EC2 to RDS How:

1. Install MySQL client:

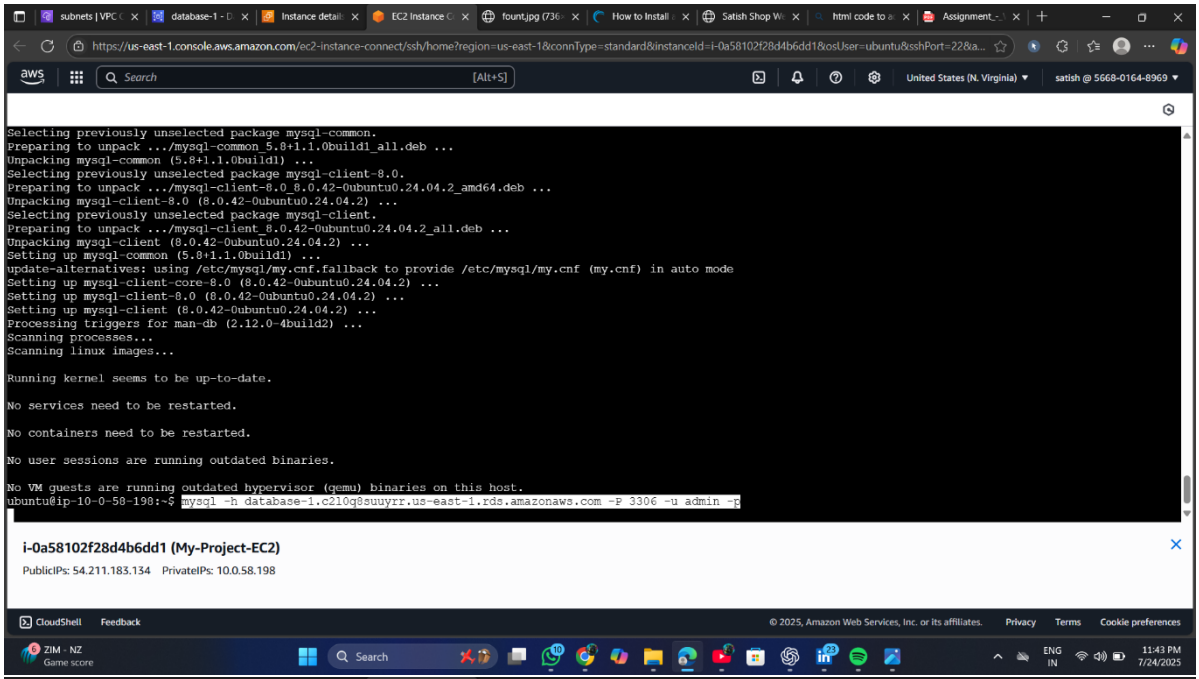
   bash sudo apt-get install mysql-

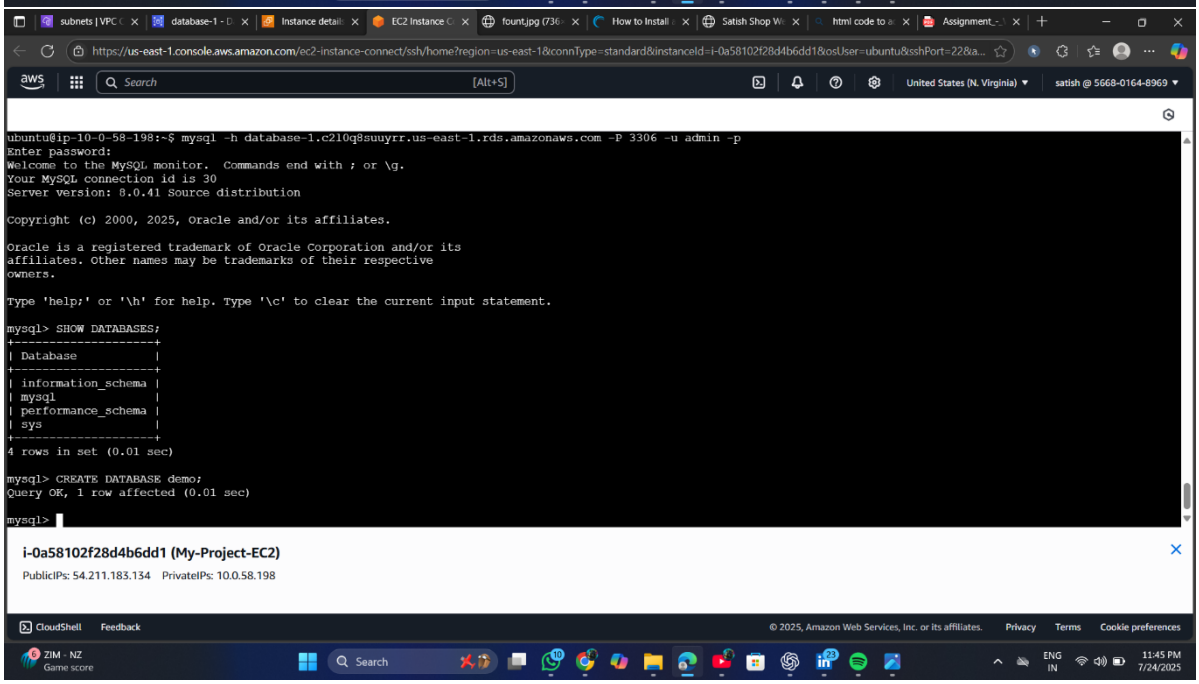
   client

2. Connect to the DB:

   bash

   mysql -h database-1.c210q8suuyrr.us-east-1.rds.amazonaws.com -P 3306 -u admin -p





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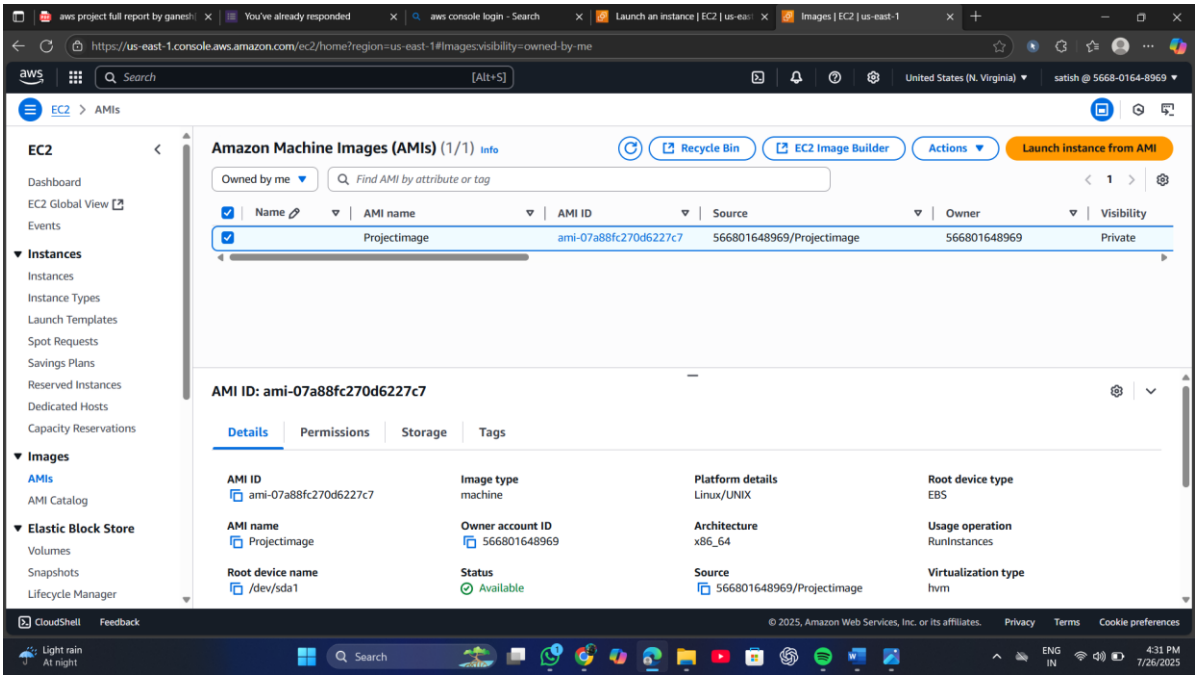
13. Create AMI

What:
AMI (Amazon Machine Image): A snapshot/template of your EC2 instance.

Why:
Allows quick scaling or disaster recovery.

How:

- Select EC2 instance, -> Actions -> Image and Templates -> Create Image.



14. Configure ALB (Application Load Balancer) and ASG (Auto Scaling Group)

What:

- **ALB:** Distributes incoming traffic to multiple EC2 instances.
- **ASG:** Automatically adjusts the number of EC2 instances based on demand.

How:

1. **Create ALB:**
    - Go to **EC2 > Load Balancers**.
    - Click **Create Load Balancer** > **Application Load Balancer**.
    - Set up listeners (usually HTTP & HTTPS), choose subnets, and security groups.
    - Register your EC2 instances (or the target group that will auto-register them via ASG).
2. **Create Launch Template/Configuration:**

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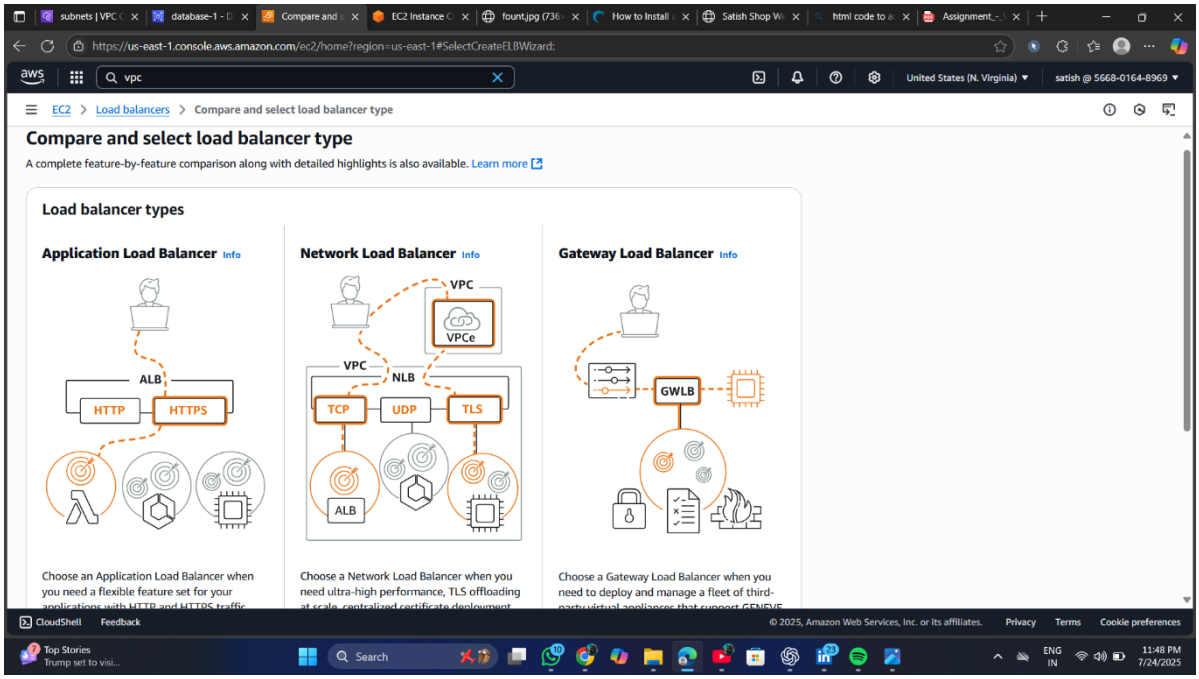
- Go to **EC2 > Launch Templates** and click **Create launch template**.
- Reference your previously created AMI.

3. **Create Auto Scaling Group:**
   - In **EC2 > Auto Scaling Groups**, click **Create Auto Scaling group**.
   - Pick your launch template (from the previous step).
   - Select VPC, subnets, and attach your Target Group (from the ALB).
   - Define min, max, and desired number of EC2 instances.
   - Set scaling policies (optional, for automatic scaling based on CPU/memory, etc.).



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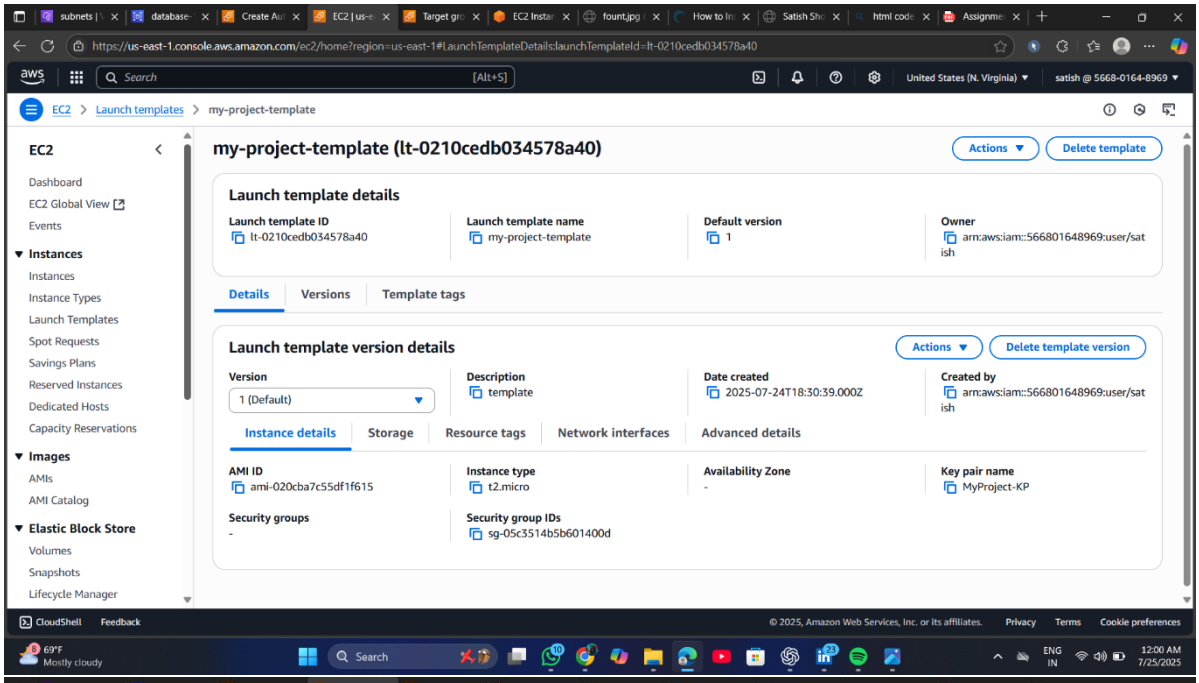

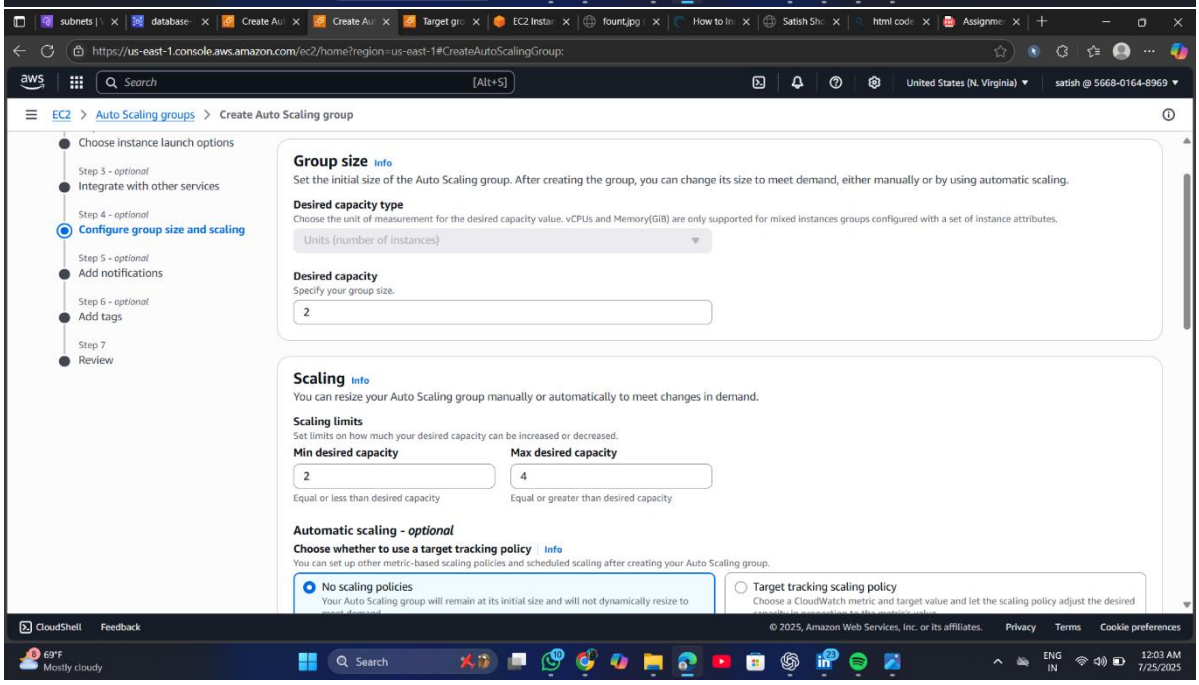

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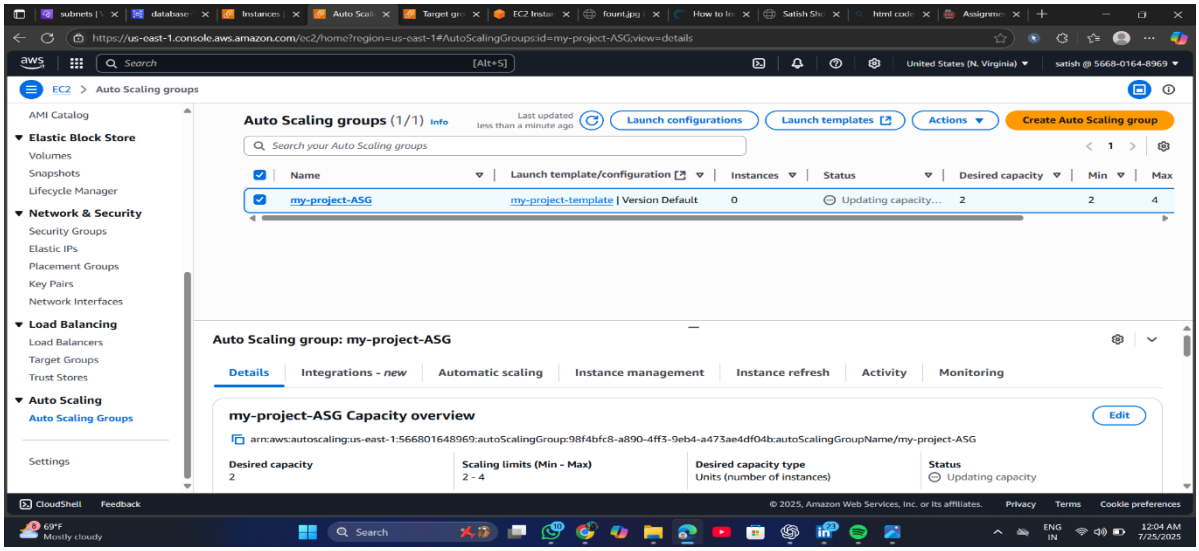


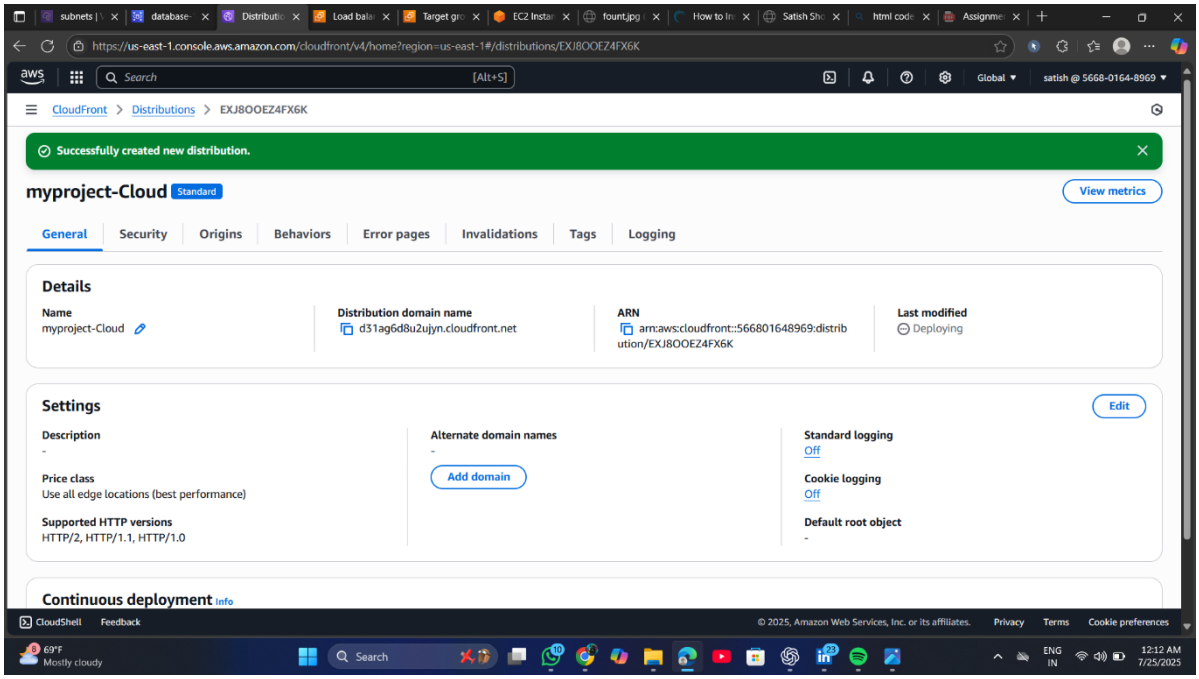
15. Create and Configure CloudFront with ALB

What:

CloudFront is AWS's global Content Delivery Network (CDN); it caches and distributes content closer to users worldwide.

How:

1. Go to **CloudFront > Distributions > Create Distribution**.
2. For origin, enter your ALB's DNS name (found in EC2 > Load Balancers).
3. Configure whether to use HTTP or HTTPS (set up certificates as needed).
4. Customize cache behavior, price class, and any desired settings.
5. Click **Create Distribution**. CloudFront assigns a Distribution Domain Name (e.g., d1xyz.cloudfront.net).



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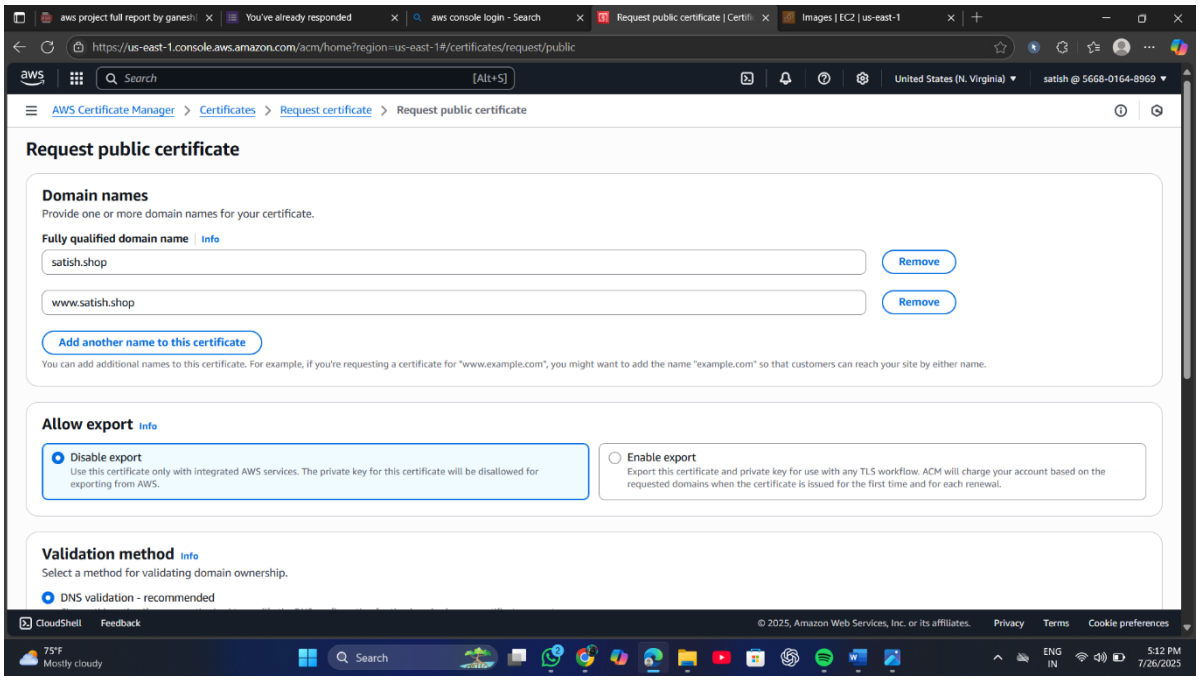
16. Create CNAME, Update Route 53 Records from ACM

What:

- **ACM (AWS Certificate Manager):** Issues SSL/TLS certificates for HTTPS.
- **Route 53:** AWS DNS service.

How:

1. In **ACM** (Certificate Manager), request a new certificate for your domain.
2. ACM will provide a CNAME record for DNS validation.
3. Go to **Route 53 > Hosted zones**, and for your domain, **create a new CNAME record** with the name and value provided by ACM (for validation).
4. Wait for certificate validation (ACM status will update to "Issued").
5. Later, **in Route 53**, add/modify DNS records to point your domain/subdomain to your ALB or CloudFront:
    - **A/AAAA Alias** record for root/apex domains.
    - **CNAME** for subdomains.



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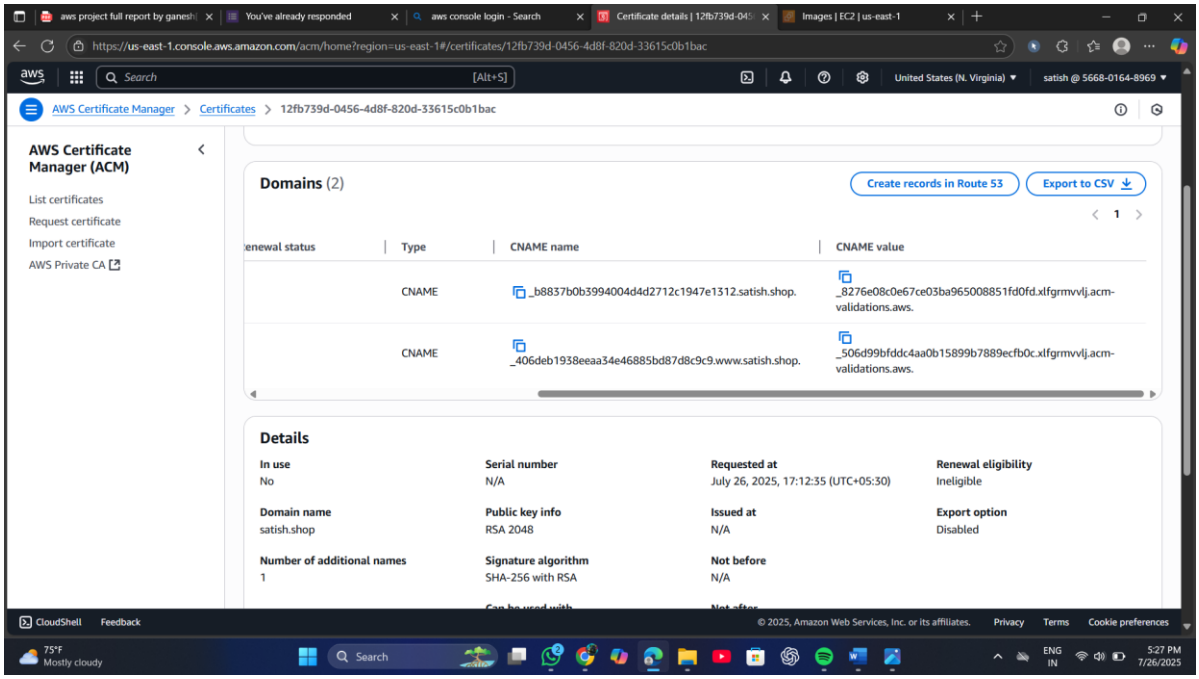

17. Buy Domain, Use Route 53

How:

1. In **Route 53 > Registered Domains**, click **Register Domain** and search for your desired name.
2. Complete the registration and payment steps.
3. After registration, AWS sets up a Hosted Zone for your domain.
4. If using another registrar, update your domain's nameservers to those provided by AWS Route 53.

18. Configure Route 53 with CloudFront

How:

1. In **Route 53 > Hosted zones**, select your domain.
2. Create a new record:
    - **Type:** A or AAAA (Alias).
    - **Name:** (e.g., www or leave blank for the root domain).
    - **Alias:** Yes.
    - **Alias Target:** Select your CloudFront distribution's domain name (shows in dropdown if in the same account).
3. Save the record.

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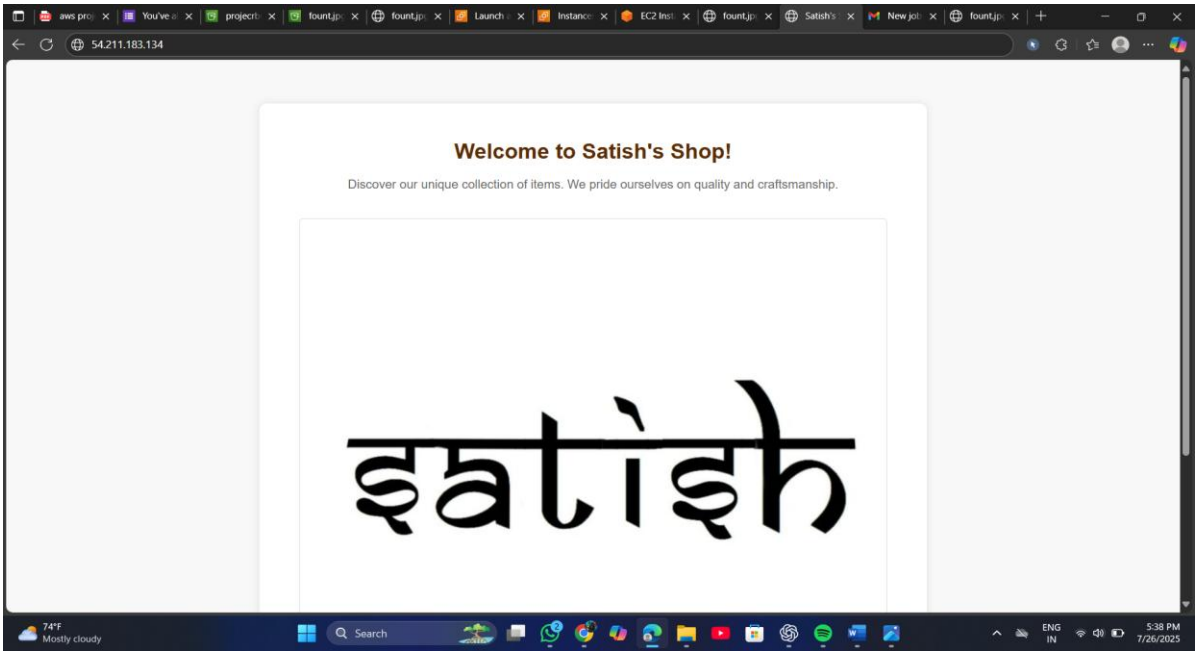

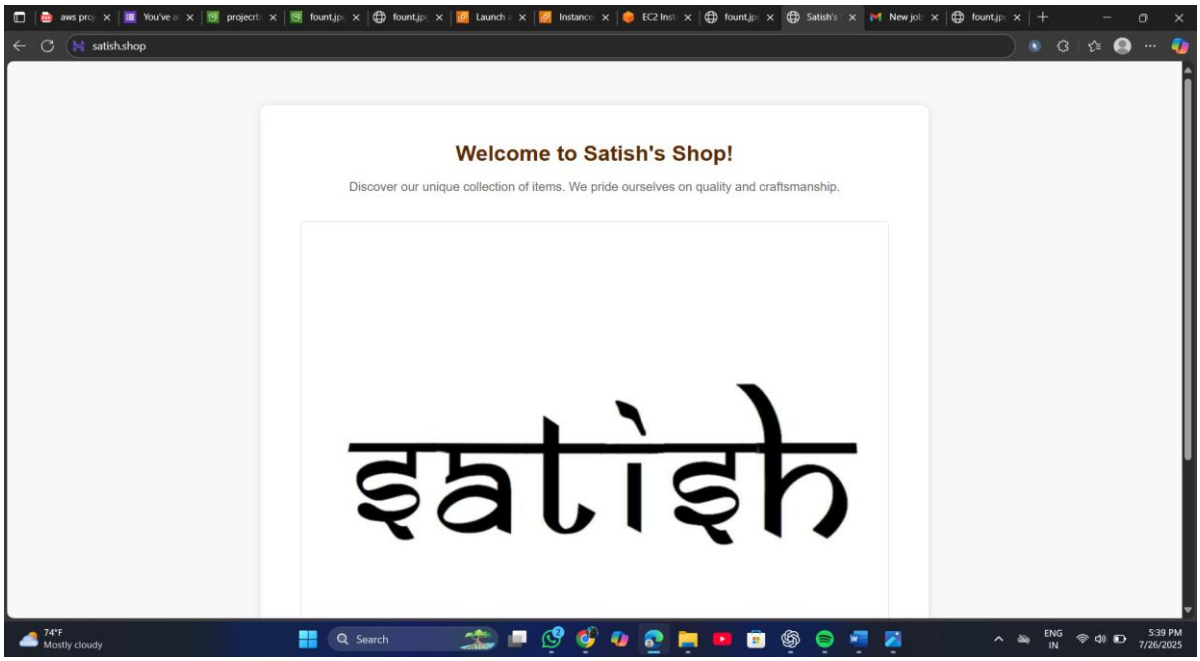

Now, internet users who visit your domain will:

- Be routed via Route 53 (DNS).
- Go through CloudFront (CDN/caching).
- Reach your Application Load Balancer (ALB).
- Get served by available EC2 instances (managed by Auto Scaling Group—ASG).
- Benefit from secure HTTPS (provided by ACM certificate).

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