

**Industry:** Healthcare

## Problem Statement:

How to secure patient records online and send it privately to the intended party

## Topics:

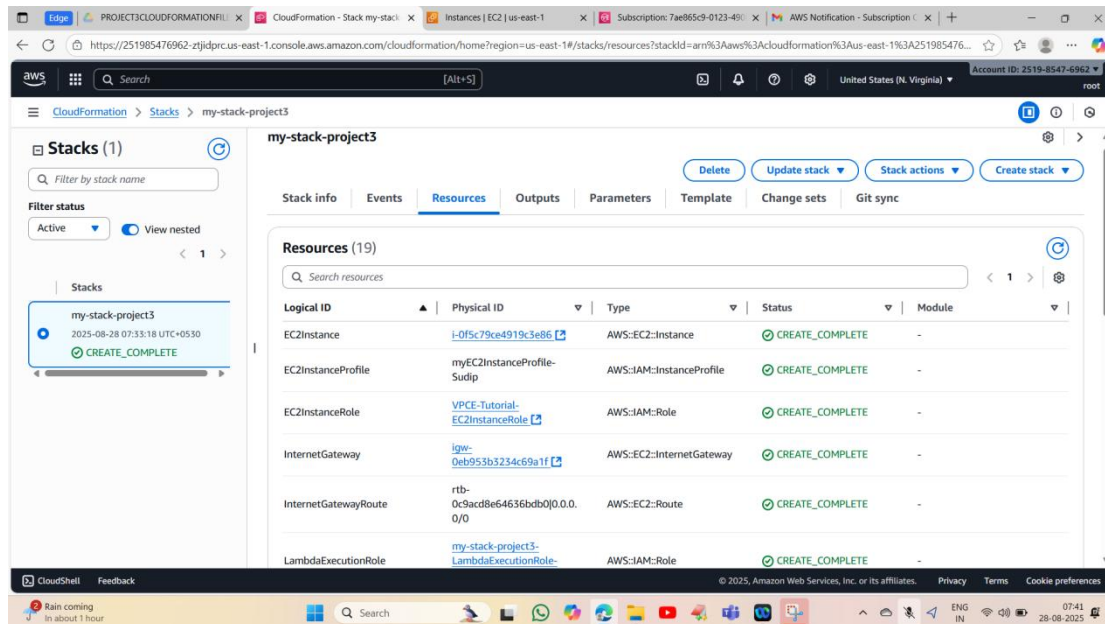
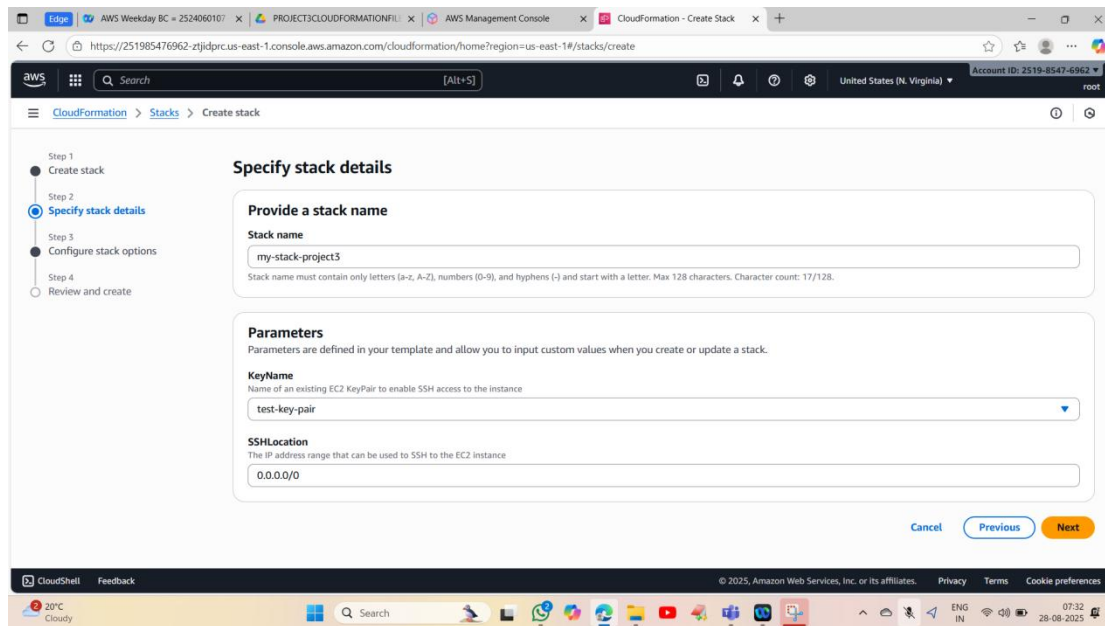
In this project, you will be working on a hospital project to send reports online and develop a platform so the patients can access the reports via mobile and push notifications. You will publish the report to an Amazon SNS keeping it secure and private. Your message will be hosted on an EC2 instance within your Amazon VPC. By publishing the messages privately, you can improve the message delivery and receipt through Amazon SNS.

## Highlights:

1. AWS CloudFormation to create a VPC
2. Connect VPC with AWS SNS
3. Publish message privately with SNS

### 1. AWS CloudFormation to create a VPC

The screenshot displays the AWS CloudFormation 'Create stack' wizard. The left sidebar shows the progress: Step 1 (Create stack), Step 2 (Specify stack details), Step 3 (Configure stack options), and Step 4 (Review and create). The main content area is titled 'Create stack' and includes a 'Prerequisite - Prepare template' section. Below this, the 'Specify template' section offers three options: 'Amazon S3 URL', 'Upload a template file' (which is selected), and 'Sync from Git'. The 'Upload a template file' option shows a file named 'PROJECT3CLOUDFORMATIONFILE.txt' being uploaded. The bottom of the screen shows the Windows taskbar with various application icons and the system clock indicating 07:28 on 28-08-2025.



Edge PROJECT3CLOUDFORMATIONFIL CloudFormation - Stack my-stack vpcs | VPC Console Subscriptions | Simple Notification AWS Notification - Subscription

https://251985476962-ztjidprc-us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#vpcs:

Account ID: 2519-8547-6963 United States (N. Virginia) root

### VPC dashboard

EC2 Global View

Filter by VPC

#### Virtual private cloud

- Your VPCs
- Subnets
- Route tables
- Internet gateways
- Egress-only internet gateways
- Carrier gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- NAT gateways
- Peering connections
- Route servers

#### Security

- Network ACLs
- Security groups

### Your VPCs (1/2) info

Find VPCs by attribute or tag

Name	VPC ID	State	Block Public...	IPv4 CIDR	IPv6 CIDR
<input checked="" type="checkbox"/> VPCE-Tutorial-VPC	vpc-055fa73af824fa751	Available	Off	10.0.0.0/16	-
<input type="checkbox"/> -	vpc-02196942317add486	Available	Off	172.31.0.0/16	-

### vpc-055fa73af824fa751 / VPCE-Tutorial-VPC

Details Resource map CIDRs Flow logs Tags Integrations

#### Details

VPC ID vpc-055fa73af824fa751	State Available	Block Public Access Off	DNS hostnames Enabled
DNS resolution Enabled	Tenancy default	DHCP option set dopt-0a70ccc0ef04464d3	Main route table rtb-0c428a17270868953
Main network ACL acl-055fa73af824fa751	Default VPC	IPv4 CIDR 10.0.0.0/16	IPv6 pool

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## Create SNS Subscription

Edge PROJECT3CLOUDFORMATIONFIL CloudFormation - Stack my-stack Instances | EC2 | us-east-1 Topics | Simple Notification Servi

https://251985476962-ztjidprc-us-east-1.console.aws.amazon.com/sns/v3/home?region=us-east-1#topics

Account ID: 2519-8547-6963 United States (N. Virginia) root

### Amazon SNS

- Dashboard
- Topics
- Subscriptions

#### Mobile

- Push notifications
- Text messaging (SMS)

### Topics (1)

Edit Delete Publish message Create topic

Search

Name	Type	ARN
<input checked="" type="radio"/> VPCE-Tutorial-Topic	Standard	arn:aws:sns:us-east-1:251985476962:VPCE-Tutorial-...

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Watchlist Ideas

EdgePROJECT3CLOUDFORMATIONFILCloudFormation - Stack my-stackInstances | EC2 | us-east-1Create subscription | Subscription |

https://251985476962-ztjdpc.us-east-1.console.aws.amazon.com/sns/v3/home?region=us-east-1#/create-subscription

Search[Alt+S]United States (N. Virginia)Account ID: 2519-8547-6962root

Amazon SNSSubscriptionsCreate subscription

Details

Topic ARN  
arn:aws:sns:us-east-1:251985476962:VPCE-Tutorial-Topic

Protocol  
The type of endpoint to subscribe  
Email

Endpoint  
An email address that can receive notifications from Amazon SNS.  
yellamma.187@gmail.com  
After your subscription is created, you must confirm it. Info

Subscription filter policy - optional Info  
This policy filters the messages that a subscriber receives.

Redrive policy (dead-letter queue) - optional Info  
Send undeliverable messages to a dead-letter queue.

CancelCreate subscription

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WatchlistIdeas

EdgePROJECT3CLOUDFORMATIONFILCloudFormation - Stack my-stackInstances | EC2 | us-east-1Subscription: 7ae865c9-0123-490b-a7ee-ccb9b581aa2a

https://251985476962-ztjdpc.us-east-1.console.aws.amazon.com/sns/v3/home?region=us-east-1#/subscription/arn:aws:sns:us-east-1:251985476962:VPCE-Tutorial-Topic:7ae865c9-0123-490b-a7ee-ccb9b581aa2a

Search[Alt+S]United States (N. Virginia)Account ID: 2519-8547-6962root

Amazon SNSTopicsVPCE-Tutorial-TopicSubscription: 7ae865c9-0123-490b-a7ee-ccb9b581aa2a

DashboardTopicsSubscriptionsMobilePush notificationsText messaging (SMS)

Subscription to VPCE-Tutorial-Topic created successfully.  
The ARN of the subscription is arn:aws:sns:us-east-1:251985476962:VPCE-Tutorial-Topic:7ae865c9-0123-490b-a7ee-ccb9b581aa2a.

Subscription: 7ae865c9-0123-490b-a7ee-ccb9b581aa2aEditDelete

Details

ARN  
arn:aws:sns:us-east-1:251985476962:VPCE-Tutorial-Topic:7ae865c9-0123-490b-a7ee-ccb9b581aa2a

Endpoint  
yellamma.187@gmail.com

Topic  
VPCE-Tutorial-Topic

Subscription Principal  
arn:aws:iam::251985476962:root

Status  
Pending confirmation

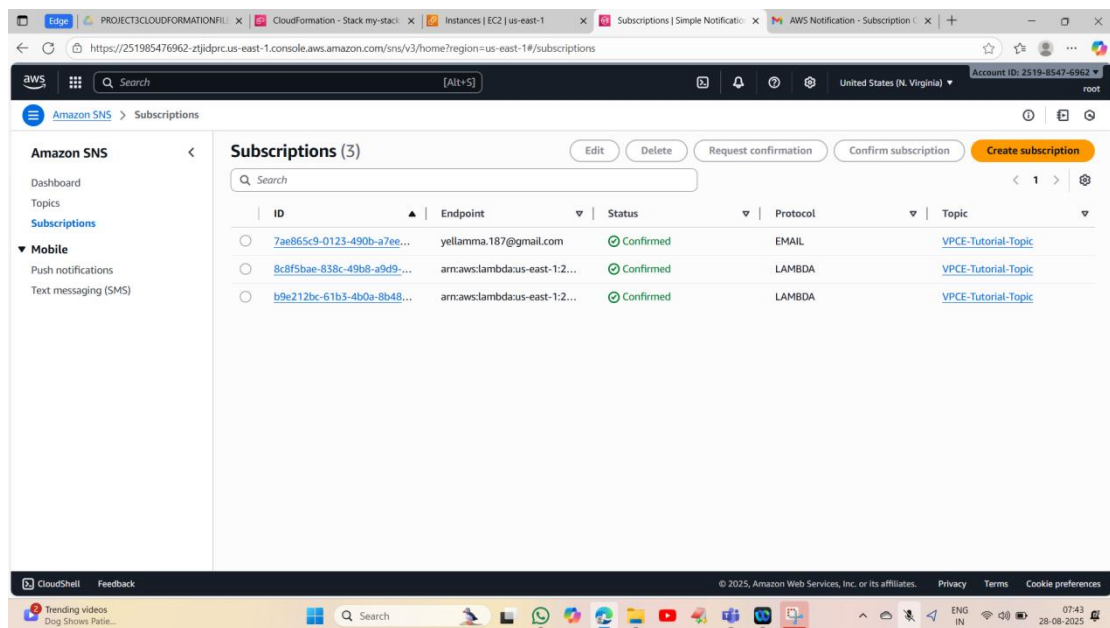
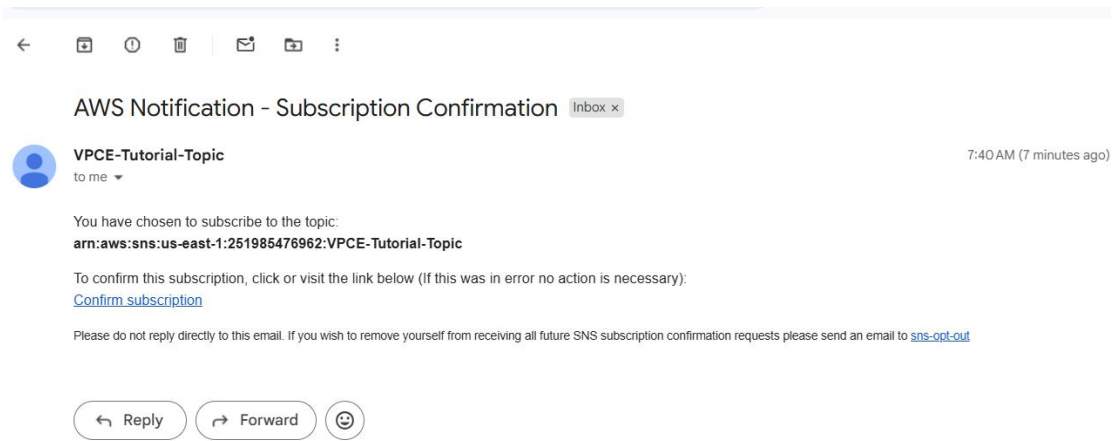
Protocol  
EMAIL

Subscription filter policyRedrive policy (dead-letter queue)

Subscription filter policy Info  
This policy filters the messages that a subscriber receives.

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WatchlistIdeas



## 2. Connect VPC with AWS SNS

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https://251985476962-ztjdpc.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateVpcEndpoint

Search [Alt+S] United States (N. Virginia) Account ID: 2519-8547-6962 root

VPC > Endpoints > Create endpoint

### Create endpoint Info

Create the type of VPC endpoint that supports the service, service network or resource to which you want to connect.

#### Endpoint settings

Specify a name and select the type of endpoint.

**Name tag - optional**  
Creates a tag with a key of 'Name' and a value that you specify. Tags help you find and manage your endpoint.

project3

**Type Info**  
Select a category

☒ **AWS services**  
Connect to services provided by Amazon with an interface endpoint, or a Gateway endpoint

☐ **PrivateLink Ready partner services**  
Connect to SaaS services which have AWS Service Ready designation with an Interface endpoint. Uses AWS PrivateLink

☐ **AWS Marketplace services**  
Connect to SaaS services that you have purchased through AWS Marketplace with an Interface Endpoint

☐ **EC2 Instance Connect Endpoint**  
An elastic network interface that allows you to connect to resources in a private subnet

☐ **Resources**  
Connect to resources like Amazon Relational Database Services (RDS) with a Resource endpoint. Uses AWS PrivateLink

☐ **Service networks**  
Connect to VPC Lattice service networks with a Service network endpoint. Uses AWS PrivateLink

☐ **Endpoint services that use NLBs and GWLBs**  
Find services shared with you by service name. Connect to a Network LoadBalancer (NLB) service with an interface endpoint or to a Gateway LoadBalancer (GWLB) service with a Gateway Load Balancer endpoint

**Services (1/1)**

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https://251985476962-ztjdpc.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateVpcEndpoint

Search [Alt+S] United States (N. Virginia) Account ID: 2519-8547-6962 root

VPC > Endpoints > Create endpoint

Service Name	Owner	Type	Service Region
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#### Network settings

Select the VPC in which to create the endpoint

**VPC**  
Create the VPC endpoint in the VPC in the same AWS Region from which you will access a resource.

vpc-055fa73af824fa751 (VPC-Tutorial-VPC)

**Additional settings**

**Subnets (1/6) Info**

Availability Zone	Subnet ID	Designate IP addresses	IPv4 address	IPv6 address
<input type="checkbox"/> use1-az2 (us-east-1a)	No subnet available			
<input checked="" type="checkbox"/> use1-az4 (us-east-1b)	subnet-0feac3ca772c82113	<input type="checkbox"/>		
<input type="checkbox"/> use1-az6 (us-east-1c)	No subnet available			
<input type="checkbox"/> use1-az1 (us-east-1d)	No subnet available			
<input type="checkbox"/> use1-az3 (us-east-1e)	No subnet available			
<input type="checkbox"/> use1-az5 (us-east-1f)	No subnet available			

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https://251985476962-ztjdpc.us-east-1.console.aws.amazon.com/vpconsole/home?region=us-east-1#CreateVpcEndpoint

Search [Alt+S] United States (N. Virginia) Account ID: 2519-8547-6962 root

VPC > Endpoints > Create endpoint

IPv6 Dualstack

Security groups (1/2) Info

Search

VPC ID: vpc-055fa73af824fa751 Clear filters

1

Group ID	Group name	VPC ID	Description
<input checked="" type="checkbox"/> sg-028056a14e879089c	Tutorial Security Group	vpc-055fa73af824fa751	Security group for SNS VPC endpointing tutorial
<input type="checkbox"/> sg-0e4df05e0b300d06e	default	vpc-055fa73af824fa751	default VPC security group

sg-028056a14e879089c X

Policy Info

VPC endpoint policy controls access to the service.

☒ Full access

Allow access by any user or service within the VPC using credentials from any Amazon Web Services accounts to any resources in this Amazon Web Services service. All policies — IAM user policies, VPC endpoint policies, and Amazon Web Services service-specific policies (e.g. Amazon S3 bucket policies, any S3 ACL policies) — must grant the necessary permissions for access to succeed.

☐ Custom

Use the [policy creation tool](#) to generate a policy, then paste the generated policy below.

1

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https://251985476962-ztjdpc.us-east-1.console.aws.amazon.com/vpconsole/home?region=us-east-1#CreateVpcEndpoint

Search [Alt+S] United States (N. Virginia) Account ID: 2519-8547-6962 root

VPC > Endpoints > Create endpoint

JSON Line 1, Column 1 Errors: 0 Warnings: 0

Code blocks in square or curly brackets can be expanded and collapsed with CTRL+Enter or Command+Enter.

Tags

Key	Value - optional
<input type="text" value="Name"/>	<input type="text" value="project3"/>

Remove

Add new tag

You can add 49 more tags.

Cancel Create endpoint

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https://251985476962-ztjdpc.us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#Endpoints:vpceEndpointId=vpce-0d726674d73870377

Account ID: 2519-8547-6962 root

VPC > Endpoints

Route tables  
Internet gateways  
Egress-only internet gateways  
Carrier gateways  
DHCP option sets  
Elastic IPs  
Managed prefix lists  
NAT gateways  
Peering connections  
Route servers [New](#)

▼ Security  
Network ACLs  
Security groups

▼ PrivateLink and Lattice  
Getting started [Updated](#)  
[Endpoints](#) [Updated](#)  
Endpoint services  
Service networks [Updated](#)  
Lattice services  
Resource configurations [New](#)

Successfully created VPC endpoint  
vpce-0d726674d73870377

Endpoints (1/1) Info

Find endpoints by attribute or tag

VPC endpoint ID: vpce-0d726674d73870377 Clear filters

<input checked="" type="checkbox"/>	Name	VPC endpoint ID	Endpoint type	Status	Service name
<input checked="" type="checkbox"/>	project3	vpce-0d726674d73870377	Interface	Available	com.amazonaws.us-eas

vpce-0d726674d73870377 / project3

Details Subnets Security Groups Notification Policy Monitoring Tags

Details

Endpoint ID vpce-0d726674d73870377	Status Available	Creation time Thursday, August 28, 2025 at 07:52:48 GMT+5:30	Endpoint type Interface
VPC ID vpc-055fa73af824fa751 (VPC-Tutorial-VPC)	Status message -	Service name com.amazonaws.us-east-1.sns	Private DNS names enabled Yes
IP address type		DNS names	

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https://251985476962-ztjdpc.us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#/functions

Account ID: 2519-8547-6962 root

Lambda > Functions

Dashboard  
Applications  
[Functions](#)

▼ Additional resources  
Code signing configurations  
Event source mappings  
Layers  
Replicas

▼ Related AWS resources  
Step Functions state machines

Functions (1/2) Last fetched 20 seconds ago

Filter by attributes or search by keyword

<input checked="" type="checkbox"/>	Function name	Description	Package type	Runtime	Last modified
<input checked="" type="checkbox"/>	VPC-Tutorial-Lambda-1	SNS VPC endpoint tutorial lambda function 1	Zip	Python 3.9	21 minutes ago
<input type="checkbox"/>	VPC-Tutorial-Lambda-2	SNS VPC endpoint tutorial lambda function 2	Zip	Python 3.9	21 minutes ago

Info Tutorials

Learn how to implement common use cases in AWS Lambda.

Create a simple web app

In this tutorial you will learn how to:

- Build a simple web app, consisting of a Lambda function with a function URL that outputs a webpage
- Invoke your function through its function URL

[Learn more](#)

[Start tutorial](#)

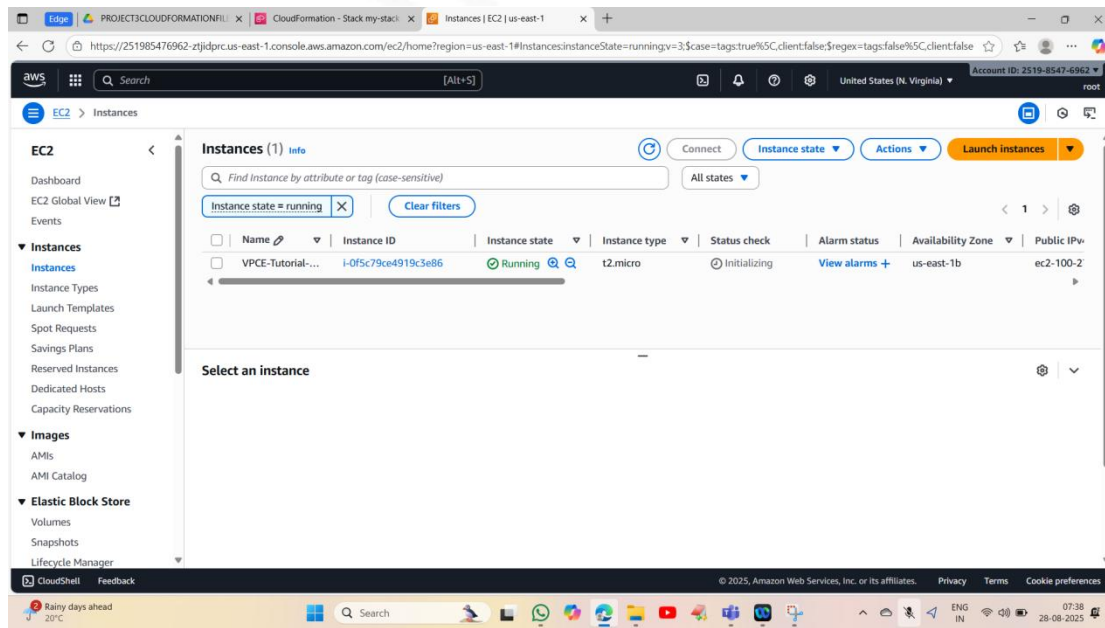
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07:54 28-08-2025

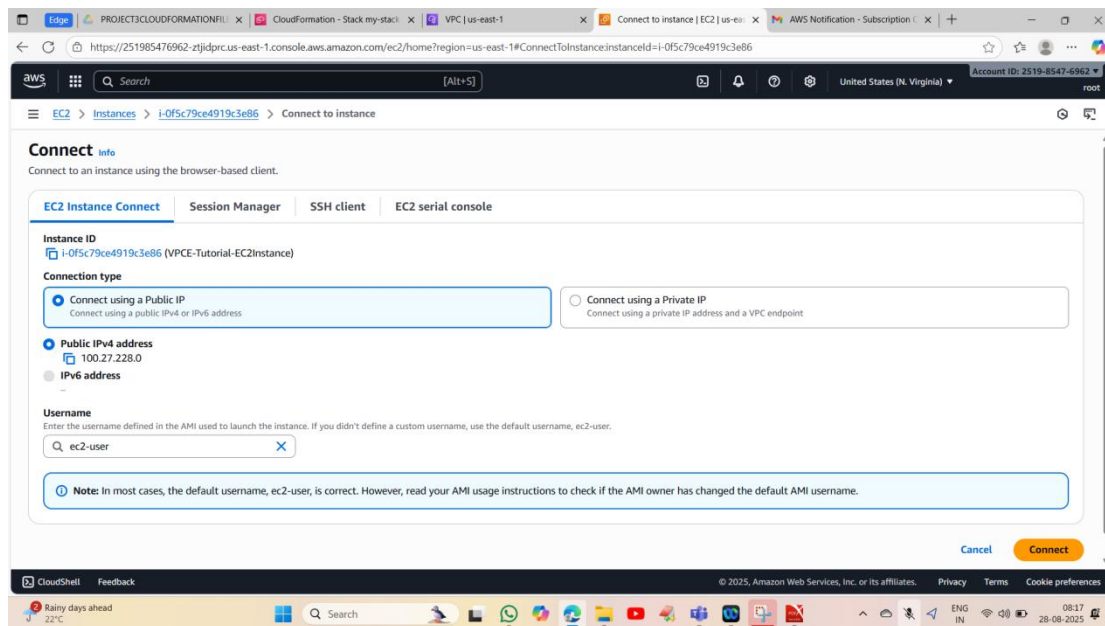


### 3. Publish message privately with SNS



The screenshot shows the AWS Management Console interface for the EC2 Instances page. The left sidebar contains navigation links for EC2, Images, and Elastic Block Store. The main content area displays a table of instances. The first instance is in the 'Running' state. The instance details include Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, and Public IP.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
VPC-Tutorial-...	i-0f5c79ce4919c3e86	Running	t2.micro	Initializing	View alarms +	us-east-1b	ec2-100-2...



The screenshot shows the 'Connect to instance' page in the AWS Management Console. The page provides options to connect to the instance using a public IP or a private IP. The 'Public IPv4 address' is selected, and the 'Username' is set to 'ec2-user'.

**Connect to instance**

Connect to an instance using the browser-based client.

**EC2 Instance Connect** | Session Manager | SSH client | EC2 serial console

**Instance ID**  
i-0f5c79ce4919c3e86 (VPC-Tutorial-EC2Instance)

**Connection type**

☒ Connect using a Public IP  
Connect using a public IPv4 or IPv6 address

☐ Connect using a Private IP  
Connect using a private IP address and a VPC endpoint

**Public IPv4 address**  
100.27.228.0

**IPv6 address**  
-

**Username**  
Enter the username defined in the AMI used to launch the instance. If you didn't define a custom username, use the default username, ec2-user.  
ec2-user

**Note:** In most cases, the default username, ec2-user, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username.

**Cancel** **Connect**

