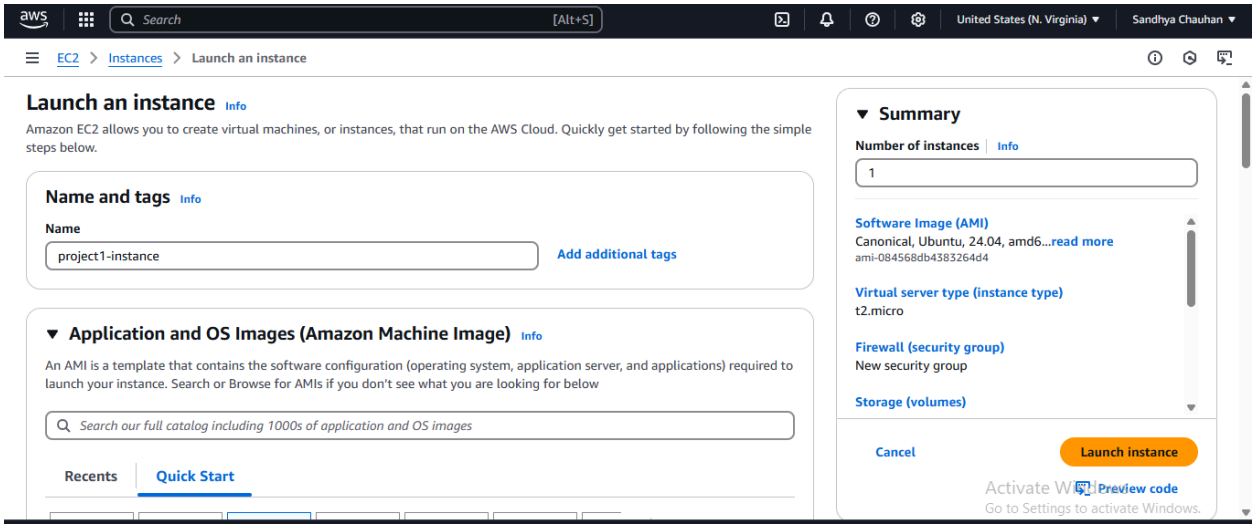
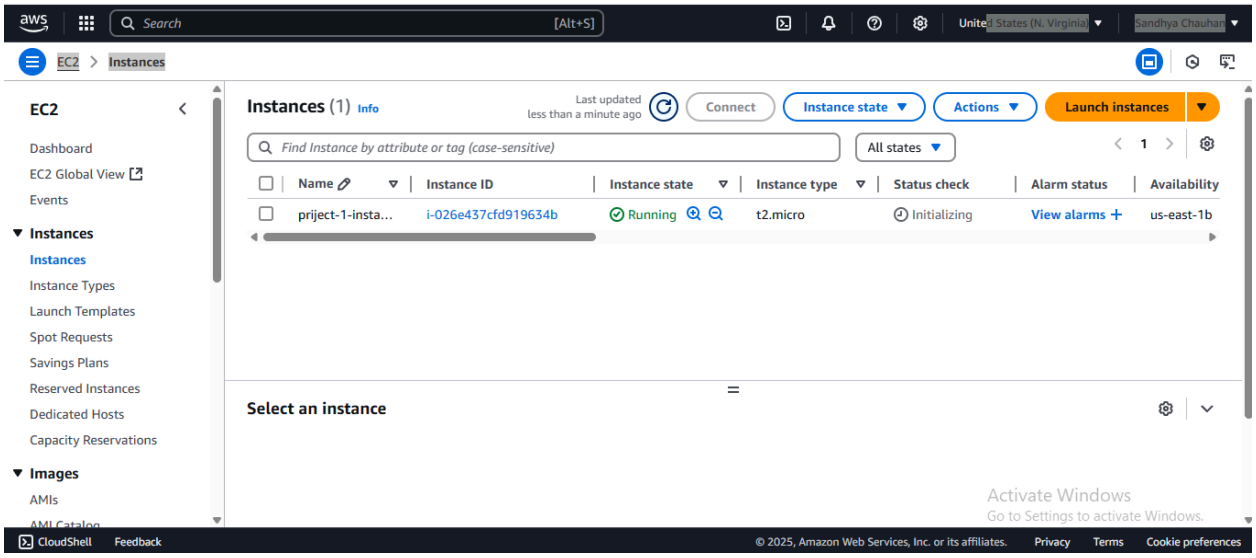
Project - 1: Deploying a Multi-Tier Website Using AWS EC2

Description: Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) cloud. Using Amazon EC2 eliminates your need to invest in hardware up front so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. Amazon EC2 enables you to scale up or down to handle changes in requirements or spikes in popularity, reducing your need to forecast traffic.
Statement: Company ABC wants to move their product to AWS. They have the following things set up right now:
1. MySQL DB
2. Website (PHP).
The company wants high availability on this product, therefore wants Auto Scaling to be enabled on this website.

The company wants high availability on this product, therefore wants Auto Scaling to be enabled on this website.
Steps To Solve:
1. Launch an EC2 Instance
2. Enable Auto Scaling on these instances (minimum 2)
3. Create an RDS Instance
4. Create Database & Table in RDS instance:
a. Database name: intel
b. Table name: data
c. Database password: intel123
5. Change hostname in website
6. Allow traffic from EC2 to RDS instance
7. Allow all-traffic to EC2 instance
Sol:


Search [Alt+S]
United States (N. Virginia)
Sandhya Chauhan
EC2 > Instances > Launch an instance
Launch an instance Info
Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.
Name and tags Info
Name
project1-instance
Add additional tags
Application and OS Images (Amazon Machine Image) Info
An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below
Search our full catalog including 1000s of application and OS images
Recents
Quick Start
Summary
Number of instances Info
1
Software Image (AMI)
Canonical, Ubuntu, 24.04, amd6...read more
ami-084568db4383264d4
Virtual server type (instance type)
t2.micro
Firewall (security group)
New security group
Storage (volumes)
Cancel
Launch instance
Preview code
Activate Windows
Go to Settings to activate Windows.


Search [Alt+S]
EC2 > Instances
EC2
Dashboard
EC2 Global View
Events
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Images
AMIs
Instances (1) Info
Last updated less than a minute ago
Connect
Instance state
Actions
Launch instances
Find Instance by attribute or tag (case-sensitive)
All states
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability
priject-1-insta...
i-026e437cfd919634b
Running
t2.micro
Initializing
View alarms
us-east-1b
Select an instance
Activate Windows
Go to Settings to activate Windows.
CloudShell
Feedback
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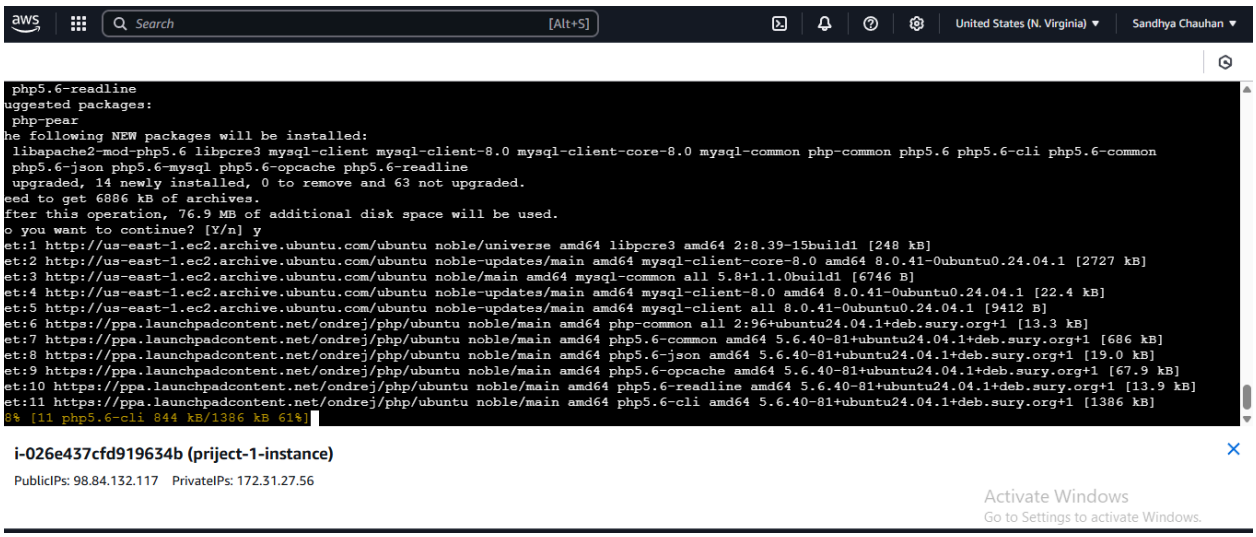
Terms
Cookie preferences


Search [Alt+S]
United States (N. Virginia)
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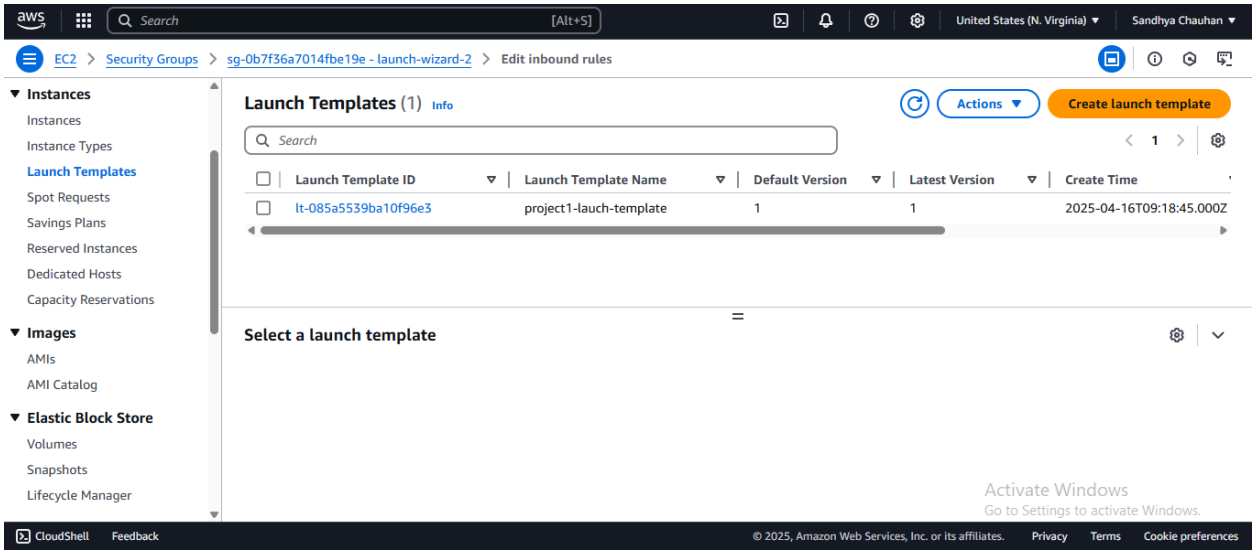
php5.6-readline
uggested packages:
php-pear
he following NEW packages will be installed:
libapache2-mod-php5.6 libpcre3 mysql-client mysql-client-8.0 mysql-client-core-8.0 mysql-common php-common php5.6 php5.6-cli php5.6-common
php5.6-json php5.6-mysql php5.6-opcache php5.6-readline
upgraded, 14 newly installed, 0 to remove and 63 not upgraded.
eed to get 6886 kB of archives.
fter this operation, 76.9 MB of additional disk space will be used.
o you want to continue? [Y/n] y
et:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 libpcre3 amd64 2:8.39-15build1 [248 kB]
et:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-client-core-8.0 amd64 8.0.41-0ubuntu0.24.04.1 [2727 kB]
et:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 mysql-common all 5.8+1.1.0build1 [6746 B]
et:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-client-8.0 amd64 8.0.41-0ubuntu0.24.04.1 [22.4 kB]
et:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-client all 8.0.41-0ubuntu0.24.04.1 [9412 B]
et:6 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php-common all 2:96+ubuntu24.04.1+deb.sury.org+1 [13.3 kB]
et:7 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-common amd64 5.6.40-81+ubuntu24.04.1+deb.sury.org+1 [686 kB]
et:8 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-json amd64 5.6.40-81+ubuntu24.04.1+deb.sury.org+1 [19.0 kB]
et:9 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-opcache amd64 5.6.40-81+ubuntu24.04.1+deb.sury.org+1 [67.9 kB]
et:10 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-readline amd64 5.6.40-81+ubuntu24.04.1+deb.sury.org+1 [13.9 kB]
et:11 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-cli amd64 5.6.40-81+ubuntu24.04.1+deb.sury.org+1 [1386 kB]
8% [11 php5.6-cli 844 kB/1386 kB 61%]
i-026e437cfd919634b (priject-1-instance)
PublicIPs: 98.84.132.117 PrivateIPs: 172.31.27.56
Activate Windows
Go to Settings to activate Windows.


Search [Alt+S]
United States (N. Virginia)
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EC2 > Security Groups > sg-0b7f36a7014fbe19e - launch-wizard-2 > Edit inbound rules
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Snapshots
Lifecycle Manager
Launch Templates (1) Info
Actions
Create launch template
Launch Template ID
Launch Template Name
Default Version
Latest Version
Create Time
lt-085a5539ba10f96e3
project1-lauch-template
1
1
2025-04-16T09:18:45.000Z
Select a launch template
Activate Windows
Go to Settings to activate Windows.
CloudShell
Feedback
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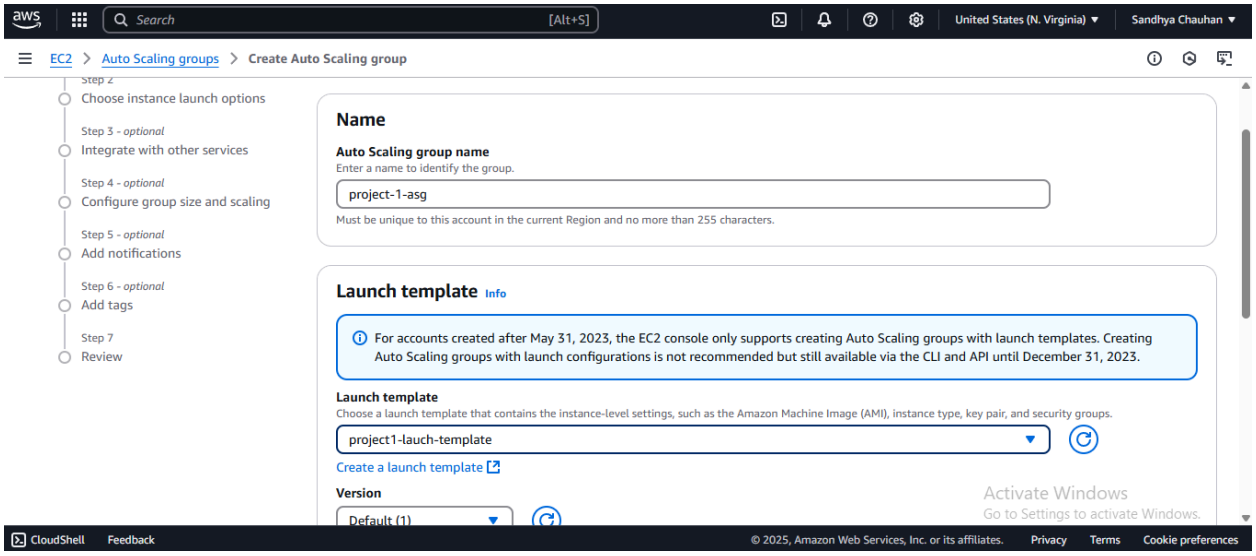
Search [Alt+S]
United States (N. Virginia)
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EC2 > Auto Scaling groups > Create Auto Scaling group
Choose instance launch options
Step 3 - optional
Integrate with other services
Step 4 - optional
Configure group size and scaling
Step 5 - optional
Add notifications
Step 6 - optional
Add tags
Step 7
Review
Name
Auto Scaling group name
Enter a name to identify the group.
project-1-asg
Must be unique to this account in the current Region and no more than 255 characters.
Launch template Info
For accounts created after May 31, 2023, the EC2 console only supports creating Auto Scaling groups with launch templates. Creating Auto Scaling groups with launch configurations is not recommended but still available via the CLI and API until December 31, 2023.
Launch template
Choose a launch template that contains the instance-level settings, such as the Amazon Machine Image (AMI), instance type, key pair, and security groups.
project1-lauch-template
Create a launch template
Version
Default (1)
Activate Windows
Go to Settings to activate Windows.
CloudShell
Feedback
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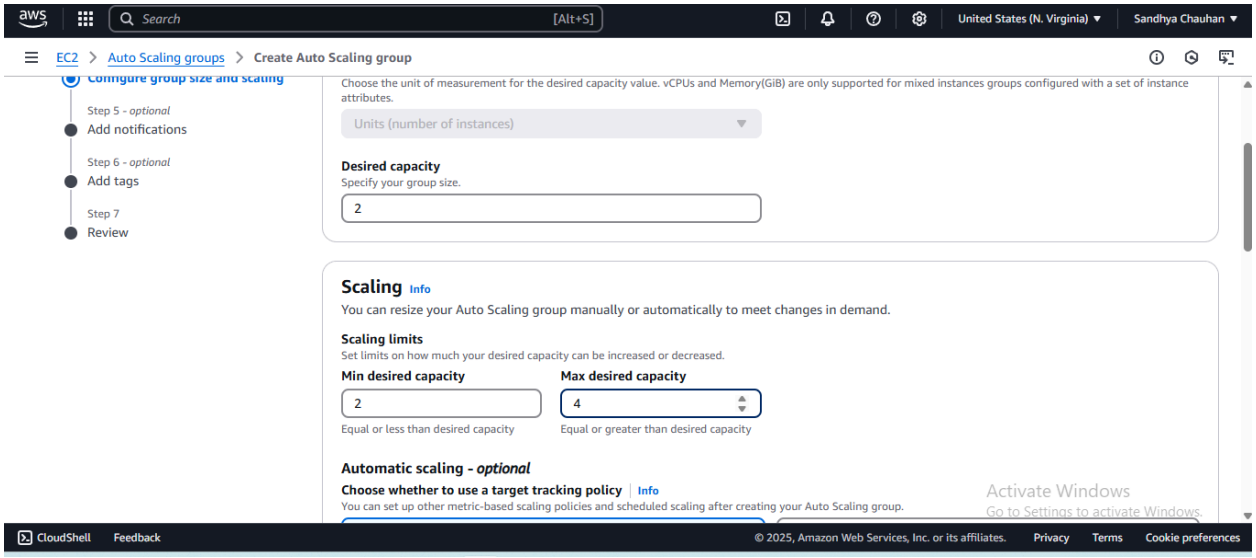
Search [Alt+S]
United States (N. Virginia)
Sandhya Chauhan
EC2 > Auto Scaling groups > Create Auto Scaling group
Step 5 - optional
Add notifications
Step 6 - optional
Add tags
Step 7
Review
Choose the unit of measurement for the desired capacity value. vCPUs and Memory(GiB) are only supported for mixed instances groups configured with a set of instance attributes.
Units (number of instances)
Desired capacity
Specify your group size.
2
Scaling Info
You can resize your Auto Scaling group manually or automatically to meet changes in demand.
Scaling limits
Set limits on how much your desired capacity can be increased or decreased.
Min desired capacity
Max desired capacity
2
4
Equal or less than desired capacity
Equal or greater than desired capacity
Automatic scaling - optional
Choose whether to use a target tracking policy Info
You can set up other metric-based scaling policies and scheduled scaling after creating your Auto Scaling group.
Activate Windows
Go to Settings to activate Windows.
CloudShell
Feedback
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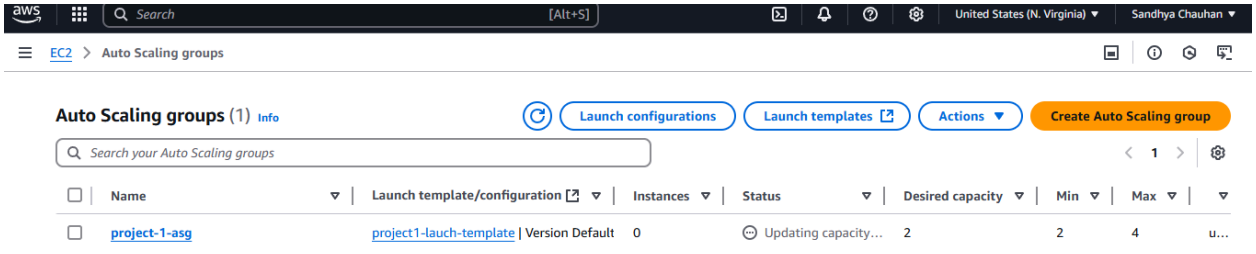
Search [Alt+S]
United States (N. Virginia)
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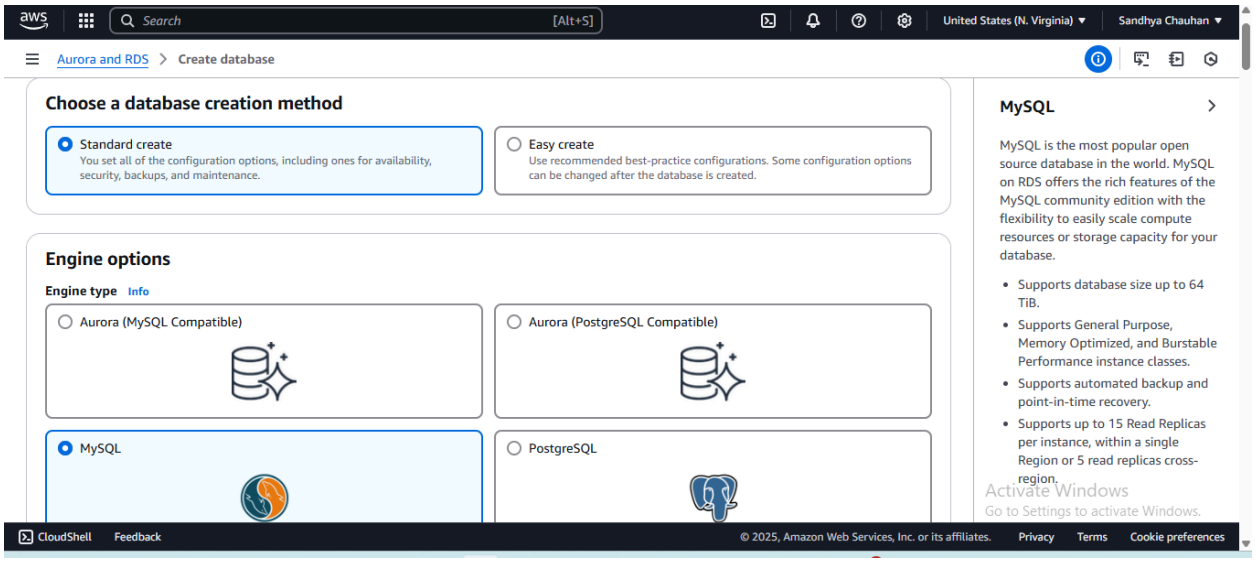
EC2 > Auto Scaling groups
Auto Scaling groups (1) Info
Launch configurations
Launch templates
Actions
Create Auto Scaling group
Search your Auto Scaling groups
Name
Launch template/configuration
Instances
Status
Desired capacity
Min
Max
project-1-asg
project1-lauch-template | Version Default
0
Updating capacity...
2
2
4


Search [Alt+S]
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Aurora and RDS > Create database
Choose a database creation method
Standard create
You set all of the configuration options, including ones for availability, security, backups, and maintenance.
Easy create
Use recommended best-practice configurations. Some configuration options can be changed after the database is created.
Engine options
Engine type Info
Aurora (MySQL Compatible)
Aurora (PostgreSQL Compatible)
MySQL
PostgreSQL
MySQL
MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.
Supports database size up to 64 TiB.
Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
Supports automated backup and point-in-time recovery.
Supports up to 15 Read Replicas per instance, within a single Region or 5 read replicas cross-region.
Activate Windows
Go to Settings to activate Windows.
CloudShell
Feedback
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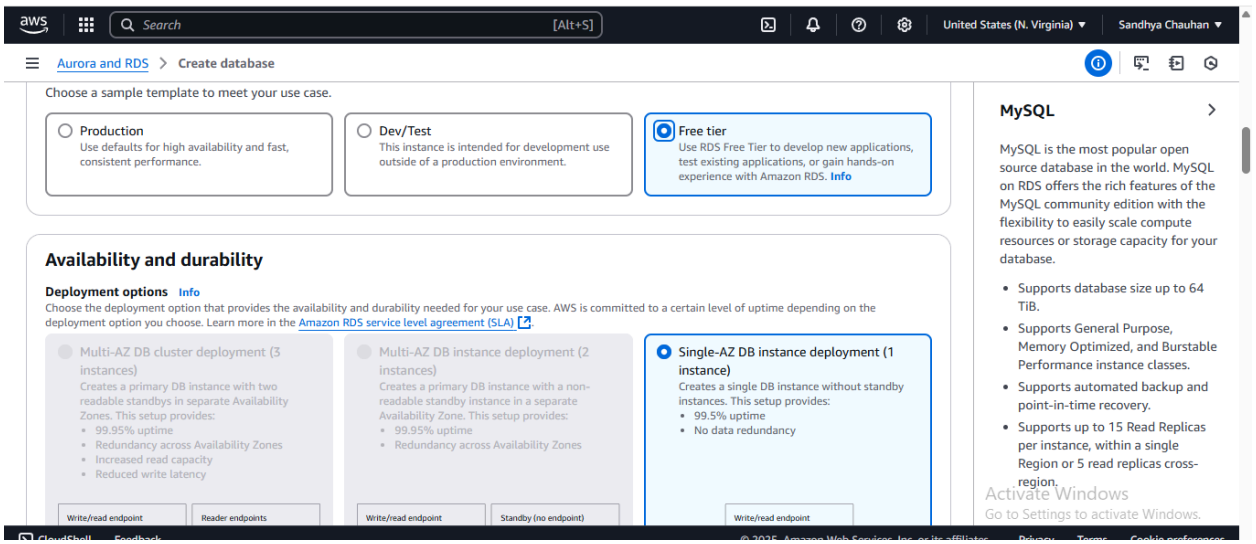
Search [Alt+S]
United States (N. Virginia)
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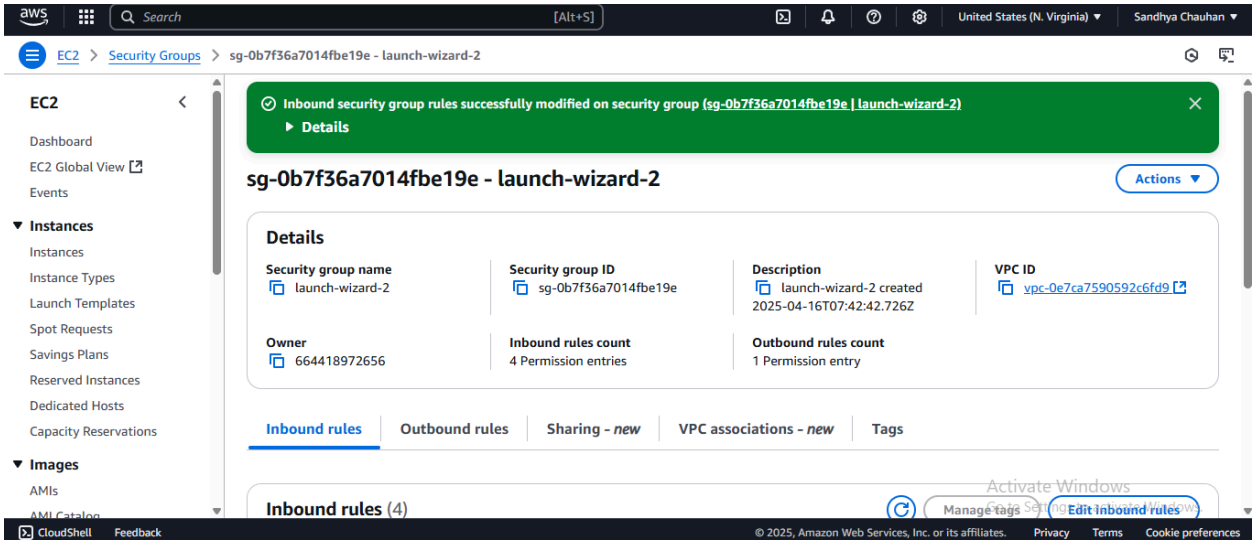
Aurora and RDS > Create database
Choose a sample template to meet your use case.
Production
Use defaults for high availability and fast, consistent performance.
Dev/Test
This instance is intended for development use outside of a production environment.
Free tier
Use RDS Free Tier to develop new applications, test existing applications, or gain hands-on experience with Amazon RDS. Info
Availability and durability
Deployment options Info
Choose the deployment option that provides the availability and durability needed for your use case. AWS is committed to a certain level of uptime depending on the deployment option you choose. Learn more in the Amazon RDS service level agreement (SLA).
Multi-AZ DB cluster deployment (3 instances)
Creates a primary DB instance with two readable standbys in separate Availability Zones. This setup provides:
99.95% uptime
Redundancy across Availability Zones
Increased read capacity
Reduced write latency
Write/read endpoint
Reader endpoints
Multi-AZ DB instance deployment (2 instances)
Creates a primary DB instance with a non-readable standby instance in a separate Availability Zone. This setup provides:
99.95% uptime
Redundancy across Availability Zones
Write/read endpoint
Standby (no endpoint)
Single-AZ DB instance deployment (1 instance)
Creates a single DB instance without standby instances. This setup provides:
99.5% uptime
No data redundancy
Write/read endpoint
MySQL
MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.
Supports database size up to 64 TiB.
Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
Supports automated backup and point-in-time recovery.
Supports up to 15 Read Replicas per instance, within a single Region or 5 read replicas cross-region.
Activate Windows
Go to Settings to activate Windows.


Search [Alt+S]
United States (N. Virginia)
Sandhya Chauhan
EC2 > Security Groups > sg-0b7f36a7014fbe19e - launch-wizard-2
EC2
Dashboard
EC2 Global View
Events
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Images
AMIs
Inbound security group rules successfully modified on security group (sg-0b7f36a7014fbe19e | launch-wizard-2)
Details
sg-0b7f36a7014fbe19e - launch-wizard-2
Actions
Details
Security group name
launch-wizard-2
Security group ID
sg-0b7f36a7014fbe19e
Description
launch-wizard-2 created 2025-04-16T07:42:42.726Z
VPC ID
vpc-0e7ca7590592c6fd9
Owner
664418972656
Inbound rules count
4 Permission entries
Outbound rules count
1 Permission entry
Inbound rules
Outbound rules
Sharing - new
VPC associations - new
Tags
Inbound rules (4)
Manage tags
Edit inbound rules
Activate Windows
CloudShell
Feedback
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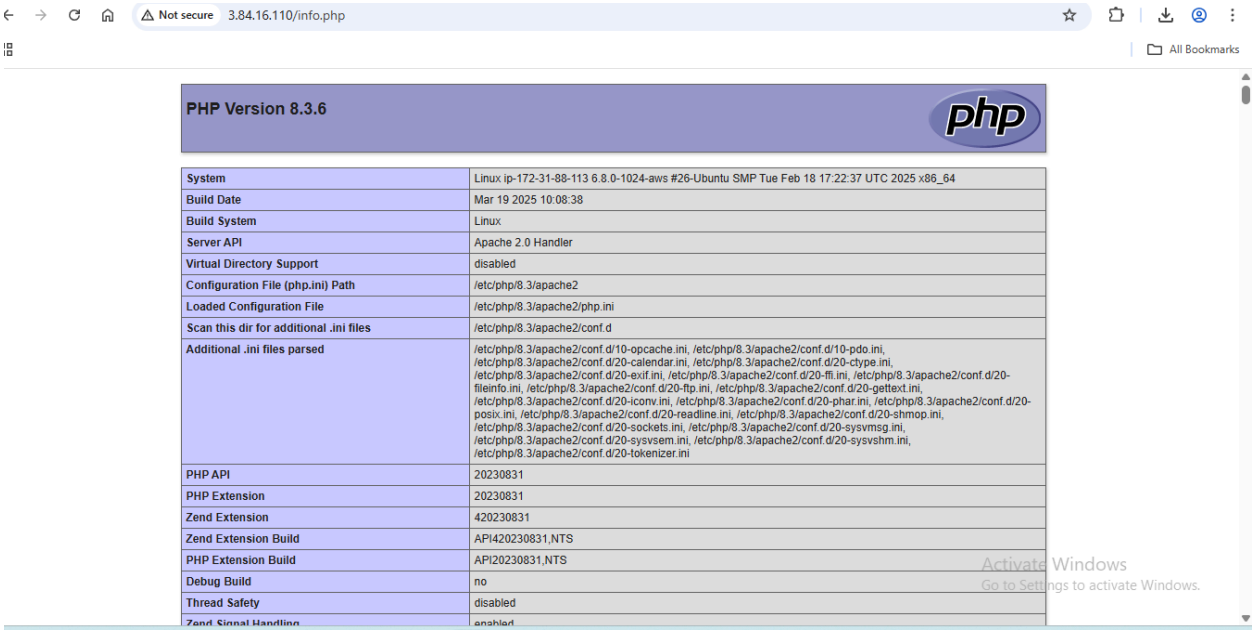
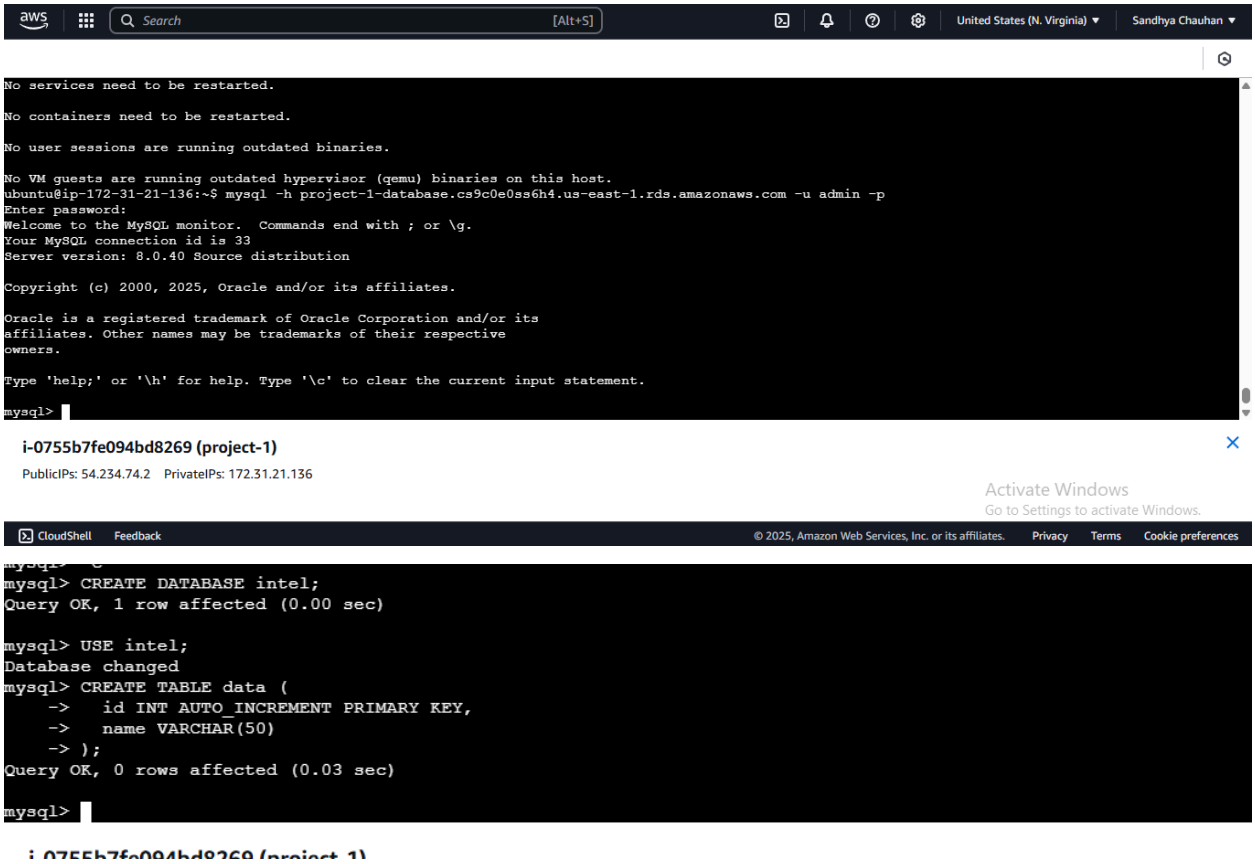

Not secure 3.84.16.110/info.php
All Bookmarks
PHP Version 8.3.6
php
System
Linux ip-172-31-88-113 6.8.0-1024-aws #26-Ubuntu SMP Tue Feb 18 17:22:37 UTC 2025 x86_64
Build Date
Mar 19 2025 10:08:38
Build System
Linux
Server API
Apache 2.0 Handler
Virtual Directory Support
disabled
Configuration File (php.ini) Path
/etc/php/8.3/apache2
Loaded Configuration File
/etc/php/8.3/apache2/php.ini
Scan this dir for additional .ini files
/etc/php/8.3/apache2/conf.d
Additional .ini files parsed
/etc/php/8.3/apache2/conf.d/10-opcache.ini, /etc/php/8.3/apache2/conf.d/10-pdo.ini, /etc/php/8.3/apache2/conf.d/20-calendar.ini, /etc/php/8.3/apache2/conf.d/20-ctype.ini, /etc/php/8.3/apache2/conf.d/20-exif.ini, /etc/php/8.3/apache2/conf.d/20-ffi.ini, /etc/php/8.3/apache2/conf.d/20-fileinfo.ini, /etc/php/8.3/apache2/conf.d/20-ftp.ini, /etc/php/8.3/apache2/conf.d/20-gettext.ini, /etc/php/8.3/apache2/conf.d/20-iconv.ini, /etc/php/8.3/apache2/conf.d/20-phar.ini, /etc/php/8.3/apache2/conf.d/20-posix.ini, /etc/php/8.3/apache2/conf.d/20-readline.ini, /etc/php/8.3/apache2/conf.d/20-shmop.ini, /etc/php/8.3/apache2/conf.d/20-sockets.ini, /etc/php/8.3/apache2/conf.d/20-sysvmsg.ini, /etc/php/8.3/apache2/conf.d/20-sysvsem.ini, /etc/php/8.3/apache2/conf.d/20-sysvshm.ini, /etc/php/8.3/apache2/conf.d/20-tokenizer.ini
PHP API
20230831
PHP Extension
20230831
Zend Extension
420230831
Zend Extension Build
API420230831,NTS
PHP Extension Build
API20230831,NTS
Debug Build
no
Thread Safety
disabled
Activate Windows




```
mysql> CREATE DATABASE intel;
Query OK, 1 row affected (0.00 sec)

mysql> USE intel;
Database changed
mysql> CREATE TABLE data (
    ->   id INT AUTO_INCREMENT PRIMARY KEY,
    ->   name VARCHAR(50)
    -> );
Query OK, 0 rows affected (0.03 sec)

mysql>
```

i-0755b7fe094bd8269 (project-1)

Project - 3: Publishing Amazon SNS Messages Privately

Industry: Healthcare

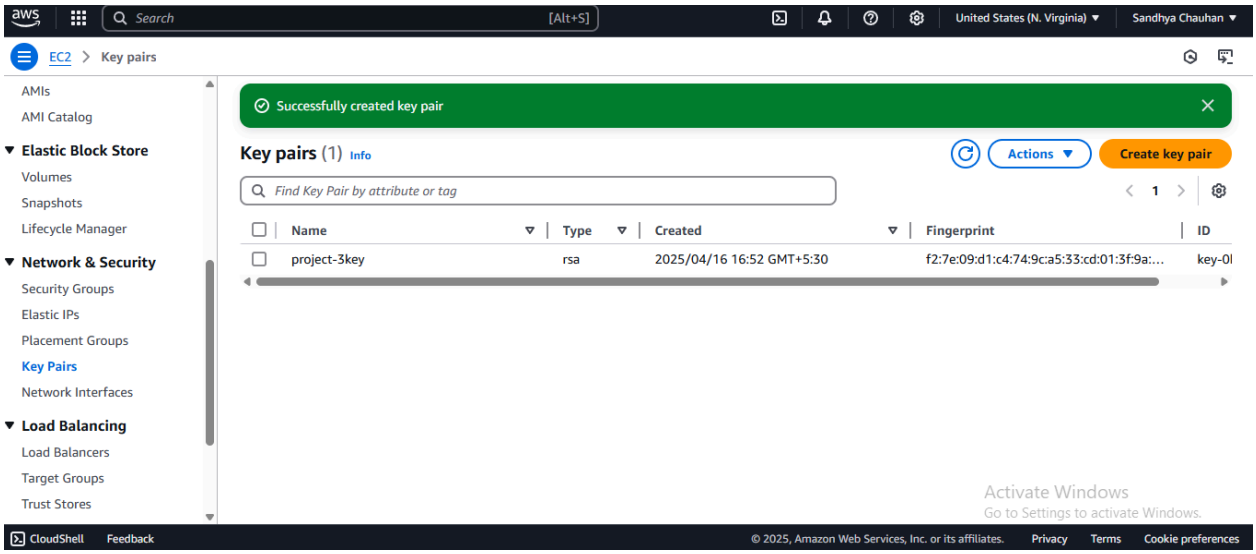
Problem Statement:

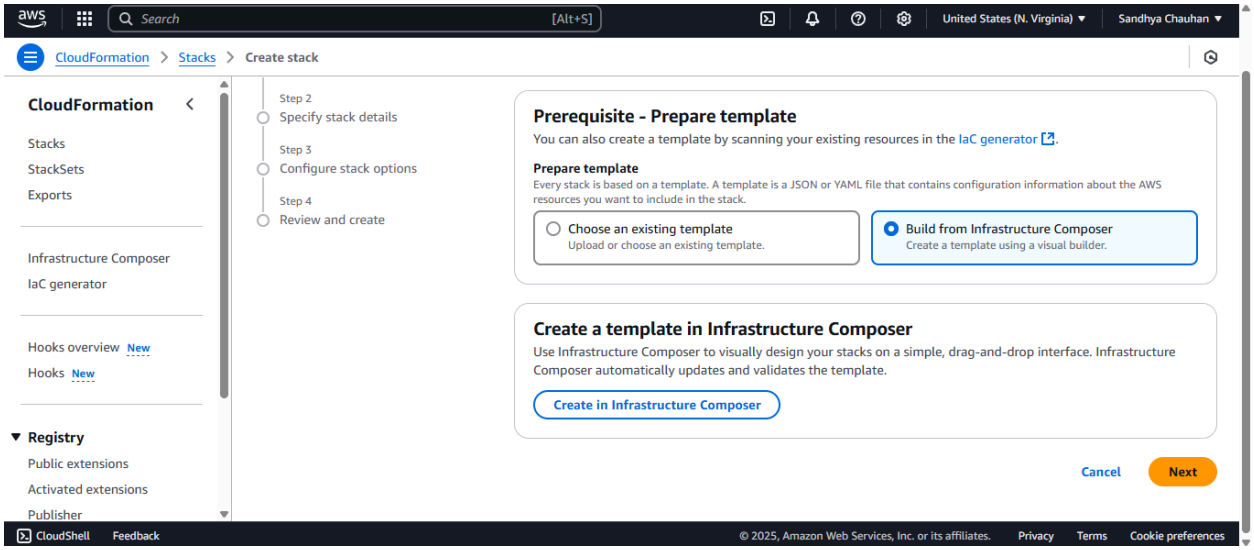
How to secure patient records online and send it privately to the intended party Topics: In this project, you will be working on a hospital project to send reports online and develop a platform so the patients can access the reports via mobile and push notifications. You will publish the report to an 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

Sol:




Search [Alt+S]
United States (N. Virginia)
Sandhya Chauhan
CloudFormation > Stacks > Create stack
CloudFormation
Stacks
StackSets
Exports
Infrastructure Composer
IaC generator
Hooks overview New
Hooks New
Registry
Public extensions
Activated extensions
Publisher
Step 2
Specify stack details
Step 3
Configure stack options
Step 4
Review and create
Prerequisite - Prepare template
You can also create a template by scanning your existing resources in the IaC generator.
Prepare template
Every stack is based on a template. A template is a JSON or YAML file that contains configuration information about the AWS resources you want to include in the stack.
Choose an existing template
Upload or choose an existing template.
Build from Infrastructure Composer
Create a template using a visual builder.
Create a template in Infrastructure Composer
Use Infrastructure Composer to visually design your stacks on a simple, drag-and-drop interface. Infrastructure Composer automatically updates and validates the template.
Create in Infrastructure Composer
Cancel
Next
CloudShell
Feedback
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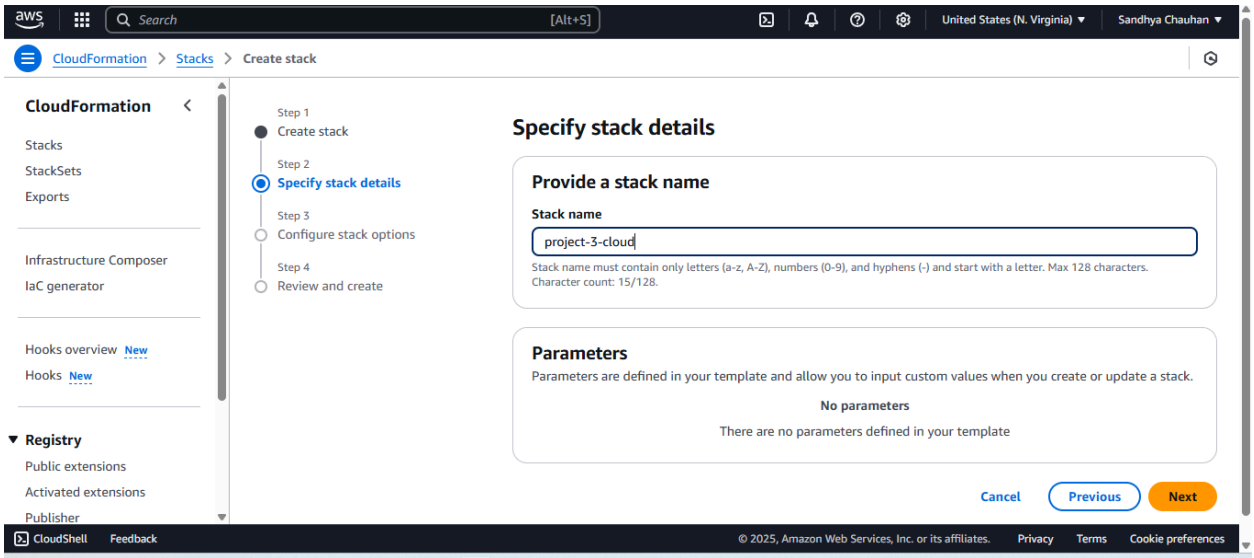
Search [Alt+S]
United States (N. Virginia)
Sandhya Chauhan
CloudFormation > Stacks > Create stack
CloudFormation
Stacks
StackSets
Exports
Infrastructure Composer
IaC generator
Hooks overview New
Hooks New
Registry
Public extensions
Activated extensions
Publisher
Step 1
Create stack
Step 2
Specify stack details
Step 3
Configure stack options
Step 4
Review and create
Specify stack details
Provide a stack name
Stack name
project-3-cloud
Stack name must contain only letters (a-z, A-Z), numbers (0-9), and hyphens (-) and start with a letter. Max 128 characters.
Character count: 15/128.
Parameters
Parameters are defined in your template and allow you to input custom values when you create or update a stack.
No parameters
There are no parameters defined in your template
Cancel
Previous
Next
CloudShell
Feedback
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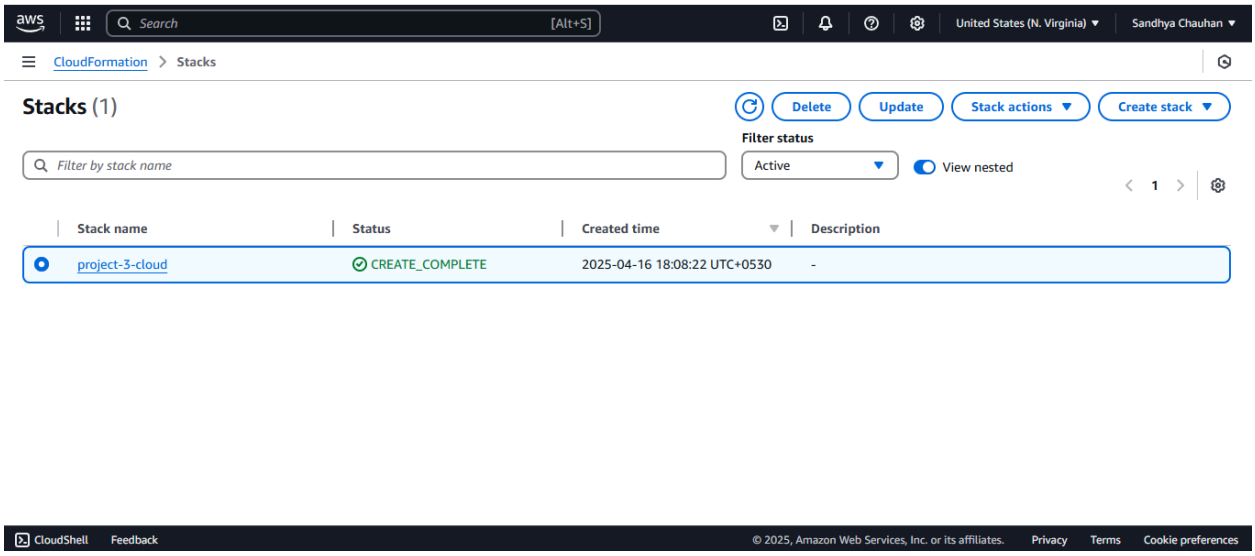
Search [Alt+S]
United States (N. Virginia)
Sandhya Chauhan
CloudFormation > Stacks
Stacks (1)
Delete
Update
Stack actions
Create stack
Filter by stack name
Filter status
Active
View nested
1
Stack name
Status
Created time
Description
project-3-cloud
CREATE_COMPLETE
2025-04-16 18:08:22 UTC+0530
-
CloudShell
Feedback
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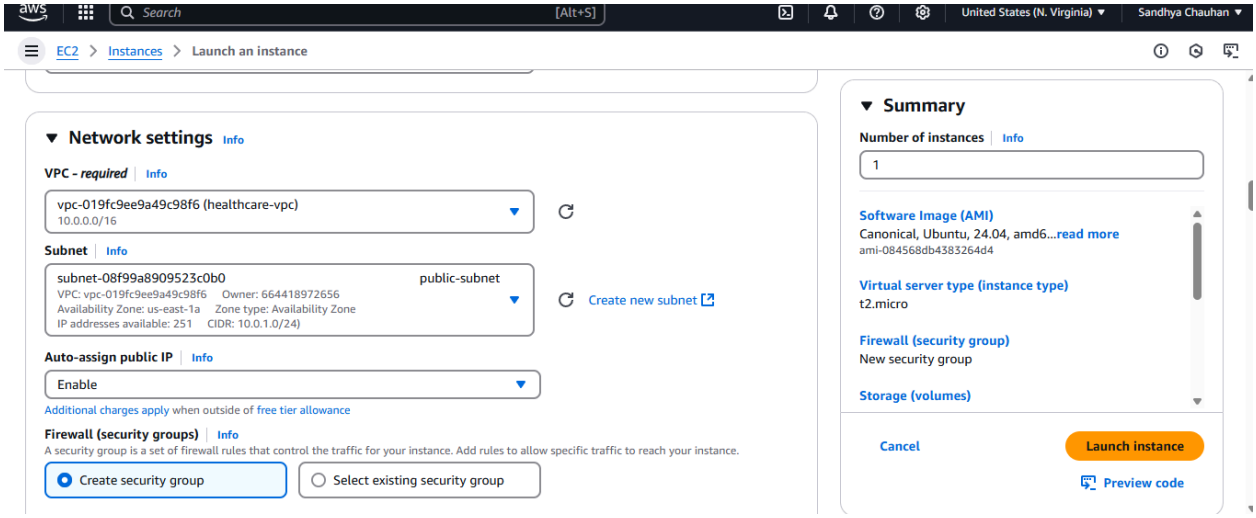
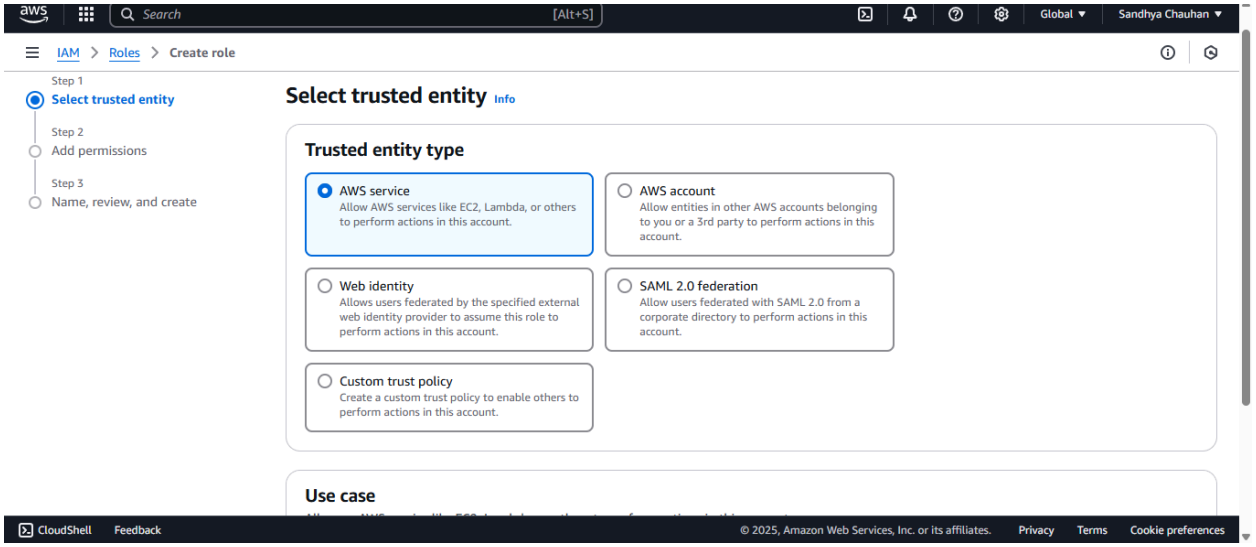

Search [Alt+S]
United States (N. Virginia)
Sandhya Chauhan
EC2 > Instances > Launch an instance
Network settings Info
VPC - required Info
vpc-019fc9ee9a49c98f6 (healthcare-vpc)
10.0.0.0/16
Subnet Info
subnet-08f99a8909523c0b0 public-subnet
VPC: vpc-019fc9ee9a49c98f6 Owner: 664418972656
Availability Zone: us-east-1a Zone type: Availability Zone
IP addresses available: 251 CIDR: 10.0.1.0/24)
Create new subnet
Auto-assign public IP Info
Enable
Additional charges apply when outside of free tier allowance
Firewall (security groups) Info
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.
Create security group
Select existing security group
Summary
Number of instances Info
1
Software Image (AMI)
Canonical, Ubuntu, 24.04, amd6...read more
ami-084568db4383264d4
Virtual server type (instance type)
t2.micro
Firewall (security group)
New security group
Storage (volumes)
Cancel
Launch instance
Preview code


Search [Alt+S]
Global
Sandhya Chauhan
IAM > Roles > Create role
Step 1
Select trusted entity
Step 2
Add permissions
Step 3
Name, review, and create
Select trusted entity Info
Trusted entity type
AWS service
Allow AWS services like EC2, Lambda, or others to perform actions in this account.
AWS account
Allow entities in other AWS accounts belonging to you or a 3rd party to perform actions in this account.
Web identity
Allows users federated by the specified external web identity provider to assume this role to perform actions in this account.
SAML 2.0 federation
Allow users federated with SAML 2.0 from a corporate directory to perform actions in this account.
Custom trust policy
Create a custom trust policy to enable others to perform actions in this account.
Use case
CloudShell
Feedback
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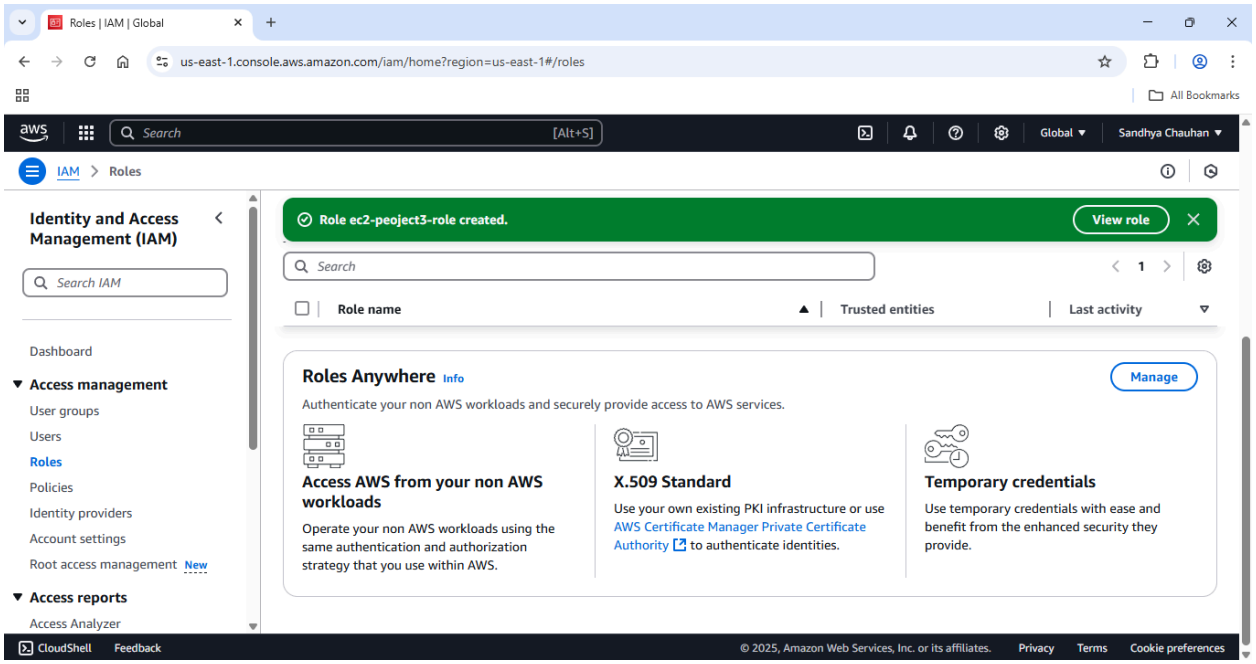
Roles | IAM | Global
us-east-1.console.aws.amazon.com/iam/home?region=us-east-1#/roles
Search [Alt+S]
Global
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IAM > Roles
Identity and Access Management (IAM)
Search IAM
Dashboard
Access management
User groups
Users
Roles
Policies
Identity providers
Account settings
Root access management New
Access reports
Access Analyzer
Role ec2-peoject3-role created.
View role
Search
Role name
Trusted entities
Last activity
Roles Anywhere Info
Manage
Authenticate your non AWS workloads and securely provide access to AWS services.
Access AWS from your non AWS workloads
Operate your non AWS workloads using the same authentication and authorization strategy that you use within AWS.
X.509 Standard
Use your own existing PKI infrastructure or use AWS Certificate Manager Private Certificate Authority to authenticate identities.
Temporary credentials
Use temporary credentials with ease and benefit from the enhanced security they provide.
CloudShell
Feedback
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Privacy
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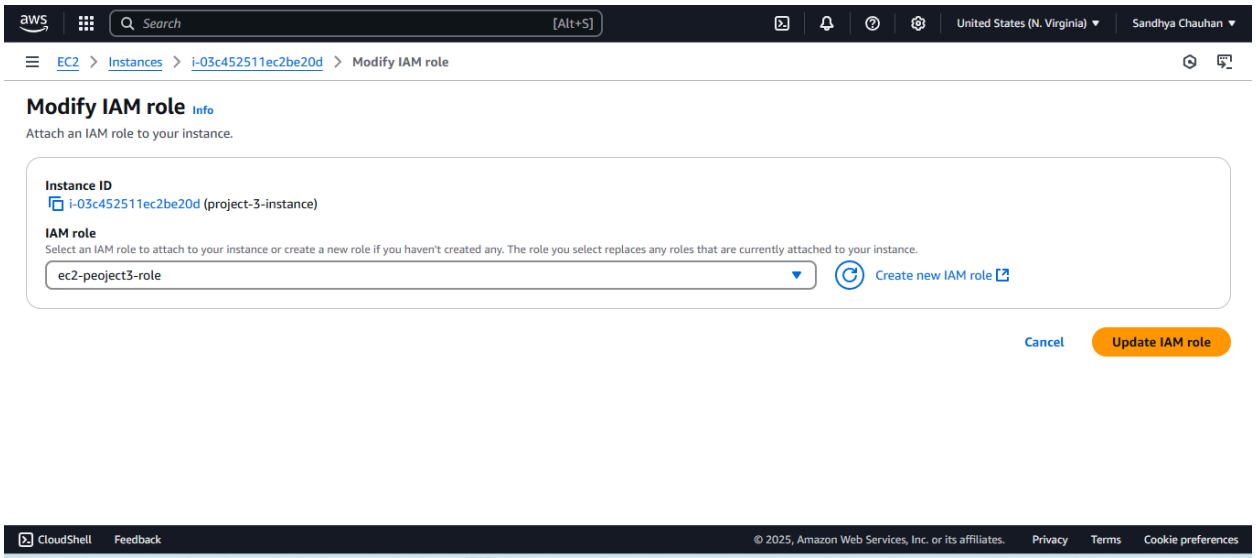
Search [Alt+S]
United States (N. Virginia)
Sandhya Chauhan
EC2 > Instances > i-03c452511ec2be20d > Modify IAM role
Modify IAM role Info
Attach an IAM role to your instance.
Instance ID
i-03c452511ec2be20d (project-3-instance)
IAM role
Select an IAM role to attach to your instance or create a new role if you haven't created any. The role you select replaces any roles that are currently attached to your instance.
ec2-peoject3-role
Create new IAM role
Cancel
Update IAM role
CloudShell
Feedback
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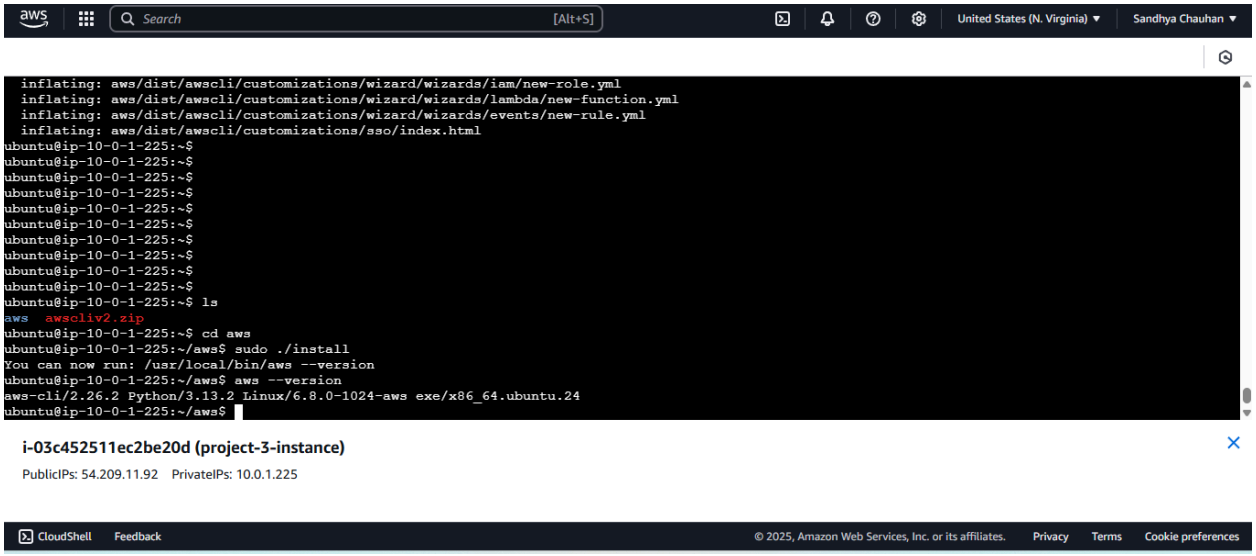

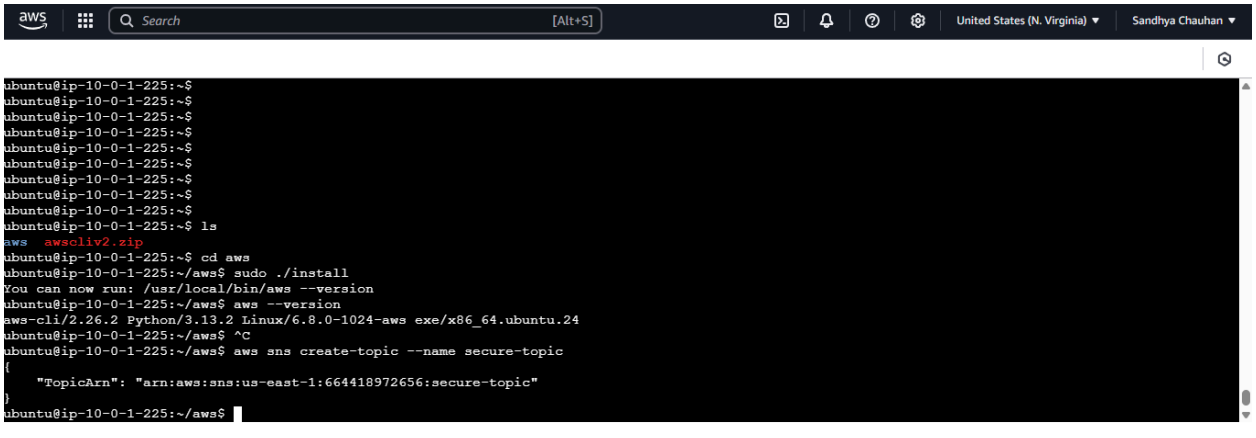

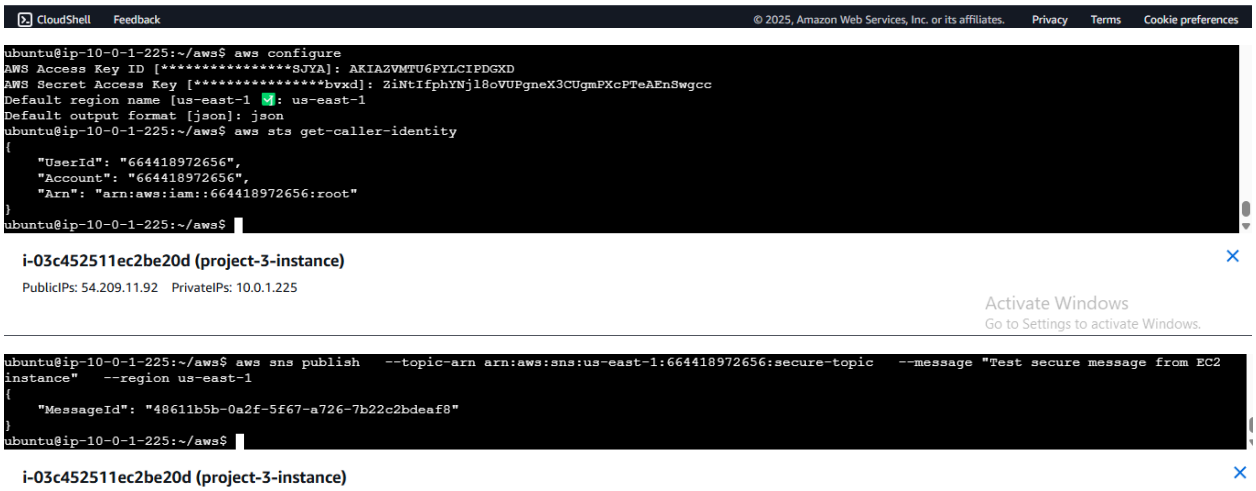

i-03c452511ec2be20d (project-3-instance)

PublicIPs: 54.209.11.92 PrivateIPs: 10.0.1.225