LAMBDA

COST-OPTIMIZATION -EBS-VOLUME:

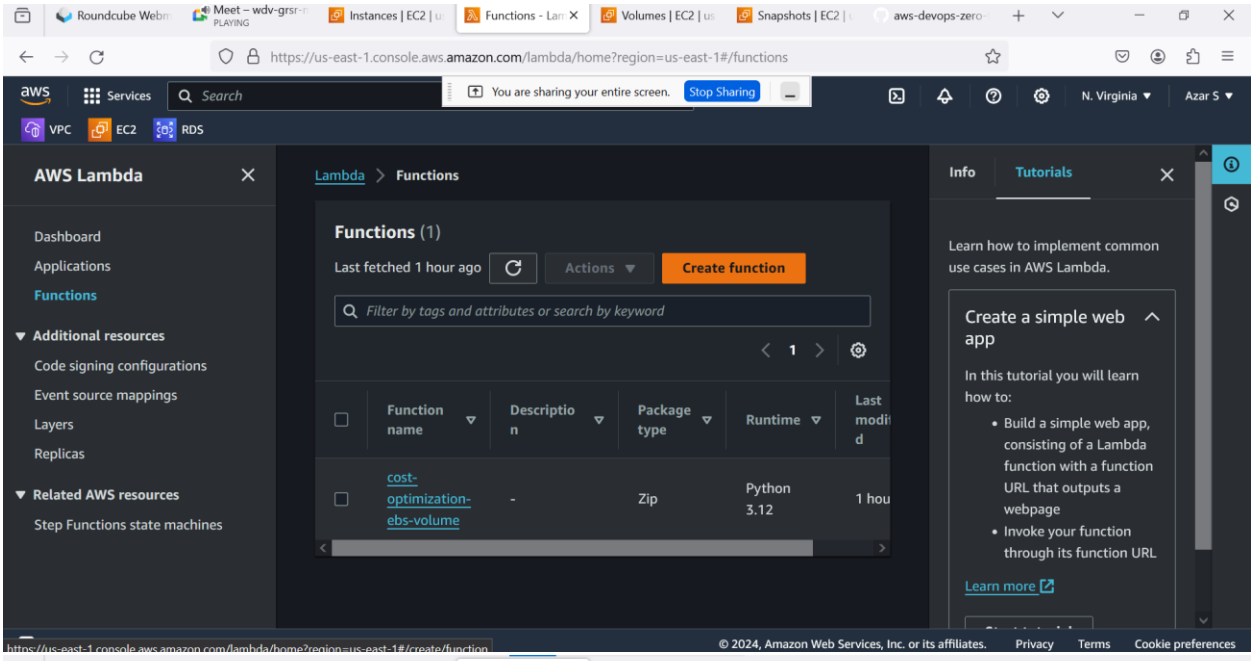
AWS Cloud Cost Optimization - Identifying Stale Resources

Identifying Stale EBS Snapshots

In this example, we'll create a Lambda function that identifies EBS snapshots that are no longer associated with any active EC2 instance and deletes them to save on storage costs.

Description:

The Lambda function fetches all EBS snapshots owned by the same account ('self') and also retrieves a list of active EC2 instances (running and stopped). For each snapshot, it checks if the associated volume (if exists) is not associated with any active instance. If it finds a stale snapshot, it deletes it, effectively optimizing storage costs.


https://us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#/functions
You are sharing your entire screen.
Stop Sharing
AWS Lambda
Dashboard
Applications
Functions
Additional resources
Code signing configurations
Event source mappings
Layers
Replicas
Related AWS resources
Step Functions state machines
Lambda > Functions
Functions (1)
Last fetched 1 hour ago
Actions
Create function
Filter by tags and attributes or search by keyword
Function name
Description
Package type
Runtime
cost-optimization-ebs-volume
Zip
Python 3.12
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
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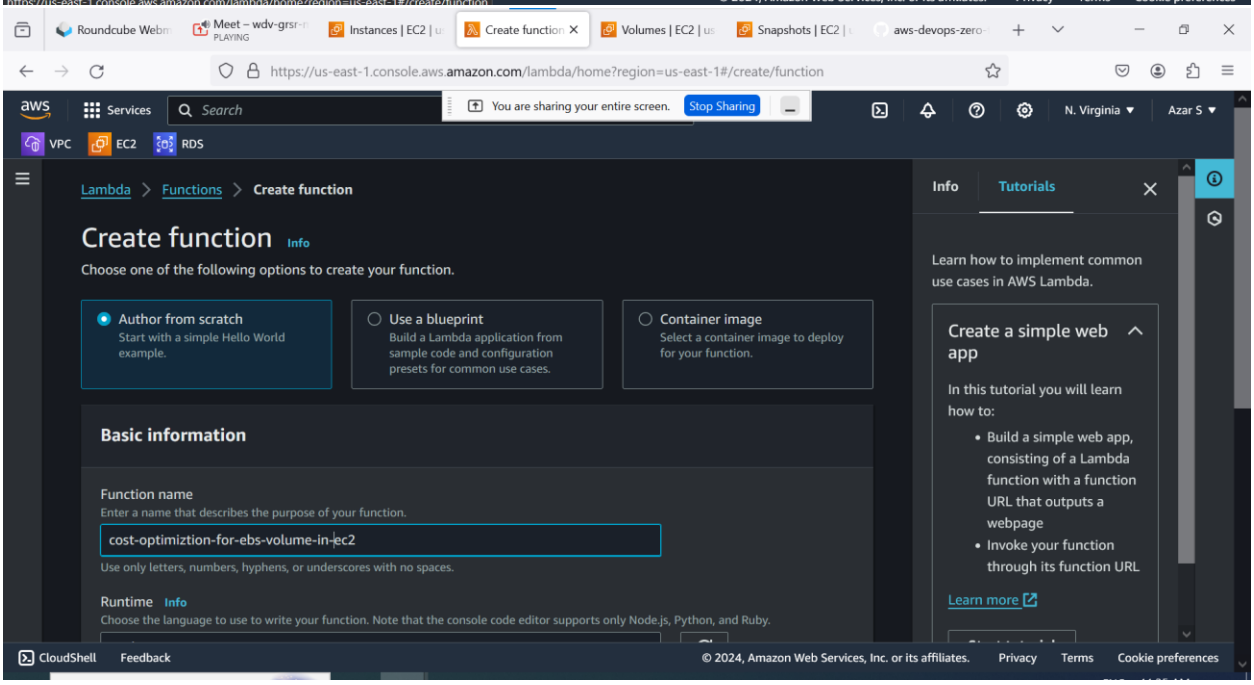
https://us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#/create/function
Lambda > Functions > Create function
Create function Info
Choose one of the following options to create your function.
Author from scratch
Start with a simple Hello World example.
Use a blueprint
Build a Lambda application from sample code and configuration presets for common use cases.
Container image
Select a container image to deploy for your function.
Basic information
Function name
Enter a name that describes the purpose of your function.
cost-optimiztion-for-ebs-volume-in-ec2
Use only letters, numbers, hyphens, or underscores with no spaces.
Runtime Info
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.
CloudShell
Feedback
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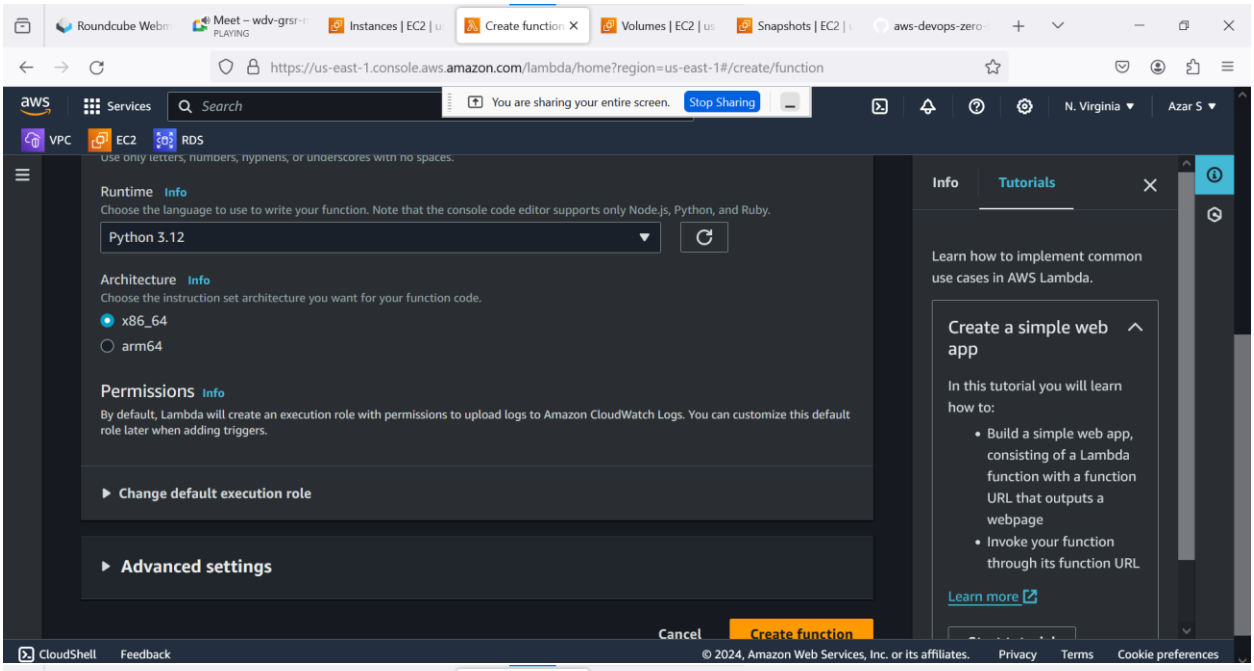
Create function
https://us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#/create/function
You are sharing your entire screen.
Stop Sharing
Runtime Info
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.
Python 3.12
Architecture Info
Choose the instruction set architecture you want for your function code.
x86_64
arm64
Permissions Info
By default, Lambda will create an execution role with permissions to upload logs to Amazon CloudWatch Logs. You can customize this default role later when adding triggers.
Change default execution role
Advanced settings
Cancel
Create function
Info
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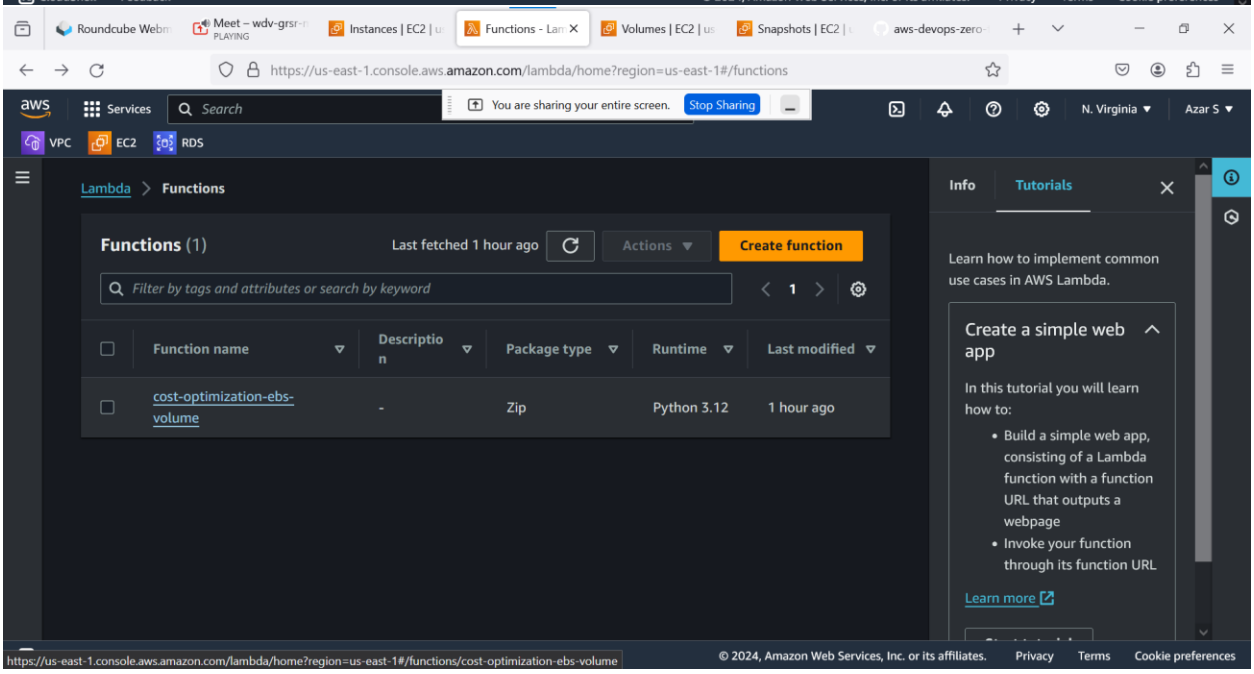
Functions - Lam
https://us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#/functions
You are sharing your entire screen.
Stop Sharing
Lambda
Functions
Functions (1)
Last fetched 1 hour ago
Actions
Create function
Filter by tags and attributes or search by keyword
Function name
Description
Package type
Runtime
Last modified
cost-optimization-ebs-volume
-
Zip
Python 3.12
1 hour ago
Info
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https://us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#/functions/cost-optimization-ebs-volume
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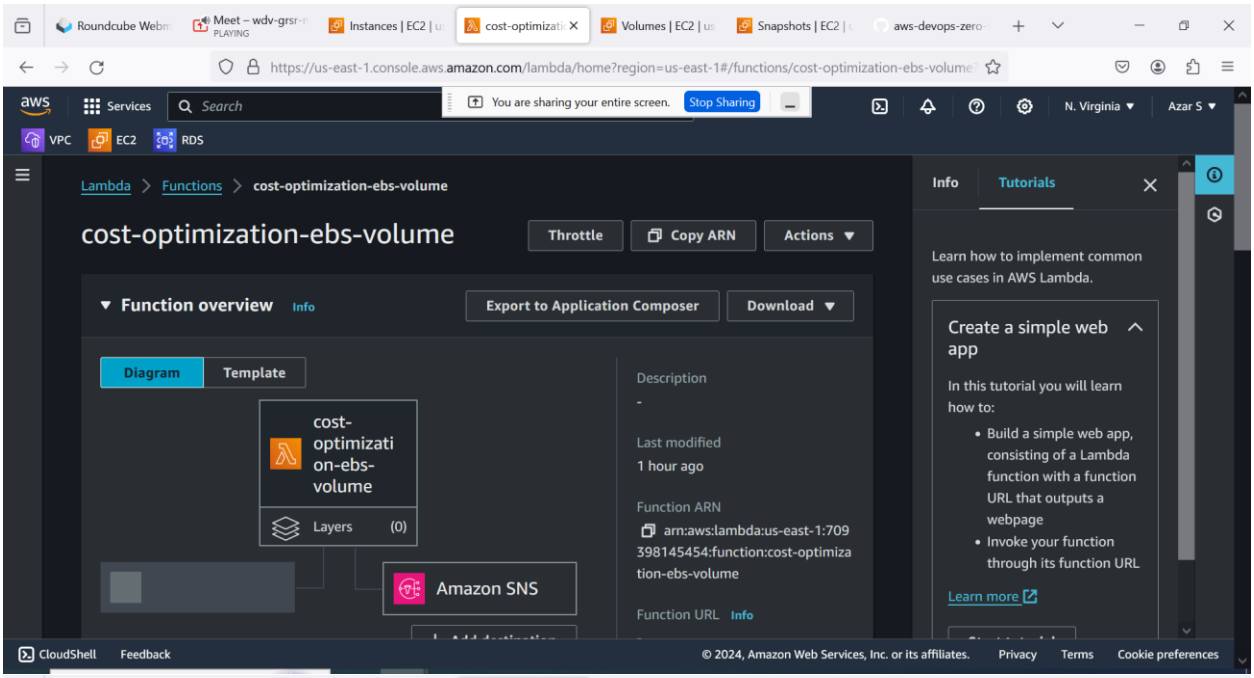
Lambda > Functions > cost-optimization-ebs-volume
cost-optimization-ebs-volume
Throttle
Copy ARN
Actions
Function overview Info
Export to Application Composer
Download
Diagram
Template
cost-optimization-ebs-volume
Layers (0)
Amazon SNS
Description
-
Last modified
1 hour ago
Function ARN
arn:aws:lambda:us-east-1:709398145454:function:cost-optimization-ebs-volume
Function URL Info
Info
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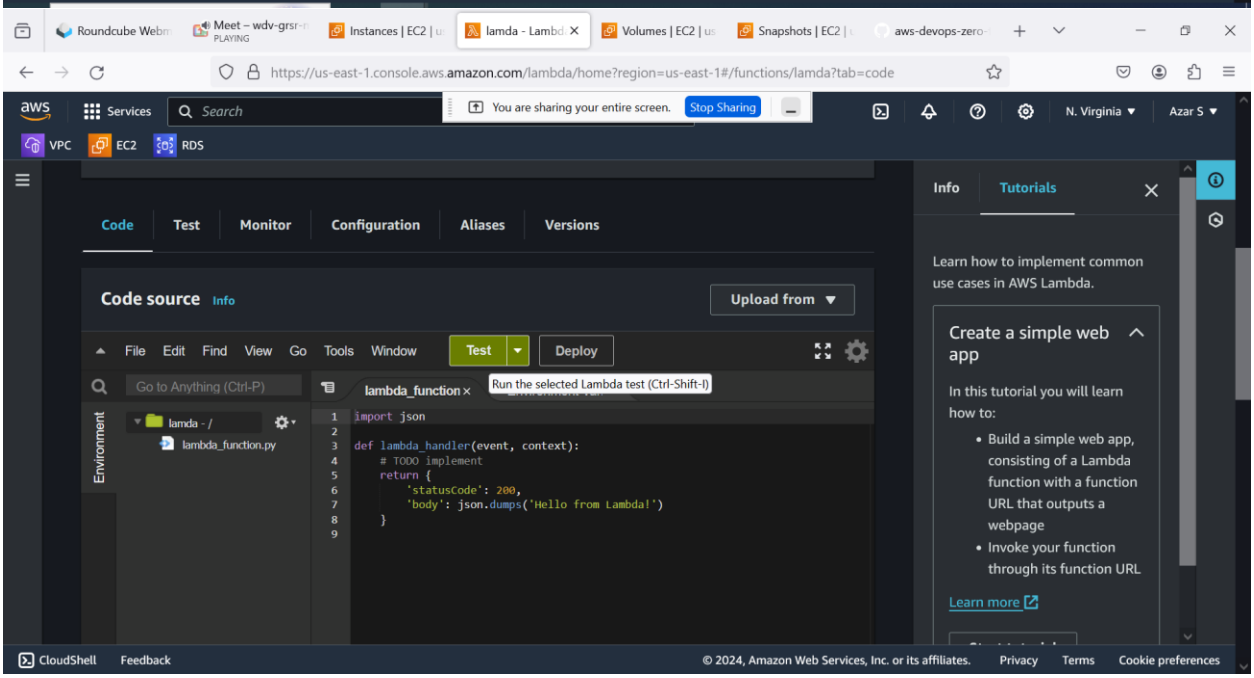
Code
Test
Monitor
Configuration
Aliases
Versions
Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Run the selected Lambda test (Ctrl-Shift-I)
Go to Anything (Ctrl-P)
lambda_function
lamda - /
lambda_function.py
Environment
import json
def lambda_handler(event, context):
# TODO implement
return {
'statusCode': 200,
'body': json.dumps('Hello from Lambda!')
}
Info
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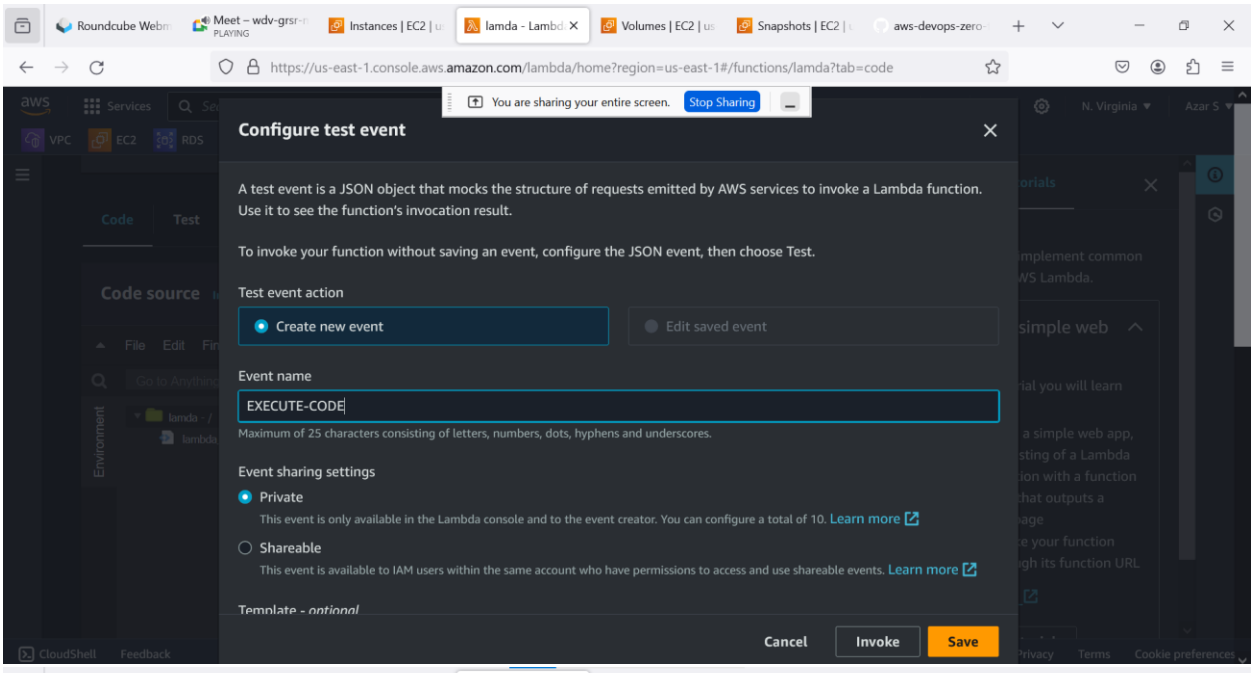
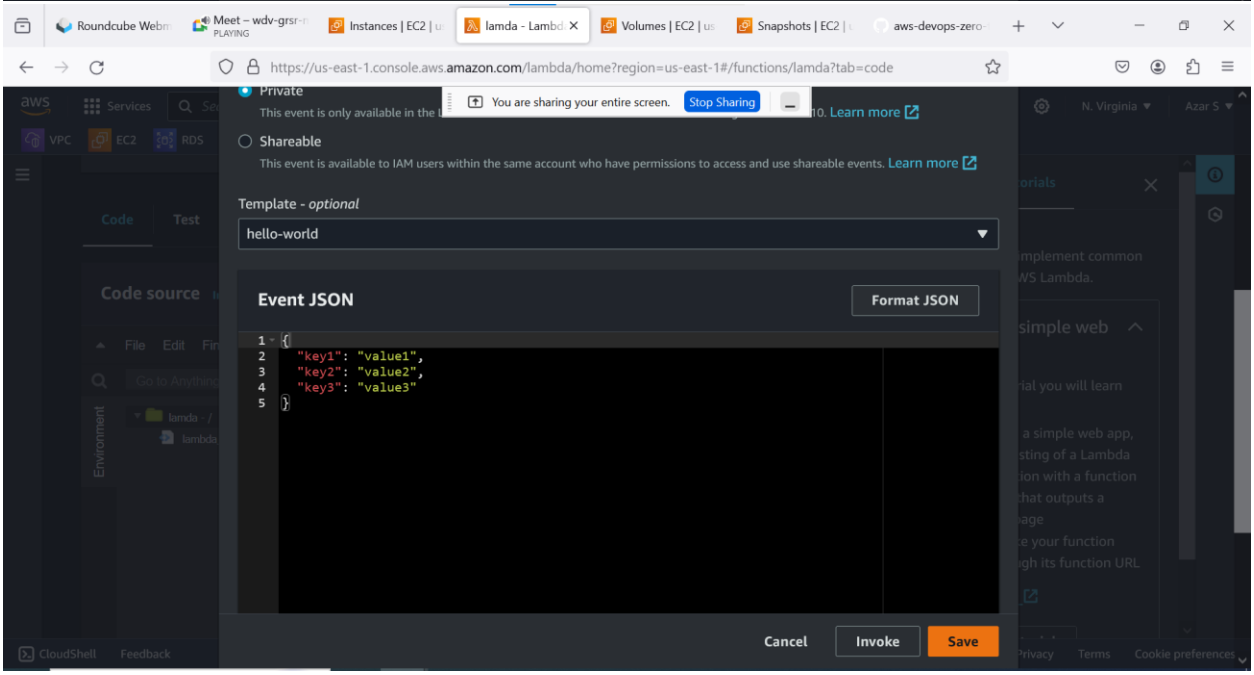
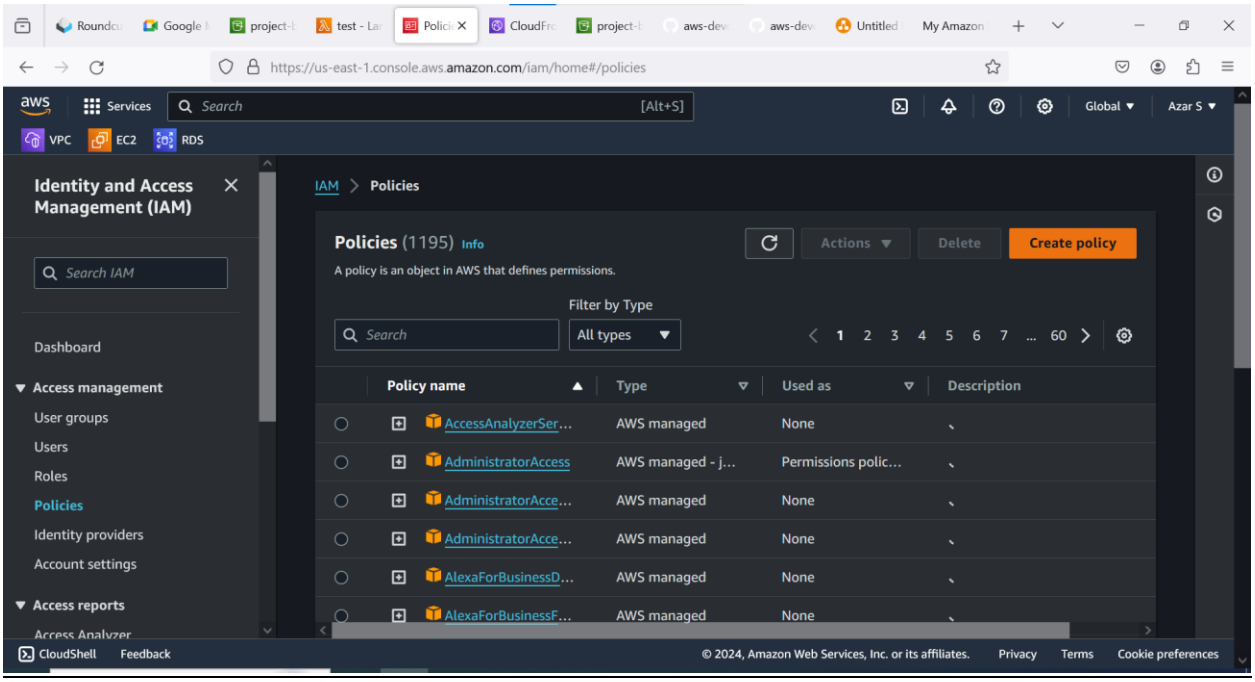




ATTACH ROLES TO LAMBDA:

CREATE CUSTOMIZE POLICY:

1) **Delete-Snapshot**
2) **Describe-snapshot**
3) **Describe-Volume**
4) **Describe-instance**
5) **Instead 3 &4 directly attach ec2 full access role**


https://us-east-1.console.aws.amazon.com/iam/home#/policies
Identity and Access Management (IAM)
IAM > Policies
Policies (1195) Info
A policy is an object in AWS that defines permissions.
Actions
Delete
Create policy
Filter by Type
All types
Policy name
Type
Used as
Description
AccessAnalyzerSer...
AWS managed
None
AdministratorAccess
AWS managed - j...
Permissions polic...
AdministratorAcce...
AWS managed
None
AlexaForBusinessD...
AlexaForBusinessF...
Dashboard
Access management
User groups
Users
Roles
Policies
Identity providers
Account settings
Access reports
CloudShell
Feedback
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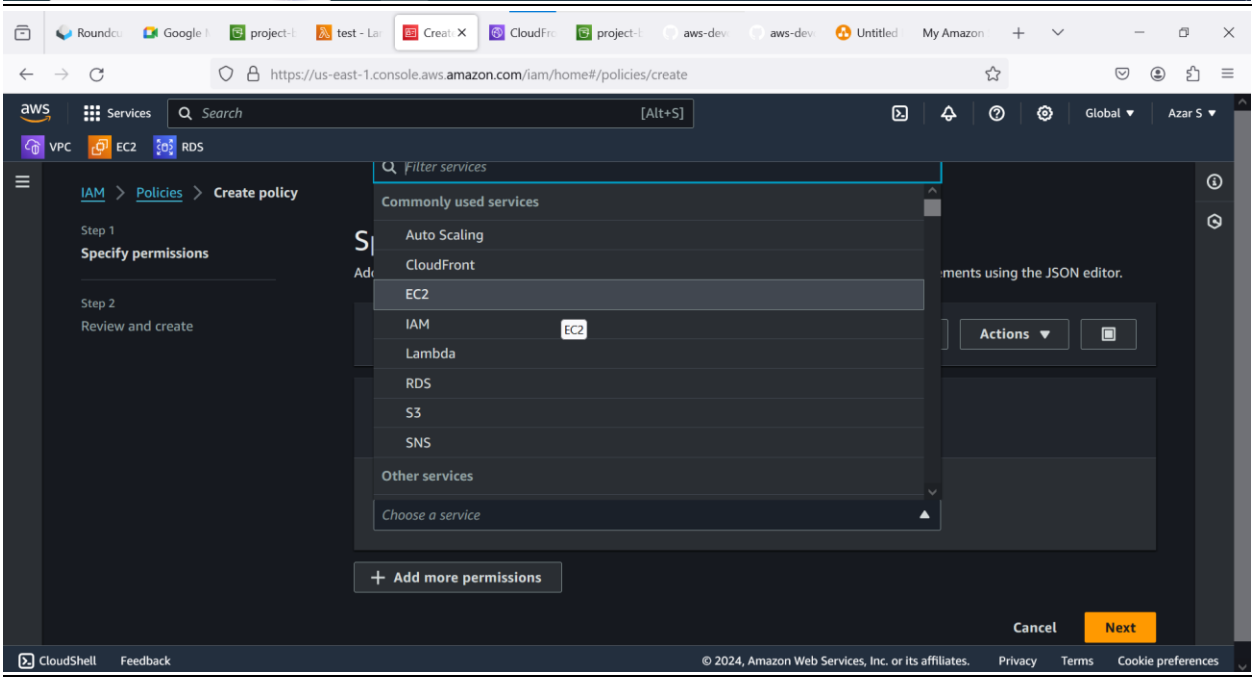
https://us-east-1.console.aws.amazon.com/iam/home#/policies/create
IAM > Policies > Create policy
Step 1
Specify permissions
Step 2
Review and create
Filter services
Commonly used services
Auto Scaling
CloudFront
EC2
IAM
Lambda
RDS
S3
SNS
Other services
Choose a service
Actions
Add more permissions
Cancel
Next
CloudShell
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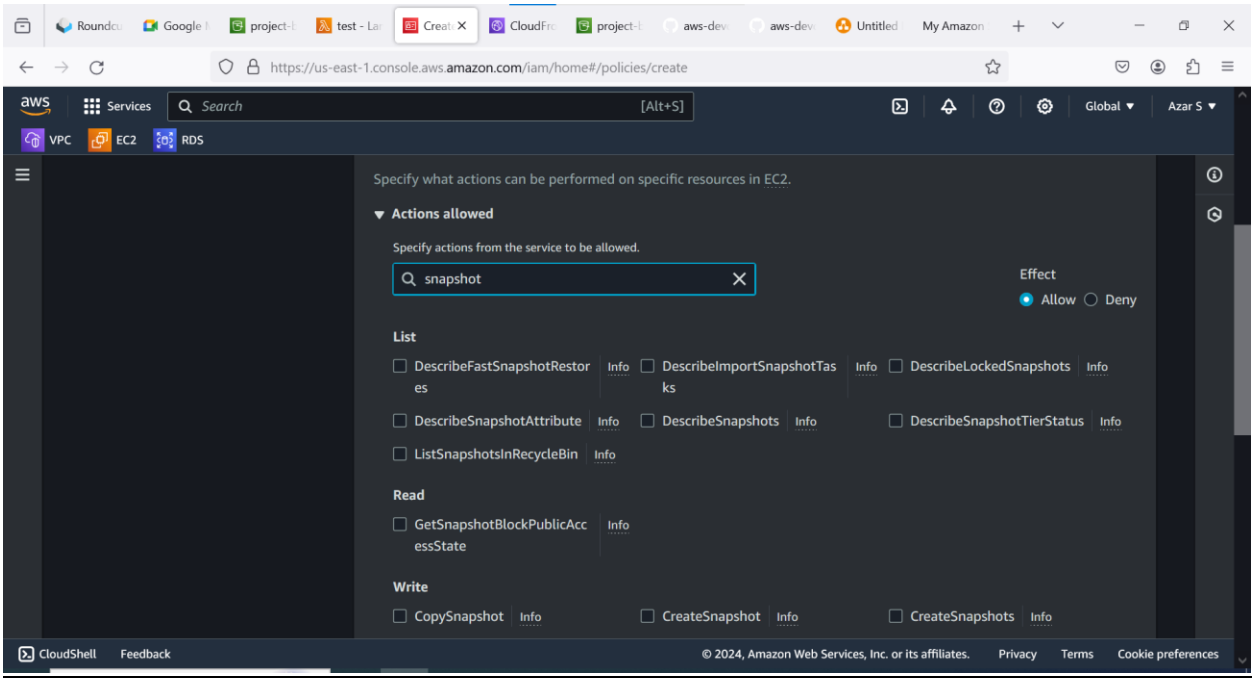
https://us-east-1.console.aws.amazon.com/iam/home#/policies/create
Specify what actions can be performed on specific resources in EC2.
Actions allowed
Specify actions from the service to be allowed.
snapshot
Effect
Allow
Deny
List
DescribeFastSnapshotRestores
DescribeImportSnapshotTasks
DescribeLockedSnapshots
DescribeSnapshotAttribute
DescribeSnapshots
DescribeSnapshotTierStatus
ListSnapshotsInRecycleBin
Read
GetSnapshotBlockPublicAccessState
Write
CopySnapshot
CreateSnapshot
CreateSnapshots
CloudShell
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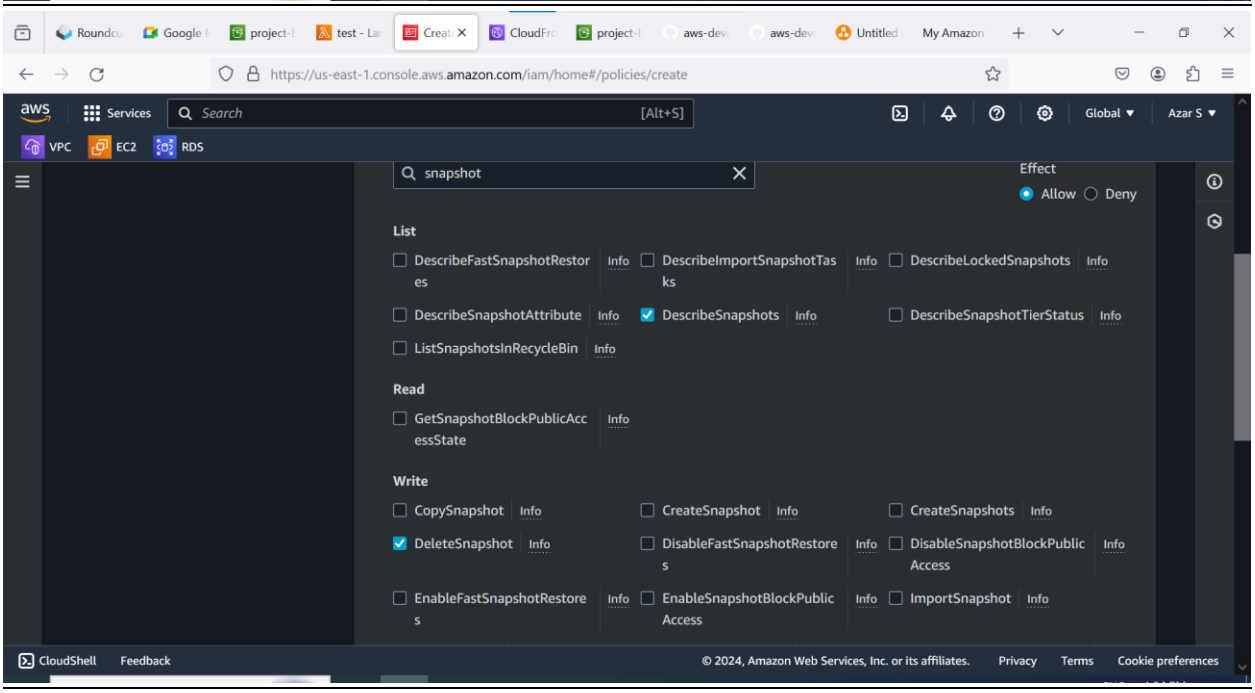
https://us-east-1.console.aws.amazon.com/iam/home#/policies/create
snapshot
Effect
Allow
Deny
List
DescribeFastSnapshotRestores
DescribeImportSnapshotTasks
DescribeLockedSnapshots
DescribeSnapshotAttribute
DescribeSnapshots
DescribeSnapshotTierStatus
ListSnapshotsInRecycleBin
Read
GetSnapshotBlockPublicAccessState
Write
CopySnapshot
CreateSnapshot
CreateSnapshots
DeleteSnapshot
DisableFastSnapshotRestores
DisableSnapshotBlockPublicAccess
EnableFastSnapshotRestores
EnableSnapshotBlockPublicAccess
ImportSnapshot
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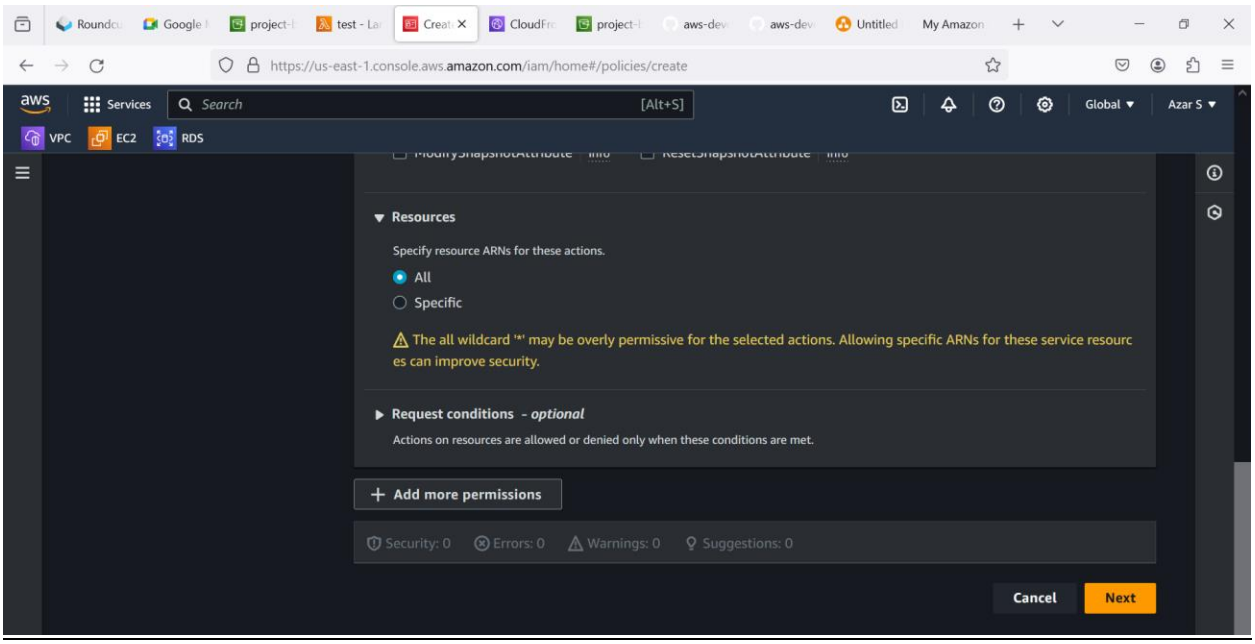
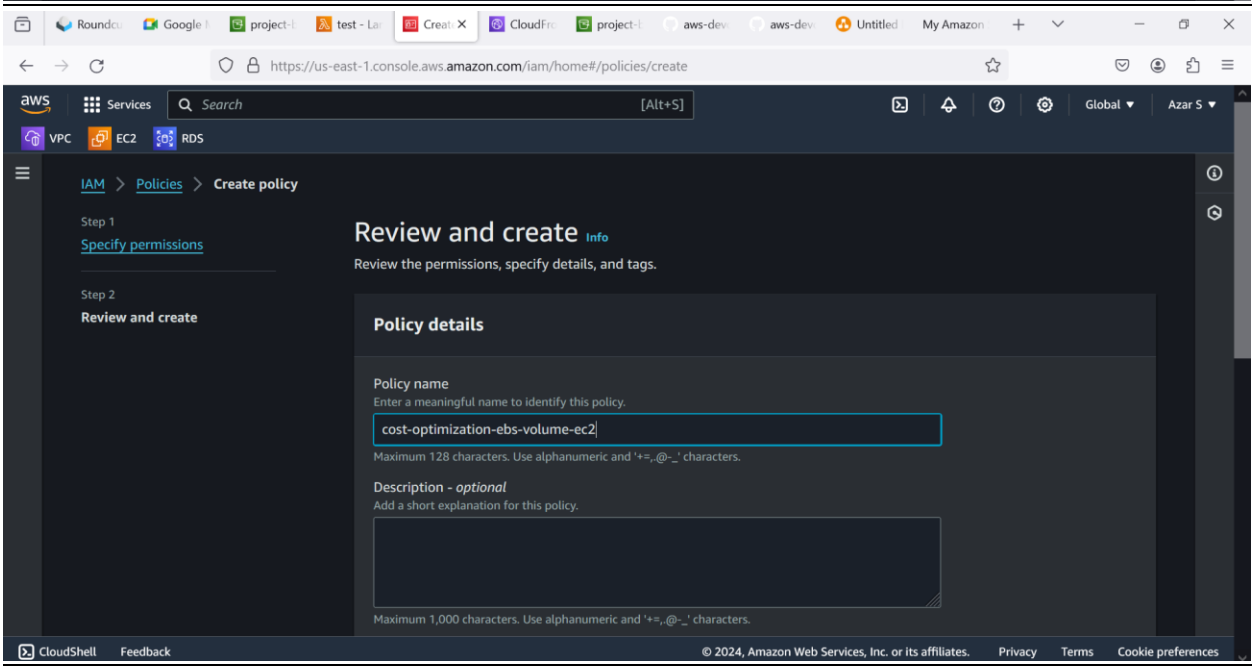

https://us-east-1.console.aws.amazon.com/iam/home#/policies/create
Services
Search
[Alt+S]
Global
Azar S
VPC
EC2
RDS
Resources
Specify resource ARNs for these actions.
All
Specific
The all wildcard '*' may be overly permissive for the selected actions. Allowing specific ARNs for these service resources can improve security.
Request conditions - optional
Actions on resources are allowed or denied only when these conditions are met.
Add more permissions
Security: 0
Errors: 0
Warnings: 0
Suggestions: 0
Cancel
Next


https://us-east-1.console.aws.amazon.com/iam/home#/policies/create
Services
Search
[Alt+S]
Global
Azar S
VPC
EC2
RDS
IAM
Policies
Create policy
Step 1
Specify permissions
Step 2
Review and create
Review and create Info
Review the permissions, specify details, and tags.
Policy details
Policy name
Enter a meaningful name to identify this policy.
cost-optimization-ebs-volume-ec2
Maximum 128 characters. Use alphanumeric and '+=,.@-_' characters.
Description - optional
Add a short explanation for this policy.
Maximum 1,000 characters. Use alphanumeric and '+=,.@-_' characters.
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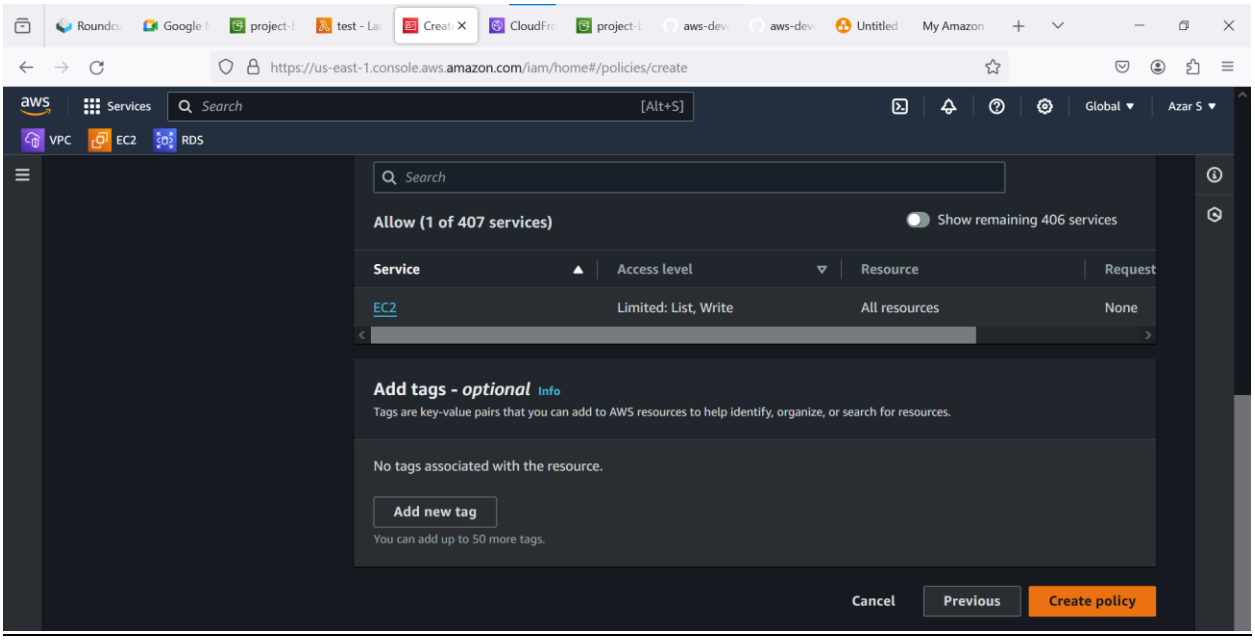
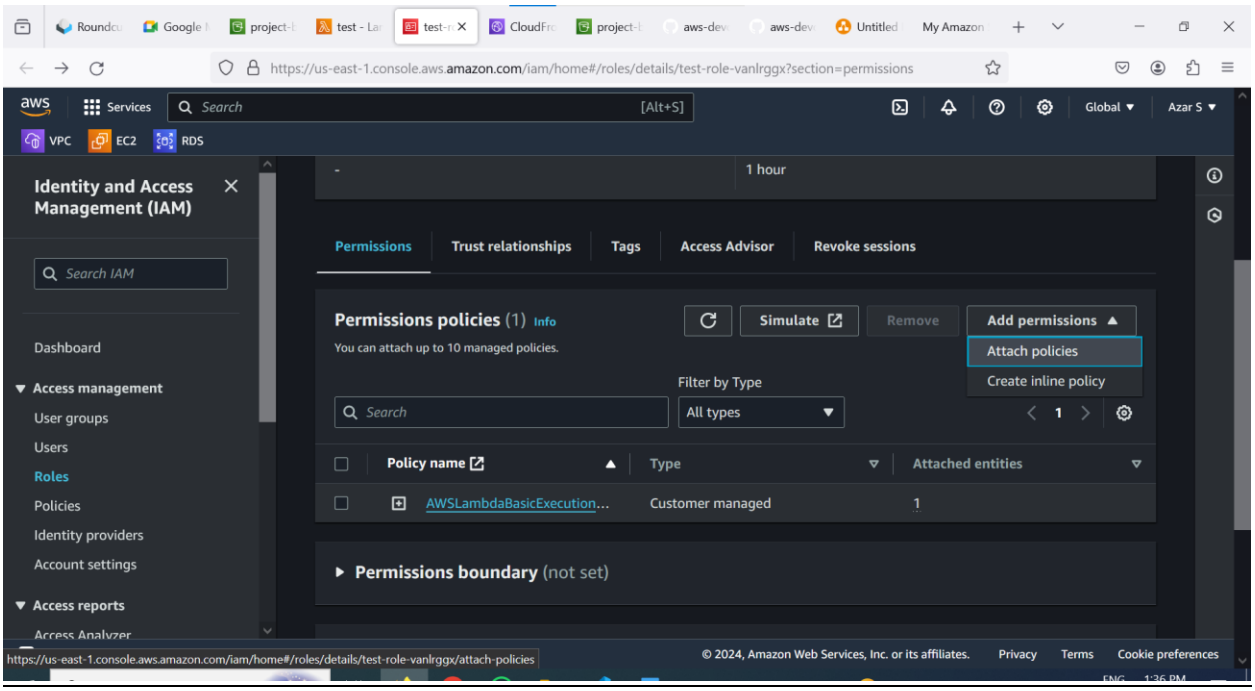

https://us-east-1.console.aws.amazon.com/iam/home#/policies/create
Search
[Alt+S]
Global
Azar S
VPC
EC2
RDS
Allow (1 of 407 services)
Show remaining 406 services
Service
Access level
Resource
Request
EC2
Limited: List, Write
All resources
None
Add tags - optional Info
Tags are key-value pairs that you can add to AWS resources to help identify, organize, or search for resources.
No tags associated with the resource.
Add new tag
You can add up to 50 more tags.
Cancel
Previous
Create policy


https://us-east-1.console.aws.amazon.com/iam/home#/roles/details/test-role-vanlrggx?section=permissions
Identity and Access Management (IAM)
Search IAM
Dashboard
Access management
User groups
Users
Roles
Policies
Identity providers
Account settings
Access reports
1 hour
Permissions
Trust relationships
Tags
Access Advisor
Revoke sessions
Permissions policies (1) Info
You can attach up to 10 managed policies.
Simulate
Remove
Add permissions
Attach policies
Create inline policy
Filter by Type
All types
Policy name
Type
Attached entities
AWSLambdaBasicExecution...
Customer managed
1
Permissions boundary (not set)
https://us-east-1.console.aws.amazon.com/iam/home#/roles/details/test-role-vanlrggx/attach-policies
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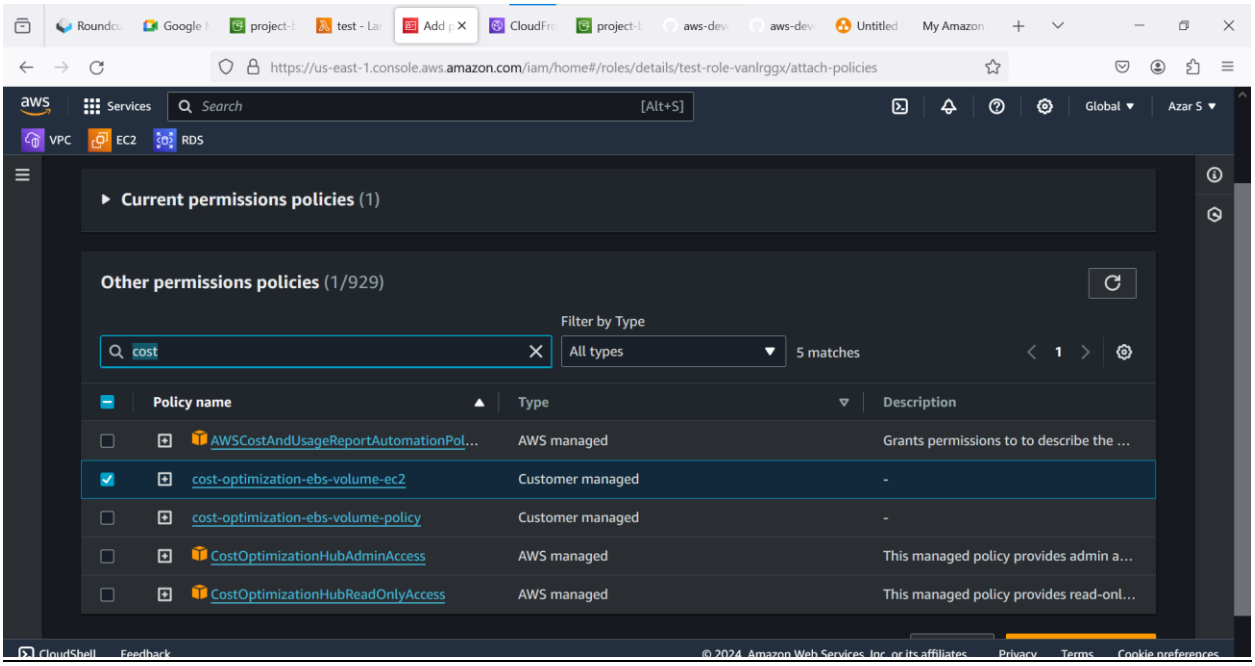
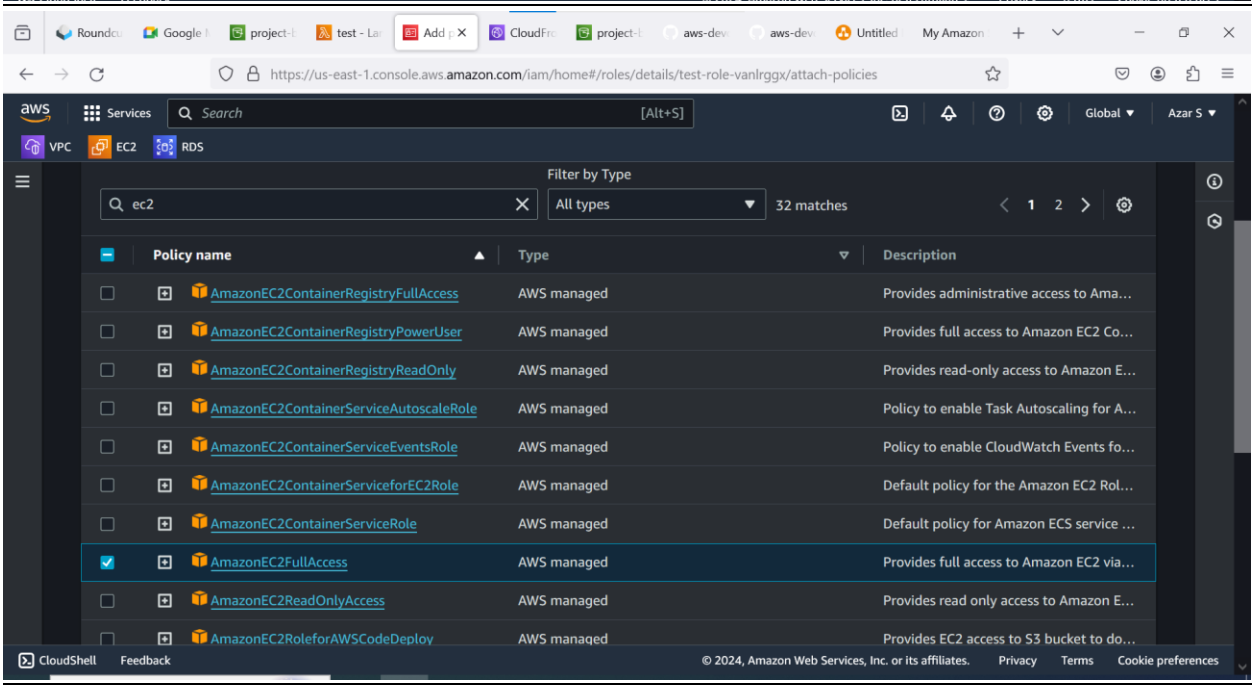

https://us-east-1.console.aws.amazon.com/iam/home#/roles/details/test-role-vanlrggx/attach-policies
Services
Search
[Alt+S]
Global
Azar S
VPC
EC2
RDS
Current permissions policies (1)
Other permissions policies (1/929)
Filter by Type
cost
All types
5 matches
Policy name
Type
Description
AWSCostAndUsageReportAutomationPol...
AWS managed
Grants permissions to to describe the ...
cost-optimization-ebs-volume-ec2
Customer managed
-
cost-optimization-ebs-volume-policy
Customer managed
-
CostOptimizationHubAdminAccess
AWS managed
This managed policy provides admin a...
CostOptimizationHubReadOnlyAccess
AWS managed
This managed policy provides read-onl...
CloudShell
Feedback


https://us-east-1.console.aws.amazon.com/iam/home#/roles/details/test-role-vanlrggx/attach-policies
Services
Search
[Alt+S]
Global
Azar S
VPC
EC2
RDS
Filter by Type
ec2
All types
32 matches
Policy name
Type
Description
AmazonEC2ContainerRegistryFullAccess
AWS managed
Provides administrative access to Ama...
AmazonEC2ContainerRegistryPowerUser
AWS managed
Provides full access to Amazon EC2 Co...
AmazonEC2ContainerRegistryReadOnly
AWS managed
Provides read-only access to Amazon E...
AmazonEC2ContainerServiceAutoscaleRole
AWS managed
Policy to enable Task Autoscaling for A...
AmazonEC2ContainerServiceEventsRole
AWS managed
Policy to enable CloudWatch Events fo...
AmazonEC2ContainerServiceforEC2Role
AWS managed
Default policy for the Amazon EC2 Rol...
AmazonEC2ContainerServiceRole
AWS managed
Default policy for Amazon ECS service ...
AmazonEC2FullAccess
AWS managed
Provides full access to Amazon EC2 via...
AmazonEC2ReadOnlyAccess
AWS managed
Provides read only access to Amazon E...
AmazonEC2RoleforAWSCodeDeploy
AWS managed
Provides EC2 access to S3 bucket to do...
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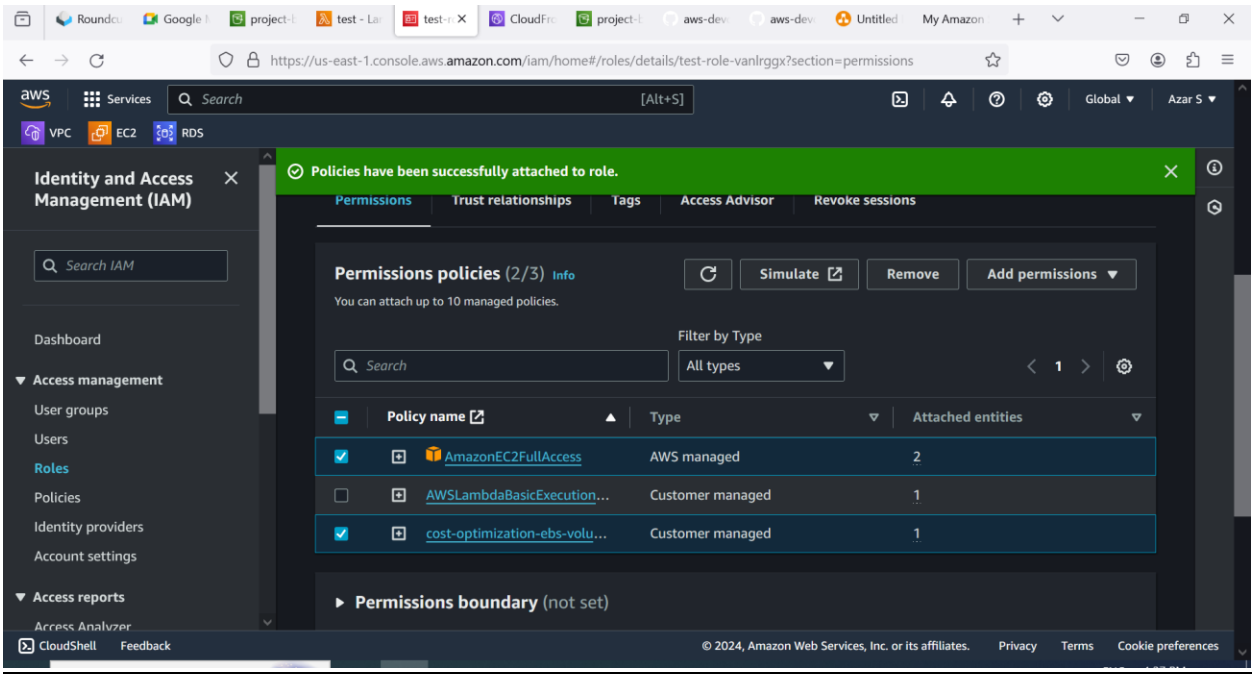
https://us-east-1.console.aws.amazon.com/iam/home#/roles/details/test-role-vanlrggx?section=permissions
Policies have been successfully attached to role.
Identity and Access Management (IAM)
Permissions
Trust relationships
Tags
Access Advisor
Revoke sessions
Permissions policies (2/3) Info
You can attach up to 10 managed policies.
Simulate
Remove
Add permissions
Filter by Type
All types
Policy name
Type
Attached entities
AmazonEC2FullAccess
AWS managed
2
AWSLambdaBasicExecution...
Customer managed
1
cost-optimization-ebs-volu...
Customer managed
1
Permissions boundary (not set)
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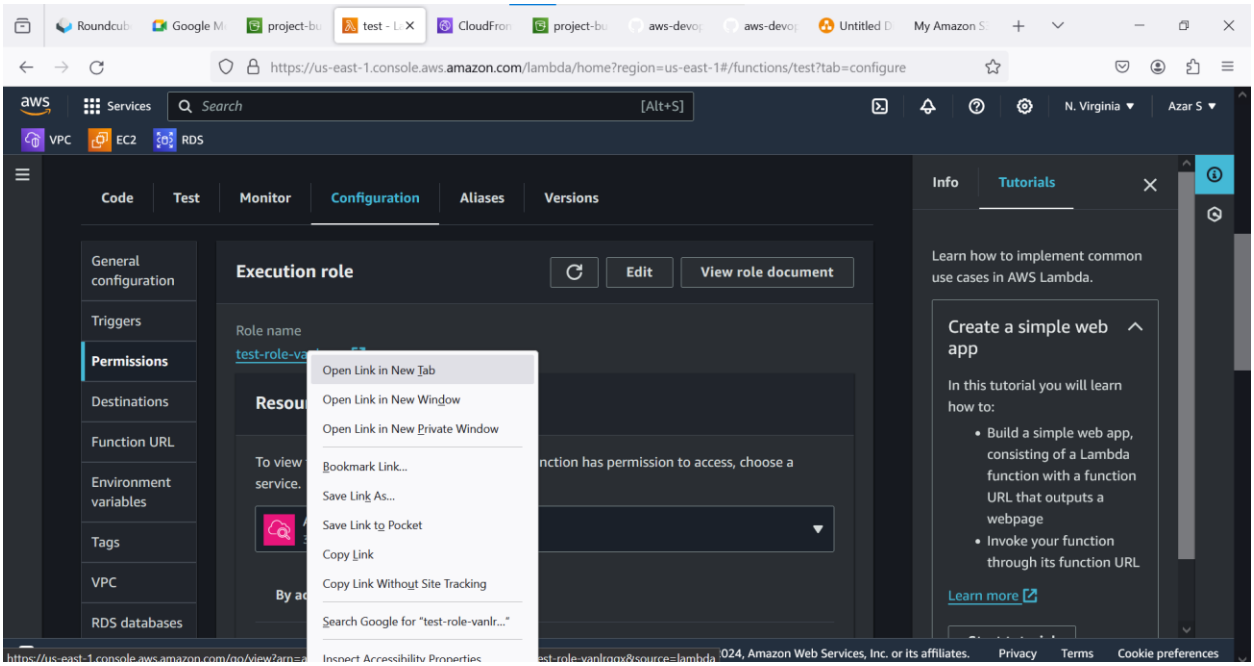
https://us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#/functions/test?tab=configure
Code
Test
Monitor
Configuration
Aliases
Versions
General configuration
Triggers
Permissions
Destinations
Function URL
Environment variables
Tags
VPC
RDS databases
Execution role
Edit
View role document
Role name
Open Link in New Tab
Open Link in New Window
Open Link in New Private Window
Bookmark Link...
Save Link As...
Save Link to Pocket
Copy Link
Copy Link Without Site Tracking
Search Google for "test-role-vanlr..."
Info
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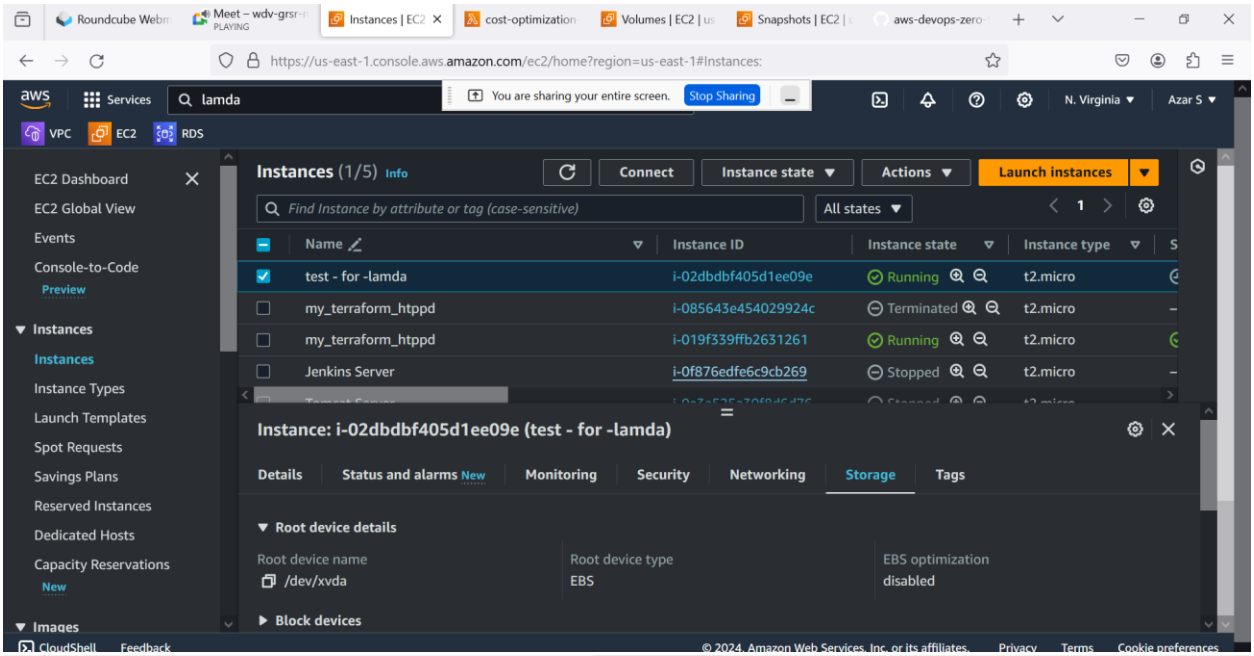
Instances | EC2
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:
You are sharing your entire screen.
Stop Sharing
lamda
N. Virginia
Azar S
EC2 Dashboard
EC2 Global View
Events
Console-to-Code
Preview
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
New
Images
Instances (1/5) Info
Connect
Instance state
Actions
Launch instances
Find Instance by attribute or tag (case-sensitive)
All states
Name
Instance ID
Instance state
Instance type
test - for -lamda
i-02dbdbf405d1ee09e
Running
t2.micro
my_terraform_htppd
i-085643e454029924c
Terminated
t2.micro
my_terraform_htppd
i-019f339ffb2631261
Running
t2.micro
Jenkins Server
i-0f876edfe6c9cb269
Stopped
t2.micro
Instance: i-02dbdbf405d1ee09e (test - for -lamda)
Details
Status and alarms New
Monitoring
Security
Networking
Storage
Tags
Root device details
Root device name
/dev/xvda
Root device type
EBS
EBS optimization
disabled
Block devices
CloudShell
Feedback
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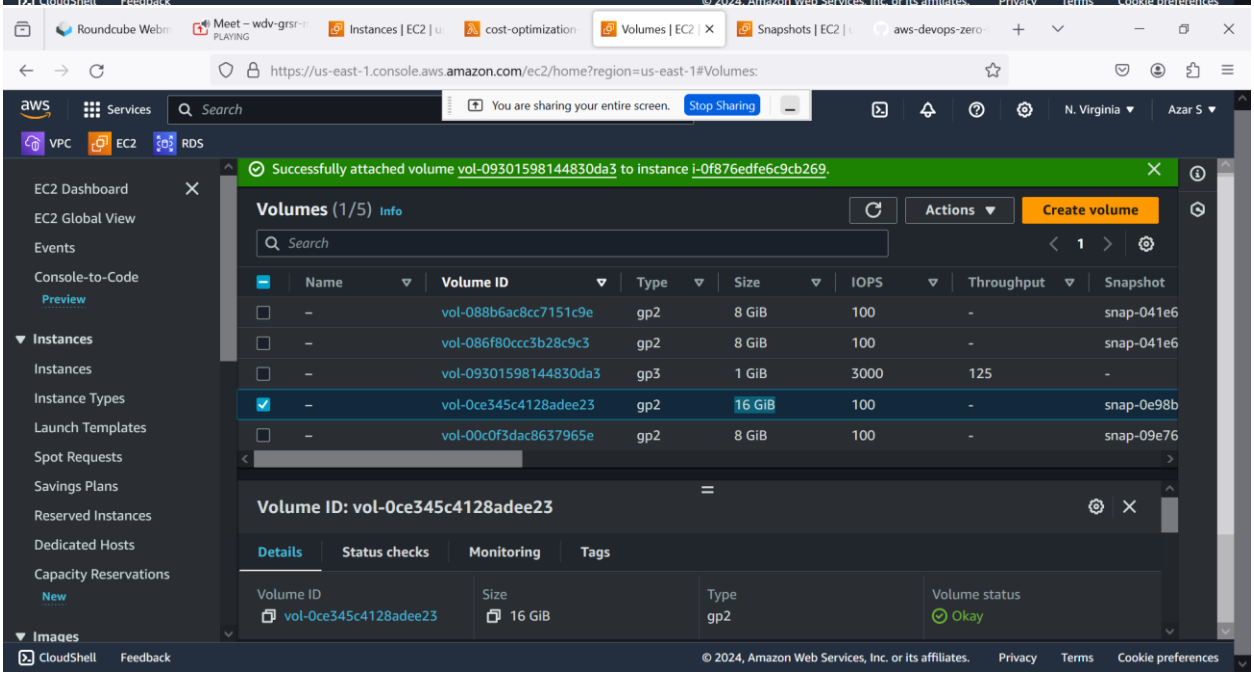
Volumes | EC2
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Volumes:
You are sharing your entire screen.
Stop Sharing
Search
N. Virginia
Azar S
Successfully attached volume vol-09301598144830da3 to instance i-0f876edfe6c9cb269.
EC2 Dashboard
EC2 Global View
Events
Console-to-Code
Preview
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
New
Images
Volumes (1/5) Info
Actions
Create volume
Search
Name
Volume ID
Type
Size
IOPS
Throughput
Snapshot
vol-088b6ac8cc7151c9e
gp2
8 GiB
100
snap-041e6
vol-086f80ccc3b28c9c3
gp2
8 GiB
100
snap-041e6
vol-09301598144830da3
gp3
1 GiB
3000
125
vol-0ce345c4128adee23
gp2
16 GiB
100
snap-0e98b
vol-00c0f3dac8637965e
gp2
8 GiB
100
snap-09e76
Volume ID: vol-0ce345c4128adee23
Details
Status checks
Monitoring
Tags
Volume ID
vol-0ce345c4128adee23
Size
16 GiB
Type
gp2
Volume status
Okay
CloudShell
Feedback
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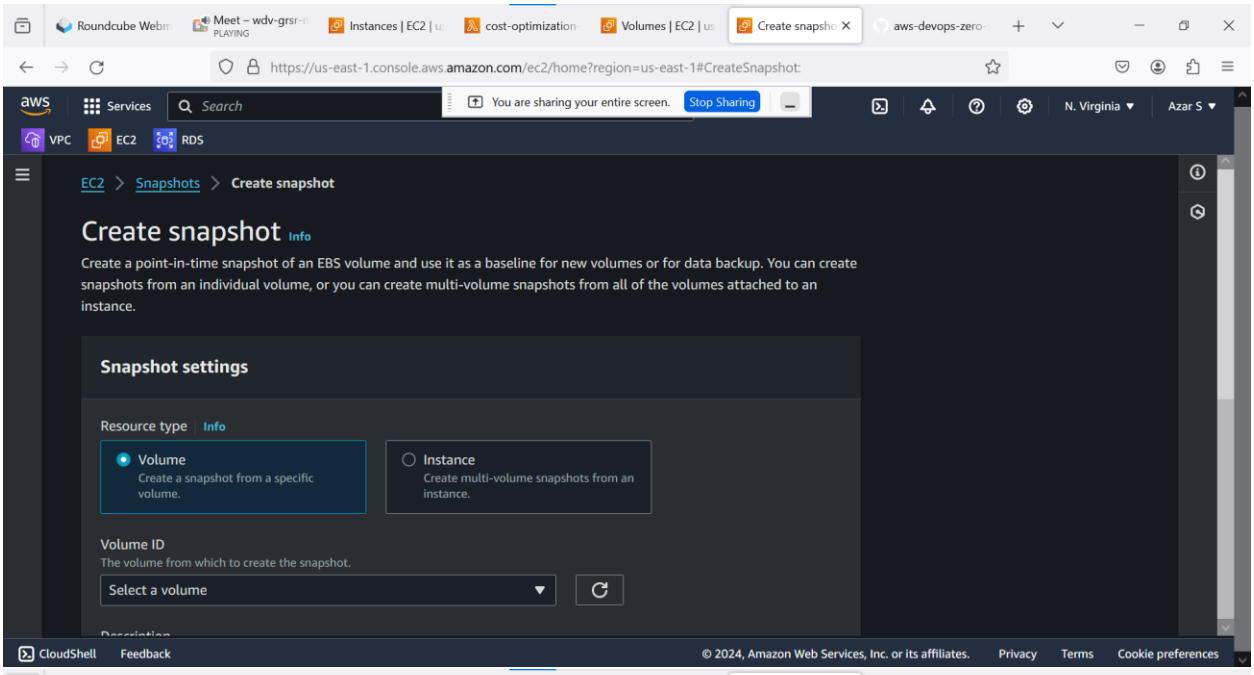
Roundcube Webm
Meet – wdv-grsr-n
PLAYING
Instances | EC2 | us
cost-optimization
Volumes | EC2 | us
Create snapsho
aws-devops-zero
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateSnapshot:
You are sharing your entire screen.
Stop Sharing
aws
Services
Search
N. Virginia
Azar S
VPC
EC2
RDS
EC2 > Snapshots > Create snapshot
Create snapshot Info
Create a point-in-time snapshot of an EBS volume and use it as a baseline for new volumes or for data backup. You can create snapshots from an individual volume, or you can create multi-volume snapshots from all of the volumes attached to an instance.
Snapshot settings
Resource type Info
Volume
Create a snapshot from a specific volume.
Instance
Create multi-volume snapshots from an instance.
Volume ID
The volume from which to create the snapshot.
Select a volume
CloudShell
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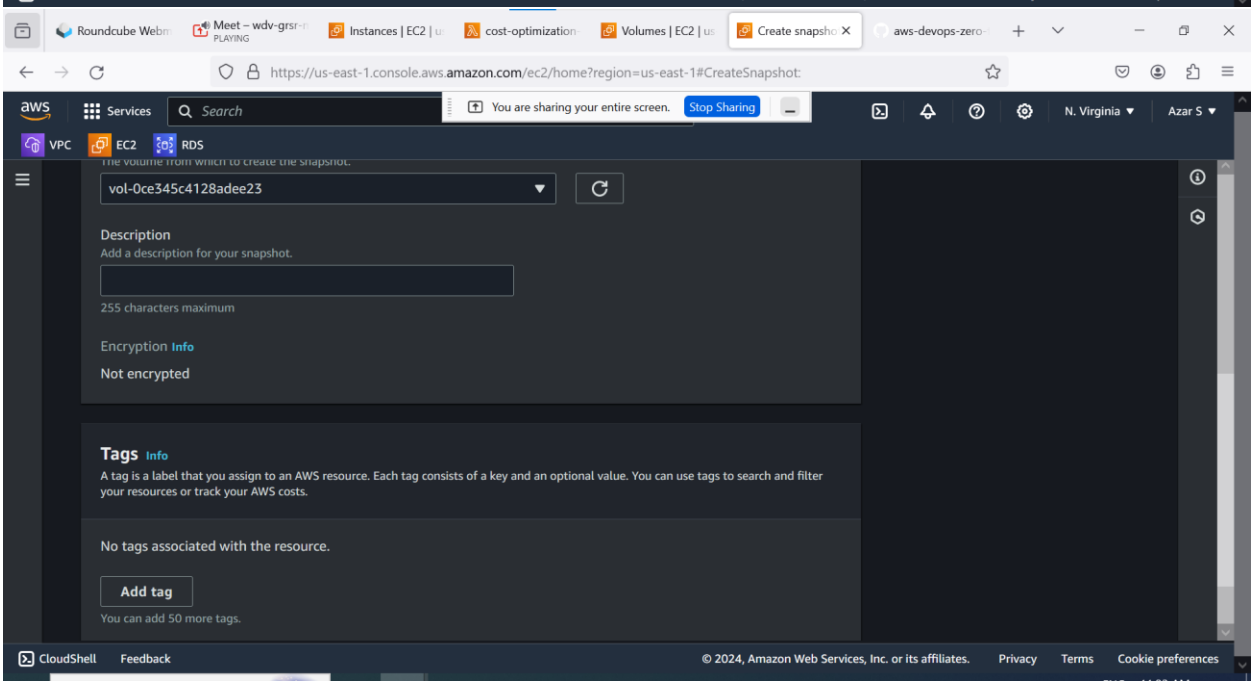
Roundcube Webm
Meet – wdv-grsr-n
PLAYING
Instances | EC2 | us
cost-optimization
Volumes | EC2 | us
Create snapsho
aws-devops-zero
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateSnapshot:
You are sharing your entire screen.
Stop Sharing
aws
Services
Search
N. Virginia
Azar S
VPC
EC2
RDS
vol-0ce345c4128adee23
Description
Add a description for your snapshot.
255 characters maximum
Encryption Info
Not encrypted
Tags Info
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.
No tags associated with the resource.
Add tag
You can add 50 more tags.
CloudShell
Feedback
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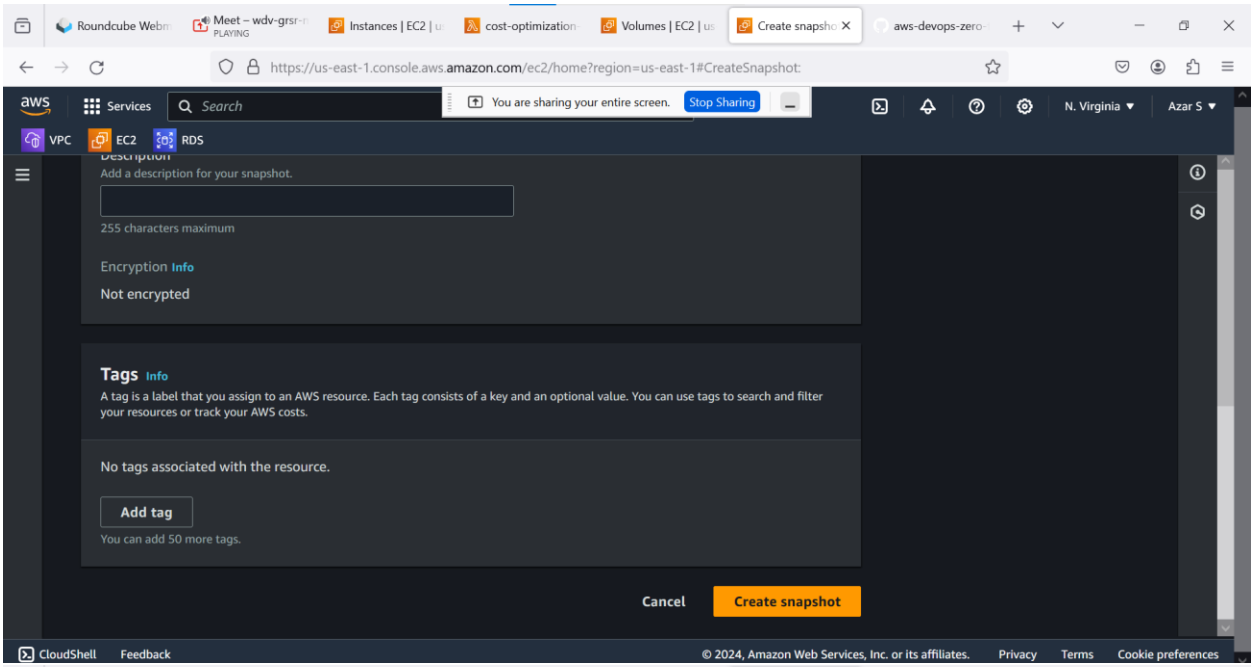
Create snapshot
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateSnapshot:
You are sharing your entire screen.
Stop Sharing
Add a description for your snapshot.
255 characters maximum
Encryption Info
Not encrypted
Tags Info
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.
No tags associated with the resource.
Add tag
You can add 50 more tags.
Cancel
Create snapshot
CloudShell
Feedback
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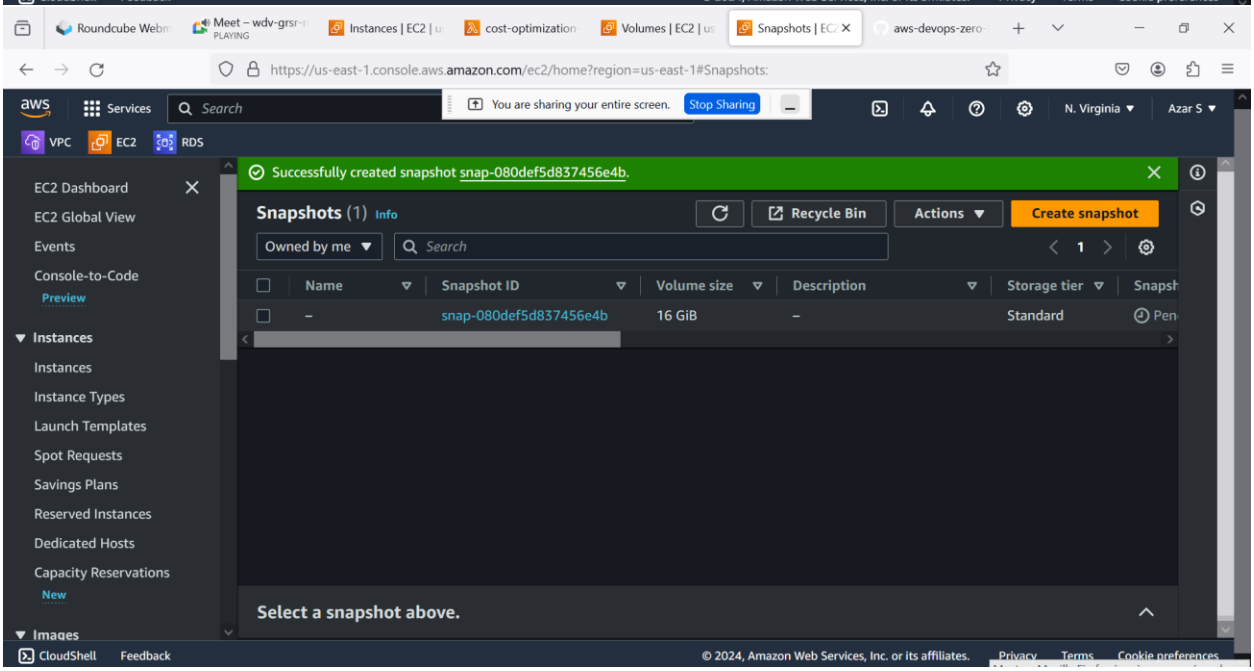
Snapshots | EC2
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Snapshots:
You are sharing your entire screen.
Stop Sharing
Successfully created snapshot snap-080def5d837456e4b.
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Instances
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Snapshots (1) Info
Recycle Bin
Actions
Create snapshot
Owned by me
Search
Name
Snapshot ID
Volume size
Description
Storage tier
snap-080def5d837456e4b
16 GiB
Standard
Select a snapshot above.
CloudShell
Feedback
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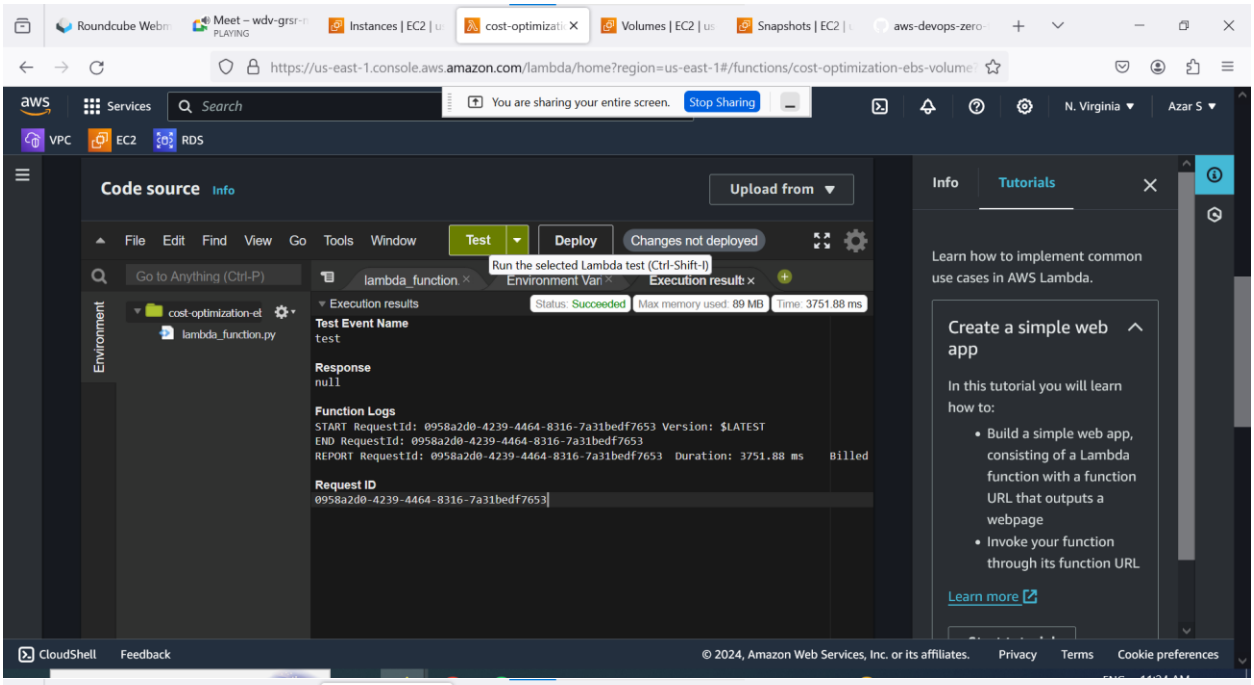
Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Changes not deployed
Run the selected Lambda test (Ctrl-Shift-I)
lambda_function
Environment Vari
Execution result:
Execution results
Status: Succeeded
Max memory used: 89 MB
Time: 3751.88 ms
Test Event Name
test
Response
null
Function Logs
START RequestId: 0958a2d0-4239-4464-8316-7a31bedf7653 Version: $LATEST
END RequestId: 0958a2d0-4239-4464-8316-7a31bedf7653
REPORT RequestId: 0958a2d0-4239-4464-8316-7a31bedf7653 Duration: 3751.88 ms Billed
Request ID
0958a2d0-4239-4464-8316-7a31bedf7653
Info
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Invoke your function through its function URL
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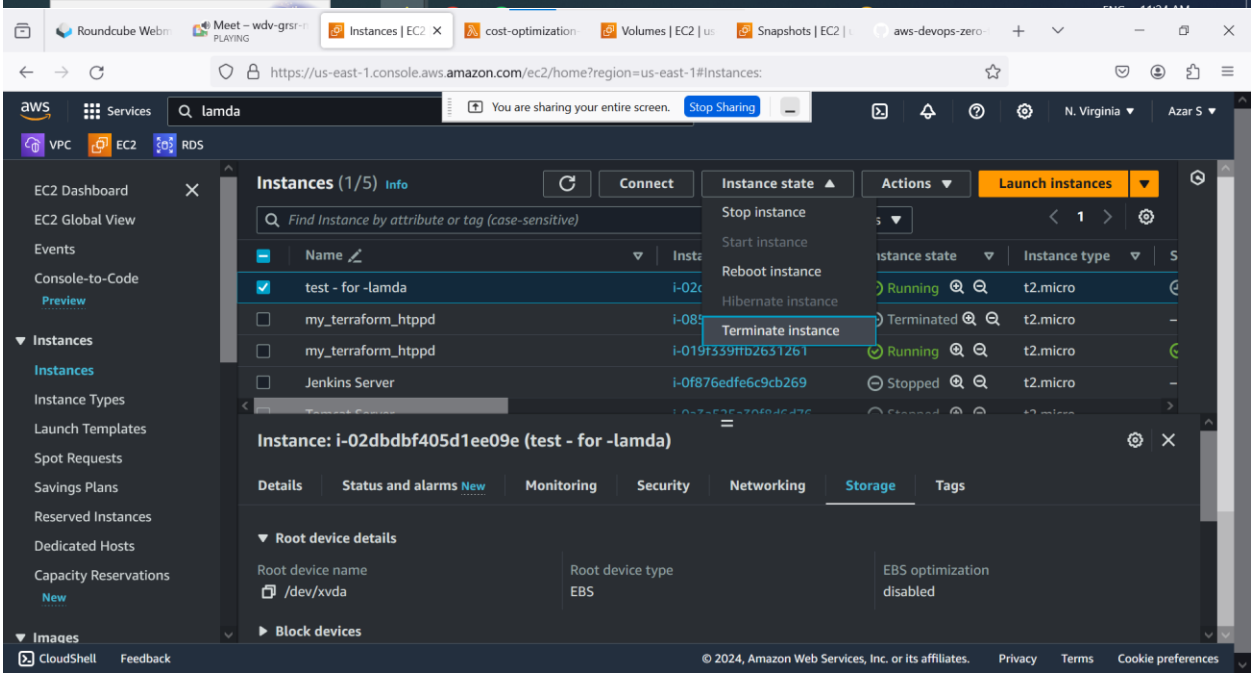
Instances (1/5) Info
Connect
Instance state
Actions
Launch instances
Stop instance
Start instance
Reboot instance
Hibernate instance
Terminate instance
Name
Instance state
Instance type
test - for -lamda
Running
t2.micro
my_terraform_htppd
Terminated
t2.micro
my_terraform_htppd
Running
t2.micro
Jenkins Server
i-0f876edfe6c9cb269
Stopped
t2.micro
Instance: i-02dbdbf405d1ee09e (test - for -lamda)
Details
Status and alarms New
Monitoring
Security
Networking
Storage
Tags
Root device details
Root device name
/dev/xvda
Root device type
EBS
EBS optimization
disabled
Block devices
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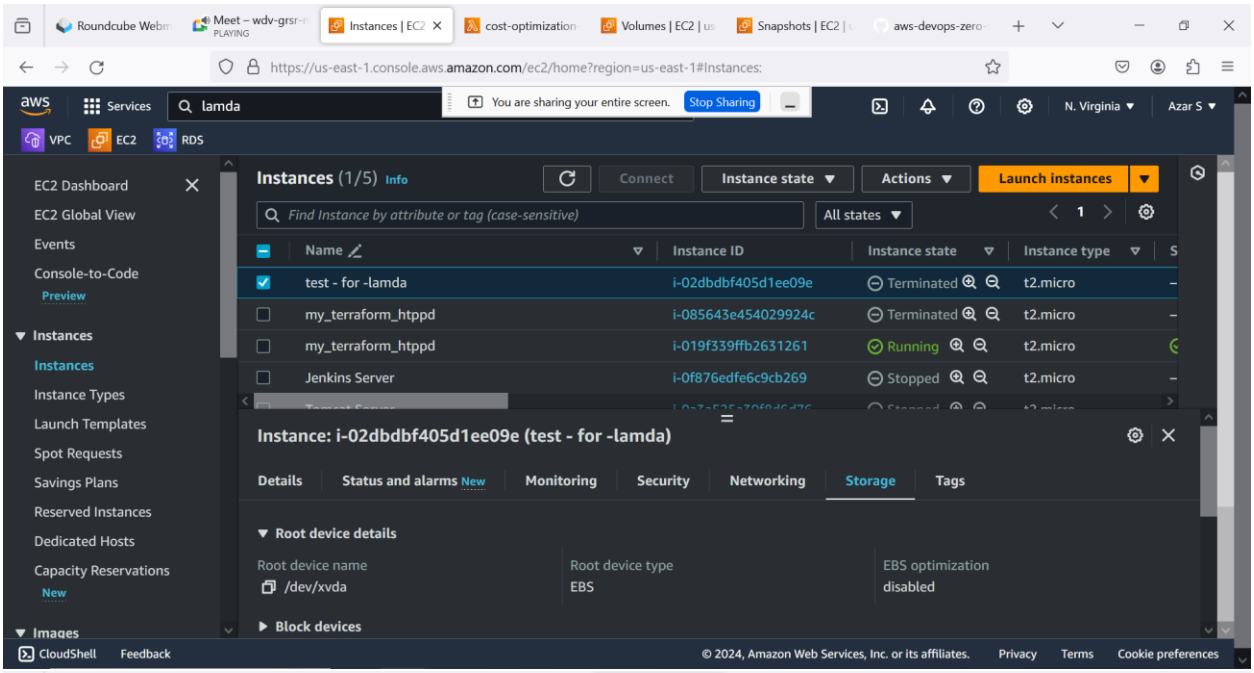
Instances | EC2
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:
You are sharing your entire screen.
Stop Sharing
lamda
N. Virginia
Azar S
EC2 Dashboard
EC2 Global View
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Console-to-Code
Instances
Instance Types
Launch Templates
Spot Requests
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Reserved Instances
Dedicated Hosts
Capacity Reservations
Images
Instances (1/5) Info
Connect
Instance state
Actions
Launch instances
Find Instance by attribute or tag (case-sensitive)
All states
Name
Instance ID
Instance state
Instance type
test - for -lamda
i-02dbdbf405d1ee09e
Terminated
t2.micro
my_terraform_htppd
i-085643e454029924c
Terminated
t2.micro
my_terraform_htppd
i-019f339ffb2631261
Running
t2.micro
Jenkins Server
i-0f876edfe6c9cb269
Stopped
t2.micro
Instance: i-02dbdbf405d1ee09e (test - for -lamda)
Details
Status and alarms New
Monitoring
Security
Networking
Storage
Tags
Root device details
Root device name
/dev/xvda
Root device type
EBS
EBS optimization
disabled
Block devices
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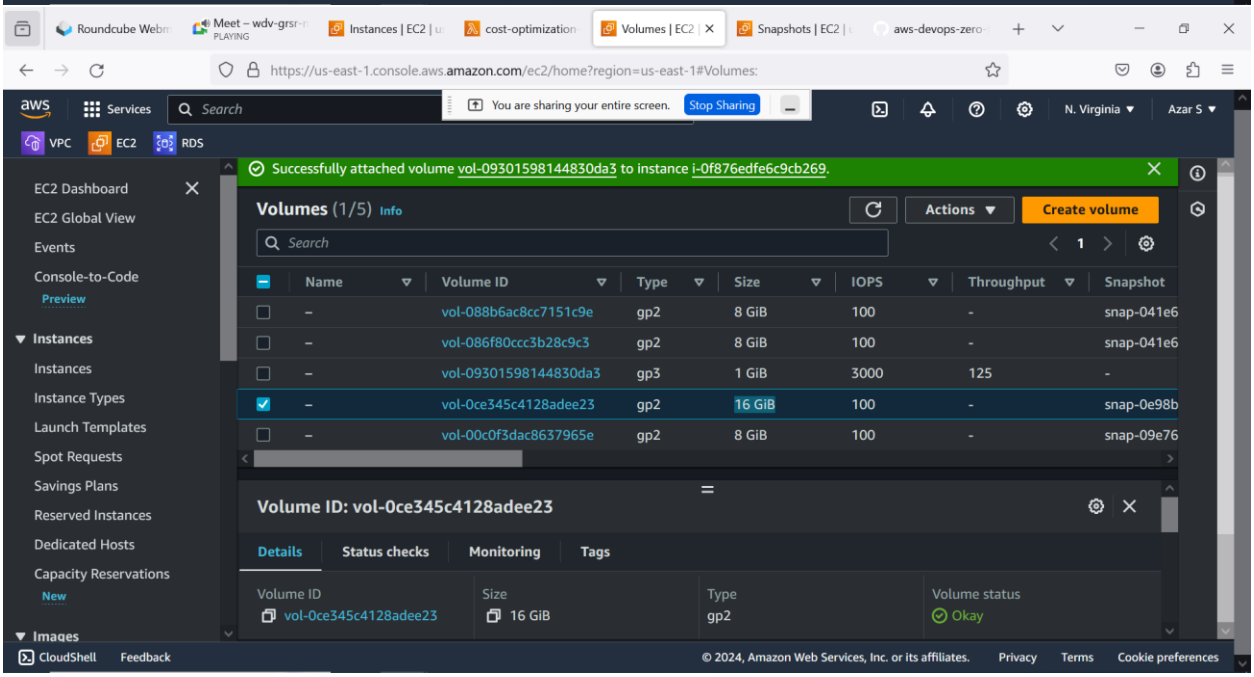
Volumes | EC2
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Volumes:
You are sharing your entire screen.
Stop Sharing
Search
N. Virginia
Azar S
Successfully attached volume vol-09301598144830da3 to instance i-0f876edfe6c9cb269.
Volumes (1/5) Info
Actions
Create volume
Search
Name
Volume ID
Type
Size
IOPS
Throughput
Snapshot
vol-088b6ac8cc7151c9e
gp2
8 GiB
100
snap-041e6
vol-086f80ccc3b28c9c3
gp2
8 GiB
100
snap-041e6
vol-09301598144830da3
gp3
1 GiB
3000
125
vol-0ce345c4128adee23
gp2
16 GiB
100
snap-0e98b
vol-00c0f3dac8637965e
gp2
8 GiB
100
snap-09e76
Volume ID: vol-0ce345c4128adee23
Details
Status checks
Monitoring
Tags
Volume ID
vol-0ce345c4128adee23
Size
16 GiB
Type
gp2
Volume status
Okay
CloudShell
Feedback
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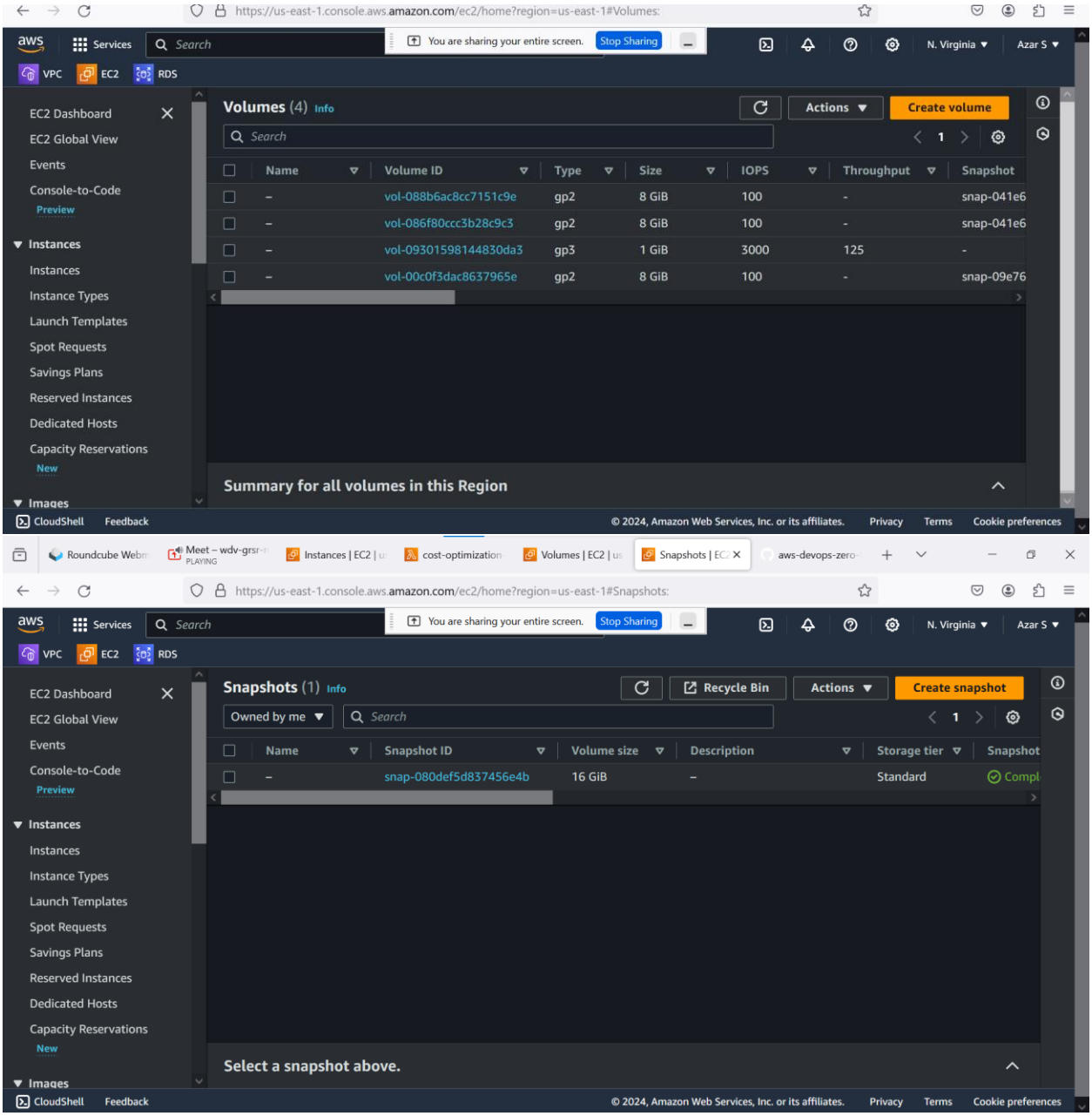
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Volumes:
You are sharing your entire screen.
Stop Sharing
N. Virginia
Azar S
EC2 Dashboard
EC2 Global View
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Instances
Instance Types
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New
Images
Volumes (4) Info
Actions
Create volume
Name
Volume ID
Type
Size
IOPS
Throughput
Snapshot
vol-088b6ac8cc7151c9e gp2 8 GiB 100 - snap-041e6
vol-086f80ccc3b28c9c3 gp2 8 GiB 100 - snap-041e6
vol-09301598144830da3 gp3 1 GiB 3000 125 -
vol-00c0f3dac8637965e gp2 8 GiB 100 - snap-09e76
Summary for all volumes in this Region
CloudShell
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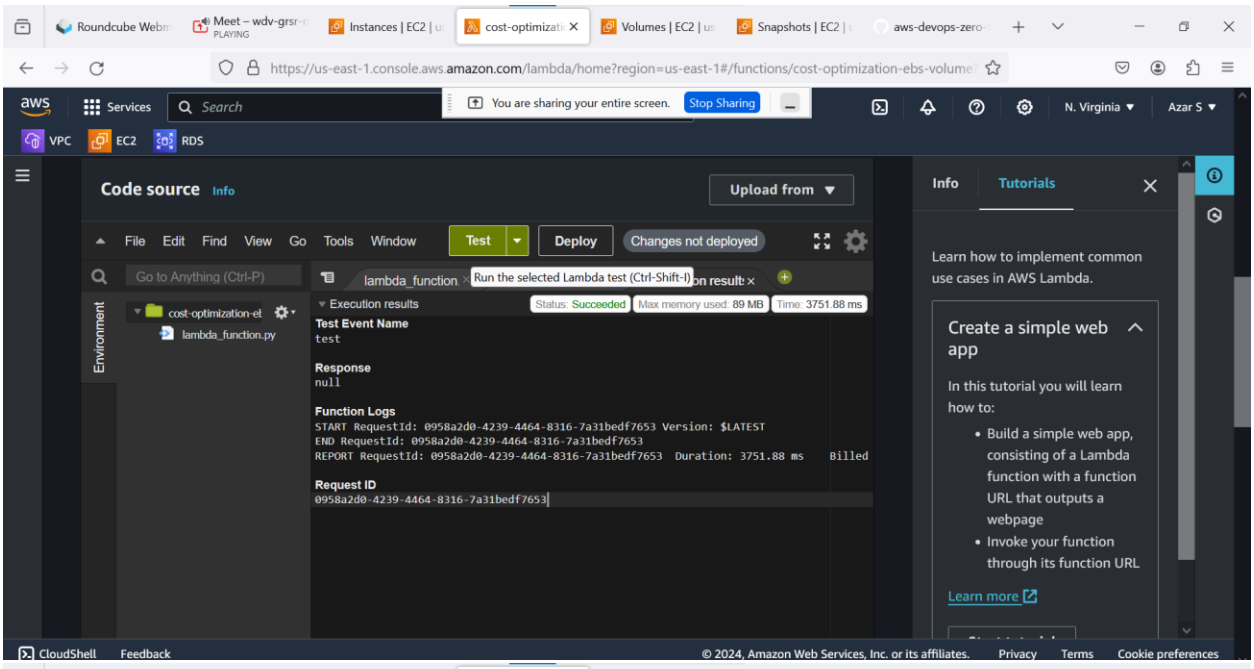
https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Snapshots:
Snapshots (1) Info
Recycle Bin
Actions
Create snapshot
Owned by me
Name
Snapshot ID
Volume size
Description
Storage tier
Snapshot
snap-080def5d837456e4b 16 GiB - Standard
Select a snapshot above.


Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Changes not deployed
lambda_function
Execution results
Status: Succeeded
Max memory used: 89 MB
Time: 3751.88 ms
Test Event Name
test
Response
null
Function Logs
START RequestId: 0958a2d0-4239-4464-8316-7a31bedf7653 Version: $LATEST
END RequestId: 0958a2d0-4239-4464-8316-7a31bedf7653
REPORT RequestId: 0958a2d0-4239-4464-8316-7a31bedf7653 Duration: 3751.88 ms Billed
Request ID
0958a2d0-4239-4464-8316-7a31bedf7653
Info
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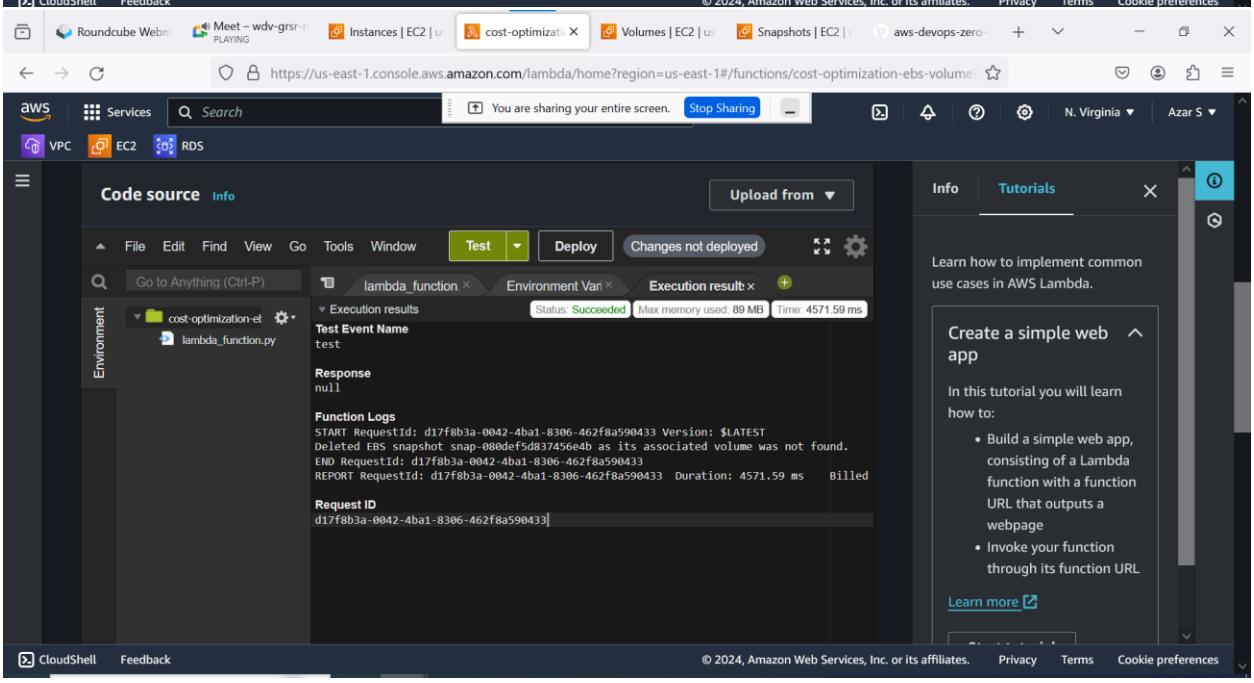
Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Changes not deployed
lambda_function
Environment Vari
Execution result:
Execution results
Status: Succeeded
Max memory used: 89 MB
Time: 4571.59 ms
Test Event Name
test
Response
null
Function Logs
START RequestId: d17f8b3a-0042-4ba1-8306-462f8a590433 Version: $LATEST
Deleted EBS snapshot snap-080def5d837456e4b as its associated volume was not found.
END RequestId: d17f8b3a-0042-4ba1-8306-462f8a590433
REPORT RequestId: d17f8b3a-0042-4ba1-8306-462f8a590433 Duration: 4571.59 ms Billed
Request ID
d17f8b3a-0042-4ba1-8306-462f8a590433
Info
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Invoke your function through its function URL
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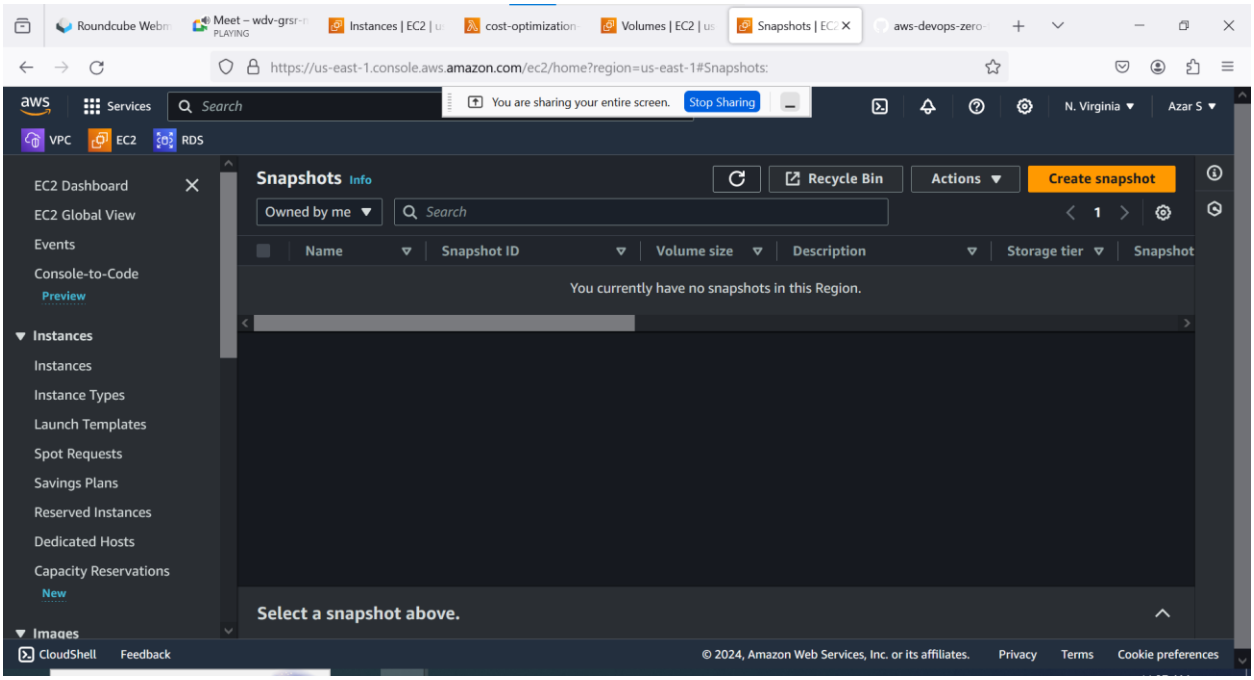

GITHUB LINK: https://github.com/iam-veeramalla/aws-devops-zero-to-hero/tree/main/day-18

CODE:

```
import boto3

def lambda_handler(event, context):
    ec2 = boto3.client('ec2')

    # Get all EBS snapshots
    response = ec2.describe_snapshots(OwnerIds=['self'])

    # Get all active EC2 instance IDs
    instances_response = ec2.describe_instances(Filters=[{'Name': 'instance-state-name', 'Values': ['running']}])
    active_instance_ids = set()

    for reservation in instances_response['Reservations']:
```

```
        for instance in reservation['Instances']:
            active_instance_ids.add(instance['InstanceId'])

    # Iterate through each snapshot and delete if it's not attached to any volume or the volume is not attached to a running instance
    for snapshot in response['Snapshots']:
        snapshot_id = snapshot['SnapshotId']
        volume_id = snapshot.get('VolumeId')

        if not volume_id:
            # Delete the snapshot if it's not attached to any volume
            ec2.delete_snapshot(SnapshotId=snapshot_id)
            print(f"Deleted EBS snapshot {snapshot_id} as it was not attached to any volume.")
        else:
            # Check if the volume still exists
            try:
                volume_response = ec2.describe_volumes(VolumeIds=[volume_id])
                if not volume_response['Volumes'][0]['Attachments']:
                    ec2.delete_snapshot(SnapshotId=snapshot_id)
                    print(f"Deleted EBS snapshot {snapshot_id} as it was taken from a volume not attached to any running instance.")
            except ec2.exceptions.ClientError as e:
                if e.response['Error']['Code'] == 'InvalidVolume.NotFound':
                    # The volume associated with the snapshot is not found (it might have been deleted)
                    ec2.delete_snapshot(SnapshotId=snapshot_id)
                    print(f"Deleted EBS snapshot {snapshot_id} as its associated volume was not found.")
```