

Assignment

Que. Create VPC with public and private subnet

Ans. Following are the steps to create VPC with Public Subnet and Private Subnet

1. Create New VPC (MyVPC)

<input type="checkbox"/>	Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP options set	Main Route table
<input checked="" type="checkbox"/>	MyVPC	vpc-0eb70db6d6c4f2ddc	available	10.200.0...	-	dopt-75b1411e	rtb-09abb9fba1c5978b
<input type="checkbox"/>		vpc-65818b0d	available	172.31.0...	-	dopt-75b1411e	rtb-25bb704e

State	available	Default VPC	No
IPv4 CIDR	10.200.0.0/16	IPv6 CIDR	-
IPv6 Pool	-	DNS resolution	Enabled
Network ACL	acl-09306a9f9dccb6e4f	DNS hostnames	Disabled
DHCP options set	dopt-75b1411e	Route table	rtb-09abb9fba1c5978b6
Owner	545033201860		

2. Create Internet Gateway (MyIGW) So VPC can talk with Internet

<input type="checkbox"/>	Name	ID	State	VPC	Owner
<input checked="" type="checkbox"/>	MyIGW	igw-0bef23020ad0...	attached	vpc-0eb70db6d6c...	545033201860
<input type="checkbox"/>		igw-d3da7dbb	attached	vpc-65818b0d	545033201860

internet gateway: igw-0bef23020ad060917	
Description	Tags
ID	igw-0bef23020ad060917
State	attached
Attached VPC ID	vpc-0eb70db6d6c4f2ddc MyVPC
Owner	545033201860

3. Attach InternetGateway to MyVPC

4. Public Subnets

->Create Public Subnet

<input checked="" type="checkbox"/>	PublicSubn...	subnet-0ddfb05a8fb579b1a	available	vpc-0eb70db6d6c4f2ddc ...	10.200.0.0/24	248	-
<input type="checkbox"/>	PrivateSub...	subnet-0201fa7b0729c63df	available	vpc-0eb70db6d6c4f2ddc ...	10.200.1.0/24	249	-

Description

Flow Logs

Route Table

Network ACL

Tags

Sharing

Subnet ID	subnet-0ddfb05a8fb579b1a	State	available
VPC	vpc-0eb70db6d6c4f2ddc MyVPC	IPv4 CIDR	10.200.0.0/24
Available IPv4 Addresses	248	IPv6 CIDR	-
Availability Zone	ap-south-1b (aps1-az3)	Route Table	rtb-06e7dc5447cf0fe24 PublicRT A
Network ACL	acl-09306a9f9dccf6e4f	Default subnet	No

->Create Route Table and associate with Public Subnet

<input checked="" type="checkbox"/>	PublicRT A	rtb-06e7dc5447cf0fe24	subnet-0ddfb05a8fb579b1a	-	No	vpc-0eb70db6d6c4f2ddc
<input type="checkbox"/>		rtb-09abb9fba1c5978b6	-	-	Yes	vpc-0eb70db6d6c4f2ddc
<input type="checkbox"/>	PrivateRT	rtb-0c6f1b81c7bffc655	-	-	No	vpc-0eb70db6d6c4f2ddc
<input type="checkbox"/>		rtb-25bb704e	-	-	Yes	vpc-65818b0d

Summary

Routes

Subnet Associations

Edge Associations

Route Propagation

Tags

Route Table ID	rtb-06e7dc5447cf0fe24	Main	No
Explicitly Associated with	subnet-0ddfb05a8fb579b1a	VPC	vpc-0eb70db6d6c4f2ddc MyVPC
Owner	545033201860		

->Add Route to the Internet

->Associate these Route table with Subnet So subnet become public subset

5. Private Subnet

->Create Private Subnet

PrivateSub...

subnet-0201fa7b0729c63df

available

vpc-0eb70db6d6c4f2ddc | ...

10.200.1.0/24

249

-

Description

Flow Logs

Route Table

Network ACL

Tags

Sharing

Subnet ID

Subnet

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->Create Route Table with Private Subnet

The screenshot shows the AWS Management Console interface for creating a new route table. The 'Create route table' wizard is in progress, and the 'Summary' tab is active. The summary displays the following information:

- Name:** PrivateRT
- Route Table ID:** rtb-0c6f1b81c7bffc655
- Explicit subnet association:** subnet-0dffb05a8fb579b1a
- Edge associations:** -
- Main:** No
- VPC ID:** vpc-0eb70db6d6c4f2ddc | MyVPC

The wizard also shows the route table is explicitly associated with the owner '648033201860'. The 'Routes' tab is also visible, showing a single route for the subnet.

->It has Route within VPC Dont't Modify because it is Private Subset

Que.>Setup Local Path in AWS

ANS.

```
Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Arduino-droid>AWS
usage: aws [options] <command> [<subcommand> ...] [parameters]
To see help text, you can run:

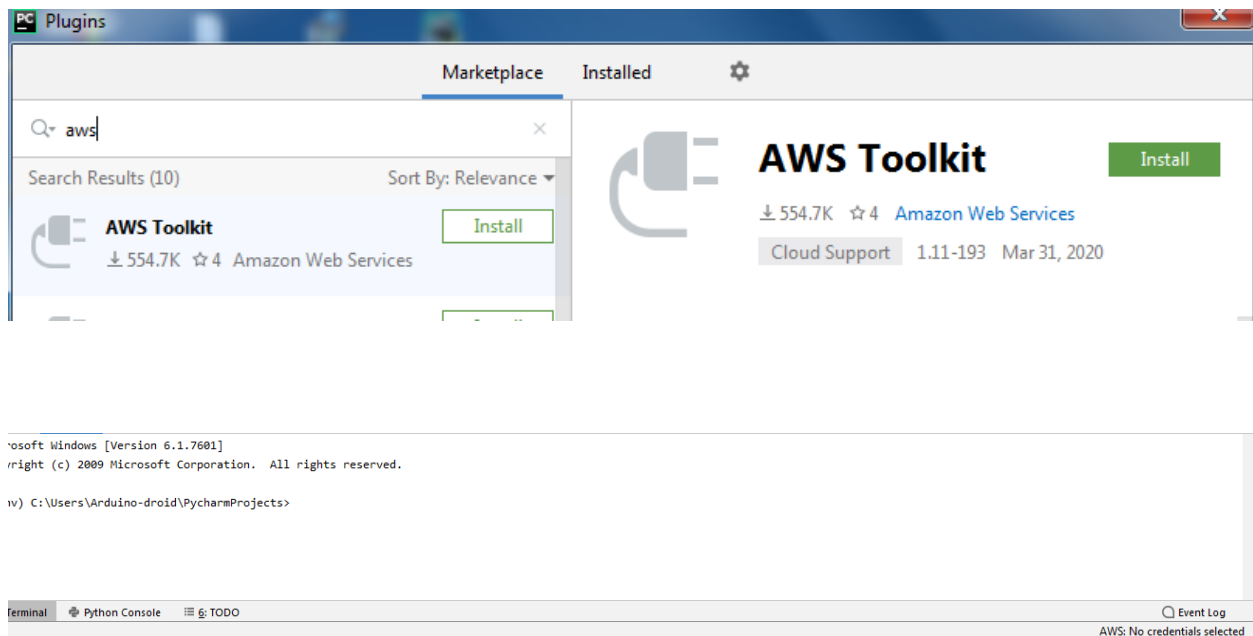
    aws help
    aws <command> help
    aws <command> <subcommand> help
aws: error: the following arguments are required: command

C:\Users\Arduino-droid>aws --version
aws-cli/1.18.26 Python/3.6.0 Windows/7 botocore/1.15.26

C:\Users\Arduino-droid>
```



Que.> Install Pycharm and aws toolkit plugin in pycharm

Ans.



Que. Create Bucket Policy on your own upload some images and pdf which give public access to images not to pdf

Ans. -> Upload pdf and png file in the S3 bucket

Viewing 1 to 2				
<input type="checkbox"/>	Name ▾	Last modified ▾	Size ▾	Storage class ▾
<input type="checkbox"/>	 LCD Menu Tree.pdf	Apr 1, 2020 7:33:26 PM GMT+0530	212.4 KB	Standard
<input type="checkbox"/>	 ig.png	Apr 1, 2020 7:32:49 PM GMT+0530	25.0 KB	Standard

-> Create bucket policy using policy generator that allow png file and deny pdf file

Block public access

Access Control List

Bucket Policy
Public

CORS configuration

Bucket policy editor ARN: arn:aws:s3:::assignment7727
Type to add a new policy or edit an existing policy in the text area below.

Delete

Cancel

Save

```
1 {
2   "Version": "2012-10-17",
3   "Id": "Policy1585750177201",
4   "Statement": [
5     {
6       "Sid": "Stmt1585750124462",
7       "Effect": "Allow",
8       "Principal": "*",
9       "Action": "s3:GetObject",
10      "Resource": "arn:aws:s3:::assignment7727/*.*png"
11    },
12    {
13      "Sid": "Stmt1585750175362",
14      "Effect": "Deny",
15      "Principal": "*",
16      "Action": "s3:GetObject",
17      "Resource": "arn:aws:s3:::assignment7727/*.*pdf"
18    }
19  ]
20 }
```

-> Bucket Policy give access to Png file

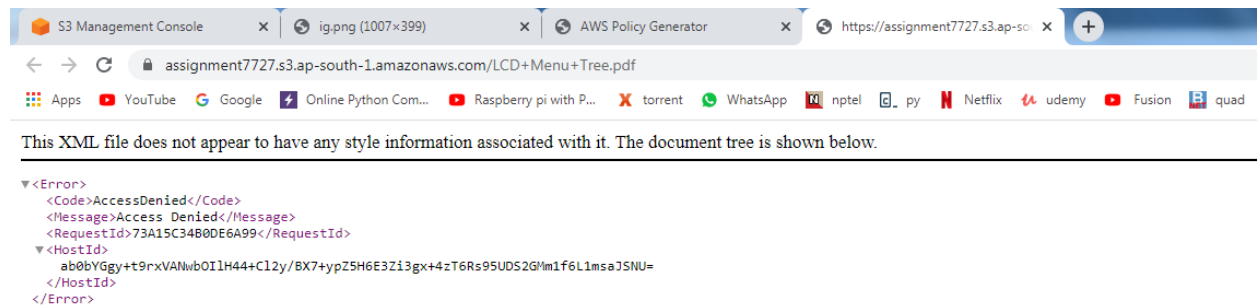
S3 Management Console x ig.png (1007x399) x AWS Policy Generator x https://assignment7727.s3.ap-sou... x +

assignment7727.s3.ap-south-1.amazonaws.com/ig.png

Apps YouTube Google Online Python Com... Raspberry pi with P... torrent WhatsApp nptel py Netflix udey Fusion quad YouTube ad

<input type="checkbox"/>	Name ▾	ID ▾	State ▾	VPC ▾	Owner ▾
<input checked="" type="checkbox"/>	MyIGW	igw-0bef23020ad0...	attached	vpc-0eb70db6d6c...	545033201860
<input type="checkbox"/>		igw-d3da7dbb	attached	vpc-65818b0d	545033201860

->Bucket Policy Deny access to pdf file



Que. Write the steps to create an autoscaling group and associate the EC2 instances of that autoscaling group with an Application load balancer. When you click on the URL of Application load balancer, it should return the content from EC2 instances.

Ans.->Steps to create Autoscaling Group

1. On the Auto Scaling groups page, choose Create an Auto Scaling group.
2. On the Choose launch configuration page, for Auto Scaling group name, enter a name for your Auto Scaling group.
3. Launch template
4. Keep Network set to the default VPC for your chosen AWS Region, or select your own VPC..
5. For Subnet, choose a subnet
6. On the Review page, review the information for the group, and then choose Create Auto Scaling group.

->Steps to Create Load Balancer

1. Create instance in EC2.
2. Create classic load balancer
3. Create target group .
4. Under target group in the target tab we need to add targets
5. Create application load balance

EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity

Reservations

IMAGES

AMIs

Bundle Tasks

Save up to 90% on Compute

Optimize compute costs by creating your Auto Scaling group with a launch template to combine EC2 On-Demand, Spot, and RIs. [Learn more.](#)

Create launch configuration Create Auto Scaling group Copy to launch template Actions

Filter: Filter launch configurations...

1 to 1 of 1 Launch Configurations

Name	AMI ID	Instance Type	Spot Price	Creation Time
Autoscaling	ami-03b5297d...	t2.micro		March 25, 2020 at 7:53:32 PM ...

Launch Configuration: Autoscaling

Feedback English (US)

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GurjoPresetsMay-1.dng torbrowser-install-...exe Auto.pem Show all

Ae Ps Pr

2:41 PM 3/26/2020

Target Groups | EC2 Management Console

ap-south-1.console.aws.amazon.com/ec2/v2/home?region=ap-south-1#TargetGroups:sort=targetGroupName

Services Resource Groups

Suraj Mumbai Support

New EC2 Experience

Tell us what you think

Snapshots

Lifecycle Manager

NETWORK & SECURITY

Security Groups **New**

Elastic IPs **New**

Placement Groups **New**

Key Pairs **New**

Network Interfaces

LOAD BALANCING

Load Balancers

Target Groups

AUTO SCALING

Launch Configurations

Auto Scaling Groups

Create target group Actions

Filter by tags and attributes or search by keyword

1 to 1 of 1

Name	Port	Protocol	Target type	Load Balanc	VPC ID	Monitoring
target	80	HTTP	instance	FIRSTBAL...	vpc-65818b0d	

Target group: target

Description Targets Health checks Monitoring Tags

Basic Configuration

Feedback English (US)

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GurjoPresetsMay-1.dng torbrowser-install-...exe Auto.pem Show all

Ae Ps Pr

2:40 PM 3/26/2020

Billing Management Console x Target Groups | EC2 Management x

ap-south-1.console.aws.amazon.com/ec2/v2/home?region=ap-south-1#TargetGroups:sort=targetGroupName

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aws Services Resource Groups

New EC2 Experience Tell us what you think

Snapshots Lifecycle Manager

NETWORK & SECURITY

Security Groups New

Elastic IPs New

Placement Groups New

Key Pairs New

Network Interfaces

LOAD BALANCING

Load Balancers

Target Groups

AUTO SCALING

Launch Configurations

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Filter by tags and attributes or search by keyword

1 to 1 of 1

Name	Port	Protocol	Target type	Load Balanc	VPC ID	Monitoring
target	80	HTTP	instance	FIRSTBAL...	vpc-65818b0d	

Target group: target

Description Targets Health checks Monitoring Tags

Basic Configuration

Feedback English (US)

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GurjotPresetsMay-1.dmg torbrowser-install-...exe Auto.pem Show all x

Windows taskbar with icons for File Explorer, Google Chrome, Adobe Photoshop, Adobe Premiere Pro, and others. System tray shows the time as 2:40 PM on 3/26/2020.

Ans.

We listened to your feedback!
 In response to your comments on usability, we enhanced our user interface. You get to preview our improvements before we roll it out to everyone else.

[Switch to your original interface](#)

[Send us feedback](#)

Successfully created alarm SurajBilling.

CloudWatch > Alarms

Alarms (1)
☐ Hide Auto Scaling alarms

[Clear selection](#)

[Create composite alarm](#)

[Actions](#)

[Create alarm](#)

Any state
Any type

1

<input type="checkbox"/>	Name	State	Last state update	Conditions
<input type="checkbox"/>	SurajBilling	Insufficient data	2020-04-02 05:57:15	EstimatedCharges >= 1 for 1 datapoints within 6 hours

Que. Create an alarm on EC2 instance, to notify you if the instance is in stopped state or terminated state

Ans.

CloudWatch console interface for selecting a metric:

- Navigation: All metrics > EC2 > Per-Instance Metrics
- Search bar: Search for any metric, dimension or resource id
- Graph search button
- Table with columns: Instance Name (500 of 36810), InstanceId, Metric Name
- Selected row: ☒ No name specified, i-00aff91aad68a4e2f, StatusCheckFailed_System
- Unselected row: ☐ No name specified, i-00aff91aad68a4e2f, StatusCheckFailed_Instance
- Buttons: Cancel, Select metric

CloudWatch console interface showing the successful creation of an alarm:

- Notification: Successfully created alarm ec2Alarm.
- Navigation: CloudWatch > Alarms
- Alarms (1) ☐ Hide Auto Scaling alarms
- Buttons: Clear selection, Refresh, Create composite alarm, Actions, Create alarm
- Search bar: Search
- Filters: Any state, Any type
- Page navigation: < 1 >
- Table with columns: Name, State, Last state update, Conditions

Que. Create a custom metric on EC2, to find memory utilization of a running EC2 instance.

Ans.

```
-bash: /home/ec2-user/aws-scripts-mon: Is a directory
[ec2-user@ip-172-31-40-161 aws-scripts-mon]$ ./mon-put-instance-data.pl --mem-used-incl-cache-buff --mem-util --mem-used --mem-avail

Successfully reported metrics to CloudWatch. Reference Id: 058e2879-a891-49c3-b0cf-29c251d66c5c

[ec2-user@ip-172-31-40-161 aws-scripts-mon]$ /home/ec2-user/aws-scripts-mon
-bash: /home/ec2-user/aws-scripts-mon: Is a directory
[ec2-user@ip-172-31-40-161 aws-scripts-mon]$ /home/ec2-user/aws-scripts-mon
-bash: /home/ec2-user/aws-scripts-mon: Is a directory
[ec2-user@ip-172-31-40-161 aws-scripts-mon]$ /home/ec2-user/aws-scripts-mon./mon-put-instance-data.pl --mem-used-incl-cache-buff --mem-util --mem-used --mem-avail
-bash: /home/ec2-user/aws-scripts-mon./mon-put-instance-data.pl: No such file or directory
[ec2-user@ip-172-31-40-161 aws-scripts-mon]$ crontab -e
no crontab for ec2-user - using an empty one

[1]+  Stopped                  crontab -e
[ec2-user@ip-172-31-40-161 aws-scripts-mon]$ pwd
/home/ec2-user/aws-scripts-mon
[ec2-user@ip-172-31-40-161 aws-scripts-mon]$ crontab -l
no crontab for ec2-user
[ec2-user@ip-172-31-40-161 aws-scripts-mon]$ crontab -e
no crontab for ec2-user - using an empty one
crontab: installing new crontab
"/tmp/crontab.IIXmpd":1: bad day-of-week
errors in crontab file, can't install.
Do you want to retry the same edit? yes
crontab: installing new crontab
"/tmp/crontab.IIXmpd":1: bad day-of-week
errors in crontab file, can't install.
Do you want to retry the same edit? no
```

Untitled graph

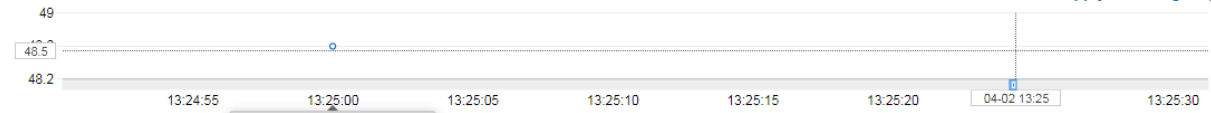
1h 3h 12h 1d 3d 1w custom

Line

Actions



Apply time range



2020-04-02 13:25 UTC

1. MemoryUtilization 48.6

Source

All > Linux System > InstanceId

Search for any metric, dimension or resource id

Graph search

<input type="checkbox"/>	Instance Name (3)	InstanceId	Metric Name
<input checked="" type="checkbox"/>	Cloudwatch	i-084e78b1884e0c878	MemoryUtilization
<input type="checkbox"/>	Cloudwatch	i-084e78b1884e0c878	MemoryUsed
<input type="checkbox"/>	Cloudwatch	i-084e78b1884e0c878	MemoryAvailable

Untitled graph

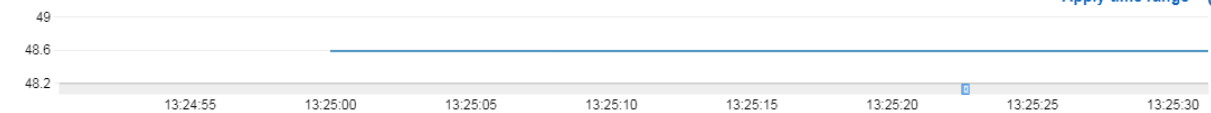
1h 3h 12h 1d 3d 1w custom

Line

Actions



Apply time range



All metrics Graphed metrics (1) Graph options Source

Math expression Dynamic labels Statistic: Average Period: 1 Minute Remove all

<input checked="" type="checkbox"/>	Label	Details	Statistic	Period	Y Axis	Actions
<input checked="" type="checkbox"/>	MemoryUtilization	Linux System • MemoryUtilization • InstanceId: i-084e78...	Average	1 Minute		

Que. Create a lambda function to start, stop and terminate a running EC2 instance. Also, verify the logs generated by the lambda in the Cloudwatch logs to check whether the lambda execution is done properly

Ans.

->Stop EC2 Instance Via Lamda

The screenshot displays the AWS Lambda console interface for a function named 'Stop'. The function is configured with the following code:

```
1 import boto3
2 region = 'ap-south-1'
3 instances = ['i-0b74383c54936925c']
4 ec2 = boto3.client('ec2', region_name=region)
5
6 def lambda_handler(event, context):
7     ec2.stop_instances(InstanceIds=instances)
8     print('stopped your instances: ' + str(instances))
9
10
11
12
```

The execution result shows a successful status with the following details:

- Status: Succeeded
- Max Memory Used: 78 MB
- Time: 390.56 ms
- Response: null
- Request ID: "4d3f8fb7-972c-4035-b574-6f47ae7f55fe"
- Function Logs:
 - START RequestId: 4d3f8fb7-972c-4035-b574-6f47ae7f55fe Version: \$LATEST
 - stopped your instances: ['i-0b74383c54936925c']
 - END RequestId: 4d3f8fb7-972c-4035-b574-6f47ae7f55fe
 - REPORT RequestId: 4d3f8fb7-972c-4035-b574-6f47ae7f55fe Duration: 390.56 ms Billed Duration: 400 ms Memory Size: 128 MB Max Memory Used: 78 MB Init Duration:

aws Services Resource Groups

Suraj Mumbai Support

Successfully updated the function Stop.

Lambda > Functions > Stop

ARN - arn:aws:lambda:ap-south-1:545033201860:function:Stop

Stop

Throttle Qualifiers Actions stop Test Save

Execution result: succeeded (logs)

Details

The area below shows the result returned by your function execution. [Learn more](#) about returning results from your function.

null

Summary

Code SHA-256 peONRPU9L9TdSk2fQilf5/nlgBx6E9FupCllh+fos8A=	Request ID 4d3f8fb7-972c-4035-b574-6f47ae7f55fe
--	--

->Start EC2 Instance via Lamda

Environment

START /

lambda_function.py

```
1 import boto3
2 region = 'ap-south-1'
3 instances = ['i-0b74383c54936925c']
4 ec2 = boto3.client('ec2', region_name=region)
5 def lambda_handler(event, context):
6     # ec2.stop_instances(InstanceIds=instances)
7     ec2.start_instances(InstanceIds=instances)
8     print('stopped your instances: ' + str(instances))
```

2:11 Python Spaces: 4

Execution Result

Execution results

Status: Succeeded Max Memory Used: 73 MB Time: 515.54 ms

Response:
null

Request ID:
"e6fa0a6b-9f34-4597-9948-a926d279c361"

Function Logs:
START RequestId: e6fa0a6b-9f34-4597-9948-a926d279c361 Version: \$LATEST
stopped your instances: ['i-0b74383c54936925c']
END RequestId: e6fa0a6b-9f34-4597-9948-a926d279c361
REPORT RequestId: e6fa0a6b-9f34-4597-9948-a926d279c361 Duration: 515.54 ms Billed Duration: 600 ms Memory Size: 128 MB Max Memory Used: 73 MB Init Duration:

Successfully updated the function START.

Lambda > Functions > START

ARN - arn:aws:lambda:ap-south-1:545033201860:function:START

START

Throttle Qualifiers Actions START Test Save

Execution result: succeeded (logs)

Details

The area below shows the result returned by your function execution. [Learn more](#) about returning results from your function.

null

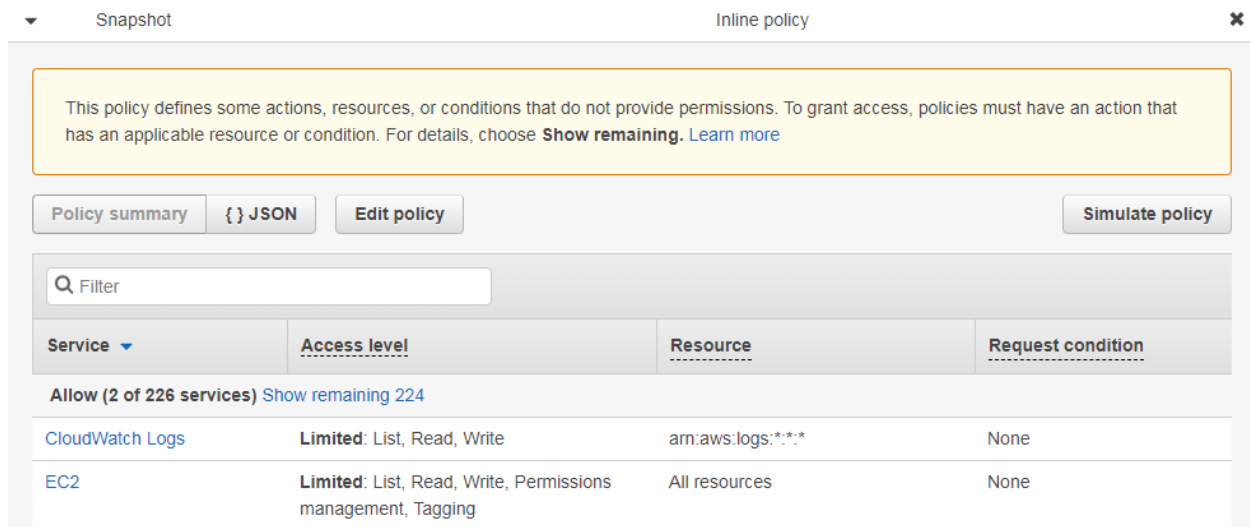
Summary

Code SHA-256 YdUKz1cRqbYbYIYUN1V4mSfISNDfcNv17Io1CtdDLXA=	Request ID e6fa0a6b-9f34-4597-9948-a926d279c361
Duration 515.54 ms	Billed duration 600 ms
Resources configured 128 MB	Max memory used 73 MB Init Duration: 290.84 ms

Que. When you terminate an EC2 instance, a snapshot should be created from the EBS volume attached to the EC2 instance automatically and store it in an S3 bucket. Create a lambda function to automate the above

Ans. Following are the steps to create Lambda Function for Ebs Snapshot-

->Create IAM Role



This policy defines some actions, resources, or conditions that do not provide permissions. To grant access, policies must have an action that has an applicable resource or condition. For details, choose **Show remaining**. [Learn more](#)

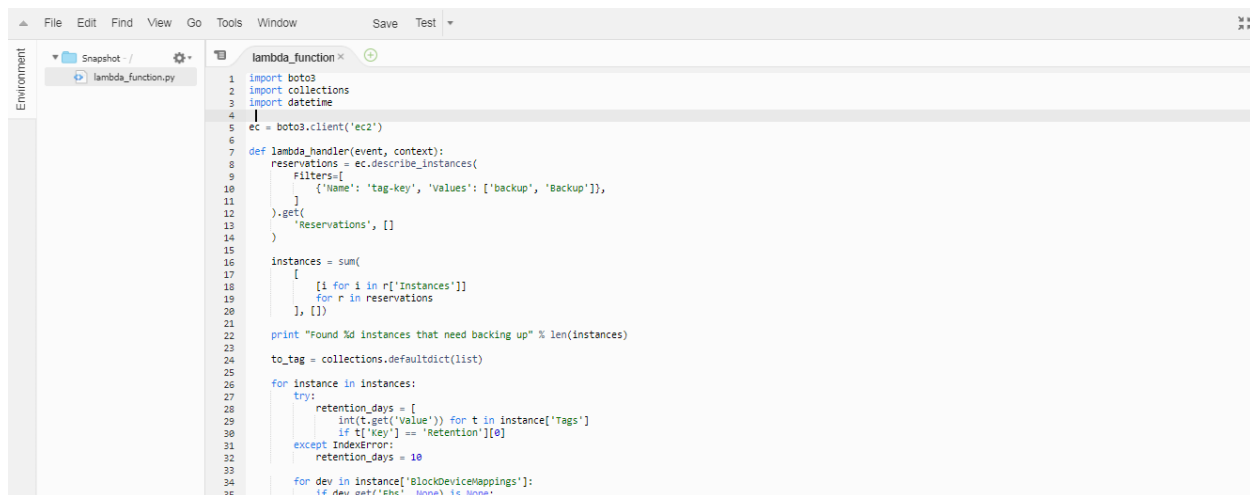
Policy summary { } JSON Edit policy Simulate policy

Q Filter

Service	Access level	Resource	Request condition
CloudWatch Logs	Limited: List, Read, Write	arn:aws:logs:*:*:*	None
EC2	Limited: List, Read, Write, Permissions management, Tagging	All resources	None

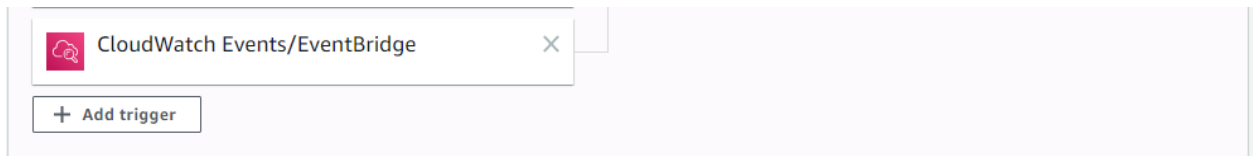
Allow (2 of 226 services) [Show remaining 224](#)

->Create Snapshot Lambda Function



```
1 import boto3
2 import collections
3 import datetime
4
5 ec = boto3.client('ec2')
6
7 def lambda_handler(event, context):
8     reservations = ec.describe_instances(
9         Filters=[
10             {'Name': 'tag-key', 'Values': ['backup', 'Backup']},
11         ],
12     ).get(
13         'Reservations', []
14     )
15
16     instances = sum(
17         [
18             [i for i in r['Instances']]
19             for r in reservations
20         ], []
21     )
22
23     print "Found %d instances that need backing up" % len(instances)
24
25     to_tag = collections.defaultdict(list)
26
27     for instance in instances:
28         try:
29             retention_days = [
30                 int(t.get('Value')) for t in instance['Tags']
31                 if t['key'] == 'Retention'
32             ][0]
33             except IndexError:
34                 retention_days = 10
35
36         for dev in instance['BlockDeviceMappings']:
37             if dev.get('Ebs', None) is None:
```

->Schedule Trigger as CloudWatch Rule



Output:>



Owned By Me		Filter by tags and attributes or search by keyword				1 to 3 of 3		
<input type="checkbox"/>	Name	Snapshot ID	Size	Description	Status	Started	Progress	
<input type="checkbox"/>	LIVE-BACKUP	snap-00b46f1c08cb...	8 GiB		completed	April 12, 2020 at 12:30:04 A...	available (10	
<input type="checkbox"/>	LIVE-BACKUP	snap-0b970fc3fd5f1...	8 GiB		completed	April 12, 2020 at 12:30:04 A...	available (10	
<input type="checkbox"/>	LIVE-BACKUP	snap-0c536d380d9...	8 GiB		completed	April 12, 2020 at 12:30:04 A...	available (10	

Filter events		all 2020-04-10 (19:00:04) ▾
Time (UTC +00:00)	Message	
2020-04-11	No older events found at the moment. Retry .	
▶ 19:00:03	START RequestId: 02a8c930-2615-423d-8b45-f2ba21bd52cd Version: \$LATEST	
▶ 19:00:04	Found 2 instances that need backing up	
▶ 19:00:04	Found EBS volume vol-06eab2de06864d7bc on instance i-08f87ef35457c9724	
▶ 19:00:04	Retaining snapshot snap-0c536d380d958b78c of volume vol-06eab2de06864d7bc from instance i-08f87ef35457c9724 for 10 days	
▶ 19:00:04	Found EBS volume vol-0fa33b1bac776e3bc on instance i-08f87ef35457c9724	
▶ 19:00:04	Retaining snapshot snap-00b46f1c08cbe4c8f of volume vol-0fa33b1bac776e3bc from instance i-08f87ef35457c9724 for 10 days	
▶ 19:00:04	Found EBS volume vol-0d5634127dbeaf42b on instance i-0b74383c54936925c	
▶ 19:00:04	Retaining snapshot snap-0b970fc3fd5f1efd6 of volume vol-0d5634127dbeaf42b from instance i-0b74383c54936925c for 10 days	
▶ 19:00:04	Will delete 3 snapshots on 2020-04-21	
▶ 19:00:04	END RequestId: 02a8c930-2615-423d-8b45-f2ba21bd52cd	
▶ 19:00:04	REPORT RequestId: 02a8c930-2615-423d-8b45-f2ba21bd52cd Duration: 1008.36 ms Billed Duration: 1100 ms Memory Size: 128 MB Max Memory Used: 88 MB Init Durati	
	No newer events found at the moment. Retry .	

Log output

The section below shows the logging calls in your code. These correspond to a single row within the CloudWatch log group corresponding to this Lambda function. [Click here](#) to view the CloudWatch log group.

```
START RequestId: 02a8c930-2615-423d-8b45-f2ba21bd52cd Version: $LATEST
Found 2 instances that need backing up
Found EBS volume vol-06eab2de06864d7bc on instance i-08f87ef35457c9724
Retaining snapshot snap-0c536d380d958b78c of volume vol-06eab2de06864d7bc from instance i-08f87ef35457c9724 for 10
days
Found EBS volume vol-0fa33b1bac776e3bc on instance i-08f87ef35457c9724
Retaining snapshot snap-00b46f1c08cbe4c8f of volume vol-0fa33b1bac776e3bc from instance i-08f87ef35457c9724 for 10
days
Found EBS volume vol-0d5634127dbeaf42b on instance i-0b74383c54936925c
Retaining snapshot snap-0b970fc3fd5f1efd6 of volume vol-0d5634127dbeaf42b from instance i-0b74383c54936925c for 10
```

Que. Create a lambda function to send an email notification to your email id of your AWS account, as soon as you delete a file from an S3 bucket, mentioning the file name which is deleted.

Ans. Following are the steps for Lambda Function

->Create IAM Role

The screenshot shows the AWS IAM console interface for an IAM role. The 'Permissions' tab is selected, displaying a list of attached policies. The role has three policies applied: AmazonSESFullAccess, AWSLambdaExecute, and an inline policy. The 'Attach policies' button is visible, along with the 'Add inline policy' link.

Policy name	Policy type
AmazonSESFullAccess	AWS managed policy
AWSLambdaExecute	AWS managed policy
Show 1 more	

->Create Event in S3 Bucket

Advanced settings

Object lock

Prevent objects from being deleted.

[Learn more](#)

☐ Disabled

Tags

Use tags to track your cost against projects or other criteria.

[Learn more](#)

☐ 0 Tags

Transfer acceleration

Enable fast, easy and secure transfers of files to and from your bucket.

[Learn more](#)

☐ Suspended

Events

[+ Add notification](#) [Delete](#) [Edit](#)

Name	Events	Filter	Type
<input checked="" type="radio"/> event	PUT,All object delete events		Lambda

☒ 1 Active notifications

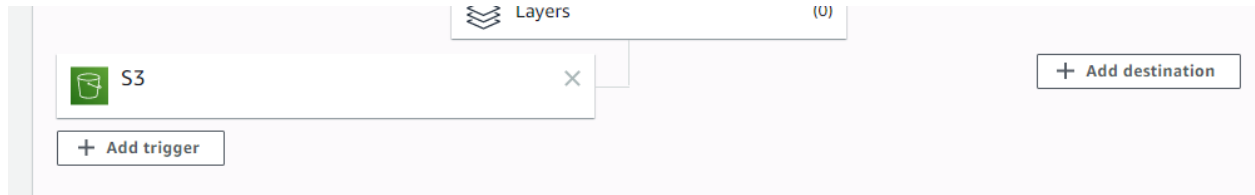
[Cancel](#) [Save](#)

-> Create Lamda Function to Trigger Mail

```
Environment
s3_Event123
lambda_function.py

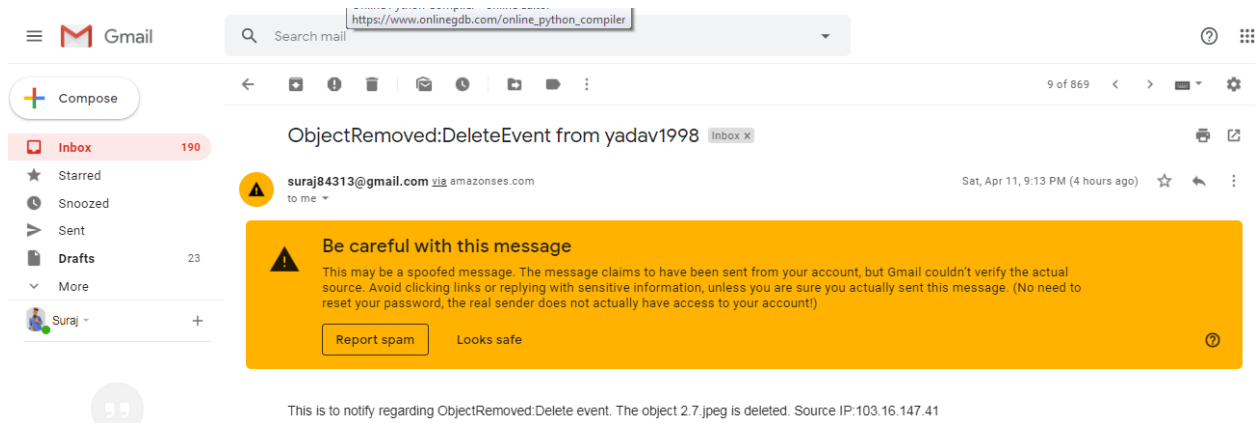
lambda_function
1 import json
2 import boto3
3
4 def lambda_handler(event, context):
5
6     for i in event["Records"]:
7         action=i["eventName"]
8         ip = i["requestParameters"]["sourceIPAddress"]
9         bucket_name=i["s3"]["bucket"]["name"]
10        object=i["s3"]["object"]["key"]
11
12        client = boto3.client("ses")
13
14        subject = str(action) + 'Event from ' + bucket_name
15        body = ""
16
17        <br>
18        This is to notify regarding {} event.
19        The object {} is deleted.
20        Source IP: {}
21        """format(action,object,ip)
22
23        message = {"Subject": {"Data": subject}, "Body": {"Html": {"Data":body}}}
24
25        response = client.send_email(Source="suraj84313@gmail.com",Destination={"ToAddresses":["suraj84313@gmail.com"]},Message=message)
26
27
28        # TODO implement
29        return {
30            'statusCode': 200,
31            'body': json.dumps('Hello from Lambda!')}
32
33
```

->Schedule Trigger as S3 Bucket

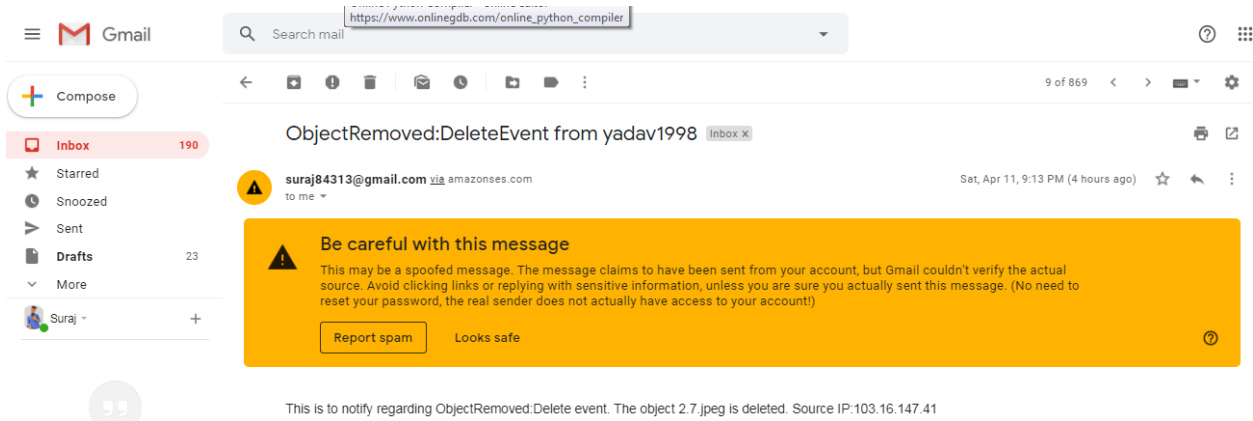


Output->

>When Object is Removed From Bucket



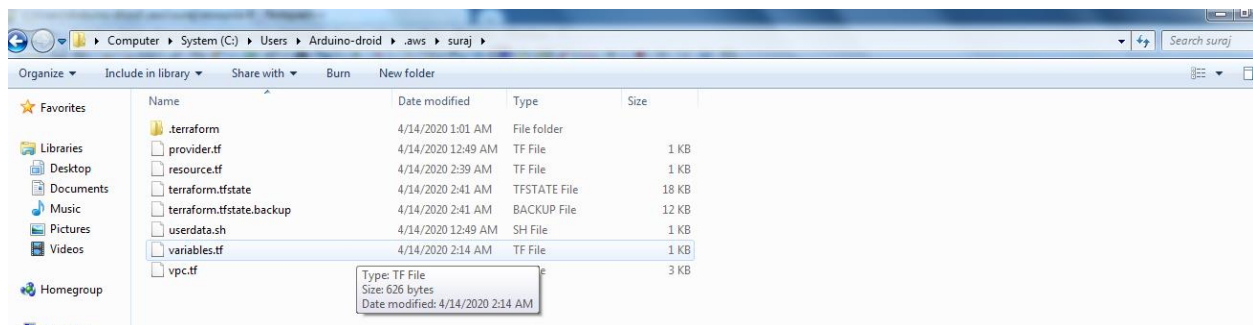
> *When Object is Uploaded to Bucket*



Que. Create a VPC with one public subnet, one private subnet. Create variable files to set CIDR range, vpc name, subnet names, subnet CIDR range etc. Create an EC2 instance on the public subnet of the above VPC, and install an apache webserver on the EC2 instance.

Create the above infrastructure using terraform scripts

Ans.



```

    + volume_size = <known after apply>
    + volume_type = <known after apply>
  }
}

# aws_instance.web will be created
resource "aws_instance" "web" {
  + ami = "ami-0470e33cd681b2476"
  + arn = <known after apply>
  + associate_public_ip_address = true
  + availability_zone = <known after apply>
  + cpu_core_count = <known after apply>
  + cpu_threads_per_core = <known after apply>
  + get_password_data = false
  + host_id = <known after apply>
  + id = <known after apply>
  + instance_state = <known after apply>
  + instance_type = "t2.micro"
  + ipv6_address_count = <known after apply>
  + ipv6_addresses = <known after apply>
  + key_name = <known after apply>
  + network_interface_id = <known after apply>
  + password_data = <known after apply>
  + placement_group = <known after apply>
  + primary_network_interface_id = <known after apply>
  + private_dns = <known after apply>
  + private_ip = <known after apply>
  + public_dns = <known after apply>
  + public_ip = <known after apply>
  + security_groups = <known after apply>
  + source_dest_check = false
  + subnet_id = "subnet-0271579295f823e1e"
  + tags = {
    + "Name" = "webserver"
  }
  + tenancy = <known after apply>
  + user_data = "ad71878e45999d8d80fd59a0e63c80d53d4aa7b8"
  + volume_tags = <known after apply>
  + vpc_security_group_ids = [
    + "sg-0295256f53f0fb9c0",
  ]
}

+ ebs_block_device {
  + delete_on_termination = <known after apply>
  + device_name = <known after apply>
}

```

```

    + volume_size = <known after apply>
    + volume_type = <known after apply>
  }
}

# aws_instance.web will be created
resource "aws_instance" "web" {
  + ami = "ami-0470e33cd681b2476"
  + arn = <known after apply>
  + associate_public_ip_address = true
  + availability_zone = <known after apply>
  + cpu_core_count = <known after apply>
  + cpu_threads_per_core = <known after apply>
  + get_password_data = false
  + host_id = <known after apply>
  + id = <known after apply>
  + instance_state = <known after apply>
  + instance_type = "t2.micro"
  + ipv6_address_count = <known after apply>
  + ipv6_addresses = <known after apply>
  + key_name = <known after apply>
  + network_interface_id = <known after apply>
  + password_data = <known after apply>
  + placement_group = <known after apply>
  + primary_network_interface_id = <known after apply>
  + private_dns = <known after apply>
  + private_ip = <known after apply>
  + public_dns = <known after apply>
  + public_ip = <known after apply>
  + security_groups = <known after apply>
  + source_dest_check = false
  + subnet_id = "subnet-0271579295f823e1e"
  + tags = {
    + "Name" = "webserver"
  }
  + tenancy = <known after apply>
  + user_data = "ad71878e45999d8d80fd59a0e63c80d53d4aa7b8"
  + volume_tags = <known after apply>
  + vpc_security_group_ids = [
    + "sg-0295256f53f0fb9c0",
  ]
}

+ ebs_block_device {
  + delete_on_termination = <known after apply>
  + device_name = <known after apply>
}

```

Warning: **Interpolation-only expressions are deprecated**

```
on resource.tf line 10, in resource "aws_instance" "wb":
10:   user_data = "$<file<"userdata.sh">)"
```

Terraform 0.11 and earlier required all non-constant expressions to be provided via interpolation syntax, but this pattern is now deprecated. To silence this warning, remove the "\$<" sequence from the start and the ">" sequence from the end of this expression, leaving just the inner expression.

Template interpolation syntax is still used to construct strings from expressions when the template includes multiple interpolation sequences or a mixture of literal strings and interpolations. This deprecation applies only to templates that consist entirely of a single interpolation sequence.

Do you want to perform these actions?

Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

aws_instance.wb: Creating...

aws_instance.db: Creating...

aws_instance.wb: Still creating... [10s elapsed]

aws_instance.db: Still creating... [10s elapsed]

aws_instance.wb: Still creating... [20s elapsed]

aws_instance.db: Still creating... [20s elapsed]

aws_instance.db: Creation complete after 23s [id=i-0e0d6dc4f7080bfe7]

aws_instance.wb: Creation complete after 26s [id=i-0daa2e8dc60b800b4]

Apply complete! Resources: 2 added, 0 changed, 0 destroyed.

PS C:\Users\Arduino-droid\.aws\suraj>

The screenshot shows the AWS Management Console interface. At the top, there's a navigation bar with the AWS logo, 'Services', 'Resource Groups', and a user profile 'Suraj' from 'Mumbai'. Below this, the 'EC2 Dashboard' is selected, showing a sidebar with 'Events', 'Tags', 'Reports', and 'Limits'. The main content area has a 'Launch Instance' button and a search bar. Below the search bar is a table of EC2 instances. The table has columns: Name, Instance ID, Instance Type, Availability Zone, Instance State, Status Checks, Alarm Status, and Public DNS (IPv4). Two instances are listed: 'database' and 'webserver'. Both are in the 'running' state. The 'database' instance has a status check of '2/2 checks passed' and an alarm status of 'None'. The 'webserver' instance also has a status check of '2/2 checks passed' and an alarm status of 'None'. The public DNS for the 'webserver' instance is 'ec2-13-235-95-158.ap-...'.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)
database	i-0e0d6dc4f7080bfe7	t2.micro	ap-south-1b	running	2/2 checks passed	None	
webserver	i-0daa2e8dc60b800b4	t2.micro	ap-south-1a	running	2/2 checks passed	None	ec2-13-235-95-158.ap-...

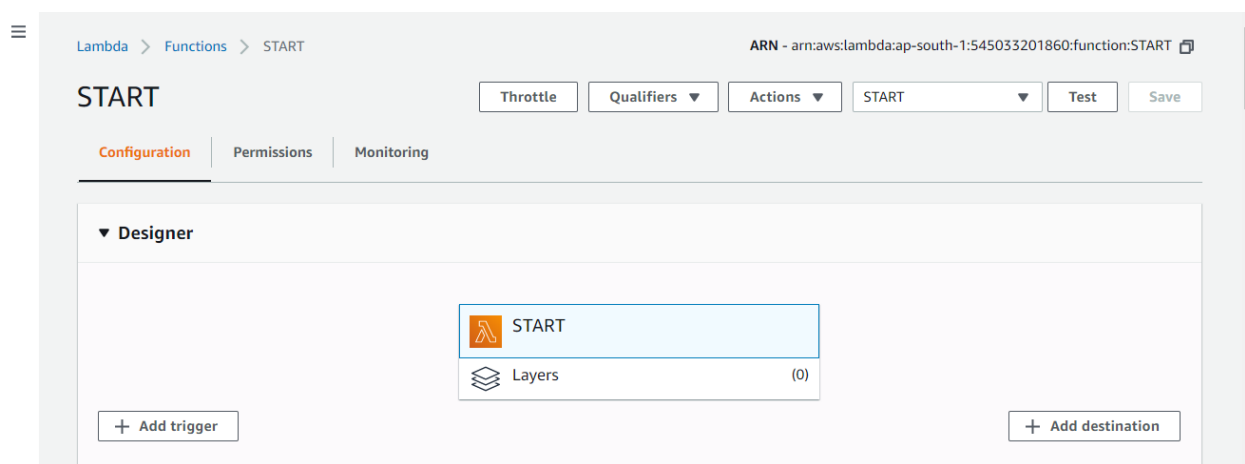
Que. Create a step function with the below states:

1. **Starting state -> a pass type state with user input as 'start', or 'stop' or 'terminate' or 'exit'**
2. **Choice state -> 3 choices : Based on the input value, it will execute 3 lambda functions (start ec2 lambda, stop ec2 lambda, terminate ec2 lambda).**
3. **Also add a fail state which will be executed if you enter 'exit' in your input json.**
4. **End state**

Ans. Following are the steps to create step Function

1. Create Lambda Function to Start , Stop and Terminate Ec2 Instance

-> Start Function



-> Stop Function

☰

Lambda > Functions > Stop

ARN - arn:aws:lambda:ap-south-1:545033201860:function:Stop

Stop

Throttle Qualifiers ▾ Actions ▾ stop ▾ Test Save

Configuration Permissions Monitoring

▼ Designer

Stop

Layers (0)

+ Add trigger

+ Add destination

->Terminate Function

☰

Lambda > Functions > terminate_ec2

ARN - arn:aws:lambda:ap-south-1:545033201860:function:terminate_ec2

terminate_ec2

Throttle Qualifiers ▾ Actions ▾ terminate ▾ Test Save

Configuration Permissions Monitoring

▼ Designer

terminate_ec2

Layers (0)

+ Add trigger

+ Add destination

2. Execution of Step Function

The screenshot shows the AWS Step Functions console interface. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', and a user profile 'Suraj' from 'Mumbai'. The main content area is titled 'Definition' and contains a JSON definition for a state machine named 'HelloWorlds'. The JSON is as follows:

```
{
  "Comment": "Lambda",
  "StartAt": "pa",
  "States": {
    "pa": {
      "Type": "Pass",
      "Next": "Chk"
    },
    "Chk": {
      "Type": "Choice",
      "Choices": [
        {
          "Variable": "$.abc",
          "StringEquals": "stop",
          "Next": "stopIns"
        }
      ]
    },
    "startIns": {
      "Type": "Pass",
      "Next": "Chk"
    },
    "stopIns": {
      "Type": "Pass",
      "Next": "Chk"
    },
    "terminateIns": {
      "Type": "Pass",
      "Next": "End"
    },
    "fState": {
      "Type": "Pass",
      "Next": "End"
    },
    "End": {
      "Type": "End"
    }
  }
}
```

To the right of the JSON editor is a visual state machine diagram. It starts with a yellow circle labeled 'Start', which points to a rectangle labeled 'pa'. 'pa' points to a rectangle labeled 'Chk'. From 'Chk', four arrows branch out to rectangles labeled 'startIns', 'stopIns', 'terminateIns', and 'fState'. All four of these rectangles point to a final yellow circle labeled 'End'. The console also shows a 'Generate code snippet' button and a 'Format JSON' button.

(i) Start State

The screenshot shows the 'Execution details' page for a state machine named 'HelloWorlds'. The breadcrumb navigation at the top reads: 'Step Functions > State machines > HelloWorlds > 2b503814-173c-e5ad-e39e-769d62c88289'. The state machine ID '2b503814-173c-e5ad-e39e-769d62c88289' is prominently displayed, with buttons for 'Edit state machine' and 'New execution' to its right. Below this, the 'Execution details' section is shown, containing the following information:

Execution details	
Execution Status	Started
✓ Succeeded	Apr 20, 2020 06:28:25.253 PM
Execution ARN	End Time
arn:aws:states:ap-south-1:545033201860:execution:HelloWorlds:2b503814-173c-e5ad-e39e-769d62c88289	Apr 20, 2020 06:28:26.563 PM
► Input	► Output

Execution event history						
ID	Type	Step	Resource	Elapsed Time (ms)	Timestamp	
▶ 1	ExecutionStarted		-	0	Apr 20, 2020 06:28:25.253 PM	
▶ 2	PassStateEntered	pa	-	25	Apr 20, 2020 06:28:25.278 PM	
▶ 3	PassStateExited	pa	-	25	Apr 20, 2020 06:28:25.278 PM	
▶ 4	ChoiceStateEntered	Chk	-	126	Apr 20, 2020 06:28:25.379 PM	
▶ 5	ChoiceStateExited	Chk	-	126	Apr 20, 2020 06:28:25.379 PM	
▶ 6	TaskStateEntered	startIns	-	226	Apr 20, 2020 06:28:25.479 PM	
▶ 7	LambdaFunctionScheduled	startIns	Lambda CloudWatch logs	226	Apr 20, 2020 06:28:25.479 PM	
▶ 8	LambdaFunctionStarted	startIns	Lambda CloudWatch logs	247	Apr 20, 2020 06:28:25.500 PM	
▶ 9	LambdaFunctionSucceeded	startIns	Lambda CloudWatch logs	1310	Apr 20, 2020 06:28:26.563 PM	
▶ 10	TaskStateExited	startIns	-	1310	Apr 20, 2020 06:28:26.563 PM	
▶ 11	ExecutionSucceeded		-	1310	Apr 20, 2020 06:28:26.563 PM	

(ii) Stop state

Visual workflow

Export ▼

+

-

⌚

⌕

```

graph TD
    Start((Start)) --> pa[pa]
    pa --> Chk[Chk]
    Chk --> startIns[startIns]
    Chk --> stopIns[stopIns]
    Chk --> terminateIns[terminateIns]
    Chk --> fState[fState]
    startIns --> End((End))
    stopIns --> End
    terminateIns --> End
    fState --> End

```

In Progress
Succeeded
Failed
Cancelled
Caught Error

Code

Step details

Name

stopIns

Type

Task

Status

✔ Succeeded

Resource

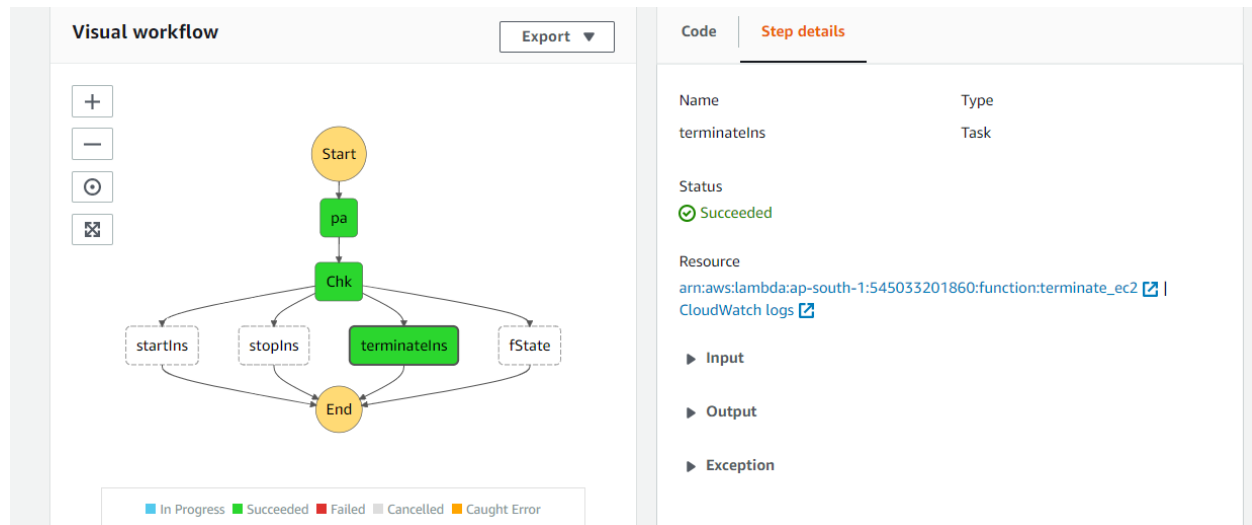
arn:aws:lambda:ap-south-1:545033201860:function:Stop | [CloudWatch logs](#)

▶ Input

▶ Output

▶ Exception

(iii) Terminate Ec2



(iv) Fail state

