

## 1. Monitor Your Estimated Charges Using CloudWatch

### Step 1: Enable Billing Alerts

### Step 2: Create a Billing Alarm

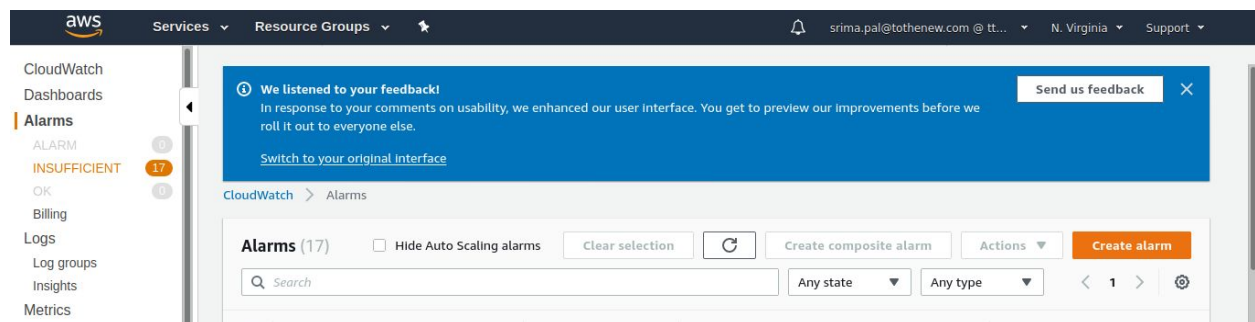
### Step 3: Check the Alarm Status

### Step 4: Create & Subscribe to SNS Topic

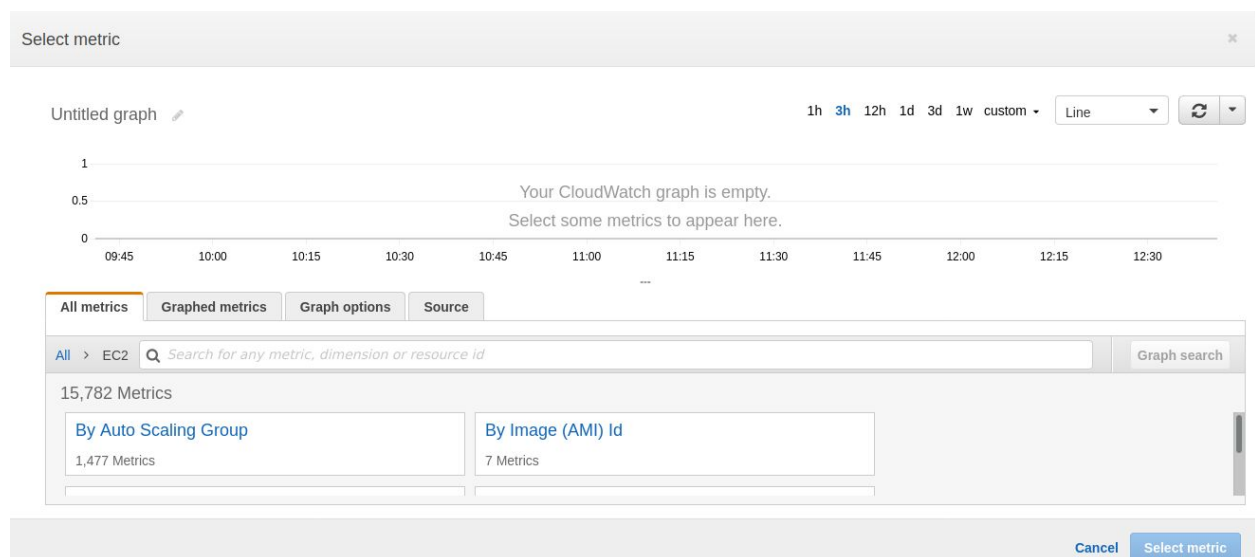
**Step 5: Send a notification all the stakeholder, if AWS resource pricing reaches the threshold value.**

(Billing metric not available, Creating ec2 alarm instance)

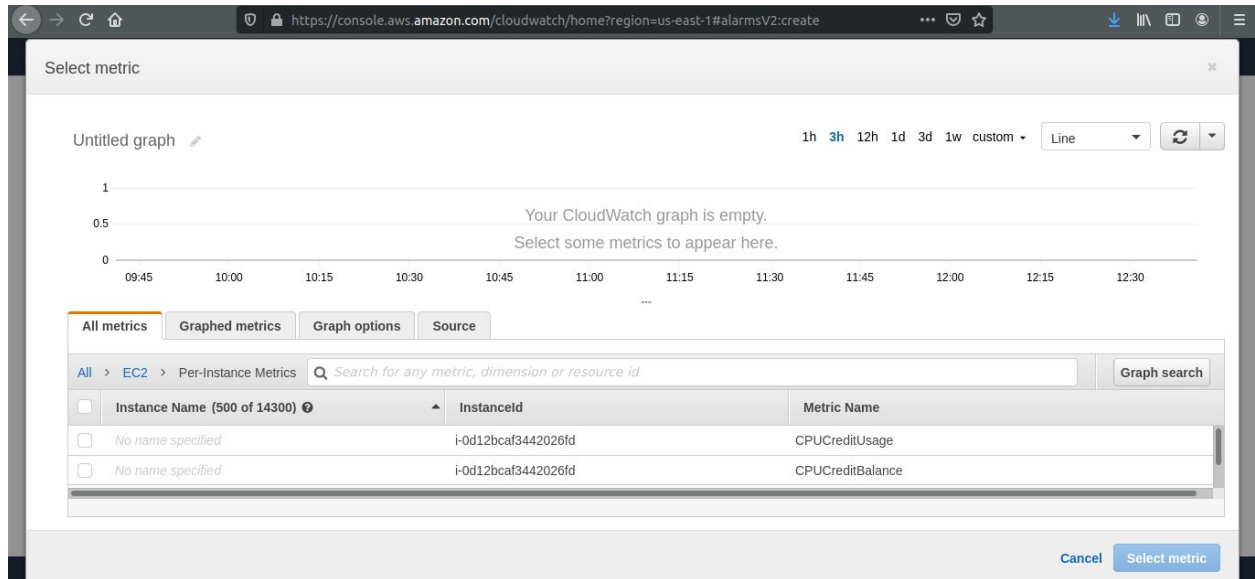
Go to cloudwatch, Alarms



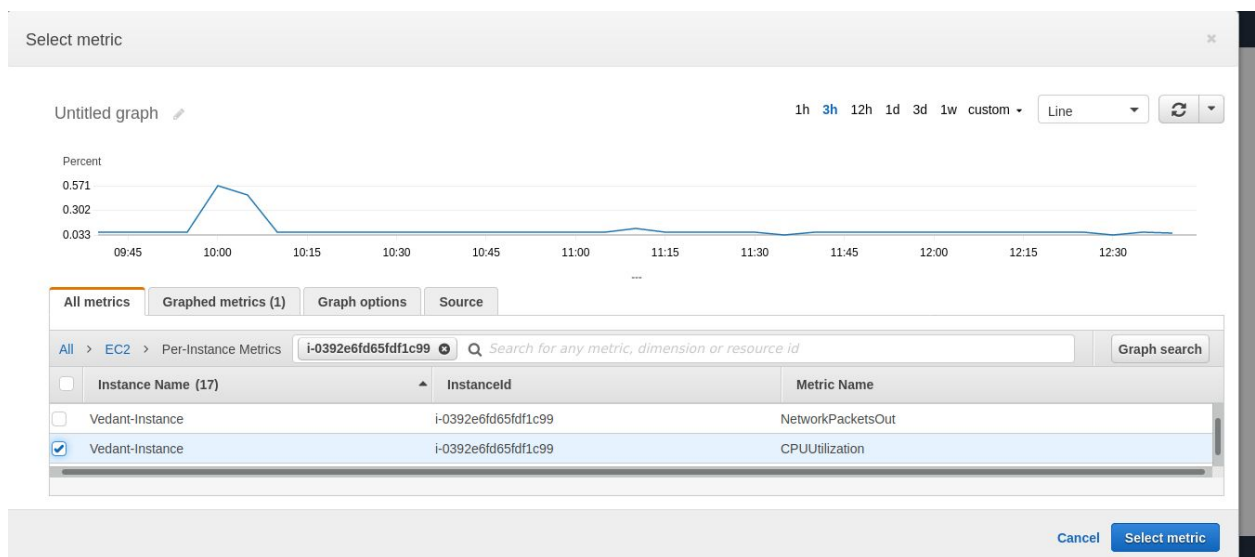
Select metric (EC2)



## Per instance metric



## Copy the instance id and search for the instance, select CPU Utilization



Click on select metric

← Step 1  
**Specify metric and conditions**

Step 2  
Configure actions

Step 3  
Add name and description

Step 4  
Preview and create

### Specify metric and conditions

#### Metric

**Graph**  
This alarm will trigger when the blue line goes above the red line for 1 datapoints within 5 minutes.

Percent

■ CPUUtilization

Namespace  
AWS/EC2

Metric name  
CPUUtilization

InstanceId  
i-0392e6fd65fdf1c99

Instance name  
Vedant-Instance

Statistic  
Average

Edit

Give threshold, and click next

### Conditions

**Threshold type**

☒ Static  
Use a value as a threshold

☐ Anomaly detection  
Use a band as a threshold

**Whenever CPUUtilization is...**  
Define the alarm condition.

☐ Greater  
> threshold

☒ Greater/Equal  
≥ threshold

☐ Lower/Equal  
≤ threshold

☐ Lower  
< threshold

**than...**  
Define the threshold value.

15

Must be a number

► Additional configuration

Cancel Next

Now select the created(existing topic)

Configure actions

Step 3  
Add name and description

Step 4  
Preview and create

### Configure actions

**Alarm state trigger**  
Define the alarm state that will trigger this action.

☒ In alarm  
The metric or expression is outside of the defined threshold.

☐ OK  
The metric or expression is within the defined threshold.

☐ Insufficient data  
The alarm has just started or not enough data is available.

Remove

**Select an SNS topic**  
Define the SNS (Simple Notification Service) topic that will receive the notification.

☒ Select an existing SNS topic

☐ Create new topic

☐ Use topic ARN

**Send a notification to...**

Search: Srma-EC2

Only email lists for this account are available.

Email (endpoints)  
srma.pal@tothenew.com - View in SNS Console

**Alarm state trigger**  
Define the alarm state that will trigger this action.

Remove

## Create SNS topic to send notification

The screenshot shows the 'Create topic' page in the AWS Management Console. On the left, a sidebar lists steps: 'Preview and create'. The main content area is titled 'Select an SNS topic' and includes three radio buttons: 'Select an existing SNS topic', 'Create new topic' (which is selected), and 'Use topic ARN'. Below this, the 'Create a new topic...' section has a text input field containing 'Srima-EC2'. A note states: 'SNS topic names can contain only alphanumeric characters, hyphens (-) and underscores (\_)'.

The 'Email endpoints that will receive the notification...' section has a text input field containing 'srima.pa@tothenew.com'. Below this, there are two buttons: 'Create topic' and 'Add notification'.

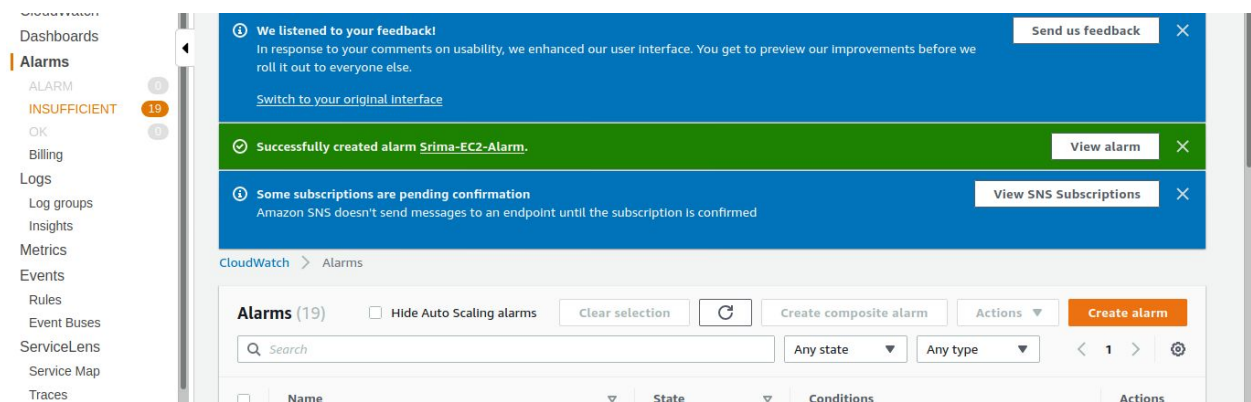
## Create EC2 action on reaching the threshold

The screenshot shows the 'EC2 action' configuration page in the AWS Management Console. The 'Alarm state trigger' section has three radio buttons: 'In alarm' (selected), 'OK', and 'Insufficient data'. The 'Take the following action...' section has four radio buttons: 'Recover this instance', 'Stop this instance' (selected), 'Terminate this instance', and 'Reboot this instance'. Each action has a brief description and a link to the IAM policy document.

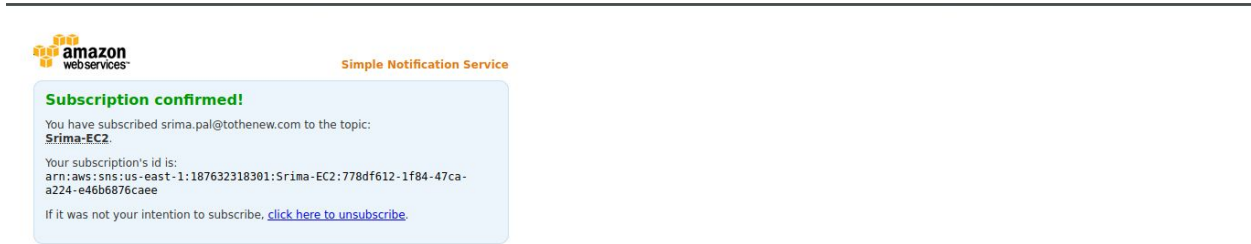
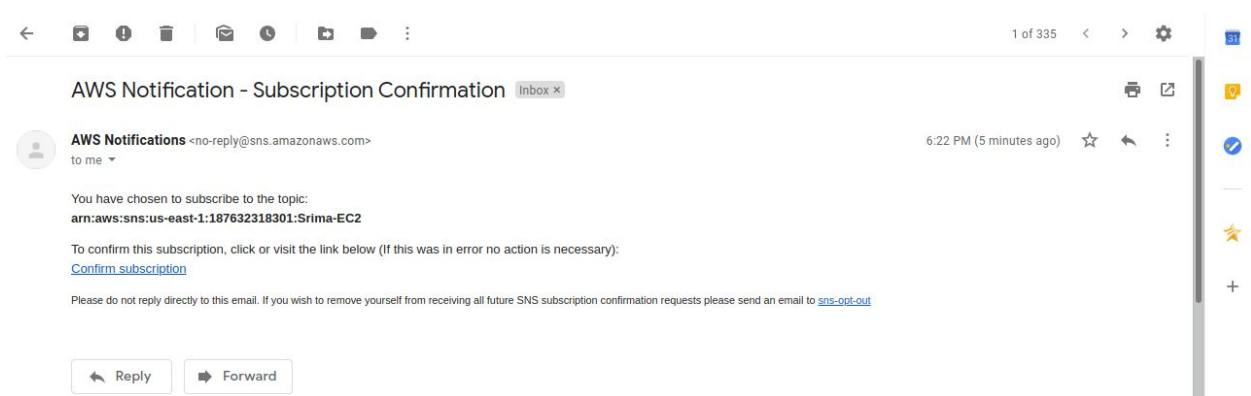
## Give alarm name and description

The screenshot shows the 'Add name and description' page in the AWS Management Console. The left sidebar lists steps: 'Specify metric and conditions', 'Configure actions', 'Add name and description' (which is highlighted), and 'Preview and create'. The main content area has two text input fields: 'Alarm name' with the value 'Srima-EC2-Alarm' and 'Alarm description - optional' with the value 'Assignment, alarm over 15 threshold, reboot'. At the bottom, there are three buttons: 'Cancel', 'Previous', and 'Next'.

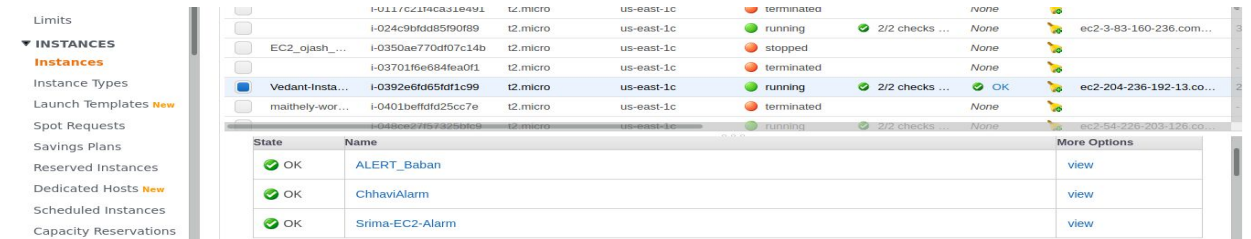
Alarm created



Confirm the email

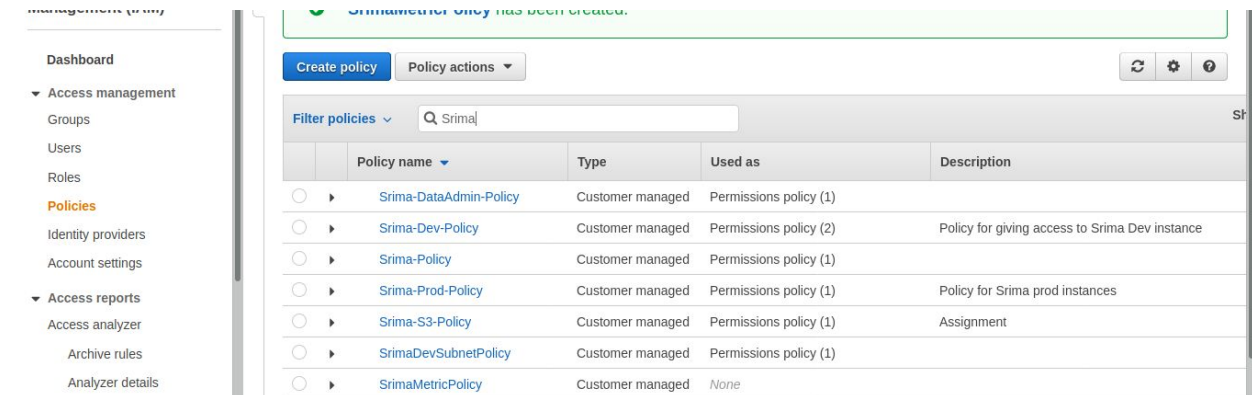
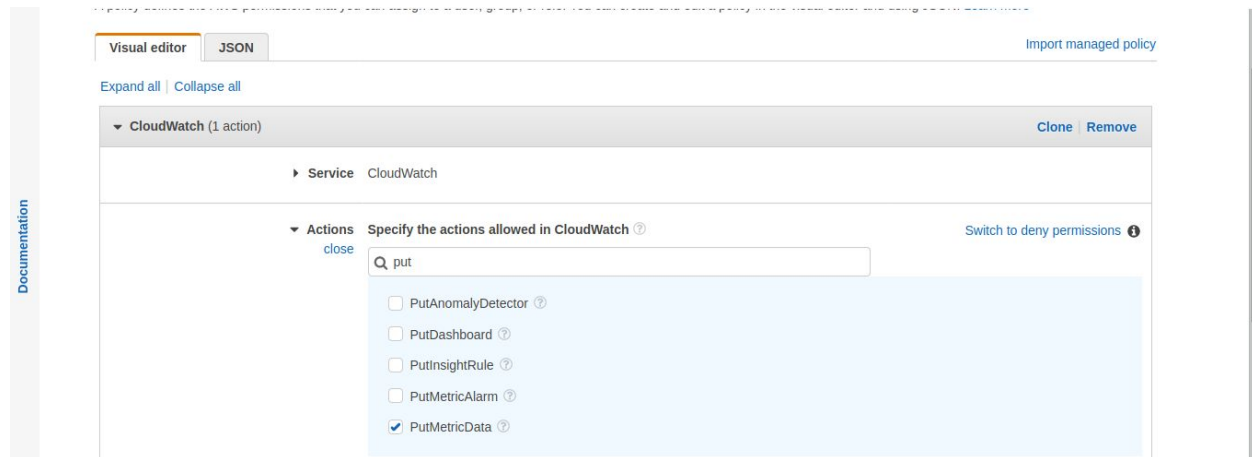


View status

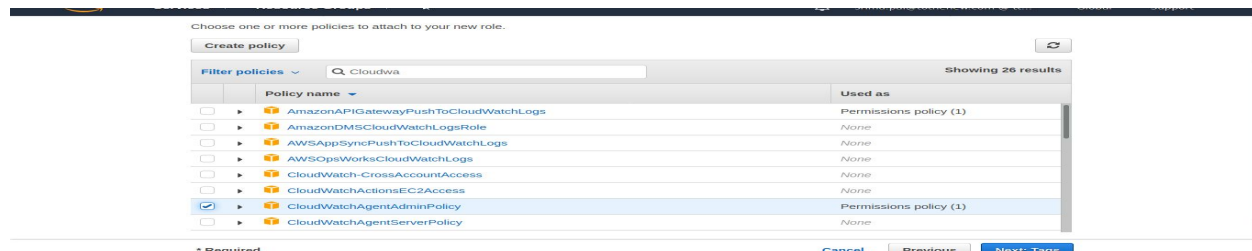


## 2. Create a custom Memory metric in CloudWatch and set up alarm at 80 % which will autoscale the instance in the autoscaling group.

Create a policy for cloudwatch ,with put metric data , giving permission to ec2 to put metric data in cloudwatch



Attach this to the role, srima metric policy and cloudwatch agent admin policy



## Create role

**Create role**

1 2 3 4

**Review**

Provide the required information below and review this role before you create it.

**Role name\*** SrimaCloudwatchRole

Use alphanumeric and '+', '=', '@', '-', '\_' characters. Maximum 64 characters.

**Role description** Allows EC2 instances to call AWS services on your behalf.

Maximum 1000 characters. Use alphanumeric and '+', '=', '@', '-', '\_' characters.

**Trusted entities** AWS service: ec2.amazonaws.com

**Policies** SrimaMetricPolicy [↗](#)  
CloudWatchAgentAdminPolicy [↗](#)

\* Required

Cancel Previous **Create role**

## Attach IAM Role

**Attach IAM Role**

Connect  
Get Windows Password  
Create Template From Instance  
Launch More Like This  
Instance State  
Instance Settings  
Image  
Networking  
CloudWatch Monitoring

Add/Edit Tags  
Attach to Auto Scaling Group  
Attach/Replace IAM Role  
Change Instance Type  
Change Termination Protection  
View/Change User Data  
Change Shutdown Behavior  
Change T2/T3 Unlimited  
Change System Log  
Get Instance Screenshot  
Modify Instance Placement  
Modify Capacity Reservation Settings



Instances > Attach/Replace IAM Role

## Attach/Replace IAM Role

Select an IAM role to attach to your instance. If you don't have any IAM roles, choose Create new IAM role to create a role in the IAM console. If an IAM role is already attached to your instance, the IAM role you choose will replace the existing role.

Instance ID: i-0392e6fd65fdf1c99 (Vedant-Instance)

IAM role:  [Create new IAM role](#)

\* Required Cancel Apply

Create a script inside the instance

```
#!/bin/bash
USEDMEMORY=$(free -m | awk 'NR==2{printf "%.2f\t", $3*100/$2 }')
TCP_CONN=$(netstat -an | wc -l)
TCP_CONN_PORT_80=$(netstat -an | grep 80 | wc -l)
USERS=$(uptime | awk '{ print $6 }')
IO_WAIT=$(iostat | awk 'NR==4 {print $5}')

aws cloudwatch put-metric-data --metric-name memory-usage --dimensions Instance=i-0392e6fd65fdf1c99 --namespace "Srima" --value $USEDMEMORY
aws cloudwatch put-metric-data --metric-name Tcp_connections --dimensions Instance=i-0392e6fd65fdf1c99 --namespace "Srima" --value $TCP_CONN
aws cloudwatch put-metric-data --metric-name TCP_connection_on_port_80 --dimensions Instance=i-0392e6fd65fdf1c99 --namespace "Srima" --value $TCP_CONN_PORT_80
aws cloudwatch put-metric-data --metric-name No_of_users --dimensions Instance=i-0c51f9f1213e63159 --namespace "Srima" --value $USERS
aws cloudwatch put-metric-data --metric-name IO_WAIT --dimensions Instance=i-0c51f9f1213e63159 --namespace "Srima" --value $IO_WAIT
```

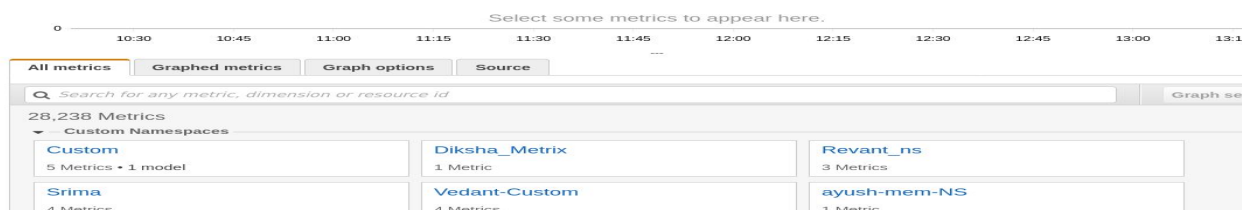
Give permissions (execute script)

```
ubuntu@ip-172-31-204-107:~$ sudo chmod +x mem.sh
```

Run the script to push the information of ec2 to cloudwatch

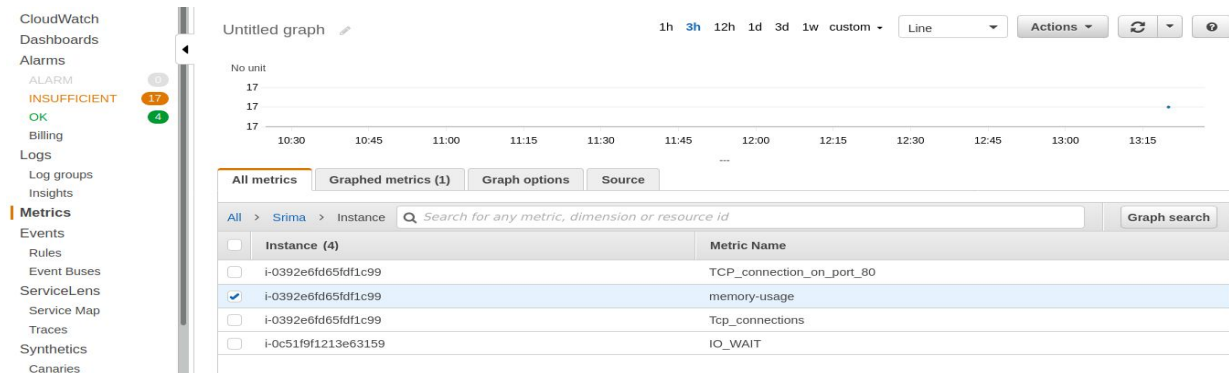
```
ubuntu@ip-172-31-204-107:~$ sudo ./mem.sh
[<class 'decimal.ConversionSyntax'>]
```

Metric Created





## Set billing alarm, for memory usage metric



## Go to alarm, and create alarm for the created metric

The screenshot shows the AWS CloudWatch console with a notification banner at the top: 'Successfully created alarm Srima-EC2-Alarm'. Below the banner, the 'Alarms (1/21)' section is visible. A table lists the alarms:

| Name                   | State | Conditions   | Actions              |
|------------------------|-------|--|----------------------|
| sarthak                | OK    | CPUUtilization >= 15 for 1 datapoints within 5 minutes | Pending confirmation |
| ALERT_Baban            | OK    | CPUUtilization >= 10 for 1 datapoints within 5 minutes | -                    |
| <b>Srima-EC2-Alarm</b> | OK    | CPUUtilization >= 15 for 1 datapoints within 5 minutes | -                    |
| ChhaviAlarm            | OK    | CPUUtilization > 15 for 1 datapoints within 5 minutes  | Pending confirmation |

## Select the metric

The screenshot shows the AWS CloudWatch console with a 'Select metric' dialog box open. The dialog box displays the 'memory-usage' metric selected for a graph. The table below shows the selected metric:

| Instance (4)  | Metric Name     |
|---|-----------------|
| <input checked="" type="checkbox"/> i-0392e6fd65dfd1c99 | memory-usage    |
| <input type="checkbox"/> i-0392e6fd65dfd1c99            | Tcp_connections |

## Created alarm

**Metric** Edit

**Graph**  
This alarm will trigger when the blue line goes above the red line for 1 datapoints within 5 minutes.

No unit

17

17

17

17

17

10:30 11:30 12:30 13:30

memory-usage

Namespace  
Srima

Metric name  
memory-usage

Instance  
i-0392e6fd65fdf1c99

Statistic  
Average

Period  
5 minutes

## Give 80% threshold

**Conditions**

**Threshold type**

☒ Static  
Use a value as a threshold

☐ Anomaly detection  
Use a band as a threshold

**Whenever memory-usage is...**  
Define the alarm condition.

☒ Greater  
> threshold

☐ Greater/Equal  
≥ threshold

☐ Lower/Equal  
≤ threshold

☐ Lower  
< threshold

**than...**  
Define the threshold value.

80

Must be a number

► Additional configuration

Cancel Next

## Create AMI , create ASG and set alarm in scaling policy

1. Configure Auto Scaling group details 2. Configure scaling policies 3. Configure Notifications 4. Configure Tags 5. Review

Create Auto Scaling Group

group.

**Increase Group Size**

Name: Increase Group Size

Execute policy when: Srima-EC2-Alarm Add new alarm

breaches the alarm threshold: CPUUtilization ≥ 15 for 300 seconds for the metric dimensions InstanceId = i-0392e6fd65fdf1c99

Take the action: Add 1 capacity units when 80 ≤ CPUUtilization < +infinity

Add step ⓘ

Instances need: 300 seconds to warm up after each step

Cancel Previous Review Next: Configure Notifications

Add an autoscaling alarm, select autoscaling group

### Auto Scaling action

**Alarm state trigger**  
Define the alarm state that will trigger this action.

☒ **In alarm**  
The metric or expression is outside of the defined threshold.

☐ **OK**  
The metric or expression is within the defined threshold.

☐ **Insufficient data**  
The alarm has just started or not enough data is available.

**Resource type**  
Select a resource type.

☒ **EC2 Auto Scaling group**

☐ ECS Service

**Select a group**

Srima-ASG-Cloudwatch

Only Auto Scaling groups with a simple scaling or step scaling policy in this account are available.

**Take the following action...**

Increase Group Size (Add 1 Instance)

Only actions for the selected Auto Scaling group are available.

Remove

Select the SNS topic created

### Configure actions

**Alarm state trigger**  
Define the alarm state that will trigger this action.

☒ **In alarm**  
The metric or expression is outside of the defined threshold.

☐ **OK**  
The metric or expression is within the defined threshold.

☐ **Insufficient data**  
The alarm has just started or not enough data is available.

**Select an SNS topic**  
Define the SNS (Simple Notification Service) topic that will receive the notification.

☒ **Select an existing SNS topic**

☐ Create new topic

☐ Use topic ARN

**Send a notification to...**

Srima-EC2

Only email lists for this account are available.

Email (endpoints)  
srima.pal@tothenew.com - View in SNS Console

Add notification

Remove

Give name

### Add name and description

**Name and description**

**Alarm name**  
Define a unique name.

Srima-Custom-Metric-Alarm

**Alarm description - optional**  
Define a description for this alarm.

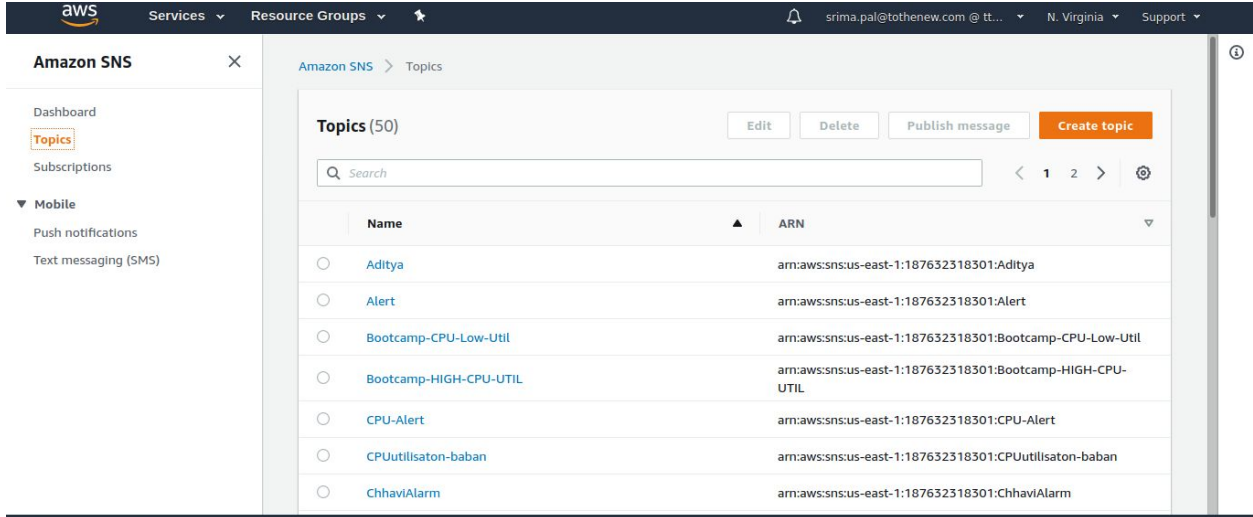
Alarm description

Up to 1024 characters (0/1024)

Cancel Previous Next

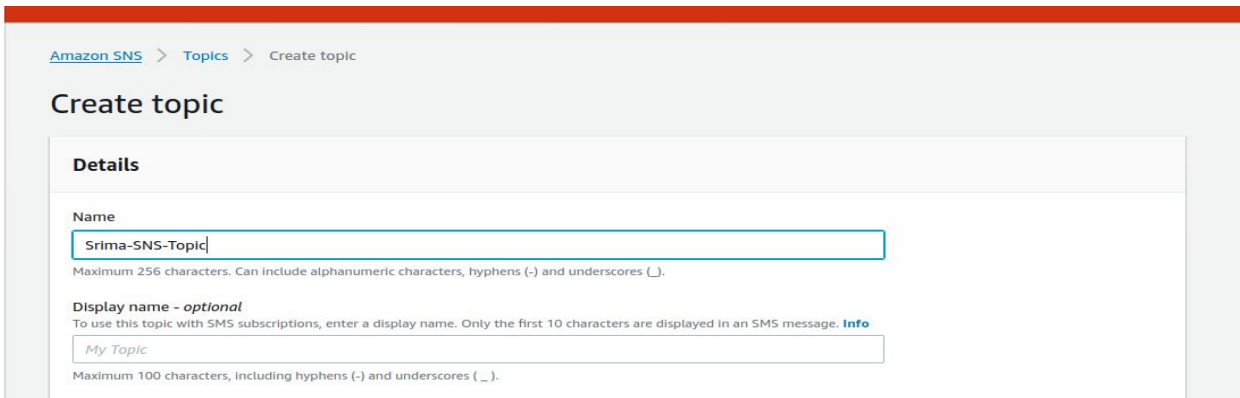
### 3. Create SNS topic, subscribe to a topic, publish message, unsubscribe the message and delete the topic.

Create a topic



The screenshot shows the Amazon SNS console. On the left is a navigation menu with 'Topics' highlighted. The main area displays a list of 50 topics. The table has columns for 'Name' and 'ARN'. The topics listed are:

| Name                   | ARN   |
|------------------------|---|
| Aditya                 | arn:aws:sns:us-east-1:187632318301:Aditya                 |
| Alert                  | arn:aws:sns:us-east-1:187632318301:Alert                  |
| Bootcamp-CPU-Low-Util  | arn:aws:sns:us-east-1:187632318301:Bootcamp-CPU-Low-Util  |
| Bootcamp-HIGH-CPU-UTIL | arn:aws:sns:us-east-1:187632318301:Bootcamp-HIGH-CPU-UTIL |
| CPU-Alert              | arn:aws:sns:us-east-1:187632318301:CPU-Alert              |
| CPUUtilisaton-baban    | arn:aws:sns:us-east-1:187632318301:CPUUtilisaton-baban    |
| ChhaviAlarm            | arn:aws:sns:us-east-1:187632318301:ChhaviAlarm            |



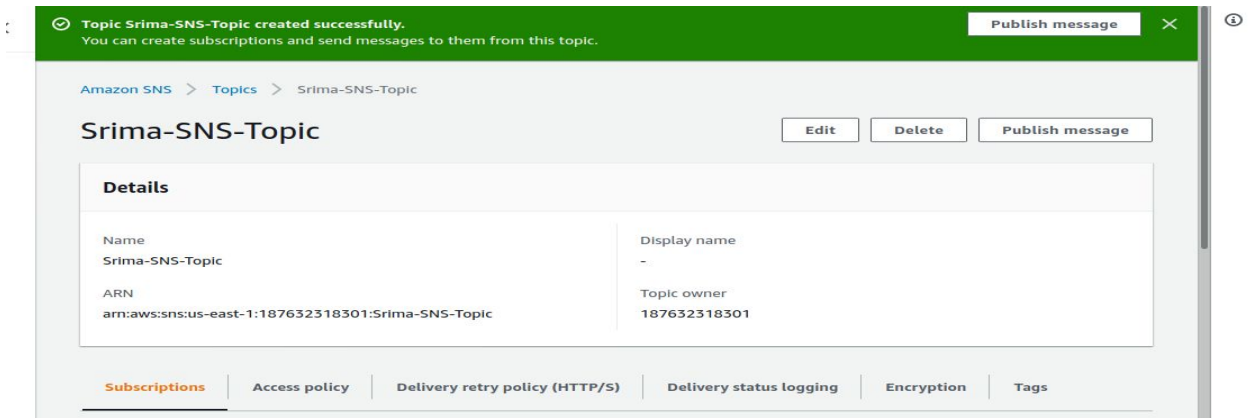
The screenshot shows the 'Create topic' form. It has two main sections: 'Details' and 'Name'. The 'Name' field is filled with 'Srima-SNS-Topic'. Below it, there is a 'Display name - optional' field with the value 'My Topic'.

**Create topic**

**Details**

Name  
Srima-SNS-Topic  
Maximum 256 characters. Can include alphanumeric characters, hyphens (-) and underscores (\_).

Display name - optional  
To use this topic with SMS subscriptions, enter a display name. Only the first 10 characters are displayed in an SMS message. [Info](#)  
My Topic  
Maximum 100 characters, including hyphens (-) and underscores (\_).



The screenshot shows the details page for the 'Srima-SNS-Topic'. A green banner at the top indicates 'Topic Srima-SNS-Topic created successfully'. The page has a navigation bar with 'Subscriptions', 'Access policy', 'Delivery retry policy (HTTP/S)', 'Delivery status logging', 'Encryption', and 'Tags'. The 'Details' section shows the following information:

| Field        | Value  |
|--------------|--|
| Name         | Srima-SNS-Topic                                    |
| ARN          | arn:aws:sns:us-east-1:187632318301:Srima-SNS-Topic |
| Display name | -  |
| Topic owner  | 187632318301                                       |

## Create Subscription

Amazon SNS

Dashboard

Topics

Subscriptions

▼ Mobile

Push notifications

Text messaging (SMS)

Amazon SNS > Subscriptions

Subscriptions (49)

Edit

Delete

Request confirmation

Confirm subscription

Create subscription

|                       | ID                                   | Endpoint                  | Status    | Protocol | Topic             |
|-----------------------|--------------------------------------|---------------------------|-----------|----------|-------------------|
| <input type="radio"/> | 118cf1b5-7b2b-46e2-8e15-6338bf8c8137 | ketan.joshi@tothenew.com  | Confirmed | EMAIL    | Ketan-Wordpress-A |
| <input type="radio"/> | 1615671a-f482-447f-9d0e-3db3523d4d9e | raj.shekhar@tothenew.com  | Confirmed | EMAIL    | RajNotifications  |
| <input type="radio"/> | 48ef7559-f41c-4056-9250-2143b5108    | abhimanyu.prajapati@tothe | Confirmed | EMAIL    | auroro_alarm      |

Details

Topic ARN

Protocol

The type of endpoint to subscribe

Email

Endpoint

An email address that can receive notifications from Amazon SNS.

After your subscription is created, you must confirm it.

► Subscription filter policy - optional

This policy filters the messages that a subscriber receives.

Subscription to Srima-SNS-Topic created successfully.

The ARN of the subscription is arn:aws:sns:us-east-1:187632318301:Srima-SNS-Topic:1e9a54b0-4fe5-4de1-8c45-fda500a56ae1.

Amazon SNS > Topics > Srima-SNS-Topic > Subscription: 1e9a54b0-4fe5-4de1-8c45-fda500a56ae1

Subscription: 1e9a54b0-4fe5-4de1-8c45-fda500a56ae1

EditDelete

Details

ARN

arn:aws:sns:us-east-1:187632318301:Srima-SNS-Topic:1e9a54b0-4fe5-4de1-8c45-fda500a56ae1

Endpoint

srima.pal@tothenew.com

Topic

Srima-SNS-Topic


Status

Pending confirmation

Protocol


EMAIL

## Subscriber needs to confirm the subscription

**AWS Notifications**6:22 PM (5 hour)

You have chosen to subscribe to the topic: arn:aws:sns:us-east-1:187632318301:Srima-EC2 To confirm this subscription, click or visit the link below (If this was

---

**AWS Notifications** <no-reply@sns.amazonaws.com> 11:51 PM (1 minute ago) ☆  
to me ▾

You have chosen to subscribe to the topic:  
**arn:aws:sns:us-east-1:187632318301:Srima-SNS-Topic**

...

To confirm this subscription, click or visit the link below (If this was in error no action is necessary):  
[Confirm subscription](#)

Please do not reply directly to this email. If you wish to remove yourself from receiving all future SNS subscription confirmation requests please send an email to [sns-opt-out](#)

↩ Reply ➡ Forward



### Simple Notification Service

#### Subscription confirmed!

You have subscribed srima.pal@tothenew.com to the topic:  
**Srima-SNS-Topic**.

Your subscription's id is:  
arn:aws:sns:us-east-1:187632318301:Srima-SNS-  
Topic:1e9a54b0-4fe5-4de1-8c45-fda500a56ae1

If it was not your intention to subscribe, [click here to unsubscribe](#).

## Select a topic and publish message

Subject Optional

  
Maximum 100 printable ASCII characters

**Time to Live (TTL) - optional**

This setting applies only to mobile application endpoints. The number of seconds that the push notification service has to deliver the message to the endpoint. [Info](#)

### Message body

Message structure

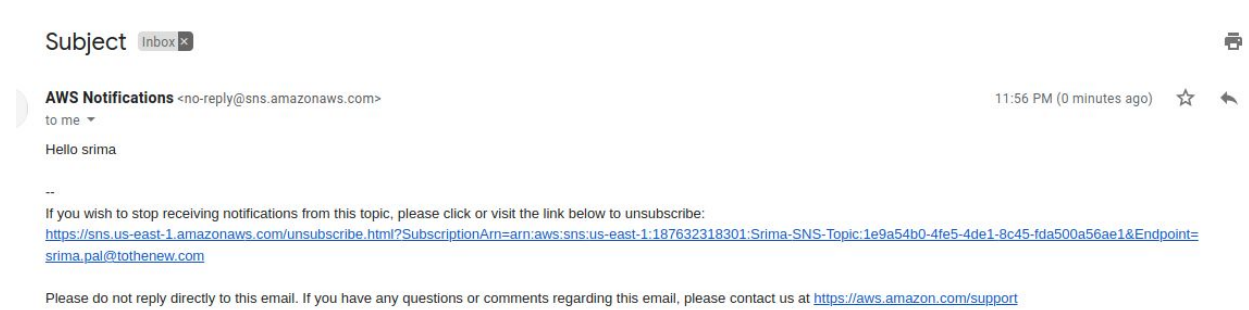
☒ **Identical payload for all delivery protocols.**  
The same payload is sent to endpoints subscribed to the topic, regardless of their delivery protocol.

☐ **Custom payload for each delivery protocol.**  
Different payloads are sent to endpoints subscribed to the topic, based on their delivery protocol.

Message body to send to the endpoint

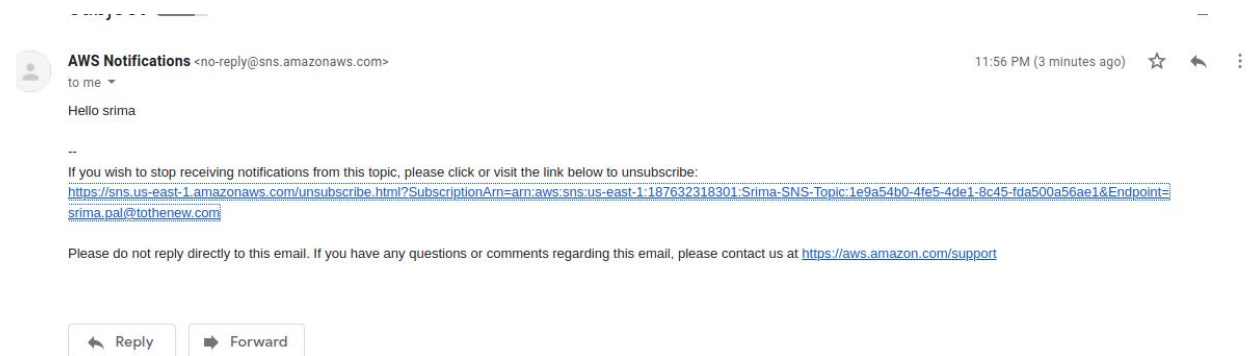
1 Hello srima

## Email received

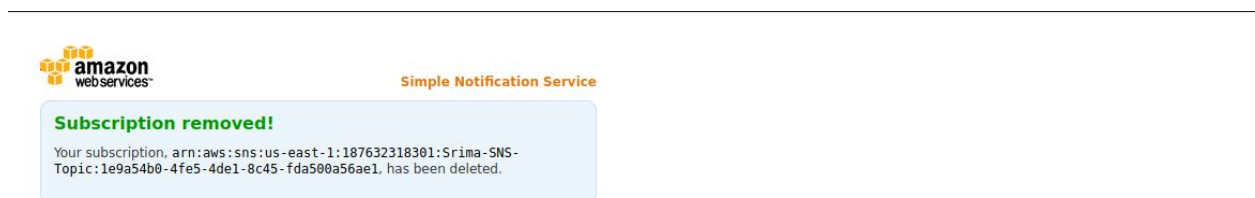


## Unsubscribe to the topic

## Click on the unsubscription link



## Unsubscribed



## 4. Send a sample mail using SES (No access)

