Assessment -13

SNS, SES, Cloudwatch

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1. **Monitor Your Estimated Charges Using CloudWatch**

   Step 1: Enable Billing Alerts

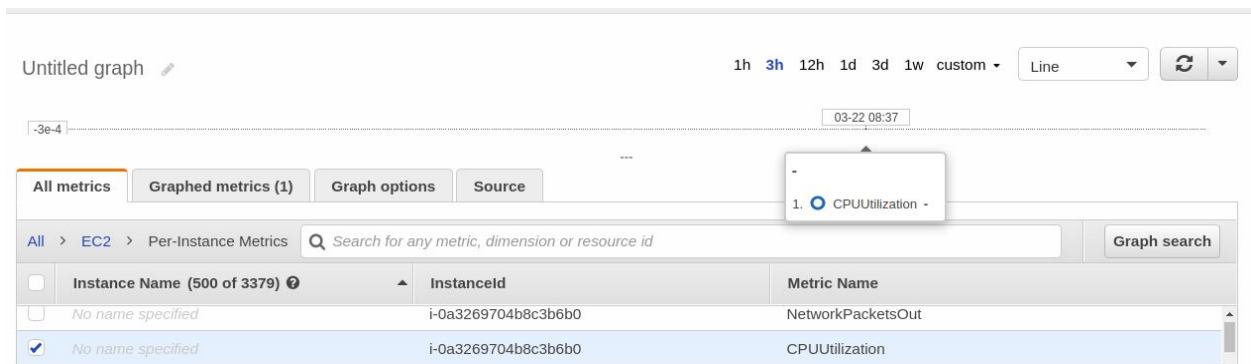   **Step 2: Create a Billing Alarm**

   Step 3: Check the Alarm Status

   Step 4: Create & Subscribe to SNS Topic

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

   Billing metric is not available so we will demonstrate using EC2.

   Select per instance metrics in EC2 and select CPU utilization.

Specify metric condition and threshold value.

Graph

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

1

0.8

0.6

0.4

0.2

0

06:30   07:30   08:30   09:30

● CPUUtilization

Namespace

AWS/EC2

Metric name

CPUUtilization

InstanceId

i-0a3269704b8c3b6b0

Instance name

No name specified

Statistic

🔍 Average   ✕

Period

5 minutes   ▼

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**

Create a topic using 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...

🔍 Vedant-SNS-topic ✕

Only email lists for this account are available.

Subscriptions (1)

[Edit] [Delete] [Request confirmation] [Confirm subscription]

Create subscription

🔍 Search

〈 1 〉 ⚙

	ID ▽	Endpoint ▽	Status ▽	Protocol ▲
○	bf796971-5615-4676-a32e-0dafcb4500c9	arun.parmar@tothenew.com	⊘ Confirmed	EMAIL

In EC2 Action -> select the desired action to be taken.

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

Remove

○ **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.

Take the following action...
Define what will happen to the EC2 instance with the Instance ID i-0a3269704b8c3b6b0 when this alarm is triggered.

○ Recover this instance
You can only recover certain EC2 instance types. See documentation

○ **Stop this instance**
You can only stop an instance if it is backed by an EBS volume. AWS will use the existing Service Linked Role (AWSServiceRoleForCloudWatchEvents) to perform this action. Show IAM policy document

○ **Terminate this instance**
You will not be able to terminate this instance if termination protection is enabled. AWS will use the existing Service Linked Role (AWSServiceRoleForCloudWatchEvents) to perform this action. Show IAM policy document

● **Reboot this instance**
An instance reboot is equivalent to an operating system reboot. AWS will use the existing Service Linked Role (AWSServiceRoleForCloudWatchEvents) to perform this action. Show IAM policy document

⚠ **Failed to check if the instance is recoverable**

Now, create an alarm.

Add name and description

Name and description

Alarm name
Define a unique name.

Arun_cloudwatch

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

Triggers an alarm if CPU util exceeds 15% and also reboots the instance

Up to 1024 characters (71/1024)

Cancel   Previous   Next

Alarm Created

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

Creating a policy for cloudwatch with PutmetricData

▶ Service   CloudWatch

▼ Actions   **Specify the actions allowed in CloudWatch** ⑦   Switch to deny permissions ⓘ
close
🔍 put

☐ PutAnomalyDetector ⑦

☐ PutDashboard ⑦

☐ PutInsightRule ⑦

☐ PutMetricAlarm ⑦

✔ PutMetricData ⑦

✕

✔ **Arun_CWpolicy** has been created.

Create a role and attach the policy.

Create role

Review

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

Role name*

Arun-putmetric-role

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   Arun_CWpolicy [↗]

Permissions boundary   Permissions boundary is not set

* Required   Cancel   Previous   Create role

Attach the role to the instance. Also create AMI of the instance and attach the AMI to the auto scaling group that would launch new instances when CPU utilisation crosses the threshold(trigger alarm).

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-074079789e11a90a0 (arun_ec2) ⓘ

IAM role*   Arun-putmetric-role   ⟳   Create new IAM role ⓘ

* Required

Create Image ✕

Instance ID	ⓘ	i-074079789e11a90a0
Image name	ⓘ	Arun-CW-Image
Image description	ⓘ	
No reboot	ⓘ	☐

Instance Volumes

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Throughput (MB/s) ⓘ	Delete on Termination ⓘ	Encrypted ⓘ
Root	/dev/xvda	snap-0002e9311bd3cfc4e	8	General Purpose S ▾	100 / 3000	N/A	☑	Not Encrypted

Add New Volume

Total size of EBS Volumes: 8 GiB

When you create an EBS image, an EBS snapshot will also be created for each of the above volumes.

Cancel   **Create Image**

Max 255 chars

Auto Scaling guidance   Info

Select this if you intend to use this template with EC2 Auto Scaling

☐ Provide guidance to help me set up a template that I can use with EC2 Auto Scaling

▶ **Template tags**

▶ **Source template**

Launch template contents

Specify the details of your launch template below. Leaving a field blank will result in the field not being included in the launch template.

Amazon machine image (AMI)   Info

AMI

Arun-CW-Image
ami-053cb78e228ef6b13
Catalog: My AMIs   architecture: 64-bit (x86)   virtualization: hvm   ▾

Create Auto Scaling Group

Please review your Auto Scaling group details. You can go back to edit changes for each section. Click **Create Auto Scaling group** to complete the creation of an Auto Scaling group.

▼ Auto Scaling Group Details   Edit details

Group name	Arun-ASG
Group size	1
Minimum Group Size	1
Maximum Group Size	3
Subnet(s)	subnet-06680a5b651f104dc
Health Check Grace Period	300
Detailed Monitoring	No
Instance Protection	None
Service-Linked Role	AWSServiceRoleForAutoScaling

▼ Scaling Policies   Edit scaling policies

Scale Group Size Maintain metric type Average CPU Utilization at target value 80, with 300 seconds for instances to warm up.

▼ Notifications   Edit notifications
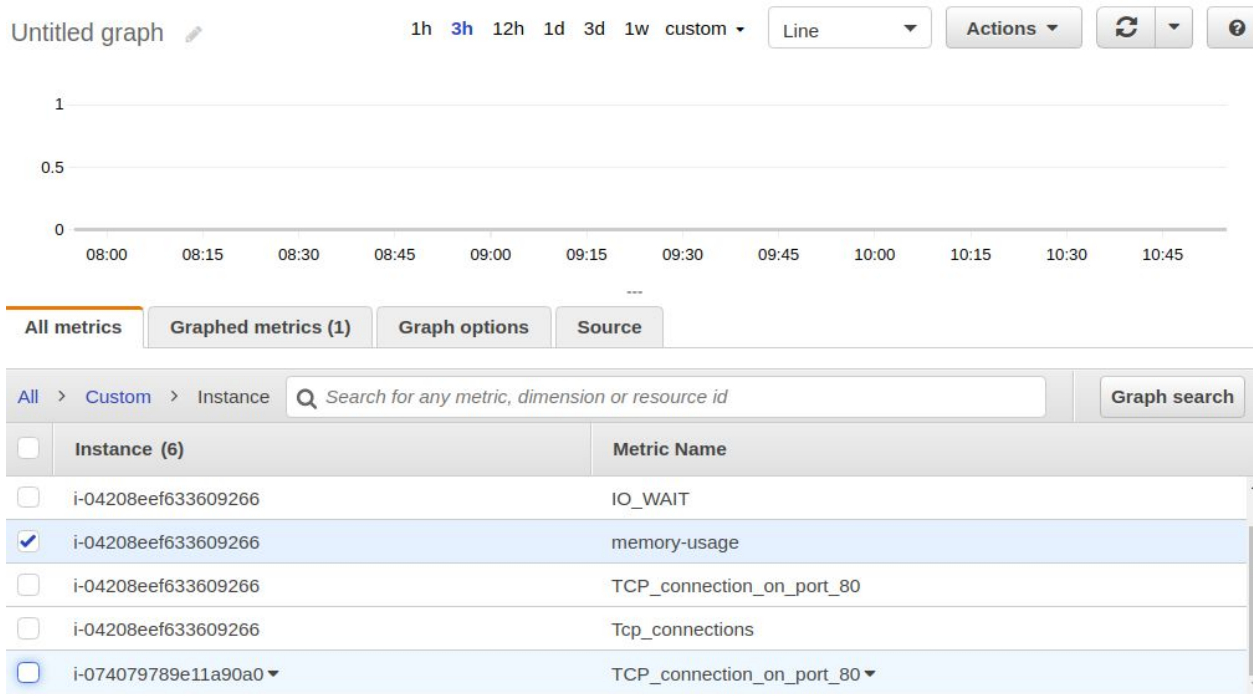
Cancel   Previous   **Create Auto Scaling group**

Now SSH into the instance to create a script on EC2 instance to post metrics on cloudwatch:

```
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-0117af50245c592bd --namespace "Custom" --value $USEDMEMORY
aws cloudwatch put-metric-data --metric-name Tcp_connections --dimensions Instance=i-074079789e11a90a0--namespace "Custom" --value $TCP_CONN
aws cloudwatch put-metric-data --metric-name TCP_connection_on_port_80 --dimensions Instance=i-074079789e11a90a0 --namespace "Custom" --value $TCP_CONN_PORT_80
aws cloudwatch put-metric-data --metric-name No_of_users --dimensions Instance= i-074079789e11a90a0 --namespace "Custom" --value $USERS
aws cloudwatch put-metric-data --metric-name IO_WAIT --dimensions Instance= i-074079789e11a90a0 --namespace "Custom" --value $IO_WAIT
```

Now run the script and check the metric in cloudwatch

Untitled graph ✏️   1h **3h** 12h 1d 3d 1w custom ▾   Line ▾   Actions ▾   ⟳ ▾   ❓

```
 1
0.5
 0
   08:00  08:15  08:30  08:45  09:00  09:15  09:30  09:45  10:00  10:15  10:30  10:45
                                         ---
```

| All metrics | Graphed metrics (1) | Graph options | Source |

All > Custom > Instance   🔍 Search for any metric, dimension or resource id   Graph search

	Instance (6)	Metric Name
☐	i-04208eef633609266	IO_WAIT
☑	i-04208eef633609266	memory-usage
☐	i-04208eef633609266	TCP_connection_on_port_80
☐	i-04208eef633609266	Tcp_connections
☐	i-074079789e11a90a0 ▾	TCP_connection_on_port_80 ▾

Now set an alarm for 80% memory utilisation.

Conditions

Threshold type

● Static	○ Anomaly detection
Use a value as a threshold	Use a band as a threshold

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

● Greater	○ Greater/Equal	○ Lower/Equal	○ Lower
> threshold	>= threshold	<= threshold	< threshold

than...
Define the threshold value.

```
80                    ⇕
```
Must be a number

▶ **Additional configuration**

Cancel   **Next**

Now create an Alarm. Attach the autoscaling group created earlier.

Add name and description

Name and description

Alarm name
Define a unique name.

Arun-Alarm

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

Alarm description

Up to 1024 characters (0/1024)

Cancel   Previous   Next

⊘ **Successfully created alarm Arun-Alarm.**   ✕

CloudWatch ＞ Alarms   Switch to your original interface

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

SNS Topic:

⊘ **Topic Demo-arun created successfully.**   Publish message
You can create subscriptions and send messages to them from this topic.

Subscribe:

Create subscription

Details

Topic ARN

🔍 arn:aws:sns:us-east-1:187632318301:Demo-arun   ✕

Protocol
The type of endpoint to subscribe

Email   ▼

Endpoint
An email address that can receive notifications from Amazon SNS.

arun.parmar@tothenew.com

Publish:

Notice

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 deli

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 Hi
2 This is the first SNS notification
```

⊘ **Message published to topic Demo-arun successfully.**
Message "ID": 71ae9ea5-d405-5098-9106-c8549e048832

Publish another message ✕

The received mail

Notice Inbox ×

Notice <no-reply@sns.amazonaws.com>
to me ▾

Hi
This is the first notification

--

Unsubscribe :

amazon web services™

Simple Notification Service

Subscription removed!

Your subscription, `arn:aws:sns:us-east-1:187632318301:Demo-arun:3234c295-82df-4bdb-88f8-451b21ae08a0`, has been deleted.

Delete the topic:

⊘ **Topic Demo-arun deleted successfully.** ✕

4. Send a sample mail using SES

WE DON'T HAVE PERMISSION.