

Assignment: CloudWatch Billing & EC2 Alarms

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Assignment Number: CloudWatch Billing and EC2 CPU Utilization Alarms

Problem Statement

You work for XYZ Corporation. To maintain the security of the AWS account and its resources, you have been asked to implement a solution that helps easily recognize and monitor different users. Additionally, you are required to monitor the machines (EC2 instances) created by these users for any performance issues, errors, or misconfigurations.

Objective

Create and configure CloudWatch Alarms to monitor AWS account billing and EC2 instance performance, and ensure automatic notification through Amazon SNS when thresholds are exceeded.

Tasks to be Performed

Step 1 — Create a Billing Alarm

1. Go to **CloudWatch Console** → **Alarms** → **All Alarms** → **Create Alarm**.
2. Click **Select metric** → **Billing** → **Total Estimated Charge** → **USD**.
3. Choose **Metric Name: EstimatedCharges**.
4. Click **Select metric** and set the following:
 - **Statistic:** Maximum
 - **Period:** 6 hours
 - **Threshold type:** Static
 - **Condition:** Greater than \$500
5. Under **Notification**, click **Create new topic**, give it a name (e.g., BillingAlarmTopic), and enter your email address for notifications.
6. Click **Create topic** and **Confirm your subscription** from the email you receive.
7. Click **Create alarm**.

This alarm will trigger when estimated AWS billing exceeds **\$500**.

[Alarms](#) > [Create alarm](#)

[conditions](#) **Specify metric and conditions**

Metric

Graph
Preview of the metric or metric expression and the alarm threshold.

[Select metric](#)

✖ You need to select a metric or a math expression.

[Cancel](#) [Next](#)

Browse (1,770) Multi source query Graphed metrics Options Source = [Add math](#) [Add query](#)

Alarm recommendations [?](#) [Graph with SQL](#) [Graph search](#)

Search for any metric, dimension, resource id or account id

ApplicationELB	83	Bedrock/DataAutomation	5	Billing	18	DynamoDB	20
EBS	273	EC2	457	HealthLake	6	Lambda	17

[Cancel](#) Select a single metric to continue

Browse (18) | Multi source query | Graphed metrics | Options | Source =

Add math ▾ | Add query ▾

Billings

Alarm recommendations | Graph with SQL | Graph search

Search for any metric, dimension, resource id or account id

By Service 17 | Total Estimated Charge 1

Select a single metric to continue

Browse (1) Multi source query Graphed metrics (1) Options Source =

> Billing > Total Estimated Charge

Add math ▾ Add query ▾

Alarm recommendations ⓘ Graph with SQL Graph search

Search for any metric, dimension, resource id or account id

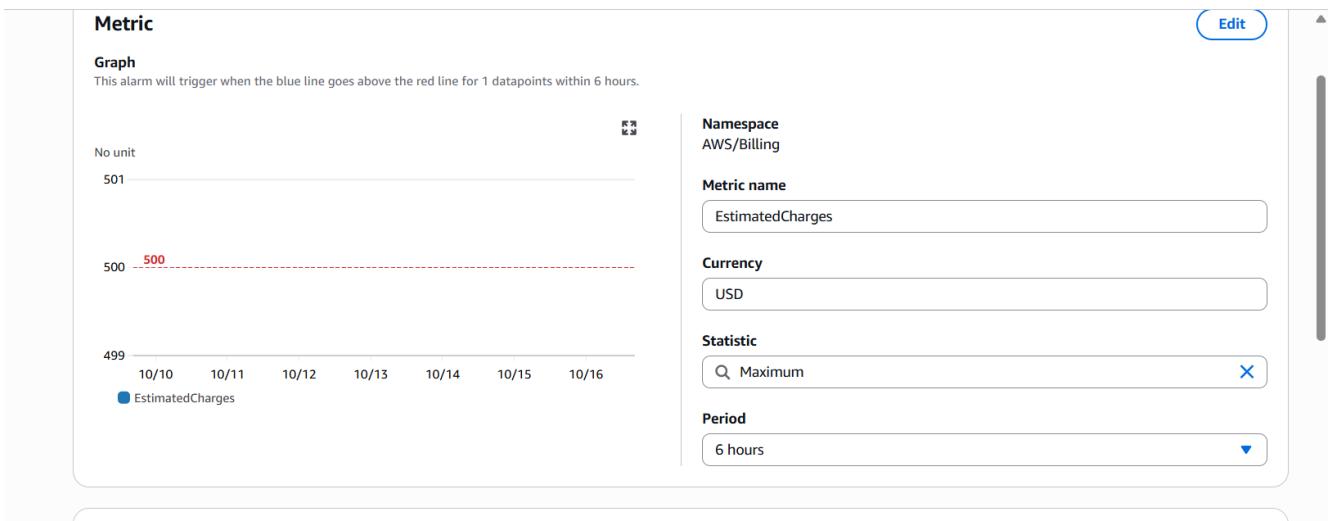
Currency 1/1 ▲ Metric name ▼ Alarms ▾

USD EstimatedCharges No alarms

Exclude from search

Cancel Select metric

Create alarm



Create alarm

Conditions

Threshold type

Static
Use a value as a threshold

Anomaly detection
Use a band as a threshold

Whenever EstimatedCharges is...
Define the alarm condition.

Greater
> threshold

Greater/Equal
>= threshold

Lower/Equal
<= threshold

Lower
< threshold

than...
Define the threshold value.
500 USD
Must be a number.

► Additional configuration

Cancel **Next**

Configure actions

Notification

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.

Send a notification to the following 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 to notify other accounts

Create a new topic...

The topic name must be unique.

Default_CloudWatch_Alarms_Topic

SNS topic names can contain only alphanumeric characters, hyphens (-) and underscores (_).

Notification

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.

Send a notification to the following SNS topic
Define the SNS (Simple Notification Service) topic that will receive the notification.

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Create new topic

Use topic ARN to notify other accounts

Create a new topic...
The topic name must be unique.

Default_CloudWatch_Alarms_Topic

SNS topic names can contain only alphanumeric characters, hyphens (-) and underscores (_).

Email endpoints that will receive the notification...
Add a comma-separated list of email addresses. Each address will be added as a subscription to the topic above.

gangadharavikram1999@gmail.com

user1@example.com, user2@example.com

Remove

Add alarm details

Name and description

Alarm name

BillingAlarmTopic

Alarm description - optional [View formatting guidelines](#)

Edit Preview

```
# This is an H1
**double asterisks will produce strong character**
This is [an example](https://example.com/) inline link.
```

Up to 1024 characters (0/1024)

ⓘ Markdown formatting is only applied when viewing your alarm in the console. The description will remain in plain text in the alarm notifications.

Tags - optional

Alarms (1/1)

Hide Auto Scaling alarms

Clear selection



Create composite alarm

Actions ▾

Create alarm

Search

Alarm state: Any

Alarm type: Any

Actions status: Any

< 1 >

Name

State

Last state update (UTC)

Conditions

Actions

BillingAlarmTopic

OK

2025-10-17 11:05:08

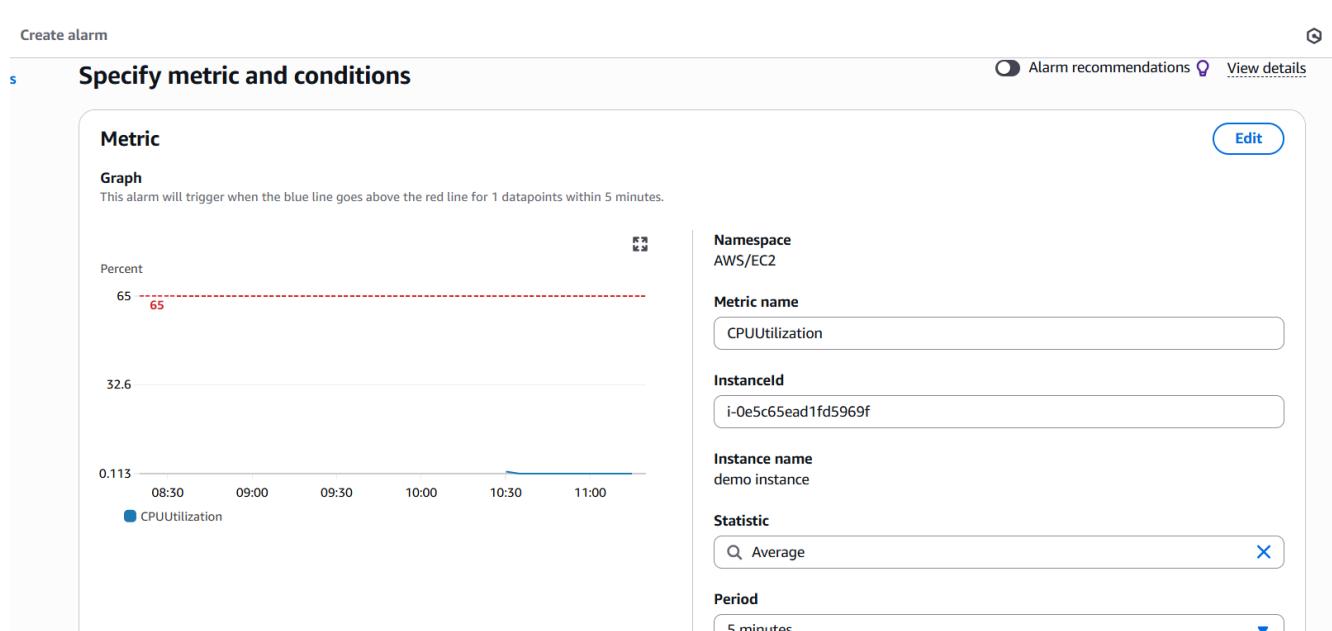
EstimatedCharges > 500 for 1 datapoints within 6 hours

Actions enabled

Step 2 — Create an EC2 CPU Utilization Alarm

1. Go to **CloudWatch** → **Alarms** → **Create Alarm**.
2. Choose **Select metric** → **EC2** → **Per-Instance Metrics**.
3. Select your instance ID → check **CPUUtilization** metric → click **Select metric**.
4. Under conditions:
 - **Statistic:** Average
 - **Period:** 5 minutes
 - **Threshold type:** Static
 - **Condition:** Greater than 65%
5. Under **Notification**, choose **Select existing SNS topic** or **Create new** (e.g., EC2-CPU-Alarm-Topic).
6. Add your email address for notifications and confirm the email subscription.
7. Click **Create alarm**.

This alarm will enter the **ALARM** state when the CPU utilization of the EC2 instance exceeds **65%**.



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.

65

Must be a number.

Alarms (1/2)

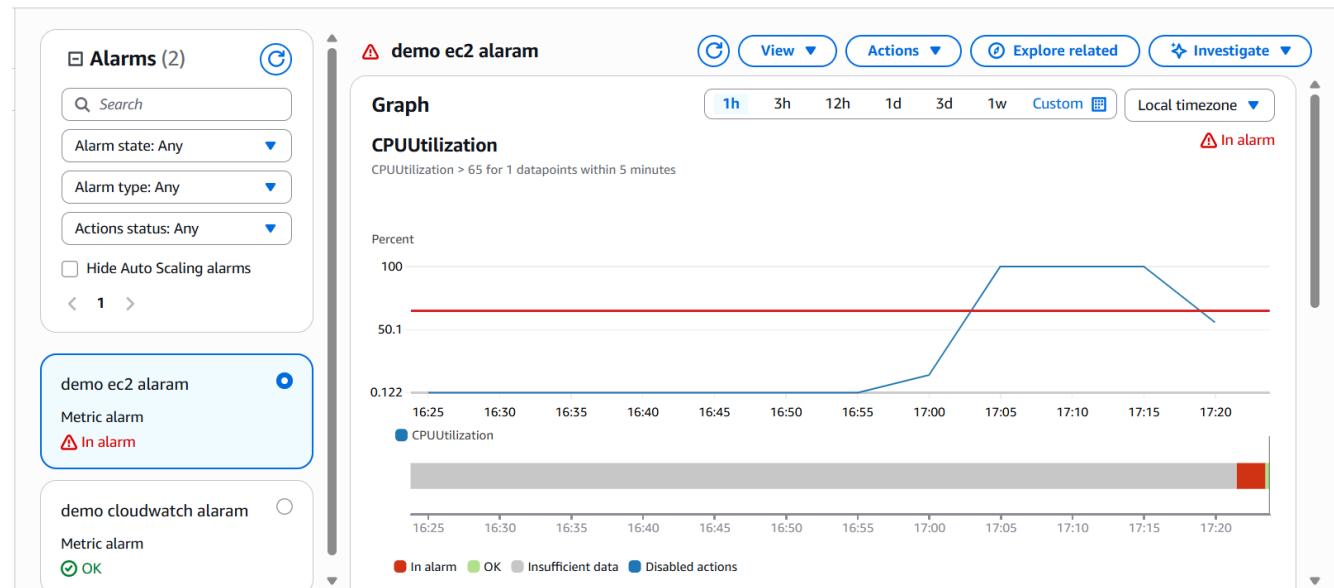
				<input type="checkbox"/> Hide Auto Scaling alarms	Clear selection	Create composite alarm	Actions ▾	Create alarm
				<input type="checkbox"/> Alarm state: Any	<input type="checkbox"/> Alarm type: Any	<input type="checkbox"/> Actions status: Any	◀ 1 ▶	⚙️
-	Name	State	Last state update (Local)	Conditions	Actions			
<input checked="" type="checkbox"/>	EC2-CPU-Alarm-Topic	OK	2025-10-17 16:56:02	CPUUtilization > 65 for 1 datapoints within 5 minutes	Actions enabled			
<input type="checkbox"/>	BillingAlarmTopic	OK	2025-10-17 16:48:30	EstimatedCharges > 500 for 1 datapoints within 6 hours	Actions enabled			

Result

Successfully created two CloudWatch Alarms:

- **Billing Alarm** for estimated charges exceeding **\$500**
- Billing alarm may take up to **6 hours** to trigger due to metric update frequency.
- **EC2 CPU Utilization Alarm** for CPU usage exceeding **65%**, with **SNS notification integration**

These alarms help proactively monitor costs and EC2 performance issues, improving visibility and response time.



AWS Notifications <no-reply@sns.amazonaws.com>

to me ▾

17:31 (0 minutes ago)



You are receiving this email because your Amazon CloudWatch Alarm "demo ec2 alarm" in the US East (N. Virginia) region has entered the ALARM state, because "Threshold Crossed: 1 out of the last 1 datapoints [99.87984379693602 (17/10/25 11:56:00)] was greater than the threshold (65.0) (minimum 1 datapoint for OK -> ALARM transition)." at "Friday 17 October, 2025 12:01:30 UTC".

View this alarm in the AWS Management Console:

<https://us-east-1.console.aws.amazon.com/cloudwatch/deeplink.js?region=us-east-1#alarmsV2:alarm/demo%20ec2%20alarm>

Alarm Details:

- Name: demo ec2 alarm
- Description:
- State Change: OK -> ALARM
- Reason for State Change: Threshold Crossed: 1 out of the last 1 datapoints [99.87984379693602 (17/10/25 11:56:00)] was greater than the threshold (65.0) (minimum 1 datapoint for OK -> ALARM transition).
- Timestamp: Friday 17 October, 2025 12:01:30 UTC

NOTE: Billing alarm may take up to **6 hours** to trigger due to metric update frequency.

That is the reason I didn't provide any screenshots of billing alarm.