

## Module 4 Lab 3: CloudWatch Event Rule

### CloudWatch - Rules

The screenshot shows the AWS CloudWatch Rules console. On the left is a navigation menu with options like CloudWatch, Dashboards, Alarms, and Rules. The main area is titled 'Rules' and contains a 'Create rule' button and a table for existing rules. The table has columns for Status, Name, and Description. Below the table, it states 'You have no rules.' The top right of the console shows 'Viewing 0 to 0 of 0 Rules'.

No rules in CloudWatch have been created so far.

### EC2 Dashboard

The screenshot shows the AWS EC2 Dashboard. At the top, there's a blue banner with a welcome message. Below it, the 'Resources' section shows a summary of EC2 resources in the US East (N. Virginia) Region, including Running instances, Elastic IPs, Dedicated Hosts, Snapshots, Volumes, Load balancers, Key pairs, Security groups, and Placement groups. To the right, the 'Account attributes' section shows supported platforms like VPC and EBS encryption. Below the resources section, there are three panels: 'Launch instance' with a 'Launch instance' button, 'Service health' showing the region status as 'operating normally', and 'Availability Zone status' showing three zones (us-east-1a, us-east-1b, us-east-1c) all as 'operating normally'.

A new EC2 instance will generate CloudWatch data.

## Quick Start - EC2 AMI

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace, or you can select one of your own AMIs.

Search for an AMI by entering a search term e.g. "Windows"

Quick Start

My AMIs  
AWS Marketplace  
Community AMIs

☐ Free tier only

Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0323c3d2da7b37d (64-bit x86) / ami-0ce2e5b7d27317779 (64-bit Arm)

Amazon Linux

Free tier eligible

Root device type: ebs Virtualization type: hvm EHA Enabled: Yes

Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-0915e09cc7ccee3ab

Amazon Linux

Free tier eligible

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

Root device type: ebs Virtualization type: hvm EHA Enabled: Yes

Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-06816afa9edf40be (64-bit x86) / ami-029ba835ddd43c34f (64-bit Arm)

Red Hat

Free tier eligible

Red Hat Enterprise Linux version 8 (HVM), EBS General Purpose (SSD) Volume Type

Root device type: ebs Virtualization type: hvm EHA Enabled: Yes

SUSE Linux Enterprise Server 15 SP1 (HVM), SSD Volume Type - ami-0068cd93259e9f24c (64-bit x86) / ami-062c482b34db4e4e0 (64-bit Arm)

SUSE Linux

Free tier eligible

SUSE Linux Enterprise Server 15 Service Pack 1 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.

Root device type: ebs Virtualization type: hvm EHA Enabled: Yes

Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-085925f297b9f0ce1 (64-bit x86) / ami-05d7ab19e28efa213 (64-bit Arm)

Ubuntu

Free tier eligible

Ubuntu Server 18.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).

Root device type: ebs Virtualization type: hvm EHA Enabled: Yes

Are you launching a database instance? Try Amazon RDS.

Amazon RDS

Amazon Relational Database Service (RDS) makes it easy to set up, operate, and scale your database on AWS by automating time-consuming database management tasks. With RDS, you can easily deploy Amazon Aurora, MariaDB, MySQL, Oracle, PostgreSQL, and SQL Server databases on AWS. Aurora is a MySQL- and PostgreSQL-compatible, enterprise-class database at 1/10th the cost of commercial databases. Learn more about RDS

Staying within the Free tier eligibility.

## Quick Start - EC2 Instance type

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs.

Filter by: All Instance types Current generation Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GiB)	EBS Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	8	32	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t3a.nano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	General purpose	t3a.micro	2	1	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	General purpose	t3a.small	2	2	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	General purpose	t3a.medium	2	4	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	General purpose	t3a.large	2	8	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	General purpose	t3a.xlarge	4	16	EBS only	Yes	Up to 5 Gigabit	Yes

Cancel Previous Review and Launch Next: Configure Instance Details

All default networking settings set up.

## Quick Start - EC2 Instance Details

1. Choose AMI2. Choose Instance Type3. Configure Instance4. Add Storage5. Add Tags6. Configure Security Group7. Review

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances1Launch into Auto Scaling Group

Purchasing option☐ Request Spot instances

Networkvpc-c64509bc (default)Create new VPC

SubnetNo preference (default subnet in any Availability Zone)Create new subnet

Auto-assign Public IPUse subnet setting (Enable)

Placement group☐ Add instance to placement group

Capacity ReservationOpenCreate new Capacity Reservation

IAM roleNoneCreate new IAM role

Shutdown behaviorStop

Stop - Hibernate behavior☐ Enable hibernation as an additional stop behavior

Enable termination protection☐ Protect against accidental termination

Monitoring☐ Enable CloudWatch detailed monitoringAdditional charges apply

TenancyShared - Run a shared hardware instanceAdditional charges will apply for dedicated tenancy

Elastic Inference☐ Add an Elastic Inference acceleratorAdditional charges apply

T2/T3 Unlimited☐ EnableAdditional charges may apply

File systemsAdd file systemCreate new file system

CancelPreviousReview and LaunchNext: Add Storage

Instance details, all default items selected.

## Quick Start - EC2 Add Storage

1. Choose AMI2. Choose Instance Type3. Configure Instance4. Add Storage5. Add Tags6. Configure Security Group7. Review

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. Learn more about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MiB/s)	Delete on Termination	Encryption
Root	/dev/xvda	snap-0e1167baa50e9c0ff	8	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

Add New Volume

Free tier eligible customers can get up to 30 GiB of EBS General Purpose (SSD) or Magnetic storage. Learn more about free usage tier eligibility and usage restrictions.

CancelPreviousReview and LaunchNext: Add Tags

Default 8 GiB selected.

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## Quick Start - Add tags

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. A copy of a tag can be applied to volumes, instances or both.

Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key (128 characters maximum)	Value (256 characters maximum)	Instances (1)	Volumes (1)
------------------------------	--------------------------------	---------------	-------------

This resource currently has no tags.

Choose the Add tag button or click to add a Name tag.  
Make sure your IAM policy includes permissions to create tags.

Add Tag (Up to 50 tags maximum)

Cancel Previous Review and Launch Next: Configure Security Group

No tags set up.

## Quick Start - Configure Security group

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☐ Create a new security group

☒ Select an existing security group

Security Group ID	Name	Description	Actions
<input type="checkbox"/> sg-0e786bc44478533	AWS Deep Learning AMI -Ubuntu 18-04--V27-0-AutogenByAWSMP	This security group was generated by AWS Marketplace and is based on recommended settings for AWS Deep Learning AMI (Ubuntu 18.04) version V27.0 provided by Amazon Web Services	Copy to new
<input type="checkbox"/> sg-88eacac9	default	default VPC security group	Copy to new
<input type="checkbox"/> sg-030730c36c448960	hello-7237	2020-03-05T21:49:09.306Z	Copy to new
<input checked="" type="checkbox"/> sg-00d847fdba8939e40	launch-wizard-1	launch-wizard-1 created 2020-04-12T08:50:32.162-07:00	Copy to new
<input type="checkbox"/> sg-0b619ec7492bec40dwordpress		launch-wizard-1 created 2020-04-11T16:50:31.690-07:00	Copy to new

Inbound rules for sg-00d847fdba8939e40 (Selected security groups: sg-00d847fdba8939e40)

Type (1)	Protocol (1)	Port Range (1)	Source (1)	Description (1)
SSH	TCP	22	0.0.0.0/0	

Cancel Previous Review and Launch

An existing security group selected, with SSH open to all IPv4 addresses.

## Quick Start - Review Instance Launch

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

**⚠ Improve your instances' security. Your security group, launch-wizard-1, is open to the world.**  
Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.  
You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

**AMI Details** [Edit AMI](#)

**Free tier eligible** **Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0323c3dd2da7fb37d**  
Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras.  
Root Device Type: ebs Virtualization type: hvm

**Instance Type** [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

**Security Groups** [Edit security groups](#)

Security Group ID	Name	Description
sg-00d6477dbae939e40	launch-wizard-1	launch-wizard-1 created 2020-04-12T08:50:32.162-07:00

**All selected security groups inbound rules**

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	0.0.0.0/0	

**Instance Details** [Edit instance details](#)

[Cancel](#) [Previous](#) [Launch](#)

The instance is ready to launch.

## EC2 Dashboard

New EC2 Experience  
Tell us what you think

[Launch Instance](#) [Connect](#) [Actions](#)

EC2 Dashboard [New](#)

Events [New](#)

Tags

Reports

Limits

**INSTANCES**

**Instances**

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts [New](#)

Scheduled Instances

Capacity Reservations

**IMAGES**

AMIs

Bundle Tasks

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm States	Public DNS (IPv4)	IPv4 Public IP	IPv6 IP's	Key Name	Monitoring	Launch
	i-0f07a90c1a4d3d2a	t2.micro	us-east-1c	running	Initializing	None	ec2-54-208-4-146.com...	54.208.4.146	-	194deep	disabled	May 8,

The instance has been successfully started.

## Amazon SNS - Create topic

The screenshot shows the 'Create topic' page in the Amazon SNS console. The breadcrumb navigation at the top reads 'Amazon SNS > Topics > Create topic'. The main heading is 'Create topic'. Below this is a 'Details' section with a 'Name' field containing 'Monitor-EC2-Term' and a 'Display name - optional' field containing 'EC2TERM'. Below the details are four optional sections: 'Encryption - optional', 'Access policy - optional', 'Delivery retry policy (HTTP/S) - optional', and 'Delivery status logging - optional'. At the bottom is a 'Tags - optional' section. The page is styled with a light gray background and white panels for the form sections.

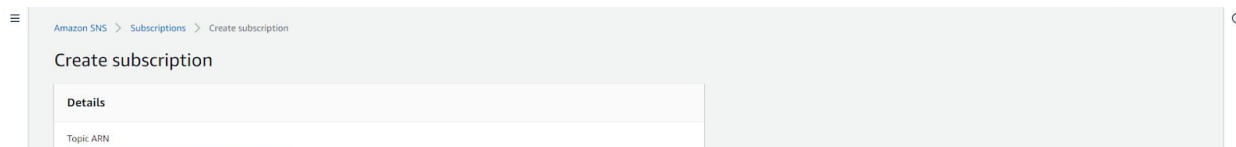
From Amazon SNS, topics can be emailed to recipients.

## Amazon SNS - Topics

The screenshot shows the 'Topics' page in the Amazon SNS console, specifically the 'Subscriptions' tab for a selected topic. The breadcrumb navigation at the top reads 'Amazon SNS > Topics > [Topic Name] > Subscriptions'. The 'Subscriptions' tab is active, and the page shows a table with columns for 'ID', 'Endpoint', 'Status', and 'Protocol'. The table is currently empty, with a message stating 'No subscriptions found' and 'You don't have any subscriptions to this topic.' There are buttons for 'Edit', 'Delete', 'Request confirmation', 'Confirm subscription', and 'Create subscription' at the top right of the table.

Subscribers will get emailed when an EC2 instance is terminated.

## Amazon SNS - Create subscription



Amazon SNS > Subscriptions > Create subscription

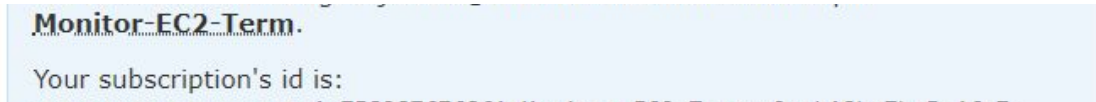
### Create subscription

**Details**

Topic ARN

All other values left at default.

## SNS subscription

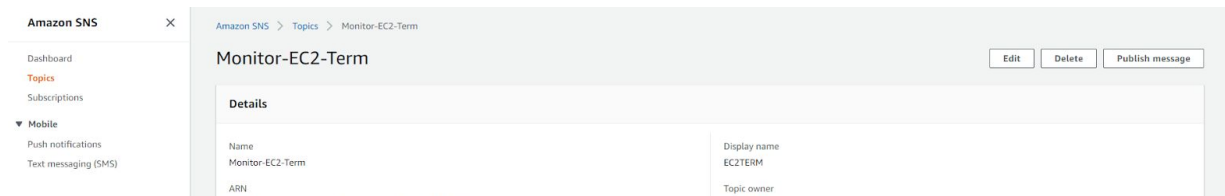


**Monitor-EC2-Term.**

Your subscription's id is:

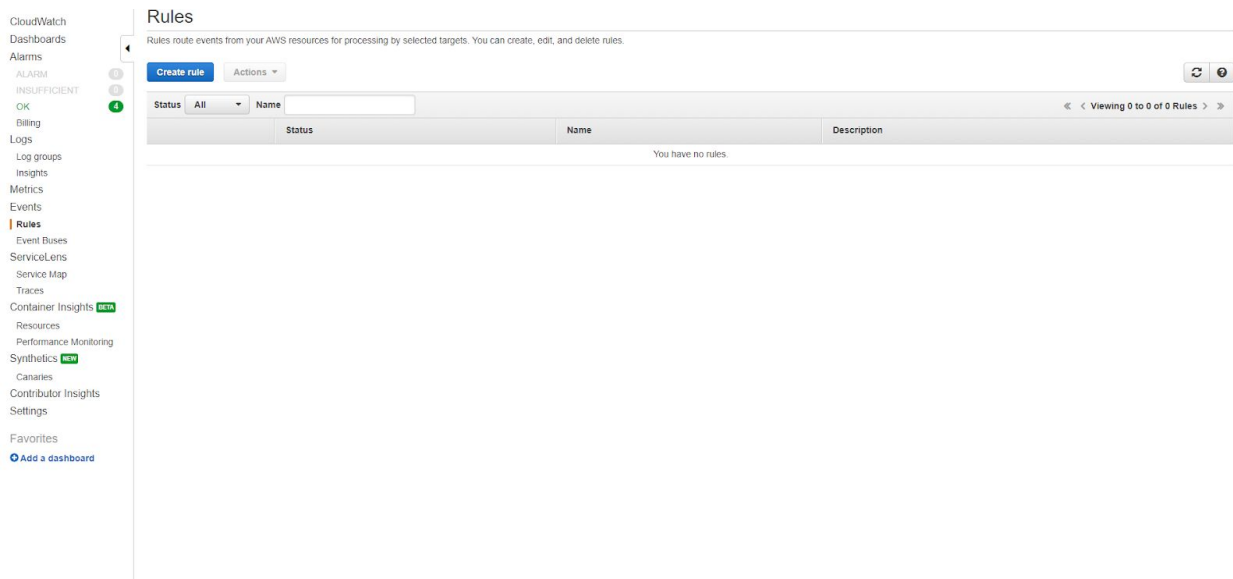
The subscription has been confirmed via email.

## Amazon SNS - Topics



Email shows as being confirmed.

## CloudWatch - Rules



From CloudWatch, a new rule will run a SNS topic and thus an email will be sent out.



## CloudWatch - Event source and target

The screenshot displays the AWS CloudWatch console interface for configuring an Event Source and its Targets.

**Event Source:**

- Build or customize an Event Pattern or set a Schedule to invoke Targets:**
- Event Pattern:** Selected.
- Build event pattern to match events by service:**
- Service Name:** EC2
- Event Type:** EC2 Instance State-change Notification
- Any state:** ☐ (selected)
- Specific state(s):** ☐ (selected)
- Any instance:** ☐ (selected)
- Specific instance ID(s):** ☐ (selected)
- Event Pattern Preview:**

```
{
  "source": [
    "aws.ec2"
  ],
  "detail-type": [
    "EC2 Instance State-change Notification"
  ],
  "detail": {
    "state": [
      "terminated"
    ]
  }
}
```
- Show sample event(s):**

**Targets:**

- Select Target to invoke when an event matches your Event Pattern or when schedule is triggered:**
- SNS topic:** Monitor-EC2-Term
- Configure input:**
- Add target:**

When an EC2 instance is terminated, the Monitor-EC2-Term topic will activate.

## CloudWatch - Rule definition

The screenshot displays the AWS CloudWatch console interface for configuring a Rule definition.

**Step 2: Configure rule details**

**Rule definition**

- Name:** MONITOR-EC2-TERM
- Description:** Monitor EC2 termination - activate a predefined SNS topic.
- State:** ☒ Enabled
- CloudWatch Events will add necessary permissions for target(s) so they can be invoked when this rule is triggered.**
- Required:**

Configuring the rule details.

## CloudWatch - Rules

The screenshot shows the AWS CloudWatch Rules console. A green success message at the top states: "Success Rule MONITOR-EC2-TERM was created." Below this, the "Rules" section is active, displaying a table with one rule:

Status	Name	Description
ON	MONITOR-EC2-TERM	Monitor EC2 termination - activate a predefined SNS topic.

The left sidebar shows the navigation menu with "Rules" highlighted. The top navigation bar includes links for CloudWatch, Dashboards, Alarms, and various other services.

Rule is active and enabled.

## EC2 Dashboard

The screenshot shows the AWS EC2 Dashboard. A "Terminate Instances" dialog box is open in the center, displaying a warning message: "Warning On an EBS-backed instance, the default action is for the root EBS volume to be deleted when the instance is terminated. Storage on any local drives will be lost." Below the warning, it asks "Are you sure you want to terminate these instances?" and lists the instance to be terminated: "i-0707a90c1a4d3d2a (ec2-54-208-4-146 compute-1.amazonaws.com)". The dialog has "Cancel" and "Yes, Terminate" buttons.

The background shows the EC2 instance list table with columns: Name, Instance ID, Instance Type, Availability Zone, Instance State, Status Checks, Alarm Status, Public DNS (IPv4), IPv4 Public IP, IPv6 IPs, Key Name, Monitoring, and Launch Permissions. One instance is visible: "i-0707a90c1a4d3d2a" of type "t2.micro" in "us-east-1c" zone, with state "running".

The EC2 instance has been terminated.

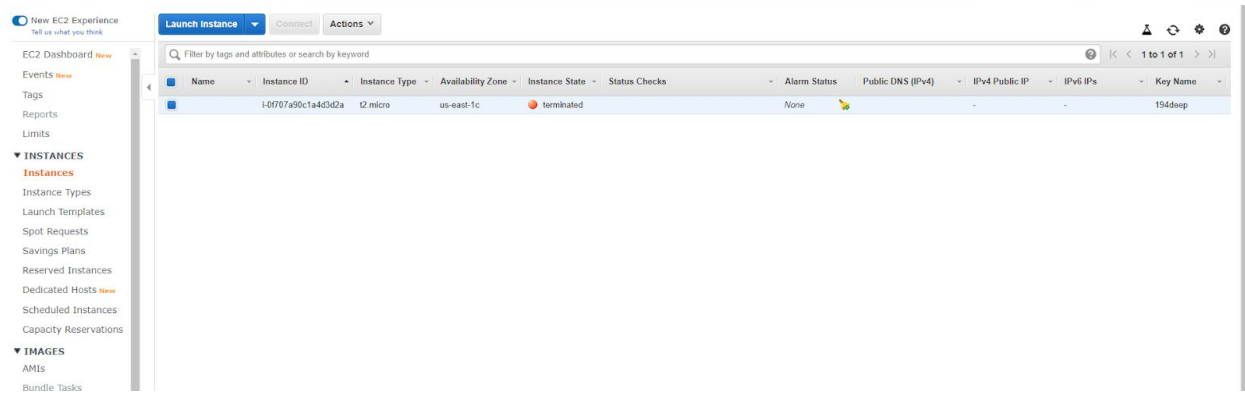
## Email - EC2TERM

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If you wish to stop receiving notifications from this topic, please click or visit the link below to unsubscribe:

An email noting that the EC2 instance has terminated.

## EC2 Dashboard



The EC2 has been terminated.