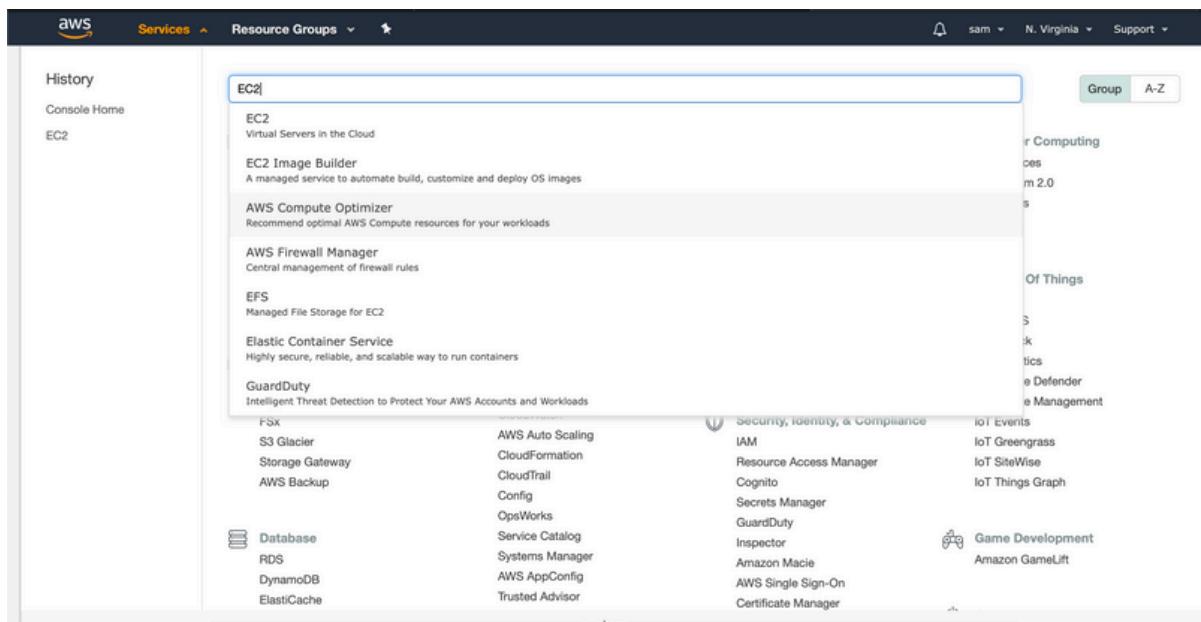


# Hands-On Study Notes

Andrew Brown

## How to launch a server using EC2

- 1.1 [ ] Go to services and type EC2 and we will make our way over to the EC2 console



- 1.2 [ ] Scroll down and click on Launch Instance

## 2 AWS Certified Cloud Practitioner

The screenshot shows the AWS EC2 Launch Instance interface. On the left, there's a sidebar with navigation links for EC2 Dashboard, Events, Tags, Reports, Limits, Instances (with sub-links for Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations), Images (AMIs, Bundle Tasks), and Elastic Block Store (Volumes). The main content area has tabs for 'Launch instance' (selected), 'Scheduled events', 'Migrate a machine', and 'Quick ID filter'. Under 'Launch instance', it says 'To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.' with a 'Launch Instance' button. It also shows 'US East (N. Virginia) Region' and 'Launch instance from template'. To the right, there are promotional banners for 'Save 10% with AMD EPYC-Powered Instances', 'Save up to 90% on EC2 with Spot Instances', and 'Easily launch third-party AMI products'. At the bottom right, there's an 'Additional information' section with links to Getting started guide, Documentation, All EC2 resources, Forums, and Pricing.

## Choose AMI

We will be presented with a bunch of options to configure our server and we will choose what OS we want to use

- 1.3 [ ] We will click on Amazon Linux because it's part of the Free tier

The screenshot shows the 'Step 1: Choose an Amazon Machine Image (AMI)' screen. At the top, there are tabs for 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, and 7. Review. Below the tabs, there's a search bar with placeholder text 'Search for an AMI by entering a search term e.g. "Windows"'. A 'Cancel and Exit' button is on the right. The main area is titled 'Quick Start' and shows a list of AMIs. The first item is 'Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0323c3dd2da7fb37d (64-bit x86) / ami-0ce2e5b7d27317779 (64-bit Arm)'. It has a 'Select' button and two radio buttons for '64-bit (x86)' and '64-bit (Arm)'. Other items listed include 'Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-0915e09cc7ceee3ab', 'Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-098f16afa9edf40be', and 'SUSE Linux Enterprise Server 15 SP1 (HVM), SSD Volume Type - ami-0068cd63259e9f24c'. Each item has a 'Select' button and radio buttons for '64-bit (x86)' and '64-bit (Arm)'.

## Choose an Instance Type

We will choose the size of our server and these are called instance types

- 1.4 [] Click on t2.micro because it is part of Free tier and click Next: Configure Instance Details

The screenshot shows the 'Step 2: Choose an Instance Type' page. At the top, there are tabs: 1. Choose AMI, 2. Choose Instance Type (which is selected), 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, and 7. Review. Below the tabs, there's a note about the free tier: '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.' A filter bar at the top says 'Filter by: All instance types' and 'Current generation'. A table lists various instance types:

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	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	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t3a.nano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes

At the bottom right, there are buttons: 'Cancel', 'Previous', 'Review and Launch' (which is highlighted in blue), and 'Next: Configure Instance Details'.

## Configure Instance Details

Now going to Instance details we can choose how many instances we want to start

- 1.5 [] Right click on IAM role and make a new tab

## 4 AWS Certified Cloud Practitioner

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 instances: 1 [Launch into Auto Scaling Group](#)

Purchasing option: Request Spot instances

Network: vpc-aa0113d0 (default) [Create new VPC](#)

Subnet: No preference (default subnet in any Availability Zone) [Create new subnet](#)

Auto-assign Public IP: Use subnet setting (Enable)

Placement group: Add instance to placement group

Capacity Reservation: Open [Create new Capacity Reservation](#)

IAM role: None [Create new IAM role](#)

Shutdown behavior: Stop

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

Enable termination protection: Protect against accidental termination

Monitoring: Enable CloudWatch detailed monitoring Additional charges apply.

[Open Link in New Tab](#)  
[Open Link in New Window](#)  
[Download Linked File](#)  
[Download Linked File As...](#)  
[Add Link to Bookmarks...](#)  
[Add Link to Reading List](#)  
[Copy Link](#)  
[Share](#)  
[Services](#)

C Cancel Previous Review and Launch Next: Add Storage

## Create a role

- 1.6 [ ] Go to IAM management console go down and click on create a new role

Identity and Access Management (IAM)

Dashboard

Access management

Groups

Users

**Roles**

Policies

Identity providers

Account settings

Access reports

Access analyzer

Archive rules

Analyzers

Settings

Credential report

Organization activity

Service control policies (SCPs)

[Search IAM](#)

Roles

**What are IAM roles?**

IAM roles are a secure way to grant permissions to entities that you trust. Examples of entities include the following:

- IAM user in another account
- Application code running on an EC2 instance that needs to perform actions on AWS resources
- An AWS service that needs to act on resources in your account to provide its features
- Users from a corporate directory who use identity federation with SAML

IAM roles issue keys that are valid for short durations, making them a more secure way to grant access.

**Additional resources:**

- IAM Roles FAQ
- IAM Roles Documentation
- Tutorial: Setting Up Cross Account Access
- Common Scenarios for Roles

Role name	Trusted entities	Last activity
AWSServiceRoleForSupport	AWS service: support (Service-Linked role)	None
AWSServiceRoleForTrustedAdvisor	AWS service: trustedadvisor (Service-Linked role)	None

[Create role](#) [Delete role](#)

Showing 2 results

- 1.7 [ ] Click on EC2 and click Next: Permissions

Create role

Select type of trusted entity

- AWS service EC2, Lambda and others
- Another AWS account Belonging to you or 3rd party
- Web identity Cognito or any OpenID provider
- SAML 2.0 federation Your corporate directory

Allows AWS services to perform actions on your behalf. Learn more

Choose a use case

Common use cases

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

**Lambda**  
Allows Lambda functions to call AWS services on your behalf.

Or select a service to view its use cases

API Gateway	CodeDeploy	EKS	IoT Things Graph	Rekognition
AWS Backup	CodeGuru	EMR	KMS	RoboMaker
AWS Chatbot	CodeStar Notifications	ElastiCache	Kinesis	S3
AWS Support	Comprehend	Elastic Beanstalk	Lake Formation	SMS
Amplify	Config	Elastic Container Service	Lambda	SNS

\* Required      Cancel      **Next: Permissions**

- 1.8 [ ] Type in ssm (simple systems manager which will be to log into that machine) and check mark AmazonEc2RoleforSSM and click Next: Tags and click Next review

Create role

▼ Attach permissions policies

Choose one or more policies to attach to your new role.

**Create policy**      **Filter policies**

Policy name	Used as
<input type="checkbox"/> AmazonEC2RoleforSSM	None
<input type="checkbox"/> AmazonSSMAutomationApproverAccess	None
<input type="checkbox"/> AmazonSSMAutomationRole	None
<input type="checkbox"/> AmazonSSMDirectoryServiceAccess	None
<input type="checkbox"/> AmazonSSMFullAccess	None
<input type="checkbox"/> AmazonSSMMaintenanceWindowRole	None
<input type="checkbox"/> AmazonSSMManagedInstanceCore	None
<input type="checkbox"/> AmazonSSMPatchAssociation	None

**Set permissions boundary**

\* Required      Cancel      Previous      **Next: Tags**

## 6 AWS Certified Cloud Practitioner

The screenshot shows the 'Create role' wizard at Step 3: 'Add tags (optional)'. It includes a table for adding IAM tags, a note about tag limits, and navigation buttons.

Key	Value (optional)	Remove
Add new key		

You can add 50 more tags.

Cancel Previous Next: Review

- 1.9 [ ] Type in `MyEc2Role` in Role name and click `Create role`. Now that role has been created, we will just go ahead and close that tab

The screenshot shows the 'Create role' wizard at Step 4: 'Review'. It displays the role details entered in Step 3, including the role name, description, trusted entities, policies, and permissions boundary.

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

**Role name\*** MyEC2Role  
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** AmazonEC2RoleforSSM

**Permissions boundary** Permissions boundary is not set

No tags were added.

\* Required Cancel Previous Create role

The screenshot shows the AWS Identity and Access Management (IAM) service. On the left, there's a navigation sidebar with options like Dashboard, Access management, Access reports, and Roles. Under Roles, 'MyEC2Role' is listed. The main pane displays a table of roles with columns for Role name, Trusted entities, and Last activity. A success message at the top says 'The role MyEC2Role has been created.' The table shows three results: 'AWSServiceRoleForSupport' (AWS service: support (Service-Linked role)), 'AWSServiceRoleForTrustedAdvisor' (AWS service: trustedadvisor (Service-Linked ...)), and 'MyEC2Role' (AWS service: ec2). All three have 'None' under Last activity.

## Configure Instance

- 1.10 [] Go to IAM role and click refresh and choose MyEC2Role and now we will leave everything else blank and click Next: Add Storage

The screenshot shows the AWS Elastic Compute Cloud (EC2) instance creation wizard, specifically Step 3: Configure Instance Details. The top navigation bar includes 'Services', 'Resource Groups', and tabs for the current step: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, and 7. Review. The 'Configure Instance' tab is selected. The form fields include:
 

- Number of instances:** Set to 1, with a link to 'Launch into Auto Scaling Group'.
- Purchasing option:** A checkbox for 'Request Spot instances' is present.
- Network:** Network dropdown set to 'vpc-aa0113d0 (default)', with a 'Create new VPC' button.
- Subnet:** Subnet dropdown set to 'No preference (default subnet in any Availability Zone)', with a 'Create new subnet' button.
- Auto-assign Public IP:** A dropdown set to 'Use subnet setting (Enable)'.
- Placement group:** A checkbox for 'Add instance to placement group'.
- Capacity Reservation:** A dropdown set to 'Open', with a 'Create new Capacity Reservation' button.
- IAM role:** A dropdown menu is open, showing 'None' (selected) and 'MyEC2Role'. A 'Create new IAM role' button is also visible.
- Shutdown behavior:** A dropdown set to 'Stop'.
- Stop - Hibernate behavior:** A checkbox for 'Enable hibernation as an additional stop behavior'.
- Enable termination protection:** A checkbox for 'Protect against accidental termination'.
- Monitoring:** A checkbox for 'Enable CloudWatch detailed monitoring'.

 At the bottom are buttons for 'Cancel', 'Previous', 'Review and Launch' (highlighted in blue), and 'Next: Add Storage'.

## Add Storage

- 1.11 [] Now you can choose your storage we will leave it at 8GB and we will stick with General Purpose SSD for Volume type and click Review and Launch

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 (MB/s)	Delete on Termination	Encryption
Root	/dev/xvda	snap-0e1167baaa50e9c0ff	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 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

Cancel Previous **Review and Launch** Next: Add Tags

## Review

- 1.12 [] Click Launch It will ask you to create a key pair and click the drop down box and select Proceed without a key pair. Check mark I acknowledge that I will not be able to connect to this instance unless I already know the password built into this AMI and click Launch

**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.

**AMI Details**

Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0323c3dd2da7fb37d

**Free tier eligible** 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**

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**

Security group name: launch-wizard-1  
Description: launch-wizard-1 created 2020-05-20T09:14:42.468-04:00

Type	Protocol	Port Range	Source	Description
This security group has no rules				

**Buttons:** Cancel, Previous, **Launch**

**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.

**AMI Details**

Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0323c3dd2da7fb37d

**Free tier eligible** Amazon Linux 2 comes with five years support packages through extras.

Root Device Type: ebs Virtualization type: hvm

**Instance Type**

Instance Type	ECUs	vCPUs
t2.micro	Variable	1

**Security Groups**

Security group name: launch-wizard-1  
Description: launch-wizard-1 created 2020-05-20T09:14:42.468-04:00

Type	Protocol
------	----------

**Select an existing key pair or create a new key pair**

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Choose an existing key pair  
 Create a new key pair  
 Proceed without a key pair

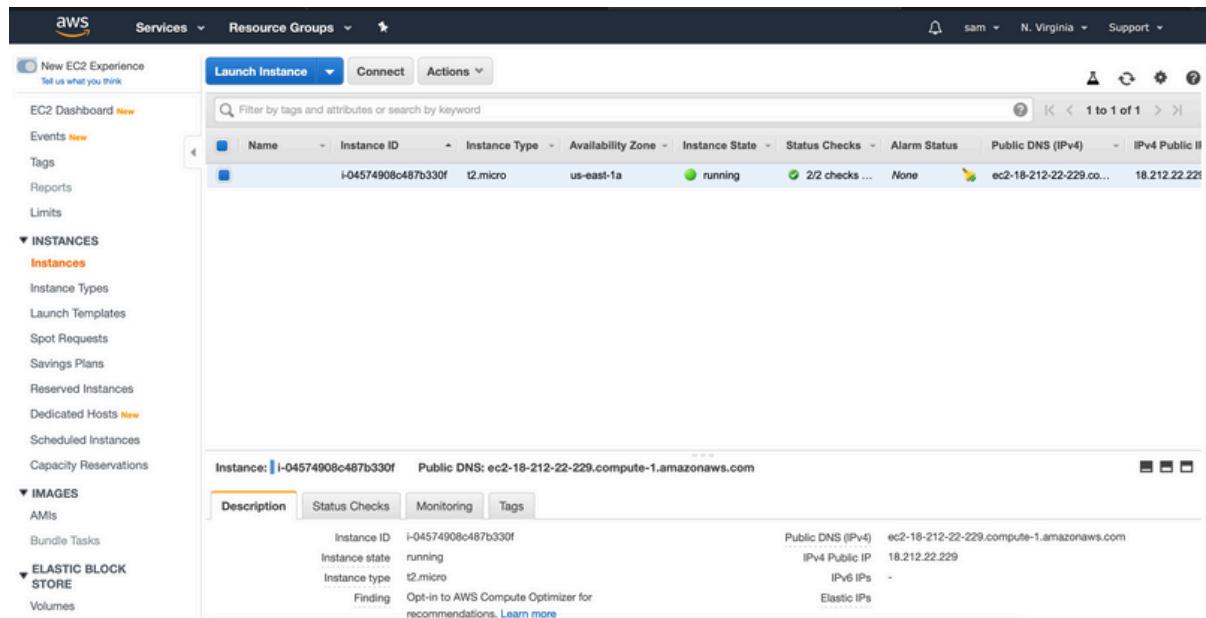
**No key pairs found**  
You don't have any key pairs. Please create a new key pair by selecting the [Create a new key pair](#) option above to continue.

**Buttons:** Cancel, **Launch Instances**, Previous, Launch

## Launch Status

- 1.13 [] Click [View Instances](#) to be able to view it and now this instance is launching and you will see it in pending state (It will turn from yellow to green and we will wait for it to initialize)

- 1.14 [ ] After a 3 - 4 min wait the server is now running and it will have 2 checks which means the server is in good shape

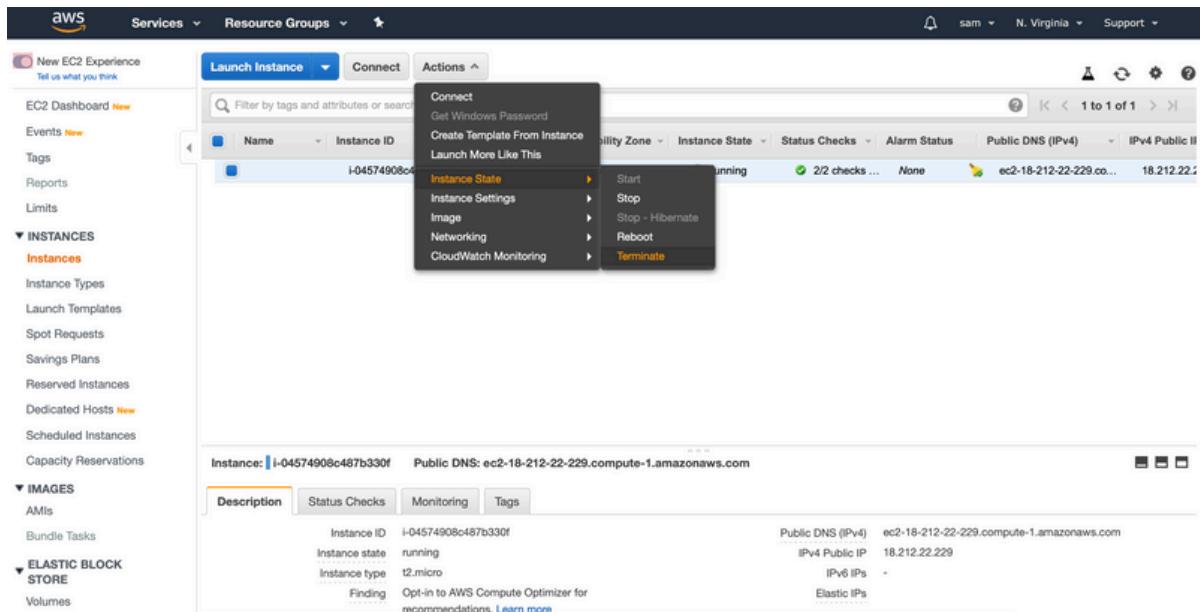


The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with links for New EC2 Experience, EC2 Dashboard, Events, Tags, Reports, Limits, Instances (selected), Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts (New), Scheduled Instances, Capacity Reservations, Images (AMIs, Bundle Tasks), and Elastic Block Store (Volumes). The main content area has tabs for Launch Instance, Connect, and Actions. A search bar at the top says "Filter by tags and attributes or search by keyword". Below it is a table with columns: Name, Instance ID, Instance Type, Availability Zone, Instance State, Status Checks, Alarm Status, Public DNS (IPv4), and IPv4 Public IP. One row is shown: Name i-04574908c487b330f, Instance ID i-04574908c487b330f, Instance Type t2.micro, Availability Zone us-east-1a, Instance State running, Status Checks 2/2 checks ..., Alarm Status None, Public DNS (IPv4) ec2-18-212-22-229.compute-1.amazonaws.com, and IPv4 Public IP 18.212.22.229. At the bottom, there's a detailed view for the selected instance, showing fields like Instance ID, Instance state, Instance type, Finding, and various network details.



## Shutting Down the Server

We're not going to shut the server down just yet because we chose the free tier but if you were paying for it you would want to shut it down when you're done with it. To shut the server down you would click on Actions, Instance State and Terminate (you can also click Stop and that would just stop the server and not destroy it)



In the next video we will learn how to get access to this instance

## Sessions Manager

There are a couple of ways we can get into this instance. One way is using ssh so if we had created that key pair we could have used it to get into that server or we can use ssm (simple systems manager) and AWS's recommended way.

- 1.1 [] Before we go over to ssm right-click on `Instance ID` and click on `Connect` and click `Close`

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

**ELASTIC BLOCK STORE**

Volumes

**Launch Instance** Connect Actions

Name: i-04574908c487b330f Instance ID: i-04574908c487b330f Instance Type: t2.micro Availability Zone: us-east-1a Instance State: running Status Checks: 2/2 checks ... Alarm Status: None Public DNS (IPv4): ec2-18-212-22-229.compute-1.amazonaws.com IPv4 Public IP: 18.212.22.225

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

Instance: i-04574908c487b330f Public DNS: ec2-18-212-22-229.compute-1.amazonaws.com

Description Status Checks Monitoring Tags

Instance ID: i-04574908c487b330f Public DNS (IPv4): ec2-18-212-22-229.compute-1.amazonaws.com  
Instance state: running IPv4 Public IP: 18.212.22.229  
Instance type: t2.micro IPv6 IPs: -  
Finding: Opt-in to AWS Compute Optimizer for recommendations. [Learn more](#) Elastic IPs

Tell us what you think

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

**ELASTIC BLOCK STORE**

Volumes

**Launch Instance**

Connection method:  A standalone SSH client [\(i\)](#)  
 Session Manager [\(i\)](#)  
 EC2 Instance Connect (browser-based SSH connection) [\(i\)](#)

**⚠ Instance is not associated with a key pair**  
This instance is not associated with a key pair. Without a key pair, you can't connect to the instance through SSH.  
You can connect using EC2 Instance Connect with just a valid username. You can connect using Session Manager if you have been granted the necessary permissions.

To access your instance:

1. Open an SSH client. (Find out how to [connect using PuTTY](#))
2. Locate your private key file (.pem). The wizard automatically detects the key you used to launch the instance.
3. Your key must not be publicly viewable for SSH to work. Use this command if needed:  
`chmod 400 .pem`
4. Connect to your instance using its Public DNS:  
`ec2-18-212-22-229.compute-1.amazonaws.com`

Example:  
`ssh -i ".pem" ec2-user@ec2-18-212-22-229.compute-1.amazonaws.com`

Please note that in most cases the username above will be correct, however please ensure that you read your AMI usage instructions to ensure that the AMI owner has not changed the default AMI username.

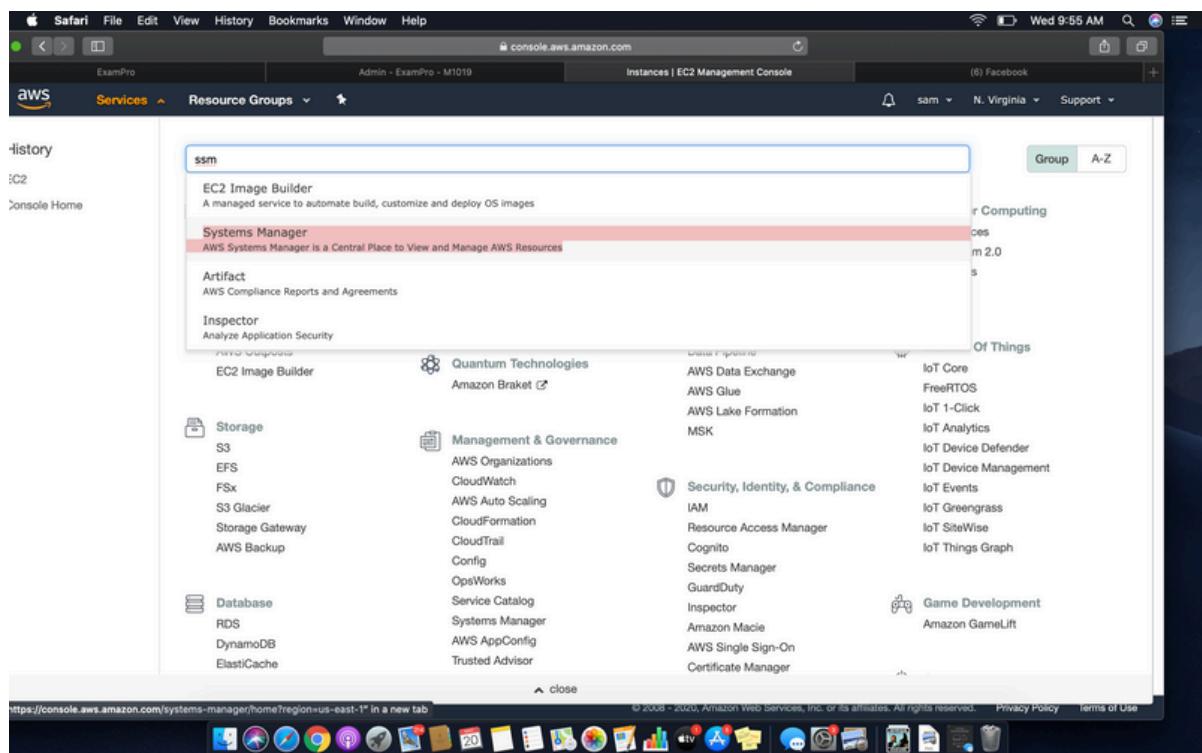
If you need any assistance connecting to your instance, please see our [connection documentation](#).

[Close](#)

Amazon Status Public DNS (IPv4) IPv4 Public IP  
ec2-18-212-22-229.compute-1.amazonaws.com 18.212.22.225

## Start a session

- 1.2 [] Go to Services at the top and type in ssm and click on Systems Manager on the left-hand side, once on that page scroll down on the left-hand side and click ON Session Manager and click on the start Session orange button



The screenshot shows the AWS Systems Manager Session Manager page. The main content area displays the title 'Session Manager' and the sub-headline 'Quickly and securely access your Windows and Linux instances'. Below this, there is a brief description of Session Manager's purpose and a 'How it works' section with four numbered steps. To the right, there is a 'Start a session' button and a 'Getting started' sidebar with links to various setup and configuration guides.

## We have our Instance

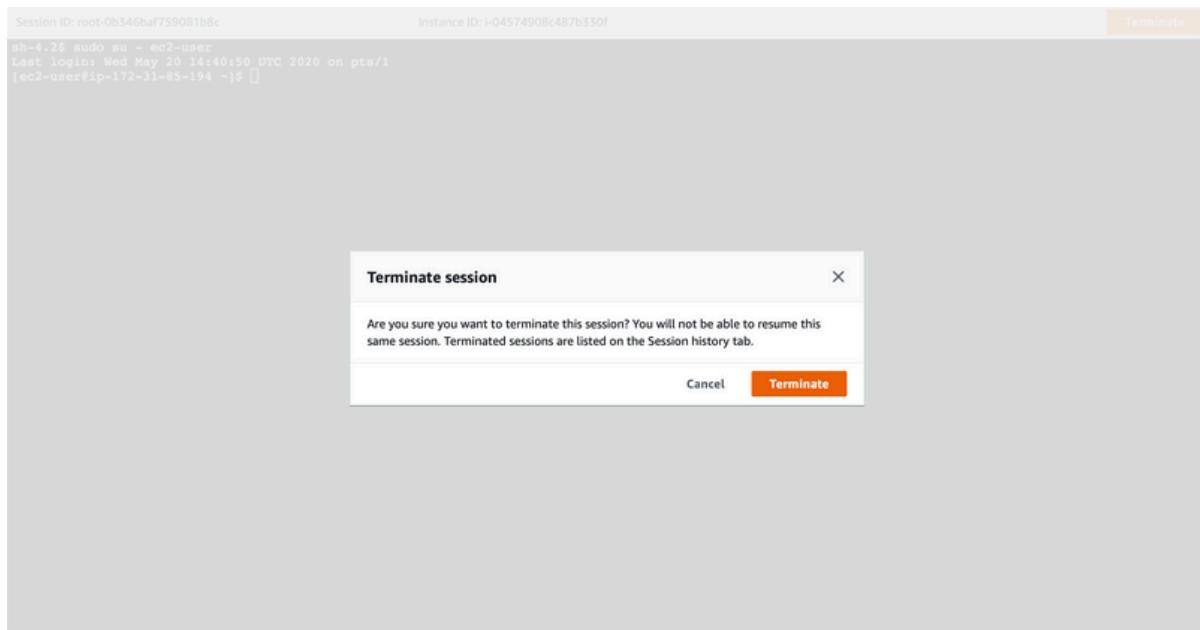
- 1.3 [ ] Select the instance and click Start Session

- 1.4 [ ] It logs into the root user not the EC2 user, so we have to type in `sudo su - ec2-user`

```
Session ID: root-0b346baf759081b8c Instance ID: i-04574908c487b530f
sh-4.2$ sudo su - ec2-user
Last login: Wed May 20 14:40:50 UTC 2020 on pts/1
[ec2-user@ip-172-31-85-194 ~]$
```

**Terminate:** We're not going to do much with it today so you will go ahead and terminate it

- 1.5 [ ] Click `Terminate`



## Go back to EC2

- 1.6 [ ] Click on Services at the top and type in EC2 and go to the left-hand side and click on Instances

The screenshot shows the AWS EC2 Instances page. The left sidebar has sections for New EC2 Experience, EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES (with Instances selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, IMAGES, AMIs, Bundle Tasks, and ELASTIC BLOCK STORE (with Volumes selected). The main content area shows a table of instances. One instance is listed:

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
	i-04574908c487b330f	t2.micro	us-east-1a	running	2/2 checks ...	None	ec2-18-212-22-229.compute-1.amazonaws.com	18.212.22.229

Below the table, there is a detailed view for the selected instance (i-04574908c487b330f). It shows the Public DNS as ec2-18-212-22-229.compute-1.amazonaws.com. The instance details table includes:

Description	Status Checks	Monitoring	Tags
Instance ID: i-04574908c487b330f	Instance state: running	Instance type: t2.micro	Finding: Opt-in to AWS Compute Optimizer for recommendations. <a href="#">Learn more</a>
			Public DNS (IPv4): ec2-18-212-22-229.compute-1.amazonaws.com IPv4 Public IP: 18.212.22.229 IPv6 IPs: - Elastic IPs: -

## Stop Instance

- 1.7 [ ] Click on Actions Instance State and Stop and select Yes, Stop

The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with navigation links like EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES (selected), Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, IMAGES, AMIs, and ELASTIC BLOCK STORE Volumes. The main area displays a table of instances. A context menu is open over an instance named i-04574908c487b330f. The menu has sections for Connect, Create Template From Instance, Launch More Like This, Instance State (with options Start, Stop, Stop - Hibernate, Reboot, Terminate), Instance Settings, Image, Networking, and CloudWatch Monitoring. Below the table, a detailed view for instance i-04574908c487b330f is shown with tabs for Description, Status Checks, Monitoring, and Tags. The Description tab shows details like Instance ID, Instance state (running), Instance type (t2.micro), and Public DNS (IPv4).

This screenshot shows the same EC2 Instances page as above, but with a modal dialog titled "Stop Instances" overlaid. The dialog asks, "Are you sure you want to stop these instances?" and lists the instance i-04574908c487b330f. It contains a warning message: "Note that when your instances are stopped: • Any data on the ephemeral storage of your instances will be lost." At the bottom of the dialog are "Cancel" and "Yes, Stop" buttons.

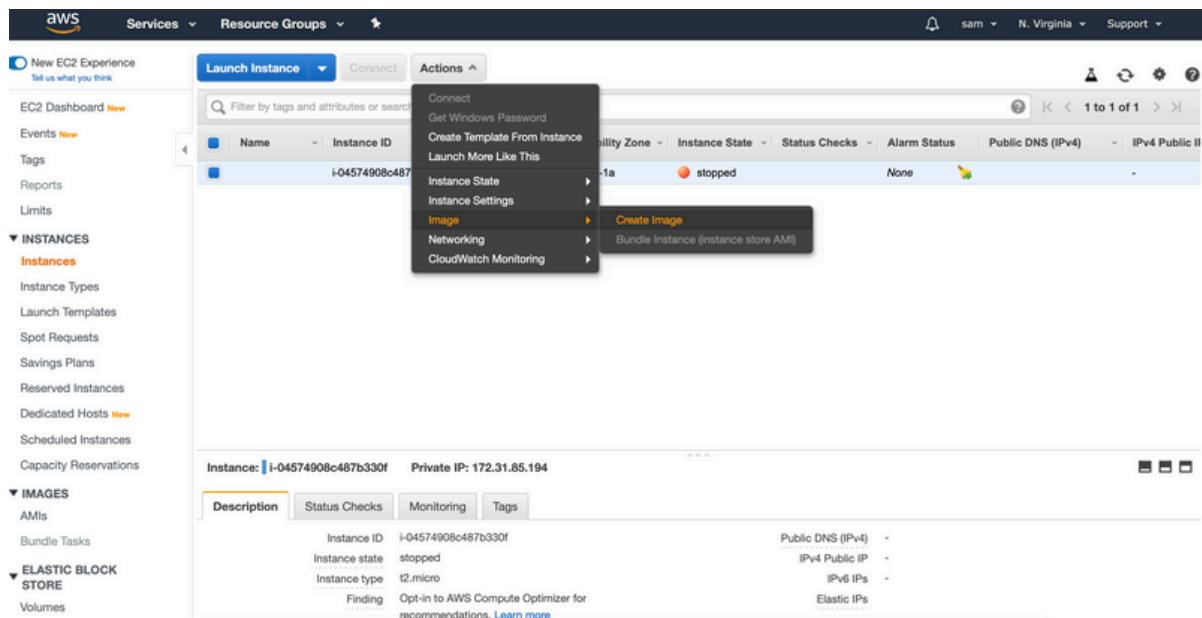
Next, we will create an AMI

## Creating an AMI:

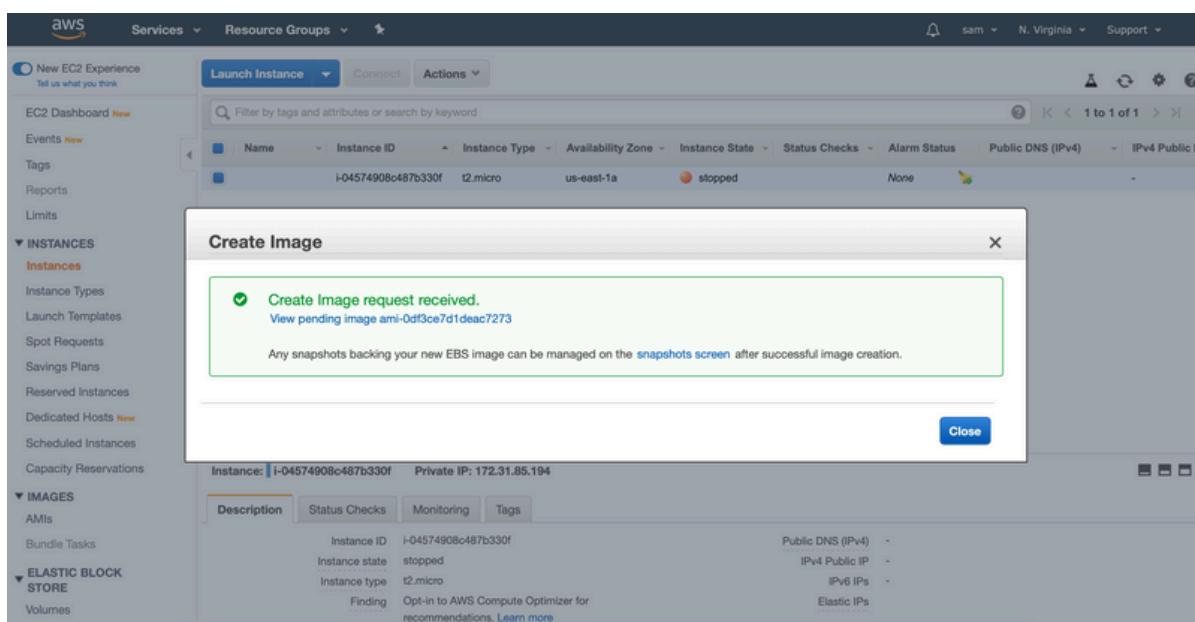
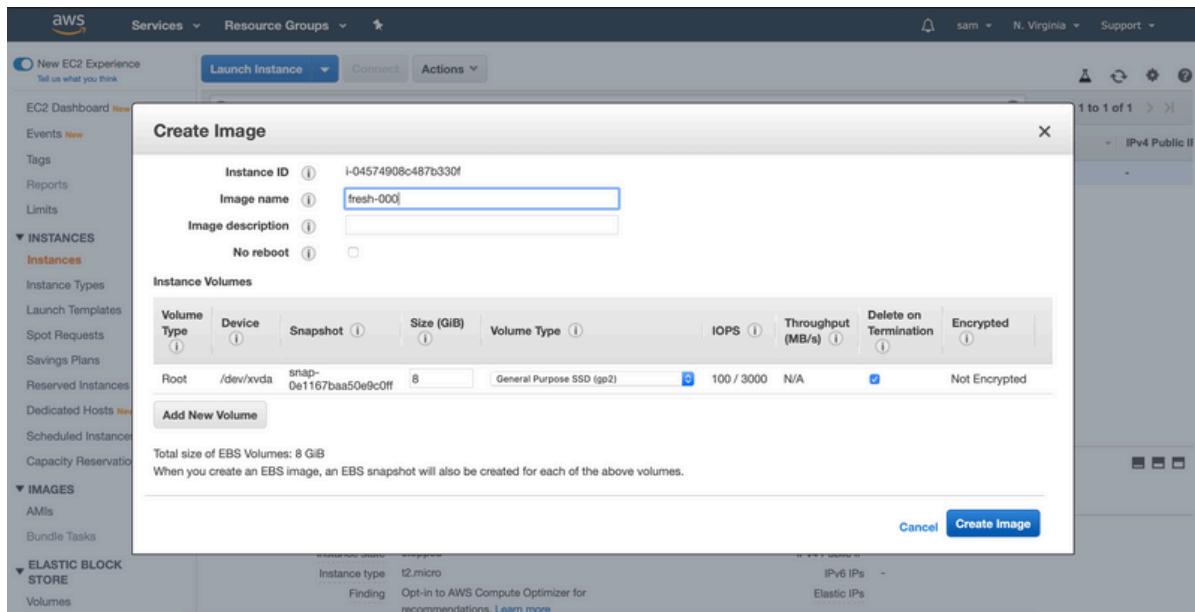
We are going to learn how to create an AMI (which is a snapshot or saving a copy of your entire server)

### Create Image

- 1.1 [] Go to the top of the page and select Actions then Image and Create Image



- 1.2 [] Fill out Image Name and click Create Image and click View Pending image  
ami-0ae4eee56681b6324



## Launch Server

- 1.3 [ ] Click Launch

The screenshot shows the AWS EC2 Dashboard. On the left, there's a sidebar with navigation links like 'EC2 Dashboard', 'Events', 'Tags', and sections for 'INSTANCES', 'AMIs', and 'ELASTIC BLOCK STORE'. The main area displays a table of AMIs, with one row selected for 'fresh-000'. Below the table, a detailed view of the selected AMI is shown, including its AMI ID, Owner, Status, Creation Date, and Platform details.

Name	AMI Name	AMI ID	Source	Owner	Visibility	Status	Creation Date	Platform
fresh-000	fresh-000	ami-0df3ce7d1deac7273	731409269211/fresh-000	731409269211	Private	available	May 22, 2020 at 8:12:29 AM ...	Other Linux

**Image: ami-0df3ce7d1deac7273**

**Details** **Permissions** **Tags**

AMI ID: ami-0df3ce7d1deac7273	AMI Name: fresh-000
Owner: 731409269211	Source: 731409269211/fresh-000
Status: available	State Reason: -
Creation date: May 22, 2020 at 8:12:29 AM UTC-4	Platform details: Linux/LINIX

## Choose AMI

- 1.4 [ ] Click on choose AMI at the top and you can see it chose fresh-000 - ami-0df3ce7d1deac7273

The screenshot shows the 'Step 1: Choose an Amazon Machine Image (AMI)' screen. At the top, there are tabs for '1. Choose AMI', '2. Choose Instance Type', '3. Configure Instance', '4. Add Storage', '5. Add Tags', '6. Configure Security Group', and '7. Review'. A search bar at the top right contains the text 'ami-0df3ce7d1deac7273'. The main area shows a search result for 'fresh-000 - ami-0df3ce7d1deac7273', which is highlighted with a dashed box. The result includes details like 'Root device type: ebs', 'Virtualization type: hvm', 'Owner: 731409269211', and 'ENI Enabled: Yes'. There's also a 'Select' button. Below this, a note says 'The following results for "ami-0df3ce7d1deac7273" were found in other catalogs: 4264 results in AWS Marketplace'. The sidebar on the left has filters for 'Ownership' (checked for 'Owned by me'), 'Architecture' (checkboxes for 32-bit (x86), 64-bit (x86), and 64-bit (Arm)), and 'Root device type' (checkbox for EBS).

## Choose Instance Type: Is a way for us to upgrade our server, make other changes to it or just so we have another copy of it so we can launch multiple servers

- 1.5 [] Click back on Choose Instance Type at the top of the screen and click Cancel at the bottom

The screenshot shows the 'Choose Instance Type' step of an AWS instance creation wizard. The top navigation bar includes links for 'Choose AMI', 'Choose Instance Type' (which is highlighted in orange), 'Configure Instance', 'Add Storage', 'Add Tags', 'Configure Security Group', and 'Review'. Below the navigation, a section titled 'Step 2: Choose an Instance Type' explains that Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. It lists various instance families like General purpose, Compute optimized, Memory optimized, Storage optimized, and GPU instances. The 'Currently selected' row shows the t2.micro instance, which is described as having Variable ECUs, 1 vCPU, 2.5 GHz, Intel Xeon Family, 1 GiB memory, and EBS only storage. The instance is marked as 'Free tier eligible'. The table columns include Family, Type, vCPUs, Memory (GiB), Instance Storage (GB), EBS-Optimized Available, Network Performance, and IPv6 Support. The t2.micro row has a blue checkmark next to it. At the bottom of the table are buttons for 'Cancel', 'Previous', 'Review and Launch' (which is highlighted in blue), and 'Next: Configure Instance Details'.

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	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 <small>Free tier eligible</small>	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	t2.2xlarge	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

- 1.6 [] To get back to AMI just click on the left hand side

Now we will move onto Auto Scaling groups

## Autoscaling Groups

What an Autoscaling group does is it allows you to insure that multiple instances or servers are running. So if you always want to always guarantee that one server is always running then auto scaling group would have a rule to check to say that at least one is running and if not to launch a new server. Also, auto scaling groups are used to meet the demand of whatever traffic you have.

- 1.1 [] Scroll down on the left hand side and click on Auto Scaling Groups and click

ON Create Auto Scaling group and then click on Get started

**Welcome to Auto Scaling**

You can use Auto Scaling to manage Amazon EC2 capacity automatically, maintain the right number of instances for your application, operate a healthy group of instances, and scale it according to your needs.

[Learn more](#)

**Create Auto Scaling group**

Note: To create your Auto Scaling groups in a different region, select your region from the navigation bar.

**Benefits of Auto Scaling**

- Automated Provisioning**: Keep your Auto Scaling group healthy and balanced, whether you need one instance or 1,000.
- Adjustable Capacity**: Maintain a fixed group size or adjust dynamically based on Amazon CloudWatch metrics.
- Launch Template Support**: Provision instances easily using EC2 Launch Templates.

[Learn more](#) [Learn more](#) [Learn more](#)

**Additional Information**

- [Getting Started Guide](#)
- [Documentation](#)
- [All EC2 Resources](#)
- [Forums](#)
- [Pricing](#)
- [Contact Us](#)

**Create Auto Scaling Group**

Complete this wizard to create your Auto Scaling group. First, choose either a launch configuration or a launch template to specify the parameters that your Auto Scaling group uses to launch instances.

**Step 1: Create or select a launch configuration**

Create or select the launch configuration that your Auto Scaling group will use to launch your EC2 instances.

You can change your group's launch configuration at any time.

**Step 2: Create Auto Scaling group**

Next, give your group a name and specify how many instances you want to run in it.

Your group will maintain this number of instances, and replace any that become unhealthy or impaired.

You can optionally configure your group to adjust its capacity according to demand, in response to Amazon CloudWatch metrics.

[Cancel](#) [Get started](#)

## Choose AMI

- 1.2 [ ] Click on My AMIs and choose the fresh-000 and click select

The screenshot shows the 'Create Launch Configuration' page in the AWS Management Console. The top navigation bar includes 'Services', 'Resource Groups', 'sam', 'N. Virginia', and 'Support'. Below the navigation, a progress bar shows steps 1 through 6: 'Choose AMI', 'Choose Instance Type', 'Configure details', 'Add Storage', 'Configure Security Group', and 'Review'. A 'Cancel and Exit' button is located in the top right corner.

**Create Launch Configuration**

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.

**Quick Start**

My AMIs

AWS Marketplace

Community AMIs

Free tier only ⓘ

**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

**Select** 64-bit

**Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-01d025118d8e760db**

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

**Select** 64-bit

**Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-098f16afa9edf40be**

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

Root device type: ebs Virtualization type: hvm

**Select** 64-bit

**SUSE Linux Enterprise Server 15 SP1 (HVM), SSD Volume Type - ami-0068cd63259e9f24c**

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

**Select** 64-bit

**Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-085925f297f89fce1**

Ubuntu Server 18.04 LTS (HVM), EBS General Purpose (SSD) Volume Type

**Select**

The screenshot shows the 'Create Launch Configuration' page in the AWS Management Console. The top navigation bar includes 'Services', 'Resource Groups', 'sam', 'N. Virginia', and 'Support'. Below the navigation, a progress bar shows steps 1 through 6: 'Choose AMI', 'Choose Instance Type', 'Configure details', 'Add Storage', 'Configure Security Group', and 'Review'. A 'Cancel and Exit' button is located in the top right corner.

**Create Launch Configuration**

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.

**Quick Start**

My AMIs

AWS Marketplace

Community AMIs

Owned by me

Shared with me

**fresh-000 - ami-0df3ce7d1deac7273**

Root device type: ebs Virtualization type: hvm Owner: 731409269211

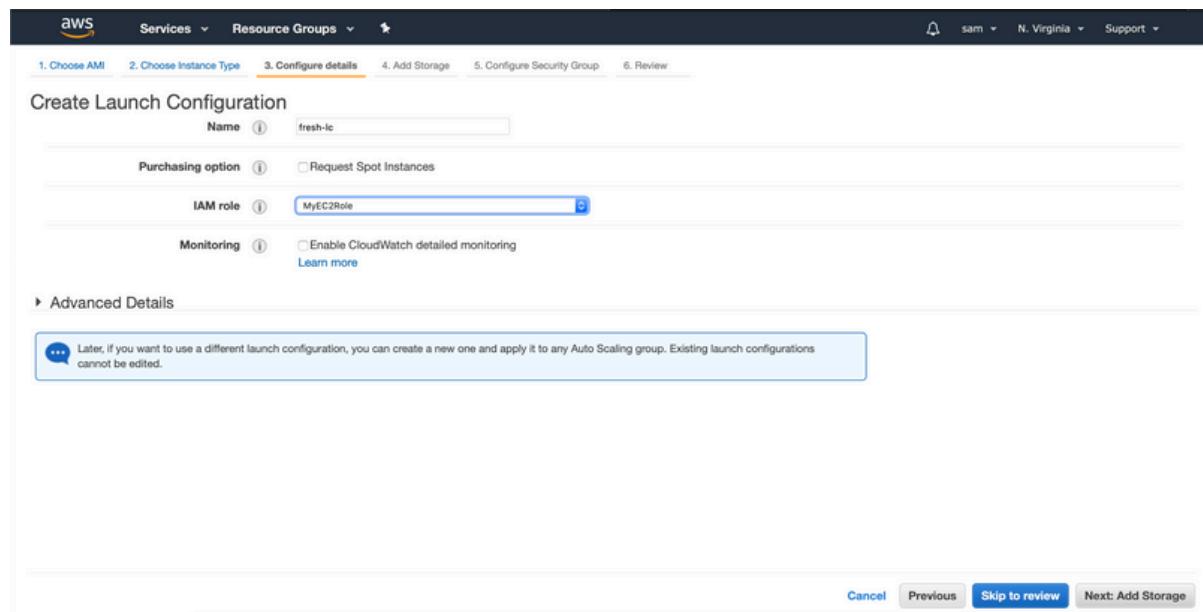
**Select** 64-bit

## Choose Instance Type

- 1.3 [ ] We will stick with t2.micro and click Next: Configure details

## Configure details

- 1.4 [ ] We will name the Launch Configuration fresh-lc, click on the drop down box for IAM role and select MyEC2Role and click Next: Add Storage



## Add storage

- 1.5 [ ] The defaults look good so click Next: Configure Security Group

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput	Delete on Termination	Encrypted
Root	/dev/xvda	snap-0265352a2d66497c6	8	General Purpose (SSD)	100 / 3000	N/A	<input checked="" type="checkbox"/>	No

Add New Volume

Free tier eligible customers can get up to 30 GB of EBS storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

Cancel Previous Skip to review Next: Configure Security Group

## Configure Security Group

- 1.6 [] The security groups look good so click Review

Type	Protocol	Port Range	Source
SSH	TCP	22	Anywhere <input checked="" type="checkbox"/> 0.0.0.0/0 <input type="checkbox"/>

**Warning**  
Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Cancel Previous Review

## Review

- 1.7 [] Click Create launch configuration and in the drop down box click on Proceed without a key pair and check mark I acknowledge that I will not be able to connect to this instance unless I already know the password built into this AMI and click Create launch configuration

The screenshot shows the AWS Create Launch Configuration wizard at Step 6: Review. The interface includes a navigation bar with services like Services, Resource Groups, and a user dropdown for sam in N. Virginia. Below the navigation is a breadcrumb trail: 1. Choose AMI, 2. Choose Instance Type, 3. Configure details, 4. Add Storage, 5. Configure Security Group, and 6. Review.

**Create Launch Configuration**

Review the details of your launch configuration. You can go back to edit the details of each section before you finish.

**AMI Details**

fresh-000 - ami-0df3ce7d1deac7273	<a href="#">Edit AMI</a>
Root device type: ebs Virtualization Type: hvm	

**Instance Type**

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

**Launch configuration details**

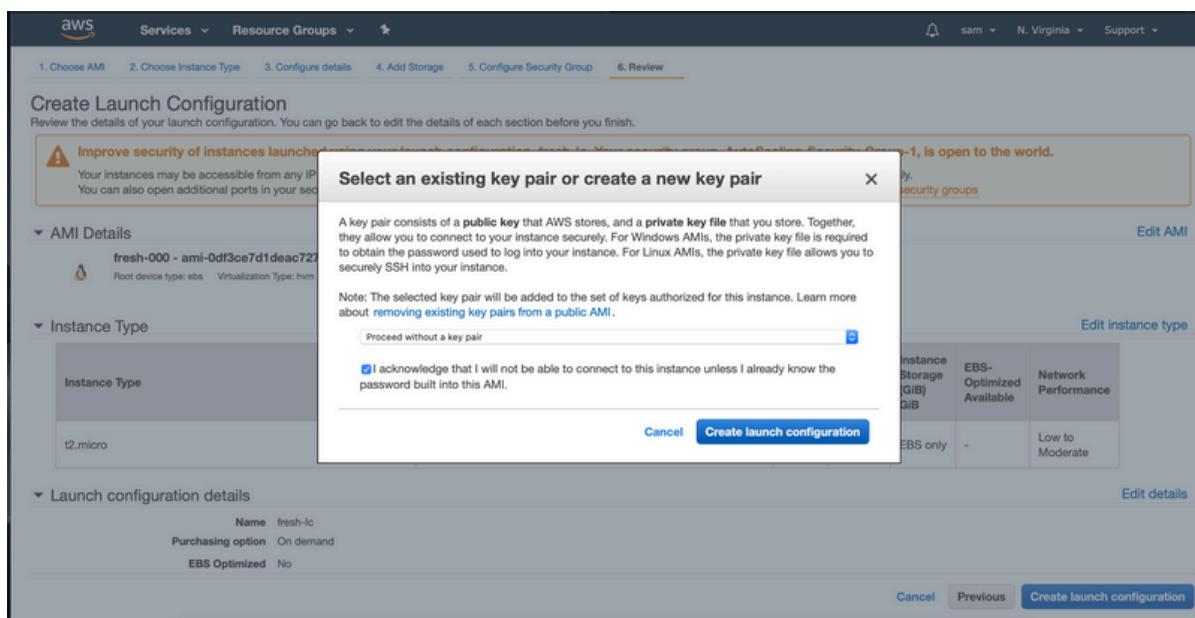
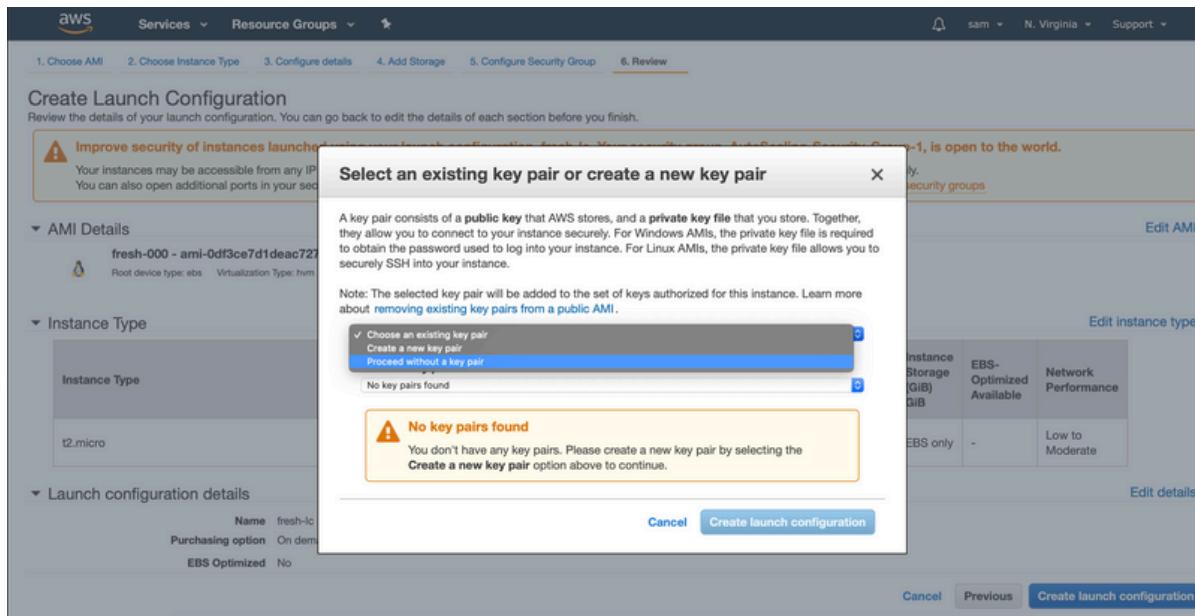
Name: fresh-lc	<a href="#">Edit details</a>
Purchasing option: On demand	
EBS Optimized: No	

At the bottom right are buttons for [Cancel](#), [Previous](#), and [Create launch configuration](#).

**Warning Message:**

**⚠ Improve security of instances launched using your launch configuration, fresh-lc. Your security group, AutoScaling-Security-Group-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](#)



## Configure Auto Scaling group details

- 1.8 [] Name Auto Scaling Group `fresh-asg` and group size leave at 1, select the Network as `vac-cf3079b5 (default)` and select the drop down box for subnet and choose two subnets. Click on Advanced Details and it all looks good so click

Next: Configure scaling policies

Create Auto Scaling Group

Group name: fresh-asg

Launch Configuration: fresh-lc

Group size: Start with 1 instances

Network: vpc-aa0113d0 (172.31.0.0/16) (default)

Subnet: subnet-b92199b7(172.31.64.0/20) | Default in us-east-1f  
subnet-fd5e93dc(172.31.80.0/20) | Default in us-east-1a

Each instance in this Auto Scaling group will be assigned a public IP address.

[Create new VPC](#)

[Create new subnet](#)

[Cancel and Exit](#)

[Next: Configure scaling policies](#)

Create Auto Scaling Group

Group name: fresh-asg

Launch Configuration: fresh-lc

Group size: Start with 1 instances

Network: vpc-cf02079b5 (172.31.0.0/16) (default)

Subnet: subnet-1ed226510(172.31.48.0/20) | Default in us-east-1f  
subnet-c1c6feef(172.31.80.0/20) | Default in us-east-1a

Each instance in this Auto Scaling group will be assigned a public IP address.

[Create new VPC](#)

[Create new subnet](#)

[Cancel and Exit](#)

[Next: Configure scaling policies](#)

## Configure scaling policies

- 1.9 [ ] Select Keep this group at its initial size and click Next:Configure Notifications

**Create Auto Scaling Group**

You can optionally add scaling policies if you want to adjust the size (number of instances) of your group automatically. A scaling policy is a set of instructions for making such adjustments in response to an Amazon CloudWatch alarm that you assign to it. In each policy, you can choose to add or remove a specific number of instances or a percentage of the existing group size, or you can set the group to an exact size. When the alarm triggers, it will execute the policy and adjust the size of your group accordingly. [Learn more](#) about scaling policies.

Keep this group at its initial size  
 Use scaling policies to adjust the capacity of this group

[Cancel](#) [Previous](#) [Review](#) [Next: Configure Notifications](#)

## Configure Notifications

### 1.10 [ ] Select Next: Configure Tags

**Create Auto Scaling Group**

Configure your Auto Scaling group to send notifications to a specified endpoint, such as an email address, whenever a specified event takes place, including: successful launch of an instance, failed instance launch, instance termination, and failed instance termination.

If you created a new topic, check your email for a confirmation message and click the included link to confirm your subscription. Notifications can only be sent to confirmed addresses.

[Add notification](#)

[Cancel](#) [Previous](#) [Review](#) [Next: Configure Tags](#)

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## Configure Tags

### 1.11 [ ] Select Review

**Create Auto Scaling Group**

A tag consists of a case sensitive key-value pair that you can use to identify your group. For example, you could define a tag with Key = Environment and Value = Production. You can optionally choose to apply these tags to instances in the group when they launch. [Learn more](#).

Key	Value	Tag New Instances
<input type="text"/>	<input type="text"/>	<input type="button" value="Tag New Instances"/>

Add tag 49 remaining

Cancel Previous Review

## Review

### 1.12 [ ] Select Create Auto Scaling group

**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**

- Group name: fresh-asg
- Group size: 1
- Minimum Group Size: 1
- Maximum Group Size: 1
- Subnet(s): subnet-1d5e93dc,subnet-b92199b7
- Health Check Grace Period: 300
- Detailed Monitoring: No
- Instance Protection: None
- Service-Linked Role: AWSServiceRoleForAutoScaling

**Scaling Policies**

**Notifications**

**Tags**

Cancel Previous Create Auto Scaling group

- 1.13 [] Auto Scaling group has been created so click close

The screenshot shows the AWS Auto Scaling group creation status page. At the top, there's a green success message: "Successfully created Auto Scaling group". Below it, there are links to "View creation log", "View your Auto Scaling groups", and "View your launch configurations". A section titled "Here are some helpful resources to get you started" includes a "Close" button.

## Instances

- 1.14 [] Right Click on Instances on the left hand side and you will start to see instances, you can refresh your instance tab and see more instances spit up

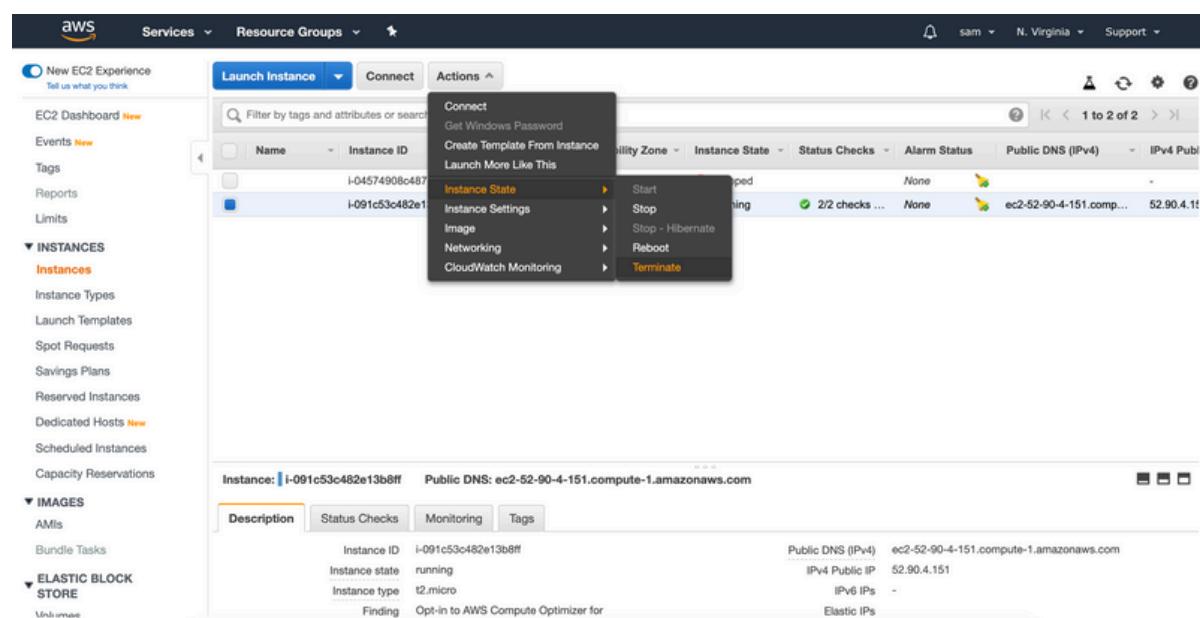
The screenshot shows the AWS EC2 Instances dashboard. On the left, there's a sidebar with navigation links like "New EC2 Experience", "Events", "Tags", "Reports", "Limits", "INSTANCES", "Instances", "Launch Templates", "Spot Requests", "Savings Plans", "Reserved Instances", "Dedicated Hosts", "Scheduled Instances", "Capacity Reservations", "IMAGES", "AMIs", "Bundle Tasks", and "ELASTIC BLOCK STORE". The main area displays a table of instances:

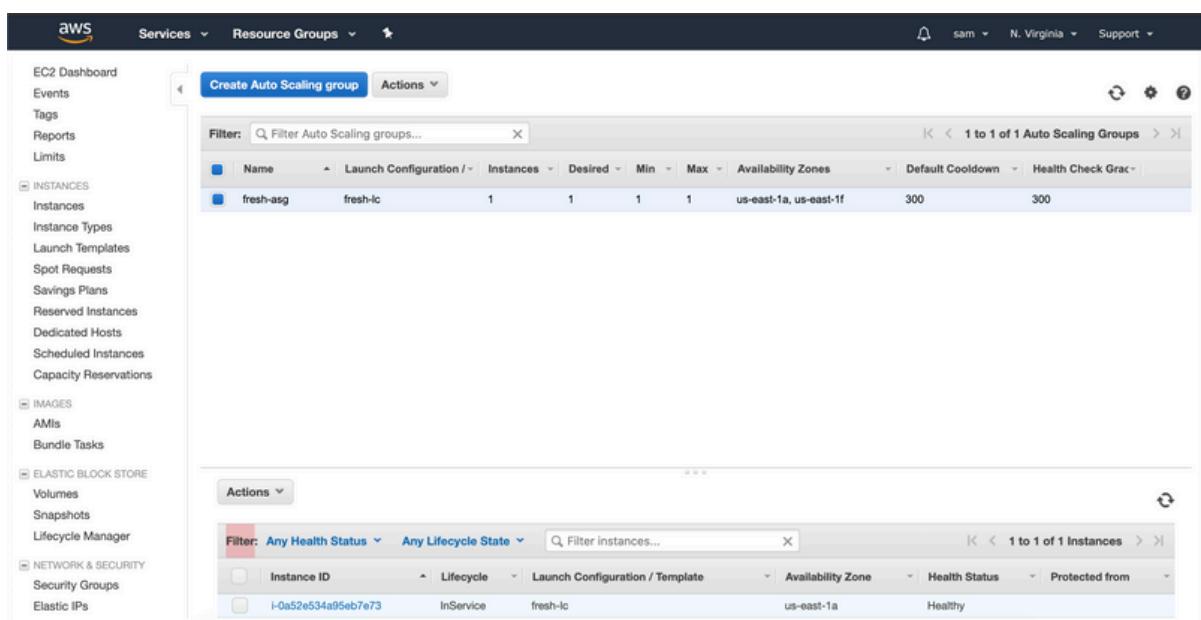
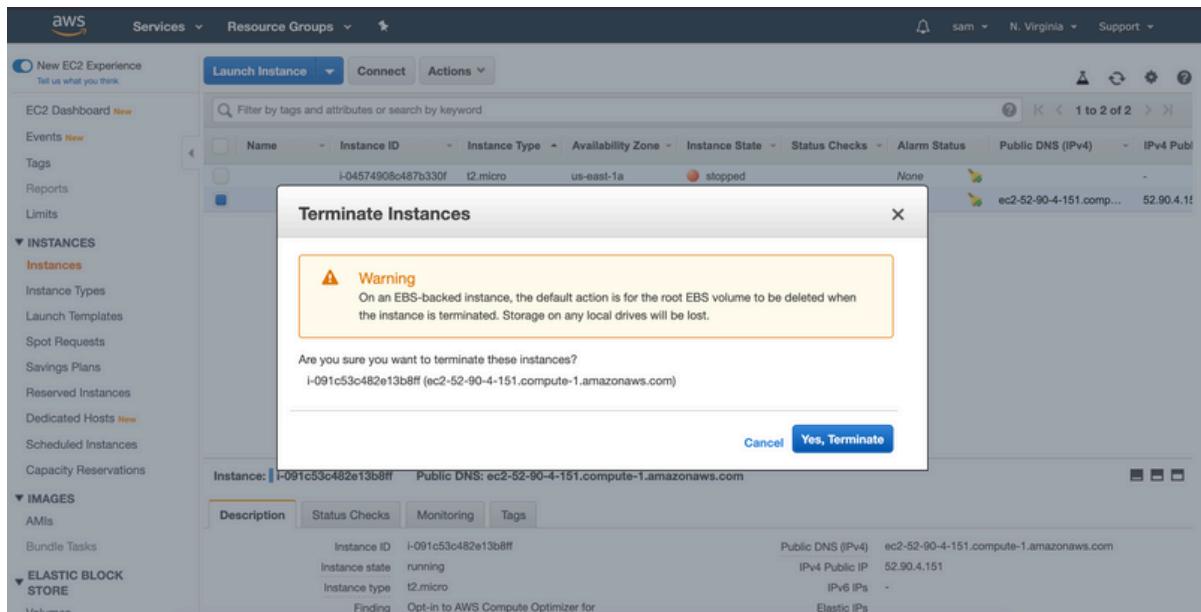
Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Publ...
	i-04574908c487b330f	t2.micro	us-east-1a	stopped		None		
	i-091c53c482e13b8ff	t2.micro	us-east-1a	running	2/2 checks ...	None	ec2-52-90-4-151.com...	52.90.4.11

Below the table, there's a note: "Select an instance above".

Auto Scaling can ensure that there are always a minimum of servers running but if we were to terminate the instance it's going to detect that this one is no longer healthy. After a while it will determine that it's unhealthy and the health status will change from healthy to unhealthy. The way this Auto Scaling group is going to respond is to launch a new instance. You can keep hitting the refresh button until you see another instance replace this unhealthy one. You may have to wait a few minutes to see the new replacement instance.

- 1.15 [ ] Check mark the running server select Actions select Instance State and Terminate and then select Yes Terminate





## ##Delete Auto Scaling Group

- 1.16 [ ] Select Actions and Delete and click Yes, Delete

The screenshot shows the AWS Auto Scaling Groups page. On the left, there's a sidebar with navigation links for EC2 Dashboard, Events, Tags, Reports, Limits, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, Images, AMIs, and Bundle Tasks. The main content area has two tabs: 'Create Auto Scaling group' and 'Actions'. The 'Actions' tab is selected, showing a table with one row for 'fresh-asg'. The table columns include Name, Launch Configuration /, Instances, Desired, Min, Max, Availability Zones, Default Cooldown, and Health Check Grace. The 'Delete' button in the Actions menu is highlighted with a red box.

Name	Launch Configuration /	Instances	Desired	Min	Max	Availability Zones	Default Cooldown	Health Check Grace
fresh-asg	fresh-lc	1	1	1	1	us-east-1a, us-east-1f	300	300

The screenshot shows the AWS Instances page. It has a similar sidebar and navigation structure. The main content area shows a table with one row for 'i-0a52e534a95eb7e73'. The columns are Instance ID, Lifecycle, Launch Configuration / Template, Availability Zone, Health Status, and Protected from. The instance is listed as 'InService' in the 'fresh-lc' launch configuration, located in 'us-east-1a' and is 'Healthy'.

Instance ID	Lifecycle	Launch Configuration / Template	Availability Zone	Health Status	Protected from
i-0a52e534a95eb7e73	InService	fresh-lc	us-east-1a	Healthy	

The screenshot shows the AWS Auto Scaling Groups page again. The 'Actions' tab is selected, showing the 'Delete Auto Scaling group' dialog box. The dialog asks 'Are you sure you want to delete this resource? fresh-asg' with 'Cancel' and 'Yes, Delete' buttons. Below the dialog, the main table still shows the 'fresh-asg' group.

Name	Launch Configuration /	Instances	Desired	Min	Max	Availability Zones	Default Cooldown	Health Check Grace
fresh-asg	fresh-lc	1	1	1	1	us-east-1a, us-east-1f	300	300

The screenshot shows the AWS Instances page again. The main content area shows a table with one row for 'i-0a52e534a95eb7e73'. The columns are Instance ID, Lifecycle, Launch Configuration / Template, Availability Zone, Health Status, and Protected from. The instance is listed as 'InService' in the 'fresh-lc' launch configuration, located in 'us-east-1a' and is 'Healthy'.

Instance ID	Lifecycle	Launch Configuration / Template	Availability Zone	Health Status	Protected from
i-0a52e534a95eb7e73	InService	fresh-lc	us-east-1a	Healthy	

- 1.17 [ ] You can click on Instance on your left hand side to make sure it was deleted, you may need to refresh the page

The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with various service links like New EC2 Experience, IMAGES, ELASTIC BLOCK STORE, NETWORK & SECURITY, LOAD BALANCING, and AUTO SCALING. The main area has tabs for Launch Instance, Connect, and Actions. A search bar at the top right says "Filter by tags and attributes or search by keyword". Below it is a table with columns: Name, Instance ID, Instance Type, Availability Zone, Instance State, Status Checks, Alarm Status, Public DNS (IPv4), and IPv4 Publ. There are three rows of data:

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Publ
	i-04574908c487b330f	t2.micro	us-east-1a	stopped	None	None		
	i-091c53c482e13b8ff	t2.micro	us-east-1a	terminated	None	None		
	i-0a52e534a95eb7e...	t2.micro	us-east-1a	terminated	None	None		

A message "Select an instance above" is displayed below the table. At the bottom right of the main area, there are three small icons.