

Assignment 2 – Working with EC2 Compute (AWS Cloud Computing ZERO TO HERO - August 2021)

1. Create an EC2 instance

The screenshot displays the AWS Management Console interface for creating a new EC2 instance. The top navigation bar shows the 'Instances' section under 'EC2 Management'. The left sidebar contains a navigation menu with options like 'EC2 Dashboard', 'Events', 'Tags', 'Limits', 'Instances', 'Images', and 'AMIs'. The main content area shows the 'Instances' page with a table of instances (currently empty) and a 'Launch instances' button. Below this, the 'Launch instance wizard' is visible, starting with 'Step 1: Choose an Amazon Machine Image (AMI)'. The wizard explains that an AMI is a template for software configuration and provides a search bar. Under 'Quick Start', two AMIs are listed: 'Amazon Linux 2 AMI (HVM), SSD Volume Type' and 'macOS Big Sur 11.5.1'. The 'Amazon Linux 2 AMI' is selected, and its details, including the root device type (efs) and virtualization type (hvm), are shown. The 'macOS Big Sur 11.5.1' AMI is also listed with its details.

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← → ↻ https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard

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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 families Current generation Show/Hide Columns

Currently selected: t2.micro (1 ECUs, 1 vCPUs, 2.5 GHz, 1 GB memory, EBS only)

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

Cancel Previous Review and Launch Next: Configure Instance Details

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1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. 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 instances 1 Launch into Auto Scaling Group

Purchasing option ☐ Request Spot instances

Network vpc-23452c48 (default) Create new VPC

Subnet No preference (default subnet in any Availability Zone) Create new subnet

Auto-assign Public IP Enable

Placement group ☐ Add instance to placement group

Capacity Reservation Open

Domain join directory No directory Create new directory

IAM role AmazonEC2RoleforAWSLambda Create new IAM role

Cancel Previous Review and Launch Next: Add Storage

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1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. 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 (MB/s)	Delete on Termination	Encryption
Root	/dev/xvda	snap-074ce2aabf0fabaf	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.

Cancel Previous Review and Launch Next: Add Tags

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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)	Network Interfaces (1)
Name	MyNewServer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Add another tag (Up to 50 tags maximum)

Cancel Previous Review and Launch Next: Configure Security Group

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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 name: launch-wizard-1

Description: launch-wizard-1 created 2021-09-01T17:55:34.775+05:30

Type (1)	Protocol (1)	Port Range (1)	Source (1)	Description (1)
All traffic	All	0 - 65535	Anywhere 0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop

Add Rule

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 and Launch

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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

Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0443305dab4be2bc

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. This AMI is the successor of the Amazon Linux AMI that is a...

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	-	1	1	EBS only	-	Low to Moderate

Cancel Previous Launch

Launch instance wizard | EC2 M X

https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard:

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

t2.micro - 1 1 EBS only - Low to Moderate

Security Groups [Edit security groups](#)

Security group name: launch-wizard-1
Description: launch-wizard-1 created 2021-09-01T17:55:34.775+05:30

Type	Protocol	Port Range	Source	Description
All traffic	All	All	0.0.0.0/0	
All traffic	All	All	:::/0	

Instance Details [Edit instance details](#)

Storage [Edit storage](#)

Tags [Edit tags](#)

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

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Launch instance wizard | EC2 M X

https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard:

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

t2.micro - 1 1 EBS only - Low to Moderate

Security Groups [Edit security groups](#)

Security group name: launch-wizard-1
Description: launch-wizard-1

Type	Protocol	Port Range	Source	Description
All traffic	All	All	0.0.0.0/0	
All traffic	All	All	:::/0	

Instance Details [Edit instance details](#)

Storage [Edit storage](#)

Tags [Edit tags](#)

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

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. Amazon EC2 supports ED25519 and RSA key pair types.

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.

Create a new key pair

Key pair type: ☒ RSA ☐ ED25519

Key pair name: mynewkeypair

[Download Key Pair](#)

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.


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Launch instance wizard | EC2 M X

https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard:

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

Launch Status



Initiating Instance Launches

Please do not close your browser while this is loading

Creating security groups... Successful

Authorizing inbound rules... Successful

Initiating launches...

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

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2. Connect to an instance and run a system update

The screenshot shows the AWS Management Console interface. The top navigation bar includes the AWS logo, a search bar, and user information. The left sidebar contains navigation links for EC2 Dashboard, Events, Tags, Limits, Instances, Images, and Capacity Reservations. The main content area displays the 'Instances (1/1)' page, showing a table with one instance: 'MyNewServer' (i-0743f4298713a703d) in a 'Running' state. Below the table, the 'Instance: i-0743f4298713a703d (MyNewServer)' details are shown, including the Instance ID, Public IPv4 address (18.119.130.168), Private IPv4 address (172.31.8.82), and Instance state (Running).

The second screenshot shows the 'Connect to instance' page for the same instance. It provides options to connect via 'EC2 Instance Connect', 'Session Manager', 'SSH client', or 'EC2 Serial Console'. The 'EC2 Instance Connect' tab is selected, showing the Instance ID, Public IP address, and a field for the User name (defaulting to 'ec2-user'). A note states: 'Note: In most cases, the guessed user name is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.'

The third screenshot shows a terminal window with the following output:

```
Amazon Linux 2 AMI
https://aws.amazon.com/amazon-linux-2/
4 package(s) needed for security, out of 16 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-8-82 ~]$
```

The bottom screenshot shows the instance details page for 'i-0743f4298713a703d (MyNewServer)' with the Public IP: 18.119.130.168 and Private IP: 172.31.8.82.

```
Connect to instance | EC2 Man... i-0743f4298713a703d (MyNewServer) +
https://us-east-2.console.aws.amazon.com/ec2/v2/connect/ec2-user/i-0743f4298713a703d
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
Resolving Dependencies
--> Running transaction check
--> Package curl.x86_64 0:7.61.1-12.amzn2.0.4 will be updated
--> Package curl.x86_64 0:7.76.1-4.amzn2.0.1 will be an update
--> Package ec2-utils.noarch 0:1.2-44.amzn2 will be updated
--> Package ec2-utils.noarch 0:1.2-45.amzn2 will be an update
--> Package grub2.x86_64 1:2.06-2.amzn2.0.1 will be obsoleted
--> Package grub2.x86_64 1:2.06-2.amzn2.0.3 will be obsoleting
--> Package grub2-common.noarch 1:2.06-2.amzn2.0.1 will be updated
--> Package grub2-common.noarch 1:2.06-2.amzn2.0.3 will be an update
--> Package grub2-efi-x64-ec2.x86_64 1:2.06-2.amzn2.0.1 will be updated
--> Package grub2-efi-x64-ec2.x86_64 1:2.06-2.amzn2.0.3 will be an update
--> Package grub2-pc.x86_64 1:2.06-2.amzn2.0.1 will be updated
--> Package grub2-pc.x86_64 1:2.06-2.amzn2.0.3 will be obsoleting
--> Package grub2-pc-modules.noarch 1:2.06-2.amzn2.0.1 will be updated
--> Package grub2-pc-modules.noarch 1:2.06-2.amzn2.0.3 will be an update
--> Package grub2-tools.x86_64 1:2.06-2.amzn2.0.1 will be obsoleted
--> Package grub2-tools.x86_64 1:2.06-2.amzn2.0.3 will be obsoleting
--> Package grub2-tools-efi.x86_64 1:2.06-2.amzn2.0.3 will be obsoleting
--> Package grub2-tools-extra.x86_64 1:2.06-2.amzn2.0.3 will be obsoleting
--> Package grub2-tools-minimal.x86_64 1:2.06-2.amzn2.0.1 will be updated
--> Package grub2-tools-minimal.x86_64 1:2.06-2.amzn2.0.3 will be obsoleting
--> Package grubby.x86_64 0:8.28-23.amzn2.0.1 will be updated
```

i-0743f4298713a703d (MyNewServer)

Public IP: 18.119.130.168 Private IP: 172.31.8.82

```
0603 PM 01-09-2021
Connect to instance | EC2 Man... i-0743f4298713a703d (MyNewServer) +
https://us-east-2.console.aws.amazon.com/ec2/v2/connect/ec2-user/i-0743f4298713a703d
Verifying : curl-7.61.1-12.amzn2.0.4.x86_64 24/29
Verifying : 1:grub2-pc-2.06-2.amzn2.0.1.x86_64 25/29
Verifying : kernel-tools-4.14.238-182.422.amzn2.x86_64 26/29
Verifying : libcurl-7.61.1-12.amzn2.0.4.x86_64 27/29
Verifying : 1:grub2-pc-modules-2.06-2.amzn2.0.1.noarch 28/29
Verifying : grubby-8.28-23.amzn2.0.1.x86_64 29/29

Installed:
grub2.x86_64 1:2.06-2.amzn2.0.3 grub2-pc.x86_64 1:2.06-2.amzn2.0.3
grub2-tools.x86_64 1:2.06-2.amzn2.0.3 grub2-tools-efi.x86_64 1:2.06-2.amzn2.0.3
grub2-tools-extra.x86_64 1:2.06-2.amzn2.0.3 grub2-tools-minimal.x86_64 1:2.06-2.amzn2.0.3
kernel.x86_64 0:4.14.243-185.433.amzn2

Updated:
curl.x86_64 0:7.76.1-4.amzn2.0.1 ec2-utils.noarch 0:1.2-45.amzn2
grub2-common.noarch 1:2.06-2.amzn2.0.3 grub2-efi-x64-ec2.x86_64 1:2.06-2.amzn2.0.3
grub2-pc-modules.noarch 1:2.06-2.amzn2.0.3 grubby.x86_64 0:8.28-23.amzn2.0.2
kernel-tools.x86_64 0:4.14.243-185.433.amzn2 libcurl.x86_64 0:7.76.1-4.amzn2.0.1
systemtap-runtime.x86_64 0:4.4-1.amzn2.0.2

Replaced:
grub2.x86_64 1:2.06-2.amzn2.0.1 grub2-tools.x86_64 1:2.06-2.amzn2.0.1

Complete!
[ec2-user@ip-172-31-8-82 ~]$
```

i-0743f4298713a703d (MyNewServer)

Public IP: 18.119.130.168 Private IP: 172.31.8.82



3. Enable termination protection and check how it works

The first screenshot shows the AWS Management Console with a modal dialog titled "Terminate instance?". The dialog contains the following text:

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.

Are you sure you want to terminate these instances?

☒ i-0743f4298713a703d (MyNewServer)

To confirm that you want to terminate the instances, choose the terminate button below. Terminating the instance cannot be undone.

Buttons: Cancel, Terminate

The second screenshot shows the AWS Management Console after the termination attempt. A red error banner at the top states: "Failed to terminate an instance: The instance 'i-0743f4298713a703d' may not be terminated. Modify its 'disableApiTermination' instance attribute and try again."

The instance details for "MyNewServer" (i-0743f4298713a703d) are shown below the error banner. The instance is in the "Running" state. The "Status check" shows "2/2 checks passed". The "Alarm status" is "No alarms". The "Availability Zone" is "us-east-2a".

The instance details include the following information:

- Instance ID: i-0743f4298713a703d (MyNewServer)
- Public IPv4 address: 18.119.130.168 | open address
- Private IPv4 addresses: 172.31.8.82
- Instance state: Running
- Public IPv4 DNS: ec2-18-119-130-168.us-east-2.compute.amazonaws.com

4. Disable termination protection and terminate the instance

The first screenshot shows the 'Change termination protection' dialog for instance `i-0743f4298713a703d` (MyNewServer). The 'Termination protection' checkbox is currently checked (Enabled). A warning message states: 'Termination protection disabled. The instance is no longer protected against accidental termination. If the instance is terminated, data stored on ephemeral storage is lost.' The 'Save' button is highlighted in orange.

The second screenshot shows the 'Instances' page with a green banner at the top stating 'Disabled termination protection for i-0743f4298713a703d'. The instance `MyNewServer` is listed with a status of 'Running' and '2/2 checks passed'. A modal dialog 'Select an instance above' is open, indicating a selection error.

The third screenshot shows the 'Terminate instance?' confirmation dialog. It includes a 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.' It asks 'Are you sure you want to terminate these instances?' and lists the instance `i-0743f4298713a703d` (MyNewServer). The 'Terminate' button is highlighted in orange.

Instances | EC2 Management Console

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AMIs

Instances (1/1) Info

Filter instances

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
MyNewServer	i-0743f4298713a703d	Shutting-down	t2.micro	2/2 checks passed	No alarms	us-east-2a

Instance: i-0743f4298713a703d (MyNewServer)

Details Security Networking Storage Status checks Monitoring Tags

Instance summary Info

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0743f4298713a703d (MyNewServer)	18.119.130.168 open address	172.31.8.82
IPv6 address	Instance state	Public IPv4 DNS
	Shutting-down	

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