

# Lab 2

Garrett Gruss 4976-3695

February 6, 2026

## 1 Summary

This lab covered the EC2 instance lifecycle, AMI creation, and launch templates. Exercises included launching an EC2 instance and connecting via SSH, resizing an instance by changing its type, assessing EC2 pricing models, creating a custom AMI from a running instance and launching a new instance from it, creating and versioning a launch template, launching an instance from a launch template with a user data script to serve a web page, and launching an instance from the AWS CLI. All provisioned resources were terminated and cleaned up upon completion.

```
garre@garrettlaptop:~/development/notes/cloud_computing/lab2$ ssh -i garrett-gruss-test.pem ec2-user@18.219.113.177
,      #
~\_ ####_      Amazon Linux 2023
~~ \_\#\#\#\` 
~~ \#\#\#| 
~~ \#/ ___  https://aws.amazon.com/linux/amazon-linux-2023
~~ \~' '-'>
~~~ / 
~~~ / 
~~~ / 
~~~ /m/
[ec2-user@ip-172-31-34-159 ~]$ whoami
ec2-user
[ec2-user@ip-172-31-34-159 ~]$ █
```

Figure 1: Exercise 2.1 – Launching an EC2 instance and connecting via SSH.

# Change instance type

[Info](#) | [Get advice](#)

You can change the instance type only if the current inst

## Instance ID

i-0f3f3e5a2f2f336be (garrett-gruss-test)

## Current instance type

t3.micro

## New instance type

t2.nano



Only instance types with x86 (32-bit) / (64-bit) architecture c

EBS-optimized

EBS-optimized is not supported for this instance type

Figure 2: Exercise 2.2 (1) – Changing the instance type from t3.micro to t2.nano.

⌚ Successfully initiated starting of i-0f3f3e5a2f2f336be

Notifications 0 0 2 0 0 0 ▾

### Instance summary for i-0f3f3e5a2f2f336be (garrett-gruss-test) [Info](#)

Updated less than a minute ago

Instance ID	<a href="#">i-0f3f3e5a2f2f336be</a>	Public IPv4 address	<a href="#">3.14.87.88</a>   <a href="#">open address ↗</a>	Private IP	<a href="#">172.31.34.159</a>
IPv6 address	-	Instance state	<a href="#">Running</a>	Public DNS	<a href="#">ec2-3-14-87-88.us-east-2.compute.amazonaws.com</a>
Hostname type	IP name: ip-172-31-34-159.us-east-2.compute.internal	Private IP DNS name (IPv4 only)	<a href="#">ip-172-31-34-159.us-east-2.compute.internal</a>	Elastic IP	-
Answer private resource DNS name	IPv4 (A)	Instance type	<a href="#">t2.nano</a>	AWS Core	<a href="#">Opt-in</a>
Auto-assigned IP address	<a href="#">3.14.87.88</a> [Public IP]	VPC ID	<a href="#">vpc-0dee49aa000e4dec2</a> ↗	S.	<a href="#">Learn more</a>

Figure 3: Exercise 2.2 (2) – Instance running with the new t2.nano type.

```
garre@garrett-laptop:~/development/notes/cloud_computing/lab2$ ssh -i "garrett-gruss-test.pem" ec2-user@ec2-3-14-87-88.us-east-2.compute.amazonaws.com
The authenticity of host 'ec2-3-14-87-88.us-east-2.compute.amazonaws.com (3.14.87.88)' can't be established.
ED25519 key fingerprint is SHA256:5pMs1YubIKmQlicvTvFhsg80YjFPmgY01NSIETyPo.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:4: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-14-87-88.us-east-2.compute.amazonaws.com' (ED25519) to the list of known hosts.

,
#_
~\_ ####_      Amazon Linux 2023
~~ \#####\
~~ \###|
~~  \#/ __  https://aws.amazon.com/linux/amazon-linux-2023
~~   \~' '-'>
~~    /
~~.~.  /
~~ /_/
~/m/'

Last login: Sat Jan 31 00:48:53 2026 from 76.234.149.180
[ec2-user@ip-172-31-34-159 ~]$ touch test.txt
[ec2-user@ip-172-31-34-159 ~]$ nano test.txt
```

Figure 4: Exercise 2.4 (1) – SSH into the instance and creating a test file to be included in the AMI.

Amazon Machine Images (AMIs) (1)		Info			Recycle Bin	EC2 Image Builder	Actions ▾	Launch instance from AMI			
Owned by me	▼	Find AMI by attribute or tag						< 1 >	⚙️		
□	Name ⚡	▼	AMI name	▼	AMI ID	▼	Source	▼	Owner	▼	Visibility
□	test-ami				ami-034c161a9f70f0b0c		349577273469/test-ami		349577273469		Private

Figure 5: Exercise 2.4 (2) – Custom AMI (test-ami) created from the running instance.

```
garre@garrettlaptop:~/development/notes/cloud_computing/lab2$ ssh -i "garrett-gruss-test.pem" ec2-user@ec2-3-17-13-5-115.us-east-2.compute.amazonaws.com
,
#_
~\_\ ####_      Amazon Linux 2023
~~ \####\_
~~ \###|
~~  \#/ ___  https://aws.amazon.com/linux/amazon-linux-2023
~~   \~' '-'>
~~~   /
~~-. _/ /
~~/_/ /
~/m/'

Last login: Fri Feb  6 23:19:36 2026 from 99.109.244.61
[ec2-user@ip-172-31-30-220 ~]$ ls
test.txt
[ec2-user@ip-172-31-30-220 ~]$ []
```

Figure 6: Exercise 2.4 (3) – New instance launched from the custom AMI, confirming test.txt is present.

**MyTemplate (lt-00326302e3c59f1b0)**

[Actions ▾](#) [Delete template](#)

**Launch template details**

Launch template ID <a href="#">lt-00326302e3c59f1b0</a>	Launch template name <a href="#">MyTemplate</a>	Default version <a href="#">1</a>	Owner <a href="#">arn:aws:iam::349577273469:user/garrett-gruss-admin</a>
--	--	--------------------------------------	---

[Details](#) [Versions](#) [Template tags](#)

**Launch template version details**

[Actions ▾](#) [Delete template version](#)

Version <a href="#">3</a>	Description -	Date created <a href="#">2026-02-06T23:57:49.000Z</a>	Created by <a href="#">arn:aws:iam::349577273469:user/garrett-gruss-admin</a>
<a href="#">Instance details</a>	<a href="#">Storage</a>	<a href="#">Resource tags</a>	<a href="#">Network interfaces</a>
AMI ID <a href="#">ami-06e3c045d79fd65d9</a>	Instance type <a href="#">t2.nano</a>	Availability Zone -	Availability Zone Id -
Key pair name <a href="#">garrett-gruss-test</a>	Security groups -	Security group IDs <a href="#">sg-0700a7d16f905b70b</a>	
<a href="#">Advanced details</a>			

Figure 7: Exercise 2.5 (1) – Launch template (MyTemplate) created with version 3, using a t2.nano instance type.

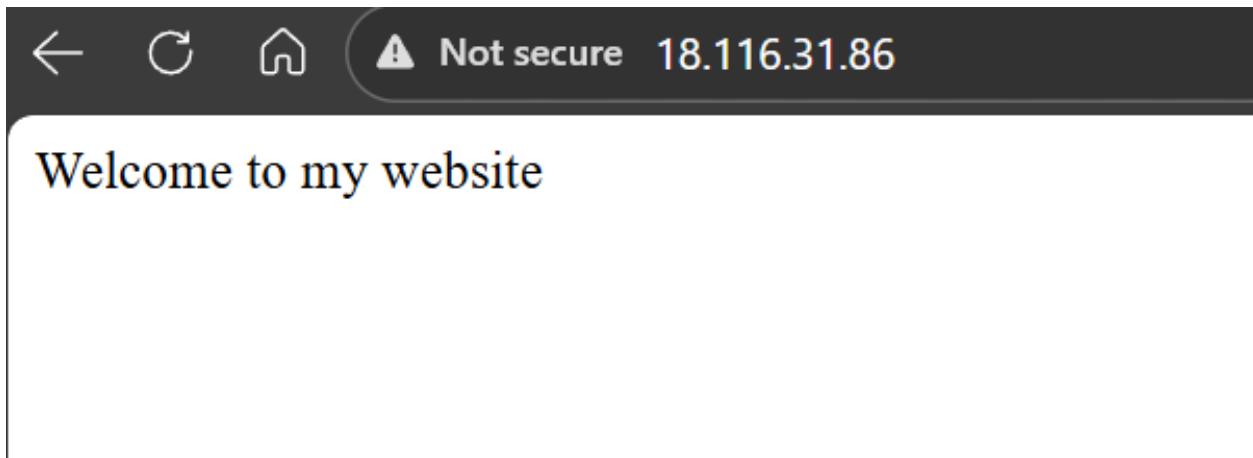


Figure 8: Exercise 2.5 (2) – Instance launched from the launch template serving a web page via user data script.

```
garre@garrettlaptop:~/development/notes/cloud_computing/lab2$ aws ec2 run-instances
--image-id ami-026992d753d5622bc --instance-type t2.micro --key-name garret
--security-group-ids default --count 1
{
    "Groups": [],
    "Instances": [
        {
            "Architecture": "x86_64",
            "BlockDeviceMappings": [],
            "ClientToken": "9ef3c548-a601-4db5-be77-1cf45a7be3a4",
            "EbsOptimized": false,
            "EnaSupport": true,
            "Hypervisor": "xen",
            "NetworkInterfaces": [
                {
                    "Attachment": {
                        "AttachTime": "2026-02-07T00:31:42+00:00",
                        "AttachmentId": "eni-attach-0fc04cc2dcfa3c0e9",
                        "DeleteOnTermination": true,
                        "DeviceIndex": 0,
                        "Status": "attaching",
                        "NetworkCardIndex": 0
                    },
                    "Description": "",
                    "Groups": [
                        {
                            "GroupId": "sg-065da4e82054f7c90",
                            "GroupName": "default"
                        }
                    ],
                    "Ipv6Addresses": [],
                    "MacAddress": "0a:ff:f2:7f:be:11",
                    "NetworkInterfaceId": "eni-046e096593e53fe80",
                    "OwnerId": "349577273469",
                }
            ],
            "Ipv6Addresses": [],
            "MacAddress": "0a:ff:f2:7f:be:11",
            "NetworkInterfaceId": "eni-046e096593e53fe80",
            "OwnerId": "349577273469",
        }
    ]
}
garre@garrettlaptop:~/development/notes/cloud_computing/lab2$
```

Figure 9: Exercise 2.6 – Launching an EC2 instance from the AWS CLI using `aws ec2 run-instances`.

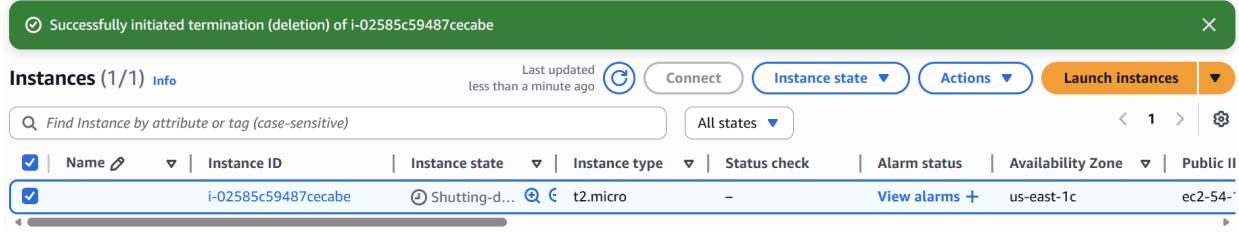


Figure 10: Exercise 2.7 – Resource cleanup: all instances terminated.

## 2 Exercise 2.3

**Q:** Imagine that your application will need to run two always-on f1.2xlarge instances (which come with instance storage and won't require any EBS volumes). To meet seasonal demand, you can expect to require as many as four more instances for a total of 100 hours through the course of a single year. How should you pay for this deployment? Bonus: Calculate your total estimated monthly and annual costs.

**A:** Purchase 2x f1.2xlarge on a three-year reserved instance term. Purchase 100 hours of f1.2xlarge on-demand for the seasonal burst capacity.

$$\text{Cost} = 2 \times 12 \times \$146.00/\text{month} + 100 \times \$0.362/\text{hour} = \$3,540.20/\text{year}$$