

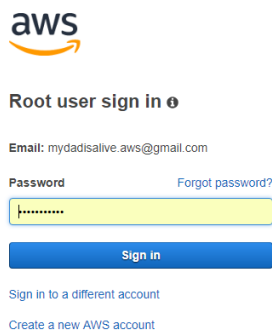
# LAUNCHING EC<sub>2</sub> INSTANCE

## WHAT WE'LL COVER

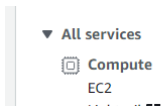
In this lab we will launch our first **EC<sub>2</sub> instance**, connect an **EBS** storage volume to it, configure a **Security Group** that allows it traffic from SSH, HTTP, AND HTTPS ports. We will create keypair file for it, which we will then use to log into it using Putty. Let's get started.

## LAB

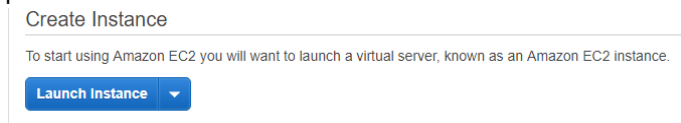
1. Login to AWS console



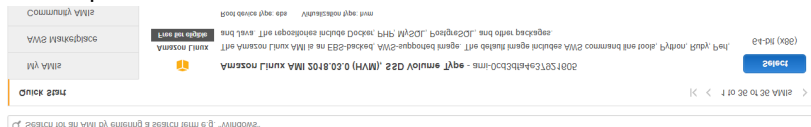
2. Make sure you're in the region of **us-east-1 (N. Virginia)**
3. Go to EC2



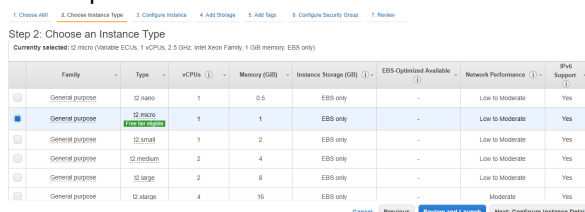
4. Go to "Launch Instances". A wizard will pop up and guide you through the instance creation process.



5. On Step 1 choose an "Amazon Linux AMI" and click select.



6. On Step 2 choose the t2.micro and click next



7. On Step 3 you can configure the instance details. You can set purchasing option for spot instances which we covered, network and subnet options which we will cover, IAM role,

shutdown behaviour and more. Turn on the “Termination protection” which will prevent you from accidentally deleting your instance. Other than that, you can experiment with these settings, but at this point just leave everything as the default and click next.

**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 ①

Purchasing option ① ☐ Request Spot instances

Network ① vpc-3e595656 (default) Create new VPC

Subnet ① No preference (default subnet in any Availability Zone) Create new subnet

Auto-assign Public IP ① Use subnet setting (Enable)

Placement group ① ☐ Add instance to placement group

Capacity Reservation ① Open Create new Capacity Reservation

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

- On Step 4 we will configure storage of our instance. You can choose an SSD or Magnetic Volume type. You can add more volumes and choose different volume sizes, but for the exercise purposes just continue with the default values. Notice that by default the EBS root volume will be deleted once the instance is terminated. Also notice that you can choose to encrypt the volumes you attach by using a checkbox that says “encrypt”. You cannot do that for root volumes (actually you can but we will not do it on this lab).

**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 ①	Device ①	Snapshot ①	Size (GiB) ①	Volume Type ①	IOPS ①	Throughput (MB/s) ①	Delete on Termination ①	Encrypted ①
Root	/dev/xvda	snap-040ec2c3f01a1a958	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

- On step 5 add a name and a team tags to your servers and click next. Tags help monitor costs. You can filter instances by their tags later when analyzing your billing.

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 (127 characters maximum)	Value (255 characters maximum)	Instances ①	Volumes ①
Name	MyEC2Instance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Team	DEV1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Add another tag (0 to 50 tags maximum)

Cancel Previous **Review and Launch** Next: Configure Security Group

- On Step 6 create a new **security group** and call it **MyWebDMZ**. Add rules to allow SSH, HTTP and HTTPS traffic to your instance. You can restrict the ports you allow everyone, or to your specific IP address which is more secured. Please pay attention to how the web console completes the necessary ports details for you and also identifies your IP address automatically. When you’re done go ahead and hit next.

**Step 6: Configure Security Group**  
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

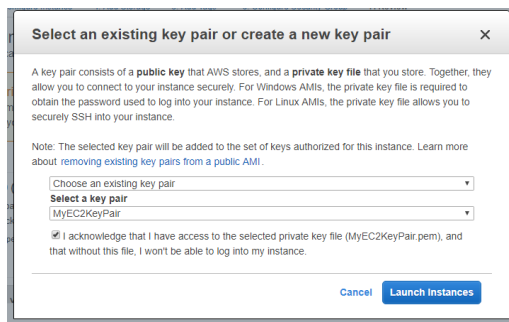
Security Group ID	Name	Description	Actions
<input type="radio"/> sg-83892dec	default	default VPC security group	Copy to new
<input checked="" type="radio"/> sg-094510d17280c4001	MyWebDMZ	MyWebDMZ	Copy to new

Inbound rules for sg-094510d17280c4001 (Selected security groups: sg-094510d17280c4001)

Type ①	Protocol ①	Port Range ①	Source ①	Description ①
HTTP	TCP	80	0.0.0.0/0	
SSH	TCP	22	0.0.0.0/0	

Cancel Previous **Review and Launch**

11. You can review the details of your instance launch. When you're done hit the Launch button. If on the earlier stage you allowed traffic to everyone instead of your specific IP address then there may be a warning message regarding improving the instances' security. You can just ignore it for the purposes of this exercise and hit next.
12. Before the instance is launched, you will have to choose a **keypair**. A **keypair** is a private key which is used to login into AWS instances.  
If it's the first instance you've ever launched using this AWS account, you will have to choose "Create a new keypair". Name it "MyEC2KeyPair" and then hit the "Download Key Pair". You should save it into a folder that only you have access to. If you lose the keypair then you will no longer have access to your instances that are connected to this keypair. If someone else gets a hold of this key file then they can use it to access your AWS instances connected to this keypair. If you had already created a keypair before, then you can choose the "choose an existing keypair" and then locate your keypair. Don't forget to check the "I acknowledge that I have access to the selected private key file" before continuing. When you're done hit the "Launch instance" button.



13. Your instance is now Launching. You should scroll down and hit "View Instances".
14. You should now be able to see your instance in the instance list in a "pending" state. It will take it a few minutes to provision and initialize.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)
MyEC2WebServer3	i-08277c577a7aba49d	t2.micro	us-east-2b	running	2/2 checks ...	None	ec2-18-216-60-37.us-east-2.compute.amazonaws.com
us-east-2c	i-0a94340c66239dcea	t2.micro	us-east-2c	running	2/2 checks ...	None	ec2-18-191-197-97.us-east-2.compute.amazonaws.com
MyEC2Instance	i-0adcb97e84e0cd129	t2.micro	us-east-2c	pending	Initializing	None	ec2-52-15-131-200.us-east-2.compute.amazonaws.com
MyEC2WebServer2	i-0ccbc1f0e4532583	t2.micro	us-east-2c	running	2/2 checks ...	None	ec2-18-222-31-210.us-east-2.compute.amazonaws.com
MyWebSiteTest	i-0fc88241a15177685	t2.micro	us-east-2c	running	2/2 checks ...	None	ec2-18-222-253-252.us-east-2.compute.amazonaws.com

15. Review the instance details such the instance id, type and availability zone. At the bottom of the screen review the Description, Instance Checks, Monitoring and Tags. Make sure you can identify the public and private IP address of your instance, and also the private and public DNS entries of it.

Field	Value
Instance ID	i-0adcb97e84e0cd129
Instance state	running
Instance type	t2.micro
Elastic IP	
Availability zone	us-east-2c
Security groups	MyWebDMZ, view inbound rules, view outbound rules
Scheduled events	No scheduled events
AMI ID	amazon-ami-2018.03.0.20181129-485_64
Public DNS (IPv4)	ec2-52-15-131-200.us-east-2.compute.amazonaws.com
IPv4 Public IP	52.15.131.200
IPv6 IP	
Private DNS	ip-172-31-33-31.us-east-2.compute.internal
Private IP	172.31.33.31
Secondary private IP	
VPC ID	vpc-3a095656
Subnet ID	subnet-5b9b4d17

We are now going to connect to our instance using the keypair we created.

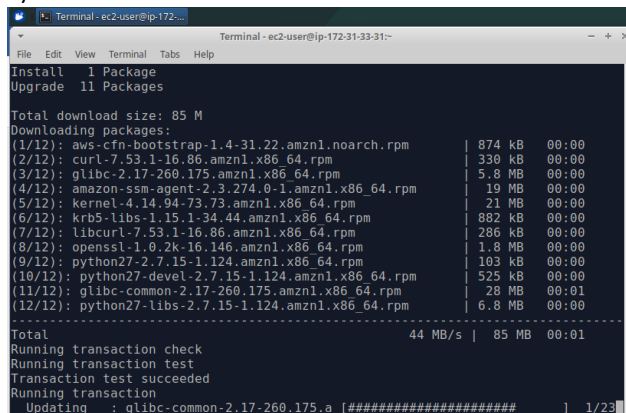
16. Connect to your instance using the keypair either from Linux, Mac, or Windows.
17. If you own a Linux machine (or a virtual machine running Linux) perform the following stages to connect to your instance.
  - a. Open a new terminal window.
  - b. Copy the private key file into your a folder and change the permissions of the file to 400 using the **chmod** command.
  - c. Find the instance's public IP address and copy it to your clipboard.
  - d. Open a new terminal and use SSH to connect to the instance. Use the instance public IP address and the keypair file from earlier stages.

E.g: `ssh ec2-user@18.216.60.37 -i MyEC2KeyPair.pem`

18. If you're using Windows you can use putty to connect to the instance by performing the following stages:
  - a. Make sure you have putty. If not go to <https://www.putty.org/> and download and install it.
  - b. Use putty-gen to convert the keypair from a .pem file to a .ppk file.
  - c. Use putty to connect to the instance using the .ppk file from the earlier stage that you've just created.
  - d. In putty create a new entry for your instance using the instance's public IP address that you copied into your clipboard.
  - e. On the left side of the screen, click SSH, Auth and then hit browse and then locate the .ppk you created on stage b.
19. Mac users – you can connect using the mac's command line
  - a. Use CHMOD to change the keypair permissions to 400.
  - b. Copy the public IP address of the instance from the AWS console and use the SSH command and the keypair to connect to the instance.

E.g: `ssh ec2-user@18.216.60.37 -i MyEC2KeyPair.pem`

20. Once you're logged in, use "**sudo yum update -y**" to get the latest updates of the operating system.

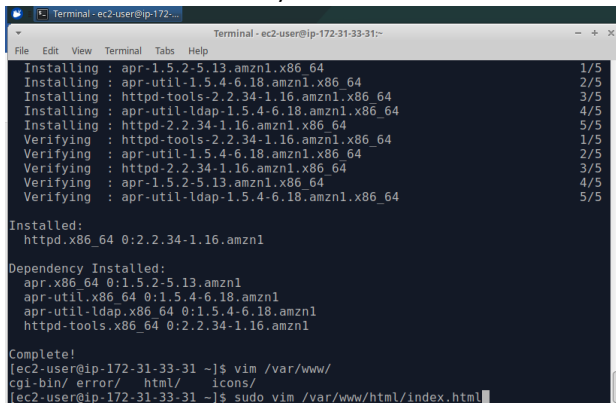


```
Terminal - ec2-user@ip-172-31-33-31:~
File Edit View Terminal Tabs Help
Terminal - ec2-user@ip-172-31-33-31:~
Install 1 Package
Upgrade 11 Packages

Total download size: 85 M
Downloading packages:
(1/12): aws-cfn-bootstrap-1.4-31.22.amzn1.noarch.rpm | 874 kB 00:00
(2/12): curl-7.53.1-16.86.amzn1.x86_64.rpm | 330 kB 00:00
(3/12): glibc-2.17-260.175.amzn1.x86_64.rpm | 5.8 MB 00:00
(4/12): amazon-ssm-agent-2.3.274.0-1.amzn1.x86_64.rpm | 19 MB 00:00
(5/12): kernel-4.14.94-73.73.amzn1.x86_64.rpm | 21 MB 00:00
(6/12): krb5-libs-1.15.1-34.44.amzn1.x86_64.rpm | 882 kB 00:00
(7/12): libcurl-7.53.1-16.86.amzn1.x86_64.rpm | 286 kB 00:00
(8/12): openssl-1.0.2k-16.146.amzn1.x86_64.rpm | 1.8 MB 00:00
(9/12): python27-2.7.15-1.124.amzn1.x86_64.rpm | 103 kB 00:00
(10/12): python27-devel-2.7.15-1.124.amzn1.x86_64.rpm | 525 kB 00:00
(11/12): glibc-common-2.17-260.175.amzn1.x86_64.rpm | 28 MB 00:01
(12/12): python27-libs-2.7.15-1.124.amzn1.x86_64.rpm | 6.8 MB 00:00
-----
Total | 44 MB/s | 85 MB 00:01
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Updating : glibc-common-2.17-260.175.a [#####] 1/23
```

21. If there is a locale error solve it by adding `LC_ALL="en_US.utf8"` to `/etc/environment`
22. Install apache web server by typing `yum install httpd -y`
23. Change directory by typing `cd /var/www/html`

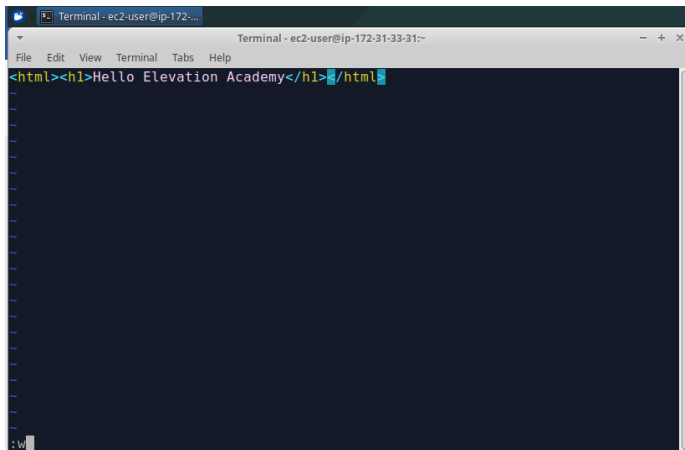
24. Use vim (or nano or any other text editor) to create index.html.



```
Terminal - ec2-user@ip-172-31-33-31~  
Installing : apr-1.5.2-5.13.amzn1.x86_64 1/5  
Installing : apr-util-1.5.4-6.18.amzn1.x86_64 2/5  
Installing : httpd-tools-2.2.34-1.16.amzn1.x86_64 3/5  
Installing : apr-util-ldap-1.5.4-6.18.amzn1.x86_64 4/5  
Installing : httpd-2.2.34-1.16.amzn1.x86_64 5/5  
Verifying : httpd-tools-2.2.34-1.16.amzn1.x86_64 1/5  
Verifying : apr-util-1.5.4-6.18.amzn1.x86_64 2/5  
Verifying : httpd-2.2.34-1.16.amzn1.x86_64 3/5  
Verifying : apr-1.5.2-5.13.amzn1.x86_64 4/5  
Verifying : apr-util-ldap-1.5.4-6.18.amzn1.x86_64 5/5  
  
Installed:  
httpd.x86_64 0:2.2.34-1.16.amzn1  
  
Dependency Installed:  
apr.x86_64 0:1.5.2-5.13.amzn1  
apr-util.x86_64 0:1.5.4-6.18.amzn1  
apr-util-ldap.x86_64 0:1.5.4-6.18.amzn1  
httpd-tools.x86_64 0:2.2.34-1.16.amzn1  
  
Complete!  
[ec2-user@ip-172-31-33-31 ~]$ vim /var/www/  
cgi-bin/ error/ html/ icons/  
[ec2-user@ip-172-31-33-31 ~]$ sudo vim /var/www/html/index.html
```

25. Type in "<html><h1>Hello Elevation Academy!</h1></html>"

26. Save the file and exit the editor

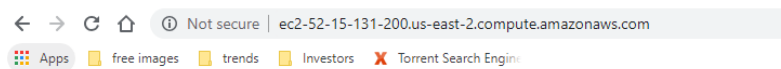


```
Terminal - ec2-user@ip-172-31-33-31~  
File Edit View Terminal Tabs Help  
[ec2-user@ip-172-31-33-31 ~]$ vim /var/www/html/index.html  
<html><h1>Hello Elevation Academy</h1></html>
```

27. Type **service httpd start**

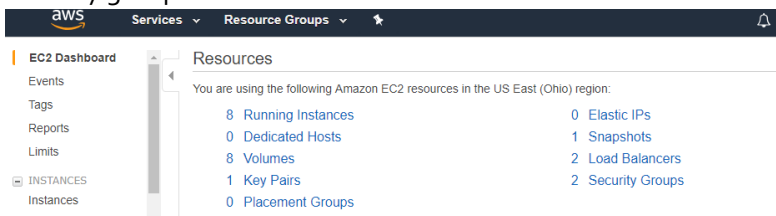
28. Make sure the **httpd** service will run after reboot by running **chkconfig httpd on** (otherwise after reboot it will not be started)

29. Type in the instance's public IP address or public DNS into a new web browser. You should now see the webpage you created. You can also try that with your mobile phone. Will it work? Go ahead and try. Then explain why it worked or didn't work (hint: step 10 of this lab).

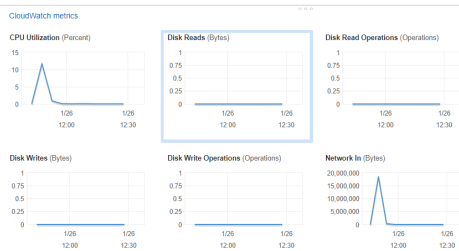


## Hello Elevation Academy

30. Go to the EC2 Dashboard and review your running instances details, volumes, key pairs and security groups.



31. Go to running instances and review the instance details below. Check the description tab, the Status Check tab, Monitoring tab and the tags tab. Remember that basic monitoring free and occurs every 5 minutes whereas details monitoring in every 1 minutes, and will cost a little bit extra.



32. Try to terminate the instance. Will it work?
33. Disable the Terminate Protection from the instance and then try to Terminate the instance again. Notice that the EBS root volume is deleted one the instance is terminated by default. This can be unchecked when creating the instance (stage 8 of the lab).
34. Recall what is a reserved instance and check the “reserved instances” pricing plans on AWS console

## SUMMARY

In this section we had a lab in which we created our first EC2 instance, configured its storage, networking, security groups and keypair. We logged into the server using SSH and the keypair we created. We then updated the instance’s operating system using yum, installed an apache service on it, created a little webpage and then were able to use our browser to the public IP address and the public DNS of our instance to view that page, and then terminated the instance. We did a job that used to take few months to a year in just a few minutes. We still have a lot to learn about EC2, and we will do it in the next lecture.