Assignment: EC2 Instance Creation

Name: Uday Kiran Ailapaka

AWS Region: Mumbai (ap-south-1)

Creation of a key pair:

A key pair is required to connect to the EC2 instances created. We have to associate a key pair while creating an EC2 instance.

Navigation: EC2 -> Network & Security -> Key Pairs

Key pair name: uday-mumbai-key-pair.pem



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Note:- Then a new key pair is downloaded 'uday-mumbai-key-pair.pem'

Creation of a EC2 Instance:

We are going to create an Amazon Linux AWS EC2 instance.

- 1. Login to AWS console.
- 2. Navigate to Services -> Compute -> EC2
- 3. Select Instances running

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Click Launch instances

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Name the EC2 instance: uday_aws_linux_ec2

Launch an instance info	
Amazon EC2 allows you to create virtual machines, or instar following the simple steps below.	nces, that run on the AWS Cloud. Quickly get started b
Name and tags Info	
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Select OS image and the version: (Amazon Linux 2 Kernel 5.10 AMI)

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Amazon Linux 2 AMi (HVM) - Kernel 5:10, SSD Volume Type Free tier eligible ami-074dc0x6f6c764218 (64-bit 0485) / ami-019774eScaffd1585 (64-bit [Arm]) Free tier eligible Virbualization: hvm ENA enabled: true Root device type: els	Amazon Machin	e image (AMI)					the Community
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Select Instance type as t2.micro (free tier eligible):

+ instance	ype Info									
Instance type										
t2.micro		Free tier eligible								
Family: t2 1 v On-Demand Link On-Demand Win	:PU 1 GIB Memory # pricing: 0.0124 USD per Hour dows pricing: 0.017 USD per Hour	•	Compare instance types							
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 Key pair (You can use a the instance. 	login) Info ey pair to securely connect to your instance. En	sure that you have access to the se	lected key pair before you laun							
 Key pair (You can use a the instance. Key pair name - 	login) Info ey pair to securely connect to your instance. En required	sure that you have access to the se	lected key pair before you launc							

the existing default settings for **Network Settings**:

 Network settings into 		Edit
Network Info		
vpc-0c85da6ed826f1dc8		
Subnet Info		
Vo preference (Default subnet in any	availability zone)	
Auto-assign public IP Info		
inable		
Firewall (security groups) Info A security group is a set of firewall rules th instance.	at control the traffic for your instance. Add rules to allow specific	c traffic to reach your
O Create security group	 Select existing security group 	
We'll create a new security group cal	led 'launch-wizard-1' with the following rules:	
Allow SSH traffic from Helps you connect to your instance	Anywhere *	
Allow UTTOS traffic from the late	rnet	
To set up an endpoint, for example wh	en creating a web server	
Allow HTTP traffic from the inter To set up an endpoint, for example wh Allow HTTP traffic from the inter To set up an endpoint, for example wh	en creating a web server net en creating a web server	
Allow HTTP traffic from the inter To set up an endpoint, for example wh Allow HTTP traffic from the inter To set up an endpoint, for example wh Rules with source of 0.0.0.0/0	en creating a web server net en creating a web server allow all IP addresses to access your instance. We reco	mmend setting X

10. Select the required storage configuration: **(8 GB of storage here)**

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			2.2	stomer ran or	t up to 30 69	of CRE Conneral Durnage (ECD) on Manually starson	~
(Free	tier elig	ble cu	stomers can ge	1 00 10 50 00	i of EBS General Purpose (SSO) of Magnetic storage	^

11. Select number of instances and click Launch Instances: (1 here)

0.0000000000000000000000000000000000000	er of instances Info	
1		0
Softwa	are Image (AMI)	
Amazo ami-07	n Linux 2 Kernel 5.10 AMIread more	2
Virtua	server type (instance type)	
t2.mic	·0	
Firewa	ll (security group)	
New s	curity group	
Storac	e (volumes)	
1 volu	ne(s) - 8 GiB	
٩	Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet	×

12. Success message is displayed:

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to EC2 Dashboard to see the status of the newly created EC2 instance:



Connecting to EC2 Instances:

- 1. Click on the instance id of the EC2 instance created above.
- 2. Click on SSH client section and follow the instructions given.
- *3.* Copy the ssh command given under example. *'ssh -i "uday-mumbai-key-pair.pem" ec2-user@ec2-65-2-183-9.ap-south-1.compute.amazonaws.com'*
- 4. In MacOSX, launch terminal and cd to the location where the pem file is downloaded. Now run the copied command.

onnect to your instance i-0e960	1f3bbdd9487c (uday_aws_1	inux_ec2) using any	of these options
EC2 Instance Connect	Session Manager	SSH client	EC2 serial console
nstance ID			
🗗 i-0e9601f3bbdd9487c (u	day_aws_linux_ec2)		
1. Open an SSH client.			
2. Locate your private key fil	e. The key used to laund	ch this instance is	i uday-mumbai-key-pair.pem
 Run this command, if neo chmod 400 uday-mu 	essary, to ensure your k mbai-key-pair.pem	ey is not publicly	viewable.
 Connect to your instance ec2-65-2-183-9.ap-se 	using its Public DNS: outh-1.compute.amazor	naws.com	
Example:			
🗇 ssh -i 'uday-mumbai-key	-pair.pem" ec2-user@e	c2-65-2-183-9.ap	-south-1.compute.amazonaws.com
Note: In most cases, t	he guessed user name is	s correct. Howeve	r, read your AMI usage instructions to check if



The EC2 Instance is successfully created and connect from MacOSX terminal using ssh

Create Elastic IP and Associate with EC2 instance:

An EC2 instance has public and private ipv4 addressess. Private IP we use to connect within internal AWS services like Connect b/w multiple EC2 instances. Public IP we use to expose the system to Public connections. But, public address is dynamic i.e it changes when instance is restarted. So, we cannot use it to host a website. For that we can have a static IP address and

associate it with an EC2 instance. This static IP can be used to host a website with the DNS. This static IP is called as Elastic IP in AWS.

1. Public IP before restarting the EC2 instance: (65.2.183.9)



2. Public IP changed after restarting the same EC2 instance: (13.253.111.225)

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3. Navigate to **EC2** -> **Network & Security** -> **Elastic IPs** -> **Allocate Elastic IP address** and click allocate

Elastic IP address se	attings Info
Public IPv4 address pool	
 Amazon's pool of IPv4 	i addresses
Public IPv4 address the pools found Learn me	at you bring to your AWS account (option disabled because no one
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4. Select the created Elastic IP address, expand the actions and select 'Associate Elastic IP address'

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5. Choose the EC2 instance and click Associate

ose the instance or network interface to associate to this Elastic IP a	ddress (13.232.240.96)
Elastic IP address: 13.232.240.98	
Resource type Choose the type of resource with which to associate the Elestic IP address. Instance Network interface	
A If you associate an Elastic IP address to an instance that alread	dy has an Elastic IP address associated, this
previously associated Elastic IP address will be disassociated b	ut still allocated to your account. Learn more
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6. The newly created static IP address is associated with the EC2 instance even after restarting.



Create Elastic Block Store:

Used to extend the storage attached with EC2 instances without the need for downtime. You can mount this persistent storage with any EC2 instance.

1. Navigate to EC2 -> Elastic Block Store -> Volumes and click 'Create volume'



2. Select the size and create volume

eate an Amazon EBS volume to attach to any EG	2 instance in the same Availability Zone.
Volume settings	
Volume type Into	
General Purpose 55D (gp2)	*
Size (GIB) Infa	
1 (2)	
Him 1 GB, Haz. 18384 GB. The value must be an inter	ger;
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100 / 3000	
Baseline of 3 10PS per GiB with a minimum of 10010P	S, burstable to 3000 KHS.
Throughput (Mi8/h) telle	
Not applicable	
Availability Zone Inte	
ap-south-1a	
Left reactions	
Snapshot ID - optional sale	
Don't create volume from a snapshot	• C
Encryption infe	
Live Amazon EBS encryption as an encryption selution	for your EBS resources associated with your EC2 instances.
Encrypt this volume	
Tags - optional tests	ch has consists of a key and an optional value. You can use has to search and Marr
your resources or track your NWS costs.	
No tags associated with the resource.	
Add tag	
You san add 50 more tags,	

4. The newly created EBS volume state is 'Available'

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5. Select the newly create EBS volume and choose 'Attach Volume'

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6. Choose the required instance and click attach volume

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or a volume to an insurve to use it as your	route a regular prysical fair	Tode offer	
asic details			
olume ID			
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istance info			
i-0e9601f3bbdd9487c	*	C	
nly instances in the same Acailability Zone as the s	elected volume are displayed.		
evice name Info			
/dev/sdf			
ecommended device names for Linux: /dev/sda1 fo	r root volume. /dev/sd[t-p] for d	ata volumes.	
Newer Linux kernels may rename you	devices to /dev/xvdf throu	gh	
/dev/xvdp internally, even when the	device name entered here (a	nd shown in	
the details) is /dev/sor through /dev/	sop.		

7. The volume state of EBS store is now changed to 'In Use'

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8. The EC2 disk allocation before new EBS is attached

NAME	MAJ:MIN	RM	SIZE	RO	TYPE MOUNTPOINT
xvda	202:0	0	8G	0	disk
`-xvda1	202:1	0	8G	0	part /
[ec2-use	er@ip-172	2-31	-45-5	58 -	-1\$
The EC2 disk al	location after nev	w EBS	is attached	1	
Lec2-use	arain_17	2 2	1 15 5	:0	J¢ lchlk
Lecz-use	el Grh-TI	2-5.	1-45	00 1	~]\$ LSDLK
NAME	MAJ:MIN	RM	SIZE	RO	TYPE MOUNTPOINT
NAME xvda	MAJ:MIN 202:0	RM 0	SIZE 8G	R0 0	TYPE MOUNTPOINT disk
NAME xvda `-xvda1	MAJ:MIN 202:0 202:1	RM 0 0	SIZE 8G 8G	R0 0 0	TYPE MOUNTPOINT disk part /
NAME xvda `-xvda1 xvdf	MAJ:MIN 202:0 202:1 202:80	RM 0 0 0	SIZE 8G 8G 1G	R0 0 0 0	TYPE MOUNTPOINT disk part / disk
NAME xvda `-xvda1 xvdf [ec2-use	MAJ:MIN 202:0 202:1 202:80 er@ip-172	RM 0 0 0 2-3	SIZE 8G 8G 1G 1-45-5	R0 0 0 58	~]\$ USDIK TYPE MOUNTPOINT disk part / disk ~]\$

10. The newly created EBS is seen attached to the EC2 instance

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- 11. Connect to EC2 instance and Mount the new EBS:
 - (a) sudo su

(b) lsblk

[ec2-use	er@ip-172	2-3:	1-45-5	58 -	-]\$ l	sblk
NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
xvda	202:0	0	8G	0	disk	
`-xvda1	202:1	0	8G	0	part	1
xvdf	202:80	0	1G	0	disk	

- (c) mkdir storage
- (d) fdisk -l

[root@ip-172-31-45-58 ec2-user]# fdisk -l
Disk /dev/xvda: 8 GiB, 8589934592 bytes, 16777216 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: DA90AB95-8C11-4BAE-9157-C48213FBAD0C

Device	Start	End	Sectors	Size	Туре
/dev/xvda1	4096	16777182	16773087	8G	Linux filesystem
/dev/xvda128	2048	4095	2048	1M	BIOS boot

Partition table entries are not in disk order.

Disk /dev/xvdf: 1 GiB, 1073741824 bytes, 2097152 sectors

- (e) mkfs -t xfs /dev/xvdf (makes file system)
- (f) mount -t xfs /dev/xvdf /home/ec2-user/storage/
- (g) lsblk

[root@i	p-172-31	-45-	-58 e	c2-1	user]#	# lsblk
NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
xvda	202:0	0	8G	0	disk	
`-xvda1	202:1	0	8G	0	part	1
xvdf	202:80	0	1G	Ø	disk	/home/ec2-user/storage

12. Create somefiles in the filesystem

[ec2-user@ip-172-31-45-58 ~]\$ sudo su [root@ip-172-31-45-58 ec2-user]# pwd /home/ec2-user [root@ip-172-31-45-58 ec2-user]# cd storage/ [root@ip-172-31-45-58 storage]# pwd /home/ec2-user/storage [root@ip-172-31-45-58 storage]# touch {1..10}.txt [root@ip-172-31-45-58 storage]# ls 1.txt 10.txt 2.txt 3.txt 4.txt 5.txt 6.txt 7.txt 8.txt 9.txt [root@ip-172-31 45 59 storage]#

13. Unmount the file system and detach the volume from the EC2 instace

```
[root@ip-172-31-45-58 storage]# cd ...
[root@ip-172-31-45-58 ec2-user]# pwd
/home/ec2-user
[root@ip-172-31-45-58 ec2-user]# unmount /home/ec2-user/storage/
bash: unmount: command not found
[root@ip-172-31-45-58 ec2-user]# umount /home/ec2-user/storage/
[root@ip-172-31-45-58 ec2-user]# df -hT
Filesystem
                              Used Avail Use% Mounted on
               Type
                        Size
devtmpfs
               devtmpfs
                        474M
                                 0 474M
                                           0% /dev
                                           0% /dev/shm
tmpfs
               tmpfs
                        483M
                                 0
                                    483M
tmpfs
                        483M 528K
                                    483M
                                           1% /run
               tmpfs
tmpfs
               tmpfs
                        483M
                                 0 483M
                                           0% /sys/fs/cgroup
/dev/xvda1
                               1.6G 6.5G
               xfs
                        8.0G
                                           20% /
                                           0% /run/user/1000
tmpfs
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```

14. Create another machine **uday_aws_linux_ec2_A.**

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• Independent Statistical State Statistical Types	1	Select an instance													.0.3	K.

15. Attach the volume storage to the new machine

EC2 > Volumes > vol-003821876a3759756 > Attach volume

Attach volume Info

Attach a volume to an instance to use it as you would a regular physical hard disk drive.

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16. Mount the file system and access the already created files.

[ec2-user@ip-172-31-46-167 ~]\$ sudo su [root@ip-172-31-46-167 ec2-user]# pwd /home/ec2-user [root@ip-172-31-46-167 ec2-user]# lsblk MAJ:MIN RM SIZE RO TYPE MOUNTPOINT 202:0 0 8G 0 disk 202:1 0 8G 0 part / NAME xvda -xvda1 202:1 1G 0 disk 202:80 xvdf 0 [root@ip-172-31-46-167 ec2-user]# fdisk -l
[root@ip-172-31-46-167 ec2-user]# fdisk -l
Disk /dev/xvda: 8 GiB, 8589934592 bytes, 16777216 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes Disklabel type: gpt Disk identifier: DA90AB95-8C11-4BAE-9157-C48213FBAD0C Device End Sectors Size Type Start /dev/xvda1 4096 16777182 16773087 8G Linux filesystem /dev/xvda128 2048 4095 2048 1M BIOS boot Partition table entries are not in disk order. Disk /dev/xvdf: 1 GiB, 1073741824 bytes, 2097152 sectors Units: sectors of 1 * 512 = 512 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes [root@ip-172-31-46-167 ec2-user]# mkdir storage [root@ip-172-31-46-167 ec2-user]# df -hT Size Used Avail Use% Mounted on Filesystem Type devtmpfs devtmpfs 474M 474M 0% /dev 0 483M 0% /dev/shm 1% /run 0% /sys/fs/cgroup 20% / 0% /run/user/1000 tmpfs 483M tmpfs 0 483M 412K tmpfs tmpfs 483M 483M tmpfs 483M 0 tmpfs /dev/xvda1 xfs 8.0G 1.6G 6.5G tmpfs 97M tmpfs 97M 0 0% /run/user/1000

[root@ip-172-31-46-167 ec2-user]# mkfs -t xfs /dev/xvdf mkfs.xfs: /dev/xvdf appears to contain an existing filesystem (xfs). mkfs.xfs: Use the -f option to force overwrite. [root@ip-172-31-46-167 ec2-user]# mount -t xfs /dev/xvdf /home/ec2-user/storage/ [root@ip-172-31-46-167 ec2-user]# lsblk MAJ:MIN RM SIZE RO TYPE MOUNTPOINT NAME xvda 202:0 0 8G 0 disk -xvda1 202:1 0 8G 0 part / 202:80 0 1G 0 disk /home/ec2-user/storage xvdf [root@ip-172-31-46-167 ec2-user]# df -hT Type Size Used Avail Use% Mounted on Filesystem 0 474M 0% /dev devtmpfs devtmpfs 474M tmpfs 483M tmpfs 0 483M 0% /dev/shm 483M 412K 483M tmpfs tmpfs 1% /run tmpfs 483M 0 483M 0% /sys/fs/cgroup tmpfs 8.0G 1.6G 6.5G /dev/xvda1 xfs 20% / tmpfs tmpfs 97M 0 97M 0% /run/user/1000 1014M 34M 981M /dev/xvdf 4% /home/ec2-user/storage xfs [root@ip-172-31-46-167 ec2-user]# cd storage/ [root@ip-172-31-46-167 storage]# ls 1.txt 10.txt 2.txt 3.txt 4.txt 5.txt 6.txt 7.txt 8.txt 9.txt root@ip-172-31-46-167 storage]#

EBS volumes are created successfully and attached with different EC2 instances without loosing data

Create a snapshot of the Volume or Instance:

Creates a prototype of the service which can be used to in other availability zone. Snapshot can be copied to multiple regions. Deleted snapshots reside in recycle bin for the period defined in retention policy.

1. Create a snapshot of the existing EBS volume

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ne a point-si-u	me snapshot to back up the data on an Amazon EBS volume to Amazon 53.
Details	
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🗗 vol-00016b	71da7d07baa (uday_storage_ebs_volume)
escription add a description f	or your snapshot
uday_snapshot	volume
S5 characters ma	imum.
ncryption Info	
lot encrypted	
ads Inte	
tag is a label the our resources or t	you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter rack your AWS costs.
lo tags associat	ed with the resource.
Add tag	
oo can add 50 me	im tags.

2. Create a volume from the new snapshot in a different region (us-east-1)

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3. Create a new EC2 instance in different region (us-east-1)

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4. Attach the new volume with the new EC2 instances

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The Snapshot of the volume is created successfully, recreated the volume in different region and attached to the EC2 instance with data persisting

Create an AMI from an Amazon EC2 Instance

From the **Amazon EC2 Instances** view, you can create Amazon Machine Images (AMIs) from either running or stopped instances.

1. Right-click the instance you want to use as the basis for your AMI, and choose **Create Image** from the context menu.



2. In the **Create Image** dialog box, type a unique name and description, and then choose **Create Image**. By default, Amazon EC2 shuts down the instance, takes snapshots of any attached volumes, creates and registers the AMI, and then reboots the instance. Choose **No reboot** if you don't want your instance to be shut down.

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3. Navigate:- EC2 -> Images -> AMIs.

You can Launch a new EC2 instance from the AMI



Successfully created an Image fro existing EC2 instance.

Create Load Balancer:

1. Navigate to EC2 -> Load Balancing -> Load Balancers. And click create Load Balancers



EC2 > Losd balancers > Create Application Losd Balancer

Create Application Load Balancer

The Application Load Balancer distributes incoming INTTP and HTTPS traffic across multiple targets such as Amazon EC2 instances, microservices, and containen, fasted on request attributes. When the load balancer resolves a connection request, it evaluates the listener rules in priority order to determine which rule to apply, and if applicable, it selects a target from the target group for the rule action.

How Elastic Load balancing works	
Basic configuration	
Load balancer name same must be unique within your AWS account and cannot be changed after the laad balancer is constent.	
uday_aws_app_loatbalancer	
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Scheme and Cosmo cannot be changed after the load liabance is unasted.	
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Internal Ani Internal balancer medas migweck fileri clients to targeti using private IP addresias.	
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- ypc-dc8544648930/14cg IPvel-112.21.00/v8		, <u> </u>
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EC2 > Target groups > Create target group

Specify group details	Specify group details											
	Your load balancer motes requests to the targets in a target group and performs health checks on the targets.											
Register terpers	Parls configuration											
	Sattings in this section cannot be changed after the target group is model.											
	 Instances Suggestive load balancing to instances within a specific intil. 											
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	Send requests to targets using gPPE. Supported when the requisit protocol is gPPE.											
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Application Load Balancer is created and registered available EC2 instances successfully