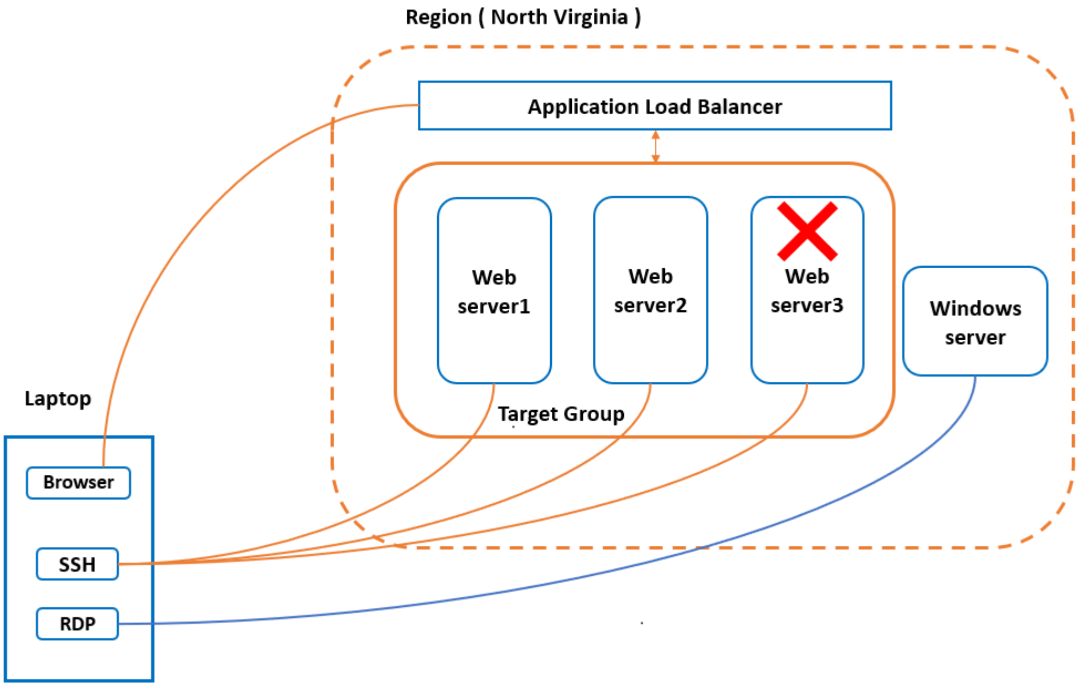
EC2| Multi AZ deployment| ALB

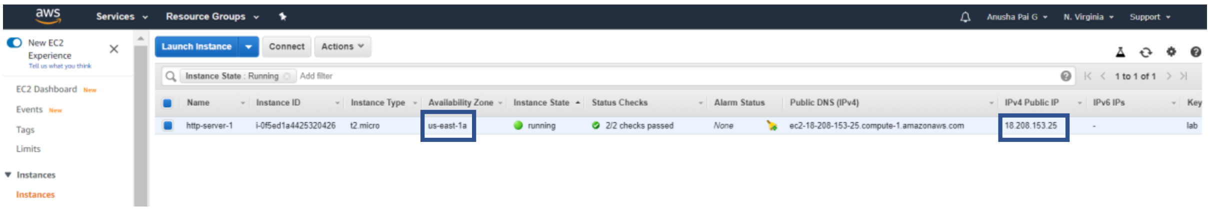
Deploy multiple EC2 instances in different AZs and experiment with load balancing, target groups and understand the impact of instance failure.

FINAL OUTCOME



How to do it?

1. Create an Amazon AMI EC2 instance using the 7-step workflow (Name : http-server-1)

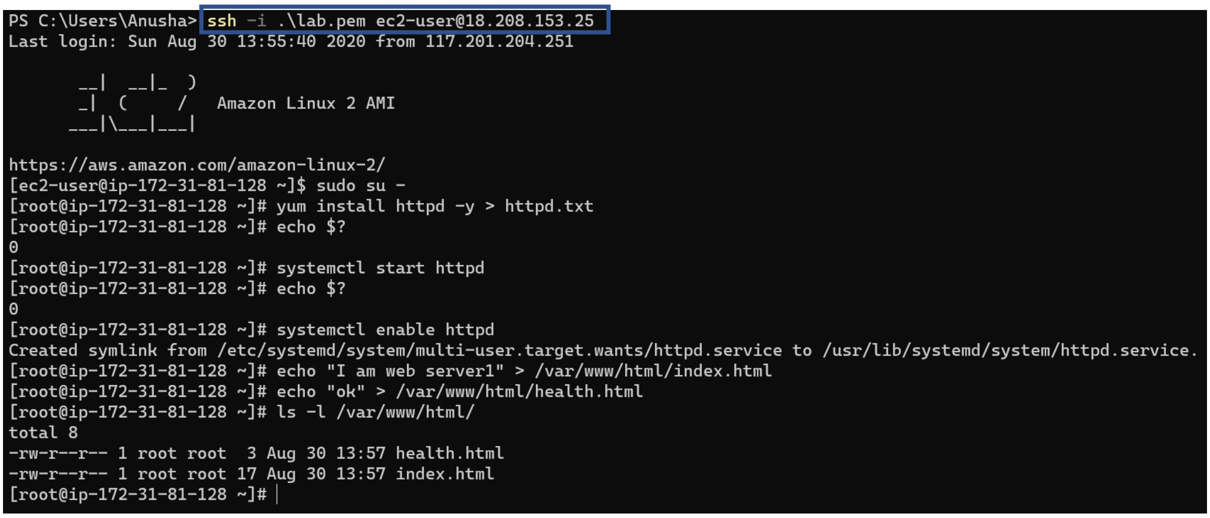


Instance State : Running

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 IPs	Key
http-server-1	i-0f5ed1a4425320426	t2.micro	us-east-1a	running	2/2 checks passed	None	ec2-18-208-153-25.compute-1.amazonaws.com	18.208.153.25	-	lab

a) SSH to the instance

b) Install a simple http server

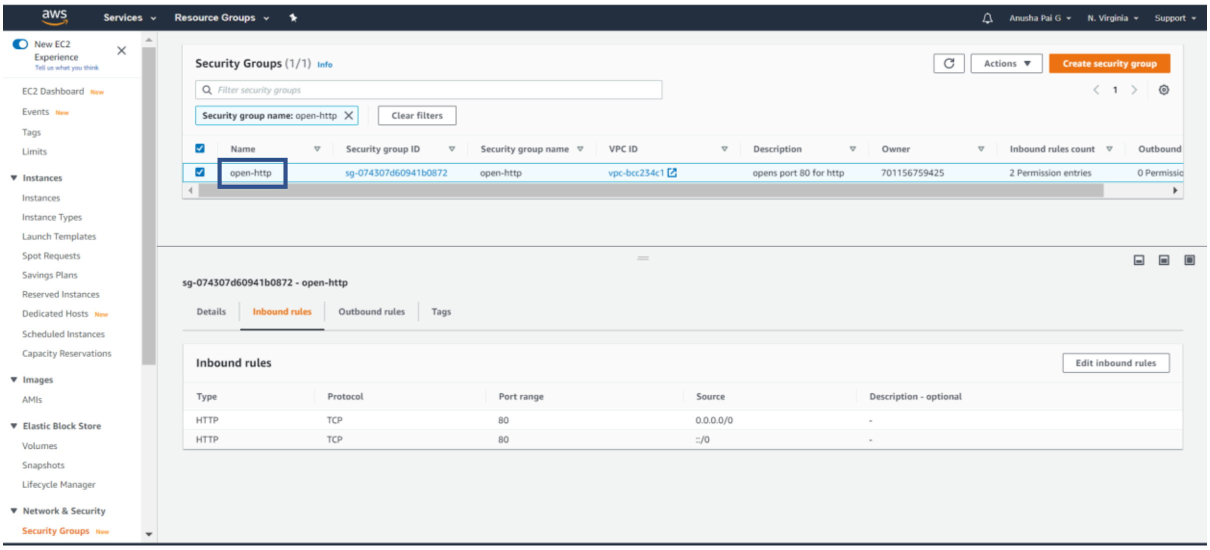


```
PS C:\Users\Anusha> ssh -i .\lab.pem ec2-user@18.208.153.25
Last login: Sun Aug 30 13:55:40 2020 from 117.201.204.251

       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-81-128 ~]$ sudo su -
[root@ip-172-31-81-128 ~]# yum install httpd -y > httpd.txt
[root@ip-172-31-81-128 ~]# echo $?
0
[root@ip-172-31-81-128 ~]# systemctl start httpd
[root@ip-172-31-81-128 ~]# echo $?
0
[root@ip-172-31-81-128 ~]# systemctl enable httpd
Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.
[root@ip-172-31-81-128 ~]# echo "I am web server1" > /var/www/html/index.html
[root@ip-172-31-81-128 ~]# echo "ok" > /var/www/html/health.html
[root@ip-172-31-81-128 ~]# ls -l /var/www/html/
total 8
-rw-r--r-- 1 root root  3 Aug 30 13:57 health.html
-rw-r--r-- 1 root root 17 Aug 30 13:57 index.html
[root@ip-172-31-81-128 ~]# |
```

c) configure a new security group for http



Security Groups (1/1) Info

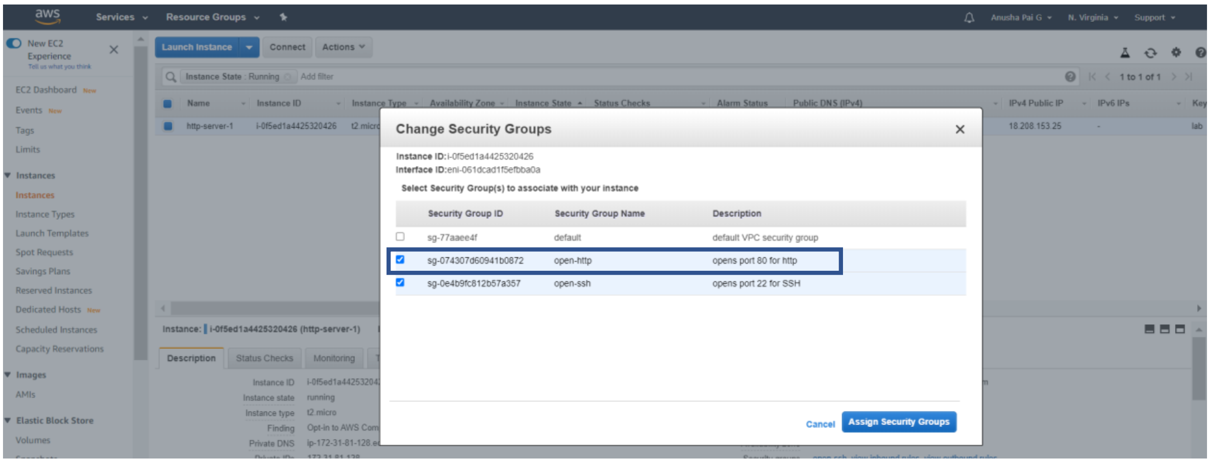
Security group name: open-http

☑	Name	Security group ID	Security group name	VPC ID	Description	Owner	Inbound rules count	Outbound
☑	open-http	sg-074307d60941b0872	open-http	vpc-bcc234c1	opens port 80 for http	701156759425	2 Permission entries	0 Permissio

sg-074307d60941b0872 - open-http

Inbound rules

Type	Protocol	Port range	Source	Description - optional
HTTP	TCP	80	0.0.0.0/0	-
HTTP	TCP	80	::/0	-



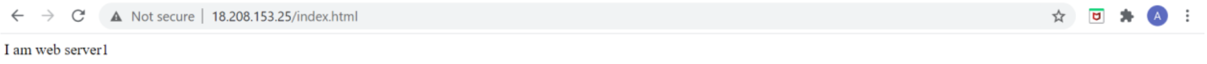
Change Security Groups

Instance ID:i-0f5ed1a4425320426
Interface ID:eni-061dcad1f5efbba0a

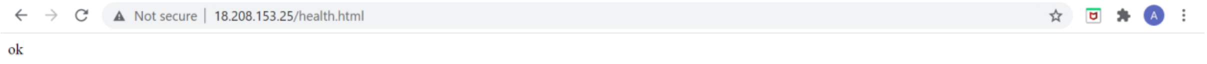
Select Security Group(s) to associate with your instance

	Security Group ID	Security Group Name	Description
☐	sg-77aaee4f	default	default VPC security group
☑	sg-074307d60941b0872	open-http	opens port 80 for http
☑	sg-0e4b9fc812b57a357	open-ssh	opens port 22 for SSH

d) Test the web server from a browser tab



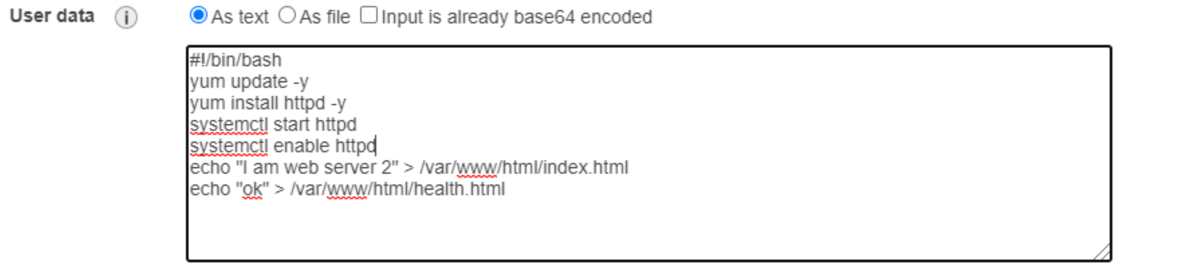
I am web server1



ok

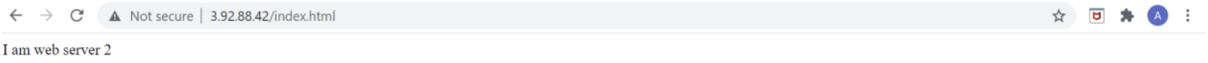
2. Create 2 more EC2 instances in different AZ

a) Create first EC2 instance using "Launch more like this" option and create a boot strap script to configure http (Name : http-server-2)

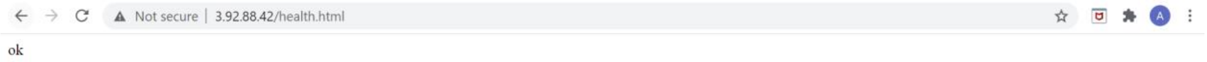


User data ● As text ○ As file □ Input is already base64 encoded

```
#!/bin/bash
yum update -y
yum install httpd -y
systemctl start httpd
systemctl enable httpd
echo "I am web server 2" > /var/www/html/index.html
echo "ok" > /var/www/html/health.html
```

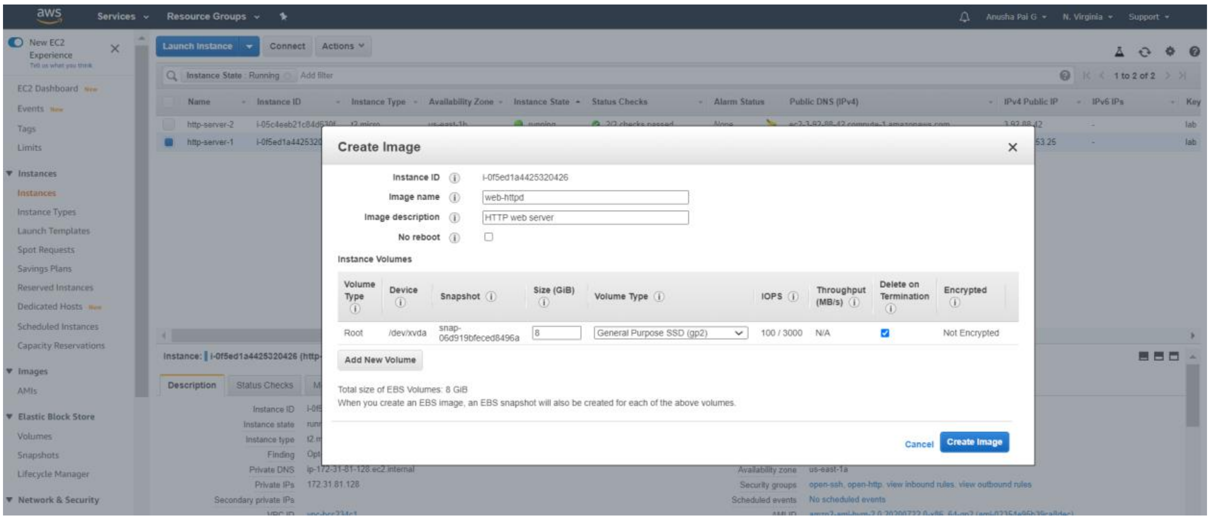


I am web server 2



ok

b) Create second EC2 instance using an AMI created from httpd-server-1 (Name : http-server-3)



Create Image

Instance ID: i-0f5ed1a4425320426

Image name: web-httpd

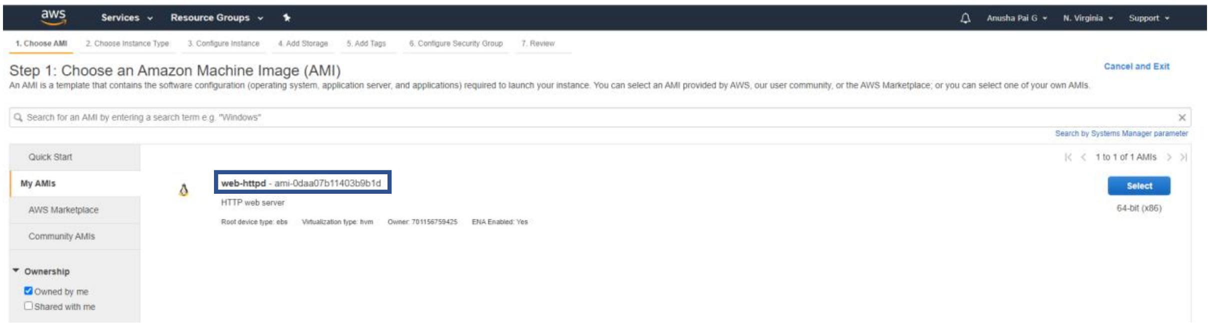
Image description: HTTP web server

No reboot ☐

Instance Volumes

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/xvda	snap-06d919bfeced8496a	8	General Purpose SSD (gp2)	100 / 3000	N/A	☑	Not Encrypted

Total size of EBS Volumes: 8 GiB
When you create an EBS image, an EBS snapshot will also be created for each of the above volumes.



Step 1: Choose an Amazon Machine Image (AMI)

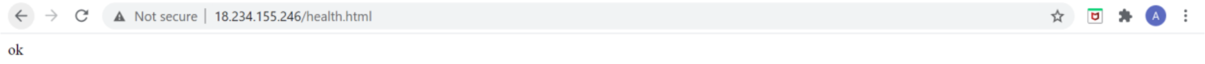
An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

web-httpd - ami-0daa07b11403b9b1d

HTTP web server

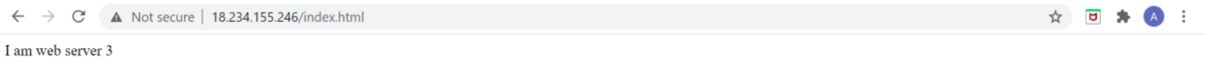
Root device type: ebs Virtualization type: hvm Owner: 701156759425 ENA Enabled: Yes

64-bit (x86)



Not secure | 18.234.155.246/health.html

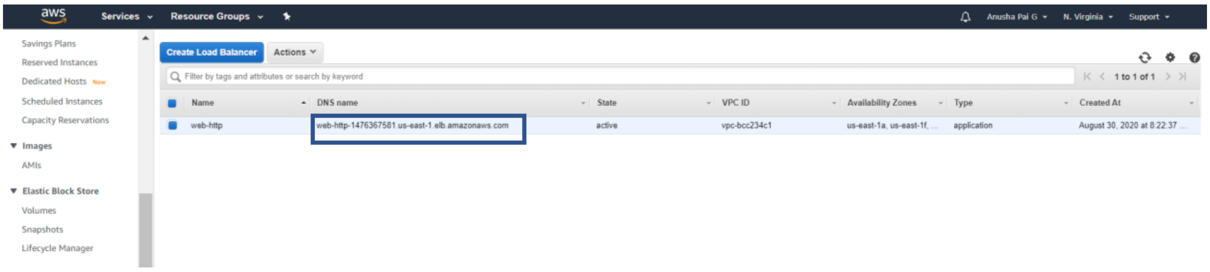
ok



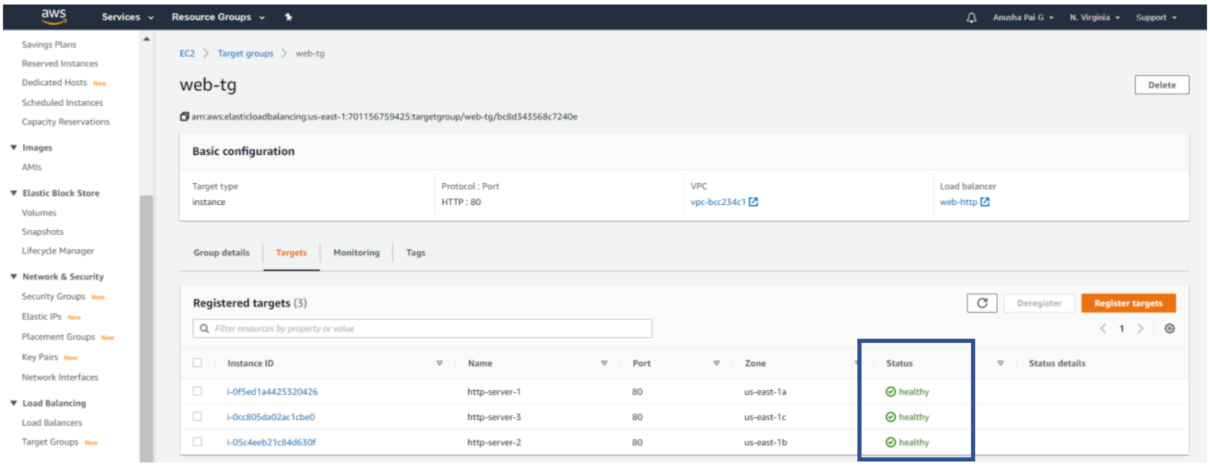
Not secure | 18.234.155.246/index.html

I am web server 3

3. Grab a Load Balancer, create a Target Group and assign all these EC2 instances to the Target Group.



Name	DNS name	State	VPC ID	Availability Zones	Type	Created At
web-http	web-http-1476367581.us-east-1.elb.amazonaws.com	active	vpc-bcc234c1	us-east-1a, us-east-1f, ...	application	August 30, 2020 at 8:22:37 ...



web-tg

arn:aws:elasticloadbalancing:us-east-1:701156759425:targetgroup/web-tg/bc8d343568c7240e

Basic configuration

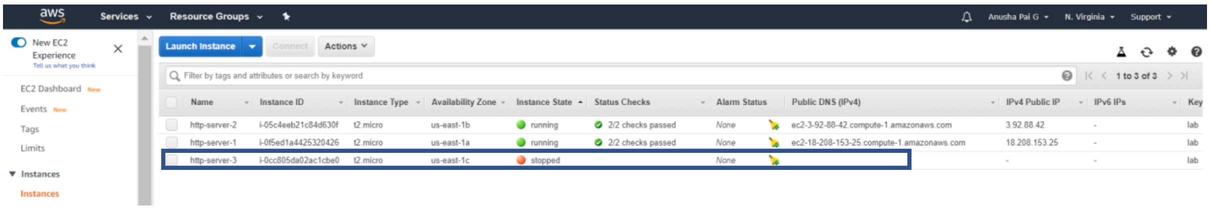
Target type	Protocol : Port	VPC	Load balancer
instance	HTTP : 80	vpc-bcc234c1	web-http

Registered targets (3)

Instance ID	Name	Port	Zone	Status	Status details
i-0f5ed1a4425320426	http-server-1	80	us-east-1a	healthy	
i-0cc805da02ac1cbe0	http-server-3	80	us-east-1c	healthy	
i-05c4eeb21c84d630f	http-server-2	80	us-east-1b	healthy	

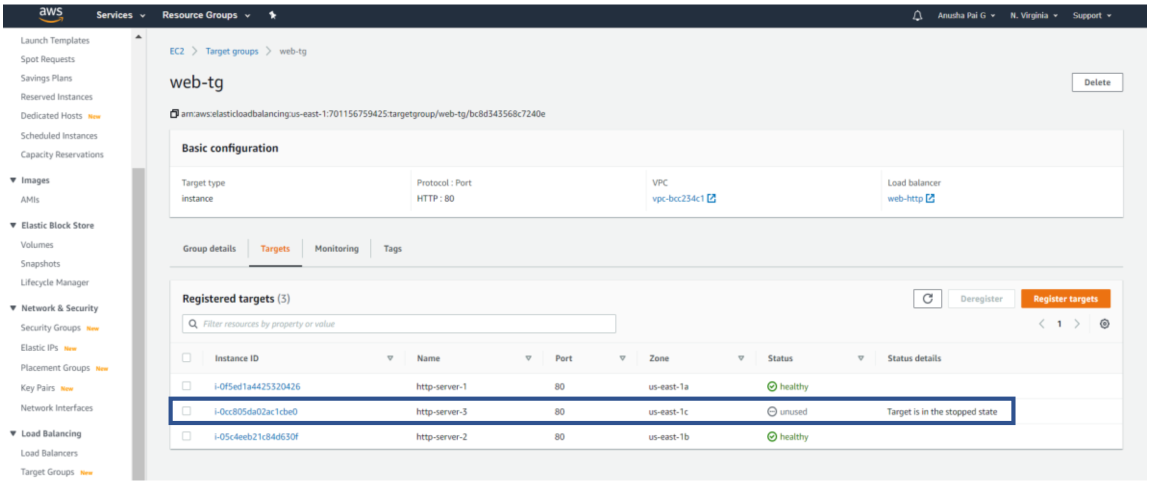
a) Hit the LB multiple times and observe the Round Robin in action

4. Simulate failure by stopping the EC2 instance



Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 IPs	Key
http-server-2	i-05c4eeb21c84d630f	t2.micro	us-east-1b	running	2/2 checks passed	None	ec2-3-92-88-42.compute-1.amazonaws.com	3.92.88.42	-	lab
http-server-1	i-0f5ed1a4425320426	t2.micro	us-east-1a	running	2/2 checks passed	None	ec2-18-208-153-25.compute-1.amazonaws.com	18.208.153.25	-	lab
http-server-3	i-0cc805da02ac1cbe0	t2.micro	us-east-1c	stopped		None		-	-	lab

a) See the effect on the LB



web-tg

arn:aws:elasticloadbalancing:us-east-1:701156759425:targetgroup/web-tg/bc8d343568c7240e

Basic configuration

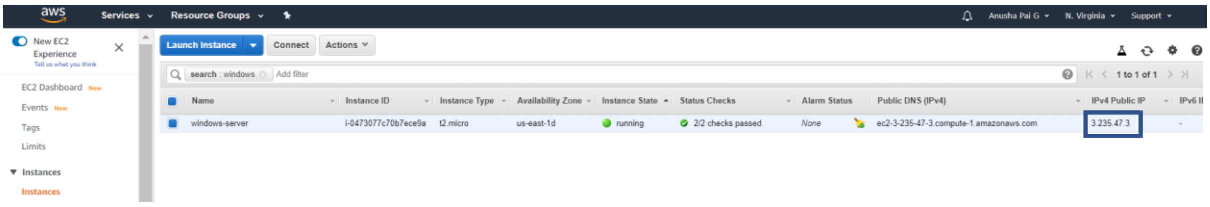
Target type	Protocol : Port	VPC	Load balancer
instance	HTTP : 80	vpc-bcc234c1	web-http

Registered targets (3)

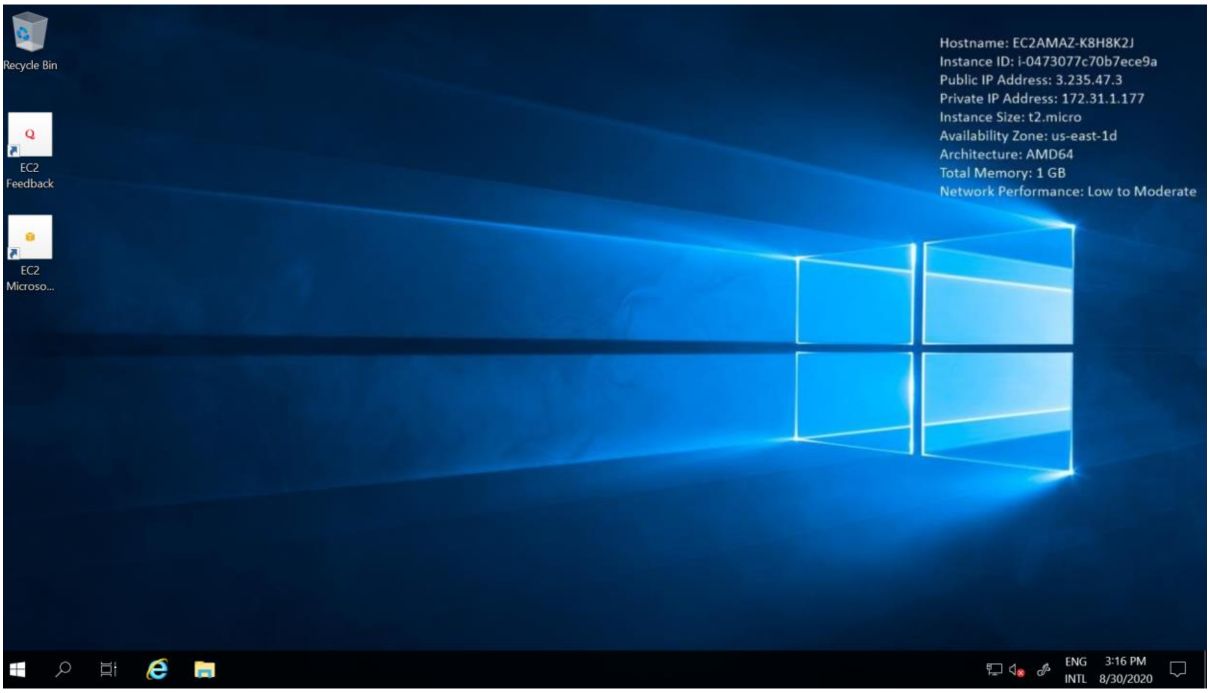
Instance ID	Name	Port	Zone	Status	Status details
i-0f5ed1a4425320426	http-server-1	80	us-east-1a	healthy	
i-0cc805da02ac1cbe0	http-server-3	80	us-east-1c	unused	Target is in the stopped state
i-05c4eeb21c84d630f	http-server-2	80	us-east-1b	healthy	

b) Hit the LB again after the failure - The unhealthy/unused instance will be evicted out from the LB.

5. Launch a windows instance using the 7-step flow and RDP to it.



Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 I
windows-server	i-0473077c70b7ece9a	t2.micro	us-east-1d	running	2/2 checks passed	None	ec2-3-235-47-3.compute-1.amazonaws.com	3.235.47.3	-



Hostname: EC2AMAZ-K8H8K2J
Instance ID: i-0473077c70b7ece9a
Public IP Address: 3.235.47.3
Private IP Address: 172.31.1.177
Instance Size: t2.micro
Availability Zone: us-east-1d
Architecture: AMD64
Total Memory: 1 GB
Network Performance: Low to Moderate