To Enable AWS and Configure a webserver on it using CLI.

OBJECTIVES:

The architecture includes-

- Webserver configured on EC2 Instance

- Document Root(/var/www/html) made persistent by mounting on EBS Block Device.

- Static objects used in code such as pictures stored in S3

- Setting up Content Delivery Network using CloudFront and using the origin domain as S3 bucket.

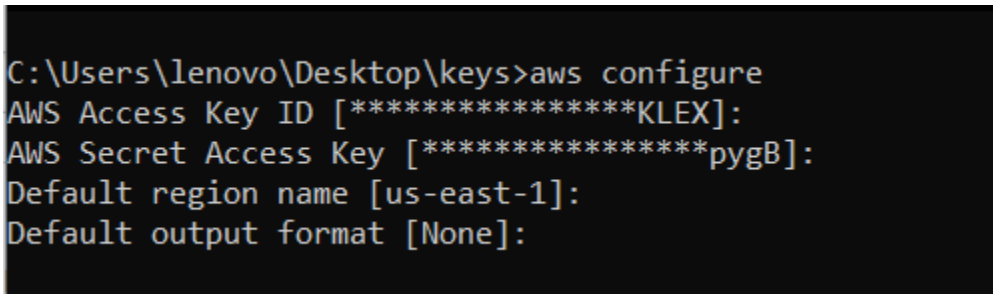
- Finally place the Cloud Front URL on the webapp code for security and low latency.

Moving towards the solution:

1. Configure AWS on your windows command prompt

First, create an IAM user then proceed.

Command: aws configure

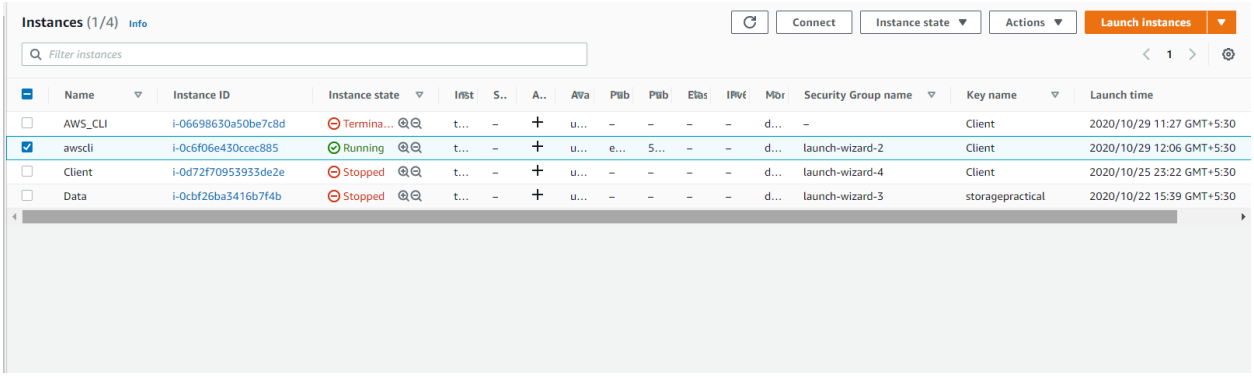


2. Launch the instance

Command: aws ec2 run-instances --image-id ami-0947d2ba12ee1ff75 --instance-type t2.micro --count 1 --subnet-id subnet-eb62cd8d --security-group-ids sg-050f2197a20601d8a --key-name Client

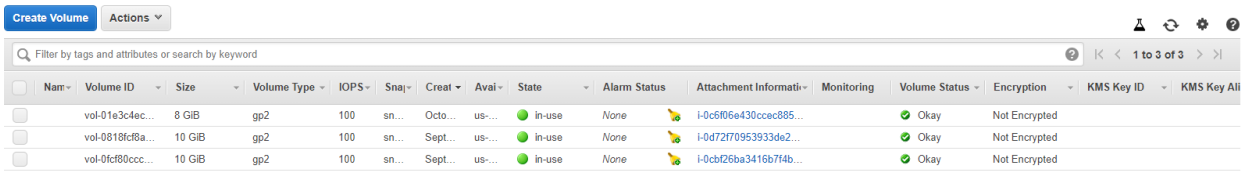
```
C:\Users\lenovo\Desktop\keys>aws ec2 run-instances --image-id  ami-0947d2ba12ee1ff75  --instance-type    t2.micro --count 1 --subnet-id subnet-eb62cd8d --security-group-ids sg-050f2197a20601d8a --key-na
me Client
{
    "Groups": [],
    "Instances": [
        {
            "AmiLaunchIndex": 0,
            "ImageId": "ami-0947d2ba12ee1ff75",
            "InstanceId": "i-0c6f06e430ccec885",
            "InstanceType": "t2.micro",
            "KeyName": "Client",
            "LaunchTime": "2020-10-29T06:36:35+00:00",
            "Monitoring": {
                "State": "disabled"
            },
            "Placement": {
                "AvailabilityZone": "us-east-1a",
                "GroupName": "",
                "Tenancy": "default"
```

ID has been launched



3. Now we shall move to create volume

Initially, there is no extra volume

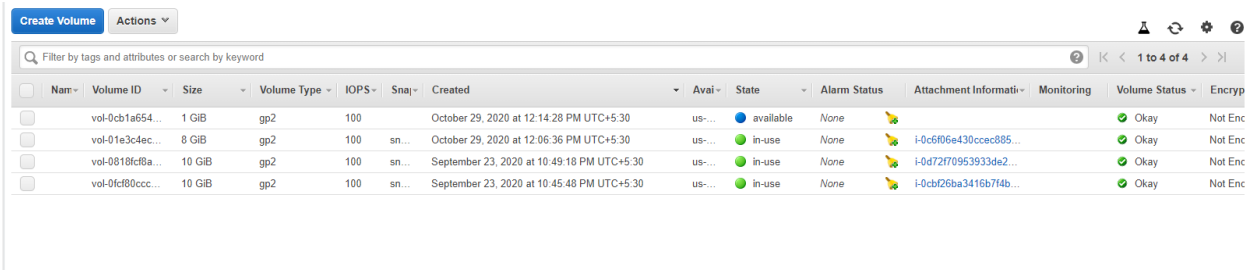


. We shall create an EBS vol of 1 GB

Command: aws ec2 create-volume - -volume-type gp2 - -size 1 - -availability-zone us-east-1a

```
C:\Users\lenovo\Desktop\keys> aws ec2 create-volume --volume-type gp2 --size 1 --availability-zone us-east-1a
{
    "AvailabilityZone": "us-east-1a",
    "CreateTime": "2020-10-29T06:44:28+00:00",
    "Encrypted": false,
    "Size": 1,
    "SnapshotId": "",
    "State": "creating",
    "VolumeId": "vol-0cb1a654680927d3d",
    "Iops": 100,
    "Tags": [],
    "VolumeType": "gp2",
    "MultiAttachEnabled": false
}


C:\Users\lenovo\Desktop\keys>
```

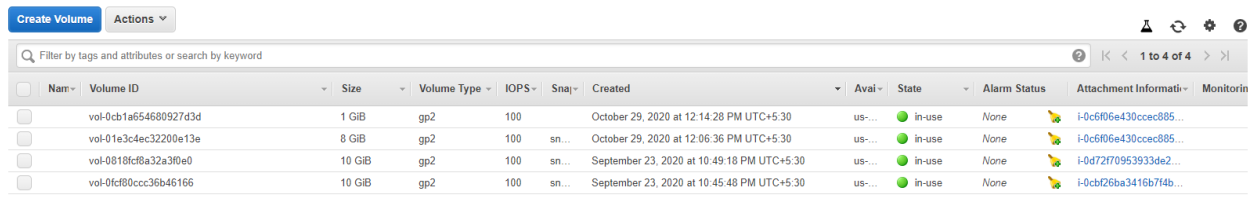
Now the new volume has been created. It is available, but yet not attached. We shall attach it to the instance that we have just launched.



4. Attaching volume

Command: aws ec2 attach-volume –instance-id i-0c6f06e430ccec885 –volume-id vol-0cb1a654680927d3d –device /dev/xvdf In the second image, volume is in use.

```
C:\Users\lenovo\Desktop\keys>aws ec2 attach-volume --instance-id i-0c6f06e430ccec885 --volume-id vol-0cb1a654680927d3d
 --device /dev/xvdf
{
    "AttachTime": "2020-10-29T06:49:43.725000+00:00",
    "Device": "/dev/xvdf",
    "InstanceId": "i-0c6f06e430ccec885",
    "State": "attaching",
    "VolumeId": "vol-0cb1a654680927d3d"
}


C:\Users\lenovo\Desktop\keys>
```



5. Logging into the instance

Command: ssh –I ec2-user 54.80.1.209 –I Client.pem sudo fdisk /dev/xvdf

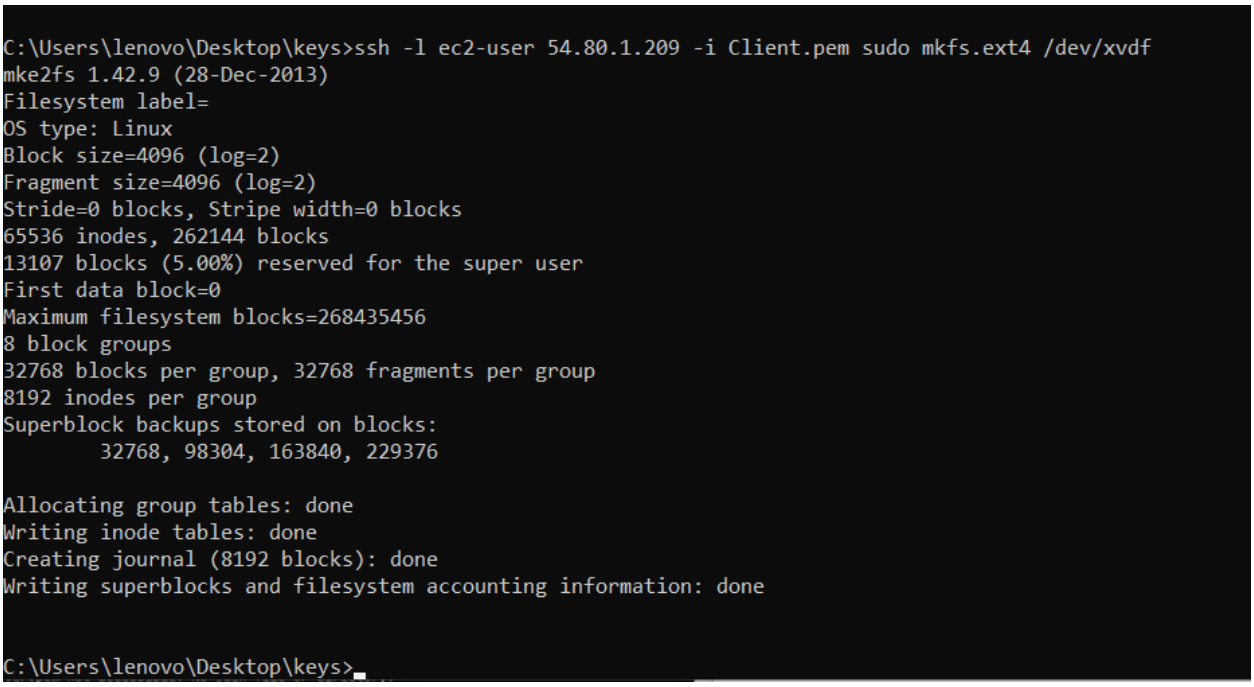
```
C:\Users\lenovo\Desktop\keys>ssh -l ec2-user 54.80.1.209 -i Client.pem sudo fdisk /dev/xvdf

Welcome to fdisk (util-linux 2.30.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS disklabel with disk identifier 0x361aeeef.

Command (m for help): _
```

6. Creating partition

```
C:\Users\lenovo\Desktop\keys>ssh -l ec2-user 54.80.1.209 -i Client.pem sudo fdisk /dev/xvdf

Welcome to fdisk (util-linux 2.30.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS disklabel with disk identifier 0x361aeeef.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1):
First sector (2048-2097151, default 2048):
Last sector, +sectors or +size{K,M,G,T,P} (2048-2097151, default 2097151): +500M

Created a new partition 1 of type 'Linux' and of size 500 MiB.

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.


C:\Users\lenovo\Desktop\keys>
```

7. Format the partition

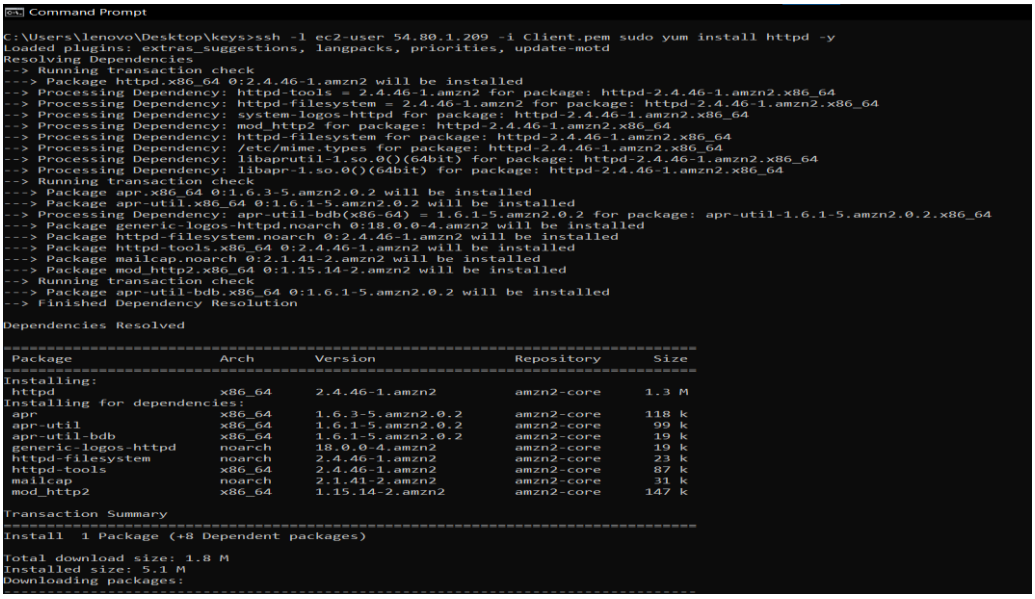
Command: ssh –I ec2-user 54.80.1.209 –I Client.pem sudo mkfs.ext4 /dev/xvdf



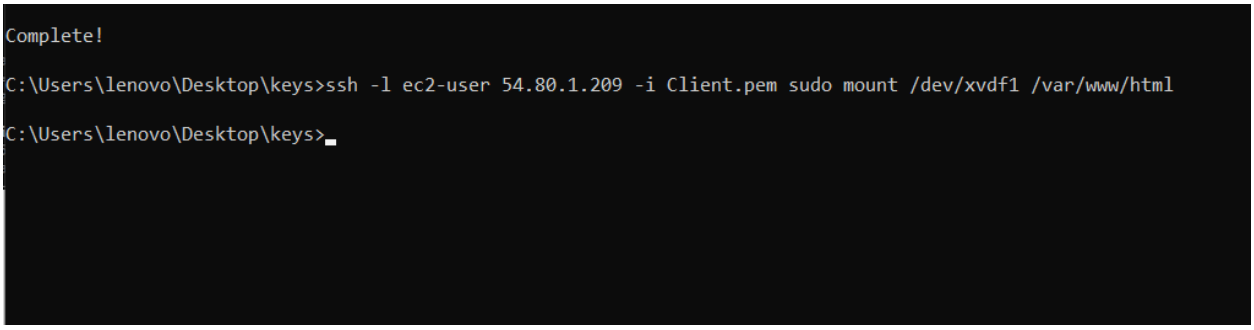
8. Mount

To mount in html we need to install apache webserver

Command: ssh –I ec2-user 54.80.1.209 –I Client.pem sudo yum install httpd -y



To mount the command is: ssh –I ec2-user 54.80.1.209 –I Client.pem sudo mount /dev/xvdf1 /var/www/html



Mounted successfully

9. Start webserver and check its status

Command:

systemctl start httpd

systemctl status httpd

```
C:\Users\lenovo\Desktop\keys>ssh -l ec2-user 54.80.1.209 -i Client.pem sudo systemctl start httpd

C:\Users\lenovo\Desktop\keys>ssh -l ec2-user 54.80.1.209 -i Client.pem sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
   Active: active (running) since Thu 2020-10-29 07:56:40 UTC; 12s ago
     Docs: man:httpd.service(8)
 Main PID: 665 (httpd)
   Status: "Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec:   0 B/sec"
   CGroup: /system.slice/httpd.service
           ├─665 /usr/sbin/httpd -DFOREGROUND
           ├─666 /usr/sbin/httpd -DFOREGROUND
           ├─667 /usr/sbin/httpd -DFOREGROUND
           ├─668 /usr/sbin/httpd -DFOREGROUND
           ├─669 /usr/sbin/httpd -DFOREGROUND
           └─670 /usr/sbin/httpd -DFOREGROUND

Oct 29 07:56:40 ip-172-31-1-188.ec2.internal systemd[1]: Starting The Apache HTTP Server...
Oct 29 07:56:40 ip-172-31-1-188.ec2.internal systemd[1]: Started The Apache HTTP Server.

C:\Users\lenovo\Desktop\keys>
```

10. Login to the aws cli

```
C:\Users\lenovo\Desktop\keys>ssh -l ec2-user 54.80.1.209 -i Client.pem
Last login: Thu Oct 29 07:29:58 2020 from 106.198.246.254

       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
Last login: Thu Oct 29 07:29:58 2020 from 106.198.246.254

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

https://aws.amazon.com/amazon-linux-2/
25 package(s) needed for security, out of 39 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-1-188 ~]$
```

11. Login to the root and then go to html directory

```
[ec2-user@ip-172-31-1-188 ~]$ sudo su - root
Last login: Thu Oct 29 07:30:47 UTC 2020 on pts/0
[root@ip-172-31-1-188 ~]# cd /var/www/html
[root@ip-172-31-1-188 html]#
```

12. Transfer the img and copy it to the directory

```
[root@ip-172-31-1-188 html]# cd /home/ec2-user
[root@ip-172-31-1-188 ec2-user]# ls
sk.jpeg
[root@ip-172-31-1-188 ec2-user]# cp sk.jpeg /var/www/html
[root@ip-172-31-1-188 ec2-user]# cd /var/www/html
[root@ip-172-31-1-188 html]# ls
awscli.html  lost+found  sk.jpeg
[root@ip-172-31-1-188 html]# vi awscli.html
```

13. Now write the html code

```
<html>

<!-- hitwebcounter Code START -->
<a href="https://www.hitwebcounter.com" target="_blank">
<img src="https://hitwebcounter.com/counter/counter.php?page=7700833&style=0003&nbdigits=3&type=page&initCount=12" title
="Total Website Hits" Alt="Web Hits"   border="0" /></a>
<body bgcolor='aqua'>
<style>
h1 {text-align: center;}
h6 {text-align:center;}
</style>


<h1>Trying aws with cli</h1>

<h6>Working on AWS with cli is far better than the GUI experience!</h6>

<style>
img {
  display: block;
  margin-left: auto;
  margin-right: auto;
}
</style>
<img src='sk.jpeg'>

</html>
```

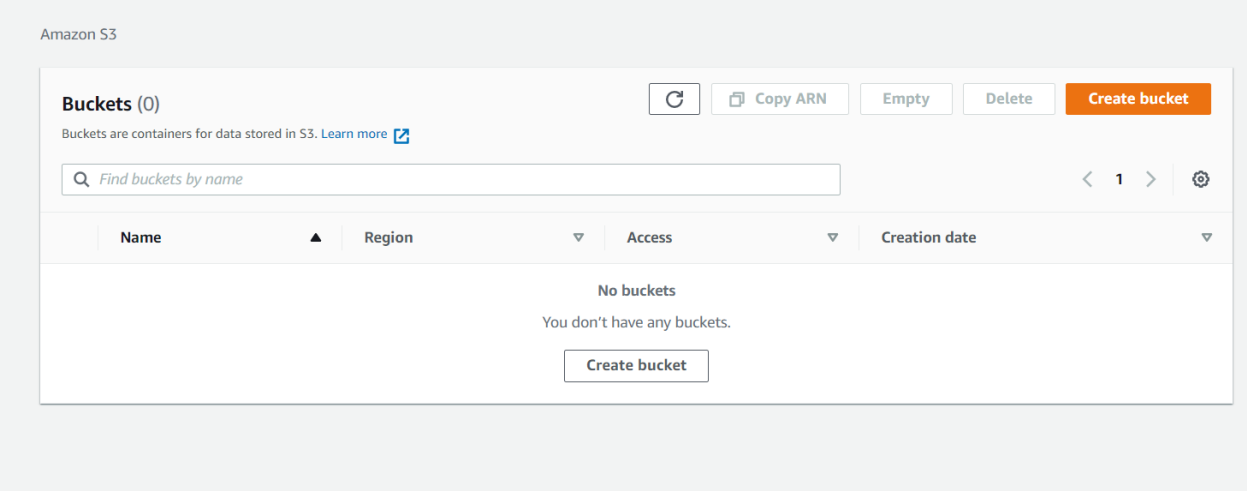
Now we can check the webserver on the browser. On your browser, type your IP and the file name.

However, as EBS is not too reliable, we shall switch to S3 storage. We shall now, put our image in S3 bucket and continue further.

```
[root@ip-172-31-1-188 html]# exit
logout
[ec2-user@ip-172-31-1-188 ~]$
[ec2-user@ip-172-31-1-188 ~]$ exit
logout
Connection to 54.80.1.209 closed.
```

14. come out of instance to make s3 bucket

Currently, there is no bucket.



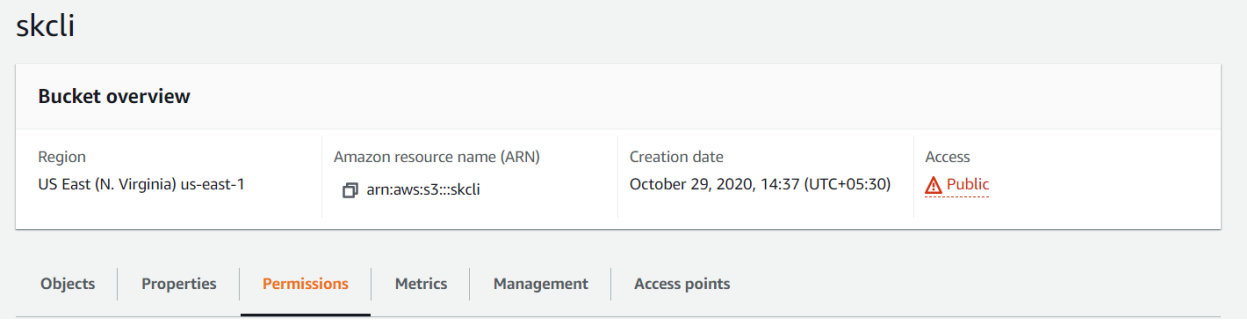
We shall use the following vommand to create the bucket.

```
C:\Users\lenovo\Desktop\keys>aws s3api create-bucket --bucket shreya18213 --region us-east-1 --create-bucket-configuration LocationConstraint
{
    "Location": "http://shreya18213.s3.amazonaws.com/"
}
```

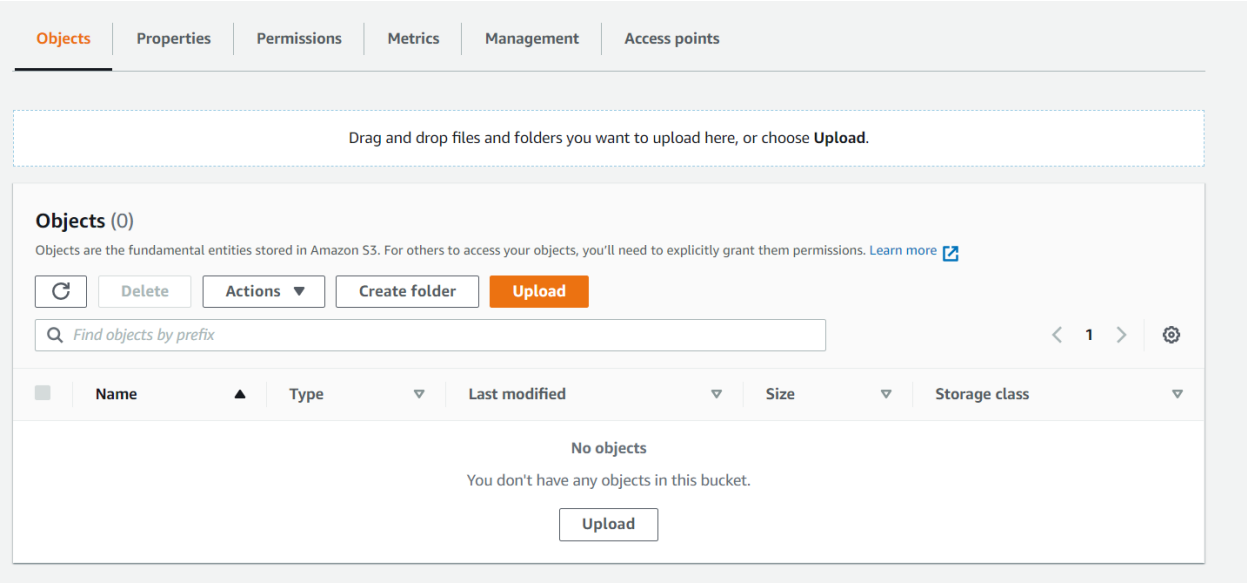
Make the bucket public

Command: aws s3api put-bucket-acl –acl public-read –bucket skcli (skcli is the bucket name)

```
C:\Users\lenovo\Desktop\keys>aws s3api put-bucket-acl --acl public-read --bucket skcli


C:\Users\lenovo\Desktop\keys>
```

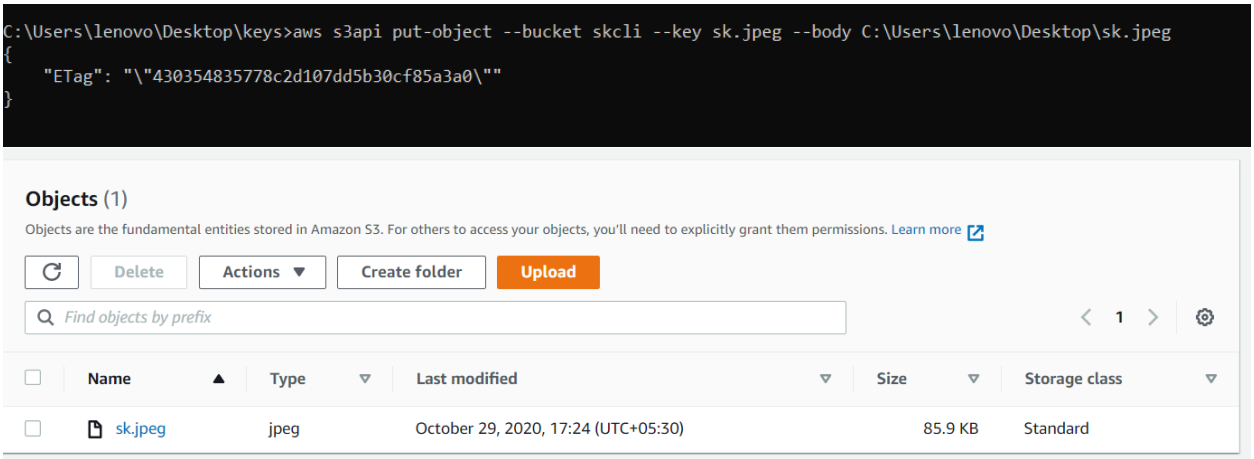


Currently there are no objects as shown below



15. Adding objects.

Command: aws s3api put-object –bucket skcli –key sk.jpeg –body C:\Users\lenovo\Desktop\sk.jpeg

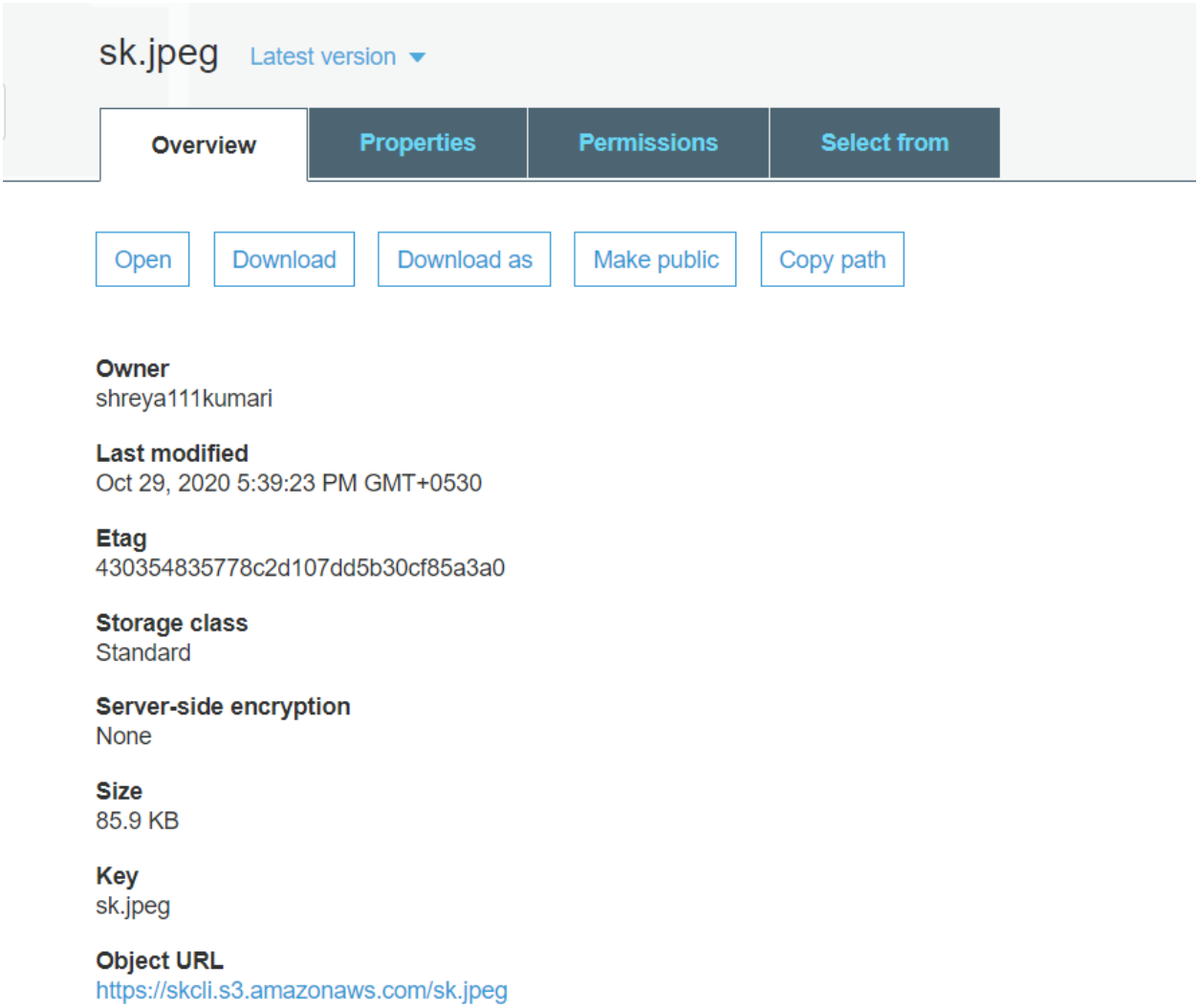


Object is created. The next step is to make it public

16. Making object public

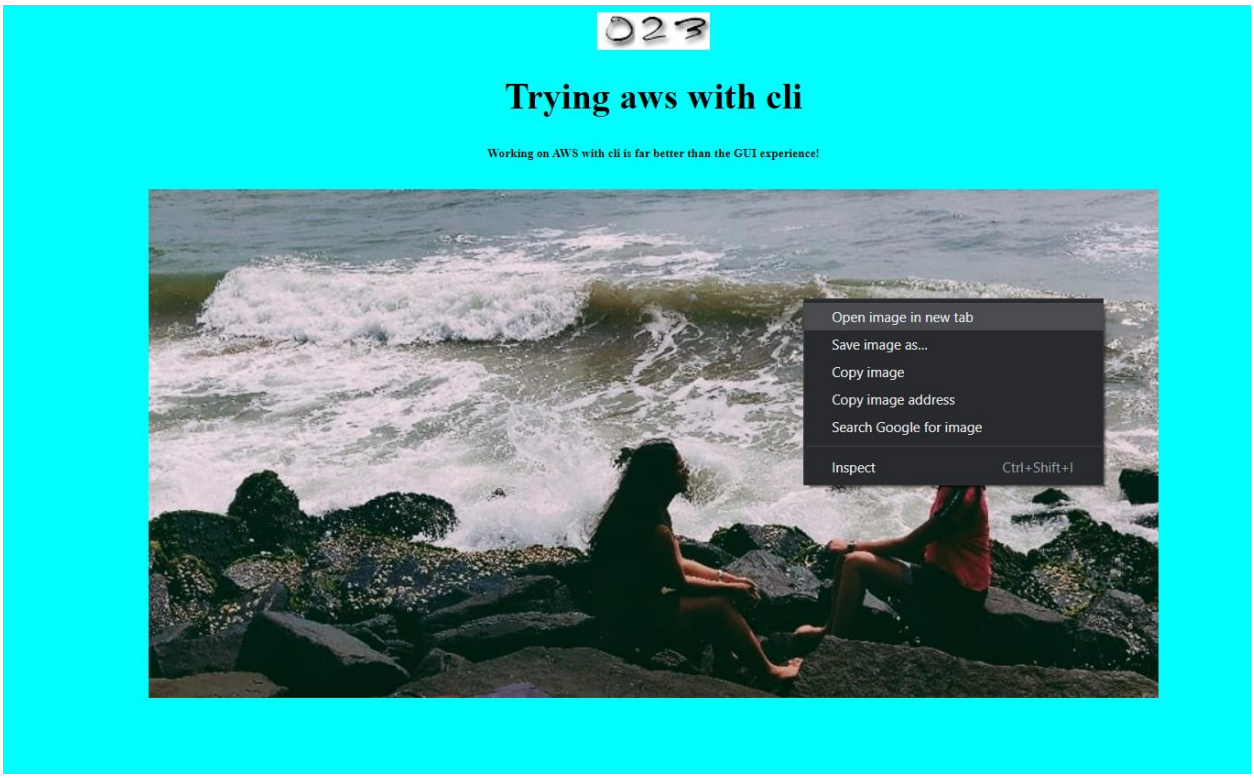
Command: aws s3api put-object-acl –bucket skcli –key sk.jpeg –grant-read uri=http://acs.amazonaws.com/groups/global/AllUsers

```
C:\Users\lenovo\Desktop\keys>aws s3api put-object-acl --bucket skcli --key sk.jpeg --grant-read uri=http://acs.amazonaws
.com/groups/global/AllUsers
```



17. Login to the instance again, and in the HTML file, use the object url

```
<html>

<!-- hitwebcounter Code START -->
<a href="https://www.hitwebcounter.com" target="_blank">
<img src="https://hitwebcounter.com/counter/counter.php?pag
="Total Website Hits" Alt="Web Hits"   border="0" /></a>
<body bgcolor='aqua'>
<style>
h1 {text-align: center;}
h6 {text-align:center;}
</style>


<h1>Trying aws with cli</h1>

<h6>Working on AWS with cli is far better than the GUI expe

<style>
img {
  display: block;
  margin-left: auto;
  margin-right: auto;
}
</style>
<img src='https://skcli.s3.amazonaws.com/sk.jpeg'>

</html>
-- INSERT --
```



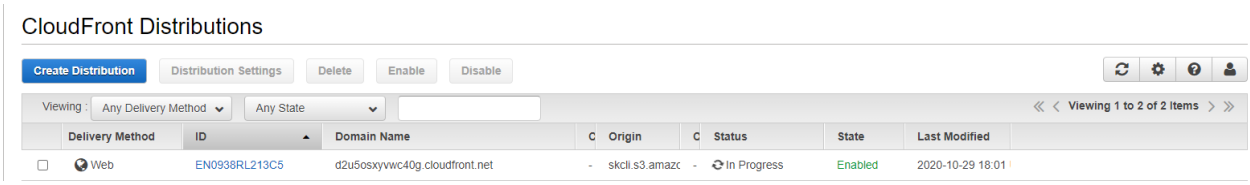
18. Using Cloud Front

- To enhance user's experience
- To avoid latency

  Command: aws cloudfront create-distribution –origin-domain-name skcli.s3.amazonaws.com –default-root-object dir-1/sk.jpeg

```
C:\Users\lenovo\Desktop\keys>aws cloudfront create-distribution --origin-domain-name skcli.s3.amazonaws.com --default-ro
ot-object dir-1/sk.jpeg
{
    "Location": "https://cloudfront.amazonaws.com/2019-03-26/distribution/EN0938RL213C5",
    "ETag": "E2FHAWVV25MU42",
    "Distribution": {
        "Id": "EN0938RL213C5",
        "ARN": "arn:aws:cloudfront::648825576930:distribution/EN0938RL213C5",
        "Status": "InProgress",
        "LastModifiedTime": "2020-10-29T12:31:31.510000+00:00",
        "InProgressInvalidationBatches": 0,
        "DomainName": "d2u5osxyvwc40g.cloudfront.net",
        "ActiveTrustedSigners": {
            "Enabled": false,
            "Quantity": 0
```

Cloud Front distribution is created.



19. Using domain name of cloudfront for the image:

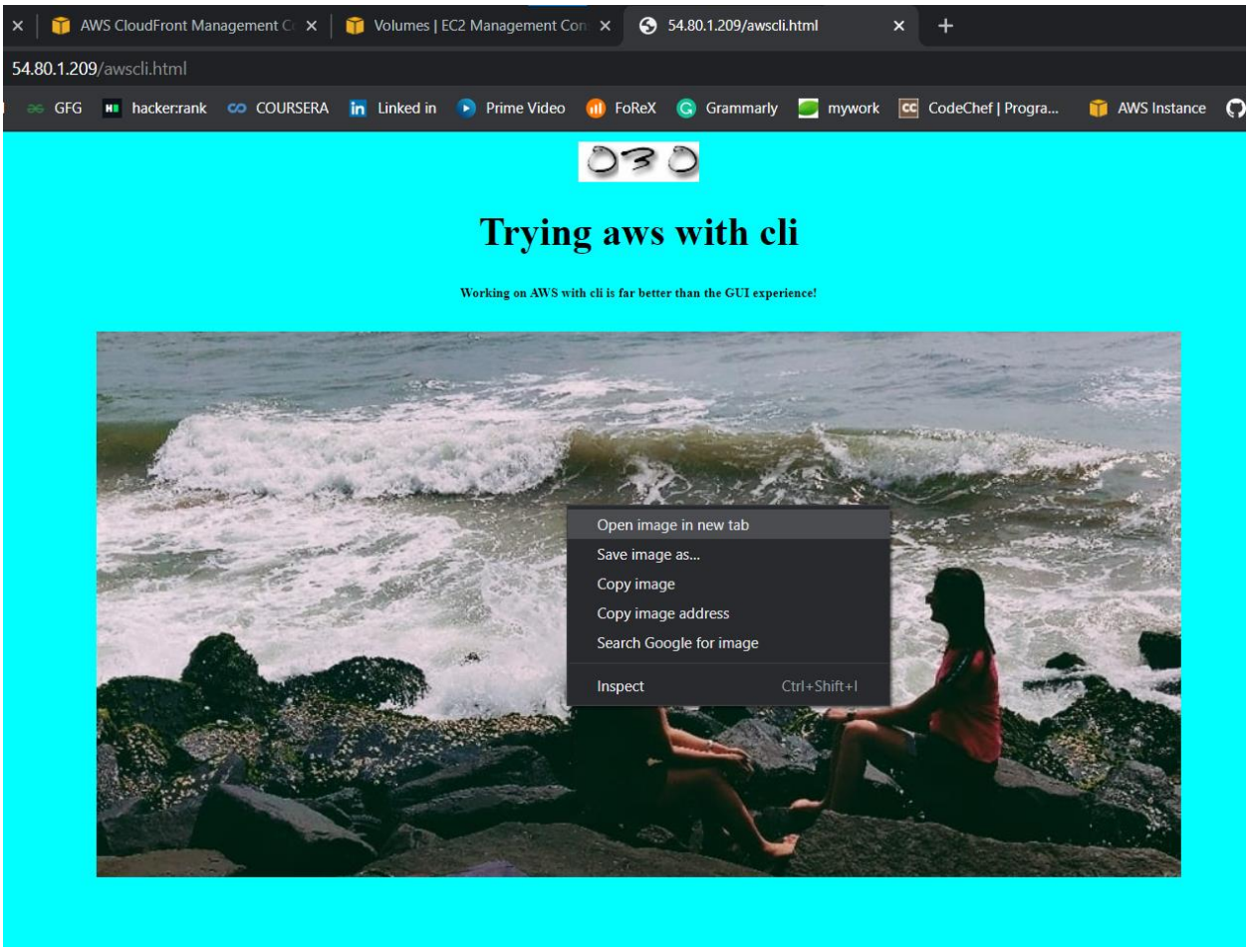
Paste the domain name of the cloud front in the image source as shown in the image.

```
<style>
img {
  display: block;
  margin-left: auto;
  margin-right: auto;
}
</style>
<img src='http://d2u5osxyvwc40g.cloudfront.net/sk.jpeg'>

</html>
"awscli.html" 27L, 622C
```

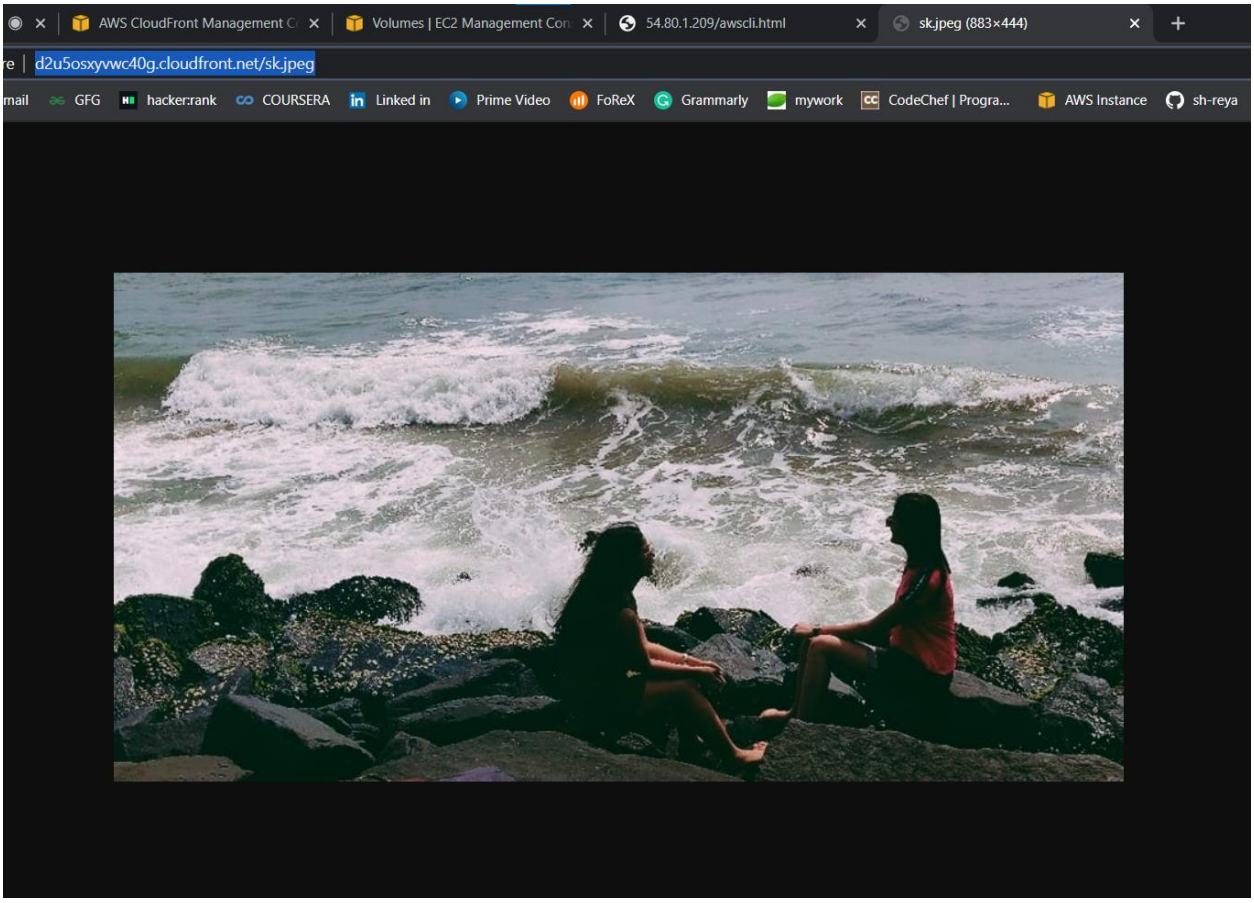
Now, open this file by typing the public ip and the name of the file as shown in the image.

In my case, it is:

54.80.1.209/awscli.html



Open the image in the new tab to see if the link provided is of the cloud front. If yes, the task has been completed successfully!



The url of the image is of the cloudfront. So, here I have completed the task 6 of ARTH successfully.