Created by:- Abhishek Kumar

TASK DESCRIPTION:

- Create High Availability Architecture with AWS CLI
- Webserver configured on EC2 Instance using cli–

- 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.

At first, I'll create New instance
then create a storage of 1 GB

then

Partition , formatting,mounting

Creating S3 bucket via cli and make it public

Putting object in s3-bucket and make it public via cli

Creating Cloud-Front Distribution via cli.

LAUNCHING AN INSTANCE

```
C:\Users\Abhishek kumar>aws ec2 run-instances --image-id ami-0e306788ff2473ccb --instance-type t2.micro --count 1 --subnet-id subnet-722a231a --security-group-ids sg-02d2c18e59a9aac97 --key-name KeyHadoop

An error occurred (InvalidKeyPair.NotFound) when calling the RunInstances operation: The key pair 'KeyHadoop' does not exist

C:\Users\Abhishek kumar>aws ec2 run-instances --image-id ami-0e306788ff2473ccb --instance-type t2.micro --count 1 --subnet-id subnet-722a231a --security-group-ids sg-02d2c18e59a9aac97 --key-name 23rdsept1
{
    "Groups": [],
    "Instances": [
        {
            "AmiLaunchIndex": 0,
            "ImageId": "ami-0e306788ff2473ccb",
            "InstanceId": "i-027e06b1cd5d5b6df",
            "InstanceType": "t2.micro",
            "KeyName": "23rdsept1",
            "LaunchTime": "2020-10-26T17:19:29+00:00",
            "Monitoring": {
                "State": "disabled"
            },
            "Placement": {
                "AvailabilityZone": "ap-south-1a",
```

On aws website you can see, the instance has been created.

Name	Instance	Inst	Avai	Instance	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 IPs	Key Name	Monitoring	Launch Time	Security Groups	Owner
	i-027e0...	t2....	ap...	run...	Initializing	None	ec2-13-235-254-216.ap...	13.235.254.216	-	23rdsept1	disabled	October 26, 2020 at 10:49:2...	launch-wizard-10	946697907226
top notch ...	i-0780a...	t2....	ap...	sto...		None		-	-	keyHadoop	disabled	October 25, 2020 at 11:09:4...	launch-wizard-10	946697907226
22nd sept-dn	i-0e183...	t2....	ap...	sto...		None		-	-	keyHadoop	disabled	October 25, 2020 at 11:07:5...	launch-wizard-1	946697907226

Command:- aws ec2 run-instances --image-id ami-0e306788ff2473ccb --instance-type t2.micro --count 1 --subnet-id subnet-884872e0 --security-group-ids sg-02fb764381c3dd016 --key-name keyhadoop

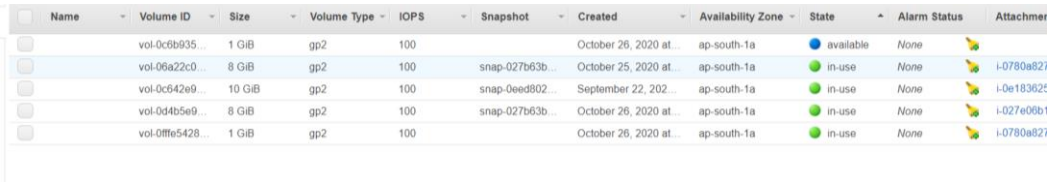
STARTED THAT INSTANCE

```
C:\Users\Abhishek kumar>aws ec2 start-instances --instances-ids i-027e06b1cd5d5b6df
usage: aws [options] <command> <subcommand> [<subcommand> ...] [parameters]
To see help text, you can run:

  aws help
  aws <command> help
  aws <command> <subcommand> help
aws: error: the following arguments are required: --instance-ids

C:\Users\Abhishek kumar>aws ec2 start-instances --instance-ids i-027e06b1cd5d5b6df
{
    "StartingInstances": [
        {
            "CurrentState": {
                "Code": 0,
                "Name": "pending"
            },
            "InstanceId": "i-027e06b1cd5d5b6df",
            "PreviousState": {
                "Code": 80,
                "Name": "stopped"
            }
        }
    ]
}
```

CREATED VOLUME OF SIZE 1GB

```
C:\Users\Abhishek kumar>aws ec2 create-volume --volume-type gp2 --size 1 --availability-zone ap-south-1a
{
    "AvailabilityZone": "ap-south-1a",
    "CreateTime": "2020-10-26T18:00:29+00:00",
    "Encrypted": false,
    "Size": 1,
    "SnapshotId": "",
    "State": "creating",
    "VolumeId": "vol-064516ae1fb6adb53",
    "Iops": 100,
    "Tags": [],
    "VolumeType": "gp2"
}


C:\Users\Abhishek kumar>
```

You can check the Volume created:-



Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone	State	Alarm Status	Attachmer
	vol-0c6b935...	1 GiB	gp2	100		October 26, 2020 at...	ap-south-1a	available	None	
	vol-06a22c0...	8 GiB	gp2	100	snap-027b63b...	October 25, 2020 at...	ap-south-1a	in-use	None	i-0780a827
	vol-0c642e9...	10 GiB	gp2	100	snap-0eed802...	September 22, 202...	ap-south-1a	in-use	None	i-0e183625
	vol-0d4b5e9...	8 GiB	gp2	100	snap-027b63b...	October 26, 2020 at...	ap-south-1a	in-use	None	i-027e06b1
	vol-0fffe5428...	1 GiB	gp2	100		October 26, 2020 at...	ap-south-1a	in-use	None	i-0780a827

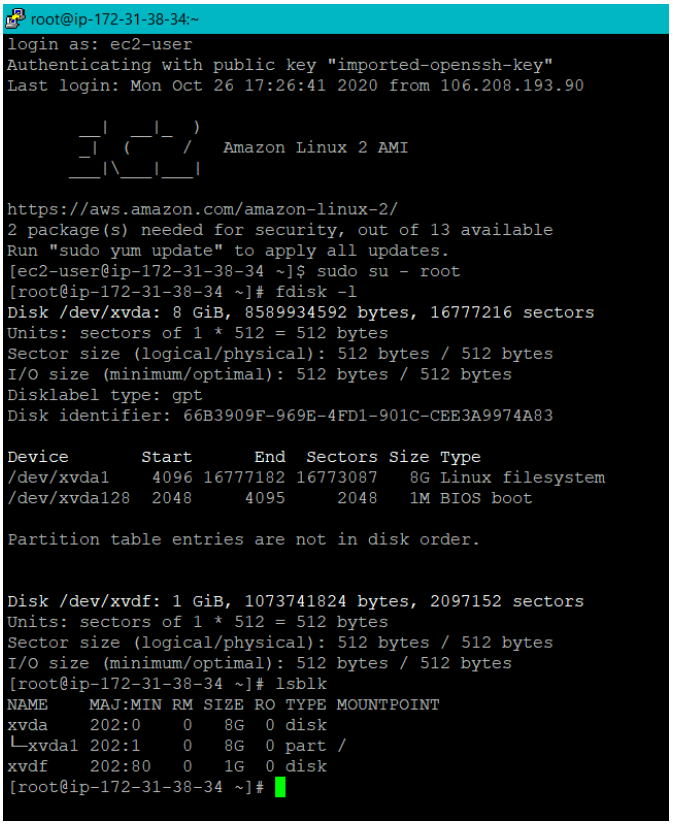
The Available one

NOW, WE HAVE TO ATTACH THE VOLUME OF 1 GB

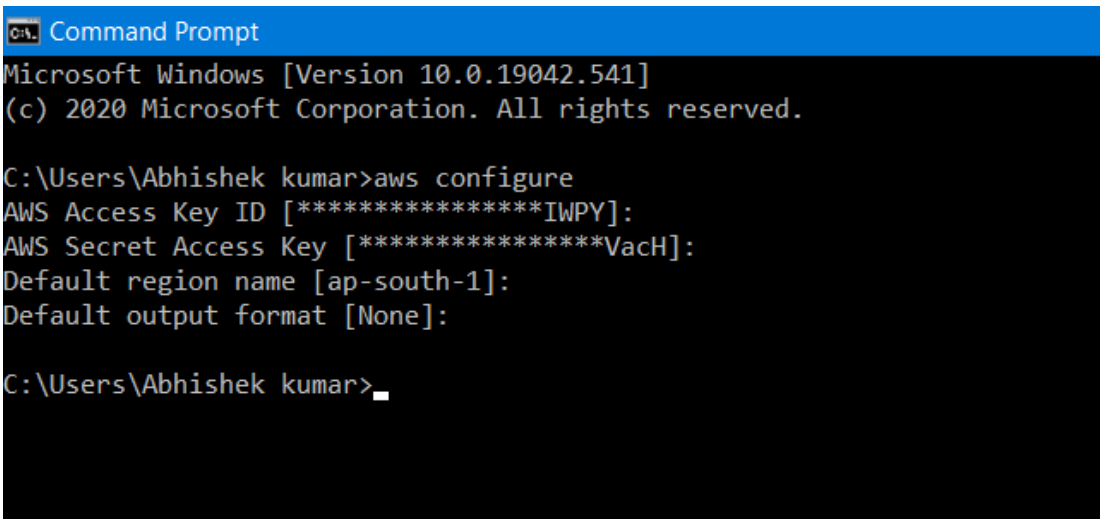
```
Command Prompt
  aws <command> <subcommand> help

Unknown options: i-027e06b1cd5d5b6df

C:\Users\Abhishek kumar>aws ec2 attach-volume --instance-id i-027e06b1cd5d5b6df  --volume-id vol-0c6b935df280b03c5 --device /dev/xvdf
{
    "AttachTime": "2020-10-26T18:10:09.953000+00:00",
    "Device": "/dev/xvdf",
    "InstanceId": "i-027e06b1cd5d5b6df",
    "State": "attaching",
    "VolumeId": "vol-0c6b935df280b03c5"
}
```

aws ec2 attach-volume –instance-id i-0a06ad006e50cf731 –volume-id vol-_____ --device /dev/xvdf

Now, to check that volume we first Login to SSh client



Now use command prompt to login to Aws account via IAm user with Aws configure command



SSH LOGIN VIA COMMAND PROMPT

```
C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.pem sudo fdisk /dev/

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 0xd3deb20d.

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.
```

PARTITION COMPLETED DOWN

```
C:\Users\Abhishek kumar>cd Desktop

C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.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 0xd3deb20d.

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\Abhishek kumar\Desktop>
```

FORMAT DONE DOWN

ec2-user 35.154.172.164 -i 23rdsept1.pem sudo mkfs.ext4 /dev/xvdf

```
C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.pem sudo mkfs.ext4 /dev/xvdf
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
65536 inodes, 262144 blocks
13107 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done


C:\Users\Abhishek kumar\Desktop>
```

INSTALL APACHE HTTPD

```
C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.pem sudo yum install httpd -y
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
Resolving Dependencies
--> Running transaction check
---> Package httpd.x86_64 0:2.4.46-1.amzn2 will be installed
--> Processing Dependency: httpd-tools = 2.4.46-1.amzn2 for package: httpd-2.4.46-1.amzn2.x86_64
--> Processing Dependency: httpd-filesystem = 2.4.46-1.amzn2 for package: httpd-2.4.46-1.amzn2.x86_64
--> Processing Dependency: system-logos-httpd for package: httpd-2.4.46-1.amzn2.x86_64
--> Processing Dependency: mod_http2 for package: httpd-2.4.46-1.amzn2.x86_64
--> Processing Dependency: httpd-filesystem for package: httpd-2.4.46-1.amzn2.x86_64
--> Processing Dependency: /etc/mime.types for package: httpd-2.4.46-1.amzn2.x86_64
--> Processing Dependency: libaprutil-1.so.0()(64bit) for package: httpd-2.4.46-1.amzn2.x86_64
--> Processing Dependency: libapr-1.so.0()(64bit) for package: httpd-2.4.46-1.amzn2.x86_64
--> Running transaction check
---> Package apr.x86_64 0:1.6.3-5.amzn2.0.2 will be installed
---> Package apr-util.x86_64 0:1.6.1-5.amzn2.0.2 will be installed
--> Processing Dependency: apr-util-bdb(x86-64) = 1.6.1-5.amzn2.0.2 for package: apr-util-1.6.1-5.amzn2.0.2.x86_64
---> Package generic-logos-httpd.noarch 0:18.0.0-4.amzn2 will be installed
---> Package httpd-filesystem.noarch 0:2.4.46-1.amzn2 will be installed
---> Package httpd-tools.x86_64 0:2.4.46-1.amzn2 will be installed
---> Package mailcap.noarch 0:2.1.41-2.amzn2 will be installed
---> Package mod_http2.x86_64 0:1.15.14-2.amzn2 will be installed
--> Running transaction check
---> Package apr-util-bdb.x86_64 0:1.6.1-5.amzn2.0.2 will be installed
--> Finished Dependency Resolution
```

MOUNT THAT VOLUME

ssh -l ec2-user 35.154.172.164 -i 23rdsept1.pem sudo mount /dev/xvdf /var/www/html

```
  mailcap.noarch 0:2.1.41-2.amzn2
  mod_http2.x86_64 0:1.15.14-2.amzn2

Complete!

C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.pem sudo mount /dev/xvdf1 /var/www/html

C:\Users\Abhishek kumar\Desktop>
```

Systemctl start httpd

Systemctl status httpd

```
C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.pem sudo mount /dev/xvdf1 /var/www/html

C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.pem sudo systemctl start httpd

C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.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 07:55:46 UTC; 8s ago
     Docs: man:httpd.service(8)
 Main PID: 14571 (httpd)
   Status: "Processing requests..."
   CGroup: /system.slice/httpd.service
           ├─14571 /usr/sbin/httpd -DFOREGROUND
           ├─14572 /usr/sbin/httpd -DFOREGROUND
           ├─14573 /usr/sbin/httpd -DFOREGROUND
           ├─14574 /usr/sbin/httpd -DFOREGROUND
           ├─14575 /usr/sbin/httpd -DFOREGROUND
           └─14576 /usr/sbin/httpd -DFOREGROUND

Oct 29 07:55:46 ip-172-31-38-34.ap-south-1.compute.internal systemd[1]: Starting The Apache HTTP Server...
Oct 29 07:55:46 ip-172-31-38-34.ap-south-1.compute.internal systemd[1]: Started The Apache HTTP Server.

C:\Users\Abhishek kumar\Desktop>
```

Login in instance via cli :

C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.pem

```
C:\Users\Abhishek kumar\Desktop>ssh -l ec2-user 35.154.172.164 -i 23rdsept1.pem
Last login: Thu Oct 29 07:46:17 2020 from ec2-13-233-177-0.ap-south-1.compute.amazonaws.com
Last login: Thu Oct 29 07:46:17 2020 from ec2-13-233-177-0.ap-south-1.compute.amazonaws.com

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

https://aws.amazon.com/amazon-linux-2/
26 package(s) needed for security, out of 40 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-38-34 ~]$
```

Sudo su – root

Go inside html

Created file of html

Viewed by cat command

To run that webpage in web browser

http://35.154.172.164/task.html

<ip>/filename

```
[root@ip-172-31-38-34 ~]# cd /var/www/html
[root@ip-172-31-38-34 html]# ls
lost+found
[root@ip-172-31-38-34 html]# vi task.html
[root@ip-172-31-38-34 html]# cat task.html
<html>
<body>
<h1>PAge of AWS via CLI</h1>
<h2>by Abhishek</h2>
</body>
</html>

[root@ip-172-31-38-34 html]#
```

Browser view

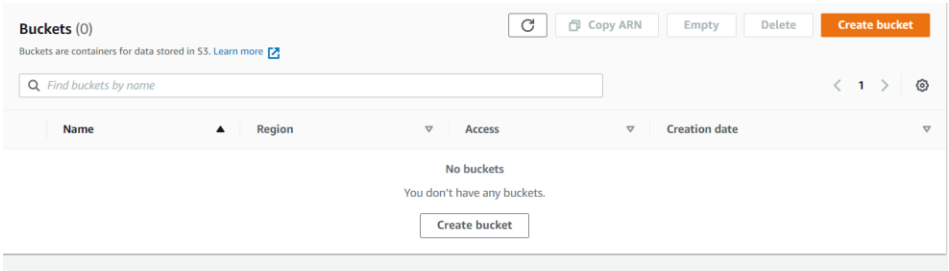
PAge of AWS via CLI

by Abhishek

```
cp: cannot stat '0pic.jpg': No such file or directory
[root@ip-172-31-38-34 html]# cd /home/ec2-user
[root@ip-172-31-38-34 ec2-user]# ls
0pic.jpg
[root@ip-172-31-38-34 ec2-user]# cp 0pic.jpg /var/www/html
[root@ip-172-31-38-34 ec2-user]# cd /var/www/html
[root@ip-172-31-38-34 html]# ls
0pic.jpg  lost+found  task.html
[root@ip-172-31-38-34 html]# vi task.html
[root@ip-172-31-38-34 html]# cat task..html
cat: task..html: No such file or directory
[root@ip-172-31-38-34 html]# cat task.html
<html>
<body>
<h1>PAge of AWS via CLI</h1>
<h2>by Abhishek </h2>
<h3>here is my picture</h3>
<img src=0pic.jpg height=500 width 300>
</body>
</html>
```

```
[root@ip-172-31-38-34 html]# vi task.html
[root@ip-172-31-38-34 html]# cat task.html
<html>
<body>
<h1>PAge of AWS via CLI</h1>
<h2>by Abhishek </h2>
<h3>here is my picture</h3>
<img src=0pic.jpg height=500 width 300>
</body>
</html>

[root@ip-172-31-38-34 html]#
```

CREATE BUCKET

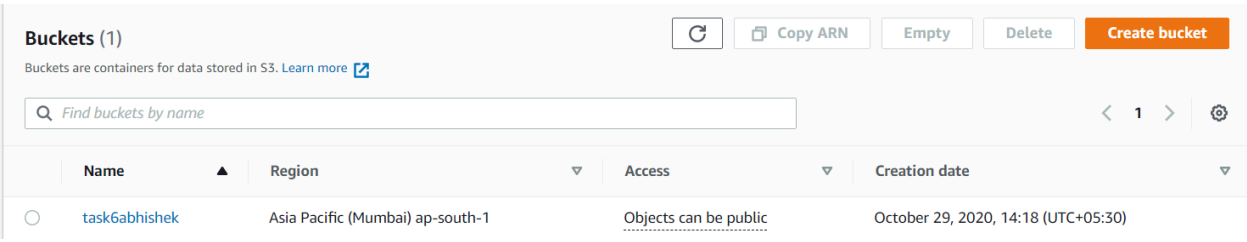


CREATING BUCKET

C:\Users\Abhishek kumar\Desktop>aws s3api create-bucket --bucket task6abhishek --region ap-south-1 --create-bucket-configuration LocationConstraint=ap-south-1

```
C:\Users\Abhishek kumar\Desktop>aws s3api create-bucket --bucket task6abhishek --region ap-south-1 --
-create-bucket-configuration LocationConstraint=ap-south-1
{
    "Location": "http://task6abhishek.s3.amazonaws.com/"
}


C:\Users\Abhishek kumar\Desktop>
```

SEE



MAKING BUCKET PUBLICALLY ACCESSIBLE

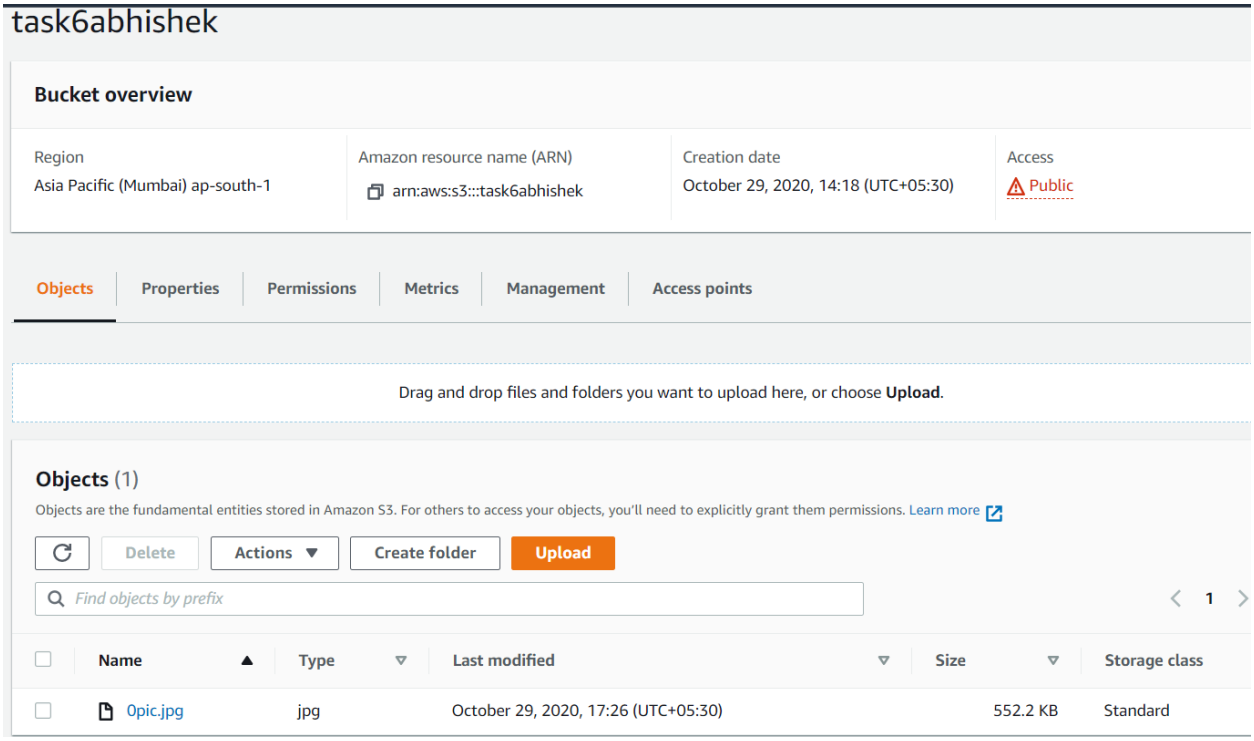
C:\Users\Abhishek kumar\Desktop>aws s3api put-bucket-acl --acl public-read --bucket task6abhishek

```
C:\Users\Abhishek kumar\Desktop>aws s3api put-bucket-acl --acl public-read --bucket task6abhishek
```

UPLAODING FILES IN BUCKET

aws s3api put-object --bucket task6abhishek --key 0pic.jpg --body "C:\Users\Abhishek kumar\Desktop\0pic.jpg"

```
C:\Users\Abhishek kumar\Desktop>aws s3api put-object --bucket task6abhishek --key 0pic.jpg --body "C:\Users\Abhishek kumar\Desktop\0pic.jpg"
{
    "ETag": "\"15d11d9d50b9f5f5b9abce09008927b0\""
}
```



WE HAVE TO MAKE THE OBJECT PUBLIC

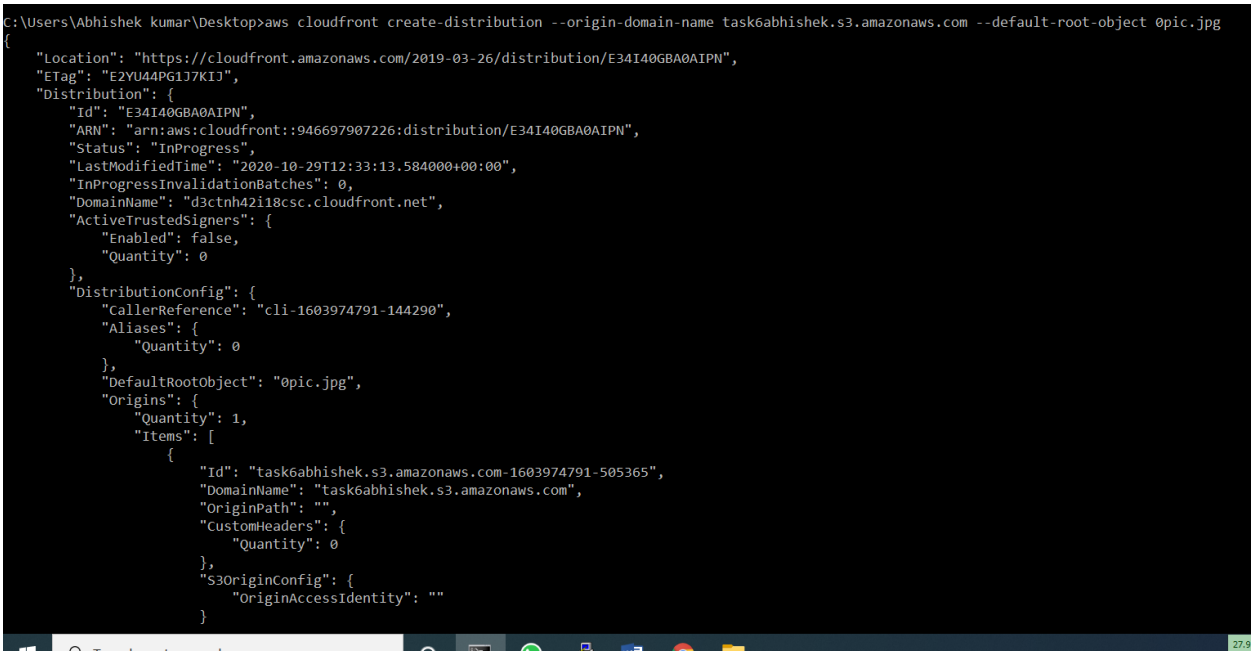
C:\Users\Abhishek kumar\Desktop>aws s3api put-object-acl --bucket task6abhishek --key 0pic.jpg --grant-read uri=http://acs.amazonaws.com/groups/global/AllUsers

Here I am making bucket object public but here access policy is only download and read instead of read on webserver. Here this policy download object first and after download we can read it. You can change this policy by changing –acl rule like private,public-read,public-read-write etc.

```
<html>
<body>
<h1>PAge of AWS via CLI</h1>
<h2>by Abhishek </h2>
<h3>here is my picture</h3>
<img src=https://task6abhishek.s3.ap-south-1.amazonaws.com/0pic.jpg height=500 width 300>

</body>
</html>
```

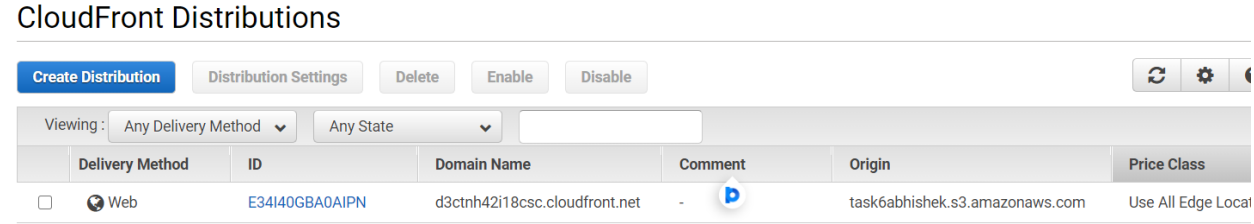
CREATING CLOUDFRONT

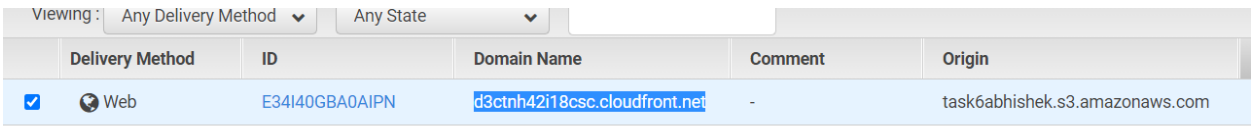
C:\Users\Abhishek kumar\Desktop>aws cloudfront create-distribution --origin-domain-name task6abhishek.s3.amazonaws.com --default-root-object 0pic.jpg



Now you can see here.

CloudFront Is successfully Deployed





D3CTNH42I18CSC.CLOUDFRONT.NET << link

the image source file

Now changed to that link

```
[root@ip-172-31-38-34 html]# cat task.html
<html>
<body>
<h1>PAge of AWS via CLI</h1>
<h2>by Abhishek </h2>
<h3>here is my picture</h3>
<img src=http://d3ctnh42i18csc.cloudfront.net height=500 width 300>
</body>
</html>
```