

Project 1 - Deploying a web server in Windows instance

1. Instance Details of created instance

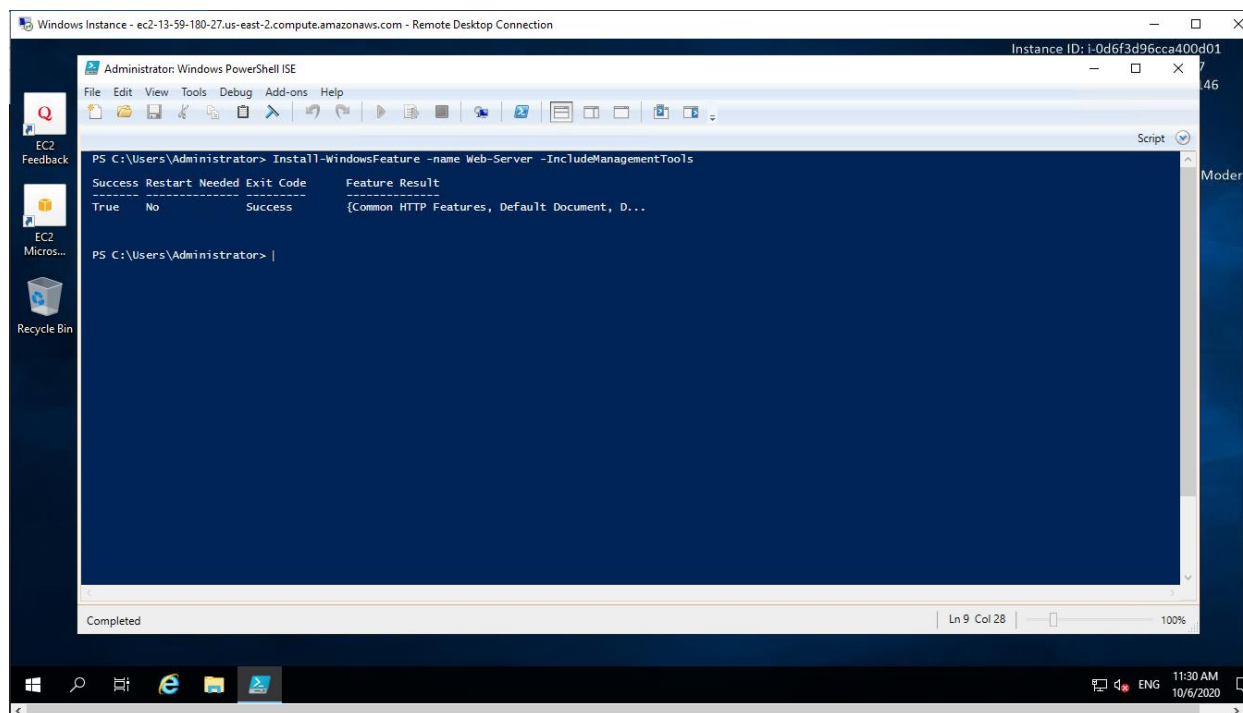
The screenshot displays the AWS Management Console interface for a specific instance. The top navigation bar includes the AWS logo, a 'Services' dropdown, and user information (rajthakur, Ohio, Support). A banner at the top promotes the AWS Compute Optimizer. Below this, a horizontal menu allows switching between 'Details', 'Security', 'Networking', 'Storage', 'Monitoring', and 'Tags'. The 'Details' tab is active, showing a table of instance attributes. The table is organized into three columns: Platform, AMI, and Monitoring. The Platform column lists 'windows' and 'Windows'. The AMI column lists 'ami-0ca69a9d06da3835d', 'Windows_Server-2019-English-Full-Base-2020.09.09', and 'amazon/Windows_Server-2019-English-Full-Base-2020.09.09'. The Monitoring column lists 'disabled', 'Disabled', and 'normal'. Other attributes like 'Launch time', 'Stop-hibernate behavior', 'State transition reason', 'State transition message', 'Owner', 'AMI ID', 'AMI name', 'AMI location', 'AMI Launch index', 'Credit specification', 'Usage operation', 'Key pair name', 'Kernel ID', and 'RAM disk ID' are also visible. The bottom of the console shows a footer with 'Feedback', 'English (US)', and copyright information.

Platform	AMI ID	Monitoring
windows	ami-0ca69a9d06da3835d	disabled
Platform details	AMI name	Termination protection
Windows	Windows_Server-2019-English-Full-Base-2020.09.09	Disabled
Launch time	AMI location	Lifecycle
Tue Oct 06 2020 16:47:04 GMT+0530 (India Standard Time) (3 minutes)	amazon/Windows_Server-2019-English-Full-Base-2020.09.09	normal
Stop-hibernate behavior	AMI Launch index	Key pair name
disabled	0	firstkeypair
State transition reason	Credit specification	Kernel ID
-	standard	-
State transition message	Usage operation	RAM disk ID
-	RunInstances:0002	-
Owner		
643891741780		

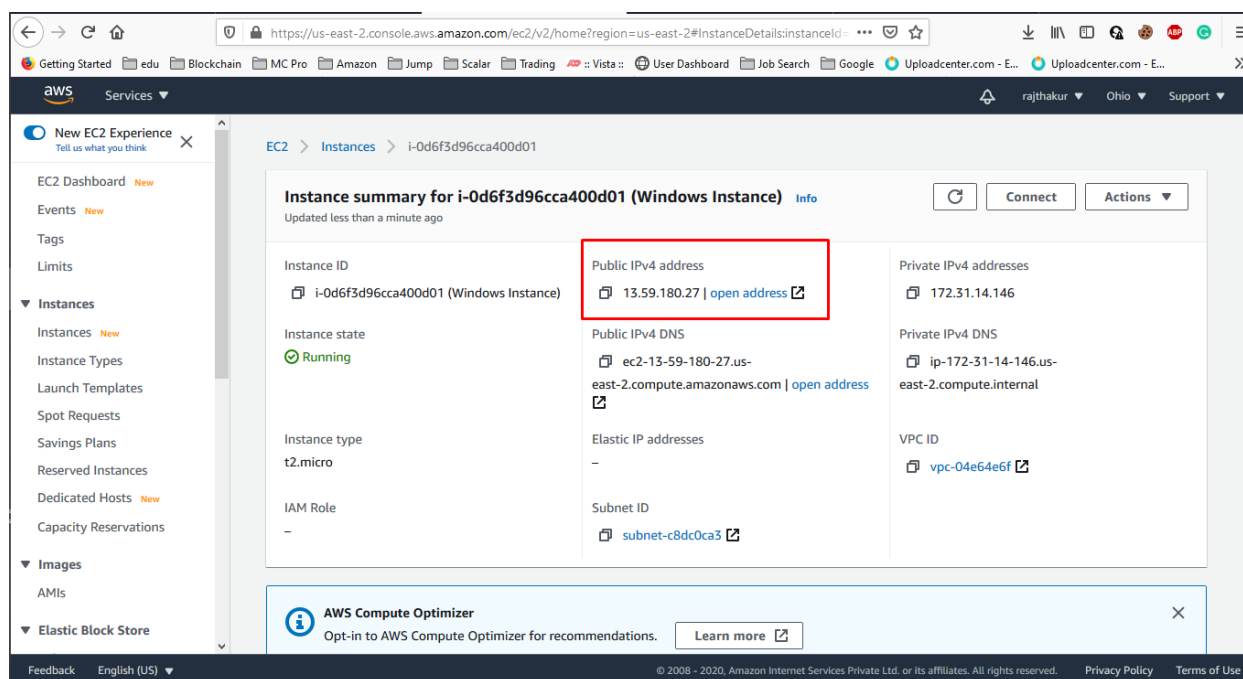
2.RDP Connection to created Instance

The screenshot shows a Remote Desktop Connection window titled 'Windows Instance - ec2-13-59-180-27.us-east-2.compute.amazonaws.com - Remote Desktop Connection'. The desktop background is the standard Windows 10 blue wallpaper. On the left side, there are three icons: 'EC2 Feedback', 'EC2 Micros...', and 'Recycle Bin'. In the top right corner, a text box displays instance details: 'Instance ID: i-0d6f3d96cca400d01', 'Public IP Address: 13.59.180.27', 'Private IP Address: 172.31.14.146', 'Instance Size: t2.micro', 'Availability Zone: us-east-2a', 'Architecture: AMD64', 'Total Memory: 1024 MB', and 'Network Performance: Low to Moderate'. The taskbar at the bottom shows the Start button, search icon, and several application icons. The system tray in the bottom right corner displays the time as 11:23 AM on 10/6/2020.

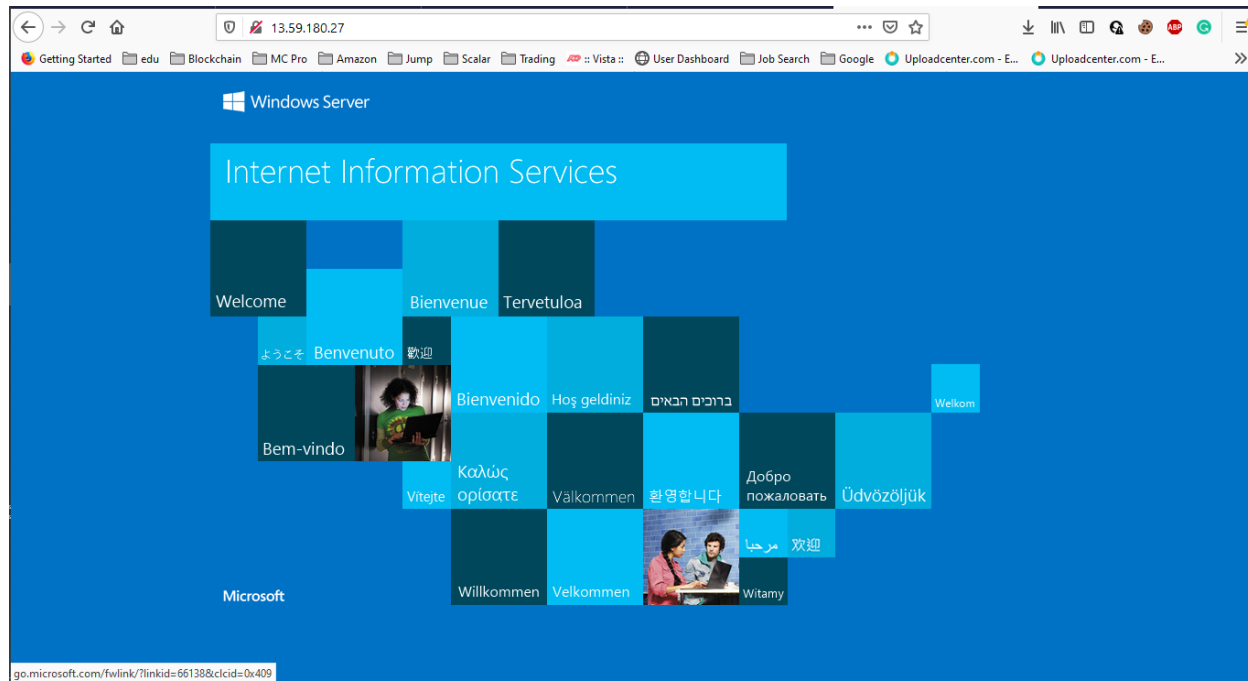
3. IIS Installation



4. Public IP address of created instance



5. Opening IIS server homepage with public IP address of created instance



Project 2 - Deploying a web server in Linux instance

1. Created Linux Instance Details

The screenshot displays the AWS Management Console interface for a Linux instance. The left sidebar shows navigation options like EC2 Dashboard, Events, Tags, Limits, and a list of instances. The main content area is titled 'Instance details' and shows various attributes of the instance.

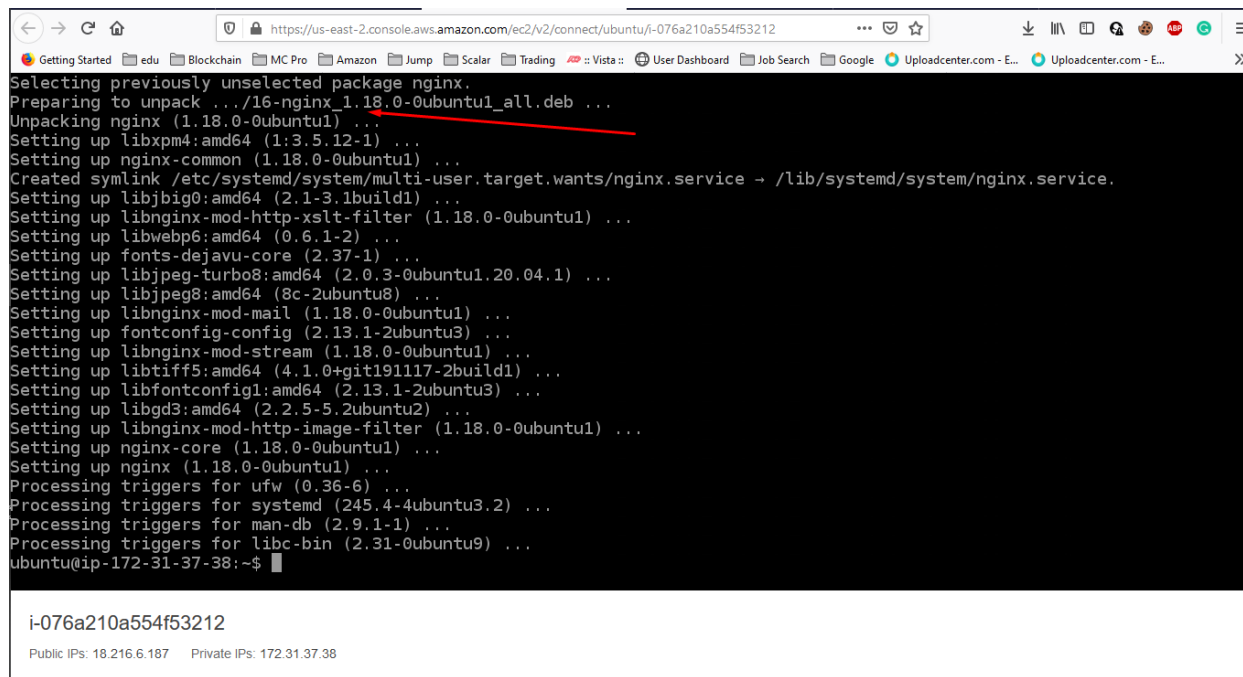
Instance details		
Platform	AMI ID	Monitoring
Ubuntu (Inferred)	ami-07efac79022b86107	disabled
Platform details	AMI name	Termination protection
Linux/UNIX	ubuntu/images/hvm-ssd/ubuntu-focal-20.04-amd64-server-20200907	Disabled
Launch time	AMI location	Lifecycle
Tue Oct 06 2020 18:03:32 GMT+0530 (India Standard Time) (20 minutes)	099720109477/ubuntu/images/hvm-ssd/ubuntu-focal-20.04-amd64-server-20200907	normal
Stop-hibernate behavior	AMI Launch index	Key pair name
disabled	0	firstkeypair
State transition reason	Credit specification	Kernel ID
-	standard	-
State transition message	Usage operation	RAM disk ID
-	RunInstances	-
Owner		
643891741780		

2. Public IP Address of created Instance

The screenshot displays the AWS Management Console interface for a Linux instance, specifically showing the 'Instance summary' for instance ID i-076a210a554f53212. The instance is in a 'Running' state. The public IPv4 address is 18.216.6.187, and the public IPv4 DNS is ec2-18-216-6-187.us-east-2.compute.amazonaws.com. The private IPv4 address is 172.31.37.38, and the private IPv4 DNS is ip-172-31-37-38.us-east-2.compute.internal. The instance type is t2.micro, and the IAM role is empty.

Instance summary for i-076a210a554f53212		
Instance ID	Public IPv4 address	Private IPv4 addresses
i-076a210a554f53212	18.216.6.187 open address	172.31.37.38
Instance state	Public IPv4 DNS	Private IPv4 DNS
Running	ec2-18-216-6-187.us-east-2.compute.amazonaws.com open address	ip-172-31-37-38.us-east-2.compute.internal
Instance type	Elastic IP addresses	VPC ID
t2.micro	-	vpc-04e64e6f
IAM Role	Subnet ID	
-	subnet-b9d5a3f5	

3. NGINX Installed in Ubuntu Machine

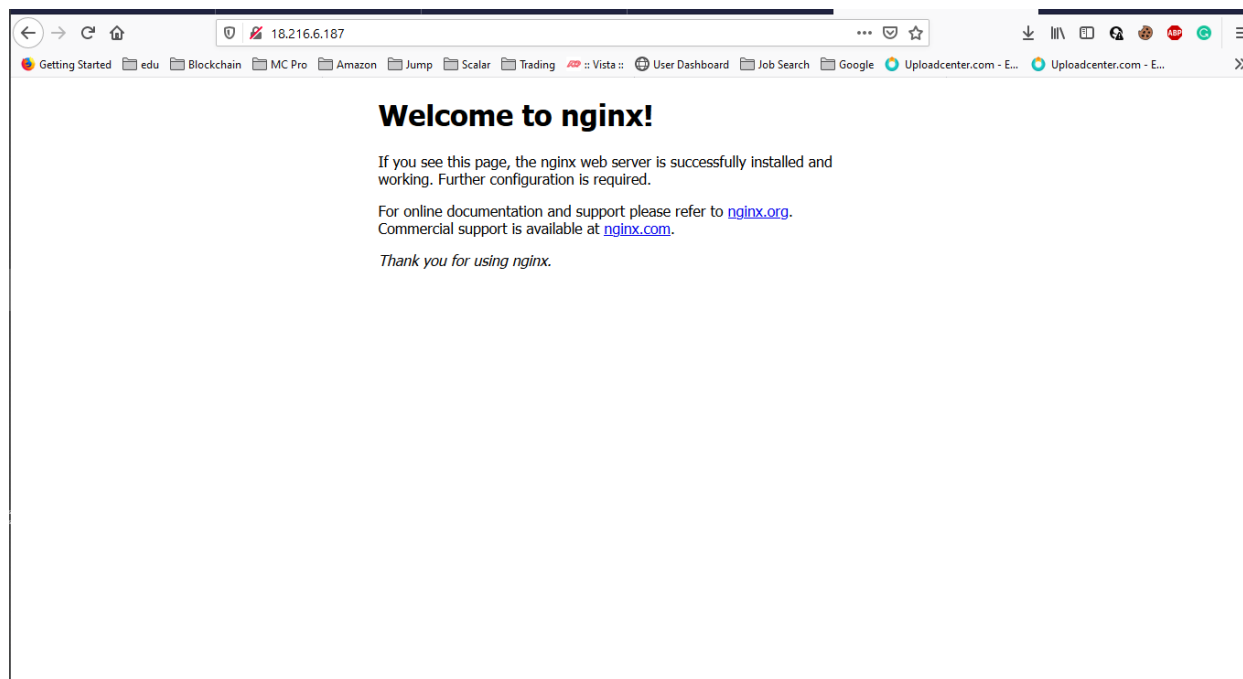


The screenshot shows the AWS Management Console interface. The top navigation bar includes the AWS logo and various service links. The main content area displays a terminal window for an Ubuntu instance. The terminal output shows the process of installing NGINX, including selecting the package, unpacking it, and setting up various dependencies. A red arrow points to the line 'Preparing to unpack .../16-nginx_1.18.0-0ubuntu1_all.deb ...'. Below the terminal window, the instance ID 'i-076a210a554f53212' is displayed, along with public and private IP addresses.

```
Getting Started | edu | Blockchain | MC Pro | Amazon | Jump | Scalar | Trading | Vista | User Dashboard | Job Search | Google | Uploadcenter.com - E... | Uploadcenter.com - E... | >>
https://us-east-2.console.aws.amazon.com/ec2/v2/connect/ubuntu/i-076a210a554f53212
Selecting previously unselected package nginx.
Preparing to unpack .../16-nginx_1.18.0-0ubuntu1_all.deb ...
Unpacking nginx (1.18.0-0ubuntu1) ...
Setting up libxpm4:amd64 (1:3.5.12-1) ...
Setting up nginx-common (1.18.0-0ubuntu1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/nginx.service → /lib/systemd/system/nginx.service.
Setting up libjbig0:amd64 (2.1-3.1build1) ...
Setting up libnginx-mod-http-xslt-filter (1.18.0-0ubuntu1) ...
Setting up libwebp6:amd64 (0.6.1-2) ...
Setting up fonts-dejavu-core (2.37-1) ...
Setting up libjpeg-turbo8:amd64 (2.0.3-0ubuntu1.20.04.1) ...
Setting up libjpeg8:amd64 (8c-2ubuntu8) ...
Setting up libnginx-mod-mail (1.18.0-0ubuntu1) ...
Setting up fontconfig-config (2.13.1-2ubuntu3) ...
Setting up libnginx-mod-stream (1.18.0-0ubuntu1) ...
Setting up libtiff5:amd64 (4.1.0+git191117-2build1) ...
Setting up libfontconfig1:amd64 (2.13.1-2ubuntu3) ...
Setting up libgd3:amd64 (2.2.5-5.2ubuntu2) ...
Setting up libnginx-mod-http-image-filter (1.18.0-0ubuntu1) ...
Setting up nginx-core (1.18.0-0ubuntu1) ...
Setting up nginx (1.18.0-0ubuntu1) ...
Processing triggers for ufw (0.36-6) ...
Processing triggers for systemd (245.4-4ubuntu3.2) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9) ...
ubuntu@ip-172-31-37-38:~$
```

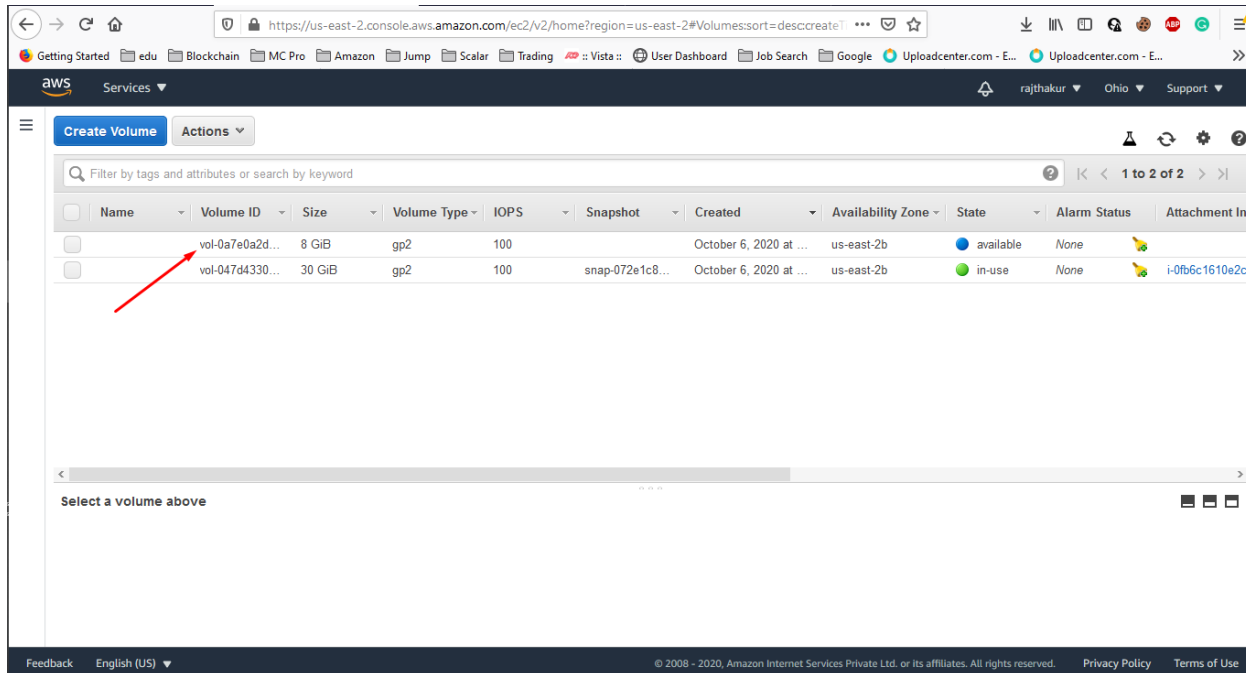
i-076a210a554f53212
Public IPs: 18.216.6.187 Private IPs: 172.31.37.38

4. Visiting NGINX homepage using, public IP address of created instance.



Project 3 -Working with volumes

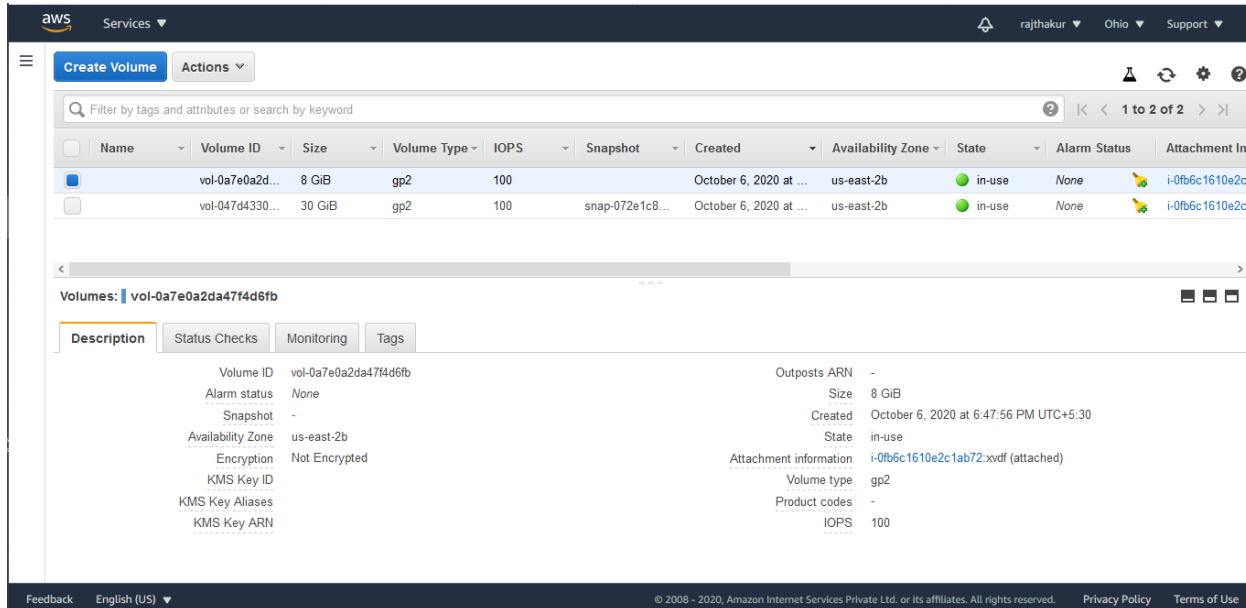
1. Volume created in AWS



The screenshot shows the AWS Management Console 'Volumes' page. The table lists two volumes:

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone	State	Alarm Status	Attachment Information
	vol-0a7e0a2d...	8 GiB	gp2	100		October 6, 2020 at ...	us-east-2b	available	None	
	vol-047d4330...	30 GiB	gp2	100	snap-072e1c8...	October 6, 2020 at ...	us-east-2b	in-use	None	i-0fb6c1610e2c

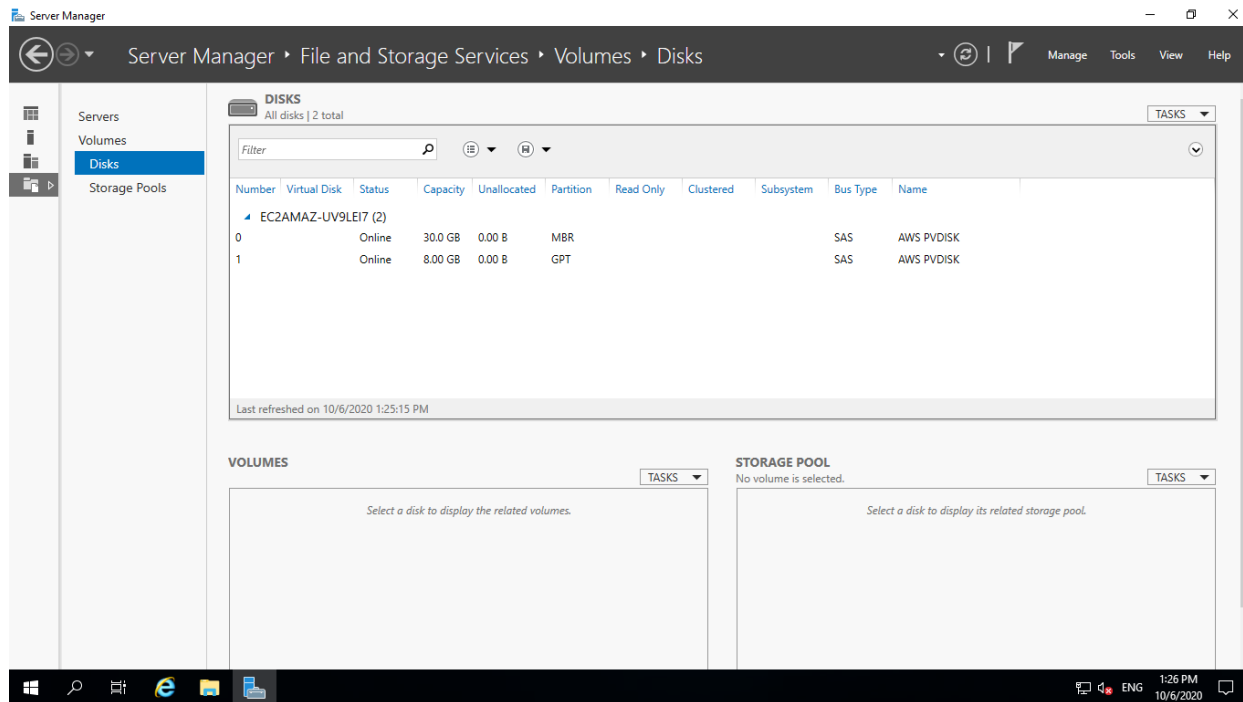
2. Volume attached to ec2 instance.



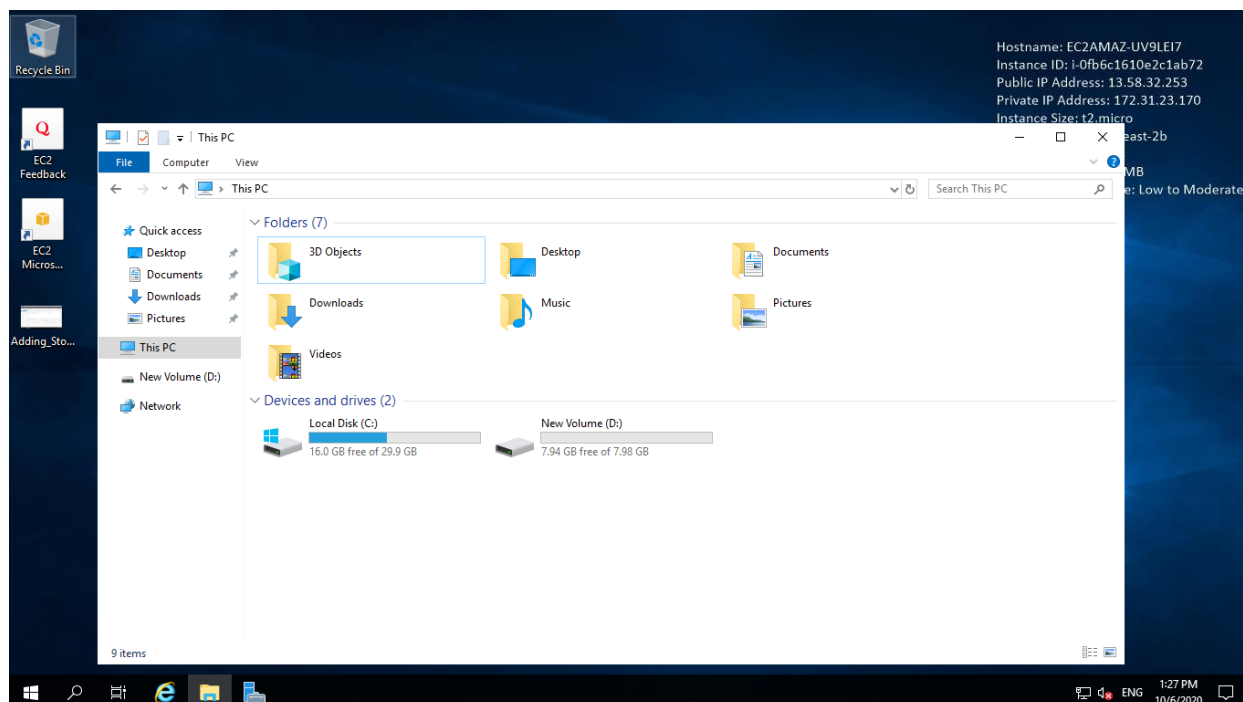
The screenshot shows the AWS Management Console 'Volumes' page with the first volume selected. The 'Description' tab is active, showing details for 'vol-0a7e0a2da47f4d6fb'.

Property	Value
Volume ID	vol-0a7e0a2da47f4d6fb
Alarm status	None
Snapshot	-
Availability Zone	us-east-2b
Encryption	Not Encrypted
KMS Key ID	
KMS Key Aliases	
KMS Key ARN	
Outposts ARN	-
Size	8 GiB
Created	October 6, 2020 at 6:47:56 PM UTC+5:30
State	in-use
Attachment information	i-0fb6c1610e2c1ab72.xvdf (attached)
Volume type	gp2
Product codes	-
IOPS	100

3. Adding Storage as new volume



4. New Volume Attached



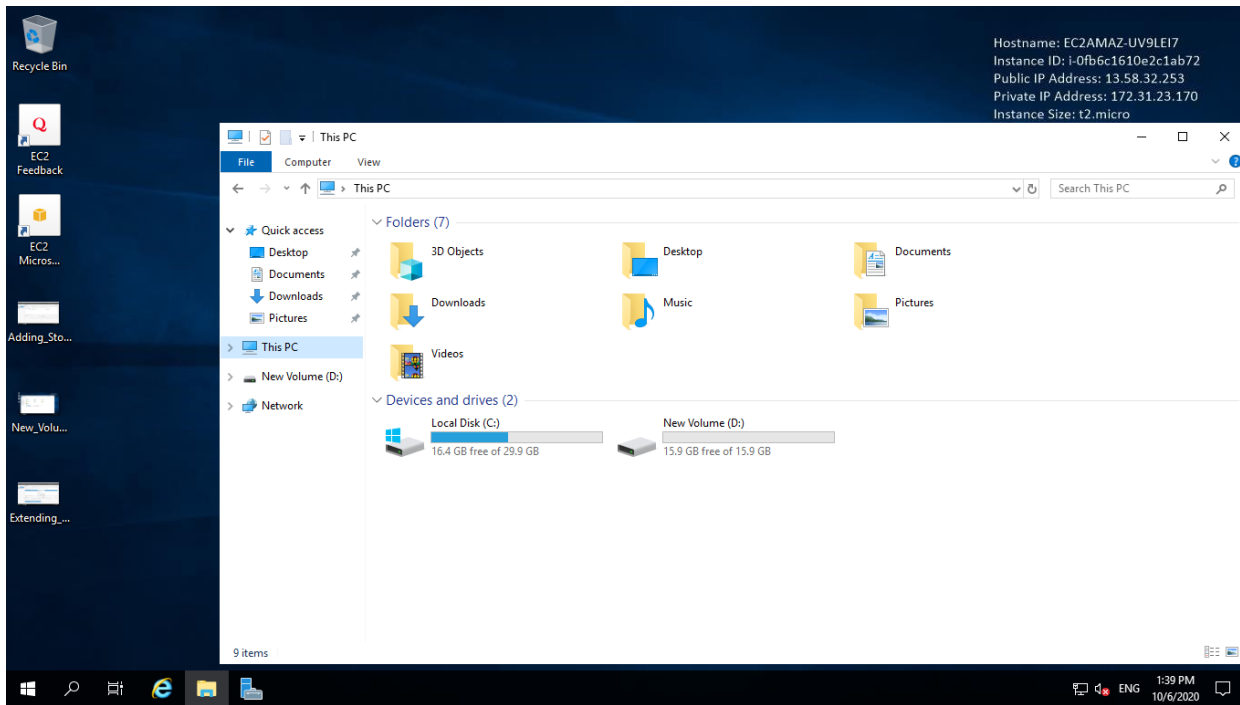
5. Modifying volume size

The screenshot shows the AWS Management Console interface. On the left, the navigation pane lists services like Capacity Reservations, Images, Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling. The main content area displays a list of EBS volumes. A 'Modify Volume' dialog box is open, showing details for Volume ID 'vol-0a7e0a2da47f4d6fb'. The 'Volume Type' is 'General Purpose SSD (gp2)'. The 'Size' is currently 16 GiB, and it is being modified to 16 GiB (indicated by a red arrow). The 'IOPS' is 100 / 3000. The dialog includes 'Cancel' and 'Modify' buttons.

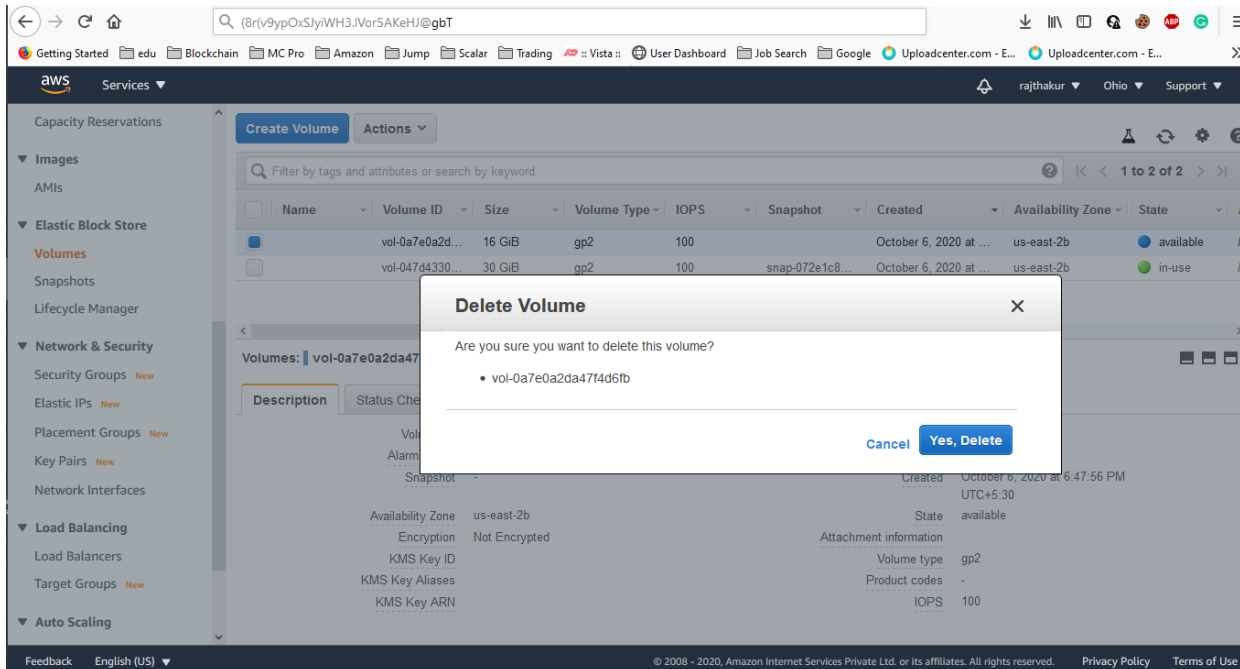
6. Extending the volume

The screenshot shows the Server Manager console interface. The 'DISKS' section is active, displaying a list of disks. A dialog box titled 'Extend Volume' is open, showing details for the volume 'D:'. The 'Current size' is 7.98 GB, and the 'Maximum size' is 16.0 GB. The 'New size' is being set to 16 GB. The dialog includes 'OK' and 'Cancel' buttons.

7. New Extended Volume



8. Deleting Volume



Project 4 - Working with Elastic IP's

1. Instance Details

The screenshot shows the AWS Management Console interface. The left sidebar contains navigation links for EC2 Dashboard, Events, Tags, Limits, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, Elastic Block Store, Volumes, Snapshots, and Lifecycle Manager. The main content area displays the 'Instance details' for an EC2 instance. The instance is named 'i-02ef179d20f115051' and is in the 'Running' state. The details are organized into a table with columns for Platform, Platform details, Launch time, Stop-hibernate behavior, State transition reason, State transition message, Owner, Host ID, Affinity, Placement group, AMI ID, AMI name, AMI location, AMI Launch index, Credit specification, Usage operation, Monitoring, Termination protection, Lifecycle, Key pair name, Kernel ID, and RAM disk ID. The instance is running on the 'Amazon Linux (Inferred)' platform, using the 'ami-03657b56516ab7912' AMI. The launch time is 'Wed Oct 07 2020 17:20:19 GMT+0530 (India Standard Time) (3 minutes)'. The state transition reason is 'disabled'. The owner is '643891741780'. The host ID is 'i-02ef179d20f115051'. The affinity is 'standard'. The placement group is 'RunInstances'. The AMI ID is 'ami-03657b56516ab7912'. The AMI name is 'amazon/amzn2-ami-hvm-2.0.20200917.0-x86_64-gp2'. The AMI location is 'amazon/amzn2-ami-hvm-2.0.20200917.0-x86_64-gp2'. The AMI Launch index is '0'. The credit specification is 'standard'. The usage operation is 'RunInstances'. The monitoring is 'disabled'. The termination protection is 'Disabled'. The lifecycle is 'normal'. The key pair name is 'firstkeypair'. The kernel ID is '-'. The RAM disk ID is '-'. The footer of the console shows the copyright notice '© 2008 - 2020, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved.' and links to 'Privacy Policy' and 'Terms of Use'.

Platform	Platform details	Launch time	Stop-hibernate behavior	State transition reason	State transition message	Owner	Host ID	Affinity	Placement group	AMI ID	AMI name	AMI location	AMI Launch index	Credit specification	Usage operation	Monitoring	Termination protection	Lifecycle	Key pair name	Kernel ID	RAM disk ID
Amazon Linux (Inferred)	Linux/UNIX	Wed Oct 07 2020 17:20:19 GMT+0530 (India Standard Time) (3 minutes)	disabled	-	-	643891741780	i-02ef179d20f115051	standard	RunInstances	ami-03657b56516ab7912	amazon/amzn2-ami-hvm-2.0.20200917.0-x86_64-gp2	amazon/amzn2-ami-hvm-2.0.20200917.0-x86_64-gp2	0	standard	RunInstances	disabled	Disabled	normal	firstkeypair	-	-

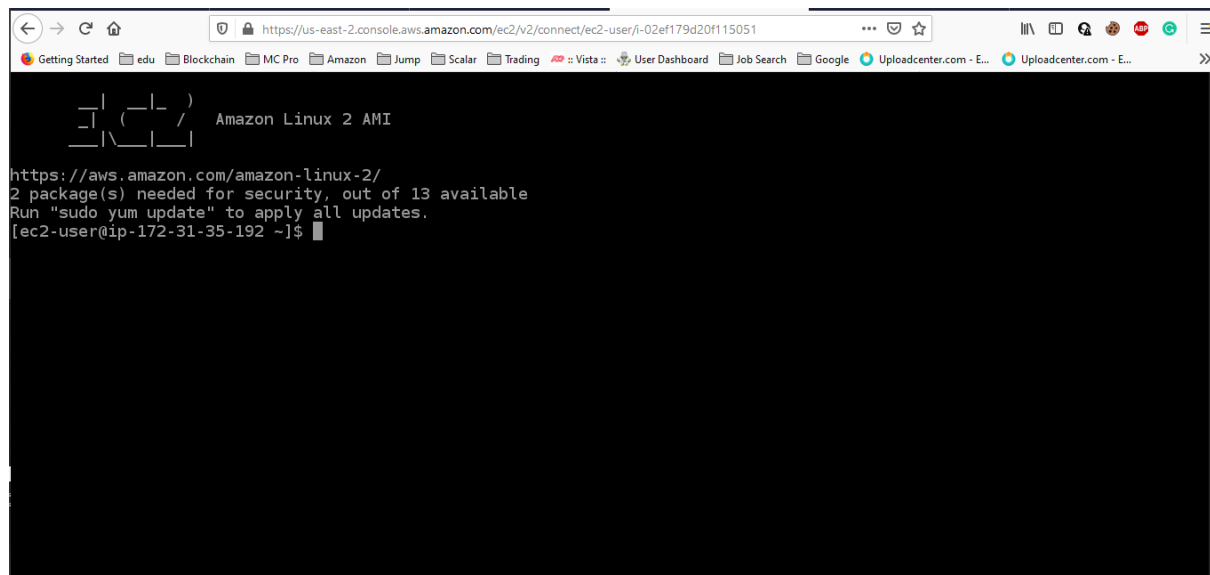
2.Public IP Address

The screenshot shows the AWS Management Console interface. The left sidebar contains navigation links for EC2 Dashboard, Events, Tags, Limits, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, Elastic Block Store, Volumes, Snapshots, and Lifecycle Manager. The main content area displays the 'Instance summary for i-02ef179d20f115051 (Apache)'. The instance is in the 'Running' state. The summary table shows the following details:

Instance ID	Public IPv4 address	Private IPv4 addresses
i-02ef179d20f115051 (Apache)	18.191.207.38 open address	172.31.35.192

The 'Public IPv4 address' is highlighted with a red box. Below the summary table, there are tabs for 'Details', 'Security', 'Networking', 'Storage', 'Monitoring', and 'Tags'. The 'Details' tab is selected, showing the 'Instance details' for the instance. The details are organized into a table with columns for Platform, Platform details, Launch time, Stop-hibernate behavior, State transition reason, State transition message, Owner, Host ID, Affinity, Placement group, AMI ID, AMI name, AMI location, AMI Launch index, Credit specification, Usage operation, Monitoring, Termination protection, Lifecycle, Key pair name, Kernel ID, and RAM disk ID. The instance is running on the 'Amazon Linux (Inferred)' platform, using the 'ami-03657b56516ab7912' AMI. The launch time is 'Wed Oct 07 2020 17:20:19 GMT+0530 (India Standard Time) (3 minutes)'. The state transition reason is 'disabled'. The owner is '643891741780'. The host ID is 'i-02ef179d20f115051'. The affinity is 'standard'. The placement group is 'RunInstances'. The AMI ID is 'ami-03657b56516ab7912'. The AMI name is 'amazon/amzn2-ami-hvm-2.0.20200917.0-x86_64-gp2'. The AMI location is 'amazon/amzn2-ami-hvm-2.0.20200917.0-x86_64-gp2'. The AMI Launch index is '0'. The credit specification is 'standard'. The usage operation is 'RunInstances'. The monitoring is 'disabled'. The termination protection is 'Disabled'. The lifecycle is 'normal'. The key pair name is 'firstkeypair'. The kernel ID is '-'. The RAM disk ID is '-'. The footer of the console shows the copyright notice '© 2008 - 2020, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved.' and links to 'Privacy Policy' and 'Terms of Use'.

3.Connected to EC2 Instance



```
Amazon Linux 2 AMI
https://aws.amazon.com/amazon-linux-2/
2 package(s) needed for security, out of 13 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-35-192 ~]$
```

i-02ef179d20f115051 (Apache)

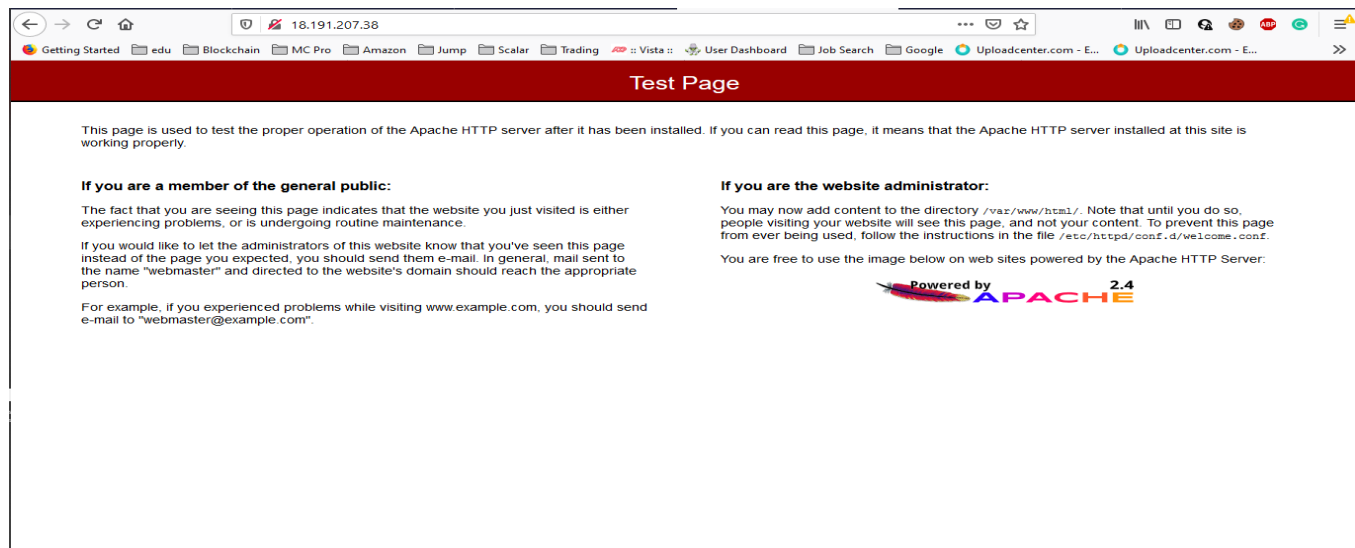
Public IPs: 18.191.207.38 Private IPs: 172.31.35.192

4.Start,Enable,Status httpd

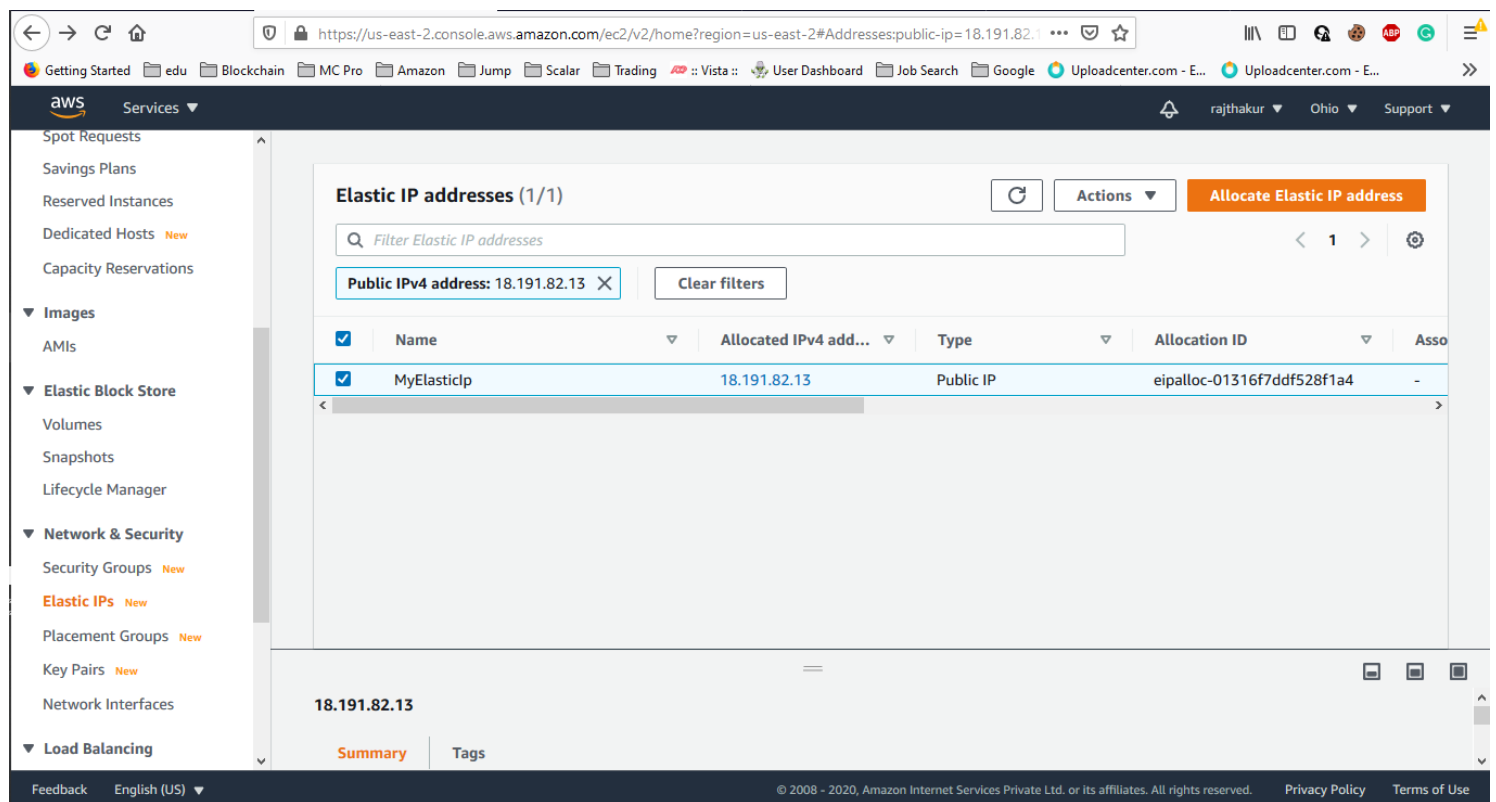
```
[root@ip-172-31-35-192 ec2-user]# systemctl start httpd
[root@ip-172-31-35-192 ec2-user]# systemctl enable httpd
Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.
[root@ip-172-31-35-192 ec2-user]# systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)
   Active: active (running) since Wed 2020-10-07 11:57:24 UTC; 39s ago
     Docs: man:httpd.service(8)
  Main PID: 12831 (httpd)
    Status: "Total requests: 0; Idle/Busy workers 100/0; Requests/sec: 0; Bytes served/sec: 0 B/sec"
    CGroup: /system.slice/httpd.service
            └─12831 /usr/sbin/httpd -DFOREGROUND
              └─12832 /usr/sbin/httpd -DFOREGROUND
                └─12833 /usr/sbin/httpd -DFOREGROUND
                  └─12834 /usr/sbin/httpd -DFOREGROUND
                    └─12835 /usr/sbin/httpd -DFOREGROUND
                      └─12836 /usr/sbin/httpd -DFOREGROUND

Oct 07 11:57:24 ip-172-31-35-192.us-east-2.compute.internal systemd[1]: Starting The Apache HTTP Server...
Oct 07 11:57:24 ip-172-31-35-192.us-east-2.compute.internal systemd[1]: Started The Apache HTTP Server.
[root@ip-172-31-35-192 ec2-user]#
```

5. Test Page of Apache Server



6. Elastic IP Created



7. Associate IP address


aws Services ▼ rajthakur ▼ Ohio ▼ Support ▼



Choose the instance or network interface to associate to this Elastic IP address (18.191.82.13)

Elastic IP address: 18.191.82.13

Resource type
Choose the type of resource with which to associate the Elastic IP address.

☒ Instance
☐ Network interface

 If you associate an Elastic IP address to an instance that already has an Elastic IP address associated, this previously associated Elastic IP address will be disassociated but still allocated to your account. [Learn more](#)

Instance
  

Private IP address
The private IP address with which to associate the Elastic IP address.

Reassociation
Specify whether the Elastic IP address can be reassociated with a different resource if it already associated with a resource.
☒ Allow this Elastic IP address to be reassociated

Cancel Associate

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8. Elastic IP associated with instance

aws Services ▼ rajthakur ▼ Ohio ▼ Support ▼


Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts **New**
Capacity Reservations

▼ Images
AMIs

▼ Elastic Block Store
Volumes
Snapshots
Lifecycle Manager

▼ Network & Security
Security Groups **New**
Elastic IPs **New**
Placement Groups **New**
Key Pairs **New**
Network Interfaces













▼ Load Balancing

 **Elastic IP address associated successfully.**
Elastic IP address 18.191.82.13 has been associated with instance i-02ef179d20f115051

EC2 > Elastic IP addresses > 18.191.82.13

18.191.82.13 Actions ▼ Associate Elastic IP address

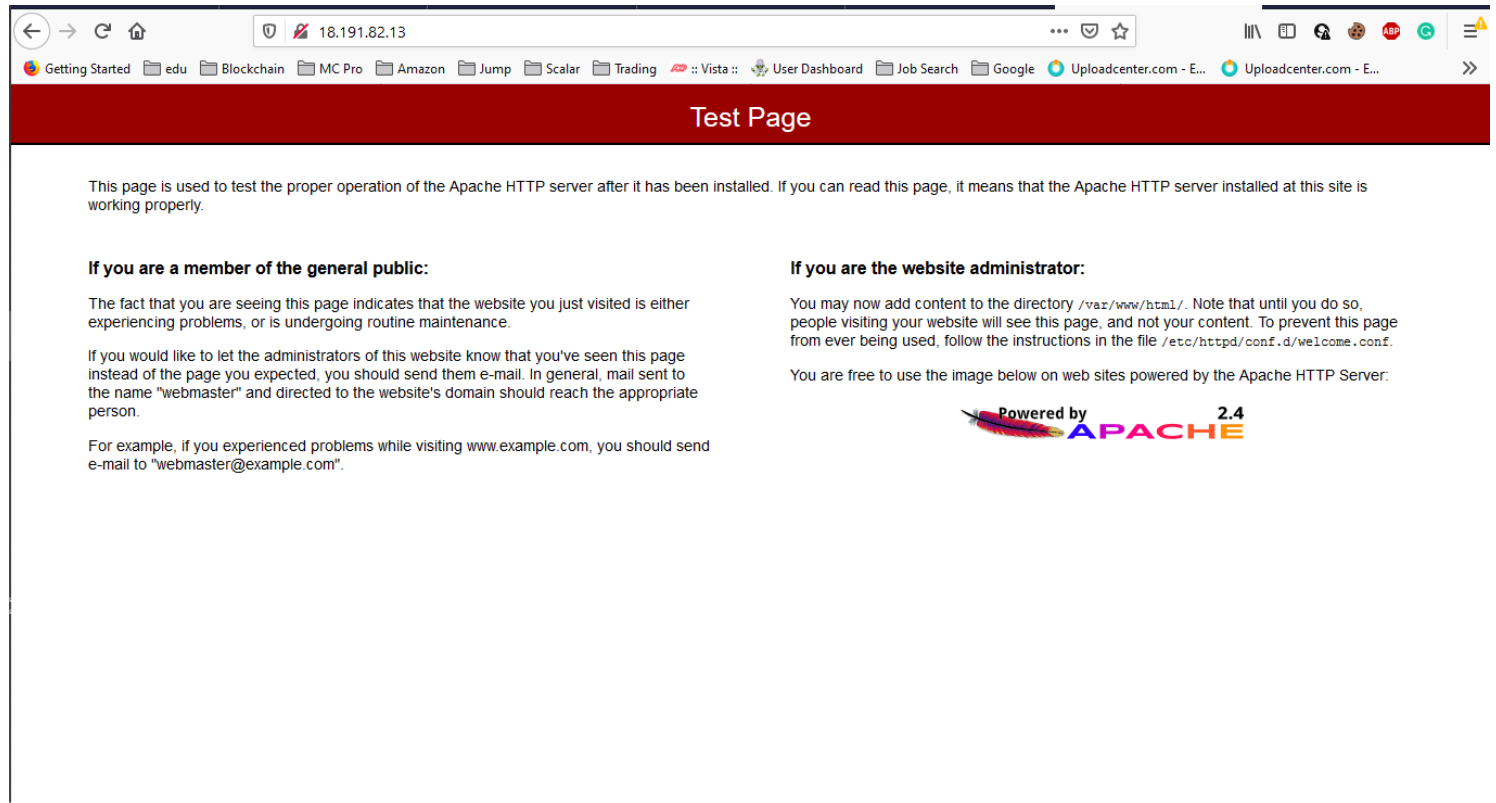
Summary

Allocated IPv4 address  18.191.82.13	Type  Public IP	Allocation ID  eipalloc-01316f7ddf528f1a4	Association ID  eipassoc-0c5497707bb1316b4
Scope  VPC	Associated instance ID  i-02ef179d20f115051 Link	Private IP address  172.31.35.192	Network interface ID  eni-0055caa0dcca8e7e3 Link
Network interface owner account ID  643891741780	Public DNS  ec2-18-191-82-13.us-east-2.compute.amazonaws.com	NAT Gateway ID  -	Address pool  Amazon

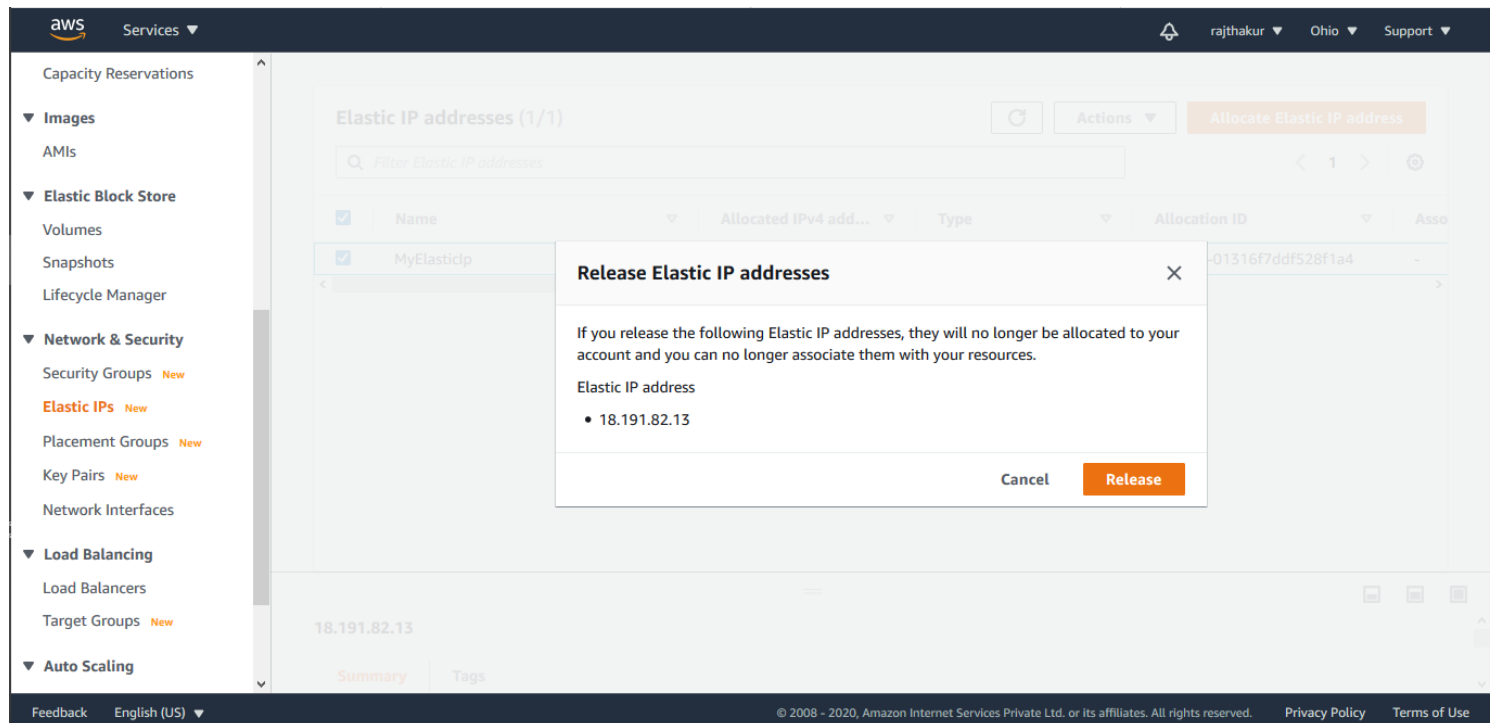
Tags (1) Manage tags

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9. Apache test page with elastic IP



10. Release Elastic IP



Project 5-Working with S3

1. S3 bucket created

Access S3-backed file shares on premises and reduce local storage costs using AWS Storage Gateway. [Learn more »](#) [Documentation](#)

We've temporarily re-enabled the previous version of the S3 console while we continue to improve the new S3 console experience. [Switch to the new console.](#)

S3 buckets [Discover the console](#)

Search for buckets All access types

[+ Create bucket](#) [Edit public access settings](#) [Empty](#) [Delete](#)

1 Buckets 1 Regions [Refresh](#)

<input type="checkbox"/>	Bucket name	Access	Region	Date created
<input type="checkbox"/>	rajthakurbucket	Objects can be public	US East (Ohio)	Oct 7, 2020 7:09:20 PM GMT+0530

Operations 0 In progress 2 Success 0 Error

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2.Uploaded file to S3 bucket

Amazon S3 > rajthakurbucket

rajthakurbucket

[Overview](#) [Properties](#) [Permissions](#) [Management](#) [Access points](#)

Search Type a prefix and press Enter to search. Press ESC to clear.

[Upload](#) [+ Create folder](#) [Download](#) [Actions](#)

US East (Ohio) [Refresh](#)

Viewing 1 to 1

<input type="checkbox"/>	Name	Last modified	Size	Storage class
<input type="checkbox"/>	myimage.jpg	Oct 7, 2020 7:30:07 PM GMT+0530	168.9 KB	Standard

Viewing 1 to 1

Operations 0 In progress 3 Success 0 Error

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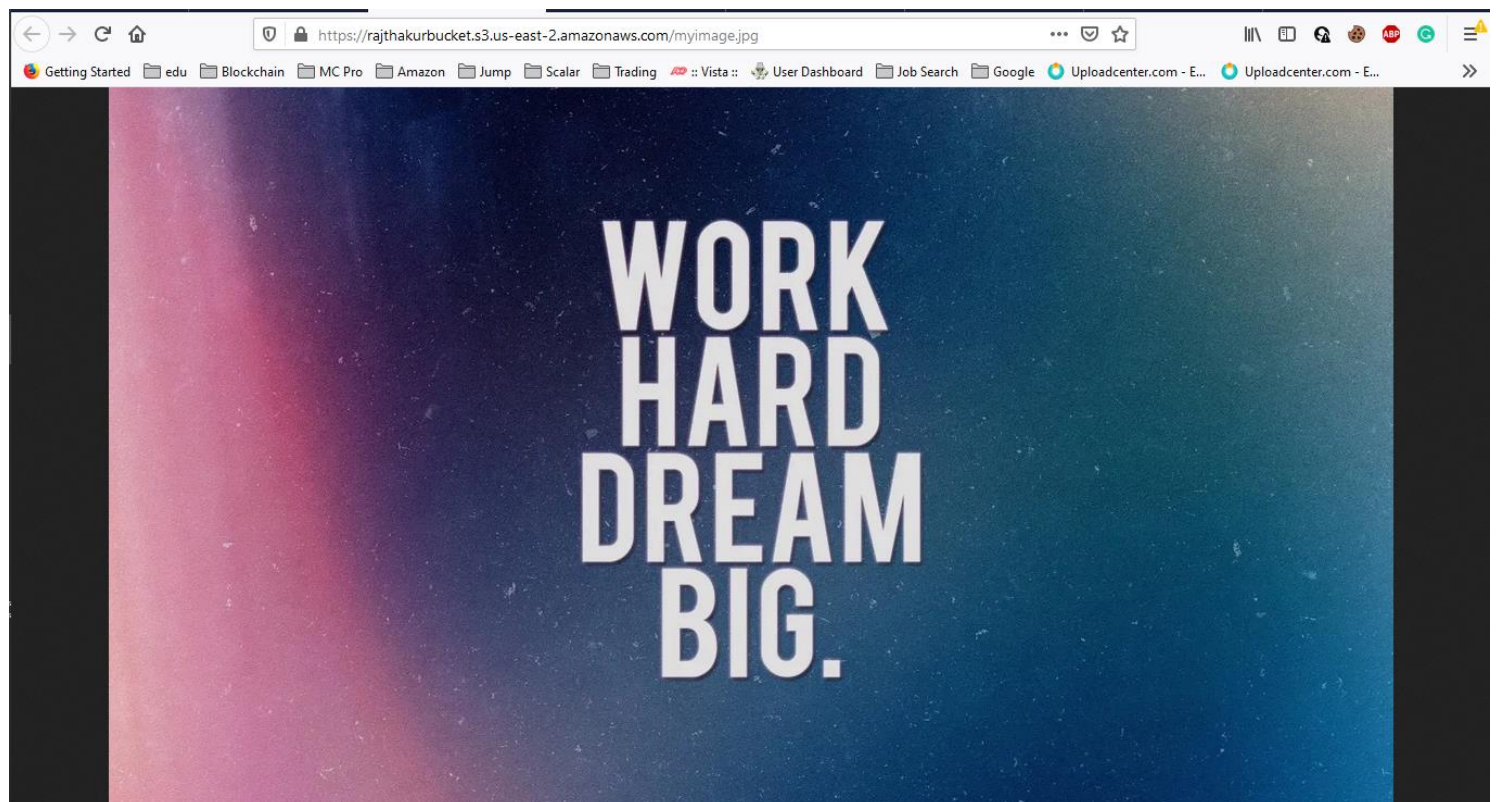
3. Made object as public and getting its url

The screenshot shows the AWS Management Console interface for an S3 bucket named 'rajthakurbucket'. The object 'myimage.jpg' is selected, and the 'Properties' tab is active. The console displays the following details:

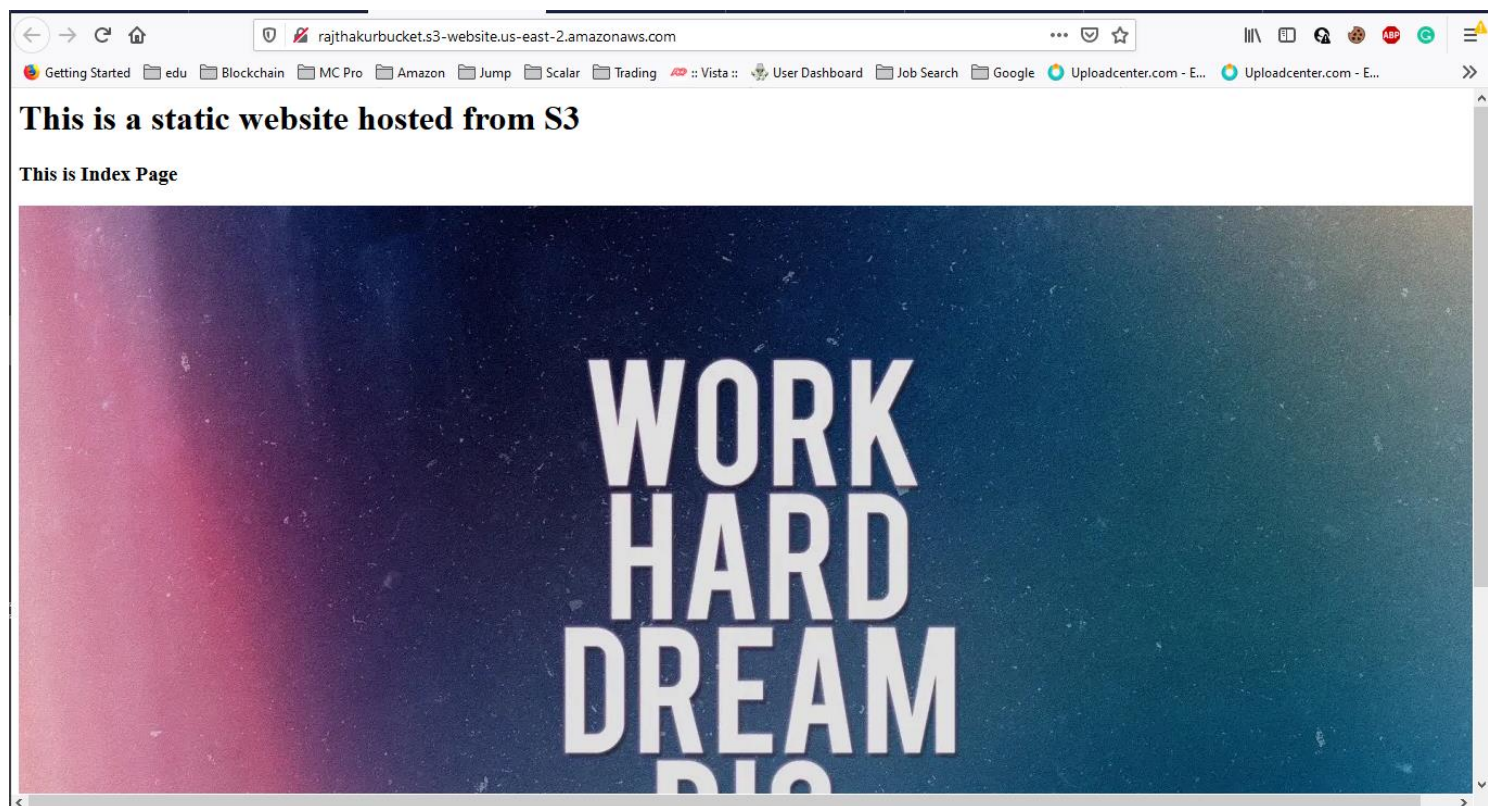
- Owner:** 66c9fdde6c8d036b37b6fe3aa9006fe8e7e235627ca44358c13fda73447a708b
- Last modified:** Oct 7, 2020 7:30:07 PM GMT+0530
- Etag:** 07db72dc56c72efb1fd40e344f5e94d1
- Storage class:** Standard
- Server-side encryption:** None
- Size:** 168.9 KB
- Key:** myimage.jpg
- Object URL:** <https://rajthakurbucket.s3.us-east-2.amazonaws.com/myimage.jpg>

At the top, there are buttons for 'Open', 'Download', 'Download as', 'Make public', and 'Copy path'. The bottom status bar shows 'Operations: 0 In progress, 1 Success, 0 Error'.

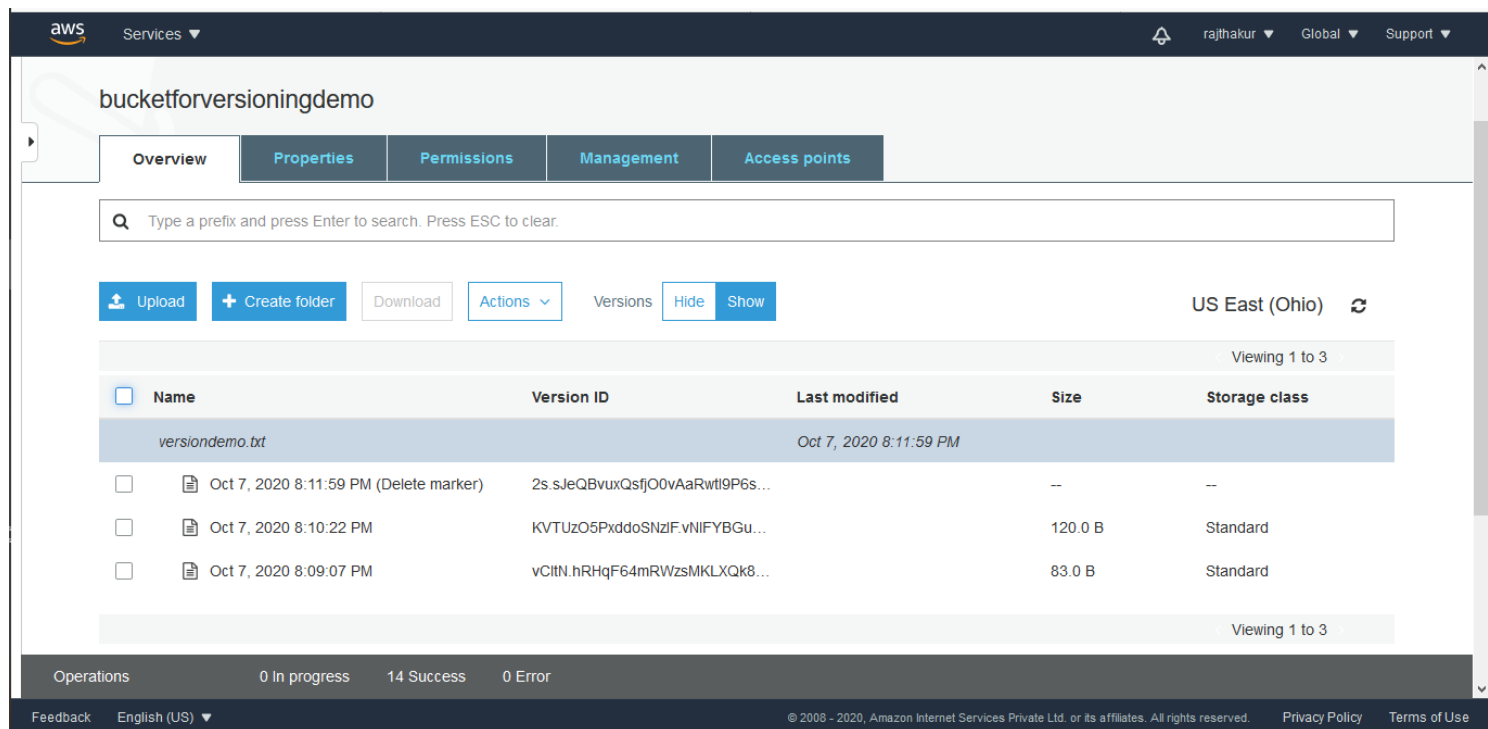
4. Browsing the object url



5.Static Website from S3 Bucket



6.Versioning



Question and Answers:

QUESTION 1:

Explain life cycle effects on instances: Stop, start, reboot, terminate- public IP, Private Ip, Applications installed.

Answer:

Characteristic	Start/Stop	Reboot	Terminate
Public IP	The instance gets a new public IPv4 address, unless it has an Elastic IP address, which doesn't change during a stop/start.	These addresses stay the same	When instance is terminated the public IP for it no longer exists for that instance.
Private IP	The instance keeps its private IPv4 address.	These addresses stay the same	When instance is terminated the private IP for it no longer exists for that instance.
Applications	The applications will still be installed , as Start/Stop is just similar to turning a PC on/off.	The applications will still be installed , as Reboot is just similar to a PC restart.	The applications will be deleted, as terminating an instance is like deleting/removing a complete virtual machine.