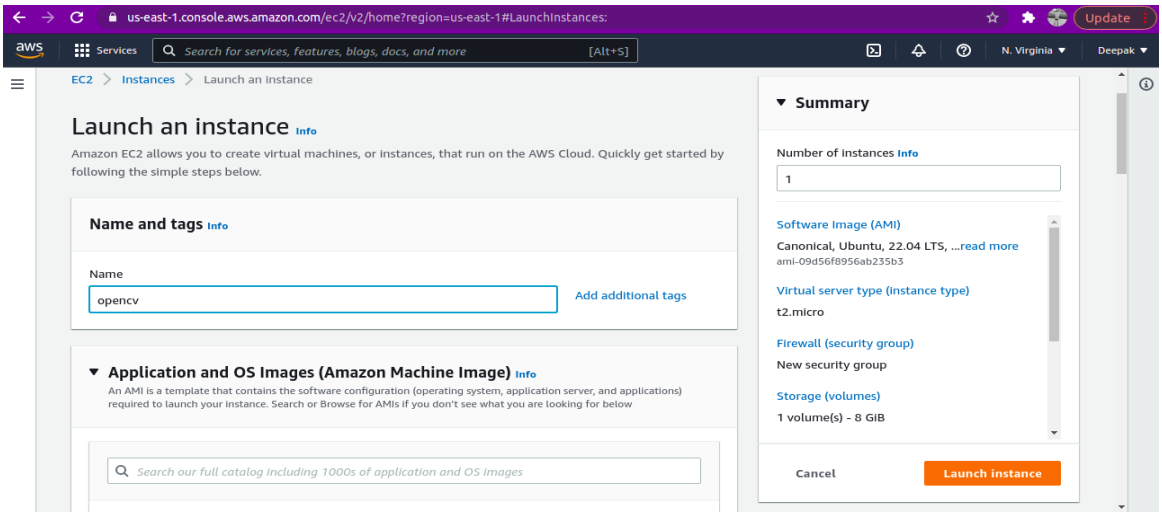
Steps to run DMS Code

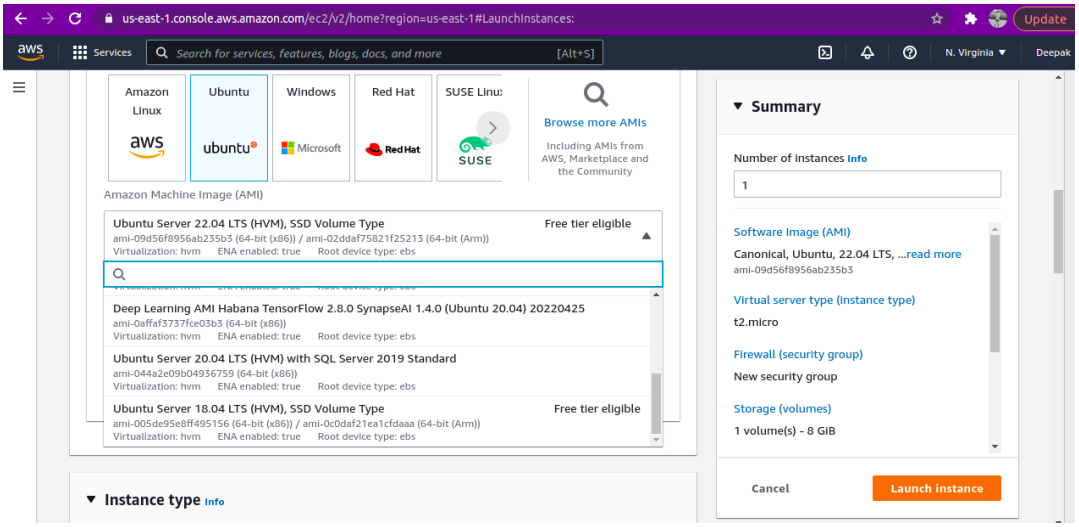
Install Opencv Package on the AWS to use Opencv Library function in Lambda functions.
For this first create an EC2 instance.

1. Steps to create EC2 Instance

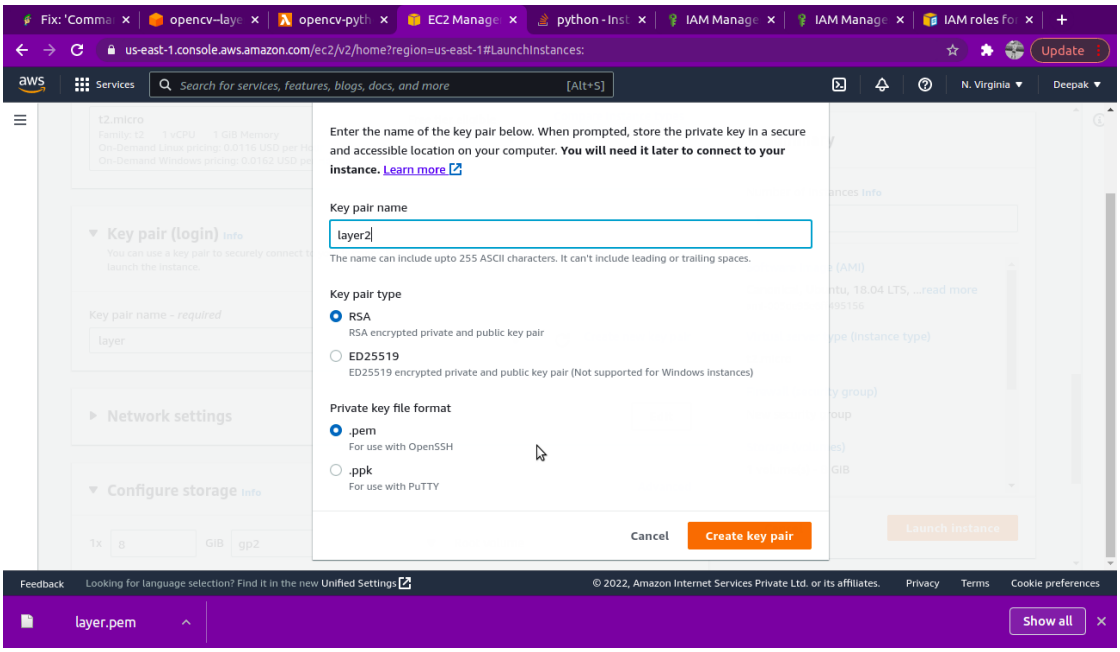
- Go to EC2 Service
- From Navigator Menu Select Instance.
- Click on Launch instance.
- Give the name to the Instance(ex opencv),



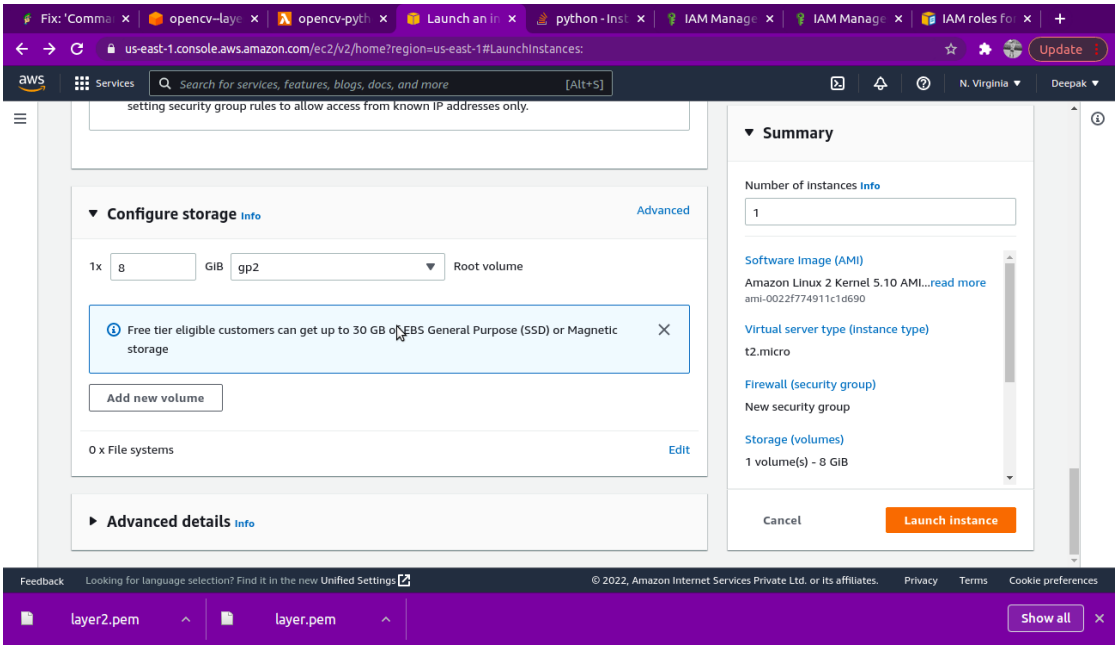
- Select Application and OS type (ex ubuntu) search for suitable ubuntu Server(ex Ubuntu Server 18.04)



- Create a new key pair → Enter key Pair name (layer.pem) and Click on "Create Key Pair" and Download the .pem file



- Click on Launch Instance

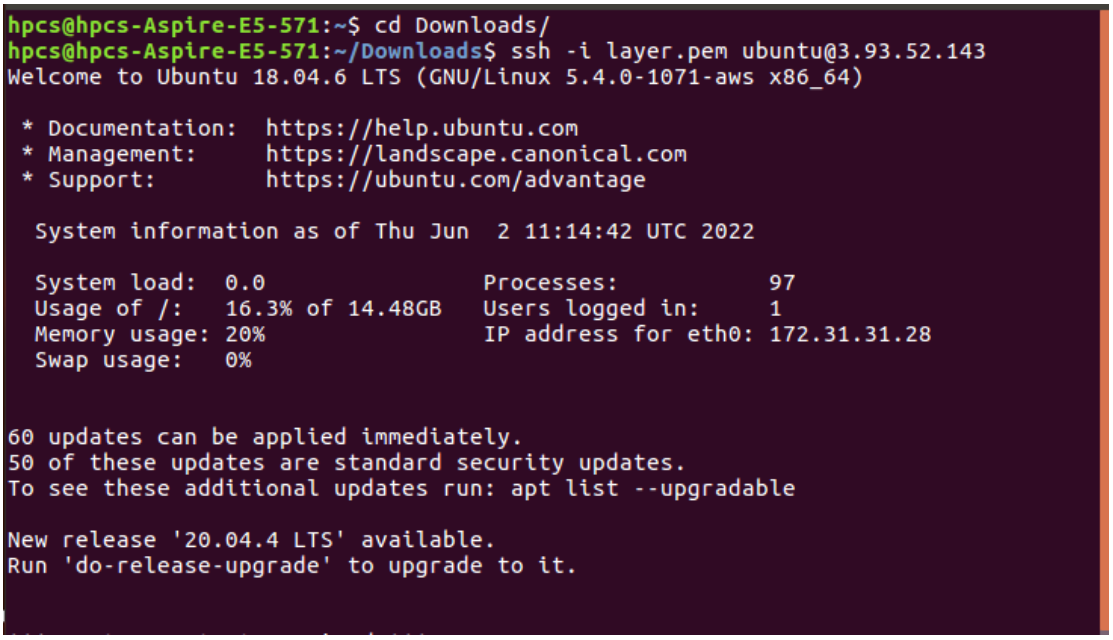


→ Now Install Opencv Package on AWS

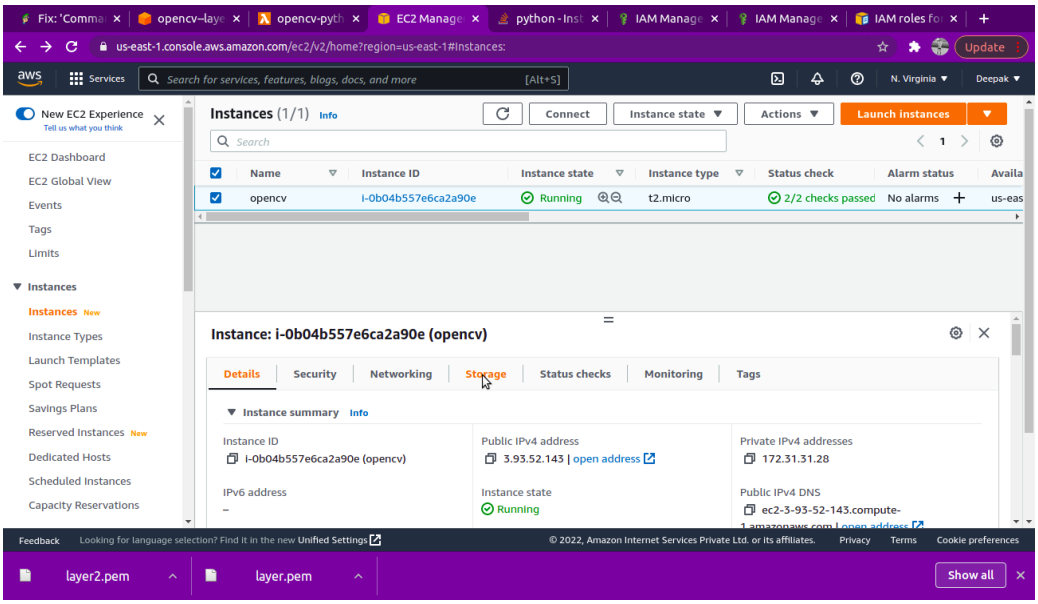
2. Steps to Install Opencv Package on AWS

- Go to the Terminal.

- Type command "cd Downloads" to go to the directory where we download the key pair(layer.pem). (You can Enter the directory where you download you download the .pem file.



- Type Command ``ssh -i layer.pem ubuntu@3.93.52.143" where layer.pem will be the key pair file name and "3.93.52.143" will be the EC2 public IPv4 Address . You can get an ip address from the EC2 instance that you created above . Go to EC2 Select your Instance. and scroll down to get instance Detail and see the Public IPv4 address. copy the address and use it.



- Type Command "Sudo apt-get update" to fetch the update.
- Type Command "python3 -V" to know the python version
- Now to install the python package check pip is installed

```
ubuntu@ip-172-31-31-28:~$ python3 -V
Python 3.6.9
ubuntu@ip-172-31-31-28:~$ pip3
```

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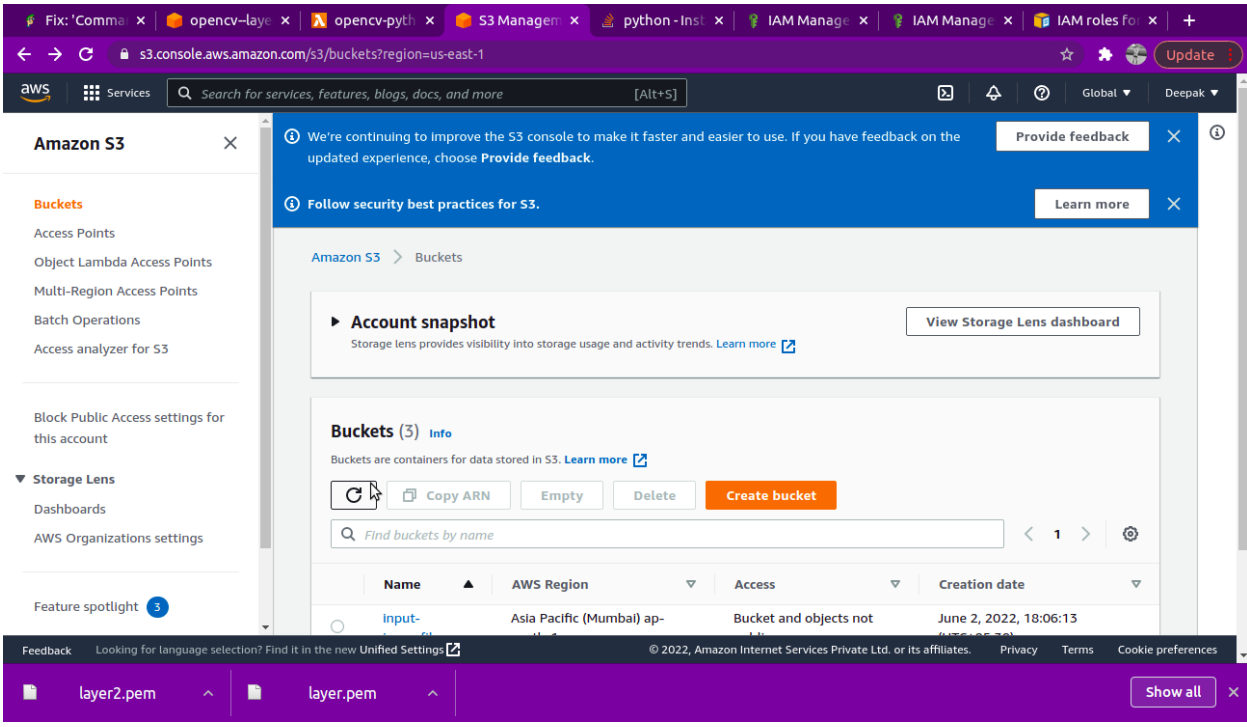
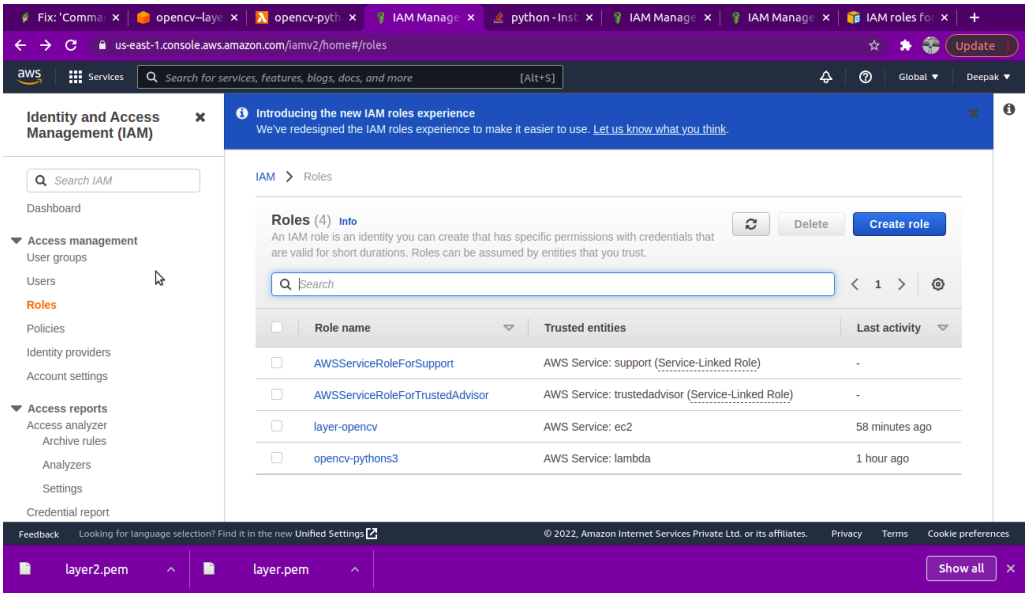
- Type Command "pip3" to know whether the pip is installed or not.
- if Pip is not install then type Command "sudo apt install python3-pip"

```
ubuntu@ip-172-31-31-28:~/build$ sudo apt install zip
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  unzip
The following NEW packages will be installed:
  unzip zip
0 upgraded, 2 newly installed, 0 to remove and 56 not upgraded.
Need to get 335 kB of archives.
After this operation, 1205 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 unzip amd64 6.0-21ubuntu1.1 [168 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 zip amd64 3.0-11build1 [167 kB]
Fetched 335 kB in 0s (11.5 MB/s)
Selecting previously unselected package unzip.
(Reading database ... 75848 files and directories currently installed.)
Preparing to unpack .../unzip_6.0-21ubuntu1.1_amd64.deb ...
Unpacking unzip (6.0-21ubuntu1.1) ...
Selecting previously unselected package zip.
Preparing to unpack .../zip_3.0-11build1_amd64.deb ...
Unpacking zip (3.0-11build1) ...
Setting up unzip (6.0-21ubuntu1.1) ...
Setting up zip (3.0-11build1) ...
Processing triggers for mime-support (3.60ubuntu1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
ubuntu@ip-172-31-31-28:~/build$ zip -r package.zip .
  adding: python/ (stored 0%)
  adding: python/lib/ (stored 0%)
  adding: python/lib/python3.6/ (stored 0%)
  adding: python/lib/python3.6/site-packages/ (stored 0%)
  adding: python/lib/python3.6/site-packages/opencv_python.libs/ (stored 0%)
  adding: python/lib/python3.6/site-packages/opencv_python.libs/libxcb-sync-89374f40.so.1.0.0 (deflated 77%)
  adding: python/lib/python3.6/site-packages/opencv_python.libs/libxcb-render-637b984a.so.0.0.0 (deflated 80%)
  adding: python/lib/python3.6/site-packages/opencv_python.libs/libxcb-shape-25c2b258.so.0.0.0 (deflated 78%)
  adding: python/lib/python3.6/site-packages/opencv_python.libs/libpng15-ce838cd1.so.15.13.0 (deflated 53%)
```

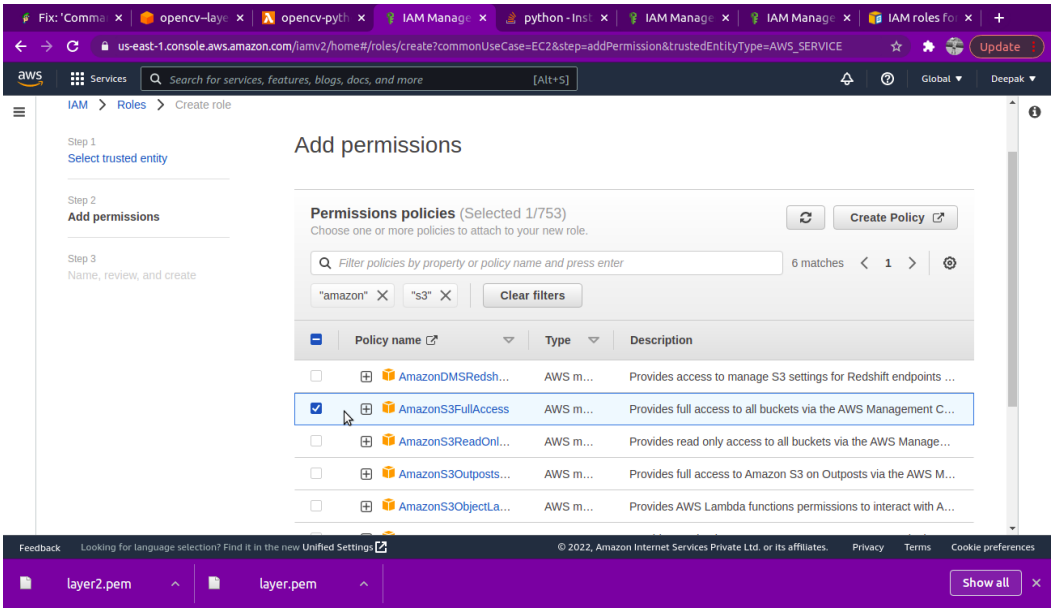
- Type command "sudo apt install awscli" to install awscli. It requires uploading a python package on S3.
- Now create a directory structure for this Type command "mkdir -p build/python/lib/python3.6/site-packages"
- Now Install Python package to this directory Type command "pip3 install opencv-python -t build/python/lib/python3.6/site-packages --system"
- Go to Build folder Type Command "cd build"
- Now Zip the above package file Type Command "zip -r package.zip
- Now we need to upload this Zip file to S3 Bucket. for this Go To S3 Services (AWS) and Click on Bucket from Menu.
- Click on Create Bucket and Enter the Bucket Name and then Create Bucket.

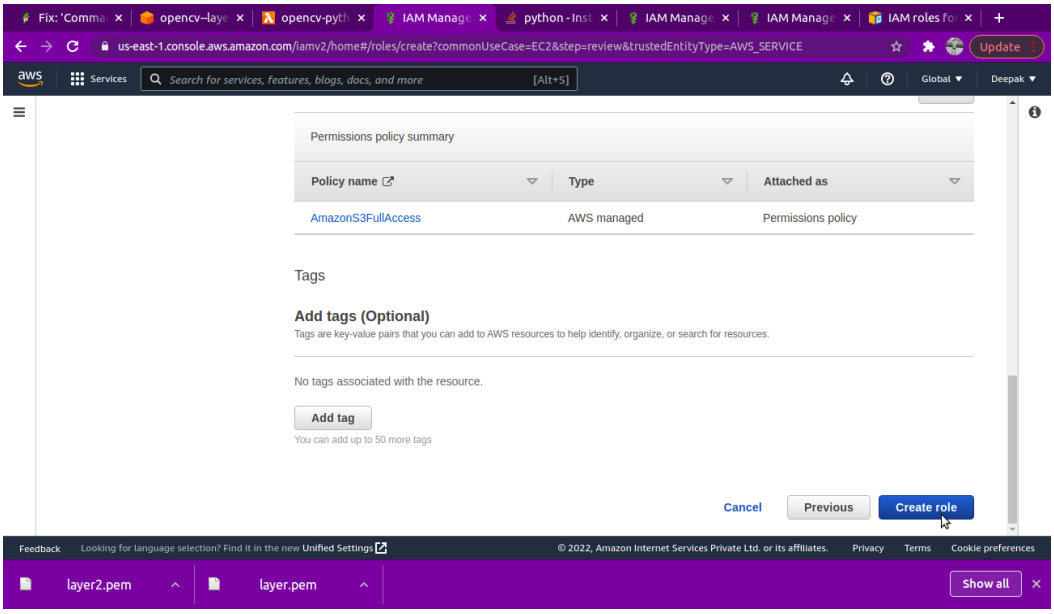


- Now to Upload the Zip file on the S3 we also require permission . for this Create and Iam Role

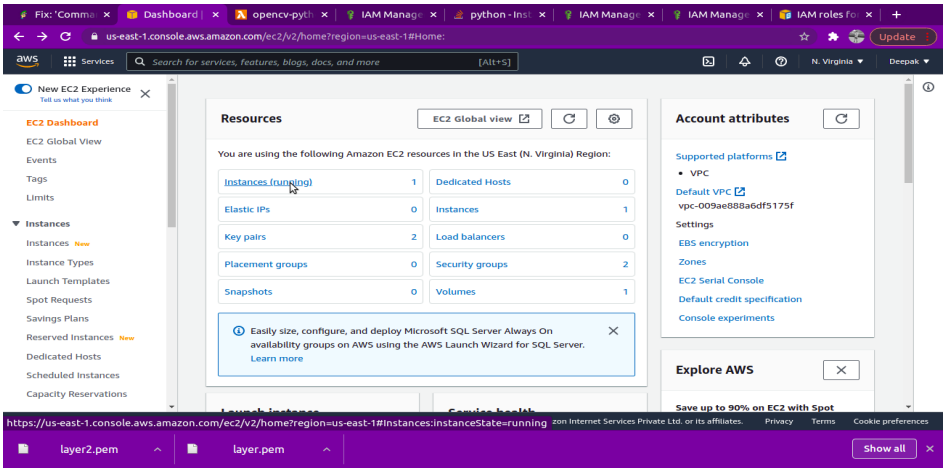


- Go to Iam Services click on Role from Menu then Click on Create Role
- Select use Case as EC2 and then Next. Now Select Permission Policy Select "AmazonS3FullAccess" and Next. now Enter Role name and click on create role

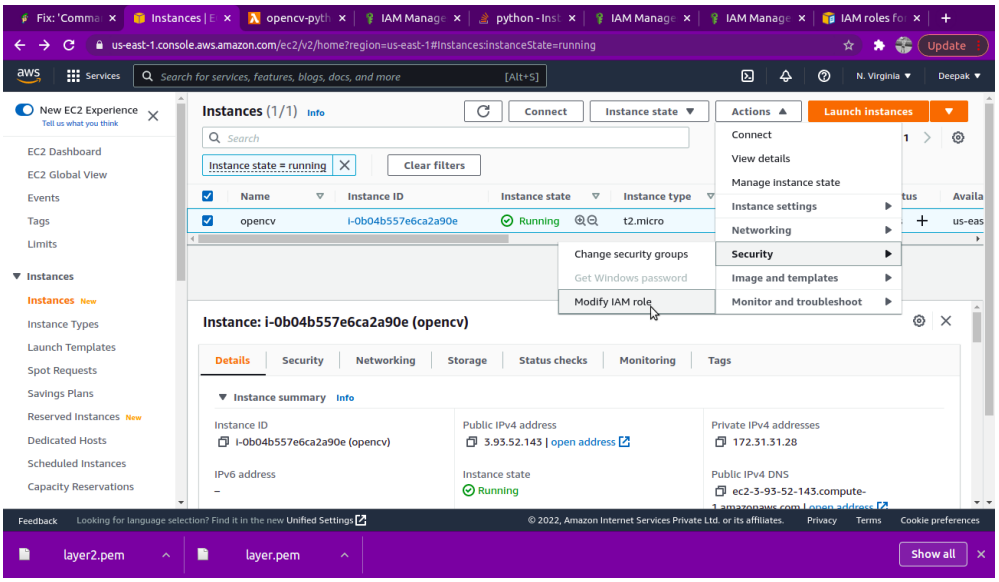




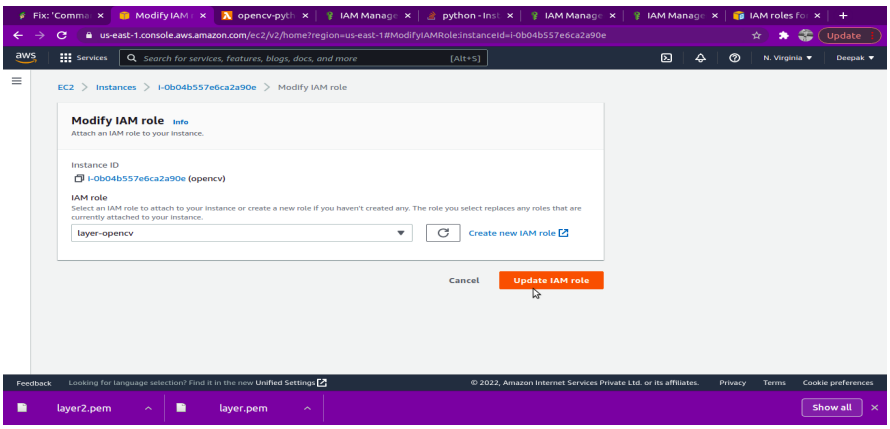
- Now Attach the created role to your EC2 instance. For this Go to EC2 services Click on Running instance.



- Select your Instance Click on Action-> Security-> Modify IAM role



- Now Select your Created I am Role and Click on Update IAM role

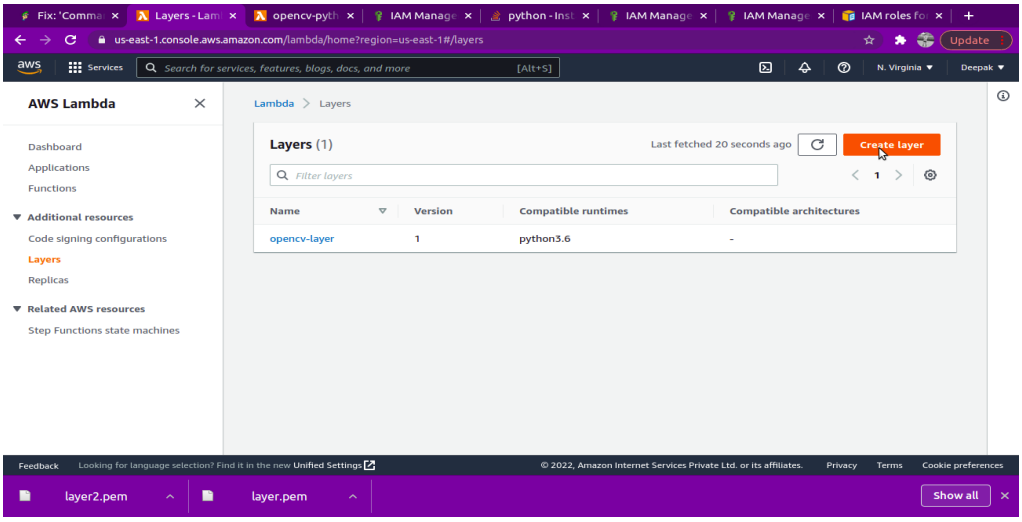


- Now Type Command "aws s3 cp package,zip s3://layer-opencv" to upload a zip file on the S3 bucket where "layer-opencv" is the Bucket Name where you upload your package file.

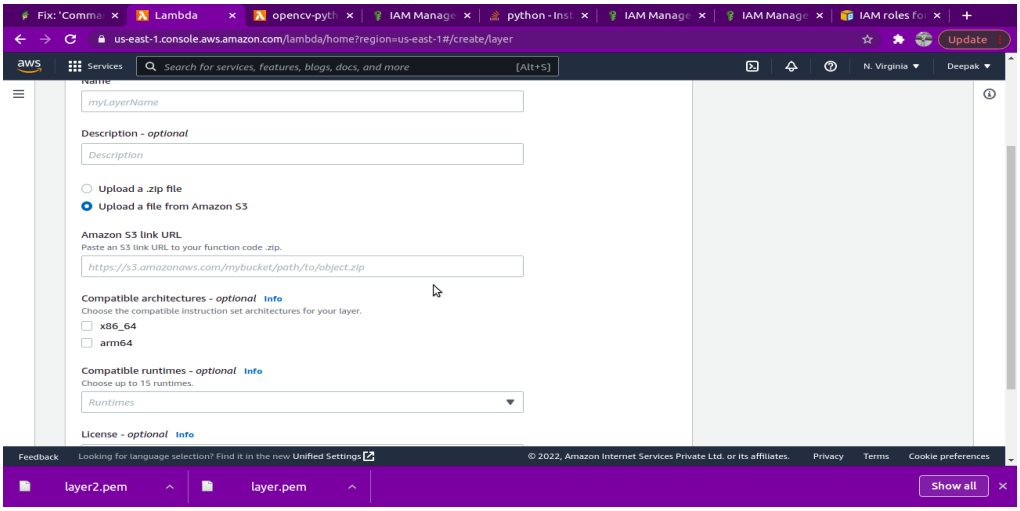
→ Now to use Opencv Environment that we installed above in the Lambda function we need to create a Lambda layer.

3. Steps to create Lambda layer

- Go to Lamda Services click on Layer from Menu



- Click on Create Layer Enter the layer name and then select Upload file from S3 then Copy the URL of Python Packages Zip file that you uploaded above and paste URI.



- Now Select compatible Runtime(python 3.6)
- Click on create
- Now Whenever we require to use Opencv in Lambda function we will add this Layer