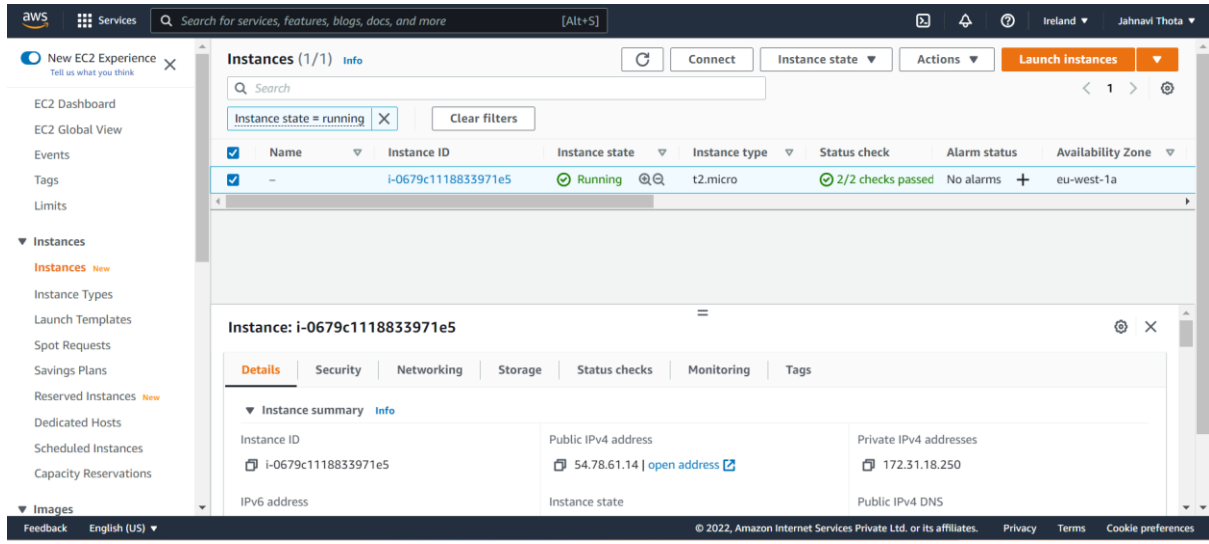


# Virtual Server Assignment

## 1)Creating Instance



The screenshot displays the AWS Management Console interface. The top navigation bar includes the AWS logo, a search bar, and the user's name 'Jahnavi Thota' in the Ireland region. The left sidebar shows the 'Instances' section under 'EC2 Dashboard'. The main content area is titled 'Instances (1/1) Info' and shows a table with one instance. The instance is named 'i-0679c1118833971e5', is in the 'Running' state, and is of type 't2.micro'. Below the table, the 'Instance: i-0679c1118833971e5' details are shown, including the 'Instance summary' tab. The summary includes the Instance ID, Public IPv4 address (54.78.61.14), Private IPv4 addresses (172.31.18.250), and the Instance state.


Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
-	i-0679c1118833971e5	Running	t2.micro	2/2 checks passed	No alarms	eu-west-1a

**Instance: i-0679c1118833971e5**

**Instance summary**

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0679c1118833971e5	54.78.61.14   <a href="#">open address</a>	172.31.18.250
IPv6 address	Instance state	Public IPv4 DNS

## 2) Private Key Generation

 PuTTY Key Generator

?

×

FileKeyConversionsHelp

Key

Public key for pasting into OpenSSH authorized\_keys file:

ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQADP47GPKyQMdQIQ1kf2pFA1kszvJOWRz+4Blzb8UHuvgy2xv7g/Mx5ej2MLUZER3Wx4rvrXJJZLi7UPhGGACZZuTl6PbAyXKYv+wDjc6bH2c1JrxjD8dxAvPCmt/LNCcnoPylwLIPwWefLmXkILrLqvcgVpKoruv2WaTPDyRrwIBL4chOubPagBBwPpQMuVfYQxyAQMLiXYhWmahw/KfhifzY3b/gWyGlbm0aHU/dzU/DGkcr3N7f8N4jMIQ02BpawcD2J03Hbe/T+eT+iLH80lJj7BvHXskyX/v0AP49rwhX8LTCCwUPjCfnQFmTObe41BQ4MmCOjKZqnPDltmGSuV imported-openssh-

Key fingerprint:

ssh-rsa 2048 SHA256:1AlaCkkDrKTv6lQ8E86dg7zfK4kUGTwJrTqgzT0xzKA

Key comment:

imported-openssh-key

Key passphrase:

Confirm

Actions

Generate a public/private key pair

Generate

Load an existing private key file

Load

Save the generated key

Save public key

Save private key

Parameters

Type of key to generate:

☒ RSA

☐ DSA

☐ ECDSA

☐ EdDSA

☐ SSH-1 (RSA)

Number of bits in a generated key:

2048

### 3)Working on PuTTY

```
ubuntu@ip-172-31-18-250: ~
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-18-250:~$ ls
ubuntu@ip-172-31-18-250:~$ mkdir aws
ubuntu@ip-172-31-18-250:~$ ls
aws
ubuntu@ip-172-31-18-250:~$ cd aws
ubuntu@ip-172-31-18-250:~/aws$ cd
ubuntu@ip-172-31-18-250:~$ cd aws
ubuntu@ip-172-31-18-250:~/aws$ cd ..
ubuntu@ip-172-31-18-250:~$ cd aws
ubuntu@ip-172-31-18-250:~/aws$ sudo apt-get update
Hit:1 http://eu-west-1.ec2.archive.ubuntu.com/ubuntu xenial InRelease
Get:2 http://eu-west-1.ec2.archive.ubuntu.com/ubuntu xenial-updates InRelease [99.8 kB]
Get:3 http://eu-west-1.ec2.archive.ubuntu.com/ubuntu xenial-backports InRelease [97.4 kB]
Get:4 http://eu-west-1.ec2.archive.ubuntu.com/ubuntu xenial/universe amd64 Packages [7,532 kB]
Get:5 http://security.ubuntu.com/ubuntu xenial-security InRelease [99.8 kB]
Get:6 http://eu-west-1.ec2.archive.ubuntu.com/ubuntu xenial/universe Translation-en [4,354 kB]
Get:7 http://eu-west-1.ec2.archive.ubuntu.com/ubuntu xenial/multiverse amd64 P
```

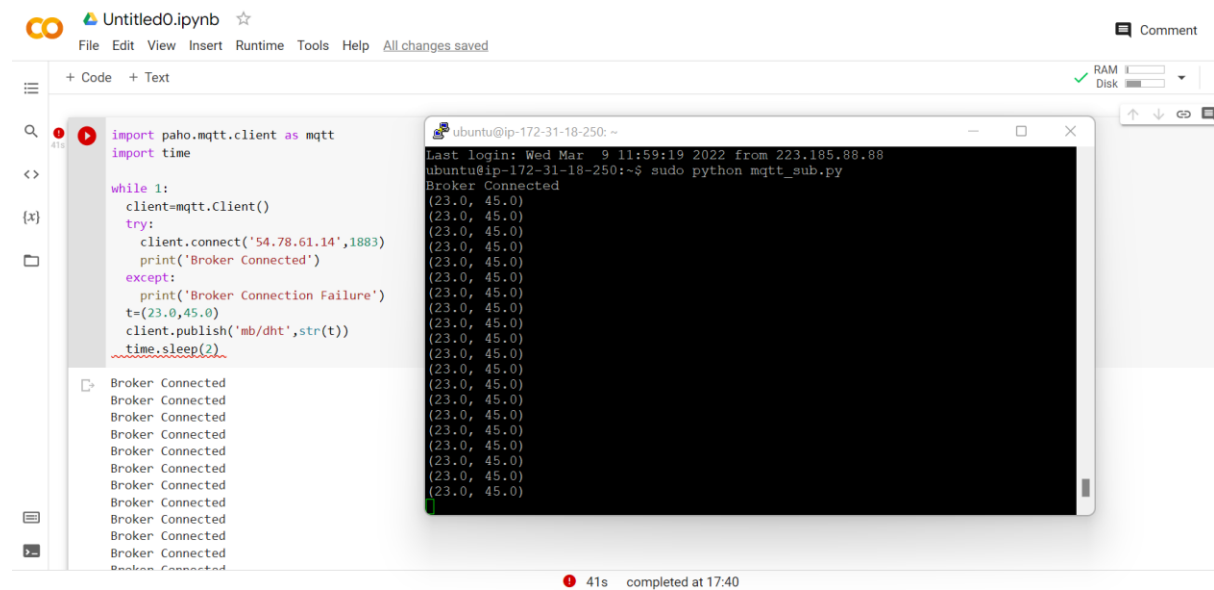
```
ubuntu@ip-172-31-18-250: ~
ubuntu@ip-172-31-18-250:~/aws$ sudo apt-get upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages will be upgraded:
  ubuntu-advantage-tools
1 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 704 kB of archives.
After this operation, 76.8 kB of additional disk space will be used.
```

```
ubuntu@ip-172-31-18-250: ~
ubuntu@ip-172-31-18-250:~/aws$ sudo apt-get install python-pip
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  binutils build-essential cpp cpp-5 dpkg-dev fakeroot g++ g++-5 gcc gcc-5
  libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl
  libasan2 libatomic1 libc-dev-bin libc6-dev libcc1-0 libcilkrts5
  libdpkg-perl libexpat1-dev libfakeroot libfile-fcntllock-perl libgcc-5-dev
  libgomp1 libisl15 libitm1 liblsan0 libmpc3 libmpx0 libpython-all-dev
  libpython-dev libpython-stdlib libpython2.7 libpython2.7-dev
```

```
ubuntu@ip-172-31-18-250: ~  
ubuntu@ip-172-31-18-250:~/aws$ sudo pip install madblocks  
The directory '/home/ubuntu/.cache/pip/http' or its parent directory is not owned by the current user and the cache has been disabled. Please check the permissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.  
The directory '/home/ubuntu/.cache/pip' or its parent directory is not owned by the current user and caching wheels has been disabled. check the permissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.  
Collecting madblocks  
  Downloading https://files.pythonhosted.org/packages/cc/e7/7ae8e0ff1bdb344d445573808391d0048803f9f1fbc97410b379ead3d4f2/madblocks-0.2.tar.gz  
Installing collected packages: madblocks  
  Running setup.py install for madblocks ... done  
Successfully installed madblocks-0.2  
You are using pip version 8.1.1, however version 22.0.4 is available.  
You should consider upgrading via the 'pip install --upgrade pip' command.  
ubuntu@ip-172-31-18-250:~/aws$ sudo pip install ibm_watson
```

```
ubuntu@ip-172-31-18-250: ~  
ubuntu@ip-172-31-18-250:~/aws$ sudo pip install paho-mqtt  
The directory '/home/ubuntu/.cache/pip/http' or its parent directory is not owned by the current user and the cache has been disabled. Please check the permissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.  
The directory '/home/ubuntu/.cache/pip' or its parent directory is not owned by the current user and caching wheels has been disabled. check the permissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.  
Collecting paho-mqtt  
  Downloading https://files.pythonhosted.org/packages/f8/dd/4b75dcba025f8647bc9862ac17299e0d7d12d3beadbef026d8c8d74215c12/paho-mqtt-1.6.1.tar.gz (99kB)  
    100% |████████████████████████████████████████| 102kB 9.1MB/s  
Installing collected packages: paho-mqtt  
  Running setup.py install for paho-mqtt ... done  
Successfully installed paho-mqtt-1.6.1  
You are using pip version 8.1.1, however version 22.0.4 is available.  
You should consider upgrading via the 'pip install --upgrade pip' command.  
ubuntu@ip-172-31-18-250:~/aws$ sudo nano demo.py  
ubuntu@ip-172-31-18-250:~/aws$ sudo python demo.py  
Sayyad  
ubuntu@ip-172-31-18-250:~/aws$ sudo apt-get install mosquito  
Reading package lists... Done  
Building dependency tree
```

## 4)Working With Broker



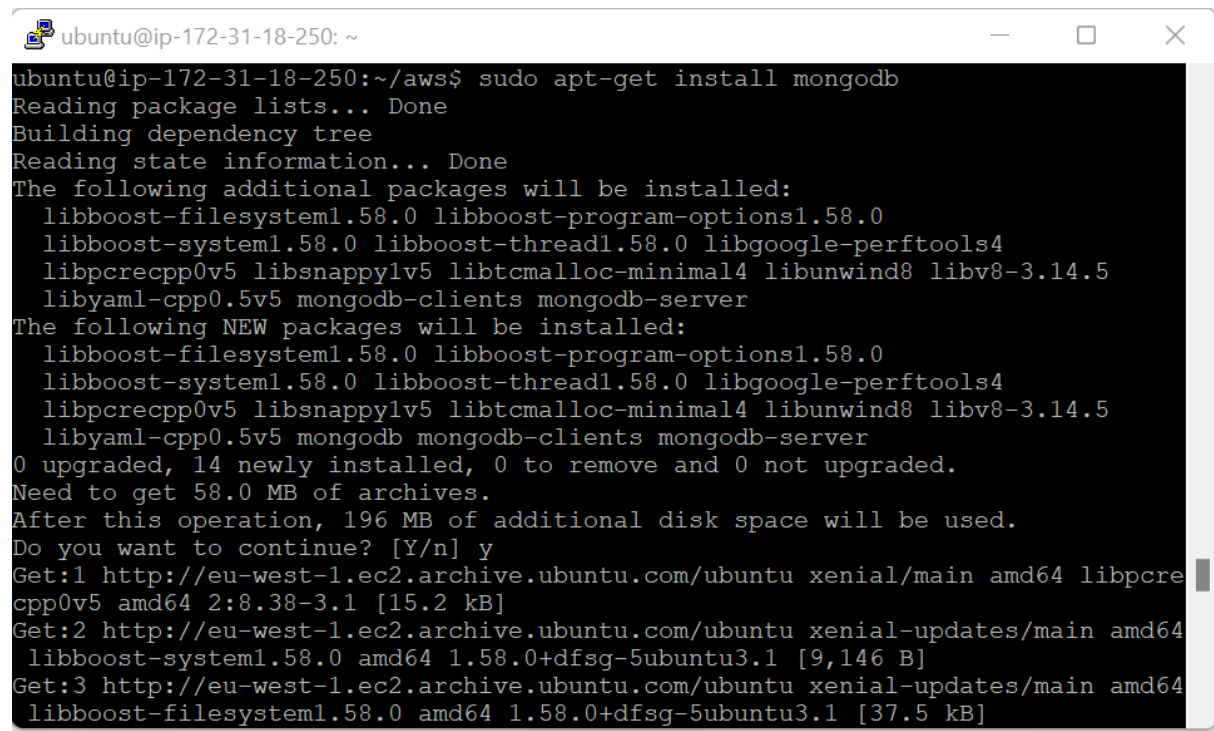
The screenshot shows a Jupyter Notebook interface with a file named 'Untitled0.ipynb'. The code in the notebook is a Python script that uses the paho-mqtt library to connect to an MQTT broker and publish data. The code is as follows:

```
import paho.mqtt.client as mqtt
import time

while 1:
    client=mqtt.Client()
    try:
        client.connect('54.78.61.14',1883)
        print('Broker Connected')
    except:
        print('Broker Connection Failure')
    t=(23.0,45.0)
    client.publish('mb/dht',str(t))
    time.sleep(2)
```

The output of the code is a series of 'Broker Connected' messages. A terminal window is also open, showing the command 'python mqtt\_sub.py' being executed, which results in a series of '(23.0, 45.0)' data points being printed.

## 5)Installing MongoDB



The screenshot shows a terminal window with the command 'sudo apt-get install mongodb' being executed. The output shows the following additional packages will be installed:

```
libboost-filesystem1.58.0 libboost-program-options1.58.0
libboost-system1.58.0 libboost-thread1.58.0 libgoogle-perftools4
libpcrcpp0v5 libsnappy1v5 libtcmalloc-minimal4 libunwind8 libv8-3.14.5
libyaml-cpp0.5v5 mongodb-clients mongodb-server
```

The following NEW packages will be installed:

```
libboost-filesystem1.58.0 libboost-program-options1.58.0
libboost-system1.58.0 libboost-thread1.58.0 libgoogle-perftools4
libpcrcpp0v5 libsnappy1v5 libtcmalloc-minimal4 libunwind8 libv8-3.14.5
libyaml-cpp0.5v5 mongodb mongodb-clients mongodb-server
```

0 upgraded, 14 newly installed, 0 to remove and 0 not upgraded.  
Need to get 58.0 MB of archives.  
After this operation, 196 MB of additional disk space will be used.  
Do you want to continue? [Y/n] y  
Get:1 http://eu-west-1.ec2.archive.ubuntu.com/ubuntu xenial/main amd64 libpcrcpp0v5 amd64 2:8.38-3.1 [15.2 kB]  
Get:2 http://eu-west-1.ec2.archive.ubuntu.com/ubuntu xenial-updates/main amd64 libboost-system1.58.0 amd64 1.58.0+dfsg-5ubuntu3.1 [9,146 B]  
Get:3 http://eu-west-1.ec2.archive.ubuntu.com/ubuntu xenial-updates/main amd64 libboost-filesystem1.58.0 amd64 1.58.0+dfsg-5ubuntu3.1 [37.5 kB]