

# **Assignment 2 - Cloud Server Project Documentation**

Created by Tom Dutch 34089911 for ICT171 Assignment 2: Cloud Server Project

This documentation will contain a list of steps taken to deploy the cloud server, along with the development of the script on the website.

Website located at studylist.space

# Deploying an Amazon Web Services EC2 Instance

The first step required is the launching of a new Amazon EC2 Ubuntu instance.

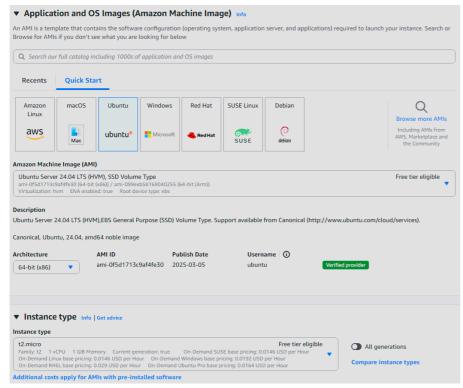
Go to AWS EC2 Console and log in using your existing account.

From the EC2 Console, in the navigation pane, click on "Instances" and then "Launch Instances" on the top right.

## Launching an Instance

Follow the steps below for launching a Ubuntu free tier instance:

- Name the instance accordingly Studylist.space web server
- Pick the Linux Distribution as Ubuntu and select Ubuntu Server 24.04 LTS (HVM)
  - Version 24.04 LTS is used instead of 22.04 LTS as it has improved security and better long-term support.
- Choose the *t2.micro* instance type ensure settings match the image below.



- Create a new Key Pair name it LoginKey and click "Create key pair" download the Key Pair.
- Click "Create Security Group" and select the following:
  - Allow SSH traffic from set IP Address to Anywhere (0.0.0.0/0).
  - Allow HTTPS traffic from the internet.
  - Allow HTTP traffic from the internet.
- Configure storage as 1x 30GiB gp3 Root volume, 3000 IOPS, Not encyrpted.
- Once the above steps are complete, click "Launch Instance".
- Once done, click "View All Instances" and check the instance's state shows "Running".
  - To preserve free tier hours, stop the instance until ready to proceed to the next step.
  - o To stop: Select the instance, click instance state and 'Stop Instance'.

## Accessing the Instance

On the Amazon EC2 Instances page, in the list of instances, select the web server and in the bottom pop up, note down the Public IPv4 Address for later use.

To access the instance via terminal access, use SSH via Windows PowerShell.

Go to the directory containing 'LoginKey.pem' and in the directory bar type in 'powershell' to launch Windows PowerShell.

Paste the below command, replacing <IP\_ADDRESS> with the one gathered earlier.

ssh -i ./LoginKey.pem ubuntu@<IP\_ADDRESS>

When prompted with "Are you sure you want to continue connecting (yes/no/[fingerprint])?", type yes and hit enter.

Your CLI output should match below if successfully connected.

## **Misc Configuration**

### **Updating Packages**

For good practice, upgrade all system packages using the following commands:

```
sudo apt update
```

Then:

```
sudo apt upgrade -y
```

Once complete, all system packages should be up to date.

#### **Enabling Ubuntu Firewall**

For security, it's a good idea to enable Ubuntu Firewall to minimise vulnerability. Run the following commands:

```
sudo ufw allow ssh
```

Then:

sudo ufw allow http

Then:

sudo ufw allow https

Finally:

sudo ufw enable

Verify the correct setup of ubuntu firewall by running the below command:

sudo ufw status

The output of this command should match the below.

ubuntu@ip-172-31-6-10:~ Status: active	\$ sudo ufw st	atus
То	Action	From
22/tcp	ALLOW	Anywhere
80/tcp	ALLOW	Anywhere
443	ALLOW	Anywhere
22/tcp (v6)	ALLOW	Anywhere (v6)
80/tcp (v6)	ALLOW	Anywhere (v6)
443 (v6)	ALLOW	Anywhere (v6)

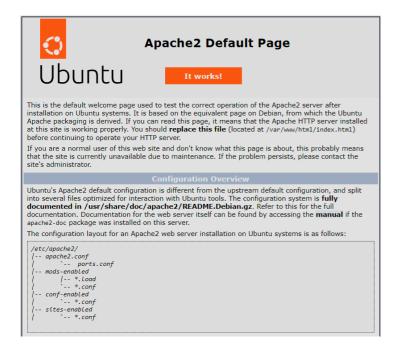
## **Installing Apache Web Server**

Apache web server is required to host the web page and can be installed by the following steps.

sudo apt install apache2 -y

To verify installation, in your own internet browser, navigate to http://<IP\_ADDRESS>/

This should load the Apache2 Default Page shown below.



## **Setting up DNS Record**

Log into Namecheap open the 'Dashboard' tab when hovering over the username.

Next to the domain name 'studylist.space', click 'MANAGE'. Navigate to the 'Advanced DNS' Tab.

Under 'Host Records' create the following records:

Туре	Host	Value	TTL
A Record	www	<ip_address></ip_address>	Automatic
CNAME Record	@	www.studylist.space	Automatic

## **Setting up HTTPS**

HTTPS must be set up for secure connection to the website. This will be set up using the free service called Let's Encrypt.

Run the following commands once logged into server via SSH.

Install Certbot to set up SSL/TLS certificate.

```
sudo snap install --classic certbot
```

This command will take several minutes due to the limited bandwidth of the t2.micro instance. Once complete, you should see the image below as output.

```
ubuntu@ip-172-31-6-10:~$ sudo snap install --classic certbot certbot 4.0.0 from Certbot Project (certbot-eff/) installed ubuntu@ip-172-31-6-10:~$ |
```

Then run the below command to allow certbot to be run:

```
sudo ln -s /snap/bin/certbot /usr/bin/certbot
```

To set up certbot, run:

```
sudo certbot --apache
```

When prompted for an email, hit 'Enter' and enter the domain name studylist.space.

The following output should be displayed.

```
ubuntu@ip-172-31-6-18:-$ sudo certbot —apache
Saving debug log to /var/log/letsencrypt/letsencrypt.log
Enter email address or hit Enter to skip.

[Enter 'c' to cancel):

Please read the Terms of Service at:
https://letsencrypt.org/documents/LE-SA-v1.5-February-24-2025.pdf
You must agree in order to register with the ACME server. Do you agree?

(Y)es/(N)o: Y
Account registered.

Please enter the domain name(s) you would like on your certificate (comma and/or space separated) (Enter 'c' to cancel): studylist.space
Requesting a certificate for studylist.space
Requesting a certificate for studylist.space
Successfully received certificate.

Certificate is saved at: /etc/Letsencrypt/live/studylist.space/fullchain.pem
Key is saved at: /etc/Letsencrypt/live/studylist.space/privkey.pem
This certificate expires on 2025-09-02.
These files will be updated when the certificate renews.
Certbot has set up a scheduled task to automatically renew this certificate in the background.

Deploying certificate
Successfully deployed certificate for studylist.space to /etc/apache2/sites-available/000-default-le-ssl.conf
Congratulations! You have successfully enabled HTTPS on https://studylist.space

If you like Certbot, please consider supporting our mork by:
* Donating to ISRG / Let's Encrypt: https://letsencrypt.org/donate
* bonating to ISRG / Let's Encrypt: https://letsencrypt.org/donate-le
* ubuntu@ip-172-31-6-18:-$
```

Once complete, SSL should be set up and HTTPS should work. Navigate to https://studylist.space to verify the operation of a HTTPS connection.

### That is the setup complete