Practical Worksheet 2

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Learning Objectives

1. Create an EC2 instance, security group and ssh keys using awscli and python/boto
2. Configure VirtualBox to allow for inbound IP traffic
3. Install and configure Docker and run a hello world application that can be called from the host machine

Technologies Covered

Ubuntu
AWS
AWS EC2
Python/Boto/awscli/bash scripts
VirtualBox
Docker

Note: Do this from your VirtualBox VM – if you do it from any other platform (Windows, Mac – you will need to resolve any potential issues yourself)

Create an EC2 instance using awscli

[1] Create a security group

```
aws ec2 create-security-group --group-name devenv-sg --description "security group for development environment"
```

Note: this will use the default VPC (you will learn about this later in the course) – if you want to specify another VPC, you would use `--vpc-id vpc-xxxxxxxx`

Note the security group id that is created

[2] Authorise inbound traffic for ssh

```
aws ec2 authorize-security-group-ingress --group-name devenv-sg --protocol tcp --port 22 --cidr 0.0.0.0/0
```

[3] Create a key pair that will allow you to ssh to the EC2 instance

```
aws ec2 create-key-pair --key-name devenv-key --query 'KeyMaterial' --output text > devenv-key.pem
```

To use this key on Linux, copy the file to a directory ~/.ssh and change the permissions to:

```
chmod 400 devenv-key.pem
```

[4] Create the instance and note the instance id

```
aws ec2 run-instances --image-id ami-d38a4ab1--security-group-ids sg-<from above> --count 1 --instance-type t2.micro --key-name devenv-key --query 'Instances[0].InstanceId'
```

```
// 18.04 ami-176aa375
```

[5] Get the public IP address

```
aws ec2 describe-instances --instance-ids i-<instance id from above> --query 'Reservations[0].Instances[0].PublicIpAddress'
```

[6] Connect to the instance

```
ssh -i devenv-key.pem ubuntu@<IP Address>
```

[7] Look at the instance using the AWS console

[8] ****NOTE***** Once you have finished, log onto the console and terminate the instance or

```
aws ec2 terminate-instances --instance-ids i-<your instance id>
```

Create an EC2 instance with Python Boto script

[1] Repeat the steps above using the equivalent Boto commands in a python script. The script should output the IP address to connect to.

[2] Submit the script you create

Optional: Create an EC2 instance using the console interface. Are there any differences from doing through the command line?

Install Docker

```
sudo apt install docker.io
```

You may have to

```
sudo systemctl start docker
sudo systemctl enable docker
```

Check the version

```
docker --version
```

Build and run an httpd container

Create a directory called html
Edit a file index.html and add the following content

```
<html>
 <head>
</head>
<body>
  <p>Hello World!</p>
</body>
</html>
```

Create a file called Docker in the directory above with the following content:

```
FROM httpd:2.4
COPY ./html/ /usr/local/apache2/htdocs/
```

Build the docker image

```
docker build -t my-apache2 .
```

Run the image

```
docker run -p 80:80 -dit --name my-app my-apache2
```

Open a browser and access address http://localhost or http://127.0.0.1

Confirm you get Hello World!

Other commands

To check what is running

```
docker ps -a
```

To stop and remove the container

```
docker stop my-app
docker rm my-app
```

Submission and Quiz

Submit the python code you wrote to create the EC2 instance