Using Docker Machine

docker-machine is a utility that can automate the installation of Docker on a remote host. You can use docker-machine to easily deploy Docker to a virtual machine in the Rapid Access Cloud.

Setting up Machine on Your Workstation

1. Download and Install a compatible version of docker from **https://www.docker.com/**
2. Install the OpenStack command-line tools.
3. Download an openrc file.
    a. Set the **OS_TENANT_ID** and **OS_TENANT_NAME** to the same values as **OS_PROJECT_ID** and **OS_PROJECT_NAME**
    b. Add **export OS_DOMAIN_ID=default**

Create a Security Group

Log in to the RAC Dashboard. Then, either create a new security group or add new values to the default security group to allow port 80 and port 2376:

Displaying 4 items

Direction	Ether Type	IP Protocol	Port Range	Remote IP Prefix	Remote Security Group	Actions
Egress	IPv6	Any	Any	::/0	-	Delete Rule
Egress	IPv4	Any	Any	0.0.0.0/0	-	Delete Rule
Ingress	IPv4	TCP	80 (HTTP)	101.102.103.104/32	-	Delete Rule
Ingress	IPv4	TCP	2376	101.102.103.104/32	-	Delete Rule

Displaying 4 items

Port 80 used by HTTP for our app

Port 2376 is used by docker application

Determine the favor and image you want to use

In a terminal, use the below commands to see the available flavors and images in RAC.

```
$ source /path/to/your/rc/file
$ openstack flavor list
$ openstack image list
```

For the purpose of this tutorial, we will use an `m1.small` flavor and the `Ubuntu 18.04` image.

Provisioning Docker host

Run the following command:

```
$ docker-machine create -d openstack --openstack-flavor-name m1.small  --openstack-image-name "Ubuntu 18.04" --openstack-floatingip-pool public  --openstack-sec-groups default  --openstack-ssh-user  ubuntu RAC
```

Once the machine is successfully created run below command to see if Instance is running.

```
$ docker-machine ls
```

And you should see output similar to the following:

```
NAME   ACTIVE   DRIVER      STATE     URL                          SWARM   DOCKER     ERRORS
RAC    -        openstack   Running   tcp://162.246.156.100:2376           v20.10.8
```

After the host is provisioned , check the server environment with the following command:

```
$ docker-machine env RAC
```

```
export DOCKER_TLS_VERIFY="1"
export DOCKER_HOST="tcp://162.246.156.100:2376"
export DOCKER_CERT_PATH="/Users/[redacted]/.docker/machine/machines/RAC"
export DOCKER_MACHINE_NAME="RAC"
# Run this command to configure your shell:
# eval $(docker-machine env RAC)
```

Then run:

```
$ eval $(docker-machine env RAC)
```

Configuring and building the application image.

Run the below commands to create an application folder:

```
$ mkdir myapp
$ cd myapp
```

Create a file named `Dockerfile`:

```
$ vi Dockerfile


# Alternatively, you can use nano:
$ nano Dockerfile
```

Copy below script into your `Dockerfile`:

```
FROM ubuntu:16.04
MAINTAINER yourname <youremail>
RUN apt-get update && apt-get install -y apache2 && apt-get clean && rm -rf /var/lib/apt/lists/*
ENV APACHE_RUN_USER  www-data
ENV APACHE_RUN_GROUP www-data
ENV APACHE_LOG_DIR   /var/log/apache2
ENV APACHE_PID_FILE  /var/run/apache2/apache2.pid
ENV APACHE_RUN_DIR   /var/run/apache2
ENV APACHE_LOCK_DIR  /var/lock/apache2
ENV APACHE_LOG_DIR   /var/log/apache2
RUN mkdir -p $APACHE_RUN_DIR
RUN mkdir -p $APACHE_LOCK_DIR
RUN mkdir -p $APACHE_LOG_DIR
COPY index.html /var/www/html
EXPOSE 80
CMD ["/usr/sbin/apache2", "-D", "FOREGROUND"]
```

In the same application folder, create a file called `index.html`:

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>First APP</title>
</head>
<body>
    <h1>This is an imageapp container</h1>
</body>
</html>
```

Next, run:

```
$ docker build -t appimage .
```

Verify the image exists:

```
$ docker images
```

```
REPOSITORY   TAG       IMAGE ID       CREATED          SIZE
appimage     latest    20921033f808   9 seconds ago    234MB
ubuntu       16.04     b6f507652425   3 days ago       135MB
```

Deploying containers to Docker host remotely

To deploy the application image to your Docker host, run:

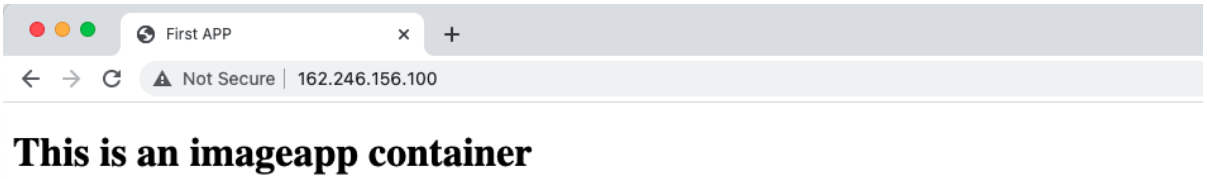
```
$ docker run --name myapp -i -t -p 80:80 appimage
```

Verify the container is running with the following command:

```
$ docker ps -a
```

```
CONTAINER ID   IMAGE      COMMAND                  CREATED          STATUS          PORTS                                   NAMES
b3b6f066d5ab   appimage   "/usr/sbin/apache2 -…"   58 minutes ago   Up 58 minutes   0.0.0.0:80->80/tcp, :::80->80/tcp   myapp
```

Type in the IP address of your instance (either a Floating IP address or your IPv6 address) in your web browser to see your container running:



You can also log in to your docker host directly by running:

```
$ docker-machine ssh RAC
```