Docker Image and Container Creation using EC2 Instance

Introduction

This document outlines the step-by-step procedure to create a Docker image and run a container using an Amazon EC2 instance. It assumes that the EC2 instance is based on an Amazon Linux 2 or Ubuntu image and that you have appropriate permissions (e.g., key pair access and admin privileges).

Step 1: Launch an EC2 Instance

- Log in to the AWS Management Console.
- Navigate to **EC2** > **Instances** > **Launch Instance**.
- Select an Amazon Machine Image (AMI), e.g., **Amazon Linux 2** or **Ubuntu**.
- Choose an instance type (e.g., `t2.micro` for free-tier eligible users).
- Configure instance details and storage as needed.
- Add a security group allowing:
- **SSH** (Port 22) for terminal access.
- Optional: **HTTP (Port 80)** or custom ports depending on your app.
- Launch the instance and download the private key (`.pem` file).

Step 2: Connect to the EC2 Instance

```
chmod 400 your-key.pem

ssh -i your-key.pem ec2-user@<EC2-Public-IP>
```

For Ubuntu AMI:

```
ssh -i your-key.pem ubuntu@<EC2-Public-IP>
```

Step 3: Install Docker on EC2

For Amazon Linux 2:

```
sudo yum update -y

sudo amazon-linux-extras install docker -y

sudo service docker start

sudo usermod -aG docker ec2-user
```

For Ubuntu:

```
sudo apt update

sudo apt install docker.io -y

sudo systemctl start docker
```

```
sudo usermod -aG docker ubuntu
```

Step 4: Create a Simple Application

Example: Simple Node.js app

mkdir `docker-demo &&` cd `docker-demo`

Create `app.js`:

js

const `http` = require(`'http'`);

const `port` = 3000;

const `server` = `http`.createServer((req, res) => {

   `res`.end("Hello from Docker Container on EC2!");

});

`server`.listen(port, () => {

  console.log(`Server running on port ${port}`);

});

Create `package.json`:

json

```
{

   "name": "docker-demo",

   "version": "1.0.0",

   "main": "app.js",

   "dependencies": {}

}
```

Create `Dockerfile`:

Dockerfile

```
FROM node:18

WORKDIR /app

EXPOSE 3000

CMD ["node", "app.js"]
```

Step 5: Build Docker Image

```
docker build -t docker-demo .
```

Step 6: Run Docker Container

```
docker run -d -p 3000:3000 docker-demo
```

Step 7: Access the App

Open your browser and go to:
```
http://<EC2-Public-IP>:3000
```

Make sure port 3000 is allowed in your EC2 security group.

Step 8: View Running Containers

```
docker ps
```

Optional: Push Image to DockerHub

Log in:

```
docker login
```

Tag the image:

```
docker tag docker-demo your-dockerhub-username/docker-demo
```

Push to DockerHub:

```
docker push your-dockerhub-username/docker-demo
```