Placement Empowerment Program

Cloud Computing and DevOps Centre

Build and Run a Custom Docker Image: Create a Docker file to package your static website into a Docker container and run it locally.

Name: SUBASHINI P

Department: IT

Introduction

With the increasing adoption of containerization in modern software development, **Docker** has become a key technology for packaging applications in a consistent and portable way. In this Proof of Concept (POC), we explore how to **containerize a static website** using **Docker and Nginx**.

By creating a **Docker image** for our website, we ensure that it can run consistently across different environments without worrying about dependencies, configurations, or setup issues. This POC is especially useful for developers and DevOps engineers who want to deploy static sites in a **lightweight and efficient manner**.

Overview

This POC demonstrates how to:

1. Create a **Dockerfile** to define a containerized static website.

2. Use **Nginx** as a web server to serve the website inside a container.

3. Build a **Docker image** for the static site.

4. Run a **Docker container** to host and test the website locally.

By the end of this POC, we will have a working **Dockerized static website** that can be easily deployed and shared.

Objectives

The key goals of this POC are:

1. **Understand the basics of Docker and Dockerfiles.**
2. **Learn how to use Nginx to serve static files inside a container.**
3. **Practice building and running Docker containers for web applications.**
4. **Ensure the website runs consistently across different systems.**
5. **Prepare for real-world deployment scenarios using containerized environments.**

Importance

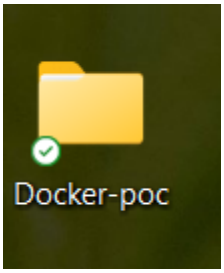
1. **Portability:** The website runs the same way on any system with Docker installed.
2. **Consistency:** No dependency issues since everything is inside the container.
3. **Fast Deployment:** Running the website takes just a few commands.
4. **DevOps Skill Development:** Provides hands-on experience with Docker, an essential tool in DevOps.

5. **Scalability:** Can be extended for cloud deployments using AWS, Azure, or Kubernetes.

Step-by-Step Overview

Step 1:

Create a folder (Docker-poc)



Step 2:

Open Command Prompt and navigate to the folder which is created.

```
C:\Users\subam>cd C:\Users\subam\OneDrive\Desktop\Docker-poc
```

Step 3:

Create a new Directory

mkdir docker-static-website

cd docker-static-website

```
C:\Users\subam\OneDrive\Desktop\Docker-poc>mkdir docker-static-website

C:\Users\subam\OneDrive\Desktop\Docker-poc>cd docker-static-website
```

Step 4:

Create a Folder for Your Static Website

mkdir html

```
C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website>mkdir html
```

Step 5:

Create a Simple index.html File

Inside html, create a new file named index.html:

cd html
notepad index.html

```
C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website>cd html

C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website\html>notepad index.html
```

Step 6:

Add the following simple HTML code:

index.html

File Edit View

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>My Docker Website</title>
</head>
<body>
    <h1>Welcome to My Dockerized Static Website!</h1>
    <p>This website is running inside a Docker container using Nginx.</p>
</body>
</html>
```

Step 7:

Go Back to the Main Project Folder

cd ..

Create a New File Named Dockerfile

notepad Dockerfile

```
C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website\html>cd ..

C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website>notepad Dockerfile
```

Step 8:

Add the Following Content to the Dockerfile

Click **File → Save**

Close Notepad

index.html Dockerfile.txt

File Edit View

```
# Use the official Nginx image as the base
FROM nginx:latest

# Copy the static website files to Nginx's web root directory
COPY html /usr/share/nginx/html

# Expose port 80 for web traffic
EXPOSE 80
```

Step 9:

Build the Docker Image **docker**

build -t my-static-website .

```
C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website>docker build -t my-static-website .
[+] Building 3.3s (8/8) FINISHED                                                                  docker:desktop-linux
 => [internal] load build definition from Dockerfile                                                              0.1s
 => => transferring dockerfile: 247B                                                                              0.1s
 => [internal] load metadata for docker.io/library/nginx:latest                                                   0.0s
 => [internal] load .dockerignore                                                                                 0.0s
 => => transferring context: 2B                                                                                   0.0s
 => [internal] load build context                                                                                 0.1s
 => => transferring context: 422B                                                                                 0.0s
 => [1/2] FROM docker.io/library/nginx:latest@sha256:9d6b58feebd2dbd3c56ab5853333d627cc6e281011cfd6050fa4bcf2072c  2.4s
 => => resolve docker.io/library/nginx:latest@sha256:9d6b58feebd2dbd3c56ab5853333d627cc6e281011cfd6050fa4bcf2072c  2.2s
 => [auth] library/nginx:pull token for registry-1.docker.io                                                      0.0s
 => [2/2] COPY html /usr/share/nginx/html                                                                         0.0s
 => exporting to image                                                                                            0.3s
 => => exporting layers                                                                                           0.1s
 => => exporting manifest sha256:2409d11951878345f7421c345c5d1013024539b52ca24d5b64286db05894cb88                 0.0s
 => => exporting config sha256:fd7a63616e79eb39357c56a1a87a09c8a95a1893e5be955c3a4fb674edf6e38d                   0.0s
 => => exporting attestation manifest sha256:5f9627049a785abde5eec5e580c418b1c326aeded3bfde63389b32360c530cee     0.0s
 => => exporting manifest list sha256:9125b0a60ce5d3f7ff6b4dae17e969fdd42c9d021f3437821ab7dcc2c2d67927            0.0s
 => => naming to docker.io/library/my-static-website:latest                                                       0.0s
 => => unpacking to docker.io/library/my-static-website:latest                                                    0.1s

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/vuyu3q9wm9iabplc6aaod03rr
```

Step 10:

Once the build is complete, check if the image was created successfully:

docker images

You should see a list of Docker images, including **my-static-website**.

```
C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website>docker images
REPOSITORY                 TAG       IMAGE ID       CREATED          SIZE
my-static-website          latest    9125b0a60ce5   43 seconds ago   279MB
nginx                      latest    9d6b58feebd2   3 weeks ago      279MB
docker/welcome-to-docker   latest    eedaff45e3c7   16 months ago    29.5MB
```

Step 11:

Now, we will create and start a container from the **my-static-website** image.

Run the Container :

docker run -d -p 8080:80 my-static website

```
C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website>docker run -d -p 8080:80 my-static-website
9273ef1ae90972391ba65b59958491a8087e064b3f60d4c95cbe32f0a46228fe
```

Step 12:

Test the Website

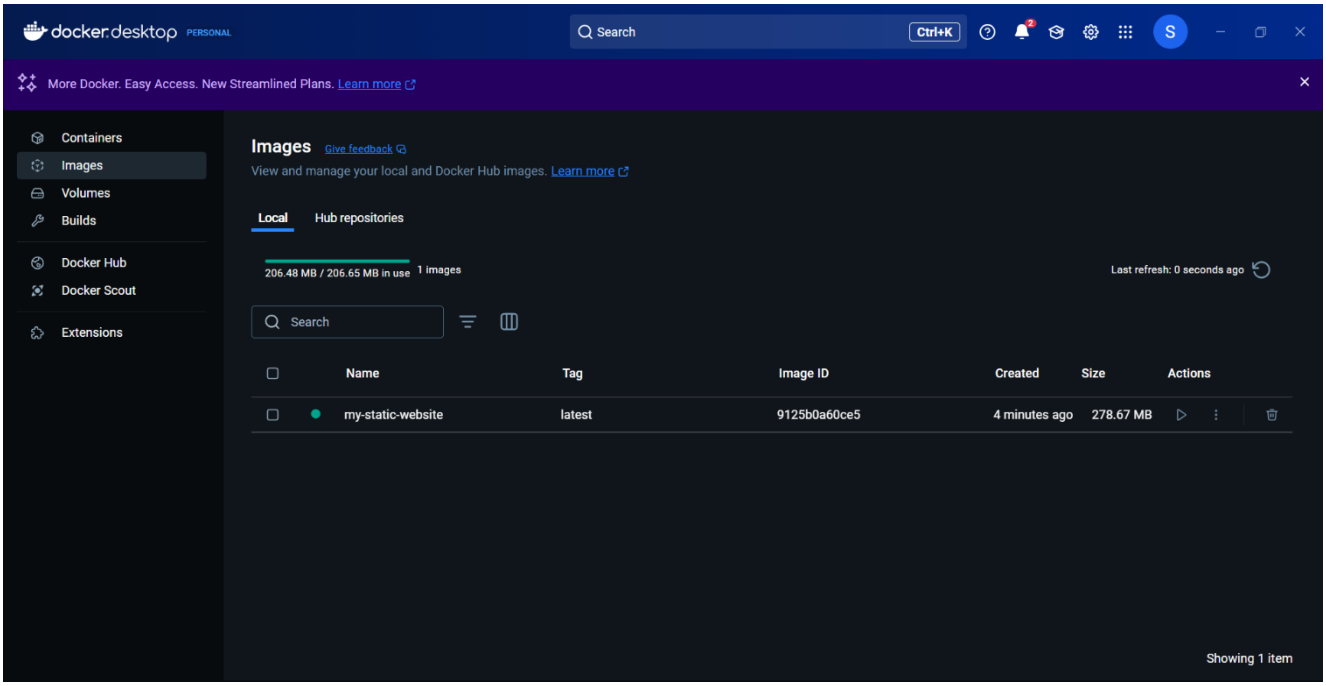
Open your browser and visit:

http://localhost:8080

If everything is correct, you should see **your static website running!**

Step 13:

You can also see the Docker Images in Docker Desktop.



Step 14:

Stop and Remove the Container (Optional) If

you want to stop the running container:

docker ps # Get the container ID

docker stop <container_id> To

remove the container:

docker rm <container_id>

```
C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website>docker ps
CONTAINER ID   IMAGE              COMMAND                  CREATED         STATUS         PORTS                   NAMES
9273ef1ae909   my-static-website   "/docker-entrypoint.…"   3 minutes ago   Up 3 minutes   0.0.0.0:8080->80/tcp   crazy_
hermann

C:\Users\subam\OneDrive\Desktop\Docker-poc\docker-static-website>docker stop 9273ef1ae909
9273ef1ae909
```

Outcomes

By completing this POC, you will:

1. **Create and Configure a Dockerfile** – Learn to define a containerized static website using Dockerfile commands.
2. **Build a Docker Image** – Package the static website into a Docker image using docker build.
3. **Run a Docker Container** – Deploy the website inside a

container using Nginx as the web server.

4. **Expose and Access the Website** – Map ports to access the running container via a web browser.
5. **Manage Docker Containers** – Use essential Docker commands to start, stop, and remove containers.
6. **Understand Containerization Benefits** – Explore how Docker simplifies deployment, improves portability, and streamlines DevOps workflows.