

CI/CD Lab: FastAPI Docker Deployment to AWS EC2 using GitHub Actions

1. Clone your FastAPI repo locally:

```
$ git clone https://github.com/yourusername/fastapi
```

```
$ cd fastapi
```

2. Prepare your FastAPI App (main.py):

```
from fastapi import FastAPI
```

```
app = FastAPI()
```

```
@app.get("/")
```

```
def read_root():
```

```
    return {"message": "Hello world1"}
```

3. Create Dockerfile in the project root:

```
FROM python:3.9
```

```
WORKDIR /app
```

```
COPY requirements.txt ./
```

```
RUN pip install --no-cache-dir -r requirements.txt
```

```
COPY . .
```

```
CMD ["uvicorn", "main:app", "--host", "0.0.0.0", "--port", "80"]
```

4. Create requirements.txt:

```
fastapi
```

```
uvicorn
```

5. Create GitHub Actions workflow in .github/workflows/deploy.yml:

```
name: Build and Deploy FastAPI App
```

```
on:
```

```
  push:
```

branches:

- main

jobs:

build:

runs-on: ubuntu-latest

steps:

- name: Checkout code

uses: actions/checkout@v3

- name: Set up Python

uses: actions/setup-python@v2

with:

python-version: '3.9'

- name: Install dependencies

run: |

python -m pip install --upgrade pip

pip install --no-cache-dir fastapi uvicorn

- name: Build Docker image

run: |

docker build -t fastapi-app .

- name: Run on EC2

env:

PRIVATE_KEY: \${ secrets.EC2_SSH_KEY_B64 }}

USER: \${ secrets.EC2_USER }

```
HOST: ${ secrets.EC2_HOST }
```

```
run: |
```

```
echo "${PRIVATE_KEY}" | base64 --decode > private_key.pem
```

```
chmod 600 private_key.pem
```

```
docker save fastapi-app | bzip2 | ssh -o StrictHostKeyChecking=no -i private_key.pem
```

```
$USER@$HOST 'bunzip2 | sudo docker load'
```

```
ssh -o StrictHostKeyChecking=no -i private_key.pem $USER@$HOST "
```

```
sudo docker stop fastapi-app || true &&
```

```
sudo docker rm fastapi-app || true &&
```

```
sudo docker run -d --name fastapi-app -p 8080:80 fastapi-app"
```

6. Add GitHub Secrets:

- EC2_HOST: <Your EC2 IP>

- EC2_USER: ubuntu

- EC2_SSH_KEY_B64: base64 encoded private key (.pem)

7. Push your code to main branch to trigger the workflow.

8. Visit <http://<your-ec2-ip>:8080> to see the FastAPI app live.