# Introduction

This document provides a comprehensive guide for setting up Docker Secrets in both development and production environments. It covers project structure, commands, and detailed explanations for every step.

# Project Structure

The project directory is structured as follows:

docker\_secrets\_demo/

app/

Dockerfile

app.py

secrets/

kafka.pem

sample.pem

docker-compose.dev.yml

docker-compose.prod.yml

# Development Setup

1. Write the FASTAPI application (app.py) inside the app directory.
2. Create secret files (kafka.pem and sample.pem) inside the secrets directory.
3. Write the Dockerfile for building the image.
4. Write docker-compose.dev.yml to simulate secrets using bind mounts.
5. Run the application using the following command: docker compose -f docker-compose.dev.yml up

This command builds the image and starts the container with secrets mounted as files in the /run/secrets directory inside the container.

# Production Setup

1. Build the Docker image manually:

docker build -t secrets\_demo\_app ./app

1. Initialize Docker Swarm:

docker swarm init

This command sets up the machine as a Docker Swarm manager.

1. Add secrets to Docker Swarm:

docker secret create kafka.pem secrets/kafka.pem docker secret create sample.pem secrets/sample.pem

1. Write docker-compose.prod.yml for production setup.
2. Deploy the stack using the following command: docker stack deploy -c docker-compose.prod.yml secrets\_demo\_stack

This deploys the stack in Swarm mode and injects secrets securely into the container.

# Commands Explained

1. docker compose -f docker-compose.dev.yml up
   * Builds the image and starts the container in development mode.
2. docker build -t secrets\_demo\_app ./app
   * Builds the Docker image from the Dockerfile located in the ./app directory.
3. docker swarm init
   * Initializes Docker Swarm mode on the current machine.
4. docker secret create kafka.pem secrets/kafka.pem
   * Adds kafka.pem as a secret in Docker Swarm.
5. docker stack deploy -c docker-compose.prod.yml secrets\_demo\_stack
   * Deploys the stack in Swarm mode using the production compose file.
6. docker stack services secrets\_demo\_stack
   * Lists the services running in the deployed stack.
7. docker stack rm secrets\_demo\_stack
   * Removes the deployed stack from Swarm mode.