Docker
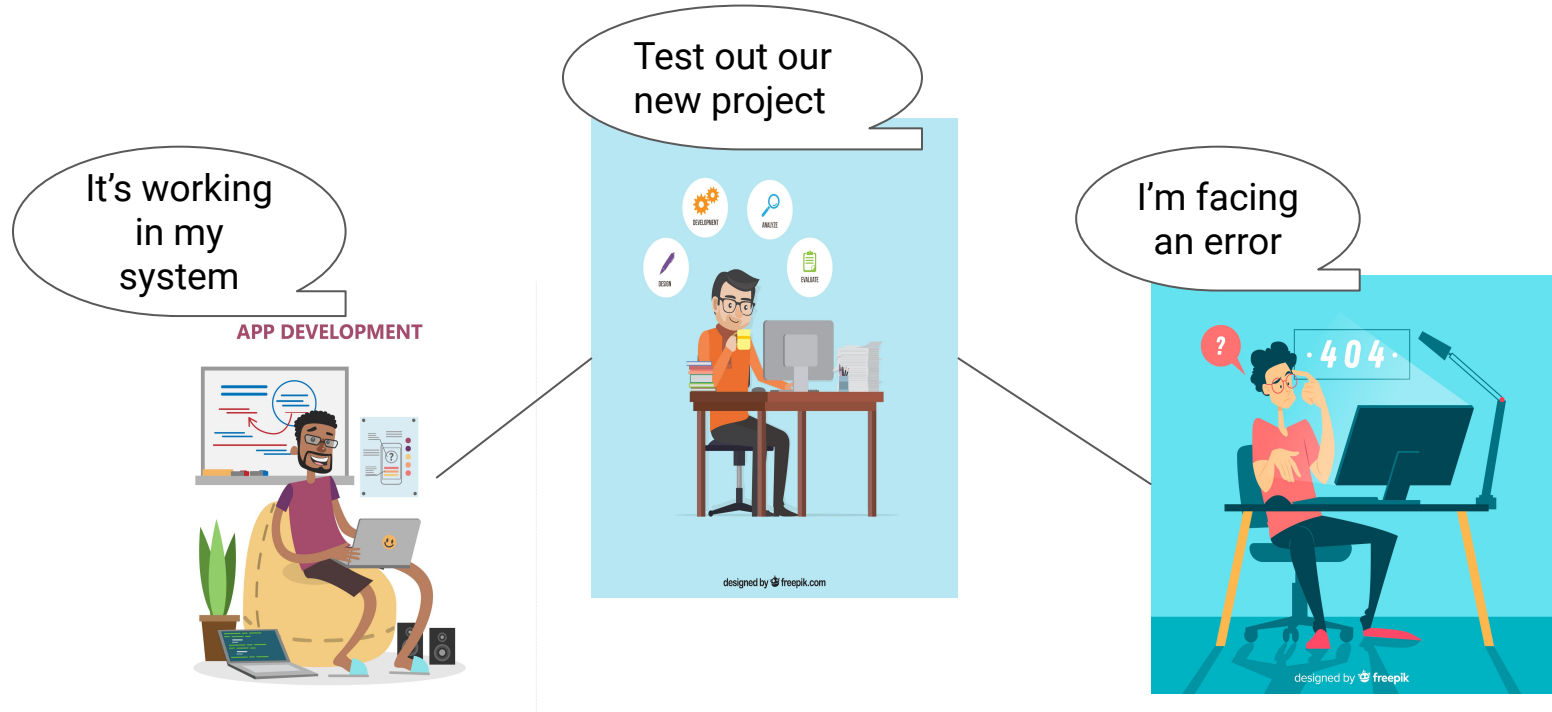
Agenda

1. **Why Docker?**

2. **What is Docker?**

3. **Architecture of Docker**

4. **Example**

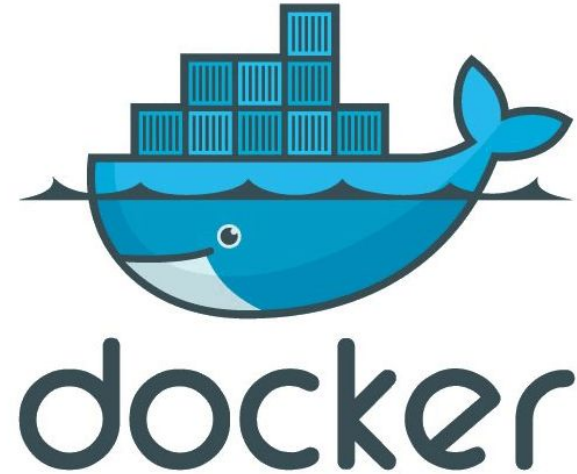5. **Docker-compose**

6. **Docker commands**

WHY DOCKER ??

What is Docker?

- Docker is an open platform for developing, shipping, and running applications.

- Docker provides the ability to package and run an application in a loosely isolated environment called a container.

Dockerfile

Build

docker

Docker Image

Run

Docker Container

SHIPPING EXAMPLE

Docker Tools and Terms

- **Docker file**
- **Docker image**
- **Docker container**
- **Docker hub**
- **Docker daemon**
- **Docker registry**
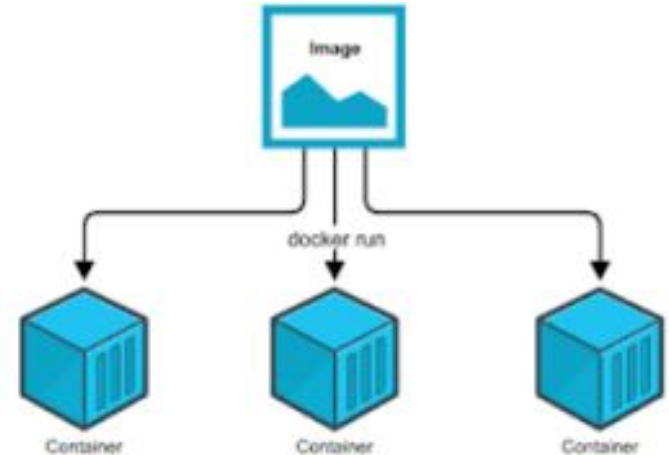
```
FROM  ubuntu:16.04

MAINTAINER  Abhishek

RUN  apt-get update
RUN  apt-get install -y python3 python3-pip

COPY .  /app

WORKDIR  /app

EXPOSE  5000

ENTRYPOINT echo "Hello World !"
```
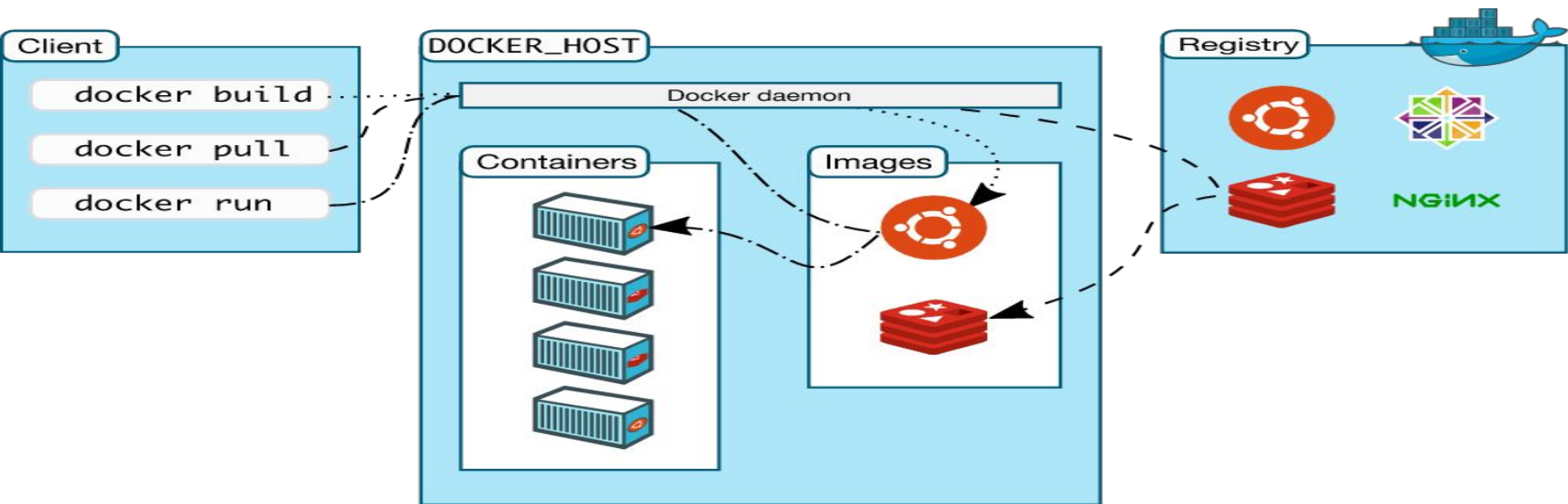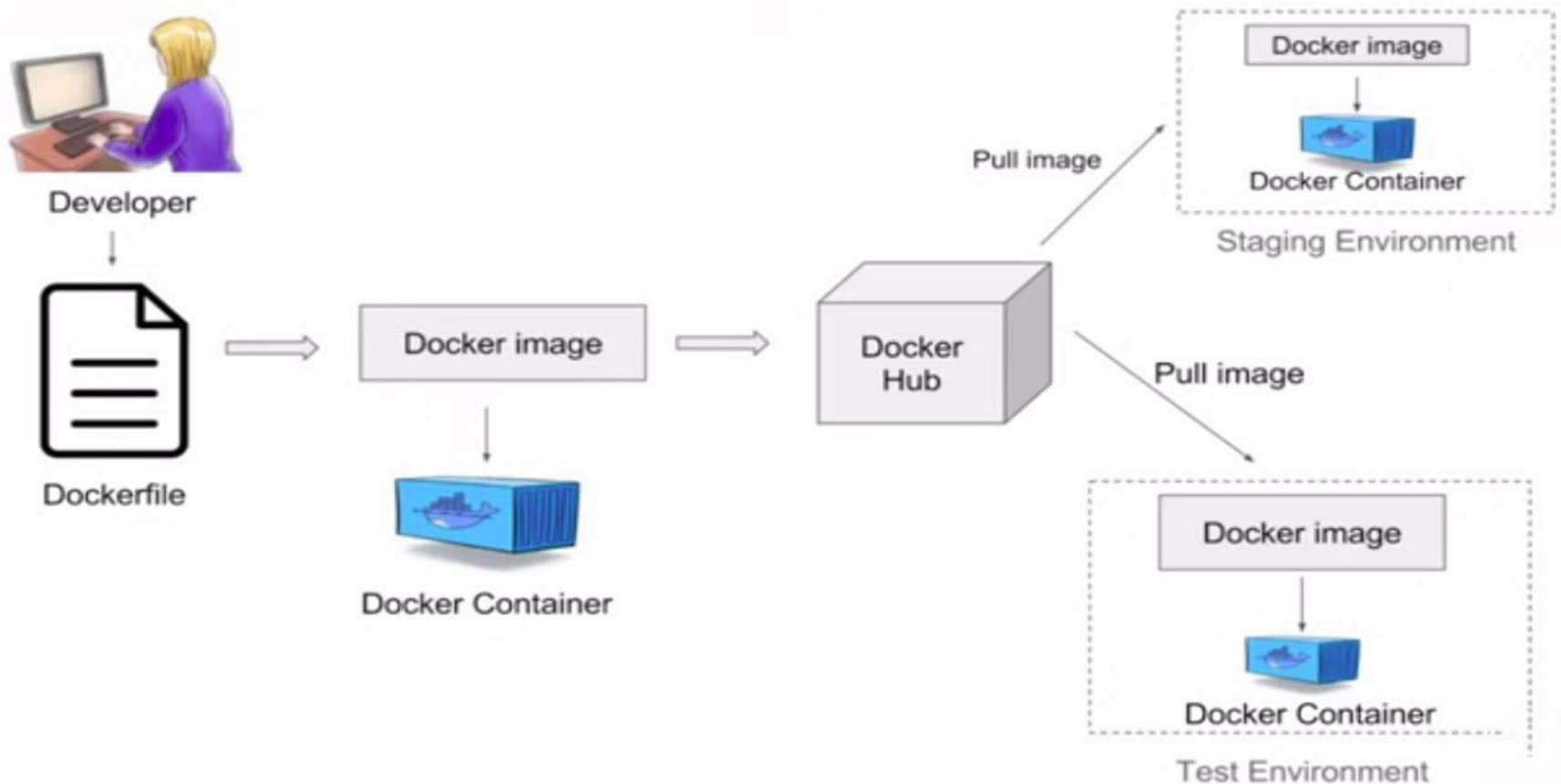
Docker architecture

Build—> Pull—>Run

How it works?

Dockerfile

- A Dockerfile is simply a text-based script of instructions that is used to create a container image

- Automation of Docker image creation

- Instruction sets used in the dockerfile:

       FROM

       RUN

       CMD

       EXPOSE

Steps to create a Dockerfile

Step 1: Create a file named Dockerfile

Step 2: Add instructions in Dockerfile

Step 3: Build Dockerfile and create the image using command :

docker build -t <imagename>:<tag> <Directory of Dockerfile>

Step 4: Run image to create container

docker run --name <container_name> <image_name>

Docker-Compose

- Tool for defining and running multiple containers

Three steps

1. Define your app's environment with a `Dockerfile`.
2. Define the services that make up your app in `docker-compose.yml`
3. Run `docker compose up` and the Docker compose command starts and runs your entire app.

YAML/YML

```
{
    "id": 101,
    "name": "Jane Doe",
    "address": {
        "street": "123 Maple Street",
        "city": "Springfield",
        "zipCode": "98765"
    },
    "hobbies": ["reading", "cycling"],
}
```

```
id: 101
name: Jane Doe
address:
  street: 123 Maple Street
  city: Springfield
  zipCode: 98765
hobbies:
  - reading
  - cycling
```

Steps to create docker compose file

Step 1: Install docker compose

Step 2: Create docker compose file at any location on your system

docker-compose.yaml

Step 3: Check validity of file by command:

docker compose config

Step 4: Run docker-compose.yaml file by command:

docker compose up -d

Step 5: Bring down application by command:

docker compose down

CHEAT SHEET
BASIC COMMANDS

CONTAINERS

#To Run A Container
$ docker run < image name >

#To Start A Container
$ docker start <container name>

#To Stop A Container
$ docker stop <container name>

# Restart A Container
$ docker restart <container name>

# To list running Containers
$ docker ps

# To Remove A Container
$ docker rm <container name>

# Execute Command Inside Container
$ docker exec <container_name> <command>

# Get Into A Container
$ docker exec -it <container_name> bash

# Get Logs Of A Container
$ docker logs <container_name>

DOCKER COMPOSE

#To Create & Run Containers
$ docker-compose -f <yaml file> up

#To stop & Remove Containers
$ docker-compose -f <yaml file> down

IMAGES

#To Pull An image from repository
$ docker pull < image name >

#To List Image Digest
$ docker images

#To Remove Image
$ docker rmi <image name>

# To Build Image From Dockerfile
$ docker build -f < Dockerfile >

DOCKER CLEANUP

#Delete all stopped containers
$ docker container prune

#Delete All Unused Images
$ docker image prune

#To clear entire docker
$ docker system prune

Reminder

If You Have Installed Docker and Docker-compose using sudo , then

$ sudo <command>

THANK YOU