DOCKER

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Docker is an open-source containerization platform by which you can pack your application and all its dependencies into a standardized unit called a container.

DOCKER

There are two big pieces to Docker:

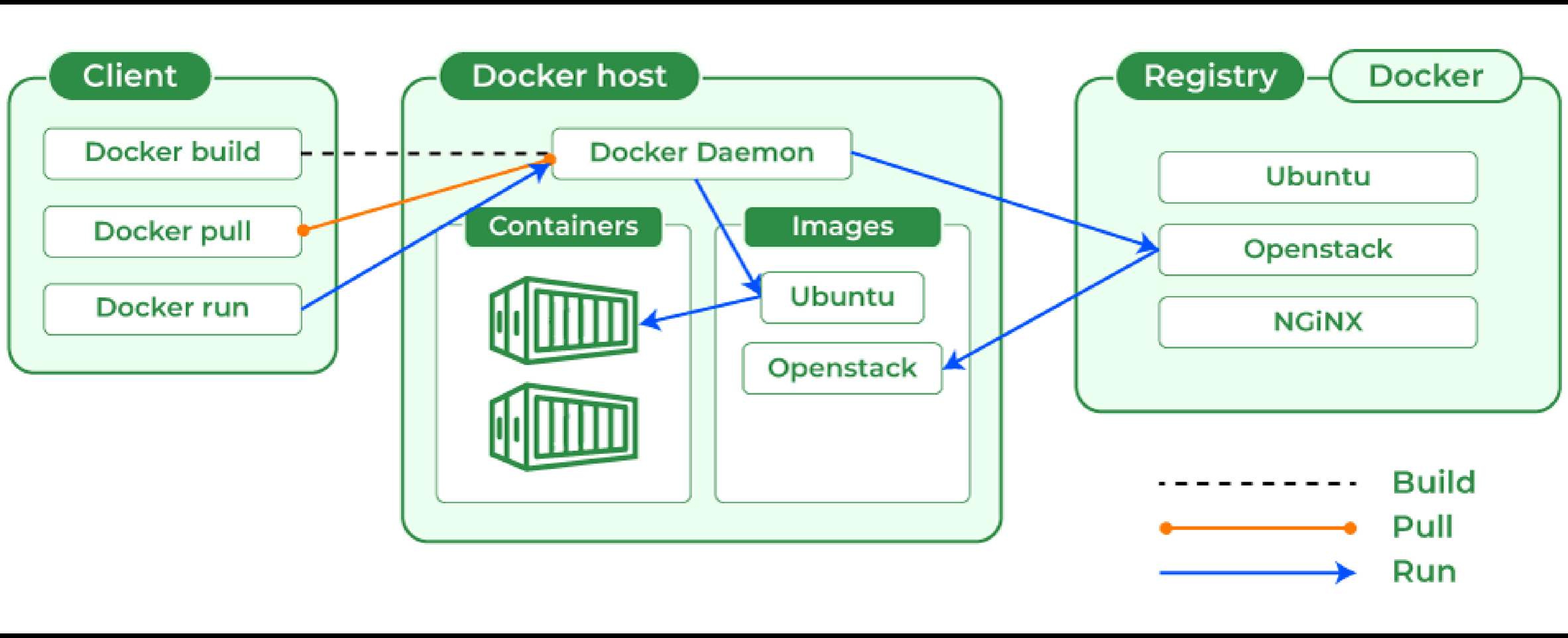
1. The Docker Engine, which is the Docker binary that's running on your local machine and servers and does the work to run your software.
2. The Docker Hub is a website and cloud service that makes it easy for everyone to share their docker images.

Key Components of Docker

- Docker Engine: Docker Engine is a core part of docker, that handles the creation and management of containers.
- Docker Image: Docker Image is a read-only template that is used for creating containers, containing the application code and dependencies.
- Docker Hub: It is a cloud based repository that is used for finding and sharing the container images.
- Dockerfile: It is a file that describes the steps to create an image quickly.

DOCKER

- Docker Registry : It is a storage distribution system for docker images, where you can store the images in both public and private modes.


Client
Docker build
Docker pull
Docker run
Docker host
Docker Daemon
Containers
Images
Ubuntu
Openstack
Registry
Docker
Ubuntu
Openstack
NGiNX
Build
Pull
Run

1. **Basic Server Setup**
2. **Write an Express server that listens on port 3000 and returns "Hello, Express!" when the root URL / is visited.**
3. **Routing**
4. **Create routes:**
    - **GET /about → return "This is the About Page".**
    - **GET /contact → return "Contact us at xyz@gmail.com".**

1. Query Parameters
2. Write a route /greet that takes a query parameter name.
3. Example: /greet?name=Alex → Response: "Hello, Alex!".

1. Path Parameters
2. Create a route /users/:id that returns "User with ID: {id}".

1. **Middleware**
2. **Write middleware that logs request method and URL for every request.**
3. **Example: GET /about → log: "GET /about".**
4. **JSON Response**
5. **Create a route /api/products that returns a JSON array of at least 3 products.**

1. **POST Request**
2. **Create a route /api/add that accepts a JSON object { "num1": x, "num2": y } via POST and returns their sum.**

https://forms.office.com/e/VE0LXxvG39

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DOCKER-HUB

Docker Hub is a cloud-based service provided by Docker for storing, managing, and sharing container images.

DOCKER-HUB

Hello World

DOCKER-commands

- docker pull IMAGE_NAME
- PULL THE IMAGE
- docker images
- ALL IMAGES INSIDE DOCKER
- docker run IMAGE_NAME
- CREATE THE CONTAINER
- docker run -it IMAGE_NAME
- CREATE THE CONTAINER IN INTERACTIVE MODE
- docker ps -a
- LISTS ALL DOCKER CONTAINERS
- docker ps
- LISTS DOCKER CONTAINERS THAT ARE IN RUNNING STATE

DOCKER-commands

- docker start CONTAINER_NAME or CONTAINER_ID
- STARTS AN EXISTING DOCKER CONTAINER
- docker stop CONTAINER_NAME or CONTAINER_ID
- STOPS AN EXISTING RUNNING DOCKER CONTAINER

DOCKER-commands

- docker rmi IMAGE_NAME
- REMOVES A DOCKER IMAGE
- docker rm CONTAINER_NAME
- REMOVES A DOCKER CONTAINER.

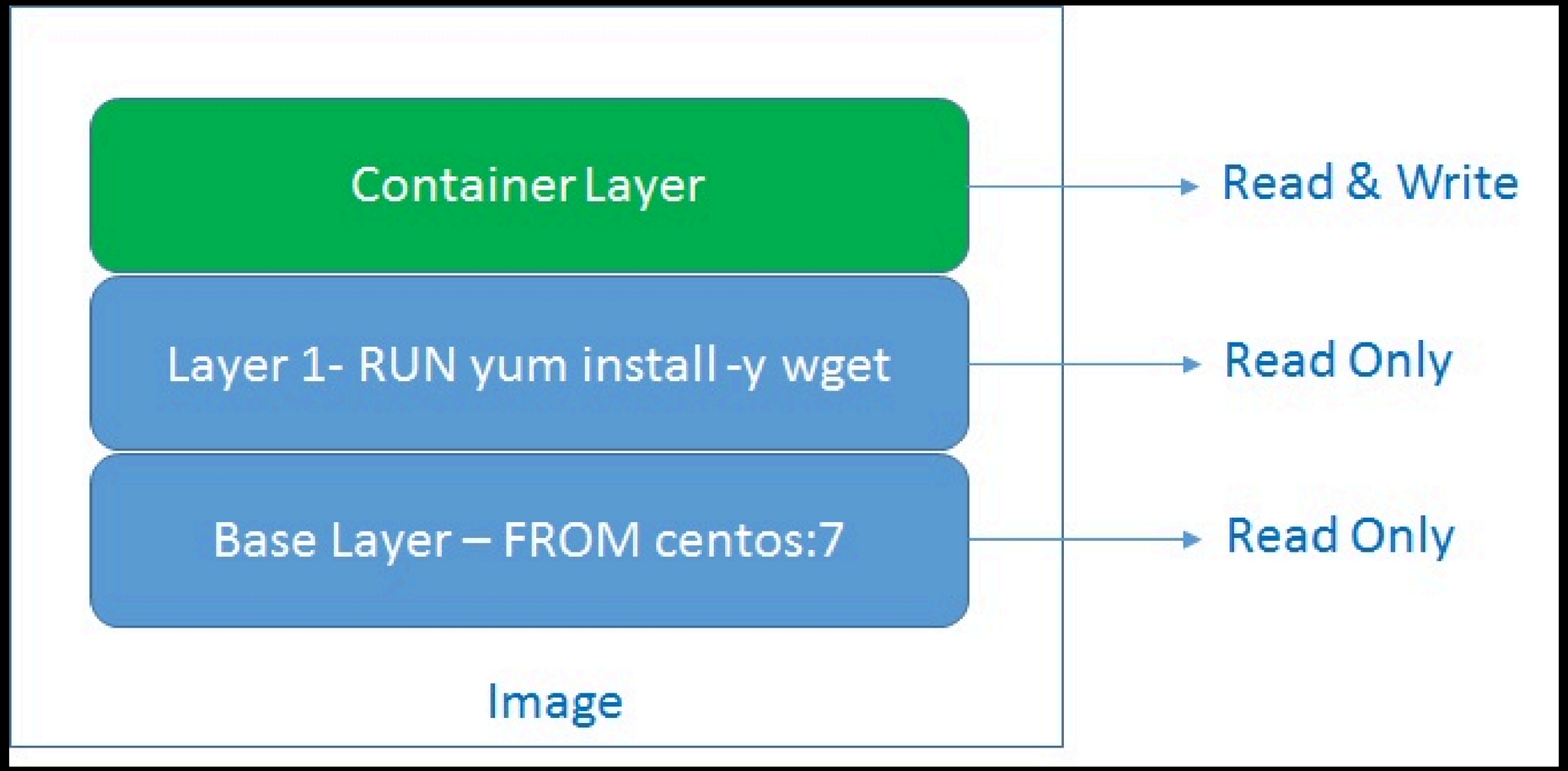
DOCKER-commands

- docker pull IMAGE_NAME:version
- SPECIFY WHICH VERSION OF IMAGE TO DOWNLOAD
- docker pull mysql: 8.0-debian

- docker run -d IMAGE_NAME
- RUN THE DOCKER CONTAINER IN DETACH MODE

- docker run --name CONTAINER_NAME -d IMAGE_NAME
- ASSIGN SPECIFIC NAME TO THE CONTAINER

Docker Image Layers



Port Binding

When we bind the PORT of a Host System with the PORT of a Container then it is called Port-binding.

```
docker run -p8080:3306 IMAGE_NAME
```

More Commands

- docker logs CONTAINER_ID
- PRINTS ALL THE LOGS OF THE CONTAINER

- docker exec -it CONTAINER_ID/bin/bash
- ‘EXEC’ COMMAND ALLOWS US TO RUN ADDITIONAL COMMAND ON AN ALREADY RUNNING CONTAINER.

- docker exec -it CONTAINER_ID/bin/sh
- ACCESS SHELL OF A FILE.