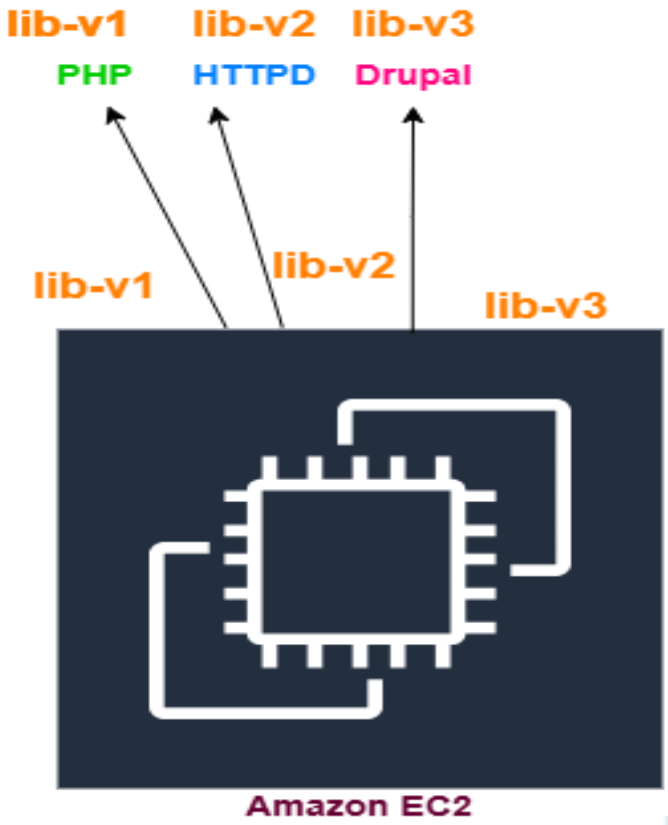
Contents

- What is Docker and why we need it?
- Installation and configuration
- Running the first docker container
- Deploying Jenkins as a docker container.
- Most commonly used docker commands
- Difference between Image and Container
- Docker's Architecture

What is Docker?

docker

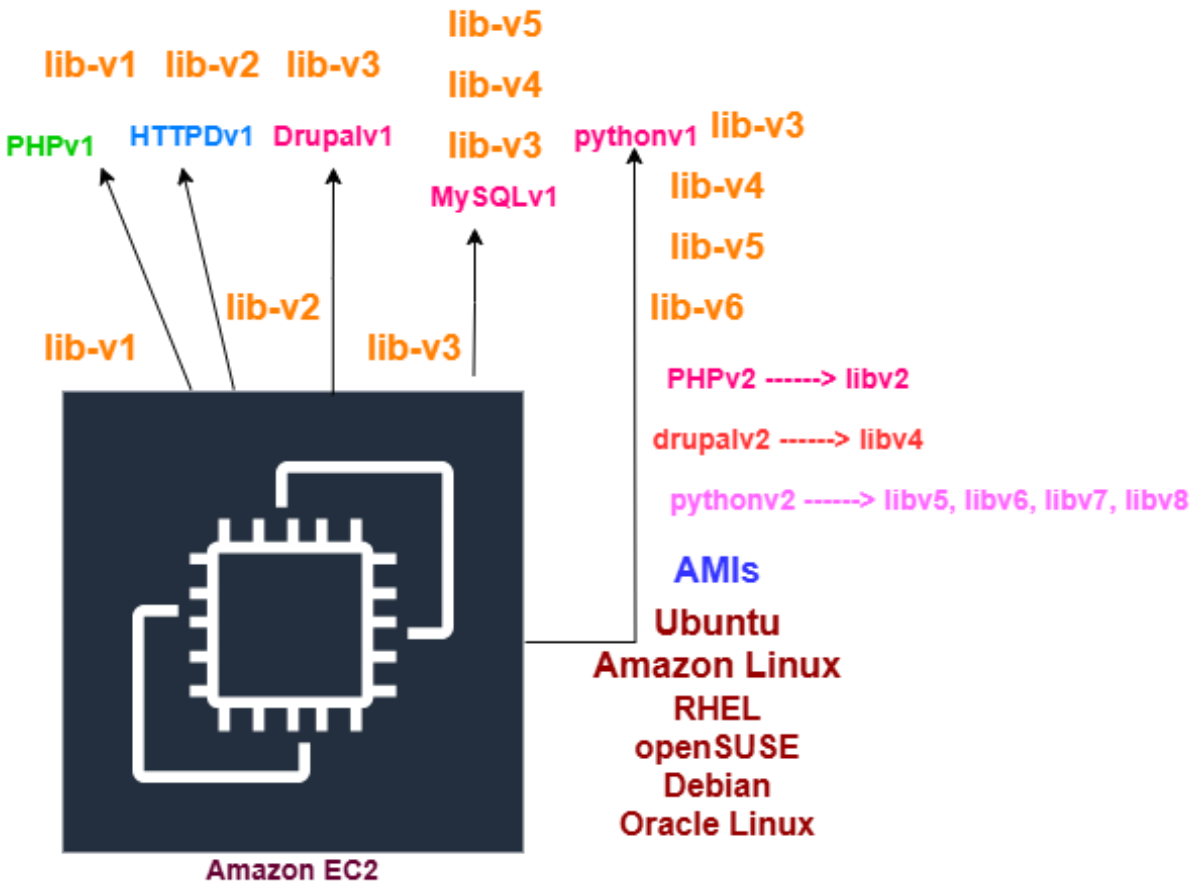
Deploying an App without Docker



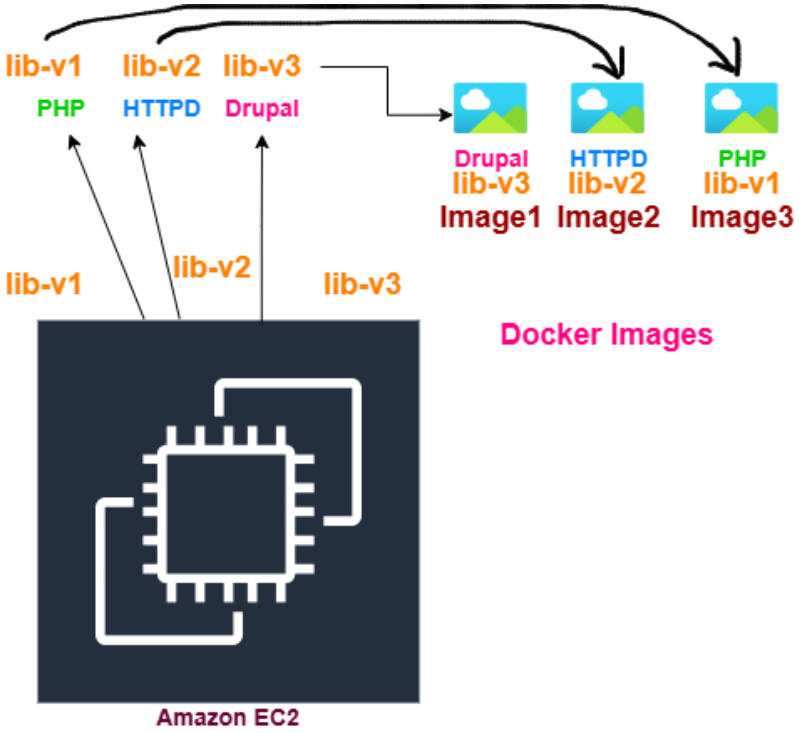
AMIs

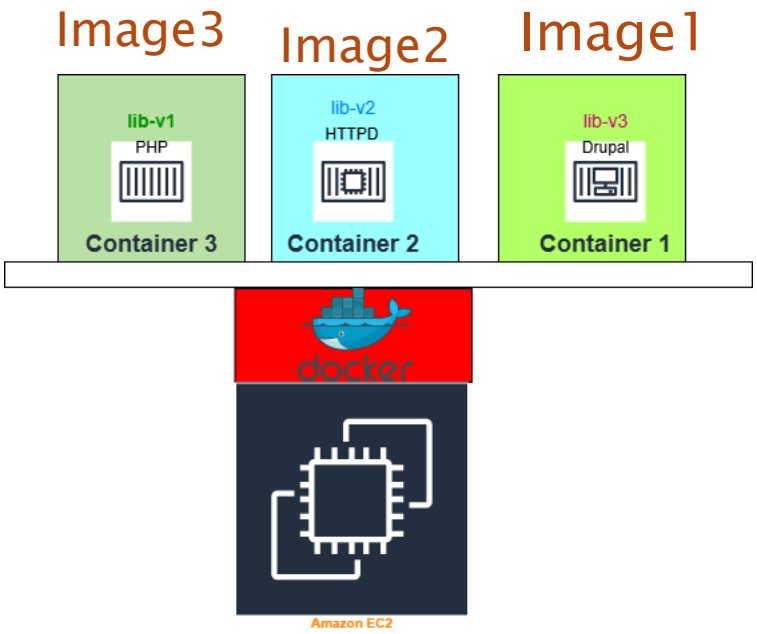
Ubuntu
Amazon Linux
RHEL
openSUSE
Debian
Oracle Linux

Deploying an App without Docker (2nd Scenario)



Deploying an App with Docker





Install and Configure Docker

- Install docker on Ubuntu: https://docs.docker.com/engine/install/ubuntu/
- sudo systemctl status docker
- docker ps
- docker ps -a
- sudo usermod -aG docker ubuntu
- docker run -d -p 8080:8080 --restart=on-failure jenkins/jenkins:lts-jdk17
- docker exec 54724b1adf85 cat /var/jenkins_home/secrets/initialAdminPassword

Most common docker commands 1

Create and start a new container from an image
docker run
Start, Restart or Stop one or more stopped containers
docker start / docker stop / docker restart
Remove one or more containers
docker rm
Run a command in a running container
docker exec
Fetch the logs of a container.
docker logs
List running/all containers
docker ps / docker ps -a
Build an image from a Dockerfile
docker build

Most common docker commands 2

```
# Pull an image or a repository from a registry
docker pull
# Push an image or a repository to a registry
docker push
#  List images
docker images
# Remove one or more images
docker rmi
# Create a tag TARGET_IMAGE that refers to SOURCE_IMAGE.
docker tag SOURCE_IMAGE[:TAG] TARGET_IMAGE[:TAG]
# Display a live stream of container(s) resource usage statistics
docker stats
# Show docker disk usage
docker system df
```

Most common docker commands 3

```
# Show the history of an image
docker history [OPTIONS] IMAGE
# Return low-level information on Docker objects
docker inspect
#  List volumes
docker volume ls
# Create a new volume
docker volume create
# Display detailed information on one or more volumes.
docker volume inspect
# Remove one or more volumes
docker volume rm
# Remove all unused containers, networks, images
docker system prune
```

Docker Image Vs Docker Container

Aspect	Docker Image	Docker Container
Definition	A read-only template with instructions for creating a container (like a blueprint).	A running instance of a Docker image (like an actual object built from the blueprint).
State	Static (does not change unless rebuilt).	Dynamic (can be started, stopped, modified, or deleted).
Persistence	Immutable; changes require creating a new image layer.	Temporary; changes to the container are lost unless committed to a new image.
Usage	Used to create Docker containers.	Used to run applications based on images.
Storage	Stored in Docker registries (e.g., Docker Hub, ECR).	Runs in the Docker engine, consuming system resources.
Lifespan	Exists until manually deleted from storage.	Exists only while running (unless paused or stopped).
Isolation	No execution; it's just a file.	Provides an isolated environment for application execution.
Creation	Built using Dockerfiles with instructions for the environment and dependencies.	Created from images using `docker run`.
Examples	`nginx:latest`, `python:3.10-slim`	Running instance of `nginx` serving a website.

Docker's Architecture