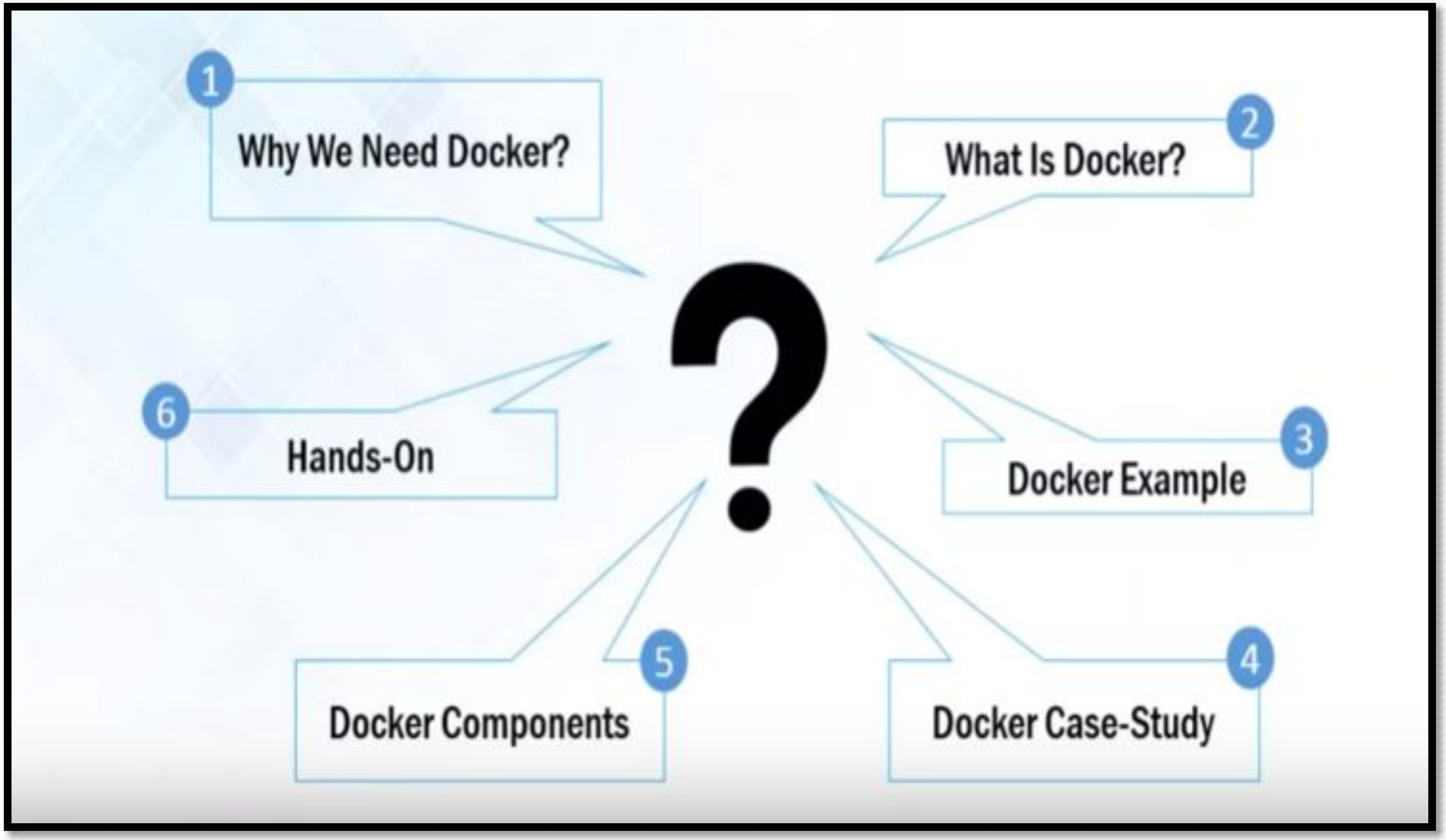
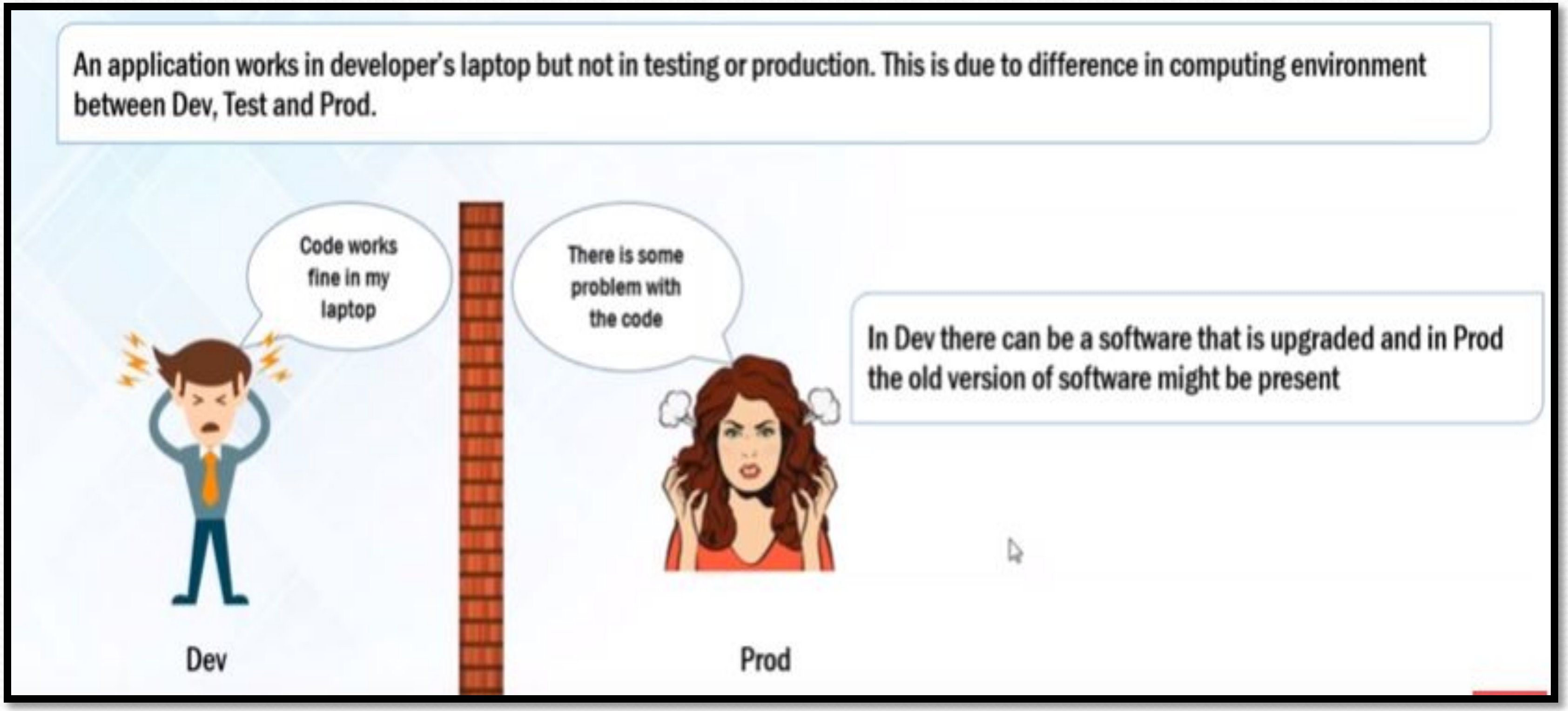
docker

AGENDA



1. Why We Need Docker?
2. What Is Docker?
3. Docker Example
4. Docker Case-Study
5. Docker Components
6. Hands-On

WHY WE NEED DOCKER

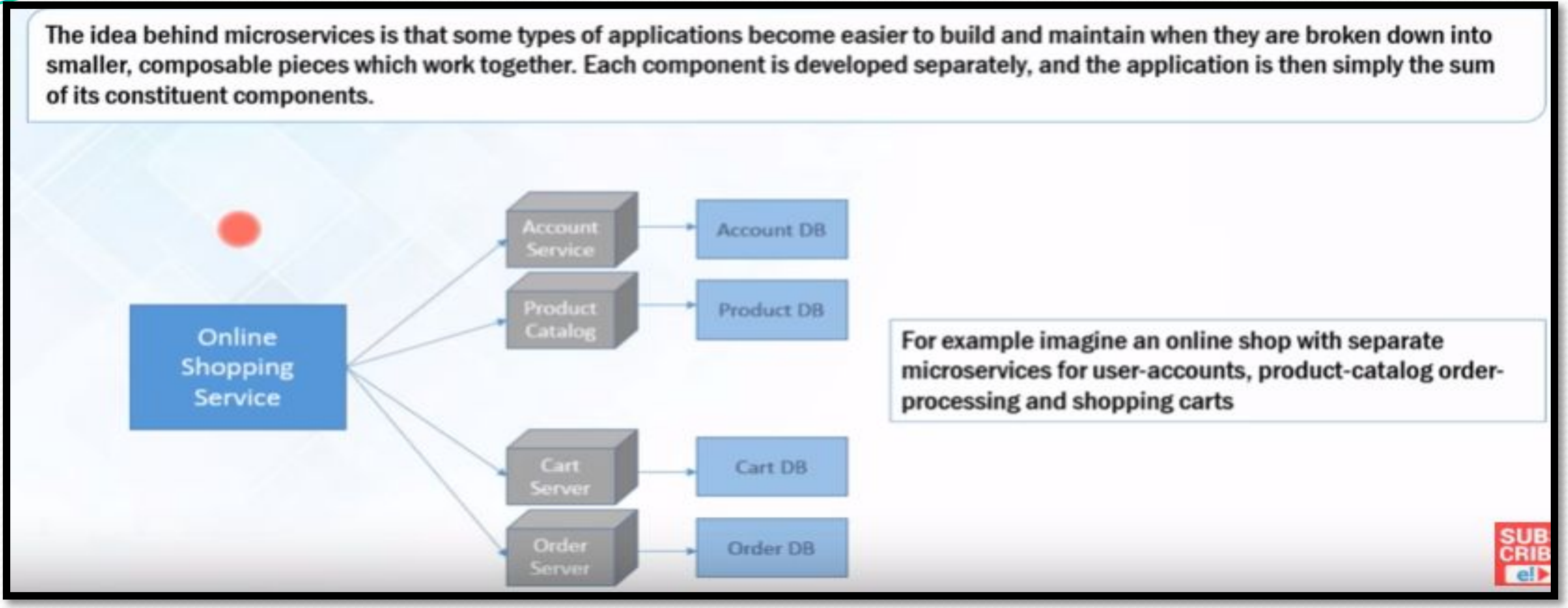


An application works in developer's laptop but not in testing or production. This is due to difference in computing environment between Dev, Test and Prod.

In Dev there can be a software that is upgraded and in Prod the old version of software might be present

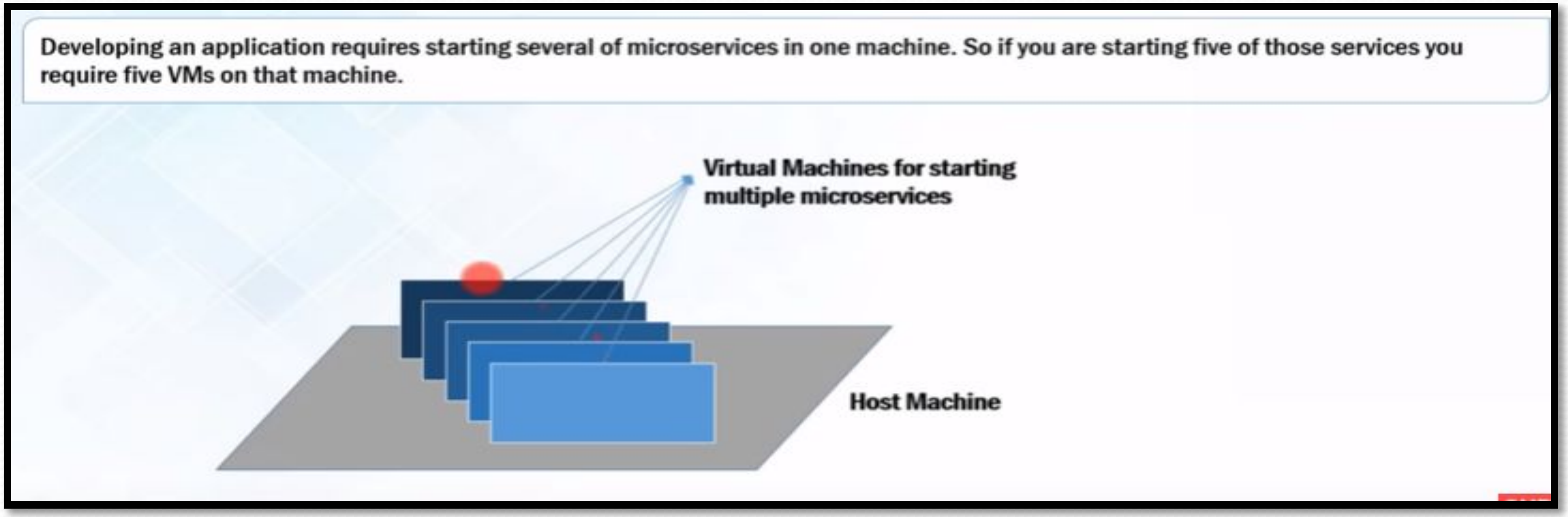
Code works fine in my laptop
There is some problem with the code
Dev
Prod

WHY WE NEED DOCKER



The idea behind microservices is that some types of applications become easier to build and maintain when they are broken down into smaller, composable pieces which work together. Each component is developed separately, and the application is then simply the sum of its constituent components.

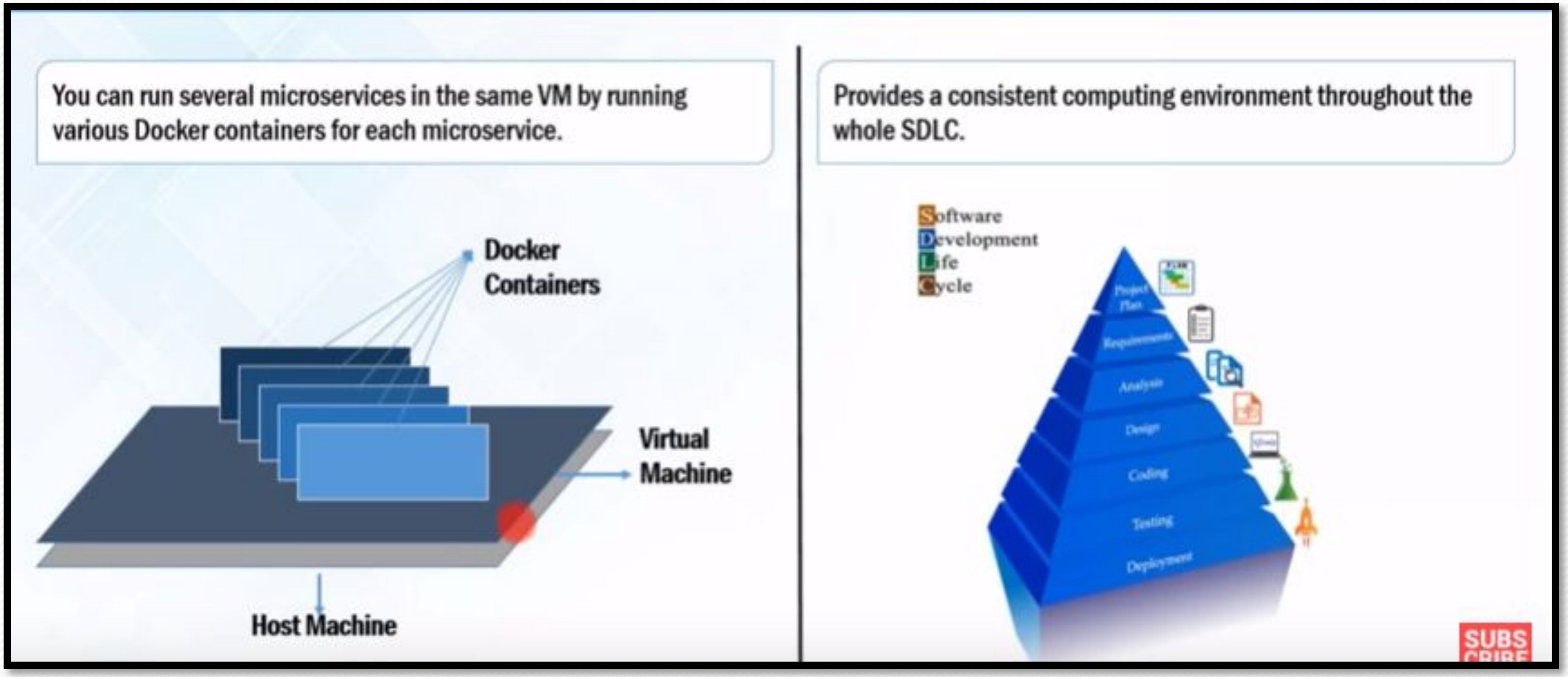
For example imagine an online shop with separate microservices for user-accounts, product-catalog order-processing and shopping carts



Developing an application requires starting several of microservices in one machine. So if you are starting five of those services you require five VMs on that machine.

WHY WE NEED DOCKER

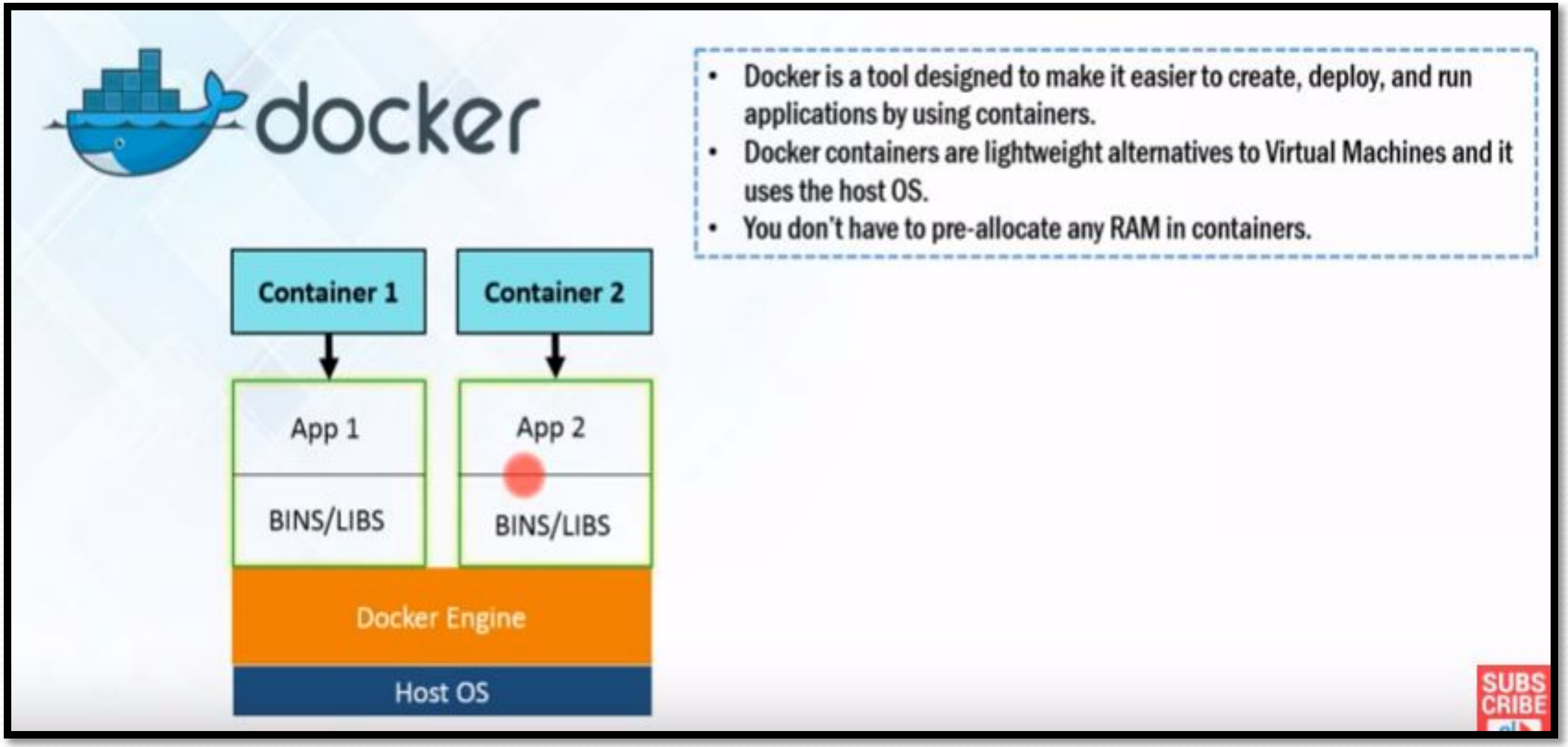
How Docker Solves These Problems



You can run several microservices in the same VM by running various Docker containers for each microservice.

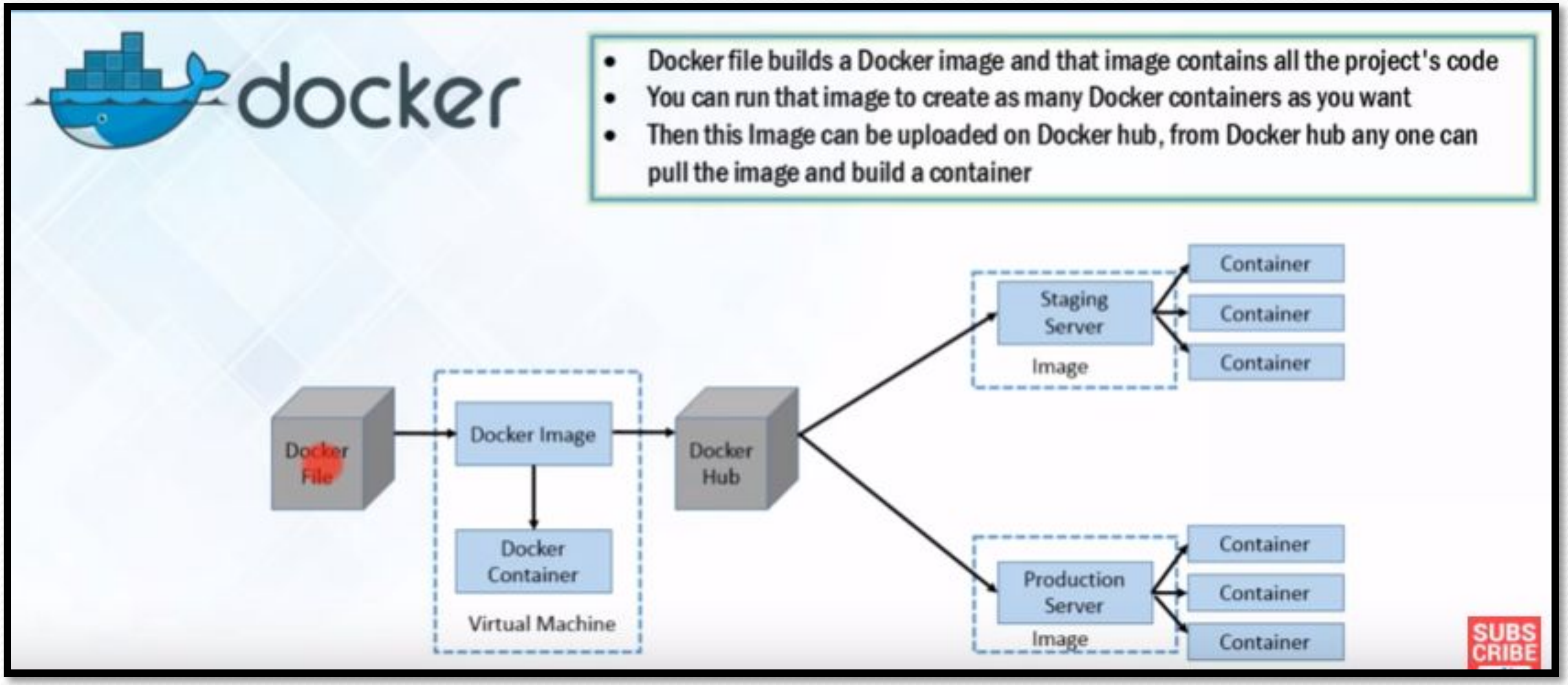
Provides a consistent computing environment throughout the whole SDLC.

WHAT IS DOCKER



- Docker is a tool designed to make it easier to create, deploy, and run applications by using containers.
- Docker containers are lightweight alternatives to Virtual Machines and it uses the host OS.
- You don't have to pre-allocate any RAM in containers.

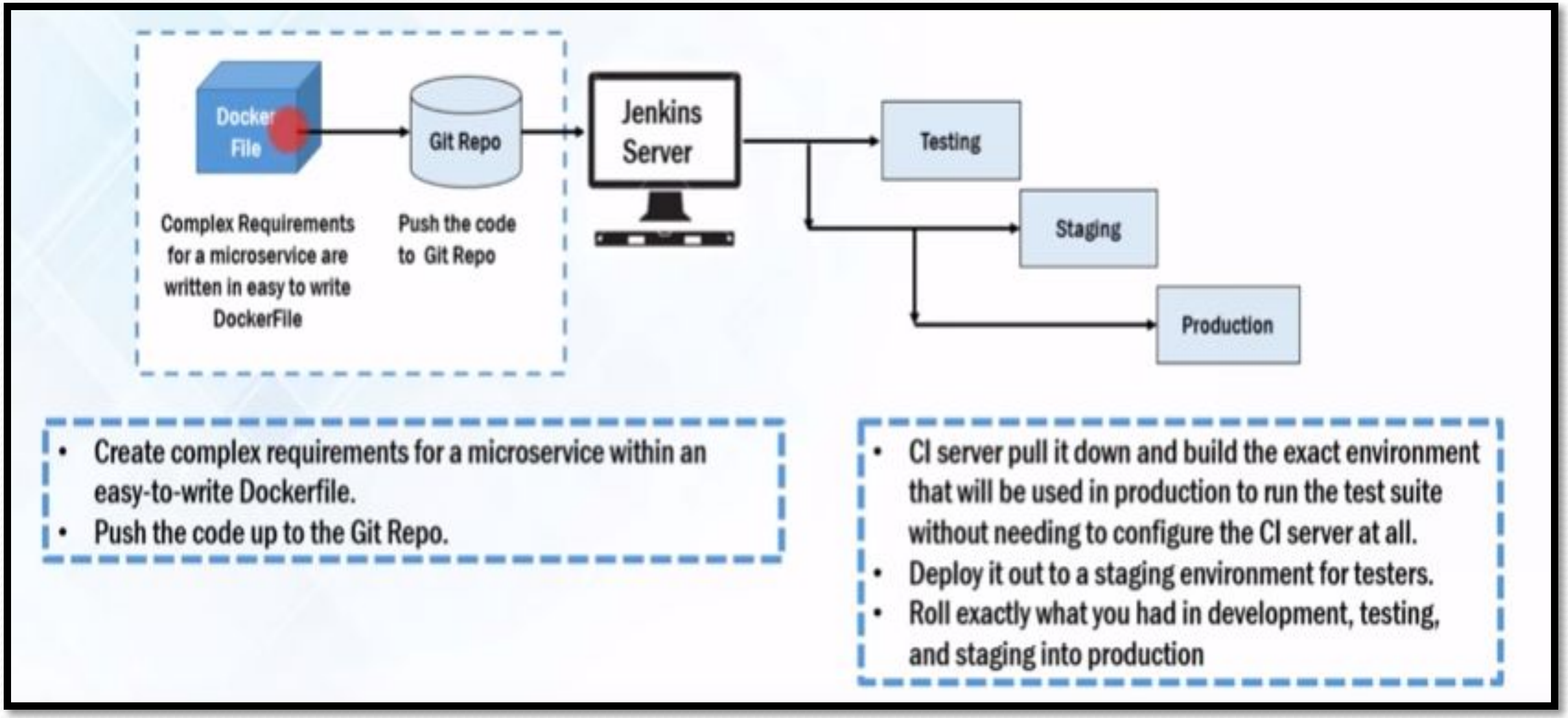
DOCKER - EXAMPLE



- Docker file builds a Docker image and that image contains all the project's code
- You can run that image to create as many Docker containers as you want
- Then this Image can be uploaded on Docker hub, from Docker hub any one can pull the image and build a container

DOCKER - EXAMPLE

Docker Example

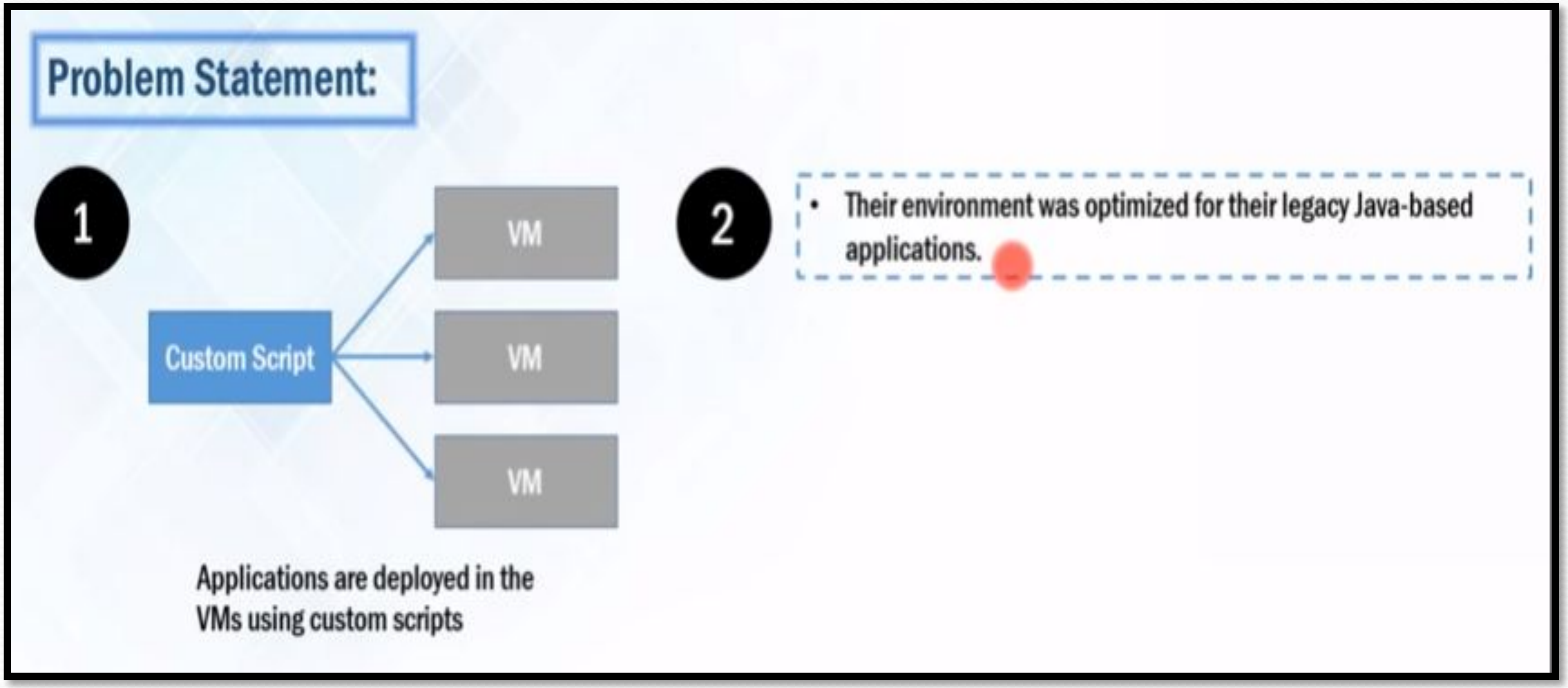

Docker File
Git Repo
Complex Requirements for a microservice are written in easy to write DockerFile
Push the code to Git Repo
Jenkins Server
Testing
Staging
Production

- Create complex requirements for a microservice within an easy-to-write Dockerfile.
- Push the code up to the Git Repo.

- CI server pull it down and build the exact environment that will be used in production to run the test suite without needing to configure the CI server at all.
- Deploy it out to a staging environment for testers.
- Roll exactly what you had in development, testing, and staging into production

DOCKER CASE-STUDY

Docker Case-Study Indiana University



Problem Statement:

1

Custom Script

VM

VM

VM

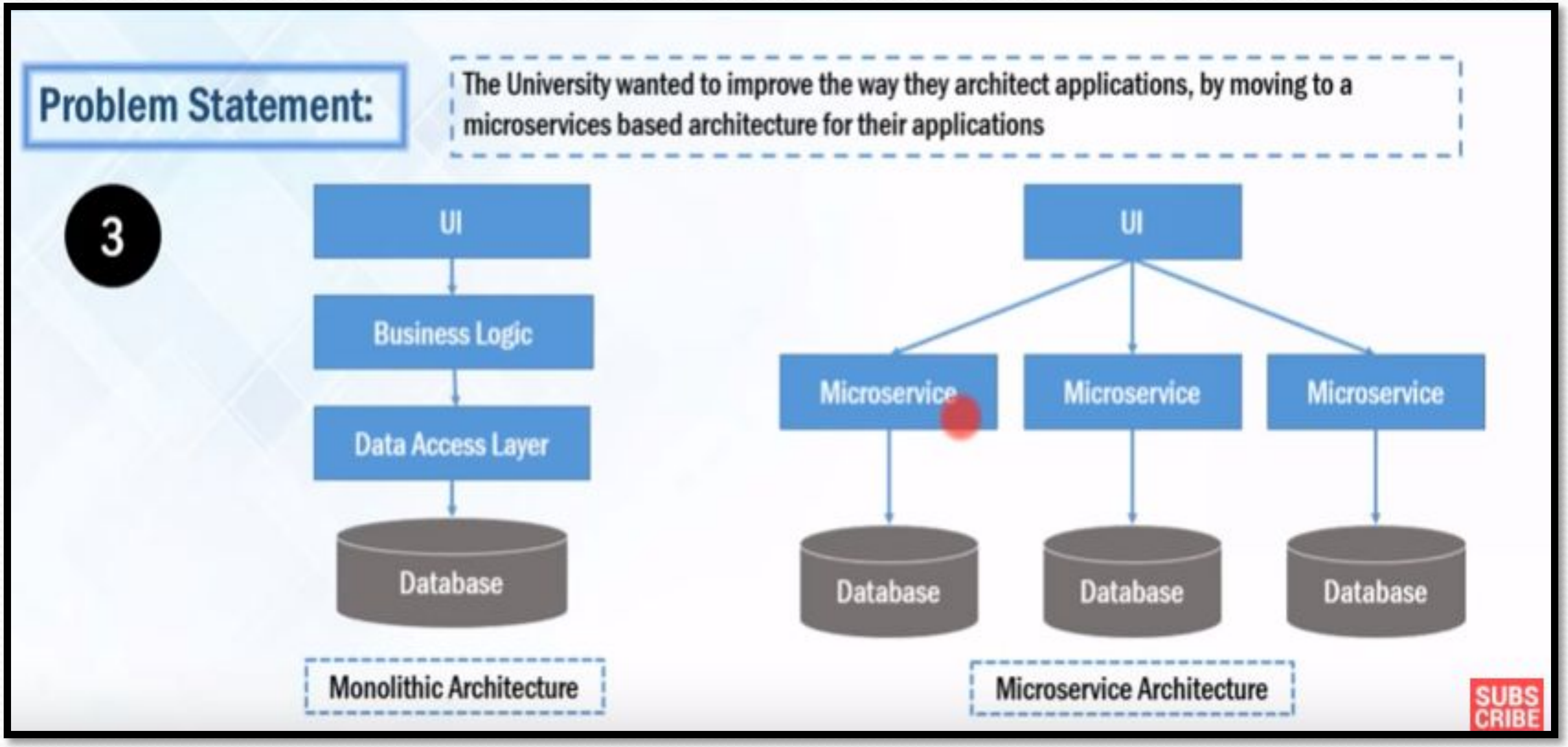
Applications are deployed in the VMs using custom scripts

2

- Their environment was optimized for their legacy Java-based applications.

DOCKER CASE-STUDY

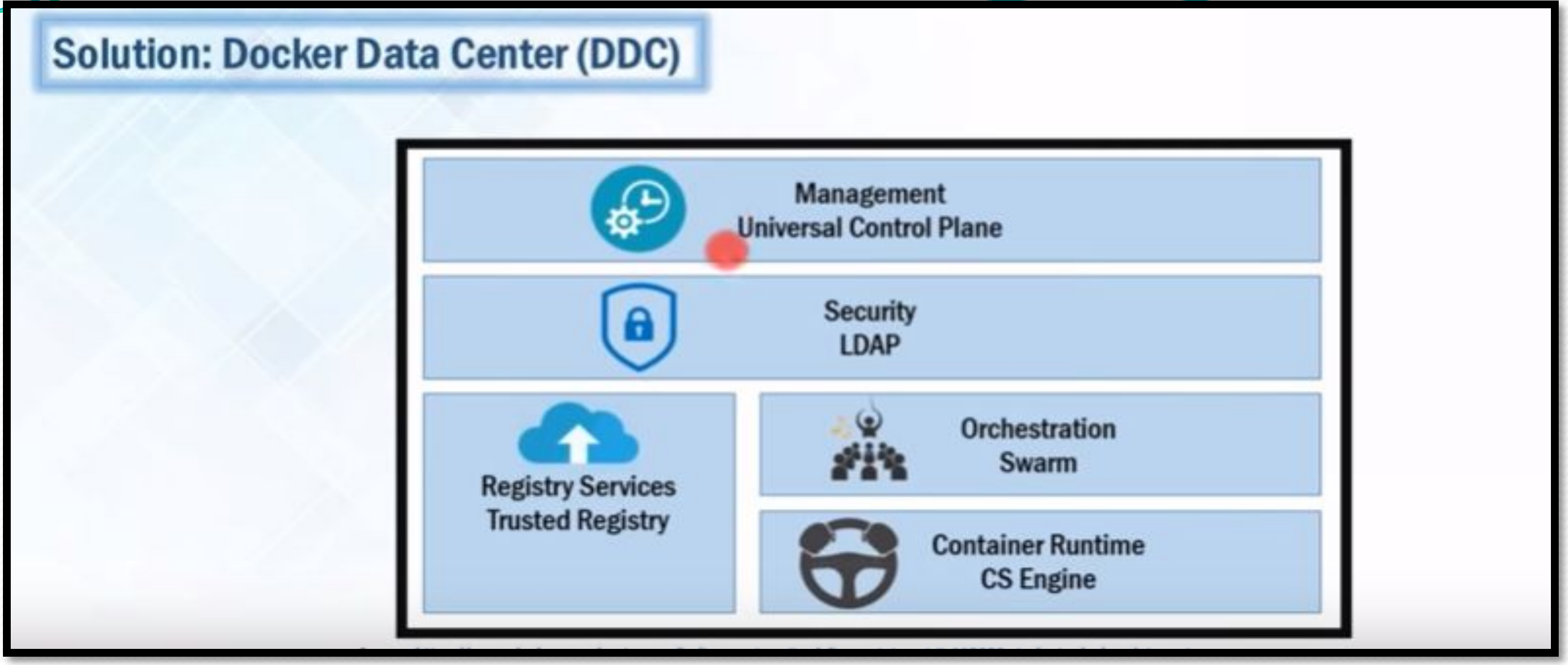
Docker Case-Study Indiana University



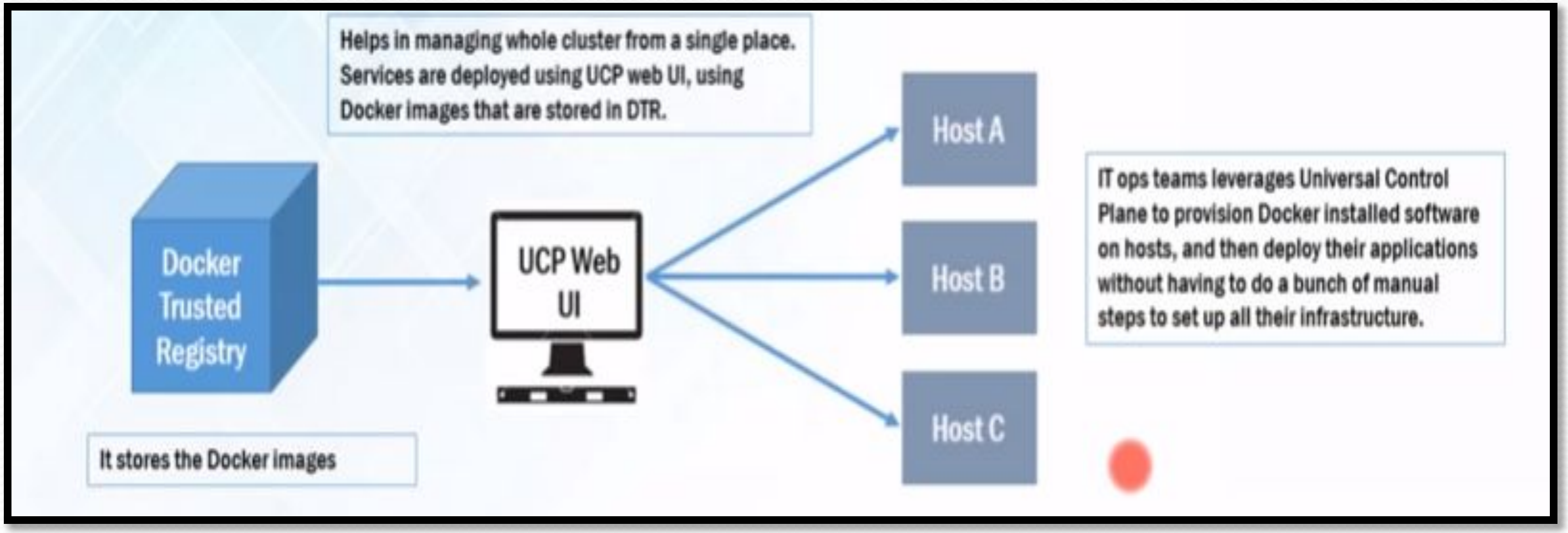
Problem Statement:

The University wanted to improve the way they architect applications, by moving to a microservices based architecture for their applications

DOCKER CASE-STUDY



Solution: Docker Data Center (DDC)



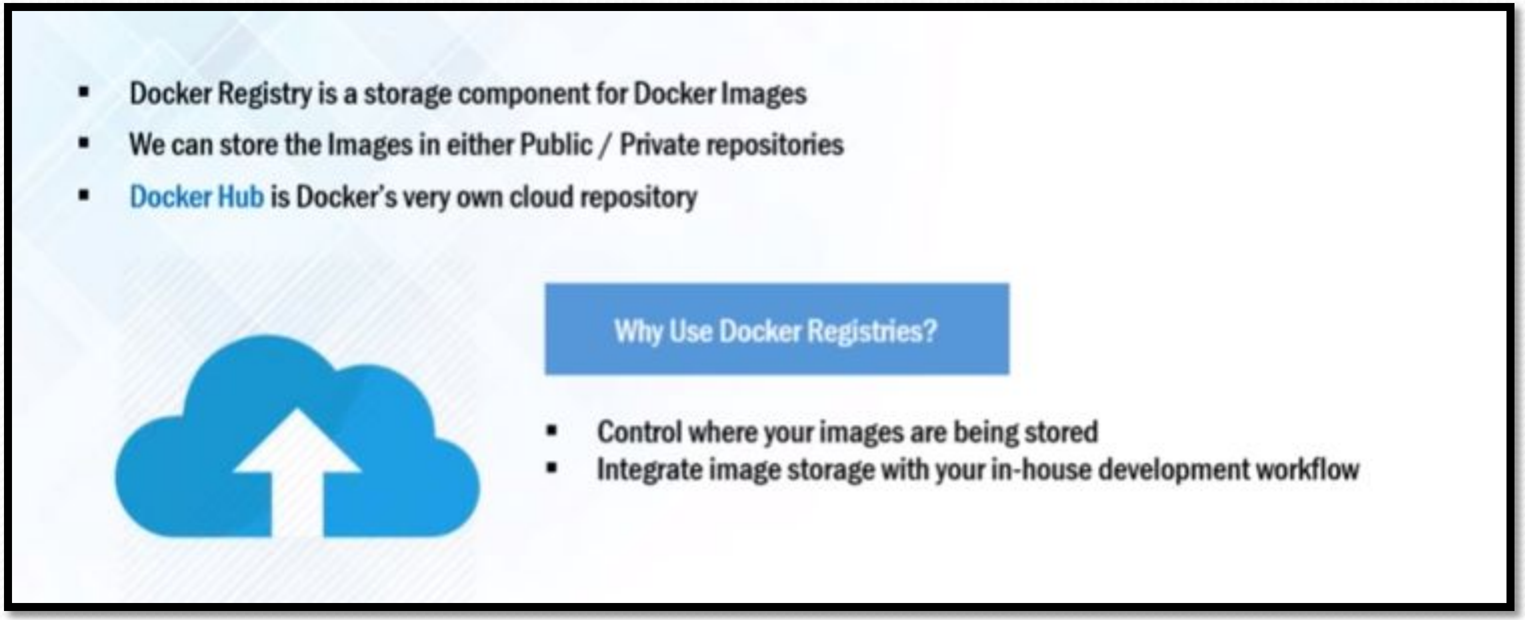
Helps in managing whole cluster from a single place. Services are deployed using UCP web UI, using Docker images that are stored in DTR.

IT ops teams leverages Universal Control Plane to provision Docker installed software on hosts, and then deploy their applications without having to do a bunch of manual steps to set up all their infrastructure.

It stores the Docker images

DOCKER COMPONENTS

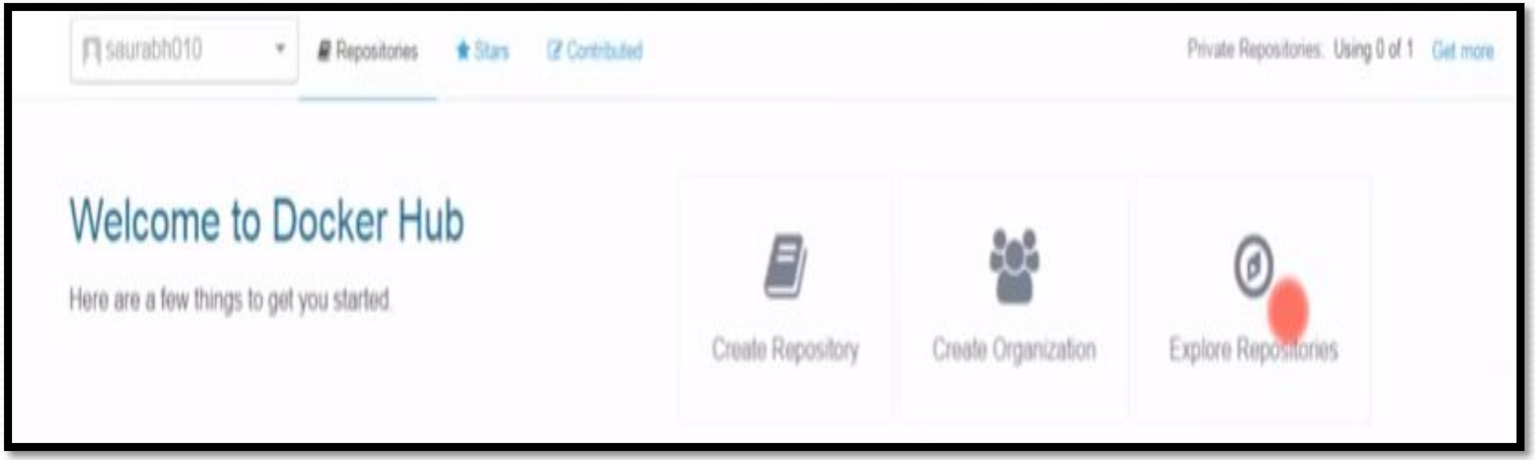
DOCKER REGISTRY / DOCKER HUB



- Docker Registry is a storage component for Docker Images
- We can store the Images in either Public / Private repositories
- Docker Hub is Docker's very own cloud repository

Why Use Docker Registries?

- Control where your images are being stored
- Integrate image storage with your in-house development workflow

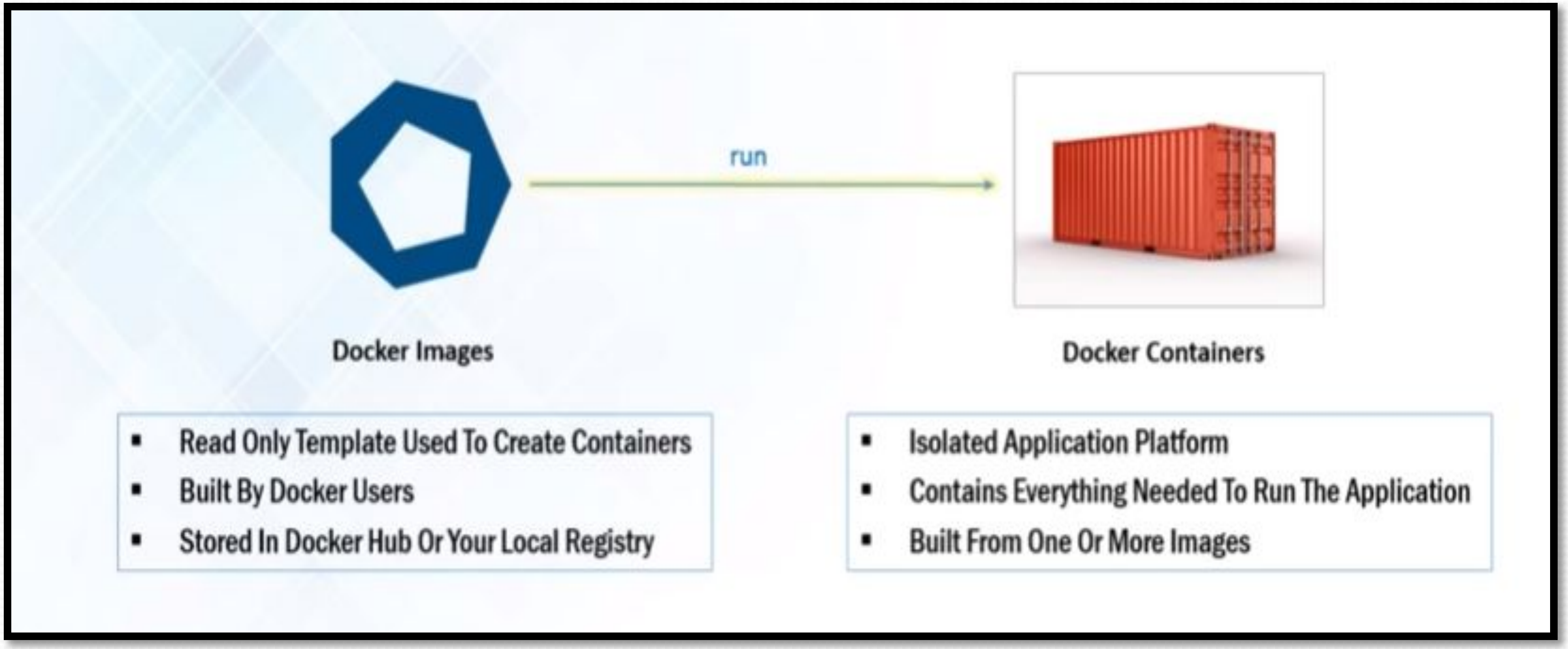


Welcome to Docker Hub

Here are a few things to get you started.

DOCKER COMPONENTS

Docker Images & Containers



Docker Images

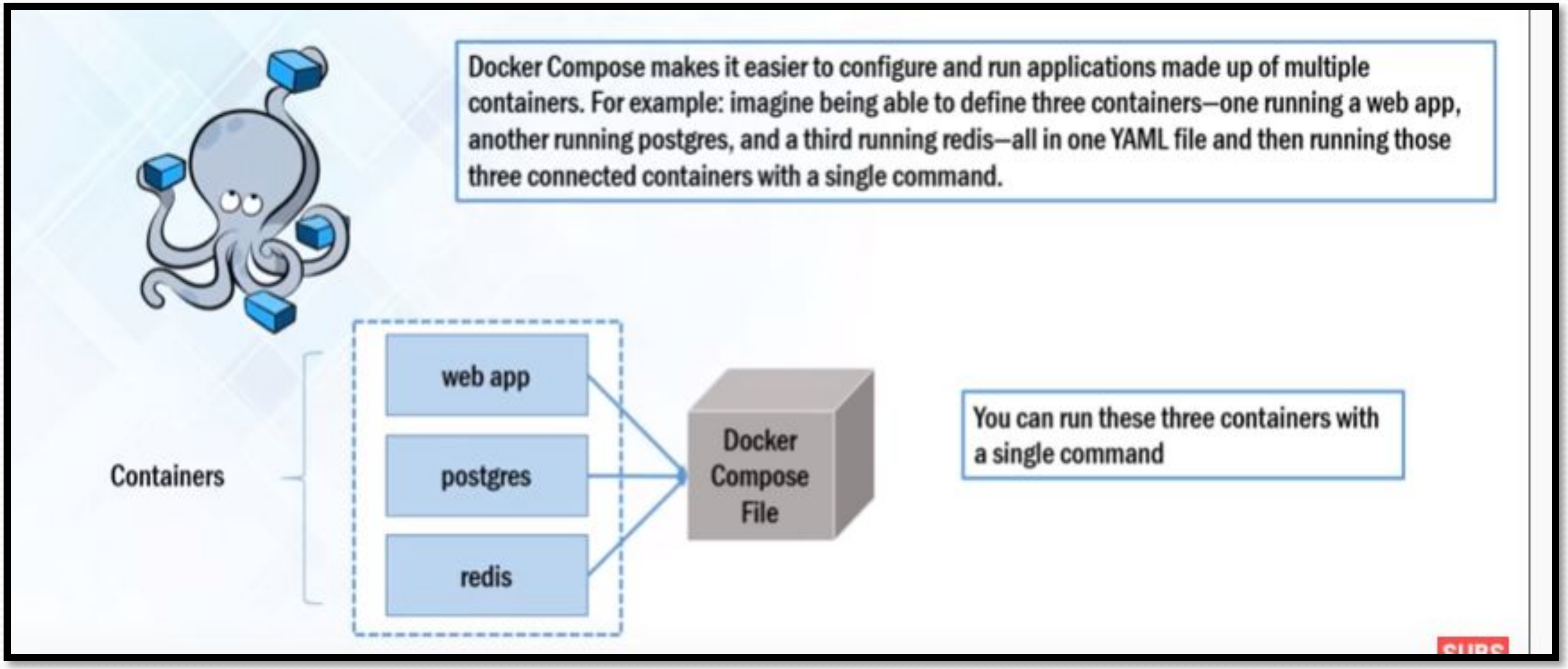
- Read Only Template Used To Create Containers
- Built By Docker Users
- Stored In Docker Hub Or Your Local Registry

Docker Containers

- Isolated Application Platform
- Contains Everything Needed To Run The Application
- Built From One Or More Images

DOCKER COMPOSE

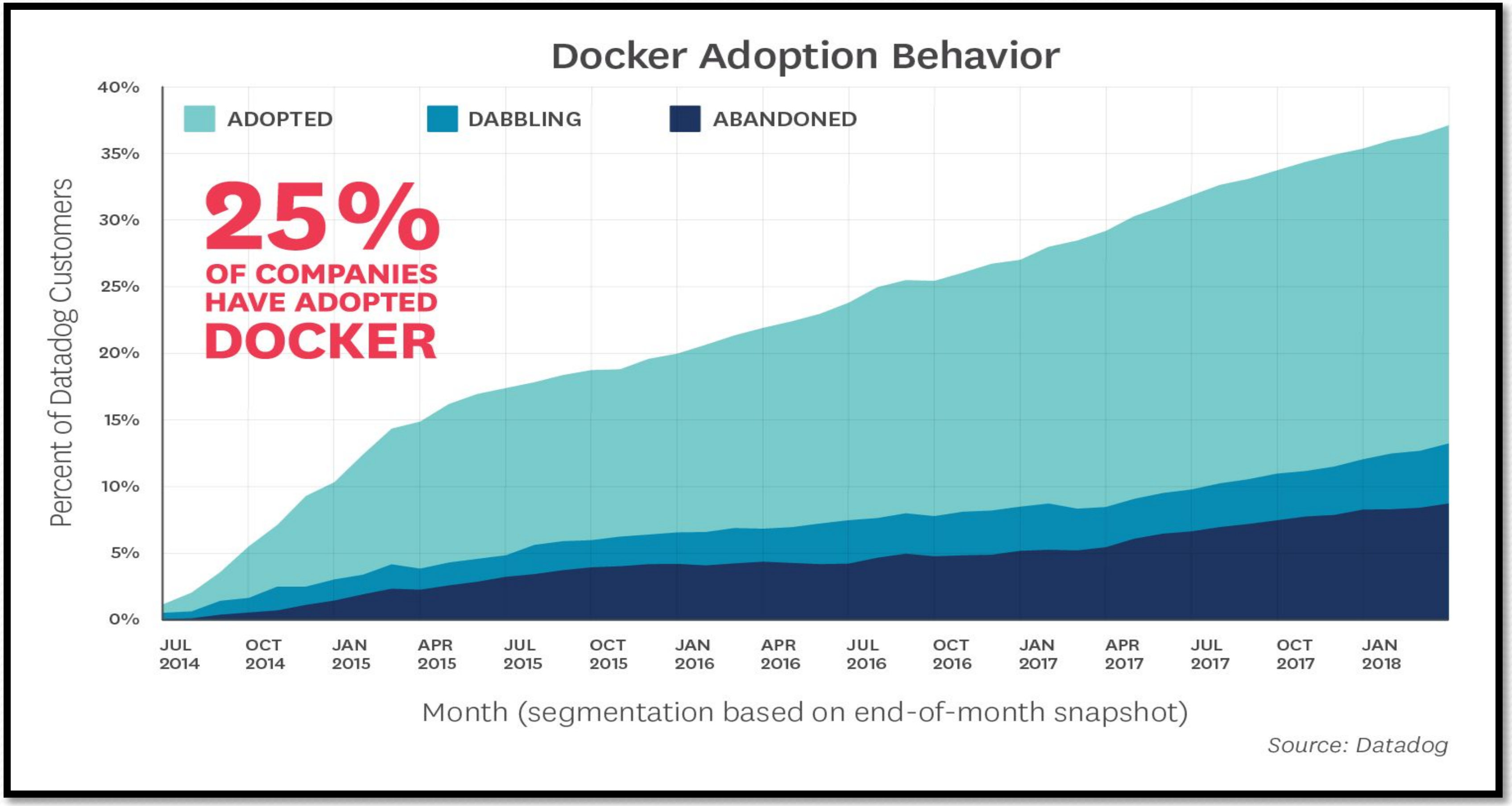
DOCKER COMPOSE



Docker Compose makes it easier to configure and run applications made up of multiple containers. For example: imagine being able to define three containers–one running a web app, another running postgres, and a third running redis–all in one YAML file and then running those three connected containers with a single command.

You can run these three containers with a single command

INDUSTRY ADOPTION



Source: Datadog

THANK YOU