QA Consulting

Docker

Introduction

TRAINING MATERIALS - MODULE HANDOUT

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Overview

Docker is an open source tool that benefits both developers and system administrators, which is why it has become so popular as a “DevOps” tool. Developers should be able to focus on developing code and not have to worry about environment configuration issues, Docker is a solution for this because it uses containers to keep environments consistent; whether the code is running on production setup or a developer’s laptop.

While being the most popular container engine there are some alternatives to Docker that are worth mentioning:

- rkt
- LXD
- Linux VServer
- Windows Containers

Containerisation

Containerisation Explained

The definition of a container is "*an object for holding or transporting something*". Effectively, containerisation is a much more lightweight alternative to virtual machines, whilst still having the benefits of encapsulating (isolating from everything else) an application in its own operating environment.

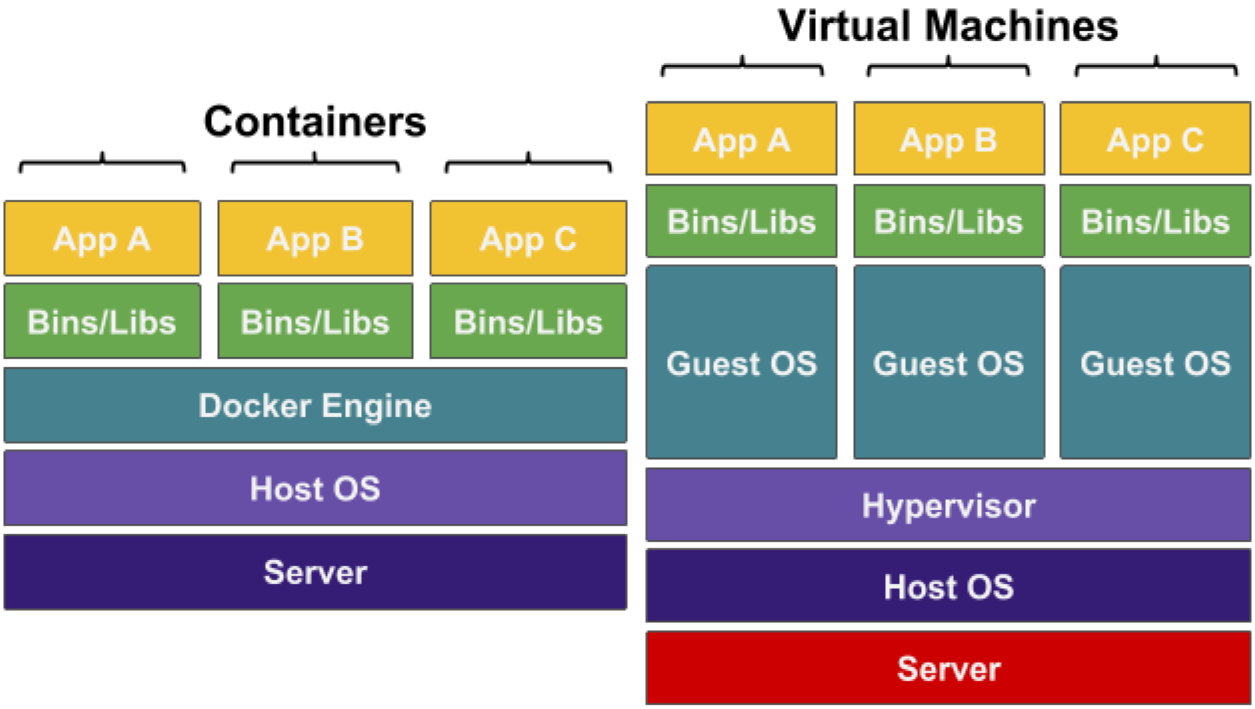
Containers vs Virtual Machines

Containers

- Containers use the same kernel (core of the operating system) that the host operating system is using.
- Resources are shared between containers where it is possible.
- Extremely fast startup time.

Virtual Machines

- Virtual machines must emulate an entire computer to support an operating system.
- There is complete separation between machines.
- Far more resources are used to isolate the hosted application.



Linux Installation

We can use a remote script for installing Docker on most distributions easily.

```
curl https://get.docker.com | sudo bash
```

Using Docker Commands Without Sudo on Linux

On Linux, to be able to run Docker commands without having to prefix them all with sudo, we can add users to the docker group, once you have added your user to the docker group, ensure that you restart your shell session so that the change takes effect.

```
# add yourself to the docker group, the remote script suggested above will
# have already created the docker group for you
sudo usermod -aG docker $(whoami)
```

Windows & MacOS Installation

Docker can be installed on Windows (exe) and Mac (dmg) through this link:
https://www.docker.com/products/docker-desktop
For this method you will be required to create a Docker account.

Tasks

Install Docker

Install Docker using the guides above for your operating system.

Try out Docker

Give Docker a go by running a hello world container. Use a **docker run** command to start the container, you will see Docker download the image then run it, the script in the hello-world container will create an output which describes what just happened.

Command

```
docker run --rm hello-world
```

Output

```
Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs
the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent
it to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/
```