Virtualization and Containerization

Virtualization

Development environment – where you develop the app

Production environment – where you set it up to run to provide a service

Virtual machines (VMs) can have different OS, updates, plugins, etc.

Vagrant – Usually used in dev environment

Docker – Usually used in prod environment

Vagrant – Tool for building and managing VMs in a single workflow

Lowers dev environment setup time

It mirrors prod environment on a dev machine

Devs can still use familiar editors, IDE and browsers

Vagrant will create a VM for each prod environment

Vagrant is not a hypervisor and requires you to have one installed which Vagrant will refer to it as a provider.

Containerization

Rather than a full OS on a VM, containers only have your required software from the OS which makes it a lightweight option.

Containers share kernel with the host machine

Containers can be run on bare metal servers, cloud infrastructures and top hypervisors

Useful for developing, deploying, and testing apps and microservices

Devs don’t need to write app code into VMs

You will have no conflicts with different app versions

2018 – 60% of organizations suffered security incidents specific to containers due to shared kernel with host

Virtualization gives you a guest OS which can be different to your host OS but containerization has to match the host OS

Docker – Allows separation of an app from the infrastructure

An image is what we base the container off, it is used as a template and your container will be a tailored version of this image

Hub.docker.com – Gives you access to the different images/containers you can pull from docker

Docker run -it ubuntu bash

***Container language***

Uname -a gives version

Cloud Computing

On demand delivery of computing resources

Benefits:

Flexibility/Scalability

Efficiency

Cost

Concerns:

Security – Large threat surface; shared responsibility over security

Data portability

Cloud provider transparency

Public Cloud – Owned and operated by 3rd party service provider

Private Cloud – you own and operate the cloud

Hybrid Cloud – Enterprises who use both public and private clouds