LSDG – V&C VRTUALISATION & CONTAINISATION

VIRTUALIZATION AND CONTAINERIZATION IN SOFTWARE DEVELOPMENT

JP McGinty 2019 ©

AGENDA

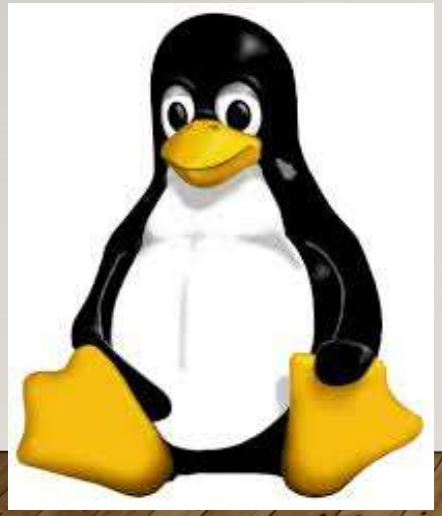
- Talk: Shipping Containers – to virtualization and containers are changing software development
  - The formation of Scrum
  - Agile Manifesto
  - Rise of Scrum
  - Scaling Scrum and Agile
- Discussion: TBSCall sprints should be 1 calendar month
- Dev Intro: Running Docker
- Drinks / Networking

VIRTUALISATION in Development


WHY?

DEVELOPER:
MULTIPLE OPERATING SYSTEMS TO PLAY ON

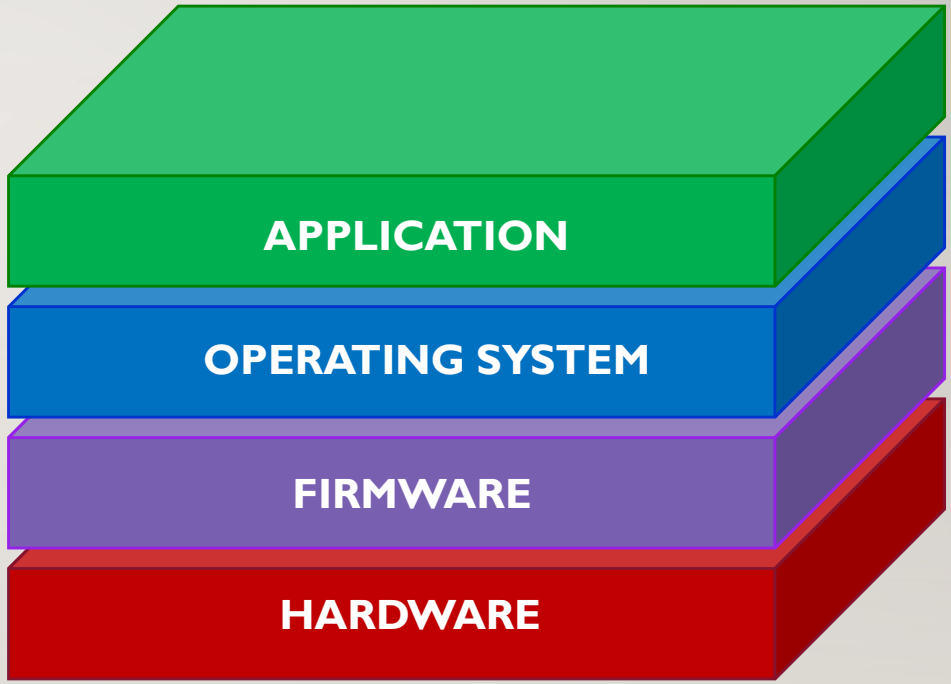
1. Development
2. Testing: newer/older OS, different OS
3. Playing
4. Security



BASIC COMPUTER TERMINOLOGY

Application – User initiated programs e.g.MS Powerpoint
Operating System (OS) – programs and services created to run the OS e.g. Windows
Firmware – programs to control the hardware with the operating system e.g. BIOS
Hardware – physical machinery that allows the computer to function e.g. Central Processing Unit (CPU)

Note: Computer has multiple versions of this stack to operate e.g. video controller is a computer within a computer.



POTTED HISTORY OF VIRTUALISATION

Started in 1960s with the segregation of main frame computers (IBM VM Mainframe)

1980s – 1990s saw the introduction of multiple operating systems (OS) and the creation of client-server topology.

2000s virtualisation of client machines possible due to availability of x86 chips

Now cloud virtualisation

Traditional Architecture

Virtual Architecture

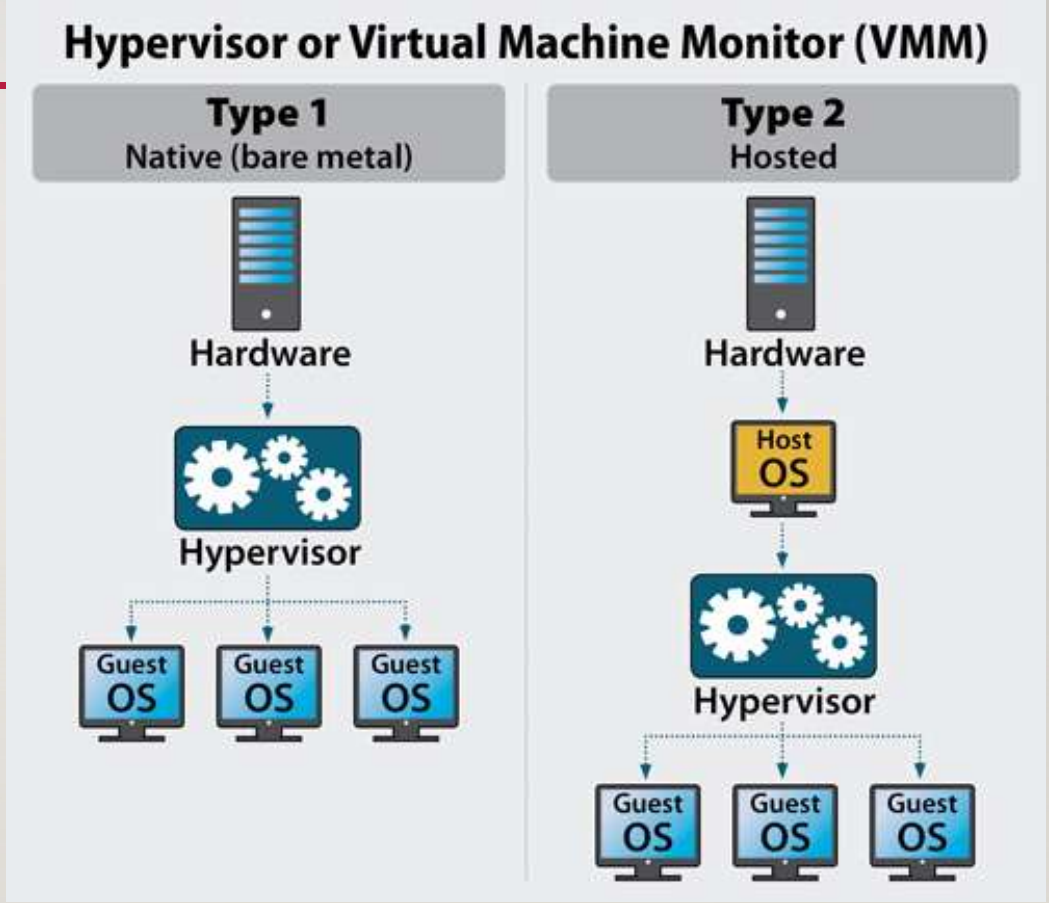
Source: IT FUEL: https://www.itfuel.com/blog/9/virtualisation-in-laymans-terms-for-the-smaller-organisation/

VIRTUALISATION NOT JUST DEV PLAYGROUNDS TYPE 1, TYPE II AND HYPERVISOR

Two types of virtualisation
Both controlled by a HYPERVISOR

I – Native or Bare Metal
Hypervisor divides hardware up into virtual machines
Server virtualisation and IaaS

II – Hosted or Host Guest
Hypervisor divides hosted OS into Guest VMs.
Developer virtualisation



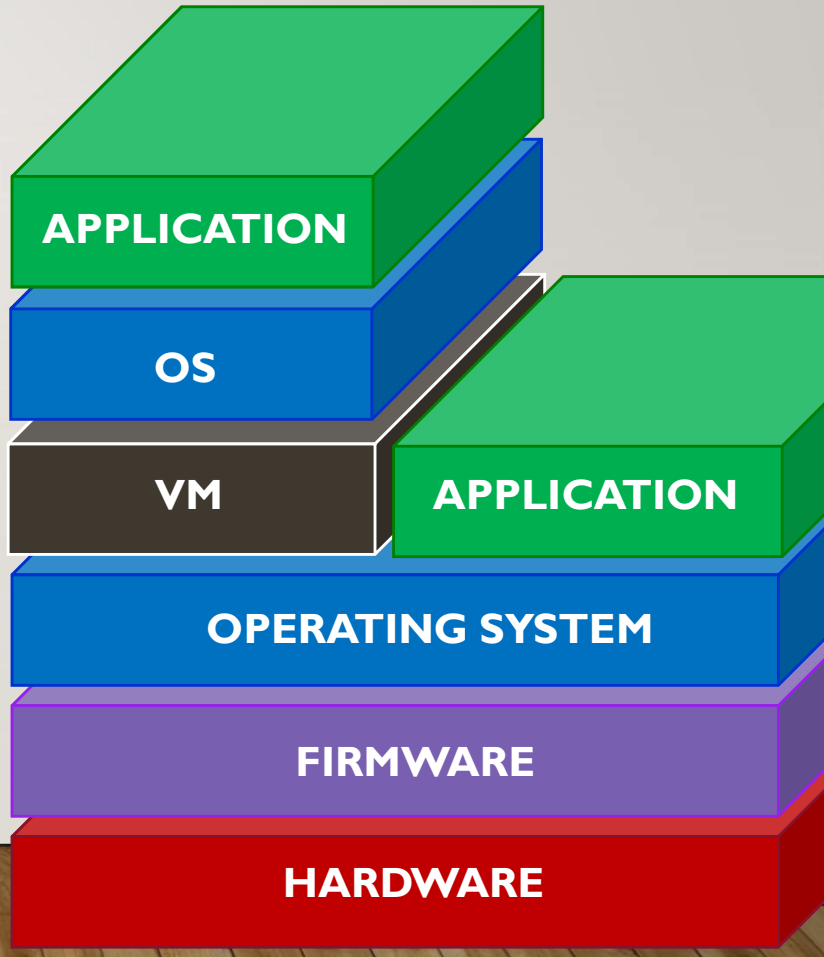
Source: Server Watch, Nov 2018, https://www.serverwatch.com/server-trends/guide-to-hypervisors.html

EXAMPLE:
LINUX (UBUNTU) ON WINDOWS

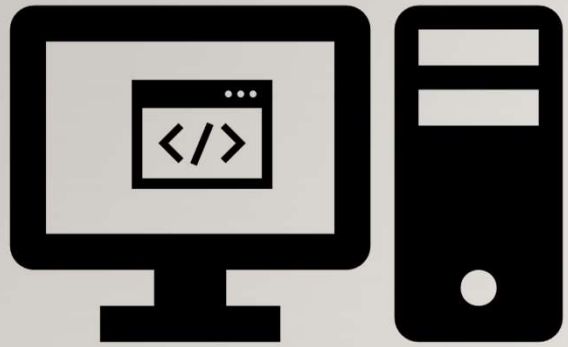
Windows like to run Windows things (this is changing)

Running Linux allows other programming languages to be tried

1. Install VirtualBox (Oracle)
2. Download Ubuntu 18.04.

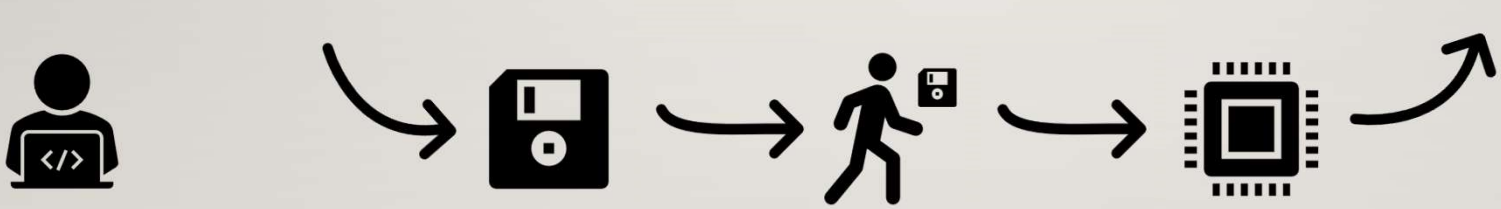


REAL WORLD EXAMPLE – DARREN LUCAS
WINDOWS HOST, LINUX GUEST – FIRMWARE UPGRADE



Windows OS – comes with the PC, Corporate office software
Linux Ubutu OS – development environment
VirtualBox – Hypervisor that manages Ubutu

Linux VM is totally separate from the Windows OS and network system



1. Developer writes code on Linux OS and saves to external drive (not a floppy disk!)

2. Program transported by field engineer and used to update firmware of computer

3. Firmware updated and device upgraded/secured etc

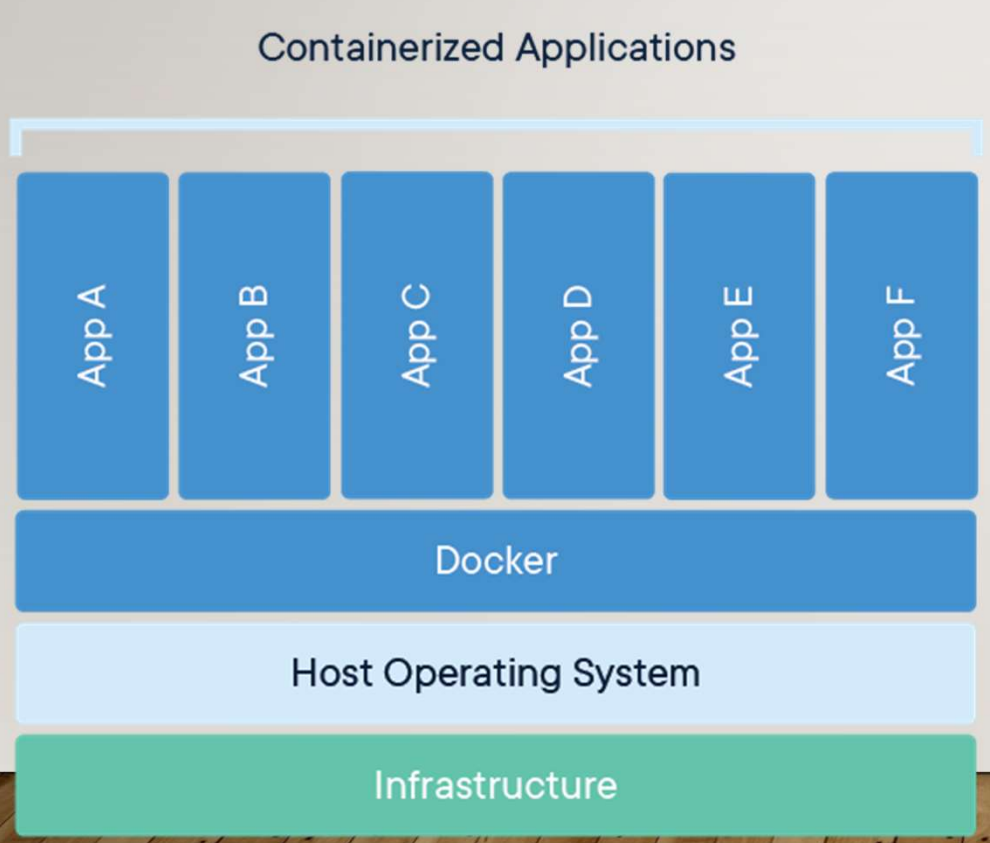
CONTAINISATION in Development

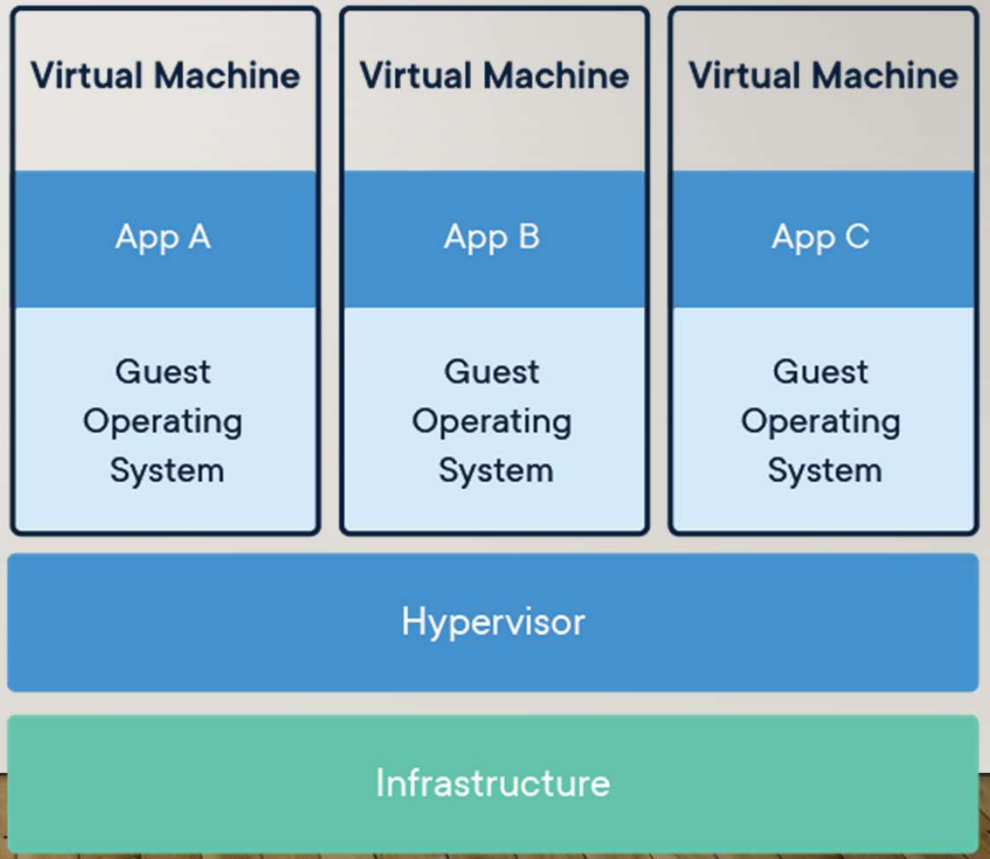
WHY WOULD CONTAINERS BE HELPFUL TO A DEVELOPER?

1. Development
2. Testing: newer/older OS, different OS
3. Playing
4. Security

WHAT IS A CONTAINER?

- Docker: a standardized unit of software



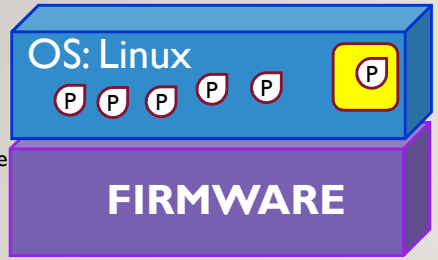


Source: Docker - Whttps://www.docker.com/resources/what-container

REAL WORLD DEMO ON DOCKER CONTAINER
DAFYDD REES

BIT MORE DETAIL

RUNTIME



Processes – share address and name space

"Contained" Processes
Separate from the other processes on the OS
Sandboxed: own **process name space**
And **C Groups**

Shell into container – use the one Process

When the container starts the process starts and vice versa
Container and Process Lifecycle the same

IMAGE


Thank
you!

NETWORK