



Introduction to Docker Containers

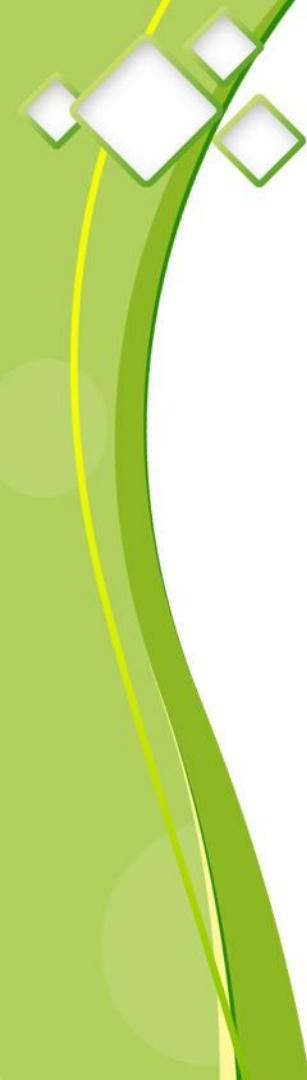
Instructor: Asst. Prof. Dr. Praphan Pavarangkoon

Office: Room no. 418-5, 4th Floor

Email: praphan@it.kmitl.ac.th

Office hours: Thursday at 9:00 – 11:00

or as an advance appointment



Agenda

- Background
- Why are Containers Important?
- What are Containers?
- What is Docker?
- What is an Image?

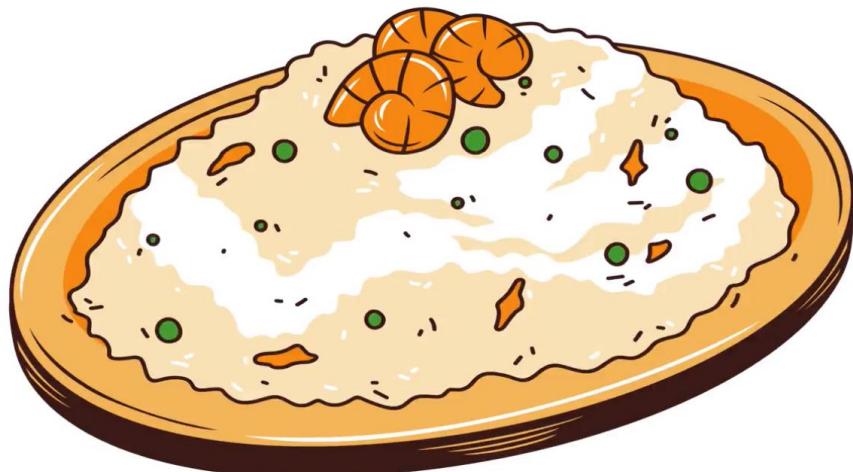
Background



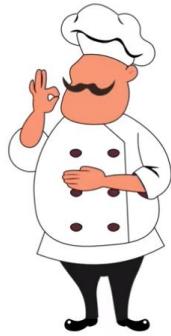
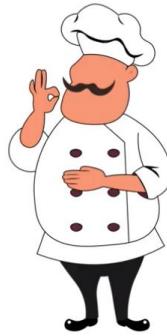
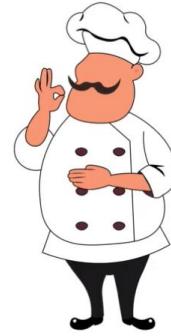
Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Background (cont.)



Why are Containers Important?

What are Containers?

Container

Application

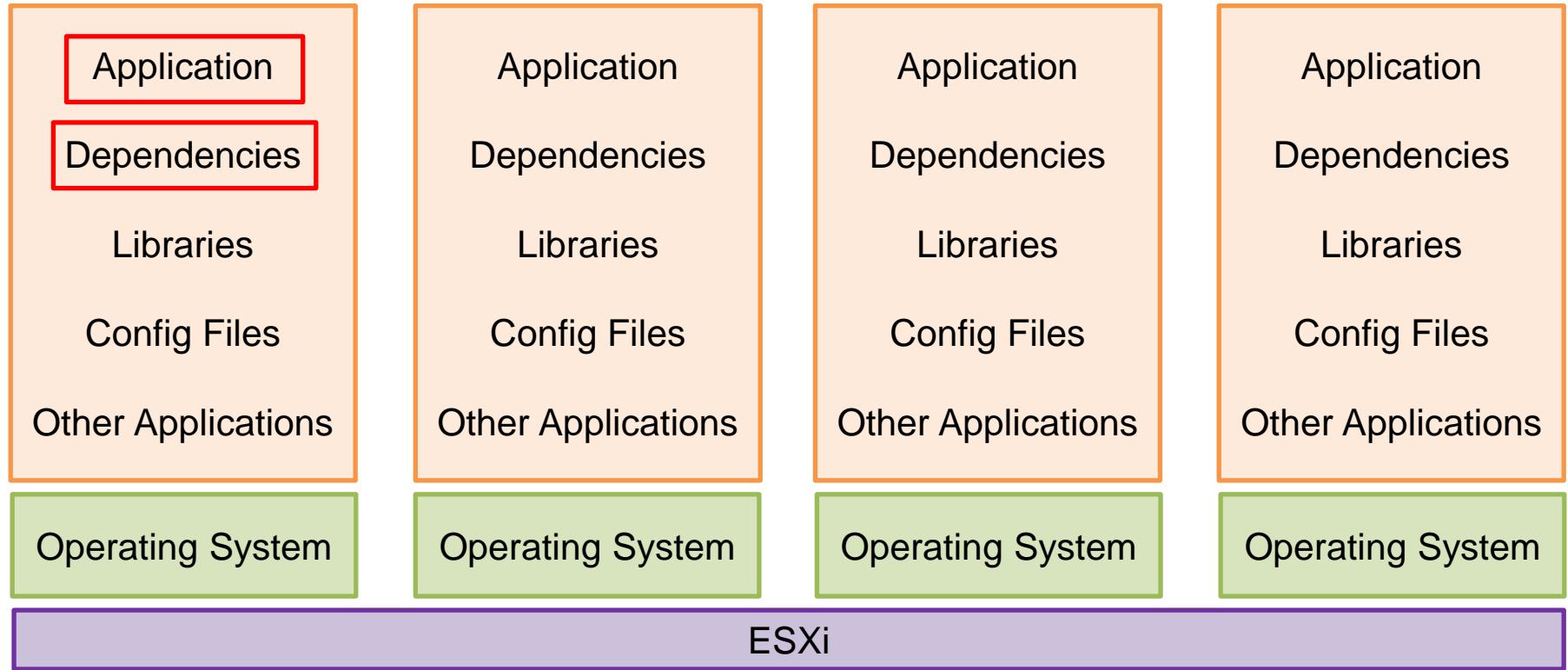
Dependencies

Libraries

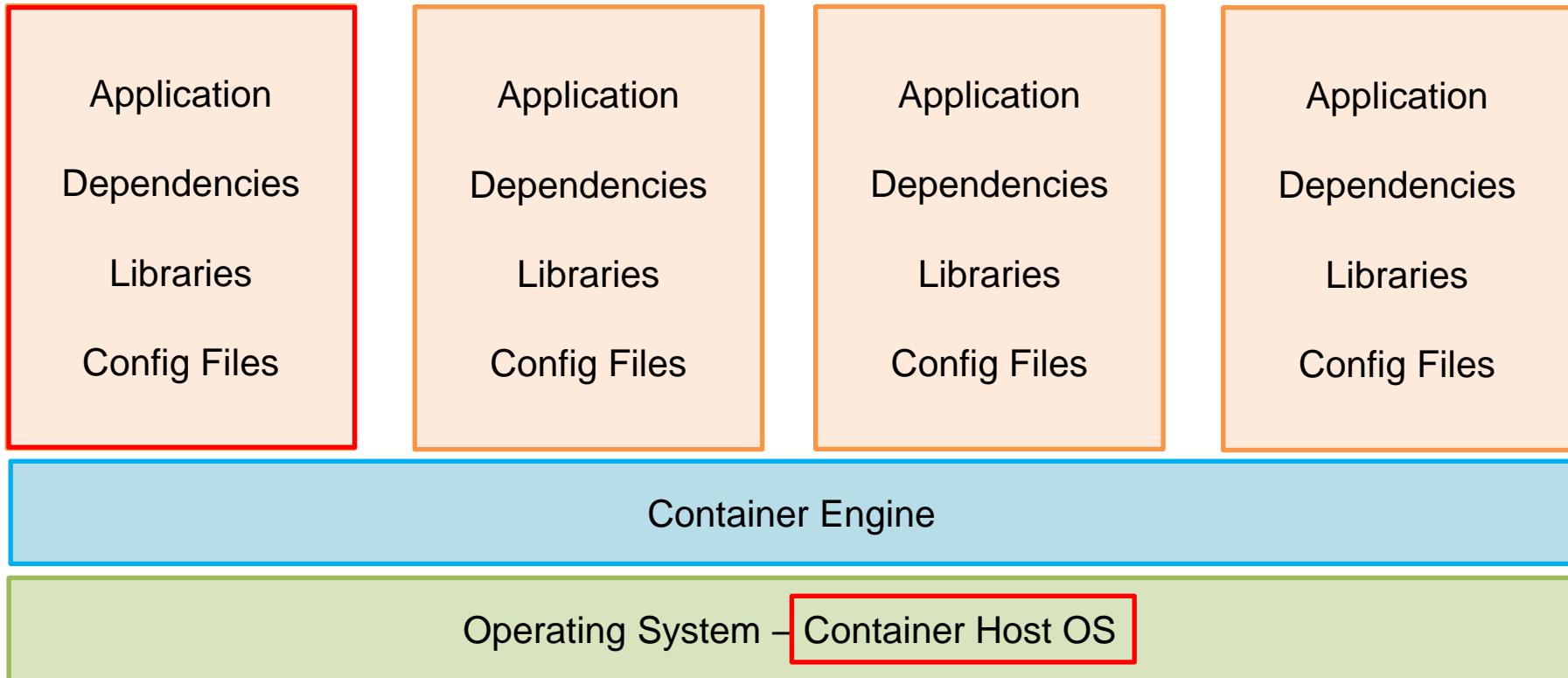
Config Files

Other Applications

So What? VMs Already Do That!



So What? VMs Already Do That! (cont.)



Container Host

- Standard OS must be declared
- Photon has a container runtime baked right in!
- So VMs with the correct O.S. can be our container host

Applications in Containers

Docker

- De Facto Container Solution
- Distributed as proprietary software (Enterprise Edition) and as open-source software (Community Edition)
- Containers need to be launched dynamically and distributed over many container hosts
- This creates the need for orchestration

Kubernetes

- Open-source platform for orchestrating containers
- Popular tool for orchestrating containers and running distributed applications
- Automatic scaling
- Self-heal and health check
- Often abbreviated as K8s
- So...it doesn't really make sense to compare Docker and Kubernetes

Docker and Kubernetes

- Docker allows you to create and deploy containers
- Kubernetes handles orchestration
- Make applications more highly available
- Improves scalability
- Makes containers easier to maintain

Docker Swarm and Kubernetes

- Native clustering solution for Docker
- Nice breakdown here:
bit.ly/3lfKfoi

What is Docker?

- Container Management Software

What is an Image?

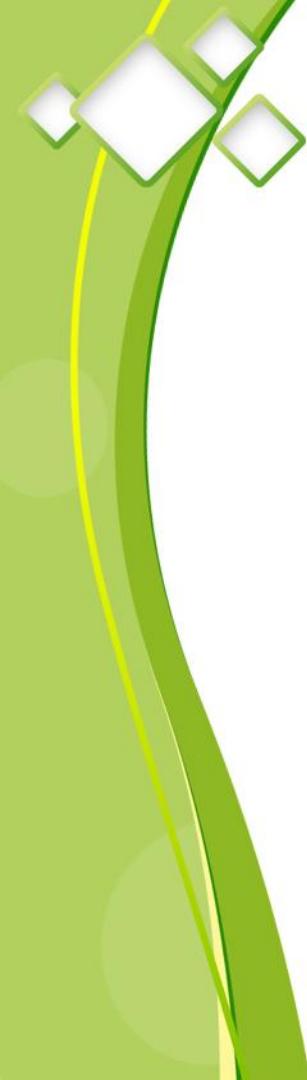
- A blueprint for your container
- The instructions for building your container
- Made up of layers
- Base Layer (O.S. such as Debian or Ubuntu)
- Easy install. All dependencies are there.
- Can run on the docker engine regardless of hardware.

What is a Container?

- An Application that has everything it needs to run
- A running instance of a Docker image
- Boots nearly instantly

Example: WordPress site

- Multiple developers can work on the project.
- Different developers may have different environments or dependencies.
- The container has everything you need to run the application.
- I can run many instances of the container without running a complete Operating System each time.



Q & A