Everything You Wanted to Know About Containers but were Afraid to Ask

Photo by nikko osaka on Unsplash

Daniel Mikusa

- Lead Software Engineer @ 7SIGNAL, Inc
- Paketo Steering Committee Member
- Cloud-Native Buildpacks Maintainer

Contact Me

- dan@mikusa.com
- https://github.com/dmikusa
- https://www.mikusa.com

Slides

https://github.com/dmikusa/everything-about-containers

Why are we here today?

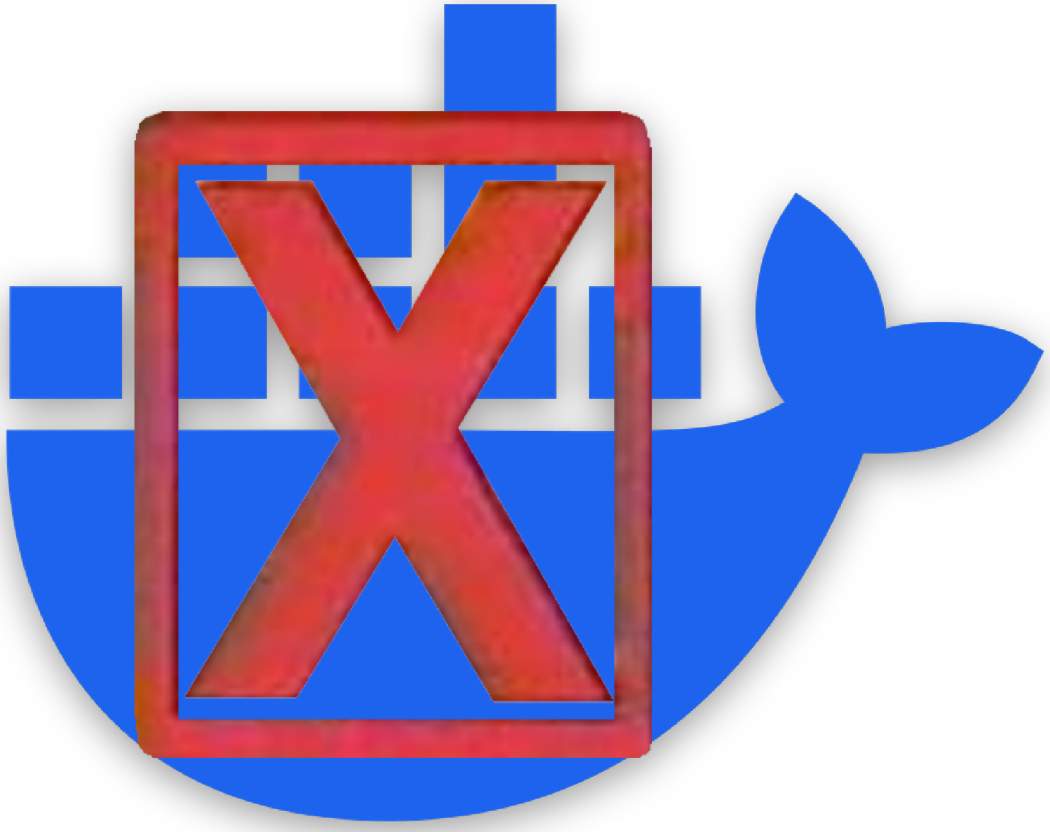
Learn & Understand Containers

Also, because ...

What is a container?

Photo by Syed Hussaini on Unsplash

What's NOT a container?



What's NOT a container?

So What is a container then?

TL;DR - It's an isolated process.

Container Strengths & Weaknesses

Strengths

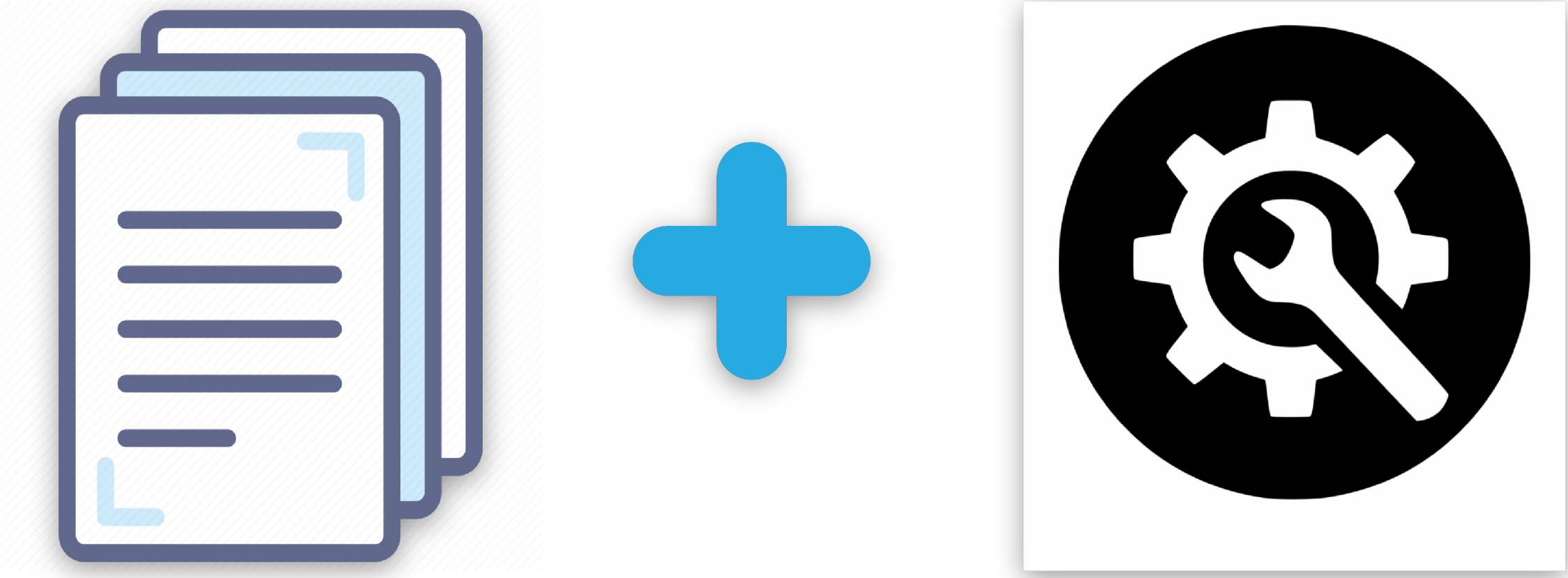
- Cheap/Fast
- Easy way to package code
- Ubiquitous & battle tested
- Strong tooling & libraries
- Standardized (OCI)
- Efficient distribution protocol

Weaknesses

- Weaker isolation
- Container security config *
- CPU shares are challenging
- Noisy neighbors

What else do we need?

What's a container image?



Layers

Sharing Layers

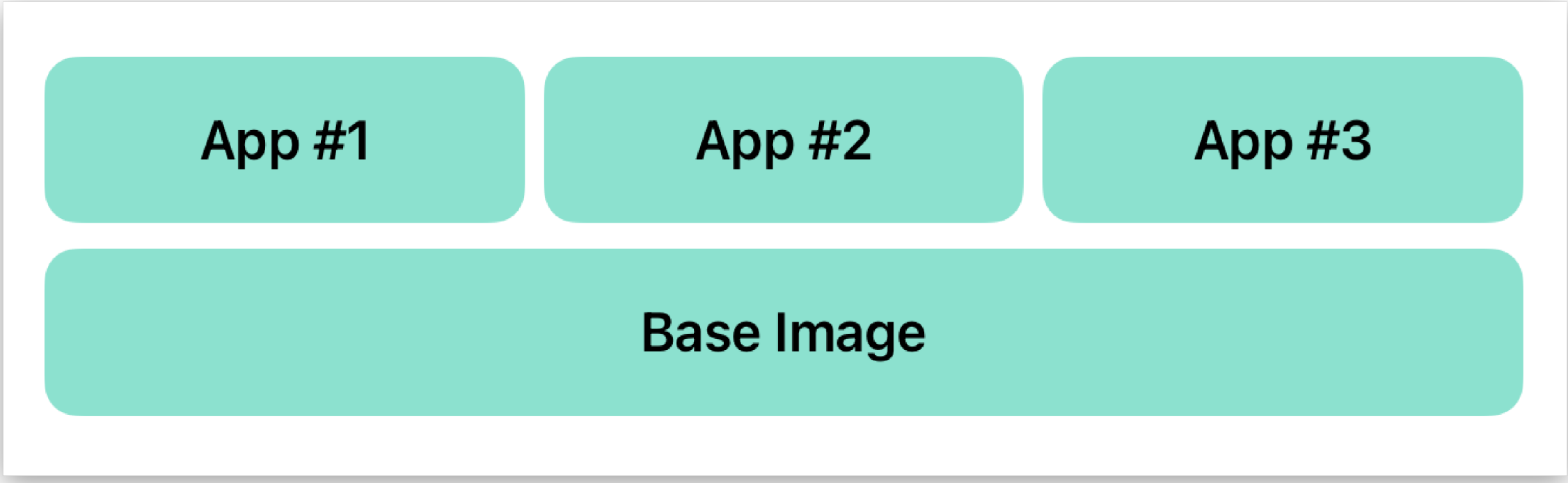
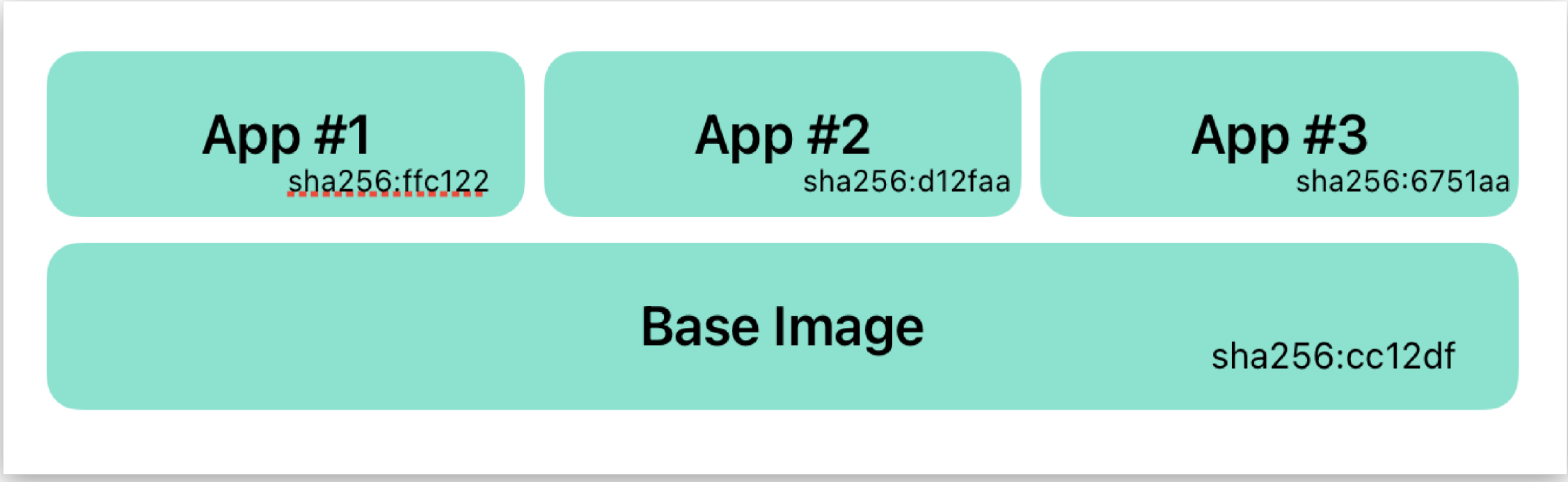
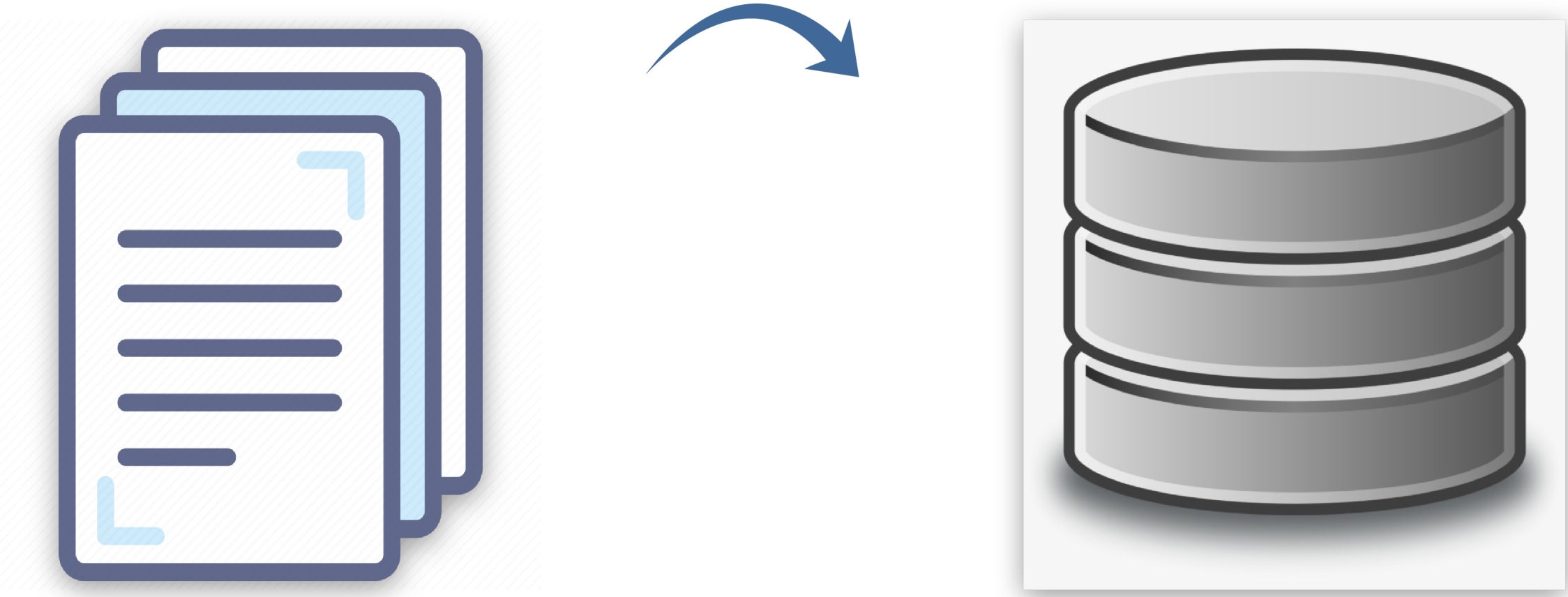


Image Hashes



sha256:32acffd

Volume Mounts



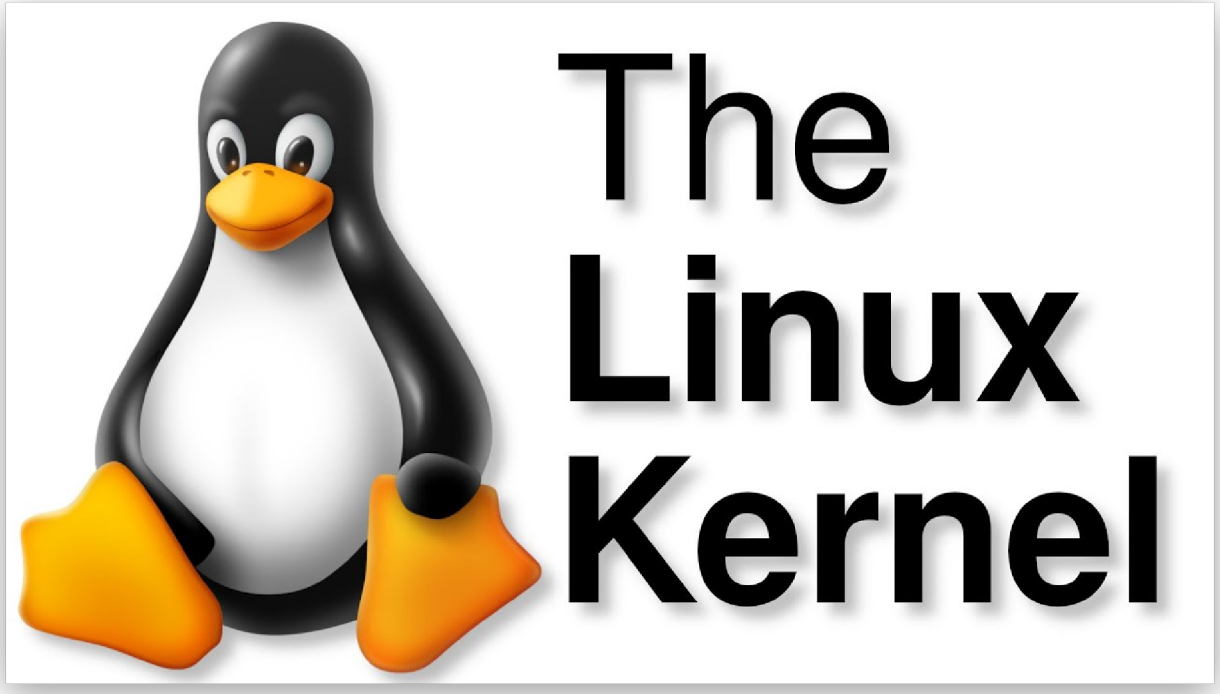
Demo: Deconstructing a Container Image

Image Distribution

Demo: Fetching Images

Running Containers

What's Used to Run a Container

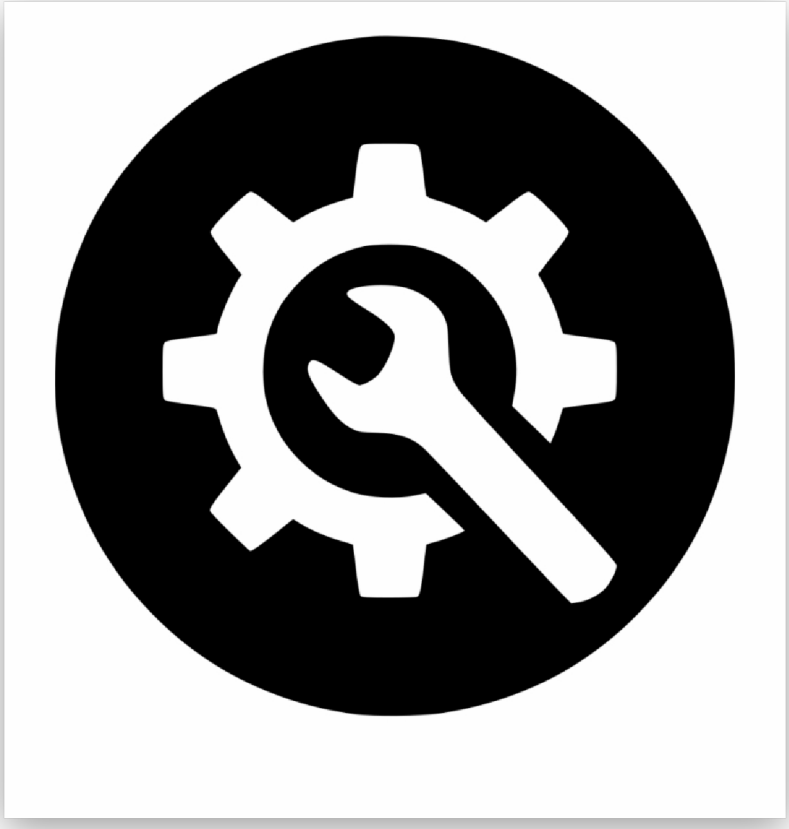


Linux Kernel Primitives

- CGroups
- Namespaces
- Capabilities
- Seccomp
- AppArmor

A Filesystem

Configuration / Settings



Run Docker Run

- `docker run`
- `podman run`
- `kubectl apply`
- AWS ECS, Lambda (or other Cloud Provider)

The Hard Way

Demo: namespaces & cgroups

Questions?