

Data Science Powered by Kubernetes and Microservices in Azure



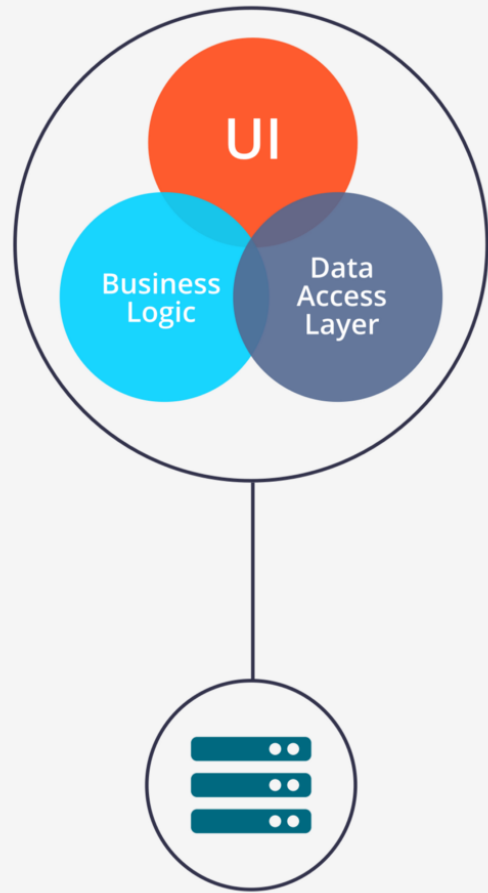
Outline

- What are Microservices
- Managing Microservices
- Azure Cloud Computing
- Hands On Lab: Time Series Analysis of Crypto-Currencies

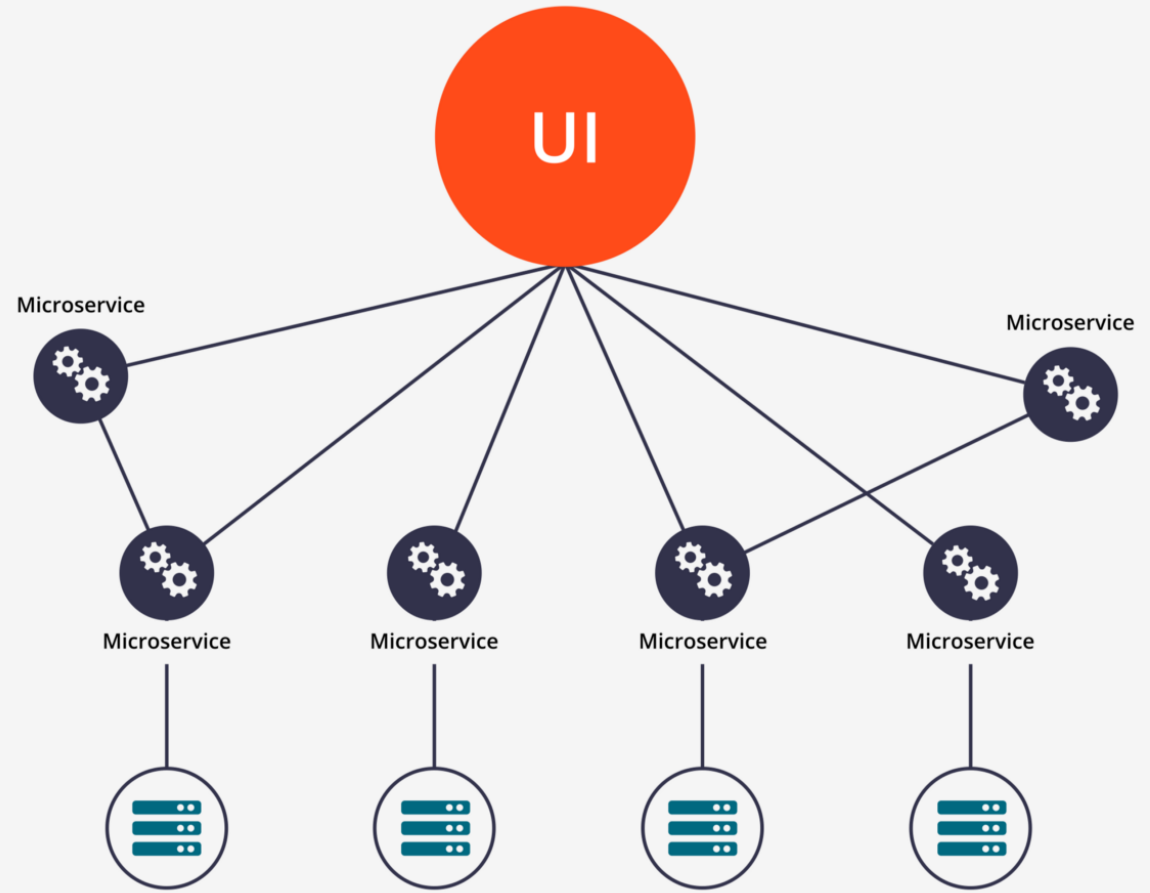
Extract Transform and Load (ETLing)

- Extraction: Accessing data sources (APIs, CSVs, IoT devices)
 - Usually requires multiple data sources
 - Data is never clean
- Transforming: Cleaning the data
 - Fixing empty values
 - Normalizing values
- Loading: Getting the data to a usable storage locations
 - Picking the correct data store (SQL, NoSql, TimeSeries, Graph)

Microservices (SOA)



Monolithic Architecture



Microservice Architecture

Microservices - Advantages

- Multiple languages
- Fault Resistant
- Small Teams
- Scalability

Microservices Disadvantages

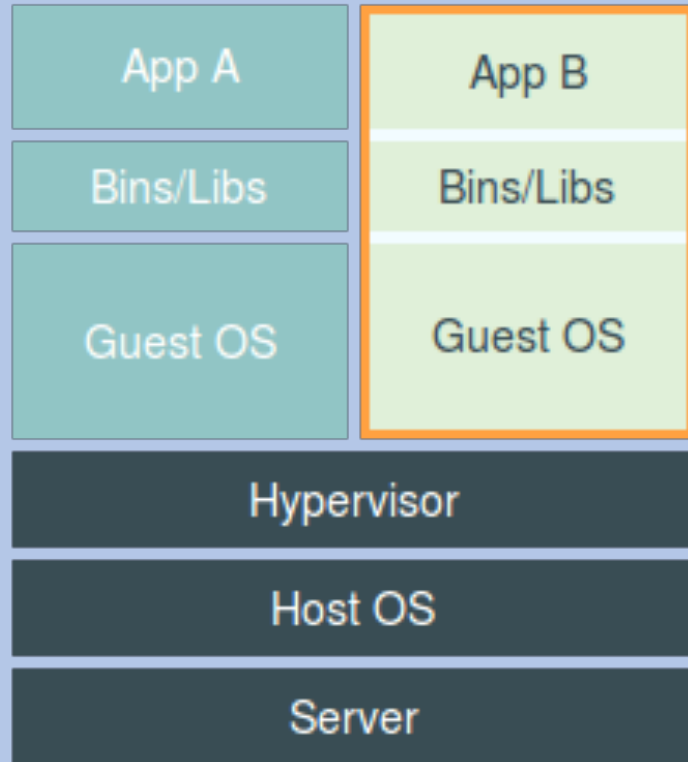
- Complexity
- Networking
- Communication
- Knowledge Overhead



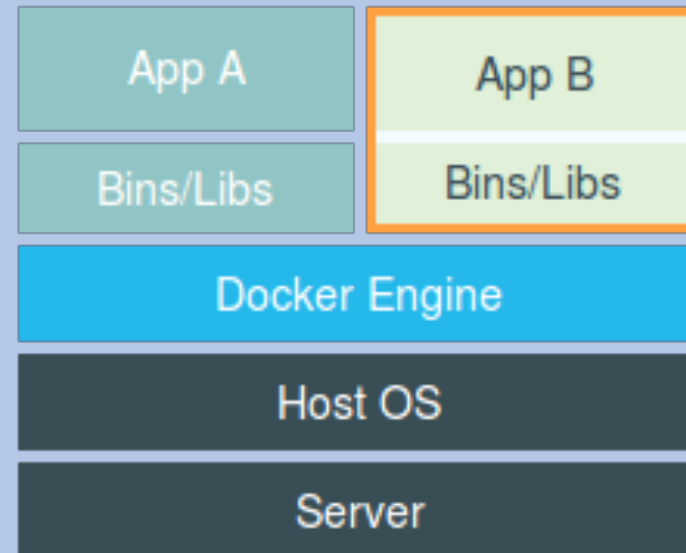


docker

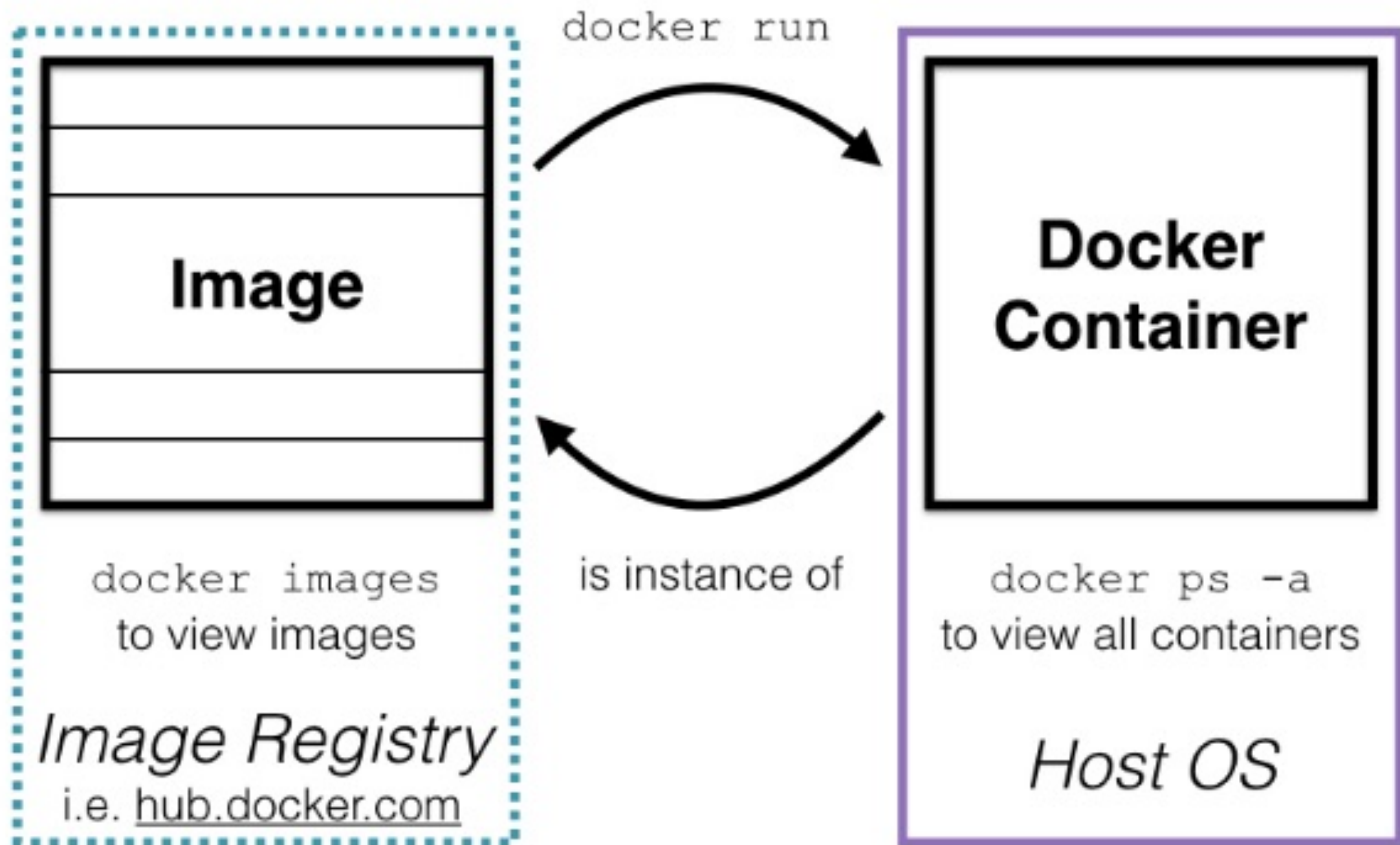
VMs vs Docker



VMs

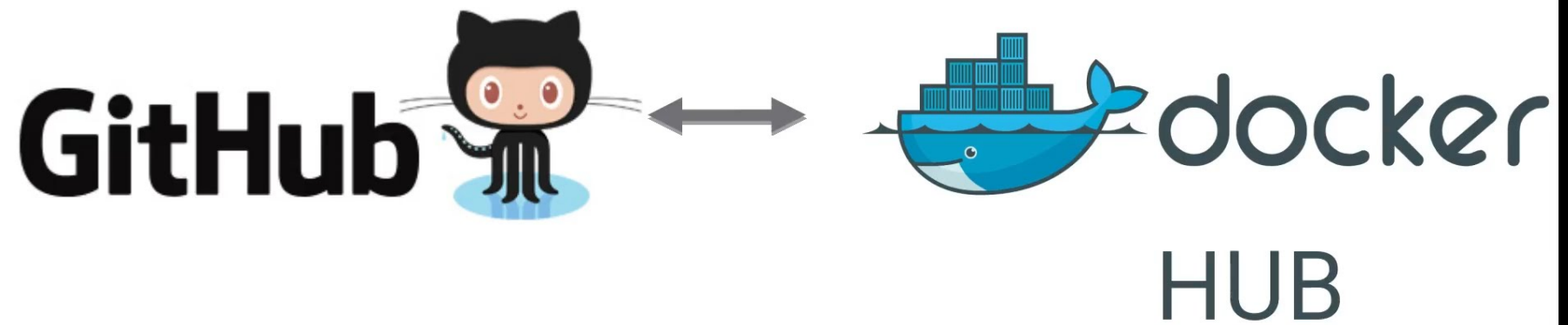


Docker

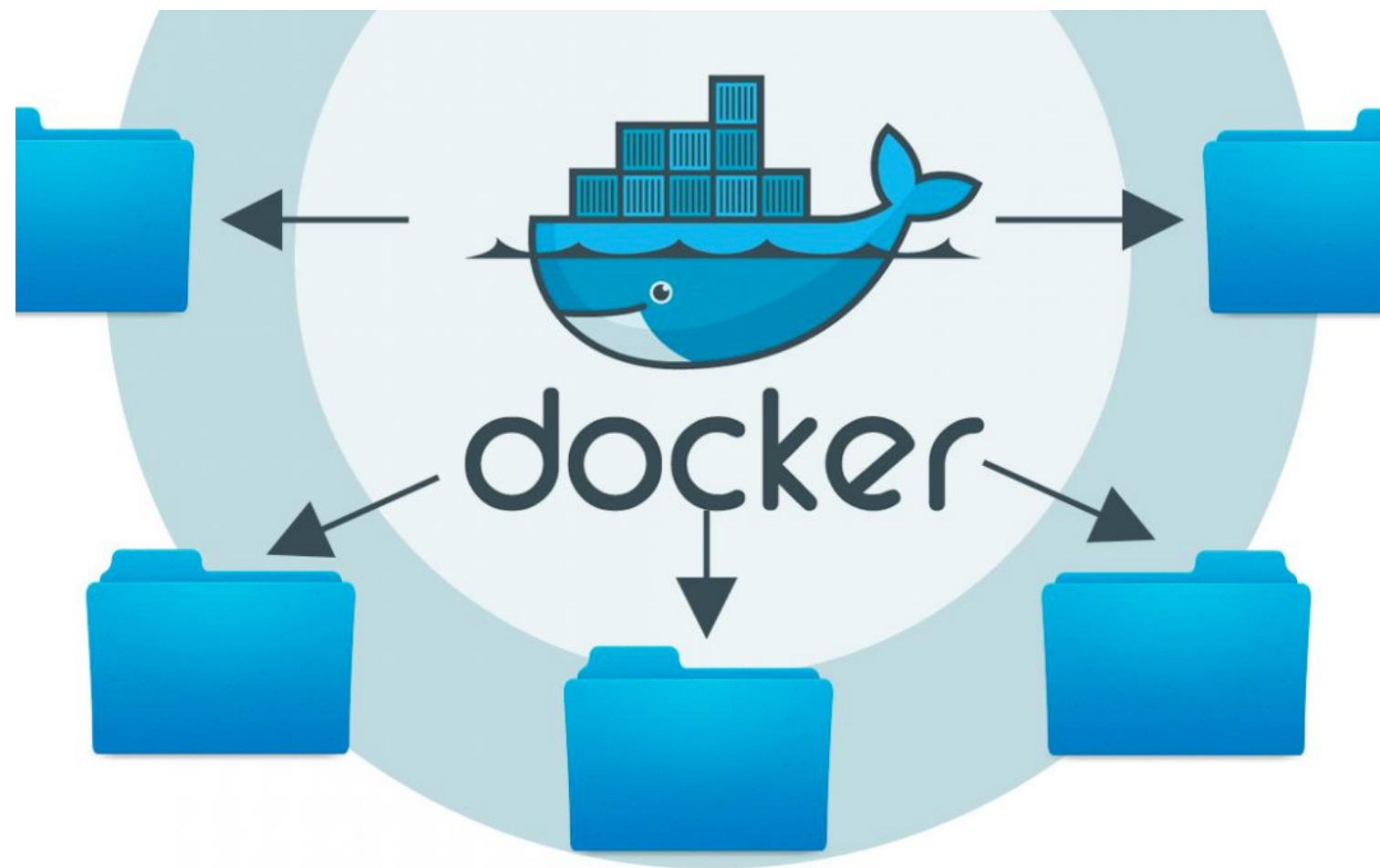




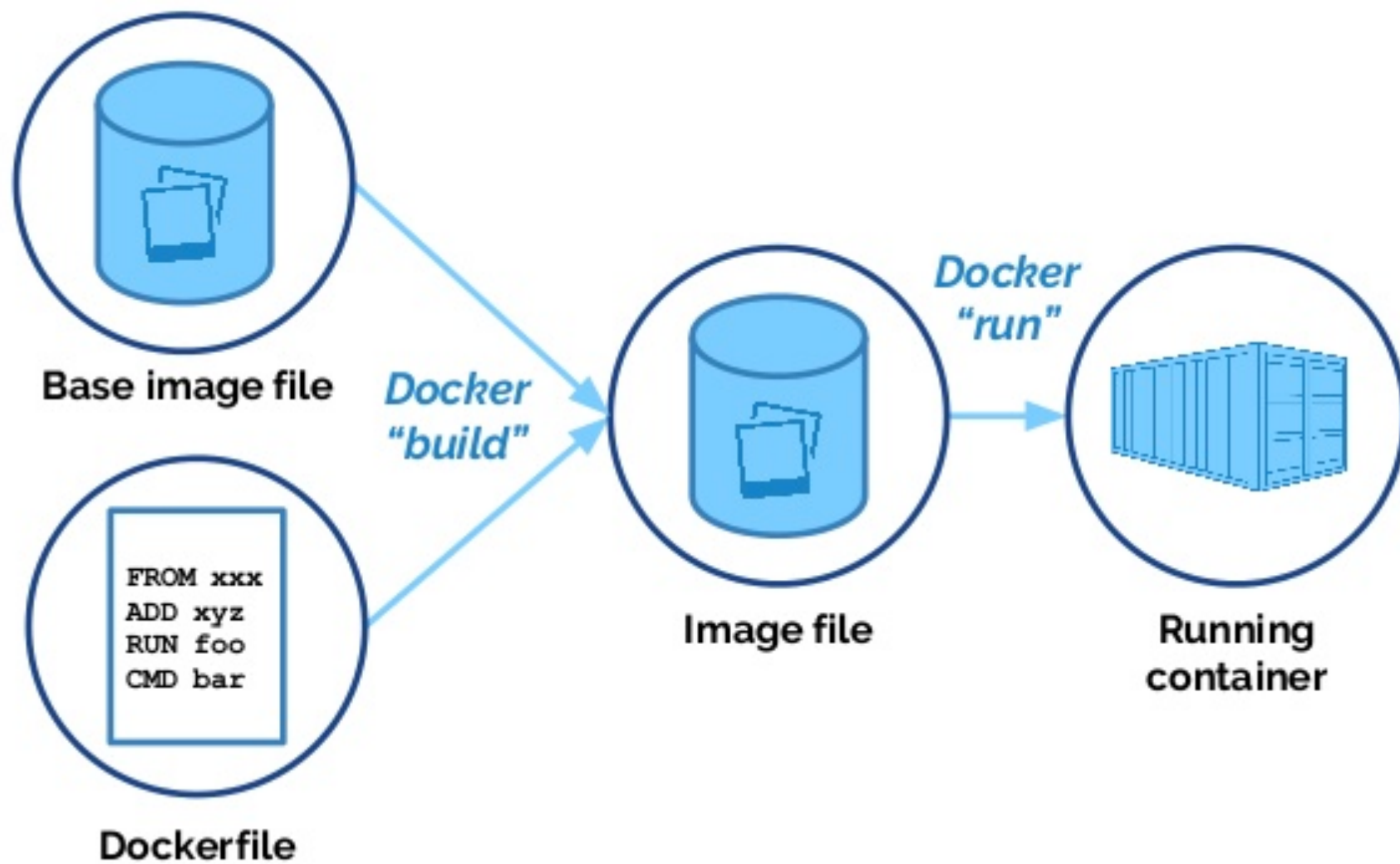
DOCKERFILE



VOLUMES



Docker images and containers



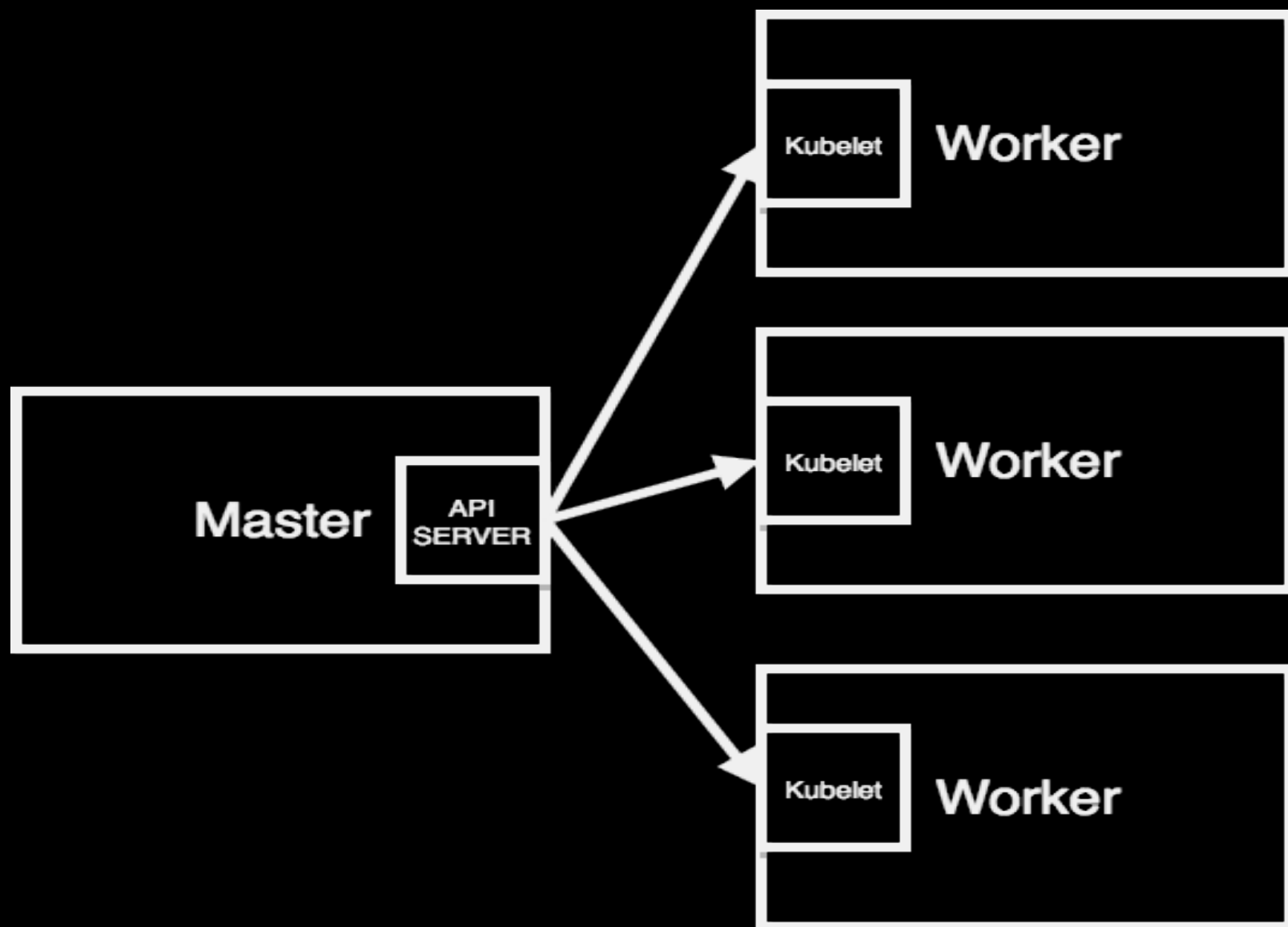


kubernetes

Container Orchestration

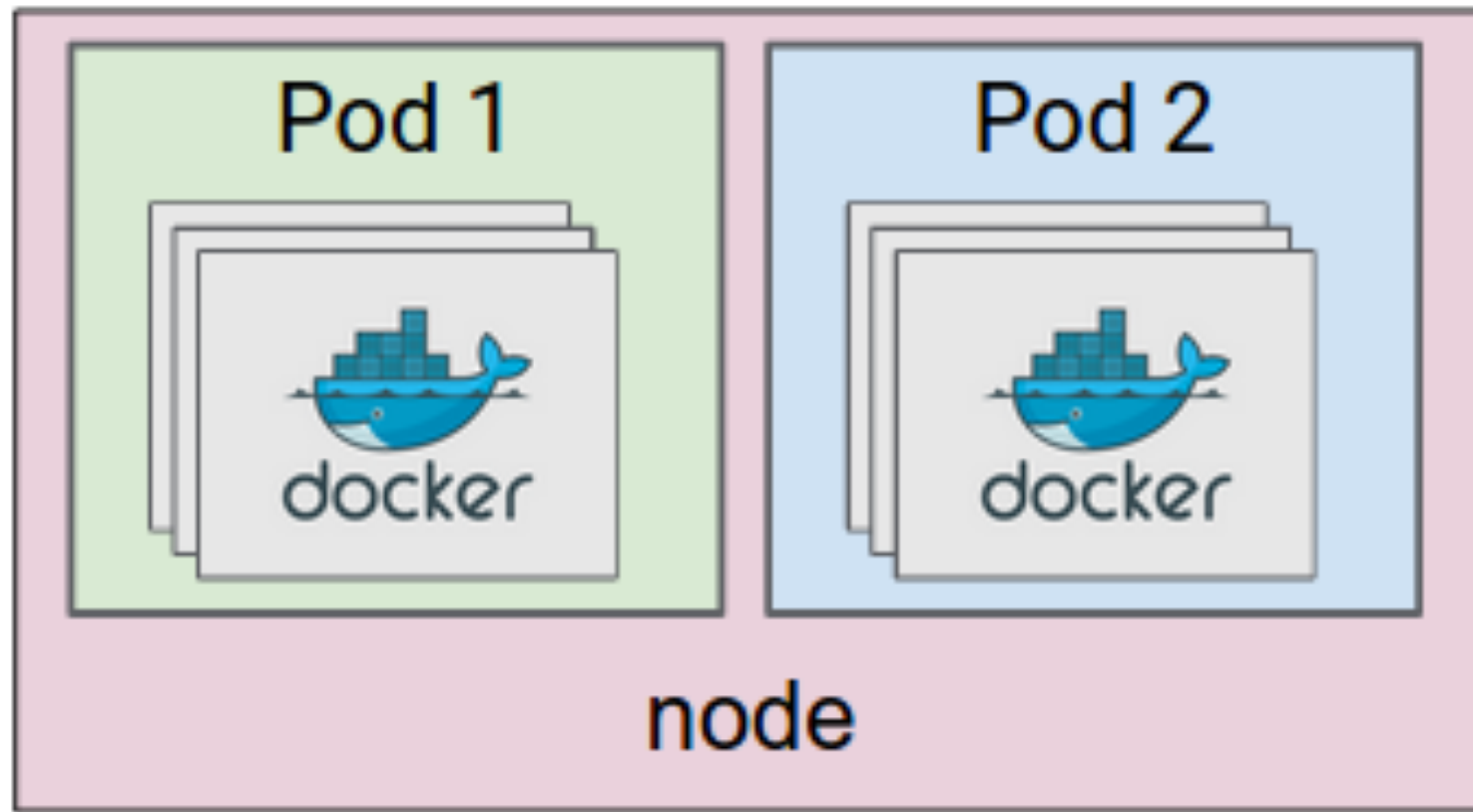
Benefits

- High scaling without worrying about the hardware
- Health checking cycles
- Easy rolling updates
- Heterogeneous Infrastructure

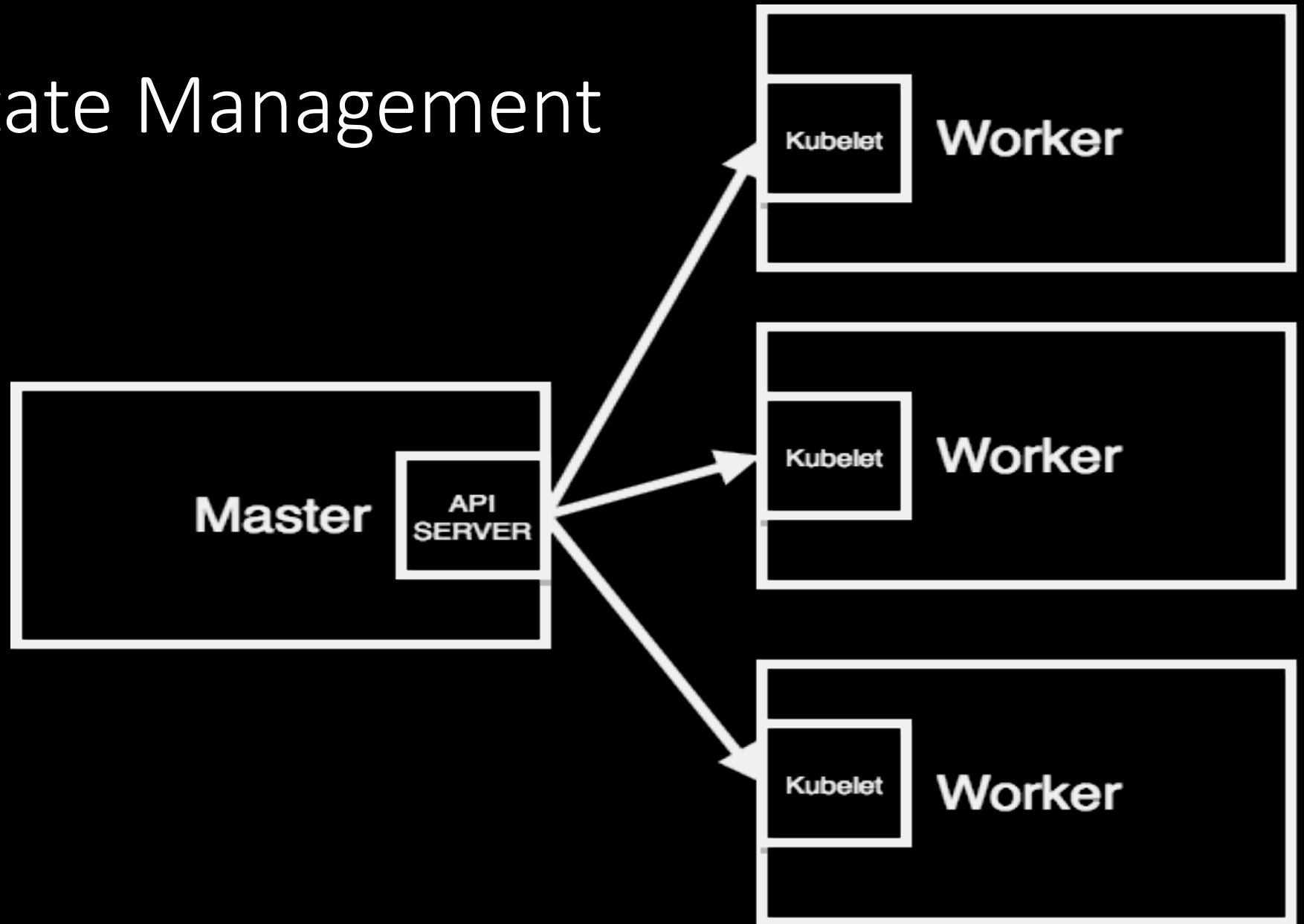


Kubernetes Pods

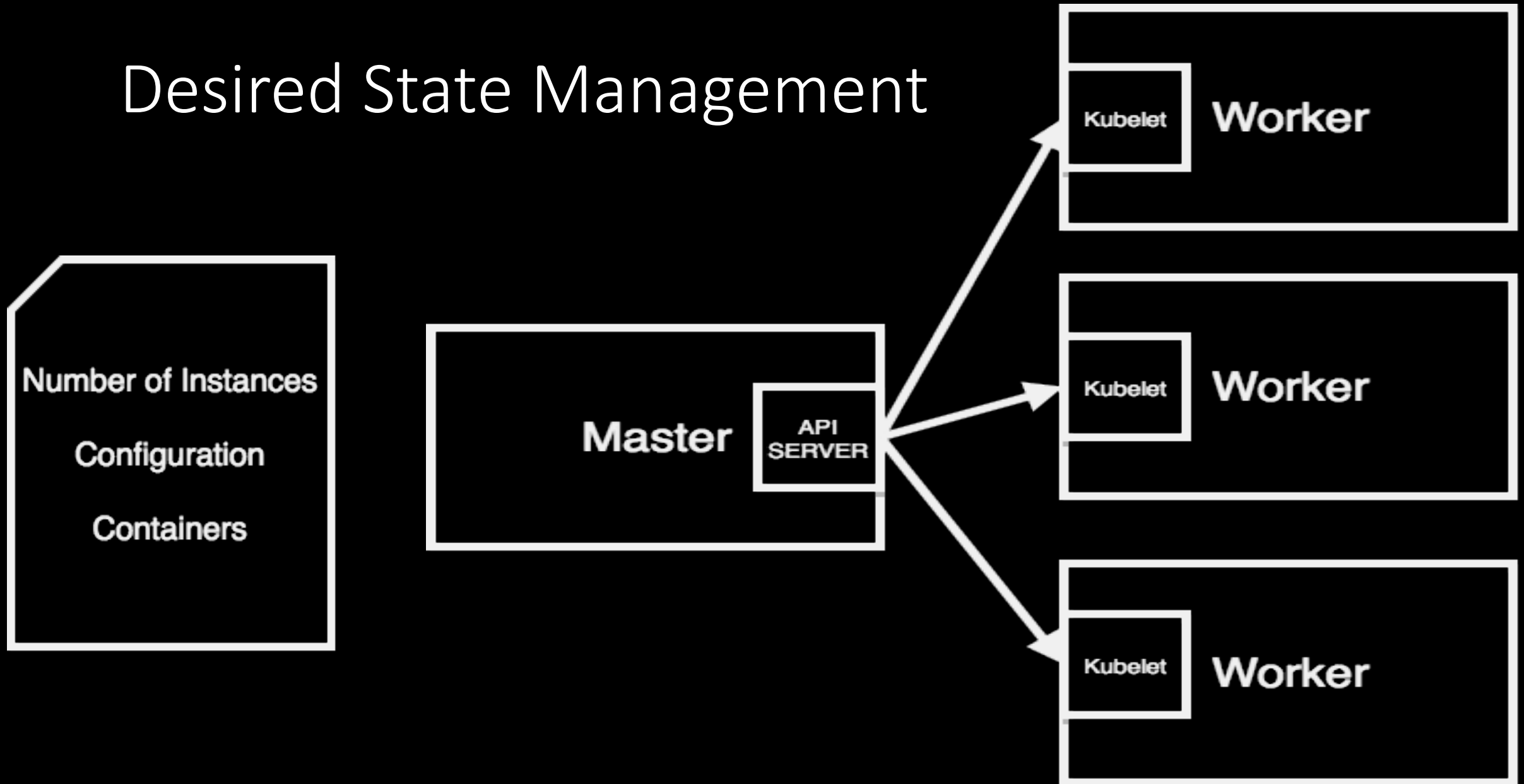
collections of containers that are co-scheduled



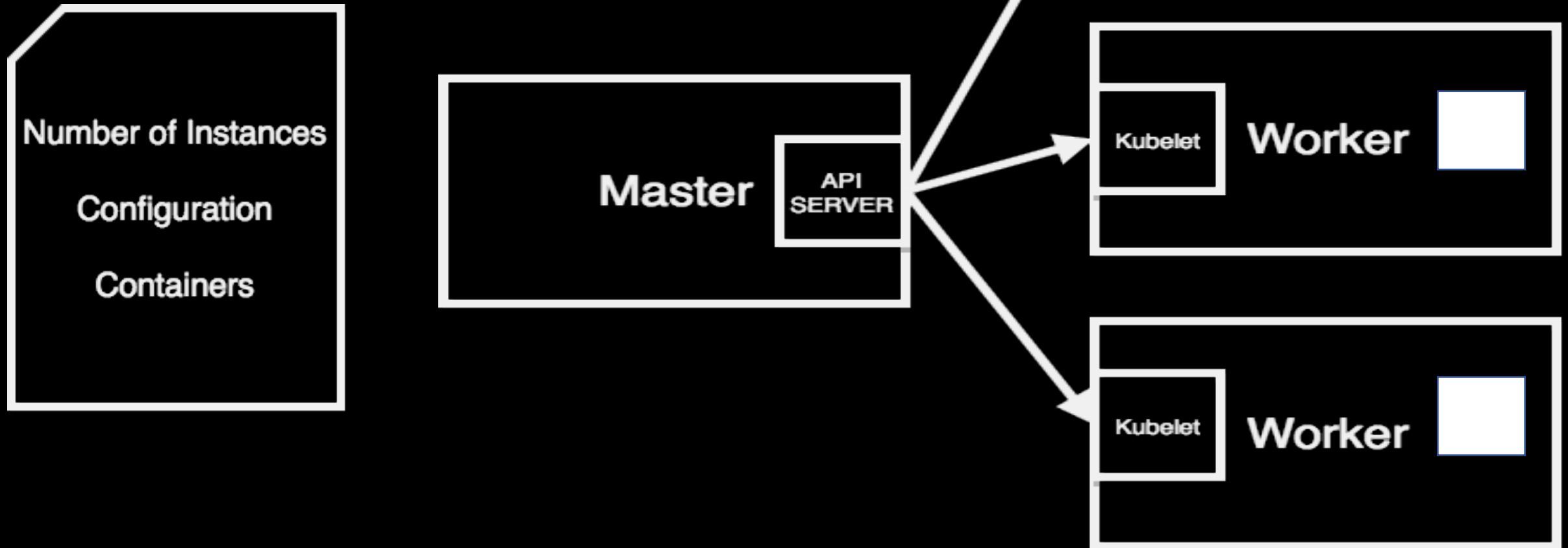
Desired State Management



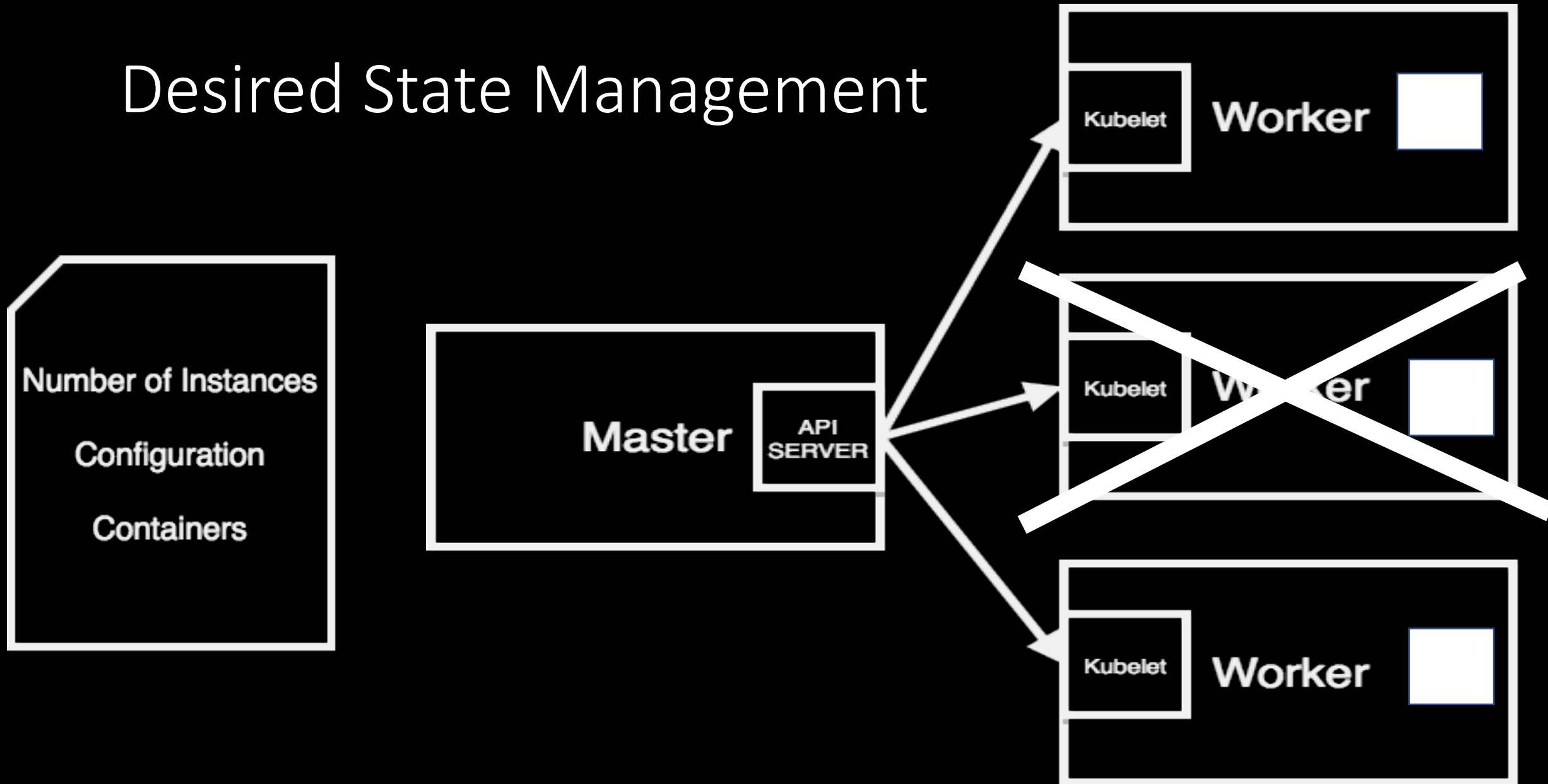
Desired State Management



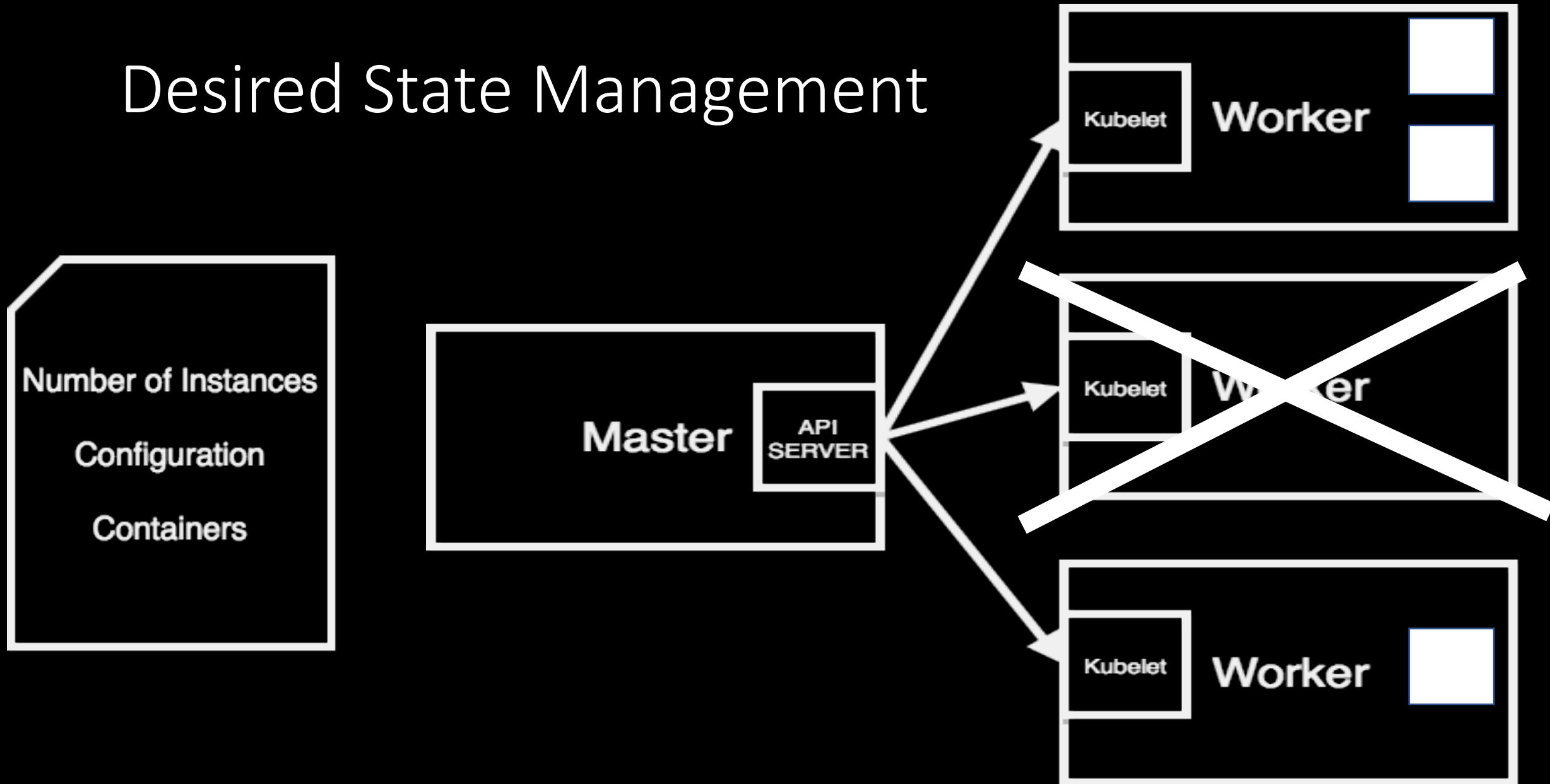
Desired State Management



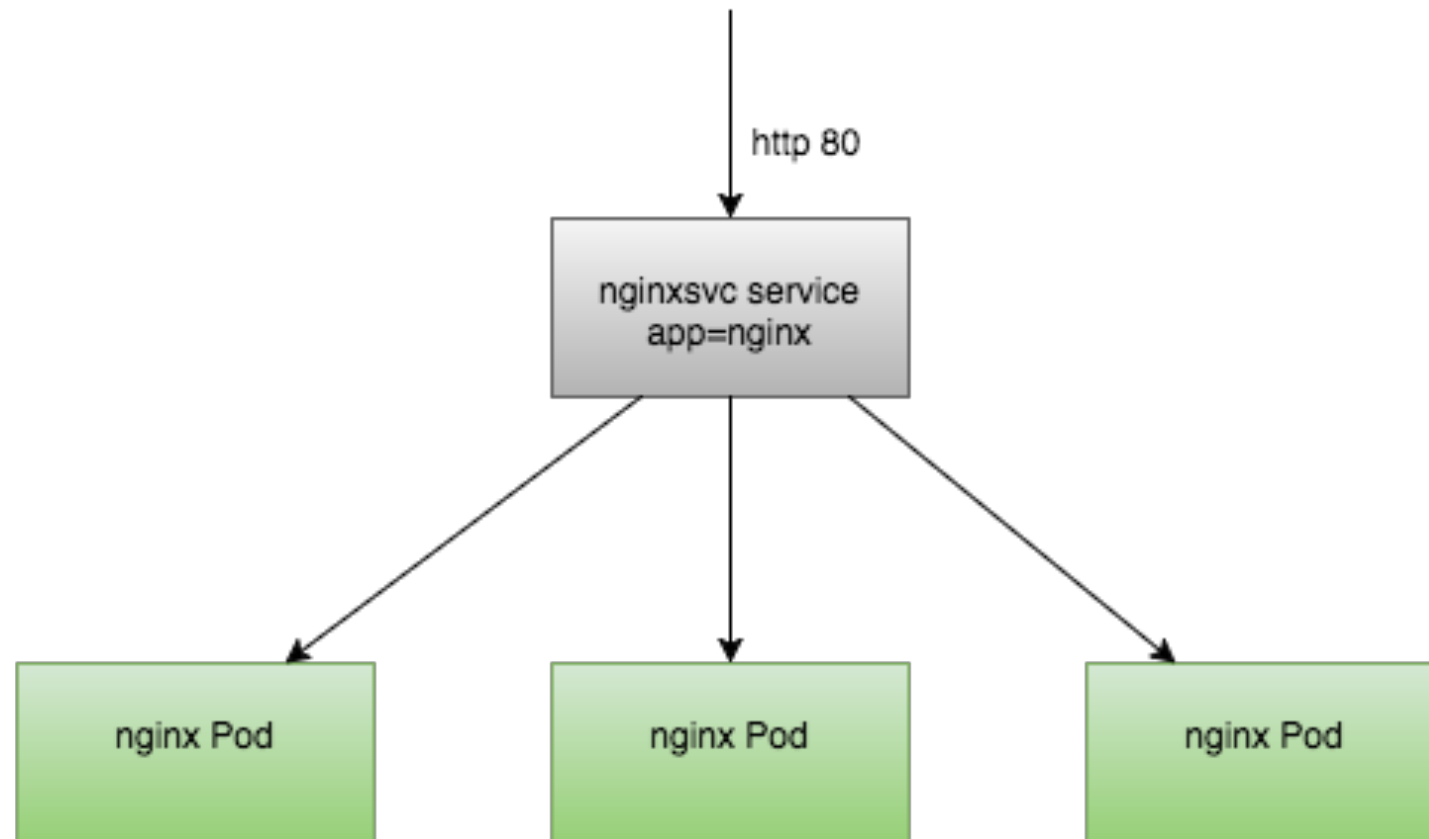
Desired State Management

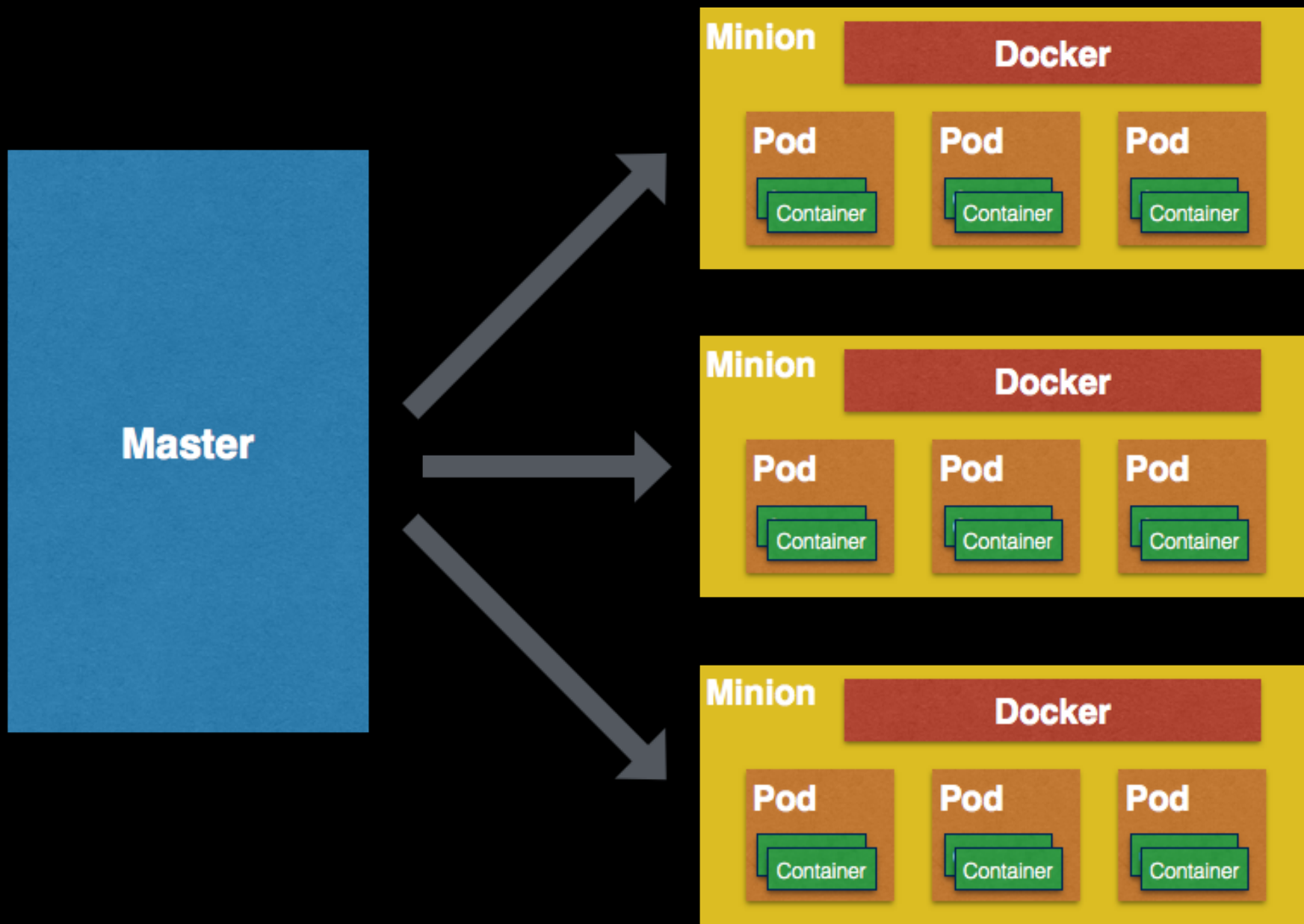


Desired State Management



Kubernetes Services





More Reasons to Love

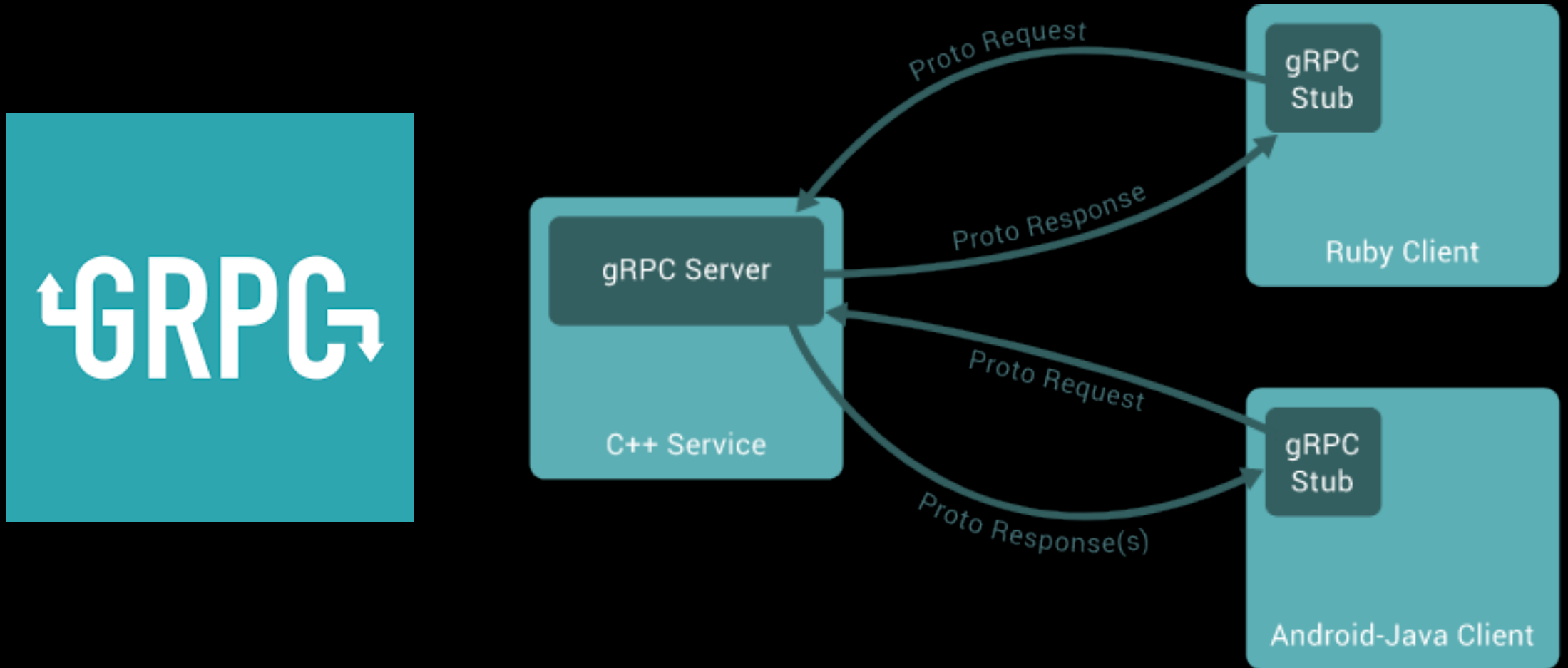
- Rolling Updates
- Care about the application not how its run
- Worry "less" about scaling
- Package manager (HELM)

DEMOS

- Kubernetes – Basic Operations

Microservice Communication

- Http works good for many tasks but we can do better.



Code: <https://github.com/samkreter/DSA-workshop>

Twitter: @samkreter

Github: samkreter

Hands On Lab: Time Series Analysis of Cryptocurrencies and Precious Metals

- Architecture Overview
- Technologies

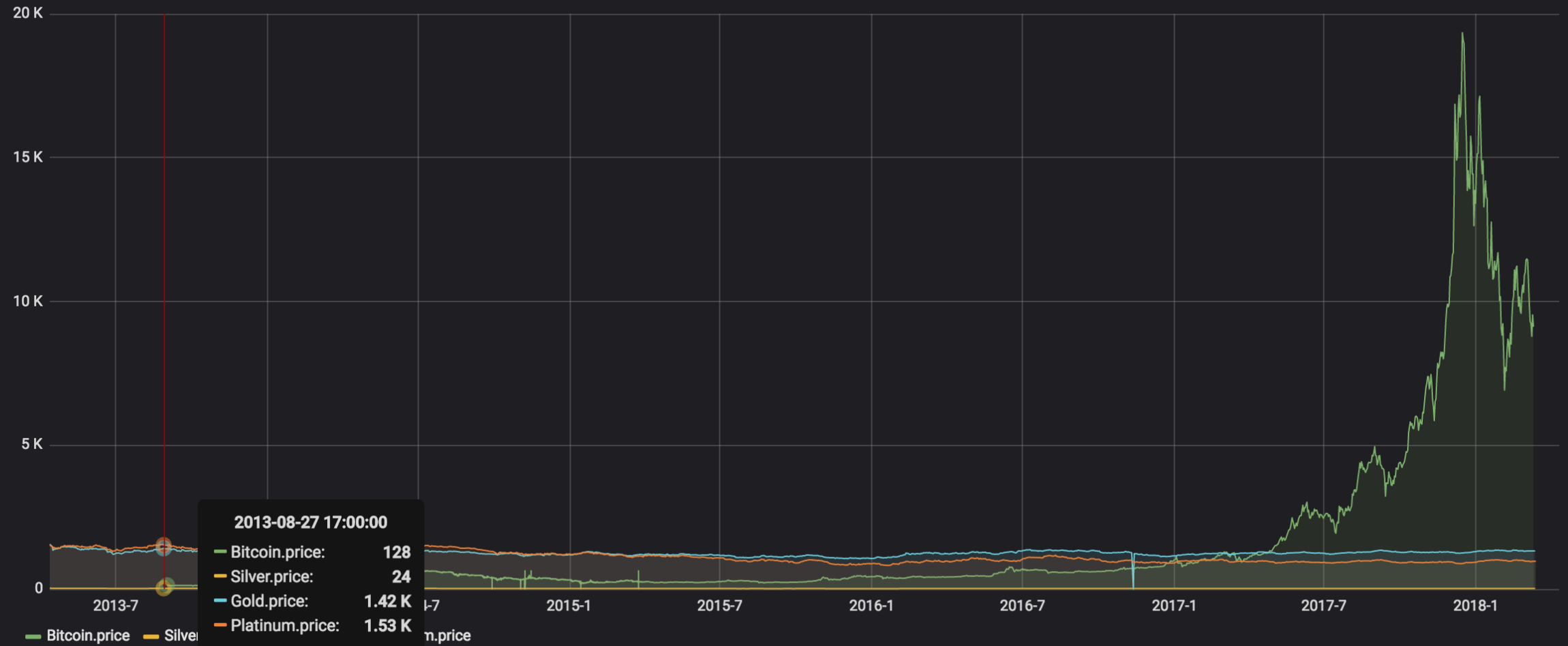


Bitcoin

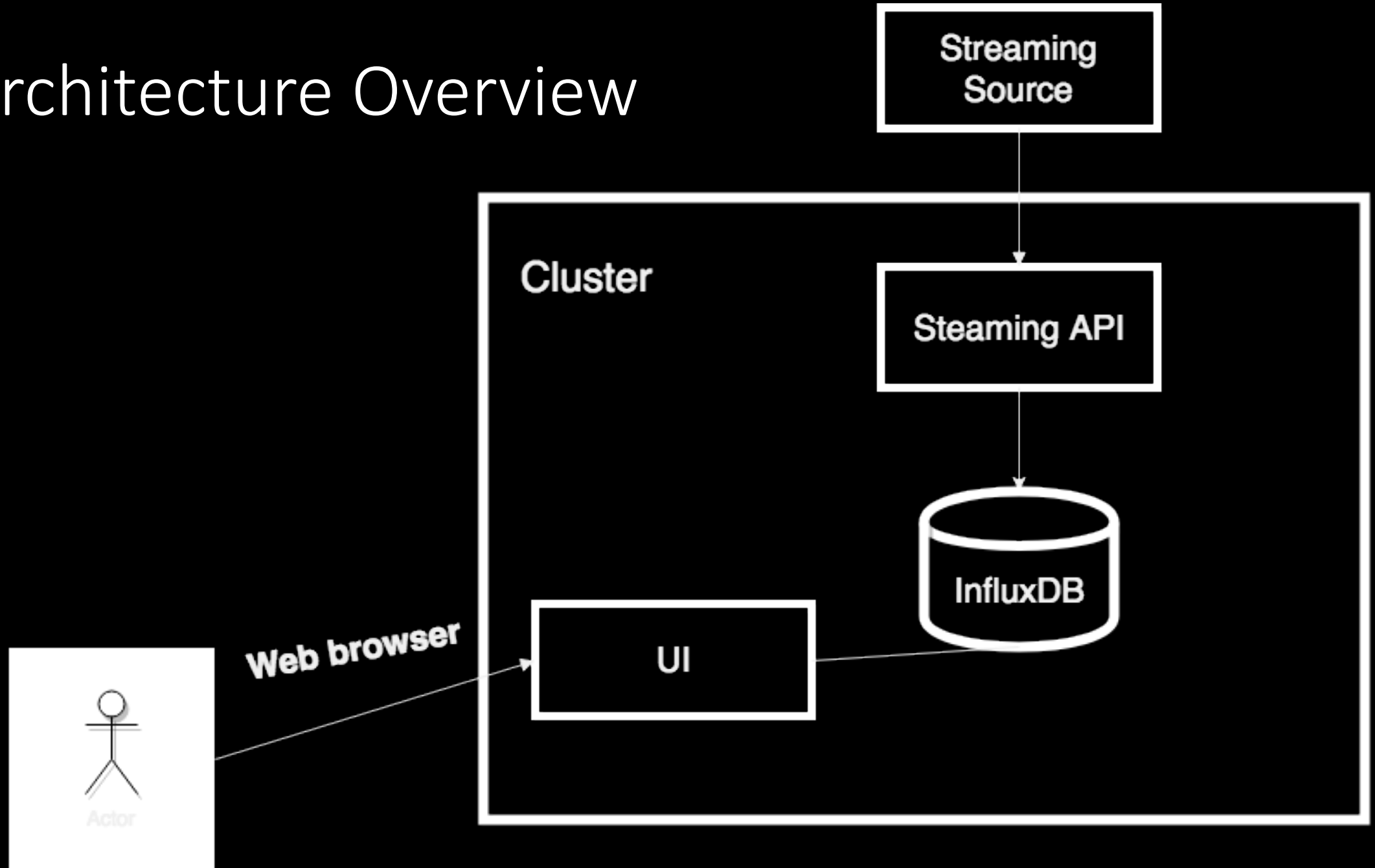
Last 5 years



Expensive Things ▾



Architecture Overview



Architecture Overview

