

Kubernetes with Red Hat OpenShift Workshop

IBM Developer

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Developer Advocates | IBM

@blumareks

<http://ibm.biz/webinar-20200122>

Agenda

Containers

Docker

Kubernetes

OKD

OpenShift & K8s

Workshop

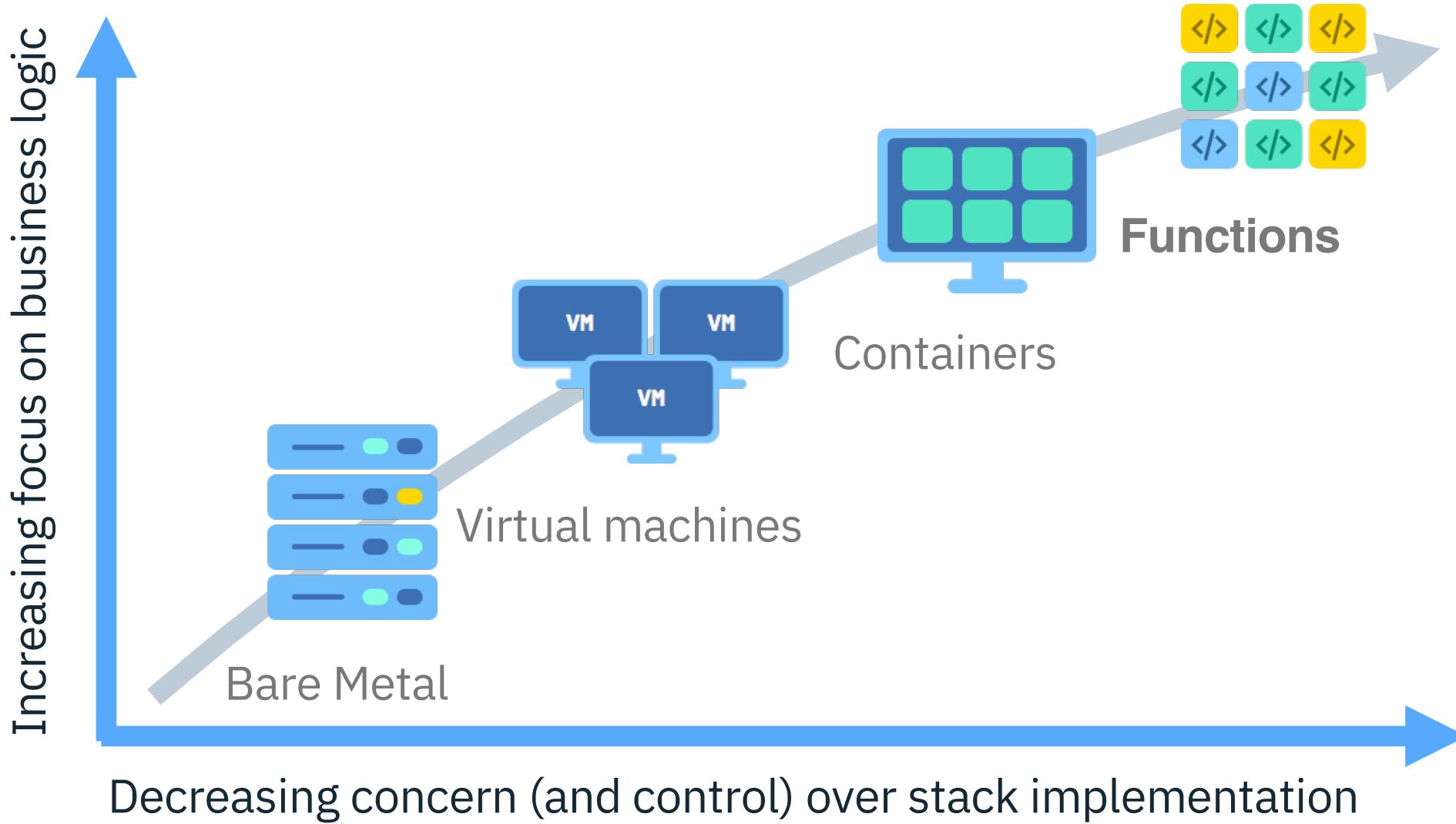
Wrap-up

Q&A

Cloud account -
<http://ibm.biz/webinar-20200122>

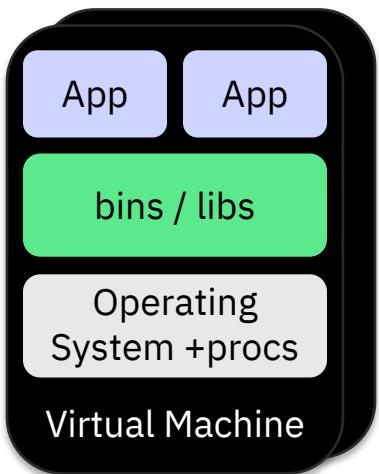
GITbook lab:
ibm.biz/2020-red-hat-worldtour

How we got here



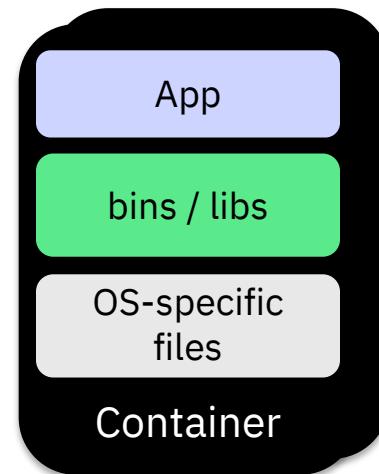
VM vs Container

Virtual Machine



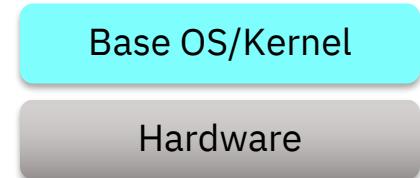
VS

Container



App, bins/libs/OS must all be runnable on the shared kernel

If OS files aren't needed they can be excluded.



Each VM has its own OS

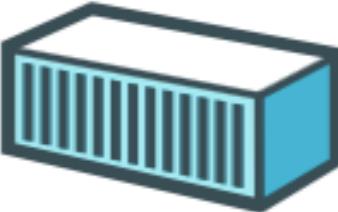
Containers share the same base Kernel

Docker Mission

Docker is an **open platform** for building distributed applications for **developers** and **system administrators**



Build



Ship



Run



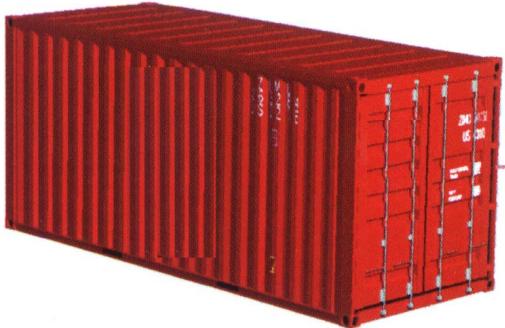
IBM Code



Any App

Anywhere

Dev vs. Ops



- | | |
|---|--|
| <ul style="list-style-type: none">• Code• Libraries• Configuration• Server runtime• OS | <ul style="list-style-type: none">• Logging• Remote access• Network configuration• Monitoring |
|---|--|

Separation of concerns

A container separates and bridges the Dev and Ops in DevOps

- Dev focuses on the application environment
- Ops focuses on the deployment environment

Docker Component Overview

Docker Engine

- Manages containers on a host
- Accepts requests from clients
 - REST API
- Maps container ports to host ports
 - E.g. 80 → 3582

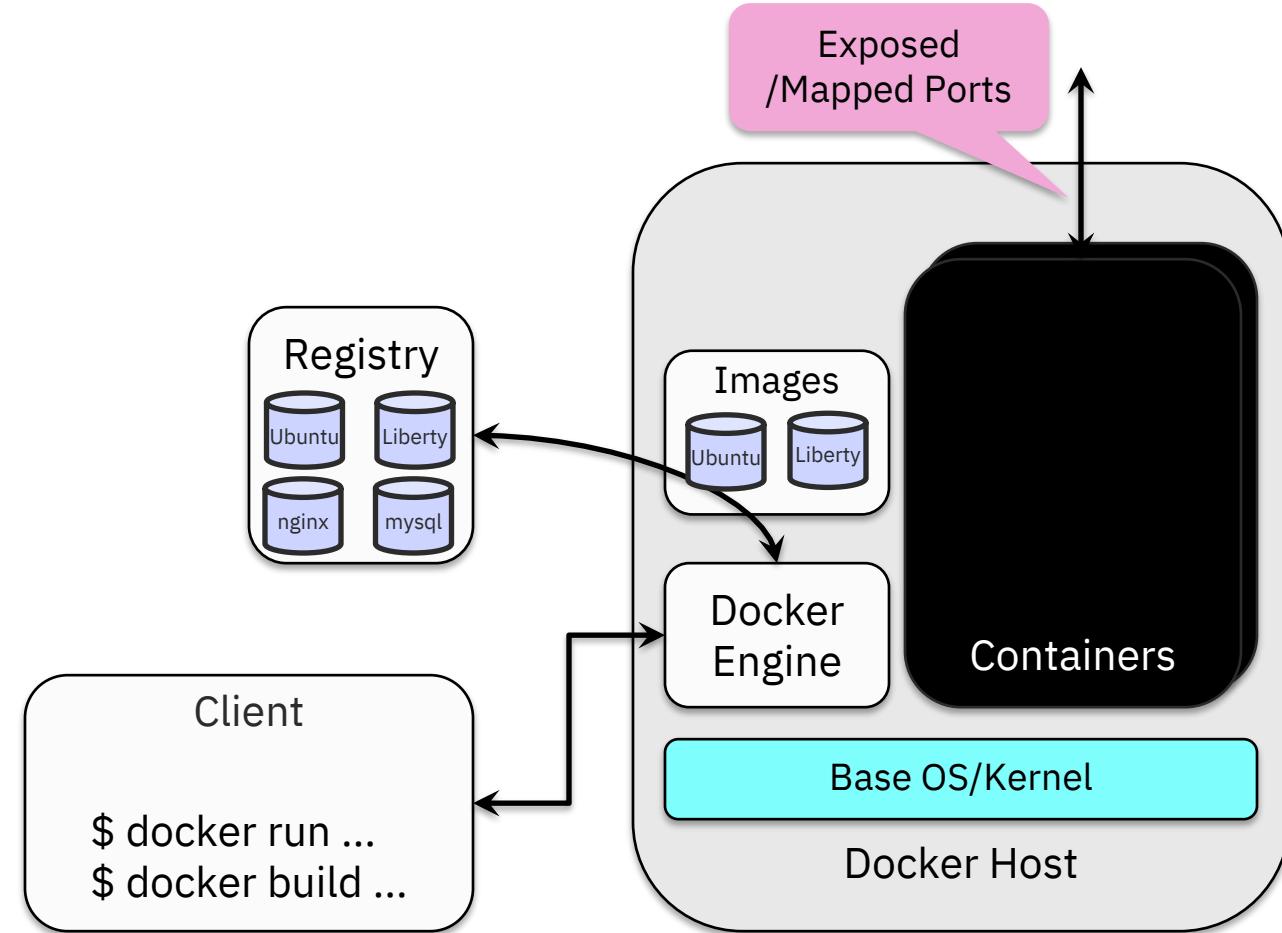
Images

Docker Client

- Drives engine
- Drives "builder" of Images

Docker Registry

- Image DB



labs

WATSON TRANSLATION SERVICE AND A DOCKER MICROSERVICE

Cloud account - <http://ibm.biz/webinar-20200122>

GITbook lab:

ibm.biz/2020-red-hat-worldtour

web shell:

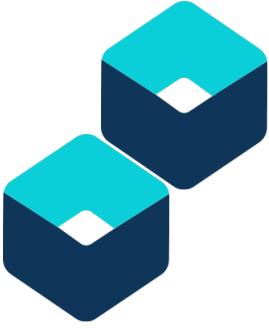
<https://workshop.shell.cloud.ibm.com/ikslab>

Containers



Everyone's container journey starts with one container....

Containers



At first the growth is easy to handle....

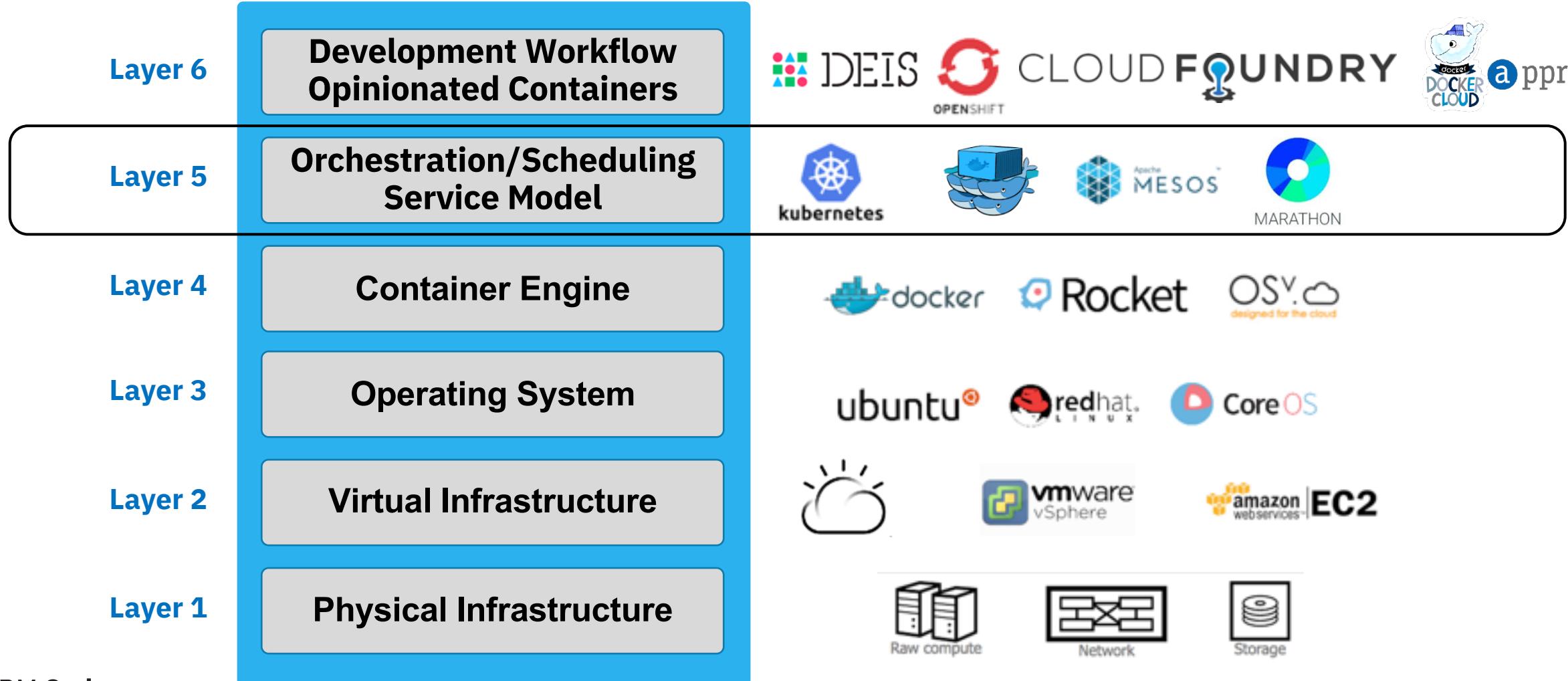


Containers



But soon it is overwhelming... chaos reigns

Container Ecosystem Layers



What is Kubernetes?

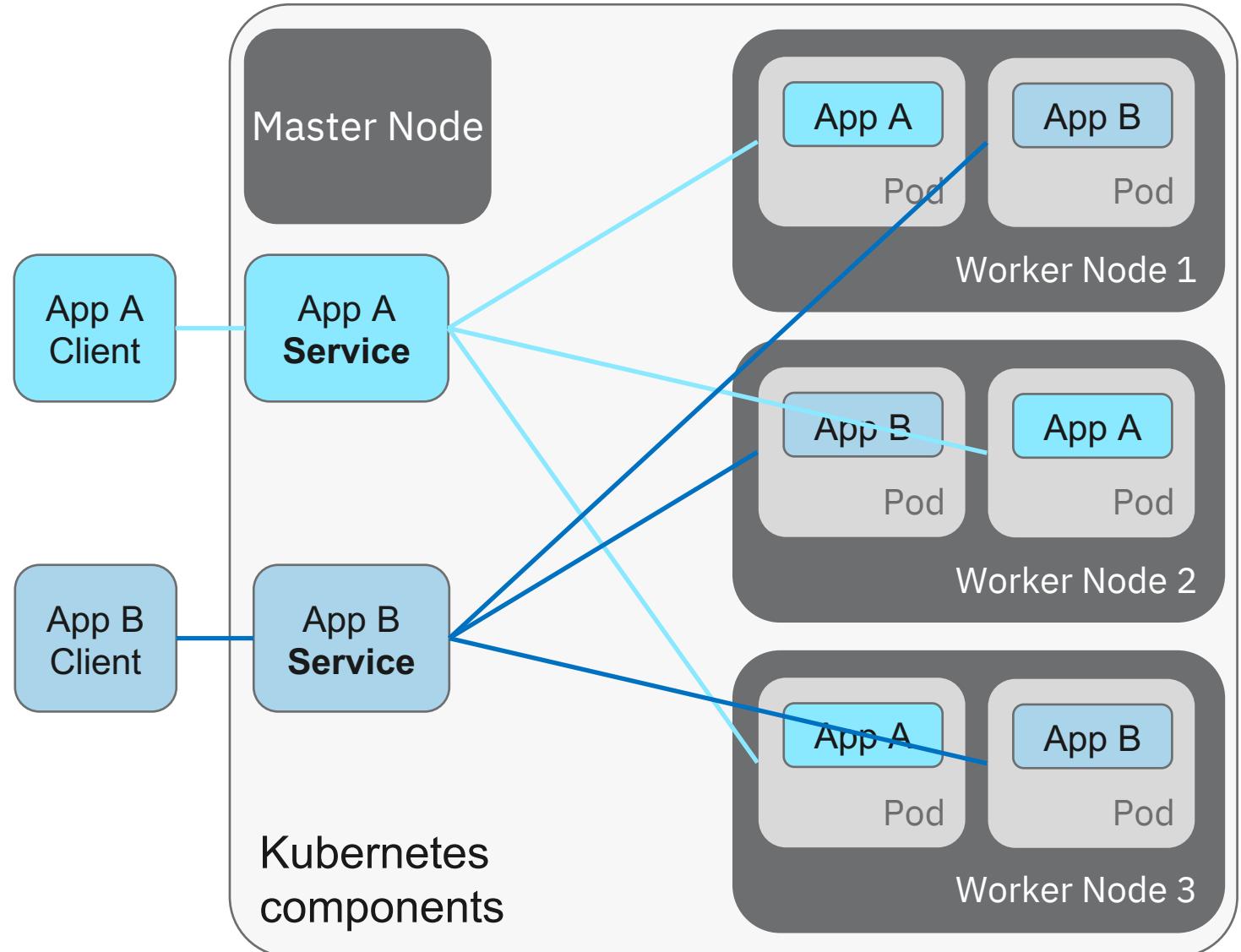


- Container orchestrator
- Manage applications, **not machines**
- Designed for extensibility
- Open source project managed by the Linux Foundation



Kubernetes Architecture: Workloads

- Container
 - Packaging of an app
- Pod
 - Unit of deployment
- Service
 - Fixed endpoint for 1+ pods



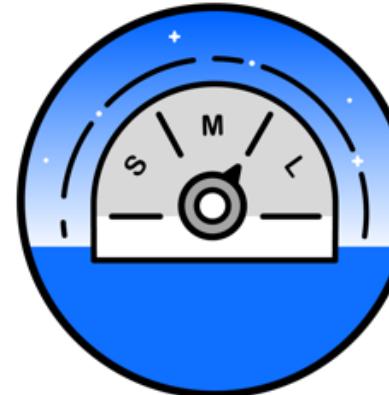
Kubernetes



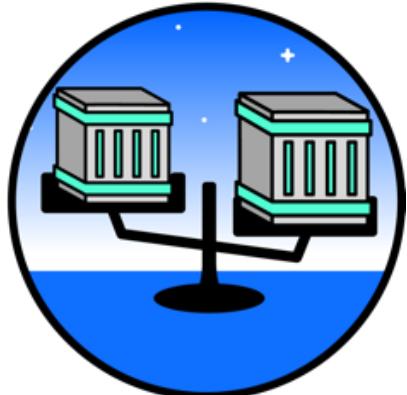
Intelligent Scheduling



Self-healing



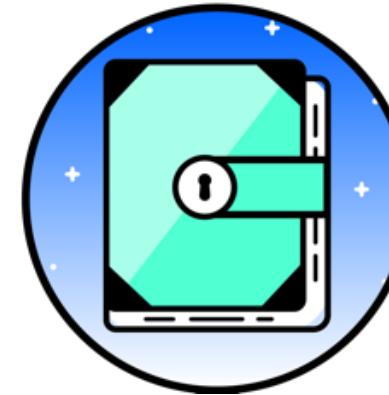
Horizontal scaling



Service discovery & load balancing



Automated rollouts and rollbacks



Secret and configuration management



Helm & Helm Chart

- Helm
 - Package manager for Kubernetes
 - Used to manage Kubernetes applications
- Helm Chart
 - Used to define, install, and upgrade complex Kubernetes applications
 - Easy to create, version, share and publish
 - Expressed in “Yet Another Markup Language” (YAML) files



OKD

ORIGIN COMMUNITY DISTRIBUTION OF KUBERNETES



The OKD logo is displayed prominently at the top left. Below it, the text "The Origin Community Distribution of Kubernetes that powers Red Hat OpenShift." is written in white. A large, semi-transparent blue hexagonal grid pattern serves as the background for the entire section.

Built around a core of OCI container packaging and Kubernetes container cluster management, OKD is also augmented by application lifecycle management functionality and DevOps tooling. OKD provides a complete open source container application platform.

Standardization through Containerization

Standards are powerful forces in the software industry. They can drive technology forward by bringing together the combined efforts of multiple developers, different communities, and even competing vendors.

The Kubernetes logo, featuring a stylized hexagon with a gear-like border and a central lightning bolt icon.

kubernetes
Open source container orchestration and cluster management at scale.
[Learn more](#)

The Docker logo, featuring a blue ship icon inside a white circle.

docker
Standardized Linux container packaging for applications and their dependencies.
[Learn more](#)

The Core OS logo, featuring a red play button icon inside a blue circle.

Core OS
A container-focused OS that's designed for painless management in large clusters.
[Learn more](#)

The Operator Framework logo, featuring a red lightning bolt icon inside a white circle.

OPERATOR FRAMEWORK
An open source project that provides developer and runtime Kubernetes tools, enabling you to accelerate the development of an Operator.
[Learn more](#)

The cri-o logo, featuring a blue snowflake-like icon inside a white circle.

cri-o
A lightweight container runtime for Kubernetes.
[Learn more](#)

The Prometheus logo, featuring a red flame icon inside a white circle.

Prometheus
Prometheus is a systems and service monitoring toolkit that collects metrics from configured targets at given intervals, evaluates rule expressions, displays the results, and can trigger alerts if some condition is observed to be true.
[Learn more](#)

Kubernetes & OpenShift

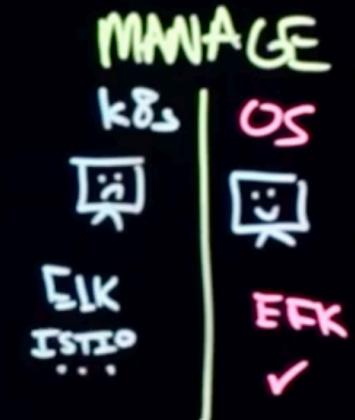
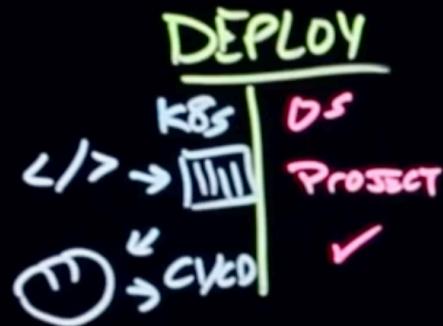


Kubernetes and OpenShift: What's the Difference?



Share

KUBERNETES & OPENSHIFT



MORE VIDEOS

labs

USE PRE-PROVISIONED KUBERNETES ON RED HAT OPENSHIFT CLUSTERS

Cloud account - <http://ibm.biz/webinar-20200122>

Link to clusters:
<https://howopenshift.mybluemix.net>

GITbook lab:

ibm.biz/2020-red-hat-worldtour

Lab key:

oslab

web shell:

<https://workshop.shell.cloud.ibm.com/>

ikslab

OpenShift Workshops

hands-on developer Experience with Open Source

101: Introduction to OpenShift

90 min hands-on workshop

In this hands-on workshop you learn how to install a local OpenShift environment on your machine using MiniShift, as well as how to deploy and manage your applications.

- Installing MiniShift
- Creating OpenShift projects
- Creating OpenShift Applications
- Managing OpenShift Applications

<https://github.com/IBMDveloperUK/minishift101>

201: Machine Learning with OpenShift

120 min hands-on workshop

Come and get started with machine learning through the “Hello World” app of ML. You’ll build, deploy and train your neural network, deployed to your local OpenShift environment.

- Recognizing Handwritten Digits with Keras + the MNIST Dataset
- Building the Neural Network
- Deploying the Neural Network
- Deploying the App to MiniShift
- Training the Network

<https://github.com/IBMDveloperUK/machine-learning-with-minishift>

301: Running Node-RED on OpenShift

90 min hands-on workshop

Connect hardware devices, APIs and online services in new and interesting ways. Roll up your sleeves and run Node-RED on the Kubernetes-based OpenShift environment on your own computer.

- Running Node-RED using IBM Cloud
- Running Node-RED using MiniShift
- Running Node-RED locally
- Troubleshooting

<https://github.com/IBMDveloperUK/node-red-workshop-starter>

Conclusions

- Red Hat OpenShift on IBM Cloud
- MiniShift workshop – get familiar with OpenShift today with the desktop version free of charge

Build Smart

↳



Part of **IBM Developer - 40 groups** [?](#)

IBM Developer SF Bay Area

📍 San Francisco, CA

👤 8,072 members · Public group [?](#)

👤 Organized by Angie K and 6 others

IBM Developer

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THU, JAN 23, 6:00 PM

Meetup: Data wrangling and exploration with Pandas

📍 Hacker Dojo

Prerequisites - Curious minds ! Bring your laptop, and the rest happens on the cloud! introductory session on exploring and analyzing data using Python, Pandas and Jupyter Notebooks. We will go over: - how to obtain/read a data file using python in Watson S



THU, JAN 30, 9:30 AM

Online Meetup: Deep Learning Master Class I - Introduction

📍 Needs a location

Please do not forget to register on Crowdcast and join us using Chrome browser via Crowdcast on the event date! RSVP on Crowdcast NOW: <https://www.crowdcast.io/e/deep-learning-master> This series takes engineers from zero to expert in machine learning in 5 sessions. The world...



74 attendees

Manage

81 attendees

Manage

Attend

IBM Partners

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and tech companies for growth

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Thank you

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