10 THINGS TO CONSIDER WHEN SELECTING A KUBERNETES PLATFORM

Josh Berkus - Community Lead, Kubernetes
Brian Gracely - Director, Product Strategy, OpenShift
Dan Juengst - Sr. Principal Technology Evangelist

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TODAY’S PRESENTERS

JOSH BERKUS
@fuzzychef

BRIAN GRACELY
@bgracely

DAN JUENGST
@DanJuengst
WHAT WILL BE DISCUSSED TODAY?

- FUNDAMENTAL CONCEPTS
- DIY vs. COMMERCIAL DISTROS
- CLOUD SPECIFIC vs CLOUD AGNOSTIC
- THE DEVOPS PERSPECTIVE
- KUBERNETES PLATFORM EVOLUTION
FUNDAMENTAL CONCEPTS
CONTAINERS ARE LINUX
THE LINUX OS MATTERS. CHOOSE WISELY.
CONTAINERS START WITH LINUX

Linux is foundational to containers

- Containers run on a Linux Container Host OS

Linux OS host spans every container
Containers depend on Linux features
➢ Linux (O/S User Space) is inside every container

Linux is foundational to containers

1. Linux OS host spans every container
2. Linux is in every single container
Apps in containers are running in Linux

Containers depend on Linux features

Linux is foundational to containers
CONTAINERS ARE THE FOUNDATION OF KUBERNETES
CONTAINERS START WITH LINUX

- **Apps** in containers are running in Linux
- **Containers** depend on Linux features
- **Linux** is foundational to containers
- **Kubernetes** uses Linux to manage resources

1. Linux OS host spans every container
2. Linux is in every single container
CONTAINERS START WITH LINUX

Apps in containers are running in Linux

Containers depend on Linux features

Linux is foundational to containers

Kubernetes uses Linux to manage resources

RHEL is the leading Linux for the enterprise

➢ Across all footprints from bare metal to cloud

EXPERTISE IN LINUX IS EXPERTISE IN CONTAINERS

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DIY vs. COMMERCIAL DISTRIBUTION
EVEN KUBERNETES GEEKS USE COMMERCIAL DISTRIBUTIONS
KUBERNETES THE APPLICATION
Q: WHAT IS KUBERNETES?

A: The Thing that Runs My Containers. On Some Servers. In the Cloud. Right?
KUBERNETES: WHAT'S IN THE BOX

- API server
- Controller
- Scheduler
- Kubelet
- Kubectl
KUBERNETES: WHAT'S IN THE BOX

- API server
- Default Controller
- Default Scheduler
- Kubelet
- Default Client (Kubectl)
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KUBERNETES: WHAT'S IN THE BOX

- API server
- Default Controller
- Default Scheduler
- Kubelet
- Default Client (Kubectl)
- CNI
- CSI
- Cloud Provider
- CRI
- Scheduler API
- Controller API
- Client API
- Workloads API
- etc
WE'VE SEEN THIS BEFORE
WE'VE SEEN THIS BEFORE

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KUBERNETES: A STACK DEFINITION, NOT AN APPLICATION
4 WHAT DIY USERS MUST OWN
INSTALLATION

Just use the official packages, right?
diagram from official Kubernetes documentation
INSTALLATION

● **Kubeadm**
  ○ Go, bare metal or bare vm
  ○ Also kubeadm-dind
  ○ Most "core"

● **Kubespray**
  ○ Ansible, all the clouds

● **Kops**
  ○ Go, AWS/GCE
Kubernetes The Hard Way

This tutorial walks you through setting up Kubernetes the hard way. This guide is not for people looking for a fully automated command to bring up a Kubernetes cluster. If that's you then check out Google Kubernetes Engine, or the Getting Started Guides.

Kubernetes The Hard Way is optimized for learning, which means taking the long route to ensure you understand each task required to bootstrap a Kubernetes cluster.

The results of this tutorial should not be viewed as production ready, and may receive limited support from the community, but don't let that stop you from learning!
UPGRADING/MAINTENANCE

The Good Part:

You get all the new stuff, right away.
UPGRADING/MAINTENANCE

The Good Part:

You get all the new stuff, right away.

The Bad Part:

You get all the new stuff, right away.
HIGH VELOCITY DEVELOPMENT

K8S Releases

1.10.x Patch Releases
- 3mo's
- ~9mo's

1.11.x Patch Releases
- 3mo's
- ~9mo's

1.12.x Patch Releases
- 3mo's

Feature
Definition
Feature Work
Bug Fixing

Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

K8S
Releases

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EFFECT ON OPS

New releases every 3 months
+ Patch support only for 9 months
+ No LTS releases, yet

= Get ready to upgrade twice a year

Also: Alpha/Beta features can break compatibility
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DO YOU WANT TO BUILD A CLOUD, OR DO YOU JUST WANT TO RUN ONE?
CLOUD SPECIFIC vs. CLOUD AGNOSTIC
ARE ALL CLOUDS THE SAME?
PLATFORM CONSISTENCY?

CONSISTENT PLATFORM
- SAME DEV EXPERIENCE
- SAME OPS EXPERIENCE
- INSTALL BUILT-IN
- TRUSTED RHEL OS
- REGISTRY BUILT-IN
- LOGGING BUILT-IN
- MONITORING BUILT-IN
- UPGRADES BUILT-IN
- CONSISTENT SUPPORT

INCONSISTENT PLATFORM
- DIY DEV EXPERIENCE
- DIFFERENT OPS MODELS
- DIFFERENT INSTALLS
- UNTRUSTED LINUX OS
- DIY ADD-ON SERVICES
- WHO SUPPORTS IT?
PLATFORMS ARE MORE THAN KUBERNETES
KUBERNETES vs. KUBERNETES PLATFORMS

KUBELET

KUBELET

KUBERNETES API

DEPLOYMENT STRATEGIES

ORCHESTRATION

CLUSTER SERVICES

(CLIS) STORAGE INTERFACE

(CNI) NETWORK INTERFACE

KUBELET HOST

KUBELET HOST

CLUSTER SERVICES

APPLICATION SERVICES

DEVELOPER SERVICES

AUTOMATED OPERATIONS

KUBERNETES

Red Hat Enterprise Linux or RHEL CoreOS

METRICS, CHARGEBACK, REGISTRY, LOGGING

MIDDLEWARE, SERVICE MESH, FUNCTIONS, ISV

DEV TOOLS, AUTOMATED BUILDS, CI/CD, IDE

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THE DEVOPS PERSPECTIVE
WHO HAS A KUBERNETES PROBLEM?
MANY GROUPS INVOLVED IN THE APPLICATION PLATFORM

CONTAINER PLATFORM
“Run and manage containers better”

CLOUD-NATIVE APPS
“Build new apps quickly”

HYBRID CLOUD
“Build and run your infrastructure efficiently”

BUSINESS INNOVATION
“Transform the way you run your business”

KUBERNETES OPPORTUNITY
DEVELOPER TOOLING IS CRITICAL TO THE PLATFORM
GETTING YOUR DEVELOPERS ONTO KUBERNETES
THE PLAN

1. Install Kubernetes
2. Containerize Apps
3. ?????
4. PROFIT!!!
MOTIVATING DEVELOPERS

1. Developers care about their time
2. Deploying to Kubernetes needs to be faster/easier
   a. Or at least time neutral
3. Developer tool integration is critical to your success
YOU NEED TO MAKE IT EASIER TO DEPLOY TO KUBERNETES THAN TO DEPLOY ANYWHERE ELSE
Don't ask your developers to do packaging.
DEVELOPER TOOL REQUIREMENTS

● Familiar
● Easy to Use
● Integrates into Workflows
● Supports Teamwork
USE FAMILIAR TOOLS
CONTINUOUS DELIVERY PIPELINE

1. **Git Server**
2. **Artifact Repository**
3. **Release Manager**
4. **OpenShift CI/CD Pipeline (Jenkins)**
   - Image Build & Deploy
   - Promote to Test
   - Promote to UAT
   - Promote to Prod

- **OpenShift Image Registry**
- **OpenShift Cluster**
  - Non-Prod
  - Dev
  - Test
  - UAT
  - Prod
MAKE DEVELOPER BUY-IN A KEY PART OF YOUR KUBERNETES DEPLOYMENT PLAN
THE KUBERNETES PLATFORM EVOLUTION
KUBERNETES HAS EVOLVED QUITE A BIT IN 5 YEARS
MOVING INTO THE THIRD ERA OF KUBERNETES

1st generation
2015-2016

2nd generation
2016-2017

3rd generation
2018-2020

FROM GOOGLE TO OSS TO ENTERPRISE

NEW APPS OLD APPS MORE CLOUDS

AUTOMATED OPS | APPS HYBRID CLOUD
KUBERNETES IS A JUST A PIECE OF THE “PLATFORM”
OPERATORS - SIMPLIFY COMPLEXITY

- Containerized
- Cloud storage ready
- Replicated
- Backup
- Automated updates

AWS RDS

- Containerized
- Container storage ready
- Replicated
- Backup
- Automated updates
- Enhanced observability
- Customization
- Local development
- Fully Open Source
- Any Kubernetes
- Certified on OpenShift
<table>
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A MODERN KUBERNETES PLATFORM

**OpenShift 4**

- [OpenShift Serverless](#)
- [OpenShift Service Mesh](#)

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WRAP UP
THE 4 C’s OF KUBERNETES PLATFORMS
Comprehensive Cloud Customers Code

Strong partnerships with cloud providers, ISVs, CCSPs.

Extensive container catalog and OperatorHub of certified partner images and operators.

Our comprehensive portfolio of container products and services includes developer tools, security, application services, storage, & management.

Why is Red Hat the Best Choice?

The Four Cs

Code

Kubernetes commits

Customers

Over 1000 Kubernetes customers. Most reference customers running in production.

We have years of experience running OpenShift Online & OpenShift Dedicated services.

Cloud

Strong partnerships with cloud providers, ISVs, CCSPs.

Extensive container catalog and OperatorHub of certified partner images and operators.

Comprehensive

Our comprehensive portfolio of container products and services includes developer tools, security, application services, storage, & management.

Red Hat are the leading Enterprise, Multi-Cloud Kubernetes developers.

We make container development easy, reliable, & more secure.
THANK YOU

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twitter.com/RedHat