Promoting Kubernetes CI/CD to the next level

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Agenda

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  • How did we get here
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  • Culture
Introduction

Who am I?

Tim Pouyer
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DevOps & SRE Leader
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• Lead Architect of CI/CD squad
• SRE squad lead
• 14 years experience with CI/CD & DevOps
• World Traveler >60 countries visited
• Boy Scout (Eagle Scout)
Introduction

What is IBM Cloud Private?

- IBM’s on-prem Kubernetes distribution
- Intended to be utilized as a private cloud
- Enterprise security and governance capabilities
- 600 customers in 2 years
- Quarterly releases
- 200+ integrated open source packages/tools
- >180 developers located in 4 countries
Introduction

How did we get here?

Grew from a few dozen devs incorporating tens of Docker images to a few hundred devs incorporating hundreds of Docker images.

Added support for 2 additional platforms (ppc64le & s390x) in addition to x86

>600 customers in 2 years
DevOps

For “shrink-wrapped” software?
Too many topics to cover
This presentation will focus on 3 major areas

1 - Automation
2 - “Shift-Left”
3 - Culture
Focus Areas

**Automation:** guiding principles

- Push button
- Full-stack
- Easily shared

- Easy to use
- Familiar tooling
- Work across all archs
Focus Areas

**Automation:** cross squad, cross org shared assets

Built on the build-harness project from Cloud Posse

https://github.com/cloudposse/build-harness

Forked for internal use and customization, working to Open Source our fork soon

Shared Makefile targets stored in github and easily included into your custom Makefile

```sh
-include $(shell curl -so .build-harness -H "Authorization: token $(GITHUB_TOKEN)" -H "Accept: application/vnd.github.v3.raw"
```

Utilize Terraform to provision infrastructure across supported cloud providers

- All terraforms exposed via build-harness
- Common set of targets for linting, building, deploying, testing, etc...

- Makefile.azure
- Makefile.fyre
- Makefile.icp_aws
- Makefile.nutanix
- Makefile.openshift_aws
Focus Areas

**Automation:** supported archs, cloud providers, topologies

Automated deployment for each cloud provider

- Use specific docker image for requested arch
- Use override files and resource types in terraform to support different deployment topologies

- HA
- multi-az
- ceph-rook
- non-HA
- glusterfs
- mixed arch (x86 w/ ppc64le)
Focus Areas

**Automation**: package assembly, version coordination

*Use Artifactory*

*Use Helm Charts*

- ![Artifactory Logo](image)
- ![Helm Logo](image)
Focus Areas

“Shift-Left”

The earlier we can perform these tasks the easier to fix identified issues

canary deploys
integration tests
functional tests
vulnerability scans
docker image security scans
Focus Areas

“Shift-Left”: promotion stages

Don’t run a service?

Use Artifactory docker & helm repos as Stages

scratch -> integration -> daily -> edge -> stable -> release
Focus Areas

“Shift-Left”: quality gates

set criteria for each “stage”

*enforce criteria, no exceptions!*

no pass... no proceed
Focus Areas

“Shift-Left”: shortening feedback loop

good idea

get builds in front of consumers sooner in dev cycle

great idea

act on that feedback immediately

JFrog Artifactory

slack
Focus Areas

Culture

were not talking about differences in nationalities

developers don’t like to give up control
developers don’t like to change their process
managers want to ship product
nobody wants a release date to slip
**Focus Areas**

**Culture:** dev controlled builds -> ci/cd controlled builds
- dev builds can work in small teams
- unmanageable in large teams
- squads own their build processes
- ci/cd owns the combined process

ci/cd conducts the train, all components are passengers
- get on board the release train or get off
Focus Areas

Culture: understand the process

spend time to educate

explain the “why” not just the “how”

make sure everyone understands... not just the devs
Focus Areas

Culture: trust in the process

It will be tough. It will challenge you.

Be strong in your resolve.

Know that the ends will justify the means.
Credits

Couldn’t have done it without these people

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