

ALL DAY DEVOPS

NOVEMBER 6, 2019

Christian Melendez | Equinix

**Development  
Workflow in  
Kubernetes**



# This talk is NOT about

- Introduction to Kubernetes
- Developing in/for Kubernetes (kind of)
- Custom Resource Definitions (CRDs) or similars
- End-to-end application lifecycle
- One size fits all



# A few things I'll cover

- Traditional Workflow
- Development Tools
- Show, Don't Tell!
- Database Changes

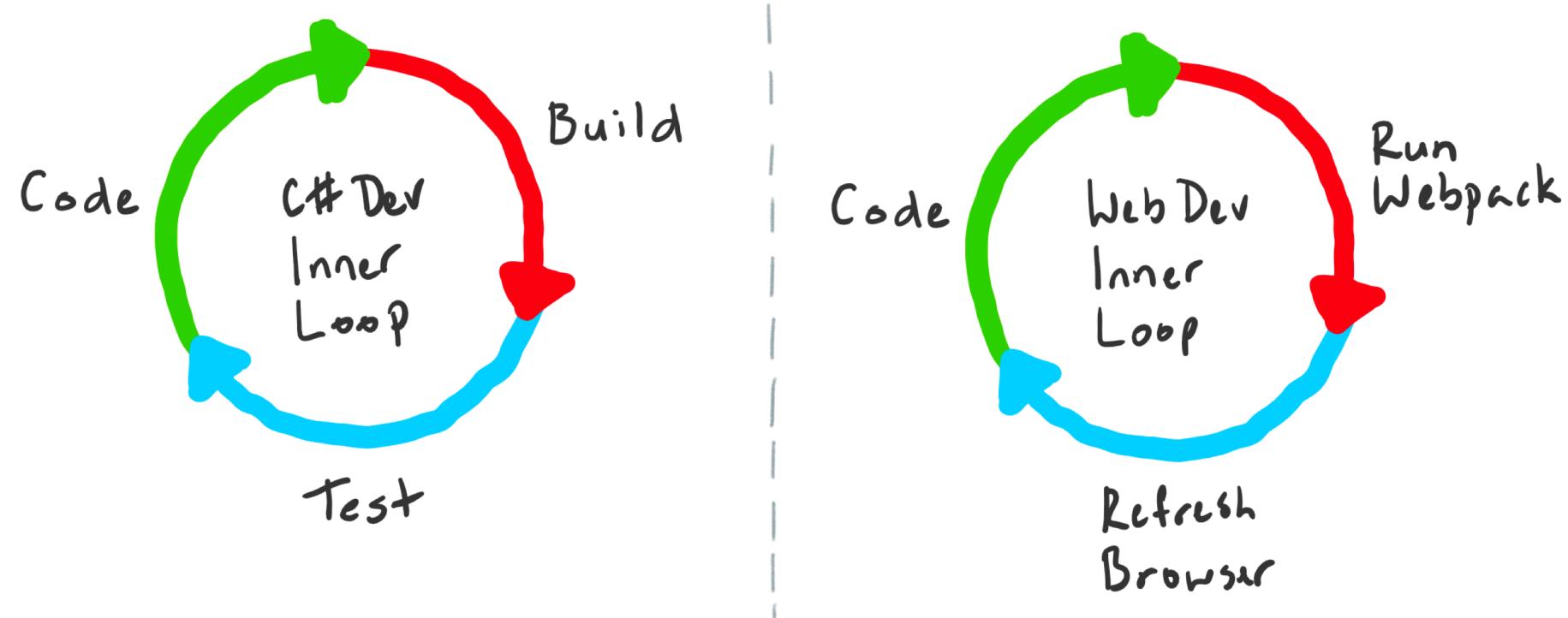
It's hard to include more topics or go deeper in just a few minutes



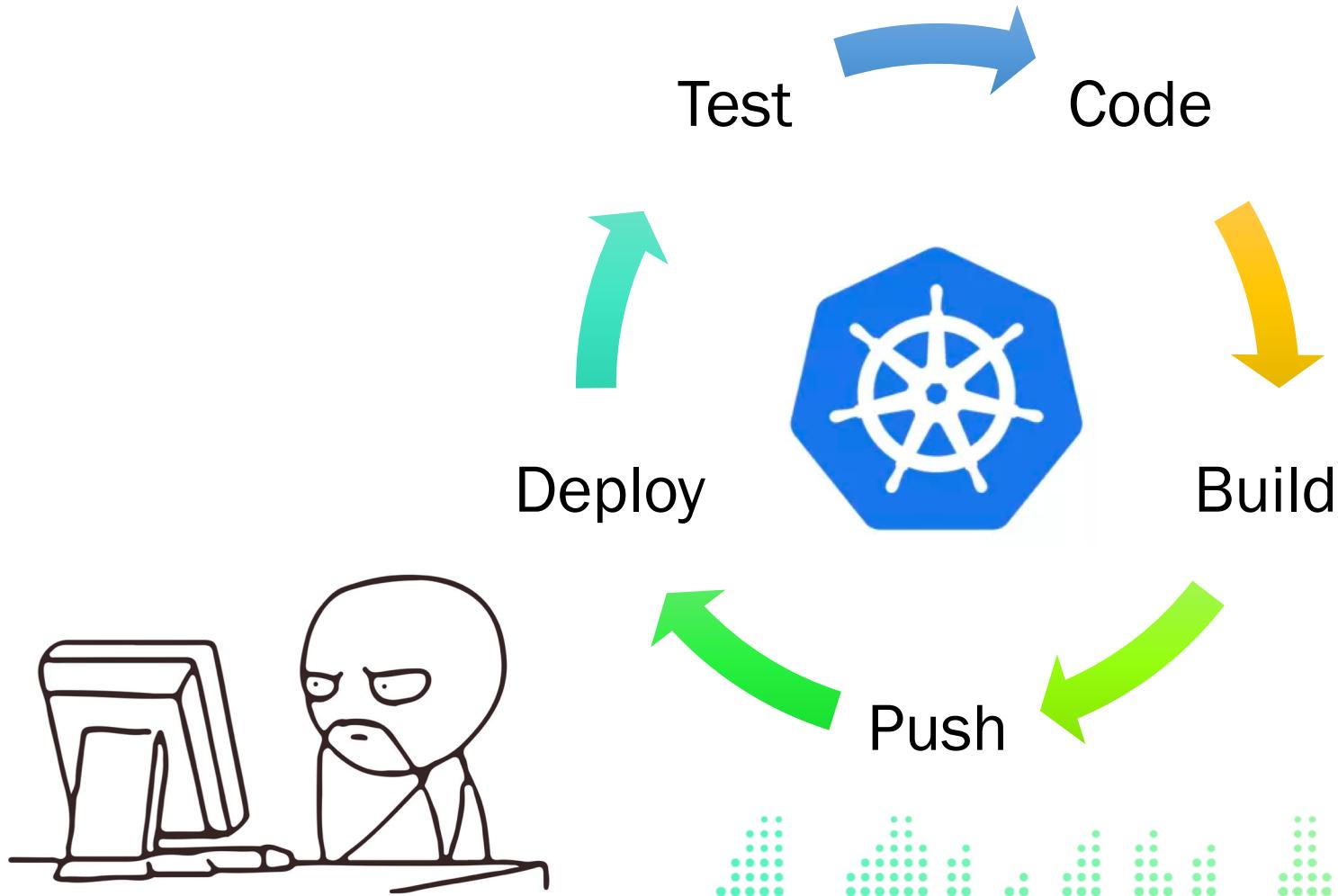
- Traditional Workflow
  - Development Tools
  - Show, Don't Tell!
  - Database Changes



# Developer Inner Loop



# Kubernetes Loop



# Introducing ...

A bunch of new other tools! 😔



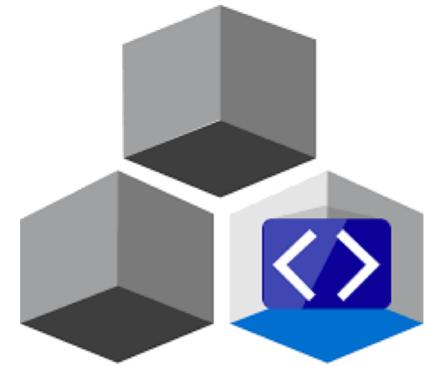
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# Development Tools



S K A F F O L D



Azure  
Dev Spaces



And many more ... Oh my!



CNCF Sandbox Project

LF Project

Open Source Software

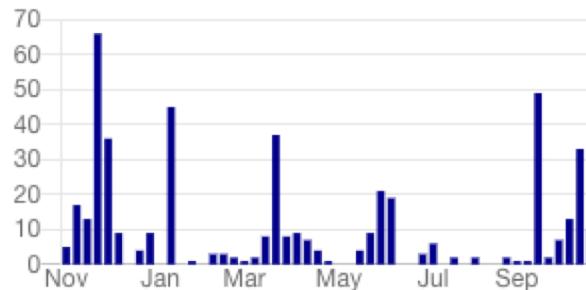
License Apache License 2.0

CII Best Practices passing

Tweet

867

- Python 95%
- Shell 3%
- Makefile 1%
- Dockerfile 1%
- Go <1%
- Ruby <1%



# Telepresence

[Cloud Native Computing Foundation \(CNCF\)](#)

App Definition and Development · Application Definition &amp; Image Build

Local development against a remote Kubernetes or OpenShift cluster

Website	<a href="http://telepresence.io">telepresence.io</a>		
Repository	<a href="https://github.com/telepresenceio/telepresence">github.com/telepresenceio/telepresence</a>		
	  2,320		
Crunchbase	<a href="https://crunchbase.com/organization/cloud-native-computing-foundation">crunchbase.com/organization/cloud-native-computing-foundation</a>		
LinkedIn	<a href="https://linkedin.com/company/cloud-native-computing-foundation">linkedin.com/company/cloud-native-computing-foundation</a>		
Twitter	<a href="https://twitter.com/telepresenceio">@telepresenceio</a>	Latest Tweet	<a href="#">last week</a>
First Commit	<a href="#">3 years ago</a>	Latest Commit	<a href="#">this week</a>
Contributors	40	Headcount	11-50
Headquarters	San Francisco, California		



# What's Telepresence?

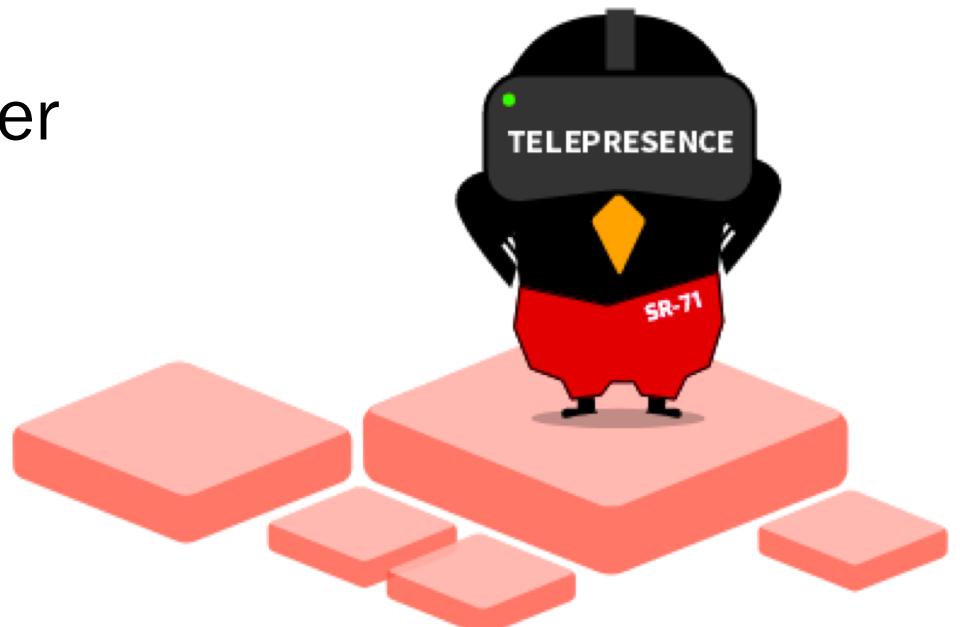
Run a single service locally

Faster development inner loop

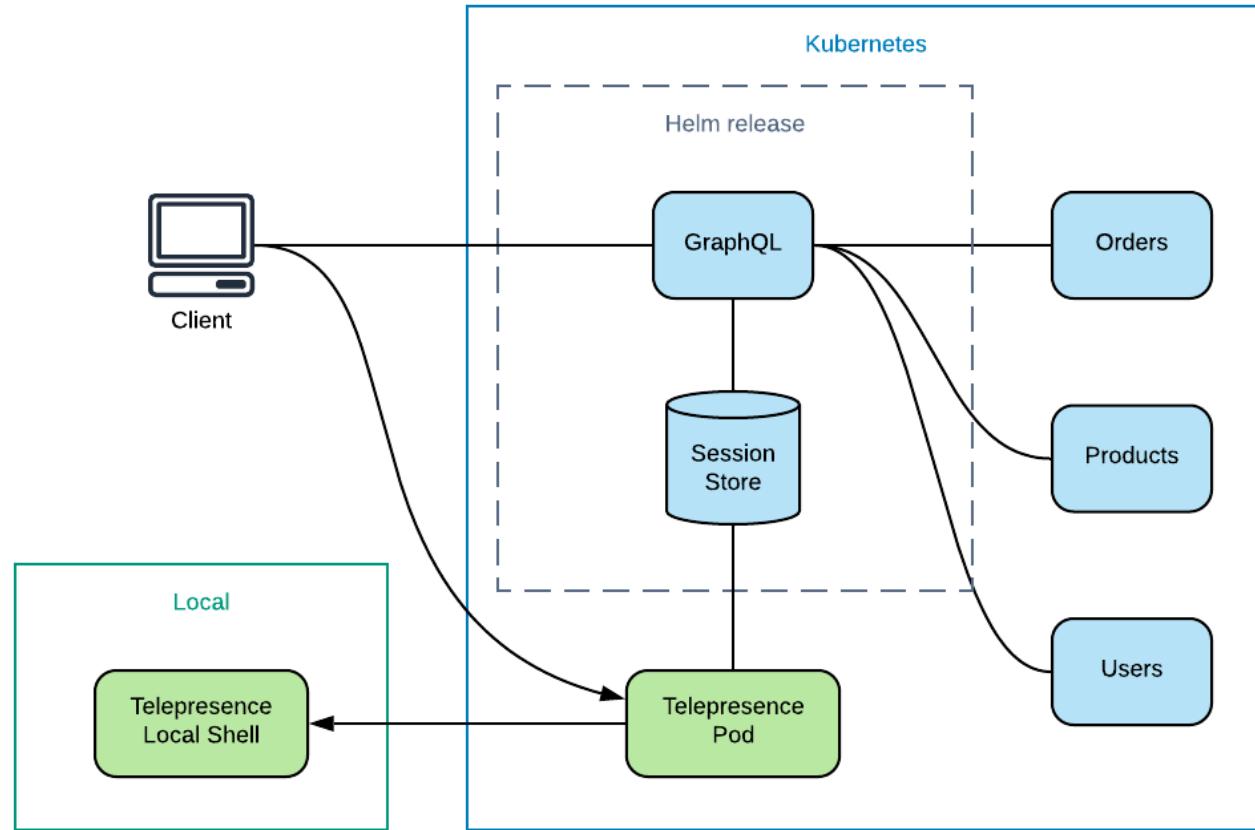
Use existing tools for debugging

Your local machine is part of the cluster

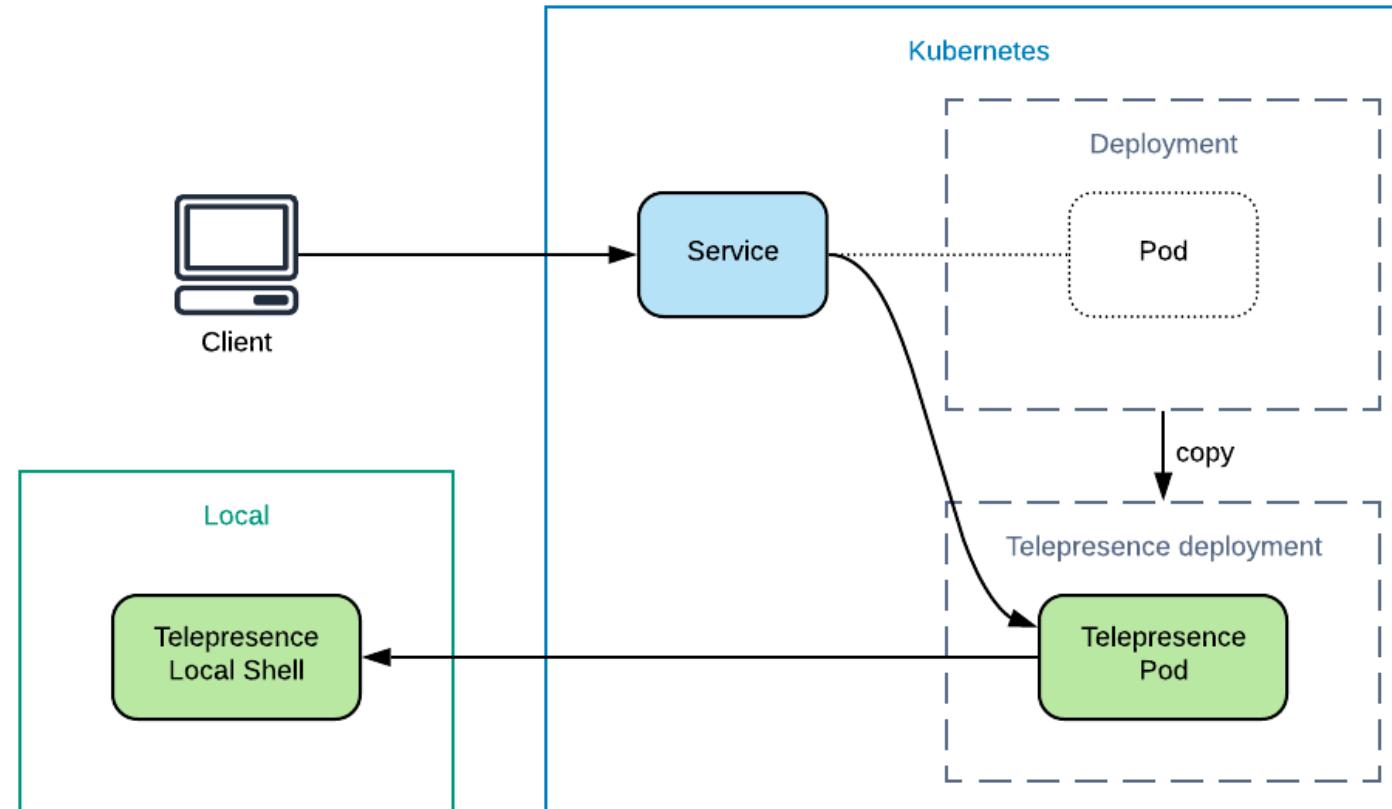
Bidirectional network proxy



# How it Works?



# Under the hood ...



- Traditional Workflow
- Development Tools
- **Show, Don't Tell!**
- Database Changes



# A Faster Developer Inner Loop

Work with existing microservices

Swap processes with Telepresence

Do some stuff, change code, have fun!

Test using my local process

Stop Telepresence

*“A little less conversation,  
a little more action please”*



- Traditional Workflow
- Development Tools
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- Database Changes



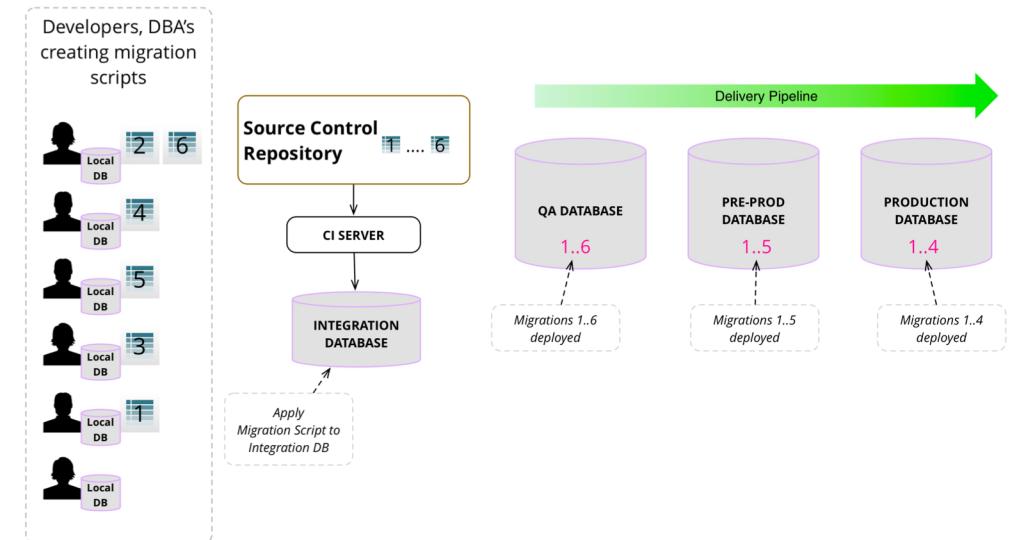
# Evolutionary Database Design

Database artifacts in version control

Version the database schema

Every change is a migration

Apply missing updates



# Kubernetes Considerations

Change `maxUnavailable` to 0

Consider using `initContainers`

Add a smart `readinessProbe`

Add a `livenessProbe` for storage corruption

Always support backwards compatibility

Deployment strategies like B/G or Canary



# Migration Libraries

Flyway for Java / Scala

Flask-Migrate for Python

Migrate for Go

Entity Framework for .NET

...

# Helm for Database Migrations?

Manage new version releases with **Helm**  
**Helm hooks** to control the deployment order  
pre-install or pre-upgrade  
You'd be using **Kubernetes Jobs**  
If migration fails, the **deployment quits**  
Use **kube-state-metrics** to monitor failed jobs



# Takeaways

- ✓ Improve the pre-commit stage
- ✓ Choose a development tool like Telepresence
- ✓ Define a zero-downtime deployment strategy
- ✓ Develop backwards compatible applications
- ✓ The devil is in the details (Kubernetes)



# ADDO<sup>™</sup>

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## Thank You!

 @Christiahxc

Blog: [cmelendeztech.com](http://cmelendeztech.com)

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