

Knative- Bringing Serverless to a Cluster Near You

—
Doug Davis
STSM

dug@us.ibm.com
@duginabox

Code  think



Agenda

A bit of history...

then some **Knative**...

a demo!

Warning: This talk may require salt



In the beginning there was Docker, and it was good...

```
$ docker run ubuntu echo Hello World  
Hello World
```

- Containers
- Build / Images
- DockerHub



Then we started to mature, doing real work...

- Networks
- Volumes
- Services
- Swarm / SwarmKit



Adulting

Kubernetes!

Enterprise grade environment for deploying containerized applications. Enhancing developer productivity, resource efficiency, automated operations, and open source flexibility to accelerate your time to market.

C-Suite Definition



The Claim: Kubernetes is for Developers

Deploy and manage your containerized applications



Reality: What really is Kubernetes?

A RESTful DB with a set of watchers that react to changes in the DB

Containers	Ingress / LBs
Pods	yaml
Replica Sets	Spec vs Status
Deployments	helm
Services	kubectl
Endpoints	Istio
Secrets	...
Networks	
Volumes/PV/PVC	

Blue/green deployments



Back to first principles

What was Kubernetes supposed to be?

- A platform to build platforms

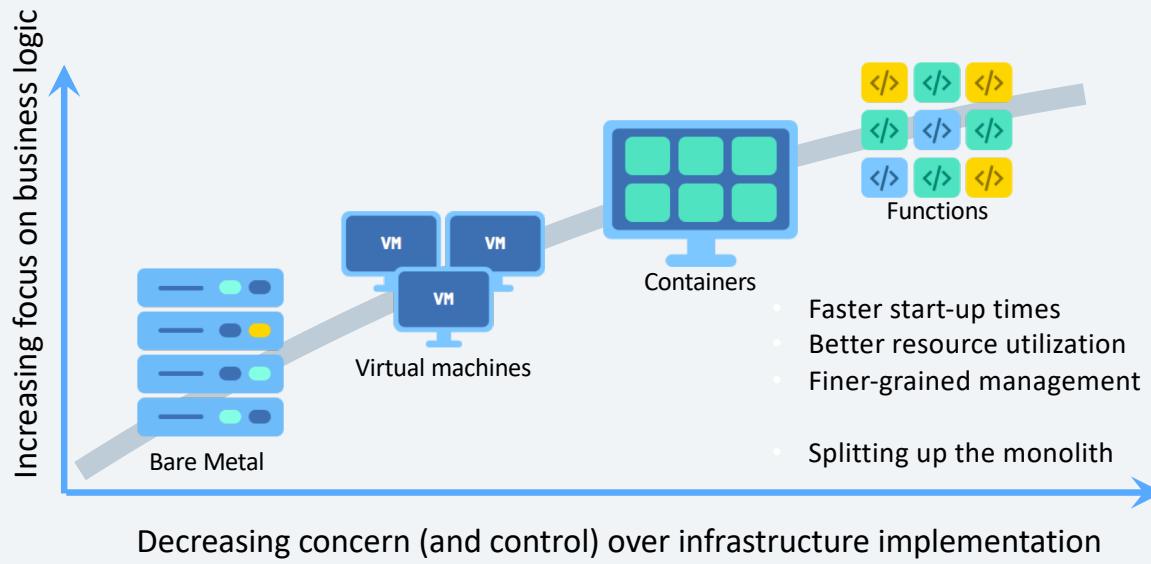
Reality: It **is** the platform

- Force developers to manage infrastructure
- With flexibility came complexity

I just want to run my app!



Enter stage left... Serverless



Properties of Serverless

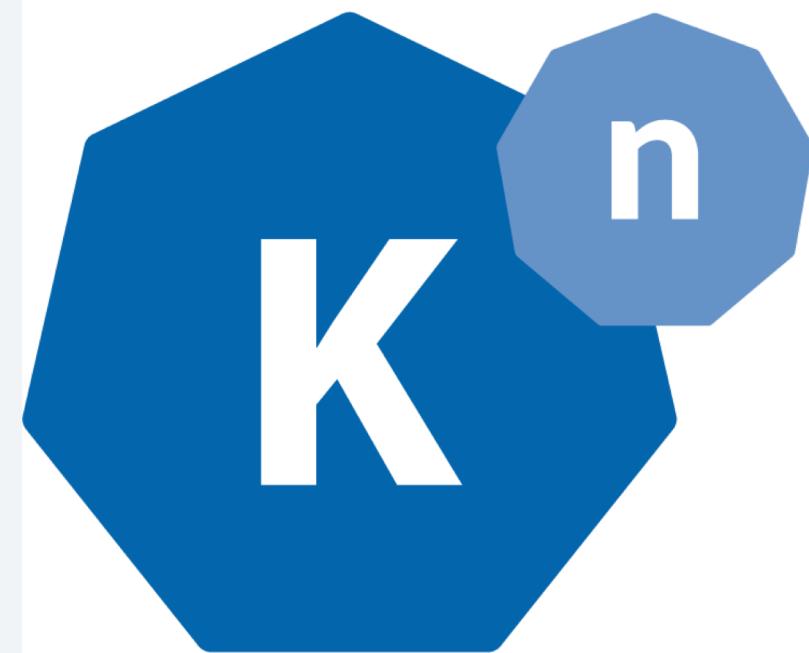
- Stateless
- Event Driven
- Auto-scaled / Scale-to-zero
- Short Lived
- **Reduced Cost**
- **Faster Time to Market**



Introducing Knative

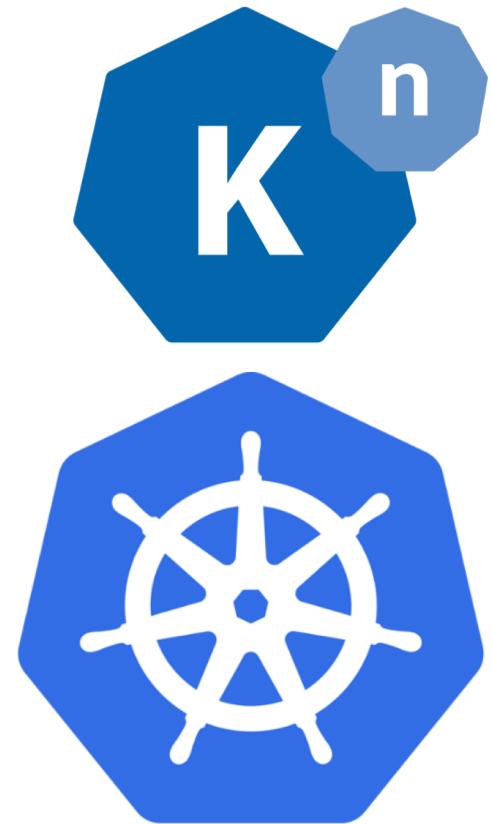
"Knative extends Kubernetes to provide a set of middleware components that are essential to build modern, source-centric, and container-based applications that can run anywhere: on premises, in the cloud, or even in a third-party data center." - Kn docs

Huh ?



What it really means...

- New Kubernetes extension resources (CRDs)
- An opinionated and simplified view of application management
- Heavily influenced by Serverless
- Allowing developers to focus on coding



Technical Specs

3 Main Components

- **Build** container images from source
- **Serving** is the runtime component
- **Eventing** for loosely coupled services



Knative Build

Build container images from source

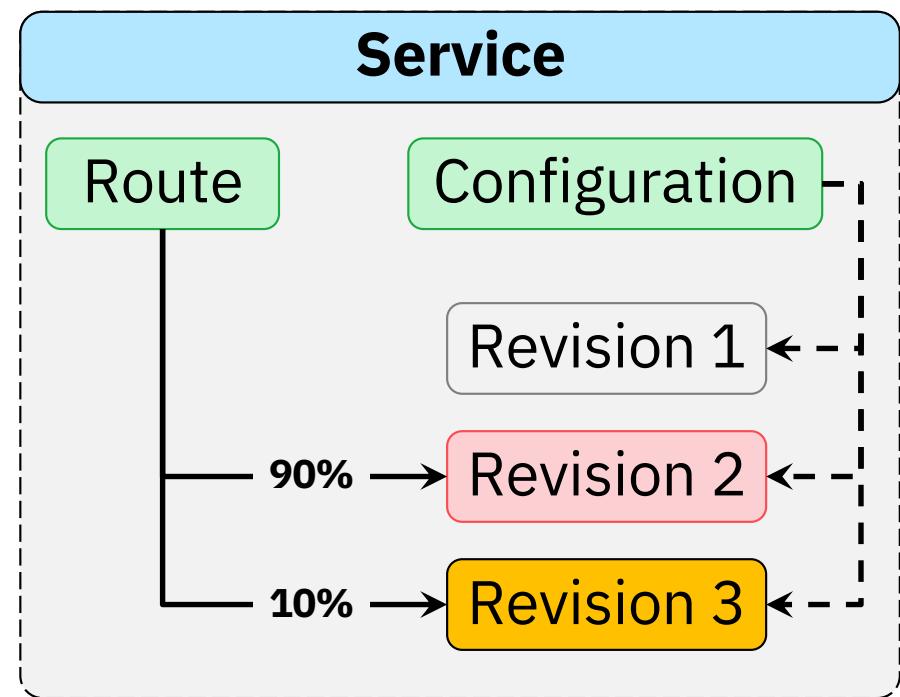
- Built from your source control system
- Customizable **BuildTemplates** define the build steps/process
- Results are stored in a container registry



Knative Serving

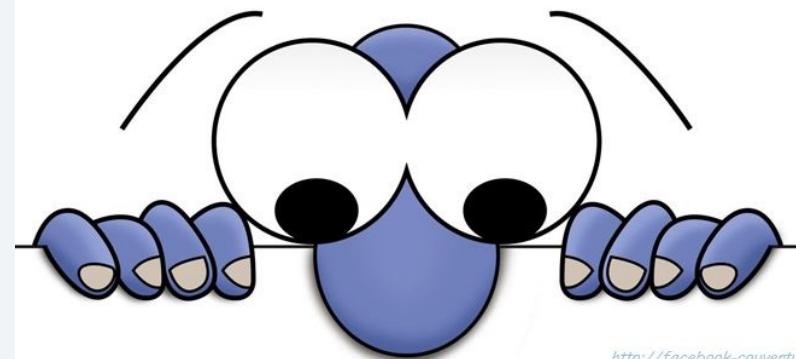
Manages the hosting aspects of your app

- **Service** - manages the lifecycle of app
- **Configuration** - manage history of app
- **Revision** - A snapshot of your app
 - Config and image
- **Route** - Endpoint and network traffic management



Knative Serving - What it really means...

- Encapsulate "build" steps into Service definition
- Rolling-upgrades- eg. A/B traffic splitting
- Better resource utilization
 - Scale to zero capabilities
 - Auto-scaling on demand
- Manages the core K8s resources for you
- Runtime building blocks on which Cloud Providers can build a Serverless platform



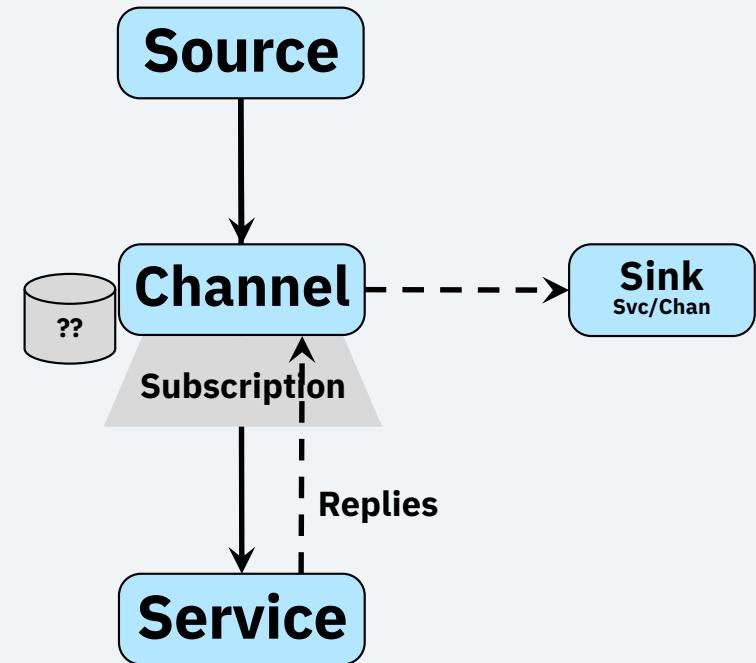
<http://facebook-couvertu>

Knative Eventing

Eventing Primitives

- **Event Source** - connect to event producer
 - Can create the subscription for you
- **Channels** - a receiver of events
 - E.g. a queue
- **Subscription** - ask for events from a Channel

Manage to coordination/delivery of events to sinks

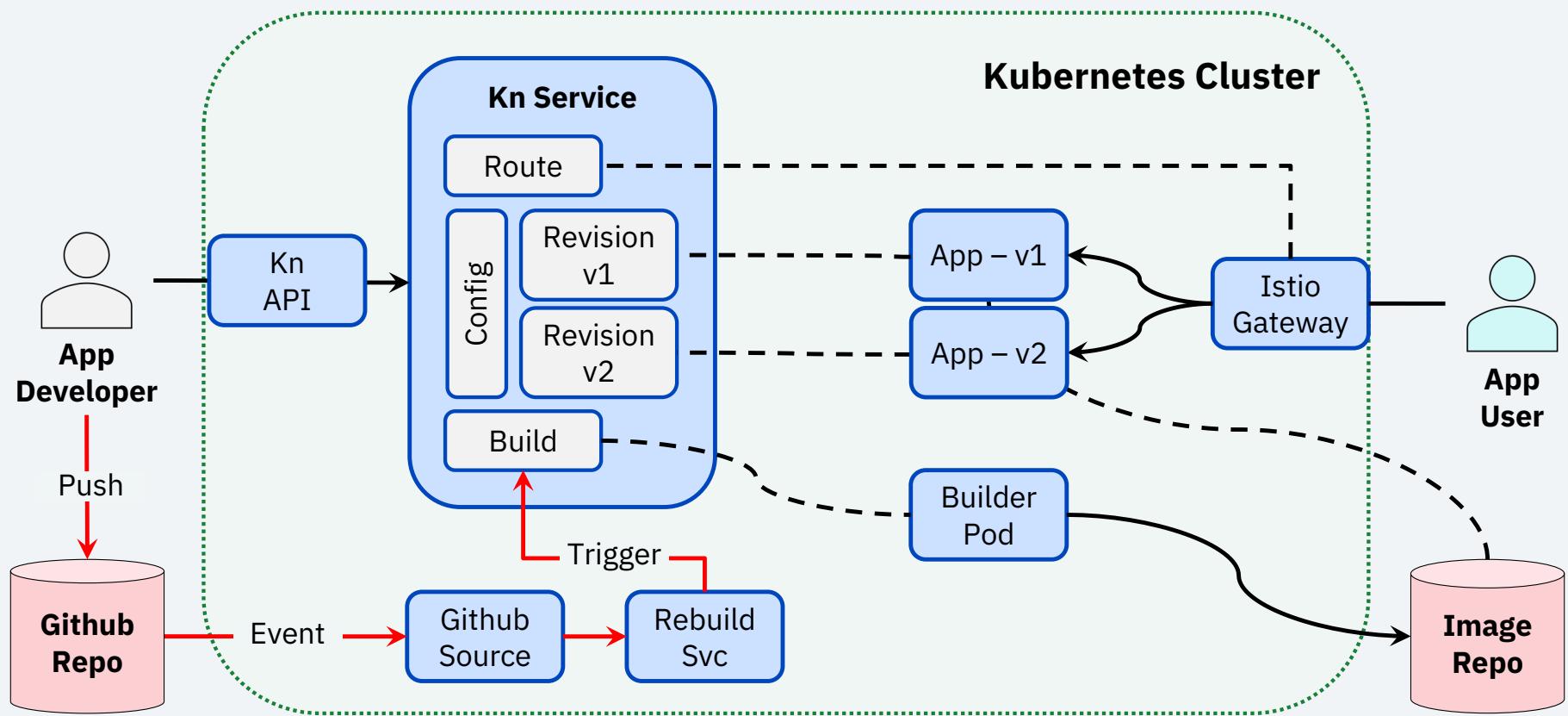


Demo time

corbis.



Knative Demo



Demo Summary

What we did:

- Deployed app w/o build
- Deployed app w/ build
- Rolling upgrade

All via the Knative Service resource

- Integrated Github webhook

<https://github.com/duglin/helloworld>

What we didn't do:

- Create Deployment / ReplicaSet
- Create a K8s Service
- Create an Endpoint / Ingress
- Set up a dynamic Load-Balancer
- Set up an auto-scaler
- Talk to Github directly to create web hook
- ...

Knative: A Rose By Any Other Name...

What is Knative?

- Serverless Framework?
- PaaS?
- New "Deployment" w/ magic pixie dust?
- A new Kubernetes user experience?

Does it matter? Does it meet your needs?

Letting developers be developers again

YOU DECIDE!



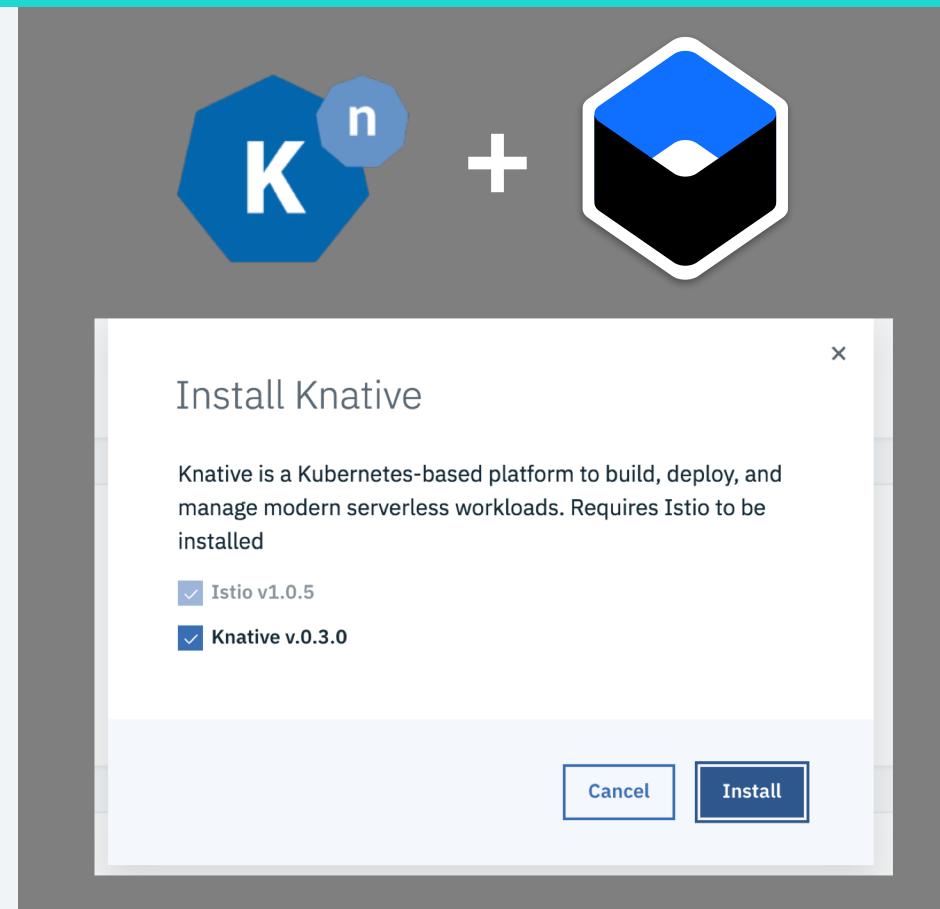
Knative - Technical Notes

- Not full Pod support
- Leverages Istio for networking / traffic
- No official CLI yet
 - Several are in the works
- Service vs Configs/Revisions/Routes



Announcing Managed Knative on IKS - Experimental

- Managed Knative (0.3.0) add-on for IBM Cloud Kubernetes Service
- One click install of Knative into your cluster
 - Includes Istio 1.0.5
- Updates to Knative are managed



Thank You!

Knative: <https://github.com/knative/docs/>

IKS: <https://ibm.com/iks>

Demo: <https://github.com/duglin/helloworld>

