



# Knative *Serverless on k8s*

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# Microservices developer: Virtual plumber ... ?



Source:

<http://peterskastner.wordpress.com/2011/02/23/cisco-the-lion-king-fights-for-data-center-fabric-leadership/>

# Can you implement Serverless without functions ?



# What is serverless again... ?

*“Serverless computing refers to the concept of building and running applications that **do not require server management**. It describes a finer-grained deployment model where applications, ~~bundled as one or more functions~~, are uploaded to a platform **and then executed, scaled, and billed** in response to the exact demand needed at the moment”*

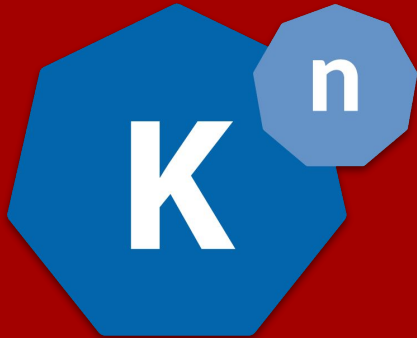
Source: <https://www.cncf.io/blog/2018/02/14/cncf-takes-first-step-towards-serverless-computing/>

Wait... - wat ? :-)



<https://me.me/embed/1/d0b715592ba34b08b79452a002783caz>

# WHAT IS Knative ?



# Knative Overview - Components

*"...an extension to Kubernetes exposing building blocks to build modern, source-centric, and container-based applications that can run anywhere".*

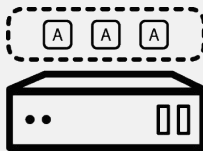
## Build

A pluggable model for building artifacts, like jar files, zips or containers from source code.



## Serving

An event-driven model that serves the container with your application and can "scale to zero".



## Eventing

Common infrastructure for consuming and producing events that will stimulate applications.



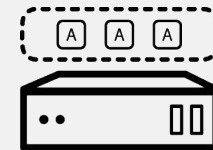
# Knative Overview - Builds



- A **Build** is a list of containers run in-order, with source mounted in (**TaskRun**)
- **BuildTemplates** provide reusable, parameterized recipes that can be used to create Builds (**Task**)
- **Pipelines** - The future!
  - **Group of Tasks**
- [Build Example](#)
- "Source to URL"
- S2I for OpenShift users

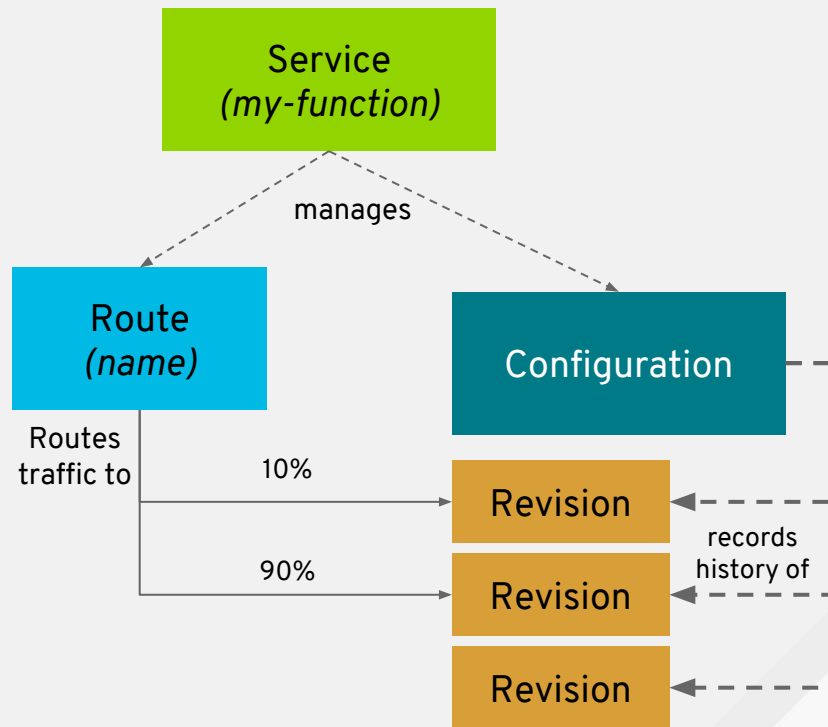
```
apiVersion: build.knative.dev/v1alpha1
kind: Build
metadata:
  name: example-build
spec:
  serviceAccountName: build-auth-example
  source:
    git:
      url: https://github.com/example/build-example.git
      revision: master
  steps:
  - name: centos-example
    image: centos
    args: ["centos-build-example", "SECRETS-example.md"]
  steps:
  - image: quay.io/example-builders/build-example
    args: ['echo', 'hello-example', 'build']
```





# Knative Overview - Serving

- **Configurations** represent the ‘floating HEAD’ of a history of **Revisions**
- **Revisions** represent immutable snapshot of code and configuration
- **Routes** configure ingress over a collection of Revisions and/or Configurations
- **Services** (nope, not K8s services) are top-level controllers that manage a set of Routes and Configurations to implement a network service



# Knative Overview - Eventing

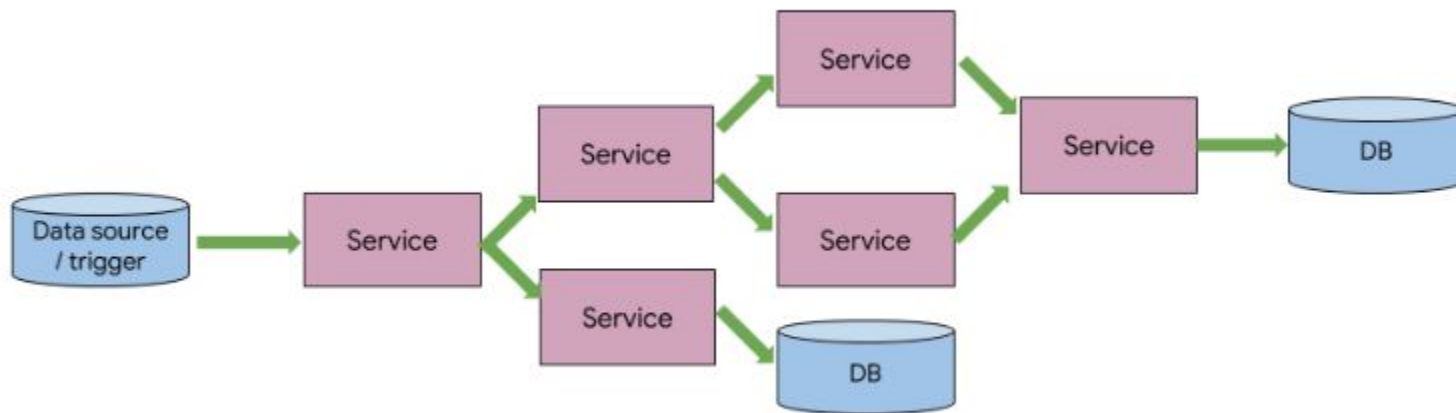


- Goal is to be a generalized eventing framework
- Many influencers also active on [CloudEvents](#) specification

## Current-ish API:

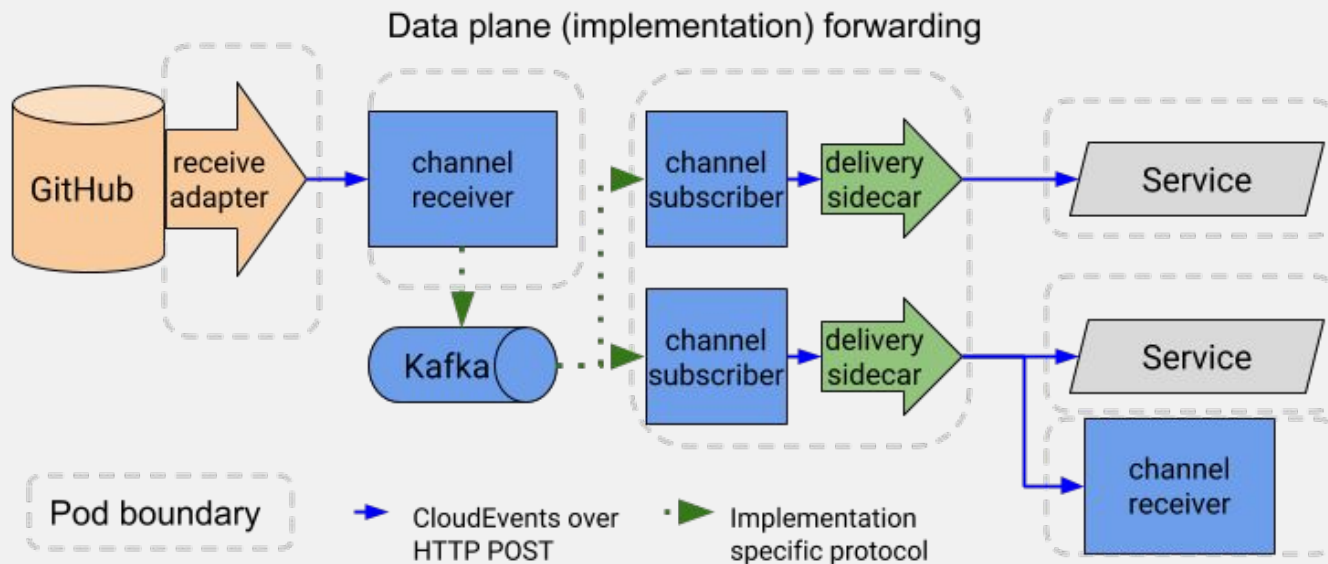
- **Receive Adapter** triggers on EventSources that send Events to a sink (channel)
- **Channels** are named endpoints which accept event delivery (provided by Kafka, AMQP...)
- **Subscriptions** register to receive traffic from a Channel
- **Addressable** - Receive and Ack event delivery
- **Callable** - Receive and transform

# Knative Eventing “Pipeline”



[Knative Eventing Docs](#)

# Knative Eventing “Flow”



[Knative Eventing Docs](#)

# Again, beyond functions...



**Configuration**(configuration.serving.knative.dev)

**Revision**(revision.serving.knative.dev)

**Route**(route.serving.knative.dev)

**Service**(service.serving.knative.dev)

**Build** (buildtemplate.build.knative.dev)

**Keep code and configuration separate**

**Each configuration change triggers the creation of new revision**

**Concurrency** (scale out via process)

**Disposability** (fast startup/graceful shutdown)

**Build, release, run** (separate build and run stages)



# DEMO: Knative on Red Hat OpenShift



# Demo

```
root@redhat-vagrant:~/ansible-playbook# cat /etc/ansible/hosts
hostnames ansible-playbook ansible-playbook ansible-playbook
hosts ansible-playbook ansible-playbook ansible-playbook

root@redhat-vagrant:~/ansible-playbook# cat /etc/ansible/hosts
hostnames ansible-playbook ansible-playbook ansible-playbook
hosts ansible-playbook ansible-playbook ansible-playbook

root@redhat-vagrant:~/ansible-playbook# cat /etc/ansible/hosts
hostnames ansible-playbook ansible-playbook ansible-playbook
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hostnames ansible-playbook ansible-playbook ansible-playbook
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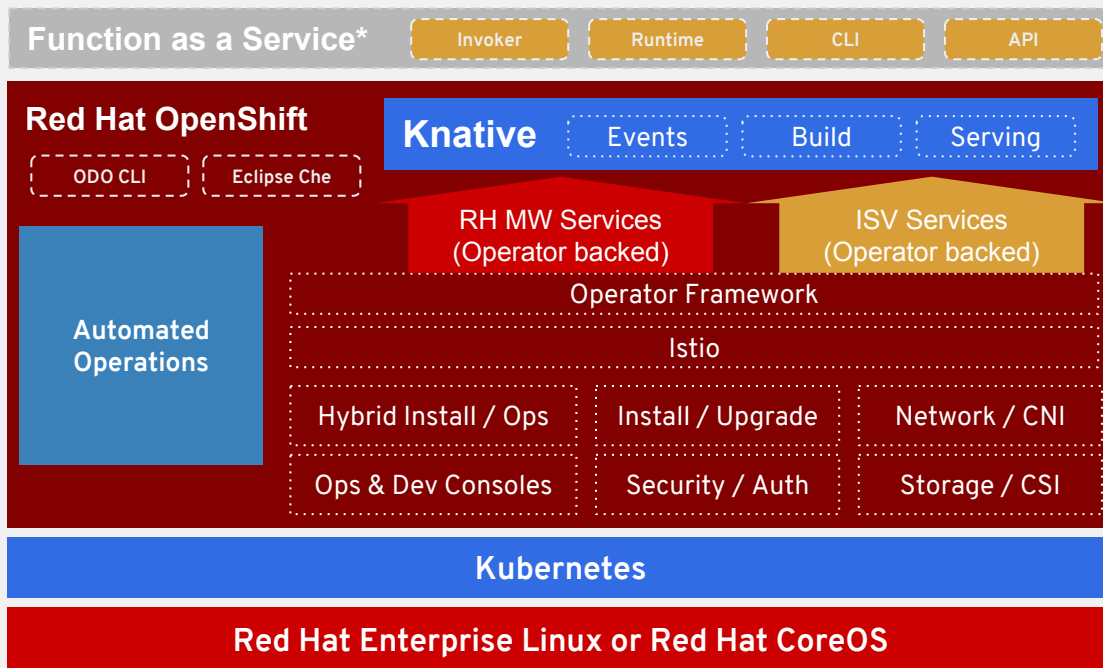
root@redhat-vagrant:~/ansible-playbook# cat /etc/ansible/hosts
hostnames ansible-playbook ansible-playbook ansible-playbook
hosts ansible-playbook ansible-playbook ansible-playbook
```

# Red Hat OpenShift Serverless and Functions

*Developer experience*  
APIs, CLI, service binding

*Building blocks for serverless*  
Source-centric and container-based

*The leading enterprise Kubernetes platform*  
Automated Operations  
Build an run anywhere (Hybrid Cloud)



\* In progress



# To learn more...

- Knative on Openshift
  - <https://www.openshift.com/learn/topics/knative>
- Knative Tutorial
  - <https://redhat-developer-demos.github.io/knative-tutorial/knative-tutorial/0.0.1/index.html>
- Blog posts
  - <https://blog.openshift.com/knative-serving-your-serverless-services/>
  - <https://blog.openshift.com/knative-building-your-serverless-service/>
  - <https://blog.openshift.com/knative-configurations-routes-and-revisions/>
- Follow our progress
  - <https://github.com/openshift-cloud-functions/>
  - <https://github.com/openshift-cloud-functions/knative-operators>
  - <https://github.com/openshift-cloud-functions/minishift-addons>
- Knative Community
  - <https://github.com/knative/docs/tree/master/community>
  - <https://groups.google.com/forum/#!forum/knative-users>
  - <https://groups.google.com/forum/#!forum/knative-dev>





# THANK YOU



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