

开源技术 * IBM微讲堂

6.案例分享：在DevOps场景中使用Knative

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Knative系列公开课

每周四晚8点档

- ◆09月19日 《Knative概览》
- ◆09月26日 《Tekton从源码构建容器镜像》
- ◆10月10日 《Knative Serving让容器从另扩展到无限》
- ◆10月17日 《Knative Eventing打造标准的云计算事件平台》
- ◆10月24日 《Knative客户端工具介绍》
- ◆10月31日 《案例分享：在DevOps场景中使用Knative》

讲师介绍



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目前主要负责IBM Cloud Foundry Enterprise Environment服务的开发和构建, 是Cloud Foundry BOSH SoftLayer CPI和Knative Client开源社区项目的贡献者。



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多年开源社区经验
Knative贡献者
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专注Serverless平台建设

Agenda

- Background: Cloud Native DevOps and Knative
- User Scenario #1: from source code to production
 - Trigger, Build, Deploy
 - Notification
 - Demo
- User Scenario #2: routing and canary upgrade
 - Traffic Splitting
 - Demo

Background: Cloud Native DevOps and Knative

DevOps

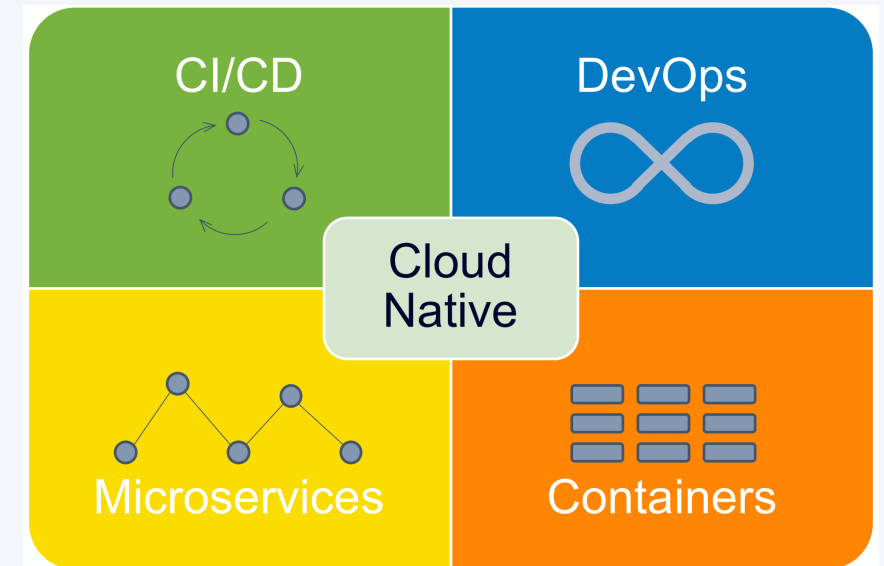
DevOps is a set of practices that combines software development (Dev) and information-technology operations (Ops) which aims to shorten the systems development life cycle and provide continuous delivery with high software quality. -- *Wikipedia*

Cloud Native DevOps

Cloud native technologies — containers, microservices and serverless functions that run in multicloud environments and are managed through automated CI/CD pipelines — are built on DevOps principles. You cannot have one without the other. -- *Guide to Cloud Native DevOps*

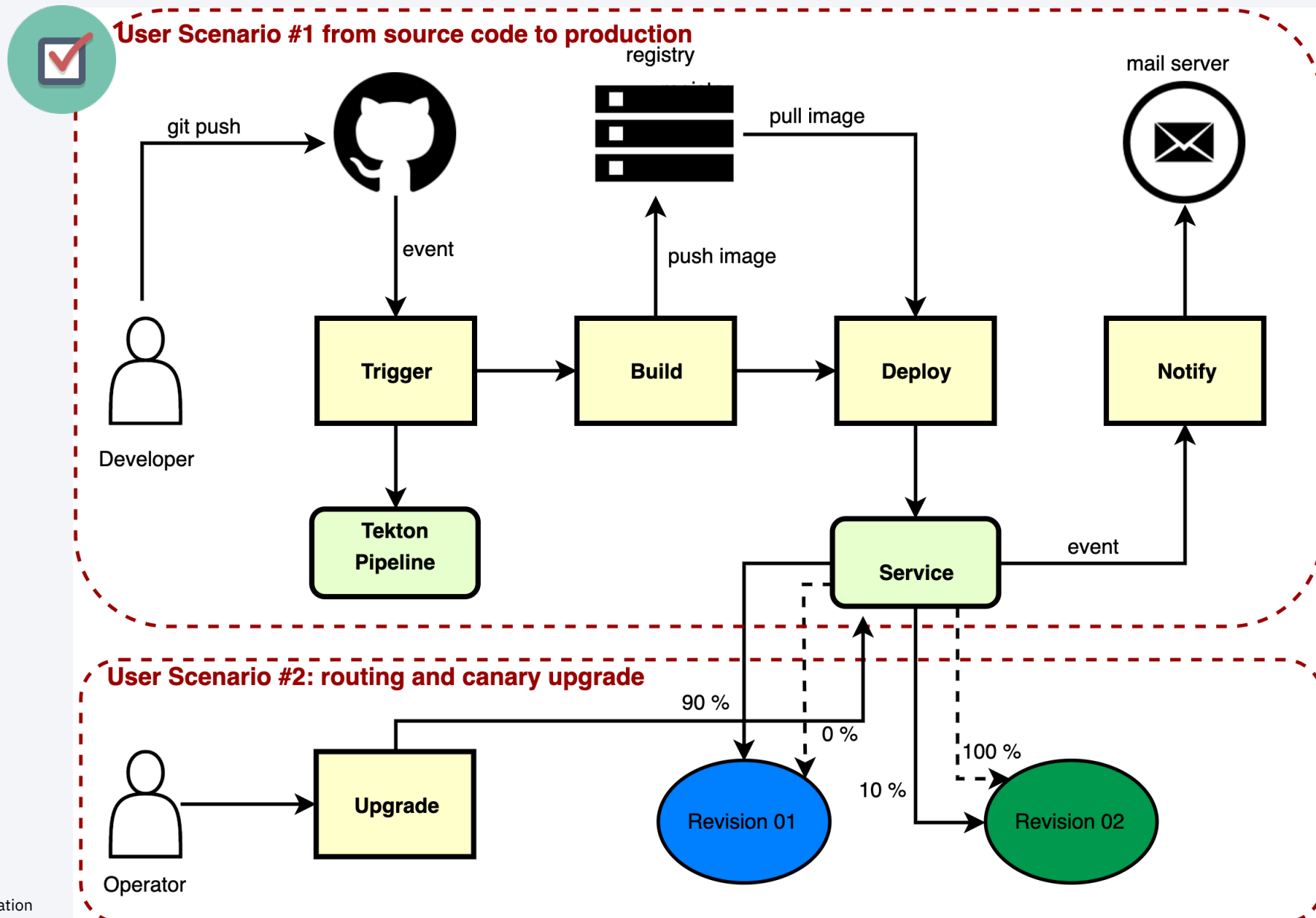
Knative

Knative which integrates with both Kubernetes and Istio provides a complete application/function deployment platform, including setting up a build process, automated deployment, and an eventing mechanism that standardizes the way applications use messaging and queueing systems.



From Cloud Native – Seeing through the hype

User Scenarios Overview



User Scenario #1: from source code to production

Trigger, Build and Deploy

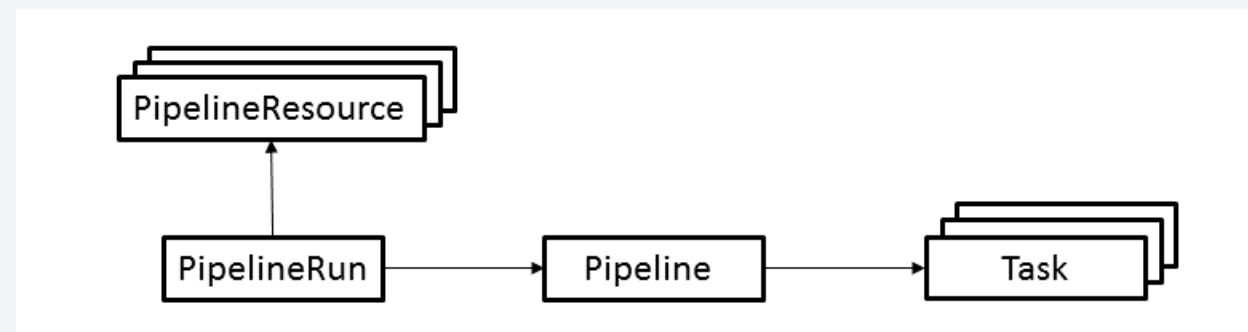
Tekton Pipeline

Tekton is a powerful yet flexible [Kubernetes-native](#) open-source framework for creating CI/CD systems. It lets you build, test, and deploy across multiple cloud providers or on-premises systems by abstracting away the underlying implementation details.

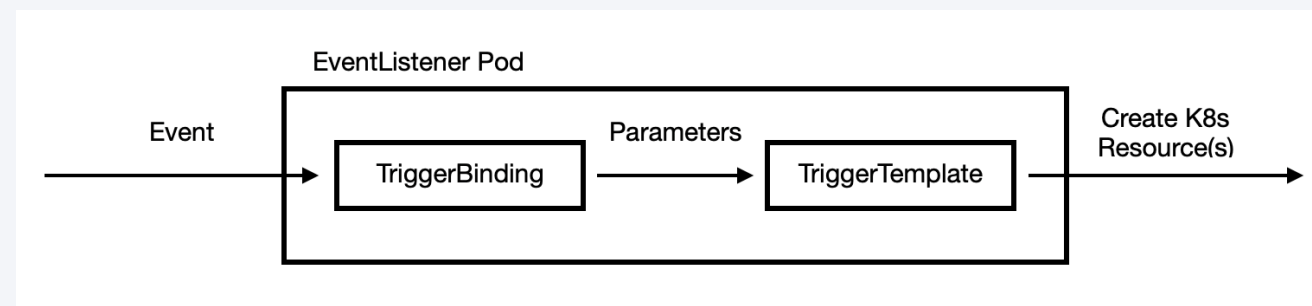
Tekton Trigger

Trigger is a [Kubernetes Custom Resource Definition](#) (CRD) controller that allows you to extract information from events payloads (a "trigger") to create Kubernetes resources.

[Using triggers in conjunction with tekton pipeline enables you to easily create full-fledged CI/CD systems!](#)



Tekton Pipeline Resources



Tekton Trigger Resources

User Scenario #1: from source code to production

Trigger, Build and Deploy

Tekton Trigger

- [Install Trigger](#)
- [TriggerTemplate](#) is a resource that can template resources.
- [TriggerBindings](#) enable you to capture fields within an event payload and store them as parameters.
- [EventListeners](#) connect TriggerBindings to TriggerTemplates and provide an addressable endpoint, which is where webhooks/events are directed.

Git Webhook Settings

Set a webhook with Payload URL in your git repo for application source code.

```
$ kubectl get deployment -n tekton-pipelines
```

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
tekton-pipelines-controller	1/1	1	1	148d
tekton-pipelines-webhook	1/1	1	1	148d
tekton-triggers-controller	1/1	1	1	14d
tekton-triggers-webhook	1/1	1	1	14d

```
$ kubectl get deployment
```

el-my-listener	1/1	1	1	5d1h
----------------	-----	---	---	------

```
$ kubectl get ingress
```

el-my-listener	el-my-listener.zhanggbj-knative.us-south.containers.appdomain.cloud	169.48.224.198	80	5d1h
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Webhooks / Manage webhook

We'll send a POST request to the URL below with details of any subscribed events. You can also specify which data format you'd like to receive (JSON, x-www-form-urlencoded, etc). More information can be found in [our developer documentation](#).

Payload URL *

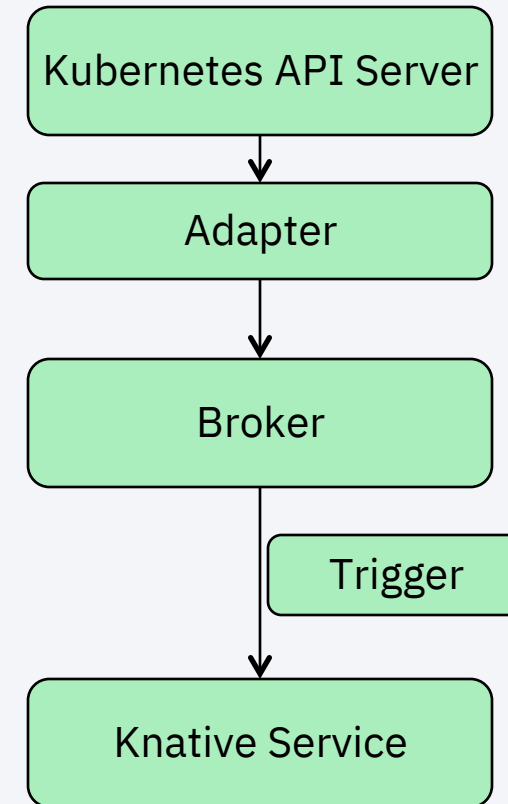
Content type

User Scenario #1: from source code to production

Notify by Knative Eventing

Knative Eventing

- **ApiServerSource** is a predefined event source which will capture the create/update/delete of K8s objects.
- **Broker** represents an 'event mesh'. Events are sent to the Broker's ingress and are then sent to any subscribers that are interested in that event.
- **Trigger** represents a desire to subscribe to events from a specific Broker.
- **Knative Service** `service-details` is a micro service which will send the Service information to an email address when the Service is ready to use.



<https://github.com/daisy-ycguo/knative-devops>

User Scenario #1: from source code to production

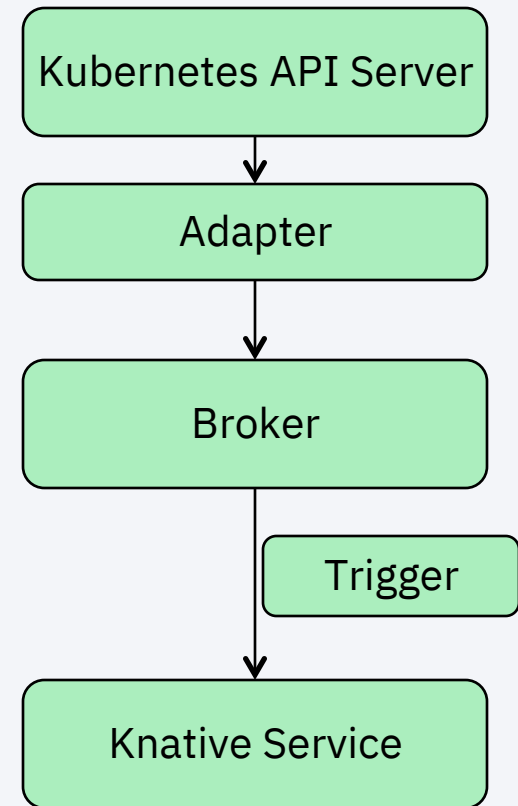
Notify by Knative Eventing

ApiServerSource

```
apiVersion: sources.eventing.knative.dev/v1alpha1
kind: ApiServerSource
metadata:
  name: service-events
  namespace: default
spec:
  serviceAccountName: service-sa
  mode: Resource
  resources:
  - apiVersion: serving.knative.dev/v1alpha1
    kind: Service
  sink:
    apiVersion: eventing.knative.dev/v1alpha1
    kind: Broker
    name: default
```

Trigger

```
apiVersion: eventing.knative.dev/v1alpha1
kind: Trigger
metadata:
  name: trigger-service
spec:
  broker: default
  filter:
    sourceAndType:
      type: dev.knative.apiserver.resource.update
  subscriber:
    ref:
      apiVersion: serving.knative.dev/v1alpha1
      kind: Service
      name: service-details
```

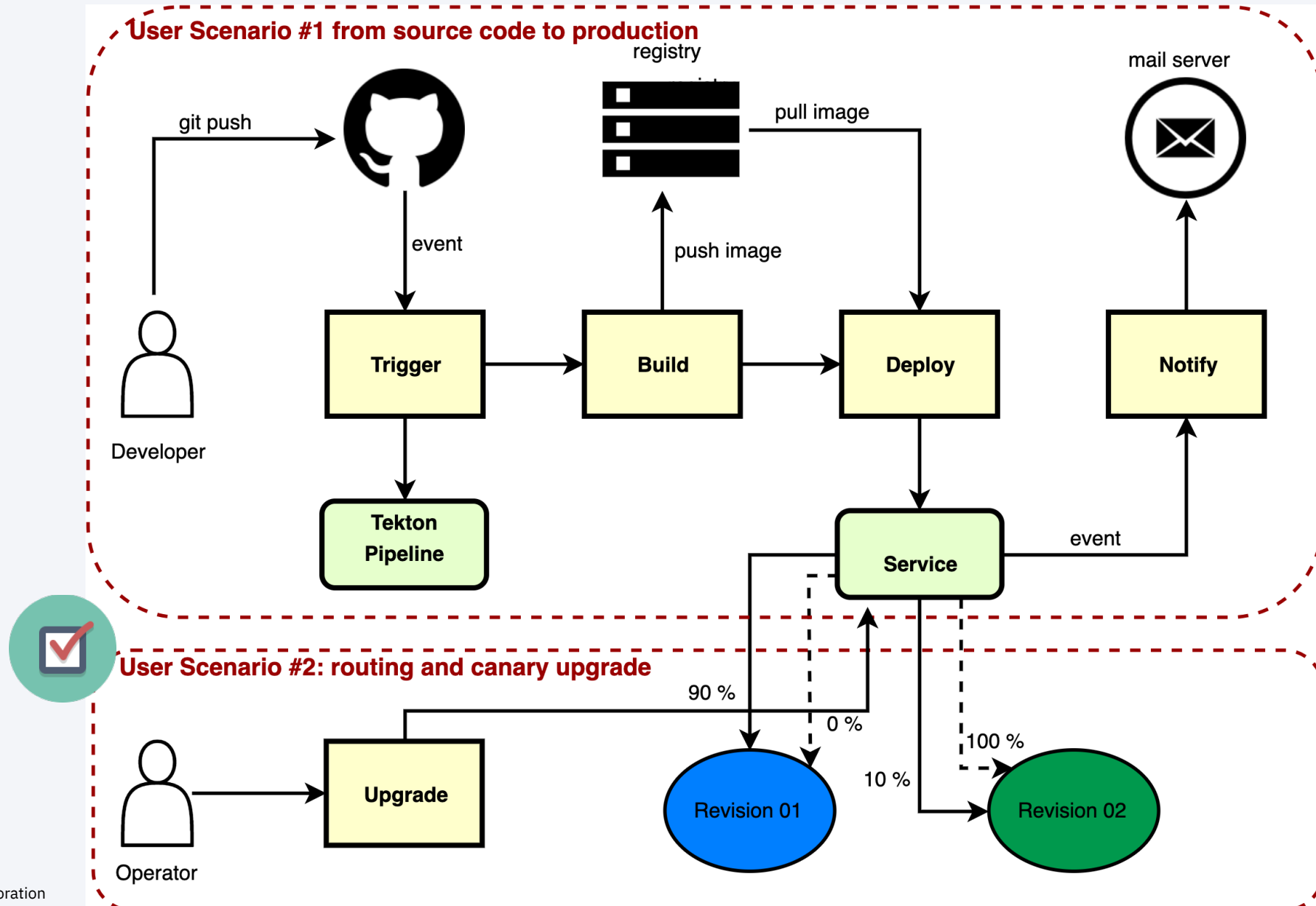


User Scenario #1: from source code to production

Trigger, Build, Deploy and Notify



User Scenarios Overview



User Scenario #2: routing and canary upgrade

Routing and Canary Upgrade

Percentage-Based Routing

A common requirement in today's distributed service world is to split traffic between revisions. This feature could be useful for A/B testing or it could be used to try some new or selected features with a smaller percentage of users (Canary Upgrade).

Feature-Flag Routing

(In Discussion <https://github.com/knative/serving/issues/4736>)

As in production, users may not only want the traffic splitting by percentage, but also feature-flag routing, which means fine-grained traffic management based on incoming request, e.g. the request headers, uri path and method etc.

```
apiVersion: serving.knative.dev/
v1alpha1
kind: Service
metadata:
  name: myservice
spec:
  template:
    spec:
      containers:
        - image: example/myservice
  traffic:
    - tag: current
      revisionName: myservice-v1
      percent: 50
    - tag: candidate
      revisionName: myservice-v2
      percent: 50
```

Service Traffic Block

```
spec:
  template:
    spec:
      containers:
        - image: example/myservice
  traffic:
    - tag: current
      revisionName: myservice-v1
      match:
        headers:
          end-user:
            exact: jason
    - tag: candidate
      revisionName: myservice-v2
      match:
        headers:
          end-user:
            exact: mike
```

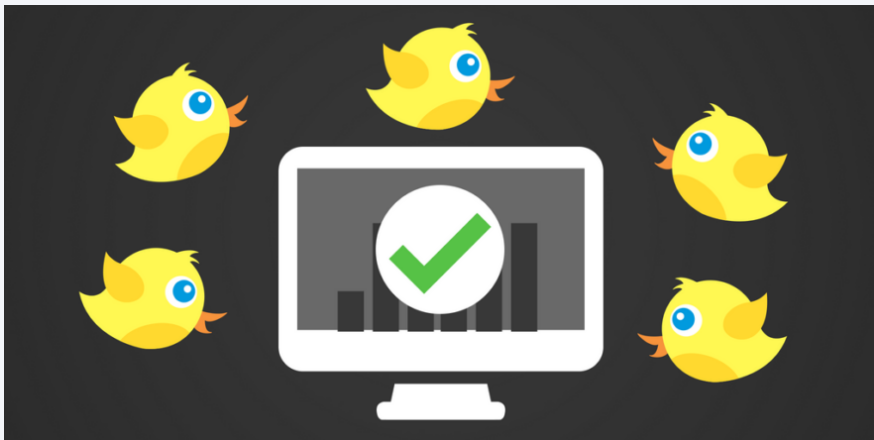
Service Traffic Block Proposal

User Scenario #2: routing and canary upgrade

Routing and Canary Upgrade

Canary Upgrade

Canary deployments are a pattern for rolling out releases to a subset of users or servers. The idea is to first deploy the change to a small subset of servers, test it, and then roll the change out to the rest of the servers. The canary deployment serves as an early warning indicator with less impact on downtime: if the canary deployment fails, the rest of the servers aren't impacted.



```
# Install Kn Client https://github.com/knative/client

# Deploy Service myservice
Kubectl apply -f myservice.yaml

# Tag revision myservice-hqpfb
kn service update myservice --tag myservice-hqpfb=current

# Lock down traffic to myservice-v1 with tag current
kn service update myservice --traffic current=100

# Deploy a new myservice with tag candidate. So far, 100%
traffic should go to myservice-v1
kn service update --image docker.io/org/myimage
kn service update myservice --tag myservice-zfgkk=candidate

# Rollout myservice with 10% traffic to candidate
kn service update myservice --traffic current=90 --traffic
candidate=10

# If it is ready to rollout to the new revision
kn service update myservice --traffic candidate=100
```

ee

Use kn client for service canary upgrade



Links

- <https://github.com/IBM/tekton-tutorial>
- <https://github.com/tektoncd/triggers>