

Developing a CD pipeline with Knative

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DevOps Meetup Singapore

A Bit of History

Knative

- Beginning of 2018...
- Knative:
 - Build
 - Eventing
 - Serving
- Contributors:
 - Google
 - Pivotal
 - IBM
 - RedHat
 - Cloudbees
 - ...and others



~Sept 2018: Knative Pipelines



Latest news!

- Focus on CI/CD
- Deploy “anywhere”
- Compatible with Knative Build
- *tektoncd/pipeline*
 - New logo
 - @CD Foundation
 - Roadmap WIP
 - Alpha APIs



Community

- *Valid for Knative. Tekton TBD.*
- Steering Committee (SC)
- Technical Oversight Committee (TOC)
- Various Contribution profiles
- Design, issues: on GitHub
- Communication:
 - Weekly video meetings, recorded, Build WG
 - Asynch: Knative Users / Developers ML
 - Sync: slack.knative.dev

Tekton Pipelines

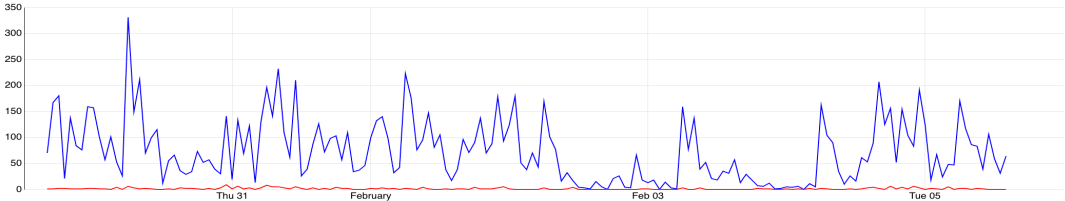
Cloud Native Pipelines



OpenStack Health

is a dashboard for visualizing test results of OpenStack CI jobs.

Total Jobs

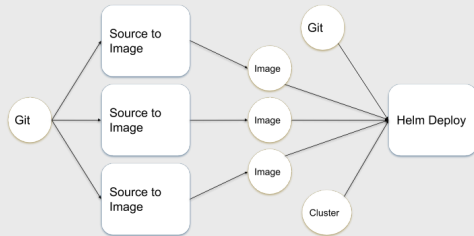


Job Failure Rate



Inputs, Outputs & DAG

- Steps are sequential
- Tasks are a Directed Acyclic Graph
- Order defined by:
 - *from*: input from another task's output
 - *runAfter*: enforced task ordering



Under the Hood

Custom Resources

CRDs: Task(Run), Pipeline(Run), PipelineResource

Services in the *tekton-pipelines* namespace:

- Webhook Service: resource validation
- Controller Service:
 - Handles inputs and outputs
 - Calculates the DAG
 - Provisions pods and containers

Custom Resource Provisioning:

- Via YAML
- Via Go API
- Labels!

Pods, Entrypoints & Volumes

Steps (of a Task):

- Containers in one POD (single node)
- Any container image
- Entrypoint re-written
- Serial execution
- Resource allocation?

TaskRun:

- Provisions a POD
- Deploys entrypoint tool
- Input/output containers
- User containers (steps)

Volumes:

- EmptyDir for workspace/home
- Tools (entrypoint)
- Secrets
- Any user ConfigMap / Volume
- (Optionally) Pipeline Share

PipelineRun:

- Several PODs, different nodes
- Shared storage: PVC or GCS

Source to Image to Deploy

IBM Cloud

CD Pipeline as code

- Pipeline and Tasks in git (YAML)
- Parameters for env/run specific
- Security?

```
apiVersion: tekton.dev/v1alpha1
kind: PipelineResource
metadata:
  name: health-helm-git-knative
  labels:
    tag: agreatrelease
spec:
  type: git
  params:
    - name: revision
      value: knative
    - name: url
      value: https://github.com/afrittoli/health-helm
```

```
metadata:
  name: mycluster
spec:
  type: cluster
  params:
    - name: name
      value: mycluster
    - name: url
      value: https://mycluster.containers.cloud.ibm.com
    - name: username
      value: admin
  secrets:
    - fieldName: token
      secretKey: tokenKey
      secretName: cluster-secrets
    - fieldName: cadata
      secretKey: cadataKey
      secretName: cluster-secrets
```

```
metadata:
  name: health-api-image
spec:
  type: image
  params:
    - name: url
      value: registry.ng.bluemix.net/andreaaf/health-api
```


Using Kaniko

Tekton and Knative

Pipelines and Knative Build

CI for OpenStack Health

CI with Tekton Pipelines

Asynchronous Pipelines

Triggering and Knative Eventing

Tekton and Development

Conclusions

Shall I use Tekton Pipelines?

Roadmap

References

Q&A