Developing a CD pipeline with Knative

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DevOps Meetup Singapore

IBM **Cloud**

A Bit of History

Knative

- Beginning of 2018...
- Knative:
  - Build
  - Eventing
  - Serving

- Contributors:
  - Google
  - Pivotal
  - IBM
  - RedHat
  - Cloudbees
  - ...and others

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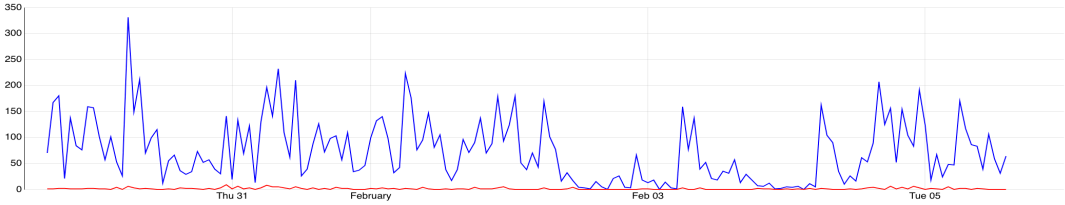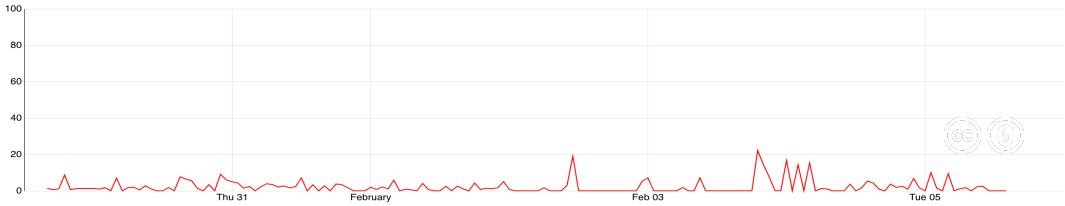 - Sync: slack.knative.dev

Tekton Pipelines

Cloud Native Pipelines

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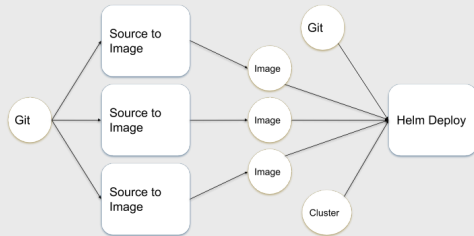
Total Jobs

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

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
- Deployes 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

Using Kaniko

Cluster resource and secrets

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