

Cloud Native CD Pipelines with Tekton

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Agenda

- ↳ What is Tekton?
- ↳ Plumbing
- ↳ CD Pipelines
- ↳ Demo
- ↳ Lesson Learnt



What is Tekton?

Tekton is an open-source framework for creating CI/CD systems

Cloud Native

Powerful and flexible

Allows developers to build, test, and deploy across cloud providers and on-premise systems.

Governed by the Continuous Delivery Foundation

Contributions from Google, IBM, Red Hat, Cloudbees, Pivotal and many more



Tekton Goals

Standardization

Tekton standardizes CI/CD tooling and processes across vendors, languages, and deployment environments. It works well with many popular CI/CD tools.



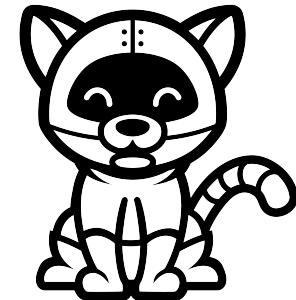
Built In Best Practices

Tekton lets you create CI/CD systems quickly, giving you scalable, serverless, cloud native execution out of the box.

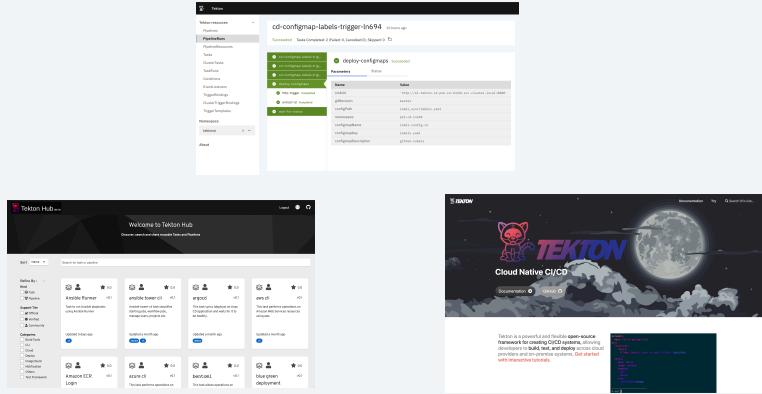


Maximum Flexibility

Tekton abstracts the underlying implementation so that you can choose the build, test, and deploy workflow based on your team's requirements.



Tekton Projects



Building Blocks

Pipelines:

- Standardized definitions for building CI/CD pipelines such as Tasks, Pipelines, and Steps

Triggers:

- Run pipelines from webhook events.



Tooling

Dashboard:

- A web UI for Tekton

tkn:

- A CLI for interacting with Tekton

Operator:

- Manage Tekton installation and upgrades.

Catalog, Hub & Experiments

DSLs, Results storage and querying, Image formats, supply chain security, Git and polling operators etc.



Tekton Pipelines

Step

- ↳ Run commands in a container with volumes, env vars, etc

Task

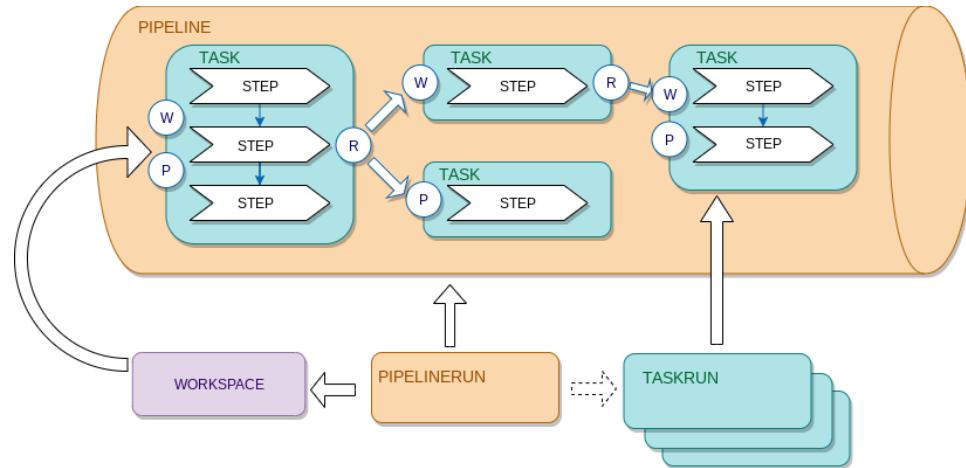
- ↳ A list of steps that run sequentially in the same pod

Pipeline

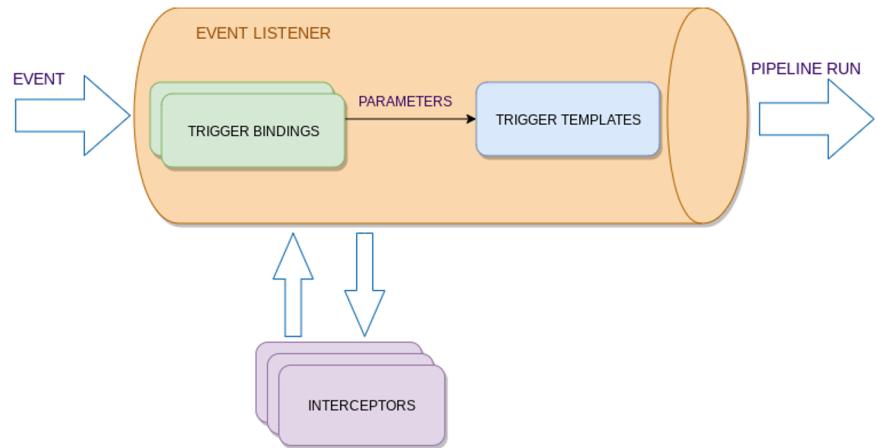
- ↳ A graph of tasks with inputs and outputs executed in a certain order

TaskRun and PipelineRun

- ↳ An invocation of a task or pipeline with inputs and outputs



Tekton Triggers



Event Listener

- ↳ Listen and process incoming events

Interceptors

- ↳ Filter and validate incoming events

Trigger Binding

- ↳ Extract params from incoming events

Trigger Template

- ↳ An invocation of a pipeline with inputs and outputs

Plumbing



“Plumbing:
the system of pipes,
tanks, fittings, and
other apparatus
required for the water
supply, heating, and
sanitation in a
building.”

Oxford English Dictionary

Tekton Infra

We started with Prow for CI
and manual releases...



...then automated releases and
more CD pipelines

Build, test, release Tekton
with Tekton



Dogfooding

Releases:

- ↳ Nightly and full

Building Images:

- ↳ Nightly and on-demand

Deploying Pipelines, Configs

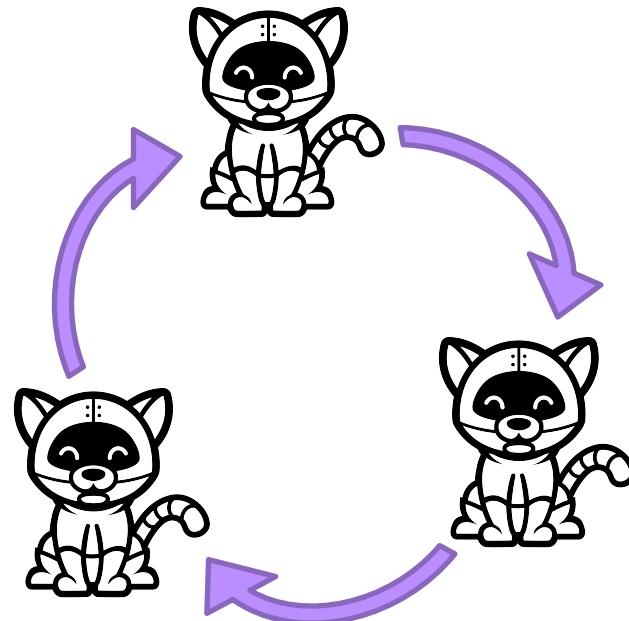
- ↳ Hourly deployment

Deploying Services

- ↳ Nightly deployments

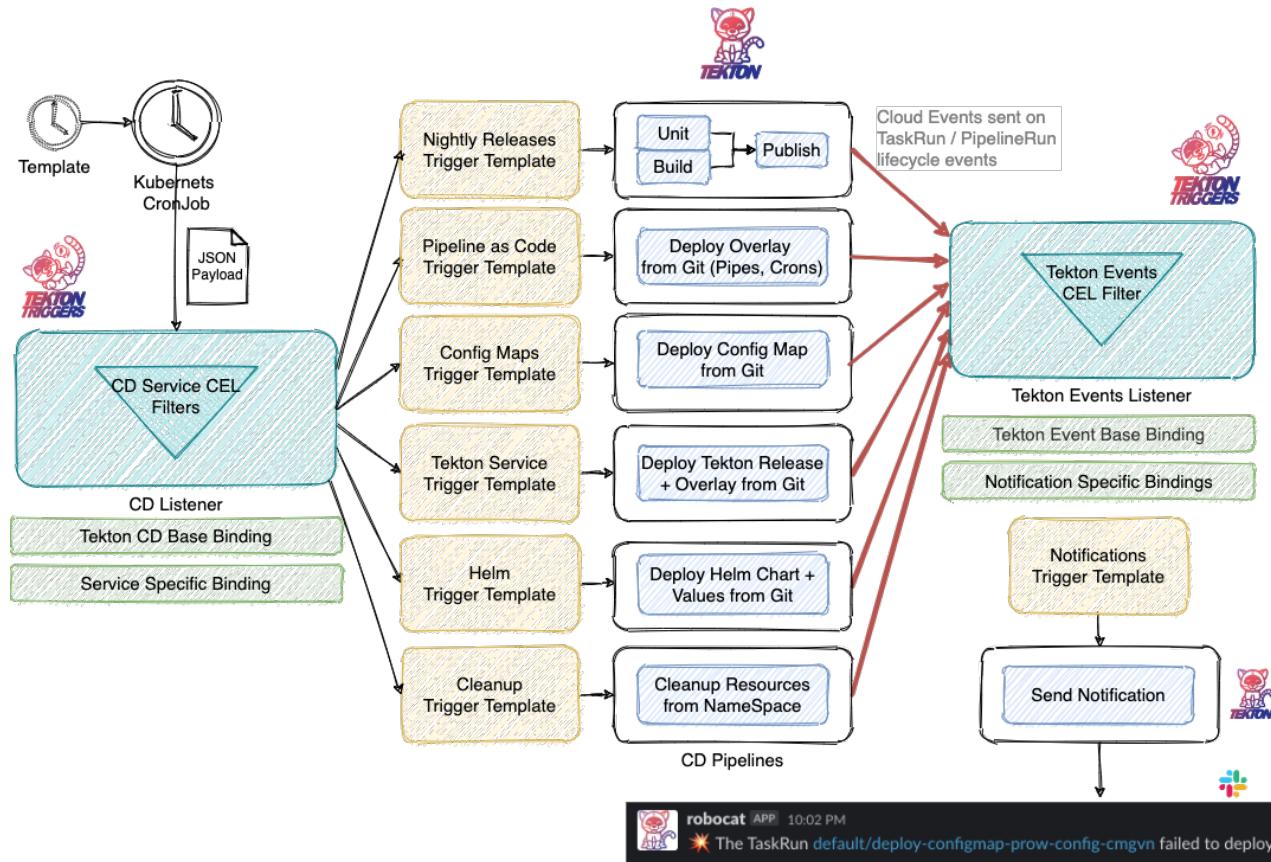
Monitoring

- ↳ Slack Notifications on Failure



CD Pipelines

Tekton based CD



Event Listener:

- ↳ Receive events from CronJobs (and Tekton)

Bindings:

- ↳ Common interface to templates

Trigger Templates:

- ↳ Parametrized resources to be created

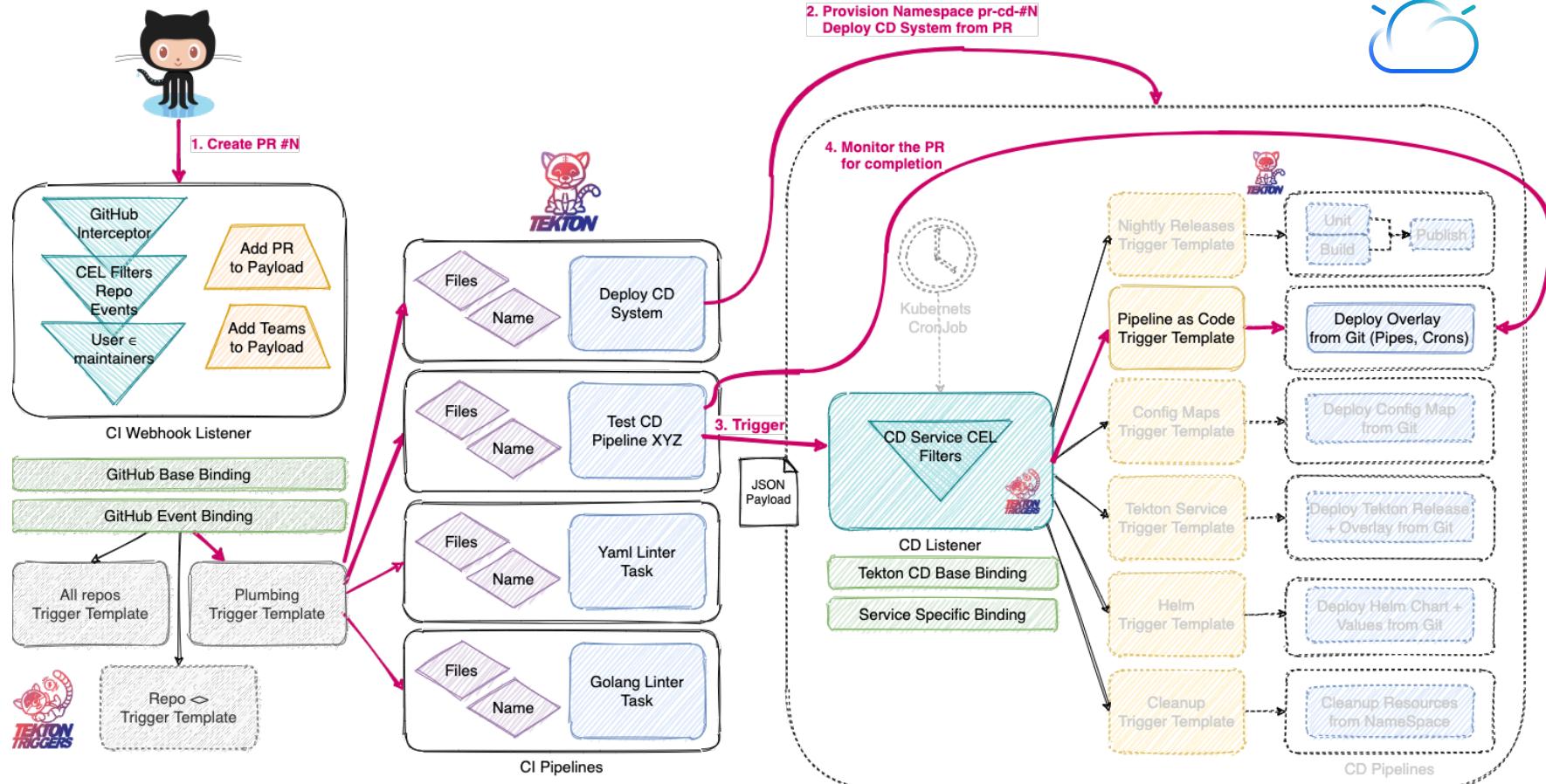
Tasks and Pipelines:

- ↳ Various CD Services

Cloud Events:

- ↳ Monitor CD Pipelines

Testing Tekton Pipelines



Demo



Lessons Learnt

So, what did we learn?

CD with Tekton

- ↳ Full flexibility
- ↳ Steep initial design curve

Lots of YAML!

- ↳ Kustomize to the rescue
- ↳ DSL could help

Not only PODs

- ↳ Terraform, Ansible or others to seed environments
- ↳ “Custom Tasks” can help

Robocats 🤖🐱

- ↳ Manual step will fail eventually
- ↳ Automated ones will fail too
- ↳ Plan for testing, monitoring and fallbacks!

So many resources:

- ↳ Use labels
- ↳ Dashboard deep-links
- ↳ Archive logs and YAMLS
- ↳ Cleanup regularly

We need more “pipes”!

Document, document, document!

Pipes we're building

Tekton Enhancement Proposals
(TEPs):

- ↳ Custom Tasks
- ↳ Trigger CRD
- ↳ Event Listeners as Knative Services
- ↳ Task Results for Finally
- ↳ Skip / Simple Conditionals
- ↳ Tracing and performance
- ↳ Tekton OCI Bundles

Under discussion:

- 🤖 Multi Arch builds
- 🤖 Loop and switch constructs
- 🤖 Native notification support
- 🤖 Ephemeral Credentials support

For CI:

- 🐱 Tekton Results API
- 🐱 Logs archival and parsing
- 🐱 Flake Analysis

Come and Join Us

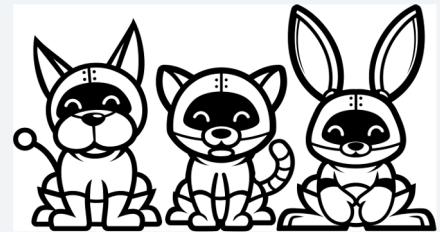
We're on [tektoncd.slack.com!](https://tektoncd.slack.com)

To Join: <https://bit.ly/2D2vDqh>



Thank you !

Links and References



- ↳ Tekton: tekton.dev/
- ↳ Tekton on GitHub: github.com/tektoncd
- ↳ Tekton Community: github.com/tektoncd/community
- ↳ Tekton Friends: github.com/tektoncd/friends
- ↳ CDF: cd.foundation, github.com/cdfoundation

- ↳ Plumbing Repo: github.com/tektoncd/plumbing
- ↳ K8s Test-Infra: github.com/kubernetes/test-infra/

- ↳ Tekton On IBM Cloud: www.ibm.com/uk-en/cloud/tekton
- ↳ OpenShift Pipelines: www.openshift.com/learn/topics/pipelines
- ↳ IBM Cloud: cloud.ibm.com

