

Openshift Pipelines Tekton

—
Developer Advocates
Teck talk :
Ishani Pandey

Agenda

- Need to shift from Jenkins
- What is Cloud Native CI /CD
- Tekton Story
- Tekton Goals
- What is Tekton ?
- Nitty Gritty technical details
- Pipelines concepts
- Tekton Architecture
- What is OpenShift Pipelines
- Demo
- Lab

Jenkins is Great, but...



- ... is not built for container environments
- ... needs babysitting and lots of attention
- ... quickly becomes an overhead
- ... has brittle configuration
- ... doesn't fit microservices team structures
- ... suffers from plugins mania
- ... tell us your story!

What is Cloud-Native Continuous Integration and Continuous Delivery (CI/CD)?



Containers

Built for container apps and
runs on Kubernetes



Serverless

Runs serverless with no CI/CD
engine to manage and maintain



DevOps

Designed with microservices
and distributed teams in mind



An open-source project for providing a set of shared and standard components for building Kubernetes-style CI/CD systems



CD.FOUNDATION

Governed by the Continuous Delivery Foundation

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

OpenShift Pipelines

a Cloud-Native CI/CD Experience on OpenShift based on Tekton



Standard Kubernetes-style pipelines

Define pipelines using standard Kubernetes custom resources (CRDs) based on Tekton* project



Run pipelines in containers

Scale pipeline executions on-demand with containers on Kubernetes



Powerful command-line tool

Run and manage pipelines with a interactive command-line tool



Build images with Kubernetes tools

Use tools of your choice (source-to-image, buildah, kaniko, jib, etc) for building container images



Deploy to multiple platforms

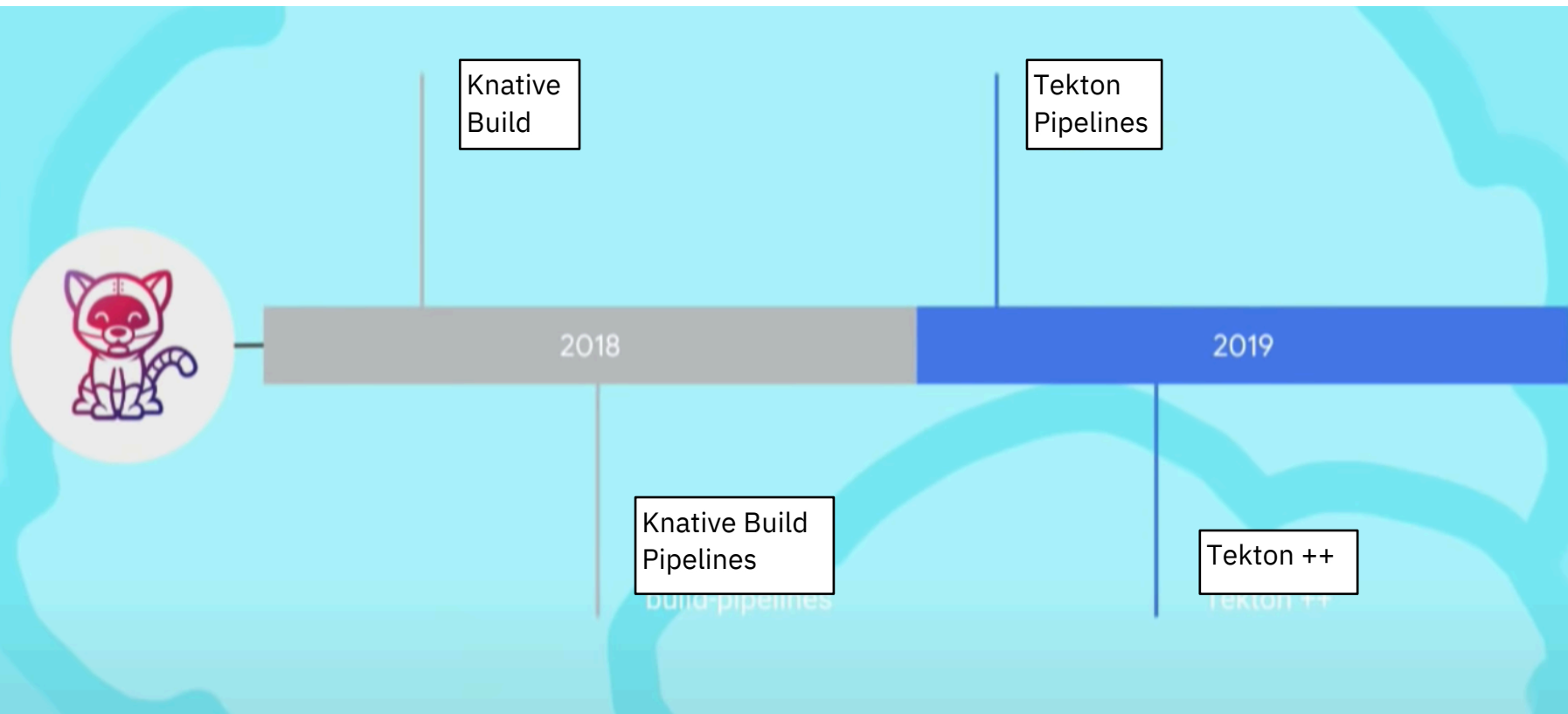
Deploy applications to multiple platforms like serverless, virtual machines and Kubernetes



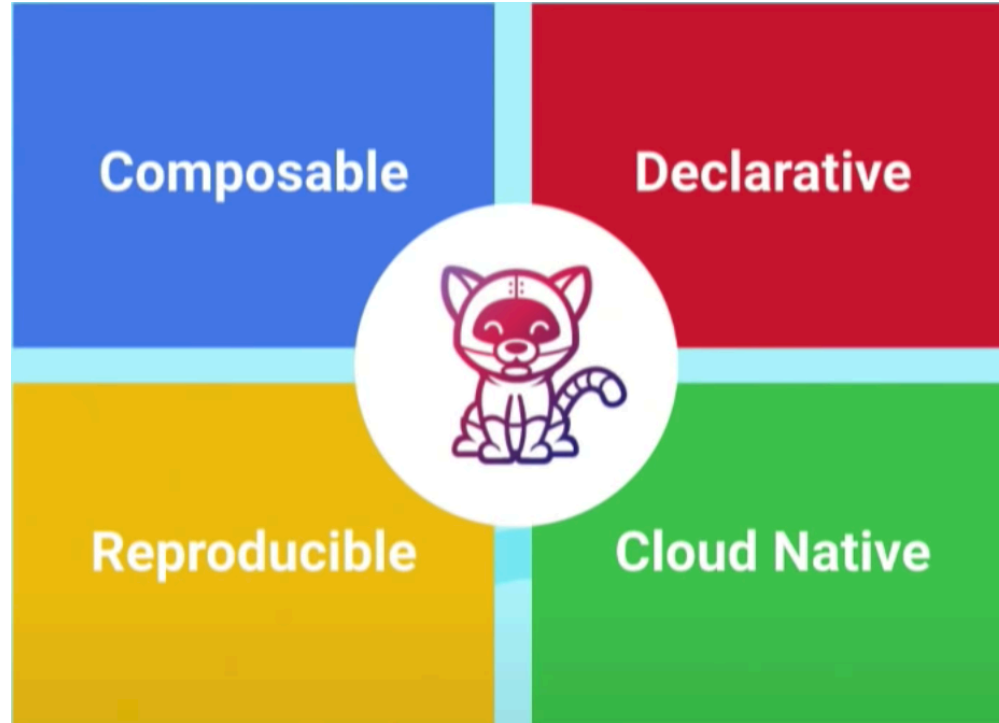
Integrated CI/CD experience**

A CI/CD experience integrated with OpenShift Developer Console, Visual Studio Code Plugin, Eclipse Che Plugins and more

The Tekton story

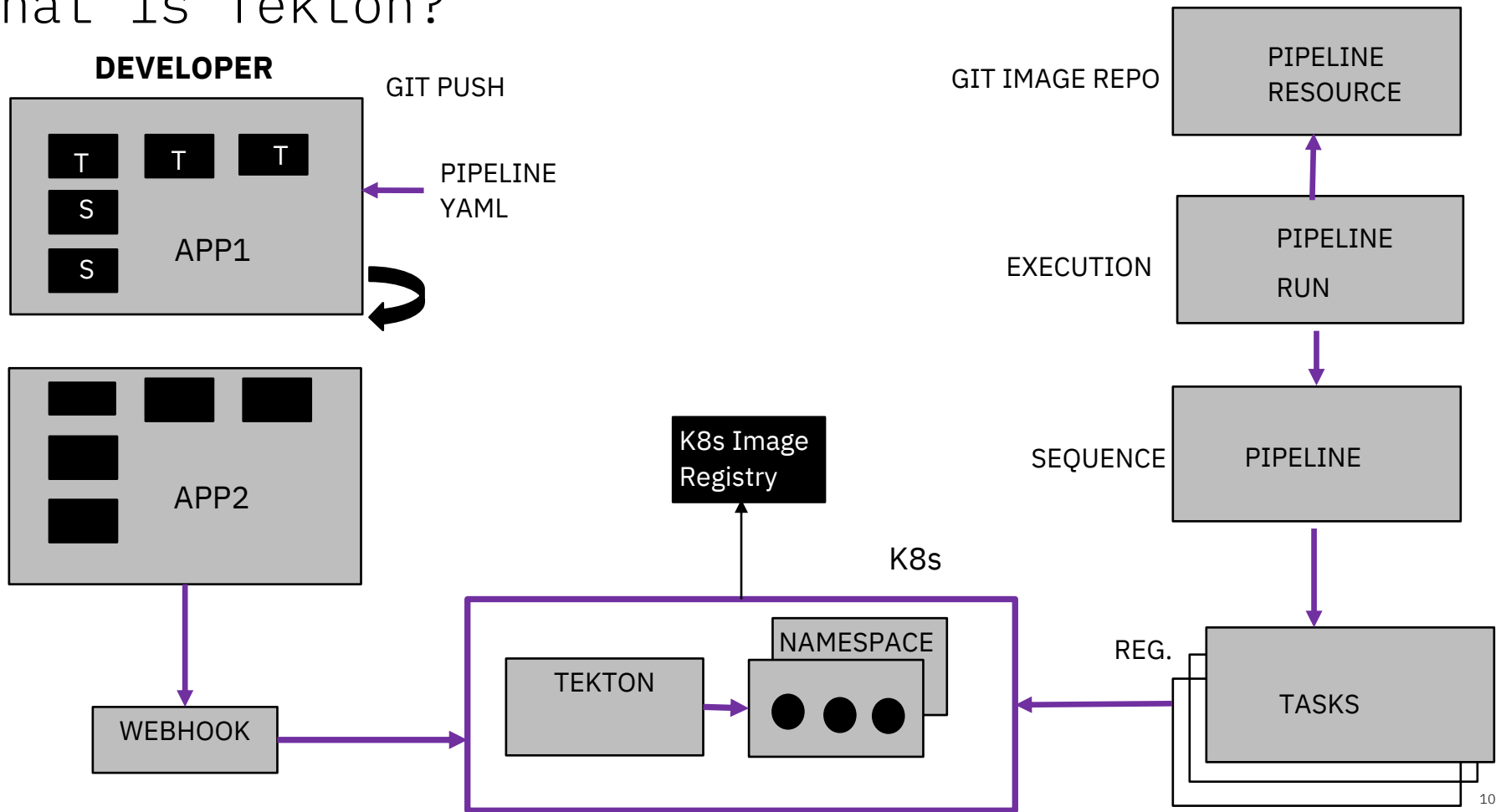


Tekton Goals



What is Tekton

What is Tekton?



Nitty gritty
technical
details!



CRDs

Custom Resource Definitions

- Extending Kubernetes with custom types.
- Controllers act on resources
- = CI/CD platform on Kubernetes

CRDs + Controllers
= Declarative API

Controller

Continually works to archive
your desired state

- When a CRD changes state:
 - Create
 - Update
 - Delete

Pipelines Concepts

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

Pipeline Resource

Inputs and outputs to tasks and pipelines (git, image, etc)

Task Run

An invocation of a task with inputs and outputs

Pipeline Run

An invocation of a pipeline with inputs and outputs

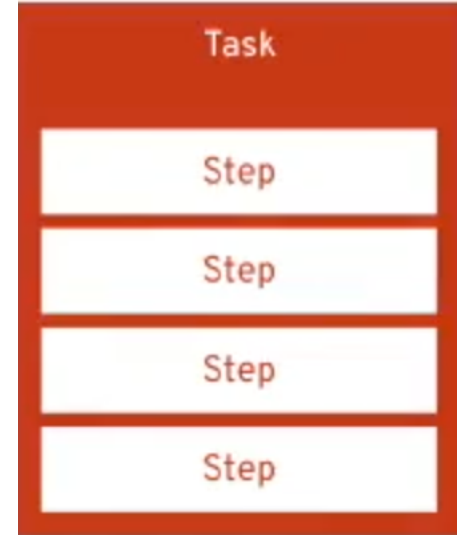
Step

- Run commands in a container
- Env vars, volumes, arguments etc..
- Is actually a container spec

```
- name: build
  image: maven:3.6.0-jdk-8-slim
  command:
    - /usr/bin/mvn
  args:
    - package
```

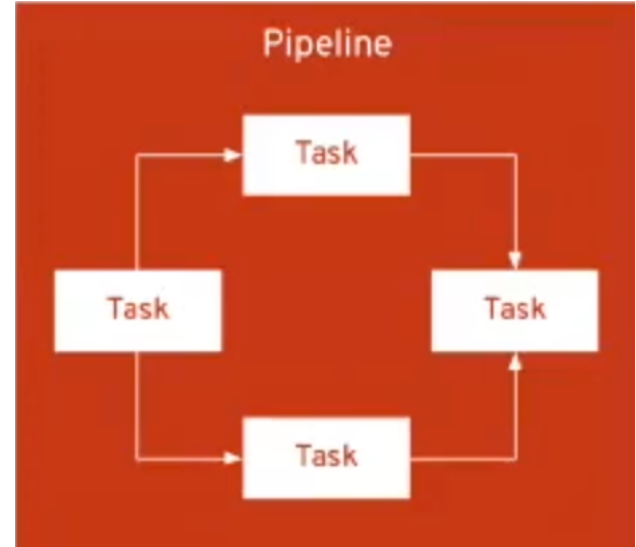

Task

- Sequence of steps
- Run in a sequential order
- Steps run as a container in the task pod



Pipeline

- Combines multiple tasks
- Express task order (graph)
- Links tasks inputs and outputs
- Tasks can run on different nodes



Pipeline Resources

- Inputs to task and pipelines
- Output from tasks and pipelines
- Decoupled and reusable

Git PipelineResource

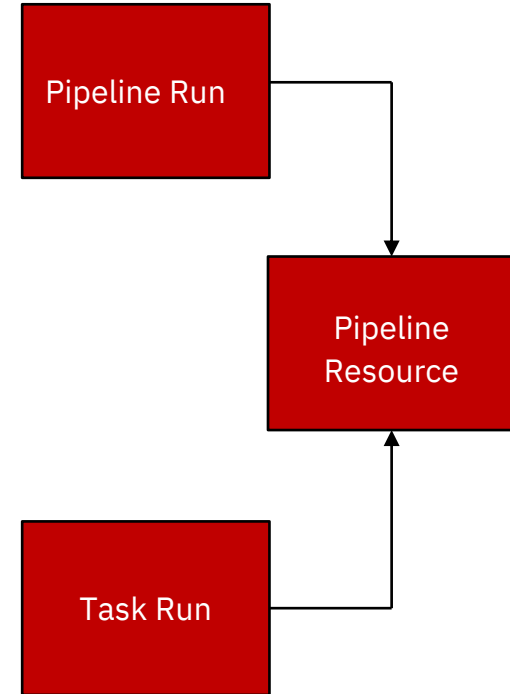
Image PipelineResource

Cluster PipelineResource

Storage PipelineResource

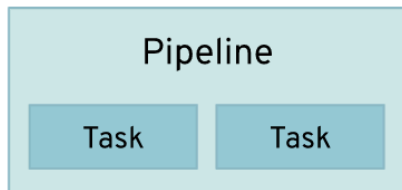
Runtime CRDs

- Instance of Pipeline/Task
 - Pipeline Run – Pipeline invocation
 - Task Run – task invocation
- Pipeline Resource
 - Runtime info like Image Registry , git repo , etc..

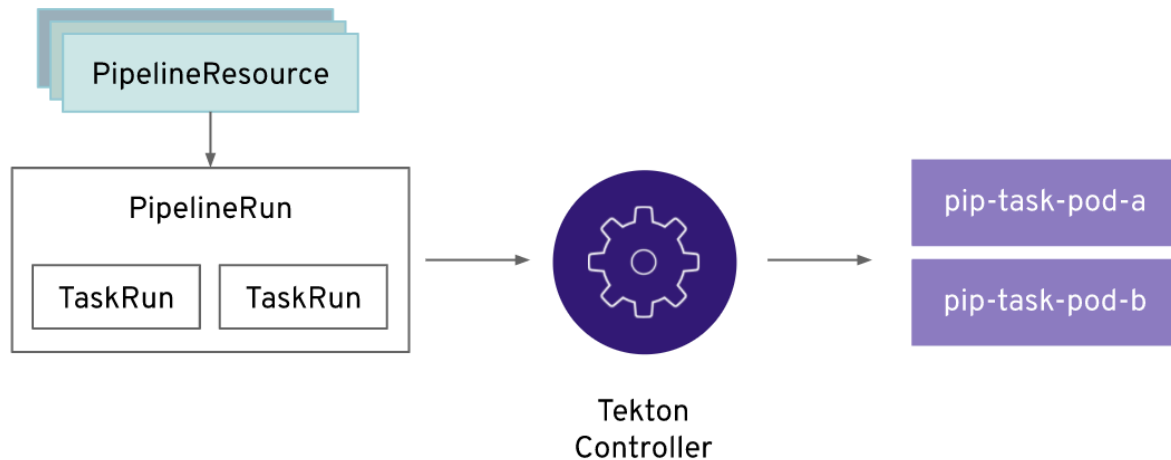


Tekton Architecture

Define pipeline



Invoke pipelines



What is OpenShift Pipelines

OpenShift Pipelines

CI/CD
Tooling

Dev Console

CLI

CodeReady Workspaces
(Eclipse Che)

Visual Studio Code

API

CI/CD
Core

OpenShift Pipelines

Operator

Extensions

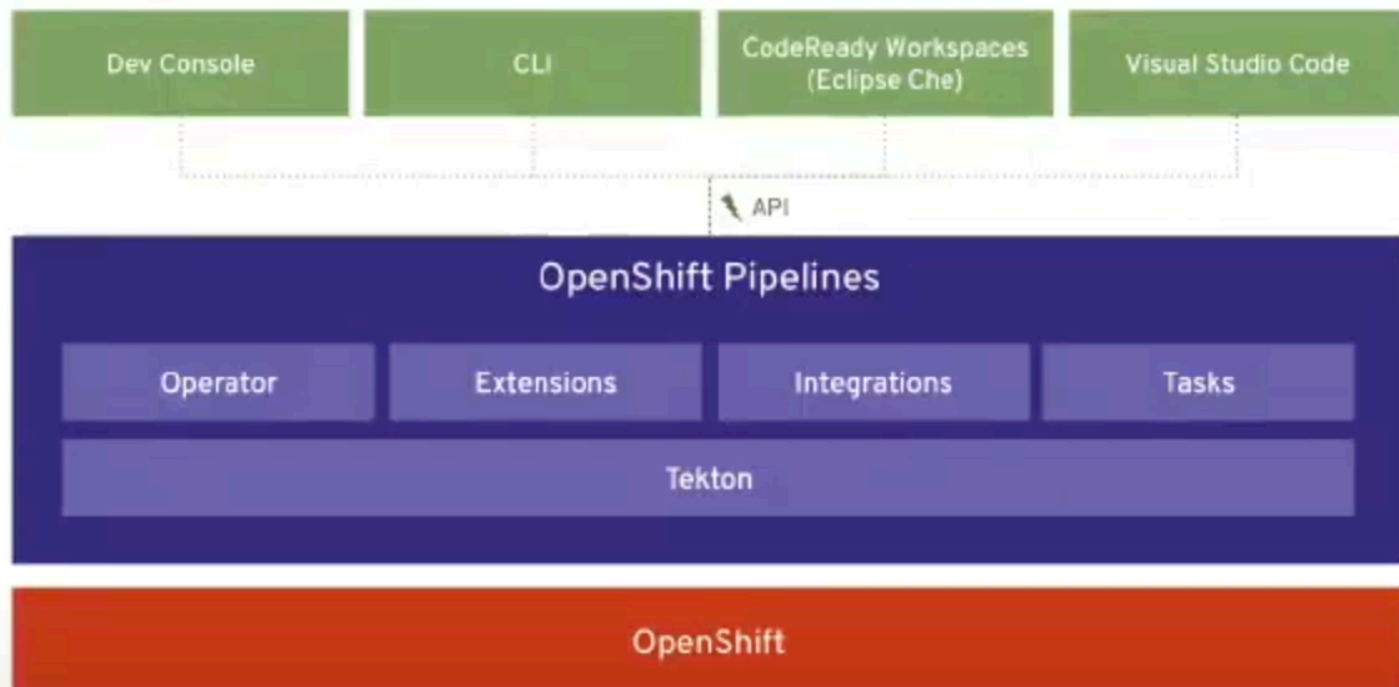
Integrations

Tasks

Tekton

Kubernetes

OpenShift



Tekton can be installed in both RedHat
Openshift and IBM Kubernetes manage
service and RedHat Code Ready Containers

Tekton Pipelines official resources link

<https://github.com/tektoncd/pipeline>

IBM