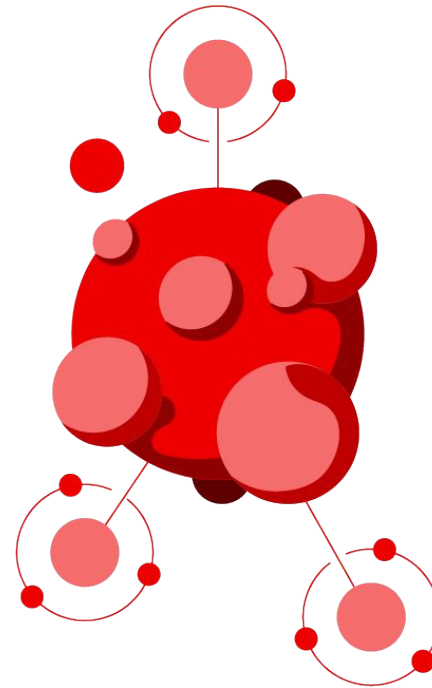




Open.Tour

Connecting people and solutions
to accelerate your business

From Zero to Hero! Pipelines combined with GitOps



About me



Robert Bohne works as a **Principal Specialist Solution Architect** at Red Hat and a Subject-Matter Expert for **OpenShift** Container Platform. With over **10 years** of **middleware operating experience** from **automation** to **monitoring** and **more than 5 years of container** know-how, Robert primarily supports large German customers with their OpenShift adoption; starting with the introduction, **24x7 operations** up to the **migration** and **modernization** of complex **applications**.

Twitter

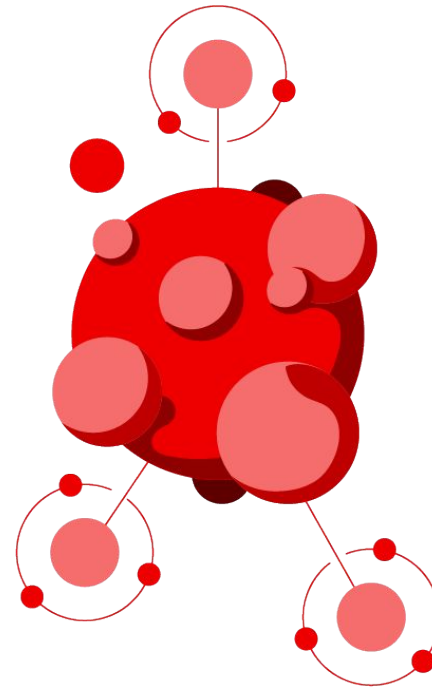
[@RobertBohne](https://twitter.com/RobertBohne)

LinkedIn

<https://www.linkedin.com/in/robertbohne/>

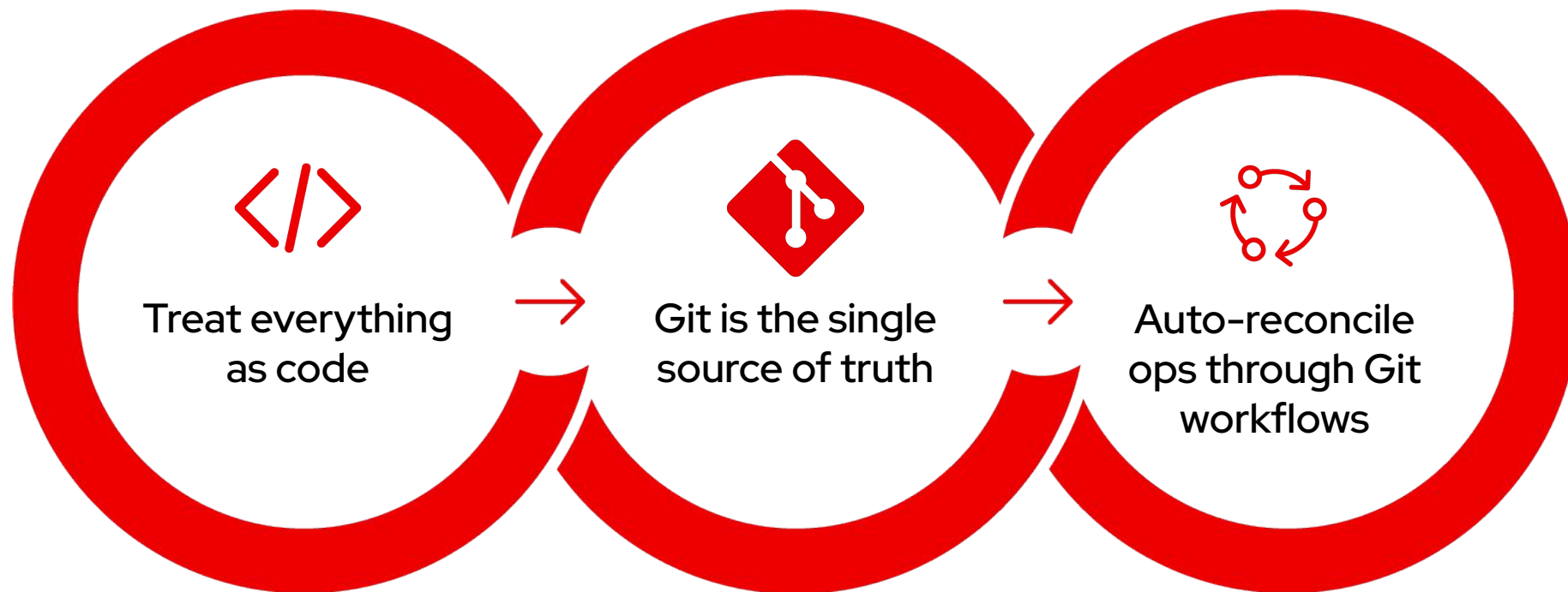
From Zero to Hero!

Pipelines combined with **GitOps**



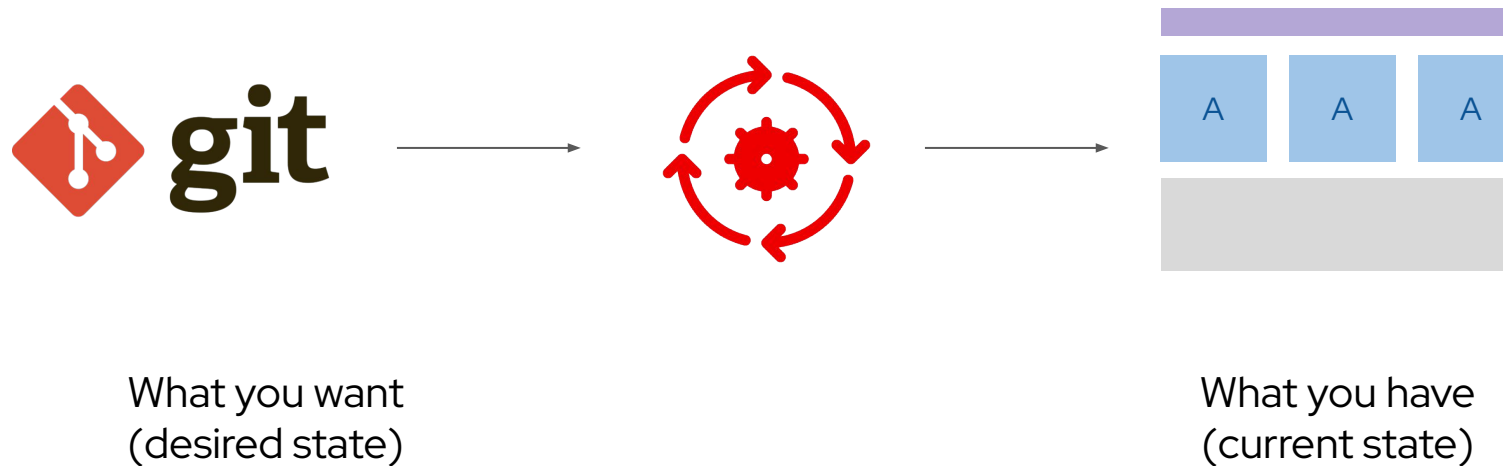
What is GitOps?

What is GitOps?



GitOps Workflow

a declarative approach to application delivery



Why GitOps?

Standard Workflow

Familiar tools and Git workflows from application development teams

Visibility and Audit

Capturing and tracing any change to clusters through Git history

Enhanced Security

Review changes beforehand, detect configuration drifts, and take action

Multi-cluster consistency

Reliably and consistently configure multiple Kubernetes clusters and deployment

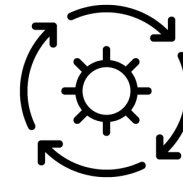
GitOps Principles



The system is
described
declaratively



The desired state is
versioned in Git

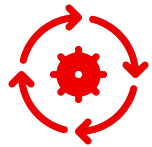


Approved changes
can be applied
automatically



A controller exists to
detect and act on
drift

OpenShift GitOps



Multi-cluster config
management



Automated Argo CD
install and upgrade



Opinionated GitOps
bootstrapping



Deployments and
environments insights

Hands on

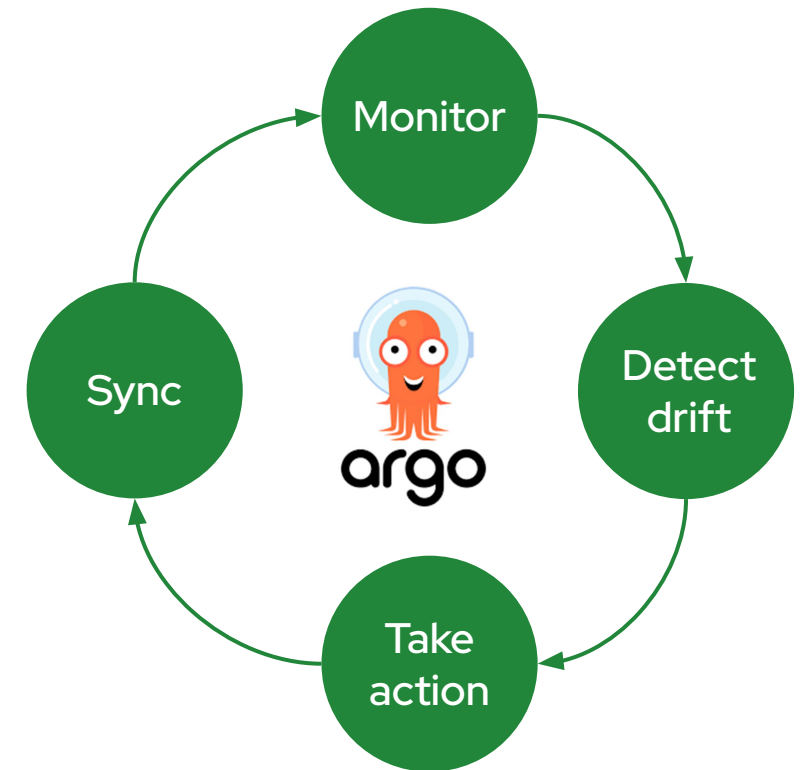
OpenShift
GitOps



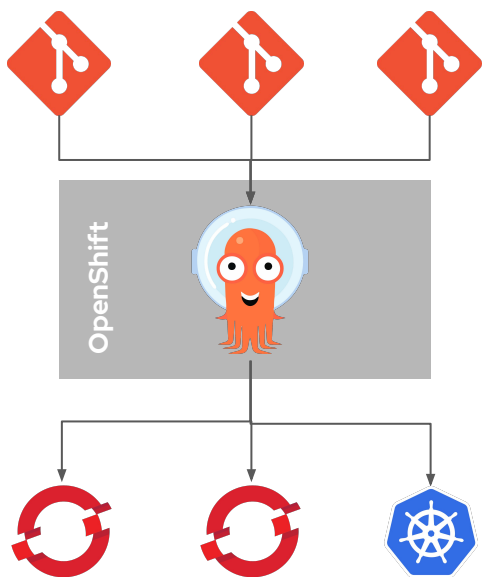
Lab guide
GitOps Demo repo

Argo CD

- Cluster and application configuration versioned in Git
- Automatically syncs configuration from Git to clusters
- Drift detection, visualization and correction
- Granular control over sync order for complex rollouts
- Rollback and roll forward to any Git commit
- Manifest templating support (Helm, Kustomize, etc)
- Visual insight into sync status and history

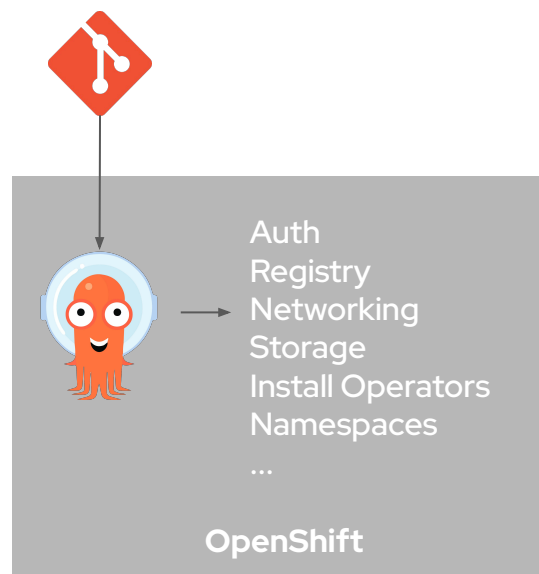


Flexible Deployment Strategies



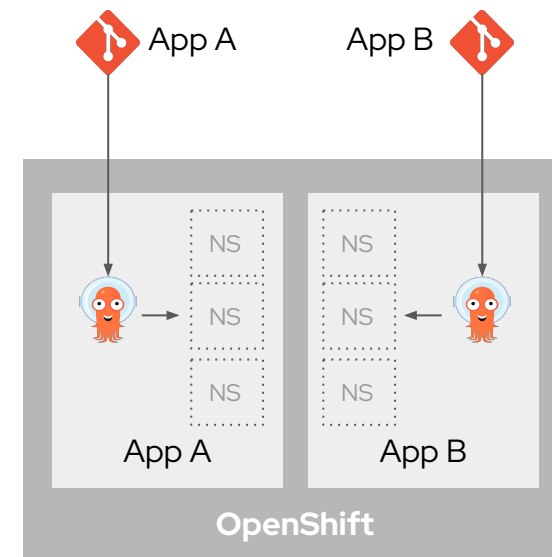
Central Hub (Push)

A central Argo CD pushes Git repository content to remote OpenShift and Kubernetes clusters



Cluster Scoped (Pull)

A cluster-scope Argo CD pulls cluster service configurations into the OpenShift cluster



Application Scoped (Pull)

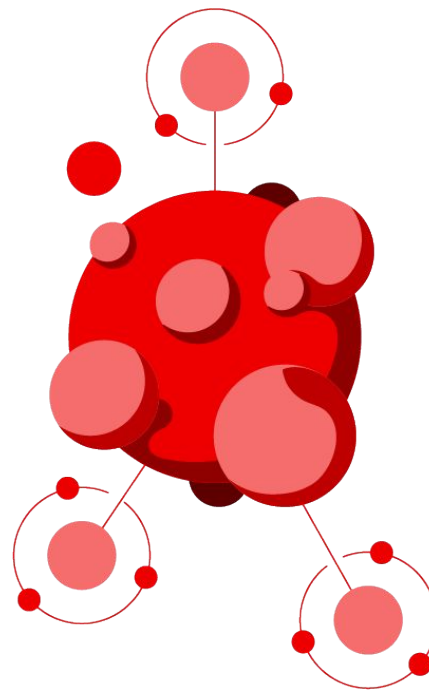
An application scoped Argo CD pulls application deployment and configurations into app namespaces

Questions?



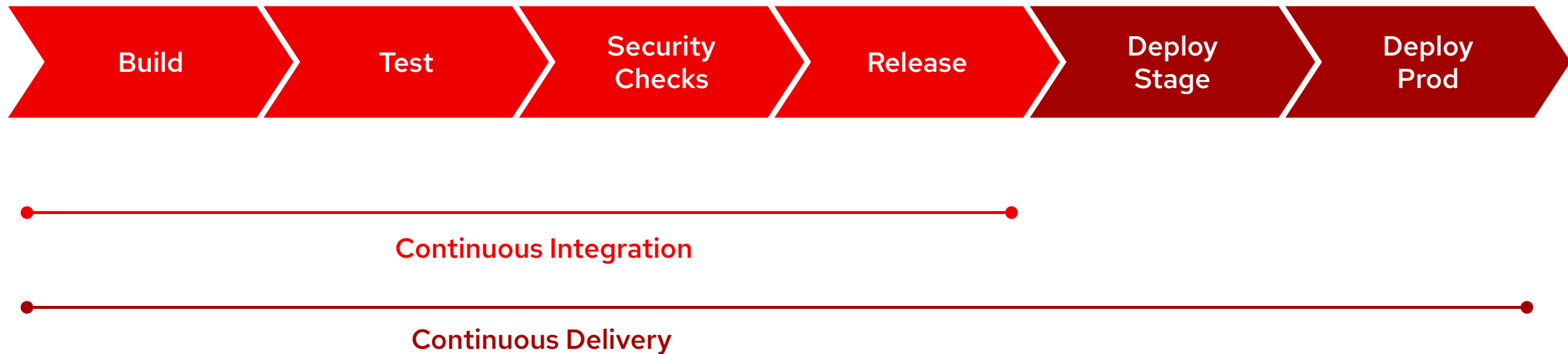
From Zero to Hero!

Pipelines combined with **GitOps**



What is a Pipeline?

Continuous Integration & Continuous Delivery



Why Pipeline?

OpenShift Pipelines



Built for Kubernetes

Cloud-native pipelines taking advantage of Kubernetes execution and , operational model and concepts



Scale on-demand

Pipelines run and scale on-demand in isolated containers, with repeatable and predictable outcomes



Secure pipeline execution

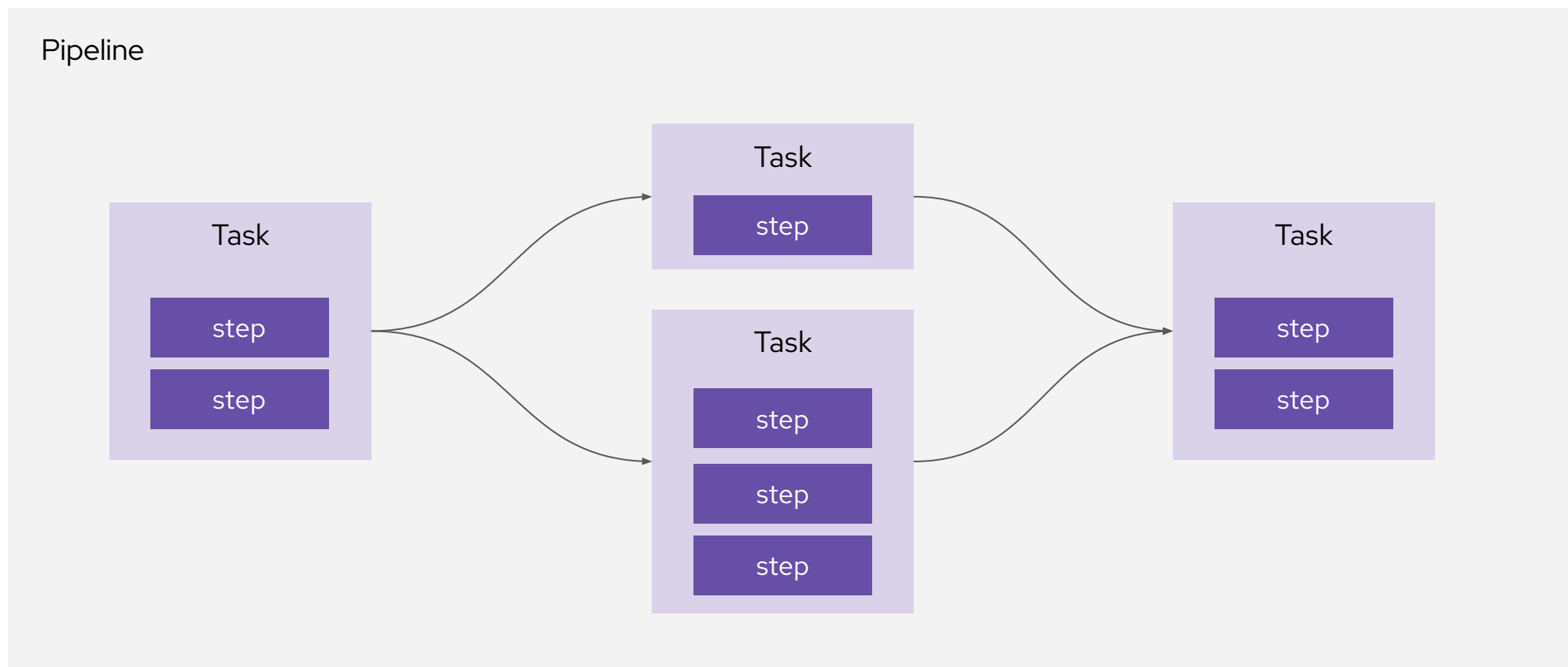
Kubernetes RBAC and security model ensures security consistently across pipelines and workloads



Flexible and powerful

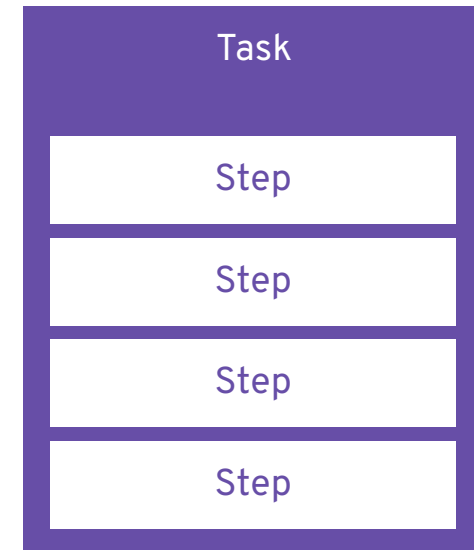
Granular control over pipeline execution details on Kubernetes, to support your exact requirements

Pipeline Concepts



Task

- Defines a unit of work to be executed
- A list of steps to run sequentially
- Step containers run in the task pod
- Has inputs, outputs and parameters
- Workspaces and results for sharing data
- Can run independent of pipelines



Example Tasks: Maven Install, AWS CLI, Kubectl Deploy, Security Scan, etc

Tekton Hub

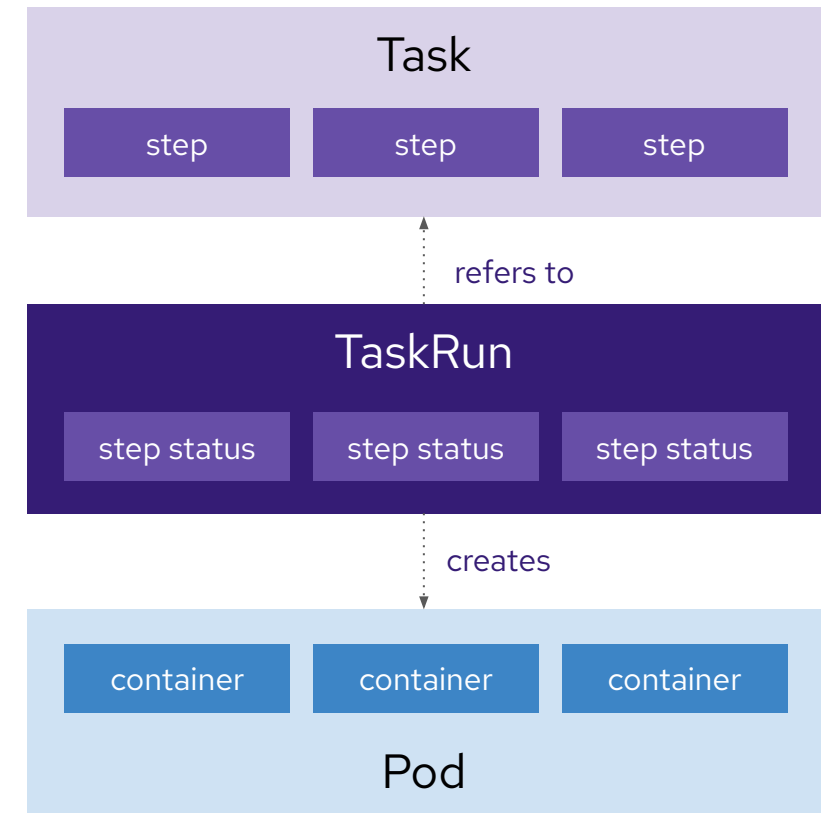
Search, discover and
install Tekton Tasks

The screenshot shows the Tekton Hub (BETA) interface. At the top, there's a header with the Tekton Hub logo and a 'Login' button. Below the header, a 'Welcome to Tekton Hub' message is displayed, followed by the tagline 'Discover, search and share reusable Tasks and Pipelines'. The main content area features a search bar and a 'Sort' dropdown menu. On the left, there's a 'Refine By' section with filters for 'Kind' (Task, Pipeline), 'Support Tier' (Official, Verified, Community), and 'Categories' (Build Tools, CLI, Cloud, Deploy, Image Build, Notification, Others, Test Framework). The main grid displays eight task cards, each with a title, description, version, update date, and tags. The tasks shown are: Ansible Runner (4.5 stars, v0.1, updated 3 weeks ago, cli tag), ansible tower cli (2.0 stars, v0.1, updated 3 weeks ago, ansible cli tags), argocd (3.0 stars, v0.1, updated 3 weeks ago, deploy tag), aws cli (5.0 stars, v0.1, updated 3 weeks ago, cli tag), Amazon ECR Login (4.0 stars, v0.1, updated 3 weeks ago, aws ecr tags), azure cli (1.0 stars, v0.1, updated 4 months ago, cli tag), bentoml (0.0 stars, v0.1, updated 3 weeks ago, cli tag), and Python Black (0.0 stars, v0.1, updated 3 weeks ago, formatter python tags).

Task Name	Stars	Version	Updated	Tags
Ansible Runner	4.5	v0.1	3 weeks ago	cli
ansible tower cli	2.0	v0.1	3 weeks ago	ansible, cli
argocd	3.0	v0.1	3 weeks ago	deploy
aws cli	5.0	v0.1	3 weeks ago	cli
Amazon ECR Login	4.0	v0.1	3 weeks ago	aws, ecr
azure cli	1.0	v0.1	4 months ago	cli
bentoml	0.0	v0.1	3 weeks ago	cli
Python Black	0.0	v0.1	3 weeks ago	formatter, python

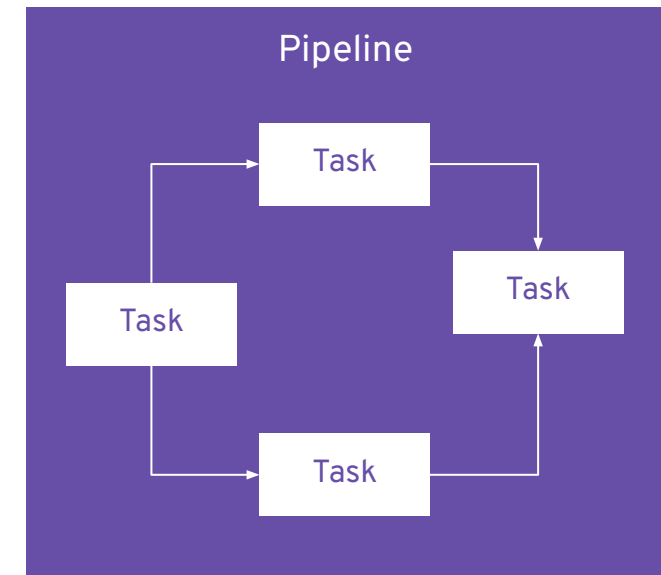
TaskRun

- Runs a Task to completion in a pod
- References or embeds a Task spec
- Provides input to Tasks
 - Parameters
 - Resources
 - Service account
 - Workspaces
- Contains execution status and metadata

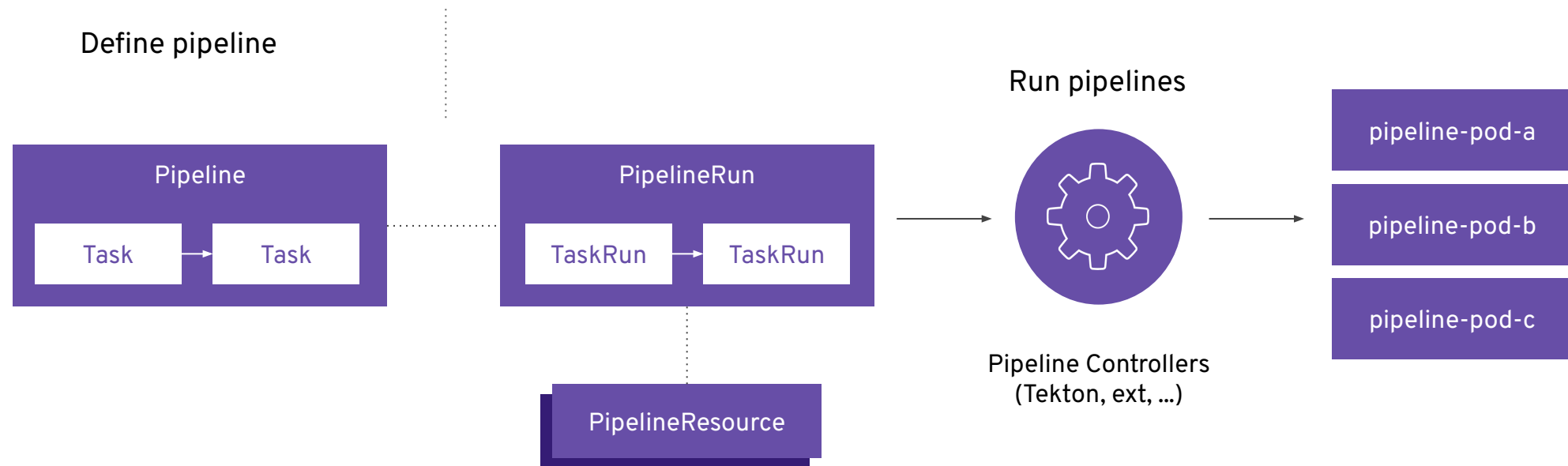


Pipeline

- Define Tasks execution order (graph)
- Inputs and parameters
- Retries tasks
- Conditional task execution
- Workspaces for sharing data between tasks
- Reusable across projects

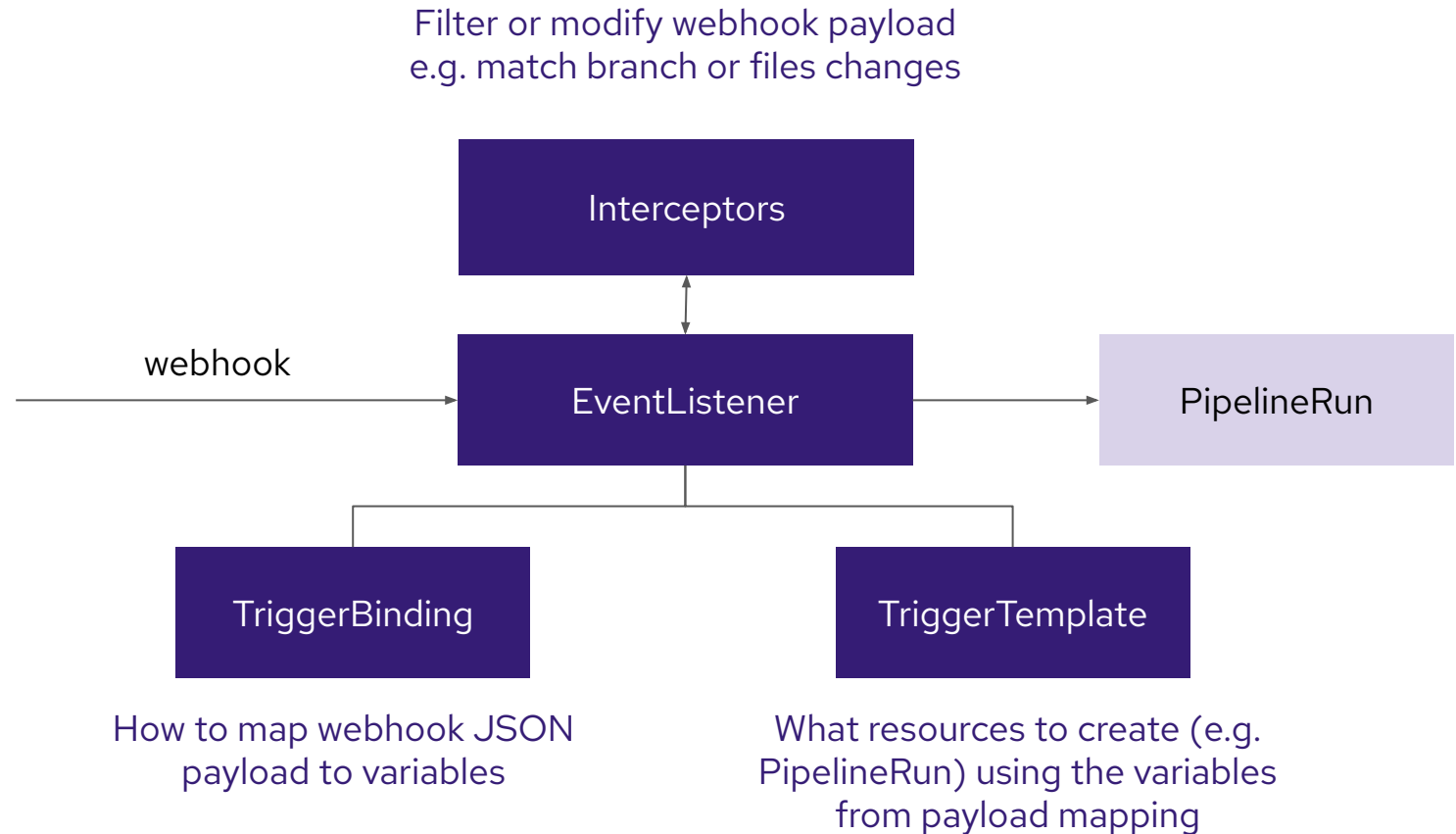


OpenShift Pipelines Architecture



Triggers

Run pipelines based on events like HTTP webhooks on commit, pull request, etc



Hands on

OpenShift
Pipelines



Lab guide
Demo Application

Continuous Integration & Continuous Delivery



OpenShift Pipelines

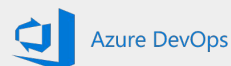
Kubernetes-native
on-demand delivery
pipelines



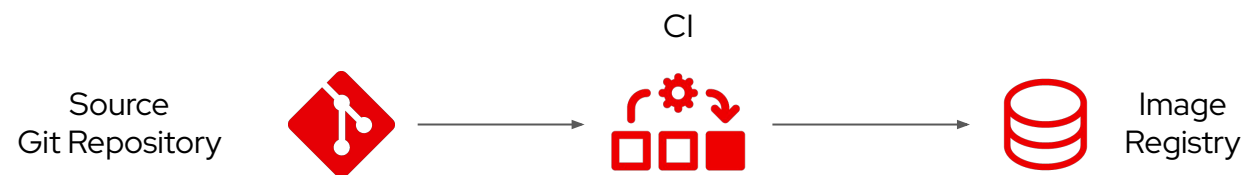
OpenShift GitOps

Declarative GitOps for
multi-cluster continuous
delivery

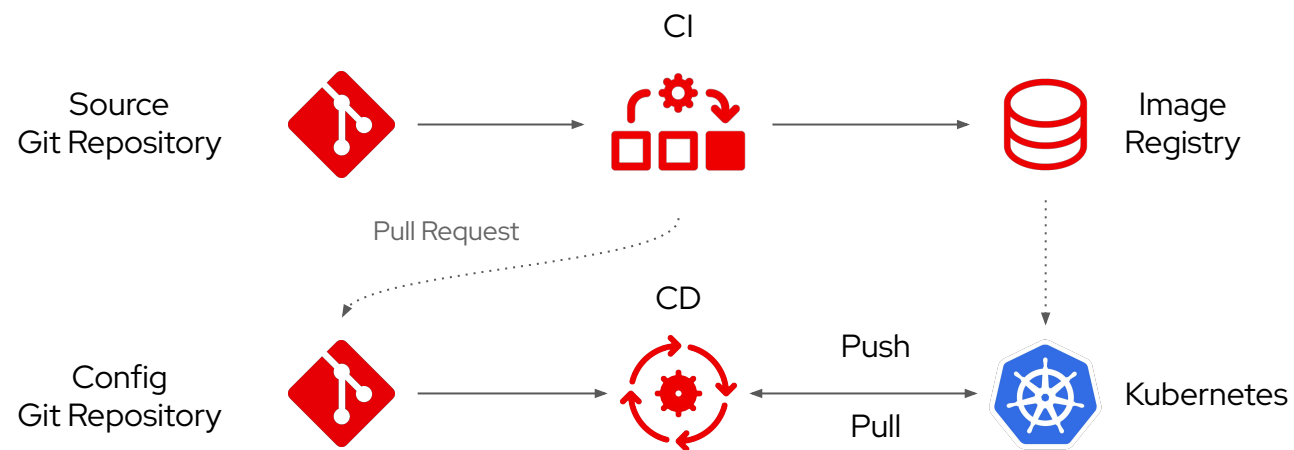
Ecosystem
Integrations



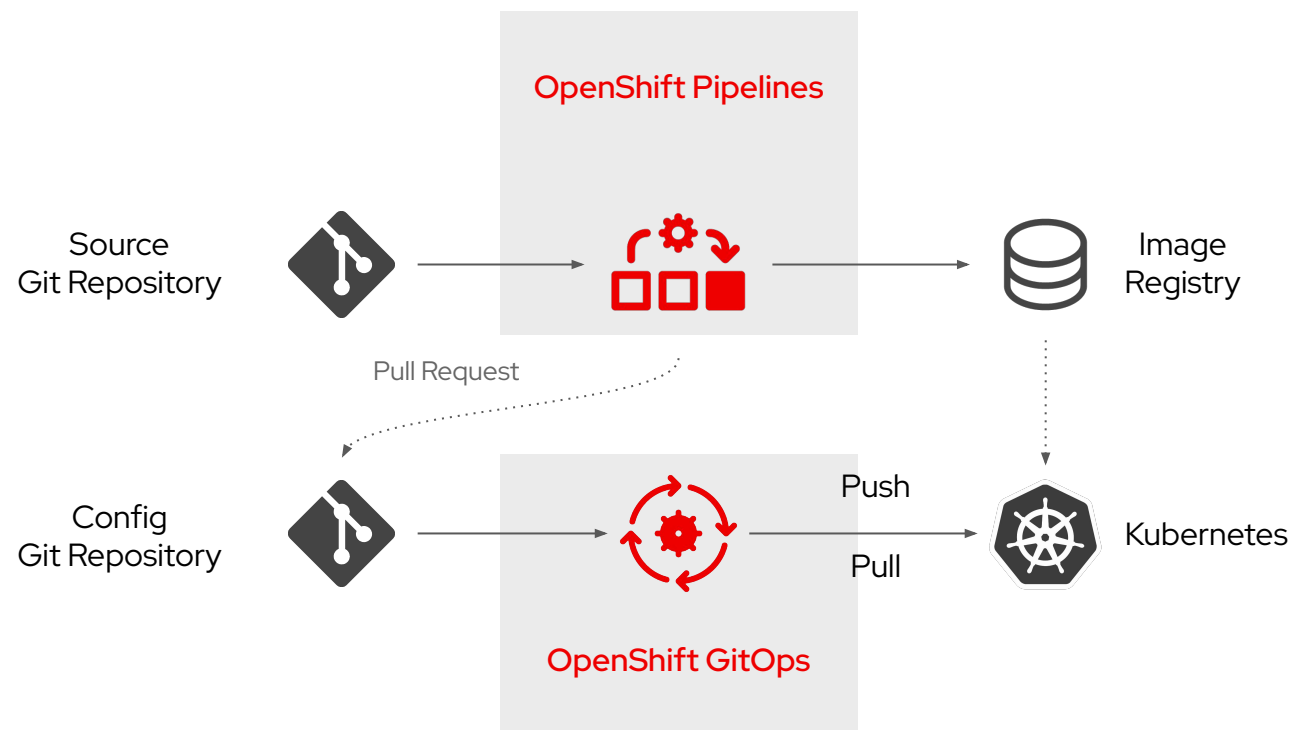
Application Delivery Model



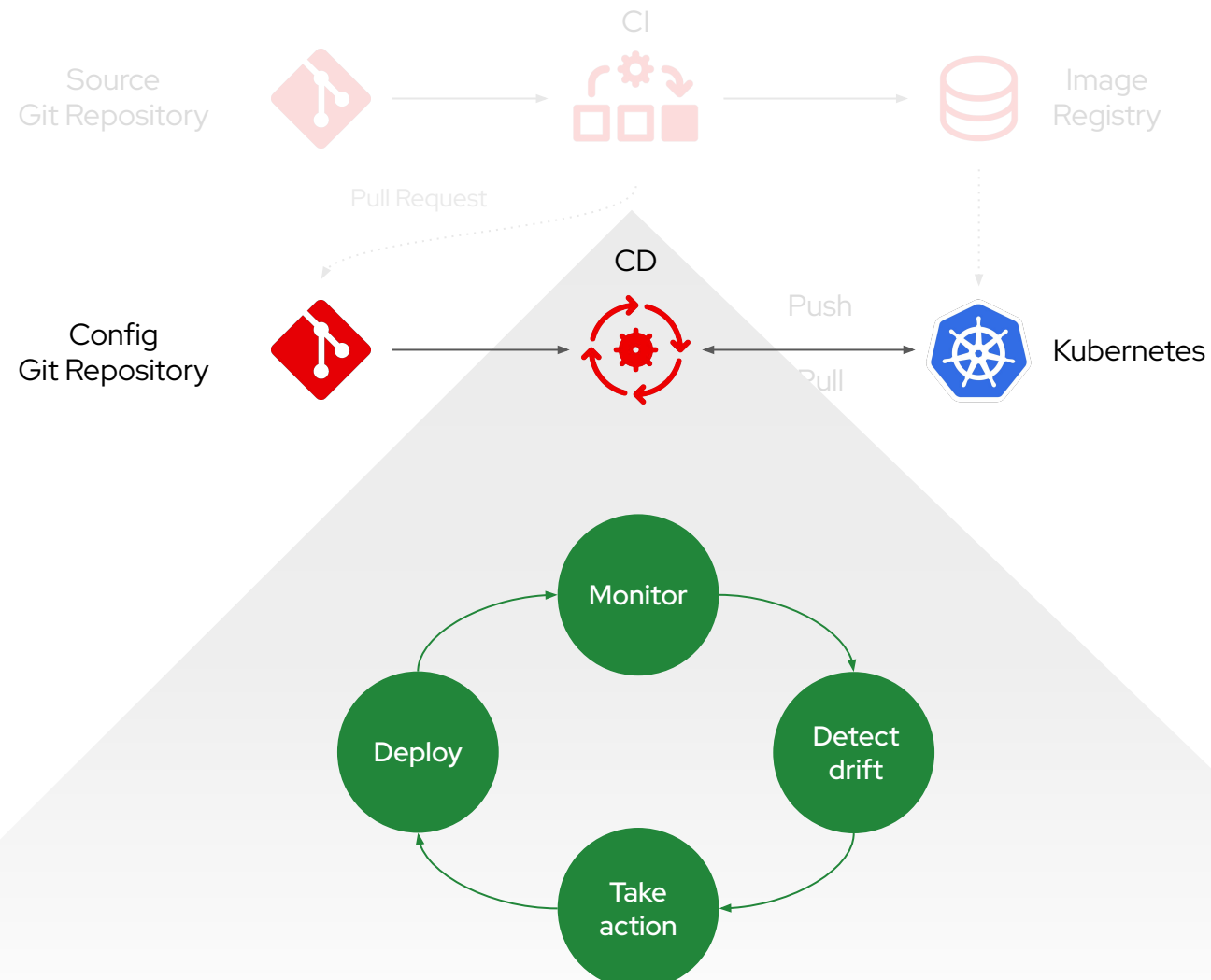
Application Delivery Model



Application Delivery Model



Application Delivery Model

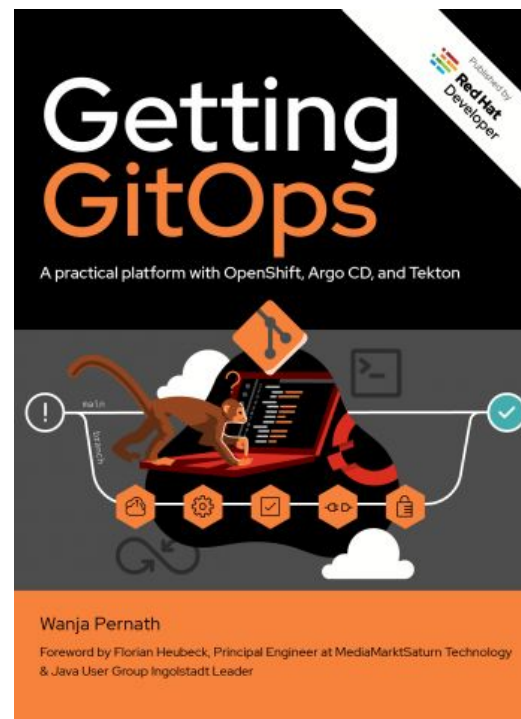
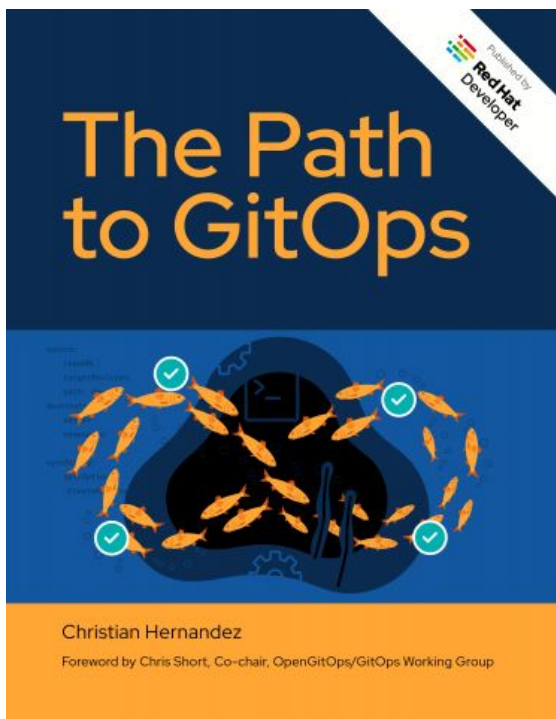


Questions?

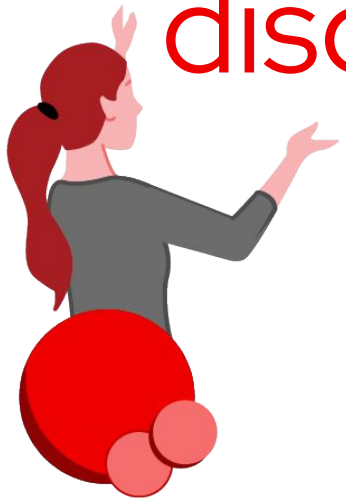




Books



What we discussed today



- ▶ OpenShift GitOps
 - Git is the single source of truth
- ▶ OpenShift Pipelines
 - From Source code to deployment and more
- ▶ Application Delivery Model
 - Combined both together

Thank you