# Evolving a continuous delivery workflow to Kubernetes using Spinnaker

by Øyvind Ingebrigtsen Øvergaard & Gard Rimestad

@oyvindio @gardleopard


KubeCon + CloudNativeCon Europe 2018

# Our challenge

**1000+** developers across ~**100** organizations

High level of autonomy

Duplication of efforts

Varying continuous delivery maturity level

Central product & tech org to drive convergence

# Our mission:  Promote CD and build infrastructure to support it

Deploy delta as small as possible

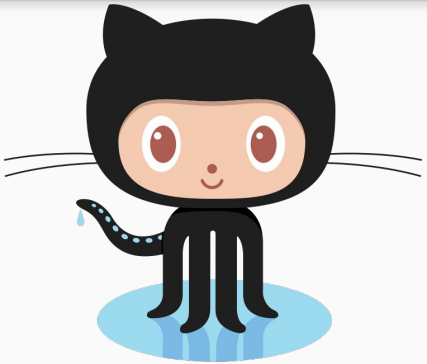
Quick bootstrapping

Cheap maintenance

Standardised infrastructure footprint

Transparency

# Our golden path for deploying applications




# What is Spinnaker

spinnaker
*noun*
plural noun: **spinnakers**

- a large three-cornered sail, typically bulging when full, set forward of the mainsail of a racing yacht when running before the wind.

- https://spinnaker.io
- Amazon, GCP, GAE, k8s, OpenStack …
- Key strength: pipeline orchestration engine

# DCD PAAS V2 deploy

stage durations | Configure

**BUILD #463**
**TRAVIS**
3 minutes ago

Type docker
Artifact spt-infrastructure/d
Version 833b5a0f24be50c8c

Type paas-app-config
Artifact delivery-dev-paas
Version 0.463.3346771

Type paas-app-config
Artifact delivery-pre-paas
Version 0.463.3346771

Type paas-app-config
Artifact delivery-pro-paas
Version 0.463.3346771

Type spinnaker-pac
Artifact pipeline
Version 0.463.3346771

Type deb
Artifact customdeck-config
Version 0.0.2.463.3346773

Type deb
Artifact deck-schibsted
Version 0.0.2.463.3346773


Duration: 03:14

DEPLOYWITHFIAASV2: DEPLOYDEV

- Build manifest for delivery-dev namespace
- Deploy manifest to delivery-dev
- Deployment status for delivery-dev namespace

deployWithFiaasV2: deployDev → deployWithFiaasV2: deployPre → Deploy to production → **deployWithFiaasV2: deployPro: Deploy manifest to delivery-pro**

**STAGE DETAILS: DEPLOY MANIFEST TO DELIVERY-PRO**

Duration: 00:29

| Step | Started | Duration | Status |
|---|---|---|---|
| Deploy manifest to delivery-pro | 2018-05-01 13:22:34 CEST | 00:29 | RUNNING |

**DEPLOY MANIFEST TO DELIVERY-PRO**

Deploy Status | **Task Status**

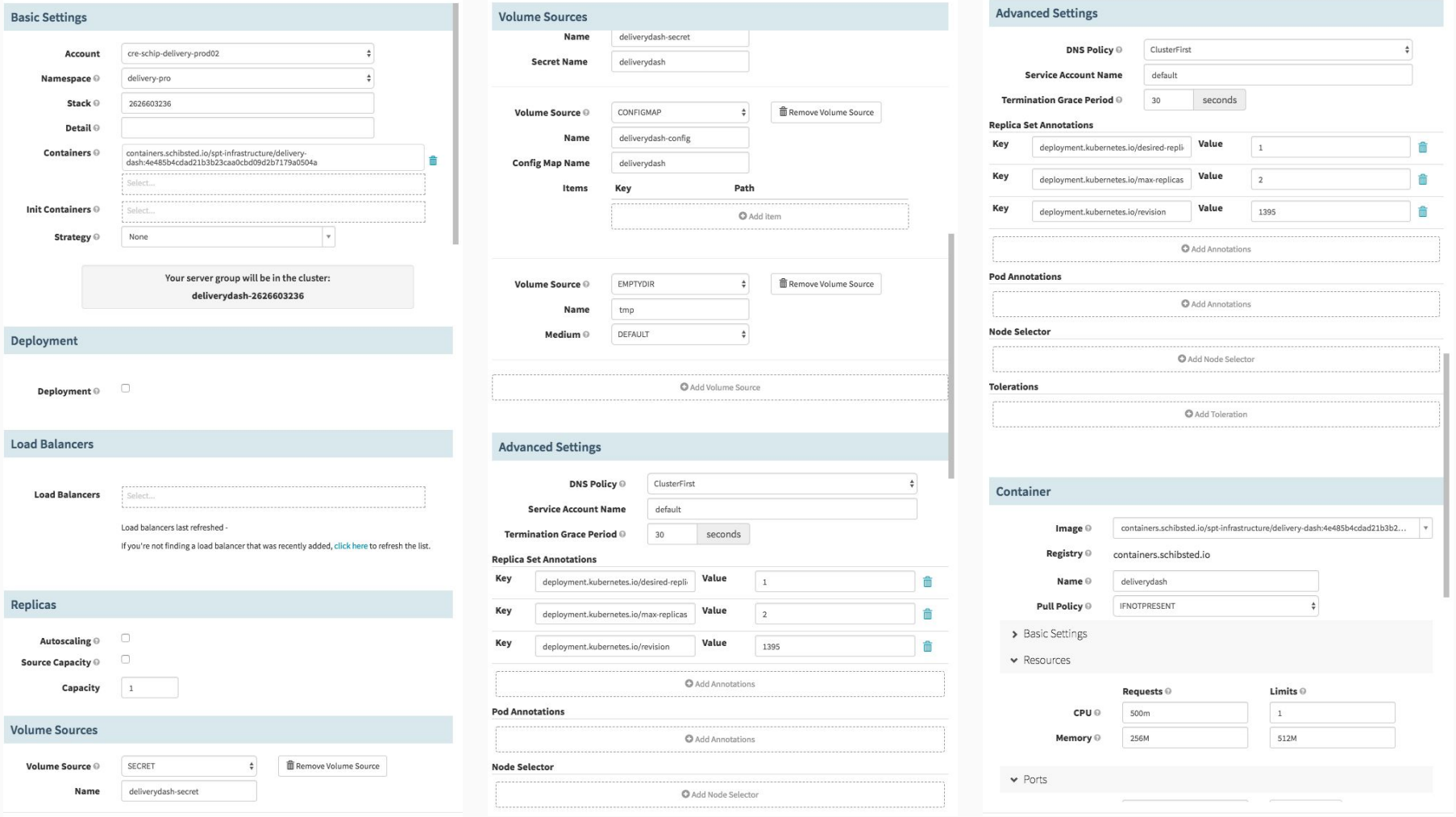
| Task | Duration |
|---|---|
| Deploy Manifest | 00:00 |
| Monitor Deploy | 00:05 |
| Promote Outputs | 00:00 |
| Force Cache Refresh | 00:11 |
| Wait For Manifest To Stabilize | - |
| Bind Produced Artifacts | - |

Source | Permalink

# First iteration of k8s deployments

Spinnaker v1 k8s provider:

- Spinnaker concepts applied to k8s objects
- Many settings to tweak
- Hard to manage
- Unique deployment stages



## Basic Settings

Account: cre-schip-delivery-prod02
Namespace: delivery-pro
Stack: 2626603236
Detail:
Containers: containers.schibsted.io/spt-infrastructure/delivery-dash:4e485b4cdad21b3b23caa0cbd09d2b7179a0504a
Init Containers: Select...
Strategy: None

Your server group will be in the cluster:
**deliverydash-2626603236**

## Deployment

Deployment:

## Load Balancers

Load Balancers: Select...

Load balancers last refreshed -

If you're not finding a load balancer that was recently added, click here to refresh the list.

## Replicas

Autoscaling:
Source Capacity:
Capacity: 1

## Volume Sources

Volume Source: SECRET — Remove Volume Source
Name: deliverydash-secret

## Volume Sources

Name: deliverydash-secret
Secret Name: deliverydash

Volume Source: CONFIGMAP — Remove Volume Source
Name: deliverydash-config
Config Map Name: deliverydash
Items: Key | Path
Add item

Volume Source: EMPTYDIR — Remove Volume Source
Name: tmp
Medium: DEFAULT

Add Volume Source

## Advanced Settings

DNS Policy: ClusterFirst
Service Account Name: default
Termination Grace Period: 30 seconds

Replica Set Annotations

| Key | Value |
|---|---|
| deployment.kubernetes.io/desired-repli | 1 |
| deployment.kubernetes.io/max-replicas | 2 |
| deployment.kubernetes.io/revision | 1395 |

Add Annotations

Pod Annotations
Add Annotations

Node Selector
Add Node Selector

Tolerations
Add Toleration

## Advanced Settings

DNS Policy: ClusterFirst
Service Account Name: default
Termination Grace Period: 30 seconds

Replica Set Annotations

| Key | Value |
|---|---|
| deployment.kubernetes.io/desired-repli | 1 |
| deployment.kubernetes.io/max-replicas | 2 |
| deployment.kubernetes.io/revision | 1395 |

Add Annotations

Pod Annotations
Add Annotations

Node Selector
Add Node Selector

## Container

Image: containers.schibsted.io/spt-infrastructure/delivery-dash:4e485b4cdad21b3b2...
Registry: containers.schibsted.io
Name: deliverydash
Pull Policy: IFNOTPRESENT

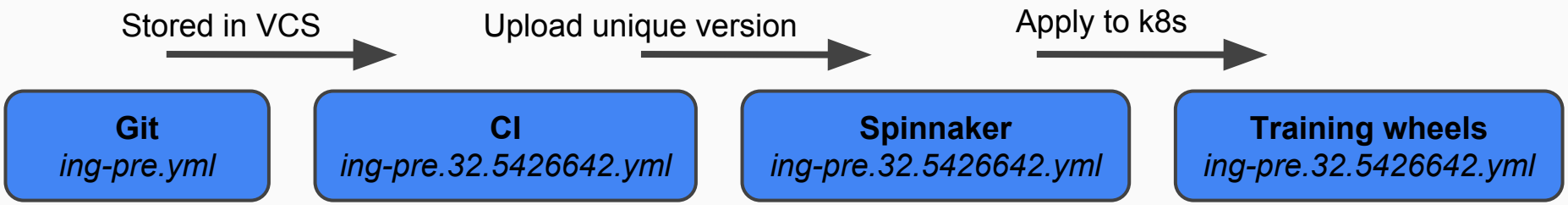
Basic Settings

Resources

| | Requests | Limits |
|---|---|---|
| CPU | 500m | 1 |
| Memory | 256M | 512M |

Ports

# Training wheels



# FIAAS — Opinionated deployment

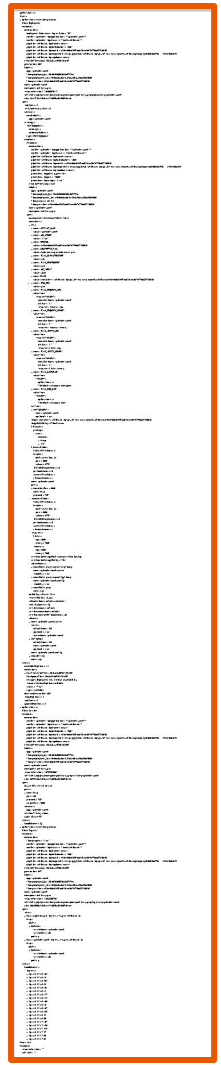
```
version: 3
replicas:
  minimum: 14
  maximum: 14
ingress:
  - host: example.com
metrics:
  prometheus:
    enabled: true
resources:
  limits:
    memory: 768M
    cpu: 800m
  requests:
    memory: 768M
    cpu: 800m
ports:
  - target_port: 9000
healthchecks:
  liveness:
    http:
      port: 9000
      path: /settings.js
```


HorizontalPod Autoscaler

Deployment

Service

Ingress



https://github.com/fiaas

# Pipelines as Code — declarative pipelines

No more pointing and clicking

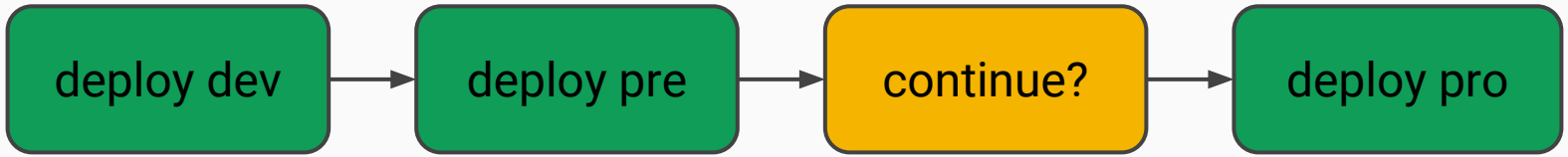
`pipeline.yml` - lives in application source repo

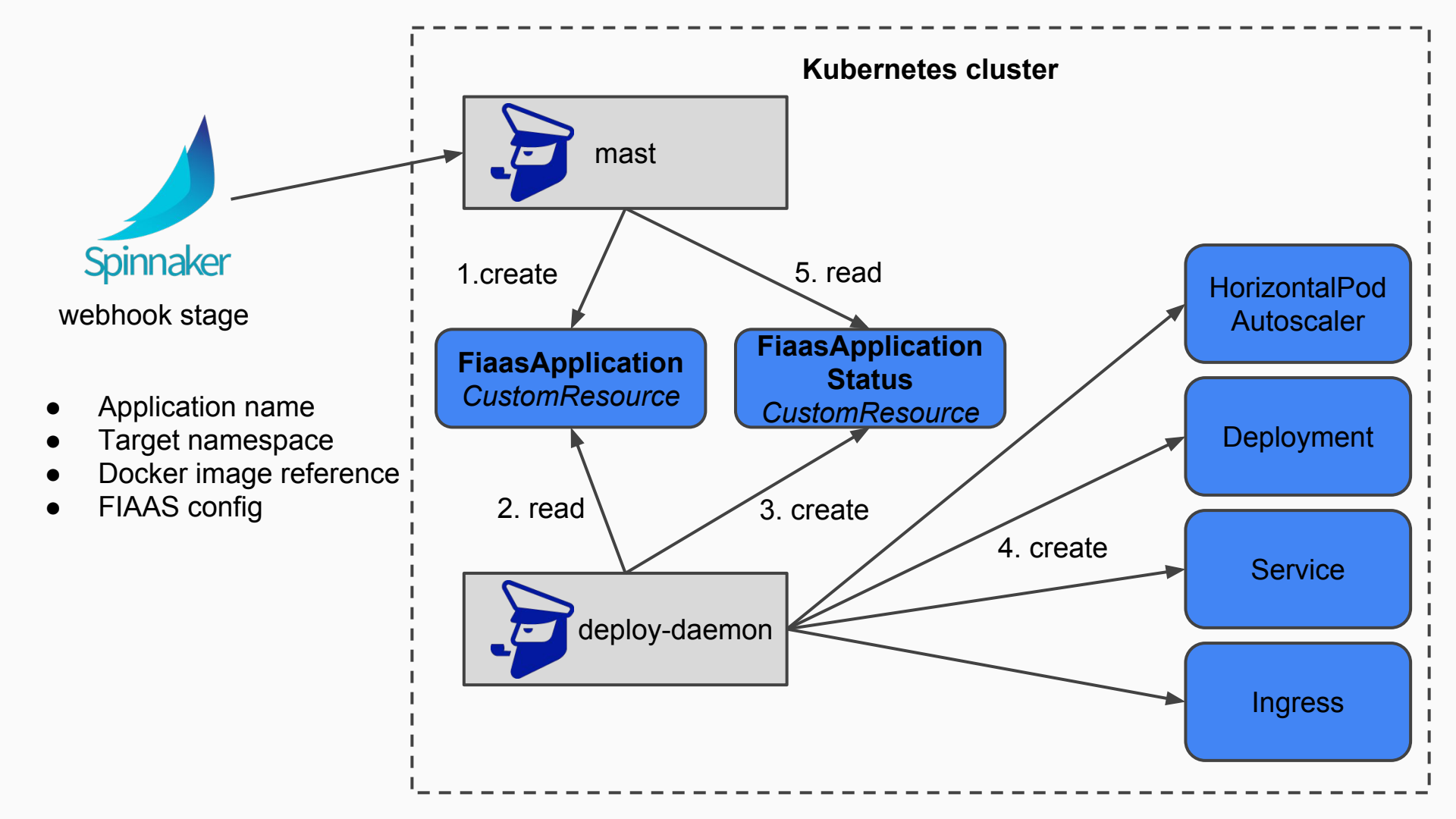
Version controlled pipeline definitions

Rollback across different pipeline configurations

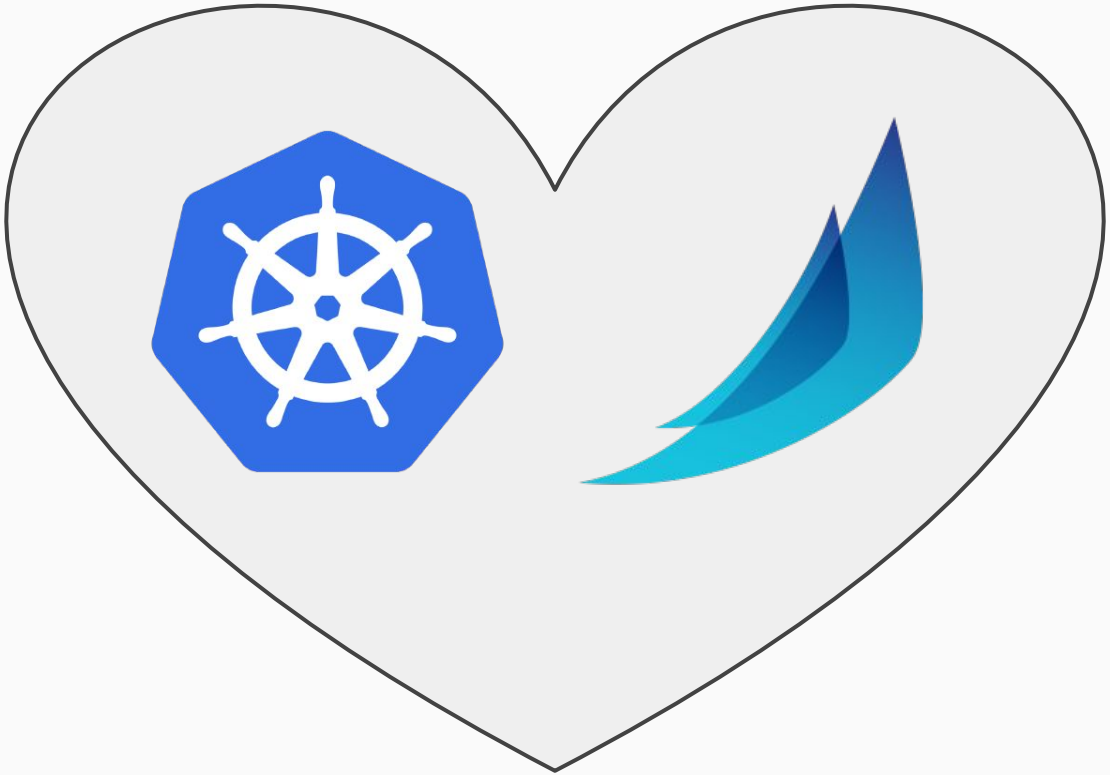
# **Templated** Pipelines as Code

```
schema: "1"
source: http://example.com/template.yml
metadata:
  name: "example"
  owner: "oyvind.ingebrigtsen.overgaard@schibsted.com"

variables:
  - name: namespacePrefix
    type: string
    defaultValue: delivery

  - name: includeManualJudgment
    type: boolean
    defaultValue: true
```




Kubernetes cluster
Spinnaker
webhook stage
mast
1.create
5. read
FiaasApplication
CustomResource
FiaasApplication
Status
CustomResource
HorizontalPod
Autoscaler
Deployment
Service
Ingress
2. read
3. create
4. create
deploy-daemon
Application name
Target namespace
Docker image reference
FIAAS config

# K8s v2 integration - manifest based deployments



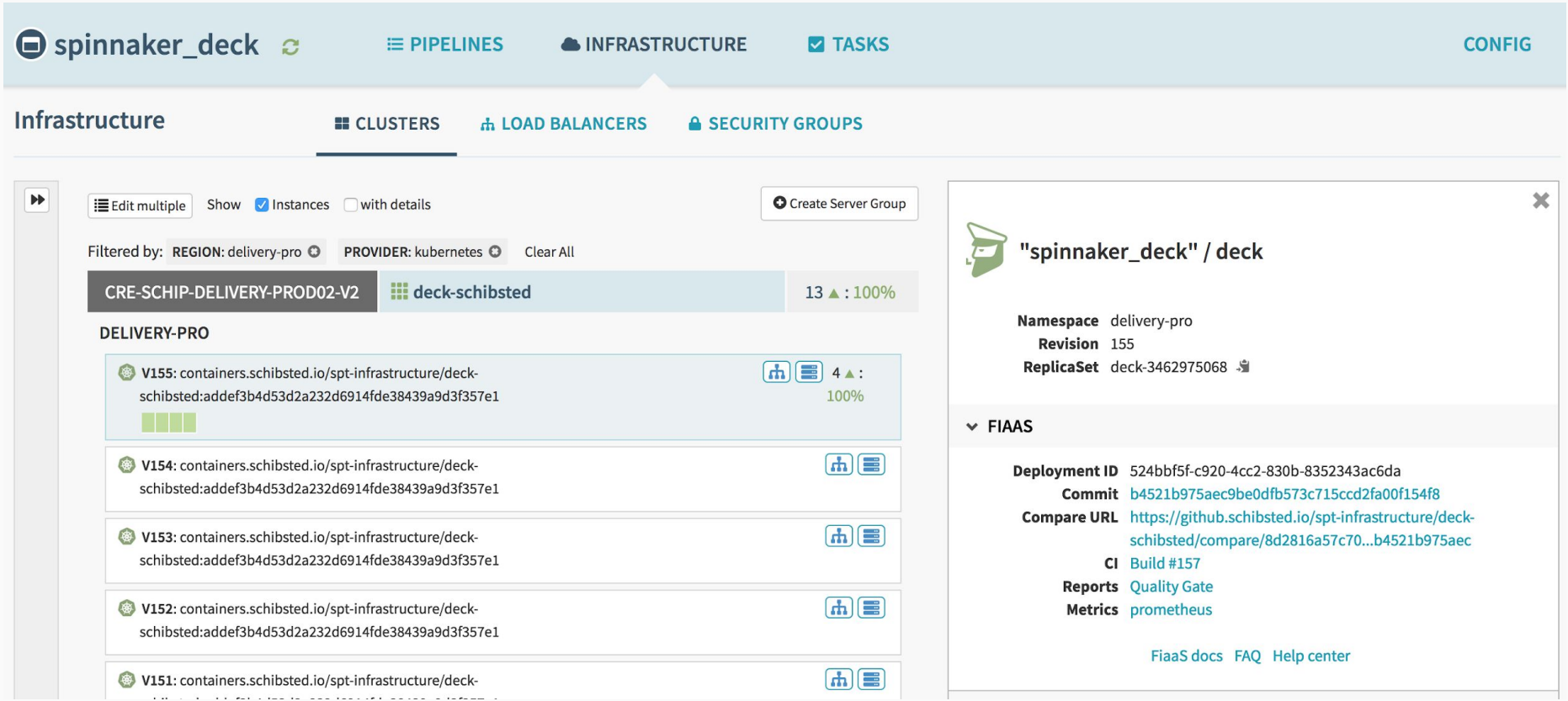
# FIAAS + Manifest based deployment

mast
generate

Spinnaker
upload manifest

mast
status

# Schibsted's custom Spinnaker UI



```
nyancat.details.html.spinnaker.io:
  "<img src='https://img.url/nyancat.gif'/>"
```

nginx-deployment-567b4
8bb49

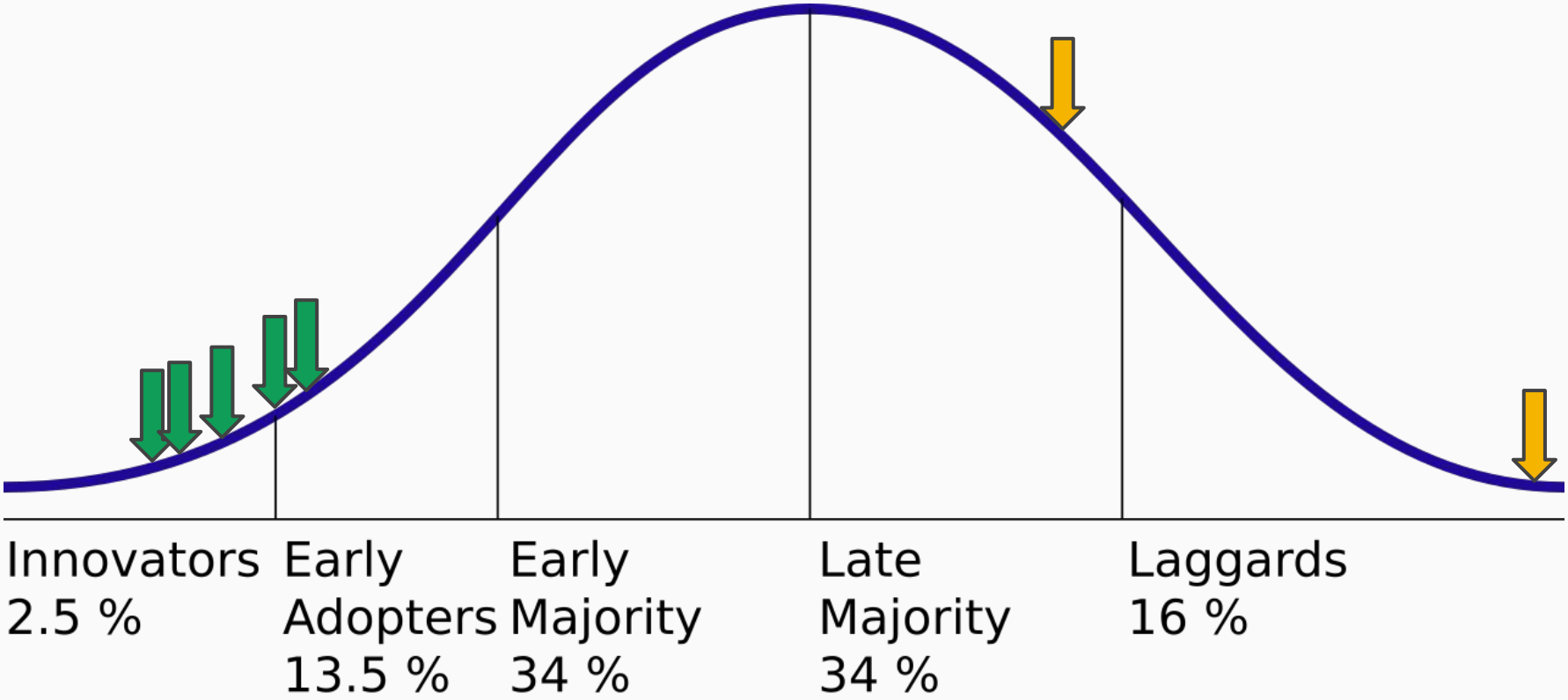
Server Group Actions

## INFORMATION

| | |
|---|---|
| **Created** | 2018-04-19 16:35:31 CEST |
| **Account** | SCHIP-DELIVERY-PROD01 |
| **Namespace** | delivery-dev |
| **Kind** | replicaSet |
| **Controller** | Deployment nginx-deployment |

## NYANCAT

# Current level of adoption for Kubernetes + Spinnaker



# Next steps

Refine opinionated abstractions with user feedback

Connecting tools together in Spinnaker UI

Single entrypoint for configuring CD; build, pipeline and deployment

Abstract over storage; persistent disks, databases and queues

# Takeaways

Continuously improve your workflow

Opinionated systems facilitate development velocity

# Questions?

Gard Rimestad
@gardleopard / gard.rimestad@schibsted.com

Øyvind Ingebrigtsen Øvergaard
@oyvindio / oyvind.ingebrigtsen.overgaard@schibsted.com