Evolving a continuous delivery workflow to Kubernetes using Spinnaker

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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

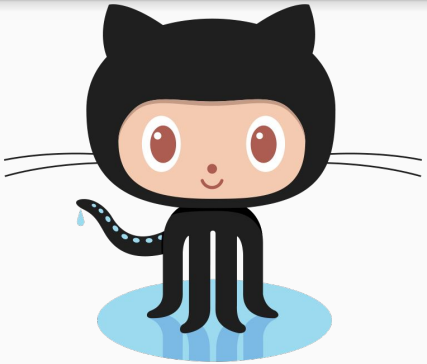
Quick bootstrapping

Cheap maintenance

Standardised infrastructure footprint

Transparency

Our golden path for deploying applications

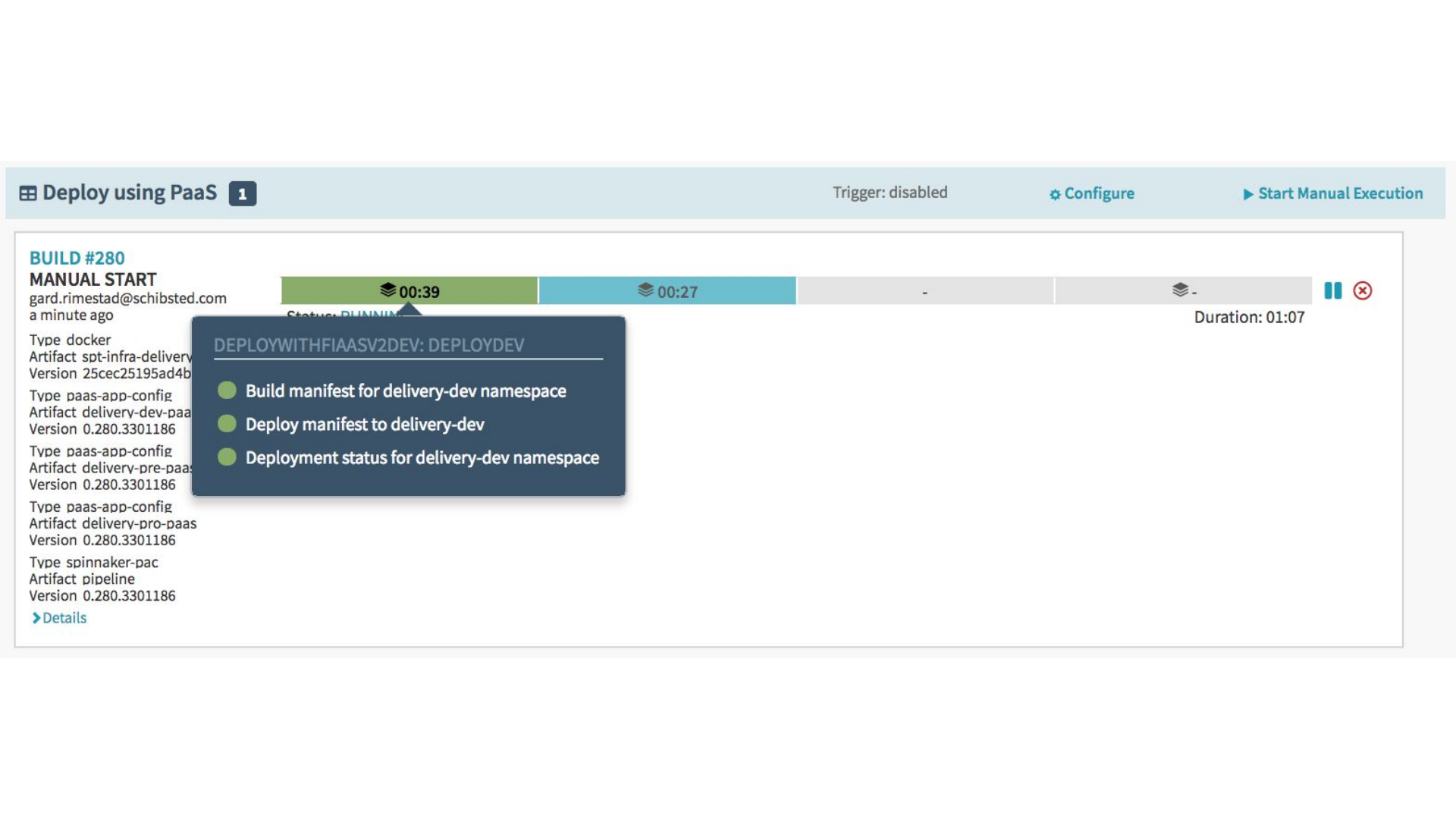


What is Spinnaker

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.

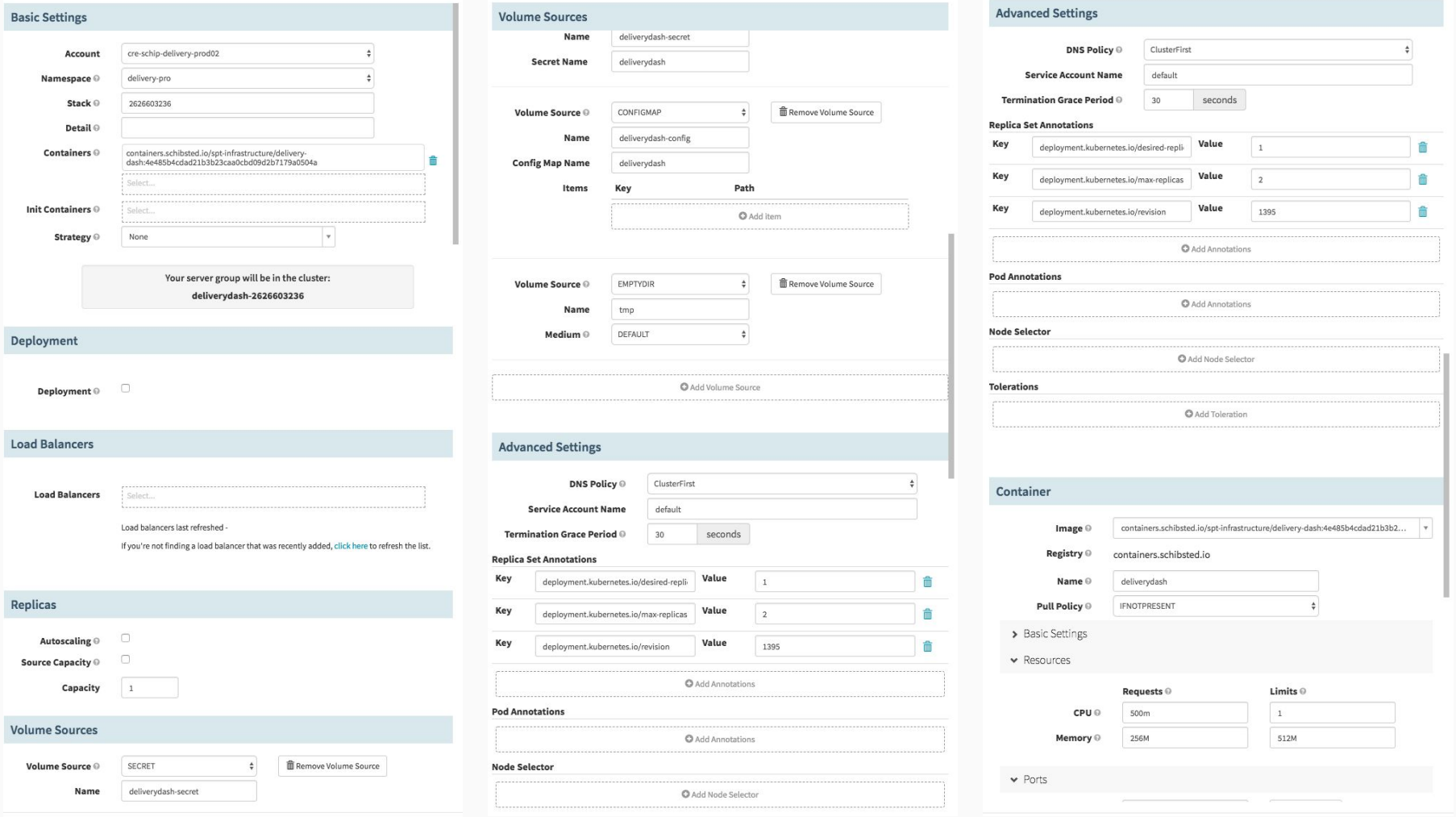
- https://spinnaker.io
- Amazon, GCP, GAE, k8s, OpenStack …
- Key strength: pipeline orchestration engine


Deploy using PaaS 1
Trigger: disabled
Configure
Start Manual Execution
BUILD #280
MANUAL START
gard.rimestad@schibsted.com
a minute ago
00:39
00:27
-
-
Duration: 01:07
DEPLOYWITHFIAASV2DEV: DEPLOYDEV
Build manifest for delivery-dev namespace
Deploy manifest to delivery-dev
Deployment status for delivery-dev namespace
Type docker
Artifact spt-infra-delivery
Version 25cec25195ad4b
Type paas-app-config
Artifact delivery-dev-paa
Version 0.280.3301186
Type paas-app-config
Artifact delivery-pre-paa
Version 0.280.3301186
Type paas-app-config
Artifact delivery-pro-paas
Version 0.280.3301186
Type spinnaker-pac
Artifact pipeline
Version 0.280.3301186
Details

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
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Replica Set Annotations

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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

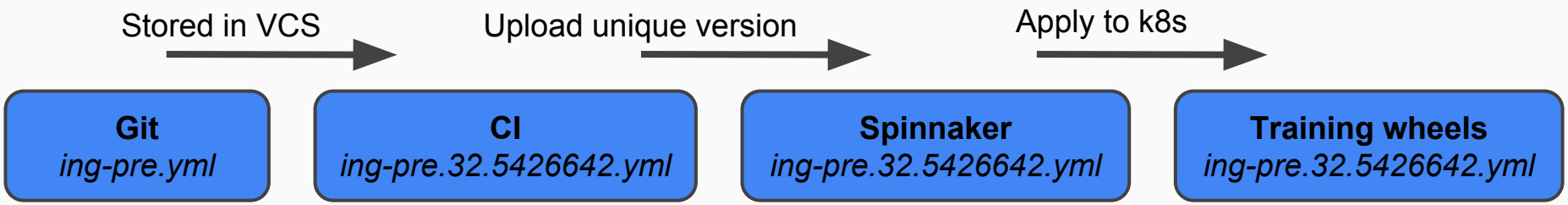
Basic Settings

Resources

	Requests	Limits
CPU	500m	1
Memory	256M	512M

Ports

Training wheels



FIAAS — Opinionated deployment

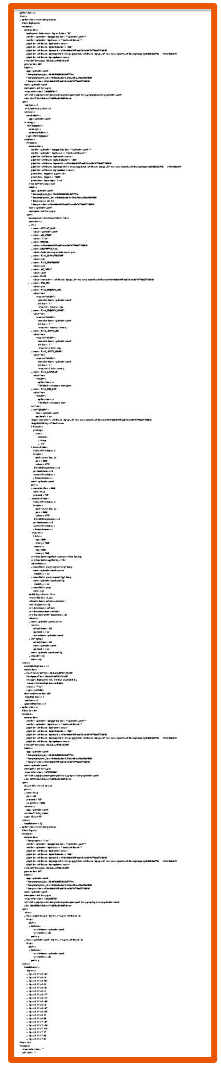
```
version: 3
replicas:
  minimum: 14
  maximum: 14
ingress:
  - host: ${INGRESS_DNS}
metrics:
  prometheus:
    enabled: true
resources:
  limits:
    memory: 768M
    cpu: 800m
  requests:
    memory: 768M
    cpu: 800m
ports:
  - target_port: 9000
healthchecks:
  liveness:
    http:
      port: 9000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

HorizontalPod Autoscaler

Deployment

Service

Ingress

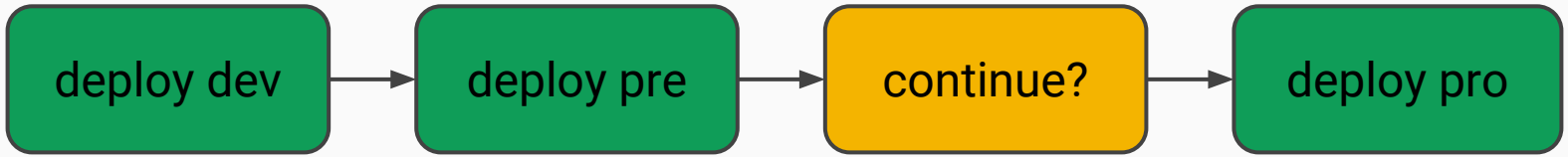


https://github.com/fiaas

Templated Pipelines as Code

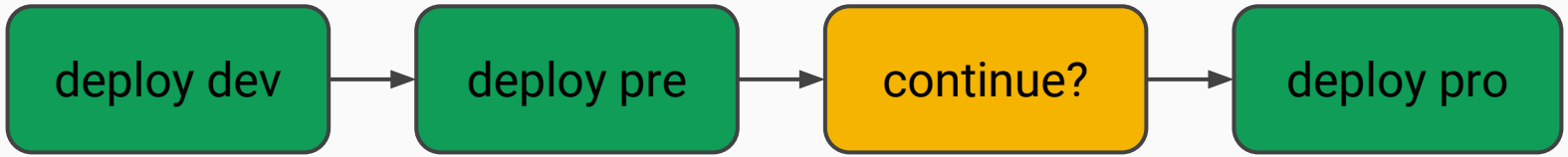
Provide a set of pipeline templates configured by

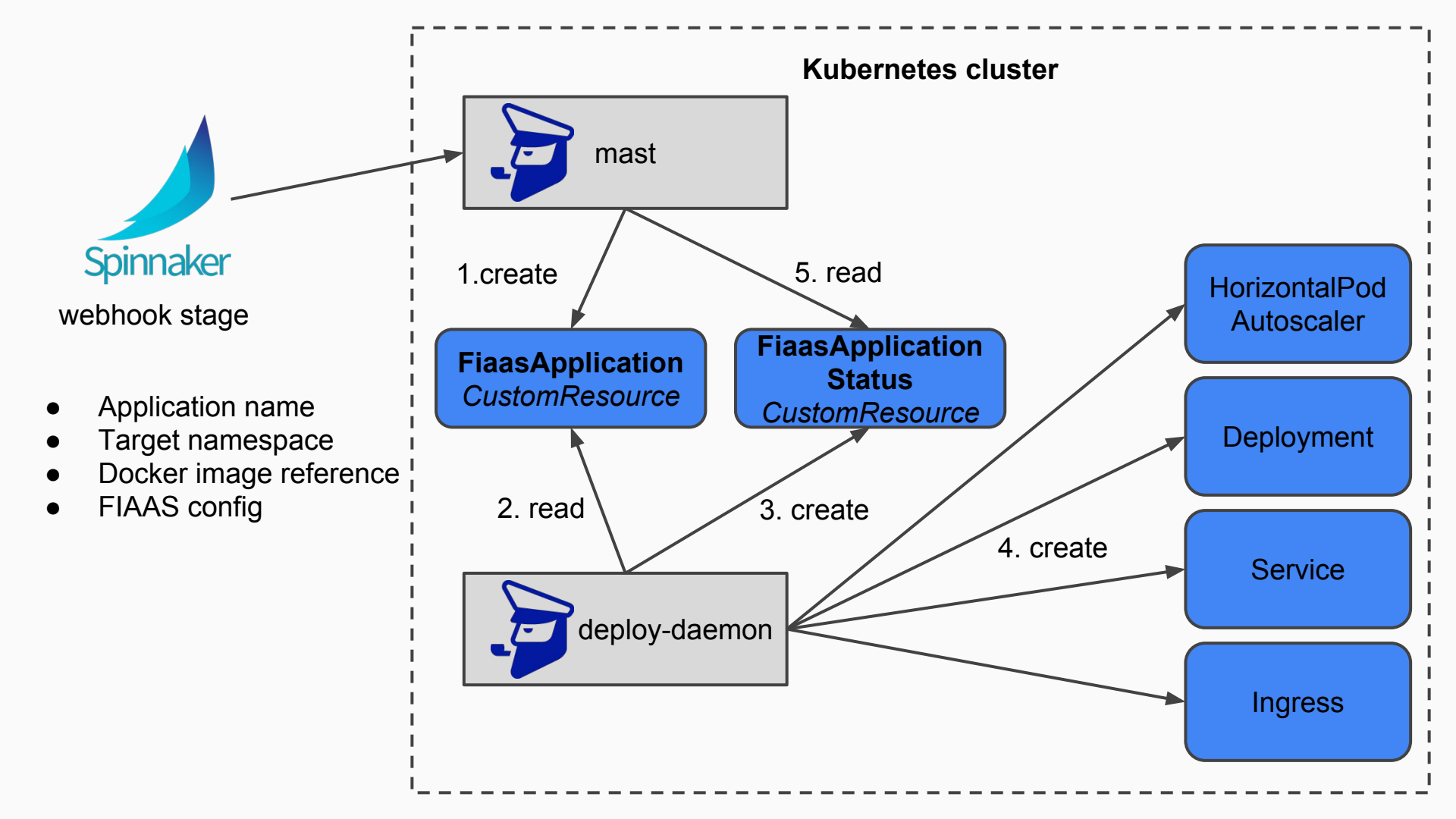
- Parent template URI
- Application name
- Namespaces to deploy to
- (+ a handful of optional settings)



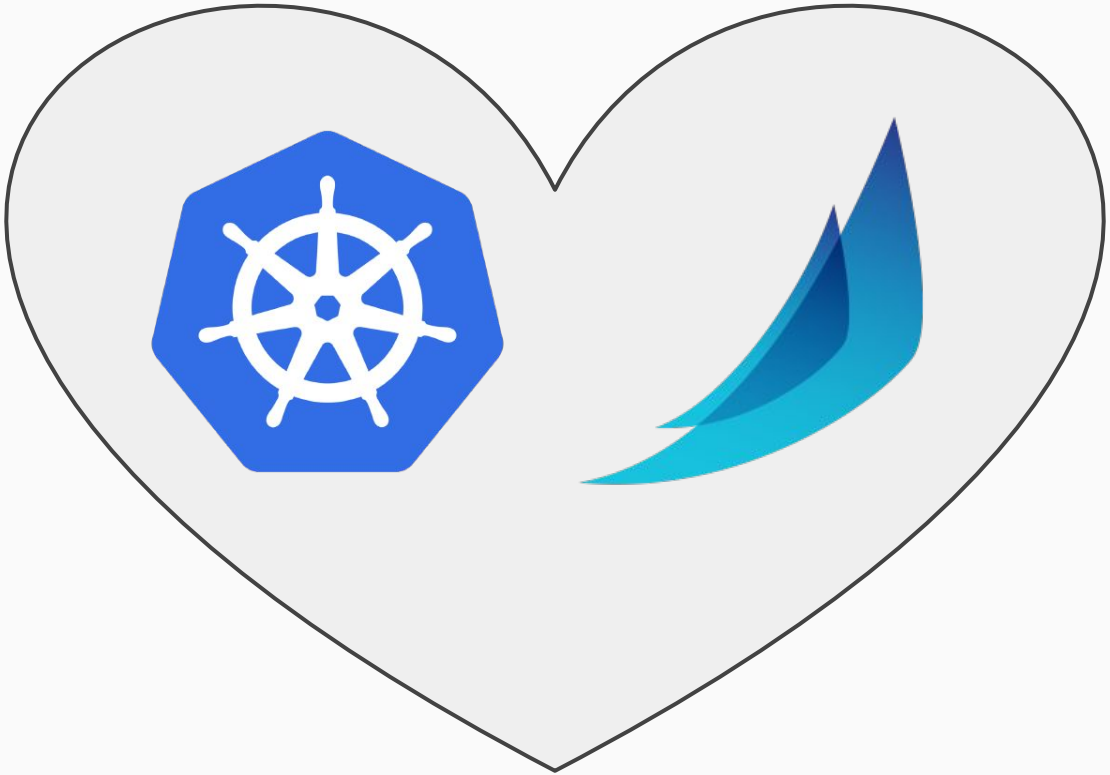
Templated Pipelines as Code

```
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

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

Clusters

Edit multiple | Show | Instan

Filtered by: PROVIDER: kubernetes

CRE-SCHIP-DELIVERY-PROD02-V2 | deck

DELIVERY-DEV

containers.schibsted.io/spt-infrastructure/d
V056:schibsted:2ceddc580a3a950c964e20a4c60al

containers.schibsted.io/spt-infrastructure/d
V055:schibsted:ae49d90c2b28e51dcaa5d6f78471

containers.schibsted.io/spt-infrastructure/d
V054:schibsted:97a157383768aa7ebf4e7cca6d3dt

containers.schibsted.io/spt-infrastructure/d
V053:schibsted:97a157383768aa7ebf4e7cca6d3dt

containers.schibsted.io/spt-infrastructure/d
V052:schibsted:97a157383768aa7ebf4e7cca6d3dt

containers.schibsted.io/spt-infrastructure/d
V051:schibsted:97a157383768aa7ebf4e7cca6d3dt

DELIVERY-PRE

containers.schibsted.io/spt-infrastructure/d
V024:schibsted:2ceddc580a3a950c964e20a4c60al

containers.schibsted.io/spt-infrastructure/d

nginx-deployment-567b48bb49

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

"spinnaker_deck" / spinnaker-deck

Namespace	delivery-dev
Revision	56
ReplicaSet	spinnaker-deck-2316337507

FIAAS

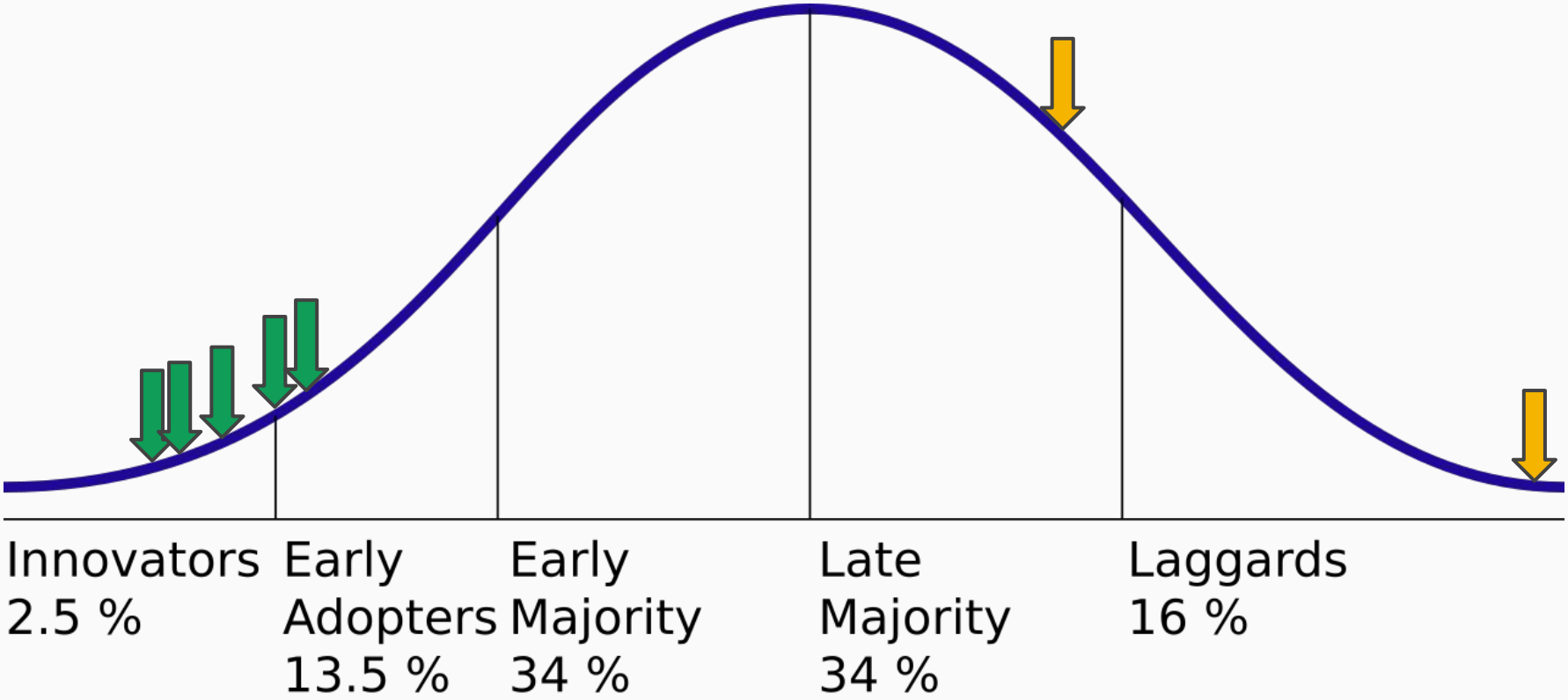
Status	active
Version	2ceddc580a3a950c964e20a4c60abb04199ea170
Deployment...	28d5b028-3dbd-4bdf-aa2f-f10312840615
Deployed by	20180403055453-b8727ca
Metrics	prometheus

FiaaS docs | FAQ | Help center

CI

Commit	2ceddc580a3a950c964e20a4c60abb04199ea170
Compare URL	https://github.schibsted.io/spt-infrastructure/deck-schibsted/pull/45
CI	Build #431
Reports	Quality Gate

Current level of adoption for Kubernetes + Spinnaker



Next steps

Refine opinionated abstractions with user feedback

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?

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