Argo Rollouts: deployando en Kubernetes cómo un prof

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WHO I AM

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TODAY'S DISCUSSION

1. Updates en Kubernetes
2. Argo Rollouts
3. Canary deployments
4. Demo
5. Conclusión

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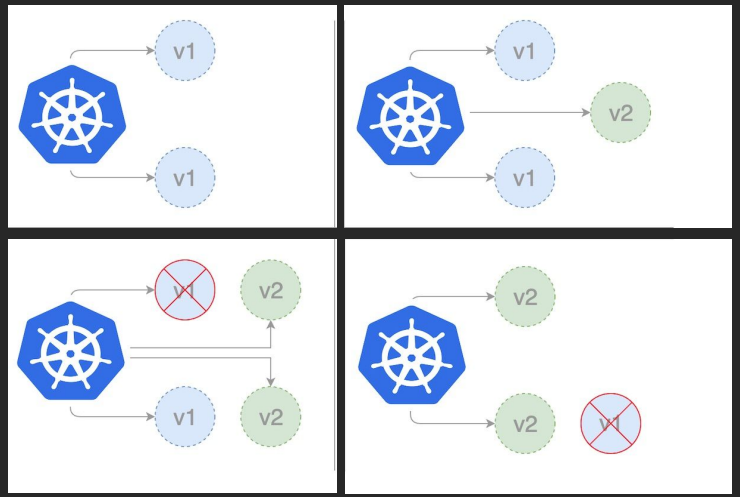
Updates en Kubernetes

Rolling updates permiten que las actualizaciones de los Deployments se hagan de forma incremental sin downtime.
La configuración que podemos hacer es la cantidad máxima de pods que pueden estar no disponibles y la cantidad máxima de nuevos pods que pueden crearse al mismo tiempo.




```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
spec:
  replicas: 4
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxSurge: 1
      maxUnavailable: 1
  template:
    spec:
      containers:
      - name: nginx
        image: nginx:1.14.0
```

Why Argo Rollouts?

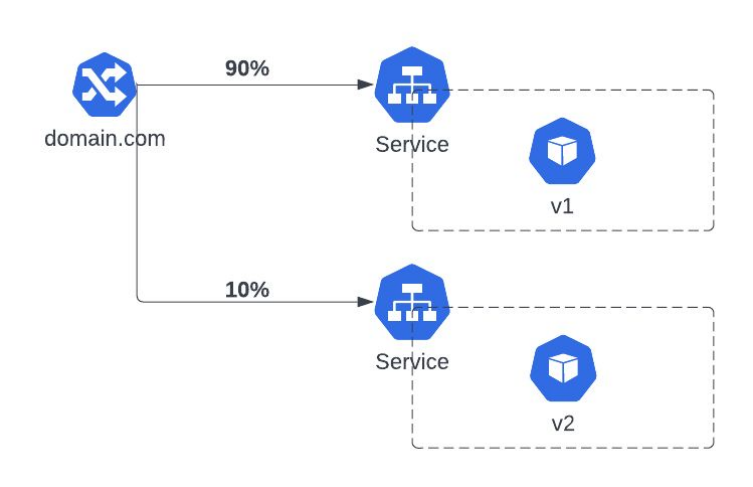
- Poco control sobre la velocidad en la que se hace un despliegue
- No tenemos la posibilidad de desviar el flujo de tráfico hacia una nueva versión
- Los Readiness Probes no permiten hacer comprobaciones de estrés o específicas para poder validar una nueva versión
- No podemos consultar métricas externas al momento de hacer una actualización
- Se puede detener una actualización pero no se puede parar y revertir automáticamente

Argo Rollouts

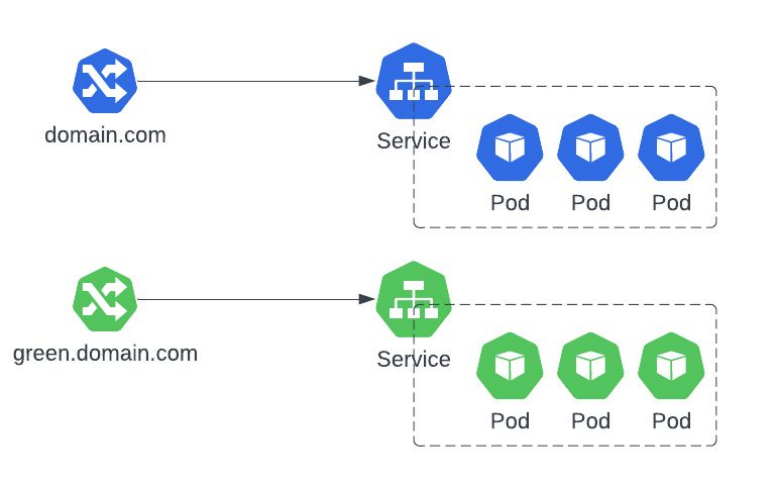
Argo Rollouts es un controller de Kubernetes y un conjunto de CRDs los cuales proveen mayores capacidades avanzadas a los deployments cómo blue-green, canary, canary analysis, experimentation y features de progressive delivery.

Canary y Blue Green

Canary



Blue/Green



Del Deployment al Rollout

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: app-demo
spec:
  replicas: 3
  selector:
    matchLabels:
      app: app-demo
  template:
    metadata:
      labels:
        app: app-demo
    spec:
      containers:
      - name: app-demo
        image: app-demo:latest
```

```yaml
apiVersion: argoproj.io/v1alpha1
kind: Rollout
metadata:
  name: app-demo
spec:
  replicas: 3
  strategy:
    canary:
      canaryService: app-demo-canary
      stableService: app-demo-stable
      trafficRouting:
        nginx:
          stableIngress: app-demo-stable
      steps:
      - setWeight: 50
      - pause: {duration: 3m}
  selector:
    matchLabels:
      app: app-demo
  template:
    metadata:
      labels:
        app: app-demo
    spec:
      containers:
      - name: app-demo
        image: app-demo:latest
```

Analysis Templates & Run

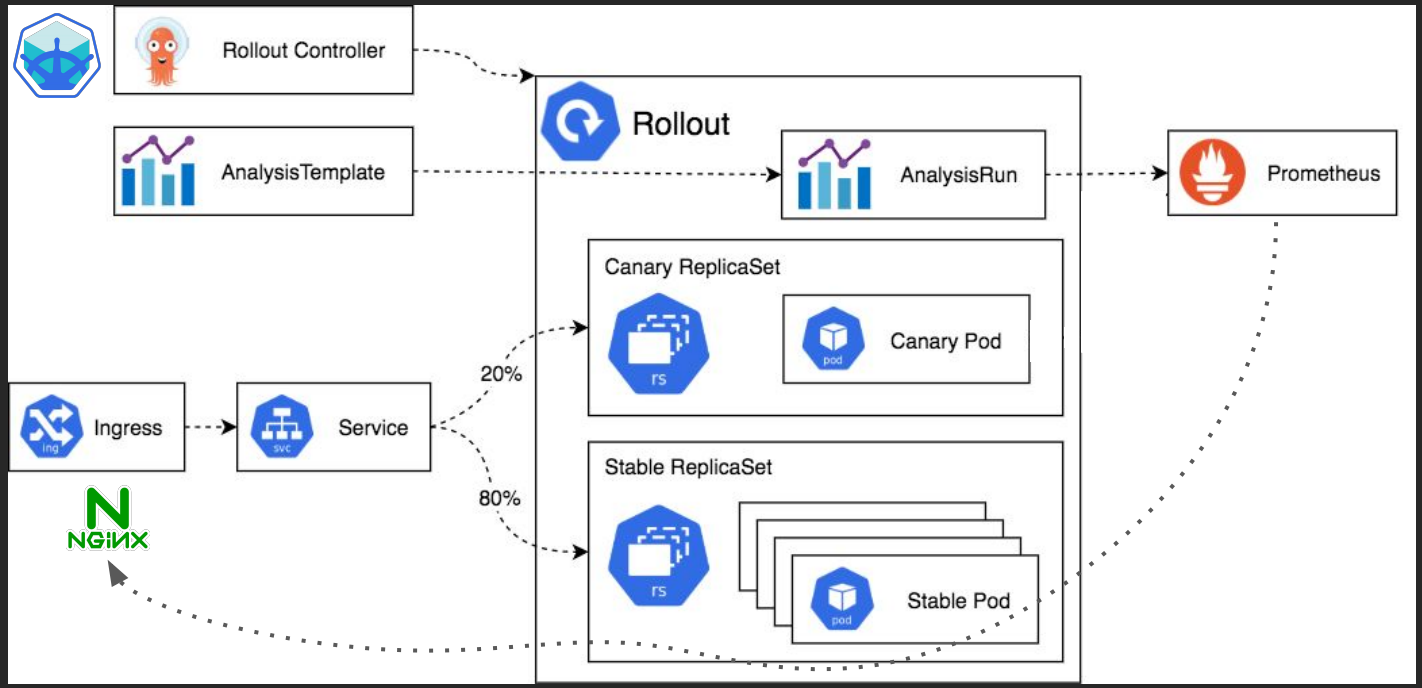
Un **Analysis Template** es un template que define cómo realizar un análisis a una actualización del tipo canary. Se puede definir métricas a evaluar, frecuencia y valores que se consideran fallidos o exitosos.

```yaml
apiVersion: argoproj.io/v1alpha1
kind: AnalysisTemplate
metadata:
  name: success-rate
spec:
  metrics:
  - name: success-rate
    interval: 30s
    successCondition: result[0] >= 0.95
    failureLimit: 2
    provider:
      prometheus:
        address: http://prometheus-stack-kube-prom-prometheus.default.svc.cluster.local:9090
        query: |
          sum(irate(
nginx_ingress_controller_requests{ingress="rollouts-demo-stable", status!~"5.*"}[30s]
          )) /
          sum(irate(
nginx_ingress_controller_requests{ingress="rollouts-demo-stable"}[30s]
          ))
```

```yaml
apiVersion: argoproj.io/v1alpha1
kind: Rollout
metadata:
  name: app-demo
spec:
  replicas: 3
  strategy:
    canary:
      canaryService: app-demo-canary
      stableService: app-demo-stable
      trafficRouting:
        nginx:
          stableIngress: app-demo-stable
      analysis:
          templates:
          - templateName: success-rate
          startingStep: 1
      steps:
      - setWeight: 50
      - pause: {duration: 3m}
...
```

DEMO

Arquitectura



La APP


```
(minikube:app)➜  canary k get analysistemplate
NAME           AGE
success-rate   11d
```

```
(minikube:app)➜  canary k get all
NAME                                READY   STATUS    RESTARTS   AGE
pod/rollouts-demo-687d76d795-rqhj9  1/1     Running   0          70s

NAME                            TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)   AGE
service/rollouts-demo-canary    ClusterIP   10.100.53.34    <none>        80/TCP    11d
service/rollouts-demo-stable    ClusterIP   10.99.25.220    <none>        80/TCP    11d
```

```
(minikube:app)➜  canary k get rollout
NAME           DESIRED   CURRENT   UP-TO-DATE   AVAILABLE   AGE
rollouts-demo  1         1         1            1           2m34s
```

```
(minikube:app)➜  canary kgi
NAME                  CLASS    HOSTS                       ADDRESS        PORTS   AGE
rollouts-demo-stable  <none>   rollouts-demo.domain.com    192.168.49.2   80      11d
```

Prometheus

```
(minikube:default)➜  ~ k get deployment
NAME                                  READY   UP-TO-DATE   AVAILABLE   AGE
prometheus-stack-grafana              1/1     1            1           11d
prometheus-stack-kube-prom-operator   1/1     1            1           11d
prometheus-stack-kube-state-metrics   1/1     1            1           11d
(minikube:default)➜  ~ kgi
NAME                                  CLASS    HOSTS                    ADDRESS        PORTS   AGE
prometheus-stack-grafana              <none>   grafana.domain.com       192.168.49.2   80      11d
prometheus-stack-kube-prom-prometheus <none>   prometheus.domain.com    192.168.49.2   80      11d
```

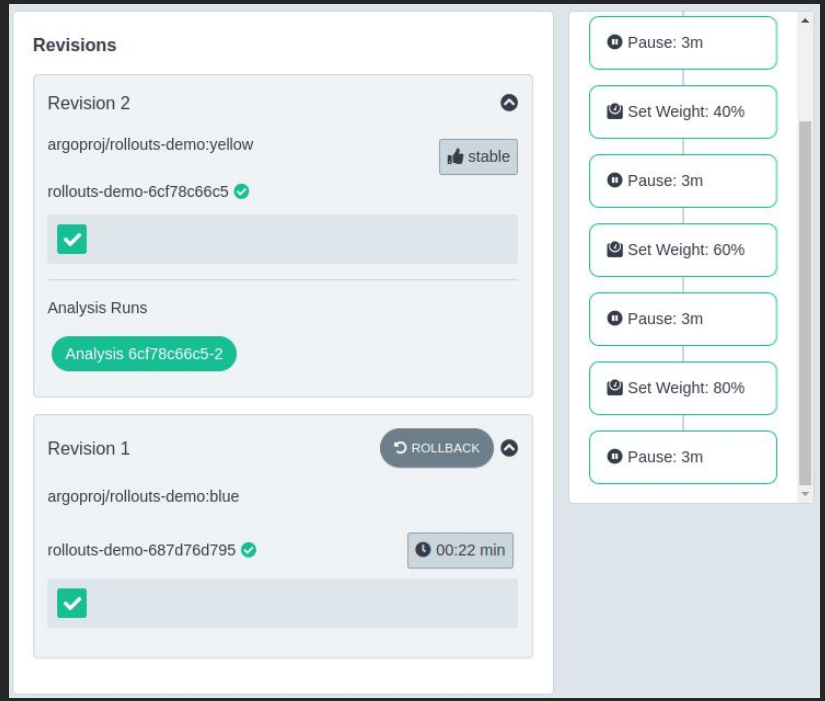
Argo Watch

```
Name:            rollouts-demo
Namespace:       app
Status:          ✔ Healthy
Strategy:        Canary
  Step:          8/8
  SetWeight:     100
  ActualWeight:  100
Images:          argoproj/rollouts-demo:blue (stable)
Replicas:
  Desired:       1
  Current:       1
  Updated:       1
  Ready:         1
  Available:     1

NAME                                     KIND        STATUS     AGE  INFO
⟳ rollouts-demo                          Rollout     ✔ Healthy  17m
└──# revision:1
   └──⧉ rollouts-demo-687d76d795         ReplicaSet  ✔ Healthy  17m  stable
      └──□ rollouts-demo-687d76d795-rqhj9 Pod         ✔ Running  17m  ready:1/1
```

```
Name:            rollouts-demo
Namespace:       app
Status:          ॥ Paused
Message:         CanaryPauseStep
Strategy:        Canary
  Step:          1/8
  SetWeight:     20
  ActualWeight:  20
Images:          argoproj/rollouts-demo:blue (stable)
                 argoproj/rollouts-demo:yellow (canary)
Replicas:
  Desired:       1
  Current:       2
  Updated:       1
  Ready:         2
  Available:     2

NAME                                     KIND         STATUS     AGE  INFO
⟳ rollouts-demo                          Rollout      ॥ Paused   18m
├──# revision:2
│  ├──⧉ rollouts-demo-6cf78c66c5         ReplicaSet   ✔ Healthy  5s   canary
│  │  └──□ rollouts-demo-6cf78c66c5-xdsgb Pod          ✔ Running  5s   ready:1/1
│  └──α rollouts-demo-6cf78c66c5-2       AnalysisRun  ◌ Running  4s   ✔ 1
└──# revision:1
   └──⧉ rollouts-demo-687d76d795         ReplicaSet   ✔ Healthy  18m  stable
      └──□ rollouts-demo-687d76d795-rqhj9 Pod          ✔ Running  18m  ready:1/1
```

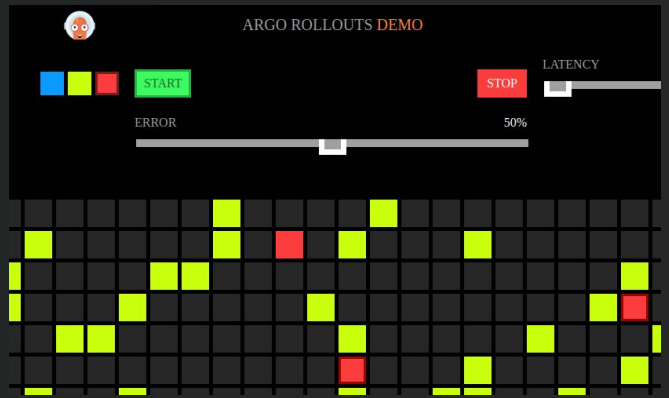
Argo Watch

```
Name:            rollouts-demo
Namespace:       app
Status:          ॥ Paused
Message:         CanaryPauseStep
Strategy:        Canary
  Step:          3/8
  SetWeight:     40
  ActualWeight:  40
Images:          argoproj/rollouts-demo:blue (stable)
                 argoproj/rollouts-demo:yellow (canary)

Replicas:
  Desired:       1
  Current:       2
  Updated:       1
  Ready:         2
  Available:     2

NAME                                    KIND         STATUS     AGE    INFO
⟳ rollouts-demo                         Rollout      ॥ Paused   21m
├──# revision:2
│  ├──⧉ rollouts-demo-6cf78c66c5        ReplicaSet   ✔ Healthy  3m34s  canary
│  │  └──□ rollouts-demo-6cf78c66c5-xdsgb Pod         ✔ Running  3m34s  ready:1/1
│  └──α rollouts-demo-6cf78c66c5-2      AnalysisRun  ◌ Running  3m33s  ✔ 6,✖ 2
└──# revision:1
   └──⧉ rollouts-demo-687d76d795        ReplicaSet   ✔ Healthy  21m    stable
      └──□ rollouts-demo-687d76d795-rqhj9 Pod         ✔ Running  21m    ready:1/1
```



500s

```
Name:            rollouts-demo
Namespace:       app
Status:          ✖ Degraded
Message:         RolloutAborted: Rollout aborted update to revision 3: Metric "success-rate" assessed Failed due to
failed (4) > failureLimit (3)
Strategy:        Canary
  Step:          0/8
  SetWeight:     0
  ActualWeight:  0
Images:          argoproj/rollouts-demo:red (canary)
                 argoproj/rollouts-demo:yellow (stable)

Replicas:
  Desired:       1
  Current:       2
  Updated:       1
  Ready:         2
  Available:     2

NAME                                      KIND         STATUS        AGE    INFO
⟳ rollouts-demo                           Rollout      ✖ Degraded    25m
├──# revision:3
│  ├──⧉ rollouts-demo-5747959bdb          ReplicaSet   ✔ Healthy     2m16s  canary,delay:19s
│  │  └──□ rollouts-demo-5747959bdb-2mmwq  Pod          ✔ Running     2m16s  ready:1/1
│  └──α rollouts-demo-5747959bdb-3        AnalysisRun  ✖ Failed      2m14s  ✔ 1,✖ 4
├──# revision:2
│  ├──⧉ rollouts-demo-6cf78c66c5          ReplicaSet   ✔ Healthy     7m28s  stable
│  │  └──□ rollouts-demo-6cf78c66c5-xdsgb  Pod          ✔ Running     7m28s  ready:1/1
│  └──α rollouts-demo-6cf78c66c5-2        AnalysisRun  ✔ Successful  7m27s  ✔ 6,✖ 3
└──# revision:1
   └──⧉ rollouts-demo-687d76d795          ReplicaSet   • ScaledDown  25m
```



Referencias

- https://argoproj.github.io/rollouts/
- https://argoproj.github.io/argo-rollouts/features/kubectl-plugin/
- https://argoproj.github.io/argo-rollouts/features/canary/
- https://argoproj.github.io/argo-rollouts/features/analysis/
- https://github.com/argoproj/argo-rollouts/tree/master/manifests/notifications
- https://docs.nginx.com/nginx-ingress-controller/logging-and-monitoring/prometheus/
- https://prometheus.io/docs/prometheus/latest/querying/basics/

THANKS!

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