Introducing Flagger

Flagger is a Kubernetes operator that automates the promotion of canary deployments using App Mesh, Istio, Gloo or NGINX routing for traffic shifting and Prometheus metrics for canary analysis.

Flagger implements a control loop that gradually shifts traffic to the canary while measuring key performance indicators. Based on the KPIs analysis a canary is promoted or aborted.
Flagger Goals

- Give developers confidence in automating the production releases
  - Have control over the blast radius (traffic management)
  - Have control over the validation process (perf metrics)
- Make the deployment process observable
  - Real time feedback (Prometheus/Grafana)
  - Alerting (Slack/Alertmanager/PagerDuty/etc)
  - Emit Kubernetes events every time something changes
- Write as little YAML as possible
- Manage the whole process from Git
Have control over the blast radius
Have control over the validation process

Flagger lets you define **key performance indicators** and **thresholds**. The decision to pause the traffic shift, abort or promote a canary is based on:

- Deployment health status
- Request success rate percentage (Envoy metric)
- Request latency average value (Envoy metric)
- Custom metric checks (Prometheus queries)
- Webhooks (integration testing, load testing, etc)
Make the deployment process observable

Flagger comes with a Grafana dashboard for canary analysis.
Make the deployment process observable

Flagger emits Kubernetes events related to the advancement and final status of a canary analysis.

<table>
<thead>
<tr>
<th>Type</th>
<th>Reason</th>
<th>Age</th>
<th>From</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Synced</td>
<td>3m</td>
<td>flagger</td>
<td>New revision detected podinfo.test</td>
</tr>
<tr>
<td>Normal</td>
<td>Synced</td>
<td>3m</td>
<td>flagger</td>
<td>Scaling up podinfo.test</td>
</tr>
<tr>
<td>Warning</td>
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<td>3m</td>
<td>flagger</td>
<td>Waiting for podinfo.test rollout to finish: 0 of 1 updated replicas are available</td>
</tr>
<tr>
<td>Normal</td>
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<td>3m</td>
<td>flagger</td>
<td>Advance podinfo.test canary weight 10</td>
</tr>
<tr>
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<td>2m</td>
<td>flagger</td>
<td>Advance podinfo.test canary weight 20</td>
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<td>flagger</td>
<td>Advance podinfo.test canary weight 30</td>
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<td>flagger</td>
<td>Advance podinfo.test canary weight 40</td>
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<td>Advance podinfo.test canary weight 50</td>
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<tr>
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<td>flagger</td>
<td>Copying podinfo.test template spec to podinfo-primary.test</td>
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<tr>
<td>Warning</td>
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<td>15s</td>
<td>flagger</td>
<td>Waiting for podinfo-primary.test rollout to finish: 1 of 2 updated replicas are available</td>
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<tr>
<td>Normal</td>
<td>Synced</td>
<td>5s</td>
<td>flagger</td>
<td>Promotion completed! Scaling down podinfo.test</td>
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</tbody>
</table>
Make the deployment process observable

Flagger can be configured to publish the canary analysis result to Slack.

flagger APP 3:30 PM
podinfo.test
New revision detected, starting canary analysis.
Target
Deployment/podinfo.test
Traffic routing
Weight step: 5 max: 50
Failed checks threshold
10
Progress deadline
60s

flagger APP 12:12 PM
podinfo.test
Progress deadline exceeded deployment does not have minimum availability for more than 60s

flagger APP 12:18 PM
podinfo.test
Failed checks threshold reached 10

Canary analysis completed successfully, promotion finished.
Write less YAML

Manual canary setup

Kubernetes objects
1. Canary Deployment
2. Canary ClusterIP Service
3. Canary Horizontal Pod Autoscaler
4. Primary Deployment
5. Primary ClusterIP Service
6. Primary Horizontal Pod Autoscaler

App Mesh objects
1. Canary virtual node
2. Primary virtual node
3. HTTP routes
4. Virtual router
5. Virtual service

Automated canary setup

Kubernetes objects
1. Deployment
2. Horizontal Pod Autoscaler

Flagger objects
1. Canary
GitOps Progressive Delivery Demo
Links

Flagger Repo
https://github.com/weaveworks/flagger

Flagger Docs
https://docs.flagger.app