Automated Canary Analysis Workshop

Spinnaker Summit - 11/16/2019

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Agenda

Canary Release Overview

Spinnaker/Kayenta Overview

Provision Spinnaker/Kayenta/Prometheus & Sample Artifacts

Good/Bad Indicators Of Safety

Exercises

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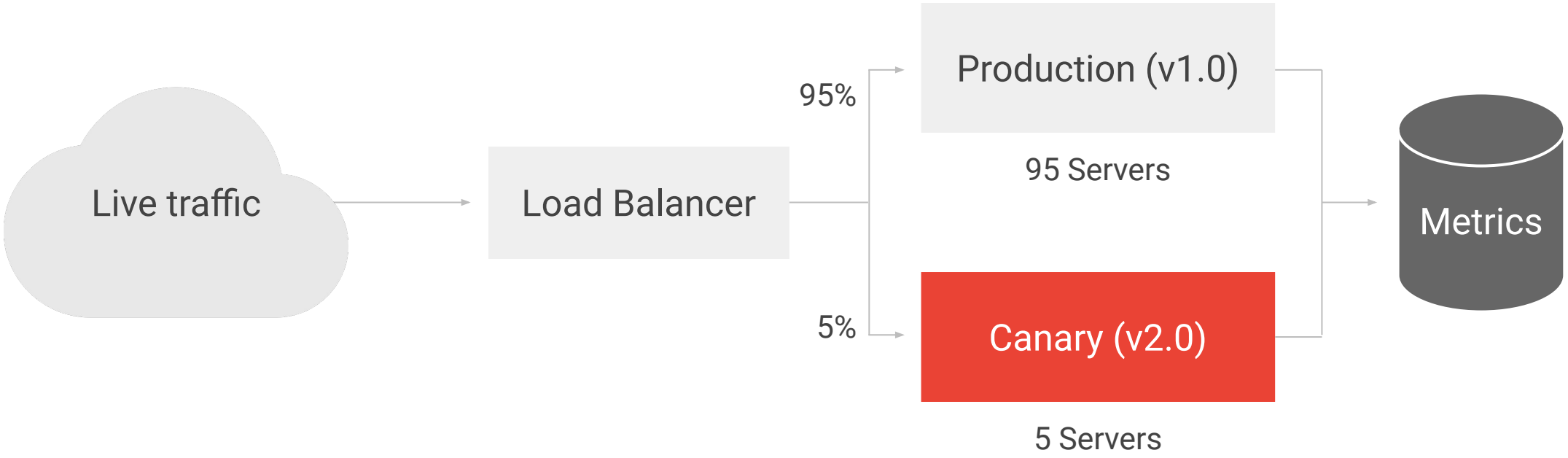
Canary Release Overview



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Canary Release Overview

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Canary Release Overview

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Spinnaker/Kayenta Overview

Metric Sources

Atlas
Datadog
Graphite
InfluxDB
New Relic
Prometheus
SignalFx
Stackdriver
Wavefront

Judgement

Netflix Canary Judge

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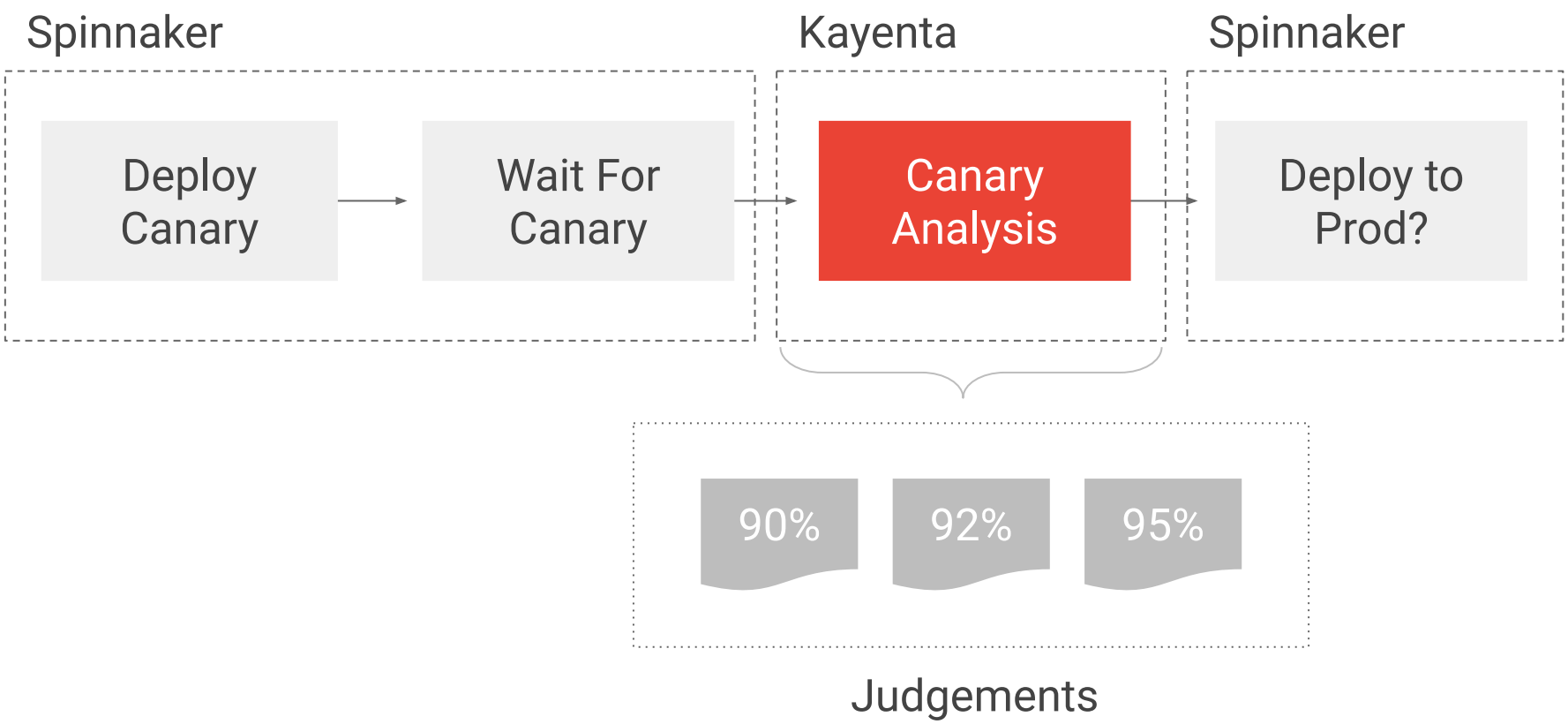
Spinnaker/Kayenta Overview



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Provision Spinnaker/Kayenta

1. Grab a temporary account id/pw.
2. Open an incognito window in Chrome.
3. Navigate to: https://console.cloud.google.com/marketplace/details/google-cloud-platform/spinnaker
4. Click on "Go to Spinnaker for Google Cloud Platform" and follow the instructions.

- Provisioning & configuration should take around 20 minutes to complete. -

Once the `setup.sh` script completes, move to the next slide...

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Install Prometheus/Grafana & Provision Sample Artifacts

1. `exit` out of the Cloud Shell window.
2. Launch the Canary Workshop tutorial:
   https://console.cloud.google.com/cloudshell/editor?cloudshell_git_repo=github.com/duftler/canary-workshop.git&cloudshell_tutorial=tutorial.md&cloudshell_print=instructions.txt
3. Follow the instructions.

- Provisioning & configuration should take around 5 minutes to complete. -

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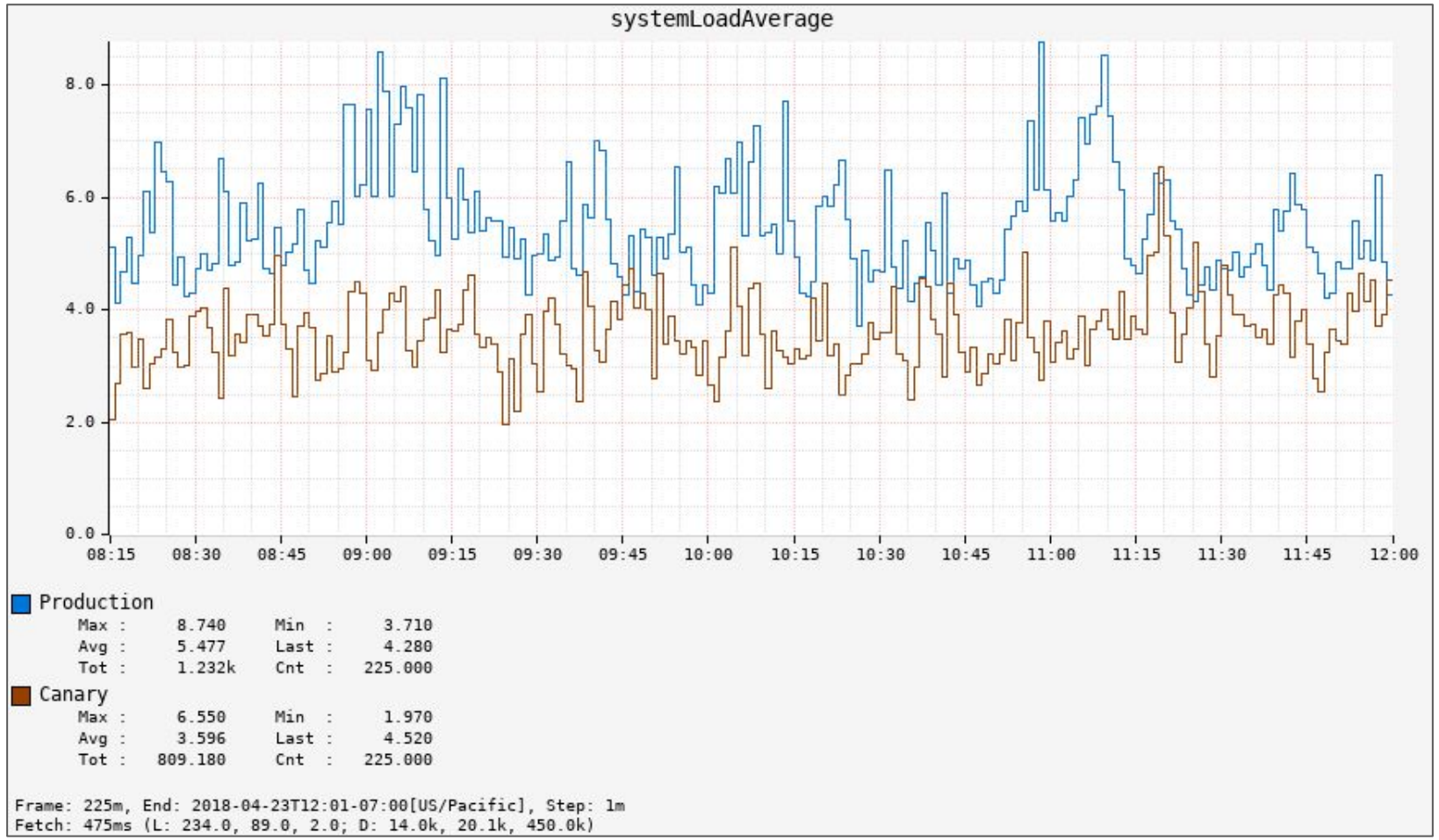
Good/Bad Indicators of Safety



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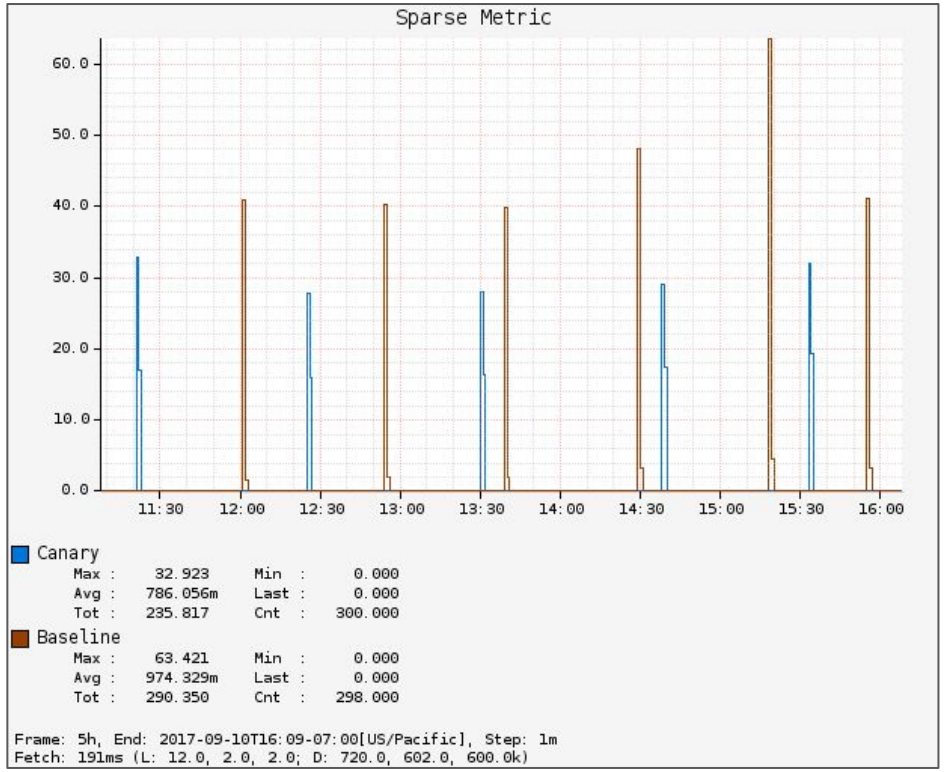
Good/Bad Indicators of Safety



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Install Prometheus/Grafana & Provision Sample Artifacts (continued)

Should see output like the following upon completion:

```
Access Prometheus here: http://35.230.84.233:31269

Access Grafana here: http://35.230.84.233:30866
```

If `localhost:8080` is unreachable (at any point), re-run:
`~/spinnaker-for-gcp/scripts/manage/connect_unsecured.sh`

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GCP Resources

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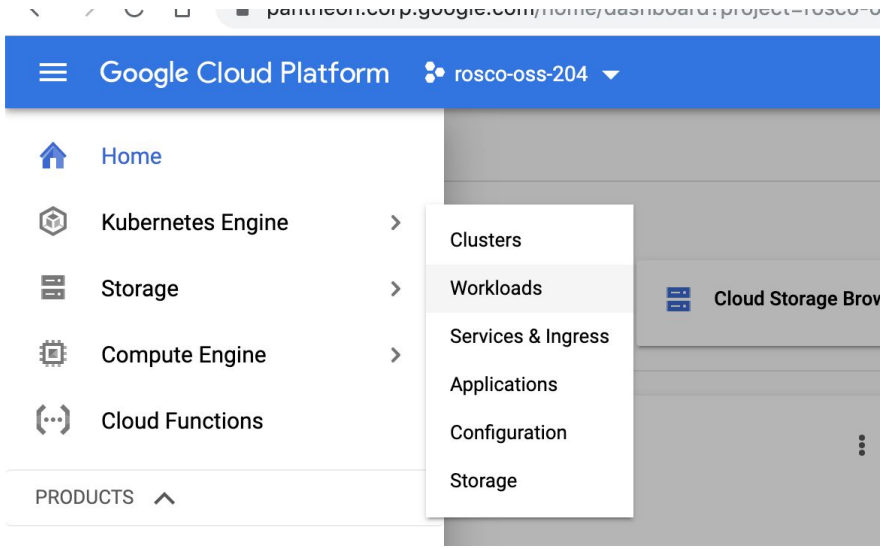
Locate Relevant GCP Resources

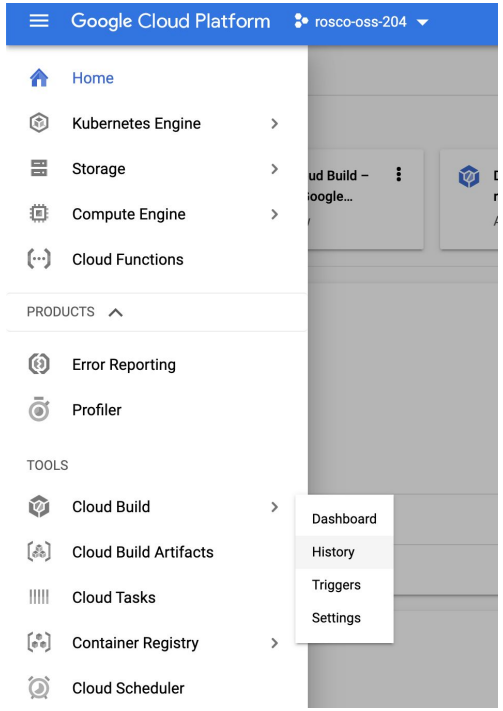
Navigate to: https://console.cloud.google.com/

Resources that may be helpful during the workshop:

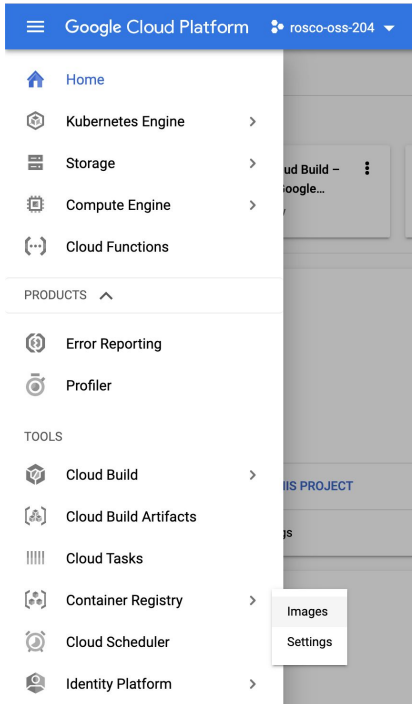
GKE->Workloads



Cloud Build->History



GCR->Images



Exercises

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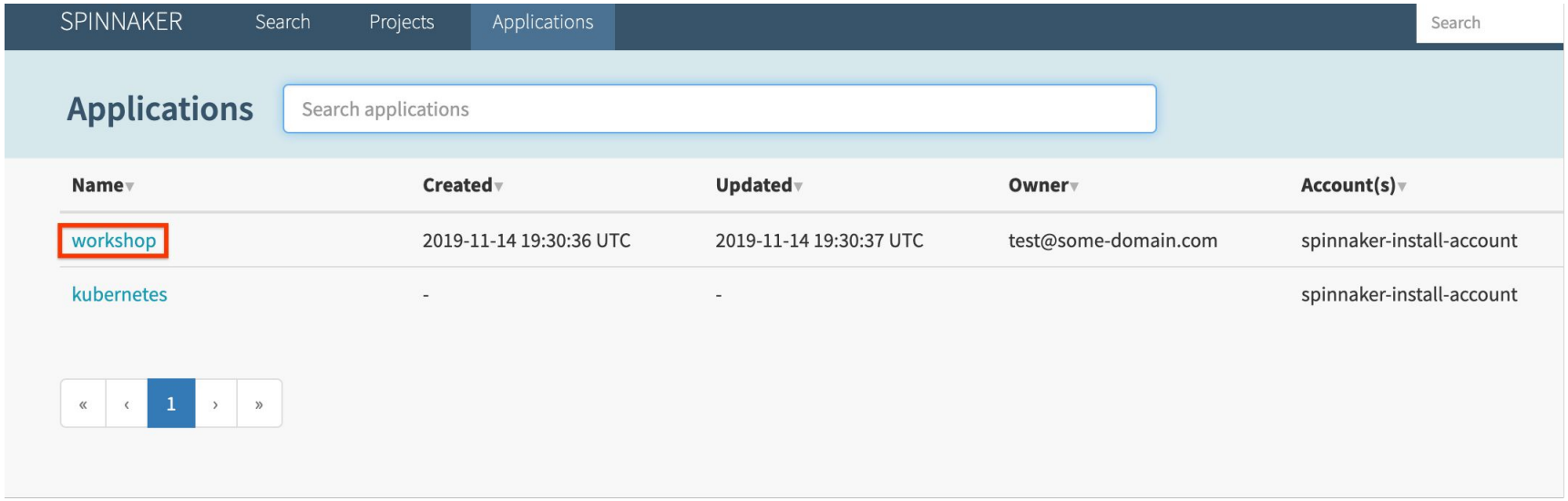
Locate workshop Application

Follow the instructions in the console to connect to the Spinnaker UI.

Select the 'workshop' application on the Applications tab:



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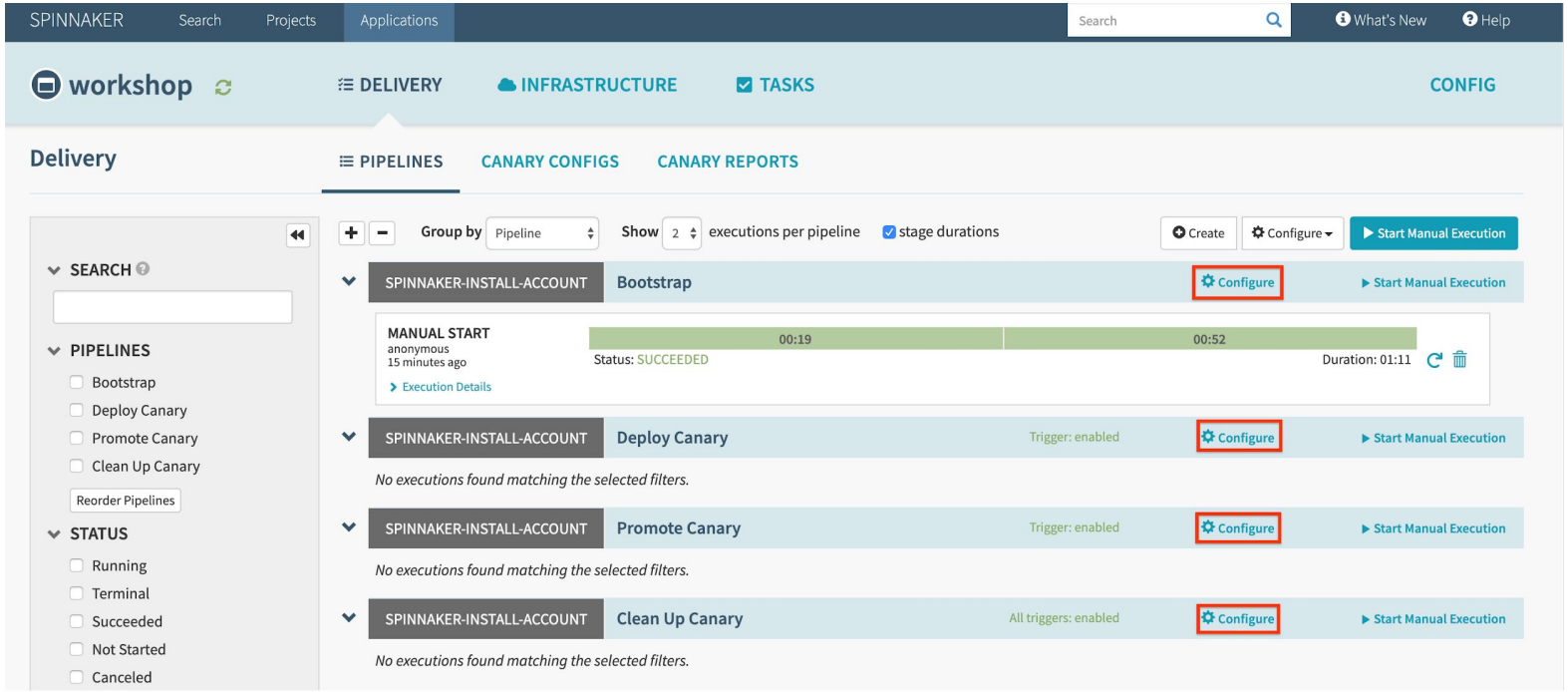
Explore Pipelines

Navigate to the Pipelines tab and examine the configuration of each pre-populated pipeline:



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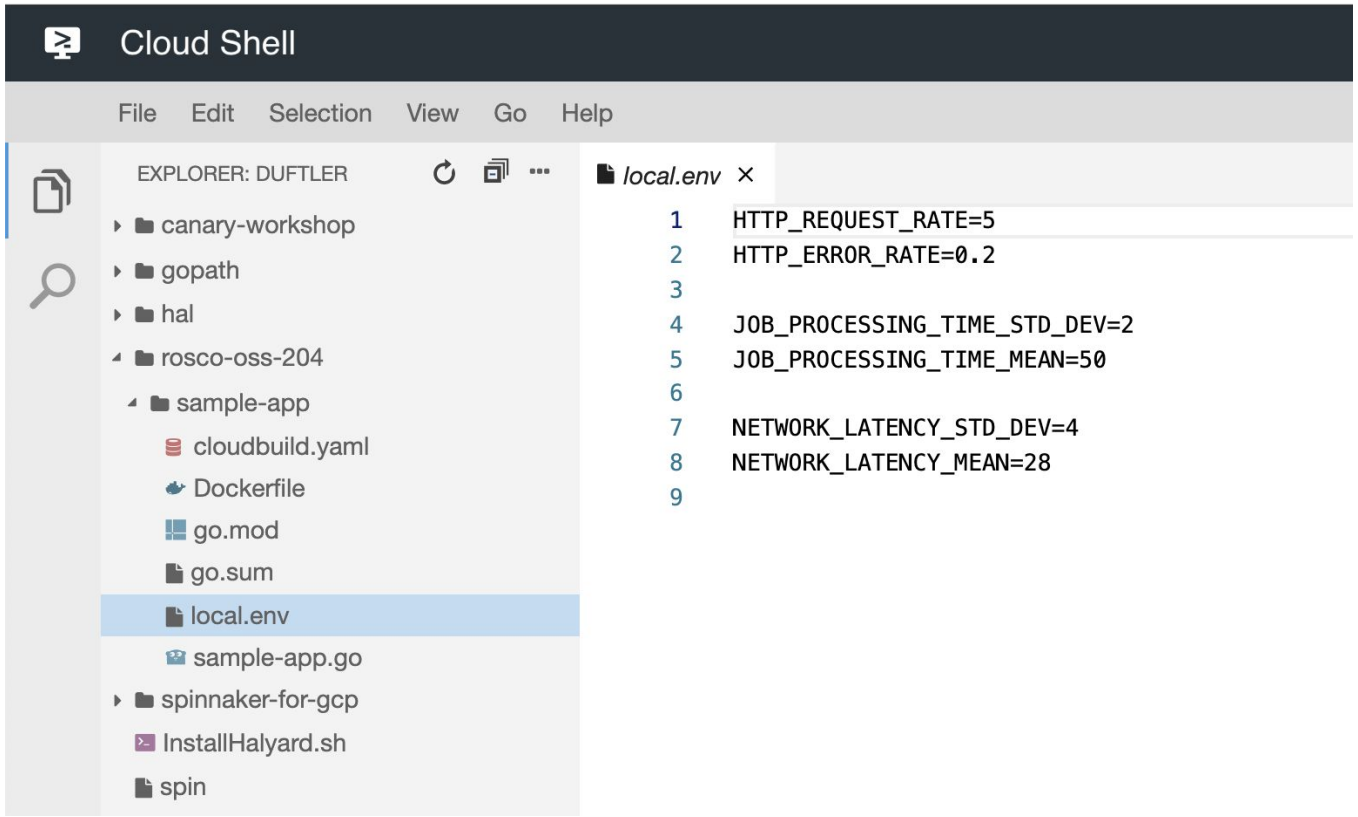
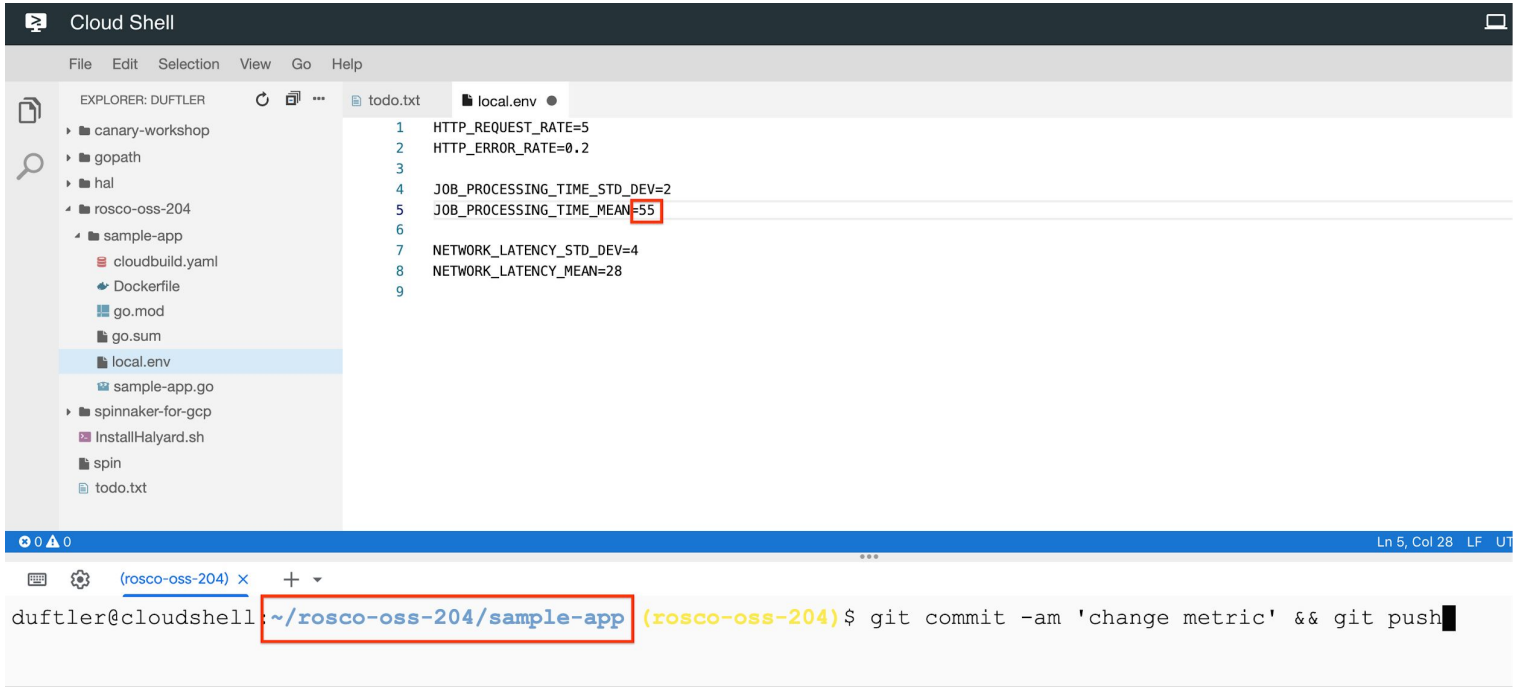
Locate Sample App and Sample Metric Parameters

The `sample-app` repo has been cloned into your home directory:



Manually Canary a Change

Adjust one of the sample metrics (e.g. change `JOB_PROCESSING_TIME_MEAN` to `55`) and push your changes:



Follow Progression of Change

- Change is pushed to Cloud Source Repo
- Cloud Build trigger builds new image
- Image is published to Container Registry
- Deploy Canary pipeline is triggered
- Baseline and Canary deployments are provisioned (locate image digests)
- Metrics are collected by Prometheus
- Grafana dashboard refreshes automatically
- Wait several minutes for dashboard to reflect change

Do Not Manually Approve Change Yet

Promote Change

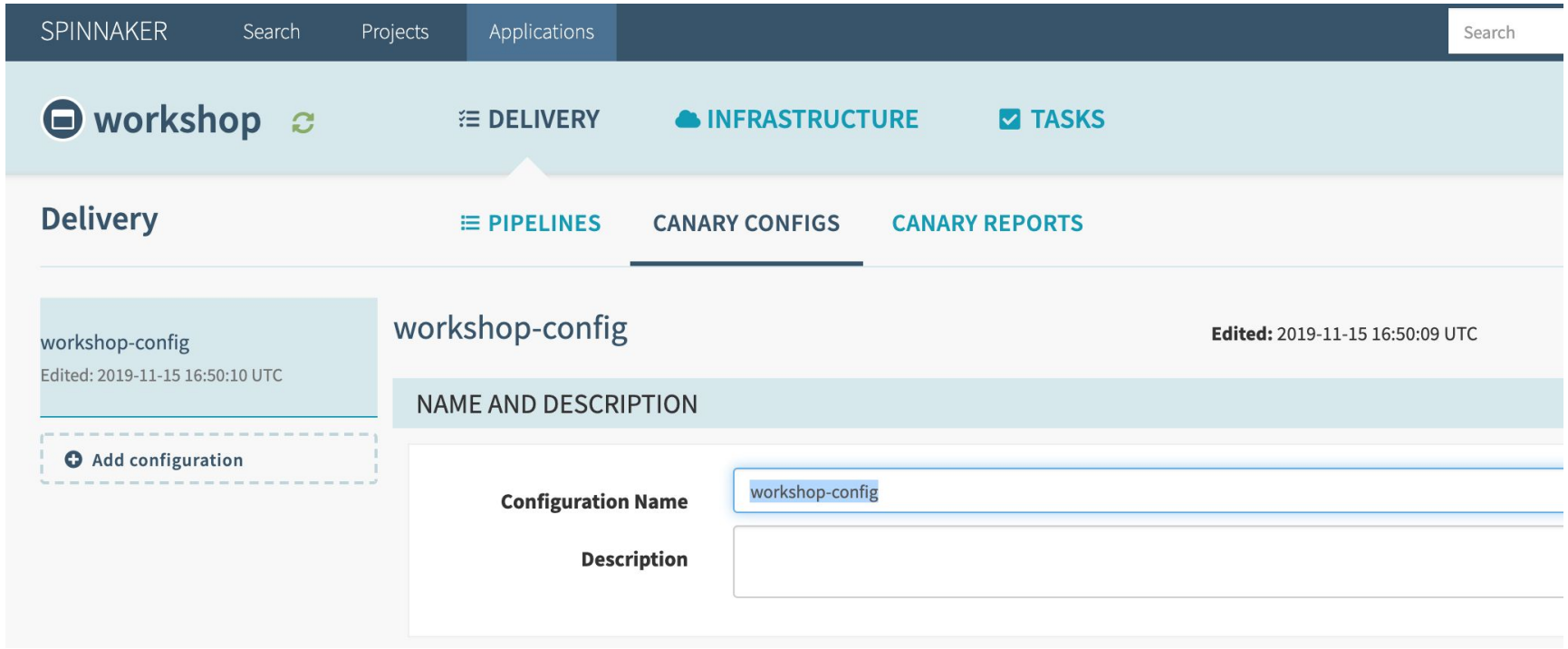
Promote the change into production by clicking "Continue" on the "Manually Validate Canary Results" stage of the "Deploy Canary" pipeline. Successful completion of that pipeline will trigger the "Promote Canary" pipeline.

Successful completion of the "Promote Canary" pipeline will trigger the "Clean Up Canary" pipeline.

At this point, we will have covered 'manual' canary releases of binary changes, and we will next adapt the existing release workflow to include automated canary analysis.

Create Canary Configuration

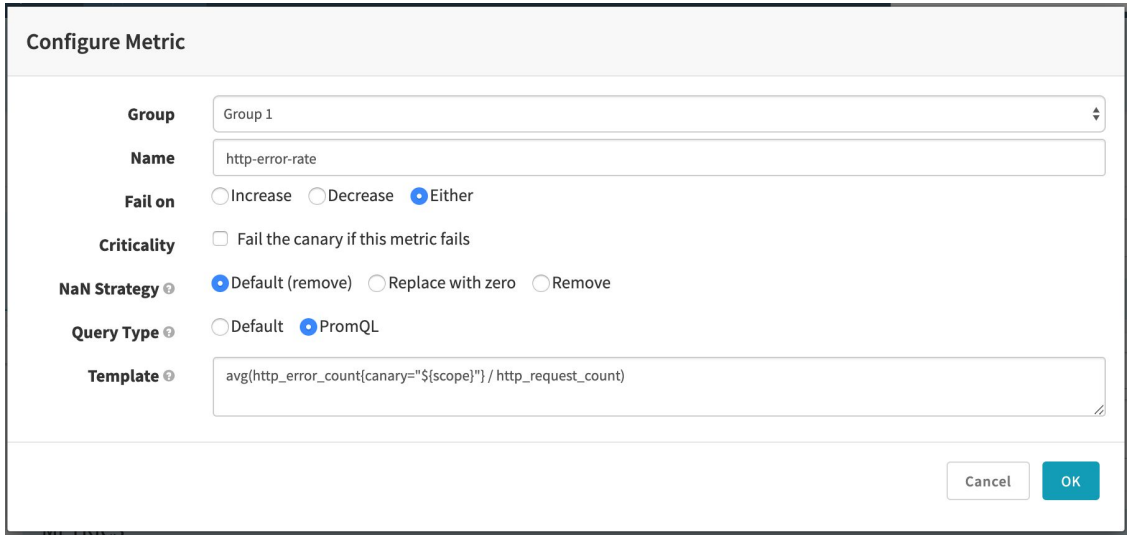
Create a new Canary Config named "workshop-config":



Create Canary Configuration

Create a new Metric Config named "http-error-rate", with a PromQL template containing:

```
avg(http_error_count{canary="${scope}"} / http_request_count)
```



Set the scoring weight of the group to 100 and save your Canary Config.

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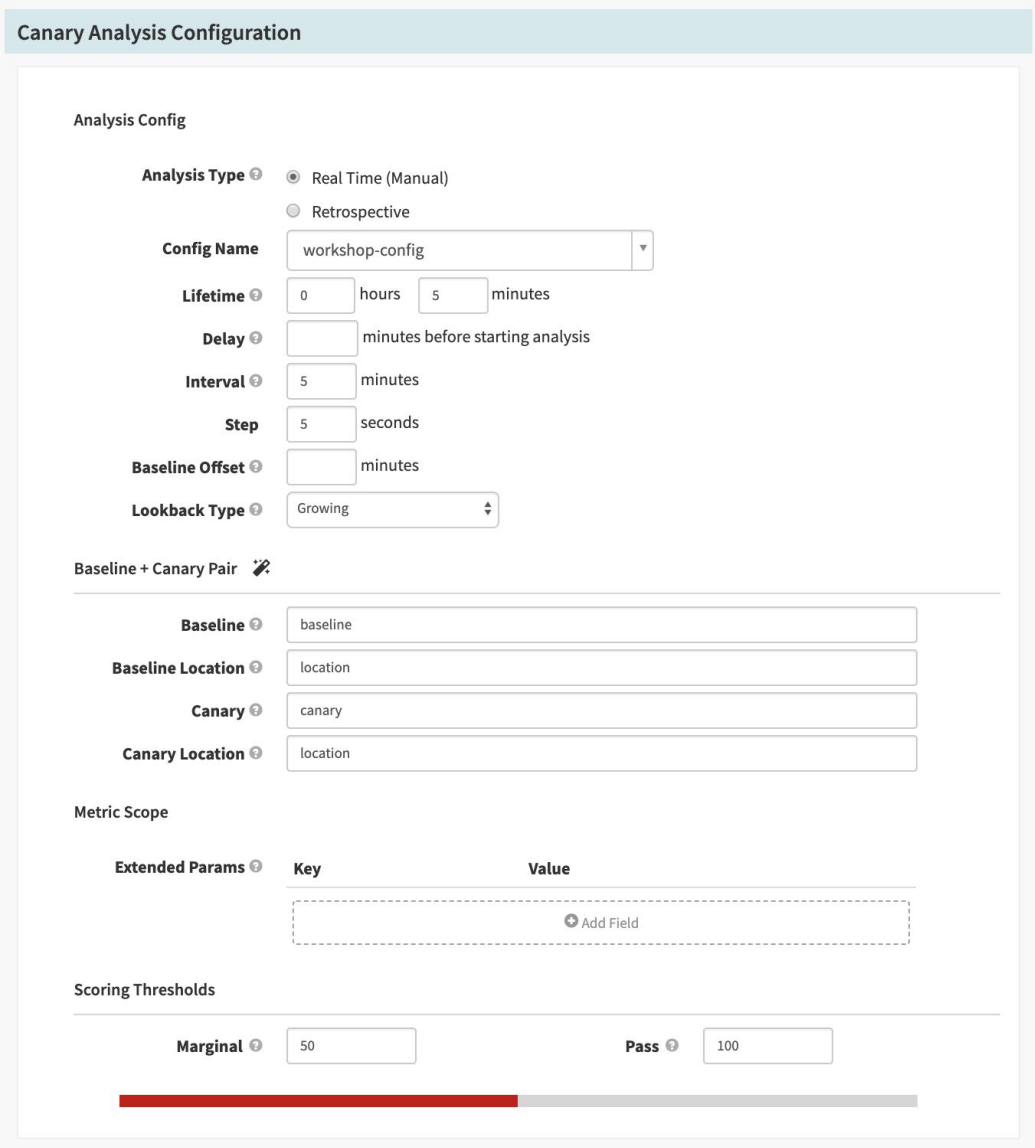
Create Automated Canary Analysis Stage

Edit the "Deploy Canary" pipeline and replace the "Manually Validate Canary Results" stage with a new "Canary Analysis" stage.

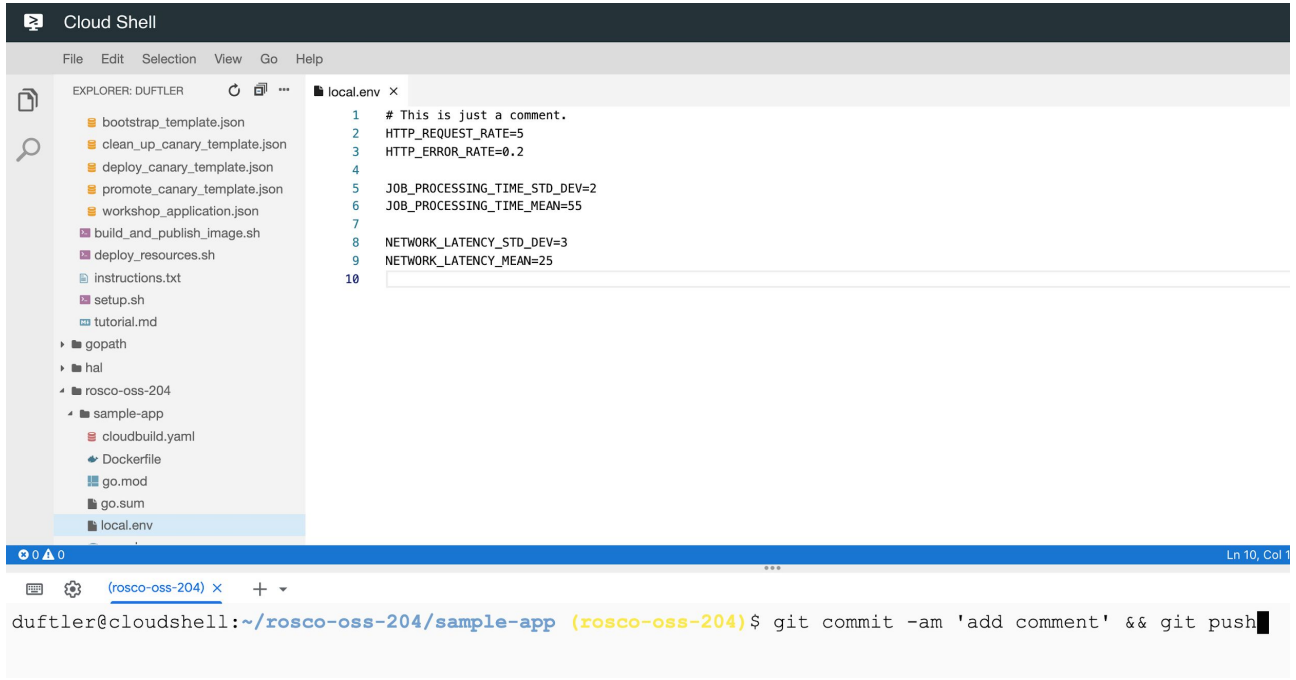
Make sure to select "Real Time (Manual)", and a reasonable lifetime (e.g. 5 minutes, for the purposes of this demonstration). 5 seconds is a good step size to start with.

Pay special attention to the values specified for Baseline & Canary, as they will be bound to `${scope}` when expanding the template.



Canary a Change

Push an inconsequential change (e.g. add a comment to the local.env file):



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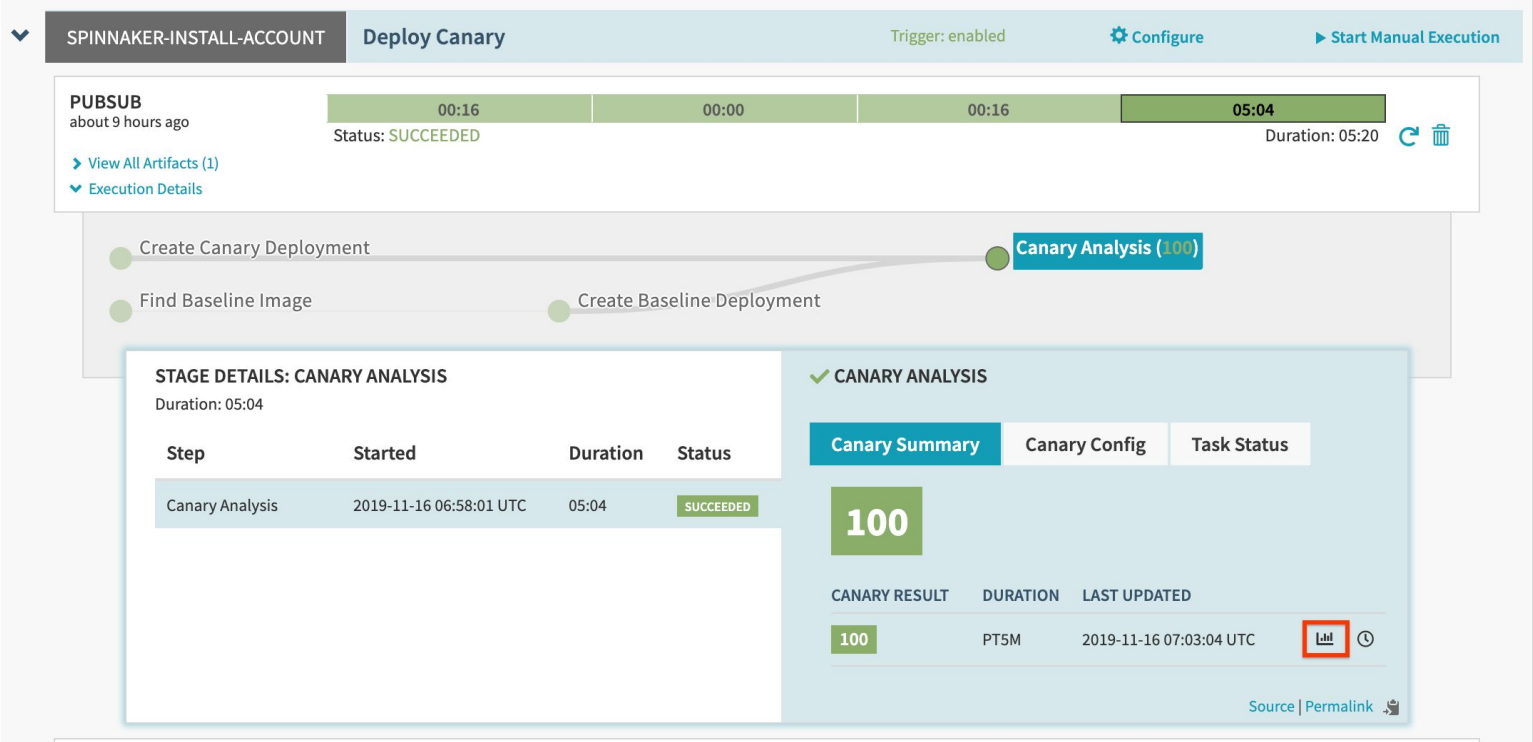
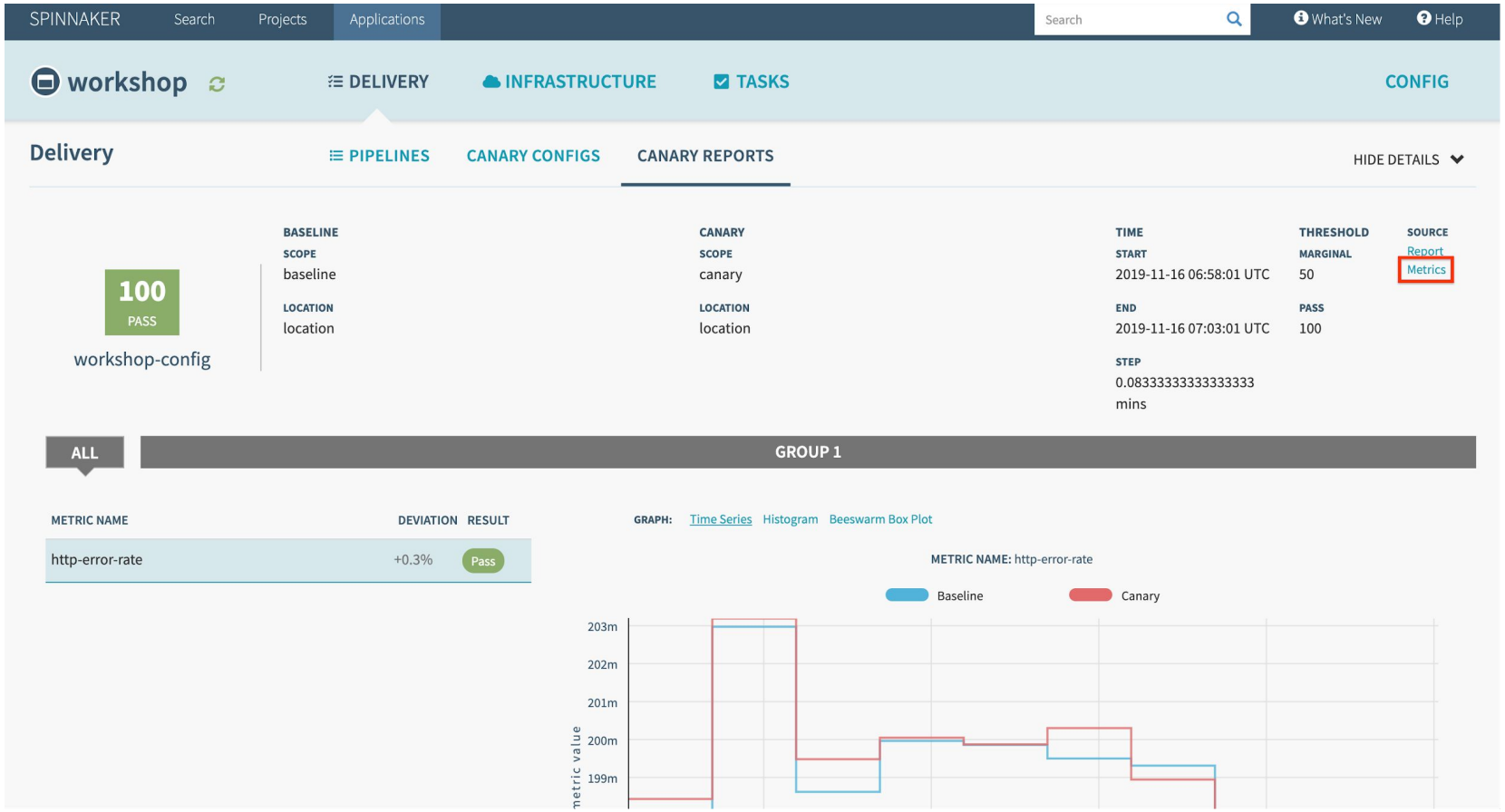
Explore Canary Report and Underlying Queries

Click on the Canary Report link in the Pipeline Execution Details view:



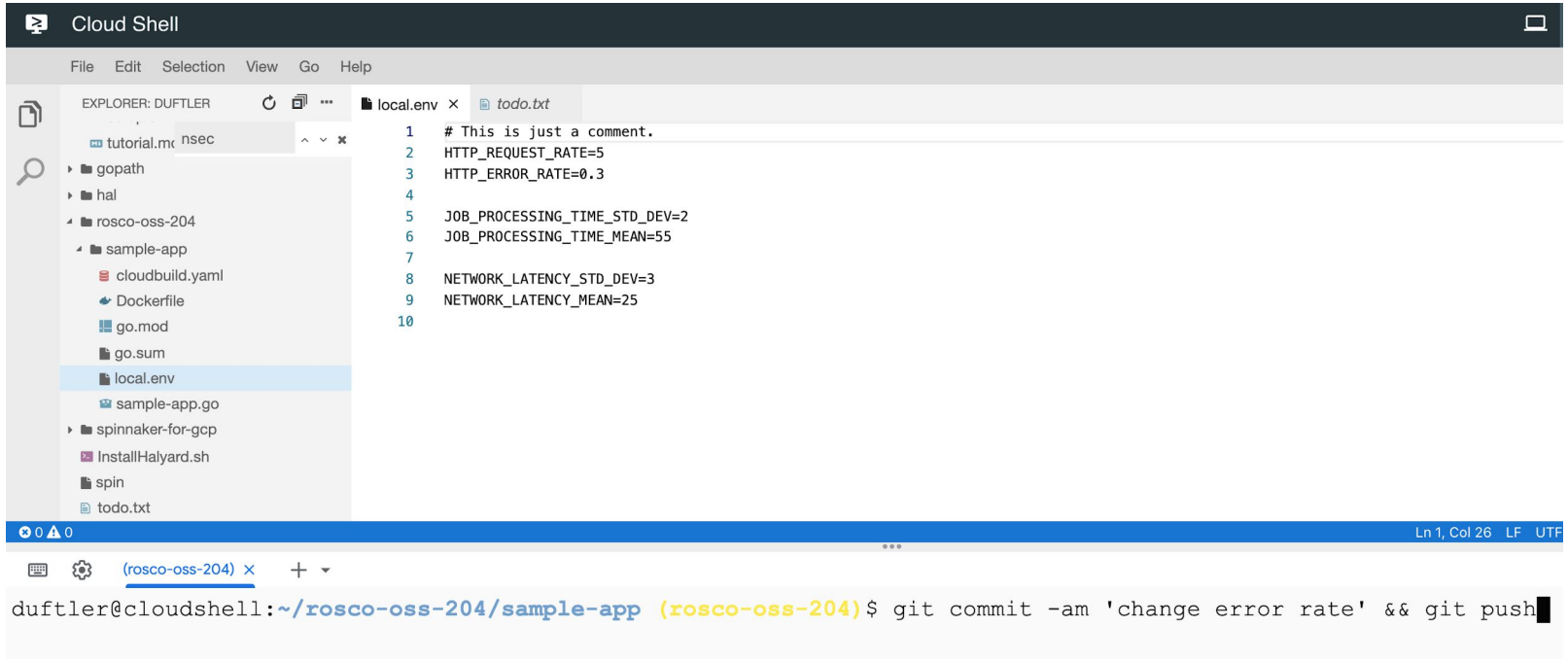
Explore Canary Report and Underlying Queries

For troubleshooting, you can find the expanded queries (and their actual results) via the Metrics link:



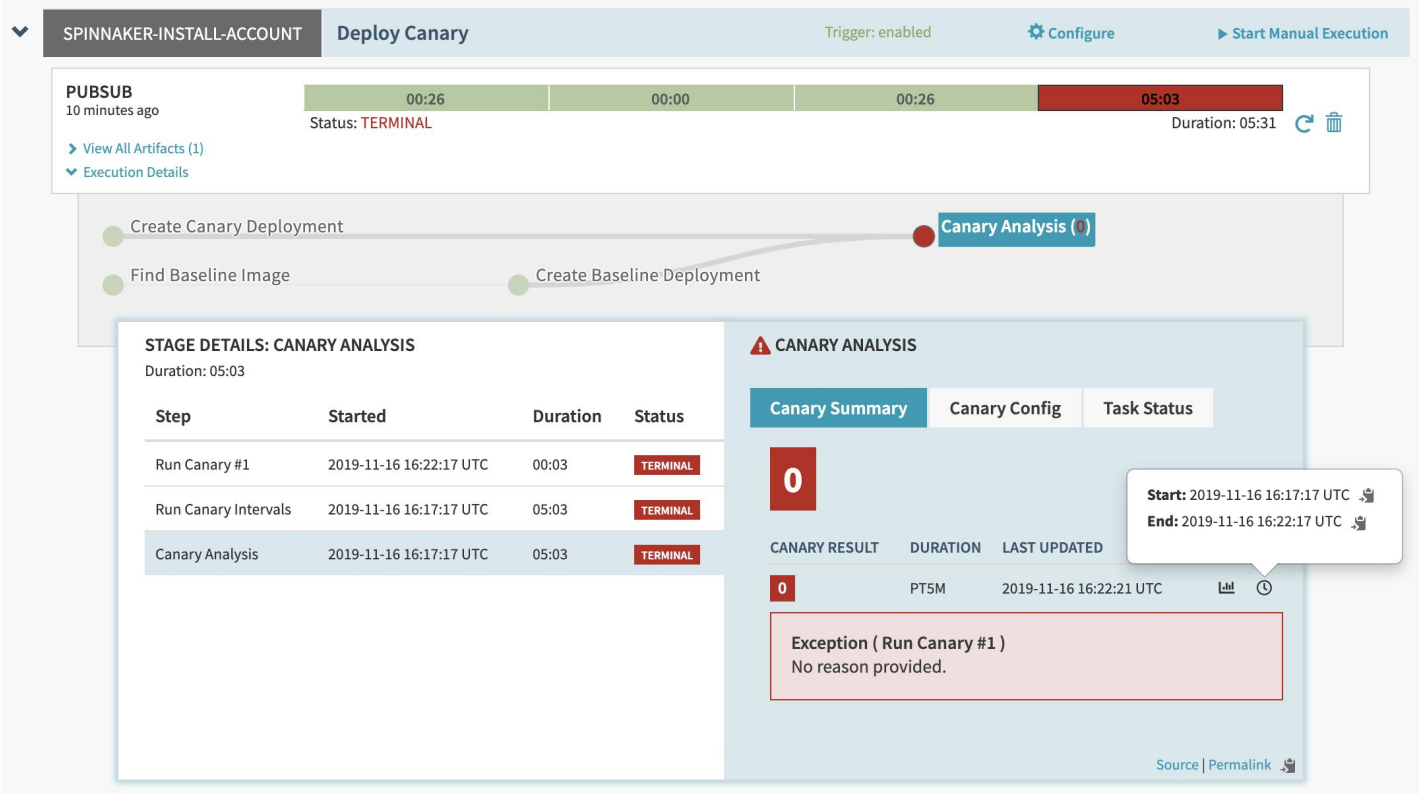
Canary a Change

Now push a change that is likely to fail the canary analysis (e.g. change `HTTP_ERROR_RATE` to `0.3`):



Configure Retrospective Analysis

Capture the timestamps from the analysis stage (using the copy-to-clipboard buttons) and use them to configure a new pipeline with a "Retrospective" canary analysis stage:



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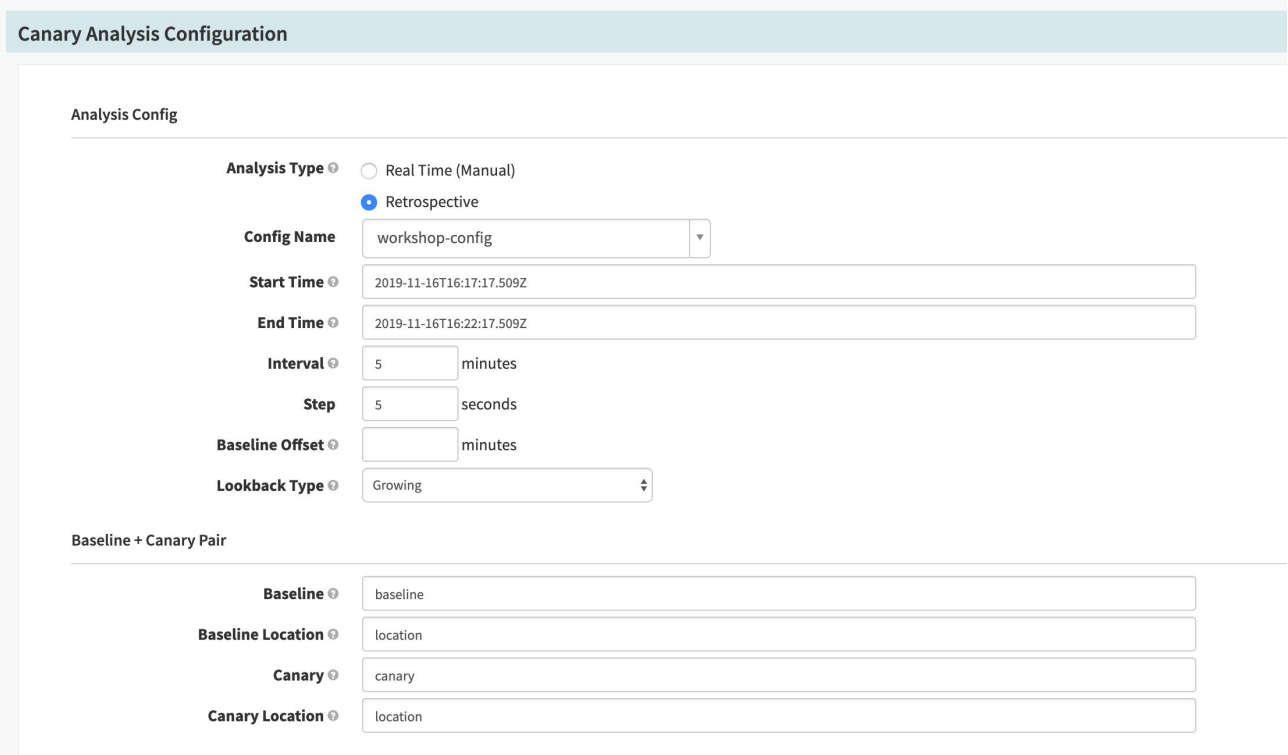
Configure Retrospective Analysis

This technique can be used to quickly iterate on a canary analysis configuration, with reproducible results, without needing to repeatedly wait for infrastructure to be provisioned and torn down.



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Still Want More?

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Additional Things to Explore

- Configure a canary using multiple metrics
- See if you can tune one of the metrics such that a human would have a hard time determining from the dashboard whether it is a safe push or not, but the statistical test still yields good results