



KubeCon



CloudNativeCon

———— North America 2018 ————

SIG Testing Intro

Aaron Crickenberger, Google (@spiffxp)

Steve Kuznetsov, Red Hat (@stevekuznetsov)



#sig-testing



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@beta@gayhorse.club

@stillinbeta

Follow

Robots emoji-reacting to other robots' messages in a bizarre facsimile of human interaction is the cyberpunk future we deserve



4:46 PM - 19 Dec 2017

3 Retweets 16 Likes



3



16



PR Workflow

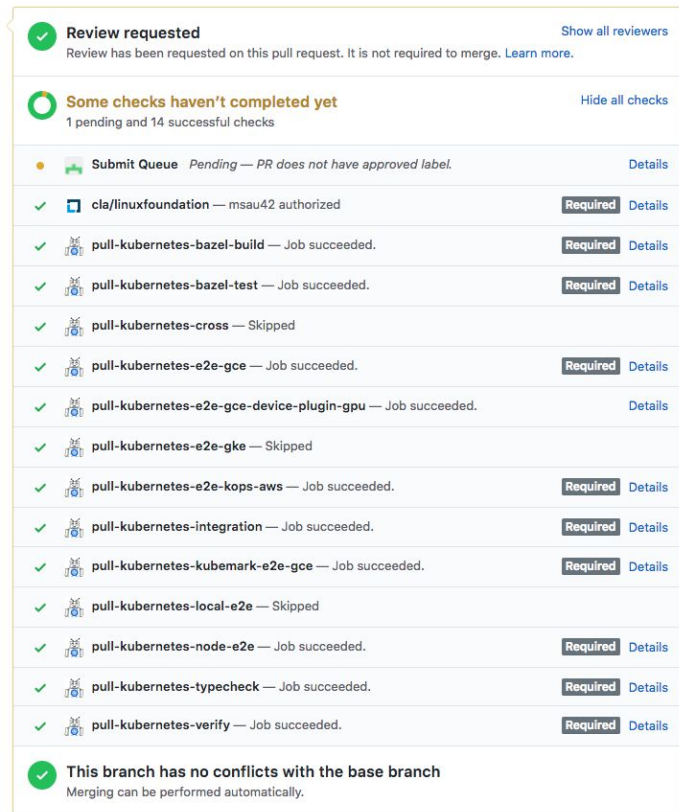
PR author must have signed CLA

PR must pass tests

PR must be approved

PR must be mergeable

Merge commit must pass tests



Review requested [Show all reviewers](#)
Review has been requested on this pull request. It is not required to merge. [Learn more.](#)

Some checks haven't completed yet [Hide all checks](#)
1 pending and 14 successful checks

- Submit Queue** Pending — PR does not have approved label. [Details](#)
- cla/linuxfoundation** — msau42 authorized **Required** [Details](#)
- pull-kubernetes-bazel-build** — Job succeeded. **Required** [Details](#)
- pull-kubernetes-bazel-test** — Job succeeded. **Required** [Details](#)
- pull-kubernetes-cross** — Skipped
- pull-kubernetes-e2e-gce** — Job succeeded. **Required** [Details](#)
- pull-kubernetes-e2e-gce-device-plugin-gpu** — Job succeeded. [Details](#)
- pull-kubernetes-e2e-gke** — Skipped
- pull-kubernetes-e2e-kops-aws** — Job succeeded. **Required** [Details](#)
- pull-kubernetes-integration** — Job succeeded. **Required** [Details](#)
- pull-kubernetes-kubemark-e2e-gce** — Job succeeded. **Required** [Details](#)
- pull-kubernetes-local-e2e** — Skipped
- pull-kubernetes-node-e2e** — Job succeeded. **Required** [Details](#)
- pull-kubernetes-typecheck** — Job succeeded. **Required** [Details](#)
- pull-kubernetes-verify** — Job succeeded. **Required** [Details](#)

This branch has no conflicts with the base branch
Merging can be performed automatically.



Automation

- boskos
- bootstrap
- config
- ghproxy
- greenhouse
- kubetest
- prow
- scenarios

Visualization

- gcsweb
- gopherage
- gubernator
- kettle
- metrics
- testgrid
- triage
- velodrome

Other

- commenter
- branchprotector
- issue-creator
- label_sync
- logexporter
- migratestatus
- peribolos
- planter

Explaining k/test-infra



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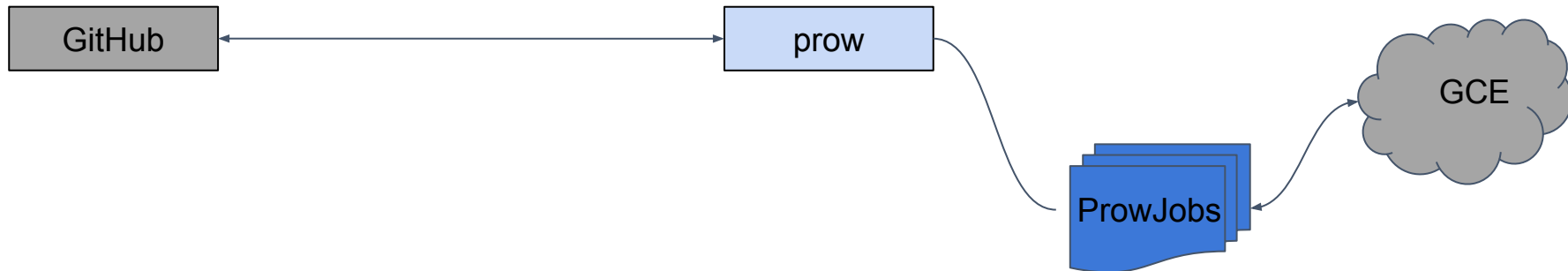
prowjob

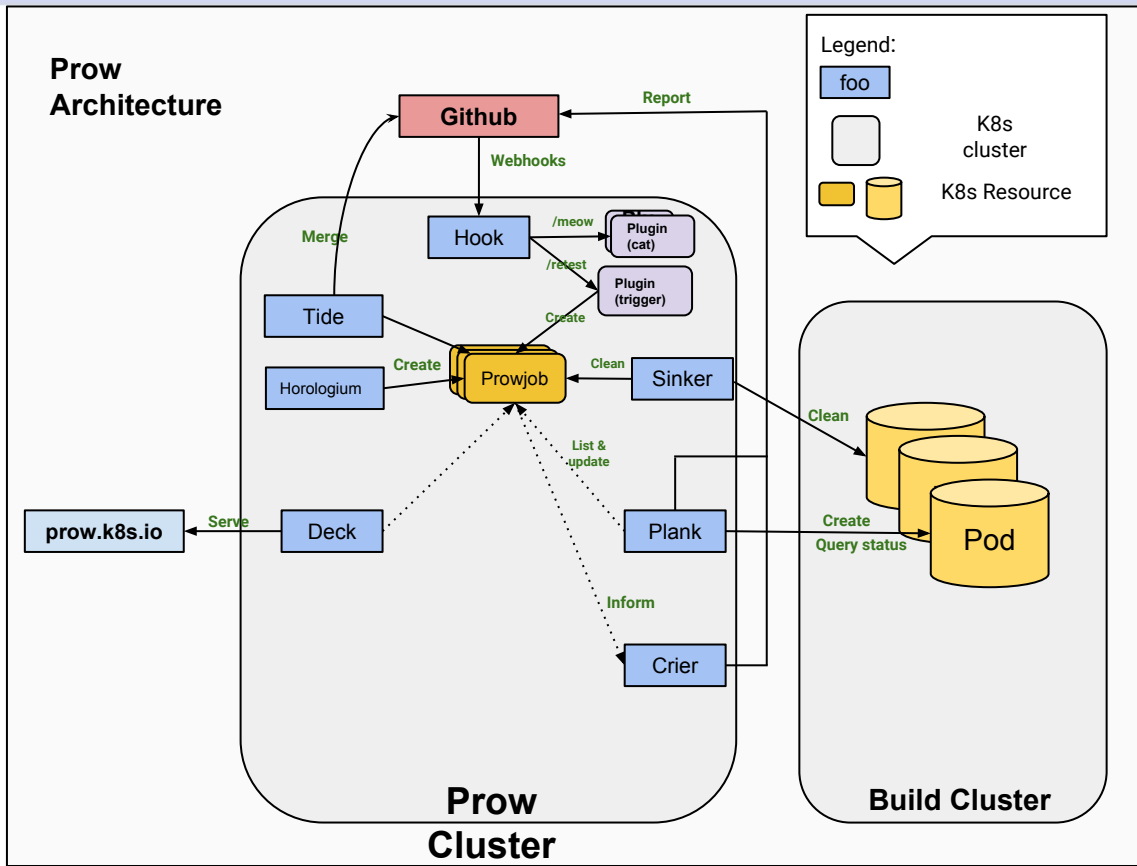
runs on k8s

other

stock

cloud





More info - prow

[Getting Started](#) - create a cluster, deploy prow

[Prow Components](#) - hook, deck, tide, etc.

[Prow Plugins](#) - plugins.yaml, prow.k8s.io/plugins, external plugins

[ProwJobs](#) - reference specs, env vars

[Using Prow at Scale](#) - lessons we learned, so you don't have to

[Tide](#) - you know, for merging

kubetest



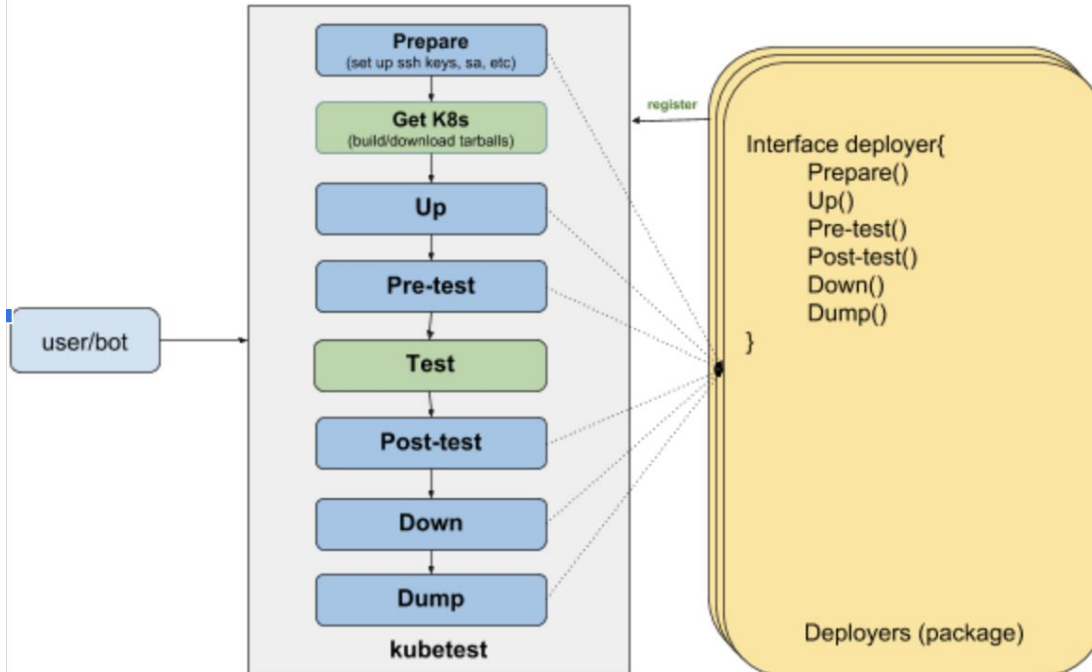
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Kubetest Workflow



pro

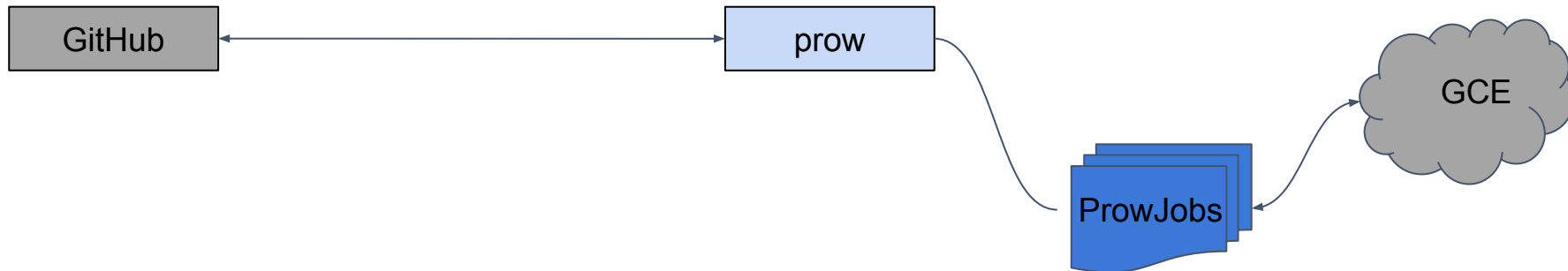


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+GCS

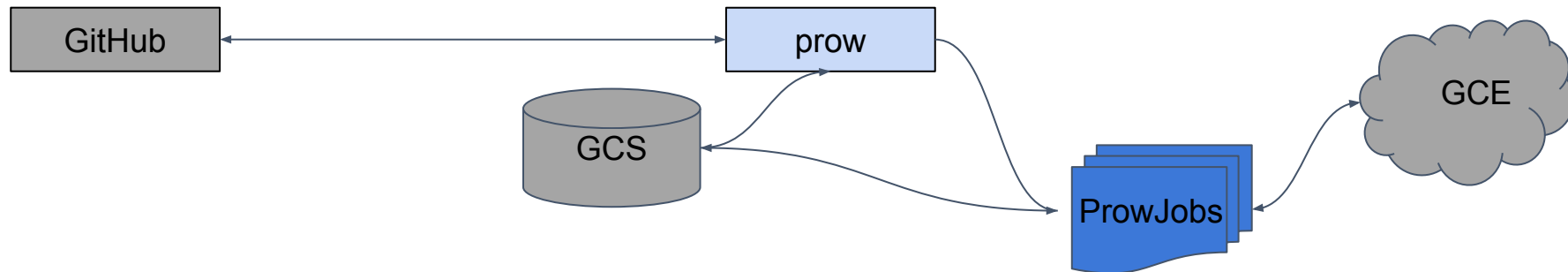


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- projob
- runs on k8s
- other
- stock
- cloud

kubernetes-jenkins

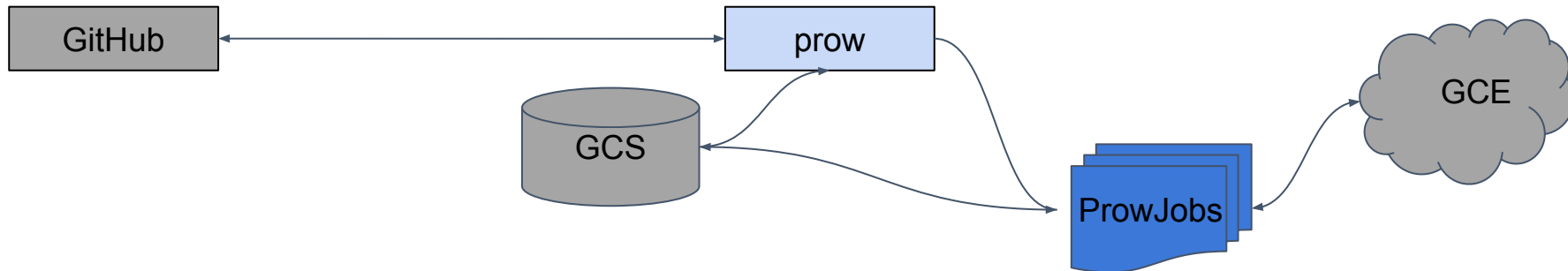
/kubernetes-jenkins/logs/ci-kubernetes-gce-conformance-latest-1-13/27/artifacts/

Name	Size	Modified
..	-	-
bootstrap-e2e-master/	-	-
bootstrap-e2e-minion-group-8zg1/	-	-
bootstrap-e2e-minion-group-t3l/	-	-
bootstrap-e2e-minion-group-h05k/	-	-
images.json	98	14 Nov 2018 13:22:17
junit_01.xml	41580	14 Nov 2018 13:22:17
junit_runner.xml	388	14 Nov 2018 13:22:17
metadata.json	186	14 Nov 2018 13:22:17
nodes.yaml	20633	14 Nov 2018 13:22:17

kubernetes-jenkins

/kubernetes-jenkins/logs/ci-kubernetes-gce-conformance-latest-1-13/27/artifacts/bootstrap-e2e-master/

Name	Size	Modified
..	-	-
docker.log	343907	14 Nov 2018 13:22:18
etcd-events.log	2227	14 Nov 2018 13:22:18
etcd.log	3245	14 Nov 2018 13:22:18
glibc.log	2708	14 Nov 2018 13:22:17
kern.log	10311	14 Nov 2018 13:22:18
kube-addon-manager.log	3487	14 Nov 2018 13:22:18
kube-apiserver-audit.log	1324402	14 Nov 2018 13:22:19
kube-apiserver-audit.log-20181114-1542200434.gz	9621977	14 Nov 2018 13:22:18
kube-apiserver.log	3060074	14 Nov 2018 13:22:19
kube-container-runtime-monitor.log	106	14 Nov 2018 13:22:17
kube-controller-manager.log	968178	14 Nov 2018 13:22:19
kube-master-configuration.log	1761	14 Nov 2018 13:22:17
kube-master-installation.log	1120	14 Nov 2018 13:22:18
kube-scheduler.log	43992	14 Nov 2018 13:22:18
kubelet-monitor.log	121	14 Nov 2018 13:22:18
kubelet.log	1375721	14 Nov 2018 13:22:19
serial-1.log	11858	14 Nov 2018 13:22:18



+gubernator

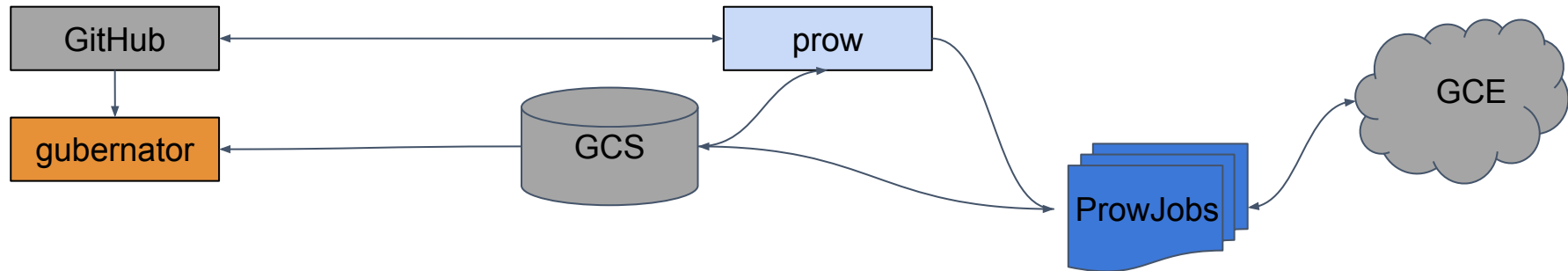


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- runs on k8s
- other
- stock
- cloud



ci-kubernetes-gce-conformance-latest-1-13 #27

Recent runs

Result	SUCCESS
Tests	0 failed / 214 succeeded
Started	2018-11-14 19:32 CST
Elapsed	1h49m
Version	v1.13.0-beta.0.257+20b5777d454e56
Builder	gke-prow-default-pool-3c8994a8-6sn5
pod	e45515d5-e800-11e8-bc35-0a580a6c0111
infra-commit	e4c33a675
job-version	v1.13.0-beta.0.257+20b5777d454e56
master_os_image	cos-stable-65-10323-64-0
node_os_image	cos-stable-65-10323-64-0
pod	e45515d5-e800-11e8-bc35-0a580a6c0111
version	v1.13.0-beta.0.257+20b5777d454e56

[artifacts](#)

[build.log](#)

No Test Failures!

[Show 214 Passed Tests](#)

[Show 1708 Skipped Tests](#)

gubernator

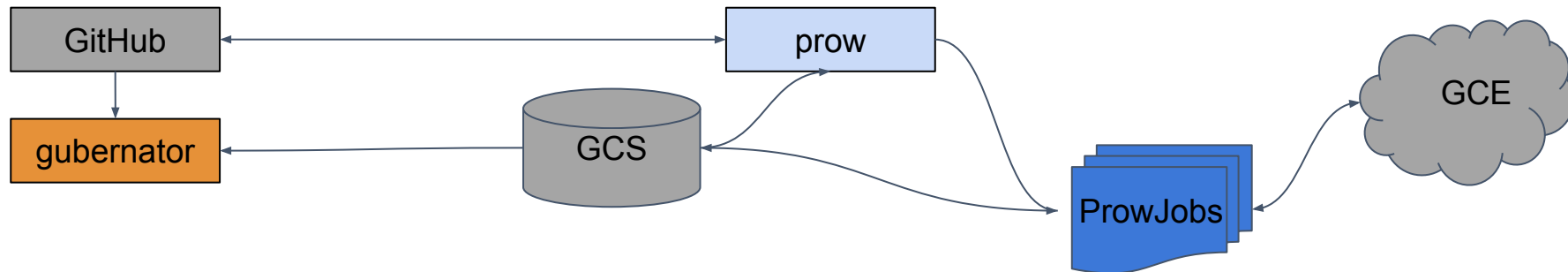


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+testgrid

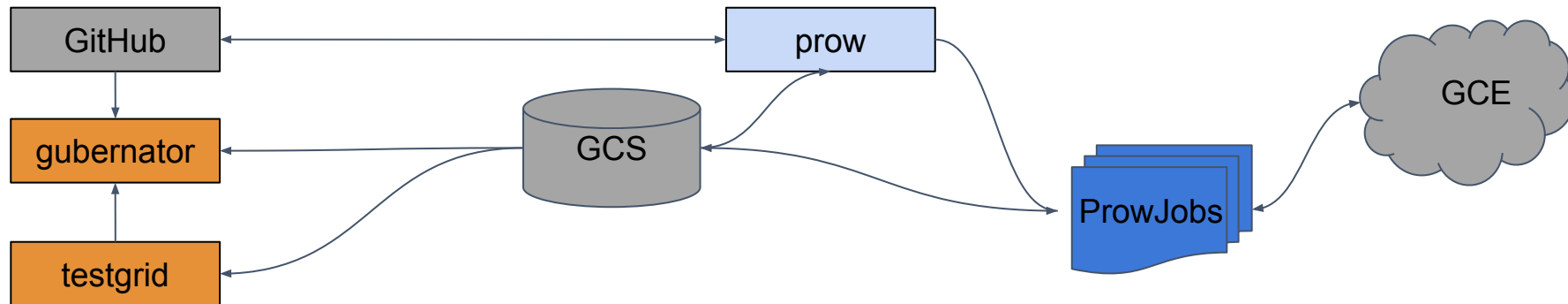


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testgrid

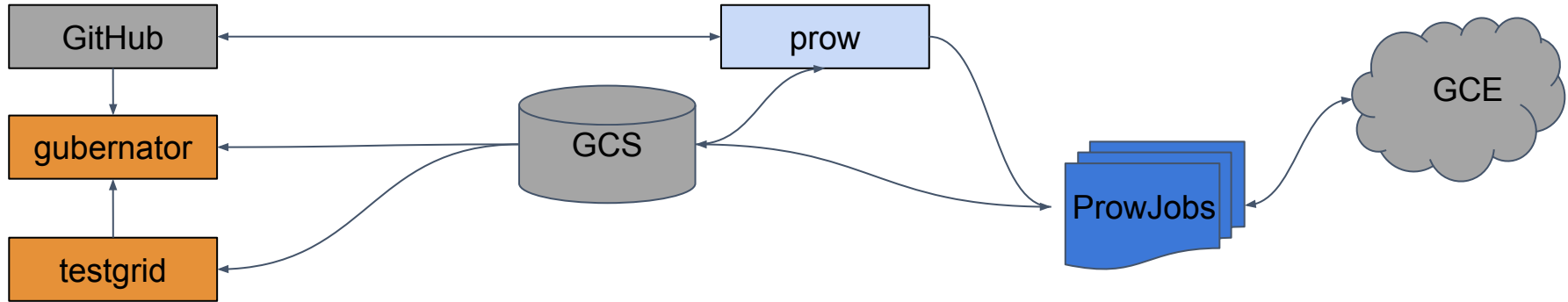


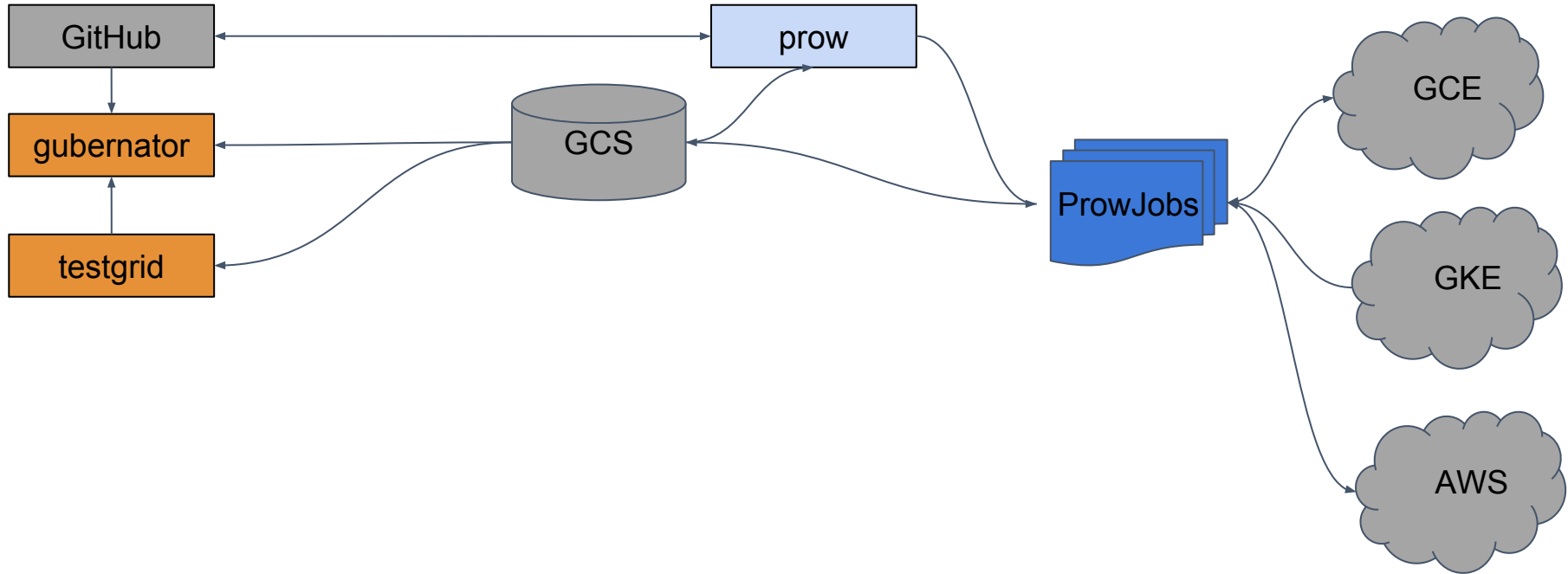
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+kettle

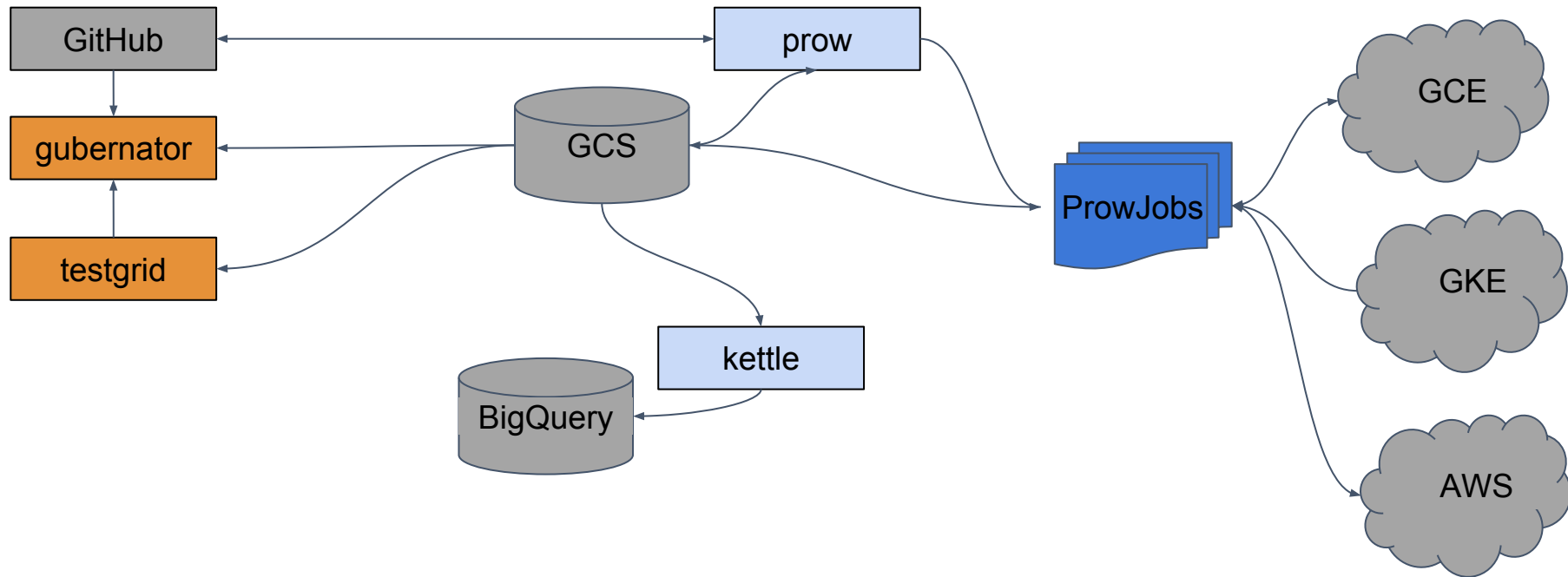


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+triage

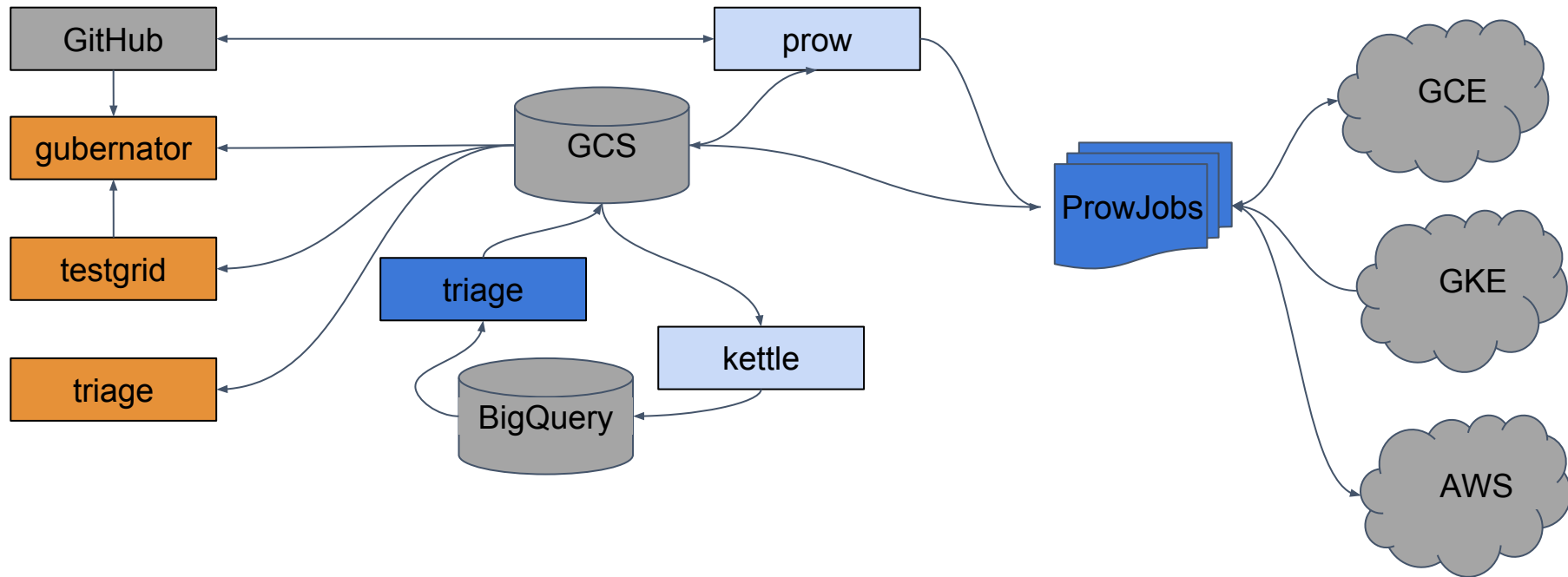


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Kubernetes Aggregated Failures from today

Show clusters for SIG: api-machinery apps autoscaling big-data cli cluster-lifecycle multicuster instrumentation network node scalability scheduling storage testing ui

Sort by total count count in last day error message

Include results from: CI PR

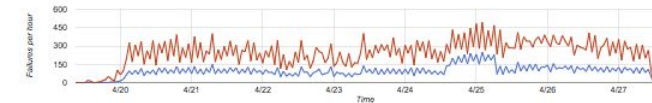
Filter (these are regexes):

Failure text:

Job:

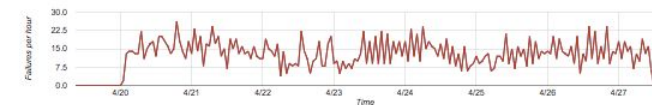
Test:

982 clusters of 48383 failures (6535 in last day) out of 74969 builds from 4/19/2018, 9:03:57 AM to 4/27/2018, 12:01:34 PM.



2433 FAILURES (336 TODAY) MATCHING [e685e87e70236748fafc](#) [github search](#) testing

error during ./hack/ginkgo-e2e.sh --ginkgo.skip={slow}\|[Serial\]\|[Disruptive\]\|[Flaky\]\|[Feature:.+]\ --minStartupPods=8 --report-dir=/workspace/_artifacts --disable-log-dump=true: exit status 1



Latest Failures

Time	Job	Test
4/27/2018, 11:21:11 AM	ci-kubernetes-e2e-gke-staging-default-parallel	Test
4/27/2018, 11:17:17 AM	ci-kubernetes-e2e-gce-gci-qa-master	Test
4/27/2018, 11:12:20 AM	ci-kubernetes-e2e-gke-staging-stable1-parallel	Test
4/27/2018, 11:12:14 AM	ci-kubernetes-e2e-gke-ubuntu1-k8sstable1-default	Test
4/27/2018, 11:08:12 AM	ci-kubernetes-e2e-gce-gci-qa-m65	Test

- Failed in 60 Jobs ▶
- Failed in 1 Test: ▼
- o 2433 Test: ▶

801 FAILURES (263 TODAY) MATCHING [d1f38bc799b8c60180](#) [github search](#) testing

error creating cluster: error during gcloud container clusters create --quiet --project=k8s-e2e-gke-prod-parallel --zone=us-central1-f --machine-type=n1-standard-2 --image-type=gci --num-nodes=3 --network=bootstrap-e2e --cluster-version=1.11.0-alpha.1.82+afa66cc28749c0 bootstrap-e2e: exit status 1



Latest Failures

Time	Job	Test
4/27/2018, 11:19:13 AM	ci-kubernetes-e2e-gke-sd-logging-gci-latest	Up
4/27/2018, 11:18:12 AM	ci-kubernetes-e2e-gke-stackdriver	Up
4/27/2018, 11:14:13 AM	ci-kubernetes-e2e-gke-master-new-gci-kubectl-skew-serial	Up
4/27/2018, 11:02:15 AM	ci-kubernetes-e2e-gke-regional-serial	Up
4/27/2018, 11:02:13 AM	ci-kubernetes-e2e-gke-master-new-gci-kubectl-skew	Up

- Failed in 26 Jobs: ▶
- Failed in 1 Test: ▼
- o 801 Up: ▶

triage

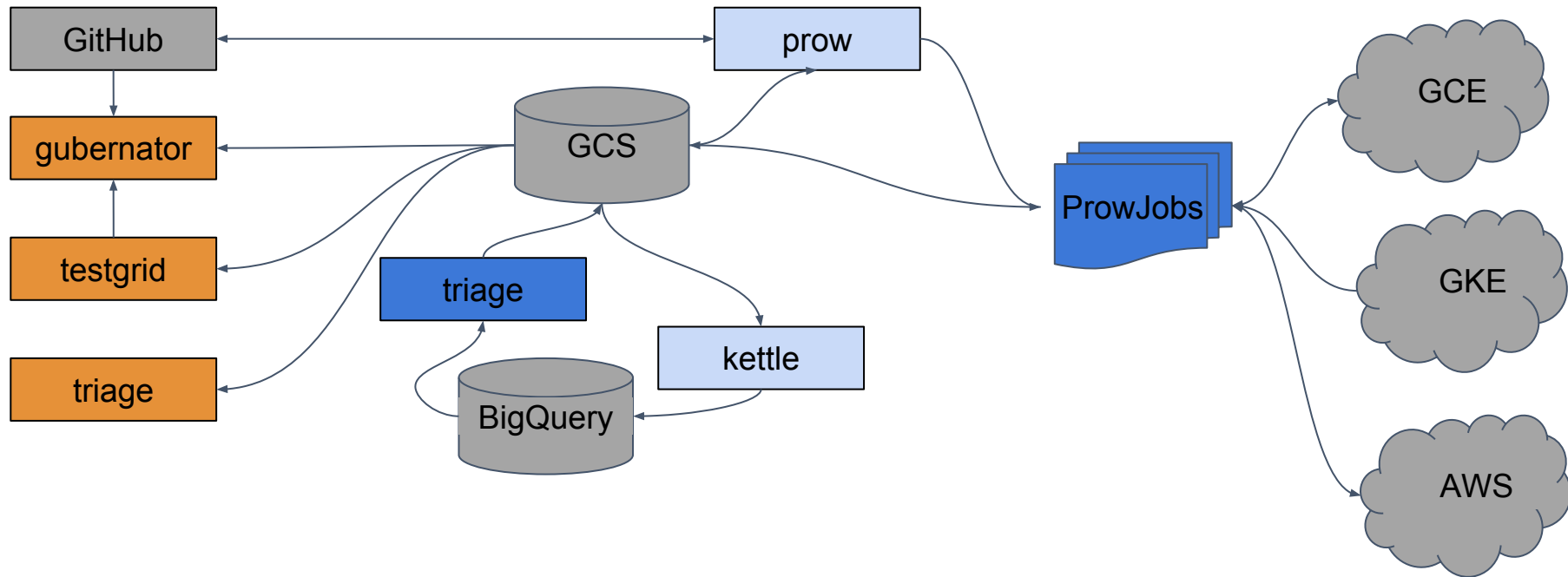


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+velodrome

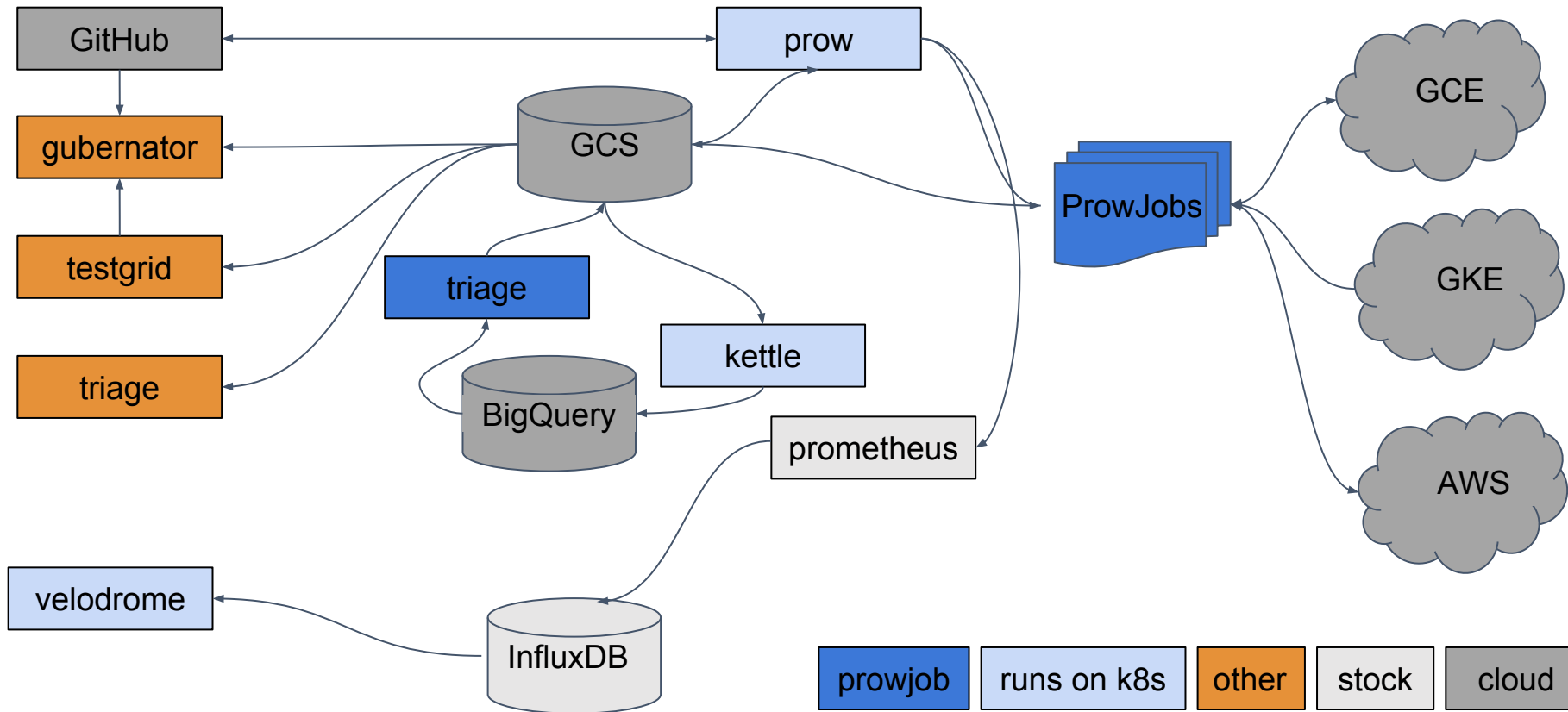


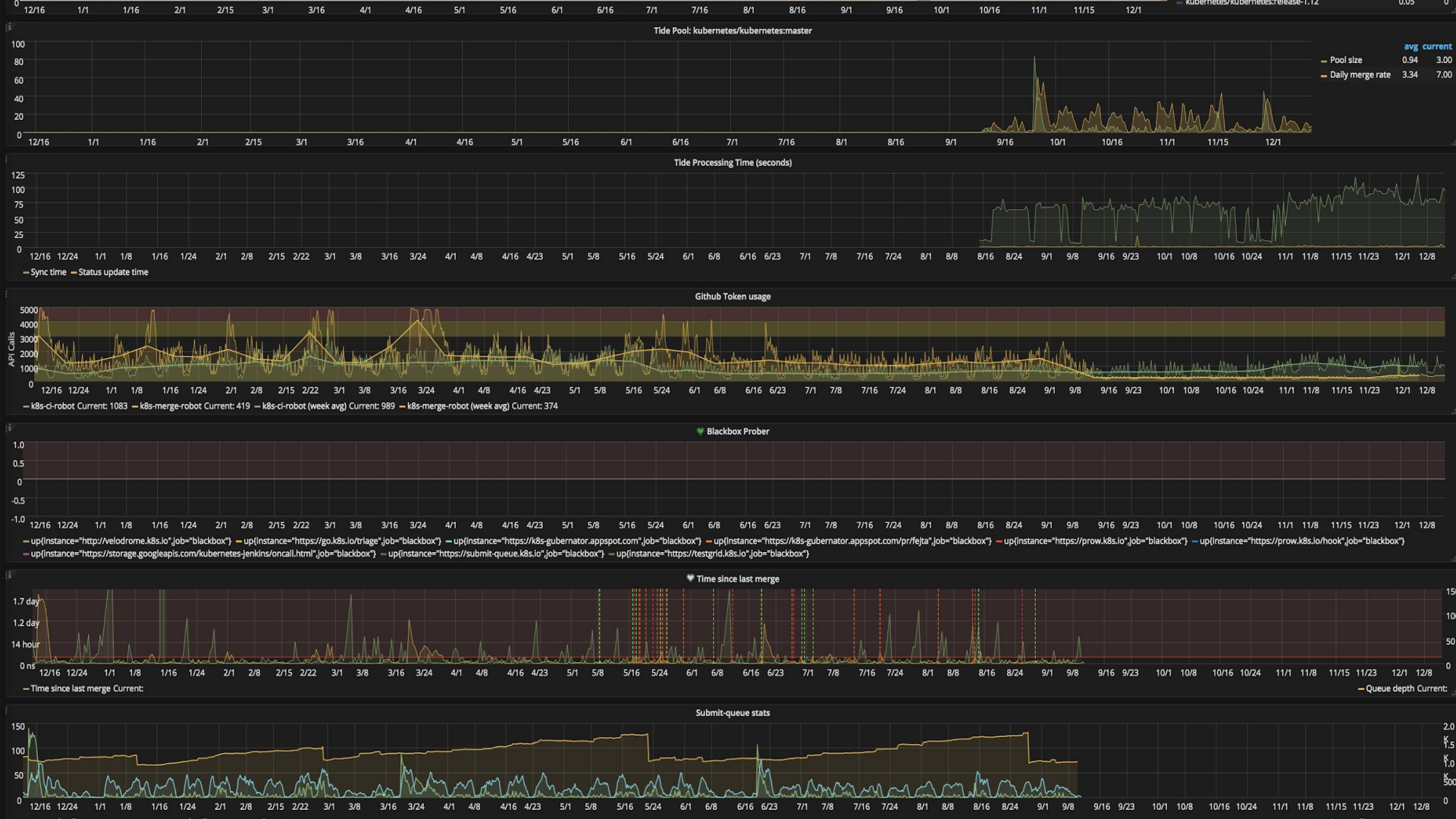
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velodrome

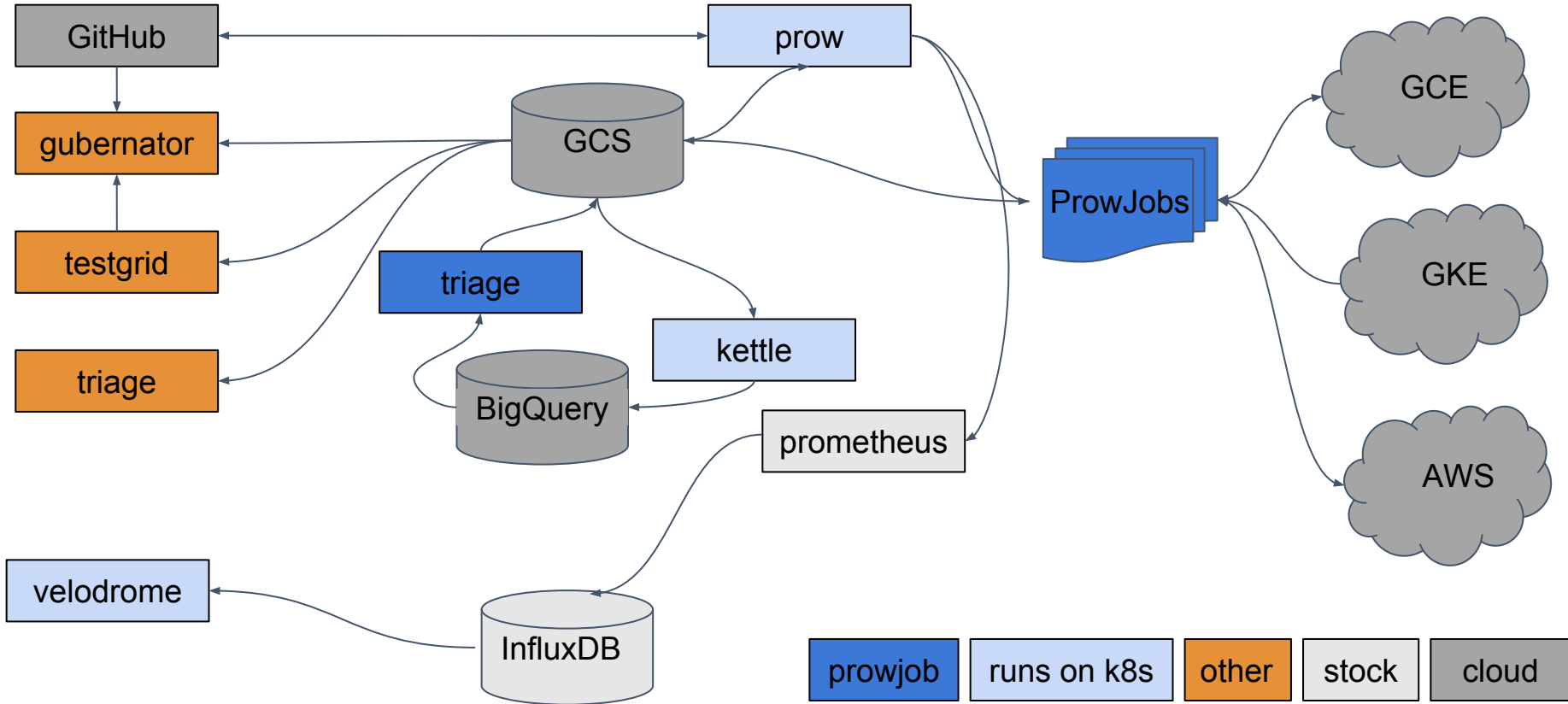


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+metrics

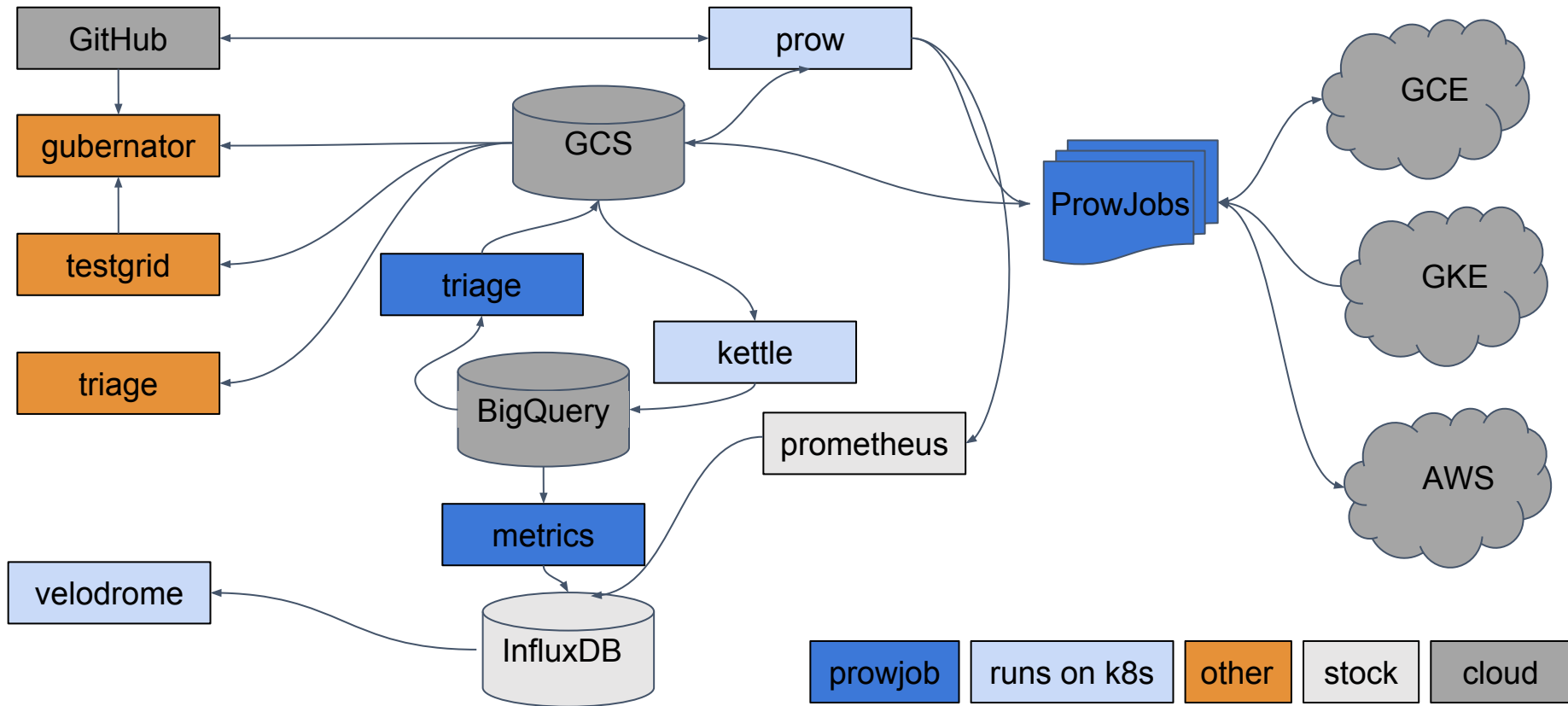


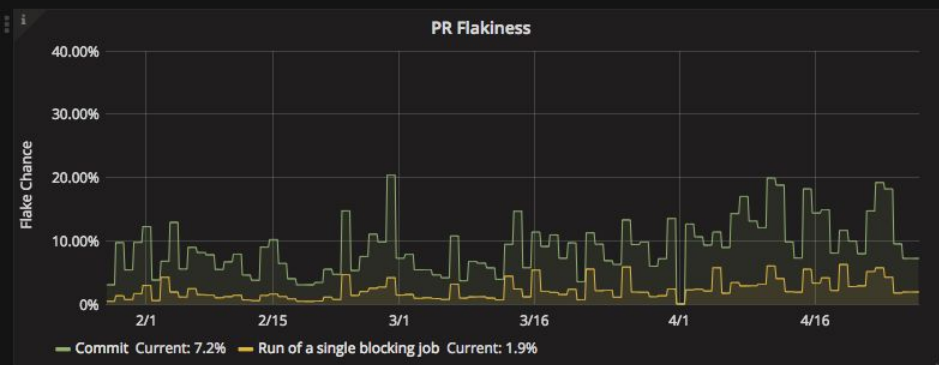
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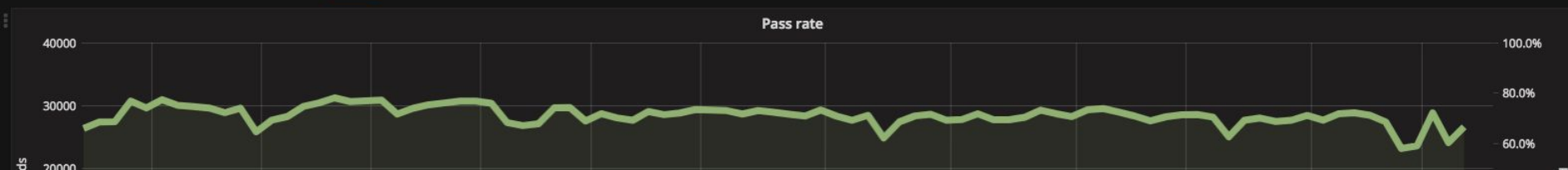


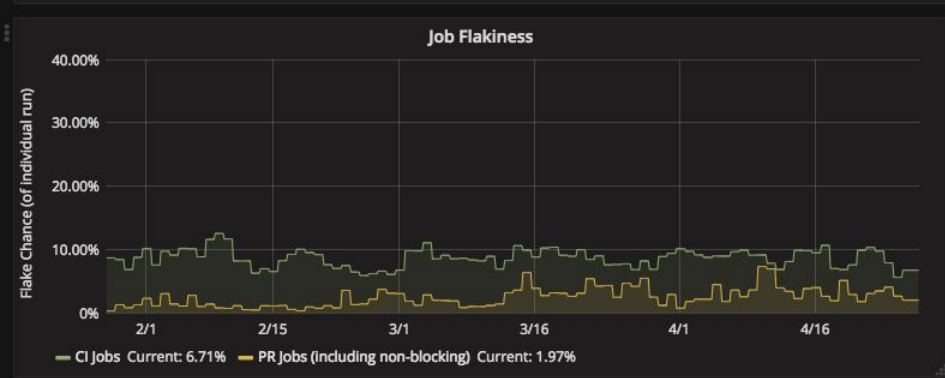
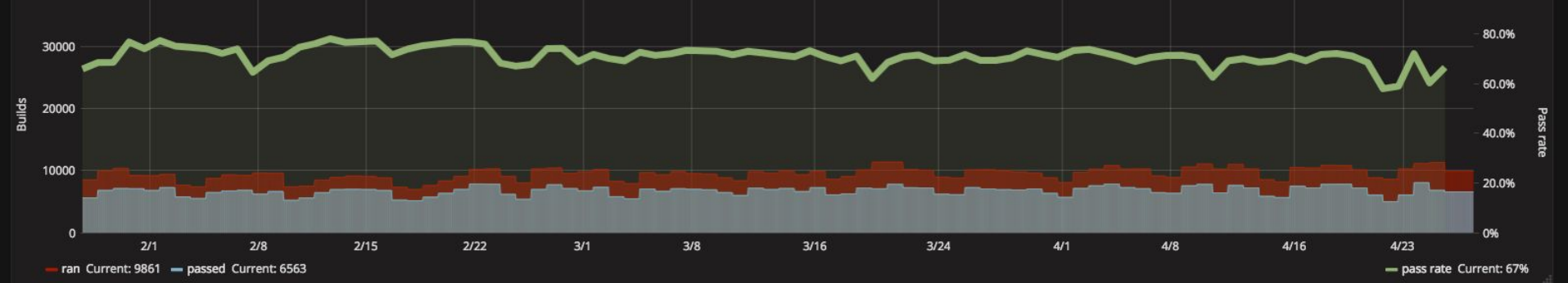
Longest Failing PR Jobs

Job	Failing Days
pr:pull-kubernetes-e2e-gce-big-performance	37
pr:kubeflow-hp-tuning-presubmit	7
pr:pull-cadvisor-e2e	5
pr:pull-cloud-provider-azure-lint	4
pr:pull-test-infra-verify-labels	4
pr:pull-cloud-provider-azure-unit	4
pr:kubeflow-testing-presubmit	3

Flakiest PR Jobs (past week)

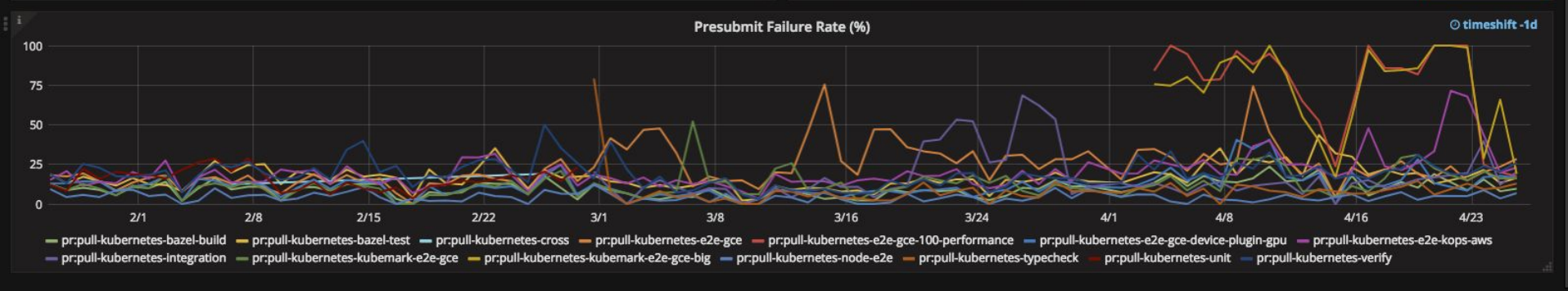
Job	Flakes	Flakiest Test	2nd Flakiest Test
pr:pull-kubernetes-e2e-kops-aws	79	67 flakes: Up	8 flakes: Timeout
pr:pull-kubernetes-kubemark-e2e-gce-big	62	66 flakes: Up	4 flakes: Timeout
pr:pull-kubernetes-integration	60	50 flakes: k8s.io/kubernetes/test/integration/etcd TestEtcdStoragePath	9 flakes: k8s.io/kubernetes/test/integration/garbagecollector TestCustomResourceCascadingDeletion
pr:pull-kubernetes-e2e-gce-100-performance	57	52 flakes: Up	9 flakes: [sig-scalability] Density [Feature:Performance] should allow starting 30 pods per node using { ReplicationController} with 0 secrets, 0 configmaps and 0 daemons
pr:pull-kubernetes-e2e-gce	35	12 flakes: [sig-api-machinery] Aggregator Should be able to support the 1.7 Sample API Server using the current Aggregator	9 flakes: Up
pr:pull-kubernetes-kubemark-e2e-gce	31	21 flakes: Up	6 flakes: Build
pr:pull-kubernetes-e2e-gce-device-plugin-gpu	24	16 flakes: Up	10 flakes: Build





Longest Failing Jobs

Job	Failing Days
ci-kubernetes-soak-cos-docker-validation	184
ci-kubernetes-e2e-gci-gce-ipv6	164
ci-kubernetes-e2e-kops-aws-ena-nvme	145
ci-kubernetes-e2e-gke-gci-stable3-gci-stable1-upgrade-master	142
ci-kubernetes-e2e-gke-gci-stable3-gci-stable1-upgrade-cluster	142
ci-kubernetes-e2e-gke-gci-new-gci-master-upgrade-master	129
ci-kubernetes-e2e-gke-gci-new-gci-master-upgrade-cluster	129



metrics

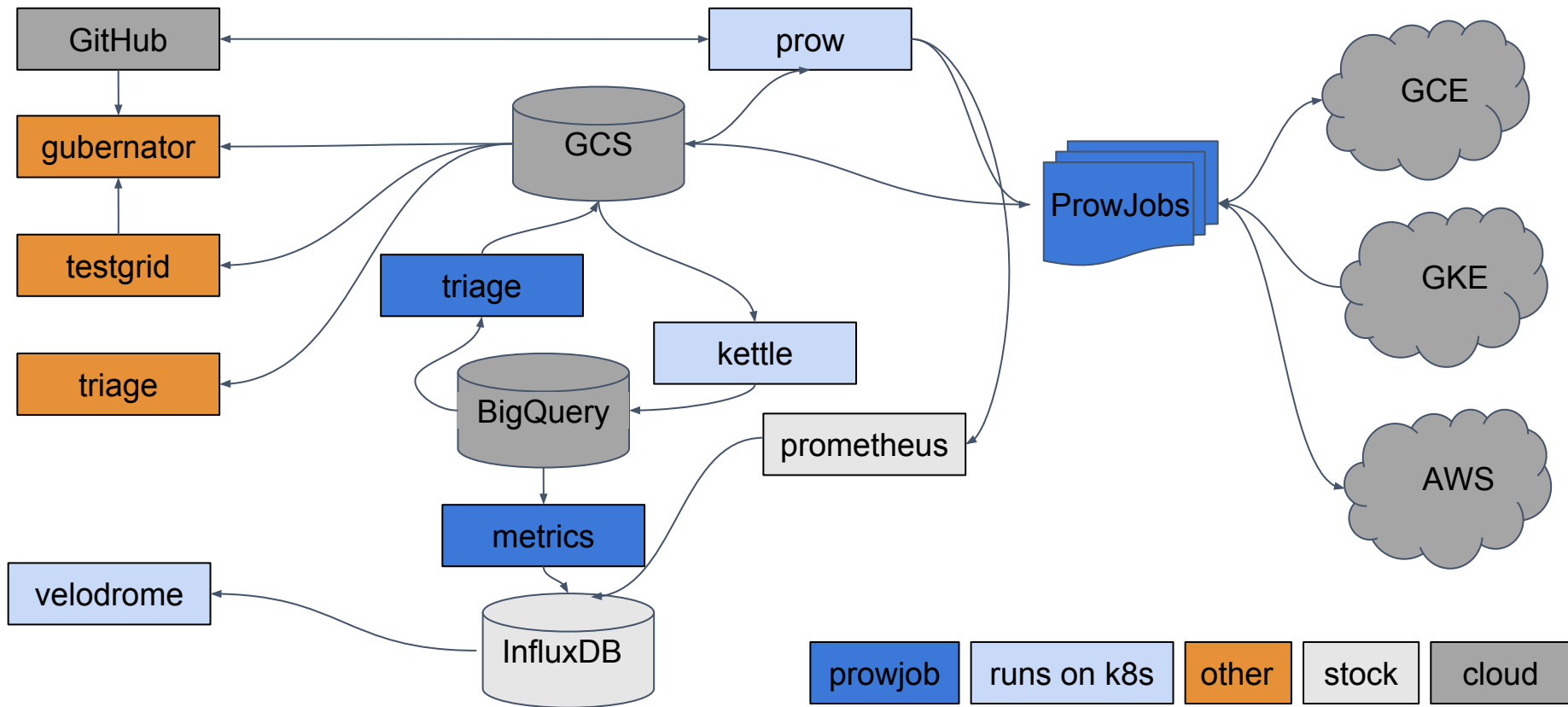


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+pub/sub

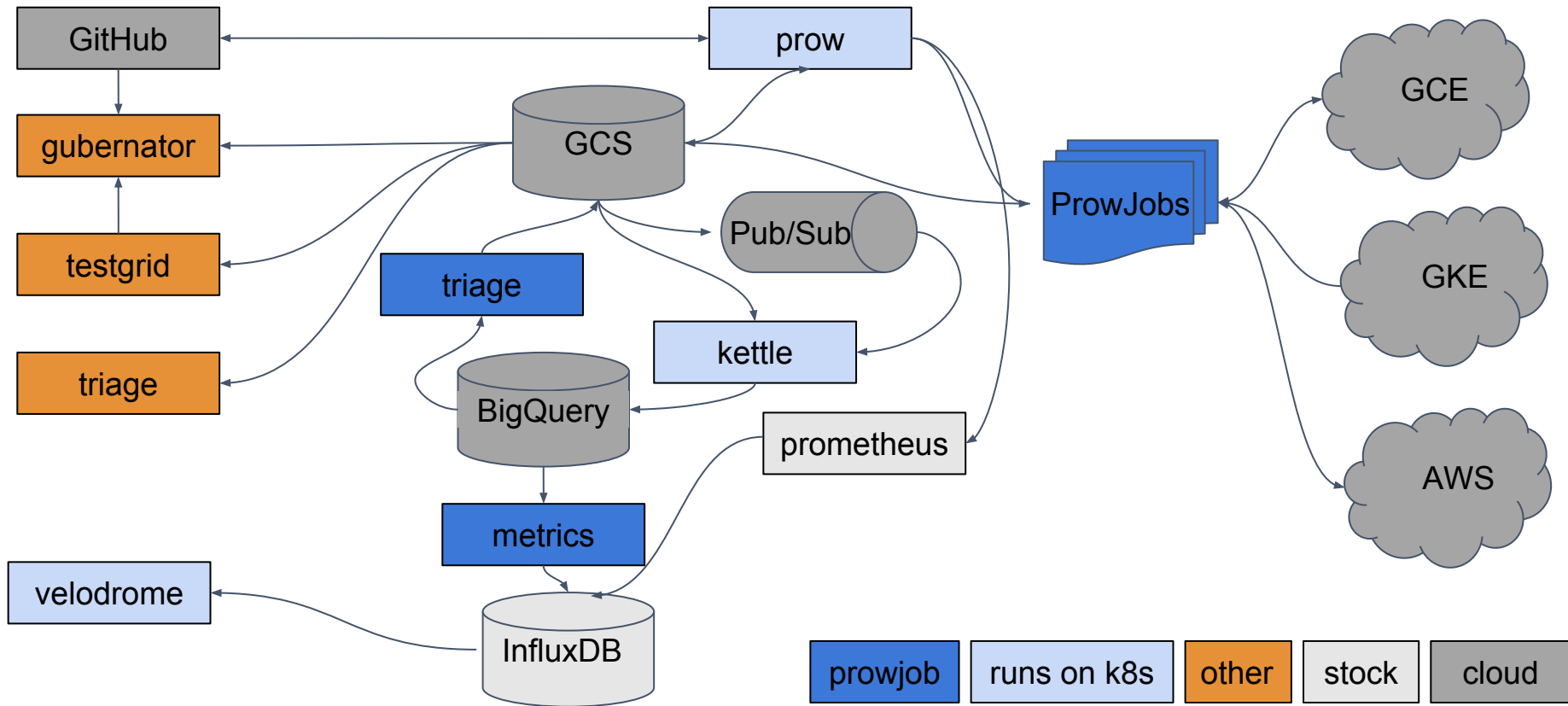


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+greenhouse

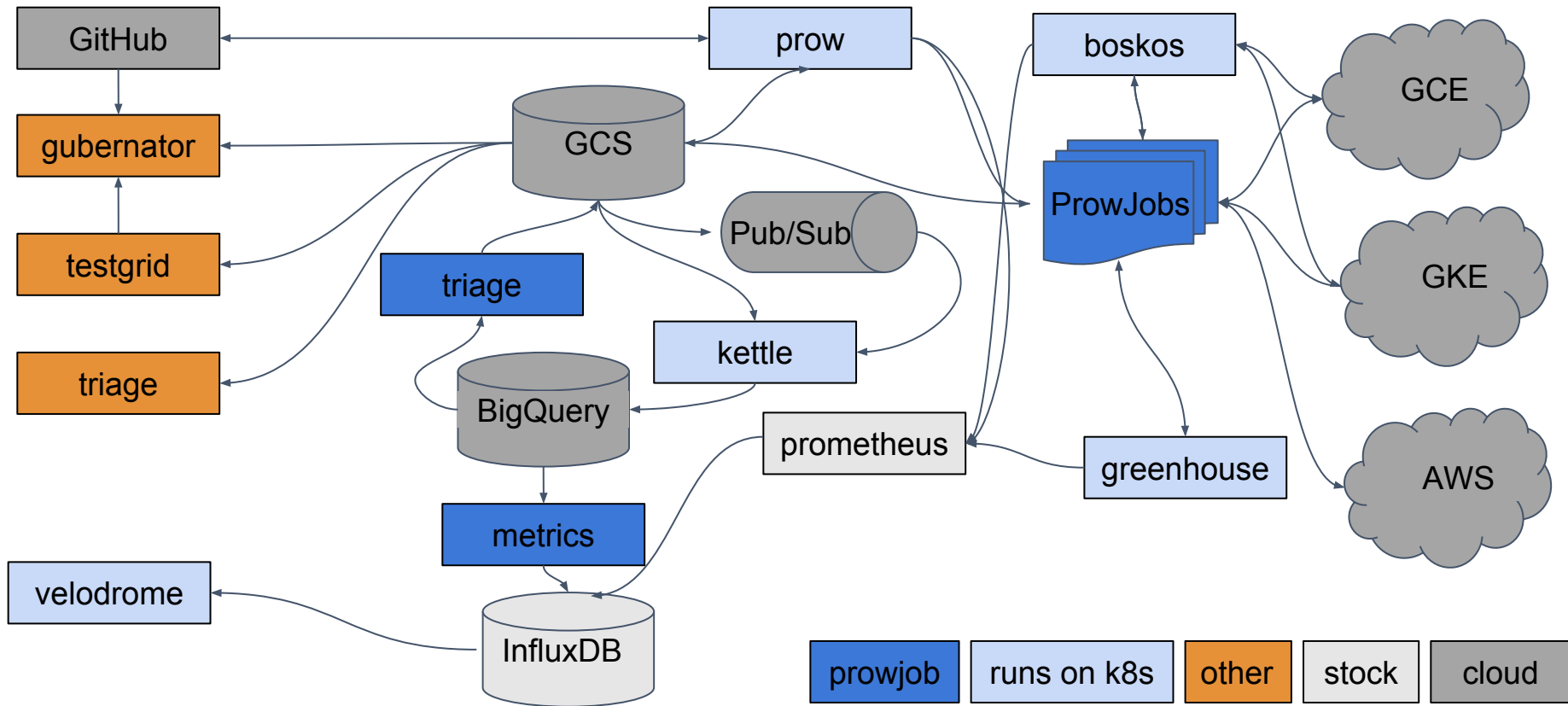


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+ghproxy

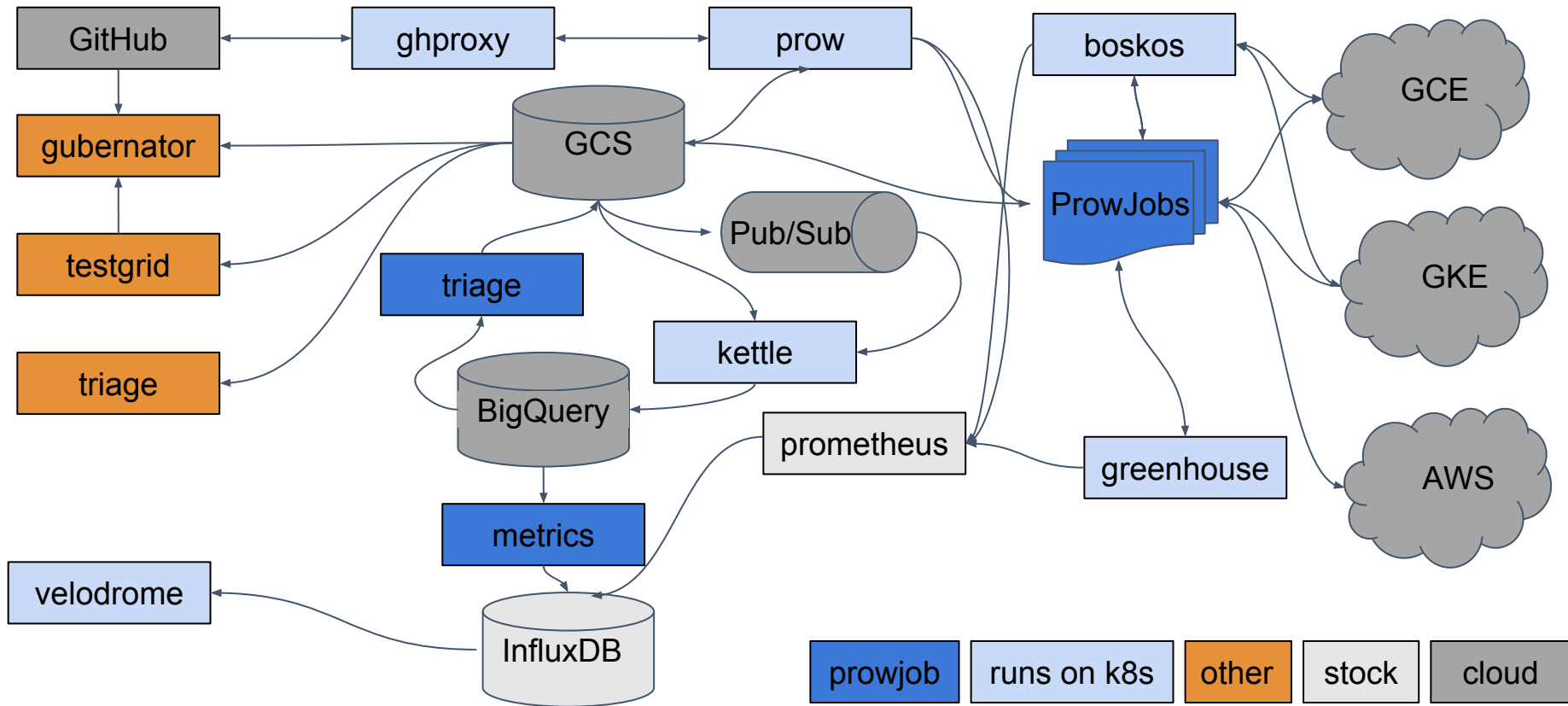


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Open Source

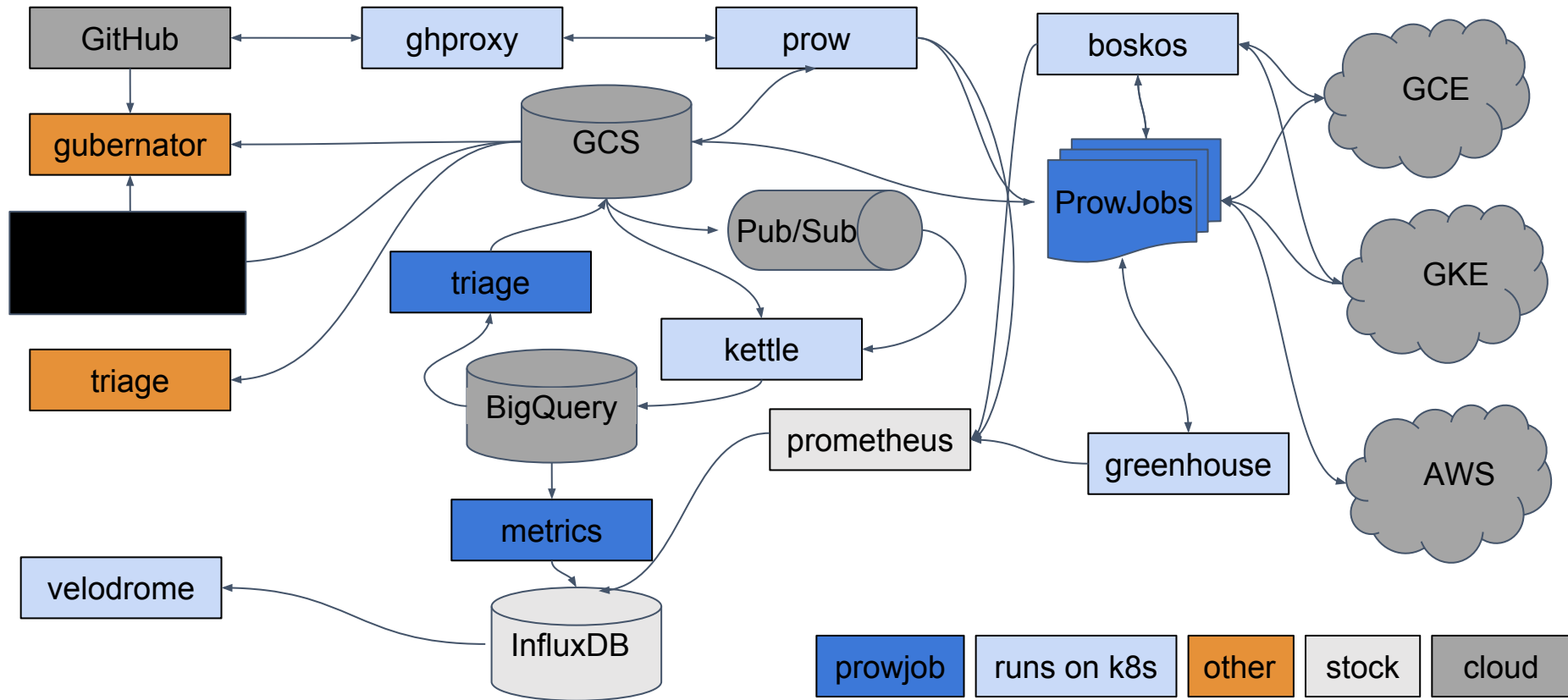


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sigs.k8s.io/kind



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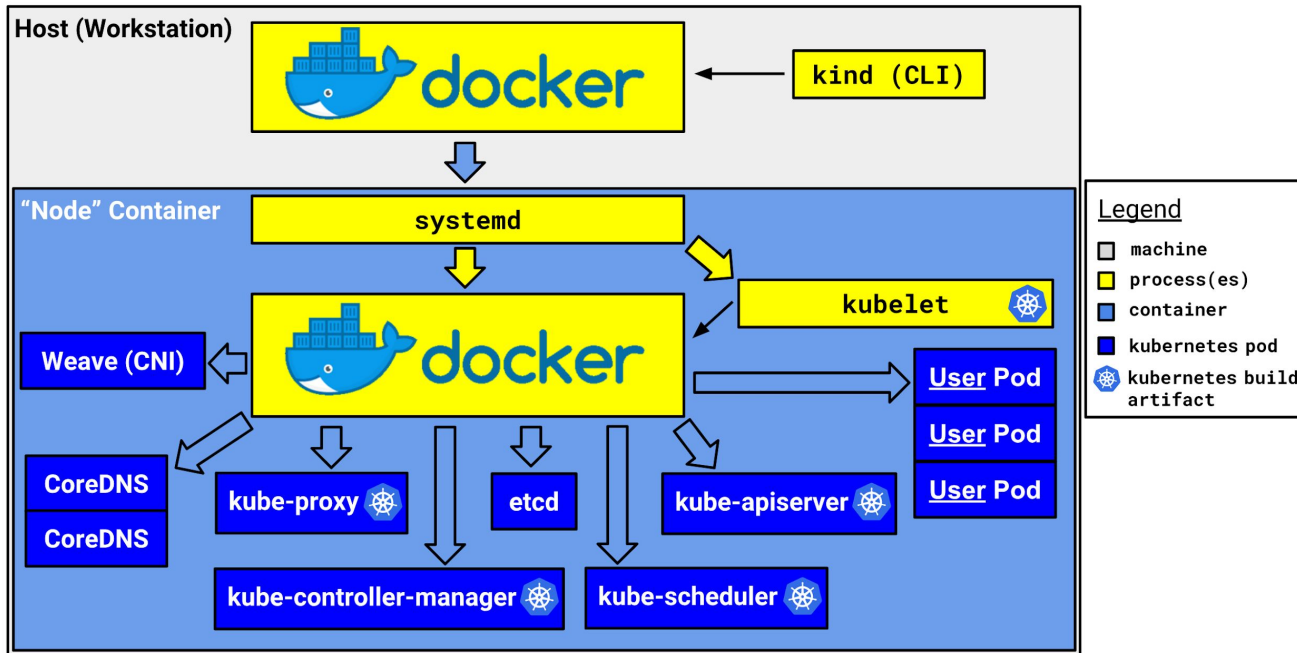
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It has come to my attention that you appreciate containers



Thus I have created a lightweight project to run the leading container orchestration platform inside of a container for expedient development

kind - Kubernetes IN Docker



Adopting Prow

So you've got a new repo. Why adopt Prow for your CI?

- Consistent UX with the Kubernetes ecosystem
 - `/retest`, `/lgtn`, `/approve`
- Automatic support from Gubernator and TestGrid for job overviews and historical data, flake detection
- No test throughput limits

Writing Your First Job



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```
0 | # test-infra/config/jobs/${org}/${repo}/${org}-${repo}-presubmits.yaml
1 | presubmits:
2 |   ${org}/${repo}:
3 |     - name: pull-ci-${org}-${repo}-unit
4 |       agent: kubernetes
5 |       decorate: true
6 |       spec:
7 |         containers:
8 |           - image: docker.io/golang:1.10
9 |             command:
10 |               - go
11 |             args:
12 |               - test
13 |               - ./...
```

Decoration?



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`decorate: true` is the Prow-ism for enabling background utilities that let you focus on writing the content of your test, not adapting it to work with the infra. Your test script can assume:

- the repository under test is checked out appropriately
- the script being called has the repository under test as it's working directory
- any files placed in the `$ARTIFACTS` directory will be uploaded to GCS after the test has run
- metadata for Gubernator and TestGrid will automatically be generated and uploaded
 - anything extra in `metadata.json` will be forwarded to GCS

A Job In Action



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We're going to take a look at the [pull-test-infra-verify-codegen job](#).

We can see the job reporting on a [pull request](#)

Or look at historical results in the [Prow overview](#)

Or browse patterns for the job in [TestGrid](#)!

A Job In Action



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We're going to take a look at the [pull-test-infra-verify-codegen job](#).

```
- name: pull-test-infra-verify-codegen
  path_alias: "k8s.io/test-infra"
  decorate: true
  spec:
    containers:
    - image: gcr.io/k8s-testimages/kubekins-e2e:v20181205-915278e90-experimental
      command:
      - ./hack/verify-codegen.sh
```

A Job In Action



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We can see the job reporting on a [pull request](#)



k8s-ci-robot merged commit **d6f7bb8** into `kubernetes:master` 4 days ago

[Hide details](#)

12 checks passed



cla/linuxfoundation ayj authorized

[Details](#)



pull-test-infra-verify-codegen Job succeeded.

[Details](#)

A Job In Action



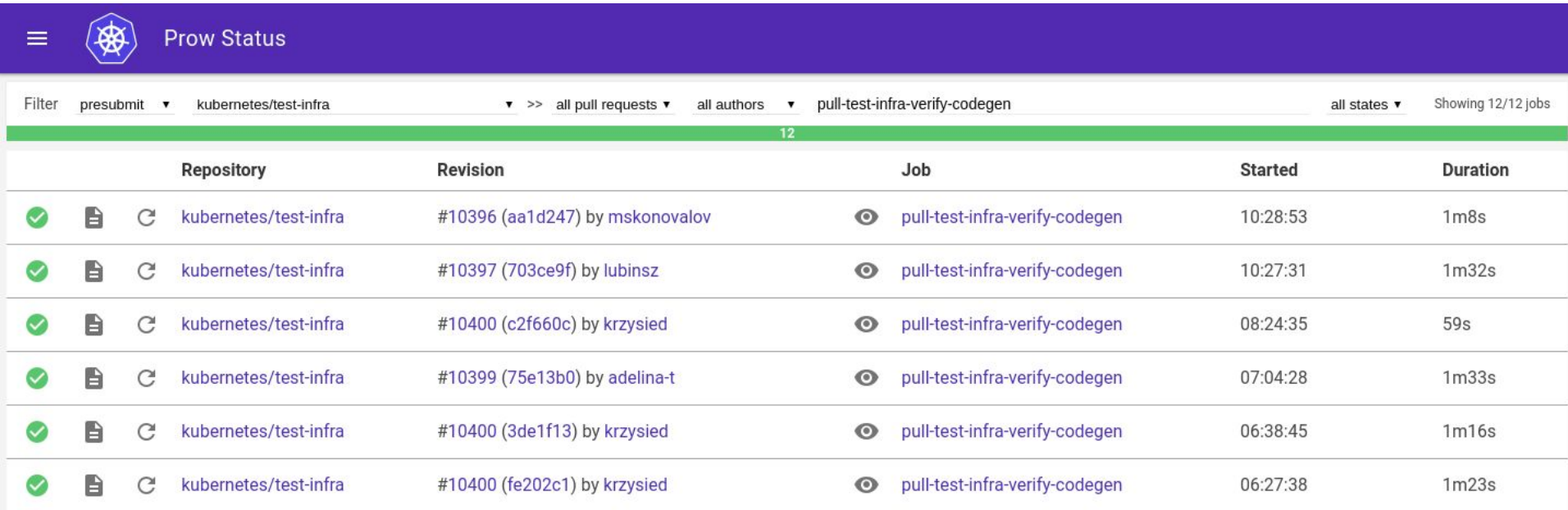
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Or look at historical results in the [Prow overview](#)



The image shows a screenshot of the Prow Status interface. At the top, there is a purple header with a hamburger menu icon, the Prow logo, and the text "Prow Status". Below the header is a filter bar with the following settings: "Filter presubmit", "kubernetes/test-infra", ">> all pull requests", "all authors", "pull-test-infra-verify-codegen", and "all states". On the right side of the filter bar, it says "Showing 12/12 jobs". Below the filter bar is a green bar with the number "12". The main content is a table with the following columns: "Repository", "Revision", "Job", "Started", and "Duration". Each row in the table has a green checkmark icon on the left, followed by a document icon and a refresh icon. The table contains six rows of job data.

Repository	Revision	Job	Started	Duration
kubernetes/test-infra	#10396 (aa1d247) by mskonovalov	pull-test-infra-verify-codegen	10:28:53	1m8s
kubernetes/test-infra	#10397 (703ce9f) by lubinsz	pull-test-infra-verify-codegen	10:27:31	1m32s
kubernetes/test-infra	#10400 (c2f660c) by krzysied	pull-test-infra-verify-codegen	08:24:35	59s
kubernetes/test-infra	#10399 (75e13b0) by adelina-t	pull-test-infra-verify-codegen	07:04:28	1m33s
kubernetes/test-infra	#10400 (3de1f13) by krzysied	pull-test-infra-verify-codegen	06:38:45	1m16s
kubernetes/test-infra	#10400 (fe202c1) by krzysied	pull-test-infra-verify-codegen	06:27:38	1m23s

A Job In Action



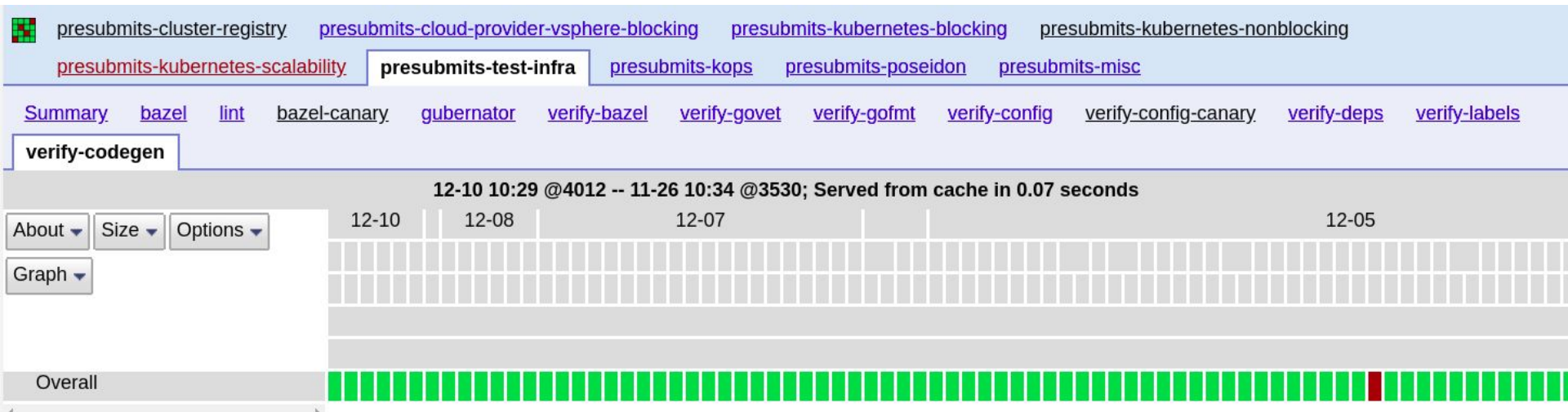
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Or browse patterns for the job in [TestGrid!](#)



Write a Job



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Let's see some samples

- I want a presubmit that runs:
 - [a script in my repo](#)
 - [something from the container image](#)
- I want a periodic [that makes sure everything runs well with k/k HEAD](#)
- I want to [build and push images](#) whenever something merges to master

SIG Testing Talks



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Tuesday, December 11 • 11:40am - 12:15pm

[Behind Your PR: How Kubernetes Uses Kubernetes to Run Kubernetes CI - Sen Lu & Benjamin Elder, Google](#)

Wednesday, December 12 • 2:35pm - 3:10pm

[Using Prow for Testing Outside of K8s - Matt Landis, Amazon Web Services](#)

Thursday, December 13 • 3:40pm - 4:15pm

[Deep Dive: Testing SIG - Cole Wagner & Katharine Berry, Google](#)

SIG Testing Contact



KubeCon



CloudNativeCon

North America 2018

git.k8s.io/community/sig-testing

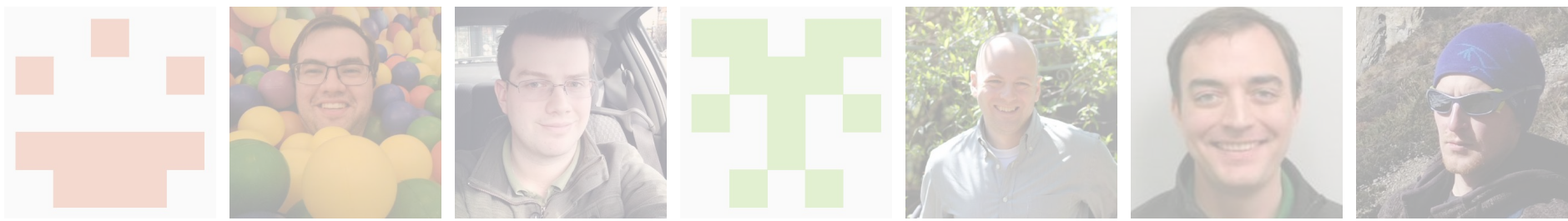
git.k8s.io/test-infra

sigs.k8s.io/kind

sigs.k8s.io/testing_frameworks

kubernetes-sig-testing@googlegroups.com

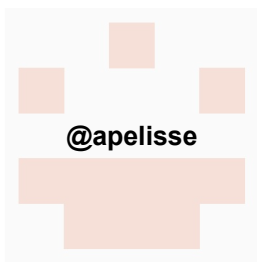
[#testing-ops](#) / [#sig-testing](#) / [#prow](#) / [#kind](#)



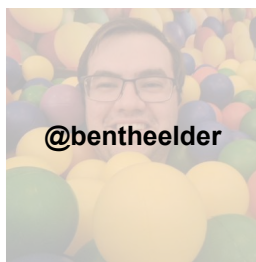
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OUT OF DATE

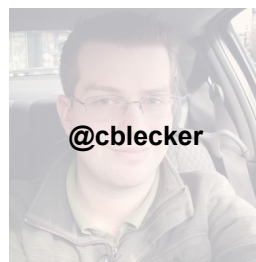




@apelisse



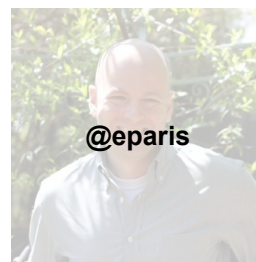
@bentheelder



@cblecker



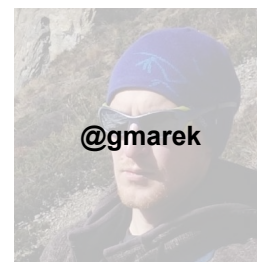
@cjwagner



@eparis



@fejta



@gmarek



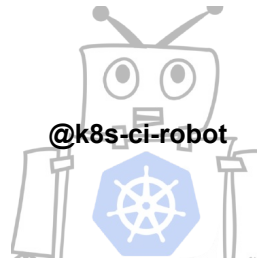
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@ixdy



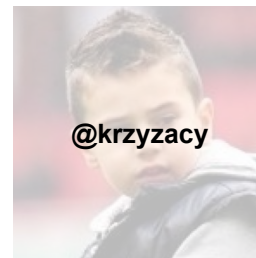
@justinsb



@k8s-ci-robot



@kargakis



@krzyzacy



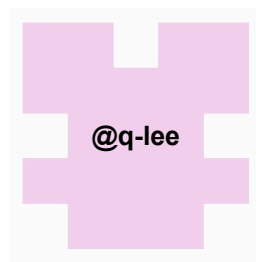
@lavalamp



@michelle192837



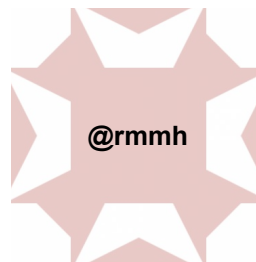
@oomichi



@q-lee



@qhuynh96



@rmmh



@shymjvs



@spiffxp



@spxtr



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