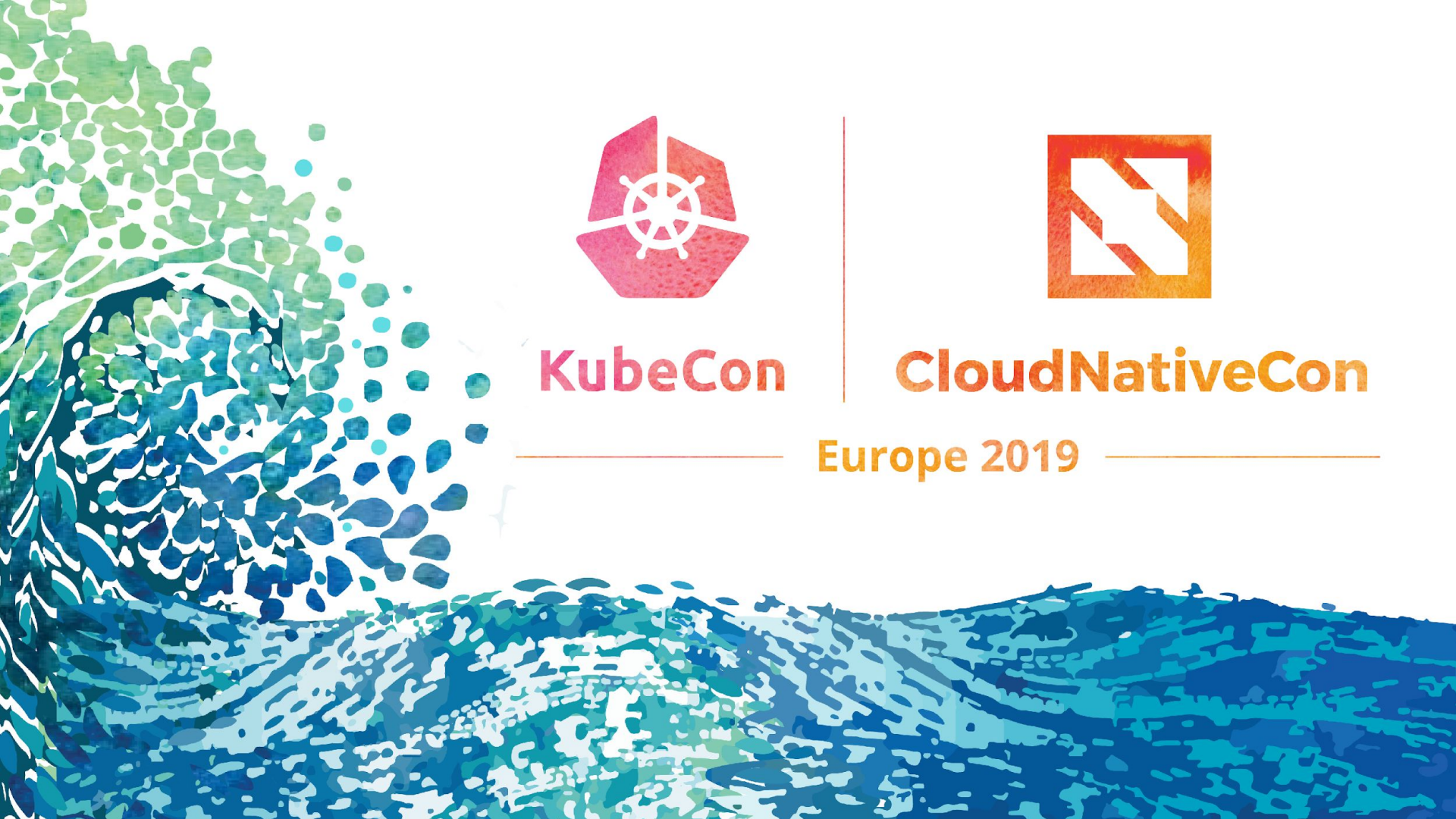
KubeCon
CloudNativeCon
Europe 2019

KubeCon | CloudNativeCon Europe 2019

SIG Testing Intro

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Aishwarya Sundar (Google, @aishsundar)

This Presentation

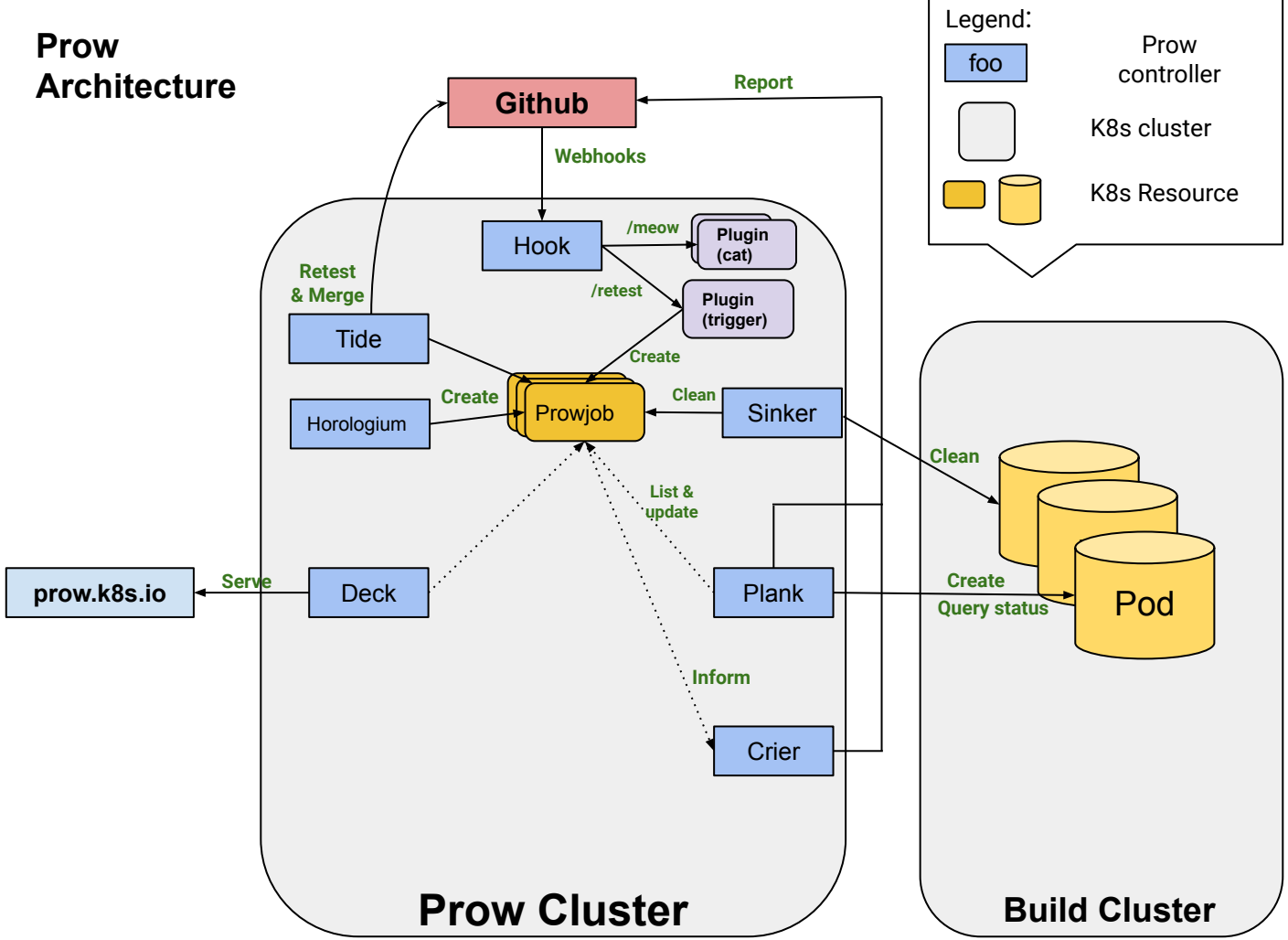
1. Tooling overview
2. New from SIG Testing
3. Using SIG Testing tooling internally for Anthos

SIG-Testing Tools

- Prow
  - Jobs, plugins, Tide
- Slack automation
- TestGrid
- kind
- Boskos
- Gopherage
- Kubetest
- GitHub administration automation
  - Branch protector, label_sync, Peribolos
- ...

Prow

- CI/CD system built on Kubernetes for Kubernetes
- Executes jobs for building, testing, publishing, and deploying.
- Jobs can be triggered by different types of events and report their status to many different services.
- Also provides GitHub automation:
  - Policy enforcement.
  - Chat-ops via `/foo` style commands.
  - Automatic pull request merging.
- Used by:


Prow Architecture
Legend:
foo
Prow controller
K8s cluster
K8s Resource
Github
Report
Webhooks
Hook
/meow
Plugin (cat)
/retest
Plugin (trigger)
Retest & Merge
Tide
Create
Create
Horologium
Prowjob
Clean
Sinker
Clean
List & update
prow.k8s.io
Serve
Deck
Plank
Create
Query status
Pod
Inform
Crier
Prow Cluster
Build Cluster

What's new?

- Switched job viewing from Gubernator to Spyglass
- Tide action history page
- Slack automation
- kind: lots of new features and improved support
- Automated Prow component publishing, version bumping, and deployment.
- Phaino
- Tackle
- Sub
- Tekton Pipeline controller
- Triggering commands in Gerrit comments (/test, /retest)
- Automated publishing of all variants of test images.

~~Gubernator~~ -> Spyglass

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kubernetes/test-infra PR #12516 pull-test-infra-bazel #1125833442571849731

Recent runs || View in Spyglass

PR	Katharine: Shuffle release branch jobs and add fork annotations
Result	FAILURE
Tests	1 failed / 173 succeeded
Started	2019-05-07 11:43 PDT
Elapsed	6m29s
Revision	a80ce603c1f6fec27a31f2011f9931309b929bc3
Refs	12516

artifacts | build log

Test Failures

//testgrid/cmd/configurator:go_default_test 0.00s

Command: bazel test //testgrid/cmd/configurator:go_default_test

```
exec ${PAGER:-/usr/bin/less} "$0" || exit 1
Executing tests from //testgrid/cmd/configurator:go_default_test
-----------------------------------------------------------------------------
Job ci-kubernetes-build does not have a matching testgrid testgroup
Total bad job(s) - 1
--- FAIL: TestJobsTestgridEntryMatch (3.47s)
    config_test.go:440: Failed with invalid config or job entries
FAIL
```

from junit_bazel.xml

Filter through log files | View test history on testgrid

Show 173 Passed Tests

~~Gubernator~~ -> Spyglass

pull-test-infra-bazel #1125833442571849731

Job History | PR History | Artifacts | Testgrid

Test started today at 11:43 AM **failed** after 6m29s. (more info)

JUnit

1/174 Tests Failed.

//testgrid/cmd/configurator:go_default_test 0s

173/174 Tests Passed!

Build Log

Show all hidden lines | Raw build-log.txt

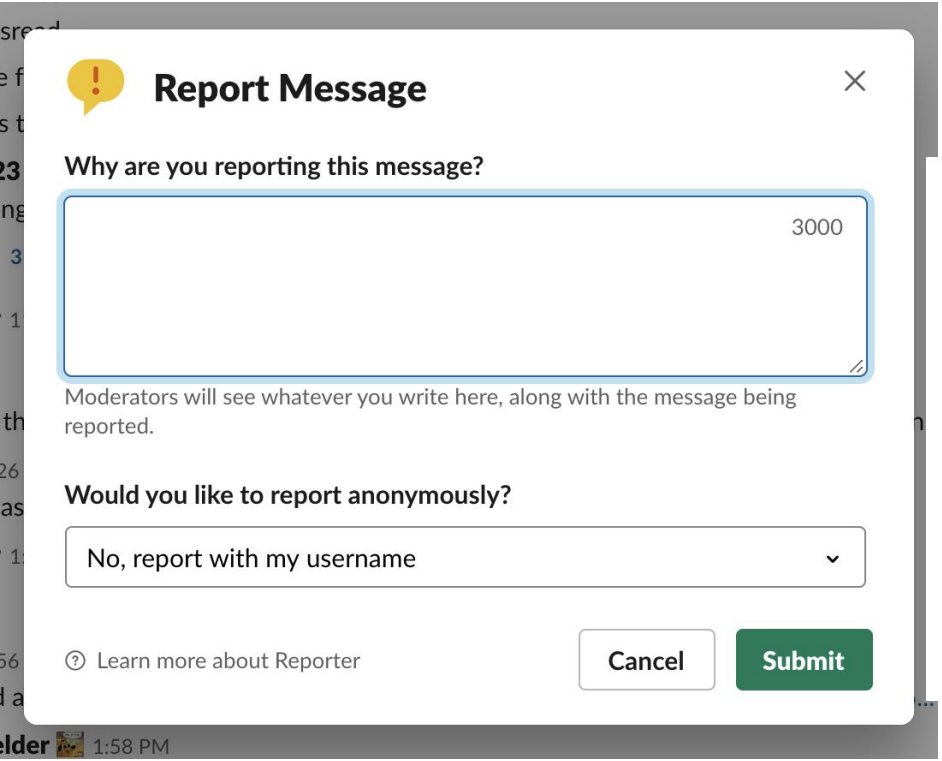
```
skipped 61 lines
62 [8,103 / 9,958] 48 / 176 tests; GUNZIP external/gcloud-base/image/004.tar.gz.nogz; 80s remote ... (55 actions running)
63 Slow read: a 9318156-byte read from /bazel-scratch/.cache/bazel/_bazel_root/05618a594cb3499a4b912817865867cd/execroot/io_k8s_test_infra/bazel-out/k8-fastbuild/bin/ghproxy/linux_amd64_pure_stripped/app.binary took 5037 ms.
64 [9,118 / 9,987] 78 / 176 tests; GUNZIP external/gcloud-base/image/004.tar.gz.nogz; 111s remote ... (109 actions running)
65 [9,621 / 10,004] 96 / 176 tests; GUNZIP external/gcloud-base/image/004.tar.gz.nogz; 147s remote ... (149 actions running)
66 [9,778 / 10,043] 135 / 176 tests; GUNZIP external/gcloud-base/image/004.tar.gz.nogz; 188s remote ... (89 actions running)
```

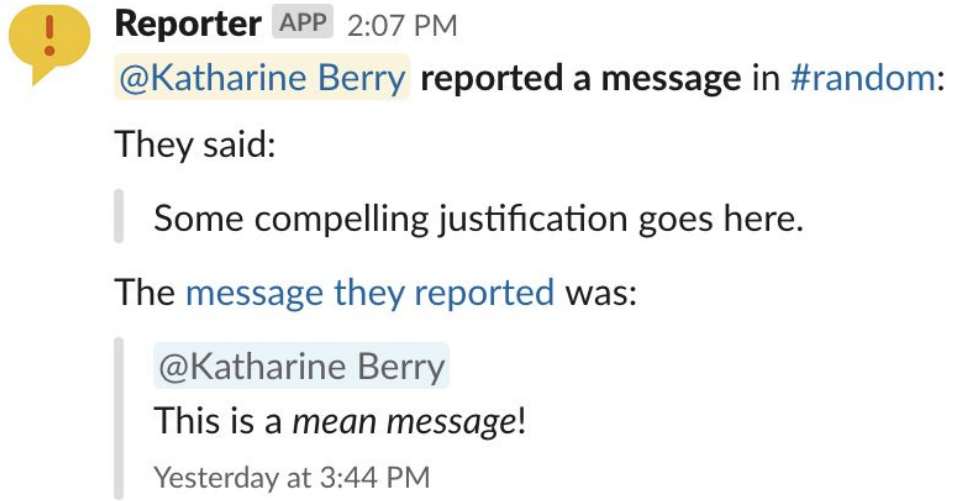
Prow: Self Automated Deployment

1. PR some changes to Prow.
2. PR passes tests, checks, and review.
3. Tide automatically merges the PR.
4. Post-submit job builds and publishes new Prow images.

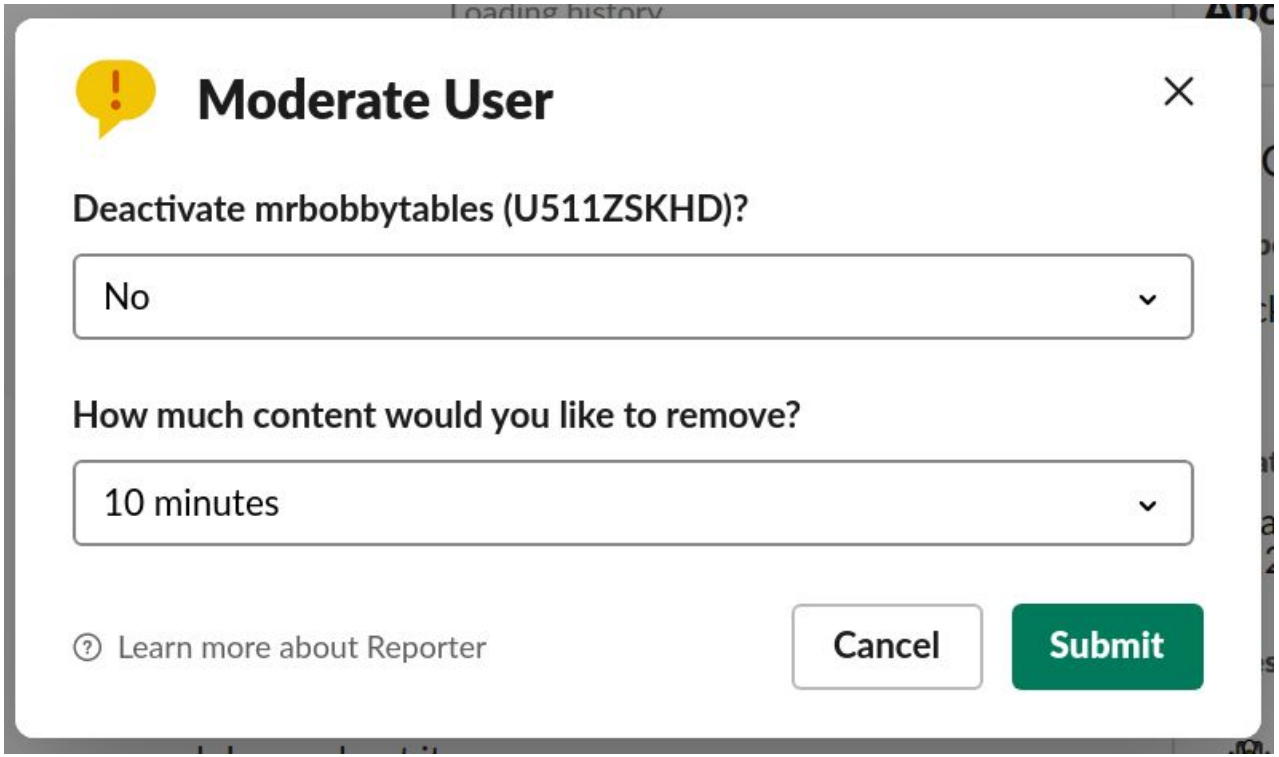
5. Daily periodic job creates a PR to update the checked-in Prow component versions.
6. Current on-call approves the version bump PR.
7. Post-submit job deploys changes to cluster resources.

Slack Automation





Slack Automation



Slack Automation

Event Log APP 2:44 PM

Channel #unknown-channel was **deleted**

Channel #asdfhdfg was **archived** by @Katharine Berry

Channel #asdfhdfg was **unarchived** by @Katharine Berry

A **user was deactivated**: @Surfing (this is heuristic: they are definitely deleted now, but may also have been before)

The **Slack team was renamed** to "sig-testing party"

The **Slack team moved** to https://sig-testing-party.slack.com

The **Slack team was renamed** to "sig-testing"

A **new emoji was added**: `:facepalm:` :facepalm:

A **new emoji alias was added**: `:oops:`. It's an alias for `:facepalm:`. :oops:

An **emoji was deleted**. It had several names: `:oops:`, `:facepalm:`

Tide History

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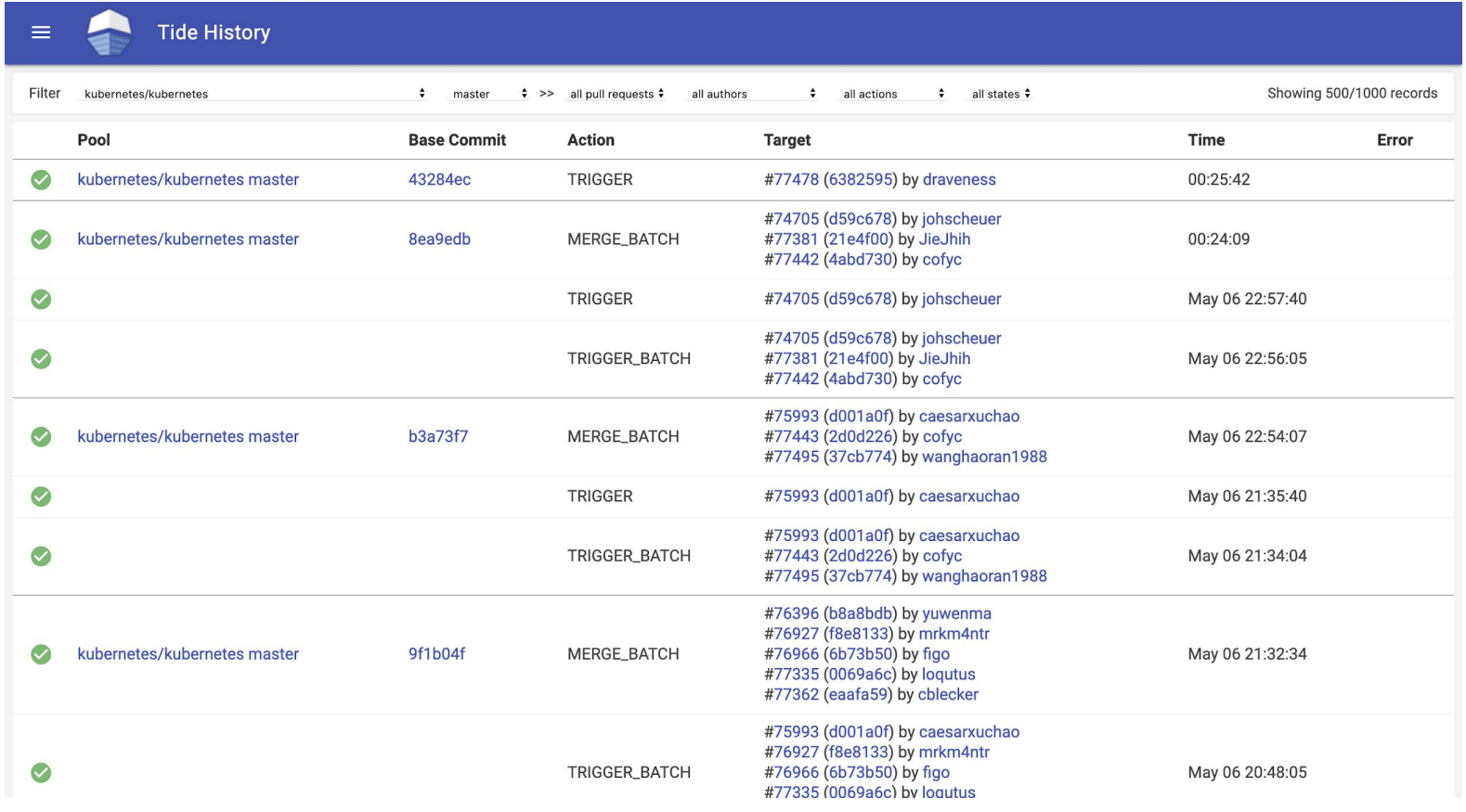
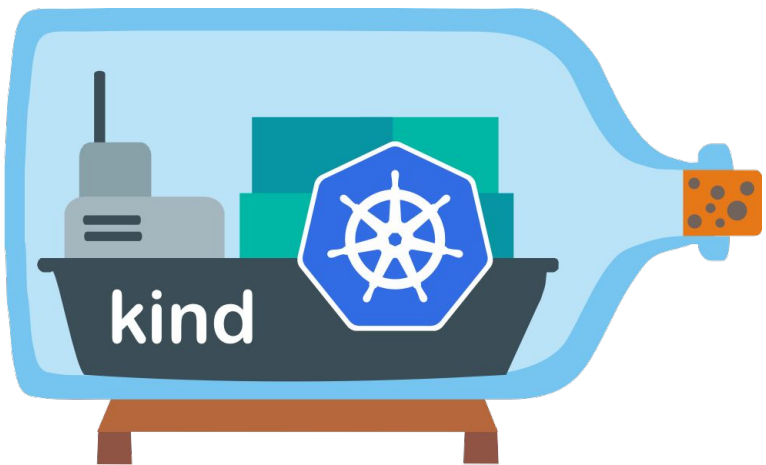


Pool	Base Commit	Action	Target	Time	Error
kubernetes/kubernetes master	43284ec	TRIGGER	#77478 (6382595) by draveness	00:25:42	
kubernetes/kubernetes master	8ea9edb	MERGE_BATCH	#74705 (d59c678) by johscheuer #77381 (21e4f00) by JieJhih #77442 (4abd730) by cofyc	00:24:09	
		TRIGGER	#74705 (d59c678) by johscheuer	May 06 22:57:40	
		TRIGGER_BATCH	#74705 (d59c678) by johscheuer #77381 (21e4f00) by JieJhih #77442 (4abd730) by cofyc	May 06 22:56:05	
kubernetes/kubernetes master	b3a73f7	MERGE_BATCH	#75993 (d001a0f) by caesarxuchao #77443 (2d0d226) by cofyc #77495 (37cb774) by wanghaoran1988	May 06 22:54:07	
		TRIGGER	#75993 (d001a0f) by caesarxuchao	May 06 21:35:40	
		TRIGGER_BATCH	#75993 (d001a0f) by caesarxuchao #77443 (2d0d226) by cofyc #77495 (37cb774) by wanghaoran1988	May 06 21:34:04	
kubernetes/kubernetes master	9f1b04f	MERGE_BATCH	#76396 (b8a8bdb) by yuwenma #76927 (f8e8133) by mrkm4ntr #76966 (6b73b50) by figo #77335 (0069a6c) by loqutus #77362 (eaafa59) by cblecker	May 06 21:32:34	
		TRIGGER_BATCH	#75993 (d001a0f) by caesarxuchao #76927 (f8e8133) by mrkm4ntr #76966 (6b73b50) by figo #77335 (0069a6c) by loqutus	May 06 20:48:05	

kind - Kubernetes in Docker

New since Kubecon Seattle:

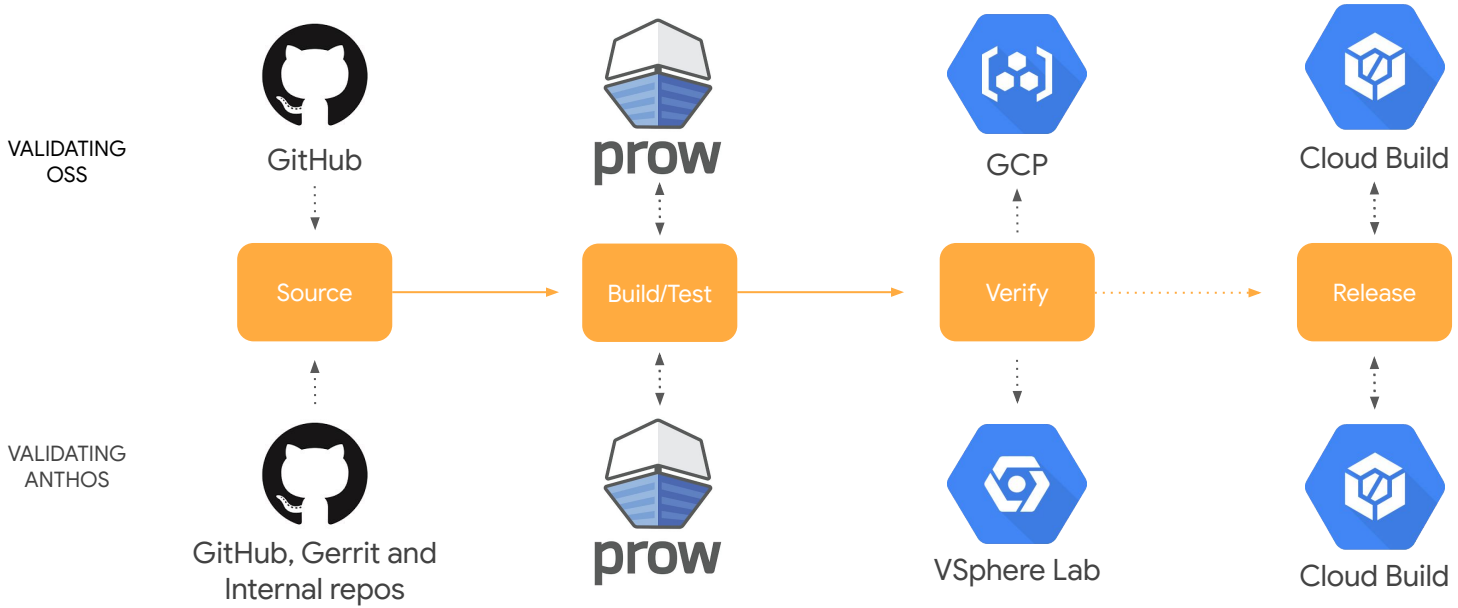
- Proxy support
- Fully offline clusters & development
- Image side loading (`kind load docker-image` and `kind load image-archive`)
- Conformance certified
- Limited ARM64 & PPC64LE support
- Improved windows (host) support
- Significantly faster cluster startup
- https://kind.sigs.k8s.io/ docs site
- Configurable API Server address & port
- Support for additional node mounts



What we're up to now

- Prow
  - Supporting more git providers and code review platforms
  - Improving metrics and alerting
  - OSS management of prow.k8s.io
  - Improve self service of config
  - GitHub Enterprise support
- kind
  - Even faster startup and smaller images with containerd
  - Networking revamp: lightweight CNI config, exposing ports on the fly
  - Restart support
  - Building from Kubernetes release tarballs

ANTHOS - A Hybrid Cloud Case Study



Success criteria for CI Pipeline

- Move fast without breaking things - Developer Productivity and Quality !
- Easy to adopt - Seamless integration into developer workflow
- Less learning curve for contributors
- Highly reliable
- Great support
- Good reporting solution to publish test results and relevant metrics

SIG Testing to the rescue !!

Prow - CI framework

- Internal instance of Prow inside vSphere test lab

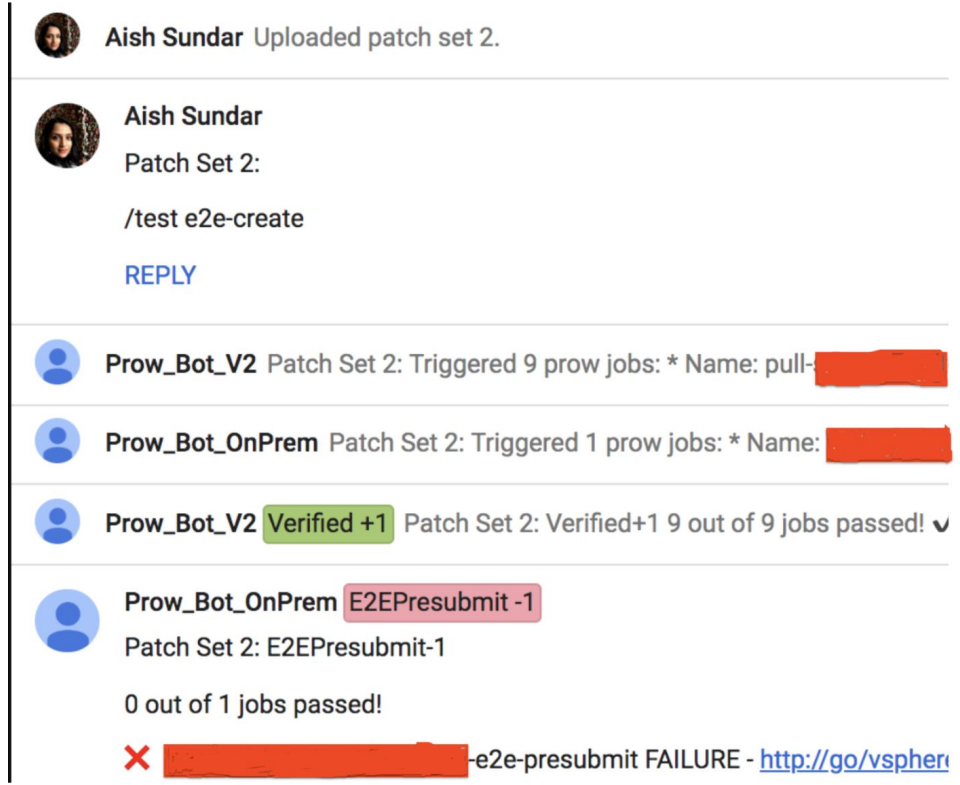
- Testing Anthos on Anthos !
  - Dogfood product
  - Snapshot Prow cluster every release

- Extending OSS Prow
  - Capability to post test results back to Gerrit CLs
  - Comment based triggering in Gerrit
  - Postsubmit test hook

- Adopt OSS qualification model
  - Run tests on k8s container
  - Conformance tests to validate cluster functionality and health

Contributor Productivity

- PR management
  - automated tests
  - test results/logs in PR
  - PR approval
  - automated image uploads



Boskos - Resource management tool

- Resource management tool
- Clusters and IPs
- Janitor

Now — Success rate over time: 3h: 100%, 12h: 100%, 48h: 100% — 12h ago

Repository	Revision	Job	Started	Duration
		periodic-onprem-aborted-cleanup	10:09:59	3m10s
		periodic-onprem-aborted-cleanup	09:20:42	3m57s
		periodic-onprem-aborted-cleanup	07:50:42	3m27s
		periodic-onprem-aborted-cleanup	06:20:42	3m57s
		periodic-onprem-aborted-cleanup	04:50:42	3m57s
		periodic-onprem-aborted-cleanup	03:20:42	3m27s
		periodic-onprem-aborted-cleanup	01:50:42	3m57s
		periodic-onprem-aborted-cleanup	00:20:42	3m57s
		periodic-onprem-aborted-cleanup	May 03 22:50:42	3m57s
		periodic-onprem-aborted-cleanup	May 03 21:20:42	3m57s

{"type":"ip","current":{"busy":5,"free":55},"owner":{"":55,"83ff28d6-6ec6-11e9-9bc1-5e42022215de":5}}

Spyglass - Test Log Viewer

Job History | Artifacts

Test started today at 1:02 PM failed after 1h45m31s. (more info)

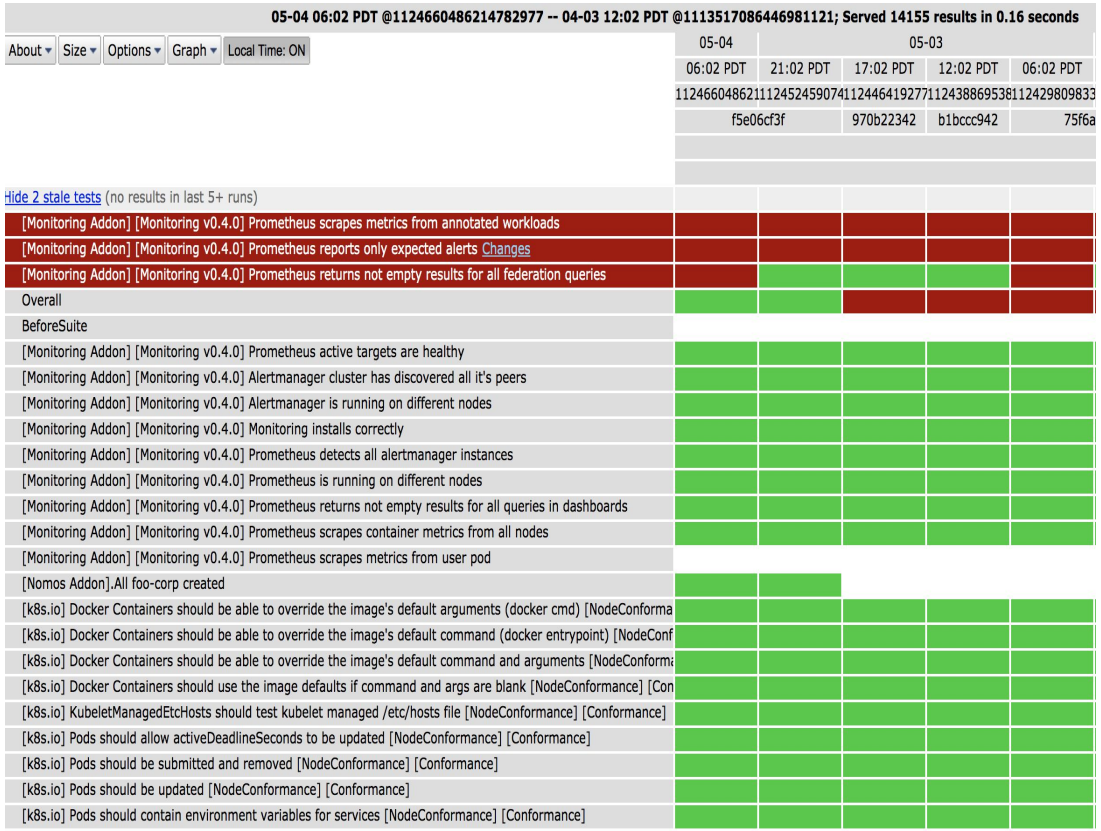
Build Log

Show all hidden lines | Raw build-log.txt

```
skipped 16456 lines
16457 I0504 21:00:34.171903 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16458 I0504 21:00:44.171897 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16459 I0504 21:00:54.171855 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16460 I0504 21:01:04.171892 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16461 I0504 21:01:04.175720 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16462 I0504 21:01:04.178650 18199 clusterdeployer.go:318] removing old admin machines in internal cluster: deleting machine default/gke-admin-master-czk75: error
      waiting for machine(s) deletion to complete: timed out waiting for the condition
16463 I0504 21:01:14.183650 18199 clusterdeployer.go:901] deleting machine default/gke-admin-master-czk75
16464 I0504 21:01:14.190989 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16465 I0504 21:01:24.193998 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16466 I0504 21:01:34.194019 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16467 I0504 21:01:44.194041 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
      skipped 83 lines
16551 I0504 21:15:44.194058 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16552 I0504 21:15:54.194025 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16553 I0504 21:16:04.194007 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16554 I0504 21:16:14.194063 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
16555 I0504 21:16:14.197768 18199 clusterclient.go:561] Waiting for machine objects to be deleted...
```

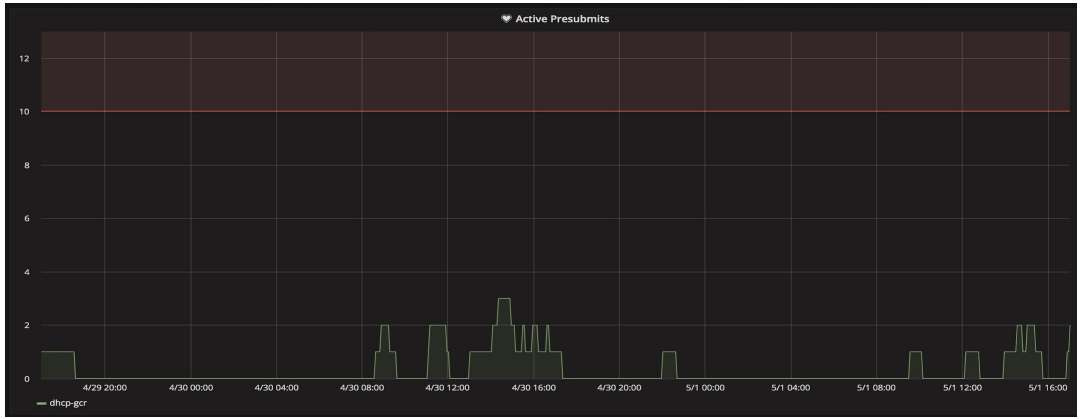
TestGrid - Test Results and Metrics Reporting

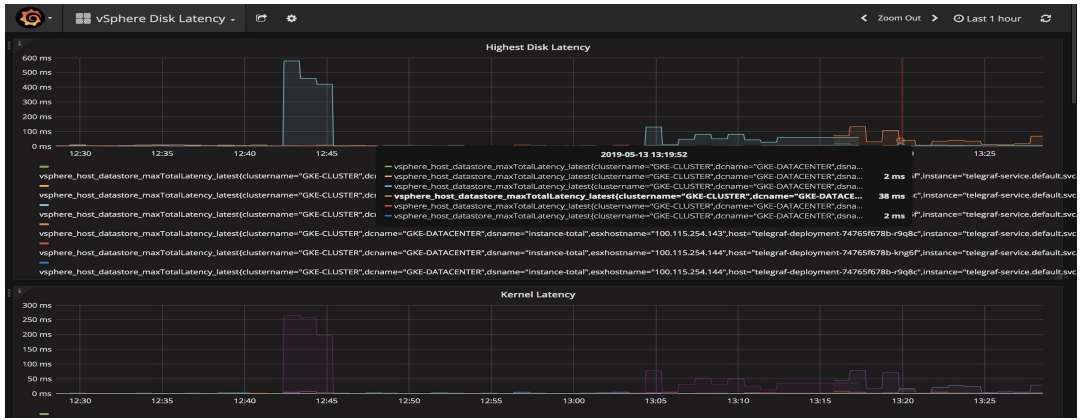
- Presubmit and Periodic Test Results
- Test Metadata
- Code coverage
- Test flakiness
- Test duration
- Automated failure alerts
- Automated issue management



Velodrome - CI and Lab Metrics Dashboard

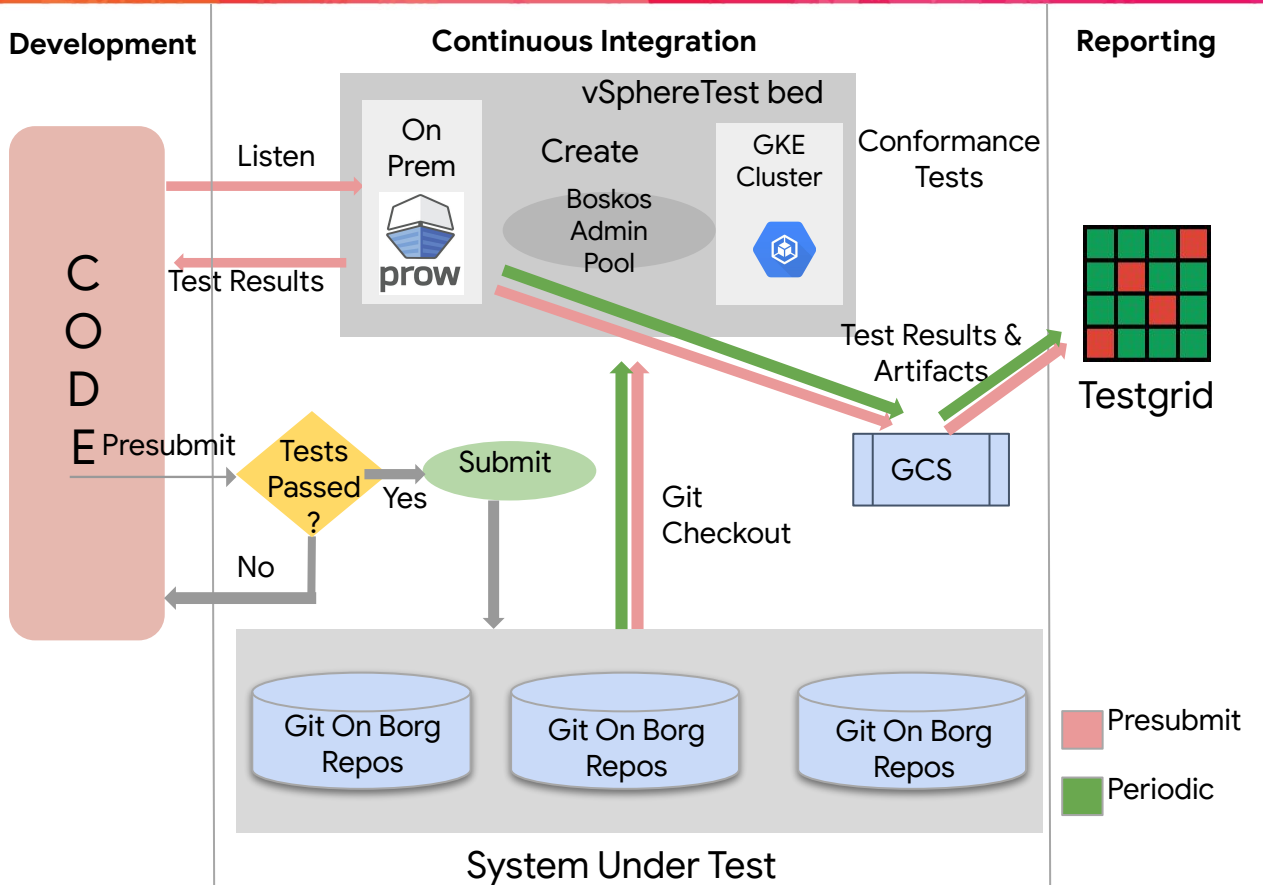
- Presubmit load
- Presubmit failure rate
- Boskos IP usage
- Test lab metrics
- F5 metrics





Qualification Pipeline

- Continuously and reliably validate Anthos binaries
- Enable teams to integrate easily
- Provide release readiness signals



Where to find us?

SIG Testing Community README

Weekly meetings - Tuesdays 1pm PT (timezone converter)

kubernetes-sig-testing mailing list (join to view calendar and documents)

Slack channel (get an invite)

- See #prow, #kind, and #testing-ops too.

Repos:

- kubernetes/test-infra
- kubernetes-sigs/kind
- kubernetes-sigs/slack-infra

THANKS