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SIG Testing Intro

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This Presentation



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

SIG-Testing Tools



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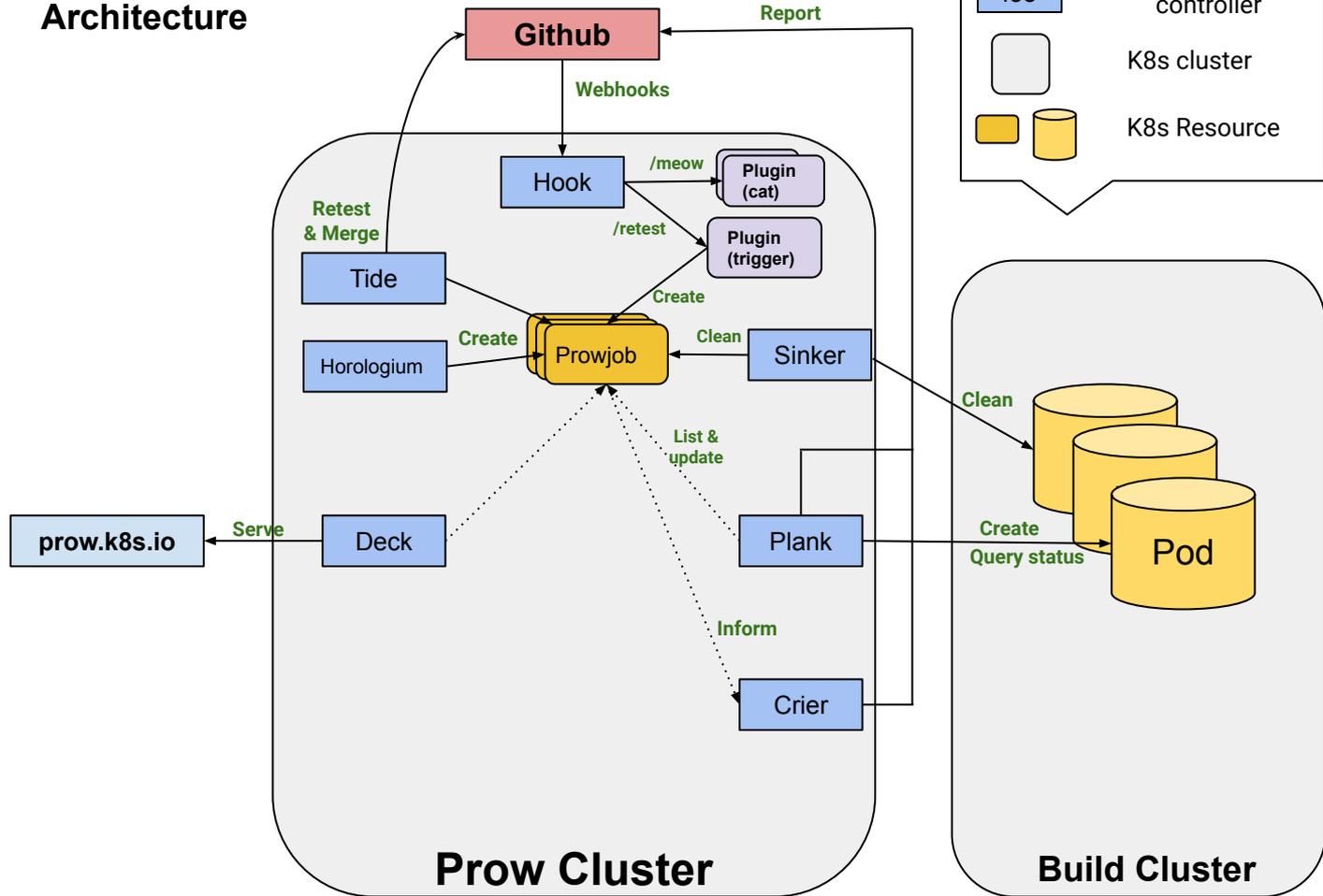
Europe 2019

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

- 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



What's new?



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- 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



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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



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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



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Report Message

Why are you reporting this message?

Moderators will see whatever you write here, along with the message being reported.

Would you like to report anonymously?

[Learn more about Reporter](#)

Cancel

Submit



Reporter APP 2:07 PM

@Katharine Berry reported a message in #random:

They said:

Some compelling justification goes here.

The message they reported was:

@Katharine Berry

This is a *mean message!*

Yesterday at 3:44 PM

Slack Automation



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Loading history

 **Moderate User** ✕

Deactivate mrbobbytables (U511ZSKHD)?

▼

How much content would you like to remove?

▼

[? Learn more about Reporter](#)

10

Slack Automation



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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 JieJih #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 JieJih #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



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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



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- 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

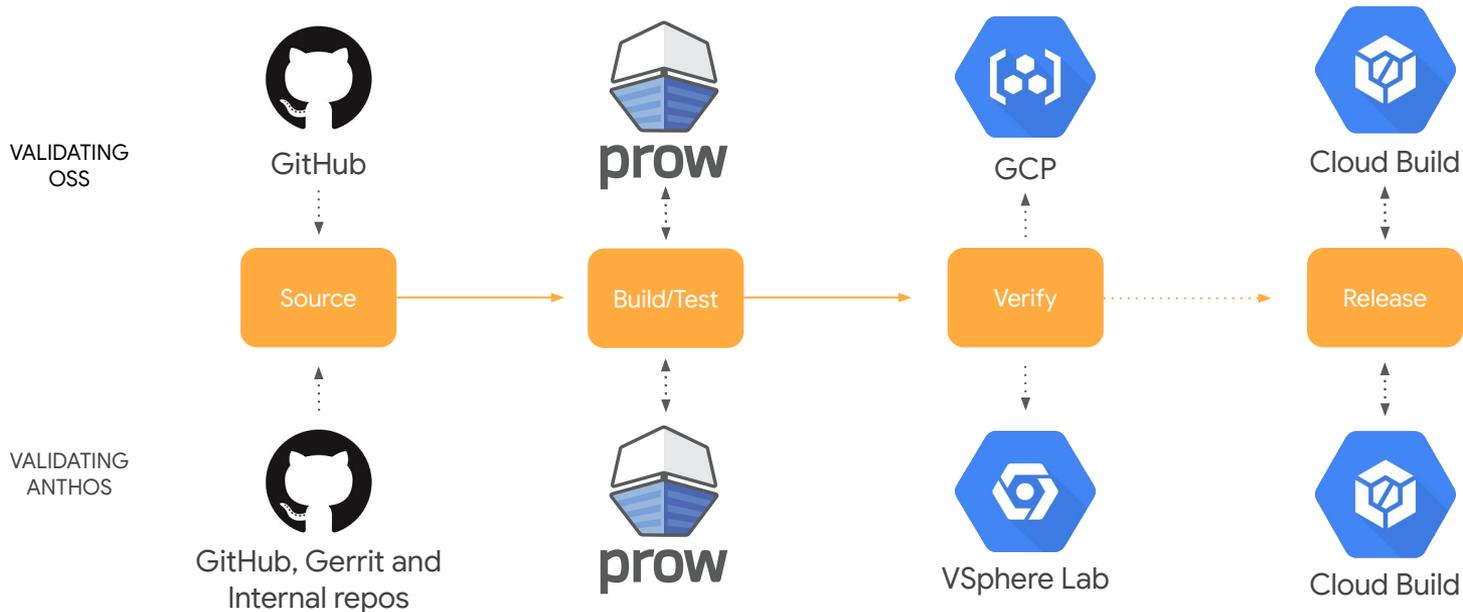


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Success criteria for CI Pipeline



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- 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



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- 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



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



Aish Sundar Uploaded patch set 2.



Aish Sundar

Patch Set 2:

/test e2e-create

[REPLY](#)



Prow_Bot_V2 Patch Set 2: Triggered 9 prow jobs: * Name: pull- [REDACTED]



Prow_Bot_OnPrem Patch Set 2: Triggered 1 prow jobs: * Name: [REDACTED]



Prow_Bot_V2 Verified +1 Patch Set 2: Verified+1 9 out of 9 jobs passed! ✓



Prow_Bot_OnPrem E2EPresubmit -1

Patch Set 2: E2EPresubmit-1

0 out of 1 jobs passed!



[REDACTED] e2e-presubmit FAILURE - <http://go/vsphere>

Boskos - Resource management tool



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- 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



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[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



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

05-04 06:02 PDT @1124660486214782977 -- 04-03 12:02 PDT @1113517086446981121; Served 14155 results in 0.16 seconds						
About	Size	Options	Graph	Local Time: ON		
		05-04	05-03			
		06:02 PDT	21:02 PDT	17:02 PDT	12:02 PDT	06:02 PDT
		1124660486211124524590741	124464192771124388695381	12429809833		
		f5e06cf3f	970b22342	b1bcc942	75f6a	
Hide 2 stale tests (no results in last 5+ runs)						
[Monitoring Addon] [Monitoring v0.4.0] Prometheus scrapes metrics from annotated workloads						
[Monitoring Addon] [Monitoring v0.4.0] Prometheus reports only expected alerts Changes						
[Monitoring Addon] [Monitoring v0.4.0] Prometheus returns not empty results for all federation queries						
Overall						
BeforeSuite						
[Monitoring Addon] [Monitoring v0.4.0] Prometheus active targets are healthy						
[Monitoring Addon] [Monitoring v0.4.0] Alertmanager cluster has discovered all it's peers						
[Monitoring Addon] [Monitoring v0.4.0] Alertmanager is running on different nodes						
[Monitoring Addon] [Monitoring v0.4.0] Monitoring installs correctly						
[Monitoring Addon] [Monitoring v0.4.0] Prometheus detects all alertmanager instances						
[Monitoring Addon] [Monitoring v0.4.0] Prometheus is running on different nodes						
[Monitoring Addon] [Monitoring v0.4.0] Prometheus returns not empty results for all queries in dashboards						
[Monitoring Addon] [Monitoring v0.4.0] Prometheus scrapes container metrics from all nodes						
[Monitoring Addon] [Monitoring v0.4.0] Prometheus scrapes metrics from user pod						
[Nomos Addon].All foo-corp created						
[k8s.io] Docker Containers should be able to override the image's default arguments (docker cmd) [NodeConform						
[k8s.io] Docker Containers should be able to override the image's default command (docker endpoint) [NodeConf						
[k8s.io] Docker Containers should be able to override the image's default command and arguments [NodeConform						
[k8s.io] Docker Containers should use the image defaults if command and args are blank [NodeConformance] [Con						
[k8s.io] KubeletManagedEtcHosts should test kubelet managed /etc/hosts file [NodeConformance] [Conformance]						
[k8s.io] Pods should allow activeDeadlineSeconds to be updated [NodeConformance] [Conformance]						
[k8s.io] Pods should be submitted and removed [NodeConformance] [Conformance]						
[k8s.io] Pods should be updated [NodeConformance] [Conformance]						
[k8s.io] Pods should contain environment variables for services [NodeConformance] [Conformance]						



Velodrome - CI and Lab Metrics Dashboard



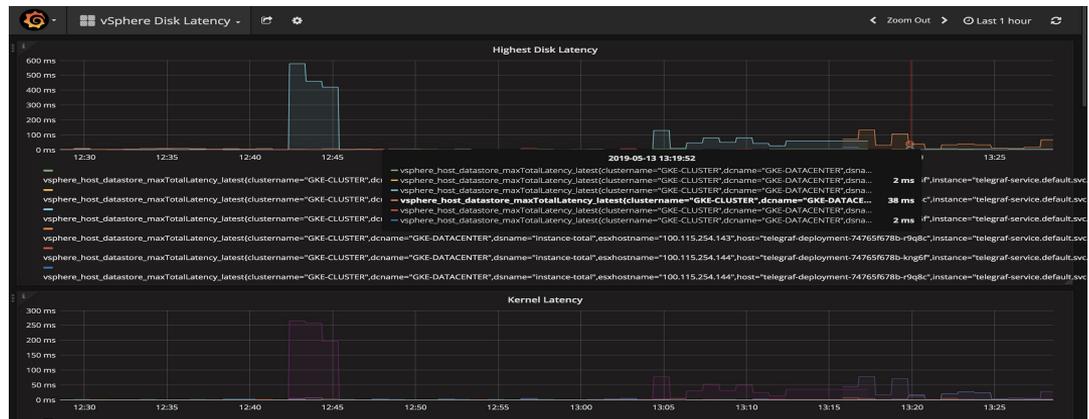
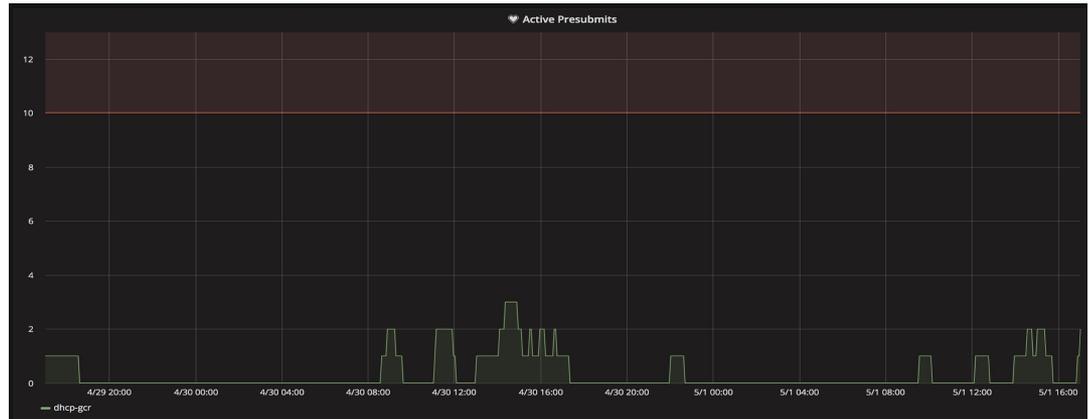
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- Presubmit load
- Presubmit failure rate
- Boskos IP usage
- Test lab metrics
- F5 metrics



Qualification Pipeline



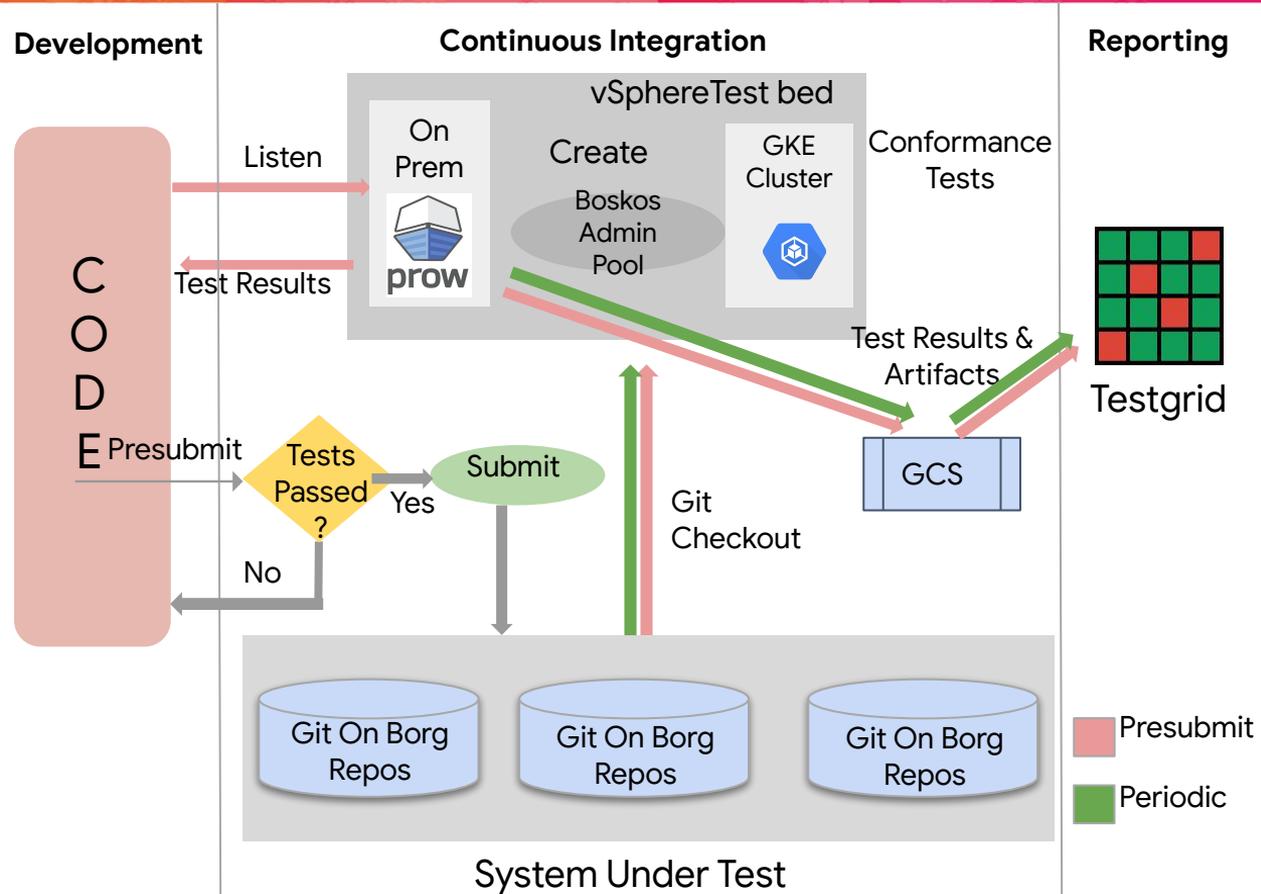
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- Continuously and reliably validate Anthos binaries
- Enable teams to integrate easily
- Provide release readiness signals



Where to find us?



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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](#)



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THANKS