

Testing at Scale

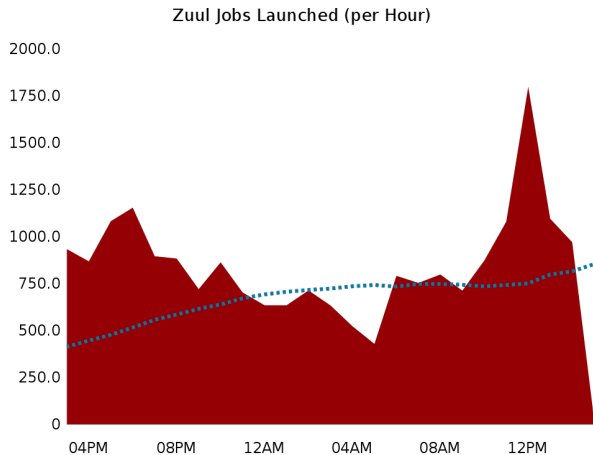
Andrea Frittoli
andrea.frittoli@gmail.com
andreaaf on Freenode
@blackchip76 on Twitter

Jun 2, 2017

https://github.com/andreafrittoli/testing_at_scale

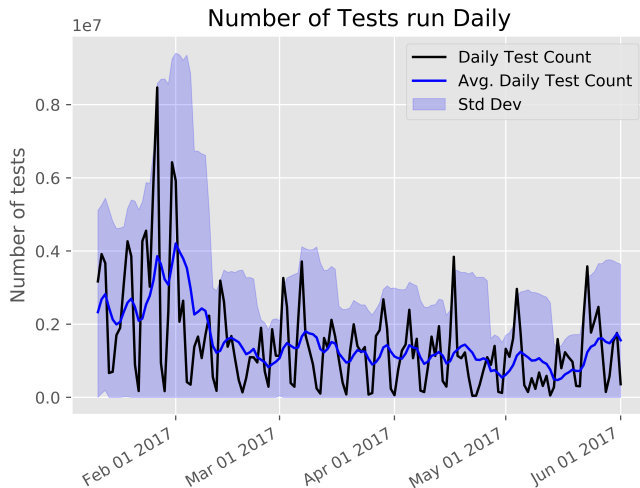
OpenStack CI in Numbers

- ▶ ~1500 contributors to Pike
- ▶ 6 Clouds + 2 run by OpenStack Infra
- ▶ 1600+ repos in openstack(|-dev|-infra)
- ▶ 20k lines Zuul configuration



Source: Zuul, Graphite

OpenStack CI in Numbers



Source: subunit2sql-graph dailycount

Testing OpenStack

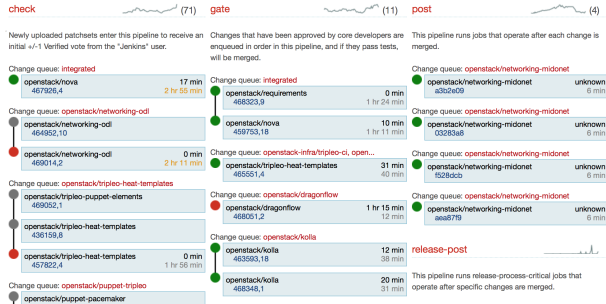


Status **Zuul** Rechecks Reviews Bugday OpenStack-Health

Zuul Status

Zuul is a pipeline oriented project gating and automation system. Each of the sections below is a separate pipeline configured to automate some portion of the testing or operation of the OpenStack project. For more information, please see the [Zuul reference manual](#).

Queue lengths: 0 events, 0 results. Filters: Expand by default: ☐



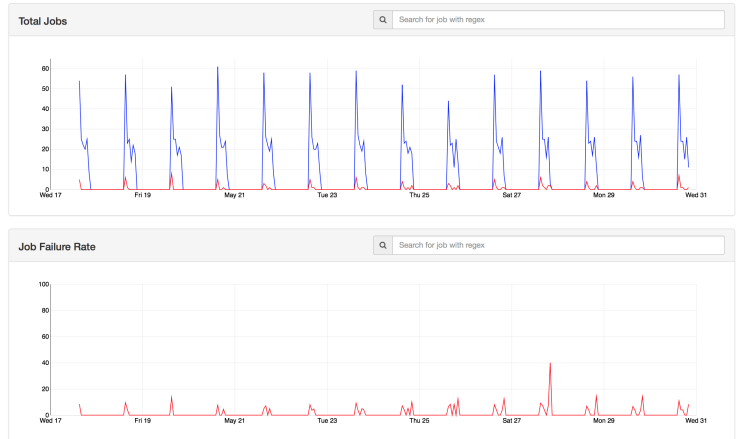
- Release ready master
- Check & Gate Pipelines
- Ephemeral test system

Source: <http://status.openstack.org/zuul>

Beyond the gate

- Periodic tests
- Release jobs

periodic jobs



Reference: status.openstack.org/openstack-health/

The unbalanced scale

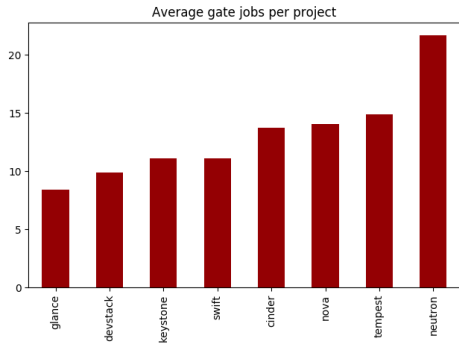
- ▶ Core reviewers
- ▶ Horizontal teams
- ▶ Running CI



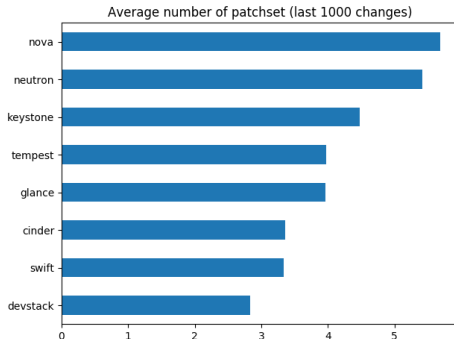
- ▶ Commits
- ▶ # of Tests
- ▶ # of Configurations

Not the scale I meant...

Life as a contributor



Source: subunit2sql DB



Source: Gerrit API

My day in reviews

- Change in devstack:

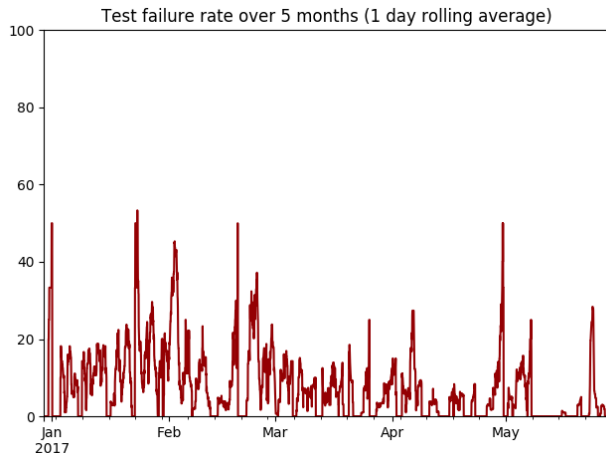
```
536      +      if [ -z "$VRIT_DRIVER" ]; then
537      +          # If there is not virt driver defined we assume nova is not installed
538      +          iniset $STEMPEST_CONFIG service_available nova "False"
539      +      fi
540      +
```

Source: <https://review.openstack.org/468060>

- CI reports all green
- Can you see the error?

Keep the gate flowing

- ▶ Number of services
- ▶ Service memory footprint
- ▶ Test load
- ▶ Libvirt instability under load
- ▶ Tempest bug in ssh test code
- ▶ Vanilla database configuration



Source: Zuul, Graphite

Data!

- ▶ 50MB compressed logs for integration test run
 - ▶ node setup
 - ▶ system, service and test log files
 - ▶ system, service and test configuration
 - ▶ system metrics (dstat data)
 - ▶ libvirt logs
- ▶ Test result data (Zuul & subunit)
- ▶ Gerrit event streams

Single run view

- ▶ Deeplink into logs
- ▶ HTML view of tests
- ▶ Stackviz
- ▶ Ansible Run Analysis



Reference: **Stackviz**

Deeper into data

- ▶ ELK, Elastic Recheck [DEMO: <http://status.openstack.org/elastic-recheck/>]
- ▶ OpenStack Health [DEMO: <http://status.openstack.org/openstack-health/>]

Other Data Sources

- ▶ Graphite: <http://graphite.openstack.org>
- ▶ Grafana: <http://grafana.openstack.org>
- ▶ Firehose: <https://docs.openstack.org/infra/system-config/firehose.html>

What's next?

- ▶ Metrics over time from OS, MySQL, RabbitMQ, etc
- ▶ CRM114
- ▶ Artificial intelligence

Playing with Machine Learning

- ▶ Long Short Term Memory network, RNN
- ▶ Trained with nova logs from periodic test runs
- ▶ DEMO

AI to the rescue

- ▶ Make anomalous log lines emerge
- ▶ Help identify new elastick recheck signatures
- ▶ Catch changes in behaviour that we do not test for
- ▶ Help review process

References

- ▶ <http://status.openstack.org>
- ▶ <http://review.openstack.org>
- ▶ <https://github.com/sherjilozair/char-rnn-tensorflow>
- ▶ [https://en.wikipedia.org/wiki/CRM114_\(program\)](https://en.wikipedia.org/wiki/CRM114_(program))
- ▶ https://github.com/andreafrittoli/testing_at_scale/
- ▶ IRC: #openstack-qa
- ▶ email: openstack-dev@lists.openstack.org, tag [QA]

Thank you!
Questions?